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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Mail to:

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DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
January 2, 1990 Volume 1110 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

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CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the Official Gazette from July 1, 1964, through December 31, 1988. These notices and rule changes are currently in effect unless otherwise noted.

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INFORMATION AND CORRESPONDENCE

(1) Official Patent Office Mailing Address Remains Washington, D.C.

The official mailing address for all communications sent to the Patent Office remains:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Any telegrams sent to the Patent Office must also bear the above identical address.

The physical location of the Patent Office is 2021 Jefferson Davis Highway, Arlington, Virginia. This address must not be used when addressing mail to the Patent Office.

No reference to Crystal Plaza, Virginia, should be made in the address of any communication intended for delivery to the Patent Office by the Post Office Department or Western Union.

Compliance with this instruction will help prevent any unnecessary delay of mail, telegrams, etc.

C. A. KALK,
Feb. 20, 1969. *Director of Administration.*

(Office name change per Public Law 93-596, Jan. 2, 1975)

[860 O.G. 662]

(2) Group Number on all Communications Going to the Examining Groups

Applicants and their attorneys or agents are reminded that the Group number should be typed on amendments and other communications relating to matters handled in the examining groups in order to expedite the processing of mail. The number of the Group should be placed on right-hand side, opposite the serial number or name of the applicant.

This reminder does not apply to notices and reasons of appeal to the United States Court of Appeals for the Federal Circuit.

These communications should be sent to the Solicitor at the address below:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Attention to these details will improve the efficiency and reduce the time necessary to process incoming mail.

Nov. 23, 1983. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1037 OG 25]

(3) Mailing of Papers to the PTO in Patent Interference Proceedings

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or applicationinvolved in an interference proceeding, as follows:

BOX INTERFERENCE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

Nov. 28, 1983. DONALD J. QUIGG,
Deputy Commissioner of Patents and Trademarks.

[1037 OG 25]

(4) Establishment of a Special Box for Expedited Processing of Issue Fees

Effective immediately, the Patent and Trademark Office has established a special box designator for issue fees to allow expedited processing of the Issue Fee Transmittal (PTOL Form 85), and the order for advance copies.

In order to take advantage of this new service, the envelope should be addressed:

Box Issue Fees
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Only the Issue Fee Transmittal (PTOL Form 85), advance copy orders and the fees associated with these two services are to be placed in the envelope. Including documents other than those specified will delay their reaching the area for which they were intended.

PLEASE USE THE NEW ISSUE FEE BOX.

THERESA A. BRELSFORD,
Mar. 4, 1988 *Assistant Commissioner for Administration.*

[1088 OG 41]

(5) Establishment of Three Special Boxes for Expedited Processing

The Patent and Trademark Office has established three additional special boxes to allow expedited processing of non-fee amendments to patent applications, petitions for filing date and/or serial number information for patent applications, and issue fees.

In order to take advantage of these new expedited services, the envelope must be addressed:

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For non-fee amendments to patent applications:

Box Non-Fee Amendments (Pats)
Commissioner of Patents and Trademarks
Washington, D.C. 20231

For petitions under 37 CFR 1.182 and associated fees for obtaining filing date and/or serial number information for patent applications prior to receipt of the official "Filing Receipt", "Notice to File Missing Parts", or "Notice of Incomplete Application".

Box SN
Commissioner of Patents and Trademarks
Washington, D.C. 20231

For Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings:

Box Issue Fees
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Only those documents specified for the special box are to be placed in the envelope addressed to that special box. Placing extraneous documents in an envelope marked for any special box will significantly delay their reaching the area for which they were intended.

Mar. 22, 1988. THERESA A.BRELSFORD,
Assistant Commissioner for Administration.

[1089 OG 45]

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(6) **Identification for Application Correspondence**

The Office is continuing to experience difficulty in matching incoming papers with the corresponding application files. This applies especially to responses to Office Actions, powers of attorney, changes of address, status letters, requests for extensions of time, and petitions.

A very necessary part of a complete identification of a pending application is the three-digit Group or Art Unit number, e.g., 110 or 111. Frequently, the Group or Art Unit number is entirely omitted, or there are errors in this number. In the latter situation the error often occurs as a result of the case having been reassigned within the Office, and the communication is directed to an Examining Group other than that indicated in the most recent Office Action.

Where the Group Art Unit number is entirely omitted, the routine operations of the Application Branch must be interrupted solely for the purpose of determining the location of the application so that the communication can be properly routed. Under these circumstances the efficiency of the Application Branch is impaired and the incoming paper is delayed in reaching its proper destination. Where such papers are not essential to compliance with a statutory period or time limit for response, they may be returned for completion to identify the location of the files.

To assist the Office in expediting its business, it is requested that ALL papers relating to a pending application include the following information:

1. Serial number (checked for accuracy),
2. Group Art Unit number (copied from filing receipt or most recent Office Action),
3. Filing date,
4. Name of the Examiner who prepared the most recent Office Action.
5. Title of the invention.

To further reduce the burden on Application Branch and the Examining Groups, it is also requested that the submission of additional or supplemental papers on a newly filed application be deferred until a filing receipt has been received. In the same vein, it would be appreciated if the filing of additional papers, relating to an allowed application were deferred until a notice of allowance (POL-85) was received.

If the above suggestions are adopted the processing of both new and allowed applications could proceed more efficiently and promptly through the Patent Office.

Mar. 5, 1971. RICHARD A. WAHL,
Assistant Commissioner.

[885 O.G. 2]

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(7) **Identifying Application Correspondence With Issue Batch Number**

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

Jan. 16, 1976. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[943 O.G. 519]

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(8) **Hand Delivery of Papers**

The notices of November 10, 1969 (869 O.G. 345) and September 8. 1970 (879 O.G. 667), regarding "Hand Delivery of Papers," are superseded and the practice indicated below is hereby made effective.

Any paper which relates to a pending application may be personally delivered to an Examining Group. However, the Examining Group will accept the paper only if: (1) the paper is accompanied by some form of receipt which can be handed back to the person delivering the paper; and (2) the Examining Group being asked to receive the paper is responsible for acting on the paper.

The receipt may take the form of a duplicate copy of such paper or a card identifying the paper. The identifying data on the card should be so complete as to leave no uncertainty as to the paper filed. For example, the card should contain the applicant's name(s), Serial No., filing date and a description of the paper being filed. If more than one paper is being filed for the same application, the card should contain a description of each paper or item.

Under this procedure, the paper and receipt will be date stamped with the Group date stamp. The receipt will be handed back to the person hand delivering the paper. The paper will be correlated with the application and made an official paper in the file, thereby avoiding the necessity of processing and forwarding the paper to the Examining Group via the Mail Room.

The Examining Group will accept and date stamp a paper even though the paper is accompanied by a check or the paper contains an authorization to charge a Deposit Account. However, in such an instance, the paper will be hand carried by Group personnel to the Office of Finance for processing and then made an official paper in the file.

Jan. 29, 1974. WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[919 O.G. 1070]

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(9) **Post Card Receipt Reminder**

Applicants and the agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for *each* document for which a receipt is desired.

Nov. 21, 1968. RICHARD A. WAHL,
Assistant Commissioner.

[857 O.G. 667]

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(10) **Acknowledgement of Receipt of a Patent or Trademark Application**

When early notification of the serial number of newly filed application papers is desired, a *stamped, self-adressed post card* should be submitted with each application. Immediately after the mail has been opened in the Patent and Trademark Office, the post card will be stamped with both the receipt date and the serial number, and then returned to the addressee.

Within recent months, hundreds of cards could not be successfully returned because of insufficient postage or incomplete or nonexistent forwarding addresses. Accurate and complete addresses, including ZIP codes, are necessary to ensure prompt acknowledgement of the receipt of patent and trademark applications.

To assist in easy identification once the post card has been returned, it is suggested that the post card include applicant's names and title of invention.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

July 19, 1982. THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

[1021 O.G. 96]

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(11) **Inclusion of Preliminary Classification on Filing Receipts**

In response to a request from a patent attorney, we will print the preliminary classification assigned to an application on the filing receipt. It will show the class only and will be labeled "PRELIMINARY CLASS:". The new field will appear on the filing receipt shortly. We will not accept requests to correct the filing receipt for errors in or changes to the preliminary class.

Feb. 18, 1987. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1076 OG 25]

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(12) **Status Inquiries**

In an effort to sharply reduce the volume and need for status inquiries, the past policy that diligence must be established by making timely status requests in connection with petitions to revive is hereby discontinued.

When an application has been abandoned for an excessive period before the filing of a petition to revive, an appropriate terminal disclaimer may be required. It should also berecognized that a petition to revive must be accompanied by the proposed response unless it has been previously filed (Rule 137). Also, under Rule 113, "Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each claim so rejected and, if any claim stands allowed, compliance with any requirement or objection as to form."

New Applications

Current examining procedures now provide for the routine mailing from the Examining Groups of Form POL-327 in every case of allowance of an application except where an Examiner's Amendment is promptly mailed. Thus, the separate mailing of a Form POL-327 or an Examiner's Amendment in addition to a formal Notice of Allowance (POL-85) in all allowed cases would seem to obviate the need for status inquiries even as a precautionary measure where the applicant may believe his new application may have been passed to issue on the first examination. However, as an exception, a status inquiry would be appropriate where a Notice of Allowance is not received within three months from receipt of either a Form POL-327 or an Examiner's Amendment.

Current examining procedures also aim to minimize the spread in dates among the various examiner dockets of each Art Unit and Group with respect to actions on new applications. Accordingly, the dates of the "oldest new applications" appearing in the *Official Gazette* are fairly reliable guides as to the expected time frames of when the Examiners reach the cases for action.

Therefore, it should be rarely necessary to query the status of a new application.

Amended Applications

Amended cases are expected to be taken up by the examiner and an action completed within two months of the amendment date. Accordingly, a status inquiry is not in order after response by the attorney until five or six months have elapsed with no response from the Patent Office. A post card receipt for responses to Office actions, adequately and specifically identifying the papers filed, will be considered *prima facie* proof of receipt of such papers. Where such proof indicates the timely filing of a response, the submission of a copy of the post card with a copy of the response will ordinarily obviate the need for a petition to revive. Proof of receipt of a timely response to a final action will obviate the need for a petition to revive only if the response was in compliance with Rule 113.

In General

It is expected that this new policy will result in sharply reducing the number of status inquiries and permit the time now spent on them to be used in increasing Patent Office efficiency in other more essential areas.

Such status inquiries as may be still necessary may be more expeditiously processed by the Patent Office if each inquiry includes the application Serial Number, filing date, name of the applicant, name of the Examiner who prepared the most recent Office action, and Group Art Unit (taken from the most recent Office communication) in addition to the last known status of the application, and is accompanied by a stamped return-addressed envelope. Telephone inquiries regarding the status of applications should be directed to the group clerical personnel and not to the examiners. Inasmuch as the official records and applications are located in the clerical section of the Examining Groups, the clerical personnel can readily provide status information without consulting the examiners.

Status replies will be made by the Patent Office clerical support force and will only indicate whether the application is awaiting action by the Examiner or the applicant's response to an Office action. In the latter instance the mailing date of the Office action will also be given.

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The Notices of Dec. 5, 1969 (869 O.G. 1031) and Sept. 22, 1965 (819 O.G. 444) are hereby superseded.

RICHARD A. WAHL,
Nov. 24, 1971. *Assistant Commissioner of Patents.*

[893 O.G. 810]

(13) **Change of Address**

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice or change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner reasonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
May 28, 1975. *Deputy Assistant Commissioner for Patents.*

[935 O.G. 1352]

(14) **Change of Address or Practitioner in a Plurality of Patent Applications**

Change of Address

This notice is supplemental to the Notice of May 28, 1975, 935 O.G. 1352.

In those instances where a change in the correspondence address of a registered attorney or agent is necessary in a plurality of applications, and the number of applications is such as to cause undue hardship, the notification filed in each application may be a reproduction of a properly executed, original notification. The original notice may be sent to the Office of the Solicitor as notification to the Attorney's Roster of the change of address, or may be filed in one of the applications affected, provided that the notice includes an authorization for the public to inspect and copy the original notice in the event one of the applications containing a copy matures into a patent and the application containing the original paper is either pending or has become abandoned. The copies submitted in each affected application must identify where the original paper is located. Otherwise the practice governing the filing of notifications of change of address remains the same.

Powers of Attorney

In the event of a need to file a change in the power of attorney in a plurality of applications of a common assignee or inventive entity, and the number of applications is such as to cause undue hardship, a single, original paper may be used provided that a reproduction of this original paper is supplied in each of the affected applications. The copy of the original paper must identify in which application the original paper is located and authorize the public to inspect and copy the original paper in the event one of the applications containing a copy matures into a patent and the application containing the original paper is pending or has become abandoned. The procedures and usual prerequisites for the filing of grants and/or revocations or power of attorney otherwise remain the same.

WILLIAM FELDMAN,
Sept. 9, 1976. *Deputy Assistant Commissioner for Patents.*

[951 O.G. 454]

(15) **Express Mail**

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the *Official Gazette* of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
May 15, 1975. *Acting Assistant Commissioner for Administration.*

[936 O.G. 1554]

(16) **Certificate of Mailing Procedures**

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the *Official Gazette* on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the *Official Gazette* on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO-85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, the sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., responses to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the *Official Gazette* (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO-85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

> I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on _____
> (Date of Deposit)
> _____
> Name of applicant, assignee, or Registered Representative
> _____
> Signature
> _____
> Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application and is, therefore, excluded from the Certificate of Mailing Procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

[962 O.G. 20]

(17) **Change in Legal Holidays**

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded, in view of Public Law 98-144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC § 6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:

New Year's Day, Jan. 1.
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May.
Independence Day, July 4.
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11.
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

DONALD J. QUIGG,
July 15, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1069 OG 12]

(18) **Closing of Patent and Trademark Office on Monday, Jan. 26, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Jan. 26, 1987, the Patent and Trademark Office will consider Jan. 26, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purpose of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Jan. 27, 1987.

DONALD W. PETERSON,
Jan. 28, 1987. *Acting Assistant Secretary and Commissioner of Patents and Trademarks.*

[1075 OG 29]

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(19) **Closing of Patent and Trademark Office on Monday, Feb. 23, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Feb. 23, 1987, the Patent and Trademark Office will consider Feb. 23, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Feb. 24, 1987.

Feb. 27, 1987. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1098 OG 548]

(20) **Closing of the Patent and Trademark Office on Friday, Jan. 20, 1989**

In view of the fact that Federal and District of Columbia government offices in Washington, D.C. metropolitan area, including the Patent and Trademark Office were officially closed on Jan. 20, 1989, the Patent and Trademark Office will consider Jan. 20, 1989, a "holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of e.g. 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Jan. 23, 1989. Papers deposited in U.S. Department of Commerce District Offices on Jan. 20, 1989, will similarly be considered timely for the purposes of 35 U.S.C. §§ 119, 133 and 151.

Jan. 6, 1989 DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1098 OG 548]

(21) **Filing of Papers During Unscheduled Closings of the Patent and Trademark Office**

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open.

When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Information regarding whether or not the Office is officially closed on any particular day may be obtained by calling (703)-557-INFO.

Nov. 18, 1988 DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

[1097 OG 53]

(22) **Drawings in Patent Applications Filed After January 1, 1989**

The general rule applicable to release of any paper in a patent application file is that no paper (including a drawing) will be returned for any purpose whatever. 37 CFR 1.59. New rules published in the *Official Gazette* (1097 OG 36 (December 13, 1988)) effective January 1, 1989, no longer require the submission of formal drawings in a patent application. Since corrections are the responsibility of the applicant, the original drawing(s) should be retained by the applicant for future correction, if necessary.

As a result of adoption of these new rules relating to drawings, the Patent and Trademark Office will no longer release to applicants, bonded drafting companies or others, drawings from patent applications filed after January 1, 1989, and after January 1, 1991, no drawings may be borrowed from the office.

Access to applications is still provided with the proper power to inspect. If copies of any papers or drawings within the application are required, arrangements may be made through the File Information Unit and copies may be made in the Public Search Room. If there is some extraordinary situation that requires release of an original drawing in possession of the office, relief may be requested by filing a petition under 37 CFR 1.183.

July 7, 1989 Theresa A. Brelsford
Assistant Commissioner for Administration

[1105 OG 68]

(23) **Listing of Commercial Bonded Draftsmen**

The following listing of bonded draftsmen supersedes the listing published on Sept. 24, 1985 at 1058 O.G. 27.

Robert MacCollum
Patent Drafting Services
13108 Engelwood Dr.
Silver Spring, Md. 20904
(301) 622-3940

Suzanne Nahmias
P.O. Box 2413
Gatithersburg, Md. 20879
(301) 336-0351

Edward J. Oliver
Oliver Patent Drafting Service
1205 Darlington St.
Forestville, Md. 20747
(301) 336-0351

Quinn Patent Drawing Services
P. O. Box 1435
Alexandria, Va. 22313
(703) 548-3766

Ellsworth G. Jackson
101 Rittenhouse St. N. E.
Washington D.C. 20011
(202) 726-0908

Mil-R Productions
3110 Mt. Vernon Ave.
Suite 1000
Alexandria, Va. 22305
(703) 548-3879

Fleit, Jacobson, Cohn, Price,
Holman & Stern
Jennifer Bldg.
400 7tn St. NW
Washington, D. C. 20004
(202) 638-6666

Patent Reproduction Co.
26 N St., SE.
Washington, D.C. 20003
(202) 488-7096

Anthony L. Costantino
17300 Lafayette Dr.
Olney, Md. 20832
(301) 924-3491

Mason, Fenwick and Lawrence
1225 Eye St. N.W.
Suite 1000
Washington, D.C. 20005
(202) 289-1200

John A. Ballard
2001 Jefferson Davis Hwy.
Suite 705, Crystal Plz. 1
Arlington, Va. 22202
(703) 685-7228

Litman Law Offices, Ltd.
P.O. Box 15035
Crystal City Station
Arlinton, Va. 22202
(703) 920-6000

W. R. Taggert, d/b/a
Studios of W. Tag
9801 S. A1A, Lot 795-2
Jensen Beach, Fla. 34957
(407) 229-1442

Oblon, Spivak, McClelland,
Maier and Neustadt, P.C.
1775 Jefferson Davis Hwy.
Arlington, Va. 22202
(703) 521-5940

Quality Patent Printing
P.O. Box 240
556 S. 22nd St.
Arlington, Va. 22202
(703) 892-6212

Gerald M. Murphy
P.O. Box 2098
Eads Street Station
Arlington, Va. 22215
(301) 881-1928

Publication of this list does not constitute a recommendation or endorsement of any individual or firm by the Patent and Trademark Office. All arrangements for drafting related services are the sole responsibility of users of such services.

Mar. 11, 1987. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1077 OG 4]

(24) **Submission of Corrected Drawings in Allowed Applications**

When drawings need to be corrected in an allowed application, the applicant is required to submit acceptable corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.

Jan. 14, 1985. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1051 OG 3]

(25) **Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities and Enforcement Procedures**

Agency: Patent and Trademark Office, Department of Commerce
Action: Notice
Summary: The Patent and Trademark Office is revising its regulations relating to use of Patent and Trademark Office records or search facilities and procedures for enforcing these regulations. These regulations and their enforcement are necessary to promote an atmosphere conducive to research and to maintain the integrity of the files and records in the Patent and Trademark Office.
Effective Date: July 1, 1987
For Further Information Contact: Theresa A. Brelsford, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.
Supplementary Information: The procedures will apply to all visitors to the Patent and Trademark Office.

Visitors are reminded that unauthorized removal of government material or property may be prosecuted as a criminal felony under the provisions of 18 U.S.C. 2071, in addition to the imposition of administrative sanctions contained in these procedures.

Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

These regulations are established for all persons using the facilities of the Patent and Trademark Office (PTO), and will be appropriately enforced as specified herein.

Smoking within PTO is prohibited except in designated areas (41 CFR §§ 101-20.109-10).

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge of the General Services Administration which appear in 41 CFR Subpart 101-20.3 (41 CFR §§ 101-20.300 through 101-20.315).

Packages, briefcases and other personal effects brought into the PTO, as well as storage lockers provided for general use, are subject to search by authorized personnel for reasonable cause under the provisions of 41 CFR 101-20.301.

Unauthorized removal of PTO files, documents, reference materials, or any government property is prohibited. In addition to the administrative sanctions specified in these regulations, violators may also be subject to arrest and prosecution under the provisions of 18 U.S.C. 2071 which carries a possible "fine of $2,000 or imprisonment for not more than three years, or both", and/or the violator may be subject to discipline under the PTO Code of Professional Responsibility if he or she is a practitioner as defined in 37 CFR 10.1(r).

All persons must comply with posted Official Notices and with verbal requests made by PTO personnel for compliance with these regulations.

1. User Passes
   a. Individuals visiting any area of the PTO must obtain a valid, non-transferable user pass and wear it visibly displayed at all times while on the premises.
   b. Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first Permanent User Pass is issued at no charge. Permanent User Passes subsequently issued as replacements will be provided at a charge of $5.00 per Pass. The holder of a Permanent User Pass may be issued one (1) Temporary User Pass, within a ninety (90) day period

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at no charge. A request for a second Temporary User Pass during the same ninety day period will require the purchase of a Permanent User Pass at the required replacement fee.

c. Temporary User Passes may be obtained by visitors at no charge from the managers of the Patent or Trademark Public Search Rooms and are valid through the expiration date stamped thereon.

d. Permanent and Temporary User Passes must be surrendered to the PTO upon request for cause.

2. Use of Search Areas

a. The Patent and Trademark Office facilities may be used by visitors only during the hours specified, Monday through Friday, and are closed to the public on Saturdays, Sundays and Legal Holidays:

Patent Public Search Rm., Mezzanine and Microfilm Center	8:00 a.m. — 8:00 p.m.*
Trademark Public Search Rm.	8:00 a.m. — 5:30 p.m.*
Assignment Search Rm., Public Service Center, and Scientific Library	8:30 a.m. — 5:00 p.m.*
Patent Examining Organizations, Trademark Examining Law Offices and all other public access areas of the PTO	8:30 a.m. — 5:00 p.m.*

* Clearing of these areas would begin prior to this time to ensure all visitors are out of the building by the time designated.

b. Materials available for search purposes in the Patent and Assignment Search Rooms and patent application file histories shall not be removed from those areas.

c. Trademark registrations in the Trademark Search Library shall not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.

d. Trademark files shall not be removed from PTO space in Crystal Plz. Bldg. 2.

e. Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.

f. Visitors to a Patent Examining Group Search Area must register with the designated Group Search Area representative indicating the times entering and leaving the area, User Pass number, and the class(es) and subclass(es) to be searched.

g. Documents removed from the files of Patent Examining Group search areas must be immediately returned to their proper location after use. Documents shall not be removed from the area in which they were obtained without specific written authorization from a Group Director or Supervisory Patent Examiner in the Examining Group where the material(s) reside. Such authorization will not be given for U.S. Patents and other material readily available through the Scientific Library.

3. PROHIBITIONS

The following are prohibited:

a. Conduct which is rude or abusive to PTO employees or others.

b. Smoking and consumption of food or beverages in other than designated areas.

c. Loud talking or any conduct which may be disruptive to others.

d. Use of radios, televisions, typewriters, photographic equipment, dictation equipment and other mechanical, electrical or electronic items without specific authorization from an Assistant Commissioner of the PTO.

e. Improper use, mutilation, destruction or unauthorized removal of PTO records, documents or government property.

f. Reserving seats or work areas.

g. Affixing messages to walls, telephone booths or other government property, except designated message boards.

h. Use of the PTO as a mailing address, use of PTO stationery, and use of PTO emblem or seal.

i. Use of PTO telephones and other office equipment, such as copiers, etc., except where specifically provided for public use. This includes the use of PTO telephones to receive incoming calls.

j. Use of any computer terminal other than the TRAM terminals provided for public use in the Trademark Search Library, and the CASPIR and FOUR-PHASE terminals (or CASSIS terminal if the FOUR-PHASE terminals are not operating) provided in th Patent Public Search Room for public use.

k. Placing PTO files or documents, government property or government owned reference materials in rental storage lockers.

l. Use of rental storage lockers without depositing the required fee or holding the key to a storage locker beyond the specified maximum period of use.

Procedures for Enforcement of the Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

Under applicable statutes and regulations, including 40 U.S.C. 486(c), 41 CFR 101-20.3, and appropriate sections of Department Organization Orders 10-14 and 30-3 of the Department of Commerce, the procedures appearing below are established.

1. Violations involving unauthorized removal of PTO files, documents, records or government property.

a. Each observed or reported violation will be investigated.

b. Persons found in possession of PTO material or government property, other than in areas or under circumstances where possession is specifically authorized, shall be required to immediately surrender the material or property and if appropriate, their User Pass. An oral explanation for the possession of such material or property will be requested by the PTO.

c. Each incident involving unauthorized possession of PTO material or government property shall be immediately reported by telephone or in person to the Office or Group Director of the area from which the* material or property was taken.

d. If it appears to the Office or Group Director that possession of the materials was inadvertent or otherwise unintentional, no further action will be taken. The materials will be replaced appropriately and the person's User Pass will be returned.

e. If it appears to the Office or Group Director that possession of the materials was intentional, all persons involved shall be required to submit written statements detailing the circumstances and, in the case of a PTO User/visitor, show cause why the User Pass and visitor privileges should not be suspended or revoked. Statements will also be obtained from other witnesses where appropriate. The material or property shall be secured for possible use as evidence by the Office or Group Director, if appropriate.

f. If the involved person possesses a Permanent User Pass, it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration. A Temporary User Pass may be issued as replacement by the Assistant Commissioner for Administration, pending action on an alleged violation.

g. If the involved person possesses only a Temporary User Pass it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration within two weeks of the incident. No replacement will be provided pending action by the Assistant Commissioner for Administration.

2. Other violations of public use regulations.

a. Each observed or reported violation will be investigated. The persons involved shall be informed of the nature of the violation and requested to comply with regulations.

b. If it appears that the violation was inadvertent or otherwise unintentional and the involved person immediately conforms to the regulations, no further action will be taken.

c. If the violation appears to be intentional or if the person involved refuses to comply with a verbal request from a PTO employee or continues to violate the regulations after being requested to comply, the person shall be required to surrender his or her User Pass to the PTO. A written report of each violation and the User Pass will be submitted to the Assistant Commissioner for Administration for a final decision. User Pass replacement procedures shall be as specified in paragraphs 1.f. or 1.g.

d. If the Assistant Commissioner for Administration determines that a reported violation was inadvertent or otherwise not intentional, the User Pass will be returned and no further action will be taken. In all other cases, the Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass and visitor privileges should not be suspended or revoked.

e. A written decision will be rendered by the Assistant Commissioner for Administration after consideration of any timely submitted response.

f. In the case of a written decision by the Assistant Commissioner for Administration adverse to a practitioner as defined by 37 CFR 10.1(r), a copy of the written decision will be forwarded to the Director of the Office of Enrollment and Discipline for whatever further action, including sanctions, as may be appropriate under the PTO Code of Professional Responsibility.

3. Factors to be Considered in Assessing Penalties.

a. Penalties will be determined on a case by case basis.

b. Prior violations of regulations will be considered when assessing whether any violation is willful, deliberate or intentional, and when determining the penalty to be imposed.

c. Penalties may be assessed as follows, depending on circumstances:

(1) For a first offense: from a written warning to a 30 day suspension of the User Pass and visitor privileges.

(2) For a second offense: a suspension of the User Pass and visitor privileges from 5 days to one year.

(3) For a third or subsequent offense: from a suspension of 30 days to permanent revocation of the User Pass and visitor privileges.

(4) For any single serious or aggravated violation: suspension of the User Pass and visitor privileges for up to one year or permanent revocation of the User Pass and visitor privileges. A serious or aggravated violation is defined as any instance involving multiple violations of regulations during a single event or acts which also constitute a violation of Federal or local criminal law.

4. Record of Penalties Imposed.

A record of penalties imposed for given violations will be maintained by the Assistant Commissioner for Administration. These records will be made available to the public upon request.

5. Use of Public Facilities During Suspension or After Revocation of User Pass.

No individual will be permitted to use the facilities specified in these regulations while his or her User Pass is suspended or revoked.

6. Absence of Assistant Commissioner for Administration.

In the absence of the Assistant Commissioner for Administration, the Deputy Assistant Commissioner for Administration will carry out the responsibilities assigned by these regulations.

7. Absence of Designated PTO Officials.

In the absence of any Designated PTO Official, a Deputy or Acting Official will carry out the responsibilities assigned by these regulations.

8. Assistance.

PTO employees may, when necessary, request the Security Officer of the Patent and Trademark Office or the Federal Protective Service or their contractors to provide assistance in carrying out their assigned responsibilities in paragraphs 1. and 2.

9. Appeals.

Decisions rendered by the Assistant Commissioner for Administration may be reviewed on petition to the Commissioner.

May 11, 1987. THERESA A. BRELSFORD, *Assistant Commissioner for Administration.*

[1079 OG 6]

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(26) **Unlawful Removal of Labels**

We have found a large number of security labels, torn from Search Room patent copies, in stack areas of the Public Search Room. We remind persons removing security labels or otherwise mutilating Search Room patent copies, or removing Search Room patent copies from the Search Room without authorization, that such acts are criminal offenses punishable by fine, imprisonment or both.

You should be aware that engaging in such acts violates the prohibition against "the willful destruction of or damage to property; the theft of property." 41 Code of Federal Regulations § 101-20.303. Violations are punishable by "a fine of not more than $50 or imprisonment of not more than 30 days, or both." 41 Code of Federal Regulations § 101-20.315.

You should also be aware that engaging in such acts subjects you to punishment under the following criminal provision in Title 18 U.S. Code, § 2071:

> (a) Whoever willfully and unlawfully conceals, removes, mutilates, obliterates, or destroys, or attempts to do so, or, with intent to do so takes and carries away any record, proceeding, map, book, paper, document or other thing * * * shall be fined not more than $2,000 or imprisoned not more than three years, or both.
>
> (b) Whoever, having custody of any such record, proceeding, map, book, document, paper, or other thing, willfully and unlawfully conceals, removes, mutilates, obliterates, falsifies, or destroys the same, shall be fined not more than $2,000 or imprisoned not more than three years, or both; and shall forfeit his office and be disqualified from holding any office under the United States.

UNLESS THE REMOVAL OF SECURITY LABELS FROM SEARCH ROOM PATENT COPIES CEASES, THE OFFICE WILL TAKE APPROPRIATE ACTION, SUCH AS EXERCISING ITS AUTHORITY UNDER 41 CODE OF FEDERAL REGULATIONS § 101-20.301 TO INSPECT PACKAGES, BRIEFCASES AND OTHER CONTAINERS BROUGHT INTO, WHILE ON, OR BEING REMOVED FROM THE SEARCH ROOM.

Mar. 28, 1983. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[1029 OG 136]

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(27) **Out-of-Town Request for Files**

Delays are being experienced in receiving files ordered from the Federal Records Center in Suitland, Md. Therefore, more time must be allowed when out-of-town requestors are ordering patented files or abandoned or registered trademark files in advance of their arrival in the area. Until recently, a five-day

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notice was sufficient to obtain a file located in the Federal Records Center. Now we are suggesting that ten days be allowed when ordering Suitland files. A 24-hour notice is still normally adequate when the file is located in the PTO File Repository in Crystal City. Out-of-town requests for files should be directed to Ms. Jacqueline Waldo on (703) 557-2977. Requestors will be notified by phone, prior to planned arrival date, whether or not the requested file will be available.

July 10, 1984 THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1045 O.G. 3]

(28) **Use of Certificate of Correction Forms**

The purpose of this notice is, to once again, remind patentees and their attorneys and agents to submit the text of any correction under 37 CFR 1.322 and 1.323 on the Certificate of Correction form, PTO-1050, which is available free of charge from the Patent and Trademark Office. The presentation of all corrections on this form permits its use as camera copy for prompt, direct offset printing of the Certificate of Correction.

Instructions for use of Form PTO-1050 are printed on the top portion thereof, and are also set forth, in further detail, in Section 1402.02 of the Manual of Patent Examining Procedures. It is especially important that the typing be clean and clear. Both thin, light type and heavy, smudged type should be avoided. Changes and corrections are preferably made by use of white opaque correction fluid.

The typing should be within the borders printed on the form and a two-inch blank space should be left at the bottom of the last page of the form for the placement of the signature of the Attesting Officer.

Both sheets of the printed form should be forwarded to the Office. The copies should be stapled together only at the upper left-hand margin at the indicated location.

Copies of form PTO-1050 may be obtained, as needed, from either the Correspondence and Mail Division in Building 2, or from the receptionist in the lobby of Building 3, Crystal Plaza, Arlington, Va.

May 10, 1977. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[959 O.G. 3]

(29) **ARS Patent Culture Collection Initiation of Fees**

As a result of recent policy changes, the ARS Culture Collection (NRRL) henceforth will charge a user fee for deposit and distribution of microbial cultures maintained in conjunction with U.S. and foreign patent applications. User fees apply to patent cultures only; as it has in the past, the ARS Culture Collection will continue to exchange other microbial germplasm with the scientific community without charge. The fee schedule will apply to all patent cultures deposited after Sept. 30, 1983. A fee of $500.00 will be charged for each strain, payable at the time of deposit. A $20.00 fee will be charged for the distribution of all released patent cultures that have been deposited after Sept. 30, 1983. There will be no charge for distribution of patent cultures already on deposit or for others received before this date. Checks, in U.S. dollars, should be made payable to the Agricultural Research Service, USDA. USDA laboratories and designated cooperators will be exempt from fee assessment. The types of microorganisms accepted by the ARS Culture Collection are the same as announced in the past and include industrially important bacteria, yeasts, molds, and *Actinomycetales*. Viruses and highly pathogenic or especially fastidious microorganisms are not accepted. Further information on types of microorganisms accepted and conditions for deposit may be obtained by contacting A. J. Lyons, Curator ARS Patent Culture Collection, Northern Regional Research Center, USDA-ARS-NCR, 1815 N. University St., Peoria, Ill. 61604 (Tel. 309/685-4011).

[1033 OG 26]

(30) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent of Documents (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. If a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

Aug. 3, 1984. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1045 O.G. 28]

(31) **Subscription Pricing Information**

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section
First-class domestic mailing $375.00
Fourth-class domestic mailing $270.00
Fourth-class foreign mailing $337.50
Single copies each, domestic $13.00
Single copies each, foreign $16.25

Back copies will not be furnished.

This change is effective with Government Periodicals and Subscription Services Price List 36, dated Summer, 1984. Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

Sept. 11, 1984. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1047 O.G. 11]

(32) **Rules Service Company Address Change**

The Patent and Trademark Office has been notified of a change in the address and telephone number of the Rules Service Company which publishes a looseleaf Rules of Practice in Patent and Trademark Cases with a revision service. The new address and telephone numbers are:

Rules Service Company
4341 Montgomery Avenue
Bethesda, Maryland 20014
(301) 656-4660

Apr. 7, 1980. SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks

[994 O.G. 10]

(33) **Patent and Trademark Office Services**

The Patent and Trademark Office is making every effort to utilize its resources as effectively and efficiently as possible. However, delays in some services are being experienced. To improve services, the PTO is taking the following steps:

Beginning with the issue of January 1, 1980, the original formal drawing which is supplied by the patent applicant and is 8 1/2 by 14 inches (21.0 by 29.7 cm.) is being stored within the patented file in the Patent Search Division. This is a change from the earlier practice under which the drawing is stored in a separate location from the patent file wrappers. The new procedure will simplify obtaining the complete patented file. This procedure will be used for a three month trial period and then reevaluated for its effectiveness.

Effective Dec. 3, 1979, sale of tokens and maintenance of all token operated photocopy and microfilm reader-printer equipment throughout the Patent and Trademark Office are being performed by a private contractor, T S Info Systems, Inc. (TSI). Improved quality and timeliness of copy service to the public are anticipated.

All token sales are made between the hours of 8:30 A.M. and 5:00 P.M. at the token sales booth in the Record Room located in Building CP-4. When purchasing tokens by check, please make the check payable to "TSI" rather than "Commissioner of Patents and Trademarks." Tokens will not be sold at the cashier's window in CP2.

Effective February 1, 1980, charges for tokens to PTO customer deposit accounts will no longer be accepted.

Effective immediately, no requests for new patent or trademark drawings will be accepted by the Patent and Trademark Office. New drawings will be prepared only for requests already received. All currently available drafting time and facilities are required to correct the backlog of drawings needing correction prior to issue. When this backlog has been eliminated, a notice will be issued to that effect and new drawings can again be prepared for the public.

Effective immediately, three additional special mail room boxes will be established in the PTO:

Box 4 will be used for all mail for the Office of Legislation and International Affairs.

Box 5 will be used for documents which are related to trademarks and for which no fee is required at the time of filing; e.g., amendments to applications and requests for extensions of time to file an opposition. For mail directed to the Trademark Trial and Appeal Board, put "Attention TTAB" on the envelope in addition to "Box 5."

Box 7 will be used for reissue applications which are involved in litigation and any subsequently filed papers for these applications.

Mail appropriately addressed will be sorted and forwarded on a more timely basis.

Applicants and other users of the PTO services can assist in improving the efficiency of office by doing the following:

Use the following special PTO box numbers for forwarding particular types of mail. The boxes should be used only for the specified purpose.

Box 2—Replenishment of funds in deposit accounts.

Box 4—Mail for the Office of Legislation and International Affairs.

Box 5—"No fee" mail related to trademarks.

Box 7—Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.

Box 8—All papers for the Office of the Solicitor.

Box 9—Coupon orders for U.S. patent and trademark copies.

Box 10—Orders for certified copies of patent and trademark applications.

Box PCT—Mail related to applications filed under the Patent Cooperation Treaty.

Only that material for which the special box was established should be enclosed.

The special box numbers have been established to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Therefore, if any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they were intended.

Envelopes should be addressed:
Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Consider the fact that some PTO services are experiencing delays, and allow sufficient lead time for services requested of the Office. Where possible, urgent items which require no fee should be hand delivered to the appropriate area.

Minimize the number of inquiries to the PTO regarding acknowledgment of receipt of applications, fee papers, orders for patent copies, etc.

Include a self addressed return post card with newly filed applications. The serial number assigned the application will be stamped on the post card, which will constitute the means by which the application can be identified.

Use commercial services for preparation of new patent and trademark application drawings.

On all papers which are filed in patent and trademark applications and are being sent to an examining group, include the appropriate identifying data, such as examining group number, examiner's name, and the number of the application paper to which the response is directed. The paper should also identify the type of document being presented (e.g., response to Office action #_____, amendment, etc.). The name and telephone number of the individual representing the applicant also should appear on all papers.

These steps have been devised in an effort to minimize delays in services. We solicit the help and cooperation of the public.

Jan. 4, 1980. SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks

[990 O.G. 184]

(34) **Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks**

1. *Service of court papers*

This notice supersedes the Solicitor's Notice of Sept. 10, 1982 [1023 *Official Gazette* 3 (Oct. 5, 1982)].

Court papers may be served on the Solicitor in the following manner:

A. By hand between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor located in Crystal Plz., Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Fl., Rm. 5-C-15, Arlington, Va.

B. By mail in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215.

Court papers mailed to an address other than the Solicitor's service address above, or hand-delivered to the Office of the

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Solicitor, are deemed to be served when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the Patent and Trademark Office in connection with an application or other proceeding pending in the Office should not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be filed in the Office and will be returned. No exceptions will be made to this policy.

2. *Filing of a notice of appeal to the Federal Circuit*

A notice of appeal from a decision of the Board of Patent Appeals and Interferences in an *ex parte* or *inter partes* patent matter or a decision of the Trademark Trial and Appeal Board in an *ex parte* or *inter partes* trademark matter must be timely filed.

A certificate of mailing under 37 CFR § 1.8 *cannot* be used for the purpose of effecting "filing" of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit. *In re Thrifty*, 231 USPQ 560 (Comm'r. Pat. 1986),*mandamus denied mem.*, Misc. No. 137 (Fed. Cir. Nov. 21, 1986) (unpublished). Thus, a notice of appeal which reaches the Patent and Trademark Office after the due date, is not considered to be timely filed, even though mailed prior to the due date with a certificate of mailing under 37 CFR § 1.8.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any of the following ways:

A. By mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service *only*) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

C. By hand to the Office of the Solicitor.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit should not be mailed to the Solicitor's mail service address.

JOSEPH F. NAKAMURA,
June 8, 1987. *Solicitor.*

[1079 OG 72]

(35) **Appeals to CAFC**

In every case of an appeal to the CAFC from a decision of the Board of Patent Appeals and Interferences or the Trademark Trial and Appeal Board, a copy of the notice of appeal should be separately transmitted to the Office of the Solicitor at the time the original notice is filed with the Commissioner. The Solicitor's copy should be sent in an envelope addressed as follows:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attn: Office of the Solicitor

In lieu of mailing, the copy for the Solicitor may be hand-delivered to the Office of the Solicitor. Sending a copy of the notice of appeal to the Solicitor's Office will prevent or reduce delays in docketing appeals in the CAFC.

DONALD W. PETERSON,
July 17, 1987. *Deputy Commissioner of Patents and Trademarks.*

[1081 OG 14]

(36) **Service of Court Papers on the Commissioner of Patents and Trademarks**

The procedure set forth in M.P.E.P. § 1216 (5th ed., revs. 1 to 6) under the heading "Service of Court Papers on Commissioner of Patents and Trademarks" was superceded by the procedure set forth in the Solicitor's Notice of June 8, 1987 [1079 OG 72], which remains in effect and which also describes the procedure for filing a notice of a appeal to the Federal Circuit. The portion of that notice concerning service of court papers on the Commissioner is repeated below, as modified to include additional guidelines about supplementation of the mail service address.

Court papers may be served on the Commissioner in either of the following ways:

A. By *hand* between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor, located in Crystal Plaza Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Floor, Room C-15, Arlington, Va.

B. By *mail* in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must *not* be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office should not be mailed to the solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

JOSEPH F. NAKAMURA,
Feb. 22, 1988 *Solicitor.*

[1088 OG 39]

(37) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 2

[Docket No. 80480]
Communications with the Office of the Solicitor

Agency: Patent and Trademark Office, Commerce.
Action: Final rule; technical amendments.
Summary: On Mar. 24, 1987, final rules regarding the address of certain communications to the Patent and Trademark Office were issued. (52 FR 9394, Mar. 24, 1987.) Also, on Mar. 7, 1985 and Aug. 11, 1986, final rules regarding the court review of decisions by the Patent and Trademark Office Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board, respectively, were issued. (50 FR 9383, Mar. 7, 1985 and 51 FR 28710, Aug. 11, 1987.)

This notice makes technical corrections to § 1.1, 1.302 and 2.145(b) by specifying the address to which correspondence should be sent to the Office of the Solicitor. The change reflects existing practice consistent with rules of court governing service of court papers on the Solicitor. The change also will expedite

the processing of other non-court communications with the Office of the Solicitor.

Effective Date: June 9, 1988

For Further Information Contact: John H. Raubitschek by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The Patent and Trademark Office (PTO) finds for good cause that because the technical changes made by this rule will have no substantive effect, it is unnecessary to seek prior public comment of this rule under 5 U.S.C. 553. Because a notice of proposed rulemaking and an opportunity for public comment is not required for this technical amendment, this rule is also exempt from the provisions of the Regulatory Flexibility Act requiring a regulatory flexibility analysis. The PTO has determined that this rule is not a major rule within the meaning of section 1(b) of Executive Order 12291. The PTO has also determined that this rule has no federalism implications affecting the relationship between the national government and the States as outlined in Executive Order 12612. This rule does not contain a collection of information for purposes of the Paperwork Reduction Act.

List of subjects:

Administrative practice and procedure, Courts, Inventions and patents, Trademarks

For the reasons set forth above, 37 CFR Parts 1 and 2 are amended as follows:

Part 1—Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 [Amended]

Section 1.1 is amended by adding new paragraph (g)

*****

(g) All communications relating to pending litigation which are required by the Federal Rules of Civil or Appellate Procedure or by a rule or order of a court to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215 or such other address as may be designated in writing in the litigation. All other communications to the Office of the Solicitor should be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Any communication which does not involve pending litigation which is received at P.O. Box 15667 will not be filed in the Office but will be returned. See § 1.302(c) and 2.145(b)(3) for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

3. Section 1.302 [Amended]

Section 1.302 is amended by adding new paragraph (c)

*****

(c) A notice of appeal, if mailed to the Office, shall be addressed as follows: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Part 2—Rules of Practice in Trademark Cases

4. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

5. Section 2.145(b) [Amended]

Section 2.145(b) is amended by adding new paragraph (b)(3).

*****

(b)(3) The notice, if mailed to the Office, shall be addressed as follows: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

DONALD J. QUIGG
May 3, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1090 OG 72]

(38) **Sale of Copies of Reexamination Requests**

Copies of reexamination requests, all cited references, and the file wrapper and contents of the patent file for which reexamination is requested are available at a charge of $0.30 per page. Orders for such copies must indicate the control number assigned the reexamination request. Orders should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Customer Services Division.

GERALD J. MOSSINGHOFF,
July 31, 1981. *Commissioner of Patents and Trademarks.*

[1010 O.G. 4]

(39) **DEPARTMENT OF COMMERCE**
Billing Code: 3510-16
Patent and Trademark Office

[Docket No. 70470-9062]

Electronic Data Dissemination Policies and Guidelines

Agency: Patent and Trademark Office, Commerce
Action: Electronic Data Dissmenination Policies and Guidelines - Final Notice.
Summary: The U.S. Patent and Trademark Office (PTO) has undertaken a program to automate its operations. As a result, electronic patent and trademark data are being created and new techniques are being implemented to expand the use of the PTO's collection of electronic information, which will contain all U.S. patents and registered trademarks and selected foreign patents. These data bases comprise one of the largest information resources of the Nation.
Date: May 3, 1989.
Address: Comments should be addressed to: Donald J. Quigg, Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231.
For Further Information Contact: Bradford R. Huther at 703-557-1572.
Supplementary Information:

In response to Public Law 96-517, the 1980 legislation which amended patent and trademark laws, the PTO prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basis concepts: the creation of electronic data bases that (1) would eventually replace the PTO's all-paper patent and trademark files, and thereby improve their intregrity and quality; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. An IBM-based computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and to retrieve and display all information as a substitute for paper file searches. Trademark examiners have been using T-Search exclusively since January 1988, and the capability is ready to be deployed for public use in the Trademark Search Library.

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An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS — large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers — were interconnected on July 1, 1986 to enable system test and evaluation to begin in the testbed group. Optical disk storage units were subsequently installed to house the test data base of digital images of U.S. and foreign patents. In December 1987, the testbed patent examiners began using the APS image search and retrieval capability (APS-Image) in a live production environment. Based on recommendations of an Industry Review Panel appointed by the Deputy Secretary of Commerce to review the Office's patent automation program, changes were made and the testbed examiners are using a stable, reliable system suited to their need. The digital image retrieval capability of APS has been stabilized in the testbed, which now is being used as an operational testbed for deployment to other patent examining groups. A decision on the next incremental deployment of the digital image retrieval and other electronic searching capabilities is planned to be made in mid-1989. Additional system capabilities for office automation and other administrative support will be added to those already installed in the testbed over the next several months to supplement the search and retrieval capabilities. Examiners will be provided access to commercial data bases, such as industry-specific data bases, from the electronic workstations.

PTO continues to digitize the entire backfile of almost five million U.S. patents. The source for the digital image scanning operation is the archival set of patent documents which is believed to contain the best available copy of each patent. First, images of all U.S. patents in the testbed group's search files were converted to digital form and placed on optical disks for use in electronic classification and combined text classification searches. Subsequently, the remaining patents were captured. These patents will be written to optical disk and loaded on APS before APS-Image can be deployed to the remaining patent examining groups and the public. Through exchange agreements with the European and Japanese Patent Offices, European patents issued since 1920 and all Japanese patents have been or will be converted to a common facsimile standard and key patents will be entered for on-line retrieval.

On-line access to the full-text of all U.S. patents granted after 1974 and the English language abstracts of Japanese and Chinese patents — a data base of more than two million records representing about 52 gigabytes of data — was deployed to the patent examining staff beginning in June 1986. Access to this full-text data base (APS-Text) permits examiner to search the text of more than one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process. Searches are conducted from single screen text terminals located throughout the Office, supported by a NAS-9080 dual processor. The APS-Text capability is ready for deployment to the public in the Patent Public Search Room.

The PTO intends to enter the text of U.S. patents issued after 1970.

To fulfill its mission to disseminate information and to guide the management of its electronic information resources, on June 8, 1984, the PTO issued guidelines and policies for dissemination and distribution of electronic patent data. These were published in 49 *Federal Register* 2485 (June 14, 1984). Subsequently, the Office of Management and Budget issued revised policies and expanded guidelines for electronic data dissmemination in OMB Circular A-130 dated December 1985 and entitled "Management of Federal Information Resources."

On August 20, 1987, PTO published in 52 *Federal Register* 31442 a notice (1) to inform the public of the PTO's intention to amend its pricing policy for data base products, and to expand the scope of its dissemination policies and guidelines to encompass patent and trademark electronic data; (2) to explain the current situation with regard to public access to automated patent and trademark search rooms and libraries; and (3) to solicit public comments on the intended proposals.

On December 10, 1987, PTO published in 52 *Federal Register* 46815 a notice amending the pricing policy for data base products and expanding the scope of the policies and guidelines to encompass patent and trademark data. That notice also extended the period to December 31, 1987, for receiving public comments on alternatives for funding public access to patent or trademark search rooms or libraries.

On June 23, 1988, PTO published in 53 *Federal Register* 23677 a notice informing the public of its intention to publish a comprehensive edition of the policies and guidelines to replace the versions published in the June 14, 1984 and December 10, 1987 notices.

In that notice, the PTO also published a summary of the comments received on the three alternatives for financing public access to the automated search systems in PTO's public search rooms and libraries. Subsequently, Public Law 100-703 was enacted on November 19, 1988. The law allows the Commissioner of Patents and Trademarks to establish reasonable fees for access by the public to the automated search systems.

Response to Comments

Comment: If user fees are established for public access to the automated patent and trademark systems, will those fees also be charged by the Patent Depository Libraries (PDLs)?
Response: Arrangements will be worked out between the PTO and individual libraries for providing access to the automated search system. Arrangements will depend on each library's authority to collect user fees for the service on their own or the PTO's behalf. Fees for access in PDLs would be adjusted to account for any different equipment costs, maintentance and added telecommunications costs.
Comment: How would PDLs administer the free access provision of Public Law 100-703?
Response: Based on PTO's policy for administering this provision, arrangements would be worked out with individual libraries.
Comment: One respondent asked if PTO conducted a study to determine the potential demand in PDLs for trademark information and patent information.
Response: Several surveys on the demand for patent and trademark information have been conducted which provide unofficial indications to the PTO for the need for patent and trademark information. Reports to the PTO indicate that the demand for trademark information is increasing.
Comment: One respondent wanted clarification of what will ultimately be available to the PDLs — paper, microfilm, electronic data.
Response: The form of the patent and trademark information in each PDL ultimately will depend on decisions made between the PTO and individual PDLs and the technology and economics of remote access for providing access to the automated search systems.
Comment: If PTO contracts for the provision of public access, who owns the PTO data base?
Response: The PTO will continue to own the PTO data base.
Comment: One respondent claimed that section B is inconsistent with OMB Circular A-130 and that the order of sub-paragraphs B(1) and B(2) should be reversed.
Response: Section B relates only to the PTO search facilities and PDLs. This policy is consistent with OMB Circular A-130 by providing an information "safety net" to the public through the dissemination of information in the search facilities and libraries. PTO states in paragraph F that, outside the search facilities and libraries, it will encourage the private sector to offer commercial patent and trademark search and retrieval services, and it will not compete with the private sector.

Sub-paragraphs B(1) and B(2) state that PTO will choose the most efficient means for providing search and retrieval services in its search facilities and PDLs, directly and/or through a contractor.
Comment: One respondent suggested that there might be misunderstanding between sections C and E.
Response: Section C specifically refers to commercial data bases whereas section E refers to PTO-owned data bases.
Comment: In section D, what does the term "existing collections in the PDLs" mean?
Response: In the June 23, 1988 edition of the *Federal Register*, the reference to "existing collections" meant the collections held by each individual library. Collections vary from library to library, and acquistion of collections is up to each individual PDL. Section D has been revised because section 104(c) of Public Law 100-703 allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.
Comment: Section E provides for the possibility that a commercial search and retrieval service could be substituted for the PTO automated systems in the PDLs. Would the PDLs be required to absorb the cost?
Response: Arrangements would be worked out between the PTO and each individual library and would depend on the library's ability to provide commercial services on its premises.
Comment: One respondent asked for a brief explanation of OMB Circular A-76, entitled "Performance of Commercial Activities."
Response: The A-76 process enhances quality and efficiency by using competition to select the most cost-effective operation to perform a service. It requires that studies be conducted to see whether work should be performed by the Government or by industry. This program was formalized in 1955 and, in 1966, the Bureau of the Budget issued the policy as Circular No. A-76.
Comment: One respondent suggested that the word "indirectly" in section F should be removed since there already are many private trademark search enterprises. Another respondent suggested that the word "encouraged" in that same section should be changed to "allowed." A third resondent said that PTO should "directly encourage" the private sector by making its data available in electronic form.
Response: Section F as written expresses how the PTO will indirectly achieve its dissemination goals. No change has been made to the wording.
Comment: One respondent suggested that PTO should not even consider "exclusive" arrangements with regard to the sale of bulk data as suggested by Section H.
Response: Paragraph H has been changed by deleting the word "normally."
Comment: One respondent suggested that marginal cost recovery described in section I should be limited to commercial entities seeking bulk data.
Response: All cost of goods and services are fully user-fee funded under the terms of OMB Circular A-25, "User Fees."
Comment: Several respondents asked for clarification of the statement that the trademark automated system could be ready for public deployment by September 30, 1988.
Response: Under a proposed rule package entitled Patent and Trademark Automated Search System Fees, the PTO is proposing to provide access to T-Search.
Comment: One respondent asked for clarification and more specificity to the response concerning the PTO's authority to automate PDLs.
Response: Section 13 of title 35, United States Code, authorizes the Commissioner to conduct a patent depository library program for disseminating patent information to the public. The Paperwork Reduction Act of 1980, as amended, 44 USC, chapter 35, requires each Federal agency to "implement applicable government-wide...information policies...with respect to...dissemination of information...and other information resource management functions..." OMB Circular A-130 establishes a Government-wide policy of disseminating Government Information products and services in the manner most cost effective for the Government. Accordingly, the Paperwork Reduction Act would authorize disseminating patent information to the PDLs in some electronic form, in lieu of paper or microfilm, if it is the most cost-effective mode. The authority for providing access to patent and trademark information in the PDLs like that for the Patent Search Room and Trademark Search Library is the authority inherent in various provisions of the patent law other than section 13 such as section 10 of title 35. The PDLs serve as extensions of the PTO for disseminating patent and trademark information in other geographic locations.
Comment: One respondent asked that PTO adhere to Rep. Kastenmeier's instructions reported in 134 Cong. Rec. H9676 (daily ed. Oct 5, 1988) (statement of Rep. Kastenmeier), to follow the letter and spirit of the copyright law regarding nonpatent literature.
Response: The PTO will adhere to the letter and the spirit of the copyright law as it applies to the inclusion of nonpatent literature in the Automated Patent System.

Other Considerations:

The PTO has determined that this notice is not a major rule within the meaning of section 1 (b) of Executive Order 12291. Therefore, a Regulatory Analysis has not nor will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this amended policy statement by the Administrative Procedure Act (5 U.S.C. 553(b) (A)), no initial or final Regulatory Flexibility Analysis has to be or will be prepared. The PTO also has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612. This notice does not contain a collection of information requirement for purposes of the Paperwork Reduction Act.

ELECTRONIC DATA DISSEMINATION POLICIES AND GUIDELINES

Dissemination in Government Public Search Facilities and Depository Libraries

It is the goal of the PTO to achieve effective, widespread dissemination of information concerning patents and Federally registered trademarks to all segments of the U.S. public.

A. The dissemination goal will be accomplished directly by the PTO by providing electronic search and retrieval services to the public in search facilities located in the PTO, in other facilities which may be established by the Government and in Patent Depository Libraries (PDLs). PDLs are Federal, State and local government, university or non-profit organization libraries designated by the PTO to offer public access to patent collections.

B. To the extent funding is authorized and appropriated, search and retrieval services will be provided in the PTO's search facilities and PDL's either:

(1) by the PTO, using its own data bases, computers, communications equipment, and software, and/or

(2) by PTO contractors.

C. Access to commercial data bases that are available to the PTO's examiners, for example industry-specific data bases, will be furnished either through an APS workstation or a terminal furnished by data base vendors in the PTO public search facilities at commercial rates, provided the user has established a commercial account with the data base vendor.

The PTO will not act as an agent for any data base vendor in providing training for, assisting in, or collecting fees for the use of such commercial data bases.

D. Services furnished in the PTO public search facilities and in PDLs will be at no cost to the public for access to paper and microform records. The cost of accessing PTO owned electronic data bases and systems will be recouped from user fees set to recover the marginal costs of such services.

E. The type of service for public search and retrieval, either PTO or commercial services, will be chosen based on the method and criteria established by the 1983 revision to OMB Circular A-76, entitled "Performance of Commercial Activities."

Distribution of PTO Data for Commercial Dissemination

F. In addition to B. and C. above, the PTO will pursue its dissemination goal indirectly by encouraging the private sector to offer commercial patent and trademark search and retrieval services and will seek to avoid competition with private sector firms in providing such services to the public outside the PTO search facilities and PDLs.

G. Fees charged for bulk data developed by the PTO will be based on the marginal cost of providing such distribution services.

H. Arrangements will be non-exclusive. Bulk resale of PTO data will be permitted subject to the terms of each bulk sales agreement.

I. Fees charged to the public for U.S. patent and trademark data products will be based on the marginal cost of providing such products.

J. The PTO will receive non-U.S. electronic patent data through exchange agreements with other patent offices and international intergovernmental organizations. In

general, the PTO will not distribute such data, except in conjunction with services that may be provided by the PTO or its contractors in the PTO public search facilities and PDLs. Rather, it will seek to have contractual arrangements established directly between the organization and the commercial data base vendor and will not act as a service agent or representative unless there is a special need that cannot be met otherwise.

Mar. 7, 1989 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1102 OG 11]

(40) **Computer Aided Search for Class 364 Subclasses 200 and 900**

In 1975 the Patent and Trademark Office installed an experimental computer search system for searching the computer and digital data processing system arts classified in Class 364/200 and 900. This system, known as Computer Controlled Microform Search System (CCMSS), functioned until 1983 when it could no longer be kept operational.

A new computer aided search system, Computer Aided Search and Patent Image Retrieval (CASPIR), has been installed and is available to the public. The new system possesses features similar to the previous system in that each subclass is searchable using a topic index list of approximately 400 terms, which may be combined with Boolean logic into a search question. The user is able to view from 5 to 12 pages of documents meeting the search strategy under computer control of a microfilm viewer.

CASPIR has all of the original data base of the CCMSS (which covered patents dated 1950-1981). In addition, its data base, coded and filmed, has been updated through Sept., 1984.

It is anticipated that CASPIR will be updated according to the following schedule. Once a month the codes assigned to new documents will be entered into the data base by Patent and Trademark Office personnel. Documents thus entered will not be available on the microfilm viewer but will show up on the data terminal in response to search questions. Users would need to consult search room paper files to see the documents. To assure efficient filming and maximum use of the film strips, the filming of coded documents will take place on a quarterly basis—Jan., Apr., July and Oct. Following this procedure, the coded data base should not be more than one to two months behind current patent issue dates and the filmed copies of coded documents should not be more than three to four months behind current patent issue dates.

Terminals are currently available for public use in Crystal Plaza 2, Rm 5C-22. Reservations for terminal use may be made by calling 703-557-3651 during normal business hours. Patent and Trademark Office personnel are available to assist the user in terminal operation. Effective Mar. 11, 1985 these public terminals will be moved to the Public Search Room in Crystal Plz. CP3-1A-3. Reservations for use may then be made by contacting Mr. Bernard Thomas at 703-557-2276.

Feb. 5, 1985. EARL LEVY,
Director, Group 230 Patent and Trademark Office.

[1052 OG 56]

(41) **Availability of Concordance—Fifth Edition**

The Patent and Trademark Office announces the availability of the "Concordance Fifth Edition-1985 United States Patent Classification to International Patent Classification" which relates the U.S. Patent Classification, as revised through Feb. 29, 1984, (Classification Order No. 929) to the Fourth Edition of the International Patent Classification, 1984, as published for the World Intellectual Property Organizations by Carl Heymanns Verlag K. G., Munich.

Copies of the Concordance are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 003-004-00611-1. The price for this publication is $6.50 for U.S. and $8.15 for foreign mailing.

July 3, 1985. WILLIAM S. LAWSON,
Administrator for Documentation.

[1057 OG 20]

(42) **Availability of Copies of the Magnetic Tape of the Fourth Edition of the International Patent Classification (IPC)**

The Assembly of the IPC Union has decided to make available copies of the magnetic tapes of the IPC through the International Bureau of the World Intellectual Property Organization.

The IPC Assembly made the following decisions:

"The International Bureau should put at the disposal of the Industrial Property Offices of any country member of the IPC Union which so wishes the magnetic tape. . .of the IPC at cost, provided that any such Office receiving a tape accepts the three conditions set forth. . .below:

(i) the tape is used by those Offices. . .for the purposes of carrying out their functions,
(ii) no reproduction of the tape or its contents, in whole or in part, is made in the form of paper copies or microfiches, except in the case of on-line printouts, and
(iii) the tapes or copies thereof, in whole or in part, are not made available to any third party."

The Committee of Experts of the IPC Union decided that the tape (in English or French language) would be made available to Industrial Property Offices of countries being members of the IPC Union at the price of 1,000 Swiss francs.

In order to carry out its function of disseminating patent information contained on IPC tapes, the U.S. Patent and Trademark Office may need the assistance of qualified U.S. public organizations or private companies. Accordingly, the Office will consider requests from such organizations or companies interested in disseminating such information.

The Committee also decided that, subject to the conditions enumerated in (ii) and (iii) above, the tapes would be made available for the following prices to any public organization or private company authorized by its government:

* for internal use only, at the price of 5,000 Swiss francs; and
* for exploitation of the tape on a commercial basis, at the price of 30,000 Swiss francs.

The Patent and Trademark Office will authorize United States public organizations and private companies to purchase the tape under these conditions and at the agreed upon prices quoted.

For further information contact:

Office of International Patent Classification
Crystal Square, Bldg. 4, Room 108
U.S. Patent and Trademark Office
Washington, D.C. 20231
Tel: (703) 557-3756

Feb. 1, 1985. WILLIAM S. LAWSON,
Administrator for Documentation.

[1052 OG 56]

(43) **Simultaneous Issue of Patents**

Applicants and their attorneys who desire the simultaneous issue of allowed applications must submit the request to:

Commisoner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of Publications
CP2-6C07

The request must contain the following information about each allowed application for which simultaneous issue is requested:

(1) serial number
(2) filing date
(3) name(s) of inventor(s)
(4) title of invention
(5) date of allowance
(6) batch number

Separate copies of the request must accompany each Issue Fee Transmittal (PTO-85b).

Questions concerning this practice may be directed J. Bania, Director, Office of Publications, Area Code (703) 557-3794.

This notice supersedes the notice published on Aug. 25, 1978, at 974 O.G. 16.

Nov. 9, 1987. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1085 OG 6]

(44) **Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission**

Effective Nov. 1, 1988, certain papers to be filed in national patent applications and reexamination proceedings for consideration by the Office of the Assistant Commissioner for Patents, the Office of the Deputy Assistant Commissioner for Patents, and the Patent Examining Groups (Patent Examining Corps) may be submitted to the Patent and Trademark Office (PTO) by facsimile transmission.

The provision of 37 CFR 1.33(a), requiring signatures on amendments and other papers filed in applications, is hereby waived to the extent that a facsimile signature is acceptable. The paper that is used as the original for the facsimile transmission must have an original signature, and should be retained by applicant or the representative as evidence of the content of the facsimile transmission. No special format, addressing information or written ratification is required for facsimile transmissions. However, the paper size must be 8 1/2" by 14" or smaller to be accepted.

A facsimile center has been established in the Patent Examining Corps to receive and process submissions. The filing date accorded the submission will be the date the complete transmission is received by the PTO facsimile unit unless that date is a Saturday, Sunday or Federal holiday within the District of Columbia, in which case the official date of receipt will be the next business day.

Each transmission session must be limited to papers to be filed in a single national patent application or reexamination proceeding. It is recommended that the Serial Number of the application or Control Number of the reexamination be entered as a part of the sender's identification, if possible. It is also recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. The transmitting activity report should be retained along with the paper used as the original.

The papers, including authorizations to charge deposit accounts, which may be submitted using this procedure, are limited to those which may be filed in national patent applications and reexamination proceedings and which are to be considered by the PTO organizations named above. Examples of such papers are amendments, responses to restriction requirements, request for reconsideration before the examiner, petitions, terminal disclaimers, powers of attorney, notices of appeal and appeal briefs.

New or continuing patent applications of any type, assignments, issue fee payments, maintenance fee payments, declarations or oaths under 37 CFR 1.63 or 1.67, and formal drawings are excluded, as are all papers relating to international patent applications. Papers to be filed in applications that are subject to a secrecy order under 37 CFR 5.1 - 5.8, and directly related to the secrecy order content of the application, are also excluded. Informal communications between applicant and the examiner, such as proposed claims for interview purposes, are permissible and are encouraged. Informal communications from applicants will not be made of record in the application or reexamination and must be clearly identified as informal such as by including the word "DRAFT" on each paper. To facilitate informal communications from examiners, applicants are encouraged to supply their facsimile phone numbers on communications to the Office.

The facsimile submissions may include a certificate for each paper stating the date of transmission. A copy of the facsimile submission with a certificate attached thereto will be evidence of transmission of the paper should the original be misplaced. The person signing the certificate should have a reasonable basis to expect that the paper would be facsimile transmitted on the date indicated. An example of a preferred certificate is:

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

Type or print name of person signing certification

Signature _____ Date _____

When possible, the certification should appear on a portion of the paper being transmitted. If the certification is presented on a separate paper, it must identify the application to which it relates, and the type of paper being transmitted; e.g. amendment, notice of appeal, etc.

In the event that the facsimile submission is misplaced or lost in the PTO, the submission will be considered filed as of the date of the transmission, if the party who transmitted the paper:

(1) Informs the PTO of the previous facsimile transmission promptly after becoming aware that the submission has been misplaced of lost;
(2) Supplies another copy of the previously transmitted submission with the Certification of Transmission; and
(3) Supplies a copy of the sending unit's report confirming transmission of the submission. In the event that a copy of the report is not available, the party who transmitted the paper may file a declaration under 37 CFR 1.68 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely transmission.

If all criteria above cannot be met, the PTO will require applicant to submit a verified showing of facts. Such a showing must show to the satisfaction of the Commissioner the date the PTO received the submission.

The facsimile center will have five facsimile units and will be staffed during the business hours of 8:30 a.m. and 5:00 p.m., Monday through Friday, excluding holidays. Although the units may normally be accessed at all times, including non-business hours, there may be times when reception is not possible due to equipment failure or maintenance requirements. Accordingly, applicants are cautioned not to rely on the availability of this service at the end of response periods.

The telephone number for accessing the facsimile machines is (703) 557-9564. In the event that the transmission cannot be accepted at the telephone number above, a backup number has been established at (703) 557-9567. The facsimile center staff can be reached at telephone number (703) 557-4277 during normal business hours.

Oct. 19, 1988 DONALD J. QUIGG,
Assistant Secretary and Commissioner for Patents and Trademarks

[1096 OG 30]

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(45) Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission

A facsimile machine has recently been installed at the Board of Patent Appeals and Interferences (Board). Accordingly, a party who wishes to file papers in a patent application or reexamination proceeding in which an appeal is pending and which is located at the Board may do so via the Board's facsimile machine, the telephone number of which is (703)557-8642. Normally, the file of a patent application or reexamination proceeding in which an appeal is pending is forwarded to the Board approximately six weeks after the examiner's answer has been mailed.

Certain papers in interference proceedings may also be filed via the Board's facsimile machine, for example, motions, briefs, designations of lead attorney, etc. The following are *excluded:* transcripts of depositions or of interrogatories, cross-interrogatories or recorded answers; preliminary statements; exhibits; and evidentiary records under 37 CFR 1.653.

All papers filed with the Board by facsimile transmission are subject to the provisions, requirements and exclusions stated in the Commissioner's Notice of October 19, 1988 (1096 O.G. 30, Nov. 15, 1988), entitled "Filing of Certain Papers and Authorization to Charge Deposit Accounts by Facsimile Transmission."

October 17, 1989 — SAUL I. SEROTA, *Chairman, Board of Patent Appeals and Interferences*

[1108 OG 15]

RECORDS AND FILES

(46) Assignee Names

Effective April 1, 1976, only the first appearing name of an assignee will be printed on the patent where multiple names for the same party are identified on the Base Issue Fee Transmittal form, POL-85b. Such multiple names may occur when both a legal name and an "also known as" or "doing business as" name is also included. This printing practice will not, however, affect the existing practice of recording assignments with the Office in the Assignment Division. The assignee entry on form POL-14 85b should still be completed to indicate the assignment data as recorded in the Office. For example, the assignment filed in the Office and therefore the POL-85b assignee entry might read "Smith Company doing business as (d.b.a.) Jones Company." The assignee entry on the printed patent will read "Smith Company."

For purposes of compiling and publishing the 1976 Annual Index of Patentees, this change will be retroactive to patents issuing on January 6, 1976.

Dec. 17, 1975. — RICHARD J. SHAKMAN, *Assistant Commissioner for Administration.*

[942 O.G. 186]

(47) Submission of Uniform Assignee Names on the Issue Fee Payment Form PTOL-85b

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL-85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL-85b should ensure that the same company name form is used for all patents issuing to a particular company.

Nov. 17, 1977. — RICHARD J. SHAKMAN, *Assistant Commissioner for Administration.*

[965 O.G. 8]

(48) Assignments Affecting Applications of Joint Inventors

Over the past several years, the Assignment Branch of the Patent and Trademark Office has been charging a single fee for recording the assignment of a patent or patent application of joint inventors when separate assignment documents are executed by the joint inventors and then filed together for recording.

This practice is in error because it conflicts with 37 CFR 1.21 Miscellaneous Fees and Charges (h) Recording of Documents which states:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or applications $20.00.

Effective Nov. 1, 1984, the Assignment Branch will charge in accordance with the above regulation, the fee of $20.00 for each assignment document of the joint inventors which relates to the patent or patent applications.

Oct. 1, 1984. — THERESA A. BRELSFORD, *Assistant Commissioner for Administration.*

[1047 O.G. 49]

(49) Recordability of Foreclosures for Assignment Purposes

It has been the practice of the Assignment Branch to record security agreements between a secured party and a debtor which refer specifically to a patent or a patent application and which are signed by the debtor. However, foreclosures by the secured party were not recorded because they were not signed by the debtor. Accordingly, before recording a foreclosure not signed by a debtor, the Assignment Branch required a Court order. This requirement forced the secured party to bring action in a court of law where otherwise Court action might not have been necessary.

To facilitate recording of foreclosures not signed by a debtor and avoid unnecessary court proceedings, the Office will record foreclosures which comply with all of the following criteria:

(1) Submission of the foreclosure document with original endorsement by the secured party, or a verified copy thereof;
(2) Identification of the patent by patent number or the patent application by serial number, or other acceptable identifier(s) as specified in 37 CFR 1.331(c), in the body of the foreclosure document itself or any addenda incorporated by reference;
(3) Reference to the security agreement recorded under 37 CFR 1.331; and
(4) Submission of a verified statement by a representative of the secured party stating that the patent or the patent application has been legally foreclosed on based upon the applicable state laws.

A foreclosure document complying with the above criteria will be deemed to be a recordable instrument in accordance with 37 CFR 1.331.

March 14, 1988. — THERESA A. BRELSFORD, *Assistant Commissioner for Administration.*

[1089 OG 35]

(50) Title of Invention Carried on Office Records

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

Aug. 31, 1977. — BRADFORD R. HUTHER, *Acting Assistant Commissioner for Administration.*

[962 O.G. 23]

(51) Notice to Patent Owners and Parties Responsible for Paying Maintenance Fees Concerning Fee Address and Payor Number

37 CFR 1.363, effective Nov. 1, 1984, provides for a "fee address" to be entered in the Office patent file records for use in all correspondence relating to maintenance fees. The "fee address" is in addition to the "correspondence address" under 37 CFR 1.33 which will continue to be used for all reexamination and interference purposes. If no separate "fee address" is specified, the "correspondence address" will also be used for maintenance fee correspondence.

In order to simplify changes in address by patent owners having several patents, and data input by the Patent and Trademark Office, a "payor number" will be assigned to each "fee address" when a "fee address" is presented to the Office in a patent or request. A request for a "payor number" before a maintenance fee is paid or due will permit a patent owner to request that the "fee address" or "payor number" be recorded in the Office records of the patents owned on which maintenance fees are due so that all notices relating to maintenance fees will be sent to the "fee address".

The Patent and Trademark Office has established a procedure for assigning a "payor number" upon request by a patent owner or a party responsible for paying maintenance fees. Such a party may be, for example, the finance office of a corporation or of a separate organization specializing in maintenance fee payments. Under the procedure, a patent owner or other party may request a "payor number" for a particular "fee address" by writing to: Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231. Each request for a "payor number" should include:

—the "fee address" to be used by the Office, and
—the telephone number of the fee addressee to be used to resolve problems.

After receipt of a "payor number", it may be used to indicate to the Patent and Trademark Office the "fee address" to be used in particular patents on which maintenance fees will become due and in applications in which issue fees have been or are being paid. Any request for entry of a "payor number" or "fee address" in the Office records of a patent, however, must be signed by the patent owner or his or her attorney or agent of record.

After a "payor number" has been assigned, it should be used in all future maintenance fee payments and related correspondence. However, where a "payor number" has not been previously entered in the Office records for a patent, the mere indication of a "payor number" at the time of payment of the maintenance fee, without the signature of the patent owner or the owner's attorney or agent of record, will not serve to make the "payor number" of record in the Office for that patent.

Oct. 19, 1984. — THERESA A. BRELSFORD, *Assistant Commissioner for Administration.*

[1048 O.G. 48]

(52) New System To Monitor Patent Applications

During this summer the Patent and Trademark Office will begin implementation of a new office-wide computer system, the Patent Application Locator and Monitor System (PALM 3), for monitoring the location and status of pending patent applications. The system will also have the ability to print data on certain form letters such as the Notice of Allowance, using computer-controlled printers located in the Examining Groups. This will permit the Notice of Allowance to be printed and mailed by the Groups shortly after the Examiner has decided that an application is in condition for allowance. Under the new system, the Notice of Allowance will be mailed prior to completion of final issue revision by the Group clerical staff. In those applications where an Examiner's Amendment is required, it will normally be mailed as an attachment to the Notice of Allowance.

When existing printing backlogs have been eliminated, this accelerated mailing should reduce the time between allowance by the examiner and issuance of the patent grant in most cases. The nature and/or extent of the revisions or processing requirements subsequent to mailing of the Notice of Allowance may result in little or no reduction in the time required for the printing of a few patents. In addition, it is possible that, as a result of this additional processing, withdrawal or correction of the Notice for a given application may be required. For instance, prosecution might be reopened as a result of the Quality Review Program. In situations where the Base Issue Fee has been paid and the Notice of Allowance is subsequently withdrawn, the applicant may request that a refund be made or that the fee be credited to a Deposit Account.

Applicants will continue to receive a three part Notice of Allowance packet, but, as a result of automated printing, the Notice will be produced in a slightly revised format. This new format will have the following application data printed thereon:

—Serial Number
—Filing Date
—Total Claims Allowed
—Date of Mailing
—Examiner Name and Group Art Unit
—First Named Applicant
—Title of the Invention
—Base Issue Fee Due (Utility Applications Only)
—Attorney's Docket Number
—Class and Subclass Where Issued

Copy (a) of the new Notice of Allowance will be used as applicant's record copy in the current manner. Copy (b) will continue to be used as a transmittal for the fee with copy (c) required when a charge to a deposit account is authorized. The new version of copy (c) will also have a section to notify the Office of a change in an inventor's address. Note that this address change need not be signed by the inventor. This procedure eliminates the need for the separate Inventor's Address Change form (PTOL-231) now in use.

One other change to current practice will also be implemented as a result of the new system. Beginning with patents issuing in the late fall of this year, advance orders for patent copies will only be sent to the correspondence address of record in the application. This practice will permit computer generation of mailing labels for the orders and thereby eliminate the need for the separate, pink Advance Order form (PTO-721) now in use. Requests for advance orders will now be made in a special section of copy (b) of the Notice of Allowance. During the transition from the old order method to the new, it will be

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necessary to send some advance orders to the correspondence address of record in the application rather than some other address as has been requested on an earlier submitted Advance Order Form.

While the major impacts on the public will be limited to those discussed above, one other minor matter should be mentioned. It is anticipated that, due to the absence of data in the master data base, some information occasionally may not be printed on the Notice of Allowance or on other form correspondence. However, this does not necessarily mean that a corrected Notice or form letter is required. Furthermore, since the data base is not used for printing of the patent grant, the missing information should appear on the final issued patent if it is in the application file wrapper. This problem is expected to diminish as the implementation of the system proceeds and the data base becomes more complete. The cooperation of applicants and their representatives during this system implementation is sincerely appreciated by the Patent and Trademark Office.

June 16, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

[997 O.G. 9]

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(53) **Policy Regarding Storage, Retention and Availability of the Foreign Patent Documents in the Numeric Collection of the Patent & Trademark Office***

The U.S. Patent and Trademark Office (PTO) maintains the largest collection of foreign patent documents in the United States. This collection is a major technical information resource that supports the patent examination function as well as the PTO's mission of disseminating technical information. The collection is divided into two parts-the classified collection which is distributed among the examiners' search files, and the numeric collection which is maintained by the PTO's Scientific Library. A large portion of the numeric collection is in paper form, but it also includes considerable microfilm with some overlap between the two forms. Some of the documents are republished versions of earlier publications (e.g., unexamined and examined applications). One of the PTO's objectives has been to reduce the bulky paper foreign patent files in the numeric collection by replacing them, where possible, with good quality microfilm and by eliminating duplicates. A number of other considerations bear on the management of this collection. Because of the importance of the collection, the PTO has established a policy intended to ensure the effective storage, retention, and availability of the foreign patent documents in its numeric collection. The purpose of this notice is to inform the public of this policy which is set forth below.

The public is invited to consider and submit comments on the policy. Please address comments to:

William S. Lawson
Administrator for Documentation
U.S. Patent and Trademark Office
Washington, D.C. 20231

General Policy

The U.S. Patent and Trademark Office (1) is the National repository for all foreign patent documents, except design patents; (2) will maintain, in numerically retrievable collections, as many as possible of these documents for which there is or may be a reasonable level of need, and (3) will make these documents conveniently accessible to the PTO and to the public.

Implementation

1. The Scientific Library is responsible for policy implementation.

2. At least all post-1920 foreign patent documents needed to meet "Minimum Documentation" requirements of the Patent Cooperation Treaty will be housed in the Scientific Library in either paper or microfilm form.

3. All paper copies of foreign patent documents not needed to meet "Minimum Documentation" requirements will be housed either in the Scientific Library or other storage space in accordance with usage activity. The documents with greater activity will be housed in the Scientific Library until space therein is exhausted and the remaining documents will be housed in the other storage space.

4. All foreign journals (official gazettes) will be housed in the Scientific Library.

5. All paper copies of foreign patent documents needed for copy request fulfillment will be stored in a form accessible for prompt retrieval.

6. Whenever feasible, paper copies of foreign patent documents will be replaced by good quality microfilm.

7. 16mm roll microfilm will be the microform preferred for PTO use and archival storage. If 16mm microfilm is not available or is unacceptable, the Library may decide, on a case-by-case basis, whether a different microform should be obtained.

8. All microfilm of foreign patent documents intended for use by the PTO and the public will be housed in the Scientific Library. All archival microfilm will be housed in a facility that is suitable for the preservation and protection of the microfilm and for needed access.

9. Paper copies of foreign patent documents will be disposed of if good quality microfilm of the corresponding documents is available in the Library, good quality archival microfilm is available in the PTO, and the PTO has the legal rights to sell paper copies made from the microfilm and to reproduce the microfilm for internal use; paper copies for which there is little or no demand may be disposed of despite the availability of only marginal-quality microfilm. Paper copies for which good quality microfilm is available in the Library, but for which the other conditions noted above are not met, will be retained, although they need not be stored in a form accessible for prompt retrieval. However, such documents will be stored in accordance with a procedure designed to ensure preservation of the documents, adequate records of stored material and efficient utilization of space.

10. Where an application has been republished, a decision will be made on a c"ountry-by-country" basis as to whether the duplicate version or versions of the initial document will be retained. The basis for this decision will be the current or anticipated utility of the duplicate documents to the PTO and the public.

11. Collections of paper copies that are not needed by the PTO will be disposed of promptly. Such collections will first be offered, for a limited time, to developing countries through the World Intellectual Property Organization. Collections which cannot be disposed of in this manner may then be disposed of, preferably by offering them for sale, as part of some exchange, or as gifts. However, if unneeded paper copy collections cannot be disposed of in a beneficial manner within a reasonable period of time, they will be discarded.

12. Requests for copies of foreign patent documents from within the PTO and from the public will be fulfilled promptly.

13. Fees to the public for copies of foreign patent documents will be set at a level commensurate with full cost recovery and with the provision of prompt, efficient copy service.

14. As the complete text of foreign patent documents is captured in electronic form and becomes retrievable, numerically and otherwise, to the PTO and to the public, in the automated patent system, paper copies will be disposed of and the retention of microfilm reconsidered.

15. It is recognized that this policy does not provide for all possible circumstances regarding the foreign patent document collection and there may be limited instances where some deviation from the policy is justified. In such cases, the deviation will be justified in writing by the Program Manager of the Scientific Library and approved by the Administrator for Documentation and the Assistant Commissioner for Patents.

Nov. 26, 1984.

WILLIAM S. LAWSON,
Administrator for Documentation.

[1052 OG 3]

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*The PTO also maintains a very large, technologically classified collection of foreign patent documents. This policy *does not* apply to the classified collection.

FEES AND PAYMENT OF MONEY

(54) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1 and 2

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish fee related procedures and fees in amounts which would comply with the requirements of either Public Law 96-517 or H.R. 6260, dependent upon which is effective on Oct. 1, 1982. This action is necessary at this time in view of the requirements to establish fees and procedures contained in Public Law 96-517 and the requirements which would also be present under H.R. 6260 enacted as a Public Law. This final rule is being issued in two sections with the first section relating to patent fees and the second section relating to trademark fees. This final rule is also being issued in alternative form so that the proper fees and procedures will become effective on Oct. 1, 1982, under either Public Law 96-517 or the Public Law which results from enactment of H.R. 6260. Thus, if Public Law 96-517 remains fully effective on Oct. 1, 1982, the rule changes contained herein which are common to Public Law 96-517 and H.R. 6260, as well as those specific to Public Law 96-517, contained in Alternative A of each section, will become effective. Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, the rule changes contained herein which are common to Public Law 96-517 and H.R. 6260, as well as those specific to H.R. 6260, contained in Alternative B of each section, will become effective. Thus, the intended effect of this action is to adopt rules which will be effective on Oct. 1, 1982, establishing patent and trademark fees and procedures regardless of whether Public Law 96-517 remains fully effective or whether H.R. 6260 has been enacted.
Effective Date: Oct. 1, 1982. However, prior to Oct. 1, 1982, the Department of Commerce will publish a document confirming the amendments under either Alternative A or Alternative B set forth herein depending upon enactment of H.R. 6260 as a Public Law.
For Further Information Contact: As to the patent rules contact R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3-11A13, Washington, D.C. 20231.
For Further Information Contact: As to the trademark rules contact Miss Maude Williams by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Rm. 3-11C17, Washington, D.C. 20231.
Supplementary Information:

SECTION I...REVISION OF PATENT FEES

Background

A notice of proposed rulemaking was published in the *Federal Register* on June 28, 1982, at 47 FR 28042-28063 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57-120. An oral hearing was held on July 9, 1982. Fourteen written letters and statements were submitted. Five persons testified at the oral hearing. Full consideration has been given to all of the letters, statements, and testimony.

Objectives of Rule Changes

These rule changes are designed primarily to implement the Patent and Trademark Office fees which are provided for by Public Law 96-517, or which would be set in, or provided for by, the Public Law resulting from H.R. 6260.

Public Law 96-517

Public Law 96-517 presently requires that fees be established by the Commissioner for the processing of patent applications from filing through issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. Public Law 96-517 requires that by Oct. 1, 1982, fees for the processing of patent applications, other than design patents, be set by the Commissioner to recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. Similarly, fees for processing design patents are to be set to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. By Oct. 1, 1982, fees for all other services or materials related to patents are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

Public Law 96-517 also requires that fees be set for maintaining all patents filed on or after Dec. 12, 1980, other than design patents, in force. It also requires that maintenance fees must recover 25 per centum of the estimated cost to the Office of processing patent applications, other than design patent applications, by the fifteenth fiscal year following Dec. 12, 1980. Under Public Law 96-517, the maintenance fees are due 3 1/2, 7 1/2, and 11 1/2 years after grant of the patent.

Public Law 96-517 is presently effective and this rule change is designed to implement the fee provisions of that law if it remains fully effective on Oct. 1, 1982. The changes which will become effective on Oct. 1, 1982, under Public Law 96-517 (without enactment of H.R. 6260) are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under only Public Law 96-517, which appear in Alternative A.

H.R. 6260

On June 8, 1982, the House of Representatives passed H.R. 6260. H.R. 6260 would establish a number of statutory fees which the Commissioner is required to charge. Among the more significant of these are fees for filing a patent application, issuing, and maintaining a patent in force. The fees for filing a patent application and issuing a patent would be set forth in § 41(a) of Title 35, United States Code, as proposed to be amended by H.R. 6260. Certain other fees, such as appeal fees, the fee for filing a disclaimer, and fees for filing petitions seeking to revive an abandoned application and for extensions of time, would also be set in § 41(a) of Title 35, United States Code. Section 41(b) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would set forth the fees for maintaining a patent in force. These fees would be due 3 1/2, 7 1/2, and 11 1/2, years after grant of the patent or within a grace period of six months thereafter. Section 41(c) of Title 35, United States Code, as proposed to be amended by H.R. 6260, would provide for the acceptance of maintenance fees after the statutory grace period under certain conditions and with certain effects.

H.R. 6260 would also provide for the reduction by 50 per centum in the fees paid under § 41(a) and (b) of Title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established, and to be established therefor.

Section 41(d) of Title 35, Untied States Code, as proposed to be amended by H.R. 6260, would also provide that the Commissioner establish fees for all other processing, services, or materials related to patents which are not covered in § 41(a)-(c) of Title 35, United States Code, to recover the estimated average cost to the Office of the processing, services, or materials.

The changes which will become effective on Oct. 1, 1982, *upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982*, are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. H.R. 6260 includes other provisions which would be the subject of other proposals for rulemaking.

DISCUSSION OF SIGNIFICANT CHANGES

This rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a patent application, or during the term of a patent. A number of significant changes are made in order to implement either Public Law 96-517 or H.R. 6260.

Under H.R. 6260, and Alternative B of this rule making, fees under § 41(a) and (b) of Title 35, United States Code, would be reduced by 50 per centum for independent inventors, small

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business concerns, and nonprofit organizations. H.R. 6260 would give the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. H.R. 6260 defines small business concerns by reference to § 3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking, in Alternative B, implements the fee system which would be established by H.R. 6260 and lists all applicable fees.

* * * * *

Another significant change relates to fees established under Public Law 96-517 and which would be established by H.R. 6260 for petitions for extensions of time to take actions required by the Commissioner in an application. H.R. 6260 would establish a fee of $50 for filing a petition for a first one-month extension of time, an additional fee of $100 for filing a petition for a second one-month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a petition for a third one-month extension of time which would expire three months after the end of the time period set for taking action. A fourth one-month extension with an additional fee of $200 could be requested if additional time was available under the statute. Under H.R. 6260, the Commissioner would have authority to issue regulations providing when, within any maximum time period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. The Commissioner would also not be precluded by H.R. 6260 from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause. This rulemaking implements the extension of time provisions of H.R. 6260 by permitting applicants in the majority of situations to file the petition for an extension of time and the fee at the time of and along with the filing of the response for which a non-statutory or shortened statutory time period has been set. This will reduce the amount of paperwork involved and should significantly reduce the expenses of applicants and the Office since resources now devoted to the separate processing of petitions for extensions of time will no longer be required to be expended thereon. The fees are set to provide a proper control on the number of extensions of time given. The same procedures relating to extensions of time which would be established under Alternative B and H.R. 6260 will also be established under Alternative A and Public Law 96-517. Thus, whether the rules are effective on Oct. 1, 1982, under Public Law 96-517 and Alternative A, or under H.R. 6260 and Alternative B, the same procedures for obtaining extensions of time will be in effect with the only differences being in the amount of the fees.

Another significant change relates to the implementation of the fee for revival of an unintentionally abandoned application which would be authorized under H.R. 6260. H.R. 6260 would establish two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees would be applicable to petitions to accept the delayed payment of the fee for issuing a patent. Under H.R. 6260, a fee of $50 is established in § 1.17(1) for filing a petition for revival under §§ 133 or 151 of Title 35, United States Code, in accordance with standards presently in effect where the delay resulting in the abandonment, or the delay in payment of the issue fee, was unavoidable. Under H.R. 6260, a fee of $500 is established in § 1.17(m) for filing each petition for revival, or for acceptance of the delayed payment of an issue fee, where the abandonment or the failure to pay the issue fee was unintentional. A mere statement that abandonment was unintentional plus the $500 fee is all that is required in this case for this purpose. Under H.R. 6260 and this rulemaking an applicant would have a choice of which petition and fee to file seeking revival depending on the circumstances involved. The changes discussed in this paragraph cannot be made effective without enactment of H.R. 6260 as a Public Law.

The rulemaking also provides for fees for filing certain petitions which have, in some cases, heretofore, been decided without a charge. These fees are established under Public Law 96-517 and are provided for by the amendment of § 41(d) of Title 35, United States Code, which would be introduced by H.R. 6260. Under § 41 of Title 35, United States Code, as amended by Public Law 96-517 or as it would be amended by H.R. 6260, fees are authorized for the processing of various petitions desiring certain actions to be taken regarding patent applications, for the recording of assignments, for reexamination of patents, and for the processing of international applications under the Patent Cooperation Treaty. In general, fees are not being required for those petitions which are supervisory in nature. For example, where applicants are petitioning from an allegedly improper action of the examiner, it is felt that such petitions should be processed and decided without charge since they are not asking for any special privilege but are attempting to correct an allegedly incorrect Office holding. The changes discussed in this paragraph will be in effect on Oct. 1, 1982, whether the rules become effective under Public Law 96-517 and Alternative A, or under H.R. 6260 and Alternative B.

Many of the fees currently set forth in § 1.21 are being increased to reflect the cost of currently performing that service.

DISCUSSION OF SPECIFIC SECTIONS CHANGED

The sections changed are grouped in this proposal under three different categories. Those changes which are common to Public Law 96-517 and H.R. 6260 appear first and are numbered 1-54. Those changes which relate only to Public Law 96-517 appear as Alternative A and are numbered 55-62. Those changes which are dependent upon enactment of H.R. 6260 appear as Alternative B and are numbered 63-71. The changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, Alternative B will become effective on Oct. 1, 1982, in which case Alternative A will not become effective.

Rule Changes Common To Public Law 96-517 and H.R. 6260

The following sections are changed, effective Oct. 1, 1982, under either Public Law 96-517 or H.R. 6260:

Section 1.11 is amended to change the reference for the reexamination request fee to § 1.20(c).

Section 1.12 is amended to break the section into four paragraphs. Paragraph (a) maintains current practice but adds specific reference to § 1.19(a)(5) which sets the cost of copies.

Paragraph (b) maintains current wording except for inserting "patent" after "abandoned" and changing "his" to "applicant's". Paragraph (c) includes new language relating to obtaining copies of assignment records not open to the public. Access can be obtained only with the applicant's permission or by petition with fee to the Commissioner for such access in particular situations. No change in the showing required by petition to obtain access is intended by this amendment. Paragraph (d) contains present language except for reference to the specific rule which sets forth the charge for time consumed in making assignment searches.

New paragraph (e) of § 1.14, sets forth the two ways in which access can be obtained to patent applications which are not open to the public. The two ways are (1) by petitioning and paying the petition fee and approval of the Commissioner of such petition and (2) by obtaining written approval from the applicant.

New § 1.19 provides fees for copies of various documents supplied by the Office. The fees have been grouped into 5 paragraphs. New paragraph (a) provides fees for uncertified copies. Subparagraphs (a)(1) and (2) indicate the prices of printed patent copies. Sub-paragraph (a)(3) provides a single fee for a copy of an application, as filed, for each 50 pages, or fraction thereof. This practice should make it much easier to determine the amount of the required fee. Subparagraph (a)(4) sets a single fee for a copy of each 100 pages, or fraction thereof, of a patent file wrapper. Subparagraph (a)(5) provides for a charge of 30 cents per page for copies of Office records other than those covered by subparagraphs (a)(1) through (4). Subparagraph (a)(6) provides a fee for a microfiche copy of a microfiche.

Paragraph (b) of § 1.19 sets fees for certified copies of Office documents. Subparagraph (b)(1) sets a fee for certifying Office

records. Subparagraph (b)(2) provides a single fee for searching assignment records, preparing an abstract of the title and certification thereof. Sub-paragraph (b)(3) provides a fee for comparing copies not prepared by the Office prior to certification in order to provide basis for certification. Paragraph 1.19(c) sets the fees for subscribing to all of the patents issued annually in particular subclasses. This charge is in addition to the normal copy charge under § 1.19(a)(1) and (2). Paragraph 1.19(d) sets the fee for providing patent copies to libraries under 35 U.S.C. 13. Paragraph 1.19(e) provides fees for lists of United States patents in particular subclasses.

Section 1.21 is amended to contain those miscellaneous fees which do not relate to the topics covered in §§ 1.16-1.20. All of the fees in § 1.21 are established under the authority given the Commissioner by 35 U.S.C. 41(d) as amended by Public Law 96-517 or as proposed in H.R. 6260. Paragraph 1.21(a) establishes fees for admission to the examination for registration to practice, registration, reinstatement and issuance of certificates of good standing of patent attorneys and agents. Subparagraph 1.21(b)(1) sets forth the fee for establishing and reinstating deposit accounts, while subparagraph 1.21(b)(2) sets forth the fee due when the balance at the end of each month is below $40. Paragraph 1.21(c) sets the fee for filing a disclosure document. Paragraph 1.21(d) sets the fee for renting a delivery box. Paragraph 1.21(e) sets the fee for an international-type search report. Although all national applications now receive what is known as an international-type search, if a report thereof is desired in addition to an Office action, the fee set in § 1.21(e) is required. Paragraph 1.21(f) sets a fee for searching Office records for purposes not otherwise specified. Paragraph 1.21(g) sets the fee for tokens for copying machines. Paragraph 1.21(h) sets the fee for recording assignments, agreements, and other documents. Paragraph 1.21(i) sets forth the fee for publishing a notice of availability of a patent for licensing or sale in the *Official Gazette*. Paragraph 1.21(j) sets the fee for the Office providing a duplicate or replacement of a permanent Office user pass. Paragraph 1.21(k) indicates that the Commissioner may specify charges for items and services not otherwise specified at a level to recover the actual cost of providing such an item or service by the Office.

Section 1.24 is revised so that the denomination of coupons sold by the Office will be in more convenient amounts.

Section 1.25 is amended to provide, in paragraph (a), a reference to the fee for establishing a deposit account and a service charge if the end of the month balance is below $40.00. Paragraph (b) is amended by revising the present sentence to refer to post-issuance fees and by adding a second sentence which would specifically provide in the regulations for the possibility of an applicant giving a general authorization to charge any fee due under §§ 1.16-1.18 in a particular application to a deposit account during the entire pendency of the application.

This general authorization would not apply after the patent issues, e.g., to maintenance fees. The last sentence of paragraph (b) permits fees during reexamination to be charged to a deposit account by filing an authorization with the request for reexamination.

Section 1.26 is amended to provide in paragraph (a) that a withdrawal of a request for an oral hearing will not entitle appellant to a refund. Paragraph 1.26(a) raises the amount which will not be refunded without specific request from fifty cents to one dollar. Paragraph (b) relating to refunds of international search fees during subsequent examination of a national application is deleted since such refunds are now covered by reductions in the appropriate fees paid under § 1.445 rather than solely by direct refunds. Paragraph (c) is amended to bring the spelling of "requester" into conformance with that used in other sections of the regulations.

Section 1.45 is amended to provide in paragraphs (b) and (c) for a petition and petition fee to be filed to correct misjoinder of inventorship situations in pending applications. The fee will cover the additional time required by the Office to process such applications.

Section 1.47 is amended to provide for petitions and fees for filing applications signed by less than all inventors, or a person not the inventor.

Section 1.51 is amended to refer to the filing fees in new § 1.16 and to add a new paragraph (c) indicating that applicants may file authorizations to charge fees required under any of §§ 1.16-1.18 to deposit accounts.

Section 1.52 is amended to add a reference in paragraph (a) to new paragraph (d). New paragraph (d) provides in the rules for filing an application in a language other than English if a verified English translation and fee under § 1.17(k) are timely submitted.

Section 1.55 is amended in paragraph (b) to require a petition and fee for processing priority papers submitted after the issue fee is paid.

Section 1.75 is amended to add a reference to § 1.16 and a sentence referring to the fee for multiple dependent claims set forth in § 1.16(d).

Section 1.85 is amended to delete the sentence relating to mounting of informal drawings.

Section 1.86 is removed to delete the reference to the Office draftsman making drawings since such service is no longer available.

Section 1.102 is amended by revising paragraph (a) and adding new paragraphs (c) and (d). Revised paragraph (a) refers to paragraph (b) and added paragraphs (c) and (d). Paragraph (c) requires a petition but no fee where the basis for the petition to make special is the applicant's age or health or the impact of the invention on improving the environment or conservation of energy. Paragraph (d) requires a petition and the fee set forth in § 1.17(i) for petitions to make special on grounds other than those above.

Section 1.103 is amended in paragraph (a) to provide for filing a petition and the fee set forth in § 1.17(i) for a suspension of action except that no fee would be required where the reason for the suspension is the fault of the Patent and Trademark Office. Paragraph (b) is amended to clearly indicate that suspensions are directed to actions by the Office and not responses by the applicant.

Section 1.104, paragraph (d) is amended to change the fee reference to correspond to § 1.21(e).

Section 1.134 is added to indicate that unless applicant is notified of any non-statutory or shortened statutory period in an Office action, a maximum period for response of six months is allowed.

Section 1.135 is amended to provide that if no response is filed within the time set in the Office action under § 1.134 or as it may be extended under § 1.136, the application will be abandoned unless an Office action indicates that another consequence, such as disclaimer, will take place. Paragraph (b) is amended to include a reference to paragraph (a). Paragraph (c) is amended to add that applicant's reply must be a bona fide attempt to respond as well as to advance the case to final action in order for applicant to be given an opportunity to supply any omission.

Section 1.136 is amended to revise the title and provide for two distinct procedures to extend the period for action or response in particular situations. The procedure which is available for use in a particular situation will depend upon the circumstances. Paragraph 1.136(a) permits an applicant to file a petition for extension of time and a fee as in § 1.17(a), (b), (c), or (d) up to four months after the end of the time period set to take action except (1) where prohibited by statute, (2) in interference proceedings, or (3) where applicant has been notified otherwise in an Office action. The petition and fee can be filed prior to or with the response. The filing of the petition and fee will extend the time period to take action up to four months dependent on the amount of the fee paid except in those circumstances noted above. Paragraph 1.136(a) will effectively reduce the amount of paperwork required by applicants and the Office since the extension will be effective upon filing of the petition and payment of the appropriate fee and without acknowledgment or action by the Office and since the petition and fee can be filed with the response. Paragraph (b) provides for requests for extensions of time upon a showing of sufficient cause when the procedure of paragraph (a) is not available. Although the petition and fee procedure of § 1.136(a) will normally be available within 4 months after a set period for response has expired, an extension request for cause under § 1.136(b) must be filed during the set period for response. The sentence in paragraph (b) relating to who may grant an extension under paragraph (b) is eliminated thereby providing additional flexibility to designate persons to act on requests under paragraph (b). Extensions of time in interference proceedings are governed by § 1.245.

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Section 1.165, paragraph (b) is amended to delete therefrom the last sentence which refers to a fee for mounting copies. Since little or no need has been found for this provision in the rules, it is deleted.

Section 1.171, as amended, adds a reference to § 1.19(b)(2) which sets forth the fee for title reports.

Section 1.177 is amended to require a petition and fee as set forth in § 1.17(i) where it is desired that divisions of a reissue issue on different dates.

Section 1.181 is amended to indicate in paragraph (d) that if a petition to the Commissioner is filed under the provisions of a section which requires a petition fee and the required fee is not paid, the petition will be dismissed. The amendment to paragraph (g) deletes the reference to § 1.183.

Section 1.182 is amended to add a sentence requiring any petition filed under this section to be accompanied by the petition fee set forth in § 1.17(h).

Section 1.183 is amended to specifically refer to the inherent authority of the Commissioner to suspend or waive the rules at the Commissioner's initiative. The amendment also indicates the Commissioner's authority to designate others to act for the Commissioner in appropriate circumstances. The rule language also requires the payment of the petition fee set forth in § 1.17(h) if a petition to suspend or waive the rules is filed.

Section 1.191 is amended to change the fee reference for filing a notice of appeal to § 1.17(e) and delete the word "primary" since some actions which are subject to appeal are not made by a "primary" examiner.

Section 1.192, paragraph (a), is amended to refer to the fee for filing an appeal brief set forth in § 1.17(f). The present language requiring a showing of sufficient cause for extensions of time for filing the brief and an indication that an oral hearing is desired at the time of filing the brief are removed from paragraph 1.192(a). Under the amendment to paragraph 1.192(a), the provisions of § 1.136 will apply to extensions of time for filing the brief. The time for requesting an oral hearing is now set in § 1.194(b).

Section 1.194 is amended to revise paragraphs (b) and (c) to refer to the fee for oral hearing in § 1.17(g) and to indicate in paragraph (b) that any request for an oral hearing must be made within one month after the mailing date of the examiner's answer.

Section 1.197, paragraph (b), is amended to modify the last sentence relating to extensions of time to make the provisions of § 1.136 applicable thereto. Paragraph 1.197(b) is also amended to limit requests for rehearing, reconsideration or modification of a Board decision to one. This will not significantly change present practice since such requests are now required to be filed within thirty days from the date of the original decision.

Section 1.231, paragraph (a)(1), is amended to change the reference to the fee for filing a request for reexamination to § 1.20(c).

Sections 1.245 and 1.246 are amended to indicate that the provisions of § 1.136 do not apply to time periods in interferences.

Section 1.263 is amended to add a reference to the fee for filing a disclaimer contained in § 1.20(d).

New section 1.268 is added to provide a rule relating to the filing of interference settlement agreements. The rule generally follows 35 U.S.C. 135(c) and provides for filing of petitions and fees in paragraphs 1.268(b) and (c).

Section 1.292, paragraph (a), is amended to require the payment of the fee set forth in § 1.17(j) with any petition for the institution of public use proceedings.

Section 1.304, paragraph (a), is amended to provide for extension of the time period for filing an appeal or civil action to be subject to the provisions of § 1.136 and refer to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals.

Section 1.311 is amended to designate the present section as paragraph (a) and revise it in several ways. Paragraph (a) indicates that the notice of allowance will be sent to the correspondence address as indicated under § 1.33. The issue fee (§ 1.18) is indicated as being due 3 months from the date of mailing of the notice of allowance. Paragraph 1.311(b) permits an authorization to be filed either before or after the mailing of the notice of allowance to charge the issue fee to a deposit account.

Section 1.312 is amended to divide the section into two paragraphs and require a petition and payment of the fee under § 1.17(i) for any amendment filed after payment of the issue fee.

Section 1.313 is amended to provide in paragraph (a) clear basis for the Office withdrawing applications from issue on its own initiative or upon petition by applicant accompanied by the petition fee set forth in § 1.17(i). Any accompanying amendment must comply with the requirements of § 1.312. Paragraph (b) clarifies when an application will be withdrawn from issue after assignment of the issue date and patent number.

Section 1.314 is amended to revise the wording to eliminate reference to a portion of the issue fee and adds reference to the possibility that an application in which the issue fee was paid can be withdrawn from issue under § 1.313 or the issuance thereof deferred pursuant to a petition by the applicant and the payment of the petition fee under § 1.17(i).

Section 1.321 is amended to include references in both paragraphs (a) and (b) to the statutory disclaimer fee in§ 1.20(d) and delete the reference to § 1.21.

Section 1.324 is amended to include reference to the fee in § 1.20(b) and change the word "application" to "petition".

Section 1.331, paragraph (a), is amended to add a new sentence which gives the citation of the fee for recording assignments and to indicate that instruments recorded on the Government register under Part 7 of Title 37, Code of Federal Regulations, do not require payment of such fee.

Section 1.332 is amended to refer to the fee in § 1.21(h) for recording an assignment.

Section 1.334 is amended to divide the rule into three paragraphs and also require an address of the assignee so that correspondence can be directed to the assignee if required. New paragraph (c) provides for filing a petition and the fee set in § 1.17(i) seeking to have the patent issue to the assignee where such assignment has not been recorded at the time the issue fee is paid.

Section 1.341, paragraph (h), is amended to refer to the fee set forth in § 1.21(a)(2) for registration of an attorney or agent.

Section 1.347 is amended to add a sentence referring to the fee set forth in § 1.21(a)(3) for reinstatement of an attorney or agent.

Section 1.445 is amended to increase the PCT transmittal fee and search fee to a level needed to cover the cost of performing the required functions. Paragraph 1.445(a)(2) is also amended to provide, in effect, for a reduction in the international search fee due to the United States Patent and Trademark Office as an International Searching Authority where a corresponding United States national application with fee has been filed. In addition, paragraph 1.445(a)(4) is amended to credit the national fee required under § 1.16(a)-(d) where an international search fee has been paid on the corresponding international application to the United States as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee a request for a refund of the excess under § 1.446(b) may be filed at the time of paying the national fee. The supplemental search fee for inventions in addition to the first, where lack of unity of invention has been found, is reduced since the present fee is more than is required to cover the costs. The national fee amount is the same as the national application filing fees in § 1.16(a)-(d).

Section 1.446(b) is revised to permit a refund of a portion of the search fee to the extent set forth in § 1.445(a)(4), if such refund is requested at the time of paying the national fee.

Section 1.451 is amended in paragraph (b) to revise the citation of the fees for a certified copy.

Section 1.510 is amended to cite the section which sets forth the fee for requesting reexamination. There is no change in the amount of this fee.

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Alternative B...Rule Changes Under H.R. 6260

The following sections will become effective on Oct. 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to that date:

Section 1.16 in Alternative B establishes in the regulations those statutory fees which would be charged by the Commissioner for filing patent applications under H.R. 6260. Section 1.16 also includes additional filing fees set in 35 U.S.C. 41(a)(1) to cover the cost of examining complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. Section 1.16 also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under 35 U.S.C. 41(a) as it would be amended by H.R. 6260, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in § 112 of Title 35, United States Code, or any claim depending therefrom, is considered as separate dependent claims in accordance with the number of claims to which reference is made.

The fees in § 1.16 are reduced by 50 per centum for applications filed by small entities, i.e., independent inventors, nonprofit organizations and small business concerns, in accordance with H.R. 6260. Therefore, two fees are listed under each paragraph.

New § 1.16 relates to application filing fees. Paragraph (a) sets a basic filing fee of $300 which will be required in all original patent applications. The term "original" as used in the regulations means "non-reissue". An "original" application can be a first filing, a division, a continuation, or a continuation-in-part application. Paragraph 1.16(b) provides for an additional fee of $30 for each independent claim in excess of 3 in an original application. New paragraph 1.16(c) provides for an additional fee of $10 for each claim in excess of 20, whether independent or dependent. A multiple dependent claim is considered to be that number of claims to which direct reference is made. Also, any claim which refers to a multiple dependent claim is considered for fee calculation purposes to be the number of claims to which direct reference is made in the multiple dependent claim. Paragraph 1.16(d) provides for a new fee of $100 in each application which contains one or more multiple dependent claims. The note following paragraph 1.16(d) is intended to clearly indicate that the applicant, attorney, or agent may pay any additional fees required under paragraphs (b), (c) and (d) of § 1.16, or cancel such claims without payment of such additional fees, either at the time of filing or by the time a response is due to any notice of fee deficiency mailed by the Office. If the fees are not paid or the claims cancelled by the end of the period set for response to the notice of fee deficiency, the application will be held abandoned. New paragraph 1.16(e) establishes the amount of the surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application. This fee is being established at this time, but will only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6260. New paragraph 1.16(f) provides for a filing fee of $125.00 for a design application.

Paragraphs 1.16(g) and (h) incorporate into the regulations the filing fees for plant and reissue applications.

Paragraphs 1.16(i) and (j) set forth the additional claim fees required in reissue applications based on claims in excess of those in the original patent.

New § 1.17 relates to patent application processing fees which are normally due during the time a patent application is pending. New paragraphs (a), (b), (c) and (d) provide for the payment of an extension fee for obtaining an automatic extension of time upon filing a petition as provided for in § 1.136(a). The extension fee can be paid during the period for which an extension of time to respond is desired, or after the original period for response has expired, provided that any maximum statutory period which may apply has not expired. The fees set forth in § 1.17 are the total fees required under § 1.136(a) for the periods indicated and any extension fee previously paid to extend a particular period is credited toward the total extension fee required. Paragraph (e) sets forth the fee for filing a notice of appeal to the Board of Appeals. Paragraph (f) sets forth the fee for filing an appeal brief for appellant. Paragraph (g) provides for a new fee for requesting an oral hearing before the Board of Appeals. Paragraphs (h) and (i) set forth fees which will be required with petitions to the Commissioner under those sections of the regulations which specifically indicate that such petition fees are required. The amount of the fees are set at two levels based on the degree of complexity of the petitions in order to recover the estimated average cost to the Office of processing the petitions. Paragraph (j) provides for a fee to be paid with any petition for institution of a public use proceeding to cover the estimated average cost of such a proceeding. Paragraph (k) sets forth a new fee for processing an application filed with a non-English language specification. The fee will cover the additional processing costs involved in such applications. New paragraph (l) incorporates into the regulations the fee which will be charged for filing a petition to revive or to accept late payment of the issue fee where the delay was unavoidable. New paragraph (m) incorporates into the regulations the fee which will be established in 35 U.S.C. 41(a)7, as amended by H.R. 6260, to be charged for a petition for the revival of an unintentionally abandoned application for patent or for the unintentionally delayed payment of an issue fee.

Since paragraphs 1.17(h), (i), (j) and (k) are established under the authority given the Commissioner under 35 U.S.C. 41(d) as it would be amended by H.R. 6260, only one level of fee is set. H.R. 6260 only provides for the reduction of fees charged to small entities of those fees established in 35 U.S.C. 41(a) and (b).

New § 1.18 sets the amount of the issue fees specified by H.R. 6260. New paragraph (a) establishes an issue fee of $500.00 for all original and reissue patents except for designs and plants. New paragraph (b) sets the amount of the issue fee for a design patent. New paragraph (c) sets forth the issue fee for a plant patent. All fees in § 1.18 will be reduced by 50 per centum for small entities.

New § 1.20 sets fees for various post-issuance functions performed by the Office. New paragraph (a) sets forth a fee for providing a certificate of correction of an applicant's mistake. New paragraph (b) sets a fee to accompany a petition to correct inventorship in a patent under § 1.324. New paragraph (c) transfers the $1,500.00 fee for requesting reexn from present § 1.21(x) to this new section. New paragraph (d) provides for a fee for filing a disclaimer under § 1.321. Maintenance fees required by Public Law 96-517 and which would be set in H.R. 6260 are placed in this section. Specific maintenance fees, which are required by Public Law 96-517, for those patents resulting from applications filed on and after Dec. 12, 1980 and up to the date of enactment of H.R. 6260 are being established at this time in paragraphs 1.20(e)-(g). New paragraphs 1.20(h)-(j) incorporate into the regulations the maintenance fees which would be provided in 35 U.S.C. 41(b) by H.R. 6260. The fees in paragraphs 1.20(a)-(c) are only set at one level because they are established under 35 U.S.C. 41(d). The fees in paragraphs 1.20(e)-(g) are only set at one level because they are established under Public Law 96-517 and are not subject to reduction for small entities. The details implementing the payment of maintenance fees are not being established at this time.

Section 1.66 is amended to provide for the use of an apostille of a foreign official to attest to oaths or affirmations made in foreign countries in accordance with 35 U.S.C. 115 and 261, as amended by H.R. 6260.

Section 1.137, as amended, designates the existing section as part of paragraph (a), adds a reference to the new fee under § 1.17(l) for a petition for revival where the delay which resulted in abandonment was unavoidable, indicates that the petition must be promptly filed, and states when the showing that the delay was unavoidable must be verified. New paragraph 1.137(b) provides for filing a statement and a fee under § 1.17(m) for revival of an application which was unintentionally abandoned, and also indicates when such petitions can be filed. Paragraph (c) requires that any petition for revival under paragraph (a) of § 1.137 be promptly filed and that a terminal disclaimer, equivalent to the period of abandonment of the application, be filed with any petition under paragraph (a) filed more than six months after the date of abandonment.

Section 1.155 is amended to refer in paragraph (a) to § 1.18(b) which sets forth the issue fee for a design application. Paragraph 1.155(b), as amended, includes a reference to the fee for delayed

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payment of the issue fee set forth in § 1.71(1) where the delay in payment was unavoidable, indicates that the petition must be promptly filed, and states when showings that the delay was unavoidable must be verified. New paragraph 1.155(c) provides for acceptance of the late payment of the issue fee where the delay was unintentional upon petition and payment of the fee set forth in § 1.17(m). New paragraph 1.155(c) also indicates when such petitions can be filed. Paragraph 1.155(d) is added to require a terminal disclaimer equivalent to the period of abandonment of the application where petition under paragraph (b) of § 1.155 is not filed within six months of the date of abandonment.

Section 1.316 is amended to implement the statutory provisions of 35 U.S.C 41(a) with regard to petition fees for revival of applications abandoned for failure to pay the issue fee. Paragraph (b) is amended to provide for petitions for revival with the fee in § 1.17(1) where the delay in payment was unavoidable, to indicate that the petition must be promptly filed, and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is added to provide for petitions for revival with the fee in § 1.17(m) where the delay was unintentional. New paragraph (c) also indicates when such petitions can be filed. Paragraph (d) is added to require a terminal disclaimer equivalent to the period of abandonment of the application where a petition under paragraph (b) of § 1.316 is not filed within six months of the date of abandonment.

Section 1.317 is amended to implement the statutory provisions of 35 U.S.C. 41(a) with regard to petition fees for patents lapsed for failure to pay the remaining balance of the issue fee. Paragraph (a) is amended to show that it applies only to patents in which the issue fee was paid prior to Oct. 1, 1982. Issue fees paid on or after that date will be in accordance with § 1.18. Paragraph (b) is amended to provide for petitions with the fee in § 1.17(1) where the delay in payment was unavoidable, to indicate that the petition must be promptly filed, and to state when showings that the delay was unavoidable must be verified. Paragraph (c) is added to provide for petitions with the fee in § 1.17 (m) where the delay was unintentional. New paragraph (c) also indicates when such petitions can be filed. Paragraph (d) is added to require a terminal disclaimer equivalent to the period of lapse of the patent where a petition under paragraph (b) of § 1.317 is not filed within six months of the date of lapse.

RESPONSE TO COMMENTS ON THE RULES

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Written comments were received from three patent law groups and eleven individuals. The three patent law groups were (1) the American Patent Law Association whose membership includes several thousand lawyers involved in the practice of law before the U.S. Patent and Trademark Office; (2) the Patent, Trademark and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of The Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups and by 3 individuals on their own behalf.

These comments appear below along with responses thereto. Comments received relating to §§ 1.9, 1.27 and 1.28 and the forms of Part 3 are not discussed in substance in this rule change since additional time for submitting written comments is provided until Aug. 13, 1982. All comments presented to these rules will be discussed in a later rule promulgation.

Comment:

One person argued that it is unreasonable to require fees to lengthen a shortened statutory period.

Reply:

A shortened statutory time is provided for by statute. The shortened period helps reduce patent pendency time and speed the disclosure of technology and information about patent rights. Many applicants can reply within the present three month shortened period which has been in effect for over fifteen years. The fee for extending the time provides a positive method for applicants to obtain an extension of time while still expediting the prosecution of their applications.

Comment:

Another person commented that H.R. 6260 should be rejected in that the fee levels are too high.

Reply:

The consideration of the merits of H.R. 6260 is not before the Office in this rule change.

Comment:

Three patent bar groups and two individuals presented comments relating to the effect of the new extension of time fees in § 1.17 and the effect thereof on the current practice of granting an automatic one-month extension of time if a timely first response to a final rejection is filed by the applicant.

Reply:

The Office plans to terminate the automatic one-month extension of time practice on Oct. 1, 1982. It is felt that the extensions of time which are readily available under §§ 1.17 and 1.136 will meet the needs of applicants. The amount of the fees required to obtain an extension will be the same for periods of response before and after final rejection.

Comment:

One suggestion was made to permit the filing of an appeal without the appeal fee where the Office has not acted on a timely response after final rejection by applicant.

Reply:

Such a procedure is not possible under the provisions of H.R. 6260 since it calls for the appeal fee "On filing an appeal" in § 41(a)6.

Comment:

Two comments were received requesting that the rules be changed to make the due date for paying the fee for an oral hearing on appeal after the examiner's answer on appeal.

Reply:

A change in the rules has been made to provide that the fee for an oral hearing is due no later than one month after the date of mailing of the examiner's answer.

Comment:

Two comments were received requesting that no charge for revival of an abandoned application be made where the abandonment resulted from the non-receipt of an Office action by the applicant.

Reply:

It is present Office practice to remail any Office action which is not received at applicant's correspondence address and start anew the response period. This procedure will continue in the future under the revised rules.

Comment:

Three patent bar groups and two individuals indicated that the proposed deletion of the refund provisions due to PCT search reports in § 1.26(b) and § 1.446(b) would make the cost of filing under the Patent Cooperation Treaty prohibitively high and does not recognize the benefit of an earlier search on a corresponding application.

Reply:

In view of these comments, proposed § 1.445(a) (2) and (4) and § 1.446(b) have been amended to provide a credit of $250 where there is a corresponding application.

Comment:

One individual requested that the multiple dependent claim practice set forth in § 1.75(c) be changed to permit one multiple dependent claim to refer to another multiple dependent claim as permitted under European practice.

Reply:

This suggestion cannot be adopted since it is contrary to 35 U.S.C. 112 and cannot therefore be changed by rule.

Comment:

One suggestion was made to change "official" to "Office" in § 1.135(b).

Reply:

The suggestion has been adopted.

Comment:

One suggestion was made to allow refund of the oral hearing fee if an oral hearing is not held.

Reply:

This suggestion was not adopted since such refund is not appropriate in view of the fact that the fee is stated to be "for requesting an oral hearing" and not the actual conduct thereof.

Comment:

Three patent bar groups raised the question as to whether an applicant would be permitted to revive an unintentionally abandoned application under § 1.137(b) after having been unsuccessful in the unavoidable approach under § 1.137(a) and suggested that this be made clear when the proposed rules are promulgated.

Reply:

Yes, an applicant under certain conditions could use § 1.137(b) after having been unsuccessful in the unavoidable approach under § 1.137(a).

Comment:

Several comments related to the possibility of reviving applications unintentionally abandoned up to 15 years ago.

Reply:

In view of the comments received, § 1.137(b) is being implemented to provide only for the revival of applications which were unintentionally abandoned for a reasonable but limited period of time. This should create no substantial problems in regard to intervening rights situations. It would permit some greater flexibility than that originally proposed but should have no significant effect on the current case backlog, pendency or number of interferences pending.

Comment:

One comment was received pointing out that the availability of an "unintentional abandonment" revival under § 1.137(b) should not result in stricter holdings in "unavoidable abandonment" revival petitions under § 1.137(a).

Reply:

The Office plans to continue to use the current criteria used to decide petitions to revive applications unavoidably abandoned.

Comment:

One written comment questioned whether the Commissioner has statutory authority to revive unintentionally abandoned applications.

Reply:

If Congress did not intend the Commissioner to have such authority there would have been no reason to establish fees in § 41(a)7 in H.R. 6260. The legislative history of H.R. 6260, House Report No. 97-542 (Committee on the Judiciary), also makes the Congressional intent clear. The provisions in H.R. 6260 relating to unintentional abandonment are substantive in addition to setting the fee.

Comment:

One letter questioned what is intended by the statement in § 1.137(b) that the Commissioner may require additional information where there is a question whether the abandonment was unintentional.

Reply:

Additional information would be required only where there is an indication that the abandonment was intentional, for example, where an express abandonment has been filed. The record should be clear how such an express abandonment was unintentional if the petition is to be granted.

Comment:

One comment raised the question as to whether in a petition to revive on grounds that the delay was unavoidable under § 1.137(a), it would be sufficient that a registered attorney's statement be submitted which merely recites facts as related to him or her by another.

Reply:

Statements must be made, where possible, by the person having direct personal knowledge of the facts. No change in the "showing" required or the persons making them is intended in such petitions. The rule merely clarifies that a statement by a registered attorney or agent need not be in the form of an oath or declaration.

Comment:

One comment suggested that § 1.317 be changed to provide for the situation where there was a lapse in a patent due to the unintentional delay in paying a balance of issue fee due.

Reply:

Section 1.317 has now been changed to provide for this lapse situation.

Comment:

Three patent bar groups and one individual indicated that a full credit of the amount equal to the international search fee be made where both a U.S. national and international seach are made by the United States Patent and Trademark Office.

Reply:

While a complete credit is not considered proper in view of additional processing work (including searching) required in the second application, a credit of $250 has been provided in revising § 1.445(a) (2) and (4).

Comment:

One person commented that the term "patent" should be inserted after "abandoned" in § 1.12(b).

Reply:

The suggestion has been adopted.

DISCUSSION OF SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES

A number of other changes which have been made as a result of the comments received and further review of the proposed rulemaking are identified below.

Implementation of the changes to § 1.9, new §§ 1.27 and 1.28, and the deletion of Part 3 are being deferred for further comments by Aug. 13, 1982. See the discussion below.

Subparagraph (a) (5) of § 1.19 has been changed from that proposed by referring to subparagraphs (1) through (4) rather than (3) and (4) in order to clarify that copies of patents cannot be ordered at the rate set in subparagraph (a) (5). Instead, copies of patents must be ordered under paragraphs (a) (1) and (2) of § 1.19.

Section 1.24 has been changed from that proposed to provide for the sale of 40-cent coupons. Coupons in this denomination may be useful in view of the charge of forty cents for a printed copy of a registered mark in § 2.6(m) of Alternative A of the trademark rules.

Sections 1.137, 1.155 and 1.316 have been changed from that proposed in Alternative B to further specify the conditions under which unintentionally abandoned applications can be revived.

Sections 1.192 and 1.194 have been changed from that proposed so as to allow a request for an oral hearing and the payment of the required fee therefor to be made one month after the date of the examiner's answer. Previously, appellant was required to indicate a desire for an oral hearing at the time of filing the brief. The sections will now permit appellant to consider the examiner's answer before deciding whether to request an oral hearing and pay the required fee.

Section 1.317 has been changed in Alternative B to provide for the situation where there was a lapse in a patent due to the unintentional delay in paying a balance of issue fee due.

Section 1.445(a) (2) and (4) have been changed from that proposed to provide for a reduction in the international search fee where there has been a corresponding United States national application and a credit to the national fee where an international search fee has been paid in a corresponding international application and the international search has been made by the United States Patent and Trademark Office.

Section 1.446(b) has been changed from that proposed to permit a refund of a portion of the search fee to the extent set forth in § 1.445(a) (4), if such refund is requested at the time of paying the national fee.

IMPLEMENTATION OF PATENT FEE REVISION

The effective date of the patent fee revisions contained in this rulemaking is Oct. 1, 1982.

* * * * *

The changes which will become effective on Oct. 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. The rule changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law prior to Oct. 1, 1982.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, the rule changes in Alternative B will become effective on Oct. 1, 1982, in which case the rule changes in Alternative A will not become effective on Oct. 1, 1982.

Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amount and in accordance with the pro

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cedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under § 1.8 will be considered to be the date of receipt in the Office. In order to ensure clarity in the implementation a discussion of the implementation of specific sections is set forth below:

IMPLEMENTATION OF SPECIFIC SECTIONS

The various sections will be implemented in the manner set forth below:

§ 1.16 National application filing fees.

Any national patent application filing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section. Any additional fees which become due under § 1.16 in pending applications on or after Oct. 1, 1982, or which have not been paid prior to Oct. 1, 1982, must be paid in the amounts set forth in this section even though the application was filed prior to Oct. 1, 1982. For example, if an application filed prior to Oct. 1, 1982, is amended on or after Oct. 1, 1982, to include a multiple dependent claim for the first time, the fee set forth in § 1.16(d) must be paid.

The surcharge in § 1.16(e) of Alternative B is being established at this time, but will only be made effective when the statutory authority for the late filing of the fee or the oath or declaration becomes effective under 35 U.S.C. 111, as it would be amended by H.R. 6250. The statutory authority for the late filing of the fee or the oath or declaration becomes effective six months after enactment of H.R. 6260 as a Public Law.

§ 1.17 Patent application processing fees.

Any patent application processing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section.

The extension fees which must accompany a petition for an extension of time become effective on Oct. 1, 1982, and apply to any application for which the period for responding, i.e., taking action, expires on Oct. 1, 1982, or thereafter. If a response or action by the applicant was due before Oct. 1, 1982, and was not filed timely or an extension of time until Oct. 1, 1982, or thereafter, was not obtained, then § 1.136(a) cannot be used to obtain an extension. *Any response or action required before Oct. 1, 1982, cannot have its time extended by using § 1.136(a).* If one or more previous extensions have been granted prior to Oct. 1, 1982, extending the time for taking action until Oct. 1, 1982, or thereafter, the fees which are due for additional extensions under § 1.136(a) will be as set forth in § 1.17(a)-(d) under either Alternative A or B.

* * * * *

The previous practice of extending the shortened statutory period an additional month upon the filing of a timely first response to a final rejection is being discontinued effective with any first response to a final rejection filed on or after Oct. 1, 1982. Applicants can obtain additional time for response after that date by paying the appropriate fee for the same. An object of the previous practice, as expressed in § 714.13 of the Manual of Patent Examining Procedure, was to obviate the necessity for appeal or filing a continuing application merely to gain time to consider the examiner's position in reply to a response timely filed after final rejection. Under § 1.136(a) the object of the previous practice can be achieved without continuing the previous practice. Thus, under § 1.136(a) an applicant can file a timely first response to a final rejection within the initial period without having to file an appeal or a continuing application if the examiner's response is not received prior to the expiration of the initial period for response. If the timely first response places the application in condition for allowance no additional response and no extension fee from applicant is required. If the examiner's advisory action indicates the timely first response did not place the application in condition for allowance the applicant may then consider the examiner's position to determine whether further prosecution is desirable. If further prosecution is not desired the application can be abandoned without further response or expense. If further prosecution is desired, the applicant can petition and pay the necessary fee to extend the time to the extent appropriate up to the maximum permitted by statute. The availability of this flexibility under § 1.136(a) eliminates the necessity for the previous practice. Further, under H.R. 6260 extensions of time would be granted in most instances by virtue of the payment of fees rather than without fees as in the previous practice. The elimination of the previous practice after final rejection is thus consistent with the letter and spirit of H.R. 6260.

After an applicant has petitioned and paid the extension fees of $550 for response within the fourth month pursuant to § 1.136(a), any further extensions which are permitted under the statute must be obtained under § 1.136(b).

A petition for extension of time under § 1.136(a) may incorporate by reference a previously filed response without including an additional copy of the response in circumstances where the response was received late and the petition is filed to extend the time so that the response will be considered timely.

The appeal fees set forth in § 1.17(e)-(g) are due for notices of appeal or briefs filed, or requests for oral hearings filed, on or after Oct. 1, 1982. If more than one appeal occurs in an application, the fees are due for each notice of appeal, each brief, and each request filed for an oral hearing as long as a decision on the merits by the Board of Appeals resulted from the first notice of appeal, brief, and request for an oral hearing. If the examiner reopens prosecution in the application after appeal and prior to the decision by the Board of Appeals then the fee for the notice of appeal, brief, and request for an oral hearing will apply to a later appeal which does result in a decision by the Board of Appeals. No refund of any appeal fees is permitted since such are due on filing or on requesting an oral hearing. No fee is required for a reply brief.

The fees for petitions set forth in § 1.17(h)-(j) and (1) apply to any such petition filed on or after Oct. 1, 1982. The fee set forth in § 1.17(m) of Alternative B would apply, with enactment of H.R. 6260 prior to Oct. 1, 1982, to petitions (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent. Section 1.137(b) of Alternative B would apply to applications unintentionally abandoned by failure to prosecute, e.g., failure to respond to an Office action. Sections 1.155(c) and 1.316(c) of Alternative B would apply to applications in which the payment of the fee for issuing a patent is unintentionally delayed. These sections would be implemented, with enactment of H.R. 6250 prior to Oct. 1, 1982, by making them effective as to any applications which would be covered by the literal language of the sections. In addition, and for a transition period between Oct. 1, 1982, and Dec. 31, 1982, a petition to revive an unintentionally abandoned application would be granted if (i) the application received a decision on a petition to revive the application on or after Oct. 1, 1981, and before July 30, 1982, or (ii) a petition was filed or renewed on or after Oct. 1, 1981, and before July 30, 1982, provided in the case of both (i) and (ii) that a petition to revive was filed within one year of the date of abandonment. The dates in question were chosen so as to permit this remedial provision to be given as wide an application as possible to benefit applicants whose applications have previously been unintentionally abandoned, but who could not meet the previous requirements for a showing that the delay resulting in the abandonment was unavoidable. The dates were also chosen to prevent an applicant whose application has been abandoned for an unduly long period from attempting to take advantage of this new provision, possibly to the detriment of individuals or companies who had begun to make, use, or sell the subject matter of the application after the date of abandonment of the application. By using these dates the possibility of reviving the application of an applicant who has, in effect, abandoned the invention under 35 U.S.C. 102(c) is minimized. Implementing these sections in the manner set forth would be appropriate and proper in view of the legislative history of H.R. 6260, contained in House Report No. 97-542 (Committee on the Judiciary), which indicates that the Commissioner can establish time limits within which petitions to revive or to accept late payment of issue fees can be filed. Thus, it is entirely proper to limit such petitions in the manner set forth in order to prevent abuses from occurring. To ensure that abuses do not occur, § 1.137(b), 1.155(c), 1.316(c), and 1.317(c) specifically indicate that waivers of the time periods involved will not be considered via petitions under § 1.183.

The fee set forth in § 1.17(k) is required for any application on or after Oct. 1, 1982, with a specification in a non-English language.

§ 1.18 Patent issue fees.

Any patent issue fee paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section even if the notice of allowance was mailed prior to Oct. 1, 1982, and indicates different amounts due. If the issue fee is paid prior to Oct. 1, 1982, any balance of issue fee due must be paid in accordance with § 1.317.

§ 1.19 Document supply fees.

The document supply fees set forth in this section will apply to all orders and requests received by the Patent and Trademark Office on or after Oct. 1, 1982.

§ 1.20 Post-issuance fees.

The post-issuance fees set forth in § 1.20(a)-(d) apply to any petitions, requests, or actions filed on or after Oct. 1, 1982. The amounts of the maintenance fees are included in § 1.20.

Maintenance fees will be required for any patent actually applied for on or after Dec. 12, 1980, whether or not the patent is entitled to the benefit of an earlier filing date under 35 U.S.C. 120 or a right of priority under 35 U.S.C. 119. For reissue patents, the controlling date would be the filing date of the original patent. For example, maintenance fees would only be required where the application for the original patent was filed on or after Dec. 12, 1980. As to patents resulting from international applications filed under the Patent Cooperation Treaty, maintenance fees will be required on all patents resulting from international applications having PCT filing dates on or after Dec. 12, 1980.

The details implementing payment of the maintenance fees are not being established at this time since such fees will not be due for some time and additional consideration of the problems thereof is required.

§ 1.21 Miscellaneous fees and charges.

The miscellaneous fees and charges set forth in this section will apply to all orders and requests received by the Patent and Trademark Office on or after Oct. 1, 1982.

§ 1.445 International application filing and processing fees.

Any international application filing and processing fees paid on or after Oct. 1, 1982, must be paid in the amounts set forth in this section.

Implementation Of Certain Sections Deferred For Further Comments

In view of the comments and the recommendations received at the hearing on July 9, 1982, the period for written comments on § 1.9(c), (d), (e), and (f), and on §§ 1.27 and 1.28, has been extended until Aug. 13, 1982 (see 47 FR 32458, July 27, 1982). Comments received at the hearing on July 9, 1982, expressed the view that there is no necessity to publish final rules on § 1.9(c), (d), (e), and (f), and on §§ 1.27 and 1.28, by August 2, 1982, and that further time for consideration and comment was necessary. Persons commenting stated a belief that the pressure of time does not apply to §§ 1.27 and 1.28 as it does apply to the fee rulemaking. Accordingly, the period for written comments on these sections is extended until Aug. 13, 1982. After receiving written comments by Aug. 13, 1982, the changes to § 1.9 and proposed §§ 1.27 and 1.28 will be adopted as final rules with such modifications as are found to be appropriate after review of the comments. These rule changes, with any appropriate modifications thereof, must become effective on Oct. 1, 1982, with enactment of H.R. 6260 prior to Oct. 1, 1982. Accordingly, adoption of the changes to § 1.9 and new §§ 1.27 and 1.28 is being deferred at this time to permit additional written comments by Aug. 13, 1982. However, these rule changes will be adopted, with any appropriate modifications, as soon as possible after receipt of the additional written comments. No additional proposal will be published and no additional hearing will be held prior to adoption of final rules on the changes to § 1.9 and on new §§ 1.27 and 1.28.

As a result of additional comments presented during the hearing on the proposed trademark fees, the period for written comments on the deletion of Part 3 was also extended until Aug. 13, 1982, to provide an additional opportunity for interested persons to comment on this proposed change. Since it is not essential that this deletion be published by Aug. 2, 1982, it is appropriate to extend the period for comments. No additional proposal will be published and no additional hearing will be held prior to a decision on whether or not to delete Part 3 as proposed.

SECTION II—REVISION OF TRADEMARK FEES

Background

A notice of proposed rulemaking was published in the Federal Register on June 28, 1982, at 47 FR 28063-28065 and in the Official Gazette on June 29, 1982, at 1019 TMOG 110-119. An oral hearing was held on July 9, 1982. Three written letters and statements were submitted. Three persons testified at the oral hearing. Full consideration has been given to all of the letters, statements, and testimony.

Objectives of Rule Changes

These amendments establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks.

Public Law 96-517

Public Law 96-517 authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for providing all other services and materials relating to trademarks and other marks. Public Law 96-517 requires that by Oct. 1, 1982, fees for the filing and processing of an application for the registration of a trademark or other mark be set to recover in the aggregate 50 percent of the estimated average cost to the Office of such processing. Also by Oct. 1, 1982, fees for providing all other services and materials relating to trademarks and other marks are to be set to recover the estimated average cost to the Office of performing the service or furnishing the material.

H.R. 6260

On June 8, 1982, the House of Representatives passed H.R. 6260. This bill would amend the fee provisions to be implemented on Oct. 1, 1982. H.R. 6260 would repeal the provisions in Public Law 96-517 requiring that filing and processing fees be set to recover in the aggregate 50 percent of the estimated average cost of such processing to the Office, and that fees for providing all other services and materials relating to trademarks and other marks be set to recover the estimated average cost to the Office of performing the service or furnishing the material. In passing H.R. 6260, the House of Representatives recommended a fee schedule to the Commissioner for fiscal year 1983. The fees set in Alternative B adopt the House recommendation.

This rule change, therefore, is also designed in the alternative to implement the fee provisions as they would be amended by H.R. 6260. The rule change contains changes which are common to Public Law 96-517 and H.R. 6260, as well as alternative rule changes which are specific to Public Law 96-517 (Alternative A) and to H.R. 6260 (Alternative B).

DISCUSSION OF SIGNIFICANT CHANGES

This rulemaking places into the appropriate sections of Title 37, Code of Federal Regulations, the various fees which are due on filing, during the pendency of a trademark application, or during the life of a registration.

Rule changes for implementing provisions of Public Law 96-517 or H.R. 6260 other than the fee provisions have not been included. Rule changes for implementing provisions other than the fee provisions will be published in a later rulemaking proposal.

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DISCUSSION OF SPECIFIC SECTIONS CHANGED

The sections changed are grouped in this document under three different categories. Those changes which are common to Public Law 96-517 and H.R. 6260 appear first and are numbered 72-76. The change which relates only to Public Law 96-517 appears as Alternative A and is numbered 77. The change which is dependent upon enactment of H.R. 6260 appears as Alternative B and is numbered 78. The changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, Alternative B will become effective on Oct. 1, 1982, in which case Alternative A will not become effective.

The specific rules for which changes are made are §§ 2.6, 2.85, 2.101, 2.146, 2.162 and 2.167.

Rule Changes Common to Public Law 96-517 and H.R. 6260

Section 2.85, paragraph (e), is amended to delete reference to late filed fees for oppositions and affidavits. The manner in which such fees shall be handled is described in the pertinent sections for affidavits and oppositions.

Section 2.101, paragraph (c), is amended to delete the reference to a service charge which will no longer be charged for late-filed fees for oppositions.

Section 2.146, paragraph (b), is amended to add a fee for filing a petition to the Commissioner. Paragraph (f) of this section which indicates that no fee is required is deleted.

Section 2.162, paragraph (d), is amended to remove the reference to a service charge for late-filed fees on § 8 affidavits.

Section 2.167, paragraph (g), is added to establish procedures relating to the fee for affidavits under § 15, 15 U.S.C. 1065, and to state the Office's action when no fee or an insufficient fee is filed.

* * * * *

Alternative B... Rule Change Only Under H.R. 6260

Section 2.6 is revised to establish the fees recommended by the House of Representatives under H.R. 6260 for filing and processing applications for the registration of trademarks or other marks and for providing services and materials relating to trademarks or other marks. The $10 fee recommended by the House for certified copies appears in paragraphs (n) and (o) as a fee of $6.50 for a copy of a registered mark showing title and/or status and a fee of $3.50 for certification.

RESPONSE TO COMMENTS ON THE RULES

Specific comments were received on several of the sections. All of the comments included in the written submissions and the oral testimony were considered in adopting the changes set forth herein.

Written comments were received from three individuals. Oral comments were presented at the hearing on behalf of a patent and trademark law group, the American Patent Law Association, and an organization of trademark owners and lawyers, the United States Trademark Association. One individual spoke on behalf of a law firm and expanded upon the points raised in his previously submitted written comments.

These comments appear below along with responses thereto, where appropriate.

Comment:

The representative of the trademark association spoke favorably about the proposal presented. The organization opposed 100% recovery of trademark costs from user fees. It was felt that such an approach reflected a misconception that trademarks benefit only their owners and not consumers and the economy as a whole. The speaker solicited the assistance of the Patent and Trademark Office in altering this viewpoint.

Comment:

The representative of the bar group questioned the fairness of the Office in establishing the fees under Alternative B. It appeared that the Office had accepted the USTA proposals only where they were higher. In all cases where the USTA recommendations were lower than those proposed, the difference was split. The filing fee was singled out as the most unfair fee.

Reply:

In Alternative B, the rules adopt the fee levels recommended by the House Committee on the Judiciary in House Report No. 97-542. The Report recognizes that the Office needs to recover a certain amount of fee income over the next three years. The application filing fee is expected to furnish more than 60% of the estimated annual income. It could not be reduced further without endangering operations. The reduction from $200.00 to $175.00 per class was covered to a large extent by higher fees for other services.

Comment:

The philosophy of H.R. 6260 is to recover no more than 100%. Final fees should recover this level and no more.

Reply:

Projecting processing costs three years in advance can never be absolutely accurate. The Office must have sufficient funds to process anticipated workloads under the fees set during fiscal years 1983-1985 when costs are expected to be somewhat higher than present costs.

Comment:

One suggestion involved retaining Part 4 of 37 CFR, at least for the present. Occasional users of the registration system find it to be a readily available reference. Certain information in the forms is available from no other source. The speaker believed the time pressures to implement the fee changes precluded proper consideration of the merits of Part 4.

Reply:

The period for comment on deletion of Part 4 has been extended to August 13, 1982 to allow for additional public comment and internal consideration.

Comment:

The suggestion was made that references to affidavits and oppositions should be eliminated from § 2.85(e) as the handling of late filed fees for these items is already covered directly in §§ 2.101(c), 2.162(d) and 2.167(g).

Reply:

This suggestion was implemented.

Comment:

A suggestion was made that §§ 2.101(c), 2.162(d) and 2.167(g) dealing with oppositions and affidavits under Section 8 and Section 15 be amended to require payment of all late filed fees within the time period specified in the notification by the Office.

Reply:

All of the sections state that the affidavit or opposition "will not be refused if the required fee(s). . . are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office." This language is considered sufficient to require payment of all fees or have the opposition, affidavit or declaration refused.

Comment:

One suggestion was made to either cite § 2.6 in all sections being changed relative to fees or to cite it in none.

Reply:

Citations of § 2.6 have been added to § 2.101(c) and § 2.146(b) to conform to § 2.162(d) and § 2.167(g).

Comment:

It was suggested that the fee for a combined section 8 and 15 affidavit needed to be specified in the rules.

Reply:

Section 2.6 has been changed to provide this combined fee.

DISCUSSION OF SIGNIFICANT DIFFERENCES BETWEEN PROPOSED AND FINAL RULES

A number of changes which were made as a result of the comments received and further review of the proposed rulemaking are identified below.

Deletion of Part 4 has been deferred for further comment by Aug. 13, 1982 (see 47 FR 32458, July 27, 1982). As elimination of Part 4 is not essential to the setting of fees, and does not have to be in place 60 days before implementation, it was decided to ask for further public comment.

Section 2.85(e) has been revised to eliminate the references to oppositions and affidavits. Because the handling of late filed fees for these items is specified elsewhere, these references in § 2.85(e) were redundant and confusing.

Both alternatives of § 2.6 have been revised to add a fee for a combined affidavit under sections 8 and 15 of the Act. In order to prevent possible confusion by users of the Trademark system, it was included separately.

IMPLEMENTATION OF TRADEMARK FEE REVISION

The effective date of the trademark fee revisions contained in this rulemaking is Oct. 1, 1982.

* * * * *

The changes which will become effective on October 1, 1982, upon enactment of H.R. 6260 as a Public Law prior to Oct. 1, 1982, are (1) the rule changes common to Public Law 96-517 and H.R. 6260, and (2) the rule changes under H.R. 6260, which appear in Alternative B. The rule changes common to Public Law 96-517 and H.R. 6260 will become effective on Oct. 1, 1982, whether or not H.R. 6260 is enacted as a Public Law prior to Oct. 1, 1982.

* * * * *

Upon enactment of H.R. 6260 as a Public Law prior to October 1, 1982, the rule changes in Alternative B will become effective on Oct. 1, 1982, in which case the rule changes in Alternative A will not become effective on Oct. 1, 1982.

Any fee which is due and payable on or after Oct. 1, 1982, must be paid in the amount and in accordance with the procedures contained in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing under § 1.8 will be considered to be the date of receipt in the Office. In order to ensure clarity in the implementation a discussion of the implementation of Section 2.6 is set forth below:

IMPLEMENTATION OF SECTION 2.6

Fees set forth in Section 2.6 must be paid in the amounts set forth in this section on or after Oct. 1, 1982. Any additional fees which become due under § 2.6 in pending applications on or after Oct. 1, 1982, or which have not been paid prior to Oct. 1, 1982, must be paid in the amounts set forth in this section even though the application was filed prior to Oct. 1, 1982. For example, if an application filed prior to Oct. 1, 1982, is amended on or after Oct. 1, 1982, to include additional classes, the fee set forth in § 2.6(a) must be paid per class added.

IMPLEMENTATION OF CERTAIN SECTIONS DEFERRED FOR FURTHER COMMENTS

As a result of additional comments presented during the hearing on the proposed trademark fees, the period for written comments on the deletion of Part 4 has also been extended until August 13, 1982, to provide an additional opportunity for interested persons to comment on this proposed change (see 47 FR 32458, July 27, 1982). Since it is not essential that this deletion be published by Aug. 2 1982, it is appropriate to extend the period for comments. No additional proposal will be published and no additional hearing will be held prior to a decision on whether or not to delete Part 4 as proposed.

OTHER CONSIDERATIONS RELATING TO PATENT AND TRADEMARK FEE REVISIONS

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with therequirements of the Regulatory Flexibility Act (Public Law 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et. seq.).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-54) for several reasons. Public Law 96-517 and H.R. 6260 have both taken intoo consideration the impact they may have on small entities. The fees under Public Law 96-517 are set to recover 50% of patent and trademark processing costs rather than full costs and generally the rate of increase in the fees is less than that of inflation since the last increase in fees in 1965. Further, the rules implementing Public Law 96-517 take into consideration small entities by setting a lower patent filing fee than issue fee to recover the required level of patent processing costs. The lower filing fee permits a small entity to file a patent application for a relatively low cost and not have to pay the higher balance of fees required to achieve Public Law 96-517 recovery levels until examination is complete and it is known that a patent will issue. Under H.R. 6260 and this rulemaking, small entities would be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to requests for extensions of time, will be reduced.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and under Sections 31 and 41 of the Trademark Act of July 5, 1946, 15 U.S.C. §§ 1113, and 1123, Parts 1 and 2 of Title 37, Code of Federal Regulations, are amended as set forth below.

July 14, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

* * * * *

[Note: H.R. 6260 became Public Law 97-247 on Aug. 27, 1982. Rules that became effective Oct. 1, 1982 are those rules common to Public Law 96-517 and H.R. 6260 and those set forth in Alternative B. The adopted rules are reproduced in the notice entitled "Revision of Patent and Trademark Fees Confirmation," published at 1022 O.G. 21, which is reprinted immediately following this notice.]

[1021 O.G. 19]

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(55) **Department of Commerce Patent and Trademark Office 37 CFR Parts 1 and 2 [Docket No. 2714-129]**

Revision of Patent and Trademark Fees Confirmation

Agency: Patent and Trademark Office, Commerce.
Action: Confirmation of rules.
Summary: This document confirms certain rule changes for patent and trademark fees and fee-related procedures which take effect on Oct. 1, 1982. These rule changes implement H.R. 6260 which was enacted as Public Law 97-247 on Aug. 27, 1982.
Effective Date: Oct. 1, 1982.

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For Further Information Contact: As to the patent rules contact: R. Franklin Burnett, by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3-11A13, Washington, D.C. 20231.

As to the trademark rules contact: Miss Maude Williams, by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Rm. 3-11C17, Washington, D.C. 20231.

Supplementary Information: The Patent and Trademark Office is required by law to publish a notice in the Federal Register of its fees at least 60 days before the effective date thereof (35 U.S.C. 41(g)). Thus, on July 30, 1982 a final rule document was published at 47 FR 33086 setting forth rule changes for patent and trademark fees and procedures which take effect on Oct. 1, 1982. The document was based on the public law in effect at that time, Public Law 96-517, and on H.R. 6260, which was then pending but is now Public Law 97-247. The final rule document published on July 30, 1982, in the Federal Register sets out—

(1) rules that are common to both Pub. L. 96-517 and H.R. 6260 (now Pub. L. 97-247);
(2) Alternative A which contains rule changes implementing Pub. L. 96-517 alone; and
(3) Alternative B which contains rule changes implementing H.R. 6260 (now Pub. L. 97-247).

H.R. 6260 was enacted as Public Law 97-247 on Aug. 27, 1982, and the Patent and Trademark Office hereby confirms that the rule changes common to both Pub. L. 96-517 and H.R. 6260 and Alternative B are those which go into effect on Oct. 1, 1982. The rules under Alternative A are hereby withdrawn. Additional rule changes required by Public Law 97-247 will be made the subject of separate rulemakings.

List of Subjects in 37 CFR Parts 1 and 2

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Nonprofit organizations, Small businesses, Trademarks.

AMENDMENT OF REGULATIONS

For the reasons set out in the preamble, 37 CFR Parts 1 and 2 are confirmed as being amended by the final rule published on July 30, 1982 at 47 FR 33086 as set forth below.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Sept. 14, 1982.

1. The rule changes made in Alternative A relating to patents which begin at 47 FR 33107 and in Alternative A relating to trademarks which begin at 47 FR 33112 are hereby withdawn.
2. Confirmed as effective Oct. 1, 1982 are the rule changes published July 30, 1982 common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) and Alternatives B. The rule changes relating to patents common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) were published on July 30, 1982 at 47 FR 33099. The rule changes relating to patents under Alternative B were published at 47 FR 33108. The rule changes relating to trademarks common to Public Law 96-517 and H.R. 6260 (now Public Law 97-247) were published on July 30, 1982 at 47 FR 33111. The rule changes relating to trademarks under Alternative B were published at 47 FR 33112. Corrections to the July 30, 1982 publication were published on Aug. 4 and 5, 1982 at 47 FR 33688 and 33959.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

(56) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 3 and 4
[Docket No. 2827-167]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish procedures for the payment of fees under § 41 (a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for independent inventors and nonprofit organizations as required by the public law resulting from H.R. 6260. This action is necessary at this time in order that the procedures for paying the reduced fees will be effective on Oct. 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by the public law resulting from H.R. 6260. This final rule also deletes Parts 3 and 4 which contain outdated sample forms and corrects a reference to a section which appears in § 1.451.
Effective Date: Oct. 1, 1982.
For Further Information Contact: As to the patent rules contact R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Rm. 3-11A13, Washington, D.C. 20231.

As to the trademark rules contact Miss Maude Williams by telephone at (703) 557-2222 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Maude Williams, Room 3-11C17, Washington, D.C. 20231
Supplementary Information: Notices of proposed rulemaking relating to the revision of patent and trademark fees were published in the *Federal Register* on June 28, 1982, at 47 FR 28042-28065 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57-120. Oral hearings were held on July 9, 1982. Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the *Official Gazette* on Aug. 10, 1982, at 1021 O.G. 19-94. In view of comments received at the hearings, additional time for comment on the rules covered by this change was given until Aug. 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458.

This final rule is being adopted as soon as possible after the enactment of the public law resulting from H.R. 6260. The Patent and Trademark Office has determined that the requirement of 5 U.S.C. 553 (d) for publication not less than 30 days before its effective date does not apply to this final rule since it will reduce patent fees for independent inventors and nonprofit organizations.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which are provided for by the public law resulting from H.R. 6260.

Public Law Resulting From H.R. 6260

The public law resulting from H.R. 6260 provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of Title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The public law resulting from H.R. 6260 gives the Commissioner authority to establish regulations defining independent inventors and nonprofit organizations. The public law resulting from H.R. 6260 defines small business concerns by reference to § 3 of the Small Business Act and regulations established by the Small Business Administration. This rulemaking establishes regulations defining independent inventors and nonprofit organizations. The Small Business Administration is establishing the definition of a small business concern for the purpose of paying reduced fees under the public law resulting from H.R. 6260. This rulemaking also establishes the procedures which will be followed by independent inventors and nonprofit organizations when paying the reduced fees. The procedures to be followed by small business concerns when paying the reduced fees will be established in a separate final rule.

Discussion of Specific Sections

The following sections are changed by this final rule, effective Oct. 1, 1982:

Section 1.9, as amended, adds paragraphs (c), (e), and (f) which define "independent inventor" and "nonprofit organizations" as used in Title 37, Code of Federal Regulations, Chapter I. Each of these along with "small business concern" is identified as a "small entity" for purposes of paying fees which are set under § 41 (a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Paragraph (d) of § 1.9 relates to the definition of small business concern which is being established by the Small Business Administration. Accordingly, proposed paragraph 1.9(d) is not being promulgated at this time.

The public law resulting from H.R. 6260 authorizes the Commissioner to establish regulations defining independent inventors and nonprofit organizations. Section 1.9(c) defines an independent inventor as any inventor who (1) has not assigned, granted, conveyed, or licensed, and (2) is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization. Once an individual sole inventor, or one of several joint inventors, has assigned, granted, conveyed, or licensed, or comes under an obligation to assign, grant, convey, or license, any rights to the invention to anyone who could not likewise obtain status as a small entity, the inventor(s) will no longer be entitled to pay fees in the amounts established for an independent inventor (§ 1.9(c)). Section 1.9 (c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to another individual or individuals who could qualify as an independent inventor or inventors if they had made the invention. In addition, § 1.9 (c) will permit an individual inventor to make an assignment, grant, conveyance, or license of partial rights in the invention to a small business concern or nonprofit organization. Under the circumstances described in the previous two sentences the individual inventor could still qualify as an independent inventor. However, if the independent inventor assigned, granted, conveyed, or licensed, or came under an obligation to assign, grant, convey, or license, any rights to the invention to any individual or organization which could not qualify as a small entity (§ 1.9 (f)), then the inventor would no longer qualify as an independent inventor.

Proposed section 1.9 (d) relating to the definition of a small business concern is not being promulgated at this time.

Section 1.9(e) defines a nonprofit organization by utilizing and broadening the definition contained in 35 U.S.C. 201 (i). The term "university or other institution of higher education" as used in § 1.9 (e) means an educational institution which (1) admits as regular students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate, (2) is legally authorized within the jurisdiction in which it operates to provide a program of education beyond secondary education, (3) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit toward such a degree, (4) is a public or other nonprofit institution, and (5) is accredited by a nationally recognized accrediting agency or association. The definition of "university or other institution of higher education" as set forth herein essentially follows the definition of "institution of higher education" contained in 20 U.S.C. 1141(a). Institutions which are strictly research facilities, manufacturing facilities, service organizations, etc., are not intended to be included within the term "other institution of higher education" even though such institutions may perform an educational function or publish the results of their work.

Section 1.9(f) identifies an independent inventor, a small business concern, or a nonprofit organization as a "small entity" for purposes of paying fees set under § 41 (a) and (b) of Title 35, United States Code, as amended by the public law resulting from H.R. 6260. Fees established under § 41 (c) or (d) of Title 35, United States Code, will not be reduced for small entities since such a reduction is not permitted or authorized by the public law resulting from H.R. 6260. Paragraphs (c), (e), and (f) of § 1.9 should be read together with §§ 1.27 and 1.28 which deal with establishing status as a small entity and the effect thereof.

New § 1.27 provides in paragraph (a) that any person seeking to establish as a small entity, as defined in § 1.9 (f) for the purpose of paying reduced fees, must file a statement to that small entity. Paragraph 1.27(b) provides specifically for inventors filing statements claiming status as independent inventors. Paragraph 1.27 (c) relating to claiming status as a small business concern is not being promulgated at this time, but will be subject of a separate final rule. Paragraph 1.27 (d) provides for claiming status as a nonprofit organization. Under § 1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

New § 1.28 provides guidance as to the effect of failure to establish, or notify the Office of any change from, small entity status. Paragraph 1.28 (a) provides that once status as a small entity has been established in an application or patent, without the filing of a further verified statement pursuant to § 1.27, unless the Office is notified of a change in status. Under paragraph 1.28(a), status as a small entity in one application or patent does not affect any other application or patent except in applications filed under § 1.60 where a reference is made to a verified statement in a parent application. Paragraph 1.28 (b) requires that notification of any change in status resulting in loss of entitlement to small entity status be filed in the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. Section 1.28 also provides guidance as to the effect of improperly establishing status as a small entity. The intent of the reduced fees for small entities is to soften the impact of the fee increases under § 41(a) and (b) of Title 35, United States Code, as such sections are amended by the public law resulting from H.R. 6260, upon those who are least able to absorb the increased fees without overall damage to their ability to participate in the patent system through the filing, issuing and maintaining of patents. Accordingly, any attempt to improperly establish status as a small entity will be viewed as a serious matter by the office and paragraph 1.28(d) indicates that any attempt to fraudulently establish status as a small entity or pay fees as a small entity will be considered as a fraud practiced or attempted on the Office. In addition, improperly and through gross negligence establishing status as a small entity or paying fees as a small entity will be considered as a fraud practiced or attempted on the Office. Normally, the Office will not question a claim to status as a small entity. However, if the Office must resolve such an issue in a question arising before it, the Office will look to the actual or practical status of the individual or oganization claiming status as a small entity rather than the professed or apparent status.

Section 1.451, paragraph (b), is amended to correct a reference to another section of the regulations.

Parts 3 and 4 are removed to eliminate all of the patent and trademark forms from the Code of Federal Regulations. The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which is available for sale to the public from the Superintendent of Documents and which includes full size copies of substantially all the forms in the Code of Federal Regulations in view of the difficulty of keeping such forms is not mandatory.

Discussion of Significant Differences Between Proposed and Final Rules

A number of changes which have been made to §§ 1.9, 1.27 and 1.28 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (c) of § 1.9 has been changed from that proposed to simplify the definition by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention". No change in substance is intended by removing these words since the phrase "any rights in the invention" obviously is inclusive of all rights regardless of how they are, or would be, transferred. The words "or otherwise" have also been removed to simplify the definition without a change in substance.

Paragraph (d) of § 1.9 is not being promulgated by this rule change.

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Paragraph (e) of § 1.9 is changed from that proposed by adding the words "located in any country" in item (e) (1) to clarify the fact that a university or other institution of higher education can qualify regardless of location. Paragraph (e) is also changed from that proposed by adding an item (4) to clarify that a nonprofit organization if it could qualify as a nonprofit organization under item (2) or (3) of paragraph (e) "if it were located in this country." Thus, under paragraph (e) of § 1.9 nonprofit organizations will be treated the same for purposes of paying fees regardless of location.

Paragraph (a) of § 1.27 has been changed from that proposed by substituting the words "any fee paid as a small entity". This change is intended to clarify the fact that a verified statement is not required with every fee.

Paragraph (b) of § 1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern or nonprofit organization is to be filed by "the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization . . ." The term "official" as used in paragraph (b) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern or nonprofit organization. For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Paragraph (c) of § 1.27 relating to claiming status as a small business concern is not being promulgated at this time, but will be the subject of a separate final rule.

Paragraph (d) of § 1.27 has been changed from that proposed in the same manner as paragraph (b) of § 1.27 has also been changed from that proposed by adding a reference to § 1.9 (e)(4).

Paragraph (a) of § 1.28 has been changed from that proposed by adding the words "or patent" in the first and third sentences since the failure to establish status as a small entity could occur in a patent as well as in an application. An exception to the requirement for a verified statement has also been inserted into paragraph (a) of § 1.28 for applications filed under § 1.60 where the status as a small entity has been established in a parent application and is still proper. Under this change in paragraph (a) of proposed § 1.28, the application filed under § 1.60 "must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired."

Paragraph (b) of § 1.28 has been completely rewritten from that proposed to remove the requirement that the notification of a change in status resulting in loss of entitlement to small entity status must be filed prior to paying the next fee due. Instead, paragraph (b) of § 1.28 provides that after establishment of small entity status, "fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue is due or any maintenance fee is due." Paragraph (b) of § 1.28 is also changed from that proposed by removing the sentence stating that payment of any fee as a small entity serves "as a representation that such payment as a small entity is proper at the time the payment is made." This change does not sanction the payment of improper fees, but is no longer necessary in view of another change in paragraph (b) which specifically provides that notification of any change in status resulting in loss of entitlement to small entity status "must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to § 1.9." The effect of the changes to paragraph (b) of § 1.28 is to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. This means that only four checks are required during the pendency and term of a patent after initial establishment of small entity status if such establishment was prior to payment of the issue fee. The last sentence of paragraph (b) has been changed from that proposed by inserting the words "of change in status" after "notification" for clarity.

Paragraph (c) of § 1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error occurred. This change from paragraph (c) as proposed will reduce paperwork and will provide a three-month grace period to correct errors with no explanations required for correction during that three-month period. The change has also been made to alleviate concerns about paragraph (d) of § 1.28 which is being adopted as proposed.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and the written comments, were considered in adopting the changes set forth herein.

Written comments on the patent rules and forms affected by this final rule were received from three patent law groups and thirteen individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.

Comment:

One comment suggested that the definition of "independent inventor" be simplified.

Reply:

The definition of "independent inventor" has been simplified without a change in substance by removing the words "including (i) the right to make, use, or sell the invention, and (ii) the right to exclude others from making, using, or selling the invention."

Comment:

One comment suggested that there is no need to include any more than a simplified statement that a "non-profit organization includes a university or other institution of higher education"

Reply:

The suggestion has not been adopted since it is the intent of the rules to delineate as clearly as possible what organizations can qualify as nonprofit organizations without having to expend undue resources deciding each request on a case-by-case basis.

Comment:

One comment suggested that § 1.9(e) discriminates against foreigners and thus violates the principle of national equality set forth in the Stockholm text of the Paris Convention for the Protection of Industrial Property.

Reply:

Section 1.9(e), as promulgated, defines a nonprofit organization in such a way that it is clear that foreigners are not excluded.

Comment:

One comment questioned whether or not government organizations can qualify as nonprofit organizations and more specifically, whether or not a government research facility can qualify under the broad definition of a nonprofit scientific or educational organization. Another comment recommended that § 1.9(e) be expanded to include the U.S. Government in the definition of a "nonprofit organization."

Reply:

Government organizations as such, whether domestic or foreign, cannot qualify as nonprofit organizations as defined in § 1.9(e). Section 1.9(e) was based upon 35 U.S.C. 201(i), as established by Public Law 96-517. The limitation to "an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)(3)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a))" would by its nature exclude the U.S. government and its agencies and facilities, including research facilities and government corporations. State and foreign governments and governmental agencies and facilities would be similarly excluded. Section 1.9(e) is not intended to include within the definition of a nonprofit organization government organizations of any kind located in any country. A university or other institution of higher education located in any country would qualify, however, as a "nonprofit organization" under § 1.9(e) even though it has some government affiliation since such institutions are specifically included.

Comment:

One comment was directed to, and opposed, Public Law 96-517 and H.R. 6260 rather than the specific provisions of §§ 1.9, 1.27 and 1.28 on the ground that the concept of a self-supporting agency is ill-conceived, shortsighted and wrong.

Reply:

Public Law 96-517 and H.R. 6260 are not issues for consideration in this rule change.

Comment:

One comment asserted that the imposition of different fees depending upon the status of an applicant is unwise, unworkable, and will not "improve the efficiency of the Patent Office", while another comment urged the Office to "disavow the proposal for a two-tier fee system and adopt a different approach to assuring that patent and trademark fees are set so that individual inventors and small businesses can continue to obtain the protection of the patent and trademark system." Another comment supported the two-tier fee system, particularly as related to universities.

Reply:

The imposition of different fees is a legislative mandate imposed by the public law resulting from H.R. 6260 and is not an issue for consideration in this rule change.

Comment:

Four comments expressed concern that small entity status is required to be confirmed each time a fee as a small entity is paid. Alternative procedures which involve (1) confirming status at the time of filing and at the time the issue fee is paid, or (2) allowing a statement of status to hold for a period of time were recommended.

Reply:

The last sentence in § 1.27(a) states that "[s]uch a verified statement need only be filed once in an application or patent and remains in effect until changed." It was not intended that such statements would be required each time a fee is paid. In order to clarify § 1.27(a), the first sentence has been changed to require the statement prior to or with the first fee paid as a small entity. Thereafter, notice is only required where a change in status occurs. In addition, § 1.28(b) has been rewritten to provide that "[o]nce status as a small entity has been established in an application or patent, fees as a small entity may thereafter be paid in that application or patent without regard to a change in status until the issue fee is due or any maintenance fee is due."

Comment:

One comment suggested that a paragraph 1.27(e) be added which would require confirmation of small entity status at the time of paying the patent issue fee and each maintenance fee and that this be done by a statement which designates the applicant's small entity status as of the close of the last fiscal year next preceding the date of the statement.

Reply:

The suggested paragraph has not been added. However, paragraph (b) of § 1.29 has been completely rewritten to permit status to be established and then checked only (1) at the payment of the issue fee and (2) at the time of payment of each maintenance fee. Instead of requiring papers to be filed confirming status as suggested in the comment, the rules as adopted require that "[n]otification of any change in status resulting in loss of entitlement to small entity status must be filed in the application or patent prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate pursuant to § 1.9." Paragraph (b) of § 1.28, as promulgated, is considered preferable to the suggested paragraph (e) of § 1.27 since it will eliminate the filing of a confirming statement where there has been no change in status as a small entity. This reduces unnecessary paperwork.

Comment:

One comment suggested that verified statements of small entity status need not be filed in Rule 60 applications.

Reply:

The suggestion was adopted and is reflected by the change in § 1.28(a). In such applications, it will be sufficient to include a reference to a verified statement establishing small entity status in a parent application if status as a small entity is still proper and desired.

Comment:

One comment suggested that proposed paragraph 1.28(b) be amended by inserting the words "believed to be" after "small entity is" in the second sentence.

Reply:

Paragraph (b) of § 1.28 as promulgated does not contain the sentence to which the suggestion is directed.

Comment:

One comment suggested that paragraph (c) of § 1.28 be amended by deleting the word "verified" so that a statement explaining how an error in good faith occurred can be made "on the basis of information and belief."

Reply:

The suggestion has not been adopted However, paragraph (c) of § 1.28 as promulgated permits the correction of errors without a verified statement if the correction is accomplished within three months after the date the error occurred.

Comment:

Three comments expressed concern about the provision dealing with fraud on the Patent and Trademark Office because of some questionable act in connection with paying fees as a small entity and indicated that some persons have raised a question as to the Office's authority to designate the payment of a lesser fee as fraud. The comments suggested that proposed § 1.28 be withdrawn and turned over to an ad hoc group of Patent and Trademark Office officials and practitioners for immediate examination and timely comment.

Reply:

The period for comments was extended until Aug. 13, 1982, as an alternative to, and in response to, the suggestion that § 1.28 be withdrawn and turned over to an ad hoc committee. The extended period for comments has now expired and all comments which have been received have been carefully considered. In response to the statement that some persons have raised a question regarding the Office's authority to designate payment of a lesser fee as fraud, no authority has been cited which would establish or suggest that the Office does not have the authority to adopt this section. Paragraph (d) of § 1.28 has been strictly limited to those situations in which there is an attempt to fraudulently establish entity, or improperly and through gross negligence establish status or pay fees as a small entity. Paragraph (d) of § 1.28 is clearly within the rule-making authority provided to the Commissioner pursuant to 35 U.S.C. 6 to protect the integrity of the system established by the public law resulting from H.R. 6260, whereby fees are reduced for small entities. In order to alleviate the concerns expressed about paragraph (d) of § 1.28, paragraph (c) of § 1.28 has been changed from that proposed to require a verified statement explaining how the error in good faith occurred only in situations where the error is not corrected within three months of the date on which the error occurred. This three-month grace period to correct errors with no explanations required for correction during that three-month period should reduce the concern about paragraph (d) of § 1.28.

Comment:

One comment by an attorney (1) objected to and requested removal of the second sentence of § 1.28(d) because he has to rely on the information provided by the client and does not have the facilities to check the reliability of information the client provides relating to the client's status as a small entity, and (2) raised the question as to how much investigation any attorney or other individual must make in order to avoid being guilty of "gross negligence" under § 1.28(d).

Reply:

The rules do not authorize an attorney to sign a verified statement establishing status as a small entity on behalf of a client. The client has to sign the verified statement. Paragraph (b) of § 1.27 requires that any verified statement filed on behalf of an independent inventor must be signed by the independent inventor except as provided in §§ 1.42, 1.43, or 1.47. Paragraph (d) of § 1.27 requires that any verified statement filed on behalf of a nonprofit organization must be signed by an official of the nonprofit organization empowered to act on behalf of the organization. The intent of paragraphs (b) and (d) of § 1.27 is that the verified statement be signed by the person in the best position to know the facts as to whether or not status as a small entity can be properly established. Insofar as the attorney's irresponsibilities and duty to investigate are concerned, these do not differ from those presently owed the Office under §§ 1.56, 1.346, and 1.555.

Comment:

One comment suggested that paragraph (d) of § 1.28 be replaced by a provision under which a "stiff fine" would be assessed against "a wrongdoer who has not paid fees in good faith."

Reply:

The suggestion has not been adopted. Assessing a fine as

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the only penalty against "a wrongdoer who has not paid fees in good faith" might tend to encourage the payment of incorrect fees on the theory that it is unlikely that such a matter would be brought to the attention of the Office.

Comment:

Three comments opposed the proposed deletion of Part 3 for the reasons that (1) it is useful to have an up-to-date set of forms and (2) there does not seem to be a pressing need to delete the forms.

Reply:

The Patent and Trademark Office has prepared a booklet entitled "Patent and Trademark Forms Booklet" which includes full size copies of substantially all of the forms in Part 3. Since the forms currently in Part 3 are not "up-to-date" as was suggested in the comment, no present need is seen to maintain Part 3.

Response to Comments on the Trademark Rules

Specific comments were received on the proposed deletions of Part 4. All of the comments included in the written submissions and the oral testimony were considered.

Written comments were received from four individuals. Oral comments restating previously submitted written comments on Part 4 were presented by one individual on behalf of his law firm.

These comments appear below along with replies thereto.

Comment:

One comment stated that there are rules in Part 4 which are not set forth elsewhere. Such guidelines and information include, among others, the types of commerce on which an application may be based and a requirement for the use of bond paper for typed drawings.

Reply:

Part 4 does not really carry the effect of rules because the forms are not mandatory, but are merely illustrative. The information referred to by this individual can be found elsewhere, such as in the Trademark Manual of Examining Procedure. Furthermore, despite the fact that the forms do not carry the force of rules, any correction or modification to them requires the cumbersome and time-consuming processes that are associated with a rules change.

Comment:

Several comments reflected the opinion that some attorneys, particularly those who do not specialize in trademark matters, may rely on the forms that appear in Part 4. It was believed that these individuals may not have or be aware of the compilation of forms identified as the "Patent and Trademark Office Forms Booklet." In the absence of such forms in Part 4, these individuals may devise their own application formats. Such a practice would result in increased informalities which, in turn, would result in unnecessary correspondence and delayed prosecution. In addition, the commenters believed that the number of written and oral inquiries to the Office of the Director of the Trademark Examining Operation would increase dramatically.

Reply:

The Office of the Director of the Trademark Examining Operation currently has a general information telephone line to answer inquiries and to accept requests for trademark application forms and related literature. While the Office of the Director indicates the availability of the forms booklet to many callers, copies of the appropriate trademark application form are sent to those individuals who request them. It is more likely that an individual who is unaware of the trademark application form would call the Office of the Director to request an application form than create one for the particular purpose.

Comment:

One individual, aware of the Office's plans for automation of the trademark program, saw the present deletion of the forms to be inappropriate. This individual felt that the deletion of the forms at this point would signal to the user community that the Office no longer had any interest in receiving applications in any particular format. To take such a position within a year or two of the introduction of a rigidly standardized application format was, in the opinion of this commenter, unwise. The adoption of a machine-readable application form would require greater, rather than diminished, reliance on a prescribed format.

Reply:

Within the next year or two, the Office will begin experimenting with the use of optical character recognition (OCR) equipment to automate the current data capture processes. Trademark application formats that are compatible with this equipment are likely to require special sizing and printing and, as such, are not acceptable for reduced size printing in the Code of Federal Regulations. If the existing forms were to be maintained in Part 4, they would remain available for use by applicants. As a result, the implementation of the new standardized application formats would be made more difficult.

Comment:

One commenter believed that since the next reprinting of Volume 37 of the Code of Federal Regulations will be in July, 1983, there is no pressing need to eliminate Part 4 at this time. This individual felt that users of the trademark registration system should be given additional opportunity to consider the significance of removing Part 4.

Reply:

Only four comments have been received on the deletion of Part 4. The elimination of Part 4 at this time will guarantee that the forms do not appear in the 1983 reprinting of the CFR. Of course, they will appear in the 1982 version of the CFR booklet and will be available until the new edition is published. In this matter, future access to these forms will be limited and those requiring help may contact the Office and receive the proper trademark forms.

Implementation of §§1.9, 1.27, and 1.28

Status as a small entity can be established in any application or patent for which a fee is due on or after Oct. 1, 1982, and in which small entity status is available and desired.

Other Considerations Relating to Patent and Trademark Fee Revisions

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conversation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et. seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L 96-354) for several reasons. The public law resulting from H.R. 6260 has taken into consideration the impact the increase in fees may have on small entities. Under the public law resulting from H.R. 6260 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are place upon the public.

List of Subjects in 37 CFR Parts 1, 3 and 4

Administrative practice and procedure, Colleges and universities, Courts, Fraud, Inventions and patents, Nonprofit organizations, Small businesses, Trademarks.

(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

GERALD J. MOSSINGHOFF,
Aug. 26, 1982. *Commissioner of Patents and Trademarks.*

[1022 OG 29]

(57) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 2909-187]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent and trademark cases to establish a definition and procedures for the payment of fees under section 41(a) and (b) of Title 35, United States Code, by small business concerns as required by Pub. L. 97-247. This action adopts the definition of a "small business concern" for purposes of paying patent fees established by the Small Business Administration and is necessary at this time in order that the procedures for paying reduced fees will be effective on Oct. 1, 1982, the effective date of the changes in the amounts of Patent and Trademark Office fees established by Pub. L. 97-247.
Effective Date: Oct. 1, 1982
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: R. Franklin Burnett, Room 3-11A13, Washington, D.C. 20231.
Supplementary Information: A notice of proposed rulemaking was published in the Federal Register on June 28, 1982, at 47 FR 28042-28063 and in the *Official Gazette* on June 29, 1982, at 1019 O.G. 57-120. Oral hearings were held on July 9, 1982 Full consideration has been given to all of the letters, statements, and testimony received at the time. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982 at 47 FR 33959. The final rule was also published in the *Official Gazette* on Aug. 10, 1982, at 1021 O.G. 19-94. In view of comments received at the hearings, additional time for comment on certain rules, including those covered by this change, was given until Aug. 13, 1982. The notice extending the time for comment was published on July 27, 1982 at 47 FR 32458. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on Sept. 10, 1982 at 47 FR 40134-40140.

Objectives of Rule Changes

These rule changes are designed to implement the Patent and Trademark Office fees and procedures which are provided for by Pub. L. 97-247.

Public Law 97-247

Pub. L. 97-247, signed Aug. 27, 1982, provides that funds available under the act "shall be used to reduce by 50 per centum the payment of fees under section 41(a) and (b) of title 35, United States Code" by independent inventors, small business concerns, and nonprofit organizations. The Commissioner has established regulations defining independent inventors and nonprofit organizations. Pub. L. 97-247 defines small business concerns by reference to Section 3 of the Small Business Act and regulations established by the Small Business Administration. The Small Business Administration has now established the definition of a small business concern for the purpose of paying reduced fees under Pub. L. 97-247. That definition is hereby incorporated into the patent rules of practice in § 1.9(d). This rulemaking also establishes the procedures which will be followed by small business concerns when paying the reduced fees.

Discussion of Specific Sections

The following sections are changed by this final rule, effective Oct. 1, 1982:

Section 1.9, as amended, adds paragraph (d) which defines small business concern as used in Title 37, Code of Federal Regulations, Chapter I. A small business concern is identified as a "small entity" for purposes of paying fees which are set under section 41(a) and (b) of Title 35, United States Code, as amended by Pub. L. 97-247.

Section 1.9(d) defines a small business concern by reference to and incorporation of § 121.3-18 of Title 13, Code of Federal Regulations. A small business concern is defined therein as any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. The section further defines affiliates of concerns and defines also the terms "employees" and "number of employees." Concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees a business concern has is determined by counting the number of persons of the concern and its affiliates employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern and of its affiliates. The number of employees is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Business concerns located in any country which meet the small business definition and which comply with the applicable procedures can qualify as a "small business concern". Under the definition, a small business concern would no longer qualify as a small business concern if any rights were assigned to any individual or concern which could not qualify as a small entity pursuant to § 1.9(f), or if the concern came under an obligation to assign any rights to any individual or concern which could not qualify as a small entity.

Section 1.9(d) also incorporates paragraph (b) of 13 CFR 121.3-18which provides for appeals to the Small Business Administration from Patent and Trademark Office adverse initial size determinations.

Paragraph 1.27(c) provides for claiming status as a small business concern. Any person seeking to establish status as a small entity, for the purpose of paying reduced fees, must file a statement to that effect prior to or with the payment of the first fee paid as a small entity. Under § 1.27, as long as all of the rights remain in small entities, the fees established for a small entity can be paid. This includes circumstances where the rights were divided between an independent inventor, a small business concern and a nonprofit organization or any combination thereof.

A number of changes which have been made to §§ 1.9 and 1.27 as a result of the comments received and further review of the proposed rulemaking are identified below.

Paragraph (d) of § 1.9 has been changed from that proposed so as to incorporate into § 1.9(d), the definition established by the Small Business Administration in § 121.3-18 of Title 13, Code of Federal Regulations. The definition differs from that proposed in specifying the number of employees constituting a small business concern and specifying that the concern must be one which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license any rights in the invention to any person or concern which could not be classified as an independent inventor, small business concern, or nonprofit organization.

Paragraph (c) of § 1.27 has been changed from that proposed to clarify who is to file the verified statement. The verified statement for a small business concern is to be signed by "the owner or an official of the small business concern empowered to act on behalf of the concern." The term "official" as used in paragraph (c) is intended to include any officer, employee, or part-owner empowered to act on behalf of a small business concern. For example, an officer or employee of a corporation empowered to act for the corporation by its board of directors would be qualified to sign such a verified statement.

Response to Comments on the Patent Rules

Specific comments were received on a number of the sections. All of the comments, including the oral testimony and

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the written comments, were considered in adopting the changes set forth herein.

Written comments on the rules affected by this final rule were received from three patent law groups and a number of individuals. The three patent law groups were (1) the American Patent Law Association; (2) the Patent, Trademark, and Copyright Section of the Virginia State Bar; and (3) the Patent, Trademark and Copyright Law Section of the Bar Association of the District of Columbia.

Oral comments were presented at the hearing on behalf of two patent law groups.

The comments appear below along with replies thereto.

Comment:

Two comments urged that in view of the "exceedingly complex" definitions of a "small business" in 13 CFR 121.3, the patent system and those associated with it would be best served by setting forth clear guidelines as to whether or not a business qualifies as a small business without reference to the Small Business Act and without incorporation by reference of "the too many pages of SBA regulatory definition."

Reply:

Pub. L. 97-247 specifically refers to section 3 of the Small Business Act and regulations established by the Small Business Administration for determining whether or not a business concern qualifies as a small business concern. Pub. L. 97-247 therefore does not permit the establishment of guidelines without reference to the Small Business Act and regulations established by the Small Business Administration. Section 1.9(d), however, does incorporate the definition as established in § 121.3-18 of Title 13, Code of Federal Regulations. This will enable persons to utilize § 1.9(d) without also referring to a copy of Title 13, CFR.

Comment:

One comment argued that § 1.27 should be corrected or clarified to indicate that a small business concern would be entitled to the 50 percent fee reduction even though it may grant a non-exclusive or even an exclusive license to some non-small entity.

Reply:

The suggestion has not been adopted. Section 1.27 requires that the concern qualify as a small business concern as defined in § 1.9(d). Section 1.9(d) defines a small business concern by incorporating 13 CFR 121.3-18, which in turn defines a small business concern as one not exceeding a particular size which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section." The intent of both 13 CFR 121.3-18 and 37 CFR 1.9(d) and 1.27(c) is to limit the payment of reduced fees under section 41 (a) and (b) of Title 35, United States Code, to those situations in which all of the rights in the invention are owned by small entities, i.e., independent inventors, small business concerns, or nonprofit organizations. To do otherwise would be clearly contrary to the intended purpose of the legislation which contains no indication that fees are to be reduced in circumstances where rights are owned by non-small entities. Adopting the suggestion might, for example, permit a non-small entity to transfer patent rights to a small business concern which would pay the reduced fees and grant an exclusive license to the non-small entity.

Comment:

One comment suggested that the specific Small Business Administration regulations which are applicable be specified in § 1.9(d).

Reply:

The definition of a small business concern as established by the Small Business Administration is now incorporated into § 1.9(d).

Implementation of §§ 1.9 and 1.27

Status as a small entity can be established in any application or patent for which a fee is due on or after Oct. 1, 1982, and in which the individual inventor, small business concern, or nonprofit organization meets the qualifications established for small entity status.

Other Considerations Relating to Patent and Trademark Fee Revisions

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*).

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) for several reasons. Pub. L. 97-247 has taken into consideration the impact the increase in fees may have on small entities. Under Pub. L. 97-247 and this rulemaking, small entities will be able to pay reduced fees for filing patent applications and for the issuance and maintenance in force of patents.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Small businesses.

Amendment of Regulations

For the reasons indicated above and pursuant to the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, and Pub. L. 97-247, Part 1 of Title 37, Code of Federal Regulations, is amended as set forth below.

PART 1...RULES OF PRACTICE IN PATENT CASES

1. Section 1.9 is amended by adding a new paragraph (d) to read as follows:

§ 1.9 Definitions.

* * * * *

(d) A small business concern as used in this chapter means any business concern as defined by the Small Business Administration in 13 CFR 121.3-18, published on September 30, 1982 at 47 FR 43273. For the convenience of the users of these regulations, that definition states:

§ 121.3-18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code

(a) Pursuant to Pub. L. 97-247, a small business concern for purposes of paying reduced fees under 35 U.S. Code 41 (a) and (b) to the Patent and Trademark Office means any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. For the purpose of this section concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of the business concern is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Employees are those persons employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern.

(b) If the Patent and Trademark Office determines that a concern is not eligible as a small business concern within this section, the concern shall have a right to appeal that determination to the Small Business Administration. The Patent and Trademark Office shall transmit its written decision and the pertinent size determination file to the SBA in the event of such adverse determination and size appeal. Such appeals by concerns should be submitted to the SBA at 1441 L Street, NW., Washington, D.C. 20416 (Attention: SBA Office of General Counsel). The appeal should state the basis upon which it is claimed that the Patent and Trademark Office initial size determination on the concern was in error; and the facts and arguments supporting the concern's claimed status as a small business concern under this section.

2. Section 1.27 is amended by adding a new paragraph (c) to read as follows:

§ 1.27 Statement of status as small entity.

* * * * *

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in [g49 1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in § 1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such.

Sept. 23, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[FR Doc.82-26941 Filed 9-29-82; 8:45 am]
BILLING CODE 3610-16- M

SMALL BUSINESS ADMINISTRATION
13 CFR Part 121

Definition of Small Business for Paying Reduced Patent Fees Under Title 35, United States Code

Agency: Small Business Administration.
Action: Final rule.
Summary: The Small Business Administration in conjunction with the Patent and Trademark Office is establishing a definition of small business for the purpose of paying patent fees under section 41 (a) and (b) of Title 35, United States Code, which are reduced by 50 per centum for small business concerns as required by Pub. L. 97-247. The definition would be implemented by the Patent and Trademark Office, which has recently published its regulations on the fee reduction procedures (47 FR 40134, Sept. 10, 1982).
Effective Date: Oct. 1, 1982.
For Further Information Contact: R. Franklin Burnett (703) 557-3054. Harvey Bronstein (202) 653-6373.
Supplementary Information: Pub. L. 97-247 provides that funds available under the Act to the Patent and Trademark Offi ce "shall be used to reduce by 50 per centum the payment of fees under Section 41 (a) and (b) of Title 35, United States Code, by small business concerns as defined in Section 3 of the Small Business Act and by regulations established by the Small Business Administration."

A notice of proposed rulemaking relating to the definition of a small business was published in the *Federal Register* on Aug. 31, 1982 (47 FR 38311). The regulation being issued is the same as that which was proposed. In order to be a small business, the number of employees of the concern, including those of its affiliates, may not exceed 500 persons. Concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of a business concern is determined by counting the number of persons of the concern and its affiliates employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern and of its affiliates. The number of employees is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year.

The definition also requires a small business for this purpose to be one which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section."

Discussion of Comments

One comment from the American Patent Law Association, whose membership includes several thousand lawyers involved in the practice of law before the U.S. Patent and Trademark Office, expressed "no comment regarding the definition" and expressed "[t]hanks for all that's been done toward a hopefully workable definition." The remaining comments were from individual patent attorneys rather than comments on behalf of any organization.

Two comments raised questions about the intended scope of the term "license." It was suggested that clarification is needed as to what is included within the scope of the term. One comment suggested that, "[a]t the very least, the record should reflect that the definition is not intended to reach implied licenses to use and resell patented articles purchased from a small business." The comment is correct insofar as it suggests that such "implied licenses" are not intended to be included within the scope of the term. Likewise, an order by the applicant to a firm to build a proto-type machine or product for the applicant's own use is not considered to constitute a license for purposes of the definition.

Another suggestion was that the regulation be reworded to deny small business status where revenue above a certain dollar amount was received from licensing rights under the invention to a concern which could not qualify as a small entity. It was also suggested that the term "exclusive license of any of the rights in the invention" be used instead of the term "license." The latter two suggestions have not been adopted. Adoption of these suggestions would cause the regulation to become more complicated, and does not appear necessary to aid small concerns in accord with the purposes of the legislation. In addition, it could substantially broaden the number of concerns which could qualify with a resulting excessive loss of revenue to the Patent and Trademark Office. It is not seen likely that the restriction on licensing would unduly or adversely affect the ability of the small business concern to participate in the patent system.

Another comment which was made related to a firm which is a subsidiary of a university or other nonprofit organization. The suggestion was made that the number of employees of the university or other nonprofit affiliate be excluded from consideration in determining whether or not the business concern qualifies as a small business concern. The suggestion has not been adopted since the situation raised is already treated under the definition of nonprofit organization established by the Patent and Trademark Office on Sept. 10, 1982, at 47 FR 40134-40140. Under that Patent and Trademark Office regulation, a wholly owned subsidiary of a nonprofit or university is considered a part of the university or nonprofit and thus is already eligible for the fee reduction.

One comment suggested that the regulation contain language specifying that concerns meeting its requirements are also independently owned and operated and not dominant in their field of operation under the Small Business Act. It is not necessary to include this language since this regulation already contains an affiliation test for this purpose; and it is generally unlikely that a small concern would be found to be dominant. The

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legislative history of the Small Business Act indicates that "The mere fact that a small business makes a particular product or item and is dominant in its field with respect to the particular product or item is not intended to disqualify it from the benefits of this Act * * *" (House Report 494, 83rd Congress, 1st Session 1953). SBA Size Appeals Board precedents have consistently stated that dominance under the Act and the SBA regulations is not viewed in narrow industry subdivisions. It, therefore, does not appear that concerns defined as small business under this provision would be dominant within the meaning of the Small Business Act.

Another comment suggested that foreign concerns should not be eligible as small business under this provision. Since this patent legislation was enacted by the Congress with knowledge of the Paris Convention for the Protection of Industrial Property, there is no indication that Congress intended that foreign small business not be eligible for the fee reduction. It is the view of the Patent and Trademark Office that excluding foreign small concerns would violate U.S. treaties in the patent area.

This comment also questioned whether the Patent and Trademark Office should make initial size determinations, or whether they could more appropriately be made by SBA. Since the fee reduction procedure is part of the patent application and of other Patent and Trademark Office actions and may involve Patent law questions, it would be administratively infeasible to have initial size determinations made by the SBA. The Patent and Trademark Office recently issued regulations (Sept. 10, 1982, 47 FR 40134) which set forth the fee reduction procedures.

Other Considerations Relating to the Rulemaking

Environmental, energy, and other considerations: The rule will not have a significant impact on the quality of the human environment or the conservation of energy resources.

Small business concerns will be benefited by the rule. The proposed rule will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). Public Law 97-247 has taken into consideration the impact it may have on small entities and has reduced the fees, therefore, by 50 per centum.

The Small Business Administration has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no significant additional record keeping or reporting requirements are placed upon the public.

List of Subjects in 13 CFR Part 121

Small businesses, Inventions and patents.

PART 121...SMALL BUSINESS SIZE STANDARDS

Accordingly, pursuant to Section 3 of the Small Business Act and Pub. L. 97-247, Part 121 of Title 13 of the Code of Federal Regulations is amended by adding § 121.3-18 to read as follows:

§ 121.3-18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code.

(a) Pursuant to Pub. L. 97-247, a small business concern for purposes of paying reduced fees under 35 U.S. Code 41 (a) and (b) to the Patent and Trademark Office means any business concern (1) whose number of employees, including those of its affiliates, does not exceed 500 persons and (2) which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a nonprofit organization under this section. For the purpose of this section concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both. The number of employees of the business concern is the average over the fiscal year of the persons employed during each of the pay periods of the fiscal year. Employees are those persons employed on a full-time, part-time or temporary basis during the previous fiscal year of the concern.

(b) If the Patent and Trademark Office determines that a concern is not eligible as a small business concern within this section, the concern shall have a right to appeal that determination to the Small Business Administration. The Patent and Trademark Office shall transmit its written decision and the pertinent size determination file to the SBA in the event of such adverse determination and size appeal. Such appeals by concerns should be submitted to the SBA at 1441 L Street, NW., Washington, D.C. 20416 (Attention: SBA Office of General Counsel). The appeal should state the basis upon which it is claimed that the Patent and Trademark Office initial size determination on the concern was in error and the facts and arguments supporting the concern's claimed status as a small business concern under this section.

ROBERT B. WEBBER,
Acting Administrator.

Sept. 23, 1982.

[FR Doc. 82-20940 Filed 9-29-82; 8:45 am]
BILLING CODE 8025-01-M

[1023 O.G. 23]

(58)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 31-201-229]

Revision of Patent Practice

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to clarify the practice under certain sections of Public Law 97-247 of 1982 and to make certain other changes and clarifications in practice which have been found desirable after some experience. The rulemaking changes the practice under §§ 1.27 and 1.28 with regard to subsequently establishing small entity status and qualifying for a refund of fees paid in full. The changes in other rules clarify and improve the practice in certain areas.
Effective Date: Apr. 1, 1984
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) clarify the small entity status of independent inventors, small business concerns and nonprofit organizations having funding agreements with a federal governmental agency as defined in 35 U.S.C. 202(c) (4); 2) rewrite § 1.28 to provide a system for obtaining a refund of a portion of a fee paid in full when small entity status is established within two months of the date of such payment; 3) provide that a separate statement establishing small entity status is not required in an application filed under § 1.62 when such status has been established in the parent application; and 4) modify certain other rules to clarify practice.

New § 1.21(1) establishes a fee for processing and retaining any application which is abandoned for failing to complete the application pursuant to § 1.53(d). This new paragraph, as well as the changes to §§ 1.53 and 1.78, indicate that in order to obtain benefit of a prior U.S. application, either the basic filing fee or the processing and retention fee of § 1.21(1) must be paid. Section 1.53(d) further establishes that the application will be disposed of if the required fee is not paid within a set period. Section 1.56(b) requires submission of copies of foreign patent documents, non-patent publications, or other non-patent items

of information disclosed pursuant to the duty to disclose. New § 1.191(d) clarifies that § 1.136 applies in patent applications and that § 1.550(c) applies in reexamination proceedings to all time periods set forth in §§ 1.191-1.194, 1.196 and 1.197.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules:

Section 1.5, paragraph (a) is amended to remove a reference to § 1.55, which is no longer appropriate and to clarify how letters to the Office are to be identified.

Section 1.6 is amended as proposed to clarify the manner in which letters and papers, including fees, filed in accordance with § 1.10 by "Express Mail" are date stamped when received in the Patent and Trademark Office. Such letters and papers, which comply with § 1.10, will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday or federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays, or federal holidays within the District of Columbia.

Section 1.10, paragraphs (a) and (c), are amended to clarify that papers deposited as "Express Mail" on a Saturday, Sunday, or a federal holiday within the District of Columbia will be stamped with the date of the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. A cross reference to § 1.6(a) has also been added to the rule. This change was not contained in the notice of proposed rulemaking but is being made to avoid confusion and to ensure that the Office's practice in date-stamping of papers is clearly understood. The change was suggested by a comment received on the proposed rules.

Section 1.14 is amended as proposed to revise paragraph (b) to clarify that only complete patent applications as defined in § 1.51(a) which become abandoned will be retained for a period of twenty years from the filing date. Incomplete applications will be retained as provided in §§ 1.21 and 1.53.

Section 1.19, paragraph (b)(3), is amended as proposed to clarify that only copies made from Office records, but not prepared by the Office, will be compared with the original prior to certification of the copies. The Office will not compare copies made from some other copy or record with Office records for purposes of certification. The stated charge of ten cents per page would not be sufficient to make a word-by-word comparison. The requirements of the public appear to still be served by limiting the use of the comparison fee to Office records.

Section 1.21 is amended as proposed to revise paragraph (b) (2) and establish a new paragraph (1). The change in paragraph (b) (2) is in accord with the change § 1.25 (a). New paragraph (1) provides a fee for processing and retaining any application which is abandoned pursuant to § 1.53(d). Such applications have received a filing date pursuant to 35 U.S.C. 111 but have been abandoned for failure to complete the application by filing the oath or declaration, filing fee or surcharge § 1.16(e)). The fee covers the handling, filming, processing, data input and storage required to retain an application. The fee is not due in any application in which the basic filing fee was paid.

Section 1.25 is amended as proposed to revise paragraph (a) to set the minimum deposit for a deposit account at $1000 and to clarify that an amount sufficient to cover all fees as well as services, copies, etc., requested must always be on deposit. This minimum amount is considered necessary and proper in view of the substantial increase in the amounts of fees being charged to deposit accounts and the processing costs of handling overdrawn accounts. Paragraph (b) clarifies that fees may be charged against a deposit account only where sufficient funds are on deposit to cover the entire amount of the fees. Paragraph (b) also clarifies that an authorization to charge a fee to a deposit account will not be considered payment on the date the authorization to charge is effective as to that fee unless sufficient funds are present in the account to cover the fee.

Section 1.27 is amended as proposed to revise paragraphs (b), (c) and (d) to provide clearly that an independent inventor, small business concern, or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a federal agency pursuant to 35 U.S.C. 202(c) (4). Section 1.27 is amended to state that such a license does not constitute a license or a conveyance of rights which would preclude qualifying for small entity status. The amendment is necessary for clarification and to avoid frustrating the intent of Public Law 97-247 and Public Law 96-517 when taken together.

The text of Title 35, United States Code, § 202(c) (4) reads as follows:

§ 202. Disposition of rights

(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

* * * * *

(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

Section 1.28 is amended as proposed to revise paragraph (a) to clarify that a separate verified statement is not required to be filed in a file wrapper continuing application filed pursuant to § 1.62, if status as a small entity has been established in the parent application and is still proper. Section 1.28(a) also permits a refund of a fee timely paid in the full amount if within two months of the date of the full timely payment: (1) small entity status is properly established, and (2) a refund is requested. Under § 1.28(a), no request for a refund filed later than two months after the date on which a full fee has been paid will be entertained even if additional time is sought to file the request. The two-month period referred to in § 1.28(a) is not a period for response under § 1.136 and cannot be extended. Section 1.28(a) provides for, in somewhat modified form, the practice presently in effect pursuant to a waiver of § 1.28 published at 1023 O.G. 77 on Oct. 26, 1982 and extended at 1027 O.G. 115 on Feb. 15, 1983. The revised refund procedures in § 1.28(a) will apply to any fees timely paid in full on or after the effective date of the final rule. The refund procedures set forth in the Patent and Trademark Office *Official Gazette* Notice entitled "Filing of Verified Statements Claiming Small Entity Status" published at 1023 O.G. 77 on October 26, 1982, and the *Official Gazette* Notice entitled "Requirement for Filing Verified Statements Claiming Small Entity Status" published at 1027 O.G. 115 on Feb. 15, 1983, continue in effect until the effective date of the final rule.

Section 1.52(d) is amended as proposed to clarify that the verified English translation of a non-English language application and the fee set forth in § 1.17(k) can be filed with the application or within such time as may be set by the Office.

Section 1.53, paragraphs (b) and (d), are amended to clarify in paragraph (b) that the application for patent must be filed in the name of the actual inventor or inventors by giving all their names as required by § 1.41. Paragraph 1.53(d) states that if a correspondence address is provided, notice will be provided to that address where the appropriate filing fee or oath or declaration does not accompany the application. Paragraph 1.53(d) also provides that if the required filing fee is not paid, or the processing and retention fee is not paid, within one year of the date of mailing of notification pursuant to paragraph 1.53(d) or within one year from the filing date if no correspondence address is included in the application, the application will be disposed of. The paragraph further indicates that no copies will be provided or certified by the Office of an application which has been disposed of or in which neither the basic filing fee nor the processing fee has been paid. Finally, paragraph 1.53(d) specifies that if no correspondence address is included in the application, applicant will have two months from the filing date to file the fee, oath or declaration and to pay the surcharge set forth in § 1.16(e) in order to prevent abandonment of the application.

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Section 1.55, paragraph (b), is amended as proposed to correct an error in referring to paragraph (a) of this section.
Section 1.56 is amended as proposed to revise paragraph (b) and add a new paragraph (j). Paragraph 1.56(b) requires that a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form being disclosed pursuant to § 1.56 accompany such disclosures unless the copy is not in the possession of the person making the disclosure. In such a situation, a statement to that effect is required. Paragraph 1.56(b) also adds "or her" to refer to both genders. New paragraph 1.56(j) states that applicant will be notified if a copy or statement required pursuant to § 1.56(b) is not submitted and that applicant will be given a time period within which to file the copy or a statement that the copy is not in the possession of the person making the disclosure. Such a time period would be extendable under § 1.136. Failure to respond in a proper and timely manner would result in abandonment of the application.
Section 1.59 is amended as proposed to clarify that the Office will furnish copies of papers received in the Office at the usual cost only if the basic filing fee or the processing and retention fee has been paid.
Section 1.60 is amended to break the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended § 1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph 1.60(b) provides that the signing of the oath or declaration can be omitted if the prior application was complete as set forth in § 1.51(a). New paragraph 1.60(b) also requires that a true copy of the prior complete application be filed. The final rule also clarifies that the copy of the oath or declaration filed must show the applicant's signature or contain an indication it was signed. Paragraph 1.60(b) also provides that only amendments reducing the number of claims or adding a reference to the prior application will be entered before calculating the filing fee and granting the filing date.
Section 1.62 is amended as proposed to revise paragraphs (a) and (d). Paragraph 1.62(a) provides that the file wrapper continuing procedure is applicable only to prior complete applications under § 1.51(a). Paragraph 1.62(d) clarifies that the filing fee referred to is the basic filing fee.
Section 1.78 is amended as proposed to change the title to more explicitly define the contents of the section. Paragraph 1.78(a) specifies that in order for an application to claim the benefit of a prior filed copending national application, the prior application must be complete as set forth in § 1.51(a) or be entitled to a filing date as set forth in § 1.53(b) and include the basic filing fee set forth in § 1.16, or be entitled to a filing date as set forth in § 1.53(b) and have paid the processing and retention fee set forth in § 1.21(l) within the time period set forth in § 1.53(d).
Section 1.121 is amended as proposed to revise paragraph (c) to specify how amendments to the description and claims are to be made in reissue applications.
Section 1.123 is amended as proposed to clarify that the sketch showing proposed amendments to the drawing with its cover letter should be a separate paper.
Section 1.135 is amended as proposed to remove paragraph (d) since it is not necessary in view of the ability to obtain extensions of time under § 1.136(a) by petition and payment of fee.
Section 1.136 is amended as proposed to clarify in paragraphs (a) and (b) that the extension of time practice under this section does not apply in interference proceedings or in reexamination proceedings. Extension of time practice in interference proceedings, including extension of time for appeal or civil action (§ 1.304), is subject to § 1.245. Extension of time practice in reexamination proceedings, including extension of time for appeal or civil action (§ 1.304), is subject to § 1.550(c).
Section 1.191 is amended as proposed to add a new paragraph (d) to provide that the time periods for appeal and review set forth in §§ 1.191-1.194, 1.196 and 1.197 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings.
Section 1.192 is amended as proposed to revise paragraph (a) to delete the reference to § 1.136 since it is provided for in new § 1.191(d).
Section 1.197 is amended as proposed to revise paragraph (b) to delete the reference to § 1.136 since it is provided for in new § 1.191(d).
Section 1.304 is amended as proposed to clarify that extensions of time periods set forth therein are subject to the provisions of § 1.245 for interferences or § 1.550(c) where reexamination proceedings are involved rather than to § 1.136 which applies in all other cases.
Section 1.550 is amended as proposed to revise paragraph (c) to clarify that the time for taking any action, including appeal, by a patent owner in a reexamination proceeding is governed solely by this section.
Section 1.555 is amended to revise paragraphs (a) and (b). In paragraph 1.555(a) "prior art" statement has been changed to "information disclosure" statement to conform to the language of § 1.98. Paragraph 1.555(b) requires that disclosures pursuant to this paragraph be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. Thirty-five letters presenting written comments were received. No oral testimony was presented at the public hearing conducted on Oct. 18, 1983. All of the comments were considered in adopting the changes set forth herein. Comments appear below with responses thereto.

Comments from Associations

Comment:
The American Patent Law Association commented that they were in full accord with most of the proposed changes. They submitted comments and suggestions from some members. The Patent, Trademark and Copyright Section of the American Bar Association did not render an official section position on the proposed rule changes but polled its members and found the majority of the member responding either to favor the proposed rule changes or to view them as acceptable. They also submitted comments and suggestions from some members. The United States Trademark Association commented on the proposed rules concerning deposit accounts.
Reply:
The efforts and input of these organizations are appreciated. Specific comments and suggestions from individual members of the organizations are covered below.

Comments from Individuals

Comment:
One comment was received that the proposed amendment to § 1.6 was unnecessary and possibly improper.
Reply:
The amendment to § 1.6 has been adopted as proposed. The amended rule sets out the Patent and Trademark Office practice which has been in effect. No papers are stamped as having arrived in the Office on Saturday, Sunday, or a federal holiday within the District of Columbia no matter how the papers are filed. Article 4, C(3) of the Paris Convention says that the period of priority shall be extended until the first following working day "when the Office is not open for the filing of applications in the country where protection is claimed". To accept papers through use of "Express Mail" or some other way on Saturdays, Sundays or federal holidays within the District of Columbia would raise the possibility that the Office would be viewed as open for the filing of papers on such days and thereby remove the current ability to file a priority claiming application on the first working day if the priority year ended on a non-working day. The final rule avoids this implication.
Comment:
One comment indicated that the change to § 1.6 should not be applied retroactively to papers filed before the clarifying language was placed in the rule.
Reply:
Any such fact situation will be reviewed through the normal petition procedure.
Comment:
One comment suggested that § 1.10 be amended rather than § 1.6 with regard to papers deposited as "Express Mail" on a Saturday, Sunday, or federal holiday within the District of Columbia.

Reply:
This comment has been adopted in that both §§ 1.6 and 1.10 have been amended to avoid any possible confusion.
Comment:
One comment suggested that § 1.19(b) (3) be changed to permit the Office to certify material not copied from the records of the Office when reproduction of Office records is not feasible or possible.
Reply:
This comment has not been adopted. The Office will only certify that material is a copy of an Office record if, in fact, the material was reproduced from the Office record.
Comment:
One person commented that the $100 processing and retention fee under § 1.21 was excessive and unnecessary.
Reply:
The fee is considered proper and necessary in view of the cost to the Office in handling, filming, processing and storage required to retain an application which has a filing date but in which no basic filing fee has been paid. If this expense is not covered by the applicant, it must be recovered from other sources.
Comment:
Twenty-seven comments were received on the proposal to amend § 1.25 to raise to $1000 the minimum balance required in a deposit account. The amount is also referred to in § 1.21(b) (2). These comments generally suggested that the $1000 amount was too high for account holders who did not use their accounts for charges other than small fees such as for patent copies. Several comments received acknowledged that the minimum balance for deposit accounts should be raised and suggested various amounts less than the proposed $1000. Several comments suggested a separate account category for persons who do not use their accounts for other than small fees. Two comments suggested that the Office accept credit cards for payment of fees.
Reply:
These comments and suggestions have not been adopted. The fees for filing, processing and issuing of patent and trademark applications have increased so as to make the present $40 minimum balance for deposit accounts totally inadequate. A number of persons objecting to the $1000 minimum balance acknowledged that they used their deposit accounts as a safeguard against failure to calculate or to submit proper fees by a check. An account with a very low balance obviously cannot be effective as a safeguard when a patent filing fee is $300 and a patent issue fee is $500. Dealing with overdrawn accounts causes administrative problems for the Patent and Trademark Office. An authorization to charge an account without sufficient funds to cover a charge will not be effective as payment and may result in loss of rights to an applicant. Also, unnecessary expense will be incurred by an applicant if an insufficient balance in an account results in abandonment of an application and the necessity of filing a petition to revive under 37 CFR 1.137(b) with the requisite $500 fee. Experience has shown that many single practitioners and small firms have failed to have sufficient funds in their accounts when needed. The increase of the minimum balance in deposit accounts to $1000 is seen to be necessary and proper. A failure to raise the minimum balance in deposit accounts to $1000 would serve as an incorrect indication that the Patent and Trademark Office views a minimum balance of less than $1000 as acceptable. If it is not possible for a small firm or individual to maintain a minimum balance of $1000, the deposit account could still be retained and used by paying the service charge set forth in § 1.21(b) (2) for any month in which the balance at the end of the month is below $1000. The use of credit cards is not considered viable since legislation would be required to do so.
Comment:
Two comments were received suggesting that a license to a federal agency in an invention made by a federal employee should not preclude the employee from qualifying as a small entity and that § 1.27 should be amended to cover this situation.
Reply:
These comments have not been adopted. Such an amendment was not proposed and the public has not had an opportunity to comment on it.
Comment:
One comment suggested that the time for filing a verified statement claiming small entity status to obtain a refund of a filing fee pursuant to § 1.28 should run from the date of mailing of the filing receipt due to difficulty in identifying the new application before the filing receipt is received. Three persons suggested that the period for establishing small entity status and requesting a refund should be three months rather than two months as proposed.
Reply:
These comments have not been adopted. An application may be identified before the filing receipt is issued in a number of ways including title, inventor's name, filing date and attorney docket number. Also, a postcard may be included with filing of the application to learn the application serial number. The two month period for obtaining a refund is seen to be adequate since the small entity practice is no longer new and the public has had time to become familiar with it. It allows sufficient time to have a small entity statement executed and sent to the Patent and Trademark Office.
Comment:
One comment suggested that it should be made clear that an application filed in a foreign language (§ 1.52(d)) without including a signed oath or declaration can receive a filing date under the provisions of § 1.53(b).
Reply:
The regulations permit and this reply makes it clear that an application filed in a language other than English can receive a filing date by complying with § 1.53(b).
Comment:
Three comments were received suggesting that the proposed language not be added to § 1.53(b). One comment alleged that the requirement to name the inventors upon filing a patent application is not required or even authorized by statute.
Reply:
35 U.S.C. 111 says that application for patent "shall be made. or authorized to be made, by the inventor". The rules of practice (§ 1.41(a)) contain the same requirement. The amendment to § 1.53(b) is only clarifying the rules by also placing the requirement in that section. Further, United States patent practice has long required that the inventors be named at the time of filing.
Comment:
One person commented that the language of § 1.53(d) should be changed to reflect that only one of the filing fee or processing and retention fee must be paid to prevent the application being disposed of.
Reply:
The language of the rule is seen to be unambiguous in this regard.
Comment:
One person commented that the language of § 1.53(d) should be changed to establish a time within which the processing and retention fee may be paid to prevent the application being disposed of when no correspondence address has been provided.
Reply:
The suggestion has been adopted.
Comment:
One person suggested that § 1.56(b) which states that copies of disclosed documents must be filed is inconsistent with § 1.56(j) which provides that such copies must be filed unless they are not in the possession of the person making the disclosure.
Reply:
The language of § 1.56(b) has been modified to clarify this point.
Comment:
Three persons commented that the requirement of § 1.56(b) that copies of disclosed documents be supplied was an unnecessary burden. One person commented similarly on the requirement of § 1.555 that copies of disclosed documents be supplied. Another person suggested that the proposed amendment to § 1.56(b) would require submission of a complete document even if only a small portion were relevant.
Reply:
The Office agrees with another person who commented that the "requirement that disclosers in application and reexamination proceedings provide copies of disclosed documents which they have is fair and reasonable and should aid the Examiner in making an informed as possible decision in any given proceeding". The portion of a document required to be submitted

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under § 1.56(b) is the portion which is material to the examination of the application under § 1.56(a).

Comment:

One person commented that the proposed amendment to § 1.78(a) would appear to require that a petition for correction of inventorship under § 1.48 be filed in a parent application as well as in the continuing application in which the inventorship was corrected.

Reply:

The amendment to § 1.78 does not change the practice regarding the filing of petitions under § 1.48.

Comment:

One person commented that § 1.123 is unclear as amended in not referring to the paper requesting that amendments to the drawing be made.

Reply:

The Patent and Trademark Office no longer makes amendments to the drawings. Applicants must submit new drawings with the changes or use bonded draftsmen to make the amendments. A paper requesting that the Office make the amendments is therefore inappropriate.

Comment:

Four persons commented that § 1.135(d) should not be deleted since they thought it desirable to be able to ratify unsigned papers without paying any fee.

Reply:

The statute and rules now provide for obtaining extensions of time through simple petition and payment of fee and for revival through a simple statement that the abandonment was unintentional and the payment of a fee. Further, a filing date can now be obtained on filing an application without the oath or declaration. The handling of unsigned papers by the Patent and Trademark Office causes administrative problems and expense to the Office and delays the processing of applications. The emergency-type situations involving loss of rights which the previous practice was intended to cover have been substantially eliminated by the changes in the law and rules.

Comment:

One person commented that § 1.191(d) was undecipherable in that it refers to a number of other rules.

Reply:

This section was intended to serve as a point of summarization for the applicable extension of time rules in appeals before the Board of Appeals. The section is seen to adequately serve that purpose.

Comment:

One person commented that the final sentence of § 1.555(b) needs clarification.

Reply:

This sentence was not changed by the proposed rules and is seen to be clear as written.

Comment:

One person commented that proposed § 1.555(b) requires copies and does not make any exceptions or qualifications on this requirement.

Reply:

The language of § 1.555(b) has been clarified to require filing of a copy of each foreign patent document or non-patent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354). Public Laws 96-517 and 97-247 have both taken into consideration the impact they may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to filing of small entity statements in applications filed under § 1.62 will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Part 1, is amended as follows:

1. Section 1.5 is amended by revising paragraph (a) to read as follows:

§ 1.5 Identification of application, patent or registration.

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

* * * * *

2. Section 1.6 is amended by revising paragraph (a) to read as follows:

§ 1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt except where such letters and papers are filed in accordance with § 1.10. Any such letters and papers filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

* * * * *

3. Section 1.10 is amended by revising paragraphs (a) and (c) to read as follows:

§ 1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia. See § 1.6(a).

* * * * *

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) (unless the certificate date is a Saturday, Sunday, or federal holiday within the District of Columbia-see § 1.6(a)) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

4. Section 1.14 is amended by revising paragraph (b) to read as follows:

§ 1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to §§ 1.139, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§ 1.51(a)) which are abandoned may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

5. Section 1.19 is amended by revising paragraph (b) (3) to read as follows:

§ 1.19 Document supply fees.

* * * * *

(b) * * *

(3) For comparing copies, made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, with the original, prior to certification of the copies, per page $0.10

* * * * *

6. Section 1.21 is amended by revising paragraph (b) (2) and by adding a new paragraph (1) to read as follows:

§ 1.21 Miscellaneous fees and charges.

* * * * *

(b) * * *

(2) Service charge for each month when the balance at the end of the month is below $1000 ..... $2.00

* * * * *

(1) For processing and retaining any application abandoned pursuant to § 1.53(d) unless the required basic filing fee has been paid ..... $100.00.

7. Section 1.25 is revised to read as follows:

§ 1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§ 1.21(b)(1)). A minimum deposit of $1000 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. A service charge (§ 1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1000.

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts if sufficient funds are on deposit to cover such fees. A general authorization to charge all fees, or only certain fees, set forth in §§ 1.16 to 1.18 to a deposit account containing sufficient funds may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to § 1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee.

8. Section 1.27 is amended by revising paragraphs (b), (c) and (d) to read as follows:

§ 1.27 Statement of status as small entity.

* * * * *

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§ 1.42, 1.43, or 1.47 of this part, and must aver that the inventor qualifies as an independent inventor in accordance with § 1.9(c) of this part. Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring to their status. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to U.S.C. 202(c)(4) does not constitute a license as set forth in § 1.9 of this part.

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in § 1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in § 1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in § 1.9 of this part.

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in § 1.9(e) of this part specifying under which one of § 1.9(e)(1), (e)(2), (e)(3), or (e)(4) of this part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in § 1.9 of this part. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their

status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a conveyance of rights as set forth in this paragraph.

9. Section 1.28 is amended by revising paragraph (a) to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§ 1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to § 1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under § 1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under § 1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established by a verified statement filed in each application or patent in which the status is available and desired, except those applications filed under § 1.60 or § 1.62 of this part where the status as a small entity has been established in a parent application and is still proper. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to § 1.27 of this part unless the Office is notified of a change in status. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established, except those filed under § 1.60 or § 1.62 of this part. Applications filed under § 1.60 or § 1.62 of this part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired.

* * * * *

10. Section 1.52 is amended by revising paragraph (d) to read as follows:

§ 1.52 Language, paper, writing, margins.

* * * * *

(d) An application may be filed in a language other than English. A verified English translation of the non-English language application and the fee set forth in § 1.17(k) are required to be filed with the application or within such time as may be set by the Office.

11. Section 1.53 is amended by revising paragraphs (b) and (d) to read as follows:

§ 1.53 Serial number, filing date, and completion of application.

* * * * *

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75, and (2) any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No new matter may be introduced into an application after its filing date (§ 1.118).

* * * * *

(d) If the application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided, and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. If the required filing fee is not timely paid, or if the processing and retention fee set forth in § 1.21(1) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the fee, oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application or one year from the filing date to pay the processing and retention fee set forth in § 1.21(1) to prevent disposal of the application.

* * * * *

12. Section 1.55 is amended by revising paragraph (b) to read as follows:

§ 1.55 Claim for foreign priority.

* * * * *

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his or her attorney or agent, when submitting a claim for such right as specified in paragraph (a) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

13. Section 1.56 is amended by revising paragraph (b) and by adding a new paragraph (j) to read as follows:

§ 1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his or her own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.

* * * * *

(j) If any disclosure pursuant to this section does not include a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or a statement that a copy thereof is not in the possession of the person making the disclosure, applicant will be so notified and given a period of time within which to file the copy or a statement that a copy is not in the possession of the person making the disclosure. The time period set may be extended under § 1.136.

14. Section 1.59 is revised to read as follows:

§ 1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to § 1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§ 1.16) or the processing and retention fee § 1.21(1)) has been paid.

15. Section 1.60 is revised to read as follows:

§ 1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in § 1.51(a) and (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date.

16. Section 1.62 is amended by revising paragraphs (a) and (d) to read as follows:

§ 1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application § 1.51(a)) to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application.

* * * * *

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate basic filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

* * * * *

17. Section 1.78 is amended by revising the title and paragraph (a) to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in the same applicant's prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must be (1) complete as set forth in § 1.51, or (2) entitled to a filing date as set forth in § 1.53(b) and include the basic filing fee set forth in § 1.16; or (3) entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(1) within the time period set forth in § 1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

* * * * *

18. Section 1.121 is amended by revising paragraph (e) to read as follows:

§ 1.121 Manner of making amendments.

* * * * *

(e) In reissue applications, both the descriptive portion and the claims are to be amended by either (1) submitting a copy of a portion of the description or an entire claim with all matter to be deleted from the patent being placed between brackets and all matter to be added to the patent being underlined, or (2) indicating the exact word or words to be stricken out or inserted and the precise point where the deletion or insertion is to be made. Any word or words to be inserted must be underlined. See § 1.173.

* * * * *

19. Section 1.123 is revised to read as follows:

§ 1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner and should be a separate paper.

20. Section 1.135 is amended by removing paragraph (d).

21. Section 1.136 is revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to § 1.207. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.245 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension

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carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.245 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

22. Section 1.191 is amended by adding a new paragraph (d) to read as follows:

§ 1.191 Appeal to Board of Appeals.

* * * * *

(d) The time periods set forth in §§ 1.191 through 1.194, 1.196 and 1.197 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings.

23. Section 1.192 is amended by revising paragraph (a) to read as follows:

§ 1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved.

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24. Section 1.197 is amended by revising paragraph (b) to read as follows:

§ 1.197 Action following decision.

* * * * *

(b) A single request for rehearing or reconsideration, or modification of the decision, may be made if filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states.

* * * * *

25. Section 1.304 is amended by revising paragraph (a) to read as follows:

§ 1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time provided pursuant to § 1.197(b) or § 1.256(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The time periods set forth herein are subject to the provisions of § 1.136 or § 1.550(c) as to decisions of the Board of Appeals, or § 1.245 as to decisions of the Board of Patent Interferences.

* * * * *

26. Section 1.550 is amended by revising paragraph (c) to read as follows:

§ 1.550 Conduct of reexamination proceedings.

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension.

* * * * *

27. Section 1.555 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.555 Duty of disclosure in reexamination proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. All such individuals who are aware, or become aware, of patents or printed publications material to the reexamination which have not been previously made of record in the patent file must bring such patents or printed publications to the attention of the Office. An information disclosure statement, preferably in accordance with § 1.98, should be filed wihin two months of the date of the order for reexamination, or as soon thereafter as possible in order to bring such patents or printed publications to the attention of the Office.

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility on behalf of the patent owner for the reexamination proceeding or through a patent owner acting in his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the reexamination.

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GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Nov. 30, 1983.

[1038 O.G. 275]

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(59)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40442-49092]

Final Rules for Patent Maintenance Fees

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the payment of patent maintenance fees. Public Law 96-517, enacted on Dec. 12, 1980 and Public Law 97-247, enacted on Aug. 27, 1982, provided for the payment of maintenance fees at intervals of 3 1/2, 7 1/2 and 11 1/2 years from the date of grant of the patent for maintaining in force an original patent, a reissue patent of an invention, and under Public Law 96-517, a plant patent and reissues thereof. The changes provide specific rules and procedures which will assist patentees in avoiding the inadvertent expiration of a patent for failure to pay the appropriate maintenance fee.
Effective Date: Nov. 1, 1984
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to 1) establish a set of rules and procedures for the payment of patent maintenance fees; and 2) effect the provisions of Public Laws 96-517 and 97-247 with respect to payment of maintenance fees. The proposed rules were published on Apr. 24, 1984, in Vol. 49 of the *Federal Register*, pages 17692 through 17698; and on May 8, 1984, at Vol. 1042 of the *Official Gazette*, pages 22 through 38. A public hearing was held on the proposed rule changes on June 26, 1984.

A public briefing on the Office's maintenance fee payment plans was announced at 49 *Federal Register* 2806 on Jan. 23, 1984, and at 1038 *Official Gazette* 293 on Jan. 31, 1984. The public briefing was held on Feb. 22, 1984.

Discussion of Specific Rules

Section 1.1., is amended as proposed to add a new paragraph (d) to provide a "Box M. Fee" in the Patent and Trademark Office to which all maintenance fee correspondence and payments should be directed. Changes in small entity status in patents and changes in the "fee address" under § 1.363, as well as payments of maintenance fees should be directed to "Box M. Fee".

Section 1.9, paragraph (d) is amended as proposed to make a change in citation and title of the rule of the Small Business Administration which relates to the small business size standard for paying reduced patent fees. This change was published in the Federal Register as a final rule on Feb. 9, 1984 at 49 Fed. Reg. 5024-5048. The wording of the rule itself was not changed. This change is made to bring the wording of title 37, Code of Federal Regulations into conformance with title 13, Code of Federal Regulations.

Section 1.17, is amended as proposed to establish in paragraph (h) a fee of $120 for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (h) of § 1.17 is also amended to establish a fee of $120 for reconsideration of a decision on petition refusing to accept the delayed payment of a maintenance fee in an expired patent.

Section 1.19, is amended as proposed to add new paragraphs (f) and (g). New paragraph (f) provides for a $10.00 fee for a microfiche copy of a patent file wrapper record. Microfiche copies of these patent files have recently become available for patents issued after Jan. 1, 1984. No fee had previously been set by rule for this service. This fee is not directly related to maintenance fees but is set at this time for convenience. New paragraph (g) establishes a $3.00 fee for providing an uncertified statement indicating either the status of payment of maintenance fees due on a patent or the expiration of a patent. This charge does not apply to any receipt normally provided to the fee addressee as a result of the payment of a maintenance fee, but does apply in any other instance when written evidence of the status of payment of maintenance fees on a patent is requested, whether by the patentee or a member of the public.

Section 1.20, is amended as proposed to add new paragraphs (k), (l) and (m). New paragraph (k) provides for a $100.00 surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982. Since Public Law 96-517 did not provide for small entities, the surcharge amount of $100 applies to all such patents. New paragraph (l) provides for a $100 surcharge for patentees other than a small entity and a $50 surcharge for small entity patentees when paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant based on an application filed on or after Aug. 27, 1982. This surcharge of $100 is subject to a 50% reduction for small entities pursuant to Public Law 97-247. New paragraph (m) provides for a $500 surcharge for accepting payment of a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee. This $500 surcharge applies only under Public Law 97-247 where the patent is based on an application filed on or after Aug. 27, 1982 and where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable. The requirement that the delay be "unavoidable" is the same as that for reviving an abandoned application under 35 U.S.C. 133. However, the amount of evidence required will depend upon when the showing that the delay was "unavoidable" is made. This surcharge does not apply to patents based on applications filed prior to Aug. 27, 1982 since acceptance of a maintenance fee after expiration of a patent for non-timely payment is not possible under Public Law 96-517. Since this surcharge is provided for under 35 U.S.C. 41(c), it is not subject to a 50% reduction for small entities. The surcharge in paragraph (m) is not in addition to the surcharge in paragraph (l), but is in lieu thereof.

Section 1.33 is amended as proposed to add a new paragraph (d) which allows a "correspondence address" or change thereto to be filed during the enforceable life of the patent. The "correspondence address" will be used in correspondence relating to maintenance fees unless a separate "fee address" has been specified. Paragraph (d) also includes a reference to § 1.363 relating to the "fee address" to be used for maintenance fee purposes.

New § 1.362 is added to provide for times for payment of maintenance fees. New paragraph (a) sets forth the requirement that maintenance fees as set forth in § 1.20(e)-(j) must be paid in order to maintain a patent in force if the application maturing into a patent was filed on or after Dec. 12, 1980 and is subject to the payment of maintenance fees. The maintenance fee amounts set in § 1.20(e)-(g) are subject to adjustment in accordance with the provisions of Public Law 96-517. The maintenance fee amounts set in § 1.20(h)-(j) are subject to adjustment in accordance with the provisions of Public Law 97-247 on Oct. 1. 1985, and every third year thereafter, to reflect fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Other patent fees are also subject to similar adjustments.

New paragraph (b) of § 1.362 stipulates that no maintenance fees are due for plant patents if the plant patent application was filed on or after Aug. 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees. New paragraph (c) defines the pertinent application filing dates for purposes of determining whether maintenance fees are applicable. Paragraph (c) (1) establishes that for national applications not claiming benefit of an earlier application, the actual United States filing date controls. Paragraph (c) (2) establishes that for national applications claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date controls. Paragraph (c) (3) provides that for continuing national applications claiming benefit of a prior application under 35 U.S.C. 120, the actual United States filing date of the continuing application is the controlling date. Paragraph (c) (4) provides that for a reissue application, the United States filing date of the application which matured into the original patent upon which the reissue application is based will control. Paragraph (c) (5) establishes that for an international application which has entered the United States as a Designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treaty controls. This is consistent with 35 U.S.C. 363.

Paragraph (d) of new § 1.362 sets forth the time periods when maintenance fees can be paid without a surcharge. Those periods, referred to generally as the "window period," are the six-month periods preceding each due date, i.e., 3 years through 3 years and six months, 7 years through 7 years and six months, and 11 years through 11 years and six months after grant of the patent. The "due dates" are defined in 35 U.S.C. 41(b). A maintenance fee paid on the last day of a window period can be paid without surcharge. The last day of a window period can be paid without surcharge. The last day of a window period is the same date (anniversary date) the patent was granted 3 years and six months, 7 years and six months, or 11 years and six months after grant of the patent. Paragraph (d) has been modified from the proposal to add "and" between items (2) and (3) and change the comma at the end of the paragraph to a period.

Paragraph (e) of new § 1.362 sets forth the grace periods during which maintenance fees, under either Public Law 96-517 or Public Law 97-247, may be paid with the surcharge under § 1.20(k) or (l). The grace periods are the six-month periods immediately following each due date, i.e., after 3 years and six months and up to 4 years, after 7 years and six months and up to 8 years, and after 11 years and six months and up to 12 years after grant of the patent. A maintenance fee may be paid with the surcharge on the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant to prevent the patent from expiring.

Paragraph (f) of new § 1.362 specifies that where the last day for paying a maintenance fee falls on a Saturday, Sunday, or a

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or a federal holiday within the District of Columbia, the maintenance fee may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. For example, if the "window period" provided by paragraph (d) for paying a maintenance fee without surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee can be paid without surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. Likewise, if the grace period provided by paragraph (e) for paying a maintenance fee with surcharge ended on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee could be paid with surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday. In the latter situation, the failure to pay the maintenance fee and surcharge on the next succeeding day which is not a Saturday, Sunday, or federal holiday will result in the patent expiring on a date (4, 8, or 12 years after the date of grant) earlier than the last date on which the maintenance fee and surcharge could be paid. This situation results from the provisions of 35 U.S.C. 21, but those provisions do not extend the expiration date of the patent if the maintenance fee and any required surcharge are not paid when required. For example, if the grace period ended on Saturday, the maintenance fee and surcharge could be paid on the next succeeding business day, e.g. Monday, but the patent will have expired at midnight on Saturday if the maintenance fee and surcharge were not paid on the following Monday. Paragraph (f) has been modified from the proposal to explicitly refer to "any necessary surcharge" for clarity since the ability to pay on the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia applies to the maintenance fee, including any necessary surcharge.

Paragraph (g) of new § 1.362 establishes that if the proper fees are not received within the time period specified in paragraphs (d), (e), or (f) the patent expires at the end of the grace period set forth in paragraph (e). Paragraph (g) also specifies that a patent which expires for the failure to pay the maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

New § 1.363 is added as proposed to provide for a "fee address" for maintenance fee purposes. New paragraph (a) specifies that the correspondence address used during prosecution of the application will be used unless 1) a "fee address" is provided for maintenance fee purposes when submitting the issue fee, 2) a correspondence address change for all purposes is filed after payment of the issue fee, or 3) a "fee address" or a change in the "fee address" is filed after payment of the issue fee.

Paragraph (b) of new § 1.363 specifies that an assignment does not result in a change of address for maintenance fee purposes. Due to the possible expiration of a patent for failure to timely pay the appropriate maintenance fee, patentees should ensure that the Patent and Trademark Office is properly notified of the proper "fee address" to which all maintenance fee communications are to be directed. Under both Public Law 96-517 and Public Law 97-247 the burden is on the patentee to timely pay maintenance fees. The Patent and Trademark Office will attempt to assist patentees through appropriate courtesy notices. However, the failure to receive one or more notices will not relieve the patentee of the obligation to timely pay the appropriate maintenance fee to prevent the patent from expiring by operation of law if the maintenance fee is not paid. Section 1.363 does not provide for maintenance fee correspondence to be directed to more than one address.

New § 1.366 is added to establish the guidelines and procedures for submission of maintenance fees, including any necessary surcharges. New paragraph (a) states that the patentee may pay maintenance fees and any necessary surcharges or any person or organization may pay maintenance fees and any necessary surcharges on behalf of the patentee without filing in the Patent and Trademark Office evidence of authorization by the patentee to pay maintenance fees. This will enable patentees to pay the maintenance fees and any necessary surcharges themselves or authorize some person or organization to pay maintenance fees and any necessary surcharges on their behalf. No verification of the authority to pay maintenance fees and any necessary surcharges in a particular patent will be made by the Patent and Trademark Office. While anyone may pay the maintenance fees and any necessary surcharges on a patent, any Patent and Trademark Office notices relating to maintenance fees will be mailed to the "fee address" set forth in § 1.363. Paragraph (a) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity.

Paragraph (b) of new § 1.366 specifies that a maintenance fee and any necessary surcharge for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid, and at the proper time, i.e., within the periods set forth in § 1.362. Paragraph (b) has been modified from the proposal by changing "proper amount" to "amount due on the date the maintenance fee and any necessary surcharge are paid." This change results from adoption of a suggestion that a maintenance fee payment made during the window period should not require adjustment if the maintenance fees are thereafter increased to reflect increases in the Consumer Price Index. Under paragraph (b) as adopted herein, if the amount of the maintenance fee is correct on the date it is paid and credited to the patent, a later change in the maintenance fees to reflect changes in the Consumer Price Index will not require a modification in the amount paid. However, in order for the maintenance fee to be considered paid it must be submitted in accordance with § 1.366. Paragraph (b) has also been modified from the proposal to explicitly refer to § 1.362(f) for purposes of clarity where the last day for paying a maintenance fee with or without a surcharge falls on a Saturday, Sunday, or a federal holiday within the District of Columbia. In such circumstances, the fee with any necessary surcharge may be paid on the next succeeding day which is not a Saturday, Sunday, or federal holiday. The maintenance fee and any necessary surcharge may be paid in the manner set forth in § 1.23, i.e., it should be in United States specie, Treasury notes, national bank notes, post office money orders, or by certified check. As indicated in § 1.23, if the maintenance fee payment is sent in any other form, the Office may delay or cancel the credit until collection is made. For example, a personal or other uncertified check drawn on a United States bank which is not immediately negotiable, e.g., because of lack of signature or insufficient funds, will not constitute payment of a maintenance fee. However, a personal check drawn on a United States bank can be used if it is immediately negotiable. Any remittance from foreign countries must be payable and immediately negotiable in the United States for the full amount of the maintenance fee required.

Paragraph (b) of new § 1.366 also provides that maintenance fees may be paid by an authorization to charge a deposit account established pursuant to § 1.25. The authorization to charge the deposit account must be submitted within the periods set forth in § 1.362 and must be limited to maintenance fees payable on the date of submission. The authorization to charge the deposit account can not, under paragraph (b), be submitted prior to the third, seventh, or eleventh year after the grant of the patent. If an authorization to charge a deposit account were submitted to pay the maintenance fee due at three years and six months after grant, a new authorization to charge a deposit account or other form of payment will have to be submitted at the appropriate time for each of the maintenance fees due at 7 years and six months and 11 years and six months. Paragraph (b) also specifies that any payment or authorization filed at any time other than that set forth in § 1.362(d), (e) or (f) will not serve as a payment of the maintenance fee, except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner pursuant to § 1.378. Paragraph (b) also specifies that a payment of less than the required amount, a payment in a manner other than that set forth in § 1.23, or the filing of an authorization to charge a deposit account having insufficient funds, will not constitute payment of a maintenance fee on a patent. The authorization is required to authorize the immediate charging of the fee to the deposit account. An authorization would be improper if it only authorized the fee to be charged at a later date, e.g., on the last possible day of payment without surcharge. Such an authorization would not serve as payment of the maintenance fee. Any payment which fails to result in the entire proper amount of the maintenance fee being present on the due date will not constitute payment of the maintenance fee. Paragraph (b) also specifies that the certificate of mailing procedures of § 1.8 or the mailing by "Express Mail" provisions of § 1.10 may be utilized in paying maintenance fees. The specific requirements of either § 1.8 or § 1.10 must be fully complied with if either is used.

Paragraph (c) of new § 1.366 establishes the data necessary

and desired when submitting maintenance fee payments and any necessary surcharges. New paragraph (c) specifies that maintenance fee payments and any necessary surcharges must include at least the 1) patent number and 2) United States application serial number. Paragraph (c) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity since the identifying information must also be supplied when submitting surcharges. The wording of § 1.366(c) has also been changed from the proposal to clarify that the required application serial number is that of the application upon which the patent issued. This change from the proposal makes clear that the serial number required to be submitted is not that of a prior parent application but rather, the actual application which matured into the patent for which maintenance fees are to be paid. If the maintenance fee is being paid on a reissue patent, the serial number required is that of the reissue application. Since this required information will be used as a cross-check to ensure that the maintenance fee is properly credited, the application serial number must correspond to the patent which issued therefrom. If less than the required information is submitted, the Office will not credit the payment. Additionally, if notice is required that the proper identifying data has not been submitted, it would result in requiring the payment of a surcharge if the necessary data is submitted after the "window period" closes. If the required information is not submitted until after the end of the grace period, the patent would have expired because of the failure to properly identify the patent to which the maintenance fee payment is to be credited prior to the expiration of the grace period. The patentee in such a circumstance could proceed under § 1.378, if appropriate, or could file a petition under § 1.377 within the period set therein seeking to have the maintenance fee accepted as timely even though all of the proper identifying data was not present prior to the expiration of the grace period.

Paragraph (d) of new § 1.366 specifies that the following information should also be submitted for each patent on which a maintenance fee or surcharge is paid: 1) whether it is the 3 1/2, 7 1/2, or 11 1/2 year fee, 2) whether small entity status is being changed or claimed with the payment, 3) the amount of the maintenance fee and any surcharge being submitted, 4) any assigned payor number, 5) patent issue date and 6) United States application filing date. Paragraph (d) has been modified from the proposal to explicitly refer to "any necessary surcharges" for clarity. Paragraph (d) has also been changed from the proposal to emphasize that when the payment is being made on a reissue patent the required patent number and application serial number are those of the reissue patent and reissue application. Where the payment is a maintenance fee and any necessary surcharge on a reissue patent, in addition to the information requested for all payments, paragraph (d) as adopted herein also requests certain identifying data relating to the original patent, i.e., original patent number, original patent issue date, and original United States application filing date. The reason for requesting the original patent number, original patent issue date, and original United States application filing date is that the origina filing and issue dates are the dates which control if and when maintenance fees must be paid to prevent the reissue patent from expiring. The reference to a payor number has been added. A payor number will be assigned to each "fee address" in order to facilitate data input and subsequent changes in the location of the "fee address." Details of the "payor number" system will be announced to the public in a future *Official Gazette* notice. Although the submission of the information requested in paragraph (d) is not mandatory, it would expedite the processing of the maintenance fee payments.

The final rule thus requires less mandatory information, i.e., the patent number and U.S. application serial number, than would have been required by the proposed rule. The required information is considered to be the least that is required to make a cross-check and thus assure that the maintenance fee is being credited to the proper patent. The patent issue date and the application filing date, which were included in the proposed rule as mandatory information, are included in the final rule as desirable, but not mandatory, information The effect of this change is that an error in either the patent issue date or the application filing date, or both, by the person paying the maintenance fee would not result in a refusal to accept the maintenance fee and to credit the payment thereof to the patent, if the patent number and United States application serial number were correct, i.e., in agreement. However, if any error included either the patent number or the United States application serial number such that they were not in agreement the payment would not be accepted and credited until correction was made. The date of the correction would be the date the maintenance fee payment is credited as being made.

Paragraph (e) of new § 1.366 specifies that maintenance fee payments and any surcharges relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in § 1.23 or by an authorization to charge a deposit account. Maintenance fee payments and surcharge payments relating thereto which are co-mingled with payments for other fees or charges, e.g., application filing fees, issue fees, petition fees, document supply fees, etc., will not be accepted. The maintenance fees require processing by a separate area of the Office and are not processed in the same manner as other fees and charges. Maintenance fees for a number of patents can be submitted together in one submission and one payment. Paragraph (e) specifies that if maintenance fee payments for more than one patent are submitted together, they should be submitted on as few sheets as possible, listing the patent numbers in increasing patent number order. If the payment submitted, which can be made as a single payment, is insufficient to cover the maintenance fees and any surcharges for all the listed patents, the payment will be applied in the order the patents are listed. In such a circumstance where the fees are insufficient, the maintenance fee and any surcharge for one or more of the last listed patents will not be paid.

Paragraph (f) of new § 1.366 serves as a reminder to patentees of the necessity to check for the loss of small entity status prior to paying each maintenance fee on a patent. This is already a requirement of § 1.28(b). Paragraph (f) provides that notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. If status as a small entity has been previously established by filing a statement and such status is checked and is found to be proper, no notification is required. It is not necessary to file new verified statements claiming small entity status at this point if the status as a small entity has been established and is still proper even if rights have been transferred to a small entity who has not previously filed a verified statement. The requirement is to notify the Patent and Trademark Office of the loss of entitlement and to pay the maintenance fee in the proper amount for other than a small entity where appropriate. The refund provisions of § 1.28(a) for later submitted small entity statements will apply to maintenance fees.

Paragraph (g) of new § 1.366 provides that maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§ 1.26 and 1.28(a). A patentee cannot obtain a refund of a maintenance fee which was due and payable on the patent. Any duplicate payment will be refunded to the fee address.

New § 1.377 is added as proposed to provide a mechanism for review of a decision refusing to accept and record payment of a maintenance fee filed prior to the expiration of a patent. Paragraph (a) of new § 1.377 specifies that a patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee. This petition may be used, for example, in situations where an error is present in the identifying data required by § 1.366(c) with the maintenance fee payment, i.e., either the patent number or the application serial number are incorrect. A petition under § 1.377 would not be appropriate where there is a complete failure to include at least one correct mandatory identifier as required by § 1.366(c) for the patent since no evidence would be present as to the patent on which the maintenance fee was intended to be paid. If the maintenance fee payment with an incorrect mandatory identifier was made near the end of the grace period, the patent might expire since the Office would not credit the fee to a patent. For patents based on applications filed between Dec. 12, 1980 and Aug. 27, 1982, there is no provision for acceptance of a maintenance fee after the grace period such as in § 1.378 and so the filing of a petition under § 1.377 would provide an avenue for seeking relief. A petition under § 1.377 would not be appropriate where the patentee paid a maintenance fee on one

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patent when the patentee intended to pay the maintenance fee on a different patent but through error identified the wrong patent by patent number and application serial number. Likewise, a petition under § 1.377 would not be appropriate where the entire maintenance fee payment, including any necessary surcharge, was not filed prior to expiration of the patent.

Paragraph (b) of new § 1.377 specifies that any petition under new § 1.377 must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of. The petition must be accompanied by the petition fee of $120 provided for in the amendment to § 1.17(h). Paragraph (b) also provides that the petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to have resulted from an error by the Patent and Trademark Office.

Paragraph (c) of new § 1.377 specifies that any petition filed under the section must comply with the requirements of paragraph (b) of § 1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. A person or organization whose only responsibility insofar as the patent is concerned is the payment of a maintenance fee is not a party in interest for purposes of paragraph (c) of § 1.377. The petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. If the petition is signed by a person not registered to practice before the Patent and Trademark Office, the petition must include the authority of the person signing the petition as patentee, assignee, or other party in interest.

New § 1.378 is added as proposed to establish the procedure for acceptance of the delayed payment of a maintenance fee in an expired patent in order to reinstate that patent. This procedure is only available under Public Law 97-247 where the application on which the patent is based was filed on or after Aug. 27, 1982. If the maintenance fee is due under Public Law 96-517, i.e., the application on which the patent is based was filed on or after Dec. 12, 1980, and before Aug. 27, 1982, the delayed payment of the maintenance fee is not provided for by statute and cannot be accepted after expiration of the patent, and the patent cannot be reinstated.

Paragraph (a) of new § 1.378 provides that the Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after Aug. 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable. The surcharge set forth in § 1.20(m) must be paid as a condition of accepting payment of the maintenance fee. No separate petition fee is required for this petition. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the intervening rights provisions of 35 U.S.C. 41(c) (2).

Paragraph (b) of new § 1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed within six months of the expiration of the patent. Under paragraph (b), the petition must include the required maintenance fee set forth in § 1.20(h)-(j); the surcharge set forth in § 1.20(m); and a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee. In view of the requirement to enumerate the steps taken to ensure timely payment of the maintenance fee, an argument that the patentee was ignorant of the requirement to pay maintenance fees will not constitute a showing of unavoidable delay. Evidence that despite reasonable care on behalf of the patentee and/or the patentee's agents, and reasonable steps to ensure timely payment, the maintenance fee was unavoidably not paid, could be submitted in support of an argument that the delay in payment was unavoidable. For example, an error in a docketing system could possibly result in a finding that a delay in payment was unavoidable if it were shown that reasonable care was exercised in designing and operating the system and if it were shown that the patentee took reasonable steps to ensure that the patent was entered into the system to ensure timely payment of the maintenance fees.

Paragraph (c) of new § 1.378 specifies the requirements of a petition for acceptance of the delayed payment of a maintenance fee filed more than six months after the expiration of a patent. These requirements are much more stringent in view of the heavy burden of proof that the delay was unavoidable. The legislative history of Public Law 97-247, House Report No. 97-542 (Committee on the Judiciary), indicates that "[a]fter the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable." The six month period provided for petition under paragraph (b) is considered to be a reasonable period of time within which to seek reinstatement of a patent which expired for failure to pay the maintenance fee. Any petition filed more than six months after expiration must meet the more stringent requirements of paragraph (c). Under paragraph (c), the petition must include the same elements as in paragraph (b) and, in addition, must demonstrate that the failure to pay the maintenance fee was unavoidable due to circumstances outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing in a petition under paragraph (c) must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more than six months after expiration of the patent was unavoidable. In contrast to a petition under paragraph (b), a showing in a petition under paragraph (c) of an error in a docketing system will not be sufficient to find that the delay was unavoidable. Instead, a petition filed under paragraph (c) must demonstrate that the circumstances resulting in the delay were entirely outside the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee, e.g., serious efforts without success to raise the funds required to pay the maintenance fee.

Paragraph (d) of new § 1.378 requires that a petition filed under § 1.378 be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. A person or organization whose only responsibility insofar as the patent is concerned is the payment of a maintenance fee is not a party in interest for purposes of paragraph (d) of § 1.378. Under paragraph (d), the petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office. If the petition is signed by a person not registered to practice before the Patent and Trademark Office, the petition must include the authority of the person signing the petition as patentee, assignee, or other party in interest.

Paragraph (e) of new § 1.378 provides a mechanism for obtaining reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a). This mechanism is a petition for reconsideration which may be filed within two months of, or such other time as set in the decision refusing to accept the delayed payment of the maintenance fee. In contrast to petitions filed under paragraph (a), the petition for reconsideration filed under paragraph (e) of new § 1.378 will require the separate petition fee set forth in the amendment to § 1.17(h). Paragraph (e) also provides that after the decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. Paragraph (e) also provides for refund of the maintenance fee and the surcharge set forth in § 1.20(m) if the delayed payment of the maintenance fee is not accepted. The refund will be made following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. Paragraph (e) specifies that the fee for filing the petition for reconsideration will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Eight letters submitting written comments were received. Oral testimony was presented by two persons (one person testified on behalf of the American Intellectual Property Law Association) at the public hearing conducted on June 26, 1984. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

One comment suggested that the surcharge set at 37 CFR 1.20(m) for accepting a maintenance fee after expiration of the patent should be reduced from $500.00 to $50.00 and that this amount should be reduced by 50 percent for small entities.

Reply:

The suggestion has not been adopted. The surcharge set at 37 CFR 1.20(m) is considered to be appropriate in view of the importance of the relief being obtained. Before a surcharge under 37 CFR 1.20(m) is due the patent will have already expired due to the failure to pay a maintenance fee within a one-year period provided for the payment. Setting a lower amount as the surcharge would tend to denigrate the importance of the relief obtained by the acceptance of a maintenance fee after expiration of a patent. Further, a lower surcharge amount is not justified in view of the ample opportunity for payment of the maintenance fee which is presented by the one-year period in which payment can be made and the fact that the public is now on notice that maintenance fees are due and payable. Further, the Patent and Trademark Office will provide courtesy notices regarding the need to pay maintenance fees at a plurality of points in time before the patent expires. Such a notice now appears on the patent grant and presently plans are to print such a courtesy notice on the Notice of Allowance and the Issue Fee Receipt. Notices will be printed in the *Official Gazette* listing the patent number ranges of patents on which maintenance fees can be paid and a notice will be mailed to the patentee during the grace period if the maintenance fee is not paid. Therefore, relatively few patentees should fail to pay the maintenance fee before expiration of the patent due to unavoidable circumstances. The surcharge set at 37 CFR 1.20(m) is established pursuant to 35 U.S.C. 41(c) and therefore the small entity provisions of Public Law 97-247 do not apply to this fee. Also, Public Law 97-247 provides that the surcharge set at 37 CFR 1.20(m) could be in addition to any surcharge established for payment of the maintenance fee during the grace period as set at 37 CFR 1.20(1). The Patent and Trademark Office has established a separate surcharge set at 37 CFR 1.20(m) not in addition to the surcharge set at 37 CFR 1.20(1), but in lieu thereof. The amount set at 37 CFR 1.20(m) is not seen to be excessive.

Comment:

Two comments suggested that the small entity reduced fee provisions of Public Law 97-247 should have been applied to maintenance fees required under Public Law 96-517.

Reply:

The maintenance fee amounts under Public Law 96-517 set at 37 CFR 1.20(e)-(g) were previously set and are not part of the present rulemaking. It should be noted, however, that Public Law 96-517 did not provide for reduction of fees for small entities. Reductions of fees for small entities were established in Public Law 97-247 only for fees under 35 U.S.C. 41(a) and (b) thereof. The maintenance fee levels in 37 CFR 1.20(e)-(g), however, were established under 35 U.S.C. 41(c) of Public Law 96-517 rather than 35 U.S.C. 41(a) or (b) of Public Law 97-247. Therefore, the fee amounts previously set at 37 CFR 1.20(e)-(g) are not seen to be subject to reduction for small entities.

Comment:

One comment suggested that the Office permit any of the maintenance fees to be paid in advance, either at the time of paying the issue fee or during any of the window periods. Another comment suggested that the Office should accept a fee payment earlier than the window period if the fee has no possibility of being changed due to changes in the Consumer Price Index.

Reply:

These suggestions have not been adopted. The second comment listed above points out the problem with regard to the suggestion in the first comment. Public Law 97-247 provided for adjustments of the maintenance fees every third year to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Allowing maintenance fees to be paid in advance would preclude such adjustments to these maintenance fees unless very burdensome administrative steps were implemented to require adjustments in the fee amount previously paid when the maintenance fees are adjusted at a later time. Requiring maintenance fees to be paid in a consistently time-ordered basis as in § 1.362 will also be helpful administratively and for budgeting purposes. As to the second comment above, it is not seen that there would be substantial benefit to the public since the period would be short during which a maintenance fee could not change due to changes in the Consumer Price Index. Thus, the patentee would only be able to make the maintenance fee payment a short time before the period during which payment may be made pursuant to § 1.362.

Comment:

Two comments suggested that a maintenance fee payment made during the window period should not require adjustment if the maintenance fees are thereafter increased toreflect increases in the Consumer Price Index.

Reply:

These comments have been adopted by an appropriate change in paragraph (b) of § 1.366. Maintenance fees which are paid during the window period in the amount required on the date of payment will be accepted as proper and full payment. If the maintenance fees change after such a proper payment, no adjustment in the amount will be required or permitted. Thus, if the maintenance fee increases before the close of the window period, the patentee will not be required to make up any deficiency between the amount properly paid during the window period and the new increased fee. Likewise, if the maintenance fee decreases before the close of the window period, no refund will be permitted of part of the maintenance fee properly paid in the amount due when the payment was made. Payments must be made in the amount proper on the date of payment. For example, if payment is made during the grace period, the payment must be made in the amount then required irrespective of the amount of the maintenance fee which would have been due if payment had been made during the window period.

Comment:

Three comments were directed to the proposed requirements in § 1.366(c) for data identifying the patent upon which maintenance fee payments are being made. One comment indicated that many computer annuity systems now existing have a data base designed to accept only two identifying numbers. This comment and one other comment suggested that the patent number and issue date be required to be submitted with the maintenance fee to identify the patent number. Another comment suggested that the required identifying data be the patent number, issue date, name of the inventor and title of the invention.

Reply:

The suggested changes to the proposed rule have been adopted in part. The requirement for identifying data to uniquely identify the patent for which maintenance fees are being paid is an important one. The Patent and Trademark Office and the public must be able to determine with certainty which patents are in force and which patents have expired because the maintenance fees were not paid. The comments seem to recognize that at least two identifiers are necessary so that a cross-check can be made to avoid errors. The suggested use of the issue date with the patent number would not provide a reliable cross-check. In excess of one thousand patents usually issue on each issue date. Therefore a mistake in the last four digits in the patent number supplied with the maintenance fee payment would often not be detected by use of the issue date as a cross-check. The Patent and Trademark Office has determined that the two best identifying data units for use as a cross-check are the patent number and the application serial number. These identifiers are unique since each is specific to one patent or application and are thus required to be provided with a maintenance fee payment by the final rule. The application serial number and the patent number are both listed on the issued patent and in the *Official Gazette* and therefore should be readily available to patentees.

Comment:

One comment suggested that no petition fee should be charged for filing a petition under 37 CFR 1.377 seeking review of a decision refusing to accept and record payment of a maintenance fee filed prior to expiration of a patent. The comment further suggested that, if a fee is charged, the filing of a petition thereunder should be presumed to be a request for a return of the petition fee if it is determined that the refusal to accept and record a maintenance fee payment was due to Patent and Trademark Office error.

Reply:

The suggestion that no petition fee be charged has not been adopted. The petition fee, although required in advance, will be retained by the Patent and Trademark Office only in those instances where the refusal to accept and record the fee resulted

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from an error on the part of someone other than the Patent and Trademark Office. In those instances where the refusal to accept and record the fee resulted from a Patent and Trademark Office error the Office intends to refund the petition fee, either based upon the request included in the petition or upon the initiative of the Office. The reason for including a request for a refund, where appropriate, in the petition is to ensure that such request is not inadvertently overlooked. In view of the expense involved, it would be inappropriate to process a petition without a petition fee where the error necessitating the petition was made by the petitioner or someone acting on behalf of the patentee.

Comment:

One comment suggested that the term "unavoidable" should be more specifically defined in 37 CFR 1.378(b) (3) and (c) (3), if possible.

Reply:

As stated in this rulemaking, the requirement that the delay in payment of the maintenance fee be "unavoidable" is the same as that for reviving an abandoned application under 35 U.S.C. 133. This standard has been in effect for many years and should be well understood by the public. The rule is seen to be adequate as written, especially in view of the discussion in this rulemaking which includes several specific examples based on when the petition to accept the delayed payment of a maintenance fee is filed.

Comment:

One comment suggested that Public Law 97-247 should be "liberally interpreted" to permit acceptance of delayed payments of maintenance fees required under Public Law 96-517. Proposed 37 CFR 1.378 was limited to patents issuing on applications filed on or after Aug. 27, 1982, the effective date of Public Law 97-247.

Reply:

The final rule has not been changed from the proposal. The remedy suggested by the comment cannot be provided in view of the language of 35 U.S.C. 41(c) (1) which applies only to maintenance fees required by 35 U.S.C. 41(b) of Public Law 97-247. Section 17(a) of Public Law 97-247 clearly states "the maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act."

Comment:

Several of the comments received were directed to proposed statutory changes which were said to be desirable in the area of maintenance fees.

Reply:

These comments were not suggesting that the proposed rules were not in compliance with the present statutes, but rather that the statutes themselves should be changed. These comments are beyond the scope and purpose of this rule change.

Implementation of Maintenance Fee Payment Procedures

The Patent and Trademark Office is presently developing its internal working procedures for processing maintenance fee payments and for notifying the public as to the status of maintenance feepayments on particular patents. The first maintenance fees become due early in 1985. In order to be as helpful as possible in informing the public as to the Patent and Trademark Office's current plans it is useful to outline the basic procedures the Patent and Trademark Office intends to adopt to process maintenance fees so that the interrelationship with the rules is understood. These basic procedures are subject to change as experience and circumstances dictate.

Notices by the Patent and Trademark Office

Under the statutes, the Patent and Trademark Office has no duty to notify patentees when their maintenance fees are due. It is the responsibility of the patentee to assure that the maintenance fees are paid to prevent expiration of the patent. The Patent and Trademark Office will, however, provide some notices as reminders that maintenance fees are due, but the notices, errors in the notices, or the lack of notices, will in no way relieve a patentee from the responsibility to make timely payment of each maintenance fee to prevent the patent from expiring by operation of law. The notices provided by the Patent and Trademark Office will be merely courtesy in nature and intended to aid patentees. These notices, errors in these notices, or the lack of notices, will in no way shift the burden of monitoring thetime for paying maintenance fees on patents from the patentee to the Patent and Trademark Office.

Preprinted Standard Notice Wording

The patent grant currently includes a reminder that maintenance fees may be due. The Notice of Allowance and Issue Fee Receipt are presently planned to be revised to contain reminder notice wording that maintenance fees may be due.

Official Gazette Notice

A notice will appear in each issue of the *Official Gazette* which will indicate which patents have been granted 3, 7 and 11 years earlier, that the window period has opened and that maintenance fee payments will now be accepted for these patents.

Another *Official Gazette* notice published after expiration of the grace period will indicate any patent which has expired due to non-payment of maintenance fees and any patents which have been revived under 35 U.S.C. 41(c). An annual compilation of such expirations and revivals will also be published.

Courtesy Reminder Notice

Since patentees are expected to maintain their own record systems and since most patentees are expected to pay their maintenance fees during the "window period" to prevent payment of a surcharge, the Office will not send any reminder notices to patentees at the fee address until after the grace period has begun. This will reduce and simplify the mailing of notices but still give patentees an opportunity to pay their maintenance fees with surcharge during the grace period before expiration of their patents. Such notices will be mailed to the fee address as set forth in § 1.363.

Action Notices

The Office will issue a receipt for payment of maintenance fees after entry of the maintenance fee payment. Such a receipt will provide an opportunity for the patentee to check if the Office has properly credited the payment. The original document submitted by the patentee when paying the maintenance fee will also be appropriately marked and returned to the fee address. If actual experience indicates that they are not needed, the receipt notices and/or the return of the original document may be discontinued.

The patentee will also be notified by mail at the fee address as set forth in § 1.363 of any expiration or revival of the patent.

Fee Address

The patentee may provide the Patent and Trademark Office with a fee address under § 1.363, which address may be different from the correspondence address under § 1.33, when submitting the issue fee or in a separate later-filed paper. The fee address will be used by the Office for all correspondence directed to the patentee concerning maintenance fees. If no separate fee address is provided by the patentee under § 1.363, the correspondence address under § 1.33 will also be used for maintenance fee purposes.

Payment of Maintenance Fees

Transmittals of maintenance fees may be limited to a single patent or may involve several patents. If a transmittal involves several patents they should be listed in increasing numerical order. The following format is suggested for use when paying maintenance fees and any necessary surcharges. Although only the mandatory identification elements consisting of the patent number and United States application serial number, set forth in § 1.366(c) are required, the items referred to in § 1.366(d) should also be included to expedite processing of maintenance fees and any necessary surcharges. In addition,

February 22, 1987

Commissioner of Patents and Trademarks
Box M. Fee
Washington, D.C. 20231

Dear Sir:

Enclosed is a check drawn for the amount of $1,500 for the payment of the maintenance fees on the following patents.

Patent Number	Serial Number	Patent Date	Application FilingDate	Payment Year	Small Entity	Amount Paid	Surcharge	Fee Code
P.P.5,188	380,062	Feb. 7, 1984	May 20, 1981	4	...	$200.00	...	170
Re.31,522	481,494	Feb. 14, 1984	April 1, 1983	4	...	$200.00	$100.00	170/176
*(4,374,741	...	(Feb. 22, 1983)	(July 21, 1981)	...	...	...	...	...
4,429,419	339,620	Feb. 7, 1984	Jan. 15, 1982	4	...	$200.00	...	170
4,429,433	412,101	Feb. 7, 1984	Aug. 27, 1982	4	No	$400.00	...	173
4,429,439	458,474	Feb. 7, 1984	Jan. 17, 1983	4	Yes	$200.00	...	273
**4,432,000	380,681	Feb. 14, 1984	Aug. 26, 1981	4	...	$200.00	...	170
				Subtotals		$1,400.00	$100.00	
				Total Amount Paid		$1,500.00		

The Commissioner is hereby authorized to charge any deficiency in the required fee or to credit any overpayment to Account No. 12-3456.

Respectfully submitted,

John Doe
(703) 557-3054

*Note: Information from original patent is included in parenthesis for the reissue patent for which payment is being made.

**Note: Application filing Date is the PCT International Filing Date.

The indication of the fee code used by the Patent and Trademark Office would assist in proper financial crediting within the Office. It is also suggested that the telephone number of the person submitting the payment be supplied.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 it seq.

The General Counsel of the Deparatment of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). Public Law 97-247 has taken into consideration the impact it may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less that $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The maintenance fee payment information collection requirement contained in the final rules has been submitted to OMB for review under Section 3504(h) of the Paperwork Reduction Act. Comments relating to this requirement should be directed to the Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for Commerce, Patent and Trademark Office.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 96-517 and Pub. L. 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

Part 1 [Amended]

37 CFR, Part 1, is amended as follows:

1. Section 1.1 is amended by adding a new paragraph (d) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(d) Payments of maintenance fees in patents and other communications relating thereto should be additionally marked "Box M. Fee."

§ 1.9 [Amended]

2. Paragraph (d) of § 1.9 is amended by changing the citation "13 CFR 121.3-18, published on Sept. 30, 1982 at 47 FR 43273." to "13 CFR 121.12." and by changing the words " § 121.3-18 Definition of small business for paying reduced patent fees under Title 35, U.S. Code" to "§ 121.12 Small business for paying reduced patent fees."

3. Section 1.17 is amended by adding to the end of paragraph (h) the following:

§ 1.17 Patent application processing fees.

* * * * *

(h) * * *

- § 1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent

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- § 1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent

4. Section 1.19 is amended by adding new paragraphs (f) and (g) to read as follows:

§ 1.19 Document supply fees.

* * * * *

(f) Microfiche copy of patent file record.....$10.00
(g) Uncertified statement as to status of the payment of maintenance fees due on a patent or expiration of a patent $3.00

5. Section 1.20 is amended by adding new paragraphs (k), (l), and (m) to read as follows:

§ 1.20 Post-issuance fees.

* * * * *

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 .....$100.00

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§ 1.9(f)).....$50.00
By other than a small entity $100.00

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $500.00

6. Section 1.33 is amended by adding a new paragraph (d) to read as follows:

§ 1.33 Correspondence respecting patent applications, reexamination proceedings, and other proceedings.

* * * * *

(d) A "correspondence address" or change thereto may be filed with the Patent and Trademark Office during the enforceable life of the patent. The "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified. See § 1.363 for "fee address" used solely for maintenance fee purposes.

7. A new center heading and § 1.362 is added to Subpart B to read as follows:

Maintenance Fees

§ 1.362 Time for payment of maintenance fees.

(a) Maintenance fees as set forth in § 1.20(e)-(j) are required to be paid in all patents based on applications filed on or after Dec. 12, 1980, except as noted in paragraph (b) of this section, to maintain a patent in force beyond 4, 8 and 12 years after the date of grant.

(b) Maintenance fees are not required for plant patents based on applications filed on or after Aug. 27, 1982 or for any design patents. Maintenance fees are not required for a reissue patent if the patent being reissued did not require maintenance fees.

(c) The application filing dates for purposes of payment of maintenance fees are as follows:

(1) For an application not claiming benefit of an earlier application, the actual United States filing date of the application.

(2) For an application claiming benefit of an earlier foreign application under 35 U.S.C. 119, the United States filing date of the application.

(3) For a continuing (continuation, division, continuation-in-part) application claiming the benefit of a prior patent application under 35 U.S.C. 120, the actual United States filing date of the continuing application.

(4) For a reissue application, the United States filing date of the original non-reissue application on which the patent reissued is based.

(5) For an international application which has entered the United States as a Designated Office under 35 U.S.C. 371, the international filing date granted under Article 11(1) of the Patent Cooperation Treary which is considered to be the United States filing date under 35 U.S.C. 363.

(d) Maintenance fees may be paid in patents without surcharge during the periods extending respectively from:

(1) 3 years through 3 years and 6 months after grant for the first maintenance fee.

(2) 7 years through 7 years and 6 months after grant for the second maintenance fee, and

(3) 11 years through 11 years and 6 months after grant for the third maintenance fee.

(e) Maintenance fees may be paid with the surcharge set forth in § 1.20(k) or (l) during the respective grace periods after:

(1) 3 years and 6 months and through the day of the 4th anniversary of the grant for the first maintenance fee,

(2) 7 years and 6 months and through the day of the 8th anniversary of the grant for the second maintenance fee, and

(3) 11 years and 6 months and through the day of the 12th anniversary of the grant for the third maintenance fee.

(f) If the last day for paying a maintenance fee without surcharge set forth in paragraph (d) of this section, or the last day for paying a maintenance fee with surcharge set forth in paragraph (e) of this section, falls on a Saturday, Sunday, or a federal holiday within the District of Columbia, the maintenance fee and any necessary surcharge may be paid under paragraph (d) or paragraph (e) respectively on the next succeeding day which is not a Saturday, Sunday, or federal holiday.

(g) Unless the maintenance fee and any applicable surcharge is paid within the time periods set forth in paragraphs (d), (e) or (f) of this section, the patent will expire as of the end of the grace period set forth in paragraph (e) of this section. A patent which expires for the failure to pay the maintenance fee will expire at the end of the same date (anniversary date) the patent was granted in the 4th, 8th, or 12th year after grant.

8. A new § 1.363 is added to Subpart B to read as follows:

§ 1.363 Fee address for maintenance fee purposes.

(a) All notices, receipts, refunds, and other communications relating to payment or refund of maintenance fees will be directed to the correspondence address used during prosecution of the application as indicated in § 1.33(a) unless:

(1) a "fee address" for purposes of payment of maintenance fees is set forth when submitting the issue fee, or

(2) a change in the correspondence address for all purposes is filed after payment of the issue fee, or

(3) a "fee address" or a change in the "fee address" is filed for purposes of receiving notices, receipts and other correspondence relating to the payment of maintenance fees after the payment of the issue fee, in which instance, the latest such address will be used.

(b) An assignment of a patent application or patent does not result in a change of the "correspondence address" or "fee address" for maintenance fee purposes.

9. A new § 1.366 is added to Subpart B to read as follows:

§ 1.366 Submission of maintenance fees.

(a) The patentee may pay maintenance fees and any necessary surcharges, or any person or organization may pay

maintenance fees and any necessary surcharges on behalf of a patentee. Authorization by the patentee need not be filed in the Patent and Trademark Office to pay maintenance fees and any necessary surcharges on behalf on the patentee.

(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362(d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in § 1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate of mailing procedures of either § 1.8 or § 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

(c) In submitting maintenance fees and any necessary surcharges, identification of the patents for which maintenance fees are being paid must include the following:

(1) the patent number, and

(2) the serial number of the United States application for the patent on which the maintenance fee is being paid.

(d) Payments of maintenance fees and any surcharges should identify the fee being paid for each patent as to whether it is the 3 1/2, 7 1/2 or 11 1/2 year fee, whether small entity status is being changed or claimed, the amount of the maintenance fee and any surcharge being paid, any assigned payor number, the patent issue date and the United States application filing date. If the maintenance fee and any necessary surcharge is being paid on a reissue patent, the payment must identify the reissue patent by reissue patent number and reissue application serial number as required by paragraph (c) of this section and should also include the original patent number, the original patent issue date and the original United States application filing date.

(e) Maintenance fee payments and surcharge payments relating thereto must be submitted separate from any other payments for fees or charges, whether submitted in the manner set forth in § 1.23 or by an authorization to charge a deposit account. If maintenance fee and surcharge payments for more than one patent are submitted together, they should be submitted on as few sheets as possible with the patent numbers listed in increasing patent number order. If the payment submitted is insufficient to cover the maintenance fees and surcharges for all the listed patents, the payment will be applied in the order the patents are listed, beginning at the top of the listing.

(f) Notification of any change in status resulting in loss of entitlement to small entity status must be filed in a patent prior to paying, or at the time of paying, the earliest maintenance fee due after the date on which status as a small entity is no longer appropriate. See § 1.28(b).

(g) Maintenance fees and surcharges relating thereto will not be refunded except in accordance with §§ 1.26 and 1.28(a).

10. A new § 1.377 is added to Subpart B to read as follows:

§ 1.377 Review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.

(a) Any patentee who is dissatisfied with the refusal of the Patent and Trademark Office to accept and record a maintenance fee which was filed prior to the expiration of the patent may petition the Commissioner to accept and record the maintenance fee.

(b) Any petition under this section must be filed within 2 months of the action complained of, or within such other time as may be set in the action complained of, and must be accompanied by the fee set forth in § 1.17(h). The petition may include a request that the petition fee be refunded if the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

(c) Any petition filed under this section must comply with the requirements of paragraph (b) of § 1.181 and must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

11. A new § 1.378 is added to Subpart B to read as follows:

§ 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent based on application filed on or after Aug. 27, 1982.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent based on an application filed on or after Aug. 27, 1982, after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by § 1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

(b) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section within six months of the expiration of the patent must include:

(1) the required maintenance fee set forth in § 1.20(h)-(j);

(2) the surcharge set forth in § 1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee.

(c) Any petition to accept the delayed payment of a maintenance fee filed under paragraph (a) of this section more that six months after the expiration of the patent must include:

(1) the required maintenance fee set forth in § 1.20(h)-(j);

(2) the surcharge set forth in § 1.20(m); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely and the failure to timely pay the maintenance fee was due entirely to circumstances outside of the control of the patentee. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee and the circumstances which were outside of the control of the patentee and those acting on behalf of the patentee in paying the maintenance fee. The showing must be sufficient in scope and content to meet the heavy burden of proof required to show that a delay in payment of the maintenance fee of more that six months after expiration of the patent was unavoidable.

(d) Any petition under this section must be signed by an attorney or agent registered to practice before the Patent and Trademark Office, or by the patentee, the assignee, or other party in interest. Such petition must be in the form of a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

(e) Reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a) of this section may be obtained by filing a petition for reconsideration within two months of, or such other time as set in, the decision refusing to accept the delayed payment of the maintenance fee. Any such petition for reconsideration must be accompanied by the petition fee set forth in § 1.17(h). After decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. If the delayed payment of the maintenance fee is not accepted, the maintenance fee and the surcharge set forth in § 1.20(m) will be refunded following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. The fee set forth in § 1.17(h) for filing the petition for reconsideration will not be refunded unless the refusal to accept and

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record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

July 30,1984 — GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[1046 O.G. 28]

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(60) **MAINTENANCE FEE PAYMENTS**

The Patent and Trademark Office (PTO) has received inquiries concerning the PTO'S refusal to accept payment of a maintenance fee in two fact situations.

A. The PTO has refused to accept authorization to charge a maintenance fee and/or surcharge to a Deposit Account unless the paper containing the authorization to charge was timely filed and included an authorizing signature. Upon reconsideration, this requirement for a signature to authorize a maintenance fee and/or surcharge to be charged to a Deposit Account is abolished since papers concerning maintenance fees are not considered to be papers filed in the application under 37 CFR 1.33(a).

Request for refunds due to the above-noted change in practice should be directed to the Refund Section of the Accounting Division of the Office of Finance.

B. The PTO has refused to accept the maintenance fee and surcharge specified in a Maintenance Fee Reminder mailed prior to April 17, 1989, but paid on or after April, 17, 1989. New fees effective April 17, 1989, raised the amount due for maintenance fees and surcharges. However, Maintenance Fee Reminders mailed prior to that date reflected the old fees. Some patentees have submitted the amount requested on the Maintenance Fee Reminder only to have the PTO refuse to accept those fees due as being insufficient. Often, the PTO notice that the amount tendered is insufficient is received after the expiration date of the patent under 37 CFR 1.362(g).

The amount of the maintenance fee required by statute is based upon the date of effective receipt in the PTO. The amount of the surcharge needed for payment during the six month grace period is set by regulation. The PTO will accept the payment submitted under the following conditions:

(1) the total amount submitted for the maintenance fee and surcharge was at least the amount of the maintenance fee required by statute based upon the date of receipt in the PTO and was the total amount requested in the Maintenance Fee Reminder for the patent;

(2) the amount submitted was paid prior to expiration of the patent under 37 CFR 1.362(g);

(3) the insufficiency in payment of the maintenance fee and surcharge is discovered after expiration of the patent under 37 CFR 1.362(g); and

(4) a petition under 37 CFR 1.183 is promptly filed after discovery of the insufficiency in payment of the maintenance fee and surcharge. The petition must request (a) that the amount previously paid be accepted as the maintenance fee required by statute; (b) that the amount submitted above that required for the maintenance fee be accepted as the surcharge; (c) that the holding of expiration be withdrawn; and (d) that no petition fee be required. The petition must state the date the insufficiency in payment of the maintenance fee and surcharge was discovered. The petition must also include a statement that the person who authorized or instructed that the maintenance fee and surcharge be paid was not aware of the fee increase. Such statement must be verified if made by a person not registered to practice before the PTO.

Petition under 37 CFR 1.183 should be directed to the Office of the Deputy Assistant Commissioner for Patents.

October 4, 1989 — DONALD J. QUIGG, *Assistant Secretary and Commissioner of Patents and Trademarks*

1107 OG 78

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(61) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 50725-5025]

Revision of Patent Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark office is amending the rules of practice in patent cases, Part I of title 37, Code of Federal Regulations to adjust fee amounts. This action is necessary at this time because operating costs have increased over the past three years and the Commissioner is authorized by § 41(f) of title 35, United States Code, to adjust fees established in § 41(a) and § 41(b) of title 35, United States Code, on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index. Fees for other processing, services or materials related to patents as provided by § 41(d) and § 376 of title 35, United States Code, are being adjusted to recover the estimated average cost to the Office of such processing, services or materials.
Effective Date: Oct. 5, 1985.
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to adjust patent fees because costs have increased and the Commissioner is authorized to (1) adjust statutory patent fees set forth in § 41(a) and § 41(b) of title 35, United States Code, to reflect fluctuations occurring during the previous three years in the Consumer Price Index (CPI), as authorized by § 41(f) of title 35, United States Code, (2) adjust fees for processing, services, or materials related to patents which have been established by the Commissioner in accordance with § 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing, services or materials, and (3) adjust fees for filing and processing an application under the Patent Cooperation Treaty which have been established by the Commissioner to recover the estimated average cost of such processing in accordance with Section 376 of title 35, United States Code.

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

A notice of proposed rulemaking was published in the *Federal Register* on June 21, 1985, at 50 FR 25896-25902. Corrections of typographical errors were published on July 1, 1985, at 50 FR 27030, and on July 15, 1985, at 50 FR 28596. The notice also was published in the *Official Gazette* on July 2, 1985, at Vol. 1056, pages 6 through 25. An oral hearing was held on July 18, 1985. Fifteen written letters and statements were submitted. One person testified at the oral hearing. Full consideration has been given to all of these letters, statements, and testimony.

Background Information: Patent and Trademark Office fees are authorized by sections 41 and 376 of title 35, United States Code. Section 41(a) of title 35, United States Code, establishes a number of statutory fees. Among the more significant of these are fees for filing a patent application and issuing a patent. Certain other fees, such as appeal fees, the fee for filing a disclaimer, fees for filing petitions seeking to revive an abandoned application and for extensions of time also are set in § 41(a) of title 35, United States Code. Section 41(b) of title 35, United States Code, sets forth the statutory fees for maintaining a patent in force if the application was filed on or after Aug. 27, 1982.

The provisions of Public Law 96-517 also authorize maintenance fees for applications other than design and plant patent applications filed on or after Dec. 12, 1980 and before Aug. 27, 1982. These maintenance fees are to recover 25 percent of the estimated cost to the Office of processing patent applications.

Section 1 of Public Law 97-247 authorized the reduction by 50 percent in the fees paid under § 41(a) and § 41(b) of title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established. This authorization will expire on Sept. 30, 1985. Legislation has been introduced to authorize this reduction for an additional three years. If such authority is not continued, the small entity reduction will be rescinded and appropriate amendments to the regulations will be made.

Section 41(f) of title 35, United States Code, provides that fees established in § 41(b) of title 35, United States Code, "may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor." Section 41(f) also provides that changes of less than one percent may be ignored.

Policy for applying the Consumer Price Index: The Department of Labor's Consumer Price Index (CPI) is made public approximately twenty-one days after the end of the month being calculated. The time lag between the initiation and the completion of the rulemaking process dictated that the Mar. through Sept. 1985 inflation rate be projected in the original rulemaking proposal. This estimate resulted in a cumulative three-year CPI of 11.7 percent applied to patent fees.

Based upon actual data through June 1985 and projecting the CPI to Sept. 30, 1985, the Administration's revised projected cumulative CPI for the three-year (1982-1985) period is 11.8 percent. The Patent and Trademark Office has used the 11.8 percent projection in adjusting the fees established in § 41(a) and § 41(b) of title 35, United States Code. The revised CPI projection has not caused a change from the proposal in any of the § 41(a) and § 41(b) fees.

After application of the 11.8 percent projected fluctuation in the CPI to fees set forth in § 41(a) and § 41(b), amounts for all non-small entity fees were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees below $100 were rounded to the nearest even number so that all comparable small entity fees would be in whole numbers. Section 41(d) of title 35, United States Code, provides that the "Commissioner will establish fees for all other processing, services, or materials related to patents" which are not covered in § 41(a) and § 41(b) of title 35, United States Code, "to recover the estimated average cost to the Office of such processing, services or materials."

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty. The fees under the Patent Cooperation Treaty are keyed to full cost recovery of the processing costs under the Treaty.

The general guidelines used by the Patent and Trademark Office in determining the non-statutory fees are set forth in OMB Circular A-25. Costs were determined from the best available records and included direct and indirect costs to the Office of carrying out the activity.

Since these non-statutory fees are expected to remain in place for the three year fee cycle 1986-1988, the calculated costs were then adjusted by a mid-cycle inflation rate of 6.21 percent derived from the Administration's inflation projection. After application of the projected mid-cycle inflation rate, amounts were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

The fees established under § 41(d) and § 376 of title 35, United States Code have been modified from the proposal. For the first fee cycle (1983-1985), fees established under § 41(d) and § 376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on Oct. 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986-1988), the PTO had proposed to set fees established under § 41(d) and § 376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish § 41(d) and § 376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or workload, and (3) greater reliance upon and use of the individual fee costs developed by the PTO's Office of Finance.

It is intended that the amount of any fee due and payable on or after Oct. 5, 1985 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under § 1.8 of title 37, Code of Federal Regulations, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under § 1.8" is *not* "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 of title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper". Such items include, *inter alia*, the filing of national and international applications for patents and the filing of trademark applications. The provisions of § 1.10 of title 37, Code of Federal Regulations relating to filing of papers and fees by "Express Mail" with certificate, however, do apply to *any paper or fee* (including patent and trademark applications) to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of mailing dated on or after Oct. 5, 1985, the amount of the fee to be paid is the fee established herein if a change is being made in the fee.

It is further intended that the amount due and payable for services provided in Fiscal Year 1986 will be the amount set in this rulemaking even if the fee becomes due prior to Oct. 5, 1985. Such fees include, but are not limited to, the annual service charge for subscription services (§ 1.19(c)(1) and the annual rental for a delivery box (§ 1.21(d)).

In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below:

DISCUSSION OF SPECIFIC RULES

Section 1.16 National application filing fees

Section 1.16 is amended to adjust patent application filing fees established in § 41(a) of title 35, United States Code and set forth in paragraphs (a)-(d) and (f)-(j) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.16, paragragh (e) is amended to adjust the patent application surcharge fee authorized by § 111 of title 35, United States Code. Paragraph (e) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.17 Patent application processing fees

Section 1.17 is amended to adjust patent application processing fees established in § 41(a) of title 35, United States Code, and set forth in paragraphs (a)-(g), (l) and (m) of this section to reflect fluctations in the Consumer Price Index. The wording of paragraph (l) has been broadened to include reference to applications abandoned under § 371(d) of title 35, United States Code.

Section 1.17, paragraphs (h)-(k) are amended to adjust the patent application processing fees authorized by § 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Paragraphs (h)-(k) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing petitions to the Commissioner, public use proceedings, and non-English language specifications.

Section 1.18 Patent issue fees

Section 1.18 is amended to adjust patent issue fees established in § 41(a) of title 35, United States Code and set forth in paragraphs (a)-(c) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.19 Document supply fees

Section 1.19 is amended to adjust the fees authorized by § 41(d) of title 35, United States Code for services and materials as set forth in paragraphs (a)-(c), (e) and (f) of this section to recover the estimated average cost to the Office of the specified services and materials. Paragraphs (a)-(c) have been modified from the proposal to more precisely recover the estimated

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average cost to the Office of supplying the documents specified in these paragraphs. Section 1.19 has been modified further to reduce the fees specified in paragraphs (e) and (f), which were not proposed for adjustment to more precisely recover the estimated average cost to the Office of supplying the documents.

Section 1.19, paragraph (a) is amended further to clarify the services and documents provided. It would provide for copies of specific documents at a flat fee. Copies of general Office records would be provided at a per page fee. Paragraph (a)(4) has been modified from the proposal to provide copies of a patent file wrapper and its contents at $75 for each 200 pages or a fraction thereof.

Section 1.19, paragraph (b) is amended further to delete subparagraph (3). A flat fee for comparing and certifying copies of documents made from Office records is provided in new paragraph (i) of this section.

Section 1.19, paragraph (c) is amended further to provide for ten subclasses with the annual service charge.

Section 1.19 is amended to provide in new paragraph (h) a $10 per document flat fee for an uncertified copy of a non-United States patent document. This fee would apply to copies of foreign patent applications such as those which are published at 18 months or when allowable for opposition.

Section 1.19 is amended to provide in new paragraph (i) a flat fee for comparison and certification of each copy of a document made from Office records but not prepared by the Office.

Section 1.19 is amended to provide in new paragraph (j) a fee for duplicate filing receipts and corrected filing receipts due to applicant error.

Paragraphs (i) and (j) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified.

Section 1.20 Post-issuance fees

Section 1.20, paragraphs (a)-(c) are amended to adjust patent post-issuance fees authorized by § 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Section 1.20 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the post-issuance fees set forth in paragraphs (b)-(c). Section 1.20 has been modified further to reduce the fee set forth in paragraph (a), which was not proposed for adjustment, to more precisely recover the estimated average cost to the Office of providing a certificate of correction.

Section 1.20, paragraphs (d) and (h)-(j), are amended to adjust patent post-issuance fees established in § 41(a) and § 41(b) of title 35, United States Code, to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraphs (e)-(g), are amended to adjust post-issuance fees authorized by Section 2 of Public Law 98-622. These fees must be set at a level to eventually recover 25 percent of the estimated cost to the Office of processing patent applications. In order to achieve this level of recovery, these maintenance fees are adjusted to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraph (k), is amended to adjust the patent maintenance surcharge fee authorized by Section 2 of Public Law 96-517. Paragraph (k) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.20, paragraph (l), is amended to adjust the post-issuance fee authorized by § 41(b) of title 35, United States Code. Paragraph (l) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.21 Miscellaneous fees and charges

Section 1.21 is amended to adjust the miscellaneous fees and charges authorized by § 41(d) of title 35, United States Code and set forth in paragraphs (a)-(f), (h) and (i) of this section to recover the estimated average cost to the Office of such processing. Section 1.21 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the miscellaneous services for which fees were set forth in paragraphs (a)(2)-(a)(6), (b)(1), (d)-(f), (h)(1) and (i). Section 1.21 has been modified further to reduce the fees specified in paragraphs (c) and (h)(2), which were not proposed for adjustment, to more precisely recover the estimated average cost to the Office of those services.

Section 1.21, paragraph (g), is modified from the proposal to change the term "copy machine tokens" to "CopiShare card."

Section 1.21, paragraph (k), is amended to change the word "section" to "part" to clarify that any charge not provided for in these rules would be made at actual cost.

Section 1.21 is amended to provide in new paragraph (m) a $20 fee for processing checks returned "unpaid" by a bank.

Section 1.24 Coupons

Section 1.24 is amended to adjust the fee for the purchase of coupons for patents to make it comparable to the fee required for the purchase of U.S. patents.

Section 1.24 is amended to delete reference to forty cent coupons which are no longer sold by the Patent and Trademark Office.

Section 1.25 Deposit accounts

Section 1.25 is amended to establish a restricted subscription deposit account to be used exclusively for subscription orders of patent copies as issued. A minimum deposit of $300 is required to establish and maintain, without payment of a monthly service fee, a restricted subscription deposit account.

Section 1.26 Refunds

Section 1.26 is amended to change paragraph (c) to provide for a refund of $1,300 if the Commissioner decides not to institute reexamination proceedings. The $1,300 refund would apply to those instances where the reexamination fee of $1,770 under § 1.20(c) was paid. The current $1,200 refund will be made in those cases where the current $1,500 reexamination fee was paid.

Section 1.53 Serial number, filing date, and completion of application.

Section 1.53 is amended to change paragraph (c) to reduce to $15 the handling fee charged in the event a specification or drawing is not submitted within the time period set by the Office. Section 1.53 has been modified to more precisely recover the estimated average cost to the Office of handling an application with missing parts.

Section 1.297 Publication of statutory invention registration

Section 1.297, paragraph (b), is amended to modify the statement to be printed on each statutory invention registration. The language of the statement is modified so as to be more easily understood.

Section 1.445 International application filing and processing fees

Section 1.445, paragraphs (a)(1)-(a)(4), are amended to adjust the fees authorized by § 376 of title 35, United States Code, for international application processing to recover the estimated average cost to the Office of such processing. The cost of the international search fee set forth in paragraph 1.445(a)(2)(i) has been reduced and the amount credited by the Office under paragraph 1.445(a)(2)(ii) is not changed. Paragraphs (a)(1) and (a)(3) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing international applications. However, the amount of the credit under 1.445(a)(4) is somewhat less than at present and is the same as in the proposed rules.

Section 1.445(a)(5) is amended to adjust the surcharge authorized by § 371(d) of title 35, United States Code. Paragraph (a)(5) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index and to provide for a small and large entity amount to be consistent with § 1.16(e).

Section 1.445(a)(6) is amended to adjust the processing fee for an English translation filed after 20 months from the priority date to recover the estimated average cost to the Office of such processing. Paragraph (a)(6) has been modified from the proposal to more precisely recover the estimated average cost to the Office of processing an English translation and to be consistent with § 1.17(k).

Section 1.446 Refund of international application filing and processing fees.

Section 1.446 is amended to delete paragraph (b). The substance of the deleted material is included in section 1.445, paragraph (a)(4).

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Fifteen letters submitting written comments and eight questions by telephone were received. Oral testimony was presented by one person at the public hearing conducted on July 18, 1985. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment:

PTO fees are already too high and burdensome to the patent community.

Reply:

There has been no indication that PTO fees are burdensome to the patent community. In 1984, we expected to receive 107,000 patent applications and actually received 109,539. In 1985, we are currently receiving applications at an annual rate of approximately 116,000.

The PTO is adjusting patent processing and patent service fees because costs have increased. The Commissioner may adjust patent statutory fees by changes which have occurred during the past three years in the Consumer Price Index (CPI). This authority is provided by 35 U.S.C. 41(f). The intent of the Congress in indexing the statutory patent fees set in 1982 to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation. Indexing of statutory patent fees was not intended to raise additional revenues beyond the rate of inflation.

The Commissioner also is authorized to adjust non-statutory patent fees to recover the estimated average cost to the Office of processing, services and materials. This authority is provided by 35 U.S.C. 41(d). As previously discussed, several of the proposed fees have been modified to more precisely recover the estimated average cost to the Office of processing, materials and services.

Comment:

PTO has failed to abide by the provisions of Public Law 96-517 and the accompanying report (House Report 96-1307). Specifically, the PTO has failed to abide by the 50 percent recovery limitation for patent processing fees and the restrictions on the use of fee income.

Reply:

Public Law 96-517, although enacted into law, was never fully implemented because the Congress passed H.R. 6260 which was enacted as Public Law 97-247 on Aug. 27, 1982. Public Law 97-247 provides for an eventual 100 percent cost recovery through processing and maintenance fees except for the subsidy for certain small entities, and contains no restrictions on the use of income from fee revenues.

This rulemaking adjusts, by the Consumer Price Index (CPI), the patent processing (41(a)) and patent maintenance (41(b)) fees established by Public Law 97-247. The CPI adjustment allows the programs supported by § 41(a) and (b) fees to keep pace with inflation. Any growth in the aggregate rate of recovery of fees versus costs in this second cycle of fees is due primarily to the first time collection of maintenance fee receipts.

The restrictions on the use of income from fee revenues, which were included in House Report 96-1307 accompanying Public Law 96-517, were based upon a 50 percent recovery of patent costs from user fees. Then-Commissioner Mossinghoff testified before the Subcommittee on Courts, Civil Liberties, and Administration of Justice, when Congress was considering H.R. 6260, that the Administration's PTO user fee program was proposed to improve the quality of service at the PTO by reducing patent pendency, trademark pendency and automating patent and trademark operations. The Commissioner went on to say that "The major increases in the three program areas will be paid for by the sharp increase in user fees that we are recommending." The Congressional debate on this proposal indicates that the Subcommittee approved these innovative fee provisions in order to improve the level of patent and trademark services provided to users of the Office.

Comment:

Fees should relate to the actual "costs of processing patent applications" and should not include "overhead" expenses.

Reply:

The fees applicable to patent filing, issuance and maintenance fees were established by the Congress and set forth in 35 U.S.C. § 41(a) and (b). Regardless if Congress included "overhead" expenses when setting these statutory patent fees, these fees may be adjusted only to reflect the fluctuations in the CPI every three years. Fees for other processing, services or materials related to patents are set by the Commissioner pursuant to 35 U.S.C. 41(d) to recover the Office's estimated average cost. The legislative history of Public Law 97-247, including the accompanying House Report, does not provide guidance regarding how "estimated average cost" was to be determined. These fees were determined under the general guidelines of OMB Circular A-25, entitled "User Charges," which established general policies for developing an equitable and uniform system of charges for certain government services and property. Circular A-25 provides that a reasonable charge should be imposed to recover the full cost to the Government of rendering a service to an identifiable recipient, who receives a substantial benefit not accruing to the general public, e.g., receiving a patent. The concept of full cost recovery includes an appropriate overhead charge. Therefore, the inclusion of overhead expenses in calculating the costs of processing patent applications is appropriate.

Comment:

The PTO does not include a description of any cost containment measure.

Reply:

The PTO has taken all possible measures to contain costs. During fiscal year 1985, a zero-based analysis was conducted of all programs and their associated funding. The purpose of the review was to assure that adequate resources were available to meet the PTO's most important priorities while addressing unanticipated costs such as, the full absorption of the fiscal year 1985 pay raise, new pay scale for patent examiners, higher postal and telephone rates, greater use of PTO services, etc. The PTO's annual budget request is thoroughly reviewed by the Department of Commerce, by the Office of Management and Budget, and by the Congressional Appropriations Committees prior to enactment. The PTO is complying with the President's Deficit Reduction Program. The fiscal year 1986 budget request reflects reductions to travel, printing and consultants as required by the Deficit Reduction Act of 1984; administrative cost savings; and grade reductions and pay cuts. The PTO program to reduce patent pendency, once achieved in 1987, will require less resources than are currently expended. The Automation program, too, as it achieves its major milestones, will deliver cost benefits.

Comment:

The PTO has proposed to adjust fees because costs have increased but they did not include an explanation of how costs were calculated.

Reply:

Patent statutory fees, which are set forth in 35 U.S.C. 41(a) and (b), can be adjusted on Oct. 1, 1985 and every three years thereafter to reflect fluctuations which have occurred in the Consumer Price Index (CPI). The costs of processing a patent application from receipt to issue or abandonment were calculated in 1982 at the time the present fees were set by statute. The most significant elements of processing a patent application are compensation costs, space and the costs incurred for printing the *Official Gazette* and patent grants.

As a result of these increases to the major costs incurred in the processing of a patent application, the PTO is adjusting the statutory 41(a) and (b) patent fees by the full CPI of 11.8 percent in order to recover the projected budgeted collections for patent processing for the years 1986-1988.

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Non-statutory patent and patent service fees are being set to recover the estimated average cost to the Office over the next three years (1986-1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A-25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property. The cost of all processing, services and/or materials associated with each non-statutory (§ 41(d)) patent fee was determined. Since these fees are expected to remain in place for three years (1986-1988), each cost was adjusted by a mid-cycle inflation rate of 6.21 percent which was derived from the Administration's 1986-1988 inflation projection.

Comment:

The PTO has proposed to set § 41(d) fees at a level which exceeds the estimated average cost to the Office. PTO's cost calculations do not support the proposed § 41(d) fees.

Reply:

Fees established pursuant to 35 U.S.C. 41(d) and 376, non-statutory patent and patent service fees, are being set to recover the estimated average cost to the Office over the next three years (1986-1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A-25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property.

The PTO employed cost-finding techniques for determining the costs of all processing, services and/or materials associated with each non-statutory patent fee. These costs were documented by the Director, Office of Finance and reviewed by each responsible Assistant Commissioner. Since the revised fees are expected to remain in place for the next three years (1986-1988), each cost was adjusted by the mid-cycle inflation rate of 6.21 percent. The fee was then set based upon this inflated cost.

For the first fee cycle (1983-1985), fees established under § 41(d) and § 376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on Oct. 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986-1988), the PTO had proposed to set fees established under § 41(d) and § 376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish § 41(d) and § 376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or in workload, and (3) greater reliance upon and use of the individual fee costs developed by PTO financial analysts.

In modifying the proposed fees, the PTO used the raw cost data derived for each fee, adjusted that amount by the projected mid-cycle inflation rate of 6.21 percent, and rounded the adjusted cost by applying standard arithmetical rules. Fees of $100 or more were rounded to the nearest $10. Fees between $99 and $2 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

Comment:

The increase inmaintenance fees appears to be driven by non-cost considerations. Since they have just begun to be collected, there could be no actual cost histories on which to base the adjustments.

Comment:

The increase in claim fees seem to be proposed without any seemingly real increase in cost specifically attributable to these items.

Reply:

Patent statutory fees such as claim and maintenance fees, which are set forth in 35 U.S.C. 41(a) and (b), may be adjusted every three years to reflect changes which have occurred in the Consumer Price Index (CPI) for the prior three years. The costs of processing, issuing and maintaining patents were calculated in 1982 at the time the present fees were set by statute. Patent maintenance fees as set forth in both Public Laws 96-517 and 97-247 are one of several sources of income available to the PTO to cover the costs of processing, issuing and maintaining a patent. The most significant elements of processing, issuing and maintaining patents are personnel compensation, benefits, space and printing costs. Since 1982, these costs have risen in an amount equal to and in some cases, in an amount exceeding, the CPI increase for the individual year.

As a result of these cost increases, the PTO is adjusting § 41(a) and § 41(b) patent fees and the Public Law 96-517 maintenance fees by the full CPI of 11.8 percent.

Comment:

PTO's proposed adjustments to § 41(a) and § 41(b) fees are higher than the 11.7 percent fluctuation in the Consumer Price Index because of the rounding principles PTO has applied.

Reply:

The intent of the Congress in indexing the statutory patent fees, 35 U.S.C. 41(a) and (b), to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation with regard to the fees set in 1982. Indexing of statutory patent fees was not intended to be a method of raising additional revenues, nor has the PTO used it for that purpose, but rather for administrative ease. Rounding will ease the administration of these fees by permitting the PTO and users to deal in increments of ten when the adjusted fee is $100 or greater or in even amounts when the fee is below $99. This will ease implementation of the 50 percent reduction in fees for small businesses, non-profit organizations and individuals. Moreover, any surpluses which may result are for the short-term only. By applying routine techniques, there should be a balancing out of shortfalls and surpluses in the long-run.

Comment:

The fee for a deferred declaration under 34 U.S.C. 111 should be changed so that such a fee would only be required if the declaration were filed later than three months from the actual filing date.

Reply:

The suggestion for permitting the declaration to be filed up to three months after the actual filing date without a surcharge has not been adopted. It would place administrative burdens on the Office since it would encourage the late filing of oaths or declaration.

Comment:

There appears to be no justification for the significant increase to the surchage fees.

Reply:

In proposing adjustments to penalty surcharge fees, the PTO considered the costs incurred in providing special handling to certain cases, and proposed to set the fee at a level that would recover costs and preclude unnecessary resort to pertinent procedures but not so high as to be burdensome where resort to these procedures is necessary. In response to several comments received on the proposed surcharge fees, the proposal has been modified to limit the adjustments to surcharge fees set forth in § 1.16(e), § 1.20(k), § 1.20(l) and § 1.445 (a)(5) to changes which have occurred during the past three years in the Consumer Price Index.

Comment:

Patent Cooperation Treaty (PCT) fee increases far exceed the 11.7 percent average increase applied to national applications. This increase could seriously affect use of PCT system.

Reply:

The PCT fees set under 35 U.S.C. 376 are based on cost recovery and are not adjusted by the Consumer Price Index. The fees under § 1.445 are set to reflect estimated average processing costs. A reduction was made in the amount of the international search fee if performed by the U.S. Patent and Trademark Office. While the credit for a prior U.S. search is unchanged and other PCT fees are increased, the overall adjustment level of PCT fees is generally in line with the CPI.

Comment:

The small entity reduction should be adopted for the PCT surcharge.

Reply:

The final rule has been modified from the proposal to provide for small and large entity amounts in § 1.445(a)(5). This is to correspond to a similar fee in § 1.16(e).

Comment:

The proposed fees for a copy of a patent file wrapper and its contents (1.19(a)(4)) are unfair at the breakpoint. It would be more equitable to charge $75 for each 200 pages or fraction thereof.

Reply:

In proposing a fee of $75 for up to 200 pages and $350 for 201 pages or more for a copy of a patent file wrapper and its contents, the PTO was attempting to move to a flat fee for this service. Since there were objections to the breakpoint, the final rule has been modified from the proposal to reflect a fee of $75 for each 200 pages or fraction thereof.

Comment:

The proposed increase in § 1.20(c) regarding requests for reexamination and the related decrease in § 1.26(c) relating to refunds where reexamination is not ordered, appeared to be set from a revenue generating standpoint rather than being cost-driven.

Reply:

While the comment does not suggest what the fees should be, it is noted that the two fees have to be considered together. The notice of proposed rulemaking set a fee of $1,800 for filing a request for reexamination, which was an increase from the previous fee of $1,500. This fee has been modified from the proposal and is now set at $1770. The refund where reexamination is denied was proposed to be raised from $1,200 to $1,300, which raises the refund from the amount previously refunded. The amount refunded has not changed from the proposal. The relative amounts of the initial fee and the refund are set to obtain the necessary recovery of costs from reexamination.

Comment:

A separate schedule of fees should be instituted for interference proceedings, but such fees should apply only to junior parties, since interferences are conducted primarily for their benefit.

Reply:

The rules already provide for certain fees relating to interference proceedings; see § 1.644(e) and (f), and § 1.666(b) and (c). In general, however, the PTO decided in 1982 that the costs of interference proceedings should be factored into the fees charged in connection with the processing and examination of patent applications, because (1) an interference is a proceeding instituted by the PTO, and (2) it would not be administratively feasible to attempt to provide a fee schedule to cover the myriad of different situations which may occur in the course of an interference. Since these reasons are still considered applicable, the suggestion has not been adopted.

Comment:

The proposed fee for admission to the examination (1.21(a)(1)) for registration to practice is too high for students who often sit for the exam and it is inappropriate because administering the exam is not a service to the public but a cost of operating the PTO.

Reply:

The fee for admission to the examination for registration to practice reflects the costs of conducting the examination twice a year nationwide. The significant increase is due to the fact that the fee had been understated in relation to cost during the 1983-1985 fee cycle. Fees established in this rulemaking will more precisely recover the estimated average cost to the Office of administering and grading the examination and are consistent with the cost recovery principles of OMB Circular A-25.

Comment:

The proposed fee for requesting a regrading of an examination (1.21(a)(6)) should be waived if the regrading request was necessitated by a PTO error.

Reply:

Any fee may be refunded if paid by mistake or paid in excess of that required. See 35 U.S.C. 42(d).

Comment:

The PTO should retain the present fee for admission to the examination to practice before the Office (1.21(a)(1)) and increase the fee payable upon registration to practice (1.21(a)(2)).

Reply:

This suggestion has not been adopted in this rulemaking. The fees for admission to the examination and for registration to practice have been set to recover the cost of those services.

Comment:

The proposed fee for reviewing a decision of the Director of Enrollment and Discipline (1.21(a)(5)) appears to be low in view of the significant amount of time and effort involved in a review.

Reply:

The fee for this service, as modified, recovers the estimated average cost to the Office of providing the service.

Comment:

The fees for processing an application filed with a specification in a non-English language (1.17(k)) and for filing an English translation of an international application later than 20 months after the priority date (1.445(a)(6)) appear to be in excess of cost.

Reply:

The final rules have been modified from the proposed to provide for a fee of $26, the cost of processing applications filed with non-English language specifications in both domestic and international cases.

Comment:

An extension of time to Aug. 16, 1985 for the submission of comments was requested.

Reply:

The PTO is required by 35 U.S.C. 41(g) to publish a notice of fee increases in the *Federal Register* at least 60 days prior to the effective date of the fee increase. In order to have the proposed fee increases become effective near the start of the fiscal year, the extension of time could not be granted.

Comment:

Why were there no proposals to adjust trademark fees?

Reply:

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

Comment:

Do we plan to verify the inflation rate before publication of the final rules?

Reply:

The projected inflation rate has been verified. The Administration's latest projected annual cumulative Consumer Price Index for the three year period 1982-1985 is 11.8 percent. Application of this index to § 41(a) and § 41(b) fees results in no change from the proposal.

Other Considerations: The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Public Law 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to patent fee rules.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Public Law 96-354). The principal impact of the major patent fees has already been taken into account in Public Law 97-247, which provided small entities with a 50 percent reduction in the major patent fees. Although that legislation will expire on Sept. 30, 1985, legislation has been introduced to reauthorize the 50 percent reduction in patent fees for an additional three years. The rule change adjusts fees to reflect the change in the Consumer Price Index and cost of processing services as provided by statute (35 U.S.C. 41(d) and 41(f)).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41, 111, 157, 302, and 376 and Public Laws 96-517, 97-247 and 98-622, the Patent and Trademark Office is amending 37 CFR Part 1 as set forth below.

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is revised to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:

By a small entity (§ 1.9(f)) $170.00
By other than a small entity $340.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) $17.00
By other than a small entity $34.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20. (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):

By a small entity (§ 1.9(f)) $6.00
By other than a small entity $12.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) $55.00
By other than a small entity $110.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity (§ 1.9(f)) $55.00
By other than a small entity $110.00

(f) For filing each design application:

By a small entity (§ 1.9(f)) $70.00
By other than a small entity $140.00

(g) Basic fee for filing each plant application:

By a small entity (§ 1.9(f) $110.00
By other than a small entity $220.00

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) $170.00
By other than a small entity $340.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f)) $17.00
By other than a small entity $34.00

(j) In addition to the basic filing fee in a reissue application: for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent. (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee purposes):

By a small entity (§ 1.9(f)) $6.00
By other than a small entity $12.00
(Note, see § 1.445 for international application filing and processing fees).

(35 U.S.C. 6, 41, 111; Public Law 97-247)

3. Section 1.17 is amended by revising paragraphs (a)-(m) to read as follows:

§ 1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $28.00
By other than a small entity $56.00

(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $85.00
By other than a small entity $170.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $195.00
By other than a small entity $390.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.19(f)) $305.00
By other than a small entity $610.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity. $130.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f) $55.00
By other than a small entity. $110.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $140.00

§ 1.47...for filing by other than all the inventors or a person not the inventor.
§ 1.48...for correction of inventorship.
§ 1.182...for decision on questions not specifically provided for.
§ 1.183...to suspend the rules.
§ 1.295...for review of refusal to publish a statutory invention registration.
§ 1.377...for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.
§ 1.378(e)...for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.
§ 1.644(e)...for petition in an interference.
§ 1.644(f)...for request for reconsideration of a decision on petition in an interference.
§ 1.666(c)...for late filing of interference settlement agreement.
§ § 5.12, 5.13, & 5.14...for expedited handling of foreign filing license.
§ 5.15...for changing the scope of a license.
§ 5.25...for retroactive license.

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $72.00

§ 1.12...for access to an assignment record.
§ 1.14...for access to an application.
§ 1.55...for entry of late priority papers.
§ 1.102...to make application special.
§ 1.103...to suspend action in application.
§ 1.177...for divisional reissues to issue separately.
§ 1.312...for amendment after payment of issue fee.
§ 1.313...to withdraw an application from issue.
§ 1.314...to defer issuance of a patent.
§ 1.334...for patent to issue to assignee, assignment recorded late.
§ 1.666(b)...for access to interference settlement agreement.

(j) For filing a petition to institute a public use proceeding under § 1.292 ..... $860.00

(k) For processing an application filed with a specification in a non-English language (§ 1.52(d)) $26.00

(l) For filing a petition (1) for the revival of an unavoidably abandoned application under 35 U.S.C. 133, or 371 or (2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity (§ 1.9(f)) $28.00
By other than a small entity $56.00

(m) For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.19(f) $280.00
By other than a small entity $560.00

(35 U.S.C. 6, 41, 157, 376; Public Law 97-247)

4. Section 1.18 is revised to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) $280.00
By other than a small entity $560.00

(b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f)) $100.00
By other than a small entity $200.00

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) $140.00
By other than a small entity $280.00

(35 U.S.C. 6, 41, Public Law 97-247)

5. Section 1.19 is amended by revising paragraphs (a)-(c), (e) and (f), and by adding new paragraphs (a)(7), and (h)-(j) to read as follows:

§ 1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent or color statutory invention registration $1.50
(2) Printed copy of a plant patent or statutory invention registration in color $6.00
(3) Copy of patent application as filed $9.00
(4) Copy of patent file wrapper and contents, per 200 pages or a fraction thereof $75.00
(5) Copy of Office records, except as otherwise provided in this section, per page ..... $.50
(6) Microfiche copy of microfiche, per microfiche ..... $.50
(7) Copy of patent assignment record $1.50

(b) Certified copies of Office documents:

(1) For certifying Office records, per certificate $3.00
(2) For a search of assignment records, abstract of title and certification, per patent $12.00

(c) Subscription services:

(1)Subscription orders for printed copies of patents as issued, annual service charge for entry of order and ten sub classes $7.00
(2)For annual subscription to each additional subclass in addition to the ten covered by the fee under paragraph (c)(1) of this section, per subclass ..... $.70

* * * * *

(e) List of patents in subclass:

(1)For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof $1.00
(2)For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof $1.00

(f) Microfiche copy of patent file record $6.00

* * * * *

(h) Uncertified copy of a non-United States patent document, per document $10.00

(i) To compare and certify copies made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, per copy of document ..$5.00

(j) Additional filing receipts:

Duplicate $14.00
Corrected due to applicant error $14.00

(35 U.S.C. 6, 41, 157)

6. Section 1.20 is amended by revising paragraphs (a)-(l) to read as follows:

§ 1.20 Post-Issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§ 1.323) $29.00
(b) Petition for correction of inventorship in patent (§1.324) $140.00
(c) For filing a request for reexamination (§ 1.510(a)) $1,770.00
(d) For filing each statutory disclaimer

By a small entity (§ 1.9(f)) $28.00
By other than a small entity $56.00

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(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant $225.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years, the fee is due by seven years and six months after the original grant $445.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant $650.00

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) $225.00
By other than a small entity $450.00

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $445.00
By other than a small entity $890.00

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $670.00
By other than a small entity $1,340.00

(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 ..... $110.00

(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§ 1.9(f)) $55.00
By other than a small entity $110.00

* * * * *

(35 U.S.C. 6, 41, 302; Public Laws 96-517, 97-247, 98- 622)

7. Section 1.21 is amended by revising paragraphs (a)-(i) and (k), and adding a new paragraph (m) to read as follows:

§ 1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:

(1) For admission to examination for registration to practice, fee payable upon application $250.00
(2) On registration to practice. $81.00
(3) For reinstatement to practice $9.00
(4) For certificate of good standing as an attorney or agent $10.00
Suitable for framing. $88.00
(5) For review of a decision of the Director of Enrollment and Discipline § 10.2(c) $92.00
(6) For requesting regrading of an examination under §10.7(c) $92.00

(b) Deposit accounts:

(1) For establishing or reinstating a deposit account $8.00
(2) Service charge for each month when the balance at the end of the month is below $1,000. ..... $20.00
(3) Service charge for each month when the balance at the end of the month is below $300 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued. $20.00

(c) Disclosure document: For filing a disclosure document $6.00

(d) Delivery box: Local delivery box rental, per annum $43.00

(e) International-type search reports: For preparing an international-type search report of an international-type search made at the time of the first action on the merits in a national patent application $28.00

(f) Search of Office records: For searching Patent and Trademark Office records for purposes not otherwise specified, per one-half hour or fraction thereof $14.00

(g) CopiShare card: Cost per copy $0.20

(h) Recording of documents:

(1) For recording each assignment, agreement or other paper relating to the property in a patent or application $7.00
(2) Where a document to be recorded under paragraph (h)(1) of this section refers to more than one patent or application, for each additional patent or application $2.00

(i) Publication in *Official Gazette*: For publication in the *Official Gazette* of a notice of the availability of an application or a patent for licensing or sale, each application or patent. $7.00

* * * * *

(k) For items and services, that the Commissioner finds may be supplied, for which fees are not specified by statute or by this part, such charges as may be determined by the Commissioner with respect to each such item or service. ..... actual cost

* * * * *

(m) For processing each check returned "unpaid" by a bank $20.00

(35 U.S.C. 6, 41)

8. Section 1.24 is proposed to be revised to read as follows:

§ 1.24 Coupons.

Coupons in denominations of one dollar for the purchase of trademark registrations and one dollar and fifty cents for the purchase of patents, designs, defensive publications, and statutory invention registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50 and the one dollar and fifty cent coupons are sold individually and in books of 50 with stubs for record for $75. These coupons are good until used; they may be transferred but cannot be redeemed.

(35 U.S.C. 6)

9. Section 1.25, paragraph (a), is revised to read as follows:

§ 1.25 Deposit accounts.

(a) For the convenience of attorneys, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§ 1.21(b)(1)). A minimum deposit of $1,000 is required for paying any fees due or in ordering any services offered by the Office. However, a minimum deposit of $300 may be paid to establish a restricted subscription deposit account used exclusively for subscription order of patent copies as issued. At the end of each month, a deposit account statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. Charges to accounts with insufficient funds will not be accepted. A service charge § 1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1,000. For restricted subscription deposit accounts, a service charge (§ 1.21(b)(3)) will be assessed for each month that the balance at the end of the month is below $300.

* * * * *

(35 U.S.C. 6)

10. Section 1.26 is amended by revising paragraph (c) to read as follows:

§ 1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,300 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

(35 U.S.C. 6, 41)

11. Section 1.53 is amended by revising paragraph (c) to read as follows:

§ 1.53 Serial number, filing date, and completion of application.

* * * * * *

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period with which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $15.00 handling fee.

* * * * *

12. Section 1.297, paragraph (b), is revised to read as follows:

§ 1.297 Publication of statutory invention registration.

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(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

(35 U.S.C. 6, 157)

13. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing and processing fees.

* * * * *

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $170.00

(2)A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with fee has been filed $420.00
(ii) Corresponding prior United States national application with fee has been filed $250.00

(3)A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2), per additional invention $140.00

(4)The national fee, that is, the amount set forth as the filing fee under § 1.16(a) through (d) credited, if requested at the time of filing, by an amount of $170.00 where an international search fee as required by paragraph (a)(2)(i) of this section has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Only one such credit is permitted based on a single international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date:

By a small entity (§ 1.9(f)) $55.00
By other than a small entity $110.00

(6)For filing an English translation of an international application later than 20 months after the priority date (§ 1.61(b)) $26.00

* * * * *

(35 U.S.C. 6, 376)

14. Section 1.446 is amended by removing paragraph (b):

§1.446 Refund of international application filing and processing fees.

* * * * *

(b) [Reserved]

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(35 U.S.C. 6, 376)

July 31, 1985. DONALD J. QUIGG, *Acting Commissioner of Patents and Trademarks.*

[1057 OG 24]

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(62) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 10

Docket No. 80340-8188

Practice Before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Final rule; correction.
Summary: Oct. 4, 1988, final rules amending regulations regarding the representation of others before the Patent and Trademark Office were issued. (53 FR 38948, Oct. 4, 1988.) This notice makes a technical correction to § 10.101(b) to reflect that by reason of the amended regulations, §§ 10.10(c) and 10.10(d) currently address practice of Government employees before the Patent and Trademark Office in patent cases.
Effective Date: Feb. 13, 1989.
For Further Information Contact: Cameron Weiffenbach by telephone at [703] 557-2012 or by mail marked to his attention and addressed to Box OED, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:

List of Subjects in 37 CFR Part 10

Administrative practice and procedure.

PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500;15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

§10.101 [Amended]

2. Section 10.101(b) [Amended]

The reference in § 10.101(b) to "§ 10.6(d)" is revised to read "§§ 10.10(c) and 10.10(d)."

Feb. 2, 1989. DONALD J. QUIGG, *Assistant Secretary and Commissioner of Patents and Trademarks*

[1100 OG 7]

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(63) **DEPARTMENT OF COMMERCE**
BILLING CODE: 3510-16
Patent and Trademark Office

37 CFR Parts 1 and 2

[Docket No. 90363-9063]
RIN: 0651-AA40
Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office proposes to amend the rules of practice in patent and trademark cases, Parts 1 and 2 to Title 37, Code of Federal Regulations, to set forth charges that will be made to users of the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office plans to provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available) hereinafter referred to as APS-Text, and T-Search in its Patent Search Room and Trademark Search Library located in Crystal City, Virginia. The Office does not plan to provide on-line access to its patent and trademark data bases at any other facilities at the present time.

The Office will be making both search systems available to the public free of charge during this rulemaking process for the purposes of self-education and training (familiarization).

The paper or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations continue to be available to the public free of charge as provided by section 104(b) of Pub. L. 100-703.

The proposed rule changes are intended to establish a basis for the charges for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.
Dates: Written comments must be submitted on or before June 30, 1989; a public hearing will be held on June 30, 1989 at 9:00 a.m. Requests to present oral testimony should be received on or before June 29, 1989.
Addresses: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Frances Michalkewicz, Suite 912 on the 9th floor of Building 2, Crystal Park, located at 2121 Crystal Drive, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The purpose of the proposed rule change is to establish new fees for the on-line use of APS-Text, and T-Search that are to be provided in the Office's facilities in Crystal City, Virginia. This is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which is being published separately in this issue of the *Federal Register* as a final rule. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is provided for by section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees also are presented for information.
Background: In response to Public Law 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve their integrity and quality; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registrations have been converted to an electronic data base and textual and digital image data. A computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and to retrieve and display all information as a substitute for paper file searches. Trademark examiners have been using T-Search exclusively since January 1988, and the capability is ready to be deployed for public use in the Trademark Search Library.

The T-Search "dead data base," trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. The trademark examining attorneys do not search this data base. The Office is soliciting the public's comments as to whether this data base should be compared to the paper copy and corrected for use by public searchers at a cost projected to be about $250,000.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected on July 1, 1986 to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from single screen text terminals located throughout the Office. The APS-Text capability is ready for deployment to the public in the Patent Search Room.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tabular data and chemical and mathematical equations will have been added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained on APS-Text during January, 1988 and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches.

A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December, 1988. Preliminary review indicates that public users considered T-Search to be valuable both as a primary source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Public Law 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Public Law 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest. The proposed Office policy retains the flexibility authorized by the enabling legislation to waive fees in appropriate circumstances.

The information contained in the automated data bases, which will be available to the public at the location of the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through private vendors on-line for a fee. At the present time, it is considered to be in the public interest to waive the proposed fee in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term paper, or a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate would include an individual doing work for remuneration ...e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only where the terminals are available. It is not anticipated that fees will be waived for each individual except once or twice each year depending on the circumstances. The Commissioner reserves the right to control access to the data bases and deny a waiver to any individual.

In the course of developing criteria, consideration was given to charging reduced fees to an individual who could claim small entity status as defined in 35 U.S.C. $ 41(h). However, since it is anticipated that the majority of people that will be using the automated data bases would be members of law firms or commercial search services, this approach was obviously flawed.

As proposed, the waiver policy would apply only to use of the automated system, and not to any service that may also be available to conduct a search or to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual. The Office encourages both comments and suggestions on the waiver policy that realistically address the public interest and the need to meet existing fiscal responsibilities.
COST CALCULATIONS: The Office calculated unit costs for all fees based on OMB Circular A-25, "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. Proposed user charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS-Text to the public, the Office followed Congressional direction that fees be reasonable by reflecting the marginal cost for providing the new service and not including the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the eight (8) month period October 1989 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected that an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The Office also is proposing to provide some free training and access time during training on the automated search systems in accordance with § 104(C) of Public Law 100-703 which reads, "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

Cost of equipment included in the fee calculations for public access include network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs are included for a portion of license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The usage rate estimates are based on the three month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected to be trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During the three

month study period, use of the three terminals averaged approximately 50 per cent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempt to take into account such factors and assumptions as:

1. Future public users, on average, will use APS-Text less frequently than the 42 frequent users selected for the 1988 study, since the study group was weighted toward a small number of frequent public searchers, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) will reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes — the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a work day, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, will provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appears to be adequate for the forseeable future.

6. For purposes of actual use of available text terminals, the following estimates are used:

(a) In fiscal year 1990, up to ten terminals will be available during the first quarter. An estimate of 45 percent utilization of available text terminal time is projected. By increasing the number of text terminals to 15 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time is projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time is projected.

(b) During fiscal year 1991 and beyond, stable levels of usage should be achieved, yielding an estimated 35 per cent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, this anticipates a total of 286 search sessions per day.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Terminal Session Time
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$918,197
Hardware & Maintenance	$1,036,587
Software (license fees)	$300,357
Site Preparation	$38,118
Non-capital Furniture	$8,750
Supplies & Forms	$3,500
Sub-Total	$2,305,509
General & Adminstrative Overhead	$361,50
TOTAL COST	$2,667,013
Estimated Use (hours)	73,755
UNIT COST (per hour)	**$36.16**

The marginal cost for one hour of Office staff search assistance on APS-Text includes the costs of personnel compensation and benefits.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Office Staff Search Assistance
(September 1989-October 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	$45,65
TOTAL COST	$45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	**$25.71**

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, and supplies and forms. A summary is as follows:

APS-Text
Marginal Cost of
Each Printed Page
(October 1989-September 1992)

Cost Element	Public Shar (Marginal Cost)
Personnel: Compensation and Benefits	$173,47
Hardware & Maintenance	$13,843
Non-capital Furniture	$5,000
Supplies & Forms	$41,27
Sub-Total	$233,589
General & Administrative Overhead	$36,627
TOTAL COST	$270,216
Estimated Use (pages)	5,028,750
UNIT COST (per page)	**$0.054**

The marginal cost for one hour terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, general and administrative overhead, and maintentance on the T-Search terminals.

The usage rate for T-Search during fiscal years 1990-1992 is projected to be 28 percent. This rate is extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search and about 24 to 28 public users were active on T-Search each month. Overall usage rate of these active users was 14 percent. It is anticipated that the overall number of users and the usage rate will double once T-Search is made available in the Trademark Search Library to all public users of that search facility and training is provided on a routine basis.

A summary of the fee calculations are as follows:

T-Search
Marginal Cost of One-Hour of
Terminal Session Time
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$195,171
Hardware & Maintenance	$28,809
Site Preparation	$1,000
Supplies & Forms	$3,298
Sub-Total	$228,278
General & Administrative Overhead	$30,932
TOTAL COST	$259,210
Estimated Use (hours)	5,985
UNIT COST (per hour)	**$43.31**

The marginal cost for one hour of Office staff search assistance on T-Search includes the costs of personnel compensation and benefits.

A summary of the fee calculations is as follows:

T-Search
Marginal Cost of One-Hour of
Office Staff Search Assistance
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	$45,659
TOTAL COST	$45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	**$25.71**

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms. A summary of the costs is as follows:

T-Search
Marginal Cost of
Each Printed Page
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$27,862
Hardware & Maintenance	$5,274
Supplies & Forms	$3,579
Sub-Total	$36,715
General & Adminstrative Overhead	$4,975
TOTAL COST	$41,690
Estimated Use (pages)	448,875
UNIT COST (per page)	**$0.093**

Rounding Procedures: Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate.

The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

PROCEDURES FOR PUBLIC USE OF APS-TEXT AND T-SEARCH

Patent Search Room Configuration

Initially ten (10) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and administration activities. Fifteen (15) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

Trademark Search Library Configuration

Initially three (3) T-Search terminals with associated printers will be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space for control and administration activities. Additional terminals and printers will be added as demand warrants and space permits.

Procedures for public use of APS-Text and T-Search have been made as similar as possible in order to provide for consistency in application and ease of administration. Unless specifically stated to apply to only one system, procedures apply to both APS-Text and T-Search.

Training

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. Ten (10) members of the public may be trained during each class. Training is expected to be held in the Crystal City complex, probably during evening hours.

To enable prospective users to become effective on T-Search, four (4) hours of basic training is being offered. T-Search training is expected to be held in the Crystal City complex.

Enrollment in all training classes will be on a lottery basis. Public users wishing to be trained on APS-Text or T-Search, will be required to submit an application form by a specific deadline to allow the Office adequate time to select, schedule and notify attendees.

System Use and Fee Procedures

To ensure equity of public access to the automated systems, as well as efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules as with other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search Room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Eight (8) of the initial ten (10) terminals in the Patent Search Room and two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in both the Patent Search Room and the Trademark Search Library will be available for walk-up users and for assisted searches for infrequent users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches is subject to change based upon operational experience.

All public use of APS-Text and T-Search with the exception of scheduled training classes is on a pre-payment basis. In prepaying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalize payment.

Discussion of Specific Rules

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, if amended as proposed, would add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21, if amended as proposed, would add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21, if amended as proposed, would add new paragraph (q) to set the fee for a printed copy from APS-Text.

37 CFR 2.6 Trademark fees

Section 2.6, if amended as proposed, would add new paragraph (u) to set the fees for access to the automated trademark search system (T-Search) and provide for the waiver of fees under certain circumstances.

Section 2.6, if amended as proposed, would add new paragraph (v) to set the fees for T-Search search assistance by Office staff.

Section 2.6, if amended as proposed, would add new paragraph (w) to set the fee for a printed copy from T-Search.

Other Considerations:

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

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The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entitites (Regulatory Flexibility Act, Pub. L. 96-354). The proposed rules make the Office's on-line, automated patent full-text search and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Lists of Subjects in 37 CFR Parts 1 and 2

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the Office is proposing to amend Title 37 of the Code of Federal Regulations, Chapter I, as set forth below. All proposed additions are printed between arrows (© §) and all deletions are shown between brackets ([ ]).

PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is proposed to be amended by adding new paragraphs (o)-(q).

§ 1.21 Miscellaneous fees and charges.

* * * * *

© (o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest. $40.00

(p) Marginal cost, paid in advance, for each hour of Office staff search assistance to conduct a search using Automated Patent System full-text search capabilities (PTS-Text), prorated for the actual time used. $25.00

(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal . . . . . .$0.10§

PART 2-RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is proposed to be amended by adding new paragraphs (u)-(w).

§ 2.6 Trademark fees

* * * * *

© (u) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest. $40.00

(v) Marginal cost, paid in advance, for each hour of Office staff search assistance to conduct a search using T-Search capabilities, prorated for the actual time used $25.00

(w) Marginal cost, for each printed page generated from the T-Search terminal . . . . . .$0.10§

Mar. 7, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1102 OG 94]

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(64)

Public Law 96-517
96th Congress
An Act

To amend the patent and trademark laws.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 29 the following new chapter 30:

Dec.12, 1980

[H.R. 6933]
Patent and trademark laws, amendment.

"CHAPTER 30-PRIOR ART CITATIONS TO OFFICE AND REEXAMINATION OF PATENTS

"Sec.
"301. Citation of prior art.
"302. Request for reexamination.
"303. Determination of issue by Commissioner.
"304. Reexamination order by Commissioner.
"305. Conduct of reexamination proceedings.
"306. Appeal.
"307. Certificate of patentability, unpatentability, and claim cancellation.

"§301. Citation of prior art

35 USC 301.

Any person at any time may cite to the Office in writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written

request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

"§302. Request for reexamination

35 USC 302.

Fee

"Any person at any time may file a request for reexamination by the Office of any claim of a patent on the basis of any prior art cited under the provisions of section 301 of this title. The request must be in writing and must be accompanied by payment of a reexamination fee established by the Commissioner of Patents pursuant to the provisions of section 41 of this title. The request must set forth the pertinency and manner of applying cited prior art to every claim for which reexamination is requested. Unless the requesting person is the owner of the patent, the Commissioner promptly will send a copy of the request to the owner of record of the patent.

"§ 303. Determination of issue by Commissioner

35 USC 303.

Record.

Refund

"(a) Within three months following the filing of a request for reexamination under the provisions of section 302 of this title, the Commissioner will determine whether a substantial new question of patentability affecting any claim of the patent concerned is raised by the request, with or without consideration of other patents or printed publications. On his own initiative, and any time, the Commissioner may determine whether a substantial new question of patentability is raised by patents and publications discovered by him or cited under the provisions of section 301 of this title.

"(b) A record of the Commissioner's determination under subsection (a) of this section will be placed in the official file of the patent and a copy promptly will be given or mailed to the owner of record of the patent and to the person requesting reexamination, if any.

"(c) A determination by the Commissioner pursuant to subsection (a) of this section that no substantial new question of patentability has been raised will be final and nonappealable. Upon such a determination, the Commissioner may refund a portion of the reexamination fee required under section 302 of this title.

"§ 304. Reexamination order by Commissioner

35 USC 304.

Filing period

"If, in a determination made under the provisions of subsection 303(a) of this title, the Commissioner finds that a substantial new question of patentability affecting any claim of a patent is raised, the determination will include an order for reexamination of the patent for resolution of the question. The patent owner will be given a reasonable period, not less than two months from the date a copy of the determination is given or mailed to him, within which he may file a statement on such question, including any amendment to his patent and new claim or claims he may wish to propose, for consideration in the reexamination. If the patent owner files such a statement, he promptly will serve a copy of it on the person who has requested reexamination under the provisions of section 302 of this title. Within a period of two months from the date of service, that person may file and have considered in the reexamination a reply to any statement filed by the patent owner. That person promptly will serve on the patent owner a copy of any reply filed.

"§ 305. Conduct of reexamination proceedings

35 USC 305.

35 USC 132,133.

"After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Appeals, will be conducted with special dispatch within the Office.

"§ 306. Appeal

35 USC 306.

35 USC 134.
35 USC141-145.

"The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and may seek court review under the provisions of sections 141 to 145 of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

"§ 307. Certificate of patentability, unpatentability, and claim cancellation

35 USC 307.

"(a) In a reexamination proceeding under this chapter, when the time for appeal has expired or any appeal proceeding has terminated, the Commissioner will issue and publish a certificate canceling any claim of the patent finally determined to be unpatentable, confirming any claim of the patent determined to be patentable, and incorporating in the patent any proposed amended or new claim determined to be patentable.

"(b) Any proposed amended or new claim determined to be patentable and incorporated into a patent following a reexamination proceeding will have the same effect as that specified in section 252 of this title for reissued patents on the right of any person who made, purchased, or used anything patented by such proposed amended or new claim, or who made substantial preparation for the same, prior to issuance of a certificate under the provisions of subsection (a) of this section."

35 USC 252.

SEC. 2. Section 41 of title 35, United States Code, is amended to read as follows:

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"§ 41. Patent fees 35 USC 41.

"(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

"(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through dispostion by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

"(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

"(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50. 35 USC 13.

"(e) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge. Waiver. 35 USC 132.

"(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three years. Notice.

"(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register." Notice

SEC. 3. Section 42 of title 35, United States Code, is amended to read as follows:

"§ 42. Patent and Trademark Office funding 35 USC 42

"(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

"(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

"(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office.

"(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required." Refund.

SEC. 4. Section 154 of title 35, United States Code, is amended by deleting the word "issue".

SEC. 5. Section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended to read as follows:

"§ 31. Fees

"(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material. However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register. Notice.

"(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with any occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups." Waiver. Indian Products, exception.

SEC. 6. (a) Title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 37 the following new chapter 38:

"CHAPTER 38-PATENT RIGHTS IN INVENTIONS MADE WITH FEDERAL ASSISTANCE

"Sec.
"200. Policy and objective.
"201. Definitions.
"202. Disposition of rights
"203. March-in rights.
"204. Preference for United States industry.
"205. Confidentiality.
"206. Uniform clauses and regulations.
"207 Domestic and foreign protection of federally owned inventions.
"208. Regulations governing Federal licensing.
"209. Restrictions on licensing of federally owned inventions.
"210. Precedence of chapter.
"211. Relationship to antitrust laws.

"§ 200. Policy and objective. 35 USC 200

"It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supp
orted inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

"§ 201. Definitions 35 USC 201

"As used in this chapter—

"(a) The term `Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.

"(b) The term `funding agreement' means any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.

"(c) The term `contractor' means any person, small business firm, or nonprofit organization that is a party to a funding agreement.

"(d) The term `invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title.

"(e) The term `subject invention' means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.

"(f) The term `practical application' means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

"(g) The term `made' when used in relation to any invention means the conception or first actual reduction to practice of such invention.

"(h) The term `small business firm' means a small business concern as defined at section 2 of Public Law 85-536 (15 U.S.C 632) and implementing regulations of the Administrator of the Small Business Administration.

"(i) The term `nonprofit organization' means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

5 USC 202.

"§ 202. Disposition of rights

"(a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: Provided, however, That a funding agreement may provide otherwise (i) when the funding agreement is for the operation of Government-owned research or production facility, (ii) in exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter or (iii) when it is determined by a Government authority which is authorized by statute or Executive order to conduct foreign intelligence or counterintelligence activities that the restriction or elimination of the right to retain title to any subject invention is necessary to protect the security of such activities. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter. Funding agreement.

"(b)(1) Any determination under (ii) of paragraph (a) of this section shall be in writing and accompanied by a written statement of facts justifying the determination. A copy of each such determination and justification shall be sent to the Comptroller General of the United States within thirty days after the award of the applicable funding agreement. In the case of determinations applicable to funding agreements with small business firms copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration. Written determination. Copy to Comptroller General. Copy to SBA.

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"(2) If the Comptroller General believes that any pattern of determinations by a Federal agency is contrary to the policy and objectives of this chapter or that an agency's policies or practices are otherwise not in conformance with this chapter, the Comptroller General shall so advise the head of the agency. The head of the agency shall advise the Comptroller General in writing within one hundred and twenty days of what action, if any, the agency has taken or plans to take with respect to the matters raised by the Comptroller General.

Contrary agency determinations.

"(3) At least once each year, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

Report to congressional committies.

"(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

funding agreement requirements.

"(1) A requirement that the contractor disclose each subject invention to the Federal agency within a reasonable time after it is made and that the Federal Government may receive title to any subject invention not reported to it within such time.

"(2) A requirement that the contractor make an election to retain title to any subject invention within a reasonable time after disclosure and that the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such time.

"(3) A requirement that a contractor electing rights file patent applications within reasonable times and that the Federal Government may receive title to any subject inventions in the United States or other countries in which the contractor has not filed patent applications on the subject invention within such times

"(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

"(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: Provided, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

"(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

"(7) In the case of a nonprofit organization, (A) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions and which is not, itself, engaged in or does not hold a substantial interest in other organizations engaged in the manufacture or sale of products or the use of processes that might utilize the invention or be in competition with embodiments of the invention (provided that such assignee shall be subject to the same provisions as the contractor); (B) a prohibition against the granting of exclusive licenses under United States Patents or Patent Applications in a subject invention by the contractor to persons other than small business firms for a period in excess of the earlier of five years from first commercial sale or use of the invention or eight years from the date of the exclusive license excepting that time before regulatory agencies necessary to obtain premarket clearance unless, on a case-by-case basis, the Federal agency approves a longer exclusive license. If exclusive field of use licenses are granted, commercial sale or use in one field of use shall not be deemed commercial sale or use as to other fields of use, and a first commercial sale or use with respect to a product of the invention shall not be deemed to end the exclusive period to different subsequent products covered by the invention; (C) a requirement that the contractor share royalties with the inventor; and (D) a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education.

"(8) The requirements of sections 203 and 204 of this chapter.

"(d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.

Rights, retention.

"(e) In any case when a Federal employee is a coinventor of any invention made under a funding agreement with a nonprofit organization or small business firm, the Federal agency employing such coinventor is authorized to transfer or assign whatever rights it may acquire in the subject invention from its employee to the contractor subject to the conditions set forth in this chapter.

Rights, transfer or assignment.

"(f) (1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether the licensing may be required in connection with the practice of a subject invention, a specifically identified work object, or both. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this paragraph.

Third party licensing, prohibition.

"(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for an agency hearing. Any action commenced for judicial review of such determination shall be brought within sixty days after notification of such determination.

"§ 203. March-in rights

35 USC 203

"With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter, the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal agency determines that such—

"(a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

"(b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;

"(c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

"(d) action is necessary because the agreement required by section 204 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 204.

"§ 204. Preference for United States industry

35 USC 204

"Notwithstanding any other provision of this chapter, no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such small business firm or nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

Waiver

"§ 205. Confidentiality

35 USC 205

"Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

"§ 206. Uniform clauses and regulations

35 USC 206

"The Office of Federal Procurement Policy, after receiving recommendations of the Office of Science and Technology Policy, may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 204 of this chapter and the Office of Federal Procurement Policy shall establish standard funding agreement provisions required under this chapter.

"§ 207. Domestic and foreign protection of federally owned inventions

35 USC 207

"Each Federal agency is authorized to—

"(1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;

"(2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned patent applications, patents, or other forms of protection obtained, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 29 of this title as determined appropriate in the public interest;

35 USC 281 *et seq*

"(3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract; and

"(4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in any federally owned invention.

"§ 208. Regulations governing Federal licensing

35 USC 208

"The Administrator of General Services is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention, other than inventions owned by the Tennessee Valley Authority, may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

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"§ 209. Restrictions on licensing of federally owned inventions

35 USC 209.

"(a) No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development and/or marketing of the invention, except that any such plan may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

Development or marketing plan

"(b) A Federal agency shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

Manufacture in U. S.

"(c)(1) Each Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a federally owned domestic patent or patent application only if, after public notice and opportunity for filing written objections, it is determined that—

"(A) the interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

"(B) the desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention,

"(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

"(D) the proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public.

"(2) A Federal agency shall not grant such exclusive or partially exclusive license under paragraph (1) of this subsection if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

Anti trust factors.

"(3) First preference in the exclusive or partially exclusive licensing of federally owned inventions shall go to small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

Small business preference

"(d) After consideration of whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced, any Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a foreign patent application or patent, after public notice and opportunity for filing written objections, except that a Federal agency shall not grant such exclusive or partially exclusive license if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

Antitrust factors.

"(e) The Federal agency shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Record.

"(f) Any grant of a license shall contain such terms and conditions as the Federal agency determines appropriate for the protection of the interests of the Federal Government and the public, including provisions for the following:

Terms and conditions.

"(1) periodic reporting on the utilization or efforts at obtaining utilization that are being made by the licensee with particular reference to the plan submitted: Provided, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code;

"(2) the right of the Federal agency to terminate such license in whole or in part if it determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken or can be expected to take within a reasonable time, effective steps to achieve practical application of the invention;

"(3) the right of the Federal agency to terminate such license in whole or in part if the licensee is in breach of an agreement obtained pursuant to paragraph (b) of this section; and

"(4) the right of the Federal agency to terminate the license in whole or in part if the agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee.

"§ 210. Precedence of chapter

35 USC 210

"(a) This chapter shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organizations contractors in a manner that is inconsistent with this chapter, including but not necessarily limited to the following:

"(1) section 10(a) of the Act of June 29, 1935, as added by title I of the Act of Aug. 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);

"(2) section 205(a) of the Act of Aug. 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);

"(3) section 501(c) of the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 951(c); 83 Stat. 742);

91 Stat. 1320

"(4) section 106(c) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1395(c); 80 Stat. 721);

"(5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);

64 Stat. 154

"(6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);

68 Stat. 944

"(7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);

"(8) section 6 of the Coal Research Development Act of 196
0 (30 U.S.C. 666; 74 Stat. 337);

"(9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);

"(10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

"(11) subsection (e) of section 302 of the Appalachian Regional Development Act of 1965 (40 U.S.C. App. 302(e); 79 Stat. 5);

"(12) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901); 88 Stat. 1878);

88 Stat. 1887.
42 USC 5908.

"(13) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 86 Stat. 1211);

"(14) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);

"(15) section 8001(c)(3) of the Solid Waste Disposal Act (42 U.S.C. 6981(c); 90 Stat. 2829);

"(16) section 219 of the Foreign Assistance Act of 1961 (22 U.S.C. 2179; 83 Stat. 806);

"(17) section 427(b) of the Federal Mine Health and Safety Act of 1977 (30 U.S.C. 937(b); 86 Stat. 155);

"(18) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);

"(19) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);

"(20) section 6(b) of the Solar Photovoltaic Energy Research Development and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516);

7 USC 178j.

"(21) section 12 of the Native Latex Commercialization and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat. 2533); and

92 Stat. 1316.

"(22) section 408 of the Water Resources and Development Act of 1978 (42 U.S.C. 7879; 92 Stat. 1360).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

"(b) Nothing in this chapter is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

Rights, disposition.

"(c) Nothing in this chapter is intended to limit the authority of agencies to agree to the disposition of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued on Aug. 23, 1971 (36 Fed. Reg. 16887), agency regulations, or other applicable regulations or to otherwise limit the authority of agencies to allow such persons to retain ownership of inventions. Any disposition of rights in inventions made in accordance with the Statement or implementing regulations, including any disposition occurring before enactment of this section, are hereby authorized.

"(d) Nothing in this chapter shall be construed to require the disclosure of intelligence sources or methods or to otherwise affect the authority granted to the Director of Central Intelligence by statute or Executive order for the protection of intelligence sources or methods.

Disclosure.

"§ 211. Relationship to antitrust laws

35 USC 211.

"Nothing in this chapter shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law."

(b) The table of chapters for title 35, United States Code, is amended by adding immediately after the item relating to chapter 37 the following:

"38. Patent rights in inventions made with Federal assistance."

SEC. 7. AMENDMENTS TO OTHER ACTS.—The following Acts are amended as follows:

(a) Section 156 of the Atomic Energy Act of 1954 (42 U.S.C. 2186; 68 Stat. 947) is amended by deleting the words "held by the Commission or".

(b) The National Aeronautics and Space Act of 1958 is amended by repealing paragraph (g) of section 305 (42 U.S.C. 2457(g); 72 Stat. 436).

(c) The Federal Nonnuclear Energy Research and Development Act of 1974 is amended by repealing paragraphs (g), (h), and (i) of section 9 (42 U.S.C. 5908 (g), (h), and (i); 88 Stat. 1889-1891).

SEC. 8. (a) Sections 2, 4, and 5 of this Act will take effect upon enactment.

Effective dates.

(b) Section 1 of this Act will take effect on the first day of the seventh month beginning after its enactment and will apply to patents in force as of that date or issued thereafter.

35 USC 41 note.

(c) Section 3 of this Act will take effect on the first day of the first fiscal year beginning on or after one calendar year after enactment. However, until section 3 takes effect, the Commissioner may credit the Patent and Trademark Office appropriation account in the Treasury of the United States with the revenues from collected reexamination fees, which will be available to pay the costs to the Office of reexamination proceedings.

(d) Any fee in effect as of the date of enactment of this Act will remain in effect until a corresponding fee established under section 41 of title 35, United States Code, or section 1113 of title 15, United States Code, takes effect.

(e) Fees for maintaining a patent in force will not be applicable to patents applied for prior to the date of enactment of this Act.

(f) Sections 6 and 7 of this Act will take effect on the first day of the seventh month beginning after its enactment. Implementing regulations may be issued earlier.

(g) Sections 8 and 9 will take effect on the date of enactment of this Act.

SEC. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act, a plan to identify, and if necessary develop or have developed, computerized data and retrieval systems equivalent to the latest state of the art which can be ap-

Computerized data and retrieval system, report to Congress
35 USC 14 note.

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plied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system, and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future.

SEC. 10. (a) Section 101 of title 17 of the United States Code is amended to add at the end thereof the following new language:

"A `computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." "Computer program."

(b) Section 117 of title 17 of the United States Code is amended to read as follows:

"§ 117. Limitations on exclusive rights: Computer programs 17 USC 117.

"Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided: 17 USC 106

"(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

"(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

Approved Dec. 12, 1980.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 96-1307, Pt. 1 (Comm. on the Judiciary) and No. 96—1307, Pt. 2 (Comm. on Government Operations).
CONGRESSIONAL RECORD, Vol. 126 (1980):
Nov. 17, considered and passed House.
Nov. 20, considered and passed Senate, amended.
Nov. 21, House concurred in Senate amendment.

(65)

Public Law 97-247
97th Congress
An Act

To authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That there is authorized to be appropriated for the payment of salaries and necessary expenses of the Patent and Trademark Office to become available for fiscal year 1983, $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary as well as such additional or supplemental amounts as may be necessary, for increases in salary, pay, retirement, or other employee benefits authorized by law. Funds available under this section shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of title 35, United States Code, by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration. When so specified and the the extent provided in an appropriation Act, any amount appropriated pursuant to this section and, in addition, such fees as shall be collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), may remain available without fiscal year limitation. 15 USC 632

SEC. 2. Notwithstanding any other provision of law, there is authorized to be appropriated for the payment of salaries and expenses of the Patent and Trademark Office, $121,461,000 for the fiscal year ending September 30, 1982, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

SEC. 3. (a) Section 41(a) of title 35, United States Code, is amended to read as follows: Fees.

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. 35 USC 112.

"2. For issuing each original or reissue patent, except in design or plant cases, $500.

"3. In design and plant cases:

"a. On filing each design application, $125.

"b. On filing each plant application, $200.

"c. On issuing each design patent, $175.

"d. On issuing each plant patent, $250.

"4. On filing each application for the reissue of a patent, $300; in addition, on filing or on

presentation at any other time, $30. for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"5. On filing each disclaimer, $50.

"6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

"7. On filing each petition for the revival of an unintentionally abondoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50. 35 USC 133, 151.

"8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

"a. On filing a first petition, $50.

"b. On filing a second petition, $100.

"c. On filing a third or subsequent petition, $200.". Maintenance fees.

(b) Section 41(b) of title 35, United States Code, is amended to read as follows:

"(b) The Commissioner shall charge the following fees for maintaining a patent in force:

"1. Three years and six months after grant, $400.

"2. Seven years and six months after grant, $800.

"3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an application maintenance fee. No fee will be established for maintaining a design or plant patent in force." Expiration. Surcharge.

(c) Section 41(c) of title 35, United States Code, is amended to read as follows:

"(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period. Maintenance fee, delayed payment. Surcharge.

"(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection."

(d) Section 41(d) of title 35, United States Code, is amended to read as follows:

"(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 113 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50." Fees. 35 USC 13.

(e) Section 41(f) of title 35, United States Code, is amended to read as follows:

"(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occuring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored,". Adjusted fees.

(f) Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended by deleting "Fees will be set and adjusted by the Commissioner to recover the aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or funished the material.".

(g) Section 42(c) of the title 35, United States Code, is amended by adding the following sentence at the end thereof: "Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.".

SEC. 4. Section 3(a) of title 35, United States Code is amended (1) by deleting the phrase "not more than fifteen"; and (2) by inserting the phrase "appointed under section 7 of this title" immediately after the phrase "examiners-in-chief".

SEC. 5. Section 111 of title 35, United States Code, is amended to read as follows:

"SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and Aplications

under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.". 35 USC 112. 35 USC 113. 35 USC 115. Filing date.

SEC. (a) Section 116 of title 35, United States Code, is amended (1) by deleting the phrase "Joint inventors" from the title and inserting in its place "Inventors"; and (2) in the third paragraph, by deleting the phrase "a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error" and inserting in its place the phrase "through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application".

(b) Section 256 of title 35, United States Code, is amended to read as follows:

"§ 256. Correction of named inventor

"Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

"The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.".

SEC. 7. Section 6 of the title 35, United States Code, is amended by deleting paragraph (d) thereof.

SEC. 8. (a) Section 8(a) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(a)), is amended (a) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

(b) Section 8(b) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(b)), is amended (1) by deleting the word "stille"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

SEC. 9. (a) Section 13 of the Trademark Act of 1946, as amended (15 U.S.C. 1063), is amended (1) by deleting the phrase "a verified" and inserting in its place the word "an"; (2) by adding the phrase "when requested prior to the expiration of an extension" immediately after the word "cause"; and (3) by deleting the fourth sentence.

(b) Section 14 of the Trademark Act of 1946, as amended (15 U.S.C. 1064), is amended by deleting the word "verified".

SEC. 10. Section 15 of the Trademark Act of 1946, as amended (15 U.S.C. 1065), is amended by deleting the phrase "the publication" and inserting in its place the word "registration".

SEC. 11. The first sentence of section 16 of the Trademark Act of 1946, as amended (15 U.S.C. 1066), is amended to read as follows: "Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive.".

SEC. 12. Section 21 of title 35, United States Code, is amended—

(1) by deleting the phrase "Day for taking action falling on Saturday, Sunday, or holiday" from the title and inserting in its place the phrase "Filing date and day for taking action";

(2) by inserting the following as subsection (a):

"(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner."; Filing date.

(3) by designating the existing paragraph as subsection (b); and

(4) by inserting the word "federal" in subsection (b), as designated above, immediately after the word "a".

SEC. 13. Section 6(a) of title 35, United States Code, is amended (1) by deleting the word "and", third occurrence, and inserting in its place a comma; (2) by inserting the phrase ", or exchanges of items or services" immediately after the word "programs"; and (3) by inserting the phrase "or the administration of the Patent and Trademark Office" immediately after the word "law", second occurrence.

SEC. 14. (a) Section 115 of title 35, United States Code, is amended by (1) deleting the phrase "shall be" and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(b) Section 261 of title 35, United States Code, is amended, in the third paragraph, by inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(c) Section 11 of the Trademark Act of 1946, as amended (15 U.S.C. 1061), is amended by (1) deleting the phrase "shall be", first occurrence, and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

SEC. 15. Section 13 of title 35, United States Code, is amended by deleting "(a)9" and inserting in its place "(d)".

SEC. 16. Section 173 of title 35, United States Code, is amended to read as follows: "Patents

for designs shall be granted for the term of fourteen years."

SEC. 17. (a) Sections 1, 2, 4, 7, and 13 through 15 of this Act shall take effect on the date of enactment of this Act. Sections 3 and 16 of this Act shall take effect on Oct. 1, 1982. The maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act. Each patent applied for on or after the date of enactment of this Act shall be subject to the maintenance fees established pursuant to section 3(b) of this Act or to maintenance fees hereafter established by law, as to the amounts paid and the number and timing of the payments. Effective dates. 35 USC 41 note.

(b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:

"§ 294. Voluntary arbitration

"(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding. Awards. 9 USC 1 *et seq*

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification. 35 USC 282. Modification.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner. Notices. Modification.

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner."

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration.".

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment.

Approved Aug. 27, 1982.

LEGISLATIVE HISTORY...H.R. 6260

HOUSE REPORT No 97-542 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 128 (1982):
June 8, considered and passed House.
Aug. 12, considered and passed Senate.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 18, No. 36 (1982):
Aug. 28, Presidential statement.

(66) 97TH CONGRESS **HOUSE OF REPRESENTATIVES** **REPORT**

2d Session No. 97-542

PATENT AND TRADEMARK OFFICE AUTHORIZATION

May 17, 1982....Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following
REPORT
[To accompany H.R. 6260]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 6260) to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other

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purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

PURPOSE OF THE BILL

The purpose of H.R. 6260 is to authorize appropriations for the Patent and Trademark Office for fiscal years 1983 through 1985.

STATEMENT

The Subcommittee on Courts, Civil Liberties and the Administration of Justice previously held two days of hearings on the legislation, receiving testimony from a representative group of witnesses including the Commissioner of Patents and Trademarks, the American Bar Association Section of Patent, Trademark and Copyright Law, the American Patent Law Association, the Patent, Trademark and Copyright Section of the State Bar of Virginia, the United States Trademark Association and the General Patent Counsel of the General Electric Corporation.

H.R. 6260 reflects the recommendation of the Administration with three modifications as follows. First, the Administration proposal authorized the Commissioner of Patents and Trademarks to establish fees administratively. The subcommittee approved an amendment to set forth specific fees in the statute and limited the Commissioner's authority to raise fees. Second, the Administration recommended that user fees recover 100% of the costs of actual processing of patents and trademarks. The subcommittee amended the bill to reduce by 50% patent filing and maintenance fees for individual inventors, small businesses and not for profit institutions. The effect of the amendment is to increase by $8 million the authorized appropriation which would have been provided under the original Administration request. Third, the subcommittee adopted a recommendation of the Commissioner of Patents and Trademarks, the American Bar Association and a coalition of corporate patent counsel permitting arbitration of patent disputes.

H.R. 6260 was considered by the Full Committee on the Judiciary on May 11, 1982 and was approved as reported by the subcommittee with an amendment offered by Mr. Frank described below.

SYNOPSIS OF H.R. 6260

SECTIONS 1...3

Authorizes the Patent and Trademark Office for fiscal year 1983 at an appropriations level of $76,000,000 and for fiscal years 1984 and 1985 such sums as may be necessary. This would be augmented by additional fee income under the bill of approximately $79 million for a total budget of $155 million. In fiscal year 1982 the Patent and Trademark Office was authorized at a level of $118,961,000 of which $29,600,000 was provided through fee income. Fiscal year 1983 will be the first year in which fee income under P.L. 96-517 will be credited to the Patent and Trademark Office without being counted as part of its authorized appropriation. Had this new accounting procedure been applied to fiscal year 1982 the authorization and appropriation for the Patent and Trademark Office would have been $89 million. This constitutes the actual level of taxpayer support of the Office. Thus, H.R. 6260 authorizes the expenditure of tax revenue in fiscal 1983 to support the Patent and Trademark Office at a level $21 million lower than for fiscal 1982. H.R. 6260 proposes to double current fees as the means of making up for the difference between a lower level of taxpayer support and an increased total budget. Further, maintenance fees which were first authorized in P.L. 96-517 and which will not begin to be collected until fiscal year 1986 (Oct. 1, 1985) will also be doubled over the amounts provided for under P.L. 96-517.

The overall objective of H.R. 6260 is to provide for increased user support for the Patent and Trademark Office costs associated with the actual processing of patent applications by fiscal year 1996. The fee schedule is designed to return to the government 100% of actual costs. However, an amendment to the original Administration proposal adopted by the subcommittee would reduce by half the fees for individuals, small businesses and nonprofit inventors. At the present time less than 25% of the actual costs of processing patent applications are supported by fee revenue and under P.L. 96-517, which becomes effective on Oct. 1, 1982, this amount will gradually begin to rise but will only reach 50% of actual costs in 1996.

The amendment offered by Mr. Frank and approved by the Committee modifies that portion of Section 3 of H.R. 6260 dealing with Trademark fees. Public Law 96-517 (35 United States Code, section 31(a)) provides, "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost . . . of performing the service or furnishing the material."

The Administration requested that the figure, "50 per centum", be changed to "100 per centum", thus mandating full recovery to the Treasury of all costs associated with processing trademarks. An amendment offered during subcommittee consideration of the legislation proposed to reduce fee generated revenue supporting processing of trademarks to less than the 100 per centum recovery level. The amendment was not agreed to. The author of the amendment, Mr. Frank, then proposed to amend the law to provide a statutory fee schedule which would return revenue to the Patent and Trademark Office at a level designed to recover 100 per centum of costs. However, following consultations with interested parties, Mr. Frank modified his amendment simply to repeal those portions of P.L. 96-517 which mandate a specified level of cost recovery for the processing of trademark registrations. Thus, the level of cost recovery for processing of trademark registrations will be within the discretion of the Commissioner. The Committee is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed

in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of fee:	*Proposed fee*
Application filing fee per class	$175
Renewal fee	300
Late renewal	100
Section 12(c) claim	100
New certificate	100
Certificate of correction	100
Disclaimer to registration	100
Amendment to registration	100
Per class combines section 8 and 15 affidavit	200
Per class section 8 affidavit alone	100
Per class section 15 affidavit alone	100
All petitions to Commissioner	100
Cancellation opposition per class	200
TTAB appeal	100
Certified copies	10
Copies of trademarks	1
Assignments	(1)

[1]100 plus for each mark in addition to 1.

Section 3(d) also permits the Commissioner of Patents to accept late payment of maintenance fees where it is established that the delay in payment was unavoidable.
Section 4 permits the Commissioner of Patents and Trademarks to appoint temporary examiners in chief for the Board of Patent Appeals to deal more flexibly with workload.
Section 5 permits late filing of the oath and fee accompanying submission of specifications and drawings which accompany patent claims.
Section 6 permits greater flexibility in correcting mistakes in the naming of inventors on a patent application.
Section 7 allocates funds from the Patent and Trademark Office to the Department of State to pay the financial obligations of administering the patent Cooperation Treaty.
Section 8 clarifies the Trademark law with respect to what constitutes use of a mark "in commerce".
Section 9 deletes the burdensome technical requirement that trademark oppositions be verified.
Section 10 makes the date of registration rather than the date of publication the crucial date for purposes of establishing the incontestability of a trademark. This eliminates an ambiguity in the present law.
Section 11 limits the declaration ofinterferences under the trademark law to situations where extraordinary circumstances exist.
Section 12 authorizes the Commissioner of the Patent and Trademark Office the flexibility to deal with problems of delay in filing due to postal service breakdowns.
Section 13 permits the Commissioner of Patents to enter into cooperative studies, programs, exchanges and similar ventures associated with the administration of the Patent Office.
Section 14 conforms U.S. Patent and Trademark Law to a recent international treaty governing diplomatic or consular legalization of documents.
Section 15 corrects a mistaken citation in P.L. 96-517.
Section 16 creates a uniform term for design patents.
Section 17 establishes the effective dates for provisions of the Act. Increased filing fees would apply to all applications made on or after the date of enactment of H.R. 6260.
Section 18 permits voluntary arbitration of patent disputes.

SECTION-BY -SECTION ANALYSIS

SECTION 1

This section authorizes appropriations for the Patent and Trademark Office for the payment of salaries and necessary expenses of the Office. For Fiscal Year 1983, this section authorizes appropriations of $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary, as well as such additional and supplemental amounts as may be necessary to cover any increases in salary, pay, retirement, or employee benefits which may be authorized by law. Funds made available by these appropriations are to be used to reduce by 50 per centum the amount of the fees to be paid under title 35, United States Code, section 41(a) and (b) by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration.

In addition, fees collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), will augment the authorized appropriation to provide the resources needed to conduct the operations of the Office for fiscal year 1983. The total resources for the Office in fiscal year 1983, that is, the amount appropriated pursuant to this section plus fees collected pursuant to the patent and trademark laws, which will be available to the Office, are estimated to be $154,934,000. The corresponding levels for fiscal year 1984 and fiscal year 1985 are estimated in the President's Budget to be $167 million and $176 million, respectively. Any additional amounts to cover increases in salary, pay, retirement, or other employee benefits which may be authorized by law will be in addition to, and will therefore increase, those program levels. Finally, any funds appropriated pursuant to this section and all fees collected, when specified in an appropriation act, will remain available without any fiscal year limitation.

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SECTION 2

This section provides that, notwithstanding any other provision of law, there is authorized to be appropriated to the Patent and Trademark Office for fiscal year 1982, $121,461,000 and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law. This section increases the amount authorized for the Patent and Trademark Office by 2.5 million over that authorized in Public law 97-35. The President is recommending a supplemental appropriation of $2,500,000 for the Patent and Trademark Office for fiscal year 1982 in order to carry out the program recommendations included in his fiscal year 1983 Budget.

SECTION 3

This section establishes certain statutory fees which are to be charged by the Commissioner and authorizes the Commissioner to establish other fees whose amounts are not specifically set. Thus, the major routine fees which are applicable to patents and patent application processing are established (e.g., filing, issuance, and maintenance fees). The Commissioner is authorized to establish fees for all other processing, services, or materials related to patents which are not specifically established by statute. The processing and service fees, which would be established at a level to recover the estimated average costs to the Office. A more specific discussion of the various provisions of this section is set forth below.

Section 3(a) amends section 41(a) of title 35 to provide the amounts of the fees for filing and issuance of patent applications. In addition, the section includes provisions for increasing the filing fees due to increased complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. The section also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under section 41(a)1, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made. Under the section, errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner. This will enable the Commissioner to establish regulations whereby patent applications may correct, without prejudice, errors in payment of the additional fees, i.e., those in addition to the basic fees established.

Under section 41(a)2, the fee for issuing all original and reissue patents, except in design or plant cases, would be a uniform amount of $500. No supplemental issue fees are required.

Section 41(a)3 establishes fixed fees for filing applications for, and issuance of design and plant patents. For design patent cases, the filing fee would be $200 and the issue fee $250.

Section 41(a)4 relates to fees in reissue cases and establishes a fee of $300 for filing each application for the reissue of a patent. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 is due for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

Under section 41(a)5, a fee of $50 would be established for filing each disclaimer in a patent or patent application.

Section 41(a)6 establishes a fee due on filing an appeal from the examiner to the Board of Appeals of $115. In addition, a fee of $115 is due on filing a brief in support of the appeal, and a fee of $100 is due for requesting an oral hearing before the Board of Appeals.

Section 41(a)7 establishes two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees are applicable to petitions to accept the delayed payment of the fee for issuing a patent. The fees set forth in this section are due on filing the petition. Since the section provides for two alternative fees with different standards, the section would permit the applicant seeking revival or acceptance of a delayed payment of the fee for issuing a patent to choose one or the other of the fees and standards under such regulations as the Commissioner may establish. Under the section the Commissioner could establish time limits within which petitions under each of the different fees and standards can be filed. The section establishes a fee of $500 for filing each petition for revival or for acceptance of the delayed payment of an issue fee where the abandonment or the failure to pay the issue fee is unintentional. In order to prevent abuse and injury to the public the Commissioner could require a terminal disclaimer equivalent to the period of abandonment and could require applicants to act promptly after becoming aware of the abandonment. The section establishes a fee of $50 for filing a petition under sections 133 or 151 of title 35 in accordance with standards presently in effect requiring that the delay resulting in the abandonment, or the delay in payment of the issue fee, be unavoidable. Under this section a petition accompanied by either a fee of $500 or a fee of $50 would not be granted where the abandonment or the failure to pay the fee for issuing the patent was intentional as opposed to being unintentional or unaviodable. This section would permit the Commissioner to have more discretion than present law to revive abandoned applications and accept late payment of the fee for issuing a patent in appropriate circumstances.

Section 41(a)8 establishes fees for filing of petitions for extensions of time. Various time periods are set by the Office for taking actions on matters relating to patent applications. These time periods are set pursuant to statute or by regulations established by the Commissioner under the authority granted to the Commissioner by statute. This section would provide for fees for filing petitions to extend the time periods set pursuant to statute or by regulations for taking action within any limitations set by statute.

A fee of $50 is established for filing a request for a first one month extension of time, an additional fee of $100 for filing a request for a second one month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a request for a third one month extension of time which would expire three months after the end of the time period set for taking action. A subsequent or fourth extension could be requested if additional time was available under the statute. In no case could a period be extended beyond the maximum time set by statute.

The Commissioner may issue regulations providing when, within any maximum period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. This section does preclude the Commissioner from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause.

Section 41(b) provides that the Commissioner charge the following fees for maintaining a patent other than a design or plant patent, in force: at three years and six months after grant, $400; at seven years and six months after grant, $800; and at eleven years and six months after grant, $1,200. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of a maintenance fee.

In order to avoid an inequitable loss of patent rights, the Commissioner is given the authority to accept payment of any maintenance fee after the six-month grace period if it is established that the delay in payment was unavoidable. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment. After the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable. A surcharge may be imposed by the Commissioner as a precondition to acceptance of a late fee. This surcharge may be in addition to any surcharge imposed for payment during the grace period.

A provision is included to protect the rights of one who began using or who took steps to begin use of a patent which expired for failure to pay a maintenance fee and which was subsequently reestablished by acceptance of the late payment. The intervening rights provision in section 41(c)(2) is similar to the intervening rights provision in 35 U.S.C. 252 concerning reissued patents.

Section 41(d) provides that the Commissioner establish fees for all other processing services, or materials related to patents not specified in section 41 at an amount calculated to recover the estimated average cost to the Office of such processing, services, or materials. Such processing and other services includes, but is not limited to, the processing of various petitions desiring certain actions to be taken regarding patent applications, recording of assignments, reexamination of patents and the processing of international applications. Fees for materials include the price of patent copies, certifications and other copying services. The yearly fee for providing a library specified in section 13 of title 35 with uncertified copies of the specifications and drawings for all patents issued in that year is set at $50.

Section 41(f) provides that the fees established in subsections (a) and (b) of section 41 may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than one per centum may be ignored by the Commissioner in making such adjustments.

Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is being changed to grant the Commissioner discretion to establish the level of recovery of office costs related to trademarks. It is expected that the Commissioner will set the fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system. This may require that other fees for services or materials related to trademarks recover more than their actual estimated cost in order that the Commissioner achieve in the aggregate adequate cost recovery for the entire trademark operation.

A provision is inserted in section 42(c) of title 35 in order to ensure that the tradermark fees collected are used to fund trademark operations only and not the processing of patent applications.

SECTION 4

Section 3 of title 35 is amended by deleting specific reference to the number of examiners-in-chief in the first sentence. Elimination of the upper limit on the number of permanent members of the Board of Appeals would provide greater flexibility in filling most of its personnel needs, thereby avoiding an excess of examiner details. The authority to appoint acting examiners-in-chief, however, is maintained in order that temporary fluctuations in the workload of the Board may be accommodated.

SECTION 5

Under revised section 111 of title 35, the filing date of an application would be that on which the specification and any required drawings are received by the Patent and Trademark Office. The oath or declaration and filing fee could be submitted at such later time as established by the Commissioner, without any loss of the original filing date. Under the amendment, an applicant could either file the oath or declaration (including the applicant's signature) and fee together with an application or submit them at a later time as determined by the Commissioner.

The section would also authorize the imposition of a surcharge as a condition for accepting filing of the oath of payment of the filing fee after the filing date of the application. Since an application filed without the oath or declaration would not be signed or "made" by the applicant, the amendment permits a patent attorney or agent, authorized by the applicant, to submit the specification and drawings for the purpose of obtaining a filing date. Should the applicant, however, fail to file the oath or declaration, or pay the filing fee within the time limits set by the Commissioner, the application would be regarded as having been abandoned.

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SECTION 6

The third paragraph of section 116 of title 35 is amended to enlarge the possibilities for correcting misnamed inventive entities. As a consequence, correction would be permitted also in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Commissioner would have the authority to substitute the true inventor for the erroneously named person. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to a different, but actual, joint inventors, conversions from erroneously identified joint inventors to different but actual, joint inventors, and conversions from erroneously identified joint inventors to a different, but actual, sole inventor would also be permitted. In each instance, however, the Commissioner must be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name.

The ability to receive a filing date based on a specification and drawings without signature as set forth in revised section 111 of title 35, and to file the oath or declaration and pay the filing fee within such period as determined by the Commissioner is also available to joint inventors.

Section 256 of title 35, which is a companion to section 116, would be amended to similarly enlarge the possibilities for correction of misnamed inventors in issued patents.

SECTION 7

Section 6(d) of title 35, which provides for the allocation of appropriated Patent and Trademark Office funds to the Department of State for payment of United States financial obligations under the Patent Cooperation Treaty, is deleted. The Department of State has traditionally assumed responsibility for financial obligations for international agreements to which the United States adheres.

SECTION 8

Section 8(a) of the Trademark Act is amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has been interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce may have been inadvertent in the 1946 Act, this section has interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" for registrations published under section 12(c) of the Act. (This pertains to registrations issued under the Act of Mar. 3, 1881 and the Act of Feb. 20, 1905).

The word "still" has been deleted from section 8(a) and 8(b). Thus, the owner of a registration issued on the basis of a foreign registration under the provisions of section 44(e) of the Act will have to submit an affidavit to the effect that the mark is in use in commerce. Since the mark need not be used in commerce when it is registered, the requirement cannot be required to state that it is "still" in such use.

SECTION 9

Section 13 of the Trademark Act is amended to delete the requirement that an opposition be verified. The sentence which allowed an unverified application to be verified at a later date has been deleted. In addition, a phrase has been added to make it clear that any subsequent extension of time to file an opposition, beyond the first extension, must be requested before the end of the preceding extension.

Section 14 of the Trademark Act would also be amended to delete the requirement that a petition to cancel a registration be verified.

SECTION 10

Section 15 of the Trademark Act is amended to change the term "the publication" to "registration" in the first sentence. This change makes the date of registration rather than the date of publication the crucial date for purposes of incontestablility. It will also make section 15 consistent with sections 22 and 33 of the Act.

SECTION 11

Section 16 of the Trademark Act is amended to limit the declaration of interferences to those situations where a petition to the Commissioner shows that extraordinary circumstances exist, the rights of the parties can be determined adequately by the existing opposition and cancellation procedures. Additionally, if an interference is declared between an application and a registration and the applicant wins, a cancellation must still be initiated against the registration.

SECTION 12

A new subsection (a) has been added to section 21 of title 35 to authorize, but not to require, the Commissioner of Patents and Trademarks to give as the filing date of any paper or fee which is required to be filed in the Patent and Trademark Office the date on which the paper or fee was deposited with the United States Postal Service. The Commissioner may also give as the filing date of any paper or fee which was required to be filed in the Patent and Trademark Office the date it would have been deposited with the United States Postal Service but for postal service interruptions or emergencies which the Commissioner designates. The requirements governing whether any given paper or fee may be given the filing date of the day on which it was, or would have been deposited with the United States Postal Service will be set forth in regulations established by the Commissioner.

Section 21(b) of title 35 is identical to existing section 21 with two minor amendments. The word "federal" has been inserted before the phrase "holiday within the District of Columbia" to clarify the nature of the holiday.

SECTION 13

This section clarifies the authority of the Commissioner in section 6(a) of title 35 to enter into a wide range of cooperative agreements concerning the patent and trademark laws or the administration of the Patent and Trademark Office. These agreements are in addition to the exchange of publications authorized in 35 U.S.C. 11(b) and 12. These cooperative agreements may take the form of studies, programs, exchanges, and other similar ventures. Thus, the Patent and Trademark Office could, for example, exchange patent copies, non-patent literature, tapes or services in return for goods or services of value to the Patent and Trademark Office.

SECTION 14

The amendments of 35 U.S.C. 115 and Section 11 of the Trademark Act of 1946 recognize the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" which entered into force in the United States on Oct. 15, 1981. The Convention abolishes the requirement of diplomatic or consular legalization for foreign public documents which are sworn to or acknowledged by a notary public in any of the countries adhering to the Convention. For documents executed by a notary public of all other foreign countries, diplomatic or consular legalization will still be required.

The amendment of 35 U.S.C. 261 is intended to give affirmative effect to acknowledgments executed pursuant to the Hague Convention.

SECTION 15

This section corrects an incorrect citation. Public Law 96-517 amended section 41 of title 35, United States Code, in a way which eliminated 35 U.S.C. § 41(a)(9). Unfortunately, section 13 of title 35, United States Code, was not amended accordingly by Public Law 96-517. This section corrects that oversight.

SECTION 16

This section sets a uniform term of fourteen years for all design patents.

SECTION 17

Sections 17(a) and (c) specify the effective dates of the Act. Section 17(a) also specifies that the maintenance fees provided for in section 3(b) of this Act will only apply to patents in which the application was filed on and after the date of enactment or to maintenance fees later established by law.

Section 17(b) adds a section to title 35 providing for the voluntary arbitration of patent disputes by the parties to the dispute. The section requires that the Commissioner be notified in writing of an award made by an arbitrator or modified by a court. Such notification will be entered in the record of the prosecution of the patent.

At present, agreements to arbitrate some aspects of disputes arising under patent licenses are enforceable by the courts; however, there have been court decisions that have disapproved arbitration of disputes concerning patent validity or infringement. In this regard, see, for example, *Zip Mfg. Co. v. Pep Mfg. Co. 44 F.2d 184, 7 U.S.P.Q. 62 (D. Del. 1930) and Beckman Instruments, Inc. v. Technical Developments Corp.* 433 F.2d 55, 167 U.S.P.Q. 10 (7th Cir. 1965).

Partly as a reaction to those decisions, during the 93rd Congress both the Department of Commerce and the Department of Justice endorsed a provision specifically authorizing arbitration of validity and infringement disputes. This provision, included in an omnibus patent law revision bill, S. 2504, was never enacted due to the many controversial aspects of that legislation.

In the view of the Committee, a statutory authorization of voluntary agreements to arbitrate validity and infringement disputes would benefit both the parties to these disputes and the public.

Statutory endorsement of arbitration agreements would assure the parties that they could avail themselves of the numerous advantages of arbitration without the possibility of having to reargue the dispute in court. The advantages of arbitration are many: it is usually cheaper and faster than litigation; it can have simpler procedural and evidentiary rules; it normally minimizes hostility and is less disruptive of ongoing and future business dealings among the parties; it is often more flexible in regard to scheduling of times and places of hearings and discovery devices; and, arbitrators are frequently better versed than judges and juries in the area of trade customs and the technologies involved in these disputes.

The enforcement of voluntary arbitration provisions would serve the public in two ways. First, the availablity of arbitration with its numerous advantages will enhance the patent system and thus will encourage innovation. This view is supported by the Committee for Economic Development in their Jan. 1980 statement entitled "Stimulating Technological Progress." Secondly, arbitration could relieve some of the burdens on the overworked Federal courts. Chief Justice Burger in his speech to the American Bar Association on Jan. 24, 1982, generally endorsed the use of arbitration to reduce the judicial backlog. Also, I think it is important to note that the American Bar Association's Section on Patent, Trademark and Copyright Law has endorsed court enforcement of arbitration agreements calling for arbitration of validity and infringement.

The recommendations of the Secretary of Commerce to increase substantially patent and trademark user fees were made on the promise that such increases "will lay the groundwork for revitalizing the patent and trademark systems." The Secretary committed to three major goals: (1) to reach an average patent application pendency time of 18 months by FY 1987, (2) to issue an examiner's first action on trademark registrability in three months and disposal of an application within 13 months, and (3) to move realistically toward a fully automated Office by the 1990's. In accepting the Administration's recommendations on user fees, the Committee fully expects the Administration to live up to its end of the bargain to bring about a first-class Patent and Trademark Office. To provide an opportunity for timely and effective Committee oversight of progress toward improving the Patent and Trademark Office, the Committee directs that the Secretary of Commerce report annually to the Committee on progress toward achieving the three major goals of the Patent and Trademark Office, as outlined above, and, in addition, promptly inform the Committee at any time it appears that any of the goals, for any reason, is viewed as not attainable.

OVERSIGHT STATEMENT

The Committee on the Judiciary has oversight responsibility over the Patent and Trademark Office in the Department of Commerce. In addition to its ongoing oversight, the Committee's Subcommittee on Courts, Civil Liberties and the Administration of Justice held an oversight hearing with respect to the Patent and Trademark Office on Mar. 4, 1981, published as Oversight Hearings Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the Committee on the Judiciary, House of Representatives, Ninety-Seventh Congress, First Session on the Copyright Office, The U.S. Patent and Trademark Office, and the Copyright Royalty Tribunal. Serial No. 17.

The Committee expects to continue its oversight activities in this area.

STATEMENT OF THE BUDGET COMMITTEE

No statement has been received on H.R. 6260 from the House Committee on the Budget.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 7, rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate of H.R. 6260, as amended, prepared by the Congressional Budget Office.

U.S. CONGRESS
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 13, 1982.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional budget Office has prepared the attached cost estimate for H.R. 6260, a bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely

ALICE M. RIVLIN,
Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 6260.

2. Bill title: A bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

3. Bill status: As ordered reported by the House Committee on the Judiciary, May 11, 1982.

Bill purpose: H.R. 6260 would authorize 1982 appropriations at a level $2.5 million above the amount already appropriated, and would provide a $76 million authorization level in 1983 to carry out the activities of the Patent and Trademark Office (PTO). In addition, such sums as may be necessary are authorized for fiscal years 1984 and 1985, plus such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other benefits authorized by law for each fiscal year 1983 thorugh 1985. PTO would also have available for obligation offsetting fee collections as provided for in Public Law 96-517, plus the additional fees as specified in H.R. 6260.

Assuming enactment of H.R. 6260, total PTO collections over time would result in recovery of approximately 100 percent of patent and trademark processing costs. Individuals, small businesses, and non-profit institutions would be exempt from the proposed additional fees, however, but would continue to follow the fee schedule outlined in P.L. 96-517, which assumes the ultimate recovery of approxiamtely 50 percent of all processing costs.

The President's 1982 budget includes a request for a $2.5 million supplemental for the PTO. The Administration has recommended increasing user fees to ultimately recover 100 percent of processing costs beginning in 1983, but does not provide for any exemptions to the proposed fee increases relative to current law. The effect of exemptions is to increase by approximately $8 million the authorized level of appropriations relative to the Administration's request.

In addition, the bill would make a number of other changes that are not expected to have a cost impact.

5. Cost estimate:

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Authorization level:					
Specified	2.5	76.0	....	....	....
Estimated	....	6.8	86.4	86.8	....
Subtotal	2.5	82.8	86.4	86.8	....
Total estimated outlays	2.4	61.8	82.4	82.8	5.5

Including outlays from appropriations to date for PTO, total 1982 outlays are estimated to be $121.5 million, and total 1983 outlays are estimated to be $79.8.

The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: The authorization levels for PTO for 1982 and 1983 are those specified in the bill. The estimate authorization levels for 1984 and 1985 assume a level of funding sufficient to maintain a program level of $167 million and $176 million, respectively, including offsetting collections. In addition, authorization for increases in pay and other benefits of approximately $6.8 million, $7.4 million, and $7.8 million for fiscal years 1983 through 1985, respectively, were estimated based on CBO's current inflators. Outlays are based on historical spending patterns.

The estimated collections to PTO as a result of fees charged to cover the costs of processing trademarks and patents were provided by the agency, and assume the fee structure outlined in the bill. The estimated collections, under current law and under H.R. 6260, are shown in the table below.

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Estimated offsetting collections:					
Current law	....	47.8	52.7	57.7	....
Added by H.R. 6260	....	31.2	35.3	39.3	....
Total...H.R. 6260	....	79.0	88.0	97.0	....

7. Estimate comparison: None.
8. Previous CBO estimate: None.
9. Estimate prepared by: Mary B. Maginniss.
10. Estimate approved by: C. G. Nuckols (James L. Blum, Assistant Director for Budget Analysis).

COMMITTEE VOTE

The Committee on the Judiciary ordered H.R. 6260 as amended reported by a voice vote, without objection being heard, with a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

TITLE 35, UNITED STATES CODE
PART 1...PATENT AND TRADEMARK OFFICE

* * * * *

CHAPTER 1...ESTABLISHMENT, OFFICERS, FUNCTIONS

* * * * *

§ 3. Officers and employees.

(a) There shall be in the Patent and Trademark Office a Commissioner of Patents and Trademarks, a Deputy Commissioner, two Assistant Commissioners, and [not more than fifteen] examiners-in-chief *appointed under section 7 of this title*. The Deputy Commissioner, or, in the event of a vacancy in that office, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed and takes office. The Commissioner of Patents and Trademarks, the Deputy Commissioner, and the Assistant Commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law shall appoint all other officers and employees.

* * * * *

§ 6. Duties of Commissioner.

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies [and] programs, *or exchanges of items or services* regarding domestic and international patent and trademark law *or the administration*

of the Patent and Trademark Office, and shall have charge of property belonging to the Patent and Trademark Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent offices and international intergovernmental organizations, or may authorize such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent and Trademark Office, not to exceed $100,000 in any year, to the Department of State for the purpose of making special payments to internatinal intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

[(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.]

* * * * *

§ 13. Copies of patents for public libraries.

The Commissioner may supply printed copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41 [(a)9] (d) of this title.

* * * * *

CHAPTER 2...PROCEEDINGS IN THE PATENT AND TRADEMARK OFFICE

* * * * *

§ 21. [Day for taking action falling on Saturday, Sunday, or holiday] *Filing date and day for taking action.*

(a) *The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.*

(b) When the day, or the last day, for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or a *Federal* holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding secular or business day.

* * * * *

CHAPTER 4...PATENT FEES

* * * * *

§ 41. Patent fees

[(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

[(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actua' processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

[(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

[(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patenis issued in that year will be $50.]

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design or plant cases, $500.

3. In design and plant cases:

a. On filing each design application, $125.

b. On filing each plant application, $200.

c. On issuing each design patent, $175.

d. On issuing each plant patent, $250.

4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, $50.

6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

a. On filing a first petition, $50.

b. On filing a second petition, $100.

c. On filing a third or subsequent petition. $200.

(b) The Commissioner shall charge the following fees for maintaining a patent in force:

1. Three years and six months after grant, $400.

2. Seven years and six months after grant, $800.

3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) No patent, the term of which has been maintained as a result of the accepiance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to seli to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued p: actice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.

(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

(3) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

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[(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three times.

(f) The fees established in subsection (a) and (b) of this section may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.

(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register.

§ 42. Patent and Trademark Office funding.

(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States. the provisions of section 725e of title 31, United States Code, notwithstanding.

(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office. *Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.*

(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required.

PART II—PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

* * * * *

CHAPTER 11—APPLICATION FOR PATENT

* * * * *

[§ 111. Application for patent

[Application for patent shall be made by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include: (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be signed by the applicant and accompanied by the fee required by law.]

SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

* * * * *

§ 115. Oath of applicant

The applicant shall make oath that he believes himself to be the original and first inventor of the process, machine, manufacture, or composition of matter, or improvement thereof, for which he solicits a patent; and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or when, made in a foreign country, before any diplomatic or consular office of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority [shall be] *is* proved by certificate of a diplomatic or consular officer of the United States, or *apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States* and such oath shall be valid if it complies with the laws of the state or country where made. When the application is made as provided in this title by a person other than the inventor, the oath may be so varied in form that it can be made by him.

§ 116. [Joint inventors] *Inventors.*

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each sign the application and make the required oath, except as otherwise provided in this title.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor

may subsequently join in the application.

Whenever [a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error] *through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application,* and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.

* * * * *

CHAPTER 16...DESIGNS

* * * * *

§ 173. Term of design patent.

[Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.]

Patents for designs shall be granted for the term of fourteen years.

* * * * *

PART III...PATENTS AND PROTECTION OF PATENT RIGHTS

* * * * *

CHAPTER 25...AMENDMENT AND CORRECTION OF PATENTS

* * * * *

[§ 256. Misjoinder of inventor.

[Whenever a patent is issued on the application of persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by error and without any deceptive intention, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.

[Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by error and without deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.

[The misjoinder or nonjoinder of joint inventors shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.]

§ 256. Correction of named inventor.

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.

CHAPTER 16...OWNERSHIP AND ASSIGNMENT

* * * * *

§ 261. Ownership; assignment.

Subject to the provisions of this title, patents shall have the attributes of personal property.

Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. The applicant, patentee, or his assigns or legal representatives may in like manner grant and convey an exclusive right under his application for patent, or patents, to the whole or any specified part of the United States.

A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

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CHAPTER 29—REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

Sec.
281. Remedy for infringement of patent.

* * * * *

294. Voluntary arbitration.

* * * * *

§ 294. Voluntary arbitration.

(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.

* * * * *

TRADEMARK ACT OF 1946

* * * * *

Sec. 8 (a). Duration of registration—Cancelation at end of 6 years unless affidavit of use filed.

Each certificate of registration shall remain in force for 20 years: *Provided*, That the registration of any mark under the provisions of this Act shall be canceled by the Commissioner at the end of 6 years following its date, unless within 1 year next preceding the expiration of such 6 years the registrant shall file in the Patent and Trademark Office an affidavit showing that said mark is [still] in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. Special notice of the requirement for such affidavit shall be attached to each certificate of registration.

Sec. 8(b). Cancelation of republished prior registrations unless affidavit of use filed.

Any registration published under the provisions of subsection (c) of section 12 of this Act shall be canceled by the Commissioner at the end of 6 years after the date of such publication unless within 1 year next preceding the expiration of such 6 years and registrant shall file in the Patent and Trademark Office an affidavit showing that said marks is [still] in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

* * * * *

Sec. II. Acknowledgments and verifications.

Acknowledgments and verifications required hereunder may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country, before any diplomatic or consular officer of the United States or before any official authorized to administer oaths in the foreign country concerned whose authority [shall] is proved by a certificate of a diplomatic

or consular officer of the United States *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States*, and shall be valid if they comply with the laws of the state or country where made.

* * * * *

Sec. 13. Opposition to registration of marks on the Principal Register.

Any person who believes that he would be damaged by the registration of a mark upon the principal register may upon payment of the required fee, file [a verified] *an* opposition in the Patent and Trademark Office, stating the grounds therefor, within thirty days after the publication under subsection (a) of section 12 of this Act of the mark sought to be registered. Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause *when requested prior to the expiration of an extension*. The Commissioner shall notify the applicant 86 of each extension of the time for filing opposition. [An unverified opposition may be filed by a duly authorized attorney, but such opposition shall be null and void unless verified by the opposer within a reasonable time after such filing to be fixed by the Commissioner.] An opposition may be amended under such conditions as maybe prescribed by the Commissioner.

SEC. 14 A [verified] petition to cancel a registration of a mark, stating the grounds relied upon, may, upon payment of the prescribed fee, be filed by any person who believes that he is or will be damaged by the registration of a mark on the principal register established by this Act, or under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905—

(a) within five years from the date of the registration of the mark under this Act; or

(b) within five years from the date of publication under section 12(c) hereof of a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905; or

(c) at any time if the registered mark becomes the common descriptive name of an article or substance, or has been abandoned, or its registration was obtained fraudulently or contrary to the provisions of section 4 or of subsections (a), (b), or (c) of section 2 of this Act for a registration hereunder, or contrary to similar prohibitory provisions of said prior Acts for a registration thereunder, or if the registered mark is being used by, or with the permission of, the registrant so as to misrepresent the source of the goods or services in connection with which the mark is used; or

(d) at any time if the mark is registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, and has not been published under the provisions of subsection (c) of section 12 of this Act; or

(e) at any time in the case of a certification mark on the ground that the registrant (1) does not control, or is not able legitimately to exercise control over, the use of such mark, or (2) engages in the production or marketing of any goods or services to which the certification mark is applied, or (3) permits the use of the certification mark for purposes other than to certify, or (4) discriminately refuses to certify or to continue to certify the goods or services of any person who maintains the standards or conditions which such mark certifies:

Provided, That the Federal Trade Commission may apply to cancel on the grounds specified in subsections (c) and (e) of this section any mark registered on the principal register established by this Act, and the prescribed fee shall not be required.

Sec. 15. Incontestability under certain conditions of right to use mark.

Except on a ground for which application to cancel may be filed at any time under subsections (c) and (e) of section 14 of this Act, and except to the extent, if any, to which the use of a mark registered on the principal register infringes a valid right acquired under the law of any State or Territory by use of a mark or trade name continuing from a date prior to the date of [the publication] *registration* under this Act of such registered mark, the right of the registrant to use such registered mark in commerce for the goods or services on or in conncection with which such registered mark has been in continuous use for 5 consecutive years subsequent to the date of such registration and is still in use in commerce, shall be incontestable: *Provided*, That—

(1) there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register; and

(2) there is no proceeding involving said rights pending in the Patent Office or in a court and not finally disposed of; and

(3) an affidavit is filed with the Commissioner within 1 year after the expiration of any such 5-year period setting forth those goods or services stated in the registration on or in connection with which such mark has been in continuous use for such 5 consecutive years and is still in use in commerce, and the other matters specified in subsections (1) and (2) hereof; and

(4) no incontestable right shall be acquired in a mark which is the common descriptive name of any article or substance, patented or otherwise.

Subject to the conditions above specified in this section, the incontestable right with reference to a mark registered under this Act shall apply to a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, upon the filing of the required affidavit with the Commissioner within 1 year after the expiration of any period of 5 consecutive years after the date of publication of a mark under the provisions of subsection (c) of section 12 of this Act.

The Commissioner shall notify any registrant who files the above-prescribed affidavit of the filing thereof.

Sec. 16. Interference.

[Whenever application is made for the registration of a mark which so resembles a mark previously

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registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause *confusion or mistake or to deceive, the Commissioner may declare that an interference exists. [Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to decieve.* No interference shall be declared between an application and the registration of a mark the right to the use of which has become incontestable.

* * * * *

§ 31. Fees

Aug. 27, 1982

(H.R. 6260)

Patent and Trademark Office

Appropriation Authorization

(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. [Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.] However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with an occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups.

* * * * *

(67) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1

Rules of Practice in Patent Cases; Reexamination Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent cases to provide procedures for the reexamination of patents. Public Law 96-517 amended the patent act to authorize reexamination proceedings as a means for improving the quality of United States patents. The Patent and Trademark Office intends, through this amendment of its rules, to provide patent owners and the public with guidance on the procedures the Office will follow in conducting reexamination proceedings.
Effective date: July 1, 1981.
For Further Information Contract: Mr. R. Franklin Burnett by telephone at [703]557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks. Washington, D.C. 20231.
Supplementary Information: This rule change relates to a procedure for reexamination of patents as provided for in Public Law 96-517, section 1 of which relates to reexamination and becomes effective on July 1, 1981.

Background:

A notice of proposed rulemaking was published in the Federal Register on Jan. 13, 1981 at 46 FR 3162-3175 and in the *Official Gazette* on Feb. 17, 1981 at 1003 O.G. 36-47.

The proposed rulemaking set forth two somewhat distinct procedures directed towards determining and improving the quality and reliability of United States patents. The procedures were (1) provisions for reexamination of patents as provided for in Pub. L. 96-517, section 1 of which relates to reexamination and becomes effective on July 1, 1981, and (2) provisions for inter partes protest proceedings in a patent application between the patent applicant and a member (or members) of the public who has (have) access to the application file.

An oral hearing was held on Apr. 16, 1981. Fifty-nine written letters and statements were submitted. Nineteen persons testified at the oral hearing which resulted in 107 pages of testimony.

Discussion of General Issues Involved

After careful consideration of the comments which have been received, the part of the proposed rulemaking relating to reexamination of patents as set forth in new Chapter 30 which Pub. L. 96-517 added to Title 35 of the United States Code [35 U.S.C. 301-307] is being adopted with certain changes. The remainder of the proposal relating to inter partes protest proceedings is not being adopted.

The comments relating to the proposed rules for inter partes protest proceedings were generally mixed, with a majority of persons and associations submitting comments either opposed to these proposed rules or indicating that adoption of the proposed rules should be delayed or deferred for further study and consideration.

A number of comments were received requesting some further changes to the rules be made. The thrust of some of the suggested changes would be to remove public access to reissue applications and to limit public participation in the examination of reissue applications. The changes suggested included restoring the rules in these areas to essentially their pre-1977 form. In particular, it was suggested that § 1.175 be amended to eliminate paragraph (a)(4). These changes were not a part of the published proposal and are not being adopted at this time. Their consideration and adoption would require a new notice of proposed rulemaking.

Further, since the subject matter of reissue applications is already known to the public the necessity for maintaining them in confidence is not compelling. The elimination of paragraph (a)(4) of § 1.175 would not have a significant effect since less than one-fourth of the currently filed reissue applications are based solely upon the 1977 change to § 1.175. Under the present circumstances, it is more appropriate to defer any consideration of such changes until this issue has been reviewed further and possibly until some experience is gained under the rules adopted herein relating to reexamination. Such experience may indicate the desirability of either retaining the 1977 change to § 1.175, deleting the 1977 change, or making different changes in the rules.

The comments relating to reexamination were generally favorable with most of the comments indicating general approval of the proposed rules. Among the more often mentioned specific comments were suggestions relating to public notice of reexamination requests and/or orders. A number of comments also related to requester and/or third party participation in the reexamination proceeding and also to the scope of the proceeding.

After careful review of the comments and suggestions it has been decided to adopt the suggestions relating to the publication in the *Official Gazette* of requests for reexamination for which the fee has been paid. In addition, any reexaminations ordered at the initiative of the Commissioner will also be announced in the *Officiol Gazette*. The announcement will include at least the date of the request or any Commissioner initiated order, a reexamination request or order control number, the patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

The suggestions and comments relating to more participation in the reexamination proceeding by the requester and third parties have been adopted only to a limited degree. The requester will in general have only that participation provided by the rules as proposed. However, any citations under § 1.501 by any person will be entered in the patent file up until the date of an order to reexamine. The essentially ex parte nature of the proceeding is believed to be in keeping with the spirit and intent of the statute even though the statute does not require ex parte proceedings. Ex parte proceedings will minimize the costs and other effects of reexamination requests on patentees, especially individuals and small businesses.

The scope of the reexamination proceeding which was originally proposed has been essentially adopted in the final rules. The suggestions that the rules be broadened to include other issues have not been adopted since the other issues would unduly complicate the proceedings, raise the expense of the proceedings and raise questions whether such issues can be considered under Pub. L. 96-517.

Discussion of the Major Specific Issues Involved

The rules relating to reexamination proceedings are directed to the procedures set forth in new Chapter 30 of Title 35 of the United States Code (35 U.S.C. 301-307). This Chapter provides for the citation of prior art in patents, filing of requests for reexamination, decisions on such requests, reexamination and appeal from reexamination decisions, and the issuance of a certificate at the termination of the reexamination proceedings. Present §§ 1.1, 1.5, 1.11, 1.33, 1.34, 1.36, 1.104, 1.107, 1.109, 1.111, 1.112, 1.113, 1.115, 1.116, 1.121, 1.191, 1.192, 1.196, 1.197, 1.231, 1.248, 1.301, and 1.303 are amended to provide for reexamination procedures. A new "Subpart D-Reexamination of Patents" includes new §§ 1.501, 1.510, 1.515, 1.520, 1.525, 1.530, 1.535, 1.540, 1.550, 1.552, 1.555, 1.560, 1.565, and 1.570. Paragraph (b) of § 1.291, relating to prior art citations in patents, is deleted, since provisions therefor appear in § 1.501.

Section 1.1, as amended, provides for communications relating to reexamination proceedings to be marked "Box Reexam" to speed internal Office mail processing. No comments were received concerning this section. The proposal has been modified to indicate that only requests should be marked "Box Reexam".

Section 1.5, as amended, provides for all letters relating to a reexamination proceeding to be identified by patent number and a reexamination request control number. No comments were received concerning this section. Section 1.5 has been modified to also include reference to the Group Art Unit and the examiner, if known.

Section 1.11, as amended, provides for all papers made of record in reexamination proceedings to be open to inspection and copying by the public. Eighteen comments were received relating to publication of a notice in the *Officiol Gazette*. A new paragraph (c) has been added which provides for the publication of requests with sufficient fees paid and orders initiated by the Commissioner. Proposed paragraph "c" has been adopted as paragraph "d".

Section 1.33, as amended, has a new paragraph (c) relating to which address communications for the patent owner will be sent and who may sign papers filed. Four comments were received on this section relating to whom the mail should be addressed. One proposal, which suggested use of the current address of the attorney or agent of record, was adopted.

Section 1.34, as amended, provides for the appointment of an attorney or agent in a reexamination proceeding. Only one comment was received on this section which proposed a rule specifically allowing attorneys to file requests without identifying their clients. Since any person may request reexamination, such a rule is not felt necessary.

Section 1.36, as amended, provides for the revocation and withdrawal of powers of attorney in a reexamination proceeding. No comment was received. Section 1.36 is adopted as proposed with an additional change which added "or her" near the end.

Section 1.104, as amended, broadens the present section to also include reexamination. Three comments were received on § 1.104. All comments indicated that the examiner should not make a prior art search. Although no complete new search by the examiner is required, the use of patents and printed publications in addition to those submitted by the requester is clearly indicated in 35 U.S.C. 303(a). According, § 1.104 is adopted as proposed.

Section 1.107, as amended, provides for the citation of prior art by the examiner in a reexamination proceeding. The amended rule also refers to foreign published applications, as well as patents. No comments were received on this section. It is adopted as proposed.

Section 1.109, as amended, provides for the examiner to supply reasons for allowance in a reexamination proceeding if the examiner believes that the record does not make clear the reasons for allowing a claim or claims. No comments were received on this section. Except for a clarifying change in language, it is adopted as proposed.

Section 1.111, as amended, provides for replies by the patent owner in a reexamination proceeding. One comment was received which suggested a clarification. The suggestion was adopted. Other non-substantive changes have been made in the proposed section to shorten the sentences for clarity.

Section 1.112, as amended, provides for reexamination and reconsideration of the patent under reexamination after responses by the patent owner. Three comments were received on this section.

The wording has been changed as suggested to avoid any confusion between "reexamination" and "reexamine". The sentences have also been shortened for clarity.

Section 1.113, as amended, provides for a final rejection or action in a reexamination proceeding. One comment was received which pointed out a possible conflict between the amendment rights of section 305 and the final rejection of section 1.113. No problem is seen in this regard because of the provision of section 305 which states that "reexamination will be conducted according to the procedures established for initial examination." The section is adopted as proposed with the last sentence being divided into two sentences for clarity.

Section 1.115, as amended, provides for amendments by the patent owner in a reexamination proceeding. No comments were received concerning this section. The section is adopted as proposed with minor changes for clarity.

Section 1.116, as amended, provides for amendments after final action in reexamination proceedings. One comment was received which was the same as that mentioned and responded to in Section 1.113 above. The sentences have been shortened for clarity.

Section 1.121, as amended, contains a new paragraph (f) which requires a complete copy of any new or amended claim when presented during reexamination proceedings. Two persons commented on this section. One proposed side-by-side presentation of amended and original claims. The other proposed that exactly the same procedure be used as is now in effect for amending reissue claims. Neither suggestion was adopted since neither lends itself to printing only the amended claims in a certificate as easily as the procedure set forth in § 1.121(f). The proposed section was revised to also provide for the amendment of the description. In addition, the last three sentences of § 1.510(e) have been inserted as the last three sentences of § 1.121(f) in order to provide a more complete description therein of the manner of making amendments, including the numbering of claims, the restriction on scope of the claims and the prohibition against the introduction of new matter.

Section 1.191, as amended, provides for appeal to the Board of Appeals by the patent owner from any decision adverse to patentability, in accordance with 35 U.S.C. 306. One comment was received on proposed § 1.191 which urged that the requester should also be entitled to appeal. This proposal was not adopted because it is not provided for in the law and could result in

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harassment if permitted. The section is adopted as proposed except that "primary" contained in the existing rule is retained.

Section 1.192, as amended, provides two months from the date of the Notice of Appeal for the patent owner to file an appeal brief in a reexamination proceeding. Five comments were received relating to § 1.192 which proposed that the period for filing an appeal brief in a reexamination appeal be two months as in other appeals. The proposed rule has been adopted with the suggested two month period. The sentences have been shortened for clarity.

Section 1.196 and § 1.197 are being amended to refer to "appellants", which is a term which includes both applicants and patent owners.

These two sections were not published for comment, however, the issues involved were presented in proposed §§ 1.191 and 1.192. Paragraph (c) of § 1.197 has also been rewritten for clarity.

Section 1.231(a)(1), as amended, provides for a motion that a patent claim is unpatentable in an interference proceeding where reexamination thereof has also been requested.

Three comments were received concerning § 1.231. All comments related to when interference or reexamination proceedings would be suspended. Section 1.565 provides basis for such suspensions. Decisions will be made on a case by case basis, depending on the particular fact situation. The sentences in § 1.231(a)(1) have been shortened and rearranged for clarity.

An amendment was proposed to delete the last two sentences of § 1.247 relating to proof of service. No comments were received concerning this section but, on reconsideration, no need for such deletion is felt necessary and no change is being adopted.

Section 1.248, as amended, includes a new paragraph (b) relating to methods of serving papers and proof of service. No comments were received concerning this section. The section is adopted as proposed with minor changes for clarity and to conform to the Federal Rules of Civil Procedure.

Section 1.291, as amended, deletes paragraph (b). Former paragraph (b) dealt with the citation of prior art provisions. It was deleted since the provisions are now covered by § 1.501. Five persons commented on § 1.291. One comment relating to filing protests in reexamination proceedings was not adopted since such proceedings are ex parte in nature and are limited to consideration of prior art patents and printed publications cited by the public prior to the order. Two persons mentioned providing a procedure for citation of prior art by patentees. Citation of prior art by patentees is included in § 1.501. The two other comments related to the content of protest proceedings, which are not part of this final rule. Section 1.291 is adopted as proposed except that the paragraph designation of (c) is not being changed.

Section 1.301, as amended, provides for appeal by the owner of a patent in reexamination proceedings to the U.S. Court of Customs and Patent Appeals. Four comments were received relating to § 1.301. One person suggested the insertion of "any" as the fourth word in the section. This suggestion was adopted. The other three comments related to appeals in inter partes protest proceedings which are not a part of this promulgation. Section 1.301 is adopted as proposed with only the above mentioned change.

Section 1.303, as amended, provides for remedy by civil action under 35 U.S.C. 145 for the owner of a patent in reexamination proceedings. No comments were received concerning this section. The changes from the proposal are the insertion of "any" as the fourth word in the section as suggested in § 1.301 and the addition of, "306" to the title.

New § 1.501 provides a system for citation of patents and printed publications to the Patent and Trademark Office for placement in the patent file by any person during the period of enforceability of the patent in accordance with 35 U.S.C. 301. Seventeen persons commented on § 1.501. Nine comments indicated that citations should be limited to patents or printed publications. Six comments indicated that persons citing art should be required to apply it to at least one claim. Three persons held the opposite view. The final rule wording provides for citations limited to patents and printed publications where the person making the citation states the pertinency and applicability of the citation to the patent and the bearing the citation has on the patentability of at least one claim of the patent. The final rule provides that a citation made by the patent owner may include an explanation of how the claims differ from the prior art cited. Any citations which include items other than patents and printed publications will not be entered in the patent file. This does not, of course, limit in any manner the kinds and types of information which can be relied upon in protests against pending patent applications, whether such be original applications or reissue applications. Four persons stated that a separate letter requesting confidentiality should be required in cases desiring confidentiality. This provision was not considered to be necessary. One comment requested clarification of the term "period of enforceability of a patent." The meaning of this term appears to be clear since it includes any period for which recovery can be had for infringement. Under usual circumstances, this would be the term of the patent plus the six years provided by 35 U.S.C. 286. Five comments were received relating the paragraph (c) concerning service of citations on the patent owner. The wording has been clarified. A suggestion was made that prior art copies and translations of non-English documents be required. This suggestion was not adopted since such documents are not absolutely essential until a request for reexamination has been filed. However, if the person citing the patents or printed publications desires that they be considered in any subsequent reexamination proceedings, copies and any necessary English translation should be included with the citation. A proposal was also made to charge a fee to prevent harassment. This proposal was not adopted since the mere citation of prior art is not considered to constitute harassment. A suggestion was made to change the title of the section. This suggestion was adopted in slightly modified form.

New § 1.510 sets forth procedures for any person to request reexamination in accordance with 35 U.S.C. 302. Paragraph (a) of new § 1.510 limits the period for such request to the period of enforceability of the patent for which the request is filed and requires payment of the fee for requesting reexamination. Paragraph (b) of new § 1.510 indicates what each request for reexamination must include. Paragraph (c) of new § 1.510 indicates under which conditions a request for reexamination will be considered. Paragraph (d) of new § 1.510 indicates the date on which the entire fee is received will be considered to be the date of the request for reexamination. Upon reconsideration of the paragraph as proposed, it was considered more appropriate to base the filing date of the request for reexamination on the receipt of the fee for requesting reexamination rather than include other matters. Proposed paragraph (d) has been amended accordingly and is adopted. Paragraph (e) of new § 1.510 covers amendments which a patent owner can propose. Such amendments can accompany a request for reexamination by the patent owner. The paragraph, with changes in wording for clarity, is adopted as proposed. A new paragraph (f) was added to clarify that requests for reexamination may be filed by attorneys or agents on behalf of a requester. Nineteen persons commented on § 1.510. One person inquired as to whether confidential requests would be accepted. In response thereto, § 1.510 provides that any person may file a request for reexamination. That person's name will not be maintained in confidence. One suggestion was made to permit comment and rebuttal before the decision under § 1.515. No need for such a procedure is seen since the only question to be considered is whether or not a substantial new question of patentability has been raised. An opportunity for comment and rebuttal is provided after the issuance of the order. One comment was received which desired provision for supplemental requests at a reduced fee. This proposal was not adopted since it is felt that all requesters should share equally in the cost. One comment was received which proposed that duplicate copies of the request be filed in the Office so that one copy would be available for public inspection at all times. This proposal was not adopted since it would appear to create more problems than it would solve. One comment was received that only "readily available" translations should be required. It is felt that if a document is considered to be sufficiently pertinent to request reexamination, that an English translation should be provided to insure complete and proper consideration. A suggestion was made relating to paragraph (b)(5) that direct service be limited to registered patent attorneys. No need for such a restriction is seen. Various other comments relating to procedures were considered but were not adopted.

New § 1.515 relates to a determination as to whether the request has presented a substantial new question of patentability under 35 U.S.C. 303. Paragraph (a) of new § 1.515 requires that the determination be made within 3 months of the filing date of the request. Paragraph (b) of new § 1.515 refers to the refund provisions. Paragraph (c) of new § 1.515 provides for review by petition to the Commissioner of any decision refusing reexamination. Seven persons commented on § 1.515. Several comments were received suggesting that the term "reexamination" should be dropped before "examiner". This proposal was adopted. Several persons requested that all art cited in the patent file at the time of the order under § 1.525 be considered when deciding whether a substantial new question of patentability is presented in the request. This is possible under the provision of § 1.515(a) which permits "consideration of other patents or printed publications", but is not required insofar as prior art not relied upon in the request is concerned. One person suggested that "is" be changed to-affirms-in paragraph (c). This proposal has been adopted. One commentor questioned whether a right to review was available under paragraph (c) if reexamination was ordered. No right to review exists in such a case because all claims will be reviewed in view of all prior art during the reexamination under § 1.550.

New § 1.520 provides for reexamination at the initiative of the Commissioner under the provisions of the last sentence of paragraph (a) of 35 U.S.C. 303. Six persons commented on § 1.520. One comment was received that indicated that the section did not include a reference to patents "discovered by the Commissioner" which is contained in 35 U.S.C. 303(a). This phrase has been added to the rule. A request was made that the sentence Normally requests from outside-will not be considered." be deleted from the rule. The sentence is being retained since the rule wording provides an easy referene for Office policy. Two comments were received that indicated a desire to have any decisions not to reexamine in Commissioner initiated situations be made part of the patent file. This proposal was not adopted since the basis for not reexamining may involve many policy issues in addition to whether a substantial new question of patentability exists in the case. If all papers in such a case would be made part of a file, it may lead to conclusions that there are no new questions of patentability when this question may not have been addressed because the reexamination was not ordered for other reasons such as little or no interest in a patent about to expire. One comment stated that the section safeguards the rights of the patentee. The language referring to the designation and delegation of authority to appropriate Patent and Trademark Office officials is deleted as unnecessary since the Commissioner's authority to designate and delegate is implicit and understood.

New § 1.525 provides for ordering reexamination where a substantial new question of patentability has been found pursuant to §§ 1.515 or 1.520. Six comments were received relating to § 1.525. One comment was made that the attorney should be able to return notices to the sender if he is unable to contact the patent owner. This topic has not been added to the rules but will be handled on a case by case basis. One comment requested that the patent owner have the option to request that the reexamination be performed by an examiner (1) other than the original examiner, or (2) other than the examiner who issued the order. Comments were also received on both sides of the question as to whether the original examiner should conduct the reexamination. In response, it would appear to be inappropriate to allow an interested party to select the examiner. Under the section, the only limitation placed on the selection of the examiner by the Office is that the same examiner whose decision was reversed on petition ordinarily will not conduct the reexamination. Paragraph (b) has been changed to provide that the notices published in the *Official Gazette* will be considered to be constructive notice.

New § 1.530 relates to the statement and proposed amendments provided for in the second sentence of 35 U.S.C. 304. Amendments submitted by the patent owner cannot enlarge the scope of a claim in the patent. Amendments will not be effectively entered into the patent until the certificate under § 1.570 and 35 U.S.C. 307 is issued. Nine comments were received on § 1.530. Several persons felt that the patent owner should be allowed to comment before the decision under § 1.515 is made. Providing for such a comment would delay the decision under § 1.515 which must be made within three months following the filing date of the request. Further, no need is seen for a statement relating to whether a new question of patentability is present since the patent owner has the opportunity to address any issues of patentability only after the first Office action. One comment questioned whether paragraph (d) also related to the description. This paragraph has been amended to clarify the matter. One person questioned whether an amendment could be filed with a statement. Paragraph (b) clearly answers this question in the affirmative. Several comments requested more time than two months for the patent owner to file a statement. In reply, the law in section 304 indicates that a reasonable period of not less than two months be provided for the patent owner's statement. If the period is too short in particular situations, extensions of time can be requested. It is felt that two months should be retained in the rule in view of the "Special Dispatch" required in reexamination cases. The proposed second sentence of paragraph (b) has not been adopted since § 1.525(b) now provides for the publication of notices of the filing of all requests which are accompanied by the proper fee.

New § 1.535 provides for reply by the reexamination requester to the statement under § 1.530 of the patent owner and for service on the patent owner of any such reply. The last sentence of proposed § 1.540 has been added as the last sentence of § 1.535. Five persons commented on § 1.535. Four persons indicated that the requester should be given additional opportunity to comment. The reasons for the limited participation are that it is all that is required under the law, it prevents to a great degree, harassment of a patent owner, it results in a less expensive proceeding for all parties, and it results in an earlier conclusion of the proceedings.

New § 1.540 relates to the consideration of statements under § 1.530 and replies under § 1.535. One comment was received that the phrase "may result in their being refused" was worded too loosely. In the absence of any specific suggestion, the proposed wording is considered to be adequate and is adopted as proposed. In addition, it is appropriate that the Office retain discretion as to consideration in such cases.

New § 1.550 covers the basic items relating to the conduct of reexamination proceedings. These proceedings basically follow the same procedures used for examining patent applications. The patent owner will be required to serve the reexamination requester with any response by the patent owner to the Office, in order to remove the necessity of the requester having to continuously monitor the file wrapper. Fourteen persons commented on 1.550.

Several persons commented that they felt that at least some input by third parties should be permitted. Paragraph (e) has been revised to permit third party input up until the time of the order. Several comments were received that the periods for response should be extended to be similar to those in regular application Office actions. Although problems may arise in certain cases and extensions of time may be granted, it is felt that relatively short response times are necessary in order to process reexaminations with "special dispatch." A question was raised as to the effect of failure to respond to an Office action. Paragraph (d) has been amended to clarify this matter.

New § 1.552 covers the scope of reexamination in a reexamination proceeding. While it is not intended that the examiners will routinely complete a new search when conducting reexamination, the examiners will be free to, and will, very likely, conduct additional searches and cite and apply additional prior patents and publications when they consider it is appropriate and beneficial to do so. Insofar as the actual reexamination is concerned, the examination as to original patent claims is only on the basis of patents or printed publications. However, narrowed amended claims or new claims limited to the original disclosure will also be examined for compliance with other sections of the statute (35 U.S.C. 112 and 132) which are necessary in order to ensure that any amended or new claims are supported, valid, and do not introduce new matter. New § 1.552 also provides that questions relating to matters other than those identified in paragraphs (a) and (b) of the section would merely be noted by the examiner as being an open question in the record. Patent owners could then file a reissue application if they wish such questions to be resolved. Ten persons commented on § 1.552. Several persons commented that the question of fraud should be considered in reexamination proceedings. Comments were also received that the proceedings should be limited to patents and printed publications. The rules have been written to follow the statute which speaks only to reexamination based on patents and printed publications. Mixed comments were also received concerning the retention of the

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second sentence of paragraph (c). The paragraph is being adopted as proposed with the addition of a reference to the fact that the examiner will note the existence of unresolved questions in an Office action. In addition, the phrase "raised or" has been deleted from paragraph (c) as unnecessary.

New § 1.555 covers the duty of disclosure by a patent owner in a reexamination proceeding involving the owner's patent. Nine persons commented on § 1.555. Four persons supported placing a duty of disclosure on the patent owner. One comment was received that an oath or declaration be required of the patent owner in a reexamination so as to minimize the appearance and occurrence of any fraudulent acts and to emphasize the patentee's obligation of candor. While the suggestion for an oath or declaration has not been adopted, § 1.555 does place an obligation of candor on the patent owner insofar as bringing patents or printed publications to the attention of the Office is concerned. The necessity for an oath or declaration in addition to the obligation placed on the patent owner by § 1.555 is not apparent at this time. Accordingly, the suggestion has not been adopted. Two persons felt the duty of disclosure should apply to both the patent owner and requester. This proposal was not adopted since no sanction could be easily applied against the requester who violated such a rule. One person suggested broadening the duty requirements to include information in addition to patents and printed publications. Although such a practice may be desirable, no need is seen to require information under the reexamination rules which cannot be used during the reexamination. One person felt that there should be no duty of disclosure requirement in reexamination proceedings since the Office will be considering specific prior art and the presence or absence of other prior art does not seem terribly relevant. This suggestion was not adopted since the issue of patentability is not limited to the specific prior art presented and the duty to disclose is consistent with current practice under § 1.56. The section is adopted as proposed except for the indication that prior art statements should be filed in accordance with § 1.98. Also, the section has been divided into two sentences for clarity.

New § 1.560 relates to the conduct of interviews in reexamination proceedings. Seven comments were received directed to § 1.560. One comment requested elimination of interviews. This suggestion was not adopted since interviews have been found to be very helpful in resolving issues. Five comments were received which indicated that the requester should be permitted to attend all interviews. This suggestion was not adopted because of the otherwise ex parte nature of the examination. Two comments were received which indicated that interviews should be permitted before the first Office action. This suggestion was not adopted since such interviews would be held at a time when the Office has not yet taken a position on the allowability of the claims under reexamination. Section 1.560 is adopted as proposed.

New § 1.565 provides for the Commissioner to determine which, if any, proceedings should be stayed, consolidated, or suspended, if concurrent proceedings involving the patent under reexamination are instituted or in progress. Four comments were received concerning § 1.565. One comment pointed out the desirability of combining copending reexamination proceedings. This concept has been accepted and a new paragraph (c) has been added to cover this matter. Two comments voiced concern over the possibility of delay resulting from stayed, suspended or combined cases. Although some delay may result, it is felt that a resolution of all issues should occur at an earlier date. Decisions as to whether to delay or combine cases will be made on a case by case basis to minimize delays and to protect the interests of all parties concerned. One comment was made to allow the patent owner to comment prior to any decision to stay proceedings by the Commissioner. The desirability of such comment will be decided on a case by case basis and is not considered desirable for placement in the rules. The addition of paragraph (c) and the insertion of "is or" before "becomes" in the first sentence of paragraph (b) are the only changes from the proposed rule.

New § 1.570 concerns the issuance of the reexamination certificate under 35 U.S.C. 307 after conclusion of reexamination proceedings. The certificate will cancel any patent claims determined to be unpatentable, confirm any patent claims determined to be patentable, and incorporate into the patent any amended or new claim determined to be patentable. Three commentors mentioned § 1.570. Two persons questioned the statutory authority for paragraph (d). In response to the concern for statutory authority, it is the position of the Office that once all of the claims have been canceled from the patent, the patent ceases to be enforceable for any purpose. Accordingly, any pending reissue or other Office proceeding relating to a patent in which such a certificate has been issued will be terminated. This provides a degree of assurance to the public that patents with all the claims canceled via reexamination proceedings will not again be asserted. One commentor indicated that copies of the certificate should be part of subsequently sold copies of the patent. Such a practice is intended but is not being made part of the regulations.

Environmental, energy, and other consideration: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291.

[Text of adopted rules appears in 37 CFR. revised July 1, 1982.]

May 12, 1981.

RENE D. TEGTMEYER,
Acting Commissioner of Patents and Trademarks.

May 15, 1981.

ROBERT B. ELLERT,
Acting Assistant Secretary for Productivity, Technology, and Innovation.

[FR Doc. 81-16831 Filed 5-26-81; 8:45 am]

[1007 O.G. 30]

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(68) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 & 5
[Docket No. 21223-259]

Revision of Patent Procedure

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.

Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to implement the sections of Public Law 97-247 of 1982 which become effective on Feb. 27, 1983, and to make other miscellaneous changes. The other miscellaneous changes are being made to clarify and improve the rules where appropriate. The rulemaking also is amending Part 5 of 37 CFR to establish procedures for expediting the granting of a license under 35 U.S.C. 184 permitting the filing of a patent application in a foreign country.
Effective Date: Feb. 27, 1983.
For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: This rule change is designed primarily to 1) implement the changes in practice in the Patent and Trademark Office provided for in Public Law 97-247 enacted on Aug. 27, 1982; 2) clarify or rewrite certain rules; and 3) expedite the granting of licenses under 35 U.S.C. 184.

This rule change contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves.

Certain of the changes are housekeeping in nature.

A number of final rules have already been issued to implement Public Law 97-247. A final rule on "Revision of Patent and Trademark Fees" was published on July 30, 1982 at 47 FR 33086-33112 with corrections in the printing thereof being published on Aug. 4, 1982, at 47 FR 33688 and on Aug. 5, 1982, at 47 FR 33959. The final rule was also published in the *Official Gazette* on Aug. 10, 1982, at 1021 O.G. 19-94. A final rule relating to definitions of "independent inventor" and "nonprofit organizations" was published on Sept. 10, 1982 at 47 FR 40134-40140 and on Sept. 21, 1982 at 1022 O.G. 29-46. A

"Revision of Patent and Trademark Fees Confirmation" was published on Sept. 17, 1982 at 47 FR 41272-41283 and on Sept. 28, 1982 at 1022 O.G. 61-97. A final rule relating to the definition of "small business concern" was published on Sept. 30, 1982 at 47 FR 43272-43276 and on Oct. 19, 1982 at 1023 O.G. 23-29.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules:

Section 1.4

Section 1.4 is amended as proposed to add a reference to Subpart D relating to citation of prior art and reexamination.

Section 1.6

Section 1.6 is amended as proposed to insert "federal" before "holidays" in paragraphs 1.6(a)-(c) in accordance with § 21(b) of Title 35, United States Code, as amended by Public Law 97-247. New paragraph 1.6(d) will establish in the regulations a procedure under which papers and fees which could not be filed on a particular date because of an interruption or emergency in the United States Postal Service which is so designated by the Commissioner, may be promptly filed after the ending of such a designated interruption or emergency and be considered as having been filed on that particular date. Authority for such a practice is found in § 21(a) of Title 35, United States Code, as amended by Public Law 97-247.

Section 1.7

Section 1.7 is amended as proposed to insert "federal" before "holiday" in accordance with 35 U.S.C. 21(b), as amended by Public Law 97-247.

Section 1.8

Section 1.8 is amended to remove in paragraph 1.8(a) the references to §§ 3.55 and 4.23, which sections were removed from the rules by the rulemaking entitled "Revision of Patent and Trademark Fees" published in the Federal Register on September 10, 1982 at 47 Fed. Reg. 40134-40140. The change in paragraph 1.8(a)(i) results from the change made in § 111 of Title 35, United States Code, by Public Law 97-247. Under the revised rule, the certificate of mailing procedure would be available for filing patent oaths or declarations and filing fees. However, the certificate of mailing procedure could not be used for filing patent specifications and drawings to obtain a filing date. Such papers can be filed under new § 1.10. The final rule clarifies that each paper or fee filed under § 1.8 must include its own certificate of mailing. The proposed amendment to § 1.8(a)(viii) referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, has been adopted as a final rule as published on Oct. 26, 1982 at 47 FR 47380-47382 and therefore is not republished here.

Section 1.10

Section 1.10 is amended as proposed to provide a procedure for assigning the date on which any paper or fee is deposited as "Express Mail" with the United States Postal Service as the filing date of the paper or fee in the Patent and Trademark Office. Authority for the Commissioner to establish such a procedure is provided in § 21(a) of Title 35, United States Code, as amended by Public Law 97-247 for any paper or fee required to be filed in the Patent and Trademark Office. This procedure covers the filing of all documents, including patent and trademark applications, and fees since they are required to be filed in the Patent and Trademark Office for processing. Questions were raised during the public hearing and in the written comments regarding the authority of the Commissioner to promulgate § 1.10 insofar as it would provide for the use of "Express Mail" to file patent and trademark applications. The argument advanced was that the amendment of 35 U.S.C. 21(a) by Public Law 97-247 did not permit the Commissioner to adopt rules whereby "Express Mail" could be used to file patent and trademark applications since such applications are not papers or fees "required to be filed in the Patent and Trademark Office." It was urged that this language of 35 U.S.C. 21(a), in conjunction with amended 35 U.S.C. 111 which states that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office," prevents adoption of proposed § 1.10.

The arguments presented are not supported by the legislative history or by the literal language of the statute. Section 111 of Title 35, United States Code, before and after Public Law 97-247, requires patent applications to be made "in writing to the Commissioner." This is apparent from the first sentence of 35 U.S.C. 111 which provides that [a] pplication for patent shall be made. . .in writing to the Commissioner." Thus, one seeking a patent is "required" to make application for the same "in writing to the Commissioner." The written application clearly constitutes a "paper or fee required to be filed in the Patent and Trademark Office." Section 21(a) of Title 35, United States Code, authorizes the Commissioner to adopt rules whereby "any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." The authority provided by section 21(a) extends to "any paper or fee" to which the Commissioner, by an appropriate rulemaking, so extends it. The Commissioner can, therefore, by rule, establish that "any paper or fee," including a patent or trademark application, is "filed" or "received in the Patent and Trademark Office" when it is deposited with the United States Postal Service. The terms "filed" and "received" as used in 35 U.S.C. 21(a) and 111 can therefore be given the same meaning by an appropriate rulemaking by the Commissioner.

The legislative history, H.R. Rep. No. 542, 97th Cong., 2nd Sess. 8A (1982), clearly supports the interpretation set forth herein. In discussing new subsection (a) which has been added to section 21 of Title 35, United States Code, the Report emphasizes that the authority extends to "any paper or fee which is required to be filed" in the Patent and Trademark Office. The Report specifically states that the "requirements governing whether any given paper or fee may be given the filing date of the day on which it was . . . deposited with the United States Postal Service will be set forth in regulations established by the Commissioner." Clearly no restrictions were placed by the statute or the legislative history on the types of papers or fees which the Commissioner can consider as having been filed in the Patent and Trademark Office on the date of deposit with the United States Postal Service.

The new procedure, in paragraph 1.10(a), requires the use of the "Express Mail Post Office to Addressee" service of the United States Postal Service. This service provides for the use of a mailing label on which the Post Office clearly indicates the date on which it was deposited. Paragraph 1.10(b) requires (1) that the number of the "Express Mail" mailing label be placed on each paper or fee and (2) that a certificate of mailing by "Express Mail", signed by the person mailing the paper or fee, be included on each paper or fee and state the date of deposit as "Express Mail" in the United States Postal Service. The requirement that each paper or fee have the number of the "Express Mail" mailing label and the certificate of mailing by "Express Mail" included thereon is necessary so that the Patent and Trademark Office can verify when each paper or fee was filed if questions relating thereto arise. The number and certificate must be placed on each separate paper and each fee transmittal either directly on the document or by a separate paper firmly and securely attached thereto. It is not necessary that the number and certificate be placed on each page of a particular paper or fee transmittal. Merely placing the number and certificate in one prominent location on each separate paper or fee transmittal will be sufficient.

Under new paragraph 1.10(c), the Office will accord the paper or fee the date of deposit as "Express Mail" as the filing date without further proof unless a question is present regarding the date of mailing. If, however, more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date, or if other questions regarding the date of mailing are present, new paragraph 1.10(c) provides that the person mailing the paper or fee may be required to file (1) a copy of the "Express Mail" receipt showing the actual date of mailing and (2) a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement

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(oath or declaration) unless made by a person registered to practice before the Patent and Trademark Office.

The certificate of mailing procedure of § 1.8(a) continues to be available in addition to the proposed procedure under § 1.10. The final rule (§ 1.10) has been changed from that proposed to allow for a reasonable time between mailing and delivery rather than only for one day since actual delivery in one day is not always provided from all areas of the country. The final rule clarifies that each paper or fee must include its own certificate of mailing by "Express Mail." This rule is being promulgated at this time so that individuals who desire to use the service may do so after the effective date.

The "Express Mail" service is seen to be preferable to other types of postal services because a readily legible mailing date is provided to both the applicant and the Patent and Trademark Office on the "Express Mail" label. Also, the labels are of uniform size and can therefore be kept on file relatively easily by the Office, if such is determined to be necessary or desirable. Registered mail and certified mail, on the other hand, provide only a postmark for the mailing date when such mail arrives in the Patent and Trademark Office and such postmarks are often illegible. Also, such mail arrives in various size envelopes which do not easily lend themselves to being filed so that the postmark may be retained. Administrative burdens including lack of certainty of mailing date and storage are considered greater for registered or certified mail than for "Express Mail." The Patent and Trademark Office will monitor closely the use of "Express Mail" by the public and may reconsider permitting the use of other forms of service provided by the United States Postal Service.

Section 1.17

Section 1.17, paragraph (h), is amended as proposed to remove the reference to § 1.45 and add a reference to new § 1.48 relating to the correction of inventorship in patent applications.

Section 1.22

Section 1.22 is amended to recognize that filing dates may be assigned without payment of the basic filing fee as authorized by § 111 of Title 35, United States Code, as amended by Public Law 97-247. New paragraph 1.22(b) indicates that fees paid to the Office should be itemized in such a manner that the purpose for which the payment is submitted can be clearly determined by Office personnel for proper processing. The final rule includes clarification that it refers to patent and trademark fees and charges.

Section 1.24

Section 1.24 is amended as proposed to remove the reference to coupons in denominations of forty cents since coupons in this denomination are no longer necessary.

Section 1.41

Section 1.41 is amended as proposed to require in paragraph 1.14(a) that a patent be applied for in the name of the actual inventor or inventors and that the full names of the inventors be stated. Paragraph 1.41(b), as amended, clarifies the definition of the word "applicant". New paragraph 1.41(c) permits any person authorized by the applicant to file an application for patent in order to receive a filing date on behalf of the inventor or inventors, but the oath or declaration for the application must be made by all of the actual inventors in accordance with §§ 1.63 and 1.64. Under new paragraph 1.41(d), a showing may be required from the person initially filing an application that the filing was authorized.

Sections 1.42 and 1.43

Sections 1.42 and 1.43 are amended as proposed to remove the requirement that the legal representative sign the application papers in view of the changes in 35 U.S.C. 111, as amended by Public Law 97-247. The oath or declaration must still be signed. Several occurrences of the masculine gender in § 1.42 have been removed.

Section 1.45

Section 1.45 is amended as proposed to remove present paragraphs 1.45(b) and (c) in view of new § 1.48 and remove the requirement that joint inventors sign the application papers. The joint inventors are, however, still required to make the oath or declaration in accordance with new §§ 1.63 and 1.64.

Section 1.46

Section 1.46 is amended as proposed, with two commas being added for clarity, to permit anyone to file the application if authorized by the inventor or inventors or one of the persons mentioned in §§ 1.42, 1.43, or 1.47.

Section 1.47

Section 1.47 is amended as proposed to change the reference for the rule on oaths or declarations from § 1.65 to § 1.63.

Section 1.48

Section 1.48 adds a new section relating to correction of inventorship as authorized by § 116 of Title 35, United States Code, as amended by Public Law 97-247. Under § 1.48, if the correct inventor or inventors are not named in an application for patent, the application could be amended to name only the actual inventor or inventors so long as the error in the naming of the inventor or inventors occurred without any deceptive intention on the part of the actual inventor or inventors. Section 1.48 requires that the amendment be diligently made and be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by § 1.63; (3) the fee set forth in § 1.17(h); and (4) the written consent of any assignee. Correction will be permitted, if diligently requested, in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Office has the authority to substitute the true inventor for the erroneously named person. If deceptive intention was present on the part of other individuals substantively involved in the preparation or prosecution of the application their conduct will be considered and appropriate action taken under 37 CFR 1.56. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to different, but actual, joint inventors; conversions from erroneously identified joint inventors to different but actual, joint inventors; and conversions from erroneously identified joint inventors to a different, but actual, sole inventor will also be permitted. In each instance, however, the Office will have to be assured of the presence of innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting a substitution of a true inventor's name. The final rule language has been modified from that proposed to follow more precisely the language of the statute and the legislative history by permitting correction where the error occurred without any deceptive intention on the part of the actual inventor or inventors.

Section 1.51

Section 1.51 is amended to change the reference in paragraph (a)(2) to new § 1.63 for the requirements of an oath or declaration and to change paragraph (b) with regard to the required time for filing information disclosure statements. The final rule has been modified from that proposed by eliminating the word "material" before the "information disclosure statement" and the title has been changed to substitute "a complete" for "an" to be more precise.

Section 1.52

Section 1.52 is amended as proposed to revise paragraph 1.52(c) relating to interlineations, erasures, cancellations or other alterations in application papers to specify that such changes must be made before the signing of any accompanying

oath or declaration and should be dated and initialed or signed by the applicant on the same sheet of paper. Paragraph 1.52(c), as amended, prohibits making alterations in the application papers after the signing of an oath or declaration referring to such application papers. Under paragraph 1.52(c), as amended, amendments to application papers made after the signing of an oath or declaration referring to the application papers can only be made in the manner provided by §§ 1.121 and 1.123-1.125.

Section 1.53

Section 1.53 is amended to revise the title to indicate that the section, as amended, relates to application serial numbers, filing dates and completion of applications. Paragraph 1.53(a) indicates that a serial number is assigned to any filed application for identification purposes, even if the application is incomplete or informal. Paragraph 1.53(b) provides that a filing date is assigned to an application as of the date a specification containing a description and claim and any required drawing are filed in the Patent and Trademark Office. Although the filing fee and oath or declaration can be submitted later, no amendments can be made to the specification or drawings which will introduce new matter. This practice is authorized by 35 U.S.C. 111 as amended by Public Law 97-247. New paragraph 1.53(c) provides for notifying applicant of any application incomplete because the specification or drawing is missing and giving the applicant a time period to correct any omission. If the omission is not corrected within the time period given, the application will be returned or otherwise disposed of and a handling fee of $50.00 will be retained from any refund of a filing fee. New paragraph 1.53(d) provides that, where a filing date has been assigned to a filed specification and drawing, the applicant will be notified and be given a period of time in which to file the missing fee, oath or declaration and to pay the surcharge due. The time period the Office plans to set is one month from the date of notification by the Patent and Trademark Office, but in no case less than two months after the date of filing of the application. New paragraph 1.53(e) indicates that a patent application will not be forwarded for examination on the merits until all required parts have been received. New paragraph 1.53(f) indicates that international applications filed under the Patent Cooperation Treaty which designate the United States of America are considered to have a United States filing date under PCT Article 11(3), except as provided in 35 U.S.C. 102(e), on the date the requirements of PCT Article 11(1)(i) to (iii) are met. Paragraphs 1.53(b) and (c) have been modified from those proposed by changing the word "received"' to the word "filed." The word "receipt" in paragraph 1.53(c) has also been changed to "filing". These changes have been made to ensure that the language of § 1.53 cannot be considered to conflict with the use of "Express Mail" to file patent applications and obtain a filing date as of the date of deposit as "Express Mail" with the United States Postal Service.

Section 1.54

Section 1.54 is amended as proposed to designate the existing section as paragraph (a) and add a reference to § 1.53. Paragraph 1.54(b) is added to indicate that applicant will be informed of the serial number and filing date of the application.

Section 1.55

Section 1.55 is amended to limit the section to claims for foreign priority by removing paragraphs (a) and (d) and redesignating paragraphs (b) and (c) as paragraphs (a) and (b). Paragraph 1.55(a) is amended to change the reference from § 1.65 to new § 1.63. The final rule language includes a reference to 35 U.S.C. 172 which modifies 35 U.S.C. 119 for design patents.

Section 1.56

Section 1.56 is amended to revise paragraph (c) to remove reference to signing of the application but to add reference to signing of the oath or declaration pursuant to new § 1.63. Paragraph 1.56(c) has also been modified from that proposed to break it down into four items as suggested by a comment. Under paragraph 1.56(c), an application may be stricken from the files if an oath or declaration pursuant to § 1.63 is signed in blank, is signed without review of the oath or declaration by the person making the oath or declaration, or is signed without the review of the specification, including the claims, as required by § 1.63(b). Paragraph 1.56(c) also provides for an application to be stricken from the files if application papers filed in the Office are altered after the signing of an oath or declaration pursuant to § 1.63 referring to those application papers.

Section 1.57

Section 1.57 is removed as proposed since the requirements relating to applicant's signature to the oath or declaration of the application are adequately covered in other sections.

Section 1.59

Section 1.59 is rewritten as proposed to refer to and conform with the changes proposed in § 1.53.

Section 1.60

Section 1.60 is amended to require the applicant to supply a copy of the originally signed application in all cases where the § 1.60 filing procedure is used. The Office will no longer prepare copies. The Office, by a separate final rule, published at 47 F.R. 47242 on October 25, 1982, has adopted a new § 1.62 to provide for the filing of a file wrapper continuing application which greatly lessens the need for the Office to continue to prepare copies under § 1.60. The final rule language makes clear that the statement accompanying a true copy of the parent application must be a verified statement unless made by a person registered to practice before the Office.

Section 1.62

Section 1.62 is amended to avoid inconsistency with 35 U.S.C. 111 which becomes effective on February 27, 1983. 35 U.S.C. 111 as of that date permits filing dates to be granted to patent applications without receipt of the basic filing fee, or oath or declaration. Section 1.62 is therefore being amended to permit the granting of a filing date in accordance with § 111. This amendment of § 1.62 is necessary to ensure compliance with 35 U.S.C. 111. The Patent and Trademark Office finds that it would be impractical not to amend § 1.62 so as to grant a filing date in accordance with 35 U.S.C. 111 and not doing so might also be construed to prevent applicants from taking advantage of the provisions of 35 U.S.C. 111 authorizing the delay in the filing of the fee and oath or declaration. If § 1.62 is not amended in the manner set forth in this final rule, questions may be raised as to compliance with 35 U.S.C. 111 as it will exist effective February 27, 1983. Revised paragraph 1.62(a) indicates the minimum requirements for granting of a filing date. Paragraphs 1.62(b) and (c) cover the filing fee and oath or declaration requirements, respectively. Paragraph 1.62(d) relates to later filing of the filing fee or oath or declaration as provided for in 35 U.S.C. 111. Paragraphs 1.62(e)-(i) are identical to former paragraphs 1.62(b)-(f).

Section 1.63

Section 1.63 is added to replace 1.65 relating to the required content and execution of an oath or declaration filed as a part of a patent application and is intended to state the minimum contents thereof. An applicant may, if desired, choose to include one or more additional averments in the oath or declaration such as, for example, stating that the patent is not barred under the provisions of 35 U.S.C. 102. Paragraph 1.63(a) provides that the oath or declaration, (1) be executed in accordance with § 1.66 or § 1.68, (2) identify the specification to which it is directed in some definite manner such as giving the title of the invention or serial number of the application, if previously filed, (3) identify each inventor and his or her residence and country of citizenship, and (4) state whether the inventor is a sole or joint inventor of the claimed invention.

Paragraph 1.63(b) further requires the oath or declaration to state that the person signing the oath or declaration (1) has reviewed and understands the contents of the identified specification, (2) believes the named inventor is the original and the first inventor, and (3) acknowledges the duty to disclose infor-

mation which is material. While paragraph 1.63(b) requires the person signing the oath or declaration to review and understand the specification including the claims, it is not intended to require that such person be skilled in patent law so as to grasp the legal implications of claim language and drafting. The person must recognize, however, that what is being claimed is the subject matter which that person regards as his or her invention pursuant to 35 U.S.C. 112.

Paragraph 1.63(c) requires that any application in which a claim for foreign priority is made identify in the oath or declaration the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed.

Paragraph 1.63(d) requires that the oath or declaration in a continuation-in-part application, which discloses and claims subject matter in addition to that disclosed in the prior copending application, state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in § 1.56(a) which occurred between the filing date of the parent application and the national or PCT international filing date of the continuation-in-part application. This latter requirement is not new, but is included to serve as a reminder to the person making the oath or declaration of this duty to disclose material information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the continuation-in-part application. For example, in circumstances where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120, the duty to disclose extends to any material information, as defined in § 1.56(a) measured from the filing date of the continuation-in-part application. This would include the first foreign patenting, and any foreign patenting subsequent to the first which materially differs therefrom, of the subject matter of the parent application which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application. Any publication of the parent application, other than foreign patenting, or any public use or sale in the United States of the subject matter of the prior application, which occurred more than one year prior to the national or PCT international filing date of the continuation-in-part application, would also come within § 1.56(a) in such circumstances. See *In re Ruscetta and Jenny*, 118 U.S.P.Q. 101 (C.C.P.A. 1958); *In re van Langenhoven*, 458 F. 2d 132, 173 U.S.P.Q. 426 (C.C.P.A. 1972), and *Chromalloy American Corp. v. Alloy Surfaces, Co., Inc.*, 339 F. Supp. 859, 173 U.S.P.Q. 295 (Del. 1972).

Section 1.64

Section 1.64 is added as proposed to clearly indicate who must sign the oath or declaration of a patent application.

Section 1.65

Section 1.65 is removed as proposed because the oath or declaration requirements set forth therein are covered by new § 1.63.

Section 1.67

Section 1.67 is amended as proposed to remove all of paragraphs (a) and (b) and substitute therefor new wording. Paragraph 1.67(a) indicates that a supplemental oath or declaration meeting the requirements of new § 1.63 may be required to correct deficiencies or inaccuracies present in an earlier oath or declaration. Paragraph 1.67(b) requires a supplemental oath or declaration to be filed (1) when a claim is presented embracing material not originally claimed and (2) when a subsequently filed oath or declaration under § 1.53(d) refers to an amendment which includes improper new matter. Paragraph 1.67(b) also clearly states the prohibition against entry of new matter after the filing date of the application.

Section 1.69

Section 1.69, paragraph (b), is amended as proposed to change the time at which a translation of a non-English language oath or declaration which has not been supplied by the Office must be filed. The time period for filing the translation is changed to two months after notification that a translation is required. The reference to § 1.65 in paragraph 1.69(b) is changed to § 1.63.

Section 1.70

Section 1.70 is amended to refer to § 1.63 for the requirements to be met when an oath or declaration is filed under 35 U.S.C. 371(c)(4). The wording of the title in the final rule is changed to reflect more clearly the subject matter of the rule.

Section 1.77

Section 1.77 is amended as proposed to change paragraphs (h) and (i) to refer to the abstract of the disclosure and signed oath or declaration, respectively.

Section 1.97

Section 1.97 is amended to change the title from "prior art statement" to "information disclosure statement". This change is appropriate since the designation "information disclosure statement" more accurately characterizes the nature and content of the information which may be included in such a statement. Information which is required to be submitted pursuant to § 1.56 may ultimately be determined not to be "prior art," but nevertheless may be "material" pursuant to § 1.56. Section 1.97 has also been modified from that proposed by eliminating the word "material" since information submitted pursuant to § 1.97 may be considered to be of questionable materiality or may be determined, upon examination, not to be "material". Section 1.97 now provides that an information disclosure statement should be filed with the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. Paragraph 1.97(b) has been amended in recognition that applicant may choose to furnish other material information in another manner or statement. Paragraph 1.97(b) now also refers to section 1.56(a) for the definition of "material information". The amendments to paragraph 1.97(b) do not in any manner reduce the obligation to submit material information as defined in § 1.56(a).

Section 1.98

Section 1.98 indicates that information disclosure statements should list prior art with all of the information which is required to print such citations on the front page of a patent. The final rule states clearly that the publication date indicated on the document should be submitted. This will not serve to preclude a showing of a different, actual publication date. Another purpose of the citation requirements in this section is to permit ready reference to the document from its citation.

Section 1.99

Section 1.99 is amended to change the title to be consistent with the amendment to § 1.97.

Section 1.101

Section 1.101 is amended to indicate specifically that applications which are to have their examination advanced pursuant to § 1.102 will be taken up for examination out of order by the examiner. The final rule is also modified to set out when international applications which have complied with the requirements of 35 U.S.C. 371(c) are taken up for action.

Section 1.118

Section 1.118 is amended as proposed to designate the previous section as new paragraph (a) and amend it to clearly state that no new matter may be introduced into an application and to make specific reference to §§ 1.53, 1.63 and 1.67. New paragraph 1.118(b) indicates how improper amendments which introduce new matter in the specification or claims will be handled by the examiner.

Section 1.123

Section 1.123 is amended to require all corrections to drawings to be made by bonded draftsmen at applicant's expense since the Office does not have sufficient draftsmen to make such corrections. Sketches of any desired corrections will, however, still require approval of the examiner. The final rule makes clear that changes in the drawing may be made by submission of substitute drawings.

Section 1.125

Section 1.125 is amended to relax the prohibition against substitute specifications which are not required by the examiner. The section, however, adds the requirement that any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Under the section the statement must be a verified statement if made by a person not registered to practice before the Office. The final rule specifies that a substitute specification may not be accepted unless it is clear to the examiner that processing of the application would be facilitated thereby.

Section 1.131

Section 1.131 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent as long as the patent upon which the rejection is based does not claim the rejected invention. Section 1.131 cannot be used to overcome a rejection based upon a United States patent claiming the rejected invention. This is true regardless of whether the rejected claims are contained in an application being examined or a patent being reexamined. Section 1.131 is inapplicable if the same invention is being claimed by the United States patent upon which the rejection is based. Under the section as amended, the same person or persons who would make the affidavit or declaration in an application will be required to make the affidavit or declaration on behalf of the owner of the patent under reexamination.

Section 1.132

Section 1.132 is amended as proposed to refer to the use of affidavits or declarations under the section during reexamination of a patent.

Section 1.137

Section 1.137 is amended as proposed to except from the provisions of paragraph (b) those applications abandoned pursuant to § 1.53(d) because the fee, oath, or declaration and the surcharge were not submitted. Section 111 of Title 35, United States Code, as amended by Public Law 97-247, requires that any delay in submission of the fee and oath be shown to be unavoidable. Thus, paragraph (b) of § 1.137 permitting revival where abandonment was unintentional is inapplicable to the revival of applications which become abandoned pursuant to § 1.53(d).

Section 1.141

The proposed amendments to § 1.141 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 1.153

Section 1.153 is amended to change the reference for oath and declaration requirements from § 1.65 to § 1.63 and to conform the language of the rule to be consistent therewith.

Section 1.154

Section 1.154 is amended as proposed to revise paragraph (e) to refer to the signed oath or declaration requirements of § 1.153(b).

Section 1.162

Section 1.162 is amended as proposed to change the reference from § 1.65 to § 1.63.

Section 1.163

Section 1.163 is amended as proposed to change the wording of the section to clearly indicate that a signed oath or declaration is required rather than a signed specification.

Section 1.172

Section 1.172 is amended to indicate clearly that the reissue oath is signed and sworn to rather than the reissue application. The final rule has been modified from that proposed by referring to a "reissue oath" rather than to "reissue oaths".

Section 1.174

Section 1.174 is amended as proposed to remove the requirement that photoprints of original drawings be securely mounted or pasted on sheets of drawing board because paper drawings are acceptable.

Section 1.175

Section 1.175 is amended as proposed to change the reference to the oath or declaration from § 1.65 to § 1.63.

Sections 1.301, 1.302 and 1.303

The proposed amendments to sections 1.301, 1.302 and 1.303, referring to the Court of Appeals for the Federal Circuit rather than to the Court of Customs and Patent Appeals, have been adopted as final rules as published on Oct. 26, 1982 at 47 FR 47380-47382 and corrected on Nov. 5, 1982 at 47 FR 50142 and therefore are not republished here.

Section 1.324

Section 1.324 is amended to include wording similar to that in § 1.48 for correction of inventorship in applications.

Section 1.325

Section 1.325 is amended as proposed to include reference to the reexamination procedure.

Section 1.335

Section 1.335 is added as proposed to provide a new section relating to the filing in the Patent and Trademark Office of notices of arbitration awards. Such filing is required under § 294 of Title 35, United States Code, as added by Public Law 97-247. The final rule has also been modified in response to a comment to indicate that the notices of arbitration awards are intended to be placed in the patent files.

Section 1.565

The proposed amendments to § 1.565 are withdrawn infra to permit the public to study the issues involved and make any further recommendations considered appropriate.

Section 5.12

Section 5.12 is amended as proposed to separate the section into two paragraphs. Paragraph (a) provides that the filing of an application for an invention made in the United States is considered to include a petition for a license for foreign filing. If a license is granted, it will be indicated on the filing receipt. If it is not granted, no indication of the denial will appear. Failure to grant a license should be considered a denial of a first petition for a license. A subsequent petition may be filed under § 5.12(b). Section 5.12(b) is essentially the text of § 5.12 in its previous form. No rights to file a petition for license are being removed.

Withdrawal of Proposed Amendments To Sections 1.141 and 1.565.

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A number of the speakers at the public hearing held on Dec. 16, 1982, urged that the amendments to §§ 1.141 and 1.565 be deferred or dropped pending further study. Those urging that the proposed amendments to § 1.141 not be adopted at this time included speakers from the American Patent Law Association, from Committee 103 of the American Bar Associations's Patent, Trademark & Copyright Section, and from the Bar Association of the District of Columbia. The Boston Patent Law Association urged that the amendment to § 1.565 be removed or held in abeyance. The American Patent Law Association indicated that more time was needed for its committees to analyze the issues in the proposed amendments to §§ 1.141 and 1.565.

In response to the recommendations received at the public hearing, the proposed amendments to §§ 1.141 and 1.565 are being withdrawn at this time to permit the public to study the issues involved and make any further recommendations considered appropriate. Pending the further study referred to by the speakers at the hearing and consideration of any recommendations resulting therefrom, the Office will continue to operate under present §§ 1.141 and 1.565 as interpreted by the Manual of Patent Examining Procedure and relevant Patent and Trademark Office and judicial precedents.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony, were considered in adopting the changes set forth herein.

Forty-eight letters presenting written comments were received and seven persons testified at the public hearing on Dec. 16, 1982.

Comments appear below along with responses thereto.

Comment:

One comment objected to inadequate notice regarding these proposed rule changes.

Reply:

The proposed rules notice was published in the *Federal Register* on Oct. 27, 1982. This is more than seven weeks prior to the date of the hearing and four months prior to the effective date of the final rules. Such periods are considered to be reasonable in view of the fact that the legislation requiring the rule changes was only enacted on Aug. 27, 1982 and that other rule changes were required to be implemented by Oct. 1, 1982.

Comment:

One comment proposed that "Patent and Trademark Office" should be used in the rules rather than merely "Office".

Reply:

The proposal has been adopted in the final rules in those locations where confusion may otherwise result.

Comment:

Five comments requested that promulgation of §§ 1.10, 1.63, 1.97, 1.141 and 1.565(e) be delayed and the period for comment extended until Mar. 30, 1983.

Reply:

Amendments to §§ 1.141 and 1.565 are not being promulgated at this time to provide time for further consideration and study as requested. If after study, a rule change is felt desirable, a new proposal will be issued. New § 1.10 is being promulgated to make it available to applicants as it was intended in the statute. New § 1.63 is being added and § 1.65 deleted to reduce the formal statements required. If desired, the old oath and declaration forms may continue to be used if the statement is included that applicant "has reviewed and understands the contents of the specification, including the claims". For continuation-in-part applications, it is necessary to also include language is conformance with § 1.63(d). Section 1.97 is being promulgated to remove problems relating to the time period in the current wording and to clarify the section in general.

Comment:

One person questioned why Sunday was not mentioned in § 1.6(b) or (c).

Reply:

Section 1.6(b) and (c) are limited to weekdays which by definition excludes Sunday.

Comment:

Two comments were received which proposed that only a certificate of mailing procedure as in § 1.8(a) be used for determining the date of deposit under 35 U.S.C. 21.

Reply:

The filing date of an application is considered to be much more critical than the filing dates of papers accepted under § 1.8. The application filing date is often critical for determining if a statutory bar exists, whether foreign priority can be claimed and who is the senior party in an interference. Therefore, papers filed for purposes of receiving an application filing date should have some clear indication of the date of receipt by the United States Postal Service. Such a practice would also probably require storing all of the envelopes in the file wrapper for record purposes.

Comment:

Three comments were received which stated that private courier services should also be provided for in § 1.10.

Reply:

Section 21(a) as amended by Public Law 97-247 provides for filing dates being given only when "deposited with the United States Postal Service." Although private courier services may be used to deliver papers to the Patent and Trademark Office, the actual date of receipt by the Patent and Trademark Office will be considered to be the filing date.

Comment:

A comment was received which argued that the Post Office date stamp should be stamped on the mailing label instead of having to enter the label number on each document.

Reply:

Stamping the mailing label would not add anything since the postal clerk receiving the "Express Mail" must already indicate the date and time of deposit and initial the label. A purpose of placing the label number on each paper is to permit several papers to be placed in a single envelope. The mailing labels may be retained in the Patent and Trademark Office for later verification.

Comment:

Seven comments were received that the requirement that the item be received the following day (§ 1.10(b)) was unnecessarily restrictive.

Reply:

Section 1.10 does not require that the item be received the next day in the Patent and Trademark Office in order to receive the date of deposit as the mailing date. The one day reference has been deleted. Further proof of mailing may be required where an unreasonable period of time is involved and supporting evidence is not otherwise available to the Patent and Trademark Office. Documents deposited with the United States Postal Service will be given a filing date which corresponds to the date of receipt indicated by the postal clerk on the "Express Mail" mailing label.

Comment:

Four comments indicated that § 1.10 does not assist in placing applicants and attorneys outside the Washington area on the same footing as those in Washington.

Reply:

The main purpose of § 1.10 is to implement 35 U.S.C. 21(a) in a manner which would provide for granting filing dates for papers and fees as of the date of their deposit with the United States Postal Service. Certainly these provisions using "Express Mail," together with the certificate of mailing procedure available under § 1.8, will go a long way in reducing last minute deliveries to the Patent and Trademark Office by persons outside the Washington area.

Comment:

Two comments stated that the comments accompanying § 1.10(c) should be clarified to explain the meaning of "more than one day."

Reply:

The final rule has been clarified.

Comment:

It was proposed by one person that the "affidavit or declaration" under § 1.10(c) be waived if the statement is made by a registered attorney or agent.

Reply:

The suggestion has been adopted.

Comment:

It was indicated by one person that certified mail provides proof of mailing date under § 1.10 by virtue of the Post Office stamp on the certified mail receipt card.

Reply:

The information on the certified mail receipt card is of no benefit to the Patent and Trademark Office since it is immediately returned to the sender. The Patent and Trademark Office would not be able to retain any information which gives proof of the date of mailing.

Comment:

Three comments raised questions as to the need to make the acceptance of the "Express Mail" contingent upon the performance of the Post Office in § 1.10(c).

Reply:

The acceptance of the "Express Mail" is not contingent upon "next day delivery". The reference in § 1.10(c) to proof of mailing merely provides a basis for the Office requiring proof of mailing where an explanation appears to be necessary to clarify the record. Such information is expected to be required only in a few instances. The rule has also been revised to clarify this matter.

Comment:

Five persons suggested the use of registered or certified U.S. mail for obtaining filing dates under 35 U.S.C. 21.

Reply:

Registered mail does not provide any information or evidence to the Patent and Trademark Office as to the date of mailing other than the postmark, which is often unreadable. Storage of envelopes containing such postmarks is also burdensome. The deficiency of certified mail has already been discussed.

Comment:

One person questioned what treatment will be accorded a paper placed in an "Express Mail" box receptacle after the box has been cleared for the last time on a given day.

Reply:

The paper will be considered to be deposited as of the date of receipt indicated on the "Express Mail" mailing label by the Postal Service clerk.

Comment:

One person commented that he found the idea of using a declaration or affidavit to establish a date of deposit unacceptable because it exposes the integrity of the assignment of filing dates to the risk of deception.

Reply:

The use of declarations or affidavits is usually intended to help explain activities which can be supported by exhibits. For example, if the Office copy of the mailing label was not entirely readable, applicant's copy of the "Express Mail" mailing label could accompany a declaration and serve as the basis for granting a filing date.

Comment:

Three persons objected to permitting only the individual who places the correspondence in an "Express Mail" facility to execute the certificate of express mailing under § 1.10(c).

Reply:

The wording of § 1.10(c) differs from § 1.8 because the documents which are expected to be filed under § 1.10 are patent and trademark applications. The filing dates of such documents are very important and should therefore be based on personal knowledge.

Comment:

One comment was received which suggested that § 1.10 be adopted with an effective date retroactive to a year earlier.

Reply:

Such an earlier date is not possible since the statutory authority for § 1.10 does not come into effect until Feb. 27, 1983.

Comment:

One comment proposed designating the Patent and Trademark Office as an "Express Mail" Post Office to make lower rates available.

Reply:

Such a designation is not possible.

Comment:

One person requested that the Patent and Trademark Office publish a form of certificate of mailing by "Express Mail" suitable for purposes of § 1.10(b).

Reply:

A suggested form is included in the preamble of this rule change.

Comment:

One comment proposed that § 1.10(c) clearly state what evidence will be necessary and sufficient to prove a filing date by mailing.

Reply:

A specific answer cannot be given since it is dependent upon the particular fact situation and what evidence is actually available.

Comment:

Two comments questioned whether P.L. 97-247 authorized a rule such as § 1.10 granting filing dates as of the mailing date.

Reply:

The question raised by this comment has been treated in the discussion of § 1.10 supra.

Comment:

One comment proposed that § 1.10 be corrected to read- Any paper or fee *required* be filed- to more closely conform with 35 U.S.C. 21(a).

Reply:

No need is seen to change § 1.10 as suggested since, if a patent is desired, it is "required" that each paper relating to an application be filed in the Patent and Trademark Office.

Comment:

One comment indicated that the requirement to place the "Express Mail" label number on each paper and fee is not realistic.

Reply:

The placement of the label number on each paper or fee allows later verification of the mailing dates of all different papers mailed in one envelope and is not seen to be overly burdensome.

Comment:

A question was raised as to whether the "Express Mail" label number should be placed on every page.

Reply:

The label number need not be placed on each page. It should, however, be placed on the first page of each separate document, such as, a new application, amendment, assignment, and transmittal letter for a fee, along with the certificate of mailing by "Express Mail". Although the label number may be on checks, such a practice is not required.

Comment:

A question was raised by one party as to the location within the Patent and Trademark Office of the mailing labels where papers to different applications are placed in the same envelope.

Reply:

The mailing labels from all "Express Mail" packages are expected to be removed and initially retained centrally in the Mail Room of the Patent and Trademark Office. The number on each document will allow direct access to the appropriate mailing label if any questions should arise.

Comment:

One comment suggested that § 1.22(b) be amended to exclude itemization of all fees where a general authorization to charge a deposit account has been given.

Reply:

Even where fees are charged to a deposit account, it is desirable to know specifically which fees are to be paid. Therefore, the suggestion has not been adopted.

Comment:

One comment was received which suggested adding a sentence to § 1.41(d) indicating that the filing of an oath or declaration executed by the applicant would constitute proof of authority to file the application.

Reply:

Such an additional sentence is not considered to be necessary since the Patent and Trademark Office does not intend to utilize the provisions of § 1.41(d) unless a controversy arises.

Comment:

One comment was received which suggested the addition to the end of § 1.42 of the words "except for patents granted to the assignee either of the inventor or of the legal representative of the inventor."

Reply:

No change is considered to be necessary since few, if any, problems have arisen without such additional wording in the past. The existing rule wording "upon proper intervention" also provides protection for assignees.

Comment:

One comment was received which indicated that § 1.46 does not clearly authorize an assignee of a part interest to cause an

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application to be placed on file.
Reply:
Although § 1.46 may not make this point clear, it is clear from § 1.41(c).
Comment:
One comment recommended that the requirement to show diligence in correcting inventorship under § 1.48 be deleted.
Reply:
It is felt that corrections of inventorship should be diligently made in patent applications. The naming of correct inventorship is necessary for the Patent and Trademark Office to make decisions on topics such as double patenting, priority claims and first inventorship.
Comment:
It was recommended in one comment that the verified statement of facts required by § 1.48 "by the original named inventor or inventors" be replaced by a requirement that he or they merely assent to the statement of the facts since others may be better able to provide the best evidence.
Reply:
Since it is the original inventorship that is being changed, it is believed that all of the previously named inventors should positively indicate their agreement with the facts in the case. Affidavits by other individuals may also be supplied where such persons have direct personal knowledge of certain aspects of the case.
Comment:
One comment indicated that "it seems a reasonable presumption that if ownership is unaffected, deceptive intent is absent" in a § 1.48 correction of inventorship situation and that such a presumption could be written into the rules.
Reply:
Even if applications are commonly owned, the wrong inventorship could be deceptively named to obtain rights which are only available to the same inventive entities. The report on Public Law 97-247 also states that "the commissioner must be assured of the presence of innocent error, without deceptive intention..." before permitting a substitution of a true inventor's name.
Comment:
One person suggested that the deceptive intent in § 1.48 refer to the acts of the actual inventors rather than to both the alleged and actual inventor or inventors.
Reply:
This suggestion has been adopted in both §§ 1.48 and 1.324, but deceptive intention on the part of other parties is subject to review under § 1.56.
Comment:
One person suggested that in § 1.48, line 3 "may" be changed to-must- .
Reply:
The suggestion has not been adopted. Corrections may only be made if the conditions set forth in § 1.48 are satisfied.
Comment:
Two comments objected to the insertion of "material" in § 1.51(b).
Reply:
This word has been removed and does not appear in the final rule.
Comment:
One comment suggested changing "an" to-a complete-in the title of § 1.51.
Reply:
This suggestion has been adopted.
Comment:
One comment indicated that §§ 1.52(c) and 1.56(c) seemed overly inflexible and harsh when considering minor grammatical changes.
Reply:
Although § 1.56 indicates that applications "may" be stricken, rather than "must"be stricken, it is stillconsidered important to maintain a clear line in the regulations against changes in the original applications made after the execution of the application oath or declaration. The line between grammatical changes and changes relating to the merits is frequently unclear.
Comment:
Three comments noted an apparent inconsistency between proposed §§ 1.10 and 1.53 as to whether § 1.10 relates to the filing of patent applications.
Reply:
Section 1.10 does relate to the filing of patent applications. In order to clarify the wording, "received" in § 1.53(b) has been changed to "filed".
Comment:
One comment was received suggesting that a sentence be added to § 1.53(d) to indicate that PCT applicants cannot submit late filing fees, oaths or declarations under 35 U.S.C. 371.
Reply:
Such a reference in § 1.53 does not appear appropriate because this section relates to "filing dates". In the PCT situation, the filing date was already granted at the time of filing the PCT international application.
Comment:
One comment was received which suggested that § 1.53(a) be rewritten to indicate all applications are assigned serial numbers but not accorded filing dates.
Reply:
The proposal was not adopted since it is considered unnecessary.
Comment:
One person suggested that § 1.53(b) be amended to specify that only "a specification *purporting* to contain a description and at least one claim . . ." is needed to obtain a filing date.
Reply:
No change is being made since a determination must be initially made as to whether or not a specification has been filed. In any case, sufficiency of the specification must later be checked by the examiner.
Comment:
One person indicated that the time period for filing a correction to a defect in an application is left entirely within the discretion of the Commissioner and that any setting of periods of time would be tantamount to an exercise of rulemaking authority. Section 1.53(d) should be provided with an explicit time limitation.
Reply:
No specific time period is considered to be necessary in the regulations. The Commissioner has full authority and discretion under the statute in 35 U.S.C. 111 to set periods of time. The statute does not require the Commissioner to use the rulemaking process to set time periods for response to an action or requirement by the Patent and Trademark Office in a patent application.
Comment:
Two comments were received objecting to the use of the words "or otherwise disposed of" in § 1.53(c).
Reply:
This wording has existed in § 1.53(b) in the past without objection. No need is seen to depart from this wording at this time.
Comment:
One person questioned whether the change in § 1.54(b) would result in return post cards not being stamped with the application serial number.
Reply:
No change is intended in the existing return post card practice.
Comment:
One comment proposed adding another sentence to § 1.154(b) indicating that foreign priority claims will be acknowledged on the filing receipt.
Reply:
This proposal is not being adopted since the examiner must determine whether the statutory requirements of 35 U.S.C. 119 have been met before an acknowledgment can be sent.
Comment:
One comment suggested that the Patent and Trademark Office indicate on the filing receipt both the filing date under 1.10 and the actual date of receipt.
Reply:
The actual date of receipt can be obtained by requesting a receipt from the Postal Service. The actual date of receipt cannot be placed on the filing receipt because of current computer limitations. The suggestion is therefore not being adopted at this time.
Comment:
One comment was received indicating that it is not clear whether or not an application based on a specification and drawing, but containing no oath or declaration or filing fee, could serve as the basis for a priority claim under 35 U.S.C. 120.
Reply:
If the filed specification and drawings fully disclose the invention as required by 35 U.S.C. 112, the application may serve as a basis for a priority claim under § 120 even if no oath or declaration, or no fee has been filed, as long as the continuing application is filed prior to the abandonment of the first application under § 1.53(d).
Comment:
One comment suggested that § 1.55(b) be removed since the requirements of the statute are fully set forth in 35 U.S.C. 119.
Reply:
Although the statutory requirements set forth basic requirements, it is felt that the more specific details of § 1.55(b) provide needed guidance for applicants.
Comment:
Two persons questioned the meaning of "inspection and review" in § 1.56(c) and suggested certain amendments.
Reply:
The words "inspection and" are being removed to eliminate any redundancy. The paragraph has also been broken down into four items as proposed by a comment.
Comment:
One suggestion was made that applicant be allowed to order a copy of the parent patent, with payment of fee, when filing a § 1.60 application.
Reply:
Such a practice is contrary to the intent of the rule change. The problems the Patent and Trademark Office is attempting to solve by the change, which are caused by poor copies and delays in processing, would remain with such a practice.
Comment:
Two persons suggested that § 1.60 be amended to drop "and claimed" from the title.
Reply:
The suggestion has been adopted.
Comment:
One person suggested that § 1.60 be modified to drop the requirement for verification by affidavit when the statement is made by a registered patent attorney or agent.
Reply:
The suggestion has been adopted.
Comment:
One comment noted that there is no specific requirement in § 1.56, 1.63 or 1.98 to identify foreign applications filed more than one year prior to the U.S. filing date.
Reply:
Section 1.63(b)(3) broadly requires applicant to acknowledge the duty to disclose information material to the examination of the application. This information includes foreign patents based on applications filed more than a year prior to the filing date of the United States application and which issue before the filing date of the United States application.
Comment:
One person felt that § 1.63(b)(1) will be a disaster for the patent system since the inventor may not be physically able to review and understand the invention or because the legal language format used in claims may not be understood by the inventor. Five persons argued that adoption of § 1.63 would result in raising the defense that the inventor did not understand the claims in each patent infringement suit.
Reply:
The inventor is not expected to understand all the legal interpretations or limitations in a claim. The inventor is expected to recognize that what is being claimed is the subject matter which the inventor regards as his or her invention pursuant to 35 U.S.C. 112. The physical factors have to some extent existed in past practice and have been handled on a case-by-case basis where necessary. The situation outlined would exist in any signing of a legal document. The wording of § 1.63 has been explained in the preamble to minimize occurrences of problems.
Comment:
One comment noted that many inventors do not know whether additional subject matter is claimed in a continuation-in-part application under § 1.63(d).
Reply:
The wording in § 1.63(d) is considered to be appropriate and in accordance with case law. If uncertainty exists the attorney or agent, if any, should clarify the matter and § 1.63(d) should be followed.
Comment:
One person proposed that § 1.63(d) be modified to explicitly require the disclosure of foreign patents granted before the filing of the continuation-in-part application.
Reply:
Section 1.63(d) has been amended to clearly indicate that material information pursuant to § 1.56(a) between the filing date of the parent application and the filing date of the continuation-in-part application must be disclosed. The discussion of new § 1.63 refers to material foreign patents published during this time interval.
Comment:
Two comments indicated concern with the parenthetical language in proposed § 1.63(d) in that it would create severe problems.
Reply:
Paragraph (d) of § 1.63 has been amended to remove such problems.
Comment:
One comment suggested adding he or she is aware of after information in § 1.63(b)(3) and (d).
Reply:
This suggestion is not adopted since such wording is already present in § 1.56(a).
Comment:
One comment suggested that § 1.63(c) clarify what is intended by "the first filed foreign application," particularly in view of 35 U.S.C. 119, third paragraph.
Reply:
The rule has been amended to clarify the matter.
Comment:
One comment was received suggesting changes be made in the title and that paragraph (b) of § 1.70 refer to § 1.63 instead of "this section."
Reply:
The change suggested to the title has been made. The suggestion to paragraph (b) has not been made since it is considered unnecessary.
Comment:
Three comments were received which indicated that the wording of § 1.97(a) would require an immediate filing of disclosure information if the filing receipt is received just before three months after filing.
Reply:
The wording of § 1.97(a) has been changed to remove this problem.
Comment:
One comment was received which urged that the title of § 1.97 and contents of § 1.97(b) not be changed, since the proposed wording would not require filing of the closest prior art.
Reply:
The proposed changes are not intended to make any changes in the type of information which is to be submitted to the Office. The proposal has been adopted in modified form.
Comment:
One person indicated preference for the use of "prior art" in §§ 1.51(b), 1.97, 1.98, and 1.99 since it does not create an inferred admission that the information submitted is material. Five comments favored the removal of "prior art" from § 1.97 but objected to the addition of "material".
Reply:
The rule change was proposed to answer arguments that the use of the term "prior art" implied that the information was a reference against applicant's invention. Since the majority of the comments supported modifying the rule, the use of the terms "prior art" as well as "material" are being dropped.
Comment:
Two comments were received concerning § 1.98(a) suggesting that the "place of publication" be clarified or removed.
Reply:
This suggestion has not been adopted since the "place of publication" is not mandatory. It is intended to mean the city and country of publication. Also the citation of the "place of publication" is consistent with the § 1.107(a) requirements.
Comment:
It was suggested by one person that § 1.101 be amended to

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clarify when PCT international applications which have entered the national stage should be taken up for examination.
Reply:
An amendment has been made to § 1.101 as suggested to clarify that they are taken up in order based on the date they have entered the national stage by compliance with the requirements of 35 U.S.C. 371(c).
Comment:
One comment was presented suggesting that the words "which are not examined on the merits" in § 1.101 be removed.
Reply:
The suggestion has been adopted.
Comment:
One comment urged returning to the use of the Office draftsmen for minor corrections to reduce the burden under proposed § 1.123.
Reply:
Some minor corrections may be made by the Office draftsmen on a time-available basis. However, since the Office currently has only a few draftsmen who are responsible for reviewing and approving all drawings, very little time is presently available for making corrections.
Comment:
Four suggestions were made to amend § 1.123 to specifically provide for the filing of substitute drawings if corrections are required.
Reply:
These suggestions have been adopted.
Comment:
One comment was received indicating that § 1.125 should indicate to whom it should be clear that acceptance of a substitute specification would facilitate processing.
Reply:
An amendment has been made to clarify that it should be clear to the examiner.
Comment:
One comment suggested removal of the last sentence of § 1.137(b) to permit § 1.183 petitions to be filed to waive time periods for requesting revival of unintentionally abandoned applications.
Reply:
No change in § 1.137(b) is considered to be appropriate at this time since § 1.137(b) only became effective on Oct. 1, 1982.
(Since changes to § 1.141 are not being promulgated in this rule change, comments and replies to this section are not included.)
Comment:
One comment pointed out that the reference to a "period of twelve months" in § 1.153 was indefinite.
Reply:
Section 1.153 has been amended to remove the indefiniteness.
Comment:
One comment was presented which suggested that § 1.172 refer to a "reissue oath" rather than to "reissue oaths."
Reply:
This suggestion has been adopted.
Comment:
One comment suggested the insertion of "the filing of" before "each patent" in § 1.335(a) and (b).
Reply:
The suggestion has been adopted.
(Since the proposed addition of a new paragraph (e) to § 1.565 is not being adopted in this rule change, comments and replies to this section are not included.)
Comment:
One suggestion was made that a procedure be designed in which foreign filing licenses could be granted by return post card without losing the time required to send the filingreceipts.
Reply:
It is felt that the procedure under § 5.12 should be adopted at this time and be placed into operation. If after some experience additional modifications are found desirable, further changes could be made. To introduce several alternative procedures at this time is considered to be too complex and may endanger the success of the proposed procedure.
Comment:
One comment requested that the Office grant a prospective foreign filing license under § 5.12 for all data and amendatory material to be filed abroad.
Reply:
Such petitions are not part of this proposed change but this concept is being considered in a separate rule change proposal.
Comment:
One comment suggested that the Filing Receipt specifically indicate whether or not a license has been denied under § 5.12.
Reply:
The proposed practice under § 5.12 would indicate on the Filing Receipt when a license is granted. On other cases in which a license is not granted further review is required. A license may still be granted at a later date.
Comment:
One comment stated that it should be possible to petition at any early date for a foreign filing license as well as obtain one on the filing receipt.
Reply:
It will still be possible to petition earlier for a license under revised § 5.12.

Implementation Of Patent Procedure Revisions

The effective date of the patent procedure revisions contained in this rulemaking is Feb. 27, 1983. The various sections will be implemented in the manner set forth below:

§ 1.10 Filing of papers and fees by "Express Mail" with certificate.

The "Guidelines under § 1.10" set forth below provide guidance in implementing § 1.10:

Guidelines under § 1.10

A) The certification under § 1.10 requires a signature of the person depositing the paper with the United States Postal Service as "Express Mail". Specifically, if the certification under § 1.10 appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification under § 1.10.

B) When possible, the certification under § 1.10 should appear on an upper portion of the first page of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO 85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper or fee it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., complete application, specification and drawings, responses to rejection or refusal, notice of appeal, etc. If the serial number of the application is not known, the identification should include at least the name of the inventor(s) and the title of the invention. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

D) In situations wherein the correspondence includes papers for more than one application e.g., a single envelope containing separate applications or papers for various parts of the Patent and Trademark Office, each paper must have its own certification and the "Express Mail" label number as part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a notice of appeal), each paper should also have its own certification as a part thereof or attached thereto.

F) Practitioners may place the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

"Express Mail" mailing label number _____

Date of Deposit _____

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

_____
(Typed or printed name of person mailing paper or fee)

_____
(Signature of person mailing paper or fee)

§ 1.48 Correction of inventorship.

Any patent application pending on or after Feb. 27, 1983, is subject to the provisions of this section.

§ 1.53 Serial number, filing date, and completion of application.

The provisions of this section apply to any patent application filed on or after Feb. 27, 1983.

§ 1.63 Oath or declaration.

The provisions of § 1.63 will become effective on Feb. 27, 1983, and will apply to any oath or declaration filed on or after that date. However, in order to provide a smooth transition from the old oath or declaration requirements to the new, the Office will continue to accept between Feb. 27, 1983, and June 30, 1983, any oath or declaration in compliance with § 1.65 as it existed immediately prior to Feb. 27, 1983, so long as that oath or declaration is attached to and was executed as a part of an application to be filed in the Patent and Trademark Office.

Effective July 1, 1983, all oaths or declarations filed under § 1.51(a)(2) as a part of a patent application must fully comply with § 1.63.

A suggested format for a declaration is set forth below:

Declaration For Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

_____

the specification of which

(check one) ☐ is attached hereto.
☐ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes ☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes ☐ No
(Number)	(Country)	(Day/Month/Year Filed)	☐ Yes ☐ No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor _____
Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____
Full name of second joint inventor, if any _____
Second Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____

(Supply similar information and signature for third and subsequent joint inventors.)

The declaration form set forth above is specifically designed for use where the specification is attached to the form and the specification and declaration are filed at one time, and also where the declaration form is filed after the specification and drawings in accordance with § 1.53. The form can be used where foreign priority is claimed under 35 U.S.C. 119 and where the benefit of one or more United States applications is claimed under 35 U.S.C. 120. Appropriate modifications can be made in the form so long as compliance with the rules is maintained. For example, if the form is being used as a supplemental declaration form which is being submitted after numerous amendments the form might appropriately be modified by changing the words "was amended on" to "with amendments through."

§ 1.335 Filing of notice of arbitration awards.

The written notices required by this section should be directed to the attention of the Office of the Solicitor, which Office will be responsible for processing of such notices.

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Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act. (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The rule change will not have a significant averse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) for several reasons. Public Law 97-247 has taken into consideration the impact it may have on small entities. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, changing existing procedures where they can be simplified.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to foreign filing license petitions, will be reduced.

List of Subjects in 37 CFR Parts 1 and 5

Administrative practice and procedure, Courts, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Parts 1 and 5, are amended as follows:

1. Section 1.4 is amended by revising paragraph (a) to read as follows:

§ 1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises: (1) correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and (2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401 to 1.482; of reexamination of patents in Subpart D, §§ 1.501 to 1.570; and of trademark applications, §§ 2.11 to 2.189.

* * * * *

2. Section 1.6 is revised to read as follows:

§ 1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

(b) Mail placed in the Patent and Trademark Office pouch up to midnight on weekdays, excepting Saturdays and federal holidays, by the post office at Washington, D. C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch.

(c) In addition to being mailed or delivered by hand during office hours, letters and other papers may be deposited up to midnight in a box provided at the guard's desk at the lobby of building 3 of the Patent and Trademark Office at Crystal Plaza, Arlington, Virginia and at the main entrance (14th Street) of the Department of Commerce Building, Washington, D. C., on weekdays except Saturdays and federal holidays, and all papers deposited therein are considered as received in the Patent and Trademark Office on the day of deposit.

(d) If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any paper or fee which is (1) promptly filed after the ending of the designated interruption or emergency and (2) accompanied by a statement indicating that such paper or fee would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

3. Section 1.7 is revised to read as follows:

§ 1.7 Times for taking action: Expiration on Saturday, Sunday or federal holiday.

Whenever periods of time are specified in this part in days, calendar days are intended. When the day, or the last day fixed by statute or by or under this part for taking any action or paying any fee in the Patent and Trademark Office falls on Saturday, Sunday, or on a federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding day which is not a Saturday, Sunday, or a federal holiday. See § 1.304 for time for appeal or for commencing civil action.

4. Section 1.8 is amended by revising the introductory text of paragraph (a) and paragraph (a)(1), (a)(2) introductory text, and (a)(2)(i) to read as follows:

§ 1.8 Certificate of mailing.

(a) Except in the cases enumerated below, papers and fees required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if: (1) they are addressed to the Commissioner of Patents and Trademarks, Washington, D. C. 20231, and deposited with the U.S. Postal Service with sufficient postage as first class mail prior to expiration of the set period, and (2) they also include a certificate for each paper or fee stating the date of deposit. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed on or before the date indicated. The actual date of receipt of the paper or fee will be used for all other purposes. This procedure does not apply to the following:

(i) The filing of a national patent application specification and drawing or other papers for the purpose of obtaining an application filing date;

* * * * *

5. A new section 1.10 is added to read as follows:

§ 1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service.

(b) Any paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing, be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and any such paper or fee must also include a certificate of mailing by "Express Mail" which states the date of mailing by "Express Mail" and is signed by the person mailing the paper or fee.

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

6. Section 1.17 is amended by revising paragraph (h) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph—$120.00

—§ 1.47 for filing by other than all the inventors or a person not the inventor
—§ 1.48 for correction of inventorship
—§ 1.182 for decision on questions not specifically provided for
—§ 1.183 to suspend the rules
—§ 1.268 for late filing of interference settlement agreement

* * * * *

7. Section 1.22 is revised to read as follows:

§ 1.22 Fees payable in advance.

(a) Patent and trademark fees and charges payable to the Patent and Trademark Office are required to be paid in advance, that is, at the time of requesting any action by the Office for which a fee or charge is payable with the exception that under § 1.53 applications for patent may be assigned a filing date without payment of the basic filing fee.

(b) All patent and trademark fees paid to the Patent and Trademark Office should be itemized in each individual application, patent or other proceeding in such a manner that it is clear for which purpose the fees are paid.

8. Section 1.24 is revised to read as follows:

§ 1.24 Coupons.

Coupons in denominations of one dollar are sold by the Patent and Trademark Office for the convenience of regular purchasers of U.S. patents and trademark registrations; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50. These coupons are good until used; they may be transferred but cannot be redeemed.

9. Section 1.41 is revised to read as follows:

§ 1.41 Applicant for patent.

(a) A patent must be applied for in the name of the actual inventor or inventors. Full names must be stated, including the family name and at least one given name without abbreviation together with any other given name or initial.

(b) Unless the contrary is indicated the word "applicant" when used in these sections refers to the inventor or joint inventors who are applying for a patent, or to the person mentioned in § 1.42, 1.43, or 1.47 who is applying for a patent in place of the inventor.

(c) Any person authorized by the applicant may file an application for patent on behalf of the inventor or inventors, but an oath or declaration for the application (§ 1.63) can only be made in accordance with § 1.64

(d) A showing may be required from the person filing the application that the filing was authorized where such authorization comes into question.

10. Section 1.42 is revised to read as follows:

§ 1.42 When the inventor is dead.

In case of the death of the inventor, the legal representative (executor, administrator, etc.) of the deceased inventor may make the necessary oath or declaration, and apply for and obtain the patent. Where the inventor dies during the time intervening between the filing of the application and the granting of a patent thereon, the letters patent may be issued to the legal representative upon proper intervention.

11. Section 1.43 is revised to read as follows:

§ 1.43 When the inventor is insane or legally incapacitated.

In case an inventor is insane or otherwise legally incapacitated, the legal representative (guardian, conservator, etc.) of such inventor may make the necessary oath or declaration, and apply for and obtain the patent.

12. Section 1.45 is amended by removing paragraphs (b) and (c) and the designation (a) to the first paragraph and by revising the text to read as follows:

§ 1.45 Joint inventors.

Joint inventors must apply for a patent jointly an each must make the required oath or declaration: neither of them alone, nor less than the entire number, can apply for a patent for an invention invented by them jointly, except as provided in § 1.47.

13. Section 1.46 is revised to read as follows:

§ 1.46 Assigned inventions and patents.

In case the whole or a part interest in the invention or in the patent to be issued is assigned, the application must still be made or authorized to be made, and an oath or declaration signed, by the inventor or one of the persons mentioned in §§ 1.42, 1.43, or 1.47. However, the patent may be issued to the assignee or jointly to the inventor and the assignee as provided in § 1.334.

14. Sections 1.47 is revised to read as follows:

§ 1.47 Filing when an inventor refuses to sign or cannot be reached.

(a) If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself or herself and the omitted inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and by the required fee (§ 1.17(h)) and must state the last known address of the omitted inventor. The Patent and Trademark Office shall forward notice of the filing of the application to the omitted inventor at said address. Should such notice be returned to the Office undelivered, or should the address of the omitted inventor be unknown, notice of the filing of the application shall be published in the *Official Gazette*. The omitted inventor may subsequently join in the application on filing an oath or declaration of the character required by § 1.63. A patent may be granted to the inventor making the application, upon a showing satisfactory to the Commissioner, subject to the same rights which the omitted inventor would have had if he or she had been joined.

(b) Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action may make application for patent on behalf of and as agent for the inventor. The oath or declaration in such an application must be accompanied by a petition including proof of the pertinent facts and a showing that such action is necessary to preserve

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the rights of the parties or to prevent irreparable damage, and by the required fee § 1.17(h)) and must state the lat known address of the inventor. The assignment, written agreement to assign or other evidence of proprietary interest, or a verified copy thereof, must be filed in the Patent and Trademark Office. The Office shall forward notice of the filing of the application to the inventor at the address stated in the application. Should such notice be returned to the Office undelivered, or should the address of the inventor be unknown, notice of the filing of the application shall be published in the *Official Gazette*. The inventor may subsequently join in the application on filing an oath or declaration of the character required by § 1.63. A patent may be granted to the inventor upon a showing satisfactory to the Commissioner.

15. A new section 1.48 is added to read as follows:

§ 1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (2) an oath or declaration by each actual inventor or inventors as required by § 1.63. (3) the fee set forth in § 1.17(h); and (4) the written consent of any assignee.

16. Section 1.51 is amended by revising paragraphs 1.51(a)(2) and (b) to read as follows:

§ 1.51 General requisites of a complete application.

(a) * * * * *

(2) An oath or declaration, see §§ 1.63 and 1.68.

* * * * *

(b) Applicants are encouraged to file an information disclosure statement. See §§ 1.97 through 1.99.

17. Section 1.52 is amended by revising paragraph (c) to read as follows:

§ 1.52 Language, paper, writing, margins.

* * * * *

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed must be made before the signing of any accompanying oath or declaration pursuant to § 1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. No such alterations in the application papers are permissible after the signing of an oath or declaration referring to those application papers (§ 1.56(c)). After the signing of the oath or declaration referring to the application papers, amendments may only be made in the manner provided by §§ 1.121 and 1.123-1.125.

* * * * *

18. Section 1.53 is revised to read as follows:

§ 1.53 Serial number, filing date, and completion of application.

(a) Any application for a patent received in the Patent and Trademark Office will be assigned a serial number for identification purposes.

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75, and (2) any drawing required by § 1.81(a), are filed in the Patent and Trademark Office. No new matter may be introduced into an application after its filing date (§ 1.118).

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $50.00 handling fee.

(d) If an application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section.

(e) An application for a patent will not be placed upon the files for examination until all its required parts, complying with the rules relating thereto, are received, except that certain minor informalities may be waived subject to subsequent correction whenever required.

(f) The filing date of an international application designating the United States of America shall be treated as the filing date in the United States of America under PCT Article 11(3), except as provided in 35 U.S.C. 102(e).

19. Section 1.54 is revised to read as follows:

§ 1.54 Parts of application to be filed together; filing receipt.

(a) It is desirable that all parts of the complete application be deposited in the Office together; otherwise a letter must accompany each part, accurately and clearly connecting it with the other parts of the application. See § 1.53 with regard to completion of an application.

(b) Applicant will be informed of the application serial number and filing date by a filing receipt.

20. Section 1.55 is revised to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§ 1.224); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in § 1.17(i).

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his attorney or agent, when submitting a claim for such right as specified in paragraph (b) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

21. Section 1.56 is amended by revising paragraph (c) to read as follows:

§ 1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(c) Any application may be stricken from the files if:

(1) An oath or declaration pursuant to § 1.63 is signed in blank;

(2) An oath or declaration pursuant to § 1.63 is signed without review thereof by the person making the oath or declaration;

(3) An oath or declaration pursuant to § 1.63 is signed without review of the specification, including the claims, as required by § 1.63(b); or

(4) The application papers filed in the Office are altered after the signing of an oath or declaration pursuant to § 1.63 referring to those application papers.

* * * * *

§ 1.57 [Removed]

22. Section 1.57 is removed.

23. Section 1.59 is revised to read as follows:

§ 1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to § 1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost.

24. Section 49 § 1.60 is revised to read as follows:

§ 1.60 Continuation or divisional application for invention disclosed in a prior application.

A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application. Signing and execution of the application papers by the applicant may be omitted provided the copy is supplied by and accompanied by a statement by, the applicant or his or her attorney or agent that the application papers comprise a true copy of the prior application as filed. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date.

25. Section § 1.62 is revised to read as follows:

§ 1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification and drawings from a prior application to be abandoned, may be filed before the payment of the Issue fee, abandonment of, or termination of proceedings on a prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior application.

(b) The filing fee for a continuation, continuation-in-part, or divisional application under this section is based on the number of claims remaining in the application after entry of any preliminary amendment and entry of any amendments under § 1.116 unentered in the prior application which applicant has requested to be entered in the continuing application.

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by § 1.63 must also be filed. In a continuation or divisional application which discloses and claims only subject matter disclosed in a prior application, no additional oath or declaration is required.

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number.

(f) The filing of an application under this section will be construed to include a waiver of secrecy by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

(g) The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application.

(h) The applicant is urged to furnish the following information relating to the prior application to the best of his or her ability:

(1) Title as originally filed and as last amended;
(2) Name of applicant as originally filed and as last amended;
(3) Current correspondence address of applicant;
(4) Identification of prior foreign application and any priority claim under 35 U.S.C. 119.

(i) Envelopes containing only application papers and fees for filing under this section should be marked "Box FWC".

26. A new section 1.63 is added to read as follows:

§ 1.63 Oath or declaration.

(a) An oath or declaration filed under § 1.51(a)(2) as a part of an application must:

(1) Be executed in accordance with either § 1.66 or § 1.68;
(2) Identify the specification to which it is directed;
(3) Identify each inventor and the residence and country of citizenship of each inventor; and
(4) State whether the inventor is a sole or joint inventor of the invention claimed.

(b) In addition to meeting the requirements of paragraph (a), the oath or declaration must state that the person making the oath or declaration:

(1) Has reviewed and understands the contents of the specification, including the claims, as amended by any amendment specifically referred to in the oath or declaration;
(2) Believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought; and
(3) Acknowledges the duty to disclose information which is material to the examination of the application in accordance with § 1.56(a).

(c) In addition to meeting the requirements of paragraphs (a) and (b) of this section, the oath or declaration in any

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application in which a claim for foreign priority is made pursuant to § 1.55 must identify the foreign application for patent or inventor's certificate on which priority is claimed, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose material information as defined in § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

27.A new section 1.64 is added to read as follows:

§ 1.64 Person making oath or declaration.

(a) The oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43, or 147.

(b) If the person making the oath or declaration is not the inventor (§§ 1.42, 1.43, or 1.47), the oath or declaration shall state the relationship of the person to the inventor and, upon information and belief, the facts which the inventor is required to state.

§ 1.65 [Removed]

28. Section 1.65 is removed.

29. Section 1.67 is revised to read as follows:

§ 1.67 Supplemental oath or declaration.

(a) A supplemental oath or declaration meeting the requirements of § 1.63 may be required to be filed to correct any deficiencies or inaccuracies present in an earlier filed oath or declaration.

(b) A supplemental oath or declaration meeting the requirements of § 1.63 must be filed (1) when a claim is presented for matter originally shown or described but not substantially embraced in the statement of invention or claims originally presented, and (2) when an oath or declaration submitted in accordance with § 1.53(d) after the filing of the specification and any required drawings specifically and improperly refers to an amendment which includes new matter. No new matter may be introduced into an application after its filing date even if a supplemental oath or declaration is filed (§ 1.53(b); § 1.118). In proper cases the oath or declaration here required may be made on information and belief by an applicant other than inventor.

30. Section 1.69 is amended by revising paragraph (b) to read as follows:

§ 1.69 Foreign language oaths and declarations.

* * * * *

(b) Unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by a verified English translation, except that in the case of an oath or declaration filed under § 1.63 the translation may be filed in the Office no later than two months from the date applicant is notified to file the translation.

31. Section 1.70 is amended by revising the title and paragraph (a) to read as follows:

§ 1.70 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371, he or she must file an oath or declaration in accordance with § 1.63.

* * * * *

32. Section 1.77 is amended by revising paragraphs (h) and (i) to read as follows:

§ 1.77 Arrangement of application elements.

* * * * *

(h) Abstract of the disclosure.
(i) Signed oath or declaration.

* * * * *

33. The center heading preceding § 1.97 and section 1.97 are revised to read as follows:

INFORMATION DISCLOSURE STATEMENT

§ 1.97 Filing of information disclosure statement.

(a) As a means of complying with the duty of disclosure set forth in § 1.56, applicants are encouraged to file an information disclosure statement at the time of filing the application or within the later of three months after the filing date of the application or two months after applicant receives the filing receipt. If filed separately, the disclosure statement should, in addition to the identification of the application, include the Group Art Unit to which the application is assigned as indicated on the filing receipt. The disclosure statement may either be separate from the specification or may be incorporated therein.

(b) A disclosure statement filed in accordance with paragraph (a) of this section shall not be construed as a representation that a search has been made or that no other material information as defined in § 1.56(a) exists.

34. Section 1.98 is amended by revising the title and paragraph (a) to read as follows:

§ 1.98 Content of information disclosure statement.

(a) Any disclosure statement filed under § 1.97 or § 1.99 shall include: (1) A listing of patents, publications or other information and (2) a concise explanation of the relevance of each listed item. The disclosure statement shall be accompanied by a copy of each listed patent or publication or other item of information in written form or of at least the portions thereof considered by the person filing the disclosure statement to be pertinent. All United States patents listed should be identified by their patent numbers, patent dates and names of the patentees. Each foreign published application or patent should be cited by identifying the country or office which issued it, the document number and publication date indicated on the document. Each printed publication should be identified by author (if any), title of the publication, pages, date and place of publication.

* * * * *

35. Section 1.9 is revised to read as follows:

§ 1.99 Updating of information disclosure statement.

If prior to issuance of a patent an applicant, pursuant to his or her duty of disclosure under § 1.56 wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental information disclosure statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements of § 1.98.

36. Section 1.101 is amended by revising paragraph (a) to read as follows:

§ 1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to § 1.102 and those applications in which the Office has accepted a request for waiver of patent rights filed under § 1.139. International applications whic have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f) no action may be taken prior to 21 months from the priority date.

* * * * *

37. Section 1.118 is revised to read as follows:

§ 1.118 Amendment of disclosure.

(a) No amendment shall introduce new matter into the disclosure of an application after the filing date of the application § 1.53(b)). All amendments to the specification, including the claims, and the drawings filed after the filing date of the application must conform to at least one of them as it was at the time of the filing of the application. Matter not found in either, involving a departure from or an addition to the original disclosure, cannot be added to the application after its filing date even though supported by an oath or declaration in accordance with § 1.63 or § 1.67 filed after the filing date of the application.

(b) If it is determined that an amendment filed after the filing date of the application introduces new matter, claims containing new matter will be rejected and deletion of the new matter in the specification and drawings will be required even if the amendment is accompanied by an oath or declaration in accordance with § 1.63 or § 1.67.

38. Section 1.123 is revised to read as follows:

§ 1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner. The paper requesting amendments to the drawing should be separate from other papers.

39. Section 1.125 is revised to read as follows:

§ 1.125 Substitute specification.

If the number or nature of the amendments shall render it difficult to consider the case, or to arrange the papers for printing or copying, the examiner may require the entire specification, including the claims, or any part thereof, to be rewritten. A substitute specification may not be accepted unless it has been required by the examiner or unless it is clear to the examiner that acceptance of a substitute specification would facilitate processing of the application. Any substitute specification filed must be accompanied by a statement that the substitute specification includes no new matter. Such statement must be a verified statement if made by a person not registered to practice before the Office.

40. Section 1.131 is amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the applicant or the owner of the patent under reexamination shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the applicant or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the applicant's or patent owner's application was filed in this country.

* * * * *

41. Section 1.132 is revised to read as follows:

§ 1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

42. Section 1.137 is amended by revising paragraph (b) to read as follows:

§ 1.137 Revival of abandoned application.

* * * * *

(b) An application unintentionally abandoned for failure to prosecute, except pursuant to § 1.53(d), may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be filed within one year of the date on which the application became abandoned or be filed within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date of abandonment of the application. A petition to revive an unintentionally abandoned application must be accompanied by (1) a statement that the abandonment was unintentional, (2) a proposed response unless it has been previously filed, and (3) a petition fee as set forth in § 1.17(m). Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the abandonment was unintentional. The three month period set forth in this paragraph may be extended under the provisions of § 1.136(a), but no further extensions under § 1.136(b) will be granted. Petitions to the Commissioner under § 1.83 to waive any time periods for requesting revival of an unintentionally abandoned application will not be considered, but will be returned to the applicant.

* * * * *

43. Section 1.153 is amended by revising paragraph (b) to read as follows:

§ 1.153 Title, description and claim, oath or declaration.

* * * * *

(b) The oath or declaration required of the applicant must comply with § 1.63.

44. Section 1.154 is amended by revising paragraph (e) to read as follows:

§ 1.154 Arrangement of specification.

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(e) Signed oath or declaration (See § 1.153(b)).

45. Section 1.162 is revised to read as follows:

§ 1.162 Applicant, oath or declaration.

The applicant for a plant patent must be the person who has invented or discovered and asexually reproduced the new and distinct variety of plant for which a patent is sought (or as provided in §§ 1.42, 1.43, and 1.47). The oath or declaration required of the applicant in addition to the averments required by § 1.63, must state that he or she has asexually reproduced the plant. Where the plant is a newly found plant the oath or declaration must also state that it was found in a cultivated area.

46. Section 1.163 is amended by revising paragraph (b) to read as follows:

§ 1.163 Specification.

* * * * *

(b) Two copies of the specification (including the claim) must be submitted, but only one signed oath or declaration is required. The second copy of the specification may be a legible carbon copy of the original.

47. Section 1.172 is amended by revising paragraph (a) to read as follows:

§ 1.172 Applicants, assignees.

(a) A reissue oath must be signed and sworn to or declaration made by the inventor or inventors except as otherwise provided (see §§ 1.42, 1.43, 1.47), and must be accompanied by the written assent of all assignees, if any, owning an undivided interest in the patent, but a reissue oath may be made and sworn to or declaration made by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.

* * * * *

48. Section 1.174 is amended by revising paragraph (a) to read as follows:

§ 1.174 Drawings.

(a) The drawings upon which the original patent was issued may be used in reissue applications if no changes whatsoever are to be made in the drawings. In such cases, when the reissue application is filed, the applicant must submit a temporary drawing which may consist of a copy of the printed drawings of the patent or a photoprint of the original drawings of the size required for original drawing.

* * * * *

49. Section 1.175 is amended by revising the introductory text of paragraph (a) to read as follows:

§ 1.175 Reissue oath or declaration.

(a) Applicants for reissue, in addition to complying with the requirements of § 1.63 must also file with their applications a statement under oath or declaration as follows:

* * * * *

50. Section 1.324 is revised to read as follows:

§ 1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in § 1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors.

51. Section 1.325 is revised to read as follows:

§ 1.325 Other mistakes not corrected.

Mistakes other than those provided for in §§ 1.322, 1.323, 1.324, and not affording legal grounds for reissue or for reexamination, will not be corrected after the date of the patent.

52. A new § 1.335 is added to read as follows:

§ 1.335 Filing of notice of arbitration awards.

(a) Written notice of any award by an arbitrator pursuant to 35 U.S.C. 294 must be filed in the Patent and Trademark Office by the patentee, or the patentee's assignee or licensee. If the award involves more than one patent a separate notice must be filed for placement in the file of each patent. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the award.

(b) If an award by an arbitrator pursuant to 35 U.S.C. 294 is modified by a court, the party requesting the modification must file in the Patent and Trademark Office, a notice of the modification for placement in the file of each patent to which the modification applies. The notice must set forth the patent number, the names of the inventor and patent owner, and the names and addresses of the parties to the arbitration. The notice must also include a copy of the court's order modifying the award.

(c) Any award by an arbitrator pursuant to 35 U.S.C. 294 shall be unenforceable until any notices required by paragraph (a) or (b) of this section are filed in the Patent and Trademark Office. If any required notice is not filed by the party designated in paragraph (a) or (b) of this section, any party to the arbitration proceeding may file such a notice.

53. Section 5.12 is revised to read as follows:

§ 5.12 Petition for license.

(a) Filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 U.S.C. 184 for the subject matter of the application. The filing receipt will indicate if a license is granted. If the initial automatic petition is not granted, a subsequent petition may be filed under paragraph (b) of this section.

(b) Petitions for license under 35 U.S.C. 184 should be presented in letter form and should include petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks

Dec. 23, 1982.

[1027 OG 9]

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(69) **Deposit Accounts...Statutory Fee Charges**

Beginning on May 1, 1966, and until further notice, statutory fees, including filing fees for patent, design, and trademark applications, issue fees, appeal fees and opposition, cancellation and petition fees may be charged against the deposit accounts provided for by Rule 25(a) of the Rules of Practice in patent cases. During this period the prohibition of Rule 25(b) against such charges will be suspended.

In view of the facts that these fees are indispensable parts of the actions to which they relate and that the charging of a fee against an account which does not contain sufficient funds to cover it cannot be regarded as a payment of the fee, it is evident that the overdrawing of a deposit account may result in the loss of a vital date and may also impose a substantial burden on the Patent Office in making appropriate correction of its records.

It is, therefore, necessary that effective steps be taken to avoid such overdrafts, as follows:

Checks of all accounts will be made periodically, and if any account is found to have been overdrawn, it will be immediately removed from the active accounts and no further drafts on it will be honored. Prompt payment of the outstanding balance will be required and the depositor or his attorney may be called on for an itemized statement identifying all statutory fees charged against the account during the period in question in order that it may be ascertained whether any previously granted date should be withdrawn.

It is emphasized that the success of the procedure outlined above depends upon the maintenance of a sufficient balance in deposit accounts at all times to meet any charges made against them. The Office must, therefore, strictly refuse to permit any depositor who has once overdrawn his account to maintain such an account in the future and in the event that any substantial number of overdrafts occurs it may be necessary to reestablish the prohibition of Rule 25(b) against charging statutory fees against deposit accounts.

Accordingly, effective May 1, 1966, the requirement of Rule 25(a) that an amount sufficient to cover all charges made against an account must always be on deposit will be strictly enforced, regardless of whether any fee is included in such charges and where this requirement is not complied with the account involved will be removed from the active accounts.

EDWARD J. BRENNER,
Commissioner.

Feb. 23, 1966.

[824 O.G. 1200]

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(70) **Request for Refunds**

In order to expedite the processing of refunds for payment of fees by actual mistake or in excess of the designated fees, attorneys and applicants requesting refunds should direct their correspondence to the attention of the "Refund Section, Accounting Division, Office of Finance." This procedure should be followed whether the request is for a refund check or for a credit to the deposit account. The problems of misrouting the request for a refund in the Patent and Trademark Office would be alleviated and the payment of refunds accelerated.

BRADFORD R. HUTHER,
Assistant Commissioner for Finance & Planning.

[1024 O.G. 59 (11-23-82)]

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(71) **Deposit Account Authorizations**

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in §§ 1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed." A general authorization would not apply to document supply fees under § 1.19, such as those required for certified copies; to post-issuance fees under § 1.20 such as those required for maintenance fees; or to miscellaneous fees and charges under § 1.21, such as assignment recording fees.

Many applications filed prior to Oct. 1, 1982, contain broad language authorizing *any* additional fees which might have been due to be charged to a deposit account. The Patent and Trademark Office does not interpret such broad authorizations, filed prior to Oct. 1, 1982, to include authorization to charge to a deposit account the issue fee or other fees in sections 1.16, 1.17 and 1.18 except those associated with the paper containing the broad authorization. However, such a broad authorization filed in an application on or after Oct. 1, 1982, will be interpreted as authorization to charge the issue fee; as well as any other fee set forth in §§ 1.16, 1.17 or 1.18. Fees under sections 1.19, 1.20 and 1.21 will not be charged as a result of a general authorization under section 1.25.

It is recommended that authorizations to charge fees to deposit accounts include reference to the particular fees or fee sections of the rules which applicant intends to authorize. For example, if filing and processing fees under §§ 1.16 and 1.17 only are intended to be included in the authorization, and not the issue fee under § 1.18, the authorization could read: "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required during the entire pendency of the application to Deposit Account No. _____." Such an authorization would clearly exclude issue fees under 37 CFR 1.18 while including all the filing and processing fees listed in 37 CFR 1.16 and 1.17. Similarly, if it were intended to authorize the charging of fees relating only to a specific paper, the authorization could read "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. _____." Such authorizations would cover situations in which a check to cover a filing and processing fee under 37 CFR 1.16 and 1.17 was omitted or was for an amount less than the amount required.

It is extremely important that the authorization be clear and unambiguous. If applicants file authorizations which are ambiguous and which deviate from the usual forms of authorizations, the Office may not interpret the authorizations in the manner applicants intend. In such cases applicants could be subject to further expenses, petitions, etc. in order to correct fees which were not charged as intended due to an ambiguous authorization.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

July 1, 1983.

[1032 OG 32]

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(72) **Deposit Account Authorization to Charge Issue Fee**

This notice supplements the Official Gazette notice, dated July 1, 1983, published at 1032 O.G. 33 on July 26, 1983.

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in 37 CFR 1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed."

The Patent and Trademark Office will treat broad language to "charge any additional fees which may be required at any time during the prosecution of the application" as authorization to charge the issue fee on applications filed on or after Oct. 1, 1982.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents

Sept. 30, 1988

[1095 OG 44]

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(73) **Notice to All Deposit Account Holders**

Beginning Oct. 7, 1983, please *mail deposit account remittances only* to:

Patent and Trademark Office
P.O. Box 70541
Chicago, Ill 60673

To expedite credit to your deposit account and the treasury, and arrangement has been made between the Patent and Trademark Office, Treasury Department, and the First National Bank of Chicago utilizing a special "lockbox" depositary to receive deposit account remittances.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks and be accompanied by it *the top portion of your deposit account statement*. Submit only remittances for deposit accounts to this new address. All other correspondence should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

LEONARD L. NAHME,
Director Office of Finance.

[1035 OG 27]

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(74) **Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies**

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00.

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscription and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557 3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557 3227.

June 23, 1986. THERESA A. BRELSFORD, *Assistant Commissioner, for Administration.*

[1068 OG 37]

(75) **Unpaid Fee Checks**

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§ 1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

Oct. 5, 1987. DONALD W. PETERSON, *Deputy Commissioner*

[1083 TMOG 44]

(76) **Posting of Filing Fee Codes**

We are making a minor change in the recording of fees so that we can speed up the processing of mail.

First, a brief explanation of the problem. Incoming mail to the PTO has soared. The number of envelopes received in the Mail Room in the first four months of this fiscal year is almost 30% higher than for the same period last year. This sudden increase has taxed existing resources and a backlog has developed. It takes a new employee over one year to become proficient in recognizing the hundreds of different types of documents entering the Office, the appropriate fee codes to apply, and the appropriate destination.

One of the most time-consuming functions of the Mail Room initial review clerks is the determination of how many independent and dependent claims there are in a patent application so that the appropriate amounts can be coded for the basic application fee, the extra independent claim fee, the extra total claim fee, and the multiple dependent claim fee. This can involve a substantial amount of time in complicated cases, particularly when there are preliminary amendments. With over 30,000 individual documents patent applications and all other mail to be processed and routed each day, such time-consuming delays have a severe adverse impact in moving all the work.

So, effective immediately, we are making a change which will move the mail more quickly. Rather than go through the time-consuming computation in the Mail Room to determine the amount to charge to each specific claim fee code, the total amount received will be recorded in one filing code. The detailed calculations will continue to be done later in the process where, in conjunction with the formality review of the application, the analysis takes place as to whether or not the fee submitted was correct. The individual charges remain the same and the information on claims contained in the application will continue to be reported on the application filing receipt without change. Here's what would be seen on deposit account charges and checks:

101 - Includes amount for basic filing fee, extra independent claims, extra total claims, and multiple dependent claims, previously recorded as 101, 102, 103, and 104, respectively.
201 - Includes same items as above for small entity applications, previously recorded as 201, 202, 203, and 204.
108 - Includes same items as above for reissue applications, previously recorded as 108, 109, and 110.
208 - Includes same items as above for small entity reissue applications, previously recorded as 208, 209, and 210.

This revised procedure allows us to be more efficient.

Mar. 31, 1988. THERESA A. BRELSFORD, *Assistant Commissioner for Administration*

[1089 OG 57]

APPLICATION CONTENT

(77) **Use of Metric System of Measurements in Patent Applications**

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applicants are strongly encouraged to use either (1) only metric (S.I.) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

July 1, 1974. C. MARSHALL DANN, *Commissioner of Patents.*

[924 O.G. 1104]

(78) **Filing of Patent Applications Pursuant to 37 CFR 1.60**

Applicants are reminded that 37 CFR 1.60 was amended effective Feb. 27, 1983 to require applicants to furnish a copy of the prior application upon filing.

Some applicants continue to request that the copy be made by the Patent and Trademark Office as was done under the practice prior to Feb. 27, 1983. Others are filing a copy of the specification of the prior application, but not a copy of the oath or declaration. The Office will no longer make such copies as part of processing the new application.

The requirements of 37 CFR 1.60 must be complied with before a filing date will be granted for the continuing application.

It should be noted that 37 CFR 1.60 has been amended effective Apr. 1, 1984 to divide the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended 37 CFR 1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph (b) requires that the prior application be complete as set forth in 37 CFR 1.51(a) in order to properly file an application under 37 CFR 1.60. A complete application under 37 CFR 1.51(a) includes a signed oath or declaration. If the prior application was not a complete application (37 CFR 1.51(a)), a continuation or divisional application cannot be filed utilizing the provisions of 37 CFR 1.60 and any continuation or divisional application must include new application papers and be filed in accordance with 37 CFR 1.53.

Paragraph (b) of 37 CFR 1.60 also requires that a true copy of the prior complete application be filed. The copy must include the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication (on the oath or declaration) that it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. See the final rulemaking published in the Jan. 4, 1984 *Federal Register* at 49 FR 548-556 and reprinted in the Jan. 24, 1984 *Official Gazette* at 1038 O.G. 275 283.

Apr. 6, 1984. GERALD J. MOSSINGHOFF *Commissioner of Patents and Trademarks.*

[1042 O.G. 18]

(79) **Information in Oath/Declaration Necessary to Identify the Specification in Accordance with 37 CFR 1.63**

Section 1.63 of 37 CFR requires that an oath or declaration "identify the specification to which it is directed." Since filing dates are now granted on applications with the oath or declaration being filed later with a surcharge, the question has arisen as to what information must be supplied in the oath or declaration to identify the specification to which it is directed and to comply with the rule.

The declaration form suggested by the Office includes spaces for filling in the names of the inventors, title of invention, application serial number, filing date, foreign priority application information and United States priority application information. While this information should be provided, it is not essential that all of these spaces be filled in in order to adequately identify the specification in compliance with 37 CFR 1.63.

The following combinations of information supplied in an oath or declaration are acceptable as minimums for identifying a specification:

(1) name of inventor and application serial number;
(2) name of inventor, attorney docket number which was on the application as filed, and filing date of the application;
(3) name of inventor, title of invention and filing date;
(4) name of inventor, title of invention and reference to a specification which is attached to the oath or declaration at the time of execution and filed with the oath or declaration;
(5) name of inventor, title of invention and a statement by a registered attorney or agent that the application filed in the PTO is the application which the inventor executed by signing the oath or declaration.

If the oath or declaration is filed with an "attached" specification as indicated in item (4) above, it must be accompanied by a statement that the "attached" specification is a copy of the specification and any amendments thereto which were filed in the Office in order to obtain a filing date for the application. Such statement must be a verified statement if made by a person not registered to practice before the Office.

Oaths or declarations which do not meet the requirements set forth above will not be accepted as complying with 37 CFR 1.63 for completing an application. Any variance from the above guidelines will only be considered upon the filing of a petition for waiver of the rules under 37 CFR 1.183 accompanied by a petition fee (37 CFR 1.17(h)). Supplemental oaths or declarations in accordance with 37 CFR 1.67 will be required in applications in which the oaths or declarations are not completely filled in but contain sufficient information to identify the specifications to which they apply as detailed above.

Sept. 12, 1983. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[1035 OG 3]

(80) **Graphical Illustrations in the Specification**

For convenience many applicants have been including graphs or other types of graphical illustrations in the text portion of the specification. These illustrations do not come within the purview of 37 C.F.R. 1.58 which permits tables and chemical and mathematical formulas in the specification in lieu of formal drawings. Frequently, these graphical illustrations do not have satisfactory reproduction characteristics. Moreover, these reproductions are generally less than satisfactory due to the fact that the illustrations are usually reduced in size in order to fit a column of the printed patent page. Accordingly, effective immediately, graphs and graphical type illustrations in the specification will be objected to under 37 C.F.R. 1.58(a) and drawings pursuant to 37 C.F.R. 1.81 will be required.

Jan. 12, 1978. WILLIAM FELDMAN, *Deputy Assistant Commissioner for Patents.*

[967 O.G. 2]

(81) **Inclusion of Copyright or Mask Work Notices in Patents**

Under current intellectual property laws, it is possible to obtain copyright protection or mask work protection as well as patent protection for certain designs and technologies. On occasion, an author/inventor considers it desirable to include a notice of copyright or mask work in a design or utility patent which discloses material on which copyright or mask work protection has previously been established.

The inclusion of a copyright or mask work notice in a patent that discloses material on which copyright or mask work protection has previously been established, would serve to publicize and thereby protect the various intellectual property rights of the author/inventor. Further, this publication would tend to protect the public by militating against an unintentional encroachment into these rights. The presence of an unrestricted copyright or mask work notice in a patent could have an inhibiting effect on public dissemination of the patent disclosure to the extent it discourages the facsimile reproduction of the patent. This possible effect would be contrary to the mission of the Patent and Trademark Office to disseminate knowledge and information publicly by way of patent issuance, publication, and distribution. To avoid this effect, it is considered necessary to include an appropriate authorization of the author/inventor with any copyright or mask work notice appearing in a patent.

In light of these considerations, the Patent and Trademark Office will permit the inclusion of a copyright or mask work notice in a design or utility patent application, and thereby any patent issuing therefrom, which discloses material on which copyright or mask work protection has previously been established, under the following conditions:

(1) The copyright or mask work notice must be placed adjacent to the copyright or mask work material. Therefore, the notice may appear at any appropriate portion of the patent application disclosure, including the drawing. However, if appearing on the drawing, the notice must be limited in print size from inch to inch and must be placed within the "sight" of the drawing immediately below the figure representing the copyright or mask work material. If placed on a drawing in conformance with these provisions, the notice will not be objected to as extraneous matter under 37 CFR 1.84.

(2) The content of the notice must be limited to only those elements required by law. For example, "©1983 John Doe" (17 U.S.C. 401) and "*M* John Doe" (17 U.S.C. 909) would be properly limited, and under current statutes, legally sufficient notices of copyright and mask work respectively.

(3) Inclusion of a copyright or mask work notice will be permitted only if the following authorization is included at the beginning (preferably as the first paragraph) of the specification to be printed for the patent:

> A portion of the disclosure of this patent document contains material which is subject to copyright or mask work . The copyright or mask work owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all copyright or mask work rights whatsoever.

(4) Inclusion of a copyright or mask work notice after a Notice of Allowance has been mailed will be permitted only if the criteria of 37 CFR 1.312 have been satisfied.

The inclusion of a copyright or mask work notice in a design or utility patent application, and thereby any patent issuing therefrom, under the conditions set forth above will serve to protect the rights of the author/inventor, as well as the public, and will serve to promote the mission and goals of the Patent and Trademark Office. Therefore, the inclusion of a copyright or mask work notice which complies with these conditions will be permitted. However, any departure from these conditions may result in a refusal to permit the desired inclusion. If the authorization required under condition (3) above does not include the specific language "(t)he [copyright or mask work] owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, . . .", the notice will be objected to as improper by the examiner of the application. If the examiner maintains the objection upon reconsideration, a petition may be filed in accordance with 37 CFR 1.181.

RENE D. TEGTMEYER,
Mar. 20, 1987. *Assistant Commissioner for Patents.*

[1077 OG 22]

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(82)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket Number 80106-8200]

Miscellaneous Changes in Patent Practice

Agency: Patent and Trademark Office, Commerce
Action: Final Rule

Summary: The Patent and Trademark Office is amending its regulations to (1) correct certain rules to conform to previous changes in other rules, (2) require all correspondence directed to the Patent and Trademark Office concerning a patent application to include the series code and serialnumber or serial number and filing date, (3) provide for the indication of copyright and mask work protection in patent applications, (4) require that any necessary corrections to drawings be made only by submission of new or replacement drawings, (5) provide in limited situations for the use of color drawings in utility patent applications, (6) prohibit the use of broken lines in design patent application drawings to show hidden planes and surfaces, and (7) provide for a refund of a portion of the preliminary examination fee where the Demand is withdrawn. The change pertaining to the drawings would remove any need for patent applicants or their representatives to borrow drawings filed in patent applications from the Office after the effective date of the rule change for purposes of making corrections.

Effective Date: Jan. 1, 1989. The non-return of drawings provision of § 1.85(b) will apply to drawings in patent applications filed after Jan. 1, 1989.

For Further Information Contact: Louis O. Maassel by telephone at (703) 557-3070 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplemental Information: Proposed rulemaking requesting comment was published on May 9, 1988 in the *Federal Register* at 53 FR 16522 - 16527 and on May 24, 1988 in the *Official Gazette* at 1090 O.G. 57 - 62.

An oral hearing was conducted on July 21, 1988 to receive comments.

Written comments were received from 5 patent law groups, 2 patent law firms and 6 individuals. One person also presented oral testimony.

No comments were received relating to the proposed amendment of §§ 1.4, 1.5(b), 1.53(d), 1.56, 1.81, 1.84(j) & (l), 1.152, 1.378, 1.421 and 1.480.

The comments received relating to amendments to particular sections and replys thereto are listed below.

Comments relating to § 1.5(a).
Comment:

Six comments indicated that they considered the punishment of returning papers with improper identification as too harsh a penalty, since such return could result in the necessity of paying extension of time fees or revival of an abandoned application.
Reply:

The return of papers with improper identification is not intended to serve as punishment or a penalty, but as a solution to a major problem. In fact, most of the improperly identified papers are not ones for which a time period is running, e.g., priority papers, information disclosure statements, status inquiries, etc. The Patent and Trademark Office's (PTO) goal is to match papers with the appropriate application as quickly as possible. The practice of the PTO has been to attempt to match papers with the correct application by using the Patent Application Locating and Monitoring (PALM) System to conduct a search by applicant's name. Such a search is very slow and merely lists all application numbers under the name of the inventor. These application numbers must then be individually checked to attempt to match any other identifying information found on the paper. If this process is unsuccessful, attempts are made to reach the sender by telephone. Telephone calls usually require further followup since the paper cannot usually be identified immediately. Frequently, the serial number is not even available to the sender since application-related papers are being sent to the PTO before notification of serial number has been received. For papers not successfully matched after these attempts, the process of using PALM and making telephone calls is repeated days and weeks later. Despite the considerable effort and resources applied to matching papers, there are still thousands of unmatched papers. Undoubtedly, many were followed up by status inquiries or complaint letters from the senders, subsequent PTO searches for missing papers, and resubmissions by senders, some with petitions or extension of time fees. This waste of resources by both the PTO and the applicants is a major concern. Since the goal is to match papers as quickly and efficiently as possible, and not to institute a harsh penalty, the final rule was modified. Papers which are not properly identified will be returned, but if they are resubmitted to the PTO within two weeks of the date they are returned by the PTO, the original date of receipt will be retained without the need for paying fees for extension of time or revival of an abandoned application. Where no return address is available, the papers will be retained for a reasonable period of time to await any followup correspondence. If no followup correspondence is received within a reasonable period of time, the papers will be destroyed.
Comment:

Three comments included the proposal that the filing date and serial number be accepted as meeting the requirements of § 1.5(a).
Reply:

This proposal has been adopted in the final rule.
Comment:

One comment proposed that implementation of the proposal be delayed for one year to provide sufficient time to allow applicants to adapt to the requirements.
Reply:

The requirements are believed to be quite simple and are already met by almost all papers filed in the PTO. Therefore, an extended period of time to adapt is not seen to be necessary or appropriate.
Comment:

Two comments suggested that a procedure be developed under which an applicant could resubmit a corrected return paper with fee in a timely manner, and receive the benefit of the date of the original submission as its filing date.
Reply:

The substance of this suggestion has been adopted in final § 1.5(a), but without the charge of a fee. The final rule provides resubmission of a returned paper with proper identification within two weeks of the PTO mailing date of the letter returning the paper to the sender to resubmit the paper and retain the benefit of the filing date of the original submission. If desired, the resubmission could be mailed under the certificate of mailing procedure of § 1.8 or the "Express Mail" procedure of § 1.10.
Comment:

Three comments suggested that a form or notice be sent, with a time limit set for return of appropriate identification with minimal fee or subcharge.
Reply:

The proposal would require the PTO to retain the unmatched papers in some kind of order, probably alphabetically by inventor name and or by receipt date, so that responses could be matched. A double matching of all papers would be necessary. The responses with the appropriate identification would have to be matched to the original papers submitted, then these would have to be matched with the applications. If responses with appropriate identification did not reference the fact that a notice had been sent, they may not be associated with the original, again resulting in more unmatched papers. Accordingly, the proposal was not adopted.
Comment:

One comment indicated that including the word "must" with respect to providing the serial number and series code is too severe a requirement.
Reply:

The current rules in 37 CFR 1.5 state such identification "should" be on application-related papers. This term has apparently been too permissive and has contributed to the problem. The use of "must" is believed to be sufficiently strong to aid in resolving the problem.
Comment:

One comment included the proposal that a wrong serial number be considered as a defective execution under 35 U.S.C. 26 which could be corrected without loss of filing date.
Reply:

The legislative history of 35 U.S.C. 26 is quite clear that the intent of the section was to remedy problems only in the execution of oaths and declarations.
Comment:

Two comments questioned the meaning of "series code."
Reply:

The series code is the two digit number preceding the serial number on the application filing receipt. A new series code is assigned each time a new series of six digit serial numbers is begun. The current series code is "07". It appears before the serial number, for example 07/123,456. An illustrative example is also included in the final rule.
Comment:

One comment included the proposal that a more appropriate name for the combination of series code and serial number would be "application number."
Reply:

This proposal has been adopted in the final rule.
Comment:

One comment raised the question as to whether correspondence relating to a patent application should contain both the heading "PATENT" as suggested in the helpful hints and "PATENT APPLICATION" as called forin 1.5(a).
Reply:

"PATENT APPLICATION" should be used on patent application correspondence. This should be placed in an obvious location on the top page.
Comment:

One comment noted that the return post card only contains the serial number and not the series code.
Reply:

The PTO plans to begin identifying an eight-digit application number on return post cards. The series code will be the first two digits, followed by a slant "/" and the six digit serial number. Although the series code has not been stamped along with the serial number on the return post card used by many applicants, the series code changes only once about every 7 or 8 years when a new set of serial numbers is begun with 000,001. Therefore, until the eight-digit application number is stamped on return post cards, the current series code "07" can be used along with the serial number currently stamped on the post card.
Comment:

Three comments suggested that the rules provide that a paper without proper identification be returned only if the PTO found it impossible to match the paper to a particular application file.
Reply:

Attempts to match improperly identified papers with a particular application file is very time consuming and experience has shown that the benefits of such time consuming effort are not worth the effort expended.
Comment:

One comment questioned the meaning of "such information" in the second sentence of § 1.5(a).
Reply:

"Such information" means the items referred to in the first sentence, namely, the series code and serial number, serial number and filing date, or international application number.
Comment:

One comment indicated that the PTO may not return a paper in a timely manner.
Reply:

Although no assurance can be given as to the prompt return of all impropely identified papers, such papers will be returned in most instances from the PTO Mail Room within one day of the opening of the envelopes containing the papers and discovery of incomplete identification. Also, the time for resubmission of a returned paper is calculated from the PTO mailing date so that no injury would result from a prompt resubmission.
Comment:

One comment indicated that if the filing receipt is delayed or lost, it would preclude timely status inquiries or cause delays in preliminary matters such as a request for a foreign filing license.
Reply:

A self-addressed return post card, with proper postage, can be used to obtain early notification of the application number.

Comments relating to § 1.53.
Comment:

One comment pointed out inconsistent wording between proposed § 1.53 and the explanatory comments in the notice of proposed rulemaking.
Reply:

The apparent inconsistency has been corrected.

Comments relating to § 1.71 and § 1.84(o).
Comment:

One comment raised a question whether the PTO should make a comment as to the legal sufficiency of a copyright notice

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mentioned in § 1.71 since the PTO does not administer the copyright law.
Reply:
An indication of what is considered to be legally sufficient copyright notice was included to assist applicants who may not be familiar with the copyright law.

Comments relating to § 1.84(a).
Comment:
Five comments were received objecting to the prohibition of photolithographs as drawings.
Reply:
The final rule does not prohibit photolithographs as drawings.

Comments relating to § 1.84(b).
Comment:
Three comments were received relating to drawing sheet sizes. One comment favored using only the A4 size and the other two comments favored using letter size (8 1/2 by 11 inches).
Reply:
Since applicants have three different size sheets which may be used as they choose, no need is currently seen to make a single size mandatory. The use of letter size drawing sheets requires further study and if acceptable, will be proposed for public comment in the future.

Comments relating to § 1.84(i).
Comment:
One comment included the suggestion that clarifying language changes be made in § 1.84(i).
Reply:
The comment relating to the wording of the last sentence of § 1.84(i) has been adopted.

Comments relating to § 1.84(n).
Comment:
One comment supported the change to § 1.84(n).

Comments relating to § 1.84(p).
Comment:
Two comments relating to color drawings in utility applications were received. One comment proposed that the applicant be permitted to file color drawings at his or her choice but that the patent be printed in black and white only with copies of the color drawings being available at extra cost. The other comment related to the patent examiner having the discretion to accept color drawings rather than requiring a petition to be filed.
Reply:
In the past only a very few applications have shown a need to include drawings in color. Until more experience is gained, it is considered best to allow color drawings in limited situations and approval to remain in a central location by petition.
Comment:
One comment stated that is is not proper to charge a higher fee where color drawings are required.
Reply:
Color drawings are considered to be beyond the normal requirements set forth in the rules and therefore require waiver of the rules for acceptance.

Comments relating to § 1.85(a).
Comment:
One comment was received suggesting that "may" be changed to "shall" in § 1.85(a).
Reply:
The PTO is currently very liberal in accepting informal drawings and no need is seen for making the propsed change.

Comments relating to § 1.85(b) & (c).
Comment:
One comment proposed allowing drawings filed in the PTO to be withdrawn to make minor changes.
Reply:
The problems relating to charging out drawings would remain if drawings are allowed to be removed from the PTO for any reason. A major purpose of the rule change is to remove the necessity to have a drawing charge-out system in the PTO in the future.
Comment:
One comment asked whether § 1.85(b) would be construed to deny access to a PTO drawing for making a copy.
Reply:
Applicants and their representatives will continue to have access to their files and obtain copies of drawings.
Comment:
One comment proposed adding another sentence to § 1.85(c) to clarify that an extension of time is available under § 1.136 for filing of formal drawings but not for payment of the issue fee.
Reply:
This proposal has been adopted with somewhat different wording.
Comment:
One comment indicated that the three month period for submitting corrections should be measured from the "notice of allowability" rather than the "notice of allowance."
Reply:
This proposal has been adopted in the final rule.

Discussion of specific rules

Section 1.4, as amended, corrects the listing of rules in paragraph (a)(2).

Section 1.5, as amended, provides that all correspondence related to a U.S. national patent application already filed with the Patent and Trademark Office must include the identification of the application number which comprises both the series code and the serial number assigned to that application by the Patent and Trademark Office, (e.g., 07/123,456) or the serial number and filing date. Any correspondence not containing such identification will be returned to the sender where a return address is available. The final rule has been revised to provide that if the correspondence is remailed to the PTO within two weeks of the mailing date of the PTO's cover letter returning the correspondence, the PTO will grant the benefit of the original date of receipt of the returned correspondence. The two-week period will not be extended under § 1.136. Applicants may use either § 1.8 or § 1.10 mailing procedures for resubmissions of returned correspondence. No correspondence relating to an application should be filed prior to when notification of the application number is received from the PTO. If for some reason returned correspondence is resubmitted later than two weeks after the return mailing by the PTO, the resubmitted correspondence will be accepted but given its date of receipt with proper identification. If the original date of receipt is desired, applicants may petition under § 1.183 for waiver of the rules. Given there are over 30,000 documents to be routed each day, this requirement greatly facilitates the matching of correspondence received with the relevant patent application file. Without proper number identification, documents are either significantly delayed during processing or are never matched with the relevant application file. The amendments to paragraph (b) draw attention to the different requirements for identification in correspondence relating to the payment of maintenance fees.

Section 1.53(c) and (d), as amended, state that a copy of the "Notice of Incomplete Application" or "Notice to File Missing Part" form sent to the applicant by the Office should accompany any response submitted to the Office in order for the response to be accepted. This will prevent the inadvertent assignment of a new application number to correspondence sent in response to such notices or the misrouting of the correspondence.

Section 1.56(c), as amended, corrects the reference to the "Board of Appeals" to read "Board of Patent Appeals and Interferences."

Section 1.71, as amended, contains new paragraphs (d) and (e) relating to the inclusion of copyright and mask word notices in patent applications. The provisions proposed are similar to those set forth in the Official Gazette notice dated Mar. 20, 1987 titled "Inclusion of Copyright or Mask Work Notice in Patents" appearing on Apr. 21, 1987 at 1077 O.G. 22. Under current intellectual property laws, it is possible to obtain copyright protection or mask work protection as well as patent protection for certain designs and technologies. On occasion, an author or inventor considers it desirable to include a notice of copyright or mask work in a design or utility patent which discloses material on which copyright or mask work protection previously has been established.

The inclusion of a copyright or mask work notice in a patent that discloses material on which copyright or mask work protection previously has been established, will serve to publicize and thereby protect the various intellectual property rights of the author or inventor. Further, this publication would tend to protect the public by militating against an unintentional encroachment of the rights. The presence of an unrestricted copyright or mask work notice in a patent could have an inhibiting effect on public dissemination of the patent disclosure to the extent it discourages the facsimile reproduction of the patent. The possible effect would be contrary to the mission of the Patent and Trademark Office to disseminate knowledge and information publicly by way of patent issuance, publication, and distribution. To avoid this effect, it is considered necessary to include an appropriate authorization by the author or inventor for copying of the patent itself with any copyright or mask work notice appearing in the patent. Inclusion of a copyright or mask work notice after a Notice of Allowance has been mailed will be permitted only if the criteria of 37 CFR 1.312 have been fulfilled. If the authorization required by amended § 1.71(e) is not included, the notice will be objected to as improper by the examiner. If the examiner maintains the objection upon reconsideration, further review must be by way of a petition filed in accordance with 37 CFR 1.181.

Section 1.81, as amended, clarifies that high quality copies of drawings should be sumitted in patent applications. Since corrections are the responsibility of the applicant, the original drawing(s) should be retained by the applicant for future correction, if necessary.

Section 1.84(a), as amended, elimates reference to two-ply or three-ply bristol board. Amended paragraph (a) also adds a reference to paragraph 1.84(p) relating to color drawings in utility patent applications.

Only one copy of the drawing is required or desired. The Office had attempted to encourage the submission of three copies, but compliance was very low. It was determine that it is more efficient for the Office to rely on consistency and only one copy. Accordingly, hereafter only one copy of the drawings should be submitted.

The Patent and Trademark Office will no longer release to applicants, bonded drafting companies, or others, drawings from patent applications filed after the effective date of these rule changes. See amended § 1.85(b). If corrections to the drawings are necessary, new corrected drawings must be prepared by the applicant and filed in the Patent and Trademark Office. Therefore, the applicant, attorney or agent should retain the original drawing so that a corrected original drawing or corrected copy may be later submitted if necessary.

The Office will continue to allow applicants to borrow drawings for correction which have been filed prior to the effective date of these rule changes.

Section 1.84(b), as amended, provides for applicants using drawing sheets which are 8 1/2 by 13 inches in size.

Section 1.84(i), as amended, contains grammatical corrections in the test of the rules and clarifies Office drawing requirements as to exploded views, enlarged views and views which require several sheets.

Section 1.84(j), as amended, clarifies how views should be arranged when they are placed sideways on the drawing sheet.

Section 1.84(l) as amended, indicates that drawings may be identified by lightly writing identifying information in the top margin on the drawings. For identification by application number, the Office prefers that the information be placed on the front of the drawing. When the applicant forwards drawings separate from the original application papers, a cover letter identifying the application by application number should accompany the drawings. The application number should also be placed on drawings filed after the application number has been indicated in correspondence to the applicant, in accordance with § 1.84(l).

Section 1.84(n) is added and permits numbering of the drawing sheets. However, such numbering would not appear on the drawings of the printed patent.

Section 1.84(o) is added and provides for the indication of copyright or mask work protection notice on patent application drawings. This procedure is the same as that established by the *OfficialGazette* notice dated Mar. 20, 1987 published on Apr. 21, 1987 at 1077 O.G. 22.

Section 1.84(p) is added and provides in the rules for the filing of color drawings in a very limited number of utility patent applications. An *Official Gazette* notice relating to this topic dated Aug. 6, 1986, titled "Use of Color Drawings in Utility Patents" was published on Sept. 15, 1987 at 1082 O.G. 25. In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the letters patent and the patent copies which are printed at the issuance of the patent will be only in black and white. However, copies of the patent with the color drawings may be purchased separately from the Patent and Trademark Office upon special request and payment of the fee.

It is anticipated that color drawings will only be permitted when color drawings are the only practical method in a utility patent application in which to disclose the subject matter sought to be patented. In order to avoid issues of lack of description or enablement under 35 U.S.C. 112 or new matter under 35 U.S.C. 132, applicants are advised to file the desired color drawings as part of the original application papers. The petition should be directed to the attention of the Deputy Assistant Commissioner for Patents.

Section 1.85, as amended, indicates that drawings not complying with § 1.84 will be accepted in some instances for purposes of examination and that drawings which do comply with all the rules relating to drawings will be required later, and that no corrections will be permitted to drawings filed in the Patent and Trademark Office after the effective date of the rule change.

When corrected drawings are required to be sumitted at the time of allowance, the applicant is required to submit *acceptable* drawings within three months from the mailing of the "Notice of Allowability." Within that three-month period, two weeks should be allowed for review of the drawings by the Drafting Branch. If the Office finds that further correction is necessary, the applicant must submit a new corrected drawing to the Office within the original three-month period to avoid the necessity of obtaining an extension of time and paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the receipt of the Notice of Allowability.

Section 85(b) provides that the Patent and Trademark Office will not release drawings filed in applications having a filing date after Jan. 1, 1989 for purposes of correction. Also, in order to give sufficient notice to applicants, allow most patent applications currently on file to be processed, and set a time at which the PTO need no longer provide a system for borrowing of any drawings, (§ 1.85(b) provides that after Jan. 1, 1991 no drawings may be borrowed from the PTO for the purpose of making drawing corrections.

Section 1.152, as amended, permits broken lines on drawings to show visible environmental structure but not hidden planes and surfaces in design patent application drawings.

Section 1.378, as amended, conforms with section 404 of Public Law 98-622 which states:

> "(a) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after Dec. 12, 1980, and before Aug. 27, 1982, to the same extent as in the case of patents based on applications filed in the Patent and Trademark Office on or after Aug. 27, 1982."

The amended rule wording includes reference to maintenance fees due on patents based on applications filed in the Patent and Trademark Office on or after Dec. 12, 1980 and before Aug. 27, 1982.

Section 1.421(f), as amended, deletes reference to a cancelled PCT Rule and adds reference to the current PCT Rule provision.

Section 1.480(d), as amended, provides for a refund of a portion of the international preliminary examination fee where the applicant withdraws the demand before the examiner has begun the international preliminary examination. An amount equal to the transmittal fee would be retained by the Patent and Trademark Office to cover the administrative cost involved.

Environmental, Energy, and Other Considerations

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The rule change does not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entitites (Regulatory Flexibility Act, Pub. L. 96-354) because the rule change corrects some rules so that they correspond to earlier changes, relate to identification of applications on correspondence, allow greater flexibility in patent drawing content and handling, and provide for a refund where a proper demand for international preliminary examination has been filed but withdrawn later.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalsim implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change involves collection of information requirements subject to the Paperwork Reduction Act of 1980, 40 U.S.C. 3501 *et seq.*, and are cleared under OMB Control No. 0651-0011.

List of Subjects in 37 CFR Part 1.

Administrative practice and procedure, Authority delegations (Government agencies), Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 41, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Part 1, is amended as follows:

PART 1— RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.4 is amended by revising paragraph (a)(2) to read as follows:

§1.4 Nature of correspondence.

(a) * * *

(2) Correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.378; of international applications in Subpart C, §§ 1.401 to 1.499; of reexamination of patents in Subpart D, §§ 1.501 to 1.570; of interferences in Subpart E; §§ 1.601 to 1.690; of extension of patent term in Subpart F, §§ 1.710 to 1.785; and of trademark applications §§ 2.11 to 2.189.

* * * * *

3. Section 1.5 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.5 Identification of application, patent or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the certificate of mailing procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

(b) When the letter concerns a patent other than for purposes of paying a maintenance fee, it should state the number and date of issue of the patent, the name of the patentee, and the title of the invention. For letters concerning payment of a maintenance fee in a patent, see the provisions of § 1.366(c).

* * * * *

4. Section 1.53 is amended by revising paragraphs (c) and (d) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. A copy of the "Notice of Incomplete Application" form notifying the applicant should accompany any response thereto submitted to the Office. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $15.00 handling fee.

(d) If an application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" formed mailed to applicant should accompany any response thereto submitted to the Office. If the required fee is not timely paid, or if the processing and retention fee set forth in § 1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application; or, if no basic filing fee has been paid, one year from the filing date to pay the processing and retention fee set forth in § 1.21(l) to prevent disposal of the application.

5. Section 1.56 is amended by revising paragraph (e) to read as follows:

§ 1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(e) The examination of an application for compliance with paragraph (d) of this section will normally be delayed until such time as (1) all other matters are resolved, or (2) appellant's reply brief pursuant to § 1.193(b) has been received and the application is otherwise prepared for consideration by the Board of Patent Appeals and Interferences, at which time the appeal will be suspended for examination pursuant to paragraph (d) of this section. The prosecution of the application will be reopened to the extent necessary to conduct the examination pursuant to paragraph (d) of this section including any appeal pursuant to § 1.191. If an appeal has already been filed based on a rejection on other grounds, any further rejection under this section shall be treated in accordance with § 1.193(c).

* * * * *

6. Section 1.71 is amended by adding new paragraphs (d) and (e) to read as follows:

§ 1.71 Detailed description and specification of the invention.

* * * * *

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may appear at any appropriate portion of the patent application disclosure. For notices in drawings, see § 1.84(o). The content of the notice must be limited to only those elements required by law. For example, " 1983 John Doe" (17 U.S.C. 401) and "© John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

(e) The authorization shall read as follows:

A portion of the disclosure of this patent document contains material which is subject to 'copyright or mask work,' protection. The 'copyright or mask work' owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all 'copyright or mask work' rights whatsoever.

7. Section 1.81 is amended by revising the title and paragraph (a) to read as follows:

§ 1.81 Drawings required in patent application.

(a) The applicant for a patent is required to furnish a drawing of his or her invention where necessary for the understanding of the subject matter sought to be patented; this drawing, or a high quality copy thereof, must be filed with the application. Since corrections are the responsibility of the applicant, the original drawing(s) should be retained by the applicant for any necessary future correction.

* * * * *

8. Section 1.84 is amended by revising paragraphs (a), (b), (i), (j) and (l) and by adding new paragraphs (n), (o), and (p), to read as follows:

§ 1.84. *Standards for drawings.*

(a) *Paper and Ink.* Drawings or high quality copies thereof which are submitted to the Office must be made upon paper which is flexible, strong, white, smooth, non-shiny and durable. India ink, or its equivalent in quality, is preferred for pen drawings to secure prefectly black solid lines. The use of white pigment to cover lines is not normally acceptable. See paragraph (p) of this section for use of color drawings in utility patent applications.

(b) *Size of sheet and margins.* The size of the sheets on which drawings are made may be exactly 8 1/2 by 14 inches (21.6 by 35.6 cm.), exactly 8 1/2 by 13 inches (21.6 by 33.1 cm.), or exactly 21.0 by 29.7 cm. (DIN size A4). All drawing sheets in a particular application must be the same size. One of the shorter sides of the sheet is regarded as its top.

* * *

(2) On 8 1/2 by 13 inch drawing sheets, the drawing must include a top margin of 1 inch (2.5 cm.) and bottom and side margins of 1/4 inch (6.4 mm.) from the edges, thereby leaving a "sight" precisely 8 by 11 3/4 inches (20.3 by 29.8 cm.). Margin border lines are not permitted. All work must be included within the "sight." The sheets may be provided with two 1/4 (inch (6.4 mm.) diameter holes having their centerlines spaced 11/16 inch (17.5 mm.) below the top edge and 2 3/4 inches (7.0 cm.) apart, said holes being equally spaced from the respective side edges.

(3) On 21.0 by 29.7 cm. drawing sheets, the drawing must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm. Margin border lines are not permitted. All work must be contained within a sight size not to exceed 17 by 26.2 cm.

* * * * *

(i) *Views.* The drawing must contain as many figures as may be necessary to show the invention; the figures should be consecutively numbered if possible in the order in which they appear. The figures may be plan, elevation, section, or perspective views, and detail views of portions or elements, on a larger scale if necessary, may also be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When an exploded view is shown in a figure which is on the same sheet as another figure, the exploded view should be placed in brackets. When necessary, a view of a large machine or device in its entirety may be broken and extended over several sheets if there is no loss in facility of understanding the view. Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets should be so arranged that the complete figure can be understood by laying the drawing sheets adjacent to one another. The figures, even through on separate sheets, should be labeled as separate figures, for example as Fig. 1a, Fig. 1b, etc., so that it would be apparent that the views actually comprise one figure. The arrangement should be such that no part of any of the figures appearing on the various sheets is concealed and that the complete figure can be understood even though spaces will occur in the complete figure because of the margins on the drawing sheets. The plane upon which a sectional view is taken should be indicated on the general view by a broken line, the ends of which should be designated by numerals corresponding to the figure number of the sectional view and have arrows applied to indicate the direction in which the view is taken. A moved position may be shown by a broken line superimposed upon a suitable figure if this can be done without crowding, otherwise a separate figure must be used for this purpose. Modified forms of construction can only be shown in separate figures. Views should not be connected by projection lines nor should centerlines be used. When a portion of a figure is enlarged for magnification purposes, the figure and the enlarged figure must be labeled as a separate figures.

(j) *Arrangement of Views.* All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views

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longer than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet with the appropriate top margin to be used as the heading space is on the right-hand side. One figure must not be placed upon another or within the outline of another.

* * * * *

(l) *Identification of drawings.* Identifying indicia (such as the application number, group art unit, title of the invention, attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2 3/4 inches (7.0 cm.) in width may be placed in a centered location between the side edges within three-fourths inch (19.1 mm.) of the top edge. Either this marking technique on the front of the drawing or the placement, although not preferred, of this information and the title of the invention on the back of the drawings is acceptable. Authorized security markings may be placed on the drawings provided they are outside the illustrations and are removed when the material is declassified. Other extraneous matter will not be permitted upon the face of a drawing.

* * * * *

(n) *Numbering of drawing sheets.* The drawing sheets may be numbered in consecutive arabic numbers at the top of the sheets, in the middle, but not in the margin. Such numbering will be deleted for printing purposes since page numbers are added at the time of printing the patent by the Office.

(o) Copyright or Mask Work Notice. A copyright or mask work notice may appear in the drawing but must be placed with the "sight" of the drawing immediately below the figure representing the copyright or mask work material and be limited to letters having a print size of 1/8 to 1/4 inches (3.2 to 6.4 mm) high. The content of the notice must be limited to only those elements required by law. For example, "© 1983 John Doe" (17 U.S.C. 401) and "© John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in 1.71(e) is included at the beginning (preferably as the first paragraph) of the specification.

(p) *Limited use of color drawings in utility patent applications.* Paragraph (a) of this section requires that drawings in utility patent applications must be in black on white paper. However, on rare occasion, color drawings may be necessary as the only practical medium by which to disclose the subject matter sought to be patented in a utility patent application. The Patent and Trademark Office will accept color drawings in utility patent applications only after granting of a petition by the applicant under § 1.183 of this part which requests waiver of the requirements of paragraph (a) of this section. Any such petition should be directed to the Office of the Deputy Assistant Commissioner for Patents and must include the following:

(1) The appropriate fee set forth in § 1.17(h).
(2) Five (5) sets of color drawings on DIN size A4 (21.0 by 29.7 cm.) sheets.
(3) A proposed amendment to insert in the specification the following language as the first paragraph in the portion of the specification relating to the brief description of the drawing:

"The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee."

9. Section 1.85 is revised to read as follows:

§ 1.85 Corrections to drawings.

(a) The requirements of § 1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for reproduction, may be admitted for examination but in such case a new drawing must be furnished.

(b) The Patent and Trademark Office will not release drawings in applications having a filing date after Jan. 1, 1989, or any drawings from any applications after Jan. 1, 1991, for purposes of correction. If corrections are necessary, new corrected drawings must be submitted within the time set by the Office.

(c) When corrected drawings are required to be submitted at the time of allowance, the applicant is required to submit acceptable drawings within three months from the mailing of the "Notice of Allowability." Within that three-month period, two weeks should be allowed for review of the drawings by the Drafting Branch. If the Office finds that correction is necessary, the applicant must submit a new corrected drawing to the Office within the original three-month period to avoid the necessity of obtaining an extension of time and paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the receipt of the Notice of Allowability. The provisions with respect to obtaining an extension of time relates only to the late filing of corrected drawings. The time limit for payment of the issue fee is a fixed three-month period which cannot be extended as set forth in 35 U.S.C. 151.

10. Section 1.152 is revised to read as follows:

§ 1.152 Drawing.

The design must be represented by a drawing made in conformity with the rules laid down for drawings of mechanical inventions and must contain a sufficient number of views to constitute a complete disclosure of the appearance of the article. Appropriate surface shading must be used to show the character or contour of the surfaces represented. Broken lines may be used to show visible environmental structure, but may not be used to show hidden planes and surfaces which cannot be seen through opaque materials.

11. Section 1.478 is amended by revising paragraphs (b)(1) and (c)(1) to read as follows:

§ 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

* * * * *

(b) * * *

(1) The required maintenance fee set forth in § 1.20 (e) - (j),

* * *

(c) * * *

(1) The required maintenance fee set forth in § 1.20 (e) - (j),

* * *

12. Section 1.421 is amended by revising paragraph (f) and adding a new paragraph (g) to read as follows:

§ 1.421 Applicant for international application.

* * * * *

(f) Changes in the person, name, or address of the applicant of an international application shall be made in accordance with PCT Rule 92bis.

(g) The wording of PCT Rule 92bis is as follows:

PCT Rule 92bis - Recording of Changes in Certain Indications in the Request or the Demand *92bis Recording of Changes by the International Bureau*

(a) The International Bureau shall, on the request of the applicant or the receiving Office, record changes in the following indications appearing in the request or demand:

(i) person name, residence, nationality or address of the applicant,
(ii) person, name or address of the agent, the common representative or the inventor.

(b) The International Bureau shall not record the requested change if the request for recording is received by it after the expiration:

(i) of the time referred to in Article 22(1), where Article 39(1) is not applicable with respect to any Contracting State;
(ii) of the time limit referred to in Article 39(1)(a), where Article 39(1) is applicable with respect to at least one Contracting State.

13. Section 1.480 is amended by revising paragraph (d) to read as follows:

§ 1.480 Demand for international preliminary examination.

* * * * *

(d) Withdrawal of a proper Demand prior to the start of the international preliminary examination will entitle applicant to a refund of the preliminary examination fee minus the amount of the transmittal fee set forth in § 1.445(a)(1).

Nov. 21, 1988

DONALD J. QUIGG.
Assistant Secretary and Commissioner of Patents and Trademarks

[1097 OG 36]

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(83)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
Docket No. 81024-9224
Rin 0651-AA30

Revision of Patent Application Filing Practices

Agency: Patent And Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to clarify requirements in the filing of patent applications and to provide for procedures to cure certain defects in the filing of applications.
Effective Date: Jan. 16, 1990.
For Further Information Contact: J. Michael Thesz by telephone at (703) 557-8384 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Proposed rulemaking requesting comments was published on Nov. 30, 1988 in the *Federal Register* at 53 FR 48402-48421 and on Dec. 13, 1988, in the *Official Gazette* at 1097 O.G. 16-35 regarding adjusting patent and trademark fee amounts and including proposed changes to the rules involved in this rulemaking. The period for receiving comments on the rules involved in this rulemaking was extended by a notice published on Feb. 15, 1989 in the *Federal Register* at 54 FR 6936. The final rules adjusting patent and trademark fee amounts were published Feb. 15, 1989 in the *Federal Register* at 54 FR 6893-6910 and on March 7, 1989 in the *Official Gazette* at 1100 O.G. 7-25.

Comments on the rules involved in this rulemaking were received from two patent law associations and from three individuals. The comments received relating to particular sections and replies thereto are listed below.

Comments Related to Section 1.53

Comment: One comment suggested that it would be helpful to new practitioners, in particular, if section 1.53 was amended to specify that continuation and divisional applications may be filed under section 1.53.

Reply: The suggestion in the comment has been adopted. Language has been added to paragraph (b) of section 1.53 to specify what types of applications may be filed under sections 1.53, 1.60 and 1.62. Also, the information about filing continuation and divisional applications from paragraph (a) of section 1.60 has been placed in paragraph (b) of that section to clarify that the information applies only to applications filed under section 1.60.

Comment: One comment stated support for the proposed petition for correcting a failure to name the inventors of an application on filing but suggested that the rule should be "liberalized to indicate that the inventors do *not* need to be named at the time the application is filed, but may be named later when filing the declaration or oath." Another comment expressed no opposition for requiring a petition and fee for late submission of the names of the inventors but argued that a filing date should be granted regardless thereof since 35 U.S.C. 111 provides for a filing date upon submission of a specification and drawing.

Reply: This suggested modification to the rule has not been adopted. The suggested modification was not proposed for comment. Further, United States patent practice has long required naming all the inventors on filing. The petition procedure of the rule as amended provides adequate relief where the inventors are not named on filing through administrative oversight, for example. It is not appropriate, however, to adopt a procedure where applications could routinely be filed without naming the inventors since this would delay the processing of the applications and since the name of the inventor is often required to provide a unique identifier for an application. The name of the inventor is not only used by attorneys to identify an application but is used to locate an application within the Office, for example, when the serial number is unknown. To delay the date when the inventors are named would unduly add to the administrative burden of the Office.

Comment: One comment stated that the proposed requirement for satisfactorily explaining the delay in supplying the inventors' names was improper since 35 U.S.C. 111 uses the language "within such period and under such conditions" as may be prescribed by the Commissioner. The comment stated that "satisfactorily" implies other and unknown standards, which are not specified conditions although requiring the petitioner to explain the delay is a condition.

Reply: The comment has been adopted in that the language of the final rule does not use "satisfactorily". The final rule requires that the petition set forth the reasons the delay in supplying the names of the inventors should be excused. It is appropriate to require reasons since there may be reasons when such a petition would not be granted, e.g., where the sole reason given that the names of the inventors were not supplied was to purposely delay the processing of the application.

Comments Related to Section 1.60

Comment: One comment questioned whether under section 1.60 there is need for a petition satisfactorily explaining the delays in filing the true copy of the application or a statement that it is a true copy or whether these items should be permitted to be filed without explanation as in the case of an oath submitted after the filing date of an application under section 1.53.

Reply: The filing of an oath later than the filing date of an application, with the payment of a surcharge, under section 1.53 is expressly permitted by 35 U.S.C. 111. No such provision exists for applications filed under section 1.60. Further, it is not appropriate to encourage, in any way, the delay in processing and examining applications filed under section 1.60. The requirement for a petition with a satisfactory explanation of the delay, e.g., that the copy was omitted through inadvertence rather than for purposes of delaying the application, is considered to be appropriate.

Commment Related to Section 1.60 and 1.62

Comment: One comment supported the provisions of proposed sections 1.60 and 1.62 for excusing 1) the failure to file a true copy of the prior application or the statement that the papers are a true copy (in section 1.60) or 2) the error of filing a copy of the prior application or a new specification (in section 1.62). The comment, however, stated a belief that applicants should have the option of proceeding under either of these proposed rules or under section 1.53 to obtain as the filing date the original date of receipt of the continuing application papers, if desired.

Reply: It is already possible for an applicant to petition under 37 CFR 1.182 to have an application filed under sections 1.60 and 1.62 converted to an application under section 1.53. These different types of applications have different requirements, are reviewed by different personnel within the Office, and are processed in different manners. Conversion from a section 1.60 or 1.62 application to a section 1.53 application involves an administrative burden to the Office. Sections 1.60 and 1.62 as

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amended provide specific procedures so that applicants can correct the mentioned errors. These procedures should provide the remedy desired by applicants in all but very unusual situations. It is not necessary or appropriate to try to address these very unusual situations in this rulemaking.

Comments Related to Section 1.62

Comment: One comment suggested that Section 1.62(e) should refer to an amendment to the prior application as it exists "at the time of filing of the application under this section" rather than the time of filing the prior application.

Reply: The language suggested in the comment has been adopted.

Comment: One comment questioned whether a petition and fee or denial of filing date were necessary where a copy of a specification from the prior application or a new specification is improperly filed with an application under section 1.62. The comment suggested that a clerk could simply disregard the copy or the specification and place it somewhere in the file with some sort of notation that it is not accepted.

Reply: Changes to the prior application when filing under section 1.62 must be made by amendment to the prior application as it exists at the time of filing the section 1.62 application since the papers from the prior application including the specification are used to constitute the file wrapper continuing application under 37 CFR 1.62. Experience has shown that, when a copy of a specification or a new specification is filed with a section 1.62 application , a different type of application may have actually been desired. For example, a continuing application under section 1.60 may have been desired with the prior application not being expressly abandoned as occurs under section 1.62(g). Also, in the case of a continuation-in-part application, presumably the new disclosure would be contained in the specification erroneously filed with the section 1.62 application. Thus, it is not appropriate to just disregard the copy or the new specification filed with the section 1.62 application. To do so in the first example would result in an unwanted express abandonment. To do so in the second example would disregard the new invention disclosed in the erroneously filed specification. This would raise the possibility of a statutory bar under 35 U.S.C. 102(b) arising if, for example, the new invention was placed on sale in expectation that a filing date would be accorded to the application including the new disclosure. The course of action adopted is to stop the processing of the application as soon as the error is detected, to notify applicant of the error and to give applicant an opportunity to correct the error in whatever way was intended through the filing of a petition and fee.

Comment: One comment questioned whether an amendment, and not a petition, cancelling an improperly submitted copy of a specification filed with a request for a section 1.62 application would be appropriate to obtain a filing date as of the original date of filing the continuing application papers.

Reply: Paragraph (j) of section 1.62 does provide for correction of the filing error, e.g., by amendment cancelling the copy of the prior application, without the filing of a petition and fee provided the correction is made before the payment of the issue fee, abandonment of or termination of proceedings on the prior application. In such a case, the filing date will be the date of receipt of the correction. However, if the date of deposit is necessary or desired as the filing date, a petition and fee are required. This is appropriate in view of the extra Office handling and processing which is necessitated by applicant's error on filing.

Comment: One comment stated that proposed paragraphs (e) and (j) of section 1.62, when read together, seemed to indicate that a filing date would be granted as of the date the filing error was corrected and not as of the date of deposit of the application. It was suggested that paragraph (e) should expressly state that once the specification is cancelled, the application will be accorded a filing date as of the date of filing of the request for the section 1.62 application.

Reply: The suggestion in the comment has been adopted. Language has been added to section 1.62(e) to state that a filing date "as of the date of deposit of the request for an application under this section" may be granted if an appropriate petition is filed.

Discussion of Specific Rules

Section 1.17, paragraph (i)(1), is amended to include reference to the petitions set forth in sections 1.53, 1.60 and 1.62 by this rulemaking.

Section 1.21, as amended, adds a new paragraph (n) setting forth the fee for handling incomplete or improper applications under sections 1.53(c), 1.60 and 1.62.

Section 1.53, paragraph (b), is amended to establish a procedure whereby the failure to name all the inventors on filing an application, which results in a filing date not being accorded to the application, can be excused upon the filing of a petition which sets forth reasons sufficient to show that the delay in supplying the names should be excused. If the petition is granted, the application would be accorded a filing date as of the date the original papers were deposited. No specific provision allowing this relief was previously in the rules. Paragraph (b) is also amended to specify that a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and section 1.78(a)) may be filed under sections 1.53, 1.60 and 1.62, that a continuation-in-part application may be filed under sections 1.53 or 1.62 and that the requirements for obtaining a filing date set forth in paragraph (b) apply to applications filed under section 1.53. Paragraph (c), as amended, sets forth the procedure which the Office uses to notify an applicant that the names of the inventors have been omitted and refers to the handling fee set in section 1.21(n), rather than including the fee amount in the rule. This practice is consistent with the other rules which refer to fees.

Section 1.55, paragraph (a), is amended to clarify the language of the rule by adding "an" before "interference".

Section 1.60 is amended to remove and reserve paragraph (a) and to amend paragraph (b) to include the information presently in paragraph (a) so as to clarify that the information applies only to applications filed under this section. Paragraph (b) is also amended to require that an applicant, who desires to file an application under the rule, indicate that the application is being filed pursuant to the rule. Applications which are not specifically designated as being filed under section 1.60 are considered as having been filed under section 1.53, which does not require an originally executed declaration before a filing date is given. The amendment also establishes a procedure whereby the failure to file a true copy of the prior application or the statement that the papers are a true copy, which results in a filing date not being accorded the application, can be excused upon the filing of a petition satisfactorily explaining the delay in filing these items. If the petition is granted, the application would be accorded a filing date as of the date of deposit of the request for a section 1.60 application. No specific provision allowing this relief was previously in the rules. Paragraph (c) is added to set forth the procedure which the Office uses to notify an applicant that an application filed under paragraph (b) is incomplete and the handling fee which is deducted from the amount refunded if an application is not completed after notice to do so has been given.

Section 1.62, paragraph (e), is amended to specifically state that changes to the prior application must be made by an amendment to the prior application filed in the application under section 1.62. An application which includes a copy of the prior application or a new specification is improper under the rule and is not accorded the date of deposit as the filing date unless a petition is filed and granted. This specific statement will hopefully eliminate errors by applicants. The paragraph establishes a procedure whereby such an error can be excused upon the filing of a petition with instructions to cancel the copy or specification. If the petition is granted, the application will be accorded a filing date as of the date of deposit of the request for a section 1.62 application. Paragraph (j) sets forth the procedure which the Office uses to notify the applicant that an application filed under the section is improper and the handling fee which is deducted from the amount refunded if an application is not corrected after notice to do so has been given.

Section 1.96 is amended to indicate that a copy of the microfiche appendix with computer program listings in an application is a part of the file wrapper and contents available for purchase after a patent based on the application is granted or the application is otherwise made publicly available.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. Sections 3501 et seq. This rule involves information collection requirements subject to the Paperwork Reduction Act and approved by the Office of Management and Budget under Control No. 0651-0011.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L 96-354).

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 41, and Public Law 97-247, the Office is amending Title 37 of Code of Federal Regulations as set forth below.

Part 1 Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is amended by revising paragraph (i)(1) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§ 1.12-for access to an assignment record.
§ 1.14-for access to an application.
§ 1.53-to accord a filing date.
§ 1.55-for entry of late priority papers.
§ 1.60-to accord a filing date.
§ 1.62-to accord a filing date.
§ 1.103-to suspend action in application.
§ 1.177-for divisional reissues to issue separately.
§ 1.312-for amendment after payment of issue fee.
§ 1.313-to withdraw an application from issue
§ 1.314-to defer issuance of a patent.
§ 1.334-for patent to issue to assignee, assignment recorded late.
§ 1.666(b)-for access to interference settlement agreement.

* * * * *

3. Section 1.21 is amended by adding paragraph (n) to read as follows:

§ 1.21 Miscellaneous fees and charges.

* * * * *

(n) For handling an incomplete or improper application under § 1.53(c), § 1.60 or § 1.62 ..... $20.00.

4. Section 1.53 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.53 Serial number, filing date and completion of application.

* * * * *

(b) The filing date of an application for patent filed under this section is the date on which: (1) a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and (2) any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No new matter may be introduced into an application after its filing date (§ 1.118). If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(i)(1) is filed which sets forth the reasons the delay in supplying the names should be excused. A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) may be filed pursuant to this section, § 1.60 or § 1.62. A continuation-in-part application may be filed pursuant ot this section or § 1.62.

(c) If any application is filed without the specification, drawing or name, or names, of the actual inventor or inventors required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification, drawing, name, or names, of the actual inventor, or inventors, in order to obtain a filing date as of the date of filing of such submission. A copy of the "Notice of Incomplete Application" form notifying the applicant should accompany any response thereto submitted to the Office. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

* * * * *

5. Section 1.55 is amended by revising paragraph (a) to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of an interference (§ 1.630); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in § 1.17(i)(1).

* * * * *

6. Section 1.60 is amended by removing and reserving paragraph (a) and revising paragraph (b) and adding new paragraph (c) to read as follows:

§ 1.60 Contunuation or divisional application for invention disclosed in a prior application.

(a) [RESERVED]

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) if (1) the prior application was a complete application as set forth in § 1.51(a), (2)applicant indicates that the application is being filed pursuant to this section and files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application, (3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application, and (4) the application is filed before the patenting or abandonment of or termination of proceedings on the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before

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the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application. If a true copy of the prior application as filed is not filed with the application or if the statement that the application papers are a true copy is omitted, the application will not be given a filing date earlier than the date upon which the copy and statement are filed, unless a petition with the fee set forth in § 1.17(i)(1) is filed which satisfactorily explains the delay in filing these items.

(c) If an application filed pursuant to paragraph (b) of this section is incomplete, applicant will be notified and given a time period within which to complete the application in order to obtain a filing date as of the date of filing the omitted item provided the omitted item is filed before the patenting or abandonment of or termination of proceedings on the prior application. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

7. Section 1.62 is amended by revising paragraph (e) and by adding a new paragraph (j) to read as follows:

§ 1.62 File wrapper continuing procedure.

* * * * *

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section. No copy of the prior application or new specification is required. The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i)(1) is filed with instructions to cancel the copy or specification.

* * * * *

(j) If any application filed under this section is found to be improper, the applicant will be notified and given a time period within which to correct the filing error in order to obtain a filing date as of the date the filing error is corrected provided the correction is made before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. If the filing error is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

8. Section 1.96 is amended by revising paragraph (b)(1) to read as follows:

§ 1.96 Submission of computer program listings.

* * * * *

(b) * * *

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public for inspection, and microfiche copies thereof will be available for purchase with the file wrapper and contents, after a patent based on such application is granted or the application is otherwise made publicly available.

* * * * *

Nov. 6, 1989

JEFFERY M. SAMUELS
Acting Commissioner
of Patents and Trademarks

[1109 OG 6]

(84) **Use of Color Drawings in Utility Patents**

This notice supersedes the Official Gazette notice, dated Aug. 6, 1986, published at 1070 O.G. 10 on Sept. 9, 1986.

Under 37 CFR 1.84, the drawings of a utility patent application must be in black and white. However, on occasion, color drawings may be appropriate. In this circumstance, the Patent and Trademark Office will entertain a petition under 37 CFR 1.183 to waive the requirements of § 1.84 to the extent that color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) will be accepted for the purposes and under the conditions set forth below.

The petition must be accompanied by five (5) sets of color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) for examination, copying and archival purposes.

In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the patent copies which are printed at issuance of the application will depict the drawings in black and white only. However, a set of color drawings will be attached to the Letters Patent. Moreover, copies of the patent with color drawings attached thereto will be provided by the Patent and Trademark Office upon special request and payment of the fee necessary to recover the actual costs associated therewith.

Accordingly, the petition must also be accompanied by a proposed amendment to insert the following language as the first paragraph in the portion of the specification containing a brief description of the drawings:

> The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

It is anticipated that such a petition will be granted only when the Patent and Trademark Office has determined that a color drawing is the only practical medium by which to disclose in a printed utility patent the subject matter sought to be patented.

It is emphasized that a decision to grant the petition should not be regarded as an indication that color drawings are necessary to comply with a statutory requirement. In this latter respect, clearly it is desirable to file any desired color drawings as part of the original application papers in order to avoid issues concerning statutory defects (e.g., lack of enablement under 35 USC 112 or new matter under 35 USC 132). The filing of the petition, however, may be deferred until acceptable drawings are required by the examiner.

The petition should be directed to the attention of the Office of the Deputy Assistant Commissioner for Patents.

July 24, 1987.

RENE D. TEGTMEYER,
Assistant Commissioner
for Patents

[1082 OG 25]

(85) **Multiple Dependent Claims and New Drawing Filing Requirements**

Introduction

On January 24, 1978, Public Law 94-131 (pages 108-115 of "Patent Laws," August 1976 issue) and the Patent Cooperation Treaty came into force. This public law amends the patent statute, Title 35, United States Code, by providing for procedures and requirements set forth in the Patent Cooperation Treaty. Some of these statutory amendments also effect the laws governing the processing and examination of regular United States national applications filed on and after January 24, 1978.

The amendments of the patent law which will affect *U.S. patent applications filed on and after January 24, 1978,* relate to two elements of the patent application: the claims and the drawings. With regard to claims, the amendments to 35 U.S.C. 41 and 112 provide for multiple dependent claims in accordance with PCT Rule 6.4. With regard to drawings, the amendment to 35 U.S.C. 113 changes the requirements for filing drawings

in order to obtain a filing date in accordance with PCT Article 7.

Purpose

This memorandum establishes in more detail the new procedures required by the amended statute. Any questions concerning these instructions may be directed to either Mary Turowski (extension 7-3776) in the administration area or Louis Maassel (extension 7-3070) in the examining area.

Revised 37 CFR sections 1.75(c), (f,1) and (g); and 1.81 and 1.83(c) were published in the *Official Gazette* of February 21, 1978.

Multiple Dependent Claims

Generally, a multiple dependent claim is a dependent claim which refers back in the alternative to more than one preceding independent or dependent claim.

The second paragraph of 35 U.S.C. section 112 has been revised in view of the multiple dependent claim practice introduced by the Patent Cooperation Treaty. Thus, section 112 authorizes multiple dependent claims, as long as they are in the alternative form (e.g., "A machine according to claims 3 *or* 4, further comprising . . ."). Cumulative claiming (e.g., "A machine according to claims 3 *and* 4, further comprising . . .") is *not* permitted. A multiple dependent claim may refer in the alternative to only one set of claims. A claim such as "A device as in claims 1, 2, 3 or 4, made by a process of claims 5, 6, 7 or 8" is improper. Section 112 allows reference to only a particular claim. Furthermore, a multiple dependent claim may *not* serve as a basis for any other multiple dependent claim, either directly or indirectly. These limitations help to avoid undue confusion in determining how many prior claims are actually referred to in a multiple dependent claim.

The amendment of the second paragraph of section 112 further clarifies that the limitations or elements of each claim incorporated by reference into a multiple dependent claim must be considered separately. Thus, a multiple dependent claim, as such, does not contain all the limitations of all the alternative claims to which it refers, but rather, contains in any one embodiment only those limitations of the particular claim referred to for the embodiment under consideration. Hence, a multiple dependent claim must be considered in the same manner as a plurality of single dependent claims.

Restriction Practice

For restriction purposes, each embodiment of a multiple dependent claim will be considered in the same manner as a single dependent claim. Therefore, restriction may be required between the embodiments of a multiple dependent claim. Also, some embodiments of a multiple dependent claim may be held withdrawn while other embodiments are considered on their merits.

Handling of Multiple Dependent Claims by the Application Division

The Application Division will be responsible for verifying whether multiple dependent claims filed with the application are in proper alternative form, that they depend only upon prior independent and single dependent claims and also for calculating the amount of the filing fee. A new form, PTO 1360, has been designed to be used in conjunction with the current fee calculation form PTO 875.

Handling of Multiple Dependent Claims by the Examining Group Clerical Staff

The examining group clerical staff is responsible for verifying compliance with the statute and rules of multiple dependent claims added by amendment and for calculating the amount of any additional fees required. This calculation should be performed on form PTO 1360.

If a multiple dependent claim (or claims) is added in an amendment without the proper fee, the amendment will not be entered until the fee has been received. In view of the requirements for multiple dependent claims, no amendment containing new claims or changing the dependency of claims will be entered before checking whether the paid fees cover the costs of the amended claims. The applicant, or his attorney or agent, will usually be contacted to pay the additional fee in the same manner as currently in existence for such defects. Where a letter is written in insufficient fee situations, a copy of the multiple dependent claim fee calculation form PTO 1360 will be included for applicant's information.

Handling of Dependent Claims by the Examiner

Should any multiple dependent claim be in an application filed prior to January 24, 1978 or include a claim association or claim structure that violates any of the prohibitions, the claim will be objected to as not being in proper form as required by 37 CFR 1.75 in the next Office action. Such an improper claim will not be further treated on the merits.

When referring to a singular dependent claim or a single embodiment of a multiple dependent claim, as when making a rejection, such a claim or embodiment will be referred to by using the number of all of the claims involved in that claim or embodiment, starting with the highest. For example, if claim 2 was dependent on claim 1, the notations would be 2/1. If in the same application, claim 3 was independent and claim 4 was multiple dependent on claims 2 or 3, the notations would be 4/2/1 and 4/3. Furthermore, if claim 5 depended from claim 4, the notations would be 5/4/2/1 and 5/4/3. Each of these embodiments will be treated individually. It would be possible for claim 4/2/1 to be rejected under section 102 and claim 4/3 to be indicated as avoiding the prior art and being allowable if rewritten in independent form. A number of embodiments may be grouped together if there is a common ground of rejection, but it must be clear how each embodiment is treated.

A claim, such as claim 4, will not be allowed until all embodiments covered thereby are allowable. If an embodiment of a multiple dependent claim avoids the art while other embodiments are rejected over prior art, a statement will be made that that embodiment avoids the art and would be allowed if rewritten in separate dependent or independent form. Wording similar to the following may be used:

> "Embodiment _____ would be allowable if rewritten as a proper dependent or independent claim which contains only the limitations of this embodiment."

Calculation of Fees When Multiple Dependent Claims are Presented, Use of Form PTO-1360

To assist in the computation of the fees for multiple dependent claims, a separate "Multiple Dependent Claim Fee Calculation Sheet," form PTO 1360, has been designed for use with the current "Patent Application Fee Determination Record," form PTO 875. Form PTO 1360 will be placed in the file wrapper by the Application Division where multiple dependent claims are in the application as filed. If multiple dependent claims are not included upon filing, but are later added by amendment, the examining group clerical staff will place the form in the file wrapper. If there are multiple dependent claims in the application, the total number of independent and dependent claims for fee purposes will be calculated on form PTO 1360 and the total number of claims and number of independent claims will then be placed on form PTO 875 for final fee calculation purposes.

If at least $65 is included with the application on filing, but the total fee is insufficient, a "Notice of Insufficient Fee," form PTO 1094, is placed in the file wrapper by the Application Division as is currently done. The notice will be mailed by the examining group in accordance with established procedures.

Calculating Fees for Multiple Dependent Claims Proper Multiple Dependent Claims

Amended section 41(a) of title 35, U.S.C., provides that claims in multiple dependent form cannot be considered as single dependent claims for the purpose of calculating fees. Thus, a multiple dependent claim would be considered to be that number of dependent claims to which it refers. Any proper claim depending directly or indirectly from a multiple dependent claim would also be considered as the same number of dependent claims as referred to in the multiple dependent claim from which it depends.

Improper Multiple Dependent Claim

If any multiple dependent claim is improper, Application Division may indicate that fact by placing an encircled numeral

"1" in the "Dep. Claims" column of form PTO 1360. The fee for any improper multiple dependent claim, whether it is defective for not being in the alternative form or for being directly or indirectly dependent on a prior multiple dependent claim, will only be one, since only an objection to the form of such a claim will normally be made.

This procedure also greatly simplifies the calculation of fees. Any claim depending from an improper multiple dependent claim will also be considered to be improper and be counted as one dependent claim.

FEE CALCULATION EXAMPLE

Claim Number	
1	Independent
2	Dependent on claim 1
3	Dependent on claim 2
4	Dependent on claim 2 or 3
5	Dependent on claim 4
6	Dependent on claim 5
7	Dependent on claim 1 or 4
8	Dependent on claim 1 or 5
9	Dependent on claim 8
10	Independent
11	Dependent on claim 1 or 10
12	Dependent on claim 1 and 10

FORM PTO-1360 (1/90) — U.S. DEPT. COMM. PAT. AND TRAD. OFF.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET
(FOR USE WITH FORM PTO-875)

	AS FILED		AFTER 1ST AMDT		AFTER 2ND AMDT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1					
2		1				
3		1				
4		2				
5		2				
6		3				
7		(2)				
8		(2)				
9		(2)				
10	1					
11		2				
12		(2)				
TOTALS IND.	2					
TOTAL DEP.	14	(2)		(2)		(2)
TOTAL CLAIMS	16					

Comments on Fee Calculation Example

Claim 1.—This is an independent claim; therefore, a numeral "1" is placed opposite claim number 1 in the "Ind." column.

Claim 2.—Since this is a claim dependent on a single independent claim, a numeral "1" is placed opposite claim number 2 in the "Dep." column.

Claim 3.—Claim 3 is also a single dependent claim, so a numeral "1" is placed in the "Dep." column.

Claim 4.—Claim 4 is a proper multiple dependent claim. It refers directly to two claims in the alternative, namely, claims 2 or 3. Therefore, a numeral "2" to indicate direct reference to two claims is placed in the "Dep." column opposite claim number 4.

Claim 5.—This claim is a singularly dependent claim depending from a multiple dependent claim. For fee calculation purposes, such a claim is counted as being that number of claims to which direct reference is made in the multiple dependent claim which it depends. In this case, the multiple dependent claim number 4 it depends from counts as 2 claims; therefore, claim 5 also counts as 2 claims. Accordingly, a numeral "2" is placed opposite claim number 5 in the "Dep." column.

Claim 6.—Claim 6 depends indirectly from a multiple dependent claim 4. Since claim 4 counts as 2 claims, claim 6 also counts as 2 dependent claims. Consequently, a numeral "2" is placed in the "Dep." column after claim 6.

Claim 7.—This claim is a multiple dependent claim since it refers to claims 1 or 4. However, as can be seen by looking at the "2" in the "Dep." column opposite claim 4, claim 7 directly depends from a multiple dependent claim. This practice is improper under 35 U.S.C. 112 and Rule 1.75(c). Following the procedure for calculating fees for improper multiple dependent claims, a numeral "1" is placed in the "Dep." column with a circle drawn around it to alert the examiner that the claim is improper.

Claim 8.— This claim is a multiple dependent claim since it refers to claims 1 or 5. However, since claim 5 depends from multiple dependent claim 4, claim 8 indirectly depends from multiple dependent claim 4 through claim 5. This practice is improper. See MULTIPLE DEPENDENT CLAIMS, paragraph 2, above. Consequently, a numeral "1" is placed in the dependent claim column with a circle drawn around it.

Claim 9.—Claim 9 is improper since it depends from an improper claim. If the base claim is in error, this error cannot be corrected by adding additional claims depending therefrom. Therefore, a numeral "1" with a circle around it is placed in the "Dep." column.

Claim 10.-Here again we have an independent claim which is always indicated with a numeral "1" in the "Ind." column opposite the claim number.

Claim 11.-This claim refers to two independent claims in the alternative. A numeral "2" is therefore placed in the "Dep." column opposite claim 11.

Claim 12.—Claim 12 is a dependent claim which refers to two claims in the conjunctive ("1 *and* 10") rather than in the alternative ("1 *or* 10"). This form is improper under 35 U.S.C. 112 and Rule 1.75(c). Accordingly, since claim 12 is improper, an encircled numeral "1" is placed in the "Dep." column opposite claim 12.

Calculation of Filing Fee

After the numbers of "Ind." and "Dep." claims are noted on form PTO-1360, each column is added. In this example., there are 2 independent claims and 14 dependent claims or a total of 16 claims. The number of independent and total claims can then be placed on form PTO-875 and the fee calculated. In this example, the total number of claims 16 minus 10 leaves 6, which is multiplied by $2 for an additional total claim fee of $12. The total number of independent claims in the example is 2, which minus 1 is 1, which times the $10 rate is $10. The total filing fee is therefore $65 + $12 + $10, or total of $87.

Drawing Requirements

Revised 35 U.S.C. 113 relaxes the previous requirements for submission of drawings on filing under certain conditions. The first sentence of 35 U.S.C. 113 does require a drawing to be submitted upon filing where such drawing is necessary for the understanding of the invention. In this situation the lack of a drawing renders the application incomplete and as such, the application cannot be given a filing date until the drawing is received. The second sentence of 35 U.S.C. 113 deals with the situation wherein a drawing is not necessary for the understanding of the invention but the case admits of illustration and no drawing was submitted on filing. The lack of the drawing in this situation does not render the application incomplete but rather is treated much in the same manner as an informality. The examiner should require such drawings in almost all such instances. Such drawings could be required during the processing of the application but do not have to be furnished at the time the application is filed. The applicant is allowed at least two months from the date of the letter requiring drawings to submit them.

Handling of Drawing Requirements Under the First Sentence of 35 U.S.C. 113

Under the revised provisions the Application Division examiner will continue to make the initial decision in all new applications as to whether a drawing is "necessary" under the first sentence of 35 U.S.C. 113.

If during examination an examiner feels that a filing date should not have been granted in an application because it does not contain drawings, the matter will be brought to the attention of the Supervisory Primary Examiner (SPE) for review. If the SPE decides that drawings are required to understand the subject matter of the invention, the SPE will return the application to the Application Division with a memorandum requesting cancellation of the filing date and identifying the subject matter required to be illustrated.

Handling of Drawing Requirements Under the Second Sentence of 35 U.S.C.

35 U.S.C. 113 also deals with the situation wherein the drawing is not necessary for the understanding of the invention, but the subject matter admits of illustration by a drawing and the applicant has not furnished a drawing. The lack of the drawing in this situation does not render the application incomplete but rather is treated as an informality. A filing date will be accorded with the original presentation of the papers, despite the absence of drawings. In these situations, a drawing or further illustration will normally be required by the examiner. This may be done either prior to examination in a separate letter or in the first Office action and may be handled in much the same manner as informal photocopy drawings are presently handled. The examiner should require drawings where appropriate as early as possible, since the possession of the drawing at that time would facilitate the examination process. A letter requiring drawings may contain wording similar to the following:

> "The examiner has decided that the subject matter of this applicaton admits of illustration by a drawing and that a drawing would facilitate the understanding of the subject matter disclosed. (Continue with a specific mention of those items of which drawings are desired.) Applicant is required to furnish a drawing under 37 CFR 1.81. (Incorporate in Office action or set two-month period for response.)"

The applicant will be given at least two months from the date of such requirement to submit drawings. If the requirement for drawings is included in an Office action, the time for supplying the drawings will be the same as the time of response to the Office action. Upon receipt of the drawing within the period set, the examiner will check the drawings for new matter. If new matter is included, the drawing will not be entered. It will be objected to as containing new matter. A new drawing without such new matter may be required if the examiner still feels a drawing is needed under 37 CFR 1.81 or 1.83. The examiner's decision would be reviewable by petition to the Commissioner under Rule 1.181. The decision on such a petition would be handled by the Group Director. If a drawing is not timely received in response to a letter from the examiner which requires a drawing, the application becomes abandoned for failure to respond.

Feb. 8, 1978. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[968 O.G. 7]

(86) **Use of Symbol "Ø" in Patent Applications**

The Greek letter Phi has long been used as a symbol in equations in all technical disciplines. It further has special uses which include the indication of an electrical phase or clocking signal as well as an angular measurement. The recognized symbols for the upper and lower case Greek Phi characters, however, do not appear on most typewriters. This apparently has led to the use of a symbol composed by first striking a zero key and then backspacing and striking the "cancel" or "slash" key to result in "Ø" which is an approximation of accepted symbols for the Greek character Phi. In other instances the symbol is composed using the upper or lower case letter "O" with the "cancel" or "slash" superimposed thereon by backspacing or is simply handwritten in a variety of styles. These expedients result in confusion because of the variety of type sizes and styles available on modern typewriters.

In recent years, the growth of data processing has seen the increasing use of this symbol ("Ø") as the standard representation of zero. The "slashed" or "cancelled zero" is used to indicate zero and avoid confusion with the upper case letter "O" in both text and drawings.

Thus, when the symbol "Ø" in one of its many variations, as discussed above, appears in patent applications being prepared for printing, confusion as to the intended meaning of the symbol arises. Those (such as examiners, attorneys, and applicants) working in the art can usually determine the intended meaning of this symbol because of their knowledge of the subject matter involved, but editors preparing these applications for printing have no such specialized knowledge and confusion arises as to which symbol to print. The result, at the very least, is delay until the intended meaning of the symbol can be ascertained.

Since the Office does not have the resources to conduct a technical editorial review of each application before printing, and in order to eliminate the problem of printing delays associated with the usage of these symbols, any questions about the intended symbol will be resolved by the editorial staff of the Office of Publications by printing the symbol "Ø" whenever that symbol is used by the applicant. Any Certificate of Correction necessitated by the above practice will be at the patentee's expense (37 CFR 1.323) because the intended symbol was not accurately presented by the Greek upper or lower case Phi letters (Ì, Ø) in the patent application.

Dec. 20, 1978. RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

[978 O.G. 152]

(87) **U.S. Accession to Hague Convention Abolishing the Requirement of Legalization for Foreign Public Documents**

On Oct. 15, 1981, the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" entered into force between the United States and twenty-eight foreign countries that are parties to the Convention. The Convention applies to any document submitted to the United States Patent and Trademark Office for filing or recording, which is sworn to or acknowledged by a notary public in any one of the member countries. The Convention abolishes the certification of the authority of the notary public in a member country by a diplomatic or consular officer of the United States and substitutes certification by a special certificate, or apostille, executed by an officer of the member country. Accordingly, the Office will accept for filing or recording a document sworn to or acknowledged before a notary public in a member country if the document bears, or has appended to it, an apostille certifying the notary's authority. The requirement for a diplomatic or consular certificate, specified in 37 CFR 1.66 and note 1 of 37 CFR 3.45, will not apply to a document sworn to or acknowledged before a notary public in a member country if an apostille is used.

The member countries that are parties to the Convention are:

Austria	Italy	Spain
Bahamas	Japan	Suriname
Belgium	Lesotho	Swaziland
Botswana	Liechtenstein	Switzerland
Cyprus	Luxembourg	Tonga
Fiji	Malawi	U.K. of Great
France	Malta	Britain and
Germany	Mauritius	N. Ireland
Fed. Rep. of	Netherlands	United States
Hungary	Portugal	Yugoslavia
Israel	Seychelles	

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The Convention prescribes the following form for the apostille:

Model of certificate

The certificate will be in the form of a square with sides at least 9 centimetres long

APOSTILLE
(Convention de La Haye du Oct. 5, 1961)

1. Country: .....
This public document
2. has been signed by .....
3. acting in the capacity of .....
4. bears the seal/stamp of .....
.....

Certified

5. at ..... 6. the .....

7. by .....
8. No .....
9. Seal/stamp: 10. Signature: .....
.....

Nov. 5, 1981.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1013 O.G. 3]

(88) **Simulated or Predicted Tests or Examples**

In order to provide for uniform practice before the Patent and Trademark Office, the following clarification of current Office practice relating to simulated or predicted tests or examples is being set forth. This notice specifies the Office policy which is currently in effect and is considered to have been in effect in the past in this area. The wording of the MPEP provisions prior to this amendment went further than was intended. The amended sections below spell out more clearly the Office's position from the start.

The following wording will be substituted in revision number 8 for that presently in paragraph D of section 608.01(p) of the Manual of Patent Examining Procedure.

MPEP § 608.01(p)

"D. Simulated or Predicted Test Results or Prophetic Examples

Simulated or predicted test results and prophetical examples (paper examples) are permitted in patent applications. Working examples correspond to work actually performed and may describe tests which have actually been conducted and results that were achieved. Paper examples describe the manner and process of making an embodiment of the invention which has not actually been conducted. Paper examples should not be represented as work actually done. No results should be represented as actual results unless they have actually been achieved. Paper examples should not be described using the past tense.

The first and last paragraphs of MPEP section 707.07(1) are being deleted.

Apr. 15, 1982.

DONALD J. QUIGG,
Deputy Commissioner of Patents and Trademarks

[1018 O.G. 27]

(89) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1 [Docket No. 71008-7208]

Variety Denomination Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice applicable to the patenting of plants. Under the proposed rules of practice, an applicant for such a patent would, in addition to any requirements for obtaining a patent, also be required to record an identifying variety denomination for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties (the UPOV Convention), to which the United States adheres.
Dates: Comments on the proposed rules must be submitted by Jan. 8, 1988, to assure their consideration in formulating the rules put into effect. A public hearing will be held on Jan. 15, 1988, beginning at 9:30 A.M., in the Commissioner's Conference Room, Crystal Plz. 3, the Patent and Trademark Office.
Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be publicly available in the Patent and Trademark Office, Crystal Plz. 3, Arlington, Va., Rm. 11C28.
For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The UPOV Convention became applicable to the United States on Nov. 8, 1981, as a consequence of the President's exercise of authority to adhere to this international agreement. Under Articles 6 and 13 of the UPOV Convention, each plant variety for which protection is sought must be given a variety denomination and that denomination recorded ("registered" in the language of the Convention) at least by the time the patent is granted. It is left to each of the UPOV member states to determine how recordation is effected. For the United States, the issuance of a patent which includes the denomination of the variety would constitute recordation and registration for the purposes of compliance with UPOV Convention. The patent examining process would include consideration of the suitability for recordation of the proposed variety denomination.

Attention is called to two earlier Commissioner's Notices on this subject. The Notice of Oct. 20, 1981 (46 FR 51426) stated that appropriate rules for the registration of variety denominations, as required by the UPOV Convention, would be issued. The Commissioner's Notice, published in the Federal Register on Aug. 16, 1985, 50 FR 33062, proposed amendments to the Patent and Trademark Office's rules of practice to carry out this requirement. In light of public comments received, the earlier proposed rules are being withdrawn from consideration and replaced by these revised proposed rules. These would apply to plants patented under either 35 U.S.C. 101 or 161, but would not apply to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the United States Department of Agriculture.

These proposed rules, in accordance with the patent law requirements for providing a descriptive title for a patent application, would require the variety denomination proposed for recordation to be included in the title of the application. The denomination would be judged for recordability by the examiner assigned the application for examination, who would consult with appropriate trademark examination officials to determine if there exists a possibly conflicting trademark registration or application for registration.

The recordation of a variety denomination for purposes of compliance with UPOV Convention Article 13 is not to be understood as conveying any legal rights in that denomination. Recordation does no more than establish a prima facie case that can be asserted as evidence of the possible generic nature of the variety denomination, if genericness is not already established by its usage in the commercial market, advertising or publication.

Under the proposed rules, the Patent and Trademark Office in examining the recordability of variety denominations will, in addition to its trademark records, utilize the Office's compilation of denominations obtained from horticultural, agricultural, floral and other professional societies, national breeders' rights offices, the UPOV Union's Secretariat, standard references and other available sources. Article 13 of the UPOV Convention requires that the variety denomination must enable the plant variety to be identified, that the denomination not consist solely of numbers except if this is shown to be an established practice for designating plant varieties, and that the denomination not be liable to mislead or cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. No specific naming system is required by the Article. While a portion of the consuming public and others might prefer plant variety names conforming to the International Code of Nomenclature for Cultivated Plants or the UPOV Guidelines, common usage, code systems or other ways of identifying plants cannot be ignored.

The Patent and Trademark Office would accept for recordation a variety denomination complying with the requirements of the UPOV Convention's Articles 13(2) and 13(4). A number of variety denomination systems currently in use, such as the system described in the 1980 revision of the International Code of Nomenclature for Cultivated Plants, the UPOV Guidelines and various code systems may also meet these requirements. Sexually reproduced varieties could be named in compliance with the requirements of the Federal Seed Act.

In the event the examiner does not approve a proposed variety denomination for recordation, the applicant could petition the Commissioner for approval. Thus, the examination and approval of variety denominations will be handled in the same way as other procedural and administrative requirements not relating to the merits of the invention, such as the requirement to provide an abstract of the disclosure or the requirement to provide a title. A final refusal by the Commissioner on petition would require submission of another proposed denomination for recordation.

The petition to the Commissioner will be subject to a fee and the other requirements relating to petitions. The Commissioner may in appropriate cases delegate to the Assistant Commissioner for Trademarks or other appropriate trademark officials the decision of such petitions, under 37 C.F.R. 1.181(g).

The UPOV Convention requires the applicant to identify the patented variety by the same variety denomination (or a translation thereof) in all UPOV member states. A different denomination may be recorded in a particular member state, however, in cases where the denomination registered in another member state is unsuitable for business or other reasons. An applicant may during the course of examination be required to inform the Office of any other denomination by which the variety is known.

While these rules provide for the recordation of variety denominations, they recognize at the same time that, in cases of conflict, previously established proprietary rights are paramount. Recordation is in legal effect, therefore, no more than publication of a denomination which is or may become the generic name of a plant variety.

Trademark owners, owners of other proprietary rights and patent applicants share a common interest in knowing as early as possible if a variety denomination proposed for recordation possibly conflicts with a trademark or other proprietary rights. Accordingly, each denomination proposed for recordation, along with the genus and species to which the variety belongs, shall be published in the *Official Gazette* as soon as reasonably possible after receipt of the application in the Office. The Commissioner has determined that publication of such information constitutes special circumstances under 35 U.S.C. 122.

The public may provide information to the Office concerning the recordability of a proposed denomination. Such information would be entered in the official file wrapper of the application and be available to the examiner. Such information shall be called to the attention of the applicant by the Office.

Also, the *Official Gazette* would list newly recorded denominations in United States patents in order for trademark owners to assert their rights in appropriate cases through private negotiations or judicially, as they may now do in trademark cases. Proceedings in the Office in regard to the registration of variety denominations, however, will be conducted ex parte.

Under the proposed rules, each applicant would be required to specify in an application for protection of a plant variety the date of first use of the denomination if used prior to filing of the patent application, or later to provide information about the date of first commercial use during pendency of the application. In cases of conflict between a trademark and a proposed variety denomination, the variety denomination will not be accepted for recordation unless its first commercial use clearly antedates another's established rights.

If a patentee learns of a conflict between a trademark and the recorded variety denomination after issuance of the patent, the patentee in order to resolve the conflict will be permitted to record a different denomination by means of the Certificate of Correction procedure. Also, a variety denomination found after issuance of a patent to be commercially unsuitable or ill-advised could be changed in a similar manner.

The Office now permits plants and plant varieties to be patented both specifically and broadly under patent 35 U.S.C. 101. In some cases, however, claims in an application will not be limited to a specific variety. These proposed rules would apply only to applications where a specific variety or varieties are claimed. Only these need be identified by a variety denomination, except where the number of varieties involved makes this impractical. In such a case, each claim directed to a specific variety would include its variety denomination, but these variety denominations could be omitted from the title of the patent. Variety denominations would not be required for microorganisms or microscopic plant parts.

Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This rule contains a collection of information requirement subject to the Paperwork Reduction Act. This colletion of information requirement has been cleared by OMB under control No. 0651-0011.

The General Counsel of the Department Commerce has certified to the Small Business Administration that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The variety denomination requirement will not impose extra work on patent applicants (whether small or large businesses or individuals). The rules will help avoid burdensome and expensive litigation over trademark rights.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part 1 is proposed to be amended by revising {g49 {g49 1.72, and 1.17 and adding a new {g49 1.168 as set forth below. All proposed additions are printed between arrows.

PART 1 —RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§ 1.17 Patent application processing fees.

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(h) * * *

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▶§1.168(d) For petitioning the Commissioner to record a plant variety denomination . . .
§ 1.168(g) For petitioning the Commissioner to record a substitute plant variety denomination . . . ◀

3. Section 1.72 is proposed to be amended by adding the following paragraph:

§ 1.72 Title and abstract.

* * *

▶(c) In the case of an application for the patenting of a plant variety under the provisions of 35 U.S.C. 101 or 161, the title of the application must include a variety denomination for the specific new variety claimed, except as provided for in § 1.168(b). The granting of the patent will be deemed the recordation of the variety denomination for purposes of compliance with Article 13 of the International Convention for the Protection of New Varieties of Plants, as revised on Oct. 23, 1978.

4. A new § 1.168 is proposed to be added, to read as follows:

▶§ 1.168 Variety denomination, submission to the Office, examination.
(a) The variety denomination submitted by the patent applicant under § 1.72 will be examined for compliance with the International Convention for the Protection of New Varieties of Plants. Specifically, the denomination:

(1) must enable the plant variety to be identified;
(2) must not be likely to cause confusion, to cause mistake or to deceive concerning the characteristics, value or identity of the plant variety or the identity of the breeder;
(3) must not consist solely of numbers except if this is an established practice for designating plant varieties; and
(4) must not be likely to cause confusion or mistake or to deceive as to any prior right of a third party, and shall not affect prior rights of third parties.

(b) If a proposed variety denomination is not included as part of the title of the application, when filed, the examiner shall set a period of not less than thirty days to provide a variety denomination. If a plurality of plant varieties are claimed, which make it impractical to include each variety denomination in the title of the application, each claim directed to a specific plant variety shall instead include the denomination of the claimed plant variety. In cases where no specific plant variety is claimed, for example, a patent directed to the improvement of a plant species, the denomination requirement applicable to the patenting of a plant variety or varieties will be waived.
(c) If the examiner determines that a proposed variety denomination is not suitable for recordation, the examiner shall refuse recordation thereof and shall set forth in an Office action the reasons for such refusal. An applicant disagreeing with the reasons for such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to record a proposed variety denomination is repeated and made final, the examiner shall at the same time require the applicant to propose another variety denomination for recordation.
(d) After a final requirement by the examiner for submission of a proposed new variety denomination, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing another variety denomination petition the Commissioner for review of the examiner's holding, upon payment of the fee set forth in § 1.17(h).
(e) The applicant is required to submit for recordation the same variety denomination (or, if not in English, a translation or transliteration thereof) as that previously registered or recorded, or proposed for registration in an earlier filed application for protection of the same variety in another member state of the International Union for the Protection of New Varieties of Plants. The applicant may submit another denomination for recordation, however, upon a showing satisfactory to the examiner as to why the denomination originally submitted or registered in another member state of the said Union is unsuitable for recordation in the United States. During pendency of an application, the examiner may require the applicant to provide information regarding all denominations for the same variety registered or proposed for registration in other member states of the said Union before the application was filed in the United States.
(f) The applicant shall indicate in the application the date of first commercial use in the United States if any, of the variety denomination proposed for recordation; or, if not commercially used prior to filing of the application, indicate during pendency of the application when the denomination has first been commercially used in this country. No variety denomination will be recorded if first commercially used after the establishment of third party proprietary rights to the denomination.
(g) A patentee in order to avoid a conflict between a recorded variety denomination and a trademark or other proprietary right, or where the recorded variety denomination is likely to be confused with another, or where business or marketing considerations dictate, may propose for recordation a substitute variety denomination for that already recorded. Such a proposal shall be in the form of a petition to the Commissioner together with the fee set forth in § 1.17(h). The proposed substitute denomination will be examined in the same manner as the denomination originally recorded, and upon recordation shall be promptly published in the *Official Gazette*. A Certificate of Correction indicating such substitute denomination shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for recordation of a substitute denomination.
(h) The Commissioner shall upon its receipt in the Office promptly publish in the *Official Gazette* each variety denomination proposed for recordation and the genus and species of the plant involved. Correspondence from the public objecting to the recordation of such denomination, if accompanied by reasons therefor, will be placed in the official file and considered by the examiner in an ex parte manner. An objection to recordation may be based on an earlier recorded or unrecorded variety denomination, a registered or common law trademark, a trade name or trade indicia, or other alleged prior right timely called to the Office's attention. The applicant shall be notified by the Office of the receipt of such correspondence. The secrecy of any pending application will be preserved in accordance with 35 U.S.C. 122.◀

Sept. 18, 1987.

RENE TEGTMEYER,
Assistant Commissioner for Patents

[1085 OG 13]

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(90)

DEPARTMENT OF COMMERCE

Patent and Trademark Office
37 CFR Part 1

[Docket Number 90364-9064]

RIN:0651-AA37

Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures

Agency: Patent and Trademark Office, Commerce
Action: Notice of proposed rulemaking
Summary: The Patent and Trademark Office (PTO) proposes to amend its regulations to establish a standardized format for descriptions of nucleotide and amino acid sequence data submitted as part of patent applications, in conjunction with the required submission of this data in computer readable form. The standardized format is needed to permit proper examination and processing of such applications and to improve quality and efficiency of the examination process, promote conformity with usage of the scientific community, and improve dissemination of sequence data in electronic form. The proposed standard symbols and format for sequence data, and the submission of this data in computer readable form, would be required for most disclosures of nucleotide and amino acid sequence data in patent applications filed after the effective date of the rule change.
Dates: Comments must be submitted on or before July 12, 1989 a public hearing will be held on July 12, 1989 at 9:00 a.m. Requests to present oral testimony should be received on or before July 3, 1989.
Addresses: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Lois E. Boland; Special Program Examiner, Office of the Assistant Commissioner for Patents. The hearing will be held in Room 912, on the 9th floor of Crystal Park Building 2, located at 2121 Crystal Drive, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 923 of Crystal Park Building 2, located at 2121 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Lois E. Boland, Special Program Examiner, Office of the Assistant Commissioner for Patents, by telephone at (703) 557-8384 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplemental Information: Currently, problems exist in the presentation, examination and printing of nucleotide and amino acid sequence data because of the lack of uniformity in submission of sequence data to the PTO and the impracticality of properly searching and examining sequences submitted in paper form. For example, it is impractical for an examiner, searching a particularly lengthy sequence in a non-conforming format, to accurately key the query necessary to search the sequence in a computerized search. Further, the lack of standardized symbol use and standardized format results in a very difficult comparison, on the part of the examiner and the public, of what is claimed in a given patent application and what is disclosed in the prior art. Still further, the number of patent applications containing nucleotide and amino acid sequences is increasing every year. The major examination problems can be attributed to the volume of data and the use of inconsistent paper formats. The lack of consistency in symbols used and formatting requires examiners to attempt to convert the sequence data, as it appears in patent applications, into formats that are consistent with those appearing in the prior art in order to make proper evaluations of the patentability of the inventions claimed in the patent applications. Problems are also encountered in the printing of nucleotide and amino acid sequence data in patents because the data must be rekeyed under current patent printing procedures. This easily results in the printing of erroneous sequences. In summary, the diversity and complexity of nucleotide and amino acid sequence data result in searching and analysis difficulties both within the PTO and outside the PTO, decreased accuracy of search and reproduction and increased cost.

The PTO proposes to amend its regulations to establish a standardized format for descriptions of nucleotide and amino acid sequence data submitted as a part of patent applications, in conjunction with the required submission of the data in computer readable form, which would result in the following advantages:

1. Cost savings in input of sequence data;
2. A practical and more accurate sequence search capability;
3. Improved interference detection;
4. More efficient examination;
5. Improved accuracy of printed sequences;
6. Creation of a PTO data base of most patent-disclosed sequence data;
7. Improved public data access and dissemination in electronic form;
8. Exchange of published sequence data, in electronic form, with the Japanese Patent Office (JPO) and the European Patent Office (EPO) in a Trilateral Sequence Exchange Project;
9. Conformity with the scientific community; and
10. The encouragement of private vendors to include sequences appearing in patents in their data bases.

With regard to interference detection, no distinction is made in the rules that follow between sequences that are claimed versus those that are disclosed but not claimed. Such a distinction may prove to be beneficial in the determination of inteferences. However, problems may arise due to the amendment of an application whereby that which is claimed versus that which is disclosed but not claimed may vary until issuance. Comments are requested on the advantages and disadvantages of distinguishing between claimed and disclosed sequences, and, whether a distinction should be made.

In those areas of biotechnology in which nucleotide and/or amino acid sequence information is significant, many patent applicants are accustomed to or familiar with the submission of such sequence information to various sequence databases, such as GenBank which is operated and maintained by the National Instiututes of Health. In order to facilitate such submissions or merely for the purpose of researching and developing sequence information, many eventual patent applicants also generate or encode sequence information in computer readable form. In view of this, the format proposed herein is based on the GenBank data format and forms currently in use. Submission of sequence data using the current GenBank format and forms is generally acceptable, except where there are differences between the GenBank format and forms and the rules herein. In those instances where differences do arise, e.g., with regard to specific patent application and computer readable form information, the rules that follow control the format of the sequence submission. To facilitate compliance with the rules that follow, the PTO may make available to the public input programs that are modeled after the GenBank Author-In program and are futher specifically tailored to the requirements herein and the PTO may also offer a course for applicants and/or their attorneys to aid in their compliance with these rules, if there is sufficient indication of need for such programs and/or courses.

The proposed standard symbols and format, as well as the submission of sequence data in computer readable form, would be required for all disclosures of nucleotide and amino acid sequence data in patent applications filed after the effective date of the rule change. It is currently envisioned that January 1, 1990 will be the effective date of the final rule change. It is also envisioned that, for the great majority of applications affected by this rule change, applicants will not be subjected to significant additional burdens, with regard to both time and/or costs, in order to comply with these proposed rules. However, if exceptional circumstances do arise and certain applicants experience specific hardships in attempting to comply with these rules, the PTO will consider appropriate non-fee petitions to waive the rules. The proposed rule change will not apply to reissue or reexamination applications filed after the effective date unless the application which matured into the patent sought to be reissued or reexamined was subject to these rules.

The proposed rules are part of an ongoing coordinated effort in the private sector and among the EPO, the JPO and the PTO to standardize the use of symbols and the format for sequence information, in order to permit the exchange and use of each other's data. The proposed rules define a set of symbols and procedures that will be both mandatory and the only way that an applicant will be permitted to describe informaton about a sequence that falls within the definitions used in the proposed rules. Thus, proposed § 1.821 defines a sequence for the purpose of these proposed rules, the requirements for specific symbols, formats, paper and computer readable copies of the sequence, and the deadlines for complying with the requirements. Proposed §§ 1.822 to 1.824 set forth detailed descriptions of the requirements that are proposed to be mandatory for the presentation of sequence data, and proposed § 1.825 sets forth procedures that would be available to an applicant in the event that amendments to the sequence information or replacement of the

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computer readable copy became necessary. There is nothing in these proposed rules that is intended to alter in any manner the prohibition against the introduction of new matter (35 U.S.C. 132 and 251), or the prohibition against the introduction of information that is not described in the application as originally filed (35 U.S.C. 112, first paragraph).

With general regard to the symbols and format to be used for nucleotide and/or amino acid sequence data set forth in proposed § 1.822 and the form and format for sequence submissions in computer readable form set forth in proposed §1.824, the PTO intends to accommodate progress in the areas of both standardization and computerization as they relate to sequence data by subsequently amending the rules to take into account any such progress. This progress will probably be reflected in a liberalization of the proposed rules. For example, the computer readable form is currently being limited to diskettes and tapes, but it can readily be seen that progress in the technology for developing databases of the type the PTO has envisioned will likely permit a broadening of the permissible types of computer readable forms that may be submitted. The same can be said for the computer/operating-system configurations that are currently permitted. As the PTO becomes able to provide greater liberality in these areas, the PTO will do so by the publication of appropriate notices in the *Official Gazette*. Further, the PTO will periodicaly update the final rules to reflect the *Official Gazette* notices published in the interim.

Discussion of specific rules

Section 1.821(a), if added as proposed, would present a definition for "nucleotide and/or amino acid sequences." This definition sets forth limits, in terms of numbers of amino acids and/or numbers of nucleotides, at or above which, compliance with the rules that follow is required. The limit of four or more amino acids has been established herein for consistency with limits in place for industry database collections whereas the limit of ten or more nucleotides, while lower than certain industry database limits, has been established to encompass those nucleotide sequences to which the smallest probe will bind in a stable manner. Specifically, the amino acid limit is consistent with the limits in place in industry database collections, such as the National Biomedical Research Foundation Protein Identification Resource (NBRF-PIR; Washington, D.C.) database and the International Protein Information Database in Japan (JIPID; Tokyo). The limits for amino acids and nucleotides are also consistent with those established for sequence data exchange with the JPO and the EPO.

Sections 1.821(a)(1) and 1.821(a)(2), if added as proposed, would present further definitions for those nucleotide and amino acid sequences that are intended to be embraced by the rules that follow. Nucleotide sequences are futher limited to those that can be represented by the symbols set forth in proposed § 1.822(b)(1). Amino acid sequences are further limited to those listed in proposed § 1.822(b)(2) and those L-amino acids that are commonly found in naturally occuring proteins. The limitation to L-amino acids is based upon the fact that there currently exists no widely accepted standard nomenclature for representing the scope of amino acids encompassed by non-L-amino acids, and, as such, the process of meaningfully encoding these other amino acids for computerized searching and printing is not currently feasible.

Section 1.821(b), if added as proposed, would require exclusive conformance, with regard to the manner in which the nucleotide and/or amino acid sequences are presented and described, with the rules that follow for all applications that include nucleotide and amino acid sequences that fall within the above definitions. This requirement is necessary to minimize any confusion that could result if more than one format for representing sequence data was employed in a given application. It is also expected that the preferred standard format will be more readily and widely accepted and adopted if its use is exclusive, as well as mandatory.

Section 1.821(c), if added as proposed, would require that applications, containing nucleotide and/or amino acid sequences that fall within the above definitions, contain, as a separate part of the disclosure on paper copy, a disclosure of the nucleotide and/or amino acid sequences, and associated information, using the format and symbols that are set forth in proposed §§1.822 and 1.823. This separate part of the disclosure on paper copy will be referred to as the "Sequence Listing" and requires that each sequence disclosed in the application appear separately in the "Sequence Listing," with each sequence further being assigned a sequence identification number, referred to as "SEQ ID NO." A plurality of sequences may, if feasible, be presented on a single page and this may be extended to the separate presentation of both nucleotide and amino acid sequences on the same page. The requirement for sequence identification numbers, at a minimum, requires that each sequence be assigned a different number for purposes of identification. However, where practical and for ease of reference, sequences should be presented in the separate part of the application in numerical order.

Section 1.821(d), if added as proposed, would require the use of the assigned sequence identifier in all instances where the description or claims of a patent application discuss sequences regardless of whether a given sequence is also embedded in the text of the description or claims of an application. This requirement is also intended to permit references, in both the description and claims, to sequences set forth in the "Sequence Listing" by the use of assigned sequence identifiers without repeating the sequence in the text of the description or claims.

Section 1.821(e), if added as proposed, would require the submission of a copy of the "Sequence Listing" in computer readable form. The computer readable form will be used by the PTO to establish a database for searching and printing nucleotide and amino acid sequences. This electronic database will also enable the PTO to exchange patented sequence data, in electronic form, with JPO and the EPO. It should be noted that the PTO's database will comply with the confidentiality requirement imposed by 35 U.S.C. 122. That is, the PTO will not exchange or make public any information on any sequence until the patent application containing that information matures into a patent.

The second sentence of proposed §1.821(e) indicates that, as between the paper copy of the "Sequence Listing" and the computer readable copy thereof, the paper copy would serve as the official copy. However, the PTO would like to permit correction of the paper copy, at the least, during the pendency of a given application by reference to the computer readable copy thereof if both the paper and computer readable forms were submitted at the time of filing of the application. In this regard, the PTO will assume that the computer readable form has been incorporated by reference into the application, when the paper and computer readable forms were submitted at the time of filing of the application. The PTO will attempt to accommodate or address all correction issues but it must be kept in mind that the real burden rests with the applicant to ensure that discrepancies between the paper copy and the computer readable form are minimized and applicants should be aware that there will be instances where the applicant may have to suffer any consequences of discrepancies between the two. All corrections would be made by appropriate fee-paid petitions. The paper copy would also serve as the official copy for priority purposes. Comments specifically addressing this issue are encouraged, with the caveat that the PTO does not desire to be bound by a requirement to permanently preserve computer readable forms for support, priority or correction purposes. For example, the PTO will make corrections, where appropriate, by reference to the computer readable form as long as the computer readable form is still available to the PTO. However, once use to the PTO for processing has ended, i.e., once the PTO has entered the data contained on the computer readable form into the appropriate database, the PTO does not currently intend to futher preserve the computer readable form, submitted by applicant.

Section 1.821(f), if added as proposed, would require that the paper and computer readable copies of the "Sequence Listing" be accompanied by a statement that the content of the paper and computer readable copies are the same, at the time when the computer readable form is submitted. This statement must be a verified statement if it is made by a person not registered to practice before the PTO. Such a statement may be made by the applicant.

Section 1.821(g), if added as proposed, would require compliance with the requirements of paragraphs (b) through (f), as discussed above, within two months from the date of filing under 35 U.S.C. 111 or within two months from the date of entering the national stage of an international application under 35 U.S.C.371

or one month from the date of a notice requiring compliance, whichever is later, if the above noted requirements are not satisfied at the time of filing. Failure to comply will result in the abandonment of the application. Submissions in response to requirements under this paragraph must be accompanied by a statement that the submission includes no new matter. This statement must be a verified statement if made by a person not registered to practice before the PTO. Again, such a statement may be made by the applicant. Extensions of time in which to reply to a requirement under this paragraph are available pursuant to 37 CFR 1.136. When an action by the applicant is a bona fide attempt to comply with these rules, at the time of filing or later or in response to a notice to comply, and it is apparent that compliance with some requirement has been inadvertently omitted, the opportunity to explain and supply the omission may be given before the question of abandonment is considered.

Section 1.821(h), if added as proposed, would require compliance with the requirements of paragraphs (b) through (f), as discussed above, within one month from the date of a notice requiring compliance in an international application filed in the the United States Receiving Office under the Patent Cooperation Treaty (PCT), if the above noted requirements are not satisfied at the time of filing. A search report for those claims in the application that are directed to nucleotide and/or amino acid sequences will not be established by the PTO, as an international searching authority, where there is a failure to comply with the above requirements. Submissions in response to requirements under this paragraph must be accompanied by a statement that the submission does not go beyond the disclosure in the international application as filed. This statement must be a verified statement if made by a person not registered to practice before the PTO. Such a statement may be made by an applicant. Delays in meeting the time limit set forth in this rule may only be excused as provided in PCT Rule 82.

Section 1.822, if added as proposed, would set forth the format and symbols to be used for listing nucleotide and/or amino acid sequence data. The codes for representing the nucleotide and/or amino acid characters are set forth in the tables of paragraphs (b)(1) through (b)(4) of this section. For the purpose of setting forth the sequence in the "Sequence Listing," only those symbols in paragraph (b)(1) for "Base codes" and in paragraph (b)(2) for "Amino acids" are to be used, as further set forth in paragraphs (c) and (e) of this section. The "Modified base controlled vocabulary" in paragraph (b)(3) and the "Modified and unusual amino acids" in paragraph (b)(4) are not to be used in setting forth the sequences; but they may be used in the description and/or the "Sequence Listing" corresponding to, but not including, the sequence itself. For example, where an "N" occurs in a nucleotide sequence or where an "Xaa" occurs in an amino acid sequence, these variables may be described in the description and/or the "Sequence Lising" as being one of the listed modified bases or one of the listed modified or unusual amino acids, respectively.

In paragraph (b) of proposed § 1.822, the second sentence thereof would require that a fixed width, proportional font be used to present sequence data. This would be required to ensure that the desired sequence character spacing and numbering be maintained upon printing.

In paragraphs (b)(2) and (e) of proposed § 1.822, the use of three-letter codes for amino acids would be required. The use of the three-letter codes for amino acids is preferred over the one-letter codes from the perspective of facilitating the examiner's review of the application papers, including the "Sequence Listing", and the public's, as well as the examiner's, use of the printed patents.

Paragraphs (d) through (p) of proposed § 1.822 would set forth the format for presenting sequence data. These paragraphs set forth the manner in which the characters in sequences are to be grouped, spaced, presented and numbered. It should be noted that paragraph (d) of this section would require that amino acids corresponding to codons in the coding parts of a nucleotide sequence be listed above the corresponding codons. This would be required to eliminate potential ambiguities in those instances where both the coding and non-coding strands of a nucleotide sequence are presented. The enumeration procedure for amino acid sequences follows this rationale in paragraph (n) of this section. Sequences that are circular in configuration are intended to be encompassed by these rules and numbering procedures for them are provided in paragraph (n) of this section. The numbering procedures set forth in paragraphs (l) through (n) of this section are not necessarily intended to be consistent with all currently employed numbering procedures. The objective here is to establish a reasonable numbering procedure that can readily be followed and adhered to in the future. As a whole, these formatting procedures also reflect those that have been agreed to for electronic data exchange with the JPO and the EPO.

Section 1.823, if added as proposed, would set forth the informational requirements for inclusion in the separate part of the disclosure on paper copy that would be submitted in accordance with proposed § 1.821(c). This section lists the items of information that are to be included in the "Sequence Listing," which constitutes the separate part of the disclosure on paper copy. The items of information are to be presented in the "Sequence Listing," immediately preceding the actual nucleotide and/or amino acid sequence, in the order in which those items are listed in this section. The heading for each item of information shall not include the parenthetical explanatory information included in this section.

In proposed § 1.823, the items of information are broken down into two categories. The first category is directed to "GENERAL INFORMATION" and includes information relating to the application being filed, the diskette/tape being submitted and publication information. It is likely that this information will be applicable for all sequences and, as such, will need to be set forth only once in a given "Sequence Listing." The second category is directed to "INFORMATION FOR SEQ ID NO:X" and includes information that, most likely, will be specific for each sequence disclosed. Where more than one sequence is disclosed this category will repeat and subsequent headings should be set forth as:"(3) INFORMATION FOR SEQ ID NO:2:," "(4) INFORMATION FOR SEQ ID NO:3;:" etc. Throughout the above two categories, the items of information are further broken down into categories relating to whether their submission is mandatory (M), recommended (R) or optional (O). Certain items are also designated as those that may repeat (rep) in a given "Sequence Listing." The first category includes those items for which inclusion in the "Sequence Listing" is mandatory. These mandatory items of information relate to the patent application, the computer readable form, basic sequence data and the applicable priority or PCT data. The reference in paragraph (b)(1)(v)(C) of proposed § 1.823 to "F-terms" relates to the key-word indexing of patents that is being undertaken by the JPO in conjunction with their automation plans. The second category includes those items for which inclusion in the "Sequence Listing" is recommended, but not required. These recommended items of information provide further information relating to the sequence listed. These additional items of information are of interest to examiners and will create a more comprehensive database and, as a result, would serve to facilitate sequence searching. The third category includes items of information that are primarily for the purpose of providing more complete information upon dissemination, for which inclusion in the "Sequence Listing" is also optional.

A sample "Sequence Listing" is included as Appendix I, following this notice. As indicated in the sample "Sequence Listing," only information that is applicable to a given sequence need be listed in the "Sequence Listing." The sample "Sequence Listing" also serves to illustrate that when the coding parts of a nucleotide sequence and their corresponding amino acids have been identified, if applicant desires to discuss those amino acids in the coding parts of the nucleotide as a separate sequence, those amino acids must also be set forth as a separate sequence. This will minimize ambiguities that may result in those instances where the amino acids corresponding to the coding parts of a nucleotide sequence constitute two separate amino acid sequences. Further, in those instances when applicant desires to discuss, as separate sequences, all three phases of the coding parts of a nucleotide sequence, six separate sequences should be set forth in the "Sequence Listing" to minimize confusion. These six sequences would include three nucleotide sequences separately showing the three phases of the coding parts of the sequence and three separate amino acid sequences corresponding to the coding parts of the three phases of the nucleotide sequence. A complete listing of abbrevinated headings for all items of information is provided in Appendix II, also following this notice. For purposes of clarity, when a nucleotide sequence is being described, the appropriate responses for "(ii) KIND" are also set forth in Appendix II, but only those that are

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applicable should be included in a given "Sequence Listing." After the heading for each item in the "Sequence Lisiting," the appropriate information or a yes/no answer should be provided. Where SEQ ID NO:X appears, the appropriate sequence identification number should be provided.

In paragraph (b)(1)(i) of proposed § 1.823, the item of information relating to "APPLICANT" should be limited to a maximum of the first ten named applicants in the application.

In paragraph (b)(2)(vii) of proposed § 1.823, relating to "FEATURES" or the description of the points of biological significance in a given sequence, it is recommended, but not required, that the information that is provided by the applicant conform to the controlled vocabulary that is set forth in GenBank's Feature Representation in Nucleotide Sequence Data Libraries," Release 57.0, as may be amended.

Section 1.824, if added as proposed, would set forth the form for sequence submissions in computer readable form. Currently, the computer readable form is being limited to diskettes or tapes. However, as noted above, it is contemplated that this may be broadened in the future in light of progress in the technology for developing and establishing databases of this type. The manner in which the sequence information is encoded on the computer readable form and the computer/operating-system configurations on which the computer readable form must be readable are also set forth. The proposed rule indicates that currently acceptable computer/operating-system configurations include IBM, Macintosh and UNIX. Again, it is possible that this may be broadened in the future to encompass other computer/operating-system configurations. If a given sequence and its associated information cannot practically or possibly fit on a single diskette or tape, as would be required in paragraph (d) of this section, an exception via a non-fee petition to waive this provision will normally be granted. As set forth in paragraph (g) of proposed §1.824, the computer readable forms that are submitted in accordance with these rules will not be returned to the applicant. Paragraph (h) of proposed § 1.824 requires the labeling, with appropriate identifying information, of the computer readable forms that are submitted in accordance with these rules.

Section 1.825, if added as proposed, would set forth the procedures for amending the "Sequence Listing" and the computer readable copy thereof. The procedures that have been defined in this section involve the submission of either substitute sheets of the "Sequence Listing" or substitute copies of the computer readable form, in conjunction with statements that indicate support for the amendment in the application, as filed, and that the substitute sheets or copies include no new matter. The requirement for statements regarding the absence of new matter follows current practice relating to the submission of substitute specifications, as set forth in 37 CFR 1.125. Paragraph (c) of proposed § 1.825 explicitly addresses the situation where amendments to the "Sequence Listing" are made after a patent has been granted, e.g., by a certificate of correction, reissue or reexamination. Paragraph (d) of proposed § 1.825 addresses the possibility and presents a remedy for the situation where the computer readable form may be found by the PTO to be damaged or unreadable.

Other Considerations

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Chief Counsel for Advocacy, Small Business Administration that the proposed rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) due to the limited number of entities, both small and otherwise, that are involved in the relevant technology. Further, the costs associated with the proposed rule change would not have a significant impact on overall costs associated with filing patent applications because the proposed rule change adopts standards, procedures, and formats which are becoming industry and international norms.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The proposed rule contains a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* Collections of information relating to patent applications have previously been approved by the Office of Management and Budget under code 0651-0011. For the great majority of applications that will be filed having nucleotide and amino acid sequences falling within the limits defined herein, applicants will not have to expend any substantial extra time to comply with these rules over and above that previously approved for patent applications. For the most part and as noted above with regard to current practice in the industry, the required information will have already been keyed into a computer system. As such, compliance with these rules will involve only the additional submission of relevant application and computer readable form information and a minor, one-time, revision of the format for presenting sequence data, after which, no additional expenditure of time for format compliance will be necessary. Any burden that may be attributed to the submission of relevant application and computer readable form information may, in fact, be more than offset by the fact that compliance with these rules will have the substantial benefit of reducing the overall time necessary to prepare applications because a given sequence will only have to be set forth once in an application and further references thereto will be made by means of a sequence identifier. Accordingly, compliance with these rules is estimated to take approximately fifteen additional minutes, including time for reviewing instructions, maintaining data needed and completing and reviewing the collection of information. Send commments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503, Attention: Paperwork Reduction Project 0651-XXXX.

Lists of Subjects in 37 CFR Part 1:

Administrative practice and procedure, Courts, Freedom of information:, Inventions and patents, Reporting and record-keeping requirements, Small businesses.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office is proposing to amend Title 37 of the Code of Federal Regulations as set forth below.

PART 1...RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. New §§ 1.821 - 1.825 are proposed to be added to read as follows:

APPLICATION DISCLOSURES CONTAINING NUCLEOTIDE AND/OR AMINO ACID SEQUENCES

§1.821 Nucleotide and/or amino acid sequence disclosures in patent applications.

(a) "Nucleotide and/or amino acid sequences" as used in §§ 1.821 through 1.825 is interpreted to mean a sequence of four or more amino acids or a sequence of ten or more nucleotides. Nucleotides and amino acids are futher defined as follows:

(1) "Nucleotides" are intended to embrace only those nucleotides that can be represented using the symbols set forth in §§ 1.822(b)(1). Modifications, e.g. methylated bases, may be described in the description and/or the separate part of the disclosure on paper copy corresponding to, but not including, the nucleotide sequence.

(2) "Amino acids" are those L-amino acids commonly found in naturally occuring proteins and are listed in § 1.822(b)(2). Those amino acid sequences containing D-amino acids are not intended to be embraced by this definition. Any amino acid sequence that contains post-translationally modified amino acids may be described as the amino acid sequence that is initially translated using the symbols shown in § 1.822(b)(2) with the modified positions, e.g. hydroxylations or glycosylations, being described in the description and/or the separate part of the disclosure on paper copy corresponding to, but not including, the amino acid sequence. Only peptides or proteins containing normal peptide bonds are embraced by this definition.

(b) Patent applications which contain disclosures of nucleotide and/or amino acid sequences, in accordance with the above definition, shall, with regard to the manner in which the nucleotide and/or amino acid sequences are prsented and described, conform exclusively to the requirements of §§ 1.821 through 1.825.

(c) Patent applications which contain disclosures of nucleotide and/or amino acid sequences must contain, as a separate part of the disclosure on paper copy, hereinafter referred to as the "Sequence Listing," a disclosure of the nucleotide and/or amino acid sequences and associated information using the symbols and format in accordance with the requirements of § 1.822 and 1.823. Each sequence disclosed must appear separately in the "Sequence Listing." Each sequence set forth in the "Sequence Listing" shall be assigned a separate identifier written as SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, etc.

(d) Where the description or claims of a patent application discuss a sequence listing that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the assigned identifier, in the text of the description or claims, even if the sequence is also embedded in the text of the description or claims of the patent application.

(e) A copy of the "Sequence Listing' refferred to in paragraph (c) of this section must also be submitted in computer readable form in accordance with the requirements of § 1.824. The computer readable form is a copy of the "Sequence Listing" and will not necessarily be retained as part of the patent application file.

(f) in addition to the paper copy required by paragraph (c) of this section and the computer readable form required by paragraph (e) of this section, a statement that the content of the paper and computer readable copies are the same must be submitted with the computer readable form. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(g) If the requirements of one or more of paragraphs (b) through (f) of this section are not satisfied at the time of filing under 35 U.S.C. 111 or at the time of entering the national stage under 35 U.S.C. 371, applicant has two months from the date of filing or one month from the date of a notice which will be sent requiring compliance with one or more of the above requirements, whichever is later, in which to comply, or the application will be considered to be abandoned. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission includes no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(h) If the requirements of one or more paragraphs (b) through (f) of this section are not satisfied at the time of filing, in the United States Receiving Office, an international application under the Patent Cooperation Treaty (PCT) applicant has one month from the date of a notice which will be sent requiring compliance with one or more of the above requirements, or such futher time as may be set by the Commissioner, in which to comply, or no international search report will be established by the United States Patent and Trademark Office as an International Searching Authority for those claims in the application that are directed to nucleotide and/or amino acid sequences. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission does not go beyond the disclosure in the international application as filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office. Any delay in meeting this time limit may only be excused as provided for in the PCT_

§ 1.822 Symbols and format to be used for nucleotide and/or amino acid sequence data.

(a) The symbols and format to be used for nucleotide and/or amino acid sequence data shall conform to the following requirements.

(b) The code for representing the nucleotide and/or amino acid sequence characters shall conform to the code set forth in the table in paragraphs (b)(1) through (b)(4) of this section. A fixed width font shall be used to present sequence data. The modified base controlled vocabulary in paragraph (b)(3) of this section and the modified and unusal amino acids in paragraph (b)(4) of this section shall not be used in the nucleotide and/or amino acid sequences; but may be used in the description and/or the "Sequence Listing" corresponding to, but not including, the nucleotide and/or amino acid sequence.

(1) Base Codes:

Symbol	Meaning
A	A; adenine
C	C; cytosine
G	G; guanine
T	T; thymine
U	U; uracil
M	A or C
R	A or G
W	A or T/U
S	C or G
Y	C or T/U
K	G or T/U
V	A or C or G; not T/U
H	A or C or T/U; not G
D	A or G or T/U; not C
B	C or G or T/U; not A
N	(A or C or G or T/U) unknown or other)

(2) Amino acid three-letter abbreviations:

Abbreviation	Amino acid name
Ala	Alanine
Arg	Arginine
Asn	Asparagine
Asp	Aspartic Acid (Aspartate)
Asx	Aspartic Acid or Asparagine
Cys	Cysteine
Glu	Glutamic Acid (Glutamate)
Gln	Glutamine
Glx	Glutamine or Glutamic Acid
Gly	Glycine
His	Histidine
Ile	Isoleucine
Leu	Leucine
Lys	Lysine
Met	Methionine
Phe	Phenylalanine
Pro	Proline
Ser	Serine
Thr	Threonine
Trp	Tryptophan
Tyr	Tyrosine
Val	Valine
Xaa	Unknown or other

(3) Modified base controlled vocabulary:

Abbreviation	Modified base description
ac4c	4-acetylcytidine
chm5u	5-(carboxyhydroxylmethyl)uridine
cm	2'-O-methylcytidine
cmnm5s2u	5-carboxymethylaminomethyl-2-thioridine
cmnm5u	5-carboxymethylaminomethyluridine
d	dihydrouridine
fm	2'-O-methylpseudouridine
gal q	beta,D-galactosylqueosine
gm	2'-O-methylguanosine
i	inosine

i6a	N6-isopentenyladenosine
m1a	1-methyladenosine
m1f	1-methylpseudouridine
m1g	1-methylguanosine
m1l	1-methylinosine
m22g	2,2-dimethylguanosine
m2a	2-methyladenosine
m2g	2-methylguanosine
m3c	3-methylcytidine
m5c	5-methylcytidine
m6a	N6-methyladenosine
m7g	7-methylguanosine
mam5u	5-methylaminomethyluridine
mam5s2u	5-methoxyaminomethyl-2-thiouridine
man q	beta,D-mannosylqueosine
mcm5s2u	5-methoxycarbonylmethyluridine
mo5u	5-methoxyuridine
ms2i6a	2-methylthio-N6-isopentenyladenosine
ms2t6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurie 6yl)carbamoyl)threonine
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N-methyl-carbamoyl)threonine
mv	uridine-5-oxyacetic acid methylester
o5u	uridine-5-oxyacetic acid (v)
osyw	wybutoxosine
p	pseudouridine
q	queosine
s2c	2-thiocytidine
s2t	5-methyl-2-thiouridine
s2u	2-thiouridine
s4u	4-thiouridine
t	5-methyluridine
t6a	N-((99-beta-D-ribofuranosylpurine-6-yl)carbamoyl)threonine
tm	2'-O-methyl-5-methyluridine
um	2'-O-methyluridine
yw	wybutosine
x	3-(3-amino-3-carboxypropyl)uridine,(acp3)u

(4) Modified and unusual amino acids:

Abbreviation	Modified and unusual amino acid
Aad	2-Aminoadipic acid
bAad	3-aminoadipic acid
bAla	beta-Alanine,beta-Aminopropionic acid
Abu	2-Aminobutyric acid
4Abu	4-Aminobutyric acid,piperidinic acid
Acp	6-Aminocaproic acid
Ahe	2-Aminoheptanoic acid
Aib	2-Aminoisobutyric acid
bAib	3-Aminoisobutyric acid
Apm	2-Aminopimelic acid
Dbu	2,4-Diaminobutyric acid
Des	Desmosine
Dpm	2,2'-Diaminopimelic acid
Dpr	2,3-Diaminopropionic acid
EtGly	N-Ethylglycine
EtAsn	N-Ethylasparagine
Hyl	Hydroxylysine
aHyl	all-Hydroxylysine
3Hyp	3-Hydroxyproline
4Hyp	4-Hydroxyproline
Ide	Isodesmosine
alle	allo-Isoleucine
MeGly	N-Methylglycine, sarcosine
Melle	N-Methylisoleucine
MeLys	N-Methylvaline
Nva	Norvaline
Nle	Norleucine
Orn	Ornithine

`(c) A nucleotide sequence shall be listed using the one-letter code for the nucleotide bases, as in paragraph (b)(1) of this section.

(d) The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately above the corresponding codons.

(e) The amino acids in a protein or peptide sequence shall be listed using the three-letter code with the first letter as an upper case character, as in paragraph (b)(2) of this section.

(f) The bases in a nucleotide sequence (including introns) shall be listed in groups of 10 bases except in the coding parts of a sequence.

(g) The bases in the coding parts of a nucleotide sequence shall be listed as triplets (codons).

(h) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each codon or group of ten bases.

(i) A nucleotide sequence shall be listed with a maximum of 16 codons or 60 bases per line, with a space provided between each amino acid.

(j) A single stranded nucleotide sequence shall be presented in the 5' to 3' direction, from left to right.

(k) A double stranded nucleotide sequence shall be presented with the anti-coding strand below the positive coding strand and with the positive coding strand numbered in the 5' to 3' direction from left to right.

(l) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.

(m) The enumeration of nucleotide bases shall start at the first base of the sequence with number 1. The enumeration shall be continuous through the whole sequence in the direction 5' to 3'. The enumeration shall be marked in the right margin, next to the line containing the one-letter codes for the bases, and giving the number of the last base of that line.

(n) The enumeration of amino acids shall start at the first amino acid of the mature protein, with number 1. It shall be marked above the sequence every 5 amino acids. The presequences and signal sequences, when present, shall have negative numbers, counting backwards starting with the amino acid next to number 1.

(o) For those nucleotide sequences that are circular in configuration, the enumeration method set forth in paragraph (m) of this section remains applicable with the exception that the designation of the first base of the nucleotide sequence may be made at the option of the applicant. The enumeration method for amino acid sequences that is set forth in paragraph (n) of this section remains applicable for amino acid sequences that are circular in configuration.

(p) A partial sequence shall be numbered as a separate sequence and a sequence with a gap or gaps shall be numbered as a plurality of separate sequences, with the number of separate sequences being equal in number to the number of continous strings of sequence data.

§ 1.823 Requirements for nucleotide and/or amino acid sequences as part of the application papers.

(a) The "Sequence Listing," required by § 1.821(c), setting forth the nucleotide and/or amino acid sequences, and associated information in accordance with paragraph (b) of this section, must begin on a new page and be titled "Sequence Listing" and appear immediately prior to the claims.

(b) The "Sequence Listing" shall, except as otherwise indicated, include, in addition to and immediately preceding the actual nucleotide and/or amino acid sequence, the following items of information. The order and presentation of the items of information in the "Sequence Listing" shall follow the order in which those items are listed herein with appropiately numbered headings, wherein the headings are designated by those terms in upper case characters, not including any parenthetical explanatory information. Those items of information that are applicable for all sequences shall only be set forth once in the "Sequence Listing." The submission of those items of information designated with an "M" is mandatory. The submission of those items of information designated with an "R" is recommended, but not required. The submission of those items of information designated with an "O" is optional. Those items designated with "rep" may have multiple responses and, as such, the item may be repeated in the "Sequence Listing."

(1)**GENERAL INFORMATION** (Application, diskette/tape and publication information):

(i) **APPLICANT:** (maximum of first ten named applicants-M):

(ii) **TITLE OF INVENTION:** (title of the invention, as elsewhere in application-M):

(iii) **CORRESPONDENCE ADDRESS:** (M):

(A) **STREET:** (correspondence street address, as elsewhere in application):

(B) **CITY:** (correspondence city address, as elsewhere in application):

(C) **STATE:** (correspondence state, as elsewhere in application):

(D) **COUNTRY:** (correspondence country, as elsewhere in application):

(E) **ZIP:** (correspondence zip or postal code, as elsewhere in application):

(iv) **COMPUTER READABLE FORM:** (M):

(A) **MEDIUM TYPE:** (type of diskette/tape submitted):

(B) **COMPUTER:** (type of computer used with diskette/tape submitted):

(C) **OPERATING SYSTEM:** (type of operating system used):

(D) **SOFTWARE:** (type of software used to create computer readable form):

(v) **CURRENT APPLICATION DATA:** (M):

(A) **APPLICATION NUMBER:** (U.S. application number, including series code and serial number, if available):

(B) **FILING DATE** (U.S. application filing date, if available):

(C) **CLASSIFICATION:** (IPC/US classification or F-term designation, where F-terms have been developed, if assigned):

(vi) **PRIOR APPLICATION DATA:** (prior domestic, foreign priority or international application data, if applicable-M/rep):

(A) **DOCUMENT NUMBER** (document numbers):

(B) **COUNTRY** (country or countries):

(C) **FILING DATE** (document filing date(s)):

(D) **PUBLICATION DATE** (document publication date(s)):

(vii) **ATTORNEY/ AGENT INFORMATION** (O):

(A) **NAME** (attorney/agent name):

(B) **REGISTRATION NUMBER** (attorney/agent registration number):

(C) **REFERENCE DOCKET NUMBER** (attorney/agent reference or docket number):

(viii) **TELECOMMUNICATION INFORMATION** (O):

(A) **TELEPHONE** (telephone number of applicant or attorney/agent):

(B) **TELEFAX** (telefax number of applicant or attorney/agent):

(C) **TELEX** (telex number of applicant or attorney/agent):

(ix) **PUBLICATION STATUS** (Have the data that are disclosed in SEQ ID NO:X been published)-O/rep):

(A) **AUTHORS** (authors of publication):

(B) **TITLE** (title of publication):

(C) **JOURNAL** (journal name in which data published):

(D) **VOLUME** (journal volume in which data published):

(E) **ISSUE** (jorunal issue number in which data published):

(F) **PAGES** (journal page numbers in which data published):

(G) **DATE** (journal date in which data published including month/date/year or season):

(H) **RELEVANT RESIDUES** (Does SEQ ID NO:X correspond to published sequence?-rep):

(1) **START** (Postion start-starting postion in SEQ ID NO:X of corresponding data):

(2) **END** (Position end-ending position in SEQ ID NO:X of corresponding data):

(3) **BASE PAIRS** (Base pairs-is this corresponding data listed by the use of base pairs?):

(4) **AMINO ACIDS** (Amino acid residues-is this corresponding data listed by the use of amino acid residues?):

(2) **INFORMATION FOR SEQ ID NC:X** (rep):

(i) **SEQUENCE CHARACTERISTICS** (M):

(A) **LENGTH** (sequence length, expressed as number of base pairs of amino acid residues):

(B) **TYPE** (sequence type, i.e., whether nucleic acid or amino acid):

(C) **STRANDEDNESS** (if nucleic acid, number of strands, i.e., whether single stranded or double stranded):

(D) **TOPOLOGY** (whether sequence is circular or linear)

(ii) Kind (kind of nulceotide sequenced in SEQ ID NO:X (at least one of the following should be included in Sequence Listing-R)):

-Hypothetical RNA;
-Hypothetical DNA;
-Genomic DNA;
-Genomic RNA;
-cDNA to mRNA;
-cDNA to genomic RNA;
-Organelle DNA;
-Organelle RNA;
-Specific organelle;
-tRNA;
-rRNA;
-snRNA;
-scRNA;
-Other nucleic acid, identify.

-or-

(ii)**KIND** (kind of peptide or protein sequence in SEQ ID NO:X-R):

(A) **SEQUENCE ASSEMBLY METHOD** (at least one of the following should be included in Sequence Listing):

-overlap of sequenced fragments;
-homology;
-other;

(B) **FRAGMENT TYPE** (at least one of the following should be included in Sequence Listing):

-N-terminal;
-C-terminal;
-internal fragment and

(C) **HYPOTHETICAL** :

(iii) **ORIGINAL SOURCE** (original source of molecule sequenced in SEQ ID NO:X-R):

(A) **GENUS:**

(B) **ORGANISM/ SPECIES:**

(C) **SUB SPECIES:**

(D) **STRAIN:**

(E) **INDIVIDUAL ISOLATE** (name/number of individual/isolate):

(F) **DEVELOPMENTAL STATE:**

(1) **GERM LINE:**

(2) **REARRANGED:**

(G) **HAPLOTYPE:**

(H) **TISSUE TYPE:**

(I) **CELL TYPE:**

(iv). **IMMEDIATE SOURCE** (immediate experimental source of the sequence in SEQ ID NO:X-R):

(A) **CELL LINE** (name of cell line):

(B) **LIBRARY** (library-type, name):

(C) **CLONE** (clone(s)):

(v)**POSITION IN GENOME** (postion of sequence in SEQ ID NO:X in genome-R):

(A) **CHROMOSONE /SEGMENT** (chromosome/segement-name/number):

(B) **MAP POSITION**

(C) **UNITS** (units for map position, i.e., whether units are genome percent, nucleotide number or other/specify):

(vi) **PROPERTIES OF SEQUENCE** (properites of the sequence in SEQ ID NO:X-R):

(A) **PHENOTYPE:**(associated phenotype(s)):

(B) **ACTIVITY:**(biological/enzymatic activity-biological/enzymatic activity of its product):

(C) **FUNCTIONAL CLASS:** (general functional classification of the gene or gene product):

(D) **BINDING MACROMOLECULES:** (macromolecules to which the gene product can bind):

(E) **SUBCELLULAR LOCATION:** (subcellular localization of the gene product):

(F) **OTHER INFORMATION:** (other relevant information):

(vii) **FEATURES:** (description of points of biological significance in the sequence in SEQ ID NO:X-R/rep):

(A) **LOCATION:** (number of first and last bases/ amino acids in feature):

VOL
1110
ISS
1
JA
2
1990
UMI

(B) **IDENTIFICATION METHOD:** (method by which the feature was identified, i.e., by experiment, by similarity with known sequences or to an established consensus sequence, or by similarity to some other pattern):

(C) **COMPLEMENT:** (indicate whether feature is located on the nucleic acid strand complementary to that in SEQ ID NO:X):

(viii) **SEQUENCE DESCRIPTION; SEQ ID NO:X:**

§ 1.824 Form and format for nucleotide and/or amino acid sequence submissions in computer readable form.

(a) The computer readable form shall contain a printable copy of the "Sequence Listing," as defined in §§ 1.821(c), 1.822 and 1.823, recorded as a single file on either a diskette or a magnetic tape. The computer readable form shall be encoded and formatted such that a printed copy of the "Sequence Listing" may be recreated using the print commands of the computer/operating-system configuration specified in paragraph (f) of this section.

(b) The file in paragraph (a) of this section shall be encoded in a subset of the American National Standard Code for information Interchange (ASCII). This subset shall consist of all printable ASCII characters including the ASCII space character plus line-termination, pagination and end-of-file characters associated with the computer/operating-system configurations specified in paragraph (f) of this section. No other characters shall be allowed.

(c) The computer readable form may be created by any means, such as word processors, nucleotide/amino acid sequence editors or other custom computer programs; however, it shall be readable by one of the computer/operating-system configurations specified in paragraph (f) of this section, and shall conform to the specifications in paragraphs (a) and (b) of this section.

(d) The entire printable copy of the "Sequence Listing" shall be contained within one file on a single diskette or magnetic tape. This provision may be waived by petition, without the payment of a fee, upon showing that it is not practical or possible to submit the entire printable copy of the "Sequence Listing" within one file on a single diskette or magnetic tape.

(e) The submitted diskette or tape shall be write-protected such as by covering or uncovering diskette holes, removing diskette write tabs or removing tape write rings.

(f) The submitted computer readable form shall be readable on one of the following computer/operating-system configurations:

(1) Computer: IBM PC/XT/AT, IBM PS/2 or compatibles;
Operating system: PC-DOS or MS DOS (Versions 2.1 or above);
Line Terminator: ASCII Carriage Return plus ASCII Line Feed;
Pagination: ASCII Form Feed or Series of Line Terminators;
End-of-File: ASCII SUB (Ctrl-Z);
Media: Diskette-5.25 inch, 360 Kb storage;
Diskette-5.25 inch, 1.2 Mb storage;
Diskette-3.50 inch, 720 Kb storage;
Diskette-3.5 inch, 1.44 Mb storage;
Magnetic tape-9 track, 3200/1600 bits per inch;
Print Command: PRINT filename.extension;

(2) Computer: IBM PC/XT/AT, IBM PS/2 or compatibles;
Operating system: Unix or Zenix System V;
Line Terminator: ASCII Carriage Return;
Pagination: ASCII Form Feed or Series of Line Terminators;
End-of-File: None;
Media: Diskette-5.25 inch, 360 Kb storage;
Diskette-5.25 inch, 1.2 Mb storage;
Diskette-3.50 inch, 720 Kb storage;
Diskette-3.5 inch, 1.44 Mb storage;
Print Command: LPR filename;

(3) Computer: Apple Macintosh;
Operating System: Macintosh;
Macintosh File Type: text with line termination
Line Terminator: Pre-defined by text type file;
Pagination: Pre-defined by text type file;
End-of-file; Pre-defined by text type file;
Media: Diskette-3.50 inch, 400 Kb storage;
Diskette-3.50 inch, 800 Kb storage and
Print Command: Use PRINT command from any Macintosh Application that processes text files, such as MacWrite or TeachText.

(g) Computer readable forms that are submitted to the Office will not be returned to the applicant.

(h) All computer readable forms shall have a label permanentaly affixed thereto on which has been hand printed or typed, a description of the format of the computer readable form as well as the name of the applicant, the title of the invention, the date on which the data were recorded on the computer readable form and the name and type of computer and operating system which generated the files on the computer readable form. If all of this information can not be printed on a label affixed to the computer readable form, by reason of size or otherwise, the label shall include the name of the applicant and the title of the invention and a reference number, and the additional information may be provided on a container for the computer readable form with the name of the applicant, the title of the invention, the reference number and the additional information affixed to the container. If the computer readable form is submitted after the date of filing under 35 U.S.C. 111 or after the date of entry in the national phase under 35 U.S.C. 371, the labels mentioned herein must also include the date of the application and the application number, including series code and serial number.

§ 1.825 Amendments to or replacement of sequence listing and computer readable copy thereof.

(a) Any amendment to the paper copy of the "Sequence Listing" must be made by the submission of substitute sheets. Amendments must be accompanied by a statement that indicates support for the amendment in the application, as filed, and a statement that the substitute sheets include no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(b) Any amendment to the paper copy of the "Sequence Listing," in accordance with paragraph (a) of this section, must be accompanied by a substitute copy of the computer readable form, including all previously submitted data with the amendment incorporated therein, accompanied by a statement that the copy in computer readable form is the same as the substitute copy of the "Sequence Listing." Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(c) Any appropriate amendments to the "Sequence Listing" in an application after the grant of a patent thereon must comply with the requirements of paragraphs (a) and (b) of this section.

(d) If upon receipt, the computer readable form is found to be damaged or unreadable, applicant must provide, within such time as set by the Commissioner, a substitute copy of the data in computer readable form accompanied by a statement that the substitute data is identical to that originally filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

March 7, 1989

Donald J. Quigg
Assistant Secretary and Commissioner of Patents and Trademarks

[1102 OG 34]

APPENDIX I
SAMPLE SEQUENCE LISTING

(1) **GENERAL INFORMATION**:
(i)**APPLICANT:** Joan Doe
John Doe
(ii) **TITLE OF INVENTION:** Isolation and Charaterization of a Gene Encoding a Protease From Paramecium sp.
(iii)**CORRESPONDENCE ADDRESS**:
(A) **STREET**123 Main Street
(B) **CITY** Smalltown
(C) **STATE** Anystate
(D) **COUNTRY** USA
(E) **ZIP** 12345
(iv) **COMPUTER READABLE SOURCE**
(A) **MEDIUM TYPE** Diskette, 3.50 inch, 800 Kb storage
(B) **COMPUTER** Apple Macintosh
(C) **OPERATING SYSTEM** Macintosh 5.0
(D) **SOFTWARE** MacWrite
(v) **CURRENT APLLICATION DATA**:
(A) **APPLICATION NUMBER** 09/999,999
(B) **FILING DATE** February 28, 1989
(C) **CLASSIFICATION** US Class/sub-999/99
(vi) **PRIOR APPLICATION DATA**:
(A**DOCUMENT NUMBER**: PCT/US88/99,999
(B) **COUNTRY:** RO/US
(C)**FILING DATE**: March 1, 1988
(vii) **ATTORNEY/ AGENT INFORMATION**
(A) **NAME** J. Smith
(B) **REGISTRATION NUMBER** 00001
(C) **REFERENCED DOCUMENT NUMBER** 01-0001
(viii) **TELECOMMUNICATION INFORMATION**
(A) **TELEPHONE** (909) 999-0001
(B) **TELEFAX** (909) 999-0002
(ix) **PRIOR STATUS** Data in SEQ ID NO:1 and SEQ ID NO:2 have been published.
(A) **AUTHORS** Joan Doe
John Doe
(B) **TITLE** Isolation and Characterization of a Gene Encoding a Protease from Paramecium sp.
(C)**JOURNAL:** Fictional Genes
(D) **VOLUME:** 1
(E) **ISSUE** 1
(F) **PAGES** pp 1-20
(G) **DATE:**March 2, 1988
(H) **RELEVANT RESIDUES** SEQ ID NO:1 and SEQ ID NO:2 correspond entirely to published sequences.

(2) **INFORMATION FOR SEQ ID NO:1:**
(i) **SEQUENCE CHARACTERISTICS**:
(A) **LENGTH**957 base pairs
(B) **TYPE** nucleic acid
(C) **STRANDEDNESS:** single
(D) **TYPOLOGY:** linear
(ii) **KIND:** nucleotide-genomic DNA
(iii) **ORIGINAL SOURCE**:
(A) **GENUS:** Paramecium
(B)**ORGANISM/SPECIES:** sp.
(E) **INDIVIDUAL/ISOLATE:** XYZ2
(I) **CELL TYPE:** unicellular organism
(iv)**IMMEDIATE SOURCE**:
(B) **LIBRARY:** genomic
(C) **CLONE:** Para-XYZ2/36
(vi) **PROPERTIES**:
(A) **PHENOTYPE:** expresses protease
(8) **SEQUENCE DESCRIPTION** SEQ ID NO:1:

```
ATCGGGATAG TACTGGTCAA GACCGGTGGA CACCGGTTAA CCCCGGTTAA GTACCGGTTA 60
TAGGCCATTT CAGGCCAAAT GTGCCCAACT ACGCCAATTG TTTTGCCAAC GGCCAACGTT 120
ACGTTCGTAC GCACGTATGT ACCTAGGTAC TTACGGACGT GACTACGGAC ACTTCCGTAC 180
GTACGTACGT TTACGTACCC ATCCCAACGT AACCACAGTG TGGTCGCAGT GTCCCAGTGT 240
                                                    -30
                                          Met Thr Pro Pro Glu Arg Leu
ACACAGACTG CCAGACATTC TTCACAGACA CCCC ATG ACA CCA CCT GAA CGT CTC 295
     -25             -20             -15
Phe Leu Pro Arg Val Cys Gly Thr Thr Leu His Leu Leu Leu Leu Gly
TTC CTC CCA AGG GTG TGT GGC ACC ACC CTA CAC CTC CTC CTT CTG GGG 343
   -10             -5
Leu  Leu  Leu Val  Leu  Leu Pro  Gly  Ala  His
CTG  CTG  CTG GTT  CTG  CTG CCT  GGG  GCC  CAT GTGAGGCAGC AGGAGAATGG 393
                                                                Gly
GGTGGCTCAG CCAAACCTTG AGCCCTAGAG CCCCCCTCAA CTCTGTTCTC CTAG GGG 452
 1                5                  10                  15
Leu  Met  His  Leu Ala  His  Ser  Asn  Leu  Lys  Pro  Ala  Ala  His  Leu  Ile
CTC ATG CAT CTT GCC CAC AGC AAC CTC AAA CCT GCT GCT CAC CTC ATT 501
```

```
GTAAACATCC ACCTGACCTC CCAGACATGT CCCCACCAGC TCTCCTCCTA CCCCTGCCTC 561
AGGAACCCAA GCATCCACCC CTCTCCCCCA ACTTCCCCCA CGCTAAAAAA AACAGAGGGA 621
GCCCACTCCT ATGCCTCCCC CTGCCATCCC CCAGGAACTC AGTTGTTCAG TGCCCACTTC 681
                    20                  25                  30
Tyr  Pro  Ser  Lys  Gln  Asn  Ser  Leu  Leu  Trp  Arg  Ala  Asn  Thr  Asp  Arg
TAC CCC AGC AAG CAG AAC TCA CTG CTC TGG AGA GCA AAC ACG GAC CGT 729
          35                  40                  45
Ala  Phe  Leu Gln  Asp  Gly  Phe  Ser  Leu Ser  Asn  Asn  Ser Leu  Leu  Val
GCC TTC CTC CAG GAT GGT TTC TCC TTG AGC AAC AAT TCT CTC CTG GTC 777
AAGAAAAAAT AATTGATTTC AAGACCTTCT CCCCATTCTG CCTCCATTCT GACCATTTCA 837
GGGGTCGTCA CCACCTCTCC TTTGGCCATT CCAACAGCTC AAGTCTTCCC TGATCAAGTC 897
ACCGGAGCTT TCAAAGAAGG AATTCTAGGC ATCCCAGGGG ACCCACACCT CCCTGAACCA 957
```

(3) **INFORMATION FOR SEQ ID NO:2:**
(i) **SEQUENCE CHARACTERISTICS:**
(A) **LENGTH:** 82 amino acids
(B) **TYPE:** amino acid
(D) **TOPOLOGY:** linear
(ii) **KIND:** peptide or protein
(A) **SEQUENCE ASSEMBLY METHOD:**other, deduction
(vii) **FEATURES:** signal sequence
(A) **LOCATION:**-34 to -1
(B) **IDENTIFICATION METHOD:**similarity to other signal sequences, hydrophobic

(8) **SEQUENCE DESCRIPTION:** SEQ ID NO:2:

```
          -30                 -25                 -20
Met Thr Pro Pro Glu Arg Leu Phe Leu Pro Arg Val Cys Gly Thr Thr
          -15                 -10                 -5
Leu His Leu Leu Leu Leu Gly Leu Leu Leu Val Leu Leu Pro Gly Ala
    1                 5                  10
His Gly Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His
15                  20                  25                  30
Leu Ile Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr
                    35                  40                  45
Asp Arg Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu
Leu Val
```


Appendix II
HEADINGS FOR INFORMATION ITEMS IN § 1.823
(1) General Information:
(i) Applicant:
(II) Title of Invention:
(iii) Correspondence Address:
(A) Street:
(B) City:
(C) State:
(D) Country:
(E) Zip:
(iv) Computer Readable Form:
(A) Medium Type:
(B) Computer:
(C) Operating System:
(D) Software:
(v) Current Application Data:
(A) Application Number:
(B) Filing Date:
(C) Classification:
(vi) Prior Application Data:
(A) Document Number:
(B) Country:
(C) Filing Date:
(D) Publication Date:
(vii) Attorney/Agent Information:
(A) Name:
(B) Registration Number:
(C) Reference Number:
(viii) Telecommunication Information:
(A) Telephone:
(B) Telefax:
(C) Telex:
(ix) Publication Status:
(A) Authors
(B) Title:
(C) Journal:
(D) Volume:
(E) Issue:
(F) Pages:
(G) Date:
(H) Relevant Residues:
(1) Start:
(2) End:
(3) Base Pairs:
(4) Amino Acids:

(2) Information For SEQ ID NO:X:
(i) Sequence Characteristics:
(A) Length:
(B) Type:
(C) Strandedness:
(D) Topology:
(ii) Kind (if nucleotide-at least one of the following should be included:
-Hypothetical RNA;
-Hypothetical DNA;
-Genomic DNA;
-Genomic RNA;
-cDNA to mRNA;
-cDNA to genomic RNA
-Organelle DNA;
-Organelle RNA;
-Specific organelle;
-tRNA;
-rRNA;
-snRNA;
-scRNA;
-Other nucleic acid, identify):
-or-
(ii) Kind (if peptide or protein):
(A) Sequence Assembly Method:
(B) Fragment Type:
(C) Hypothetical:
(iii) Orginial Source:
(A) Genus:
(B) Organism/Species:
(C) Sub-species:
(D) Strain:
(E) Individual isolate:
(F) Developmental Stage:
(1) Germ Line:
(2) Rearranged:
(G) Haplotype:
(H) Tissue Type:
(I) Cell Type:
(iv) Immediate Source:
(A) Cell LIne:
(B) Library:
(C) Clone:
(v) Position in Genome:
(A) Chromosome/Segment:
(B) Map Position:
(C) Units:
(vi) Properties of Sequence:
(A) Phenotype:
(B) Activity:
(C) Functional Class:
(D) Binding Macromolecules:
(E) Subcellular Location:
(F) Other Information:
(vii) Features:
(A) Location:
(B) Identification Method:
(C) Complement:
(viii) Sequence Description: SEQ ID NO:X

VOL
1110
ISS
1
JA
2
1990
UMI

EXAMINATION OF APPLICATIONS

(91) Examination of Claims For Patentability Under 35 U.S.C. 103

The purpose of this notice is to inform the public of the current Patent and Trademark Office policy concerning determinations of obviousness under 35 U.S.C. 103 in view of the recent Supreme Court decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (1976).

The following text is a copy of a memorandum issued to all patent examining personnel relative to this topic. "A clarification of the policy of the Patent and Trademark Office in the examination of claims for patentability under 35 U.S.C. 103 seems in order at this time in view of the Supreme Court's decision in *Sakraida* v. *Ag Pro*, 189 USPQ 449 (decided April 20, 1976) which is similar to the Court's earlier decision in *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 163 USPQ 673 (decided December 8, 1969). "Office policy has consistently been to follow *Graham* v. *John Deere Co.*, 148 USPQ 4559 (decided February 21, 1966) in the consideration and determination of obviousness under 35 U.S.C. 103. The three factual inquiries enunciated therein as a background for determining obviousness are as follows:

1. Determination of the scope and content of the prior art;
2. Ascertaining the differences between the prior art and the claims in issue; and
3. Resolving the level of ordinary skill in the pertinent art.

"Attention is directed to MPEP Section 706 for a more complete discussion of the application of the Graham test. "The Supreme Court reaffirmed and relied upon the Graham three-pronged test in its consideration and determination of obviousness in the fact situations presented in both the Ag Pro and Black Rock decisions. In each case, the Court went on to discuss whether the claimed combinations produced a `new or different function' and a `synergistic result,' but clearly decided whether the claimed inventions were unobvious on the basis of the three-way test in Graham. Nowhere in its decisions in those cases does the Court state that the `new or different function' and `synergistic result' tests supersede a finding of unobviousness or obviousness under the Graham test. "Accordingly, examiners should continue to apply the test for patentability under 35 U.S.C. 103 set forth in Graham. It should be noted that the Supreme Court's application of the Graham test to the fact circumstances in Ag Pro is somewhat stringent, as it was in Black Rock."

C. MARSHALL DANN,
Commissioner of Patents & Trademarks.

July 8, 1976.

[949 O.G. 3]

(92) Translations of Foreign Language References

Frequently, Office actions cite references that are in a foreign language. In the event a translation of the entire text or portion of the text of the reference is readily available in the examiners' search files, a copy of the translation will normally be included with the Office action. However, applicants are cautioned that the inclusion of a translation with a foreign language reference should not be construed to mean that the examiner used or relied on the translation, or that it is accurate or an official translation made by the Patent and Trademark Office.

While this service may be infrequent, it could be increased by the submission of translations by the applicant to the Office. Accordingly, it is requested that translations of foreign language references be transmitted to the Office, and in particular be transmitted with the response to the Office action or in a separate envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. In addition, it would be of great assistance to the Office in filing the translation, if the translation carried the following: 1. an identification of the foreign language reference and, where possible. 2. its location in the examiners' search files (e.g. location should be known if reference was cited in Office action). If indentifying information is not available, the incoming translation should carry the name "Scientific Library" thereon so that it can be processed by the Library.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Oct. 26. 1977.

[964 O.G. 24]

(93) Restriction Between Inventions

The practice set out in the notice of June 20, 1968 (852 O.G. 509) is hereby revised as follows.

Under the statute an application may properly be required to be restricted to one of two or more claimed inventions only if they are able to support separate patents and they are either independent or distinct.

If it is demonstrated that two or more claimed inventions have no disclosed relationship ("independent"), restriction should be required, and it is not necessary to further show that the claimed inventions are distinct. If it is demonstrated that two or more claimed inventions have a disclosed relationship ("dependent"), then a showing of distinctness is required to substantiate a restriction requirement.

Where inventions are neither independent nor distinct, one from the other, or they are not sufficiently different to support more than one patent, their joinder in a single application must be permitted.

Every requirement to restrict has two aspects, (1) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct, and (2) the reasons for insisting upon restriction therebetween.

In order to support a requirement to restrict between combination and subcombination inventions, two-way distinctness must be demonstrated.

If it can be shown that a combination, as claimed (1) does not require the particulars of the subcombination as claimed for patentability, and (2) the subcombination can be shown to have utility either by itself or in other and different relations, the inventions are distinct. When these factors cannot be shown, such inventions are not distinct.

Two or more claimed subcombinations, disclosed as usable together in a single combination, and which can be shown to be separately usable, are usually distinct from each other.

In applications claiming inventions in different statutory categories only one-way distinctness is needed to support a restriction requirement. For example, in applications containing claims to both process and apparatus, distinctness may be shown if (1) the process as claimed can be practiced by hand or by another materially different apparatus, or (2) the apparatus as claimed can be used to practice another and materially different process.

As in the notice of May 1, 1974 concerning Markush-Type claims (922 O.G. 1016), if the search and examination of an entire application can be made without serious burden, the examiner is encouraged to examine it on the merits, even though it includes claims to distinct or independent inventions.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Apr. 9, 1975.

[934 O.G. 450]

(94) Restriction Policy and Practice

The purpose of this notice is to inform the public of the results of the survey that was conducted on restriction requirements made under 35 U.S.C. 121 in the Patent Examining Groups and to report clarifications that have been implemented as a result of a review of restriction policy and practice.

The survey involved about 320 patent applications in which a restriction only Office action had been prepared by an examiner in the period between July—Sept. 1983. The selection of applications was proportioned among Groups according to the volume of restriction requirements during the period. The statistics collected (Appendix A) and the definitions (Appendix B) for each item on the survey form are provided at the end of this notice.

Some of the significant findings of the survey include:

† 19% (61/320) of the requirements surveyed were not reasonable based on a review of the record
† 35% (88/249) of the requirements surveyed (not involving an election of species) were not supported by any reasons, or contained reasons which were clearly inapplicable to the facts
† 41% (53/128) of the actions following an election and traverse did not address the arguments contained in the traverse
† 91% (48/53) of a sample of 53 applications surveyed—the attorney or agent of record had no record of receiving a telephone call requesting an oral election

In response to the results of this survey, existing guidelines in Chapter 800 of the Manual of Patent Examining Procedure (MPEP) have been reviewed with each examiner and supervisor in the Patent Examining Corps in order to promote uniformity of practice and compliance with existing guidelines. A follow-up survey will be conducted in early 1985. In addition, as a result of a review of our existing policy and guidelines, the following clarifications have been made:

(1) Telephone Practice (MPEP 812.01)
Except in those cases where the requirement for restriction is complex, the application is being prosecuted by the applicant pro se, or the examiner knows from past experience that an election will not be made by phone, the examiner should make a telephone call to the attorney or agent of record and request an oral election in accordance with MPEP 812.01, first paragraph.
If an election cannot, or will not, be made orally at the time of the call or within a reasonable time thereafter, generally three working days, the Office action requiring the election in writing should contain the following sentence
"A telephone call was made to (name of attorney or agent) on (date) to request an oral election to the above restriction requirement, but did not result in an election being made."

(2) Multiple Inventions In A Continuing Application
Where claims to multiple inventions within the meaning of 35 U.S.C. 121 are presented in a continuing application (continuation, division, continuation-in-part including those which may be filed under 37 CFR 1.60 or 1.62), the examiner should make (or repeat) an appropriate requirement for restriction and require an election by the applicant UNLESS
(1) the applicant acknowledges the previous requirement in the parent application and clearly indicates which invention is to be prosecuted if the requirement is repeated. The examiner should make any proper requirement for restriction in the first Office action, state how applicant has indicated an election (e.g. statement in a preliminary amendment or transmittal letter), and include an action on the merits on the claims of the elected invention;

or

(2) The application is a continuation, but not a division or CIP filed as a File Wrapper Continuation (FWC) under 37 CFR 1.62. The examiner should assume that the requirement and election made in the parent application carries over unless otherwise indicated by applicant. The examiner's first action should include a repetition of the restriction requirement made in the parent application to the extent it is still applicable in the continuation and an indication that prosecution is being continued on the invention elected and prosecuted by applicant in the parent application.
The policy and practice of making requirements final and seeking review by way of petition (37 CFR 1.144) remains unchanged in a continuing application, whether a requirement for election was first made in the parent and renewed in the continuation application or was made for the first time in the continuation application.

(3) Product, Process of Making, Process of Using (MPEP 806.05(i))
Practice in this situation is being amended to conform to Rule 13.2(i) of the Patent Cooperation Treaty (PCT) so that a three way requirement can be required only where the process of making is not "specially adapted" to make the product (i.e. the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.
The Manual of Patent Examining Procedure will be revised to reflect these clarifications in the next revision.

GERALD MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Aug. 1, 1984.

[1046 O.G. 2]

(95) Restriction Practice Survey II

This notice is intended to inform the public of the results of a follow-up survey of applications containing a written restriction requirement. The results of the first survey were reported in the *Official Gazette* on Sept. 4, 1984 (1046 OG 2; Restriction Policy and Practice). Survey II involved 319 applications selected at random in the Patent Examining Groups from those in which a restriction only action had been credited to an examiner in the period of July—Sept. 1984. This period was after the Corps Management Meeting on June 5, 1984 in which restriction policy and practice were reviewed with all SPEs and Directors, and followed the distribution of review materials to all examiners. The results of Survey II showed significant improvements over the results of Survey I, but the results were still not considered satisfactory in several aspects.

Survey Procedure: The selection of applications was generally proportioned among the Groups to correspond to the relative proportion of restriction only actions that were completed in each Group in the last quarter of FY 84. A minimum of ten applications were surveyed from each Group. The distribution was as follows:

	110-16	210-11	310-10
	120-37	220-10	320-18
	130-33	230-10	330-24
	150-47	240-30	340-30
		250-13	350-20
		260-10	
TOTALS	133	84	102

The survey team consisted of the same people who conducted the first survey. One person from the survey team reviewed each selected application file and completed the survey form regarding the restriction requirement(s) in the file. The same survey form was used in each survey.

In the event an application file could not be located or was not readily available, a different application was selected for the survey. In general, the substitute application was selected from those requirements completed by the same examiner assigned to the original application.

The survey did not include any design applications.

Survey Results: Statistical results of the survey are set forth on the survey form used in the Appendix including summaries on a Corps and discipline level. References in this notice to "Item " refer to the numbered items indicated on the survey form. These results indicate an improvement in all are as which were identified as acute problems in the first survey. We did not do a telephone survey to determine whether applicant's representative had been called prior to writing the requirement.

In addition to the survey, the statistics on restriction requirements before and after the training effort following the first survey are of interest. Statistics show that the number of restriction only actions has decreased 36% Corps-wide (52% in Group 120 which had the highest volume in the first survey) following our training effort. These statistics are shown below.

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Quarter	Total First Actions	Total Corps Restriction Requirements	Group 120 Restriction Requirements
Apr-Jun 1984	32,035	2,771	514
Jul-Sep 1984	32,216	1,939	220
Oct-Dec 1984	28,158	1,522	212
	(32,358)*	(1,775)*	(247)*
Oct-Dec vs Apr-Jun		...36%	...52%.

*Figures adjusted (7/6 of actual) to reflect a 7 pay period quarter for comparison with the Apr.- June and July- Sept. quarters which included 7 pay periods.

In addition, 24% of the applications in the second survey contained a specific reference to a telephone call that was made by the examiner, but did not result in an election being made. It was also apparent that some of the requirements were sufficiently complex to warrant a written communication.

The applications reviewed in the second survey resulted in the conclusion that 9% of the requirements that were made were not reasonable on the record that was reviewed (Item 10 -30/319). This compares to 19% (61/320) in the first survey. Of the 30 cases in which a conclusion of unreasonableness was made, the requirement was traversed in 22 (73%) of those cases, not traversed in 7 cases (23%), and no response was filed in 1 case. In the 22 cases where the unreasonable requirement was traversed, the requirement was withdrawn in 10 cases, not withdrawn in 8 cases, and no subsequent action had been made in 4 cases. In the first survey, 11 unreasonable requirements were withdrawn out of 61 made. The survey form on each of the unreasonable requirements in the second survey was returned and discussed with the Group Director.

In our opinion, the reasons provided by the examiner for insisting upon restriction were not proper (either non-existent or based on the wrong criteria) in 18% (Item 5j-57/319) of the applications surveyed—compared to 35% in the first survey. In many of these cases, the reviewer determined that the requirement was justified, but for reasons which the examiner did not set forth in the requirement.

Our second survey revealed that applicant had traversed the requirements in 134 cases (Item 7c), and that where the examiner had given another action in those cases (Item 8-98), the reasons in the traverse had not been responded to in 30% (Item 8b-30/98) of the cases. This represents a very modest improvement of the results in the first survey where 41% (53/128) had not responded to the arguments presented in applicants traverse.

In addition to the statistical results, the survey team met to discuss some of the problems observed during the survey. Several members of the team again observed that problems were more likely to arise where complex requirements involving a large number of claims and/or inventions are encountered, and where the claim schedule required the application of combination—sub-combination criteria to show patentable distinctness (MPEP 806.05c—two-way distinctness). Where three or more inventions are presented in a single application, it was observed that the examiner rarely showed distinctness among all of the combinations of groups (e.g. I-II, II-III, I-III). Another observation that was frequently made was that many of the problems with incomplete requirements could have been avoided by the use of the form paragraphs and associated instructions.

Further Action: While the second survey indicated that significant improvements have been realized in our pursuit of uniformity in restriction practice, we have not achieved an acceptable level of performance in several areas. The same types of problems predominated in each survey, but are now at a reduced level. There is clearly a continuing need for supervisory review.

Supervisors will take the opportunity to emphasize the following points to examiners in their Art Units:

(1) Use of telephone when appropriate to minimize pendency time;
(2) Reasons to support the requirement (to satisfy the criteria for independence of patentable distinctness) *and* reasons for insisting upon restriction should be given in each written requirement. Mere conclusions are not sufficient;
(3) The substance of arguments contained in applicant's traverse should be responded to in the Office action following the traverse;
(4) A showing of two-way distinctness is required in situations where combination-subcombination criteria are applicable (MPEP 806.05c); and
(5) Use of appropriate form paragraphs should be encouraged.

In addition, each Group will review all restriction requirements made in the Group in a pay period at least once every six months.

Finally, review of restriction practice will not be made a component part of the Quality Review Program on an ongoing basis because of the desirability of identifying problems of this type before prosecution is over and the desirability of maintaining their focus on substantive issues. Of course, the Quality Review Staff will continue to bring problems with restriction requirements to the attention of the Director when they are encountered in the course of their review procedures.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1053 OG 5]

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(96) Revised Practice Re Markush-Type Claims

This notice deals with Markush-type generic claims which include a plurality of alternatively usable substances or members. In most cases, a recitation by enumeration is used because there is no appropriate or true generic language. In many cases, the Markush-type claims include independent and distinct inventions. This is true where two or more of the members are so unrelated and diverse that a prior art reference anticipating the claim with respect to one of the members would not render the claim obvious under 35 U.S.C. 103 with respect to the other member(s).

In applications containing claims of that nature, the Examiner may require a provisional election of a single species prior to examination on the merits. The provisional election will be given effect in the event that the Markush-type claim will be examined fully with respect to the elected species and further to the extent necessary to determine patentability. Should the Markush-type claim be found not allowable, examination will be limited to the Markush-type claim and claims to the elected species, with claims drawn to species patentably distinct from the elected species held withdrawn from further consideration.

As an example, in the case of an application with a Markush-type claim drawn to the compound C-R, wherein R is a radical selected from the group consisting of A, B, C, D, and E, the Examiner may require a provisional election of a single species, CA, CB, CC, CD, or CE. The Markush-type claim would then be examined fully with respect to the elected species and any species considered to be clearly unpatentable over the elected species. If on examination the elected species is found to be anticipated or rendered obvious by prior art, the Markush-type claim and claims to the elected species shall be rejected, and claims to the non-elected species would be held withdrawn from further consideration. As in the prevailing practice, a second action on the rejected claims would be made final.

On the other hand, should no prior art be found that anticipates or renders obvious the elected species, the search of the Markush-type claim will be extended. If prior art is then found that anticipates or renders obvious the Markush-type claim with respect to a *non-elected species*, the Markush-type claim shall be rejected and claim to the non-elected species held withdrawn from further consideration. The prior art search, however, will not be extended unnecessarily to cover all non-elected species. Should applicant, in response to this rejection of the Markush-type claim, overcome the rejection, as by amending the Markush-type claim to exclude the species anticipated or rendered obvious by the prior art, the amended Markush-type claim will be re-examined. The prior art search will be extended to the extent necessary to determine patentability of the Markush-type claim. In the event prior art is found during the re-examination that anticipates or renders obvious the amended Markush-type claim, the claim will be rejected and the action made final. Amendments submitted after the final rejection further restricting the scope of the claim will not be entered. If the members of the Markush group are sufficiently few in number or so closely related that a search and examination of the entire claim can be made without serious burden, the Examiner is encouraged to examine all claims on the merits, even though they are directed to independent and distinct inventions. In such a case, the Examiner will not follow the above procedure and will not require restriction.

This notice supersedes the practice set out in 922 O.G. 1016. dated May 1, 1974.

Although the above practice is now in effect, a rule change proposal is also being considered to provide for prosecution of multiple inventions in a single patent application by submission of additional fees.

Oct. 23, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[976 O.G. 128]

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(97) Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371

The purpose of this notice is to set forth procedural guidelines for deciding questions of unity of invention which may arise in international applications when searched by the United States Patent and Trademark Office (USPTO) as an International Searching Authority and when examined during the national phase in the United States as a Designated Office after entry under 35 U.S.C. 371 in connection with the Patent Cooperation Treaty (PCT).

The May 28, 1986, decision in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, Civil Action No. 84-1212-A, (E.D. Va.) held the Patent and Trademark office interpretation of 37 CFR 1.141(b)(2) as applied to unity of invention determinations in international applications was not in accordance with the Patent Cooperation Treaty and its implementing legislation. In the Caterpillar international application, the USPTO, when acting as an International Searching Authority, held lack of unity of invention between a set of claims directed to a process for forming a sprocket and a set of claims drawn to an apparatus (die) for forging such a sprocket. The court stated that it was an unreasonable interpretation to say that the expression "specifically designed" as found in PCT Rule 13.2(ii) means that the process and apparatus can only be used with each other as set forth in the Manual of Patent Examining Procedure (MPEP) § 806.05(e).

Therefore, in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371, PCT Rule 13.1 and 13.2 as interpreted in *Caterpillar* will be followed when considering unity of invention of claims of different categories without regard to 37 CFR 1.141. No change is being made in the restriction practice under 37 CFR 1.141(b) and (c) in United States national applications filed under 35 U.S.C. 111 outside the PCT. No change in practice is being made in regard to claims of the same category of invention either in PCT or U.S. national applications. Such a change in U.S. national restriction practices would require a statutory change in the fee levels to cover the additional examining effort required in individual patent applications.

PCT Rules 13.1 and 13.2 are reproduced below:

PCT RULE 13
Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention").

13.2 Claims of Different Categories

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

PCT Rule 13 only will be applied in the restriction practice used in national phase applications entered under 35 U.S.C. 371 because 35 U.S.C. 372(b)(2) provides that "The Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations".

Guidelines As to Implementation of Revised Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371

(1) The revised practice for international and national phase applications will *not* be used for national applications filed under 35 U.S.C. 111.

(2) The revised practice will *not* affect the treatment of the claims of any applications (national or international) where the question of lack of unity of invention relates to other than different categories of invention issues. Therefore, restriction and unity of invention practice involving, for example, Markush type claims, genus-species, intermediate-final product or combination-subcombination situations are *not* affected for any applications by this notice.

(3) The expression "and as set forth in §§ 1.141" in 37 CFR 1.481(a) will no longer be considered operative in view of the decision in *Caterpillar Tractor Co.*, supra. The criteria of § 1.141 continue to be applicable to U.S. national applications filed under 35 U.S.C. 111 as they were in effect prior to the Caterpillar decision and essentially the same as the practice which was in effect for many years prior to the PCT implementation. That is, practice will continue as set forth in MPEP Chapter 800 as modified in 1046 OG 2 for the practice relating to product, process of making and process of using. The practice in this latter situation is that a three way requirement for restriction can only be required where the process of making is distinct from the product (i.e., the requirements of MPEP 806.05(f) are met). Otherwise, the process of using must be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. A determination of the patentability of the product need not be made prior to making a requirement for restriction.

(4) The criteria of PCT Rule 13 will be applied when determining unity of invention of claims to different categories of invention in considering international applications as an International Searching Authority and during the national phase as a Designated Office under 35 U.S.C. 371.

(5) The revised practice will apply to all international applications before the PTO as an International Searching Authority in which no search report has been issued and in all pending national stage applications entered under 35 U.S.C. 371 in which a holding of lack of unity of invention (requirement for restriction) has not been made final by the examiner or acquiesced in by the applicant as of the date of this notice.

(6) In applying PCT Rule 13 to international applications as an International Searching Authority and to national phase applications under 35 U.S.C. 371, examiners will consider for unity of invention all of the claims to different categories of invention in the application and will permit retention in the same application for searching and/or examination, of claims to the categories which meet the requirements of any one of PCT Rule 13.1(i) to (iii).

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In view of the court's treatment of the USPTO's distinctness test in Caterpillar, the USPTO will also permit in the same international application the following two combinations:

(a) an independent claim for a given product and an independent claim for a process specially adapted for the manufacture of said product.
(b) an independent claim for a given product and an independent claim for a process of using the said product.

If the different categories of claims do not fall within any *one* of PCT Rule 13.2(i) to (iii) or additional combinations (a) or (b) above, i.e., they claim more or less categories of invention than permitted in any one of PCT Rule 13.2(i) to (iii) or combination (a) or (b) above, unity of invention may not be present. Further, an independent claim for a use in PCT Rule 13.2(i) and combination (b) above is construed as being limited to a claim directed to a process.

In determining unity of invention under PCT Rule 13.2(i) and (iii) and combination (a) above, the examiner will consider the word "specially" which appears before "adapted" to be an emphasis word rather than a limitation. In determining unity of invention under PCT Rule 13.2(ii), the examiner will consider the word "specifically" which appears before "designed" to be an emphasis word rather than a limitation.

Detailed Explanation

Under PCT Rule 13.2, Unity of Invention as to different categories of inventions is covered on the basis of 4 different categories of invention. They are:

A. a product
B. a process (for manufacture)
C. a use of the said product
D. an apparatus or means for carrying out the process for manufacture.

PCT Rule 13.2 provides for grouping of certain of these different categories of inventions and retaining unity of invention.

i. PCT Rule 13.2(i) provides for grouping claims to:

A. a product
B. a process for the manufacture of said product
C. a use of the said product

ii. PCT Rule 13.2(ii) provides for grouping claims to:

B. a process (e.g. for the manufacture of a product)
D. an apparatus or means for carrying out the said process.

iii. PCT Rule 13.2(iii) provides for grouping claims to:

A. a product
B. a process for the manufacture of the product
D. apparatus or means for carrying out the process.

Also permitted by the USPTO are combinations:

(a) A. a product
B. a process for the manufacture of said product

(b) A. a product
C. a use of the said product

If an application includes claims to all the categories of invention set forth in any one of PCT Rule 13.2(i), (ii), (iii), combinations (a) or (b) above, and no additional categories of invention are present, unity of invention exists and no additional search fees should be required or restriction requirement made.

For example, if an application contains claims to only a process for the manufacture of a product and claims to a use of a product and no product claims is present, there is lack of unity of invention since the provisions of Rule 13.2(i) do not apply and the process for manufacture of a product is independent of the use of the product since neither is dependent on the other. Also, if claims to all three categories of PCT Rule 13.2(i) are present at the time of the first Office action and all the product claims are canceled in the response to the first Office action, a requirement for restriction could be made, if appropriate, in the second Office action in view of the independent inventions remaining in the application. PCT Rule 13.2(i) would no longer apply since all three categories of claims would no longer be present in the application. However, the fact that claims to a certain category of invention are unpatentable does not affect the question of unity of invention provided the unpatentable claims are retained in the application.

Where claims to a category of invention in addition to those listed in any one of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above included in an application, unity of invention may be lacking between the claims drawn to the categories set forth in any *one* of PCT Rule 13.2(i), (ii), (iii) or combinations (a) or (b) above, and the claims to the additional category of invention. For example, if an application contained claims to a process for manufacture, claims to an apparatus or means for carrying out the process and claims to a use of the product manufactured, there could be lack of unity of invention. In such a situation the examiner should group the claims to the process for manufacture and the claims for an apparatus or means for carrying out the process because unity of these two categories exists under PCT Rule 13.2(ii). The claims to the use of the product could be separately grouped if the "use" is shown to be "independent and distinct" of both the "process for manufacture" and the "apparatus or means for carrying out the process" as provided in Chapter 800 of the Manual of Patent Examining Procedure (MPEP).

When the claims presented in an application are directed to several categories of invention so that more than one paragraph of PCT Rule 13.2 and combinations (a) or (b) above applies, the examiner will inspect the claims to see if the categories of invention set forth in PCT Rule 13.2, paragraphs (i), (iii) and (ii), and then combinations (a) or (b) above are present in the application in that order. For example, if the categories of PCT Rule 13.2(i) are found in the application, the claims to those categories stated in PCT Rule 13.2(i) will be considered as one invention and any claims to different categories of invention will be reviewed to determine if they are "independent and distinct" of *all* the claims covered in PCT Rule 13.2(i) in accordance with theprovisions of Chapter 800 of the MPEP.

Under PCT Rule 13.2 and combinations (a) and (b) above, unity will exist where the claims are limited to one invention in each category of invention recited. For example, under PCT Rule 13.2(i), claims are permitted to one product, one process of manufacturing and one use. If multiple products, processes of manufacture or uses are claimed, the first invention in the category first mentioned in the claims will be considered as the elected invention. The first recited invention of each additional category which is related as described in paragraph 7 below with the first invention as indicated in the previous sentence will be considered elected. Accordingly, for example, if multiple products are claimed, the first recited product is constructively elected and the first recited process, if multiple processes adapted for making and/or using the product are claimed, is also constructively elected. Any such holding by the examiner will be made in the form of a restriction requirement in an application entered in the USPTO under 35 U.S.C. 371. Such a restriction requirement would be made on the basis of criteria set forth in MPEP Chapter 800. Applicant would have the right to traverse such a restriction requirement in the response to the Office action.

(7) The inventions recited by the claims of different categories must be drawn to related rather than independent inventions. For example, the product as claimed in PCT Rule 13.2(i) and combinations (a) and (b) above must be able to be made by the claimed process for manufacture and the use claimed must be able to use the claimed product. Likewise in PCT Rule 13.2(ii), the apparatus as claimed must be able to carry out the claimed process. In PCT Rule 13.2(iii), the claimed process of manufacture must be able to make the claimed product and the claimed apparatus or means must be able to perform the claimed process of manufacture.

(9) Applicants should clearly indicate on all application papers filed for entry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111.

(10) Any prior notices or policies relating to unity of invention which are inconsistent herewith are superceded to the extent they are inconsistent with this notice.

Appropriate changes in the Code of Federal Regulations will be proposed in due course to adjust the level of the search fees and national fees of § 1.445 to recover the cost of searching and examining international applications with claims to different categories of invention in a single international application. The fees were originally set based on the unity of invention practice previously in effect.

If necessary, additional guidance for processing applications under PCT Rule 13 will be issued as experience is gained.

Aug. 15, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1070 OG 11]

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(98)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 61231-7086]

Unity of Invention and Patent Cooperation Treaty [Chapter II]

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Final Rulemaking.
Summary: The Patent and Trademark Office hereby amends its regulations (1) to change the practice in handling unity of invention issues in international applications under the Patent Cooperation Treaty (PCT) and those entering the national stage under 35 U.S.C. 371 and (2) to establish procedures necessary for patent applicants to proceed under Chapter II of the Patent Cooperation Treaty. This rule change is being made because (1) the current rules for handling unity of invention issues in international applications are not consistent with the court decision in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks* , 231 USPQ 590 (E.D. Va. 1986), and (2) legislation implementing Chapter II of the Patent Cooperation Treaty has recently been enacted. The promulgated rules will result in (1) the treatment of unity of invention issues in international applications consistently with the court decision while retaining the current practice for national applications filed under 35 U.S.C. 111, and (2) procedures adequate for applicants to proceed under Chapter II of the Patent Cooperation Treaty.
Effective Date: July 1, 1987.
For Further Information Contact: Louis O. Maassel by telephone at (703) 557-3070 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This final rule change relates to (1) questions of unity of invention which may arise in international applications when searched as an International Searching Authority and when examined as an International Preliminary Examining Authority by the United States Patent and Trademark Office (USPTO) and during the national stage in the United States as a Designated Office after entry under 35 U.S.C. 371 pursuant to the Patent Cooperation Treaty (PCT) and (2) procedures to be followed and fees to be paid under Chapter II of the Patent Cooperation Treaty. The rule change will also increase the amount of the international search fees and national fees in international applications in view of increased average effort required by the USPTO because of changes in the rules relating to unity of invention. No fees are being established under 35 U.S.C. 41.

Background Information

Unity of Invention

The May 28, 1986, decision in *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, 231 USPQ 590 (E. D. Va., 1986) held that the Patent and Trademark Office interpretation of 37 CFR 1.141(b)(2) as applied to unity of invention determinations in international applications was not in accordance with the Patent Cooperation Treaty and its implementing rules. In the Caterpillar international application, the USPTO, acting as an International Searching Authority, had held lack of unity of invention between a set of claims directed to a process for forming a sprocket and a set of claims drawn to an apparatus (die) for forging a sprocket. The court stated that it was an unreasonable interpretation to say that the expression "specifically designed" as found in PCT Rule 13.2(ii) means that the process and apparatus have unity of invention if they can only be used with each other, as set forth in the Manual of Patent Examining Procedure (MPEP) [g49 806.05(e).

Therefore, when the Patent and Trademark Office considers international applications as an International Searching Authority, as an International Preliminary Examining Authority, and during the national stage as a Designated or Elected Office under 35 U.S.C. 371, PCT Rule 13.1 and 13.2 will be followed when considering unity of invention of claims of different categories without regard to the practice in national applications filed under 35 U.S.C. 111. No change is being made in the current restriction practice in United States national applications filed under 35 U.S.C. 111 outside the PCT. No change in practice is being made in regard to claims of the same category of invention either in PCT international applications or in U.S. national applications. Any such change in U.S. national restriction practice would require a statutory change in the fee levels in order to cover the additional examining effort required in individual patent applications.

The unity of invention procedures set forth in the rules are already being substantially followed by the examiners in the USPTO as a result of the notice signed on Aug. 15, 1986, and published in the *Official Gazette* on Sept. 9, 1986 at 1070 O.G. 11. The notice of Sept. 9, 1986 and any prior notices or policies relating to unity of invention which are inconsistent with the rules and procedures in this final rules notice are superseded to the extent that they are inconsistent.

The unity of invention practice set forth in PCT Rule 13 will be applied in national stage applications entered under 35 U.S.C. 371 because 35 U.S.C. 372(b)(2) provides that "The Commissioner may cause the question of unity of invention to be reexamined under section 121 of this title, within the scope of the requirements of the treaty and the Regulations". However, continuing applications filed under 35 U.S.C. 111 of international applications under the provisions of 35 U.S.C. 365(c) will be subject to the same restriction practice as other United States national applications filed under 35 U.S.C. 111. However, it is noted that where several inventions have been searched in the parent international application, the examination of such inventions in a continuing national application may not be burdensome and the examiner may consider all the inventions in such an application without making a restriction requirement.

Implementation of Unity of Invention Practice in International Applications and National Stage Applications Entered Under 35 U.S.C. 371

(1) The practice established by these rules for international and national stage applications will *not* be applied to national applications filed under 35 U.S.C. 111.

(2) The practice established by these rules will *not* affect the treatment of the claims of any applications (national or international) where the question of lack of unity of invention relates to other than different categories of invention issues.

Therefore, restriction and unity of invention practice involving, for example, Markush type claims, genus-species, intermediate-final product or combination-subcombination situations is *not* affected for any applications by this rule change.

(3) The criteria of § 1.141 would continue to be applicable to U.S. national applications filed under 35 U.S.C. 111 in a manner similar to that in effect prior to the Caterpillar decision and essentially the same as the practice which was in effect for many years prior to the PCT implementation. That is, national restriction practice will continue as set forth in MPEP Chapter 800, as modified in 1046 O.G. 2 for the practice relating to product, process of making and process of using. The practice in this latter situation is that a three way requirement for restriction can only be made where the process of making is distinct from the product (i.e., the requirements of MPEP 806.05(f) are met). Otherwise, claims to the process of using must be joined with the claims directed to the product and the

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process of making the product even though a showing of distinctness between the product and process of using the product (MPEP 806.05(h)) could be made. This concept is included in paragraph 1.141(b).

(4) Under the rules, the criteria of PCT Rule 13.2 will be applied when considering unity of invention of claims drawn to different categories of invention in international applications as an International Searching Authority, International Preliminary Examining Authority, and as a Designated or Elected Office in international applications which enter the national stage under 35 U.S.C. 371.

(5) Under the rules, in applying PCT Rule 13.2 to international applications as an International Searching Authority, an International Preliminary Examining Authority and to national stage applications under 35 U.S.C. 371, examiners will consider for unity of invention all of the claims to different categories of invention in the application and will permit retention in the same application for searching and/or examination, claims to the categories which meet the requirements of any one of PCT Rule 13.2(i) to (iii).

Under the rules, the USPTO will also permit in the same international or national stage application the following two combinations:

(1) An independent claim for a given product and an independent claim for a process specially adapted for the manufacture of said product.

(2) An independent claim for a given product and an independent claim for a process of using the said product.

Under the rules, if an application contains a combination of categories of claims which do not fall within any *one* of the combinations of PCT Rule 13.2(i) to (iii) or additional combinations (1) or (2) above, i.e., they claim more or less categories of invention than permitted in any one of PCT Rule 13.2(i) to (iii) or combination (1) or (2) above, unity of invention may not be present.

Further, an independent claim for a use in PCT Rule 13.2(i) and combination (2) above will be construed as being limited to a claim directed to a process of using. In determining unity of invention under PCT Rule 13.2(i) and (iii) and combination (1) above, under the rules, the examiner will consider the word "specially" which appears before "adapted" to be an emphasis word rather than a limitation. In determining unity of invention under PCT Rule 13.2(ii), the examiner will consider the word "specifically" which appears before "designed" to be an emphasis word rather than a limitation.

Under the rules, if an application includes claims to all the categories of invention set forth in any one of PCT Rule 13.2(i), (ii), (iii), combinations (1) or (2) above, and no additional categories of invention are present, unity of invention will exist and no additional fees will be required or restriction requirement made.

For example, if an application contained claims to only a process for the manufacture of a product and claims to a use of a product and no product claim is present, there will be lack of unity of invention since the provisions of Rule 13.2(i) do not apply because claims to all categories of invention set forth in PCT Rule 13.2(i) are not included in the application and the process for manufacture of a product is independent of the use of the product since neither is dependent on the other. Also if claims to all three categories of PCT Rule 13.2(i) were present at the time of the first Office action in a national stage application and all the product claims are rejected in the first Office action, a requirement for restriction could also be made, if appropriate, in view of independent inventions being in the application without an allowable linking (product) claim.

Under the rules, where claims to a category of invention in addition to those listed in any one of PCT Rule 13.2 (i), (ii), (iii) or combinations (1) or (2) above are included in an application, unity of invention may be lacking between the claims drawn to the combination of the categories of invention set forth in any *one* of PCT Rule 13.2(i), (ii), or (iii) or combinations (1) or (2) above, and the claims to the additional category of invention. For example, if an application contains claims to a process for manufacture, claims to an apparatus or means for carrying out the process and claims to a process of using the product manufactured, there could be lack of unity of invention. In such a situation the examiner should group the claims to the process for manufacture and the claims for an apparatus or means for carrying out the process because unity of these two categories exists under PCT Rule 13.2(ii). The claims to the use of the product can be separately grouped if the "use" is shown to be "independent and distinct" of both the "process for manufacture" and the "apparatus or means for carrying out the process" as provided in Chapter 800 of the Manual of Patent Examining Procedure (MPEP).

When the claims presented in an application are directed to several categories of invention under the rules so that more than one paragraph of PCT Rule 13.2 and combinations (1) or (2) above applies, the examiner would inspect the claims to see if the categories of invention set forth in PCT Rule 13.2, paragraphs (i), (ii) and (iii), and then combinations (1) or (2) above are present in the application in that order. For example, if the categories of PCT Rule 13.2(i) are found in the application, the claims to those categories stated in PCT Rule 13.2(i) will be considered as one invention and any claims to different categories of invention will be reviewed to determine if they are "independent and distinct" of *all* the claims covered in PCT Rule 13.2(i) in accordance with the provisions of Chapter 800 of the MPEP.

(6) Under PCT Rule 13.2 and combinations (1) and (2) above, unity will exist where the claims are limited to one invention in each category of invention recited. For example, under PCT Rule 13.2(i), claims are permitted to one product, one process of manufacturing the product and one use of the product. If multiple products, processes of manufacture or uses are claimed, the first invention in the category first mentioned in the claims would be considered as the elected invention under the rules. The first recited invention of each additional category which is related to the first invention as indicated in the previous sentence will be considered elected. Accordingly, for example, if multiple products are claimed, the first recited product will be considered to be constructively elected and if multiple processes adapted for making and/or using the product are claimed, the first recited process will also be constructively elected. Any additional inventions of the same category will be subject to payment of additional fees during the international stage. In a national stage application submitted under 35 U.S.C. 371 any such holding by the examiner will be made in the form of a restriction requirement. Such a restriction requirement will be made on the basis of criteria set forth in MPEP Chapter 800. Applicant will have the right to traverse such a restriction requirement in the response to the Office action.

(7) Inventions of different categories, to have unity of invention, must be related rather than independent inventions. For example, the product as claimed in PCT Rule 13.2(i) and combinations (1) and (2) above must be capable of being made by the claimed process for manufacture or being used in the claimed process of use. Likewise in PCT Rule 13.2(ii), the apparatus as claimed must be capable of carrying out the claimed process. In PCT Rule 13.2(iii), the claimed process of manufacture must be capable of preparing the claimed product and the claimed apparatus or means must be able to perform the claimed process of manufacture.

(8) Under §§ 1.494 and 1.495, applicants must indicate on all application papers filed for entry under 35 U.S.C. 371 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111.

Patent Cooperation Treaty, Chapter II

The Patent Cooperation Treaty became effective for the United States on Jan. 24, 1978. The United States, however, was one of six countries (out of the 40 countries who have ratified or acceded to the Treaty) which had reservations not to be bound by Chapter II. The document removing the reservation as to Chapter II was deposited with the Director General of the World Intellectual Property Organization on Apr. 1, 1987. Accordingly, Chapter II of the Treaty for the United States of America, Pub. L. 99-616 and these final regulations become effective 3 months later on July 1, 1987.

Chapter I of the Patent Cooperation Treaty provides a standardized application format and a centralized filing procedure for international patent applications. Pursuant to Chapter I, an applicant may submit an International application, designating those member countries in which the applicant desires patent protection. Filing an international application has the same effect as filing a separate application in all designated

member states with respect to the filing date. In addition, by filing an international application, the applicant does not have to incur the expenses associated with national patent prosecution in the designated countries until 20 months from the priority date of the international application. During this period, the applicant obtains an international search report citing prior art deemed to be relevant to the claims of the invention contained in the international application. This helps the applicant decide whether to proceed with patent prosecution in the various countries originally designated.

Chapter II of the Patent Cooperation Treaty provides two further benefits for the applicant. First, an additional 10 months is allowed, for a total of 30 months from the priority date of the international application, before the applicant must decide whether to proceed with national patent prosecution in the elected countries. Second, the applicant is provided with an international preliminary examination report. In contrast to the international search report, which provides citations of prior art pertinent to the invention, the international preliminary examination report is a non-binding opinion from an International Preliminary Examining Authority as to whether the invention is novel, involves an inventive step (is non-obvious), and is industrially applicable. A preliminary examination report will be established within 28 months from the priority date. This preliminary examination report, together with the additional 10 months before the decision to proceed with national prosecution is required, places the applicant in a better position to consider commercial factors associated with the invention and to decide whether to pursue patent protection in the various elected countries.

To take advantage of these benefits provided by Chapter II, an applicant must file a "Demand" for a preliminary examination in an appropriate International Preliminary Examining Authority prior to the expiration of the 19th month from the priority date and pay certain fees. The final rules establish the amounts of some of the necessary fees and procedures under Chapter II and also group all the rules unique to international applications in a separate area of the regulations. The rules fall into three groups: (1) those directed to procedures under Chapter I, (2) those directed to procedures under Chapter II, and (3) those directed to entering the national stage under 35 U.S.C. 371.

Changes From the Proposed Rules

In § 1.475, a new paragraph (f) has been added which sets forth in the rules the exact wording of PCT Rule 13. PCT Rule 13 was included in the proposed rules as a footnote. The incorporation of the wording of PCT Rule 13 into § 1.475(f) will make it easier to refer to and easier to locate. Sections 1.475, 1.476, 1.487 and 1.499 are also changed to refer to § 1.475(f) rather than footnote 1.

In § 1.480(c), the wording has been clarified by adding a reference to the election of the United States.

Section 1.484(f) has been modified from the proposal to permit more than one interview in those situations where the examiner considers that an additional interview would be helpful.

In § 1.485, paragraph (b) has not been included since the substance thereof is set forth in § 1.484(d).

In § 1.492(a)(2) and (3), "i" has been deleted in order to refer to both § 1.445(a)(2)(i) and (ii).

An additional paragraph (a)(4) has been added to § 1.492 and an additional paragraph (b) has been added to § 1.496 which provide for a substantially reduced national fee and special procedure, respectively, where the application has satisfied the requirements of novelty, inventive step (non-obviousness) and industrial applicability before the United States International Preliminary Examining Authority as to the identical claims which are in the application at the national stage in the Patent and Trademark Office. Amendments during subsequent prosecution will only be permitted in response to an examiner's rejections or objections. Thus, no new claims are permited. Therefore, most of such cases will require little or no prosecution to satisfy the requirements for patentability. The title of § 1.496 has been broadened in view of the new paragraph (b) and proposed § 1.496 has been redesignated as paragraph (a).

In §§ 1.494 and 1.495, an additional paragraph has been added to indicate the date of abandonment of an international aplication as to the United States if the requirements of 35 U.S.C. 371(c) are not timely fulfilled.

Response to Comments Received

Specific comments were received on several of the proposed rules, particularly those relating to unity of invention and fees. Sixteen letters submitting written comments were received. Oral testimony was presented by five persons at the public hearing conducted on Apr. 6, 1987 resulting in 46 pages of testimony. All of the written and oral comments were considered in adopting the changes set forth herein. Comments suggesting modifications to the proposed rules or requesting clarification thereto appear below with responses thereto.

Comment:

A question was raised as to whether the deadline for filing a continuing application under 35 U.S.C. 365(c) and 120 was 20 or 22 months under Chapter I and 30 or 32 months under Chapter II.

Reply:

The Patent and Trademark Office considers the international application to be pending until the 22nd month from the priority date if the United States has been designated and no Demand for International Preliminary Examination has been filed prior to the expiration of the 19th month from the priority date and until the 32nd month from the priority date if a Demand for International Preliminary Examination which elected the United States of America has been filed prior to the expiration of the 19th month from the priority date provided that a copy of the international application has been communicated to the Patent and Trademark Office within the 20 or 30 month period, respectively. If a copy of the international application has not been communicated to the Patent and Trademark Office within the 20 or 30 month period respectively, the international application becomes abandoned as to the United States 20 or 30 months from the priority date respectively. These periods have been placed in the rules as paragraph (h) of § 1.494 and paragraph (i) of § 1.495. A continuing application under 35 U.S.C. 365(c) and 120 may be filed anytime during the pendency of the international application.

Comment:

A comment was received concerning the situation where a continuing application is filed under 35 U.S.C. 365(c) of an international application which claims priority of an earlier filed foreign application as to (1) whether the applicant must specifically claim priority in the continuing application and (2) whether the certified copy of the priority application which may have been communicated to the Patent and Trademark Office by the International Bureau may be relied upon without any need to file a certified copy of the priority application in the continuing application.

Reply:

As to item (1), it is necessary under the statute for the applicant to claim priority in the continuing application. Otherwise there is no indication that such benefit is desired in the continuation and the information may not be present for printing of any subsequent patent.

As to item (2), the certified copy of the priority application communicated by the International Bureau is placed in a folder and is not assigned a U.S. serial number unless the national stage is entered. Such folders are disposed of if the national stage is not entered. Therefore such certified copies may not be available if needed later in the prosecution of a continuing application. An alternative would be to physically remove the priority documents from the folders and transfer them to the continuing application. The resources required to request transfer, retrieve the folders, make suitable record notations, transfer the certified copies, enter and make of record such copies in the continuing applications is substantial. Accordingly, the priority documents in folders of international applications which have not entered the national stage may not be relied on.

Comment:

One comment raised the question whether a continuing application filed under 35 U.S.C. 111 and entitled to the benefit of a prior international application designating the United States under 35 U.S.C. 365(c) and 120 would be subject to the PCT unity practice of § 1.499 or the national restriction practice under § 1.141.

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Reply:
A continuing application filed under 35 U.S.C. 111 would be subject to the national restriction practice as set forth in § 1.141 and Chapter 800 of the Manual of Patent Examining Procedure. Only those international applications entering the national stage under 35 U.S.C. 371 and § 1.494 or § 1.495 would be subject to the unity of invention practice set forth in § 1.499.
Comment:
Five comments were made to the effect that the unity practice set forth in the rules was not consistent with the unity of invention criteria currently under discussion in the WIPO "harmonization" treaty meetings.
Reply:
At the present time there appears to be no agreed upon unity practice in the harmonization meetings. Only a discussion document has been prepared by WIPO. The Patent and Trademark Office is currently making a very intensive study of unity of invention in the United States, Japan and the European Patent Office. The practice which may result from this study and subsequent discussions is also not clear at this time. For these reasons as well as the fee implications of such a change, it is considered preferable to proceed with a clarification of the unity of invention practice which is to be used as part of the regulations for use by patent applicants and examiners at this time and, if modification of the practice is required in the future, appropriate changes in the law and the rules will be made at that time.
Comment:
Two comments argued that the difference in treatment of unity of invention is contrary to 35 U.S.C. 372(a).
Reply:
35 U.S.C. 372(a) states:

> All questions of substance and, within the scope of the requirements of the treaty and Regulations, procedure in an international application designating the United States shall be determined as in the case of national applications regularly filed in the Patent and Trademark Office.

This section is interpreted as relating only to substantive questions of patentability which includes matters such as the definition of prior art. See PCT Article 27(5). If section 372(a) were interpreted to include items other than those relating to substantive questions of patentability, items such as requirements to obtain a filing date would be included. Clearly, an international application must only meet the filing date requirements of PCT Article 11(1) even though a U.S. national application must meet the requirements of 35 U.S.C. 111.
Comment:
One comments was received stating that the U.S. rules should define prior art for PCT purposes and also the manner of issuing International Preliminary Examination Reports.
Reply:
Prior art for PCT purposes is already defined in PCT Rule 64 and the procedures are set forth in PCT Rules 66 and 70. To repeat the substance of these PCT rules in the U.S. rules would be duplicative and possibly lead to different interpretations if different wording was used.
Comment:
One comment inquired whether the International Preliminary Examining Report was binding on a USPTO examiner in the national stage.
Reply:
An International Preliminary Examination Report is not binding on a USPTO examiner. PCT Article 33(1) clearly states that the "objective of the international preliminary examination is to formulate a preliminary and non-binding opinion." Since the USPTO has had no experience with International Preliminary Examination Reports prepared by foreign offices, as well as foreign offices having no experience with Reports prepared by the USPTO, the degree of reliance on such Reports in the national stage cannot be determined at the present time. Studies underway with the European Patent Office and the Japanese Patent Office regarding inventive step and other matters and experience with Reports from other International Preliminary Examining Authorities may be helpful in further addressing this question in the future.
Comment:
Two comments were received asking why § 1.141(b) was being changed since there was no change in U.S. restriction practice.
Reply:
No change is being made in U.S. restriction practice in applications filed under 35 U.S.C. 111. The amendments to § 1.141 basically delete expressions used in the Patent Cooperation Treaty which are not used in U.S. national practice. The criteria deleted from § 1.141(b) still remain in Chapter 800 of the Manual of Patent Examining Procedure.
Comment:
One comment was made that any interpretation by the PTO of the PCT Unity language will carry over to the Harmonization Treaty.
Reply:
The U.S. delegation to the WIPO harmonization meetings has several times requested that guidelines be prepared for consideration with the Unity of Invention Article and Rules. Any interpretation of future treaty wording would be controlled by the guidelines.
Comment:
Three comments were received that the PTO is attempting to promulgate a variation of PCT Rule 13 which is contrary to the Caterpillar decision because the U.S. rules are not identical in scope with PCT Rule 13.
Reply:
The U.S. rules relating to Unity of Invention are considered to be in accordance with PCT Rule 13 and the Caterpillar decision. Rules 1.475, 1.487 and 1.499 are not identical with PCT Rule 13.2 because the U.S. rules are somewhat broader because additional combinations are included. The U.S. rules are also consistent with the Caterpillar decision because this decision related only to the interpretation of the expressions in PCT Rule 13.2.
Comment:
One comment inquired as to the amount of the handling fee.
Reply:
The amount of the handling fee is set forth in the SCHEDULE OF FEES appearing at the end of the PCT Rules. These fees are stated in Swiss Francs. The current amount for the Handling Fee is 200 Swiss Francs. The amount in U.S. dollars will be established by the Director General based on the current exchange rates as provided in PCT Rule 57.2(c).
Comment:
One comment proposed that a rule be implemented under which an examiner must complete the first written opinion within two months of the filing of the Demand.
Reply:
Although the Office will expect an examiner to begin the International Preliminary Examination as early as possible after receipt, delay in issuing the written opinion may occur because the International Preliminary Examination fee was paid later than the filing of the Demand under PCT Rule 58.2, the application contains defects in form or contents or the application lacks unity of invention. Thus, such a rule would not be appropriate.
Comment:
One comment questioned the need to re-impose restriction (holding of lack of unity of invention) if a linking claim is not allowable.
Reply:
There is no mandatory requirement that the examiner impose a holding of lack of unity if the linking claim is shown to lack novelty and inventive step. However, if such a possibility did not exist, applicants could present broad generic claims to entire classes of inventions and thereby prevent any subsequent holding of lack of unity by the examiner.
Comment:
One comment suggested that applicants in national patent applications be allowed to take advantage of the PCT unity criteria by paying a surcharge.
Reply:
Such a fee is not provided for under 35 U.S.C. 41 and would appear to require legislative action.
Comment:
Three comments suggested that the increases in the search fees were either unlawful or inconsistent with the spirit of the Patent and Trademark Office Authorization Act passed by Congress in 1986 in view of the freeze imposed thereby.
Reply:
The Patent and Trademark Office Appropriations Act (Public Law 99-607) at Sec. 3(b) states.

> (b) PATENT FEES.—The Commissioner of Patents and Trademarks may not, during fiscal years 1986, 1987, and 1988, increase fees established under section 41(d) of title 35, United States Code, except for purposes of making adjustments which in the aggregate do not exceed fluctuations during the previous 3 years in the Consumer Price Index, as determined by the Secretary of Labor. The Commissioner also may not establish additional fees under such section during such fiscal years.

The legislative history also makes clear that the prohibition against fee increases relates only to those fees established under section 41(d) and indicates that fees for new types of processing, services, or materials are not prohibited. The prohibition in the appropriation authorization is strictly limited to fees established under 35 U.S.C. 41(d) and does not affect the authority of the Commissioner to set fees under the Patent Cooperation Treaty. Note 35 U.S.C. 376 which authorizes the Commissioner to set fees for both the international and national stages. The new services relating to unity of invention are clealry not within the scope of the appropriation authorization restriction.
Comment:
Three comments stated that the $100 fee increase for an international search is clearly excessive.
Reply:
The increase in the search fee is to recover the average estimated additional cost of processing international applications with claims to more inventions than were permitted when the current search fees were established. The increase is established also to provide for an expected higher percentage of international applications containing claims to more than one category of invention. If experience shows these expectations were in error, fees will be adjusted in the future.
Comment:
One comment stated that the increase in the international search fee was not justified by *Caterpillar Tractor Co.* v. *Commissioner of Patents and Trademarks*, 231 USPQ 590 (E. D. Va. 1986) which merely clarified an aspect of existing law and did not change it.
Reply:
The decision in the Caterpillar case indicated that the Office's criteria for unity of invention on which the amount of the search fee was determined were too strict in construing the language of the Treaty and that broader criteria were permitted under the terms of the Treaty. Fees under the Patent Cooperation Treaty were set based on pre-Caterpillar interpretations of PCT Rule 13.2 by the Patent and Trademark Office. Since such broader criteria require a more extensive search than that on which the search fee was previously calculated, an increase in the search fee is necessary to cover the cost of the additional search required under the broader criteria in accordance with the Caterpillar decision.
Comment:
One comment stated that the increase in the international search fee penalizes an applicant presenting clearly a single invention.
Reply:
A broadening of the interpretation of unity of invention and the increase in the average amount of work required in searching an international application results in a higher fee being required. A more narrow interpretation of unity of invention permits a lower average fee and would tend to benefit applicants with a clearly single invention. The Caterpillar decision and majority of comments received supported a more liberal interpretation of unity of invention. Testimony at the hearing indicated a preference for spreading any additional costs among all applicants.
Comment:
One comment was received which suggested that § 1.484(d) be amended by adding a further sentence.

> If, after receipt of any response to the written opinion, the Examiner is of the opinion that some or all of the claims are not patentable, the Examiner shall issue a second written opinion which identifies any patentable subject matter, including any suggestions for claim modification to properly define the invention.

Reply:
The wording of the proposed sentence is clearly inappropriate since the International Preliminary Examination Report does not make any determination of "patentability." Note PCT Article 35(2). Furthermore, the time limits for issuing an International Preliminary Examination Report are such that there may not be sufficient time in most cases to issue a second opinion and receive a response thereto. Modifications in the interview practice are a more practical way of assuring a more complete and thorough international preliminary examination.
Comment:
One comment suggested that § 1.484(f) be amended to read:

> An applicant will be permitted *at least* [no more than] one personal or telephone interview, which must be conducted *prior to 27 months from the priority date* during the non-extendable time limit for response by the applicant to the written opinion.

Reply:
A less restrictive interview policy has been incorporated into § 1.484(f). The period for an interview cannot be delayed until the 27th month from the priority date since this is the time at which the examiners will be required to complete their Reports in order to allow time for reviews and mailing.
Comment:
One comment proposed that § 1.485 be amended as follows:

> The time limit for response in a written opinion of the International Preliminary Examining Authority may not be extended *to expire beyond 27 months from the priority date, without the permission of the Group Director.*

Reply:
No need is seen to limit the end of the response period to the end of the 27th month since the period will be set by the examiner when a written opinion is mailed. The time limit cannot be extended (§ 1.484(d)) due to tight time frames for establishing the International Preliminary Examination Report within 28 months from the priority date. The time limits for response to a written opinion are set forth in PCT Rule 66.2(d).
Comment:
Two written comments and the oral testimony indicated that the fees for entering the national stage should be considerably less after an international search and preliminary examination. The small $40.00 reduction in national stage fees is criticized as too small and a token fee of $40-$50 is stated as being more reasonable.
Reply:
The fees are based on an adjustment of the U.S. filing fee based on estimated additional work or savings. However, in view of the comments, an additional basic nation fee level has been added as § 1.492(a)(4) for those situations where the Patent and Trademark Office has established an International Preliminary Examination Report which indicates that all the claims entering the national stage have satisfied the criteria of PCT Articles 31(1) to (4). Current studies of the benefit of having PCT search reports from the searching authorities indicate an improvement in quality but no overall reduction in search or examining time. The search report from other than international searching authorities, with rare exceptions, does not allow the USPTO examiner to eliminate any part of the national search.
Comment:
One comment argued that reciprocal treatment should be given to foreign applicants for benefits given U.S. applicants.
Reply:
Although the European Patent Office offers a 20% reduction of only the search fee portion of its national stage entry fees, the resulting fee of a little under $1000 at current exchange rates is still more than twice the amount of the highest U.S. national fee. In Japan the national fee for requesting examination is currently 26,000 yen (a little under $200 at current exchange rates) where the search report was not prepared by the Japanese Patent Office and 6,000 yen if the search report was prepared by the Japanese Patent Office.
Comment:
One comment urged that the U.S. rules match the less restrictive EPO rules with regard to the issuance of more than

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one written opinion and providing additional opportunity for the applicant to communicate with the examiner.

Reply:

The proposed rules (§ 1.484) have been modified to provide for a less restrictive interview practice. The examiner should permit interview(s) during the time limit for response to the written opinion where such interviews would be useful and time is available to permit issuance of the International Preliminary Examination Report prior to the deadline of 28 months after the priority date.

Although nothing in the rules limit the proceedings to one written opinion, most demands are expected to be filed near the end of the 19th month deadline. Preparation of the first written opinion may be delayed because the fees were not paid at the time of filing the Demand, formal errors are found in the documents or unity of invention is lacking. The time limits for a reply to the first written opinion will normally be set at 2 months, although 3 months may be given where the time limit for reply ends prior to 25 months from the priority date. Response by the 25th month will allow the examiner 2 months to prepare the International Preliminary Examination Report.

However, a Demand may be filed much earlier than 19 months from the priority date and International Preliminary Examination may begin early as provided for in PCT Rule 69.1(b). Where time and other circumstances permit, a second written opinion may be provided, possibly with a one month time limit for reply.

Comment:

One comment stated that proposed § 1.485(b) is a duplication of § 1.484(d).

Reply:

Proposed paragraph (b) has been deleted in final rule 1.485.

Comment:

One comment stated that procedures for the manner of issuing International Preliminary Examination Reports should be set forth in the U.S. rules.

Reply:

Items already specifically covered in the PCT articles and rules are not needed in U.S. rules. The agreement with WIPO also regulates these matters as do the PCT search and preliminary examination guidelines.

Comment:

One comment stated that the treatment of the International Preliminary Examination Report (IPER) by the USPTO at the national stage is not clear.

Reply:

The IPER will be considered along with other relevant information when conducting a national examination for patentability. PCT Article 33(1) indicates that the objective of the International Preliminary Examination Report is to formulate a preliminary and non-binding opinion; it is not binding on any office. Any new questions relating to patentability may be raised.

Comment:

One comment stated that a dual standard of unity defies logic.

Reply:

The dual standard is necessary since the fees for patent applications filed under 35 U.S.C. 111 were set based upon an application being limited to one invention as defined at the time the fees were set which differs from the interpretation of unity under PCT required in view of the Caterpillar decision.

Comment:

One comment stated that if additional PCT international search fees are required they should be made by statutory change.

Reply:

The Commissioner is authorized by statute (35 U.S.C. 376) to set the national fee for PCT origin applications. Any change in national restriction practice for applications filed under 35 U.S.C. 111 would be made only after statutory change.

Comment:

One comment indicated that in view of the Caterpillar decision holding the Office interpretation of "specifically designed" to be an unreasonable interpretation, the Office is proposing a double standard.

Reply:

U.S. national law under 35 U.S.C. 121 does not require a consideration or interpretation of "specifically designed" to be made. This must only be made in PCT cases and those entering the national stage under 35 U.S.C. 371.

Discussion of Specific Rules

Section 1.8 is amended to indicate clearly that the certificate of mailing procedures thereunder may not be used for the filing of papers and fees relating to international applications. It should be noted that the provisions of § 1.10 regarding the filing of papers or fees by "Express Mail" apply to all papers and fees to be filed in the Patent and Trademark Office, including those relating to international applications.

Section 1.61 "Filing of applications in the United States of America as a Designated Office" is removed and the substance thereof moved to new § 1.494. Section 1.70 "Oath or declaration under 35 U.S.C. 371(c)(4)" is removed and the substance thereof moved to new § 1.497. These moves result in the rules relating to the international applications entering the national stage being located in a single area of the rules.

Section 1.101 is amended to remove the discussion of the order of examination for international applications entering the national stage, which is covered by new § 1.496.

Section 1.141 is amended to basically return the rule to its wording prior to the 1978 rule change implementing the Patent Cooperation Treaty and will be directed solely to national applications. This will avoid confusion with PCT Rule 13.2 which was interpreted by the court in *Caterpillar Tractor Co. v. Commissioner of Patents and Trademarks*, supra, to have a different meaning than intended in present § 1.141. It does, however, retain for applicants the ability to claim a "reasonable number" of species rather than only 5, which limit existed prior to the 1978 rule change. Paragraph (b) continues the practice stated in the *Official Gazette* notice of Aug. 1, 1984 published at 1046 O.G. 2. Unity of invention in international applications before the USPTO as an International Searching Authority under Chapter I of the Patent Cooperation Treaty is covered by § 1.475. Unity of Invention before the USPTO as an International Preliminary Examining Authority under Chapter II of the Patent Cooperation Treaty is covered by § 1.487. Unity of invention in international applications entering the national stage under 35 U.S.C. 371 is covered by § 1.499.

Section 1.401 is amended to include the definition of some terms used for Chapter II of the Patent Cooperation Treaty.

Section s1.414 is amended to include reference to the United States Patent and Trademark Office functioning as an Elected Office under Chapter II of the Patent Cooperation Treaty as well as a Designated Office under Chapter I.

Section 1.416 is added to indicate and describe the functioning of the United States Patent and Trademark Office as an International Preliminary Examining Authority under Chapter II of the Patent Cooperation Treaty.

Section 1.431 and 1.432 are amended, in accordance with PCT Rule 15.4(b)(ii) and amended 35 U.S.C. 361, to indicate that the time limit for payment of the designation fee is one year from the priority date or one month from the date of receipt of the international application if that one month time limit expires after the expiration of one year from the priority date.

Section 1.445 is amended to increase the amount of the international search fees to provide for recovery of the average additional cost of processing applications with claims to more inventions than were permitted under the unity of invention criteria used when the previous international search fee amounts were established. The amounts for national stage fees are removed from § 1.445 and are now set forth in § 1.492.

The international search fee and national fees were previously established based on the effort and cost to the Office of searching and examining a single invention as defined by the United States Patent and Trademark Office prior to the decision in the Caterpillar case. Since additional effort will be required to search and examine an average application under the new rules defining unity of invention, the average international search and national fee must also be increased to cover the additional cost to the Office.

Section 1.475 "Changes in person, name, or address of applicants," is redesignated as § 1.472 to allow the grouping of rules into PCT Chapter I, PCT Chapter II and national stage related rules. No change other than redesignation is made.

A new § 1.475 is added to relate to unity of invention before the International Searching Authority. Paragraph (a) clearly indicates that PCT Rule 13 is to be followed in all such cases and paragraph (b) adds combinations acceptable under unity of invention in addition to those set forth in PCT Rule 13.2. Paragraph (c) relates to the handling of claims to categories in addition to the combinations specified in paragraph (b). Paragraph (d) relates to situations in which more than one invention of the same category of invention is recited in an international application. Paragraph (e) makes clear that inventions of different categories must be related, rather than independent, for unity of invention to exist. Paragraph (f) sets forth PCT Rule 13 for the convenience of patent applicants.

Section 1.481, regarding determination of unity of invention before the International Searching Authority, is redesignated as § 1.476 and amended to delete reference to § 1.141 from paragraph (a).

Section 1.482 is redesignated as § 1.477 and amended to make clear in the title that it deals with protests to findings of lack of unity of invention before the International Searching Authority. The amendment to paragraph (b) corrects an error in referring to another paragraph of the section.

A new § 1.480 is added to deal with the Demand for an international preliminary examination. Paragraph (a) indicates that a Demand is required to be filed to obtain an international preliminary examination and that the preliminary examination fee of § 1.482(a)(1) and the handling fee of § 1.482(b) are due at the time of filing of the Demand. If the fees are not paid at the time of filing of the Demand, the United States Patent and Trademark Office acting as an International Preliminary Examining Authority will provide an opportunity to pay the fees in accordance with PCT Rules 57.4 and 58.2.

Paragraph (b) of § 1.480 specifies that the Demand must be made on a standardized form as required by PCT Rule 53.1 and that such forms are available from the United States Patent and Trademark Office.

Paragraph (c) of § 1.480 specifies that, if the Demand is made prior to the expiration of the 19th month from the priority date, the provisions of PCT Article 39 and § 1.495 shall apply to allow entry into the national stage prior to the expiration of 30 months after the priority date. The final rule has been changed to add reference to the election of the United States. If the Demand is not filed prior to the expiration of the 19th month from the priority date, the provisions of PCT Article 22 and § 1.494 shall apply to allow entry into the national stage prior to the expiration of 20 months after the priority date.

Paragraph (d) of § 1.480 indicates that withdrawal of a proper Demand will not entitle applicant to a refund of the preliminary examination fee even if no claims are found that can or will be searched (PCT Article 34(4)(a)). A Demand that is so informal that it would be considered under the PCT Rules as if it had not been submitted will not be considered a proper Demand under the rule. A change in purpose after the filing of a Demand will not entitle an applicant to a refund of the preliminary examination fee. PCT Rule 57.6 states that in no case shall the handling fee, or any supplement to the handling fee, be refunded.

A new § 1.482 is added to specify the international preliminary examination fees. Paragraph (a) sets a lower fee for the international preliminary examination where an international search fee has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority. Paragraph (a) also sets a lower additional preliminary examination fee for the preliminary examination of additional inventions found in the international application where a supplemental search fee has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority. Paragraph (b) indicates that the handling fee is prescribed in PCT Rule 57 and any necessary supplement to the handling fee shall be paid directly to the International Bureau in accordance with PCT Rule 57.1(b).

A new § 1.484 is added to describe the conduct of international preliminary examination. The rule describes that, if necessary, a written opinion will be established after consideration of any defects in accordance with PCT Rule 66.2 and after an examination to determine if the claimed invention has novelty, involves an inventive step (is non-obvious) and is industrially applicable. A written opinion prior to the international preliminary examination report would not be necessary if the international application does not contain any defects as mentioned in PCT Rule 66.2 and if all claims are found to be novel, involve an inventive step (non-obvious) and are industrially applicable. The written opinion will set a time limit for applicant to respond in accordance with PCT Rule 66.2(d). The time limit for reply will normally be two months but will be three months where the time limit will expire prior to 25 months from the priority date. The time limit may not be extended due to the tight time constraints under Chapter II of the Patent Cooperation Treaty. An international preliminary examination report will be established and one copy will be submitted to the International Bureau and one copy to applicant. The rule specifies that no international preliminary examination report will be established prior to issuance of an international search report and that no international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority. Paragraph (f) specifies that at least one personal or telephone interview with the examiner will be permitted during the international preliminary examination. Additional interviews are permissible if the examiner determines that it would be helpful. Additional interviews will be governed, in part, by the time remaining before the time for issuance of the international preliminary examination report. The period during which the interview(s) can be held is limited by the non-extendable time limit for response by the applicant to a written opinion. Although nothing in this or any other rule limits the number of written opinions which may be established prior to the International Preliminary Examination Report, in most cases time will limit the number of written opinions to one.

A new § 1.485 is added to deal with amendments by applicant during international preliminary examination. An applicant is permitted by the rule to make amendments at the time of filing of the Demand and within the period set in any written opinion on the application as defined in § 1.484. Amendments under the rule would be required to be made by submitting replacement sheets and a description of how the replacement sheet differs from the replaced sheet. If an amendment cancels an entire sheet, that amendment should be communicated by letter without a replacement sheet. Proposed paragraph (b) is not promulgated because the substance thereof is set forth in § 1.484(d).

New § 1.487 defines what constitutes unity of invention before the International Preliminary Examining Authority. The standards for unity of invention generally parallel those set in § 1.475 regarding proceedings before the International Searching Authority.

New § 1.488 is added to set forth how the International Preliminary Examining Authority will proceed in handling determinations regarding the unity of invention criteria of § 1.487.

New § 1.489 sets forth the procedures to be followed by an applicant who wishes to protest a holding of lack of unity of invention by the International Preliminary Examining Authority. The additional fees would be required to be paid if more than one invention is to be examined, but could be accompanied by a request for refund and a statement setting forth reasons for disagreement with the holding of lack of unity of invention or why the required additional fees are excessive. This rule is in accordance with PCT Rule 68.3(c).

New § 1.491 is added to define the start of the national stage. Section 1.491 is the first rule in a new group of rules relating to applications entering the national stage pursuant to 35 U.S.C. 371.

New § 1.492 is added to set forth the fees and charges for international applications entering the national stage under 35 U.S.C. 371. The basic national fee is set forth in paragraph (a) at four levels to reflect the benefit that the United States Patent and Trademark Office will derive from having previously conducted an international preliminary examination or an international search. In § 1.492(a)(2) and (3), "(i)" has been deleted in order to refer to both § 1.445(a)(2)(i) and (ii). Paragraph (a)(4) which makes reference to § 1.496(b) has been added in view of comments received that indicated that in some instances substantial reliance may be placed upon the International Preliminary Examination Reports by the Patent and Trademark Office. The rule also sets the fee for an independent claim in excess of 3 (paragraph (b)), for presentation of each claim in excess of 20 (paragraph (c)) and for an application containing a multiple dependent claims (paragraph (d)). Paragraphs (e) and (f) include the fees previously contained in § 1.445 and include the alternative times for entering the national stage pursuant to § 1.494 or § 1.495.

New § 1.494 is added to contain substantially the provisions of former § 1.61 in amended form. This section relating to filing application documents in the United States Patent and Trade-

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mark Office to enter the national stage has been grouped with other sections relating to the nation stage for the convenience of applicants and examiners involved in the prosecution of international applications entering the national stage. The rule applies where no Demand for international preliminary examination has been filed prior to the expiration of the 19th month from the priority date. If such a Demand were filed, § 1.495 would apply.

Section 1.494(f) requires that a specific indication be given by the applicant when entering the national stage that the documents being submitted are being submitted under 35 U.S.C. 371. If no clear indication is found, the documents will be considered to be for a regular national application under 35 U.S.C. 111. Paragraph (g) makes clear that the various time limits set out in the rule, some of which are set by the PCT, may not be extended pursuant to § 1.136 or otherwise. The extension of time provisions, including petition and payment of a fee, set out in § 1.136(a) do not apply to the time limits of the rule or time limits set by the International Searching Authority or the International Preliminary Examining Authority. New paragraph (h) clarifies when an international application designating the United States becomes abandoned as to the United States.

New § 1.495 is added to deal with filing application documents in the United States Patent and Trademark Office to enter the national stage where a Demand for international preliminary examination has been filed with an International Preliminary Examining Authority prior to the expiration of the 19th month from the priority date. In such a case, an applicant will have 30 months from the priority date to enter the national stage. The rule parallels in many respects § 1.494. New paragraph (i) clarifies when an international application electing the United States becomes abandoned as to the United States.

New § 1.496 is added to specify in paragraph (a) that international applications in the national stage will be taken up for action based on the date when the requirements of 35 U.S.C. 371(c) are met. Paragraph (b) indicates that applications entering the U.S. national stage only with claims which have been found in an International Preliminary Examination Report to have satisfied the criteria for novelty, inventive step (non-obviousness) and industrial applicability as defined in PCT Article 33(1) to (4) will be taken up for action before other applications. Preliminary amendments may accompany the filing of the national stage application to cancel claims which do not satisfy the criteria. These applications will have paid the lower filing fee set in § 1.492(a)(4) and most will not require extensive prosecution, i.e., objection or rejection before resolving the issue of patentability. Amendments will not be permitted to be made in such applications other than in response to objections as to form or to cancel claims in response to a rejection made by the examiner in the national stage application. Such a rejection could be necessary, for example, where applicant submits information in accordance with the duty of disclosure under 37 CFR 1.56(a).

New § 1.497 is added to contain substantially the wording of removed § 1.70. This rule relates to the oath or declaration required to enter the national stage and is grouped with other national stage entry requirements.

New § 1.499 is added to cover unity of invention during the national stage. The provisions of the section are basically parallel to those of §§ 1.475 and 1.487. Paragraph (f) indicates the manner of handling a finding of lack of unity of invention on grounds other than those involving different categories of invention.

Environmental, Energy, and Other Considerations

The rule change does not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because considerable savings can potentially be achieved under Chapter II of the Patent Cooperation Treaty because additional time is provided for applicants to decide whether to proceed with the cost of foreign prosecution and savings will in fact be achieved under the unity of invention practice and the provision for reduced fees for small entities entering the national stage in making an application for a United States patent.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirement contained in these rules was submitted to the Office of Management and Budget (OMB) at the time of the proposed rulemaking for review under Section 3504(h) of the Paperwork Reduction Act. OMB has approved the information collection requirement and has assigned OMB control number 0651-0021 thereto.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by a 35 U.S.C. 6 and 376(b) and Pub. L. 99-616, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.8 is amended by revising paragraph (a)(2)(xi) to read as follows:

§ 1.8 Certificate of mailing.

(a) * * *
(2) * * *
(xi) The filing of international applications for patent and all papers and fees relating thereto.

* * * * *

§ 1.61 [Removed]

3. Section 1.61 is removed.

§ 1.70 [Removed]

4. Section 1.70 is removed.

5. Section 1.101 is amended by revising paragraph (a) to read as follows:

§ 1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to § 1.102. See § 1.496 for order of examination of international applications in the national stage.

* * * * *

6. Section 1.141 is revised to read as follows:

§ 1.141 Different inventions in one national application.

(a) Two or more independent and distinct inventions may not be claimed in one national application, except that more than one species of an invention, not to exceed a reasonable number, may be specifically claimed in different claims in one national application, provided the application also includes an allowable claim generic to all the claimed species and all the claims to species in excess of one are written in dependent form (§ 1.75) or otherwise include all the limitations of the generic claim.

(b) Where claims to all three categories, product, process of making, and process of use, are included in a national application, a three way requirement for restriction can only be made where the process of making is distinct from the product. If the process of making and the product are not distinct, the process of using may be joined with the claims directed to the product and the process of making the product even though a showing of distinctness between the product and process of using the product can be made.

Subpart C—International Processing Provisions

7. The authority for Subpart C is revised to read as follows:

Authority: Pub. L. 94-131, 89 Stat. 685; Pub. L. 99-616, 35 U.S.C 351 through 376.

8. Section 1.401 is amended to redesignate paragraph (g) as paragraph (i) and add new paragraphs (g) and (h) as follows:

§ 1.401 Definitions of terms under the Patent Cooperation Treaty

* * * * *

(g) "Demand'," when capitalized, means that document filed with the International Preliminary Examining Authority which requests an international preliminary examination.

(h) "Annexes" means amendments made to the claims, description or the drawings before the International Preliminary Examining Authority.

* * * * *

9. Section 1.414 is revised to read as follows:

§ 1.414 The United States Patent and Trademark Office as a Designated Office or Elected Office.

(a) The United States Patent and Trademark Office will act as a Designated Office or Elected Office for international applications in which the United States of America has been designated or elected as a State in which patent protection is desired.

(b) The United States Patent and Trademark Office, when acting as a Designated Office or Elected Office during international processing will be identified by the full title "United States Designated Office" or by the abbreviation "DO/US" or by the full title "United States Elected Office" or by the abbreviation "EO/US".

(c) The major functions of the United States Designated Office or Elected Office in respect to international applications in which the United States of America has been designated or elected, include:

(1) Receiving various notification throughout the international stage and
(2) Accepting for national stage examination international applications which satisfy the requirements of 35 U.S.C. 371.

10. Under "General Information," a new § 1.416 is added to read as follows:

§ 1.416 The United States International Preliminary Examining Authority.

(a) Pursuant to appointment by the Assembly, the United States Patent and Trademark Office will act as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office and in other Receiving Offices as may be agreed upon by the Commissioner, in accordance with agreement between the Patent and Trademark Office and the International Bureau.

(b) The United States Patent and Trademark Office, when acting as an International Preliminary Examining Authority, will be identified by the full title "United States International Preliminary Examining Authority" or by the abbreviation, "IPEA/US."

(c) The major functions of the International Preliminary Examining Authority include:

(1) Receiving and checking for defects in the Demand;
(2) Collecting the handling fee for the International Bureau and the preliminary examination fee for the United States International Preliminary Examining Authority;
(3) Informing applicant of receipt of the Demand;
(4) Considering the matter of unity of invention;
(5) Providing an international preliminary examination report which is a non-binding opinion on the questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), and to be industrially applicable; and
(6) Transmitting the international preliminary examination report to applicant and the International Bureau.

11. Section 1.431 is amended by revising paragraph (d)(2) to read as follows:

§ 1.431 International application requirements.

* * * * *

(d) * * *

(2) The designation fee, or the amount necessary to cover all the designations made in the request if not paid by the applicant within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date.

* * * * *

12. Section 1.432 is amended by revising paragraph (b) to read as follows:

§ 1.432 Designation of States and payment of designation fees.

* * * * *

(b) The designation fees may be paid upon filing of the international application, but must be paid before the expiration of one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date. Failure to timely pay the designation fee for a particular Designated State will result in the withdrawal of that designation. Failure to timely pay at least one designation fee will result in the withdrawal of the international application.

13. Section 1.445 is amended by revising the title and paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14), $170.00.
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:
(i) No corresponding prior United States national application with basic filing fee has been filed, $520.00.

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(ii) A corresponding prior United States national application with basic filing fee has been filed, $350.00.
(3) A supplemental search fee when required, per additional invention, $140.00.

§ 1.475 [Redesignated as § 1.472]

14. Section 1.475 is redesignated as § 1.472.

15. A new § 1.475 is added following the heading, "Unity of Invention," to read as follows:

§ 1.475 Unity of invention before the International Searching Authority.

(a) An international application before the International Searching Authority will be considered to have unity of invention if the claims are in accordance with PCT Rule 13 (see paragraph (f) of this section).

(b) An international application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the combinations of categories as set forth in PCT Rule 13.2 (see paragraph (f) of this section) or to the combination of—

(1) A product and a process for the manufacture of said product, or

(2) A product and a process of use of said product.

If an application contains claims to more or less than one of the combinations of categories set forth in PCT Rule 13.2 (see paragraph (f) of this section) or a combination set forth in paragraphs (b)(1) or (2) of this section, unity of invention may not be present.

(c) If an international application contains claims to a category of invention in addition to those categories included in any one of the combinations specified in paragraph (b) of this section, lack of unity of invention may be held between the categories included in the combination and the claims to the additional category of invention.

(d) Unity of invention will exist where the claims are limited to one of the combinations of categories set forth in PCT Rule 13.2 (see paragraph (f) of this section) or in a combination set forth in paragraphs (b)(1) or (2) of this section. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the inventions to be searched. Any such holding by the examiner will be made of record as a holding of lack of unity of invention.

(e) The inventions recited by the claims of different categories must be related rather than independent inventions.

(f) The wording of PCT Rule 13 is as follows:

PCT Rule 13—Unity of Invention

13.1 Requirement

The international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept "requirement of unity of invention").

13.2 Claims of Different Categories

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

13.3 Claims of One and the Same Category

Subject to Rule 13.1, it shall be permitted to include in the same international application two or more independent claims of the same category (i.e., product, process, apparatus, or use) which cannot readily be covered by a single generic claim.

13.4 Dependent Claims

Subject to Rule 13.1, it shall be permitted to include in the same international application a reasonable number of dependent claims, claiming specific forms of the invention claimed in an independent claim, even where the features of any dependent claim could be considered as constituting in themselves an invention.

13.5 Utility Models

Any designated State in which the grant of a utility model is sought on the basis of an international application may, instead of Rules 13.1 to 13.4, apply in respect of the matters regulated in those Rules the provisions of its national law concerning utility models once the processing of the international application has started in that State, provided that the applicant shall be allowed at least two months from the expiration of the time limit applicable under Article 22 to adapt his application to the requirements of the said provisions of the national law.

16. Section 1.481 is redesignated as § 1.476 and is amended by revising paragraph (a) to read as follows:

§ 1.476 Determination of unity of invention before the International Searching Authority.

(a) Before establishing the international search report, the International Searching Authority will determine whether the international application complies with the requirement of unity of invention as set forth in PCT Rule 13 (see § 1.475(f)) and § 1.475.

* * * * *

17. Section 1.482 is redesignated as § 1.477 and is amended by revising the title and paragraph (b) to read as follows:

§ 1.477 Protest to lack of unity of invention before the International Searching Authority.

* * * * *

(b) Protest under paragraph (a) of this section will be examined by the Commissioner or the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

* * * * *

18. A new Section 1.480 is added preceded by a heading to read as follows:

International Preliminary Examination

§ 1.480 Demand for international preliminary examination.

(a) On the filing of a Demand and payment of the fees for international preliminary examination (§ 1.482), the international application shall be the subject of an international preliminary examination. The preliminary examination fee (§ 1.482(a)(1)) and the handling fee (§ 1.482(b)) shall be due at the time of filing of the Demand.

(b) The Demand shall be made on a standardized printed form. Copies of the printed Demand forms are available from the Patent and Trademark Office. Letters requesting printed forms should be marked "Box PCT".

(c) If the Demand is made prior to the expiration of the 19th month from the priority date and the United States of America is elected, the provisions of § 1.495 shall apply rather than § 1.494.

(d) Withdrawal of a proper Demand will not entitle applicant to a refund of the preliminary examination fee or handling fee.

19. A new Section 1.482 is added to read as follows:

§ 1.482 International preliminary examination fees.

(a) The following fees and charges for international preliminary examination are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of, $370.00.

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of, $570.00.

(2) An additional preliminary examination fee when required, per additional invention:

(i) Where a supplemental search fee as set forth in § 1.445(a)(3) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, $125.00.

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, $190.00.

(b) The handling fee is due on filing the Demand. Any necessary supplement to the handling fee shall be paid directly to the International Bureau.

(35 U.S.C. 6, 376)

20. A new § 1.484 is added to read as follows:

§ 1.484 Conduct of international preliminary examination.

(a) An international preliminary examination will be conducted to formulate a non-binding opinion as to whether the claimed invention has novelty, involves an inventive step (is non-obvious) and is industrially applicable.

(b) No international preliminary examination report will be established prior to issuance of an international search report.

(c) No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority.

(d) The International Preliminary Examining Authority will establish a written opinion if any defect exists or if the claimed invention lacks novelty, inventive step or industrial applicability and will set a non-extendable time limit in the written opinion for the applicant to respond.

(e) If no written opinion under paragraph (d) of this section is necessary, or after any written opinion and the response thereto or the expiration of the time limit for response to such written opinion, an international preliminary examination report will be established by the International Preliminary Examining Authority. One copy will be submitted to the International Bureau and one copy will be submitted to the applicant.

(f) An applicant will be permitted a personal or telephone interview with the examiner, which must be conducted during the non-extendable time limit for response by the applicant to a written opinion. Additional interviews may be conducted where the examiner determines that such additional interviews may be helpful to advancing the international preliminary examination procedure. A summary of any such personal or telephone interview must be filed by the applicant as a part of the response to the written opinion or, if applicant files no response, be made of record in the file by the examiner.

21. A new § 1.485 is added to read as follows:

§ 1.485 Amendments by applicant during international preliminary examination.

The applicant may make amendments at the time of filing of the Demand and within the time limit set by the International Preliminary Examining Authority for response to any written opinion. Any such amendments must—

(1) Be made by submitting a replacement sheet for every sheet of the application which differs from the sheet it replaces unless an entire sheet is cancelled and

(2) Include a description of how the replacement sheet differs from the replaced sheet.

If an amendment cancels an entire sheet of the international application, that amendment shall be communicated in a letter.

22. A new § 1.487 is added to read as follows:

§ 1.487 Unity of invention before the International Preliminary Examining Authority.

(a) An international application before the International Preliminary Examining Authority will be considered to have unity of invention if the claims are in accordance with PCT Rule 13 (see § 1.475(f)).

(b) An international application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the combinations of categories as set forth in PCT Rule 13.2 (see § 1.475(f)) or to the combination of—

(1) A product and a process for the manufacture of said product or

(2) A product and a process of use of said product.

If an application contains claims to more or less than one of the combinations of categories of invention set forth in PCT Rule 13.2 (see § 1.475(f)) or a combination set forth in paragraphs (b)(1) or (2) of this section, unity of invention may not be present.

(c) If an international application contains claims to a category of invention in addition to those categories included in any one of the combinations specified in paragraph (b) of this section, lack of unity of invention may be held between the categories included in the combination and the claims to the additional category of invention.

(d) Unity of invention will exist where the claims are limited to one of the combinations of categories set forth in PCT Rule 13.2 (see § 1.475(f)) or a combination set forth in paragraphs (b)(1) or (2) of this section. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the inventions to be examined. Any such holding by the examiner will be made of record as a holding of lack of unity of invention.

(e) The inventions recited by the claims of different categories must be related rather than independent inventions.

23. A new § 1.488 is added to read as follows:

§ 1.488 Determination of unity of invention before the International Preliminary Examining Authority.

(a) Before establishing any written opinion or the international preliminary examination report, the International Preliminary Examining Authority will determine whether the international application complies with the requirement of unity of invention as set forth in § 1.487.

(b) If the International Preliminary Examining Authority considers that the international application does not comply with the requirement of unity of invention, it may:

(1) Issue a written opinion and/or an international preliminary examination report, in respect of the entire international application and indicate that unity of invention is lacking and specify the reasons therefor without extending an invitation to restrict or pay additional fees. No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority.

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(2) Invite the applicant to restrict the claims or pay additional fees, pointing out the categories of invention found, within a set time limit which will not be extended. No international preliminary examination will be conducted on inventions not previously searched by an International Searching Authority, or

(3) If applicant fails to restrict the claims or pay additional fees within the time limit set for response, the International Preliminary Examining Authority will issue a written opinion and/or establish an international preliminary examination report on the main invention and shall indicate the relevant facts in the said report. In case of any doubt as to which invention is the main invention, the invention first mentioned in the claims and previously searched by an International Searching Authority shall be considered the main invention.

(c) Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Preliminary Examining Authority may raise the objection of lack of unity of invention.

24. A new § 1.489 is added to read as follows:

§ 1.489 Protest to lack of unity of invention before the International Preliminary Examining Authority.

(a) If the applicant disagrees with the holding of lack of unity of invention by the International Preliminary Examining Authority, additional fees may be paid under protest, accompanied by a request for refund and a statement setting forth reasons for disagreement or why the required additional fees are considered excessive, or both.

(b) Protest under paragraph (a) of this section will be examined by the Commissioner of the Commissioner's designee. In the event that the applicant's protest is determined to be justified, the additional fees or a portion thereof will be refunded.

(c) An applicant who desires that a copy of the protest and the decision thereon accompany the international preliminary examination report when forwarded to the Elected Offices, may notify the International Preliminary Examining Authority to that effect any time prior to the issuance of the international preliminary examination report. Thereafter, such notification should be directed to the International Bureau.

25. A new § 1.491 is added preceded by a new heading to read as follows:

National Stage

§ 1.491 Entry into the national stage.

An international application enters the national stage when the applicant has filed the documents and fees required by 35 U.S.C. 371(c) within the periods set forth in § 1.494 or § 1.495.

26. A new § 1.492 is added to read as follows:

§ 1.492 National stage fees.

The following fees and charges for international applications entering the national stage under 35 U.S.C. 371 are established by the Commissioner under 35 U.S.C. 376:

(a) The basic national fee;

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) $150
By other than a small entity $300

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By small entity (§ 1.9(f)) $170
By other than small entity $340

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) $225
By other than a small entity $45

(4) Where the international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Ofice and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)) $25
By other than a small entity $50

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) $17
By other than a small entity $34

(c) In addition to the basic national fee, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§ 1.9(f)) $6
By other than a small entity $12

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) $55
By other than a small entity $110

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic national fee or oath or declaration later than 20 months from the priority date pursuant to § 1.494(c) or later than 30 months from the priority date pursuant to § 1.495(c):

By a small entity (§ 1.9(f)) $55
By other than a small entity $110

(f) For filing an English translation of an international application later than 20 months after the priority date § 1.494(c)) or for filing an English translation of the international application or of any annexes to the international preliminary examination report later than 30 months after the priority date § 1.495(c) and (e)), $26.00.

(35 U.S.C. 6, 376)

27. A new § 1.494 is added to read as follows:

§ 1.494 Entering the national stage in the United States of America as a Designated Office.

(a) Where no Demand has been filed with an appropriate International Preliminary Examining Authority by the expiration of 19 months from the priority date (see § 1.495), the applicant must fulfill the requirements of PCT Article 22 and 35 U.S.C. 371 within the time periods set forth in paragraphs (b) or (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) The applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date

(1) A copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office;

(2) A translation of the international application into the English language, if it was originally filed in another language;

(3) The basic national fee (see § 1.492(a)); and

(4) An oath or declaration of the inventor (see § 1.497).

(c) The applicant may furnish any required English translation of the international application, the basic national fee and the oath or declaration of the inventor after 20 months but not later than the expiration of 22 months from the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the basic national fee or the oath or declaration of the inventor later than the expiration of 20 months after the priority date.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 20 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 20 months from the priority date will be considered to be cancelled.

(e) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

(f) The documents and fees submitted under paragraphs (b) and (c) of this section must be clearly identified as a submission to enter the national stage under 35 U.S.C. 371, otherwise the submission will be considered as being made under 35 U.S.C. 111.

(g) The time limits set out in paragraphs (b), (c) and (d) of this section may not be extended pursuant to § 1.136 or otherwise.

(h) An international application becomes abandoned as to the United States 20 months from the priority date if a copy of the international application is not communicated to the Patent and Trademark Office prior to 20 months from the priority date where the United States has been designated but not elected prior to 19 months from the priority date. If a copy of the international application is communicated within 20 months to the Patent and Trademark Office, an international application will become abandoned as to the United States 22 months from the priority date if the required English translation(s), fees and oath or declaration under 35 U.S.C. 371(c) are not filed within 22 months from the priority date.

28. A new § 1.495 is added to read as follows:

§ 1.495 Entering the national stage in the United States of America as an Elected Office.

(a) Where a Demand has been filed with an appropriate International Preliminary Examining Authority and not withdrawn by the expiration of 19 months from the priority date, the applicant must fulfill the requirements of 35 U.S.C. 371 within the time periods set forth in paragraph (b) or (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) The applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date

(1) A copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office;

(2) A translation of the international application into the English language, if it was originally filed in another language;

(3) The basic national fee (see § 1.492(a)); and

(4) An oath or declaration of the inventor (see § 1.497).

(c) The applicant may furnish any required English translation of the international application, the basic national fee and the oath or declaration of the inventor after 30 months but not later than the expiration of 32 months from the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the basic national fee or the oath or declaration of the inventor later than the expiration of 30 months after the priority date.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 30 months from the priority date will be considered to be cancelled.

(e) A translation into English of any annexes to the international preliminary examination report, if the annexes were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Translations of the annexes which are not received by the expiration of 30 months from the priority date may be submitted within 32 months from the priority date accompanied by the processing fee set forth in § 1.492(f). Translations of the annexes which are not timely received will be considered to be cancelled.

(f) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

(g) The documents submitted under paragraphs (b) and (c) of this section must be clearly identified as a submission to enter the national stage under 35 U.S.C. 371, otherwise the submission will be considered as being made under 35 U.S.C. 111.

(h) The time limits set out in paragraphs (b), (c), (d) and (e) of this section may not be extended pursuant to § 1.136 or otherwise.

(i) An international application becomes abandoned as to the United States 30 months from the priority date if a copy of the international application is not communicated to the Patent and Trademark Office prior to 30 months from the priority date and a Demand for International Preliminary Examination which elected the United States of America has been filed prior to the expiration of 19 months from the priority date. If a copy of the international application is communicated within 30 months to the Patent and Trademark Office, an international application will become abandoned as to the United States 32 months from the priority date if the required English translation(s), fees and oath or declaration under 35 U.S.C. 371(c) are not filed within 32 months from the priority date.

29. A new § 1.496 is added to read as follows:

§ 1.496 Examination of international applications in the national stage.

(a) International applications which have complied with the requirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless an express request for early processing has been filed under 35 U.S.C. 371(f), no action may be taken prior to one month after entry into the national stage.

(b) A national stage application filed under 35 U.S.C. 371 may have paid therein the basic national fee as set forth in § 1.492(a)(4) if it contains, or is amended to contain, at the time of entry into the national stage, only claims which have been indicated in an international preliminary examination report prepared by the United States Patent and Trademark Office as satisfying the criteria of PCT Article 33(1)-(4) as to novelty,

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inventive step and industrial applicability. Such national stage applications in which the basic national fee as set forth in § 1.492(a)(4) has been paid may be amended subsequent to the date of entry into the national stage only to the extent necessary to eliminate objections as to form or to cancel rejected claims. Such national stage applications in which the basic national fee as set forth in § 1.492(a)(4) has been paid will be taken up out of order.

30. A new § 1.497 is added to read as follows:

§ 1.497 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application, if the inventor, desires to enter the national stage under 35 U.S.C. 371 pursuant to § 1.494 or § 1.495, he or she must file an oath or declaration in accordance with § 1.63.

(b) If the international application was made as provided in § 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by § 1.63 to state.

31. A new § 1.499 is added to read as follows:

§ 1.499 Unity of invention during the national stage.

(a) An international application which has entered the national stage by meeting the requirements of 35 U.S.C. 371 will be considered to have unity of invention if the claims are in accordance with PCT Rule 13 (see § 1.475 (f)).

(b) An application in the national stage containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the combinations of categories as set forth in PCT Rule 13.2 (see § 1.475(f)) or to the combination of—

(1) A product and a process for the manufacture of said product or 31

(2) A product and a process of use of said product.

If an application contains claims to more or less than one of the combinations of categories of invention set forth in PCT Rule 13.2 (see § 1.475(f)) or a combination set forth in paragraphs (b)(1) and (2) of this section, unity of invention may not be present.

(c) If an application in the national stage contains claims to a category of invention in addition to those categories included in any one of the combinations specified in paragraph (b) of this section, lack of unity of invention may be held between the categories included in the combination and the claims to the additional category of invention.

(d) Unity of invention will exist in an application in the national stage where the claims are limited to one of the combinations of categories set forth in PCT Rule 13.2 (see § 1.475(f)) or a combination set forth in paragraph (b)(1) or (2) of this section. If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the elected invention to be examined. Any such holding of an election by the examiner will be made in the form of a restriction requirement which confirms the election made by the presentation of the claims. Such a restriction requirement would be made on the basis of whether the inventions are independent and distinct. Applicant has the right to traverse such a restriction requirement in the response to the Office action in which the election is indicated.

(e) The inventions recited by the claims of different categories must be related rather than independent inventions.

(f) If the examiner finds that a national stage application lacks unity of invention, the examiner may in an Office action require the applicant in the response to the Office action to elect the invention to which the claims shall be restricted, this official action being called a requirement for restriction. Such requirement may be made before any action on the merits but may be made at any time before the final action at the discretion of the examiner. Review of any such requirement is provided under §§ 1.143 and 1.144.

DONALD J. QUIGG,
Apr. 28, 1987 *Assistant Secretary and Commissioner of Patents and Trademarks*

[FR Doc. 87-11977 Filed 5-27-87; 8:45 am]
BILLING CODE 3510-16-M

[1079 OG 32]

(99) Revised Procedures for Recording Searches and Considerations of Certain Prior Art

In order to provide a more complete, accurate and uniform record of what has been searched and considered by the examiner for each application the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO 892, "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. *A complete search of a subclass*, including all United States and foreign patent documents and other publications placed therein. The complete classification (class and subclass) will be recorded.
2. *A limited search of a subclass*, for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B, 4 below.)
   The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.
3. *An update of a search previously made.*
   This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.
   When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. _____)" will be recorded. If the parent has been patented, the patent number "Pat. N. _____ " instead of serial number in the above phrase will be recorded.
4. *A mechanized search* of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

Mechanized Search Systems

Termatrex Systems:

Automatic Fuel Controls
Boots & Shoes
Chemical Testing
Combined Fasteners
Electrical Contact Materials
Surface Bonding Using Critical Metal

Edge-Notched Card System:

Fluid Devices

Punch Card Systems:

Electrolysis
Organometallics
Steroids

Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors
Digital Data Processing Systems
Special Purpose Digital Processing Systems

When a search with a Termatrex or Edge-Notched card system is conducted, the examiner will complete form PTO 1041 in two copies, recording all queries searched, even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

B. "SEARCH NOTES" Box Entries

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialled:

1. *A cursory search*, or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant. The classification will be recorded, followed by "(Cursory)."
2. *A consultation* with other examiners to determine if relevant search fields exist in their areas of expertise. The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.
3. A search of a publication not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:

   a. *Abstracting publications*, such as Chemical Abstracts or the Engineering Index the name of the publication, the list of terms consulted in the index and the period covered will be recorded.
   b. *Periodicals*—The title and period or volumes covered, as appropriate will be recorded.
   c. *Books*—The title and author, edition or date, as appropriate, will be recorded.
   d. *Other types of literature* not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.).
      Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.
   e. *Computer search in Scientific Library*—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.
      There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service. These search systems include many data bases.
      A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.
      The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note of "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.

4. A search of only the *publications in a subclass*. The class and subclass followed by "(publications only)" will be recorded.
5. *A review of art cited in a parent application* or in an original patent, as required for all continuing and reissue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention. The serial number of a parent application that is still Pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted. The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

C. Not Recorded

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below:

1. *Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.*
   In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.
2. *Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.*
   In each instance where an examiner considers, but does not cite on form PTO-892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGTMEYER,
Feb. 22, 1977. *Assistant Commissioner for Patents.*

[956 O.G. 1546]

(100) Prior Art Cited by Applicants

Effective immediately, applicants are encouraged to use new form PTO-1449, "List of Prior Art Cited by Applicant," when preparing a prior art statement under 37 CFR 1.97-1.99. A copy of the form is included herewith from which suitable reproductions can be made. This form, which will enable applicants to provide the PTO with a uniform listing of prior art citation, supersedes form PTO-3.72.

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While the filing of prior art statements is voluntary, the procedure is governed by the guidelines of Section 609 of the Manual of Patent Examining Procedure and 37 CFR 1.97 through 1.99. To be considered a proper prior art statement, form PTO-1449 shall be accompanied by an explanation of relevance of each listed item, a copy of each listed patent or publication or other item of information and a translation of the pertinent portions of foreign documents (if an existing translation is readily available to the applicant), and should be submitted in a timely manner as set out in MPEP Sec. 609.

Examiners will consider all prior art citations submitted in conformance with 37 CFR 1.98 and MPEP Sec. 609 and place their initials adjacent the citations in the boxes provided on the form. Examiners will also initial citations not in conformance with the guidelines which may have been considered. A reference may be considered by the examiner for any reason whether or not the citation is in full conformance with the guidelines. A line will be drawn through a citation if it is not in conformance with the guidelines and has not been considered. A copy of the submitted form, as reviewed by the examiner, will be returned to the applicant with the next communication. The original of the form will be entered into the application file.

Each citation initialed by the examiner will be printed on the issued patent in the same manner as prior art cited by the examiner on form PTO-892.

The reference designations "AA," "AB," etc. (referring to applicant's reference A, Applicant's reference B, etc.) will be used by the examiner in the same manner as examiner's reference designations "A," "B," "C," etc. on Office Action Form PTO-1142.

Aug. 15, 1980.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[998 O.G. 8]

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(101)Report on the Quality Reinforcement Program

The Patent and Trademark Office (PTO) has instituted a Quality Reinforcement Program to identify services offered by the PTO that are in need of improvement. As a part of this program, the Office, in cooperation with the American Intellectual Property Law Association (AIPLA), has completed an evaluation of selected practices performed by both patent examiners and representatives of patent applicants during the examination process. The results of this evaluation are detailed in Volume I of the PTO Report of the Quality Reinforcement Program. A summary of the findings of this report is presented below. This summary is presented to report on the findings and to solicit suggestions from both the public and employees of the Patent & Trademark Office on steps that might be taken to raise the level of performance of those practices found to be in need of improvement. The full report and evaluation, which is quite extensive with over 350 pages, is available at the PTO.

Address: Comments and inquiries should be addressed to: The Commissioner of Patents and Trademarks, Washington, D.C. 20231, to the attention of Edward Kubasiewicz, Director, Examining Group 250, Rm. CP4-9D19.

Date: Comments should be submitted by June 16, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

SUMMARY OF VOLUME I—REPORT ON CURRENT LEVEL OF PERFORMANCE OF SELECTED PATENT EXAMINING CORPS PRACTICES

This is a summary of Volume I of the Quality Reinforcement Program Report, which addresses the current level of performance of selected Patent Examining Corps practices. This summary presents a background of the Quality Reinforcement Program and a synopsis of conclusions reached for each selected practice.

Background of the Quality Reinforcement Program

On Feb. 25, 1986, President Reagan issued an executive order establishing a comprehensive program for the improvement of productivity throughout all of government. From this executive order the Department of Commerce evolved a Productivity Improvement Program entitled PROJECT PRIDE. The program was announced as encompassing productivity, quality excellence and client satisfaction.

The role of U.S. Patent and Trademark Office (PTO) in PROJECT PRIDE centers around quality, and is entitled the Quality Reinforcement Program.

The goal of the PTO program is to improve the quality of patent examining functions and the timeliness and quality of other public services. In particular, the program focuses on improving the quality of practices performed in three different areas of the PTO, i.e., the Patent Examining Corps, the Office of Administration and the Office of Documentation.

The quality of an issued patent and the record before the PTO in the patented file are extremely important to the patent owner and to others who may be competitors or otherwise affected by the patent. Investment decisions and the recoupment of research, development and marketing expenditures often depend upon patent protection. Potential licensees and infringers need to know where they stand in regard to an issued patent. Patent owners and others need to be able to have a high degree of confidence in the validity of a patent. Valid patents and a clear and correct file record will help to eliminate unnecessary and expensive patent litigation costs which are currently estimated to total at least $800 million per year.

The concern for productivity and productivity improvement is not a recent development at the PTO. During the past quarter of a century one of the most pressing problems for the Office has been a large and growing backlog of unexamined patent applications and the resulting long pendency time between filing an application and issuance of a patent. The average pendency of patent applications in 1964 was 37 months. However, average pendency dropped steadily in the 1970s until it culminated in an average pendency of 18 months in 1977. This pendency was shortlived due to a loss of adequate resources. However, pendency is once again falling and it is expected that an average pendency of 18 months will be achieved in 1989.

Historically, the Office has successfully responded to situations similar to the one in which it presently finds itself. Beginning in the 1960s when the backlog of new applications exceeded 200,000, a program designed to drastically increase the productivity of the Corps was initiated. Part of that program was what has since become known as "compact prosecution". An increased staff of examiners was reinstructed to take a new approach toward examining in which patentable subject matter was looked for and indicated as early in the prosecution of the case as possible, references were automatically furnished with actions, attorneys were urged to originally file claims of the broadest possible range of scope, telephonic prosecution was instituted, first actions and application disposals became the measure of examiners' performance, preprinted first action forms were designed, etc.

The question before the Office now is whether sufficient attention is being given to quality. The intent of the Quality Reinforcement Program, as it applies to the Patent Examining Corps, is to take stock of the present situation and to consider whether any corrective action needs to be taken to improve the quality of the examination process.

The Office is currently using and improving various tools to assure a quality examined patent. These tools include the quality review program, supervisory reviews of examiner work through the performance appraisal system and through the promotion and signatory authority programs, improved and expanded examiner training, development of the automated patent system to improve the quality of examiner searching, recruitment of "top-of-the-class" new examiners, and detailed and clear guidlines on examining policy and procedure.

The Quality Reinforcement Program is a new quality tool for improving the actual quality of the patents issued as well as the record behind the issuance of these patents. This new program differs from the quality review program in that this program looks at the key pieces of the patent examining process that contribute to and make up the end product or patent rather than looking only at the end product. The Quality Reinforcement Program focuses on the effectiveness and consistency with which examiners apply existing law and procedures and how they communicate their findings to applicants. The program also focuses on the attorney's contribution to this work product. Lastly, the program focuses on the timeliness of some of the services provided by the Corps' clerical support staff. Such focusing is not intended to be carried out one time only. Rather, the methodology used in this program will be applied to any key pieces, identified by PTO personnel or the bar in the future, as needing a review of the type dictated by this program. The aim in short is to build quality and timeliness from the ground up and to maintain them at a high level.

This report presents and analyzes the findings of the Quality Reinforcement Program only as the findings relate to practices performed in the Patent Examining Corps. The portion of the program reported in this volume represents a cooperative effort between the Corps and the American Intellectual Property Law Association (AIPLA) through its Ad Hoc Committee on Quality. The focus is on certain practices involved in the prosecution, examination and processing of patent applications by both the PTO and by patent applicants and their representatives.

Methodology

The methodology adopted for the program comprises the following process:

1. select target practices,
2. determine the current quality or performance level of thetarget practices,
3. compare the current performance of the target practices to the desired level of performance,
4. implement, where appropriate, steps to raise the current level of performance to the desired level,
5. subsequently, determine the level of performance of the target practices, and
6. compare the current level of performance to the subsequently determined level of performance to determine what, if any, change has occurred.

Target Practices

A number of practices were targeted for the program as a result of complaints and concerns, raised by the bar and PTO personnel. The targeted practices are identified as follows:

A. Explanations of Rejections

This program targeted examiner "explanations of rejections" as a practice to be reviewed based in part on a de-emphasis by the Office on the degree to which examiners were required to include detailed explanations of the supporting rationale behind their rejections during the 1970s. The PTO instituted the use of an abbreviated, handwritten form (PTO-1142) for the preparation of first Office actions during the early 1970s. The form provided for a cryptic description of how the references were being combined in a § 103 rejection and provided little space for explanation of the supporting rationale behind rejections. The form was mandatory for all first actions, and was discontinued in 1982 primarily due to complaints from the patent bar and the courts that examiner explanations of rejections were not sufficient. The inclusion of "explanations of rejections" as a targeted practice for this program enables the evaluation of whether further improvement is needed in this area.

B. Final Rejection Practice

This program targeted "final rejection practice" for review based in part on the conflicting needs of PTO and patent applicants/attorneys in this area of practice. In order to reduce the time applicants must wait to obtain a patent and to increase efficiency of the examination process, the PTO uses various incentives for examiners to make their rejections final early in the prosecution.

To the contrary, patent applicants often desire to have the examiner repeatedly reconsider his or her position or to continue to amend the claims. These conflicting incentives often lead to disputes relating to the propriety and/or timeliness of final rejections and to whether amendments are entered after an action has been made final.

C. Information Disclosure Statements

This program targeted "information disclosure statements" for review based upon concerns expressed by both applicants/attorneys and by the Patent Examining Corps over the submission of these statement.

Patent examiners, in the interest of efficiency and productivity, are benefited by the disclosure to the Office of all material information relating to the patentability of the application prior to their first Office action. However, this must be balanced against the practical reality that applicants/attorneys often don't become aware of material information until later in the prosecution, and don't have readily available translations of foreign documents or copies of documents for submission to the PTO. This practice looks at the extent to which the practical needs of both the PTO and the applicant/attorney are served by the procedures relating to "information disclosure statement".

D. Interviews

This program targeted "interviews" for review to determine the extent to which personal discussions are held between examiners and attorneys and to evaluate whether the parties consider personal interviews to be a productive or helpful means for clarifying issues that may not have been clearly communicated in earlier written communications. Selection of "interviews" as a targeted practice was based in part on isolated complaints by some examiners that interviews were not always productive for them and by some attorneys that some examiners are reluctant to hold interviews.

PTO procedures require that all business with the Office be conducted in writing (37 CFR § 1.2). To comply with this rule and still accommodate request for oral discussions with examiners, it is PTO policy that the substance of all personal interviews must be reduced to writing (see § 713.04 of the MPEP). Selection of "interviews" as a targeted practice was also based on concerns that the written record include an explanation of the substance of all oral interviews. Under this practice, the program focused on determining the perceptions of examiners and attorneys about interviews.

E. Responses by Applicant

This program targeted "responses by applicant" for review to determine the extent to which practitioners representing patent applicants submit responses to examiner actions that are complete and in compliance with current rules and procedures. Specific activities under this topic, such as the extent to which explanations of why claims are considered unobvious over the art cited by the examiner and the degree of compliance with 37 CFR § 1.116 when amendments are presented after a final rejection, were selected based upon some complaints by examiners about attorney responses in these areas.

F. Completeness of the Record

This program targeted "Completeness of the Record" for review based primarily upon the importance of a complete file record to those who must review patented files and make important decisions based upon the facts and determinations therein. The necessity of insuring a complete file record has been urged by such diverse interests as federal court judges, potential licensees, potential infringers, and those attempting to avoid infringement.

This topic looks at the extent to which examiners insure a complete file record by including a statement

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of reasons for allowance where appropriate, fully and properly record the search of the prior art, and check foreign priority information for accuracy and completeness. This topic does not look at the extent to which examiners explain their rejection; see targeted practice A, "Explanation of Rejections." The extent to which applicants file complete responses iscovered in targeted practice E, "Responses by Applicant."

G. Compact Prosecution

This program targeted "Compact Prosecution" for review based upon its importance as a key element in current PTO efforts to reduce pendency time of applications to an average of 18 months. The premise behind compact prosecution is that pendency time will be minimized if each stage of prosecution is fully and thoroughly conducted by both examiners and applicants. The demands of such a standard have inevitably led to complaints from each side relating to the completeness of considerations and the willingness to take that "extra step". Examiners have been criticized for confining searches to only what is literally claimed, and for failing to indicate possible areas of patentability at the earliest possible stage. Applicants have been criticized for failure to claim all limitations that might be considered patentable prior to the initial search by the examiner, for amending the claims to include these limitations only after first action, and for failing to correct significant formal deficiencies prior to initial examination.

H. Appeal Practice

This program targeted "Appeal Practice" for review primarily due to the recent and substantial increase in the backlog of appealed applications awaiting decision by the Board of Patent Appeals and Interferences. Primary emphasis was placed on determining the extent to which appellant's brief and the examiner's answer are formally complete so that expeditious consideration may be given by the Board.

As a result of the high priority being given by the PTO to reduce the backlog of cases at the Board, additional survey questions were included to determine the extent to which additional requirements beyond those currently in effect for the preparation of the appellant's brief and examiner's answer would be useful to examiners and the Board.

I. Allowances After Appeal Brief

This program targeted "Allowances after Appeal" for review in response to complaints that examiners often allow cases after appellant has filed a brief when the cases should have been allowed before the brief was filed.

J. Processing Times

This program targeted "Processing Times" for review based upon its importance to the PTO goal of reducing pendency of patent applications to 18 months.

DETERMINATION OF CURRENT LEVELS OF PERFORMANCE

The step of determining the current level of performance of the targeted practices was accomplished through a number of surveys.

One survey, called the Applications Survey, was an internal factual survey that involved selecting a sample of 150 applications on a random basis from all the examining groups. A survey team, comprising three Supervisory Patent Examiners (SPEs) and three reviewers from Qualtiy Review, performed a detailed review of the applications according to a questionnaire, which was developed with the joint cooperation of the AIPLA Ad Hoc Quality Committee.

A second survey, called the AIPLA Survey, was an opinion questionnaire provided by the AIPLA to 5500 of its members. The questionnaire was developed jointly with the AIPLA Ad Hoc Quality Committee. The AIPLA questionnaire sought the perception of the attorneys of the quality of the work performed by the Corps relative to the targeted practices. Space was provided for the respondents to include comments on the questionnaire. Over 1100 attorneys responded to the questionnaire.

Another survey, called the Examiners Survey, was also an opinion questionnaire provided to all patent examiners and SPEs on a voluntary and anonymous basis. The questionnaire queried the examiners and SPEs about the practices of the practitioners before the PTO. Space was provided for the respondents to include comments on the questionnaire. Over 650 responses were received.

A fourth survey, called the Appeals Survey, was also an internal factual survey. The questionnaire was developed with the cooperation of the AIPLA Ad Hoc Quality Committee. The questionnaire sought data about the practices carried out in the appeal process in the PTO. For this survey, 60 applications were selected on a random basis from all the examining groups. The survey team performed a detailed review of the applications according to the questionnaire.

Three other surveys were used to gather data. All of these surveys were developed and conducted by the Office of Quality Review. Two surveys involved the review of 1878 allowed applications concerning information disclosure statements. Another survey involved the review of 290 applications allowed after appellant had filed an appeal brief, but before an examiner's answer was prepared.

Relative to the processing times, PALM reports were used to obtain data on the practices targeted for this activity.

COMPARISON OF CURRENT LEVELS TO DESIRED LEVELS

The step of comparing the current levels of performance to the desired or standard levels of performance was accomplished by setting out the desired or standard level for each target practice. Next, all the information provided by the surveys was analyzed for each target practice and compared to the desired or standard level for the target practice. The analysis resulted in the following general conclusions. (A detailed listing of all conclusions for each targeted practice is presented in Section VII of Volume I of the Quality Reinforcement Program Report.)

SUMMARY OF CONCLUSIONS

A. Explanations of Rejections

1. Identification of Statutory Basis for Rejection

Over 95% of the rejections under 35 USC §§ 103 and 112, second paragraph (clarity), cited the statutory basis for the rejection. With respect to rejections under 35 USC § 102, 92% of the rejections cited the statutory basis. Hence, no significant improvement is needed in specifying the statutory basis of a rejection based on 35 USC §§ 102, 103 or 112, second paragraph.

With respect to rejections under 35 USC § 112, first paragraph, 14-19% of the rejections based on a non-enabling disclosure and 42% of the rejections based on new matter failed to cite the statutory basis. Hence, improvement is needed in specifying that a rejection, based on new matter or the lack of an enabling disclosure, is under 35 USC § 112, first paragraph.

2. Explanation of Rejections Based on Prior Art

Approximately two-thirds of the rejections reviewed failed to explain why the claimed invention would have been obvious in view of the applied prior art. Over 75% of the attorneys responding to the AIPLA survey perceived rejections under 35 USC § 103 as lacking an explanation of why the claimed invention would have been obvious. Moreover, 70 comments from attorneys (the highest for any topic) were critical of the explanations of rejections under 35 USC § 103. Hence, significant improvement is needed to assure that rejections based on prior art appropriately communicate the rationale for such rejections.

3. Explanation of Rejections Under 35 USC § 112, First Paragraph, Non-Enabling Disclosure

Nineteen percent of all the non-enabling disclosure rejections reviewed failed to give reasons in support of the rejection. Hence, improvement is needed in explaining why a disclosure is non-enabling.

4. Explanation of Rejections Under 35 USC §112, First Paragraph, New Matter

With respect to rejections based on new matter, 35% of the rejections reviewed failed to pointout the language considered to be new matter, and 40% of these rejections did not give a reason why the language was considered new matter. Hence, significant improvements are needed in pointing out the language that is considered to be new matter, and explaining why the new matter is not supported by the disclosure as originally filed.

5. Explanation of Rejections Under 35 USC § 112, Second Paragraph

Approximately 90% of the rejections reviewed pointed out the claim language considered unclear. Thus, no significant improvement is needed in pointing out *what* claim language is considered unclear in rejections under the second paragraph of § 112.

Twenty-three percent of the non-final rejections reviewed failed to explain why the language was considered unclear. In final actions, 8% of the rejections failed to explain why the language was considered unclear. Hence, improvement is needed in explaining *why* the claim language is considered unclear in rejections under the second paragraph of § 112.

6. Alternative Rejections Under 35 USC §§ 102/103

Three percent of the actions reviewed contained alternative rejections under 35 USC §§ 102, 103. Ten percent of the examiners' answers reviewed contained similar rejections. The number of alternative rejections under either § 102 or § 103 was sufficiently low so that no further action is required.

B. Final Rejection Practice

1. Timely Development of Issues in Examiner and Attorney Communications

The perception surveys indicate that examiner actions and attorney responses leading up to final rejection do not adequately develop the issues. The objective Applications Survey data indicate that 32% of examiners' non-final actions do not fully respond to all arguments raised by the applicant. Improvement is needed by both examiners and attorneys in fully developing the issues prior to final.

Final rejections were found to treat all claims, but were deficient in answering all arguments presented by the applicant and in treating affidavits and declarations submitted to overcome rejections. Improvement is needed in responding to all issues raised during the prosecution when making a final rejection.

2. Appropriateness of Final Rejection

Thirteen percent of the final actions surveyed were considered premature. However, 91% of the final rejections reviewed were considered to be reasonable. Thirty-nine percent of the attorneys responding to the AIPLA survey perceived final actions as proper only occasionally or rarely.

Though examiners appear to be doing an acceptable job in making reasonable and proper final rejections, some improvement is needed. However, attorney perception is substantially lower than the factual findings. This may be due to a desire by attorneys for a more liberal after final procedure rather than improper examiner application of the current procedure.

3. Advisory Actions

Advisory actions were found to be mailed in a timely manner.

Thirty-three percent of the amendments filed after final were improperly refused entry. Only 46% of the attorneys responding to the AIPLA surveyperceived that reasons given by examiners for the non-entry of amendments after final were clear almost always or most of the time. Moreover, only 50% of these attorneys perceived their response to final rejections to have been given full consideration.

In only 39% of the instances when an amendment to existing claims was entered after final did the advisory action clearly specify the grounds of rejection applicable to the amended claims.

Hence, significant improvements are needed in assuring that amendments after final:

a. are not arbitrarily refused entry,
b. are given sufficient consideration, and
c. communicate the ground of rejection for any claim amended after the final rejection.

C. Information Disclosure Statements

1 .Frequency and Timeliness of Submissions

Information disclosure statements are submitted either as statements in the specification or as separate papers in approximately 60% of the applications. Eighty-two percent of the statements are submitted prior to the first action. However, 47% are filed more than three months from the filing date. In 1978, just after 37 CFR § 1.56 was amended, only 21% of the statements were filed more than three months after the filing date. Twelve percent of applications on appeal had statements filed after the final rejection. Two percent of the statements are filed after the application has been allowed.

Only 11% of the statements filed more than three months after the filing date contained an explanation for the delay.

Hence, significant improvements are needed for assuring that information disclosure statements are filed in a timely manner, and with an explanation for the delay when filed late.

2. Submission Includes Explanation of Relevancy of Documents

The explanation of the relevance of the art is substantially below standard whether the citation is incorporated in the specification or is in a separate paper. Hence, significant improvement is needed in assuring that explanations of the relevance of documents cited in information disclosure statements are provided.

3. Copy of Documents Supplied

Copies of cited documents, regardless of type, are not provided in approximately 60% of cases when statements are incorporated into the specification. Even when eliminating those statements citing only U.S. patent documents, the Applications Survey still shows a 25% level of noncompliance for specification-incorporated statements. There is a need for improvement in supplying copies of documents cited in specification-incorporated statements.

4. Translation of Foreign Documents Provided

Either a translation or a statement that a translation is not readily available is generally not provided when the citation is incorporated in the specification. While compliance with the standard is better when the citation is in a separate paper, compliance is still poor. Improvement is needed.

5. Form PTO-1449 or Equivalent

Since the use of PTO form 1449 is not mandatory, this section merely reports the degree to which the form is voluntarily used and is thus informational only. Form PTO-1449 is used in about 70% of disclosure statement submissions when the submission is in a separate paper.

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The form is used in about 25% of the disclosure statements incorporated in the specification.

6. Miscellaneous

Examiners considered art submitted prior to first action in 93% of cases reviewed. Improvement is needed to insure 100% compliance.

While the survey results indicate a perception by examiners that related copending applications are not being fully disclosed, no objective survey data was recorded on this topic. Since attorneys are only required to cite related applications that are *material*, the survey question does not measure perceived performance against the current standard. No conclusions can be reached based upon the survey data.

D. Interviews

1. Interviews in General

The results of the AIPLA survey indicate that, of the attorneys responding to the survey,

a. 75% perceived interviews as productive,
b. 89% perceived interviews to be kept as scheduled,
c. 68% perceived examiners to be adequately prepared, and
d. 85% perceived the interview summary form to be completed adequately.

The results of the Examiners Survey indicate that, of the examiners responding to the survey,

a. 53% perceived interviews as productive,
b. 96% perceived interviews to be kept as scheduled,
c. 88% perceived attorneys to be adequately prepared, and
d. 67% perceived attorneys as making the substance of the interview of record.

The survey results indicate that attorneys perceive that examiners are willing to grant at least one interview if timely requested. No need for improvement would appear necessary. A substantial number of attorneys (approximately 30%) feel that examiners are only occasionally or rarely willing to discuss and attempt to resolve substantive issues at interviews. However,examiners often express the desire to reserve commitments until after an interview so that full consideration of all points could be made. It cannot be concluded from the survey data whether examiners could be making more substantive commitments at interviews. No need for improvement is indicated. Some improvement is needed by attorneys in ensuring that an adequate written record of the substance of all interviews is provided.

2. Telephone Restriction

As a general policy, the examiner should telephone the attorney of record and request an oral election when making a restriction requirement. In 62% of the restriction requirements reviewed, the policy was followed. However, the telephone is not required to be used when examiners know that an election will not be made by phone. The number of instances of the remaining 38% where no restriction was made for this reason was not determined. Hence, while it appears that some improvement is needed, the degree of need for improvement cannot be determined without further study.

E. Responses by Applicant

1. Responses under 37 CFR § 1.111

Approximately 90% of the responses reviewed were technically fully responsive to Office actions. However, the percentage of responses that explained why the claimed invention would have been unobvious in view of the prior art was significantly lower. Moreover, some of the comments from examiners indicate that they feel responses often argue references individually rather than address the combination of references set forth in the prior Office action. At least part of this may be due to the lack of an examiner explanation in rejections how references are used and combined.

Hence, no significant improvement is needed in assuring that responses under § 1.1$reat all objections and rejections. However, significant improvement is needed in assuring that responses include an explanation of why it would have been unobvious to combine or modify the references in the manner suggested by the examiner.

2. Responses Under 37 CFR § 1.116

Only 16% of the amendments filed after a final rejection that were reviewed presented a showing of good and sufficient reasons why they were necessary and why they were not presented earlier. Moreover, 48% of the examiners and SPEs responding to the Examiners Survey perceived that attorneys generally do not start serious prosecution or make substantial amendments until after the final rejection.

Hence, significant improvement is needed in assuring that responses under § 1.116 explain why an amendment was not presented earlier.

3. Appeal Briefs—Responses to Rejections

Ninety-four percent of the briefs reviewed contained an explanation why the examiner's modification of the references would have been unobvious. Hence, no significant improvement is needed in assuring that briefs adequately communicate why the examiner's rejection is considered improper.

4. Affidavits/Declarations Submitted to Overcome Rejections

Approximately 20% of affidavits/declarations are not filed in a timely manner. Hence, improvement is needed in assuring that affidavits/declarations are submitted in a timely manner.

Examiner perception of the sufficiency of affidavits to either establish proper "nexus" when asserting commercial success or to present evidence to substantiate an allegation of "secondary considerations" was very low, indicating a need for at least some attorney improvement.

F. Completeness of the Record

1. Reasons for Allowance

In 22% of the applications reviewed, the reason for allowance was not clear from the record. Moreover, only 50% of the attorneys responding to the AIPLA Survey perceived the reason for allowance made of record by the examiner, as clearly establishing why the claims were allowed. Hence, significant improvement is needed in assuring that the record clearly explain why the claims were allowed.

2. Recordation of Searches

Eighty-five percent of the applications surveyed had search boxes properly filled out by the examiner. Approximately 45% of the applications, wherein an automated search was made, were lacking information about the automated search. Hence, improvements are needed in assuring that the search data are recorded in a complete and accurate manner.

3. Foreign Priority Data Verified

The priority/PCT data appearing on the face of the file wrapper were not verified in 23% of the applications reviewed. Hence, a significant improvement is needed in assuring that the priority/PCT data appearing on the file jacket are verified.

G. Compact Prosecution

1. Adequacy of Applications Prior to First Action

Applications should be devoid of obvious informalities. Significant improvement is needed in foreign origin applications since 70% of the examiners surveyed perceived foreign applications as containing substantial formal deficiencies almost always or most of the time. However, only 16% of the examiners perceived U.S. origin applications as containing substantial formal deficiencies.

The disclosure should be readily understandable and the claims should clearly define the invention to enable the examiner to conduct an adequate search. Improvement is needed in foreign origin applications since 20% of the examiners surveyed perceive such applications as lacking an adequate disclosure to permit examination almost always or most of the time. However, 97% of these examiners perceive U.S. origin applications as containing an adequate disclosure.

Claims should be presented that range from the broadest to the most detailed that applicant is willing to accept. Substantial improvement is needed in this area since the Applications Survey shows that only approximately 60% of the applications surveyed contained such a range of claims.

2. Searches

The first search should cover the invention as described and claimed. Substantial improvement is needed in conducting a more thorough search at the time of the first action since 50% of the applications surveyed revealed newly applied art in subsequent actions that should have been applied in a previous action.

A search should be made in the issuing class/subclass. Improvement is needed in this area because 11% of the allowed applications reviewed did not indicate that the issuing class/subclass was searched.

3. Indication of Allowable Subject Matter

Examiners should communicate certain aspects or features ofapplicant's invention that if properly claimed would receive favorable consideration. Significant improvement is needed in this area since only 59% of the applications that were deemed appropriate for an indication of allowable subject matter had such an indication.

H. Appeal Practice

1. Appellant's Brief—Format

Ninety-five percent of the briefs reviewed contained a concise explanation of the invention. However, only 46% of the explanations contained a reference back to the drawings and/or specification. Hence, a significant improvement is needed in assuring that appellant's explanation of the invention refers to the drawing and/or specification. Ninety-five percent of the briefs reviewed contained a copy of the claims. Hence, no significant improvement is needed in assuring that appellants provide a copy of the claims on appeal.

In addition, formal matters that are not currently required in briefs were found to be included in the surveyed briefs to the following extent,

a. 27% of the briefs included a separate summary of the issues on appeal,
b. 53% of the briefs included a citation of the references as well as an explanation of each reference,
c. 7% of the briefs included a reference back to the drawings or specification in the copy of the claims presented in the brief; however, 58% of the examiners surveyed thought that an appeal brief would be more useful if the claims on appeal were read on the drawings or specification, and
d. 2% of the briefs pointed out an exemplary claim; however 60% of the examiners surveyed thought that an appeal brief would be more useful if appellant is required to state whether all the claims on appeal stand or fall together.

The formal requirements of the brief should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the brief.

2. Examiner's Answer—Format

Ninety percent of the answers surveyed identified the status of all the claims in the applications. One hundred percent of the answers cited all the references relied upon in the appeal and pointed out any deficiencies in the copy of the claims provided by appellant. Hence, no significant improvements are needed in the format of the examiners' answers, as measured against the formal requirements for examiner's answers.

In addition, formal matters that are not currently required in examiner's answers were found to be included in the surveyed answers to the following extent,

a. 15% of the answers included a summary of the issues on appeal,
b. 40% of the answers included an explanation of the invention, and
c. 28% of the answers included an explanation of the references.

The formal requirements of the examiner's answer should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the examiner's answer.

3. Examiner's Answer—Completeness

Seventy-two percent of the answers reviewed responded to every significant argument raised in the briefs. Hence, a significant improvement is needed in assuring that examiners' answers respond to every significant argument/issue raised by appellants.

4. Post Examiner's Answer Practice

The Appeals Survey shows that a substantial number of reply briefs are merely noted with no further comment by the examiner. The findings are inconclusive regardingthe propriety of the reply briefs or whether reply briefs are being treated properly by examiners.

I. Allowance After Appeal Brief

Thirty-nine percent of applications allowed after an appeal brief had been filed were found to have no change in appellant's position. Hence, significant improvement is needed in assuring that applications are allowed at the earliest appropriate stage of prosecution.

J. Processing Times

1. 16 Mailing of Office Actions

Substantial improvement in mailing Office actions earlier than one month from the day when the examiners are given credit for the Office action has been accomplished since the inception of the Quality Reinforcement Program.

2. Mailing of Notices of Allowance

Substantial improvement in assuring that Notices of Allowances are mailed promptly has been accomplished since the inception of the Quality Reinforcement Program.

3. Responses to Amendments After Final

Substantial improvement in mailing responses to amendments after final has been accomplished since the inception of the Quality Reinforcement Program.

Perceptions

In addition to reaching conclusions on the current level of performance of each target practice, the program determined the opinions of patent examiners and representatives of applicants on various topics involved in the examination process. A summary of their perceptions is presented below.

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Examiner legal proficiency was perceived by attorneys to be in definite need of improvement.

Examiner technical competency, care in doing the job, and neatness of attire were perceived by attorneys as more positive than negative, but in need of improvement.

Clerical competency and care in doing the job were perceived by attorneys to be in definite need of improvement.

Clerical functions including neatness of attire, cooperativeness, courteousness and availability were perceived as being more positive than negative, but with substantial room for improvement.

Attorney handling of foreign origin applications was perceived by examiners to be deficient in preparation of the case for examination. Attorney practices including continued prosecution after final, interview practice, submission of information disclosure statements and explanation of reasons for disagreement with § 103 rejections were also of concern to examiners.

[1078 OG 22]

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(102) **Report on Results of an Oct. 1985—Feb. 1986 Survey on the Citation by Applicants of Information Disclosure Statements in Patent Applications**

This report summarizes the data compiled from a sample of 1200 allowed utility applications surveyed in the Office of Quality Review during the period of Oct. 1, 1985 to Feb. 14, 1986.

For purposes of the survey, a "citation", whether appearing in the specification or in a separate paper, is defined as either (1) a listing of patents or publications together with a concise explanation of the relevance of each listed item (i.e. an "information disclosure statement" under 37 CFR 1.98(a)), or (2) a "mere listing" of patents or publications. In addition, a "reference", or "document", is defined as any patent or other publication cited by applicant.

This survey report is similar to and presented in the same general format as the survey reports published in the *Official Gazette* of Nov. 23, 1976, pages 1356 and 1357, of Sept. 26, 1978, pages 22 and 23, and of Aug. 12, 1980, pages 8 and 9. It should be noted, however, that the phrase "prior art statement" used throughout the three previous survey reports has been replaced by the more appropriate phrase "information disclosure statement" reflecting the current terminology of 37 CFR 1.97-1.99 as amended.

This survey indicates, among other things, that 60% of the sampled applications include citations by applicants. This is somewhat less than the 63% finding in the survey reported in the 1980 O.G. and the 64% finding in the 1978 survey but still represents an improvement over the 54% finding in the 1976 survey. In addition, more citations are being submitted later in the prosecution than previously. The percentage of applications having citations submitted in separate papers has increased while the percentage of applications having such papers submitted within three months of the filing of an application is down from 79% in 1978 and 73% in 1979 to 53% presently. Also, while the percentage of applications having citations accompanied by copies of references cited has increased, overall compliance with Office guidelines has decreased.

A separate, recent informal review of citations made after allowance similarly indicated frequent noncompliance with the guidelines of Section 609 of the Manual of Patent Examining Procedure. Often, citations were in the form of prior art search reports made by foreign patent offices many months or years earlier, submitted without copies of the references, discussion of materiality, or any explanation for the late submission. The Office is presently considering action to remedy these problems

The statistics are otherwise presented without comment as follows:

		Chem.	Elec.	Mech.	Total
(1)	Number of applications in sample	350	415	435	1200
	(Percent of total sample)	29%	35%	36%	100%

Number of applications having citations submitted in:

(2)	Separate papers only	69	82	82	233
	(Percent of sample 2/1)	20%	20%	19%	19%
(3)	Both separate paper *and* in specification	41	60	44	145
	(Percent of sample 3/1)	12%	14%	10%	12%
(4)	The specification only	12	94	121	336
	(Percent of sample 4/1)	35%	23%	28%	28%
(5)	Total number of applications having citations	231	236	247	714
	(Percent of sample 5/1)	66%	57%	57%	60%

Application in which the applicant submitted citations in the *specification*.

		Chem.	Elec.	Mech.	Total
(6)	Number of applications including citations in the specification	162	154	165	481
	(Percent of applications havingcitations in the specification 6/1)	46%	37%	38%	40%
(7)	Number of applications including mere listing of references in the specification	12	6	17	35
	(Percent of applications having mere listing of references in the specification 7/1)	3%	1%	4%	3%
(8)	Number of applications including information disclosure statements in the specification	150	148	148	446
	(Percent of applications having disclosure statements in the specification 8/1)	43%	36%	34%	37%
(9)	Number of applications including information disclosure statements in the specification which included copies of the references	67	55	65	187
	(Percent of applications, with disclosure statements in the specification, having copies of the references 9/8)	45%	37%	44%	42%
(10)	Number of applications including information disclosure statements in the specification which comply fully with the guidelines (37 CFR 1.97-1.99;MPEP § 609) (e.g. timely filed, translations where applicable, etc.)	46	45	40	131
	(Percent of applications, with disclosure statements in the specification, which fully comply with CFR and MPEP 10/8)	31%	30%	27%	29%
(11)	Number of applications including information disclosure statements citing non-English documents in the specification	60	36	31	127
	(Percent of applications, with disclosure statements in the specification, citing non-English documents 11/8)	40%	24%	21%	28%

Applications in which applicant submitted citations in *separate papers*.

		Chem.	Elec.	Mech.	Total
(12)	Number of applications including citations in a separate paper	110	142	126	378
	(Percent of applications having citations in separate papers 12/1)	31%	34%	29%	32%
(13)	Number of applications including separate paper citations submitted within 3 months of the filing date of the application	48	88	65	201
	(Percent of separate paper citations submitted within 3 months 13/12)	43%	62%	52%	53%
(14)	Number of applications including separate paper citations which include a copy(s) of the reference(s)	103	134	114	351
	(Percent of separate paper citations including copy(s) of the reference(s)	94%	94%	90%	93%
(15)	Number of applications including separate paper citations which cited a non-English document	47	53	43	143
	(Percent of separate paper citations citing non-English documents	43%	37%	34%	38%
(16)	Number of applications including separate papers with information disclosure statements	88	100	81	269
	(Percent of separate paper citations having disclosure statements	80%	70%	64%	71%
(17)	Number of applications including separate paper citations which fully comply with the guidelines (37 CFR 1.97-1.99; MPEP § 609)	31	58	37	126
	(Percent of separate paper citations which fully comply with CFR and MPEP 17/12)	28%	41%	29%	33%

Applications in which applicant submitted *more than ten* citations.

		Chem.	Elec.	Mech.	Total
(18)	Number of applications having more than ten citations	32	25	22	79
	(Percent of applications having more than ten citations	9%	6%	5%	7%

Aug. 15, 1986.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks.

[1040 OG 24]

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(103) **Express Abandonments**

Experience over the past several months has indicated the need to clarify and re-emphasize existing practice regarding express abandonments submitted under 37 CFR 1.138.

Since 1966, when Rule 138 was revised, it is no longer required that the applicant and the assignee of record, if any, sign an express abandonment. The revised rule indicates that a patent application may be expressly abandoned by an attorney or agent of record. Therefore, prior to signing a declaration of express abandonment of a patent application, it is imperative that the attorney or agent of record exercise every precaution in ascertaining that the abandonment of the application is in accordance with the desires and best interests of the applicant. Moreover, special

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care should be taken to insure that the appropriate application from a group of related applications is correctly identified in the letter of abandonment.

A declaration of abandonment signed by the applicant or his attorney or agent of record becomes effective when an appropriate official of the Office takes action in recognition of the declaration. When so recognized, the date of abandonment may be the date of recognition or a different date if so specified in the declaration itself. For example, where a continuing application is filed with a request to abandon the prior application as of the filing date accorded the continuing application, the date of the abandonment of the prior application will be in accordance with the request once it is recognized.

Action in recognition of an express abandonment may take the form of an acknowledgement by the examiner or the Patent Issue Division of the receipt of the express abandonment, indicating that it is in compliance with 37 CFR 1.138 (see Section 711.01 MPEP). Alternatively, recognition may be no more than the transfer of drawings to a new application pursuant to instructions which include a request to abandon the application containing the drawings to be transferred (see 37 CFR 1.60 and Section 608.02(i) MPEP).

It is suggested that divisional applications being submitted under 37 CFR 1.60 be reviewed before filing to ascertain whether the prior application should be abandoned. Recent experience reveals that some divisional applications are being filed under 37 CFR 1.60 with requests to transfer the drawings from, and abandon, the prior application. Following the recognition of the abandonment, the attorney or agent signing the request informs the Office that the request was made by mistake for any one of a number of reasons. Care should be exercised in situations such as these as the Office looks on express abandonments as acts of deliberation, intentionally performed.

Another common situation involves the submission of an express abandonment following the allowance of an application The express abandonment may not be recognized unless it is actually received by appropriate officials in time to act before the date of issue. In those cases, once a patent number and issue date have been assigned to the application, it is considered too late to act on the express abandonment unless a petition under Rule 313(b) or Rule 183 is granted (see Section 711.01 of MPEP).

WILLIAM FELDMAN,
Apr. 7, 1975. *Deputy Assistant Commissioner for Patents.*

[934 O.G. 2]

(104) **Notice of Abandonment for Failure to Prosecute Application**

Effective immediately the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED.THISNOTICEMAILED:
In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976: 951 O.G. 1342) but was office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandonment.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicated on the contention that neither the Office action nor the notice of abandonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,
May 9, 1977. *Deputy Assistant Commissioner for Patents.*

[959 O.G. 24]

(105) **Requirement for a Response Under 37 CFR 1.136 and 1.137 Where a Continuing Application is Being Filed.**

This notice is intended to clarify the requirements for a response as required by 37 CFR 1.136 or 1.137 in situations involving a petition for extension of time or a petition to revive an abandoned application for the purpose of filing a continuing application.

In those instances where an extension of time or a revival of an abandoned application is sought solely for the purpose of filing a continuing application under 35 U.S.C. 120 and where the prior application is to be abandoned in favor of the continuing application, the filing of a response as required by 37 CFR 1.111, 1.113, 1.192 or other regulation is considered to be an unnecessary expenditure of resources by the applicant. Accordingly, in these situations, the Patent and Trademark Office will accept the filing of a continuing application as a response under 37 CFR 1.136 or 1.137.

To facilitate processing by the Office, any such petition for extension of time or petition to revive should specifically refer to the filing of a continuing application and also include an express abandonment of the prior application conditioned upon the granting of the petition and the granting of a filing date to the continuing application.

GERALD J. MOSSINGHOFF,
May 13, 1983. *Commissioner of Patents and Trademarks.*

[1031 OG 11]

(106) **Petitions Under 37 CFR 1.183 to Waive the One Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)**

Petitions to revive an unintentionally abandoned application (37 CFR 1.137(b)) or to accept an unintentionally late paid issue fee (37 CFR 1.155(c) or 1.316(c)) must befiled within one year of the date on which the application became abandoned.

In the last sentence of the above-noted subsections of 37 CFR, the Commissioner of Patents and Trademarks has indicated that petitions under 37 CFR 1.183 to waive any time period requirements for filing a request pursuant to these subsections will not be considered, but will be returned to the applicant. However, it has become apparent that under certain very limited conditions, the interests of the patent system would be better served by considering such petitions.

These very limited conditions arise when an application becomes abandoned due to an action or inaction by applicant and the Patent and Trademark Office performs a positive, documented and Official act* (e.g., by issuing an Official document) which could lead a reasonable individual to conclude that the action or inaction was appropriate. If this conclusion is a contributing factor in the applicant's failure to realize the true, abandoned status of his application in time to file a petition under one of the above-noted subsections, then conditions exist under which a § 1.183 petition will be considered.

For example, if an applicant files papers for a continuing application under 37 CFR 1.60 or 1.62 on a date when the parent application is abandoned (e.g., the applicant neglected to obtain an extension of time in the parent application), the requirements of these regulations are not satisfied and the papers should not be processed into an application. However, if in spite of this error the Office issues a filing receipt for the continuing application, a reasonable individual could conclude that the continuing application had been properly filed on a date when the parent application was pending. Further, if the lack of copendency between the parent and the continuing applications is not discovered until after one year from the date on which the parent application became abandoned, the opportunity to obtain copendency by reviving the parent application under 37 CFR 1.137(b) is lost. As an additional example, if an applicant submits a check for payment of the issue fee and the payment is improper (e.g., the check is not timely submitted or is returned to the Office unpaid due to insufficient funds), the application should be held abandoned. However, if in spite of the improper issue fee payment the Office issues the application as a patent, a reasonable individual could conclude that the issue fee payment had been proper. Further, if the improper issue fee payment is not discovered until after one year from the date on which the application became abandoned, the opportunity to request acceptance of a late paid issue fee under 37 CFR 1.155(c) or 1.316(c) is lost.

The abandonment problems described in the above-noted examples are clearly attributed to an error on the part of the applicant. Nevertheless, such a problem could be aggravated when the Office performs a positive, documented and Official act* which, in the circumstances recounted above, may be a contributing factor in the loss of an opportunity to rectify this problem by filing a petition under one of the above-noted subsections. In light of these factors, the Commissioner will exercise his authority under 37 CFR 1.183 to waive the one year period requirement for filing a petition pursuant to 37 CFR 1.137(b), 1.155(c) or 1.316(c) providing the following strictly limited conditions are present:

(1) The applicant's action or inaction which caused the application to become abandoned was clearly an unintentional oversight which resulted from a bona fide attempt, as evidenced by Patent and Trademark Office records, to comply with patent statutes, rules and procedures in order to keep the application pending as desired; and
(2) The Office performed a positive, documented and Official act* which could lead a reasonable individual to conclude that the action or inaction was proper and this conclusion was a contributing factor in the applicant's failure to realize the true abandoned status of his application in time to file a petition under one of the above-noted subsections; and
(3) A petition under 37 CFR 1.183 and one of the above-noted subsections is filed within three (3) months of the date applicant is notified by the Office or otherwise becomes aware of the abandoned status of the application; and
(4) The petition is accompanied by a terminal disclaimer with fee under 37 CFR 1.321 dedicating to the public a terminal part, equivalent to the period of abandonment, of the term of any patent granted on the application or on any application entitled to the benefit of the filing date of the application under 35 USC 120.

For a transitional period of three (3) months from the date of this Notice, the requirement for filing a petition within three (3) months of the date referred to in condition (3), above, will not be enforced providing:

(a) the abandoned application could have been restored to pending status if a petition under one of the above-noted subsections had been timely filed; and
(b) the applicant made a bona fide attempt, as evidenced by Patent and Trademark Office records, to restore the abandoned application to pending status within three months of the date applicant was notified by the Office or otherwise became aware of the abandoned status of the application.

Applicants should note that this is intended to be a very limited extension of the Commissioner's discretion in exercising his authority to waive the one year period required under the above-mentioned subsections. For this reason, the above-noted conditions and provisions will be strictly adhered to and any petition under § 1.183 which fails to comply with these conditions or provisions will be denied.

*NOTE: THE FAILURE OF THE PATENT AND TRADEMARK OFFICE TO SEND AN OFFICIAL COMMUNICATION (E.G., A NOTICE OF ABANDONMENT) IS *NOT* CONSIDERED TO BE A POSITIVE, DOCUMENTED AND OFFICIAL ACT WITHIN THE MEANING OF THIS NOTICE.

JAMES E. DENNY,
Aug. 26, 1985. *Deputy Assistant, Commissioner for Patents*

[1059 OG 4]

(107) **Procedure for Handling Amendments under 37 CFR 1.116**

On Oct. 1, 1982, pursuant to Public Law 97-247, the Patent and Trademark Office discontinued the previous practice in patent applications of extending without fee the shortened statutory period for response to a final rejection upon the filing of a timely first response to a final rejection (37CFR 1.116). Since Oct. 1, 1982, applicants are able to obtain additional time for a first or subsequent response to a final rejection by petitioning and paying the appropriate fee under 37 CFR 1.136(a), provided the additional time does not exceed the six month statutory period.

In order to continue to encourage the early filing of any first response after a final rejection and to take care of any situations in which the examiner does not timely respond to a first response after final rejection which is filed early in the period for response, the Office is changing the manner in which the period for response is set on any rejection mailed after Feb. 27, 1983.

Under the changed procedure, if an applicant initially responds within two months from the date of mailing of any final rejection setting a three-month shortened statutory period for response and the Office does not mail an advisory action until after the end of the three-month shortened statutory period, the period for response for purposes of determining the amount of any extension fee will be the date on which the Office mails the advisory action advising applicant of the status of the application, but in no event can the period extend beyond six months from the date of the final rejection. This procedure will apply only to a first response to a final rejection and will be implemented by including the following language in each final rejection mailed after Feb. 27, 1983:

> A shortened statutory period for response to this final action is set to expire three months from the date of this action. In the event a first response is filed within two months of the mailing date of this final action and the advisory action is not mailed until after the end of the three-month shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than six months from the date of this final action.

For example, if applicant initially responds within two months from the date of mailing of a final rejection and the examiner mails an advisory action before the end of three months from the date of mailing of the final rejection, the shortened statutory period will expire at the end of three months from the date of mailing of the final rejection. In such a case, any extension fee would then be calculated from the end of the three-month period. If the examiner, however, does not mail an

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advisory action until after the end of three months, the shortened statutory period will expire on the date the examiner mails the advisory action and any extension fee may be calculated from that date.

Statutory periods set in Office actions mailed before Feb. 28, 1983, will not be effected by this change in procedure.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Jan. 14, 1983.

[1027 OG 71]

(108) **Expedited Procedure for Processing Amendments and Other Responses After Final Rejection (37 CFR 1.116)**

In an effort to improve the timeliness of the processing of amendments and other responses under 37 CFR 1.116, and thereby provide better service to the public, the Patent and Trademark Office (PTO) is establishing, effective immediately, an expedited processing procedure which the public may utilize in filing amendments and other responses after final rejection under 37 CFR 1.116. In order for an applicant to take advantage of the expedited procedure the amendment or other response under 37 CFR 1.116 will have to be marked as a "Response Under 37 CFR 1.116—Expedited Procedure-Examining Group (Insert Examining Group Number)" on the upper right portion of the amendment or other response and the envelope must be marked "Box AF" in the lower left hand corner. The markings preferably should be written in a bright color with a felt point marker. If the response is mailed to the Office, the envelope should contain only responses under 37 CFR 1.116 and should be mailed to "Box AF, Commissioner of Patents and Trademarks, Washington, D.C. 20231." Instead of mailing the envelope to "Box AF" as noted above, the response may be hand-carried to the particular Examining Group or other area of the Office in which the application is pending and marked on the outside envelope "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)".

Upon receipt by the PTO from the Postal Service of an envelope appropriately marked "Box AF," the envelope will be specially processed by the PTO Mail Room and forwarded promptly to the Examining Group, via the Office of Finance if any fees have to be charged or otherwise processed. Upon receipt of the response in the Examining Group it will be promptly processed by a designated clerical employee and forwarded to the examiner, via the Supervisory Primary Examiner (SPE), for action. The SPE is responsible for ensuring that prompt action on the response is taken by the examiner. If the examiner to which the application is assigned is not available and will not be available for an extended period, the SPE will ensure that action on the application is promptly taken to assure meeting the PTO goal described below. Once the examiner has completed his or her consideration of the response, the examiner's action will be promptly typed and mailed by clerical employees designated to expedite the processing of responses filed under this procedure. The Examining Group supervisory personnel, e.g., the Supervisory Primary Examiners, Supervisory Applications Clerk, and Group Director are responsible for ensuring that actions on responses filed under this procedure are promptly processed and mailed.

The PTO goal is to mail the examiner's action on the response within one month from the date on which the amendment or response is received by the PTO. The PTO is establishing monitoring procedures to determine how well the goal is being achieved. If the goal of mailing the action on the response within one month or less is not achieved in a high percentage of applications, e.g., at least 90-95% of appropriately marked responses, after a reasonable trial period, the PTO will institute further changes in procedures in the future which will give appropriate relief to applicants in cases where the delay is due to Office processing.

Applicants are encouraged to utilize this expedited procedure in order to facilitate PTO processing of responses under 37 CFR 1.116. If applicants do not utilize the procedure by appropriately marking the envelope and enclosed papers, the benefits expected to be achieved therefrom will not be attained. The procedure cannot be expected to result in achievement of the goal in applications in which the delay results from actions by the applicant, e.g., delayed interviews, applicant's desire to file a further response, or a petition by applicant which requires a decision and delays action on the response. In any application in which a response under this procedure has been filed and no action by the examiner has been received within the time referred to herein, plus normal mailing time, a telephone call to the SPE of the relevant Group Art Unit would be appropriate in order to permit the SPE to determine the cause for any delay. If the SPE is unavailable or if no satisfactory response is received, the Group Director of the Examining Group should be contacted.

Any comments on this expedited procedure during the trial period are invited and should be directed to the attention of Rene D. Tegtmeyer, Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks..Designate.

Sept. 20, 1985.

[1059 OG 19]

(109) **New Procedures for Recordation of Interviews**

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the *Official Gazette* of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977.Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in section 713.04 of the Manual of Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information:

...Serial Number of the application
...Name of applicant
...Name of examiner
...Date of interview
...Type of interview (personal or telephone)
...Name of participant(s) (applicant, attorney or agent, etc.)
...An indication whether or not an exhibit was shown or a demonstration conducted
...An identification of the claims discussed
...An identification of the specific prior art discussed
...An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
...The signature of the examiner who conducted the interview
...Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted.
2) an identification of the claims discussed.
3) an identification of specific prior art discussed.
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner.
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner.
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Aug. 30, 1977.

[962 O.G. 21]

(110) **Viewing of Video Tapes During Interviews**

The Patent and Trademark Office has video tape equipment available in the facilities of the Patent Academy for viewing video tapes from applicants during interviews with patent examiners.

The video tape equipment may use VHS and UHS (3/4 inch tape) cassettes.

Attorneys or applicants wishing to show a video tape during an examiner interview must be able to demonstrate that the content of the video tape has a bearing on an outstanding issue in the application and its viewing will advance the prosecution of the application. Prior approval of viewing of a video tape during an interview must be granted by the SPE. Also, use of the room and equipment must be granted by the Training Manager to avoid any conflict with the Patent Academy.

Requests to use video tape viewing equipment for an interview should be made at least one week in advance to allow the Patent Academy staff sufficient time to ensure the availability and proper scheduling of both a room and equipment.

Interviews using Office video tape equipment will be held only in the Academy facilities located in One Crystal Park, Rm. 502. Attorneys or applicants should not contact the Patent Academy directly regarding availability and scheduling of video equipment. All scheduling of rooms and equipment should be done through and by the examiner conducting the interview.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

May 6, 1986.

[1067 OG 4]

(111) **Statements Filed Under Atomic Energy Act And NASA Act**

Attention is called to the provisions of section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) and section 305(*c*) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457). These statutes provide that the title to inventions useful in the production or utilization of special nuclear material or atomic energy, made or conceived in the course of or under any contract, subcontract, or arrangement entered into with or for the benefit of the Atomic Energy Commission, and any invention made in the performance of any work under any contract of the National Aeronautics and Space Administration, shall be vested in the United States. They also provide that no patent may be granted for any invention useful in the production or utilization of special nuclear material or atomic energy, or which in the opinion of the Commissioner has significant utility in the conduct of aeronautical or space activities, unless the applicant files with his application or within 30 days after request therefor by the Commissioner, a statement under oath setting forth (*a*) the full facts in regard to the making or conception of the invention, and (*b*) the situation with regard to the contractual relationships involving the Commission or the Administration. Careful attention should be given the exact wording of the requirements of whichever of these sections is pertinent in order to assure that all of the requirements are met. Since the duty of requiring the statements is placed by law on the Commissioner of Patents, it is incumbent on the Commissioner to determine whether the statements are timely filed and sufficient in substance to comply. Since these laws do not provide for any extension of the 30-day period or for reviving an applicaton which has become abandoned for failure to file a proper statement, it is important that such statements be timely filed and that they do so comply in order to avoid loss of valuable patent rights.

The "full facts" involved in the conception and making of an invention should include those which are unique to that invention. The use of form paragraphs or printed forms which

set forth only broad generalized statements of fact is not ordinarily regarded as meeting the requirements of these statutes.

This office has construed the word "applicant" in both of these statutes to mean the inventor or joint inventors in person. Accordingly, in the ordinary situation, the statements must be signed by the inventor or joint inventors, if available. This construction is consistent with the fact that no other person could normally be more knowledgeable of the "full facts concerning the circumstances under which such invention was made," (42 U.S.C. 2457) or, "full facts surrounding the making or conception of the invention or discovery" (42 U.S.C. 2182).

In instances where an applicant does not have first-hand knowledge whether the invention involved work under any contract, subcontract, or arrangement with or for the benefit of the Atomic Energy Commission, or had any relationship to any work under any contract of the National Aeronautics and Space Administration, and includes in his statement information of this nature derived from others, his statement should identify the source of his information. Alternatively, the statement by the applicant could be accompanied by a supplemental declaration or oath, as to the contractual matters, by the assignee or other person, e.g., an employee thereof, who has the requisite knowledge.

Where an applicant is deceased or incompetent, or where it is shown to the satisfaction of this Office that he refuses to furnish a statement or cannot be reached after diligent efforts, declarations or statements under oath setting forth the information required by the statutes may be accepted from an officer or employee of the assignee who has sufficient knowledge of the facts. The offer of such substitute statements should be based on the actual unavailability of or refusal by the applicant, rather than mere inconvenience. Where it is shown that one of joint inventors is deceased or unavailable, a statement by all of the other joint inventor(s) may be accepted.

WILLIAM FELDMAN,
Aug. 13, 1973. *Deputy Assistant Commissioner for Patents.*

[914 O.G. 2]

(112) **NOTICE OF CHANGES IN THE ADMINISTRATION OF 42 U.S.C. 2182 AND 2457 (PROPERTY RIGHTS STATEMENTS TO DOE AND NASA).**

Effective Nov. 1, 1986, the PTO will change the procedures under which property rights statements to the Department of Energy (DOE), 42 U.S.C. 2182, or National Aeronautics and Space Administration (NASA), 42 U.S.C. 2457 are requested and processed. These statements are required before a patent can issue on any invention useful in the production or utilization of special nuclear material or atomic energy (for the Department of Energy) or having significant utility in the conduct of aeronautical and space activities (for the National Aeronautics and Space Administration).

Currently, the PTO waits until after an application is otherwise in condition for allowance before property rights statements are requested. Under the new procedure, if a statement is necessary, an informal request for the statement will be issued shortly after filing. The request will identify which chapter(s) of the statute apply and an informal period of 45 days will begin running from the mail date of the notice.

If no response is received within 45 days, a formal notice will be issued. The statutory period for response to the formal notice is 30 days. There is no provision for extension of this time limit, and the penalty for failure to file an acceptable, timely statement is abandonment. In view of these strict time limits and penalties, applicants are strongly urged to take advantage of the period for informal correspondence by responding to the so-called 45-Day Letter. Additionally, the new 45-Day Letter will provide extensive information on the format and content of an acceptable statement. This should relieve many of the difficulties applicants currently experience in generating the statement. See also 914 OG. 2 for additional information on the form and content of property rights statements.

The statement should be an accurate reflection of the ownership of the invention on which patent protection is granted. Thus, if during prosecution before the examiner the claimed invention is so changed or the property rights situation so altered as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. In those rare situations where property rights may be changed by an amendment to the claims after the statement has been filed, applicants are reminded that failure to submit such additional information where appropriate may be considered a false representation of material facts and render the patent owner vulnerable to sanctions as set forth in the above statutes. The PTO will not review applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

The text of the new 45-Day Letter is reproduced below.

• • • • •

The subject matter of this application appears to:
... be "useful in the production or utilization of special nuclear material or atomic energy " as recited in 42 U.S.C. 2181 (Department of Energy (DOE)).
... have significant utility in the conduct of aeronautical and space activities as recited in 42 U.S.C. 2457 (National Aeronautics and Space Administration (NASA)).

Accordingly, no patent can issue on this application unless applicant(s) file a statement (under oath or in the form of a declaration as provided by 37 CFR 1.68) setting forth (1) the full facts concerning the circumstances under which the invention was made and conceived and (2) the relationship (if any) of the invention to the performance of any work under any contract or other arrangement with the Agency(ies) noted above. On the reverse side of this form is an example of an acceptable format for this statement. The language appearing in paragraphs III and/or IV of the example *must* appear if applicant is attempting to establish that no relationship (under item 2 above) exists.

If the invention disclosed in this application was developed under a contract, grant or cooperative agreement between the Agency(ies) indicated above and a person, small business or non-profit organization and rights to the invention have been determined by specific reference to 35 U.S.C. 202 in the contract, grant or cooperative agreement, then applicant need not submit the statement described above. Instead, applicant may file a verified statement (under oath or in the form of a declaration, 37 CFR 1.68) setting forth the information required by 35 U.S.C. 202(c)(6).

IF NO STATEMENT HAS BEEN RECEIVED WITHIN FORTY-FIVE DAYS OF THE MAIL DATE INDICATED ABOVE, a formal requirement for statement will then be issued. No provision is made for extension of the statutory thirty-day period for response to the formal requirement and the penalty for failure to file an acceptable and timely statement is abandonment of the application. Therefore, applicants are strongly encouraged to submit a statement at this time in order to avoid the issuance of a formal requirement.

IT IS IMPORTANT TO NOTE that the statement must accurately represent the property rights situation of the claimed invention if and when the application is found allowable. Thus, if during prosecution before the examiner, the claimed invention is so altered or the property rights situation so changed as to impact the accuracy of a statement submitted earlier, a supplemental statement must be filed. Failure to submit such additional information where appropriate may be considered as false representation of material facts and render the patent owner vulnerable to loss of patent rights and other sanctions as set forth in the statutes. The PTO will not review allowed applications for this possibility. The responsibility for complying with the statutes rests with the applicants.

Any questions regarding this requirement should be directed to Licensing and Review at (703) 557-4948.

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The following is an example of an acceptable property rights statement. Statements of this type are, of course, only suitable for situations in which *NO* Agency funds or other considerations were involved in the making or conception of the invention. While this example is in the form of a declaration, a sworn document is equally acceptable.

• • • • •

I (We)_____,
citizens of_____residing
at_____.
declare:

That I(we) made and conceived the invention described and claimed in patent application Serial Number_____
filed in the United States of America on_____,
titled.
_____
_____

(Check and complete either I. or II. below)

____I. (For Inventors Employed by an Organization)

That I (we) made and conceived this invention while employed by_____.
That the invention is related to the work I am (we are) employed to perform and was made within the scope of my (our) employment duties;
That the invention was made during working hours and with the use of facilities, equipment, materials, funds, information and services of ____(name of employer)_____.
Other relevant facts are_____
_____

That to the best of my (our) knowledge and belief (and/or based upon information provided by

of_____):

...OR...

____II. (For Self-Employed Inventors)

that I (we) made and conceived this invention on my (our) own time using only my (our) own facilities, equipment, materials, funds, information and services. Other relevant facts are
_____
_____
That to the best of my (our) knowledge and belief:
_____
(Check III and/or IV below as appropriate)

____III. The invention was not made or conceived in the course of, or in connection with, or under the terms of any contract, subcontract or arrangement entered into with or for the benefit of the United States Atomic Energy Commission or its successors: Energy Research and Development Administration or the Department of Energy.

...AND/OR...

____IV. The invention was not made (conceived or first actually reduced to practice) under nor is there any relationship of the invention to the performance of any work under any contract of the National Aeronautics and Space Administration.

The undersigned inventor(s) declare further that all statements made herein of his or her (their) own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Inventor's Signature:
Post Office Address:
Date:

Inventor's Signature:
Post Office Address:
Date:

• • • • •

Information regarding these changes in the processing of property rights statements may be obtained by calling or writing Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231 (703-557-4 2877).

DONALD J. QUIGG,
Sept. 16, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1071 OG 14]

(113) **Extension of Time Limit**

This notice is intended to clarify certain misunderstandings and indicates the treatment given to requests for an extension of time in a situation where applicant has been given a time limit to complete an otherwise incomplete but bona fide attempt to respond to the previous Office action and advance the case to final action.

According to 37 CFR 1.135(c) when the applicant has filed a response to an examiner's action but consideration of some matter or compliance with some requirement has been inadvertently omitted, an opportunity to explain and supply the omission may be given before the question of abandonment is considered. According to the M.P.E.P., Section 710.02(c), the examiner may give applicant one month or the remainder of the period for response, whichever is longer, to complete the response. Neither the regulation nor the M.P.E.P. indicate that this time can be extended.

Under the regulation, the missing matter or lack of compliance must be considered by the examiner as being "inadvertently omitted." Once an inadvertent omission is brought to the attention of the applicant, the question of inadvertence no longer exists. Therefore, any further time to complete the response would not be appropriate under 37 CFR 1.135(c). Accordingly, no extension of time will henceforth be granted in these situations.

WILLIAM FELDMAN,
Nov. 28, 1977 *Deputy Assistant Commissioner for Patents.*

[965 O.G. 14]

(114) **TITLE 37...PATENTS, TRADEMARKS AND COPYRIGHTS**

Chapter 1...Patent and Trademark Office, Department of Commerce

Part 1...Rules of Practice in Patent Cases

Patent Examining and Appeal Procedures

On October 4, 1976 notice was given in the Federal Register (41 FR 43729) of a proposal to amend sixteen sections of Title 37 of the Code of Federal Regulations relating to patent examining and appeal procedures. Interested persons were invited to comment on the proposal by December 7, 1976. One hundred seventy-five written letters and statements were submitted. A hearing was held in Arlington, Virginia on December 7, 1976 at which 21 persons testified orally. Careful consideration has been given to all comments received and the proposal is being adopted with certain changes.

The regulations adopted involve all sections that were proposed to be revised, amended or added—namely, §§ 1.11, 1.14, 1.52, 1.56, 1.65, 1.69, 1.97, 1.98, 1.99, 1.109, 1.175, 1.194, 1.196, 1.291, 1.292, and 1.346. Amendments also are being made in two sections which were not included in the published

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proposal—§§ 1.51 and 1.176. Since amendments to these sections are closely related to the substance of matters notice and public comment on these amendments are deemed unnecessary.

In addition, amendments are being adopted which were published for comment in two earlier, much less extensive proposals that concerned availability of certain files for public inspection. A notice of a proposed amendment to § 1.14(b) was published on June 4, 1974 (39 FR 19786). A notice of a proposed amendment to § 1.11(a) was published on September 17, 1974 (39 FR 33376). No negative comments were submitted with respect to either of these proposals and both are being adopted without change.

The text of the rules will be reproduced in the Patent and Trademark Office **Official Gazette** in about a month with additions indicated by arrows and deletions indicated by brackets to help readers identify the changes. A transcript of the hearing, the letters and written statements received, and a summary and analysis of the comments are available for public inspection in Room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

Purpose of Rules

The purpose of the rules that are being adopted is to improve the quality and reliability of issued patents by strengthening patent examining and appeal procedures. It is desirable that patents be as dependable as possible, so as to enhance the incentives provided by the patent system to make inventions, to invest in research and development, to put new or improved products on the market, and to disclose inventions that otherwise would be kept as trade secrets. It is believed that the rules being adopted will help to maintain strong patent incentives.

The rules afford patent owners an opportunity, through the filing of a reissue application, to obtain a ruling from an examiner on the pertinence of additional prior art after a patent has been issued. The rules also broaden the public's opportunity for participation in the patent examining process, consistent with the limitations of statute, the protection of trade secrets, and the need to avoid making it unduly expensive to obtain a patent.

The rules set forth the duty of candor and good faith which applicants have to the Patent and Trademark Office and encourage them to provide information about the prior art in a way that will make it more useful to examiners. A provision for foreign language oaths by individuals who do not understand English is intended to make them more aware of their representations and of their obligations.

Under the rules more Patent and Trademark Office decisions that could have important precedent value will be available to the public, and some additional files will be available for inspection. Proceedings before the Board of Appeals are modified to help avoid the issuance of invalid patents. The rules encourage examiners to see that persons inspecting the file history of issued patents will be able to tell why the case was allowed.

Reissue Applications

Amended § 1.175 permits a patent owner to have new prior art considered by the Office by way of a reissue application without making any changes in the claims or specification. It is adopted with no change from the proposal. The requirement for an oath or declaration alleging that the reissue applicant believes "the original patent to be wholly or partly inoperative or invalid. . . ." is dispensed within § 1.175(a) (1) unless the applicant believes that to be the case. Section 1.175(a) (4) recognizes that reissues may be filed to have the patentability of the original patent considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

Thus, a patentee may file a reissue if he believes his patent is valid over prior art not previously considered by the Office but would like to have a reexamination. The procedure may be used at any time during the life of a patent. During litigation, a federal court may, if it chooses, stay proceedings to permit new art to be considered by the Office.

If a reissue application is filed as a result of new prior art with no changes in the claims or specification and the examiner finds the claims patentable over the new art, the application will be rejected as lacking statutory basis for a reissue, since 35 USC 251 does not authorize reissue of a patent unless it is deemed wholly or partly inoperative or invalid. However, the record of prosecution of the reissue will indicate that the prior art has been considered by the examiner.

A substantial majority of the comments received favored amended § 1.175 as a means for improving the reliability of patents and avoiding unnecessary litigation costs. The negative comments generally questioned the statutory authority of the Commissioner to adopt this section. Authority for § 1.175 is believed to exist in 35 U.S.C. 6, which is the Commissioner's rulemaking authority, and in 35 U.S.C. 251. The latter section of the statute requires that the patent be deemed wholly or partly inoperative or invalid before a reissue may be granted, but does not require such a belief by the patentee before a reissue application may be filed. The case law does not suggest that the approach of new § 1.175(a)(4) is inconsistent with 35 U.S.C.251.[1] Inasmuch as 35 U.S.C.251 is a remedial provision,[2] it is believed that a liberal interpretation is justified and that adequate authority exists for the amended section.

Amended § 1.11(b) opens all reissue applications to inspection by the general public. Section 1.11(b) also provides for announcement of the filings of reissue applications in the *Official Gazette*. This announcement will give interested members of the public an opportunity to submit to the examiner information pertinent to patentability of the reissue application. The announcement will include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned. Section 1.11(b) is amended from the proposal to so indicate. Reissue applications already on file on the effective date of the section will not be automatically open to inspection and will not be announced in the *Official Gazette*. However, a liberal policy will be followed in granting petitions for access to individual applications already on file.

In order that members of the public may have time to review the reissue application and submit pertinent information to the Office before the examiner's action, § 1.176 is amended to provide that reissue applications will not be acted on sooner than two months after the *Official Gazette* announcement of filing. A substantial majority of the comments received favored adoption of § 1.11(b). The only opposition was based upon a suggestion that no statutory authority exists. However, since reissue applications contain no new disclosure, and therefore no trade secrets or confidential information, they are considered to present a "special circumstance" within the meaning of 35 U.S.C. 122.

The insertion of "all" as the fifth word of the first sentence of § 1.11(b) is for clarity. The word "furnished" is changed to "obtained" in § 1.11 for clarity.

Protests and Public Use Proceedings

Amended §§ 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions in avoiding the issuance of invalid patents.

A substantial majority of the comments favored these sections and viewed them as improving the quality of issued patents. Entry of protests has been upheld in court.[3]

Section 1.291(a) provides that public protests against pending applications will be entered in the application file and will, if they meet stated requirements, be considered by the examiner. To guarantee consideration by the examiner, protests must be accompanied by copies of prior art documents relied upon, although protests without copies will not necessarily be ignored. This is similar to the requirement of new § 1.98 that copies of patents and publications accompany prior art statements. Section 1.291 does not contemplate permitting a protester to participate as a party in further proceedings. In the case of

[1] See *In re Clark*, F.2d 623, 187 USPQ 209 (CCPA 1975), at footnote 4 where the court declined to decide whether it is proper to seek reissue merely to disclose uncited prior art. See also *In re Altenpohl*, 500 F.2d 1151, 183 USPQ 38 (CCPA 1974).

[2] See it *In re Oda*. 443 F.2d 1200, 170 USPQ 268 (CCPA 1971).

[3] *International Paper Co. v. Fibreboard Corp.*, 63 F.R.D. 88, 181 USPQ 740 (D. Del. 1974).

applications available to the public, such as reissue applications, the protester may file papers rebutting statements made by the applicant. The examiner at his discretion may request a protester to submit additional written information or may provide extra time for comments by a protester to be filed.

To ensure consideration by the examiner, all protests must be timely submitted. Protests will generally be considered timely submitted, if they are filed before final rejection or allowance of the application by the examiner. The consideration given to protests filed after final rejection or allowance of the application by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Obviously, if the prior art documents anticipate or clearly render obvious one or more claims they will not knowingly be ignored. It must be recognized, however, that the likelihood of consideration by the examiner decreases as the patent date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

The first sentence of § 1.291(a) is deleted as unnecessary. Section 1.291(a) also is changed from the proposal to make clear that it applies to pending applications and that all protests will be referred to the examiner having charge of the subject matter involved.

Section 1.291(b) incorporates the existing Office policy of permitting persons to submit prior art citations or copies of prior art after a patent has been granted. The section is changed from the proposal by the addition of the words "any papers related thereto" to recognize that statements as to the pertinence of prior art may be submitted. Both the citations and the related papers are to be entered without comments. The material submitted is not examined by the Office but is available to members of the public inspecting Office records.

Some suggestions were received for major modifications of § 1.291. It was suggested that an advisory opinion of the examiner be placed in the patent file when protests were received after issuance of the patent. Several persons supported a suggestion for examiners to state whether a "new issue" was raised by prior art cited by a protester. Another suggestion was that a procedure similar to that used in the recent Trial Voluntary Protest Programs[4] be adopted on a continuing basis. These suggestions were carefully considered, but are not adopted. The suggestions extend substantially beyond [g49 1.291 as proposed, and their benefits do not appear sufficient to justify the added cost at this time.

Materials submitted to the Office under §§ 1.291 and 1.292 are to be served upon the applicant, patentee, attorney or agent when possible. The term "patentee" is used in its ordinary sense as defined in 35 USC 100(d). If service is not possible, materials are to be submitted in duplicate so that the Office can attempt to send the duplicate copy. The proposal is changed by adding the words "with the Office" after "filed" in §§ 1.291(c) and 1.292(b) for clarity.

In § 1.292, the requirement that petitioner bear the Office's expenses in conducting the public use proceeding is deleted. Section 1.292 is also amended to ensure that the existence of public use proceedings is recorded in the application file wrapper. Notice of a petition for a public use proceeding will be entered in the file in lieu of the petition itself when the petition and the accompanying papers are too bulky to accompany the file. Any public use papers not physically entered in the file will be publicly available whenever the application file wrapper is available.

Duty of Disclosure

Amended § 1.56 defines the duty to disclose information to the Office and the criteria for striking an application when that duty is violated. The wording of the section is changed in several respects from the proposal, but the purpose and general scope are the same as in the proposal. The section codifies the existing Office policy on fraud and inequitable conduct, which is believed consistent with the prevailing case law in the federal courts. The expanded wording of the section is intended to be helpful to individuals who are not expert in the judicially developed doctrines concerning fraud. The section should have a stabilizing effect on future decisions in the Office and may afford guidance to courts as well.

A majority of comments received favored § 1.56 as proposed or with modifications. Persons opposed expressed concern over the imprecise definition of the duty of disclosure and the possibility that the proposal would substantially increase the burden on patent applicants. Some stated that there would be increased litigation as a result of the proposal. Several suggestions were received on better ways to define the individuals who should disclose information and the kinds of information that should be disclosed.

The first sentence of § 1.56(a) is changed from the proposal adding the word "substantively," so that individuals having a duty of disclosure are limited to those who are "substantively involved in the preparation or prosecution of the application." This change is intended to make clear that the duty does not extend to typists, clerks, and similar personnel who assist with an application. This phrase, when taken with the last sentence of § 1.56(a), is believed to provide an adequate indication of the individuals who are covered by the duty of disclosure. The word "with" is inserted in the first sentence of § 1.56(a) before "the assignee" and before "anyone to whom there is an obligation to assign" to make clearer that the duty applies only to individuals, not to organizations.

Numerous comments concerned the term "relevance" that was used in the proposal. In response to the comments, language is substituted in § 1.56 and related sections which is believed to establish a clearer standard for determining whether information need be disclosed to the Office. "Relevant" is replaced by "material" because the latter term connotes something more than a trivial relationship. It appears to be more commonly used in court opinions. In addition, the third sentence of § 1.56, which defines materiality, is rewritten. The sentence now states that information is material "where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." The sentence paraphrases the definition of materiality used by the Supreme Court in its recent decision in *TSC Industries* v. *Northway*.[5] Although in that case the court was concerned with rules promulgated by the Securities and Exchange Commission, the Court's articulation of materiality is believed consistent with the prevailing concept that has been applied by lower courts in recent patent cases.

The definition of materiality in § 1.56 will have to be interpreted in the context of patent law rather than securities law. Principles followed by courts in securities cases should not be translated to patent cases automatically. It is noteworthy, however, that in formulating the definition of materiality in *TSC Industries* the Supreme Court considered some of the same matters over which concern was expressed in the public comments on proposed § 1.56. The court noted that the standard of materiality should not be so low that persons would be "subjected to liability for insignificant omissions or misstatements," or so low that the fear of liability would cause management "simply to bury the shareholder in an avalanche of trivial information—a result that is hardly conducive to informed decision making."[6]

Although the third sentence of § 1.56(a) refers to decisions of an examiner, it is intended that the duty of disclosure would apply in the same manner in the less common instances where the official making a decision on a patent application is someone other than an examiner—e.g., a member of the Board of Patent Interferences or the Board of Appeals. This is implicit in the duty "of candor and good faith" toward the Office that is specified in the first sentence of § 1.56(a).

Comments and questions were received concerning the term "information" used in the second and third sentences of § 1.56(a) and elsewhere. It means all of the kinds of information required to be disclosed under current case law. In addition to prior art patents and publications, it includes information on prior public uses, sales, and the like. It is not believed practicable to define information in the text of the rule at this time. However, the rule is not intended to require disclosure of information favorable to patentability...e.g., evidence of commercial success of the invention. Neither is it meant to require disclosure of

[4] 923 O.G. 2; 930 O.G. 1454; 938 O.G. 945

[5] U.S.... 48 L. Ed. 2d 757, 96 S. Ct. 2126, 44 U.S.L.W. 4852, decided June 14, 1976.

[6] 426 U.S. at..., 48 L. Ed. 2d at 763, 96 S. Ct. at 2132, 44 U.S.L.W. at 4855.

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information concerning the level of skill in the art for purposes of determining obviousness.

Several comments were received concerning the duty to disclose information the patent applicant regards as confidential, including information the applicant has received from another party under an injunction of secrecy. This problem has existed prior to amendment of § 1.56. The Patent and Trademark Office, of course, keeps information disclosed by applicants confidential until a patent is issued. It has been suggested that the Office should develop a mechanism for continuing to hold information in confidence after issuance of a patent if in the judgment of the examiner the information is not material to the examination of the application. The feasibility of offering a rule for public comment on this topic at a later date will be considered.

New § 1.56(b) is added to make clear that information may be disclosed to the Office through an attorney or agent of record or through a pro se inventor, and that other individuals may satisfy their duty of disclosure to the Office by disclosing information to such an attorney, agent or inventor. Information that is not material need not be passed along to the Office.

Proposed sections 1.56 (b) and (c) have been revised and shortened and appear at §§ 1.56 (c) and (d). The proposal was criticized for leaving it open to the Office to apply a different standard of materiality from the one set forth in § 1.56.[7] Section 1.56(d) as adopted states that an application "shall" be stricken when the criteria set forth are met. Thus § 1.56(d) as adopted establishes a single standard for striking applications.

The term "inequitable conduct" is dropped from § 1.56(d) as covering too great a spectrum of conduct to be subject to mandatory striking. Inequitable conduct that is equivalent to fraud is intended to come within the definition of fraud. The Court of Customs and Patent Appeals already has interpreted "fraud" in existing § 1.56 to encompass conduct of this sort.[8] Moreover, § 1.56(d) as adopted calls for striking an application either for fraud or for a violation of the duty of disclosure.

In § 1.56(d) "bad faith" is substituted for the term "deliberate" that was used in the proposal. This change is to make clear than an intent to deceive (or gross negligence equivalent to such an intent) must be shown before an application will be stricken. Bad faith is not present if information is withheld as a result of an error in judgment or inadvertence.

Several comments concerned whether attorneys and agents could represent their clients' interests and at the same time comply with § 1.56. Similar comments were directed to §§ 1.97 to 1.99. It is of course in the interest of the client to have a valid patent and this cannot be obtained without disclosure of known material facts. It is not inconsistent for an attorney or agent to fulfill his duty of candor and good faith to the Office and to act as an advocate for his client. The submission of information under § 1.56 does not preclude the submission of arguments that such information does not render the subject matter of the application unpatentable.

In § 1.65 a new third sentence is added to require the patent applicant to acknowledge the duty of disclosure. The language is changed from the proposal to be consistent with changes made in § 1.56. To allow time for the Office and applicants to revise printed oath and declaration forms now in use, the mandatory acknowledgement of the duty of disclosure in amended § 1.65 does not become effective until January 1, 1978. Applicants at their option may include the new language in oaths and declarations filed prior to the effective date. The Office will publish a separate notice in the Federal Register adding a sentence acknowledging the duty of disclosure to appropriate forms in 37 CFR Part 3, "Forms for Patent Cases."

The word "statement" is deleted from the title of § 1.65 to avoid confusion with the prior art statement of § 1.97 through 1.99.

Amended § 1.346 emphasizes that there must be a reasonable basis to support every allegation of improper conduct made by a registered practitioner in any Office proceeding. The language that was proposed is clarified in the section as adopted. Although § 1.346 is limited to papers filed in Office proceedings, the amendment to § 1.346 is not intended to imply that disciplinary action never will be taken against a registered practitioner under § 1.348 for a groundless allegation of improper conduct in a court proceeding.

[7]See discussion accompanying, proposed rules in Federal Register of Oct. 6, 19786, page 43731, first sentence.

[8]*Norton* v. *Curtiss*, 433 F.2d 779, 792, 167 USPQ 532, 543 (CCPA 1970).

Prior Art Statement

New §§ 1.97, 1.98 and 1.99 deal with prior art statements and provide a mechanism by which patent applicants may comply with the duty of disclosure provided in § 1.56. The sections have been substantially changed from the proposal, in response to comments received.

Unlike the corresponding part of the proposal, the sections as adopted are not mandatory, though applicants are strongly encouraged to follow the procedures described in them. Applications will be examined whether or not a prior art statement is filed and whether it complies with the rules or is defective. It is nevertheless believed that applicants will find that the use of prior art statements complying fully with the requirements of §§ 1.97 through 1.99 will be the best way to satisfy the duty of disclosure. The Patent and Trademark Office cannot assure that prior art disclosed in other ways will be considered by the examiner.

Sections 1.97 through 1.99 do not prescribe the content of what materials should be submitted in the prior art statement; this is for the applicant and the attorney or agent to decide in the light of the duty of disclosure expressed in § 1.56. The only criterion contained in §§ 1.97 through 1.99 as to content of the art cited is in § 1.97(b). This subsection indicates that the statement will be construed as a representation that the prior are listed includes what the submitter considers to be the closest art of which he is aware. The submitter need not decide which particular items of prior art are the closest or identify any items as such; the representation is simply that he is not withholding known prior art which he considers closer than that which is submitted. Section 1.97(b) makes clear that the prior art statement is not representation that a search has been made or that no better art exists.

In § 1.97(a) the time for filing the prior art statement is extended from the two months of the original proposal to three months. In most cases prior art submitted within three months will be available to the examiner before he takes up the case for action, though it will be helpful if citations are made as promptly as possibie.

Section 1.98 lists the elements of the prior art statement: a listing of the art, a concise explanation of the relevance of each listed item, and copies of the art or the pertinent portions thereof.

The prior art statement resembles somewhat the "patentability statement" of the proposal and the "patentability brief" proposed elsewhere.[9] The name has been changed to reflect a change in the requirements of § 1.98(a). Unlike the proposed version of this paragraph, which called for an explanation of why the claimed invention is believed patentable over the cited art, the paragraph as adopted calls only for a concise explanation of the relevance of each listed item. This may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention. It might be a simple statement pointing to similarities between the item of prior art and the claimed invention. It is permissible but not necessary to discuss differences between the prior art and the claims. It is thought that the explanation of relevance will be essentially as useful to the examiner as the formerly proposed explanation of patentability, and should be significantly less burdensome for the applicant to prepare.

Section 1.98 requires a copy of each patent or publication cited, including U.S. patents, to accompany the prior art statement. Several comments questioned the need for burdening the applicant to supply copies of materials that are present in the Office's files. However, substantial time and effort often is needed to locate a document in the Office's files. Since the person submitting the prior art statement generally has available a copy of the item being cited, it is believed that expense and effort can be minimized by having that person supply the copy in all cases. Consideration has been given to proposals to allow the applicant to submit an order for copies of the patents along with his statement instead of actually submitting copies. This will be further studied, but to date no way has been found to assure that the copies will be available to the examiner by the first action unless the applicant submits them with the prior art statement.

[9]E.g., Federal Register of Sept. 9, 1968, 34 FR 14176, 866 O.G. 1402; S. 2255, 94th Congress, § 131(b).

Other changes to §§ 1.97 through 1.99 from the proposal eliminate unnecessary language and clarify the requirements.

A notice published in 1974[10] contained guidelines for the citation of prior art by applicants. Many of those guidelines are repeated or superseded by §§ 1.97 through 1.99. In order to allow applicants, attorney and agents time to adjust their procedures to comply with the requirements for prior art statements, the effective date of §§ 1.97 through 1.99 will be July 1, 1977. Until these new sections become effective, applicants should continue to follow the 1974 guidelines. Issuance of a revised notice, to take effect July 1, 1977, is under study.

A survey conducted by the Office in 1976 concludes that many applicants have not been citing prior art to the Office.[11] It is hoped that with the duty of disclosure expressly set forth in § 1.56, applicants will perceive that it is to their advantage to use the procedures of §§ 1.97 through 1.99.

Section 1.51 is amended by designating the existing rule as § 1.51(a) and adding new § 1.51(b) which contains a reference to §§ 1.97 through 1.99.

Foreign Language Oaths

Amended § 1.52 and new § 1.69 are adopted as proposed.

Section 1.69 requires that oaths and declarations be in a language which is understood by the individual making the oath or declaration, i.e., a language which the individual comprehends. If the individual comprehends the English language, he must use it. If the individual cannot comprehend the English language, any oath or declaration must be in a language which the individual can comprehend. If an individual uses a language other than English for an oath or declaration, the oath or declaration must include a statement that the individual understands the content of any documents to which the oath or declaration relates. If the documents are in a language the individual cannot comprehend, the documents may be explained to him so that he is able to understand them.

The Office will provide approved translations for as many of the oath or declaration forms which appear in Part 3 of Title 37 of the Code of Federal Regulations as practicable, and in as many languages as practicable, probably using a side-by-side English/foreign language format. The availability of the foreign language forms will be announced in the *Official Gazette* at a later date.

The change in § 1.52, providing for an exception to the requirement that oaths and declarations be in the English language, is necessitated by the adoption of § 1.69.

Although very few persons opposed §§ 1.52 and 1.69, several suggested that the philosophy behind the change be extended to the specification, requiring the specification to be in a language which the applicant understands, accompanied by an English translation. This suggestion was not considered feasible because of the obvious burdens on the applicant and the danger to the applicant and the public if the translation is not literally correct. Also, if a large number of applications were filed in a foreign language, there would be significant administrative burdens on the Office. Attention is directed to the Manual of Patent Examining Procedure. § 608.1, which permits non-English language applications to be filed in certain limited circumstances.

Other suggested modifications of the proposed rule included: (1) using an English language oath or declaration with one additional clause in a language understood by the person making the oath or declaration, the clause stating that the person understands all the documents to which the oath or declaration relates; and (2) extending the two month grace period for filling an English translation of an oath or declaration filed under § 1.65.

After due consideration, suggestion (1) was believed not to accomplish the objectives of the rule as well as the adopted rule. Suggestion (2) would cause unsatisfactory delays in the initial processing of applications.

[10]Notice of Aug. 12, 1974, 926 O.G. 2.

[11]BNA's Patent, Trademark and Copyright Journal, No. 301, Oct. 28, 1976, page D-1.

Decisions and Files Made Public

Section 1.14(d) makes more explicit the conditions under which significant decisions of the Patent and Trademark Office will be made available to the public, and includes reference to decisions of the Board of Patent Interferences, in addition to decisions of the Board of Appeals and the Commissioner.

A large majority of the comments received were favorable. Several commentators felt that more decisions would be made available as a result of the proposed section and that it would assist in publicizing aspects of Office procedure which may not have been available previously.

Some negative comments were based on the view that the Freedom of Information Act[12] required all decisions of the Office to be made publicly available. A greater number of those opposing the proposed section, however, felt that applicants should have an absolute right to have their applications maintained in confidence and that no information should be made public without specific authorization from them. One commentator felt that rulemaking on this subject should be deferred until currently pending litigation[13] under the Freedom of Information Act was finally resolved.

The section as adopted is applicable to decisions deemed by the Commissioner to involve an interpretation of patent laws or regulations that would be of significant precedent value, where such decisions are contained in either pending or abandoned applications or in interference files not otherwise open to the public. It is applicable whether or not the decision is a final decision of the Patent and Trademark Office.

The parenthetical phrase in the first sentence of the proposed section, which cited other provisions of the rules under which decisions are open to public inspection, is deleted as unnecessary and possibly confusing. Also, in view of several comments received, the period of time during which an applicant or party in interest may object to having a decision made public is extended from one month to two months. At least twenty days is given to request reconsideration and seek court review before a decision is made public over an objection.

Section 1.14(d) is considered to place a duty on the Patent and Trademark Office to identify significant decisions and to take the steps necessary to inform the public of such decisions, by publication of such decisions, in whole or in part. It is anticipated, however, that no more than a few dozen decisions per year will be deemed of sufficient importance to warrant publication under the authority of this section.

Amended § 1.14(b) allows public inspection of abandoned applications referred to in defensive publications. The comments received on the proposed amendment on this topic in 1974 expressed no opposition and the proposal is adopted without change.

The amendment is intended to encourage use of the defensive publication program provided under § 1.139. The objective of that program is to make available to the public the technical disclosure of applications in which the owner prefers to publish an abstract in lieu of obtaining an examination. Existing §§ 1.11(b) and 1.139 open the complete defensive publication application to inspection by the general public upon publication of the abstract. With the amendment, an abandoned application referred to in a defensive publication application will likewise be open to public inspection, avoiding any need to repeat its contents in the defensive publication application. Thus, public availability of the applications involved should be of benefit both to the applicant and the public.

A suggestion was made that the section be extended still further to include abandoned applications referred to in foreign patents. This suggestion, however, goes too far beyond the proposal that was published and has too uncertain an impact to be adopted at this time.

Amended § 1.11(a) provides earlier access to the file of an interference which involved a patent or an application on which a patent has issued. All comments that were submitted on the 1974 proposal on this topic were favorable and two commentators felt the proposal should be extended further. The proposal is being adopted without change.

[12]USC 552.

[13]*Irons* v. *Gottschalk*; Slip Opinion, No. 74-1365 (D.C. Cir., Oct. 21, 1976).

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Under present practice, access to the file of an interference is not permitted until judicial review of the decision of the Board of Patent Interferences has been exhausted. The amended section allows access to the file after final decision of the Board of Patent Interferences if that decision is an award of priority as to all parties. It is believed that such earlier access will be of benefit to members of the public by making available information relevant to the issuance of the patent whether or not the interference decision is still being adjudicated.

Patent Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested, provides for oral arguments by or on behalf of examiners in certain appeals and reduces the time permitted for oral arguments.

Comments relating to this section were favorable by a very substantial majority, although there were several reservations to the effect that § 1.194(a) tended to discourage or downgrade oral arguments. Participation by examiners was considered to be desirable not only from the standpoint of improving the overall presentation of the argument, particularly in complex cases, but also for the educational and experience benefits to the examiners themselves.

The only opposition to the section was based on the feeling that oral hearings would be discouraged. The rule is intended to discourage oral hearings only to the same extent as the Office's 1975 Official Gazette notice on the subject.[14] Section 1.194(a) indicates that oral hearings should not be requested as a matter of course in every appeal, but only in those circumstances where the appellant feels that such a hearing will be of material assistance to the proper presentation of the appeal. The section expressly provides that equal consideration will be accorded in deciding all appeals, whether or not an oral hearing is held.

In appeals where the appellant has requested an oral hearing § 1.194(b) provides for oral argument by, or on behalf of, the primary examiner, if such argument is considered to be helpful by either the primary examiner or the Board. This provision incorporates the present practice of permitting examiners to present an oral argument before the Board.[15] It gives the Board additional discretionary authority to request presentation of an oral argument by, or on behalf of the examiner to ensure that all issues are fully and accurately presented.

Section 1.194(c) provides, as does existing § 1.194, that appeals will be assigned for consideration and decision without an oral hearing where none has been requested by the appellant. Where an oral hearing has been requested, a day of hearing will be set, and both appellant and the primary examiner will be notified. A provision for notice to the examiner is added to the proposed version. Additionally, § 1.194(c) reflects the present practice of limiting oral argument on behalf of the appellant to twenty minutes.[16] The time permitted for argument by the examiner has been shortened from twenty minutes, as proposed, to fifteen minutes. The examiner, unlike the appellant, will not ordinarily need time to present the facts of the case or for rebuttal.

In any appeal where oral argument is to be presented by, or on behalf of, the primary examiner, the appellant will be given due notice of that fact.

Proposed § 1.196(b) would have authorized the Board of Appeals to reject allowed claims, in cases before it, whenever the Board had knowledge of grounds for so doing.

While a majority of those commenting on this section favored in principle the concept of allowing the Board to have this right, significant concern was voiced that there was no statutory authority for the Board to actually reject allowed claims. Further, the question of proper authority for judicial review of such action by the Board was a matter of concern. Other reasons advanced in opposition to the section were that applicants would be inhibited from appealing by the risk of having allowed claims rejected and that the proposal would create a higher presumption of validity in cases reviewed by the Board. A significant number commented that it would be more appropriate for the Board to remand the case to the primary examiner for consideration of the grounds raised by the Board. This would afford the applicant an opportunity to demonstrate the patentability of the claims and would remove any question as to statutory authority.

In view of the comments received, existing § 1.196(b) will not be modified, but a new § 1.196(d) is added providing express authority for the Board of Appeals to include, in its decision, a statement of any grounds for rejecting any allowed claim that it believes should be considered by the primary examiner. Section 1.196(d) provides that the Board may remand the case to the examiner for such consideration, and that the applicant shall have an opportunity to respond to the grounds set forth by the Board prior to consideration, by the examiner. If the previously allowed claims are rejected by the examiner, the rejection may be appealed to the Board.

The new section further provides that a decision of the Board which includes a remand will not be considered as a final decision in the case, but that the Board, following conclusion of the proceedings before the primary examiner, will either adopt its earlier decision as final or will render a new decision based on all appealed claims, as it considers appropriate. In either case, final action by the Board will give rise to the existing alternatives available to an appellant following a decision by the Board.

In situations where the primary examiner concludes after consideration of all the evidence and argument that the remanded claims should be allowed, the new rule dealing with reasons for allowance (§ 1.109) provides an appropriate mechanism for him to explain, on the record, his reasoning for coming to this conclusion, notwithstanding the grounds set forth by the Board in its statement.

Promulgation of new § 1.196(d) does not affect the Board's existing authority to remand a case to the primary examiner without rendering a decision in appropriate circumstances. Section 1.196(d) is not intended as an instruction to the Board to reexamine every allowed claim in every appealed application. It is, rather, intended to give the Board express authority to act when it becomes apparent, during the consideration of rejected claims, that one or more allowed claims may be subject to rejection on either the same or on different grounds from those applied against the rejected claims.

Reasons for Allowance

New § 1.109 is intended to emphasize and formalize the examiner's authority to state his reasoning for allowing a claim or claims. The authority is discretionary with the examiner and is only to be used when the record does not otherwise reveal the reasons for allowance.

A majority of the comments received favored the rule as proposed because it would tend to provide courts and others who were reviewing the patent with a clearer record. Those who opposed the rule most often gave the reason that the examiner might fail to state all the reasons or the strongest reasons why a claim was allowed, which could place unnecessary limitations on the claims or create an estoppel in subsequent litigation or licensing.

To help insure that the examiner's statement of his reasoning in allowing a claim will not unnecessarily limit the claims or create an estoppel, a final sentence is added to the proposal which states that failure of the applicant to comment upon or rebut the examiner's reasoning "shall not give rise to any implication that the applicant agrees with or acquiesces in the reasoning of the examiner."

Several commenters suggested that stricter enforcement of §§ 1.111 and 1.133 would eliminate the need for a new rule concerning reasons for allowance. Situations exist, however, where a statement of reasons for allowance could be helpful, for example when an examiner withdraws a rejection for reasons not suggested by the applicant; when an applicant submits several arguments for allowing a claim and the examiner finds not all of them persuasive: when an examiner allows a claim on the first Office action after citing very close prior art: and when the examiner allows a claim after remand from the Board of Appeals (see new § 1.196(d)).

The first sentence of the proposed rule is changed to define more precisely the circumstances in which an examiner's statement is appropriate, as well as to define more precisely the content of the statement. The statement will include the examiner's "reasoning." The examiner may state his reasoning whenever he "believes that the record of the prosecution as a whole does not make clear his reasons for allowing a claim or claims."

Several persons commented that the rule should provide a procedure for appeal from the examiner's statement of his reasoning. The rule does permit applicants to comment upon the examiner's reasoning. If the applicant does not wish to comment, he may reserve for a later proceeding, without prejudice, any rebuttal. [Text of adopted rules appears in 37 CFR, revised 7-1-77]

Effective Dat.. These amendments become effective on March 1, 1977, except for §§ 1.51, 1.97, 1.98, and 1.99 which become effective on July 1, 1977, and §§ 1.65 and 1.69 which become effective on January 1, 1978.

Jan. 18, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Jan. 19, 1977. **Betsy Ancker-Johnson, Ph.D.**
Assistant Secretary for Science and Technology.

[955 O.G. 1054]

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(115) **Guidelines for Implementation of Recently Revised Rules**

Recently a number of rules relating to Patent Examining and Appeal procedures were revised. The new rules were published in the Federal Register at 42 F.R. 5588 on January 28, 1977, and in the *Official Gazette* at 955 O.G. 1054 on February 22, 1977. The following guidelines are being published to describe the procedures which are being followed in implementing 37 CFR sections 1.11, 1.97-1.99, 1.109, 1.194, 1.291 and 1.292.

Files Open to the Public

Section 1.11(b) is applicable only to those reissue applications filed on or after March 1, 1977. Those reissue applications already on file will not be automatically open to inspection but a liberal policy will be followed by the Office of the Solicitor in granting petitions for access to such applications.

(Note....These sections as changed will be incorporated into the Manual text in Rev. 3 of the Manual.)

For those reissue applications filed on or after March 1, 1977, the following procedure will be observed:

1) The filing of reissue applications will be announced in the *Official Gazette* and will include certain identifying data as specified in section 1.11(b). Any member of the general public may request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request access to a particular reissue application filed after March 1, 1977. Since no record of such request is intended to be kept, an oral request will suffice.
2) The reissue application files will be maintained in the examining groups and inspection thereof will be supervised by group personnel. Although no general limit is placed on the amount of time spent reviewing the files, the Office may impose limitation, if necessary, e.g., where the application is actively being processed.
3) Where the reissue application has left the examining group for administrative processing, requests for access should be directed to the appropriate supervisory personnel in the Division or Branch where the application is currently located.
4) Requests for copies of papers in the reissue application file must be in writing addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and may be either mailed or delivered to the Office mailroom. The price for copies made by the Office is thirty cents per page.

Prior Art Statements

This notice supersedes the notices of August 12, 1974 (926 O.G. 2) and May 19, 1975 (935 O.G. 902) relating to citations of prior art. Although new sections 1.97 through 1.99 are not effective until July 1, 1977, and are not mandatory upon applicants, they provide an ideal mechanism for complying with the duty of disclosure under 37 CFR 1.56. The statements should be submitted in accordance with the following guidelines:

1) Prior art statements should be submitted at the time of filing the application or within three months thereafter and may be separate from the specification or incorporated therein. The statement shall serve as a representation that the person preparing it has included therein what he believes to be the closest prior art of which he is aware and shall not be construed as a representation that no better art exists or that a search has been made. If the first action in the application is received prior to three months after filling of the application and no prior art statement has been submitted, the prior art statement may be submitted with the response to the first action and be considered timely.
2) The statement shall include a listing of the patents, publications or other information which the preparer of the statement wishes to cite and a concise explanation of the relevance of each listed item. Copies of the pertinent portions of all listed documents shall be supplied along with the statement, both when incorporated into the specification and when filed separately. If two or more patents or publications considered material are substantially identical, a copy of a representative one shall be included with the statement and others may merely be listed with an indication of which are considered to be substantially identical.
3) A translation of the pertinent portions of foreign language patents or publications considered material should be transmitted if an existing translation is readily available to the applicant. It will be sufficient, however, to transmit an equivalent English language patent or publication so long as it is identified as an equivalent.

   Where the applicant has submitted copies of prior art in accordance with these guidelines in a prior application, reference to the prior application and the submission therein will be sufficient for the continuing application as far as the copies are concerned. As far as the statement per se is concerned, the relevance of the prior art to the claimed subject matter must be indicated if it differs from its relevance as explained in the prior application.
4) If prior to the issuance of a patent an applicant pursuant to his duty of disclosure under 37 CFR 1.56, wishes to bring to the attention of the Office additional patents, publications or other information not previously submitted, the additional information should be submitted to the Office with reasonable promptness. It may be included in a supplemental prior art statement or may be incorporated into other communications to be considered by the examiner. Any transmittal of additional information shall be accompanied by explanations of relevance and by copies in accordance with the requirements aforementioned. The transmittal should include a statement explaining why the prior art was not earlier submitted.

While the Patent and Trademark Office will not knowingly ignore any prior art which might anticipate or suggest the claimed invention, no assurance can be given that cited art or other information not submitted in accordance with these guidelines will be considered by the examiner.

After the claims have been indicated as allowable by the examiner, e.g., by the mailing of an Ex parte Quayle action, a notice of allowability (PTOL-327), an examiner's amendment (PTOL-37), or a Notice of Allowance (PTOL-85), any citations submitted will be placed in the file. Since prosecution has ended, however, such submissions will not ordinarily be considered by the examiner unless the citation is accompanied by:

(*a*) A proposed amendment cancelling or further restricting at least one independent claim and narrowing the scope of protection sought;

[14] Mar. 20, 1975, 933 O.G. 1010.
[15] MPEP, § 1209.
[16] See notice of Mar. 20, 1975, 933 O.G. 1010.

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(*b*) A timely affidavit under 37 CFR 1.131 with respect to the material cited; or

(*c*) A statement by the applicant or his attorney or agent that, in the judgment of the person making the statement, the prior art or other information cited raises a serious question as to the patentability of the claimed subject matter, or is closer prior art than that of record.

If the material is submitted after the base issue fee has been paid, it must also be accompanied by a petition under 37 CFR 1.183 requesting a waiver of 37 CFR 1.312. Such petition, if granted, would result in review of the art by the examiner and possible entry of the amendment.

In each instance where an examiner considers, but does not cite on form PTO-892, specific prior art referred to in a paper placed in the application file, the examiner will place a notation adjacent to the reference according to the following:

> If included in the specification, the examiner will write his or her initials adjacent to any references checked and enter "checked" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" will be entered adjacent to the citations or wherever possible to indicate clearly those checked.

Reasons for Allowance

One of the primary purposes of the change in Section 1.109 is to improve the quality and reliability of issued patents by providing a complete file history which should clearly reflect, as much as is reasonably possible, the reasons why the application was allowed. Such information facilitates evaluation of the scope and strength of a patent by the patentee and the public and may help avoid or simplify litigation of a patent.

The practice of stating the reasons for allowance is not new and the rule merely formalizes the examiner's existing authority to do so and provides applicants an opportunity to comment upon any such statement of the examiner.

When the examiner determines that it is necessary or desirable, a "Statement of Reasons for Allowance" will be prepared. The "Statement" will usually be an attachment to either a notice of allowability (PTOL-327) or Examiner's Amendment (PTOL-37). Any comments considered necessary by applicant must be submitted no later than the issue fee and should preferably *accompany* the issue fee. Submission with the issue fee avoids any delay in the processing of the application and avoids the necessity to associate the comments with the application while it is in issue except at the time the file must be pulled to record the payment of the issue fee. Such comments will be entered in the application file by the Allowed Files Branch with an appropriate notation on the "contents" list of the file wrapper, but will not be reviewed by the examiner.

Oral Hearings Before Board of Appeals

Section 1.194 clarifies the circumstances in which oral hearings should be requested and provides for oral arguments by, or on behalf of, primary examiners in certain appeals. Under Section 1.194, the following procedures will be in effect:

1) In accordance with Section 1.192, appellants who desire an oral hearing must request the same at the time of filing the appeal brief.
2) If appellant has requested an oral hearing and the primary examiner intends to present an oral argument, the last paragraph of the examiner's answer will indicate this intention.
3) Notice of the oral hearing will be given to the appellant and, at the same time, to the primary examiner in those cases in which the primary examiner has indicated an intention to present an oral argument.
4) After an oral hearing has been confirmed and the date set as provided in Section 1.194(c), the application file will be delivered to the examiner via the appropriate Group Director at least one week prior to the date of the hearing for those cases in which the examiner is expected to be present at the hearing. In those cases where the Board requests the presentation of an oral argument by, or on behalf of, the primary examiner, the appellant will be so notified. The Board's request for an oral argument may, where appropriate, indicate specific points or questions to which the argument should be particularly directed. The application file will be returned to the Board before the hearing.
5) In those appeals in which an oral hearing has been confirmed and either the primary examiner or the Board has indicated a desire for oral argument, such oral argument may be presented whether or not appellant appears.

Protests and Public Use Proceedings

Amended sections 1.291 and 1.292 give greater recognition to the value of written protests and public use petitions and are intended as an aid in avoiding the issuance of invalid patents.

Under sections 1.291 (b) and (c) and 1.292(b), the following procedures will be observed:

1) Only in those instances where it has not been possible to serve protest papers upon the applicant, attorney or agent, should duplicates of the papers submitted be provided. In this case the appropriate examining group will attempt to get the duplicate copy to the applicant, attorney or agent. However, every effort should be made by the protester to effect service.
2) Citations of prior art and any papers related thereto may be entered in the file after a patent has been granted by submitting them to the attention of the Record Room, where they will be entered without comment by the Office. If after diligent effort it has not been possible to serve the prior art citations and related papers on the patentee, his attorney or agent, duplicate copies should be submitted in which case the Record Room will attempt to get the duplicate copy to the owner of record.
3) When public use petitions and accompanying papers are submitted they, or a notice in lieu thereof, will be entered in the application file. Duplicate copies should be submitted only when, after diligent effort, it has not been possible for petitioner to serve a copy of the petition on the applicant, his attorney or agent in which case the Office of the Solicitor will attempt to get the duplicate copy to the applicant, his attorney or agent.
4) To ensure consideration by the examiner, protests should be timely submitted, i.e., before final rejection or allowance. Consideration of protests filed after final rejection or allowance will depend upon the relevance of the prior art documents and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not knowingly be ignored. If protests are not timely submitted or if they fail to comply with section 1.291(a) as to the submission of a copy of each prior art document relied upon, they will be acknowledged and referred to the examiner having charge of the subject matter involved for entry in the application file and such consideration as seems warranted.

In each instance where an examiner considers but does not cite on form PTO-892 specific prior art referred to in a protest, the examiner will place a notation in the protest paper adjacent to the reference which will include his or her initials and the term "checked."

Additional future guidelines as to protest procedures may be developed after gaining experience with the new practice.

C. MARSHALL DANN,
Mar. 18, 1977. *Commissioner of Patents and Trademarks.*

[957 O.G. 11]

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(116) Further Guidelines Relating to 37 CFR 1.175 and 1.291, as Amended Effective March 1, 1977

The experience with the above revised rules since their effective date has indicated the desirability of further guidelines relating to the manner in which they are to be implemented.

The following guidelines are supplemental to those which have already been provided in the publication of the rules in the Federal Register of January 28, 1977 (42 F.R. 5588) (955 O.G. 1054, February 22, 1977), and in the earlier Guidelines published at 957 O.G. 11 on April 12, 1977. Copies of the latter two *Official Gazette* publications appear as items 59 and 60 of the current "Consolidated Listing of Recent Official Gazette Notices" published at 966 O.G. 22-32. The present guidelines are also supplemental to the appropriate sections of the Manual of Patent Examining Procedure, e.g., Sections 1401-1401.12 relating to reissue, and Section 1309.02 relating to protests. Sections 721 and 721.01 of the MPEP contain guidelines to be followed if either a reissue or other application, or a protest relative to any application, raises questions of "fraud" or "violation of the duty of disclosure." Accordingly, the above-noted materials should be consulted in addition to these further guidelines, which are in themselves not intended to completely treat the subjects involved. For the most part, the guidelines herein merely identify and clarify existing requirements and practices. The Patent and Trademark Office has a general study underway of the procedures for handling reissue applications and protests which may result in future modifications in these guidelines.

Section 1.175(a)(4) of the revised rules recognizes that reissues may be filed to have the patentability of the original patent, without changes therein, considered in view of prior art or other information relevant to patentability which was not previously considered by the Office.

The experience to date reveals the need to clarify what should be filed by the applicant in order to seek the reexamination contemplated by sub-section (a)(4) and also the type and content of the examination which the examiner will give to applications filed under sub-section (a)(4).

First, sub-section (a)(4) does *not* contemplate, or permit, the filing of a reissue application without an oath or declaration. To the contrary, an oath or declaration is required, and such oath or declaration *must* comply with each of sub-sections (a)(4), (a)(5), and (a)(6). Thus, under sub-section (a)(4) the oath or declaration must particularly specify the "prior art or other information relevant to patentability, not previously considered by the Office," which the reissue applicant considers "might cause the examiner to deem the original patent wholly or partly inoperative or invalid." The reissue oath or declaration must also request, under sub-section (a)(4), that "if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent."

Under sub-section (a)(5), the reissue oath or declaration, including those filed under sub-section (a)(4), must particularly specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred."[1] This sub-section has two specific requirements, *both of which must be complied with* in, or by, the reissue oath or declaration. Thus, insofar as (a)(4) reissue oaths or declarations are concerned, the oath or declaration must particularly specify "what might be deemed to be errors." For example, if the reissue applicant is seeking reexamination in view of particular prior art or other information, the reissue oath or declaration must point out "what might be deemed to be errors" in patentability in view of such prior art or other information. More specifically, the oath or declaration, in appropriate circumstances, might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patented files. Usually, a general statement will suffice. But where appropriate, such as where the pertinence of the new references X and Y are not evident, more specificify about "what might be deemed to be errors" should be provided. Of course, the reissue applicant does *not* have to, and presumably does *not*, agree that "errors" exist. However, the reissue applicant does have to, in the reissue oath or declaration of the sub-section (a)(4) type, particularly specify "what might be deemed to be errors relied upon."

In addition to specifying "what might be deemed to be errors relied upon," sub-section (a)(5) also requires "particularly specifying" "how they arose or occurred." This means, of course, that the reissue oath or declaration must specify the manner in which that which "might be deemed to be errors" "arose or occurred." For example, if the (a)(4) reissue is being filed for reexamination in view of prior art or other information, the reissue oath or declaration must indicate when and the manner in which the reissue applicant became aware of the possible error in the patent, e.g., third party allegation, discovery of prior art or other information subsequent to issuance of patent, knowledge of prior art or other information before issuance of patent with significance being brought out after issuance by third party, through allegations made in litigation involving the patent, etc. It is particularly important that the reissue oath or declaration adequately specify how "what might be deemed to be errors" arose or occurred. If the reissue oath or declaration does not particularly specify "how," i.e., the manner in which any possible errors arose or occurred, the Office will be unable to adequately evaluate reissue applicant's statement in compliance with (a)(6) that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant."

Sub-section (a)(6) specifically requires that the reissue oath or declaration, including those filed under sub-section (a)(4), contain the averment that the "errors, if any, arose 'without any deceptive intention' on the part of the applicant." This requirement must not be overlooked in filing since the requirement for an absence of "deceptive intention" is a necessary part of any reissue application, including those of the (a)(4) type.

The significance and importance of sub-sections (a)(5) and (a)(6) must not be overlooked or minimized insofar as reissue oaths or declarations are concerned, including those filed under sub-section (a)(4). These sub-sections, to a large extent, enable the Office to make its determination required by statute that any error is "without any deceptive intention."

In addition to meeting the requirements of Sections 1.175 (a)(4)-(a)(6) insofar as the reissue oath or declaration is concerned, the reissue applicant, at the time of filing the reissue application, including the (a)(4) type reissue application, must also be aware of the requirements of 37 CFR 1.56, as revised effective March 1, 1977. Reissue applicants may, of course, utilize new Sections 1.97-1.99 to comply with the duty of disclosure required by Section 1.56. While Section 1.97(a) provides for filing of the prior art statement within three months of the filing of the application, reissue applicants are encouraged to file the prior art statement at the time of filing the application in order that such prior art statements will be availale to the public during the two-month period provided by Section 1.176.

In situations in which the patent for which reexamination is being sought is, or has been, involved in litigation, which raised a question material to examination of the reissue application, such as the validity of the patent, or any allegation of fraud, the existence of such litigation must be brought to the attention of the Office at the time of, or shortly after, filing the application, either in the reissue oath or declaration, or in a separate paper, preferably accompanying the application as filed. Litigation begun after filing of the reissue application also should be promptly brought to the attention of the Office. The details and documents from the litigation, insofar as they are "material to the examination" of the reissue application as defined in 37 CFR 1.56(a), should accompany the application as filed, or be submitted as promptly thereafter as possible. For example, the defenses raised against validity of the patent, or charging fraud or inequitable conduct in the litigation, would normally be "material to the examination" of the reissue application. It would, in most situations, be appropriate to bring such defenses to the attention of the Office by filing in the reissue application a copy of the Court papers raising such defenses. As a minimum, the applicant should call the attention of the Office to the litigation, the existence and nature of any allegations relating to validity and/or "fraud" relating to the original patent, and the nature of litigation materials relating to these issues. Enough information should be submitted to clearly inform the Office of the nature of these issues so that the Office can intelligently evaluate the need for asking for further materials in the litigation. Thus, the existence of supporting materials which may substantiate allegations of invalidity or "fraud" should, at least, be fully described, or submitted. The Office is *not*, of course, interested in receiving voluminous litigation materials which are *not* relevant to the Office's consideration of the reissue application. The status of the litigation should be updated in the reissue application as soon as significant events happen in the litigation.

The Examination of Reissue Applications, Including Those Filed Under 37 CFR 1.175(a)(4)

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The examination of reissue applications, including those filed under sub-section (a)(4), will be in accordance with Sections 1401[g14 1401.12, M.P.E.P. Attention is particularly directed to Section 1401.09, M.P.E.P. which refers to the two aspects of reissue examination, i.e., examination in the same manner as an original application and examination for compliance with the reissue statute and rules. The purpose of the present guidelines is to supplement those presently in existence and to emphasize certain points, particularly as they relate to reissue applications filed under sub-section (a)(4).

When examining the reissue application the examiner will consider whether or not applicant, in the reissue oath or declaration, has complied with each of the requirements of 37 CFR 1.175. For example, in all reissue applications, the reissue oath or declaration must comply with the requirements of the first sentence of 37 CFR 1.65. When the reissue application is other than the (a)(4) type, the reissue oath or declaration must comply with the appropriate sub-sections (a)(1) to (a)(3) and sub-sections (a)(5) and (a)(6). When the reissue application is filed under sub-section (a)(4), the reissue oath or declaration must also comply with sub-sections (a)(5) and (a)(6). Thus, all reissue applications must comply with sub-sections (a)(5) and (a)(6). If the examination reveals a lack of compliance with any requirement of Section 1.175, e.g., the requirements of sub-sections (a)(5) and/or (a)(6), a rejection will be made on the basis that the reissue oath or declaration is insufficient. See Section 1401.08, M.P.E.P. Under no circumstances will any reissue application be passed for issue without full compliance with 37 CFR 1.175.

Applications filed under sub-section (a)(4) will not, of course, be passed for issue without amendment, but will be rejected as lacking statutory basis for a reissue if *there are no other grounds for rejection*, since 35 U.S.C. 251 does not authorize reissue of a patent unless the patent is deemed wholly or partly inoperative or invalid. If a reissue filed under sub-section (a)(4) is subsequently amended thereby converting it into an application under sub-sections (a)(1) to (a)(3), *a supplemental reissue oath or declaration must be filed containing the appropriate averments*, If such a proper supplemental oath or declaration is not filed, a rejection will be made on the basis that the reissue oath or declaration is insufficient. The supplemental oath or declaration insures compliance with 35 U.S.C. 251 by providing appropriate averments relating to actual errors rather than possible errors.

If the examiner becomes aware of litigation involving the patent sought to be reissued during examination of the reissue application, and applicant has not made the details regarding that litigation of record in the reissue application, the examiner, in the next office action, will inquire regarding the same. The following paragraph may be used for such an inquiry:

> "It has come to the attention of the examiner that the patent sought to be reissued by this application (is) (has been) involved in litigation. Any documents and/or materials, including the defenses raised against validity, or against enforceability because of fraud or inequitable conduct, which would be material to the examination of this reissue application are required to be made of record in response hereto. See 37 CFR 1.175(b)."

If the additional details of the litigation appear to be material to examination of the reissue application, the examiner may make such additional inquiries as necessary and appropriate under 37 CFR 1.175(b).

However, any application which indicates the existence of *a question* of "fraud" or "violation of the duty of disclosure" will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P., as soon as the existence of *such question* is appreciated. For example, any reissue application which seeks reexamination in view of material prior art or other information known before issuance of the patent to a person having a duty under 37 CFR 1.56(a) must be forwarded under Section 721.01, M.P.E.P., to the Assistant Commissioner via the Group Director.

The Filing of Protests Under 37 CFR 1.291

The amendments to Section 1.291 reflected the increased value the Office places on appropriate written protests as an aid in avoiding the issuance of invalid patents. The present supplemental guidelines are in addition to those previously published and referred to above.

The nature of the protest, and the timeliness of its submission, are important factors in determining the consideration which is given the protest, and by whom it is considered. Insofar as the question of timeliness is concerned, the original publication of the rules at 955 O.G. 1054, the earlier Guidelines published at 957 O.G. 11, and Section 1309.02, M.P.E.P. adequately treat this question. Protests should obviously be submitted as early in the examination process as possible in order to be of maximum benefit to the Office in its examination of the application involved.

If the protest is being filed with regard to a reissue application, the protest should be filed within the two-month period following announcement of the filing of the reissue application in the Offical Gazette, if it is at all possible to do so. If, for some reason, the protest of the reissue application cannot be filed within the two-month period provided by 37 CFR 1.176, the protest can be submitted at a later time, but protestor must be aware that reissue applications are "special" and a later filed protest may be received after action by the examiner, if submitted later than the two months provided by 37 CFR 1.176. In the event a protest is intended against a reissue application, but cannot be submitted within the two months provided following the O.G. announcement, the protestor can request an additional specified period within which to file the protest, explaining why the additional time is necessary and the nature of the protest intended. A copy of any such request for additional time to protest a reissue application beyond the two months provided must be served on the reissue applicant. The request for additional time should be directed to the appropriate Group Director. The requests for additional time beyond the two months provided will be *critically reviewed as to demonstrated need* before being granted since the delay of examination of a reissue application of another party is being requested. Accordingly, the requests should be made *only where necessary, for the minimum period required* and with a justification establishing the necessity for the extension.

Any protest filed alleging "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A-13. Protests based on grounds other than "fraud" or "violation of the duty of disclosure" should be directed to the attention of the Director of the particular examining group in which the application is pending. If the protestor is unable to specifically identify the application to which the protest is directed, but, nevertheless, believes such an application to be pending, the protest should be directed to the attention of the Assistant Commissioner for Patents, Building 3, Room 11A-13, along with as much identifying data for the application as is available.

As indicated in the earlier publications, e.g., Section 1309.02, M.P.E.P., every effort should be made by a protestor to effect service of the protest upon the attorney or agent of applicant who is of record or upon the applicant. The protest filed in the Office should reflect that service has been made. Only in those instances where service is not possible should the protest be filed in duplicate in order that the Office can attempt service. Of course, the copy served upon applicant or applicant's attorney or agent should be accompanied by a copy of each prior art or other document relied upon in the same manner as required by Section 1.291(a) for the Office copy.

The Examiner's Consideration of Protests

Protests other than those alleging "fraud" or "violation of the duty of disclosure" will be received by, or forwarded to, the Group Director of the examining group where the application is, or may be, pending and then referred to the appropriate examiner. If it is then, or later, discovered that a question of "fraud" or "violation of the duty of disclosure" exists, the application and the protest, will be forwarded to the Office of the Assistant Commissioner for Patents pursuant to Section 721.01, M.P.E.P.

If no allegations or questions of "fraud" or "violation of the duty of disclosure" are found to exist, the examiner will consider the protest and report the results of the consideration to the Group Director. If the protest has been timely submitted, i.e., before final rejection or allowance, the examiner will consider each of the prior art or other documents submitted. At least those prior art documents which the examiner relies on in rejecting claims will be made of record by means of form PTO—892. If the examiner does not cite all of the prior art or other documents of form PTO-892, the examiner will place a notation in the protest paper adjacent to the reference to the documents which will include the examiner's initials and the term "checked."

If the protest is filed after final rejection or allowance of the application, the consideration by the examiner will depend upon the relevance of the prior art documents submitted and the point in time at which they are submitted. Documents which clearly anticipate or render obvious one or more claims will not be knowingly ignored. Prosecution of the application will be reopened where necessary. However, protestor must be aware that the likelihood of consideration by the Examiner decreases as the patent issue date approaches. Accordingly, protests must be filed early in order to ensure their consideration.

If the protest is not accompanied by a copy of each prior art or other document relied upon as required by Section 1.291(a), the protestor cannot be assured that the examiner will consider the missing document. However, if the examiner does so, the examiner will either cite the document on form PTO-892 or place a notation in the protest paper adjacent to the reference to the document which will include the examiner's initials and the term "checked."

If, upon considering the protest or any submissions subsequent thereto, the examiner considers it desirable to obtain applicant's comments on the protest before further action, the examiner will offer applicant an opportunity to file comments within a set period, usually two months.

The following suggested format can be used to offer applicant an opportunity to file comments on the protest:

> "A protest against the issuance of a patent based on this application has been filed under 37 CFR 1.291 on . . . . and a copy (has been indicated as having been served on applicant) (is attached hereto). Any comments or response applicant desires to file before consideration of the protest must be filed by . . . ."

Section 1.291(a) indicates that protests are acknowledged and this acknowledgement will normally be made by the particular office to which the protest is ultimately directed for consideration. Protests alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Office of the Assistant Commissioner for Patents. Other protests, i.e., those not alleging "fraud" or "violation of the duty of disclosure" will normally be acknowledged by the Group Director of the examining group where the application is, or may be, pending.

If the protest involves an application to which the protestor has access, e.g., a reissue application filed after March 1, 1977, or one in which protestor has been formally granted access, then protestor may monitor the proceedings and file such additional papers as protestor considers appropriate. If protestor has access to the application, protestor may request the Office to supply protestor with copies of Office actions or other documents mailed by the Office. Such a request should be directed to the particular area in which the application is pending, e.g., Office of Assistant Commissioner for Patents, or Director of the particular examining group. The request should explain why protestor needs the copies in question and should indicate an intent on protestor's part to assist the Office in its examination by supplying relevant comments. Normally, the Office will send copies of Office actions to protestors where the protestor indicates an intent to review actions and, if appropriate, comment to the Office on them. However, since protestor has no right to copies of the Office actions or other documents, the granting or denying of such requests will be within the sole discretion of, and for the convenience of the Office.

If the protestor has access to the application, the examiner may communicate with the protestor *in writing* to seek clarification and/or additional information if the examiner considers such clarification and/or additional information necessary to properly consider the protest. The following suggested format can be used by the examiner to seek clarification and/or additional information from a protestor having access to an application:

> "The protest, as filed_____, has been noted. However, clarification and/or additional information is desired. In particular [Examiner explains] any submission of the requested information should be made within ONE MONTH of the date of this letter and the submission must indicate service on applicant."

While the examiner should not normally need clarification and/or additional information from the protestor where the grounds involve only published prior art, e.g., patents, periodicals, etc., under some circumstances it may be necessary for the examiner to seek such clarification and/or additional information. For example, if the date of a reference is in question, or some question of public use is involved, and the information being sought is within the knowledge or control of the protestor, the examiner may find it necessary to communicate with the protestor to obtain the same.

Where the examiner feels that a protestor with access to an application can contribute significantly to the examination process, the protestor may be given a specific period, normally one month, within which to comment on responses submitted by patent applicants to Office actions. Such a comment period should only be provided where it would appear to be of benefit to the examination process and only with the approval of a Supervisory Primary Examiner. Where an applicant agrees to such participation by a protestor or where a Court has suspended litigation for consideration of a related application by the Patent and Trademark Office with an expression of its desire for such protestor participation, it should be more liberally granted.

Where a protestor requests permission to participate in any interview between an applicant and the examiner or requests on its own behalf to have an interview with the examiner, the request should be referred to the Office of the Assistant Commissioner for Patents for action. Normally, protestor participation in interviews with examiners will not be allowed unless special justifying circumstances exist. Where authorized, participation by the protestor in an interview will be according to conditions set down by the Patent and Trademark Office. Normally, any transcript of the interview, if authorized, will be at the expense of the party or parties requesting it and will be arranged by such party or parties. Where Office actions are being sent to a protestor or where a protestor is present for an interview, a copy of the Interview Summary Form and other records made of the interview will be provided to the protestor. Where protestor's participate in an interview, they may submit their own record of the interview which will be made of record in the file.

Interviews relating to a patent application with a protestor will not be permitted without the applicant present.

A protestor with access to an application appealed to the Board of Appeals who intends to file comments or a brief in opposition to appellant's brief should file an indication of such intention within one month after the notice of appeal is filed and serve a copy of the same upon appellant. The indication of intention should state that protestor agrees to file such comments or brief in triplicate, within one month after appellant's brief is filed, and also agrees to serve a copy of the comments or brief upon appellant. If such an indication is not filed and served, or the protestor's comments or brief is not timely filed in triplicate and served, no assurance is given that the Examiner will consider the protestor's comments or brief during the preparation of the Examiner's Answer.

A protestor who participates by the filing of comments or a brief in opposition to appellant's brief may also request, at the time of filing the comments or brief, to appear at any oral hearing. If a protestor does not file such comments or brief, the protestor cannot be present at any oral hearing. If a protestor does file such a request, the Board of Appeals, in its discretion, will decide whether or not the issues on appeal are such that protestor's participation at the hearing would be helpful. The Board of Appeals will notify protestor whether or not the request to appear at the hearing is granted and, if granted, how much time will be permitted. Of course, if appellant does not request an oral hearing, or provides timely notification to the Board and protestor that appellant will not appear, protestor will not be heard.

A copy of any examiner's letter or communication to a protestor will be mailed to applicant at the same time it is mailed

to the protestor. While the examiner may communicate *in writing* with a protestor having access to the application, the examiner will *not* communicate orally and protestor must refrain from oral communications with the examiner except to ask purely procedural questions which have no relation to the substance of the protest or the merits of the application, unless specifically authorized *in writing* by the Assistant Commissioner for Patents.

Where the handling of a protest or the handling of a reissue application involved in related litigation requires an inordinately larger than normal amount of work on the part of an examiner and where otherwise warranted, Supervisory Primary Examiners may authorize the use of non-examining time for handling some or all of the examination.

The above guidelines are intended to make clearer the policies of the Patent and Trademark Office in respect to the handling of reissue applications, protests and "fraud" questions. The Office is especially interested in seeing that the consideration of reissue applications and protests is thorough and fair. It is interested in seeing that protestors have an opportunity to participate in the proceedings in the Office to the extent that such participation is helpful and appropriate in each case. It is also greatly interested in the completeness and accuracy of the file record, including indications whether or not prior art references and information mentioned in the record have been reviewed by the examiner.

The present guidelines which will be incorporated into the M.P.E.P. as soon as possible, when considered in conjunction with those previously issued and the M.P.E.P., should answer many of the questions being raised about the revised rules.

Nov. 13, 1978. DONALD W. BANNER,
Commissioner of Patents & Trademarks.

[977 O.G. 11]

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(117) **Expedited Processing of Reissue Applications and Applications Having Issues of Fraud or Failure to Comply With The Duty of Disclosure**

The Patent and Trademark Office has been experiencing increasing delays in the examination of reissue applications and other applications in which charges or questions of fraud or failure to comply with the duty of disclosure have been raised or are apparent on the record. Consideration of these charges involves considerable expenditures of resources and time. They also tend to delay prompt consideration on the merits in view of the prior art, etc. Considerable duplication of effort and expenditures of resources and time also may occur when the Office considers applications in circumstances where the same issues are concurrently being considered in Court.

Deferral of Fraud Issues

Effective immediately, the Office is instituting a policy of delaying consideration of issues of fraud or failure to comply with the duty of disclosure in any application until all other issues are settled.

Accordingly, under this procedure, applications having issues of fraud or failure to comply with the duty of disclosure will continue to be referred to the Office of the Assistant Commissioner for Patents, but will then be promptly returned, along with any appropriate examining instructions, to the Director of the Examining Group for immediate action by the Examiner. Decisions on Petitions to Strike applications pursuant to 37 CFR 1.56(d) will be deferred pending resolution of the patentability issues before the Examiner. Any such Petitions to Strike filed after the Office of the Assistant Commissioner has initially reviewed the application and returned it for immediate action will be acknowledged by the Examining Group Director and action on the Petition will be deferred pending completion of the patentability issues before the Examiner. Examiners will note in their Office actions the existence of issues of fraud or failure to comply with the duty of disclosure without commenting on the substance of such issues and will indicate that the issues will be considered after all other matters have been disposed of. Matters other than fraud or failure to comply with the duty of disclosure raised in a Petition to Strike, e.g., patentability in light of a reference, will be treated by the Examiner or other appropriate official. Petitions relating to procedural matters involving the examination of the applications, e.g., requests for protestor participation in interviews, will be decided by the appropriate Examining Group Director. Applications which have been referred to the Office of the Assistant Commissioner and which are required to be returned thereto before allowance or after abandonment of the application will have a notation placed on the face of the application file by the Office of the Assistant Commissioner requiring such return.

Suspension of Action Where There is Concurrent Litigation

In order to avoid duplication of effort, actions in applications in which there is an indication of concurrent litigation will be suspended automatically unless and until it is evident to the examiner, or the applicant indicates, that: (1) a stay of the litigation is in effect; (2) the litigation has been terminated; (3) there are no significant overlapping issues between the application and the litigation; or (4) it is applicant's desire that the application be examined at that time.

Expedited Examination of Reissues

All reissue applications, except those under suspension because of litigation, will be taken up for action ahead of other "special" applications; this means that all issues not deferred will be treated and responded to *immediately*. Furthermore, reissue applications involved in "stayed litigation" will be taken up for action in advance of other reissue applications.

Insofar as reissue applications for patents in litigation are concerned, the Office is presently considering modifications to the rules to provide for their examination within the two-month waiting period now provided by Section 1.176. Until appropriate modifications are made to the rules, the Office will entertain petitions under 37 CFR 1.183 to waive the delay period of 37 CFR 1.176. In addition, the Office is presently considering requiring the prompt disclosure of the existence of litigation related to a pending application.

Time monitoring systems are being put into effect which will closely monitor the time used by applicants, protestors, and examiners in processing reissue applications of patents involved in litigation in which the court has stayed further action.

Applicants in reissue applications involved in litigation which has been stayed, dismissed, etc. for consideration by the Patent and Trademark Office will normally be given one month to respond to Office actions in those situations where the Office determines that the reissue applicant can readily prepare a response in such time. This one month period may be extended upon a showing of clear justification. Of course, up to three months may be set for response if the Examiner determines such a period is justified.

Applicants and protestors submitting papers for entry in reissue applications of patents involved in litigation are requested to mark the outside envelope and the top right hand portion of the paper with the words "*REISSUE LITIGATION*" and with the unit of the PTO in which the reissue application is located—e.g., Assistant Commissioner for Patents, Board of Appeals or Examining Group. The notations preferably should be written in a bright color with a felt point marker. Papers marked "*REISSUE LITIGATION*" will be given special attention. Also, the PTO will place a prominent notation on the application file to indicate the existence of litigation.

The purpose of these changes is to reduce the time between filing and final action insofar as possible while still giving all parties sufficient time to be heard. This notice is supplemental to, and in some respects modifies, the earlier published notices on this subject and particularly the notice published at 977 O.G. 11 on December 12, 1978.

June 5, 1979. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[983 O.G. 24]

(118) **Prior Art Cited by Patent Offices in Other Countries**

Section 1.56 of Title 37 of the Code of Federal Regulations requires patent applicants and others associated with the prosecution of a patent application before the U.S. Patent and Trademark Office to call to the Office attention information which is material to examination. Where related or corresponding patent applications have been filed in other countries, prior art may be cited by the Patent Offices of those other countries in connection with the examination of the applications filed there. Where prior art is cited by those other Patent Offices while the U.S. application is pending, citations which are material to examination in this country and known to any of the individuals covered by Section 1.56 must be called to the attention of this Office. Attorneys and agents are reminded of their obligations in this respect.

It is suggested, of course, that such prior art be cited to the U.S. Patent and Trademark Office in a prior art statement which complies with the provisions of Section 1.97-1.99 of 37 CFR.

Apr. 23, 1979. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[982 O.G. 36]

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(119) **Documents Cited in PCT International Search Report**

This notice is intended to clarify which documents listed on an international search report prepared under the Patent Cooperation Treaty (PCT) should during the national stage before the Patent and Trademark Office (PTO):

(1) be listed and copies thereof submitted by the applicant to the PTO in an information disclosure statement filed under 37 CFR §§ 1.97-1.99,
(2) be supplied to the applicant with an Office action, and
(3) be listed by the examiner for printing on the front page of any resulting patent.

If the United States is designated in an international (PCT) application a copy of the search report will be mailed to the United States as a Designated Office by the International Bureau about 19 months after the priority date. This search report, without copies of the cited documents is placed in the national stage application file.

Accordingly, examiners in the PTO who are examining a national stage application will have a copy of the listing of documents cited in the International Search Report but they may not have copies of the documents cited therein and/or they may not have any available English translations of the cited documents. While the PTO is presently receiving copies of documents cited in PCT search reports of the European Patent Office and the Japanese Patent Office in a temporary trial program, the program may be discontinued at any time and applicants cannot rely upon this program to provide the examiner with copies of references or with any available English translation.

Citation of International Search Report Documents in Information Disclosure Statements

Applicants and/or applicant's attorney in PCT national stage applications, to ensure compliance with 37 CFR 1.56, should cite and supply copies of the documents cited in the PCT International Search Report which are "material" as defined in 37 CFR 1.56, preferably by an information disclosure statement under 37 CFR §§ 1.97-1.99.

A primary concern of the Patent and Trademark Office and the applicant should be that prior art cited in the PCT International Search Report which is material to the examination of the United States national stage application be fully considered during the examination of the United States national stage application. The best manner of ensuring such consideration is through a cooperative effort by all of the persons involved in the prosecution and examination of the United States national stage application. The applicant and his or her foreign patent attorney or agent obviously have access to, and presumably consider, the citations in the PCT International Search Report. With rare exceptions, the International Search Reort is prepared prior to the time at which applicant enters the United States national stage under 35 U.S.C. 371. Thus, applicant and his or her foreign attorney or agent are in a position to have reviewed the citations in the PCT International Search Report and call the attention of the United States patent attorney to those documents which are material. Under present case law, e.g., *Gemveto Jewelry Company, Inc. v. Lambert Bros., Inc.*, 216 U.S.P.Q. 976 (S.D. N.Y. 1982), foreign patent attorneys representing applicants for U.S. patents through United States correspondent patent attorneys are held to the same standards of conduct which apply to their United States counterparts. Since foreign applicants and their foreign patent attorneys have presumably considered the citations in the PCT International Search Report, and are under a duty to disclose the material citations contained therein, the preferred practice is to have this disclosure made via an information disclosure statement under 37 CFR §§ 1.97-1.99.

This will ensure that material citations contained in the PCT International Search Reort are considered by the examiner during the exmination of the United States national stage application. To the extent that the examiner does review the citations without an information disclosure statement having been submitted, the foreign applicant will obviously benefit therefrom. However, the foreign applicant and applicant's attorney cannot rely upon such a review by the examiner being conducted so as to relieve them of their dury to adequately disclose material prior art.

Copies of Documents Supplied With Office Actions

Copies of documents cited by the examiner in U.S. national stage applications will be provided as set forth in Section 707.05(a) of the MPEP. That is, copies of documents cited by the examiner will be provided to applicant except where the documents:

(1) are cited at allowance
(2) have been referred to in applicant's disclosure statement, and
(3) where the documents are cited and have been provided to applicant by the PTO in a parent national or international application.

Listing of Documents Cited in PCT International Search Reports by Examiners for Printing on Patents

The examiner should review all copies of documents cited in the International Search Report and should cite those documents which are material to the subject matter claimed in the national stage application. In those instances where documents are cited in the PCT search report but neither a copy of the documents nor an English translation (or English family member) is provided, the examiner may exercise discretion in deciding whether to take the necessary steps to obtain the copy and/or translation.

Where an information disclosure statement has been filed and copies have been submitted in conformance with 37 CFR 1.98 and section 609 of the Manual of Patent Examining Procedure (MPEP), the examiner must list all citations on form PTO— 892 as part of the next regular Office action following receipt thereof unless such citations are listed by applicant on form PTO-1449.

Insofar as the citation by the examiner in an Office action of all of the documents cited in a PCT International Search Report is concerned where 37 CFR 1.98 has not been followed, it is not seen to be appropriate for the examiner to automatically cite, in the national stage application, each document listed in the PCT international search report. It has been the experience of the PTO that many documents listed on the PCT international search report are not relevant to the claims in the U.S. national stage application or that an English language equivalent document is used by the examiner.

May 23, 1986. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1067 OG 32]

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Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 10

Docket No. 90135-9035

Duty of Disclosure and Practitioner Misconduct

Agency: Patent and Trademark Office, Commerce
Action: Proposed Rule
Summary: The Patent and Tradmark Office (Office) proposes to amend the rules of practice in patent cases (1) to clarify the duty of disclosure standard for information required to be submitted to the Office; (2) to make information disclosure statements mandatory for complying with the duty of disclosure; (3) to provide specific deadlines for submitting such statements including the requirement of a fee in some cases if the statement is filed after the first deadline; (4) to eliminate consideration of duty of disclosure issues by the Office except in disciplinary proceedings, and under limited circumstances in the examination of reissue applications; and (5) to eliminate the striking of patent applications which are improperly executed. The Office further proposes to amend the rules governing practice before it by registered attorneys and agents to define acts of misconduct which conform to a failure to comply with the proposed rules on duty of disclosure.

These proposed changes are considered desirable in view of the large amount of resources that are being devoted to duty of disclosure issues both within and outside the Office without significantly contributing to the reliability of the patents being issued. The proposed rules are intended: (1) to reduce the burden on patent applicants and those associated with the filing and prosecution of patent applications in complying with the duty of disclosure to the Office; (2) to minimize the risk that valuable patent rights will be lost by providing procedures and mandatory deadlines for submitting information to the Office in pending patent applications; (3) to ensure consideration of relevant information by the Office before a final decision on patentability is made by the patent examiner; and (4) to permit some of the Office resources now devoted to a consideration of duty of disclosure issues to be directed to the reduction in the backlog of pending patent applications.
Dates: Comments must be submitted on or before June 20, 1989. A public hearing will be held on June 22, 1989, beginning at 9:30 a.m. Requests to present oral testimony should be received on or before June 20, 1989.
Addresses: Address written comments and requests to present oral testimony to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Charles E. Van Horn. The hearing will be held at the U.S. Patent and Trademark Office in Room 912 of Bldg. 2, Crystal Park, located at 2121 Crystal Dr., Arlington, Va. Written comments and a transcript of the public hearing will be available for public inspection in Room 5C15 of Bldg. 2, Crystal Plz.
For Further Information: Charles E. Van Horn or John H. Raubitschek by telephone at (703) 557-4035 or by mail addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

The goal of any patent examination system is to provide for the grant of reliable patents to protect the patent owner and those who must often expend considerable resources in developing the invention. The grant of reliable patents is dependent, in large part, on the examiner making a decision on patentability after a thorough consideration of the scope and content of the prior art. Any intentional withholding from the Office of information which directly affects the determination of patentability of an invention may undermine the reliability of the resulting patent.

This proposed rule change is designed to ensure that the examiner considers the pertinent prior art before making a final decision on patentability and to allow for the reallocation of Office resources regarding the duty of disclosure in the prosecution of patent applications before the Office. It has long been recognized that by reason of the nature of an application for patent, those representing a patent applicant before the Office are required to act in a manner consistent with the highest degree of candor and good faith. *Kingsland* v. *Dorsey*, 338 U.S. 318, 83 USPQ 330 (1949), *reh.g denied*, 338 U.S. 939 (1950).

There have been several attempts to define the duty to disclose information to the Office in 37 CFR 1.56. In addition, an evolving body of case law on fraud and inequitable conduct in the Office has reflected, at times, a lack of cohesive direction. This has led to some uncertainty about the duty of disclosure and to the unproductive use of considerable resources by the Office, the patent bar, patent applicants, and patent owners in addressing issues relating to this duty. *See* 16 AIPLA Quarterly Journal Nos. 1 and 2 (1988).

The determination of inequitable conduct in the Office as it relates to the nondisclosure of information affecting the patentability of an invention has involved a factual determination of two elements: (1) materiality of the information; and (2) intent to mislead the Office on the part of the individual who did not bring the information to the attention of the Office. After the withheld information and conduct of the individual are determined to meet the threshold levels of materiality and intent, courts balance the findings relating to materiality and intent in order to evaluate whether inequitable conduct has occurred. *J. P. Stevens & Co.* v. *Lex Tex, Ltd.*, 747 F.2d 1553, 223 USPQ 1089 (Fed. Cir. 1984), *cert. denied*, 474 U.S. 822 (1985).

The Office standard for materiality in § 1.56 is considered by the courts to be an appropriate starting point for analysis since it appears to be the broadest, thus encompassing other standards, and because §1.56 governs how one ought to conduct business with the Office. *American Hoist & Derrick Co.* v. *Sowa & Sons, Inc.*, 725 F.2d 1350, 220 USPQ 763 (Fed. Cir.), *cert. denied*, 469 U.S. 821 (1984). However, the Office believes that an appropriate standard of materiality should take into consideration whether or not the examiner was influenced by the withholding of the information to avoid the harsh effects of *A. B. Dick Co.* v. *Burroughs Corp.*, 798 F.2d 1392, 230 USPQ 849 (Fed. Cir. 1986), where a patent was held to be unenforceable even though the examiner was aware of and applied the withheld prior art. In addition, there may be a question of the need for applying the concept of materiality to claims which have been canceled or modified in order to find inequitable conduct. *See Driscoll* v. *Cebalo*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984).

Some court decisions have held that intent to mislead may be inferred from the materiality of the withheld reference(s). *Argus Chemical Corp.* v. *Fibre Glass-Evercoat Co., Inc.*, 759 F.2d 10, 225 USPQ 1100 (Fed. Cir.), *cert. denied*, 474 U.S. 903 (1985). Other decisions require consideration of the attorney's or agent's good faith or lack thereof. *Allen Archery, Inc.* v. *Browning Mfg. Co.*, 819 F.2d 1087, 2 USPQ 2d 1490 (Fed. Cir. 1987). However, recently the Federal Circuit has required that in order to prove inequitable conduct, there must be evidence of intent to mislead the Office beyond the materiality of the withheld references. *FMC Corp.* v. *Manitowoc, Co. Inc.*, 835 F.2d 1411, 5 USPQ 2d 1112 (Fed. Cir. 1987) and *Burlington Industries, Inc.* v. *Dayco Corp.*, 849 F.2d 1418, 7 USPQ 2d 1158 (Fed. Cir. 1988). *See also Kingsdown Medical Consultants, Ltd.* v. *Hollister Inc.*, 863 F.2d 867, 9 USPQ 2d 1384 (Fed. Cir. 1988) (en banc).

The requirement for evidence on intent to mislead the Office was also applied to the Office in making a rejection under § 1.56. *In re Harita*, 847 F.2d 801, 6 USPQ 2d 1930 (Fed. Cir. 1988). The recent emphasis by the courts on the element of intent has led the Office to re-examine its policy with respect to § 1.56 because of the difficulty in obtaining probative evidence on intent. The Office makes its decision on the record and does not take live testimony where the demeanor of the witnesses, who are subject to cross-examination, can be observed. For the Office to conduct hearings is not considered to be an effective utilization of resources. Further, the examination procedure is essentially *ex parte* and so the evidence on intent would have to be developed primarily by the Office.

On the other hand, courts hear testimony, have subpoena power, and can easily fashion an equitable remedy to fit the precise facts in those cases where inequitable conduct is established. In addition, a court proceeding generally involves at least two participating adverse parties to develop the evidence. Thus, it seems more appropriate for inequitable conduct issues to be handled by the courts rather than by an administrative body, especially since inequitable conduct is not a statutory criterion for patentability but rather results from a judicial application of the doctrine of unclean hands.

The proposed changes to the rules relating to the duty of disclosure retain the responsibilities of candor and good faith in dealing with the Office and are intended to promote the reliability of issued patents while minimizing the risks that patent rights may be unnecessarily compromised in the examination of patent applications. The Office believes that these purposes can be accomplished by specifying the threshold level of materiality to conform with an objective "but for" standard, and by ensuring that an information disclosure statement will be considered in an application at a point in time before a final determination of patentability is made. The "but for" standard of materiality should result in a more predictable duty of disclosure because it is based on a statutory standard of patentability. Although submission of an information disclosure statement might be acceptable a short time after final action by the examiner with an additional fee to cover the increased costs of examination, the Office considers the establishment of final action as a specific deadline to be a more effective way to ensure that pertinent information will be thoroughly considered by the examiner before the patent issues and to discourage intentional delays in the submission of information disclosure statements.

Under the proposed changes to the rules, the Office will no longer +investigate violations of the duty to disclose, except with respect to a charge of misconduct under § 10.131, nor will it reject claims for such violations. Similarly, the Office will not comment upon duty of disclosure issues which are brought to the attention of the examiner except to note in the application file, when appropriate, that such issues are no longer considered by the Office during its examination of patent applications.

Examination of lack of deceptive intent in reissue applications will continue, but without any independent investigation of inequitable conduct issues. The reissue applicant's statement of lack of deceptive intent will be accepted as dispositive except in special circumstances, such as a judicial determination of fraud or inequitable conduct or an admission of facts which would conclusively establish fraud or inequitable conduct without any investigation. In those cases, the claims will be rejected under 35 U.S.C. 251 for failing to satisfy the statutory requirement of a lack of "deceptive intent." *See In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975). Accordingly, reissue will not be available to cure a prior judicial determination of inequitable conduct.

It is anticipated that under the proposed change in practice, information pertinent to a determination of patentability will be brought to the attention of the Office in a timely manner. An applicant's desire to minimize the prospect of facing an inequitable conduct charge or decision in any later litigation as well as to assure the greatest benefit of the presumption of validity under 35 U.S.C. 282, should provide sufficient incentive to furnish the necessary information to the Office. By filing information disclosure statements which include close art or information even though it is not considered to render any claim unpatentable, an applicant may thereby avoid inequitable conduct issues or charges and develop a strong defense in the event of such a charge. The practice of citing close art may be helpful in those cases where the art is combinable with other art subsequently found and cited by the examiner especially since a court may find that the withheld information does, in fact, affect patentability.

It should be noted that patentees may have to show later in litigation that there was no "intent" to withhold information or deceive the Office. Thus, until the proposed change by the Office is adopted by the Office and the courts, an applicant and those others who owe a duty to the Office should comply also with the duty as applied by the courts which may find inequitable conduct or fraud with respect to one or more claims, thereby rendering a patent unenforceable or invalid. *See Kingsdown Medical Consultants, Ltd.* v. *Hollister Inc.*, *supra*, at 20.
The proposed change is very unlikely to have a significant impact on the workload of the Federal courts since the duty of disclosure issue was raised in less than 0.3% of the pending applications over the past two fiscal years and patent suits were filed at a rate of about 0.83% of all patents granted in the same time period. Further, enforcement by the Office of the duty of disclosure has rarely avoided the necessity of consideration of this issue by the courts.

Practitioners found to have participated in inequitable conduct or fraud remain subject to disciplinary proceedings. 37 CFR Part 10.

The proposed rules would substantially conform the rules to the policy announced in the Official Gazette: "Patent and Trademark Office Implementation of 37 CFR 1.56," 1095 *Official Gazette* 16 (Oct. 11, 1988), "Further Clarification on Patent and Trademark Office Implementation of 37 CFR 1.56," 1096 *Official Gazette* 19 (Nov. 8, 1988), and "Patent and Trademark Office Implementation of 37 CFR 1.28(d) and 1.56(c), (f) and (g)," 1098 *Official Gazette* 502 (Jan. 3, 1989).

DISCUSSION OF SPECIFIC RULE CHANGE PROPOSALS:

Section 1.17, if amended as proposed, would add a fee defined in paragraph (p) to be $200.00, which is due upon filing of an information disclosure statement more than three months after the filing date of the application as described in proposed § 1.97(f) and (g) or more than two months after the date of the order for examination as set forth in proposed § 1.555(b). Two exemptions from this fee requirement are provided in §§ 1.97(g) and 1.555(b). The information disclosure statement will not be considered to have been filed until the fee is paid in full.

Prior to the changes in the duty of disclosure proposed herein, an applicant assumed the risk of violating the duty if an examiner cited a reference before it was brought to the attention of the Office. Under the proposed rules, which are more flexible in allowing information to be brought to the attention of the Office, the duty would not be violated until a patent issued. Therefore, the proposed fee is being charged to cover a new service as well as to compensate the Office for the extra work caused the examiner who may have to redo part or all of the examination.

Section 1.28(d)(2) is proposed to be amended to remove the references to § 1.56(d) (proposed to be deleted) and to § 1.555 of this part. This proposal retains the identification of a fraud practiced or attempted on the Office, but removes the reference to those sections of this part which provide for rejections based on such fraud.

Section 1.52(c) is proposed to be amended to remove the reference to § 1.56(c), which is proposed to be deleted. As noted below, the Office proposes that it will no longer take steps to strike an application for the reasons defined in § 1.56(c).

Section 1.56 is proposed to be deleted in its entirety to provide a clear demarcation with past practice in the Office and to facilitate future citation and application of the proposed new rule and the principles it embodies. Thus, a legal search of § 1.57 will reveal only cases decided under the new practice, but a search of § 1.56 will be limited to cases decided under the old practice.

Proposed § 1.57 defines the new duty to disclose information to the Office and the limited circumstances in which the Office will take action when it is determined that a violation has occurred. Proposed § 1.57 defines various aspects of Office practice, procedure and policy as follows:

(a) who has the duty to disclose;
(b) what information is required to be disclosed;
(c) circumstances for action by the Office; and
(d) misconduct - lack of candor and good faith.

Section 1.57(a), as proposed, defines the class of individuals who owe a duty of candor and good faith to the Office. The purpose of § 1.57(a) is to define the same class of individuals included in § 1.56. Thus, the duty is owed by four groups of individuals that are not necessarily mutually exclusive: (1) any named inventor as defined in paragraph (a)(1); (2) any non-inventor as defined in paragraph (a)(2); (3) each registered attorney or agent as defined in paragraph (a)(3); and (4) any other individual who is both substantively involved in the preparation or prosecution of the application and who is associated with at least one of the entities defined in paragraph (a)(4)(II). The latter group of individuals would include foreign patent attorneys representing an applicant for a U.S. patent through a local correspondent firm. *See In re Harita, supra*, and *Gemveto Jewelry Co., Inc.* v. *Lambert Bros., Inc.*, 542 F. Supp. 933, 216 USPQ 976 (S.D.N.Y. 1982). It would also include a person acting as liaison between the inventor and the attorney or agent handling the prosecution of an application before the Office and who is involved in the preparation or prosecution of the application in a manner that would make a reasonable representative aware of the substantive aspects of the patent

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application. The person does not have to be a member of a law firm or corporate patent department employed by the assignee of the patent application. On the other hand, merely because the individual worked on related cases for the same assignee would not, without further knowledge of the content and claims of the application being considered, create a duty of disclosure for that individual, nor would there be a duty to inquire of that individual as to whether he or she knew of relevant information.

Section 1.57(b), as proposed, represents a significant departure from the standard defined under § 1.56. It adopts an objective "but for" standard of materiality, which requires a conclusion that a pending claim would not have been permitted to issue in a patent grant "but for" the misrepresentation, concealment, or otherwise culpable conduct with respect to any fact. That is, the "but for" standard of materiality requires a conclusion that a pending claim is (1) patentable in the absence of a given fact which is the subject of misrepresentation, concealment or otherwise culpable conduct; and (2) unpatentable in the presence of such fact. In deciding the question of materiality under the "but for" standard, a decision maker would first look to the patentability of the claim based on the record and the facts known to the individuals designated in § 1.57(a) without the fact which was misrepresented, concealed, or otherwise subject to culpable conduct, i.e., as though the fact did not exist. Having determined that the claim is patentable without the fact which was misrepresented, concealed, or otherwise subject to culpable conduct, the decision maker would then determine if the claim is unpatentable assuming the fact does exist. If the claim is determined to be unpatentable, the fact would meet the "but for" test standard of materiality proposed in these rules.

Whether or not information meets the "but for" standard of materiality is not dependent upon what the examiner would do with the misrepresented or concealed information if the true facts were known to the examiner, but rather whether or not the information would make a difference in the patentability of the claims if the information had been properly disclosed and not misrepresented nor concealed.

Thus, the determination of patentability under this standard is not based on the subjective determination of any particular examiner or other Office personnel, nor on the subjective determination of any of the individuals defined in proposed § 1.57(a), but consists of an objective legal conclusion as to the patentability of one or more claims under relevant sections of Title 35 and applicable judicial precedent. A person would not be considered by the Office to have violated the duty of disclosure under § 1.57 until a patent issued and it is determined that at least one patent claim is unpatentable based at least in part on information withheld from the Office.

The duty to disclose under proposed § 1.57(b) does not apply to information which is of record in an application. In other words, there would be no violation of the duty if the examiner independently finds the withheld prior art and makes it of record in the application file prior to the issuance of a patent. Further, information and documents cited in international search reports from the European Patent Office (EPO) and the Japanese Patent Office (JPO) will be considered to be of record under certain circumstances in the corresponding PCT-based national stage application filed under 35 U.S.C. 371. Those circumstances include the current agreement among the three patent offices (EPO, JPO, USPTO) that international search reports prepared by any of the three offices and designating another office will include a copy of each document cited and an indication of the relevance of such document. This cooperative arrangement has been working informally for about five years and became a formal continuing program recently. Thus, the duty to disclose does not apply to documents cited in an international search report prepared by any of the three offices because they will be considered by the Office to be of record in the national stage application filed in the United States under 35 U.S.C. 371.

The information which is misrepresented or concealed need not anticipate a pending claim to fall within the "but for" standard of materiality, but must, when added to other facts of record in the application and known to the individuals designated in proposed § 1.57(a) preclude the allowance of at least one pending claim in a patent. Allowance may be precluded under appropriate sections of Title 35 in addition to any judicially created doctrine such as double patenting of the obviousness type.

A pending claim within the meaning of proposed § 1.57(b) is a claim which is presented for examination and has not been canceled. No duty of disclosure would exist as to a claim that is canceled in a preliminary amendment submitted with the application papers. Similarly, no duty of disclosure would exist as to a claim that has been canceled at the time a person defined in proposed § 1.57(a) becomes aware of a publication that would render that claim unpatentable, either by itself or in combination with other evidence of record or known to such a person. On the other hand, a duty of disclosure would exist as to a claim that has been withdrawn from consideration by the examiner - for example, as the result of a restriction requirement - but has not been canceled. Nevertheless, a violation of that duty would not occur unless and until a patent issued with such a claim.

The duty of disclosure arises at the point in time when an individual becomes aware of information not of record in the application that would render unpatentable any claim then pending. Actual knowledge of the pertinent information and its materiality is not required by this proposed paragraph if the individual should have known of the information and its materiality. *See FMC Corp.* v. *Manitowoc Co., supra* and *FMC Corp.* v. *Hennessy Industries, Inc.*, 836 F.2d 521, 5 USPQ 2d 1272 (Fed. Cir. 1987). The duty of disclosure continues until that claim is canceled. If a claim is modified during prosecution in the Office, the scope of the amended claim determines the duty of disclosure. But, as mentioned above, there would be no violation of that duty unless a patent issues with a claim which would be unpatentable over information which includes the withheld prior art or information.

Proposed § 1.57(b) makes mandatory the procedures set forth in proposed §§ 1.97 and 1.98 for disclosing to the Office information that meets the "but for" standard of materiality. The general practice of filing information disclosure statements as a method of complying with the duty of disclosure would no longer be optional.

Finally, proposed § 1.57(b) indicates that an individual designated in proposed § 1.57(a)(4) can satisfy the duty of disclosure by disclosing information to an individual designated in any of proposed § 1.57(a)(1)-(3). This provision relates only to the determination of possible misconduct on the part of the individual designated in proposed § 1.57(a)(4), and does not otherwise satisfy the duty of disclosure owed to the Office.

Proposed § 1.57(c) emphasizes that responsibility for compliance with the duty defined in paragraph (b) rests with the individuals identified in paragraph (a), and that generally no evaluation will be made by the Office in any proceeding as to compliance with paragraph (b). The only circumstances in which the Office will consider compliance with this section under the proposed rules are either with reference to a disciplinary proceeding under 37 CFR Part 10 or in limited situations with a reissue application, as where there is a judicial determination of fraud or inequitable conduct or an admission of facts which would conclusively establish fraud or inequitable conduct without any investigation.

Proposed § 1.57(d) would provide a cross reference to the rules relating to the representation of others before the Office in 37 CFR Part 10 and indicate that the failure of a registered representative to comply with the duty of candor and good faith required by proposed § 1.57 may be cause for instituting disciplinary action under § 10.131 for misconduct.

The provisions of § 1.56(c), (f) and (g) are proposed to be eliminated because an application may be filed in the Office without an oath or declaration pursuant to § 1.53(d). Further, the defects in executing a patent application listed in § 1.56(c) would have to be cured by filing a supplemental oath or declaration pursuant to proposed § 1.67(c). Accordingly, the Office will not consider striking an application for these defects under the proposed rules and will not entertain a petition directed to such matters. However, the conduct of any practitioner permitting a material alteration of the application papers after the oath or declaration has been signed, which is prohibited by § 1.52(c), is not condoned by the Office and remains subject to a disciplinary proceeding. *See* § 10.23(c)(11).

Similarly, since the Office will not comment on duty of disclosure issues which are brought to its attention in original or reissue applications except in very limited circumstances related to deceptive intent in a reissue application, the provisions of § 1.56(d), (e), (h) and (i) are proposed to be eliminated. The provision in § 1.56(j) that a time period would be set by the Office for the applicant to provide copies of documents omitted from an information disclosure statement is to be deleted because time may be given only in very limited circumstances in order to complete an information disclosure statement under proposed § 1.97.

Section 1.63(a)(1) is proposed to be revised to require that an oath or declaration be dated when it is signed. Thus, the Office will be able to determine if there has been an unusual length of time between the date of execution of the oath or declaration and the filing date of the application. Also, a cross reference to § 1.64 is added because that section contanns several execution requirements.

Section 1.63(b)(3) and (d) are proposed to be revised to reflect that § 1.56 is being replaced by new § 1.57. The oath or declaration filed with an application would need to acknowledge a duty to disclose information as required by proposed § 1.57. Any oath or declaration, which acknowledges a duty to disclose information material to the examination of the application in accordance with the present § 1.56(a), would be acceptable under the proposed rules since the proposed standard of materiality is included within the standard previously applied by the Office (i.e., if an individual complied with the former standard, that individual would comply with the proposed standard).

Section 1.67 is proposed to be revised to add new paragraph (c) requiring that a new oath or declaration be filed if a prior one contained any of the defects previously listed in § 1.56(c). The new oath or declaration may be sought by the Office or the applicant may voluntarily submit one.

The provisions of present § 1.97 are proposed to be revised to require the submission of a statement regarding information which an individual designated in proposed § 1.57(a) has a duty to disclose under proposed § 1.57(b), to define the time periods for filing an information disclosure statement, and to continue the option to file a statement directed to information which the applicant would like the Office to consider even though the information may not meet the "but for" level of materiality.

Under proposed § 1.97(a), an information disclosure statement would be required to be filed in each national application or Patent Cooperation Treaty (PCT)-based national stage application where an individual designated in proposed § 1.57(a) knows or should have known of information which meets the objective "but for" test of proposed § 1.57(b). An individual is not obligated to conduct a prior art search nor furnish a negative information disclosure statement. The filing of an information disclosure statement in a reexamination proceeding is addressed in the proposed revision of § 1.555.

Under proposed § 1.97(b), an information disclosure statement may be filed to contain information which an applicant would like the Office to consider in the examination of an application. There is no duty or requirement to disclose information to the Office unless it meets the threshold materiality and knowledge requirements set forth in proposed § 1.57.

Section 1.97(c), as proposed, would make mandatory the time periods for filing an information disclosure statement. This provision differs from current practice which only encouraged the filing of an information disclosure statement within a short period of time after the application is filed. By requiring a statement to be filed within the times specified, the Office seeks to promote the efficiency of the examination process and to help avoid duty of disclosure issues. Specifically, the statement shall be filed in a national patent application within three months of the filing date of the application. For a PCT-based national stage application, the statement shall be filed within three months of entry of the national stage application as set forth in § 1.491. In each type of application, an information disclosure statement may be filed after the three-month period, but this would normally require a fee. The purpose of the fee for information submitted after the three-month period is to compensate the Office for the extra work caused the examiner who may have to redo part or all of the examination because of the late submission.

The time periods for filing a statement are not subject to an extension of time under § 1.136. However, the examiner may allow an additional time period to permit an applicant to provide any information required by § 1.98, which was inadvertently omitted. The concept proposed here is the same as that applied under § 1.135(c). Otherwise, if the applicant needs to supplement an incomplete statement after the three-month period has expired, the additional information would have to be filed as part of a separate statement under § 1.97(f), which may require a fee.

An information disclosure statement timely filed within the three months of the filing date pursuant to proposed § 1.97(c) will be considered by the examiner, even if filed after the mailing of an examiner's final action or a notice of allowance, which in rare instances may occur within three months of the filing date. For the purposes of this proposed section, the statement will be considered to be filed on the day it is received in the Office, or the date of mailing on a properly executed certificate of mailing pursuant to § 1.8 or Express Mail certificate pursuant to § 1.10, whichever is earlier.

Proposed § 1.97(d) would continue the present practice of permitting an applicant to file an information disclosure statement either as a paper or submission separate from the specification or by incorporating the information disclosure statement in the specification of the application.

Proposed § 1.97(e) would stipulate that the mere filing of an information disclosure statement shall not constitute an admission that any information disclosed in that statement renders unpatentable any claim pending in the application, unless the statement contains an admission within the meaning of § 1.106(c). This section would also continue the present policy that the filing of an information disclosure statement will not be construed as a representation that any patentability search has been made.

Proposed § 1.97(f) would expand and revise the existing practice of filing supplemental information disclosure statements under § 1.99. Under the proposed section, an applicant may satisfy the duty of disclosure requirement by filing a statement after the three-month period in paragraph (c) has expired. In addition, a statement would be required to bring to the attention of the Office any information not in the record nor contained in an information disclosure statement filed under proposed paragraph (c), which meets the standard of materiality in proposed § 1.57. As in paragraph (c), a statement filed under paragraph (f) may include other information which an applicant would like the Office to consider in examining the application. Thus, such a statement may be used to supplement one filed under paragraph (c).

It should be noted that the standard of materiality applies to claims pending in the application and relates to information of record in the application being examined in addition to the information known or which should have been known by an individual designated in proposed § 1.57(a). Thus, a document known to such an individual which was not required to be disclosed in an information disclosure statement under proposed § 1.97(c) may need to be disclosed in a statement under proposed § 1.97(f) due to intervening events.

For example, the scope of the claims may be changed to make a document fall within the proposed standard of materiality even though the document was not relevant to the patentability of the claims as originally presented. As an additional example, an inventor may know of a first reference which by itself does not render a claim unpatentable However, the examiner may find and cite a second reference which makes the first reference fall within the proposed scope of materiality - thereby creating a duty to disclose the first reference. Likewise, the first reference may become relevant due to the citation of a third reference by a foreign patent office or because of the independent discovery by the inventor during the examination process of a fourth reference. All of these possibilities continue to make it important for individuals to bring pertinent information to the attention of the Office as soon as it is discovered.

It is recognized that patentability may be established by the submission to the Office of evidence of unexpected results or commercial success. In addition, a reference may be removed from consideration by filing an antedating affidavit containing evidence of prior invention under § 1.131. It is permissible for an applicant to rely on such evidence in determining whether or not to disclose certain information to the Office even if the evidence is not submitted to the Office for evaluation Therefore, there would be no violation of the duty of disclosure if, prior to the issuance of a patent, an applicant is or becomes aware of such evidence that would establish patentability of all the claims over the withheld information and the art of record. Of course, a court later might conclude that the evidence was not sufficient to establish patentability and find that there was inequitable conduct On the other hand, if the applicant becomes aware of such evidence after issuance of a patent, this would not avoid a violation of the duty to the Office because the patent would not

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have issued *but for* the withholding of information.

A statement under paragraph (f) must be filed no later than the business day prior to the mailing date of the final action or the notice of allowance, whichever occurs first This will enable the examiner to consider carefully the statement without disrupting the normal processing of applications within the Office. In the event that a final Office action is withdrawn or a notice of allowance is rescinded, any information disclosure statement that had not been filed in a timely manner would be acceptable if timely resubmitted and otherwise proper in form and content The application would then be treated as if no final action or notice of allowance had been mailed up to the point that such an action is withdrawn or rescinded. No extensions of time are permitted under § 1.136 although the examiner may set an additional time period to permit an applicant to provide any information required by § 1.98, which was inadvertently omitted.

As noted above, a statement that was untimely when filed under paragraph (f) could be considered timely by the occurrence of subsequent events If one of those events occurs, the information contained in the statement would be considered by the examiner if the information disclosure statement is timely resubmitted. In the absence of any of those events, such that the statement remains untimely, the information contained in the statement would be considered only if the application in which it is filed is abandoned and the information is disclosed in a continuing application in the manner prescribed in proposed § § 1.97 and 1.98. This will require that copies of documents cited in the information disclosure statement be resubmitted in the continuing application.

Proposed § 1.97(g) would require that a fee in the amount set forth in proposed § 1.17(p) accompany an information disclosure statement filed under paragraph (f) unless the statement certifies that all of the information disclosed in such a statement was, within three months prior to the date the statement is filed in the Office, either first cited by a foreign patent office in a counterpart foreign patent application or first came to the attention of any person charged with the duty of disclosure in § 1.57(a). The date on the action by the foreign patent office begins the three-month period in the same manner as the mailing of an Office action starts a three-month shortened statutory period for response. Likewise, the filing date of the statement is the date the statement is received in the Office, or the date of mailing if accompanied by a properly executed certificate of mailing under § 1.8, or certificate of Express Mail under § 1.10, whichever occurs earlier.

The term "counterpart foreign patent application" means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent application are substantively identical. Although paragraph (g) does not require a fee if the information disclosure statement is submitted within certain time periods, this is not intended to modify the requirement in paragraph (f) of this section that a statement must be filed before the final action or notice of allowance is mailed.

Certification by a registered practitioner that the statement was filed within the three-month period of either first citation by a foreign patent office or first discovery of the information (not the materiality of the information) will be accepted as dispositive of compliance with this provision in the absence of evidence to the contrary. A statement on information and belief normally will not be sufficient. Although it is recognized that an individual actually becomes aware of the information in the communication from the foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to the first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee. The Office is willing to absorb any additional cost in considering such information submitted three months after filing the application only when it is clear that an applicant is diligent in providing the information to the Office.

Under proposed § 1.97(h), an information disclosure statement would not be considered to be filed until all component parts of a complete statement under proposed § 1.98 are filed with the Office, except for inadvertent omissions. Thus, the filing of a statement identifying relevant documents but intentionally failing to supply available copies of all the cited documents will not be accepted until such copies are supplied. Paragraph (h) also sets forth the consequences and procedures for processing an information disclosure statement that is either not complete and/or not filed in a timely manner. Such a statement will not be deemed to satisfy any applicable duty of disclosure owed to the Office by an individual designated in proposed §1.57(a) but will be returned to the applicant and not considered by the Office in that application. If the required fee was submitted, it will be refunded. The Office will note in the record of the application that an information disclosure statement was returned to the applicant. It is expected that an applicant will file a continuing application to have the Office consider pertinent prior art which comes to his or her attention after final action or notice of allowance has been mailed if the prior art affects the patentability of any claim.

Under the proposed revision of § 1.98, the administrative details of supplying information to the Office are defined. For the most part, these details remain unchanged from current practice, but the format and wording has been modified to provide greater clarity. Under proposed § 1.98(a), the information disclosure statement must include a listing of the information required to be disclosed by § 1.97, preferably in or on a form which is suitable for inclusion in the record without requiring the examiner to reproduce the same information on a form acceptable to the printer so that the documents will be listed on the patent. Those submitting an information disclosure statement are encouraged to use form PTO-1449, "Information Disclosure Citation." In addition to the listing, the statement must include an explanation of the reason each item of information is listed. Typically, the reason would include a concise explanation of the relevance of each item to the claimed invention, but may further contain an explanation of why the claimed invention should be considered patentable over the item of information.

Proposed § 1.98(b) would continue the present practice and policy of requiring an individual to submit a legible copy of the document or other information cited in the information disclosure statement either in its entirety or at least that portion of each item of information which caused the individual submitting the information to list that item in the information disclosure statement. If a copy of the document or item of information is not in the possession, custody, control or is not otherwise readily available to any individual designated in proposed §1.57(a), the individual submitting the statement must submit a statement to that effect at the time of presenting the statement to the Office. It is not expected that the latter situation will arise very often, but because of the time deadlines involved in filing an information disclosure statement, it is considered appropriate to provide this flexibility for individuals charged with the duty to bring information to the attention of the Office. The Office will not, however, assume the responsibility of obtaining a copy of that item of information before making a final determination of patentability.

Copies of pending U.S. patent applications cited in the information disclosure statement should not be submitted to the Office as set forth in proposed § 1.98(b)(1)(III) because this may result in the unnecessary disclosure of the contents of such patent applications when the application in which it was cited matures into a patent.

Proposed § 1.98(c) continues the present practice and policy regarding the identifying information to be listed for each document typically cited in an information disclosure statement. Listing of the patentees or authors in a patent or publication may be limited to the last name of the first listed inventor followed by "*et al* ."

Proposed § 1.98(d) continues the present practice and policy relative to citing and supplying information which is cumulative and relative to supplying a translation of information that is not in the English language. Under this proposed section, if any of the information required to be disclosed is substantially cumulative in terms of its content relative to the patentability of the claims, the statement need be accompanied by only a single copy of a document containing the essential information provided that the omission of the copies of the cumulative information is explained.

In addition, an English language translation of a foreign language document or the relevant portion thereof need only be submitted when it is in the possession, custody or control of, or readily available to any individual designated in proposed § 1.57(a). This does not mean that such an individual must purchase a translation in each case, even though a translating service is readily available. But if the individual has the ability to translate the foreign language into English and has done so for the purposes of reviewing the information relative to the claimed invention, the translation would be considered "readily available" to the individual.

Section 1.175(a)(7) is proposed to be revised to reflect that §1.56 is being replaced by § 1.57. Any reissue oath acknowledging a duty to disclose information, which is material to the examination of the application in accordance with the present § 1.56(a), would be acceptable under the proposed rules as explained in connection with the proposed change to § 1.63(b) and (d).

Section 1.193(c) is proposed to be deleted and reserved, reflecting the intention of the Office not to comment on duty of disclosure issues in an original or reissue application except in very limited circumstances related to deceptive intent in a reissue application.

Section 1.291(a) is proposed to be revised to eliminate consideration in a protest of an allegation about duty of disclosure issues. Since the Office will not be investigating these issues, such a protest will merely be placed in the application file without comment. Further, protests which do not adequately identify a pending application will be disposed of because the Office cannot act on such protests.

Section 1.291(c) is proposed to be revised to remove the reference to § 1.56. As explained above, there would be no need to require information in a protest with respect to an issue of duty of disclosure.

Section 1.313(b) is proposed to be revised to include, as a reason for withdrawing an application from issue after the issue fee has been paid, a request by an applicant to consider information which has not been filed in a timely manner. Accordingly, since the Office will not consider information which is untimely filed in an application, it is necessary to provide a mechanism to permit an applicant to withdraw an application from issue in the event that it is desired to have the Office consider information that has come to the attention of an individual specified in proposed §1.57(a) after the mailing of the final Office action or the notice of allowance. This mechanism is also available to those who belatedly decide to bring the information to the attention of the Office before the patent issues. The Office wishes to provide every reasonable opportunity for an individual to avoid the consequences of misconduct in the Office.

Section 1.555 is proposed to be revised to conform with the duty of disclosure contained in new § 1.57 and to require that an information disclosure statement be filed within certain time periods Under proposed § 1.555(a), there would be no fee if the statement is filed within two months of the date of the order for reexamination pursuant to § 1.525. An information disclosure statement limited to information not of record as of the date of the order for reexamination will not be considered to be a patent owner's statement pursuant to § 1.530.

Under proposed § 1.555(b), a statement may be filed after the two months if accompanied by a fee in certain circumstances and if filed prior to the mailing of a notice of intent to issue a reexamination certificate. A fee would be due unless it is certified that all of the information disclosed in such a statement was, within two months prior to the date the statement is filed in the Office, either first cited by a foreign patent office in a counterpart foreign patent application or first came to the attention of any person charged with the duty of disclosure in § 1.57(a) if the same information was not earlier cited by a foreign patent office in a counterpart foreign application.
As stated with respect to proposed § 1.97(g), the date on the action by the foreign patent office begins the two-month period and the filing date of the statement is the date the statement is received in the Office, or the date of mailing if accompanied by a properly executed certificate of mailing under § 1.8, or certificate of Express Mail under § 1.10, whichever is earlier. Extensions of time to file an information disclosure statement under either paragraph will not be permitted because 35 U.S.C. 305 requires that reexamination proceedings be conducted with special dispatch and because such a provision would defeat the purpose of the fee to pay for the added costs of examination.

The duty of disclosure is not violated in a reexamination proceeding unless a claim either confirmed or allowed in a reexamination certificate would be rendered unpatentable by withheld information known at the time of the mailing of the notice of intent to issue a reexamination certificate.

Relevant prior art discovered after the mailing of the notice of intent would not be considered in the pending reexamination proceeding. Therefore, the patent owner may wish to file a new request for reexamination under 35 U S C. 302 to have the new information considered on the merits. An information disclosure statement filed in a reexamination proceeding must be made in accordance with the form and content specified in proposed § 1.98.

Subparagraph 10 of § 10.23(c) is proposed to be revised to reflect that § 1.56 is proposed to be replaced by proposed § 1.57 and to add a reference to the duty of disclosure requirement in a reexamination set forth in § 1.555. The proposed change in the duty of disclosure will, of course, have an impact on any disciplinary action charging a practitioner with a violation of that duty.

Subparagraph 11 of § 10.23(c) is proposed to be revised to reflect the change that § 1.56(c) is proposed to be deleted. Although applications having defects in their execution will no longer be stricken, the Office desires to continue to discourage practitioners from permitting alterations in the application papers after the oath or declaration is signed as prohibited by § 1.52(c), especially if such alterations are material.

Mere editing, such as correcting misspellings, would not be considered to involve material changes. Nor would the insertion of filing or patent information of a parent or related application. However, adding to or deleting from the application matters of substance, such as a working example or a claim, would be considered to be a material change.

OTHER CONSIDERATIONS:

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the proposed rules do not require individuals to submit information that they are not already under an obligation to provide to the Office. The proposed rules further promote the efficiency of the examination process by requiring a timely submission of an information disclosure statement and eliminating rejections based on inequitable conduct, thereby reducing the costs to all patent applicants.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this proposed rule has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This proposed rule contains a collection of information requirement subject to the Paperwork Reduction Act, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Each information disclosure statement is estimated to take approximately 30 minutes, including time for reviewing instructions, gathering and maintaining data needed and completing and reviewing the collection of information. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington D.C. 20503. (Attention Paper Reduction Project 0651-0011)

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

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37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are proposed to be amended as follows:

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In § 1.17, paragraph (p) is proposed to be added to read as follows:

§ 1.17 Patent Application Processing Fees.

* * * *

(p) For filing an information disclosure statement under §§ 1.97(f) and (g) and 1.555(b). 200.00

3. Section 1.28(d)(2) is proposed to be revised to read as follows:

§ .28 Effect on fees of failure to establish status, or change status, as a small entity.

* * * * *

(d)(1) * * *

(2) Improperly and through gross negligence (i) establishing status as a small entity or (ii) paying fees as a small entity shall be considered as a fraud practiced or attempted on the Office.

4. Section 1.52(c) is proposed to be revised to read as follows:

§1.52 Language, paper, writing margins.

* * * * *

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed must be made before the signing of any accompanying oath or declaration pursuant to § 1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. No such alterations in the application papers are permissible after the signing of an oath or declaration referring to those application papers. After the signing of the oath or declaration referring to the application papers, amendments may only be made in the manner provided by §§ 1.121 and 1.123 through 1.125.

* * * * *

5. Section 1.56 is proposed to be removed and reserved § 1.56 [Reserved]

6. Section 1.57 is proposed to be added to read as follows:

§1.57 Duty of disclosure.

(a) A duty of candor and good faith toward the Office rests on the following individuals:

(1) any named inventor who signs the oath required by 35 U.S.C. 117 and 35 U.S.C. 118;
(2) any non-inventor who signs the oath required by the last sentence of 35 U.S.C. 115 in an application filed under 35 U.S.C. 117 and 35 U.S.C. 118;
(3) each registered attorney or agent who prepares or prosecutes the application; and
(4) every other individual who is:

(i) substantively involved in the preparation or prosecution of the application; and

(ii) associated with the inventor, an assignee, or any entity to whom there is an obligation to assign the application or any patent issuing thereon.

(b) Any individual designated in paragraph (a) of this section has a duty to disclose to the Office all information not considered by the Office to be of record in an application, which that individual knows or should have known would render unpatentable any pending claim. This duty continues with respect to the pending claim until it is canceled or the application becomes abandoned at which time the duty ceases. Thus, the duty is violated only if a patent issues with a claim which would be rendered unpatentable by the withheld information when all the facts of record in the patent file and known to the individuals designated in paragraph (a) of this section at the time the patent issues are considered. The manner for submitting the required information to the Office is provided in §§ 1.97 and 1.98. Disclosure to a person designated in paragraphs (a)(1), (a)(2), or (a)(3) of this section by an individual designated in paragraph (a)(4) of this section shall satisfy the duty as to that individual.

(c) No evaluation as to compliance with this section will be made by the Office except as provided below:

(1) in a reissue application where the Office is presented with clear and convincing evidence of deceptive intent in obtaining a patent, such as a judicial determination of fraud or inequitable conduct or an admission of facts conclusively establishing fraud or inequitable conduct without conducting an investigation; or
(2) in a disciplinary proceeding against a practitioner under Part 10.

(d) Failure of a registered patent attorney or agent to comply with the duty of candor and good faith may be cause for instituting disciplinary action under § 10.131 for misconduct. *See also* § 10.23(c)(10).

7. Section 1.63 is proposed to be revised to read as follows:

§ 1.63 Oath or declaration.

(a) * * *

(1) Be signed, dated and executed in accordance with §§ 1.64 and 1.66 or 1.68;

* * * * *

(b) * * *

(3) Acknowledges the duty to disclose information in accordance with § 1.57.

* * * * *

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose information in accordance with § 1.57 which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

8. Section 1.67 is proposed to be revised to add paragraph (c) to read as follows:

§1.67 Supplemental oath or declaration.

* * * * *

(c) A supplemental oath or declaration meeting the requirements of § 1.63 must also be filed if the application was altered after the oath or declaration was signed or if the oath or declaration was signed:

(1) in blank;

(2) without review thereof by the person making the oath or declaration; or
(3) without review of the specification, including the claims, as required by § 1.63(b).

9. Section 1.97 is proposed to be revised to read as follows:

§1.97 Filing of information disclosure statement.

(a) An information disclosure statement shall be filed within the time periods set forth in this section in each:

(1) national patent application; and
(2) PCT-based national stage application to disclose all information which any individual charged with the duty of disclosure in § 1.57(a) knows or should have known renders unpatentable any claim pending in the application at the time the information disclosure statement is filed. If there is no such information, an information disclosure statement is not required.

(b) An information disclosure statement may also disclose other information which an applicant would like the Office to consider in examining the application.

(c) An information disclosure statement may be filed without a fee in a national patent application within three months of the filing date of the application. In a PCT-based national stage application, the statement may be filed without a fee within three months of entry of the national stage application under § 1.491. No extensions of time are permitted under § 1.136 except that if a *bona fide* attempt has been made to comply with § 1.98 but part of the required information was inadvertently omitted, additional time may be given to enable full compliance.

(d) Any information disclosure statement filed under this section may be:

(1) filed in a paper separate from the specification of the application; or
(2) incorporated in the specification.

(e) Unless an information disclosure statement contains an admission within the meaning of § 1.106(c), the filing of an information disclosure statement shall not constitute an admission that any information disclosed renders unpatentable any claim pending in the application. Nor shall the mere filing be construed as a representation that a patentability search has been made.

(f) If, after the time for submitting an information disclosure statement under paragraph (c) of this section has expired, there is information not of record which is required to be disclosed under §1.57(b), a statement shall be timely filed in the form required by § 1.98. The statement may also include other information which the applicant would like to have considered. Any statement filed under this paragraph will be deemed timely only if it is filed prior to the mailing of an examiner's final action under § 1.113 or of a notice of allowance under § 1.311, whichever occurs first. No extensions of time are permitted under §1.136 except that if a *bona fide* attempt has been made to comply with § 1.98 but part of the required information was inadvertently omitted, additional time may be given to enable full compliance.

(g) The information disclosure statement under paragraph (f) of this section shall be accompanied by the fee set forth in § 1.17(p) unless the statement certifies that, within three months prior to the date the statement is filed in the Office, the date of either one of the following events occurred:

(1) the mailing of a communication from a foreign patent office in a counterpart foreign patent application first citing all the patents, publications, and other material disclosed in the statement; or
(2) the first knowledge by any person charged with the duty of disclosure in § 1.57(a) of all the patents, publications, and other material disclosed in the statement if they were not cited earlier by a foreign patent office in a counterpart foreign patent application.

(h) Any information disclosure statement which does not comply with § 1.98 except for inadvertent omissions considered under paragraphs (c) and (f) of this section or any statement which is not timely filed as required by this section, will be:
(1) deemed not to satisfy any applicable duty of disclosure owed under § 1.57 if a patent subsequently issues;
(2) returned to the applicant; and
(3) considered only if:

(i) {dn the application is abandoned, and
(ii) {dn the information is disclosed in an information disclosure statement timely filed in a continuing application.

10. Section 1.98 is proposed to be revised to read as follows:

§ 1.98 Content of information disclosure statement.

(a) The information disclosure statement shall include:

(1) {dn a list of all the patents, publications, or other material required or permitted to be disclosed under § 1.97(a), (b) and (f); and
(2) a concise explanation of why each patent, publication, or other material is listed.

(b) The information disclosure statement shall be accompanied by:

(1) a legible copy of:

(i) each U.S. Patent;
(ii) each publication or foreign patent or that portion of which caused it to be listed; and
(iii) {dn all other material, except patent application files, or that portion of which caused it to be listed; or

(2) a statement that a copy is not in the possession, custody, or control or is not readily available to any individual designated in § 1.57(a).

(c) Each U.S. patent listed in an information disclosure statement shall be identified by patentee(s), patent number and issue date. Any foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and a publication date indicated on the patent or published application. Each publication shall be identified by author(s), if any, title of publication, relevant pages of the publication, date and place of publication.

(d) When the disclosures of two or more patents or publications required to be reported in an information disclosure statement are substantively cumulative, a single copy of one patent or publication may be submitted and the other patents or publications merely listed in the statement provided that an explanation is included about the omission of the copies of the cumulative information. If an English language translation of a foreign language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in § 1.57(a), a copy of the translation shall accompany the statement. [OMB Control No. 0651-0011]

11. Section 1.99 is proposed to be removed and reserved.

§ 1.99 [Reserved]

12. Section 1.175(a)(7) is proposed to be revised to read as follows:

§ 1.175 Reissue oath or declaration.

(a) * * *

(7) Acknowledging a duty to disclose information in accordance with § 1.57.

* * * * *

13. Section 1.193(c) is proposed to be removed and reserved:

§ 1.193 Examiner's Answer.

* * * * *

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(c) [Reserved]

14. Section 1.291(a) and (c) are proposed to be revised to read as follows:

§ 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if (1) the protest is timely submitted; and (2) the protest is either served upon the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible. Protests raising duty of disclosure issues will be placed in the application file without comment on these issues. Further, protests which do not adequately identify a pending patent application will not be considered by the Office but will be disposed of.

* * * * *

(c) An acknowledgment of the entry of a protest under paragraph (a) of this section in a reissue application file will be sent to the member of the public filing the protest. A member of the public filing a protest under paragraph (a) of this section in an application for an original patent will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard which the member of the public may include with the protest in order to receive an acknowledgment by the Office that the protest has been received. The Office will communicate with the applicant regarding any protest entered in the application file and may require the applicant to supply information, including responses to specific questions raised by the protest, in order for the Office to decide any issues raised by the protest. The active participation of the member of the public filing a protest pursuant to paragraph (a) of this section ends with the filing of the protest and no further submission on behalf of the protestor will be acknowledged or considered unless such submission raises new issues which could not have been earlier presented, and thereby constitutes a new protest.

15. Section 1.313(b) is proposed to be revised to read as follows:

§ 1.313 Withdrawal from issue.

* * * * *

(b) When the issue fee has been paid, and the patent to be issued has received its issue date and patent number, the application will not be withdrawn from issue for any reason except (1) a mistake on the part of the Office; (2) an illegality in the application; (3) unpatentability of one or more claims; or (4) consideration of identified information under § 1.57 in a continuing application.

16. Section 1.555 is proposed to be revised to read as follows:

§ 1.555 Duty of disclosure in reexamination proceedings.

(a) The duty of candor and good faith owed to the Office in a reexamination proceeding is the same as that provided in § 1.57, but the duty is not violated unless a claim either confirmed or allowed in a reexamination certificate would be rendered unpatentable by the withheld information known at the time a notice of intent to issue a reexamination certificate under § 1.570 is mailed. Any information disclosure statement bringing patents or printed publications to the attention of the Office shall be in the form required by §1.98 and may be filed without a fee within two months of the date of the order for reexamination under § 1.525. An information disclosure statement limited to information not of record as of the date of the order for reexamination will not be considered to be a patent owner's statement pursuant to § 1.530.

(b) Upon payment of the fee set forth in § 1.17(p), an information disclosure statement may be filed after two months from the date of the order for reexamination but no later than the mailing of the intent to issue a reexamination certificate. The fee in § 1.17(p) will not be required if the statement certifies that, within two months prior to the date the statement is filed in the Office, the date of either one of the following events occurred:

(1) the mailing of a communication from a foreign patent office in a counterpart foreign patent application first citing all the patents, publications, and other material disclosed in the statement; or
(2) the first knowledge by any person charged with the duty of disclosure in §1.57(a) of all the patents, publications, and other material disclosed in the statement if they were not cited earlier by a foreign patent office in a counterpart foreign patent application.

(c) No extensions of time are permitted under either paragraph (a) or (b) of this section except that, if a *bona fide* attempt has been made to comply with § 1.98 but part of the required information was inadvertently omitted, additional time may be given to enable full compliance.

Part 10 - Representation of Others Before the Patent and Trademark Office

17. The authority citation for Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

18. Section 10.23(c), paragraphs (10) and (11) are proposed to be revised to read as follows:

§10.23 Misconduct.

* * * * *

(c) * * *

(10) Violating the duty of candor or good faith requirements of §1.57(a) and (b) and § 1.555(a) of this subchapter.
(11) Knowingly filing, or causing to be filed, an application containing any material alteration made in the application papers after the signing of the accompanying oath or declaration.

* * * * *

Feb. 2, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

[1101 OG 12]

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(121) **Extensions of Time in Reexamination Proceedings**

This notice is intended to clarify extension of time practice as it relates to reexamination proceedings, and supplement the provisions of Section 2265 of the Manual of Patent Examining Procedure (MPEP).

The provisions of 37 CFR 1.136(a) and (b) are *NOT* applicable to reexamination proceedings under any circumstances. Public Law 97-247 amended 35 U.S.C. 41 to authorize the Commissioner to charge fees for extensions of time to take action in an "application". A reexamination proceeding does not involve an "application". 37 CFR 1.136 authorizes extensions of the time period only in an application in which an applicant must respond or take action. There is neither an "application", nor an "applicant" involved in a reexamination proceeding.

Requests for an extension of time to file a patent owner's statement under 37 CFR 1.530 or respond to any Office action in a reexamination proceeding must be filed under 37 CFR 1.550(c). These requests for an extension of time will be granted only for sufficient cause and must be filed on or before the day on which action by the patent owner is due. In no case will mere filing of a request for extension of time automatically effect any extension. Although the appeal provisions of 37 CFR 1.192(a), 1.197(b), and 1.304(a) set time periods applicable to reexamination as well as application proceedings, they also include a further proviso making these time periods subject to the extension provisions of 37 CFR 1.136. However, for the reasons set forth above, the extension provisions of 37 CFR 1.136 are limited to application proceedings and do not apply to reexamination proceedings. Therefore, any request for an extension of time in a reexamination proceeding to file a brief or reply brief, a request for reconsideration or rehearing, or a notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, will be considered under the provisions of 37 CFR 1.550(c). The regulations setting a time period in which any of these actions must be taken set a time for reply within the meaning of 37 CFR 1.550(b), which time can be extended under 37 CFR 1.550(c).

The extension-of-time practice in reexamination proceedings in which a final Office action has been mailed continues to be reflected in MPEP Section 2265. That is, the after-final practice in reexamination proceedings did not change Oct. 1, 1982, and the automatic extension of time policy for response to a final rejection and associated practice are still in effect in reexamination proceedings.

Extensions of time for a requester of a reexamination, who is not the patent owner, are available only in rare circumstances. A request for an extension of the time period to file a petition from the denial of a request for reexamination can only be entertained by filing a petition under 37 CFR 1.183 with appropriate fee to waive the time provisions of 37 CFR 1.515(c). No extensions will be permitted to the two-month time for filing a reply by the requester under 37 CFR 1.535. This two-month period is set by statute (35 U.S.C. 304) and cannot be extended.

Feb. 17, 1983.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1028 OG 18]

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(122) **Loss of Patent Rights Due to Failure to Timely Respond During Reexamination**

This notice is intended to remind patent owners and patent practitioners that patent rights can be, and have been, lost as a result of the failure to timely respond to an Office action, or meet a time deadline, in a reexamination proceeding. Failure to timely respond, meet a time deadline, or timely request an extension of time results in termination of a reexamination proceeding under 37 CFR 1.550(d) and issuance of a reexamination certificate under 37 CFR 1.570 in accordance with the last action of the Office. Neither the statute nor the rules provide for reviving the terminated proceeding. A certificate must issue.

Practitioners are reminded that requests for an extension of time in a reexamination proceeding must be filed under 37 CFR 1.550(c) with an appropriate justification and not by payment of an extension of time fee under 37 CFR 1.136(a). Further, such requests must be filed on or before the day on which the response is due.

The statute requires that reexamination be conducted with special dispatch. Accordingly, such proceedings are treated "special" throughout the PTO including the setting of two month shortened statutory periods for response to Office actions wherein extensions of time are controlled by the Office under § 1.550(c) and not by the patent owner under § 1.136(a). Further, special monitoring of reexamination is regularly conducted *throughout* the Office to insure timeliness. Applications are separately tracked and monitored in the PTO's PALM (Patent Application Locating and Monitoring) system. Particularly attention is given to newly filed requests to insure that the determination on whether or not to order reexamination is mailed within the three month statutory deadline. The reexamination file wrapper is quickly compiled and forwarded to the examining group within one month of the filing of the request for reexamination by a special Reexamination Preprocessing Unit located in the Application Branch. For ease of identification, reexamination files have a special and unique "control number" identification numbering system separate and apart from the regular "serial number" series used for regular patent applications. The reexamination files are bright orange in color to insure that they are not "lost in the crowd" of regular application files. The reexamination files are stored together in each examining group separate and apart from regular applications. A special printing cycle for accelerated publication of the reexamination certificate is utilized.

It has become apparent that many practitioners have not read the rules or if they have read the rules they have been unwilling to appreciate the significance of the special dispatch requirement of the statute and the intent of the regulations implementing that special dispatch. As noted above, appropriate rules have been drafted and extraordinary steps have been taken within the PTO to implement the special dispatch requirement. In contrast, as evidenced by recent petitions in reexamination proceedings, it appears that some practitioners have not adopted appropriate and necessary special docketing and operating procedures to insure proper and timely compliance with the special dispatch requirement and the regulations adopted for its implementation. It is expected that practitioners will take the steps necessary to provide appropriate in-house special docketing and operating procedures which earmark reexamination cases as different and apart from regular applications. These steps should be taken to insure timely response in reexamination proceedings and to prevent the loss of patent rights. The existence or non-existence of such steps and the manner in which any steps are implemented will be a significant consideration in reviewing any petition requesting a waiver of the rules to accept a late response in a reexamination proceeding.

The public is hereby put on notice that the rules relating to timely response and extension of time practice in reexamination proceedings will be *strictly enforced* in the future.

July 10, 1987

DONALD J. QUIGG,
Commissioner of Patents and Trademarks.

[1081 OG 5]

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(123) **Clarification of Reexamination Practice and Change in Reexamination Certificate Wording**

I. *Clarification of Reexamination Practice.*

This notice is intended to clarify the options open to the patent owner *in a reexamination proceeding* when an allowable dependent claim depends from a rejected or cancelled *patent* claim.

A. *Leave dependent claim in dependent form.*

It is unnecessary in a reexamination proceeding to rewrite an allowable dependent patent claim in independent form when the dependent patent claim depends from a rejected or cancelled *patent* claim. The allowable dependent patent claim may remain in the printed format as it appears in the patent even though the patent claim upon which it is dependent is cancelled. Since the original patent claim numbers are not changed in a reexamination proceeding the content of the cancelled base patent claim would remain in the printed patent and would be available to be read as a part of the allowed dependent patent claim.

If a new claim (a claim other than a claim appearing in the patent) has been later cancelled, a claim which depends thereon will be rejected as incomplete and must be rewritten. New claims which depend from a rejected or cancelled patent claim do not have to be rewritten.

If the patent owner elects to leave a dependent claim (original or new) in dependent form when the independent patent claim is rejected or cancelled, the reexamination certificate would indicate (1) that the patentability of an allowed unamended dependent patent claim "is confirmed" or (2) that a new dependent claim is "determined to be patentable". The independent patent claim (cancelled or rejected at the time of the issuance of the reexamination certificate) would be indicated as "cancelled". Note that if the dependent patent claim which is left in dependent form is amended (e.g., correction of a misspelled word) the certificate would indicate the claim "to be patentable as amended". The independent patent claim is considered to be incorporated by reference in the dependent claim even though the independent claim is cancelled from the patent by the certificate.

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B. *Combine claims into independent claim.*
It is also permissible for the patent owner to amend either the dependent or independent patent claim to incorporate the subject matter of the other. If the patent owner elects to rewrite one of the dependent or independent claims to include the subject matter of the other and cancel the other claim, the rewritten claim would be indicated on the certificate as being "patentable as amended". The other claim which was cancelled would be indicated on the certificate as "cancelled".

C. *Present new claim and cancel patent claims.*
It is also permissible for the patent owner to present a new claim incorporating the subject matter of the independent and dependent patent claims and cancel the independent and dependent patent claims. In this case the certificate would indicate "new claim is added and determined to be patentable". The cancelled independent and dependent patent claims would be indicated as "cancelled".

NOTE: This Practice Applies Only to Reexamination and Does Not Change Current Practice Relating to Original and Reissue Applications

II. *Change in Reexamination Certificate Wording.*
The Office is also modifying the language of reexamination certificates directed to claims that are cancelled (for any reason) by dropping the language "having been finally determined to be unpatentable" since the existing language may not be accurate in all cases and since the patent and reexamination files are open to the public and the record speaks for itself. The certificate will merely state such a claim "is cancelled". This change will be effective with the July 17, 1984, Official Gazette issue.

June 14, 1984. DONALD J. QUIGG,
Deputy Commissioner of Patent and Trademarks.

[1044 O.G. 11]

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(124) **Reexamination Litigation Policy**

This notice is intended to set forth the PTO's current policy and guidelines relating to reexamination practice when the patent undergoing reexamination has been or concurrently is involved in litigation. This policy results from the decision of the U.S. Court of Appeals for the Federal Circuit in *Ethicon v. Quigg* 849 F.2d 1142, 7 USPQ 2d 1152 (Fed. Cir. 1988). The Court's decision sets forth the principle that the "special dispatch" provision of the reexamination statute requires the PTO to continue its examination of claims in reexamination proceedings without stays even if there is court litigation involving allegations of invalidity of the patent under reexamination. More particularly, the Court held that the only circumstances under which the PTO may discontinue a reexamination are when a district court finds the claims under reexamination to be invalid and that decision is either upheld on appeal or not appealed, i.e., "final." Accordingly, the following policy and guidelines will be followed in order to implement the principles set forth in the *Ethicon* decision where reexamination and related litigation are present.

I. *Stay of Reexamination*

The Court held that the PTO's previous policy, set forth in 37 CFR §1.565(b) and MPEP 2286, of *staying* a reexamination proceeding when a trial on the merits *starts* in related litigation conflicts with the statutory requirement for "special dispatch." 35 U.S.C. §305. Accordingly, the previous policy of the Office of *sua sponte* staying a reexamination proceeding upon the start of the trial in related litigation has been rescinded. The reexamination will continue concurrently with the pending litigation notwithstanding the stage of the litigation.

II. *Issuance of Court Decision During Reexamination*

A *non-final* district court decision concerning a patent under reexamination shall have no binding effect on a reexamination proceeding.

The issuance of a *final* district court decision upholding validity during a reexamination also will have no binding effect on the examination of the reexamination. This is because the Court states in *Ethicon* that the PTO is *not* bound by a courts's holding of patent *validity* and should continue the reexamination. The Court notes that district courts and the PTO use different standaards of proof in determining invalidity and thus on the same evidence could quite correctly come to different conclusions. Specifically, invalidity in a district court must be shown by "clear and convincing" evidence, whereas in the PTO it is sufficient to show nonpatentablility by a "preponderance" of evidence. Since the "clear and convincing" standard is harder to satisfy than the "preponderance standard," deference will ordinarily be accorded to the factual findings of the court where the evidence before the PTO and the court is the same. If the sufficient reasons are present, claims held valid by the court may be rejected in reexamination.

On the other hand, the Court states that a *final* holding of *invalidity* is binding on the PTO and the reexamination may be discontinued. Upon the issuance of a holding of claim invalidity or unenforceability by a district court, reexamination of those claims will continue in the PTO until the court's decision becomes *final*. Upon the issuance of a *final* holding of invalidity or unenforceability, the claims held invalid or unenforceable will be withdrawn from consideration in the reexamination. The reexamination will continue as to any remaining claims. If all of the claims are *finally* held invalid or unenforceable, the reexamination will be vacated as no longer containg a substantial new question of patentability.

III. *Initial Determination of a Substantial New Question of Patentability*

When the initial question as to whether the prior art raises a substantial new question of patentability as to a patent claim is under consideration, the existence of a final court decision of claim *validity* in view of the same or different prior art does not necessarily mean that no new question is present, in view of the different standards of proof employed by the district courts and the PTO. Thus, while the PTO may accord deference to factual findings made by the court, the determination of whether a substantial new question of patentablilty exists will be made independently of the court's decision on vaildity as it is not controlling on the PTO. A *non-final* holding of claim *invalidity* or unenforceability will not be controlling on the question of whether a substantial new question of patentability is present. A *final* holding of claim *invalidity* or unenforceability, however, is controlling on the PTO. In such cases a substantial new question of patentability would *not* be present as to the claims held invalid or unenforceable.

Identification of Current Stays

The PTO is currently attempting to identify all reeexamination proceedings which are currently stayed pursuant to concurrent litigation in order to lift the stays. To assist the PTO, the patent owner in any such stayed reexamination proceeding should alert the PTO of the stayed proceeding and request that the stay be lifted. Any third party requester may alert the PTO of a stayed proceeding in a notice of litigation under 37 CFR 1.565(a).

Jan. 18, 1989 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1099 OG 16]

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(125) **Priority Claims Based on Inventors Certificates**

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, application for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

Aug. 17, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 O.G. 14]

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(126) **Requirements for Priority Documents, Priority Based on Application for Industrial Design**

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and
(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

Aug. 15, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 O.G. 14]

(127) **Right of Priority (35 U.S.C. 119) Based on a Foreign Application Filed Under a Bilateral or Multilateral Treaty**

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed under such a treaty, certain information must be supplied to the Patent and Trademark Office. In addition to the application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

Aug. 9, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[962 O.G. 2]

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(128) **Using Certificate of Correction to Perfect Claim for Priority Under 35 USC 119**

Under 35 USC 119, an applicant may assert a right of priority and claim the benefit of an earlier filing date in a foreign country. In this regard, 35 USC 119 states:

> No application for patent shall be entitled to this right or priority unless a claim therefor and a certified copy of the original foreign application, specification and drawings upon which it is based are filed in the Patent and Trademark Office before the patent is granted. . . .

The failure to perfect a claim to foreign priority benefits prior to issuance of the patent may be cured by filing a reissue application; *Brenner* v. *State of Israel*,158 USPQ 584 (CA DC 1968).

However, under certain conditions, this failure may also be cured by filing a Certificate of Correction request under 35 USC 255 and 37 CFR 1.323. For example, in the case of *In re Van Esdonk*, 187 USPQ 671 (Comr. 1975), the Commissioner granted a request to issue a Certificate of Correction in order to perfect a claim to foreign priority benefits. In that case, a claim to foreign priority benefits had not been filed in the application prior to issuance of the patent. However, the application was a continuation of an earlier application in which the requirements of 35 USC 119 had been satisfied. Accordingly, the Commissioner held that the "applicants' perfection of a priority claim under 35 USC 119 in the parent application will satisfy the statute with respect to their continuation application."

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Although *In re Van Esdonk* involved the patent of a continuation application filed under 37 CFR 1.60, it is proper to apply the holding of that case in similar factual circumstances to any patented application having benefits under 35 USC 120. This is primarily because a claim to foreign priority benefits in a continuing application, where the claim has been perfected in the parent application, constitutes in essence a mere affirmation of the applicant's previously expressed desire to receive benefits under 35 USC 119 for subject matter common to the foreign, parent, and continuing applications.

In summary, a Certificate of Correction under 35 USC 255 and 37 CFR 1.323 may be requested and issued in order to perfect a claim to foreign priority benefits in a patented continuing application if the requirements of 35 USC 119 had been satisfied in the parent application prior to issuance of the patent and the requirements of 37 CFR 1.55(a) are met.

However, a claim to foreign priority benefits cannot be perfected via a Certificate of Correction if the requirements of 35 USC 119 had not been satisfied in the patented application, or its parent, prior to issuance and the requirements 37 CFR 155(a) are not met. In this latter circumstance, the claim to foreign priority benefits can be perfected only by way of a reissue application in accordance with the rationale set forth in *Brenner* v. *State of Israel, supra.*

July 25, 1986. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1069 OG 38]

(129) **Abstract of the Disclosure**

This notice is intended to announce a change in the examining practice concerning review of the abstract for compliance with the guidelines set forth in MPEP 608.01(b).

At present, the examiner is instructed to review the abstract for compliance with the guidelines when passing the case to issue, making any necessary revisions by examiner's amendment. This policy has led to the necessity for many changes by the examiner which could have and should have been made at an earlier point in the prosecution. For example, abstracts in excess of the 250 word limit require cancellation and/or rewriting of portions thereof. This 250 word limit is strictly enforced since it represents a requirement of the printing process and the printed patent format designed to present a maximum amount of information concerning a patent on a single page.

Effective immediately, examiners are to require correction of the abstract at the earliest point in the prosecution that non-compliance with the guidelines is detected. Applicants are expected to observe the guidelines in drafting the abstract and correct any defect that is identified in an Office action. Applicants are encouraged to make the necessary corrections not only to relieve the examiner of this burden, but also to help avoid any potential conflict with respect to altering the scope of the enabling disclosure. In this regard, it should be noted that the abstract of the disclosure has been interpreted to be a part of the specification for the purposes of compliance with paragraph 1 of 35 USC 112. *In re Armbruster,* 512 F2d 676, 185 USPQ 152 (CCPA 1975). However, although it is preferable for applicant to make any necessary changes, the examiner will retain the authority and responsibility for reviewing, editing and revising the abstract of the disclosure at the time of allowance of the application to assure compliance with the guidelines.

Section 608.01(b) of the Manual of Patent Examining Procedures will be amended appropriately.

Dec. 30, 1977. WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[967 O.G. 2]

(130) **Supplemental Guidelines for The Implementation of 37 CFR 1.109—Reasons for Allowance**

A recent review of recorded statements of reasons for allowance indicates the need for a better understanding regarding implementation of new Rule 109 (37 CFR 1.109).

These guidelines are supplemental to those published in the **Official Gazette** at 957 O.G. 11 on April 12, 1977 and amplified in Section 1302.14 MPEP, Rev. 52, April 1977.

In determining whether reasons for allowance should be recorded the primary consideration lies in the first sentence of the Rule.

"If the examiner believes that the record of the prosecution *as a whole* does not make clear his reasons for allowing a claim or claims, the examiner may set forth such reasoning." (Emphasis added.)

In most cases the examiner's actions and the applicant's response make evident the reasons for allowance, satisfying the "record as a whole" proviso of the rule. This is particularly true when applicant fully complies with 37 CFR 1.111(b) and (c), 37 CFR 1.119 and 37 CFR 1.133(b). Thus where the examiner's actions clearly point out the reasons for rejection and the applicant's response explicitly represents reasons why claims are patentable over the reference, the reasons for allowance are in all probability evident from the record and no statement should be necessary. Conversely, where the record is not explicit as to reasons, but allowance is in order, then a logical extension of 37 CFR 1.111, 1.119 and 1.133 would dictate that the examiner should make reasons of record and such reasons should be specific.

Where specific reasons are recorded by the examiner, care must be taken to insure that such reasons are accurate, precise and do not place unwarranted interpretations, whether broad or narrow, upon the claims. The examiner should keep in mind the possible misinterpretations of his statement that may be made and its possible estoppel effects. Each statement should include at least: (1) the major difference in the claims not found in the prior art of record, and (2) the reasons why that difference is considered to define patentably over the prior art if either of these reasons for allowance is not clear in the record. The statement is not intended to necessarily state all the reasons for allowance or all the details why claims are allowed and should not be written to specifically or impliedly state that all the reasons for allowance are set forth.

Under the rule, the examiner must make a judgement of the individual record to determine whether or not reasons for allowance should be set out in that record. These guidelines, then, are intended to aid the examiner in making that judgement. They comprise illustrative examples as to applicability and appropriate content. They are not intended to be exhaustive.

Examples of When It Is Likely That a Statement Should Be Added to the Record

1. Claims are allowed on the basis of one (or some) of a number of arguments and/or affidavits presented and a statement is necessary to identify which of these were persuasive, for example:
   - *a.* When the arguments are presented in an appeal brief.
   - *b.* When the arguments are presented in an ordinary response with or without amendment of claims.
   - *c.* When both an affidavit under 37 CFR 1.131 and arguments under 102 and 103 are presented.
2. First action issue:
   - *a.* Of non-continuing application wherein claims are very close to cited prior art and differences have not been discussed elsewhere.
   - *b.* Of continuing applications wherein reasons for allowance are not apparent from the record in the parent case or clear from preliminary filled matters.
3. Withdrawal of a rejection for reasons not suggested by applicant, for example:
   - *a.* As a result of an appeal conference.
   - *b.* When applicant's arguments have been misdirected or are not persuasive alone and the Examiner comes to realize that more cogent argument is available.
   - *c.* When claims are amended to avoid a rejection under 35 USC 102 but arguments (if any) fail to address the question of obviousness.
4. Allowance after remand from the Board of Appeals.
5. Allowance coincident with the citation of newly found references that are very close to the claims, but claims are considered patentable thereover:
   - *a.* When reference is found and cited (but not argued) by applicant.
   - *b.* When reference is found and cited by Examiner.
6. Where the reasons for allowance *are* of record but in the Examiner's judgement, are unclear (e.g. spread throughout the file history) so that an unreasonable effort would be required to collect them.
7. Allowance based on claim interpretation which might not be readily apparent, for example:
   - *a.* Article claims in which method limitations impart patentability.
   - *b.* Method claims in which article limitations impart patentability.
   - *c.* Claim is so drafted that "non-analogous" art is not applicable.
   - *d.* Preamble or functional language "breathes life" into claim.

Examples of Statements of Suitable Content

1. The primary reason for allowance of the claims is the inclusion of .03 to .05 percent nickel in all the claims. Applicant's second affidavit, in example 5 shows unexpected results from this restricted range.
2. During two telephonic interviews with applicant's attorney, Mr.—on 5/6 and 5/10/77, the Examiner stated that Applicant's remarks about the placement of the primary teaching's grid member were persuasive, but he pointed out that applicant did not claim the member as being within the reactor. Thus, an amendment doing such was agreed to.
3. The instant application is deemed to be directed to an unobvious improvement over the invention patented in Pat. No. 3,953.224. The improvement comprises baffle means *12* whose effective length in the extraction tower may be varied so as to optimize and to control the extraction process.
4. Upon reconsideration, this application has been awarded the effective filing date of S.N. _____. Thus the rejection under 35 USC 102(d) and 103 over Belgian Patent No. 757,246 is withdrawn.
5. The specific limitation as to the pressure used during compression was agreed to during the telephone interview with applicant's attorney. During said interview, it was noted that applicants contended in their amendment that a process of the combined applied teachings could not result in a successful article within the amended pressure range. The Examiner agreed to rely on this statement (see page 3, bottom, of applicant's amendment), and the case was allowed.
6. In the Examiner's opinion, it would not be obvious to a person of ordinary skill in the art first to eliminate one of top members 4, second to eliminate plate 3, third to attach remaining member 4 directly to tube 2 and finally to substitute this modified handle for the handle 20 of Nania (see Fig. 1) especially in view of applicant's use of term "consisting."

Examples of Statements That Are Not Suitable as to Content

1. The 3 roll press couple has an upper roll 36 which is swingably adjustable to vary the pressure selectively against either of the two lower rolls. (Note: The significance of this statement may not be clear if no further explanation is given.)
2. The main reasons for allowance of these claims are applicant's remarks in the appeal brief and an agreement reached in the appeals conference.
3. The instant composition is a precursor in the manufacture of melamine resins. A thorough search of the prior art did not bring forth any compositions which corresponds to the instant compositions. The Examiner in the art also did not know of any art which could be used against the instant composition.
4. Claims 1-6 have been allowed because they are believed to be both novel and unobvious.

The examiner should *not* include in his statement any matter which does not relate directly to the reasons for allowance. For example:

5. Claims 1 and 2 are allowed because they are patentable over the prior art. If applicants are aware of better art than that which has been cited, they are required to call such to the attention of the Examiner.
6. The reference Jones discloses and claims an invention similar to applicant's. However, a comparison of the claims, as set forth below, demonstrates the conclusion that the inventions are non-interfering.

Jan. 24, 1978. WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[968 O.G. 6]

(131) **Practice/Re: New Grounds of Rejection After Appeal Brief Has Been Filed**

A new practice has been implemented in the Patent Examining Corps to promote uniformity and adherence to guidelines in situations where a new ground of rejection is made in an Office action after an appeal brief has been filed. Under this practice Supervisory Patent Examiner approval is required for any new ground of rejection made after the filing of an Appeal Brief. This requirement extends to new grounds of rejection made either in an examiner's answer or in an Office action reopening prosecution. Evidence of that approval should appear on applicant's copy of the Office action or answer as well as the record copy. Consultation with or approval by the Group Director is no longer required in these situations.

This new practice does not alter the existing guidelines for reopening prosecution (MPEP) 706.7(e) or for making a new ground of rejection in an examiner's answer (MPEP 1208.01). Appropriate modification will be made to applicable Sections of the Manual of Patent Examining Procedure in a future revision.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[970 O.G. 94 (5-23-78)]

(132) **Commercial Success and Other Considerations Bearing on Obviousness**

In order to clarify Office practice relative to considerations of commercial success and other items bearing on obviousness, the following changes are made in the Manual of Patent Examing Procedure.

In section 716, subsection 4, change the sub-title and first paragraph to read as follows:

4. *Commercial Success and Other Considerations Bearing on Obviousness*

Affidavits or declarations submitting evidence of commercial success, long-felt but unsolved needs, failure of others, etc., must be considered by the Examiner in determining the issue of obviousness of claims for patent-ability under 35 U.S.C. 103. Such evidence might be utilized to give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy, *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) ; *In re Palmer.* 172 USPQ 126, 451 F.2d 1100 (CCPA 1971) ; *In re Fielder and Underwood,*

176 USPQ 300, 471 F.2d 640 (CCPA 1973). The *Graham* v. *John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida* v. *Ag Pro*,425 U.S. 273, 189 USPQ 449 (1976) or *Andersons Black Rock, Inc.* v. *Pavement Salvage Co., Inc.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A & P Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147 87 USPQ 303 (1950). See *Dann* v. *Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), at 261, footnote 4.

The weight attached to evidence of commercial success, etc. by the Examiner will depend upon its materiality to the issue of obviousness and the amount and nature of the evidence. Note the great reliance apparently placed on this type of evidence by the Supreme Court in upholding the patent in *United States* v. *Adams*, 383 U.S. 39, 148 USPQ 479 (1966).

Evidence of commercial success, etc. must be commensurate in scope with the scope of the claims [*In re Tiffin*, 448 F.2d. 791. 171 USPQ 294 (1971)]. Further in considering evidence of commercial success, care should be taken to evaluate to the extent possible from the evidence submitted, whether the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is *not* the result of heavy promotion or advertising, shift in advertising consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc. [*In re Mageli, et al.* 176 USPQ 305, (CCPA 1973)]; [*In re Noznick, et al*, 178 USPQ 43, (CCPA 1973)].

Similarly in considering evidence of longfelt but unsolved needs and failure of others, care should be taken to determine whether such failures were due to lack of interest or appreciation of an invention's potential or marketability rather than want of technical know-how [*Scully Signal Co.* v. *Electronics Corp. of America*, 196 USPQ 657 (1st Cir. 1977)].

In section 716, subsection 4, add the following as the last paragraph:

If, after evaluating the evidence, the examiner is still not convinced that the claimed invention is patentable, his action should include a simple statement to that effect, identifying the reason(s) (e.g., evidence of commercial success not convincing, the commercial success not related to the technology, etc.).

RENE D. TEGTMEYER,
July 10, 1978. *Assistant Commissioner for Patents.*

[973 O.G. 34]

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(133) **Handling of Dependent Claims by the Examiner**

Effective immediately, the following practice will be followed by patent examiners when making reference to a dependent claim—either singular or multiple. The new practice is intended to simplify and streamline our current practice (MPEP 608.01(n), Revision 55, January 1978) which experience indicates was unnecessarily burdensome in many cases.

1. When identifying a singular dependent claim which does not include a reference to a multiple dependent claim, either directly or indirectly, reference should be made only to the number of the dependent claim.
2. When identifying the embodiments included within a multiple dependent claim, or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, each embodiment should be identified by using the number of the claims involved, starting with the highest, *to the extent necessary* to specifically identify each embodiment.
3. When all embodiments included within a multiple dependent claim or a singular dependent claim which includes a reference to a multiple dependent claim, either directly or indirectly, are subject to a common rejection, objection or requirement, reference may be made only to the number of the dependent claim.

The following table illustrates the intended differences between current and the revised practice where each embodiment of each claim must be treated on an individual basis:

Claim Number	Claim Dependency	Identification: Current Practice	Identification: Revised Practice
1	Independent	1	1
2	Depends from	12/1	1
3	Depends from 2	3/2/1	3
4	Depends from 2 or 3	4/2/1	4/2
		4/3/2/1	4/3
5	Depends from 3	5/3/2/1	5
6	Depends from 2, 3 or 5	6/2/1	6/2
		6/3/2/1	6/3
		6/5/3/2/1	6/5
7	Depends from 6	7/6/2/1	7/6/2
		7/6/3/2/1	7/6/3
		7/6/5/3/2/1	7/6/5

When all embodiments in a multiple dependent claim situation (claims 4, 6 and 7 above) are subject to a common rejection, objection or requirement, reference may be made only to the number of the individual dependent claim. For example, if 4/2 and 4/3 were subject to a common ground of rejection, reference should be made only to claim 4 in the statement of that rejection.

The provisions of 35 USC 132 require that each Office action make it explicitly clear what rejection, objection and/or requirement is applied to each claim embodiment.

WILLIAM FELDMAN,
Oct. 17, 1978. *Deputy Assistant Commissioner.*

[976 O.G. 128]

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(134) **Microorganisms—Patentable Subject Matter**

The decision of the Supreme Court in *Diamond* v. *Chakrabarty* (206 U.S.P.Q. 193) held that microorganisms produced by genetic engineering are not excluded from patent protection by 35 U.S.C. § 101. It is clear from the Supreme Court decision that the question of whether or not an invention embraces living matter is irrelevant to the issue of patentability.

Accordingly, the Patent and Trademark Office is now examining patent applications including claims to microorganisms which had been under suspension. Assuming that the products involved were the result of human intervention and were not products of nature, such claims will not be rejected under 35 U.S.C. § 101 as directed to unpatentable subject matter.

SIDNEY A. DIAMOND,
July 29, 1980. *Commissioner of Patents and Trademarks.*

[997 O.G. 24]

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(135) **Department of Commerce**
Patent and Trademark Office

Designation of International Depository Authorities under the Budapest Treaty

The Budapest Treaty and the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure came into force on Aug. 19, 1980 with respect to the United States, Bulgaria, France, Hungary, and Japan. A copy of the Treaty was published in the *Official Gazette* on Aug. 23, 1977 (961 O.G. 21-26).

This Treaty authorizes each State for which the Treaty is in effect to designate a depository on its territory to serve as an international depository authority. More than one depository may be designated. Each such depository will be authorized to receive and store deposits, and dispense samples thereof, in compliance with the Treaty and the patent laws of each State adhering thereto. The Treaty is open for adherence by any

member State of the Paris Union for the Protection of Industrial Property.

The Commissioner of Patents and Trademarks hereby solicits requests from private and public depositories located in the United States to serve as international depository authorities. Requests should be addressed to: Sidney A. Diamond, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Each request must explain and, to the extent practicable, provide evidence of the depository's capacity to meet the obligations of the Treaty. Such request must also include an offer by the depository to assume the cost of transferring deposits made under the Treaty to another international depository authority in the event of default of any of its Treaty obligations. The availability of funds for such transfer, if needed, must be available through a bond, special reserve fund, escrow or other means judged suitable by the Commissioner.

Requests will be promptly evaluated by the Commissioner of Patents and Trademarks, and each requesting depository promptly notified of the decision reached. Questions or inquiries concerning this notice may be addressed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557-3065.

The World Intellectual Property Organization, in Geneva, Switzerland, the Secretariat for the Paris Union, has provided a memorandum explaining the role and obligations of international depository authorities. This memorandum is reproduced below for the guidance of depositories in requesting recognition as an international depository authority.

MEMORANDUM

For the purposes of prospective international depositary authorities under the Budapest Treaty

Introduction

1. This memorandum contains informations for the benefit of any depositary institutions (culture collections) that may wish to become "international depositary authorities" under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (done at Budapest on Apr. 28, 1977). Its brevity is such that it cannot be exhaustive. Any interested person requiring full information should refer to the relevant provisions of the Budapest Treaty and the Regulations under it (any reference hereinafter to an "Article" or to a "Rule" is a reference to an Article of the Budapest Treaty or to a Rule of the Regulations under it).

Objectives of the Budapest Treaty

2. Disclosure of the invention is a generally recognized requirement for the grant of patents (for the purposes of this memorandum, the word "patent" also covers other titles of protection, such as inventors' certificates). Normally, an invention is disclosed by means of a written description. Where an invention involves the use of a microorganism that is not available to the public, such a description is not sufficient for disclosure, since the invention could not be used by a person skilled in the art. That is why in the patent procedure of an increasing number of countries it is necessary not only to file a written description but also to deposit, with a depositary institution, a sample of the microorganism. When protection for the invention is sought in several countries, the complex and costly procedures of the deposit of the microorganism might have to be repeated in each of those countries. The objective of the Budapest Treaty is precisely to obviate such multiple deposits: under the Treaty a single deposit with one "international depositary authority" is sufficient for the purposes of patent procedure before the industrial property offices of all Contracting States, and of inter-governmental organizations granting regional patents which have declared that they recognize the effects of the Treaty (Articles 3(1)(a) and 9(1)(a)).

General Remarks on International Depositary Authorities

3. "International depositary authorities" are depositary institutions that have acquired the status of international depositary authorities. To obtain this status, a depositary institution has to be located on the territory of a Contracting State or of a member State of one of the organizations referred to in the preceding paragraph, and has to benefit from "assurances" furnished by that Contracting State or organization to the effect that the institution complies and will continue to comply with the requirements referred to in paragraph 5 below (Article 6(1)). The action for acquiring this status is taken by the State or organization concerned (Article 7 and Rule 3). There is nothing to prevent it from making more than one depositary institution acquire such status: it is therefore possible for there to be several international depositary authorities located on the territory of one and the same State.

4. An international depositary authority can lose its status either entirely (in which case "termination of status" is spoken of) or partly, in other words in respect of certain types of microorganisms only (in which case "limitation of status" is spoken of). Loss of the status occurs if the State or organization whose action brought about the acquisition of the status denounces the Treaty or withdraws the declaration of recognition of the effects of the Treaty (in which case the loss of status can only be total), or if the State or organization withdraws its assurances regarding the international depositary authority, or again by virtue of a decision of the Assembly of Contracting States taken at the request of another Contracting State or another organization (Articles 8, 9(4) and 17(4); Rule 4).

Requirements Which Have to be Met by International Depositary Authorities

5. The requirements referred to in paragraph 3 above which a depositary institution has to meet in order to become a depositary authority are the following (Article 6(2) and Rule 2):

(a) The institution has to have a continuous existence. It has to be impartial and objective—which means among other things that it has to be free of any dependence on interests that are liable to prejudice the disinterested performance of its functions—and it has to be available, for the deposit of microorganisms, to any depositor under the same conditions. These requirements, which in fact seem self-evident, are designed to give the public in general and depositors in particular fundamental guarantees of reliability as to the smooth operation of the system. On the other hand, the legal status of the institution is irrelevant: it may be either public or private.

(b) The institution has to have the necessary staff and facilities to perform its scientific and administrative tasks, which consist among other things in:

(i) accepting for deposit any or certain kinds of microorganisms;

(ii) examining the viability of the microorganisms deposited with it and issuing a receipt to the depositor and any required viability statement (see paragraphs 7 and 8 below);

(iii) storing the deposited microorganism for at least 30 years (Rule 9(1)) in such a way as to keep them viable and uncontaminated;

(iv) providing for sufficient safety measures to minimize the risk of losing the deposited microorganisms,

(v) complying with respect to the microorganisms deposited under the Treaty with the requirement of secrecy which means giving no information to anyone on the question whether a microorganism has been thus deposited and giving no information to anyone (except to a person who is entitled to a sample—see paragraph 10 below) on any microorganism thus deposited (Rule 9(2));

(vi) furnishing, rapidly and in an appropriate manner, samples of the deposited microorganisms to all those who are entitled to such samples (see paragraph 10 below).

Handling of Microorganism Deposits by the International Depositary Authority

6. *Reception of the microorganism.* The international depositary authority may require that the microorganism be deposited in an appropriate form and quantity, and that it be accompanied by a form established by that authority. In such a case, the said authority has to communicate its requirements (and any

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amendments to them) to the International Bureau in order that the latter may communicate them to all the depositors concerned (Rules 6.3 and 13.2(b)(v)). When it receives the microorganism, the international depository authority notes the date of receipt of the deposit and gives it an accession number (Rule 7.3(iii) and (v)). It issues a receipt to the depositor attesting the receipt and acceptance of the deposit (Rule 7). The model of the international form for the receipt, the use of which will be mandatory, will be established by the Director General of WIPO and communicated to all international depositary authorities.

7. *Viability test.* The international depositary authority promptly tests the viability of the microorganism; it also undertakes viability tests at reasonable intervals, depending on the kind of microorganism and its possible storage conditions, or at any time, if necessary for technical reasons or at the request of the depositor (Rule 10.1).

8. *Viability statement.* The international depositary authority issues a statement concerning the viability of the microorganism to the depositor or to any person receiving a sample of the microorganism (see paragraph 10 below) (Rule 10.2). The model of the international form for the viability statement, the use of which is mandatory, will be established by the Director General of WIPO and communicated to all international depositary authorities.

9. *Storage of the microorganism.* The international depositary authority stores the microorganism for a period of at least 30 years after the date of its deposit, or until five years have elapsed without its having received a request for a sample, the period expiring later being applicable (Rule 9.1). It complies with the requirement of secrecy at all times (see paragraph 5(v) above). Where it cannot furnish samples of the deposited microorganism for any reason, it notifies the depositor of the fact, indicating the reason and informing him that he is entitled to make a new deposit (Article 4).

10. *Furnishing of samples.* The Regulations contain detailed provisions specifying who is entitled to receive samples of the microorganism, and when (Rule 11). The depositor himself is entitled to receive a sample at any time. He may authorize third parties to have samples furnished to them, whereupon thethird parties receive a sample on presentation of their authorizations. Any industrial property office to which the Treaty applies may receive a sample on request if it needs the microorganism for the purposes of a patent procedure. Any other person may obtain a sample on request if an industrial property office to which the Treaty applies certifies that, under the applicable law, that person has a right to a sample of the microorganism concerned; the Regulations specify in detail the certification procedure. The use of a form (whose contents will be established by the Assembly and communicated by the International Bureau to all international depositary authorities) is mandatory for the request and certification. There is an alternative procedure wherey the industrial property office from time to time communicates to international depositary authorities lists of the accession numbers given to the deposit of the microorganisms referred to in the patents granted and published by it; the effect of this communication is to authorize those authorities to furnish samples of the microorganisms to anyone. It should be stressed that it follows from the foregoing that the international depositary never has to decide itself whether it has the right to furnish a sample since it only does so if it has the authorization of the depositor or of an industrial property office. The international depositary authority furnishes the sample in a container marked with the accession number given to the deposit and accompanied by a copy of the receipt for the deposit. It notifies the depositor of the furnishing of the sample.

11. *Communication of the scientific description and/or proposed taxonomic designation.* If the depositor has indicated a scientific description and/or proposed a taxonomic designation of the deposited microorganism, the international depositary authority must communicate it, on request, to any person entitled to receive a sample of the said microorganism (Rule 7.6).

12. *Fees.* For the procedure under the Treaty and the Regulations, the international depositary authority has the right to charge a fee in certain cases (specified in Rule 12.1). The two main fees are the fee for the storage of the microorganism (which is a single fee for the entire period of storage) and the fee for the furnishing of a sample (the furnishing of samples to industrial property offices is free of charge, however). The international depositary authority fixes the amounts of fees at its discretion, but they must not vary on account of the nationality or residence of the persons who have to pay them.

July 14, 1978. SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

[999 O.G. 2]

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(136) **Entry Into Force of the Budapest Treaty**

The Patent and Trademark Office announces the entry into force on Aug. 19, 1980 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure with respect to the United States, Hungary, Bulgaria, France and Japan. A copy of the Treaty was published in the Official Gazette on Aug. 23, 1977 (961 O.G. 21-36).

Following entry into force of the Treaty, each state adhering or acceding thereto will be authorized to nominate depositories on its territory to serve as international depository authorities. Upon compliance with certain procedural steps set forth in the Treaty, each such depository will be designated an international depository authority.

No depository in the United States or elsewhere has yet been nominated or designated to serve as an international depository authority. It is expected, however, that some depositories will shortly be designated both in the United States and other States adhering to the Treaty. Public notice will be provided of the designation of each international depository authority and its requirements for patent deposits.

An application for a patent in any adhering States involving the action of a microorganism, for which a deposit is required, may make the required deposit in any international depository authority. The fact and date of making the deposit will be recognized for all patent purposes in each State adhering to the Treaty. No further deposit will be required for national patent processing or enforcement, provided a deposit is properly made under the provisions of the Treaty.

An application for a United States patent will not be required to proceed under the provisions of the Budapest Treaty, however. Such an applicant may rely instead on a deposit made in any depository meeting the requirements set forth in *In re Argoudelis, et al.*, 168 USPQ 99 (CCPA, 1970) and reprinted in section 608.01(p), Manual of Patent Examining Procedure.

Questions or information regarding the Budapest Treaty may be directed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557-3065.

July 14, 1980. SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

July 16, 1980. JORDAN J. BARUCH,
Assistant Secretary for Productivity, Technology and Innovation.

[997 O.G. 10]

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(137) **Department of Commerce**
Patent and Trademark Office
Recognition of United States Depository as an International Depository Authority Under the Budapest Treaty

As provided in Article 7 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the United States announces recognition of the American Type Culture Collection, Rockville, Md., as an international depository authority. The communication of the Director General of the World Intellectual Property Organization according this recognition as of Jan. 31, 1981 follows:

Dec. 30, 1980. SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

BUDAPEST Notification No. 11

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

Communication of the United States of America Relating to the Acquisition of the Status of International Depositary Authority by the American Type Culture Collection

The Director General of the World Intellectual Property Organization (WIPO) presents his compliments to the Minister for Foreign Affairs and has the honor to notify him of the receipt, on Nov. 17, 1980, of a written communication from the Government of the United States of America, relating to the American Type Culture Collection, indicating that the said depositary institution is located on the territory of the United States of America and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements concerning the acquisition of the status of international depositary authority as specified in Article 6(2) of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on Apr. 28, 1977.

The American Type Culture Collection will acquire the status of international depositary authority under the said Treaty as from Jan. 31, 1981, the date of publication of the said communication in the Jan. 1981 issue of *Industrial Property/La Propriete industrielle* (see Article 7(2) of the said Treaty).

Dec. 3, 1980.

[1002 O.G. 116]

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(138) **Department of Commerce**
Patent and Trademark Office
Recognition of United States Depository as an International Depository Authority Under the Budapest Treaty

As provided in Article 7 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the United States announces recognition of the Agricultural Research Culture Collection, Peoria, Ill., as an international depository authority. The communication of the Director General of the World Intellectual Property Organization according this recognition as of Jan. 31, 1981 follows:

Dec. 30, 1980. SIDNEY A. DIAMOND,
Commissioner of Patents and Tradmarks.

BUDAPEST Notification No. 12

BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE

Communication of the United States of America Relating to the Acquisition of the Status of International Depositary Authority by the Agricultural Research Culture Collection

The Director General of the World Intellectual Property Organization (WIPO) presents his compliments to the Minister for Foreign Affairs and has the honor to notify him of the receipt, on Dec. 2, 1980, of a written communication from the Government of the United States of America, relating to the Agricultural Research Culture Collection, indicating that the said depositary institution is located on the territory of the United States of America and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements concerning the acquisition of the status of international depositary authority as specified in Article 6(2) of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, done at Budapest on Apr. 28, 1977.

The Agricultural Research Culture Collection will acquire the status of international depositary authority under the said Treaty as from Jan. 31, 1981, the date of publication of the said communication in the Jan. 1981 issue of *Industrial Property/La Propriete industrielle* (see Article 7(2) of the said Treaty).

Dec. 8, 1980.

[1002 O.G. 116]

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(139) **Request for Certification of Deposits Made Under the Budapest Treaty**

Deposits of microorganisms made in International Depositary Authorities are subject to the regulations of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. Rule 11.3(a) of the Treaty regulations establishes a procedure by which an industrial property office shall assure the depositary that release of a sample is proper. Pursuant to the Treaty, the United States Patent and Trademark Office receives requests for certification that release of a sample of a deposited microorganism is proper under United States law. Effective immediately, all such requests for certification shall be directed to the Director, Patent Examining Group 120, United States Patent and Trademark Office, who has been delegated the authority to act on requests for certification under Rule 11.3(a) of the Budapest Treaty regulations.

Sept. 4, 1987. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1083 OG 5]

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(140) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 70635-9174]
RIN: 0651-AA13
Deposit of Biological Materials for Patent Purposes

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending its rules of practice in patent cases to define procedures to govern the deposit of biological materials for patent purposes. Where an invention is or relies on a biological material which cannot be described in writing alone, and access to the biological material is necessary to satisfy the statutory requirements for patentability under 35 U.S.C. 112, these rules prescribe the procedures and conditions for making a deposit that will satisfy these requirements. These rules also prescribe examining procedures that will be used to address deposit issues, and the procedures pertaining to access to a deposit once a patent is granted.
Effective Date: January 1, 1990.
For Further Information Contact: Charles E. Van Horn or Harris A. Pitlick by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:

Every patent must contain a written description of the invention sufficient to enable a person skilled in the art to which the invention pertains to make and use the invention. Where the invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible or repeatable manner, access to the biological material is necessary for the satisfaction of the statutory require-

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ments for patentability under 35 U.S.C. 112. The rules set forth examining procedures and conditions of deposit which must be satisfied in the event a deposit is required to provide the necessary access. The rules do not address the substantive issue of whether a deposit is required under any particular set of facts.

These rules will be effective for all applications filed on or after January 1, 1990, and for all reexamination proceedings in which the request for reexamination was filed on or after January 1, 1990, except that deposits made prior to the effective date which are acceptable under current practice will be acceptable in such applications and proceedings. Since most of the provisions reflect existing policy and practice, little change to existing practice or burden on applicants for patent and patent owners relying on the deposit of biological material is anticipated. Applicants and patent owners are encouraged to comply with these rules prior to the effective date.

The final rules on the deposit of biological materials for patent purposes have evolved over several years of actual experience in administering the guidelines set forth in Section 608.01(p) of the Manual of Patent Examining Procedure, including several administrative and judicial decisions, and interaction with interested public, bar and industry groups. A draft policy statement on the deposit of biological materials was circulated among interested bar and industry groups and published in the BNA-Patent, Trademark and Copyright Journal on May 22, 1986. An advance notice of proposed rulemaking setting forth rules being considered for deposits of biological material was published in the *Federal Register*, 52 FR 34080 (September 9, 1987), and in the *Official Gazette*, 1082 O.G. 47 (September 29, 1987). Finally, a notice of proposed rulemaking relating to the deposit of biological materials for patent purposes was published in the *Federal Registar* 53 FR 39420 (October 6, 1988), and in the *Official Gazette*, 1095 O.G. 47 (October 25, 1988).

In this notice of final rulemaking, a description of the changes in the text of the proposed rules is provided along with an explanation of the reasons supporting the changes. In addition, comments received in response to the notice of proposed rulemaking are analyzed. Finally, an explanation of the content of the final rules is provided, together with a compilation of relevant comments and responses that have been made during the rulemaking process. This explanation and compilation of previous comments and responses will serve as a set of guidelines that will be reproduced in the Manual of Patent Examining Procedure in due course.

Changes in Text of Proposed Rules

Several changes have been made in the text of the final rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

Section 1.200 as proposed has been renumbered as § 1.801 as adopted and the term "patent purposes" as proposed has been replaced with the term "purposes of patents for inventions under 35 U.S.C. 101" as adopted to clarify that the regulations pertaining to the deposit of biological material do not apply for purposes other than patents for inventions. Thus, these regulations are not applicable to applications for plant patents under 35 U.S.C. 161-164.

Section 1.201 as proposed has been renumbered as § 1.802 as adopted and the term "or Opportunity" in the heading thereof has been inserted after "Need" to reflect the permissive nature of a deposit when not necessary to satisfy 35 U.S.C. 112.

Paragraph (a) thereof as proposed provided that where a claimed invention is or relies on a biological material, the disclosure may include a deposit of the biological material deposited in a depository and under conditions complying with these regulations, provided a precondition was satisfied. The precondition was that the biological material not be known and readily available to the public and not be describable in writing alone. Paragraph (a) as adopted eliminates this precondition, does not require that the biological material be, or be used for, a claimed invention, does not require that the deposit be made in a depository and under conditions complying with these regulations, and more accurately states that the disclosure may include *reference to* a deposit, since the deposit is not physically part of the disclosure. Paragraph (a) as adopted merely provides that where an invention is, or relies on, a biological material, the disclosure may include reference to a deposit of such biological material.

Paragraph (b) of § 1.802 prescribes that biological material need not be deposited unless access to the material is necessary to satisfy 35 U.S.C. 112. If a deposit is necessary, it shall be acceptable if made in accordance with these regulations. Proposed paragraph (b) made no reference to 35 U.S.C. 112. Situations where a biological material is known and readily available to the public or can be made or isolated without undue experimentation are now listed as some, but not an exhaustive set, of the circumstances where deposit need not be made. The term "from known and readily available material" has been dropped from the end of the term "can be made or isolated without undue experimentation" as redundant. Paragraph (b) as adopted also prescribes that once deposited in a depository complying with these regulations, a biological material will be considered to be readily available even though some requirement of law or regulation permits access only under conditions imposed for safety, public health or similar reasons. Proposed paragraph (b) did not include the condition of deposit in a depository complying with these regulations.

Proposed paragraph (c) thereof was limited to reference to a specific organism or other biological material in a specification disclosure as not creating a presumption that the material was necessary to satisfy 35 U.S.C. 112 or that a deposit thereof is required. Paragraph (c) as adopted eliminates the term "specific organism or other" as redundant and also includes the act of deposit by an applicant or patent owner as not creating a presumption that the deposit is or was required.

Section 1.202 as proposed has been renumbered as § 1.803 as adopted.

Paragraph (a) thereof as proposed prescribed that a deposit shall be made in any International Depositary Authority (IDA) or any other depository recognized as suitable by the Office. Paragraph (a) as adopted now specifies that such deposits shall be recognized for the purpose of these regulations so as not to preclude deposits made for other reasons such as a gratuitous disclosure. Paragraph (a)(2) as adopted eliminates the requirement in the proposed rule that impartial consultants be from the biotechnology industry or governmental agencies. Paragraph (a)(2) as adopted also contains new sub-subparagraph (vii) as a requirement which a suitable depository must meet, *viz.*, that it promptly notify depositors of its inability to furnish samples, and the reasons why. This requirement appeared, in essence, in proposed § 1.204(a).

Proposed paragraph (b) thereof has not been adopted. Replacement of deposits is governed solely by § 1.805, infra.

Proposed paragraph (c) thereof has been adopted as paragraph (b). In subparagraph (2) thereof, "(b)" has been changed to "(a)(2)" to correct an inadvertent error in the proposed rule.

Proposed paragraph (d) thereof has been adopted as paragraph (c) except that the reference to paragraph (a) has been changed to paragraph (a)(2) to more clearly delineate which category of depository is intended to be covered by this paragraph of § 1.803 and all references to other paragraphs whose designations have been changed by adoption of these rules have been changed accordingly.

Proposed paragraph (e) thereof has been adopted as paragraph (d).

Section 1.203 as proposed has been renumbered as § 1.804 as adopted.

Paragraph (a) thereof prescribed that an original deposit of a biological material may be made before filing an application for patent or, pursuant to a requirement that will be made by the examiner no later than the date the Notice of Allowance and Issue Fee Due is mailed, during pendency of the application for patent. Paragraph (a) as adopted adds a precondition to making an original deposit that the biological material be specifically identified in the application as filed. Since proposed paragraph (a) did not address original deposits made during the pendency of an application that were not made pursuant to a requirement of an examiner, the rule as adopted states that original deposits may be made during pendency of an application for patent, subject to § 1.809, *infra*, which prescribes, *inter alia*, when during the pendency of an application for patent a deposit shall be made when made pursuant to a requirement by the examiner.

Paragraph (b) thereof as proposed required a statement that, for an original deposit made after the effective filing date of an application for patent, the biological material deposited was the same biological material described in the application as filed.

Paragraph (b) as adopted substitutes the word "a" for the word "the" since more than one biological material may be referred to in the application as filed, drops the word "same" and requires the statement that the biological material deposited is a biological material specifically identified in the application as filed.

Section 1.204 as proposed has been renumbered as § 1.805 as adopted and a reference to supplemental deposits has been added to the heading thereof. Paragraphs (a) and (b) of the section as proposed have been substantially rewritten as paragraphs (a), (b) and (c). New elements have been added and some eliminated, although some elements of the proposed rule on replacement deposits have been adopted, either with similar language or different language.

Elements of the proposed rule on replacement deposits which have not been adopted include a requirement that replacement deposits be made or be made within a specific time limit. Ramifications in Office proceedings from not making a replacement deposit, or in the case of a patent, not diligently making a replacement deposit, are stated.

A requirement in the proposed section that depositories promptly notify depositors of an inability to furnish samples has been adopted as § 1.803(a)(2)(vii), *supra*.

Paragraph (a) of § 1.805 requires a depositor, after receiving notice during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as dscribed in the specification, to notify the Office in writing, in each application for patent or patent affected. In such a case, or where the Office otherwise learns, during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, the need for making a replacement or supplemental deposit will be governed by the same considerations governing the need for making an original deposit under the provisions set forth in § 1.802(b). A replacement or supplemental deposit made during the pendency of an application for patent shall not be accepted unless it meets the requirements for making: an original deposit under these regulations, including the requirement set forth under § 1.804(b). A replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be recognized by the Office unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section. The proposed rules did not provide for certificates of correction relating to replacement or supplemental deposits.

Paragraph (b) of § 1.805 prescribes that a request for certificate of correction under this section shall not be granted unless the certificate identifies the accession number for the replacement or supplemental deposit; the date of the deposit; and the name and address of the depository.

Paragraph (c) of § 1.805 prescribes that a certificate of correction under this section shall not be granted unless the request therefor is made promptly after the replacement or supplemental deposit has been made and includes a verified statement of the reason for making the replacement or supplemental deposit; a verified statement from a person in a position to corroborate the fact, and shall state, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited; a verified showing that the patent owner acted diligently - in the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or in the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification; a verified statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified.

Paragraph (d) of § 1.805 prescribes that a depositor's failure to replace a deposit, or in the case of a patent, to diligently replace a deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after being notified that the depository possessing the deposit cannot furnish samples thereof, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

Paragraph (e) as adopted is identical to proposed paragraph (d) except that the word "the" before "patent" has been replaced with "a" because the term "the patent" had no antecedent basis, and the term "according to these regulations" has been inserted after the word "replaced" to make it clear that the rebuttable presumption according to this paragraph applies only where the replacement deposit has been made according to these regulations.

Paragraph (f) as adopted is substantially similar to proposed paragraph (e) with respect to an applicant's ability to make a replacement for any reason during the pendency of an application for patent. Paragraph (f) extends such applicant's ability to supplemental deposits as well. The first two sentences of proposed paragraph (e) prescribing when a replacement deposit shall be made while an application is still pending and that an applicant notify the Office when a replacement deposit is necessary have been adopted in § 1.805(a), *supra*.

Paragraph (g) as adopted is identical to proposed paragraph (f) except that supplemental deposits are also included and the reference to another section therein has been changed to reflect its renumbering.

Paragraph (h) as adopted is substantially similar to proposed paragraph (g) except for two changes. One is that the word "the" before "biological material" has been changed to "a" because the term "the biological material" had no antecedent basis. The other change is replacement of the term "viable deposit is in the depository" with the term "depository can furnish samples thereof". The term "in the depository" was not clear. The word "viable" before "deposit" would have excluded biological materials not capable of reproduction either directly or indirectly. For biological materials which are so capable of reproduction, samples of viable deposits thereof which become nonviable cannot be furnished by the depository.

Paragraph (i) as adopted modifies paragraph (h) as proposed. Whereas the proposed rule proscribed a patentee from replacing a viable deposit where the depository can furnish samples, the rule as adopted states that the Office will not recognize in any Office proceeding a replacement deposit of a biological material made by a patent owner where the depository could furnish samples of the deposit being replaced.

Section 1.205 as proposed has been renumbered as § 1.806 as adopted. The proposed rule had set the term of deposit as, *inter alia*, at least thirty years after the date of a viable deposit. The rule as adopted sets the thirty-year term to begin after a deposit, before or during pendency of an application for patent, is made. The term of a deposit made by a patent owner is not prescribed. However, § 1.805(a), *supra*. prescribes that a replacement or supplemental deposit made in connection with a patent will not be recognized in any Office proceeding unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of § 1.805, one of which terms is a verified statement by the patent owner that the term of the new deposit expires no earlier than the term of the deposit being replaced or supplemented. An additional change in the rule as adopted is the replacement of the term "deposited biological material" with the word "deposit" since the former term had no antecedent basis.

Section 1.206 as proposed has been renumbered as § 1.807 as adopted. The rule as adopted is identical to the rule as proposed except for the reference to a rule which has been renumbered.

Section 1.207 as proposed has been renumbered as § 1.808 as adopted.

In paragraph (a) thereof, first word, "The" as proposed has been replaced with "A" because "The" had no antecedent basis.

In view of the non-adoption of proposed § 1.207(c), *infra*, paragraph (a)(2) as adopted refers to only paragraph (b), not paragraphs (b) and (c).

Paragraph (b)(1) as proposed permitted a depositor to require, *inter alia*, that a depository furnish samples only if a request for

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a sample is in writing and signed.

Paragraph (b) as adopted permits a depositor to require a request to be in writing or other tangible form. The signing requirement, however, has not been adopted.

Paragraph (b)(3) as proposed permitted a depositor to require, inter alia, that a depository furnish the depositor with a copy of the request. This requirement has not been adopted.

Paragraph (c) as proposed has not been adopted.

Paragraph (d) as proposed, with one change, has been adopted as paragraph (c). The change is the insertion of the term "made to the Office" after the term "Upon request" to make it clear that certification imposes no burden on a depository.

Section 1.208 as proposed has been renumbered as § 1.809 as adopted.

The term "required" when referring to "deposit" in proposed paragraphs (a), (b) and (c) thereof has been changed to "needed" as adopted for purposes of consistency with § 1.802. The term "in case one has not been made, or" as proposed in paragraph (a) has been replaced with "and if needed," as adopted for purposes of clarification. The statement as proposed that a deposit accepted in any acceptable depository under § 1.202(a) shall be accepted for patent purposes if made under conditions complying with § 1.207(a) has not been adopted. The statement is redundant in view of the provision in § 1.802(b) as adopted that a deposit necessary for the satisfaction of 35 U.S.C. 112 shall be acceptable if made in accordance with these regulations. Since the question of deposits may come up in reissue applications and reexamination proceedings as well as in applications for patents, paragraph (a) as adopted covers examination of all such applications and proceedings. Paragraph (a) as adopted also refers to supplemental deposits since issues of the need for a supplemental deposit may arise where a deposit has lost its capability to function as described in the specification. Paragraph (a) as proposed prescribed that affected claims would be rejected in an Office action. Paragraph (a) as adopted drops "in an Office action" and instead prescribes that the claims would be rejected "where appropriate."

Paragraph (b)(1) as proposed was limited to applicants. Paragraph (b)(1) as adopted covers applicants for patents and patent owners involved in specified Office proceedings. The provision for applicants for patents in paragraph (b)(1) as adopted is identical to the provision for applicants in paragraph (b)(1) as proposed except for the additional adoption of a reference to supplemental deposits. Paragraph (b)(1) as adopted additionally provides for patent owners responding to a rejection under paragraph (a) of this section by requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805.

Paragraph (b)(2) as proposed has not been adopted. Subparagraph (3) has therefore been renumbered as (2) and the reference therein to paragraph (b)(2) has been eliminated. Two additions have been made. One, since the question of deposit may come up in connection with a reissue application or reexamination proceeding, the term "or patent" has been inserted after "application" in the first sentence. Two, since paragraph (a) provides for a rejection under 35 U.S.C. 112 when a deposit actually made cannot be accepted, it is considered an appropriate response that a deposit actually made should be accepted. Thus, the term "and/or why a deposit actually made should be accepted" has been inserted at the end of the first sentence of paragraph (b)(2) as adopted.

Paragraph (c) as proposed has been adopted except that the term "for patent" has been inserted after "application" in the first sentence to make it clear that this paragraph does not apply to other applications, such as applications for reissues. Additionally, the word "the" before the proposed term "required deposit" has been changed to "a" because the term "the required deposit" had no antecedent basis. Finally, the term "37 CFR" preceding "1.136" in the proposed rule has been replaced with "§" as adopted to be consistent with standard nomenclature.

Paragraph (d)(3) as proposed required a taxonomic description of the deposit. Paragraph (d)(3) as adopted requires a description of the deposited biological material sufficient to specifically identify it and to permit examination. Paragraphs (d)(1), (d)(2), (d)(3) and (d)(4) have otherwise been adopted exce'pt for the addition of prefatory articles "The" or "A".

Response to and Analysis of Comments

Written comments from sixteen (16) sources were received in response to the notice of proposed rulemaking. Some suggestions made in comments have been adopted as presented or in modified form and others have not been adopted. A detailed analysis of the comments follows.

Comment: The proposed rule numbers, except § 1.200, are the same as those of the old interference rules, and it appears to be Office practice to normally avoid using rule numbers which end in "00," especially for a rule, viz., § 1.200, which is the first of a group of rules. The rules, if adopted, should have different numbers.

Response: The suggestion has been adopted. Proposed §§ 1.200 through 1.208 have been renumbered as §§ 1.801 through 1.809 as adopted, respectively.

Comment: Two comments ask whether the rules will apply retroactively. One comment suggests that they should and further, that the benefits provided for depositors in proposed §§ 1.207(b) and (c) take effect immediately so that those patent applicants who would benefit from them will be encouraged not to delay in filing or obtaining a patent until a final rule takes effect.

Response: To the extent the rules codify existing Office practice, they are already effective. Otherwise, the rules will be effective in applications for patent or for reissue of patent filed on or after January 1, 1990, and in reexamination proceedings in which the request for reexamination was filed on or after January 1, 1990, except that deposits made prior to the effective date which are acceptable under current practice will be acceptable in such applications and proceedings. Applicants and patent owners are encouraged to comply now with those requirements of the rules not required by existing Office practice.

Comment: A sentence should be added at the end of proposed § 1.200 to clarify that the rule does not preclude the possibility of depositing other biological materials for patent purposes, such as plants per se, even though not within the scope of the term "biological material" as defined by the rule. Adding such a sentence would be consistent with previous concerns expressed to the Office over the possible requirement for deposits with respect to plant patents. With the added sentence, the rule would not address any kind of requirement for deposit in plant patents.

Response: In a response to a comment in the notice of proposed rulemaking, it was stated that the Office did not intend to propose rules on deposits under the Plant Patent Act (35 U.S.C. 161-164) at this time, nor will the Office take the position that a deposit is required under the present provisions of 35 U.S.C. 162. The text of the rule adopted in § 1.801 is the same as proposed in § 1.200 except that the rule now explicitly states that the regulations are for purposes of patents for inventions under 35 U.S.C. 101. Thus, these regulations do not and are not intended to address the question of deposits in plant patent applications.

Comment: One comment suggests that the language in § 1.200 should be expanded to make it clear that other biological materials, such as plants per se, are not precluded from being deposited. Another comment assumes that the Office intends to limit the scope of "biological material" as defined by this rule. The rules and commentary should indicate that the scope and effect of the rules are limited to biological materials as defined in the rules. This rule is acceptable provided it simply defines what constitutes biological material.

Response: None of the suggestions have been adopted. In a response to a comment in the notice of proposed rulemaking, it was stated that biological material is defined in the proposed rule in terms of a non-exhaustive list of what it includes and that no materials were explicitly excluded. The response also stated that the Office does not contemplate that there would be many situations where a material that is not capable of self-replication either directly or indirectly would be acceptable as a deposit under these regulations but that an applicant was not precluded in any given case from attempting to show why such a material should be acceptable. Plants per se are an example of such materials.

Comment: The proposed rules do not, but should, address a problem associated with marine sponges and other marine macroorganisms. These materials and their natural location can be adequately described so that one skilled in the art could obtain them using the necessary equipment. But their taxonomy is in a developmental stage and scientific names are subject to revision. Deposit and maintenance of these materials in viable form is not practical. They can and have been deposited in non-viable form, preserved or fixated in a suitable non-destructive medium, where their shelf life is expected to be at least 30 years.

Response: See the response to the previous comment. As stated in a response to a comment in the advance notice of proposed rulemaking, the PTO Board of Patent Appeals and Interferences held that a description of the precise geographic location of marine tunicates used in a claimed invention was adequate to satisfy the enablement requirement of 35 U.S.C. 112. *Ex Parte Rinehart*, 10 USPQ2d 1719 (PTO Bd. Pat. App. & Int. 1985). It was also stated in that response that the term "readily" as used in the term "known and readily available" appearing in the proposed rules is considered appropriate to define that degree of availability which would be reasonable under the circumstances. Since the comment states that the subject materials and their natural location can be adequately described so that one skilled in the art could obtain them using the necessary equipment, the disclosure would appear to be sufficient to meet the enablement requirements of 35 U.S.C. 112 without a deposit so long as their degree of availability is reasonable under the circumstances.

Comment: In a response to a comment in the notice of proposed rulemaking which was in response to a solicitation for comments in the advance notice of proposed rulemaking on the setting of an appropriate minimum number of seeds to ensure availability of the seed through the enforceable life of the patent, it was stated that the Office does not intend to propose rules quantifying a minimum number of seeds but that the Office will consider 2500 to be a minimum number in the normal case and will provide an applicant an opportunity to provide justification why a lesser number would be suitable under the circumstances of a particular case. One comment suggests that 2500 may present problems where the normal yield of a plant is only a few seeds. A more reasonable minimum is 1250. Another comment suggests that there be no minimum number but an obligation on the part of the depositor to replace a seed each time one is requested.

Response: Since the Office has stated that an applicant will be provided an opportunity to show why a lesser amount than 2500 seeds would be appropriate in a particular case, the policy of requiring minimum number of 2500 is adhered to. An obligation on the part of the depositor to replace a seed each time one is requested is simply impractical.

Comment: The title of proposed § 1.201 should be changed from "Need to make a deposit" to "Opportunity to make a deposit" since the provision states that "the disclosure may include a deposit of a biological material . . . ."

Response: The suggestion has been adopted in part. Since § 1.802 applies to situations both when a deposit may be made (optional) and when a deposit is neoessary, the heading of the rule states both need and opportunity in the alternative.

Comment: Proposed § 1.201(a) should state that the disclosure may include reference to a deposit, rather than that the disclosure may include a deposit.

Response: The suggestion has been adopted in § 1.802(a).

Comment: Proposed § 1.201(a) does not clearly permit deposits where conditions enumerated therein do not apply. The proposed rule should be revised by eliminating the requirement that the biological material not be known and readily available to the public before a deposit may be made. The proposed revision would make clear that an applicant has a universal and unconditional right to make a deposit of a biological material whenever the biological material cannot be described in writing alone, regardless of whether the material is known and readily available. The rule as proposed is not consistent with the permissive use of deposits where they might not be mandated. The proposed revision would dispel any suggestion or implication that the legal standard under which deposits are mandated is that the biological material be neither known nor readily available. Obviously, such materials even if unknown and not readily available might be enabled solely through a written description, rendering deposit unnecessary.

Response: The suggestion has been adopted in § 1.802(a). In addition, the rule as adopted permits deposits even where the biological material can be described in writing alone and even where the claimed invention is not, or does not rely on, the biological material. Section 1.802(a) as adopted permits reference in the disclosure to a deposit of a biological material, the only precondition being that an invention is or relies on that material. The requirement in the proposed rule that the biological material not be known and readily available to the public and not be describable in writing alone, and that the material be, or be used for, the claimed invention, has not been adopted.

Comment: Two comments suggest that § 1.201(a) refer to 35 U.S.C. 112. One comment suggests that § 1.201(a) should make some reference to 35 U.S.C. 112 for completeness. Another comment suggests that proposed § 1.201(a) contains no standard and should thus make reference to 35 U.S.C. 112, for example, by inserting words to the effect that the biological material cannot be described in writing alone to satisfy the requirements of 35 U.S.C. 112.

Response: The suggestions have not been adopted. *But see* the response to the next comment.

Comment: Proposed § 1.201(b) should be revised by stating that biological material need not be deposited unless necessary for the satisfaction of the statutory requirements of 35 U.S.C. 112. Thus, the rule would state that the ultimate reason for a requirement for a deposit would be to satisfy 35 U.S.C. 112. Further, the rule should state one circumstance, among others, where a biological material need not be deposited, *viz.*, where it is known and readily available to the public or can be made or isolated without undue experimentation. The last sentence of proposed § 1.201(b) should state a precondition that a deposit of the biological material be made in a depository complying with these regulations.

Response: The suggestions have been adopted in § 1.802(b).

Comment: Proposed § 1.201(c) should be revised by stating that the actual deposit of a biological material referred to in a specification disclosure also does not create a presumption that the material is necessary to satisfy 35 U.S.C. 112 or that the deposit is or was required. The proposed revision would recognize that the act of deposit does not and should not constitute an admission by the applicant that the deposit was made because it was necessary to satisfy 35 U.S.C. 112. For example, deposit may be necessary in the United States prior to the time a patent application is filed in order for an applicant to be entitled to assert a priority right under patent laws of a foreign country based on a United States application which makes reference to such deposit. Additionally, applicants ought to be encouraged to make deposits in questionable cases without such act being construed as an admission of any sort.

Response: The suggestion has been adopted in § 1.802(c).

Comment: The term "or other biological material" in proposed § 1.201(c) should be changed to "or any other biologial material" to make sure that all biological materials that would normally be considered for deposits are included.

Response: The comment is not understood. Nevertheless, it is moot. The term "specific organism or other biological material" in proposed § 1.201(c) has been changed to "biological material" in § 1.802(c) as adopted.

Comment: Two comments suggest that proposed § 1.202(a)(2) unnecessarily limits who may be consulted in determining the suitability of a depository to be recognized by the Office to those in the biotechnology industry or Government agencies. Views from academia may be wanted. One of the comments suggests, therefore, that the term "from the biotechnology industry or governmental agencies" be deleted from § 1.202(a)(2).

Response: The suggestions have been adopted in § 1.803(a)(2).

Comment: Proposed § 1.202(a) should be revised to state that a deposit shall be recognized for the purposes of these regulations if made in a depository according to subparagraph (1) or (2) thereof. The proposed revision would allow for deposits other than in Office-recognized depositories, but give deposits in Office-recognized depositories the "safe harbor" advantages of these regulations.

Response: The suggestion has been adopted in § 1.803(a). Simply put, the rules do not prohibit deposits made under any conceivable conditions. The Office will treat a deposit not made according to these regulations, however, as if no deposit had been made.

Comment: The provision set forth in proposed § 1.202(c)(3), i.e., that a depository seeking status under paragraph (a)(2) indicate that it intends to be available, for the purposes of deposit, to any depositor under these same conditions, should also be listed in § 1.202(a)(2), which enumerates the qualifications for a depository seeking recognition as suitable by the Office.

Response: The suggestion is not being adopted. The requirement in proposed § 1.202(a)(2)(v), and § 1.803(a)(2)(v) as

adopted, that the depository be impartial and objective, is inclusive of a requirement that it be available, for purposes of deposit, to any depositor under these same conditions.

Comment: One comment suggests that the proposed rules do not adequately define the term "depositor". It could be the inventor, the assignee, one to whom the inventor has an obligation to assign, or the individual who signs the deposit form. In the case of joint inventors with different institutional ties, who is the depositor ? Assuming that where the inventor is a university professor, the depositor is the university, deposit in that university's depository would be precluded by proposed § 1.202(a)(2)(ii) and possibly § 1.202(a)(2)(v). An exception should be made for non-profit organizations. They should be allowed to "self-deposit" since it is highly improbable that they would refuse to provide samples to third parties. The availability of a strain from a university was found to satisfy 35 U.S.C. 112 in *Merck and Co., Inc. v. Chase Chemical Co.*, 273 F.Supp. 68, 77, 92, 155 USPQ 139, 146, 159 (D.N.J. 1967). Another comment suggests that it is not clear, where the depositor is a separate, independent division of a particular entity and the depository is another separate, independent division of the same entity, whether this arrangement meets the terms of proposed § 1.202(a)(2)(ii).

Response: None of the suggestions have been adopted. In § 1.803(a)(2)(ii) as adopted, a depository recognized to be suitable by the Office and not otherwise an IDA must exist independent of the control of the depositor. In a response to a comment in the notice of proposed rulemaking, it was stated that the term "depositor" is intended to include the party on whose behalf the deposit is made. It was further stated in that response that the rationale of the Office in requiring that a depository, if not an IDA, be independent of the depositor was adequately discussed in the advance notice of proposed rulemaking. The advance notice stated:

> The concept of an independent depository or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or an internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidentally alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the free access to the biological material for any purpose once the term of the patent expires. Further, while the PTO is constrained to approve independent depositories other than an IDA, the PTO has neither the resources nor capability to assess the individual capability of any party that wishes to act as its own depository. The rules under consideration are intended to minimize depositories that will be found acceptable.
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> The above discussion applies to non-profit organizations as well as for-profit organizations. Moreover, it is clear from the discussion above that the scope of the term "depositor" is limited only by the requirement that the depositor have *no control* over the depository. Such a relationship is not necessarily inconsistent with one where there is some legal relationship between depositor and depository. The *Merck* case cited above does not stand for the proposition that a university is necessarily an acceptable depository because it makes available samples of a biological material. In *Merck*, the availability of the biological material from the university was evidence that the biological material was known and readily available. While a deposit by an applicant in a depository under the applicant's control will not be recognized by the Office as a deposit under these regulations, an applicant is not precluded from showing that the deposited material, by virtue of conditions of public knowledge of unrestricted availability of samples of the deposit, is known and readily available to the public. However, depositors should be aware that relying on such a showing rather than making a deposit according to these regulations involves a risk that the biological material might in the future not be readily available. The university relied on in the Merck case, for example, eventually ceased its practice of making biological materials readily available.

Comment: Proposed § 1.202(b) is intended to apply in the event that a depository ceases to enjoy the status of a recognized depository. The manner of making a substitute deposit in such a situation would not seem to be fully explained by a reference to proposed § 1.204. For example, if a depository were to cease operation, it might not be able to, in the words of proposed § 1.204(a), "promptly after having noted its inability to furnish samples, notify the depositor of such inability". Second, the rule as proposed is difficult to follow. For example, it indicates that a substitute deposit "must be viable if the biological material is of a kind capable of self-replication". The implication that certain deposits might be non-viable is at best confusing in the absence of a definition for viability.

Response: Proposed § 1.202(b) has not been adopted. Section 1.805, the rule as adopted on replacement deposits, puts the burden exclusively on the applicant or patent owner, whatever the case may be, to both make a replacement deposit and make the necessary showing that such a deposit complies with these regulations. Viability is dealt with exclusively by § 1.807 as adopted.

Comment: Three comments suggest that it be a requirement of the rules that the biological material have been in existence at the time of filing the patent application. One comment suggests that a sentence be added to proposed § 1.208(a) to require that the application as filed state that the biological material is in existence. The other comments suggest that proposed § 1.203 require an averment that the deposited biological material was in existence at the time the application was filed.

Response: None of the suggestions have been adopted. Patent law does not require an actual reduction to practice as a condition precedent to filing a patent application. While few, if any, situations can be imagined where the description requirement of 35 U.S.C. 112 can be satisfied where the biological material was not in existence at the time of filing, the rules do not preclude such a situation. *But see* the response to the next comment.

Comment: Proposed § 1.203(a) should require that a biological material may be deposited only if an adequate antecedent basis exists in the specification as filed, i.e., the biological material to be deposited must be specifically identified therein.

Response: The suggestion has been adopted in § 1.804(a). It must be clear from the application as filed that the invention claimed and described in the specification "was fully capable of being reduced to practice (i.e., no technological problems, the resolution of which would require more than ordinary skill and reasonable time, remained in order to obtain an operative, useful process)." *Feldman v. Aunstrup* 517 F.2d 1351, 1355, 186 USpQ 108, 113 (CCPA 1975), *cert. denied*, 424 U.S. 912 (1976). *Accord, In re Lundak*, 773 F.2d 1216, 1221, 227 USPQ 90, 94 (Fed. Cir. 1985).

Comment: Two comments suggest that proposed § 1.203(a) be revised so that it addresses the permissible situation where a deposit is made during the pendency of an application for patent not pursuant to a requirement made by an examiner.

Response: The suggestion has been substantially adopted in § 1.804(a). An original deposit may be made, subject to § 1.809, during pendency of the application for patent. Where § 1.809 does not apply, i.e., where a deposit is ultimately not required, a deposit may be made at any time during pendency.

Comment: The Office should discuss in the commentary accompanying the notice of proposed § 1.203(b) as a final rule the meaning and intent behind the requirement that the deposited biological material be the "same" as the material described in the specification. For example, does the Office contemplate that the statement constitute a representation that the deposited material is in essentially the same form as was in existence at the time of the filing of the patent specification, and, accordingly as specifically described therein ?

Response: Proposed § 1.203(b) has been adopted as § 1.804(b) but with the word "same" deleted and the term "described" replaced with "specifically identified." Under § 1.804(b), the biological material deposited must be a biological material specifically identified in the application as filed.

Comment: One comment asks whether a patent which is defective because of the lack of a deposit can be rectified by making the deposit in connection with a reissue application. Another comment points out that the issue of post-grant original deposits is not addressed by these regulations and the Office is urged to comment to this effect in the final promulgation of the rules.

Response: It is assumed from the comment that a deposit was necessary at the time the patent issued. A patent defective because of lack of a necessary deposit is necessarily fatally defective for failure to comply with the first paragraph of 35 U.S.C. 112. Reissue is not available in such cases. See *In re Hay*, 534 F.2d 917, 189 USPQ 790 (CCPA), *cert. denied*, 429 U.S. 977 (1976). Whether reissue is available where a biological material necessary for compliance with 35 U.S.C. 112 was known and readily available at the time of issuance of the patent and subsequently ceased to be readily available is not addressed by this response. Nor do the rules address the question of post-issue original deposits, whether necessary or not to comply with the patent statutes.

Comment: Many comments were received regarding proposed § 1.204 and the subject of replacement deposits. One comment suggests that the time limits in proposed § 1.204(a) for making replacement deposits, specifically as they apply post-grant, are totally arbitrary. For example, a replacement deposit made four months after notice from the depository, without a suitable petition for extension of time, could not be relied on. A number of comments suggest that in proposed § 1.204(a), it is not clear who is required to petition whom in order to obtain an extension of time' in which to make a replacement deposit. A depository is not equipped to deal with the legalities of such matters. If the petition is filed with the Office, there will be administrative burdens. Another comment suggests that instead of specified time limits and petitions for extensions of time, the rule should state that where a patentee makes a replacement deposit, the patentee shall promptly request a certificate of correction identifying the particulars of the replacement deposit and that no such certificate of correction shall be granted unless the request includes, inter alia, a verified showing that the patentee acted diligently in making the replacement deposit. A certificate of correction in providing the particulars of the new deposit (depository and accession number) would provide the simplest and most straightforward vehicle under which the patentee could assure continuing public notice (and accordingly public access) to particular biological materials described in the specification. Corrections to the issued patent would be made subject to all conditions of these deposit regulations and an additional specific requirement that the replacement deposit be made diligently after the notification is received that samples cannot be furnished from the deposit. This generalized requirement of diligence is preferable to the more rigid and cumbersome procedures set forth in the rules as proposed.

Response: The provisions of a three-month time limit for making a replacement deposit and petitioning for extensions of time t extend the limit in proposed § 1.204(a) applied by their terms only to patentees or patent owners. These provisions have not been adopted. Except in reexamination and reissue applications, it is beyond the rulemaking authority of the Office to regulate issued patents. Thus, instead of requiring patent owners to make replacement, or supplemental, deposits and to make them within a specified time, or to require them to request certificates of correction, paragraphs (a), (b) and (c) of § 1.805 as adopted specify that a replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be recognized in any Office proceeding unless the patent owner requests a certificate of correction under § 1.323 provided certain specified conditions are met, including that the patent owner acted diligently in making the replacement or supplemental deposit and promptly thereafter requested the certificate of correction.

Comment: The rules should indicate that replacement deposits made during the pendency of an application will be treated in exactly the same way as any other deposit made after the filing date.

Response: The suggestion has been essentially adopted in § 1.805(a) which states, *inter alia*, that a replacement or supplemental deposit made in connection with an application for patent shall be accepted if it meets the requirements for making an original deposit under these regulations, including the requirement set forth under § 1.804(b).

Comment: The rules should address a situation where the deposit is of a non-viable biological material, such as a marine sponge or other marine macroorganism. Filling requests for samples can ultimately consume the entire deposit. Two other comments suggest that a depositor be permitted to charge the requesting party a fee sufficient to cover the cost of replacing the deposit. A competitor could "drain off" the store of deposit and thereby require replacement at significant econonic hardship to the depositor.

Response: Where the biological material deposited is capable of self-replication either directly or indirectly, exhaustion of the deposit would appear to be highly unlikely. Regardless of the type of biological material deposited, however, the depositor must assure that samples thereof be available beyond the enforceable life of any patent relying on the material.

Comment: Nothing in the regulations which define the suitability of a depository requires that the depository itself must provide notice to depositors in the event of an inability to furnish samples yet proposed § 1.204(a) does.

Response: The suggestion has been adopted in §1.803(a)(2)(vii).

Comment: A number of comments suggest that the legal ramifications of an additional deposit made pursuant to proposed § 1.204(h), i.e., made where an earlier deposit has become contaminated or has lost its capability to function as described in the specification, are not clear. Some of the same comments go on to suggest that the deposit provided for in § 1.204(h) be termed a "supplemental" deposit rather than an "additional" deposit to emphasize the relationship between it and the earlier deposit, that such a deposit have the same legal effect as the earlier deposit provided the patent holder provides a verified statement that it is identical to the earlier deposit, and that it have the same accession number as the earlier deposit, perhaps with a suffix modification. One comment suggests that the rules require that a deposit under paragraph (h) be assigned the same accession number but with an appropriate suffix. A depository commentator asks that where a deposit under paragraph (h) is made, which deposit — the earlier or the later one — should be made available to the public. Currently, this depository advises a requesting party that there are two deposits.

Response: The suggestion of replacing the term "additional" with the term "supplemental" has been adopted but in a somewhat different setting. Whereas proposed § 1.204(h) stated that nothing in the regulations was intended to prohibit a patentee from making an additional deposit, paragraphs (a), (b), (c), (f) and (g) of § 1.805 as adopted provide for patent owners as well as patent applicants making supplemental deposits of a biological material earlier deposited from which a depository can still furnish samples. These paragraphs provide for supplemental deposits similar to the provisions in these paragraphs for replacement deposits, including the requirement of showing diligence in making the deposit in connection with a patent, except that instead of making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, as in the case of a replacement deposit, the deposit is made after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification. While the rules specify that the Office in any Office proceeding will recognize supplemental deposits if made under certain conditions, it is not known what legal effect a court will give to such recognition. As far as what accession number a depository should give to a supplemental deposit, this is a matter within the discretion of the depository. As to which deposit, either an earlier deposit or a supplemental deposit, should be made available to the public, this would depend on the accession number requested. A supplemental deposit made according to these regulations would be freely available to the public to the same extent as an original deposit made according to these regulations. Obviously, nothing in these regulations prohibits a depository from advising a requesting party that there is more than one deposit of a particular biological material.

Comment: To the extent proposed § 1.204 regulates the effects on patents, in other than certain statutorily defined situations such as reexamination and reissue, for failure to make replacement deposits according to the rule, it exceeds the rulemaking authority of the Office. An example is proposed § 1.204(c).

Response: Section 1.805 as adopted, to the extent it addresses replacement deposits made by patent owners, contains no affirmative provisions requiring or prohibiting replacement deposits. Rather, it prescribes what an applicant or patent owner may do vis-a-vis the Office if a replacement deposit is made and what the ramifications are in any Office proceeding if a replacement deposit is not made or improperly made. Proposed § 1.204(c) was, and § 1.805(d) as adopted is, limited to Office proceedings. The provision that a patentee may not replace a viable deposit where the depository can furnish samples in

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proposed § 1.204(h) has been replaced in § 1.805(i) as adopted with the provision that the Ofice will not recognize in any Office proceeding a replacement deposit made by a patent owner where the depository could furnish samples of the deposit being replaced.

Comment: One comment suggests that the term of deposit in proposed § 1.205 is excessive. The term should be through the expiration of the patent plus 10 years. Another comment suggests that § 1.205 be adopted except that the last sentence should be deleted and the term "viable" before "deposit" be dropped. The term "viable" should be deleted as viability is dealt with elsewhere, e.g., proposed § 1.206. The last sentence should be deleted because, while the Office may set what it considers adequate terms of deposit on or before patent grant, it has no statutory authority or mechanism for supervising the term of the agreement of the deposit. The last sentence is also highly indefinite in failing to indicate how far beyond the enforceable life of a patent the deposit must be maintained.

Response: The suggestions have been adopted in part. Proposed § 1.205, including the last sentence, has been adopted as § 1.806 except that the thirty-year term applies to any deposit made before or during pendency of an application for patent. No requirement of viability is stated in the rule. The Office agrees that once a patent issues, it has no authority or mechanism for supervising the term of the agreement of the deposit. But the Office does have the authority to set the term of deposit while an application is still pending. That is all § 1.806 does. In almost all cases, the term of deposit as set forth in the first sentence of § i.806 will extend beyond the enforceable life of the patent for which a deposit was made. The last sentence of § 1.806 is intended to cover those rare circumstances where extended prosecution in the Office results in expiration of the term of deposit as set forth in the first sentence while the patent is still enforceable. At this time, there appears to be no need to specify any finite time period beyond the enforceable life of a patent. If experience demonstrates that the public interest is not being served by the present provisions, an appropriate amendment will be proposed.

Comment: A depository commentator suggests that the requirement in proposed § 1.207(b)(1) that a request for a sample of the deposited material be signed poses an administrative burden on depositories which accept telephone, telex and electronic mail requests for samples. Requiring that a request be signed can and will delay the receipt of samples by many days. The signing requirement should not be adopted.

Response: The suggestion has been adopted in § 1.808(b)(1).

Comment: A depository commentator suggests that the requirement in proposed § 1.207(b)(3) that a copy of the request be provided to the depositor poses a problem since most requests also include a request for samples of many other deposited biological materials. For such a request, it would be necessary to send a copy to each depositor, blanking out the other deposits not made by that depositor. It should be sufficient that the depositor is notified to whom and the date a sample was provided. The cost will be much greater if a copy has to be supplied.

Response: The suggestion has been adopted in § 1.808(b)(3).

Comment: A depository commentator suggests that in proposed § 1.207(b), it is not clear, after the term of the patent, whether the deposit is again restricted as it was before the patent was granted, i.e., not furnished unless the requesting party has the proper authorization from the depositor or the Commissioner, or whether the deposit is no longer subject to subparagraphs (1), (2) and (3) thereof and can be furnished without any specific identification or notification. It is suggested that either a statement be added as to what happens after the term of the patent or the term "during the term of the patent" be deleted.

Response: The suggestions have not been adopted. Section 1.808(a)(2) requires that subject to paragraph (b) thereof, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. Paragraph (b), by its terms, is limited to the term of the patent. A contract between a depositor and a depository according to paragraph (b) but which extends beyond the term of the patent would violate paragraph (a)(2). It should be self-evident that for deposits in compliance with these regulations, samples of the deposit may be furnished without any specific identification or notification for requests made after the term of the patent.

Comment: While many comments suggest adoption of a rule restricting the transfer of a sample of a deposited material to a third party without the depositor's permission, such as proposed § 1.207(c), as well as the adoption of a rule requiring other restrictions on access to deposited material, two comments suggest that such rules not be adopted. The rationale is that if a deposit is basically a replacement for that which could not be adequately written in the patent specification itself, no specific statutory authority exists for restricting access to the deposited material any more than the patent law would countenance restrictions on access to the written description itself. If abuses exist by virtue of the absence of limitations on access to deposited materials, then the remedy for patent infringement is as applicable to deposited material as it is to infringers acting from knowledge of the written description itself. Accordingly, unrestricted access to deposits should be allowed. One of the comments suggests further that if there are to be some restrictions to access, proposed § 1.207(c) is otherwise problematic and ineffective. For example, the limitation on access applies to "derived" materials which could include wholly noninfringing derivatives which might themselves constitute a patentable invention of a third party requester. The proposed rule would deny the third party requester the right to what ought to be an unrestricted right to sell or otherwise dispose of this derivative material to third parties. Moreover, the proposed rule is remediless since the Office neither has continuing jurisdicton over the patentee nor a third party requester. Two depository commentators expressed reservations about proposed § 1.207(c). One suggests that the first sentence therein is in direct contradiction to the long-standing policies of both NRRL and ATCC. Most depositories no longer require this type of guarantee from requesting parties as they find it almost impossible to enforce. The other suggests that the administrative burden to the depository in handling agreements made pursuant to the proposed rule will be great and the cost will be borne by the depositor. At $10 an agreement and 300 requests a year for a particular deposit, the cost to the depositor would be $3,000 a year. If § 1.207(c) is adopted, there should be some mention that if a depository charges a fee for this service, the fee must be paid or the depository will not be obligated to provide the service. In the European Patent Office (EPO), which has a similar provision, the EPO, not the depository, obtains the agreement and advises the depository to make the sample available. The comment asks if the Office is prepared to do this. Additional comments ask what rules govern a new deposit for patent purposes of the same or derived biological material by a requesting party if the substance of proposed § 1.207(c) is adopted. Some comments were in response to a solicitation in the notice of proposed rulemaking for alternative approaches and suggestions for an appropriate definition of "essential characteristics" with respect to derived material in proposed § 1.207(c).

Response: The Office has decided not to adopt a rule permitting a depositor to require that a sample of a deposited biological material shall be furnished only if the requesting party has agreed not to make the material or a derivative thereof available to a third party without the depositor's permission. Thus, proposed § 1.207(c) has not been adopted. The Office agrees with many of the comments about shortcomings in the proposed rule. Fundamentally, however, the proposed rule has not been adopted in view of the rationale stated in the comment that no greater restriction on access to a deposit should be permitted than is permitted on access to the written description itself, even considering that the practical value of access to a deposit may be substantially greater than access to the written description and that infringement may be more difficult to police. While it might be argued that the adoption of proposed § 1.207(b) with revisions as § 1.808(b) is inconsistent with this rationale, the Office believes that permitting the depositor to require a requesting party, in essence, to identify itself is not unreasonable under the circumstances and is consistent with international practice as embodied in the Budapest Treaty.

Comment: Many comments which suggest the adoption of the substance of proposed § 1.207(c) also suggest the adoption of rules incorporating the recommendations made in the April 8, 1987 World Intellectual Property Organization (WIPO) report on the Industrial Property Protection of Biotechnological Inventions (1) to use the biological material only for experimental purposes concerning the invention, and (2) not to export the biological material except to a country for which a relevant patent has been granted. The reasons generally given were that it is necessary to protect the patentee and enhance the patentee's ability to enforce a patent relying on a deposited material. One comment suggests that incorporating the recommendation on experimental use would clarify what is permitted by law. In the Notice of Proposed Rulemaking, 53 Fed. Reg. at 39423-24, the Office described the difficulties in drafting a regulation incorporating these recommendations and requested specific suggestions as to how to draft a regulation which both accomplishes the intended purpose and is not inconsistent with law. No specific suggestions were received, although one comment suggests that where a deposited material is covered by an unexpired U.S. patent, a rule be adopted permittinq the depositor to require the requesting party to agree to comply with the provisions of 35 U.S.C. 271. Another comment suggests that legislation is necessary to deal with the problems addressed by the WIPO recommendations. A restriction against exports could be considered to be violative of 35 U.S.C. 112 since foreign requesters would be denied access to deposits where a patentee had never sought foreign patent protection. A restriction to experimental purposes only, while more justifiable, raises two problems. One is that "experimental purposes" have not been defined and the term has been open to several interpretations. The other is that the proper redress for non-experimental use is a suit for patent infringement, not a suit based on the requester's promise to the depository. The comment suggests that a rule be adopted permitting the depositor to require that a requesting party acknowledge that the furnishing of a sample of the deposited biological material does not constitute a license, express or implied, to use that sample for any purpose.

Response: None of the suggestions have been adopted for essentially the same rationale discussed in the response to the previous comment. None suggest how to draft a regulation which both accomplishes the intended purpose and is not inconsistent with law, and which provides a compelling justification and rationale for departing from present policy and practice. The suggestion that a requesting party agree to comply with 35 U.S.C. 271 as a condition precedent to obtaining a sample of deposited biological material is interpreted as an agreement not to infringe a corresponding valid patent, something which a requesting party is already bound not to do under law. The suggestion that a depositor be permitted to require a requesting party to acknowledge that there is no express or implied license to use a sample for any purpose exceeds the rulemaking authority of the Office since certain unlicensed uses of patented subject matter have been found by the courts to be permissible.

Comment: Many of the comments suggesting adoption of the substance of § 1.207(c) and/or the WIPO recommendations on experimental use and export also suggest adoption of rules permitting additional restrictions. One comment suggests requiring the recipient of biological material to report, at least annually, to the patent holder, on the research and other results obtained by use of the biological material. The same commentator suggests that even after patent expiration, an unlicensed recipient should not be permitted to use the biological material for other than experimental purposes absent agreement from the depositor. The commentator would prohibit commercial use of the biological material without permission of the depositor. Another comment suggests that the policy consideration for permitting deposits is to insure that the patented invention can be practiced after patent expiration. Requiring a requesting party to enter into an agreement with the depositor defining the terms and conditions under which a sample of the deposited material would be used, making an accounting of such use, and proof of compliance, is neither unreasonable nor contrary to law. It would not place an administrative burden on the Office since the depository could be permitted to release samples only if the requesting party signs a license. Any attempt by the depositor to impose an unlawful restriction and withhold release would be a matter for the courts, not the Office. Another comment suggests various additional restrictions be adopted. These are (1) that the requesting party have residence in the U.S. or in the country where the depository is located, if different; (2) that the patentee be given the option to restrict furnishing of samples to independent experts only for the duration of the patent; and (3) that the deposit be released only if the depositor expressly consents (in the absence of which validity of the patent must be resolved without recourse to the deposit). Restriction (1) should be adopted so that the deposit cannot be legally exported to a country where the patent owner has no enforceable rights. Restriction (2) should be adopted to prevent access of the deposited material to potential infringers. Its adoption should be coupled with a statement that a deposit released to an expert shall be regarded as being available to the public. Restriction (3) should be adopted as an extension to the description in proposed § 1.201 that the disclosure "may include a deposit." In other words, the patentee at any time during the patent term should be able to rely on the written description alone for satisfying 35 U.S.C. 112, such as where the reasons for requiring a deposit originally no longer exist.

Response: None of the suggestions have been adopted for essentially the same reasons discussed in the responses to the previous two comments.

Comment: A depository commentator suggests that proposed § 1.207(d) needs further deliberation. Now, publication in a U.S. patent of a deposit and accession number is sufficient for that depository (ATCC) to make samples available. The Office should be prepared to receive several thousand requests for certification under § 1.207(d) if adopted. If the Office is going to certify the availability of deposits, it should certify the availability of all deposits. Easier than the proposed rule would be to include a statement in the patent that there is a deposit, its accession number and where it is deposited, and that it has been made under the condition that it is available upon publication of the issued patent.

Response: The suggestion has not been adopted. The comment appears to be interpreting the term "Upon request" at the beginning of proposed § 1.207(d) to mean "Upon request to a depository for a sample of a deposited material", or in other words, the commentator appears to have interpreted the proposed language as requiring the depository to request certification from the Office each time a request for a sample of a deposit is made. It was not intended to impose such a burden on depositories. Rather, it was intended that the term "Upon request" refer to a request made to the Office. Therefore, proposed § 1.207(d), revised by inserting the term "made to the Office" after "Upon request", has been adopted as § 1.808(c).

Comment: One comment suggests that there is no apparent reason for the use of the different words " [e]stablishing" and "[a]rguing", in proposed paragraphs (b)(2) and (b)(3), respectively, of § 1.208 since the same meaning is intended by each. Either word alone should be used in both subparagraphs (2) and (3). The same comment goes on to suggest that the reference to paragraph (b)(2) in the last sentence of proposed § 1.208(b)(3) is redundant since the examiner may be convinced that a deposit is not required where the applicant has established that the involved biological material is known and readily available to the public. A comment along the same lines suggests that paragraph (b)(2) is unnecessary. As a purely logical matter, an applicant ought to be entitled to reply to a rejection either by making an acceptable deposit or arguing why a deposit is not required under the circumstances. Proposed § 1.208(b)(2) is merely one possibility for an argument that a deposit is not required.

Response: The suggestions have been adopted. Proposed § 1.208(b)(2) has not been adopted and proposed § 1.208(b)(3) has been substantially adopted as § 1.809(b)(2). In addition, § 1.809(b)(2) provides for examination with respect to a patent, since deposit issues may arise in connection with a reissue application and/or a reexamination proceeding, and provides also for an argument that a deposit actually made should be accepted.

Comment: A number of comments suggest that the term "taxonomic description" in proposed § 1.208(d)(3) is unclear and inappropriate in some cases. One comment suggests that it is not clear how complete a description is required. If construed in its broadest sense, it could have the undesirable effect of delaying filing of an application until taxonomic characteristics have been determined. Some biological materials within the scope of the proposed rules, such as plasmids, are not susceptible of taxonomic description. The requirement that the specification contain a taxonomic description should not be adopted since such a description may not be possible and since the availability of a deposit makes such a description superfluous, since the taxonomy is inherent in the deposit. The response to comments made earlier regarding the taxonomic description requirement is inconsistent with the proposed rule. The response states that the extent to which a taxonomic description is required will depend on the facts of the case yet the proposed rule states that the

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specification *shall* contain such a description. The response states that the taxonomic description must be sufficient for purposes of 35 U.S.C. 112 yet the requirement of a deposit presupposes that a written description alone will not satisfy the statute. The need to verify that the deposited biological material is that disclosed in the specification arises only when the deposit is made after the filing date. That situation can be dealt with by deleting the taxonomic description requirement from § 1.208(d) and adding a new subparagraph (e) which would provide that in cases where a deposit is made after the filing date and where the nature of the material permits, a taxonomic description is required in addition to the items specified in subparagraph (d). Another comment suggests that the term "taxonomic" be deleted since it is irrelevant to many types of deposits and would provide greater clarity to the rules. Another comment suggests that the current language in proposed § 1.208(d)(3) be replaced with "Fully identify and describe the deposited material".

Response: The suggestions have been adopted in part. Section 1.809(d)(3) as adopted requires a description of the deposited biological material sufficient to specifically identify it and to permit examination. While the rule does not by its terms require a taxonomic description, such a description should satisfy the rule as adopted in cases where the biological material deposited admits of a taxonomic description.

Comment: The Office should petition the Budapest Assembly to address the same issues dealt with in the proposed rules so that they apply to both U.S. and foreign filings. Uniformity in the rules is important, especially for U.S. inventors who file here and abroad.

Response: While uniformity in both U.S. and foreign rules is desirable, this is not deemed to be the appropriate forum in which to address the suggestion.

Discussion of Specific Sections

BIOLOGICAL MATERIAL [§ 1.801]:

The section indicates that the rules pertaining to deposits for purposes of patents for inventions under 35 U.S.C. 101 are intended to relate to biological material. For the purposes of these rules, the term "biological material" is defined in terms of a non-exhaustive list of representative materials which can be deposited in accordance with the procedures defined in these rules. Since these rules are intended to address procedural matters in the deposit of biological material for patent purposes, and are not designed to decide such substantive issues such as whether a deposit of a particular organism or material would be recognized or needed to be made for the purposes of satisfying the statutory requirements for patentability under 35 U.S.C. 112, the definition provided in this section is intended to be permissive - specifically defining materials which can be deposited.

Biological material includes material that is capable of self-replication either directly or indirectly. Direct self-replication includes those situations where the biological material reproduces by itself. Representative examples of materials capable of self-replication are defined in the rule. Indirect self-replication is meant to include those situations where the biological material is only capable of replication when another self-replicating biological material is present. Self-replication after insertion in a host is one example of indirect self-replication. Examples of indirect replicating biological materials include viruses, phages, plasmids, symbionts, and replication defective cells. The list of representative examples of each type of replicating material includes viruses to demonstrate that the lists are not intended to be mutually exclusive.

Although plant material is included within the scope of the definition of biological material for purposes of patents for inventions under 35 U.S.C. 101, these rules on deposits are not applicable to applications filed under the Plant Patent Act (35 U.S.C. 161-164). The Office is of the view that a deposit is not required under the present provisions of 35 U.S.C. 162. Thus, no plant patent granted under the provisions of 35 U.S.C. 161-164 need be supported by a deposit. As with other biological material deposited for purposes of patents for inventions under 35 U.S.C. 101, the deposit of plant material together with the written specification must enable those skilled in the art to make and use the claimed invention.

As with some types of reproducible biological material, seeds can be reproduced only after a growing season which may be relatively long. Although the rules do not specify a specific number of seeds to be deposited to meet the requirements of these rules, the Office will consider 2500 to be a minimum number in the normal case, but will give an applicant the opportunity to provide justification why a lesser number would be suitable under the circumstances of a particular case. The Department of Agriculture requires a deposit of 2500 seeds for the grant of a Plant Variety Protection Certificate. As the reproduction of seeds will often take a substantial period of time, the Office will require, at a minimum, a number of seeds that is likely to satisfy demand for samples once the patent is granted.

Section 1.801 does not attempt to identify what biological material either needs to be or may be deposited to comply with the requirements of 35 U.S.C. 112. For the most part, this issue must be addressed on a case-by-case basis. Thus, while the Office does not presently contemplate that there would be any situations where a material that is not capable of self-replication either directly or indirectly would be acceptable as a deposit, an applicant is clearly not precluded in any given application, by these rules, from attempting to show why the deposit of such a material should be acceptable to satisfy the requirements of 35 U.S.C. 112.

NEED OR OPPORTUNITY TO MAKE A DEPOSIT [§ 1.802]

This section permits a deposit of a biological material to be referenced in a patent application where an invention is, or relies on, a biological material. The invention may rely on a biological material for the purposes of making or using the invention, either as a preferred mode or an alternative mode of operation. It is not necessary, for the purposes of paragraph (a), that a deposit be required to satisfy the requirements of 35 U.S.C. 112 before a reference to a deposit is permitted in the specification.

There is no necessary implication or presumption that can or should be made about the need for a deposit simply because reference to a deposit is made in an application disclosure. As noted in paragraph (b), biological material need not be deposited unless access to such material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112 and that access is not otherwise available in the absence of a deposit. Where a deposit is required to provide the necessary access, a deposit is acceptable for patent purposes only where it is made in accordance with these regulations. Even where access to biological material is required to satisfy these statutory requirements, a deposit may not be necessary if access sufficient to satisfy these requirements is otherwise available.

For example, applicant could show that the biological material is known and readily available to the public. The concepts of "known and readily available" are considered to reflect a level of public accessibility to a necessary component of an invention disclosure that is consistent with an ability to make and use the invention. To avoid the need for a deposit on this basis, the biological material must be both known and readily available - neither concept alone is sufficient. A material may be known in the sense that its existence has been published, but is not available to those who wish to obtain that particular known biological material. Likewise, a biological material may be available in the sense that those having possession of it would make it available upon request, but no one has been informed of its existence.

By showing that a biological material is known and readily available or by making a deposit in accordance with these rules, applicant does not guarantee that such biological material will be available forever. Public access during the term of the patent may affect the enforceability of the patent. Although there is a public interest in the availability of a deposited biological material during and after the period of enforceability of the patent, the examiner need not be unduly concerned about continued access to the public. Unless there is a reasonable basis to believe that the biological material will cease to be available during the life of the patent, the examiner should accept current availability as satisfying the requirement. The incentives provided by the patent system should not be constrained by the mere possibility that a disclosure that was once enabling would become non-enabling over a period of time through no fault of the patentee. *In re Metcalfe*, 410 F.2d 1378, 161 USPQ 789 (CCPA 1969).

There are many factors that may be used as indicia that a biological material is known and readily available to the public. Relevant factors include commercial availability, references to the biological material in printed publications, declarations of

accessibility by those working in the field, evidence of predictable isolation techniques, or an existing deposit made in accordance with these rules. Each factor may or may not be sufficient alone to demonstrate that the biological material is known and readily available. Those applicants that rely on evidence of accessibility other than a deposit take the risk that the patent may no longer be enforceable if the biological material necessary to satisfy the requirements of 35 U.S.C. 112 ceases to become accessible.

The Office will accept commercial availability as evidence that a biological material is known and readily available only when the evidence is clear and convincing that the public has access to the material. A product could be commercially available but only at a price that effectively eliminates accessibility to those desiring to obtain a sample. The relationship between an applicant relying on a biological material and the commercial supplier relied upon is one factor that would be considered in determining whether the biological material was known and readily available. However, the mere fact that the biological material was available only through the patent holder or the patent holder's agents or assigns shall not, by itself, justify a finding that the necessary material is not readily available, absent reason to believe that access to the biological material would later be improperly restricted.

The mere reference to a deposit or the biological material itself in any document or publication does not necessarily mean that the deposited biological material is readily available. Even a deposit made under the Budapest Treaty and referenced in a United States or foreign patent document would not necessarily meet the test for known and readily available unless the deposit was made under conditions which are consistent with those specified in these rules, including the one that requires, with one possible exception, that all restrictions on the accessibility will be irrevocably removed upon the granting of the patent.

Applicant may show that a deposit is not necessary even though specific biological materials are required to practice the invention if those biological materials can be made or isolated without undue experimentation. Deposits may be required to support the claims if an isolation procedure requires undue experimentation to obtain the desired biological material. *Ex Parte Jackson*, 217 USPQ 804 (PTO Bd. Pat. App. 1982) No deposit is required, however, where the required biological materials can be obtained from publicly available material with only routine experimentation and a reliable screening test. *Tabuchi v. Nubel*, 559 F.2d 1183, 194 USPQ 521 (CCPA 1977); *Ex Parte Hata*, 6 USPQ 2d 1652 (PTO Bd. Pat. App. & Int. 1987).

Once a deposit is made in a depository complying with these rules, and under conditions complying with these rules, a biological material will be considered to be readily available even though some requirement of law or regulation in the United States or in the country where the depository institution is located permits access to the material only under conditions imposed for health, safety or similar reasons. This provision is consistent with the Budapest Treaty (Article 5) and is designed to permit the patenting of inventions involving materials having restricted distribution, where the restrictions are imposed for the public, as opposed to the private, welfare.

Paragraph (c) specifically provides that the mere reference to a deposit of biological material in the specification disclosure or the actual deposit of such material does not create any presumption that such referenced or deposited material is necessary to satisfy 35 U.S.C. 112, or that a deposit in accordance with these regulations is or was required. Since reference to a biological material cannot be added to a specification disclosure after filing an application without risking the prohibited introduction of new matter (35 U.S.C. 132), applicants must be permitted to address the need to make a deposit in accordance with these regulations without jeopardizing a filing date. Thus, the examiner has the burden of showing that a deposit is required to satisfy 35 U.S.C. 112, and cannot rely on whether a deposit has been made or has been referenced in the specification disclosure to establish a *prima facie* case that the disclosure does not comply with 35 U.S.C. 112 without deposit.

ACCEPTABLE DEPOSITORY [§ 1.803]

This section indicates that a depository will be recognized as acceptable for the purposes of these regulations if it is either an International Depositary Authority (IDA) established under the Budapest Treaty, or if it is a depository recognized as suitable by the Commissioner. After the effective date of these regulations, a deposit of biological material which is made in a depository which is not recognized as acceptable under this regulation will not be considered as satisfying the requirements of 35 U.S.C. 112. On the other hand, if a deposit is not required to satisfy the requirements of 35 U.S.C. 112, it is permissible to make reference to such a deposit even though it may not be in a depository or made under the conditions which are acceptable under these regulations. As new depositories are accepted under the Budapest Treaty or are recognized as suitable by the Commissioner, their identity will be announced in the *Official Gazette*.

An organization may be recognized as suitable by the Office if the procedure and conditions specified in paragraphs (a)(2) and (b) are followed. Generally, it is not the intention of the Office to recognize as suitable any organization where the need for a suitable depository for patent purposes is being met by depositories recognized as IDAs under the Budapest Treaty. Suitability will be judged by the Commissioner, based on need and the information supplied by the organization seeking status, and information obtained from other sources that may be consulted.

While there is a desire to provide flexibility to a patent applicant in selecting an appropriate depository, these rules are not intended to permit each patent applicant to become its own depository since both the patent owner and the public have an interest in the continued availability and accessibility of the deposit during the enforceable life of the patent, and the public has a continuing interest in its availability when the patent is no longer enforceable. The concept of a depository independent of the control of the depositor or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are substantially free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidentally alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the access to the biological material once the term of the patent expires.

When a depository having status under paragraph (a)(2) of this regulation seeks to change the kinds of biological materials that it will accept and maintain for the purposes of these rules, a communication requesting such a change should be directed to the Commissioner containing the information requested in paragraph (b). When such a change is requested, the requesting organization should provide a complete list of the kinds of biological materials it will accept.

Paragraph (d) of this section indicates that once a depository is recognized as suitable for the purposes of this rule, or has defaulted or discontinued its performance under this section, notice thereof will be published in the *Official Gazette* of the Patent and Trademark Office. A current list of IDAs recognized under the Budapest Treaty is as follows:

Agricultural Research Culture Collection (NRRL) - USA
American Type Culture Collection (ATCC) - USA
Australian Government Analytical Laboratories (AGAL) - Australia
Centraalbureau Voor Schimmelcultures (CBS) - Netherlands
Collection Nationale De Culture De Micro-organismes (CNCM) - France
Commonwealth Agriculturial Bureau (CAB), International - Mycological Institute - United Kingdom
Culture Collection of Algae and Protozoa (CCAP) - United Kingdom
Deutsche Sammlung Von Mikroorganismen (DSM) - Federal Republic of Germany
European Collection of Animal Cell Cultures (ECACC) - United Kingdom
Fermentation Research Institute (FRI) - Japan
Institute of Micro-organism Biochemistry and Physiology of the USSR Academy of Science (IBFM) - Soviet Union
In Vitro International, Inc. (IVI) - USA
Mezogazdasagi Es Ipari Mikroorganizmusok Magyar Nemzeti Gyujtemenye (MIMNG) - Hungary

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National Bank for Industrial Microorganisms and Cell Cultures (NBIMCC) - Bulgaria
National Collection of Industrial Bacteria (NCIB) - United Kingdom
National Collection of Type Cultures (NCTC) - United Kingdom
National Collection of Yeast Cultures (NCYC) - United Kingdom
USSR Research Institute for Antibiotics of the USSR Ministry of the Medical and Microbiological Industry (VNIIAA) - Soviet Union
USSR Research Institute for Genetics and Industrial Microorganism Breeding of the USSR Ministry of the Medical and Microbiological Industry (VNII Genetika) Soviet Union

TIME OF MAKING AN ORIGINAL DEPOSIT [§ 1.804]

This section specifies the time for making an original deposit to fulfill the requirements of 35 U.S.C. 112. Paragraph (a) specifies not only a permissible time frame for making an original deposit, but also specifies that the biological material deposited must be specifically identified in the application for patent as filed. The requirement for a specific identification is consistent with the description requirement of the first paragraph of 35 U.S.C. 112, and to provide an antecedent basis for the biological material which either has been or will be deposited before the patent is granted.

The description in the Lundak application as filed (now patent 4,594,325) provides a suitable illustration of the specific identification and description which is required in an application for patent as filed. In that application, an immortal B-cell line was disclosed and claimed. The cell line was referred to in the application as filed as WI-L2-729 HF2. The methods of obtaining and using this cell line were also described in the application as filed. A deposit of the cell line was made with the American Type Culture Collection (ATCC) about a week after the application was filed in the United States. The United States Court of Appeals for the Federal Circuit held that the requirements of access by the Office to a sample of the cell line during pendency, and public access after grant, were met by Lundak's procedures. The Court further held that the addition of information designating the depository, accession number, and deposit date of the deposited cell line in ATCC after the filing date did not violate the prohibition against new matter in 35 U.S.C. 132. *In re Lundak*, 773 F.2d 1216, 227 USPQ 90 (Fed Cir. 1985). It must be clear from the application as filed that the invention claimed and described in the specification "was fully capable of being reduced to practice (i.e., no technological problems, the resolution of which would require more than ordinary skill and reasonable time, remained in order to obtain an operative, useful process)." *Feldman v. Aunstrup*, 517 F.2d 1351, 1355, 186 USPQ 108, 113 (CCPA 1975), *cert. denied*, 424 U.S. 912 (1976).

When the original deposit is made after the effective filing date of an application for patent, applicant is required to promptly submit a verified statement from a person in a position to corroborate that the biological material which is deposited is a biological material specifically identified in the application (the filing date of which is relied upon) as filed. The nature of this corroboration will depend on the circumstances in the particular application under consideration, including the length of time between the application filing date and the date of deposit. While few, if any, situations can be imagined where the description requirement of 35 U.S.C. 112 can be satisfied where the biological material was not in existence at the time of filing, the rules do not preclude such a situation. There is no requirement in the patent law that an actual reduction to practice occur as a condition precedent to filing a patent application. The requirement for a verified statement is not necessary under paragraph (b) of this section if the person making the statement is an attorney or agent registered to practice before the Office.

For the purposes of complying with the requirements of 35 U.S.C. 112, a deposit of a biological material may be made at any time before filing the application for patent or during the pendency of the application subject to the conditions of § 1.809. Where the deposit is needed to satisfy the requirement of 35 U.S.C. 112 and is made during the pendency of the application, it must be made no later than the time period set by the examiner at the time the Notice of Allowance and Issue Fee Due is mailed. A necessary deposit need not be made by applicant until the application is in condition for allowance so long as applicant provides a written assurance that an acceptable deposit will be made on or before the payment of the issue fee. This written assurance must provide sufficiently detailed information to convince the examiner that there is no outstanding issue regarding deposits that needs to be resolved.

Those applicants intending to file patent applications in a country foreign to the United States relying upon biological material that must be deposited to satisfy the requirements of 35 U.S.C. 112 when the application is filed in the United States are cautioned that in many countries the deposit must be made before the filing date of the priority application in order to obtain foreign priority rights. Thus, while the deposit of a biological material subsequent to the effective filing date of a United States application is sufficient to comply with 35 U.S.C. 112, an applicant may not be able to rely on the filing date of such a U.S. application if a patent is sought in a country foreign to the United States.

REPLACEMENT OR SUPPLEMENT OF DEPOSIT [§ 1.805]

This section relates to the deposit of a biological material to replace or supplement a previous deposit. The term "replacement" is directed to those situations where one deposit is being substituted for another. An applicant may have greater latitude in replacing a deposit during the pendency of an application than after the patent is granted. Replacement will typically take place where the earlier deposit is no longer viable. The term "supplement" is directed to those situations where the earlier deposit is still viable in the sense that it is alive and capable of replication either directly or indirectly, but has lost a quality (e.g., purity, functionality) it allegedly possessed at the time the application was filed. The procedures in these rules contemplate that only the original depositor would have a right to replace or supplement the original deposit.

Paragraph (a) relates to the procedure for replacing or supplementing a deposit with respect to a pending application or a patent. An applicant for patent or patent owner whose patent is the subject of a reissue application or reexamination proceeding is required to notify the Office when it obtains information that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification. When the Office is so notified or otherwise becomes aware of such information, the need for making a replacement or supplemental deposit will be determined by the same considerations used to determine the need for an original deposit under § 1.802(b).

A replacement or supplemental deposit made in connection with a pending application for patent will be accepted if it meets all the requirements for making an original deposit. It should be noted that for a pending application for patent, applicant need not replace or supplement the identical material previously deposited, but may make an original deposit of a biological material which is specifically identified and described in the application as filed. Whether this alternative deposit will meet the requirements of 35 U.S.C. 112 with respect to the claimed subject matter must be resolved by the examiner on a case-by-case basis.

A replacement or supplemental deposit made in connection with a patent, whether or not it is the subject of a pending reissue application or reexamination proceeding, shall not be recognized in any Office proceeding unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section. These paragraphs specify the procedures that a patent owner must follow to ensure both that a replacement or supplemental deposit will be recognized in any Office proceeding and that a certificate of correction under this section containing "up to date" information about a deposited biological material will be granted. The term "recognized in any Office proceeding" as used in this section includes the proceeding in which a request for certificate of correction under this section is acted upon. Paragraph (b) describes the information which must be contained in the certificate of correction, whereas paragraph (c) describes when the request must be made and the information which must be provided in the request to make the correction. The rules require, *inter alia*, that replacement or supplement of a deposit be made diligently, followed by prompt request thereafter for a certificate of correction, as conditions precedent to being recognized in any Office proceeding.

Thus, for example, if a patent owner learns early during the term of the patent that the depository cannot furnish samples of a deposit described in the patent and the patent owner fails to both diligently make a replacement deposit and promptly thereafter request a certificate of correction under these rules, a replacement deposit made years later when the patent becomes the subject of a reissue application or reexamination proceeding will not be recognized by the Office nor will any request for certificate of correction in connection with that deposit be granted.

Where a proper request for certificate of correction is made and has been granted, any correction made to the original patent will be automatically incorporated into any reissued or reexamined patent unless changes are made during examination of the reissue application or reexamination proceeding.

Paragraph (d) of § 1.805 sets forth the Office position that the failure to make a replacement deposit or, in the case of a patent, diligently make a replacement deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after notification that samples of an earlier deposit cannot be furnished, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

Paragraph (e) thereof indicates that the Office will apply a rebuttable presumption of an identity between the replacement deposit and an original deposit where a patent making reference to the deposit is relied on during any Office proceeding. This means that where a replacement deposit is permitted and made, the examiner will assume that the same material as described in the patent is accessible from the identified depository unless evidence to the contrary comes to the attention of the Office.

An applicant for patent may make a replacement or supplemental deposit during the pendency of the application for any reason. The provisions of paragraph (f) of § 1.805 recognize that since an original deposit may be made during the pendency of the application subject to the conditions of § 1.809, a replacement or supplemental deposit logically cannot be held to any higher standard or any further requirements. Likewise, the provisions of paragraph (g) indicate that neither a replacement nor a supplemental deposit need be made where, at the point in time when replacement or supplement would otherwise be necessary, access to the necessary biological material was otherwise available. For example, a replacement or supplemental deposit would not be required under the circumstances where access to the necessary biological material was established through commercial suppliers.

The provisions of paragraph (h) of § 1.805 indicate that a replacement deposit is not required even though the depository cannot furnish samples, under certain conditions, to those requesting a sample outside of the jurisdiction where the depository is located. The conditions are specified in this paragraph as being limited to national security, health or environmental safety reasons.

Finally, paragraph (i) of this section indicates that the Office will not recognize in any Office proceeding a replacement deposit made by the patent owner where the depository could furnish samples of the deposit being replaced. The best evidence of what was originally deposited should not be lost through destruction or replacement if made in association with an existing patent. A supplemental deposit may be accepted in an Office proceeding, however, depending on the circumstances in each case.

TERM OF DEPOSIT [§ 1.806]

The term of deposit must satisfy the requirements of the Budapest Treaty which sets a term of at least 30 years from the date of deposit and at least five (5) years after the most recent request for the furnishing of a sample of the deposit was received by the depository. In the event that the 30-year term covers the 17-year term of the patent plus six (6) years to include the Statute of Limitations, no further requirement is necessary. The mere possibility of patent term extension or extended litigation involving the patent should not be considered in this analysis.

In the event that the 30-year term of deposit measured from the date of deposit would necessarily terminate within the period of enforceability of the patent (normally the 17-year term plus six (6) years), samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made. No requirement should be made as to any particular period of time beyond the enforceable life of the patent. The purpose of the requirement is to insure that a deposited biological material necessary for the practice of a patented invention would be available to the public after expiration of the patent for which the deposit was made. The term of the deposit must comply with the requirements of each sentence of § 1.806 whether or not the deposit is made under the Budapest Treaty. A specific statement that the deposit complies with the second sentence of this section is required only where the 30-year term would terminate within the enforceable life of the patent.

VIABILITY OF DEPOSITS [§ 1.807]

This section requires that the deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. This requirement for viability is essentially a requirement that the deposited material is capable of reproduction. For the purpose of making a deposit under these rules, there is no requirement that evidence be provided that the deposited material is capable or has the ability to perform any function described in the patent application. However, as with any other issue of description or enablement, if the examiner has evidence or reason to question the objective statements made in the patent application, applicants may be required to demonstrate that the deposited biological material will perform in the manner described.

Under the Budapest Treaty, there is a requirement that the deposit be tested for viability before it is accepted. Thus, a mere statement by applicant, an authorized representative of applicant or the assignee that the deposit has been accepted under the Budapest Treaty would satisfy § 1.807.

For each deposit which is not made under the Budapest Treaty, a viability statement must be filed in the patent application and contain the information listed in paragraph (b) of this section. Under paragraph (c), the examiner will accept the conclusion set forth in a viability statement which is issued by a depository recognized under § 1.803(a). If the viability test indicates that the deposit is not viable upon receipt, or the examiner cannot for scientific or other valid reasons accept the statement of viability received from the applicant, the examiner shall so notify the applicant stating the reasons for not accepting the statement and proceed with the examination process as if no deposit had been made.

FURNISHING OF SAMPLES [§ 1.808]

This section requires that the deposit of biological material be made under two (2) conditions:

(1) access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and

(2) with one exception, that all restrictions imposed by the depositor on the availability to the public of the deposited biological material will be irrevocably removed upon the granting of the patent.

The one exception that is permitted is specified in paragraph (b) of this section which permits the depositor to contract with the depository to require that samples of a deposited biological material shall be furnished only if a request for a sample, during the term of the patent meets any one or all of the three conditions specified in this paragraph. These conditions are:

(1) the request is in writing or other tangible form and dated; and/or

(2) the request contains the name and address of the requesting party and the accession number of the deposit; and/or

(3) the request is communicated in writing by the depository to the depositor along with the date on which the sample was furnished and the name and address of the party to whom the sample was furnished.

It should be noted that this exception to the general rule that all restrictions will be removed must be strictly followed and that no variations of this explicit exception will be accepted as meeting the conditions of this section. This exception is consistent with the provisions in the Budapest Treaty and its implementing regulations (Rule 11.4).

Since the mere description of a deposit or identity of a deposit in a patent specification is not necessarily an indication that a

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requirement for deposit was made or that a deposit which complies with these rules has been made, accessibility to a deposited material referenced in a patent may depend on the satisfaction of conditions not apparent on the face of the patent. For these reasons, and upon request made to the Patent and Trademark Office, the Office will certify whether a deposit has been stated to have been made under conditions which would make it available to the public as of the issue date of the patent grant provided the request is made to the Director of Patent Examining Group 180, and contains the following information:

(1) the name and address of the depository
(2) the accession number given to the deposit
(3) the patent number and issue date of the patent referring to the deposit and
(4) the name and address of the requesting party.

For those deposits made pursuant to the Budapest Treaty, the World Intellectual Property Organization provides a form (Form BP-12) for requesting a certification of the availability of samples of deposited microorganisms pursuant to Rule 11.3(a) of the regulations under the Budapest Treaty. Copies of this form are available from the Director of Patent Examining Group 180.

EXAMINATION PROCEDURES [§ 1.809]

This section sets forth procedures that will be used by the examiner to address a deposit issue. Deposit issues may arise in the examination of claims in applications for patent and for reissue of a patent, and in the examination of new or amended claims in a reexamination proceeding. The burden is initially on the Office to establish that access to a biological material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. Once the Office has met this burden, the burden shifts to the applicant or patent owner to demonstrate that access to such biological material either is not necessary or is already available, or that a deposit of such material is being or will be made, replaced or supplemented in accordance with these regulations.

Under paragraph (a) of this section, once the examiner has determined that access to a biological material is necessary, and that access is not presently available in accordance with these regulations, the examiner should make an appropriate rejection under 35 U.S.C. 112.

The applicant or patent owner may respond, pursuant to paragraph (b)(2) of this section, to a rejection made under paragraph (a) thereof by arguing why a deposit is not needed under the circumstances and/or why a deposit actually made should be acceptable. Other prescribed responses which are available to such a rejection depend upon whether the rejection is made in an application for patent, on the one hand, or in a proceeding involving a patent, i.e., an application for reissue patent or reexamination proceeding, on the other hand.

In an application for patent, applicant may respond, pursuant to paragraph (b)(1) of this section, by either making an acceptable original, replacement or supplemental deposit in accordance with these regulations, or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee. In a proceeding involving a patent, the patent owner may respond, pursuant to paragraph (b)(1) of this section, by requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805. In all cases, any other response shall be considered non-responsive. The rejection will be repeated and made final until the requirements of paragraph (b)(1) of this section are satisfied or the examiner is convinced that a deposit. is not required for the claimed subject matter.

As set forth in paragraph (c) of this section, in the event that an application for patent is otherwise in condition for allowance except for a needed deposit and the Office has received a written assurance that an acceptable deposit will be made, the Office will mail to the applicant a requirement that the needed deposit be made within three (3) months together with the Notice of Allowance and Issue Fee Due. Although the period for paying the issue fee cannot be extended under the provisions of § 1.136, the period for satisfying the requirement to make an acceptable deposit may be extended under the provisions of that section. Failure to make the needed deposit in accordance with this requirement may be considered a failure to prosecute the application under 35 U.S.C. 133 and result in abandonment of the application.

The type of written assurance which will be considered acceptable by the Office that an acceptable deposit will be made within the required time must include sufficient information to conclude that there is no outstanding issue with regard to the deposit of an appropriate biological material under conditions which satisfy these rules.

In a proceeding involving a patent, it may not be possible to request a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805. For example, if the patent owner is on notice that samples of an original deposit can no longer be furnished by the depository, failure to diligently make a replacement deposit will preclude grant of a certificate of correction. A replacement deposit subsequently made will not be recognized by the Office nor will a request for certificate of correction, even if made promptly thereafter, be granted. It would also not be possible to request a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805 where no original deposit was made before or during the pendency of the application which matured into the patent.

A patent defective because of lack of a necessary deposit is necessarily fatally defective for failure to comply with the first paragraph of 35 U.S.C. 112. Reissue is not available in such cases. *See In re Hay*, 534 F.2d 917, 189 USPQ 790 (CCPA 1976). Whether reissue is available where a biological material necessary for compliance with 35 U.S.C. 112 was known and readily available at the time of issuance of the patent and subsequently ceased to be readily available is problematic. Nevertheless, the rules do not provide for post-issue original deposits.

Where an applicant for patent has any doubt whether access to a biological material specifically identified in the specification is necessary to satisfy 35 U.S.C. 112 or whether such a material, while presently freely available, may become unavailable in the future, the applicant would be well-advised to make a deposit thereof before any patent issues. Similarly, where a patent owner has any doubt whether a deposit referred to in the specification is of a biological material necessary to satisfy 35 U.S.C. 112 and, if the material is necessary, whether it is otherwise known and readily available, the patent owner would be well-advised to follow the procedures set forth in paragraphs (b) and (c) of § 1.805 after receiving the notice specified in those paragraphs.

Paragraph (d) of this section sets forth the requirements for the content of the specification with respect to a deposited biological material. Specifically, the specification shall contain the accession number for the deposit, the date of the deposit, the name and address of the depository, and a description of the deposited biological material sufficient to specifically identify it and to permit examination. The description must be sufficient to permit verification that the deposited biological material is in fact that disclosed. Once the patent issues, the description must be sufficient to aid in the resolution of questions of infringement. As a general rule, the more information that is provided about a particular deposited biological material, the better the examiner will be able to compare the identity and characteristics of the deposited biological material with the prior art.

OTHER CONSIDERATIONS

The rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration, that this rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The deposit practice will not impose extra work on patent applicants (whether small or large businesses or individuals).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rules contain a collection of information requirement subject to the Paperwork Reduction Act which has been approved by the Office of Management and Budget under Control No. 0651-0022. Public reporting burden for this collection of information is estimated to average one hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed to make a deposit or request a sample, and completing and reviewing the collection of information. It is further estimated that a respondent depository would spend about five hours collecting and submitting the necessary information to be recognized as a suitable depository by the Office. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (Paperwork Reduction Project 0651-0022). No comments regarding this burden estimate or any other aspect of this collection of infomation, including suggestions for reducing this burden, were received in response to the notice of proposed rulemaking.

LIST OF SUBJECTS IN 37 CFR PART 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements, Small business.

For the reasons set out in the preamble, 37 CFR Part 1 is being amended as follows:

PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C 6 unless otherwise noted.

2. A new Subpart G - Biotechnology Invention Disclosures, consisting of center heading - Deposit of Biological Materials - and new §§ 1.801 to 1.809 are added to read as follows:

Subpart G - Biotechnology Invention Disclosures

Deposit of Biological Material

Sec.
1.801 Biological material.
1.802 Need or Opportunity to make a deposit.
1.803 Acceptable depository.
1.804 Time of making an original deposit.
1.805 Replacement or supplement of deposit.
1.806 Term of deposit.
1.807 Viability of deposit.
1.808 Furnishing of samples.
1.809 Examination procedures.

Subpart G - Biotechnology Invention Disclosures
Authority: 35 U.S.C. 6

Deposit of Biological Material

§ 1.801 Biological material.

For the purposes of these regulations pertaining to the deposit of biological material for purposes of patents for inventions under 35 U.S.C. 101, the term biological material shall include material that is capable of self-replication either directly or indirectly. Representative examples include bacteria, fungi including yeast, algae, protozoa, eukaryotic cells, cell lines, hybridomas, plasmids, viruses, plant tissue cells, lichens and seeds. Viruses, vectors, cell organelles and other non-living material existing in and reproducible from a living cell may be deposited by deposit of the host cell capable of reproducing the non-living material.

§ 1.802 Need or Opportunity to make a deposit.

(a) Where an invention is, or relies on, a biological material, the disclosure may include reference to a deposit of such biological material.

(b) Biological material need not be deposited unless access to such material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. If a deposit is necessary, it shall be acceptable if made in accordance with these regulations. Biological material need not be deposited, inter alia, if it is known and readily available to the public or can be made or isolated without undue experimentation. Once deposited in a depository complying with these regulations, a biological material will be considered to be readily available even though some requirement of law or regulation of the United States or of the country in which the depository institution is located permits access to the material only under conditions imposed for safety, public health or similar reasons.

(c) The reference to a biological material in a specification disclosure or the actual deposit of such material by an applicant or patent owner does not create any presumption that such material is necessary to satisfy 35 U.S.C. 112 or that deposit in accordance with these regulations is or was required.

§ 1.803 Acceptable depository.

(a) A deposit shall be recognized for the purposes of these regulations if made in

(1) any International Depositary Authority (IDA) as established under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, or

(2) any other depository recognized to be suitable by the Office. Suitability will be determined by the Commissioner on the basis of the administrative and technical competence, and agreement of the depository to comply with the terms and conditions applicable to deposits for patent purposes. The Commissioner may seek the advice of impartial consultants on the suitability of a depository. The depository must:

(i) Have a continuous existence;

(ii) Exist independent of the control of the depositor;

(iii) Possess the staff and facilities sufficient to examine the viability of a deposit and store the deposit in a manner which ensures that it is kept viable and uncontaminated;

(iv) Provide for sufficient safety measures to minimize the risk of losing biological material deposited with it

(v) Be impartial and objective;

(vi) Furnish samples of the deposited material in an expeditious and proper manner; and

(vii) Promptly notify depositors of its inability to furnish samples, and the reasons why.

(b) A depository seeking status under paragraph (a)(2) of this section must direct a communication to the Commissioner which shall:

(1) Indicate the name and address of the depository to which the communication relates;

(2) Contain detailed information as to the capacity of the depository to comply with the requirements of paragraph (a)(2) of this section, including information on its legal status, scientific standing, staff and facilities;

(3) Indicate that the depository intends to be available, for the purposes of deposit, to any depositor under these same conditions;

(4) Where the depository intends to accept for deposit only certain kinds of biological material, specify such kinds;

(5) Indicate the amount of any fees that the depository will, upon acquiring the status of suitable depository under paragraph (a)(2) of this section, charge for storage, viability statements and furnishings of samples of the deposit.

(c) A depository having status under paragraph (a)(2) of this section limited to certain kinds of biological material may extend such status to additional kinds of biological material by directing a communication to the Commissioner in accordance with paragraph (b) of this section. If a previous communication under paragraph (b) of this section is of record, items in common with the previous communication may be incorporated by reference.

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(d) Once a depository is recognized to be suitable by the Commissioner or has defaulted or discontinued its performance under this section, notice thereof will be published in the *Official Gazette* of the Patent and Trademark Office.

§ 1.804 Time of making an original deposit.

(a) Whenever a biological material is specifically identified in an application for patent as filed, an original deposit thereof may be made at any time before filing the application for patent or, subject to § 1.809, during pendency of the application for patent.

(b) When the original deposit is made after the effective filing date of an application for patent, the applicant shall promptly submit a verified statement from a person in a position to corroborate the fact, and shall state, that the biological material which is deposited is a biological material specifically identified in the application as filed, except if the person is an attorney or agent registered to practice before the Office, in which case the statement need not be verified.

§ 1.805 Replacement or supplement of deposit.

(a) A depositor, after receiving notice during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, shall notify the Office in writing, in each application for patent or patent affected. In such a case, or where the Office otherwise learns, during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, the need for making a replacement or supplemental deposit will be governed by the same considerations governing the need for making an original deposit under the provisions set forth in § 1.802(b). A replacement or supplemental deposit made during the pendency of an application for patent shall not be accepted unless it meets the requirements for making an original deposit under these regulations, including the requirement set forth under § 1.804(b). A replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be accepted unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section.

(b) A request for certificate of correction under this section shall not be granted unless the certificate identifies:

(1) The accession numter for the replacement or supplemental deposit;

(2) The date of the deposit; and

(3) The name and address of the depository.

(c) A request for a certificate of correction under this section shall not be granted unless the request is made promptly after the replacement or supplemental deposit has been made and:

(1) Includes a verified statement of the reason for making the replacement or supplemental deposit;

(2) Includes a verified statement from a person in a position to corroborate the fact, and shall state, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited;

(3) Includes a verified showing that the patent owner acted diligently—

(i) In the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or

(ii) In the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification;

(4) Includes a verified statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and

(5) Otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified.

(d) A depositor's failure to replace a deposit, or in the case of a patent, to diligently replace a deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after being notified that the depository possessing the deposit cannot furnish samples thereof, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

(e) In the event a deposit is replaced according to these regulations, the Office will apply a rebuttable presumption of identity between the original and the replacement deposit where a patent making reference to the deposit is relied upon during any Office proceeding.

(f) A replacement or supplemental deposit made during the pendency of an application for patent may be made for any reason.

(g) In no case is a replacement or supplemental deposit of a biological material necessary where the biological material, in accordance with § 1.802(b), need not be deposited.

(h) No replacement deposit of a biological material is necessary where a depository can furnish samples thereof but the depository for national security, health or environmental safety reasons is unable to provide samples to requesters outside of the jurisdiction where the depository is located.

(i) The Office will not recognize in any Office proceeding a replacement deposit of a biological material made by a patent owner where the depository could furnish samples of the deposit being replaced.

§ 1.806 Term of deposit.

A deposit made before or during pendency of an application for patent shall be made for a term of at least thirty (30) years and at least five (5) years after the most recent request for the furnishing of a sample of the deposit was received by the depository. In any case, samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made.

§ 1.807 Viability of deposit.

(a) A deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. Viability may be tested by the depository. The test must conclude only that the deposited material is capable of reproduction. No evidence is necessarily required regarding the ability of the deposited material to perform any function described in the patent application.

(b) A viability statement for each deposit of a biological material defined in paragraph (a) of this section not made under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure must be filed in the application and must contain:

(1) The name and address of the depository;

(2) The name and address of the depositor;

(3) The date of deposit;

(4) The identity of the deposit and the accession number given by the depository;

(5) The date of the viability test;

(6) The procedures used to obtain a sample if the test is not done by the depository; and

(7) A statement that the deposit is capable of reproduction.

(c) If a viability test indicates that the deposit is not viable upon receipt, or the examiner cannot, for scientific or other valid reasons, accept the statement of viability received from the applicant, the examiner shall proceed as if no deposit has been made. The examiner will accept the conclusion set forth in a viability statement issued by a depository recognized under § 1.803(a).

§ 1.808 Furnishing of samples.

(a) A deposit must be made under conditions that assure that:

(1) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and

(2) Subject to paragraph (b) of this section, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent.

(b) The depositor may contract with the depository to require that samples of a deposited biological material shall be furnished only if a request for a sample, during the term of the patent:

(1) Is in writing or other tangible form and dated;

(2) Contains the name and address of the requesting party and the accession number of the deposit; and

(3) Is communicated in writing by the depository to the depositor along with the date on which the sample was furnished and the name and address of the party to whom the sample was furnished.

(c) Upon request made to the Office, the Office will certify whether a deposit has been stated to have been made under conditions which make it available to the public as of the issue date of the patent grant provided the request contains:

(1) The name and address of the depository;

(2) The accession number given to the deposit;

(3) The patent number and issue date of the patent referring to the deposit; and

(4) The name and address of the requesting party.

§ 1.809 Examination procedures.

(a) The examiner shall determine pursuant to § 1.104 in each application for patent, application for reissue patent or reexamination proceeding if a deposit is needed, and if needed, if a deposit actually made is acceptable for patent purposes. If a deposit is needed and has not been made or replaced or supplemented in accordance with these regulations, the examiner, where appropriate, shall reject the affected claims under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed and/or why a deposit actually made cannot be accepted.

(b) The applicant for patent or patent owner shall respond to a rejection under paragraph (a) of this section by

(1) In the case of an applicant for patent, making an acceptable original or replacement or supplemental deposit or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee, or, in the case of a patent owner, requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805, or

(2) Arguing why a deposit is not needed under the circumstances of the application or patent considered and/or why a deposit actually made should be accepted. Other replies to the examiner's action shall be considered non-responsive. The rejection will be repeated until either paragraph (b)(1) of this section is satisfied or the examiner is convinced that a deposit is not needed.

(c) If an application for patent is otherwise in condition for allowance except for a needed deposit and the Office has received a written assurance that an acceptable deposit will be made on or before payment of the issue fee, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the needed deposit be made within three months. The period for satisfying this requirement is extendable under § 1.136. Failure to make the needed deposit in accordance with this requirement will result in abandonment of the application for failure to prosecute.

(d) For each deposit made pursuant to these regulations, the specification shall contain:

(1) The accession number for the deposit;

(2) The date of the deposit;

(3) A description of the deposited biological material sufficient to specifically identify it and to permit examination; and

(4) The name and address of the depository.

Dated: July 21, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1106 OG 37]

(141) **Plant Life—Patentable Subject Matter**

The decision by the Board of Patent Appeals and Interferences in Ex Parte Hibberd (Sept. 18, 1985) held that the Plant Patent Act (35 USC 161-164) and the Plant Variety Protection Act (7 USC 2321 et seq.) do not represent the exclusive forms of protection for plant life covered by these acts, and that there is no irreconcilable conflict between these plant-specific statutes and 35 USC 101. It is clear from the Board decision that plant life is not excluded from patent protection under 35 USC 101.

Accordingly, the Patent and Trademark Office is now examining applications including claims to plant life —e.g., plants per se, seeds, plant parts. To the extent that the claimed subject matter is directed to a "nonnaturally occurring manufacture or composition of matter — a product of human ingenuity" (*Diamond* v. *Chakrabarty*, 447 U.S. 303 (1980)), such claims will not be rejected under 35 USC 101 as being directed to unpatentable subject matter.

Oct. 8, 1985.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks—Designate.

[1060 OG 4]

(142) **Petitioning to Make Applications Relating to Biotechnology Special**

This notice is intended to highlight the procedures which are available to applicants and, in particular, to applicants seeking patents on inventions relating to biotechnology, so as to have their applications accorded "special" status. A new interim procedure is also hereby established. Applications which have been made special will be advanced out of turn for examination and, subject alone to diligent prosecution by the applicant, will continue to be treated as special throughout the entire course of prosecution in the Patent and Trademark Office.

The Office accords special status to patent applications by granting petitions to make special on a number of grounds. These grounds include, for example, prospective manufacture of the invention, actual infringement of the invention, that the invention will materially enhance the quality of the environment and for inventions relating to safety of research in the field of recombinant DNA. See 37 CFR 1.102 and Manual of Patent Examining Procedure (MPEP) section 708.02 for details. Applicants seeking patents on inventions relating to biotechnology may petition based on any of the above grounds if they meet the appropriate criteria.

A new application (one which has not received any examination by the examiner) may be granted special status under the accelerated examination program. As set forth in MPEP 708.02, applicants are not subject to any of the above-mentioned criteria under this program but merely must 1) submit a written petition and the fee set forth in 37 CFR 1.17(i) which presently is $72.00; 2) present all claims directed to a single invention; 3) submit a statement that a pre-examination search was made, specifying by whom the search was made and listing the field of search; 4) submit one copy of each of the references deemed most closely related to the subject matter encompassed by the claims; and 5) submit a detailed discussion of the references pointing out how the claimed subject matter is distinguishable over the references. In those instances where the petition for this special status does not meet all the prerequisites set forth above, applicant will be notified of the defects and will be given an opportunity to perfect the petition.

In addition to the above-noted procedures to have biotechnology applications accorded special status, a new interim procedure is hereby established whereby applicants who are small entities may request that their biotechnology applications be granted special status. To take advantage of this interim special status for biotechnology inventions, an applicant must file a petition with the petition fee under 37 CFR 1.17(i) requesting the special status and must (1) state that small entity status has been established or include a verified statement establishing small entity status; (2) state that the subject of the patent application is a major asset of the small entity; and (3) state that the development of the technology will be significantly impaired if examination of the patent application is delayed

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including an explanation of the basis for making the statement. This newly established interim procedure will remain in effect until further notice in the *Official Gazette*. It is intended that a notice discontinuing this procedure will be published as the average pendency approaches the 18 month goal in this area. If the number of requests for making applications special under this procedure is too great, the procedure may have to be limited or discontinued.

The Office is continuing to work to reduce the pendency time for all applications. Special efforts are being made to reduce the pendency of biotechnology applications where filings are increasing rapidly and an already large backlog exists. Meanwhile, applicants who so desire can petition to have their applications made special as noted above. Questions concerning petitions to make special should be directed as follows:

1) to the Office of the Assistant Commissioner for Patents for petitions based on the grounds of prospective manufacture or infringement;
2) to the Board of Patent Appeals and Interferences for petitions on applications within the jurisdiction of the Board; or
3) to the appropriate Examining Group for petitions to make special on all other grounds.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

June 22, 1988

[1092 OG 55]

(143) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 21001-201]

File Wrapper Continuing Application Procedure

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases to provide a new procedure for filing continuation, continuation-in-part, and divisional patent applications. This procedure is being provided to simplify filing and processing of continuation, continuation-in-part and divisional patent applications which have heretofore required a new set of application papers. By using the application which is to be abandoned, the procedure will eliminate many of the problems currently involved in preparing and processsing such continuing patent application papers.
Effective Date: Feb. 27, 1983.
For Further Information Contact: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The Patent and Trademark Office is amending the rules of practice for patent cases to permit an applicant to file a continuation or division of a pending patent application by simply filing a request therefor and paying the necessary application filing fee. To file a continuation-in-part application, an amendment adding the additional subject matter and an oath or declaration relating thereto is also required.

The "file wrapper continuing" (FWC) procedure is incorporated in the rules by adding a new §1.62. Under this simplified procedure, any continuing application such as a continuation, continuation-in-part, or divisional application may be filed by using the papers in the copending prior application, which application will become automatically expressly abandoned. Under the FWC procedure, a new serial number is assigned and the specification, drawings and other papers in the parent application file wrapper are used as the papers in the continuing application. Changes in inventorship may be made. The "file wrapper continuing" (FWC) procedure is available for utility, design, plant, and reissue applications to the full extent that continuing applications can now be filed in such applications. Use of the FWC procedure will automatically result in express abandonment of the prior application as of the date that the continuation, continuation-in-part, or divisional application is filed.

The FWC procedure could be used for any continuation, continuation-in-part or divisional application provided the applicant wishes the copending prior application to become abandoned. If a divisional application is desired without abandonment of the parent application, the procedure under §1.60 should be used. Applicant also has the option of filing new application papers with a reexecuted oath or declaration.

Background

The notice of proposed rulemaking was published in the Federal Register on Nov. 7, 1980 at 45 FR 73965 and in the Official Gazette on Dec. 9, 1980 at 1003 O.G. 9. An oral hearing was held on Feb. 4, 1981.

Discusslon of Major Issue Involved

A continuation or divisional application is an application in which the disclosure is identical to an earlier application. However, the claims may be changed. Continuation applications are often filed in situations where the applicant feels that the issue of patentability has not been satisfactorily resolved before the examiner and the application is not in condition for an appeal from the final rejection to the Board of Appeals. Divisional applications are filed voluntarily or as a result of a requirement for restriction by the examiner in a prior application. Continuation-in-part applications are filed where additional subject matter is added and claimed in the application. Under 35 U.S.C. 120 of the patent law, a continuation, continuation-in-part or divisional application may be filed during the pendency of the prior application and the benefit of the filing date of the prior application for the subject matter disclosed therein may be obtained.

The practice under § 1.60 has resulted in a number of problems, especially difficulties in obtaining good-quality copies of prior applications. In addition, the practice involves unnecessary handling and processing delays.

Under new § 1.62, the specification, claims and drawings, and any amendments in the prior application are made available for use in the continuation, continuation-in-part, or divisional application. A new filing fee is required in accordance with 35 U.S.C. 41 and 37 CFR 1.16. The only other statutory requirement under 35 U.S.C. 111 is a signed oath or declaration. Since a continuation or divisional application cannot contain new matter, the oath or declaration filed in the prior application would supply all the information required under the statute and rules to have a complete application and to obtain a filing date. Accordingly, the previously-filed oath or declaration will be considered to be the oath or declaration of the § 1.62 continuation or division. However, if a continuation-in-part application is being filed, or a correction of inventorship is being made, then a new oath or declaration must be signed and filed by the applicant.

The original disclosure of an application filed under § 1.62 will be the original parent application as executed by the inventor(s). However, the filing fee will be based on the claims in the § 1.62 application after entry of any unentered amendments under § 1.116 in the prior application and any preliminary amendment which may accompany the FWC request and filing fee. The Certificate of Mailing Procedure under 37 CFR 1.8 will not apply to filing a request for a "File Wrapper Continuing" application since the filing of such a request is considered to be a filing of application papers for the purpose of obtaining an application filing date (37 CFR 1.8(a)(i)).

The applicant may file a signed FWC request and the regular filing fee under § 1.16 and other necessary papers with the Patent and Trademark Office, either by mail addressed to "Box FWC" or in person with the mail room. An individual check or deposit account authorization should accompany each FWC application, since combined checks delay processing.

The Correspondence and Mail Division will sort out all "Box FWC" envelopes upon receipt and deliver them to a reader for prompt special handling. The reader would apply the "Mail Room" date stamp and mark the categories of the fees. The papers for each FWC application would be assigned a regular national serial number and be placed in a "Jumbo" size file wrapper. The Special Handling Branch will review the FWC request for accuracy and completeness and assign the filing date if everything appears to be in order. Problems will be handled, insofar as possible, by calling the applicant or attorney by telephone. There will be no need for any processing of the FWC application by the Classification or Examination Branches of Application Division since there are no papers to be examined and the FWC application will be routed to the group assigned the prior application. When the FWC application file wrapper is received in the examining group, the parent application will be promptly obtained and processed by a clerical staff member. All of the correspondence from the Office in a FWC application will refer to the FWC application serial number and filing date and will be processed in the same manner as any other continuation, continuation-in-part or divisional application. The first action final rejection procedures set forth in § 706.07(b) of the Manual of Patent Examining Procedure will also apply to FWC applications filed under § 1.62.

The PALM III system will supply information to authorized persons as to the location of the parent application file wrapper and will tie the parent application number to the FWC application number.

The provisions of § 1.62 provide that if any application in the file wrapper is available to the public that all applications in the file wrapper will be available to the public.

Some of the anticipated benefits of the new § 1.62 procedure are the following:

For the Applicant

1. Formal requirements will be minimal.
2. A more prompt first action in the continuing application should be received in view of reduced processing time. The Application Division can process promptly all § 1.62 applications with minimal effort. In the examining groups, the applications will be given high priority for processing purposes.
3. Amendments made to the specification, drawings and claims of the prior application will carry over into the § 1.62 continuing application and will not need to be resubmitted in the continuing application.

For the Public

1. The pendency of a series of applications should be reduced since the time delay before examination and issuance of a continuing application filed under the § 1.62 procedure would be reduced.
2. The entire record of prosecution could be in one file wrapper under the § 1.62 procedure, even if several continuing applications are filed. This will result in easier access by the public to a series of applications if a patent is later issued.

For the Patent and Trademark Office

1. The workload of reviewing and processing new application papers in the Application Division will be reduced.
2. The examining group clerks will not be required to again enter amendments made in the prior application.
3. Less storage space will be required under § 1.62 since there will be fewer papers to store.
4. The prior application file history and references cited therein will be readily available to the examiner under § 1.62 and will not need to be ordered from abandoned files.
5. The Office will not be required to prepare a copy of the prior application file under the § 1.62 procedure.

Discussion of Comments Received

After careful consideration of the comments which have been received, the proposed rulemaking relating to file wrapper continuing application procedure is being adopted with certain changes. A total of 23 comment letters were received. Six of these letters were received from patent law organizations. Two persons presented oral comments at the hearing. The comments of 6 letters supported the proposed rulemaking without further suggestions for change. Only one letter opposed the proposal.

Seven of the letters urged adoption of a procedure whereby an applicant could pay a fee to have a final rejection withdrawn so that prosecution could be extended in an application rather than filing a continuing application. This suggestion was not adopted for several reasons. Such a procedure could not be used for filing of continuation-in-part applications, the average pendency of applications in the Office would be extended, and significant problems in internal record systems would be created.

A number of comments were received which presented specific suggestions to proposed § 1.62. Four letters commented that the requirement of proposed § 1.62(a)4 to supply information as to title, applicant, correspondence address, etc. in order to file under § 1.62 could easily lead to filing errors.

In final § 1.62(a)(3) only the serial number, filing date and applicant's name of the prior application are required. The filing of information relating to the title, applicant's name, etc. is however urged in paragraph (e) of final § 1.62 and is needed to prepare Office records and the filing receipt.

One comment letter was received which indicated that a specific reference should be made to unentered amendments filed under 37 CFR 1.116. Such a reference has been added to paragraph (a)(2) of § 1.62.

Two letters objected to the requirement in proposed § 1.62(a)(2) that a new set of claims be presented. This requirement has been deleted from final § 1.62.

A number of general comments were also presented relating to §1.62. One comment argued that the proposed practice would encourage abuse by examiners of the second action final rejection practice. In response to this argument, it is felt that the proposed procedure would not create any new problems.

One comment indicated that problems involving access to the file wrapper may arise. It is felt, however, that access problems should not arise in view of paragraph (c) of final § 1.62 which relates to waiver of secrecy. The current PALM III computer record system is capable of indicating the location of both the prior and continuing applications.

One comment was received relating to proposed § 1.138 which indicated that the reference to § 1.60 was confusing. The reference to § 1.60 has been deleted in final § 1.138.

New § 1.62 sets forth the requirements of the file wrapper continuing procedure.

Section § 1.138 is amended so that a registered attorney or agent could, without being of record, file a § 1.62 application and expressly abandon a pending prior application. Such an action would not affect applicant's rights to any great extent since the prior application would only be expressly abandoned if a filing date was granted to a continuing application.

Other Considerations

Environmental, Energy, and Other Considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980(44 U.S.C. 3501 et seq.).

The rule change will not have a significant adverse economic impact on a substantial number of small entities because it adds no burdens and does simplify filing procedures (Regulatory Flexibility Act, Pub. L. 96-354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to preparing application papers and amendments, will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Lawyers.

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(Text of adopted rules appears in 37 CFR, revised July 1, 1983.)

GERALD J. MOSSINGHOFF,
Sept. 30, 1982. *Commissioner of Patents and Trademarks.*

[FR Doc. 82-29283 Filed 10-23-82; 8:45 am]
BILLING CODE 3510-16-M

[1024 O.G. 59]

(144) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1

Reissue, Reexamination, Protest and Examination Procedures in Patent Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases (1) to eliminate consideration of the so-called "no defect" reissue applications, (2) to limit the participation by protestors during the examination of patent applications, (3) to reject and permit appeal to the Board of Appeals for failure to comply with the duty of disclosure rather than striking applications without appeal rights, and (4) to clarify the interface between patent application examination and patent reexamination in certain areas. These changes are intended to (1) reduce the prosecution costs of patent applicants, and (2) permit some of the Patent and Trademark Office resources now devoted to consideration of the so-called "no defect" reissue applications, and to extensive participation by protestors during application examination, to be directed toward reduction of the backlog of pending patent applications. The changes are also intended to provide for review by the Board of Appeals of duty of disclosure issues which arise during patent application examination. The rule changes are further intended to clarify the interface between the duty of disclosure during patent application examination and the duty of disclosure during patent reexamination, as well as the treatment of concurrent reissue and reexamination proceedings on the same patent.
Effective Date: July 1, 1982.
For Further Information Contact: Mr. R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks. Washington, D.C. 20231.

Supplementary Information:

Background

A notice of proposed rulemaking was published in the Federal Register on Nov. 10, 1981, at 46 FR 55666-55672 and in the Official Gazette on Dec. 8, 1981, at 1013 O.G. 19-25. An oral hearing was held on Feb. 4, 1982. Forty-two written letters and statements were submitted. Fourteen persons testified at the oral hearing which resulted in 113 pages of testimony. Consideration was also given to the comments presented at the oral hearing on Apr. 16, 1981, relating to the proposed rules for implementing patent reexamination.

Objectives of Rule Change

The rule change is designed to adopt and implement suggestions from members of the public for changes in patent examination practice considered desirable in light of the implementation of statutory patent reexamination, contained in Public Law 96-517. Many of the persons who commented in writing and at the hearing held on Apr. 16, 1981, on the proposed rules for implementing patent reexamination favored modification of patent examination rules as amended herein. This rule change is designed to implement the suggestions received and, in particular, to reduce the prosecution costs of patent applicants by limiting the amount of participation by protestors during the patent application examination process.

The rule change also seeks to reduce the amount of time required by the Patent and Trademark Office to examine protested applications by limiting protestor participation. The technical expertise of the Patent and Trademark Office will continue to be available to make determinations of patentability on the basis of prior art and related facts on an ex parte basis. However, the patent examiners in the Office are not trained as hearing examiners and have no substantial experience in handling inter partes matters. Under the rule change, protestor participation will be limited to the filing of papers in opposition to the grant of a patent with no Office communications to the protestor resulting therefrom beyond an acknowledgment of receipt of a protest or petition to strike in reissue applications. The opportunity to comment on Office actions and applicants' responses is eliminated. The rule change also intends to accomplish these purposes by eliminating the consideration of reissue applications not initially presented to correct defects pursuant to 35 U.S.C. 251.

The rule change is also designed to provide for review by the Board of Appeals of duty of disclosure issues which arise during patent application examination. This is accomplished by amending § 1.56(d) to provide that the claims in an application be rejected if upon examination pursuant to 35 U.S.C. 131 and 132 it is found that applicant is not "entitled to a patent under the law" because of fraud or a violation of the duty of disclosure. The rejection would be made under the same conditions and circumstances previously used to strike an application, i.e., "clear and convincing evidence" of fraud or any violation of the duty of disclosure through bad faith or gross negligence. The statute, 35 U.S.C. 131, provides for examination of an application "and if on such examination it appears that the applicant is entitled to a patent under the law, the Commissioner shall issue a patent * * *" Section 132 of Title 35, United States Code, makes provision for the rejection of a claim for a patent as a result of the examination directed by 35 U.S.C. 131. While questions of fraud and violations of the duty of disclosure have historically been dealt with by the Commissioner through the mechanism of striking the affected application, there is no statutory requirement that the Commissioner act in that manner. Clearly the Commissioner can choose how, and by whom, the examination directed by 35 U.S.C. 131 can be made. 35 U.S.C. 132 authorizes a rejection in those circumstances where applicant is not "entitled to a patent under the law." The rule change simply modifies the mechanism and procedures which the Commissioner will use where the applicant is not "entitled to a patent under the law" because of failures to comply with § 1.56(d).

The rule change is also designed to clarify the interface between patent application examination and patent reexamination in certain areas. The two areas involved are duty of disclosure and concurrent proceedings involving a patent under reexamination and for which a reissue application has been filed.

Sections 1.56, 1.106, 1.175, 1.193, 1.291, 1.555, 1.565, and 1.570 are amended to accomplish the purpose indicated above.

Discussion of Specific Rules

Access and Publication of Reissue Applications

The changes proposed in § 1.11 are not being adopted since only one of the twenty-two comments favored the changes.

The publication of notices of the filing of reissues and provisions for public access to reissues will therefore continue as at present. Such publication eliminates the need for interested members of the public to periodically monitor the patent files to determine if a reissue application has been filed.

Amendments to § 1.56

A large majority of the comments supported the amendments to § 1.56. A number of comments questioned the advisability of having relatively inexperienced or non-attorney examiners handle questions of fraud or violation of the duty of disclosure. In response thereto, the amendments to the rule do not require that such questions be handled by the examiner who examines the application for questions of obviousness, enablement, etc. The Office presently plans to have questions of possible fraud or violation of the duty of disclosure examined by examiners with legal training assigned to the Office of the Assistant Commissioner for Patents. Several comments suggested that the provisions for striking an application pursuant to existing paragraph (c) of § 1.56 are inconsistent with the rejection for fraud or violation of the duty of disclosure contemplated in the amendment to paragraph (d). In response thereto, it is pointed out that paragraph (c) of § 1.56 makes striking of the application discretionary with the Commissioner. It is thus more appropriate to retain this authority to strike the application in appropriate circumstances rather than to make it subject to a rejection. No inconsistency is seen between the different routes under paragraphs (c) and (d) of [g49 1.56. Several comments were received indicating concern about the possible delay of a decision by the Board of Appeals pending consideration of a fraud or duty of disclosure question. In response to these concerns, it is pointed out that less time overall will be required by having the Board of Appeals consider the matter once rather than in a series of separate decisions. Further, expense to the applicant will be minimized by one appeal rather than two. The amendments to § 1.56 are adopted as proposed except for some clarifying changes in paragraph (g).

Section 1.56 is amended by revising the title and paragraph (d), and by adding new paragraphs (e) through (i). The revision to the title and paragraph (d) provides for the rejection of claims upon examination pursuant to 35 U.S.C. 131 and 132 on the ground that applicant is not entitled to a patent under the law if it is established by clear and convincing evidence (1) that any fraud was practiced or attempted on the Office in connection with the application, or in connection with any previous application upon which the application relies, or (2) that there was any violation of the duty of disclosure through bad faith or gross negligence in connection with the application, or in connection with any previous application upon which the application relies. Under amended paragraph (d), any rejection which would be made would include all the claims in the application.

The standards to be used in rejecting the claims under paragraph (d) as amended, would be the same as those utilized by the Commissioner in striking applications pursuant to present paragraph (d), i.e., clear and convincing evidence of fraud or any violation of the duty of disclosure through bad faith or gross negligence. Consistent with present practice, the revision of paragraph (d) looks to fraud or a violation of the duty of disclosure through bad faith or gross negligence with relation to the application under consideration or any previous application upon which the application relies.

The phrase "in connection with the application" is construed in the same manner as in the present unamended paragraph (d). For purposes of this section, a reexamination proceeding on a patent would be considered as being "in connection with the application" insofar as consideration of any subsequent reissue application is concerned. The phrase also includes within its scope the mere refiling of the subject matter of an application in another application without relying in the second application upon the first application. Thus, an appropriate rejection upon examination pursuant to 35 U.S.C. 131 and 132 based on conduct or actions proscribed by § 1.56(d) could not be avoided merely by refiling the subject matter of the application in a second or subsequent application which did not rely upon the earlier application. The phrase "in connection with any previous application upon which the application relies" is intended to include all applications upon which the application under consideration relies, either directly or indirectly. For example, an application to reissue a patent obviously relies upon the application which resulted in the patent sought to be reissued. Likewise, continuation applications, continuation-in-part applications, and divisional applications also rely upon one or more parent applications.

New paragraph (e) of § 1.56 normally delays the examination of an application for compliance with paragraph (d) of § 1.56 until such time as (1) all other matters are resolved, or (2) appellant's reply brief pursuant to § 1.193(b) has been received and the application is otherwise ready for consideration by the Board of Appeals, at which time the appeal will be suspended for examination pursuant to paragraph (d) of this section. Present plans are to have this examination on the question of fraud or violation of the duty of disclosure conducted by examiners with legal training assigned to the Office of the Assistant Commissioner for Patents. Paragraph (e), as added, would thus permit the resolution of issues arising under § 1.56(d) to be delayed until consideration of such issues is necessary and appropriate. The practice under new paragraph (e) is generally consistent with present practice under paragraph (d) which normally delays the substantive resolution of fraud and duty of disclosure issues until other issues have been resolved in favor of applicant. Under new paragraph (e) an appeal would be suspended for examination pursuant to amended paragraph (d) of § 1.56 once appellant's reply brief pursuant to § 1.193(b) has been received and the application is otherwise ready for consideration by the Board of Appeals. If no questions of possible violation of § 1.56 are raised or evident on the record before the examiner, no examination for compliance with paragraph (d) of § 1.56 will be undertaken. New paragraph (e) provides for the reopening of prosecution of the application to the extent necessary to conduct the examination pursuant to amended paragraph (d) of § 1.56 including any appeal pursuant to § 1.191. New paragraph (e) also indicates that where an appeal has already been filed based on a rejection on other grounds, any further rejection under amended paragraph (d) will be treated in accordance with amended § 1.193(c).

New paragraph (f) continues the present long standing practice whereby any member of the public can file a petition to strike an application from the files pursuant to paragraph (c) of § 1.56. Such petitions are currently being filed without specific mention in § 1.56. Under revised § 1.56 petitions to strike an application for a violation of § 1.56 are limited to violations of paragraph (c), with any violations of paragraph (d) being subject matter for rejection under paragraph (d). New paragraph (f) requires that any such petition alleging a violation of paragraph (c) which is entered in the application file must: (1) Be timely filed, (2) specifically identify the application to which the petition is directed, and (3) be served on the applicant or be filed with the Office in duplicate in the event service is not possible. New paragraph (f) does not specifically limit a "timely petition" to any particular point in the examination of the application. Such petitions will generally be considered "timely" if they are filed before final rejection or allowance of the application by the examiner. Whether or not a petition filed after final rejection or allowance of the application by the examiner is considered "timely" will depend upon the circumstances and the point in the prosecution at which the petition is submitted.

New paragraph (f) requires that the petition specifically identify the application to which the petition is directed. While an identification by application serial number is not essential, the identification must include enough specificity that the Office can determine with certainty the application to which the petition is directed. Paragraph (f) requires service of the petition on the applicant, or a duplicate copy in the event service is not possible, before the petition will be entered. While the Office might, in some circumstances, reproduce and serve a petition on the applicant, a member of the public would have no assurance that this would be done and, under paragraph (f), could not rely upon the Office doing so. Paragraph (f) also requires that any petition filed by an attorney or agent comply with [g49 1.346.

New paragraph (g) of § 1.56 assures a member of the public that a petition to strike an application for violation of paragraph (c) of § 1.56 which meets the requirements of paragraph (f) will be considered by the Office. Language has been added to conform to additional language in § 1.291(c). The Office will send petitioner an acknowledgment of the entry of a petition to strike in a reissue application file. However, the Office will not communicate with the member of the public filing such a petition in non-reissue applications, except for the return of any self-addressed postcard which was enclosed which merely acknowledges receipt of the petition. The member of the public filing the petition will not be permitted to contact the Office as to the disposition, or status, of the petition, or to participate in any Office proceedings relating to the petition. No further papers will be acknowledged or considered unless they raise new issues which could not have been earlier presented and thereby constitute a new proper petition. Mere arguments relating to the Office's decision on the petition or applicant's response to the petition would not qualify as a new proper petition. The disposition of the petition, once one has been filed, will, under paragraph (g), be an ex parte matter between the Office and the applicant. Paragraph (g) provides for communication by the Office with the applicant regarding a petition to strike the application which has been entered in the application

file. Under new paragraph (g) the applicant could be required by the Office to respond to the petition. Any such response would be ex parte and would not be served on the member of the public filing the petition.

New paragraph (h) of § 1.56 provides that any member of the public may seek to have the claims in an application rejected pursuant to the amended paragraph (d) of § 1.56 by filing a timely protest in accordance with § 1.291. New paragraph (h) also requires that any such protest filed by an attorney or agent seeking a rejection of claims pursuant to amended paragraph (d) of § 1.56 must be in compliance with § 1.346. One comment suggested that the last sentence of paragraph (h) is redundant since § 1.346 applies without any specific mention. After careful consideration of the comment the sentence is being retained in order to emphasize and remind attorneys and agents of the obligations imposed by § 1.346.

New paragraph (i) provides for the Office requiring the applicant to supply information pursuant to paragraph (a) of § 1.56 in order for the Office to decide any issues relating to paragraphs (c) and (d) of § 1.56, whether or not such issues arise as a result of a petition or a protest, or arise from other sources, e.g., an examiner discovering the issue while studying the application file. Any requirements for information under new paragraph (i) will be ex parte in nature between the Office and the applicant. The ex parte nature of the requirements for information under new paragraph (i) differs from past practice under which information was required, or requested, from applicant and one or more petitioners or protestors in some cases.

Rejection of Claims

Five comments were submitted relating to new paragraph (c) of § 1.106. Two of the comments favored the paragraph as written and three recommended modification or clarification of the paragraph to ensure that it is not inconsistent with *In re Ruff, et al.*, 45 CCPA 1037, 118 USPQ 340 (CCPA 1958), and subsequent decisions. No modification or clarification of the paragraph is considered necessary since the intent of the paragraph was not to change current practice, but was merely to emphasize the importance placed on admissions and to make {g49 1.106 more closely reflect current practice, which includes practice following *In re Ruff, et al.*, and subsequent decisions. The amendments to § 1.106 are adopted as proposed.

Section 1.106 is amended to include a new paragraph (c) which emphasizes the importance placed on admissions by the applicant or the patent owner in a reexamination proceeding insofar as matters affecting patentability are concerned. Paragraph (c) includes a reference to the use of rejections based upon facts within the knowledge of the examiner as provided in § 1.107. Paragraph (c) does not constitute a change in practice, but does result in § 1.106 more closely reflecting current practice.

Reissue Oath or Declaration

Ten persons commented on § 1.175. Four comments were received in support of the proposed change. Three of these favorable comments were from patent law groups. Of the six comments received opposing the change, two were from patent law groups. Eleven comments received at the Apr. 16, 1981, hearing on reexamination argued for retraction of the "Dann Amendments" which included § 1.175(a)(4). Four comments at the Apr. 16, 1981, hearing favored retaining the "Dann Amendments". The arguments supporting the change were generally that paragraph (a)(4) was not necessary in view of the new reexamination procedure. The arguments opposing the deletion were generally that an inter partes practice before the Office is desirable from the standpoint of the judiciary and for a complete resolution of issues. After careful consideration of all of the arguments and the resources available in the Patent and Trademark Office, it is felt that the practice under paragraph (a)(4) of § 1.175 should be discontinued and paragraph (a)(4) should be cancelled.

The numbering of paragraphs (a)(5) and (6) is not being changed. Proposed paragraph 1.175(a)(6) is being adopted as new paragraph 1.175(a)(7). The proposed wording is otherwise being adopted without change.

Amended § 1.175 eliminates paragraph (a)(4). Under paragraph (a)(4), the Office gave advisory opinions on patentability over additional prior art without any changes in the patent claims. The courts have generally refused to give preclusive effect to these advisory opinions. See *PIC, Inc.* v. *Prescon Corp.*, 485 F. Supp. 1302, 205 USPQ 228 (D. Del. 1980), and *Rohm and Haas Co.* v. *Mobil Oil Corp.*, 525 F. Supp. 1298, 212 USPQ 354 (D. Del. 1981). Accordingly, in view of the implementation of patent reexamination pursuant to Pub. L. 96{g14 517 it is appropriate to discontinue the advisory opinions provided pursuant to § 1.175(a)(4). Under amended § 1.175 an applicant for reissue of a patent will be required to file with the reissue application a statement under oath or declaration specifically averring a defect in the patent, e.g., "a defective specification or drawing," or an excess or insufficiency in the claims. Amended {g49 1.175 also requires, in paragraphs (a)(5) and (a)(6), that applicant specify "errors" as opposed to "what might be deemed to be errors." Amended § 1.175 effectively eliminates Office consideration of the merits of "no defect" reissue applications since any such "no defect" reissue applications filed after July 1, 1982, the effective date of the changes to § 1.175, will not be examined as to questions of patentability. In addition, § 1.175(a)(7) has been added to parallel the provisions in § 1.65 requiring the same acknowledgment of the duty of disclosure in the oath or declaration of reissue applications as in the case of non-reissue applications.

Delay in Examination of Reissue Applications

Six comments were received relative to the proposed changes in § 1.176. One comment supported, and five comments opposed, deleting the two month waiting period before action could be taken by an examiner in a reissue application. The opposing comments favored retaining the two month period to provide an opportunity for interested parties to submit information relating to the examination of a reissue application after notice of the filing thereof has been published in the Official Gazette. Since the notices under § 1.11 will continue to be published, no need is seen to change § 1.176. The proposed change is therefore not adopted.

Examiner's Answer

Only one comment was made relating to the proposed addition of paragraph (c) to § 1.193. It suggested including a minimum time period for response in the rule. This suggestion was not adopted because in some circumstances it may be appropriate to set a shorter or a longer period for the reply brief. The amendments to § 1.193 are adopted as proposed.

Paragraph (c) adds to § 1.193 a provision that any decision rejecting claims pursuant to § 1.56(d) in an application already on appeal from a rejection based on other grounds shall constitute a supplemental examiner's answer introducing a new ground of rejection and removing the suspension of the appeal introduced pursuant to § 1.56(e). Prior to entering any such supplemental examiner's answer under paragaph (c), the Office may require information from applicant pursuant to paragraph (i) of § 1.56. Under paragraph (c) of § 1.193, the appellant may file a reply to the supplemental examiner's answer. Paragraph (c) provides that the appellant's reply to the supplemental examiner's answer will be considered and responded to as necessary with appellant being provided with an additional month, or such other time as may be set, within which to reply to any such response from the Office. After introduction of a supplemental examiner's answer pursuant to paragraph (c) and any replies and response thereto, the application will be forwarded to the Board of Appeals for consideration.

Protests by the Public Against Pending Applications

Fifteen persons commented on the proposed amendment of § 1.291. Two persons suggested that protests be acknowledged by more than the return of a self-addressed postcard. The suggestion has been adopted to the extent of providing for an acknowledgment of the entry of a protest in a reissue application file to be sent to the member of the public filing the protest. The suggestion has not been adopted insofar as original applications are concerned since these applications are generally required to be kept in confidence under 35 U.S.C. 122. Further, the use of return postcards is an established method of receiving acknowledgment from the Office that a paper has been filed. By merely returning the postcard to a protestor in an application for an original patent and directing Office initiated communications solely to applicant, the amount of Office resources required will be minimized.

Several persons commented that the protest proceeding should be more inter partes. The weight of the comments received at the hearings held on Apr. 16, 1981, and Feb. 4, 1982, and in writing, favored ex parte proceedings. To ensure that the proceedings are essentially ex parte, a sentence is being added to paragraph (c) of § 1.291, indicating that active participation by a member of public ends with the filing of the protest. To retain the inter partes nature of the protest would be contrary to the majority of the comments received and to one of the major purposes of the rule change, i.e., to reduce the amount of time spent by the Office in examining protested applications. The amendments to paragraphs (a) and (b) of § 1.291 are adopted as proposed and paragraph (c) is being revised as indicated above.

Amended § 1.291 continues to permit protests by the public against pending original and reissue applications. The protest may include any grounds which the member of the public filing the protest believes to be applicable.

Amended paragraph (a) of § 1.291 provides for entry of a protest in the application file if the protest specifically identifies the application, is timely submitted, and is either served upon the applicant in accordance with § 1.248, or filed with the Office in duplicate, in the event service is not possible. The comments made above in the discussion of new paragraph (f) of § 1.56 regarding the timeliness of the filing or submission, specific identi-fication of the application, and service on the applicant, are also applicable to the amendments of paragraph (a) of § 1.291. The requirement that the Office acknowledge the filing of a protest is deleted from paragraph (a), but is covered in paragraph (c).

New paragraph (b) of § 1.291 assures members of the public that a protest will be considered by the Office if (1) it specifically identifies the application to which it is directed; (2) it is timely submitted; (3) it is properly served upon the applicant in accordance with § 1.248, or is filed with the Office the duplicate in the event service is not possible; (4) it includes a listing of the patents, publications or other information relied upon and a concise explanation of the relevance of each listed item; (5) it includes a copy of each listed patent or publication or other item of information in written form, or at least the pertinent portions thereof; and (6) it includes an English language translation of all the necessary and pertinent parts of any non-English language document relied upon. It is considered desirable that § 1.291 advise members of the public as to the contents which should be included in any protest since there will be no Office communications directed to the member of the public submitting the protest under paragraph (c). Thus, under paragraph (c) members of the public will not be given an opportunity to complete any protest which is incomplete. Amended paragraph (c) provides for the acknowledgment of the entry of a protest in a reissue application file.

Amended paragraph (c) of §1.291 provides that a member of the public filing a protest in an application for an original patent will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard acknowledging receipt of the protest. Amended paragraph (c) of § 1.291 does not permit the member of the public filing the protest, or any other member of the public, to contact the Office as to the disposition, or status, of the protest or to participate in any Office proceedings relating to the protest. The disposition of the protest, once it has been filed will, under paragraph (c), be an ex parte matter between the Office and the applicant. However, applications which are open to the public may be inspected pursuant to § 1.11.

Amended paragraph (c) provides for the Office to communicate with the applicant regarding any protest entered in the application file. Under paragraph (c), the applicant could be required by the Office to respond to the protest. Any response would be ex parte and would not be served on the member of the public filing the protest. Paragraph (c) provides for the Office to require applicant to supply information pursuant to pargraph (a) of § 1.56 in order for the Office to decide any issues raised by the protest. Requirements for information under paragraph (c) will be ex parte in nature between the Office and the applicant. The ex parte nature of the requirements for information under paragraph (c) differs from past practice under which information could be required, or requested, from applicant and one or more protestors. Under amended paragraph (c), the active participation of the protestor ends with the filing of the protest and no further submission on behalf of the protestor will be acknowledged or considered unless such submission raises new issues which could not have been earlier presented, and thereby constitutes a new protest. Mere arguments relating to an Office action or an applicant's response would not qualify as a new protest.

Duty of Disclosure in Reexamination Proceedings

Only two comments were received relative to proposed § 1.555. One comment argued that the Office should never ignore a violation of the duty of disclosure or leave it hanging. In response thereto, neither the statute nor the presently existing reexamination rules provide for reexamination on grounds other than those based on patents or printed publications. The second comment questioned whether a patent owner has a duty to cite new prior art after a request but prior to an order to reexamine. No further clarification of the section is necessary since § 1.555(a) specifies when the patent owner should file a prior art statement in a reexamination proceeding. The amendments to § 1.555 are adopted as proposed.

Amended § 1.555 makes the duty of disclosure in reexamination proceedings more consistent with the duty of disclosure in patent applications. Paragraph (a) of § 1.555 specifies that a duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner or involved employees of the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. This rule is consistent with the duty set forth in § 1.56(a) insofar as patent applications are concerned, except that in paragraph (a) of § 1.555 the patent owner is specified rather than the inventor as set forth in paragraph (a) of § 1.56. This does not, however, impose the responsibility for compliance with the duty of disclosure on a corporate entity or organization but leaves the responsibility with involved individuals in the corporation or other organization. Paragraph (a) of § 1.555 places a requirement on the individuals identified to bring to the attention of the Office patents or printed publications material to the reexamination which have not been previously made of record in the patent file and specifies how that should be accomplished.

Amended paragraph (b) of § 1.555 essentially parallels existing paragraph (b) of § 1.56 and makes similar pro-visions applicable to disclosures in reexamination proceedings.

Amended paragraph (c) of § 1.555 provides that the duties of candor, good faith, and disclosure required in paragraph (a) of § 1.555 have not been complied with if any fraud was practiced or attempted on the Office or there was any violation of the duty of disclosure through bad faith or gross negligence by, or on behalf of, the patent owner in the reexamination proceeding. The language of paragraph (c) refers to fraud or violation of the duty of disclosure in the reexamination proceeding since such conduct during the pendency of applications is covered by § 1.56.

Amended paragraph (d) of § 1.555 affirms that the responsibility for compliance with § 1.555 rests upon the individuals identified in paragraph (a). Paragraph (d) also provides that no evaluation will be made in the reexamination proceeding by the Office as to compliance with {g49 1.555. Paragraph (d) of § 1.555 also provides that questions of compliance with § 1.555 which are discovered during a reexamination proceeding will be noted as unresolved questions in accordance with present § 1.552(c). Paragraph (d) will not preclude the patent owner from filing a reissue application to have questions of candor, good faith, and duty of disclosure considered and resolved, including such questions which arise during a reexamination proceeding, so long as the requirements of 35 U.S.C. 251 have been met. Paragraph (d) does not preclude suspension or disbarment proceedings under present § 1.348 based upon conduct during a reexamination proceeding.

Concurrent Office Proceedings

Four comments were received on § 1.565. One comment proposed adding a sentence at the end of paragraph (b) of §

1.565 reflecting that reexamination would only be stayed in extraordinary situations. This suggestion has not been adopted since it is considered inappropriate to attempt to further define by rule the circumstances under which a stay of the reexamination may be appropriate. Two comments were received raising questions as to the treatment, during a merged reissue and reexamination proceeding, of broader claims which are present therein because of a reissue application which contained broadened claims. No clarification or change is necessary since the broadened claims are properly in the merged proceeding during the period it is merged. Such broader claims which are present in both the reissue and reexamination files during the pendency of the merged proceeding will be treated in accordance with the reissue statute and case law during the pendency of the merged proceeding. If the merged proceeding ceases to exist because of the abandonment of the reissue application, the claims in the reexamination file, including any broadened claims, will be examined in accordance with the reexamination statute and rules. Finally, one comment did not agree with merging reissue and reexamination proceedings because the merger is not seen to produce cost savings or other salutary results. One of the reasons for the merged proceedings is to ensure that claims of differing scope and inconsistent responses are not presented at the same time in different proceedings in the same patent. Moreover, since the proceedings are concurrent rather than sequential, a significant savigs in resources and overall pendency time may be realized by merging in many cases.

The amendment to § 1.565 clarifies the proposed language of paragraph (b), eliminates from paragraph (b) the last two sentences relating to the treatment of concurrent reexamination and reissue proceedings, and adds a new paragraph (d) relating to this subject. The clarification in paragraph (b) is intended to avoid misinterpretations relating to stay determinations where concurrent litigation or reissue applications are involved.

Under new paragraph (d), which is consistent with the practice presently in effect under paragraph (b), if a reissue application and a reexamination proceeding on which an order pursuant to present § 1.525 has been mailed are pending concurrently on a patent, a decision will normally be made to merge the two proceedings or to stay one of the proceedings. New paragraph (d) also provides that where merger of a reissue application and a reexamination proceeding is ordered, the merged examination will be conducted in accordance with present §§ 1.171-1.179. The examiner, in examining the merged proceeding, will apply the reissue statute and case law, in addition to applicable provisions of §§ 1.171-1.179, to the merged proceeding. This is appropriate in view of the fact that the statutory provisions for reissue applications and reissue application examination include, *inter alia*, provisions equivalent to 35 U.S.C. 305 relating to the conduct of reexamination proceedings. New paragraph (d) of § 1.565 makes clear that the patent owner must place and maintain the same claims in the reissue application and the reexamination proceeding during the pendency of the merged proceeding. Under new paragraph (d) of § 1.565 the examiner's actions and any responses by the patent owner in a merged proceeding will apply to both the reissue application and the reexamination proceeding and will be physically entered into both files. New paragraph (d) also provides that any reexamination proceeding merged with a reissue application shall be terminated by the grant of the reissued patent. The amendments to § 1.565 are adopted with the changes or clarification indicated in paragraph (b).

Reexamination Certificate

Section 1.570, as amended, revises paragraph (e) to refer to new paragraph (d) of § 1.565 rather than paragraph (b) in order to reflect the changes in § 1.565.

No comments were received concerning the section and it is adopted without change.

Interim Procedures on Applications Pending on Effective Date

On July 1, 1982, the revised procedures of §§ 1.56(d) and 1.193(c) will apply to any applications then pending which have not been the subject of a final Office decision on questions of fraud or violation of the duty of disclosure. Any petition to strike an application from the files or any protest against a pending application filed prior to July 1, 1982, will be governed by the rules in effect prior to that date. Any applications filed under § 1.175(a)(4) prior to July 1, 1982, will be examined until the application is amended and a reissue patent issues thereon or the application becomes abandoned. For a discussion of the interim practice in effect prior to July 1, 1982, see 1013 O.G. 18-19.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291.

List of Subjects In 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Lawyers.

Amendment of Regulations

(Text of adopted rules appear in 37 CFR, revised July 1, 1983.)

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks

Apr. 6, 1982.

[FR Doc. 82-13613 Filed 5-18-82; 8:45 am]
BILLING CODE 3510-16-M

[1019 O.G. 37]

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(145) Interim Reissue, Reexamination, Protest, And Examination Procedures In Patent Cases Pending Proposed Revision of 37 CFR §§ 1.11, 1.56, 1.106, 1.175, 1.176, 1.193, 1.291, 1.555, 1.565, and 1.570.

This notice sets forth, in general, the practice the Office intends to follow pending a final determination on the "Notice of proposed rulemaking" published in the Federal Register on November 10, 1981, at 46 F.R. 55666-55672. The "Notice of proposed rulemaking" is also being published in this issue of the Official Gazette.

Practice Relating To § 1.11

Any reissue application which is presently open to inspection by the general public pursuant to present § 1.11(b), and any reissue application filed before the effective date of a change in the rule, will continue to be open to inspection by the general public. No restriction of access to those reissue applications is contemplated at this time, either during their pendency before the Office, or after an abandonment of the reissue application. The filing of reissue applications will continue to be announced in the Official Gazette pending revision of § 1.11(b).

Practice Relating To § 1.56

Any issues arising under § 1.56(d) prior to the effective date of a change in paragraph (d) will continue to be handled in accordance with paragraph (d) as it presently exists. If paragraph (d) is amended as proposed, the Office presently intends to apply the revised procedures to any applications then pending which have not been the subject of a final Office decision on questions of "fraud" or violation of the duty of disclosure.

Any petitions to strike applications from the files which have been filed prior to the date of publication of this Notice in the Official Gazette will continue to be treated in accordance with the practices in effect prior to this Official Gazette Notice via the appropriate sections of the Manual of Patent Examining Procedure.

Any petition to strike an application from the files which is filed after the date of publication of this Notice will be considered in accordance with the procedure set forth in the "Notice of proposed rulemaking" insofar as participation by the petitioner is concerned. Since the provisions of 37 CFR 1.56 now in effect do not guarantee a member of the public the right to participate fully in Office consideration of petitions to strike applications, it is considered appropriate and proper to restrict participation on behalf of a petitioner as set forth in the "Notice of proposed rulemaking" while such proposed rulemaking is pending. At this time the degree of participation is solely at the discretion of the Commissioner and the Commissioner is hereby acting in his discretion to restrict such participation. Accordingly, any petition to strike an application from the files which is filed after the date of publication of this Notice must include a self-addressed postcard specifically identifying the petition and the application to which the petition is directed if an acknowledgement of the filing of the petition is desired. A member of the public filing a petition to strike an application after the date of publication of this Notice will not receive any communications from the Office relating to the petition, other than the return of a self-addressed postcard which the Office will stamp and return in order to acknowledge receipt of the petition. All Office communications will be conducted with the applicant in accordance with the procedures set forth in the proposed rulemaking, which procedures are those currently in effect.

Practice Relating To § 1.106

No interim practice is necessary regarding this proposed revision since it would not constitute a change in practice, but would merely make § 1.106 more closely reflect current practice.

Practice Relating To § 1.175

Any applications filed under § 1.175(a)(4) prior to the effective date of any change in the rule will be examined until the application is amended and a reissue patent issues thereon or the application becomes abandoned.

Practice Relating To § 1.176

The examination of any applications filed prior to the effective date of any change in the rule will continue to be delayed for two months after the announcement of the filing in the Official Gazette, except where the delay period is waived by a decision on a petition under 37 CFR 1.183.

Practice Relating To § 1.193(c)

No interim practice is necessary regarding this proposed revision since the practice of rejecting claims pursuant to § 1.56(d) will not be adopted prior to the effective date of a change in paragraph (d).

Practice Relating To § 1.291

Any protest against a pending application which is filed after the date of publication of this Notice in the Official Gazette will be treated essentially in accordance with the procedures set forth in the "Notice of proposed rulemaking." Any protests which have been filed prior to the date of publication of this Notice in the Official Gazette will continue to be treated in accordance with the practices in effect prior to this Official Gazette Notice via the appropriate sections of the Manual of Patent Examining Procedure. Since the provisions of 37 CFR 1.291 now in effect do not guarantee a member of the public the right to participate fully in Office consideration of protests filed under § 1.291, it is considered appropriate and proper to restrict participation on behalf of a protestor essentially as set forth in the "Notice of proposed rulemaking" while such proposed rulemaking is pending. At this time the degree of participation is solely at the discretion of the Commissioner and the Commissioner is hereby acting in his discretion to restrict such participation. Accordingly, any protest filed after the date of publication of this Notice will be acknowledged as set forth in present § 1.291 on a self-addressed postcard which protestor is hereby advised to include with the protest. The self-addressed postcard must specifically identify the protest and the application to which the protest is directed, to the extent such identifying data for the application is known. A member of the public filing a protest against a pending application after the date of publication of this Notice will receive no communication from the Office relating to the protest, other than the self-addressed postcard which the Office will stamp and return in order to acknowledge receipt of the protest as set forth in present § 1.291(a). All Office communications will be conducted with the applicant in accordance with the procedures set forth in the proposed rulemaking, which procedures are those currently in effect. Pending adoption of the proposed rulemaking the Office will consider protests which comply with present §1.291(a) even though the protest does not include all the items enumerated in proposed new paragraph (b) of § 1.291.

Practice Relating To § 1.555

No interim practice is necessary regarding this proposed revision since it merely makes § 1.555 more closely parallel § 1.56 and more specifically defines the responsibility of a patent owner in a reexamination proceeding.

Practice Relating To § 1.56

No interim practice is necessary regarding this proposed revision since it merely clarifies, but does not change, present practice.

Practice Relating To § 1.570

No interim practice is necessary since this proposed revision merely reflects the paragraph change proposed in {g49 1.565.

CONCLUSION

The present interim procedures will be in effect until further notice and pending a final determination on the proposed rulemaking.

DONALD J. QUIGG,
Deputy Commissioner of Patents & Trademarks.

Nov. 16, 1981.

[1013 O.G. 18]

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(146) Patent and Trademark Office Implementation of 37 CFR 1.56

The Patent and Trademark Office has been reviewing, and discussing in conjunction with various private sector groups, its implementation of 37 CFR 1.56 which deals with the duty of disclosure and inequitable conduct. Determination of inequitable conduct issues requires an evaluation of the intent of the party involved. While some court decisions have held that intent may be inferred in some circumstances, consideration of the good faith of the party, or lack thereof, is often required. In several recent court decisions, a high level of proof of intent to mislead the Office was required in order to prove inequitable conduct under 37 CFR 1.56. See *In re Harito*, 847 F.2d 801, 6 USPQ 2d 1930 (Fed. Cir. 1988) and *FMC Corp.* v. *Manitowoc Co. Inc.*, 835 F.2d 1411, 5 USPQ 2d 1112 (Fed. Cir. 1988).

The Office is not the best forum in which to determine whether there was an "intent to mislead", such intent is best determined when the trier of facts can observe demeanor of witnesses subjected to cross-examination. The Office is not presently equipped to handle live testimony. Modifying Office procedures to do so would not be an effective utilization of resources. A court, with subpoena power, is presently the best forum to consider duty of disclosure issues under the present evidentiary standard for finding an "intent to mislead". The court proceeding involves two participating adverse parties. This is not the case in the Office, since even "protesting" parties are not permitted to participate under the Rules. Also, it is the courts and not the Office that are in the best position to fashion an equitable remedy to fit the precise facts in those cases where inequitable conduct is established. Furthermore, inequitable conduct is not set by statute as a criteria for patentability but rather is a judicial application of the doctrine of unclean hands which is appropriate to be handled by the courts rather than

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by an administrative body. Because of the lack of tools in the Office to deal with this issue and because of its sensitive nature and potential impact on a patent, Office determinations generally will not deter subsequent litigation of the same issue in the courts on appeal or in separate litigation. Office determinations significantly add to the expense and time involved in obtaining a patent with little or no benefit to the patent owner or any other parties with an interest.

Accordingly, the Office will no longer investigate and reject original or reissue applications under 37 CFR 1.56 and to the extent 37 CFR 1.56 now requires the Office to do so, it is hereby waived. Likewise, the Office will not comment upon duty of disclosure issues which are brought to the attention of the Office in original or reissue applications except to note in the application, in appropriate circumstances, that such issues are no longer considered by the Office during its examination of patent applications. Examination of lack of deceptive intent in reissue applications will continue but without any investigation of inequitable conduct issues. Applicant's statement of lack of deceptive intent normally will be accepted as dispositive except in special circumstances such as an admission or judicial determination of fraud or inequitable conduct.

The duty of disclosure requirements set forth in 37 CFR 1.56(a) will remain in effect pending modification by rulemaking procedure. The Office plans to propose a change in the standard of the duty of disclosure with respect to information to be submitted which an individual knows or should have known would render unpatentable any pending claim in an application. This would replace the present requirement to submit information which there is a substantial likelihood a reasonable examiner would consider important in deciding whether to allow an application to issue as a patent. The Office also plans to propose that 37 CFR 1.97-1.99 concerning information disclosure statements be modified to clarify the manner and time for submission of information to the Office for consideration in an application. Further, the Office has already indicated its support for legislation proposed by Congressman Kastenmeier in H.R. 4086 with certain clarifying changes.

This change in practice will not reduce incentives to disclose information to the Office promptly. A judicial finding of inequitable conduct or fraud will still render a patent unenforceable or invalid. Therefore, applicants will still be encouraged to comply with the Rule, as applied by the courts. Practitioners found to have participated in inequitable conduct or fraud shall be subject to disciplinary proceedings. 37 CFR Part 10.

Any response due to an outstanding requirement for information regarding the duty of disclosure or rejection under 37 CFR 1.56 may merely make reference to the change in practice set forth in this Notice. Such a response will be considered complete if timely filed. A paper will then be mailed and placed of record merely noting that the Office no longer examines patent applications for compliance with 37 CFR 1.56.

Applications in which there is no outstanding requirement for information regarding the duty of disclosure or outstanding rejection under 37 CFR 1.56, but in which a duty of disclosure issue has been noted on the record, will have a paper placed in the record and mailed to the applicant terminating consideration of the duty of disclosure issue and noting that the Office no longer examines patent applications for compliance with 37 CFR 1.56. Thereafter, no further action will be undertaken by the Office regarding the duty of disclosure issue.

The Board of Patent Appeals and Interferences will henceforth not review any rejection under 37 CFR 1.56 but will treat the rejection as withdrawn and merely note that the Office no longer examines patent applications for compliance with 37 CFR 1.56.

Questions regarding this change of practice may be directed to the Special Program Examination Unit at (703) 557-8384.

Sept. 8, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

[1095 OG 16]

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(147) **Further Clarification on Patent and Trademark Office Implementation of 37 CFR 1.56**

This notice is intended to provide further clarification to the O.G. Notice titled "Patent and Trademark Office Implementation of 37 CFR 1.56", published on Oct. 11, 1988 at 1095 O.G. 16.

As indicated in the previous notice, for a number of reasons, the Patent and Trademark Office will no longer investigate and reject original or reissue applications under 37 CFR 1.56 and will not comment upon duty of disclosure issues, which are brought to the attention of the Office, except to note in the application, in appropriate circumstances, that such issues are no longer considered by the Office during its examination of patent applications.

Further, the Office will also not consider duty of disclosure issues in interferences declared pursuant to 35 U.S.C. 135. Duty of disclosure issues which are raised by the parties in an interference will not be commented upon by the Examiner-in-Chief except to note that such issues are no longer considered by the Office. The policy is considered proper for the same reasons previously set forth regarding ex parte cases. Even though interferences are inter partes proceedings, the Office does not take live testimony where the demeanor of witnesses subjected to cross-examination can be observed.

Duty of disclosure issues which exist in pending interferences will not be decided but it merely will be noted that the Office no longer considers such issues.

Oct. 17, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1096 OG 19]

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(148) **Patent and Trademark Office Implementation of 37 CFR 1.28(d) and 1.56(c), (f) and (g)**

This notice supplements the Official Gazette Notices relating to the implementation of 37 CFR 1.56 published at 1095 *Official Gazette* 16 (Oct. 11, 1988) and 1096 *Official Gazette 19* (Nov. 8, 1988) which announced that the Office will no longer investigate and reject original or reissue applications under 37 CFR 1.56.

With regard to 37 CFR 1.28(d), it will still be considered as fraud attempted or practiced on the Office either to attempt to fraudulently (1) establish status as a small entity or (2) pay fees as a small entity or to improperly and through gross negligence (1) establish status as a small entity or (2) pay fees as a small entity. The rule, however, makes reference to 37 CFR 1.56(d) but the Office no longer investigates or rejects original or reissue applications under 37 CFR 1.56(d). Therefore, the Office will accept payment of fee deficiencies under 37 CFR 1.28 but will just note in such cases that the Office no longer investigates and rejects applications under 37 CFR 1.56.

With regard to 37 CFR 1.56(c), (f) and (g), after further review of Office practice, it has been determined that the same reasons set forth in the Official Gazette Notices cited above also apply to the investigating and striking of applications for defects in the manner in which the application was executed by the signing of an oath or declaration pursuant to 37 CFR 1.63. It is no longer considered appropriate for the Office to expend the resources required to investigate such issues and to consider striking the applications involved. The resolution of such issues involves the difficult process of determining the intent of the parties and the facts surrounding the execution of the applications. Since Feb. 27, 1983, an application may be filed without an executed oath or declaration and still be granted a filing date as to the subject matter disclosed and claimed. Therefore, while the defects in execution described in 37 CFR 1.56(c) are not condoned, it is appropriate to allow the filing of a new oath or declaration pursuant to 37 CFR 1.63 and the payment of the surcharge under 37 CFR 1.16(e) for filing and oath or declaration later than the filing date of the application without action under 37 CFR 1.56(c), (f) or (g) by the Office.

Accordingly, the Patent and Trademark Office will not consider striking an application for the type of conduct described in 37 CFR 1.56(c) and will not entertain a petition directed to such matter submitted pursuant to 37 CFR 1.56(f) and (g). Any such petition submitted will merely be placed in the application file and will not be commented upon by the Patent and Trademark Office. The provision of 37 CFR 1.56(c), (f) and (g) are hereby waived. The regulation will be modified through the rulemaking procedure.

Dec. 8, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1098 OG 502]

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(149) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227-18]

Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing. The changes simplify the obtaining of licenses for filing foreign patent applications and for filing amendments, modifications, and supplements in foreign patent applications. Under the revised rules (1) the export, but not actual filing, of technical data to a foreign country for purposes related to the filing and prosecution of a patent application may be done either under appropriate export agencies' rules or by a license issued by the Commissioner of Patents and Trademarks, (2) certain licenses issued by the Commissioner for filing foreign patent applications include a license to file amendments, modifications, and supplements, containing additional matter in foreign applications, (3) specific contents of a petition for retroactive license are established and (4) fees are set for expedited handling of requests for foreign filing licenses and for certain petitions. These changes will result in reduced work for both patent applicants and the Patent and Trademark Office and at the same time strengthen national security protections.
Effective Date: June 1, 1984.
For Further Information Contact: Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed primarily to simplify and expedite the granting of licenses under 35 U.S.C. 184. It contains a number of changes in practice designed to benefit both the Patent and Trademark Office in its handling of its mission and the public the Office serves. Notice of proposed rulemaking was published May 23, 1983, at 48 FR 23144 and corrected June 7, 1983, at 48 FR 26319.

Discussion of Specific Rules

Secton 5.11(a) has been substantially restructured and modified from the proposal. Under § 5.11(a), a license from the Commissioner of Patents and Trademarks is always needed for the act of filing a patent application in a foreign patent office unless the six-month period has passed or the invention was not made in the United States.

Amended § 5.11 (b) and (c) would clarify in the regulations that the export of technical data to a foreign country may be done under appropriate export agencies' rules controlling the export of technical data—Department of State (22 CFR Parts 121-130); Department of Commerce, International Trade Administration Office (15 CFR Part 379); or the Department of Energy (10 CFR Part 810)—or by license from the Commissioner. Compliance with the appropriate export agencies' rules or the license from the Commissioner is required before *exporting* technical data in the form of a patent application or data in any form if related to preparing, filing, and prosecuting a patent application in a foreign country, if the United States application has not been on file for six months at the time of export, or no application has been filed in the United States. It is optional from whom approval for export is obtained. In fact, for certain technical data being exported to certain countries, a specific request for a license or approval from any of the export agencies would not be necessary. However, a single license from the Commissioner would cover both export and filing and avoid any question whether a specific license or approval is required from any of the export agencies. Approval from the appropriate export agencies for export would require a separate additional license from the Commissioner for the filing of the foreign patent application. The rule changes will make the rules more closely conform with the regulations of other agencies which deal with the export of technical data to a foreign country.

The definition of export in these regulations will be controlled by the definition of export in the appropriate regulations of the export agencies having jurisdiction over the export of technical data related to the patent application. (15 CFR 379.1, 22 CFR 125.03 and 10 CFR 810.7).

The requirement of complying with the rules of the export agencies or the Commissioner before exporting an application to a foreign country is not intended to change long-standing Patent and Trademark Office interpretation of 35 U.S.C. 184 or in any way interpret the language in 35 U.S.C. 184 "file or cause or authorize to be filed" as requiring a license before technical data related to the filing or prosecution of an application is exported to a foreign country, such as to a foreign attorney or agent or corporation for review or revision for later filing. It does, however, reflect the delegations the Commissioner has received from other agencies and which are referenced in §§ 5.18, 5.19 and new § 5.20 and clarifies that a patent applicant must be licensed for export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application either by appropriate export agencies or by the Commission. The language "related to the preparation, filing or possible filing and prosecution of a foreign patent application" in § 5.11(b) is used rather than "support a patent application" as used in § 5.18 or "foreign filing" as used in § 5.19 to make clearer that the latter two phrases include the export of technical data in the form of explanations or possible claim language or the like sent to a foreign agent or other person in relation to a foreign patent application. However, a license from the Commissioner would not substitute for approvals required by appropriate export agencies if technical data is exported for purposes not related to the filing or possible filing and prosecution of a foreign patent application. For example, a license from the Commissioner would not cover export of technical data in a U.S. patent application to a foreign research laboratory to support a research project.

Further, the rule is intended to reflect that every exportation of technical data related to filing or possible filing or prosecution within six months of a United States filing without a license from the Commissioner is prohibited unless the applicant complies with the rules of the appropriate export agencies. For example, where an application has been exported to a foreign agent with an authorization to file a foreign patent application, the export of the application may be under a general license from the International Trade Administration of the Department of Commerce. A license from the Commissioner is always necessary for the actual filing of the foreign patent application. In another example, where a validated license is needed under 15 CFR Part 379 to export technical data in the form of a patent application, applicants will need to obtain an International Trade Administration license or obtain a Commissioner's license prior to the act of export. Under either example, a license from the Commissioner is required before the application is filed in a foreign patent office. In the latter example, a single license from the Commissioner will permit both export and filing of the application.

This rule is promulgated under the authority of 35 U.S.C. 6 and delegations to the Commissioner by regulation (15 CFR 370.10(sf,1j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978. Authority for this rule also exists under 35 U.S.C. 188.

The amended rule assures adequate protection of sensitive material under Title 35, United States Code and provides regulatory consistency with the Arms Export Control Act, as amended, the Export Administration Act, as amended, the Atomic Energy Act of 1954, as amended, the Nuclear Non-

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Proliferation Act of 1978, and their implementing regulations. The sanctions which apply for failure to obtain a license from either the Commissioner or the appropriate export agencies prior to export are the sanctions specified in the export acts. The sanctions which apply for failure to obtain a license from the Commissioner prior to the filing of a foreign application are the sanctions specified in Title 35, United States Code.

Section 5.11(d), proposed as § 5.11(b), states that applications under secrecy order under § 5.2 cannot be exported to an international agency or filed in a foreign country except in accordance with § 5.5.

Section 5.11(e), proposed as § 5.11(c), states that a license pursuant to paragraph (a) is not required where the invention was not made in the United States, or the United States application was on file for six months without a secrecy order being issued.

Section 5.11(f), proposed as § 5.11(d), states that a license for foreign filing may be revoked at any time upon written notice. Similarly, an authorization for foreign filing resulting from the passage of six months from the filing of a United States patent application may be revoked by the imposition of a secrecy order. The revocation is effective as of the date of the notice and is not intended to be applicable to any prior acts by applicants relying in good faith on the grant of a license.

The language of §§ 5.12(b), 5.13, and 5.14 have been clarified from the proposal to reflect that the § 1.17(h) requirement for a fee is for the expedited handling of a license. No fee is required for a routine, non-expedited request for a foreign filing license.

Section 5.15 has been changed from the form proposed. Amended § 5.15 defines licenses for foreign export and filing of two different scopes. The § 5.15(a) scope license, the grant of which is indicated on the filing receipt in accordance with § 5.12(a) published at 48 FR 2696. (Jan. 20, 1983) and 1027 OG 9 (Feb. 1, 1983), permits the subsequent export and filing of technical data for purposes related to the preparation, filing or possible filing and prosecution of the foreign application and of any amendments or modifications to the application in a foreign country, even if "additional subject matter" were introduced; provided the additional subject matter does not change the general nature of the subject matter disclosed and does not pertain to certain categories of potentially sensitive material which are set forth in § 5.15(a)(4).

The phrase "change the general nature of the subject matter disclosed" is intended to cover situations where the additional subject matter so alters the character of the disclosure that national security review is appropriate. This phrase is intended to permit a broad range of amendments, modifications and supplements, including additional subject matter. The following examples are intended to further clarify the meaning of the language "general nature of the subject matter disclosed" in § 5.15(a):

Example 1—The physical data on a named compound. If a licensed disclosure gives the name and structure of a compound, the general nature of the subject matter disclosed includes physical data such as boiling point, melting point or specific gravity of the compound. If a name of a compound is disclosed, the structure of the compound is also within the general nature. If the licensed disclosure deals with the hardness of a claimed alloy, the disclosure of tensile strength is within the general nature.

Example 2—A known specie of a known genus. If the genus "lower alkyl" is disclosed, the inclusion of the species "methyl" is within the general nature, as would be homologs and isomers of that genus.

Example 3—Comparison data of the disclosed compound to data on prior art compounds. If the licensed disclosure contains a disclosure of the compounds of a pesticide invention, and pesticidal activities, the comparison of pesticidal data of a known compound representing the closest prior art is within the general nature.

Example 4—A specific optimum temperature within a specified temperature range. If a licensed disclosure has a range of 0{g94 C to 120{g94 C, the disclosure of an optimum temperature of 100{g94 C is within the general nature.

Example 5—Activity data on compounds of the invention. If activity data on 30 of 50 named compounds is disclosed, the disclosure of activity data on other named compounds of the invention is within the general nature.

Example 6—Additional subject matter and utilities. If a licensed disclosure describes a chemical herbicide for weed control, the disclosure of chemical warfare uses or human toxic properties (other than to demonstrate safety or absence of such toxicity) *is not* within the general nature. If a licensed disclosure describes an analog computer for microwave telephone transmission, the addition of a cryptographic encoding or decoding device and utility *is not* within the general nature. If a licensed disclosure describes a battery power source for a satellite, the addition or substitution of a nuclear isotopic power source *is* within the general nature, but would be within the control of § 5.15(a)(4)(ii).

A § 5.15(b) scope license is limited to the original subject matter disclosed at the time the license was granted and does not cover "additional subject matter" as the phrase is currently interpreted (*In re Gaertner*, 202 USPQ 714 (CCPA 1979)).

Under § 5.15(c), a license with the scope of § 5.15(a) could also be granted pursuant to a § 5.13 or § 5.14 petition. If granted, the § 5.15(a) scope of license will be indicated on the license grant. For instance, under § 5.15(c) an applicant who filed a United States patent application before Feb. 27, 1983, when the filing receipt license practice became effective could request a § 5.15(a) scope license which, if granted, will cover the subsequent filing of amendments, modifications or supplements, including additional matter in a corresponding foreign patent application. The licenses under §§ 5.12(b), 5.13, and 5.14 are normally limited in scope to the original subject matter disclosed at the time the license was granted unless a license of the § 5.15(a) scope is indicated on the license grant. If a petition for a license under § 5.12(b) is granted prior to the grant of the § 5.12(a) filing receipt license, the former would merge into the latter and would be considered a § 5.12(a) license for the purpose of § 5.15.

A new § 5.20, not included in the proposal, sets forth the specific authority of the Commissioner to license foreign filing, possible filing or prosecution of a patent application in a foreign country under 35 U.S.C. 184 regarding unclassified activities in foreign atomic energy programs. This change only reflects the existing relationship between 37 CFR 5.11 and 10 CFR § 810.7 and alerts patent applicants in this technology to the Commissioner's authority. The term "sensitive nuclear technology" used in paragraph (b) of § 5.20 is defined in 10 CFR § 810.3(q).

A new § 5.25, proposed initially as § 5.20 and modified, sets forth in the regulations the requirements to be met for the granting of a retroactive license. The requirements include (1) a list of the foreign countries in which the patent application material was filed; (2) the date(s) of filing of the foreign application(s); (3) an oath or declaration which (i) states that the subject matter filed is not subject to a secrecy order under 35 U.S.C. 181, (ii) makes a showing of diligence in attempting to obtain the license upon discovery of the error, and (iii) makes a showing of facts which support a conclusion of inadvertence; and (4) includes the required fee. The section also provides in paragraph (b) for review from a denial of a petition for a retroactive license. The section further provides in paragraph (c) that the granting of a retroactive license pursuant to § 5.25 does not excuse any violation of regulations of the export agencies which may have occurred because of the failure to obtain an appropriate license prior to export.

Sections 5.21, 5.22 and 5.23 have been redesignated to become §§ 5.31, 5.32 and 5.33, respectively.

Significant Differences Between Proposed and Final Rules

Section 1.17

Section 1.17(h) is amended to include a specific reference to § 5.25 petitions for retroactive licenses for which the petition fee is charged, rather than having the present retroactive license fee under § 1.182 petitions. The fee for § 5.12(b) licenses is new and applies only where expedited handling of these license requests is sought. This fee for expedited handling is also referred to in §§ 5.13 and 5.14. Section 5.15(c) provides for a fee for changing the scope of a license.

Section 5.1

The proposed amendment to § 5.1 is not being adopted and is withdrawn.

Section 5.11

Section 5.11 is amended to control the *export* of technical data in the form of an application or data in any form if related to preparing, filing, or prosecuting a patent application in a foreign country, if the United States application has not been on file for at least six months prior to the date of transmittal, or if no application has been filed in the United States. Export approvals, if required, may be provided by appropriate export agencies—Department of State; Department of Commerce, International Trade Administration or Department of Energy—or by the Commissioner. This will enable the Patent and Trademark Office and the export agencies to better reflect and exercise the export control functions set forth in the Arms Export Control Act, as amended, the Export Administration Act of 1979, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, respectively.

Under these Acts, the export of technical data is the activity to be controlled. The final rule differs from the proposed rule in that the Patent and Trademark Office will not be the sole export control authority over technical data in the form of an application, or data in any form, if related to preparing, filing, or prosecuting a patent application. Applications will have the option to obtain necessary export approvals either (1) from appropriate export agencies or (2) from the Commissioner. The Commissioner will continue to be the sole licensing authority for the act of filing an application in a foreign patent office.

Paragraphs (a), (b), and (c) of § 5.11 control export activity by requiring either an export agency approval or a Commissioner's license for export of technical data in connection with foreign filing of an application and to that extent implement the Arms Export Control Act, the Export Administration Act, the Atomic Energy Act and the Nuclear Non-Proliferation Act. If a license is obtained from the Commissioner under § 5.12, § 5.13 or § 5.14, no separate approval for the export of technical data to a foreign country in connection with a patent application is required from the export agencies.

It is emphasized that the scope of the Commissioner's license is limited to exporting and filing technical data in the form of an application, or in any form, if related to preparing, filing and prosecuting a patent application or for consideration of the filing of a patent application in a foreign country. A Commissioner's license does not authorize selling or using technical data in a foreign country or exporting data for other purposes. These latter acts continue to require separate approvals from the appropriate export agencies.

Also, the export of technical data in any form to a foreign country for purposes other than related to filing or supporting the filing of a patent application is not controlled by Title 35, U.S.C. or the regulations in Part 5. The exportation of data to a foreign country in such cases would be subject only to other laws and regulations such as the export and arms control regulations. Approval for the export of such technical data for purposes related to filing, possible filing, or supporting the filing of a patent application will be available from the appropriate export agencies or the Commissioner. On the other hand, the Commissioner will be the sole licensing authority for the act of filing the application in a foreign patent office.

Section 5.11(d), proposed as § 5.11(b), states that an application cannot be exported to a foreign country when the corresponding United States application is under secrecy order except under § 5.5

Section 5.11(e), proposed as § 5.11(c), states that no license is required if the invention was not made in the United States, or the application was on file in the United States at least six months and is not under a secrecy order issued under § 5.2

Section 5.11(f), proposed as § 5.11(d), states that any license for foreign filing may be revoked at any time by written notification. It has been amended to further clarify that revocation also applies to authorizations resulting from the passage of six months from the filing date of a United States patent application when a secrecy order is imposed.

Section 5.12

Section 5.12(b) is clarified from the proposal to specify that the fee is for expedited handling of a petition under § 1.17(h).

Section 5.13

Section 5.13 is clarified from the proposal to specify that the fee is for expedited handling of a petition under § 1.17(h).

Section 5.14

Section 5.14(a) is clarified from the proposal to specify that the fee is for expedited handling of a petition under § 1.17(h).

The other changes in § 5.14 make grammatical corrections and do not alter the intent of the section.

Section 5.15

Section 5.15(a) broadens the scope of licenses granted under § 5.12(a). Section 5.15(a), as proposed, is changed to clarify the scope of a § 5.15(a) license and delete certain of the exclusions originally proposed. This license permits exporting technical data to and filing corresponding subject matter in an application in any foreign country. The license also permits amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application, to be exported and filed in any foreign country. This license includes additional matter which does not change the general nature of subject matter disclosed and does not pertain to certain prohibited subjects or areas listed on various export restriction lists established by the Department of State and the Department of Energy.

These changes also permit an applicant to take action in the prosecution of the foreign or international application and submit supporting data such as affidavits, test data or the like as long as it directly relates to the filing, possible filing or prosecution of the application and does not pertain to the prohibited subjects or areas enumerated in § 5.15(a)(4). The changes in § 5.15(a) obviate the problems in *In re Gaertner*, supra, by providing a license scope which covers the type of activity involved in that case.

Amended paragraph (b) of § 5.15 is the same as proposed paragraph (b) except for changes for consistency.

Amended paragraph (c) of § 5.15 differs from § 5.15(c) as proposed by including a reference to § 5.14 and specifically permitting an applicant to petition for a change of the scope of a license.

New paragraph (d) of § 5.15 is similar to proposed paragraph (d) with only changes for consistency.

New paragraph (e) of § 5.15 is similar to proposed paragraph (e) with only changes for consistency.

Paragraph (f) of § 5.15 is similar to proposed paragraph (f) with only changes for consistency.

Paragraph (g) is adopted essentially as proposed.

Section 5.17

Section 5.17 is similar to proposed § 5.17 with only consistency changes.

Section 5.20

Section 5.20, not included in the proposal, is new and clarifies the existing authority of the Commissioner under the unclassified activities in foreign atomic energy programs. Under 10 CFR 810.7, the license of the Commissioner under 37 CFR 5.11 pursuant to 35 U.S.C. 184 constitutes information available to the public and generally authorized activity.

Section 5.25

Section 5.25, proposed initially as § 5.20, is new and sets forth the requirements for petitioning for a retroactive license.

Section 5.31 and 5.32

Sections 5.21 and 5.22 are redesignated as §§ 5.31 and 5.32, respectively.

Section 5.33

Section 5.23 is redesignated as § 5.33 and adopted as proposed.

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Responses to Comments on the Rules

Specific comments were received on a number of the sections. All of the comments, including the written comments and the oral testimony were considered.

Twenty-one letters presenting written comments were received and nine persons testified at the public hearing on July 20, 1983. Comments appear below along with the responses.

Comment:

One comment objected to the amendment of § 5.1 to include "transmittal for" filing.

Reply:

This comment has been adopted by deleting the phrase from the final rule.

Comment:

Three comments requested an explanation of the conditions when a license may be revoked under § 5.11(d) be clearly set forth and asked whether, if revocation occurs, past acts are valid and whether there will be compensation for damages.

Reply:

The section has been revised to further clarify the conditions under which a license may be revoked. The power to revoke licenses has been expressly included in all issued licenses for a number of years. Section 5.11(d) as proposed, merely recognizes in the rule the fact that licenses can be revoked. With the advent of the filing of a U.S. application becoming a request for a foreign filing license under § 5.12(a), a regulatory procedure clarifying the revocation practice was appropriate. Revocation will be effective only as of the date of revocation and prior acts predicated on the license would be in compliance with 37 CFR Part 5. The rule as proposed has been clarified to indicate that revocation may apply either to a license specifically granted by the Commissioner or to an authorization to file a foreign application resulting from the passage of six months from the filing of a United States patent application. No compensation is available for revocation of a license.

Comment:

Eighteen comments requested the amendment of § 5.11 to eliminate the license requirement for "transmittal for filing" and substitute the requirement for "filing" only.

Reply:

The proposal has been adopted by eliminating the requirement for a license from the Commissioner prior to transmitting or exporting an application abroad. The regulations have been clarified to emphasize the requirements for the export of technical data in the form of an application. An applicant has a choice of exporting such applications under authority of either (1) the appropriate export agencies controlling the export of technical data—Department of State; Department of Commerce, International Trade Administration; or Department of Energy or (2) a license from the Commissioner. While a license from the Commissioner is required only for filing an application abroad, the provisions of §§ 5.18, 5.19 and 5.20 reflect the Commissioner's authority to license the export of technical data in the form of an application for purposes related to filing in addition to the foreign filing of the application in a foreign country.

Comment:

Six person objected to the transmittal license requirement and argued that the Patent and Trademark Office lacks authority under 35 U.S.C. 184 to require pre-filing (transmitting) licenses. It was also argued that foreign filing licensing is not the conduct of proceedings under 35 U.S.C. 6.

Reply:

The final rules do not require a license from the Commissioner for export (or transmittal). The export provisions of § 5.11 are issued under 35 U.S.C. 6 and pursuant to delegations under the regulations of the export agencies.

Comment:

One comment argued that the constitutional right of freedom of speech would be impaired by requiring a license for published material.

Reply:

A constitutional argument of prior restraint by export licensing of the International Traffic in Arms Regulations was reviewed by the Ninth Circuit in the case of *United States* v. *Edler*, 579 F. 2d 516 (9th Cir. 1978) cert. denied 449 U.S. 1084 (1981). No prior restraint within first amendment protection was found by the Court.

Comment:

One comment stated that the $120 petition license fee under § 5.12(b) is too high, and a $60 fee would be more reasonable.

Reply:

The license fee under § 5.12(b), § 5.13 and § 5.14 is not applicable to routine licensing requests. It is only applicable to expedited processing of license requests which require special efforts by the Patent and Trademark Office. The $120 petition fee better reflects the costs to the Patent and Trademark Office for providing expedited handling.

Comment:

One comment proposed the deletion of the last sentence of paragraph § 5.14(a) since under § 5.12(a) only those cases having interest from a security standpoint are refused a license.

Reply:

This suggestion has not been adopted because the provision may apply to petitions filed prior to receipt of a filing receipt license where expedited handling is requested.

Comment:

One comment stated that § 5.15(d) appears to be redundant since it applies only to cases on file for six months and on which no secrecy order has been imposed.

Reply:

Under § 5.15(d), a license is not needed for cases in this category if no additional subject matter is added. This section complements § 5.15(b) where a license of narrow scope is granted.

Comment:

One comment raised the question whether § 5.15(a) as to amendments, supplements, and modifications includes continuation-in-part applications.

Reply:

Continuation-in-part applications are included within the term "amendments, supplements, and modifications." *Beckman Instruments, Inc.* v. *Coleman Instruments*, 143 USPQ 278 (7th Cir. 1964).

Comment:

Two comments requested that the express language in § 5.15(a)(3) be amended to state that "Technical Data" relating to articles, materials and supplies be limited to the validated license requirements of §§ 379.4(c) and 379.4(d) of the Export Administration Regulations and no other sections, or alternatively, that paragraph (a)(3) be deleted in its entirety.

Reply:

The final rules do not include § 5.15(a)(3) as proposed.

Comment:

Two comments proposed that the two-tier licensing structure of § 5.15(a) and § 5.15(b) be amended to reflect a broad one-tier system based on § 5.15(a).

Reply:

The two-tier system reflects different treatment for applications within the inspection scope of 35 U.S.C. 181 and those outside of its inspection scope. Security review occurs on all applications with inspection cases having a narrow license grant, and noninspection cases having a broad license grant. This inspection case treatment is necessary for the Patent and Trademark Office to meet its responsibilities under 35 U.S.C. 184 and particularly 37 CFR 5.18, 5.19, and 5.20 where the State, Commerce and Energy Departments accept the Commissioner's licenses in lieu of their own export approval.

Comment:

One comment indicated that proposed § 5.15(a)(3) was of such wide scope that licenses will always be needed. The example cited was that this section would require licenses for all amendments filed in North Korea and Cuba.

Reply:

The comment is correct and the provisions of § 5.15(a)(3) have been deleted. The country of destination restrictions did not provide a workable mechanism for technology review under the provisions of 35 U.S.C. 181.

Comment:

Three comments recommended making a § 5.15(a) scope license available pursuant to a § 5.14 petition where an application was filed prior to Feb. 27, 1983, or where an initial automatic § 5.12(a) petition was not granted after Feb. 27, 1983 or where the general nature of the invention changed but is still outside of the provisions of § 5.15(a)(4).

Reply:

This provision has been adopted to allow the Commissioner to issue broadened licenses upon a § 5.14 petition in the above circumstances. New § 5.15(c) allows the Commissioner to convert the scope of a license from § 5.15(b) to a § 5.15(a) license.

Comment:

Two comments proposed the extension of a § 5.15(a) license upon petition after one or more years after the United States filing date or after grant of a § 5.15(b) license.

Reply:

This suggestion has been adopted in § 5.15(c) which will provide the mechanism by petition at any time to convert the scope of a license. This is promulgated since errors may occur in the denial of a § 5.15(a) license. Also, the initial determination of the sensitive nature of technology may be altered by changes in the security classification guidelines. Procedurally, such petitions will be referred to the appropriate defense agencies for their review of the technology prior to the grant of any license.

Comment:

One comment requested clarification on how and under what circumstances a § 5.12(b) license granted under § 5.15(c) has the same scope as a license granted under § 5.12(a).

Reply:

Licenses granted under § 5.12(a) will have the § 5.15(a) scope because the applications are not within the inspection scope of a 35 U.S.C. 181 referred to the defense agencies for security review. Under § 5.15(c), applications which are not referred to defense agencies pursuant to petitions under §§ 5.12, 5.13 and 5.14 will have a license of the scope of § 5.15(a).

Comment:

Three comments suggested an amendment to proposed § 5.20(4) to delete the "inadvertence" standard and substitute "through error without deceptive intent."

Reply:

Inadvertence is a statutory standard which cannot be altered by rulemaking. Further, judge-made law has determined the metes and bounds of this term which further proscribes the rulemaking authority of the Commissioner. In *Barr Rubber Products Co.* v. *Sun Rubber Co.*, 149 USPQ 204, 209 (S.D.N.Y., 1966) inadvertence was defined as "lack of care or attentiveness: inattention" or "an effect of inattention: a result of carelessness; an oversight, mistake, or fault from negligence."

Inadvertence signifies want of attention, and an action which is deliberately taken with full knowledge of the law and facts is not inadvertent. *In re Application of Nov. 22, 1952*, 153 USPQ 410, 411 (Asst. Commr. 1967).

Implementation of Patent Procedure Revisions

The various sections will be implemented by the Commissioner on the effective date of the rules by the acceptance of petitions under the various sections. The broadened license scope of § 5.15(a) will apply as of the effective date of these rules to all cases having filing receipt licenses under § 5.12(a) which became effective on Feb. 27, 1983. The provisions of this broad license do not apply to acts of export or filing which occurred prior to the effective date of these rules. No other action will be required by an applicant to receive the benefits of this change.

Other Considerations

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The Acting General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) for several reasons. Under this rulemaking, small entities would be able to obtain licenses without filing separate requests therefor. In general, the rule change will also expedite proceedings before the Patent and Trademark Office, simplifying existing procedures where possible.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in cost or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Paperwork Reduction Act. The collection of information requirement of this rule is included in a PTO request for approval pending before the OMB. Upon assignment of a control number by OMB, we will publish an appropriate amendment of the affected rules.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Lawyers, Small businesses.

37 CFR Part 5

Classified information, Foreign relations, Inventions and patents.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41 and 181-188 and by delegations to the Commissioner by regulation (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7) or otherwise under the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, the Patent and Trademark Office is amending Parts 1 and 5 of Title 37 of the Code of Federal Regulations as set forth below:

PART 1—[AMENDED]

1. Section 1.17 is amended by revising paragraph (h) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section of Part 1 or 5 listed below which refers to this paragraph $120.00

@§ 1.47—for filing by other than all the inventors or a person not the inventor
—§ 1.48—for correction of inventorship
—§ 1.182—for decision on questions not specifically provided for
—§ 1.183—to suspend the rules
—§ 1.268—for late filing of interference settlement agreement
—§§ 5.12, 5.13 & 5.14—for expedited handling of foreign filing license
—§ 5.15—for changing the scope of a license
—§ 5.25—for retroactive license

2. The table of contents and heading for Part 5 are revised to read as follows:

PART 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

Secrecy Orders

Sec.
5.1 Defense inspection of certain applications.
5.2 Secrecy order.
5.3 Prosecution of application under secrecy orders; withholding patent.
5.4 Petition for rescission of secrecy order.
5.5 Permit to disclose or modification of secrecy order.
5.6 General and group permits.
5.7 Compensation.
5.8 Appeal to Secretary.

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Licenses for Foreign Exporting and Filing

5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting international application.
5.12 Petition for license.
5.13 Petition for license; no corresponding application.
5.14 Petition for license; corresponding U.S. application.
5.15 Scope of license.
5.16 Effect of secrecy order.
5.17 Who may use license.
5.18 Arms, ammunition, and implements of war.
5.19 Export of technical data.
5.20 Export of technical data relating to sensitive nuclear technology.
5.25 Petition for retroactive license.

General

5.31 Effect of modification, rescission or license.
5.32 Papers in English language.
5.33 Correspondence.

Authority: 35 U.S.C. 6, 41, 181-188 and the Export Administration Act of 1979, as amended, the Arms Export Control Act, as amended, the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

3. The center heading preceding § 5.11 and the text of § 5.11 are revised to read as follows:

Licenses for Foreign Exporting and Filing

§ 5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

(b) The license from the Commissioner of Patents and Trademarks referred to in paragraph (a) would also authorize the export of technical data abroad for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application without separately complying with the regulations contained in 22 CFR Parts 121-130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of the Office of Export Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy).

(c) Where technical data in the form of a patent application, or in any form is being exported for purposes related to the preparation, filing or possible filing and prosecution of a foreign patent application, without the license from the Commissioner of Patents and Trademarks referred to in paragraphs (a) or (b) of this section, or on an invention not made in the United States, the export regulations contained in 22 CFR Parts 121-130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) must be complied with unless a license is not required because a United States application was on file at the time of export for at least six months without a secrecy order under § 5.2 being placed thereon. The term "exported" means export as it is defined in 22 CFR Parts 121-130, 15 CFR Part 379 and 10 CFR Part 810.

(d) If a secrecy order has been issued under § 5.2, an application cannot be exported to, or filed in, a foreign country (including an international agency in a foreign country), except in accordance with § 5.5.

(e) No license pursuant to paragraph (a) of this section is required if:

(1) The invention was not made in the United States, or

(2) The United States application is not subject to a secrecy order under § 5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country.

(f) A license pursuant to paragraph (a) of this section can be revoked at any time upon written notification by the Patent and Trademark Office. An authorization to file a foreign patent application resulting from the passage of six months from the date of filing of a United States patent application may be revoked by the imposition of a secrecy order.

4. Section 5.12 is amended by revising paragraph (b) to read as follows:

§ 5.12 Petition for license.

* * * * *

(b) Petitions for license should be presented in letter form and must include the required fee (§ 1.17(h)), if expedited handling of the petition is also sought, the petitioner's address, and full instructions for delivery of the requested license when it is to be delivered to other than the petitioner.

5. Section 5.13 is revised to read as follows:

§5.13 Petition for license; no corresponding application.

If no corresponding national or international application has been filed in the United States, the petition for license under § 5.12(b) must be accompanied by the required fee (§ 1.17(h)), if expedited handling of the petition is also sought, and a legible copy of the material upon which a license is desired. This copy will be retained as a measure of the license granted. For assistance in the identification of the subject matter of each license so issued, it is suggested that the petition be submitted in duplicate and provide a title and other description of the material. The duplicate copy of the petition will be returned with the license or other action on the petition.

6. Section 5.14 is amended by revising paragraphs (a) and (c) to read as follows:

§ 5.14 Petition for license; corresponding U.S. application.

(a) When there is a corresponding United States application on file, a petition for license under § 5.12(b) must include the required fee (§ 1.17(h)), if expedited handling of the petition is also sought, and must identify this application by serial number, filing date, inventor, and title, but a copy of the material upon which the license is desired is not required. The subject matter licensed will be measured by the disclosure of the United States application. Where the title is not descriptive, and the subject matter is clearly of no interest from a security standpoint, time may be saved by a short statement in the petition as to the nature of the invention.

* * * * *

(c) When the application to be filed or exported abroad contains matter not disclosed in the United States application or applications, including the case where the combining of two or more United States applications introduces subject matter not disclosed in any of them, a copy of the application as it is to be filed in the foreign country or international application which is to be transmitted to a foreign international or national agency for filing in the Receiving Office, must be furnished with the petition. If however, all new matter in the foreign or international application to be filed is readily identifiable, the new matter may be submitted in detail and the remainder by reference to the pertinent United States application or applications.

7. Section 5.15 is revised to read as follows:

§ 5.15 Scope of license.

(a) Grant of a license under § 5.12(a) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal papers to the foreign country or international agencies;

(2) To make amendments, modifications and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application;

(3) To take any action in the prosecution of the foreign or international application; and

(4) To add subject matter or take any action under paragraphs (a) (1)-(3) of this section which does not change the general nature of the subject matter disclosed at the time of filing, unless the subject matter added involves technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121-130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Grant of a license under § 5.12(b) authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to forward all duplicate and formal papers to the foreign patent agency or international patent agency and to make amendments, modifications or supplements to and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under § 5.12(b) pursuant to § 5.13 or § 5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (§ 1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. The change in the scope of a license will be as of the date of the grant of the change in scope.

(d) In those cases in which no license is required to file the foreign application or transmit the international application, no license is required to file papers in connection with the prosecution of the foreign or international application not involving the disclosure of additional subject matter.

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing or which involves the disclosure of subject matter listed in paragraphs (a)(4) (i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under § 5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(4) (i) or (ii) of this section is not introduced and,

(2) In the case where at least one of the licenses was obtained under § 5.12(b), additional subject matter is not introduced.

(g) A license does not apply to acts done before the license was granted. See § 5.25 for petitions for retroactive licenses.

8. Section 5.17 is revised to read as follows:

§ 5.17 Who may use license.

Licenses may be used by anyone interested in the export, foreign filing, or international transmittal for or on behalf of the inventor or the inventor's assigns.

9. A new § 5.20 is added to read as follows:

§ 5.20 Export of technical data relating to sensitive nuclear technology.

(a) Under regulations (10 CFR 810.7) established by the United States Department of Energy, an application filed in accordance with the regulations (37 CFR 5.11-5.33) of the United States Patent and Trademark Office and eligible for foreign filing under 35 U.S.C. 184, is considered to be information available to the public in published form and a generally authorized activity for the purposes of the Department of Energy regulations.

(b) Inquiries concerning the export of sensitive nuclear technology other than related to the filing or prosecution of a foreign patent application should be made to the Attention: Secretary, United States Department of Energy, Office of International Security Affairs, Washington, D.C. 20858.

§ 5.21 [Redesignated as § 5.31]

10. Section 5.21 is redesignated as § 5.31.

§ 5.22 [Redesignated as 5.32]

11. Section 5.22 is redesignated as § 5.32.

12. A new § 5.25 is added to read as follows:

§ 5.25 Petition for retroactive license.

(a) A petition of retroactive license under 35 U.S.C. 184 shall be presented in accordance with § 5.13 or § 5.14, and shall include:

(1) A listing of the foreign countries in which the patent application material was filed,

(2) The dates on which the material was filed,

(3) A verified statement containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order.

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was inadvertently filed abroad without the required license under § 5.11 first having been obtained, and

(4) The required fee (§ 1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of inadvertence. The showing of facts should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute inadvertence should cover the period from the time of filing until actual filing of the petition under this section.

(b) If a petition for a retroactive license is denied, a time period of not less than thirty days shall be set, during which the petition may be renewed. Failure to renew the petition within the set time period will result in a final denial of the petition. A final denial of a petition stands unless a petition is filed under § 1.181 within two months of the date of the denial. If the petition

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for a retroactive license is denied with respect to the invention of a pending application and no petition under § 1.181 has been filed, a final rejection of the application under 35 U.S.C. § 185 will be made.

(c) The granting of a retroactive license does not excuse any violation of the export regulations contained in 22 CFR Parts 121— 130 (International Traffic in Arms Regulations of the Department of State), 15 CFR Part 379 (Regulations of Office of Export Administration, International Trade Administration, Department of Commerce) and 10 CFR Part 810 (Foreign Atomic Energy Programs of the Department of Energy) which may have occurred because of the failure to obtain an appropriate license prior to export.

13. Section 5.23 is redesignated as § 5.33 and revised to read as follows:

§ 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Commissioner of Patents and Trademarks (Attention Licensing and Review), Washington, D.C. 20231."

Feb. 24, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[FR Doc. 84-8884 Filed 4-3-84; 8:45 am]
BILLING CODE 3510-16-M]

[1042 O.G 3]

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(150) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 40227-18]

Revision of Foreign Filing License Procedure

Agency: Patent and Trademark Office, Commerce
Action: Final rule: Change of effective date
Summary: The Patent and Trademark Office amended the rules of practice in patent cases, Parts 1 and 5 of 37 CFR, to establish a streamlined procedure for granting licenses for foreign filing by publishing a notice in the5 Federal Register on Apr. 4, 1984, at 49 Fed. Reg. 13456-13463. The notice set an effective date of June 1, 1984. However, title 35, United States Code, section 41(g) provides that "No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register." Since these rules establish fees and the effective date of the rules was slightly less than 60 days after the publication of the final rule change in the Federal Register, it is necessary to set a later effective date.
Date: The effective date of the rule change published at 49 Fed. Reg. 13456-13463 is changed to June 4, 1984.
For further information contact: Kenneth L. Cage by telephone at (703) 557[g14 2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Apr. 30, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

[1042 O.G. 58]

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(151) **Office of Patents and Trademarks**
Revision of the Scope of the Secrecy Order for Defense Agency Use

The Patent and Trademark Office (PTO) is revising the scope and format of the Secrecy Orders issued under the Invention Secrecy Act of 1951, 35 U.S.C. 181 et seq., 37 CFR Part 5. The present forms of Secrecy Orders are very restrictively worded to control disclosure or use of an invention under Secrecy Order. The PTO previously would only authorize disclosure or use of a Secrecy Order invention by the grant of a special permit. Permits authorize limited disclosure and permissible use of the invention depending upon the nature of the technical data and national security controls. To receive a permit, a patent applicant had to petition the Commissioner, or te defense agency sponsoring the Secrecy Order would issue or could have sua sponte issued a permit with the Order.

The revised Secrecy Orders will permit disclosure and use consistent with the national security controls needed on the technical data in a patent application. The features of existing permits are incorporated into the Orders which will eliminate the need, in many cases, for the applicant to separately petition for a permit to authorize various degrees of disclosure or use.

These revisions to the scope and format of a Secrecy Order are intended to place essentially the same national security controls on the technical data in patent applications as those on other types of technical data. With respect to publication or disclosure of information which would, in the opinion of the sponsoring Agency, be detrimental to the national security, the revised Secrecy Orders will be consistent with existing national security and export control procedures. The revised Secrecy Orders will also clarify the procedures for handling and custody of applications subject to a Secrecy Order.

The three new Secrecy Order formats to be used by the defense agencies of the Department of Defense are as follows:

(1) *Secrecy Order and Permit for Foreign Filing in Certain Countries*

This Secrecy Order will be used for those patent applications that contain technical data whose export is controlled by the guidelines contained in DOD Directive 5230.25, dated Nov. 6, 1984, (codified as 32 CFR Part 250) which relates to export control under 10 U.S.C. 140(c) and the Militarily Critical Technologies List (MCTL). See 50 U.S.C. App. 2404(d).

This Secrecy Order is intended to permit widest utilization of the technical data while still controlling any publication or disclosure which would result in an unlawful exportation. This type of Secrecy Order sets forth the applicable export controls for technical data in either the Commodity Control List (CCL) 15 CFR Parts 379, 399.1 or the Munitions List of the International Traffic in Arms Regulation (ITAR), 22 CFR Part 121.

The countries where corresponding patent applications may be filed will be identified in the Order. The Order specially authorizes use of the invention for legitimate business purposes. The definition of this term in the Order is identical to that found in DOD Directive 5230.25, 32 CFR Part 250. The level of security control requires that the subject matter must be safeguarded under conditions that provide adequate protection and prevent access by unauthorized persons. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the Order.

Following is a sample copy of this type of Secrecy Order.

Serial No.:
Filed:
Applicant:
Title:
Sponsoring Agency & Address:

ECCN[1] Reference

Goods Accompanied by Sophisticated Know-How
Keystone Equipment or Materials

ITAR[2] Reference

Goods Accompanied by Sophisticated Know-How

Secrecy Order and Permit for Foreign Filing in Certain Countries

(Title 35, United States Code, Sections 181-188 (1952))

[1]Export Control commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).
[2] International Traffic in Arms Regulations (ITAR), 22 CFR 120-130.

NOTICE: To the applicant(s) above named; his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

The principals may disclose, for legitimate business purposes,[3] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include both selling or producing products for the commercial domestic marketplace or for the commercial foreign marketplace, providing that any required expert license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or governments overseas after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and the United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government.

[3] The term legitimate business purposes is to interpreted consistent with DOD Directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49 FR 484040 (Dec. 10, 1984).

Correspondence exclusively relating to payments of taxes and fees need not be sent through the sponsoring agency and diplomatic channels provided that such correspondence contains no information pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to theappropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and permit with the first papers to be filed in the foreign patent office.

The foreign government may require a waiver in writing of any claim to compensation for loss or damage due solely to the imposition of secrecy on the invention. Belgium, France, the Federal Republic of Germany, the Netherlands, Turkey and the United Kingdom normally require such a waiver in writing.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(2) *Secrecy Order and Permit for Disclosing Classified Information*

This Secrecy Order will be used for those patent applications which contain technical data that is either classified under Executive Order 12356, National Security Information, 47 FR 14874, Aug. 6, 1982, or properly classifiable under a security guideline where the patent application owner has a current DOD Security Agreement, DOD form 441. This Agreement requires the protection of classified technical data as prescribed in the Industrial Security Manual (ISM), DOD 5220.22-M.

The intent of this Secrecy Order is to treat classified technical data in a patent application in the same manner as any other classified material under the Industrial Security Manual (ISM). Accordingly, this Secrecy Order will include a notification of the classification level of the technical data in the application, and provided a level of protection at that classification level. The Order will apply to owners of patent applications who have a current DOD Security agreement (DD Form 441) under the ISM. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the order.

The following is a copy of this second type of Secrecy Order:

Serial No:
Filed:
Applicant:
Title:
To be protected at Classification Level of:
Top Secret, Secret, Confidential, or Special Instructions
Sponsoring Agency & Address:

Secrecy Order and Permit for Disclosing Classified Information

(Title 35, United States Code, sections 181-188 (1952))

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses classifiable information. The unauhorized disclosure of such matter would be detrimental to the national security,

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and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patent and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, and 186 (1951).

The subject matter of the above-identified application has been determined to be encompassed by E.O. 19865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is subject to the "Industrial Security Manual for Safeguarding Classified Information."

The principals shall protect the subject matter as required by the Industrial Security Manual for Safeguarding Classified Information and may disclose the subject matter of the above-identified application to other persons having the requisite clearance on a "need-to-know basis" *provided* the person to whom the subject matter is disclosed is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed. The declassification, in whole or in part, of the subject matter of the above-identified application does not modify this Secrecy Order. The requirements of this Secrecy Order remain in effect until the Secrecy Order is rescinded or modified by the Commissioner of Patent and Trademarks. The fact that the subject matter as a whole is declassified should be brought to the attention of the sponsoring agency.

This permission to disclose does not authorize the disclosure of the subject matter of the above-identified application through (1) the filing of any foreign application without specific permission of the Patent and Trademark Office, or (2) the export of any item or data without any export license which may be required.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(3) Secrecy Order

This Secrecy Order will be used for those patent applications that contain properly classifiable technical data under a security guideline where the patent application owner does not have a DOD Security Agreement under the ISM.

This Secrecy Order is substantially the same as the Secrecy Order in use up to now, and will be used where the other types of Orders do not apply. This Order may be issued by direction of agencies other than the Department of Defense. Unless issued with the initial Order, modifications to the Secrecy Order and/or permits under 37 CFR 5.1 et seq. will be needed for additional disclosure.

The following is a copy of this third type of Secrecy Order:

Serial No:
Filed:
Application:
Title:
Sponsoring Agency & Address:

Secrecy Order

(Title 35, United States Code, sections 181-188 (1952))

NOTICE: To the applicant(s) above named; his, her or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter the unauthorized disclosure of which would be detrimental to the national security, and you areordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized by the Commissioner of Patents and Trademarks.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

Since the disclosure of the subject matter of the above-identified application would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

Each Secrecy Order forbids the publication or disclosure of the invention except as specially authorized. By revising these Secrecy Orders to conform with existing export and classification authority, the burden on patent applicants to seek additional permits for disclosure and/or foreign filing under 37 CFR Part 5 will be reduced. The new Secrecy Orders reflect the level of secrecy required by law and regulation for various technologies and will place National Security and export controls on the patent application in harmony with other applicable export and classification controls. Also, this change will reduce the risk of disclosure of the subject matter of the invention by providing greater guidance on the safeguarding of the subject matter invention.

Information regarding the new Secrecy Orders may be obtained by calling Mr. Kenneth L. Cage, Director, Special Laws Administration Group, at (703) 557{g14 2877 or by mail directed to Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231.

Sept. 9, 1986.

DONALD W. PETERSON,
Deputy Commissioner of Patents and Trademarks.

[FR Doc. 86-21023 Filed 9-16-86; 8:45 am]
BILLING CODE 3510-16-M

[1071 OG 31]

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(152) **Foreign Filing of Secrecy Order Inventions In Japan 37 CFR Part 5**

Under the provisions of 37 CFR Part 5—Secrecy of Certain Invention and Licenses to File Applications in Foreign Countries — the Patent and Trademark Office may, with the approval of the defense agency sponsoring the secrecy order, permit the filing of secrecy order applications under 37 CFR 5.5 in designated foreign countries. The designated countries are those where the Government of the United States of America has entered into reciprocal patent secrecy arrangements.

Such arrangements between the United States of America and Japan include the transfer of technology and the national security provisions of the Mutual Defense Assistance Agreement, signed at Tokyo on Mar. 8, 1954, and the Agreement between the Government of the United States of America and the Government of Japan to Facilitate Interchange of Patent Rights and Technical Information for Purposes of Defense, signed at Tokyo on Mar. 22, 1956. These agreements became effective for the filing in Japan of patent applications under secrecy order in the United States of America as of Apr. 12, 1988, through an exchange of notes between the Government of the United States of America and the Government of Japan on Apr. 12, 1988. With the exchange of notes, the United States of America may permit transfer to Japan and Japan will protect certain defense-related technical information in patent applications in Japan disclosing inventions which are the subject of patent applications held in secrecy in the United States of America. Japan will accord patent protection to these applications consistent with Japanese patent law.

The 1956 Agreement recognizes that privately owned technology should, to the greatest extent practicable, be exchanged through commercial agreements between owners and users. It also stipulates that rights of private owners of patents and technical information should be fully recognized and protected in accordance with laws applicable to such rights. Other provisions are intended to assure fair treatment of private owners when they deal directly with a foreign government and to prevent private information that is communicated through government channels from being used or disclosed without authorization.

The 1956 Agreement also provides for the establishment of a Technical Property Committee to be composed of representatives from each government. The Technical Property Committee is charged with general responsibility for making recommendations to the two governments on any matters relating to the Agreement which are brought before the Committee by either government, either on its own behalf or on behalf of its nationals. One of the specific functions of the Committee is to make recommendations to the governments concerning disparities in the laws of both countries affecting the compensation of owners of patents and technical information.

Policy guidance for the United States of America representatives on the Technical Property Committee is provided by the Department of Commerce, the Department of Defense, and the Department of State.

The Patent and Trademark Office is providing for the addition of Japan as a country that is available for foreign filing of secrecy order applications in the following manner:

Type 1 secrecy orders entitled "Secrecy Order and Permit for Foreign Filing in Certain Countries" 51 *Federal Register* 32938, (Sept. 17, 1986), 1071 *Official Gazette* 31, (Oct. 21, 1986), list all available countries where foreign filing is authorized. The countries are: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and United Kingdom.

As of Apr. 12, 1988, Japan will be included in all type 1 secrecy orders as one of the authorized countries for foreign filing. All type 1 secrecy orders issued prior to Apr. 12, 1988, will be modified by the Patent and Trademark Office within 30 days of this notice to include Japan as an authorized country. A sample copy of this new type 1 secrecy order appears in Appendix I.

Under all other Patent and Trademark Office secrecy orders, foreign filing in Japan will be considered on a case-by-case basis under 37 CFR 5.5. All principals as defined in 37 CFR 5.2 to be the applicant's successors, assignees and legal representatives who requested, but were denied, Japan as a country for foreign filing under 37 CFR 5.5(c) since Jan. 1, 1982, will have their petitions automatically reviewed within 90 days of the date of notice to determine if the invention may be foreign filed in Japan. In those instances where filing in Japan was requested, these principals will not have to file any petition under 37 CFR 5.5(c) before the Patent and Trademark Office in order to receive this review. If permission for filing in Japan is granted, the principals will be notified by the Patent and Trademark Office, including the identification of appropriately designated attorneys. A sample copy of this special permit for foreign filing in Japan appears in Appendix II.

Any other principals presently having an application under secrecy order desiring to file the secrecy order application in Japan should file a petition under 37 CFR 5.5 naming Japan a designated country.

To the extent possible, principals should designate whether the invention described in the patent application is or has been transferred in a format other than a patent application to Japan under the Mutual Defense Assistance Agreement between the United States of America and Japan, signed in Tokyo on Mar. 8, 1954. This information will be necessary in order to assure both governments that appropriate national security controls as rovided for in the specific Mutual Defense Assistance Agreement will be utilized.

For further information contact, Kenneth L. Cage, Director of Group 220, by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington D.C. 20231.

Apr. 12, 1988.

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

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Appendix I

Serial No: Filed:
Applicant:
Title:
Sponsoring Agency & Address:

ECCN[1] REFERENCE		ITAR[2] REFERENCE
Goods Accompanied by Sophisticated Know-How	Keystone Equipment or Materials	Goods Accompanied by Sophisticated Know-How

SECRECY ORDER AND PERMIT FOR FOREIGN FILING IN CERTAIN COUNTRIES
(Title 35, United States Code, Sections 181-188 (1952)

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter immediately must be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

[1]Export Control commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).

[2] International Traffic in Arms Regulations (ITAR), 22 CFR 120-130.

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The principals may disclose, for legitimate business purposes,[3] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include selling or producing products for the commercial domestic marketplace, or for the commercial foreign marketplace providing that any required export license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or foreign governments after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government. Correspondence exclusively relating to payments of taxes and fees need not be sent through the sponsoring agency and diplomatic channels provided that such correspondence contains no information pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to the appropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and Permit with the first papers to be filed in the foreign patent office.

The use of this permit shall constitute a waiver, unless otherwise required by the international agreements, of any claim to compensation for loss or damage due solely to the imposition of secrecy or similar treatment of the invention. Belgium, France, Federal Republic of Germany, Netherlands, Norway, Turkey and United Kingdom normally require a separate document confirming such a waiver.

In the case of Japan, the applicant shall ensure in its contract with its patent attorney that the patent attorney shall submit to the Japanese Patent Office a certified copy of this Secrecy Order and Permit. The submission of this permit to the Japanese Patent Office is considered notification to the Government of Japan and the Secrecy Order status of the above-mentioned application and a corresponding Japanese application will be considered an Agreement Application referred to in 3(a) of the Protocol to the 1956 United States-Japan Agreement.

This Order should not be construed in any way to mean that the U.S. Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration

* * * * *

Appendix II

PERMIT FOR FOREIGN FILING IN JAPAN
(35 USC 182)

Permit Docket — Petition
U.S.Serial No. — Filed
Applicant:
Title:
INITIATING AGENCY
Address:

The order of secrecy in the above-identified application is modified to permit filing of a corresponding application for patent in Japan on condition that:

(1) the papers for application in Japan be transmitted in a manner approved for information assigned protection at a classification level of 1,25,0.5 to the Initiating Agency for forwarding for filing in Japan; (Questions with respect to the handling of such information should be directed to the Initiating Agency);
(2) at the time the papers for the application in Japan are transmitted to the Initiating Agency for forwarding for filing in Japan, an extra copy of the application be included, this extra copy to be transmitted by the Initiating Agency to the authorities of the government of Japan for defense purposes;
(3) the applicant submit to the Initiating Agency as soon as possible the Application Number and filing date of the application in the Japanese Patent Office;
(4) the applicant take all reasonable steps to safeguard the information in the application in the Japanese Patent Office; and
(5) the applicant ensure in its contract with its patent attorney in Japan that the patent attorney shall submit a certified copy of this permit to the Japanese Patent Office with the whole set of documents for the application.

The use of this permit shall constitute a waiver by the applicant of any right to compensation for damage which might arise under the laws of Japan by virtue of the mere fact that the invention is being handled pursuant to 3(a) of the Protocol to the Agreement between the Government of the United States of America and the Government of Japan to Facilitate Interchange of Patent Rights and Technical Information for Purposes of Defense, signed at Tokyo on March 22, 1956 (hereinafter referred to as the 1956 Agreement), or for unauthorized disclosure of the invention, but reserving a right of compensation under Article IV of the 1956 Agreement.

This permit does not lessen the responsibility of the applicant to comply with the provisions of any applicable government contract which may require that approval to disclose information in Japan be obtained from the contracting officer.

This permit constitutes the notification to the Government of Japan, which the Government of the United States of America undertakes to make pursuant to 4(a) of the Protocol to the 1956 agreement, that the patent application mentioned in this permit is held in secrecy in the United States of America.

Further, this permit identifies an application to be filed in the Japanese Patent Office, which corresponds to the patent application mentioned in the Permit For Foreign Filing, as an Agreement Application referred to in 3(a) of the Protocol to the 1956 Agreement.

This permit may be altered or revoked, in whole or in part, by appropriate notice.

Director, Special Laws Administration

[1090 OG 9-17]

[3] The term legitimate business purposes is to interpreted consistent with DOD Directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49 FR 484040 (Dec. 10, 1984).

(153) **Foreign Filing of Secrecy Order Inventions In Designated Countries 37 CFR Part 5**

Under the provisions of 37 CFR Part 5, —Secrecy of Certain Inventions and Licenses to File Applications in Foreign Countries — the Patent and Trademark Office may, with the approval of the defense agency sponsoring the secrecy order, permit the filing of secrecy order applications under 37 CFR 5.5 in designated foreign countries with which the Government of the United States of America has entered into reciprocal patent secrecy arrangements.

The United States of America has detailed arrangements with 17 countries, most of whom are members of the Coordinating Committee for Multilateral Export Controls (COCOM). These arrangements provide protection for classified and other sensitive inventions when patent applications are being held in secret. These countries are as follows: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Sweden, Spain, Turkey and United Kingdom.

For further information contact Kenneth L. Cage by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Sept. 29, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1095 OG 63]

(154) **Foreign Filing of Secrecy Order Inventions In Spain 37 CFR Part 5**

Under the provisions of 37 CFR Part 5 — Secrecy of Certain Invention and Licenses to File Applications in Foreign Countries — the Patent and Trademark Office may, with the approval of the defense agency sponsoring the secrecy order, permit the filing of secrecy order applications under 37 CFR 5.5 in designated foreign countries. The designated countries are those where the Government of the United States of America has entered into reciprocal patent secrecy arrangements.

Such arrangements include the North Atlantic Treaty Organization (NATO) Agreement for the Mutual Safeguarding of Secrecy of Inventions Relating to Defense and for Which Applications for Patents Have Been Made (12 UST 43; TIAS 4672), which was signed at Paris, France on Sept. 21, 1960, entered into force for the United States on Jan. 12, 1961, with implementing procedures to the agreement entering into force on Sept. 3, 1969.

Spain acceded to this NATO Agreement on Aug. 10, 1987. On July 28, 1988, Spain notified the Secretary General of NATO that the implementing procedures shall be applicable to Spain as of that date.

The other NATO countries which adhere to this agreement are Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Turkey, and United Kingdom. All of the above countries, except Italy, have also entered into force the implementing procedures; however, filing arrangements with Italy are subject to a separate agreement.

With the implementation of the NATO procedures, the United States of America may permit transfer to Spain and Spain will protect certain defense-related technical information in patent applications in Spain disclosing inventions which are the subject of patent applications held in secrecy in the United States of America. Spain will accord patent protection to those applications consistent with Spanish patent law.

The Patent and Trademark Office is providing for the addition of Spain as a country that is available for foreign filing of secrecy order applications in the following manner.

Type 1 secrecy orders entitled "Secrecy Order and Permit for Foreign Filing in Certain Countries" 51 *Federal Register* 32938, (Sept. 17, 1986), 1071 *Official Gazette* 31, (Oct. 21, 1986), revised 1090 *Official Gazette* 9, (May 3, 1988), list all available countries where foreign filing is authorized. The countries are: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and United Kingdom.

As of the date of this notice, Spain will be included in all type 1 secrecy orders as one of the authorized countries for foreign filing. All type 1 secrecy orders now in force will be modified by the Patent and Trademark Office upon their renewal anniversary to include Spain as an authorized country. A sample copy of this new type 1 secrecy order appears in the Appendix.

Under all other Patent and Trademark Office secrecy orders, foreign filing in Spain will be considered on a case-by-case basis under 37 CFR 5.5. All principals, as defined in 37 CFR 5.2 to be the applicant, the applicant's successors, assignees and legal representatives who requested, but were denied, Spain as a country for foreign filing under 37 CFR 5.5(c) since Jan. 1, 1982, will have their petitions automatically reviewed within 90 days of the date of notice to determine if the invention may be foreign filed in Spain. In those instances where filing in Spain was requested, these principals will not have to file any petition under 37 CFR 5.5(c) before the Patent and Trademark Office in order to receive this review.

Any principals, including those under a type 1 secrecy order, presently having an application under secrecy order desiring to file the secrecy order application in Spain should file a petition under 37 CFR 5.5 naming Spain a designated country.

The Secretary of the Armed Services Patent Advisory Board, 5611 Columbia Pike, Room 332-A, Falls Church, Va. 22041-5013, (703) 756-2430 will provide names of patent attorneys, and agents or other representatives in Spain authorized by the Government of Spain to have access to such secrecy order applications.

For further information contact, Kenneth L. Cage, Director of Group 220, by telephone at (703) 557-2877 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington D.C. 20231.

Sept. 29, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

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Appendix

Serial No: — Filed:
Applicant:
Title:
Sponsoring Agency & — Address:

ECCN[1] REFERENCE		ITAR[2] REFERENCE
Goods Accompanied by Sophisticated Know-How	Keystone Equipment or Materials	Goods Accompanied bySophisticated Know-How

[1] Export Control Commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).
[2] International Traffic in Arms Regulation (ITAR), 22 CFR §§ 120-130.

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SECRECY ORDER AND PERMIT FOR FOREIGN FILING IN CERTAIN COUNTRIES
(Title 35, United States Code, Sections 181-188 (1952)

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter immediately must be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

The principals may disclose, for legitimate business purposes,[1] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include selling or producing products for the commercial domestic marketplace, or for the commercial foreign marketplace providing that any required export license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or foreign governments after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Sweden, Spain, Turkey and United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government. Correspondence exclusively relating to payments of taxes and fees need not be sent through the sponsoring agency and diplomatic channels provided that such correspondence contains no information pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to the appropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and Permit with the first papers to be filed in the foreign patent office.

The use of this permit shall constitute a waiver, unless otherwise required by the international agreements, of any claim to compensation for loss or damage due solely to the imposition of secrecy or similar treatment of the invention. Belgium, France, Federal Republic of Germany, Japan, Netherlands, Turkey and United Kingdom normally require a separate document confirming such a waiver.

In the case of Japan, the applicant shall ensure in its contract with its patent attorney that the patent attorney shall submit to the Japanese Patent Office a certified copy of this Secrecy Order and Permit. The submission of this permit to the Japanese Patent Office is considered notification to the Government of Japan and the Secrecy Order status of the above-mentioned application and a corresponding Japanese application will be considered an Agreement Application referred to in 3(a) of the Protocol to the 1956 United States-Japan Agreement.

This Order should not be construed in any way to mean that the U.S. Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration

[1095 OG 63]

[1] The term legitimate business purposes is to be interpreted consistent with DOD Directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49 FR 484040 (Dec. 10, 1984).

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(155) Guidelines for Extension of Patent Term Under 35 U.S.C. 156

This notice is intended to establish initial guidelines for patent owners who are seeking extensions of patent terms pursuant to newly enacted 35 U.S.C. 156. These guidelines will be effective until further notice. Section 156 of Title 35, United States Code, provides that a patent owner seeking an extension of the term of a patent pursuant to its provisions must submit an application to the Commissioner of Patents and Trademarks (hereinafter Commissioner) within a certain defined period of time. Section 156 specifies certain components the application is to contain, including "such patent or other information as the Commissioner may require." See 35 U.S.C. 156(d) (1) (E). Section 156(d) (4) also provides that "[a] n application for the extension of the term of a patent is subject to the disclosure requirements prescribed by the Commissioner." Section 156(h) provides that the "Commissioner may establish such fees as the Commissioner determines appropriate to cover the costs to the Office of receiving and acting upon applications under this section." The purpose of this notice is to provide the guidelines which a patent owner or its agent should use in deciding whether to submit an application for the extension of the term of a patent to the Patent and Trademark Office and in actually making the submission of such an application. This notice is divided into a number of sections set forth below which treat various determinations which have to be made by a patent owner or its agent prior to submission of an application and further includes guidelines as to the actual content of an application for extension of the term of a patent.

A patent owner or its agent should use the guidelines in the various sections set forth below in determining whether a patent is subject to, and meets the conditions for, extension of its term. If so, the patent owner or its agent should also use the guidelines set forth below in preparing and filing an application for extension of the patent term. If any application for extension of the term of a patent is filed in accordance with 35 U.S.C. 156 before the date on which this notice is published in the Official Gazette and is not in compliance with the requirements of this notice, applicant will be notified of the deficiencies in the application and will be given a period of time within which to correct the deficiencies.

Guidelines

§ A. *Patents subject to extension of the patent term.*

(a) Any patent which claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, is subject to being extended in accordance with 35 U.S.C. 156.

(b) The term "product" referred to in paragraph (a) of this section means (1) a human drug product or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act. The term "human drug product" means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.

§ B. *Conditions for extension of term of a patent.*

The term of a patent may be extended if:

(a) the patent claims a product or a method of using or manufacturing a product as defined in § A of this notice;
(b) the term of the patent has never been previously extended except for any interim extension issued pursuant to 35 U.S.C. 156(e) (2);
(c) an application for extension is submitted pursuant to § D of this notice;
(d) the product has been subject to a regulatory review period as defined in 35 U.S.C. 156(g) and by the Secretary of Health and Human Services before its commercial marketing or use;
(e) the product has received permission for commercial marketing or use and (i) the application is submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or used under the provision of law under which the applicable regulatory review period occurred, or (ii) in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;
(f) the term of the patent has not expired before the submission of an application pursuant to § D of this notice; and
(g) no other patent has been extended for the same regulatory review period for the product.

§ C. *Applicant for extension of patent term.*

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of § D of this notice.

§ D. *Application for extension of the term of a patent.*

(a) An application for extension of the term of a patent must be made in writing to the Commissioner of Patents and Trademarks. The filing date of an application for extension of the term of a patent is the date on which the complete application for extension and a duplicate of the papers thereof, certified as such, are received in the Patent and Trademark Office or filed pursuant to the provisions of 37 CFR 1.10. The provisions of 37 CFR 1.8 should not be used to file an application for the extension of the term of a patent.

(b) A complete application for the extension of the term of a patent comprises:

(1) a complete identification of the approved product as by appropriate chemical and physical structure or characteristics;
(2) a complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;
(3) an identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;
(4) a statement that the application is being submitted within the sixty day period permitted for submission and an identification of the date of the last day on which the application could be submitted;
(5) a complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, and the date of issue;
(6) a copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings, in the form of a cut-up copy of the original patent with only a single column of the printed patent securely mounted or reproduced in permanent form on one side of a separate paper;
(7) a copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;
(8) a statement that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claims and demonstrates the mannerin which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;
(9) the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period;
(10) a brief description of the activities undertaken by the applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities;
(11) a statement that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined;
(12) a statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to any determinations to be made relative to the application for extension; and
(13) the prescribed fee for receiving and acting upon the application for extension (see § F of this notice) and an oath or declaration as set forth in paragraph (c) of this section.

(c) Any application for extension of the term of a patent submitted pursuant to paragraphs (a) and (b) of this section must include an oath or declaration signed by the owner of record of the patent or its agent which specifically identifies the application papers and the patent for which an extension is sought and avers that the person signing the oath or declaration:

(1) has reviewed and understands the contents of the application being submitted pursuant to this section;
(2) believes the patent is subject to extension pursuant to § A of this notice;
(3) believes an extension of the length claimed is fully justified under 35 U.S.C. 156; and
(4) believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in § B of this notice.

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(d) If any application for extension of the term of a patent submitted pursuant to this section is held to be incomplete, applicant may seek to have that holding reviewed by filing a petition pursuant to 37 CFR 1.182 within such time as may be set, or if no time is set, within one month of the date on which the application was held incomplete.

§ E. *Interim extension of the term of a patent.*

An applicant who has filed an application for extension pursuant to § D of this notice may request one or more interim extensions for periods of up to one year pending a final determination on the application. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions for periods of up to one year until a final determination is made without a request by the applicant. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§ F. *Fee for receiving and acting on an application for extension of the term of a patent.*

Pursuant to 35 U.S.C. 156(h) the Commissioner has determined that a fee of $750.00 is appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for extension of the term of a patent filed pursuant to 35 U.S.C. 156. The fee should accompany the application when filed. If a fee in a different amount is adopted in Title 37 of the Code of Federal Regulations, applicant will be refunded any excess or required to submit any deficiency.

§ G. *Address for application for extension of the term of a patent and communications relating thereto.*

All applications for extension of the term of a patent and any communcations relating thereto intended for the Patent and Trademark Office should be addressed to the Commissioner of Patents and Trademarks, Box Patent Ext., Washington, D.C. 20231. When appropriate, the communication should also be marked to the attention of a particular individual.

§ H. *For further information contact:*

R. Franklin Burnett by telephone at (703) 557 3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Summary

The initial guidelines set forth above are considered to be appropriate and authorized by 35 U.S.C. 156. They will provide appropriate guidance to patent owners and their agents pending appropriate changes which will be made in Title 37 of the Code of Federal Regulations.

DONALD J. QUIGG,
Sept. 25, 1984. *Acting Commissioner of Patents and Trademarks.*

[1047 O.G. 16]

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(156) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 60594-7007]

Rules for Extension of Patent Term

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases, Part 1 of Title 37, Code of Federal Regulations, to provide the rules and procedures under which extensions in the terms of patents may be sought pursuant to the provisions of 35 U.S.C. 156 which was enacted on Sept. 24, 1984 in Title II of Pub. L. 98 417, the "Drug Price Competition and Patent Term Restoration Act of 1984." The new 35 U.S.C. 156 provides that, upon application to the Commissioner of Patents and Trademarks, the term of a particular patent, which claims a product or a method of using or manufacturing a product as defined in the Public Law, may be extended under certain circumstances and conditions where the product has been subject to a regulatory review as defined in Pub. L. 98 417 and by the Secretary of Health and Human Services, before its commercial marketing or use. The rule changes amending Part 1 of Title 37 would provide specific procedures for the submission of such applications to the Patent and Trademark Office and for the determination and issuance of certificates of patent term extension (PTE) by the Patent and Trademark Office on the applications submitted.
Effective Date: May 26, 1987.
For Further Information Contact: Charles E. Van Horn by telephone at (703) 557-3637 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: A notice of proposed rulemaking was published in the **Federal Register** on July 30, 1986, at 51 FR 27205 27215 and in the Official Gazette on Aug. 19, 1986, at 1069 O.G. 25 34. An oral hearing was held on Sept. 15, 1986. Sixteen written letters and statements were submitted. Two (2) persons testified at the oral hearing which resulted in ten (10) pages of testimony.

Objectives of the Rule Change

The rule change makes some clarifications and additions to the initial operating guidelines which were published as "Guidelines for Extension of Patent Term under 35 U.S.C. 156" in the Official Gazette of the PTO on Oct. 9, 1984. Several of the changes are designed to adopt and implement suggestions from members of the public.

Discussion of Specific Rules

Section 1.1 is amended to indicate that applications for extension of patent terms and any communications relating thereto intended for the Patent and Trademark Office should be directed to "Box Patent Ext."

The filing of an application for an extension of the term of a patent would be considered timely if received in the Patent and Trademark Office on or before the statutory deadline, or if the application is deposited with the U.S. Postal Service in accordance with the provisions of § 1.8 or § 1.10 of this part before the statutory deadline. The filing of an application for an extension of the term of a patent would be treated in the same manner as the filing of any paper required to be filed in the Patent and Trademark Office within a set period of time and not subject to the exceptions enumerated in 37 CFR 1.8(a).

Section 1.20 is amended to add paragraph (n) to establish a fee of $550.00 for filing an application for extension of the term of a patent pursuant to § 1.740. This amount is set to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for extension of patent term as provided in 35 U.S.C. 156(h) based upon PTO experience in processing applications for patent term extension during the first two years of implementation.
Comment:
The reduction in the fee for filing an application for patent term extension from $750.00 to $550.00 has raised the question of how to obtain refunds for those applications filed under the initial operating guidelines.
Reply:
When the final rules are approved, refunds will be made to those who paid the higher fee without any request being filed. Although the final rules do not take effect until 60 days from publication in the **Federal Register**, the fee of $550.00 should be paid with any application filed after the date of this publication of the final rules.
Comment:
It has been suggested that a lower fee be set for the filing of a patent term extension application which would be applicable to small entities.
Reply:
This suggestion has not been adopted since there is no statutory provision for such a fee structure.

A new "Subpart F Extension of Patent Term" is added to Part 1 to include §§ 1.710 through 1.785.

Section 1.710 defines the patents subject to extension of the patent term. Paragraph (a) of § 1.710 defines the patents subject to extension in terms of the subject matter being claimed therein. Under paragraph (a) of § 1.710 a patent to (1) a product, (2) a method of using a product, (3) or a method of manufacturing a product can be extended as long as the product meets the definition contained in paragraph (b) of § 1.710, and as long as the other conditions and requirements for extension of patent term are met. Paragraph (b) of § 1.710 follows the language of 35 U.S.C. 156 and defines a "product" as meaning (1) a human drug product or (2) any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act. The term "human drug product" as defined in paragraph (b) of § 1.710 means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.
Comment:
It has been proposed that § 1.710 be modified to specifically acknowledge that patents claiming pharmaceutical compositions or formulations of the "product" are eligible for extension or alternatively to modify the term "product" to include such compositions or formulations.
Reply:
"Product" is specifically defined in 35 U.S.C. 156(f) as follows. For a human drug product, the term means "the active ingredient of a new drug, antibiotic drug or human biological product (as those terms are used in the Federal Food, Drug and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity, or in combination with another active ingredient." A patent is considered to claim the product where it claims the active ingredient per se, or claims a composition or formulation which contains the active ingredient(s) and reads on the composition or formulation approved for commercial marketing or use.
Comment:
It has been suggested that the language of § 1.710(b) be modified to read "(1) a human drug product (i.e., the active ingredient of a new drug, antibiotic drug or human biological product, as those terms are used in the Federal Food, Drug, and Cosmetic Act and/or the Public Health Service Act)", with a similar modification at the bottom of the paragraph.
Reply:
Since the language used in this section of the rule tracks the statutory language on which it is based and to avoid possible confusion or unnecessary ambiguity, the proposed modification has not been adopted.
Comment:
It has been suggested that the definition of the term "product" be broadened to specifically refer to product-by-process claimed products.
Reply:
The term "product" as defined in the statute and rules is considered to encompass any means of defining a product. Product-by-process claims are only an alternative form available to claim a product. Neither the proposed rules nor statute limit the manner of claiming a product.

Section 1.720 defines the conditions under which the term of a patent may be extended. The conditions for extension are:

(1) The patent must claim a product or a method of using or manufacturing a product as defined in § 1.710;
(2) The term of the patent must never have been previously extended except for any interim extension issued pursuant to § 1.760;
(3) An application for extension must be submitted in compliance with § 1.740;
(4) The product must have been subject to a regulatory review period as defined in 35 U.S.C. 156(g) before its commercial marketing or use;
(5) The product must have received permission for commercial marketing or use and (i) the permission for the commercial marketing or use of the product must be the first received permission for commercial marketing or use under the provision of law under which the applicable regulatory review occurred, or (ii) in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the permission for the commercial marketing or use must be the first received permission for the commercial marketing or use of a product manufactured under the process claimed in the patent;
(6) The application must be submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred, or in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension must be submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of the product manufactured under the process claimed in the patent;
(7) The term of the patent must not have expired before the submission of an application in compliance with § 1.741; and
(8) No other patent term must have been extended for the same regulatory review period for the product.

Comment:
It has been suggested that § 1.720(e) be modified to avoid combining the two statutory requirements that (1) the product is an approved product, that is, it has received permission for commercial marketing or use and (2) that the application be submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use.
Reply:
The section has been modified to be more consistent with the underlying statutory language. In addition, subsection (e)(i) has been changed to (f), the term (ii) has been cancelled and subsections (f) and (g) have been relettered as (g) and (n) respectively. Thus, each statutory requirement is separately provided for as suggested.
Comment:
The rule appears to distinguish between the date when commercial marketing or use is "first *permitted*" for products made by DNA method inventions, versus the date a product first "*received* permission" for commercial marketing or use. Since this distinction is not required by the statute which uses the language "first permitted commercial marketing or use" in each case, is there some other policy reason for the apparent distinction?
Reply:
No distinction was intended, simply a different combination of words used to describe the same date—i.e. the date of "first permitted commercial marketing or use."
Comment:
It has been suggested that patent term extension should not be available for a patent in which a terminal disclaimer has been filed and particularly where such a terminal disclaimer was necessary to avoid double patenting.
Reply:
The suggestion has not been adopted since there is no statutory basis for denying an application for patent term extension where the term of the patent sought to be extended is affected by a terminal disclaimer.

Section 1.730 requires that an application for extension of a patent be submitted by the owner of record of the patent or its agent and that the application must comply with the requirements of § 1.740. The application papers submitted would be required to clearly reflect and establish the authority of the person submitting the application to do so on behalf of the owner. See § 1.740(b). For example, if the person submitting the application is the owner of record, the application papers would be required to so reflect. If the person submitting the application is doing so as the agent of the owner of record, the application papers must so reflect and establish the authority of the agent to act on behalf of the owner, e.g., as an officer of a corporate owner.
Comment:
It has been suggested that § 1.730 be deleted as being redundant with §§ 1.720(c) and 1.740(b).
Reply:
This suggestion has not been adopted. Section 1.730 repeats the statutory requirement as to those eligible to file the appli-

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cation for patent term extension. Sections 1.720(c) and 1.740(b) reflect the Commissioner's rule making authority as to what is necessary to demonstrate that the statutory requirement has been met by defining (1) who must sign the oath or declaration which accompanies an application for patent term extension and (2) the contents of the oath and declaration. Thus the sections are not redundant.

Section 1.740 establishes the contents and requirements of an application for extension of patent term. Paragraph (a) of § 1.740 requires that the application be made in writing to the Commissioner of Patents and Trademarks. The certified duplicate of the application papers will serve as the copy to be submitted by the Commissioner to the Secretary of Health and Human Services in order that the Secretary may determine the applicable regulatory review period as required by Pub. L. 98 417.

Paragraph (a) of § 1.740 further specifies the contents of a formal application for extension of patent. If the application does not meet all formal requirements when submitted, the applicant will be notified of the informalities and may seek to have that holding reviewed under § 1.740(c). In accordance with paragraph (a) of § 1.740, a formal application for the extension of the term of a patent shall include:

(1) A complete identification of the approved product as by appropriate chemical and generic name, physical structure or characteristics that would permit the Commissioner to make a determination of whether the patent claims the approved product, or a method of making or using the approved product;

(2) A complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;

(3) An identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;

(4) In the case of a human drug product, an identification of each active ingredient in the product and as to the product and each active ingredient, a statement that they have not been previously approved for commercial marketing or use under the Federal Food Drug and Cosmetic Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) and the provision of law under which it was approved;

(5) A statement that the application is being submitted within the sixty day period permitted for submission pursuant to proposed § 1.720(f) and an identification of the date of the last day on which the application could be submitted;

(6) A complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, the date of issue, and the date of expiration;

(7) A copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings;

(8) A copy of any disclaimer, certificate of correction, receipt or statement of maintenance fee payment, or reexamination certificate issued in the patent;

(9) A statement beginning on a new page that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;

(10) A statement beginning on a new page of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period.

(i) For a human drug product, this information will include the effective date of the investigational new drug (IND) application and the IND number; the date on which a new drug application (NDA) was initially submitted and the NDA number; and the date on which the NDA was approved;

(ii) For a food or color additive, this information will include the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number; and the date on which the application was approved;

(iii) For a medical device, this information will include the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which an application for product approval under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application; and the date on which the application was approved.

In the cases where there is no regulatory event to reflect the commencement of the testing or approval phase of the regulatory review period, applicants should include in the application the dates that they claim initiate either the approval or the testing phases and an explanation of their reasonable basis for why they conclude that these dates are the relevant dates. For instance, when the clinical trials are conducted outside the United States, the testing phase for a medical device begins on the date the clinical investigation involving the device was begun. An applicant should include an explanation as to why the date claimed is the date on which such clinical investigations had commenced. If the applicant had any means of substantiating that date, that information should be included in the application.

Finally, on this separate page in the application there should be a statement as to the length of the regulatory review period claimed including an explanation of how the applicant determined the length of the regulatory review period. It should be noted in the application that this particular calculation is made solely with respect to section 156(G)(1) thru (3) of Title 35 of the United States Code and does not take into account any other limitations or restrictions on the length of possible patent extension.

(11) A brief description beginning on a new page of the significant activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities. This description should include an identification of significant communications of substance with the Food and Drug Administration (FDA) and the dates related to such communications. For example, these activities would include the dates of the submission of new data to the FDA, communications between FDA and the applicant with respect to the appropriate protocols for testing the product, and communications between FDA and the applicant that are attempts to define the particular requirements for premarketing approval of this particular product.

(12) A statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined and whether the 14 year limit of 35 U.S.C. 156(c)(3), the five year limit of 35 U.S.C. 156(g)(4)(A) or (B) or the two year limit of 35 U.S.C. 156(g)(4)(C) applies.

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to the determination of entitlement to the extension sought (see § 1.765);

(14) The prescribed fee for receiving and acting upon the application for extension (see § 1.20(n);

(15) The name, address, and telephone number of the person to whom contacts and correspondence relating to the application for patent term extension are to be directed;

(16) A duplicate of the application papers, certified as such; and

(17) An oath or declaration as set forth in paragraph (b) of this section.

Paragraph (b) of § 1.740 requires that an oath or declaration signed by the owner of record of the patent or its agent accompany the application as a part thereof. An application for extension filed without an oath or declaration is not a formal application. The oath or declaration filed as a part of the application must specifically identify the application papers and the patent for which an extension is sought and include averments that the person signing the oath or declaration:

(1) Is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters.

(2) Has reviewed and understands the contents of the application being submitted pursuant to § 1.740;

(3) Believes the patent is subject to extension pursuant to § 1.710;

(4) Believes an extension of the length claimed is fully justified under 35 U.S.C. 156 and the applicable regulations; and

(5) Believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in § 1.720.

In signing the oath or declaration referred to in paragraph (b) of § 1.740 an official of a corporate owner or an attorney or agent acting on behalf of the owner is representing that he or she is the agent of the owner and has authority to act on behalf of the owner in filing the application for patent term extension. Note also § 1.730.

Paragraph (c) of § 1.740 provides for review of a holding that an application for patent term extension is informal by the filing of a petition with any appropriate fee, if necessary, pursuant to §§ 1.181, 1.182 or 1.183 of this title. Should an applicant disagree with the holding of informality and wish to have the holding reviewed, a petition under 37 CFR 1.181 would be appropriate. If applicant chooses to provide additional information to correct the informality, a petition under 37 CFR 1.182, accompanied by the required fee, should accompany such a filing.

The failure to timely comply with any requirement of these regulations which is not an explicit requirement of the statute may be waived under the appropriate circumstances in accordance with 37 CFR 1.183. While timely action is expected, relief under 37 CFR 1.183 may be appropriate in view of the tight time deadlines and other circumstances involved in filing an application for extension of the patent term. Any such petition must be filed with the required fee within such time as may be set, or if no time is set, within one month of the holding.

Comment:

It has been suggested that § 1.740 be modified in order to permit the obtaining of a filing date for an application should it be found not to meet all of the requirements of § 1.740(a). The suggestion arises from a concern that an application which was filed within the 60 day filing period provided by statute and which was subsequently found to be informal within the meaning of the rules, might lose the filing date for failing to meet all requirements of the rules at the time of filing. Since the period for filing an application for patent term extension is limited by statute, it might not be possible for an applicant to correct such informalities within the statutory period of 60 days and could result in the loss of rights to an extension. In this regard it has also been suggested that the rules be modified to allow a filing date for a "substantially complete application" which might have been determined by the Patent and Trademark Office to be incomplete or informal.

Reply:

This suggestion has been essentially adopted by providing a new section designated 1.741 which specifically defines the requirements which must be met in order for an application to be entitled to a filing date. These requirements are those set forth in 35 U.S.C. 156(d)(1). Section 1.740(b) has been relettered as (a) and defines what constitutes a "formal application". Subparagraph (c) now provides for notice to applicant in the event that the application as filed is found to be informal as well as applicant's recourse to such a holding. If the requirements of § 1.741 are met, the filing date will have been established as provided therein even if the application is held to be informal under § 1.740.

Comment:

Clarification of the requirements of §§ 1.740 (a)(1) and 1.740 (a)(4) has been requested with regard to products or methods of making or using them so as not to require the submission of trade secret information unless necessary for a determination of eligibility for patent term extension or at least enable the PTO to maintain the information of this type as a trade secret.

Reply:

There is no provision in the statute or proposed rules for withholding from the public any information that is submitted to the PTO or FDA relating to an application for patent term extension. If proprietary or trade secret information is submitted to the Office, and specifically identified as such, it will be maintained in secret by the PTO until a certificate of patent term extension is issued. Identification should be made by page, line and word as necessary. If such information was necessary to a determination of eligibility or any other PTO responsibility under 35 U.S.C. 156, it will be made public at the time the certificate is issued. Otherwise, the trade secret information will be expunged from the file and returned to the patent term extension applicant, if the information regard as a trade secret is specifically identified.

Comment:

Section 1.740(a)(4) is confusing because it is unclear whether an applicant for a patented formulation that combines two active agents must submit information as to the regulatory review periods for each active ingredient separately, the combined active agents, or all of the above.

Reply:

All of the above is correct, so that a determination can be made under 35 U.S.C. 156(a)(5).

Comment:

Section 1.740(a)(4) should be modified to include a statement that the applicant is not prejudiced by the rule requirements in obtaining a patent term extension where some, but not all, active ingredients have been approved by the FDA for commercial marketing or use prior to approval of the new chemical entity (NCE) claimed in the patent for which a PTE application has been filed.

Reply:

The basic issue presented by this comment is whether a patent claiming an approved product containing an old active ingredient (approved by FDA in a prior regulatory review) and a new active ingredient is eligible for patent term extension. The PTO has a long standing policy of not addressing an issue in advance of receiving an application presenting the issue for determination. However, the concept of patent term restoration appears to be directed to those situations where a new chemical entity is involved as an active ingredient, regardless of the content of the balance of the formulation approved by the FDA.

Comment:

It has been suggested that § 1.740(a)(4) be deleted as redundant with §§ 1.740(a)(1) and 1.740(a)(3) and might be interpreted as requiring information not authorized by statute.

Reply:

Section 1.740(a)(4) requires a statement, by applicant, that each active ingredient present in the approved product has not been previously approved for commercial marketing and use. This is a different requirement from either § 1.740(a)(1) or § 1.740(a)(3) which require an indentification of the approved product and an identification of the date on which the product received permission for commercial marketing or use. This information is important to a determination of eligibility under 35 U.S.C. 156(a)(5). As to the question of information authorized by statute, 35 U.S.C. 156(d)(1)(E) permits the Commissioner to request any such information required.

Comment:

It has been suggested that § 1.740(a)(6) be modified to include a requirement that the application, in identifying the patent for which extension is sought, include the date of expiration and such information should take into account any terminal disclaimer.

Reply:

Section 1.740(a)(6) has been modified to require a statement of the expiration date.

Comment:

It was observed that the proposed rules no longer require a "reissue style" cut-up copy of the original patent.

Reply:

The observation is accurate since the PTO has found that a cut-up copy has not been required and only adds unnecessary work for the applicant and bulk to the application.

Comment:

It has been suggested that § 1.740(a)(8) be modified by adding the requirement for a copy of any decision by a court of competent jurisdiction, which decision is adverse to the validity of the patent.

Reply:

This suggestion has not been adopted because the patent owner or agent has a duty of disclosure under § 1.765 which

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would reasonably include the obligation to bring such a decision to the attention of the Office.

Comment:

It has been suggested that the comments in the proposed preamble regarding § 1.740(a)(10) be revised to reflect that this subsection does not require a statement of the length of the regulatory review period and how it was determined.

Reply:

This observation concerning the requirements of § 1.740(a)(10) was correct since there was no requirement that a description be provided as to how the regulatory review period is determined. However, since it would be helpful to the FDA in confirming its own calculation to have a statement concerning the length of the regulatory review period, including how the length was determined, these requirements have been made a part of § 1.740(a)(10).

Comment:

It is suggested that the language of § 1.740(a)(11) which calls for a description of the activities carried out by the "applicant" is too restrictive since other parties may be involved in or sponsoring the FDA approval work.

Reply:

The provisions of § 1.740(a)(11) have been modified to point out that a description of the activities of the marketing applicant before the FDA is requried.

Comment:

It has been suggested that § 1.740(a)(11) should be modified to require a description of "significant" or "material" activities undertaken by the marketing applicant during the applicable review period. It is argued that the section taken in combination with the related discussion in the proposed preamble places too great a burden on an applicant, i.e. submission of summaries of all communications and all dates of any activities regarding the FDA approval process.

Reply:

The section has been modified so as to require a brief description of the significant activities undertaken by the marketing applicant during the applicable regulatory review period and the significant dates applicable thereto. Thus the requirements of this section may be met by an identification of significant communications of substance with the FDA during the regulatory review period and the dates related to such communications. There is no intent on the part of the PTO to broaden the burden of the statute, in regard to the description of the activities to which this section pertains, by requiring submission of insignificant details. The PTO does not read the statute to require an applicant to establish the existence of due diligence during the regulatory review period in order to have a complete application. It is recognized that the regulatory review process may be continuous and protracted. Not all communications are material to that process but certainly all of those which are significant to the regulatory review process should be identified. It is sufficient that the description of the activities briefly identify those significant activities undertaken by the marketing applicant in order to identify significant events in the effort directed toward regulatory approval of the product.

Comment:

It has been suggested that the requirement of § 1.740(b)(1) that the person signing or declaring other than either the patent owner or corporate owner with the authority to obligate the corporation must have "specific" written authority to sign the oath or declaration was confusing and might well work a hardship on applicants since the rule is unclear as to just what type of authorization is required.

Reply:

This section has been modified to include an attorney or agent who has general authority to take action on behalf of the patent owner with respect to patent matters so long as that person is registered to practice before the Patent and Trademark Office.

Comment:

It has been suggested that § 1.740(c), which permits an applicant whose application has been found to be informal to file a petition with the required fee pursuant to §§ 1.181, 1.182 or 1.183, is unduely burdensome for minor informalities. It has been suggested, therefore, that an applicant be given a period in which to resubmit the application in corrected form together with a fee and avoid the filing of the described petition.

Reply:

This suggestion has not been adopted since the PTO expects that the application will be complete and formal as filed. A petition, with the appropriate fee, as necessary is a well recognized mechanism for reviewing a holding that a defect exists or curing a defect in papers that have been submitted and providing an opportunity for applicant to explain how the defect occurred.

Section 1.741 provides that the filing date of an application for patent term extension will be the date on which an application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10 and which includes all of the following:

(1) An identification of the approved product;
(2) An identification of the Federal statute under which regulatory review occurred;
(3) An identification of the patent for which an extension is being sought;
(4) An identification of each claim of the patent which claims the approved product or a method of using or manufacturing the approved product;
(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsection (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services to determine the period of the extension; and
(6) A brief description of the activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities.

Section 1.741(b) provides that if an application submitted pursuant to this section is held to be incomplete, applicant may seek to have this holding reviewed under {g49 1.181.

Section 1.741 has been provided in response to concerns presented in many of the written comments received as to the limited statutory time period for filing an application for patent term extension and the possibility of not obtaining a filing date within the 60 day period during which the statute requires such an application to be filed. The rule now provides that the filing date will be that date on which the application is filed with the PTO and meets those requirements specifically set forth. These requirements are those specifically required by the statutory language of 35 U.S.C. 156(d)(1). The PTO will consider each of these statutory requirements to be satisfied in an application which provides sufficient information, directed to each requirement, to act on the application, even though further information may be desired by the PTO or Secretary before a final determination of eligibility and length of patent term extension is made.

Section 1.750 covers the determination of eligibility for extension of the term of a patent which will be made by the Patent and Trademark Office on the application for extension. As provided for by Pub. L. 98-417, and as set forth in this section, it is intended that the determination as to whether a patent is eligible for an extension can be made solely on the representations contained in the application for extension filed in compliance with § 1.740 of this part. Section 1.750 does, however, provide that further information may be required of applicant by the Commissioner or other officials or the Commissioner or other officials may make such independent inquiries as desired before a final determination is made on whether a patent is eligible for extension. In circumstances where further information is required by the Office, the applicant will be given a time period within which to respond. The failure to file a response within the period provided may result in a final determination adverse to the granting of an extension of patent term unless the response period is extended. An extension of time to respond may be requested under the provisions of 37 CFR 1.136. Under appropriate circumstances, a request for information may contain a statement that the provisions of 37 CFR 1.136(a) are not available. The intentional failure to provide the information requested also will result in a final adverse determination.

A final determination may be made at any time after an application is filed, but no later than when a certificate of

extension is issued. Section 1.750 provides that a single request for reconsideration of a final determination may be filed within one month or within such other time period set in the final determination. Section 1.750 also provides that the determination may be delegated to appropriate Patent and Trademark Office officials. A notice will be mailed to applicant containing the determination as to eligibility of the patent for extension and the period of time of the extension of the term, if any. This notice shall constitute the final determination as to eligibility and any period of extension of the patent term. If no response to the notice of final determination is received, the certificate of patent term extension will be issued in due course.

Comment:

It has been suggested that § 1.750 be modified to expressly recognize that the rules being simultaneously promulgated by the FDA (Subpart B) provide for the FDA to give the PTO assistance in making eligibility determinations under the statute and that the PTO may seek such assistance and make such independent inquiries as it deems desirable in determining eligibility.

Reply:

The § 1.750 has been modified by adding, immediately following the term "information", the phrase "or make such independent inquiries as desired".

Comment:

It has been suggested that § 1.750 be modified to permit applicant to respond to a request for information or a notice under this section under the provisions of 37 CFR 1.136(a) upon payment of the appropriate fee. Applicant could thus extend the time for the required response without meeting the requirements of 37 CFR 1.136(b).

Reply:

Sections 1.740(c) and 1.750 have been modified to permit extensions under 37 CFR 1.136. However, if time is of the essence for a particular reason, applicant should anticipate that a requirement made by the PTO would include a statement that extensions under 37 CFR 1.136(a) were not available.

Comment:

It has been suggested that § 1.750 should be modified to provide notice to applicant, 30 days prior to a final determination of eligibility for extension of the identity of all patents or claims eligible for extension in order to permit time to choose which patent to extend and which to withdraw prior to the issuance of the certificate.

Reply:

This proposal has not been adopted since applicant will be given an opportunity to elect in the notice of final determination. See § 1.770.

Comment:

It has been suggested that the identification of a final route of appeal should be set forth as a second paragraph of § 1.750.

Reply:

This proposal has not been adopted since no appeal is provided for by the legislation and the PTO does not determine the jurisdiction of the Federal Courts.

Section 1.760 provides for one or more interim extensions for periods of up to one year each where a complete application in compliance with § 1.741 has been filed by an applicant and a final determination pursuant to § 1.750 has not been made on the application. Section § 1.760 provides that the Commissioner may issue an interim extension with or without a request by the applicant. The section also provides that if an interim extension is granted, a notice will be issued to the applicant for the extension of the patent term, the notice would be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the interim extension will be published in the Official Gazette of the Patent and Trademark Office. In order for an interim extension to be granted, the application in compliance with § 1.741 must have been filed prior to the expiration date of the patent even though the interim extensions may not actually be granted until after the original expiration date of the patent. In no event will interim extensions be granted under § 1.760 for a period of patent term extension longer than that to which the patent would be eligible.

Comment:

It has been suggested that § 1.760 be clarified as to whether the one year limitation appearing therein applies to each such extension or all such extensions added together could only be for a period of up to one year.

Reply:

The section has been modified by adding the term "each" following the term "year", to make it clear that multiple extensions of up to one year each can be granted under appropriate circumstances.

Comment:

It has been suggested that § 1.760 be modified to require a shorter filing period than the present 3-months prior to expiration of the patent where appropriate.

Reply:

While § 1.760 provides that a request for an interim extension "should" be filed three months prior to the expiration of the patent, this time frame is not mandatory. Note further that the Commissioner may issue such an interim extension without the filing of a request. Any request filed within a shorter period of time will be considered, particularly where it is not possible to make an earlier request. The provisions of the rule state a highly desirable time frame for making a request but not a mandatory time limit.

Comment:

It has been suggested that § 1.760 be modified to provide that on issuance of an interim extension that the PTO will notify the patent holder, make the decision a part of the official record of the patent and publish the determination in the **Federal Register** and the Official Gazette of the PTO.

Reply:

The section has been modified as suggested.

Comment:

It has been suggested that § 1.760 be modified to provide for a single request for reconsideration of a PTO decision denying a request for an interim extension and that the patent would be granted an interim extension during the time required for reconsideration and any subsequent appeal.

Reply:

While a request for reconsideration which was timely filed would be considered, a determination that an interim extension will not be issued would only occur where the Commissioner is not convinced that the subject patent is eligible for extension under 35 U.S.C. 156. Therefore, an interim extension while applicant sought reconsideration would also be improper.

Section 1.765 defines the duty of disclosure in patent term extension proceedings. Paragraph (a) of § 1.765 specifies the individuals on whom the duty rests and the extent of the duty. Paragraph (b) of § 1.765 requires that disclosures pursuant to the section be accompanied by a copy of each written document being disclosed and specifies to whom the submission is to be made, i.e., the Patent and Trademark Office or the Secretary, as appropriate. Such disclosures would be able to be made through an attorney or agent.

Paragraph (c) of § 1.765 precludes a determination of eligibility for an extension or the issuance of a certificate if clear and convincing evidence of fraud or attempted fraud on the Office or the Secretary is determined to be present or the duty of disclosure is determined to have been violated through bad faith or gross negligence in connection with the patent term extension proceeding. Since the determination as to whether a patent is eligible for extension pursuant to § 1.750 may be made solely on the basis of the representations made in the application for extension, a final determination to refuse a patent term extension because of fraud or a violation of the duty of disclosure is expected to be rare.

Paragraph (d) of § 1.765 precludes submissions to the Patent and Trademark Office by or on behalf of third parties, thereby making patent term extension proceedings in the Office an *ex parte* matter between the patent owner or its agent and the Commissioner. Under paragraph (d) of § 1.765, submissions by third parties to the Office will be returned, or otherwise disposed of, without consideration. Paragraph (d) does not affect submissions authorized by Pub. L. 98-417 to be made to the Secretary during determination of the applicable regulatory review period.

Comment:

It has been suggested that the language of section 1.765(d) is too limited in not permitting information bearing on violations of the duty of disclosure as well as other information relevant to the determination of eligibility of the patent for extension of term to be submitted to the Office by third parties.

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Reply:
Although Congress specifically provided for public input into the determination of the length of the regulatory review period, no such provision was made for proceedings before the PTO. Since applicant already has a duty of disclosure to both the PTO and FDA, and Congress expected that it would be an administratively simple proceeding, no input from third parties is considered appropriate.
Comment:
It has been suggested that the definition of the phrase "patent term extension proceeding" should be spelled out.
Reply:
Since the phrase clearly encompasses all phases of the proceeding between the filing of an application for the extension of the term of a patent until either the issuance of an extension certificate or a final denial of eligibility no longer subject to petition, request for reconsideration or appeal, defining the phrase is not deemed a necessary part of the rules.
Comment:
It has been suggested that the phrase "information material to the" in line 12 of § 1.765(a) be changed to material adverse to a , in order to avoid unnecessary submission of evidence or information which has no bearing on the proceedings.
Reply:
This suggestion has been adopted since it is not intended to require information or evidence which has either no bearing on the proceeding or is material to a favorable determination by the Office of the Secretary.
Comment:
It has been suggested that § 1.765 is unclear in that it applies the duty of disclosure relating to the patent term extension application to "each attorney or agent who represents the patent owner." There was concern of the effect of this broad duty of disclosure, for example, in a large corporation.
Reply:
The language in this section specifically limits the duty of disclosure to those who are substantively involved on behalf of the patent owner in a patent term extension proceeding.
Comment:
It has been suggested that § 1.765 should be clarified as to whether the duty of disclosure extends to prior art discovered since issuance of the patent.
Reply:
Section 1.765(b) specifically states that an attorney, agent or patent owner has no duty to transmit information which is not material to the determination of entitlement to the extension sought.
Section 1.770 provides for the express withdrawal of an application for extension of the term of a patent if the written declaration of withdrawal signed by the owner of record or its agent is filed in the Office, in duplicate, before a determination is made pursuant to § 1.750. Under § 1.770, an application for extension of the term of a patent may not be expressly withdrawn after the date permitted for response to the final determination pursuant to § 1.750. Section 1.770 also provides that an express withdrawal is effective when acknowledged in writing by the Office and that the filing and acceptance of an express withdrawal does not entitle applicant to a refund of the filing fee for the application for patent term extension or any portion thereof.
Comment:
It has been suggested that § 1.770 be modified to set forth reasons for withdrawal of an application for patent term extension.
Reply:
Section 1.770 permits the withdrawal of an application for patent term extension for any reason prior to the date permitted for response to the final determination pursuant to § 1.750. Since reasons may arise at a later date for the withdrawal of such an application for patent term extension which are not contemplated at this time, it is preferable not to limit the reasons for withdrawal of the application under this section, but to deal with each reason on a case-by-case basis.
Comment:
It has been suggested that § 1.770 be modified to permit the withdrawal of a patent term extension application within the 30 day period for response provided for in § 1.750.
Reply:
This proposal has been adopted.
Section 1.775 provides the procedure for calculating the length of patent term extension for a human drug product.
Paragraph (a) of § 1.775 specifies that the extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer.
Paragraph (b) of § 1.775 provides that the patent term would be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services but reduced, where appropriate, by the time periods provided in paragraph (d).
Paragraph (c) defines the length of the regulatory review period which is determined by the Secretary of Health and Human Services.
For a human drug product, the regulatory review period is defined in 35 U.S.C. 156(g)(1)(B) as the sum of:

(1) The number of days in the period beginning on the date an exemption under section 505 or 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved human drug product and ending on the date an application was initially submitted for the drug product under section 505 or 507 above or under section 351 of the Public Health Service Act; and
(2) The number of days in the period beginning on the date the application was initially submitted for the approved human drug product under section 351 of the Public Health Service Act or subsection (b) of section 505 or 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date the application was approved under the section.

This period is then reduced, where appropriate, by the time periods described in paragraph (d).
Paragraph (d) of § 1.775, defines the term of the patent extension by indicating that
(1) The time period determined from paragraph (c) would be reduced, where appropriate by
(i) The number of days in the periods of paragraph (c)(1) and (c)(2) of § 1.775 which were on and before the date on which the patent issued
(ii) The number of days from paragraphs (c)(1) and (c)(2) of § 1.775 during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence; and
(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) after the period has been reduced in accordance with paragraphs (d)(1)(i) and (d)(1)(ii) of § 1.775. Half days will be ignored for purposes of subtraction.
(2) Adding the number of days determined in paragraph (d)(1) to the original term of the patent as shortened by any terminal disclaimer;
(3) Adding 14 years to the date of approval of the application under section 351 of the Public Health Service Act, or subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act;
(4) Comparing the dates for the ends of the periods obtained from (d)(2) and (d)(3) with each other and selecting the earlier date;
(5) If the original patent issued after Sept. 24, 1984, (i) by adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and
(ii) By comparing the dates obtained in paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date.
(6) If the original patent was issued before Sept. 24, 1984
(i) If no request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984, by (A) adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer and (B) by comparing the dates obtained in paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date;
(ii) If a request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug and Cosmetic Act, before Sept. 24, 1984 and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by (A) adding 2 years to the original expiration date of the patent or any earlier date set by terminal disclaimer, and (B) by comparing the dates obtained in paragraph (d)(4) and (d)(6)(ii)(A) with each other and selecting the earlier date.
Comment:
It has been suggested that the PTO publish a form for the use by patent term extension applicants in the calculation of the extension under §§ 1.775, 1.776 and 1.777.
Reply:
This suggestion has been adopted. Suitable forms will be available from the PTO.
Comment:
It has been suggested that §§ 1.775(d)(1)(ii); 1.776(d)(1)(ii) and 1.777(d)(1)(ii) be modified so as to avoid the double subtraction of any period for which an applicant has been found to have acted without due diligence where such period occurred prior to the issuance of the patent. This double subtraction would occur since both the period of regulatory review prior to the issuance of the patent and the total period of time in which applicant has been determined to have acted without due diligence is subtracted from the length of the regulatory review period on which the calculation of the period of extension of the patent is based.
Reply:
This suggestion has not been adopted since the statute makes clear that any part of the regulatory review period which occurs before the patent was granted should not be counted toward patent term extension, and makes equally clear that any period in which the marketing applicant failed to exercise due diligence, thereby unnecessarily adding to the length of the regulatory review period after the patent issued, should not be considered in determining the length of the extension period.
Comment:
It has been suggested that the language "half days will be ignored for the purposes of subtraction" which appears in §§ 1.775(d)(1)(iii), 1.776(d)(1)(iii) and 1.777(d)(1)(iii) should be clarified.
Reply:
The language in question appears in the sections which describe how the length of extension of the patent term to which an applicant is entitled is to be determined. Specifically the above listed sections are directed to the subtraction of one-half of the number of days in the period defined by subsection (c)(1), of the same section, after that period has been reduced in accordance with subsections (d)(1)(i) and (d)(1)(ii) from the regulatory review period as previously determined. Since one-half of an odd number of days will result in a fraction or one-half day, the above language, which appears in all three sections, indicates that the one half-day will be ignored and thus will not be subtracted from the regulatory review period.
Section 1.776 provides the procedure for calculating the patent term extension for a food additive or color additive. The paragraphs correspond to those of § 1.775.
Section 1.777 provides the procedure for calculating the patent term extension for a medical device. The paragraphs correspond to those of § 1.775 with the major difference being in the calculation of the regulatory review period.
Comment:
It has been suggested that subsection (c) of § 1.777 be modified in order for the definition of the "date a clinical investigation on humans involving the device was begun" to be consistent with the definition provided by FDA(21 CFR 60.22(c)(1).
Reply:
This suggestion has not been adopted since the PTO has used the language of the statute and has left to FDA the determination of the length of the regulatory review period.
Section 1.780 specifies that once a determination is made pursuant to § 1.750 that a patent is eligible for extension, a certificate of extension, under seal, will be issued to the applicant for the extension of the term of the patent. Section 1.780 also provides that the certificate will be recorded in the official file of the patent and will be considered as part of the original patent. Section 1.780 also provides for notification of the issuance of the certificate of extension to be published in the *Official Gazette* of the Patent and Trademark Office.
No certificate or extension will be issued if the term of a patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to § 1.750 would indicate that no certificate will issue.
Comment:
It has been suggested that § 1.780 be modified to clarify the situations contemplated where a patent might be eligible for extension but the patent cannot be extended. If the only possible exceptions are those of §§ 1.765 and 1.785, the rule should so state this fact.
Reply:
It is difficult to contemplate all the situations that might arise, but situations have occurred where the patent and approved product meet all the eligibility requirements of section 720, but the term of the patent cannot be extended because the patent issued less than three years before the product was approved by FDA.
Section 1.785 specifies the procedures to be followed where multiple applications are filed for extension of the same patent or of different patents for the same regulatory review period for a product. Pub. L. 98-417 and § 1.785 provide that only one patent may be extended for a regulatory review period for any product. Under § 1.785, if more than one application for extension of the same patent is filed, the certificate of extension of the term of the patent, if appropriate, would be issued based upon the first filed application for extension of patent term. If applications are filed by a single applicant for extensions of the terms of different patents based upon the same regulatory review period for a product, the certificate of extension will be issued on the application for extension of the patent having the earliest date of issuance of those for which extension is sought unless all but a single application for the extension of one patent term is voluntarily withdrawn by applicant.
If applications are filed by different applicants for extension of the terms of different patents based upon the same regulatory review period for a product, the certificate of extension will be issued on the application of the holder of the regulatory approval granted with respect to the regulatory review period. If the holder of the regulatory approval granted with respect to the regulatory review period is not an applicant, the certificate of extension will issue to the applicant for extension which holds express and exclusive authorization from the holder of the regulatory approval to rely upon the regulatory review period as the basis for the application for extension. If the holder of the regulatory approval is not an applicant and has not given a prior express and exclusive authorization to seek extension based on the regulatory review period, the certificate of extension will be issued on the application for extension of the patent having the earliest date of issuance of those for which extension is sought.
An application for extension will be considered complete and formal whether it contains the identification of the holder of the regulatory approval granted with respect to the regulatory review period or express and exclusive authorization from the holder of the regulatory approval to rely on the regulatory review period for extension. A request may be made of any applicant to supply such information regarding the authorization on which applicant relies from the holder of the regulatory approval on which the application for extension is based. The failure to provide such information within the period for response shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval and is not authorized by the holder of the regulatory approval to seek the extension being sought.
Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.
The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*
The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities because patented drugs are generally not commercialized by small entities (Regulatory Flexibility Act, Pub. L. 96-354).
The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment,

productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirement contained in this proposed rule has been submitted by OMB for review under section 3504(h) of the Paperwork Reduction Act.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Pub. L. 98-417, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

PART 1—[AMENDED]

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is amended by adding a new paragraph (f) before the note to read as follows:

§ 1.1 All communications to be addressed to the Commissioner of Patents and Trademarks.

* * * * *

(f) All applications for extension of patent term and any communications relating thereto intended for the Patent and Trademark Office should be additionally marked "Box Patent Ext." When appropriate, the communication should also be marked to the attention of a particular individual, as where a decision has been rendered.

3. Section 1.20 is amended by adding a new paragraph (n) to read as follows:

§ 1.20 Post-issuance fees.

* * * * *

(n) For filing an application for extension of the term of a patent (§ 1.740) 550.00

* * * * *

4. A new Subpart F—Extension of Patent Term, consisting of §§ 1.710 through 1.785 is added to read as follows:

Subpart F—Extension of Patent Term

Sec.

1.710 Patents subject to extension of the patent term.
1.720 Conditions for extension of patent term.
1.730 Applicant for extension of patent term.
1.740 Application for extension of patent term.
1.741 Filing date of application.
1.750 Determination of eligibility for extension of patent term.
1.760 Interim extension of patent term.
1.765 Duty of disclosure in patent term extension proceed ings.
1.770 Express withdrawal of application for extension of patent term.
1.775 Calculation of patent term extension for a human drug product.
1.776 Calculation of patent term extension for a food additive or color additive.
1.777 Calculation of patent term extension for a medical device.
1.780 Certificate of extension of patent term.
1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product.

Subpart F—Extension of Patent Term

Authority: 35 U.S.C. 6 and 156.

§ 1.710 Patents subject to extension of the patent term.

(a) A patent is eligible for extension of the patent term if the patent claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, and meets all other conditions and requirements of this subpart.

(b) The term "product" referred to in paragraph (a) of this section means—

(1) A human drug product which means the active ingredient of a new drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or

(2) Any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act.

§ 1.720 Conditions for extension of patent term.

The term of a patent may be extended if:

(a) The patent claims a product or a method of using or manufacturing a product as defined in § 1.710;

(b) The term of the patent has never been previously extended except for any interim extension issued pursuant to § 1.760;

(c) An application for extension is submitted in compliance with § 1.740;

(d) The product has been subject to a regulatory review period as defined in 35 U.S.C. 156(g) before its commercial marketing or use;

(e) The product has received permission for commercial marketing or use and

(i) The permission for the commercial marketing or use of the product is the first received permission for commercial marketing or use under the provision of law under which the applicable regulatory review occurred, or

(ii) In the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the permission for the commercial marketing or use is the first received permission for the commercial marketing or use of a product manufactured under the process claimed in the patent;

(f) The application is submitted within the sixty day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred, or in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent;

(g) The term of the patent has not expired before the submission of an application in compliance with § 1.741; and

(h) No other patent term has been extended for the same regulatory review period for the product.

§ 1.730 Applicant for extension of patent term .

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of § 1.740.

§ 1.740 Application for extension of patent term .

(a) An application for extension of patent term must be made in writing to the Commissioner of Patents andTrademarks. A formal application for the extension of patent term shall include:

(a) An application for extension of patent term must be made in writing to the Commissioner of Patents andTrademarks. A formal application for the extension of patent term shall include:

(1) A complete identification of the approved product as by appropriate chemical and generic name, physical structure or characteristics;

(2) A complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;

(3) An identification of the date on which the product received permission for commercial marketing or use under the provision of law under which the applicable regulatory review period occurred;

(4) In the case of a human drug product, an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food, Drug and Cosmetic Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) and the provision of law under which it was approved.

(5) A statement that the application is being submitted within the sixty day period permitted for submission pursuant to § 1.720(f) and an identification of the date of the last day on which the application could be submitted;

(6) A complete identification of the patent for which an extension is being sought by the name of the inventor, the patent number, the date of issue, and the date of expiration;

(7) A copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings;

(8) A copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;

(9) A statement beginning on a new page that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or a method of using or manufacturing the approved product;

(10) A statement beginning on a new page of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services to determine the applicable regulatory review period as follows:

(i) For a patent that claims a human drug product, the effective date of the investigational new drug (IND) application and the IND number, the date on which a new drug application (NDA) was initially submitted and the NDA number, and the date on which the NDA was approved;

(ii) For a patent that claims a food or color additive, the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number; and the date on which the FDA published a Federal Register notice listing the additive for use;

(iii) For a patent that claims a medical device, the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which an application for product approval under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application; and the date on which the application was approved.

(11) A brief description beginning on a new page of the significant activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities;

(12) A statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of extension claimed, including how the length of extension was determined;

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services any information which is material to the determination of entitlement to the extension sought (see § 1.765);

(14) The prescribed fee for receiving and acting upon the application for extension (see § 1.20(n));

(15) The name, address, and telephone number of the person to whom inquiries and correspondence relating to the application for patent term extension are to be directed;

(16) A duplicate of the application papers, certified as such; and

(17) An oath or declaration as set forth in paragraph (b) of this section.

(b) Any oath or declaration submitted in compliance with paragraph (a) of this section must be signed by the owner of record of the patent or its agent, specifically identify the papers and the patent for which an extension is sought and aver that the person signing the oath or declaration:

(1) Is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters.

(2) Has reviewed and understands the contents of the application being submitted pursuant to this section;

(3) Believes the patent is subject to extension pursuant to § 1.710;

(4) Believes an extension of the length claimed is justified under 35 U.S.C. 156 and the applicable regulations; and

(5) Believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in § 1.720.

(c) If any application for extension of patent term submitted pursuant to this section is held to be informal, applicant may seek to have that holding reviewed by filing a petition with the required fee, as necessary, pursuant to § 1.181, § 1,182 or § 1.183, as appropriate, within such time as may be set in the notice that the application has been held to be informal, or if no time is set, within one month of the date on which the application was held informal. The time periods set forth herein are subject to the provisions of 37 CFR 1.136.

§ 1.741 Filing date of application

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10.

A complete application shall include:

(1) An identification of the approved product;

(2) An identification of the Federal statute under which regulatory review occurred;

(3) An identification of the patent for which an extension is being sought;

(4) An identification of each claim of the patent which claims the approved product or a method of using or manufacturing the approved product;

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsections (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services to determine the period of the extension; and

(6) A brief description of the activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities.

(b) If any application submitted pursuant to this section is held to be incomplete, applicant may seek to have this holding reviewed under § 1.181.

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§ 1.750 Determination of eligibility for extension of patent term

A determination as to whether a patent is eligible for extension may be made by the Commissioner solely on the basis of the representations contained in the application for extension filed in compliance with § 1.740. This determination may be delegated to appropriate Patent and Trademark Office officials and may be made at any time before the certificate of extension is issued. The Commissioner or other appropriate officials may require from applicant further information or make such independent inquiries as desired before a final determination is made on whether a patent is eligible for extension. A notice will be mailed to applicant containing the determination as to the eligibility of the patent for extension and the period of time of the extension, if any. This notice shall constitute the final determination as to the eligibility and any period of extension of the patent. A single request for reconsideration of a final determination may be made iffiled by the applicant within such time as may be set in the notice of final determination or, if no time is set, within one month from the date of the final determination. The time periods set forth herein are subject to the provisions of 37 CFR 1.136.

§ 1.760 Interim extension of patent term

An applicant who has filed a formal application for extension in compliance with § 1.740 may request one or more interim extensions for periods of up to one year each pending a final determination on the application pursuant to § 1.750. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions, without a request by the applicant, for periods of up to one year each until a final determination is made. The patent owner or agent will be notified when an interim extension is granted and notice of the extension will be published in the Official Gazette of the Patent and Trademark Office. The notice will be recorded in the official file of the patent and will be considered as part of the original patent. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§ 1.765 Duty of disclosure in patent term extension proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services rests on the patent owner or its agent, on each attorney or agent who represents the patent owner and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of material information adverse to a determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

(b) Disclosures pursuant to this section must be accompanied by a copy of each written document which is being disclosed. The disclosure must be made to the Office or the Secretary, as appropriate, unless the disclosure is material to determinations to be made by both the Office and the Secretary, in which case duplicate copies, certified as such, must be filed in the Office and with the Secretary. Disclosures pursuant to this section may be made to the Office or the Secretary, as appropriate, through an attorney or agent having responsibility on behalf of the patent owner or its agent for the patent term extension proceeding or through a patent owner acting on his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the determination of entitlement to the extension sought.

(c) No patent will be determined eligible for extension and no extension will be issued if it is determined that fraud on the Office or the Secretary was practiced or attempted or the duty of disclosure was violated through bad faith or gross negligence in connection with the patent term extension proceeding. If it is established by clear and convincing evidence that any fraud was practiced or attempted on the Office or the Secretary in connection with the patent term extension proceeding or that there was any violation of the duty of disclosure through bad faith or gross negligence in connection with the patent term extension proceeding, a final determination will be made pursuant to § 1.750 that the patent is not eligible for extension.

(d) The duty of disclosure pursuant to this section rests on the individuals identified in paragraph (a) of this section and no submission on behalf of third parties, in the form of protests or otherwise, will be considered by the Office. Any such submissions by third parties to the Office will be returned to the party making the submission, or otherwise disposed of, without consideration by the Office.

§ 1.770 Express withdrawal of application for extension of patent term.

An application for extension of patent term may be expressly withdrawn before a determination is made pursuant to § 1.750 by filing in the Office, in duplicate, a written declaration of withdrawal signed by the owner of record of the patent or its agent. An application may not be expressly withdrawn after the date permitted for response to the final determination on the application. An express withdrawal pursuant to this section is effective when acknowledged in writing by the Office. The filing of an express withdrawal pursuant to this section and its acceptance by the Office does not entitle applicant to a refund of the filing fee (§ 1.20(n)) or any portion thereof.

§ 1.775 Calculation of patent term extension for a human drug product.

(a) If a determination is made pursuant to § 1.750 that a patent for a human drug product is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a human drug product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a human drug product will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(1)(B), it is the sum of-

(1) The number of days in the period beginning on the date an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved human drug product and ending on the date an application was initially submitted for such drug product under those sections or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved human drug product under section 351 of the Public Health Service Act, subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for a human drug product will be determined by—

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 351 of the Public Health Service Act, or subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984,

(i) By adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984, and

(i) If no request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984, by-

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a request was submitted for an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984 and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by-

(A) Adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§ 1.776 Calculation of patent term extension for a food additive or color additive.

(a) If a determination is made pursuant to § 1.750 that a patent for a food additive or color additive is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a food additive or color additive will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a food additive or color additive will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(2)(B), it is the sum of-

(1) The number of days in the period beginning on the date a major health or environmental effects test on the additive was initiated and ending on the date a petition was initially submitted with respect to the approved product under the Federal Food, Drug, and Cosmetic Act requesting the issuance of a regulation for use of the product; and

(2) The number of days in the period beginning on the date a petition was initially submitted with respect to the approved product under the Federal Food, Drug, and Cosmetic Act requesting the issuance of a regulation for use of the product, and ending on the date such regulation became effective or, if objections were filed to such regulation, ending on the date such objections were resolved and commercial marketing was permitted or, if commercial marketing was permitted and later revoked pending further proceedings as a result of such objections, ending on the date such proceedings were finally resolved and commercial marketing was permitted.

(d) The term of the patent as extended for a food additive or color additive will be determined by

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) The number of days equal to one-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date a regulation for use of the product became effective or, if objections were filed to such regulation, to the date such objections were resolved and commercial marketing was permitted or, if commercial marketing was permitted and later revoked pending further proceedings as a result of such objections, to the date such proceedings were finally resolved and commercial marketing was permitted;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984,

(i) By adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984, and

(i) If no major health or environmental effects test was initiated and no petition for a regulation or application for registration was submitted before Sept. 24, 1984, by

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a major health or environmental effects test was initiated or a petition for a regulation or application for registration was submitted by Sept. 24, 1984, and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by

(A) Adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

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§ 1.777 Calculation of patent term extension for a medical device.

(a) If a determination is made pursuant to § 1.750 that a patent for a medical device is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or earlier date as set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a medical device will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a medical device will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g) (3)(B), it is the sum of

(1) The number of days in the period beginning on the date a clinical investigation on humans involving the device was begun and ending on the date an application was initially submitted with respect to the device under section 515 of the Federal Food, Drug, and Cosmetic Act; and

(2) The number of days in the period beginning on the date the application was initially submitted with respect to the device under section 515 of the Federal Food, Drug, and Cosmetic Act, and ending on the date such application was approved under such Act or the period beginning on the date a notice of completion of a product development protocol was initially submitted under section 515(f)(5) of the Act and ending on the date the protocol was declared completed under section 515(f[sf,1`)(6) of the Act.

(d) The term of the patent as extended for a medical device will be determined by—

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period pursuant to paragraph (c) of this section:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section which were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 515 of the Federal Food, Drug, and Cosmetic Act or the date a product development protocol was declared completed under section 515(f)(6) of the Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after Sept. 24, 1984, (i) By adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(ii) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before Sept. 24, 1984, and

(i) If no clinical investigation on humans involving the device was begun or no product development protocol was submitted under section 515(f)(5) of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984, by

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a clinical investigation on humans involving the device was begun or a product development protocol was submitted under section 515(f)(5) of the Federal Food, Drug, and Cosmetic Act before Sept. 24, 1984 and the commercial marketing or use of the product was not approved before Sept. 24, 1984, by

(A) Adding 2 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) By comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

§ 1.780 Certificate of extension of patent term.

If a determination is made pursuant to § 1.750 that a patent is eligible for extension and that the term of the patent is to be extended, a certificate of extension, under seal, will be issued to the applicant for the extension of the patent term. Such certificate will be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the certificate of extension will be published in the Official Gazette of the Patent and Trademark Office. No certificate of extensio will be issued if the term of the patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to § 1.750 will indicate that no certificate will issue.

§ 1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product.

(a) Only one patent may be extended for a regulatory review period for any product (§ 1.720(g)). If more than one application for extension of the same patent is filed, the certificate of extension of patent term, if appropriate, will be issued based upon the first filed application for extension.

(b) If more than one application for extension is filed by a single applicant which seeks the extension of the term of two or more patents based upon the same regulatory review period, and the applications are otherwise eligible for extension pursuant to the requirement of this subpart, the certificate of extension of patent term, if appropriate, will be issued upon the application for extension of the patent having the earliest date of issuance of those patents for which extension is sought.

(c) If an application for extension is filed which seeks the extension of the term of a patent based upon the same regulatory review period as that relied upon in one or more applications for extension pursuant to the requirements of this subpart, the certificate of extension of patent term will be issued on the application only if-

(1) The applicant for extension is the holder of the regulatory approval granted with respect to the regulatory review period, or

(2) The holder of the regulatory approval granted with respect to the regulatory review period is not an applicant and the applicant for extension holds express and exclusive authorization from the holder of the regulatory approval to rely upon the regulatory review period as the basis for the application for extension, or

(3) The holder of the regulatory approval granted with respect to the regulatory review period is not an applicant and no applicant for extension holds an express and exclusive authorization from the holder of the regulatory approval to rely upon the regulatory review period as the basis for the application for extension and the application is for extension of the patent having the earliest date of issuance of those patents for which extension is sought based upon the same regulatory review period.

(d) An application for extension shall be considered complete and formal regardless of whether it contains the identification

of the holder of the regulatory approval granted with respect to the regulatory review period or express and exclusive authorization from the holder of the regulatory approval to rely on the regulatory review period for extension. When an application contains such information, or is amended to contain such information, it will be considered in determining whether an application is eligible for an extension under this section. A request may be made of any applicant to supply such information within a non-extendable period of not less than one (1) month whenever multiple applications for extension of more than one patent are received and rely upon the same regulatory review period. Failure to provide such information within the period for response set shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval and is not expressly and exclusively authorized by the holder of the regulatory approval to seek the extension being sought.

(e) Determinations made under this section shall be included in the notice of final determination of eligibility for extension of the patent term pursuant to § 1.750 and shall be regarded as part of that determination.

Jan. 9, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[FR Doc. 87-6045 Filed 3-23-87; 8:45 am]
BILLING CODE 3510-16-M

[1079 OG 52]

(157) Guidelines for Extension of Patent Term for New Animal Drugs or Veterinary Biological Products Under 35 U.S.C. 156 as Amended

This notice establishes initial guidelines for patent owners seeking extensions of patent terms for new animal drugs or veterinary biological products pursuant to 35 U.S.C. § 156 as amended. See Pub. L. No. 100-670 enacted Nov. 16, 1988. These guidelines are effective until further notice. This notice does not affect the procedures in place for extensions of patent terms for human drug products, food additives, color additives, or medical devices as described in 52 Federal Register 9386 (Mar. 24, 1987) and 1079 Official Gazette 52 (June 23, 1987); this notice relates solely to procedures for extensions of patent terms for new animal drugs and veterinary biological products. In time, the pertinent regulations (37 C.F.R. Part 1, Subpart F) will be changed to encompass all items for which patent term extension is authorized.

A patent owner or its agent should use the guidelines in the various sections below in determining whether a patent is subject to, and meets the conditions for, extension of its term for a new animal drug or a veterinary biological product. If so, the patent owner or its agent should also use the guidelines below in preparing and filing an application for extension of the patent term. If any application for extension of the term of a patent for a new animal drug or a veterinary biological product is filed in accordance with 35 U.S.C. § 156 as amended before the date on which this notice is published in the Official Gazette and the application is not in compliance with the requirements of this notice, applicant will be notified of the deficiencies in the application and will be given a period of time within which to correct those deficiencies.

Guidelines

§ A. Patents subject to extension of the patent term

(a) Any patent that claims a product as defined in paragraph (b) of this section, or a method of using such a product, or a method of manufacturing such a product, is now subject to being extended under 35 U.S.C. § 156 as amended.

(b) The term "product" referred to in paragraph (a) of this section means a new animal drug or veterinary biological product (as those terms are used in the Federal Food, Drug and Cosmetic Act and the Virus-Serum-Toxin Act) that is not primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes involving site specific genetic manipulation techniques, including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient.

§ B. Conditions for extension of a term of a patent

The term of a patent may be extended if:

(a) the patent claims a product or a method of using or manufacturing a product as defined in § A of this notice;
(b) the term of the patent has never been previously extended;
(c) an application for extension is submitted pursuant to § D of this notice;
(d) the product has been subject to a regulatory review period as defined in 35 U.S.C. § 1.56(g) and by the Secretary of Health and Human Services or the Secretary of Agriculture, as appropriate, before its commerical marketing or use;
(e) the product has received permission for commerical marketing or use and the application is submitted within the sixty day period beginning on the date the product first received permission for commerical marketing or use under the provision of law under which the applicable regulatory review period occurred;
(f) the term of the patent has not expired before the submission of the application pursuant to § D of this notice; and
(g) no other patent has been extended for the same regulatory review period for the product.

§ C. Applicant for extension of patent term

Any application for extension of a patent term must be submitted by the owner of record of the patent or its agent as defined in 37 C.F.R. § 1.740(b)(1) and must comply with the requirements of § D of this notice.

§ D. Application for extension of the term of a patent

(a) An application for extension of the term of a patent must be made in writing to the Commissioner of Patents and Trademarks. The filing date of an application for an extension of the term of a patent is the date on which the complete application for extension and a duplicate of the papers, certified as such, are received in the Patent and Trademark Office or filed pursuant to the provisions of 37 C.F.R. §§ 1.8 or 1.10.

(b) A complete application for the extension of the term of a patent comprises:

(1) a complete identification of the product as by appropriate chemical and generic name, physical structure or characteristics;
(2) a complete identification of the Federal statute including the applicable provision of law under which the regulatory review occurred;
(3) an identification of the date on which the product received permission for commerical marketing or use under the provision of law under which the applicable regulatory review period occurred;
(4) an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commerical marketing or use under the Federal Food, Drug and Cosmetic Act, the Public Health Services Act, or a statement of when the active ingredient was approved for commerical marketing or use (either alone or in combination with other active ingredients), the use for which it was approved, and the provision of law under which it was approved;
(5) a statement that the application is being submitted within the sixty day period permitted for submission pursuant to 37 C.F.R. § 1.720(f) and an identification of the last day on which the application may be submitted;
(6) a complete identification of the patent for which an extension is being sought by the name of the inventor(s), the patent number, the date of issue, and the date of expiration;
(7) a copy of the patent for which an extension is being sought, including the entire specification (including claims) and drawings;

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(8) a copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;
(9) a statement beginning on a new page that the patent claims the product or a method of using or manufacturing the product, and a showing that lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the product or a method of using or manufacturing the product;
(10) a statement beginning on a new page of the relevant dates and information pursuant to 35 U.S.C. § 156(g) to enable the Secretary of Health and Human Services or the Secretary of Agriculture, as appropriate, to determine the applicable regulatory review period as follows:

(i) for a patent claiming an animal drug product, (a) the date a major health or environmental effects test on the drug was initiated and any available substantiation of that date or the date of an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for such animal drug product, (b) the date on which a new drug application was initially submitted, (c) the number of the application, and (d) the date on which the application was approved; and
(ii) for a patent claiming a veterinary biological product, (a) the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective, (b) the date an application for a license was submitted under the Virus-Serum-Toxin Act, and (c) the date the license issued;

(11) a brief description beginning on a new page of the significant activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the product and the significant dates applicable to such activities;
(12) a statement beginning on a new page that in the opinion of the applicant the patent is eligible for the extension and a statement as to the length of the extension claimed, including how the length of the extension was determined;
(13) a statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services or the Secretary of Agriculture, as appropriate, any information that is material to the determination of entitlement to the extension sought;
(14) the prescribed fee for receiving and acting upon the application for extension (see § F of this notice) and an oath or declaration as set forth in paragraph (c) of this section; and
(15) the name, address, and telephone number of the person to whom inquiries and correspondence relating to the application for patent term extension are to be directed.

(c) Any application for extension of the term of a patent submitted pursuant to paragraphs (a) and (b) of this section must include an oath or declaration signed by the owner of record of the patent or its agent that specifically identifies the application papers and the patent for which an extension is sought and avers that the person signing the oath or declaration:

(1) is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters;
(2) has reviewed and understands the contents of the application being submitted pursuant to this section;
(3) believes the patent is subject to extension pursuant to § A of this notice;
(4) believes an extension of the length claimed is justified under 35 U.S.C. § 156 as amended; and
(5) believes the patent for which the extension is being sought meets the conditions for extension of the term of a patent as set forth in § B of this notice.

(d) If any application for extension of term of the patent submitted pursuant to this section is held to be incomplete, applicant may seek to have that holding reviewed by filing a petition pursuant to 37 C.F.R. § 1.182 within such time as may be set, or if no time is set, within one month of the date on which the application was held incomplete. Compliance with the provisions of these guidelines that are not required by statute may be waived in appropriate circumstances. 37 C.F.R. § 1.183.

§ E. Interim extension of the term of a patent

An applicant who has filed an application for extension pursuant to § D of this notice may request one or more interim extensions for periods of up to one year pending a final determination on the application. Any such request should be filed at least three months prior to the expiration date of the patent. The Commissioner may issue interim extensions for periods up to one year until a final determination is made without a request by the applicant. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be eligible.

§ F. Fee for receiving and acting on an application for extension of the term of a patent

Pursuant to 35 U.S.C. § 156(h), the Commissioner has determined that a fee as set forth in 37 C.F.R. § 1.20(n) (presently $550.00) is appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon the applications for extension of the term of a patent filed pursuant to 35 U.S.C. § 156 as amended. The fee should accompany the application when filed. If a fee in a different amount is adopted in Title 37 of the Code of Federal Regulations, applicant will be refunded any excess of the fee or will be required to submit any deficiency in the fee.

§ G. Address for application for extension of the term of a patent and communications relating thereto

All applications for extension of the term of a patent and any communications relating thereto intended for the Patent and Trademark Office should be addressed to Box Patent Ext., Commissioner of Patents and Trademarks, Washington, D.C. 20231.

§ H. For further information, contact:

Charles E. Van Horn by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Summary

The initial guidelines set forth above are considered to be appropriate and authorized by 35 U.S.C. [g49 156 as amended. They will provide appropriate guidance to patent owners and their agents pending appropriate changes that will be made in Title 37 of the Code of Federal Regulations.

Nov. 29, 1988

DONALD J. QUIGG.
Assistant Secretary and Commissioner of Patents and Trademarks.

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DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 90114-9135]
RIN: 0651-AA42
Patent Term Extension for Animal Drug Products

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases directed to the extension of patent term. These amendments implement the patent term restoration provisions of Pub. L. No. 100-670, 102 Stat. 3971 (November 16, 1988) which permits owners of patents relating to new animal drugs or veterinary biological products that are not biotechnology-generated to apply for extension of the terms of such patents in the same manner as owners of patents relating to human drugs, medical devices, food additives, or color additives are permitted to do under 35 U.S.C. 156.
Effective Date: August 22, 1989
For Further Information Contact: Charles E. Van Horn by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Pub. L. No. 100-670 has made it possible for owners of patents directed to new animal drugs and to veterinary biological products that are not biotechnology-generated to apply for extension of the term of such patents in a manner similar to the owners of patents directed to human drugs, food additives, color additives, and medical devices. A new animal drug or veterinary biological product is biotechnology-generated if it is primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes including site specific genetic manipulation techniques. The primary purpose of this rule change is to revise the present regulations contained in 37 CFR Part 1, Subpart F, to include the two additional categories of subject matter that can now form the basis of patent term extension. These regulations set forth procedures that govern the content and submission of applications for the extension of a patent term to the PTO, and procedures governing the extension determination and issuance of patent term extension certificates by the PTO.

Initial guidelines directed to the preparation and filing of applications for patent term extension as authorized by Pub. L. No. 100-670 were published as "Guidelines For Extension of Patent Term For New Animal Drugs or Veterinary Biological Products Under 35 U.S.C. 156 as Amended" in the Official Gazette. 1097 *Official Gazette* 63 (December 27, 1988). A notice of proposed rulemaking was published in the *Federal Register* on March 7, 1989, at 54 FR 9507 and in the Official Gazette. 1100 *Official Gazette* 128 (March 28, 1989). No oral hearing was conducted on these proposed rules. One written comment was received.

The only written comment received was directed to the proposed amendment to § 1.710(a). The proposed amendment indicated that a patent is eligible for extension of the patent term if the patent claims a product either alone or in combination with other ingredients that read on a composition that received permission for commercial marketing or use. The proposed modification was objected to because of the implication that patent term extension would not be available for composition patents where the claimed compositions do not read on the composition (new drug) approved by the FDA. Such an interpretation, it was argued, would unfairly and narrowly interpret the statute. The comment noted that where a marketing applicant seeks approval for multiple dosage forms or compositions of a new drug, the right to obtain patent term extension is triggered at the time the first new drug application is approved. In a typical situation, an injectable dosage form to be used for acute indications will require a lesser development time and be approved more rapidly than the oral dosage form of the same active ingredient intended for chronic administration. It was represented in the comment that justification for the drug development program might hinge on the expectation of an extension of an oral composition patent. If there were patents on both the injectable dosage form and the oral administration form containing the same active ingredient, which were mutually exclusive for the purposes of this illustration, the new drug holder, it is argued, should have a choice of which patent term to extend based on the first approval of a new chemical entity (NCE) drug. Finally, the comment suggested that the proposed amendment to § 1.710(a) with respect to composition patents stands in marked contrast to the situation which applies in the case of method of use patents. It is alleged, in the comment, that the rule in effect allows an extension of a method of use patent whenever the claimed method of use embraces the use of the active ingredient. According to the comment, where an NCE drug is first approved for the treatment of arthritis, a patent limited to an analgesic use of the NCE drug may be extended. (Note the requirement in § 1.740(a)(4) to identify the use for which the product was approved.)

These remarks made in this comment raise a substantive issue relating to the eligibility of patents for patent term extension under 35 U.S.C. 156 that is not addressed in the rules. The exercise of the Commissioner's rulemaking authority under 35 U.S.C. 6 and 156 can neither enlarge nor reduce the scope of eligibility of a patent for patent term extension under 35 U.S.C. 156. Secondly, the proposed amendment to § 1.710(a) is clearly couched in terms which are permissive without either explicitly or implicitly excluding other possibilities. The proposed amendment was made in response to many inquiries received over the years since enactment of 35 USC 156 as to whether a formulation or composition claim in a patent could form a basis for eligibility for patent term extension. Finally, the PTO has a long-standing policy of not addressing an issue in advance of receiving an application presenting the issue for determination. The issue of whether a patent is eligible for patent term extension that could not be enforced in either the original or extended term against the approved formulation or use that allegedly would give rise to eligibility has not been addressed yet by the PTO.

PTO experience to date did involve consideration of two applications that were filed based on approval of the human drug product OCUFEN Ophthalmic Solution, which contains the active ingredient Flurbiprofen [2-(2-fluoro-4-biphenylyl) propionic acid]. Relevant claims from the two patents that were the subject of the applications for patent term extension were as follows:

I. Patent 3,755,427 (issued August 28, 1973)
Claim 2. 2-(2-fluoro-4-biphenylyl) propionic acid.
II. Patent 3,793,457 (issued February 19, 1974)
Claim 1. A therapeutic composition useful in the treatment of pain, inflammation, and pyretic conditions which comprises a compound selected from the group consisting of 2-(2-fluoro-4-biphenylyl) propionic acid, 2-(2'-fluoro-4-biphenylyl) propionic acid, and 2-(2,2'-difluoro-4-biphenylyl) propionic acid in association with a pharmaceutically acceptable excipent the amount of said compound present in said composition being an amount effective against at least one of said conditions.

Claim 2 of the earlier issued patent is directed to the active ingredient per se, whereas claim 1 of Patent No. 3,793,457 is directed to a formulation which can contain Flurbiprofen in an amount which was effective in the treatment of pain, inflammation, and pyretic conditions.

However, since the approved indication for Ocufen was for the inhibition of intraoperative miosis, it was not immediately apparent to the PTO whether the '457 patent claimed the product within the meaning of 35 U.S.C. 156. Our view was that the 1984 Act was intended to restore to those patent owners a portion of the enforceable term of an appropriate patent of their choice which was lost due to Government required regulatory review for the product covered by the patent prior to the commercial marketing of the claimed product or the use thereof. If the patent could not be enforced against an infringer who was making, using, or selling an ophthalmic solution containing Flurbiprofen for the treatment of intraoperative miosis, it was questioned how the restoration of the lost patent term due to the regulatory process for the approved product is appropriate under the statute.

In this case, the applicant for patent term extension submitted evidence that Flurbiprofen, in an amount of 0.0004% to 0.1%, has anti-inflammatory activity in the eye when topically administered. The approved label showed that Ocufen contained 0.03% of the active ingredient and stated that the product is "a topical nonsteroidal anti-inflammatory product for ophthalmic use." The specification of the '457 patent indicated that useful compositions preferably contain 0.1-90% by weight of a compound of the invention. Thus, the dosage of the active ingredient for the indicated use clearly overlapped the effective dosages specified in the functional language of claim 1 of the '457 patent. On the basis of this evidence, the PTO concluded that the later issued patent claimed the product. As both patents were determined to be eligible for patent term extension, applicant was permitted to choose the single patent term to be extended. 35 U.S.C. 156(c)(4).

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Discussion of Specific Rules

Section 1.710(a) specifically sets forth the existing policy and practice relating to eligibility of patents claiming a composition or formulation that includes the active ingredient. A patent is considered to claim the product at least in those situations where the patent claims the active ingredient per se, or claims a composition or formulation which contains the active ingredient(s) and reads on the composition or formulation approved for commercial marketing or use.

Section 1.710(b) revises the definition of human drug product in paragraph (b)(1) to make the definition conform to Pub. L. No. 100-670. A new paragraph (b)(2) is added to expand the definition of "product" in § 1.710(a) to include a new animal drug and a veterinary biological product, but not one that is primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes including site specific genetic manipulation techniques. Present paragraph (b)(2) is redesignated as paragraph (b)(3). It should be understood that the discussion here of new animal drugs and veterinary biological products is limited to the animal drugs and products defined in Pub. L. No. 100-670.

Paragraph (e)(2) of section 1.720 is revised to indicate that the conditions given therein concern a patent for a product other than one recited in section 1.710(b)(2), due to the exclusion of biotechnology-generated new animal drugs and veterinary biological products in Pub. L. No. 100-670. A new paragraph (e)(3) is added to Section 1.720 directed to the provision in 35 U.S.C. 156(a)(5)(C), which permits the term of a patent directed to a new animal drug or veterinary biological product to be extended based on a second or subsequent approval of the active ingredient provided all the following conditions exist: (a) the patent claims the drug or product, (b) the drug or product is not covered by the claims in any other patent that has been extended ("covered by the claims" means that the drug or product would infringe a claim in the other patent), (c) the patent term was not extended on the basis of the regulatory review period for use in non-food-producing animals, and (d) the second or subsequent approval was the first permitted commercial marketing or use of the drug or product for administration to a food-producing animal. A new pertion is added to paragraph(f) directed to the case where eligibility is to be based on 35 U.S.C. 156 (a)(5)(C). In this latter case, the application must be filed within 60 days of the first approval for administration to a food-producing animal.

Paragraph (a)(4) of § 1.740(a) is amended to (1) eliminate "human" as a modifier for "product," (2) add the Public Health Service Act and the Virus-Serum-Toxin Act to the list of appropriate statutes, and (3) add a requirement to indicate the use for which the product was approved. The first two amendments are necessary to comply with terms of 35 U.S.C. 156 as amended, and the third amendment is necessary to a determination of eligibility where, for example, the application is based on a second or subsequent approval of an active ingredient, but the first approval for administration to a food-producing animal. Paragraph (a)(9) is amended to eliminate the requirement to set forth the statement, beginning on a new page, that the patent for which patent term extension is sought claims the approved product or a method of using or making same, and the required showing listing each applicable claim of the patent and demonstrating the manner in which each applicable claim reads on the approved product or a method of using or making same. This change is made because the information required by this paragraph is within the province of PTO review and there is no need to have such information recited in a readily segregable section of the application. Paragraph (a)(10) is amended to indicate that, as appropriate, the Secretary of Health and Human Services or the Secretary of Agriculture will determine the applicable regulatory review period. Paragraph (a)(10)(i) is amended to recite that a Product License Application is a type of application that may be recited in an application for term extension of a patent claiming a human biological product. New paragraphs (a)(10)(ii) and (a)(10)(iii) are added to set forth the type of tests or applications that are to be considered for determination of the applicable regulatory review period for patents claiming a new animal drug or a veterinary biological product. Present paragraphs (a)(10)(ii) and (a)(10)(iii) are redesignated as paragraphs (a)(10)(iv) and (a)(10)(v), respectively. Paragraph (a)(10)(v) has been amended to reflect that approval of a medical device could be made through the use of a product development protocol. Paragraph (a)(13) is amended to indicate that the duty to disclose any information material to the determination of entitlement to the extension sought applies also to the Secretary of Agriculture where the regulatory review was conducted by the USDA.

Section 1.741(a)(2) is amended to acknowledge that regulatory review may take place under more than one Federal statute and that each appropriate statute should be listed. This amendment is intended to apply to a situation where a human biological product is tested under an investigational new drug (IND) application pursuant to the Federal Food, Drug, and Cosmetic Act, but is approved under the Public Health Service Act. The amendment is not intended to include a situation where approval is sought for use of a particular medical device with a specific drug product which may require approval under more than a single provision of law. The product that forms the basis of an application for patent term extension must be either a medical device or a drug product; it cannot be a combination of those separate products. See the file history of U.S. Patent No. 4,428,744 for an example of the application of this principle.

Section 1.741(a)(5) is amended to recognize that the Secretary of Agriculture may determine the length of the regulatory review period where the regulatory review of the product takes place at the USDA. The section is further modified to point out that a determination of the length of the regulatory review period is made under 35 U.S.C. 156(g), and not the length of the patent term extension that is made by the PTO under 35 U.S.C. 156(c).

Section 1.765(a) is amended to recite that a duty of candor and good faith is owed to the Secretary of Agriculture in patent term extension proceedings wherein the USDA is involved.

The title of § 1.775 is amended to reflect that the section is directed to calculating patent term extension for human drug, antibiotic drug, and human biological products. Paragraphs (a), (b), (c), and (d) are amended to indicate that the determinations are being made for any of a human drug, an antibiotic drug, or a human biological product. Sections (c)(1) and (c)(2) are amended to refer merely to a "product" rather than to a "human drug product" or a "drug product" in order to make the sections clearer.

Section 1.778 is added to set forth the manner of calculation of the patent term extension for an animal drug product.

Paragraph (a) specifies that the extension will run from the original expiration date of the patent as shortened by any terminal disclaimer.

Paragraph (b) of § 1.778 provides that the patent term will be extended by the regulatory review period for the product but reduced, where appropriate, by the time periods provided in paragraph (d).

Paragraph (c) defines how the regulatory review period is to be calculated. The period is determined by counting

(1) the number of days in the period beginning on the earlier of the dates a major health or environmental effects test was initiated on the drug or an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for the drug and ending on the date an application was initially submitted for the drug under section 512 of the Federal Food, Drug, and Cosmetic Act; and

(2) the number of days in the period beginning on the date the application was initially submitted for the approved drug under subsection (b) of section 512 of the Federal Food, Drug, and Cosmetic Act and ending on the date the application was approved under the section.

The added total of the days determined in subparagraphs (c)(1) and (c)(2) constitutes the regulatory review period, which is then reduced, where appropriate, by the time periods described in paragraph (d).

Paragraph (d) of § 1.778 modifies the term of the patent extension by indicating that

(1) the time period determined from paragraph (c) would be reduced, where appropriate, by—

(i) the number of days in the period of paragraphs (c)(1) and (c)(2) of section 1.778 that were before the date on which the patent issued;

(ii) the number of days in paragraphs (c)(1) and (c)(2) of section 1.778 during which it is determined under 35 U.S.C. 156(d)(2)(B) that applicant did not act with due diligence; and

(iii) the number of days equal to one-half the number of days remaining in paragraph (c)(1) after the paragraph

(c)(1) determination has been reduced in accordance with paraprahps (d)(1)(i) and (d)(1)(ii) of section 1.778 (half days to be ignored for subtraction purposes);

(2) adding the number of days determined in paragraph (d)(1) to the original expiration date of the patent as shortened by any terminal disclaimer;

(3) adding 14 years to the date of approval of the application under section 512 of the Federal Food, Drug, and Cosmetic Act;

(4) comparing the dates obtained from paragraphs (d)(2) and (d)(3) with each other and selecting the earlier date;

(5) if the original patent issued after November 16, 1988, by—

(i) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(ii) comparing the dates obtained from paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date;

(6) if the original patent issued before November 16, 1988, and

(i) if no major health or environmental effects test on the drug was initiated and no request was submitted for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act before November 16, 1988, by—

(A) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date; or

(ii) if a major health or environmental effects test was initiated or a request for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act was submitted before November 16, 1988, and the application for commercial marketing or use of the drug was not approved before November 16, 1988, by—

(A) adding 3 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained from paragraphs (d)(4) and (d)(6)(ii)(A) with each other and selecting the earlier date.

Section 1.779 is added to set forth the manner of calculation of the patent term extension for a veterinary biological product.

Paragraph (a) specifies that the extension runs from the original expiration date of the patent as shortened by any terminal disclaimer.

Paragraph (b) of § 1.779 provides that the patent term would be extended by the regulatory review period for the product but reduced, where appropriate, by the time periods provided in paragraph (d).

Paragraph (c) defines how the regulatory review period is to be calculated. The period is determined by counting

(1) the number of days in the period beginning on the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective and ending on the date an application for a license was submitted under the Virus-Serum-Toxin Act; and

(2) the number of days in the period beginning on the date an application for a license was initially submitted under the Virus-Serum-Toxin Act and ending on the date a license was issued.

The added total of the days determined in paragraphs (c)(1) and (c)(2) constitutes the regulatory review period, which is then reduced, where appropriate, by the time periods described in paragraph (d).

Paragraph (d) of § 1.779 defincs the term of the patent extension by indicating that

(1) the time period determined from paragraph (c) would be reduced, where appropriate, by—

(i) the number of days in the periods of paragraphs (c)(1) and (c)(2) that were on and before the date on which the patent issued;

(ii) the number of days in the periods of paragraphs (c)(1) and (c)(2) during which it is determined under 35 U.S.C. 156(d)(2)(B) that the applicant did not act with due diligence; and

(iii) one-half the number of days remaining in the period defined by paragraph (c)(1) after that period is reduced in accordance with paragraphs (d)(1)(i) and (d)(1)(ii) (half days being ignored for purposes of subtraction);

(2) adding the number of days determined in paragraph (d)(1) to the original term of the patent as shortened by any terminal disclaimer;

(3) adding 14 years to the date of the issuance of a license under the Virus-Serum-Toxim Act;

(4) comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) and selecting the earlier date;

(5) if the patent was issued after November 16, 1988, by—

(i) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(ii) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date;

(6) if the original patent issued before November 16, 1988, and

(i) if no request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before November 16, 1988, by—

(A) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date; or

(ii) if a request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before November 16, 1988, and the commercial marketing or use of the product was not approved before November 16, 1988, by—

(A) adding 3 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) and selecting the earlier date.

Section 1.785(b) is amended to indicate that, in those instances where an applicant is seeking patent term extension for two or more patents based upon the same regulatory review period, the applicant will have the right to elect which patent is to have its term extended. In the absence of an election by applicant, the Commissioner will extend that patent having the earliest date of issuance.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. No. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change setting forth procedures allowing owners of patents directed to new animal drugs and veterinary biological products to apply for extension of patent term would not be expected to result in any adverse economic impact on small entities because patented drugs are generally not commercialized by small entities.

The PTO has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less that $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the abilbity of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change contains a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* which has been approved by the Office of Management and Budget under control number 0651-0020. Preparation of an application for patent term extension is estimated to take approximately sixty hours, including time for reviewing instructions, gathering and maintaining data needed, and completing

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and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington D.C. 20503. (Paperwork Reduction Project 0651-0020) No comments regarding this burden estimate or any other aspect of this collection of information were received in response to the notice of proposed rulemaking.

List of Subjects in 37 CFR Part 1, Subpart F

Administrative practice and procedure, Authority delegations (Government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 156, the PTO is amending Title 37 of the Code of Federal Regulations as set forth below.

Subpart F—Extension of Patent Term

1. The authority citation for 37 CFR Part 1, Subpart F, continues to read as follows:

Authority: 35 U.S.C. 6 and 156.

2. Section 1.710 is revised to read as follows:

§ 1.710 Patents subject to extension of the patent term.

(a) A patent is eligible for extension of the patent term if the patent claims a product as defined in paragraph (b) of this section, either alone or in combination with other ingredients that read on a composition that received permission for commercial marketing or use, or a method of using such a product, or a method of manufacturing such a product, and meets all other conditions and requirements of this subpart.

(b) The term "product" referred to in paragraph (a) of this section means—

(1) The active ingredient of a new human drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or

(2) The active ingredient of a new animal drug or veterinary biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Virus-Serum-Toxin Act) that is not primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes including site specific genetic manipulation techniques, including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or

(3) Any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act.

3. Section 1.720 is amended by revising paragraphs (e)(2) and (f) and adding paragraph (e)(3) to read as follows:

§1.720 Conditions for extension of patent term.

* * * * *

(e) The product has received permission for commercial marketing or use and—

* * * * *

(2) In the case of a patent other than one directed to subject matter within § 1.710(b)(2) claiming a method of manufacturing the product that primarily uses recombinant DNA technology in the manufacture of the product, the permission for the commercial marketing or use is the first received permission for the commercial marketing or use of a product manufactured under the process claimed in the patent, or

(3) In the case of a patent claiming a new animal drug or a veterinary biological product that is not covered by the claims in any other patent that has been extended, and has received permission for the commercial marketing or use in non-food-producing animals and in food-producing animals, and was not extended on the basis of the regulatory review period for use in non-food-producing animals, the permission for the commercial marketing or use of the drug or product after the regulatory review period for use in food-producing animals is the first permitted commercial marketing or use of the drug or product for administration to a food-producing animal.

(f) The application is submitted within the sixty-day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred; or in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty-day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent; or in the case of a patent that claims a new animal drug or a veterinary biological product that is not covered by the claims in any other patent that has been extended, and said drug or product has received permission for the commercial marketing or use in non-food-producing animals, the application for extension is submitted within the sixty-day period beginning on the date of the first permitted commercial marketing or use of the drug or product for administration to a food-producing animal;

* * * * *

4. Section 1.740 is amended by revising paragraphs (a)(4), (a)(9), (a)(10)(i) and (a)(13), adding paragraphs (a)(10)(ii) and (a)(10)(iii), and redesignating present paragraphs (a)(10)(ii) and (a)(10)(iii) as (a)(10)(iv) and (a)(10)(v), respectively, to read as follows:

§ 1.740 Application for extension of patent term.

(a) An application for extension of patent term must be made in writing to the Commissioner of Patents and Trademarks. A formal application for the extension of patent term shall include:

* * * * *

(4) In the case of a drug product, an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food, Drug, and Cosmetic Act, the Public Health Service Act, or the Virus-Serum-Toxin Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients), the use for which it was approved, and the provision of law under which it was approved.

* * * * *

(9) A statement that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or method of using or manufacturing the approved product;

(10) A statement, beginning on a new page, of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services or the Secretary of Agriculture, as appropriate, to determine the applicable regulatory review period as follows:

(i) For a patent claiming a human drug, antibiotic, or human biological product, the effective date of the investigational new drug (IND) application and the IND number; the date on which a new drug application (NDA) or a Product License Application (PLA) was initially submitted and the NDA or PLA number and the date on which the NDA was approved or the Product License issued;

(ii) For a patent claiming a new animal drug, the date a major health or environmental effects test on the drug was initiated and any available substantiation of the date or the date of an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for such animal drug; the date on which a new animal drug application (NADA) was initially submitted and the NADA number; and the date on which the NADA was approved;

(iii) For a patent claiming a veterinary biological product, the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective; the date an application for a license was submitted under the Virus-Serum-Toxin Act; and the date the license issued;

(iv) For a patent claiming a food or color additive, the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug, and Cosmetic Act was initially submitted and the petition number; and the date on which the FDA published the Federal Register notice listing the additive for use;

(v) For a patent claiming a medical device, the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which the application for product approval or notice of completion of a product development protocol under section 515 of the Federal Food, Drug, and Cosmetic Act was initially submitted and the number of the application or protocol; and the date on which the application was approved or the protocol declared to be completed.

* * * * *

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services or the Secretary of Agriculture any information which is material to the determination of entitlement to the extension sought (see § 1.765);

* * * * *

5. Section 1.741 is amended by revising paragraphs (a)(2) and (a)(5) to read as follows:

§ 1.741 Filing date of the application.

(a) * * *

(2) An identification of each Federal statute under which regulatory review occurred.

* * * * *

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsections (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services or the Secretary of Agriculture to determine the length of the regulatory review period; and

* * * * *

6. Section 1.765 is amended by revising paragraph (a) to read as follows:

§ 1.765 Duty of Disclosure in patent term extension proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services or the Secretary of Agriculture rests on the patent owner or its agent, on each attorney or agent who represents the patent owner and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of material information adverse to a determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

* * * * *

7. Section 1.775 is amended by revising the title and paragraphs (a), (b), (c), and (d) introductory text to read as follows:

§ 1.775 Calculation of patent term extension for a human drug, antibiotic drug or human biological product.

(a) If a determination is made pursuant to § 1.750 that a patent for a human drug, antibiotic drug or human biological product is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a human drug, antibiotic drug or human biological product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a human drug, antibiotic drug or human biological product will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(1)(B), it is the sum of—

(1) The number of days in the period beginning on the date an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved product and ending on the date the application was initially submitted for such product under those sections or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved product under section 351 of the Public Health Service Act, subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for a human drug, antibiotic drug or human biological product will be determined by—

* * * * *

8. Section 1.778 is added to read as follows:

§ 1.778 Calculation of patent term extension for an animal drug product.

(a) If a determination is made pursuant to § 1.750 that a patent for an animal drug is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for an animal drug will be extended by the length of the regulatory review period for the drug as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for an animal drug will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(4)(B), it is the sum of—

(1) The number of days in the period beginning on the earlier of the date a major health or environmental effects test on the drug was initiated or the date an exemption under

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subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for the approved animal drug and ending on the date an application was initially submitted for such animal drug under section 512 of the Federal Food, Drug, and Cosmetic Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved animal drug under subsection (b) of section 512 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for an animal drug will be determined by—

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section that were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 512 of the Federal Food, Drug, and Cosmetic Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after November 16, 1988, by—

(i) Adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before November 16, 1988, and

(i) If no major health or environmental effects test on the drug was initiated and no request was submitted for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act before November 16, 1988, by—

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a major health or environmental effects test was initiated or a request for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act was submitted before November 16, 1988, and the application for commercial marketing or use of the animal drug was not approved before November 16, 1988, by—

(A) Adding 3 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

9. Section 1.779 is added to read as follows:

§ 1.779 Calculation of patent term extension for a veterinary biological product.

(a) If a determination is made pursuant to § 1.750 that a patent for a veterinary biological product is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a veterinary biological product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Agriculture, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a veterinary biological product will be determined by the Secretary of Agriculture. Under 35 U.S.C. 156(g)(5)(B), it is the sum of—

(1) The number of days in the period beginning on the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective and ending on the date an application for a license was submitted under the Virus-Serum-Toxin Act; and

(2) The number of days in the period beginning on the date an application for a license was initially submitted for approval under the Virus-Serum-Toxin Act and ending on the date such license was issued.

(d) The term of the patent as extended for a veterinary biological product will be determined by—

(1) Subtracting from the number of days determined by the Secretary of Agriculture to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section that were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Agriculture that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of the issuance of a license under the Virus-Serum-Toxin Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after November 16, 1988, by—

(i) Adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before November 16, 1988, and

(i) If no request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before November 16, 1988, by—

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before Novemver 16, 1988, and the commercial marketing or use of the product was not approved before November 16, 1988, by—

(A) Adding 3 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

10. Section 1.785 is amended to revise paragraph (b) to read as follows:

§ 1.785 Multiple applications for extension of terms of the same patent or of different patents for the same regulatory review period for a product.

* * * * *

(b) If more than one application for extension is filed by a single applicant which seeks the extension of the term of two or more patents based upon the same regulatory review period, and the applications are otherwise eligible for extension pursuant to the requirement of this subpart, in the absence of an election by applicant, the certificate of extension of patent term, if appropriate, will be issued upon the application for extension of the patent term having the earliest date of issuance of those patents for which extension is sought.

May 31, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

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Department of Commerce
Patent and Trademark Office
37 CFR Part 150
[Docket No. 71038-8108]

Requests for Presidential Proclamations Under the Semiconductor Chip Protection Act of 1984, 17 U.S.C. 902(a)(2)

Agency:Patent and Trademark Office, Commerce
Action: Final Rule
Summary:The Patent and Trademark Office (PTO) is adding a new Subchapter C, Part 150 to its rules to implement the Presidential proclamation provisions of the Semiconductor Chip Protection Act of 1984, 17 U.S.C. 902(a)(2). The rules establish procedures for the evaluation of requests by foreign governments for the issuance of Presidential proclamations granting protection in the United States to mask works of foreign origin. The rules also permit the Commissioner of Patents and Trademarks independently to initiate an evaluation. The effect of the rules will be to establish a regime of protection for foreign mask works in the United States, provided mask works of U.S. origin are adequately protected in the country requesting a Presidential proclamation.
Effective Date: August 1, 1988
For Further Information Contact: Michael K. Kirk, Assistant Commissioner for External Affairs, by telephone at (703)557-3065, or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The Semiconductor Chip Protection Act of 1984 (SCPA) established a new form of intellectual property protection for mask works that are fixed in semiconductor chips. Mask works are defined as a "series of related images, however fixed or encoded," that represent the three-dimensional pattern in the layers of a semiconductor chip. Thus, the subject matter of protection under the SCPA are the layout designs of semiconductor chips, known in some countries as "integrated circuit layout designs" or as "semiconductor topographies." The SCPA provides a ten-year term of protection for original mask works measured from their date of registration or first commercial exploitation anywhere in the world. To maintain protection, mask works must be registered in the United States Copyright Office within two years of first commercial exploitation.

Protection for foreign mask works may be granted under both section 902 and section 914 of the SCPA. Section 902 sets out three different ways that foreign mask works may become eligible for protection in the United States. First, on the date the work is registered or is first commercially exploited anywhere in the world, the mask work is protectible if its owner is a national, domiciliary or sovereign authority of a foreign nation that is a party to a treaty that provides protection of mask works and to which the United States is also a party, or if a stateless person, wherever domiciled. Second, foreign mask works may be protected when they are first commercially exploited in the United States. The third way, set forth in section 902(a)(2), is where the foreign mask work comes within the scope of a Presidential proclamation. The President may issue a proclamation upon finding that a foreign nation extends to mask works of owners who are U.S. nationals or domiciliaries, protection (1) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (2) on substantially the same basis as provided in the SCPA. Pursuant to Executive Order 12504, 50 FR 4849 (Feb. 4, 1985), requests for issuance of Presidential proclamations are to be presented to the President by the Secretary of Commerce.

Section 914 was included in the SCPA as a transitional provision, intended by Congress to encourage other countries to pass laws extending protection to this new form of intellectual property. Once laws were in place, it was reasoned, permanent protection for foreign mask works could be conferred under section 902 or through a multilateral treaty that extended coverage to mask works. Section 914 gives the Secretary of Commerce authority to issue orders extending interim protection to foreign mask work owners upon the satisfaction of certain conditions. First, the Secretary must find that the foreign nation is making good faith efforts and reasonable progress toward entering into a treaty with the United States, or toward enacting legislation that will protect U.S. mask works on the same basis as domestic mask works, or at a level similar to that provided under the SCPA. Second, the Secretary must determine that nationals, domiciliaries and sovereign authorities of the foreign nation are not engaged in the misappropriation, unauthorized distribution, or unauthorized commercial exploitation of mask works. Finally, the Secretary must determine that issuance of an interim order would promote the purposes of the SCPA and international comity with respect to the protection of mask works.

By Amendment 1 to Department Organization Order 10-14, issued Dec. 3, 1984, the Secretary of Commerce delegated to the Assistant Secretary and Commissioner of Patents and Trademarks the authority under section 914 to make pertinent findings and to issue orders for the interim protection of foreign mask works. Amendment 2 to Department Organization Order 10-14, issued Sept. 28, 1987, expanded the earlier delegation to include responsibility for prescribing regulations for the presentation to the President of requests for issuance of proclamations under section 902.

The Commissioner has issued orders granting interim protection under section 914 for mask works produced in Australia, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. All of the interim protection orders were recently extended until May 31, 1989. *See Extension of Previously-Granted Interim Orders Under the Semiconductor Chip Protection Act of 1984*, 53 FR 16308 (May 6, 1988).

This proceeding was initiated by a Notice of Proposed Rulemaking published at 53 FR 5588-90 (Feb. 25, 1988). The notice set forth proposed regulations for the submission and evaluation of requests that the Secretary of Commerce recommend the issuance or revocation of a Presidential proclamation granting U.S. protection to foreign mask works under section 902(a)(2) of the SCPA. Comments on the proposed rules were received from the Commission of the European Communities and the U.S. Semiconductor Industry Association.

Discussion of Specific Rules

Section 150.1 of the new rules sets forth relevant definitions. Section 150.2 specifies the conditions under which an evaluation of recommending the issuance, revision, suspension or revocation of a section 902 proclamation will be initiated by the Commissioner. Section 150.2(a) provides that the Commissioner must initiate an evaluation of the propriety of recommending the issuance of a section 902 proclamation upon receipt of a request from a foreign government. Section 150.2(b) gives the Secretary the discretion to initiate independently an evaluation concerning issuance, revision, suspension or revocation of a proclamation, or as directed by the Secretary of Commerce.

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Section 150.3(a) states that requests for the issuance of a section 902 Presidential proclamation shall be made by "foreign governments." The definition of "foreign government" in section 150.1 of the rules makes clear that international intergovernmental organizations may request Presidential proclamations on behalf of their member states.

Section 150.3(b) lists the documentation that must accompany requests for issuance of a proclamation. The laws, legal rulings, regulations, and administrative orders submitted must be in unedited, full-text form. Where possible, the materials submitted should be reproduced from the original document, *e.g.*, from court reports or statutory instruments. Abstracts, summaries and commentaries are not acceptable. If the documents are not in English, a certified English translation must accompany them.

Section 150.4 sets out the procedure the Commissioner will follow after a request for issuance of a proclamation has been submitted, or following a decision independently to initiate an evaluation. If a foreign government requests a section 902 proclamation before a section 914 proceeding has taken place, under section 150.4(a) the Commissioner may initiate such a proceeding to compile a record of necessary information and, where appropriate, to provide interim protection in the United States while the section 902 request is pending. Section 150.4(b) provides that the information obtained during a section 914 proceeding, if one has been held, will be considered by the Commissioner in determining whether to recommend the issuance of a Presidential proclamation.

Section 150.4(c) provides that requests for Presidential proclamations, and notices of the Commissioner's determination independently to initiate section 902 evaluations, will be published in the *Federal Register*. Written comments will be requested. Section 150.4(d) requires the Commissioner to notify the Register of Copyrights and the Committees on the Judiciary of the Senate and the House of Representatives of the initiation of an evaluation. Under section 150.4(e), a hearing may be scheduled if the written comments raise issues that cannot be resolved through informal contacts Section 150.4(f) provides that the record to be considered by the Commissioner in determining whether to recommend a Presidential proclamation will be the request from a foreign government, if any, written comments received, the record of any section 914 proceedings, and the information obtained in a hearing, if one is held.

Sections 150.4(g) and (h) provide that the Commissioner will forward the draft recommendation to the Secretary, who will then forward a recommendation regarding issuance of a proclamation to the President. Section 150.5(a) makes clear that the recommendation for issuance of a proclamation may include terms and conditions regarding the duration of the proclamation. Section 150.5(b) provides that interested parties may request the revision, suspension or revocation of Presidential proclamations.

Comments on the Proposed Rules

Comments on the proposed rules were submitted by the Commission of the European Communities and the U.S. Semiconductor Industry Association (SIA). The Commission of the European Communities noted that any request for a proclamation in favor of mask works produced in the Member States will be made by the Commission. The Commission requested a clarification that the term "foreign governments" as used in section 150.3(a) includes international intergovernmental organizations which have been empowered by their member states to request Presidential proclamations granting U.S. protection to mask works produced in such states.

The PTO adopts the Commission's suggestion. The rules are not intended to preclude foreign governments from having requests for Presidential proclamations presented on their behalf by an international or regional intergovernmental organization. Accordingly, a definition of "foreign government" is added as section 150.l(b) of the rules, making clear that international intergovernmental organizations may request Presidential proclamations on behalf of their member states.

In its comments, the SIA requested that section 150.4(c) be amended to require that the Commissioner hold a public hearing when requested by any interested party after an evaluation has begun. As proposed, section 150.4(e)(2)(ii) gives the Commissioner discretion to hold a hearing to gather additional information if material issues raised in written comments cannot be resolved less formally. SIA also requested that section 150.4(f) be amended to include information obtained in public hearings in the list of materials to be evaluated by the Commissioner. SIA suggested that section 150.4(c) specify a time period of thirty (30) days after publication of a request for comments in the *Federal Register* during which written comments and requests for a hearing may be submitted.

The PTO does not agree that the Commissioner should be required to hold a hearing as part of every section 902 evaluation whenever requested. Section 150.4(b) provides that information obtained during section 914 proceedings will be used in evaluating requests for Presidential proclamations. Moreover, under section 150.4(a) the Commissioner may institute section 914 proceedings if an interim order has not been issued in favor of mask works from such a requesting nation. Given the thoroughness with which section 914 proceedings are generally conducted, the Commissioner is expected to have available a substantial record concerning the degree of protection for U.S. mask works in the subject country. A separate hearing might only serve to cause delay in such cases.

Moreover, effective public participation in the section 902 evaluation process is not dependent on whether the Commissioner holds a hearing. The rules proceed from the assumption that any material issues relating to protection of U.S. mask works in a requesting foreign country can be raised in written comments, and that these issues can be resolved flexibly through informal *inter partes* contacts. Where issues cannot be resolved through such informal contacts, section 150.4(e)(ii) gives the Commissioner discretion to hold a hearing to obtain additional views and to assist in resolving the issues. It is not evident that a mandatory hearing upon request of interested parties would provide an opportunity for exchange of views or information that is not otherwise available under section 150.4(e).

The PTO agrees that, if the Commissioner elects to hold a hearing, the information obtained should be included in the record. Accordingly, section 150.4(f) is amended to make this clarification. It is also proper that the rules specify a time period for the submission of comments following publication in the *Federal Register* of the request for a proclamation or the Commissioner's determination to initiate independently a section 902 evaluation. Thus, to ensure that all interested parties have sufficient time to investigate and prepare complete written comments, section 150.4(c) is amended to specify that comments must be submitted within sixty (60) days of *Federal Register* publication.

Discussion of Principal Changes

A new section 150.l(b) has been added to the rules as proposed to clarify that international or regional intergovernmental organizations may request Presidential proclamations on behalf of their member states, provided the member states have empowered the organization to make such requests. Proposed sections 150.l(c)-(g) have been redesignated as sections 150.l(d)-(h). The definition of "mask work" in section 150.l(d) (proposed section 150.l(c)) has been modified slightly to conform to the language in section 901(a)(2) of the SCPA. The definition of "Presidential proclamation" in section 150.l(e) (proposed section 150.l(d)) has been changed slightly by substituting the words "applying for" for the word "making" before the word "registrations." The purpose of this change is to conform the language of the rule to section 908 of the SCPA, which relates to mask work registration. The definition of "request" in section 150.l(f) (proposed section 150.l(e)) has been changed to indicate that the Commissioner is not required to treat requests for the revision, suspension or revocation of a Presidential proclamation in the same way as requests for issuance of such proclamations (*see* discussion of section 150.5(b), *infra*).

Section 150.2(a) has been expanded to make clear that the Commissioner may initiate independently an evaluation of recommending the revision, suspension, or revocation of a Presidential proclamation, as well as an evaluation of recommending the issuance of a proclamation. This change reflects the amendment to section 902(a)(2) made by the Semiconductor Chip Protection Act Extension of 1987, which clarifies that the President has the authority to revise, suspend or revoke, as well as issue, proclamations extending protection to foreign mask works.

Section 150.3(b) has been changed to state that requests for issuance of a Presidential proclamation must be accompanied by "a copy" of laws, legal rulings, regulations or administrative orders, rather than "an official copy" of such materials, as was proposed. This change is made to avoid confusion arising from the fact that the meaning of "official copy" may vary from country to country. Section 150.3(b)(5) has been redesignated as section 150.3(b)(6), and a new section 150.3(b)(5) has been added to specify that the copies submitted to the PTO must be in full text, unedited, and where possible, be reproduced from the original document.

Section 150.4(c) has also been changed. The proposed rule stated that notices of requests by foreign governments for the issuance of Presidential proclamations will be published in the *Federal Register*. Language has been added to make clear that notices of the Commissioner's determination independently to initiate evaluations will also be published in the *Federal Register*. Section 150.4(c) has also been changed to provide that comments shall be submitted to the Commissioner within sixty (60) days of publication of the *Federal Register* notice. Section 150.4(f) has been modified to include information obtained in a public hearing held pursuant to section 150.4(e)(ii), if such a hearing is held, in the list of materials to be evaluated by the Commissioner.

Section 150.5(b) has been changed to reflect the amendment to section 902(a)(2) made by the Semiconductor Chip Protection Act Extension of 1987. The first sentence provides that any interested party may request the "revision, suspension or revocation" of a proclamation. The second sentence has been modified to provide that "requests for revision, suspension or revocation of a proclamation will be considered in substantially the same manner as requests for the issuance of a section 902 proclamation." The word "substantially" has been added to indicate that the Commissioner need not initiate a formal evaluation in every case where a request is made for the revision, suspension or revocation of a Presidential proclamation, in contrast to situations where a foreign government requests the issuance of such a proclamation. While good faith requests for the revision, suspension or revocation of a proclamation will be accorded fair procedural treatment, it is proper that the Commissioner have flexibility at the outset to consider such requests on a case-by-case basis as experience is gained under these rules. If necessary, the PTO may amend the rules at a later time to provide additional procedures for consideration of requests for revision, suspension or revocation of Presidential proclamations.

Stylistic changes have also been made in sections 150.2(a), 150.3(b)(6) (proposed section 150.3(b)(5)) and 150.5(a), but these changes are for purposes of clarity and are not substantive in nature.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources. This rule is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980,44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the proposed rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*) The economic impact of a Presidential proclamation on small entities will be beneficial, since such proclamations may be issued only upon a finding that a foreign nation extends reciprocal protection to U.S. mask works.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less that $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. By extending protection to foreign mask work owners, the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets will be enhanced.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3510 *et seq.*, since no record-keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Subchapter C

Administrative practice and procedure, Authority delegations, Semiconductor chips, Mask works.

For the reasons set out in the preamble, Chapter I of Title 37 CFR is amended by adding a new Subchapter C, Part 150, as follows:

Subchapter C - PROTECTION OF FOREIGN MASK WORKS

Part 150 - REQUESTS FOR PRESIDENTIAL PROCLAMATIONS PURSUANT TO 17 U.S.C. 902(a)(2)

Sec.
150.1 Definitions.
150.2 Initiation of Evaluation.
150.3 Submission of Requests.
150.4 Evaluation.
150.5 Duration of Proclamation.
150.6 Mailing Address.

Authority: 35 U.S.C. 6; E.O. 12504, 50 FR 4849, 3 CFR, 1985 Comp., p. 335.

Section 150.1 Definitions.

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.
(b) "Foreign government" means the duly-constituted executive of a foreign nation, or an international or regional intergovernmental organization which has been empowered by its member states to request issuance of Presidential proclamations on their behalf under this part.
(c) "Interim order" means an order issued by the Secretary of Commerce under 17 U.S.C. 914.
(d) "Mask work" means a series of related images, however fixed or encoded -
  (1) having or representing the predetermined, threedimensional pattern of metallic, insulating, or semiconductor material present or removed from the layers of a semiconductor chip product; and
  (2) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product.
(e) "Presidential proclamation" means an action by the President extending to foreign nationals, domiciliaries and sovereign authorities the privilege of applying for registrations for mask works pursuant to 17 U.S.C. 902.
(f) "Request" means a request by a foreign government for the issuance of a Presidential proclamation.
(g) "Proceeding" means a proceeding to issue an interim order extending protection to foreign nationals, domiciliaries and sovereign authorities under 17 U.S.C. Chapter 9.
(h) "Secretary" means the Secretary of Commerce.

Section 150.2 Initiation of Evaluation.

(a) The Commissioner independently or as directed by the Secretary, may initiate an evaluation of the propriety of recommending the issuance, revision, suspension or revocation of a section 902 proclamation.
(b) The Commissioner shall initiate an evaluation of the propriety of recommending the issuance of a section 902 proclamation upon receipt of a request from a foreign government.

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Section 150.3 Submission of Requests.

(a) Requests for the issuance of a section 902 proclamation shall be submitted by foreign governments for review by the Commissioner.
(b) Requests for issuance of a proclamation shall include:
  (1) A copy of the foreign law or legal rulings that provide protection for U.S. mask works which provide a basis for the request.
  (2) A copy of any regulations or administrative orders implementing the protection.
  (3) A copy of any laws, regulations or administrative orders establishing or regulating the registration (if any) of mask works.
  (4) Any other relevant laws, regulations or administrative orders.
  (5) All copies of laws, legal rulings, regulations or administrative orders submitted must be in unedited, full-text form, and if possible, must be reproduced from the original document.
  (6) All material submitted must be in the original language, and if not in English, must be accompanied by a certified English translation.

Section 150.4 Evaluation.

(a) Upon submission of a request by a foreign government for the issuance of a section 902 proclamation, if an interim order under section 914 has not been issued, the Commissioner may initiate a section 914 proceeding if additional information is required.
(b) If an interim order under section 914 has been issued, the information obtained during the section 914 proceeding will be used in evaluating the request for a section 902 proclamation.
(c) After the Commissioner receives the request of a foreign government for a section 902 proclamation, or after a determination is made by the Commissioner to initiate independently an evaluation pursuant to section 150.2(a) of this part, a notice will be published in the Federal Register to request relevant and material comments on the adequacy and effectiveness of the protection afforded U.S. mask works under the system of law described in the notice. Comments should include detailed explanations of any alleged deficiencies in the foreign law or any alleged deficiencies in its implementation. If the alleged deficiencies include problems in administration such as registration, the respondent should include as specifically as possible full detailed explanations, including dates for and the nature of any alleged problems. Comments shall be submitted to the Commissioner within sixty (60) days of publication of the *Federal Register* notice.
(d) The Commissioner shall notify the Register of Copyrights and the Committees on the Judiciary of the Senate and the House of Representatives of the initiation of an evaluation under these regulations.
(e) If the written comments submitted by any party present relevant and material reasons why a proclamation should not issue, the Commissioner will:
  (1) Contact the party raising the issue for verification and any needed additional information;
  (2) Contact the requesting foreign government to determine if the issues raised by the party can be resolved; and,
    (i) If the issues are resolved, continue with the evaluation; or,
    (ii) If the issues cannot be resolved on this basis, hold a public hearing to gather additional information.
(f) The comments, the section 902 request, information obtained from a section 914 proceeding, if any, and information obtained in a hearing held pursuant to subsection (e)(ii) of this section, if any, will be evaluated by the Commissioner.
(g) The Commissioner will forward the information to the Secretary, together with an evaluation and a draft recommendation.
(h) The Secretary will forward a recommendation regarding the issuance of a section 902 proclamation to the President.

Section 150.5 Duration of Proclamation.

(a) The recommendation for the issuance of a proclamation may include terms and conditions regarding the duration of the proclamation.
(b) Requests for the revision, suspension or revocation of a proclamation may be submitted by any interested party. Requests for revision, suspension or revocation of a proclamation will be considered in substantially the same manner as requests for the issuance of a section 902 proclamation.

Section 150.6 Mailing Address.

Requests and all correspondence submitted pursuant to these guidelines shall be addressed to:

Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231

June 23, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1092 OG 52]

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(160) **Errors in Notice of Allowance**

The purpose of this notice is to clarify existing Office practice with respect to providing a new issue fee due date. Sometimes errors appear on the Notice of Allowance, such as an incorrect number of claims, the misspelling of an inventor's name, an incorrect inventorship, or an incorrect title. A duplicate Notice of Allowance correcting the errors may be requested from the Group that mailed the Notice. However, a new issue fee due date will not be provided if the information on the original Notice of Allowance is sufficient to allow a reasonable practitioner to timely file a proper issue fee in the correct application. Specifically, the mere filing of a request for a corrected or duplicate Notice of Allowance will not act to stay the period for paying the issue fee.

June 12, 1985.

JAMES E. DENNY,
Deputy Assistant Commissioner for Patents.

[1056 OG 35]

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(161) **Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120**

The Patent and Trademark Office has established initial guidelines for patent examiners to use in implementing the changes made in 35 U.S.C. 103, 116, and 120 by Public Law 98-622, the Patent Law Amendments Act of 1984. As a service to the public, those guidelines are published below. A copy of Public Law 98-622 is also being published concurrently herewith. Some of the procedural aspects of matters contained in the guidelines will be incorporated into Title 37 of the Code of Federal Regulation through the rule-making process.

Dec. 11, 1984.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Initial Guidelines As To Implementation Of 35 U.S.C. 103

Public Law 98-622 added a new sentence to 35 U.S.C. 103 which reads as follows:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The significant features resulting from this amendment to § 103 are the following:

(1) The only prior art which is disqualified is prior art under § 102(f) or (g) where the subject matter, i.e., the prior art, and the invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." (Person includes organization.)
(2) If the subject matter (prior art) qualifies as prior art under any other section, e.g., § 102(a), (b), or (e), it is still prior art and can be used.
(3) Amendment applies only to subject matter which qualifies as prior art under § 103; it does not affect subject matter which qualifies as prior art under § 102, i.e., anticipatory prior art.
(4) Term "another person" means any inventive entity other than the inventor and includes the inventor and any other person.
(5) Term "developed" is to be read broadly and is not limited to any particular manner of development.
(6) Subject matter derived from another under § 102(f) is prior art under § 103 unless the derived subject matter and the claimed invention are owned by, or subject to an obligation of assignment to, the same person at the time the claimed invention was made.
(7) The disclosure of an earlier filed patent application which issues as a patent continues to be prior art under § 102(e) against a later invented and filed application of another inventor even though the patent and the later application are owned by, or subject to an obligation of assignment to, the same person.
(8) Commonly owned applications, i.e., applications owned by the same person, may be refiled as a single application to avoid one or more of them becoming prior art against another under §§ 102(e) and 103.
(9) The phrase "owned by the same person" requires that the same person, persons, or organization own 100% of the subject matter (prior art) and 100% of the claimed invention.
(10) The phrase "subject to an obligation of assignment to the same person" requires that a legal obligation of assignment exist and not merely a moral or unenforceable obligation.
(11) As long as the same person owns the subject matter and the invention at the time the claimed invention was made, a license to another may be made without the subject matter becoming prior art.
(12) Amended § 103 requires actual ownership (or obligation to assign) be in existence at the time the claimed invention is made for the subject matter to be disqualified as prior art; acquiring one or the other later is not sufficient.
(13) Burden of establishing that subject matter is disqualified as prior art is placed on patent applicant and not on the patent examiner once the examiner establishes a prima facie case of obviousness based on the prior art.
(14) Double patenting rejections may now be made in applications based on commonly owned patents of different inventive entities and double patenting rejections of the obviousness type can be overcome by terminal disclaimers.
(15) A double patenting rejection may also be made in a later filed application where the application/patent on which the rejection is based and the later filed application are not commonly owned as long as one of the inventors is common between the later filed application and the application/patent; such a rejection cannot be overcome by terminal disclaimer in view of the lack of common ownership.
(16) The Commissioner's Notice of January 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967) is withdrawn to the extent that it does not authorize a double patenting rejection where different inventive entities are present.
(17) Inventors of subject matter not commonly owned at the time of the invention may file as joint inventors in a single application. However, the claims in such an application are not protected from a § 102(f) /103 or § 102(g)/103 rejection.

Implementation Steps As To Amended 35 U.S.C. 103

A. *Applications To Be Considered*
  (1) Amended § 103 does not "affect any final decision made by the court or the Patent and Trademark Office before the date of enactment [November 8, 1984]. . . with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired."
  (2) The amendment of § 103 will *not* be considered to apply to:
    (a) Any application which has been abandoned prior to November 8, 1984, unless such application is revived pursuant to the provisions of 37 CFR 1.137(a) or (b) and is pending on or after November 8, 1984;
    (b) Any application in which all the claims have been allowed and in which prosecution has been closed prior to November 8, 1984, e.g., by an *Ex parte Quayle* action, a Notice of allowability, or a Notice of Allowance. However, a continuing application would obtain the benefit of amended § 103 if filed prior to the abandonment or issuance of the application; and
    (c) Any application in which an appeal has been filed and is no longer pending or in which the time for filing an appeal has expired prior to November 8, 1984. However if the application contains allowed claims on or after November 8, 1984, the allowed claims are subject to amended § 103.
  (3) The amendment to § 103 will be applied to any application (a) which is before the examiner for action and in which all the claims have not been allowed and the prosecution closed or (b) in which prosecution has been closed and is being reopened to reject the allowed claims on grounds other than § 102(f) /103 or § 102(g)/103.
  (4) Applications not before the examiner for action, e.g., an application in which a response from applicant is required, will *not* be considered as to the applicability of amended § 103 unless applicant takes timely action which properly requires an action on the merits by the examiner.

B. *Conflicting Co-pending Applications Of Different Inventive Entities With No Indication That They Are Commonly Owned*
  (1) If the application files do not establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:
    (a) assume that the applications are not commonly owned;
    (b) examine the applications on all grounds other than any conflict between the applications;
    (c) consider the applicability of § 102(f) /103 or § 102(g)/103 if one application refers to the other (if there is no cross-reference between the applications it would be inappropriate for the examiner to refer to one application in the other in view of 35 U.S.C. 122);
    (d) consider interference if appropriate;
    (e) suspend the later filed application if it is otherwise allowable until the earlier filed application is abandoned or issues as a patent and then reject the later filed application under § 102(e)/103, if appropriate; and
    (f) proceed under item C below if at any time during the examination a statement is made that the applications are commonly owned.

C. *Conflicting Co-pending Applications Of Different Inventive Entities Which Are Commonly Owned*

(1) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (a) the application files refer to assignments recorded in the PTO in accordance with 37 CFR 1.331 which convey the entire rights in the applications to the same person(s) or organization(s); or (b) copies of unrecorded assignments which convey the entire rights in the applications to the same person(s) or organization(s) are filed in each of the applications; or (c) an affidavit or declaration by the common owner is filed which states that there is common ownership and explains why the affiant believes there is common ownership; or (d) other evidence is submitted which establishes common ownership of the applications in question, e.g., a court decision determining the owner. In circumstances where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

(2) If the application files establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:

(a) examine the applications as to all grounds except §§ 102(f) and (g) as they apply through § 103 if the application files establish common ownership at the time the later invention was made;

(b) examine the applications for double patenting, including double patenting of the obviousness type, and make a provisional rejection, if appropriate, (see *In re Mott*, 190 USPQ 536 (CCPA 1976);

(c) examine the later filed application under § 102(e) as it applies through § 103 and make a provisional rejection under § 102(e)/103 in the later filed application, if appropriate;

(d) permit applicant of the later filed application to file an affidavit under 37 CFR 1.131 to overcome the provisional or actual § 102(e)/103 rejection, if appropriate, and a terminal disclaimer to overcome the provisional or actual rejection on double patenting of the obviousness type.

Initial Guidelines As To Implementation Of 35 U.S.C. 116

Public Law 98-622 amended 35 U.S.C. 116 to clarify that each inventor need not "sign the application" in addition to making the required oath and to add a new sentence which reads as follows:

> "Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent."

The significant features resulting from these amendments to § 116 are the following:

(1) The joint inventors do not have to separately "sign the application," but only need apply for the patent jointly and make the required oath by signing the same; this is a clarification, but not a change in current practice.

(2) Inventors may apply for a patent jointly even though "they did not work together or at the same time," thereby clarifying (a) that it is not necessary that the inventors physically work together on a project, and (b) that one inventor may "take a step at one time, the other an approach at different times." (*Monsanto Co. v. Kamp*, 154 USPQ 259 (D.D.C. 1967)).

(3) Inventors may apply for a patent jointly even though "each did not make the same type or amount of contribution," thereby clarifying the "fact that each of the inventors plays a different role and that the contribution of one may not be as great as that of another does not detract from the fact that the invention is joint, if each makes some original contribution, though partial, to the final solution of the problem." *Monsanto*, supra.

(4) Inventors may apply for a patent jointly even though "each did not make a contribution to the subject matter of every claim of the patent."

(5) Inventors may apply for a patent jointly as long as each inventor made a contribution, i.e., was an inventor or joint inventor, of the subject matter of at least one claim of the patent; there is no requirement that all the inventors be joint inventors of the subject matter of any one claim.

(6) If an application by joint inventors includes more than one independent and distinct invention, restriction may be required with the possible result of a necessity to change the inventorship named in the application if the elected invention was not the invention of all the originally named inventors.

(7) The amendment to § 116 increases the likelihood that different claims of an application or patent may have different dates of invention; when necessary the Office or court may inquire of the patent applicant or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Implementation Steps As To Amended 35 U.S.C. 116

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended § 116.

(2) Pending applications will be permitted to be amended by complying with 37 CFR 1.48 to add claims to inventions by inventors not named when the application was filed as long as such inventions were disclosed in the application as filed since 37 CFR 1.48 permits correction of inventorship where the "correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors."

(3) Under amended § 116 an examiner will reject claims under § 102(f) only in circumstances where a named inventor is not the inventor of at least one claim in the application; no rejection under § 102(f) is appropriate if a named inventor made a contribution to the invention defined in any claim of the application.

(4) Under amended § 116 considered in conjunction with amended § 103, a rejection may be appropriate under § 102(f)/103 where the subject matter, i.e., prior art, and the claimed invention were not owned by, or subject to an obligation of assignment to, the same person at the time the invention was made.

(5) Applicants are responsible for correcting, and will be required to correct, the inventorship in compliance with 37 CFR 1.48 when the application is amended to change the claims so that one (or more) of the named inventors is no longer an inventor of the subject matter of a claim remaining in the application.

(6) In requiring restriction in an application filed by joint inventors the examiner will remind applicants of the necessity to correct the inventorship pursuant to 37 CFR 1.48 if an invention is elected and the claims to the invention of one or more inventors are cancelled.

(7) The examiner will not inquire of the patent applicant concerning the inventors and the invention dates for the subject matter of the various claims until it becomes necessary to do so in order to properly examine the application.

(8) If an application is filed with joint inventors, the examiner will assume that the subject matter of the various claims was commonly owned at the time the inventions covered therein were made, unless there is evidence to the contrary. If inventors of subject matter, not commonly owned at the time of the later invention, file a joint application, applicants have an obligation pursuant to 37 CFR 1.56 to point out the inventor and invention dates of each claim and the lack of common ownership at the time the later invention was made in order that the examiner may consider the applicability of § 102(f)/103 or § 102(g)/103. The examiner will assume, unless there is evidence to the contrary, that applicants are complying with their duty of disclosure.

Initial Guidelines As To Implementation Of 35 U.S.C. 120

Public Law 98-622 amended 35 U.S.C. 120 by striking out "by the same inventor" and inserting in its place "which is filed by an inventor or inventors named in the previously filed application."

The amended first paragraph of 35 U.S.C. 120 (the bracketed portion was deleted and the underlined portion added) reads as follows:

§120. Benefit of earlier filing date in the United States

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, [by the same inventor] *which is filed by an inventor or inventors named in the previously filed application* shall have the same effect, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application."

The significant features of these amendments to § 120 are the following:

(1) A later filed application by an inventor or inventors of a previously filed co-pending application may claim the benefit of the previously filed co-pending application under § 120 even though the later filed application does not name all of the same inventors as the previously filed application.

(2) In order for the later filed application to be entitled to claim the benefit of the earlier filed co-pending application under § 120 the earlier filed co-pending application must
(a) have at least one inventor in common with the later filed application;
(b) disclose the common inventor's invention in the manner provided by the first paragraph of 35 U.S.C. 112, i.e., fully disclose and support at least one of the common inventor's claims found in the later application.

(3) When necessary the Patent and Trademark Office or a court may inquire of the patent applicant or owner as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application.

(4) Double patenting rejections may be applicable, whether or not the applications and patents are commonly owned as long as the applications/ patent(s) have at least one inventor in common.

(5) If the applications and patents are commonly owned, the rejection of the applications on the grounds of double patenting can be overcome by an appropriate terminal disclaimer as long as the identical invention is not being claimed. See *In re Robeson*, 141 USPQ 485 (CCPA 1964), and *In re Kaye*, 141 USPQ 829 (CCPA 1964).

(6) If the applications and patents are not commonly owned, the double patenting rejection is entered in the later filed application and cannot be overcome by a terminal disclaimer since the ownership of the subject matter being claimed belongs to someone other than the owner of the later application.

Implementation Steps As To Amended 35 U.S.C. 120

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended § 120.

(2) The examiner will examine any earlier filed co-pending application to which priority is claimed under § 120 to determine if
(a) the earlier filed co-pending application has at least one inventor in common with the later filed application;
(b) the other requirements for claiming benefit under § 120 are met; and
(c) a rejection on the grounds of double patenting is proper.

(3) As long as the formal requirements for claiming benefit under § 120 are met, the examiner will permit the claim to be made without examining the earlier filed co-pending application for disclosure and support of at least one claim of the later filed application under the first paragraph of § 112 unless it becomes necessary to do so, e.g. because of an interference or an intervening reference.

(4) The examiner will not inquire of the patent applicant as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application until it becomes necessary to do so in order to properly examine the application.

(5) The examiner will examine the earlier and later filed applications and make actual or provisional rejections for double patenting where appropriate, whether or not the applications are commonly owned.

Example 1 - Single Application - Plural Inventors

Inventors A and B, both employees of Company E with obligation to assign all their inventions to E develop inventions X and Y respectively. An application for patent is properly filed listing A and B as joint inventors and with claims to both X and Y as now possible under § 116 as amended by Public Law 98-622.

Situation 1.

The claims to X and Y are not patentably distinct.

Examiner's Action:

If otherwise patentable over the prior art—allows application.

Situation 2.

The claims to X and Y are patentably distinct.

Examiner's Action:

Require restriction and election of claims to either X or Y. The applicant, after election, must correct the inventorship of the application to ist only the inventor of the elected invention; for example, inventor A if claims to invention X were elected. A divisional application with B as inventor and claims to Y may claim benefit of the originally filed application under 35 U.S.C. 120 as amended by Public Law 98-622.

Situation 3.

The application contains a Markush-type claim to X and Y and separate species claims to X and Y.

Examiner's Action:

(a) Examine the application to determine if the inventions X and Y are restrictable. If so, the claims to elected invention X (assume X is elected by applicants) and the X portion of the Markush claim to X and Y are examined.
(i) if the claim to X is allowable, the entire Markush claim and the species claim to Y must also be examined.
(ii) if the claim to X is not allowable, no further action on species claim Y or the Y portion of the Markush claim is required.

The inventorship of the application at the time of allowance must be corrected, if necessary, to correspond to the inventions covered by the claims allowed.

Example 2 - Multiple applications - plural inventions

Inventors A and B, both employees of Company E, with obligation to assign all their inventions to E, develop inventions X and Y with Y being developed by B after knowledge of A's development of X. A files application on X before B's development of Y and B later files application. Both applications establish they are owned by Company E.

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Situation 1.
The claims to X and Y are not patentably distinct.

Examiner's Action:
(a) Examine the applications as to all grounds except § 102(f) and (g) as they apply through § 103;
(b) Make a provisional rejection of the later filed application on the grounds of double patenting of the obviousness type, if appropriate. If a terminal disclaimer is filed in accordance with § 1.321(b), the provisional double patenting rejection of the obviousness type will be overcome;
(c) Examine the later filed application under § 102(e)/103 and make a provisional rejection based on § 102(e)/103, if appropriate. An affidavit under § 1.131 can be filed to overcome the rejection based on § 102(e)/103.

Situation 2.
After receiving the examiner's action in situation 1, A and B filed a continuation-in-part application with inventor C and claim A's invention, B's invention and an improvement they jointly developed with C. A and B abandon their prior applications.

Examiner's Action:
Examine the application in the normal manner; no double patenting and § 102(e)/103 problems now exist.

Example 3 - Two copending applications with no indication in the record of common ownership
Inventor A files an application with claims to invention X. Another copending application is filed by inventor B claiming invention Y. There is no indication of common ownership.

Situation 1.
The claims in the two applications are directed to patentably distinct inventions.

Examiner's Action:
If the claims are otherwise allowable, the applications are both allowed.

Situation 2.
The claims in the two applications are not patentably distinct.

Examiner's Action:
The applications are prosecuted until one application is allowable. If the time difference between the two applications is too large to declare an interference, action on the later filed application is suspended until the earlier filed application issues as a patent. At that time the later filed application is rejected over the earlier filed application under § 102(e)/103.
If the filing dates of the applications are sufficiently close to declare an interference, claims for an interference should be suggested. If the applications are commonly owned, the common owner must make the ownership known. When such common ownership is made known, a provisional double patenting rejection should be made in the later filed application. If the double patenting rejection is of the obviousness type, a terminal disclaimer under 37 CFR 1.321(b) may be filed. The later filed application should be examined under § 102(e)/103 and a provisional rejection based on § 102(e)/103 should be made in the later filed application, if appropriate. An affidavit under § 1.131 can be filed to overcome a rejection based on § 102(e)/103.

Example 4 - Claims in single application by different inventors.
An application for patent is filed in the Patent and Trademark Office in which the owner E sets forth the following information.
"The subject matter of claim 1 was invented by inventor A. The subject matter of claim 2 was invented by inventor B. Inventor B knew of the invention of inventor A at the time he made his invention. Both A and B made their inventions while working for owner E with a duty to assign". The inventions are different but not patentably distinct.

Examiner's Action:
If the claims are patentable over the prior art, the application should be allowed.

Public Law 98—622
Signed November 8, 1984

Ninety-eighth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the twenty-third dayof January, one thousand nine hundred and eighty-four

An Act

To amend title 35, United States Code, to increase the effectiveness ofthe patent laws, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

SHORT TITLE

SECTION 1. This Act may be cited as the "Patent Law Amendments Act of 1984".

TITLE I—PATENT IMPROVEMENT PROVISIONS

USE OF PATENTED INVENTIONS OUTSIDE THE UNITED STATES

SEC. 101.(a) Section 271 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:
"(f)(1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.
"(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer."

STATUTORY INVENTION REGISTRATION

SEC. 102.(a) Chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following new section:

§ 157. Statutory invention registration

"(a) Notwithstanding any other provision of this title, the Commissioner is authorized to publish a statutory invention registration containing the specification and drawings of a regularly filed application for a patent without examination if the applicant:

"(1) meets the requirements of section 112 of this title;
"(2) has complied with the requirements for printing, as set forth in regulations of the Commissioner;
"(3) waives the right to receive a patent on the invention within such period as may be prescribed by the Commissioner; and
"(4) pays application, publication, and other processing fees established by the Commissioner.

If an interference is declared with respect to such an application, a statutory invention registration may not be published unless the issue of priority of invention is finally determined in favor of the applicant.

"(b) The waiver under subsection (a)(3) of this section by an applicant shall take effect upon publication of the statutory invention registration.
"(c) A statutory invention registration published pursuant to this section shall have all of the attributes specified for patents in this title except those specified in section 183 and sections 271 through 289 of this title. A statutory invention registration shall not have any of the attributes specified for patents in any other provision of law other than this title. A statutory invention registration published pursuant to this section shall give appropriate notice to the public, pursuant to regulations which the Commissioner shall issue, of the preceding provisions of this subsection. The invention with respect to which a statutory invention certificate is published is not a patented invention for purposes of section 292 of this title.
"(d) The Secretary of Commerce shall report to the Congress annually on the use of statutory invention registrations. Such report shall include an assessment of the degree to which agencies of the Federal Government are making use of the statutory invention registration system, the degree to which it aids the management of federally developed technology, and an assessment of the cost savings to the Federal Government of the use of such procedures.".
(b) The table of sections at the beginning of chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following:

"157. Statutory invention registration.".

(c) The amendments made by this section shall take effect six months after the date of the enactment of this Act.

PRIOR ART

SEC. 103. Section 103 of title 35, United States Code, is amended by adding at the end thereof the following:
"Subject matter developed by another person, which qualifies as prior art only under subsection (f)or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

JOINT INVENTORS

SEC. 104. (a) Section 116 of title 35, United States Code, is amended by amending the first paragraph to read as follows:

"When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.".

(b) Section 120 of title 35, United States Code, is amended by striking out "by the same inventor" and inserting in lieu thereof "which is filed by an inventor or inventors named in the previously filed application".

ARBITRATION OF INTERFERENCES

SEC. 105. Section 135 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(d) Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.".

EFFECTIVE DATE

SEC. 106. (a) Subject to subsections (b), (c), (d), and (e) of this section, the amendments made by this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed after the date of enactment.
(b) The amendments made by this Act shall not affect any final decision made by the court or the Patent and Trademark Office before the date of enactment of this Act with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.
(c) Section 271(f) of title 35, United States Code, added by section 101 of this Act shall apply only to the supplying, or causing to be supplied, of any component or components of a patented invention after the date of enactment of this Act.
(d) No United States patent granted before the date of enactment of this Act shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to such effective date anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by section 103 or 104 of this Act and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability. If a person reasonably relied on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this Act, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the date of enactment.
(e) The amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment.

TITLE II—PATENT AND TRADEMARK OFFICE PROCEDURES

BOARD OF PATENT APPEALS AND INTERFERENCES

SEC. 201. (a) Section 7 of title 35, United States Code, is amended to read as follows:

"§ 7. Board of Patent Appeals and Interferences

"(a) The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed to the competitive service. The Commissioner, the Deputy Commissioner, the Assistant Commissioners, and the examiners-in-chief shall constitute the Board of Patent Appeals and Interferences.
"(b) The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents and shall determine priority and patentability of invention in interferences declared under section 135(a) of this title. Each appeal and interference shall be heard by at least three members of the Board of Patent Appeals and Interferences, who shall be designated by the Commissioner. Only the Board of Patent Appeals and Interferences has the authority to grant hearings.
"(c) Whenever the Commissioner considers it necessary, in order to keep current the work of the Board of Patent Apeals and Interferences, the Commissioner may designate any patent examiner of the primary examiner grade or higher, having the requisite ability, to serve as examiner-in-chief for periods not

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exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Patent Appeals and Interferences. Not more than one of the members of the Board of Patent Appeals and Interferences hearing an appeal or determining an interference may be an examiner so designated. The Secretary of Commerce is authorized to fix the pay of each designated examiner-in-chief in the Patent and Trademark Office at not to exceed the maximum rate of basic pay payable for grade GS 16 of the General Schedule under section 5332 of title 5. The rate of basic pay of each individual designated examiner-in-chief shall be adjusted, at the close of the period for which that individual was designated to act as examiner-in-chief, to the rate of basic pay which that individual would have been receiving at the close of such period if such designation had not been made."

(b) The item relating to section 7 in the table of sections at the beginning of chapter 1 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

INTERFERENCES

SEC. 202. Section 135(a) of title 35, United States Code, is amended to read as follows:

"(a) Whenever an application is made for a patent which, in the opinion of the Commissioner, would interfere with any pending application, or with any unexpired patent, an interference may be declared and the Commissioner shall give notice of such declaration to the applicants, or applicant and patentee, as the case may be. The Board of Patent Appeals and Interferences shall determine questions of priority of the inventions and may determine questions of patentability. Any final decision, if adverse to the claim of an applicant, shall constitute the final refusal by the Patent and Trademark Office of the claims involved, and the Commissioner may issue a patent to the applicant who is adjudged the prior inventor. A final judgment adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved in the patent, and notice of such cancellation shall be endorsed on copies of the patent distributed after such cancellation by the Patent and Trademark Office.".

APPEALS AND CIVIL ACTIONS

SEC. 203. (a) Section 141 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by striking out "of the Board of Patent Appeals may appeal" and inserting in lieu thereof "in an appeal to the Board of Patent Appeals and Interferences under section 134 of this title may appeal the decision"; and

(B) by striking out ", thereby waiving his right" and inserting in lieu thereof ". By filing such an appeal the applicant waives his or her right";

(2) in the second sentence—

(A) by striking out "board of patent interferences on the question of priority may appeal" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference may appeal the decision";

(B) by striking out "according to" and inserting in lieu thereof "in accordance with"; and

(C) by striking out "he" and inserting in lieu thereof "the party"; and

(3) by amending the last sentence to read as follows: "If the appellant does not, within thirty days after the filing of such notice by the adverse party, file a civil action under section 146, the decision appealed from shall govern the further proceedings in the case."

(b) Section 145 of title 35, United States Code, is amended—

(1) in the first sentence by striking out "Appeals may" and inserting in lieu thereof "Patent Appeals and Interferences in an appeal under section 134 of this title may,"and

(2) in the second sentence by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 146 of title 35, United States Code, is amended by striking out "board of patent intereferences on the question of priority" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference".

TECHNICAL AND CONFORMING AMENDMENTS

SEC. 204. (a) Section 41(a)(6) of title 35, United States Code, is amended—

(1) by striking out "Appeals" each place it appears and inserting in lieu thereof "Patent Appeals and Interferences"; and

(2) by inserting "in the appeal" after oral hearing".

(b)(1) Section 134 of title 35, United States Code, is amended—

(A) in the section caption by striking out "APPEALS" and inserting in lieu thereof "PATENT APPEALS AND INTERFERENCES"; and

(B) by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(2) The item relating to section 134 in the table of sections at the beginning of chapter 12 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 305 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

AMENDMENTS TO OTHER PROVISIONS OF LAW

SEC. 205. (a) Section 1295(a)(4)(A) of title 28, United States code, is amended by striking out "Appeals or the Board of Patent" and inserting in lieu thereof "Patent Appeals and".

(b) Section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) is amended in the third paragraph—

(1) by striking out "Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences";

(2) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(c)(1) Section 305(d) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(d)) is amended—

(A) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(B) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(2) Section 305(e) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(e)) is amended by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

SAVINGS PROVISION

SEC. 206. Any individual who, on the effective date of this title, is an examiner-in-chief of the Board of Patent Appeals of the Patent and Trademark Office or an examiner of interferences of the Board of Patent Interferences of such office shall be entitled to continue in office as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office as of such effective date.

EFFECTIVE DATE

SEC. 207. Section 206 of this Act and the amendments made by this title shall take effect three months after the date of the enactment of this Act.

TITLE III— NATIONAL COMMISSION ON INNOVATION AND PRODUCTIVITY

ESTABLISHMENT

SEC. 301. There is hereby established a National Commission on Innovation and Productivity (hereinafter in this title referred to as the "Commission").

MEMBERSHIP OF COMMISSION

SEC. 302. (a) The Commission shall be composed of ...

(1) three Members of the Senate appointed by the President of the Senate;

(2) three Members of the House of Representatives apointed by the Speaker of the House of Representatives; and

(3) three members appointed by the President of the United States, one of whom the President shall designate as Chairman.

Of the members appointed by the President, one member should be an appropriate officer or employee of the United States, one member should be an employer who employs inventors, and one member should be an employed inventor.

(b) At no time shall more than two of the members appointed under paragraph (1), (2), or (3) of subsection (a) be persons who are members of the same political party.

(c) Any vacancy in the Commission shall not affect its powers but shall be filled in the same manner in which the original appointment was made, and subject to the limimtation set forth in subsection (b) with respect to the original appointment.

(d) Six members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

DUTIES OF THE COMMISSION

SEC. 303. The Commission shall make a full and complete review and study of the level of innovation and producitivity of employed inventors. Such study shall include an analysis of the various methods available to inspire or stimulate individual and corporate innovation and productivity, including an assessment of the techniques used in other countries to achieve this objective. Such study may include an assessment of those aspects of other areas of intellectual property law that inspire or stimulate such innovation and productivity. The Commission shall make recomendations for such revisions of the laws of the United States, including the repeal of unnecessary or undesirable statutes, and such other changes as the Commission considers will better foster innovation and productivity.

COMPENSATION OF MEMBERS OF THE COMMISSION

SEC. 304. (a) A member of the Commission who is a Member of Congress or a full-time officer or employee of the United States shall receive no additional compensation by reason of his or her service on the Commission.

(b) Subject to amounts provided in advance in appropriations Acts, a member of the Commission from private life shall receive the daily equivalent of the annual rate of basic pay payable for level III of the Executive Schedule for each day (including traveltime) during which such member is engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred in the performance of such duties, in accordance with subchapter I of chapter 57 of title 5, United States Code.

DIRECTOR AND STAFF

SEC. 305. (a) The Commission shall have a Director who shall be appointed by the Commission and who shall be paid at a rate not to exceed the rate of basic pay payable for level IV of the Executive Schedule. The Director, subject to the direction of the Commission, shall supervise the activities of persons emloyed by the Commission and the preparation of the reports of the Commission and shall perform such other duties as may be assigned to the Director by the Commission.

(b) The Commission may appoint and fix the pay of such additional personnel as it considers appropriate.

(c) The staff of the Commission may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for GS... 16 of the General Schedule.

(d) The Chairman of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code.

GOVERNMENT AGENCY COOPERATION

SEC. 306. The Commission is authorized to request from any department, agency, or independent instrumentality of the Government any information and assistance it considers necessary to carry out its functions under this title. Each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission.

REPORT OF THE COMMISSION; TERMINATION

SEC. 307. The Commission shall submit interim reports on its activities to the President and the Congress at such times as the Commission considers appropriate, except that at least one such report shall be so submitted within one year after the date of the enactment of this Act. The Commission shall submit its final report on its activities to the President and the Congress within two years after such date of enactment. The Commission shall cease to exist sixty days after the date of the submission of its final report.

ADMINISTRATIVE SERVICES

SEC. 308. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

AUTHORIZATION OF APPROPRIATIONS

SEC. 309. There is authorized to be appropriated $250,000 to carry out this title.

EFFECTIVE DATE

SEC. 310. This title shall take effect on January 21, 1985.

TITLE IV... MISCELLANEOUS PROVISIONS

INTERNATIONAL STAGE

SEC. 401. (a) Section 361(d) of title 35, United States Code, is amended in the first sentence by inserting "or within one month after the date of such filing" after "application".

(b) Section 366 of title 35, United States Code, is amended...

(1) in the first sentence...

(A) by inserting "after the date of withdrawal," after "effect"; and

(B) by inserting before the period the following: ", unless a claim for the benefit of a prior filing date under section 365(c) of this part was made in a national application, or an international application designating the United States, filed before the date of such withdrawal"; and

(2) in the second sentence by inserting "withdrawn" after "such".

NATIONAL STAGE

SEC. 402. (a) Section 371(a) of title 35, United States Code, is amended...

(1) by striking out "is" and inserting in lieu thereof "may be"; and

(2) by striking out", except those filed in the Patent Office".

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2) of the treaty."

(c) Section 371(c)(2) of title 35, United States Code, is amended...

(1) by striking out "received from" and inserting in lieu thereof "communicated by"; and

(2) by striking out "verified" before "translation".

(d) Section 371(d) of title 35, United States Code, is amended to read as follows:

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"(d) The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Commissioner. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof, unless it be shown to the satisfaction of the Commissioner that such failure to comply was unavoidable. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty.".

(e) Section 372(b) of title 35, United States Code, is amended—

(1) by striking out the period at the end of paragraph (2) and inserting in lieu thereof "; and"; and

(2) by adding at the end thereof the following:

"(3) the Commissioner may require a verification of the translation of the international application or any other document pertaining to the application if the application or other document was filed in a language other than English.".

(f) Section 372 of title 35, United States Code, is amended by striking out subsection (c).

(g) Section 376(a) of title 35, United States Code, is amended by striking out paragraph (5) and redesignating paragraph (6) as paragraph (5).

TECHNICAL AMENDMENTS

SEC. 403. (a) Title 35, United States Code, is amended by striking out "Patent Office" each place it appears and inserting in lieu thereof "Patent and Trademark Office".

(b) The table of parts at the beginning of title 35, United States Code, is amended by adding at the end thereof the following:

"IV. Patent Cooperation Treaty ..... 351"

PATENT FEES

SEC. 404. (a) Notwithstanding section 41 of title 35, United States Code, as in effect before the enactment of Public Law 97 247 (96 Stat. 317), no fee shall be collected for maintaining a plant patent in force.

(b) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept, after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after December 12, 1980, and before August 27, 1982, to the same extent as in the case of patents based on applications filed in the Patent and Trademark Office on or after August 27, 1982.

TRADEMARK TRIAL AND APPEAL BOARD

SEC. 405. Section 3 of title 35, United States Code, is amended by adding at the end thereof the following:

"(e) The members of the Trademark Trial and Appeal Board of the Patent and Trademark Office shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS-16 of the General Schedule under section 5332 of title 5."

EFFECTIVE DATE

SEC. 406. (a) Section 404 of this Act and the amendments made by section 403 of this Act shall take effect on the date of the enactment of this Act.

(b) The amendments made by sections 401, 402, and of this Act shall take effect six months after the date of the enactment of this Act.

[1050 OG 316]

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(162) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket no. 41269-5018]

Final Rules for Miscellaneous Patent Provisions

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking
Summary : The Patent and Trademark Office is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to provide rules and procedures for the miscellaneous patent provisions enacted into law by Public Laws 98-620 and 98-622, on Nov. 8, 1984, in which statutory invention registrations, changes in appeals to the courts, prior art and joint inventor provisions and PCT international application filing and processing procedures were established or amended. The rulemaking provides specific rules and procedures for the new and amended provisions.
Effective Date : May 8, 1985
For Further Information Contact : R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information : This rule change is designed primarily to establish a set of rules and procedures for the various requirements of Public Laws 98-620 and 98-622 concerning appeals to the courts, statutory invention registrations, rejections based on prior art and double patenting, and filing of international applications under the Patent Cooperation Treaty. The proposed rules were published on Jan. 25, 1985 in Volume 50 of the Federal Register, pages 3712 through 3725. A public hearing was held on the proposed rule changes on Feb. 8, 1985.
Background Information :
Most of the rule changes contained herein are necessary as a result of Public Laws 98-620 or 98-622, both of which were signed by President Reagan on Nov. 8, 1984. The following is a summary of the purposes of the various statutory amendments.

Amended 35 U.S.C. 103 - Unpublished knowledge of prior art.

Public Law 98-622 changes a complex body of case law which discourages communication among members of research teams working in corporations, universities or other organizations. It amended 35 U.S.C. section 103 by adding a new sentence which provides that subject matter developed by another which qualifies as "prior art" only under subsections 102(f) or (g) of 35 U.S.C. is not to be considered when determining whether an invention sought to be patented is obvious under 35 U.S.C. 103, provided the subject matter and the claimed invention were commonly owned at the time the invention was made.

"Prior art" is the existing body of technical information against which the patentability of an invention is judged. Publicly known information is always considered in determining whether an invention would have been obvious. However, under *In re Bass*, 474 F. 2d 1276, 177 USPQ 178 (CCPA 1973), and *In re Clemens*, 622 F.2d 1029, 206 USPQ 289 (CCPA 1980), an earlier invention which is not public could have been treated under 35 U.S.C. 102(g), and possibly under 102(f), as prior art with respect to a later invention made by another employee of the same organization.

New technology often is developed by using background scientific or technical information known within an organization but unknown to the public. Public Law 98 622, by disqualifying such background information from prior art, encourages communication among members of research teams, and leads to more public dissemination through patents of the results of team research.

The subject matter that is disqualified as prior art under 35 U.S.C. 103 is strictly limited to subject matter that qualifies as prior art only under 35 U.S.C. 102(f) or 102(g). If the subject matter qualifies as prior art under any other subsection—e.g., subsection 102(a), 102(b) or 102(e)—it will not be disqualified as prior art under the amendment to section 103.

The contents of a patent of the same or different ownership as an application, continues to be available as prior art against the application under section 103 by virtue of section 102(e) as of the application filing date of the patent. If subject matter becomes potential prior art under section 102 (e) because a patent application is filed on such subject matter before a commonly owned claimed invention is made the subject matter of a later application the two applications may be combined (under amended §§ 116 and 120) into a single application and such subject matter (with the abandonment of the two applications) would no longer constitute potential prior art under section 102(e) or under section 103 since it would not be "described in a patent granted on an application for patent by another."

It is important to recognize that the amendment to the law applies only to consideration of prior art for purposes of section 103. It does not apply to or affect subject matter which qualifies as prior art under section 102. A patent applicant urging that subject matter is disqualified has the burden of establishing that it was commonly owned at the time the claimed invention was made.

Public Law 98-622 was not intended to permit anyone other than the inventors to be named in a patent application or patent. Also, the amendment was not intended to enable appropriation of the invention of another.

The Patent and Trademark Office has withdrawn the Commissioner's Notice of Jan. 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967), to the extent that it does not authorize a double patenting rejection where different inventive entities are present. See the Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103 116, and 120", 1050 O.G. 316 (Jan. 8, 1985). The Office is reinstituting, in appropriate circumstances, the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier); *In re Rogers*, 394 F.2d 566, 567 n. 4, 157 USPQ 569, 570 n. 4 (CCPA 1964). This is in accordance with existing case law and prevents an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See *In re Zickendraht*, 319 F.2d 225, 138 USPQ 22 (CCPA 1963) ("The doctrine is well established that claims in different applications need be more than merely different in form or content; and that *patentable distinction* must exist to entitle applicants to a second patent") and *In re Christensen*, 330 F.2d 652, 141 USPQ 295 (CCPA 1964) (". . . the correct procedure for double patenting cases is to analyze the claims to determine the inventions defined therein, and then decide whether such inventions, as claimed are *patentably distinct* and therefore qualified to be claimed in separate patents"). In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming, pursuant to the existing provisions of 37 CFR 1.321, the terminal portion of the term of the later patent and including in the disclaimer a provision that the patent shall be enforceable only for and during the period the patent is commonly owned with the application or patent which formed the basis for the rejection, thereby eliminating the problem of extending patent life.

Information learned from or transmitted to persons outside the organization is not disqualified as prior art.

The term "subject matter" will be construed broadly, in the same manner the term is construed in the remainder of § 103. The term "another" as used in § 103 means any inventive entity other than the inventor and would include the inventor and any other persons. The term "developed" is to be read broadly and is not limited by the manner in which the development occurred. The term "commonly owned" means wholly owned by the same person, persons, or organization at the time the invention was made.

Amended 35 U.S.C. 116 - Joint inventor filing

35 U.S.C. 116 as amended by Public Law 98-622 recognizes the realities of modern team research. A research project may include many inventions. Some inventions may have contributions made by individuals who are not involved in other, related inventions.

Amended 35 U.S.C. 116 allows inventors to apply for a patent jointly even though (i) they did not physically work together or at the same time, (ii) each did not make the same type or amount of contribution, or (iii) each did not make a contribution to the subject matter of every claim of the patent. Items (i) and (ii) adopt the rationale stated in decisions such as *Monsanto v. Kamp*, 269 F. Supp. 818, 154 USPQ 259 (D.D.C. 1967). Item (iii) adopts the rationale of cases such as *SAB Industries AB v. Bendix Corp.*, 199 USPQ 95 (E.D. Va. 1978).

Like other patent applications, jointly-filed applications are subject to the requirements of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application complying with 35 U.S.C. 120 would be entitled to the benefit of the earlier filing date of the original application.

It is possible that different claims of an application or patent may have different dates of invention even though the patent covers only one independent and distinct invention within the meaning of 35 U.S.C. 121. When necessary, the Patent and Trademark Office or a court may inquire of the patent application or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Amended 35 U.S.C. 120 - Benefit of prior U.S. application

35 U.S.C. 120 was amended by Public Law 98-622 to provide that an application can obtain the benefit of the filing date of an earlier application when not all inventors named in the joint application are the same as those named in the earlier application. This amendment permits greater latitude in filing "divisional" applications. For example, if the previously filed application named inventors A and B as the inventors, a later application by either A or B could be filed during the pendency of the previously filed application and claim benefit of the previously filed application. In order for a claim to be entitled to the benefit of an earlier pending application, the subject matter of the claim of the later application would have to be disclosed in the earlier application.

Similarly, if inventor A filed an application on an invention and during the pendency of that application made an improvement on the subject matter of the application as a joint inventor with inventor B, the joint application filed on behalf of inventors A and B could claim the benefit of A's previously filed sole application to the extent that the later filed joint application contained claims directed solely to A's subject matter which was disclosed in the earlier filed pending application in the manner provided by the first paragraph of section 112 of title 35, U.S.C.

Likewise, an application filed by inventors A and C could claim the benefit of an earlier filed pending application of inventors A and B, to the extent that the requirements of section 120 could be met.

Like other patent applications, jointly-filed applications will continue to be subject to the requirement of 35 U.S.C. 121 that an application be directed to only a single invention. If more than one invention is included in the application, the Patent and Trademark Office may require the application to be restricted to one of the inventions. In such a case, a "divisional" application would be entitled to the benefit of the earlier filing date of the original application.

New 35 U.S.C. 157 - Statutory Invention Registration (SIR)

This section which is effective on May 8, 1985, establishes an optional procedure by which an inventor may secure protection which is strictly defensive in nature.

Under current law, there is no simple, practical method by which an inventor can protect his or her ability to exploit the invention without obtaining a patent. The new procedure confers on an inventor the same defensive rights that a patent provides to prevent others from patenting the invention. However, it does not permit the holder to exclude others from making, using or selling the invention.

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Due to the fact that a SIR does not grant an exclusive right to an inventor, it is not necessary to subject a SIR to the lengthy examination process required for the granting of a patent. Such an examination is necessary if the SIR is subject to an interference proceeding to determine priority of invention. In all other instances, the Patent and Trademark Office will only review the application for adherence to formal printing and fee payment requirements and to ensure that the requirements of 35 U.S.C. 112 are satisfied.

An applicant desiring to have a SIR published will be required to file a regular complete application for a patent and to execute a request including a waiver of enforcement of patent rights. This waiver of the claimed invention will be effective at the time of publication. The original application can be abandoned in favor of a continuing application for a patent, claiming the filing date of the earlier filed application, by filing an express abandonment of the original application and a timely request or petition to withdraw the request for a SIR prior to publication of the SIR, thereby providing the applicant with flexibility during the pendency period of the application. Until the SIR is published the application remains an application for a patent. However, the holder of a SIR will not be able to file a reissue application to recapture the rights to exclusive use that were waived by the initial publication of the SIR.

The waiver of the right to receive a patent, required of all applicants electing to receive a SIR, applies to those remedies provided for the enforcement of a patent under section 183 and sections 271 through 289 of title 35, United States Code. The waiver also applies to remedies under other titles of the United States Code including sections 1337 and 1337a of title 19, section 2356 of title 22, and section 1498 of title 28. This waiver of enforcement applies only to the claimed subject matter of the SIR and not to any foreign patent arising from an application which might have served as the basis of a priority claim under the Paris Convention for the Protection of Industrial Property. Likewise, the waiver does not prevent the holder of a SIR from asserting any defenses provided in sections 271 through 289 of title 35, U.S.C. with respect to a charge of infringement of any other patent.

The Commissioner of Patents and Trademarks can refuse to accept the waiver in certain cases. For example, the waiver could not be accepted if the waiver is not a waiver of all the previously mentioned rights. The Commissioner also has discretion, which has not been exercised at this time, to set time limits on the waiver. This would allow the Commissioner to limit the ability of an inventor to keep inventions secret through a series of continuing patent applications followed by a conversion to a SIR.

The waiver of patent rights in the SIR to the subject matter claimed therein may affect the patentability of a claim in other related applications, particularly divisional applications, since the waiver of patent rights would be effective for all inventions claimed in the SIR and would be effective as a waiver of the right of the inventor to obtain a patent on the invention claimed in the same application or any other application, but not in any patent issued before the date the SIR is published. Where an application containing generic claims is published as a SIR, the waiver in that application applies to any other related applications, including divisions, continuations, and continuations-in-part, to the extent that the same invention claimed in the SIR is also claimed in the other related application.

The Patent and Trademark Office will apply standards similar to those which it applies in making determinations of "same invention" double patenting for purposes of determining whether or not a waiver by an inventor to claims in a SIR precludes patenting by the same inventor to subject matter in any other related application.

Therefore, the waiver would preclude patenting of an invention claimed by an inventor in a related application which is the same as the invention claimed by the same inventor in the SIR. When making this determination it is the claimed subject matter of the related application. Where the subject matter claimed in the related application is the same as the subject matter waived in the SIR, i.e., the "same invention" in the double patenting sense, the claims of the related application will be rejected as being precluded by the waiver in the SIR and cannot be overcome by a terminal disclaimer. The limitation of the scope of the waiver to the claimed invention would not affect the application of existing § 1.658(c) should the SIR become involved in an interference. If a divisional application is filed and published as a SIR claiming only a method, publication thereof will not normally effect a waiver on an application for a patent claiming only an apparatus. The waiver in a SIR would not affect any rights in a patent which issued prior to the date of publication of the SIR, but would preclude an already issued patent from being broadened by reissue if the rights to the subject matter to which broadened claims relate have been waived by publication of the SIR. The waiver applies to any rights of the same inventor in any application pending when the SIR is published even if the inventor is a joint applicant in the pending application and was a sole applicant in the application published as a SIR. The waiver would not affect the rights of any other inventor even though those rights are commonly owned by the same person.

The holder of a SIR containing the required waiver will be left without the offensive rights associated with a patent. In other respects a SIR will be the same as a patent, including the application which is published as a SIR serving as the basis for a priority claim in a foreign application under the Paris Convention. A SIR will be treated the same as a U.S. patent for all defensive purposes. The application, and the SIR published therefrom, could become involved in an interference; the SIR would be a "constructive reduction to practice" under 35 U.S.C. 102(g); it will be "prior art" under all applicable sections of 35 U.S.C. 102 including section 102(e); and it will be classified, cross-referenced and placed in the search files, disseminated to foreign patent offices, stored in the Patent and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the Patent and Trademark Office. A published SIR is intended to be a fully viable publication for defensive purposes, usable as a reference as of its filing date in the same manner as a patent. A SIR will also serve as a basis to initiate or participate in an interference or priority proceeding under 35 U.S.C. 291 in a manner similar to a patent and can be used as a reference in defense of an infringement suit.

A SIR is based on a regularly filed application for a patent. Therefore, the filing date of the application will be a sufficient basis for a priority claim in a foreign application. Article 4, section A(3) of the Paris Convention states:

> "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, whatever may be the subsequent fate of the application."

After a SIR is published, markings such as "patent pending" are improper under section 292 of title 35 of the United States Code.

The SIR will serve as a replacement for the current "defensive publication program" which was established by regulation under 37 CFR 1.139. Although publication under the "defensive publication program" was intended to provide rights similar to those of the SIR, publication under that program has been held not to be available as evidence of prior knowledge as of its filing date under section 102(a) of title 35, U.S.C. (*Ex parte Osmond*,191 USPQ 334 (P.T.O. Bd. App. 1976)). The use of a "defensive publication" as a reference to prevent a patent from issuing on a subsequent application is therefore limited. A SIR, on the other hand, will have a clear statutory basis in title 35, U.S.C. The SIR will be "prior art" and a "constructive reduction to practice" under section 102(a) and section 102(g), respectively, as of the filing date of the application on which it is based.

A SIR will not be subject to reexamination under sections 302 to 307 of title 35, United States Code.

The Commissioner is authorized to issue SIRs for defensive purposes, but is not required to do so. The Commissioner has discretion in determining whether or not a SIR should be issued on a particular application. In circumstances where the subject matter is obviously not an invention, is too informal to print, and so forth, the Commissioner has the right to refuse to publish the SIR.

SIRs will be published sooner than patents because no substantive examination will normally be required for SIRs. To the extent that examination is required, it will be conducted in the same manner as in any other patent application. Maintenance fees will not be charged for SIRs.

Since the fees set by the Commissioner for the new SIR procedure under section 157 of title 35, U.S.C. are not established under section 41(a) or (b) of that title, they are not subject to reduction if the applicant has small entity status.

If the fee for requesting publication is not paid at the time of filing of the waiver of the right to receive a patent, the Commissioner may set a period within which the fee must be paid to prevent abandonment of the application. Such a period would be subject to petitions and fees for extensions of time. If abandonment should occur, the application may be revived.

In the final analysis, the SIR procedures set forth in the law should give inventors defensive protection more cheaply than they could get by obtaining a patent. The procedure will allow the government and the private sector to make inventions public knowledge. Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new, less expensive alternative to the traditional patenting of inventions.

Amended 35 U.S.C. 361, 366, 371, 372 and 376 - Miscellaneous provisions relating to the applications under the Patent Cooperation Treaty.

Section 361(d) of title 35, United States Code, was amended effective May 8, 1985, to provide a one-month grace period from the date of filing an international application for payment of the basic international fee and the transmittal and search fees.

Section 366 of title 35, United States Code, was amended, effective May 8, 1985, to clarify the effect of withdrawal of an international application on claims for the benefit of its filing date. The withdrawal of an international application designating the United States will not deprive an applicant of the right to claim the benefit of the filing date of such an international application in a later filed application, provided the claim for benefit is made before that international application is withdrawn. Stated otherwise, this clarifies that withdrawing the designation of the United States in an international application is comparable to abandoning a national application as far as a claim for an earlier filing date is concerned.

National Stage

As a general proposition, the amendments made to 35 U.S.C. 371 set forth a legislative scheme, effective May 8, 1985, to provide greater flexibility in the Patent and Trademark Office for the handling of international applications. In addition, by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, the amendments give international applicants benefits similar to those given national applications by section 111, 35 U.S.C. as amended by Public Law 97-247 with respect to the time for filing the national fee and oath or declaration.

Section 372(b) of title 35, United States Code, is amended, effective May 8, 1985, to authorize the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases is necessary since subsection (c)(2) of section 371 was amended to remove the requirement that the translation be verified in all cases.

Section 372(c) of title 35, United States Code, was deleted thereby discontinuing the requirement for payment of a special fee to maintain claims in an international application which were not searched by an international searching authority. This deletion was made to place international applications processed in the national stage on the same footing as purely national applications.

Section 376(a) of title 35, United States Code, was also amended by Public Law 98-622 to delete mention of the special fee in order to conform with the amendment of section 372(c).

Discussion of Specific Rules

Section 1.11 is amended as proposed to add a reference to published statutory invention registrations in paragraph (a) to indicate that they are available to the public. The portion of present § 1.11(a) which deals with interferences is transferred to a new paragraph (e) and rewritten.

The amendment to paragraph (b) deletes reference to § 1.139, which is being deleted in favor of the SIR, and inserts language which covers opening to the public defensive publications published under § 1.139 as well as other applications laid open to the public such as the previously published abstracts and abbreviatures.

Section 1.11 is amended as proposed to delete the word "general" before public as unnecessary.

New paragraph (e) of § 1.11 is added to cover the availability to the public of all interferences, including those which involved a statutory invention registration. This paragraph applies to interferences declared under the new rules which became effective on Feb. 11, 1985, 49 F.R. 48416, (Dec. 12, 1984) as well as the rules formerly in effect. The term "award of priority" is intended to refer to those decisions of the Board of Patent Interferences, or Board of Patent Appeals and Interferences, awarding priority in interferences conducted under the former rules. The term "judgment" refers to judgments entered by the Board of Patent Appeals and Interferences in interferences conducted under the new rules. The language of the proposed rule has been slightly modified for clarity in the final rule.

Section 1.14 is amended as proposed to delete reference to § 1.139 since that section is being removed.

Section 1.17 paragraph (h) is amended as proposed to include the petition fee required by new § 1.295.

Section 1.17 is amended to add new paragraphs (n) and (o) to establish fees for requesting publication of statutory invention registrations. Paragraph (n) establishes a $400.00 fee for requesting publication of a statutory invention registration where no first examiner's action pursuant to § 1.104 has been issued in the application. The amount paid for basic filing fees under § 1.16(a), (f) or (g) will be credited against this amount. For example, if a $300.00 filing fee was paid, only $100.00 additional would be required for requesting publication of a statutory invention registration.

The addition of paragraph (o) to § 1.17 is similar to the addition of paragraph (n) but establishes a fee for requesting publication of applications, which have received any examiner's action pursuant to § 1.104, as a statutory invention registration. The higher fee of $800.00 set in paragraph (o) is necessary in view of the expenditure of additional Office resources in examining the application prior to the filing of the request for a statutory invention registration.

Section 1.19 is amended as proposed to provide in paragraph (a)(1) a reference to the cost of a printed copy of a statutory invention registration and in paragraph (e) to provide reference to statutory invention registrations listed by subclass.

Section 1.20 is amended as proposed to delete the requirement to pay maintenance fees in all plant patents in view of the amendment in Public Law 98-622. Paragraph 1.20(m) is amended as proposed to provide that non-timely payment of maintenance fees may be accepted in patents based on applications filed prior to Aug. 27, 1982, in accordance with Public Law 98-622.

Public Law 98-622 provides that no maintenance fees are charged for plant patents, regardless of when filed. Without this provision that no maintenance fees be charged for plant patents, plant patent owners whose applications were filed between the dates of enactment of Public Law 96-517 and Public Law 97-247 (Dec. 12, 1980 to Aug. 27, 1982) would be subject to payment of maintenance fees, while plant patent owners whose applications were filed outside those dates would not be subject to such fees. Public Law 98-622 eliminates that inconsistency.

Section 1.45 is amended as proposed to reflect the change made by Public Law 98-622 in 35 U.S.C. 116. The previously existing paragraph is designated as paragraph (a). New paragraph (b) incorporates the wording added to 35 U.S.C. 116 by Public Law 98-622. New paragraph (c) indicates that each named inventor listed in an application must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and that the application will be considered to be a joint application under 35 U.S.C. 116.

Section 1.48 is amended to add new paragraphs (b) and (c). New paragraph (b) provides for deleting the names of persons originally properly included as inventors, but whose invention is no longer being claimed in the application. Such a situation would arise where claims have been amended or deleted because they are unpatentable or as a result of a requirement for restriction of the application to one invention, or for other reasons.

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Public Law 98-622 and § 1.48(b) change the result reached in *Ex parte Lyon*, 146 USPQ 222, 1965 Dec. Comm'r. Pat. 362 (Bd. App. 1964). The final rule has fewer requirements than the proposed rule for correction of inventorship in this situation. The proposed rule would have required, in addition to the requirements of the final rule, an oath or declaration by each actual inventor or inventors as required by § 1.63 and the written consent of any assignee. The final rule requires only a petition and fee with the petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application. The amendment would have to be diligently made under paragraph (b).

The final rule adds a paragraph (c) in response to a comment to provide for the situation where an application discloses unclaimed subject matter by an inventor or inventors not named in the application as filed. In such a situation, the application may be amended pursuant to paragraph (a) of § 1.48 to add claims to the subject matter and also to name the correct inventors for the application. The claims would be added by an amendment and, in addition, an amendment pursuant to paragraph (a) of § 1.48 would be required to correct the inventors named in the application. Any claims added to the application must be supported by the disclosure as filed and cannot add new matter.

Section 1.60 is amended to include wording which would permit an application to be filed under this section only if it named as inventors the same or less than all the inventors who were named and signed the oath or declaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98-622, which permit continuing applications to be filed by different inventors. Under § 1.60 additional inventors are not permitted to be named since the oath or declaration from the prior application is relied upon.

Section 1.61 is amended as proposed to incorporate the ability to file the translation, oath or declaration, and national fee after the 20 month deadline set forth in PCT Article 22(1) for entering the national phase in the United States Patent and Trademark Office.

Public Law 98-622 amended 35 U.S.C. 371(a) to provide greater flexibility for the PTO handling international applications. Also, 35 U.S.C. 371(a), by relaxing the requirements which international applicants must satisfy by the commencement of the national stage, gives international applicants benefits similar to those given national applicants under 35 U.S.C. 111 by P.L. 97-247 with respect to the time for filing the national fee and oath or declaration.

Paragraph (b) of § 1.61 is amended to delete the 2 month time period to conform with the decision concerning PCT Article 22(2) adopted by the Assembly of the International Patent Cooperation Union (PCT Union) on Feb. 3, 1984. The amendment to the Article took effect on Jan. 1, 1985.

PCT Article 22(2) as amended, reads as follows:

> "Where the International Searching Authority makes a declaration, under Article 17(2)(a), that no international search report will be established, the time limit for performing the acts referred to in paragraph (1) of this Article shall be the same as that provided in paragraph (1)."

The additional wording to paragraph (b) of § 1.61 sets forth the ability to comply with the requirements for entering the national phase before the Patent and Trademark Office as a Designated Office within 22 months of the priority date. If the national fee or oath or declaration is submitted later than 20 months after the priority date, a surcharge as set in § 1.445(a)(5) is required to be paid. If a required English translation of the international application is filed later than 20 months after the priority date, a processing fee as set in § 1.445(a)(6) is required to be paid.

New paragraph (c) of § 1.61 provides that any amendments under PCT Article 19 which are not received along with any necessary English translation by the end of 20 months from the priority date will be considered as cancelled. This change is required in view of amended § 371(d) of 35 U.S.C.

Paragraph (d) is added as proposed to § 1.61 in view of § 372(b) of title 35, United States Code, as amended by Public Law 98-622, which authorizes the Commissioner to require a verification of the translation of an international application or any other document pertaining thereto if the application or other document was filed in a language other than English. An authorization for the Commissioner to require verification in appropriate cases was necessary since subsection (c)(2) of 35 U.S.C. 371 was amended to remove the requirement that the translation beverified in all cases.

Section 1.62 is amended by revising paragraphs (a), (c), and (h) to include wording which would permit a continuing application to be filed under this section by the same or less than all the same inventors who filed and signed the oath or delcaration in the prior application. This addition is necessary in view of the new provisions of 35 U.S.C. 120, as amended by Public Law 98-622, which permit continuing applications to be filed by different inventors. Under § 1.62, additional inventors may be added only in applications in which a new oath or declaration is required because additional subject matter is being claimed. Paragraph (h) has been amended to also request applicants to furnish the title of the invention and the names of the applicants in the continuing application to permit the Office to enter this information in its records in the Application Branch.

Section 1.78 is amended to provide in paragraph (a) that the inventorship in the continuing application may be different from the inventorship in the prior copending application and that the prior application must disclose the invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. The requirement that at least one claim be fully supported in the prior application to be entitled to priority benefit is not new, but is included to serve as a reminder that information such as foreign patenting, publication, or public use or sale in the United States which occurred more than one year prior to the filing date of the later application is available as prior art where the claims of the continuation-in-part application are not fully supported by the disclosure of the parent application so as to be entitled to an earlier effective filing date under 35 U.S.C. 120. See *In re Ruscetta*, 255 F. 2d 687, 118 USPQ 101 (CCPA 1958); *In re van Langenhoven*, 458 F. 2d 132, 173 USPQ 426 (CCPA 1972), and *Chromalloy American Corp.* v. *Alloy Surfaces Inc.*, 339 F. Suppl. 859, 173 USPQ 295 (D. Del. 1972).

Paragraph (c) as amended provides for the reply to an examiner's inquiry as to first inventor of conflicting claims in commonly owned applications or an application and a patent to be either (1) a statement that the inventions were both commonly owned at the time the later invention was made or (2) an indication of the first inventor. Paragraph (c) has been changed from that proposed in response to comments to clarify that common ownership or an obligation of assignment to the same person has to exist at the time the later invention was made. New paragraph (d) provides for making a double patenting rejection where an application claims an invention which is not patentably distinct from an invention claimed in a commonly-owned patent with the same or different inventive entities. An obviousness-type double patenting rejection could be overcome by the assignee by submitting a terminal disclaimer complying with § 1.321(b).

Section 1.101 is amended as proposed to delete reference to applications filed under § 1.139 since this section is being removed.

Section 1.103 is amended as proposed to refer in paragraph (d) to a request "for a defensive publication" rather than a request "filed under § 1.139" since § 1.139 is being removed. Paragraph (d) is amended as proposed to also refer to "patent interference proceedings under Subpart E" rather than to "proceedings under § 1.201(b)" since § 1.201(b) has been removed.

Section 1.104 is amended as proposed to add a new paragraph (e) to specify the nature of the showing necessary before the examiner would consider co-pending applications to be owned by, or subject to an obligation of assignment to, the same person for purposes of 35 U.S.C. 102(f)/103, 102(g)/103, and paragraph (d) of § 1.106. The rule permits the necessary showing to be made in different alternative ways. The necessary showing will be considered by the examiner to be present if the application files refer to assignments which are recorded in the Patent and Trademark Office in accordance with § 1.331 as long as the assignments conveyed the entire rights in the applications to

This provision is required in order to provide the printer with drawings and specification which are suitable for printing in substantially the same format as a patent.

A suggested format for use in filing a request for a statutory invention registration is as follows:

Request for Statutory Invention Registration

Application Serial No. or [ ] Attached hereto
Filed:
Titled:
Applicants:

A. In the above identified patent application, I hereby
1. request and authorize the Commissioner of Patents and Trademarks to publish the above identified regularly filed patent application as a Statutory Invention Registration. (35 U.S.C. 157)
2. waive the right to receive a United States patent on the same invention claimed in the above identified patent application. These rights, which are waived, include those specified in 35 U.S.C. § 183 and §§ 271 through 289 as well as all attributes specified for patents in any other provision of law other than title 35 United States Code. The waiver includes, but is not limited to, the remedies under 19 U.S.C. 1337 and 1337a, 22 U.S.C. 2356 and 28 U.S.C. 1498. (35 U.S.C. 157(c))
3. understand that the above waiver will be effective pursuant to 37 CFR 1.293 upon publication of the Statutory Invention Registration to waive the inventor's right to receive a United States patent on the invention claimed in the Statutory Invention Registration. (37 CFR 1.293(b) (1))
4. state that, in my opinion, the disclosure and claims of the above identified patent application meet the requirements of 35 U.S.C. 112. (37 CFR 1.293(b) (3))
5. state that, in my opinion, the above identified application complies with the requirements for printing as set forth in the Rules of Practice for Patent Cases, 37 CFR Part 1. (37 CFR 1.293(b) (4))
6. enclose the fee set forth in 37 CFR 1.17(n) or (o) for requesting publication of a Statutory Invention Registration.

[ ] A first examiner's action *has not* been mailed in the above application, 37 CFR 1.17(n)... $400.00 or
[ ] A first examiner's action *has* been mailed in the above application, 37 CFR 1.17(o) ... $800.00
$_____

Minus Basic Filing Fee, if previously paid

	Small entity	Large entity
Basic filing fee for utility patent application set forth in 37 CFR 1.16(a)	[ ] $150.00	[ ] $300.00
Basic filing fee for design patent application set forth in 37 CFR 1.16(f)	[ ] $62.50	[ ] $125.00
Basic filing fee for plant patent application set forth in 37 CFR 1.16(g)	[ ] $100.00	[ ] $200.00

MINUS:$_____
AmountDue$_____

[ ] Amount enclosed by check or money order _____.

[ ] Please charge Deposit Account No.____in the amount of _____.

[ ] If payment of any additional fee is required for publication of the Statutory Invention Registration, charge such payment to Deposit Account No._____.

B. For printing on the Statutory Invention Registration front page list below the name(s) of not more than 3 registered patent attorneys or agents OR alternatively, the name of the firm having as a member a registered patent attorney or agent. If no name is listed below, no name will be printed.
_____
_____

C. Name of assignee, if any, for printing on the Statutory Invention Registration_____
_____
Address (City and State or Country)
State of incorporation, if assignee is a corporation
_____
_____
signature(s) (37 CFR 1.293(a))
[ ] applicant(s) and any assignee
[ ] attorney or agent of record

Paragraph (c) of § 1.293 is added to define the effects of a waiver filed with a request for a statutory invention registration. The waiver is effective, upon publication of the SIR, to waive the inventor's right to receive a patent on the invention claimed in the SIR in any application for an original patent which is pending on, or filed after, the date of publication of the SIR. The waiver will affect pending or later applications the inventor filed as a joint inventor with others, but will not affect an application of another person, even if the application and the SIR were commonly owned. The waiver will affect a reissue application of an earlier patent of the inventor only to the extent that the reissue application seeks to enlarge the scope of the claims. Paragraph (c) of § 1.293 has been modified from the proposal by inclusion of a reference to § 1.106(e).

Section 1.294 is added as proposed to provide in paragraph (a) for a review of the request for publication of a statutory invention registration and the patent application to which it is directed. The request will be examined to determine if the requirements of § 1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and § 1 293 are met. Under 35 U.S.C. 157, the Commissioner is authorized to publish a statutory invention registration, but is not required to do so. Thus, the Commissioner has discretion in determining whether or not a statutory invention registration should be issued on a particular patent. In circumstances where the subject matter was obviously not a patentable invention, was too informal to print, and so forth, the request to publish the statutory invention registration will be refused.

Paragraph (b) of § 1.294 provides for notifying applicant of the results of the examination of the request for publication of the statutory invention registration. Paragraph (c) of § 1.294 provides for the issuance of a notice of the intent to publish a statutory invention registration once the request has been examined and approved.

Section 1.295 is added to provide for the review of a final refusal to publish a statutory invention registration. The review would be by petition to the Commissioner for matters other than those arising from a rejection pursuant to 35 U.S.C. 112 and by appeal for a rejection pursuant to 35 U.S.C. 112. The language of the final rule is slightly different from that proposed to emphasize that the Board either affirms or reverses decisions rather than rejections. Paragraph (a) also differs from the proposal by including, in response to a comment, a provision for requesting return of the petition fee if the necessity for the petition resulted from an error by the Patent and Trademark Office.

Section 1.296 has been modified from the proposal to provide a specific period during which a request for a statutory invention registration may be withdrawn. Under § 1.296, as modified, a request for a statutory invention registration may be withdrawn, at applicant's option, prior to the date of the notice of intent to publish a statutory invention registraiton issued pursuant to § 1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. An applicant filing such a request to withdraw may also, under § 1.296, request a refund of any amount paid in excess of the application filing fee and a handling fee of $100.00 which will be retained by the Office. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish pursuant to § 1.294(c) must be in the form of a petition pursuant to § 1.183 accompanied by the fee set forth in § 1.17(h).

Section 1.297 is added to provide for the publication of the statutory invention registration and of the notice of its publication in the *Official Gazette*. In response to a comment,

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the same person or organization. A second alternative which can be used, if assignments have not been recorded, permits the examiner to consider copies of unrecorded assignments filed in each of the applications by the applicants as long as the unrecorded assignments convey the entire rights in the applications to the same person or organization. A third alternative permits an affidavit or declaration to be filed by the common owner stating that there is common ownership and stating facts which explain why the affiant or declarant believes there is common ownership. Under this alternative, sufficient facts will have to be presented in order to enable the examiner to conclude that a prima facie case of common ownership exists. The fourth alternative permits other evidence to be used which would establish common ownership of the applications, e.g., a court decision determining the owner. The terms "person" and "organization" in the rule would include circumstances where the ownership resided in more than one person and/or organization as long as the applications are owned jointly by the same owners. Paragraph (e) also provides that where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization who is empowered to act on behalf of the corporation or organization. A mere power of attorney to prosecute a patent application will not make an individual an official of the corporation or organization or empower the individual to act on behalf of the corporation or organization.

The wording of § 1.106(d) amends the rule to reflect the change in 35 U.S.C. 103 and refers to the "entire" rights to the subject matter and the claimed invention to make it clear that the term "commonly owned" means wholly owned by the same person, persons, or organization.

If the person, persons, or organization owned less than 100 percent of the subject matter which would otherwise be prior art to the claimed invention, or less than 100 percent of the claimed invention, then common ownership would not exist. Common ownership requires that the person, persons, or organization own 100 percent of the subject matter and 100 percent of the claimed invention. As long as principal ownership rights to either the subject matter or the claimed invention reside in different persons or organizations common ownership does not exist. A license of the claimed invention to another by the owner where basic ownership rights are retained would not defeat ownership. The requirement for common ownership at the time the claimed invention was made is intended to preclude obtaining ownership of subject matter after the claimed invention was made in order to disqualify that subject matter as prior art against the claimed invention. The question of whether common ownership exists at the time the claimed invention was made is to be determined on the basis of the evidence presented and the facts of the particular case in question. Actual ownership of the subject matter and the claimed invention by the same individual or organization or a legal obligation to assign both the subject matter and the claimed invention to the same individual or organization must be in existence at the time the claimed invention was made in order for the subject matter to be disqualified as prior art. A moral or unenforceable obligation would not evidence common ownership.

The burden of establishing that subject matter is disqualified as prior art under the section is intended to be placed and reside upon the person or persons urging that the subject matter is disqualified. For example, the examiner would normally make what appears to be a proper 35 U.S.C. 102(f)/103 or 102(g)/103 rejection and the burden would be on the patent applicant to establish that subject matter is disqualified as prior art because it was commonly owned at the time the claimed invention was made. To place the burden upon the patent examiner would not be appropriate since evidence as to common ownership at the time the claimed invention was made might not be available to the patent examiner, but such evidence, if it exists, should be readily available to the patent applicant or the patentee.

The invention is made for purposes of the amendment to § 103 when the conception is complete as defined in *Mergenthaler* v. *Scudder*, 11 App. D.C. 264, 1897 C.D. 724 (C.A.D.C. 1897), and in *In re Tansel*, 117 USPQ 188 (CCPA 1958).

> "The conception of the invention consists in the complete performance of the mental part of the inventive act. All that remains to be accomplished in order to perfect the act or instrument belongs to the department of construction, not invention. It is, therefore, the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice that constitutes an available conception within the meaning of the patent law."

Mergenthaler v. *Scudder*, supra, at page 731.

Paragraph (e) of § 1.106 has been added in response to a comment that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application. Paragraph (e) of § 1.106 provides that the claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. Paragraph (e) of § 1.106 also provides that the claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and which was the same subject matter waived in the statutory invention registration.

Section 1.108 is amended as proposed to delete the reference to filing a request under § 1.139, which is being removed, and insert in its place a reference to a defensive publication.

A new section 1.110 is added as proposed to allow the examiner or other Office official to make inquiry as to the invention date, inventors and ownership at the time the invention was made when necessary for purposes of an Office proceeding.

Section 1.131 is amended to require that affidavits to overcome a rejection of a claim on a cited patent or publication be by the inventor or inventors of the subject matter of that claim. Section 1.131 has also been amended in response to a comment to permit the person qualified under §§ 1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Section 1.139 is being removed in view of the new statutory invention registration. The proposed rules made clear the intent to remove this section which established the defensive publication program although the section per se was not published as being removed. The defensive publication program is being replaced by the ability to obtain a statutory invention registration.

Section 1.193 is amended as proposed to change from twenty days to one month the time for filing a reply brief in response to an examiner's answer which raises new points of argument. This amendment is intended to simplify the docketing of this time period and make it consistent with the time period fixed for requesting an oral hearing in § 1.194(b).

Section 1.293 is added to provide who may file a request for a statutory invention registration (SIR) and the requirements of such a request in accordance with 35 U.S.C. 157 added by Public Law 98-622. Paragraph (a) of § 1.293 indicates that a request for publication of a statutory invention registration in a complete pending patent application for an original patent may be filed and be signed by the applicant, and any assignee of record, or the attorney or agent of record in the application. Paragraph (b) sets forth the requirements for a request for a statutory invention registration. Such a request must include:

(1) a waiver of the applicant's right to receive a patent. This waiver will become effective upon the date of publication. Therefore, it will be possible to petition to withdraw a request for publication of a statutory invention registration until such time that publication can not be terminated;
(2) payment of the fee for requesting publication of a statutory invention registration as set forth in § 1.17(n) or (o). The fee is set at two levels to reflect the amount of resources used by the Patent and Trademark Office;
(3) a statement that the application meets the disclosure requirements of 35 U.S.C. 112. This provision is considered desirable in order to prevent publication of defective and insufficient disclosures; and
(4) a statement that the application complies with the formal requirements of the rules of practice relating to printing.

§ 1.297 has been modified so that the statement on the statutory invention registration will specifically state that the statutory invention registration is not a patent.

Sections 1.301, 1.302 and 1.304 are amended as proposed to delete the requirement to give reasons for appeal when filing an appeal to the Court of Appeals for the Federal Circuit in accordance with § 414(a) of Public Law 98-620 which amended 35 U.S.C. 142, 143 and 144.

Section 1.378 is amended as proposed to delete from paragraph (a) the limitation that only applications filed on or after Aug. 27, 1982 may have the maintenance fee accepted after expiration of the patent. This change follows the change made by § 404(b) of Public Law 98-622.

Section 1.431 is amended as proposed to provide for the later payment directly to the Receiving Office of the basic fee portion of the international fee and the transmittal and search fees within one month of the filing of an international application. The rule follows § 361(d) of title 35 U.S.C. as amended by Public Law 98-622, to provide a one-month grace period from the date of filing of an international application for the payment of the basic international fee and the transmittal and search fees.

It should be noted that the designation fees continue to be required by 12 months after the priority date and that no subsequent grace period is provided in the Receiving Office for designation fees.

New paragraphs 1.431(d) and (e) incorporate into the regulations the provisions of PCT Rule 16 bis. Under these provisions the Receiving Office will charge any unpaid or insufficient fees to a deposit account maintained by the International Bureau. The applicant will then be notified by the International Bureau and be given one month to reimburse the amount charged plus a surcharge of 50%. The surcharge would not be less than 248 Swiss francs or more than 624 Swiss francs under the current fee schedule.

Section 1.445 is amended as proposed to clarify paragraph (a) (4) to clearly indicate that the national fee is credited by an amount of $250 only one time where a $500 search fee has been paid to the Patent and Trademark Office to act as an international searching authority. This is consistent with current practice. The special fee provisions in paragraph (a) (5) are being deleted in view of § 402(g) of Public Law 98-622 which deleted the fee in 35 U.S.C. 376(a)(5). The wording of § 1.445(a) (5) sets forth the surcharge required for filing of a national fee or oath or declaration later than 20 months from the priority date. Paragraph (a)(6) of § 1.445 is added to require a fee of $20.00 for filing an English translation of an international application later than 20 months after the priority date. This makes the practice in international applications consistent with that in national applications where a fee of $20.00 is charged under § 1.17(k) for processing an application filed with a specification in a non-English language.

Section 1.446 is amended as proposed to clarify the refund of a portion of the $500 search fee toward payment of the national fee.

Section 1.451 is amended as proposed to correct a rule citation in paragraph (b) and to amend paragraph (c) to provide for supplying a copy of the priority document to the Receiving Office in conformance with revised PCT Rule 17.1.

Section 1.461 is amended as proposed to delete provisions which relate to the applicant transmitting the record copy to the International Bureau. Provisions for such alternative transmittal were deleted from PCT Rule 22, effective Jan. 1, 1985. Accordingly, since the PCT rules no longer provide for such transmittal, the provisions therefor in the U.S. rules are also being deleted.

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Six letters submitting written comments were received. Oral testimony was presented by four persons at the public hearing conducted on Feb. 8, 1985 and the oral testimony of two of these persons (representing the American Intellectual Property Law Association and Intellectual Property Owners, Inc.) was supplemented by written statements. All of the written and oral comments were considered in adopting the changes set forth herein. Comments suggesting modifications to the proposed rules appear below with responses thereto.

Comment:

One Comment suggested that 37 CFR 1.11 be amended to create a waiver of secrecy of an application as of the date of filing of a notice of appeal to the Court of Appeals for the Federal Circuit. The comment suggests that secrecy could be maintained upon request by the appellant in such a situation.

Reply:

The change was not published in the proposed rulemaking and is considered to be too substantial a change to be adopted without publication as a proposal to allow public comment. Further, if the suggestion were adopted appellants might simply include a request for secrecy with every notice of appeal.

Comment:

One comment suggested that the $120.00 petition fee under § 1.17(h) for review of a refusal to publish a statutory invention registration under § 1.295 be returned to the petitioner if the refusal to publish is found to have occurred only through an administrative error of the PTO.

Reply:

This suggestion has been adopted by an additional sentence being added to § 1.295(a).

Comment:

Three comments suggested that the proposed fees for a statutory invention registration were too high. One comment suggested the elimination of the fee proposed in § 1.17(o).

Reply:

Although lower fees would certainly be preferred by the public, the Office must recover its costs of processing and publishing statutory invention registrations. The two levels of fees permit an applicant whose application has not had a first Office action mailed to pay a minimum amount while those filing a request for a statutory invention registration later would share the average additional costs. The amounts proposed are the current estimates of expected costs and cannot be reduced. This will become apparent when it is realized that about $250.00 of the $400.00 fee which has been established for requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104 is the cost of printing the statutory invention registration and does not include in-house publication staff costs. The remainder of the fee is used to cover the administrative processing costs and the limited examination which is required to be given pursuant to 35 U.S.C. 157. The higher fee of $800.00 which has been established is necessary to cover the additional costs to the Office when an applicant requests publication of a statutory invention registration after the office has begun examination of the application on which the applicant is requesting publication of a statutory invention registration. Since the rules permit the request to be filed at any time during the examination process substantial additional examination costs, including possibly appeal costs, may have been incurred in a particular application prior to the date on which the request for publication is made. Accordingly, the additional $400.00 is required to cover the extra costs to the Office where the applicant belatedly requests publication of a statutory invention registration. Applicants can avoid the higher costs to themselves and the Office by requesting publication of the statutory invention registration in a timely fashion prior to the mailing of the first examiner's action pursuant to § 1.104. The possibility of reducing fees below costs to the Office does not exist since the legislative history of 35 U.S.C. 157 does not reflect any intent that other Office fees or appropriations be used to defer the costs of statutory invention registrations. Further, most of the comments received urged that the fees be set as low as possible, but not below the level necessary to recover costs.

Comment:

One comment suggested that the Patent and Trademark Office should investigate less expensive procedures for printing statutory invention registrations to reduce the costs and thereby lower the fees.

Reply:

If the registrations are not printed by a system using computer tape, the subject matter of the registrations would not be easily searchable in paper form and would not be fully available for searching under the planned automated "paperless" system. Further, the "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House stated that the statutory invention registration "would be classified and cross-referenced, disseminated to foreign patent offices, stored in the Patent

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and Trademark Office computer tapes, made available in commercial data bases, and announced in the *Official Gazette* of the PTO." (130 Cong. Rec. H 10526 (1984), column 3). These uses of the statutory invention registrations preclude use of any informal method of printing which would be different from the method used for the printing of patents.

Comment:

A number of comments were received concerning § 1.48(b). The comments related to (1) the propriety of the fee required, (2) the incorporation of paragraph (b) into current § 1.48, (3) the inclusion in the rules of a fixed and definite time period to correct inventorship, (4) the inclusion in the rules of a provision to add inventors claiming previously disclosed but unclaimed subject matter, and (5) a suggestion that the change in inventorship be simplified and possibly effected by a statement by applicant's attorney.

Reply:

Each comment will be treated separately in order. (1) The fee of $120.00 to accompany a petition for correction of inventorship is considered appropriate since the consideration of such a petition and correction of Office records takes additional resources. Such a fee should also act as a discouragement to grouping marginal inventions and loosely related inventions into the same application. (2) Whether paragraph (b) is made part of § 1.48 or established as a separate rule does not appear to be a substantive matter. Paragraph (b) is being made part of § 1.48 to place all rules relating to correction of inventorship in applications in a single rule. (3) No specific time period for correction of inventorship was indicated in the proposed rules. The rule requires that the correction must be made diligently. Since the examiner will not normally be aware of when inventorship correction is required, the responsibility of making such a correction diligently must rest with the applicant. The time of the correction will vary from case to case. (4) The addition of claims to previously disclosed but unclaimed subject matter of additional inventors is considered to be an error in the application and is therefore corrected under § 1.48(a). A new paragraph (c) has been added to § 1.48 to make this clear. Such a correction must always include a new oath or declaration. (5) The correction of inventorship has been simplified from that proposed. Final § 1.48(b) does not require a new oath or declaration of each actual inventor or written consent of any assignee as originally proposed. The final rule requires a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and the fee set forth in § 1.17(h). The petition could be signed by applicant's attorney who would then take full responsibility for ensuring that the inventor is not being improperly deleted from the application.

Comment:

One comment suggested that proposed §§ 1.60 and 1.62 should be modified to permit the filing of such continuing applications with different inventive entities from the prior application.

Reply:

The procedures under §§ 1.60 and 1.62 were developed to allow continuing applications to be filed without the necessity of again obtaining an inventor's signature to a declaration. The proposed rule wording has been modified in the final rule to permit inventors to be deleted in the continuing application. The addition of inventors is now permitted where a new oath or declaration would be required because of claims in the continuing application being drawn to additional subject matter.

Comment:

One comment suggested that §§ 1.77 and 1.78 be modified to change the placement in a patent application of the information regarding cross-reference to related applications. It was suggested to require this information to be placed immediately after the Abstract, following the claims, so that the cross-reference information could be easily removed when filing the application outside the United States.

Reply:

These changes were not included in the proposed rulemaking and therefore the public has not had an opportunity to comment on the suggestion. Accordingly, the suggestion has not been adopted.

Comment:

One comment suggested that proposed § 1.78(c) be modified to permit a statement that the claimed inventions were subject to an obligation of assignment to the same person at the time the inventions were made.

Reply:

The suggestion has been adopted.

Comment:

One comment suggested that the application of double patenting rejections to applications of different inventive entities which are commonly owned as set out in proposed § 1.78(d) not be made until the effective date of this rulemaking.

Reply:

The Commissioner's Notice of Dec. 11, 1984, "Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120", 1050 O.G. 316 (Jan. 8, 1985), changed the practice in accordance with the intention of Congress in enacting Public Law 98-622. See 130 Cong. Rec. H 10527, column 3 (daily ed. Oct. 1, 1984) (statement of Rep. Kastenmeier) wherein the following statement appears:

> "The Committee expects that the Patent and Trademark Office will reinstitute in appropriate circumstances the practice of rejecting claims in commonly owned applications of different inventive entities on the ground of double patenting. This will be necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. In accordance with established patent law doctrines, double patenting rejections can be overcome in certain circumstances by disclaiming the terminal portion of the term of the later patent, thereby eliminating the problem of extending patent life."

Since the provisions of Public Law 98-622 became effective on Nov. 8, 1984, it was not appropriate to delay the change in practice.

Comment:

One comment suggested that the policy of rejecting commonly-owned applications of different inventive entities on the grounds of double patenting, as set forth in proposed § 1.78(d), was unnecessary in view of 35 U.S.C. 102(e).

Reply:

The provisions of 35 U.S.C. 102(e) will not be effective to preclude double patenting in situations where the applicants of the later filed application can use the provisions of 37 CFR 1.131 to antedate the filing date of the earlier filed application or patent. Accordingly, the application of the prohibitions against double patenting is necessary in order to prevent an organization from obtaining two or more patents with different expiration dates covering nearly identical subject matter. See 130 Cong. Rec. H 10527, supra.

Comment:

One comment suggested that proposed § 1.78(c) was broader than required by statute and capable of being construed to conflict with proposed § 1.106(d) by referring to common ownership at "the time the inventions were made" rather than at the time the later invention was made.

Reply:

The wording of § 1.78(c) has been revised from the proposal to clarify the problem spoken to in the comment.

Comment:

One comment suggested that the proposed amendment to § 1.131 not be made so that the "applicant" can make affidavits or declarations to overcome rejections. The comment suggested that the proposed rule provides no remedy in situations where the inventor is dead, insane, legally incapacitated, cannot be reached or refuses to join in the application.

Reply:

The final rule has been changed in response to the comment to permit the person qualified under §§ 1.42, 1.43, or 1.47 to make the required oath or declaration in appropriate circumstances.

Comment:

Two comments suggested that the scope of the waiver in a statutory invention registration be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof. Another comment suggested that the statutory invention registration applicant should be able to waive the right to a patent on all of the subject matter disclosed in the application if he wishes to do so. One comment suggested that the rulemaking should leave no doubt as to the standard to be applied in determining the effect of a statutory invention registration waiver in one application on a related application.

Reply:

A new paragraph (e) has been added to § 1.106 to clarify the standard to be applied in determining the effect of a statutory invention registration waiver. The suggestion that the scope of the waiver be limited to the subject matter of the claims of the statutory invention registration and not to any obvious modifications thereof has been adopted.

Comment:

Three comments suggested that since a statutory invention registration is prior art as of its effective filing date, the time permitted between the effective filing date and the publication of the statutory invention registration should be limited. Several different approaches were suggested. One comment suggested that there was no problem in this regard. Another comment suggested that the organization is studying the question and will have recommendations in several months.

Reply:

The statute makes it clear that the Commissioner is not required to publish a statutory invention registration in response to a request therefor. The case-by-case consideration of requests for publication of a statutory invention registration should safeguard the public without unduly placing limits on patent applicants. The Office will await further recommendations on this question and will observe actual experience prior to placing any time limitations on the use of statutory invention registrations.

Comment:

Two comments suggested that § 1.293 be modified to eliminate the requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112. One of these comments also suggested the elimination of the statement that the application meets formal requirements for printing. One comment suggested that if there is a requirement for a statement in the request for publication of a statutory invention registration that the application meets the requirements of 35 U.S.C. 112, there will not be a great necessity for the Office to spend a lot of time examining the application, although there has to be some examination.

Reply:

The reason for the statements in § 1.293 regarding compliance with 35 U.S.C. 112 and the formal requirements for printing as a patent was to reduce the cost of statutory invention registrations to the applicants and to the Office. The level of fees which have been established assumes that applicants will include the statements required by § 1.293 in their requests and that the statements will accurately reflect the condition of the applications to which the requests are directed.

Comment:

One comment suggested that the rules should include a fixed and definite time period in which an authorized party can withdraw a statutory invention registration after its approval and before its publication.

Reply:

The suggestion has been adopted. Section 1.296 has been modified to permit a request to withdraw the request for publication of a statutory invention registration to be filed at any time prior to the date of the notice of intent to publish the statutory invention registration. After the date of the notice of intent to publish the statutory invention registration, any request to withdraw the request for publication of the statutory invention registration must be in the form of a petition pursuant to § 1.183 accompanied by the fee set forth in § 1.17(h).

Comment:

One comment suggested that the statement to be printed on statutory invention registrations as set out in proposed § 1.297(b) be modified to be easily understood by lay people.

Reply:

The statement has been modified to specifically state that the statutory invention registration is not a patent.

Environmental, Energy, and Other Considerations: The final rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). In fact, the rule change will benefit small entities since the statutory invention registration procedures will provide a new, less expensive alternative to the traditional patenting of inventions in appropriate circumstances. Further, the ability to join multiple inventors in a single application in appropriate circumstances will be of particular benefit to small entities. Other changes, such as the elimination of the reasons for appeal, will also be beneficial to all inventors. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H.R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H 1057 (1984), column 1):

> "Last, the SIR would be particularly useful to those with limited resources such as universities and small businesses, who have a new less expensive alternative to the traditional patenting of inventions."

These rules, therefore, will have no significant adverse economic impact on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information collection requirements contained in these rules were submitted to the Office of Management and Budget (OMB) at the time of the proposed rulemaking for review under Section 3504(h) of the Paperwork Reduction Act. OMB has approved the information collection requirements and has assigned OMB control number 0651... 0018 thereto.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Pub. L. 98...620 and 98...622, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

1. Section 1.11 is amended by revising paragraphs (a) and (b) and adding new paragraph (e) to read as follows:

§ 1.11 Files open to the public.

(a) After a patent has been issued or a statutory invention registration has been published, the specification, drawings and all papers relating to the case in the file of the patent or statutory invention registration are open to inspection by the public, and copies may be obtained upon paying the fee therefor. See § 2.27 for trademark files.

(b) All reissue applications, all applications in which the Office has accepted a request to open the complete application to inspection by the public, and related papers in the application file, are open to inspection by the public, and copies may be furnished upon paying the fee therefor. The filing of reissue applications will be announced in the *Official Gazette*. The announcement shall include at least the filing date, reissue application and original patent numbers, title, class and subclass, name of the inventor, name of the owner of record, name of the attorney or agent of record, and examining group to which the reissue application is assigned.

* * * * *

(e) The file of any interference involving a patent, a statutory invention registration, or an application on which a patent has issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if: (1) the interference has terminated, or (2) an award of priority or judgment has been entered as to all parties and all counts.

2. Section 1.14 is amended by revising paragraph (b) to read as follows:

§ 1.14 Patent applications preserved in secrecy.

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(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application in which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant.

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3. Section 1.17 is amended by revising paragraphs (h) and by adding new paragraphs (n) and (o) to read as follows:

§ 1.17 Patent application processing fees.

• • • • •

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§ 1.47	...	for filing by other than all the inventors or a person not the inventor
§ 1.48	...	for correction of inventorship
§ 1.182	...	for decision on questions not specifically provided for
§ 1.183	...	to suspend the rules
§ 1.295	...	for review of refusal to publish a statutory invention registration
§ 1.37	...	for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
§ 1.378(e)	...	for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
§ 1.644(e)	...	for petition in an interference
§ 1.644(f)	...	for request for reconsideration of a decision on petition in an interference
§ 1.666(c)	...	for late filing of interference settlement agreement
§§ 5.12, 5.13, & 5.14	...	for expedited handling of foreign filing license
§ 5.15	...	for changing the scope of a license
§ 5.25	...	for retroactive license

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's acton pursuant to § 1.104 ..... $400.00 reduced by the amount of the application basic filing fee paid

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104 ..... $800.00 reduced by the amount of the application basic filing fee paid

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4. Section 1.19 is amended by revising paragraphs (a) and (e) to read as follows:

§ 1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent. $1.00

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(e) List of patents in subclass:

(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof 2.00

(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof 2.00

5. Section 1.20 is amended by revising paragraphs (e), (f), (g) and (m) to read as follows:

§ 1.20 Post-issuance fees.

• • • • •

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant $200.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant 400.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant 600.00

• • • • •

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable 500.00

6. Section 1.45 is revised by labeling the existing paragraph as (a) and by adding new paragraphs (b) and (c) to read as follows:

§ 1.45 Joint inventors.

(a) • • • • •

(b) Inventors may apply for a patent jointly even though

(1) they did not physically work together or at the same time,

(2) each inventor did not make the same type or amount of contribution, or

(3) each inventor did not make a contribution to the subject matter of every claim of the application.

(c) If multiple inventors are named in an application, each named inventor must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and the application will be considered to be a joint application under 35 U.S.C. 116.

7. Section 1.48 is amended by labeling the current paragraph as paragraph (a) and by adding new paragraphs (b) and (c) to read as follows:

§ 1.48 Correction of inventorship.

(a) • • • • •

(b) If the correct inventors are named in the application when filed and the prosecution of the application results in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. The amendment must be diligently made and shall be accompanied by:

(1) a petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application, and

(2) the fee set forth in § 1.17(h).

(c) If an application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended pursuant to paragraph (a) of this section to add claims to the subject matter and name the correct inventors for the application. [OMB Control No. 0651-0018].

8. Section 1.60 is revised to read as follows:

§ 1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)), naming as inventors the same or less than all the inventors named in a prior application and which discloses and claims only subject matter disclosed in the prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in {g49 1.51(a), (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application, and (3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application.

9. Section 1.61 is amended by revising the section heading and paragraphs (a) and (b) and adding paragraphs (c) and (d) to read as follows:

§ 1.61 Filing of applications in the United States of America as a Designated Office.

(a) To maintain the benefit of the international filing date and obtain an examination as to the patentability of the invention in the United States, the applicant shall furnish to the U.S. Patent and Trademark Office not later than the expiration of 20 months from the priority date: (1) a copy of the international application with any amendments under PCT Article 19, unless it has been previously communicated by the International Bureau or unless it was originally filed in the U.S. Patent and Trademark Office; (2) a translation of the international application and a translation of any amendments under PCT Article 19 into the English language, if originally filed in another language; (3) the national fee (see § 1.445(a)(4)); and (4) an oath or declaration of the inventor (see § 1.70).

(b) If the translation of the international application, oath or declaration, and national fee have not been submitted by the applicant within twenty (20) months from the priority date, such requirements may be met within twenty-two (22) months from the priority date. The payment of the surcharge set forth in § 1.445(a)(5) is required as a condition for accepting the national fee or the oath or declaration later than 20 months after the priority date. The payment of the processing fee set forth in § 1.445(a)(6) is required for acceptance of an English translation later than 20 months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 do not apply to the 22 month period of this section.

(c) If a copy of the amendments under PCT Article 19 is not communicated by the International Bureau or a copy thereof and any necessary English translation thereof is not received by the end of 20 months from the priority date, such failure will be regarded as cancellation of the amendments under PCT Article 19 in the international application.

(d) Verification of the translation of the international application or any other document pertaining to an international application may be required where it is considered necessary, if the international application or other document was filed in a language other than English.

10. Section 1.62 is amended by revising paragraphs (a), (c) and (h) to read as follows:

§ 1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§ 1.51(a)) which is to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application. If the continuation, continuation-in-part, or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation, continuation-in-part, or divisional application.

• • • • •

(c) In the case of a continuation-in-part application which adds and claims additional disclosure by amendment, an oath or declaration as required by § 1.63 must also be filed. In those situations where a new oath or declaration is required due to additional subject matter being claimed, additional inventors may be named in the continuing application. In a continuation or divisional application which discloses and claims only subject matter dislcosed in a prior application, no additional oath or declaration is required and the application must name as inventors the same or less than all the inventors named in the prior application.

• • • • •

(h) The applicant is urged to furnish the following information relating to the prior and continuing applications to the best of his or her ability:

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(5) The title of the invention and names of the applicants to be named in the continuing application.

• • • • •

11. Section 1.78 is amended by revising paragraphs (a) and (c) and by adding a new paragraph (d) to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in a prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must name as an inventor at least one inventor named in the later filed application and dislcose the named inventor's invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the prior application must be (1) complete as set forth in § 1.51, or (2) entitled to a filing date as set forth in § 1.53(b) and include the basic filing fee set forth in § 1.16; or (3) entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(1) within the time period set forth in § 1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

• • • • •

(c) Where two or more applications, or an application and a patent naming different inventors and owned by the same party contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should or should not be declared.

(d) Where an application claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application. An obviousness-type double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(b).

12. Section 1.101 is amended by revising paragraph (a) to read as follows:

§ 1.101 Order of examination.

(a) Applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to § 1.102. International applications which have complied with the re-quirements of 35 U.S.C. 371(c) will be taken up for action based on the date on which such requirements were met. However, unless a request has been filed under 35 U.S.C. 371(f), no action may be taken prior to 21 months from the priority date.

• • • • •

13. Section 1.103 is amended by revising paragraph (d) to read as follows:

§ 1.103 Suspension of action.

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(d) Action on applications in which the Office has accepted a request to publish a defensive publication will be suspended for the entire pendency of these applications except for purposes relating to patent interference proceedings under Subpart E.

14. Section 1.104 is amended by adding a new paragraph (e) immediately following the Note to paragraph (d) to read as follows:

§ 1.104 Nature of examination; examiner's action.

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(e) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (1) the application files refer to assignments recorded in the Patent and Trademark Office in accordance with § 1.331 which convey the entire rights in the applications to the same person or organization; or (2) copies of unrecorded assignments which convey the entire rights in the applications to the same person or organization are filed in each of the applications; or (3) an affidavit or declaration by the common owner is filed which states that there is common ownership and states facts which explain why the affiant or declarant believes there is common ownership; or (4) other evidence is submitted which establishes common ownership of the applications. In circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

15. Section 1.106 is amended by adding new paragraphs (d) and (e) to read as follows:

§ 1.106 Rejection of claims.

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(d) Subject matter which is developed by another person which qualifies as prior art only under 35 U.S.C. 102 (f) or (g) may be used as prior art under 35 U.S.C. 103 against a claimed invention unless the entire rights to the subject matter and the claimed invention were commonly owned by the same person or organization or subject to an obligation of assignment to the same person or organization at the time the claimed invention was made.

(e) The claims in any original application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the same subject matter is claimed in the application and the statutory invention registration. The claims in any reissue application naming an inventor will be rejected as being precluded by a waiver in a published statutory invention registration naming that inventor if the reissue application seeks to claim subject matter (1) which was not covered by claims issued in the patent prior to the date of publication of the statutory invention registration and (2) which was the same subject matter waived in the statutory invention registration.

16. Section 1.108 is revised to read as follows:

§ 1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references except those which have been opened to inspection by the public following a defensive publication.

17. Section 1.110 is added to read as follows:

§ 1.110 Inventorship and date of invention of the subject matter of individual claims.

When more than one inventor is named in an application or patent, the Patent and Trademark Office, when necessary for purposes of an Office proceeding, may require an applicant, patentee, or owner to identify the inventive entity of the subject matter of each claim in the application or patent. Where appropriate, the invention dates of the subject matter of each claim and the ownership of the subject matter on the date of invention may be required of the applicant, patentee or owner. See also §§ 1.78(c) and (d). [OMB Control No. 0651-0018].

18. Section 1.131 is amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§ 1.42, 1.43 or 1.47, shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

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§ 1.139 [removed]

19. Section 1.139 is removed.

20. Section 1.193 is amended by revising paragraph (b) to read as follows:

§ 1.193 Examiner's answer.

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(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. However, if the examiner's answer states a new ground of rejection appellant may file a reply thereto within two months from the date of such answer; such reply may include any amendment or material appropriate to the new ground.

• • • • •

21. A new section 1.293 is added to read as follows:

§ 1.293 Statutory invention registration.

(a) An applicant for an original patent may request, at any time during the pendency of applicant's pending complete application, that the specification and drawings be published as a statutory invention registration. Any such request must be signed by (1) the applicant and any assignee of record or (2) an attorneyor agent of record in the application.

(b) Any request for publication of a statutory invention registration must include the following parts:

(1) a waiver of the applicant's right to receive a patent on the invention claimed effective upon the date of publication of the statutory invention registration;

(2) the required fee for filing a request for publication of a statutory invention registration as provided for in § 1.17(n) or (o);

(3) a statement that, in the opinion of the requester, the application to which the request is directed meets the requirements of 35 U.S.C. 112; and

(4) a statement that, in the opinion of the requester, the application to which the request is directed complies with the formal requirements of this part for printing as a patent.

(c) A waiver filed with a request for a statutory invention registration will be effective, upon publication of the statutory invention registration, to waive the inventor's right to receive a patent on the invention claimed in the statutory invention registration, in any application for an original patent which is pending on, or filed after, the date of publication of the statutory invention registration. A waiver filed with a request for a statutory invention registration will not affect the rights of any other inventor even if the subject matter of the statutory invention registration and an application of another inventor are commonly owned. A waiver filed with a request for a statutory invention registration will not affect any rights in a patent to the inventor which issued prior to the date of publication of the statutory invention registration unless a reissue application is filed seeking to enlarge the scope of the claims of the patent. See also § 1.106(e). [OMB Control No. 0651-0018].

22. A new section 1.294 is added to read as follows:

§ 1.294 Examination of request for publication of a statutory invention registration and patent application to which the request is directed.

(a) Any request for a statutory invention registration will be examined to determine if the requirements of § 1.293 have been met. The application to which the request is directed will be examined to determine (1) if the subject matter of the application is appropriate for publication, (2) if the requirements for publication are met, and (3) if the requirements of 35 U.S.C. 112 and § 1.293 of this part are met.

(b) Applicant will be notified of the results of the examination set forth in paragraph (a) of this section. If the requirements of § 1.293 and this section are not met by the request filed, the notification to applicant will set a period of time within which to comply with the requirements in order to avoid abandonment of the application. If the application does not meet the requirements of 35 U.S.C. 112, the notification to applicant will include a rejection under the appropriate provisions of 35 U.S.C. 112. The periods for response established pursuant to this section are subject to the extension of time provisions of § 1.136. After response by the applicant, the application will again be considered for publication of a statutory invention registration. If the requirements of § 1.293 and this section are not timely met, the refusal to publish will be made final. If the requirements of 35 U.S.C. 112 are not met, the rejection pursuant to 35 U.S.C. 112 will be made final.

(c) If the examination pursuant to this section results in approval of the request for a statutory invention registration the applicant will be notified of the intent to publish a statutory invention registration.

23. A new section 1.295 is added to read as follows:

§ 1.295 Review of decision finally refusing to publish a statutory invention registration.

(a) Any requester who is dissatisfied with the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 may obtain review of the refusal to publish the statutory invention registration by filing a petition to the Commissioner accompanied by the fee set forth in § 1.17(h) within one month or such other time as is set in the decision refusing publication. Any such petition should comply with the requirements of § 1.181(b). The petition may include a request that the petition fee be refunded if the final refusal to publish a statutory invention registration for reasons other than compliance with 35 U.S.C. 112 is determined to result from an error by the Patent and Trademark Office.

(b) Any requester who is dissatisfied with a decision finally rejecting claims pursuant to 35 U.S.C. 112 may obtain review of the decision by filing an appeal to the Board of Patent Appeals and Interferences pursuant to § 1.191. If the decision rejecting claims pursuant to 35 U.S.C. 112 is

reversed, the request for a statutory invention registration will be approved and the registration published if all of the other provisions of § 1.293 and this section are met. [OMB Control No. 0651-0018].

24. A new section 1.296 is added to read as follows:

§ 1.296 Withdrawal of request for publication of statutory invention registration.

A request for a statutory invention registration, which has been filed, may be withdrawn prior to the date of the notice of the intent to publish a statutory invention registration issued pursuant to § 1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. The request to withdraw may also include a request for a refund of any amount paid in excess of the application filing fee and a handling fee of $100 which will be retained. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish issued pursuant to § 1.294(c) must be in the form of a petition pursuant to § 1.183 accompanied by the fee set forth in § 1.17(h). [OMB Control No. 0651- 0018].

25. A new section 1.297 is added to read as follows:

§ 1.297 Publication of statutory invention registration.

(a) If the request for a statutory invention registration is approved the statutory invention registration will be published. The statutory invention registration will be mailed to the requester at the correspondence address as provided for in § 1.33(a). A notice of the publication of each statutory invention registration will be published in the *Official Gazette*.

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration published pursuant to 35 U.S.C. 157 is not a patent but it has all of the attributes specified for patents in title 35, United States Code, except those specified in 35 U.S.C. 183 and sections 271 through 289. A statutory invention registration does not have any of the attributes specified for patents in any other provision of law other than title 35, United States Code. The invention with respect to which a statutory invention registration is published is not a patented invention for purposes of the marking provisions of 35 U.S.C. 292.

26. Section 1.301 is revised to read as follows:

§ 1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. The certified list of documents and any original or certified copies of such documents required by the Court will be transmitted to the Court by the Patent and Trademark Office.

27. Section 1.302 is revised to read as follows:

§ 1.302 Notice of appeal.

(a) When an appeal is taken to the U.S. Court of Appeals for the Federal Circuit, the appellant shall give notice thereof to the Commissioner within the time specified in § 1.304.

(b) In interferences, the notice must be served as provided in § 1.646.

28. Section 1.304 is amended by revising paragraph (a) to read as follows:

§ 1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of § 1.136. See § 1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See § 1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

29. Section 1.378 is amended by revising the section heading and paragraph (a) to read as follows:

§ 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable and if the surcharge required by § 1.20(m) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

* * * * *

30. Section 1.431 is amended by revising paragraphs (b)(3)(iii) and (c) and by adding new paragraphs (d) and (e) to read as follows:

§ 1.431 International application requirements.

* * * * *

(b)(3) * * *

(iii) The name of the applicant, as prescribed (note §§ 1.421-1.424);

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) may be made in full at the time international application papers required by paragraph (b) of this section are deposited or within one month thereafter. Failure to make full payment within one month of the deposit of the international application papers required by paragraph (b) of this section will result in the fees being charged to the International Bureau under the provisions of paragraph (d) of this section and PCT Rule 16 bis.

(d) The United States Receiving Office will charge to the International Bureau in accordance with PCT Rule 16 bis and will consider as having been timely paid:

(1) the transmittal fee, the basic fee portion of the international fee, or the search fee where these fees have not been fully paid by the applicant within one month of the date of deposit of the international application, and

(2) the destination fee, or the amount necessary to cover all the designations made in the request which have not been paid by the applicant within one year from the priority date.

(e) The International Bureau will notify applicant of any amount charged under paragraph (d) of this section and invite the applicant to pay directly to the International Bureau within one month from the date of the notification, the amount charged, augmented by a surcharge of 50%, provided the surcharge will not be less and will not be more, than the amounts indicated in the Schedule of Fees appended to the PCT Rules. If the payment needed to cover the transmittal fees, the basic fee, the search fee, one designation fee and the surcharge is not timely made to the International Bureau, the International Bureau will notify the Receiving Office which will declare the international application withdrawn under PCT Article 14(3)(a). If the applicant makes timely payment of the fees referred to in the previous sentence, but the amount paid is not sufficient to cover all the designation fees, the Receiving Office will declare any designations not paid withdrawn under PCT Article 14(3)(b) in accordance with PCT Rule 16 bis. 2(c).

31. Section 1.445 is amended by revising paragraphs (a)(4) and (5) and adding paragraph (a)(6) to read as follows:

§ 1.445 International application filing and processing fees.

(a) * * *

(4) The national fee, that is, the amount set forth as the filing fee under § 1.16(a) through (d) credited one time only by an amount of $250 where an international search fee of $500.00 has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Where the amount of the credit is in excess of that required for the national fee, a request for a refund of the excess under § 1.446(b) may be filed at the time of paying the national fee. Only one such credit is permitted based on a single $500.00 international search fee.

(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date $100.00

(6) For filing an English translation of an international application later than 20 months after the priority date (§ 1.61(b)) $20.00

* * * * *

32. Section 1.446 is amended by revising the section heading and paragraph (b) to read as follows:

§ 1.446 Refund of international application filing and processing fees.

* * * * *

(b) Refund of a portion of the search fee toward payment of the national fee may be made one time to the extent set forth in § 1.445(a)(4) if requested at the time of paying the national fee provided that a $500 search fee has been paid.

* * * * *

33. Section 1.451 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.451 The priority claim and priority document in an international application.

* * * * *

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office or in a separate letter filed in the Receiving Office not later than 16 months after the priority date, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau (PCT Article 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.19(a)(3) and (b)(1).

(c) If a certified copy of the priority document is not submitted together with the international application on filing, or, if the priority application was filed in the United States and a request and appropriate payment for preparation of such a certified copy do not accompany the international application on filing or are not filed within 16 months of the priority date, the certified copy of the priority document must be furnished by the applicant to the International Bureau or to the United States Receiving Office within the time limit specified in PCT Rule 17.1(a).

34. Section 1.461 is amended by deleting paragraph (b) and by revising paragraph (a) to read as follows:

§ 1.461 Procedures for transmittal of record copy to the International Bureau.

(a) Transmittal of the record copy of the international application to the International Bureau shall be made by the United States Receiving Office.

(b) (reserved)

* * * * *

Feb. 14, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[1053 OG 10]

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(163) **Establishing Common Ownership of Patent Applications and/or Patents Owned by a Corporation or Other Organization**

This notice is intended to simplify the practice of establishing common ownership of patent applications and/or patents in circumstances where the common owner is a corporation or other organization. Under 37 CFR 1.104(e), in order to establish common ownership "[i]n circumstances where the common owner is a corporation or other organization an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization." A mere power of attorney to prosecute a patent application does not make an individual an official of a corporation or organization or empower the individual to act on behalf of the corporation or organization in making an affidavit or declaration averring to common ownership. However, such an affidavit could be made by a patent attorney, patent agent, or other individual if the attorney, agent, or other individual has been appointed in writing by the corporation or organization as an official of the corporation or organization specifically empowered to make affidavits or declarations on its behalf averring to common ownership. In circumstances where such a written appointment has been given to a patent attorney, patent agent, or other individual, that person could then make affidavits or declarations averring to common ownership as long as the affidavit or declaration referred to an attached copy of the written appointment and averred that the authority is still in effect. Under this practice the original signed copy of the written appointment would be retained by the affiant or declarant unless the Patent and Trademark Office specifically required it to be filed. Unless some question arose as to the authority of the individual to make the averment as to common ownership, the Patent and Trademark Office would ordinarily not need to require the original signed copy of the written appointment. While this practice should simplify the establishing of common ownership by necessitating only one original signed written appointment, corporations and other organizations must exercise care that the written appointment is only given to those persons who are in a position to know that common ownership does in fact exist and can therefore properly make affirmative representations to that effect to the Patent and Trademark Office.

May 12, 1986.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patent and Trademarks.

[1067 OG 11]

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(164) **U.S. Department of Commerce**
Patent and Trademark Office

Special Status for Patent Applications Relating to Superconductivity

In his Remarks of July 28, 1987, to the Federal Conference On Commercial Applications of Superconductivity, the President stated that "We need to strengthen patent laws to increase protection for manufacturing processes and speed up the patent process so that it can keep pace with the fast-paced world of high technology." The President also noted that "to most of us laymen, superconductivity was a completely new term, but it wasn't long before we learned of the great promise it held out to alter our world for the better — a quantum leap in energy efficiency that would bring with it a host of benefits, not least among them a reduced dependence on foreign oil, a cleaner environment, and a stronger national economy." The President's Superconductivity Initiative of even date included, as a major administrative component, a proposal "Directing the Patent and Trademark Office to accelerate the processing of patent applications and adjudication of disputes involving superconductivity technologies when requested by the applicants to do so."

In accordance with the President's proposal, the Patent and Trademark Office will, on request, accord "special" status to all patent applications for inventions involving superconductive materials. Examples of such inventions would include those directed to the superconductive materials themselves as well as to their manufacture and application. In order that the Patent and Trademark Office may implement this procedure, we invite all applicants desiring to participate in this program to request that their applications be accorded "special" status. Such requests should be in writing, should identify the application by serial number and filing date, and should be accompanied by a statement under 37 CFR 1.102 that the invention involves superconductive materials. No fee is required. The statement must be verified if made by a person not registered to practice before the Patent and Trademark Office. Decisions whether to accord "special" status on the basis of a request will be made by the appropriate Group Director.

Requests should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 5, 1987.

DONALD J. QUIGG,
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.

[1082 TMOG 7]

(165) **Preparation for Processing High Temperature Superconductor Technology**

In response to the President's Superconductivity Initiative announced on July 28, 1987 and with the expectation of the filing of increasing numbers of patent applications relating to higher temperature superconductors, the U.S. Patent and Trademark Office has taken a number of steps to prepare for the effective handling of applications on this subject matter.

These actions include (1) establishing a special Task Force to prepare for the processing of patent applications for higher temperature superconductor technology; (2) making patent applications relating to this technology special on request of the applicant and (3) renewing support for legislation providing for an expanded scope of protection for process patents to cover products made by the patented process.

The responsibilities of the Task Force are to (1) coordinate the development of a Patent and Trademark Office capability to examine the expected large number of patent applications in this area and (2) provide an information resource and sounding board for legal and practice questions and policy development in this area. The Task Force has been assigned a number of specific tasks, such as developing a complete search file on superconductivity technology for the use of Examiners and the public, establishing a training program for examiners on the technology and assuring a uniform and consistent application of the patent law to the technology in the U.S. Patent and Trademark Office.

Sept. 16, 1987.

RENE D. TEGTMEYER, for
DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1083 OG 16]

(166) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 5
[Docket No. 70754-8056]

Miscellaneous Amendments of Patent Rules

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent cases, Parts 1 and 5 of Title 37, Code of Federal Regulations, (1) to bring the rule relating to swearing back of a reference into conformity with current interference practice; (2) to require that the appellant's brief in an *ex parte* appeal contain certain specific items; (3) to reset the time period for requesting an oral hearing in *ex parte* appeals where the examiner's answer states a new ground of rejection; (4) to clarify the procedure following a rejection after a remand to the examiner under § 1.196(b)(1); (5) to give the examiner-in-chief the authority to decide certain requests for access by an interference party; (6) to clarify the rule relating to access to pending or abandoned applications; (7) to modify the rules concerning requests for interference with an application or patent; (8) to amplify the rule concerning the requirements of a motion to declare an additional interference; (9) to make more comprehensive the rule concerning the filing of a reissue application by a patentee involved in an interference; and (10) to conform the rule concerning applications under secrecy order to current interference practice.
Effective Date: Sept. 12, 1988. Amended Sections 1.191, 1.192 and 1.193 apply to *ex parte* appeals in which the notice of appeal under § 1.191 was filed on or after Sept. 12, 1988.
For Further Information Contact: Saul I. Serota by telephone at (703) 557-4072 or Ian A. Calvert by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

Background

A notice of proposed rulemaking was published in the *Federal Register* at 52 Fed. Reg. 36736-36743 (Sept. 30, 1987) and at 1083 *Official Gazette* 19-26 (Oct. 13, 1987).

An oral hearing was held on Dec. 9, 1987. Twenty-nine written comments were received, and four persons testified at the oral hearing. Responses to these comments are incorporated in the following discussion of specific rules.

Discussion of Specific Rules

(1) Swearing Back of a Reference

The Patent and Trademark Office published the final rule amending the rules of practice in patent interference cases in the *Federal Register* at 49 Fed. Reg. 48416-48471 (Dec. 12, 1984) and at 1050 *Official Gazette* 385-440 (Jan. 29, 1985). Included in the rules adopted was § 1.601(n), which defines "same patentable invention."

Section 1.131(a), as amended, inserts "the same patentable invention, as defined in § 1.601(n), as" before the phrase "the rejected invention." The amendment does not change the present practice where the inventor of the rejected claim, the owner of a patent under reexamination, or the person qualified under §§ 1.42, 1.43 or 1.47 can swear behind a domestic patent which discloses but does not claim the same invention as the

rejected invention, a foreign patent or a printed publication. Rather, the amendment is necessary to define precisely the term "does not claim the rejected invention." See *In re Eickmeyer*, 602 F.2d 974, 979, 202 USPQ 655, 661 (CCPA 1979) where the Court stated:

> . . . we conclude that the phrase "does not claim the rejected invention" should be construed favorably to an applicant, if possible, so that unless the applicant is clearly *claiming the same invention* as the U.S. patent reference, he will not lose his rights under Rule 131. [Emphasis added.]

and also expressed its dissatisfaction with the PTO for

> . . . leaving an applicant in a position where he cannot overcome the reference claims by a 131 affidavit because the PTO has decided that the reference claims his invention, while at the same time, he is denied an interference because the PTO has decided that the claims of his application and those of the reference are not for substantially the same invention.

Possibly because of this decision, some patent practitioners may have been of the opinion that an affidavit under 37 CFR 1.131 can be used to overcome a rejection on a domestic patent so long as there is no verbatim correspondence between the claims of the application or the patent under reexamination rejected on that domestic patent and the claims of the domestic patent.
Such an opinion would not be in accord with the law expressed in cases such as *In re Clark*, 457 F.2d 1004, 173 USPQ 359 (CCPA 1972); *In re Hidy*, 303 F.2d 954, 133 USPQ 650 (CCPA 1962); *In re Teague*, 254 F.2d 145, 117 USPQ 284 (CCPA 1958); and *In re Ward*, 236 F.2d 428, 111 USPQ 101 (CCPA 1956). In *In re Hidy*, *supra*, 303 F.2d at 957, 133 USPQ at 652, the Court stated:

A Rule 131 affidavit is ineffective to overcome a United States patent, not only where there is a verbatim correspondence between claims of the application and of the patent, but also where there is no patentable distinction between the respective claims. *In re Wagenhorst*, 20 CCPA 829, 62 F.2d 831, 16 USPQ 126; *In re Teague*, 45 CCPA 877, 254 F.2d 145, 117 USPQ 284.

If the application (or patent under reexamination) and the domestic patent contain claims which are identical, or which are not patentably distinct, then the application and patent are claiming the "same patentable invention," defined by § 1.601(n) as follows:

> Invention "A" is the "same patentable invention" as an invention "B" when invention "A" is the same as (35 U.S.C. 102) or is obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

As provided in § 1.601(i), an interference may be declared whenever an examiner is of the opinion that an application and a patent contain claims for the "same patentable invention." The purpose of the amendment to § 1.131(a) is to insure that an applicant who is claiming an invention which is identical to, or obvious in view of, i.e., the same patentable invention as claimed in a domestic patent, cannot employ an affidavit under § 1.131 as a means for avoiding an interference with the patent. To allow an applicant to do so would result in the issuance of two patents to the same invention.

Two commenters suggested that § 1.131 be amended to require that an interference be declared if an affidavit or declaration under the rule cannot be used; another suggested that the examiner be required to consider the § 1.131 affidavit or declaration if an interference is not declared. These suggestions are not being adopted. As discussed above, an affidavit or declaration under § 1.131 may be used whenever the inventions claimed by the reference patent (not a statutory bar) and the application would not interfere. However, the rule could not properly be amended to require that an interference always be declared if the patent and application claims interfere, because even if the claims interfere an interference will not be declared unless the applicant first meets the requirements of 37 CFR 1.608(a) or (b). Section 1.608(b) requires an applicant whose showing is based on priority of invention to file affidavits by "one or more corroborating witnesses," whereas § 1.131 does not. Compare *Kistler* v. *Weber*, 412 F.2d 280, 162 USPQ 214 (CCPA 1969).

One commenter asserted that an applicant should be able to "pursue the swearing back of a reference while not restricting the PTO in declaring an interference." However, the PTO is not restricted from declaring an interference if an affidavit or declaration under § 1.131 is filed. The purpose of the rule change is to more clearly define when such an affidavit or declaration can be used.

Section 1.131(b), as amended, inserts in the first sentence thereof the language, "prior to" before the words "said date." This amendment makes clear that the showing of facts under § 1.131(b) must establish due diligence from a date prior to the effective date of the reference to affiant's subsequent reduction to practice or to the filing of his application as set forth in *In re Mulder*, 716 F.2d 1542, 219 USPQ 189 (Fed. Cir. 1983).

(2) Appellant's Brief and Reply Brief

A. Limitation on Length

The proposed limitations on briefs and reply briefs to 30 and 15 pages, respectively, together with the proposal that non-complying briefs and reply briefs be returned to the appellant, are not being adopted, in view of the overwhelming opposition of the majority of the commenters. While the PTO is still concerned about the filing of excessively lengthy briefs, it is hoped that the effect of the proposed rules in focusing the attention of the patent bar on this issue, together with the newly-adopted requirements of § 1.192(c), will help to alleviate the problem.

B. Contents of the Main Brief

Section 1.192, as amended, adds paragraphs (c) and (d). Paragraph (c) remains as proposed, except that item (5) has been revised and the title of item (7) has been changed. The first sentence of proposed paragraph (d) has been rewritten in response to numerous comments to the effect that dismissal of the appeal for failure to include any of the items required by paragraph (c), in the order specified in paragraph (c), would be too harsh a penalty.

Paragraph (c) requires that the brief contain, in order, seven specific items. This requirement arose from the recommendations of a committee which was appointed by the Commissioner of Patents and Trademarks in 1986 to study and report on alternatives for reducing the backlog of *ex parte* appeals at the Board of Patent Appeals and Interferences (Board). One of the committee's recommendations was that § 1.192 be amended to require that the appellant's brief include certain items. Items (3), (4), (5) and (6) of § 1.192(c) are based upon the committee's recommendations. The committee indicated that the inclusion of those items in the brief would crystallize the issues involved in the appeal. By eliminating inadequate briefs, the Board will not need to engage in what might be called "*de novo*" examination of a patent application, but rather can confine its activities to review of the appealed rejections.

The committee also recommended that certain items be required to be included in the examiner's answer. The *Manual of Patent Examining Procedure* will be amended to require that the examiner's answer contain these and other items, substantially as indicated in Appendix A.

In addition to the committee's recommendations, some of the items are supported by the evaluation of selected practices conducted as a part of the PTO's Quality Reinforcement Program. A summary of the results of that evaluation is published at 1078 *Official Gazette* 22 (May 19, 1987).

The specific items required by § 1.192(c) are:

(1) A statement of the status of all the claims in the application, or patent under reexamination, i.e., for each claim in the case, appellant should state whether it is cancelled, allowed, rejected, etc. Each claim on appeal must be identified.
(2) A statement of the status of any amendment filed subsequent to final rejection, i.e., whether or not the amendment has been acted upon by the examiner, and if so, whether it was entered, denied entry, or entered in part.

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In response to one comment, it is noted that this statement will of course be of the status of the amendment as understood by the appellant.

Items (1) and (2) are included in § 1.192(c) because in the past confusion has sometimes arisen as to which claims are on appeal, and the precise wording of those claims, particularly where the appellant has sought to amend claims after final rejection. The inclusion of items (1) and (2) in the brief will advise the examiner of what the appellant considers the status of the claims and post-final rejection amendments to be, allowing any disagreement on these questions to be resolved before the appeal is taken up for decision by the Board.

(3) A concise explanation of the invention defined in the claims involved in the appeal. This explanation is required to refer to the specification by page and line number, and, if there is a drawing, to the drawing by reference characters. Where applicable, it would be preferable to read the appealed claims on the specification and any drawing.

Two commenters felt that the requirement that the specification be referred to by page and line should be optional; another, that referring to the specification and drawings might limit the claims; and others, that reference to page and line of the specification would make the explanation less concise. Nevertheless, while reference to page and line of the specification may require somewhat more detail than simply summarizing the invention, it is considered important to enable the Board to more quickly determine where the claimed subject matter is described in the application. Since the claims are read in light of the disclosure, it is not apparent how compliance with this requirement would limit the claims.

(4) A concise statement of the issues presented for review. Each stated issue should correspond to a separate ground of rejection which appellant wishes the Board to review. While the statement of the issues must be concise, it should not be so concise as to omit the basis of each issue. For example, the statement of an issue as "Whether claims 1 and 2 are unpatentable" would not comply with § 1.192(c)(4). Rather, the basis of the alleged unpatentability must be stated, e.g., "Whether claims 1 and 2 are unpatentable under 35 U.S.C. 103 over Smith in view of Jones," or "Whether claims 1 and 2 are unpatentable under 35 U.S.C. 112, first paragraph, as being based on a non-enabling disclosure." The statement should be limited to the issues presented, and should not include any argument concerning the merits of those issues.

Two commenters suggested that the term "issues" in § 1.192 (c)(4) be replaced by "rejections," as being more in agreement with the explanation in the preceding paragraph. However, the term "issues" is considered preferable, because some rejections may encompass multiple issues. For example, a rejection for failure to comply with 35 U.S.C. 112, first paragraph, might include the issues of no written description, nonenabling disclosure, and lack of best mode. Specifying each of these as a separate issue would be more informative than including them all in a single statement of the rejection.

(5) If an appealed ground of rejection applies to more than one claim and appellant considers the rejected claims to be separately patentable, § 1.192(c)(5) requires appellant to state that the claims do not stand or fall together, and to present in the appropriate part or parts of the argument under § 1.192(c)(6) the reasons why they are considered separately patentable. The absence of such a statement will be taken by the PTO as a concession by the appellant that, if the ground of rejection is sustained as to any one of the rejected claims, it will be equally applicable to all of them. Section 1.192(c)(5) continues the current practice of the Board, and is consistent with the practice of the Court of Appeals for the Federal Circuit indicated in such cases as *In re Sernaker*, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983), and *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

One commenter recommended that this provision be deleted, because the grouping of claims would be "redundant in view of the arguments presented in the Brief and/or prior prosecution," and such grouping may estop the patentee in subsequent litigation from showing the patentable distinctness of claims within a group. Another commenter suggested that the rule be modified to state that appellant can waive arguments for patentability as to claims solely for the purpose of simplifying issues for appeal, without giving rise to any permanent inference therefrom. These recommendations are not adopted. One reason for incorporating § 1.192(c)(5) is that it is often not clear whether or not appellant is urging that certain rejected claims are separately patentable. It is not apparent why any estoppel which may result from requiring a clear statement of appellant's position should or would differ from that which may presently result from a failure to argue that claims are separately patentable.

Another commenter asserted that § 1.192(c)(5) elevates form over substance, and improperly tries to resolve the patentability of claims on formal grounds, rather than on the merits of the individual claims. What this comment seems to say is that the patentability of each claim should be determined separately, even if not argued separately. This is, however, not the current practice, as discussed above.

Two commenters suggested either that the requirement for "reasons" be deleted from § 1.192(c)(5), or that the subsection be deleted entirely. They contended that any such "reasons" should appear in the "Argument" section (§ 1.192(c)(6)), and their repetition in § 1.192(c)(5) is redundant. These suggestions have been adopted in part. Proposed § 1.192(c)(5) required the inclusion of "reasons" in order to avoid unsupported assertions of separate patentability. The requirement of "reasons" has therefore been retained, but § 1.192(c)(5) now specifies that they be included in the appropriate portion of the "Argument" section of the brief. For example, if claims 1 to 4 are rejected under 35 U.S.C. 102 and appellant considers claim 4 to be separately patentable from claims 1 to 3, he should so state in the "Grouping of claims" section of the brief, and then give the reasons for separate patentability in the 35 U.S.C. 102 portion of the "Argument" section (i.e., under § 1.192(c)(6)(iii)).

(6) The appellant's contentions with respect to each of the issues presented for review in § 1.192(c)(4), and the basis for those contentions, including citations of authorities, statutes, and parts of the record relied on. Included in this paragraph are five subparagraphs, (i) to (v). Subparagraphs (i) to (iv) concern the grounds of rejection most commonly involved in *ex parte* appeals, namely, 35 U.S.C. 112, first and second paragraphs, 35 U.S.C. 102, and 35 U.S.C. 103. Subparagraph (v) is a general provision concerning grounds of rejection not covered by subparagraphs (i) to (iv).

The purpose of subparagraphs (i) to (iv) is to insure that the appellant's argument concerning each appealed ground of rejection will include a discussion of the questions relevant to that ground. It is believed that compliance with the requirements of the particular subparagraphs which are pertinent to the grounds of rejection involved in an appeal will be beneficial both to the PTO and to appellants. It will not only facilitate a decision by the Board by enabling the Board to determine more quickly and precisely the appellant's position on the relevant issues, but also will help appellants to focus their arguments on those issues.

For each rejection not falling under subparagraphs (i) to (iv), subparagraph (v) provides that the argument should specify the specific limitations in the rejected claims, if appropriate, or other reasons, which cause the rejection to be in error. This language recognizes that for some grounds of rejection, it may not be necessary to specify particular claim limitations; for example, a rejection under 35 U.S.C. 101, as in *Ex parte Hibberd*, 227 USPQ 443 (BPAI 1985), or a rejection for violation of the duty of disclosure under 37 CFR 1.56(d), as in *Ex parte Harita*, 1 USPQ2d 1887 (BPAI 1986).

One commenter proposed that the provisions of parts (i) to (iv) should be optional, rather than mandatory. The PTO does not agree. One of the primary purposes of the present amendment of the rules is to require appellants to come to grips with the fundamental questions involved in determining patentability under 35 U.S.C. 102, 103 and 112. To make these provisions optional would defeat that purpose. Although parts (i) to (v) may, in the words of another commenter, "in essence merely parrot the relevant section of Title 35," experience of the PTO suggests that including them in the requirements for ex parte briefs is not "completely unnecessary." For similar reasons, the PTO does not favor the adoption of appropriate portions of Rule 13 of the United States Court of Appeals for the Federal Circuit and Rule 28 of the Federal Rules of Appellate Procedure, as this commenter proposed.

The latter commenter proposed as an alternative that parts (i) to (v) should be amended to, in effect, provide that the appellant must either specify the errors in the rejection or explain how the claims comply with the relevant section of the statute, rather than doing both, which may be unnecessary and create "harmful and unnecessary prosecution history estoppel" by requiring a discussion of issues not raised by the examiner. This proposal has not been adopted. Giving an appellant the option of not explaining how the claims comply with the statute would perpetuate one of the problems the rule is designed to solve.

One commenter contended that § 1.192(c)(6)(i) and (ii) improperly place on an appellant the burden of showing how the rejected claims comply with 35 U.S.C. 112. It should be remembered, however, that in the rejection from which the appeal is taken the examiner has already stated why the claims are considered unpatentable. Once this has been done, the appellant must demonstrate to the Board that the rejection is erroneous. The requirements of § 1.192(c)(6)(i) and (ii) are therefore not improper or unreasonable.

Another commenter suggested that item (B) of § 1.192(c)(6)(i) should be divided into two parts: "how-to-make" and "how-to-use." This is not considered necessary. § 1.192(c)(6)(i) states that the argument include, "as appropriate," items (A), (B) and (C). If the rejection were for failure of the disclosure to enable one skilled in the art to make the claimed subject matter, then the argument would not have to specify how the disclosure enabled use of the subject matter, and vice versa.

A commenter suggested that the language of the first sentence of § 1.192(c)(6)(iv) is misleading, and that the second and third sentences should be deleted. The commenter asserts that for a valid rejection the subject matter of the invention as a whole must be rendered obvious, in accordance with the test set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), and suggests that § 1.192(c)(6)(iv) be modified to require that the argument follow the analysis method of the Graham decision. These proposals have not been adopted. The language of § 1.192(c)(6)(iv) is based on the statute. Nothing therein is intended to change the law, or to preclude an appellant from basing arguments on the case law. The purpose of the language is to attempt to focus the argument on the specific issues of the particular case at hand, and to avoid arguments based entirely on broad generalities. The third sentence is included because it has been observed that in a number of cases appellants ignore the secondary references applied by the examiner, and argue a rejection under 35 U.S.C. 103 as though it were a rejection under 35 U.S.C. 102.

(7) An appendix containing a copy of the claims involved in the appeal.

Pursuant to one comment, the title of § 1.192(c)(7) has been changed to "Appendix."

One commenter urged that the rule should not require that the copy of the claims be located at any particular place in the brief. This proposal is not adopted, as it is considered desirable that the examiner and the Board be able to locate the copy of the claims quickly by placing it in a common position in all briefs.

Two commenters expressed the concern that § 1.192(c) does not permit the inclusion in a brief of any items other than the seven items specified. Other commenters suggested that other items be included, such as a list of the references, table of contents, table of cases, etc. It should be emphasized that § 1.192(c) merely specifies the minimum requirements for a brief, and does not prohibit the inclusion of any other material which an appellant may consider necessary or desirable. A brief is in compliance with § 1.192(c) as long as it includes items (1) to (7) in the order set forth (with the appendix, item (7), at the end).

Paragraph (d) provides that if a brief is filed which does not comply with all the requirements of paragraph (c), the appellant will be notified of the reasons for non-compliance and given a period of one month within which to file an amended brief. The appeal will be dismissed if the appellant does not file an amended brief within the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance of which he or she was notified.

Several commenters proposed that the Board, rather than the examiner, should be the arbiter of whether a brief complies with § 1.192(c). These proposals have not been adopted. The question of whether a brief complies with a rule is a matter within the jurisdiction of the examiner. Moreover, adoption of these proposals would require the application file to be sent to the Board to review the brief, then returned to the examiner for the examiner's answer. Such a procedure would not only cause unnecessary delays, but would contravene one of the purposes of § 1.192(c) by increasing the workload of the Board. Under § 1.192(d), as adopted, the appellant may file an amended brief to correct any deficiencies in the original. Moreover, if appellant disagrees with the examiner's holding of non-compliance, a petition under 37 CFR 1.181 may be filed.

Paragraph (d) also adds the following sentence:

> Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

This sentence emphasizes that all arguments and authorities which an appellant wishes the Board to consider should be included in the brief. It should be noted that arguments not presented in the brief and made for the first time at oral hearing are not normally entitled to consideration. In re Chiddix, 209 USPQ 78 (Comr. 1980); Rosenblum v. Hiroshima, 220 USPQ 383 (Comr. 1983). A number of commenters were concerned that this sentence of § 1.192(d) would preclude the filing of a supplemental paper if a new argument or authority should become available or relevant after the brief was filed. No such result is intended. The sentence in question uses the word "may" to leave open the possibility that the Board has leeway to consider arguments or authorities not included in the brief under circumstances where the failure to include them can be justified. Examples of such circumstances would be where a pertinent decision of a court or other tribunal was not published until after the brief was filed, or where a particular argument or authority was not applicable to any of the grounds of rejection in the final rejection, but was relevant to a new point of argument raised in the examiner's answer.

C. Contents of Reply Brief

Section 1.193(b), as amended, inserts the following as the second and third sentences:

> The new points of argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant.

Since the reply brief must be limited to any new points of argument raised in the examiner's answer, compliance with the requirement of the second sentence should facilitate both preparation of the reply brief by appellant and consideration of the reply brief by the PTO. The reply brief is appropriately limited to new points of argument raised in the examiner's answer because appellants have an obligation to present arguments supporting their positions in their opening briefs. Considering an argument advanced for the first time in a reply brief would not only delay the proceeding, but also would entail the risk of an improvident or ill-advised opinion on the legal issues tendered. Von Brimer v. Whirlpool Corp., 536 F.2d 838, 846, 190 USPQ 528, 534 (9th Cir. 1976).

The final sentence of § 1.193(b), as amended, provides that the reply may be accompanied by, rather than include, any amendment or material appropriate to the new ground of rejection. This change in the rule makes clear that the amendment or other material must be presented in a separate paper, rather than in the reply itself.

A number of commenters proposed that the Board, not the examiner, should determine whether or not the reply brief is directed only to new points raised in the examiner's answer. In

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essence they feel that the examiner is not in a position to fairly judge whether a reply brief complies with the rule. These proposals have not been adopted. Section 1.193(b) requires that the appellant be notified if the reply brief is not entered because of non-compliance with the rule, and an appellant who disagrees with that ruling may seek review by way of a petition under 37 CFR 1.181. This is essentially no different than the procedure currently followed (see Manual of Patent Examining Procedure, § 1208.01, p. 1200-9, 5th Ed., Rev. 7 (Dec. 1987)).

One commenter suggested that the examiner's answer be eliminated; another, that the examiner should have to file the examiner's answer first. These are both beyond the scope of the present proposal, and have not been adopted.

(3) Time Period for Requesting an Oral Hearing

Section 1.194(b), as amended, adds the following sentence after the first sentence:

> If the examiner's answer states a new ground of rejection and if appellant files a reply as provided by § 1.193(b), then the written request must be made within three months after the date of the filing of the reply.

The present rule does not provide the appellant with an additional time period for requesting an oral hearing in the event that the examiner's answer states a new ground of rejection. If the answer states a new ground of rejection, § 1.193(b) provides that appellant's reply may also include any amendment or material appropriate to the new ground of rejection. However, under § 1.194(b) appellant must file the request for oral hearing within one month after the date of the answer whereas the reply thereto must be filed within two months from the date of the answer. Consequently, appellant must file a request for oral hearing before having the benefit of the examiner's views, if any, with respect to the reply.

Although the examiner does not normally issue a supplemental answer in response to a reply, see *Manual of Patent Examining Procedure, supra*, § 1208.01, the amendment to § 1.194(b) permits the appellant to postpone filing a request for an oral hearing until three months after the date the reply is filed. This will give the appellant time to receive the examiner's response, if any, to the reply before the appellant has to decide whether to request an oral hearing.

One commenter suggested that whenever the examiner makes a new ground of rejection in the examiner's answer and appellant files a reply brief, a supplemental examiner's answer should be required, and appellant then be permitted to file a supplemental reply thereto. This suggestion has not been adopted. Under present practice (see Manual of Patent Examining Procedure, supra) the examiner includes a new ground of rejection in the examiner's answer, rather than reopening ex parte prosecution, only under circumstances where the PTO has determined that the appellant will not be unfairly prejudiced, e.g., where the reference is not basic and materially better in meeting all the claims, and the requirements for making an action final are met. This sufficiently protects the rights of the appellant, while at the same time preventing the addition of a further round of papers to the file.

(4) Procedure Following Final Rejection, Remand Under § 1.196(b)

Section 1.196(b)(1), as amended, adds the following sentence as the penultimate sentence of the section:

> Should the examiner repeat the rejection the applicant may again appeal to the Board of Patent Appeals and Interferences.

Under § 1.196(b), the Board may, in its decision on an ex parte appeal, make a new rejection of one or more appealed claims, in which case the appellant has the option of (1) submitting an appropriate amendment of the rejected claims, and/or a showing of facts, (2) requesting reconsideration, or (3) treating the decision as a final decision. If the appellant elects option (1), the case is remanded to the examiner for consideration. If the examiner does not consider that the amendment and/or showing of facts overcome the rejection, he or she will again reject the claims; if appropriate, the rejection will be made final.

An applicant in whose application such a final rejection has been made by the examiner may mistakenly believe that he or she is entitled to review by the Board of the rejection by virtue of the fact that the application was previously on appeal. The amendment corrects this belief by making clear that after such a rejection, an applicant who desires further review of the matter must file a new appeal to the Board. The language of the amendment is similar to the fourth sentence of § 1.196(d).

The proposed amendment to § 1.196(b)(1) began "Should the examiner make the rejection final," but as one commenter pointed out, 35 U.S.C 134 permits an appeal to the Board of claims which have been twice rejected. Since the claims referred to in § 1.196(b)(1) would have been twice rejected (once by the Board and once by the examiner), the examiner's rejection could be appealed even if not made final. The beginning of the amendment has therefore been changed to "Should the examiner again reject the application."

This commenter also asserted that § 1.196(b)(1) is ambiguous, in that it implies that a separate fee would be due for the subsequent appeal, "an interpretation contrary to 35 U.S.C. 134." The PTO considers that the statute requires a separate fee for such an appeal. In the § 1.196(b) situation, the appellant has already filed an appeal, paid the fee, and received a decision thereon by the Board. Any rejection under § 1.196(b) included in the Board's decision would be, according to the rule, on "any grounds not involved in the appeal." Thus, an appeal from the subsequent rejection by the examiner would be an entirely new appeal involving a different ground and would require a new notice of appeal and the payment of another fee.

(5) Request for Access by Interference Party

Section 1.612(a), as amended, adds the following sentence as the last sentence of the section:

> A party seeking access to any abandoned or pending application referred to in the opposing party's involved application or access to any pending application referred to in the opposing party's patent must file a motion under § 1.635. The amendment requires an interference party seeking access either to a pending or abandoned application referred to in an opposing party's involved application or to a pending application referred to in an opposing party's involved patent to file a motion under 37 CFR 1.635. Such a motion is decided by an examiner-in-chief (§ 1.640(b)).

Under the present practice, access can only be obtained by filing an ex parte petition to the Commissioner accompanied by the petition fee set forth in § 1.17(i) and normally no decision is rendered on the petition until after the opposing party has had an opportunity to respond to the petition. The amendment expedites the interference proceeding by eliminating the delays inherent in the petition process. By requiring the party seeking access to file a motion under § 1.635, that party will first have to confer with the opposing party in an effort to resolve the issue of access as required by § 1.637(b). The examiner-in-chief will not have to decide the issue unless it cannot be resolved by the parties.

(6) Access to Applications

Section 1.14(e), as amended, deletes the word "of" from the phrase "or of any papers relating thereto" and adds a reference to § 1.612(a) by adding the following sentence as the last sentence thereof:

> See § 1.612(a) for access by an interference party to a pending or an abandoned application.

Section 1.14(e) as presently worded appears to limit a request by a member of the public to copies of, but not access to, any papers relating to any pending or abandoned application. Any such limitation was unintentional. The amended language will permit a member of the public to request both access to and copies of those papers.

(7) Request for Interference with an Application or Patent

Sections 1.604(a) and 1.607(a), as amended, provide for the situation in which a patent applicant requests an interference with another application or patent, respectively, on the basis of one or more claims which are already present in his or her application. The present rules require that when an applicant seeks an interference with another application or an unexpired patent, he or she must present a claim corresponding to the proposed count. The amended rules eliminate this requirement if a claim or claims corresponding to the proposed count are already in the application, and the applicant identifies them as such.

(8) Motion to Declare Additional Interference

Section 1.637(e)(1)(vi), as amended, requires that a motion to declare an additional interference under 37 CFR 1.633(e)(1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference either (1) designate the claims of the opponent's application or patent which define the same patentable invention defined by the proposed count, or (2), if the opponent's application does not contain any such claim, the moving party must propose a claim to be added to the opponent's application. The present § 1.637(e)(2)(vi) includes requirement (1), but only infers alternative requirement (2). The amended section specifically includes both requirements.

(9) Filing of Reissue Application During Interference

Section 1.662(b), as amended, inserts a comma after "§ 1.633(h)" and adds the language "or would not be appropriate" at the end of the last sentence. The present rule contemplates that a reissue application may be filed by a patentee involved in an interference only for one of two reasons: either for the purpose of avoiding the interference, or for some other purpose relating to the interference, e.g., to add claims corresponding to a proposed new count. In the first case, judgment would be entered against the patentee, and in the second case, a motion under § 1.633(h) to add the reissue application to the interference would be appropriate.

However, it has been found that a patentee involved in an interference may file a reissue application for some other reason not contemplated by the rule, and for which the entry of judgment or a motion under § 1.633(h) would not be appropriate. For example, the patentee might file a reissue application for the purpose of amending claims of the patent which are directed to an invention which is patentably distinct from the issue of the interference and which is not disclosed by the opposing party. In such a situation, addition of the reissue application to the interference would be unnecessary. The amendment of § 1.662(b) accommodates this third possibility by providing that, instead of filing a motion under § 1.633(h) to add the reissue application to the interference, a patentee can show good cause why such a motion would not be appropriate under the particular circumstances involved.

(10) Applications Under Secrecy Order

Section 5.3(b), as amended, deletes the language "under secrecy order copies claims from an issued patent" and inserts in its place the language "is under secrecy order seeks to provoke an interference with an issued patent" to make the section's language consistent with that of § 1.607(d). In addition, the reference to "§ 1.205(c)66 is corrected to read "§ 1.607(d)".

Postponement of Amendment of Interference Estoppel Rule

The notice of proposed rulemaking included proposed amendments of 37 CFR 1.658(c) concerning the effect of a judgment in an interference. In response to requests by a number of commenters for further time to study the effect of the proposed amendments, the proposal will not be implemented at this time. A proposed amendment of § 1.658(c) will be published later; in the meantime, interested parties are invited to submit their comments and suggestions.

Accordingly, present § 1.658(c) remains in effect.

Environmental, Energy and Other Considerations

This rule change will not have a significant impact on the quality of the human environment or conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because it is intended to expedite the disposition of appeals and to simplify by clarification and amplification certain of the rules governing the conduct of an interference. The expedited disposition of appeals will permit the small entity to make earlier business decisions which may be affected by a pending appeal. The effect of the clarification and amplification of the rules relating to interferences will be to reduce the costs associated with involvement in an interference.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

This rule does not contain a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

List of Subjects in 37 CFR Parts 1 and 5

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Parts 1 and 5 of Title 37 of the Code of Federal Regulations are amended as set forth below.

Part 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.14 is amended by revising paragraph (e) to read as follows: § 1.14 Patent applications preserved in secrecy.

* * * * *

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must (1) be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i) or (2) include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record. See § 1.612(a) for access by an interference party to a pending or abandoned application.

3. Section 1.131 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) When any claim of an application or a patent under reexamination is rejected on reference to a domestic patent

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which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), as the rejected invention, or on reference to a foreign patent or to a printed publication, and the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§ 1.42, 1.43 or 1.47, shall make oath or declaration as to facts showing a completion of the invention in this country before the filing date of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, then the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

(b) The showing of facts shall be such, in character and weight, as to establish reduction to practice prior to the effective date of the reference, or conception of the invention prior to the effective date of the reference coupled with due diligence from prior to said date to a subsequent reduction to practice or to the filing of the application. Original exhibits of drawings or records, or photocopies thereof, must accompany and form part of the affidavit or declaration or their absence satisfactorily explained.

4. Section 1.192 is amended by revising paragraph (a) and adding new paragraphs (c) and (d) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal.

* * * * *

(c) The brief shall contain the following items under appropriate headings and in the order here indicated:

(1) Status of Claims. A statement of the status of all the claims, pending or cancelled, and identifying the claims appealed.

(2) Status of Amendments. A statement of the status of any amendment filed subsequent to final rejection.

(3) Summary of Invention. A concise explanation of the invention defined in the claims involved in the appeal, which shall refer to the specification by page and line number, and to the drawing if any, by reference characters.

(4) Issues. A concise statement of the issues presented for review.

(5) Grouping of Claims. For each ground of rejection which appellant contests and which applies to more than one claim, it will be presumed that the rejected claims stand or fall together unless a statement is included that the rejected claims do not stand or fall together, and in the appropriate part or parts of the argument under subparagraph (c)(6) of this section appellant presents reasons as to why appellant considers the rejected claims to be separately patentable.

(6) Argument. The contentions of the appellant with respect to each of the issues presented for review in subparagraph (c)(4) of this section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on. Each issue should be treated under a separate heading.

(i) For each rejection under 35 U.S.C. 112 first paragraph, the argument shall specify the errors in the rejection and how the first paragraph of 35 U.S.C. 112 is complied with, including, as appropriate, how the specification and drawings, if any, (A) describe the subject matter defined by each of the rejected claims, (B) enable any person skilled in the art to make and use the subject matter defined by each of the rejected claims, and (C) set forth the best mode contemplated by the inventor of carrying out his or her invention.

(ii) For each rejection under 35 U.S.C. 112, second paragraph, the argument shall specify the errors in the rejection and how the claims particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(iii) For each rejection under 35 U.S.C. 102, the argument shall specify the errors in the rejection and why the rejected claims are patentable under 35 U.S.C. 102, including any specific limitations in the rejected claims which are not described in the prior art relied upon in the rejection.

(iv) For each rejection under 35 U.S.C. 103, the argument shall specify the errors in the rejection and, if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and shall explain how such limitations render the claimed subject matter unobvious over the prior art. If the rejection is based upon a combination of references, the argument shall explain why the references, taken as a whole, do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may not properly be combined with features disclosed in another reference. A general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

(v) For any rejection other than those referred to in paragraphs (i) to (iv) of this section, the argument shall specify the errors in the rejection and the specific limitations in the rejected claims, if appropriate, or other reasons, which cause the rejection to be in error.

(7) Appendix. An appendix containing a copy of the claims involved in the appeal.

(d) If a brief is filed which does not comply with all the requirements of paragraph (c) of this section, the appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will be dismissed. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.

5. Section 1.193 is amended by revising paragraph (b) to read as follows:

§ 1.193 Examiner's answer.

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. The new points of argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant. If the examiner's answer states a new ground of rejection appellant may file a reply thereto within two months from the date of such answer; such reply may be accompanied by any amendment or material appropriate to the new ground.

6. Section 1.194 is amended by revising paragraph (b) to read as follows:

§ 1.194 Oral hearing.

* * * * *

(b) If appellant desires an oral hearing, appellant must file a written request for such hearing accompanied by the fee set forth in § 1.17(g) within one month after the date of the examiner's answer. If the examiner's answer states a new ground of rejection and if appellant files a reply as provided for by § 1.193(b), then the written request must be made within three months after the date of the filing of the reply. If appellant requests an oral hearing and submits therewith the fee set forth in § 1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board.

* * * * *

7. Section 1.196(b)(1) is revised to read as follows:

§ 1.196 Decision by the Board of Patent Appeals and Interferences.

* * * * *

(b) * * *

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

* * *

* * * * *

8. Section 1.604(a) is revised to read as follows: § 1.604 Request for interference between applications by an applicant.

(a) An applicant may seek to have an interference declared with an application of another by (1) suggesting a proposed count and presenting at least one claim corresponding to the proposed count or identifying at least one claim in his or her application that corresponds to the proposed count, (2) identifying the other application and, if known, a claim in the other application which corresponds to the proposed count, and (3) explaining why an interference should be declared.

* * * * *

9. Section 1.607(a) is revised to read as follows:

§ 1.607 Request by applicant for interference with patent.

(a) An applicant may seek to have an interference declared between an application and an unexpired patent by (1) identifying the patent, (2) presenting a proposed count, (3) identifying at least one claim in the patent corresponding to the proposed count, (4) presenting at least one claim corresponding to the proposed count or identifying at least one claim already pending in his or her application that corresponds to the proposed count, and, if any claim of the patent or application identified as corresponding to the proposed count does not correspond exactly to the proposed count, explaining why each such claim corresponds to the proposed count, and (5) applying the terms of any application claim (i) identified as corresponding to the count and (ii) not previously in the application to the disclosure of the application.

* * * * *

10. Section 1.612(a) is revised to read as follows:

§ 1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under § 1.131 and any evidence and explanation under § 1.608 filed separate from an amendment. A party seeking access to any abandoned or pending application referred to in the opposing party's involved application or access to any pending application referred to in the opposing party's patent must file a motion under 1.635.

* * * * *

11. Paragraph (vi) of § 1.637(e)(1) is revised to read as follows:

§ 1.637 Content of motions.

* * * * *

(e) * * *

(1) * * *

(vi) Identify all claims in the opponent's application or patent which should be designated to correspond to each proposed count; if the opponent's application does not contain any such claim, the motion shall propose a claim to be added to the opponent's application.

* * * * *

12. Paragraph (b) of § 1.662 is revised to read as follows:

§ 1.662 Request for entry of adverse judgment; reissue filed by patentee.

* * * * *

(b) If a patentee involved in an interference files an application for reissue during the interference and omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference, judgment may be entered against the patentee. A patentee who files an application for reissue other than for the purpose of avoiding the interference shall timely file a preliminary motion under § 1.633(h), or show good cause why the motion could not have been timely filed or would not be appropriate.

* * * * *

Part 5—SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

13. The authority citation for 37 CFR Part 5 is revised to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, the Export Administration Act of 1979, as amended, 50 U.S.C.App. 2401 et seq., the Arms Export Control Act, as amended, 22 U.S.C. 2751 et seq., the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq., and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 et seq., and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

14. Paragraph (b) of § 5.3 is revised to read as follows:

§ 5.3 Prosecution of application under secrecy orders; withholding patent.

* * * * *

(b) An interference will not be declared involving national applications under secrecy order. However, if an applicant whose application is under secrecy order seeks to provoke an interference with an issued patent, a notice of that fact will be placed in the file wrapper of the patent. (See § 1.607(d)).

* * * * *

APPENDIX A

Requirements for Examiner's Answer

Chapter 1200 of the Manual of Patent Examining Procedure will be amended to require that the examiner's answer include, in the order indicated, the following items:

(1) *Status of claims.* A statement of whether the examiner disagrees with the statement of the status of claims con-

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tained in the brief and a correct statement of the status of all the claims pending or cancelled, if necessary.

(2) *Status of Amendments*. A statement of whether the examiner disagrees with the statement of the status of amendments contained in the brief, and an explanation of any disagreement.

(3) *Summary of invention*. A statement of whether the examiner disagrees with the summary of invention contained in the brief, an explanation of why the examiner disagrees, and a correct summary of invention, if necessary.

(4) *Issues*. A statement of whether the examiner disagrees with the statement of the issues in the brief and an explanation of why the examiner disagrees, including:

(i) Identification of any issues which are petitionable rather than appealable, and

(ii) Identification of any issues or grounds of rejection on appeal which the examiner no longer considers applicable.

(5) *Grouping of Claims*. A statement of whether the examiner disagrees with any statement in the brief that certain claims do not stand or fall together, and, if the examiner disagrees, an explanation as to why those claims are not separately patentable.

(6) *Claims appealed*. A statement of whether the copy of the appealed claims contained in the appendix to the brief is correct and if not, a correct copy of any incorrect claim.

(7) *References of record*. A listing of the references of record relied on, and in the case of non-patent references, the relevant page or pages.

(8) *New references*. A statement of whether or not any new reference is being applied and a listing of each such reference being cited for a new ground of rejection in the examiner's answer, and in the case of non-patent references, the relevant page or pages.

(9) *Grounds of rejection*. For each ground of rejection applicable to the appealed claims, an explanation of the ground of rejection, or reference to a final rejection or other single prior action for a clear exposition of the rejection.

(i) For each rejection under 35 U.S.C. 112, first paragraph, the examiner's answer, or the single prior action, shall explain how the first paragraph of 35 U.S.C. 112 is not complied with, including, as appropriate, how the specification and drawings, if any, (a) do not describe the subject matter defined by each of the rejected claims, (b) would not enable any person skilled in the art to make and use the subject matter defined by each of the rejected claims, and (c) do not set forth the best mode contemplated by the appellant of carrying out his or her invention.

(ii) For each rejection under 35 U.S.C. 112, second paragraph, the examiner's answer, or single prior action, shall explain how the claims do not particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(iii) For each rejection under 35 U.S.C. 102, the examiner's answer, or single prior action, shall explain why the rejected claims are anticipated or not patentable under 35 U.S.C. 102, pointing out where all of the specific limitations recited in the rejected claims are found in the prior art relied upon in the rejection.

(iv) For each rejection under 35 U.S.C. 103, the examiner's answer, or single prior action, shall state the ground of rejection and point out where each of the specific limitations recited in the rejected claims is found in the prior art relied on in the rejection, shall identify any difference between the rejected claims and the prior art relied on and shall explain how the claimed subject matter is rendered unpatentable over the prior art. If the rejection is based upon a combination of references, the examiner's answer, or single prior action, shall explain the rationale for making the combination.

(v) For each rejection under 35 U.S.C. 102 or 103 where there may be questions as to how limitations in the claims correspond to features in the prior art, the examiner, in addition to the requirements of (9)(iii) and (iv) above, should compare at least one of the rejected claims feature by feature with the prior art relied on in the rejection. The comparison shall align the language of the claim side by side with a reference to the specific page, line number, drawing reference number and quotation from the prior art, as appropriate.

(vi) For each rejection, other than those referred to in paragraphs (i) to (v) of this section, the examiner's answer, or single prior action, shall specifically explain the basis for the particular rejection.

(10) *New ground of rejection*. A statement of whether or not any new ground of rejection is being made in the examiner's answer and a complete statement and explanation of any such new ground. The requirements of paragraph (9) shall be complied with for any new ground of rejection.

(11) *Response to argument*. A statement of whether the examiner disagrees with each of the contentions of appellant in the brief with respect to the issues presented and an explanation of the reasons for disagreement with any such contention. If any ground of rejection is not argued and responded to by appellant, the response shall point out each claim affected.

(12) *Period of response to new ground of rejection*. A statement setting the period for appellant to file a reply to any new ground of rejection, if necessary.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and trademarks.

May 3, 1988

[Billing Code 3510-16]

[1092 OG 26]

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(167) Treatment of Objected-to Claims After Appeal

This notice sets out the policy of the U.S. Patent and Trademark Office (PTO) with respect to the treatment of dependent claims that are not subject to rejection in an application in which an appeal to the Board of Patent Appeals and Interferences (Board) has been filed. 37 C.F.R. 1.191.

37 C.F.R. 1.197(c) reads:

> Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (37 C.F.R. 1.304) except: (1) Where claims stand allowed in an application, or (2) where the nature of the decision requires further action by the examiner. In such cases, the date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (37 C.F.R. 1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are similarly considered terminated when the appeal or civil action is terminated.

1. *When an Appeal Brief is not filed*

Upon failure to file an appeal brief, applications containing both, allowed claims and claims subject to rejection will have the appeal dismissed. The rejected claims will be cancelled and the application will issue with the allowed claims only.

Applicants should note that dependent claims which have been objected to by the examiner as being allowable except for their dependence from rejected claims are not claims which stand allowed. Accordingly, applicants must take affirmative action to overcome the objection and make the objected-to claims allowed claims. This may be done by filing an amendment rewriting objected-to dependent claims into independent form prior to termination of proceedings under 37 C.F.R. 1.197(c).

Upon termination of proceedings, the PTO will hold an application abandoned for failure to take appropriate action if the application contains only rejected and/or objected-to claims.

2. *After a Board or Court decision*

The approach outlined in (1) above will also apply to applications following an affirmance by the Board or a court of law.

An exception to the approach outlined in (1) above exists when the Board or court affirms a rejection against an independent claim and reverses all rejections against a claim dependent thereon. This type of decision requires further action by the examiner; 37 C.F.R. 1.197(c). Accordingly, upon termination of the time for appeal, the examiner will proceed in one of two ways:

a. Convert the dependent claim into independent form by examiner's amendment, cancel all claims in which the rejection was affirmed, and issue the application; or,

b. Set a one-month time period in which applicant may rewrite the dependent claim in independent form. Extension of time requests to this time period under 37 C.F.R. 1.136(a) will not be permitted. Failure to take timely action will result in abandonment under 35 U.S.C. 133 unless allowed claims are present in the application. If allowed claims are present, the examiner will cancel all rejected and objected-to claims and issue the application with the allowed claims only.

JAMES E. DENNY,
Deputy Assistant Commissioner for Patents.

Sept. 21, 1988

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(168) Revised Ex Parte Appeal Requirements

New format and content requirements for appeal briefs in ex parte appeals are now in effect for cases where the notice of appeal was filed on or after Sept. 12, 1988. The new requirements were set forth in amended 37 CFR 1.192 which was published in the Official Gazette at 1092 O.G. 26 on July 12, 1988 and reprinted on Jan. 3, 1989 in the *Consolidated Listing of Official Gazette Notices* as item number 162. The changes are also set forth in chapter 1200 of the Manual of Patent Examining Procedure as revised in revision number 9, dated Sept, 1988.

Appellant's brief is required by 37 CFR 1.192(c) to contain, under appropriate headings, (1) the status of all the claims, (2) the status of any amendment filed subsequent to final rejection, (3) a summary of the invention, (4) a concise statement of the issues presented for review, (5) a statement that claims rejected under a rejection do not stand or fall together and the reasons why (if no statements is filed it will be presumed that the rejected claims stand or fall together), (6) the arguments of the appellant with respect to each issue presented for review, and (7) and appendix containing a copy of the claims involved in the appeal. The rule further sets out specific requirements for arguments against rejections based on 35 U.S.C. 102, 103, 112 and other grounds. The examiner's answer to the brief will follow a corresponding format.

Pursuant to 37 CFR 1.192(d), if a brief is filed which does not comply with the new requirements as set forth in paragraph (c) of the rule, the appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. The one-month period will not be extended. If appellant does not file a brief overcoming the reasons for non-compliance within the one-month period, the appeal will be dismissed.

The new requirements for the appeal brief will aid in the crystallization of the issues invlolved in the appeal. This will benefit the appeallant and the examiner, as well as the Board of Patent Appeals and Interferences, in their consideration.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Jan. 23, 1989.

[1099 OG 26]

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(169) DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90143-9144]
RIN 0651-AA35

Amendment of Patent and Trademark Rules concerning Judicial Review of Decisions of the Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board and other Miscellaneous Matters.

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, relating to (1) decisions of the Board of Patent Appeals and Interferences (BPAI), (2) requests for reconsideration of decisions of the BPAI and the Trademark Trial and Appeal Board (TTAB), (3) extensions of time in proceedings after a decision by the BPAI under §§ 1.196 and 1.197, (4) practices concerning judicial review of final decisions of the BPAI and TTAB, (5) extensions of time for seeking judicial review of BPAI and TTAB decisions and (6) miscellaneous changes in the practice before the BPAI and housekeeping amendments.

Two recent decisions of the U.S. Court of Appeals for the Federal Circuit have held that even though the BPAI includes a new ground for rejection in its decision under 37 CFR § 1.196(b)(3), appellants may appeal directly to the Federal Circuit without first seeking reconsideration at the BPAI. Where judicial review is sought without requesting reconsideration, the arguments against the new ground of rejection are developed for the first time during court proceedings. The amendments require that appellants seek reconsideration of the new ground of rejection prior to appeal or commencement of a civil action.

Experience under the previous rules relating to judicial review of final board decisions indicated that the rules may have been confusing in certain respects relating to the time in which judicial review must be sought and the manner in which extensions of time for seeking judicial review may be obtained. The rules eliminate any confusion as to when judicial review must be sought and standardize the manner of obtaining extensions of time to seek judicial review.

The rules also make clarifying and housekeeping amendments with respect to practice before the BPAI.
Effective Date: August 20, 1989.
For Further Information Contact: Richard E. Schafer by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:

Background

A notice of proposed rulemaking was published in the *Federal Register* at 54 Fed. Reg. 11009 (March 16, 1989) and at 1101 *Official Gazette* 6 (April 4, 1989). No oral hearing was held and no written comments were received.

Discussion of Specific Rules

(1) *Decisions of the BPAI and requests for reconsideration of BPAI and TTAB decisions*

Only final decisions of the BPAI and TTAB are subject to judicial review. 35 U.S.C. §§ 141, 145; U.S.C. § 1071; 28 U.S.C.§ 1295 (a)(4)(A) and (B).

Section 1.196(b) provides that if the BPAI has knowledge of any grounds, not involved in the appeal, for rejecting any appealed claim, it may include in its decision a statement to that effect. The statement then constitutes a new rejection of the claims. The previous rules permitted appellants to treat the decision as a final decision in the case and thus immediately appealable. 37 CFR § 1.196(b)(3) (1988). Therefore, when an appellant proceeded under this option, arguments against the new rejection were presented for the first time to the reviewing court.

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A recent decision by the U.S. Court of Appeals for the Federal Circuit rejected the Commissioner's argument that an appellant should not be permitted to contest the BPAI's new ground for rejection because it had not requested reconsideration of that ground by the BPAI. *In re Evanega*, 829 F.2d 1110, 1113, 4 USPQ 2d 1249, 1252 (Fed. Cir. 1987). *See also In re Nielson*, 816 F.2d 1567, 1570, 2 USPQ 2d 1525, 1527 (Fed. Cir. 1987). In *Evanega*, the Commissioner urged that requiring appellants to request reconsideration, where the BPAI adopts a new ground for rejection, would provide the BPAI with an opportunity to consider appellant's arguments and correct any errors while the case was still in the PTO. This conserves judicial resources, and in any event, obtains the benefit of the BPAI's view should judicial review ultimately be sought. The court held, however, that in view of PTO regulations (37 CFR § 1.196(b)(3)) which "expressly provide that the board's decision, even if based on a new ground, is a final determination and thus may be appealed without seeking reconsideration," appellant could not be required to request reconsideration by the BPAI. *Id.*

The new rule changes eliminate 37 CFR § 1.196(b)(3). By removing § 1.196(b)(3), appellants no longer have the option of treating a new ground of rejection as final and immediately appealable. Appellants' options are limited to requesting remand to the examiner or requesting reconsideration by the BPAI as set forth in §§ 1.196(b)(1) and 1.196(b)(2). The preamble of § 1.196(b) has been amended to specifically recite that a new ground of rejection shall not be considered a final decision for judicial review.

Appellants still may elect further prosecution before the examiner under 37 CFR § 1.196(b)(1) or request reconsideration under § 1.196(b)(2). The option of § 1.196(b)(2) requires that any request for reconsideration address the new ground of rejection and specifically state the reasons why the new ground was in error. Section 1.196(b)(2) also provides that the BPAI will reconsider the new rejection and, if necessary, render a new decision. The decision on reconsideration will be deemed to incorporate the earlier decision except for any portions of the earlier decision specifically withdrawn.

Reconsideration or remand need not be requested if appellant does not contest the new ground. Appellants may seek judicial review as to claims not subject to the new ground.

Section 1.196(a) expressly provides for remands to the examiner for further consideration. The BPAI has inherent authority, as part of its role in reviewing standards of patentability applied in the PTO, to remand applications to the examiner for further consideration. *Cf.* Manual of Patent Examining Procedure (MPEP) §§ 1211 and 1212. The change merely makes express that which is inherent.

The amendments also delete the portion of former § 1.196(d) which provides (1) that any decision which includes a remand shall not be a final decision for the purposes of judicial review and (2) that upon conclusion of the proceedings on remand the BPAI may enter an order making its decision final. Those provisions have been included as new § 1.196(e). Under this paragraph, decisions pursuant to § 1.196(b) would not be final as to the claims subject to a new rejection.

The last sentence of former § 1.196(b)(1) has been deleted and placed in new § 1.196(e).

(2) *Requests for reconsideration of BPAI and TTAB decisions*

Section 1.197(b) provides that any request for reconsideration must specifically state the points believed to have been misapprehended or overlooked in the BPAI's decision. Experience has shown that many requests for reconsideration are nothing more than reargument of appellant's position on appeal. The provision, as adopted, limits requests to the points of law or fact which appellant feels were overlooked or misapprehended by the BPAI.

The amendments also clarify the exception found in the first sentence of § 1.197(b) by including specific references to the "original decision" and the "decision on reconsideration." Some confusion had been noted with respect to the meaning of the current language.

In order to simplify calculation of times for requesting reconsideration of the decisions of the boards, §§ 1.658(b), 2.129(c), and 2.144 specify a period of one month rather than the periods expressed in days. Section 1.197(a) already specified a one-month period.

(3) *Extensions of time after a decision by the BPAI to take action under §§1.196 and 1.197*

Appellants in patent cases may no longer use fee extensions under § 1.136(a) to extend the time for making an election under § 1.196(b) or seeking reconsideration under § 1.197.

Under previous rules appellants could request reconsideration of a BPAI decision up to five months after a decision or file a response to a new ground of rejection up to six months after the decision. This inordinately delayed final disposition of appeals. Section 1.136(a) provides that fee extensions are not available to file responses to a BPAI decision pursuant to §§ 1.196, 1.197 or 1.304. One month is deemed to be ample time to submit a request for reconsideration. Note that Fed. R. Civ. P. 59 provides 10 days and Fed. R. App. P. 40 provides 14 days for similar requests. Extensions under § 1.136(b) will be available to extend the time to file a response under §§ 1.196 and 1.197. Section 1.304(a) exclusively governs extensions of time to file a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See further discussion below.

Section 1.136(a) specifically refers to § 1.136(b) for extensions of time to file responses under §§ 1.196 and 1.197 and refers to § 1.304 for extensions of time to initiate judicial review. Sections 1.196(f) and 1.197(b) correlatively reference § 1.136(b) for extensions of time.

Fee extensions are not available to extend the time for electing further prosecution before the examiner under § 1.196(b)(1). Where an appellant elects further prosecution before the examiner, fee extensions under § 1.136(a) remain available to respond to the primary examiner's Office actions.

(4) *Time for seeking judicial review of decisions of the BPAI and TTAB*

Under previous rules, judicial review of final decisions of the BPAI or TTAB had to be sought within sixty days of the decision or thirty days after a decision on reconsideration. However, where a decision on reconsideration was, in effect, a new decision, it was not always clear whether the time for appeal was thirty or sixty days. Sections 1.304(a) and 2.146(d)(1) provide a two-month period to appeal from either the date of the decision or the decision on a timely filed request for reconsideration.

Some problems have been noted with respect to the time for seeking judicial review in days. Miscalculations of the statutory sixty-day time period have resulted in filing untimely requests for judicial review. In order to simplify calculation of the time for seeking judicial review, §§ 1.304(a) and 2.145(d)(1) specify two months. The two-month period meets the sixty-day requirement of 35 U.S.C. §§ 142, 145 and 146 and 15 U.S.C. §§ 1071(a)(2) and (b)(1) except for time periods which include February 28. In order to comply with the sixty-day requirement, §§ 1.304(b) and 2.145(d)(2) provide that an additional day shall be added to any two-month period for initiating judicial review which includes February 28. Appeals will always be timely if the judicial review is initiated within two months of the final decision.

Previously, the rules did not specify a time period for filing a cross-appeal or cross-action in *inter partes* cases. The absence of such a time period made it difficult for parties and their attorneys to make appropriate plans for judicial review. For example, in an interference where there has been a split judgment, one of the parties may be satisfied with the judgment but may desire to appeal the adverse judgment only if an appeal is noted by the other party. Where the appeal is filed on the last possible day, a cross-appeal is precluded. Sections 1.304(a) and 2.145(d)(1) specify that the time for filing a cross-appeal or commencing a cross-action expires (1) fourteen days after service of the notice of appeal or the summons and complaint or (2) two months after the decision to be reviewed, whichever is later.

Similarly, no provision for filing a cross-action was provided where an appellee elects to have further proceedings conducted in the district court pursuant to 35 U.S.C. § 146 or 15 U.S.C. § 1071(a)(1). Section 1.304(c) and 2.145(d)(3) provide that the time for filing a cross-action expires 14 days after service of the summons and complaint. The district court will determine whether any cross-action was timely filed since neither the complaint nor cross-action is filed in the PTO.

(5) *Extensions of time to seek judicial review*

In the past, standards for granting requests for extensions of time to take an appeal or commence a civil action varied depending upon which board was involved and upon the particular type proceeding before the board. For example, extensions relating to patent applications could be obtained by paying the appropriate fee under § 1.136(a). However, in reexamination proceedings or when judicial review was sought from a decision of the TTAB, the requester must demonstrate sufficient cause under § 1.550(c) or § 2.145(d)(1). The rules standardize the manner in which an extension of time to initiate judicial review may be obtained. The PTO has adopted a standard which is similar to the standard used in the Federal courts for granting extensions. Under the rules the Commissioner may extend the time (1) for good cause if requested before the expiration of the time provided for initiating judicial review or (2) upon a showing of excusable neglect in failing to initiate judicial review if requested after the expiration of the time period. This standard will be applicable in both trademark and patent proceedings (§§ 1.304(a) and 2.145(e)) once the "last" decision, i.e., either the decision (in circumstances where no timely reconsideration is sought) or the decision on reconsideration, of either board has been entered. In patent cases, extensions of time under § 1.136(b) and § 1.550(c) and fee extensions under 37 CFR § 1.136(a) are no longer available to extend the time for the purpose of judicial review once a decision or a decision on reconsideration has been entered. Section 1.304(a) states that the provisions of §§ 1.136 and 1.550(c) are not available to extend the time to initiate judicial review. Sections 1.136(a), 1.136(b), 1.191(d), 1.550(c), 1.645(a) and(b) refer to § 1.304 for extensions of time for seeking judicial review after a decision has been entered. Section 1.645(a) has been amended by (1) adding the introductory phrase "Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action," to the first sentence and (2) deleting the references to filing a notice of appeal or commencing a civil action in the second sentence.

In view of the amendments to §§ 1.197 and 1.304, relating to extensions of time to seek reconsideration or initiate judi-cial review, § 1.191(d) does not refer to §§ 1.196 and 1.197.

(6) *Miscellaneous amendments*

In the past, appellants could use fee extensions to delay the time for requesting an oral hearing at the BPAI. This delays final disposition of the appeal and causes administrative problems and duplication of effort due to the transfer of the appeal to the hearing docket. Section 1.191(d) no longer refers to § 1.194. Fee extensions are no longer available to extend the time for requesting an oral hearing. Extensions under § 1.136(b) are available to extend the time to request an oral hearing.

Section 1.191(b) has been rewritten as one sentence without any change in substance.

Some confusion has resulted as to who has jurisdiction over a patent application after a notice of appeal to the BPAI has been filed. Problems arose, for example, as to the appropriate PTO official to decide certain petitions and other matters after an appeal has been filed. MPEP § 1210 indicates that jurisdiction over the application normally passes at one of five possible times listed therein. Section 1.191 includes a new section (e) which provides that jurisdiction transfers to the BPAI when the application or reexamination file including all briefs and examiner's answers is transmitted to the BPAI. Thus, jurisdiction transfers to the BPAI when all written submissions by the applicant and the examiner have been entered and the application papers have been forwarded to the BPAI.

New paragraph 1.191(e) also includes a provision that the Commissioner, prior to the time the BPAI renders its decision, may *sua sponte* order that an application be remanded to the examiner for further consideration. This provision merely makes explicit the inherent authority of the Commissioner to direct and supervise the examination of patent applications.

Under previous rules there was some confusion as to when "termination of proceedings" occurs. Section 1.197(c) provides that proceedings are "terminated" when the Federal Circuit's mandate is received by the PTO or after the time for appeal from the judgment of the district court in a civil action under 35 U.S.C. § 145 has expired. The language "In such cases," in the second sentence of former § 1.197(c) has been eliminated since it was superfluous and may have been confusing.

The rules delete the phrase "that he or she elects" and substitutes "electing" therefor in §§ 1.304(c) and 2.145(c)(3), as amended. The amendment merely changes wording without any change in substance.

Section 1.196(b) changes the verb "make" to "makes" to conform the verb to the singular subject of the sentence.

Sections 1.301, 1.303, 2.145(a)(2) and 2.145(c)(3) no longer refer to transmittal of the certified list and certified copies of the notice of election to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. § 141 or 15 U.S.C. § 1071(a)(1). These procedures are required by applicable statutes or Court Rules and are unnecessary in the PTO's regulations.

Sections 1.304(a), 1.304(c), 2.145(c)(3) and 2.145(d)(1) include a statement that the certificate of mailing provisions of § 1.8 are *not* applicable. No substantive change is involved since the inapplicability of § 1.8 is already stated in §§ 1.8(a)(2)(viii) and (ix).

Sections 1.304(b) and 2.145(d)(2) recite "Federal holiday in the District of Columbia" rather than "legal holiday." These changes merely conform the language of these sections with the language of 35 U.S.C. § 21(b) and 37 CFR § 1.7.

Section 2.145(c)(2) and (3) include changes in wording without any change in substance.

Other Considerations

These rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 350 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change requiring appellants to request reconsideration under the specific circumstances set forth is not expected to result in an increase of fees charged by attorneys and agents to entities, including small entities, since the rule change is intended to eliminate erroneous grounds for rejection prior to appeal and in some instances is expected to eliminate the need for appeal.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR, Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

List of Subjects in 37 CFR, Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, Parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

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PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.136 is revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action, (2) the application is involved in an interference declared pursuant to § 1.611 or (3) the response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.196 or 1.197, § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

3. Section 1.191 is amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences

* * * * *

(b) The appeal in an application or reexamination proceeding must identify the rejected claim or claims appealed, and must be signed by the applicant, patent owner or duly authorized attorney or agent.

* * * * *

(d) The time periods set forth in §§ 1.191 through 1.193 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings. See §1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

(e) Jurisdiction over the application or patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may *sua sponte* order the application remanded to the examiner.

4. Section 1.196 is amended by revising paragraphs (a), (b) and (d) and adding new paragraphs (e) and (f) to read as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner or remand the application to the examiner for further consideration. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for the purpose of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise either of the following two options with respect to the new ground:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

* * * * *

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.136(b) for extensions of time to take action under this section.

5. Section 1.197 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.197 Action following decision

* * * * *

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See 37 CFR § 1.136(b) for extensions of time for seeking reconsideration.

(c) Termination of proceedings. Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§ 1.304) except: (1) where claims stand allowed in an application or (2) where the nature of the decision requires further action by the examiner. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§ 1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.

6. Section 1.301 is revised to read as follows:

§ 1.301 Appeal to U.S. Court of Appeals for the *Federal Circuit.*

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

7. Section 1.303 is amended by revising paragraph (c) to read as follows:

§ 1.303 Civil Action under 35 U.S.C. 145, 146, 306.

* * * * *

(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§ 1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146. The notice of election must be served as provided in § 1.646.

8. Section 1.304 is revised to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of § 1.136, 1.550(c) or 1.645(a) or (b). The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(b) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of the time specified for appeal of commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal of cross-appeal. See § 1.8(a)(2)(viii).

9. Section 1.550 is amended by revising paragraph (c) to read as follows:

§ 1.550 Conduct of reexamination proceedings

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

* * * * *

10. Section 1.645 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.645 Extension of time, late papers, stay of proceedings

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proven through the witness.

(b) Any paper belatedly filed, will not be considered except upon motion (§ 1.635) which shows sufficient cause why the paper was not timely filed. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

* * * * *

11. Section 1.658 is amended by revising paragraph (b) to read as follows:

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§ 1.658 Final Decision

* * * * *

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

* * * * *

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

12. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

13. Section 2.129 is amended by revising paragraph (c) to read as follows:

§ 2.129 Oral argument; reconsideration

* * * * *

(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within one month from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

14. Section 2.144 is revised to read as follows:

§ 2.144 Reconsideration of decision on ex parte appeal

Any request for rehearing or reconsideration, or modification of the decision, must be filed within one month from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

15. Section 2.145 is amended by revising paragraphs (a), (c)(2), (c)(3), (d)(1), (d)(2) and (d)(3) and adding new paragraph (e) to read as follows:

§ 2.145 Appeal to court and civil action.

(a) Appeal to U.S. Court of Appeals for the Federal Circuit. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal:

(1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section);

(2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

* * * * *

(c) * * *

(2) Any applicant or registrant in an ex parte case who takes an appeal to the U.S. Court of Appeals for the Federal Circuit waives any right to proceed under section 21(b) of the Act.

(3) Any adverse party to an appeal taken to the U.S. Courtof Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119. The certificate of mailing practice of § 1.8 is not available for filing a notice of election. See § 1.8(a)(2)(viii).

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(2) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act electing to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act. The time for filing a cross-action expires 14 days after service of the summons and complaint.

(e) Extensions of time to commence judicial review. The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

June 21, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

[1105 OG 5]

MISCELLANEOUS

(170) Hearings Before the Board of Appeals

In recent years the backlog of cases awaiting decision by the Board of Appeals has grown substantially. The average time elapsing between filing of the examiner's answer and final disposition is now roughly 17 months. Intensive effort by the Board and greater use of acting examiners-in-chief have been successful in raising the number of dispositions, but at the same time the number of appeals continues to grow. Thus in the first six months of 1974, the Board disposed of 1,193 appeals but received 1,915; in the last half of the year the Board disposed of 1,993 appeals but received 2,179.

In this connection it will be helpful if applicants and attorneys will dispense with oral hearings except where unusual circumstances are present which make a hearing important to the decision. Appeals submitted on brief receive just as careful consideration as those in which oral argument is presented, nor are any implications drawn as to the merits of the appeal from failure to request a hearing. It has been the Board's experience that in the ordinary case the hearing is not of great value in arriving at the ultimate decision.

Appellants are also encouraged to review cases where a hearing has already been requested, with a view to withdrawing the request if it is not necessary. It is particularly important that the Board be given timely notice whenever circumstances prevent the applicant or his representative from the appearing at a scheduled hearing.

Rule 194 (37 CFR 1.194) limits oral argument to thirty minutes unless otherwise ordered by the Board. It has been the Board's experience, however, that effective arguments can be presented in less than thirty minutes in most cases. Effective immediately the Board will be informing appellants in the notices of hearing mailed to them that oral argument will be limited to twenty minutes unless otherwise ordered before the hearing begins.

The assistance of the public will be appreciated.

Mar. 20, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[933 O.G. 1010]

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(171) Hearings Before the Board of Patent Appeals and Interferences

During the past twelve months there has been an increase in the number of ex parte appeals pending before the Board of Patent Appeals and Interferences. In order to address the growing backlog of pending appeals, it is necessary to make the most effective use of the time of Examiners-in-Chief hearing appeals. Significant amounts of time are spent by Examiners-in-Chief preparing for the hearings. In an effort to conserve the time spent in the preparation for hearing by Examiners-in-Chief, notice is hereby given that subsequent to the confirmation of attendance at oral hearing, requests for postponement of the hearing will not be granted in the absence of a showing of dramatically unusual circumstances.

June 6, 1985.

SAUL I. SEROTA,
Acting Chairman Board of Patent Appeals and Interferences.

[1056 OG 44]

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(172) Hearings Before the Board of Patent Appeals and Interferences

Rule 1.3 (37 CFR 1.3) provides that:

> "[a]pplicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy."

Notice is hereby given that persons attending hearings before the Board of Patent Appeals and Interferences are advised that the above provision also applies to dress. If an attendee at a hearing is not appropriately dressed, the attendee may be requested to leave the hearing room.

June 6, 1985.

SAUL I. SEROTA,
Acting Chairman Board of Patent Appeals and Interferences.

[1056 OG 45]

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(173) Access to Interference Settlement Agreements by Government Agencies

Under the provisions of 35 U.S.C. § 135(c), a party to an interference filing a copy of a settlement agreement may request that the copy be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person on a showing of good cause.

In order to provide the parties with a record of the inspection of such agreements by Government agencies, a representative of an agency will henceforth be required to present a written request, similar to the following, for each interference in which the inspection and/or copying of the agreement(s) is desired:

Date:_____

To: Clerk, Board of Patent Interferences

Pursuant to the provisions of 35 U.S.C. 135(c), please permit ..... the bearer(s) of this letter, to [ ] inspect and/or [ ] copy the settlement agreement(s) filed in Interference No. .... The information gained from such inspection and/or copying will be kept in confidence and will not be disclosed to any other person except for official investigative or law enforcement purposes.

.....
Name, Title
.....
Agency

The request will be placed in the folder containing the copy of the agreement, where it may be inspected by the parties or their authorized representatives.

This procedure will be applicable only to inspection or copying by the representatives of Government agencies, since no person other than a representative of a Government agency, or of a party, will be granted access to a copy of an interference settlement agreement which is kept separate from the interference file except by way of a petition for access thereto, see M.P.E.P. § 1002.02(k), item 2, and the parties to the interference are normally provided with copies of any such petition.

June 5, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

[972 O.G. 2]

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(174) Accessibility of Non-Final Discovery Opinions and Orders Issued by the Board of Patent Interferences

A number of inquiries have been received from the patent bar and other interested persons relating to discovery practice under 37 C.F.R. § 1.287 before the Board of Patent Interferences. The inquiries indicate a need for making available to the public non-final Board opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of discovery matters before the Board. While non-final opinions need not be made available to the public [5 U.S.C. § 552(a)(2)], in order to satisfy the need, copies of non-final opinions issued by the Board will be kept in a file in the Service Branch of the Board in the U.S. Patent and Trademark Office (Crystal Plaza, Building 6, Eleventh Floor, Room 1116, Arlington, Virginia). Opinions in the file may be reviewed by the public during normal business hours (8:30 A.M. to 5:00 P.M.). Copies of opinions may be made by the public on reproducing equipment in the Service Branch with tokens at a cost of $0.15 per page or copies may be ordered at a cost of $0.30 per page [37 C.F.R. 1.21(b)].

In view of the provisions of 35 U.S.C. § 122 and 37 C.F.R. § 1.11(a), a consent will be obtained by the Office from all parties in an interference before an opinion issued in connection with the interference is placed in the file if the interference file is not otherwise available to the public. Preliminary indications are that the parties and their counsel generally consent.

In order to obtain optimum dissemination of the information contained in the file, opinions placed therein will be indexed according to specific topics. Copies of the index will be updated from time to time as the need occurs. Specific questions relating

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to the index and file may be directed to the Patent Interference Examiners.

The initial index is as follows:

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1.00 Discovery in general [37 C.F.R. § 1.287]
- 1.10 Requests and service under § 1.287(a)
- 1.20 Requests under § 1.287(b)
- 1.30 Motions for additional discovery under § 1.287(c)
  - 1.31 Related to derivation
  - 1.32 Related to abandonment, suppression, and concealment
  - 1.33 Related to inequitable conduct
  - 1.34 Other
- 1.40 Motions under § 1.287(d)(1)
- 1.50 Action under § 1.287(d)(2)
- 1.60 Agreements under § 1.287(e)

Mar. 5, 1976 — C. MARSHALL DANN, Commissioner of Patents and Trademarks.

[944 O.G. 2098]

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(175) **Petitions in Interference Cases From Decisions of The Board on Motions for Additional Discovery Under 37 CFR 1.287(c)**

Notwithstanding the clear statement in the last sentence of 37 CFR 1.287(c), parties in interference cases continue to seek review by the Commissioner of decisions of the Board of Patent Interferences on motions for additional discovery under 37 CFR 1.287(c). Review of such a decision can be had along with judicial review of a decision on the question of priority. Cochran v. Kresock, 530 F.2d 385, 188 USPQ 553 (CCPA 1976); Comstock v. Kroekel, 200 USPQ 548 (Comm'r. Pat. 1978). Accordingly, parties in interference cases are reminded that a petition to the Commissioner should not be filed for the purpose of seeking review of an interlocutory decision of the Board granting or denying a motion for additional discovery under 37 CFR 1.287(c). See also Fenstermacher v. Daugherty, 189 USPQ 536 (Comm'r. Pat. 1975) and Sheehan v. Doyle, 202 USPQ 783 (Comm'r. Pat. 1978). The filing of such a petition only serves to delay the ultimate disposition of interferences on the merits. The filing of a paper for the mere purpose of delay is not permitted by the rules. 37 CFR 1.346. The Board of Patent Interferences will no longer grant a stay of proceedings pending disposition of a petition to the Commissioner seeking review of a decision of the Board on a motion for additional discovery under 37 CFR 1.287(c).

Apr. 17, 1980. — SIDNEY A. DIAMOND, *Commissioner of Patents and Trademarks.*

[994 O.G. 28]

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(176) **Commissioner's Notice Practice under 37 CFR § 1.225(b)**

When a junior party to an interference is placed under an order to show cause why judgment should not be entered pursuant to 37 CFR § 1.225 and requests final hearing to contest an ancillary matter, either the junior or senior party may file a motion for permission to take testimony pursuant to 37 CFR § 1.225(b) and the last sentence of 37 CFR § 1.251(b). However, some uncertainty has arisen as to when the motion must be filed and what it must contain.

Motion by the Junior Party

When a junior party is placed under an order to show cause and the junior party desired a testimony period, the motion for permission to take testimony should be filed preferably before the time set for responding to the order to show cause. The motion will be considered timely, however, if filed no later than twenty (20) days after the Board of Patent Interferences enters an order setting final hearing.

There are instances where the requested testimony relates to priority. For example, the junior party may occasionally desire to take testimony to establish prior inventive acts alleged in a preliminary statement even though those acts are subsequent to the senior party's effective filing date. This situation arises when (1) the junior party's preliminary statement dates fall between the filing date of the senior party's involved application and the filing date of a prior application accorded to the senior party, (2) the junior party has unsuccessfully contended in a motion under 37 CFR § 1.231 that the senior party should not be accorded benefit of the prior application, and (3) the junior party has requested final hearing to review the examiner's adverse decision on the motion.

When the requested testimony includes priority testimony, the motion to take testimony may be pro forma, viz., a simple request that a testimony period be set to obtain priority evidence. Normally, however, when a junior party seeks to take testimony under 37 CFR § 1.225(b), the proposed testimony relates solely to ancillary matters. When the requested testimony relates solely to ancillary matters, the motion must comply with the provisions of 37 CFR § 1.225(b)[g13 a showing of good cause must be submitted and a pro forma request would not be sufficient. See generally Rivise & Caesar, Interference Law and Practice, Vol. III, §§ 376-377 (1947).

Motion by the Senior Party

There are occasions when a senior party may desire a testimony period even if the junior party does not request a testimony period. See e.g., Lorenian v. Winstead, 127 USPQ 501 (Bd.Int. 1959). When a senior party desires a testimony period, the motion for permission to take testimony should be filed promptly after the Board of Patent Interferences enters an order setting final hearing, but in no event later than twenty (20) days after entry of such order. A senior party should take into account the fact that a junior party will begin preparation of a brief for final hearing after receiving notice of the briefing schedule. Therefore, a senior party should not be permitted to let a junior party expend unnecessary energy preparing a brief for final hearing if the senior party plans to move to take testimony.

As in the case of a junior party, a request to take testimony relating to priority may be pro forma. A request to take testimony limited to ancillary matters must comply with 37 CFR § 1.225(b). See 37 CFR 1.251(b), last sentence.

June 15, 1981. — RENE D. TEGTMEYER, *Acting Commissioner of Patents and Trademarks.*

[1008 O.G. 9]

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(177) **Interference Practice: Response to Order to Show Cause Under 37 CFR 1.640**

37 CFR 1.640(e) provides that when an order to show cause under 37 CFR 1.640(d) is issued against an interference party, the Board of Patent Appeals and Interferences will enter judgment against that party "unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order." In the application of this rule, some confusion has arisen as to the nature of the "paper" which the party must file when the basis of the order is 37 CFR 1.640(d)(1), i.e., where "[a] decision on a motion is entered which is dispositive of the interference against the party on any count."

Normally, the "paper" filed in response to such an order to show cause should be a simple request that final hearing (see 37 CFR 1.654) be set to review the decision on the motion which was dispositive of the interference against the party, as well as any other decision on motion which the party may wish to have reviewed by the Board.* When such a response is filed, the Examiner-in-Chief will normally set the times for filing briefs under 37 CFR 1.656. The response should be accompanied by a motion requesting a testimony period, if the party desires to take testimony. See 37 CFR 1.640(e), last sentence. Also, an opposing party may request a testimony period, even if the party responding to the order to show cause does not. Such a request should be filed promptly after the Examiner-in-Chief enters an order setting the brief times, but in no event more than twenty (20) days after entry of such order. Cf. the Commissioner's Notice of June 15, 1981, 1008 O.G. 9 (July 14, 1981).

Instead of filing a request that final hearing be set, the party under order to show cause may file a paper containing a full discussion of the reasons why judgment should not be entered. However, before deciding to file such a paper, the following should be taken into consideration:

(1) Such paper will be construed as a request for final hearing if a testimony period is requested;

(2) Such paper will be deemed a waiver of any opportunity to present oral argument concerning the matters discussed therein, and the matter will be decided by the Board based upon the content of the paper and any response thereto;

(3) An opposing party may still request final hearing and/or a testimony period within twenty (20) days of the date of service of the paper, and if either request is granted it will be necessary for the parties to file briefs under 37 CFR 1.656.

It is the policy of the Board of Patent Appeals and Interferences that when final hearing is set pursuant to a request therefor following an order to show cause issued as a result of a decision on preliminary motions under 37 CFR 1.633 or 1.634, the parties must raise at that hearing for consideration by the Board all matters specified in 37 CFR 1.655(b) which were decided on the merits by the Examiner-in-Chief and which they wish to have considered. In other words, once the brief times are set for such a final hearing, every matter which was decided by an Examiner-in-Chief in connection with a motion under 37 CFR 1.633 or 1.634 must be raised in the parties' main briefs if the parties wish to have those matters considered by the Board. A party cannot wait to see what the Board's decision on one such matter will be and then, if the decision is unfavorable to the party and the case continues, raise that matter or any other such matter at a subsequent final hearing.

Dec. 8, 1986. — DONALD W. PETERSON, *Deputy Commissioner of Patents and Trademarks.*

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(178) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
Docket No. 40104-4151

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules of practice in patent interference cases. The Patent Law Amendments Act of 1984, Public Law 98-622, §§ 201-202, abolished the Board of Appeals and Board of Patent Interferences and created in their place a Board of Patent Appeals and Interferences which will decide ex parte appeals from adverse decisions of patent examiners and interference cases. The Patent and Trademark Office, through this amendment of its rules, intends to provide guidance on the procedures the Office will be following in conducting interference cases before the Board of Patent Appeals and Interferences.
Date: The effective date of these rules is: Feb. 11, 1985.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4025 (if no answer, message may be left at 703-557-4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The Patent and Trademark Office (PTO) conducts interference proceedings to determine who as between two or more applicants for patent or one or more applicants and one or more patentees is the first inventor of a patentable invention. Heretofore, the determination was made by a Board of Patent Interferences. The Patent Law Amendments Act of 1984, Public Law 98-622, §§ 201-202 combines the Board of Appeals and the Board of Patent Interferences into a single Board of Patent Appeals and Interferences (Board) and authorizes the Board to consider priority and patentability in interference cases.

In view of the discretion given the Board under 35 U.S.C. § 135(a), as amended by Public Law 98-622 ("The Board . . . . may determine questions of patentability . . . ."), these new rules will apply to all interferences declared on or after Feb. 11, 1985, except in special circumstances, such as: (1) interferences which are declared as a result of a motion made in another interference which was pending before the Board before Feb. 11, 1985, (e.g., an interference declared as a result of a motion under 37 CFR § 1.231 to declare an additional interference); (2) an interference related to another interference declared prior to Feb. 11, 1985 (e.g., an interference involving a method of using a compound where an interference involving the same parties and the compound was declared prior to Feb. 11, 1985); and (3) an interference reinstituted after having been dissolved under the old rules (37 CFR §§ 1.201- 1.288)(e.g., an interference reinstituted after having been dissolved as a result of a motion under 37 CFR § 1.231 to dissolve on the grounds of unpatentability where the applicant has obtained allowance of the claims held unpatentable in the decision on motions).

Through these new rules the PTO seeks to improve interference procedure so that the rights of parties in interferences are determined at an early date and the overall process of examining patent applications which become involved in interferences is simplified.

In order to obtain maximum input from the public prior to formally proposing revisions to the rules, on Aug. 1, 1983, the PTO published in the Federal Register an advance notice of proposed rulemaking for interference rules. 48 F.R. 34836-34855. The advance notice was not published in the Official Gazette. Twenty-one written comments were received. All comments are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

On Jan. 30, 1984, the PTO published in the Federal Register a notice of proposed rulemaking. 49 F.R. 3768-3802. The notice was also published in the Official Gazette on Feb. 14, 1984, 1039 O.G. 11; 1039 TMOG 11. The notice also appeared in the Bureau of National Affairs' Patent, Trademark & Copyright Journal, Vol. 27, pp. 312-346 (Feb. 2, 1984), hereinafter 'BNA." Eighteen written comments were received in response to the notice of proposed rulemaking. The comments are analyzed herein. A hearing was held on May 15, 1984. Three individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The eighteen comments and copy of the transcript of the hearing are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

The new rules for interferences are set forth herein in §§ 1.601 through 1.688. The new rules replace entirely the present interference rules (37 CFR §§ 1.201 through 1.288). A "six hundred" number series is used for the new rules. The use of a six hundred number series for the new rules will permit interested individuals to research published decisions (e.g., F.2d, USPQ) or computerized legal research services (e.g., LEXIS) citing the new rules.

An index of the headings of §§ 1.601-1.688 and a table correlating 37 CFR §§ 1.201 through 1.288 (old rules) to §§ 1.601 through 1.688 (new rules) appears below.

Under the new rules, interferences are decided by the Board. The Board has jurisdiction to determine (1) priority of invention, (2) patentability of any claim corresponding to a count both as to applicants and patentees, (3) any issue of interference-in-fact as to any count, and (4) any other issue necessary to resolve the interference. The rules permit an interference to be declared on the basis of a single count defining one patentable invention in interferences involving patents as well as applications. The Board also has jurisdiction to determine whether counts are patentably distinct.

When an interference is declared, an examiner-in-chief is assigned to handle the interlocutory stages of the interference.

*It should be recognized that the decision of the Board following the final hearing may not terminate the interference. For example, if the order to show cause resulted from an Examiner-in-chief's grant of a motion for judgment, and the Board after final hearing reversed the Examiner-in-chief's decision, the case might then proceed to the taking of priority testimony. The Board's decision would however be final with regard to the basis of the motion for judgment.

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An examiner having full signatory authority determines when one or more applications or one or more applications and a patent claim the same patentable invention. When the examiner makes such determination, the examiner will forward any involved applications or patents to the Board. The examiner will designate, at the time the involved applications or patents are sent to the Board, the claims of any application and patent which correspond to each count. The examiner-in-chief can subsequently designate additional claims to correspond to a count. The examiner-in-chief assigned to handle the interference will issue a notice to the parties declaring the interference.

The object of the interference will be to resolve all controversies as to all interfering subject matter defined by one or more counts. A final decision in the interference will determine who, if anyone, is entitled to claims which correspond to a count. Any decision adverse to an applicant by the Board will constitute a final refusal by the PTO to that applicant of the claims involved. Any decision adverse to a patentee constitutes cancellation from the patent of the claims involved.

Any decision by the Board on any issue is binding on the examiner and would govern further proceedings in the PTO.

The designation of a single examiner-in-chief to handle the interlocutory phases of an interference will permit better management of, and control over, interference proceedings. The rules provide that times be set and the examiner-in-chief exercise control over proceedings in the interference such that pendency of the interference before the Board from declaration to final decision will not normally exceed 24 months. The examiner-in-chief should be familiar with the history of the interference and will be accessible to counsel for the parties. For example, an examiner-in-chief, where appropriate, may conduct telephone conference calls to obtain agreement of the parties on the setting of schedules. The rules also permit the examiner-in-chief to hold hearings in the PTO or by conference telephone call in order to expedite or settle interlocutory issues in interferences. Any hearing can be transcribed by a court reporter under such conditions as an examiner-in-chief or the Board deems appropriate. The examiner-in-chief, where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual problems during the taking of depositions. The examiner-in-chief will also be available to rule on requests for production of documents which take place during cross-examination. Oral orders given by phone will be followed by written orders.

At the time an interference is declared, the examiner-in-chief will set a time for filing preliminary motions. The preliminary motions can include:

(1) A motion for judgment on the ground that a claim corresponding to the count is not patentable to an opponent under 35 U.S.C. §§ 102, 103, 112, or any other provision of law.

(2) A motion for judgment on the ground that there is no interference-in-fact between the claims of the opponents in the interference.

(3) A motion to add or to substitute new counts, to amend a claim corresponding to a count, to designate an application or patent claim to correspond to a count, to designate an application or patent claim as not corresponding to a count, or to require an applicant to present a claim to be designated to correspond to a count.

(4) A motion to substitute another application for the application involved in the interference or to add an application for reissue to the interference.

(5) A motion to declare another interference.

(6) A motion to be accorded the benefit of an earlier application or to attack the benefit of an earlier application which has been accorded to an opponent.

Other motions are permitted as necessary, such as a motion to amend the count and/or a claim corresponding to the count in response to a preliminary motion for judgment.

Oppositions to motions are permitted if filed within a time set by the examiner-in-chief. Replies are also authorized. Papers which are not authorized by the rules or requested by the examiner-in-chief can be returned unfiled.

A preliminary statement will be filed prior to or concurrently with the preliminary motions outlined above.

Motions will be decided by an examiner-in-chief, who may consult with an examiner on questions of patentability which have not previously been decided by the examiner. The examiner-in-chief may grant a motion, deny a motion, defer consideration on the merits of a motion to final hearing, or take such other action with respect to a motion as may be appropriate, e.g., dismiss an entirely inappropriate motion.

At the time preliminary motions are decided, the preliminary statements will be opened. If a decision on a motion or inspection of the preliminary statement results in entry of an order to show cause why a judgment should not be entered, the party against whom judgment might be entered can request a hearing before the examiner-in-chief and two additional examiners-in-chief. The decision will govern further proceedings. If adverse, the decision will constitute a final agency action. If favorable, the interference will proceed before the examiner-in-chief.

After preliminary motions are decided and assuming judgment does not result, a period may be set for the parties to file motions for additional discovery. The scope of the additional discovery would be the same as under current practice.

When a time period is set for filing discovery motions, or after discovery has closed, the examiner-in-chief will set a period for taking testimony. Any party wishing to take the testimony of a witness can elect to have the testimony of the witness taken by deposition or presented by affidavit. A transcript of an ex parte deposition can be used as an affidavit. If an affidavit is presented, the opposing party may then cross-examine on oral deposition. Any redirect will take place at the deposition. The party calling the witness is responsible for securing a court reporter and filing the transcript and record associated with cross-examination of its witness.

In the event a party needs testimony from a third-party who will not appear unless a subpoena is issued, including a hostile witness, direct and cross-examination testimony may be taken on oral deposition. The rules provide that prior authorization of an examiner-in-chief is required before a party can take testimony by issuance of a subpoena under 35 U.S.C. [g49 24. The rule thus adopts the policy of *Sheehan v. Doyle*, 513 F.2d 895, 898, 185 USPQ 489, 492 (1st Cir.), cert. denied, 423 U.S. 874 (1975), and *Sheehan v. Doyle*, 529 F.2d 38, 40, 188 USPQ 545, 546 (1st Cir.), cert. denied, 429 U.S. 870 (1976), rehearing denied, 429 U.S. 987 (1976), and rejects the policy announced in *Brown v. Braddick*, 595 F.2d 961, 967, 203 USPQ 95, 101-102 (5th Cir. 1979). Testimony obtained in other proceedings, e.g., another interference or an infringement action, may be used if otherwise admissible.

Under the rules, the Federal Rules of Evidence are made applicable to interferences, except for those portions which relate to criminal actions, juries, and other matters not relevant to interferences. Those portions include:

(1) Rule 103(c).

(2) Rule 104(c), (d), and (e).

(3) The language in Rule 105 which reads "and instruct the jury accordingly."

(4) Rule 201(g).

(5) The language in Rule 403 which reads "or misleading the jury."

(6) Rule 404(a)(1) and (2).

(7) The word "charge" in Rule 405(b).

(8) The language "or criminal" and proviso (ii) in Rule 410.

(9) Rule 412.

(10) Rule 606.

(11) The language "whether by an accused" and "other" in the last sentence of Rule 607.

(12) The provisions of the first sentence of Rule 611 (c) relating to leading questions on direct examination do not apply to statements made in an affidavit authorized to be filed under the rules.

(13) The language "Except as otherwise provided in criminal proceedings by section 3500 of title 18, United States Code" and "except that in criminal cases when the prosecution elects not to comply, the order shall be one striking the testimony or, if the court in its discretion determines that the interests of justice so require, declaring a mistrial" in Rule 612.

(14) Rule 614.

(15) Rule 706.

(16) The language "excluding, however, in criminal cases matters observed by police officers and other law enforcement personnel" and "and against the Government in criminal cases" in Rule 803(8).

(17) The language "but not including, when offered by the Government in a criminal prosecution for purposes other than impeachment, judgments against persons other than the second" in Rule 803(22).

(18) The language "prosecution for homicide or in a" in Rule 804(b)(2).

(19) The language "A statement tending to expose the declarant to criminal liability and offered to exculpate the accused is not admissible unless corroborating circumstances clearly indicate the trustworthiness of the statement" in Rule 804(b)(3).

(20) Rule 1101(a), (b), (d)(2), (d)(3), and (e).

The examiner-in-chief will set a period for filing the record and briefs. Oral hearings normally will be held before a panel consisting of the examiner-in-chief assigned to the interference and two other examiners-in-chief. The panel will render a final decision in the interference. Requests for reconsideration are permitted.

In rendering its decision, the Board will consider only that evidence which can be made available to the public under [g49 1.11(a). Accordingly, the Board will not consider evidence which is submitted under a protective order issued by a court if release of that evidence under § 1.11(a) would be inconsistent with the terms of the court's order.

A final decision of the Board is reviewable in the U.S. Court of Appeals for the Federal Circuit or an appropriate U. S. district court. Any reviewing court can review all aspects of the decision including patentability, priority, and all relevant interlocutory orders, such as denials of discovery.

Except as noted above, these new rules are applicable to all interferences declared on or after Feb. 11, 1985. Interferences declared prior to Feb. 11, 1985, continue to be governed by the prior rules (37 CFR §§ 1.201-1.288 (July 1, 1984)) and will be decided by personnel of the Board of Patent Appeals and Interferences. Actions presently taken by a patent interference examiner or examiners of interferences will be taken by an examiner-in-chief.

An anticipated time schedule for a two-party interference follows.

Sections 1.601 through 1.688 would introduce new concepts in interference practice. Some of the more significant aspects of the rules, as well as some of the new concepts, include the following.

Section 1.1 codifies a practice announced in a Commissioner's Notice of Nov. 28, 1983, "Mailing of Papers to the PTO in Patent Interference Proceedings," 1037 Official Gazette 25 (Dec. 27, 1983) and authorizes a party in an interference to direct mail to the PTO intended for the interference to a special box in the Mail Room for interference papers. Amendments copying claims which are filed prior to the time an interference is declared would continue to be addressed in accordance with § 1.5(a).

Section 1.5 provides that when a paper filed in the PTO concerns an interference which has been declared, it should state the names of the parties (e.g., Smith v. Jones) and the number of the interference. The name of the examiner-in-chief assigned to the interference (§ 1.610) and the name of the party filing the paper should also appear conspicuously on the first page of the paper. Identification of the examiner-in-chief assigned to the interference and the name of the party filing the paper will greatly assist the Board in its administration of interference cases.

Section 1.8 excludes from the certificate of mailing practice any paper in an interference which an examiner-in-chief orders filed by hand or "Express Mail." Papers filed by "Express Mail" in an interference case would be addressed as set forth in § 1.1(e).

Section 1.11 sets forth when the interference file would become available to the public without a petition for access.

Section 1.48 provides that when a request is filed to correct inventorship of an application involved in an interference, the request shall comply with the requirements of § 1.48 and shall be accompanied by a motion under § 1.634. The request will be placed in the file of the application and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.138 permits an attorney or agent to sign and file a paper abandoning an application involved in an interference.

Section 1.196 more clearly sets forth the options open to an applicant when the Board makes a new ground of rejection under § 1.196(b). The last sentence of paragraph (b)(1) is intended to clarify practice in certain situations. One situation involves a case where (1) the Board affirms an examiner's rejection of a "first" claim and makes a new ground of rejection under § 1.196(b) of a "second" claim, (2) the applicant elects to have further proceedings before the examiner on the new ground of rejection on the second claim, and (3) those proceedings do not result in a further appeal (i.e., the second claim is allowed or is cancelled). The last sentence of § 1.196(b)(1) permits the Board to make its decision final on the first claim. By making its decision final on the first claim, the time period under § 1.304 for seeking judicial review begins. Another situation involves a case where (1) the Board affirms an examiner's rejection of a claim over reference A, (2) the Board also enters a new ground of rejection of the claim over reference B, (3) the applicant elects to have further proceedings before the examiner on the new ground of rejection, and (4) those proceedings result in applicant overcoming the new ground of rejection based on reference B. The last sentence of § 1.196(b)(1) permits the Board to make its decision final as to its affirmance of the rejection over reference A. Entry of an order making its decision final would start the period under § 1.304 for seeking judicial review. Thus, an applicant does not forego possible judicial review by electing further prosecution before the examiner when a new ground of rejection is made by the Board. Under paragraph (d), a recommendation by the Board that an allowed claim be rejected is binding on the examiner (rather than being a mere recommendation as was previously the case) in the absence of (1) an amendment, (2) showing of facts by affidavit or other appropriate evidence, or (3) both. The last sentence of paragraph (d) is intended to clarify that the Board may enter a final decision in certain circumstances. When the Board affirms an examiner's rejection of a "first" claim and makes a recommendation under paragraph (d) as to a "second" claim, the application is remanded to the examiner and the Board's decision affirming the rejection of the first claim is not a final decision. If proceedings before the examiner on remand do not result in a further appeal (i.e., the second claim is allowed or is cancelled), the Board may then make its decision final as to the first claim. By making its decision final as to the first claim, the time period under § 1.304 for seeking judicial review starts. Thus, an applicant does not forego judicial review on the first claim merely because of the remand proceedings with respect to the second claim.

Most of the current interference rules (§§ 1.201 through 1.247 and 1.251 through 1.288) are removed, but will continue to govern interferences declared prior to Feb. 11, 1985. Section 1.248 is retained and governs service of papers in all patent cases except interference proceedings. Section 1.646 governs service of papers in interference proceedings.

Under § 1.292, it is intended to modify public use proceedings only to the extent that public use and on sale issues which arise during an interference shall be raised by a preliminary motion under § 1.633(a). There is no fee for filing the motion in the interference, but a fee would continue to be necessary when a petition is filed for institution of a public use proceeding apart from an interference. When a public use proceeding is instituted apart from an interference, the Commissioner will designate an appropriate official to conduct the proceeding including the setting of times for taking testimony under §§ 1.671 through 1.685. There will continue to be no "additional discovery" (see §§ 1.687 and 1.688) in public use proceedings.

Section 1.304 makes clear that the provisions of § 1.136 do not apply when judicial review is sought of a decision of the Board of Patent Appeals and Interferences in (1) a reexamination proceeding or (2) an interference. An extension of time to seek judicial review of a decision of the Board in a reexamination proceeding may be obtained under § 1.550(c). An extension of time to seek judicial review of a decision of the Board in an interference proceeding may be obtained under § 1.645. Section 1.304 also establishes an "excusable neglect" standard for seeking judicial review in interference cases when a notice of appeal is untimely filed or a civil action is not timely commenced. The excusable neglect standard is intended to be the same as the standard under Rule 4(a)(5) of the Federal Rules of Appellate Procedure.

Section 1.322 provides that when a request for a certificate of correction under 35 U.S.C. § 254 (PTO mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of § 1.322 and shall be accompanied by a motion under § 1.635. The request will be

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placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.323 provides that when a request for a certificate of correction under 35 U.S.C. § 255 (patentee's mistake) is filed to make a correction of a patent involved in an interference, the request shall comply with the requirements of § 1.323 and shall be accompanied by a motion under § 1.635. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.324 provides that when a request is filed to correct inventorship of a patent involved in an interference, the request shall comply with the requirements of § 1.324 and shall be accompanied by a motion under proposed § 1.634. The request will be placed in the file of the patent and the motion will be placed in the file of the interference. The request will be decided as part of the interference.

Section 1.565 provides that when a patent is involved in an interference proceeding and a reexamination proceeding, both the interference proceeding and the reexamination proceeding will continue unless one of the proceedings is stayed. A stay of a reexamination proceeding will be made by the Commissioner. A stay of an interference proceeding will be made by an examiner-in-chief, subject to review by the Commissioner. Section 1.565 continues the present practice of the Commissioner determining in every instance whether to stay a reexamination proceeding when the patent involved in the reexamination proceeding is sought to be reissued or becomes involved in litigation.

Under § 1.601, the rules shall be construed to secure the just, speedy, and inexpensive determination of interferences. Section 1.601 defines various terms used in Subpart E including "additional discovery," "affidavit," "case-in-chief," "case-in-rebuttal," "count," "effective filing date," "filing date," "interference," "interference-in-fact," "junior party," "lead" attorney, "party," "phantom count," "same patentable invention," "separate patentable invention," "senior party," "sworn," and "United States." "Affidavits" include declarations under 35 U.S.C. § 25 and 37 CFR § 1.68 as well as statutory declarations under 28 U.S.C. § 1746. The definition of "United States" is the same as the definition of United States in 35 U.S.C. § 100(c).

The definition of "interference" permits an interference between one or more applications and one or more patents. Thus, these new rules follow the policy of Wilson v. Yakel, 1876 Dec. Comm'r. Pat. 245 (Comm'r.Pat. 1876) and, to the extent inconsistent therewith, do not follow the policy announced in Touval v. Newcombe, 194 USPQ 509 (Comm'r.Pat. 1976). However, in view of the statutory requirement for the presence of at least one application in an interference, if an applicant were to concede priority or otherwise be terminated from an interference involving only one application and more than one patent, the interference would have to be terminated for lack of subject matter jurisdiction unless one or more of the patentees filed an application for reissue which could be added to the interference under § 1.633(h). A "count" defines interfering subject matter. An interference may have two counts only if the second count defines a "separate patentable invention" from the first count. The reason the second count must define a separate patentable invention is to permit the PTO to lawfully issue separate patents to different parties in an interference when a single party does not prevail as to all counts. A "separate patentable invention" is defined in§ 1.601(n):

> Invention (A) is a "separate patentable invention" with respect to invention (B) when invention (A) is new (35 U.S.C. § 102) and non-obvious (35 U.S.C. § 103) in view of invention (B) assuming invention (B) is prior art with respect to invention (A).

Section 1.602(a) continues the present PTO practice (37 CFR § 1.201(c)) of not declaring or continuing an interference between (1) two or more applications owned by the same party or (2) an application and a patent owned by a single party unless good cause is shown. A corporation and its wholly-owned subsidiary are considered a "single party" within the meaning of § 1.602(a). Under prior rules, when a patent and an application involved in an interference became commonly owned, the interference was not "dissolved." Rather, the PTO required that the interference be terminated with a judgment. Chillas v. Weisberg, 1928 Dec. Comm'r. Pat. 24 (Comm'r.Pat. 1928); Malone v. Toth, 202 USPQ 397 (Comm'r.Pat. 1978); and Morehouse v. Armbruster, 209 USPQ 514 (Comm'r.Pat. 1980). Under these new rules, all interferences, including those involving only applications, will be terminated with a judgment. As noted in Chillas v. Weisberg, supra at 25 "the common owner can allow a judgment against the junior party to be rendered by default or it can file a concession of priority from one party to the other." Paragraphs (b) and (c) of § 1.602 continue the present PTO practice (37 CFR § 1.201(c)) of requiring a party to notify the PTO of any real party in interest not apparent on the face of the notice declaring the interference (see § 1.611) or of any change in the real party in interest after the interference is declared. The PTO needs to know the identity of any real party in interest to properly enforce § 1.602(a) and to enable an examiner-in-chief to determine whether recusal is necessary or appropriate. A new requirement in paragraphs (b) and (c), not present in 37 CFR § 1.201(c), is a 20-day time period for advising the PTO of the identity of, or any change in, the real party in interest.

Under §§ 1.601(f), 1.603, and 1.606, the interfering subject matter would be defined by one or more counts. All the claims in an application or a patent which define the same patentable invention as a count would be designated to correspond to the count. An interference would have two counts only if one count defines a separate patentable invention from another count. Under § 1.606, at the time an interference is declared between a patent and an application, a count would not be narrower in scope than any patent claim which corresponds to the count. Thus, a patent claim would be presumed, subject to a motion under § 1.633(c), not to embrace "separate patentable inventions." Some examples illustrate how the PTO would formulate counts and designate patent and application claims to correspond to counts.

Example 1: Application A contains patentable claim 1 (engine). Application B contains patentable claim 8 (engine). If an interference is declared, there would be one count (engine). Claim 1 of application A and claim 8 of application B would be designated to correspond to the count.

Example 2: Application C contains patentable claims 1 (engine) and 2 (6-cylinder engine). Application D contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application C and claim 8 of application D would be designated to correspond to the count.

Example 3: Application E contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application F contains patentable claims 11 (engine) and 12 (8-cylinder engine). Claims 1 and 2 of application E and claims 11 and 12 of application F define the same patentable invention. Claim 3 of application E defines a separate patentable invention from claims 1 and 2 of application E and claims 11 and 12 of application F. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application E and claims 11 and 12 of application F would be designated to correspond to the count. Claim 3 of application E would not be designated to correspond to the count.

Example 4: Application G contains patentable claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application H contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H define the same patentable invention. Claim 3 of application G and claim 15 of application H define a separate patentable invention from claims 1 and 2 of application G and claim 11 of application H. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of application G and claim 11 of application H would be designated to correspond to Count 1. Claim 3 of application G and claim 15 of application H would be designated to correspond to Count 2.

Example 5: Application J contains patentable claims 1 (engine), 2 (combination of an engine and a carburetor) and 3 (combination of an engine, a carburetor, and a catalytic converter). Application K contains patentable claims 31 (engine), 32 (combination of an engine and a carburetor), and 33 (combination of an engine, a carburetor, and an air filter). The engine, combination of an engine and carburetor, and combination of an engine, carburetor, and air filter define the same patentable invention. The combination of an engine, carburetor, and catalytic converter define a separate patentable invention from engine. If an interference is declared, there would be one count (engine). Claims 1 and 2 of application J and claims 31, 32, and 33 of application K would be designated to correspond to the count. Claim 3 of application J would not be designated as corresponding to the count.

Example 6: The PTO will continue to follow *Waldeck v. Lewis*, 120 USPQ 88 (Comm'r.Pat. 1955). Application L contains patentable claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application M contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of application L and claim 11 of application M would be designated to correspond to the count.

Example 7: Application N contains patentable claim 1 (benzene). Application P contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of application N and claim 11 of application P would be designated to correspond to the count.

Example 8: Application Q contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application R contains patentable claim 33 (benzene). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application Q and claim 33 of application R would be designated to correspond to the count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be one count (benzene). Claims 1 and 2 of application Q and claim 33 of application R would be designated to correspond to the count. Claim 3 of application Q would not be designated to correspond to the count.

Example 9: Application S contains patentable claims 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application T contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). If benzene and chloroform define the same patentable invention and an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of application S and claims 11, 12, and 13 of application T would be designated to correspond to the count. The PTO will continue to adhere to Becker v. Patrick, 47 USPQ 314 (Comm'r.Pat. 1939). An interference can have two counts only if one count defines a separate patentable invention from another count. If chloroform defines a separate patentable invention from benzene and an interference is declared, there would be two counts: Count 1 (benzene) and Count 2 (chloroform). Claims 1 and 2 of application S and claims 11 and 12 of application T would be designated to correspond to Count 1. Claims 1 and 3 of application S and claims 11 and 13 of application T would be designated to correspond to Count 2.

Example 10: Patent A contains claim 1 (engine). Application U contains patentable claim 11 (engine). If an interference is declared, there would be one count (engine). Claim 1 of patent A and claim 11 of application U would be designated to correspond to the count.

Example 11: Patent B contains claims 1 (engine) and 2 (6-cylinder engine). Application V contains patentable claim 8 (engine). An engine and a 6-cylinder engine define the same patentable invention. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent B and claim 8 of application V would be designated to correspond to the count.

Example 12: Patent C contains claims 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application W contains patentable claims 11 (engine) and 12 (8 cylinder engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W define the same patentable invention. Claim 3 of patent C defines a separate patentable invention from claims 1 and 2 of patent C and claims 11 and 12 of application W. If an interference is declared, there would be one count (engine). Claims 1 and 2 of patent C and claims 11 and 12 of application W would be designated to correspond to the count. Claim 3 of patent C would not be designated to correspond to the count.

Example 13: Patent D contains claim 1 (engine), 2 (6-cylinder engine), and 3 (engine with a platinum piston). Application X contains patentable claims 11 (engine) and 15 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X define the same patentable invention. Claim 3 of patent D and claim 15 of application X define a separate patentable invention from claims 1 and 2 of patent D and claim 11 of application X. If an interference is declared, there would be two counts: Count 1 (engine) and Count 2 (engine with a platinum piston). Claims 1 and 2 of patent D and claim 11 of application X would be designated to correspond to Count 1. Claim 3 of patent D and claim 15 of application X would be designated to correspond to Count 2.

Example 14: Patent E contains claims 1 (Markush group of benzene or toluene), 2 (benzene), and 3 (toluene). Application Y contains patentable claim 11 (benzene). Benzene and toluene define the same patentable invention. If an interference is declared, there would be one count (Markush group of benzene or toluene). Claims 1, 2, and 3 of patent E and claim 11 of application Y would be designated to correspond to the count.

Example 15: In this example, the claims of patent E and application Y in Example 14 are reversed. Patent E contains claim 1 (benzene). Application Y contains patentable claims 11 (Markush group of benzene or toluene), 12 (benzene), and 13 (toluene). If an interference is declared, the count would be the same as the count in Example 14—(Markush group of benzene or toluene). Claim 1 of patent E and claims 11, 12, and 13 of application Y would be designated to correspond to the count.

Example 16: The PTO will continue to follow cases such as *Case v. CPC* International, Inc., 730 F.2d 745, 221 USPQ 196 (Fed. Cir. 1984); cert. denied, 105 S.Ct. 233 (1984); Aelony v. Arni, 547 F.2d 566, 192 USPQ 486 (CCPA 1977); and Nitz v. Ehrenriech, 537 F.2d 539, 190 USPQ 413 (CCPA 1976), and declare interferences where interfering patent and application claims are mutually exclusive provided the claims define the same patentable invention. Patent F contains claim 1 (benzene). Application Z contains patentable claim 11 (xylene). Benzene and xylene define the same patentable invention. If an interference is declared, there would be one count (benzene or xylene). Claim 1 of patent F and claim 11 of application Z would be designated to correspond to the count.

Example 17: It will be the practice of the PTO under § 1.606 to initially declare interferences with counts which are identical to or broader than patent claims which correspond to the counts. A single patent claim would be presumed, subject to a motion under § 1.633(c), not to define separate patentable inventions. Patent G contains claim 1 (Markush group of benzene or chloroform), 2 (benzene), and 3 (chloroform). Application AA contains patentable claim 33 (benzene). If an interference is declared, initially it would be presumed by the PTO, subject to a later motion under § 1.633(c), that benzene and chloroform define the same patentable invention. There would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent G and claim 33 of application AA would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, that party could file a motion under § 1.633(c) to redefine the count and the claims corresponding to the counts.

Example 18: Patent H contains claims 1 (Markush group of benzene or chloroform), 2, (benzene), and 3 (chloroform). Application AB contains patentable claims 11 (Markush group of benzene or chloroform), 12 (benzene), and 13 (chloroform). Benzene and chloroform initially would be presumed, subject to a motion under § 1.633(c), to define the same patentable invention, because they are recited as a Markush group in a single patent claim. If an interference is declared, there would be one count (Markush group of benzene or chloroform). Claims 1, 2, and 3 of patent H and claims 11, 12, and 13 of application AB would be designated to correspond to the count. If a party believes benzene and chloroform define separate patentable inventions, the party could move under § 1.633(c) to substitute a count (benzene) for (Markush group of benzene or chloroform) and to add a count (chloroform). See Example 36.

Example 19: Under § 1.606, the PTO will continue to follow the practice announced in Ex parte Card and Card, 1904 Dec.Comm'r.Pat. 383 (Comm'r.Pat. 1904). Patent J contains claim 1 (method of mixing, grinding, and heating). Application AC contains patentable claim 8 (method of mixing and heating) and does not disclose or claim a grinding step. In the context of the inventions disclosed in patent J and application AC, a method of mixing, grinding, and heating is the same patentable invention as a method of mixing and heating. Under current practice, it

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would be said that "grinding" is an "immaterial" limitation in claim 1 of patent J. Under § 1.606, the fact application AC does not disclose grinding would not preclude an interference. If an interference is declared, there would be one count (method of mixing and heating). Claim 1 of patent J and claim 8 of application AC would be designated to correspond to the count.

Under § 1.605, timely filing of an amendment presenting a claim suggested by the examiner for purposes of an interference would stay ex parte proceedings in the application in which the claim is presented pending a determination by the examiner of whether an interference will be declared. Also under § 1.605(a), when an examiner suggests a claim, the applicant will be required to copy verbatim the suggested claim. At the time the suggested claim is copied, however, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the copied claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

Under § 1.607(b), when an applicant seeks an interference with a patent, e.g., by copying claims from the patent, examination of the application including any appeal would be handled with special dispatch within the PTO. "Special dispatch" would be construed to be the same as special dispatch in a reexamination proceeding. See 35 U.S.C. § 305.

Under § 1.608, the PTO will continue current practice (37 CFR § 1.204(c)) of requiring an applicant seeking to provoke an interference with a patent to submit evidence which demonstrates that the applicant is prima facie entitled to a judgment relative to the patentee. Evidence would be submitted only when the earlier of the filing date or effective filing date of the application is more than three months after the earlier of the filing date or effective filing date under 35 U.S.C. §§ 120 of the patent. The evidence may relate to patentability and need not be restricted to priority. When the evidence (1) consists of prior printed publications and patents and (2) shows that the claims of the application are not patentable, the claims in the application would be rejected and the applicant could file a request for reexamination of the patent.

Section 1.609 sets forth what an examiner shall forward to the Board when an interference is declared. For the most part, § 1.609 continues current practice. However, under § 1.609(b)(3), the examiner would identify all claims in an application which the examiner believes are patentable over the proposed counts. Thus, a claim in an application would either correspond to a count or would be indicated as being patentable over the count. For instance, in Example 3, supra, the examiner would indicate that (1) claims 1 and 2 of application E and claims 11 and 12 of application F correspond to the count and (2) claim 3 of application E defines a separate patentable invention from the count.

Under § 1.610, each interference will be declared by an examiner-in-chief. The examiner-in-chief enters all interlocutory orders in the interference. As necessary, another examiner-in-chief may act in place of the examiner-in-chief assigned to the interference. At the discretion of the examiner-in-chief assigned to the interference, a panel of two or more examiners-in-chief may enter an interlocutory order. The examiner-in-chief will set times and control proceedings such that pendency of the interference normally will not exceed 24 months. Under § 1.610(d), the examiner-in-chief is authorized to hold conferences. Any conference can be by a telephone conference call. Under § 1.610(e), an examiner-in-chief is authorized to determine a proper course of conduct for any situation not specifically covered by the rules.

Under § 1.611(a), the PTO will normally notify each party at its correspondence address (37 CFR § 1.33(a)) that an interference is declared. This practice will save the PTO the administrative burden of sending multiple notices as is required by the present rules. Under § 1.611(a), the PTO could, in an appropriate circumstance, also send a notice to a patentee or an assignee. An appropriate circumstance for sending an additional notice would be a situation where a patent was issued on the basis of an application filed under 37 CFR § 1.47. The matters to be specified in a notice declaring an interference are set out in § 1.611(c). One item to be set out is the "order of the parties," meaning the order in which the parties will take testimony. If Jones is the junior party and Smith is the senior party, the order of the parties is: Jones v. Smith. The order of the parties may change as a result of the granting of a motion under § 1.633(d), (f), or (g). Under § 1.611(d), the notice declaring the interference may also set dates for filing preliminary statements, notices that preliminary statements have been filed, motions under § 1.633, oppositions to those motions, and replies to the oppositions. Alternatively, an examiner-in-chief may set those times in a separate order before or after consultation with counsel for the parties. Under § 1.611(e), the PTO may place a notice in the *Official Gazette* each time an interference is declared involving a patent. The notice would make it easier for patent practitioners throughout the country to determine whether a given patent is or has been involved in an interference.

Under § 1.612, except for affidavits under § 1.131 and any evidence and explanation under § 1.608(b) filed separate from an amendment, each party shall have access to the file of every other party after an interference is declared. The files of applications and patents involved in an interference will be maintained if the Service Branch of the Board of Patent Appeals and Interferences for inspection and copying. Any explanation which is filed as part of an amendment or an amendment which discusses details contained in an affidavit under § 1.131 would not be sealed under § 1.612(a). Thus, § 1.612(a) continues the practice discussed in *Moorman v. Martin*, 103 USPQ 273 (Comm'r.Pat. 1950) and Calvert, *An Overview of Interference Practice*, 62 J. Pat. Off. Soc'y. 290, 293 (1980). Under § 1.612(b), each party will have access to an opponent's affidavit under § 1.131 or an opponent's evidence and explanation under § 1.608(b) when a decision is rendered on motions under § 1.633. Under § 1.612(c), a party would be required to serve any evidence and explanation under § 1.608(b) if an order to show cause is issued under § 1.617(a) and the party responds to the order under § 1.617(b). Under § 1.612(d), the parties may agree to exchange copies of their respective files.

Under § 1.613(a), when a party has appointed more than one attorney or agent of record, the party may be required to designate a "lead" attorney or agent. A lead attorney or agent would be a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the individual whom an examiner-in-chief can contact to set times and take other action in the interference. Section 1.613(b) continues the practice of not permitting the same attorney or agent to represent two or more parties in an interference except as permitted by Chapter 1, see e.g., § 1.344. Under § 1.613(c), an examiner-in-chief can make an appropriate inquiry to determine whether an attorney or agent should be disqualified from representing a party. A final decision to disqualify an attorney or agent is made by the Commissioner under 35 U.S.C. § 32.

Section 1.614 specifies when the Board gains jurisdiction over an interference. The section also indicates when an interference becomes a contested case within the meaning of 35 U.S.C. § 24. A remand to the examiner is authorized and may be useful in certain situations, such as, when a party moves under § 1.633(c) to add a proposed count which is broader than any count in an interference. Alternatively, an examiner-in-chief would be able to obtain informal opinions from examiners during the course of an interference. Nothing in the rules, however, is intended to authorize informal conferences between an examiner-in-chief and an examiner with respect to the merits of an application before the Board in an ex parte appeal from an adverse decision of the examiner.

Section 1.616 permits an examiner-in-chief or the Board to impose appropriate sanctions against a party who fails to comply with the rules or with an order entered in the interference. Paragraphs (a) through (e) set forth some of the possible sanctions which can be entered. The particular sanction to be entered would depend on the facts of a given case and ordinarily would not be entered prior to giving the affected party an opportunity to present its views. An individual examiner-in-chief could not impose a sanction granting judgment inasmuch as entry of a judgment requires action by the Board. See § 1.610(a). A party desiring sanctions imposed against an opponent could move under § 1.635 for entry of an order imposing sanctions.

Section 1.617 retains summary judgment proceedings in those cases where a junior party applicant is required to file evidence and an explanation under § 1.608(b). To avoid summary judgment, the junior party applicant must establish that it is prima facie entitled to judgment relative to the senior party patentee. For the most part, practice under § 1.617 will be the same as the current practice under 37 CFR § 1.228. The major changes would be the following: (1) A prima facie case could be based on patentability as well as priority. (2) A stricter standard would be imposed for presenting additional evidence after entry of an order to show cause. Under current practice (37 CFR § 1.228), additional evidence may be submitted with a response to an order to show cause "when a showing in excuse of . . . [its] omission from the original" showing is made. The "good cause" showing required by § 1.617(b) imposes a stricter standard than was required under the prior rules. The stricter standard is necessary to encourage applicants copying claims from a patent to better prepare their initial showings under proposed § 1.608(b). Under current practice, the Board of Patent Interferences has found that substantial time is lost in issuing orders to show cause based on an inadequate initial showing only to have an adequate showing made with the response to the order to show cause. Under the "good cause" standard, ignorance by a party or counsel of the provisions of the rules or the substantive requirements of the law would not constitute good cause. (3) When an interference involves more than two parties, all opponents would be permitted to participate in summary judgment proceedings. Thus, the new rules overrule *Chan v. Akiba v. Clayton*, 189 USPQ 621 (Comm'r.Pat. 1975). (4) Currently, an applicant must file two copies of its initial showing under 37 CFR § 1.204(c). Under § 1.608(b), a party would file only one copy of the showing. However, any party responding to an order to show cause would be required to serve a copy of its initial showing under § 1.608(b) with any response to the order to show cause. (5) A single examiner-in-chief may order an interference to proceed after issuance of an order to show cause under § 1.608(b) and the filing of a response by an applicant under § 1.617(b). Only the Board, however, may enter a summary judgment. See § 1.617(b).

Under § 1.618, the PTO has authority to return to a party any paper presented in an interference which is not authorized by, or is not in compliance with the requirements of, Subpart E. When an improper paper is filed, a party may be given an opportunity to file a proper paper under such conditions as an examiner-in-chief may deem appropriate. Two examples of improper papers are: (1) replies to replies which are not authorized by the rules and (2) papers presented which have attached thereto a paper previously filed in the interference.

Sections 1.621 through 1.629 govern preliminary statements which continue to be required in interference cases.

Under § 1.621, a preliminary statement can be signed by any individual having knowledge of the facts (e.g., the inventor) or by an attorney or agent of record. Permitting an attorney or agent of record to sign a preliminary statement eliminates unnecessary mailing of papers between parties and their attorney or agent.

Under § 1.622, the preliminary statement would identify the inventor who made the invention defined by each count. If the inventor identified in the preliminary statement is not an inventor named in the application or patent involved in the interference, a motion under § 1.634 must be diligently filed to correct inventorship.

Sections 1.623, 1.624, and 1.625 respectively set out the allegations which should be made in, and the attachments which should accompany, a preliminary statement when (1) the invention was made in the United States, (2) the invention was made abroad and was introduced into the United States, and (3) derivation by an opponent from a party is to be an issue.

Section 1.626 permits a party to file a preliminary statement which states that the party only intends to rely on the filing date of an earlier United States or foreign application. Ordinarily, a junior party who fails to file a preliminary statement is not entitled to access to any other preliminary statement filed (see § 1.631(b)). Section 1.626 would permit a junior party who only intends to rely on an earlier application to have access to any opponent's preliminary statement.

Section 1.628 sets out how an error in a preliminary statement may be corrected.

Section 1.629 sets out the effect of a preliminary statement. A party who fails to file a preliminary statement will not be permitted to prove (1) that the party made the invention defined by a count prior to the party's filing date or (2) that an opponent derived the invention from the party.

Under § 1.631, preliminary statements normally will be opened for inspection when an examiner-in-chief decides preliminary motions filed under § 1.633. A junior party who does not file a preliminary statement is not entitled to access to a preliminary statement of any other party. When an interference is terminated before preliminary statements are opened, any preliminary statement which has been filed will be returned unopened to the party who submitted the statement.

Under § 1.632, a notice must be filed by a party who intends to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice. 35 U.S.C. § 102(g). A party will not be permitted to brief (§ 1.656) or argue at final hearing (§ 1.654) that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless the notice is timely filed. A notice is timely if filed within ten (10) days of the close of the testimony-in-chief period of an opponent. While a party has the burden of proving that an opponent abandoned, suppressed, or concealed, the burden may be discharged on the basis of the opponent's evidence alone. *Shindelar v. Holdeman*, 628 F.2d 1337, 207 USPQ 112 (CCPA 1980). See also *Correge v. Murphy*, 705 F.2d 1326, 217 USPQ 753 (Fed. Cir. 1983); *Horwath v. Lee*, 564 F.2d 948, 195 USPQ 701 (CCPA 1977); and *Peeler v. Miller*, 535 F.2d 647, 190 USPQ 117 (CCPA 1976). Under current practice where notice is not required, it is possible that a party may learn for the first time that abandonment, suppression, or concealment is an issue when the party receives an opponent's brief at final hearing. See *Klug v. Wood*, 212 USPQ 767, 771 n. 2 (Bd.Pat.Int. 1981). At that point, it is often too late to reopen proceedings in the interference. The purpose of requiring the notice under § 1.632 is to make the parties and the Board aware during the interlocutory stage of an interference that abandonment, suppression, or concealment may be an issue in the interference. Early notice will permit the parties to ask for and the examiner-in-chief to set appropriate testimony periods for a party to present evidence related to abandonment, suppression, and concealment, particularly in those cases where long unexplained delays tend to prove the allegation of suppression or concealment. Early notice will also eliminate the need for the party moving to reopen the testimony period. Klug v. Wood, supra.

Under § 1.633, a party may file preliminary motions for judgment, to redefine the interference, to substitute a different application in the interference, to declare an additional interference, to be accorded the benefit of an earlier application, to attack benefit previously accorded an opponent, or to add a reissue application to the interference. The motions are called "preliminary motions" in order to distinguish the motions from other motions which might be filed during the course of an interference. The preliminary motions would replace motions currently authorized by 37 CFR § 1.231.

Under § 1.633(a), a motion to dissolve would be replaced with a motion for judgment. A party can file a motion for judgment on the ground that an opponent's claim corresponding to a count is unpatentable to the opponent. With two exceptions, unpatentability can be based on prior art (35 U.S.C. §§ 102, 103), insufficiency of disclosure (35 U.S.C. § 112, first paragraph), indefiniteness of claims (35 U.S.C. § 112, second paragraph), double patenting, estoppel, or any other ground which would support a holding that claims corresponding to a count are not patentable. The two exceptions are (1) priority of invention of the subject matter of a count by the moving party as against any opponent and (2) derivation of the subject matter of a count by the opponent from the moving party. The two exceptions are directed to issues which are traditional "priority" issues, e.g., which inventor made the invention defined by a count first or, when derivation is an issue, who made the invention. Resolution of those "priority" issues almost always requires the taking of testimony. A motion for judgment, however, would be proper when a party believed an individual not involved in the interference made the invention defined by the count prior to an opponent in the interference, but subsequent to the moving party. Thus, a patentability issue, such as that raised under 35 U.S.C. § 102(g) in *Sutter Products Co. v. Pettibone Mulliken Corp.*, 428 F.2d 639, 166 USPQ 100 (7th Cir. 1970), properly could be raised with a motion for judgment under § 1.633(a). Derivation by an opponent from an individual not involved in the interference could also be raised under § 1.633(a).

Under § 1.633(b), a party could move for a judgment when the party believes there is no interference-in-fact. A motion for judgment on the ground of no interference-in-fact is only proper under one of three conditions: (1) when an interference involves designs, (2) when the interference involves plant applications or a plant application and plant patent, or (3) when no claim of a

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party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. An example illustrates when a motion under § 1.636(b) is proper.

Example 20: Application AD contains patentable claim 1 (6-cylinder engine). Application AE contains patentable claim 3 (8-cylinder engine). An interference is declared with a single count (6 or 8-cylinder engine). Claim 1 of application AD and claim 3 of application AE are designated to correspond to the count. Applicant AD believes that a 6-cylinder engine is a "separate patentable invention" (see § 1.601(n)) from an 8-cylinder engine. Applicant AD would file a motion under § 1.633(b) for a judgment on the ground of no interference-in-fact stating why a 6-cylinder engine is patentably distinct from an 8-cylinder engine. If the Board ultimately agrees with applicant AD, a patent could issue to AD containing claim 1 of application AD and a second patent could issue to AE containing claim 3 of application AE.

Under § 1.633(c), a party may move to redefine interfering subject matter. One way to redefine interfering subject matter would be to add or substitute a count. When a party seeks to add a count, the party is required to demonstrate that the proposed count to be added is directed to a "separate patentable invention" from every other count in the interference.

A motion may be filed to amend an application claim which has already been designated to correspond to a count. See § 1.633(c)(2). Such a motion might be filed when a party believes an application claim designated to correspond to a count is unpatentable and the amended claim is believed to be patentable.

An applicant may move to add a claim to the applicant's application and to designate the claim to be added to correspond to a count. See § 1.633(c)(2). Such a motion may be filed when the applicant discloses specific subject matter which is not claimed, would like to claim the subject matter, and wants the subject matter involved in the interference.

Another way to redefine interfering subject matter would be to designate a claim as corresponding or not corresponding to a count. See § 1.633(c)(3) and (c)(4). Examples 21 and 22 illustrate this latter point.

Example 21: Application AF contains patentable claim 1 (engine). Patent K contains claims 3 (engine) and 5 (6-cylinder engine). Claim 1 of application AF and claim 3 of patent K are designated to correspond to the count. Applicant AF believes a 6-cylinder engine is the "same patentable invention" (see § 1.601(n)) as engine. Applicant AF would file a motion under § 1.633(c)(3) to designate claim 5 of patent K as corresponding to the count. If the motion is granted and applicant AF prevails in the interference, judgment would be entered against patentee K and both claims 3 and 5 of patent K would be cancelled under 35 U.S.C. § 135(a).

Example 22: Application AG contains patentable claim 1 (engine). Patent L contains claims 3 (engine) and 5 (8-cylinder engine). An interference is declared with one count (engine). Claim 1 of application AG and claims 3 and 5 of patent L are designated to correspond to the count. Patentee L believes that an 8-cylinder engine defines a "separate patentable invention" (see § 1.601(n)) from engine. Patentee L should file a motion under § 1.633(c)(4) to designate claim 5 of patent L as "not corresponding" to the count. If the motion is granted and an adverse judgment is entered against patentee L, only claim 3 would be cancelled from the patent pursuant to 35 U.S.C. § 135(a).

A motion to redefine the interfering subject matter may also request that an opponent who is an applicant be required to add a claim to the opponent's application and to designate the claim to correspond to a count. See § 1.633(c)(5). Such a motion might be filed when a party sees that the opponent discloses, but does not claim, subject matter which the party believes should be involved in the interference.

Section 1.633(i) would continue present practice (37 CFR § 1.231) of allowing a party to move to redefine the subject matter of the interference or substitute a different application when an opponent moves for judgment (see § 1.633(a) and (b)) or to attack benefit (see § 1.633(g)).

Paragraph (j) of § 1.633 will permit an opponent to move for benefit when a party moves to add or substitute a count. Thus, when a motion to add a count is filed by a party and an opponent wants benefit of an earlier application in the event the motion to add is granted, the opponent should file a motion under § 1.633(j) to be accorded benefit. The mere fact that the opponent had been accorded benefit of an earlier application when the interference was declared does not mean the opponent will be accorded benefit as to some other count which may be added on motion of some other party.

Section 1.634 authorizes a motion to correct inventorship in an application (see § 1.48) or a patent (see § 1.324) involved in an interference.

Section 1.635 authorizes the filing of motions other than those specified in §§ 1.633 or 1.634. Motions filed under § 1.635 would be referred to as "miscellaneous motions" to distinguish from "preliminary motions" under § 1.633. Instances where a miscellaneous motion would be filed include motions to correct an error in a preliminary statement, to extend time for taking action or to seek judicial review, to obtain permission to proceed under 35 U.S.C. § 24, or to obtain additional discovery.

Section 1.636 sets out the times within which a motion would be filed.

Section 1.637 sets out the content of motions. In prior interference practice, parties and their counsel have had difficulty meeting all the "unwritten" requirements for motions under 37 CFR § 1.231. Section 1.637 is quite specific in setting out the requirements for each type of motion, particularly the preliminary motions. By setting out with specificity the requirements for each type of motion, it is intended to minimize disposition of motions on technicalities. A vast majority of the comments in response to the advanced notice published in the *Federal Register* on Aug. 1, 1983, commenting on then proposed § 1.637 were in favor of the requirements for motions being specifically set out in the regulations.

Section 1.638 authorizes oppositions to motions. Any opposition would have to identify any material fact in dispute. A reply to an opposition would be authorized for all motions. A reply to a reply is not authorized.

Section 1.639 sets forth the evidence which may accompany a motion, opposition, or reply. Every material fact alleged in a motion, opposition, or an reply would have to be supported by proof. Section 1.639(b) authorizes affidavits to be used as proof for any motion. The affidavit may later be used by a party during the testimony period (see §§ 1.671(e) and 1.672(b)). When a party believes that testimony is necessary to decide a motion under § 1.633 or § 1.634, the party would have to describe the nature of the testimony needed. If an examiner-in-chief agrees that testimony is needed, appropriate interlocutory relief would be granted and testimony would be ordered.

Example 23: An interference is declared with one count between application AH and application AJ. Applicant AH files a preliminary motion under § 1.633(c)(1) to redefine the interference by adding a second count. In order to succeed, applicant AH must show that the proposed count to be added is directed to a "separate patentable invention" (see § 1.601(n)) from the count already in the interference. In the motion, applicant AH sets forth in detail the testimony which would be required to prove that the subject matter of the proposed count is to a separate patentable invention from the subject matter of the count in the interference. Applicant AJ opposes the motion on the ground that the proposed and present counts define the "same patentable invention" (see § 1.601(n)). An examiner-in-chief determines that a material fact is in dispute and that applicant AH has established testimony is needed to properly rule on the motion. Under the circumstances, the motion would be deferred to final hearing and a testimony period would be ordered. The questions of (1) whether the proposed and present counts define the same patentable invention and (2) priority would be decided at final hearing.

Under § 1.640, an examiner-in-chief would decide all motions. A hearing could be held on a motion in the discretion of an examiner-in-chief. Where appropriate, an examiner-in-chief could consult with an examiner on a question of patentability which arises in the first instance in the interference. Consultation would not be necessary where the examiner had already ruled on the patentability question which comes before the examiner-in-chief or the Board. Moreover, nothing in § 1.640 authorizes conferences between examiners-in-chief and examiners in *ex parte* appeals under 35 U.S.C. § 134 from an adverse decision of an examiner. A party is entitled to request reconsideration of a decision on a motion by a single examiner-in-chief. An opposition to a request for reconsideration could not be filed unless ordered by an examiner-in-chief or the Board, but the decision by the single examiner-in-chief would not normally be modified unless an opposition has been requested. The request for reconsideration would be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom would normally be the examiner-in-chief who decided the motion. Several comments were received in response to the advance notice questioning why the examiner-in-chief who decided the motion would form part of the panel deciding the request for reconsideration. The decision to propose, and now adopt, a regulation which would permit the examiner-in-chief who decided the motion to participate in the decision on reconsideration was made after careful balancing of all the factors involved. It could have been proposed to permit the examiner-in-chief to individually decide the request for reconsideration. However, it is believed that parties in interference cases would feel that their requests for reconsideration are being more fully considered if more than one person considers their request. The two additional examiners-in-chief would be able to consult with the examiner-in-chief most familiar with the case, but would be able to control the decision on reconsideration by a majority vote. Use of the examiner-in-chief who decided the motion and two additional examiners-in-chief would (1) minimize delay which would occur if three new examiners-in-chief were used who were unfamiliar with the record and (2) minimize the possibility that reversible error occurred if only the examiner-in-chief who decided the motion also individually decided the request for reconsideration.

Under § 1.644, petitions to the Commissioner are authorized in interference cases under certain restricted conditions. Petitions in interferences have been the source of substantial delay. Section 1.644 attempts to minimize those delays. Section 1.644 authorizes a petition to the Commissioner from a decision of an examiner-in-chief or a panel when the examiner-in-chief or the panel shall be of the opinion (1) that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (2) that an immediate decision on petition would materially advance the ultimate termination of the interference. The standard is intended to be analogous to that of a district court certifying a question to a court of appeals under 28 U.S.C. § 1292(b). A petition could be filed seeking to invoke the supervisory authority of the Commissioner. However, the petition could not be filed prior to entry of judgment and could not relate to the merits of priority or patentability or the admissibility of evidence under the Federal Rules of Evidence. A petition could also be filed seeking waiver of a rule. A fee of $120 would be charged for each petition and for each request for reconsideration of a decision on petition. Any petition would be decided on the record made before the examiner-in-chief or the Board and additional evidence could not be submitted with the petition. An opposition could not be filed unless ordered by the Commissioner. Where reasonably possible, service of a petition would have to be such that delivery is accomplished within one day. Service by hand or "Express Mail" would comply with this requirement.

Section 1.645 permits a party to file a motion to seek an extension of time to take action in an interference or to seek judicial review. The motion would have to be filed within sufficient time to actually reach an examiner-in-chief prior to expiration of the time for taking action. Under § 1.645, a moving party would not be able to assume that a motion for an extension of time would be granted. Under § 1.610(d)(6), a request for an extension of time could be made orally and an appropriate order would then be entered thus eliminating considerable paper work. The order would be the written record of the request and decision. See § 1.2. Extensions of time have caused numerous delays in interference cases. Under present interference practice, some delays are caused because attorneys and agents on many occasions unexpectedly receive orders setting times. Under the new practice, attorneys and agents can expect times to be set for filing preliminary statements, preliminary motions, motions for additional discovery, testimony, and briefs after a conference call. It is expected that use of conference calls will permit an examiner-in-chief and attorneys or agents for parties to set a time schedule which is mutually satisfactory. A motion to extend time would not be granted unless a party shows good cause. The use of conference calls would allow schedules to be set before orders setting time are entered and therefore the press of other business which arises after the examiner-in-chief and attorneys and agents agree to times would not normally be considered good cause.

Under § 1.647, when a party relies on a document in a foreign language, an English language translation of the document and an affidavit attesting to the accuracy of the translation would be required. The rule would apply to any document, including evidence submitted with motions, foreign applications for which a party seeks benefit, testimony, and exhibits introduced in evidence during testimony.

Under § 1.651, after a decision is entered on preliminary motions, an examiner-in-chief would set times for filing motions for additional discovery and for taking testimony. Any motion for additional discovery would be to obtain answers to terrogatories, requests for admissions, and documents and things necessary for a party to prepare its case-in-chief.

Section 1.653 sets out what shall be in the record to be considered by the Board at final hearing. The record would continue to be printed or typed on paper 8-1/2 by 11 inches in size. Accordingly, when a party files an affidavit, the party should use 8-1/2 by 11 inches paper for the affidavit.

Section 1.654 continues the practice of holding a final hearing where oral argument may be presented by all parties. No fee would be charged for appearing at oral argument at final hearing in an interference.

Section 1.655 specifies the matters which can be considered in rendering a final decision. Patentability is an issue which may be raised. The Board can also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion, although any interlocutory order would be presumed to be correct and burden of showing error shall be on the party attacking the order. This last procedural provision permits the Board to correct any manifest error before a party seeks judicial review of an interlocutory order along with judicial review of the Board's final decision.

Section 1.656 sets forth the requirements for briefs for final hearing. In large measure, § 1.656 follows the requirements of Rule 28 of the Federal Rules of Appellate Procedure. An original and three copies of a brief is required. Under § 1.656(h), if a party wants the Board in rendering its final decision to rule that any evidence is inadmissible, the party must file with its opening brief an original and three copies of a motion to suppress the evidence. Any previous objection to the admissibility of evidence is waived unless the motion to suppress is filed. This procedural provision makes clear that an objection to the admissibility of evidence must be renewed at final hearing and will be considered by the Board in rendering its final decision. When a junior party fails to file a brief, an order can be issued requiring the junior party to show cause why failure to file the brief should not be taken as a concession of priority.

Under § 1.658 the Board would enter a final decision. The decision can (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing claims which correspond to the count. When judgment is entered as to all counts, the decision of the Board is considered final for the purpose of judicial review. Section 1.658(c) defines the doctrine of interference estoppel as it is to be applied in the PTO after an interference is terminated. The definition of interference estoppel is designed to encourage parties in interference cases to settle as many issues as possible in one proceeding. Section 1.658(c) creates an estoppel both as to senior and junior parties unlike the present practice (37 CFR § 1.257) which limits estoppel in some instances to junior parties. An estoppel would *not* apply with respect to any claims which correspond, or which properly could have corresponded, to a count as to which the party was awarded a favorable judgment. A few examples illustrate how estoppel would be applied.

Example 24: Junior party applicant AL and senior party applicant AK both disclose separate patentable inventions "A" and "B" and claim only invention A in their respective applications. An interference is declared with a single count to invention A. Neither party files a preliminary motion (see § 1.633(c)(1)) to add a count to invention B. Judgment as to all of AL's claims corresponding to the sole count is awarded to junior party applicant AL. Senior party applicant AK would be estopped to thereafter obtain a patent containing claims to invention B, because applicant AK failed to move to add a count to invention B in the interference. Junior party applicant AL would not be estopped to obtain a patent containing claims to invention B.

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Example 25: In this example, the facts are the same as in Example 24 except that judgment is awarded as to all AK's claims corresponding to the count to senior party applicant AK. Junior party applicant AL would be estopped to obtain a patent containing claims to invention B in the interference. Senior party applicant AK would not be estopped to obtain a patent containing claims to invention B.

Example 26: Junior party applicant AM and senior party applicant AP both disclose separate patentable inventions "C", "D", and "E" and claim inventions C and D in their respective applications. An interference is declared with two counts. Count 1 is to invention C and Count 2 is to invention D. Neither party files a preliminary motion to add a proposed Count 3 to invention E. Judgment as to all AM's claims corresponding to Counts 1 and 2 is awarded to junior party applicant AM. Senior party applicant AP would be estopped to thereafter obtain a patent containing claims to invention E, because applicant AP failed to move to add a count to invention E in the interference. Junior party applicant AM would not be estopped to obtain a patent containing claim to invention E.

Example 27: In this example, the facts are the same as in Example 26 except that judgment is awarded as to all AP's claims corresponding to Counts 1 and 2 to senior party applicant AP. Junior party applicant AM would be estopped to obtain a patent containing claims to invention E, because applicant AM failed to move to add a count to invention E in the interference. Senior party applicant AP would not be estopped to obtain a patent containing claims to invention E.

Example 28: In this example, the facts are the same as in Example 26 except that judgment is awarded on all of AM's claims corresponding to Count 1 to junior party applicant AM and judgment is awarded on all AP's claims corresponding to Count 2 to senior party applicant AP. Both parties would be estopped to obtain a patent containing claims to invention E, because neither moved to add a count to invention E during the interference. Assume that junior party AM could have properly moved under § 1.633(f) to be accorded the benefit of an earlier application, but did not do so during the interference. Junior party AM would not be estopped in subsequent *ex parte* prosecution from asking for benefit of the earlier application as to the invention defined by Count 1. Accordingly, if the examiner were to reject junior party AM's claim corresponding to Count 1 on the basis of some newly discovered prior art, junior party AM could properly antedate the prior art by seeking the benefit under 35 U.S.C. § 120 of the earlier application. Thus, even though junior party AM was a "losing party" as to Count 2 (an adverse judgment as to junior party AM's claims corresponding to Count 2 having been entered), junior party AM was awarded a favorable judgment (§ 1.658(c)) as to Count 1. Junior party AM would be estopped in subsequent *ex parte* prosecution from attempting to be accorded the benefit of the earlier application as to the invention of Count 2.

Example 29: Applicant AQ discloses and claims invention "F." Applicant AR discloses and claims separate patentable inventions "F" and "G." The assignee of applicant AQ also owns an application AS which discloses and claims invention "G." An interference is declared between applicant AQ and applicant AR. The sole count is directed to invention F. No motion is filed by applicant AQ or its assignee to declare an additional interference between applicant AR and applicant AS with a count to invention G. A judgment as to all of AR's claims corresponding to the sole count is awarded to applicant AR. Applicant AS and the assignee would be estopped to obtain a patent containing claims to invention G, because applicant AR and the assignee failed to move to declare an additional interference with a count to invention G.

Example 30: The facts in this example are the same as the facts in Example 29 except that judgment as to all of AQ's claims corresponding the sole count is awarded to applicant AQ. Applicant AS and the assignee would not be estopped, because applicant AQ was not a "losing party" (§ 1.658(c)).

Example 31: Applicant AT discloses a generic invention to "solvent" and a species to "benzene." Application AT contains a patentable claim 1 (solvent) and no other claims. Applicant AU discloses the generic invention to "solvent" and species to "benzene" and "toluene." Application AU contains patentable claim 3 (solvent) and no other claims. An interference is declared with a single count (solvent). Claims 1 of application AT and claim 3 cf applicatien AU are designated to correspond to the count. No preliminary motions are filed. A judgment is entered in favor of applicant AT on the claim corresponding to the sole count. Applicant AU would be estopped to obtain a patent containing a claim to benzene, because applicant AU failed to file a preliminary motion under § 1.633(c)(1) seeking to add a count to benzene and benzene was disclosed in winning party AT's application. Applicant AU would also be estopped to obtain a patent containing a claim to toluene, unless "toluene" defines a "separate patentable invention" from "solvent ." A basis for interference estoppel (§ 1.658(c)) exists if "toluene" and "solvent" define the "same patentable invention," because a claim to "toluene" could properly have been added and designated to correspond to the count. See § 1.633(c)(2).

Under § 1.659, the Board would be able to make recommendations to examiners and the Commissioner, including recommendations that application claims not involved in the interference be rejected and that a patent be reexamined as to patent claims not involved in the interference.

Under § 1.660, a party would be required to notify the Board when the party's patent or application becomes involved in other PTO proceedings (reexamination, reissue, or protest) or litigation.

Section 1.661 sets forth when an interference is considered terminated after a judgment is entered in the interference. For the purpose of filing copies of settlement agreements, an interference is considered terminated when the time for all appeals has expired. *Tallent* v. *Lemoine*, 204 USPQ 1058 (Comm'r.Pat. 1979). See also *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.662 provides that a party may request that an adverse judgment be entered. The section also provides that when a written disclaimer (not a statutory disclaimer), concession of priority or unpatentability, abandonment of the invention, abandonment of an application, or abandonment of the contest is filed, the disclaimer, concession, or abandonment would be treated as a request for entry of an adverse judgment. Section 1.662(b) provides that when a patentee files a reissue application and omits all claims of a patent corresponding to the counts of an interference for the purpose of avoiding the interference, judgment would be entered against the patentee. Under § 1.662(c), the filing of a statutory disclaimer would not be treated as a request for entry of an adverse judgment unless all patent claims corresponding to a count are disclaimed. Under § 1.662(d), if after entry of a judgment or after filing of a statutory disclaimer no interference exists, the interference would be terminated as to any party against whom judgment has not been entered and any further prosecution of any application involved in the interference would be *ex parte* before the examiner.

Section 1.666 sets out the procedure for filing settlement agreements in interference cases. The PTC is merely a repository for copies of agreements filed under 35 U.S.C. § 135(c) and does not undertake to rule on whether the statute requires that a copy of any particular agreement be filed. *Nelson* v. *Bowler*, 212 USPQ 760 (Comm'r.Pat. 1981).

Section 1.671 sets out what would be considered evidence. The Federal Rules of Evidence, with certain exceptions, are made applicable to interference cases. Under § 1.671(e), a party cannot rely on a previously filed affidavit unless the affidavit is served and notice is given that the party inteods to rely on the affidavit. The purpose for the notice is to permit an opponent to determine whether a deposition for cross-examination is necessary (see §§ 1.672(b) and 1.673(e)).

Section 1.671(e) is intended to overrule prior construction of PTO rules in *Holmes* v. *Kelly*, 586 F.2d 234, 237 n. 7, 199 USPQ 778, 782 n. 7 (CCPA 1978) and *Brecker* v. *Jennings*, 204 USPQ 663 (Bd.Pat.Int. 1978), which considered a Rule 132 affidavit in the file of an involved application to be part of the "record" in an interference. Under § 1.671(e), a party intending to rely on such an affidavit must give notice and serve a copy of the affidavit on the opponent.

Under § 1.671(f), the significance of documentary and other exhibits must be discussed with particularity by a witness during oral deposition or in an affidavit. Section 1.671(f) sets out in the regulations an evidentiary requirement imposed by precedent. See *Popoff* v. *Orchin*, 144 USPQ 762 (Bd.Pat.Int. 1963) (unexplained experimental data should not be considered); *Chandler* v. *Mock*, 150 F.2d 563, 66 USPQ 209 (CCPA 1945) (records standing alone were held to be meaningless), and *Smith* v. *Bousquet*, 111 F.2d 157, 45 USPQ 347 (CCPA 1940) (unexplained tests in stipulated testimony are entitled to little weight). See also *In re Borkowski*, 505 F.2d 713, 184 USPQ 29 (CCPA 1974) and *Triplett* v. *Steinmayer*, 129 F.2d 869, 54 USPQ 409 (CCPA 1942). Under § 1.671(g), a party is required to obtain permission from an examiner-in-chief prior to proceeding under 35 U.S.C. § 24. This requirement insures that a subpoena is necessary (e.g., a subpoena ordinarily should not be necessary where testimony of an opponent is sought) and that testimony sought through a § 24 subpoena is relevant before a subpoena is issued. The motion seeking permission to proceed under § 24, any opposition thereto, and the order of an examiner-in-chief authorizing the moving party to proceed under § 24 will be of assistance to a federal court in the event a party is required to resort to a court to enforce the subpoena or to compel answers to questions propounded at any deposition where a witness is appearing pursuant to a subpoena. See *Sheehan* v. *Doyle*, 529 F.2d 38, 188 USPQ 545 (1st Cir.), *cert. denied*, 429 U.S. 870 (1976), *rehearing denied*, 429 U.S. 987 (1976).

Under § 1.671(h), any evidence which is not taken or sought and filed in accordance with the regulations will not admissible.

Section 1.672 sets forth the manner in which testimony shall be taken. Testimony can be taken by deposition or affidavit at the election of the party presenting the testimony. A party presenting testimony by affidavit must file and serve the affidavit. If the party presents testimony by affidavit and an opponent elects to cross-examine the affiant, the party is required to notice a deposition for the purpose of cross-examination. Re-direct and re-cross will take place at the deposition. Where the parties agree, testimony can be presented by affidavit without opportunity for cross-examination (see § 1.672(e)) or by an agreed statement of facts (see § 1.672(f)).

Section 1.673 sets out how a deposition must be noticed. A deposition can be noticed for any reasonable place in the United States. The extent to which parties, witnesses, and attorneys or agents have to travel may be considered in determining whether a place is reasonable. Prior to serving a notice for a deposition, a party is required to take two procedural steps. Under § 1.673(b), a party would be required to serve a copy of the documents and a list of the things in its possession, custody, and control upon which it intended to rely. Under § 1.673(g), the party is required to have an oral conference (in person or by telephone) with all opponents to attempt to agree on a mutually acceptable time and place for taking the deposition. An examiner-in-chief may set the time and place if agreement is not reached. A single notice listing all the witnesses and thegeneral nature of their expected testimony is then served. Under § 1.673(c) and except as provided, a party can not rely on any witness not mentioned in the notice, any document not served, or any thing not listed. Under § 1.673(h), a copy of any notice must be attached to the certified transcript of each deposition filed.

Section 1.674 sets out the persons before whom depositions can be taken.

Section 1.675 sets out how a deposition is to be taken.

Section 1.676 sets out how a court reporter should prepare and file a certified transcript of a deposition. Section 1.676(d) sets out how exhibits are to be marked for identification, used at depositions, and filed. Provisions similar to those of Rule 30(f)(1)(A) and (B) of the Federal Rules of Civil Procedure are applicable to interferences.

Section 1.677 sets out the form of a transcript of a deposition.

Under § 1.678, a transcript of a deposition must be filed in the PTO within 45 days of the date of the deposition.

Section 1.682 sets out how a party may introduce in evidence, if otherwise admissible, official records or printed publications. When a notice is served, a party is also required to serve (but not file) copies of the official records and printed publications. Any objection to the notice or to the admissibility of any official record or publication must be filed within 15 days of the date of service of the notice.

Section 1.683 sets out how a party may use testimony from another interference or proceeding.

Section 1.684 sets out how a party may take testimony in a foreign country.

Section 1.685 sets out how objections during the taking of depositions must be raised. Under § 1.685(a), an error in a notice of deposition is waived unless a motion to quash the notice is filed as soon as the error is, or could have been, discovered. Under § 1.685(b), any objection to the qualifications of an officer is waived unless (1) the objection is noted on the record of the deposition before a witness begins to testify or (2) if discovered after the deposition, a motion to suppress is filed as soon as the objection is, or could have been, discovered. Under § 1.685(c), any error in the manner in which testimony is transcribed, the transcript is signed by a witness, or the transcript is prepared or otherwise handled by the court reporter is waived unless a motion to suppress is filed as soon as the error is, or could have been, discovered. Under § 1.685(d), any objection on the merits to the admissibility of evidence (e.g., under the Federal Rules of Evidence is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Often objections are cured by subsequent testimony. Accordingly, any objection which a party wants the Board to consider at final hearing must also be made the subject of a motion under § 1.656(h).

Section 1.687 sets out how a party could seek and obtain additional discovery. "Additional discovery" is defined in § 1.601(a). Section 1.687 does not change the standard ("interest of justice") for obtaining discovery.

Section 1.688 sets out how a party can introduce into evidence admissions and answers to interrogatories obtained as a result of additional discovery.

Changes in Text

Several changes have been made to the text of the proposed rules published in the *Federal Register* on Jan. 30, 1984. The changes are discussed below. Additional rationale for the changes are further discussed under the heading "Analysis of Comments."

All references to the "Board of Appeals and Interferences" have been changed to "Board of Patent Appeals and Interferences" in view of Public Law 98-622.

In § 1.11(a) the language "or after termination of an interference without an award of judgment" has been deleted. This change has been made in view cf changes made in paragraphs (c) and (d) of § 1.662.

In response to a comment, the fee required for a petition in an interference under § 1.644(e) and a request fcr reconsideration of a decision on petition in an interference under § 1.644(f) have been set out as separate items.

Section 1.136 was changed to refer to § 1.611 rather than § 1.610(a).

The following sentence was inadvertently omitted as the third sentence of § 1.138 in the notice of proposed rulemaking: "A registered attorney or agent acting under the provision of § 1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application." This sentence presently appears in § 1.138.

In § 1.196(d), second sentence, "thirty days" has been changed to "one month".

In § 1.197(b), "thirty days" has been changed to "one month".

In the last sentence of § 1.304, "The Commissioner" has been changed to "An examiner-in-chief" and "of a decision of the Board of Patent Appeals and Interferences in an interference case" has been inserted after "time for seeking judicial review." This change is made to limit the "excusable neglect" standard to interference cases only.

In § 1.601(j), the language "all the claims of a party which correspond" has been changed to read "at least one claim of a party which corresponds". The language "all the claims of an opponent which correspond" has been changed to read "at least one claim of an opponent which corresponds".

Section 1.605(a) has been changed by deleting from the third sentence the language "a claim which is the same or substantially the same as" and by adding the following sentence as the fourth sentence: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." In the second sentence, "30 days" has been changed to "one month".

In the last sentence of § 1.606, the language "to define one patentable invention" has been changed to read: "not to contain separate patentable inventions."

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The word "and" has been inserted in § 1.607(a) before "(3)". The word "must" in the first sentence of § 1.607(c) has been changed to "shall" in response to a suggestion in a comment.

Pursuant to two separate suggestions, the following is being added after the first sentence in § 1.608(b): "Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To facilitate preparation of a record (§ 1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 by 11 inches (21.8 by 27.9 cm.)."

In § 1.609(b)(1), the language "count or counts" has been changed to "proposed count or counts". In § 1.609(b)(2), each occurrence of "the count" has been changed to "each count".

In § 1.613(a), "§ 1.344" has been changed to "this Chapter." This change is being made to obviate the need to again amend § 1.613 in the event new rules relating to practice before the PTO are issued. See the notice of proposed rulemaking published in the *Federal Register* on Aug. 24, 1984, 49 F.R. 33790, proposed §§ 10.62 and 10.66. The language "or members of the same firm of attorneys or agents" has been added after "agent" in § 1.613(b).

In § 1.615(a), second sentence, "which are" has been deleted and "in the interference" has been added after "will not be entered or considered".

Several changes have been made in § 1.617. In § 1.617(a), the language "the interference shall proceed before the examiner-in-chief" has been changed to read: "the interference shall proceed in the normal manner under the regulations of this part". The second sentence of § 1.617(b) ("A response may include a request by the applicant for a hearing before the Board.") has been changed to read: "Any request by the applicant for a hearing before the Board shall be made in the response." This change was made to clarify when and how a hearing must be requested by the applicant. The second sentence of § 1.617(d) has been changed to read: "The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." Section 1.617(e) has been re-written as follows: "Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." The language "examiner-in-chief or the" has been added after "by the applicant is timely filed, the" in the first sentence of § 1.617(g). The language "Board decides that" has been deleted from the second sentence of § 1.617(g). The language "If the Board decides otherwise" has been replaced with "Otherwise" in the third sentence of § 1.617(g). The language "before the examiner-in-chief" in the third sentence of § 1.617(g) has been changed to read: "in the normal manner under the regulations of this part." These changes will authorize either an examiner-in-chief or a Board to authorize an interference to proceed under § 1.617(g). It will continue to be necessary for the Board to enter an order *granting* summary judgment. In the last sentence of § 1.617(h), "patentee" has been changed to "any opponent".

The language "the name of" has been deleted from the first sentence of § 1.622(a). The second sentence of § 1.622(a) in the notice of proposed rulemaking ("When an inventor identified in the preliminary statement is not identical to the inventor named in the party's application or patent, the party shall file a motion . . . .") has been changed to read: "When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion . . . ." This change is being made in view of § 105(a) of Public Law 98-622 which amended 35 U.S.C. § 116 to permit joint inventors to be named "even though . . . (3) each did not make a contribution to the subject matter of every claim . . . ."

The following changes have been made in § 1.623(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description" has been changed to "copy of the first written description". In the third sentence, "when a drawing or written description" has been changed to "when a copy of the first drawing or first written description".

Several changes have been made to § 1.624. The following has been added as a second sentence in § 1.624(a)(5): "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." The following changes have been made in § 1.624(c). Each occurrence of "was made" has been changed to "was introduced into the United States." In the first sentence, "copy of the drawing" has been changed to "copy of that drawing". In the second sentence, "copy of the written description" has been changed to "copy of that written description". In the third sentence, "a drawing or written description" has been changed to "a copy of the first drawing or first written description introduced in the United States".

The following changes have been made in § 1.625(c). In the first sentence, "copy of the drawing" has been changed to "copy of the first drawing". In the second sentence, "copy of the written description" has been changed to "copy of the first written description". In the third sentence, "a drawing or written description" has been changed to "a first drawing or first written description".

The language of § 1.628(b) which read: "because the drawing or written description is not in the party's possession, custody, or control, the party may file a motion . . . to amend its preliminary statement promptly after it secures possession, custody, or control of a copy of the drawing or written description" has been changed to read as follows: "the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion . . . to amend its preliminary statement promptly after the first drawing, first written description or drawing or written description first introduced into the United States becomes available."

The first sentence ("A preliminary statement should be carefully prepared.") has been deleted from § 1.629(a).

In § 1.629(b), the language "no earlier than" has been changed to "as early as".

In § 1.629(d), the following has been added after "allegation: "unless the party complies with § 1.628(b)."

A new § 1.632 has been added to require a party to give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. A companion change has been made to § 1.654.

Two changes have been made to § 1.633(c). Paragraph (c)(2) has been changed by adding thereto the following language: "or adding a claim in the moving party's application to be designated to correspond to a count". In addition, in § 1.633(c), the "or" before "(4)" has been deleted and the following has been added to the end of the first sentence: ", or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count."

Paragraph (j) has been added to § 1.633.

In § 1.636(b), "(i)" has been changed to "(i) or (j)" in view of the addition of paragraph (j) to § 1.633. The language "filed as soon as practical" in § 1.636(c) has been changed to "diligently filed" in order to conform § 1.636 to § 1.48. A party must exercise diligence in correcting inventorship. *Van Otteren* v. *Hafner*, 278 F.2d 738, 126 USPQ 151 (CCPA 1960).

Several changes have been made to § 1.637. The language "Where appropriate," has been deleted from the following paragraphs of § 1.637: (c)(1)(vi); (c)(2)(iv); (c)(3)(iii); (d)(4); (e)(1)(viii); (e)(2)(vii); and (h)(4). The following has been added in § 1.637(c)(2) before "shall": "or adding a claim to be designated to correspond to a count". The language "amended claim" in § 1.637(c)(2)(i) has been changed to read: "amended or added claim". The language "Apply the terms of each proposed claim to the disclosure of the application" in § 1.637(c)(2)(ii) has been changed to read: "Show that the proposed or added claim defines the same patentable invention as the count." The language "proposed amended claim" in § 1.637(c)(2)(iii) has been changed to read "amended or added claim." The language "adding the proposed claim" in § 1.637(c)(2)(iii) has been changed to read: "making the amended or added claim".

The word "interferences" in § 1.637(c)(4)(ii) has been corrected to read: "interference".

Subparagraph (c)(5) has been added to § 1.637.

The following has been added as the last sentence to § 1.637(f)(2): "If the earlier application filed abroad is not in English, the requirements of § 1.647 must also be met."

In paragraph § 1.637(f)(3), the language "discloses an embodiment with the scope" has been changed to read: "constitutes a constructive reduction to practice".

The first sentence, originally proposed in § 1.638(b) ("A reply to an opposition shall not be filed unless authorized by this subpart or an examiner-in-chief or the motion was filed under §§ 1.633 or 1.634"), has been deleted. The language "any authorized reply" in § 1.638(b) has been changed to "a reply".

The language "or a motion to correct inventorship under § 1.634" has been added to the first sentence of § 1.639(c) after "preliminary motion under § 1.633."

The following has been added after the first sentence of § 1.640(b)(1): "Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved." The fourth sentence of § 1.640(c) ("A request for reconsideration will ordinarily not be granted unless an opposition has been requested by an examiner-in-chief or the Board") has been changed to read: "A decision of a single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board." In the last sentence of § 1.640(c), the language "shall be decided by a panel" has been changed to read: "shall be acted on by a panel".

The word "application" in the paragraph heading and text of § 1.642 has been changed to read: "application or patent".

Three changes have been made in § 1.644. The following language has been added after "Commissioner" in § 1.644(a)(2): "and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence". The following language has been deleted from the second sentence of § 1.644(b): "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under the Federal Rules of Evidence". The language "A request for reconsideration will ordinarily not be granted unless" in the second sentence of § 1.644(f) has been changed to read: "The decision will not ordinarily be modified unless such".

Two changes have been made in § 1.645. The word "to" has been added before "file a notice of appeal" and "commence a civil action" in the first sentence of paragraph (a). The language ", accompanied by an affidavit," has been deleted from paragraph (b).

Three changes have been made to § 1.646. The word "service" has been added after "additional" in the third sentence of paragraph (b). The language "or except as otherwise provided by this part," has been added after "otherwise ordered by an examiner-in-chief," in paragraph (c). The language in paragraph (c) "paper may be made" has been changed to "paper shall be made". The word "time" has been changed to "date" in the last sentence of paragraph (e).

A new paragraph (c) has been added to § 1.654 to require that a party give timely notice of the party's intent to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice. Section 1.632 specifies the time within which the notice shall be filed.

Three changes have been made in § 1.658. The language "paragraph (a) of the section" in the last sentence of § 1.658(b) has been changed to "paragraph (a) of this section". The "(i)" in the first sentence of § 1.658(c) has been changed to "(j)" in view of the addition of § 1.633(j). In the notice of proposed rulemaking, the second sentence of § 1.658(c) read: "A party, other than a party awarded a favorable judgment as to all counts, who could have properly moved, but failed to move, under §§ 1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with the party's failure to properly move." This sentence has been changed to read: "A losing party who could have properly moved, but failed to move, under §§ 1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment."

Several changes have been made in § 1.662. In § 1.662(a), the word "construed" has been changed to "treated". The first sentence of § 1.662(c) in the notice of proposed rulemaking read: "The filing of a statutory disclaimer under 35 U.S.C. § 253 by a patentee will not be treated as a request for entry of an adverse judgment against the patentee, but will delete any statutorily disclaimed claims from being involved in the interference." That first sentence has been changed to read: "The filing of a statutory disclaimer under 35 U.S.C. § 253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference." The second sentence of § 1.662(c) in the notice of proposed rulemaking read: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." That second sentence has been changed to read: "A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count." In view of this change, proposed § 1.662(d) has been deleted as unnecessary, and a change has also been made in § 1.11(a) to delete any reference to a termination of an interference by any means other than judgment.

The last sentence of § 1.671(g) has been changed from "The motion shall describe the general nature and show the admissibility in the interference of the testimony, document, or thing" to: "The motion shall describe the general nature and the relevance of the testimony, document, or thing."

Three changes have been made to § 1.672(b). In the second sentence after "witness by affidavit shall" the following has been added: ", prior to the close of the party's relevant testimony period". The language "file an affidavit" has been changed to "file and serve an affidavit". The following has been added after the third sentence: "A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document."

Several changes have been made in § 1.673(b). The introductory sentence of paragraph (b) ("Unless the parties agree otherwise, at least three days prior to the conference required by paragraph (g) of this section, a party shall serve, but not file, the following:") has been changed to read: "Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:" In § 1.673(b)(1) the word "copy" has been changed to "list and copy".

In the last sentence of § 1.675(d), the language "signed by the witness in the presence of any notary" has been changed to read "signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration". This change conforms § 1.675(d) to § 1.68.

In § 1.682(a)(4), ", where appropriate," has been added prior to "be accompanied" and "(§ 1.671(d))" has been added after "printed publication".

The word "admissible" in § 1.684(a)(4) has been changed to "relevant".

The following sentence has been deleted from § 1.687(b): "If the witness refuses to produce a requested document or thing, the party may file a motion (§ 1.635) for additional discovery under paragraph (c) of this section."

Section 1.688 has been revised to more clearly describe how a party may introduce in evidence an answer to a request for admission or an answer to a written interrogatory.

Analysis of Comments

Eighteen written comments were received. Three individuals testified at a hearing held on May 15, 1984. The following is an analysis of the written comments and the oral comments made at the hearing.

One comment suggested that § 1.8 not be amended to exclude from the certificate of mailing practice a paper in an interference

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which an examiner-in-chief orders to be filed by hand or "Express Mail." The comment argues that "[s]ome parties might not have an attorney in the Washington area or they may live in an area not serviced by Express Mail." The suggestion is not being adopted. Experience has shown that there are situations in interferences where it is desirable to have and the parties need a prompt ruling on a written motion. It is difficult for an examiner-in-chief to render a prompt ruling if the motion and any opposition are not promptly served and filed. In those situations where a party has no Washington, D.C. metropolitan area attorney or where a party resides in an area not served by "Express Mail," it may not be possible to hand-file or use "Express Mail." The examiner-in-chief would then exercise discretion by not invoking the exception of new subparagraph (xii) of § 1.8(a).

One comment suggested that it would be clearer if the fee for a petition in an interference and the fee for a request for reconsideration of a decision on petition in an interference were set out in § 1.17(h) as separate items. This suggestion has been adopted and the two fees have been set out in § 1.17(h) as separate items.

A suggestion was made that a reference be made in § 1.136 to § 1.611 rather than § 1.610(a). The suggestion is being adopted, because a reference to § 1.611 is believed to be more appropriate. Once an interference is declared involving an application, *ex parte* prosecution of the application is suspended and the applicant need not respond to any PTO action outstanding as of the date the interference is declared.

One comment made the following remark concerning § 1.196: "I do not understand the need or desire of the PTO to start the time to appeal to a Court from a PTO *final* decision on one claim, while PTO action is continuing on a second claim." As explained in the notice of proposed rulemaking (49 F.R. 3770, columns 2-3; 1039 O.G. 20-21; 1039 TMOG 20-21), when there are further proceedings before the examiner following a decision by the Board of Patent Appeals and Interferences, judicial review is not appropriate. Hence, under § 1.196, the PTO will not start a time for seeking judicial review of a PTO decision on one claim while PTO action is continuing on another claim. The last sentences of § 1.196(b)(1) and § 1.196(d) authorize the Board to enter an order making its decision final as to one claim when remand proceedings as to another claim result in a favorable decision for the applicant. Section 1.196 is intended to eliminate piecemeal appeals.

With respect to § 1.292(c), one commentator said: "[a] party should be able to raise public use and [on] sale issues at any stage [of an interference proceeding] provided the issue is raised in a timely manner after learning of the use or sale." Public use and on sale issues are to be raised in interferences by way of a preliminary motion under § 1.633(a). If a motion under § 1.633(a) cannot be timely filed, a belated motion may be filed provided the moving party complies with the provisions of § 1.645(b). Whether or not a belated motion will be accepted where a public use or sale is discovered after the time for filing § 1.633(a) motions which has passed will manifestly depend on the facts of a given case.

One comment suggested that the language "speedy, and inexpensive" be deleted from the second sentence of the preamble of § 1.601. This suggestion is not being adopted. The second sentence of the preamble of § 1.601 provides that the rules "shall be construed to secure the just, speedy, and inexpensive determination of every interference." The provision is modeled in part after the second sentence of Rule 1 of the Federal Rules of Civil Procedure which states that the Federal Rules "shall be construed to secure the just, speedy, and inexpensive determination of every action." The "just, speedy, and inexpensive determination" provision of § 1.601 will prove useful in construing other provisions in the rules.

Two comments were received which suggested a change in language in § 1.601(j). One comment correctly noted that "[i] f even one claim of each party defines the same patentable invention, there is an interference-in-fact." The comment went on to correctly note that "[t] he remaining claims can be disposed of by a motion under § 1.633(c)(4)." A second comment noted that under the definition proposed, all the claims of both parties corresponding to a count must define the same patentable invention. The comment went on to correctly note the intent of the PTO is, however, that an interference-in-fact exists if at least one of the claims of a party corresponding to a count defines the same patentable invention as one of the corresponding claims of an opponent. In view of the suggestions made in the two comments, § 1.601(j) has been changed to state that an interference-in-fact exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count defines the same patentable invention.

Two comments were received which suggested that the language "earliest filing date" in § 1.601(m) be changed to read "earliest effective filing date." The suggestion is not being adopted. Section 1.601(m) defines "senior party." The definition of "senior party" in § 1.601(m) is consistent with current practice and is intended to codify current practice. In an interference where there are no benefit applications, the "senior party" is the party with the earliest "filing date." There are interferences where a party may be "senior" with respect to a first count based on the filing dates of the applications involved in the interference and "junior" with respect to a second count because the opponent is entitled to benefit of an earlier application as to the second count only. Under these circumstances in the past, the PTO has designated the party who is "senior" based on the filing dates of the applications involved as the "senior party." The designation of the party as "senior party" is for procedural purposes only, i.e., setting who takes testimony first, and does not affect which party has the burden of proof. Section 1.601(m) preserves this past practice.

Comments were received regarding § 1.601(n) which defines "same patentable invention" and "separate patentable invention." One written comment suggested that § 1.601(n) be deleted. The commentator appeared at the hearing and also urged orally that § 1.601(n) be deleted. The suggestion is not being adopted. In view of the nature of the comment and the importance of the definitions in § 1.601(n), the written comment is reproduced in its entirety:

Comment: The paragraph to be deleted contains an explicit definition of both "same patentable invention" and "separate patentable invention". It requires application of a two-prong test for determining "sameness" or "separateness". Two inventions are considered to be the "same patentable invention" when they are the same under 35 USC 102 or obvious variants under 35 USC 103 when one is considered as "prior art" with respect to the other. Application of this standard may lead to results which are anomalous or in conflict with statutory requirements if, as the proposed rules apparently assume, the award of priority as to counts embodying "separate patentable inventions" will inherently and finally resolve the question of entitlement to a patent as between the parties on involved claims corresponding to those counts. Three specific problems with the definition of Rule 601(n) have been identified as follows:

(1) If the standard of separate patentability as between two counts is applied on a mutual basis (i.e., Invention A must be separately patentable from Invention B considered as prior art and Invention B must be separately patentable from Invention A considered as prior art), then the conduct of interferences with separate counts directed to both a generic invention and an included specific embodiment thereof (i.e., a species) are frustrated. If, however, such mutuality is not applied (i.e., if Invention A is the existing count, then a count directed to Invention B is proper so long as Invention B would be considered patentable over Invention A as prior art), then a number of irreconcilable anomalies in count modification through preliminary motions practice will be manifest.

(2) "Separate patentability" as a non-obviousness issue is in every context *except* interference practice before the PTO determined with finality only when an *affirmative* determination has been reached or the applicant *elects* to discontinue further prosecution of any applications embodying the invention or to admit obviousness. Because in the ex parte context an applicant may continue to marshall additional evidence supportive of non-obviousness until separate patentability over a prior art invention has been established, "separate patentability" is always a fluid concept where ultimate resolution can neither be predicted nor foreclosed. On certain cases interference proceedings under the proposed rules will be conducted and judgment rendered on the assumption of a lack of "separate patentability", which would ordinarily be subject to change or rebuttal as additional argument, evidence or other supportive activity of non-obviousness were marshalled. Thus, simply determining a proposed count is not yet "separately patentable" for the purposes of count formation ought not to foreclose post-interference reconsideration of separate patentability questions when the party proposing the count would not have been foreclosed on priority grounds.

(3) The underlying assumption that "separate patentability" is to be established under the proposed rules for one invention when a second invention is considered as "prior art" does not have any necessary correspondence to the *effect* of an adverse judgment in an interference on the question of priority. While a lost count in interference is not patentable to the loser, the lost count will be considered as "prior art" against the losing party only if the status of prior art for the purposes of 35 USC 103 is established by the record in the interference, (i.e., by representing a prior invention of another made in the United States, not abandoned, suppressed or concealed under 35 USC 102). A party entitled to priority for a count under the benefit provisions of 35 USC 119 creates no "prior art" under 35 USC 102(g)/103 against his opponent. Separate counts ought not to be created or denied in an interference on the basis of a rule which fails to account for whether the interference record will confirm the assumption in the definition that a lost count will become "prior art".

The following examples are provided as indicative of perceived difficulties in the application of the definition embodied in Rule 601(n):

Example A: Rule 601(n) is applied in a mutuality sense to an interference where the existing count (Invention A) is a broad genus over organic compounds. Both parties disclose a species (Invention B) which one of the parties alleges represents a "selection invention", i.e., is neither anticipated by the genus nor obvious therefrom. The party proposing to add a species count to Invention B must demonstrate that the genus was neither the same as nor obvious in view of the species, an impossibility since *disclosure of the species anticipates the genus under 35 USC 102*. In effect, no party could ever propose sub-generic or species counts included within broader generic counts. Since all potential patentability and priority questions with respect to possible sub-generic and species claims are intended to be resolved in the unified patentability/priority proceedings, loss of such a broad generic count might be construed as estopping the losing party from arguing entitlement to a patent for species and sub-genera within the lost count. Since proof of a single species is dispositive of the question of priority as to a genus, no matter how large, this is a more severe result than would appear to be proper or intended.

Example B: Under the facts of Example A, if the standard under which the propriety for including a second sub-generic or species count is merely that the *proposed* count must be non-obvious over the *existing* count considered as prior art, then, an interference could conceivably proceed with both the generic and the species count in the interference. The usual criteria for "selection inventions" could be employed. However, when an interference is declared with a species count embodying Invention A, then utilization of a test requiring that a proposed count be non-obvious over the existing count as prior art leads literally to the conclusion that a proposed count to a generic Invention B is *anticipated* by the existing species count and therefore may not be added to the interference. This artificial distinction can certainly not have been intended, and yet the rules provide no clear indication of which result is the "correct" one or whether another test will be employed, e.g., the narrower count need only be non-obvious over the broader count.

Example C: A party moves to substitute two sub-generic counts to allegedly separately patentable inventions, Invention A and Invention B, in place of a broad generic count to the "Markush" group of Invention A *and* Invention B. The party alleges Invention B has surprising and unexpected properties over Invention A and is separately patentable thereover. Because, however, a consideration of Invention B as "prior art" suggests Invention A would not be non-obvious thereover, the motion is denied. The moving party establishes priority as to Invention B, but loses the sole count of the interference to an opponent who filed a foreign application disclosing a single species from Invention A. The result is that the moving party with clear evidence of priority apparently loses the right to patent an invention on the technicality of "count formation" in interference. The result is substantially more severe than had he been simply faced with a statutory bar!

Example D: The senior party, a foreign applicant, relies on a priority application disclosing Embodiment A. Subsequently the junior party files a United States application directed to an Embodiment B. Thereafter both parties file applications in the United States disclosing a generic invention including both Embodiments A and B. An interference is declared on the generic invention and the junior party moves to substitute two counts, one count to Embodiment A and a second count to Embodiment B on the ground that they represent separate patentable inventions. Since the junior party's invention date for Embodiment B is after the senior party's priority date, the junior party will be obliged to concede priority on the sole count in the interference unless his motion to substitute counts is granted.

Accordingly, the junior party undertakes laboratory tests which indicate that both Embodiments A and B achieve substantially the same result in substantially the same manner without any significant differences in effectiveness. Without evidence of separate patentability to support the motion to substitute, the junior party is unsuccessful and priority is awarded to the senior party.

The junior party abandons his claim to the generic invention of the lost count, but persists in his assertion he is entitled to a patent on Embodiment B since the interference record indicates no actual priority for this embodiment in favor of the senior party. Ultimately, the junior party obtains evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting, while Embodiment A is substantially unsuitable for any practical use in a commercial setting.

Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? Finally, would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? All of these questions suggest that the utilization of a fluid concept such as non-obviousness as the basis for count formation will give unintended and unsupportable results in situations where the lack of separate patentability is prematurely assumed.

Example E: In the scenario of Example D, the non-entitlement to contest Embodiment B as a separate count was premised on a failure to demonstrate that Embodiment B was non-obvious over Embodiment A considered as prior art. However, an award of priority to the senior party based on the disclosure of Embodiment A in a foreign priority application does not render Embodiment A as available prior art (35 USC 102(g)/103) inasmuch as Embodiment A would not have been a prior invention of another made in the United States which had not been abandoned, suppressed or concealed. The junior party's entitlement to a patent on Embodiment B should depend, therefore, solely on his entitlement to priority with respect to Embodiment B. Priority is a necessary condition for entitlement to a patent since both parties disclose the embodiment and a sufficient condition since regardless of the party entitled to priority on Embodiment A, it should not become obviousness-generating prior art. Therefore, any standard or count formation which fails to reach the result of the junior party is entitled to contest priority and a patent on Embodiment B is contrary to current statutory requirements for entitlement to a patent.

The proposed rules attempt to rationally define counts in an interference so that the judgment in the interference settles all questions of entitlement to a patent. This not only cannot be done *prospectively*, but should not be done at all. Judgment should be made on *claims*, not counts and unpatentability determinations made against a party subject to the normal ex parte standard that additional evidence of non-obviousness, or other evidence of patentability wholly independent of priority itself, could compel a reconsideration of the judgment of unpatentability.

With respect to paragraph (1) of the comment, the standard of patentability will *not* be applied "on a mutual basis." Thus, if a species is patentable over a genus, the species is a "separate patentable invention" from the genus. Compare *In re Taub*, 348 F.2d 556, 146 USPQ 384 (CCPA 1965) (fluorine species might be patentable over genus of Markush group of hydrogen and

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halogen). A first count to a genus and a second count to a species which is patentable over the genus may properly appear in an interference. See e.g., Example 4. The comment suggests that if "such mutuality is not applied . . . then a number of irreconcilable anomalies . . . will be manifest." The urged "irreconcilable anomalies" are not readily apparent to the PTO.

The PTO disagrees with the concept expressed in paragraph (2) of the comment that there should be "post-interference reconsideration of separate patentability." One of the principal objects of Public Law 98-622 and these new rules is to encourage complete determination of all rights between parties in an interference and to avoid post-interference reconsideration in an *ex parte* environment of issues which were or could have been raised *inter partes* in an interference.

The commentator remarks in paragraph (3) of the comment that "[a] party entitled to priority for a count under the benefit of 35 USC 119 creates no 'prior art' under 35 USC 102(g)/103 against his opponent." *In re McKellin*, 529 F.2d 1324, 188 USPQ 428 (CCPA 1976), arguable provides support for the commentator's remark. It should be noted, however, that in defining "same patentable invention" and "separate patentable invention" in § 1.601(n), the PTO is not establishing a new definition of "prior art." Rather, the PTO is providing definitions which will determine—both initially and ultimately in an interference—how *claims* in an application or patent will be designated to correspond to counts. See §§ 1.603 and 1.606. Examples 1-19 illustrate how the PTO proposes to initially designate claims to correspond to counts. The designation of claims to correspond (or not correspond) to a count is significant because, as noted by the plurality opinion in *McKellin*, 529 F.2d at 1327, 188 USPQ at 432: "[a] n applicant [or patentee] who has lost an interference is not entitled to claims which correspond to the subject matter of the counts of the interference." Section 1.658(c) estops a party from obtaining a claim which could have been added and which would have been designated to correspond to the lost count. The definitions of "same patentable invention" and "separate patentable invention" in § 1.601(n), the availability of motions to designate or not designate claims as corresponding to a count under § 1.633(c), and the estoppel provisions of § 1.658(c) provide the basis for accomplishing the PTO's objective of resolving *inter partes* in a single proceeding all issues which are or could have been raised between parties in an interference.

Examples illustrate how §§ 1.601(n), 1.633(c) and 1.658(c) accomplish the PTO's objective.

Example 32: Application AV discloses engines in general and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). The U.S. "filing date" (§ 1.601(h)) of the AV application is prior to the U. S. filing date of the AW application, but the AW application claims a foreign priority date under 35 U.S.C. 119 based on an application filed in a foreign country prior to the filing date of the AV application. An interference is declared. The sole count of the interference is to "an engine." Claim 1 of the AV application and claim 3 of the AW application are designated to correspond to the count. During the interference, applicant AV does not move under § 1.633(c)(2) to add a claim to a 6-cylinder engine and to designate the claim to correspond to the count. Applicant AW is awarded a judgment in the interference based on the earlier filing date of the foreign patent application. After the interference, applicant AV adds claim 2 (6-cylinder engine) to the AV application. Whether AV would be entitled to a patent containing a claim to a 6-cylinder engine will depend solely on whether a 6-cylinder engine is a "separate patentable invention" from "engine"—the subject matter of the count. If a 6-cylinder engine is a "separate patentable invention" within the meaning of § 1.601(n), applicant AV could not have successfully moved under § 1.633(c)(2) to add claim 2 and to designate it to correspond to the count. Therefore applicant AV could obtain a patent containing claim 2. If, on the other hand, a 6-cylinder engine is not a "separate patentable invention," claim 2 of the AV application would be rejected on the basis of interference estoppel because claim 2 could have been added by a motion under § 1.633(c)(2). See § 1.658(c). See also Example 37.

Example 33: This example is basically the same as Example 32, except that application AV initially contains claim 1 (engine) and claim 2 (6-cylinder engine). When the interference is declared, both claims 1 and 2 of application AV are designated to correspond to the count. During the interference, applicant AV does not move under § 1.633(c)(4) to designate claim 2 as not corresponding to the count. A judgment in the interference is entered for applicant AW based on the earlier filing date of the foreign patent application. After the interference, applicant AV would not be able to obtain a patent containing claim 2, because that claim was designated to correspond to a count and entry of the judgment constitutes a final decision by the PTO refusing to grant applicant AV a patent containing claim 2.

In the written comment, Examples A through E were set out to illustrate what the commentator believed were "perceived difficulties." These examples are set out above and are analyzed below.

Analysis of Commentator's Example A

Example A does not describe any practice under these rules, because "same patentable invention" and "separate patentable invention" under § 1.601(n) are not intended to be "applied in a mutuality sense." Where a first count is to a genus and a second count is to a species within the scope of the genus, there may be two counts if the species is separately patentable from the genus. The species is "invention A" referred to in § 1.601(n); the genus is "invention B" referred to in § 1.601(n).

Analysis of Commentator's Example B

Commentator's Example B suggests—incorrectly—that if an interference is declared with a count to a species that no motion under § 1.633(c)(1) to add a count to a genus can ever be granted. If the species ("invention A" referred to in § 1.601(n)) is not anticipated by or obvious in view of the genus ("invention B" referred to in § 1.601(n)), a motion to add a separate count to the genus may be proper. The commentator uses the language "selection inventions" in both Examples A and B. Insofar as the PTO is aware, the language is not a term of art in the patent law. The PTO has not ascribed any particular meaning to the language in analyzing Examples A or B.

Analysis of Commentator's Example C

The result suggested in commentator's Example C can come to pass only if the moving party accepts as final the denial of the motion to substitute two "sub-generic counts" for the "broad generic count." Unlike practice under the rules which have been in effect, under these new rules a decision denying a motion to substitute a count is reviewable by the Board (see § 1.640(c) and § 1.655(a), second sentence). Additionally, the party could seek judicial review (35 U.S.C. §§ 141, 146) of any final decision by the Board. However, if the party accepts as final the PTO's determination that inventions A and B are the "same patentable invention," the party would be precluded from obtaining a patent to invention B. After the interference is terminated, the only conceivable way that the moving party could seek to obtain a patent containing claims to invention B would be to first successfully move to reopen the interference for the purpose of presenting additional evidence. If the motion to reopen is granted (and it would be expected that such a motion will rarely be granted), the moving party would then have to successfully establish that invention A and invention B are not the same patentable invention. The PTO will continue to follow the general guidelines of 4 Rivise & Caesar, *Interference Law and Practice*, § 821 *et seq.* (Michie Co. 1948), in determining motions to reopen an interference after entry of judgment. It should be additionally noted that interferences in which a judgment has been entered by a district court in an action brought under 35 U.S.C. § 146 or a mandate has been entered by the U. S. Court of Appeals for the Federal Circuit (35 U.S.C. § 141 or 28 U.S.C. § 1295(a)(4)(C)) will not be reopened until the district court vacates its judgment and/or the Federal Circuit withdraws its mandate.

Analysis of Commentator's Example D

Several questions asked in the commentator's Example D can be answered as follows:

Question: Is the junior party entitled to a patent notwithstanding the disposition of the issue of its separate patentability in an *inter partes* proceeding? *Answer*: No. The junior party should have presented the "evidence that Embodiment B is unexpectedly more useful than anticipated in a commercial setting" during the interference. The PTO expects to resolve issues *inter partes* in the interference. If the PTO was to permit the evidence to be presented after the interference is terminated and after *ex parte* prosecution resumes, a principal purpose of the overall change to interference practice would be defeated. It may be unfortunate that the evidence was not known to the junior party. However, it may also be true that the winning party—had the evidence been presented in the interference—could have produced probative counter-evidence. Why should the winning party be put to the expense of a second interference?

Question: If indeed, the junior party would be entitled to such a patent, must a second interference now be declared with the senior party to again litigate the issue of priority? *Answer*: The premise in the question is not correct. The junior party is not entitled to a patent to Embodiment B and therefore there will not be a second interference.

Question: Had the junior party failed to have made the motion to substitute counts in view of his utter lack of supporting evidence of separate patentability, would the estoppel under 37 CFR 1.658(c) have applied? *Answer*: Yes, unless the junior party can successfully move to reopen the interference.

Question: Would the ends of justice be better served by a standard for count formation which could be finally determined contemporaneously with the filing of the preliminary motions themselves? *Answer*: While the question is not fully understood, it should be recognized that counts will initially be formed when an interference is declared and are subject to being changed by a motion (§ 1.633(c)) or by the Board (§ 1.640(c) and § 1.655, second sentence). The correctness of the PTO's ultimate decision on what counts should be is subject to judicial review (35 U.S.C. §§ 141, 146).

Analysis of Commentator's Example E

The PTO, without agreeing or disagreeing with all of the commentator's statements in Example E, disagrees with any ultimate conclusion that the junior party is entitled to a patent on Embodiment B and that such a result "is contrary to current statutory requirements for entitlement to a patent." Interference estoppel precludes granting a patent claiming Embodiment B to the junior party even if Embodiment A is not prior art with respect to Embodiment B.

One comment asked whether "invention A" and "invention B" mentioned in § 1.601(n) "refer to the entire scope of subject matter recited in a claim or to the disclosed embodiment(s) supporting the claim (a la *In re Vogel*, [422 F.2d 438,] 164 USPQ 619 (CCPA 1970))?" The question is somewhat difficult, if not impossible, to answer in the abstract. Whether "invention A" refers to the entire scope or to the embodiments which support a claim is not controlling under these new rules. One fundamental change being made under the new rules is that judgments will be in the form of whether an applicant or patentee is or is not entitled to a *claim*. In the past, the Board of Patent Interferences has entered an "award of priority." The use of an "award of priority" does not always accurately express the "judgment" entered in many interferences. See e.g., *Applegate* v. *Scherer*, 332 F.2d 571, 573 n. 1, 141 USPQ 796, 798 n. 1 (CCPA 1964). Whether an applicant or patentee is or is not entitled to a particular claim in any given interference will depend on many factors, some of which include the scope of the claim, the scope of the opponent's claim, and the prior art. An example illustrates the point.

Example 34: Applicant AX discloses an apparatus having fastening means. The specific means disclosed are rivets. Applicant AY discloses a similar apparatus having fastening means. The specific means disclosed are a nut and bolt. The prior art reveals that items have been fastened with numerous fastening means including both rivets and nuts and bolts. In determining whether AX's apparatus with rivet fastening means is the "same patentable invention" as AY's apparatus with nut and bolt fastening means, it would be proper to consider the specific apparatus disclosed by AX, the specific apparatus disclosed by AY, the fact that both AX and AY disclose the use of "fastening means" broadly, and the prior art which shows rivets and nuts and bolts to be known fastening means.

One comment suggested that the last sentence of § 1.604(b) and the last sentence of § 1.607(c) be deleted in view of a proposed rule (§ 10.23(c)(7); 49 F.R. 10028; 49 F.R. 33809) which defines "misconduct" as including "[k] nowingly withholding from the Office information identifying a patent or application of another from which one or more claims have been copied." The proposed rule is still being considered. In any event, the last sentences of §§ 1.604(b) and 1.607(c) are instructions to examiners whereas proposed 37 CFR § 10.23(c)(7) defines misconduct for those registered to practice before the PTO. Another comment suggested deletion of § 1.604(b) because "existing rules [37 CFR § 1.56] already provide a duty of disclosure of subject matter *material* to examination." There is no inconsistency between the rule relating to the duty of disclosure and § 1.604. The comment also suggested that by identifying another application, an applicant "might be construed as having *admitted* that the claims" of the other application are directed to the same patentable invention as the claims in the applicant's application. The filing of such a paper is a statement by the applicant that the claims presented are "*known* to the applicant to define the same patentable invention" (emphasis added). If an applicant wishes to call another application to the attention of an examiner and the applicant believes that the other application does *not* claim the same patentable invention, but nevertheless may be relevant within the meaning of 37 CFR § 1.56, the applicant may identify the other application and at the same time state why the invention claimed in the other application is not the same patentable invention as the invention claimed in the applicant's application. For the reasons given, the suggestions made in the two comments are not being adopted.

Three comments relating to § 1.605 were received. One comment suggested that the language "or substantially the same as the suggested claim" be deleted from the third sentence of § 1.605. The suggestion is being adopted to the extent that the language "a claim which is the same or substantially the same as" is being deleted. Under § 1.605, when the examiner requests an applicant to copy a suggested claim, the applicant will be required to copy verbatim the claim suggested by the examiner. A second comment suggested that the second and third sentences of § 1.605 be changed to read as follows:

> The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim, or shall identify in the application one or more pending claims which the applicant regards as being directed to the same or substantially the same invention as the suggested claim, within a time specified by the Examiner, not less than thirty days. Failure or refusal of an applicant to timely present a claim or to timely identify one or more claims which are directed to the same or substantially the same invention as the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim.

A third comment suggested that the second and third sentences of § 1.605 fail to take into account the case where an applicant is already claiming the invention. The third comment suggested addition of the following at the end of the third sentence of § 1.605(a): ", unless the application already contains claims to the same patentable invention." The suggestions made in the second and third comments are not being adopted as such. However, the following sentence is being added as the fourth sentence of § 1.605: "At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared." A major deficiency of the suggestions made in the second and third comments was the inability of the PTO to efficiently and effectively handle situations where the applicant (1) presents a claim which is "substantially the same as" the suggested claim or (2) points to a claim already in the application *and* the examiner is of the opinion that the claim is not to the same patentable invention. Under these circumstances, the examiner could not properly declare an interference. Accord-

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ingly, the applicant will be required to present verbatim the suggested claim. The applicant may, however, also present any other claim which the applicant believes is more appropriate. Alternatively, the applicant, in addition to presenting verbatim the suggested claim, may also call the examiner's attention to a claim already in the application which the applicant believes is more appropriate for interference purposes. In either case, the applicant must explain to the examiner why a claim other than the suggested claim is more appropriate for inclusion in the interference. Upon consideration of the suggested claim and the applicant's alternative claims and any explanation, the examiner is in a position to forward the application to the Board for declaration of an interference. If the applicant is dissatisfied with the claims of the application designated to correspond to the count, the applicant may file an appropriate motion under § 1.633(c).

Two comments were received which suggested that the last sentence of § 1.606 is not entirely clear. One comment suggested that the language in the last sentence which reads: "to define one patentable invention" be changed to read: "not to contain separate patentable invention." This suggestion is being adopted. The use of the language "*one* patentable invention" was unfortunate and rendered the actual intent of the rule unclear. Under § 1.606, at the time an interference is declared a *rebuttable* presumption will exist that any patent claim designated to correspond to a count does not embrace separate patentable inventions. Moreover, at the time the interference is declared, no count will be narrower in scope than the broadest patent claim designated to correspond to that count. The presumption is *rebuttable* and may be challenged and overcome by a motion under § 1.633(c). Examples 17 and 18 illustrate practice under § 1.606.

Two comments were received discussing § 1.607. A first comment suggested that the word "must" in the first sentence of § 1.607(c) be changed to "shall". The suggestion is being adopted. Use of "shall" makes § 1.607(c) consistent with § 1.604(b). A second comment asked the following question:

> "If the examiner determines that the applicant's claim is patentable but that there is no interfering subject matter, and the examiner accordingly allows the claim but refuses to declare an interference, is that determination appealable [to the Board of Appeals and Interferences under 35 U.S.C. § 1.134]?"

The commentator suggests that "such a determination" is appealable and rationale in support of the commentator's position appears in Gholz, *Board of Appeals Jurisdiction Over Appeals from Decisions by Primary Examiners Refusing to Institute Interferences on Modified or Phantom Counts*, 64 J. Pat. Off. Soc'y 651 (1982). At the hearing, the commentator orally urged that the rules be amended to permit an appeal to the Board when an examiner allows a claim, but refuses to declare an interference involving the allowed claim. The suggestion is not being adopted. A decision by an examiner to allow a claim, but not to declare an interference involving the allowed claim, is petitionable and not appealable. See Gholz, *supra*, at 652 n. 13. The rule being suggested would enlarge the jurisdiction of the Board. Action by Congress would be necessary to accomplish what is embodied in the suggestion.

Several written comments and one oral presentation at the hearing were made concerning § 1.608. One comment suggested that § 1.608 be expanded to provide for summary judgment in interferences involving applications where the earlier of the filing date or effective filing date of one application was three months earlier than the date of the other application. This suggestion is not being adopted. Ordinarily, interferences are not declared between applications having effective dates more than three months apart. Moreover, expanding summary judgment proceedings to application-application interferences would result in delay in resolving interferences. Currently in application-patent summary judgment proceedings under 37 CFR § 1.204(c), very few summary judgments are entered against applicants who are junior to a patentee by more than three months. There is no reason to expect that a significant number of summary judgments would be entered in application-application interferences. As noted in the notice of proposed rulemaking, the PTO has already declined to expand summary judgment proceedings to cases where a patentee is junior to an applicant by more than three months. See 49 F.R. 3775 (paragraph bridging columns 1 and 2); 1039 O.G. 34; 1039 TMOG 34; 27 BNA 319.

Two written comments were received which suggested that § 1.608(b) should be more specific in indicating the kind of evidence which should be submitted when an applicant attempts to make out a *prima facie* case based on priority of invention. The suggestions in the comments are being adopted. The following sentence has been added to § 1.608(b):

> Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent.

Similar language appears in the current rule: 37 CFR § 1.204(c). The PTO agrees entirely with the following discussion made by one commentator:

> The material added to Rule 608(b) currently appears in existing 37 CFR § 1.204(c). A comparison of the existing language of 37 CFR § 1.204(c) with the proposed rule might be construed as suggesting that the allegations which are now expressly required where priority is an issue will be changed, specifically relaxed in some manner. Since under proposed Rule 617 this clearly is *not* the case, the proposed addition to Rule 608(b) should assist the practitioner in understanding the intent of the PTO.

The commentator has accurately pointed out that the PTO intends to apply a stricter standard for filing additional evidence in summary judgment proceedings after an order to show cause has been issued. See the notice of proposed rulemaking. 49 F.R. 3775 (column 1); 1039 O.G. 34; 1039 TMOG 1039; 27 BNA 319 (column 1).

At the hearing, it was suggested that § 1.608 should encourage the use of 8-1/2 by 11 inch paper for affidavits. This suggestion is being adopted and the following sentence has been added to § 1.608(b): "To facilitate preparation of a record (§ 1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2 x 11 inches (21.8 by 27.9 cm.)." The commentator at the hearing suggested that "many people submitting a Rule 608(b) showing are going to want to rely upon that showing under Rule 672(b)" in those cases where an interference is allowed to proceed. Use of 8-1/2 by 11 inch paper will facilitate preparation of the ultimate record.

Two comments were received with respect to § 1.609. The first comment suggested that the language "count or counts" in § 1.609(b)(1) be changed to "proposed count or counts" and that each occurrence of "the count" in § 1.609(b)(2) be changed to "each count". The suggestion is being adopted. These changes are editorial in nature and are designed to enhance the clarity of the rule. A second comment indicated that it was not clear to the commentator why it was necessary under § 1.609(b)(3) for the examiner to identify the claims in an application or patent which are deemed to be patentable over any count. The commentator went on to say that the examiner "could probably readily identify claims which would clearly be unpatentable over a count and perhaps this would be all that is needed. If the examiner simply said all claims are considered unpatentable over the count, what recourse does the applicant have if he disagrees?" The purpose of having the examiner identify all claims which are patentable over the count or counts is to place the parties on notice that those claims are allowable notwithstanding any decision in the interference. Thus, in an interference between Jones and Smith if the examiner indicates that claim 8 of Jones is patentable over the proposed count or counts, Smith will know that Jones may receive a patent containing claim 8 even if Smith wins the interference. This will permit Smith to move under § 1.633(c) to add claim 8 as corresponding to a count if Smith believes claim 8 defines the same patentable invention as one of the counts. Contrary to the suggestion in the comment, an examiner will not indicate that a claim is unpatentable over a count; rather, the examiner will designate the claim to correspond to a count. Each claim in a patent or application which is directed to the same patentable invention as a count will be designated to correspond to the count. Under the new practice, an examiner will no longer have occasion to indicate that a claim will be rejected over a lost count. To fully answer the commentator's question, if a claim is designated to correspond to a count and the applicant believes the claim does not define the same patentable invention as the count, the applicant may move under § 1.633(c) to designate the claim as *not* corresponding to the count. If the motion is granted, the examiner would be authorized to issue the applicant a patent containing the claim even if the applicant loses the interference.

Several comments were received which discuss § 1.611. One comment suggested addition of a paragraph (f) to permit expanded summary judgment proceedings in application-application interferences. Since expanded summary judgment proceedings are not contemplated, the suggestion is not being adopted. See the discussion above under analysis of comments of § 1.608(b). Two comments suggested that § 1.611(c)(8), which provides that a notice declaring the interference shall specify among other things the "order of the parties," fails to take into account the fact one party may be "senior" as to one count and "junior" as to another count. As explained above in connection the analysis of the comments concerning § 1.601(m), the "order of the parties" is a procedural tool. It indicates the "style" of the case—which practitioners are encouraged to use. If there are two counts and one party is "senior" as to one count and "junior" as to another count, the party has the burden of proof as to that count to which the party is "junior." See § 1.657. Appropriate testimony periods will be set (§ 1.651(b)) to accommodate differing burdens of proof in cases where a party is "senior" on one count and "junior" on another count. The suggestions to change the meaning of "order of the parties" are not being adopted. Another comment suggested that § 1.611(e) be changed to indicate that notice "shall" (as opposed to "may") be given in the *Official Gazette* when an interference has been declared involving a patent. No useful purpose would be served by changing "may" to "shall" inasmuch as the rights of parties involved in an interference are not affected by publication or non-publication of the fact that a patent is involved in the interference. By § 1.611 the PTO intends to exercise discretion to publish in the *Official Gazette* an identification of patents which become involved in interferences; however, the PTO does not intend to undertake an absolute obligation to do so. The use of "may" better expresses the PTO's intent behind § 1.611(e).

No written comments were received relating to § 1.612. However, at the hearing two suggestions were made orally. The first suggestion was that where a "party" has obtained a copy of his "opponent's" affidavit under § 1.131 or § 1.608(b) (see § 1.612(b)), the party should be required to notify the opponent. According to the suggestion, if the opponent then intends to rely on the affidavit (§ 1.671(e)), the opponent would have to "reserve" the affidavit on the party. This suggestion is not being adopted. When the party gains access to the affidavit under § 1.612(b), the party may or may not make an accurate copy. On the other hand, the opponent knows exactly those portions of the affidavit upon which the opponent intends to rely. After careful consideration, the PTO believes on balance that it is better for the opponent to serve a copy of the evidence upon which the opponent intends to rely. Service avoids issues as to whether the party obtained under § 1.612(b) a complete and/or accurate copy of the evidence upon which the opponent intends to rely.

The second suggestion concerning § 1.612 made orally at the hearing was that a party should have access to an opponent's "predecessor application, even though the application may not be relied upon for 35 USC, Section 120 benefit." According to the suggestion, access to a "predecessor application" may be needed to uncover relevant evidence, including violations of 37 CFR § 1.56. Specifically, the commentator called attention to *Driscoll* v. *Cebalo*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984), *rehearing denied mem.*, (Fed. Cir. July 25, 1984). The suggestion is not being adopted. The Patent Statute (35 U.S.C. § 122) provides that applications for patent will be preserved in secrecy by the PTO unless special circumstances are shown. Section 1.687(c) provides for "additional discovery" when required in the interest of justice. Additional discovery is believed to provide the necessary procedural vehicle for obtaining access to an opponent's "predecessor application."

One comment was received which suggested that the language "or members of the same firm of attorneys and agents" be added after "agent" in § 1.613(b). The suggestion is being adopted, because it is believed to make the rule clearer.

One comment was received which said the following with respect to § 1.616: "Sanctions should not be left to the Examiner-in-Chief (EIC) or BAI [Board of Patent Appeals and Interferences] - This Rule is unnecessary and should be deleted. An alternative would be to give sanction power only to the BAI." The suggestion to delete § 1.616 is not being adopted. There are cases where sanctions are warranted. See e.g., *Woods* v. *Tsuchiya*, 207 USPQ 228 (Comm'r. Pat. 1979) and *Tezel* v. *Bellantoni*, 188 USPQ 688 (Bd.Pat.Int. 1975). The PTO continues to believe that imposition of a sanction (except judgment) by a single examiner-in-chief is appropriate. In any event, a party may ask a 3-member panel of the Board to reconsider any sanction which may be imposed by a single examiner-in-chief. See § 1.640(c).

Several written and oral comments were received regarding § 1.617.

One oral comment made at the hearing suggested that "it should be explicitly stated in Rule 617(a) that the decision of the examiner-in-chief to permit the interference to proceed is without prejudice to the right of any other party to attack the sufficiency of the Rule 608(b) showing when offered as Rule 672 testimony." The suggestion is not being adopted. While no explicit statement to that effect will be placed in § 1.617(a), it necessarily follows that any opponent may attack the sufficiency of an applicant's showing under § 1.608(b) when that showing is presented as evidence under § 1.672. In summary judgment proceedings, all an applicant need do is make out a *prima facie* case. If the interference is allowed to proceed in the normal manner, the applicant must prove priority by a preponderance of evidence (when the application and the patent are copending) or beyond a reasonable doubt (when the application was filed after the patent issued). Manifestly, the burden in summary judgment proceedings is not as strict as the burden in proceedings following summary judgment. *Breuer* v. *DeMarinis*, 558 F.2d 22, 28, 194 USPQ 308, 313 (CCPA 1977) and *Schwab* v. *Pittman*, 451 F.2d 637, 640, 172 USPQ 69, 71 (CCPA 1971).

Several comments suggested that an applicant should be permitted as a matter of right to file a reply to any statement filed by any opponent under § 1.617(d). The suggestion that a reply be permitted is being adopted. Accordingly, § 1.617(e) has been changed to read: "[w] ithin a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent." Some of the comments indicated that the applicant should be able to reply to a statement by a patentee or another opponent. The language "any opponent" in § 1.617(e) is intended to include both the patentee and any other opponent. The change in the last sentence of § 1.617(h) of "patentee" to "any opponent" is intended to make clear that all parties may appear at a hearing if the applicant requests a hearing.

One comment suggested that the patentee (and presumably any other opponent) should be allowed to present "evidence" during summary judgment proceedings. This suggestion is not being adopted. A change in the second sentence of § 1.617(d) is intended to make clear that opponents may file statements in response to an applicant's "response," but the statement "shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause." The PTO does not intend to expand summary judgment proceedings into a "mini-interference." An applicant presents evidence under § 1.608(b). If the examiner-in-chief finds that evidence insufficient, an order to show cause stating reasons for the insufficiency is issued. An applicant may respond and, if appropriate, file "additional evidence." The PTO intends to be rather strict in permitting the filing of new evidence. After the applicant responds (with or without additional evidence), any opponent may file a statement. In the statement, the opponent should be free to comment on all the evidence (original and additional) which the applicant presents. Compare *In re Plockinger*, 481 F.2d 1327, 179 USPQ 103 (CCPA 1973). Under § 1.617(d) the opponent may not urge a rationale for summary judgment which does not appear in the order to show cause issued by the examiner-in-chief. However, it is not the PTO's intent to interpret § 1.617(d) in the narrow

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manner the Court of Customs and Patent Appeals interpreted 37 CFR § 1.204(c) in *Kahl* v. *Scoville*, 609 F.2d 991, 995-996, 203 USPQ 652, 656 [headnote 6] (CCPA 1979). An example will illustrate how the PTO intends to interpret § 1.617(d).

Example 35: An applicant copies claims from a patent and is required to submit a showing under § 1.608(b). Upon review of the showing under § 1.608(b), the examiner-in-chief concludes that the showing fails to make out a *prima facie* case of priority, because applicant has failed to show an actual reduction to practice. Applicant files a response and includes additional evidence which purports to show an actual reduction to practice. The patentee then files a statement in which two arguments are made. *First*, patentee argues that the additional evidence has not been properly authenticated. *Second*, patentee argues that even if applicant has shown an actual reduction to practice, summary judgment is nevertheless appropriate because applicant suppressed and concealed after the actual reduction to practice. The first argument is proper, but the second argument is not. A patentee may comment on the sufficiency of the applicant's evidence. Fairness, however, dictates that summary judgment be granted only after fair notice in the order to show cause. Accordingly, summary judgment will not be based on a rationale raised by a patentee in a statement which does not correspond to the rationale used by the examiner-in-chief in the order to show cause.

A change has been made in § 1.617(a) and § 1.617(g) to make clear that once summary judgment proceedings have concluded, an interference will proceed "in the normal manner." The change is intended to codify the decisions in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1967) and *Ing* v. *Chiou*, 207 USPQ 321 (Comm'r.Pat. 1979). This change is further discussed in the discussion of the comments received with respect to § 1.635.

One comment was received which indicated that § 1.618:

> "needs qualification. It may be appropriate to resubmit certain papers (See also § 1.644(d) last sentence)."

The precise "qualification" needed was not set forth in the comment. Likewise, no example of "certain papers" was set forth. Under the circumstances, the PTO declines to make any change in § 1.618.

Several comments were received which discussed the rules relating to preliminary statements.

Three comments were received which suggested that § 1.622(a) be amended to "take into account several court decisions holding that joint inventors need not be joint inventors of [the subject matter of] all claims." Changes have been made in § 1.622(a) consistent with the amendment to 35 U.S.C. § 116 made by Public Law 98-622.

One comment was critical of §§ 1.623(c); 1.624(c); and 1.625(c), because § 1.628(b) does not cover the possibility that a drawing might not be available, e.g., a drawing destroyed in "a fire." Section 1.628(b) has been amended to permit a party to allege a date when a first drawing or first written description was made in those circumstances where the first drawing or first written description is not available. The party will be required (1) to show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party would also be required to file a motion to amend its preliminary statement promptly after the drawing or written description becomes available. It is the PTO's intent by the amendment to § 1.628(b) to overrule the holding of headnote [1] of *Reddy* v. *Davis*, 187 USPQ 386, 388 (Comm'r.Pat. 1975)

Another comment was critical of the language "conceived" in § 1.623(a)(4). The current rules do not require a party to allege a conception; rather, they require one to allege the date of the certain acts which, if proved, would establish conception. See 37 CFR § 1.216(a)(4). According to the commentator, an allegation of conception is "unprovable and meaningless." The use of "conception" in § 1.623(a)(4) is intentional and is designed to permit a party to "plead" the earliest date on which it believes conception occurred. Contrary to the suggestion in the comment, "conception" is not meaningless and may be proved during the the testimony period. See *Gould* v. *Schawlow*, 363 F.2d 908, 150 USPQ 634 (CCPA 1966); *Meitzner* v. *Corte*, 410 F.2d 433, 161 USPQ 599 (CCPA 1969); and *Mergenthaler* v. *Scudder*, 11 App.D.C. 264, 1897 C.D. 724 (D.C.Cir. 1897). There is no need to prove "conception" in the preliminary statement.

A preliminary statement serves several useful purposes in an interference: (1) it serves to limit a party's proofs as to time, (2) it serves as a vehicle for permitting the examiner-in-chief or the Board to issue orders to show cause in those cases where it would be futile to take testimony, and (3) it serves as notice to an opponent of the case which is alleged by a party. Under the rules being announced herein, the issues which will be raised and decided by the Board at final hearing are made known during the interlocutory stage through (a) the preliminary statement, (b) motions under § 1.633 and decisions thereon, and (c) notices under § 1.632 of a party's intent to argue abandonment, suppression, or concealment. Section 1.632(a)(4) requires a party to allege a date of conception—it does not require proof of conception. The allegation puts the opponent on notice that the party intends to prove conception as of a date no earlier than the date alleged in the preliminary statement.

One comment suggested that the rules relating to preliminary statements are deficient because they do not permit one to allege allegations concerning tapes. Specifically, the commentator said: "What about a taped transcript of an invention, a practice being followed in a number of research departments of corporations?" If making a tape is the last act of conception, a party may allege the date the tape was made as the conception date under § 1.623(a)(4).

Several comments were received which suggested that a party should not have to allege derivation in a preliminary statement because the party may not know derivation occurred until the testimony period. Section 1.625 requires a party to file a preliminary statement when derivation is an issue. If derivation is not known or discovered prior to the date the preliminary statement is due, a party may move to amend the preliminary statement and allege derivation promptly after existence of derivation is discovered.

Several comments discussing § 1.624 were received. One comment suggested that § 1.624(a)(5) should require a party to state, where appropriate, that no actual reduction to practice of an invention made in a foreign country was introduced into the United States. This suggestion is being adopted and a second sentence has been added to § 1.624(a)(5) which provides: "If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state." This sentence conforms § 1.624(a)(5) to the allegation required in the second sentence of § 1.623(a)(5). Another comment suggested that the language "in the United States" be inserted after "reasonable diligence" in § 1.624(a)(6) and that all occurrences of the language "was made" in § 1.624(c) be changed to "was introduced into the United States". This suggestion is being adopted. As noted in the comment, "[t] he changes . . . are necessary to clarify that for an invention made abroad the only relevant activities are those which occur in the United States." See 35 U.S.C. § 104.

One comment asked "how does one introduce 'an actual reduction to practice of the invention' in the United States?" *Breuer* v. *DeMarinis*, 558 F.2d 22, 194 USPQ 308 (CCPA 1971), illustrates a case where an actual reduction to practice abroad was introduced into the United States.

One comment suggested that § 1.627(a) be changed to require preliminary statements "be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks and be additionally marked Box Interference—Preliminary Statement." According to the comment, the confidentiality of preliminary statements "envisioned under the proposed rules would be further enhanced . . . ." The suggestion is not being adopted. The PTO believes it is sufficient if preliminary statements are enclosed in a sealed envelope as specified in § 1.627(a). The Board will not permit access to preliminary statements which have not been ordered opened by an examiner-in-chief.

Several comments discussing § 1.629 were received. One comment suggested that the first sentence ("A preliminary statement should be carefully prepared.") should not appear in § 1.629(a). This suggestion is being adopted. The PTO agrees with the commentator that the sentence:

> "no longer appears necessary or appropriate in the context of rulemaking. The remainder of the paragraph makes the admonition redundant at best."

Two comments were received which suggested that the word "normally" be deleted from the last sentence of § 1.629(d). The suggestions are not being adopted. A preliminary statement is a pleading. The Board does not evaluate or consider the content of a drawing or written description prior to final hearing. At final hearing, in fact, the Board will only consider the drawing or written description if a party places the drawing or written description in evidence. The word "normally" first appeared in 37 CFR § 1.223(c), last sentence, in 1978 (see e.g., 973 TMOG 19 (Aug. 1, 1978)). The last sentence of 37 CFR § 1.223(c) was intended to codify headnote [2] of *Reddy* v. *Davis*, 187 USPQ 386 (Comm'r.Pat. 1975). The word "normally" appears in the rule to permit the Board to exercise discretion to evaluate or consider the content of a drawing or written description in some unusual and presently unforeseen circumstance.

One comment suggested that "no earlier than" in § 1.629(b) be changed to "as early as". The suggestion is being adopted inasmuch as it is believed to more clearly state the intent of the rule.

One comment suggested that § 1.629(d) "is improper because it fails to take into account testimony which can show that a drawing and/or written description were actually made even though the drawing and/or written description are not now available." A change to § 1.628(d) and addition of "unless the party complies with § 1.628(b)" to the first sentence of § 1.629(d) eliminates the problem raised by the commentator.

One comment discussing § 1.631(a) was received which expressed the view that a junior party should be required to send a copy of its preliminary statement to the senior party even if the senior party does not file a preliminary statement. According to the commentator, the senior party is *prima facie* the first inventor and at some time it will have to know the earliest dates alleged by the junior party. The rules require all parties to file a preliminary statement. If a junior party does not file a preliminary statement, it will be denied access to any other preliminary statement which is filed. A senior party, however, is always entitled to access to any preliminary statement filed by a junior party. See e.g., § 1.631(b). However, a junior party will only be required to serve a senior party who files a statement.

Numerous comments were received discussing § 1.633.

One commentator asked: "What sort of a judgment is in order if a count is not patentable over the prior art to an opponent?" Section 1.633(a) authorizes a party to bring a motion for judgment on the ground that the opponent's *claim* corresponding to a count is not patentable. It is important to note that the motion raises the patentability of the opponent's *claim* not the count. Accordingly, by a motion under § 1.633(a), a party seeks entry of a judgment that the opponent is not entitled to a patent containing a claim corresponding to a count.

Two comments questioned the nature of the judgment when a motion under § 1.633(b) is granted. Section 1.633(b) authorizes the filing of a motion for judgment on the ground that there is no interference-in-fact. If a motion under § 1.633(b) is granted, the judgment would provide that each party is entitled to a patent containing that party's claims corresponding to the count. Judgments in interferences under these rules will determine a party's entitlement or lack of entitlement to *claims* corresponding to a count.

One comment expressed the hope that "third party inventorship" would not be made an issue in interferences. Contrary to the hope expressed by the commentator, "third party inventorship" can be made the subject of a motion under § 1.633(a). Any ground of unpatentability may be made the subject of a motion under § 1.633(a) except (1) priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. It should be noted that under past practice, third party inventorship has not been considered "ancillary" to priority. *Sheffner* v. *Gallo*, 515 F.2d 1169, 185 USPQ 726 (CCPA 1975). However, under these rules, the question of whether an issue is "ancillary" no longer arises. See 130 Cong. Rec. H10528 (daily ed. Oct. 1, 1984)(statement by Rep. Kastenmeier). Public Law 98-622 gives the Board authority to consider priority and *patentability*. Third party inventorship involves a question of patentability. 35 U.S.C. § 102(f). One comment pointed out that § 1.633(e) adopts the estoppel rule approved by the Court of Customs and Patent Appeals in *Avery* v. *Chase*, 101 F.2d 205, 40 USPQ 343 (CCPA 1939), *cert. dgnied*, 307 U.S. 638 (1939), while rejecting the rule announced by the U. S. Court of Appeals for the District of Columbia Circuit in *International Cellucotton Products Co.* v. *Coe*, 35 F.2d 869, 30 USPQ 366 (D.C. Cir. 1936). See also *American Cyanamid Co.* v. *Coe*, 106 F.2d 851, 42 USPQ 302 (D.C. Cir. 1939). The commentator is correct in noting that the rules adopt the estoppel rule approved in *Avery* v. *Chase*. The following comment by the CCPA in its opinion in *In re Shimer*, 69 F.2d 556, 558, 21 USPQ 161, 163 (CCPA 1934), accurately expresses the intent of the PTO in promulgating §§ 1.633(e) and 1.658(c):

> It may be stated that this rule works no hardship to him who is diligent in pursuit of his rights. When an interference is declared, the files of his contestants are open to him. He has full cognizance of their disclosures and claims. So advised, it becomes his duty to put forward every claim he has. [Rule 1.633(e)] . . . affords him this opportunity. If the rule be not enforced or enforceable, then delays and litigation are greatly increased. It is quite obvious that the doctrine of estoppel, as applied in these cases, results in the better conduct of the business of the Patent [and Trademark] Office and in the public good.

One comment suggested that the following be added to the end of § 1.633(c):

> A motion to add or substitute a count shall be construed as an automatic request for the benefit of any earlier application [filing] dates accorded the existing count, and also as encompassed by a contemporaneous motion under § 1.633(f) or (g), unless indicated otherwise. Any opposition thereto must be raised in a motion opposition pursuant to § 1.638.

The suggestion is not being adopted. A specific reference to § 1.637(c) appears in § 1.633(c). The provisions of § 1.637(c) spell out in detail the steps which a moving party must take in filing a motion under § 1.633(c). One of those steps requires the moving party to request benefit of any earlier application. The mere fact that benefit has been accorded for a "first" count does not establish that benefit should be accorded for a "second" count. The PTO believes the burden should be on the moving party to point out where an earlier application supports a count rather than placing the burden on an opponent in the first instance to point out where an earlier application fails to support particular subject matter. There is no compelling reason to force the opponent "to prove a negative." It should be noted that the language "Where appropriate," has been deleted in every instance from § 1.637 to make clear that the burden lies on the moving party to request benefit when that party files a motion under § 1.633.

At the hearing, one individual commented that § 1.633(a) is not clear as to whether a motion for judgment based on "fraudulent appropriation of the moving party's invention by his opponent" excluded. The "fraudulent appropriation of the moving party's invention by his opponent" is derivation. Section 1.633(a)(2) excludes both "innocent" derivation (e.g., through a third party and unknown to either party in an interference) or "fraudulent" derivation (e.g., where one party knowingly takes the invention from an opponent). In either event if derivation by an opponent of a party's invention is proved, the party will be awarded judgment.

One comment made the following statement:

> An opponent faced with a motion for judgment on the ground that a count is unpatentable may not be able to prove patentability in the short time periods. Provision should be made for extensions of time in such cases.

Provisions for extensions of time are made in § 1.645.

One comment addressed Example 23 which appeared in the notice of proposed rulemaking. Example 23 also appears in a slightly modified form herein and, as modified, takes into account discussion in the comment. The commentator believed that the motion mentioned in Example 23 should be denied and that a testimony period should be set. Accordingly to the commentator, the granting of the motion would shift the burden to the

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opponent of the motion. The commentator's point is well taken. Actually, the motion should be deferred to final hearing and a testimony period would be set. In ruling on motions under § 1.633, it will not always be possible for the examiner-in-chief to grant or deny outright a motion. When testimony is needed to rule on a motion, the proper course of action is to defer a decision on the motion to final hearing and permit testimony. See § 1.639(c). The moving party retains the burden. If testimony is taken on patentability, the parties would also have to take testimony on priority. With all testimony at its disposal, the Board would then be in a position to rule on all issues and award a judgment.

One comment asked how the claims of the parties would be designated to correspond to the counts if in Example 18 a motion to substitute Count 2 (benzene) and add Count 3 (chloroform) was granted. The following Example 36 answers the commentator's question.

Example 36: The facts in this example are the same as Example 18. Assume that applicant AB believes that benzene and chloroform define separate patentable inventions. Applicant AB would file a motion under § 1.633(c)(1) to substitute Count 2 (benzene) for Count 1 (Markush group of benzene or chloroform) and add Count 3 (chloroform). If the examiner-in-chief grants the motion, the interference would be redeclared by deleting Count 1 and substituting in its place Counts 2 and 3. Claims 1 and 2 of the patent H and claims 11 and 12 of application AB would be designated to correspond to Count 2. Claims 1 and 3 of patent H and claims 11 and 13 of application AB would be designated to correspond to Count 3. If one party proves priority with respect to both benzene and chloroform, that party would be entitled to all claims in its application or patent corresponding to Counts 2 and 3. The other party would not be entitled to a patent containing any claim corresponding to Counts 2 and 3. If patentee H proves priority with respect to benzene and applicant AB proves priority with respect to chloroform (assuming there was no issue raised at final hearing with respect to the patentable distinctness of benzene and chloroform), the judgment would provide that patentee H is not entitled to a patent with claims 1 and 3, but is entitled to a patent with claim 2 and that applicant AB is not entitled to a patent with claims 11 and 12, but is entitled to a patent with claim 13. If an issue is properly raised at final hearing as to whether benzene and chloroform are the same patentable invention and the Board holds that they are the same patentable invention, the party proving the earliest priority as to either benzene or chloroform would prevail as to all claims. Thus, if patentee H invented benzene before applicant AB invented benzene or chloroform, patentee H would be entitled to a patent containing claims 1 through 3 even if applicant AB invented chloroform before patentee H invented chloroform. Applicant AB would not be entitled to a patent with claims 11 through 13.

An oral comment was received by telephone which raised the question of whether a party is, or could be, required to present in the party's application every claim which the party may ever seek to obtain in a patent based on the party's application. According to the commentator, such a requirement would prevent the party from proceeding *ex parte* after the interference on any claim on which a favorable judgment was not entered. It is not the PTO's intent to require a party who is an applicant to present at the outset all claims which the party may ever seek to obtain in a patent based on his application. Parties in interference cases should recognize, however, that the interference estoppel provisions of § 1.658(c) have been expanded with the view to eliminating much of the *ex parte* maneuvering which has taken place in the past after an interference is terminated. Accordingly, a party who fails to move to place a matter in issue runs a considerable risk that the party will not be able to raise the issue *ex parte* after an interference is terminated. Nevertheless, the PTO has determined that it will not, at this time, adopt the requirement suggested by the commentator. The commentator also suggested, contingent on his earlier suggestion being rejected, that the rules provide that a party be authorized to file a motion to require an opponent who is an applicant to add a claim to the opponent's application and to designate the claim as corresponding to a count. This suggestion is being adopted by addition of § 1.633(c)(5). Paragraph (c)(5) authorizes the filing of a motion to redefine the interfering subject matter by requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. A companion addition of paragraph (c)(5) to § 1.637 sets out the requirements of a motion under § 1.633(c)(5). Those requirements are: the moving party must (1) propose a claim to be added to the opponent's application, (2) show the patentability of the claim to the opponent and apply the terms of the claim to the disclosure of the opponent's application, (3) identify the count to which the proposed claim shall be designated to correspond, and (4) show that the proposed claim defines the same patentable invention as the count to which it will be designated to correspond. The following example illustrates how practice under §§ 1.633(c)(5) and 1.637(c)(5) is expected to occur.

Example 37: In this example, some of the facts set out in Example 32 will be used. Application AV discloses engines and in particular a 6-cylinder engine. Application AV contains only claim 1 (engine). Application AW discloses engines in general, but does not specifically disclose a 6-cylinder engine. Application AW contains only a single claim 3 (engine). Seeing that application AV specifically discloses a 6-cylinder engine and believing that a 6-cylinder engine is the same patentable invention as "engine," AW could move under § 1.633(c)(5) to require applicant AV to add a claim (6-cylinder engine) and to have the claim designated to correspond to the count (engine). Applicant AV could oppose on the ground that a 6-cylinder engine is not the "same patentable invention" as "engine." If the motion is granted, applicant AV would be required to add a claim to 6-cylinder engine and the claim would be designated to correspond to the count. If applicant AV loses the interference, the judgment would preclude applicant AV from obtaining a patent with claims to "engine" or "6-cylinder engine." If the motion is denied on the basis that a 6-cylinder engine is not the same patentable invention, applicant AV would not be required to present a claim to 6-cylinder engine and would be able to pursue such a claim *ex parte* even if applicant AV loses the interference.

If an applicant is ordered by an examiner-in-chief to file an amendment to present a claim and the applicant fails or refuses to timely present the amendment, the failure or refusal will be taken without further action as a disclaimer by the applicant of the subject matter of the claim. See the second sentence of § 1.640(b)(1).

At the hearing, one commentator indicated that it is not clear whether § 1.635 "would permit a motion for judgment in a situation where a junior party's case-in-chief fails as a matter of law to overcome a senior party's effective filing date." Under the rules, it is not the intent of the PTO to allow a senior party to test the sufficiency of the case-in-chief of a junior party prior to final hearing. Thus, a "motion for a directed verdict" (see Rule 50(a) of the Federal Rules of Civil Procedure) at the conclusion of the junior party's case-in-chief and prior to a senior party's case-in-chief is not authorized under the rules. If a senior party believes the case-in-chief of the junior party is insufficient as a matter of law, the senior party may *elect* to proceed immediately to final hearing. If the senior party is incorrect, however, the senior party will have waived any right to present any case-in-chief or rebuttal. See e.g., *Comstock* v. *Kroekel*, 200 USPQ 548, 550 n. 4 (Comm'r.Pat. 1978); *Lorenian* v. *Winstead*, 127 USPQ 501, 508 (Bd.Pat.Int. 1959); and, more recently, *Burson* v. *Carmichael*, 731 F.2d 849, 221 USPQ 664 (Fed. Cir. 1984) ("There is no support in law for repeated bites at the apple"). This would be true even if the only evidence relied upon by the junior party is a showing under 1.608(b). In this respect, the rules codify the decision in *Walsh* v. *Sakai*, 167 USPQ 465 (Comm'r.Pat. 1970).

Two comments were received which suggested that the twenty-day period in § 1.636(b) is too short. It was suggested that a longer time period be set and one comment suggested thirty (30) days. The suggestions are not being adopted. The time period set for filing oppositions will normally be set during a telephone conference call between the examiner-in-chief and the attorneys for the parties. The twenty-day period appears in the rule in the event a specific time for filing oppositions is not set by an examiner-in-chief. The twenty-day period is deemed to be sufficient in most cases. Twenty days are currently allowed to respond to a motion. See 37 CFR § 1.231(b). It should be noted that the twenty-day period is longer than the minimum period allowed by the Federal Rules of Civil Procedure for responding to motions. See Rule 6(d) and (e).

Two comments were received which discussed § 1.637. Both comments suggested that a sentence be added to § 1.637(f) (2) to require a translation to be filed when a party moves for benefit of an earlier foreign application which is not in English. The suggestions are being adopted and the following has been added as the last sentence of § 1.637(f) (2): "If the earlier application filed abroad is not in English, the requirements of § 1.647 must also be met." Section 1.647 requires a translation whenever a party relies on a document in a language other than English. One comment suggested that the language of § 1.637(f)(3) ("Show that the earlier application discloses an embodiment within the scope of the each count.") may be "contrary to past decisions of the CCPA which have held a disclosure can be good without a specific embodiment." The critical issue in each benefit situation is whether the earlier application constitutes a constructive reduction to practice of the invention defined by the count. The issue is necessarily resolved on a case-by-case basis and the presence or absence of an embodiment is only one factor to be considered. Accordingly, the language of § 1.647(f)(2) has been changed to read: "Show that the earlier application constitutes a constructive reduction to practice of each count." The comment also criticized the use of the word "each" in § 1.647(f)(2). The term "each" is used to make clear that when there are two or more counts, the moving party must show that the earlier application constitutes a constructive reduction to practice for each count. There are cases where a disclosure in an earlier application would constitute a constructive reduction to practice for one count but not for another count.

Several changes have been made to § 1.637 which were not made as a result of a comment submitted from the public. Each occurrence of the language "Where appropriate," in § 1.637 has been deleted as being unnecessary and possibly confusing. Whenever a party wants or believes that it is entitled to benefit of an earlier application, the party must file a motion under § 1.633(f) for benefit. The language "Where appropriate" may have given parties the mistaken impression that a motion was not necessary where benefit of the earlier application had been accorded in the papers declaring the interference. See the discussion above of the suggested change to § 1.633(c) which was rejected.

The language "or adding a claim to be designated to correspond to a count" has been added to § 1.637(c)(2). The change supplements a change made in § 1.633(c)(2). Section 1.637(c)(2) sets out the requirements for a preliminary motion to redefine the interfering subject matter by adding a claim in the moving party's application and to designate the claim to correspond to a count.

In § 1.637(c)(2)(ii), the language "Apply the terms of each proposed claim to the disclosure of the application" has been changed to "Show that the proposed or added claim defines the same patentable invention as the count". This change was made to add the requirement of showing that the new claim defines the same patentable invention as the count and to eliminate a requirement already contained in § 1.637(c)(2)(iii).

Section 1.637(c)(2)(iii) was changed to refer to an "amended or added claim" and thereby conform the language of the section to the language of § 1.633(c)(2).

Paragraph (c)(5) was added to set out the requirements of a motion under § 1.633(c)(5) which permits a party to move to require an opponent who is an applicant to add a claim to the application and to designate the claim to correspond to a count. See Example 37.

Two comments were made concerning § 1.638. One comment suggested that the twenty-day periods of paragraphs (a) and (b) were too short. The PTO has evaluated the time periods of paragraphs (a) and (b) and has decided that no change will be made to those periods. Attention is directed to the discussion above of the comments concerning § 1.636(b) which also contains a twenty-day period.

Another comment made at the hearing suggested that a reply to an opposition to a motion should be permitted as a matter of course. Upon consideration of the comment, it has been decided to authorize the filing of replies to opposition to all motions. Presently, replies are permitting as a matter of course only for oppositions to motions under 37 CFR § 1.231. Section 1.638(b), as changed, would permit the reply in every instance. The PTO over the years has received complaints concerning the inability of a party to file replies. The change being made in § 1.638(b) will be reviewed sometime in the future to determine whether authorizing replies is helpful to the Board and/or whether undue delay in resolving interference occurs because replies are filed. Moreover, the PTO will make a judgment on whether "new issues" are being raised as a matter of course in replies. It can thus be seen that the change in authorizing replies may be considered experimental and could be changed in the future if found to be counterproductive or inconsistent with the objective of resolving interferences in a relatively prompt manner.

One comment discussing § 1.639 was received. The comment states:

> The requirement that proofs of alleged material facts *must* be filed may be difficult or impossible to meet in view of the shortened times. [The] rule should make provisions for timely submission of proofs within reasonable times.

To the extent that the comment suggests setting specific times in the rules, the suggestion is not being adopted. It should be noted that if affidavits cannot be timely prepared to be filed with a motion, the moving party may wish to take advantage of paragraph (c) which requires a party to specify any testimony needed to resolve a motion.

One change was made in § 1.639(c) to make clear that a moving party or an opponent may describe any testimony needed to resolve a motion under either § 1.633 or § 1.634. Often, testimony is needed to resolve inventorship disputes. Accordingly, a party may describe testimony needed to resolve motions to correct inventorship under § 1.634. It should be noted that if a party relies solely on affidavits in support of a motion (under § 1.633 or § 1.634) and the issue raised in the motion is to be considered at final hearing, the party must comply with § 1.671(e).

Several comments were received which discussed § 1.640. One comment asked: "When the final sentence speaks of a panel deciding the request for reconsideration, does this mean that the panel decides whether to reconsider or whether to modify the decision?" It was the PTO's intent that the panel make a decision on whether to modify the decision made by the single examiner-in-chief. Accordingly, the language "shall be decided by a panel" in the last sentence of § 1.640(c) has been changed to read: "shall be acted on by a panel". Another change in language to the fourth sentence of § 1.640(c) has been made to make clear that a decision of a single examiner-in-chief will not ordinarily be modified by a panel without an opportunity to file an opposition.

Another comment suggested that § 1.640(a) be changed to "allow, even encourage, the examiner-in-chief to travel to conferences where more convenient/practical for all concerned." This suggestion is not being adopted. The use of a telephone conference call eliminates the need to adopt the suggestion. The same comment suggested that the "speedy and inexpensive" language of the second sentence of § 1.640(b) be deleted. The suggestion is not beingadopted. The comment fails to explain why the language should be deleted. It is obvious that a motion cannot always be granted or denied; other action is often appropriate, e.g., deferring consideration of a motion to final hearing. Section 1.640(b) gives the examiner-in-chief discretion to take appropriate action and the "just, speedy, and inexpensive determination" language provides some standard which an examiner-in-chief may follow in those cases where granting or denying a motion is not appropriate.

One comment was received which suggested that § 1.640 be changed to provide that an examiner-in-chief hold a hearing to determine whether an interference should proceed in those cases where a junior party fails to allege a date prior to the senior party and remains in an interference only because the junior party is alleging "fraud" by the senior party. The suggestion is not being adopted. If a party believes that an opponent has committed "fraud" or has engaged in "inequitable conduct," the party may file a motion under § 1.633(a) for judgment. Obviously, a motion for judgment on the basis of "fraud" or "inequitable conduct" must make out a case by clear and convincing evidence. The examiner-in-chief has sufficient authority under the rules to preclude a party from proceeding in an interference on a baseless charge of "fraud" or "inequitable conduct."

One oral comment was received which suggested that the examiner-in-chief be required to consult with an examiner prior to deciding a preliminary motion for judgment under § 1.633(a) based on patentability. The oral comment suggested alternate proposals:

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(1) The examiner-in-chief will normally obtain a patentability report when deciding motions involving a question of patentability.

(2) The examiner-in-chief will consult with a primary examiner prior to deciding a motion raising an issue of patentability.

The suggestion of the oral comment is not being adopted. An examiner-in-chief is a person having "competent legal knowledge and scientific ability." 35 U.S.C. § 7. Examiners-in-chief review decisions of examiners on questions of patentability. Accordingly, there is no reason to *require* an examiner-in-chief to consult with an examiner on a question of patentability. The PTO recognizes that many examiners possess special expertise in particular arts. It is for this reason that § 1.640(b) provides that "[a] n examiner-in-chief *may* consult with an examiner in deciding motions involving a question of patentability" (emphasis added). Thus, an examiner-in-chief is authorized to consult with an examiner on a question of patentability where the examiner-in-chief believes consultation will be beneficial.

One comment suggested that § 1.642 be changed to permit an examiner-in-chief to add a newly discovered patent, as well as newly discovered applications, to an interference. Inasmuch as 35 U.S.C. § 135(a) authorizes interferences between applications and patents, the suggestion is being adopted. The language "application" in § 1.642 has been changed to read: "application or patent".

Several comments discussing § 1.644 were received. One commentator made four suggestions, none of which are being adopted. First, the commentator suggested that there should be no fee for a petition under § 1.644(a)(1). This suggestion is not being adopted. A decision on a petition is a service performed by the PTO on behalf of a petitioner. The Commissioner is authorized to charge fees for services performed. 35 U.S.C. § 41(d). Second, the commentator suggested that the last sentence of § 1.644(d) be deleted. This suggestion is not being adopted. In the past when parties have filed petitions, copies of documents already in the interference file have been attached to the petition. The copies tend to increase unnecessarily the size of the file of an interference. Inasmuch as the document submitted with the petition is already in the interference, there is no need to file a "second" copy of the document. Parties can expect that petitions will be returned ((§ 1.618) if the petition is accompanied by documents which are already in the interference file. Third, the commentator argued that the "requirement of service within one (1) day is too onerous and should be deleted" from § 1.644(g). No rationale was given in support of the argument. Petitions have caused considerable delay in interference cases in the past. To avoid unnecessary delay and surprise on the part of the opponent, the PTO has decided to require that service of a petition be such that delivery to the opponent is within one (1) working day. Service within one day should not ordinarily be difficult in view of "Express Mail" and numerous commercial one-day delivery services available. Lastly, the commentator suggested that § 1.644(i) be changed to provide that decision on a petition would not be delegated to the examiner-in-chief handling the interference. The suggestion to change § 1.644(i) is not being adopted. However, when a PTO employee is granted authority to decide a petition in an interference case, the employee would not be the examiner-in-chief handling the interference or an employee on a panel of the Board deciding the petition. It would be expected that an employee deciding a petition by delegation of authority would be one who could exercise independent judgment on the petition bearing in mind that a petition will be decided on the record made before the examiner-in-chief or the panel. In connection with this latter point, findings of fact by an examiner-in-chief or the Board will be presumed to be correct unless shown to be clearly erroneous. Discretionary action by an examiner-in-chief or the Board will not be overturned unless it is shown that an abuse of discretion occurred.

One commentator asked the following: "Is § 1.644(g) intended to apply only to 'oppositions' to § 1.644 petitions, or is it also applicable to § 1.638 oppositions?" The provisions of § 1.644(g) apply only to petitions filed under § 1.644; those provisions do not apply to oppositions under § 1.638.

Two comments suggested that § 1.644(a)(2) be changed to include an express statement that a petition under paragraph (a)(2) could not be filed until after the Board has entered judgment and that the petition could not relate to the merits of priority of invention or patentability or a question of whether evidence is admissible under the Federal Rules of Evidence. The suggestions are being adopted and appropriate language has been added to § 1.644(a)(2) after the word "Commissioner". The change was suggested by the commentators so that no reasonable person could possibly overlook the fact that a petition to exercise supervisory authority can be filed *only after entry of judgment*. It should be noted that the language "and shall not relate to (1) the merits of priority of invention or patentability or (2) the admissibility of evidence under the Federal Rules of Evidence" has been deleted from § 1.644(b) in view of the change to § 1.644(a)(2).

One comment suggested that the last sentence of § 1.644(f) be changed to make clear that a decision would not ordinarily be modified until the Commissioner had requested an opposition to a request for reconsideration. This suggestion has been adopted and an appropriate change has been made to the last sentence of § 1.644(g).

One comment suggested that the word "shall" in the last sentence of § 1.644(b) precludes the filing of an opposition beyond the 15-day period specified in the rules. According to the commentator, the opposition should also be considered timely if filed within "any appropriate extension." A party may move to extend the time for filing an opposition. See § 1.645.

One comment argued that § 1.644(a)(1) cannot "be squared with the statute as interpreted in *Myers* [v. *Feigelman*, 455 F.2d 596, 172 USPQ 580 (CCPA 1972)]." The rationale in support of the comment is the following:

> I presume that the limitation in subparagraph (b) that a petition under subparagraph (a)(2) "shall not relate to . . . the merits of priority of invention or patentability or . . . the admissibility of evidence" is intended to avoid conflict with *Myers* v. *Feigelman*, 172 USPQ 580 (CCPA 1972), and its progeny. However, I read *Myers* as saying that, if the board has statutory authority to make a decision (including all the myriad of ancillary decisions that the panels and/or the single examiner-in-chief will be making under the new procedure), then the Commissioner does not have authority to review the board's or the single examiner-in-chief's decision. Or, to put it the other way around, if the Commissioner reviews an examiner-in-chief's decision, he is stepping into the shoes of the examiner-in-chief, and the Commissioner's decision is in turn reviewable by the panel (which is, of course, the only entity authorized to exercise the *statutory* jurisdiction of the board—see *Knickerbacker Toy Co.* v. *Faultless Starch Co.*, 175 USPQ 417 n.8 (CCPA 1972)). Thus, I don't see how proposed section 1.644(a)(1) can possibly be squared with the statute as interpreted in *Myers*.

It is true that the CCPA has stated that, "in performing his duties, the Commissioner cannot usurp the functions or impinge upon the jurisdiction of the Board . . . established by 35 U.S.C. 135." *In re Dickinson*, 299 F.2d 954, 958, 133 USPQ 39, 43 (CCPA 1962). See also *Myers* v. *Feigelman*, *supra*, 455 F.2d at 599 n. 8, 172 USPQ at 583 n. 8. However, it is also true that the Commissioner "shall superintend or perform all duties required by law respecting the granting and issuing of patents . . ." 35 U.S.C. § 6; *Kingsland* v. *Carter Carburetor Corp.*, 83 U.S.App.D.C. 266, 168 F.2d 565, 77 USPQ 499 (D.C.Cir. 1948); *In re Staeger*, 189 USPQ 284, 285 n. 2 (Comm'r.Pat. 1974). The Commissioner, subject to approval of the Secretary of Commerce, establishes the procedure by which the examiners-in-chief and the Board will consider interference cases. 35 U.S.C. § 6. See also 35 U.S.C. § 23 relating to affidavits and depositions.

Under the rules, the Commissioner will not determine on petition either "priority of invention" or "patentability." See § 1.644(b). Likewise, the Commissioner will not consider whether evidence should have been admitted or excluded under the Federal Rules of Evidence. The PTO believes that the federal courts, which routinely rule on admissibility under the Federal Rules, are in a better position to determine whether the Board properly interpreted the Federal Rules of Evidence.

While the Commissioner will not decide "priority of invention" or "patentability" under 35 U.S.C. § 135(a), it does not follow that the Commissioner is precluded from interpreting PTO rules on procedural matters, including procedural matters related to the admissibility of evidence on some basis other than the Federal Rules of Evidence, e.g., whether a party has complied with a PTO rule such as § 1.671(e)(procedure for relying on affidavits) or § 1.671(g)(permission required for obtaining evidence by subpoena).

Full consideration has been given to the comment. The PTO nevertheless believes that § 1.644(a)(1) is not inconsistent with law. Several comments concerning § 1.645 were received. One comment suggested that "to" be inserted in the first sentence of paragraph (a) before "file a notice of appeal" and "commence a civil action". According to the comment, "[t] he use of parallel infinitive verb forms provides greater clarity to the rule." The suggestion has been adopted.

Another commentator said the following:

> "No good reason is seen to require a notarized oath from an attorney merely to explain why a paper was filed late, if there is no claim of substantive prejudice by other parties. Attorneys and examiners-in-chief should not be spending unnecessary time and effort on merely procedural formalities. That is contrary to the intent of the new rules."

The PTO agrees with the commentator and has deleted the language "accompanied by an affidavit" from § 1.645(b).

One comment suggested that a reference to § 1.610(d)(6) which provides for oral requests should be inserted into § 1.645 to reflect intent stated in the comments [of the notice of proposed rulemaking] on proposed § 1.645." This suggestion is not being adopted. As the commentator notes, § 1.610(d) authorizes an examiner-in-chief to hold a conference call to resolve issues and to enter an appropriate order following the conference call. A conference call may be used to obtain an extension of time. If the examiner-in-chief grants the request, an order may be entered—in which case a written motion is not necessary. The order provides the written record required by 37 CFR § 1.2. However, it would unduly lengthen the rules to insert a reference to § 1.610(d) in each rule to which it may be applicable. Section 1.645(a) specifies the procedure to be used when a written motion is filed. It should be noted that an examiner-in-chief may require a written motion notwithstanding a conference call.

One comment stated that "[t] he 'other business' may be more pressing than the Interference. In order to serve the ends of justice, the PTO should be considerate in this matter." The PTO intends to evaluate each request for an extension of time on a case-by-case basis. However, extensions of time in interference cases have become "routine." A recent survey of a file in one interference revealed the following. The interference was declared on Mar. 30, 1976. Preliminary statements were filed on May 5, 1979. A decision on motions was entered on June 28, 1982. Testimony was filed on Jan. 3, 1984. During the period between declaration and filing of testimony, sixty-four (64) requests or stipulations for extension of time were filed.

When counsel and an examiner-in-chief agree to a schedule and times are set, the parties will be expected to adhere to the schedule unless there are unusual circumstances. Apart from work that counsel may have in an interference, an examiner-in-chief will have a docket and must manage not only the interference involving counsel, but numerous other interferences. The U. S. Court of Appeals for the Federal Circuit recently said the following in *Rosemount, Inc.* v. *Beckman Instruments, Inc.*, 727 F.2d 1540, 1549-1550, 221 USPQ 1, 10 (Fed. Cir. 1984):

> The conduct of a trial, granting of continuances and the like, is not, however, solely or entirely a matter of balancing conveniences of the parties. The Federal Rules of Civil Procedure recognize another consideration—the need for the exercise of discretion by the trial court in carrying out its duty of managing the judicial process, the business of the court, and the administration of justice.

Likewise, these rules also recognize the need for the exercise of discretion by an examiner-in-chief in carrying out his or her duty of managing the interference (§ 1.610), the business of the PTO (§ 1.610), and the administration of justice (§ 1.601).

Several comments were received which discussed § 1.646. One comment suggested that it would be clearer if "service" was inserted after "additional" in the last sentence of § 1.646(b). This suggestion has been adopted.

Another comment suggested that "or except as otherwise provided in these Rules" be added to § 1.646(c) after "otherwise ordered by an examiner-in-chief". The commentator pointed out that the change was needed because certain rules (§§ 1.644(g) and 1.658(b)) require service by "Express Mail" or by hand. The commentator accurately pointed out that adding the suggested phrase "will call attention to the fact that there are other rules which have their own requirements for service of papers." The suggestion has been adopted, except that "this part" has been used instead of "these Rules."

One comment suggested changing "time" to "date" in the last sentence of § 1.646(e). The suggestion has been adopted. The change is necessary to conform with the language of the rule to actual practice and other language in the rule.

Two comments suggested that § 1.646(d), which authorizes an examiner-in-chief to order service by hand or "Express Mail," be deleted. This suggestion is not being adopted. The use of "Express Mail" or delivery by hand is often desirable to expedite matters or to avoid unnecessary delay. One comment argued that delivery by hand may be prohibitive. Commercial couriers may be used to accomplish delivery by hand. The fee charged by most commercial couriers is not "prohibitive." The other comment argued that "there are circumstances when . . . [delivery by hand] is [not] possible." The use of § 1.646(d) is discretionary on the part of an examiner-in-chief. If delivery by hand, i.e., personal delivery or delivery by commercial courier, or by "Express Mail" is impossible, it would be expected that the examiner-in-chief would exercise discretion and permit service by first class mail.

One comment suggested that the language "present case," which was said to appear in § 1.651(b)(1) and § 1.651(c), be changed to "prepare case." The suggestion is not being adopted because the language "present case" does not appear in § 1.651. In any event, a testimony period is set for a party to present its testimony—either case-in-chief or case-in-rebuttal.

One comment was received which made two suggestions regarding § 1.652. First, the comment suggested that a period longer than 15 days be set for filing a response to a paper answering an order to show cause. This suggestion is not being adopted. The fifteen-day period is believed to be adequate in most cases. If more time is needed, a party may file a motion under § 1.645. Second, the comment suggested that the party placed under an order to show cause should be permitted as a matter of course to file a "reply" brief. This suggestion is not being adopted. In those instances where the Board believes a "reply" brief is desirable it may authorize the filing of a "reply."

One comment argued that § 1.653(i) "fails to make provision for exhibits which are too big to file or are too dangerous to file." If an "exhibit" cannot be filed, it will not be given consideration. A party will have to rely on testimony and/or pictures or sketches for "exhibits" (e.g., a large machine in a factory) which are too large or too dangerous to be filed in the PTO.

While no comments were received concerning § 1.654, it should be noted that a new paragraph (c) has been added and paragraph (c) as set out in the notice of proposed rulemaking has been redesignated as paragraph (d). New paragraph (c) provides that a party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under § 1.632 was timely filed.

Two comments discussing § 1.655 were received. The first comment made the following statement regarding § 1.655(a):

> Last sentence—interlocutory orders are reviewed only for 'manifest error' etc. It is not clear whether this includes show cause orders under § 1.640 resulting from unpatentability determined under § 1.633(a). However, if so, it precludes proper review of the patentability determination.

Patentability will initially be determined by a single examiner-in-chief. See §§ 1.610(a) and 1.640(b). If the examiner-in-chief determines that a claim of a party is unpatentable to that party, an order to show cause why judgment should not be entered as to that claim will be issued to that party. See § 1.640(d). If a response to the order to show cause is filed, a decision will be entered by the Board. See §§ 1.610(a) and 1.640(e). If the Board determines that the claim is not patentable to the party, a final decision and judgment will be entered holding the claim to

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be unpatentable. Review of the final decision and judgment is by judicial review under 35 U.S.C. §§ 141 or 146. It should be noted, however, that if there are other claims in the party's application or patent which are deemed to be patentable, an interlocutory order would be entered holding only that certain claims are unpatentable. A final order holding those claims unpatentable would be entered after final hearing on other issues. Such a practice will avoid piecemeal judicial review.

Another comment suggested that § 1.655 be changed to preclude consideration of patentability at final hearing. Public Law 98-622 authorizes consideration of patentability assuming patentability is properly raised by a party during the interlocutory phase of an interference.

Two comments discussing § 1.656 were received. One comment suggested that "[b] riefs should be letter size for consistency." The PTO has no preference for the size of briefs. Briefs may be filed on letter or legal-size paper. Inasmuch as the federal courts now require letter-size paper, parties who intend to use a PTO brief as an exhibit in a federal court should use letter-size paper.

Another comment suggested that § 1.656 be amended to preclude a single examiner-in-chief from ruling on admissibility of evidence. The introductory remarks to the notice of proposed rulemaking (and this notice) state that "[t] he examiner-in-chief, *where appropriate, will be available by phone to rule on the admissibility of evidence in the event parties encounter unusual* problems during the taking of depositions" (emphasis added). The commentator states:

> If an examiner-in-chief has ruled certain evidence inadmissible, that evidence would presumably not be before the Board at final hearing. Proposed Rule 1.656(h) provides a means for a party to obtain suppression of evidence to which he has made timely objection, but the Rule does not provide for any means for a party whose proffered evidence has been held inadmissible by the examiner-in-chief, to have that holding considered by the Board.

The change suggested by the comment will not be adopted. However, a brief explanation of how practice is expected to work is in order. The introductory remarks indicate that a single examiner-in-chief may rule on admissibility of evidence "where appropriate" and in "unusual" circumstances. There are times during interferences where a motion *in limine* can be helpful. For example, a junior party during its case-in-chief may wish to examine a witness on a document which was *not* served as required by § 1.673(b)(1). The senior party objects and realizes that if the junior party is permitted to examine the witness on the document, extensive cross-examination using numerous documents would be necessary. In order to avoid wasting considerable time, the parties could contact the examiner-in-chief by phone for a determination *in limine* on whether the junior party should be able to examine the witness on the document. Under the circumstances outlined the examiner-in-chief in his or her discretion could enter an order excluding the document from evidence. The order would be subject to a request for reconsideration. See § 1.640(c). Ordinarily, however, it would be expected that parties would present evidence subject to objection. See § 1.675(c), last sentence. It is not envisioned that a single examiner-in-chief will routinely rule on the admissibility of evidence.

Several comments discussing § 1.658 were received. One comment suggested that the 14-day time period in § 1.658(b) is too short. Section 1.658(b) provides that a party may file a request for reconsideration with 14 days of a final decision by the Board. The 14-day time period is the same period authorized for filing requests for reconsideration by the U. S. Court of Appeals for the Federal Circuit. See Rule 40(a) of the Federal Rules of Appellate Procedure.

Several individuals suggested that a less restricted "interference estoppel" be set out in § 1.658(c). While full consideration has been given to the suggestions, it has been decided to retain in these rules the interference estoppel provisions of § 1.658(c) essentially as proposed. "Interference estoppel" under § 1.658(c) is designed to implement the PTO's intent to have as many issues resolved as possible in a single *inter partes* proceeding. Numerous examples in this notice illustrate how practice is expected to take place under § 1.658(c).

The language in the second sentence of § 1.658(c) has been changed to more clearly state the nature of the estoppel and the exception to estoppel. The word "counts" in the second sentence of § 1.658(c) means the counts as they exist at the time a final decision is entered.

One comment was received concerning § 1.658(c) which requires a specific answer. The comment made the following statement:

> You state that an estoppel would not apply against a party awarded a favorable judgment as to *all* counts. However, it seems to me that there will be occasion when it would not be appropriate to have estoppel where there was a split decision. For instance, consider an interference between applicants A and B in which A was awarded priority as to count 1 and B was awarded priority as to count 2. If I understand you correctly, A would be estopped in post-interference *ex parte* practice to present an additional claim X which was patentably indistinct from his claim corresponding to count 1 if B had support for claim X. I think this result would be unfortunate, and that A should be permitted to further refine his claim structure after the interference — that is, after he has been assured that he is entitled to claims to the basic invention recited in count 1. Under the circumstances described by the commentator, inventor A would *not* be estopped to present a claim to X because X is "patentably indistinct" (the proper terminology under the rules would be to say X is the "same patentable invention" as the subject matter of count 1) from the subject matter of count 1. Inventor A would be entitled to claim any disclosed invention which is directed to the "same patentable invention" as count 1. The change in the second sentence of [g49 1.658(c) more clearly reflects the PTO's intent in this regard. Inventor A would *not* be entitled to claim any invention which is the "same patentable invention" as the subject matter of lost count 2. See Examples 26, 27, and 28 for illustrations of interference estoppel practice when a "split" judgment is entered.

Two comments were received discussing § 1.659. One comment suggested that the first sentence of § 1.659(b) should "reflect" that a reexamination may be based only on patents and printed publications. The suggestion is not being adopted. The basis upon which a reexamination may be instituted are set out elsewhere in the statute and rules. 35 U.S.C. 301-306; 37 CFR 1.501-1.570. There is no further need to set that basis out again in § 1.659(b). Another comment suggested that the language "not involved in the judgment of the interference" be deleted from § 1.659(b). The rationale in support of the comment was as follows:

> Besides introducing a potential ambiguity as to what claims were 'involved in the judgment,' there does not appear to be any good reasons to draw this distinction, particularly unless it is made more specific. Why should the Board be prevented from recommending reexamination of some (less relevant) patent claims and not other patent claims which are potentially even more relevant to the public, unless *all* of the *same art* has already been fully evaluated against the *same claims* in the Board's decision? (emphasis in original).

When a patent is involved in an interference, each claim of the patent will be designated to (1) correspond to a count *or* (2) not correspond to a count. All claims which are *ultimately* determined to correspond to a count will be "involved in the judgment of the interference." Inasmuch as they are involved in the judgment of the interference, there is no need to recommend reexamination of those claims. The claims involved in the interference are either patentable or unpatentable based on the final decision of the Board. Section 1.659(b) merely authorizes the Board to recommmend reexamination of patent claims which (1) are *not* involved in the judgment and (2) for one reason or another neither party saw fit to move to designate as corresponding to a count.

One comment was received which suggested that the requirements of § 1.660 are unnecessary. The PTO disagrees. The

requirements of § 1.660 are designed to keep the PTO and a party's opponent informed of activity which is relevant to an interference. These rules attempt, to the extent possible, to eliminate procedural surprise. Inasmuch as mail delays occur and the PTO cannot react instantaneously to every paper filed in connection with every application or patent, the provisions of § 1.660 are believed helpful in preventing surprise on the part of opponent's and unnecessary work by examiners-in-chief or the Board due to a lack of knowledge of relevant activity which may be taking place in the PTO.

One comment suggested that at the end of § 1.661 the following be added: "and the time for any such available appeal or review has expired." The suggestion is not being adopted. Section 1.661 already provides for finality when "no appeal . . . can be taken . . . ." The language finds antecedent basis in 35 U.S.C. § 135(a).

Several comments discussing § 1.662 were received. Two comments suggested a change be made to provide that when a patentee files a statutory disclaimer under 35 U.S.C. § 253 and deletes *all* claims corresponding to a count, the disclaimer will be treated as a request for judgment. As one of the comments pointed out, "[s] ince . . . [the filing of a statutory disclaimer disclaiming all claims corresponding to a count] by the patentee could have no other conceivable effect, the proposed rule should be changed to require judgment when all corresponding claims are disclaimed." The suggestion has been adopted and appropriate changes have been made to § 1.662(c). In view of the changes, the following language in § 1.662(c), as proposed, is not necessary: "A statutory disclaimer of any claim involved in an interference shall in subsequent proceedings have the same effect with respect to the patentee as an adverse judgment." When a patentee disclaims less than all claims corresponding to a count; the claims which remain in the patent continue to be involved in the interference and any patentability or priority issues involving those remaining claims will be involved in the judgment on the merits in the interference.

Two comments suggested that the word "dissolved" in § 1.662(d) be changed to "terminated". This suggestion is being adopted, because § 1.662(d) has been deleted. However, all interferences will be terminated with a "judgment." A change has been made in the language of § 1.11(a) to delete any reference to terminating an interference other than by judgment.

One comment suggested that the word "construed" in § 1.662(a) be changed to "treated". This suggestion has been adopted and more clearly states the intent of the PTO. The filing of the various papers mentioned paragraphs (a) and (c) of § 1.662 will result in certain action by the PTO. The word "treated" more appropriately describes the consequences of filing such papers.

One comment suggested that § 1.662(a) "is too sweeping." According to the commentator, a patentee may file a disclaimer because it has "become aware of a statutory bar or can not afford the expense of an interference." If the patentee becomes aware of a statutory bar, the patentee should call the "bar" to the attention of the PTO or file an appropriate motion under § 1.633(a) for judgment if the "bar" applies to the opponent. If a junior party patentee decides than an interference is too expensive and for that reason files a disclaimer, there is no reason why judgment should not be entered in favor of the opponent. The comment also suggested that § 1.662(c) "needs revision" because a patentee may disclaim one claim corresponding to a count, but not another. Section 1.662(c), as revised, takes into account the possibility that less than all claims corresponding to a count may be disclaimed. When some of the patent claims corresponding to a count are disclaimed, the interference proceeds on the basis of the remaining claims which correspond to the count. If all patent claims corresponding to a count are disclaimed, judgment will be entered.

One comment made the following statement regarding the third sentence of § 1.662(a):

> What of abandonment in favor of a CIP [continuation-in-part application]? Would this be construed as [a] request to enter [an] adverse judgment? Language should reflect procedural moves of substituting CIP for abandoned application and/or declaring new interference.

The third sentence of § 1.662(a) does not apply to an application which is *not* involved in an interference. If an applicant files a continuation-in-part application and successfully moves (§ 1.633(d)) to substitute the continuation-in-part for the application involved in the interference, abandonment of the application originally involved in the interference would have no bearing on the interference. Accordingly, no additional language is needed in § 1.662(a).

Two comments discussing § 1.663 were received. One comment suggested that an explanation of the status of patent claims involved in an adverse judgment should be stated in the rule. This suggestion is not being adopted. The status of patent claims involved in an adverse judgment is stated in 35 U.S.C. § 135(a). Another comment suggested that the status of "claims which could have been counts . . . should be made of record." Unless a motion (§ 1.633(c)) to add claims to correspond to counts is filed, no reference will be made in a judgment as to claims "which could have been made counts."

One comment suggested that the language "then owned by either party but" be inserted after "application" in § 1.665. This suggestion is not being adopted. The language "same parties" in § 1.665 is intended to cover a party and any assignee. The suggested language "then owned" would narrow the scope of the rule in a manner not intended by the PTO.

An oral comment at the hearing suggested that § 1.671(e) be changed so that a party would not have to serve copies of affidavits relied upon under § 1.608(b) in those cases where an opponent had already obtained copies of the Rule 608(b) affidavits. This suggestion is not being adopted. See the discussion above answering comments related to § 1.612(b). Another comment made at the hearing noted that the PTO is "adopting" the Federal Rules of Evidence. The Federal Rules include a "shop book" rule—Rule 803(b)(6). The commentator expressed the view that adopting of a "shop book" rule might make an important change in evidence which is admissible in interferences and suggested that "it would be helpful if the Patent and Trademark Office would publicly comment on this extremely important evidentiary rule . . . " The PTO believes that adoption of Rule 803(b)(6) of the Federal Rules of Evidence does not constitute a change in the admissibility of "shop book" evidence in interference cases. Rule 803(b)(6) is very similar to the former Federal Shop Book Rule (28 U.S.C. § 1732) which it replaced. The courts have articulated a rule of law which the PTO will continue to apply in determining admissibility of laboratory note books under the "shop book" Rule 803(b)(6) of the Federal Rules of Evidence. See e.g., *Alpert* v. *Slatin*, 305 F.2d 891, 134 USPQ 296 (CCPA 1962) and *Elliott* v. *Barker*, [ro 481 F.2d 1337, 179 USPQ 100 (CCPA 1973).

One comment suggested that § 1.671(f) be eliminated on the ground that a rule should not be used to train attorneys and agents. The suggestion is not being adopted. The problem addressed by § 1.671(f) is significant. By providing in the rules that documentary evidence must be explained the PTO hopes to save both parties and the Board considerable difficulty in presenting and evaluating evidence.

One comment suggested that § 1.671(g) should be changed to require a party only to show the "relevancy" of expected testimony as opposed to the "admissibility" of the testimony. This suggestion is being adopted and an appropriate change has been made to § 1.671(g) to require a moving party to "describe the general nature and the relevance of the testimony, document, or thing."

An oral comment was received which asked whether permission to issue a subpoena would be needed in the event a party seeks to call a witness under the control of an opponent. Ordinarily, the examiner-in-chief can order a party to produce an individual for a deposition as long as the individual is a party or is under the control of the party, e.g., an employee of an assignee. Where so-called "third parties" are concerned, however, issuance of a subpoena may be necessary, because the PTO has no authority to compel attendance of third parties. Several comments concerning § 1.672 were received. One comment at the hearing pointed out that use of 8-1/2 by 11 inch paper for affidavits appears to be optional. The commentator is correct in pointing out that the use is optional. By using 8-1/2 by 11 inch paper, however, a party will save considerable time when filing a record (§ 1.653).

Two comments asked questions concerning § 1.672(b), and in particular, the meaning of the word "party" in the phrase "a party shall not be entitled to rely on any document or thing not

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mentioned in one or more of the affidavits . . ." Specifically, one commentator stated:

> It is the scope of the words "the party" which leave doubt as to the meaning of the passage. If "the party" refers *only* to the party proffering the affidavit testimony, then the passage is fair since such party had the opportunity to use whatever documents it deemed favorable to its position. But if "the party" also encompasses the opponent, i.e., the cross-examining party not proffering the affidavit testimony, then the passage improperly restricts the scope of cross-examination. Surely, the proponent party cannot, simply by confining the affidavit to favorable documents, insulate the witness from cross-examination on unfavorable documents.

Section 1.672(b) refers to a "party" and an "opponent." The "party" is the party filing the affidavit and not an opponent of that party. Any "opponent" conducting cross-examination of an affiant may properly rely on documents and things not referred to in the affidavit.

One comment suggested that the language "a witness whose testimony will not be compelled under 35 U.S.C. 24" should be deleted or revised. According to the commentator:

> This is often not determinable in advance. Even a "voluntary" witness may develop cold feet and require a subpoena, or demand one for his own protection. Nor will all witnesses agreeable to affidavits be agreeable to depositions.

The suggestion is not being adopted. An affidavit may be used only when a witness agrees to sign the affidavit. If an individual refuses to sign an affidavit or voluntarily appear at a deposition, the party calling the witness will have to compel attendance at a deposition by a subpoena under 35 U.S.C. § 24 after receiving permission from an examiner-in-chief.

One comment asked why there is "no express provision . . . [in the rules] for simply taking appropriate testimony of an adverse party by notice . . . rather than requiring a subpoena?" In many cases, notice will be sufficient inasmuch as an examiner-in-chief or the Board may generally order an adverse party to appear and give testimony. Thus, in many cases a subpoena is not needed to require attendance at a deposition of an adverse party.

Two comments suggested that a time be set out in the rules by which an affidavit should be filed. The suggestion is being adopted and the second sentence of § 1.672(b) has been changed to provide that affidavits shall be filed prior to the close of the party's relevant testimony period. The two comments also suggested that the rules specify that documents relied upon in an affidavit be filed with the affidavit. This suggestion is also being adopted by an appropriate change to § 1.672(b) which will provide that a party cannot rely on any document referred to in an affidavit unless a copy of the document is filed with the affidavit. Any document filed with an affidavit must also be served (§ 1.646). Section 1.672(b) will also provide that a party may not rely on any "thing" mentioned in an affidavit unless the opponent is given reasonable access to the "thing." A "thing" is something other than a document. The comments had suggested that the "things" be limited to those under the possession, custody, or control of the party submitting the affidavit. This suggestion is not being adopted. If a "thing" is not under the possession, custody, or control of a party, the party should resort the use of a deposition and compel production of the "thing" by a subpoena under 35 U.S.C. § 24.

Four comments were received discussing § 1.673. It was suggested that the time for service under § 1.673(b) be three days if service is accomplished by hand or "Express Mail" and ten days if service is accomplished by any other means. This suggestion is being adopted. An appropriate change has been made in the introductory sentence of § 1.673(b). It was also suggested that the word "copy" in § 1.673(b)(1) be changed to read "list and copy". In support of the suggestion, one commentator states:

> In connection with the service of documents, the amendment to the proposed rule would require that a listing of documents accompany the documents themselves. This would permit cross-checking between lists and documents to ascertain whether or not discrepancies exist and reduce the possibility for later controversy.

The suggestion is being adopted. Under § 1.673(b)(1) a list of the documents would have to accompany the documents. One comment suggested that documents served should be "Bates numbered." While this suggestion is not being adopted in the sense of changing the language of a rule, it must be remembered that the party serving documents may be required to later prove exactly what was served. Using "Bates" numbers or an equivalent scheme may prove invaluable in later stages of an interference.

One comment discussing § 1.682 suggested that the language "not identified on the record during the taking of testimony of a witness" be deleted. This suggestion is not being adopted. If an official record or printed publication is made an exhibit during a deposition or in an affidavit, it need not be submitted under § 1.682. Section 1.682 permits a party to make an official record or printed publication part of the evidence being considered at final hearing without calling a witness. The official record or printed publication must, however, be self-authenticating. On the other hand, a party may present the official record or printed publication as an exhibit during testimony. When this latter course is followed, there is no need to take advantage of the provisions of § 1.682. The comment also suggested that a change be made in § 1.682(a)(4) because the requirement therein for a "certified" copy appeared to be inconsistent with § 1.671(d) which provides that a record of the PTO need not be certified. The suggestion is being adopted by adding "where appropriate" at the beginning of § 1.682(a)(4) and a reference to § 1.671(d) at the end of § 1.682(a)(4). If the official record is not a record of the PTO, it will be necessary to submit a certified copy of the official record.

Comments were received discussing § 1.684. One comment suggested that language be inserted in § 1.684(a) to make clear that the testimony authorized is for a case-in-chief or a case-in-rebuttal. The suggestion is not being adopted. The testimony authorized by § 1.684(a) is necessarily testimony for a case-in-chief or a case-in-rebuttal. The commentator correctly notes that the use of written interrogatories under § 1.684 "for cross-examination would seem neither appropriate or justified." Section 1.684 does not apply to cross-examination. If a party submits an affidavit under § 1.672(b) or intends to rely on an affidavit under § 1.617(e), the party must make the affiant available for cross-examination at a deposition. See § 1.673(e). A deposition may be noticed only "for a reasonable time and place in the United States." See § 1.673(a). Accordingly, it is not expected that § 1.684(a) will be used to cross-examine affiants residing in foreign countries. The party filing the affidavit will be required to make the affiant available for cross-examination in the United States.

One comment suggested that the provisions of § 1.685(d) are "harsher" than the corresponding provisions of 37 CFR § 1.285(c). The comment is not fully understood. Section 1.685(d) requires an objection to be stated on the record. An objection to the admissibility of evidence must be stated on the record *and* a motion under § 1.656(h) renewing the objection at final hearing must be filed. No longer will a party be permitted to attend a deposition and fail to enter an objection only to raise the objection at final hearing. The current practice permits a party to delay the objection until it is often too late to permit an opponent to correct the evidentiary basis on which the objection is bottomed.

One comment suggested that the second sentence of § 1.687(b) ("If the witness refuses to produce a requested document or thing, the party may file a motion (§ 1.635) for additional discovery under paragraph (c) of this section.") be deleted. This suggestion is being adopted. The PTO agrees with the following remark by the commentator: "[o]mission of the sentence is recommended since it is clear from [paragraph] (c) [of § 1.687] that such a motion could be made in an appropriate case."

One comment at the hearing suggested that the PTO's inability to enter protective orders makes discovery unduly complicated. The commentator suggested that under § 1.687(c), as set out in the notice of proposed rulemaking, it is possible to obtain appropriate protective orders. The commentator correctly concedes that the maximum sanction which the PTO can enter upon a proven violation of a PTO entered protective order is judgment. See § 1.616. The commentator suggested, however, that additional discovery may be conditioned on the issuance of a subpoena *duces tecum* under 35 U.S.C. § 24. Upon issuance of the subpoena, the commentator stated that the opponent could move the district court for entry of a protective order. If a party violates a protective order entered by a district court, the party would be subject to such sanctions as the district court might deem appropriate as well as a sanction by the PTO, including entry of judgment against the party. The PTO, unlike the district court, would not be able to apply a sanction after an interference is terminated.

The commentator's suggestion is believed to be sound. No change in the language of § 1.687(b) is believed to be necessary inasmuch as paragraph (b) authorizes the PTO to "specify the terms of conditions of such additional discovery." One of those terms could be requiring a party to issue a subpoena under 35 U.S.C. § 24. By making a party proceed in the first instance in the PTO, appropriate PTO orders may be entered suggesting the scope of any protective order and stating the underlying basis for requiring a party to produce documents. The order could be of assistance to the district court in subsequent enforcement or contempt proceedings.

Additional discovery obtained under a protective order issued by either the PTO or a district court will not be admitted in evidence in the PTO in determining the interference. All evidence submitted in an interference must be made available to the public under the provisions of § 1.11(a). Accordingly, any protective orders have to be vacated before a document could be admitted in evidence in the PTO which is subject to a protective order.

Example 38 illustrates how the practice would work.

Example 38: An interference involves party X and party Y. During the interference, party X files a motion for additional discovery under § 1.687(c) asking that party Y be required to produce certain documents. Party Y opposes on the sole ground that the documents contain trade secret and confidential information. Party Y indicates that it has no objection to producing the documents for inspection by counsel for party X, but insists that party X not be permitted to inspect the documents. Accordingly, party Y asks the examiner-in-chief to authorize the discovery subject to entry of a protective order. Party Y argues, however, that the sanctions of § 1.616 are not sufficient in the event of a violation of the protective order. An examiner-in-chief concludes that additional discovery should be ordered, that a protective order is appropriate, and that the sanctions of § 1.616 are not sufficient in the event of a violation of the protective order. Under the circumstances, the examiner-in-chief would enter an order directing party Y to produce the documents for inspection by counsel of party X on the condition that party X seek production of the documents by a subpoena *duces tecum* under 35 U.S.C. § 24. Upon issuance of any subpoena, party Y could move the district court for entry of a protective order. If the district court enters the protective order, party Y can produce the documents to counsel for party X. If the protective order of the examiner-in-chief is violated, an appropriate sanction up to and including judgment may be entered by the Board. In addition, party Y would be in a position to seek contempt or other sanctions in the district court. The documents produced for inspection by counsel for party X could not be admitted in evidence in the interference (until the protective order is vacated), because those documents are not documents which can be made available to the public under § 1.11(a).

The following is an anticipated time schedule for a two-party interference:

Event in Interference	Time from last event in the interference	Total time in interference
Interference declared (1.611)		
Filing of preliminary statements (1.621) and preliminary motions (1.633)	3 months	3 months
Filing oppositions to preliminary motions (1.638(a))	2/3 month	3-2/3 months
Filing replies to oppositions (1.638(b))	2/3 month	4-1/3 months
Decision on preliminary motions (1.640(b)(1)), open preliminary statements (1.631), set times for filing motions for discovery (1.687(c) and testimony (1.651(a))	1 month	5-1/3 months
Filing of motions for discovery (1.635, 1.651(a), 1.687(c))	1 month	6-1/3 months
Filing of opposition to motion for discovery (1.638(a))	2/3 months	7 months
Filing reply to opposition to motion for discovery (1.638(b))	2/3 months	7-2/3 months
Decision on motion for discovery	2/3 months	8-1/3 months
Time for compliance with any discovery	2/3 months	9 months
Junior party testimony (case-in-chief; 1.672(b)):		
Testimony	2 months	11 months
Senior party cross-examination of affiants if needed	1 month	12 months
Senior party testimony (case-in-chief and case-in-rebuttal, 1.672(b)):		
Testimony	2 months	13-2/3 months
Junior party cross-examination of affiants if needed	1 month	14-2/3 months
Junior party testimony (case-in-rebuttal):		

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Testimony	2/3 month	16 months
Senior party cross-examination of affiants if needed	2/3 month	16-2/3 months
Filing of record (1.653(c))	1-1/3 months	18 months
Brief for junior party (1.656)	1 month	19 months
Brief for senior party (1.656)	1 month	20 months
Reply brief for junior party (1.656)	2/3 month	20-2/3 months
Final hearing (1.654)	1 month	21-2/3 months
Decision (1.658)	2 months	23-2/3 months

The following is an index for §§ 1.601 through 1.688:

Rule Index

§ 1.601 Scope of rules, definitions
§ 1.602 Interest in applications and patents involved in interference
§ 1.603 Interference between applications; subject matter of the interference
§ 1.604 Request for interference between applications by an applicant
§ 1.605 Suggestion of claim to applicant by examiner
§ 1.606 Interference between an application and a patent; subject matter of the interference
§ 1.607 Request by applicant for interference with patent
§ 1.608 Interference between an application and a patent; *prima facie* showing by applicant
§ 1.609 Preparation of interference papers by examiner
§ 1.610 Assignment of interference to examiner-in-chief, time period for completing interference
§ 1.611 Declaration of interference
§ 1.612 Access to applications
§ 1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent
§ 1.614 Jurisdiction over interference
§ 1.615 Suspension of *ex parte* prosecution
§ 1.616 Sanctions for failure to comply with rules or order
§ 1.617 Summary judgment against applicant
§ 1.618 Return of unauthorized papers
§ 1.621 Preliminary statement, time for filing, notice of filing
§ 1.622 Preliminary statement, who made invention, where invention made
§ 1.623 Preliminary statement; invention made in United States
§ 1.624 Preliminary statement; invention made abroad
§ 1.625 Preliminary statement; derivation by an opponent
§ 1.626 Preliminary statement; earlier application
§ 1.627 Preliminary statement, sealing before filing, opening of statement
§ 1.628 Preliminary statement, correction of error
§ 1.629 Effect of preliminary statement
§ 1.630 Reliance on earlier application
§ 1.631 Access to preliminary statement, service of preliminary statement
§ 1.632 Notice of intent to argue abandonment, suppression, or concealment by opponent
§ 1.633 Preliminary motions
§ 1.634 Motion to correct inventorship
§ 1.635 Miscellaneous motions
§ 1.636 Motions, time for filing
§ 1.637 Content of motions
§ 1.638 Opposition and reply, time for filing opposition and reply
§ 1.639 Evidence in support of motion, opposition, or reply
§ 1.640 Motions, hearing and decision, redeclaration of interference, order to show cause
§ 1.641 Unpatentability discovered by examiner-in-chief
§ 1.642 Addition of application or patent to interference
§ 1.643 Prosecution of interference by assignee
§ 1.644 Petitions in interference
§ 1.645 Extension of time, late papers, stay of proceedings
§ 1.646 Service of papers, proof of service
§ 1.647 Translation of document in foreign language
§ 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony
§ 1.652 Judgment for failure to take testimony or file record
§ 1.653 Record and exhibits
§ 1.654 Final hearing
§ 1.655 Matters considered in rendering a final decision
§ 1.656 Briefs for final hearing
§ 1.657 Burden of proof as to date of invention
§ 1.658 Final decision
§ 1.659 Recommendation
§ 1.660 Notice of reexamination, reissue, protest or litigation
§ 1.661 Termination of interference after judgment
§ 1.662 Request for entry of adverse judgment; reissue filed by patentee
§ 1.663 Status of claim of defeated applicant after interference
§ 1.664 Action after interference
§ 1.665 Second interference
§ 1.666 Filing of interference settlement agreements
§ 1.671 Evidence must comply with rules
§ 1.672 Manner of taking testimony
§ 1.673 Notice of examination of witness
§ 1.674 Persons before whom depositions may be taken
§ 1.675 Examination of witness, reading and signing transcript of deposition
§ 1.676 Certification and filing by officer, marking exhibits
§ 1.677 Form of a transcript of deposition
§ 1.678 Transcript of deposition must be filed
§ 1.679 Inspection of transcript
§ 1.682 Official records and printed publications
§ 1.683 Testimony in another interference, proceeding, or action
§ 1.684 Testimony in a foreign country
§ 1.685 Errors and irregularities in depositions
§ 1.687 Additional Discovery
§ 1.688 Use of discovery

The following is a table correlating the present rules (37 CFR § 1.201 through § 1.288) to the rules (37 CFR §§ 1.601 through 1.688).

Rule Correlation Table

Old	New
1.201(a)	1.601(a)
1.201(b)	1.601(b), (c)
1.201(c)	1.602
1.202	none
1.203(a)	1.603(a), (b)
1.203(b)	1.605(a)
1.203(c)	1.605(b)
new	1.604(a)
1.203(d)	1.604(b)
1.204(a)	none
1.204(b)	1.608(b)
1.204(c)	1.608(c)
1.205(a)	1.606(a), (b)
1.205(b)	1.607(a), (c)
1.205(c)	1.607(d)
new	1.608(a)
1.206(a)	1.607(b)
1.207(a)	1.609
new	1.610
1.207(b)	1.611
1.208	1.613
1.211	1.614
1.212	1.615
new	1.616
1.228	1.617
new	1.618
1.215(a)	1.621(a)
1.215(b)	1.621(b)
1.215(c)	1.629(c)
1.216(a)	1.622(a), (b)
1.216(a)(1)-(6)	1.623(a)
1.216(b)	1.623(b),1.624(b), 1.625(b)
1.216(c)	1.666
1.217(a)	1.624(a), 1.625(a)
1.217(b)	1.623(a)
1.218	1.621(a)
1.219	1.627
1.222	1.628
1.223	1.629
1.224	1.630
1.225	1.640(d), (e), and 1.651(c)(4)
1.226	1.612
1.227	1.631
new	1.632
1.231	1.633, 1.634
1.237	1.641
1.238	1.642
1.242	1.643
1.243	1.635,1.636,1.637(b) 1.638 through 1.640
1.244	1.644
1.245	1.645
1.246	1.645
1.247	1.646
1.248	1.646
new	1.647
1.251	1.651
1.252	1.652
1.253	1.653
1.254	1.656
1.255	1.656(c)
1.256	1.654
1.257(a)	1.657
1.257(b)	1.658(c), (d)
1.258	1.655
1.259	1.659
new	1.660
1.262	1.662(a)
1.263	1.662(a) and (d)
1.264	1.662(b) and (c)
new	1.662(e)
1.265	1.663
1.266	1.664
1.267	1.665
1.268	1.666
1.271	1.671
new	1.671(g)
1.272(a)	1.672(a), (b)
1.272(b)	1.672(c)
1.272(c)	1.672(d), (e)
1.273(a)	1.673(a), (c), (d),
new	1.673(e)
1.273(b)	1.673(f)
1.274	1.674
1.275	1.675
1.276	1.676
1.277	1.677
1.278	1.678
1.279	1.679
1.281	1.645
1.282	1.682
1.283	1.683
1.285	1.685
1.286	eliminated
1.287(a)(1)(i),(ii)	1.673(b)
1.287(a)(1)(iii)	1.673(a)
1.287(a)(2),(3)	eliminated
1.287(b)	eliminated
1.287(c)	1.687
1.287(d)(1)	1.673(c)
1.287(d)(2)	1.616
1.287(e)	1.687(d)
1.288	1.688

Other Considerations: These rules do not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the (1) Regulatory Flexibility Act (Pub. L. 96-354), (2) Executive Order 12291, and (3) the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that these rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act; Public Law 96-354). The rules govern the conduct of interference cases which arise in the Patent and Trademark Office. In fiscal 1983, the Patent and Trademark Office received 105,704 patent applications. During the same period, 180 interferences were declared. It is expected that the overall cost will be reduced for obtaining a patent based on application which become involved in an interference. See a "section-by-section" analysis submitted for the Record by Representative Kastenmeier during discussion of H. R. 6286 on the floor of the House in which the following statement appears (130 Cong. Rec. H10528, columns 2 and 3):

> it is expected that interferences will become simpler, more expeditious, and less costly. Under the bill, all issues of patentability and priority which arise in an interference can be decided in a single proceeding rather than in a series of complicated *inter partes* and *ex parte* proceedings.

These rules, therefore, will have no significant economic impact on small entities.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers, individual industries, federal state, or local government agencies, or geographic regions. There would be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These rules do not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Lawyers.

PART 1 — RULES OF PRACTICE IN PATENT CASES

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For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 23, 41, and 135, Part 1 of Title CFR is amended as set forth below.

1. Section 1.1 is amended by adding a new paragraph (e) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(e) Communications relating to interferences and applications or patents involved in an interference should be additionally marked "BOX INTERFERENCE."

2. Section 1.4 is amended by revising paragraph (a)(2) and reprinting the introductory text of paragraph (a) to read as follows:

§ 1.4 Nature of correspondence.

(a) Correspondence with the Patent and Trademark Office comprises:

* * * * *

(2) correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.352; of international applications in Subpart C, §§ 1.401 to 1.482; of reexamination of patents in Subpart D, §§ 1.501 to 1.570; of interferences in Subpart E, §§ 1.601 to 1.688; and of trademark applications §§ 2.11 to 2.189.

* * * * *

3. Section 1.5 is amended by adding a new paragraph (e) to read as follows:

§ 1.5 Identification of application, patent or registration

* * * * *

(e) When a paper concerns an interference, it should state the names of the parties and the number of the interference. The name of the examiner-in-chief assigned to the interference (§ 1.610) and the name of the party filing the paper should appear conspicuously on the first page of the paper.

4. Section 1.8 is amended by adding to paragraph (a) a new subparagraph (xii) to read as follows:

§ 1.8 Certificate of mailing.

* * * * *

(xii) The filing of a paper in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail."

* * * * *

5. Section 1.9 is amended by adding a new paragraph (g) to read as follows:

§ 1.9 Definitions.

* * * * *

(g) For definitions in interferences see § 1.601.

6. Section 1.11 is amended by revising paragraph (a) to read as follows:

§ 1.11 Files open to the public.

(a) After a patent has been issued, the specification, drawings and all papers relating to the case in the file of the patent are open to inspection by the general public, and copies may be obtained upon paying the fee therefor. After entry of a judgment in an interference by the Board of Patent Appeals and Interferences as to all parties, the file of any interference which involved a patent, or an application on which a patent has issued, is similarly open to public inspection and procurement of copies. See § 2.27 for trademark files.

* * * * *

7. Section 1.14 is amended by removing from paragraph (d) the words "Board of Patent Appeals or the Board of Patent Interferences" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

8. Section 1.17 is amended by revising paragraphs (e), (g), (h), and (l) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) $57.50
By other than a small entity 115.00

* * * * *

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. § 134:

By a small entity (§ 1.9(f)) $50.00
By other than a small entity 100.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph. $120.00

—§ 1.47—for filing by other than all the inventors or a person not the inventor
—§ 1.48 —for correction of inventorship
—§ 1.1 —for decision on questions not specifically provided for
—§ 1.183—to suspend the rules
—§ 1.377—for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
—§ 1.37(e)—for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
—§ 1.644(e)—for petition in an interference
—§ 1.644(f)—for request for reconsideration of a decision on petition in an interference.
—§ 1.666(c)—for late filing of interference settlement agreement.
—§§ 5.12, 5.13 & 5.14—for expedited handling of foreign filing license
—§ 5.15—for changing the scope of a license
—§ 5.25@—for retroactive license

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph. ..... $ 60.00

—§ 1.12—for access to an assignment record
—§ 1.14—for access to an application
—§ 1.5—for entry of late priority papers
—§ 1.102—to make application special
—§ 1.103—to suspend action in application
—§ 1.177— for divisional reissues to issue separately
—§ 1.312—for amendment after payment of issue fee
—§ 1.313—to withdraw an application from issue
—§ 1.314—to defer issuance of a patent
—§ 1.334—for patent to issue to assignee, assignment recorded late
—§ 1.666(b)—for access to interference settlement agreement

* * * * *

9. Section 1.36 is revised as follows:

§1.36 Revocation of power of attorney or authorization; withdrawal of attorney or agent.

A power of attorney or authorization of agent may be revoked at any stage in the proceedings of a case, and an attorney or agent may withdraw, upon application to and approval by the Commissioner. An attorney or agent, except an associate attorney or agent whose address is the same as that of the principal attorney or agent, will be notified of the revocation of the power of attorney or authorization, and the applicant or patent owner will be notified of the withdrawal of the attorney or agent. An assignment will not of itself operate as a revocation of a power or authorization previously given, but the assignee of the entire interest may revoke previous powers and be represented by an attorney or agent of the assignee's own selection. See § 1.613(d) for withdrawal of an attorney or agent of record in an interference.

10. Section 1.48 is revised as follows:

§ 1.48 Correction of inventorship.

If the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by (a) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred; (b) an oath or declaration by each actual inventor or inventors as required by § 1.63; (c) the fee set forth in § 1.17(h); and (d) the written consent of any assignee. When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

11. Section 1.55 is amended by removing from paragraph (a) "1.224" and inserting, in its place, "1.630".

12. Section 1.59 is revised as follows:

§ 1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to § 1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§ 1.16) or the processing and retention fee (§ 1.21(1)) has been paid. See § 1.618 for return of unauthorized and improper papers in interferences.

13. Section 1.68 is revised as follows:

{g49 **1.68 Declaration in lieu of oath.**

Any document to be filed in the Patent and Trademark Office and which is required by any law, rule, or other regulation to be under oath may be subscribed to by a written declaration. Such declaration may be used in lieu of the oath otherwise required, if, and only if, the declarant is on the same document, warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001) and may jeopardize the validity of the application or any patent issuing thereon. The declarant must set forth in the body of the declaration that all statements made of the declarant's own knowledge are true and that all statements made on information and belief are believed to be true.

14. Section 1.103 is amended by revising paragraph (d) as follows:

§ 1.103 Suspension of action.

* * * * *

(d) Action on applications in which the Office has accepted a request filed under § 1.139 will be suspended for the entire pendency of these applications except for purposes relating to interference proceedings under §§ 1.601 through 1.688.

15. Section 1.122 is amended by revising paragraph (b) as follows:

§ 1.122 Entry and consideration of amendments.

* * * * *

(b) Ordinarily all amendments presented in a paper filed while the application is open to amendment are entered and considered, subsequent cancellation or correction being required of improper amendments. Untimely amendatory papers may be refused entry and consideration in whole or in part. For amendments presented during an interference see § 1.664.

16. Section 1.136 is amended by removing "§ 1.207" and inserting, in its place, "§ 1.611" and by removing "§ 1.245" and inserting, in its place, "§ 1.645".

17. Section 1.138 is revised as follows:

§ 1.138 Express Abandonment.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant and the assignee of record, if any, and identifying the application. An application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of § 1.34(a) or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue.

18. Section 1.181 is amended by revising paragraph (a) as follows:

§ 1.181 Petition to the Commissioner.

(a) Petition may be taken to the Commissioner: (1) from any action or requirement of any examiner in the *ex parte* prosecution of an application which is not subject to appeal to the Board of Patent Appeals and Interferences or to the court; (2) in cases in which a statute or the rules specify that the matter is to be determined directly by or reviewed by the Commissioner; and (3) to invoke the supervisory authority of the Commissioner in appropriate circumstances. For petitions in interferences, see § 1.644.

* * * * *

19. The center heading preceding § 1.191 is revised to read "APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES".

20. Section 1.191 is amended by revising the section heading and paragraphs (a) and (c) as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination, any of the claims of which have been twice rejected or who has been given a final rejection (§ 1.113), may, upon the payment of the fee set forth in § 1.17(e), appeal from the decision of the examiner to the Board of Patent Appeals and Interferences within the time allowed for response.

* * * * *

(c) An appeal when taken must be taken from the rejection of all claims under rejection which the applicant or patent owner proposes to contest. Questions relating to matters not affecting the merits of the invention may be required to be settled before an appeal can be considered.

* * * * *

21. Section 1.194 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

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22. Section 1.196 is revised as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences.

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise any one of the following three options:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall, if necessary, render a new decision which shall include all grounds upon which a patent is refused.

(3) The appellant may treat the decision, including the new grounds for rejection given by the Board of Patent Appeals and Interferences, as a final decision in the case.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, appellant shall have the right to amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences. Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

23. Section 1.197 is amended by revising paragraphs (a) and (b) as follows:

§ 1.197 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to the appellant's right of appeal or other review, for such further action by the appellant or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states.

* * * * *

24. Section 1.198 is amended by removing the words "Board of Appeals" and inserting, in their place, the words "Board of Patent Appeals and Interferences."

25. The center heading preceding § 1.201 is removed.

26. Sections 1.201 through 1.212 are removed.

27. The center heading preceding § 1.215 is removed.

28. Sections 1.215 through 1.228 are removed.

29. The center heading preceding § 1.231 is removed.

30. Sections 1.231 through 1.238 are removed.

31. The center heading preceding § 1.242 is removed.

32. Sections 1.242 through 1.247 are removed.

33. A center heading preceding § 1.248 is added which reads "MISCELLANEOUS PROVISIONS".

34. Section 1.248 is amended by adding paragraph (c) and revising the section heading as follows:

§ 1.248 Service of Papers; manner of service; proof of service in cases other than interferences.

* * * * *

(c) See § 1.646 for service of papers in interferences.

35. The center heading preceding § 1.251 is removed.

36. Sections 1.251 through 1.259 are removed.

37. The center heading preceding § 1.261 is removed.

38. Sections 1.261 through 1.268 are removed.

39. The center heading preceding § 1.271 is removed.

40. Sections 1.271 through 1.288 are removed.

41. Section 1.292 is amended by revising paragraph (a) and adding paragraph (c) as follows:

§ 1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations and the fee set forth in § 1.17(j) is filed by one having information of the pendency of an application and is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§ 1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

* * * * *

(c) A petition for institution of public use proceedings shall not be filed by a party to an interference as to an application involved in the interference. Public use and on sale issues in an interference shall be raised by a preliminary motion under § 1.633(a).

42. Section 1.301 is amended by removing the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences."

43. Section 1.302 is amended by removing from paragraph (b) "1.248" and inserting, in its place, "1.646" and by removing "and other contested cases".

44. Section 1.303 is amended by removing from paragraph (a) the words "Board of Appeals" and the words "Board of Patent Interferences" and inserting, in each of their places, the words "Board of Patent Appeals and Interferences" and by removing from paragraph (c) "1.248" and inserting, in its place, "1.646".

45. Section 1.304 is amended by revising paragraph (a) as follows:

§ 1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is sixty days from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of § 1.136. See § 1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See § 1.645(a) for extensions of time to appeal or commence a civil action in an interference. An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.

* * * * *

46. Section 1.322 is amended by revising paragraph (a) as follows:

§ 1.322 Certificate of correction of Office mistake.

(a) A certificate of correction under 35 U.S.C. 254 may be issued at the request of the patentee or the patentee's assignee. Such certificate will not be issued at the request or suggestion of anyone not owning an interest in the patent, nor on motion of the Office, without first notifying the patentee (including any assignee of record) and affording the patentee an opportunity to be heard. When the request relates to a patent involved in an interference, the request shall comply with the requirements of this section and shall be accompanied by a motion under § 1.635.

* * * * *

47. Section 1.323 is revised as follows:

§ 1.323 Certificate of correction of applicant's mistake.

Whenever a mistake of a clerical or typographical nature or of minor character which was not the fault of the Office, appears in a patent and a showing is made that such mistake occurred in good faith, the Commissioner may, upon payment of the fee set forth in § 1.20(a), issue a certificate, if the correction does not involve such changes in the patent as would constitute new matter or would require reexamination. A request for a certificate of correction of a patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under § 1.635.

48. Section 1.324 is revised as follows:

§ 1.324 Correction of inventorship in patent.

Whenever a patent is issued and it appears that the correct inventor or inventors were not named through error without deceptive intention on the part of the actual inventor or inventors, the Commissioner may, on petition of all the parties and the assignees and satisfactory proof of the facts and payment of the fee set forth in § 1.20(b), or on order of a court before which such matter is called in question, issue a certificate naming only the actual inventor or inventors. A request to correct inventorship of patent involved in an interference shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

49. Section 1550 is amended by removing from paragraph (a) "Board of Appeals" and inserting, in its place, "Board of Patent Appeals and Interferences."

50. Section 1.565 is amended by revising paragraph (b) and adding paragraph (e) as follows:

§ 1.565 Concurrent office proceedings.

* * * * *

(b) If a patent in the process of reexamination is or becomes involved in litigation or a reissue application for the patent is filed or pending, the Commissioner shall determine whether or not to stay the reexamination or reissue proceeding.

* * * * *

(e) If a patent in the process of reexamination is or becomes involved in an interference, the Commissioner may stay reexamination or the interference. The Commissioner will not consider a request to stay an interference unless a motion (§ 1.635) to stay the interference has been presented to, and denied by, an examiner-in-chief and the request is filed within ten (10) days of a decision by an examiner-in-chief denying the motion for a stay or such other time as the examiner-in-chief may set.

51. A new subpart entitled "Subpart E—Interferences" is added which reads as follows:

SUBPART E—INTERFERENCES

Sec.	
1.601	Scope of rules, definitions
1.602	Interest in applications and patents involved in interference
1.603	Interference between applications; subject matter of the interference
1.604	Request for interference between applications by an applicant
1.605	Suggestion of claim to applicant by examiner
1.606	Interference between an application and a patent; subject matter of the interference
1.607	Request by applicant for interference with patent
1.608	Interference between an application and a patent; *prima facie* showing by applicant
1.609	Preparation of interference papers by examiner
1.610	Assignment of interference to examiner-in-chief, time period for completing interference
1.611	Declaration of interference
1.612	Access to applications
1.613	Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent
1.614	Jurisdiction over interference
1.615	Suspension of ex parte prosecution
1.616	Sanctions for failure to comply with rules or order
1.617	Summary judgment against applicant
1.618	Return of unauthorized papers
1.621	Preliminary statement, time for filing, notice of filing
1.622	Preliminary statement, who made invention, where invention made
1.623	Preliminary statement; invention made in United States
1.624	Preliminary statement; invention made abroad
1.625	Preliminary statement; derivation by an opponent
1.626	Preliminary statement; earlier application
1.627	Preliminary statement, sealing before filing, opening of statement
1.628	Preliminary statement, correction of error
1.629	Effect of preliminary statement
1.630	Reliance on earlier application
1.631	Access to preliminary statement, service of

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preliminary statement
1.632 Notice of intent to argue abandonment, suppression, or concealment by opponent Preliminary motions
1.634 Motion to correct inventorship
1.635 Miscellaneous motions
1.636 Motions, time for filing
1.637 Content of motions
1.638 Opposition and reply, time for filing opposition and reply
1.639 Evidence in support of motion, opposition, or reply
1.640 Motions, hearing and decision, redeclaration of interference, order to show cause
1.641 Unpatentability discovered by examiner-in-chief
1.642 Addition of application or patent to interference
1.643 Prosecution of interference by assignee
1.644 Petitions in interference
1.645 Extension of time, late papers, stay of proceedings
1.646 Service of papers, proof of service
1.647 Translation of document in foreign language
1.651 Setting times for discovery and taking testimony, parties entitled to take testimony
1.652 Judgment for failure to take testimony or file record
1.653 Record and exhibits
1.654 Final hearing
1.655 Matters considered in rendering a final decision
1.656 Briefs for final hearing
1.657 Burden of proof as to date of invention
1.658 Final decision
1.659 Recommendation
1.660 Notice of reexamination, reissue, protest, or litigation
1.661 Termination of interference after judgment
1.662 Request for entry of adverse judgment; reissue filed by patentee
1.663 Status of claim of defeated applicant after interference
1.664 Action after interference
1.665 Second interference
1.666 Filing of interference settlement agreements
1.671 Evidence must comply with rules
1.672 Manner of taking testimony
1.673 Notice of examination of witness
1.674 Persons before whom depositions may be taken
1.675 Examination of witness, reading and signing transcript of deposition
1.676 Certification and filing by officer, marking exhibits
1.677 Form of a transcript of deposition
1.678 Transcript of deposition must be filed
1.679 Inspection of transcript
1.682 Official records and printed publications
1.683 Testimony in another interference, proceeding, or action
1.684 Testimony in a foreign country
1.685 Errors and irregularities in depositions
1.687 Additional Discovery
1.688 Use of discovery

Authority: 35 USC 6, 23, 41, and 135

SUBPART E—Interferences

§ 1.601 Scope of rules, definitions.

This subpart governs the procedure in patent interferences in the Patent and Trademark Office. This subpart shall be construed to secure the just, speedy, and inexpensive determination of every interference. For the meaning of terms in the Federal Rules of Evidence as applied to interferences, see § 1.671(c). Unless otherwise clear from the context, the following definitions apply to this subpart:

(a) "Additional discovery" is discovery to which a party may be entitled under § 1.687 in addition to discovery to which the party is entitled as a matter of right under § 1.673(a) and (b).

(b) "Affidavit" means affidavit, declaration under § 1.68, or statutory declaration under 28 U.S.C. § 1746. A transcript of an *ex parte* deposition may be used as an affidavit.

(c) "Board" means the Board of Patent Appeals and Interferences.

(d) "Case-in-chief" means that portion of a party's case where the party has the burden of going forward with evidence.

(e)"Case-in-rebuttal" means that portion of a party's case where the party presents evidence in rebuttal to the case-in-chief of another party.

(f) A"count" defines the interfering subject matter between (1) two or more applications or (2) one or more applications and one or more patents. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent which corresponds to a count is a claim involved in the interference within the meaning of 35 U.S.C. § 135(a). A claim of a patent or application which is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application which is not identical to a count, but which defines the same patentable invention as the count, is said to "correspond substantially" to the count. When a count is broader in scope than all claims which correspond to the count, the count is a "phantom count." A phantom count is not patentable to any party.

(g) The "effective filing date" of an application or a patent is the filing date of an earlier application accorded to the application or patent under 35 U.S.C. §§ 119, 120, or 365.

(h) In the case of an application, "filing date" means the filing date assigned to the application. In the case of a patent, "filing date" means the filing date assigned to the application which issued as the patent.

(i) An "interference" is a proceeding instituted in the Patent and Trademark Office before the Board to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patents contain claims for the same patentable invention.

(j) An "interference-in-fact" exists when at least one claim of a party which corresponds to a count and at least one claim of an opponent which corresponds to the count define the same patentable invention.

(k) A "lead" attorney or agent is a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the attorney or agent whom an examiner-in-chief may contact to set times and take other action in the interference.

(l) A "party" is (1) an applicant or patentee involved in the interference or (2) a legal representative or an assignee of an applicant or patentee involved in an interference. Where acts of a party are normally performed by an attorney or agent, "party" may be construed to mean the attorney or agent. An "inventor" is the individual named as inventor in an application involved in an interference or the individual named as inventor in a patent involved in an interference.

(m) A "senior party" is the party with earliest effective filing date as to all counts or, if there is no party with the earliest effective filing date as to all counts, the party with the earliest filing date. A "junior party" is any other party.

(n) Invention "A" is the "same patentable invention" as a invention "B" when invention "A" is the same as (35 U.S.C. § 102) or is obvious (35 U.S.C. § 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A". Invention "A" is a "separate patentable invention" with respect to invention "B" when invention "A" is new (35 U.S.C. § 102) and nonobvious (35 U.S.C. § 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

(o) "Sworn" means sworn or affirmed.

(p) "United States" means the United States of America, its territories and possessions.

§ 1.602 Interest in applications and patents involved in an interference.

(a) Unless good cause is shown, an interference shall not be declared or continued between (1) applications owned by a single party or (2) applications and an unexpired patent owned by a single party.

(b) The parties, within 20 days after an interference is declared, shall notify the Board of any and all right, title, and interest in any application or patent involved or relied upon in the interference unless the right, title, and interest is set forth in the notice declaring the interference.

(c) If a change of any right, title, and interest in any application or patent involved or relied upon in the interference occurs after notice is given declaring the interference and before the time expires for seeking judicial review of a final decision of the Board, the parties shall notify the Board of the change within 20 days of the change.

§ 1.603 Interference between applications; subject matter of the interference.

Before an interference is declared between two or more applications, the examiner must be of the opinion that there is interfering subject matter claimed in the applications which is patentable to each applicant subject to a judgment in the interference. The interfering subject matter shall be defined by one or more counts. Each count shall define a separate patentable invention. Each application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the applications which define the same patentable invention as a count shall be designated to correspond to the count.

§ 1.604 Request for interference between applications by an applicant.

(a) An applicant may seek to have an interference declared with an application of another by (1) suggesting a proposed count and presenting a claim corresponding to the proposed count, (2) identifying the other application and, if known, a claim in the other application which corresponds to the proposed count, and (3) explaining why an interference should be declared.

(b) When an applicant presents a claim known to the applicant to define the same patentable invention claimed in a pending application of another, the applicant shall identify that pending application, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where it appears an applicant may have failed to comply with the provisions of this paragraph.

§ 1.605 Suggestion of claim to applicant by examiner.

(a) The examiner may suggest that an applicant present a claim in an application for the purpose of an interference with another application or a patent. The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim within a time specified by the examiner, not less than one month. Failure or refusal of an applicant to timely present the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim. At the time the suggested claim is presented, the applicant may also (1) call the examiner's attention to other claims already in the application or which are presented with the suggested claim and (2) explain why the other claims would be more appropriate to be included in any interference which may be declared.

(b) The suggestion of a claim by the examiner for the purpose of an interference will not stay the period for response to any outstanding Office action. When a suggested claim is timely presented, *ex parte* proceedings in the application will be stayed pending a determination of whether an interference will be declared.

§ 1.606 Interference between an application and a patent; subject matter of the interference.

Before an interference is declared between an application and an unexpired patent, an examiner must determine that there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in the interference. The interfering subject matter will be defined by one or more counts. Each count shall define a separate patentable invention. Any application must contain, or be amended to contain, at least one claim which corresponds to each count. All claims in the application and patent which define the same patentable invention as a count shall be designated to correspond to the count. At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than any patent claim which corresponds to the count and any single patent claim will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

§ 1.607 Request by applicant for interference with patent.

(a) An applicant may seek to have an interference declared between an application and an unexpired patent by (1) presenting a proposed count and a claim corresponding to the proposed count and, if any claim of the patent or application does not correspond exactly to the proposed count, explaining why an interference should be declared, (2) identifying the patent and indicating which claim in the application and which claim or claims of the patent correspond to the proposed count, and (3) applying the terms of the application claim corresponding to the count to the disclosure of the application.

(b) When an applicant seeks an interference with a patent, examination of the application, including any appeal to the Board, shall be conducted with special dispatch within the Patent and Trademark Office. The examiner shall determine whether there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in an interference. If the examiner determines that there is any interfering subject matter, an interference will be declared. If the examiner determines that there is no interfering subject matter, the examiner shall state the reasons why an interference is not being declared and otherwise act on the application.

(c) When an applicant presents a claim which corresponds exactly or substantially to a claim of a patent, the applicant shall identify the patent and the number of the patent claim, unless the claim is presented in response to a suggestion by the examiner. The examiner shall notify the Commissioner of any instance where an applicant fails to identify the patent.

(d) A notice that an applicant is seeking to provoke an interference with a patent will be placed in the file of the patent and a copy of the notice will be sent to the patentee. The identity of the applicant will not be disclosed unless an interference is declared. If a final decision is made not to declare an interference, a notice to that effect will be placed in the patent file and will be sent to the patentee.

§ 1.608 Interference between an application and a patent; *prima facie* showing by applicant.

(a) When the earlier of the filing date or effective filing date of an application is three months or less after the earlier of the filing date or effective filing date of a patent, the applicant, before an interference will be declared, shall file an affidavit alleging that there is a basis upon which applicant is entitled to a judgment relative to the patentee.

(b) When the earlier of the filing date or the effective filing date of an application is more than three months after the earlier of the filing date or the effective filing date under 35 U.S.C. § 120 of a patent, the applicant, before an interference will be declared, shall file (1) evidence which may consist of patents or printed publications, other documents, and one or more affidavits which demonstrate that applicant is *prima facie* entitled to a judgment relative to the patentee and (2) an explanation stating with particularity the basis upon which the applicant is {it prima facie {ro entitled to the judgment. Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the earlier of the filing date or effective filing date of the patent. To

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facilitate preparation of a record (§ 1.653(g) and (h)) for final hearing, an applicant should file affidavits on paper which is 8-1/2x11 inches (21.8 by 27.9 cm.). The significance of any printed publication or other document which is self-authenticating within the meaning of Rule 902 of the Federal Rules of Evidence or § 1.671(d) and any patent shall be discussed in an affidavit or the explanation. Any printed publication or other document which is not self-authenticating shall be authenticated and discussed with particularity in an affidavit. Upon a showing of sufficient cause, an affidavit may be based on information and belief. If a examiner finds an application to be in condition for declaration of an interference, the examiner will consider the evidence and explanation only to the extent of determining whether a basis upon which the applicant would be entitled to a judgment relative to the patentee is alleged and, if a basis is alleged, an interference may be declared.

§1.609 Preparation of interference papers by examiner.

When the examiner determines that an interference should be declared, the examiner shall forward to the Board:

(a) All relevant application and patent files and
(b) A statement identifying:
(1) The proposed count or counts;
(2) The claims of any application or patent which correspond to each count, stating whether the claims correspond exactly or substantially to each count;
(3) The claims in any application which are deemed by the examiner to be patentable over any count; and
(4) Whether an applicant or patentee is entitled to the benefit of the filing date of an earlier application and, if so, sufficient information to identify the earlier application.

§ 1.610 Assignment of interference to examiner-in-chief, time period for completing interference.

(a) Each interference will be declared by an examiner-in-chief who may enter all interlocutory orders in the interference, except that only a panel consisting of at least three members of the Board shall (1) hear oral argument at final hearing, (2) enter a decision under §§ 1.617, 1.640(c) or (e), 1.652, 1.656(i) or 1.658 or (3) enter any other order which terminates the interference.

(b) As necessary, another examiner-in-chief may act in place of the one who declared the interference. Unless otherwise provided in this section, at the discretion of the examiner-in-chief assigned to the interference, a panel consisting of two or more members of the Board may enter interlocutory orders.

(c) Unless otherwise provided in this subpart, times for taking action by a party in the interference will be set on a case-by-case basis by the examiner-in-chief assigned to the interference. Times for taking action shall be set and the examiner-in-chief shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.

(d) An examiner-in-chief may hold a conference with the parties to consider: (1) simplification of any issues, (2) the necessity or desirability of amendments to counts, (3) the possibility of obtaining admissions of fact and genuineness of documents which will avoid unnecessary proof, (4) any limitations on the number of expert witnesses, (5) the time and place for conducting a deposition (§ 1.673(g)), and (6) any other matter as may aid in the disposition of the interference. After a conference, the examiner-in-chief may enter any order which may be appropriate.

(e) The examiner-in-chief may determine a proper course of conduct in an interference for any situation not specifically covered by this part.

§ 1.611 Declaration of interference.

(a) Notice of declaration of an interference will be sent to each party.

(b) When a notice of declaration is returned to the Patent and Trademark Office undelivered, or in any other circumstance where appropriate, an examiner-in-chief may (1) send a copy of the notice to a patentee named in a patent involved in an interference or the patentee's assignee of record in the Patent and Trademark Office or (2) order publication of an appropriate notice in the *Official Gazette*.

(c) The notice of declaration shall specify:

(1) the name and residence of each party involved in the interference;
(2) the name and address of record of any attorney or agent of record in any application or patent involved in the interference;
(3) the name of any assignee of record in the Patent and Trademark Office;
(4) the identity of any application or patent involved in the interference;
(5) where a party is accorded the benefit of the filing date of an earlier application, the identity of the earlier application;
(6) the count or counts;
(7) the claim or claims of any application or any patent which correspond to each count; and
(8) the order of the parties.

(d) The notice of declaration may also specify the time for: (1) filing a preliminary statement as provided in § 1.621(a); (2) serving notice that a preliminary statement has been filed as provided § 1.621(b); and (3) filing preliminary motions authorized by § 1.633, oppositions to the motions, and replies to the oppositions.

(e) Notice may be given in the *Official Gazette* that an interference has been declared involving a patent.

§ 1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under § 1.131 and any evidence and explanation under § 1.608(b) filed separate from an amendment.

(b) After preliminary motions under § 1.633 are decided (§ 1.640(b)), each party shall have access to and may obtain copies of any affidavit filed under § 1.131 and any evidence and explanation filed under § 1.608(b) in any application set out in the notice declaring the interference.

(c) Any evidence and explanation filed under § 1.608(b) in the file of any application identified in the notice declaring the interference shall be served when required by § 1.617(b).

(d) The parties at any time may agree to exchange copies of papers in the files of any application identified in the notice declaring the interference.

§ 1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent.

(a) Each party may be required to designate one attorney or agent of record as the lead attorney or agent.

(b) The same attorney or agent or members of the same firm of attorneys or agents may not represent two or more parties in an interference except as may be permitted under this Chapter.

(c) An examiner-in-chief may make necessary inquiry to determine whether an attorney or agent should be disqualified from representing a party in an interference. If an examiner-in-chief is of the opinion that an attorney or agent should be disqualified, the examiner-in-chief shall refer the matter to the Commissioner. The Commissioner will make a final decision as to whether any attorney or agent should be disqualified.

(d) No attorney or agent of record in an interference may withdraw as attorney or agent of record except with the approval of an examiner-in-chief and after reasonable notice to the party on whose behalf the attorney or agent has appeared. A request to withdraw as attorney or agent of record in an interference shall be made by motion (§ 1.635).

§ 1.614 Jurisdiction over interference.

(a) The Board shall assume jurisdiction over an interference when the interference is declared under § 1.611.

(b) When the interference is declared the interference is a contested case within the meaning of 35 U.S.C. § 24.

(c) The examiner shall have jurisdiction over any pending application until the interference is declared. An examiner-in-chief, where appropriate, may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.

§ 1.615 Suspension of *ex parte* prosecution.

(a) When an interference is declared, *ex parte* prosecution of an application involved in the interference is suspended. Amendments and other papers related to the application received during pendency of the interference to be entered or considered in the interference without the consent of an examiner-in-chief.

(b) *Ex parte* prosecution as to specified matters may be continued concurrently with the interference with the consent of the examiner-in-chief.

§ 1.616 Sanctions for failure to comply with rules or order.

An examiner-in-chief or the Board may impose an appropriate sanction against a party who fails to comply with the regulations of this part or any order entered by an examiner-in-chief or the Board. An appropriate sanction may include among others entry of an order:

(a) holding certain facts to have been established in the interference;
(b) precluding a party from filing a motion or a preliminary statement;
(c) precluding a party from presenting or contesting a particular issue;
(d) precluding a party from requesting, obtaining, or opposing discovery; or
(e) granting judgment in the interference.

§ 1.617 Summary judgment against applicant

(a) An examiner-in-chief shall review any evidence filed by an applicant under § 1.608(b) to determine if the applicant is *prima facie* entitled to a judgment relative to the patentee. If the examiner-in-chief determines that the evidence shows the applicant is *prima facie* entitled to a judgment relative to the patentee, the interference shall proceed in the normal manner under the regulations of this part. If in the opinion of the examiner-in-chief the evidence fails to show that the applicant is *prima facie* entitled to a judgment relative to the patentee, the examiner-in-chief shall, concurrently with the notice declaring the interference, enter an order stating the reasons for the opinion and directing the applicant, within a time set in the order, to show cause why summary judgment should not be entered against the applicant.

(b) The applicant may file a response to the order and state any reasons why summary judgment should not be entered. Any request by the applicant for a hearing before the Board shall be made in the response. Additional evidence shall not be presented by the applicant or considered by the Board unless the applicant shows good cause why any additional evidence was not initially presented with the evidence filed under § 1.608(b). At the time an applicant files a response, the applicant shall serve a copy of any evidence filed under § 1.608(b) and this paragraph.

(c) If a response is not timely filed by the applicant, the Board shall enter a final decision granting summary judgment against the applicant.

(d) If a response is timely filed by the applicant, all opponents may file a statement within a time set by the examiner-in-chief. The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the examiner-in-chief for issuing the order to show cause. Evidence shall not be filed by any opponent. An opponent may not request an oral hearing.

(e) Within a time authorized by the examiner-in-chief, an applicant may file a reply to any statement filed by any opponent.

(f) When more than two parties are involved in an interference, all parties may participate in summary judgment proceedings under this section.

(g) If a response by the applicant is timely filed, the examiner-in-chief or the Board shall decide whether the evidence submitted under § 1.608(b) and any additional evidence properly submitted under paragraph (b) of this section shows that the applicant is *prima facie* entitled to a judgment relative to the patentee. If the applicant is not *prima facie* entitled to a judgment relative to the patentee, the Board shall enter a final decision granting summary judgment against the applicant. Otherwise, an interlocutory order shall be entered authorizing the interference to proceed in the normal manner under the regulations of this part.

(h) Only an applicant who filed evidence under § 1.608(b) may request a hearing. If that applicant requests a hearing, the Board may hold a hearing prior to entry of a decision under paragraph (g) of this section. The examiner-in-chief shall set a date and time for the hearing. Unless otherwise ordered by the examiner-in-chief or the Board, the applicant and any opponent will each be entitled to no more than 30 minutes of oral argument at the hearing.

§ 1.618 Return of unauthorized papers.

(a) The Patent and Trademark Office shall return to a party any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart. Any paper returned will not thereafter be considered by the Patent and Trademark Office in the interference. A party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an examiner-in-chief.

(b) When presenting a paper in an interference, a party shall not submit with the paper a copy of a paper previously filed in the interference.

§ 1.621 Preliminary statement, time for filing, notice of filing.

(a) Within the time set for filing preliminary motions under § 1.633, each party may file a preliminary statement. The preliminary statement may be signed by any individual having knowledge of the facts recited therein or an attorney or agent of record.

(b) When a party files a preliminary statement the party shall also simultaneously file and serve on all opponents in the interference a notice stating that a preliminary statement has been filed. A copy of the preliminary statement need not be served until ordered by an examiner-in-chief.

§ 1.622 Preliminary statement, who made invention, where invention made.

(a) A party's preliminary statement must identify the inventor who made the invention defined by each count and must state on behalf of the inventor the facts required by paragraph (a) of §§ 1.623, 1.624, and 1.625 as may be appropriate. When an inventor identified in the preliminary statement is not an inventor named in the party's application or patent, the party shall file a motion under § 1.634 to correct inventorship.

(b) The preliminary statement shall state whether the invention was made in the United States or abroad. If made abroad, the preliminary statement shall state whether the party is entitled to the benefit of the second sentence of 35 U.S.C. § 104.

§ 1.623 Preliminary statement; invention made in United States.

(a) When the invention was made in the United States or a party is entitled to the benefit of the second sentence of 35 U.S.C. § 104, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which the first drawing of the invention was made.
(2) The date on which the first written description of the invention was made.
(3) The date on which the invention was first disclosed by the inventor to another person.
(4) The date on which the invention was first conceived by the inventor.
(5) The date on which the invention was first actually reduced to practice. If the invention was not actually reduced to practice by or on behalf of the inventor prior to the party's filing date, the preliminary statement shall so state.
(6) The date after the inventor's conception of the invention when active exercise of reasonable diligence toward reducing the invention to practice began.

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(b) If a party intends to prove derivation, the preliminary statement must also comply with § 1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a copy of the first drawing or written description cannot be filed with the preliminary statement.

§ 1.624 Preliminary statement; invention made abroad.

(a) When the invention was made abroad and a party intends to rely on introduction of the invention into the United States, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which a drawing of the invention was first introduced into the United States.
(2) The date on which a written description of the invention was first introduced into the United States.
(3) The date on which the invention was first disclosed to another person in the United States.
(4) The date on which the inventor's conception of the invention was first introduced into the United States.
(5) The date on which an actual reduction to practice of the invention was first introduced into the United States. If an actual reduction to practice of the invention was not introduced into the United States, the preliminary statement shall so state.
(6) The date after introduction of the inventor's conception into the United States when active exercise of reasonable diligence in the United States toward reducing the invention to practice began.

(b) If a party intends to prove derivation, the preliminary statement must also comply with § 1.625.

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was introduced into the United States a copy of that drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was introduced into the United States a copy of that written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a copy of the first drawing or first written description introduced in the United States cannot be filed with the preliminary statement.

§ 1.625 Preliminary statement; derivation by an opponent.

(a) When the invention was made in the United States or abroad and a party intends to prove derivation by an opponent from the party, the preliminary statement must state the following as to the invention defined by each count:

(1) The name of the opponent.
(2) The date on which the first drawing of the invention was made.
(3) The date on which the first written description of the invention was made.
(4) The date on which the invention was first disclosed by the inventor to another person.
(5) The date on which the invention was first conceived by the inventor.
(6) The date on which the invention was first communicated to the opponent.

(b) If a party intends to prove priority, the preliminary statement must also comply with § 1.623 or § 1.624.

(c) When a party alleges under paragraph (a)(2) of this section that a drawing was made, a copy of the first drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(3) of this section that a written description of the invention was made, a copy of the first written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a first drawing or first written description cannot be filed with the preliminary statement.

§ 1.626 Preliminary statement; earlier application.

When a party does not intend to present evidence to prove a conception or an actual reduction to practice and the party intends to rely solely on the filing date of an earlier application filed in the United States or abroad to prove a constructive reduction to practice, the preliminary statement may so state and identify the earlier application with particularity.

§ 1.627 Preliminary statement, sealing before filing, opening of statement.

(a) The preliminary statement and copies of any drawing or written description shall be filed in a sealed envelope bearing only the name of the party filing the statement and the style (e.g., Jones v. and number of the interference. The sealed envelope should contain only the preliminary statement and copies of any drawing or written description. If the preliminary statement is filed through the mail, the sealed envelope should be enclosed in an outer envelope addressed to the Commissioner of Patents and Trademarks in accordance with § 1.1(e).

(b) A preliminary statement may be opened only at the direction of an examiner-in-chief.

§ 1.628 Preliminary statement, correction of error.

(a) A material error arising through inadvertence or mistake in connection with (1) a preliminary statement or (2) drawings or a written description submitted therewith or omitted therefrom, may be corrected by a motion (§ 1.635) for leave to file a corrected statement. The motion shall be supported by an affidavit and shall show that the correction is essential to the ends of justice and shall be accompanied by the corrected statement. The motion shall be filed as soon as practical after discovery of the error.

(b) When a party cannot attach a copy of a drawing or a written description to the party's preliminary statement as required by §§ 1.623(c), 1.624(c), or 1.625(c), the party (1) shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and (2) shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States which is available. The party shall file a motion (§ 1.635) to amend its preliminary statement promptly after the first drawing, first written description, or drawing or written description first introduced into the United States becomes available. A copy of the drawing or written description may be obtained, where appropriate, by a motion (§ 1.635) for additional discovery under § 1.687 or during a testimony period.

§ 1.629 Effect of preliminary statement.

(a) A party shall be strictly held to any date alleged in the preliminary statement. Doubts as to (1) definiteness or sufficiency of any allegation in a preliminary statement or (2) compliance with formal requirements will be resolved against the party filing the statement by restricting the party to the earlier of its filing date or effective filing date or to the latest date of a period alleged in the preliminary statement as may be appropriate. A party may not correct a preliminary statement except as provided by § 1.628.

(b) Evidence which shows that an act alleged in the preliminary statement occurred prior to the date alleged in the statement shall establish only that the act occurred as early as the date alleged in the statement.

(c) If a party does not file a preliminary statement, the party:

(1) shall be restricted to the earlier of the party's filing date or effective filing date and
(2) will not be permitted to prove that:
(i) the party made the invention prior to the party's filing date or
(ii) any opponent derived the invention from the party.

(d) If a party files a preliminary statement which contains an allegation of a date of first drawing or first written description and the party does not file a copy of the first drawing or written description with the preliminary statement as required by §

1.623(c), § 1.624(c), or § 1.625(c), the party will be restricted to the earlier of the party's filing date or effective filing date as to that allegation unless the party complies with § 1.628(b). The content of any drawing or written description submitted with a preliminary statement will not normally] be evaluated or considered by the Board.

(e) A preliminary statement shall not be used as evidence on behalf of the party filing the statement.

§ 1.630 Reliance on earlier application.

A party shall not be entitled to rely on the filing date of an erlier application filed in the United States or abroad unless (a) the earlier application is identified § 1.611(c)(5)) in the notice declaring the interference or (b) the party files a preliminary motion under § 1.633 seeking the benefit of the filing date of the earlier application.

§ 1.631 Access to preliminary statement, service of preliminary statement.

(a) Unless otherwise ordered by an examiner-in-chief, concurrently with entry of a decision by the examiner-in-chief on preliminary motions filed under § 1.633, any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement. Within a time set by the examiner-in-chief, a party shall serve copies of its preliminary statement on every opponent who served a notice under § 1.621(b).

(b) A junior party who does not file a preliminary statement shall not have access to the preliminary statement of any other party.

(c) If an interference is terminated before the preliminary statements have been opened, the preliminary statements will remain sealed and will be returned to the respective parties who submitted the statements.

§ 1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.

A notice hall be filed by a party who intends to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice (35 U.S.C. § 102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an examiner-in-chief, a notice is timely when filed within ten (10) days of the close of the testimony-in-chief of the opponent.

§ 1.633 Preliminary Motions.

A party may file the following preliminary motions:

(a) A motion for judgment on the ground that an opponent's claim corresponding to a count is not patentable to the opponent. In determining a motion filed under this paragraph, a claim may be construed by reference to the prior art of record. A motion under this paragraph shall not be based on: (1) priority of invention of the subject matter of a count by the moving party as against any opponent or (2) derivation of the subject matter of a count by an opponent from the moving party. See § 1.637(a)

(b) A motion for judgment on the ground that there is no interference-in-fact. A motion under this paragraph is proper only if: (1) the interference involves a design application or patent or a plant application or patent or (2) no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. See § 1.637(a)

(c) A motion to redefine the interfering subject matter by (1) adding or substituting a count, (2) amending an application claim corresponding to a count or adding a claim in the moving party's application to be designated to correspond to a count, (3) designating an application or patent claim to correspond to a count, (4) designating an application or patent claim as not corresponding to a count, or (5) requiring an opponent who is an applicant to add a claim and to designate the claim to correspond to a count. See § 1.637(a) and (c).

(d) A motion to substitute a different application owned by a party for an application involved in the interference. See § 1.637(a) and (d).

(e) A motion to declare an additional interference (1) between an additional application not involved in the interference and owned by a party and an opponent's application or patent involved in the interference or (2) when an interference involves three or more parties, between less than all applications and any patent involved in the interference. See § 1.637(a) and (e).

(f) A motion to be accorded the benefit of the filing date of an earlier application filed in the United States or abroad. See § 1.637(a) and (f).

(g) A motion to attack the benefit accorded an opponent in the notice declaring the interference of the filing date of an earlier application filed in the United States or abroad. See § 1.637(a) and (g).

(h) When a patent is involved in an interference and the patentee has on file or files an application for reissue under § 1.171, a motion to add the application for reissue to the interference. See § 1.637(a) and (h).

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an oponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section or a motion to substitute a different application under paragraph (d) of this section.

(j) When a motion is filed under paragraph (c)(1) of this section an opponent, in addition to opposing the motion, may file a motion for benefit under paragraph (f) of this section as to the count to be added or substituted.

§ 1.634 Motion to correct inventorship.

A party may file a motion to (a) amend its application involved in an interference to correct inventorship as provided by § 1.48 or (b) correct inventorship of its patent involved in an interference as provided in § 1.324. See § 1.637(a).

§ 1.635 Miscellaneous motions.

A party seeking entry of an order relating to any matter other than a matter which may be raised under §§ 1.633 or 1.634 may file a motion requesting entry of the order. See § 1.637(a) and (b).

§ 1.636 Motions, time for filing.

(a) A preliminary motion under § 1.633(a) through (b) shall be filed within a time period set by an examiner-in-chief.

(b) A preliminary motion under § 1.633(i) or (j) shall be filed within 20 days of the service of the preliminary motion under § 1.633(a), (b), or (g) unless otherwise ordered by an examiner-in-chief.

(c) A motion under § 1.634 shall be diligently filed after an error is discovered in the inventorship of an application or patent involved in an interference unless otherwise ordered by an examiner-in-chief.

(d) A motion under § 1.635 shall be filed as specified in this subpart or when appropriate unless otherwise ordered by an examiner-in-chief.

§ 1.637 Content of motions.

(a) Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

(b) A motion under § 1.635 shall contain a certificate by the moving party stating that the moving party has conferred with all opposing parties in an effort in good faith to resolve by agreement the issues raised by the motion. A moving party shall indicate in the motion whether any other party plans to oppose the motion. The provisions of this paragraph do not apply to a motion to suppress evidence (§ 1.656(h)).

(c) A preliminary motion under [§ 1.633(c) shall explain why the interfering subject matter should be redefined.

(1) A preliminary motion seeking to add or substitute a count shall:

(i) Propose each count to be added or substituted.

(ii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to, the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a

moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iii) Identify all claims in an opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(iv) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(v) Show that each proposed count defines a separate patentable invention from every other count in the interference.

(vi) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(2) A preliminary motion seeking to amend an application claim corresponding to a count or adding a claim to be designated to correspond to a count shall:

(i) Propose an amended or added claim.

(ii) Show that the proposed or added claim defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each amended or added claim and apply the terms of the amended or added claim to the disclosure of the application; when necessary a moving party applicant shall file with the motion an amendment making the amended or added claim to the application.

(iv) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(3) A preliminary motion seeking to designate an application or patent claim to correspond to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim defines the same patentable invention as the count.

(iii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier application filed in the United States or abroad.

(4) A preliminary motion seeking to designate an application or patent claim as not corresponding to a count shall:

(i) Identify the claim and the count.

(ii) Show the claim does not define the same patentable invention as any other claim designated in the notice declaring the interference as corresponding to the count,

(5) A preliminary motion seeking to require an opponent who is an applicant to add a claim and designate the claim as corresponding to a count shall:

(i) Propose a claim to be added by the opponent.

(ii) Show the patentability to the opponent of the claim and apply the terms of the claim to the disclosure of the opponent's application.

(iii) Identify the count to which the claim shall be designated to correspond.

(iv) Show the claim defines the same patentable invention as the count to which it will be designated to correspond.

(d) A preliminary motion under § 1.633(d) to substitute a different application shall:

(1) Identify the different application.

(2) Certify that a complete copy of the file of the different application, except for documents filed under § 1.131 or § 1.608(b), has been served on all opponents.

(3) Show the patentability to the applicant of all claims in, or proposed to be added to, the different application which correspond to each count and apply the terms of the claims to the disclosure of the different application; when necessary the applicant shall file with the motion an amendment adding a claim to the different application.

(4) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(e) A preliminary motion to declare an additional interference under § 1.633(e) shall explain why an additional interference is necessary:

(1) When the preliminary motion seeks an additional interference under § 1.633(e)(1), the motion shall:

(i) Identify the additional application.

(ii) Certify that a complete copy of the file of the additional application, except for documents filed under §§ 1.131 or 1.608(b), has been served on all opponents.

(iii) Propose a count for the additional interference.

(iv) Show the patentability to the applicant of all claims in, or proposed to be added to, the additional application which correspond to each proposed count for the additional interference and apply the terms of the claims to the disclosure of the additional application; when necessary the applicant shall file with the motion an amendment adding a claim to the additional application.

(v) When the opponent is an applicant, show the patentability to the opponent of any claims in, or proposed to be added to, the opponent's application which correspond to the proposed count and apply the terms of the claims to the disclosure of the opponent's application.

(vi) When the opponent is a patentee, designate the claims of the patent which define the same patentable invention defined by the proposed count.

(vii) Show that each proposed count for the additional interference defines a separate patentable invention from all counts of the interference in which the motion is filed.

(viii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(2) When the preliminary motion seeks an additional interference under § 1.633(e)(2), the motion shall:

(i) Identify any application or patent to be involved in the additional interference.

(ii) Propose a count for the additional interference.

(iii) When the moving party is an applicant, show the patentability to the applicant of all claims in, or proposed to be added to the party's application which correspond to each proposed count and apply the terms of the claims to the disclosure of the party's application; when necessary a moving party applicant shall file with the motion an amendment adding any proposed claim to the application.

(iv) Identify all claims in any opponent's application which should be designated to correspond to each proposed count; if an opponent's application does not contain such a claim, the moving party shall propose a claim to be added to the opponent's application. The moving party shall show the patentability of any proposed claims to the opponent and apply the terms of the claims to the disclosure of the opponent's application.

(v) Designate the claims of any patent involved in the interference which define the same patentable invention as each proposed count.

(vi) Show that each proposed count for the additional interference defines a separate patentable invention from all counts in the interference in which the motion is filed.

(vii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

(f) A preliminary motion for benefit under § 1.633(f) shall:

(1) Identify the earlier application.

(2) When the earlier application is an application filed in the United States, certify that a complete copy of the file of the earlier application, except for documents filed under § 1.131 or § 1.608(b), has been served on all opponents. When the earlier application is an application filed abroad, certify that a copy of the application filed abroad has been served on all opponents. If the earlier application filed abroad is not in English, the requirements of § 1.647 must also be met.

(3) Show that the earlier application constitutes a constructive reduction to practice of each count.

(g) A preliminary motion to attack benefit under § 1.633(g) shall explain, as to each count, why an opponent should not be accorded the benefit of the filing date of the earlier application.

(h) A preliminary motion to add an application for reissue under § 1.633(h) shall:

(1) Identify the application for reissue.

(2) Certify that a complete copy of the file of the application for reissue has been served on all opponents.

(3) Show the patentability of all claims in, or proposed to be added to, the application for reissue which correspond to each count and apply the terms of the claims to the disclosure of the application for reissue; when necessary a moving applicant for reissue shall file with the motion an amendment adding a claim to the application for reissue.

(4) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier application filed in the United States or abroad.

§ 1.638 Opposition and reply, time for filing opposition and reply.

(a) Unless otherwise ordered by an examiner-in-chief, any opposition to any motion shall be filed within 20 days after service of the motion. An opposition shall (1) identify any material fact set forth in the motion which is in dispute and (2) include an argument why the relief requested in the motion should be denied.

(b) Unless otherwise ordered by an examiner-in-chief, a reply shall be filed within 15 days after service of the opposition. A reply shall be directed only to new points raised in the opposition.

§ 1.639 Evidence in support of motion, opposition, or reply.

(a) Proof of any material fact alleged in a motion, opposition, or reply must be filed and served with the motion, opposition, or reply unless the proof relied upon is part of the interference file or the file of any patent or application involved in the interference or any earlier application filed in the United States of which a party has been accorded or seeks to be accorded benefit.

(b) Proof may be in the form of patents, printed publications, and affidavits.

(c) When a party believes that testimony is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of the testimony needed. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

§ 1.640 Motions, hearing and decision, redeclaration of interference, order to show cause.

(a) A hearing on a motion may be held in the discretion of the examiner-in-chief. The examiner-in-chief shall set the date and time for any hearing. The length of oral argument at a hearing on a motion is a matter within the discretion of the examiner-in-chief. An examiner-in-chief may direct that a hearing take place by telephone.

(b) Motions will be decided by an examiner-in-chief. An examiner-in-chief may consult with an examiner in deciding motions involving a question of patentability. An examiner-in-chief may grant or deny any motion or take such other action which will secure the just, speedy, and inexpensive determination of the interference.

(1) When preliminary motions under § 1.633 are decided, the examiner-in-chief will, when necessary, set a time for filing any amendment to an application involved in the interference and for filing a supplemental preliminary statement as to any new counts involved in the interference. Failure or refusal of a party to timely present an amendment required by an examiner-in-chief shall be taken without further action as a disclaimer by that party of the invention involved. A supplemental preliminary statement shall meet the requirements specified in §§ 1.623, 1.624, 1.625, or 1.626, but need not be filed if a party states that it intends to rely on a preliminary statement previously filed under § 1.621(a). After the time expires for filing any amendment and supplemental preliminary statement, the examiner-in-chief will, if necessary, redeclare the interference.

(2) After a decision is entered on preliminary motions filed under § 1.633, a further motion under § 1.633 will not be considered except as provided by § 1.655(b).

(c) When a decision on any motion under §§ 1.633, 1.634, or 1.635 is entered which does not result in the issuance of an order to show cause under paragraph (d) of this section, a party may file a request for reconsideration within 14 days after the date of the decision. The filing of a request for reconsideration will not stay any time period set by the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. No opposition to a request for reconsideration shall be filed unless requested by an examiner-in-chief or the Board. A decision of single examiner-in-chief will not ordinarily be modified unless an opposition has been requested by an examiner-in-chief or the Board. The request for reconsideration shall be acted on by a panel of the Board consisting of at least three examiners-in-chief, one of whom will normally be the examiner-in-chief who decided the motion.

(d) An examiner-in-chief may issue an order to show cause why judgment should not be entered against a party when:

(1) A decision on a motion is entered which is dispositive of the interference against the party as to all counts;

(2) The party is a junior party who fails to file a preliminary statement; or

(3) The party is a junior party whose preliminary statement fails to overcome the earlier of the filing date or effective filing date of another party.

(e) When an order to show cause is issued under paragraph (d) of this section, the Board shall enter a judgment in accordance with the order unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 20 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party. If a party wishes to take testimony in response to an order to show cause, the party's response should be accompanied by a motion (§ 1.635) requesting the testimony period. See § 1.651(c)(4).

§ 1.641 Unpatentability discovered by examiner-in-chief.

During the pendency of an interference, if the examiner-in-chief becomes aware of a reason why a claim corresponding to a count may not be patentable, the examiner-in-chief may notify the parties of the reason and set a time within which each party may present its views. After considering any timely filed views, the examiner-in-chief shall decide how the interference shall proceed.

§ 1.642 Addition of application or patent to interference.

During the pendency of an interference, if the examiner-in-chief becomes aware of an application or a patent not involved in the interference which claims the same patentable invention as a count in the interference, the examiner-in-chief may add the application or patent to the interference on such terms as may be fair to all parties.

§ 1.643 Prosecution of interference by assignee.

(a) An assignee of record in the Patent and Trademark Office of the entire interest in an application or patent involved in an interference is entitled to conduct prosecution of the interference to the exclusion of the inventor.

(b) An assignee of a part interest in an application or patent involved in an interference may file a motion (§ 1.635) for entry of an order authorizing it to prosecute the interference. The motion shall show (1) the inability or refusal of the inventor to prosecute the interference or (2) other cause why the ends of justice require that the assignee of a part interest be permitted to prosecute the interference. The examiner-in-chief may allow the assignee of a part interest to prosecute the interference upon such terms as may be appropriate.

§ 1.644 Petitions in interferences.

(a) There is no appeal to the Commissioner in an interference from a decision of an examiner-in-chief or a panel consisting of more than one examiner-in-chief. The Commissioner will not consider a petition in an interference unless:

(1) The petition is from a decision of an examiner-in-chief or a panel and the examiner-in-chief or the panel shall be of the opinion (i) that the decision involves a controlling ques-

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tion of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision on petition by the Commissioner may materially advance the ultimate termination of the interference;

(2) The petition seeks to invoke the supervisory authority of the Commissioner and is not filed prior to the decision of the Board awarding judgment and does not relate to (i) the merits of priority of invention or patentability or (ii) the admissibility of evidence under the Federal Rules of Evidence; or

(3) The petition seeks relief under § 1.183.

(b) A petition under paragraph (a)(1) of this section filed more than 15 days after the date of the decision of the examiner-in-chief or the panel may be dismissed as untimely. A petition under paragraph (a)(2) of this section shall not be filed prior to decision by the Board awarding judgment. Any petition under paragraph (a)(3) of this section shall be timely if it is made as part of, or simultaneously with, a proper motion under §§ 1.633, 1.634, or 1.635. Any opposition to a petition shall be filed within 15 days of the date of service of the petition.

(c) The filing of a petition shall not stay the proceeding unless a stay is granted in the discretion of the examiner-in-chief, the panel, or the Commissioner.

(d) Any petition must contain a statement of the facts involved and the point or points to be reviewed and the action requested. Briefs or memoranda, if any, in support of the petition or opposition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the examiner-in-chief or the panel and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record in the interference shall not be submitted with the petition or opposition.

(e) Any petition under paragraph (a) of this section shall be accompanied by the petition fee set forth in § 1.17(h).

(f) Any request for reconsideration of a decision by the Commissioner shall be filed within 15 days of the decision of the Commissioner and must be accompanied by the fee set forth in § 1.17(h). No opposition to a request for reconsideration shall be filed unless requested by the Commissioner. The decision will not ordinarily be modified unless such an opposition has been requested by the Commissioner.

(g) Where reasonably possible, service of any petition, opposition, or request for reconsideration shall be such that delivery is accomplished within one working day. Service by hand or "Express Mail" complies with this paragraph.

(h) An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(i) The Commissioner may delegate to appropriate Patent and Trademark Office employees the determination of petitions under this section.

§ 1.645 Extension of time, late papers, stay of proceedings.

(a) A party may file a motion (§ 1.635) seeking an extension of time to take action in an interference, to file a notice of appeal (§§ 1.302, 1.304), or to commence a civil action (§§ 1.303, 1.304). The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action, filing the notice, or commencing the civil action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proved through the witness.

(b) Any paper belatedly filed will not be considered except upon motion (§ 1.635) which shows sufficient cause why the paper was not timely filed.

(c) The provisions of § 1.136 do not apply to time periods in interferences.

(d) In an appropriate circumstance, an examiner-in-chief may stay proceedings in an interference.

§ 1.646 Service of papers, proof of service.

(a) A copy of every paper filed in the Patent and Trademark Office in an interference or an application or patent involved in the interference shall be served upon all other parties except:

(1) Preliminary statements when filed under § 1.621; preliminary statements shall be served when service is ordered by an examiner-in-chief.

(2) Certified transcripts and exhibits which accompany the transcripts filed under §§ 1.676 or 1.684; copies of transcripts shall be served as part of a party's record under § 1.653(c).

(b) Service shall be on an attorney or agent for a party. If there is no attorney or agent for the party, service shall be on the party. An examiner-in-chief may order additional service or waive service where appropriate.

(c) Unless otherwise ordered by an examiner-in-chief, or except as otherwise provided by this part, service of a paper shall be made as follows:

(1) By handing a copy of the paper to the person served.

(2) By leaving a copy of the paper with someone employed by the person at the person's usual place of business.

(3) When the person served has no usual place of business, by leaving a copy of the paper at the person's residence with someone of suitable age and discretion then residing therein.

(4) By mailing a copy of the paper by first class mail; when service is by mail the date of mailing is regarded as the date of service.

(5) When it is shown to the satisfaction of an examiner-in-chief that none of the above methods of obtaining or serving the copy of the paper was successful, the examiner-in-chief may order service by publication of an appropriate notice in the *Official Gazette*.

(d) An examiner-in-chief may order that a paper be served by hand or "Express Mail".

(e) Proof of service must be made before a paper will be considered in an interference. Proof of service may appear on or be affixed to the paper. Proof of service shall include the date and manner of service. In the case of personal service under paragraphs (c)(1) through (c)(3) of this section, proof of service shall include the names of any person served and the person who made the service. Proof of service may be made by an acknowledgment of service by or on behalf of the person served or a statement signed by the party or the party's attorney or agent containing the information required by this section. A statement of an attorney or agent attached to, or appearing in, the paper stating the date and manner of service will be accepted as *prima facie* proof of service.

§ 1.647 Translation of document in foreign language.

When a party relies on a document in a language other than English, a translation of the document into English and an affidavit attesting to the accuracy of the translation shall be filed with the document.

§ 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an examiner-in-chief shall set (1) a time for filing motions (§ 1.635) for additional discovery under § 1.687(c) and (2) testimony periods for taking any necessary testimony.

(b) Where appropriate, testimony periods will be set to permit a party to:

(1) present its case-in-chief and/or case-in-rebuttal and/or

(2) cross-examine an opponent's case-in-chief and/or a case-in-rebuttal.

(c) A party is not entitled to take testimony to present a case-in-chief unless:

(1) the examiner-in-chief orders the taking of testimony under § 1.639(c);

(2) the party alleges in its preliminary statement a date of invention prior to the earlier of the filing date or effective filing date of the senior party;

(3) a testimony period has been set to permit an opponent to prove a date of invention prior to the earlier of the filing date or effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to that date; or

(4) a motion (§ 1.635) is filed showing good cause why a testimony period should be set.

(d) Testimony shall be taken during the testimony periods set under paragraph (a) of this section.

§ 1.652 Judgment for failure to take testimony or file record.

If a junior party fails to timely take testimony authorized under § 1.651, or file a record under § 1.653(c), an examiner-in-chief, with or without a motion (§ 1.635) by another party, may issue an order to show cause why judgment should not be entered against the junior party. When an order is issued under this section, the Board shall enter judgment in accordance with the order unless, within 15 days after the date of the order, the junior party files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 15 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party.

§ 1.653 Record and exhibits.

(a) Testimony shall consist of affidavits under § 1.672(b) and (e), transcripts of depositions under §§ 1.672(b) and (c), agreed statements of fact under § 1.672(f), and transcripts of interrogatories, cross-interrogatories, and recorded answers under § 1.684(c).

(b) An affidavit shall be filed as set forth in § 1.672(b) or (e). A certified transcript of a deposition including a deposition cross-examining an affiant, shall be filed as set forth in § 1.676. An original agreed statement shall be filed as set forth in § 1.672(f). A transcript of interrogatories, cross-interrogatories, and recorded answers shall be filed as set forth under § 1.684(c).

(c) In addition to the items specified in paragraph (b) of this section and within a time set by an examiner-in-chief each party shall file three copies and serve one copy of a record consisting of:

(1) An index of the names of each witness giving the pages of the record where the direct testimony and cross-examination of each witness begins.

(2) An index of exhibits briefly describing the nature of each exhibit and giving the page of the record where each exhibit is first identified and offered into evidence.

(3) The count or counts.

(4) Each (i) affidavit, (ii) transcript, including transcripts of cross-examination of any affiant, (iii) agreed statement relied upon by the party, and (iv) transcript of interrogatories, cross-interrogatories, and recorded answers filed under paragraph (b) of this section.

(5) Each notice, official record, and publication relied upon by the party and filed under § 1.682(a).

(6) Any evidence from another interference, proceeding, or action relied upon by the party under § 1.683.

(7) Each request for an admission and the admission and each written interrogatory and the answer upon which a party intends to rely under § 1.688.

(d) The pages of the record shall be consecutively numbered.

(e) The name of each witness shall appear at the top of each page of each affidavit or transcript.

(f) The record may be typewritten or printed.

(g) When the record is printed, it may be produced by standard typographical printing or by any process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Margins must be justified. Footnotes may not be printed in type smaller than 9 point. The page size shall be 8-1/2 by 11 inches (21.8 by 27.9 cm.) with type matter 6-1/2 by 9-1/2 inches (16.5 by 24.1 cm.). The record shall be bound to lie flat when open.

(h) When the record is typewritten, it must be clearly legible on opaque, unglazed, durable paper approximately 8-1/2 by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1-1/2 inches (3.8 cm.) on the left-hand side of the page. The pages of the record shall be bound with covers at their left edges in such manner to lie flat when open in one or more volumes of convenient size (approximately 100 pages per volume is suggested). Multigraphed or otherwise reproduced copies conforming to the standards specified in this paragraph may be accepted.

(i) Each party shall file its exhibits with the record specified in paragraph (c) of this section. One copy of each documentary exhibit shall be served. Documentary exhibits shall be filed in an envelope or folder and shall not be bound as part of the record. Physical exhibits, if not filed by an officer under § 1.676(d), shall be filed with the record. Each exhibit shall contain a label which identifies the party submitting the exhibit and an exhibit number, the style of the interference (e.g., *Jones* v. *Smith*), and the interference number. Where possible, the label should appear at the bottom right-hand corner of each documentary exhibit. Upon termination of an interference, an examiner-in-chief may return an exhibit to the party filing the exhibit. When any exhibit is returned, the examiner-in-chief shall enter an appropriate order indicating that the exhibit has been returned.

(j) Any testimony, record, or exhibit which does not comply with this section may be returned under § 1.618(a).

§ 1.654 Final hearing.

(a) At an appropriate stage of the interference, the parties will be given an opportunity to appear before the Board to present oral argument at a final hearing. An examiner-in-chief shall set a date and time for final hearing. Unless otherwise ordered by an examiner-in-chief or the Board, each party will be entitled to no more than 60 minutes of oral argument at final hearing.

(b) The opening argument of a junior party shall include a fair statement of the junior party's case and the junior party's position with respect to the case presented on behalf of any other party. A junior party may reserve a portion of its time for rebuttal.

(c) A party shall not be entitled to argue that an opponent abandoned, suppressed, or concealed an actual reduction to practice unless a notice under § 1.632 was timely filed.

(d) After final hearing, the interference shall be taken under advisement by the Board. No further paper shall be filed except under § 1.658(b) or as authorized by an examiner-in-chief or the Board. No additional oral argument shall be had unless ordered by the Board.

§ 1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under § 1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was manifestly erroneous or an abuse of discretion. All interlocutory orders shall be presumed to have been correct and the burden of showing manifest error or an abuse of discretion shall be on the party attacking the order.

(b) A party shall not be entitled to raise for consideration at final hearing a matter which properly could have been raised by a motion under §§ 1.633 or 1.634 unless (1) the motion was properly filed, (2) the matter was properly raised by a party in an opposition to a motion under §§ 1.633 or 1.634 and the motion was granted over the opposition, or (3) the party shows good cause why the issue was not timely raised by motion or opposition.

(c) To prevent manifest injustice, the Board may consider an issue even though it would not otherwise be entitled to consideration under this section.

§ 1.656 Briefs for final hearing.

(a) Each party shall be entitled to file briefs for final hearing. The examiner-in-chief shall determine the briefs needed and shall set the time and order for filing briefs.

(b) The opening brief of a junior party shall contain under appropriate headings and in the order indicated:

(1) A table of contents, with page references, and a table of cases (alphabetically arranged), statutes, and other authori-

ties cited, with references to the pages of the brief where they are cited.

(2) A statement of the issues presented for decision in the interference.

(3) A statement of the facts relevant to the issues presented for decision with appropriate references to the record.

(4) An argument, which may be preceded by a summary, which shall contain the contentions of the party with respect to the issues to be decided, and the reasons therefor, with citations to the cases, statutes, other authorities, and parts of the record relied on.

(5) A short conclusion stating the precise relief requested.

(6) An appendix containing a copy of the counts.

(c) The opening brief of the senior party shall conform to the requirements of paragraph (b) of this section except:

(1) a statement of the issues and of the facts need not be made unless the party is dissatisfied with the statement in the opening brief of the junior party and

(2) an appendix containing a copy of the counts need not be included if the copy of the counts in the opening brief of the junior party is correct.

(d) Briefs may be printed or typewritten. If typewritten, legal-size paper may be used. The opening brief of each party in excess of 50 legal-size double-spaced typewritten pages or any other brief in excess of 25 legal-size double-space typewritten pages shall be printed unless a satisfactory reason be given why the brief should not be printed. Any printed brief shall comply with the requirements of § 1.653(g). Any typewritten brief shall comply with the requirements of § 1.653(h), except legal-size paper may be used and the binding and covers specified are not required.

(e) An original and three copies of each brief must be filed.

(f) Any brief which does not comply with the requirements of this section may be returned under § 1.618(a).

(g) Any party, separate from its opening brief, but filed concurrently therewith, may file an original and three copies of concise proposed findings of fact and conclusions of law. Any proposed findings of fact shall be supported by specific references to the record. Any proposed conclusions of law shall be supported by citation of cases, statutes, or other authority. Any opposing party, separate from its opening or reply brief, but filed concurrently therewith, may file a paper accepting or objecting to any proposed findings of fact or conclusions of law; when objecting, a reason must be given. The Board may adopt the proposed findings of fact and conclusions of law in whole or in part.

(h) If a party wants the Board in rendering its final decision to rule on the admissibility of any evidence, the party shall file with its opening brief an original and three copies of a motion (§ 1.635) to suppress the evidence. The provisions of § 1.637(b) do not apply to a motion to suppress under this paragraph. Any objection previously made to the admissibility of an opponent's evidence is waived unless the motion required by this paragraph is filed. An original and three copies of an opposition to the motion may be filed with an opponent's opening brief or reply brief as may be appropriate.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to respond within a time period set in the order, judgment may be entered against the junior party.

§ 1.657 Burden of proof as to date of invention.

A rebuttable presumption shall exist that, as to each count, the inventors made their invention in the chronological order of the earlier of their filing dates or effective filing dates. The burden of proof shall be upon a party who contends otherwise.

§ 1.658 Final decision.

(a) After final hearing, the Board shall enter a decision resolving the issues raised at final hearing. The decision may (1) enter judgment, in whole or in part, (2) remand the interference to an examiner-in-chief for further proceedings, or (3) take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing the claims in the party's patent or application which correspond to the count. When the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision.

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within 14 days after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

(c) A judgment in an interference settles all issues which (1) were raised and decided in the interference, (2) could have been properly raised and decided in the interference by a motion under § 1.633 (a) through (d) and (f) through (j) or § 1.634 and (3) could have been properly raised and decided in an additional interference with a motion under § 1.633(c). A losing party who could have properly moved, but failed to move, under §§ 1.633 or 1.634, shall be estopped to take *ex parte* or *inter partes* action in the Patent and Trademark Office after the interference which is inconsistent with that party's failure to properly move, except that a losing party shall not be estopped with respect to any claims which correspond, or properly could have corresponded, to a count as to which that party was awarded a favorable judgment.

§ 1.659 Recommendation.

(a) Should the Board have knowledge of any ground for rejecting any application claim not involved in the judgment of the interference, it may include in its decision a recommended rejection of the claim. Upon resumption of *ex parte* prosecution of the application, the examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection.

(b) Should the Board have knowledge of any ground for reexamination of a patent involved in the interference as to a patent claim not involved in the judgment of the interference, it may include in its decision a recommendation to the Commissioner that the patent be reexamined. The Commissioner will determine whether reexamination will be ordered.

(c) The Board may make any other recommendation to the examiner or the Commissioner as may be appropriate.

§ 1.660 Notice of reexamination, reissue, protest, or litigation.

(a) When a request for reexamination of a patent involved in an interference is filed, the patent owner shall notify the Board within 10 days of receiving notice that the request was filed.

(b) When an application for reissue is filed by a patentee involved in an interference, the patentee shall notify the Board within 10 days of the day the application for reissue is filed.

(c) When a protest under § 1.291 is filed against an application involved in an interference, the applicant shall notify the Board within 10 days of receiving notice that the protest was filed.

(d) A party in an interference shall notify the Board promptly of any litigation related to any patent or application involved in an interference, including any civil action commenced under 35 U.S.C. § 146.

§ 1.661 Termination of interference after judgment.

After a final decision is entered by the Board, an After a final decision is entered by the Board, an interference is considered terminated when no appeal (35 U.S.C. § 141) or other review (35 U.S.C. § 146) has been or can be taken or had.

§ 1.662 Request for entry of adverse judgment; reissue filed by patentee.

(a) A party may, at any time during an interference, request and agree to entry of an adverse judgment. The filing by an applicant or patentee of a written disclaimer of the invention defined by a count, concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count, or abandonment of the contest as to a count will be treated as a request for entry of an adverse judgment against the applicant or patentee as to all claims which correspond to the count. Abandonment of an application by an applicant, other than an applicant for reissue having a claim of the patent sought to be reissued involved in the interference, will be treated as a request for entry of an adverse judgment against the applicant as to all claims corresponding to all counts. Upon the filing by a party of a request for entry of an adverse judgment, the Board may enter judgment against the party.

(b) If a patentee involved in an interference files an application for reissue during the interference and omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference, judgment may be entered against the patentee. A patentee who files an application for reissue other than for the purpose of avoiding the interference shall timely file a preliminary motion under § 1.633(h) or show good cause why the motion could not have been timely filed.

(c) The filing of a statutory disclaimer under 35 U.S.C. § 253 by a patentee will delete any statutorily disclaimed claims from being involved in the interference. A statutory disclaimer will not be treated as a request for entry of an adverse judgment against the patentee unless it results in the deletion of all patent claims corresponding to a count.

§ 1.663 Status of claim of defeated applicant after interference.

Whenever an adverse judgment is entered as to a count against an applicant from which no appeal (35 U.S.C. § 141) or other review (35 U.S.C. § 146) has been or can be taken or had, the claims of the application corresponding to the count stand finally disposed of without further action by the examiner. Such claims are not open to further *ex parte* prosecution.

§ 1.664 Action after interference.

(a) After termination of an interference, the examiner will promptly take such action in any application previously involved in the interference as may be necessary. Unless entered by order of an examiner-in-chief, amendments presented during the interference shall not be entered, but may be subsequently presented by the applicant subject to the provisions of this part provided prosecution of the application is not otherwise closed.

(b) After judgment, the application of any party may be held subject to further examination, including an interference with another application.

§ 1.665 Second interference.

A second interference between the same parties will not be declared upon an application not involved in an earlier interference for an invention defined by a count of the earlier interference. See § 1.658(c).

§ 1.666 Filing of interference settlement agreements.

(a) Any agreement or understanding between parties to an interference, including any collateral agreements referred to therein, made in connection with or in contemplation of the termination of the interference, must be in writing and a true copy thereof must be filed before the termination of the interference (§ 1.661) as between the parties to the agreement or understanding.

(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in § 1.17(i) and on a showing of good cause.

(c) Failure to file the copy of the agreement or understanding under paragraph (a) of this section will render permanently unenforceable such agreement or understanding and any patent of the parties involved in the interference or any patent subsequently issued on any application of the parties so involved. The Commissioner may, however, upon petition accompanied by the fee set forth in § 1.17(h) and on a showing of good cause for failure to file within the time prescribed, permit the filing of the agreement or understanding during the six month period subsequent to the termination of the interference as between the parties to the agreement or understanding.

§ 1.671 Evidence must comply with rules.

(a) Evidence consists of testimony and exhibits, official records and publications filed under § 1.682, evidence from another interference, proceeding, or action filed under § 1.683, and discovery relied upon under § 1.688, and the specification (including claims) and drawings of any application or patent:

(1) Involved in the interference.

(2) To which a party has been accorded benefit in the notice declaring the interference or by a preliminary motion granted under § 1.633.

(3) For which a party has sought, but has been denied, benefit by a preliminary motion under § 1.633.

(4) For which benefit was rescinded by a preliminary motion granted under § 1.633.

(b) Except as otherwise provided in this part, the Federal Rules of Evidence shall apply to interference proceedings. Those portions of the Federal Rules of Evidence relating to criminal actions, juries, and other matters not relevant to interferences shall not apply.

(c) Unless the context is otherwise clear, the following terms of the Federal Rules of Evidence shall be construed as follows:

(1) "Courts of the United States," "U.S. Magistrate," "court," "trial court," or "trier of fact" means examiner-in-chief or Board as may be appropriate.

(2) "Judge" means examiner-in-chief.

(3) "Judicial notice" means official notice.

(4) "Civil action," "civil proceeding," "action," or "trial," mean interference.

(5) "Appellate court" means United States Court of Appeals for the Federal Circuit or a United States district court when judicial review is under 35 U.S.C. § 146.

(6) "Before the hearing" in Rule 703 means before giving testimony by oral deposition or affidavit.

(7) "The trial or hearing" in Rules 803(24) and 804(5) means the taking of testimony by oral deposition.

(d) Certification is not necessary as a condition to admissibility when the record is a record of the Patent and Trademark Office to which all parties have access.

(e) A party may not rely on an affidavit filed by that party during *ex parte* prosecution of an application, an affidavit under § 1.608(b), or an affidavit under § 1.639(b) unless (1) a copy of the affidavit is or has been served and (2) a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit. When proper notice is given under this paragraph, the affidavit shall be deemed filed under § 1.672(b). A copy of the affidavit shall be included in the record (§ 1.653).

(f) The significance of documentary and other exhibits shall be discussed with particularity by a witness during oral deposition or in an affidavit.

(g) A party must file a motion (§ 1.635) seeking permission from an examiner-in-chief prior to taking testimony or seeking documents or things under 35 U.S.C. § 24. The motion shall describe the general nature and the relevance of the testimony, document, or thing.

(h) Evidence which is not taken or sought and filed in accordance with this subpart shall not be admissible.

§ 1.672 Manner of taking testimony.

(a) Testimony of a witness may be taken by oral deposition or affidavit in accordance with this subpart.

(b) A party wishing to take the testimony of a witness whose testimony will not be compelled under 35 U.S.C. § 24 may elect to present the testimony of the witness by affidavit or deposition. A party electing to present testimony of a witness by affidavit shall, prior to the close of the party's relevant testimony period, file and serve an affidavit of the witness or, where appropriate, a

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notice under § 1.671(e). To facilitate preparation of the record (§ 1.653(g) and (h)), a party should file an affidavit on paper which is 8-1/2 by 11 inches (21.8 by 27.9 cm). A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document. After the affidavit is filed and within a time set by an examiner-in-chief, any opponent may file a request to cross-examine the witness on oral deposition. If any opponent requests cross-examination of an affiant, the party shall notice a deposition under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpoee of cross-examination of a witness whose testimony is presented by affidavit, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. A party electing to present testimony of a witness by deposition shall notice a deposition of the witness under § 1.673(a). The party who gives notice of a deposition shall be responsible for obtaining a court reporter and for filing a certified transcript of the deposition as required by § 1.676.

(c) A party wishing to take the testimony of a witness whose testimony will be compelled under 35 U.S.C. § 24 must first obtain permission from an examiner-in-chief under § 1.671(g). If permission is granted, the party shall notice a deposition of the witness under § 1.673 and may proceed under 35 U.S.C. § 24. The testimony of the witness shall be taken on oral deposition.

(d) Notwithstanding the provisions of this subpart, if the parties agree in writing, a deposition may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions.

(e) If the parties agree in writing, the testimony of any witness may be submitted in the form of an affidavit without opportunity for cross-examination. The affidavit of the witness shall be filed in the Patent and Trademark Office.

(f) If the parties agree in writing, testimony may be submitted in the form of an agreed statement setting forth (1) how a particular witness would testify if called or (2) the facts in the case of one or more of the parties. The agreed statement shall be filed in the Patent and Trademark Office. See § 1.653(a).

§ 1.673 Notice of examination of witness.

(a) A party electing to take testimony of a witness by deposition shall, after complying with paragraphs (b) and (g) of this section, file and serve a single notice of deposition stating the time and place of each deposition to be taken. Depositions may be noticed for a reasonable time and place in the United States. Unless the parties agree in writing, a deposition may not be noticed for any other place without approval of an examiner-in-chief (see § 1.684). The notice shall specify the name and address of each witness and the general nature of the testimony to be given by the witness. If the name of a witness is not known, a general description sufficient to identify the witness or a particular class or group to which the witness belongs may be given instead.

(b) Unless the parties agree otherwise, a party shall serve, but not file, at least three days prior to the conference required by paragraph (g) of this section, if service is made by hand or "Express Mail," or at least ten days prior to the conference if service is made by any other means, the following:

(1) A list and copy of each document in the party's possession, custody, or control and upon which the party intends to rely at any deposition and

(2) A list of and a proffer of reasonable access to things in the party's possession, custody, or control and upon which the party intends to rely at any deposition.

(c) A party shall not be permitted to rely at any deposition on any witness not listed in the notice, or any document not served or any thing not listed as required by paragraph (b) of this section, (1) unless all opponents agree in writing or on the record to permit the party to rely on the witness, document, or thing or (2) except upon a motion (§ 1.635) promptly filed which is accompanied by any proposed notice, additional documents, or lists and which shows sufficient cause why the notice, documents, or lists were not served in accordance with this section.

(d) Each opposing party shall have a full opportunity to attend a deposition and cross-examine. If an opposing party attends a deposition of a witness not named in a notice and cross-examines the witness or fails to object to the taking of the deposition, the opposing party shall be deemed to have waived any right to object to the taking of the deposition for lack of proper notice.

(e) A party electing to present testimony by affidavit and who is required to notice depositions for the purpose of cross-examination under § 1.672(b), shall, after complying with paragraph (g) of this section, file and serve a single notice of deposition stating the time and place of each cross-examination deposition to be taken.

(f) The parties shall nor take depositions in more than one place at the same time or so nearly at the same time that reasonable opportunity to travel from one place of deposition to another cannot be had.

(g) Before serving a notice of deposition and after complying with paragraph (b) of this section, a party shall have an oral conference with all opponents to attempt to agree on a mutually acceptable time and place for conducting the deposition. A certificate shall appear in the notice stating that the oral conference took place or explaining why the conference could not be had. If the parties cannot agree to a mutually acceptable place and time for conducting the deposition at the conference, the parties shall contact an examiner-in-chief who shall then designate the time and place for conducting the deposition.

(h) A copy of the notice of deposition shall be attached to the certified transcript of the deposition filed under § 1.676(a).

§ 1.674 Persons before whom depositions may be taken.

(a) Within the United States or a territory or insular possession of the United States a deposition shall be taken before an officer authorized to administer oaths by the laws of the United States or of the place where the examination is held.

(b) Unless the parties agree in writing, the following persons shall not be competent to serve as an officer: (1) a relative or employee of a party, (2) a relative or employee of an attorney or agent of a party, or (3) a person interested, directly or indirectly, in the interference either as counsel, attorney, agent, or otherwise.

§ 1.675 Examination of witness, reading and signing transcript of deposition.

(a) Each witness before giving an oral deposition shall be duly sworn according to law by the officer before whom the deposition is to be taken.

(b) The testimony shall be taken in answer to interrogatories with any questions and answers recorded in their regular order by the officer or by some other person, who shall be subject to the provisions of § 1.674(b), in the presence of the officer unless the presence of the officer is waived on the record by agreement of all parties.

(c) All objections made at the time of the deposition to the qualifications of the officer taking the deposition, the manner of taking it, the evidence presented, the conduct of any party, or any other objection to the proceeding shall be noted on the record by the officer. Evidence objected to shall be taken subject to any objection.

(d) Unless the parties agree in writing or waive reading and signature by the witness on the record at the deposition, when the testimony has been transcribed a transcript of the deposition shall be read by the witness and then signed by the witness in the form of (1) an affidavit in the presence of any notary or (2) a declaration.

§ 1.676 Certification and filing by officer, marking exhibits.

(a) The officer shall prepare a certified transcript of the deposition by attaching to a transcript of the deposition a copy of the notice of deposition, any exhibits to be annexed to the certified transcript, and a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before commencement of testimony by the witness.

(2) The transcript is a true record of the testimony given by the witness.

(3) The name of the person by whom the testimony was recorded and, if not recorded by the officer, whether the testimony was recorded in the presence of the officer.

(4) The presence or absence of any opposing party.

(5) The place where the deposition was taken and the day and hour when the deposition began and ended.

(6) The officer is not disqualified under § 1.674.

(b) If the parties waived any of the requirements of paragraph (a) of this section, the certificate shall so state.

(c) The officer shall note on the certificate the circumstances under which a witness refuses to sign a transcript.

(d) Unless the parties agree otherwise in writing or on the record at the deposition, the officer shall securely seal the certified transcript in an envelope endorsed with the style of the interference (e.g., *Smith* v. *Jones*), the interference number, the name of the witness, and the date of sealing and shall promptly forward the envelope to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents and things produced for inspection during the examination of a witness, shall, upon request of a party, be marked for identification and annexed to the certified transcript, and may be inspected and copied by any party, except that if the person producing the documents and things desires to retain them, the person may (1) offer copies to be marked for identification and annexed to the certified transcript and to serve thereafter as originals if the person affords to all parties fair opportunity to verify the copies by comparison with the originals or (2) offer the originals to be marked for identification, after giving to each party an opportunity to inspect and copy them, in which event the documents and things may be used in the same manner as if annexed to the certified transcript. The exhibits shall then be filed as specified in § 1.653(i). If the weight or bulk of a document or thing shall reasonably prevent the document or thing from being annexed to the certified transcript, it shall, unless waived on the record at the deposition by all parties, be authenticated by the officer and forwarded to the Commissioner in a separate package marked and addressed as provided in this paragraph.

§ 1.677 Form of a transcript of deposition.

(a) A transcript of a deposition must be typewritten on opaque, unglazed, durable paper approximately 8-1/2 by 11 inches (21.8 by 27.9 cm.) in size (letter size). Typing shall be double-spaced on one side of the paper in not smaller than pica-type with a margin of 1-1/2 inches (3.8 cm.) on the left-hand side of the page. The pages must be consecutively numbered throughout the entire record of each party (§ 1.653(d)) and the name of the witness must be typed at the top of each page (§ 1.653(e)). The questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used and each question must be followed by its answer.

(b) Exhibits must be numbered consecutively and each must be marked as required by {g49 1.653(i).

§ 1.678 Transcript of deposition must be filed.

Unless otherwise ordered by an examiner-in-chief, a certified transcript of a deposition must be filed in the Patent and Trademark Office within 45 days from the date of the deposition. If a party refuses to file a certified transcript, the examiner-in-chief or the Board may take appropriate action under § 1.616. If a party refuses to file a certified transcript, any opponent may move for leave to file the certified transcript and include a copy of the transcript as part of the opponent's record.

§ 1.679 Inspection of transcript.

A certified transcript filed in the Patent and Trademark Office may be inspected by any party. The certified transcript may not be removed from the Patent and Trademark Office for printing (§ 1.653(g)) unless authorized by an examiner-in-chief upon such terms as may be appropriate.

§ 1.682 Official records and printed publications.

(a) A party may introduce into evidence, if otherwise admissible, any official record or printed publication not identified on the record during the taking of testimony of a witness, by filing a notice offering the official record or publication into evidence. If the evidence relates to the party's case-in-chief, the notice shall be filed prior to close of testimony of the party's case-in-chief. If the evidence relates to rebuttal, the notice shall be filed prior to the close of testimony of the party's case-in-rebuttal. The notice shall (1) identify the official record or printed publication, (2) identify the portion thereof to be introduced in evidence, (3) indicate generally the relevance of the portion sought to be introduced in evidence, and (4), where appropriate, be accompanied by a certified copy of the official record or a copy of the printed publication (§ 1.671(d)).

(b) A copy of the notice, official record, and publication shall be served.

(c) Unless otherwise ordered by an examiner-in-chief, any written objection to the notice or to the admissibility of the official record or printed publication shall be filed within 15 days of service of the notice. See also § 1.656(h).

§ 1.683 Testimony in another interference, proceeding, or action.

(a) Prior to close of a party's appropriate testimony period or within such time as may be set by an examiner-in-chief, a party may file a motion (§ 1.635) for leave to use in an interference testimony of a witness from another interference, proceeding, or action involving the same parties, subject to such conditions as may be deemed appropriate by an examiner-in-chief. The motion shall specify with particularity the exact testimony to be used and shall demonstrate its relevance.

(b) Any objection to the admissibility of the testimony of the witness shall be made in an opposition to the motion. See also § 1.656(h).

§ 1.684 Testimony in a foreign country.

(a) An examiner-in-chief may authorize testimony of a witness to be taken in a foreign country. A party seeking to take testimony in a foreign country shall, prior to the close of the party's appropriate testimony period or within such time as may be set by an examiner-in-chief, file a motion(§ 1.635):

(1) Naming the witness.

(2) Describing the particular facts to which it is expected that the witness will testify.

(3) Stating the grounds on which the moving party believes that the witness will so testify.

(4) Demonstrating that the expected testimony is relevant.

(5) Demonstrating that the testimony cannot be taken in this country at all or cannot be taken in this country without hardship to the moving party greatly exceeding the hardship to which all opposing parties will be exposed by the taking of the testimony in a foreign country.

(6) Accompanied by an affidavit stating that the motion is made in good faith and not for the purpose of delay or harassing any party.

(7) Accompanied by written interrogatories to be asked of the witness.

(b) Any opposition under § 1.638(a) shall state any objection to the written interrogatories and shall include any cross-interrogatories to be asked of the witness. A reply under § 1.638(b) may be filed and shall be limited to stating any objection to any cross-interrogatories proposed in the opposition.

(c) If the motion is granted, the moving party shall be responsible for obtaining answers to the interrogatories and cross-interrogatories before an officer qualified to administer oaths in the foreign country under the laws of the United States or the foreign country. The officer shall prepare a transcript of the interrogatories, cross-interrogatories, and recorded answers to the interrogatories and cross-interrogatories and shall transmit the transcript to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, D.C. 20231, with a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before answering the interrogatories and cross-interrogatories.

(2) The recorded answers are a true record of the answers given by the witness to the interrogatories and cross-interrogatories.

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(3) The name of the person by whom the answers were recorded and, if not recorded by the officer, whether the answers were recorded in the presence of the officer.

(4) The presence or absence of any party.

(5) The place, day, and hour that the answers were recorded.

(6) A copy of the recorded answers was read by or to the witness before the witness signed the recorded answers and that the witness signed the recorded answers in the presence of the officer. The officer shall state the circumstances under which a witness refuses to read or sign recorded answers.

(7) The officer is not disqualified under § 1.674.

(d) If the parties agree in writing, the testimony may be taken before the officer on oral deposition.

(e) A party taking testimony in a foreign country shall have the burden of proving that false swearing in the giving of testimony is punishable as perjury under the laws of the foreign country. Unless false swearing in the giving of testimony before the officer shall be punishable as perjury under the laws of the foreign country where testimony is taken, the testimony shall not be entitled to the same weight as testimony taken in the United States. The weight of the testimony shall be determined in each case.

§ 1.685 Errors and irregularities in depositions.

(a) An error in a notice for taking a deposition is waived unless a motion (§ 1.635) to quash the notice is filed as soon as the error is, or could have been, discovered.

(b) An objection to a qualification of an officer taking a deposition is waived unless:

(1) The objection is made on the record of the deposition before a witness begins to testify.

(2) If discovered after the deposition, a motion (§ 1.635) to suppress the deposition is filed as soon as the objection is, or could have been, discovered.

(c) An error or irregularity in the manner in which testimony is transcribed, a certified transcript is signed by a witness, or a certified transcript is prepared, signed, certified, sealed, indorsed, forwarded, filed, or otherwise handled by the officer is waived unless a motion (§ 1.635) to suppress the deposition is filed as soon as the error or irregularity is, or could have been, discovered.

(d) An objection to the competency of a witness, admissibility of evidence, manner of taking the deposition, the form of questions and answers, any oath or affirmation, or conduct of any party at the deposition is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Any objection which a party wishes considered by the Board at final hearing shall be included in a motion to suppress under § 1.656(h).

(e) Nothing in this section precludes taking notice of plain errors affecting substantial rights although they were not brought to the attention of an examiner-in-chief or the Board.

§ 1.687 Additional Discovery.

(a) A party is not entitled to discovery except as authorized in this subpart.

(b) Where appropriate, a party may obtain production of documents and things during cross-examination of an opponent's witness or during the testimony period of the party's case-in-rebuttal.

(c) Upon a motion (§ 1.635) brought by a party within the time set by an examiner-in-chief under § 1.651 or thereafter as authorized by § 1.645 and upon a showing that the interest of justice so requires, an examiner-in-chief may order additional discovery, as to matters under the control of a party within the scope of the Federal Rules of Civil Procedure, specifying the terms and conditions of such additional discovery.

(d) The parties may agree to discovery among themselves at any time. In the absence of an agreement, a motion for additional discovery shall not be filed except as authorized by this subpart.

§ 1.688 Use of discovery.

(a) If otherwise admissible a party may introduce into evidence, an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under § 1.687 by filing a copy of the request for admission or the written interrogatory and the answer. If the answer relates to a party's case-in-chief, the answer shall be filed prior to the close of testimony of the party's case-in-chief. If the answer relates to the party's rebuttal, the admission or answer shall be filed prior to the close of testimony of the party's case-in-rebuttal. Unless otherwise ordered by an examiner-in-chief, any written objection to the admissibility of an answer shall be filed within 15 days of service of the answer.

(b) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence under this subpart.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Nov. 8, 1984.

[1050 OG 385]

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(179)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 40104-4151]

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule; correction.
Summary: This document corrects clerical errors and adds material to the Analysis of Comments in the notice of final rule amending the Patent and Trademark rules of practice in patent interference cases, which were published in the Official Gazette of Jan. 29, 1985 (1050 OG 385 through 440).
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Clerical Correction to the Preamble

The following corrections are made to the Official Gazette issue of Jan. 29, 1985:

Page 386

1. In the second column, line 32 (the fifth full paragraph, the second sentence) the word "an" is inserted after the word "or"

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2. In the second column, line 48 (the fifth full paragraph), after the word "agent", the following words "of record" are inserted.

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3. In the first column, line 29 (the first full paragraph, the third sentence), the words "of an interference" are removed and the words "in an interference" are inserted in their place; in line 39 (the first full paragraph, the last sentence), the words "Federal Rule" are removed and the words "Federal Rules" are inserted in their place; in line 41 (the second full paragraph, the first sentence), the word "provide" is removed and the word "provides" is inserted in its place.

4. In the second column, line 29 (the second full paragraph, the second sentence), the word "defined" is removed and the word "defines" is inserted in its place; in line 45 (the second full paragraph, the last sentence), the spelling of the word "in" is corrected; in line 48 (the last paragraph, the first sentence), the words "one of" are removed and the words "one or" are inserted in their place.

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5. In the second column, line 59 (the paragraph bridging the third column, the second sentence), quotation marks are placed around the word "lead".

6. In the third column, line 44 (the second full paragraph, the fourth sentence), the article "a" is inserted before the word "sanction".

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7. In the first column, line 12 (the second full sentence from the top of the page), the word "proposed" is removed; in line 30 (the seventh full sentence from the top of the page), the words "and applicant" are removed and the words "an applicant" are inserted in their place; in line 55 (the first full paragraph, the second sentence), the colon appearing after the word "appropriate" is deleted and a period is inserted in its place.

8. In the third column, line 5, the first letter of the word "while" is capitalized.

Page 394

9. In the second column, line 13 (the first full paragraph, the fourth sentence), the spelling of the word "Consultation" is corrected.

Page 395

10. In the first column, line 44 (the second full paragraph, the last sentence), the spelling of the word "necessary" is corrected; in line 59 (the last paragraph, the first sentence), the spelling of the word "specifies" is corrected.

11. In the second column, line 1, the word "the" is inserted after the word "and"; in line 14 (the first full paragraph, the third sentence), the words "is required" are removed and the words "are required" are inserted in their place.

Page 396

12. In the first column, line 5, the word "of" is removed.

13. In the second column, line 13 (the first full paragraph, the fourth sentence), the word "Claims" is removed and the word "Claim" inserted in its place.

Page 397

14. In the second column, line 2, the words "would be" are removed and the word "is" is inserted in its place; in line 6, the word "intended" is removed and the word "intends" is inserted in its place.

Page 399

15. In the second column, line 41 (the fifth full paragraph), the word "had" is removed and the word "has" is inserted in its place.

16. In the third column, line 37 (the third full paragraph, the last sentence), the comma after the word "language" is removed; in line 38, the comma after the word "affidavit" is removed.

Page 401

17. In the first column, line 11 (the first full paragraph, the first sentence), the words "of sale" are removed and the words "or sale" are inserted in their place.

Page 402

18. In the first column, line 4, the word "over" is removed and the word "of" is inserted in its place.

Page 403

19. In the first column, line 2, the spelling of the word "arguably" is corrected; in line 9, the spelling of the word "definitions" is corrected.

Page 404

20. In the first column, line 18 (the second full paragraph, the fourth sentence), the words "PTO was" are removed and the words "PTO were" are inserted in their place.

21. In the second column, line 26 (the first full paragraph, the fourth sentence), the spelling of the word "under" is corrected.

Page 406

22. In the third column, line 21 (the first full paragraph, the third sentence), a closing quotation mark is placed after the word "opponents's".

Page 407

23. In the first column, line 4 (the first full paragraph, the first sentence), the spelling of the word "suggested" is corrected.

Page 409

24. In the first column, line 21 (the first full paragraph, the third sentence), the words "do not" are inserted after the word "rules".

25. In the third column, line 33 (the first full paragraph, the first sentence), the word "is" is inserted before the word "excluded".

Page 411

26. In the third column, line 26 (the third full paragraph, the third sentence), the word "permitting" is removed and the word "permitted" is inserted in its place.

Page 413

27. In the second column, line 47 (the second full paragraph, the second sentence), the reference to "1.644(b)" should read "1.644(a)(2)".

28. In the third column, line 59 (the last paragraph, the first sentence), the first letter of the word "Interference" is made lower case.

Page 416

29. In the first column, line 1, the word "opponent's" is removed and the word "opponents" is inserted in its place.

30. In the second column, line 40 (the first full paragraph, the second sentence), the reference to "1662(a)" should read "1.662(a)"; in line 45 (the first full paragraph, the third sentence), the reference to "1633(d)" should read "1.633(d)".

Page 417

31. In the second column, line 49 (the second full paragraph, the third sentence from the end), quotation marks are placed around the word "things"; in line 55 (the second full paragraph, the last sentence), the word "to" is inserted after the words "should resort".

32. In the third column, line 11 (the first full sentence from the top of the page), the colon after the word "controversy" is removed and a period is inserted in its place; in line 54 (the first full paragraph, the penultimate sentence), the spelling of the word "appropriate" is corrected.

Page 418

33. In the second column, line 16 (the first full paragraph, the first sentence), the first letter of the word "Commentator's" is made lower case.

Page 419

34. In the table correlating the old rules 37 CFR 1.201 through 1.288 to the new rules 37 CFR 1.601 through 1.688, the following corrections are made to the entries under the section, designated as new:

RULE CORRELATION TABLE

Old	New
1.201(a)	1.601(i)
1.201(b)	1.601(i)
1.203(a)	1.603
1.204(b)	1.608(a)
1.204(c)	1.608(b)
1.205(a)	1.606

1.208	1.613(b)
1.216(b)	1.623(c), 1.624(c), 1.625(c)
1.245	1.645(a)
1.246	1.645(b)
1.257(b)	1.658(c)
1.263	1.622(c)
1.264	1.662(b)
1.271	1.671(h)
1.272(b)	1.672(d)
1.272(c)	1.672(e), (f)
1.281	1.645(a)
1.287(b)	1.687(b)
1.287(c)	1.687(c)

Additional Analysis of Comments

Page 404

1. In the second column after the last full paragraph, the following paragraph is added:

An oral comment was received by telephone concerning the declaration of an interference under §§ 1.603 and 1.606 with applications filed under the provisions of 35 U.S.C. 157—Statutory Invention Registration (SIR). Under 35 U.S.C. 157(c), a published SIR has all of the attributes specified for patents except those specified in 35 U.S.C. 183 and 271 to 289. Consequently, interferences will be declared between an application and either an application containing a request for a SIR (37 CFR 1.293) or a published SIR. Until sufficient experience is gained by the PTO, the interference will be conducted by procedure established on a case by case basis.

Page 415

In the second column, after the first full paragraph, the following paragraph is added:

Oral comments have been received by telephone concerning the doctrine of interference estoppel under 37 CFR 1.658(c) with respect to a party's failure to move under 37 CFR 1.633(e) to declare an "additional interference" between an additional application not involved in the interference and owned by the party and an opponent's application or patent involved in the interference on a separate patentable invention. Generally a party will be estopped for failure to move when the separate patentable invention (subject matter) which could have been the subject of the "additional interference" was *claimed* (during the pendency of the interference) (1) in the opponent's involved application or patent or (2) in a non-involved application owned by the party.

The following illustrates the general applicability of interference estoppel in certain situations where a party fails to move under 37 CFR 1.633(e) to declare an "additional interference" on a separate patentable invention.

Party's non-involved application	Opponent's involved application or patent	Estoppel
Claimed	Claimed	Yes
Disclosed	.do	Yes
Claimed	Disclosed	Yes
Disclosed	.do	No

Clerical Corrections to the Rules

1. On page 420 the second column, the amendment to § 1.8, amendatory instruction 4 is corrected by changing "paragraph (a)(xii) to read "paragraph (a)(2)(xii)".

2. On page 421, the second column, in the second sentence of § 1.59, the spelling of the word "required" is corrected and the reference to "§ 1.21(1)" is corrected to read "§ 1.21(*l*)".

3. On page 423, the third column, § 1.324 is corrected by inserting in the second sentence the article "a" before the word "patent".

4. On page 424, the first column, in § 1.565, in the first sentence of paragraph (b), "in filed" should have read "is filed".

5. On page 425, the first column, the last sentence of § 1.601(i) is corrected by removing the last occurrence of the word "patents" and inserting, in its place, the word "patent".

6. On page 425, the first column, § 1.601(k) is corrected by removing the words "and interference" and inserting, in their place, the words "an interference".

7. On page 425, the second column the second sentence of § 1.601(n) is corrected by removing the words "a invention" and inserting, in their place, the words "an invention".

8. On page 427, the first column, § 1.611(d)(2) is corrected by inserting the word "in" after the word "provided".

9. On page 427, the second column, the reference to "1.608(b)" in the first sentence of §§ 1.612(a), 1.612(b) and 1.612(c) is corrected to read "1.608".

10. On page 427, the third column, the first sentence of § 1.615(a) is corrected by placing in italics the words "ex parte".

11. On page 427, the third column, the second sentence of § 1.616 is corrected by changing to upper case the first letter of the words "holding", "precluding" and "granting" in paragraphs (a) to (e).

12. On page 428, the first column, the first sentence of § 1.617(b) is corrected by removing the first occurrence of the word "any" and inserting, in its place, the word "may".

13. On page 428, the first column, the last sentence of § 1.617(b) is corrected by inserting the words "on each opponent" after the words "shall serve".

14. On page 428, the first column, the last sentence of § 1.617(d) is corrected by removing the words "an oral" and inserting, in their place, the article "a".

15. On page 428, the first column, the last sentence of § 1.617(g) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

16. On page 428, the second column, the second sentence of § 1.621(a) is corrected by inserting the word "by" after the first occurrence of the word "or".

17. On page 428, the second column, the first sentence of § 1.621(b) is corrected by inserting a comma after the first occurrence of word "statement".

18. On page 428, the third column, the first sentence of § 1.624(a) is corrected by removing the semicolon appearing after the word "count" and inserting, in its place, a colon.

19. On page 430, the first column, the last sentence of § 1.631(a) is corrected by removing the words "a party shall serve copies of its preliminary statement on every opponent" and inserting, in their place, the words "a party shall serve a copy of its preliminary statement on each opponent".

20. On page 430, the first column, the heading of § 1.633 is corrected by changing to lower case the first letter of the word "Motions".

21. On page 430, the third column, in § 1.636(b) the reference to "§ 1.633(a), (b), or (g)" is corrected to read "§ 1.633(a), (b), (c)(1), or (g)".

22. On page 431, the second column, in §§ 1.637(d)(2) and 1.637(e)(1)(ii) the reference to "§ 1.608(b)" is corrected to read "§ 1.608".

23. On page 431, the second column, § 1.637(e)(1)(iv) is corrected by removing the words "a claim" and inserting, in their place, the words "any claim".

24. On page 431, the third column, § 1.637(e)(2)(iii) is corrected by removing the first occurrence of the word "party's" and inserting, in its place, the word "party".

25. On page 431, the third column, the second sentence of § 1.637(e)(2)(iv) is corrected by removing the two occurrences of the word "claims" and inserting, in their place, the word "claim".

26. On page 431, the third column, in the first sentence of § 1.637(f) (2), the reference to "§ 1.608(b)" is corrected to read "§ 1.608".

27. On page 432, the first column, § 1.637(h)(3) is corrected by removing the words "a claim" and inserting, in their place, the words "any proposed claim".

28. On page 432, the second column, § 1.640(b)(2) is corrected by removing the words "entered or" and inserting, in their place, the words "entered on".

29. On page 432, the third column, the penultimate sentence of § 1.640(c) is corrected by inserting the article "a" before the words "single examiner-in-chief".

30. On page 432, the third column, § 1.640(d)(1) is corrected by removing the words "all counts" and inserting, in their place, the words "any count".

31. On page 432, the third column, the first sentence of § 1.640(e) is corrected by removing the word "filed" and inserting, in its place, the word "files".

32. On page 433, the second column, § 1.644(i) is corrected by removing the word "petition" and inserting, in its place, "petitions".

33. On page 433, the second column, the first sentence of § 1.645(a) is corrected by inserting the word "or" after "§§ 1.302," and after "§§ 1.303,".

34. On page 433, the third column, in the first sentence of § 1.646(a), the spelling of the word "every" is corrected.

35. On page 433, the third column, § 1.646(c) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

36. On page 434, the third column, § 1.653(c)(5) is corrected by removing the word "an" and inserting, in its place, the word "and".

37. On page 434, the third column, the last sentence of § 1.653(g) is corrected by removing the word "found" and inserting, in its place, the word "bound".

38. On page 435, the first column, the penultimate sentence of § 1.653(i) is corrected by removing the words "and exhibit" and inserting, in their place, the words "an exhibit".

39. On page 436, the third column, the second sentence of § 1.664(a) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

40. On page 437, the first column, the last sentence of § 1.666(c) is corrected by removing the word "Commission" and inserting, in its place, "Commissioner".

41. On page 437, the second column, the first sentence of § 1.671(b) is corrected by removing the word "part" and inserting, in its place, the word "subpart".

42. On page 437, the second column, in the first sentence of § 1.671(e) the reference to "§ 1.608(b)" is corrected to read "§ 1.608".

43. On page 437, the third column, the third sentence of § 1.672(b) is corrected by removing the words "a party shall file" and inserting, in their place, the words "a party should file".

44. On page 438, the third column, in § 1.676(a), the spelling of the third occurrence of the word "transcript" is corrected.

45. On page 440, the first column, the second sentence of § 1.684(c)(6) is corrected by removing the words "a witness refused to read" and inserting, in their place, the words "a witness refuses to read".

46. On page 440, the second column, § 1.685(c) is corrected by inserting the word "or" after the first occurrence of the word "error," and by removing the word "indorsed" and inserting, in its place, the word "endorsed".

May 21, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

[FR Doc. 85-13077 Filed 5-30-85; 8:45 am]

Billing Code 3510-16-M

[1059 OG 27]

(180) **Animals — Patentability**

A decision by the Board of Patent Appeals and Interferences in *Ex parte Allen*, 2 USPQ2d 1425 (Bd. App. & Int., Apr. 3, 1987), held that claimed polyploid oysters are nonnaturally occurring manufactures or compositions of matter within the meaning of 35 U.S.C. 101. The Board relied upon the opinion of the Supreme Court in *Diamond* v. *Chakrabarty*, 447 U.S. 303, 208 USPQ 193 (1980) as it had done in *Ex parte Hibbard*, 227 USPQ 443 (Bd. App. & Int., 1985), as controlling authority that Congress intended statutory subject matter to "include anything under the sun that is made by man." The Patent and Trademark Office now considers nonnaturally occurring non-human multicellular living organisms, including animals, to be patentable subject matter within the scope of 35 U.S.C. 101.

The Board's decision does not affect the principle and practice that products found in nature will not be considered to be patentable subject matter under 35 U.S.C. 101 and/or 102. An article of manufacture or composition of matter occurring in nature will not be considered patentable unless given a new form, quality, properties or combination not present in the original article existing in nature in accordance with existing law. See e.g. *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.*, 333 U.S. 127, 76 USPQ 280 (1948); *American Fruit Growers* v. *Brogdex*, 283 U.S. 1, 8 USPQ 131 (1931); *Ex Parte Grayson*, 51 USPQ 413 (Bd. App. 1941).

A claim directed to or including within its scope a human being will not be considered to be patentable subject matter under 35 U.S.C. 101. The grant of a limited, but exclusive property right in a human being is prohibited by the Constitution. Accordingly, it is suggested that any claim directed to a nonplant multicellular organism which would include a human being within its scope include the limitation "non-human" to avoid this ground of rejection. The use of a negative limitation to define the metes and bounds of the claimed subject matter is a permissible form of expression. *In re Wakefield*, 422 F.2d 897, 164 USPQ 636 (CCPA 1970).

Accordingly, the Patent and Trademark Office is now examining claims directed to multicellular living organisms, including animals. To the extent that the claimed subject matter is directed to a non-human "nonnaturally occurring manufacture or composition of matter — a product of human ingenuity" (*Diamond* v. *Chakrabarty*), such claims will not be rejected under 35 U.S.C. 101 as being directed to nonstatutory subject matter.

Apr. 7, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1077 OG 24]

(181) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50103-7058]

Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules to implement the arbitration provisions of section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622.
Effective Date: May 27, 1987.
For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications

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contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The arbitration rule applies to all pending interferences.

The PTO published an advance notice of rulemaking in the Federal Register of Jan. 16, 1985 (50 FR 2294-2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985 (1051 O.G. 9-10). The notice also appeared in the Bureau of National Affairs' Patent, Trademark and Copyright Journal, Vol. 29, p. 310 (Jan. 24, 1985), hereinafter "BNA." Five written comments were received in response to the advance notice.

A notice of proposed rulemaking was published in the Federal Register on Sept. 15, 1986 (51 FR 32756-32762), in the *Official Gazette* on Oct. 21, 1986 (1071 O.G. 25-31), and in BNA's Patent, Trademark and Copyright Journal, Vol. 32, pp. 552-558 (Sept. 18, 1986). In response to the notice, three comments, two in writing and one by telephone, were received. These comments are discussed herein.

All written comments are available for public inspection in Rm. 10C01, Crystal Gateway 2, 1225 Jefferson Davis Hwy., Arlington, Va.

Discussion of the Rule

Under § 1.690 the arbitrator can determine issues of patentability as between the parties but a determination by him or her that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Revise and Caesar, *Interference Law and Practice*, section 861, p. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

> • • • stipulation or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief may give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e) and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Section 1.690 requires that parties who intend to arbitrate an interference notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference". The agreement must be in writing a copy filed in the PTO within 20 days after its execution. The notification of intention to arbitrate must be made in a separate paper. Merely incorporating the notification in the agreement is not sufficient to comply with § 1.690(a). The parties also will be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard* v. *Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motion period, the examiner-in-chief will not normally grant an extension of time for the purpose. The parties will be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

Section 1.690(a) requires that an arbitration agreement include the following:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.
(2) The issues to be decided by the arbitrator.
(3) A provisions that the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

Section 1.690(c) requires that a copy of the arbitration award be filed within 20 days from the date of the award or by a date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it were accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interference. If the parties are to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and should include the following:

(1) The style (e.g., *Jones* v. *Smith*), the number of the interference and the names of the real parties in interest.
(2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.
(3) The issues for decision before the arbitrator.
(4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.

(5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

> In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—
> (a) Where the award was procured by corruption, fraud, or undue means.
> (b) Where there was evident partiality or corruption in the arbitrators, or either of them.
> (c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any part have been prejudiced.
> (d) Where the arbitrators exceeded their powers, or so imperfectly execute them that a mutual, final, and definite award upon the subject matter submitted was not made.
> (e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C. 11 reads as follows:

> In either of the following cases, the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—
> (a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.
> (b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.
> (c) Where the award is imperfect in matter of form not affecting the merits of the controversy.
> The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild and Co., Inc.* v. *Richmond, F. and P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would lie in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the practice of the PTO concerning arbitration.

Example 1

Arbitration Practice—Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with § 1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

Example 2

Arbitration Practice—Testimony Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under § 1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with § 1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

Example 3

Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefore. In response to the order, the junior party requests final hearing to

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review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

Example 4

Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to extablish vis-a-vis the public that the subject matter of the court is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

Example 5

Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

Example 6

Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

Example 7

Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(C)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examinter-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

Example 8

Arbitration Practice—Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct * * * in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of § 1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

Example 9

Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral argument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with § 1.690(a), i.e., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616. Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey* v. *Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

Example 10

Arbitration Award Filed With Record—No Notice to Examiner-In-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief would place both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with 1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

Discussion of Comments

One commentor suggested that the expression "An interference or any aspect thereof shall be arbitrated" in part (b) of proposed § 1.690 might be construed as going beyond the terms of the statute by authorizing an examiner-in-chief to require the parties to arbitrate an interference, and proposed that the quoted language be changed to "An arbitration proceeding under this section shall be conducted." To eliminate any possible misconstruction of the rule, this proposal has been adopted.

A second commentor suggested, by telephone, that a provision be added to proposed § 1.690 requiring that the arbitrator be familiar with United States interference practice, and that United States law be applied by the arbitrator in making the determination. He expressed the fear that a foreign arbitrator might reach a result contrary to established domestic law.

This suggestion has not been adopted. It is incumbent upon the parties to select the arbitrator, and to satisfy themselves as to his or her qualifications. Presumably if the arbitrator's decision is contrary to established law, any resulting patent would be subject to attack on that ground by a third party in subsequent litigation.

Another commentor stated that, with the arbitration rule, the PTO was "attempting to apply a band-aid to a system which cannot be cured by application of a band-aid," and that the first-to-file system should be adopted in place of the first-to-invent system. This suggestion is obviously far beyond the scope of the rule change under consideration. The first-to-invent system is mandated by statute and could not be replaced merely by a change in the rules. The purpose of § 1.690 is to establish a specific procedure governing the optional arbitration of interferences provided by section 105 of Pub. L. 98-622.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) because arbitration intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effects on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New § 1.690 is added to Subpart E to read as follows:

§ 1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thrity (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall

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be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

Mar. 16, 1987. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[FR Doc. 87-9373 Filed 4-24-87; 8:45 am]
BILLING CODE 3510-16-M

[1080 OG 15]

(182) **Disclosure Document Program**

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program. Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

The Program

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

Content of Disclosure Document

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8 1/2 by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

Retention

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

Warning as to Limitations

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

Jan. 4, 1971. RICHARD A. WAHL,
Assistant Commissioner of Patents.

[883 O.G. 3]

(183) **Suspension of Action Under 37 CFR 1.103 and Under 37 CFR 1.212**

The purpose of this notice is to clarify existing Office practice with respect to suspension of action. "Suspension of action" under 37 CFR 1.103 applies only to the situation where action is

to be taken *by the Examiner*. In other words, action cannot be suspended in an application which contains an outstanding Office action awaiting response by the applicant.

Under 37 CFR 1.212, upon declaration of an interference, ex parte prosecution of an application is suspended and any outstanding Office actions are considered as withdrawn by operation of the rule. *Ex parte Peterson*, USPQ 119 (Commissioner of Patents, 1941). Upon termination of the interference, the Examiner will reinstate the action treated as withdrawn by operation of 37 CFR 1.212 and set a statutory period for response. The formats set forth in MPEP 1109.01 and MPEP 1109.02 may be followed.

Careful adherence to the distinction set forth above will prevent any question of abandonment from arising in connection with cases in which suspension of prosecution has occurred.

Mar. 7, 1978. WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

[969 O.G. 8]

(184) **POSTAL SERVICE EMERGENCY CONTINGENCY PLAN**

The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557-3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

ALBUQUERQUE, N.M., 87101, Room 316, U.S. Courthouse (505) 766-2386.
ANCHORAGE, 99501, 632 Sixth Ave., Hill Bldg., Suite 412 (907) 265-4597.
ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526-6000.
BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962-3560.
BIRMINGHAM, ALA., 35205, Suite 200-201, 908 S. 20th St. (205) 325-3327.
BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223-2312.
BUFFALO, N.Y., 14202, Room 1312, Federal Bldg., 111 W. Huron St. (716) 842-3208.
CHARLESTON, W. VA., 25301, 3000 New Federal Office Bldg., 500 Quarrier St. (304) 343-6181, Ext. 375.
CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 788-2151.
CHICAGO, 60603, Room 1406, Mid-Continental Plaza Bldg., 55 E. Monroe St. (312) 353-4450.
CINCINNATI, 45202, 8028 Federal Office Bldg., 550 Main St. (515) 684-2944.
CLEVELAND, 44114, Room 600, 666 Euclid Ave. (216) 522-4750. COLUMBIA, S.C., 29204, Forest Center, 2611 Forest Dr. (803) 765-5345.
DALLAS, 75202, Room 3E7, 1100 Commerce St. (214) 749-1515.
DENVER, 80202, Room 161, New Custom House, 19th and Stout Sts. (303) 837-3246.
DES MOINES, IOWA, 50309, 609 Federal Bldg., 210 Walnut St. (515) 284-4222.
DETROIT, 48226, 445 Federal Bldg. (313) 226-3650.
GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275-9111, Ext. 345.
HARTFORD, CONN., 06103, Room 610-B, Federal Office Bldg., 450 Main St. (203) 244-3530.
HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546-8694.
HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226-4231.
INDIANAPOLIS, 46204, 355 Federal Office Bldg., 46 E. Ohio St. (317) 269-6214.
KANSAS CITY, MO , 64106, Room 1840, 601 E. 12th St. (816) 374-3142.
LOS ANGELES, 90024, 11201 Federal Bldg., 11000 Wilshire Blvd. (213) 824-7591.
MEMPHIS, 38103, Room 710, 147 Jefferson Ave. (901) 534-3213.
MIAMI, 33130, Rm. 821, City National Bank Bldg., 25 W. Flagler St. (305) 350-5267.
MILWAUKEE, 53203, Straus Bldg., 238 W. Wisconsin Ave. (414) 224-3473.
MINNEAPOLIS, 55401, 306 Federal Bldg., 110 S. Fourth St. (612) 725-2133.
NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589-6546.
NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264-0634.
NEWARK, N.J., 07102, Gateway Bldg., (4th Floor) (201) 645-6214.
PHILADELPHIA, 19106, 9448 Federal Bldg., 600 Arch St. (215) 597-2850.
PHOENIX, ARIZ., 85004, 508 Greater Arizona Savings Bldg., 112 N. Central Ave. (602) 261-3285.
PITTSBURGH, 15222, 431 Federal Bldg., 1000 Liberty Ave. (412) 644-2850.
PORTLAND, ORE., 97205, 921 SW. Washington St., Suite 521, Pittock Block. (503) 221-3001.
RENO, NEV., 89502, 2028 Federal Bldg., 300 Booth St. (702) 784-5203.
RICHMOND, VA., 23240, 8010 Federal Bldg., 400 N. 8th St. (804) 782-2246.
ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622-4243.
SALT LAKE CITY, 84111, 1201 Federal Bldg., 125 S. State St. (801) 524-5116.

SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556-5860.
SAN JUAN, P.R., 00902, Room 100, Post Office Bldg., (809) 723-4640.
SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125-29 Bull St. (912) 232-4204.
SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442-5615.

July 18, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[937 O.G. 386]

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(185) **Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings**

The Patent and Trademark Office (PTO) is adding Parts 15 and 15a to Title 37 of the Code of Federal Regulations. Part 15 concerns service of process on the Commsssioner, the Patent and Trademark Office, and employees of the Patent and Trademark Office in their official capacity. Part 15a concerns the testimony of PTO employees regarding official matters and the production of official documents in legal proceedings. Parts 15 and 15a were effective upon publication in the Federal Register. 54 FR 3976-8 (Jan. 26, 1989).

In addition, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of ju the Trademark Manual of Examining Procedure are amended, as indicated below, effective immediately.

Parts 15 and 15a, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of the Trademark Manual of Examining Procedure are published in this notice as a convenience to the public. In addition to these materials, the Patent and Trademark Office alerts the public to its position with respect to *Standard Packaging Corp.* v. *Curwood, Inc* ., 365 F. Supp. 134, 180 USPQ 234 (N.D. Ill. 1973). In the past, parties have attempted, based on *Standard Packaging*, to obtain answers to questions which the Patent and Trademark Office has regarded to be improper. While the Patent and Trademark Office believes *Standard Packaging* accurately states the law, the Office believes that the court misapplied the law to the precise questions in issue. Accordingly, the Office agrees with the Federal Circuit's observation in *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg* , 860 F.2d 428, 432, 8 USPQ 2d 1853, 1857 (Fed. Cir. 1988), that there is considerable doubt whether *Standard Packaging* was correctly decided. The Patent and Trademark Office will not permit examiners to answer questions similar to those which the *Standard Packaging* court found acceptable.

* * * * *

Department of Commerce
Patent and Trademark Office
37 CFR Parts 15 and 15a

[Docket No. 9106-9006]

Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office.
Action: Final rule.
Summary: The Patent and Trademark Office is adding 37 CFR Parts 15 and 15a to supplement 15 CFR Parts 15 and 15a. These new parts prescribe policies and procedures to be followed with respect to service of process on the Patent and Trademark Office, the Commissioner of Patents and Trademarks, and employees of the Office, the testimony of Office employees regarding official matters, and the production of official documents in legal proceedings. These regulations serve as a statement of Office policy and provide comprehensive guidelines for the Office and its employees, outside agencies, and other persons regarding the appropriate procedures for service of process, testimony, and production of documents.
Effective date: Jan. 26, 1989.
For Further Information Contact: Associate Solicitor John W. Dewhirst by mail at Box 8, U.S. Patent and Trademark Office, Washington, D.C. 20231 and by phone at (703) 557-4035.
Supplementary Information: These regulations are designed to supplement, and be construed consistent with, 15 CFR Parts 15 and 15a. The regulations in Part 15a state the views of the Office with respect to the permissible scope of testimony which may be given by Office employees in connection with their performance of quasi-judicial patent and trademark matters. These Office views are consistent with *United States* v. *Morgan* , 313 U.S. 409, 422 (1941); *Western Electric Co., Inc.* v. *Piezo Technology, Inc.* v. *Quigg*, No. 88-1216, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. Nov. 1, 1988); *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969), and *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970).

Because these regulations concern agency management and personnel, they are not rules or regulations within the meaning of section 1(a) of Executive Order 12291, and they are not subject to the requirements of that Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

These regulations, relating to agency management and personnel, are exempt from all requirements of section 553 of the Administrative Procedure Act [5 USC 553] [including a delayed effective date and therefore will be effective immediately upon publication in the Federal Register.

Because a notice of proposed rule making and an opportunity for public comments are not required to be given for these regulations by section 553 of the APA, or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Flexibility Act [5 U.S.C. 603(a) and 604(a)] .

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

List of subjects in 37 CFR Parts 15 and 15a: Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, 37 CFR is amended as follows:

1. Part 15 is added to read as follows:

Part 15
Service of Process

Sec.
15.1 Scope and purpose
15.2 Definitions
15.3 Acceptance of service of process
Authority: 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15.2(a).

§ 15.1 *Scope and Purpose.*

(a) This part supplements 15 CFR Part 15 and sets forth the procedures to be followed when a summons or complaint is served on the Office or the Commissioner or an employee of the Office in his or her official capacity. This part is to be construed consistent with 15 CFR Part 15.

(b) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding.

(c) This part does not apply to subpoenas. The procedures to be followed with respect to subpoenas are set out in Part 15a of this Title.

(d) This part does not apply to service of process made on an Office employee personally on matters not related to official business of the Office or to the official responsibilities of the Office employee.

§ 15.2 *Definitions.*

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.
(b) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, or an administrative law judge or hearing officer.
(c) "Office" means Patent and Trademark Office.
(d) "Office employee" means any officer or employee of the Office.
(e) "Official business" means the authorized business of the Office.
(f) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.

§ 15.3 *Acceptance of service of process*

(a) Any summons or complaint to be served in person or by registered or certified mail or as otherwise authorized by law on the Office or the Commissioner or an Office employee in his or her official capacity, shall be served on the Solicitor or an Office employee designated by the Solicitor.

(b) Any summons or complaint to be served by mail may be addressed to Solicitor, P.O. Box 15667, Arlington, Va. 22215. Any summons or complaint to be served by hand may be delivered to the Office of the Solicitor.

(c) Any Office employee served with a summons or complaint shall immediately notify and deliver the summons or complaint to the Office of the Solicitor.

(d) Any Office employee receiving a summons or complaint shall note on the summons or complaint the date, hour, and place of service and whether service was by personal delivery or by mail.

(e) When a legal proceeding is brought to hold an Office employee personally liable in connection with an action taken in the conduct of official business, rather than liable in an official capacity, the Office employee by law is to be served personally with process. Service of process in this case is inadequate when made upon the Solicitor or the Solicitor's designee. Any Office employee sued personally for an action taken in the conduct of official business shall immediately notify and deliver a copy of the summons or complaint to the Office of the Solicitor.

(f) An Office employee sued personally in connection with official business may be represented by the Department of Justice at its discretion. See 28 CFR 50.15 and 50.16 (1987).

(g) The Solicitor or Office employee designated by the Solicitor, when accepting service of process for an Office employee in an official capacity, shall endorse on the Marshal's or server's return of service form or receipt for registered or certified mail the following statement: "Service accepted in official capacity only." The statement may be placed on the form or receipt with a rubber stamp.

(h) Upon acceptance of service or receiving notification of service, as provided in this section, the Solicitor shall take appropriate steps to protect the rights of the Commissioner or Office employee involved.

2. Part 15a is added to read as follows:

Part 15a
Testimony by Employees and the Production of Documents in Legal Proceedings

Sec.
15a.1 Scope
15a.2 Definitions
15a.3 Office policy
15a.4 Testimony or production of documents; general rule
15a.5 Testimony of Office employees in proceedings involving the United States
15a.6 Legal proceedings between private litigants
15a.7 Procedures when an Office employee receives a subpoena
Authority: 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15a.1(e) and 15a.2(f).

§ 15a.1 *Scope*

(a) This part supplements 15 CFR Part 15a and prescribes the policies and procedures of the Office with respect to the testimony of Office employees as witnesses in legal proceedings and the production of documents of the Office for use in legal proceedings pursuant to a request, order, or subpoena. This part is issued pursuant to 15 CFR 15a.1(e) and is to be construed consistent with 15 CFR Part 15a.

(b) This part does not apply to any legal proceeding in which an Office employee is to testify, while on leave status, as to facts or events that are in no way related to the official business of the Office.

(c) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding and in no way affects the rights and procedures governing public access to records pursuant to the Freedom of Information Act or the Privacy Act. See 15 CFR 15a.4 and 37 CFR 1.15.

[§ 15a.2 *Definitions.*

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.
(b) "Demand" means a request, order, or subpoena for testimony or documents for use in a legal proceeding.
(c) "Document" means any record, paper, and other property held by the Office, including without limitation official patent and trademark files, official letters, telegrams, memoranda, reports, studies, calendar and dairy entries, maps, graphs, pamphlets, notes, charts, tabulations, analyses, statistical or informational accumulations, any kind of summaries of meetings and conversations, film impressions, magnetic tapes, and sound or mechanical reproductions.
(d) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, an administrative law judge or hearing officer or any discovery proceeding in support thereof.
(e) "Office" means Patent and Trademark Office.
(f) "Office employee" means any officer or employee of the Office.
(g) "Official business" means the authorized business of the Office.
(h) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.
(i) "Testimony" means a statement given in person before a tribunal or by deposition for use before the tribunal or any other statement given for use before a tribunal in a legal proceeding, including an affidavit, declaration under 35 U.S.C. 25, or declaration under 28 U.S.C. 1746.
(j) "United States" means the Federal Government, its departments and agencies, and individuals acting on behalf of the Federal Government.

§ 15a.3 *Office policy.*

The Office policy is that its documents will not be voluntarily produced and Office employees will not voluntarily appear as witnesses or give testimony in a legal proceeding. The reasons for this policy include:

(a) To conserve the time of Office employees for conducting official business.
(b) To minimize the possibility of involving the Office in controversial or other issues which are not related to the mission of the Office.
(c) To prevent the possibility that the public will misconstrue variances between personal opinions of Office employees and Office policy.
(d) To avoid spending the time and money of the United States for private purposes.
(e) To preserve the integrity of the administrative process, minimize disruption of the decision-making process, and prevent interference with the Office's administrative functions.

§ 15a.4 *Testimony or production of documents; general rule*

(a) No Office employee shall give testimony concerning the official business of the Office or produce any document in any legal proceeding without the prior authorization of the Solicitor. Where appropriate, an Office employee may be instructed in

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writing by the Commissioner, Solicitor, or other appropriate Office employee not to give testimony or produce a document. Without prior approval, no Office employee shall answer inquiries from a person not employed by the Department of Commerce regarding testimony or documents subject to a demand or a potential demand under the provisions of this Part. All inquiries involving a demand or potential demand on an Office employee shall be referred to the Solicitor.

(b) A certified copy of a document, not otherwise available under Chapter I of this Title, will be provided for use in a legal proceeding upon written request and payment of applicable fees required by law.

(c)(1) *Request for testimony or document.* A request for testimony of an Office employee or document shall be mailed or hand-delivered to the Office of the Solicitor. The mailing address of the Office of the Solicitor is Box 8, Patent and Trademark Office, Washington, D.C. 20231.

(2) *Subpoenas.* A subpoena for testimony by an Office employee or a document shall be served in accordance with the Federal Rules of Civil or Criminal Procedure as appropriate, or applicable state procedure, and a copy of the subpoena shall be sent to the Solicitor.

(3) *Affidavit.* Every request and subpoena shall be accompanied by an affidavit or declaration under 28 U.S.C. 1746 or, if an affidavit or declaration is not feasible, a written statement setting forth the title of the legal proceeding, the forum, the requesting party's interest in the legal proceeding, the reasons for the request or subpoena, a showing that the desired testimony or document is not reasonably available from any other source, and if testimony is requested, the intended use of the testimony, a general summary of the testimony desired, and a showing that no document could be provided and used in lieu of testimony. The purpose of this requirement is to permit the Solicitor to make an informed decision as to whether testimony or production of a document should be authorized.

(d) Any Office employee who is served with a demand shall immediately notify the Office of the Solicitor.

(e) The Solicitor may consult or negotiate with an attorney for a party or the party, if not represented by an attorney, to refine or limit a demand so that compliance is less burdensome or obtain information necessary to make the determination required by paragraph (c) of this section. Failure of the attorney or party to cooperate in good faith to enable an informed determination to be made under this part may serve as the basis for a determination not to comply with the demand.

(f) A determination under this part to comply or not to comply with a demand is not an assertion or waiver of privilege, lack of relevance, technical deficiencies or any other ground for noncompliance. The Commissioner reserves the right to oppose any demand on any legal ground independent of any determination under this part.

§ 15a.5 Testimony of Office employees in proceedings involving the United States.

(a) An Office employee may not testify as an expert or opinion witness for any party other than the United States.

(b) When appropriate, the Solicitor may authorize an Office employee to give testimony as an expert or opinion witness on behalf of the United States. Expert or opinion testimony on behalf of the United States will not be authorized in any legal proceeding involving the validity or enforceability of a patent or registered trademark.

(c) Whenever, in any legal proceeding involving the United States, a request is made by an attorney representing or acting under the authority of the United States, the Solicitor will make all necessary arrangements for the Office employee to give testimony on behalf of the United States. Where appropriate, the Solicitor may require reimbursement to the Office of the expenses associated with an Office employee giving testimony on behalf of the United States.

§ 15a.6 Legal proceedings between private litigants

(a) Testimony by an Office employee and production of documents in a legal proceeding not involving the United States shall be governed by § 15a.4.

(b) If an Office employee is authorized to give testimony in a legal proceeding, the testimony, if otherwise proper, shall be limited to facts within the personal knowledge of the Office employee. An Office employee is prohibited from giving expert or opinion testimony, answering hypothetical or speculative questions, or giving testimony with respect to subject matter which is privileged. If an Office employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Office, that employee is further prohibited from giving testimony in response to questions which seek:

(1) Information about that employee's:

(i) Background.
(ii) Expertise.
(iii) Qualifications to examine or otherwise consider a particular patent or trademark application.
(iv) Usual practice or whether the employee followed a procedure set out in any Office manual of practice in a particular case.
(v) Consultation with another Office employee.
(vi) Understanding of:
(A) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(B) Prior art.
(C) Registered subject matter, subject matter sought to be registered, or atrademark application, registration, opposition, cancellation, interference or concurrent use file.
(D) Any Office manual of practice.
(E) Office regulations.
(F) Patent, trademark, or other law.
(G) The responsibilities of another Office employee.
(vii) Reliance on particular facts or arguments.

(2) To inquire into the manner in and extent to which the employee considered or studied material in performing the quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

§ 15a.7 Procedures when an Office employee receives a subpoena.

(a) Any Office employee who receives a subpoena shall immediately forward the subpoena to the Office of the Solicitor. The Solicitor will determine the extent to which an Office employee will comply with the subpoena.

(b) If the Office employee is not authorized to comply with the subpoena, the Office employee shall appear at the time and place stated in the subpoena, produce a copy of Part 15a of Title 15 and a copy of this part, and respectfully refuse to provide any testimony or produce any document. *United States ex rel. Touhy v. Ragen*. 340 U.S. 462 (1951).

(c) When necessary or appropriate, the Solicitor will request assistance from the Department of Justice or a U.S. Attorney or otherwise assure the presence of an attorney to represent the interests of the Office or an Office employee.

Dec. 23, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Revisions to §§ 1701 and 1701.01 of MPEP

§ 1701 Office personnel not to express opinion on validity or patentability of patent

Every patent is presumed to be valid. 35 U.S.C. § 282, first sentence. Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity or invalidity of, or the patentability or unpatentability of any claim in any U.S. Patent, except to the extent necessary to carry out (a) examination of an application seeking to reissue the patent, (b) a reexamination proceeding to reexamine the patent, or (c) an interference involving the patent.

The question of validity or invalidity is otherwise exclusively a matter to be determined by a court. Members of the patent examining corps are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular patent should not have issued.

When a field of search for an invention is requested, examiners should routinely inquire whether the invention has been patented in the United States. If the invention has been patented, no field of search should be suggested.

Employees of the Patent and Trademark Office, particularly patent examiners who examined an application which matured into a patent or a reissued patent or who conducted a reexamination proceeding, should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain reference or other particular evidence was considered during the examination or proceeding and whether or not a claim would have been allowed over that reference or other evidence had it been considered during the examination or proceeding. Likewise, employees are cautioned against answering any inquiry concerning any entry in the patent or reexamination file, including the extent of the field of search and any entry relating thereto. The record of the file of a patent or reexamination proceeding must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the patent examining corps. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity or patentability.

§ 1701.01 Office personnel not to testify

[Reprint: 37 CFR 15a.1
37 CFR 15a.2
37 CFR 15a.3
37 CFR 15a.4
37 CFR 15a.5
37 CFR 15a.6
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including patent examiners, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a patent examiner, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Patent examiners and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any patent.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a patent examiner or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the +

Solicitor at least *ten working* days prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co.* v. *Corning Glass Works*. 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon a patent application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States* v. *Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co.* v. *Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. § 134 since board members need not be skilled in the art to render obviousness decision); *Lange* v. *Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in § 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

(1) Information about that employee's:
(A)Background.
(B)Expertise.
(C)Qualifications to examine or otherwise consider a particular patent or trademark application.
(D)Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
(E) Consultation with another Office employee.
(F) Understanding of:
(i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(ii) Prior art.
(iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(iv) Any Office manual of practice.
(v) Office regulations.
(vi) Patent, trademark, or other law.
(vii) The responsibilities of another Office employee.

(G) reliance on particular facts or arguments.
(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in *writing*. The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) if the party requesting the testimony further meets the following conditions:

(1) [dn The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:

(a) the style of the case,
(b) the civil action number,
(c) the district in which the civil action is pending,
(d) the judge assigned to the case, and
(e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).
(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and

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give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired. Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.

(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.

(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

* * * * *

Revisions to §§ 1801 and 1801.01 of TMEP

§ 1801 Office personnel not to express opinion on validity of registered trademark

A certificate of registration of a trademark on the Principal Register is prima facie evidence of the validity of the registration. 15 U.S.C. {g49 1057(b). Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity of any registered trademark, except to the extent necessary to carry out *inter partes* proceedings at the Trademark Trial and Appeal Board in cancellation and similar proceedings authorized by law.

The question of validity of a registered trademark is otherwise exclusively a matter to be determined by a court. Members of the trademark examining operation are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular registration should not have been published or issued.

Employees of the Patent and Trademark Office, particularly trademark examining attorneys who examined an application should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain registration or other particular evidence was considered during the examination of the application or whether a trademark would have been published or registered if the registration or other evidence had been considered during the examination. Likewise, employees are cautioned against answering any inquiry concerning any entry in the trademark registration file, including the extent of the field of search and any entry relating thereto. The record of the file of a trademark registration or *inter partes* proceedings before the Trademark Trial and Appeal Board must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the trademark examining operation. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity of any registration.

§ 1801.01 Office personnel not to testify
[Reprint: 37 CFR 15a.1
37 CFR 15a.2
37 CFR 15a.3
37 CFR 15a.4
37 CFR 15a.5
37 CFR 15a.6
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including trademark examining attorneys, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a trademark examining attorney, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Trademark examining attorneys and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any registration.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a trademark examining attorney or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the Solicitor at least *ten working* days prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co.* v. *Corning Glass Works*, 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon an application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States* v. *Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 8 USPQ 2d 1583 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co.* v. *Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. {g49 134 since board members need not be skilled in the art to render obviousness decision); *Lance* v. *Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in Sec. 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

(1) Information about that employee's:
(A) Background.
(B) Expertise.
(C) Qualifications to examine or otherwise consider a particular patent or trademark application.
(D) Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
(E) Consultation with another Office employee.
(F) Understanding of:
(i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(ii) Prior art.
(iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(iv) Any Office manual of practice.
(v) Office regulations
(vi) Patent, trademark, or other law.
(vii) The responsibilities of another Office employee.
(G) Reliance on particular facts or arguments.

(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.

(3) {dn To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in *writing*. The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) only if the party requesting the testimony further meets the following conditions:

(1) The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:

(a) the style of the case,
(b) the civil action number,
(c) the district in which the civil action is pending,
(d) the judge assigned to the case, and
(e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).

(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired.

Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.

(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.

(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

FRED E. McKELVEY,
Feb. 7, 1989. *Solicitor*.

[1099 OG 36]

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(186) **No Change in Foreign Filing License Requirements**

It should be noted that the change to 37 CFR 5.19 deleting the requirement to obtain an export license for filing a patent application in a foreign country does not in any way alter the provisions of 35 U.S.C. 184. 35 U.S.C. 184 requires that a foreign filing license be obtained from the Patent and Trademark Office before any patent application, based on an invention made in the United States, is filed abroad unless a corresponding application has been on file in the USPTO for over six months.

Further information may be obtained by contacting Mr. T. H. Tubbesing at 703-557-2897, or Mr. Edward Drazdowsky at 703-557-2167.

WILLIAM FELDMAN,
Nov. 24, 1980. *Acting Assistant Commissioner, for Patents.*

[1001 O.G. 28]

(187) **Department of Commerce
Patent and Trademark Office
United States Adherence to the International Union for the Protection of New Varieties of Plants (UPOV)**

On Nov. 12, 1980, the United States deposited its instrument of acceptance of the 1978 text of the UPOV Convention. The United States was the second State to adhere to this text, New Zealand having earlier done so.

The UPOV Convention will take effect with respect to the United States and the other adherents to the 1978 text upon a total of five adherences, three of which must be by present member States (States adhering to the text of the Convention). We expect at least three present member States to adhere shortly and the 1978 text to take effect, therefore, during 1981.

The United States deposited its instrument of acceptance on the basis of the legal protection offered for asexually reproduced plants under the plant patent law (35 U.S.C. 161-164). Accordingly, the Convention will apply only to asexually reproduced plants protected under this law. Steps are now being taken, however, by the Plant Variety Protection Office of the Department of Agriculture to conform the implementation of the Plant Variety Protection Act (7 U.S.C. 2321 et seq.) to the Convention's requirements. When this is done, the United States will notify the UPOV Secretariat that the Convention is also applicable in the United States to sexually reproduced plants protected under that Act.

Questions concerning the UPOV Convention may be directed to the Office of Legislation and International Affairs of the Patent and Trademark Office. This Office may be addressed as follows: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The Office's telephone number is (703) 557-3065.

SIDNEY A. DIAMOND,
Dec. 16, 1980. *Commissioner of Patents and Trademarks.*

[1002 O.G. 102]

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(188) **Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants**

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on Nov. 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after Nov. 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of Nov. 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after Nov. 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and
International Affairs
Box 4

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U.S. Patent and Trademark Office Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

Oct. 15, 1981. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

[1011 O.G. 27]

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(189) **Qualifications for Admission to the Examination for Registration to Practice Before the Patent and Trademark Office**

37 CFR 1.341(c) provides in pertinent part, "No person will be admitted to practice and registered unless he shall . . . establish to the satisfaction of the Commissioner that he is of good moral character and good repute and *** possessed of the legal and scientific and technical qualifications necessary to enable him to render applicants for patents valuable service ***. In order that the Commissioner may determine whether the person *** has the qualifications specified, satisfactory proof of good moral character and repute, and of sufficient basic training in scientific and technical matters must be submitted ***."

All persons requesting application forms are routinely furnished with a circular entitled "General Requirements For Admission To The Examination For Registration To Practice Before The Patent and Trademark Office". The circular contains a list of the subjects in which a person must have a bachelor's degree or the equivalency thereof in scientific and technical training to meet registration qualifications. It is strongly recommended that persons who do not have a bachelor's degree in one of those subjects comply with the instructions in the paragraph following the list to show their scientific and technical qualifications. If it is intended to rely on courses in computer science, no more than 3 semester hours of courses in computer programming will be accepted as providing part of the required basic training in scientific and technical matters. Computer science courses oriented away from the physical sciences or engineering, e.g., toward accounting or business, will not be accepted as providing any of the requisite basic training in scientific and technical matters.

Many applications for admission to an examination are filed on or just prior to the announced closing date for doing so, and these applications are frequently disapproved because the person does not furnish a satisfactory showing of his or her qualifications. For instance, persons with a bachelor's degree in a subject other than one of those listed in the circular frequently do not follow instructions in the circular and do not furnish both their transcripts and official course descriptions. Other persons list charges brought against them requiring further showings to overcome doubts raised by the charges about their character and reputation. Still others who failed one section of the examination three times do not furnish a satisfactory showing of sufficient additional legal training to pass the examination.

The Office of Enrollment and Discipline evaluates each application for admission to the examination on an individual basis as soon as practical after receipt in that office. Thereafter, notification is promptly mailed to each person whose application has been disapproved.

The Office of Personnel Management (OPM — formerly Civil Service Commission), which administers the examination, requires that it receive correct data from the Patent and Trademark Office identifying the locale of the examination and the number of persons to be tested well ahead of the examination date. *To afford adequate time to present a satisfactory supplemental showing to gain admission to the examination for which application is being made, it is recommended that all persons file their applications early, preferably at least two months before the closing date.*

All supplemental showings of qualifications and all applications filed after the announced closing date to apply for admission to an examination will be considered only in connection with the person's admission to the next succeeding examination. Admission to an examination given on a particular date is available only to persons who have filed a completed application form, a $75.00 admission fee, and a satisfactory showing of qualifications on or before the closing date for applying for admission to the examination. Examinations are given in Apr. and Oct. each year, and the respective closing dates for applying for admission to the examinations are the preceding Jan. 31 and July 31.

Sept. 18, 1984. WILLIAM FELDMAN, *Director of Enrollment and Discipline.*

[1047 O.G. 35]

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(190) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 2, and 10
Docket 407 88-4181

Practice before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending its rules governing practice before the PTO by attorneys and agents. These rules are needed to clarify and modernize the rules relating to admission to practice and the conduct of disciplinary cases. The rules are also needed to set out in the Code of Federal Regulations a PTO Code of Professional Responsibility. By amending the rules, the PTO believes the standards for admission to practice in patent cases will be more easily understood, that those practicing before the PTO will have ready access to a code of professional responsibility, and that procedure in disciplinary cases will be more easily understood. The PTO expects that the conduct of disciplinary proceedings under these rules will be more effective and less costly.
Dates: The effective date of these rules (except § 1.21(a) (5) and (6)) is Mar. 8, 1985. Section 1.21(a) (5) and (6) is effective Apr. 8, 1985.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4025 (if no answer, message may be left at 703-557-4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Attorneys and agents practice before the Patent and Trademark Office (PTO) in patent cases. 35 U.S.C. 31. Attorneys also practice before the PTO in trademark and other non-patent cases. 5 U.S.C. 500(b). A few agents also practice before the PTO in trademark cases under rules in force prior to Jan. 1, 1957.

A notice of proposed rulemaking for attorney and agent conduct and disciplinary procedure was published on Aug. 11, 1983 in the *Federal Register*, 48 F.R. 36478, and on Sept. 20, 1983 in the *Official Gazette*, 1034 O.G. 39, 1034 TMOG 33. A notice extending the comment period and setting a second hearing was published on Oct. 5, 1983 in the *Federal Register*, 48 F.R. 45424, and on Oct. 18, 1983, in the *Official Gazette*, 1035 O.G. 19, 1035 TMOG 17. The PTO decided to withdraw, and not adopt, the rules proposed in the *Federal Register* notice of Aug. 11, 1983. There were numerous objections to the proposed rules and the public indicated that a longer period for study and review of a code of conduct and disciplinary procedures was necessary.

An advance notice of proposed rulemaking setting out revised rules being considered for standards of conduct and disciplinary proceedings was published on Mar. 16, 1984, in the *Federal Register*, 49 F.R. 10012, and on Apr. 10, 1984, in the *Official Gazette*, 1041 O.G. 15, 1041 TMOG 13. Numerous organizations and individuals filed comments in response to the advance notice.

On Aug. 24, 1984, the PTO published in the *Federal Register* a notice of proposed rulemaking. 49 F.R. 33790. On Aug. 28, 1984, the notice was also published in the *Official Gazette*. 1045 O.G. 29; 1045 TMOG 25. The notice also appeared in the Bureau of National Affairs, *Patents, Trademark & Copyright Journal*, Vol. 28, No. 694, pp. 485-515 (Aug. 30, 1984). Twenty-two written comments were timely received in response to the notice of proposed rulemaking. The comments are analyzed herein. A hearing was held on Oct. 10, 1984. Five individuals appeared at the hearing. Oral comments made at the hearing are also analyzed herein. The twenty-two written comments and a copy of the transcript of the hearing are available for public inspection in Room 12B10, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

This notice of rulemaking sets out rules in three areas:

(1) Practice of attorneys and agents before the PTO in patent, trademark, and other non-patent cases §§ 10.2 through 10.19);
(2) A PTO Code of Professional Responsibility (§§ 10.20 through 10.112); and
(3) Rules governing (a) investigation of possible violations of the PTO Code of Professional Responsibility and (b) disciplinary proceedings to reprimand, suspend, or exclude (disbar) individuals from practicing before the PTO who, after notice and opportunity for a hearing, are found to have violated a disciplinary rule of the PTO Code of Professional Responsibility (§§ 10.130 through 10.170).

Familiarity with the advance notice and notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in response to the notice of proposed rulemaking are discussed. Comments not timely received in response to the advance notice are also discussed.

Tables 1, 2, and 3 are included in this notice to assist readers in correlating present rules with the new rules and to find the principal source for the new rules. An indication in Tables 1, 2, or 3 that a section is "new" means that a corresponding section does not currently appear in Tile 37 of the Code of Federal Regulations.

Table 1 shows the principal sources of the new rules which relate to (1) admission to practice of attorneys and agents in patent cases and (2) practice in trademark and other non-patent cases.

Table 2 shows the principal sources of the rules for the new PTO Code of Professional Responsibility.

Table 3 shows the principal sources of the new rules for disciplinary proceedings.

Other sources for, and rationale in support of, the proposed rules are discussed in the Supplementary Information of the advance notice, 49 F.R. 10012-10022, and the Supplementary Information of the notice of proposed rulemaking, 49 F.R. 33790-33803.

In issuing these rules, the PTO has made every effort to minimize preemption of State control over the practice of law. Thus, in § 10.1, second sentence, the new rules provide:

> Nothing in . . . [these rules] shall be construed to preempt the authority of each State to maintain control over the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives.

This provision of § 10.1 is based on language in *Sperry* v. *Florida ex rel, Florida Bar*, 373 U.S. 379, 402 (1963), and makes clear the PTO's intent to regulate only conduct related or relevant to practice before the PTO.

In an effort to ascertain whether the proposed rules would have any adverse impact on the States, copies of both the advance notice of Mar. 16, 1984, and the notice of proposed rulemaking of Aug. 24, 1984, were sent to Bar Counsel in each State. The PTO received responses from Bar Counsel in Ala., Conn., Fla., Ga., Md., Miss., Nebr., Tex., and Vt. Comments were also received from the National Organization of Bar Counsel, the American Bar Association, and others.

Alaska Bar Counsel, contrary to other bar counsel filing comments, suggested that creation of a PTO Code of Professional Responsibility would be "inherently confusing" to any attorney practicing in a State and also before the PTO. The new rules, however, do not establish for the first time a PTO Code of Professional Responsibility. The current PTO code appears in 37 CFR §§ 1.344 and 2.12. Sections 1.344 and 2.12 merely incorporate by reference the Code of Professional Responsibility of the American Bar Association (1970). The new PTO code more appropriately sets out the standards of conduct relevant to the practice of law before the PTO. Alaska Bar Counsel also felt that it would be more appropriate if the PTO brought alleged ethics violations by attorneys to local state enforcement authorities. This view was not shared by other bar counsel who filed comments. The statute (35 U.S.C. 32) authorizes the Commissioner to administer discipline. The PTO has taken disciplinary action in instances where a State has declined to do so. Moreover, there are registered patent agents who are not subject to discipline by State enforcement agencies. Finally, Alaska Bar counsel suggested that "adjudicative agencies" are too closely involved in a disciplinary matter to be impartial. Congress has determined otherwise. 35 U.S.C. 32 and 5 U.S.C. 500(d).

Comments were received from the Statewide Grievance Committee of Connecticut in response to the advance notice. Many helpful suggestions were made in the comments. Most of the suggestions were adopted at the time the notice of proposed rulemaking was published.

The Florida Bar, through its Director of Lawyer Regulation, filed comments in response to the notice of proposed rulemaking. The Florida Bar commented on §§ 10.1(c) and 10.23(c) (5). The PTO's response to the comment appears later in this notice under a discussion of § 10.1.

An Assistant General Counsel of the State Bar of Georgia filed a response to the advance notice. The response stated, among other things: "Although due to the press of business at the present time I am unable to provide a substantive response in this correspondence, I will respond within the appropriate time limits after having an opportunity to study the enclosed . . . [advance notice]." No further response was received.

Bar counsel for the Attorney Grievance Commission of Maryland filed a response to the advance notice. In his response Bar Counsel states in part:

> It does not appear to me that any of the proposed Rules would present any difficulty in the administration of discipline within Md.

Complaint Counsel for Miss. responded to the advance notice. He stated in part:

> I have not reviewed the proposed Code in comparison with the Code of Professional Responsiblity in great detail. In general however I can state that adoption of the proposed Code would not have an adverse effect upon the function of this office.

The General Counsel of the State Bar of Texas responded to the advance notice and did "not perceive that any problem would be created by . . . [the proposed rules] in Tex." The General Counsel did express the thought that the PTO's use of the word "practitioner" instead of "lawyer" would not prevent reciprocal discipline in Tex. based on disciplinary action by the PTO. The PTO sees no reason for disagreeing with the General Counsel. The word "practitioner" is used by the PTO to define registered attorneys, registered agents, *and* other attorneys authorized to practice in trademark and other non-patent cases before the PTO under 5 U.S.C. 500(b).

The Chairman of the Professional Conduct Board of Vermont responded to the advance notice. He states in part:

> I find nothing contained in the proposed rules which would present any difficulty in the administration of disciplinary matters within the State of Vermont. Further, I see no problems created vis-a-vis the Code of Professional Responsibility in this jurisdiction.

The President of the National Organization of Bar Counsel responded to the notice of proposed rulemaking. He expressed a concern as to whether the PTO intended to "provide for notice and information of . . . [each disciplinary violation by an attorney] to each jurisdiction where the attorney is licensed." Two provisions of the rules are designed to insure that States are notified of PTO disciplinary action. Section 10.158(b) (1) requires a disciplined attorney to notify all bars of which he or she is a member and to file a copy of the notice with the Director of Enrollment and Discipline of the PTO. Section 10.159(a) requires the Director to notify known state bars and appropriate bar associations of PTO disciplinary action. In addition, as a matter of policy, the PTO intends to notify the National Discipline Data Bank of the American Bar Association.

Comments were filed in response to the advance notice and the notice of proposed rulemaking by the Standing Committee on Professional Discipline of the American Bar Association. The comments filed in response to the advance notice were analyzed in the notice of proposed rulemaking and are not re-analyzed in

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this notice. In its comments responding to the notice of proposed rulemaking the Standing Committee made several helpful suggestions, some of which are being adopted. A full discussion of the PTO rationale for adopting or not adopting a particular suggestion appears under analysis of comments later in this notice. The Standing Committee urged adoption of the 1983 ABA Model Rules. The PTO is not now adopting the Model Rules *inter alia* because most States have not adopted those rules. If a significant number of states adopt the Model Rules, the PTO will consider further amendments to its Code of Professional Responsibility. The Standing Committee suggested changes to § 10.23(c) (12) which are being adopted in part. The Standing Committee suggested that notice be given to a practitioner prior to any meeting of the Committee on Discipline. This suggestion is not being adopted. In most instances, a practitioner will be able to respond to a notice under 5 U.S.C. 558(c). The Committee will have the practitioner's response at the time of its deliberation. The Standing Committee urged that hearings in disciplinary matters should be open to the public. Others opposed this position. The PTO is not adopting this suggestion in view of 35 U.S.C. 122. Further rationale for not adopting the Standing Committee's suggestion appears later in the notice. The Standing Committee urged a change in § 10.149 to make the burden for proving a disciplinary violation one of "clear and convincing evidence." This suggestion is being adopted. The Standing Committee urged that more discovery be permitted than was authorized by § 10.152 as proposed. This suggestion is being adopted as explained further in this notice. The Standing Committee also thought § 10.159 should provide for notice to the ABA National Discipline Data Bank when the PTO administers discipline. While § 10.159 will not specifically mention the Data Bank, a change has been made to permit the Director to notify appropriate bar associations. The Data Bank is an appropriate bar association.

Changes in Text: Several changes have been made in the text of the new rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

In § 1.8, the new subparagraph will be (xiii). Subparagraph (xii) was added when the rules relating to patent interference proceedings were amended. See 49 F.R. 48451 (Dec. 12, 1984).

In the first sentence of § 1.31, the term "agent" has been changed to "registered agent" to make clear that only registered agents are intended.

Section 1.33(c) is being amended to delete a reference to former §§ 1.341 and 1.347 and to now refer to §§ 10.5 and 10.11.

Section 1.56(f) and (h) is being amended to delete a reference to former § 1.346 and to now referred to § 10.18.

In the second sentence of § 10.1, "subpart shall" has been changed to "part shall" and "maintain control over" has been changed to "regulate." In the same sentence, "within its borders" has been deleted.

In § 10.2(b)[sf,4 (1), "maintain the register" has been changed to "maintain the register provided for in § 10.5".

In the next-to-the-last sentence of § 10.7(b), "examining corps" has been changed to "patent examining corps".

The language "an alien" in § 10.9(b) has been changed to read "a resident alien" to make clear that aliens registered under paragraphs (a) or (b) of § 10.6 must be resident aliens.

In the first sentence of § 10.14(c), "foreigner" has been changed to "foreign attorney or agent", "registered and in good standing" has been changed to "registered or in good standing", "applicants" has been changed to "parties" and "trademark applications" has been changed to "trademark cases".

In § 10.18(a) (1), "the paper has been read" has been changed to "the paper has been read by the practitioner".

Several changes have been made in § 10.23.

In § 10.23(c) (4) (iii), "improperly" has been added before "bestowing."

In § 10.23(c) (5), "on ethical grounds" has been added after the first occurrence of "attorney or agent" and "suspension or disbarment as an attorney or agent" (after "10.6(c)") has been deleted.

In § 10.23(c) (7), "patent" has been added before "application of another" and the following has been added as a second sentence: "See §§ 1.604(b) and 1.607(c) of this Subchapter."

In § 10.23(c) (8), "Failing to forward" has been changed to "Failing to inform a client or former client"; "inability to forward, to" has been changed to "inability to notify"; "client correspondence" has been changed to "client of correspondence"; "is correspondence which" has been changed to "is correspondence of which"; and "under the circumstances should be forwarded to the client or former client" has been changed to "under the circumstances the client or former client should be notified."

Section 10.23(c) (12) has been changed to read: "Knowingly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility."

In § 10.23(c) (15), "including" has been changed to "making a" and "matter" has been changed to "statement".

In § 10.36(b) (3), the language "in the locality" has been deleted.

The following language has been deleted from § 10.40(c): ", and may not withdraw in other matters,".

In § 10.62(b), the language "contemplated or pending litigation or" has been deleted.

In § 10.63(a), the language "contemplated or pending litigation or" has been deleted. Both occurrences of "trial or" have been deleted from § 10.63(a). The language "contemplated or pending litigation or" has been deleted from § 10.63(b).

The following sentence has been added to § 10.64(b):

"A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee." 1 In § 10.84(a) (3), "§ 10.85" has been changed to "this part".

The following sentence has been added to § 10.87(a):

"It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions."

Subparagraph (5) of § 10.89(c) as it appeared in the notice of proposed rulemaking has been deleted. Subparagraph (6) of § 10.89(c) as it appeared in the notice of proposed rulemaking has been changed to read: "(5) Engage in undignified or discourteous conduct before the Office (see § 1.3 of this Subchapter)." Subparagraph (7) of § 10.89(c) has been redesignated as subparagraph (6).

In § 10.112(a), the language:

maintained: (1) in the case of a practitioner whose office is located in the United States, the State in which the practitioner's office is situated or (2) in the case of a practitioner having an office in a foreign country or registered under § 10.6(c) in the United States or the foreign country has been changed to read:

maintained in the United States or, in the case of a practitioner having an office in a foreign country or registered under § 10.6(c). in the United States or the foreign country.

In § 10.131(a), the second sentence has been deleted as being unnecessary in view of § 10.132(b). The second sentence of § 10.131(a) in the notice of proposed rulemaking read: "The investigation shall be such as to determine whether there is probable cause to believe that a violation of a Disciplinary Rule by a practitioner has occurred."

In the first sentence of § 10.132(a), the language "that there is probable cuase to believe" has been deleted. The Committee on Discipline, not the Director, shall determine whether there is probable cause to believe that a practitioner has violated a Disciplinary Rule. See §§ 10.4(b) and 10.132(b).

Several changes have been made in § 10.133. In the first sentence of § 10.133(b), the language "§§ 10.132(b) and 10.134" has been replaced with "§ 10.134". The reference to § 10.132(b) is not necessary. The language "his or her resignation by filing" in § 10.133(b) has been deleted as unnecessary. The second sentence of § 10.133(b) has been modified to become new paragraphs (c) and (d). Paragraph (c) indicates the content of an affidavit of resignation filed prior to the date set by the administrative law judge (ALJ) for hearing. Paragraph (d) indicates the content of an affidavit of resignation filed on or after the date set by the ALJ for hearing. Paragraph (c) has been redesignated as new paragraph (e). In addition, the language "paragraph (b)" therein has been changed to "paragraphs (b) or (c)". Paragraphs (d) and (e) have been redesignated as new paragraphs (f) and (g), respectively.

In § 10.135(a) (2) (i), "Committee on Enrollment" has been changed to "Director".

In § 10.149, "a preponderance of" has been changed in both instances to "clear and convincing".

Several changes have been made to § 10.152 to expand discovery. Paragraphs (a) and (b) of § 10.152 as set out in the notice of proposed rulemaking have been redesignated as paragraphs (e) and (f), respectively, and new paragraphs (a) through (d) have been added. New paragraph (a) sets forth discovery which is authorized. New paragraph (b) sets forth matter which *cannot* be discovered. Paragraph (c) sets forth factors which an ALJ can consider in determining whether to authorize discovery. Paragraph (d) requires that a motion be filed which addresses specifically and separately each particular request for discovery. In paragraph (e) (formerly paragraph (a)), a new subparagraph (3) has been added to specify that the ALJ may require the parties to set out in a pre-hearing statement information related to expert witnesses. Old subparagraphs (3) and (4) have been redesignated as new subparagraphs (4) and (5), respectively.

In § 10.154(b), a new subparagraph (5) has been added which states: "(5) any extenuating circumstances."

In § 10.155(a), both occurrences of "on the respondent" have been deleted.

Several changes have been made to § 10.158. In § 10.158(b) (1), after "all clients of the practitioner" the following has been added "for whom he or she is handling matters before the Office". In § 10.158(b) (2), "client's active case files" has been changed to "client's active Office case files". In § 10.158(c). changes have been made to make paragraph (c) applicable to corporate patent departments and to prohibit a suspended or excluded practitioner from meeting in person or in the presence of another practitioner with an official of the PTO in connection with the prosecution of a patent, trademark, or other case.

The following has been added to the end of § 10.159(a): "and any appropriate bar associations,"

Several changes have been made in § 10.160(c). "A practitioner has been suspended or excluded" has been changed to "An individual who has resigned under § 10.133 or who has been suspended or excluded". The language "if the Director is satisfied" has been changed to "when the individual makes a clear and convincing showing". The language "suspended or excluded practitioner" has been changed to "individual".

Response to and Analysis of Comments: Twenty-two (22) written comments where timely received in response to the notice of proposed rulemaking. The comments have been analyzed. Some suggestions made in comments have been adopted and others have been rejected. A detailed analysis of the timely received comments follows. Several comments were not timely received by July 9, 1984, in response to the advance notice of proposed rulemaking of Mar. 16, 1984. These comments have now been considered and are analyzed herein.

Several comments were received which suggested that the rules purport to regulate attorney conduct beyond that necessary or proper for administration of federal programs by the PTO. It is not, and has never been, the intention of the PTO to regulate conduct except to the extent necessary for the accomplishment of federal objectives. Thus, only that conduct which is relevant to the practice of patent, trademark, or other law *before the PTO* is what the PTO seeks to regulate. The preamble of § 10.1 indicates that Subpart 10 governs solely the practice of patent, trademark, and other law before the PTO. As noted in the preamble to § 10.1, "[n]othing in this subpart shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." See *Sperry* v. *Florida ex rel. Florida Bar*, 373 U.S. 379, 402 (1963). See also *Michigan Canners and Freezers Ass'n.* v. *Agricultural Marketing and Bargaining Board*, 104 S. Ct. 2518, 2523 (1984) (State Law is preempted when it stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress) and *Fidelity Federal Savings and Loan Ass'n.* v. *de la Cuesta*, 102 S. Ct. 3014, 3022 (1982) (federal regulations have no less preemptive effect than federal statutes).

Several comments were received concerning § 10.1. The Florida Bar noted that in the notice of proposed rulemaking the PTO indicated "that failure to pay State bar dues is not a basis for suspension or exclusion before the PTO because failure to pay the dues has no relationship to the federal objectives which the PTO seeks to accomplish." 49 F.R. 33795, column 1, third full paragraph. The Florida Bar suggested that "the loss of good standing [should] be of concern to the PTO." The PTO agrees in part. Suspension from a State bar for failure to pay dues will not be viewed by the PTO as "misconduct." See § 10.23(c) (5), which has been changed to define misconduct as suspension or disbarment on ethical grounds. If an attorney is suspended by his or her State bar for failure to pay bar dues, and for that reason is no longer in good standing before the State bar, that attorney is no longer an attorney within the meaning of § 10.1(c). An attorney suspended from his or her State bar for failure to pay bar dues would no longer be eligible to represent individuals before the PTO in trademark and other non-patent cases.

One commentator suggested that the second sentence of § 10.1 be changed to read: "Nothing in this subpart shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." The suggestion is being adopted. The commentator noted that as originally proposed in the notice of proposed rulemaking, the phrase "to maintain control over the practice of law within its borders" is unduly restrictive. The commentator correctly pointed out that "[c]ertainly, New York would have the authority to regulate the practice of law by a New York attorney residing in Fla."

Another commentator noted the language "federal objectives" in § 10.1 and felt it would be appropriate for the PTO "to set forth what the federal objectives really are." The PTO does not believe it is appropriate to set out in the regulations specific federal objectives. The PTO engages in the examination of applications for patents, reexamination of issued patents, examination of applications for registrations of trademarks, and numerous *inter partes* patent and trademark proceedings. The federal objectives of the PTO center around these activities.

With respect to § 10.2(c), one commentator argued that "it is unfair to require the payment of a fee to review a final decision of the Director." The PTO disagrees. The review provided by § 10.2(c) is a service preformed by the PTO for which a fee may be charged. There is no compelling reason for not charging a fee.

Several comments were received discussing § 10.4. One commentator suggested "that a provision for no discovery or testimony from a member of the Committee on Discipline is unfair and inappropriate." The PTO does not believe that a "mini-trial" should be conducted in a subsequent disciplinary proceeding of how or why the Committee on Discipline reached its decision. The commentator also argued that 10.4(c) "would be in direct conflict with the Federal Rules of Civil Procedure" in any review in the U.S. District Court for the District of Columbia. Again, the PTO disagrees. The Federal Rules of Civil Procedure do not apply to disciplinary cases in the PTO. Moreover, those rules do not apply in cases seeking judicial review of a decision of the Commissioner in a disciplinary matter. Applicable law (35 U.S.C. 32 and Local Rule 1-26 of the district court) provides for review on the record made in the PTO. See also *Camp* v. *Pitts*, [ro 411 U.S. 138 (1973). Hence, there is no discovery in a proceeding under 35 U.S.C. 32.

Comments were received which suggest that the associate and assistant solicitors in the Office of the Solicitor cannot be isolated from the Solicitor and the Deputy Solicitor. The associate and assistant solicitors are to be isolated so that (1) the associate and assistant solicitors may act as attorney for the Director in prosecuting a disciplinary proceeding and (2) the Solicitor and Deputy Solicitor may act as legal advisor to the Commissioner in deciding a disciplinary matter. In disciplinary matters, the associate and assistant solicitors will report directly to the Director. Associate and assistant solicitors will not have occasion to discuss disciplinary matters with the Solicitor or Deputy Solicitor.

The following discussion in the *Attorney General's Manual on the Administrative Procedure Act*, pp. 5758 (1947), commenting on original § 5(c) (now 5 U.S.C. 554(d)) is believed particularly relevant to the issues raised in the comments:

> Assuming that an agency will in many cases wish to consult with certain of its staff members, it may proceed in one of two ways. It may in a particular case consult with staff members who in fact have not performed investigative or prosecuting functions in that or a factually related case. In the alternative, the agency may find it feasible so to organize its staff assignments that the staff members whom it most frequently desires to consult will be free of all investigative and prosecuting functions.

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> [I]f the agency so organizes its staff that the general counsel is not responsible for the investigative and prosecuting functions, he would be regularly available to the agency for consultation on the decision of cases.[8]

Several commentators suggested that members of the public or the PTO bar should be members of the Committee on Discipline. This suggestion is not being adopted. As noted in the notice of proposed rulemaking (49 F.R. 33793, column 2, last paragraph), there are two reasons for not adopting the suggestion. Use of individuals outside the PTO is made difficult by 35 U.S.C. 122. Administrative delays would take place because it would be more difficult to schedule meetings.

One commentator suggested that the language "at least" in the phrase "at least three employees of the Office" should be deleted from the second sentence of § 10.4(a). This suggestion is not being adopted. The "at least" language will permit the Commissioner to appoint alternate members to substitute for a member who may be disqualified or who may be unavailable for an extended period.

Section 10.10 provides that only practitioners who are registered under § 10.6 or individuals given limited recognition under § 10.9 will be permitted to prosecute patent applications of others before the PTO. One comment was received which noted that the rules do not address the "status" of (a) "an individual in a training program directed to the preparation and prosecution of applications for patent" or (b) "a long-time employee working within a patent organization in the area of preparation and prosecution of applications for patent, but has never become registered to practice as either a Patent Agent or Patent Attorney." The commentator suggested that the rules should state what such individuals or employees may do. The suggestion is not being adopted. Only registered practitioners (attorneys and agents) may practice patent law before the PTO. The commentator also suggested that the rules should provide that long-time corporate or government employees who have never been registered should be given limited recognition by the PTO. This suggestion is not being adopted. Limited recognition will be given only on a case-by-case basis. See § 10.9.

One comment suggested that "applicants" and "trademark applications" in the first sentence of § 10.14(c) rendered it unclear whether an individual authorized to practice before the PTO in trademark cases could prosecute post-registration cases, such as a cancellation proceeding. The rule has been clarified by changing "applicants" to "parties" and "trademark applications" to "trademark cases". An individual authorized to represent others under § 10.14 is authorized to appear in any trademark case.

Several comments were received discussing § 10.18. One comment made at the hearing suggested that the rule should specify who should read the paper being signed. The commentator stated: "I think it would be salutary if what you really mean is that the practitioner who signs it has read it." The suggestion is being adopted and the language of § 10.18(a) (1) has been changed from "the paper has been read" to "the paper has been read by the practitioner".

Two individuals commented that requiring the signature of a practitioner would eliminate the "custom" of having an associate sign the name of a principal attorney on a paper which the principal authorizes the associate to file. Section 10.18 requires that the practitioner signing the paper sign his or her own name. The rule would permit associate attorney John Smith to sign on behalf of principal attorney David Jones by signing the paper as follows: "David Jones by John Smith." The rule would not permit Smith to merely sign Jones' name or to sign "David Jones by JS." The rule does not authorize a non-practitioner (e.g., a para-legal or secretary) to sign a paper on behalf of a practitioner.

One comment asked the following:

> Assume an inventor is under Final Rejection and the period for proper response is near at hand. The attorney is now instructed to "keep the case alive" until a CIP [continuation-in-part] is prepared and filed. For reasons outside the control of the attorney, the CIP cannot be filed in time. Assume now the attorney files a Notice of Appeal, *never intending* to prosecute the appeal, intending only to buy time until the CIP can be filed. Would the filing of the Notice of Appeal violate Rule 10.18 and subject the attorney to PTO disciplinary action?

A notice of appeal is a proper response to a final rejection. Accordingly, it would not appear under the circumstances outlined that the notice of appeal was "interposed for delay" within the meaning of § 10.18(a) (4).

Three comments were received discussing § 10.22. One comment suggested that modifiers, such as "knowingly" and "willfully" be inserted in paragraphs (a) and (b) of § 10.22. The suggestion is not being adopted. A "materially false statement," a failure "to disclose a material fact," or furthering the application of another "known . . . to be unqualified" constitute acts which cannot be characterized as innocent. Accordingly, there is no need to insert the "modifiers" in the text of the rule. Another commentator suggested that the provisions of § 10.22 are not relevant to the federal objectives of the PTO. The PTO disagrees. Practitioners who (1) fail to tell the truth, (2) fail to reveal material information or (3) knowingly further the application of an unqualified individual to a bar, demonstrate that they are "disreputable" within the meaning of 35 U.S.C. 32. A third commentator suggested that § 10.22(b) is too broad because a practitioner could recommend an individual for membership in a bar and the individual might fail to pass the bar examination. Unless a practitioner has good reason to know that the individual will fail to pass a bar examination, it is not apparent how the practitioner's recommendation could amount to a violation of the PTO Code of Professional Responsibility.

Numerous comments were received discussing § 10.23. One comment suggested that § 10.23(c) (8) be changed to require notification of a client rather than requiring correspondence to be forwarded. This suggestion has been adopted by making appropriate changes to § 10.23(c) (8).

A suggestion was made to delete the reference to $5000 in § 10.23(c) (17). This suggestion is not being adopted. See the discussion in the advance notice, 49 F.R. 10016, column 1.

A suggestion was made that § 10.23(c) (5) has "a built-in inequity as regards different patent attorneys in different states." According to the commentator, a practitioner suspended for an act by Ohio might not be suspended for the same act by New York. The commentator reasons it would be unfair for the Office to suspend the Ohio practitioner, but not the New York practitioner. The commentator's concern is not warranted in view of the second sentence of § 10.1.

Another commentator noted that § 10.23(a) (3) "points up the difficulty of superimposing . . . [a] set of rules on of the various local jurisdictions." Here again, the commentator's concern is not believed warranted in view of the second sentence of § 10.1. Another commentator noted that "moral turpitude" is hard to define. It was suggested that possession of marijuana is regarded as a crime involving moral turpitude in some states where a 99-year sentence may be received. It was suggested that in other states possession of marijuana might result in "a slap on the wrist." If a practitioner is incarcerated for a crime in a state, it follows that the practitioner is not capable of representing individuals before the Office. This is true even if the same practitioner would not have been incarcerated in another state for the same act.

The Florida Bar raised a question concerning § 10.23(c) (5) which is answered under the discussion above of § 10.1. Section 10.23(c) (5) has been changed to make suspension or disbarment "on ethical grounds" a basis for suspension or disbarment by the Office. "Ethical grounds" would include incompetence, but would not include failure to pay State bar dues.

One comment suggested that "disreputable" and "gross misconduct" in § 10.23(a) be defined. The terms "disreputable" and "gross misconduct" appear in 35 U.S.C. 32 and need no further definition in the rules. For a discussion of "disreputable," see *Poole* v. *United States*, 54 A.F.T.R. 2d (P-H) 84-5536 (D.D.C. June 29, 1984).

Several comments suggested that the Model Rules of Professional Conduct of the American Bar Association (1983) be adopted in place of § 10.23. Adoption of the Model Rules was given consideration prior to publication of the advance notice and the notice of proposed rulemaking. The matter has been considered again. However, it has not been demonstrated to the Office that a large number of states have adopted the Model Rules. As noted in the notice of proposed rulemaking, at least Va. has rejected the Model Rules. Accordingly, the PTO will not, at this time, adopt the Model Rules. If a large number of states adopt the Model Rules in the future, the PTO would be willing to reconsider its position.

One comment suggested that "before the Office" be inserted after the word "conduct" in § 10.23(b) (4), (5), and (6). This suggestion is not being adopted in view of the second sentence of § 10.1.

A suggestion was received that "improperly" be inserted at the beginning of § 10.23(c) (4) (iii). This suggestion has been adopted.

A suggestion was received that the word "patent" be inserted before "application" in § 10.23(c) (7). This suggestion has been adopted.

A suggestion was received that § 10.23(c) (15) be changed so that a trademark practitioner could present potentially scandalous subject matter in order to receive a determination on the merits of registrability. See e.g., *In re McGinley*, 660 F.2d 481, 211 USPQ 668 (CCPA 1981). Section 10.23(c) (15) has been changed to refer only "making a scandalous or indecent statement in a paper filed in the Office."

Several individuals suggested that it may be difficult to determine the identity of tunder § 10.23(c)(8), particularly in corporate patent departments. The PTO will presume that practitioners know the identities of their clients and that information conveyed to the client is being conveyed in a manner acceptable to the client.

Section 10.23(c)(12) has been changed in response to comments which suggested that it would be difficult for practitioners to comply with § 10.23(c)(12) on the one hand and §§ 10.24 and 10.131 on the other hand. The purpose of § 10.23(c)(12) is to eliminate a frivolous complaint against practitioners. Accordingly, § 10.23(c)(12) has been changed to define as misconduct "knowningly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility."

Several individuals criticized § 10.24. The provisions of § 10.24 are derived from DR 1-103 of the Code of Professional Responsibility of the American Bar Association (1970)—the rule currently applicable to practitioners. See 37 CFR §§ 1.344 and 2.13. The PTO is not aware that the current rule causes any problems. Accordingly, the numerous suggestions to delete or amend § 10.24 are not being adopted.

One comment was received which suggested that charging another person with trademark infringement and requesting that the person withdraw a pending application "might be . . . interpreted as a violation" of § 10.31(a). The PTO disagrees. A reasonable interpretation of the rule does not justify the unreasonable construction by the commentator.

At the hearing, an individual discussed § 10.32. The individual suggested that three "practices" should be sanctioned under any PTO Code of Professional Responsibility and it was suggested that all three practices might be prohibited by § 10.32. *First*, the individual suggested that "the giving of moderately priced presents . . . to established clients on appropriate occasions— Christmas, weddings of their daughters" should not constitute a violation of § 10.32. The PTO agrees. The giving of a gift to an "established client" on the occasions suggested is not a gift "to a person for recommending the practitioner's services." *Second*, the individual suggested that a practitioner should not be prohibited from "paying for ordinary client entertainment." The PTO agrees. Again the "client" is not "a person recommending the practitioner's services" in return for being entertained. *Third*, the individual argued that the rules should not preclude an "exchange of cases with foreign practitioners." An "exchange" was said to occur "[w] here a foreign patent practitioner in his country sends cases to an American patent or trademark practitioner to prosecute before the PTO, and you send the foreign firm cases to prosecute before the foreign patent office, on the more or less explicit basis that it's something in the nature of a trade." According to the individual, the "exchange" ordinarily takes place without knowledge of the practitioner's client. The individual expressed the opinion that "exchanges" without knowledge of the client presently occur routinely. The PTO believes that the suggested "exchange" may ethically take place *only* when the practitioner's clients are fully advised of the exchange. Three other witnesses at the hearing expressed the view—correctly the PTO believes—that client knowledge is essential to an ethical exchange of the type contemplated. No change in § 10.32 is being made.

A suggestion was received that "in matters before the Office" be inserted after "professional employment" in § 10.33. The suggestion is not being adopted in view of the second sentence of § 10.1. Another comment suggested that Rule 7.3 of the Model Rules of Professional Conduct (1983) be adopted in place of § 10.33. The suggestion is not being adopted. Section 10.33 is based partly on Rule 7.3, but contains the additional language "under circumstances evidencing undue influence, intimidation, or overreaching." Section 10.33 is designed to prohibit so-called "ambulance chasing." In *Ohralik* v. *Ohio State Bar Ass'n.*, 436 U.S. 447 (1978), the Supreme Court held that a state could lawfully regulate ambulance chasing. In its opinion, the Supreme Court said:

> We need not discuss or evaluate each of these interests in detail as appellant has conceded that the State has a legitimate and indeed "compelling" interest in preventing those aspects of solicitation that involve fraud, undue influence, intimidation, overreaching, and other forms of 'vexatious conduct.' We agree that protection of the public from these aspects of solicitation is a legitimate and important state interest.

436 U.S. at 462. The additional language appearing in § 10.33 is designed to limit the application of § 10.33 to those situations in which the PTO has a legitimate interest. See also 35 U.S.C. 32 and § 10.31(a).

A suggestion was received that § 10.35(b) should be deleted. According to the suggestion, "[r]egulation of the practitioner's business arrangements should be left to state regulation." While the PTO is in general agreement with the rationale suggested, there exist partnerships of agents which are not subject to regulation by any state. Moreover, the commentator has not suggested or shown that § 10.35(b) is inconsistent with the policy of any state. Practitioners should not be free to hold themselves out as being associated with a partnership or other organizations when an association does not in fact exist.

One comment suggested that "in the locality" be deleted from § 10.36(b)(3). This suggestion is being adopted, because "in the locality" has no particular significance in the practice of patent and trademark law. Clients of patent and trademark practitioners are not necessarily located where counsel are located. Moreover, the practice is national in scope.

An individual at the hearing suggested that the PTO should delete subparagraphs (1) and (2) from § 10.37(a). This suggestion is not being adopted. The individual suggested that a client need not know that "employment" has been referred to another practitioner or to a foreign practitioner. The PTO disagrees and so did three other individuals who expressed a view at the hearing. Moreover, the PTO believes that when "farming out" occurs with the consent of a client, that the fee division should be proportional to the services rendered. Under § 10.37, "farming out" of work without knowledge and consent of a client will constitute a disciplinary rule violation.

One commentator suggested that § 10.39 "may result in numerous claims to the effect that a practitioner brought a proceeding 'merely for the purpose of harassing or maliciously injuring another person.' " Section 10.39 continues existing policy (37 CFR § 1.344 and DR 2-109 of the ABA Code (1970)). Under existing policy, the PTO has not experienced "numerous claims." Accordingly, there is no reason to expect such claims under § 10.39.

A suggestion was received that the first sentence of § 10.40(a) be changed to read: "A practitioner may withdraw from employment in a proceeding before the Office without permission from the Commissioner in those instances in which a substitute has been selected and is willing to serve." This suggestion is not being adopted. If "a substitute has been selected and is willing to serve," presumably with the consent of the client, a new power of attorney may be filed in the PTO. Another commentator suggested that § 10.40 should not apply to corporate attorneys. This suggestion likewise is not being adopted. If a corporate attorney changes jobs, the attorney should withdraw from repre-

[8]The general counsel's participation in rule making and in court litigation would be entirely compatible with his role in advising the agency in the decision of adjudicatory cases subject to section 5(c).

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senting the "old" corporation *or* the old corporation should revoke any power of attorney.

One comment suggested that the PTO should be under a burden of deciding requests for permission to withdraw within thirty (30) days. This suggestion is not being adopted, but it is and will continue to be PTO policy to promptly decide requests for permission to withdraw.

One comment suggested that ", and may not withdraw in other matters," be deleted from § 10.40(c). This suggestion has been adopted.

One comment asked whether a power of attorney given during prosecution of a patent application continues to be viable after the patent is issued. The answer is "yes." Communications received during reexamination proceedings are sent to the correspondence address established during prosecution of the application which matures into the patent being reexamined. See 37 CFR § 1.525. Notices concerning maintenance fees likewise are mailed to the correspondence address. See 37 CFR § 1.363, 49 F.R. 34725 (Aug. 31, 1984). The commentator also raised a question of who is the client when a case is filed on behalf of an individual, but the individual's assignee pays the practitioner's bills. Practitioners are expected to know the identities of their clients. If a practitioner is hired by a corporation and wishes to make that fact plain on the record of a patent application, the practitioner may file an assignment and a power of attorney signed by the assignee. If a dispute should then occur between the individual and the assignee, the record would be clear that the assignee is the client.

A comment suggested that § 10.40(a) "would appear to be unreasonable" in view of the language "giving due notice to another practitioner." Such language does not appear in § 10.40(a).

An oral comment was received by phone which questioned whether the use of para-legals or apprentices by a practitioner constitutes the unauthorized practice of law. If a para-legal or apprentice works under the direction of a practitioner and the practitioner does not allow the para-legal or apprentice to hold themselves out as a practitioner, there is no unauthorized practice of law problem within the meaning of § 10.47.

One comment discussing § 10.49 made the following statement:

> ". . . if the intent of this section is to prohibit a practitioner from forming a partnership with a lawyer who, while in good standing with his State bar, does not qualify to practice before the Office (either because he has not taken the patent examination or is not qualified to handle trademark matters), then it should be stricken."

As explained in the notice of proposed rulemaking (49 F.R. 33797, column 3), the PTO does not intend to prohibit formation of law firms by members of the Bar of any state.

One comment suggested that "in matters before the Office" should be inserted after "employment" in § 10.62(a). This suggestion is not being adopted in view of the second sentence of § 10.1.

Another comment suggested that §§ 10.62 and 10.63 be replaced with Rule 3.7(b) of the Model Rules of Professional Conduct of the ABA (1983). For reasons already discussed, the PTO is not adopting the Model Rules. The comment went on to suggest that practitioners would not be free testify concerning attorney diligence in patent interference cases. The PTO has made it plain twice that it disagrees. See the advance notice (49 F.R. 10016, column 3 (Mar. 16, 1984)) and the notice of proposed rulemaking (49 F.R. 33797, column 3, last paragraph (Aug. 24, 1984)).

A comment suggested that language in §§ 10.62 and 10.63 is not clear. Specifically, the commentator referred to "solely to an uncontested matter" or "solely to a matter of formality." This language occurs in the current rules and has not caused any known difficulty.

Two comments were received which suggested that § 10.64(b) should permit practitioners to pay fees which rightfully should be paid by a practitioner. This suggestion is being adopted and the following sentence has been added to § 10.64(b): "A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee." One of the commentators supplied the following rationale with which the PTO agrees:

> It sometimes happens that payment of a fee is necessitated by some act or omission for which the practitioner and not the client is responsible. One example is a fee for an extension of time to respond to an Office Action (see 37 C.F.R. § 1.17 and § 1.136), where the delay has resulted from the practitioner's workload for other clients, or from the practitioner's absence from his or her office for purposes unrelated to the client's business. Another example is a petition fee for revival of an application unintentionally abandoned through some inadvertent oversight on the practitioner's part. In these circumstances, it would seem unjust to require the client to bear the cost of the fee.

One comment suggested that § 10.65 should be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of § 10.1.

Another comment suggested that § 10.65(a) "may limit a practitioner serving on the board of directors of a client." The commentator went on to say that practitioners serving on boards of directors is a common practice. Inasmuch as the client consents to practitioner serving on the board, it is believed that § 10.65 does not limit a practitioner as suggested by the commentator.

One comment was received which suggested that § 10.66(d) be changed to exclude corporate patent departments. According to the comment, "why should an entire corporate patent department have to withdraw if one of its members has to withdraw for disciplinary reasons?" In situations where it would not be appropriate for an entire firm or department to withdraw, § 10.66(d) permits the Commissioner or the Director to so order. See e.g., *Sunkist Growers, Inc.* v. *The Benjamin Ansehl Co.*, 221 USPQ 1077 (Comm'r.Pat. 1984). Another comment suggested that § 10.66 should be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of § 10.1.

One comment was received which suggested that § 10.67 be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of § 10.1.

A comment was received which suggested that § 10.68(c) might be construed to preclude a practitioner from joining a law firm where attorneys who are not registered to practice before the PTO "are in control," i.e., are the "senior" partners. The definition of practitioner (see § 10.1(r)) precludes such a construction, because any attorney in good standing in any State is a practitioner. Another comment suggested that § 10.68 be amended to indicate that it relates only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of § 10.1.

One comment was made at the hearing which suggested that modifiers, such as "knowingly, willfully, intentionally," be inserted in § 10.77. This suggestion is not being adopted. The PTO believes § 10.77 states clearly the prohibited conduct.

A comment was received which suggested that §§ 10.77, 10.78, and 10.84 be amended to indicate that they refer only to matters before the PTO. This suggestion is not being adopted in view of the second sentence of § 10.1.

One comment suggested that the term "unwarranted" in § 10.85(a)(2) is "too vague as to its limits." The PTO disagrees. Contrary to the suggestion by the commentator, it is believed that practitioners can readily determine whether they are advocating a position that is unwarranted under existing law.

A comment was received which suggested that § 10.85(b) can place a difficult burden on patent counsel. In support of his position, the commentator gave two examples and commented on both examples as follows:

Example 1:

A client engages a patent attorney in the preparation of a patent application, and the patent attorney goes through the usual routine of advising the client of statutory bars, duty to disclose, etc. The attorney prepares and files the application, and during the course of the prosecution, the client informs the attorney of some activities that occurred a couple of years before filing the application, which activities might constitute an offer for sale. The attorney advises that this must be disclosed to the Patent Examiner, but the applicant refuses to follow this course of action and discharges the patent attorney. The client then engages another attorney to complete the prosecution, without telling the new attorney of the potentially damaging prior art.

Comment:

In accordance with my interpretation of § 10.85(b), the first attorney would be required to disclose this situation to the Office, unless the term "prepetrated a fraud" as it appears in that rule does not include the deliberate failure to disclose relevant prior art. My concern is that this could make for some very poor relationships with the client who might not understand the attorney's duty of disclosure before the Office.

Example 2:

A rather poor inventor has managed to drum up enough money for the filing fee for a patent application and then proceeds to prepare and file his own patent application, without the assistance of a patent attorney. After a few months, the inventor obtains some financing from an investor, and the inventor and the investor consult the patent attorney to see if he would continue with the prosecution of the application. The attorney reviews the fact pattern and informs both the inventor and the investor that there is unquestionably some prior art, in the form of an earlier publication by the inventor, which must be disclosed before the Office. When the inventor and the investor find that the attorney intends to disclose this prior art as soon as he is engaged as their attorney, the inventor and the investor tell the attorney that they would rather engage the services of some other patent attorney, and that they will not tell the second attorney of the prior art.

Comment:

As I would interpret § 10.85 (b), the first patent attorney would be obliged to inform the Office of the relevant prior art. The first patent attorney would likely have the serial number and filing date of the application, and it would appear to me that the patent attorney would have to disclose not only the prior art, but also disclose the intent of the inventor and the investor not to disclose the same. This is pretty harsh treatment, and I can see where the inventor and the investor would have some very hard feelings against the patent attorney.

The PTO agrees that under the circumstances of Example 1, a "client . . . might not understand the attorney's duty of disclosure . . . " Likewise, the PTO can understand "where the inventor and the investor [in Example 2] would have some very hard feelings against the patent attorney." Nevertheless, the commentator has correctly noted in each case that the practitioner is required to advise the PTO. The practitioner's obligation under § 10.85(b) has not been changed by the rules and is mandated by *Kingsland* v. *Dorsey*, 338 U.S. 318 (1949). See also Nahstoll, *The Lawyer's Allegiance: Priorities Regarding Confidentiality*, 41 Wash. & Lee L. Rev. 421 (1984).

A comment was received which suggested that § 10.85 be amended to indicate that it pertains only to matters before the PTO. The suggestion is not being adopted in view of the second sentence of § 10.1.

Two comments were received which suggested that § 10.87(a) could be construed to prohibit a practitioner from recommending that a client meet with an opposing party for settlement discussions. Both comments suggested that § 10.87(a) be amended to permit a practitioner to recommend that a client engage in settlement discussions directly with an opposing party. The suggestion is being adopted and the following sentence has been added to § 10.87(a): "It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions."

A suggestion was made that § 10.87 be amended to indicate that it pertains only to matters before the PTO. The suggestion is not being adopted in view of the second sentence of § 10.1.

One comment suggested that § 10.89(c) (5) be "eliminated on the grounds of vagueness" because one cannot "be expected to comply with apparently unpublished customs of courtesy or practice." The suggestion is being adopted. Subparagraph (6) of § 10.89(c) is being redesignated as subparagraph (5) and has also been changed to read: "Engage in undignified or discourteous conduct before the Office (see § 1.3 of this Subchapter)." Subparagraph (7) has been redesignated as subparagraph (6).

Another comment discussing § 10.89 asked "since when must counsel cite to the Examiner in *ex parte* proceedings cases known to be directly adverse to the position being advocated?" Counsel are expected to advise patent and trademark examiners of known controlling authority which is contrary to a position being advocated. It is important for counsel to do so in *ex parte* cases because there is no *advocate* taking a position contrary to the position being taken by an applicant. See also *Southern Pacific Transportation Co.* v. *Public Utilities Commission of the State of Calif.*, 716 F.2d 1285, 1291 (9th Cir. 1983).

A commentator contended that § 10.89(a) "makes no sense" because a decision of the PTO may have been overruled by the Federal Circuit. Section 10.89(a) is limited to "a decision of the Office made in the course of a proceeding." Practitioners are expected to follow interlocutory orders entered in PTO proceedings. Obviously if such an order is ultimately overruled or reversed by a court, it no longer need be followed. The same commentator suggested that § 10.89(c) (3) is not appropriate. Specifically, the commentator indicated that practitioners often rely on the specification of a patent application and prior art. The specification and prior art are evidence, not the "practitioner's personal knowledge."

One commentator suggested that §§ 10.92 and 10.93 be amended to indicate that they relate solely to matters before the PTO. This suggestion is not being adopted in view of the second sentence of § 10.1.

A commentator at the hearing suggested that § 10.93 be changed to permit practitioners to discuss procedural matters with interlocutory examiners or members of the Board of Patent Interferences or the Trademark Trial and Appeal Board. In view of Public Law 98-622, November 8, 1984, the Board of Patent Interferences will cease to exist on February 8, 1985. All patent interference cases will be transfered to the Board of Patent Appeals and Interferences and will be assigned to an examiner-in-chief. Practitioners may consult an examiner-in-chief orally upon adequate notice to opposing counsel. A telephone conference call may be arranged when opposing counsel desires to participate in the oral consultation. The same is true of the interlocutory examiners or members of the Trademark Trial and Appeal Board. Questions of a purely procedural nature may be asked. However, an examiner-in-chief or the interlocutory examiner or member of the Trademark Trial and Appeal Board may nevertheless decline to answer procedural questions without opposing counsel being present or involved in a conference call.

One commentator suggested that §§ 10.101, 10.102, 10.103, and 10.111 be amended to indicate that they refer only to proceedings in the PTO. The suggestion is not being adopted in view of the second sentence of § 10.1.

One comment suggested that practitioners residing in the United States should be able to maintain trust funds in a bank in any State. This suggestion is being adopted and § 10.112(a) has been changed to implement the suggestion. However, if a State bar requires funds to be kept in a bank within the State, a practitioner would be required to keep funds in a bank in the State in order to comply with State rules. Another comment suggested that § 10.112(c)(2) is not practical. According to the commentator, "invention samples and invention disclosures and drawings usually are the client's property, but keeping them in a safe deposit box is totally impractical." The commentator overlooks that portion of § 10.112(c)(2) which reads "in a safe deposit box or other place of safekeeping . . . ." A client may consent to a practitioner keeping invention samples, invention disclosures, and drawings in the practitioner's office. The practitioner, of course, should see to it that the office is maintained with appropriate security.

An individual testified at the hearing that § 10.112 is not clear. According to the individual, "I think the rules should specify that if you get money up front from a client, whether it's called a retainer, pre-payment, or whatever . . . that money has to be put into a trust fund or a trust account . . . and that you can't take the money out and spend it until you have performed the services and sent a bill to the client that says X dollars has come out of your trust account in payment of Y services." The PTO believes that § 10.112(b)(2) specifies "that you can't take the money out and spent it until you have performed the services" and that § 10.112(c)(3) specifies that you must send "a bill to the client." Accordingly, no change to § 10.112 is necessary.

One commentator testified at the hearing that the PTO rules do not address "those individuals who, due to a mental or physical defect, are not able to bring themselves in conformity with the rules of conduct . . . ." On the contrary, § 10.130

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specifies that any practitioner shown to be "incompetent" may be suspended or excluded. The commentator at the hearing referred to an individual "who has a drinking problem or one who is mentally incapable of representing people before the . . . Office." The statute (35 U.S.C. 32) and the rules address such an individual. As noted in the advance notice, the PTO has declined to adopt the suggestion appearing in Manson, *Helping Lawyers Who Need Help (But Won't Ask for It!)*, 25 Va. Bar News 27 (June 1977). See 49 F.R. 10017, column 1 (Mar. 16, 1984). If an individual is suspended due to a drinking problem, reinstatement (see § 10.160) may be conditioned on a clear and convincing showing that the drinking problem has been overcome.

One individual testified at the hearing that a "statute of limitations" should be inserted in § 10.131. This suggestion is not being adopted. As the individual noted during testimony, statues of limitations do not apply in disciplinary proceedings.

A suggestion was received that § 10.132 be changed to expressly provide that:

> No disposition adverse to the respondent shall be recommended by the Director until the respondent shall have been afforded the opportunity to be heard.

This suggestion is not being adopted. Section 10.132(a) provides that, where necessary, the Director shall comply with 5 U.S.C. 558(c) prior to calling a meeting of the Committee on Discipline. The relevant portion of 5 U.S.C. 558(c) provides:

> Except in cases of willfulness or those in which public health, interest, or safety required otherwise, the withdrawal, suspension, revocation, or annulment of a license is lawful only if, before the institution of agency proceedings therefor, the license has been given;
>
> (1) notice by the agency in writing of the facts or conduct which may warrant the action; and
> (2) opportunity to demonstrate or achieve compliance with all lawful requirements.

Where appropriate, a notice under § 588(c) will be issued prior to the time the Director takes a case to the Committee on Discipline. Any reply to the § 558 (c) notice will be reviewed by the Director and the Committee on Discipline prior to deciding whether a complaint should be filed.

Another suggestion was received which indicated that § 10.132(c) should be changed so that the "accused practitioner . . . [would] have the right to select an administrative law judge from a panel of such judges, such panel including the names of at least two law judges." This suggestion is not being adopted. No rationale was given in support of the suggestion and there is no known reason to permit a respondent to select the particular administrative law judge (ALJ) to be assigned to hear the practitioner's case.

Several changes have been made in § 10.133 by the PTO which are not in response to any comment or suggestion. The language "§§ 10.132(b) and 10.134" in the first sentence of § 10.133(b) has been changed to § 10.134". This change was made because a reference to § 10.132(b) is not necessary. The language "his or her resignation by filing" in the first sentence of § 10.133(b) has also been deleted as unnecessary. The second sentence of paragraph (b) of § 10.133 has been replaced by new paragraphs (c) and (d). New paragraph (c) specifies the content of an affidavit of resignation filed prior to the date set by the ALJ for a hearing. New paragraph (d) specifies the content of an affidavit of resignation filed on or after the date set by the ALJ for a hearing. Old paragraph (c) has been redesignated as new paragraph (e) and the language "paragraph (b)" therein has been changed to read "paragraphs (b) and (c)". Old paragraphs (d) and (e) have been redesignated as new paragraphs (f) and (g), respectively.

New paragraph (c) of § 10.133 has been added to define the conditions under which a practitioner may resign prior to the date set by the ALJ for a hearing. Experience has shown that practitioners do not readily resign prior to hearing if they are required to admit the charges against them and/or are required to admit that they could not have been defended against the charges or the subject of an investigation. Paragraph (c) does not require a practitioner to admit the charges or any lack of defense at the time of resignation. Rather, under § 10.133(c)(5), any admission is operative at the time of a request for reinstatement and only for the *limited* purpose of determining the request for reinstatement. By deferring the time when the practitioner makes the admissions, it is believed that settlements are more likely. Once a hearing begins, however, there is no reason to permit a resignation without admission of the facts and a lack of defense. The admissions of paragraph (c)(5) are relevant in determining whether reinstatement should be granted and whether sufficient time has passed between resignation and any application for reinstatement.

One comment was made at the hearing which suggested that "if, in fact there is a real stalemate in a settlement discussion, that there be some avenue so that there be, in essence, binding arbitration" on the part of the respondent and the Director. This suggestion is not being adopted. There is no reason to impose binding arbitration in disciplinary matters. While settlements are to be encouraged, if the parties (the respondent and the Director) cannot reach a mutually agreeable settlement, the proper recourse is to proceed with the disciplinary proceeding.

A suggestion was received that the second sentence of § 10.138 be deleted. The suggestion is not being adopted. The second sentence of § 10.138 provides that evidence obtained by a subpoena under 35 U.S.C. 24 will not be admitted unless prior approval was obtained from the ALJ to proceed under § 24. This provision is necessary to retain control over the proceedings in the ALJ. Moreover, an order authorizing a party to proceed under § 24 can be helpful to any district court which is required to determine whether an individual should be compelled to answer counsel's questions. Additional rationale in support of the PTO's decision not to adopt the suggestion appears in the advance notice (49 F.R. 10019, columns 1 and 2) and in the notice of proposed rulemaking (49 F.R. 33800, column 1).

Two individuals testified at the hearing concerning § 10.144. Section 10.144 provides that hearings in disciplinary cases will not be open to the public. One individual suggested that hearings in disciplinary matters should be opened to the public. The other individual took the opposite position and supported § 10.144 as proposed. The suggestion to open hearings to the public is not being adopted at this time. The PTO believes that a practitioner should not unnecessarily be exposed to charges of alleged wrongdoing until the practitioner is found to have violated the PTO Code of Professional Responsibility. Unnecessary and premature exposure could cause a practitioner's clients to find other counsel based on mere allegations. Additionally, the PTO is required to maintain information concerning patent applications in secrecy. 35 U.S.C. 122. In most disciplinary cases information concerning a patent application is revealed at any hearing. Accordingly, the PTO will not provide for public hearings. However, the PTO intends to further study the possibility of hearings open to the public (e.g., in a disciplinary proceeding involving only trademark matters) and may, in the future, propose to modify § 10.144.

Numerous comments were received which suggested that the burden of proof set forth in § 10.149 should be changed from "preponderance of evidence" to "clear and convincing evidence." As announced at the hearing, this suggestion is being adopted. The "clear and convincing evidence" standard brings § 10.149 in conformance with § 10.158(d)(1)(ii) which also requires proof by clear and convincing evidence.

The term "clear and convincing evidence" is not succeptable to a precise definition. The PTO, therefore, deems it appropriate to set forth its views on what constitutes "clear and convincing evidence." "Clear and convincing evidence" falls somewhere between proof beyond a reasonable doubt and proof by a preponderance of evidence.

A reasonable doubt is a doubt based upon reason and common sense—the kind of doubt that would make a reasonable person hesitate to act. Proof beyond a reasonable doubt must, therefore, be proof of such a convincing character that a person would be willing to rely and act upon it unhesitatingly in the most important of his or her affairs. Devitt, *Federal Jury Practice and Instructions* § 11.01 (2d ed. 1970).

To establish a fact by a preponderance of evidence means to prove that fact is more likely so than not so. A preponderance of evidence means such evidence as, when considered and compared with that opposed to it, has more convincing force, and produces in the mind of the trier of fact a belief that what is sought to be proved is more likely true than not true. Devitt, *supra* at § 7.01.

Clear and convincing evidence is that measure or degree of proof which will produce in the mind of the trier of fact a firm belief or conviction as to an allegation sought to be established; it is more than a preponderance of evidence, but less than that required to establish guilt beyond a reasonable doubt. *Hobson* v. *Eaton*, 399 F.2d 781 (6th Cir. 1968). It does not mean clear and unequivocal." *Fred C. Walker Agency, Inc.* v. *Lucas*, 215 Va. 535, 540-541, 211 S.E.2d 88, 92 (1975).

Several comments were received which suggested that § 10.150 be changed to make the Federal Rules of Evidence applicable to disciplinary proceedings. The suggestion is not being adopted. The PTO has explained, in both the advance notice (49 F.R. 10020, column 2) and the notice of proposed rulemaking (49 F.R. 338001, columns 1 and 2) why it cannot adopt the Federal Rules of Evidence in disciplinary cases. The "Federal Rules of Evidence . . . do not apply to administrative proceedings . . . ." Davis, *Administrative Law Treatise*, § 14.01 (Supp. 1970). The controlling law is set out in 5 U.S.C. 556(d) which provides in part: "Any oral or documentary evidence may be received, but the agency as a matter of policy shall provide for the exclusion of irrelevant, immaterial, or unduly repetitious evidence. A sanction may not be imposed or rule or order issued except on consideration of the whole record or those parts thereof cited by a party and supported by and in accordance with the reliable, probative, and substantial evidence." It appears to be the concern of some of the comments that the Administrative Procedure Act does not articulate an appropriate standard of evidence and that hearsay may be admitted. Suffice it to say that many adjudications occur daily under the Administrative Procedure Act, including disciplinary proceedings. The following language appearing in an opinion of the Eleventh Circuit in *TRW-United Greenfield Division* v. *National Labor Relations Board*, 716 F.2d 1391, 1394 (11th Cir. 1983), may be helpful:

> At the hearing the ALJ refused to allow five additional employees to testify that other employees told them that such a statement had been made. TRW contends it was denied a full and fair hearing by the exclusion of this testimony. The general rule is that administrative tribunals are not bound by the strict rules of evidence governing jury trials. *Opp Cotton Mills, Inc.* v. *Administrator of Wage & Hour Div.*, 312 U.S. 126, 155, 61 S.Ct. 524, 537, 85 L.Ed. 624 (1971). Thus, the admission of testimony which would be deemed incompetent in judicial proceedings would not invalidate the administrative order. *Tagg Bros. & Moorhead* v. *United States*, 280 U.S. 420, 442, 50 S.Ct. 220, 225, 74 L.Ed. 524 (1930). But this assurance of a desirable flexibility in administrative procedure does not go so far as to justify orders without a basis in evidence having rational probative force. Mere uncorroborated hearsay or rumor does not constitute substantial evidence. *Consolidated Edison Co.* v. *N.L.R.B.*, 305 U.S. 197, 230, 59 S.Ct. 206, 217, 83 L.Ed. 126 (1938). Therefore, the hearsay testimony of other employees would not have amounted to substantial evidence sufficient to support a finding for the company. We find that TRW was not denied a full and fair hearing by the judge's refusal to admit hearsay testimony.

See also *Steadman* v. *Securities and Exchange Commission*, 450 U.S. 91, 98 n. 17 (1981); *Richardson* v. *Perales*, 402 U.S. 389, 410-411 (1971); *Brown* v. *Gamage*, 377 F.2d 154, 158 (D.C.Cir.), *cert. denied*, 389 U.S. 858 (1967); Annotation, *Hearsay Evidence In Proceedings Before Federal Administrative Agencies*, 6 ALR Fed 76 (1971); and Davis, *Hearsay in Administrative Proceedings*, 32 Geo. Wash. L. Rev. 689 (1964).

A suggestion was received that § 10.151 be changed to make the deposition rules of the Federal Rules of Civil Procedure applicable to disciplinary proceedings. This suggestion is not being adopted. The discovery provisions of the Federal Rules of Civil Procedure are not being adopted by the PTO in disciplinary cases. Except for discovery which the parties agree to make voluntarily, all discovery under these rules will require the prior permission of the ALJ. This prior permission is designed to insure that the ALJ retains control over the proceeding. By requiring prior approval of the ALJ to take a deposition, the rules insure that the deposition will relate to evidence the ALJ deems to be relevant and will afford the ALJ the option of determining whether he or she wishes to observe the witness.

Several comments were received which suggested that § 10.152 be changed to permit more discovery. Some commentators urged adoption of the discovery provisions of the Federal Rules of Civil Procedure relating to requests for admissions, interrogatories, and requests for production of documents. Other commentators felt that the discovery proposed in the notice of proposed rulemaking was not sufficient and that more discovery should be authorized. These latter commentators, however, did not urge adoption of the discovery provisions of the Federal Rules of Civil Procedure. As one commentator noted:

> Disciplinary proceedings are not in the nature of civil actions and full discovery within the scope of the Federal Rules of Civil Procedure is probably not needed or desirable.

The PTO agrees that more discovery is appropriate than would have been authorized under § 10.152 as proposed. The PTO does not agree, however, that discovery should be commensurate in scope with the discovery provisions of the Federal Rules of Civil Procedure.

One commentator at the hearing who urged adoption of the discovery provisions of the Federal Rules of Civil Procedure, correctly recognized the existence of "concerns of the Patent [and Trademark] Office regarding what are alleged to be general discovery abuses." There is ample basis for the PTO's concern. See e.g., Pollack, *Discovery—Its Abuse and Correction*, 80 F.R.D. 219 (1979) (reproducing remarks made by Judge Pollack at the Fifth Circuit Judicial Conference on April 26, 1978 at New Orleans). The same commentator at the hearing went on to note, however, that if the ALJ "gets on top of a case and monitors a case very actively, then no discovery abuses will occur, and if they do, they will be dealt with swiftly and properly."

Advocates of discovery "reform" seemingly rely on two principles which are claimed to be the cure-all for discovery abuse: (1) active control by the judge and (2) sanctions. See e.g. *Second Report of the Special Committee for the Study of Discovery Abuse*, 92 F.R.D. 137 (1980). The PTO is not in a position to impose the most effective sanction—costs. However, the PTO can invest the ALJ with control over discovery. It is because the PTO can invest the ALJ with control over discovery that the suggestion for more discovery is being adopted. Section 10.152 has been changed to permit discovery which the PTO believes will be effective. The scope of the discovery, however, will not be commensurate in scope with the Federal Rules of Civil Procedure.

Paragraph (a) of § 10.152 will permit *limited* discovery an answer is filed. Discovery is not authorized prior to the filing of an answer. A party seeking discovery will have to make out a clear and convincing case to the ALJ that discovery is necessary *and* relevant. If discovery is authorized, the ALJ may set conditions he or she deems appropriate to accomplish the discovery. For example, the ALJ may set the place and time for inspection of documents which are required to be produced or the ALJ can order a party to mail copies of the documents to the other party. Under paragraph (a) of § 10.152, discovery is limited to a *reasonable* number of requests for admissions, interrogatories, or requests for production of documents and things. Consideration was given to setting numerical maximums for requests for admission, interrogatories and requests for production of documents and things. See e.g., Local Rule 11.1 of the U.S. District Court for the Eastern District of Virginia. However, numerical maximums are not presently specified. Should discovery become a problem, the PTO will give further consideration to limiting the number of discovery requests which a party may file.

Paragraph (b) of § 10.152 specified certain matters which *cannot* be discovered. Matter which will be used by another party solely for impeachment or cross-examination cannot be discovered. Documents which will be used as part of the Director's case-in-chief or the respondent's case-in-rebuttal or affirmative defenses are subject to discovery. Patent applications not available to a respondent under 35 U.S.C. § 122 are not subject to discovery. Matter relating to disciplinary proceedings commenced prior to the effective date of these rules is not available. For the most part, the reasons for a particular length of suspension or disbarment have not been stated in the past. Accordingly,

disciplinary proceedings commenced prior to these rules are not particularly relevant. See *Poole* v. *United States*, 54 A.F.T.R. 2d (P-H) 84-5536 (D.D.C. June 29, 1984). Prior disciplinary proceedings which resulted in public discipline being imposed will continue to be available in the Office of the Director of Enrollment and Discipline. Respondents will continue to be free to inspect the files of those proceedings. Matters relating to experts, except as may be required by the ALJ under § 10.152(e), likewise are not subject to discovery. Privileged matter and attorney work product are excluded from matter which can be discovered.

Paragraph (c) sets forth some factors the ALJ can consider in determining whether to authorize discovery or to limit discovery which is authorized. The factors include delay (which is a major consideration in disciplinary matters), burden on the party required to produce discovery, availability of the discovery sought to the public (in which case, discovery may not be necessary), the extent to which the matter sought to be discovered is equally available to both parties, and the extent to which discovery is available from another source.

Paragraph (d) of § 10.152 requires a party desiring discovery to file a motion which explains, in detail, how each request is relevant to an issue raised in the complaint or the answer.

Paragraph (e) of § 10.152 sets out matter which the ALJ can require a party to produce in a pre-hearing statement. Subparagraph (4) states the matter the ALJ can require disclosed related to experts.

The PTO has every reason to believe that the discovery authorized by § 10.152 will be useful and that sufficient authority has been given to the ALJ to effectively control discovery and prevent abuses. The PTO intends to monitor discovery closely in the future and will consider amending these rules if abuses occur.

One comment suggested that § 10.154(b) be modified by adding "any extenuating circumstances" as a matter to be considered in imposing a penalty. This suggestion is being adopted. Another comment suggested that § 10.154 should address "probation." This suggestion is not being adopted. Nevertheless, the PTO has authority to place a practitioner on probation for all or a portion of any suspension and to revoke the probation upon a showing of a violation. See *In re Dula*, 1030 *Official Gazette* 20 (May 17, 1983).

One comment suggested that § 10.155 be modified to specify that the Director should serve a copy of any appeal "on the respondent or on the attorney for respondent." This suggestion is not being adopted. However, in view of the suggestion the language "on the respondent" (both occurrences) in § 10.155(a) is being deleted. Section 10.142(a) specifies how service is made on a respondent who is represented by an attorney.

A suggestion was received that § 10.157 be modified to provide that a stay would be entered in every case where a respondent seeks judicial review of a decision of the Commissioner. This suggestion was rejected at the time the notice of proposed rulemaking was published (49 F.R. 33802) and is not being adopted. There are cases where a stay is not appropriate, e.g., when the disbarred practitioner is incarcerated. There are other times when a stay may be appropriate. Accordingly, stays will be granted in the discretion of the Commissioner.

Several comments were received discussing § 10.158. Some commentators suggested that § 10.158 was "too lenient" and another suggested that it was "too hard" on suspended and excluded practitioners. Section 10.158 is designed to advise suspended practitioners as to what they can and cannot do during any period of suspension. The PTO believes that § 10.158 strikes a reasonable balance in a difficult area. See the discussion concerning § 10.158 in the advance notice (49 F.R. 10021, columns 2 and 3). One comment suggested that § 10.158 should be made applicable to corporations. This suggestion is being adopted by appropriate changes in § 10.158(c) to refer to client-employers. Another comment suggested that § 10.158(b)(1) and (2) be changed to refer to matters before the PTO. This suggestion is also being adopted.

An oral comment was received asking whether the Director could conduct an investigation in connection with a determination under § 10.158(d). The Director may conduct whatever investigation is warranted to determine whether a suspended or excluded practitioner seeking reinstatement has complied with regulations relating to suspended and excluded practitioners.

A comment was received regarding § 10.159(a) which suggested that the Director notify the American Bar Association National Discipline Data Bank when a practitioner is suspended or excluded. This suggestion is not being adopted as such. However, § 10.159(a) has been changed to authorize the Director to notify "any appropriate bar association." The PTO is not inclined to mention any particular bar association by name in the rules. It will be the practice of the PTO to notify the National Discipline Data Bank, among others, when a practitioner is disciplined. Another comment suggested that the entire file of a disciplinary proceeding should not be open to the public when only some, but not all, charges are sustained. This suggestion is not being adopted. In most disciplinary matters, it would be highly inconvenient to segregate the relevant from the irrelevant. Moreover, once discipline is imposed, the principal rationale for keeping the file secret no longer exists. The disciplined practitioner will suffer whatever public embarassment results from discipline apart from whether part or all of the file is open to the public.

With respect to § 10.160, one commentator suggested that the burden on the suspended or excluded practitioner for reinstatment be stated in the rules. This suggestion is being adopted and a "clear and convincing showing" requirement has been added to § 10.160(c). Section 10.149 sets out the burden on the Director for proof of allegations in the complaint and upon the respondent for proving affirmative defenses. The showing required by § 10.158(d)(1) is by "clear and convincing evidence." One commentator suggested that the 5-year period of § 10.160(b) should be changed to a 3-year period. This suggestion is not being adopted. According to the commentator, the PTO has failed to state why a 5-year period was proposed. The commentator believes a 3-year period is more appropriate, although no reason is given in support of the commentator's belief. The PTO, after considering the matter, has concluded that some period must be specified and there is no reason to change the 5-year period proposed. A commentator suggested that a practitioner suspended for less than six months should "automatically" be reinstated. This suggestion is not being adopted, because the Director, as a condition to any reinstatement, must find that the suspended practitioner complied with § 10.158. Another commentator questioned whether the rules should provide for application for reinstatement during a period of probation. The PTO believes the rules need not make provision for application for reinstatement during probation. For example, if a practitioner is suspended for a period of three years and it is ordered that the practitioner be actually suspended for at least one year *and* that the last two years the practitioner be placed on probation, the practitioner would be able to apply for reinstatement after serving one year of the three year suspension.

The PTO disagrees with the following comment concerning § 10.161(b). "This clause is ex post facto legislation as it seeks retroactively an increase of penalties regarding conduct which occurred prior to the legislation." No legislation is involved. Section 10.161(b) does not "increase penalties."

Table 1
Principal Source of Sections 10.2 through 10.19

Sec.	
10.1 (preamble)	35 USC 31; *Sperry* v. *Florida*, 373 U.S. 379, 402 (1963)
10.1	35 USC 25; 28 USC 1746
10.1(c)	5 USC 500(b)
10.1(q)	1 USC 1
10.1(aa)	35 USC 100(c)
10.2(a)	New
10.2(b)(1)	New, but see 37 CFR 1.341(i) (1983)
10.2(b)(2)	New, but see 37 CFR 1.348(a) (1983)
10.2(c)	New, but see 37 CFR 1.341(i) (1983)
10.3	37 CFR 1.341(i) (1983)
10.4(a)	New
10.4(b)	New, but see 37 CFR 1.348(a) (1983)
10.4(c)	New
10.5	37 CFR 1.341 (1983)
10.6(a)	37 CFR 1.341(a) (1983)
10.6(b)	37 CFR 1.341(b) (1983)
10.6(c)	37 CFR 1.341(e) (1983)
10.6(d)	37 CFR 1.341(f) (1983)
10.6(e)	37 CFR 1.341(g) (1983)
10.7(a), (b)	37 CFR 1.341(c) (1983)
10.7(c)	New
10.8	37 CFR 1.341(h) (1983)
10.9(a)	37 CFR 1.342 (1983)
10.9(b)	New
10.10	37 CFR 1.343 (1983)
10.11	37 CFR 1.347 (1983)
10.12	[reserved]
10.13	[reserved]
10.14	5 USC 500(b) and 37 CFR 2.12 (1983)
10.15	35 USC 32; 5 USC 500(d) (2); 37 CFR 1.343 (1983); and 37 CFR 2.12(f) (1983)
10.16	[reserved]
10.17	[reserved]
10.18(a)	37 CFR 1.346 (1983) and 37 CFR 2.15 (1983), see also Rule 11, FRCP
10.18(b)	35 USC 32 & Rule 11, FRCP
10.19	[reserved]

Table 2
Principle Source of Sections of 10.20 through 10.112, the PTO Code of Professional Responsibility

Abbreviations:
FRCP means Federal Rules of Civil Procedure
MCPR means Model Code of Professional Responsibility of the ABA (1980)
MRPC means Model Rules of Professional Conduct of the ABA (1983)
VCPR means the Virginia Code of Professional Responsibility (1984)

Sec.	
10.20	Preamble to MCPR (1980)
10.21	MCPR Canon 1 (1980)
10.22	MCPR DR 1-101 (1980)
10.23(a)	35 U.S.C. 32
10.23(b)(1)	35 U.S.C. 32 and MCPR DR 1-102(A) (1) (1980)
10.23(b)(2)-(6)	MCPR DR 1-102(A) (2)-(6) (1980)
10.23(c)(1)-(14)	PTO created
10.23(c)(15)	Rule 11, FRCP
10.23(c)(16)-(18)	PTO created
10.23(d)	*U.S.* v. *Beecroft*, 608 F.2d 753 (9th Cir. 1979)
10.24	MCPR 1-103 (1980)
10.25 through 10.29	(reserved)
10.30	MCPR Canon 2 (1980)
10.31(a)	35 U.S.C. 32
10.31(b)	5 U.S.C. 501
10.31(c)	37 CFR 1.345(c) (1983)
10.31(d)	Newly created
10.32	MRPC Rule 7.2 (1983)
10.33	MRPC Rule 7.3 (1983)
10.34	MRPC Rule 7.4 (1983)
10.35(a)	5 U.S.C. 501 and MRPC Rule 7.5 (1983)
10.35(b)	MRPC Rule 7.5 (1983)
10.36	MCPR DR 2-106 (1980)
10.37	MCPR DR 2-107 (1980)
10.38	MCPR DR 2-108 (1980)
10.39	MCPR DR 2-109 (1980)
10.40	MCPR DR 2-110 (1980)
10.41 through 10.45	(reserved)
10.46	MCPR Canon 3 (1980)
10.47(a), (c)	MCPR DR 3-101 (1980)
10.47(b)	New (but see e.g., *Crawford* v. *State Bar of California*, 7 Cal. Rptr. 746, 355 P.2d 490 (Cal. 1960))
10.48	MCPR DR 3-102 (1980)
10.49	MCPR DR 3-103 (1980)
10.50 through 10.55	(reserved)
10.56	MCPR Canon 4 (1980)
10.57	MCPR DR 4-101 (1980)
10.58 through 10.60	(reserved)
10.61	MCPR Canon 5 (1980)
10.62	MCPR DR 5-101 (1980)
10.63	MCPR DR 5-102 (1980)
10.64	MCPR DR 5-103 (1980)
10.65	MCPR DR 5-104 (1980)
10.66	MCPR DR 5-105 (1980)
10.67	MCPR DR 5-106 (1980)
10.68	MCPR DR 5-107 (1980)
10.69 through 10.75	(reserved)
10.76	MCPR Canon 6 (1980)
10.77	MCPR DR 6-101 (1980)
10.78	MCPR DR 6-102 (1980)
10.79 through 10.82	(reserved)
10.83	MCPR Canon 7 (1980)
10.84	MCPR DR 7-101 (1980)
10.85	MCPR DR 7-102 (1980)
10.86	(reserved)
10.87	MCPR DR 7-104 (1980)
10.88	MCPR DR 7-105 (1980)
10.89	MCPR DR 7-106 (1980)
10.90	(reserved)
10.91	(reserved)
10.92	MCPR DR 7-109 (1980)
10.93	VCPR DR 7-109 (1984)
10.94 through 10.99	(reserved)
10.100	MCPR Canon 8 (1980)
10.101(a)	MCPR DR 8-101 (1980)
10.101(b)	37 CFR 1.341(f) (1983) and 41 Cp. Att'y Gen. 21 (1949), *reprinted* in 1949 Dec. Comm'r Pat. 1
10.102	MCPR DR 8-102 (1980)
10.103	MCPR DR 8-103 (1980)
10.104 through 10.109	(reserved)
10.110	MCPR Canon 9 (1980)
10.111	MCPR DR 9-101 (1980)
10.112	MCPR DR 9-102 (1980)

Table 3
Principal Source of Sections 10.130 through 10.161

Section	*Source*
10.130	35 U.S.C. 32
10.131(a)	New, but see 37 CFR 1.348(a)
10.131(b)	MCPR DR 1-103 (1980)
10.131(c)	New
10.132(a),(c)	New
10.132(b)	New, but see 37 CFR 1.348(b) (1983)
10.133	New
10.134	37 CFR 1.348(b) (1983)
10.135(a)(1)	New
10.135(a)(2)	37 CFR 1.348(b) (1983)
10.135(a)(3)	New
10.135(b)	New
10.135(c)	New
10.135(d)	5 USC 500(f)
10.136(a)	37 CFR 1.348(c) (1983)
10.136(b)	New
10.136(c)	37 CFR 1.348(c) (1983)
10.136(d)	37 CFR 1.348(c) (1983)
10.136(e)	New
10.137	37 CFR 1.348(c) (1983)
10.138	New
10.139(a)	5 USC 3105
10.139(b)	5 USC 556(c)
10.139(c)	New
10.139(d)	New
10.139(e)	New
10.140(a)	5 USC 500(b)
10.140(b)	New
10.141	New
10.142	New
10.143	New
10.144	New
10.145	New
10.146-10.148	[reserved]
10.149	New
10.150(a)	5 USC 556(d)
10.150(b)	37 CFR 1.348 (d) (3) (1983)
10.150(c)	New

10.150(d)	New
10.150(e)	New
10.151	37 CFR 1.348(d) (3) (1983)
10.152	New, see *Silverman* v. *CFTC*, 549 F.2d 28 (7th Cir. 1977)
10.153	New, but see 5 USC 557(c)
10.154	See 5 USC 557(b) and 35 USC 32
10.155	New
10.156	New
10.157	35 USC 32, Local Rule 1-26 (D.D.C.)
10.158	New
10.159	New
10.160	New
10.161	New
10.162-10.169	[reserved]
10.170	New, but see 37 CFR 1.183

Other Considerations: The rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354) and Executive Order 12291.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rules regulate the conduct of attorneys and agents who represent individuals and juristic entities before the Patent and Trademark Office and would not be expected to result in an increase of fees charged by attorneys and agents to entities, including small entities.

The Patent and Trademark Office has determined that the rules are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The information reporting requirements contained in the rules have been approved by the Office of Management and Budget, OMB Control No. 0651-0012 and OMB Control No. 0651-0017.

List of Subjects in 37 CFR Parts 1, 2 and 10.

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Trademarks, Lawyers.

For the reasons given in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 5 U.S.C. 500; 15 U.S.C. 1123; and 35 U.S.C. 6, 31, 32, and 41. Parts 1, 2, and 10 of Title 37 of the Code of Federal Regulations are amended as set forth below:

Part 1—Rules of Practice in Patent Cases

1. Section 1.8 is amended by adding to paragraph (a) (12) a new subparagraph (xiii) to read as follows:

§ 1.8 Certificate of mailing.

(a) * * *

(2) * * *

(xiii) Papers filed in connection with a disciplinary proceeding under Part 10 of this Subchapter.

2. Section 1.21 is amended by adding to paragraph (a) two new subparagraphs (5) and (6) to read as follows:

§ 1.21 Miscellaneous fees and charges.

(a) * * *

(5) For review of a decision of the Director of Enrollment and Discipline under § 10.2(c) 60.00

(6) For requesting regrading of an examination under § 10.7(c) 60.00

* * * * *

3. Section 1.31 is revised to read as follows:

§ 1.31 Applicants may be represented by a registered attorney or agent.

An applicant for patent may file and prosecute his or her own case, or he or she may be represented by a registered attorney, registered agent, or other individual authorized to practice before the Patent and Trademark Office in patent cases. See §§ 10.6 and 10.9 of this Subchapter. The Patent and Trademark Office cannot aid in the selection of a registered attorney or agent.

4. Section 1.33 is amended by removing from paragraph (c) "1.341 and 1.347" and inserting in its place "10.5 and 10.11".

5. Section 1.34 is amended by revising paragraph (a) as follows:

§ 1.34 Recognition for representation.

(a) When a registered attorney or agent acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a patent case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that under the provisions of this Subchapter and the law, he or she is authorized to represent the particular party in whose behalf he or she acts. In filing such a paper, the registered attorney or agent should specify his or her registration number with his or her signature. Further proof of authority to act in a representative capacity may be required.

* * * * *

6. Section 1.56 is amended by removing from paragraphs (f) and (h) "1.346" and inserting in its place "10.18".

7. The center heading preceding § 1.341 is removed.

8. Sections 1.341 through 1.348 are removed.

9. Section 1.455 is amended by removing from paragraph (a) "1.341" and inserting in its place "10.10".

Part 2—Rules of Practice in Trademark Cases

10. Section 2.11 is revised to read as follows:

§ 2.11 Applicants may be represented by an attorney.

The owner of a trademark may file and prosecute his or her own application for registration of such trademark, or he or she may be represented by an attorney or other individual authorized to practice in trademark cases under § 10.14 of this Subchapter. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

11. Sections 2.12 through 2.16 are removed.

12. Section 2.17 is amended by revising paragraph (a) as follows:

§ 2.17 Recognition for representation.

(a) When an attorney as defined in § 10.1(c) of this Subchapter acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a trademark case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that, under the provisions of § 10.14 and the law he or she is authorized to represent the particular party in whose behalf he or she acts. Further proof of authority to act in a representative capacity may be required.

* * * * *

13. Section 2.19 is revised to read as follows:

§ 2.19 Revocation of power of attorney or of other authorization to represent, withdrawal.

(a) Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his or her authorization.

(b) An individual authorized to represent an applicant or party in a trademark case may withdraw upon application to and approval by the Commissioner.

14. The following Part 10 is added:

Part 10—Representation of others before the Patent and Trademark Office

Sec.

10.1	Definitions
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10.3	Committee on Enrollment
10.4	Committee on Discipline
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10.12-10.13	[reserved]
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10.25-10.29	[reserved]
10.30	Canon 2
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10.35	Firm names and letterheads
10.36	Fees for legal services
10.37	Division of fees among practitioners
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10.39	Acceptance of employment
10.40	Withdrawal from employment
10.41-10.45	[reserved]
10.46	Canon 3
10.47	Aiding unauthorized practice of law
10.48	Sharing legal fees
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10.50-10.55	[reserved]
10.56	Canon 4
10.57	Preservation of confidences and secrets of a client
10.58-10.60	[reserved]
10.61	Canon 5
10.62	Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment
10.63	Withdrawal when the practitioner becomes a witness
10.64	Avoiding acquisition of interest in litigation or proceeding before the Office
10.65	Limiting business relations with a client
10.66	Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner
10.67	Settling similar claims of clients
10.68	Avoiding influence by others than the client
10.69-10.75	[reserved]
10.76	Canon 6
10.77	Failing to act competently
10.78	Limiting liability to client
10.79-10.82	[reserved]
10.83	Canon 7
10.84	Representing a client zealously
10.85	Representing a client within the bounds of the law
10.86	[reserved]
10.87	Communicating with one of adverse interest
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10.89	Conduct in proceedings
10.90-10.91	[reserved]
10.92	Contact with witnesses
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10.100	Canon 8
10.101	Action as a public official
10.102	Statements concerning officials
10.103	Practitioner candidate for judicial office
10.104-10.109	[reserved]
10.110	Canon 9
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10.130	Reprimand, suspension or exclusion
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10.132	Initiating a disciplinary proceeding; reference to an administrative law judge
10.133	Conference between Director and practitioner; resignation
10.134	Complaint
10.135	Service of complaint
10.136	Answer to complaint
10.137	Supplemental complaint
10.138	Contested case
10.139	Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays
10.140	Representative for Director or respondent
10.141	Filing of papers
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10.151 Depositions
10.152 Discovery
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10.156 Decision of the Commissioner
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10.158 Suspended or excluded practitioner
10.159 Notice of suspension or exclusion
10.160 Petition for reinstatement
10.161 Savings clause
10.162-10.169 [reserved]
10.170 Suspension of rules

Authority: 5 U.S.C. 500: 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41

Part 10—Representation of others before the Patent and Trademark Office

§ 10.1 Definitions.

This part governs solely the practice of patent, trademark, and other law before the Patent and Trademark Office. Nothing in this part shall be construed to preempt the authority of each State to regulate the practice of law, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives. Unless otherwise clear from the context, the following definitions apply to this part:

(a) "Affidavit" means affidavit, declaration under 35 U.S.C. 25 (see § 1.68 and § 2.20 of this Subchapter), or statutory declaration under 28 U.S.C. 1746.

(b) "Application" includes an application for a design, plant, or utility patent, an application to reissue any patent, and an application to register a trademark.

(c) "Attorney" or "lawyer" means an individual who is a member in good standing of the bar of any United States court or the highest court of any State. A "non-lawyer" is a person who is not an attorney or lawyer.

(d) "Canon" is defined in § 10.20(a).

(e) "Confidence" is defined in § 10.57(a).

(f) "Differing interests" include every interest that may adversely affect either the judgment or the loyalty of a practitioner to a client, whether it be a conflicting, inconsistent, diverse, or other interest.

(g) "Director" means the Director of Enrollment and Discipline.

(h) "Disciplinary Rule" is defined in § 10.20(b).

(i) "Employee of a tribunal" includes all employees of courts, the Office, and other adjudicatory bodies.

(j) "Giving information" within the meaning of § 10.23(c)(2) includes making (1) a written statement or representation or (2) an oral statement or representation.

(k) "Law firm" includes a professional legal corporation or a partnership.

(l) "Legal counsel" means practitioner.

(m) "Legal profession" includes the individuals who are lawfully engaged in practice of patent, trademark, and other law before the Office.

(n) "Legal service" means any legal service which may lawfully be performed by a practitioner before the Office.

(o) "Legal System" includes the Office and courts and adjudicatory bodies which review matters on which the Office has acted.

(p) "Office" means Patent and Trademark Office.

(q) "Person" includes a corporation, an association, a trust, a partnership, and any other organization or legal entity.

(r) "Practitioner" means (1) an attorney or agent registered to practice before the Office in patent cases or (2) an individual authorized under 5 U.S.C. 500(b) or otherwise as provided by this Subchapter, to practice before the Office in trademark cases or other non-patent cases. A "suspended or excluded practitioner" is a practitioner who is suspended or excluded under § 10.156. A "non-practitioner" is an individual who is not a practitioner.

(s) A "proceeding before the Office" includes an application, a reexamination, a protest, a public use proceeding, a patent interference, an *inter partes* trademark proceeding, or any other proceeding which is pending before the Office.

(t) "Professional legal corporation" means a corporation authorized by law to practice law for profit.

(u) "Registration" means registration to practice before the Office in patent cases.

(v) "Respondent" is defined in § 10.134(a)(1).

(w) "Secret" is defined in § 10.57(a).

(x) "Solicit" is defined in § 10.33.

(y) "State" includes the District of Columbia, Puerto Rico, and other federal territories and possessions.

(z) "Tribunal" includes courts, the Office, and other adjudicatory bodies.

(aa) "United States" means the United States of America, its territories and possessions.

§ 10.2 Director of Enrollment and Discipline.

(a) *Appointment.* The Commissioner shall appoint a Director of Enrollment and Discipline. In the event of the absence of the Director or a vacancy in the office of the Director, the Commissioner may designate an employee of the Office to serve as acting Director of Enrollment and Discipline. The Director and any acting Director shall be an active member in good standing of the bar of a State.

(b) *Duties.* The Director shall:

(1) Receive and act upon applications for registration, prepare and grade the examination provided for in § 10.7(b), maintain the register provided for in § 10.5, and perform such other duties in connection with enrollment and recognition of attorneys and agents as may be necessary.

(2) Conduct investigations into possible violations by practitioners of Disciplinary Rules, with the consent of the Committee on Discipline initiate disciplinary proceedings under § 10.132(b), and perform such other duties in connection with investigations and disciplinary proceedings as may be necessary.

(c) *Review of Director's decision.* Any final decision of the Director refusing to register an individual under § 10.6, recognize an individual under §§ 10.9 or 10.14(c), or reinstate a suspended or excluded petitioner under § 10.160, may be reviewed by petition to the Commissioner upon payment of the fee set forth in § 1.21(a)(5). A petition filed more than 30 days after the date of the decision of the Director may be dismissed as untimely. Any petition shall contain (1) a statement of the facts involved and the points to be reviewed and (2) the action requested. Briefs or memoranda, if any, in support of the petition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the Director and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record before the Director shall not be submitted with the petition. An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(OMB Control No. 0651-0012).

§ 10.3 Committee on Enrollment.

(a) The Commissioner may establish a Committee on Enrollment composed of one or more employees of the Office.

(b) The Committee on Enrollment shall, as necessary, advise the Director in connection with the Director's duties under § 10.2(b)(1).

§ 10.4 Committee on Discipline.

(a) The Commissioner shall appoint a Committee on Discipline. The Committee on Discipline shall consist of the at least three employees of the Office, none of whom reports directly or indirectly to the Director or the Solicitor. Each member of the Committee on Discipline shall be a member in good standing of the bar of a State.

(b) The Committee on Discipline shall meet at the request of the Director and after reviewing evidence presented by the Director shall, by majority vote, determine whether there is probable cause to bring charges under § 10.132 against a practitioner. When charges are brought against a practitioner, no member of the Committee on Discipline, employee under the direction of the Director, or associate solicitor or assistant solicitor in the Office of the Solicitor shall participate in rendering a decision on the charges.

(c) No discovery shall be authorized of, and no member of the Committee on Discipline shall be required to testify about, deliberations of the Committee on Discipline.

Individuals Entitled to Practice Before the Patent and Trademark Office

§ 10.5 Register of attorneys and agents in patent cases.

A register of attorneys and agents is kept in the Office on which are entered the names of all individuals recognized as entitled to represent applicants before the Office in the preparation and prosecution of applications for patent. Registration in the Office under provisions of this part shall only entitle the individuals registered to practice before the Office in patent cases.

§ 10.6 Registration of attorneys and agents.

(a) *Attorneys.* Any citizen of the United States who is an attorney and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office. When appropriate, any alien who is an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registation does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also § 10.9(b).

(b) *Agents.* Any citizen of the United States who is not an attorney and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office. When appropriate, any alien who is not an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States, and *further provided*: the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also § 10.9(b).

Note: All individuals registered prior to Nov. 15, 1938, were registered as attorneys, whether they were attorneys or not, and such registrations have not been changed.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall file proof to the satisfaction of the Director that he or she is registered and in good standing before the patent office of the country in which he or she resides and practices and who is possessed of the qualifications stated in § 10.7, may be registered as a patent agent to practice before the Office for the limited purpose of presenting and prosecuting patent applications of applicants located in such country, *provided*: the patent office of such country allows substantially reciprocal privileges to those admitted to practice before the United States Patent and Trademark Office. Registration as a patent agent under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) *Government employees.* Any officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office. If any registered attorney or agent becomes an officer or employee of the United States who is disqualified by statute from practicing as an attorney or agent in proceedings and other matters before Government departments or agencies, his or her name shall be endorsed as inactive on the register during the period of any employment by the United States. An officer or employee of the United States whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of this part may be registered to practice before the Office to the extent necessary to carry out his or her official duties. A written statement describing the official duties of the officer or employee and signed on behalf of the agency employing the officer or employee may be required by the Director.

(e) *Former Office employees.* No individual who has served in the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written statement indicating that he or she has read 18 U.S.C. 207. No individual who has served in the patent examining corps of the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written undertaking (1) not to prosecute or aid in any manner in the prosecution of any patent application pending in any patent examining group during his or her period of service therein and (2) not to prepare or prosecute or to assist in any manner in the preparation or prosecution of any patent application of another (i) assigned to such group for examination and (ii) filed within two years after the date he or she left such group, without written authorization of the Director. Associated and related classes in other patent examining groups may be required to be included in the undertaking or designated classes may be excluded from the undertaking. When an application for registration or reinstatement is made after resignation from the Office, the applicant will not be registered or reinstated if he or she has prepared or prosecuted or assisted in the preparation or prosecution of any patent application as indicated in this paragraph.

(OMB Control No. 0651-0012)

§ 10.7 Requirements for registration.

(a) No individual will be registered to practice before the Office unless he or she shall:

(1) apply to the Commissioner in writing on a form supplied by the Director and furnish all requested information and material and

(2) establish to the satisfaction of the Director that he or she is:

(i) of good moral character and repute;

(ii) possessed of the legal, scientific, and technical qualifications necessary to enable him or her to render applicants for patents valuable service; and

(iii) is otherwise competent to advise and assist applicants for patents in the presentation and prosecution of their applications before the Office.

(b) In order that the Director may determine whether an individual seeking to have his or her name placed upon the register has the qualifications specified in paragraph (a) of this section, satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters must be submitted to the Director. Except as provided in this paragraph, each applicant for registration must take and pass an examination which is held from time to time. Each application for admission to take the examination for registration must be accompanied by the fee set forth in § 1.21(a)(1) of this Subchapter. The taking of an examination may be waived in the case of any individual who has actively served for at least four years in the patent examining corps of the Office. The examination will not be administered as a mere academic exercise.

(c) Within two months from the date an applicant is notified that he or she failed an examination, the applicant may request regrading of the examination upon payment of the fee set forth in § 1.21(a)(6). Any applicant requesting regrading shall particularly point out the errors which the applicant believed occurred in the grading of his or her examination.

(OMB Control No. 0651-0012)

§ 10.8 Oath and registration fee.

Before an individual may have his or her name entered on the register of attorneys and agents, the individual must, after his or

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her application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner and pay the registration fee set forth in § 1.21(a)(2) of this Subchapter.
(OMB Control No. 0651-0012)

§ 10.9 Limited recognition in patent cases.

(a) Any individual not registered under § 10.6 may, upon a showing of circumstances which render it necessary or justifiable, be given limited recognition by the Director to prosecute as attorney or agent a specified application or specified applications, but limited recognition under this paragraph shall not extend further than the application or applications specified.
(b) When registration of a resident alien under paragraphs (a) or (b) of § 10.6 is not appropriate, the resident alien may be given limited recognition as may be appropriate under paragraph (a) of this section.

§ 10.10 Individuals not registered or recognized to practice in patent cases.

Only practitioners who are registered under § 10.6 or individuals given limited recognition under § 10.9 will be permitted to prosecute patent applications of others before the Office.

§ 10.11 Receiving names from the register.

(a) Registered attorneys and agents shall notify the Director of any change of address. Any notification to the Director of any change of address shall be separate from any notice of change of address filed in individual applications.
(b) A letter may be addressed to any individual on the register, at the address of which separate notice was last received by the Director, for the purpose of ascertaining whether such individual desires to remain on the register. The name of any individual failing to reply and give any information requested by the Director within a time limit specified will be removed from the register and the names of individuals so removed will be published in the *Official Gazette*. The name of any individual so removed may be reinstated on the register as may be appropriate and upon payment of the fee set forth in § 1.21(a)(3) of this Subchapter.
(OMB Control No. 0651-0012)

§§ 10.12-10.13 [reserved]

§ 10.14 Individuals who may practice before the Office in trademark and other non-patent cases.

(a) *Attorneys*. Any individual who is an attorney may represent others before the Office in trademark and other non-patent cases. An attorney is not required to apply for registration or recognition to practice before the Office in trademark and other non-patent cases.
(b) *Non-lawyers*. Individuals who are not attorneys are not recognized to practice before the Office in trademark and other non-patent cases, except that individuals not attorneys who were recognized to practice before the Office in trademark cases under this chapter prior to Jan. 1, 1957, will be recognized as agents to continue practice before the Office in trademark cases.
(c) *Foreigners*. Any foreign attorney or agent not a resident of the United States who shall prove to the satisfaction of the Director that he or she is registered or in good standing before the patent or trademark office of the country in which he or she resides and practices, may be recognized for the limited purpose of representing parties located in such country before the Office in the presentation and prosecution of trademark cases, *provided:* the patent or trademark office of such country allows substantially reciprocal privileges to those permitted to practice in trademark cases before the United States Patent and Trademark Office. Recognition under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.
(d) Recognition of any individual under this section shall not be construed as sanctioning or authorizing the performance of any act regarded in the jurisdiction where performed as the unauthorized practice of law.
(e) No individual other than those specified in paragraphs (a), (b), and (c) of this section will be permitted to practice before the Office in trademark cases. Any individual may appear in a trademark or other non-patent case in his or her own behalf. Any individual may appear in a trademark case for (1) a firm of which he or she is a member or (2) a corporation or association of which he or she is an officer and which he or she is authorized to represent, if such firm, corporation, or association is a party to a trademark proceeding pending before the Office.

§ 10.15 Refusal to recognize a practitioner.

Any practitioner authorized to appear before the Office may be suspended or excluded in accordance with the provisions of this part. Any practitioner who is suspended or excluded under this subpart or removed under § 10.11(b) shall not be entitled to practice before the Office.

§§ 10.16-10.17 [reserved]

§ 10.18 Signature and certificate of practitioner.

(a) Every paper filed by a practitioner representing an applicant or party to a proceeding in the Office must bear the signature of, and be personally signed by, such practitioner except those papers which are required to be signed by the applicant or party. The signature of practitioner to a paper filed by him or her, constitutes a certificate that:

(1) the paper has been read by the practitioner;
(2) the paper's filing is authorized;
(3) to the best of his or her knowledge, information, and belief, there is good ground to support the paper, including any allegations of improper conduct contained or alleged therein; and
(4) it is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See § 10.23(c)(15).

§ 10.19 [reserved]

Patent and Trademark Office Code of Professional Responsibility

§ 10.20 Canons and Disciplinary Rules.

(a) Canons are set out in §§ 10.21, 10.30, 10.46, 10.56. 10.61, 10.76, 10.83, 10.100, and 10.110. Canons are statements of axiomatic norms, expressing in general terms the standards of professional conduct expected of practitioners in their relationships with the public, with the legal system, and with the legal profession.
(b) Disciplinary Rules are set out in §§ 10.22-10.24, 10.31-10.40, 10.47-10.57, 10.62-10.68, 10.77, 10.78, 10.84, 10.85, 10.87-10.89, 10.92, 10.93, 10.101-103, 10.111, and 10.112. Disciplinary Rules are mandatory in character and state the minimum level of conduct below which no practitioner can fall without being subjected to disciplinary action.

§ 10.21 Canon 1.

A practitioner should assist in maintaining the integrity and competence of the legal profession.

§ 10.22 Maintaining integrity and competence of the legal profession.

(a) A practitioner is subject to discipline if the practitioner has made a materially false statement in, or if the practitioner has deliberately failed to disclose a material fact requested in connection with, the practitioner's application for registration or membership in the bar of any United States court or any State court or his or her authority to otherwise practice before the Office in trademark and other non-patent cases.
(b) A practitioner shall not further the application for registration or membership in the bar of any United States court, State court, or administrative agency of another person known by the practitioner to be unqualified in respect to character, education, or other relevant attribute.

§ 10.23 Misconduct.

(a) A practitioner shall not engage in disreputable or gross misconduct.
(b) A practitioner shall not:

(1) Violate a Disciplinary Rule.
(2) Circumvent a Disciplinary Rule through actions of another.
(3) Engage in illegal conduct involving moral turpitude.
(4) Engage in conduct involving dishonesty, fraud, deceit, or misrepresentation.
(5) Engage in conduct that is prejudicial to the administration of justice.
(6) Engage in any other conduct that adversely reflects on the practitioner's fitness to practice before the Office.

(c) Conduct which constitutes a violation of paragraphs (a) and (b) of this section includes, but is not limited to:

(1) Conviction of a criminal offense involving moral turpitude, dishonesty, or breach of trust.
(2) Knowingly giving false or misleading information or knowingly participating in a material way in giving false or misleading information, to:

(i) A client in connection with any immediate, prospective, or pending business before the Office.
(ii) The Office or any employee of the Office.

(3) Misappropriation of, or failure to properly or timely remit, funds received by a practitioner or the practitioner's firm from a client to pay a fee which the client is required by law to pay to the Office.
(4) Directly or indirectly improperly influencing, attempting to improperly influence, offering or agreeing to improperly influence, or attempting to offer or agree to improperly influence an official action of any employee of the Office by:

(i) use of threats, false accusations, duress, or coercion,
(ii) an offer of any special inducement or promise of advantage, or
(iii) improperly bestowing of any gift, favor, or thing of value.

(5) Suspension or disbarment from practice as an attorney or agent on ethical grounds by any duly constituted authority of a State or the United States or, in the case of a practitioner who resides in a foreign country or is registered under § 10.6(c), by any duly constituted authority of:

(i) a State,
(ii) the United States, or
(iii) the country in which the practitioner resides.

(6) Knowingly aiding or abetting a practitioner suspended or excluded from practice before the Office in engaging in unauthorized practice before the Office under § 10.158.
(7) Knowingly withholding from the Office information identifying a patent or patent application of another from which one or more claims have been copied. See §§ 1.604(b) and 1.607(c) of this Subchapter.
(8) Failing to inform a client or former client or failing to timely notify the Office of an inability to notify to a client or former client of correspondence received from the Office or the client's or former client's opponent in an *inter partes* proceeding before the Office when the correspondence (i) could have a significant effect on a matter pending before the Office, (ii) is received by the practitioner on behalf of a client or former client and (iii) is correspondence of which a reasonable practitioner would believe under the circumstances the client or former client should be notified.
(9) Knowingly misusing a certificate of mailing under § 1.8 of this Subchapter or a certificate of "Express Mail" under § 1.10 of this Subchapter.
(10) Violating the duty of candor or good faith requirements of § 1.56(a) of this Subchapter.
(11) Knowingly filing, or causing to be filed, an application which is subject to being stricken under § 1.56(c) of this Subchapter.
(12) Knowingly filing, or causing to be filed, a frivolous complaint alleging a violation by a practitioner of the Patent and Trademark Office Code of Professional Responsibility.
(13) Knowingly preparing or prosecuting a patent application in violation of an undertaking signed under § 10.6(e).
(14) Knowingly failing to advise the Director in writing of any change which would preclude continued registration under § 10.6.
(15) Knowingly signing a paper filed in the Office in violation of the provisions of § 10.18 or making a scandalous or indecent statement in a paper filed in the Office.
(16) Willfully refusing to reveal or report knowledge or evidence to the Director contrary to § 10.24 or paragraph (b) of § 10.131.
(17) Representing before the Office in a patent case either a joint venture comprising an inventor and an invention developer or an inventor referred to the registered practitioner by an invention developer when (i) the registered practitioner knows, or has been advised by the Office, that a formal complaint filed by a federal or state agency, based on any violation of any law relating to securities, unfair methods of competition, unfair or deceptive acts or practices, mail fraud, or other civil or criminal conduct, is pending before a federal or state court or federal or state agency, or has been resolved unfavorably by such court or agency, against the invention developer in connection with invention development services and (ii) the registered practitioner fails to fully advise the inventor of the existence of the pending complaint or unfavorable resolution thereof prior to undertaking or continuing representation of the joint venture or inventor. "Invention developer" means any person, and any agent, employee, officer, partner, or independent contractor thereof, who is not a registered practitioner and who advertises invention development services in media of general circulation or who enters into contracts for invention development services with customers as a result of such advertisement. "Invention development services" means acts of invention development required or promised to be performed, or actually performed, or both, by an invention developer for a customer. "Invention development" means the evaluation, perfection, marketing, brokering, or promotion of an invention on behalf of a customer by an invention developer, including a patent search, preparation of a patent application, or any other act done by an invention developer for consideration toward the end of procuring or attempting to procure a license, buyer, or patent for an invention. "Customer" means any individual who has made an invention and who enters into a contract for invention development services with an invention developer with respect to the invention by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention). "Contract for invention development services" means a contract for invention development services with an invention developer with respect to an invention made by a customer by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention).
(18) In the absence of information sufficient to establish a reasonable belief that fraud or inequitable conduct has occurred, alleging before a tribunal that anyone has committed a fraud on the Office or engaged in inequitable conduct in a proceeding before the Office.
(d) A practitioner who acts with reckless indifference to whether a representation is true or false is chargeable with knowledge of its falsity. Deceitful statements of half-truths or concealment of material facts shall be deemed actual fraud within the meaning of this part.

§ 10.24 Disclosure of information to authorities.

(a) A practitioner possessing unprivileged knowledge of a violation of a Disciplinary Rule shall report such knowledge to the Director.
(b) A practitioner possessing unprivileged knowledge or evidence concerning another practitioner, employee of the Office, or a judge shall reveal fully such knowledge or evidence upon proper request of a tribunal or other authority empowered

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to investigate or act upon the conduct of practitioners, employees of the Office, or judges.

(OMB Control No. 0651-0017)

§§ 10.25-10.29 [reserved]

§ 10.30 Canon 2.

A practitioner should assist the legal profesion in fulfilling its duty to make legal counsel available.

§ 10.31 Communications concerning a practitioner's services.

(a) No practitioner shall with respect to any prospective business before the Office, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any prospective applicant or other person having immediate or prospective business before the Office.

(b) A practitioner may not use the name of a Member of either House of Congress or of an individual in the service of the United States in advertising the practitioner's practice before the Office.

(c) Unless authorized under § 10.14(b), a non-lawyer practitioner shall not hold himself or herself out as authorized to practice before the Office in trademark cases.

(d) Unless a practitioner is an attorney, the practitioner shall not hold himself or herself out:

(1) to be an attorney or lawyer or

(2) as authorized to practice before the Office in non-patent and trademark cases.

§ 10.32 Advertising.

(a) Subject to § 10.31, a practitioner may advertise services through public media, including a telephone directory, legal directory, newspaper, or other periodical, radio, or television, or through written communications not involving solicitation as defined by § 10.33.

(b) A practitioner shall not give anything of value to a person for recommending the practitioner's services, except that a practitioner may pay the reasonable cost of advertising or written communication permitted by this section and may pay the usual charges of a not-for-profit lawyer referreal service or other legal service organization.

(c) Any communication made pursuant to this section shall include the name of at least one practitioner responsible for its content.

§ 10.33 Direct contact with prospective clients.

A practitioner may not solicit professional employment from a prospective client with whom the practitioner has no family or prior professional relationship, by mail, in-person or otherwise, when a significant motive for the practitioner's doing so is the practitioner's pecuniary gain under circumstances evidencing undue influence, intimidation, or overreaching. The term "solicit" includes contact in person, by telephone or telegraph, by letter or other writing, or by other communication directed to a specific recipient, but does not include letters addressed or advertising circulars distributed generally to persons not specifically known to need legal services of the kind provided by the practitioner in a particular matter, but who are so situated that they might in general find such services useful.

§ 10.34 Communication of fields of practice.

A registered practitioner may state or imply that the practitioner is a specialist as follows:

(a) A registered practitioner who is an attorney may use the designation "Patents," "Patent Attorney," "Patent Lawyer," "Registered Patent Attorney," or a substantially similar designation.

(b) A registered practitioner who is not an attorney may use the designation "Patents," "Patent Agent," "Registered Patent Agent," or a substantially similar designation, except that any practitioner who was registered prior to November 15, 1938, may refer to himself or herself as a "patent attorney."

§ 10.35 Firm names and letterheads.

(a) A practitioner shall not use a firm name, letterhead, or other professional designation that violates § 10.31. A trade name may be used by a practitioner in private practice if it does not imply a current connection with a government agency or with a public or charitable legal services organzation and is not otherwise in violation of § 10.31.

(b) Practitioners may state or imply that they practice in a partnership or other organization only when that is the fact.

§ 10.36 Fees for legal services.

(a) A practitioner shall not enter into an agreement for, charge, or collect an illegal or clearly excessive fee.

(b) A fee is clearly excessive when, after a review of the facts, a practitioner of ordinary prudence would be left with a definite and firm conviction that the fee is in excess of a reasonable fee. Factors to be considered as guides in determining the reasonableness of a fee include the following:

(1) The time and labor required, the novelty and difficulty of the questions involved, and the skill requisite to perform the legal service properly.

(2) The likelihood, if apparent to the client, that the acceptance of the particular employment will preclude other employment by the practitioner.

(3) The fee customarily charged for similar legal services.

(4) The amount involved and the results obtained.

(5) The time limitations imposed by the client or by the circumstances.

(6) The nature and length of the professional relationship with the client.

(7) The experience, reputation, and ability of the practitioner or practitioners performing the services.

(8) Whether the fee is fixed or contingent.

§ 10.37 Division of fees among practitioners.

(a) A practitioner shall not divide a fee for legal services with another practitioner who is not a partner in or associate of the practitioner's law firm or law office, unless:

(1) The client consents to employment of the other practitioner after a full disclosure that a division of fees will be made.

(2) The division is made in proportion to the services performed and responsibility assumed by each.

(3) The total fee of the practitioners does not clearly exceed reasonable compensation for all legal services rendered to the client.

(b) This section does not prohibit payment to a former partner or associate pursuant to a separation or retirement agreement.

§ 10.38 Agreements restricting the practice of a practitioner.

(a) A practitioner shall not be a party to or participate in a partnership or employment agreement with another practitioner that restricts the right of a practitioner to practice before the Office after the termination of a relationship created by the agreement, except as a condition to payment of retirement benefits.

(b) In connection with the settlement of a controversy or suit, a practitioner shall not enter into an agreement that restricts the practitioner's right to practice before the Office.

§ 10.39 Acceptance of employment.

A practitioner shall not accept employment on behalf of a person if the practitioner knows or it is obvious that such person wishes to:

(a) Bring a legal action, commence a proceeding before the Office, conduct a defense, assert a position in any proceeding pending before the Office, or otherwise have steps taken for the person, merely for the purpose of harassing or maliciously injuring any other person.

(b) Present a claim or defense in litigation or any proceeding before the Office that is not warranted under existing law, unless it can be supported by good faith argument for an extension, modification, or reversal of existing law.

§ 10.40 Withdrawal from employment.

(a) A practitioner shall not withdraw from employment in a proceeding before the Office without permission from the Office (see §§ 1.36, and 2.19 of this Subchapter). In any event, a practitioner shall not withdraw from employment until the practitioner has taken reasonable steps to avoid foreseeable prejudice to the rights of the client, including giving due notice to his or her client, allowing time for employment of another practitioner, delivering to the client all papers and property to which the client is entitled, and complying with applicable laws and rules. A practitioner who withdraws from employment shall refund promptly any part of a fee paid in advance that has not been earned.

(b) Mandatory withdrawal. A practitioner representing a client before the Office shall withdraw from employment if:

(1) the practitioner knows or it is obvious that the client is bringing a legal action, commencing a proceeding before the Office, conducting a defense, or asserting a position in litigation or any proceeding pending before the Office, or is otherwise having steps taken for the client, merely for the purpose of harassing or maliciously injuring any person;

(2) the practitioner knows or it is obvious that the practitioner's continued employment will result in violation of a Disciplinary Rule;

(3) the practitioner's mental or physical condition renders it unreasonably difficult for the practitioner to carry out the employment effectively; or

(4) the practitioner is discharged by the client.

(c) Permissive withdrawal. If paragraph (b) of this section is not applicable, a practitioner may not request permission to withdraw in matters pending before the Office unless such request or such withdrawal is because:

(1) the petitioner's client:

(i) insists upon presenting a claim or defense that is not warranted under existing law and cannot be supported by good faith argument for an extension, modification, or reversal of existing law;

(ii) personally seeks to pursue an illegal course of conduct;

(iii) insists that the practitioner pursue a course of conduct that is illegal or that is prohibited under a Disciplinary Rule;

(iv) by other conduct renders it unreasonably difficult for the practitioner to carry out the employment effectively;

(v) insists, in a matter not pending before a tribunal, that the practitioner engage in conduct that is contrary to the judgment and advice of the practitioner but not prohibited under the Disciplinary Rule; or

(vi) has failed to pay one or more bills rendered by the practitioner for an unreasonable period of time or has failed to honor an agreement to pay a retainer in advance of the performance of legal services.

(2) the practitioner's continued employment is likely to result in a violation of a Disciplinary Rule;

(3) the practitioner's inability to work with co-counsel indicates that the best interests of the client likely will be served by withdrawal;

(4) the practitioner's mental or physical condition renders it difficult for the practitioner to carry out the employment effectively;

(5) the practitioner's client knowingly and freely assents to termination of the employment; or

(6) the practitioner believes in good faith, in a proceeding pending before the Office, that the Office will find the existence of other good cause for withdrawal.

§§ 10.41-10.45 [reserved]

§ 10.46 Canon 3.

A practitioner should assist in preventing the unauthorized practice of law.

§ 10.47 Aiding unauthorized practice of law.

(a) A practitioner shall not aid a non-practitioner in the unauthorized practice of law before the Office.

(b) A practitioner shall not aid a suspended or excluded practitioner in the practice of law before the Office.

(c) A practitioner shall not aid a non-lawyer in the unauthorized practice of law.

§ 10.48 Sharing legal fees.

A practitioner or a firm of practitioners shall not share legal fees with a non-practitioner except that:

(a) An agreement by a practitioner with the practitioner's firm, partner, or associate may provide for the payment of money, over a reasonable period of time after the practitioner's death, to the practitioner's estate or to one or more specified persons.

(b) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the deceased practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.

(c) A practitioner or firm of practitioners may include non-practitioner employees in a compensation or retirement plan, even though the plan is based in whole or in part on a profit-sharing arrangement, providing such plan does not circumvent another Disciplinary Rule.

§ 10.49 Forming a partnership with a non-practitioner.

A practitioner shall not form a partnership with a non-practitioner if any of the activities of the partnership consist of the practice of patent, trademark, or other law before the Office.

§§ 10.50-10.55 [reserved]

§ 10.56 Canon 4.

A practitioner should preserve the confidences and secrets of a client.

§ 10.57 Preservation of confidences and secrets of a client.

(a) "Confidence" refers to information protected by the attorney-client or agent-client privilege under applicable law. "Secret" refers to other information gained in the professional relationship that the client has requested be held inviolate or the disclosure of which would be embarrassing or would be likely to be detrimental to the client.

(b) Except when permitted under paragraph (c) of this section, a practitioner shall not knowingly:

(1) Reveal a confidence or secret of a client.

(2) Use a confidence or secret of a client to the disadvantage of the client.

(3) Use a confidence or secret of a client for the advantage of the practitioner or of a third person, unless the client consents after full disclosure.

(c) A practitioner may reveal:

(1) Confidences or secrets with the consent of the client affected but only after a full disclosure to the client.

(2) Confidences or secrets when permitted under Disciplinary Rules or required by law or court order.

(3) The intention of a client to commit a crime and the information necessary to prevent the crime.

(4) Confidences or secrets necessary to establish or collect the practitioner's fee or to defend the practitioner or the practitioner's employees or associates against an accusation of wrongful conduct.

(d) A practitioner shall exercise reasonable care to prevent the practitioner's employees, associates, and others whose services are utilized by the practitioner from disclosing or using confidences or secrets of a client, except that a practitioner may reveal the information allowed by parargraph (c) of this section through an employee.

§§ 10.58-10.60 [reserved]

§ 10.61 Canon 5.

A practitioner should exercise independent professional judgment on behalf of a client.

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§ 10.62 Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment.

(a) Except with the consent of a client after full disclosure, a practitioner shall not accept employment if the exercise of the practitioner's professional judgment on behalf of the client will be or reasonably may be affected by the practitioner's own financial, business, property, or personal interests.

(b) A practitioner shall not accept employment in a proceeding before the Office if the practitioner knows or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness, except that the practitioner may undertake the employment and the practitioner or another practitioner in the practitioner's firm may testify:

(1) If the testimony will relate solely to an uncontested matter.

(2) If the testimony will relate solely to a matter of formality and there is no reason to believe that substantial evidence will be offered in opposition to the testimony.

(3) If the testimony will relate solely to the nature and value of legal services rendered in the case by the practitioner or the practitioner's firm to the client.

(4) As to any matter, if refusal would work a substantial hardship on the client because of the distinctive value of the practitioner or the practitioner's firm as counsel in the particular case.

§ 10.63 Withdrawal when the practitioner becomes a witness.

(a) If, after undertaking employment in a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness on behalf of a practitioner's client, the practitioner shall withdraw from the conduct of the proceeding and the practitioner's firm, if any, shall not continue representation in the proceeding, except that the practitioner may continue the representation and the practitioner or another practitioner in the practitioner's firm may testify in the circumstances enumerated in paragraphs (1) through (4) of § 10.62(b).

(b) If, after undertaking employment in a proceeding before the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm may be asked to sign an affidavit to be filed in the Office or be called as a witness other than on behalf of the practitioner's client, the practitioner may continue the representation until it is apparent that the practitioner's affidavit or testimony is or may be prejudicial to the practitioner's client.

§ 10.64 Avoiding acquisition of interest in litigation or proceeding before the Office.

(a) A practitioner shall not acquire a proprietary interest in the subject matter of a proceeding before the Office which the practitioner is conducting for a client, except that the practitioner may:

(1) Acquire a lien granted by law to secure the practitioner's fee or expenses; or

(2) Contract with a client for a reasonable contingent fee; or

(3) In a patent case, take an interest in the patent as part or all of his or her fee.

(b) While representing a client in connection with a contemplated or pending proceeding before the Office, a practitioner shall not advance or guarantee financial assistance to a client, except that a practitioner may advance or guarantee the expenses of going forward in a proceeding before the Office including fees required by law to be paid to the Office, expenses of investigation, expenses of medical examination, and costs of obtaining and presenting evidence, provided the client remains ultimately liable for such expenses. A practitioner may, however, advance any fee required to prevent or remedy an abandonment of a client's application by reason of an act or omission attributable to the practitioner and not to the client, whether or not the client is ultimately liable for such fee.

§ 10.65 Limiting business relations with a client.

A practitioner shall not enter into a business transaction with a client if they have differing interests therein and if the client expects the practitioner to exercise professional judgment therein for the protection of the client, unless the client has consented after full disclosure.

§ 10.66 Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner.

(a) A practitioner shall decline proffered employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the acceptance of the proffered employment, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(b) A practitioner shall not continue multiple employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the practitioner's representation of another client, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(c) In the situations covered by paragraphs (a) and (b) of this section a practitioner may represent multiple clients if it is obvious that the practitioner can adequately represent the interest of each and if each consents to the representation after full disclosure of the possible effect of such representation on the exercise of the practitioner's independent professional judgment on behalf of each.

(d) If a practitioner is required to decline employment or to withdraw from employment under a Disciplinary Rule, no partner, or associate, or any other practitioner affiliated with the practitioner or the practitioner's firm, may accept or continue such employment unless otherwise ordered by the Director or Commissioner.

§ 10.67 Settling similar claims of clients.

A practitioner who represents two or more clients shall not make or participate in the making of an aggregate settlement of the claims of or against the practitioner's clients, unless each client has consented to the settlement after being advised of the existence and nature of all the claims involved in the proposed settlement, of the total amount of the settlement, and of the participation of each person in the settlement.

§ 10.68 Avoiding influence by others than the client.

(a) Except with the consent of the practitioner's client after full disclosure, a practitioner shall not:

(1) Accept compensation from one other than the practitioner's client for the practitioner's legal services to or for the client.

(2) Accept from one other than the practitioner's client any thing of value related to the practitioner's representation of or the practitioner's employment by the client.

(b) A practitioner shall not permit a person who recommends, employs, or pays the practitioner to render legal services for another, to direct or regulate the practitioner's professional judgment in rendering such legal services.

(c) A practitioner shall not practice with or in the form of a professional corporation or association authorized to practice law for a profit, if a non-practioner has the right to direct or control the professional judgment of a practitioner.

§§ 10.69-10.75 [reserved]

§ 10.76 Canon 6.

A practitioner should represent a client competently.

§ 10.77 Failing to act competently.

A practitioner shall not:

(a) Handle a legal matter which the practitioner knows or should know that the practitioner is not competent to handle, without associating with the practitioner another practitioner who is competent to handle it.

(b) Handle a legal matter without preparation adequate in the circumstances.

(c) Neglect a legal matter entrusted to the practitioner.

§ 10.78 Limiting liability to client.

A practitioner shall not attempt to exonerate himself or herself from, or limit his or her liability to, a client for his or her personal malpractice.

§§ 10.79-10.82 [reserved]

§ 10.83 Canon 7.

A practitioner should represent a client zealously within the bounds of the law.

§ 10.84 Representing a client zealously.

(a) A practitioner shall not intentionally:

(1) Fail to seek the lawful objectives of a client through reasonably available means permitted by law and the Disciplinary Rules, except as provided by paragraph (b) of this section. A practitioner does not violate the provisions of this section, however, by acceding to reasonable requests of opposing counsel which do not prejudice the rights of the client, by being punctual in fulfilling all professional commitments, by avoiding offensive tactics, or by treating with courtesy and consideration all persons involved in the legal process.

(2) Fail to carry out a contract of employment entered into with a client for professional services, but a practitioner may withdraw as permitted under §§ 10.40, 10.63, and 10.66.

(3) Prejudice or damage a client during the course of a professional relationship, except as required under this part.

(b) In representation of a client, a practitioner may:

(1) Where permissible, exercise professional judgment to waive or fail to assert a right or position of the client.

(2) Refuse to aid or participate in conduct that the practitioner believes to be unlawful, even though there is some support for an argument that the conduct is legal.

§ 10.85 Representing a client within the bounds of the law.

(a) In representation of a client, a practitioner shall not:

(1) Initiate or defend any proceeding before the Office, assert a position, conduct a defense, delay a trial or proceeding before the Office, or take other action on behalf of the practitioner's client when the practitioner knows or when it is obvious that such action would serve merely to harass or maliciously injure another.

(2) Knowingly advance a claim or defense that is unwarranted under existing law, except that a practitioner may advance such claim or defense if it can be supported by good faith argument for an extension, modification, or reversal of existing law.

(3) Conceal or knowingly fail to disclose that which the practitioner is required by law to reveal.

(4) Knowingly use perjured testimony or false evidence.

(5) Knowingly make a false statement of law or fact.

(6) Participate in the creation or preservation of evidence when the practitioner knows or it is obvious that the evidence is false.

(7) Counsel or assist a client in conduct that the practitioner knows to be illegal or fraudulent.

(8) Knowingly engage in other illegal conduct or conduct contrary to a Disciplinary Rule.

(b) A practitioner who receives information clearly establishing that:

(1) A client has, in the course of the representation, perpetrated a fraud upon a person or tribunal shall promptly call upon the client to rectify the same, and if the client refuses or is unable to do so the practitioner shall reveal the fraud to the affected person or tribunal.

(2) A person other than a client has perpetrated a fraud upon a tribunal shall promptly reveal the fraud to the tribunal.

§ 10.86 [reserved]

§ 10.87 Communicating with one of adverse interest.

During the course of representation of a client, a practitioner shall not:

(a) Communicate or cause another to communicate on the subject of the representation with a party the practitioner knows to be represented by another practitioner in that matter unless the practitioner has the prior consent of the other practitioner representing such other party or is authorized by law to do so. It is not improper, however, for a practitioner to encourage a client to meet with an opposing party for settlement discussions.

(b) Give advice to a person who is not represented by a practitioner other than the advice to secure counsel, if the interests of such person are or have a reasonable possibility of being in conflict with the interests of the practitioner's client.

§ 10.88 Threatening criminal prosecution.

A practitioner shall not present, participate in presenting, or threaten to present criminal charges solely to obtain an advantage in any prospective or pending proceeding before the Office.

§ 10.89 Conduct in proceedings.

(a) A practitioner shall not disregard or advise a client to disregard any provision of this Subchapter or a decision of the Office made in the course of a proceeding before the Office, but the practitioner may take appropriate steps in good faith to test the validity of such provision or decision.

(b) In presenting a matter to the Office, a practitioner shall disclose:

(1) Controlling legal authority known to the practitioner to be directly adverse to the position of the client and which is not disclosed by opposing counsel or an employee of the Office.

(2) Unless privileged or irrelevant, the identities of the client the practitioner represents and of the persons who employed the practitioner.

(c) In appearing in a professional capacity before a tribunal, a practitioner shall not:

(1) State or allude to any matter that the practitioner has no reasonable basis to believe is relevant to the case or that will not be supported by admissible evidence.

(2) Ask any question that the practitioner has no reasonable basis to believe is relevant to the case and that is intended to degrade a witness or other person.

(3) Assert the practitioner's personal knowledge of the facts in issue, except when testifying as a witness.

(4) Assert the practitioner's personal opinion as to the justness of a cause, as to the credibility of a witness, as to the culpability of a civil litigant, or as to the guilt or innocence of an accused; but the practitioner may argue, on the practitioner's analysis of the evidence, for any position or conclusion with respect to the matters stated herein.

(5) Engage in undignified or discourteous conduct before the Office (see § 1.3 of the Subchapter).

(6) Intentionally or habitually violate any provision of this Subchapter or established rule of evidence.

§ 10.90-10.91 [reserved]

§ 10.92 Contact with witnesses.

(a) A practitioner shall not suppress any evidence that the practitioner or the practitioner's client has a legal obligation to reveal or produce.

(b) A practitioner shall not advise or cause a person to be secreted or to leave the jurisdiction of a tribunal for the purpose of making the person unavailable as a witness therein.

(c) A practitioner shall not pay, offer to pay, or acquiesce in the payment of compensation to a witness contingent upon the content of the witness' affidavit, testimony or the outcome of the case. But a practitioner may advance, guarantee, or acquiesce in the payment of:

(1) Expenses reasonably incurred by a witness in attending, testifying, or making an affidavit.

(2) Reasonable compensation to a witness for the witness' loss of time in attending, testifying, or making an affidavit.

(3) A reasonable fee for the professional services of an expert witness.

§ 10.93 Contact with officials.

(a) A practitioner shall not give or lend anything of value to a judge, official, or employee of a tribunal under circumstances which might give the appearance that the gift or loan is made to influence official action.

(b) In an adversary proceeding, including any *inter partes* proceeding before the Office, a practitioner shall not communicate, or cause another to communicate, as to the merits of the cause with a judge, official, or Office employee before whom the proceeding is pending, except:

(1) In the course of official proceedings in the cause.

(2) In writing if the practitioner promptly delivers a copy of the writing to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.

(3) Orally upon adequate notice to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.

(4) As otherwise authorized by law.

§§ 10.94-10.99 [reserved]

§ 10.100 Canon 8.

A practitioner should assist in improving the legal system.

§ 10.101 Action as a public official.

(a) A practitioner who holds public office shall not:

(1) Use the practitioner's public position to obtain, or attempt to obtain, a special advantage in legislative matters for the practitioner or for a client under circumstances where the practitioner knows or it is obvious that such action is not in the public interest.

(2) Use the practitioner's public position to influence, or attempt to influence, a tribunal to act in favor of the practitioner or of a client.

(3) Accept any thing of value from any person when the practitioner knows or it is obvious that the offer is for the purpose of influencing the practitioner's action as a public official.

(b) A practitioner who is an officer or employee of the United States shall not practice before the Office in patent cases except as provided in § 10.6(d).

§ 10.102 Statements concerning officials.

(a) A practitioner shall not knowingly make false statements of fact concerning the qualifications of a candidate for election or appointment to a judicial office or to a position in the Office.

(b) A practitioner shall not knowingly make false accusations against a judge, other adjudicatory officer, or employee of the Office.

§ 10.103 Practitioner candidate for judicial office.

A practitioner who is a candidate for judicial office shall comply with applicable provisions of law.

§ 10.104-10.109 [reserved]

§ 10.110 Canon 9.

A practitioner should avoid even the appearance of professional impropriety.

§ 10.111 Avoiding even the appearance of impropriety.

(a) A practitioner shall not accept private employment in a matter upon the merits of which he or she has acted in a judicial capacity.

(b) A practitioner shall not accept private employment in a matter in which he or she had personal responsibility while a public employee.

(c) A practitioner shall not state or imply that the practitioner is able to influence improperly or upon irrelevant grounds any tribunal, legislative body, or public official.

§ 10.112 Preserving identity of funds and property of client.

(a) All funds of clients paid to a practitioner or a practitioner's firm, other than advances for costs and expenses, shall be deposited in one or more identifiable bank accounts maintained in the United States or, in the case of a practitioner having an office in a foreign country or registered under § 10.6(c), in the United States or the foreign country.

(b) No funds belonging to the practitioner or the practitioner's firm shall be deposited in the bank accounts required by paragraph (a) of this section except as follows:

(1) Funds reasonably sufficient to pay bank charges may be deposited therein.

(2) Funds belonging in part to a client and in part presently or potentially to the practitioner or the practitioner's firm must be deposited therein, but the portion belonging to the practitioner or the practitioner's firm may be withdrawn when due unless the right of the practitioner or the practitioner's firm to receive it is disputed by the client, in which event the disputed portion shall not be withdrawn until the dispute is finally resolved.

(c) A practitioner shall:

(1) Promptly notify a client of the receipt of the client's funds, securities, or other properties.

(2) Identify and label securities and properties of a client promptly upon receipt and place them in a safe deposit box or other place of safekeeping as soon as practicable.

(3) Maintain complete records of all funds, securities, and other properties of a client coming into the possession of the practitioner and render appropriate accounts to the client regarding the funds, securities, or other properties.

(4) Promptly pay or deliver to the client as requested by a client the funds, securities, or other properties in the possession of the practitioner which the client is entitled to receive.

(OMB Control No. 0651-0017)

§ 10.113-10.129 [reserved]

Investigations and Disciplinary Proceedings

§ 10.130 Reprimand, suspension or exclusion.

(a) The Commissioner may, after notice and opportunity for a hearing, (a) reprimand or (b) suspend or exclude, either generally or in any particular case, any individual, attorney, or agent shown to be incompetent or disreputable, who is guilty of gross misconduct, or who violates a Disciplinary Rule.

(b) Petitions to disqualify a practitioner in *ex parte* or *inter partes* cases in the Office are not governed by §§ 10.130 through 10.170 and will be handled on a case-by-case basis under such conditions as the Commissioner deems appropriate.

§ 10.131 Investigations.

(a) The Director is authorized to investigate possible violations of Disciplinary Rules by practitioners. See § 10.2(b) (2).

(b) Practitioners shall report and reveal to the Director any knowledge or evidence required by § 10.24. A practitioner shall cooperate with the Director in connection with any investigation under paragraph (a) of this section and with officials of the Office in connection with any disciplinary proceeding instituted under § 10.132(b).

(c) Any non-practitioner possessing knowledge or information concerning a violation of a Disciplinary Rule by a practitioner may report the violation to the Director. The Director may require that the report be presented in the form of an affidavit.

§ 10.132 Initiating a disciplinary proceeding; reference to an administrative law judge.

(a) If after conducting an investigation under § 10.131(a) the Director is of the opinion that a practitioner has violated a Disciplinary Rule, the Director shall after complying where necessary with the provisions of 5 U.S.C. 558(c), call a meeting of the Committee on Discipline. The Committee on Discipline shall then determine as specified in § 10.4(b) whether a disciplinary proceeding shall be instituted under paragraph (b) of this section.

(b) If the Committee on Discipline determines that probable cause exists to believe that a practitioner has violated a Disciplinary Rule, the Director shall institute a disciplinary proceeding by filing a complaint under § 10.134. The complaint shall be filed in the Office of the Director. A disciplinary proceeding may result in:

(1) a reprimand or

(2) suspension or exclusion of a practitioner from practice before the Office.

(c) Upon the filing of a complaint under {g49 10.134, the Commissioner will refer the disciplinary proceeding to an administrative law judge.

§ 10.133 Conference between Director and practitioner; resignation.

(a) *General.* The Director may confer with a practitioner concerning possible violations by the practitioner of a Disciplinary Rule whether or not a disciplinary proceeding has been instituted.

(b) *Resignation.* Any practitioner who is the subject of an investigation under § 10.131 or against whom a complaint has been filed under § 10.134 may resign from practice before the Office only by submitting with the Director an affidavit stating his or her desire to resign.

(c) If filed prior to the date set by the administrative law judge for a hearing, the affidavit shall state that:

(1) the resignation is freely and voluntarily proferred;

(2) the practitioner is not acting under duress or coersion from the Office;

(3) the practitioner is fully aware of the implications of filing the resignation;

(4) the practitioner is aware (i) of a pending investigation or (ii) of charges arising from the complaint alleging that he or she is guilty of a violation of the Patent and Trademark Office Code of Professional Responsibility, the nature of which shall be set forth by the practitioner to the satisfaction of the Director;

(5) the practitioner acknowledges that, if and when he or she applies for reinstatement under § 10.160, the Director will conclusively presume, for the limited purpose of determining the application for reinstatement, that:

(i) the facts upon which the complaint is based are true and

(ii) the practitioner could not have successfully defended himself or herself against (A) charges predicated on the violation under investigation or (B) charges set out in the complaint filed against the practitioner.

(d) If filed on or after the date set by the administrative law judge for a hearing, the affidavit shall make the statements required by subparagraphs (1) through (4) of paragraph (b) of this section and shall state that:

(1) the practitioner acknowledges the facts upon which the complaint is based are true; and

(2) the resignation is being submitted because the practitioner could not successfully defend himself or herself against (i) charges predicated on the violation under investigation or (ii) charges set out in the complaint.

(e) When an affidavit under paragraph (b) or (c) of this section is received while an investigation is pending, the Commissioner shall enter an order excluding the practitioner "on consent." When an affidavit under paragraphs (b) or (c) of this section is received after a complaint under § 10.134 has been filed, the Director shall notify the administrative law judge. The administrative law judge shall enter an order transferring the disciplinary proceeding to the Commissioner and the Commissioner shall enter an order excluding the practitioner "on consent."

(f) Any practitioner who resigns from practice before the Office under this section and who intends to reapply for admission to practice before the Office must comply with the provisions of § 10.158.

(g) Settlement. Before or after a complaint is filed under § 10.134, a settlement conference may occur between the Director and a practitioner for the purpose of settling any disciplinary matter. If an offer of settlement is made by the Director or the practitioner and is not accepted by the other, no reference to the offer of settlement or its refusal shall be admissible in evidence in the disciplinary proceeding unless both the Director and the practitioner agree in writing.

§ 10.134 Complaint.

(a) A complaint instituting a disciplinary proceeding shall:

(1) Name the practitioner, who may then be referred to as the "respondent."

(2) Give a plain and concise description of the alleged violations of the Disciplinary Rules by the practitioner.

(3) State the place and time for filing an answer by the respondent.

(4) State that a decision by default may be entered against the respondent if an answer is not timely filed.

(5) Be signed by the Director.

(b) A complaint will be deemed sufficient if it fairly informs the respondent of any violation of the Disciplinary Rules which form the basis for the disciplinary proceeding so that the respondent is able to adequately prepare a defense.

§ 10.135 Service of complaint.

(a) A complaint may be served on a respondent in any of the following methods:

(1) By handing a copy of the complaint personally to the respondent, in which case the individual handing the complaint to the respondent shall file an affidavit with the Director indicating the time and place the complaint was handed to the respondent.

(2) By mailing a copy of the complaint by "Express Mail" or first-class mail to:

(i) a registered practitioner at the address for which separate notice was last received by the Director or

(ii) a non-registered practitioner at the last address for the respondent known to the Director.

(3) By any method mutually agreeable to the Director and the respondent.

(b) If a complaint served by mail under paragraph (a) (2) of this section is returned by the U.S. Postal Service, the Director shall mail a second copy of the complaint to the respondent. If the second copy of the complaint is also returned by the U.S. Postal Service, the Director shall serve the respondent by publishing an appropriate notice in the *Official Gazette* for four consecutive weeks, in which case the time for answer shall be at least thirty days from the fourth publication of the notice.

(c) If a respondent is a registered practitioner, the Director may serve simultaneously with the complaint a letter under § 10.11(b). The Director may require the respondent to answer the § 10.11(b) letter within a period of not less than 15 days.

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An answer to the § 10.11(b) letter shall constitute proof of service. If the respondent fails to answer the § 10.11(b) letter, his or her name will be removed from the register as provided by § 10.11(b).

(d) If the respondent is represented by an attorney under § 10.140(a), a copy of the complaint shall also be served on the attorney.

§ 10.136 Answer to complaint.

(a) *Time for answer.* An answer to a complaint shall be filed within a time set in the complaint which shall be not less than thirty days.

(b) *With whom filed.* The answer shall be filed in writing with the administrative law judge. The time for filing an answer may be extended once for a period of no more than thirty days by the administrative law judge upon a showing of good cause provided a motion requesting an extension of time is filed within thirty days after the date the complaint is filed by the Director. A copy of the answer shall be served on the Director.

(c) *Content.* The respondent shall include in the answer a statement of the facts which constitute the grounds of defense and shall specifically admit or deny each allegation set forth in the complaint. The respondent shall not deny a material allegation in the complaint which the respondent knows to be true or state that respondent is without sufficient information to form a belief as to the truth of an allegation when in fact the respondent possesses that information. The respondent shall also state affirmatively special matters of defense.

(d) *Failure to deny allegations in complaint.* Every allegation in the complaint which is not denied by a respondent in the answer is deemed to be admitted and may be considered proven. No further evidence in respect of that allegation need be received by the administrative law judge at any hearing. Failure to timely file an answer will constitute an admission of the allegations in the complaint.

(e) *Reply by Director.* No reply to an answer is required by the Director and any affirmative defense in the answer shall be deemed to be denied. The Director may, however, file a reply if he or she chooses or if ordered by the adminstrative law judge.

§ 10.137 Supplemental complaint.

False statements in an answer may be made the basis of a supplemental complaint.

§ 10.138 Contested case.

Upon the filing of an answer by the respondent, a disciplinary proceeding shall be regarded as a contested case within the meaning of 35 U.S.C. 24. Evidence obtained by a subpoena issued under 35 U.S.C. 24 shall not be admitted into the record or considered unless leave to proceed under 35 U.S.C. 24 was previously authorized by the administrative law judge.

§ 10.139 Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays.

(a) *Appointment.* An administrative law judge, appointed under 5 U.S.C. 3105, shall conduct disciplinary proceedings as provided by this part.

(b) *Responsibilities.* The administrative law judge shall have authority to:

(1) Administer oaths and affirmations;
(2) Make rulings upon motions and other requests;
(3) Rule upon offers of proof, receive relevant evidence, and examine witnesses;
(4) Authorize the taking of a deposition of a witness in lieu of personal appearance of the witness before the administrative law judge;
(5) Determine the time and place of any hearing and regulate its course and conduct;
(6) Hold or provide for the holding of conferences to settle or simplify the issues;
(7) Receive and consider oral or written arguments on facts or law;
(8) Adopt procedures and modify procedures from time to time as occasion requires for the orderly disposition of proceedings;
(9) Make initial decisions under § 10.154; and
(10) Perform acts and take measures as necessary to promote the efficient and timely conduct of any disciplinary proceeding.

(c) *Time for making initial decision.* The administrative law judge shall set times and exercise control over a disciplinary proceeding such that an initial decision under § 10.154 is normally issued within six months of the date a complaint is filed. The administrative law judge may, however, issue an initial decision more than six months after a complaint is filed if in his or her opinion there exist unusual circumstances which preclude issuance of an initial decision within six months of the filing of the complaint.

(d) *Review of interlocutory orders.* An interlocutory order of an administrative law judge will not be reviewed by the Commissioner except:

(1) when the administrative law judge shall be of the opinion (i) that the interlocutory order involves a controlling question of procedure or law as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision by the Commissioner may materially advance the ultimate termination of the disciplinary proceeding or
(2) in an extraordinary situation where justice requires review.

(e) *Stays pending review of interlocutory order.* If the Director or a respondent seeks review of an interlocutory order of an administrative law judge under paragraph (b)(2) of this section, any time period set for taking action by the administrative law judge shall not be stayed unless ordered by the Commissioner or the administrative law judge.

§ 10.140 Representative for Director or respondent.

(a) A respondent may be represented before the Office in connection with an investigation or disciplinary proceeding by an attorney. The attorney shall file a written declaration that he or she is an attorney within the meaning of § 10.1(c) and shall state:

(1) the address to which the attorney wants correspondence related to the investigation or disciplinary proceeding sent and
(2) a telephone number where the attorney may be reached during normal business hours.

(b) The Commissioner shall designate at least two associate solicitors in the Office of the Solicitor to act as representatives for the Director in disciplinary proceedings. In prosecuting disciplinary proceedings, the designated associate solicitors shall not involve the Solicitor or the Deputy Solicitor. The Solicitor and the Deputy Solicitor shall remain insulated from the investigation and prosecution of all disciplinary proceedings in order that they shall be available as counsel to the Commissioner in deciding disciplinary proceedings.

§ 10.141 Filing of papers.

(a) The provisions of § 1.8 of this Subchapter do not apply to disciplinary proceedings.

(b) All papers filed after the complaint and prior to entry of an initial decision by the administrative law judge shall be filed with the administrative law judge at an address or place designated by the administrative law judge. All papers filed after entry of an initial decision by the administrative law judge shall be filed with the Director. The Director shall promptly forward to the Commissioner any paper which requires action under this part by the Commissioner.

(c) The administrative law judge or the Director may provide for filing papers and other matter by hand or by "Express Mail."

§ 10.142 Service of papers.

(a) All papers other than a complaint shall be served on a respondent represented by an attorney by:

(1) delivering a copy of the paper to the office of the attorney; or

(2) mailing a copy of the paper by first-class mail or "Express Mail" to the attorney at the address provided by the attorney under § 10.140(a) (1); or
(3) any other method mutually agreeable to the attorney and a representative for the Director.

(b) All papers other than a complaint shall be served on a respondent who is not represented by an attorney by:

(1) delivering a copy of the paper to the respondent; or
(2) mailing a copy of the paper by first-class mail or "Express Mail" to the respondent at the address to which a complaint may be served or such other address as may be designated in writing by the respondent; or
(3) any other method mutually agreeable to the respondent and a representative of the Director.

(c) A respondent shall serve on the representative for the Director one copy of each paper filed with the administrative law judge or the Director. A paper may be served on the representative for the Director by:

(1) delivering a copy of the paper to the representative; or
(2) mailing a copy of the paper by first-class mail or "Express Mail" to an address designated in writing by the representative; or
(3) any other method mutually agreeable to the respondent and the representative.

(d) Each paper filed in a disciplinary proceeding shall contain therein a certificate of service indicating:

(1) the date on which service was made and
(2) the method by which service was made.

(e) The administrative law judge or the Commissioner may require that a paper be served by hand or by "Express Mail."

(f) Service by mail is completed when the paper mailed in the United States is placed into the custody of the U.S. Postal Service.

§ 10.143 Motions.

Motions may be filed with the administrative law judge. The adminstrative law judge will determine on a case-by-case basis the time period for response to a motion and whether replies to responses will be authorized. No motion shall be filed with the administrative law judge unless such motion is supported by a written statement by the moving party that the moving party or attorney for the moving party has conferred with the opposing party or attorney for the opposing party in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by a motion are resolved by the parties prior to a decision on the motion by the administrative law judge, the parties shall promptly notify the administrative law judge.

§ 10.144 Hearings.

(a) The administrative law judge shall preside at hearings in disciplinary proceedings. Hearings will be stenographically recorded and transcribed and the testimony of witnesses will be received under oath or affirmation. The administrative law judge shall conduct hearings in accordance with 5 U.S.C. 556. A copy of the transcript of the hearing shall become part of the record. A copy of the transcript shall be provided to the Director and the respondent at the expense of the Office.

(b) If the respondent to a disciplinary proceeding fails to appear at the hearing after a notice of hearing has been given by the administrative law judge, the administrative law judge may deem the respondent to have waived the right to a hearing and may proceed with the hearing in the absence of the respondent.

(c) A hearing under this section will not be open to the public except that the Director may grant a request by a respondent to open his or her hearing to the public and make the record of the disciplinary proceeding available for public inspection, *provided* agreement is reached in advance to exclude from public disclosure information which is privileged or confidential under applicable laws or regulations. If a disciplinary proceeding results in disciplinary action against a practitioner, and subject to § 10.159(c), the record of the entire disciplinary proceeding, including any settlement agreement, will be available for public inspection.

§ 10.145 Proof; variance; amendment of pleadings.

In case of a variance between the evidence and the allegations in a complaint, answer, or reply, if any, the administrative law judge may order or authorize amendment of the complaint, answer, or reply to conform to the evidence. Any party who would otherwise be prejudiced by the amendment will be given reasonable opportunity to meet the allegations in the complaint, answer, or reply, as amended, and the administrative law judge shall make findings on any issue presented by the complaint, answer, or reply as amended.

§§ 10.146-10.148 [reserved]

§ 10.149 Burden of proof.

In a disciplinary proceeding, the Director shall have the burden of proving his or her case by clear and convincing evidence and a respondent shall have the burden of providing any affirmative defense by clear and convincing evidence.

§ 10.150 Evidence.

(a) *Rules of evidence.* The rules of evidence prevailing in courts of law and equity are not controlling in hearings in disciplinary proceedings. However, the administrative law judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.

(b) *Depositions.* Depositions of witnesses taken pursuant to § 10.151 may be admitted as evidence.

(c) *Government documents.* Official documents, records, and papers of the Office are admissible without extrinsic evidence of authenticity. These documents, records and papers may be evidenced by a copy certified as correct by an employee of the Office.

(d) *Exhibits.* If any document, record, or other paper is introduced in evidence as an exhibit, the administrative law judge may authorize the withdrawal of the exhibit subject to any conditions the administrative law judge deems appropriate.

(e) *Objections.* Objections to evidence will be in short form, stating the grounds of objection. Objections and rulings on objections will be a part of the record. No exception to the ruling is necessary to preserve the rights of the parties.

§ 10.151 Depositions.

(a) Depositions for use at the hearing in lieu of personal appearance of a witness before the administrative law judge may be taken by respondent or the Director upon a showing of good cause and with the approval of, and under such conditions as may be deemed appropriate by, the administrative law judge. Depositions may be taken upon oral or written questions, upon not less than ten days written notice to the other party, before any officer authorized to administer an oath or affirmation in the place where the deposition is to be taken. The requirement of ten days notice may be waived by the parties and depositions may then be taken of a witness and at a time and place mutually agreed to by the parties. When a deposition is taken upon written questions, copies of the written questions will be served upon the other party with the notice and copies of any written cross-questions will be served by hand or "Express Mail" not less then five days before the date of the taking of the deposition unless the parties mutually agree otherwise. A party on whose behalf a deposition is taken shall file a copy of a transcript of the deposition signed by a court reporter with the administrative law judge and shall serve one copy upon the opposing party. Expenses for a court reporter and preparing, serving, and filing depositions shall be borne by the party at whose instance the deposition is taken.

(b) When the Director and the respondent agree in writing, a deposition of any witness who will appear voluntarily may be taken under such terms and conditions as may be mutually

agreeable to the Director and the respondent. The deposition shall not be filed with the administrative law judge and may not be admitted in evidence before the administrative law judge unless he or she orders the deposition admitted in evidence. The admissibility of the deposition shall lie within the discretion of the administrative law judge who may reject the deposition on any reasonable basis including the fact that demeanor is involved and that the witness should have been called to appear personally before the administrative law judge.

§ 10.152 Discovery.

Discovery shall not be authorized except as follows:

(a) After an answer is filed under § 10.136 and when a party establishes in a clear and convincing manner that discovery is necessary and relevant, the administrative law judge, under such conditions as he or she deems appropriate, may order an opposing party to:

(1) answer a reasonable number of written requests for admission or interrogatories;

(2) produce for inspection and copying a reasonable number of documents; and

(3) produce for inspection a reasonable number of things other than documents.

(b) Discovery shall not be authorized under paragraph (a) of this section of any matter which:

(1) will be used by another party solely for impeachment or cross-examination;

(2) is not available to the party under 35 U.S.C. § 122;

(3) relates to any disciplinary proceeding commenced in the Patent and Trademark Office prior to Mar. 8, 1985;

(4) relates to experts except as the administrative law judge may require under paragraph (e) of this section.

(5) is privileged; or

(6) relates to mental impressions, conclusions, opinions, or legal theories of any attorney or other representative of a party.

(c) the administrative law judge may deny discovery requested under paragraph (a) of this section if the discovery sought:

(1) will unduly delay the disciplinary proceeding;

(2) will place an undue burden on the party required to produce the discovery sought; or

(3) is available (i) generally to the public, (ii) equally to the parties; or (iii) to the party seeking the discovery through another source.

(d) Prior to authorizing discovery under paragraph (a) of this section, the administrative law judge shall require the party seeking discovery to file a motion (§ 10.143) and explain in detail for each request made how the discovery sought is necessary and relevant to an issue actually raised in the complaint or the answer.

(e) The administrative law judge may require parties to file and serve, prior to any hearing, a pre-hearing statement which contains

(1) A list (together with a copy) of all proposed exhibits to be used in connection with a party's case-in-chief,

(2) a list of proposed witnesses,

(3) as to each proposed expert witness:

(i) an identification of the field in which the individual will be qualified as an expert;

(ii) a statement as to the subject matter on which the expert is expected to testify; and

(iii) a statement of the substance of the facts and opinions to which the expert is expected to tesify,

(4) the identity of government employees who have investigated the case, and

(5) copies of memoranda reflecting respondent's own statements to administrative representatives.

(f) After a witness testifies for a party, if the opposing party requests, the party may be required to produce, prior to cross-examination, any written statement made by the witness.

§§ 10.153 Proposed findings and conclusions; post-hearing memorandum.

Except in cases when the respondent has failed to answer the complaint, the administrative law judge, prior to making an initial decision, shall afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum in support of the proposed findings and conclusions.

§ 10.154 Initial decision of administrative law judge.

(a) The administrative law judge shall make an initial decision in the case. The decision will include (a) a statement of findings and conclusions, as well as the reasons or basis therefore with appropriate references to the record, upon all the material issues of fact, law, or discretion presented on the record, and (b) an order of suspension or exclusion from practice, an order of reprimand, or an order dismissing the complaint. The administrative law judge shall file the decision with the Director and shall transmit a copy to the representative of the Director and to the respondent. In the absence of an appeal to the Commissioner, the decision of the administrative law judge will, without further proceedings, become the decision of the Commissioner of Patents and Trademarks thirty (30) days from the date of the decision of the administrative law judge.

(b) The initial decision of the administrative law judge shall explain the reason for any penalty of reprimand, suspension or exclusion. In determining any penalty, the following should normally be considered:

(1) the public interest;

(2) the seriousness of the violation of the Disciplinary Rule;

(3) the deterrent effects deemed necessary; and

(4) the integrity of the legal profession; and

(5) any extenuating circumstances.

§ 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. An appeal by the respondent will be filed with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal, the Director shall serve a copy of the appeal. Within thirty (30) days after receipt of an appeal or copy thereof, the other party may file a reply brief in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief. Upon the filing of an appeal and a reply brief, if any, the Director shall transmit the entire record to the Commissioner.

(b) The appeal will be decided by the Commissioner on the record made before the administrative law judge.

(c) The Commissioner may order reopening of a disciplinary proceeding in accordance with the principles which govern the granting of new trials. Any request to reopen a disciplinary proceeding on the basis of newly discovered evidence must demonstrate that the newly discovered evidence could not have been discovered by due diligence.

§ 10.156 Decision of the Commissioner.

(a) An appeal from an initial decision of the administrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse, or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Entry of a decision by the Commissioner is a final agency action in a disciplinary proceeding. In making a final decision, the Commissioner shall review the record or those portions of the record as may be cited by the parties in order to limit the issues. The Comissioner shall tranmit a copy of the final decision to the Director and to the respondent.

(b) A final decision of the Commissioner may dismiss a disciplinary proceeding, reprimand a practitioner, or may suspend or exclude the practitioner from practice before the Office.

§ 10.157 Review of Commissioner's final decision.

(a) Review of the Commissioner's final decision in a disciplinary case may be had by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 1-26 of the United States District Court for the District of Columbia.

(b) The Commissioner may stay a final decision pending review of the Commissioner's final decision.

§ 10.158 Suspended or excluded practitioner.

(a) A practitioner who is suspended or excluded from practice before the Office under § 10.156(b) shall not engage in unauthorized practice of patent, trademark and other non-patent law before the Office.

(b) Unless otherwise ordered by the Commissioner, any practitioner who is suspended or excluded from practice before the Office under § 10.156(b) shall:

(1) Within 30 days of entry of the order of suspension or exclusion, notify all bars of which he or she is a member and all clients of the practitioner for whom he or she is handling matters before the Office in separate written communications of the suspension or exclusion and shall file a copy of each written communication with the Director.

(2) Within 30 days of entry of the order of suspension or exclusion, surrender a client's active Office case files to (i) the client or (ii) another practitioner designated by the client.

(3) Not hold himself or herself out as authorized to practice law before the Office.

(4) Promptly take any necessary and appropriate steps to remove from any telephone, legal, or other directory any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice patent, trademark or other non-patent law before the Office, and within 30 days of taking those steps, file with the Director an affidavit describing the precise nature of the steps taken.

(5) Not advertise the practitioner's availability or ability to perform or render legal services for any person having immediate, prospective, or pending business before the Office.

(6) Not render legal advice or services to any person having immediate, prospective, or pending business before the Office as to that business.

(7) Promptly take steps to change any sign identifying a practitioner's or the practitioner's firm's office and the practitioner's or the practitioner's firm's stationary to delete therefrom any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice law before the Office.

(8) Within 30 days, return to any client any unearned funds, including any unearned retainer fee, and any securities and property of the client.

(c) A practitioner who is suspended or excluded from practice before the Office and who aides another practitioner in any way in the other practitioner's practice of law before the Office, may, under the direct supervision of the other practitioner, act as a para-legal for the other practitioner or perform other services for the other practitioner which are normally performed by laypersons, *provided:*

(1) the practitioner who is suspended or excluded is:

(i) a salaried employee of:

(A) the other practitioner;

(B) the other practitioner's law firm; or

(C) a client-employer who employs the other practitioner as a salaried employee;

(2) the other practitioner assumes full professional responsibility to any client and the Office for any work performed by the suspended or excluded practitioner for the other practitioner;

(3) the suspended or excluded practitioner, in connection with any immediate, prospective, or pending business before the Office, does not:

(i) communicate directly in writing, orally, or otherwise with a client of the other practitioner;

(ii) render any legal services to a client of the other practitioner; or

(iii) meet in person or in the presence of the other practitioner with:

(A) any Office official in connection with the prosecution of any patent, trademark, or other case;

(B) any client of the other practitioner, the other practioner's law firm, or the client-employer of the other practitioner;

(C) any witness or potential witness which the other practitioner, the other practitioner's law firm, or the other practitioner's client-employer may or intends to call as a witness in any proceeding before the Office. The term "witness" includes individuals who will testify orally in a proceeding before, or sign an affidavit or any other document to be filed in, the Office.

(d) When a suspended or excluded practitioner acts as a paralegal or performs services under paragraph (c) of this section, the suspended or excluded practitioner shall not thereafter be reinstated to practice before the Office unless:

(1) the suspended or excluded practitioner shall have filed with the Director an affidavit which (i) explains in detail the precise nature of all para-legal or other services performed by the suspended or excluded practitioner and (ii) shows by clear and convincing evidence that the suspended or excluded practitioner has complied with the provisions of this section and all Disciplinary Rules, and

(2) the other practitioner shall have filed with the Director a written statement which (i) shows that the other practitioner has read the affidavit required by subparagraph (d) (1) of this section and that the other practitioner believes every statement in the affidavit to be true and (ii) states why the other practitioner believes that the suspended or excluded practitioner has complied with paragraph (c) of this section.

§ 10.159 Notice of suspension or exclusion.

(a) Upon issuance of a final decision reprimanding a practitioner or suspending or excluding a practitioner from practice before the Office, the Director shall give notice of the final decision to appropriate employees of the Office and to interested departments, agencies, and courts of the United States. The Director shall also give notice to appropriate authorities of any State in which a practitioner is known to be a member of the bar and any appropriate bar association.

(b) The Director shall cause to be published in the *Official Gazette* the name of any practitioner suspended or excluded from practice. Unless otherwise ordered by the Commissioner, the Director shall publish in the *Official Gazette* the name of any practitioner reprimanded by the Commissioner.

(c) The Director shall maintain records, which shall be available for public inspection, of every disciplinary proceeding where a practitioner is reprimanded, suspended, or excluded unless the Commissioner orders that the proceeding be kept confidential.

§ 10.160 Petition for reinstatement.

(a) A petition for reinstatement of a practitioner suspended for a period of less than five years will not be considered until the period of suspension has passed.

(b) A petition for reinstatement of a practitioner excluded from practice will not be considered until five years after the effective date of the exclusion.

(c) An individual who has resigned under § 10.133 or who has been suspended or excluded may file a petition for reinstatement. The Director may grant a petition for reinstatement when the individual makes a clear and convincing showing that the individual will conduct himself or herself in accordance with the regulations of this part and that granting a petition for reinstatement is not contrary to the public interest. As a condition to reinstatement, the Director may require the individual to:

(1) meet the requirements of § 10.7, including taking and passing an examination under § 10.7(b) and

(2) pay all or a portion of the costs and expenses, not to exceed $1,500, of the disciplinary proceeding which lead to suspension or exclusion.

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(d) Any suspended or excluded practitioner who has violated the provisions of § 10.158 during his or her period of suspension or exclusion shall not be entitled to reinstatement until such time as the Director is satisfied that a period of suspension equal in time to that ordered by the Commissioner or exclusion for five years has passed during which the suspended or excluded practitioner has complied with the provisions of § 10.158.

(e) Proceedings on any petition for reinstatement shall be open to the public. Before reinstating any suspended or excluded practitioner, the Director shall publish in the *Official Gazette* a notice of the suspended or excluded practitioner's petition for reinstatement and shall permit the public a reasonable opportunity to comment or submit evidence with respect to the petition for reinstatement.

§ 10.161 Savings clause.

(a) A disciplinary proceeding based on conduct engaged in prior to the effective date of these regulations may be instituted subsequent to such effective date, if such conduct would continue to justify suspension or exclusion under the provisions of this part.

(b) No practitioner shall be subject to a disciplinary proceeding under this part based on conduct engaged in before the effective date hereof if such conduct would not have been subject to disciplinary action before such effective date.

§ 10.162-10.169 [reserved]

§ 10.170 Suspension of rules.

(a) In an extraordinary situation, when justice requires, any requirement of the regulations of this part which is not a requirement of the statutes may be suspended or waived by the Commissioner or the Commissioner's designee, *sua sponte*, or on petition of any party, including the Director or the Director's representative, subject to such other requirements as may be imposed.

(b) Any petition under this section will not stay a disciplinary proceeding unless ordered by the Commissioner or an administrative law judge.

Dec. 21, 1984. GERALD J. MOSSINGHOFF
Commissioner of Patents and Trademarks

[1052 OG 4]

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(191) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 10

[Docket No. 40788-8069]

Practice Before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Final rule; correction.
Summary: On Feb. 6, 1985, final rules regarding the representation of others before the Patent and Trademark Office were issued. (50 FR 5172, Feb. 6, 1985.) This notice makes a technical correction to the second sentence in [g49 10.157(a) to reflect the Local Rule designation currently used by the U.S. District Court for the District of Columbia.
For Further Information Contact: Nancy C. Slutter by telephone at [703] 557-4035 or by mail marked to her attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Part 10-Representation of Others Before the Patent and Trademark Office

1. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.157(a) [Corrected]

The reference in § 10.157, paragraph (a), the second sentence, to "1-26" is corrected to read "213".

Apr. 13, 1988. DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner of Patents and Trademarks.

[1090 OG 41]

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(192) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 10

[Docket No. 80866-9013]

Requests for Reconsideration in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: This final rule sets forth an amendment to 37 CFR 10.156. The purpose of the amendment is to prescribe a date on which the decision of the Commissioner of Patents and Trademarks in a Patent and Trademark (PTO) disciplinary proceeding becomes final agency action for purposes of judicial review, and to provide for one request for reconsideration or modification of such decision by a party.
Effective Date: Apr. 1, 1989
For Further Information Contact: Harris A. Pitlick by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Present rules do not explicitly provide for requests for reconsideration or modification of Commissioner's decisions in appeals from initial decisions of administrative law judges in PTO disciplinary proceedings. 37 CFR 10.156 presently provides that such a Commissioner's decision is a final agency action.

In a recent case, *Klein v. Peterson*, 6 USPQ 2d 1556 (D.D.C. 1988), a first decision of the Commissioner was withdrawn and ultimately replaced with a second decision. The respondent sought judicial review of the first decision under 35 U.S.C. 32 after its finality had already been withdrawn and then sought judicial review of the second decision. The authority of the Commissioner to, in effect, reconsider his decision in a disciplinary proceeding was challenged in the cited case. The district court held that since there was no express statutory authority proscribing the Commissioner from reconsidering the first decision, there was implicit authority to do so consistent with long-standing precedent in the area of federal administrative law.

While Klein confirmed that the Commissioner has inherent authority to reconsider a decision, at least before an appeal has been noted, the PTO believes that a rule explicitly providing for a time in which requests for reconsideration may be made by a party and a date certain for when Commissioner's decisions in disciplinary proceedings become final will both promote greater certainty in this area of disciplinary proceeding practice and eliminate the possibility of multiple appeals. The final rule is not intended to preclude the Commissioner from sua sponte reconsidering or modifying a decision in a disciplinary proceeding at any time where conditions warrant and a respondent's due process rights are not violated, consistent with long-standing federal administrative law precedent.

A notice of proposed rulemaking was published in the *Federal Register* on Oct. 3, 1988 (53 FR 38740) and the *Official Gazette* on Oct. 25, 1988 (1095 O.G. 44). Interested parties were requested to submit written comments on or before Dec. 1, 1988. No comments were received.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because in merely codifying the inherent right of the PTO to reconsider its decisions *sua sponte*, the rule extends the right to each party in a PTO disciplinary proceeding to seek reconsideration.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National government and the States as outlined in Executive Order 12612.

This rule change does not contain a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

List of Subject in 37 CFR Part 10

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Trademarks.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office amends 37 CFR Part 10 as follows:

PART 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.156 is amended by revising paragraph (a) and adding new paragraph (c) to read as follows:

10.156 Decision of the Commissioner.

(a) An appeal from an initial decision of the administrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Subject to paragraph (c) of this section, a decision by the Commissioner does not become a final agency action in a disciplinary proceeding until 20 days after it is entered. In making a final decision, the Commissioner shall review the record of those portions of the record as may be cited by the parties in order to limit the issues. The Commissioner shall transmit a copy of the final decision to the Director and to the respondent.

* * * * *

(c) A single request for reconsideration or modification of the Commissioner's decision may be made by the repondent or the Director if filed within 20 days from the date of entry of the decision. Such a request shall have the effect of staying the effective date of the decision. The decision by the Commissioner on the request is a final agency action in a disciplinary proceeding and is effective on its date of entry.

Jan. 11, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

[1100 OG 5]

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(193) **Department of Commerce**
Patent and Trademark Office
37 CFR PART 10

[Docket No. 80340-8188]

Practice Before the Patent and Trademark Office; Government Employees

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending its rules governing admission of Government employees to practice before the PTO in patent cases, Part 10 of Title 37. Those rules presently permit officers and employees of the Government to be registered only if their official duties include preparation and prosecution of patent applications. A recent decision of the U.S. District Court for the District of Columbia has held that these rules are partially invalid. By these amended rules, the PTO has conformed the rules to the court's decision and has eliminated the "inactive" status designation of registered attorneys and agents who became employed by the Government, but do not engage in the preparation and prosecution of patent applications.
Effective Date: Nov. 4, 1988
For Further Information Contact: Nancy C. Slutter by telephone at (703) 557-4035 or by mail marked to her attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Attorneys and agents must be admitted to practice before the Patent and Trademark Office (PTO) in patent cases. 35 U.S.C. 31; 37 CFR 10.10(a). Part 10 of Title 37 is being amended to allow Federal employees who fulfill the requirements for registration set forth at 37 CFR 10.7 to have their names placed on the PTO register of attorneys and agents.

In the past, the rules provided that an officer or employee of the Government whose official duties include preparation and prosecution of patent applications may be registered. 37 CFR 10.6(d). Under the rule, all other Government employees were not to be registered. If a registered practitioner became a Government employee, the rule required that the petitioner's name be endorsed as "inactive" if the employee's duties did not involve the preparation and prosecution of patent applications.

In a recent decision by the U.S. District Court for the District of Columbia, portions of 37 CFR 10.6(d) were held to be invalid. In that case, an attorney presently employed by a Federal agency petitioned the Commissioner, requesting that his name be placed (with an inactive designation) on the register of attorneys and agents entitled to practice before the PTO in patent cases. His petition was denied in view of 37 CFR 10.6(d). *In re Athridge*, 230 USPQ 470 (Comm'r Pat. 1986). Following the Commissioner's decision, the attorney sought judicial review in the U.S. District Court for the District of Columbia. The court determined that 37 CFR 10.6(d) was invalid to the extent that it precluded registration of an otherwise qualified individual solely on the basis of his status as a Government employee. Based on its determination, the court held that the employee could be registered and designated as "inactive." *Athridge* v. *Quigg*, 655 F. Supp. 779, 3 USPQ 2d 1391 (D.D.C. 1987). See also *Athridge* v. *Quigg*, 4 USPQ 2d 1656 (Comm'r Pat. 1987).

Amendments to 37 CFR §§ 10.6, 10.10 and 10.23(c) were proposed in a rulemaking notice published in the *Federal Register* at 53 FR 20871-20872 (June 7, 1988) and at 1091 *Official Gazette* 38 (June 28, 1988).

Interested parties were requested to submit written comments on or before Aug. 9, 1988. Written comments were submitted by two individuals and one organization.

Section 10.6, as amended, removes § 10.6(d). The effect of removing § 10.6(d) will permit otherwise qualified Government employees to be registered to practice before the PTO in patent cases. Registration, however, will not relieve any Government employee from otherwise complying with conflict of interest requirements, e.g., 18 U.S.C. 203, 205, 207, applicable agency regulations and personnel practices, and applicable codes of professional responsibility.

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Section 10.10, as amended, refers to restrictions on practice in patent cases imposed on Government employees, Office employees, and former Office employees.

Section 10.23(c), which sets forth specific forms of misconduct, is amended by revising paragraph 10.23(c)(13) to reflect the redesignation of paragraph 10.6(e) as § 10.10(b), and by adding new paragraphs (c) and (d), which provide that actions contrary to the restrictions on practice in patent cases set forth in amended paragraphs 10.10(c) and (d) will be treated as misconduct by the Office.

One commenter expressed concern that under § 10.10(b) as proposed, a former member of the patent examining corps could be denied registration (or reinstatement) as the result of filing an application that is assigned to his or her former examining group by the Office even though when filing the application, the practitioner sincerely did not believe the application would be assigned to that group. It is noted that § 10.10(b) contains the same provisions with respect to applications filed by former patent examiners as former § 10.6(e). A former member of the patent examining corps would not be denied registration for filing an application assigned to his or her former group if immediate action is taken to withdraw from further prosecution of the case when he or she finds out that the application has been assigned to his or her former group. Actionable misconduct occurs when the individual *knowingly* acts in violation of the undertaking signed under § 10.10(b). *See* § 10.23(c)(13).

Two comments were received suggesting an addition to § 10.66 that would correspond to newly proposed § 10.10(d). However, § 10.66 relates to Canon 5 of the Patent and Trademark Office Code of Professional Responsibility (A practitioner should exercise independent judgment on behalf of a client) and is concerned with a practitioner's relationship with clients whereas newly proposed § 10.10(d) is concerned with applicable conflict of interest laws, regulations or codes of professional responsibility as they relate to Government employees. Accordingly, it is felt that the suggested addition to § 10.66 would be inappropriate.

Two commenters suggested the addition of a new section to be designated as § 10.11(c), adapted from a notice in the Official Gazette (1064 O.G. 12) "Reinstatement of Patent Attorneys and Agents to Practice Before the U.S. Patent and Trademark Office." Such a change is not adopted in this rule package but is under consideration for a future rule change.

Two comments were received concerning the differences in the language used in proposed §§ 10.10(b) and 10.23(c)(13) and the need to avoid inconsistencies in these two sections. In particular, § 10.10(b) (last paragraph) included "providing assistance," whereas § 10.23(c)(13) did not; and § 10.23(c)(13) recited "knowingly," whereas § 10.10(b) did not. This suggestion is being adopted. Amended § 10.23(c)(13) will include the language "providing assistance" as it appears in § 10.10(b) and § 10.10(b) will be changed to include the word "knowingly."

It was suggested by two commenters that additional explanatory commentary be provided with respect to newly proposed §§ 10.10(c) and (d). It is felt that this is unnecessary in connection with the rule change. Government employees with questions concerning applicable conflict of interest laws, regulations or codes of professional responsibility should address these questions to their respective Offices of General Counsel. With respect to further comment by the Office concerning practice by Government employees before the PTO, the last paragraph under Supplementary Information in the Notice of proposed rulemaking provides sufficient clarity on this issue.

Two comments were received concerning the status of individuals who may be affected by this rule change. These individuals should contact the Office of Enrollment and Discipline (OED). In addition, the Office will publish a notice in the Official Gazette listing all individuals registered as inactive and their last known address.

Two commenters correctly observed that proposed § 10.10(b) does not require a written statement of official duties for an officer or Government employee whose official duties require the preparation and prosecution of applications for patent.

The citation to the Commissioner's decision indicating that Mr. Athridge's name has been entered on the "active" list of registered attorneys and agents entitled to practice before the PTO in patent cases has been added to the discussion under Supplementary Information as suggested.

The suggestion that the term "contrary to" be changed to "in violation of" in proposed § 10.23(c)(20) has not been adopted. The term "contrary to" is considered preferable.

Two comments were received concerning the continued effect of an opinion rendered by the Acting United States Attorney General, 41 *Op. Att. Gen.* 21, 1949 *Dec. Comm'r Pat.* 1 (1949). In response, the Commissioner advises that the PTO maintains the import of that decision is unchanged with respect to practice before the PTO by Government employees. *See In re Athridge*, 230 USPQ 470 (Comm'r Pat. 1986).

Other Considerations

This rule change will not have a significant impact on the quality of the human environment or the conservation of energy resource.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rule change allowing Government employees who meet the requirements set forth at 37 CFR 10.7 to have their names placed on the Patent and Trademark Office register of attorneys and agents would not be expected to result in an increase of fees charged by attorneys and agents to entities, including small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the national government and the state as outlined in Executive Order 12612.

The rule change will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. Office of Management and Budget approval of the registration information reporting requirements contained in the proposed rules was extended until July 31, 1990. [OMB Control No. 0651-0012].

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

Pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 31, Part 10 of Title 37 of the Code of the Federal Regulations is amended as set forth below:

PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.6 is amended by removing paragraph (d) and redesignating paragraph (e) as § 10.10(b).

3. Section 10.10 is amended by revising the title, redesignating the text as paragraph (a), revising newly redesignated paragraph (b) and adding new paragraphs (c) and (d) to read as follows:

§ 10.10 Restrictions on practice in patent cases.

(a) Only practitioners who are registered under § 10.6 or individuals given limited recognition under § 10.9 will be permitted to prosecute patent applications of others before the Office.

(b) No individual who has served in the patent examining corps of the Office may practice before the Office after termination of his or her service, unless he or she signs a written undertaking (1) not to prosecute or aid in any manner in the prosecution of any patent application pending in any patent examining group during his or her period of service therein and (2) not to prepare or prosecute or to assist in any manner in the preparation or prosecution of any patent application of another [i] assigned to such group for examination and [ii] filed within two years after the date he or she left such group, without written authorization of the Director. Associated and related classes in other patent examining groups may be required to be included in the undertaking or designated classes may be excluded from the undertaking. When an application for registration is made after resignation from the Office, the applicant will not be registered if he or she has prepared or prosecuted or assisted in the preparation or prosecution of any patent application as indicated in the paragraph. Knowingly preparing or prosecuting or providing assistance in the preparation or prosecution of any patent application contrary to the provisions of this paragraph shall constitute misconduct under § 10.23(c)(13) of this part.

(c) A practitioner who is an employee of the Office cannot prosecute or aid in any manner in the prosecution of any patent application before the Office.

(d) Practice before the Office by Government employees is subject to any applicable conflict of interest laws, regulations or codes of professional responsibility. [Approved by the Office of Management and Budget under control number 0651-0012]

4. Section 10.23 is amended by revising paragraph (c)(13) and by adding new paragraphs (c)(19) and (c)(20) to read as follows:

§ 10.23 MISCONDUCT

* * * * *

(c) * * *

(13) Knowingly preparing or prosecuting or providing assistance in the preparation or prosecution of a patent application in violation of an undertaking signed under § 10.10(b).

* * * * *

(19) Action by an employee of the Office contrary to the provisions set forth in § 10.10(c).

(20) Knowing practice by a Government employee contrary to applicable Federal conflict of interest laws, or regulations of the Department, agency or commission employing said individual.

* * * * *

Sept. 15, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1095 OG 45]

(194) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 100

[Docket No. 80995-8195]

Rights Determinations in Government Employee Inventions

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: Executive order 10096 as amended by Executive Order 10930 sets forth the policies and procedures for determining the rights of Government employees and the Government in inventions made by employees. The Delegation of Authority from the Secretary of Commerce, dated Sept. 15, 1988, transferred administration of these provisions from the Commissioner of Patents and Trademarks to the Under Secretary for Economic Affairs in the Department of Commerce. This final rule removes 37 CFR Part 100 in its entirety.
Effective date: This rule is effective Nov. 1, 1988.
For Further Information Contact: John H. Raubitschek by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights of Government employees and the Government is inventions made by the employees. The function of reviewing agency rights determinations assigned to the Secretary of Commerce was delegated by the Secretary to the Commissioner of Patents and Trademarks. On Sept. 15, 1988, the Secretary changed the delegation to the Under Secretary for Economic Affairs, who is republishing Part 100 as new Part 501 in 37 CFR.

All rights determinations and appeals relating thereto, which are pending before the Commissioner at the time 37 CFR Part 501 becomes effective, will be acted upon by the Commissioner under the procedures in 37 CFR Part 100.

The Patent and Trademark Office has determined that this notice is not a rule within the meaning of section 1(a) of Executive Order 12291. Therefore, no Regulatory Impact Analysis has to or will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given by section 553 of the Administrative Procedure Act (5 U.S.C. 553), or by any other law, no initial or final Regulatory Flexibility Analysis has to or will be prepared for the purposes of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)).

This final rule does not contain a policy with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612. Nor does this rule contain a collection of information for purposes of the Paperwork Reduction Act of 1980.

For reasons set forth in the preamble, 37 CFR Part 100 is amended as follows:

PART 100—[REMOVED AND RESERVED]

1. Part 100 is removed and reserved.

Oct. 4, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[FR Doc. 88-23238 Filed 10-7-88; 8:45 am]
Billing Code 3510-16-M

[1096 OG 15]

(195) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 501

[Docket No. 80627-8127]

Uniform Patent Policy for Domestic Rights in Inventions Made by Government Employees

Agency: Under Secretary for Economic Affairs, Department of Commerce.
Action: Final rule.
Summary: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal employee inventions with respect to the Federal employee and the Government employer. The Delegation of Authority from the Secretary of Commerce dated, Sept. 15, 1988 and effective Nov. 1, 1988, transferred administration of the provisions of Executive Order 10096 as amended by Executive Order 10930 from the Commission of Patents and Trademarks to the Under Secretary for Economic Affairs

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in the Department of Commerce. This final rule establishes 37 CFR Part 501 which sets forth this delegation of authority to the Under Secretary. In addition, each Government agency is authorized to determine whether the results of research, development, or other activity within the agency constitute an invention with the purview of Executive Order 10096, as amended by Executive Order 10930 and to determine initially the rights therein in accordance with the provisions of section 501.6 and 501.7 herein. By separate notice in today's *Federal Register* the Patent and Trademark Office is deleting 37 CFR Part 100.

Effective Date: Nov. 1, 1988.

However, all rights, determinations, and appeals submitted to the Commissioner prior to the effective date, will be reviewed by the Commissioner under the procedures of 37 CFR Part 100.

Address: Comments may be sent to Mr. Joseph P. Allen, Acting Director, Federal Technology Management Division, Office of the Under Secretary for Economic Affairs, United States Department of Commerce, Room 4839, Herbert C. Hoover Bldg., Washington, D.C. 20230.

For Further Information Contact: Mr. Joseph P. Allen, by telephone at (202) 377-8100 or Robert B. Ellert by telephone at (202) 377-5394.

Supplementary Information: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal Employee inventions with respect to the Federal employee and the Government employer. The Under Secretary for Economic Affairs of the Department of Commerce was delegated responsibility for oversight of the Executive Order on Sept. 15, 1988. Functions required by the Executive Order were previously performed by the Commissioner of Patents and Trademarks. This final rule is substantially the same as the rule set out in 37 CFR Part 100, except, the Secretary of Commerce is substituted for the Commissioner of Patents and Trademarks, and advance approval is given to agency heads to make final determinations relating to determinations of rights decisions of Government employee inventions, subject to employee appeal to the Secretary.

President Reagan in Executive Order 12591, on Apr. 10, 1987 directed all Government agencies to facilitate the transfer of technology developed at federal laboratories to the private sector and to promote its commercialization. To accomplish the goals of E.O. 12591 it is necessary that rights to inventions made by government employees be determined as expeditiously as possible. Accordingly, the Secretary has reviewed the existing procedures and policies under 37 CFR Part 100 and concluded that administration of the functions thereunder could be performed on a more efficient basis by confining the role of the Department of Commerce to appeals by employees from disputed agency determinations. Accordingly, under 37 CFR Part 501 each Government agency is given the authority to determine whether the results of research, development of other activities within the agency constitute an invention by an employee, and to determine initially the rights relating to ownership within the provisions of Executive Order 10096 as amended by Executive Order 10930. If no appeal is taken to the Secretary by an employee under section 501.8, the initial determination of the agency will be final.

Notwithstanding the fact that this is a final rule, comments are requested.

Because this rule concerns agency management and personnel, it is not a rule or regulation within the meaning of section 1(a) of Executive Order 12291, and it is not subject to the requirements of the Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

Because a notice of proposed rulemaking and an opportunity for public comments are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 553), or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)).

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612. This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

The changes in the process of determining employee rights to inventions made by this rule do not have takings implications sufficient to require preparation of a Takings Implications Assessment under Executive Order 12630.

List of Subjects in 37 CFR Part 501

Uniform patent policy. Domestic Rights in inventions, Inventions made by Government employees.

ROBERT ORTNER,
Under Secretary for Economic Affairs.

Oct. 3, 1988

* * * * *

For the reasons set forth in the preamble 37 CFR is amended by adding Chapter V, consisting of Part 501, to read as follows:

CHAPTER V—UNDER SECRETARY FOR ECONOMIC AFFAIRS, DEPARTMENT OF COMMERCE

PART 501—UNIFORM PATENT POLICY FOR DOMESTIC RIGHTS IN INVENTIONS MADE BY GOVERNMENT EMPLOYEES

Sec.

501.1 Purpose.
501.2 Scope.
501.3 Definitions.
501.4 Determination of Inventions and Rights therein.
501.5 Agency Liaison Officier.
501.6 Criteria for The Determination of Rights in and to Inventions.
501.7 Agency Determination.
501.8 Appeals by employees.
501.9 Patent protection.
501.10 Dissemination of this part and of implementing regulations.

Authority: Sec. 4, E.O. 10096, 3 CFR 1949-1953 Comp., p. 292, as amended by E. O. 10930, 3 CFR 1959-1963 Comp., p. 456; and Delegation of Authority by the Secretary of Commerce, Sept. 15, 1988, DOO 10-9.

§ 501.1 Purpose.

The purpose of this part is to provide for the administration of a uniform patent policy for the Government with respect to the domestic rights in inventions made by Government employees and to prescribe rules and regulations for implementing and effectuating such policy.

§ 501.2 Scope.

This part applies to any invention made by a Government employee and to any action taken with respect thereto.

§ 501.3 Definitions.

(a) The term "Secretary," as used in this part, means the Under Secretary of Commerce for Economic Affairs.

(b) The term "Government agency" as used in this part, means and Executive department or independent establishment of the Executive branch of the Government (including any independent regulatory commission or board, any corporation wholly owned by the United States, and the Smithsonian Institution), but does not include the Department of Energy for inventions made or conceived under the provisions of 42 U.S.C. 2182.

(c) The term "Government employee," as used in this part, means any officer or employee, civilian or military, of any Government agency, including any part-time consultant or part-time employee except as may otherwise be provided for by agency regulation approved by the Secretary.

(d) The term "invention," as used in this part, means any art, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the patent laws of the United States.

§ 501.4 Determination of Inventions and rights therein.

Each Government agency has the approval of the Secretary to determine whether the results of research, development, or other activity in the agency constitute an invention within the purview of E.O. 10096, as amended by E.O. 10930 and to determine the rights therein in accordance with the provisions of § 501.6 and 501.7 herein.

§ 501.5 Agency Liaison Officer.

Each Government agency shall designate a liaison officer to represent the agency before the Secretary. Provided, however, that the Departments of the Army, the Navy, and the Air Force may each designate a liaison officer.

§ 501.6 Criteria for the Determination of Rights In and To Inventions.

(a) The following rules shall be applied in determining the respective rights of the Government and of the inventor in and to any invention that is subject to the provisions of this part:

(1) The Government shall obtain, except as herein otherwise provided, the entire domestic right, title and interest in and to any invention made by any Government employee:

(i) During working hours, or
(ii) With a contribution by the Government of facilities, equipment, materials, funds or information, or of time or services of other Government employees on official duty, or
(iii) Which bears a direct relation to or is made in consequence of the official duties of the inventor.

Foreign patent rights are governed by the provisions of 37 CFR Part 101.

(2) In any case where the contribution of the Government, as measured by any one or more of the criteria set forth in paragraph (a)(1) of this section, to the invention is insufficient equitably to justify a requirement of assignment to the Government of the entire domestic right, title, and interest in and to such invention, or in any case where the Government has insufficient interest in an invention to obtain the entire domestic right, title, and interest therein (although the Government could obtain same under paragraph (a)(1) of this section), the Government agency concerned shall leave title to such invention in the employee, subject however, to the reservation to the government of a nonexclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes, such reservation, in the terms thereof, to appear, where practicable, in any patent, domestic or foreign, which may issue on such invention. Reference is made to section 15 of the Federal Technology Transfer Act of 1986 (15 U.S.C. 3710d) which requires a Government agency to allow the inventor to retain title to any covered invention when the agency does not intend to file a patent application or otherwise promote commercialization.

(3) In applying the provisions of paragraphs (a)(1) and (2) of this section to the facts and circumstances relating to the making of a particular invention, it shall be presumed that an invention made by an employee who is employed or assigned:

(i) To invent or improve or perfect any art, machine, design, manufacture, or composition of matter,
(ii) To conduct or perform research, development work, or both,
(iii) To supervise, direct, coordinate, or review Government financed or conducted research, development work, or both, or
(iv) To act in a liaison capacity among governmental or non-governmental agencies or individuals engaged in such research or development work, falls within the provisions of paragraph (a)(1) of this section, and it shall be presumed that any invention made by any other employee falls within the provisions of paragraph (a)(2) of this section. Either presumption may be rebutted by a showing of the facts and circumstances in the case and shall not preclude a determination that these facts and circumstances justify leaving the enire right, title and interest in and to the invention in the Government employee, subject to the law.

(4) In any case wherein the Government neither:

(i) Obtains the entire domestic right, title and interest in and to an invention pursuant to the provisions of paragraph (a)(1) of this section nor
(ii) Reserves a nonexclusive, irrevocable, royalty-free license in the invention, with power to grant licenses for all governmental purposes, pursuant to the provisions of paragraph (a)(2) of this section.

The Government shall leave the entire right, title and interest in and to the invention in the Government employee, subject to law.

§ 501.7 Agency determination.

(a) If the agency determines that the Government is entitled to obtain title pursuant to § 501.6(a)(1) and the employee does not appeal, no further review is required.

(b) In the event that a Government agency determines, pursuant to paragraph (a)(2) or (a)(4) of § 501.6, that title to an invention will be left with the employee, the agency shall notify the employee of this determination.

(c) In the case of a determination under either paragraph (a) or (b) of this section, the agency shall promptly prepare, and preserve in appropriate files, accessible to the Secretary, a written, signed, and dated statement concerning the invention including the following:

(1) A description of the invention in sufficient detail to identify the invention and show its relationship to the employee's duties and work assignments;
(2) The name of the employee and employment status, including a detailed statement of official duties and responsibilities at the time the invention was made; and
(3) An explanation of the agency determination and reasons therefor. The agency shall, subject to considerations of national security, or public health, safety, or welfare, submit to the Secretary, if an appeal is taken, a copy of this written statement.

§ 501.8 Appeals by employees.

(a) Any Government employee who is aggrieved by a Government agency determination pursuant to {g49 501.6(a)(1) or (a)(2), may obtain a review of any agency determination by filing, within 30 days (or such longer period as the Secretary may, for good cause shown in writing, fix in any case) after receiving notice of such determination, two copies of an appeal with the Secretary. The Secretary then shall forward one copy of the appeal to the Government agency.

(b) On receipt of a copy of an appeal filed pursuant to paragraph (a) of this section, the agency official who made the agency determination being appealed shall, subject to considerations of national security, or public health, safety, or welfare, promptly furnish both the Secretary and the inventor with a copy of a report containing the following information about the invention involved in the appeal:

(1) A copy of a statement by the agency containing the information specified in § 501.7, and
(2) A detailed statement of the points of dispute or controversy, together with copies of any statements or written arguments filed with the agency, and of any other relevant evidence that the agency considered in making its determination of Government interest. Within 25 days (or such longer period as the Secretary may, for good cause shown, fix in any case) after the transmission of a copy of the agency report to the employee, the employee may file a reply thereto with the Secretary and file one copy thereof with the appropriate agency decision maker.

(c) After the time for the inventor's reply to the Government agency's report has expired and if the inventor has so requested

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in his or her appeal, a date will be set for hearing of oral arguments before the Secretary, by the employee (or by an attorney whom he or she designates by written power of attorney filed before, or at the hearing) and a representative of the Government agency involved. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to thirty minutes for each side. The employee need not retain an attorney or request an oral hearing to secure full consideration of the facts and his or her arguments. The employee may expedite such consideration by notifying the Secretary when he or she does not intend to file a reply to the agency report.

(d) After a hearing on the appeal, if a hearing was requested, or after expiration of the period for the inventor's reply to the agency report if no hearing is set, the Secretary shall issue a decision on the matter within 120 days, which decision shall be final after a thirty day period for requesting reconsideration expires or on the date that a decision on a petition for reconsideration is finally disposed of. Any request for reconsideration or modification of the decision must be filed within 30 days from the date of the original decision (or within such an extension thereof as may be set by the Secretary before the original period expires). The decision of the Secretary shall be made after consideration of the statements of fact in the employee's appeal, the agency's report, and the employee's reply, but the Secretary at his or her discretion and with due respect to the rights and convenience of the inventor and the Government agency, may call for further statements on specific questions of fact or may request additional evidence in the form of affidavits or depositions on specific facts in dispute.

§ 501.9 Patent protection.

(a) A Government agency, upon determining that an invention coming within the scope of § 501.6(a)(1) or (a)(2) has been made, shall thereupon determine whether patent protection will be sought in the United States by the agency for such invention. A controversy over the respective rights of the Government and of the employee in any case shall not delay the taking of the actions provided for in this section. In cases coming within the scope of § 501.6(a)(2), agency action looking toward such patent protection shall be contingent upon the consent of the employee.

(b) Where there is an appealed dispute as to whether § 501.6(a)(1) or (a)(2) applies in determining the respective rights of the Government and of an employee in and to any invention, the agency will determine whether patent protection will be sought in the United States pending the Secretary's decision on the dispute and, if it decides that an application for patent should be filed, will take such rights as are specified in § 501.6(a)(2), but this shall be without prejudice to acquiring the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

(c) Where an agency has determined to leave title to an invention with an employee under § 501.6(a)(2), the agency will, upon the filing of an application for patent take the rights specified in that paragraph without prejudice to the subsequent acquistion by the Government of the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

§ 501.10 Dissemination of this part and of implementing regulations.

Each Government agency shall disseminate to its employees the provisions of this part, and any appropriate implementing agency regulations and delegations. Copies of any such regulations shall be sent to the Secretary. If the Secretary identifies an inconsistency between this part and the agency regulations or delegations, the agency, upon being informed by the Secretary of the inconsistency, shall take prompt action to correct it.

[FR Doc. 88-23239 Filed 10-7-88; 8:45 am]
Billing Code 3510-EA-M

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(196) **Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant**

Under 37 CFR Part 10, a practitioner is responsible for taking reasonable steps to avoid foreseeable prejudice to the rights of a client/patent applicant. This responsibility exists in all circumstances including those where the practitioner is operating through a corporate liaison or foreign agent and has no direct contact with the client/patent applicant, who in most cases is the one being represented.

This notice is intended to clarify the appropriate course of action for a practitioner to follow when the practitioner is operating through such a corporate liaison or foreign agent. In such arrangements, the registered practitioner may rely upon the advice of the corporate liaison or the client/patent applicant's foreign agent as to the action to be taken so long as the practitioner is aware that the client/patent applicant has consented after full disclosure to be represented by the liaison or agent. It will be assumed by the Patent and Trademark Office that the client/patent applicant has an agreement with the liaison or agent, arrived at after full disclosure, to be represented by the liaison or agent. Registered practitioners, if they wish, however, may maintain a copy of the agreement in this regard between the client/patent applicant and the liaison or agent in practitioner's file of the application or other proceeding before the Office. If there is, in fact, no such agreement between the client/patent applicant and the liaison or agent, the registered practitioner must communicate to the client/patent applicant.

In circumstances where the practitioner is aware that there is an agreement between the client/patent applicant and the liaison or agent, the practitioner may fully rely upon the advice of the liaison or agent as to the wishes of the client/patent applicant. For example, if the registered practitioner is instructed by the client/patent applicant's liaison or agent to allow an application to go abandoned rather than to respond to an Office action within a set period for response, the practitioner may properly do so without any further notice to the client/patent applicant.

It is assumed that withdrawal from employment by a practitioner will remain a relatively rare occurrence, particularly in view of this clarification. This notice should not be taken to require or encourage withdrawal. If a practitioner should decide to withdraw, however, the practitioner must take reasonable steps to avoid foreseeable prejudice to the rights of the client/patent applicant including allowing time for employment of another practitioner (37 CFR 10.40). Therefore, at least thirty days would be required between the date of approval by the Office of the withdrawal and the later of the expiration date of the response period or the expiration date of the period which can be obtained by a petition for extension of time and fee under 37 CFR 1.136(a). This is necessary so that the client/patent applicant would have sufficient time to obtain other representation or to take other action. If a period has been set for response and the period may be extended without a showing of cause pursuant to 37 CFR 1.136(a) by filing a petition for extension of time and fee, the practitioner will not be required to seek such extension of time for withdrawal to be approved. In such a situation, however, withdrawal will not be approved unless at least thirty days would remain between the date of approval and the last date on which such a petition for extension of time and fee could properly be filed.

Dec. 10, 1987

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1086 OG 457]

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(197) **Responsibilities of Practitioners Representing Clients in Proceedings Before The Patent and Trademark Office**

This notice is intended to remind practitioners of certain aspects of their responsibilities in representing clients in proceedings before the Office. The Notice is also intended to supplement the discussion set forth in the *Official Gazette* Notice published at 1086 *Official Gazette* 457 (Jan. 12, 1988) entitled "Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant" and to amplify and supersede the Helpful Hint published at 1084 *Official Gazette* 34 (Nov. 24, 1987) titled "Correspondence Address and/or Fee Address of Maintenance Fees."

Part 10 of title 37, Code of Federal Regulations, sets forth the Patent and Trademark Office (PTO) Code of Professional Responsibility. Each attorney or agent who practices before the PTO is subject to the rules set forth in Part 10 and should carefully study the rules promulgation originally published at 50 *Federal Register* 5158 (Feb. 6, 1985) and at 1052 *Official Gazette* 4 (Mar. 5, 1985) and reproduced as item number 172 in the Consolidated Listing of Official Gazette Notices, published at 1086 *Trademark Official Gazette* 3 (Jan. 5, 1988).

Practitioner's Client

During the promulgation of Part 10, 37 CFR, several individuals suggested that "it may be difficult to determine the identity of the 'client'. . ., particularly in corporate patent departments." The response to that suggestion was that "[t]he PTO will presume that practitioners know the identities of their clients . . .." 50 *Federal Register* 5163 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 356 (Jan. 5, 1988). For example, in a patent application, practitioner's client is ordinarily the inventor who gives practitioner a power of attorney to prosecute the application (37 CFR 1.31). A practitioner may represent only the assignee of the entire interest in a patent application if the assignee has filed a power of attorney and the assignee is conducting the prosecution of the application to the exclusion of the inventor. (37 CFR 1.32).

In the promulgation of Part 10, 37 CFR, a commenter raised a question of who is the client when an application is filed on behalf of an individual, but the individual's assignee pays practitioner's bill. The question was answered in the following manner:

> "Practitioners are expected to know the identities of their clients. If a practitioner is hired by a corporation and wishes to make that fact plain on the record of a patent application, the practitioner may file an assignment and a power of attorney signed by the assignee. If a dispute should then occur between the individual and the assignee, the record would be clear that the assignee is the client." 50 *Federal Register* 5164 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 357 (Jan. 5, 1988).

In some instances, practitioners deal with a corporate liaison or foreign agent. Such arrangements do not automatically change the person whom practitioner represents, e.g., the inventor or trademark owner. The fact that a U.S. practitioner receives instructions from the inventor or trademark owner through a foreign attorney or agent does not change the fact that the client is still the inventor or trademark owner rather than the foreign attorney or agent. See *Strojirenstvi* v. *Toyoda*, 2 USPQ 2nd 1222 (Comm'r Pat. 1986), which at 1223 cited *Yetter Manufacturing Co.* v. *Hiniker Co.*, 213 USPQ 119, 120 (D. Minn. 1981) for the principle that "when attorney served as local counsel for a law firm representing Hiniker Co., the attorney represented Hiniker and not the law firm" and also cited *Toulmin* v. *Becker*, 105 USPQ 511 (Ohio Ct. App. 1954) for the principle that "foreign patent agents or attorneys were not clients of U.S. patent attorney." The PTO expects practitioners to know the identities of their clients and to take reasonable steps to avoid foreseeable prejudice to the rights of their clients.

Obtaining Instructions Through Persons Other Than The Client

In practice, it is common for instructions relating to the application of an inventor or trademark owner, who is the client of the U.S. practitioner, to be passed to the U.S. practitioner through intermediaries, such as corporate liaisons or foreign agents. Clearly, a client may choose to use a corporate liaison or a foreign agent to convey instructions, etc., to a practitioner. In such an arrangement, the practitioner may rely upon instructions of, and accept compensation from, the corporate liaison or the foreign agent as to the action to be taken in a proceeding before the Office so long as the practitioner is aware that the client has consented to have instructions conveyed through the liaison or agent. See 37 CFR 10.68(a) and (b). An agreement between the client and the liaison or agent establishes an agency relationship between the liaison or agent and the client such that the U.S. practitioner can rely upon the liaison or agent as the representative of the client for the purpose of communicating the client's instructions about the proceeding to the U.S. practitioner. The PTO will assume that the client has an agreement with the liaison or agent to be represented by the liaison or agent. It is the responsibility of the client to notify the practitioner that the agency relationship between the client and the liaison or agent has ceased to exist and that instructions from the liaison or agent should no longer be accepted.

A practitioner could secure evidence that such an agreement exists by having a patent or trademark applicant sign a statement to that effect at the same time that the power of attorney is executed. For example, the following language could be inserted in an oath, declaration, or power of attorney form:

> "The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned."

Without an agency relationship between the liaison or agent and the client, a practitioner would be bound by 37 CFR 10.68(b) to "not permit a person who recommends, employs, or pays the practitioner to render legal services for another, to direct or regulate the practitioner's professional judgment in rendering such legal services."

Practitioner's Responsibility to a Client After the Client's Patent Issues or Trademark is Registered

The Office has received inquiries from practitioners as to their responsibilites to a client (patent or trademark applicant) after the client's patent was issued or trademark has been registered. In response thereto, it is pointed out that a power of attorney given during prosecution of a patent or trademark application is considered to be viable after the patent is issued or the trademark is registered. See 50 *Federal Register* 5164 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 357 (Jan. 5, 1988). While the Office considers such a power of attorney to be viable for purposes of the practitioner taking actions in proceedings before the Office if practitioner and the client so desire, the existence of the power of attorney to file and/or prosecute the application through issuance of the patent or registration of the trademark does not establish whether practitioner has a responsibility, and a dutaffirmatively in a proceeding before the Office on behalf of the client after the patent issues or the trademark is registered.

Practitioner's responsibility to take affirmative action in a proceeding before the Office after the patent issues or the trademark is registered depends upon whether practitioner still has a practitioner-client relationship with the client which has continued after the patent issued or trademark is registered. The mere existence of the power of attorney to file and/or prosecute the application through issuance of the patent or registration of the trademark would not establish such a practitioner-client relationship in the absence of other facts establishing such a relationship since the purpose for which the power of attorney was originally given has been accomplished.

Practitioner's Responsibility to a Former Client

While practitioner may no longer have a practitioner-client relationship with a client and therefore has no duty to represent the client in a proceeding before the Office, a practitioner nevertheless has certain obligations to a former client. These obligations are placed upon practitioner by the Office rules and are necessary for the proper conduct of proceedings before the Office. Under 37 CFR 10.23(c)(8), practitioners have a duty to inform a client or former client or timely notify the Office of an inability to notify a client or former client of certain correspondence received from the Office and also from the client's or former client's opponent in an *inter partes* proceeding before the Office. Practitioners have an obligation whether the client is a present client or a former client. Included among the items of correspondence of which practitioners have the obligation to inform clients or former clients are notices regarding main-

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tenance fees, reexamination proceedings, and institution of *inter partes* patent and trademark proceedings.

Address to Which Correspondence is Sent Regarding Patent Maintenance Fees and Reexamination Proceedings

Under 37 CFR 1.33(d), a "correspondence address" or a change thereto may be filed with the Office during the enforceable life of a patent. This "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified solely for maintenance fee purposes as provided by 37 CFR 1.363. Practitioners who do not wish to receive correspondence relating to maintenance fees must change the correspondence address in the patented file or provide the PTO with a fee address to which the correspondence should be sent. It is not required that a practitioner file a request for permission to withdraw pursuant to 37 CFR 1.36 solely for the purpose of changing the correspondence address in a patent even though a withdrawal of a practitioner would change the correspondence address.

Since 37 CFR 1.33(c) specifies that all notices, official letters and other communications for the patent owner or owners in a reexamination proceeding will be directed to the attorney or agent of record in the patent file, a request for permission to withdraw pursuant to 37 CFR 1.36 must be filed in the patent if the attorney or agent of record does not desire to receive correspondence relating to reexamination. For information on requests to withdraw, see the discussion in the Jan. 12, 1988 *Official Gazette* Notice cited above.

Contact Points For Information

If a practitioner has questions about the conduct of, or requirements relating to a particular proceeding before the Office, those questions should be directed to the particular area of the Office responsible for the proceeding. If practitioners have questions about their responsibilities to their clients, those questions should be directed to the Office of Enrollment and Discipline. The telephone number of that Office is (703) 557-2012.

DONALD J. QUIGG,
May 25, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

[1091 OG 26]

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(198) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 10
[Docket No. 81146-9134]
RIN: 0651-AA41

Exhaustion of Administrative Remedies in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: This final rule sets forth amendments to 37 CFR §§ 10.155 and 10.157. The purpose of the amendments is to clarify that a respondent dissatisfied with the initial decision by the administrative law judge in a Patent and Trademark Office (PTO) disciplinary proceeding must exhaust available administrative remedies, i.e., appeal to the Commissioner of Patents and Trademarks, before seeking judicial review under 35 U.S.C. 32.
Effective Date: August 1,1989
For Further Information Contact: Harris A. Pitlick by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: It is possible that present rules may be interpreted not to explicitly require a respondent dissatisfied with the decision of the administrative law judge (initial decision) in a PTO disciplinary proceeding to file an appeal with the Commissioner of Patents and Trademarks as a condition precedent to filing a petition for review in the United States District Court for the District of Columbia under 35 U.S.C. 32.

Under 37 CFR § 10.154(a), in the absence of an appeal to the Commissioner, the initial decision, without further proceedings, becomes the decision of the Commissioner thirty (30) days therefrom. Local Rule 213 of the United States District Court for the District of Columbia, 37 CFR § 10.157 and 35 U.S.C. 32, together provide for review of the final decision of the Commissioner by a petition in that court within 30 days of the date of that decision. Thus, the rules could be construed to permit a respondent dissatisfied with the initial decision to bypass review by the Commissioner and directly seek judicial review within 60 days of the date of the initial decision.

The purpose of 37 CFR §§ 10.154-10.157 is to outline the steps for seeking review of an initial decision in a disciplinary proceeding. There is no provision for bypassing a determination by the Commissioner unless both parties accept the decision and do not desire any further review of the initial decision. Sections 10.155 and 10.157 have been amended to clarify that a respondent must exhaust available administrative remedies by appeal to the Commissioner before judicial review can be considered ripe.

Subsequent to a notice of proposed rulemaking setting forth the proposed amendments now adopted by this Final Rule, an amendment to 37 CFR § 10.156 was adopted. *See* 54 FR 6659 (February 14, 1989). Section 10.156 now explicitly permits the respondent or the Director to make a single request for reconsideration or modification of the Commissioner's decision on appeal from an initial decision. Nothing in that rule, or in the rules adopted by this Final Rule, requires a respondent dissatisfied with the Commissioner's decision to seek reconsideration thereof. Thus, a respondent dissatisfied with the Commissioner's decision may directly seek judicial review under 35 U.S.C. 32. In other words, for purposes of 37 CFR Part 10, exhaustion of administrative remedies is complete upon appeal to the Commissioner from the initial decision.

A notice of proposed rulemaking was published in the *Federal Register* on December 28, 1988 (53 FR 52438) and the *Official Gazette* on January 17,1989 (1098 O.G. 527). Interested parties were requested to submit written comments on or before February 27, 1989. Comments from two (2) sources were received. None of the suggestions made in the comments have been adopted. A detailed analysis of the comments follows:

Comment: The proposed rules do not go quite far enough in order to comply with 5 U.S.C. 704, which specifies that

> agency action otherwise final is final for purposes of this section whether or not there has been presented or determined an application . . . unless the agency otherwise requires by rule and provides that the action meanwhile is inoperative, for an appeal to superior agency authority.

Since no rule specifies that the initial decision of the administrative law judge shall be inoperative, a sentence should be added to the end of 37 CFR § 10.154(a) stating that pending an appeal to the Commissioner in accordance with § 10.155 the decision of the administrative law judge will be inoperative. This would assure compliance with 5 U.S.C. 704 and remove any concern by practitioners subject to disciplinary proceedings that the initial decision has any binding effect prior to action by the Commissioner.

Response: The suggestion has not been adopted since it is not necessary. The above-quoted language from 5 U.S.C. 704 first appeared as part of section 10(c) of the original Administrative Procedure Act, 5 U.S.C. 1009(c) (Act of June 11, 1946, ch. 324, § 10(c), 60 Stat. 243). The meaning of the language in that section is explained in the Attorney General's Manual on the Administrative Procedure Act (1947) at 101-05. The purpose of the language quoted in the comment was to provide for judicial review at the time when agency action becomes operative, rather than at some later time, such as when further review available in the agency became exhausted. Under the regulatory scheme for review following an initial decision in a PTO disciplinary proceeding, agency action— i.e., imposition of discipline on a practitioner before the Office — cannot become operative before 20 days after the date of entry of the Commissioner's decision under 37 CFR § 10.156(a) or, if a request for reconsideration has been filed within those 20 days, before the date of entry of the decision on reconsideration under 37 CFR § 10.156(c). In other words, the initial decision cannot become operative until such time that judicial review becomes available to the affected practitioner.

The suggested change to 37 CFR § 10.154(a) is, hence, unnecessary.

Comment: The evidence upon which the General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that this proposed rule change is not expected to have a significant adverse economic impact on a substantial number of small entities has not been disclosed to the public for review and comment.

Response: No law requires that such evidence, if any, be disclosed to the public for review and comment. *See* 5 U.S.C. 605(b). The basis for the certification was that the proposed rule changes would merely make explicit what was implicity intended by the rules as originally constituted.

Comment: The proposed rule change will have a significant adverse economic impact on a substantial number of small entities because it prolongs the time for judicial review for a person who has been refused registration to practice before the Office.

Response: Both the proposed rule changes and the rules affected thereby relate solely to practitioners already registered or otherwise permitted to practice before the Office and who have been subject to a PTO disciplinary proceeding. The rules and rule changes have no impact, economic or otherwise, on persons refused registration or permission to practice before the Office.

Other Consideratalons

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that this rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because it merely makes explicit what was implicitly intended by the rules as originally constituted. Additionally, no more than a few small entities in a given year out of over 13,000 registered patent attorneys and agents and an unknown number of trademark attorneys are expected to be subject to an initial decision in a PTO disciplinary proceeding. Whatever the number of small entities, however, there would not be expected to be a significant impact on them because agency action does not take effect until after a final decision is made by the Commissioner.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less that $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This rule change does not contain a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Trademarks.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office amends 37 CFR Part 10 as follows:

PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by adding new paragraph (d) as follows:

§ 10.155 Appeal to the Commissioner.

* * * * *

(d) In the absence of an appeal by the Director, failure by the respondent to appeal under the provisions of this section shall be deemed to be both acceptance by the respondent of the initial decision and waiver by the respondent of the right to further administrative or judicial review.

3. Section 10.157 is amended by revising paragraph (a) as follows:

§ 10.157 Review of Commissioner's final decision

(a) Review of the Commissioner's final decision in a disciplinary case may be had, subject to § 10.155(d), by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 213 of the United States District Court for the District of Columbia.

* * * * *

May 26, 1989 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

[1104 OG 20]

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(199) **Department of Commerce**
Patent and Trademark Office
37 CFR {g49 1.15
[Docket No. 80515 - 8209]

Requests for Identifiable Records

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: This final rule sets forth changes that the Patent and Trademark Office (PTO) is making to the rules governing requests for records not disclosed to the public as part of the regular informational activity of the PTO. The prior rule sets out the PTO Freedom of Information Act (FOIA) procedures. The final rule updates these procedures and specifies that FOIA requests will be processed in accordance with Department of Commerce regulations contained in Part 4 of 15 CFR (Public Information).
Effective Date: Dec. 30, 1988.
For Further Information Contact: Albin F. Drost by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: As presently written, 37 CFR 1.15 describes procedures for obtaining documents under the Freedom of Information Act that have been superseded. The purpose of this rule change is to bring the PTO FOIA procedures into conformity with the Department of Commerce FOIA rules. The final rule directly advises requesters that the PTO will follow the Department of Commerce rules for disclosure of information under FOIA.

A notice of proposed rulemaking was published on July 19, 1988 (53 Fed. Reg. 27 177). Interested parties were requested to submit written comments on or before Sept. 20, 1988. No comments were received.

Other Considerations

This rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources. This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354),

Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. § 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354] because no increase in fees or paperwork should result from this rule change.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12991. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. § 3501 et seq., since no record keeping or reporting requirement within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Records.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, the Patent and Trademark Office amends Title 37 of the Code of Federal Regulations as set forth below:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

AUTHORITY: 35 U.S.C. § 6 unless otherwise noted.

2. Section 1.15 is revised as follows:

§ 1.15 Requests for identifiable records.

(a) Requests for records, not disclosed to the public as part of the regular informational activity of the Patent and Trademark Office and which are not otherwise dealt with in the rules in this part, shall be made in writing, with the envelope and the letter clearly marked "Freedom of Information Request." Each such request, so marked, should be submitted by mail addressed to the "Patent and Trademark Office, Freedom of Information Request Control Desk, Box 8, Washington, D.C. 20231," or hand delivered to the Office of the Solicitor, Patent and Trademark Office, Arlington, Virginia. The request will be processed in accordance with the procedures set forth in Part 4 of Title 15, Code of Federal Regulations.

(b) Any person whose request for records has been initially denied in whole or in part, or has not been timely determined, may submit a written appeal as provided in § 4.8 of Title 15, Code of Federal Regulations.

(c) Procedures applicable in the event of service of process or in connection with testimony of employees on official matters and production of official documents of the Patent and Trademark Office in civil legal proceedings not involving the United States shall be those established in parts 15 and 15a of Title 15, Code of Federal Regulations.

Nov. 21, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1097 OG 15]

(200) **Patent Cooperation Treaty Update**

The United States Patent and Trademark Office has received notification from the World Itellectual Propety Organization that Canada deposited its instrument of ratification to the Patent Cooperation Treaty (PCT) on 02 October 1989. Therefore, according to PCT Article 63(2), Canada may be designated in international applications filed on and after 02 January 1990.

The Danish Patent Office has informed the International Bureeau that the Danish Parliament has approved the law ratifying the European Convention (EPC) and that the instrument of ratification will be deposited in time for the Convention to enter into force for Denmark on January 1, 1990. Consequently, as from January 1, 1990, it will be possible to file international applications designating Denmark for a national patent or for a European patent or for both.

See listing of PCTmember countries on next page

Listing of PCT Member Countries

Country	Ratification or Accession	Date of Ratification or Accession	Effective Date
(1)Central African Republic*	Accession	15 September 1971	01 June 1978
(2)Senegal*	Ratification	08 March 1972	01 June 1978
(3)Madagascar	Ratification	27 March 1972	01 June 1978
(4)Malawi	Accession	16 May 1972	01 June 1978
(5)Cameroon*	Accession	15 March 1973	01 June 1978
(6)Chad*	Accession	12 February 1974	01 June 1978
(7)Togo*	Ratification	28 January 1975	01 June 1978
(8)Gabon*	Accession	06 March 1975	01 June 1978
(9)United States of America	Ratification	26 November 1975	01 June 1978
(10)Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)Congo*	Accession	08 August 1977	01 June 1978
(12)Switzerland**	Ratification	14 September 1977	01 June 1978
(13)United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)France**	Ratification	25 November 1977	01 June 1978
(15)Soviet Union	Ratification	29 December 1977	01 June 1978
(16)Brazil	Ratification	09 January 1978	01 June 1978
(17)Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)Sweden**	Ratification	17 February 1978	01 June 1978
(19)Japan	Ratification	01 July 1978	01 October 1978
(20)Denmark**	Ratification	01 September 1978	01 December 1978
(21)Austria**	Ratification	23 January 1979	23 April 1979
(22)Monaco	Ratification	22 March 1979	22 June 1979
(23)Netherlands**	Ratification	10 April 1979	10 July 1979
(24)Romania	Accession	23 April 1979	23 July 1979
(25)Norway	Ratification	01 October 1979	01 January 1980
(26)Liechtenstein**	Accession	19 December 1979	19 March 1980
(27)Australia	Accession	31 December 1979	31 March 1980
(28)Hungary	Ratification	27 March 1980	27 June 1980
(29)Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30)Finland	Ratification	01 July 1980	01 October 1980
(31)Belgium**	Ratification	14 September 1981	14 December 1981
(32)Sri Lanka	Accession	26 November 1981	26 February 1982
(33)Mauritania*	Accession	13 January 1983	13 April 1983
(34)Sudan	Accession	16 January 1984	16 April 1984
(35)Bulgaria	Accession	21 February 1984	21 May 1984
(36)Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37)Mali*	Accession	19 July 1984	19 October 1984
(38)Barbados	Accession	12 December 1984	12 March 1985
(39)Italy**	Ratification	28 December 1984	28 March 1985
(40)Benin*	Accession	26 November 1986	26 February 1987
(41)Burkina Faso*	Accession	21 December 1988	21 March 1989
(42)Spain**	Accession	16 August 1989	16 November 1989
(43)Canada	Ratification	02 October 1989	02 January 1990

*Members of African Intellectual Propety Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

November 7, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

[1109 OG 3]

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(201) **Minimum Requirements for Acceptance of Applications Under 35 U.S.C. 371 (the National Stage of PCT)**

The Patent and Trademark Office is continuing to receive application papers which do not clearly identify whether the papers (1) are being submitted to enter the national stage of the Patent Cooperation Treaty (PCT) under 35 U.S.C. 371 or (2) are being filed as a regular national application under 35 U.S.C. 111.

Attention is directed to the notice in the *Official Gazette* at 1070 O.G. 11 titled "Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371" wherein at item eight it is stated

> "(8) Applicants should clearly indicate on all application papers filed for entry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111."

To clearly indicate an international application is being filed under 35 U.S.C. 371 the applicant should use the "Transmittal Letter for United States Designated Office" (Form PTO-1390) as the transmittal letter.

Alternatively, one of the following indications may be used:

> 1) the applicant shall clearly state in the transmittal or cover letter that he or she is filing under 35 U.S.C. 371 or entering the national stage under the PCT; or
>
> 2) the applicant clearly identifies in the oath or declaration the specification to which it is directed by referring to a particular international application by PCT Serial Number and International Filing Date and that he or she is executing the declaration as, and seeking a U.S. Patent as, the inventor of the invention described in the identified international application.

Applicants are cautioned that the identification of the international application, in the oath or declaration or otherwise, as a prior filed application for priority purposes is *not* considered to be an indication of an intention to file under 35 U.S.C. 371.

If there are any conflicting instructions as to which section of the statute (371 or 111) is intended the application will be accepted under 35 U.S.C. 111. It is strongly recommended that applicant use the Form PTO-1390 in all cases where a filing under 35 U.S.C. 371 is intended.

Mar. 16, 1987.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1077 OG 13]

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(202) **Patent Cooperation Treaty: Implementing Legislation and Withdrawal of the Reservation to Chapter II.**

On Oct. 9, 1986, the U.S. Senate gave its advice and consent to withdrawal by the United States of its declaration not to be bound by chapter II of the Patent Cooperation Treaty (PCT). Public Law 99-616, that amends title 35, United States Code, to implement U.S. adherence to PCT chapter II was enacted on Nov. 6, 1986.

On Apr. 1, 1987, the President notified the Director General of the World Intellectual Property Organization of the withdrawal of the declaration by the United States. As the withdrawal takes effect three months after the date of notification, the United States will be bound by the provisions of PCT chapter II on July 1, 1987.

A notice of proposed rulemaking concerning PCT chapter II was published in the *Federal Register* on Mar. 4, 1987 (52 Fed. Reg. 6696) and was reprinted in the *Official Gazette* on Mar. 17, 1987, (1076 OG 29). The text of the President's notification and of Public Law 99-616 are reprinted below.

Apr. 13, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

NOTIFICATION

RONALD REAGAN

PRESIDENT OF THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

CONSIDERING THAT:

The Patent Cooperation Treaty, with Regulations, done at Washington June 19, 1970, was signed by the United States on that date and ratified by the United States on November 27, 1973, subject to three declarations, in pursuance of the advice and consent of the Senate;

The United States deposited its instrument of ratification with the Director General of the World Intellectual Property Organization on November 26, 1975, and the Treaty entered into force for the United States on January 24, 1978;

At the request of the President, the Senate of the United States of America by its resolution of October 9, 1986, two-thirds of the Senators present concurring therein, gave its advice and consent to withdraw one of the declarations made when the United States deposited its instrument of ratification, to wit, under Article 64(1)(a), the United States would not be bound by the provisions of Chapter II of the Treaty;

NOW, THEREFORE, I, Ronald Reagan, President of the United States of America, hereby give notice and confirm the withdrawal of the declaration by the United States regarding Chapter II of the said Treaty.

IN TESTIMONY WHEREOF, I have signed this instrument withdrawing the said declaration and caused the seal of the United States of America to be affixed.

DONE at the city of Washington this twenty-seventh day of March in the year of our Lord one thousand nine hundred eighty-seven and of the Independence of the United States of America the two hundred eleventh.

By the President: Ronald Reagan

George P. Shultz
Secretary of State

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Public Law 99-616
99th Congress

An Act

To amend the patent laws implementing the Patent Cooperation Treaty.

Nov. 6, 1986

[S.1230]
35 USC 351 note.

28 UST 7645.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Act to authorize the United States to participate in chapter II of the Patent Cooperation Treaty".

SEC. 2. (a) Section 351(a) of title 35, United States Code, is amended by striking out ", excluding chapter II thereof".

(b) Section 351(b) of title 35, United States Code, is amended by striking out "excluding part C thereof".

(c) Section 351(g) of title 35, United States Code, is amended by—

(1) striking out "term" and inserting in lieu thereof "terms";

(2) inserting "and 'International Preliminary Examining Authority'" after "Authority"; and

(3) striking out "means" and inserting in lieu thereof "mean".

(d) Section 361(d) of title 35, United States Code, is amended to read as follows:

"(d) The international fee, and the transmittal and search fees prescribed under section 376(a) of this part, shall either be paid on filing of an international application or within such later time as may be fixed by the Commissioner.".

SEC. 3. The item relating to section 362 in the analysis for chapter 36 of title 35, United States Code, is amended to read as follows:

"362. International Searching Authority and International Preliminary Examining Authority.".

SEC. 4. Section 362 of title 35, United States Code, is amended to read as follows:

§ 362. International Searching Authority and International Preliminary Examining Authority

"(a) The Patent and Trademark Office may act as an International Searching Authority and International Preliminary Examining Authority with respect to international applications in accordance with the terms and conditions of an agreement which may be concluded with the International Bureau, and may discharge all duties required of such Authorities, including the collection of handling fees and their transmittal to the International Bureau.

"(b) The handling fee, preliminary examination fee, and any additional fees due for international preliminary examination shall be paid within such time as may be fixed by the Commissioner.".

SEC. 5. Section 364(a) of title 35, United States Code, is amended by—

(a) striking out "or", first occurrence and inserting in lieu thereof ",";

(b) inserting "International Preliminary Examining Authority" after "Authority, or"; and

(c) striking out "both".

SEC. 6 Section 368(c) of title 35, United States Code, is amended by—

(a) striking out the second occurrence of "or" and inserting in lieu thereof ",", and

(b) striking out "both" and inserting in lieu thereof "International Preliminary Examining Authority".

SEC. 7. (a) Section 371(a) of title 35, United States Code, is amended to read as follows:

"(a) Receipt from the International Bureau of copies of international applications with any amendments to the claims, international search reports, and international preliminary examination reports including any annexes thereto may be required in the case of international applications designating or electing the United States."

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22 (1) or (2), or under article 39(1)(a) of the treaty".

(c) Section 371(c)(4) of title 35, United States Code, is amended by striking the "." and inserting in lieu thereof ";".

(d) Section 371(c) of title 35, United States Code, is amended by adding at the end thereof the following new paragraph (5):

"(5) a translation into the English language of any annexes to the international preliminary examination report, if such annexes were made in another language.".

(e) Section 371(d) of title 35, United States Code, is amended by adding at the end thereof the following sentence: "The requirement of subsection (c)(5) shall be complied with at such time as may be fixed by the Commissioner and failure to do so shall be regarded as cancellation of the amendments made under article 34(2)(b) of the treaty"

(f) Section 371(e) of title 35, United States Code, is amended by inserting "or article 41" after "28"

SEC. 8.(a) Section 376(a) of title 35, United States Code, is amended by—

(1) inserting "and the handling fee" after the first occurrence of "fee";

(2) striking "amount is" and inserting in lieu thereof "amounts are",

(3) redesignating paragraph (5) as paragraph (6); and

(4) inserting the following new paragraph (5):

"(5) A preliminary examination fee and any additional fees (see section 362(b))."

(b) Section 376(b) of title 35, United States Code, is amended by—

(1) inserting "and the handling fee" after the first occurrence of "fee' in the first sentence; and

(2) inserting "the preliminary examination fee and any additional fees," after "fee," in the third sentence.

SEC. 9. Sections 2 through 8 of this Act shall come into force on the same day as the effective date of entry into force of chapter II of the Patent Cooperation Treaty

Effective date.
35 USC note.

with respect to the United States, by virtue of the withdrawal of the declaration under article 64(1)(a) of the Patent Cooperation Treaty. It shall apply to all international applications pending before or after its effective date.

28 UST 7645.

Approved Nov. 6, 1986.

LEGISLATIVE HISTORY—S. 1230:

SENATE REPORTS: No. 99-275 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 132 (1986):
Oct. 16, considered and passed Senate.
Oct. 17, considered and passed House.

[1078 OG 10-13]

(203) **Implementation of Chapter II of the Patent Cooperation Treaty**

This notice is intended to be a summary of various notices published to implement Chapter II of the Patent Cooperation Treaty (PCT) on July 1, 1987.

1. *Withdrawal of reservation and implementing legislation.*

A copy of the withdrawal of the reservation as to Chapter II of the PCT under PCT Article 64(6)(b) and a copy of Public Law 99-616 implementing Chapter II of the PCT were published in the Official Gazette of May 12, 1987 at 1078 O.G. 10-13.

The proposed rule change relating to the implementation of Chapter II of the PCT was published on Mar. 4, 1987 in the Federal Register at 52 F.R. 6696-6707 and on Mar. 17, 1987 in the Official Gazette at 1076 O.G. 29-40. The final rules were published on May 28, 1987 in the Federal Register 52 F.R. 20038-20052 and on June 16, 1987 in the Official Gazette at 1076 O.G 32.

A listing of all current member countries of the PCT was published on Mar. 3, 1987 at 1076 O.G. 3. After July 1, 1987 only Denmark, Norway, Liechtenstein, Switzerland and the Republic of Korea (South Korea) retain reservations as to Chapter II of the PCT.

A listing of the level of PCT fees effective July 1, 1987, both because of rulemaking and a change in the exchange rate was published on June 23, 1987 in the Official Gazette at 1079 O.G. 50.

A notice clarifying the requirements for entering the national stage in the United States under 35 U.S.C. 371 was published on Apr. 14, 1987 at 1077 O.G. 13.

2. *International Preliminary Examining Authorities*

The United States has informed the Director General of the World Intellectual Property Organization (WIPO) that the United States Patent and Trademark Office (USPTO) will serve as an International Preliminary Examining Authority for any international application filed in the United States Receiving Office and for any international application for which the USPTO has served as the International Searching Authority.

Applicants who have filed their international applications in the USPTO as a Receiving Office may choose to have the European Patent Office (EPO) serve as their International Preliminary Examining Authority *if* (1) the EPO has served as the International Searching Authority for the international application and (2) the demand filed with the EPO is one of the first 500 demands filed by applicants who have filed their international applications in the United States Receiving Office in one of the 3 years beginning July 1, 1987.

The attention of applicants desiring to use the EPO as an International Preliminary Examining Authority is also directed to the notice titled "Information for PCT applicants concerning the procedure before the EPO as an International Preliminary Examining Authority under Chapter II of the PCT" published in the Official Journal of the European Patent Office in volume 12/1986 at pages 441-445.

A copy of the "Memorandum of Understanding" to monitor the number of demands filed in the EPO by U.S. applicants between the USPTO and EPO appears below.

June 11, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks United States Patent and Trademark Office.

Memorandum of Understanding

Procedures for monitoring and processing demands submitted to the European Patent Office by U.S. applicants who filed their international applications with the United States Receiving Office.

Purpose

The purpose of this memorandum is to set forth the procedures to be used to monitor the number of demands for international preliminary examination filed by U.S. applicants in the European Patent Office (EPO) in respect of international applications filed with the United States Receiving Office (hereinafter referred to as "demands filed in the EPO by U.S. applicants"). Such monitoring is important in view of the limit of 500 international preliminary examination reports which the EPO has agreed to establish during each of the first three years that PCT Chapter II is in effect as to the United States of America. The memorandum also sets forth the processing procedures for any demands filed in excess of the agreed to-amount.

Monitoring of Number of Demands

It is essential that U.S. applicants be informed as to the number of demands which have already been filed in the EPO by U.S. applicants, especially where the number of demands filed in the EPO is approaching 500.

In order to provide such numerical information to the U.S. applicants, the EPO will provide to the USPTO, each month during the first three years by telex, the cumulative number of demands filed in the EPO by U.S. applicants during that particular year. The USPTO will then publish a notice which indicates the number of demands filed in the EPO by U.S. applicants as of a particular date, in its Official Gazette. The number of demands filed, based upon the latest known information, will also be supplied by telephone or telex to interested persons by both the EPO and USPTO.

Processing of Demands in Excess of 500

Since the EPO will only accept 500 demands a year from U.S. applicants, the USPTO will accept any demands beyond the 500 limit filed in the EPO by U.S. applicants.

Upon receipt by the EPO of the 501st and subsequent demands from a U.S. applicant, the EPO will promptly notify the applicant that it is not competent under PCT Rule 59.1 to receive the demand. The EPO will also immediately telex or telephone the USPTO and inform it of the international appli-

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cation serial number so that the USPTO may make immediate contact with the applicant.

The EPO will refund any fees paid by the applicant to the EPO and indicate that only the USPTO is competent to receive the demand and establish the international preliminary examination report, and that the demand is being forwarded to the USPTO. The EPO will indicate the date of receipt of the demand on the demand and promptly forward it to the USPTO for further processing. The EPO will be considered to be the agent of the USPTO for purposes of receiving and dating demands. The USPTO will correspond with the applicant concerning the demand and require the payment of fees to the USPTO under PCT Rules 57.4 and 58.2.

For purposes of this procedure, the contact person in the USPTO is Louis O. Maassel (telephone 703-557-3070) and the contact person in the EPO is Mr. Colin Philpott (telephone 2399-2479) for substantive and organizational matters, or Mrs. M. Houyez-Stevens (telephone 2399-2423) for numerical information.

PAUL BRAENDLI
President,
European Patent Office.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks
United States Patent and Trademark Office.

[1080 OG 2]

(204) **Patent Cooperation Treaty (PCT) Update**

Number of demands received by the IPEA/EP from US applicants and Guidelines for use of the European Patent Office as International Preliminary Examining Authority.

Number of demands for International Preliminary Examination filed by US applicants with the European Patent Office as International Preliminary Examining Authority (IPEA/EP) as of April 29, 1988

As of April 29, 1988, the European Patent Office acting as International Preliminary Examining Authority (IPEA/EP) had received 257 demands for International Preliminary Examination from US applicants who filed their international applications with the United States Receiving Office.

Guidelines for use of the European Patent Office as International Preliminary Examining Authority

The European Patent Office (EPO) has informed the United States Patent and Trademark Office of a number of problems which have arisen with demands originating from US applicants. These problems can cause serious delays in the handling of demands and, in some cases, may result in a loss of rights or in responses being disregarded.

In particular, attention is drawn to the following points:

1. When a demand for International Preliminary Examination has been properly filed after the expiration of 19 months from the earliest priority date (or filing date when no priority is claimed), it is nevertheless validly submitted. However, the consequence of the *late filing* of the demand is that the applicant has to start the regional/national phase under Article 22 of the Treaty before the expiration of 20 months from the earliest priority date and *will not benefit* from the extension to 30 months from the earliest priority date for starting the regional/national phase under Article 39.
2. A power of attorney when needed — because of a change in the appointment of an agent or common representative under PCT Rule 90.3 — must be filed with the *International Bureau* or with the *Receiving Office*.
   However, it is recommended to file a photocopy thereof with the EPO in Munich for Information.
3. Reply to the first/second opinion (Form PCT/IPEA/408):

   (a) A written reply must contain an *original signature* (i.e. not a photocopy) by an authorized person (PCT Rule 92.1).

   (b) A reply sent by facsimile/telex/telegram must be confirmed in writing *within 14 days* from the date of its receipt; otherwise, it shall be considered not to have been submitted (PCT Rule 92.4(a)).

   (c) A reply filed outside the time limit set may be disregarded.
   Computation of the time limit is effected according to PCT Rule 80.
4. When using facsimile or telex as a means of correspondence, the communication should contain the complete appropriate number (i.e. for the facsimile: State, place, facsimile number) to facilitate a possible reply from the EPO.
5. Withdrawal of the demand for international preliminary examination or the election of any State under PCT Article 37 and Rule 75.1 must be effected by signed notice of the applicant to the *International Bureau*.
   However, it is recommended to file a photocopy thereof with the EPO in Munich for information.
6. Any withdrawal of the international application under PCT Rule 32.1 must be accomplished by signed notice of the applicant to the *International Bureau or Receiving Office*, not to the EPO in Munich.
   However, it is recommended to file a photocopy thereof with the EPO in Munich for information.
7. A notice providing general information for PCT applicants concerning the procedure before the EPO as an IPEA under PCT Chapter II can be found in the Journal EPO No. 12/1986, pages 441 to 445.

May 12, 1988

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

[1091 OG 2-3]

(205) **Patent Cooperation Treaty (PCT) Update**

Translation of the International Preliminary Examination Report (IPER) into Russian no longer required, Withdrawal by Japan of the reservation concerning filing a qatranslation of the international application by 20 months and Number of Demands received by the IPEA/EP from U.S. applicants.

Translation of the IPER into Russian no longer required

The following information was released by the World Intellectual Property Organization (WIPO) on July 17, 1987.

Pursuant to PCT Rule 72.1 the USSR State Committee for Inventions and Discoveries has informed the International Bureau of a change in the languages into which it requires a translation of the International Preliminary Examination Report (IPER) by the International Bureau.

> As from July 8, 1987, a translation of the IPER into Russian will no longer be required if the IPER has been established in English . . . .

Consequently, as of July 8, 1987, the payment of a multiple of the handling fee under PCT Rule 57.2(a) for a translation into Russian is no longer required if the Soviet Union is elected in demand for International Preliminary Examination filed in English. Nor will the supplement to the handling fee under PCT Rules 57.1(b) and 57.2(b) apply if the Soviet Union is elected in a later election under PCT Rule 56 filed with the International Bureau on or after July 8, 1987.

Withdrawal by Japan of the reservation concerning filing a translation of the International application by 20 months from the priority date

On Sept. 16, 1987, WIPO announced that on Sept. 8, 1987, the Government of Japan notified the withdrawal of the declaration made by it under PCT Article 64(2)(a) concerning the time limit applicable under Chapter II of the PCT for the furnishing of a translation of the international application. Thus, Japan will become bound by the provisions of PCT Chapter II without any reservations on Dec. 8, 1987.

Pursuant to the said declaration, the translation of an international application into Japanese must at present be furnished to the Japanese Patent Office in all cases within 20 months from the priority date.

The withdrawal of the said declaration has the effect that, as from Dec. 8, 1987, the provisions of PCT Article 39 (1)(a) (under which a translation of the international application into Japanese must be furnished within 30 months from the priority date) will apply in respect of the Japanese Patent Office as elected Office.

This 30 month time limit applies also to international applications which have been filed before Dec. 8, 1987, provided that Japan has been elected in a demand for international preliminary examination or in a later election prior to the expiration of the 19th month from the priority date *and* that on Dec. 8, 1987, 20 months from the priority date have not expired.

Number of demands for International Preliminary Examination filed by U.S. applicants with the European Patent Office as International Preliminary Examining Authority (IPEA/EP) as of Oct. 31, 1987

Pursuant to the Memorandum of Understanding between the European Patent Office (EPO) and the USPTO concerning monitoring Demands submitted to the IPEA/EP by U.S. applicants, published at 1080 O.G. 2 on July 7, 1987, the number of Demands filed by U.S. applicants (who filed their international applications with the United States Receiving Office) with the IPEA/EP as of Oct. 31, 1987 was 70.

Nov. 17, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1085 OG 30]

(206) **Patent Cooperation Treaty (PCT) Update**

Withdrawal of the Declaration under PCT Article 64(1)(a) by Norway and Number of Demands Received by the IPEA/EP from U.S. Applicants

Withdrawal of the Declaration under PCT Article 64(1)(a) by Norway Effective Jan. 1, 1989

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) of their receipt on Oct. 1, 1988 of the notification of the withdrawal by Norway of the declaration under PCT Article 64(1)(a) that it shall not be bound by Chapter II of the PCT. Thus, Norway will become bound by Chapter II of the PCT on Jan. 1, 1989.

The withdrawal of the said declaration has the effect that, on Jan. 1, 1989:

(a) Norway may be elected in demands for international preliminary examination or in later elections submitted in request of international applications in which Norway is a designated State;
(b) nationals and residents of Norway may submit demands for international preliminary examination of international applications filed by them;
(c) although demands or later elections concerning Norway may be submitted only on or after Jan. 1, 1989, they may be submitted in respect of international applications irrespective of whether such applications were or will be filed before, on or after Jan. 1, 1989.

Number of Demands for International Preliminary Examination filed by U.S. Applicants with the European Patent Office as International Preliminary Examining Authority (IPEA/EP) as of Sept. 30, 1988

As of Sept. 30, 1988 the European Patent Office acting as International Preliminary Examining Authority (IPEA/EP) had received 131 demands for International Preliminary Examination since July 1, 1988 from U.S. applicants who filed their international applications with the United States Receiving Office.

Oct. 26, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1096 OG 34]

(207) **Patent Cooperation Treaty (PCT) Update**

Withdrawal of the Declaration under PCT Article 64(1)(a) by Denmark Effective Nov. 1, 1988

The United States Patent and Trademark Office has received notification from the World Intellectual Organization (WIPO) of their receipt on Aug. 1, 1988 of the notification of the withdrawal by Denmark of the declaration under PCT Article 64(1)(a) that it shall not be bound by Chapter II of the PCT. Thus, Denmark will become bound by Chapter II of the PCT on Nov. 1, 1988.

The withdrawal of the said declaration has the effect that, on Nov. 1, 1988:

(a) Denmark may be elected in demands for international preliminary examination or in later elections submitted in respect of international applications in which Denmark is a designated State;
(b) nationals and residents of Denmark may submit demands for international preliminary examination of international applications filed by them;
(c) although demands or later elections concerning Denmark may be submitted only on or after Nov. 1, 1988, they may be submitted in respect of international applications irrespective of whether such applications were or will be filed before, on or after Nov. 1, 1988.

Sept. 7, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademark.

[1095 OG 2]

(208) **Request for Comments on the Desirability of Permitting Acceptance of Unintentionally Delayed Payment of Maintenance Fees and Revival Under 35 USC 111 of Unintentionally Abandoned Applications**

The Patent and Trademark Office has received suggestions that it would be desirable for unintentionally delayed payment of maintenance fees to be accepted and for revival of unintentionally abandoned applications to be permitted for applications abandoned for failure to submit the required fee and/or oath within the prescribed period under 35 USC 111. The purpose of this notice is to solicit public comment on draft legislation permitting acceptance of unintentionally delayed payment of maintenance fees and revival of unintentionally abandoned applications under 35 USC 111. The draft legislation follows this notice.

At the present, late payment of a maintenance fee under 35 USC 41(c)(1), and late submission of the filing fee and/or the oath under 35 USC 111 can only be accepted if the delay was unavoidable. The draft amendments provide for reinstatement of a patent to an enforceable status or revival of a patent application to a pending status in the cases of unintentional as well as unavoidable late payment of a maintenance fee and late submission of the filing fee and/or the oath respectively.

The intent of these draft amendments is to be consistent with other sections of Title 35, United States Code, which permit revival of unintentionally or unavoidably abandoned applications. Therefore, these draft amendments would permit the Commissioner to accept a late response under 35 USC 41(c)(1)

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and 35 USC 111 if the delay in submitting the response is shown to be either unavoidable or unintentional.
Dates: Comments and suggestions should be received by July 1, 1988.
Addresses: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 to the attention of Jeffrey V. Nase, Petitions Examiner, Crystal Plaza 3-11A09. For further information, contact Jeffrey V. Nase at telephone number (703) 557-4282.

Apr. 1, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

* * * * *

Proposed amendments to sections 41(c)(1) and 111 of Title 35, United States Code (new language is italic).

(1) Amend 35 USC 41 (c)(1) to read as follows:

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section *filed* after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable *or unintentional*. The Commissioner may require the payment of *surcharges in different amounts as a condition of accepting an unavoidably or unintentionally delayed* payment of any maintenance fee after the six-month grace period. *The Commissioner may not accept an unintentionally delayed payment of a maintenance fee filed later than six months after the six-month grace period.* If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) Amend 35 USC 111 to read as follows:

§ 111 Application for Patent

Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawings are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable *or unintentional*. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

Purpose of the Amendments to Sections 41 and 111:

The amendments being proposed to sections 41 and 111 are intended to provide for an increased opportunity for revival of abandoned applications or reinstatement of expired patents. At the present, under the aforementioned sections of Title 35, late payment of a maintenance fee or filing fee or late filing of an oath can only be accepted by the Commissioner for reasons that the delay was unavoidable while other sections of Title 35 permit revival of applications for unavoidable as well as unintentional reasons. Some members of the public have pointed out that there is no sound policy reason for the inconsistency in the discretion that the Commissioner may exercise in reviving abandoned applications or accepting late payment of a fee in appropriate circumstances. The intent of these draft amendments is to respond to this criticism by providing consistency between the sections of Title 35 regarding the revival of abandoned applications and the reinstatement of expired patents. These draft amendments achieve their objectives by providing for reinstatement of expired patents under 35 USC 41 (c)(1) and revival of abandoned applications under 35 USC 111 for unintentional reasons. By making the reasons regarding revival of abandoned applications and reinstatement of expired patents more consistent throughout Title 35, these draft amendments will provide an increased opportunity for, and make revival of, abandoned applications and reinstatement of expired patents less burdensome and confusing to the public.

Section Analysis:

Section (1) of this bill amends subsection 41(c)(1) of Title 35, United States Code, to give the Commissioner the authority to accept payment of any maintenance fee after the six-month grace period if the delay in payment was unintentional and the payment was made not later than six months after the end of the six-month grace period. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment of the maintenance fee on the basis of unintentional delay.

The Commissioner would establish surcharges as a precondition to acceptance of a late payment of a maintenance fee. The surcharge established for acceptance of a late payment of a maintenance fee based on unintentional delay would be substantially higher than the surcharge established for acceptance of a late payment of a maintenance fee based on unavoidable delay.

Under this section, a late payment of a maintenance fee would not be accepted where the failure to pay the maintenance fee was intentional as opposed to being unintentional or unavoidable. This subsection would permit the Commissioner to have more discretion than present law to accept late payment of the maintenance fee in appropriate circumstances. The intervening rights provided in subsection 41(c)(2) of Title 35, United States Code, would protect the rights of any person or their successors in business who made, purchased or used anything protected by the patent after the six-month grace period but prior to the acceptance of the maintenance fee based on unintentional delay.

Section (2) of this bill would amend section 111 of Title 35, United States Code, to authorize the Commissioner to revive applications unintentionally abandoned under section 111 in the same manner as the Commissioner presently revives applications unintentionally abandoned under 35 USC 41(a)7. It is intended that the fees for filing a petition for the revival of an unavoidably or unintentionally abandoned application pursuant to section 111 be the same as the fees established by the Commissioner for filing a petition for the revival of unintentionally or unavoidably abandoned application pursuant to subsection 41(a)7 of Title 35, United States Code. This amendment would permit the Commissioner to have more discretion than present law to revive applications abandoned pursuant to section 111 in appropriate circumstances.

[1089 OG 55]

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(209) Requests for Comments on the Desirability of Permitting More Participation by Non-Patent Owner Requesters During Reexamination

The Patent and Trademark Office has received indications and suggestions that reexamination requesters who are not the patent owner be permitted to participate more fully during reexamination proceedings than is now permitted under the present statute (35 USC 302-307) and rules (37 CFR 1.510-1.570). The purpose of this notice is to solicit public comment on draft legislation permitting more participation by non-patent owner requesters during reexamination proceedings. The draft legislation follows this notice.

The draft amendments to the reexamination statute permit increased requester participation throughout the reexamination proceeding including appeal to the Court of Appeals for the Federal Circuit and permit rejection of patent claims in reexamination for lack of compliance of the claims or the specification of the patent with the requirements of 35 USC 112. The amendments being proposed to sections 303, 305, and 306 are intended to increase the value of the reexamination proceeding to the public, and particularly the person requesting reexamination of another's patent, by providing well-defined, but limited, opportunities for the requester to participate in the examination process after it has begun. At present, the person requesting reexamination, if not the patent owner, is not able to participate in, or comment upon, the examination process after it has begun. The intent of these draft amendments is to provide well-defined, but limited, opportunities for the reexamination requester to comment upon, and participate in, each stage of the examination after it has begun, but to do so in such a manner that the requirement of section 305 of this title that reexamination proceedings "be conducted with special dispatch within the Office" is met.

Presently, issues under 35 USC 112 may only be raised during reexamination with respect to new claims or the amendatory subject matter of original claims. The draft amendment provides for the raising of issues under 35 USC 112 with respect to any claim - new, amended, or original.

Although not specifically provided for in the draft amendments to the statute, this increased requester participation contemplates the Commissioner, under appropriate guidelines, permitting the requester to attend, as an observer, interviews between the examiner and the patent owner. For example, the requester might not be permitted to participate in any manner. The requester might, however, be permitted to file into the reexamination record a summary of the interview or comments on the patent owners or examiner's summary.

The amendment provides a person requesting reexamination, who is not the patent owner, with the opportunity, within the times and conditions established by the Commissioner, to effectively respond to the positions taken by the patent owner during the reexamination proceeding. The amendment provides that a fee or fees for increased requester participation may be established. This could be done, for example, by an increase in the initial reexamination filing fee for all reexaminations, by requiring an individual fee for the right to further participation for each paper filed, or by a combination of such fees.

The amendment also provides the requester with the opportunity, under appropriate conditions, to appeal decisions which are favorable to patentability to the Board of Patent Appeals and Interferences and to the United States Court of Appeals for the Federal Circuit. The amendment is intended to assist the public, including patent owners and alleged or potential infringers, and the Federal courts, by providing a more expeditious and less costly alternative to patent litigation to determine questions of patentability based on patents and printed publications. These amendments will provide the public and the Federal courts with the opportunity in appropriate cases, to obtain a decision as to the patentability of subject matter which may be given preclusive effect. These amendments therefore will make patent litigation less costly and reexamination more attractive and effective.

Dates: Comments and suggestions should be received by March 1, 1988. A public hearing will be held on March 8, 1988, beginning at 9:30 a.m. in Room 11C10 on the 11th floor of Building 3, located at Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Va. Requests to make oral presentations at the hearing should be received on or before March 1, 1988.

Addresses: Address written comments and requests to make oral presentation to the Commissioner of Patent and Trademarks, Washington, D.C 20231 to the attention of R. Franklin Burnett, Crystal Plaza 3-11A13. For further information contact R. Franklin Burnett by telephone at (703) 557-3054.

Nov. 17, 1987

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Proposed Amendments to Sections 303, 305, and 306 of title 35, United States Code (New language is italic)

(1) Amend 35 U.S.C. § 303(c) to read as follows:

(c) *The Commissioner may refund a portion of the reexamination fee required under section 302 of this title upon a final determination that no substantial new question of patentability has been raised unless an appeal under the provisions of section 306 of this title is filed.*

(2) Amend 35 U.S.C. § 305 to read as follows:

§ 305 Conduct of reexamination proceedings

After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. *The examination will include issues under section 112 of this title relating to the patent undergoing reexamination and to proposed amendments to the patent. The person requesting reexamination may file a single set of comments on each notice of examination pursuant to section 132 of this title or the patent owner's response to each notice of examination pursuant to section 132 of this title, within such time and conditions, and upon payment of such fee or fees, as the Commissioner shall establish. The Commissioner may establish the fee or fees as a part of the reexamination fee under section 302 of this title or require the fee or fees to be paid at another time by the requester.* In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Patent Appeals and Interferences will be conducted with special dispatch within the Office.

(3) Amend 35 U.S.C. § 306 to read as follows:

306 Appeal

The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and under the provisions of sections 141 to *144* of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent. *Any person requesting reexamination, who is not the patent owner, may appeal to the Board of Patent Appeals and Interferences within such time and conditions and upon the payment of such fee as the Commissioner shall establish, with respect to any decision favorable to patentability or a final order denying reexamination because no substantial new question of patentability has been raised. Any person requesting reexamination, who is not the patent owner, may appeal, under the provisions of sections 141 to 144 of this title, with respect to any decision of the Board of Patent Appeals and Interferences favorable to patentability, or any decision of the Board of Patent Appeals and Interferences upholding a final order denying reexamination because no substantial new question of patentability has been raised.*

Purpose of the Amendments To Sections 303, 305, and 306

The amendments being proposed to sections 303, 305, and 306 are intended to increase the value of the reexamination proceeding to the public, and particularly to the person requesting reexamination of another's patent, by providing well-defined, but limited, opportunities to participate in the examination process after it has begun. At present, the person requesting reexamination, if not the patent owner, is not able to participate in, or comment upon, the examination process after it has begun. Some members of the public view this total lack of the ability to participate in, or comment upon, the examination process after it has begun as a serious drawback to the effectiveness of reexamination. The intent of these amendments is to respond to this criticism by providing well-defined, but limited, opportunities for the reexamination requester to comment upon, and participate in, each stage of the examination after it has begun, but to do so in such a manner that the requirement of section 305 of this title that reexamination

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proceedings "be conducted with special dispatch within the Office" is met. This amendment achieves its objectives by providing a person requesting reexamination, who is not the patent owner, with the opportunity, within the times and conditions established by the Commissioner, to effectively respond to the positions taken by the patent owner during the reexamination proceeding. Such a person is also provided with the opportunity, under appropriate conditions, to appeal decisions which are favorable to patentability to the Board of Patent Appeals and Interferences and to the United States Court of Appeals for the Federal Circuit. This amendment is intended to assist the public, including patent owners and alleged or potential infringers, and the Federal courts, by providing a more expeditious and less costly alternative to patent litigation to determine questions of patentability based on patents and printed publications. These amendments will provide the public and the Federal courts with the opportunity in appropriate cases, to obtain a decision as to the patentability of subject matter which can be given preclusive effect. These amendments therefore will make patent litigation less costly and reexamination more attractive and effective.

Section Analysis

Section (1) of this bill amends paragraph (c) of section 303 of title 35 to authorize the Commissioner to refund a portion of the reexamination fee required under section 302 of title 35 upon a final determination that no substantial new question of patentability has been raised unless an appeal under the provisions of the amendment to {g49 306 is filed. If an appeal to the Board of Patent Appeals and Interferences is filed, no refund is proper since the additional expense to the Office makes a refund inappropriate. Further, the refusal to refund a portion of the reexamination fee when an appeal is filed will discourage frivolous appeals.

Section (2) of this bill amends section 305 of title 35, United States Code, by adding to the section a new sentence including examination under section 112 of this title of all claims in a reexamination including those in the patent and those in proposed amendments to the patent. This will allow issues under section 112 with regard to the patent claims to be resolved in the reexamination along with such issues as are now being considered as to new claims or amendments to the claims of the patent under reexamination. It is not intended to extend reexamination to other issues such as whether the invention was on public use or sale or whether there was inequitable conduct in obtaining the patent. Such issues may be decided in the courts in view of the evidence presented after discovery and testimony. A new sentence is also added to the section permitting a person requesting reexamination to file either comments on each notice of examination pursuant to section 132 of this title or a reply to the patent owner's response to each notice of examination pursuant to section 132 of this title, within such time and conditions, and upon payment of such fee or fees, as the Commissioner shall establish. This amendment would permit the person requesting reexamination to have one opportunity to comment upon each notice of examination pursuant to section 132 of this title. If the person requesting reexamination is the patent owner, the patent owner's comments under this section would be expected to be incorporated into the patent owner's response to each notice of examination and the Commissioner could so require. If the person requesting reexamination is not the patent owner, this amendment would permit the requester to file a single set of comments on each notice of examination under section 132, i.e., each of the patent examiner's official actions, or the patent owner's response to each of the examiner's actions. Under this amendment, although a requester could file a set of comments on an official action by the examiner without waiting for the patent owner's response, it is not anticipated that most requesters will do so. A requester would file a set of comments on the examiner's official action, however, in situations where no response is expected by the patent owner.

The amendment authorizes the Commissioner to establish appropriate times and conditions for the filing of the comments or reply such that the requirement of this section that reexamination proceedings "be conducted with special dispatch within the Office" will be met. The Commissioner may limit the content and/or length of the comments or reply, if appropriate, to ensure that the procedure is orderly and conducted with special dispatch. The Commissioner may also, in the Commissioner's discretion, permit the requester to reply to any petitions or other submissions of the patent owner which the Commissioner may authorize to be filed during the reexamination proceeding. It is contemplated that the Commissioner will set strict times for the filing of the comments or reply in order to ensure that the reexamination proceedings are conducted expeditiously. Further, the Commissioner may, in the Commissioner's discretion, return any unauthorized or untimely comments or replies. The requester may be permitted to be present during interviews with the patent owner, subject to guidelines established by the Commissioner.

The amendment authorizes the Commissioner to establish a fee or fees for the increased requester participation. The Commissioner could do so by establishing the fee or fees as part of the reexamination fee under section 302 of this title or requiring the fee or fees to be paid at another time, e.g., upon filing the first or each comment or reply.

Section (3) of this bill amends section 306 of title 35, United States Code, by providing for an appeal to the Court of Appeals for the Federal Circuit by a patent owner from a decision adverse to patentability rather than providing alternative routes of review under both sections 141 and 145. Section (3) also amends section 306 to provide that any person requesting reexamination, who is not the patent owner, may appeal to the Board of Patent Appeals and Interferences within such time and conditions and upon the payment of such fee as the Commissioner shall establish, with respect to any decision favorable to patentability or a final order denying reexamination because no substantial new question of patentability has been raised. Section (3) also amends section 306 to provide that any person requesting reexamination, who is not the patent owner, may appeal to the Court of Appeals for the Federal Circuit with respect to any decision of the Board of Patent Appeals and Interferences favorable to patentability, or any decision of the Board of Patent Appeals and Interferences upholding a final order denying reexamination because no substantial new question of patentability has been raised.

The amendments to section 306 to require that appeals by either the patent owner or the requester, who is not the patent owner, be directed to the Court of Appeals for the Federal Circuit are designed to eliminate the limited de novo consideration in the District Court which does not appear necessary and to prevent the anomalous situation which would result if the patent owner and the requester, who is not the patent owner, could appeal or seek review in different courts. These amendments will not adversely affect the rights of either the patent owner or the requester, who is not the patent owner, since reexamination proceedings involve decisions based on patents and printed publications or admissions and previous determinations on any grounds by the courts or the Patent and Trademark Office and are suited for consideration by the Court based on the record before the Patent and Trademark Office.

The amendment to section 306 is intended to permit an appeal to the Board of Patent Appeals and Interferences of a final order denying reexamination because no substantial new question of patentability has been raised only in those circumstances where the request is found to contain no substantial new question of patentability and an order for reexamination is denied. If the reexamination request is granted on any basis, this amendment would not permit an appeal on other grounds upon which reexamination was not ordered. In such circumstances where reexamination has been ordered, any appeal would be on the basis that the decision of the examiner was favorable to patentability and not on the basis of an order denying reexamination. This amendment to section 306, provides a route of appeal to the Court of Appeals for the Federal Circuit for any person requesting reexamination, who is not the patent owner, of any decision of the Board of Patent Appeals and Interferences upholding a final order denying reexamination because no substantial new question of patentability has been raised. If reexamination of the patent is ordered as a result of the request for any reason, this route of appeal does not exist. The amendment does not provide for participation by the patent owner in any appeal of a final order denying reexamination because no substantial new question of patentability has been raised since the patent owner will fully participate if reexamination is ordered as a result of the appeal. In this respect, the amendment is consistent with the reexamination procedures in effect prior to the amendment which do not permit participation by the patent owner prior to the determination on the request for reexamination. The amendment also contemplates that precluding the patent owner from participating in any appeal of a final order denying reexamination will be less expensive to the patent owner and will simplify and expedite the appeal. The patent owner will not lose any rights by not having to participate until reexamination is ordered.

[1086 TMOG 445-448]

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(210) **Patentable Subject Matter**

Mathematical Algorithms and Computer Programs

The following represents a recent legal analysis done by Associate Solicitor Lee E. Barrett, an attorney in the Office of the Solicitor of the Patent and Trademark Office, on the subject of the patentability of mathematical algorithms and computer programs. The analysis is published for the benefit of the public.

August 9, 1989

FRED E. McKELVEY
Solicitor

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Discussion

I. *Statutory Subject Matter - 35 U.S.C. § 101*

Inventions may be patented only if they fall within one of the four statutory classes of subject matter of 35 U.S.C. § 101: "process, machine, manufacture, or composition of matter." *See Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 483, 181 USPQ 673, 679 (1974):

> [N]o patent is available for a discovery, however useful, novel, and nonobvious, unless it falls within one of the express categories of patentable subject matter of 35 U.S.C. § 101.

Subject matter that does not fall within one of the statutory classes of 35 U.S.C. § 101 is said to be "nonstatutory" or to be "unpatentable subject matter."

The broad language of § 101 is intended to dilineate a "general industrial boundary" of patentable invention. *In re Bergy*, 596 F.2d 952, 974 n.11, 201 USPQ 352, 372 n.11 (CCPA 1979), *vacated*, 444 U.S. 1028, *aff'd sub nom., Diamond v. Chakrabarty*, 447 U.S. 303, 206 USPQ 193 (1980). The first statutory class, process, is defined in 35 U.S.C. § 100(b) and refers to *acts*, while the last three classes, machine, manufacture and composition of matter, refer to physical *things*; therefore, the general field of patentable invention consists of new acts and new things. *Id.* The classes relevant to this discussion are "process" and "machine." A "process" is equivalent to a "method." *Bergy*, 596 F.2d at 965, 201 USPQ at 364. The term "machine" is used interchangeably with "apparatus." *In re Prater*, 415 F.2d 1393, 1395 n.11, 162 USPQ 541, 543 n.11 (CCPA 1969).

The question of whether a claimed invention satisfies the other conditions for patentability is "wholly apart from whether the invention falls into a category of statutory subject matter" (emphasis deleted). *Diamond v. Diehr*, 450 U.S. 175, 190, 209 USPQ 1, 9 (1981) (citing *Bergy*, 596 F.2d at 961, 201 USPQ at 361). As stated in *Parker v. Flook*, 437 U.S. 584, 593, 198 USPQ 193, 198-99 (1978):

> The obligation to determine what type of discovery is sought to be patented must precede the determination of whether that discovery is, in fact, new [i.e., novel under § 102] or obvious [§ 103].

See also In re Sarkar, 588 F.2d 1330, 1333 n.10, 200 USPQ 132, 137 n.10 (CCPA 1978) ("If the subject matter as claimed is subject to patenting, i.e., if it falls within § 101, it must them be examined for compliance with §§ 102 and 103").

Legislative history indicates that Congress contemplated that the subject matter provisions be given a broad construction and were intended to "include anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U.S. at 309, 206 USPQ at 197. Any process, machine, manufacture, or composition of matter constitutes statutory subject matter *unless* it falls within a judicially determined exception to § 101. *In re Pardo*, 684 F.2d 912, 916, 214 USPQ 673, 677 (CCPA 1982). Exceptions include laws of nature, physical phenomena and abstract ideas. *Diehr*, 450 U.S. at 185, 209 USPQ at 7, and cases cited therein. This analysis addresses whether mathematical algorithms and computer programs are statutory subject matter.

II. *Mathematical Algorithms*

A. *Mathematical algorithms per se are not a statutory "process" under § 101*

A mathematical algorithm is defined as a "procedure for solving a given type of mathematical problem." *Gottschalk v. Benson*, 409 U.S. 63, 65, 175 USPQ 673, 674 (1972); *Flook*, 437 U.S. at 585 n.1, 198 USPQ at 195 n.1; *Diehr*, 450 U.S. at 186, 209 USPQ at 8. Mathematical algorithms are nonstatutory because they have been determined not to fall within the § 101 statutory class of a "process." *Benson*. "[A]n algorithm, or mathematical formula, is like a law of nature, which cannot be the subject of a patent." *Diehr*, 450 U.S. at 186, 209 USPQ at 8. The exception applies only to *mathematical* algorithms since any process is an "algorithm" in the sense that it is a step-by-step procedure to arrive at a given result. *In re Walter*, 618 F.2d 758, 764 n.4, 205 USPQ 397, 405 n.4. (CCPA 1980); *Pardo*, 684 F.2d at 915, 214 USPQ at 676.

Although mathematical algorithms *per se* are nonstatutory, as stated in *Diehr*, 450 U.S. at 187-88, 209 USPQ at 8-9:

> [A] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. . . . [I]n *Parker v. Flook* we stated that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." 437 U.S. at 590. It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure

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or process may well be deserving of patent protection. As Justice Stone explained four decades ago:

> "While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939). [Citations omitted.]

The Supreme Court thus recognizes that mathematical algorithms are "the basic tools of scientific and technological work," *Benson*, 409 U.S. at 67, 175 USPQ at 675, and should not be the subject of exclusive rights, whereas technological application of scientific principles and mathematical algorithms furthers the constitutional purpose of promoting "the Progress of . . . Useful arts." U.S. Const. art. I, § 8. It is also recognized that mathematical algorithms may be the most precise way to describe the invention.

Where claims involve mathematical algorithms, as stated in *In re Abele*, 684 F.2d 902, 907, 214 USPQ 682, 687 (CCPA 1982):

> The goal is to answer the question "What did applicants invent?" If the claimed invention is a mathematical algorithm, it is improper subject matter for patent protection, whereas if the claimed invention is an application of the algorithm, § 101 will not bar the grant of a patent.

The tests for determining whether claims containing mathematical algorithms are statutory have gradually evolved in the courts since the Supreme Court's decision in *Benson* in 1972.

B. *Evolution of the two-part test for mathematical algorithm-statutory subject matter*

The proper legal analysis of mathematical algorithm-statutory subject matter cases is the two-part test of *In re Freeman*, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978), as modified by *Walter* and *Abele*. *See In re Meyer*, 688 F.2d 789, 796, 215 USPQ 193, 198 (CCPA 1982) ("A more comprehensive test for cases involving mathematical algorithms is set forth in *In re Abele*"). A review of the evolution of the analysis provides some useful insights into the application of the test.

In *Benson*, the Supreme Court concluded that claims directed to a particular algorithm for converting binary coded decimal numbers to binary numbers was not statutory subject matter. The Supreme Court further concluded that any patent issued on those claims "would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." 409 U.S. at 72, 175 USPQ at 676. These two conclusions formed the basis for the two-part analysis of the Court of Customs and Patent Appeals (CCPA) in *Freeman*, 573 F.2d at 1245, 197 USPQ at 471:

> First, it must be determined whether the claim directly or indirectly recites an "algorithm" in the *Benson* sense of that term, for a claim which fails even to recite an algorithm clearly cannot wholly preempt an algorithm. Second, the claim must be further analyzed to ascertain whether in its entirety it wholly preempts that algorithm.

In 1978, the Supreme Court held in *Flook* that a claim need "not . . . cover every conceivable application of the formula" to be nonstatutory. 437 U.S. at 586, 198 USPQ at 196. This decision left undefined what constitutes statutory subject matter. In *Walter*, the CCPA modified the second step of *Freeman* to require a more positive approach to determining what is claimed, 618 F.2d at 767, 205 USPQ at 407:

> If it appears that the mathematical algorithm is implemented in a specific manner to define structural relationships between the physical elements of the claim (in apparatus claims) or to refine or limit claim steps (in process claims), the claim being otherwise statutory, the claim passes muster under § 101. If, however, the mathematical algorithm is merely presented and solved by the claimed invention, as was the case in *Benson* and *Flook*, and is not applied in any manner to physical elements or process steps, no amount of post-solution activity will render the claim statutory; nor is it saved by a preamble merely reciting the field of use of the mathematical algorithm.

The CCPA noted that while the second step of *Freeman* was "*stated* in terms of preemption" it had consistently been applied "in the spirit of the foregoing principles." 618 F.2d at 767, 205 USPQ at 407.

In *Abele*, the CCPA further modified the second part of the test to provide a more comprehensive test, 684 F.2d at 906-7, 214 USPQ at 686:

> Appellants summarize the *Walter* test as setting forth two ends of a spectrum: what is now clearly nonstatutory, i.e., claims in which an algorithm is merely presented and solved by the claimed invention (preemption), and what is clearly statutory, i.e., claims in which an algorithm is implemented in a specific manner *to define structural relationships* between the physical elements of the claim (in an apparatus claim) or *to refine or limit steps* (in a process). Appellants urge that the statement of the test in *Walter* fails to provide a useful tool for analyzing claims in the "gray area" which falls between the two ends of that spectrum. We agree that the board's understanding and application of the *Walter* analysis justifies appellant's position. However, the *Walter* analysis quoted above does not limit patentable subject matter only to claims in which structural relationships or process steps are defined, limited or refined by the application of the algorithm.
>
> Rather, *Walter* should be read as requiring no more than that the algorithm be "applied in any manner to physical elements or process steps," provided that its application is circumscribed by more than a field of use limitation or non-essential post-solution activity. Thus, if the claim would be "otherwise statutory," *id.*, albeit inoperative or less useful without the algorithm, the claim likewise presents statutory subject matter when the algorithm is included. This broad reading of *Walter*, we conclude, is in accord with the Supreme Court decisions [holding "that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer," *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8].

The reason for the modification of the test was because, as noted in *Abele*, 684 F.2d at 909, 214 USPQ at 688:

> The algorithm [in *Abele*] does not necessarily refine or limit the earlier steps of production and detection as would be required to achieve the status of patentable subject matter by the board's narrow reading of *Walter*.

The second test of *Abele* suggests that the determination of whether the algorithm is "applied in any manner to physical element or process steps" may be made by viewing the claims without the algorithm and determining whether what remains is "otherwise statutory." This analysis focuses on identifying the statutory process in the claim and is consistent with previous cases such as *Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Examination of each claim demonstrates that each has no substance apart from the calculations involved"). The technique of viewing the claim without the mathematical algorithm is not inconsistent with the requirement that claims must be considered "as a whole" under § 101.

The requirement that claims be considered "as a whole" arose out of the now rejected "point of novelty" approach to statutory subject matter. Under the "point of novelty" approach, if a claim considered without the nonstatutory subject matter was unpatentable over the prior art (i.e., if the algorithm was at the "point of novelty" of the claim), the claims were found to not recite statutory subject matter. This approach was consistently rejected by the CCPA. *See In re Chatfield*, 545 F.2d 152, 191 USPQ 730 (CCPA 1976), *cert. denied*, 434 U.S. 875 (1977); *In re Deutsch*, 553 F.2d 689, 193 USPQ 645 (CCPA 1977); *In re de Castelet*, 562 F.2d 1236, 195 USPQ 439 (CCPA 1977); *Freeman; Sarkar; Walter*. The point of novelty approach was finally put to rest in *Diehr*, 450 U.S. at 188-89, 209 USPQ at 9:

> In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. . . . The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.

Under the second test of *Abele*, the claims are considered without the algorithm to determine whether what remains is "otherwise statutory," *not* to determine whether what remains is novel and nonobvious.

C. *Application of the two-part test*

1. *Step 1 - presence of a mathematical algorithm*

a. *Mathematical algorithm*

A mathematical algorithm is a "procedure for solving a given type of mathematical problem." In this sense, a mathematical algorithm refers "to methods of calculation, mathematical formulas, and mathematical procedures generally." *Walter*, 618 F.2d at 764-65 n.4, 205 USPQ at 405 n.4. "The type of mathematical computation involved does not determine whether a procedure is statutory or nonstatutory." *In re Gelnovatch*, 595 F.2d 32, 41, 201 USPQ 136, 145 (CCPA 1979). A "claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101." *Flook*, 437 U.S. at 595 n.18, 198 USPQ at 199 n.18.

Mathematical algorithms may represent scientific principles, laws of nature, or ideas or mental processes for solving complex problems. *See Meyer*, 688 F.2d at 794-95, 215 USPQ at 197:

> Scientific principles, such as the relationship between mass and energy [$E = mc^2$], and laws of nature, such as the acceleration of gravity, namely $a = 32$ ft./sec.^{2}, can be represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems.

See also Safe Flight Instrument Corp. v. Sundstrand Data Control, Inc., 706 F. Supp. 1146, 10 USPQ2d 1733 (D.Del. 1989) (mathematical algorithm representing a natural phenomenon, windshear). No distinction is made between mathematical algorithms invented by man, and mathematical algorithms representing discoveries of scientific principles and laws of nature which reveal a relationship that has always existed.

b. *"Process" versus "apparatus" claims*

Since mathematical algorithms have been determined not to fall within the § 101 statutory class of a "process," attempts have been made to circumvent the nonstatutory subject matter rejection by drafting mathematical algorithms as "machine" claims. The technique used is to draft the method steps in terms of "means for" language permitted by 35 U.S.C. § 112, sixth paragraph. While such a claim is technically a "machine" or "apparatus" claim, the courts have held that form of the claim does not control whether the subject matter is statutory. *See In re Maucorps*, 609 F.2d 481, 485, 203 USPQ 812, 815-16 (CCPA 1979):

> Labels are not determinative in § 101 inquiries. "*Benson* applies equally whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in drafting." *In re Johnson*, 589 F.2d 1070, 1077, 200 USPQ 199, 206 ([CCPA] 1978). "Though a claim expressed in 'means for' (functional) terms [under 35 U.S.C. § 112, sixth paragraph] is said to be an apparatus claim, the subject matter as a whole of that claim may be indistinguishable from that of a method claim drawn to the steps performed by the 'means.'" *In re Freeman*, 573 F.2d at 1247, 197 USPQ at 472. Moreover, that the claimed computing system may be a "machine" within "the ordinary sense of the word," as appellant argues, is irrelevant. The holding in *Benson* "forecloses a purely literal reading of § 101."

The test for determining whether "means for" apparatus claims should be treated as method claims is stated in *Walter*, 618 F.2d at 768, 205 USPQ at 408:

> If the functionally-defined disclosed means and their equivalents are so broad that they encompass any and every means for performing the recited functions, the apparatus claim is an attempt to exalt form over substance since the claim is really to the method or series of functions itself . . . . In such cases the burden must be placed on the applicant to demonstrate that the claims are truly drawn to specific apparatus distinct from other apparatus capable of performing the identical functions.
>
> If this burden has not been discharged, the apparatus claim will be treated as if it were drawn to the method or process which encompasses all of the claimed "means." *See In re Maucorps*, 609 F.2d at 485, 203 USPQ at 815-816; *In re Johnson*, 589 F.2d at 1077, 200 USPQ at 206; *In re Freeman*, 573 F.2d at 1247, 197 USPQ at 472. The statutory nature of the claim under § 101 will then depend on whether the corresponding method is statutory.

See also Meyer, 688 F.2d at 795 n.3, 215 USPQ at 198 n.3; *Abele*, 684 F.2d at 909, 214 USPQ at 688; *Pardo*, 684 F.2d at 916 n.6, 214 USPQ at 677 n.6; *Arshal v. United States*, 621 F.2d 421, 427-28, 208 USPQ 397, 404 (Ct. Cl. 1980), *cert. denied*, 449 U.S. 1077 (1981), *reh'g denied*, 450 U.S. 1050 (1981). In *Maucorps*, the limitation of various "means" in claim 1 to include certain "electric circuits" did not prevent the claim from being treated as a method. A claim is not presumed to be statutory simply because it is in apparatus form.

c. *Form of the mathematical algorithm*

The first step of the analysis is to determine whether the claim directly or indirectly recites a mathematical algorithm. A mathematical algorithm can appear in many forms. As stated in *Freeman*, 573 F.2d at 1246, 197 USPQ at 471:

> The manner in which a claim recites a mathematical algorithm may vary considerably. In some claims, a formula or equation may be expressed in traditional mathematical symbols so as to be immediately recognizable as a mathematical algorithm. *See, e.g., In re Richman*, 563 F.2d 1026, 195 USPQ 340 ([CCPA] 1977); *In re Flook*, 559 F.2d 21, 195 USPQ 9 ([CCPA] 1977), *cert. granted sub nom., Parker v. Flook*, [437 U.S. 584] (1978). Other claims may use prose to express a mathematical computation or to indirectly recite a mathematical equation or formula by means of a prose equivalent therefor. *See, e.g., In re de Castelet, supra* (claims 6 and 7); *In re Waldbaum*, 559 F.2d 611, 194 USPQ 465 ([CCPA] 1977). A claim which substitutes, for a mathematical formula in algebraic form, "words which mean the same thing," nonetheless recites an algorithm in the *Benson* sense. *In re Richman, supra* 563 F.2d at 1030, 195 USPQ at 344. Indeed, the claims at issue in *Benson* did not contain a formula or equation expressed in mathematical symbols.

Claims which include mathematical formulas or calculations expressed in mathematical symbols clearly include a mathematical algorithm. Mathematical algorithms in prose form may be expressed as literal translations of the mathematical algorithm (e.g., substituting the expression "division" or "taking the ratio" for a division sign) or may be expressed in words which indicate the mathematical algorithm. *See Safe Flight Instrument*, 706 F. Supp. at 1148, 10 USPQ2d at 1734 (subtracting); *Abele*, 684 F.2d at 908 n.8, 214 USPQ at 687 n.8 ("The algorithm, calculating the difference, is defined in the specification as a Gaussian weighting function"); *In re Taner*, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982) (summing); *In re Johnson*, 589 F.2d 1070, 1079, 200 USPQ 199, 208 (CCPA 1978) ("'computing' connotes the execution of one or a sequence of mathematical operations"); *In re Waldbaum*, 559 F.2d 611, 194

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USPQ 465 (CCPA 1977) (method of claim 1 "to count" the number of busy lines "solves a mathematical problem, to wit, *counting* a number of busy lines in a telephone system," *In re Bradley*, 600 F.2d 807, 810 n.4, 202 USPQ 480, 484 n.4 (CCPA 1979), *aff'd by an equally divided court sub nom., Diamond v. Bradley*, 450 U.S. 381, 209 USPQ 97 (1981)).

It is not always possible to determine by inspection of the claim whether it indirectly recites a mathematical algorithm; in such instances the analysis "requires careful interpretation of each claim in the light of its supporting disclosure." *Johnson*, 589 F.2d at 1079, 200 USPQ at 208. *See also id.* at 1078-79, 200 USPQ at 208 ("the flow diagrams which form part of the specification disclose explicit mathematical equations which are to be used in conjunction with each of these [claimed] steps [of 'determining' or 'correlating']"); *Waldbaum*, 559 F.2d 611, 194 USPQ 465 ("series of steps for manipulating binary numbers within a procedure for calculating the number of binary 1's and 0's present" was considered a mathematical algorithm, *Gelnovatch*, 595 F.2d at 39, 201 USPQ at 143); *In re Sherwood*, 613 F.2d 809, 818, 204 USPQ 537, 545 (CCPA 1980), *cert. denied*, 450 U.S. 994 (1981) ("claims must be said to include the indirect recitation of a mathematical equation"); *Meyer*, 688 F.2d at 795, 215 USPQ at 198 (claims indirectly "recite a mathematical algorithm, which represents a mental process that a neurologist should follow").

2. Step 2- is the mathematical algorithm "applied in any manner to physical elements or process steps?"

The second test is to determine whether the mathematical algorithm is "applied in any manner to physical elements or process steps." The guideline for the analysis should be the CCPA's suggestion in *Abele* to view the claim without the mathematical algorithm to determine whether what remains is "otherwise statutory"; if it is, it does not become nonstatutory simply because it uses a mathematical algorithm. It is recognized that "[t]he line between a patentable 'process' and an unpatentable 'principle' is not always clear." *Flook*, 437 U.S. at 589, 198 USPQ at 197. There are no definitive "tests for determining whether a claim positively recites statutory subject matter." *Meyer*, 688 F.2d at 796 n.4, 215 USPQ at 198 n.4. Nevertheless, some useful guidelines may be synthesized out of the court decisions.

a. *Post-solution activity*

If the only limitation aside from the mathematical algorithm is insignificant or non-essential "post-solution activity," the claimed subject matter is nonstatutory. *Flook*, 437 U.S. at 590, 198 USPQ at 197:

> The notion that post-solution activity . . . can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques.

Insignificant post-solution activity by itself is insufficient to constitute a statutory process. In *Flook*, the final step of adjusting an alarm limit was not sufficient. *See also Safe Flight* (final step of "means for processing said windshear signal to provide an indication representing the magnitude thereof" not sufficient); *Abele*, 684 F.2d at 909, 214 USPQ at 688 (final step of display: "that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claims"); *Walter*, 618 F.2d at 770, 205 USPQ at 409 (final step in dependent claim of magnetic recording: "If § 101 could be satisfied by the mere recordation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step"); *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 (final step of storing outputs: "each of the steps of the claimed process, except perhaps the final step of equating the process outputs to the values of the last set of process inputs, directly or indirectly recites a mathematical computation"); *Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 (final step of constructing an obstruction at a location determined by a mathematical model: "Sarkar no longer relies upon bridge of dam construction as post-solution activity steps effective to bring his process within § 101"); *de Castelet*, 562 F.2d at 1244, 195 USPQ at 446 (final step of transmitting: "That the computer is instructed to transmit electrical signals, representing the result of its calculations . . . does not transform the claim into one for a process merely *using* an algorithm").

The absence of post-solution activity or the fact that any post-solution activity may be trivial is only one factor to be considered. On one hand, as stated in *Walter*, 618 F.2d at 767-68, 205 USPQ at 407:

> if the end-product of a claimed invention is a *pure number*, as in *Benson* and *Flook*, the invention is nonstatutory regardless of any post-solution activity which makes it available for use by a person or machine for other purposes.

On the other hand, as stated in *Abele*, 684 F.2d at 908 n.9, 214 USPQ at 687 n.9:

> "the fact that [the] equation is the final step is not determinative of the section 101 issue." *In re Richman*, 563 F.2d at 1030, 195 USPQ at 343. *Accord, In re Taner*, 681 F.2d 787 ([CCPA] 1982), *overruling In re Christensen*, 478 F.2d 1392, 178 USPQ 35 ([CCPA] 1973).

The particular order of the steps should not be determinative of the statutory subject matter inquiry.

b. *Field of use limitations*

A mathematical algorithm is not made statutory by "attempting to limit the use of the formula to a particular technological environment." *Diehr*, 450 U.S. at 191, 209 USPQ at 10. Thus, "field of use" or "end use" limitations in the claim preamble are insufficient to constitute a statutory process. This is consistent with the usual treatment of preambles as merely setting forth the environment. *See Flook* (the preamble, while limiting the application of the claimed method to "a process comprising the catalytic chemical conversion of hydrocarbons" did not serve to render the method statutory); *Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Although the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting"); *de Castelet*, 562 F.2d at 1244 n.6, 195 USPQ at 446 n.6 ("The potential for misconstruction of preamble language requires that compelling reason exist before that language may be given weight"). *Compare Waldbaum*, 559 F.2d at 616 n.6, 194 USPQ 469 n.6 (portion of preambles referred to in method portion of claims "are necessary for completeness of the claims and are proper limitations thereto").

c. *Data-gathering steps*

If the only limitations in the claims in addition to the mathematical algorithm are data-gathering steps which "merely determine values for the variables used in the mathematical formulae used in making the calculations," such antecedent steps are insufficient to change a nonstatutory method of calculation into a statutory process. *See In re Richman*, 563 F.2d at 1030, 195 USPQ at 343; *Sarkar*, 588 F.2d at 1335, 200 USPQ at 139 ("If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to patenting as a 'process' under § 101"); *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step"). Where the claim "presents data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps" the claim may present statutory subject matter. *Abele*, 684 F.2d at 908, 214 USPQ at 687.

d. *Transformation of something physical*

In determining whether the claim recites a statutory process or a nonstatutory mathematical algorithm, it is useful to analyze whether there is transformation of something physical into a different form. One distinction is made between transformation of physical "signals" from one physical state to a different physical state, a statutory process in the electrical arts, and mere mathematical manipulation of "data" which, by itself, is not a statutory process. *Compare Taner* (conversion of "substantially spherical seismic signals" into "a form representing the earth's response to cylindrical or plane waves" was statutory process); *Sherwood*, 613 F.2d at 819, 204 USPQ at 546 (conversion of amplitude-versus-time seismic traces into amplitude-versus-depth seismic traces was statutory process because it "converts one physical thing into another physical thing just as any other electrical circuitry would do"); and *Johnson* (technique for removing unwanted noise from a seismic trace was statutory process); *with Walter*, 618 F.2d at 768, 770, 205 USPQ at 407, 409 (if "the claimed invention produces a physical thing . . . the fact that it is represented in numerical form does not render the claim nonstatutory" but finding that the "signals" claimed "may represent either physical quantities or abstract quantities" and thus were to the algorithm itself and not a particular application); *Richman* (method of calculating airborne radar boresight correction angle from "a plurality of signal sets" not statutory); *Gelnovatch*, 595 F.2d at 42, 201 USPQ at 145 (where "the claims solely recite a method whereby a set of numbers is computed from a different set of numbers by merely performing a series of mathematical computations, the claims do not set forth a statutory process"); and *Benson* (conversion of binary coded decimal numbers into pure binary numbers not statutory). It is manifest that the statutory nature of the subject matter does not depend on the labels "signals" or "data."

e. *Structural limitations in process claims*

Another issue is the effect of structural limitations in method claims. While structural limitations in method claims are not improper, they are usually not entitled to patentable weight unless they somehow affect or form an essential part of the process. *See Benson*, 409 U.S. at 73, 175 USPQ at 677 (claim 8 recited use of a "reentrant shift register"); *Waldbaum*, 559 F.2d at 616, 194 USPQ at 469 (machine limitations in data processor method claims); *de Castelet*, 562 F.2d at 1244, 195 USPQ at 447 ("Claims to nonstatutory processes do not automatically and invariably become patentable upon incorporation of reference to apparatus"). The related problem of specific structural language in apparatus claims has been treated, *supra*, in section II.C.1.b.

D. *Examples*

1. *Diamond v. Diehr*

The following claim was held to recite statutory subject matter.

> 1. A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:
> providing said computer with a data base for said press including at least,
> natural logarithm conversion data (ln),
> the activation energy constant (C) unique to each batch of said compound being molded, and
> a constant (x) dependent upon the geometry of the particular mold of the press,
> initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure,
> constantly determining the termperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,
> constantly providing the computer with the temperature (Z),
> repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is
> $\ln v = CZ + x$
> where v is the total required cure time,
> repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and
> opening the press automatically when a said comparison indicates equivalence.

Step 1 The claim contains an equation for controlling the in-mold time: $\ln v = CZ + x$.

Step 2 The claimed subject matter is statutory because it recites an "otherwise statutory" process in addition to the mathematical algorithm. As stated in *Abele*, 684 F.2d at 907, 214 USPQ at 686:

> In *Diehr*, were the claims to be read without the algorithm, the process would still be a process for curing rubber, although it might not work as well since the in-mold time would not be as accurately controlled.

The steps in the process, 450 U.S. at 187, 209 USPQ at 8:

> include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time.

The statutory nature of the claim is not based on the post-solution activity of opening the press, but on the application of the mathematical algorithm to the whole process.

2. *Parker v. Flook*

The following claim in *Flook* was held to recite nonstatutory subject matter.

> 1. A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical conversion of hydrocarbons wherein said alarm limit has a current value of
>
> $Bo + K$
>
> wherein Bo is the current alarm base and K is a predetermined alarm offset which comprises:
> (1) determining the present value of said process variable, said present value being defined as PVL;
> (2) determining a new alarm base B1 using the following equation:
>
> $B1 = Bo(1.0 - F) + PVL(F)$
>
> where F is a predetermined number greater than zero and less than 1.0;
> (3) determining an updated alarm limit which is defined as B1 + K; and thereafter
> (4) adjusting said alarm limit to said updated alarm limit value.

Step 1 The claim contains a mathematical algorithm comprising determining a new alarm base in step (2) and computing an "alarm limit" in step (3).

Step 2 When viewed without the steps of the mathematical algorithm, steps (2) and (3), the only limitations remaining are the preamble limitation restricting the field of use to "a process comprising the catalytic chemical conversion of hydrocarbons"; the data-gathering step of step (1); and the post-solution step of step (4). None of these limitations comprises an "otherwise statutory" process. The claim seeks to protect a method for computing an "alarm limit" rather than the application of the computation within an otherwise statutory process.

3. *In re Abele*

In *Abele*, claim 5 was held to recite nonstatutory subject matter under § 101 whereas dependent claim 6 was statutory.

> 5. A method of displaying data in a field comprising the steps of
> calculating the difference between the local value of the data at a data point in the field and the average value of the data in a region of the field which surrounds said point for each point in said field, and

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displaying the value of said difference as a signed gray scale at a point in a picture which corresponds to said data point.

6. The method of claim 5 wherein said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner.

Step 1 Claim 5 contains a mathematical algorithm, "calculating the difference," which is defined in the specification as a Gaussian weighting function.

Step 2 When claim 5 is viewed without the mathematical algorithm, the only remaining limitation is the post-solution activity of displaying the result. The display by itself did not constitute an "otherwise statutory" process. The court held that "the algorithm is neither explicitly nor implicitly applied to any certain process." 684 F.2d at 909, 214 USPQ at 688. However, when dependent claim 6 is added to the limitations of claim 5, 684 F.2d at 908, 214 USPQ at 687-88:

> Were we to view the claim absent the algorithm, the production, detection and display steps would still be present and would result in a conventional CAT-scan process. . . . [W]e view the production, detection, and display steps as manifestly statutory subject matter and are not swayed from this conclusion by the presence of an algorithm in the claimed method.

III. *Computer Programs*

A. *"Computer programs" versus "computer processes"*

A "process" or "algorithm" is a step-by-step procedure to arrive at a given result. In the patent area, a "computer process" or "computer algorithm" is a process, i.e., a series of steps, which is performed by a computer. A "[computer] program is a sequence of coded instructions for a digital computer." *Benson*, 409 U.S. at 65, 175 USPQ at 674. Computer programs are equivalently known as "software."

Unfortunately for discussion in this area, "[b]oth the series of steps performed by a computer, and the software directing those steps, have acquired the name 'computer programs.'" *Gelnovatch*, 595 F.2d at 45 n.5, 201 USPQ at 148 n.5 (Markey, C.J., dissenting). What is sought to be protected by patent is the underlying process. As stated in *Gelnovatch*, 595 F.2d at 44, 201 USPQ at 147:

> Confusion may be avoided if it be realized that what is at issue is not the "program," i.e., the software, but the process steps which the software directs the computer to perform.

See, e.g., Maucorps, 609 F.2d at 483, 203 USPQ at 814 ("The [claimed] invention is implemented via a computer program written in FORTRAN IV, either built into the calculating machine, or loaded into a general purpose computer").

B. *Statutory nature of computer processes*

1. *The Supreme Court has not ruled on the patentability of computer programs.*

The Supreme Court has not ruled on whether computer processes are *per se* statutory or nonstatutory. The decisions in *Benson*, *Flook* and *Diehr* all dealt with claims viewed as mathematical algorithms. In *Benson* and *Diehr*, the claims contained mathematical algorithms implemented by a computer. In *Benson*, the Court held that the claims preempted the use of the mathematical algorithm, but did not hold that "any program servicing a computer" would be nonstatutory. In *Diehr*, the Court held that the claims otherwise defined a statutory process for curing rubber, and that the inclusion of a mathematical algorithm or computer program did not make claim nonstatutory. The claim in *Flook* did not involve a computer process.

In *Dann* v. *Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), *rev'g on other grounds*, *In re Johnston*, 502 F.2d 765, 183 USPQ 172 (CCPA 1974), which involved a "machine system for automatic record-keeping of bank checks and deposits," the Court declined to discuss the § 101 issue of the general patentability of computer programs, 425 U.S. at 220, 189 USPQ at 258:

> We find no need to treat that question in this case, however, because we conclude that in any event respondent's system is unpatentable on grounds of obviousness. 35 U.S.C. § 103.

In *Diamond v. Bradley*, an equally divided Supreme Court affirmed the CCPA's decision in *Bradley*. The claims were directed to computer "firmware," which refers to microinstructions permanently embodied in hardware elements, and not to a computer application or process. The CCPA found that the claims literally recited a machine and that, in applying the two-part test of *Freeman*, the claims did not recite a mathematical algorithm.

2. *The CCPA has held that computer processes are statutory unless they fall within a judicially deter mined exemption*

In *Pardo*, the most recent CCPA case on computer processes, the CCPA stated that, 684 F.2d at 916, 214 USPQ at 677:

> any process, machine, manufacture, or composition of matter constitutes statutory subject matter *unless* it falls within a judicially determined exception to section 101.

The major (and perhaps only) exception in the area of computer processes is the mathematical algorithm. Although not binding precedent on the Federal Circuit, the district court in *Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith*, 564 F. Supp. 1358, 1367, 218 USPQ 212, 218 (D. Del. 1983) stated:

> The CCPA [has] . . . held that a computer algorithm, as opposed to a mathematical algorithm, is patentable subject matter.

If a computer process claim does not contain a mathematical algorithm in the *Benson* sense, the second step of the *Freeman-Walter-Abele* test is not reached, and the claimed subject matter will usually be statutory.

The traditional approach by the CCPA to the PTO's rejection of computer processes as nonstatutory subject matter has been to apply the two-part test for mathematical algorithms and to find statutory subject matter if the claims do not recite a mathematical algorithm. See *Pardo*, 684 F.2d at 916, 214 USPQ at 676 (process for converting source program into object program: "we are unable to find any mathematical formula, calculation, or algorithm either directly or indirectly recited in the claimed steps of examining, compiling, storing, and executing"); *In re Toma*, 575 F.2d 872, 877, 197 USPQ 852, 856 (CCPA 1978) (process for translating a source natural language, e.g., Russian, to a target natural language, e.g., English: "[we] are unable to find any direct or indirect recitation of a procedure for solving a *mathematical* problem"); *In re Phillips*, 608 F.2d 879, 883, 203 USPQ 971, 975 (CCPA 1979) (process for preparing architectural specifications: "Our analysis of the claims on appeal reveals no recitation, directly or indirectly, of an algorithm in the *Benson* and *Flook* sense"); *Freeman*, 573 F.2d at 1246, 197 USPQ at 471 ("The method claims here at issue do not recite process steps which are themselves mathematical calculations, formulae, or equations"); *Deutsch*, 553 F.2d 689, 692, 193 USPQ 645, 648 (CCPA 1977) (method of operating a system of manufacturing plants: "Nothing in the methods claimed by Deutsch preempts a mathematical formula, an algorithm, or any specific computer program"); *Chatfield*, 545 F.2d at 158, 191 USPQ at 736 (method of reassigning priorities within a computer: "[the] independent claims contain neither a mathematical formula nor a mathematical algorithm").

If the computer process is found to contain a mathematical algorithm, it must then pass the second part of the *Freeman-Walter-Abele* test for statutory subject matter. *See, e.g., Sherwood; Maucorps; Gelnovatch.*

Arguably, other exceptions such as "methods of doing business" and "mental steps" may be raised if a claim is not a true computer process, but merely recites that an otherwise nonstatutory process is performed on a computer. *de Castelet*, 562 F.2d at 1244, 195 USPQ at 447 ("Claims to nonstatutory processes do not automatically and invariable become patentable upon incorporation of reference to apparatus"). These would appear to be exceptions with very narrow application to claims which are not limited to implementation by a machine. For example, while a "method of doing business" *per se* is not statutory subject matter, "a method of operation on a computer to effectuate a business activity" has been held to be statutory subject matter. *Paine, Wehber v. Merrill Lynch*, 564 F. Supp. at 1369, 218 USPQ at 220. *See also Deutsch*, 553 F.2d at 692 n.5, 193 USPQ at 648 n.5 (claims were not a method of doing business because "[t]hey do not merely facilitate business dealings"); *Johnston, rev'd on other grounds, Dann v. Johnston* (apparatus claims directed to system for automatic record-keeping of bank checks and deposits did not cover a method of doing business). Similarly, machine or computer implementation of "mental steps" is statutory subject matter. *Prater; In re Bernhart*, 417 F.2d 1395, 163 USPQ 611 (CCPA 1969); *In re Musgrave*, 431 F.2d 882, 167 USPQ 280 (CCPA 1970). *See also Toma* (computer implemented method for translation of natural languages is statutory).

Chronological Order Case List

In re Prater, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969)
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In re Richman, 563 F.2d 1026, 195 USPQ 340 (CCPA 1977)

In re de Castelet, 562 F.2d 1236, 195 USPQ 439 (CCPA 1977)
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In re Gelnovatch, 595 F.2d 32, 201 USPQ 136 (CCPA 1979)
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Diamond v. Diehr, 450 U.S. 175, 209 USPQ 1 (1981)
Diamond v. Bradley, 450 U.S. 381, 209 USPQ 97 (1981), *aff'g by an equally divided Court. In re Bradley*, 600 F.2d 807, 202 USPQ 480 (CCPA 1979)
In re Pardo, 684 F.2d 912, 214 USPQ 673 (CCPA 1982)
In re Taner, 681 F.2d 787, 214 USPQ 678 (CCPA 1982)
In re Abele, 684 F.2d 902, 214 USPQ 682 (CCPA 1982)
In re Meyer, 688 F.2d 789, 215 USPQ 193 (CCPA 1982)
Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, 564 F. Supp. 1358, 218 USPQ 212 (D. Del. 1983)
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1. APPEALS

a. *Appeal Fees in Patent Cases*

Appeal fees deficiencies are frequent, causing necessity for extension fees to cover the additional time consumed in making up the appeal fee deficiency. Ensuring proper payment at time of filing the appeal will save money and time.

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2. APPLICATION FILES

a. *Requests for Allowed Patent Application Files*

Applicants or attorneys requesting files from the Publishing Division, Office of Publications, should make their request at least twenty-four hours in advance to ensure file availability. Attention is expecially directed to out-of-town requesters who visit the Office, anticipating same day service. Although the Office is usually able to respond promptly, unexpected inconvenience can be avoided if arrangements are made in advance.

Inquiries and requests should be directed to the Correspondence Section at (703) 557-6397 or (703) 557-6398 between the hours of 8:30 a.m. through 5:00 p.m. on weekdays.

b. *Returning Files to the File Information Unit (FIU)*

Customers are reminded that file histories obtained through the FIU are official government records which must not be removed from the confines of the Patent Search Room at any time. Such files must be returned to the File Information Unit by 7:45 p.m. on the same day they are obtained.

FIU personnel will continue to periodically monitor this problem. Should individual patterns of abuse be discerned, administrative sanctions up to termination of access privileges may be applied.

3. APPLICATION PAPERS

a. *Disclosure Statements*

If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners are taking up new applications before an information statement is matched with the application.

b. *Docket Numbers - Placement*

If use of a docket number is desired, the docket number should be placed in the upper right corner of the transmittal letter accompanying newly filed patent applications. This will eliminate a time consuming search of the application papers for the docket number or the likelihood of it being overlooked during processing.

c. *Papers Related to Patent Applications*

When a document concerns a previously filed application for a patent, it *must* identify on the top page in a conspicuous location, either the application number (consisting of the series code and the serial number, e.g. 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. *No papers related to a new patent application should be filed in the Office prior to receipt of this information.* [37 CFR 1.5(a)] Any papers received without this information will not be processed.

Additionally, the word "Patent" should be in the upper right hand corner and the filing date, inventor's names and title of the invention should be included on the paper.

Responses to Notices of Incomplete Application and Notices to File Missing Parts must be accompanied by a copy of the Notice form.

d. *Papers Related to Trademark Applications*

For all papers related to *trademark* applications, the word "Trademark" and the series code/serial number should be placed in the upper right-hand corner of the document. Also, please set forth the applicant's name, filing date, law office, examining attorney, and mark.

e. *Papers With No Particular Time Requirement*

Patent and trademark documents which have no particular time or sequence requirements should be filed with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority in patent applications, changes of Power of Attorney, or changes in Mailing Address following first action.

f. *Residence of Applicant*

The residence of applicant should be indicated as city and state for United States residents and city and country for residents of foreign countries.

g. *Response to Final Rejection In Patent Applications - Expediting Processing*

See section under Mail.

h. *Separation of Various Application Papers*

In *patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". In *trademark* applications, change of address and power of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel [37 CFR 1.4(c)].

i. *Supplemental or Preliminary Amendments*

Where a supplemental or preliminary amendment is found necessary in patent or trademark applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.

j. *Transmittal Letters for Deposit Account Charges*

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and will thereby reduce the processing time of incoming mail.

4. ASSIGNMENTS

a. *Assistance*

Customers are encouraged to call the Assignment Branch Quality Control Status Section (703-557-8691) with questions regarding procedure, fees or status of assignments.

b. *Delays in Assignments for New Patent Applications*

The automated patent assignment system is dependent upon bibliographic information that is keyboarded to produce filing receipts and to create records in the PALM system. When assignments are filed before the filing receipt has been produced, their processing is delayed until the bibliographic information is keyed and verified.

c. *Expediting Corrections or Updates*

When requesting correction or updating of a previously recorded patent or trademark assignment document, providing the reel and frame number of that document to the Assignment Branch will greatly expedite the recording process.

d. *Foreign Assignees*

When filing an assignment with a foreign assignee, an appointment of domestic representative is required. If more than one property is included in the assignment, a separate appointment of domestic representative is required for each property. You need only submit one original appointment. Photocopies of the appointment of domestic representative may be filed for the additional properties.

e. *Routing of Assignment Documents*

Many individuals are submitting assignment documents and requests for assignment services, together with application prosecution papers, directly to the examiner. Often, these requests get placed in the file and are not forwarded to the assignment area for handling. Please send all assignment documents and request through the Mail Room in order that they may be properly routed to the assignment area.

Please separate requests for certified copies of assignments from requests for other services including requests for certified copies of other documents. Certification of assignment documents is not performed by the same individuals as certification of other documents.

f. *Submission of Assignment Documents*

Only an original document or a certified copy of a document is acceptable for recordation. When signing an original document, ink other than black should be used so that the signature can clearly be identified as an original one.

Do not file extra copies of assignment documents. They may be mistaken as documents intended for recordation.

Be sure to attach a transmittal letter including the firm's name and address on each assignment document to ensure accurate return of the assignment document. Use extra staples to ensure the transmittal letter does not become detached. As a further safeguard, include a return address on the assignment document.

Do check the assignment document to make sure that the name of the assignor and assignee are consistent throughout the document.

g. *Trademark Registrations - Ensuring Correct Printing*

To ensure the correct printing of ownership information on a Trademark Registration at issue date, provide the trademark examining attorney with the reel and frame number of the appropriate assignment document as soon as you are notified of it.

5. CERTIFICATES OF CORRECTION

a. *Accurate Requests*

Many requests for "Certificate of Correction" result from a prefunctory comparison of the issued patent with the attorney's application file, without investigating whether the recitation in the issued patent is correct. In many instances, change to the PTO file wrapper has been caused by the examiner prior to printing of the patent in order to make appropriate corrections to the file.

6. CERTIFICATION SERVICES

a. *Expedited Service for Patent Applications-As-Filed*

If there is a need for special service, for example to meet a priority date within a short period of time, the order must be marked "RUSH" with the date/time needed and reason for the need. The order should be hand-delivered to the Manager, Assignment and Certification Division, CP2-7D13. Orders may also be mailed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, clearly marked to the attention of the Manager, Certification Branch. However, because mail orders must be initially handled by the Mail Room, requesters are cautioned that turnaround time will be several days longer than for hand-delivered orders. Every effort will be made to fill all "RUSH" orders timely, to the extent resources are available.

b. *Methods of Ordering*

Mail Orders - The address for mail orders is:

Box 10
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Hand-carried Orders - Hand-carried requests for certification service should be taken to the Public Service Window in the North Stacks of the Patent Search Room where they can be placed in the Certification Order Receipt Box or given to the attendant. For security reasons, the public is not permitted access to the Certification Branch itself.

c. *Processing Time*

The current goal for furnishing certified copies of applications-as-filed is 17 days from receipt in the Mail Room of the Patent and Trademark Office to mailing of the completed order by the Certification Branch. The 17 days includes 4 work days for Mail Room and Finance processing, 9 work days in the Certification Branch and 4 weekend days that accure over the 13 work days.

The 17-day goal applied to those orders for which microfiche of applications-as-filed are available in the Certification Branch. The microfiche for a small percentage of the total orders for certified copies of applications-as-filed must be retrieved from a remote location, or be replaced due to damage or correction. The 17-day goal does not apply to these orders.

d. *PTO vs. Public-Supplied Copies for Certification*

Requests for all certified copies of applications-as-filed and file wrapper/contents of pending patent and trademark applications will be filed with PTO supplied copies of original source documents. No public supplied copies will be accepted.

The public may submit copies of Registered Trademarks, Registered Trademark Files, Patented Files, and Patents for certification by the Certification Branch.

e. *Questions Frequently Asked*

Q. What does "certified" mean?
A. Authentication of copies by ribbon and seal of the PTO with the signature of an officer authorized by the Commissioner of Patent and Trademarks.

Q. What does an application consist of?
A. (1) Written Description (2) Claims (3) Oath or Declaration (4) Drawings, when necessary, and (5) Filing Fee.

Q. What does a file wrapper and contents (file history) consist of?
A. The original application papers plus all correspondence between the applicant/attorney of record/assignee and the PTO.

Q. Why are certified copies of applications-as-filed required?
A. Since the rights granted by a U.S. patent extend only throughout the territory of the U.S. and have no effect in a foreign country, an inventor who wishes patent protection in other countries must submit a certified copy of his or her U.S. application when applying for a patent in that country in order to receive the benefit of the U.S. filing date.

Q. What regulations govern the filing of an U.S. application in a foreign country?
A. There is a treaty relating to patents which involves 97 countries and is known as the Paris Convention for the Protection of Industrial Property. It provides that each country guarantees to the citizens of other countries the same patent rights that it gives to its own citizens.

Q. Can anyone request a copy of a pending application?
A. No. Pending applications are preserved in secrecy. No information or copies may be obtained without written authority of the applicant, attorney of record, or the assignee, if any. Such written consent must accompany the request for copies.

Q. Can orders for copies by placed by phone?
A. No. All orders must be in writing.

Q. May office copies of my application be sent to the PTO for certification?
A. No. We do not certify copies prepared outside the PTO.

Q. Will the PTO mail certified copies ordered directly to a foreign country?
A. No. With respect to the exportation of technical data, the PTO discontinued the practice of forwarding direct to any foreign country certified copies of U.S. applications ordered by residents of the United States.

Q. Are cited references in a file automatically furnished when a file wrapper and contents are requested?
A. No. Cited references are not included as papers comprising the file history. References cited are furnished only if specifically requested.

Q. Can cited references, when requested, be certified with the file wrapper and contents under one certificate?
A. No. Each reference must be certified separately.

Q. Are there instances when references are included in a file wrapper and contents?
A. Yes. If the references are submitted as attachments to a response from the applicant and if such response is entered and made a part of the file.

Q. Exclusive of applications-as-filed and file wrappers and contents of patented files, what other types of copies may be obtained from the Certification Branch?
A. The following items may be obtained:

a. Certified copies of issued U.S. patents.
b. Certified copies of foreign patents.
c. Certified copies of publications from the Scientific Library.
d. Certified copies of Office letters.
e. Certified duplicate filing receipts.
f. Certified copies of an assignment and application-as-filed, under one certificate.
g. Copies of disclosure documents.
h. Copies of the following files:

- Defensive publication files.
- Reexamination files.
- Interference files.
- Trademark files.
- Opposition files.
- Concurrent use proceedings files.
- Statutory Invention Request.
- Certified copies of assignment documents.
- Abstract of title.

f. *Status Requests or Problems*

For status inquiries, call the Input and Records Control Unit of the Certification Branch at 557-1587. For problem situations call the Manager of the Certification Branch, at 557-1552.

7. DRAWINGS FOR PATENT APPLICATIONS

a. *Proper Identification of Formal or Substitute Drawings*

When the Office receives formal or substitute drawings, a cover letter identifying the application by serial number should accompany them. It is extremely difficult to associate the drawings with the files when this information is missing. The application serial number should be placed on the sheet of drawing in accordance with 37 CFR 1.84(1).

According to 37 CFR 1.84(1), identifying indicia (such as the attorney's docket number, inventor's name, number of sheets, etc.) not to exceed 2 3/4 inches may be placed in a centered location between the side edges within three-fourths inch of the top edge. Either this marking technique on the front of the drawing or the placement of this information on the back of the drawing is acceptable. However, for identification of the serial number, the PTO prefers that it be placed on the front.

b. *Proper Identification of New Application Drawings*

During pre-examination processing, drawings are temporarily separated from the rest of the application papers. To facilitate the matching of drawings with the application, it would be helpful if the applicant's name, docket number, and the title of the invention were put on the back of the drawings. This may be done by writing lightly on the drawings or by using gum labels.

c. *Submission of Copies of Drawings*

DO NOT SUBMIT ORIGINAL DRAWINGS WITH PATENT APPLICATIONS. DO SUBMIT A HIGH QUALITY COPY. If the copy submitted passes the formality review and patent examination, no substitute drawings will be necessary. If corrections are necessary, they should be made to the original drawings. Either one good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

The PTO will not release drawings from patent applications filed after Jan. 1, 1989, to applicants, bonded drafting companies, or others.

d. *Timeliness of Submission of Corrected Drawings in Allowed Cases*

When drawings need to be corrected in an allowed patent application, the applicant is *required* to submit *acceptable* corrected drawings within a three-month shortened statutory period. Within that three-month period, two weeks should be allowed for review of the correction by the Office. If a correction is determined to be unacceptable by the Office, the applicant must arrange to have an acceptable correction re-submitted within the original three-month period to avoid the necessity of obtaining an extension of time and of paying the extension fee. Therefore, the applicant should file corrected drawings as soon as possible following the setting of the three-month shortened statutory period.

Corrected drawings, as well as the issue fee should be addressed to Box Issue Fee. Note that any assignment document should be submitted in a separate envelope, addressed to Box Assignment.

Each piece of correspondence should carry its own certificate of mailing. For example, drawings should have a certificate of mailing and the issue fee should have a certificate of mailing.

8. EXTENSIONS OF TIME IN PATENT CASES

a. *Appropriateness*

After a final rejection, where applicants' approval is not needed to amend the claims, no extension of time is required. However, if applicants' approval is required and applicants did not file their response within two months of the Final Rejection, the appropriate extension of time must be purchased.

Also, it should be noted that extensions of time may be requested under 37 CFR 1.136(a) for extending the time required to pay for the request for an oral hearing before the Board of Patent Appeals and Interferences. [MPEP §1209(1). The time for a request and fee for an oral hearing is one month from the date of the Examiner's Answer or any supplemental Examiner's Answer.

Extensions of time by fee payment under 37 CFR 1.136(a) are appropriate for filing of the Brief on Appeal in regular applications. No more than four months may be granted under 37 CFR 1.136(a). Beyond those four months, any further request must show sufficient cause under 37 CFR 1.136(b), and no additional extension fee is required.

An extension of time is not required in order to hold an interview with the examiner. However, after the period for response has ended, an extension is required for the purpose of filing a follow-up amendment by applicant and/or for the entry of an Examiner's Amendment requiring approval of the applicant.

Extensions of time are appropriate for the purpose of achieving continuity between parent and continuing applications. A separate paper requesting the extension of time must be filed in the *parent* application. It would be useful to file a *copy* of that request or petition with the papers constituting the filing of the continuing application.

b. *Extensions of Time Under 37 CFR 1.136(a)*

Under 35 U.S.C. 41(a)(8) and 37 CFR 1.136(a), a response filed within a statutory period but outside of the period set for response may be rendered timely if accompanied by (1) a petition for an extension of time and (2) the appropriate extension fee. Experience indicates that there have been differing opinions as to the language necessary to constitute an acceptable extension of time petition. This Helpful Hint is intended to clarify the policy of the Patent and Trademark Office concerning the language required for such a petition.

An extension of time under §1.136(a) requires a petition therefor and payment of the appropriate fee. The §1.136(a) petition should explicity request in writing an extension of time for the specific number of months needed as explained in §710.02(e) of the Manual of Patent Examining Procedure. This is the best way to avoid mistakes by the applicant or by the Patent and Trademark Office and assure orderly and efficient processing of the petition.

The following language is an example of a preferred §1.136(a) request:

Applicant petitions the Commissioner of Patent and Trademarks to extend the time for response to the Office action dated for_____month(s) from_____to _____ .

[If paying by check:]

Submitted herewith is a check for _____to cover the cost of the extension. (Optionally, add: Any deficiency or overpayment should be charged or credited to deposit account number_____. A duplicate copy of this sheet is enclosed.)

[If paying by charge to deposit account number:]

Please charge my deposit account number_____in the amount of _____to cover the cost of the extension. Any deficiency or overpayment should be charged or credited to this deposit account.

Applicants are cautioned that, in order to be timely, a response must be accompanied by a *specific* reference to an extension of time. A general authorization under 37 CFR 1.25(b) to charge necessary fees to a deposit account will not be interpreted as

a petition for an extension of time. For example, a response accompanied by the statement "Please charge any fees necessary under 37 CFR 1.17 to my deposit account" would not be acceptable, since the statement does not make *specific* reference to an extension of time.

As previously indicated, a proper §1.136(a) petition must be in writing. However, when an extension of time is necessary to make an Examiner's Amendment timely, the extension may be obtained by way of a verbal communication. The verbal communication must be transcribed as a written part of the official application file record. For example, during a telephone interview with an examiner, an attorney for the applicant, in order to render an Examiner's Amendment timely, may verbally request an extension of time under 37 CFR 1.136(a) and authorize a charge of the appropriate fee to his or her deposit account. If this verbal request and authorization are transcribed as a written part of the application file record (e.g., via the Examiner's Amendment or an Examiner Interview Summary Record, PTOL-413), the desired extension of time may be obtained. The filing date of the $1.136(a) petition and fee will be considered the date of the verbal request and authorization if this date is reflected in the written file record.

c. *Instances Not Permitted*

An extension of time under 37 CFR 1.136(a) is not permitted in the following instances:

(1) Where an applicant is so notified in an Office action as, for example, in a Reissue application involving a litigated patent.
(2) Where the application is involved in an interference declared pursuant to 37 CFR 1.611. See 37 CFR 1.645 for provisions governing extensions of time in interference proceedings.
(3) In reexamination proceedings. See 37 CFR 1.550(c) for extensions of time in reexamination proceedings.
(4) In PCT international applications. Under PCT Rule 26.2, extensions are permitted for correction of PCT Article 14 defects in international applications before the Receiving Office.

d. *Insufficient Fees*

Many requests for extension of time are being filed with insufficient fees. In those instances where there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six-month period has expired before the deficiency is noted and corrected, the application is held abandoned.

Please note that effective October 5, 1985, the extension fees in patent cases are as follows:

	Small Entity	Non-Small Entity
One Month Extension	$28	$56
Two Month Extension	85	170
Three Month Extension	195	390
Four Month Extension	305	610

If applicants have a deposit account, it is recommended that applicants file, in an individual application, a general authorization to charge any of the fees set forth in 37 CFR §§ 1.16 to 1.18 to a deposit account for the entire pendency of the application.

3. *Policy*

Where an extension of time is required to file a response in a timely manner, the response is not considered complete until the response, fee, and request or petition for an extension of time are received. The fee and request or petition must be filed before the expiration of the extended period requested. The fee cannot be paid outside the statutory six-month limit for the period of response.

f. *Requirement for Request or Petition for Extension*

Submission of the appropriate extension fee under 37 CFR 1.136(a) is to no avail unless a request or petition for extension is filed. Frequently, the request is omitted, which then requires an additional extension fee to cover the period to the date of the request. Occasionally, the application is held abandoned because the six month maximum statutory period has expired before detection of the omission of the request for extension. It is critical that a paper specifically requesting the extension be filed with late responses. It is also wise to use the Certificate of Mailing practice under 37 CFR 1.8 when requesting extensions.

g. *Response to Final Rejection - Avoiding Extension Fees*

In patent applications wherein a three month Shortened Statutory Period (SSP) is set for response to a Final Rejection, the response would best be filed within two months of the date of the Office Action. If filed within two months, any Advisory Action mailed after the SSP expires will reset the SSP to expire on the date of the Advisory Action for extension fee purposes, but never more than six months from the date of the Final Rejection.

h. *Supplemental Amendments*

If a timely and complete response has been filed after a *Non-Final* Office Action, an extension of time *is not required* to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a *Final* Office Action, an extension of time *is required* to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run.

9. FILES

a. *Official Searches*

The PTO has had an unusually large number of official search status letters returned by the Postal Service due to insufficient/incomplete addresses. When requesting an official search for a lost patent or trademark file, please ensure that all pertinent

information is completely filled out on the PTO Form 1216. In the case of an individual working for a particular firm, the firm's name should be included in block number 5 of the form along with the name of the requester. If you have any questions in this matter please call the Chief, Support Services Branch on (703) 557-3560.

b. *Requests for Reconstruction*

To request the reconstruction of a file, submit a written request along with a notice from the PTO Official Search unit stating that the file cannot be located.

c. *Requests for Trademark Files*

To eliminate unnecessary delays when ordering Trademark files, requestors should complete all required information blocks on form PTO-1538 (Order and Charge for Trademark Files). Failure to properly complete the form is the primary reason for requests not being quickly processed. Submitting a completed form will reduce the number of requests that have to be returned and thus reduce the overall time required to fill the request.

10. FILING RECEIPTS FOR PATENT APPLICATIONS

a. *Docket Numbers*

Docket numbers must be limited to a maximum of 12 characters to prevent truncation. The Patent Application Location and Monitoring (PALM) system data base allows a maximum of 12 characters for the attorney's docket number. Spaces, slashes and hyphens will no longer be included in the entered docket number on the official filing receipt. In an application where CASE or NAVY-CASE appears before the first character in the docket number, only the characters after CASE or NAVY-CASE will be entered on the official filing receipt.

b. *License to Foreign File*

Each newly filed patent application is routinely reviewed for security interests during pre-examination processing. A code is entered into the data base to indicate the presence or absence of security interests. When no security interest are found, the filing receipt will be generated with the notation "Foreign license granted xx/xx/xx." There is no additional cost for this security screening and license notation.

c. *Residence of Applicant*

The residence of applicant should be indicated as city and state for United States residents and city and country for residents of foreign countries. The Patent Application Location and Monitoring (PALM) System data base allows a maximum of 15 characters for the city of residence. If the city name is longer than 15 characters, it will be truncated in the data base and appear in the shortened form on the filing receipt. However, the entire city name will be taken from the file and printed on any patent that issues.

Please do not call or write the Office for a corrected filing receipt should the printed city name be cut short due to the 15-character limit.

Often applicants who are residents of foreign countries indicate street address, sections of cities, provinces or other political divisions as part of their cities of residence. This leads to confusion and possible erroneous entries in the data base. Only the foreign city and country should be indicated as the applicant's residence.

11. INTERVIEWS WITH PATENT EXAMINERS

a. *Appropriateness*

Prior to filing, no interview is permitted; only search assistance may be given to the attorney, searcher or inventor.

Prior to first action, an interview is ordinarily granted only in continuing or substitute applications; a request for an interview is untimely and will not be granted prior to first action in all other applications.

After final rejection, an interview will not be denied merely because final Office action has been rendered. Normally, one interview after a final rejection is permitted if the examiner is convinced that disposal or clarification for appeal may be accomplished with only nominal further consideration. In requesting an interview after final rejection, the intended purpose and content of the interview must be presented briefly, either orally or in writing. Interviews merely to restate arguments of record or to discuss new limitations which would require more than nominal reconsideration or new search will be denied.

After a case is sent to issue, it is technically no longer under the jurisdiction of the primary examiner (37 CFR 1.312). Requests for interviews on cases already passed to issue should be granted only with specific approval of the Group Directbr upon a showing in writing of extraordinary circumstances.

The ideal time for personal interviews, during which time an interview is clearly available, is the "Conference Period", which is the time between the filing of applicant's thorough first response to the examiner's first action on the merits and a concluding action by the examiner.

In reexamination proceedings, an interview with the owner is permitted after first action. Requests that reexamination requestors be permitted to participate in or attend interviews will be denied.

When an interference has been declared, all questions involved are to be determined *inter partes* and will not be discussed *ex parte*.

Following the grant of a United States Patent, an examiner must refuse to express any opinion or view as to the validity of the patent, except on the record in the course of examining a reissue application or a reexamination proceeding. Even in the case of search assistance on an invention, if an examiner is aware that the invention has been patented in the United States, the searcher will be referred to the prosecution file history, and the examiner will make no comment on the appropriateness of the search conducted or the references cited.

Should any examiner fail to comply with the above guidelines, the matter would best be brought to the attention of the examiner's Group Director.

Direct questions to:

Al Lawrence Smith
Director, Group 350
(703) 557-3414

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b. *Prohibitions*

No interview will be conducted with an attorney who is not registered or who has been suspended or excluded from practice regarding an application unless the attorney is the applicant in the application.

Protestors are not permitted to participate in interviews in applications where the protest was filed after Dec. 8, 1981, and the examiner will not communicate in any manner with such protestors.

12. MAIL

a. *Certificate of Mailing - Separate Certificate for Each Document*

Practitioners and others are reminded of the requirement of MPEP 512(D) which state: "In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO-85 and an assignment), each paper must have its own certification as a part thereof or attached thereto." Although form PTOL-85b, Issue Fee Transmittal, may contain a Certificate of Mailing thereon, a separate Certificate of Mailing is required for all papers included with this form, including formal drawings, since papers are separated and flow to different areas of the Office. Checks submitted with papers do not require a Certificate of Mailing.

b. *Certificate of Mailing AND Return Postcard*

Use of the Certificate of Mailing Procedure is strongly encouraged.

37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if deposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Postcard Receipt provision of MPEP 503 is used.

In those instances where the PTO never receives the correspondence, no postcard receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is *not* received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

c. *Correspondence with Certificate of Mailing Delivered by Commercial Carrier*

The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand-carried or delivered to the PTO via commercial mail service, e.g., "Federal Express," "DHL," "Purolator," " Air Borne," "UPS," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than the U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

d. *Expediting Handling of Trademark Applications*

To facilitate processsing of new trademark applications, place them in a separate envelope apart from all other mail. Identify on the outside of the envelope "TRADEMARK APPLICATION ONLY." More than one new trademark application may be placed in the same envelope. Do not place any papers in the envelope other than those related to the new trademark applications.

e. *Express Mail*

Due to a failure to follow proper procedures, many applicants are losing the advantage of receiving the date a paper or fee was deposited at the Post Office when "Express Mail" is used. According to 37 CFR $ 1.10, any such paper or fee must include a certificate of mailing by "Express Mail," signed by the person mailing the paper or fee.

To ensure papers and fees sent by "Express Mail" are accorded the proper certificate date, the following suggestions and reminders are offered:

(1) Each document must have a certificate of mailing typed on or affixed to the document. The certificate should be placed on the first page of the document or the covering letter to ensure easy accessibility. Often, the certificate is missing, illegible, inaccurate, incomplete, or difficult to locate. As a result, the paper or fee is considered to have been filed on the date of receipt in the PTO.
(2) The certificate should be legible.
(3) The Express Mail number must be placed on the certificate.
(4) Dates on the certificate must correspond to dates on the Express Mail label.
The PTO continues to receive correspondence filed under the provisions of 37 CFR 1.10 in which the certificate of mailing by "Express Mail" certifies that the correspondence is being mailed on one date while the "Express Mail" label shows a "Date-In" on a different date. This usually occurs when the "Express Mail" package is deposited in a remote "Express Mail" receptacle or mailbox after the last pickup, and accordingly is not being picked-up and processed by the Postal Service until the next business day. The question as to the treatment of such a situation was covered in the final rule making published on Jan. 20, 1983, at 48 FR 2696-2714 and on Feb. 10, 1983, at 1027 O.G. 9. The following comments appear therein.
"Comment: One person questions what treatment will be accorded a paper placed in an "Express Mail" box receptacle after the Box has been cleared for the last time on a given day."
"Reply: The paper will be considered to be deposited as of the date of receipt indicated on the "Express Mail" mailing label by the Postal Service clerk."
It is recommended that where the filing date of a paper or fee is critical, e.g., the filing of a patent application, and particularly when the deposit by "Express Mail" is being made late in the business day, the correspondence should be personally delivered to a Post Office. There the date of receipt of the "Express Mail" package can be immediately indicated by the Postal Service clerk.

(5) Each certificate must have an original signature of the person *actually mailing* the paper or fee; i.e., the person who actually deposits the paper or fee with the U.S. Postal Service.
The PTO has encountered instances in which the certificate of mailing by "Express Mail" was signed by an attorney and the deposit was made by the attorney's secretary or another member of the attorney's staff. This is improper under the provisions of 37 CFR 1.10. This section differs in that regard from 37 CFR 1.8.
(6) The preferred wording and information to be included on the certificate is as follows:

"Express Mail" Mailing Label No. (*insert B no. from Express Mail label*)
Date of Deposit (*insert date from Express Mail Label*)

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(Typed or printed name of person mailing paper or fee)
(Signature of person mailing paper or fee)

By following these procedures, problems concerning filing dates should be minimized.

f. *Response to Final Rejections In Patent Applications - Expediting Processing and Reply by PTO*

In order to ensure the quickest reply to an amendment or response after Final Rejection in patent applications, the paper must be marked in the upper right portion:

"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)"

The marking on the paper preferably should be written in, highlighted by, or encirculed with, a bright color felt-point marker.

The envelope in which the response is submitted must include only submissions under 37 CFR 1.116. The envelope must be marked "Box AF" in the lower left corner and must be addressed to:

BOX AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

If the paper is being hand-carried to the Examining Group (instead of mailing to Box AF), the envelope, if any, and the response should both be marked:

"RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP (Insert Group Number)"

Use of this procedure should avoid the necessity for extensions of time and the filing of unnecessary notices of appeal in many cases.

g. *Return Postcard*

If a receipt for any paper filed in the Patent and Trademark Office is desired, it may be obtained by enclosing with the paper a self-addressed postcard identifying the paper. The Patent and Trademark Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to clearly identify the paper for which receipt is requested. For example, the card should identify the applicant name(s), serial number, filing date, interference number, etc. Also, the paper(s) should be identified by specifying the type thereof, namely affidavit, amendment, appeal, itemized components of applications, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

A postcard receipt which itemizes and properly intentifies the papers which are being filed serves as prima facie evidence of receipt in the PTO of all the items listed thereon on the date stamped thereon by the PTO unless the postcard receipt has been annotated by the PTO to indicate that one or more items were not received. A postcard receipt will *not* serve as prima facie evidence of receipt in the PTO if the papers are not itemized in a detailed manner, e.g., number of pages of specification and number of sheets of drawings, or if the postcard receipt has been annotated to indicate that one or more items was not received.

When papers for more than one document are filed under a single cover, a return addressed postcard should be attached to the paper for each document for which a receipt is desired.

h. *Secrecy...Related Papers (37 CFR 5)*

All correspondence in connection with 37 CFR 5 should be addressed to:

Commissioner of Patents and Trademarks
(Attention Licinensing and Review)
Washington, D.C. 20231

Improperly addressing such correspondence may delay delivery and could result in violations of 37 CFR 5. See 37 CFR 5.33 regarding correspondence.

i. *Special Box...Box AF*

Since the establishment of the special box "Box Non Fee Amendment," some questions have been received as to which box should be used for amendments after final rejections. Continue to use Box AF for amendments after final rejections, even if it is a non-fee amendment. Although mail delivery by the Mail Room should be the same in either case, the Patent Examining Group will expedite those labeled Box AF.

j. *Special Box...Box Re-exam*

Requests for re-examination should be clearly marked "Box Reexam" on the outer envelope, and include only requests for re-examination. The goal for processing request for re-examination is 30 days from receipt in the Mail Room to delivery to the appropriate examining group. Requests for re-examination which are marked on the outside envelope for Box Re-exam are immediately placed in a special box for pick up by re-examination processing clerks twice daily. Properly marked requests for re-examination allow us to meet the 30-day goal and allow the examiner adequate time for considering the request.

If requests for re-examination are included in packages with other mail, the entire package will be placed with the thousands of pieces of mail received on that date to be opened in date order. Reexamination requests are, therefore, delayed for several days making the 30-day goal nearly impossible to meet, and often reducing the time available for the examiner's consideration of the request.

k. *Special Designations for Mail*

Special PTO mail department numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special departments. If any documents other then the specified type identified for each department are addressed to that department, they will be significantly delayed in reaching the appropriate area for which they were intended.

The following special department should be used only for their specified purpose. Address mail as follows:

Commisssioner of Patents and Trademarks
Box
Washington, DC 20231

Box 3	Mail for the Office of personel for NFC
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and Internal Affairs.
Box 5	"No Fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending* litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Assignment	All assignment documents except those filed with new applications.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box Patent Application	New patent application and associated papers and fees.
Box Trademark Application	New trademark application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.a
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

13. MAINTENANCE FEES

a. *Address to Which Correspondence is Sent Regarding Patent Maintenance Fees*

Under 37 CFR 1.33(d), a "correspondence address" or change thereto may be filed with the Office during the enforceable life of a patent. This "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified solely for maintenance fee purposes as provided by CFR 1.363. Practioners who do not wish to receive correspondence relating to maintenance fees must change the correspondence address in the patented file or provide the PTO with a fee address to which the correspondence should be sent. It is not required that a practitioner file a request for permission to withdraw pursuant to 37 CFR 1.36 solely for the purpose of changing the correspondence address in a patent, even though a withdrawal of a practitioner would change the correspondence address.

b. *Correspondence Address and/or Fee Address on Maintenance Fees*

Effective Nov. 1, 1984, 37 CFR 1.363 provides for a "fee address" to be entered in the Office patent file records for use in all correspondence relating to maintenance fees. The fee address is in addition to the "correspondence address" under 37 CFR 1.33. The "correspondence address" will continue to be used for all reexamination and interference purposes. If no separate fee address is specififed, the correspondence address will also be used for maintenance fee correspondence. A similar reminder appears on the Issue Fee Transmittal Form, PTOL-85(b).

Practitioners should maintain a current "correspondence address" and, if desired, a separate current "fee address" during the enforceable life of the patent in order to ensure receipt of correspondence regarding maintenance fee.

Practitioners are reminded that they are obliged to inform a client for former client (or timely notify the Office of an inability to notify a client or former client) of any maintenance fee correspondence received from the PTO. See 37 CFR 10.23(c)(8). This is similar to the practice with respect to interference and reexamination proceedings.

Practitioners who do not wish to receive correspondence relating to maintenance fees must change the correspondence address in the patented file or provide the PTO with a "fee address" to which such correspondence should be sent.

It is not required that a practitioner file a request for permission to withdraw pursuant to 37 CFR 1.36 solely for the purpose of changing the correspondence address in a patent even though a withdrawal of a practitioner would change the correspondence address. However, a request for permission to withdraw pursuant to 37 CFR 1.36 must be filed in the patent if the attorney or agent of record does not desire to receive correspondence relating to reexamination.

c. *Delayed Payment of Maintenance Fees*

Payment of any maintenance fee due on a patent after expiration of the patent may be accepted if the conditions set forth in 37 CFR 1.378 are satisfied.

In the past, petitions under 37 CFR 1.378 to accept delayed payment of the maintenance fee in an expired patent have been filed which allege, as a basis for unavoidable delay: (1) lack of knowledge that a maintenance fee was due and/or (2) failure to receive a Maintenance Fee Reminder notice from the PTO.

Practitioners are reminded that a patentee's lack of knowledge of a requirement to pay a maintenance fee does not constitute a showing of unavoidable delay; see 49 F.R. 34716 at page 34720, and 1046 O.G. 28 at page 32.

Maintenance Fee Reminder notices are mailed only as a courtesy after the "grace period" has begun; see 37 CFR 1.362(e). Patentees are expected to maintain their own docket systems to ensure timely payment of maintenance fees, preferably during the "window period"; see 37 CFR 1.362(d). Since patentees are expected to maintain their own docket systems for timely payment of maintenance fees, proof that a Maintenance Fee Reminder notice was not received from the PTO does not constitute a showing of unavoidable delay; see 49 F.R. 34716-34726, and 1046 O.G. 28-37.

Practitioners are cautioned that any petition to accept delayed payment of a maintenance fee under CFR 1.378 must include an enumeration of the steps taken to ensure timely payment of the maintenance fee. In this regard, the petition should include a detailed explanation of the docket system employed to ensure such timely payment. Any petition filed more than six months after the expiration of a patent will also be required to show that the failure to timely pay the maintenance fee was due entirely to circumstances outside the control of the patentee and those acting on behalf of the patentee.

d. *Maintenance Fee Transmittal Form Notice*

Where maintenance fee payments are to be made by authorization to charge a deposit account, the Maintenance Fee Transmittal Form, should reflect *both* the Payor's Name *and* signature in the bottom left corner thereof.

e. *Mandatory Indentifiers when Submitting Maintenance Fees*

Practitioners are reminded that a patent maintenance fee payment and any surcharge payment submitted must identify the patent to which it relates by at least *two mandatory identifiers* [see 37 CFR 1.366(c)]:

1. The patent number; and
2. The serial number of the United States application for the patent on which the maintenance fee is being paid.

Reissure patent maintenance fee due dates are based on the issue date of the original, rather than the reissue patent. The payment must identify the reissue patent by reissue patent number and reissue application serial number as the two mandatory identifiers and should also include the original patent number, the original patent issue date and the original United States application filing date. See 37 CFR 1.366(d).

The two mandatory identifiers are required as a minimum to enable a cross-check to be made to avoid errors in crediting payment of maintenance fees.

It is suggested that the payment identify the fee being paid for each patent as to whether it is the 3 1/2, 7 1/2 or 11 1/2 year fee; whether small entity status is being changed or claimed; the amount of the maintenance fee and any surcharge being paid; any assigned payor number; the patent issue date; and the United States application filing date. See 37 CFR 1.366(d).

Failure to provide at least the two above-named mandatory identifiers will likely result in the non-acceptance of the maintenance fee payment. The date the two mandatory identifiers and the required fee are submitted is the date the maintenance fee payment is credited as being made.

f. *Payor Number*

In order to simplify changes in address by patent owners having several patents, and data input by the Patent and Trademark Office, a "payor number" will be assigned to each fee address when a fee address is presented to the Office in a patent or earlier upon request. A request for a payor number before a maintenance fee is paid or due will permit a patent owner to request that the fee address and payor number be recorded in the Office records of the patents owned on which maintenance fees are due so that all notices relating to maintenance fees will be sent to the fee address.

When a fee address has been specified as provided by 37 CFR 1.363, that address is assigned a "payor number". Processing time can be greatly reduced if practitioners cite that "payor number" when submitting a maintenance fee payment.

The Patent and Trademark Office has established a procedure for assigning a payor number upon request by a patent owner or a party responsible for paying maintenance fees. Such a party may be, for example, the finance office of a corporation or of a separate organization specializing in maintenance fee payments.

Under the procedure, a patent owner or other party may request a payor number for a particular fee address by writing to:

Commissioner of Patents and Trademarks
Box M. Fee
Washington, DC 20231

Each request for a payor number should include the:

- fee address to be used by the Office, and
- telephone number of the fee addressee to be used to resolve problems.

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After receipt of a payor number, it may be used to indicate to the Patent and Trademark Office the fee address to be used in particular patents on which maintenance fees will become due and in applications in which issue fees have been or are being paid. Any request for entry of a payor number or fee address in the Office records of a patent, however, must be signed by the patent owner or his or her attorney or agent of record.

After a payor number has been assigned, it should be used in all future maintenance fee payments and related correspondence. However, where a payor number has not been previously entered in the Office records for a particular patent, the mere indication of a payor number at the time of payment of the maintenance fee, without the signature of the patent owner or the owner's attorney or agent of record, will not serve to make the payor number of record in the Office for that patent.

The problems which most often arise in connection with attempts to establish a fee address in a particular patent or group of patents is that the request is being signed by an attorney who is not of record in each of the patents. This results in the request being entered only in part.

Also, when the request is signed by an owner of the patent, the records of the Assignment Branch do not always reflect such ownership. Where the assignment was recorded prior to Dec. 1980, it would help the Office if the PTO reel and frame number of the assignment recordation were presented in the paper requesting that a fee address be entered, and if the person signing the request would indicate his or her title.

g. *Public Availability of Maintenance Fee Petitions/Decisions*

Maintenance fee petitions and decisions thereon are public records. Copies thereof can be obtained by submitting a written request to the Certification Branch. The request should state the patent number and serial number. The charge for the copies is currently $.50 per page.

14. NEW PATENT APPLICATIONS

a. *Attorney Docket Number on Incomplete/Missing Parts Notices*

In response to several requests from patent attorneys, the PTO is now entering the attorney docket number on the Notice of Incomplete Application and Notice to File Missing Parts of Application.

The attorney docket number which will be entered on the Notice will be that which was submitted on the transmittal letter as filed with a new patent application. The number must be clearly identified as an "attorney docket number."

If the Office makes a mistake in recording the attorney docket number on the Notice of Incomplete Application or the Notice to File Missing Parts of Application, such mistake is not to be used by the attorney as cause for delay in response. Nor is the attorney to request that the Office correct the docket number prior to response to the Notice. The attorney can notify the Office in the response, but no change will be made by the Office until the Filing Receipt is issued.

If the attorney wishes to change the attorney docket number from that which was entered on transmittal letter as filed, the request must be submitted through amendment, submitted to the Patent Examining Corp.

b. *Continuation or Divisional...Retaining Original Claim*

When filing under Rule 1.60, retain at least one original claim from the parent application to assure a complete application. Only amendments reducing the number of claims or adding a reference to the prior application [Rule 1.78(a)] will be entered, upon request, before calculating the filing fee and granting the filing date.

Reminder: Applicant cannot file a CIP (continuation-in-part) under Rule 1.60.

c. *Continuation or Divisional...Problems*

Applications are often filed incorrectly under 37 CFR 1.60. This causes problems not only for applicants but also for the Patent and Trademark Office. Filing dates are not granted to applications which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.

Most often, the problems that arise in this area can be characterized as the following:

(1) Applicants continue to fail to comply with the requirements of 37 CFR 1.60 with regard to what must be submitted upon filing under the rule. This is true even after the clarifying amendments (effective Apr. 1, 1984) were made to the rule. A true copy of the prior application must be filed including the specification (with claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application.

(2) Applicants are using transmittal forms which request filings under 37 CFR 1.62 when it was really desired to file a divisional application under 37 CFR 1.60 and not to abandon the parent application.

d. *File Wrapper Continuation...Preliminary Amendment*

Many continuation applications filed under 37 CFR 1.62 contain no preliminary amendment to the claims which were finally rejected in the parent application. The result is a first action final rejection of these claims. Applicants should file any desired amendments at the time the application if filed under 37 CFR 1.62, since the Office is treating these applications as "Special" and an action on the merits will be rendered quite promptly.

To expedite processing under Rule 1.62, make certain that the parent serial number cited in the transmittal letter is the correct serial number.

e. *File Wrapper Continuation...Problems*

Applications continue to be filed incorrectly under both 37 CFR 1.60 and 37 CFR 1.62. Filing dates are not granted to applications which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.

The problems that most frequently arise in this area can be characterized as the following:

(1) Applications have been filed with a transmittal form requesting filing under 37 CFR 1.60 when it was intended to file under 37 CFR 1.62. The confusion in the record of such applications must be clarified by a decision on petition before the applications can be processed for examination.

(2) Some applicants fail to realize that the parent application is abandoned by the filing of a continuing application under 37 CFR 1.62. Paragragh (g) of 37 CFR 1.62 states:

> "The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application."

Correction after such a mistaken filing under 37 CFR 1.62 usually requires a revival of the parent application under 37 CFR 1.137(a) or (b) which expends resources of both the applicant and the PTO.

(3) Some applicants are attempting to file continuing applications under 37 CFR 1.62 after payment of the issue fee in the patent application. Such applications are improper and are not entitled to a filing date. Additionally, such filings will not affect the prior application; i.e., the parent application may issue as a patent. Paragraph (a) of 37 CFR 1.62 specifies that continuing applications may be filed under 37 CFR 1.62 "before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application".

(4) Some applicants are attempting to file continuation-in-part applications under 37 CFR 1.62 with a new specification rather than with the changes made by amendment to the prior application. As stated in 37 CFR 1.62(a), filings under 37 CFR 1.62 use the specification of the prior application.

Paragraph (c) of 37 CFR 1.62 also states:

> "In the case of a continuation-in-part application which *adds and claims additional disclosure by amendment*, an oath or declaration as required by $ 1.63 must also be filed..." (emphasis added)

(5) The request for a FWC *must* contain the original signature of the inventor, assignee, attorney or agent of record, or attorney or agent filing under representative capacity. [1.34(a)]

f. *Information Disclosure Citation...Form PTO 1449*

The Public is encouraged to use Form PTO 1449, "Information Disclosure Citation," when preparing a statement under 37 CFR 1.97-1.99 (see MPEP $609). This form provides the Office with a uniform way of listing the citations and a vehicle from which the information thereon can be printed on the issued patent.

Some citations are being presented on various forms prepared by the public rather then on Form PTO 1449. As a result, delays are cropping up in the printing process because the printer has difficulty in following the various formats and is having to query the examiner each time a non-PTO 1449 form is used.

Note that listing citations on Form PTO 1449 does not raise an irrebuttable presumption that the citation is prior art. A holding by an examiner that any citation on Form PTO 1449 is prior art to claimed subject matter can be rebutted by procedures commonly used to rebut the prior art status of an examiner's citations on Form PTO 1449, "Notice of References Cited".

Among the information that should be provided on Form PTO 1449 is the date of publication of the citation. In addition, it is helpful if the class and subclass of each citation is provided. It is appreciated that classification information may not be known at the time Form PTO 1449 is prepared. When classification information is not known, draw a line in the boxes under the class and subclass heading adjacent to the citation for which classification information is not known.

g. *Petition for License*

Rule 5.12 states that "filing of an application for patent for inventions made in the United States will be considered to include a petition for license under 35 USC 184 for the subject of the application. The filing receipt will indicate a license is granted." There is no need to request a corrected filing receipt deleting the words "License Granted." Its intent is to provide the necessary acknowledgement for those filing abroad.

h. *Processing and Retention Fees for Abandoned Applications*

An application, which has become abandoned pursuant to 37 CFR 1.53(d) for failure to pay the filing fee, will be disposed of unless the processing and retention fee set forth in §1.21(1) is paid within the 1-year period referred to in § 1.53(d). Moreover, the processing and retention fee must be timely paid in order to obtain certified copies of the application (e.g., for convention priority purposes) or to establish in a later filed application the filing date benefit of an earlier copending application under 35 USC 120 and 37 CFR 1.78(a)(3). Therefore, an application which has become abandoned for the reasons set forth above should be immediately reviewed in order to timely determine the advisability of submitting a processing and retention fee payment.

i. *Surcharge for Filing a Patent Application*

Filing dates are accorded to applications filed without the basic filing fee and without the oath or declaration. In such cases, a notice is mailed by Application Branch requiring at least the basic filing fee and the oath or declaration, accompanied by a surcharge [37 CFR 1.16(e)]. In numerous instances, applicants fail to submit the surcharge causing the application to become abandoned. See 37 CFR 1.53(d) and MPEP §506.

15. PATENT COOPERATION TREATY APPLICATIONS

a. *Responses Filed in International Applications*

The 18 month publication deadline for international applications filed under the Patent Cooperation Treaty (PCT) is critical. Therefore, it is in applicant's interest to respond timely to an invitation to correct a PCT Article 14 defect. An untimely response can result in the withdrawal of the international application under Article 14 and PCT Rule 26. If an extension to respond is needed, call the person who signed the invitation before the expiration of the time limit. The PTO will strictly comply with PCT Article 14 and Rule 26 in holding international applications withdrawn when responses are untimely or not filed.

b. *Early Notification of Receipt of PCT Designated Office Cases*

If you would like to have early notification that the PTO has received requirements under 35 U.S.C. 371 to enter the Designated Office phase, you should send two self-addressed, stamped postcards with those requirements. The first postcard will be date

stamped and returned to you upon receipt of the requirements by the PCT staff. The second postcard will be sent to you when the case is released to the Mail Room to join the regular flow of national applications. The second postcard will be stamped with the U.S. serial number. If only one postcard is sent, it will be marked with the U.S. serial number but will remain with the application until requirements are completed and the case is released.

When corrections of PCT Rule 91 obvious errors in the description, claims or abstract are submitted together with corrections of defects under PCT Article 14, the transmittal letter should clearly note the Rule 91 corrections. This is necessary because, under PCT Rule 91.1(e), the Receiving Office can authorize the rectification of obvious errors only in the Request (Form PCT/RO/101), while Searching Authority authorization is needed for obvious errors in the description, claims or abstract. When the transmittal letter clearly notes the Rule 91 corrections, Searching Authority authorization of any obvious errors in the description, claims or abstract can be expedited.

Call PCT on 557-2003 if you have questions concerning responses filed during the international stage for international applications under the PCT.

16. PATENT COPIES

a. *Coupon Ordering Service*

Some problems being experienced in successfully filing coupon orders are:

@ No return address or Box Number
- Incorrect return address or box number
- Missing name of person(s) ordering copies (although the PTO attempts to send such orders, they are frequently returned by the receiving organization).
- Failure to identity whether request is for patent, trademark, or design copy.
- Failure to identity the patent, trademark, or design number being requested. Identification by application serial number is not acceptable.
- Inappropriate use of coupon for ordering a foreign patent (Foreign patents are $10.00 per copy and should be ordered through the Scientific Library).
- Insufficient payment (any coupons valued less that $1.50 must accompany additional payment either by check, money order, or additional coupons).

To ensure coupon orders can be successfully filled, please include a patent/trademark/design number, complete name, return address/box number, and the sufficient fee.

b. *Electronic Ordering Service*

Copies may be ordered electronically through the PTO's Electronic Ordering Service (EOS) rather than placing orders through the mail. With EOS, orders are received the same day they are placed, thereby reducing the turnaround time by about seven days. Orders can be placed any day, 24 hours a day.

To use EOS you need a standard computer terminal and modem. If you have any questions about equipment or the technical aspects of EOS, call (202) 377-2535.

The copy costs are $1.50 for each patent and trademark, and $6.00 for each plant patent. In addition, there will be a communication cost. This has been averaging 10 cents per copy; could range up to 25 cents on single orders.

Our regulations require that we receive payment for services before they are rendered. For this reason, a PTO deposit account is a prerequisite for becoming an EOS user. There are two types of PTO deposit accounts. One is an unrestricted account which can be used for any service PTO provides. This account requires a minimum balance of $1,000. The second type of account, the restricted deposit account, is available only for EOS and for subscriptions for copies of newly issued patents by subject matter classification. The restricted account requires a minimum balance of $300.

If you would like to become an EOS user or if you have questions, call (703) 557-7261.

c. *Subscription Services*

When submitting changes to subscription accounts, allow approximately two months from the date mailed to the Patent and Trademark Office for changes to become effective. The reason for the two month delay is to allow for changes to be recorded, data entered, and the automated system to be updated.

17. PETITIONS TO REVIVE

a. *Request and Fee for Extension Not Required*

Frequently, a petition to revive an abandoned application is accompanied by an unnecessary request and fee for extension of time. Our policy is set forth in MPEP 711.03(c). Specifically, a response does not require a request and fee for extension of time as a condition of revival.

b. *Terminal Disclaimer*

A petition to revive an abandoned application is often accompanied by an unnecessary terminal disclaimer. A terminal disclaimed is required only when a grantable petition based on *unavoidable delay* is not filed within six months of the date of abandonment [37 CFR 1.137(a) and 1.137(c)]. It follows that a terminal disclaimer should not accompany a petition based on *unintentional abandonment* [37 CFR 1.137(b)]. In these respects, analogous reasoning applies to petitions to accept late payment of the issue fee under 37 CFR 1.155 or 1.316.

When a terminal disclaimer is a necessary component of the petition, the period to be disclaimed must equal the number of months between the date of abandonment and the date a grantable petition is filed. The date of abandonment is the date the period for response has expired [see MPEP 711.04(a)]. This is normally the end of the three month shortened statutory period. Moreover, the terminal disclaimer should employ the format shown in Figure 1.

Figure 1—Terminal Disclaimer

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of (NAME)
Serial No.
Filed:
For:

TERMINAL DISCLAIMER

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS

Your petitioner, _____residing at _____, represents that he is the owner of the entire interest in the above-identified application (by virture of an assignment recorded at Reel _____, and Frame_____, filed on the _____day of _____, 19 _____).

Your petitioner, _____, hereby disclaims the terminal_____months of any patent granted on the above-identified application or on any application which is entitled to the benefit of the filing date of this application under 35 USC 120. This agreement is to run with any patent so granted and to be binding upon the grantee, its successors or assigns.

IN WITNESS THEREOF, I here unto set my hand and seal this _____day of _____19

_____
(Signature)

18. POWER TO INSPECT

a. *Power of Attorney*

The Office receives letters granting power to inspect patent applications. These may only be granted by the attorney of record or inventor. Sometimes the person signing the power is not authorized to do so, causing delay until proper authorization is received. Copies of completed applications cannot be made during the preexamination process. They can be inspected, but not pulled from the work flow to have copies made.

b. *Withdrawal of Attorney*

To expedite requests for permission to withdraw as attorney under 37 CFR § 1.36, submit the request in triplicate (original and two copies) and indicate thereon the present mailing addresses of the attorney who is withdrawing and of the applicant. The examining group number should also appear on all such requests. Because the Office does not recognize law firms, each attorney of record must sign the notice of withdrawal, or the notice of withdrawal must contain a clear indication of one attorney signing on behalf of another.

A request to withdraw is effective when approved rather than when received. This is particularly important when such requests are submitted toward the end of the period for response. There should be at least 30 days between approval of withdrawal and the expiration date of a time response period so that the applicant will have time to obtain other representation or take other action. If less than 30 days remains in a running response period, a request to withdraw is normally disapproved.

If a period has been set for response and the period may be extended [without a showing of cause pursuant to 37 CFR 1.136(a)] by filing a petition for extension of time and fee, it is not necessary to seek such extension of time for withdrawal to be approved. In such a situation, however, withdrawal will not be appproved unless at least 30 days would remain between the date of approval and the last date on which such a petition for extension of time and fee could properly be filed.

19. REISSUES

a. *Amendments*

To avoid unnecessary delays in the issuance of reissue applications, applicants and their attorneys are reminded to exercise caution and give sufficient attention to 37 CFR 1.121(a) and (e) in presenting reissue amendments. The practices and procedures vary somewhat from regular utility application amendments.

MPEP Sec. 1455 provides guidance for proper entry of amendments and claim numbering. Publication of the reissue application(s) may be needlessly postponed while formal irregularities are corrected.

b. *Oaths and/or Declarations*

Since standard oath and declaration forms are not used in reissue applications, applicants are commonly neglecting to include averments required by 37 CFR 1.63 per 37 CFR 1.175(a). The most frequent omissions involve the "duty of disclosure" acknowledgment, and the "reviewed and understands" statement. Such omissions usually necessitate additional handling and correspondence, and cause undue time delays, which result in postponement of publication of the reissue patent.

A frequent problem in reissue practice is the failure of applicants to satisfactorily comply with 37 CFR 1.175 regarding the description of all errors of the original patent in the reissue oath or declaration. Applicants are required to specify errors in the original reissue oath or declaration at the time of filing the reissue application. They must also specify, in a supplemental oath or declaration, any errors brought to their attention during the prosecution, as well as the circumstances surrounding the occurrence or discovery of these errors. Every departure from the original patent represents an "error" and must be particularly and distinctly specified and supported in the original, or a supplemental, reissue oath or declaration under 37 CFR 1.175. See MPEP Sec. 1414 and 1444. Postponement of publication of the reissue patent may result if these requirements are not met at the time of allowance.

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20. SMALL ENTITY STATUS

a. *Small Entity Statements*

Verified statements claiming small entity status, where appropriate, would best be signed and submitted at the time the application oath or declaration is signed to permit filing of the statement with the application. This would reduce correspondence between attorney and client, reduce paper handling by the PTO support staff and the PTO Finance Branch, and greatly simplify the processing of subsequent papers involving fees. If small entity status is being claimed for the first time at the time of payment of the issue fee, a verified statement claiming small entity status should be submitted with the fee. See MPEP $509.03.

21. TRADEMARKS

a. *Application Drawings*

To avoid delays in processing new trademark applications, the drawing should have the following information in the upper left hand corner:

- Drawing title.
- Applicant's name and address.
- First use date.
- First use in interstate commerce date.
- Goods, services or both

b. *File Histories*

When requesting trademark file histories, the "status date" (i.e., date abandoned) must be provided to fill the order if the file is abandoned. If not known, this information can be obtained from TRAM. The request will be returned unfilled if this date is not provided.

c. *Post Registration*

Section 8 Affidavit or Declaration Held Insufficient During Post Registration Examination — The Trademark Act of 1946, Section 8(a) was amended Aug. 27, 1982, Public Law 97-247 (96 Stat. 317), to clarify that the continued use required to be shown in the sixth year under Section 8(a) be used "in commerce."

Subsequently the Trademark Rules were amended on Jan. 28, 1983 (48 *Federal Register* 3977), to require that all Section 8(a) affidavits or declarations "state that the registered mark is in use in commerce and specify the nature of such commerce." [37 C.F.R. Section 2.162(e)].

The affidavit or declaration must be filed between the fifth and sixth year following the date of registration and it must contain a statement that the "mark is in use in commerce," with evidence thereof. There may be no extensions of time beyond the sixth year for submission of this statement and evidence of use of the mark in commerce. However, if the timely-filed affidavit or declaration does not set forth the type of commerce, the registrant will be given six months to submit that information even though the sixth year may have expired. The rules do not provide for any further extensions of time beyond the six months.

While the Post Registration Division will allow up to six months to respond to a letter from the office, a supplemental or substitute affidavit or declaration required by Section 8(a) will not be considered unless it is received before the expiration of the six year anniversary of the registration. It is suggested that registrants file Section 8(a) affidavits as early as possible between the fifth and sixth year following registration to allow time to submit an affidavit or declaration which is correct, if required.

Signatures ...The corporate title of the affiant/declarant is often missing. Occasionally, the affidavit/declaration is unsigned.

Assignments ...It will speed up the processing of Section 8 affidavits and renewal applications if the affiant/declarant will furnish the reel and frame number and the date(s) of recordation with the USPTO Assignment Section of any relevant assignment, merger, change of name, or other transfer.

Fees ...Many of the affidavits and applications for renewal contain insufficient fees. The fee schedule for these transactions done in the Post Registration is listed below:

(1)	For filing an application for renewal of a registration, per class	$300.00
(2)	For filing an affidavit under Section 8 of the Act, per class	$100.00
(3)	For filing an affidavit under Section 15 of the Act, per class	$100.00
(4)	For filing a combined affidavit under Sections 8 and 15 of the Act, per class	$200.00

If you have any questions, please call (703) 557-3061.

TRADEMARK APPLICATION EXAMINATION AND CONTENT

(212) Interviews Involving Trademark Application

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

July 6, 1964.

HORACE B. FAY, JR.,
Assistant Commissioner of Patents.

This supersedes the notice of Feb. 10, 1958. (728 O.G. TM 1)

[804 O.G. TM 147]

(213) Trademark Examining Procedure for Amended Applications; Reporting Oldest Dates of Amended Trademark Applications

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the *Official Gazette* (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

July 15, 1971.

RENE D. TEGTMEYER,
Assistant Commissioner.

[889 O.G. TM 6]

(214) Trademark Office Actions

Effective immediately Applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

Feb. 7, 1972.

ROBERT GOTTSCHALK,
Commissioner of Patents.

[895 O.G. TM 238]

(215) Petition to Make Trademark Applications Special

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lewry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

Mar. 13, 1972.

ROBERT GOTTSCHALK,
Commissioner of Patents.

[897 O.G. TM 2]

(216) Title 37...Patents, Trademarks, and Copyrights

Chapter I...Patent Office, Department of Commerce

Parts 2 and 6...Rules of Practice in Trademark Cases

International Trademark Classification

A proposal was published at 37 F.R. 6404 to revise § 6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the

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original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new § 6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act of all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the *Official Gazette*, which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§ 6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the *Official Gazette* when the List is available from local sources of the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C
Station Square House, St. Mary Cray
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

* * * * *

May 14, 1973. ROBERT GOTTSCHALK,
Commissioner of Patents.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

Published in 38 F.R. 41681, June 4, 1973

[911 O.G. TM 210]

(Note: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice; prior U.S. schedule of classes was redesignated as Rule 6.2.)

(217) Wording In Verification or Declaration of Trademark Application

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely, when applied to the goods of such other person, to cause confusion, or cause mistake, or to deceive:* —

The wording emphasized conforms to the language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance. Examiners will not require new verifications or declarations. When the obsolete wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

Mar. 25, 1974. RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[921 O.G. TM 186]

(218) Standardized Disclaimers

Beginning with the Nov. 9, 1982 issue of the *Official Gazette*, disclaimers in marks published for opposition and in those registered on the Supplemental Register will be printed in a standardized form, regardless of the text submitted. Certificates of registration for marks issued on the Supplemental Register will also contain the standardized disclaimer as of that date. Certificates of registration for marks issued on the Principal Register will contain the uniform statement beginning Feb. 1, 1983. The disclaimed matter will be taken from the disclaimer of record and inserted into a standardized disclaimer for printing and data base purposes. The new disclaimer text will take the following form:

No claim is made to the exclusive right to use apart from the mark as shown.

Aug. 30, 1982. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1022 TMOG 44]

(219) Trademark "Revivals" and "Reinstatements"

It would be of great assistance to the Office if the heading or caption of "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications carried the following identifying data:

1. Address Paper to the Attention of:
   Office of Director, Trademark Examining Operation
2. Serial Number
3. Mark
4. Applicant's Name
5. A title indicating the nature of the paper

Use of this heading for "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications will help ensure that the papers are promptly routed to the proper Office, which will prevent needless delay in its consideration.

Aug. 13, 1984. MARK M. NEWMAN,
Director, Trademark Examining Operation.

[1046 TMOG 13]

(220) T-Search Printouts as Section 2(d) References

As part of its ongoing automation program, the PTO is pleased to announce that on or about July 1, 1986, Trademark Examining Attorneys will use the automated Trademark search system (T-Search) exclusively for searching word marks. The Examining Attorneys will use computer printouts to advise applicants about Section 2(d) references. The printouts will include computer-generated facsimiles of the drawing where appropriate. The printouts will be used for word marks, whether the word is depicted in a typed drawing or in stylized form. Photocopies of certificates of registration will continue to be used for design marks.

The Patent and Trademark Office, in consultation with the Public Advisory Committee for Trademark Affairs, has established accuracy standards for the computerized data. Data elements which are not essential for examiner searching are being systematically checked and corrected. The following data elements which are essential for examiner searching purposes are essentially complete:

1. MARK
2. SERIAL NUMBER
3. REGISTRATION NUMBER
4. FILING DATE
5. REGISTRATION DATE
6. GOODS AND SERVICES
7. INTERNATIONAL CLASS
8. U.S. CLASS

Subject to the above caveat, the printouts will contain all the information that appears on the certificate of registration with one exception. If an application for registration was based on Section 44, 15 U.S.C. 1126, the printout will indicate that the registration or application was filed under the provisions of Section 44 (using the notation "SECT 44"). The printout will also show the priority date if the application was filed under the provisions of Section 44(d). However, it will not indicate the country or certificate number of the foreign registration on which the U.S. registration was based.

The printouts will also contain additional registration information which was not provided under the non-automated system, as follows:

A. Change in registration—This will indicate that a registration was changed after registration, such as by an amendment of the mark or identification of goods/services. The current information will be displayed in the printout.

B. Affidavits—This indicates that a Section 8 affidavit of continued use was accepted, that a Section 15 affidavit of incontestability was acknowledged, or that a mark was republished under the provisions of Section 12(c).

C. Renewals—Applicable renewal information, such as "1st Renewal" or "2nd Renewal" will be shown.

D. Owner—In addition to listing the original registrant, the last known owner, as the change of ownership is acknowledged by the Office by virtue of examining an affidavit or renewal, will be included.

The following provides an explanation of the terms/symbols used in the printout:

1. Goods or services appearing in double parentheses "(( ))" were not included in a Section 15 affidavit.
2. Goods or services appearing in brackets "[ ]" were deleted after registration by amendment, correction, restriction or at the time of renewal.
3. Dates will appear as year, month and day. For example, June 20, 1983 will appear as 1983.06.20.
4. Goods and services will be indicated with the international class (IC), the prior U.S. classification (US), the identification, date of first use and date of first use in commerce.
5. Registrants (OWNER) will be listed showing the owner's name, entity designation (e.g., individual, partnership, corporation), country of citizenship or state or country of incorporation, and address.
6. Pseudo mark—This material is merely a search aid and has no bearing on the registration information.
7. Design search code—This is also merely an aid for computerized searching of design marks, by which a number is assigned to describe a particular design element. It has no bearing on the registration information.
8. Mark drawing code—This indicates the appearance of the mark, and again is not part of the registration data. There are six mark drawing codes.

1—typed drawing
2—design only
3—words, letters and/or numbers and design 4—words,

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4=letters and/or number in block form (block letters; not typed drawing)
5—words, letters and/or numbers in a stylized form
6—sound marks

An example of a computer printout and a facsimile of a stylized word mark follow.

June 23, 1986.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

```
Document 1 of 1 for SS 1: FD 1351766/RN,SN
WORD MARK                 LINEA ADRIANO
TRANSLATION               THE WORDS "LINEA ADRIANO" IN THE MARK MAY BE
                          TRANSLATED INTO ENGLISH AS "LINE HADRIAN"
GOODS AND SERVICES        IC 025: US 039: G & S: ARTICLES OF CLOTHING
                          FOR MEN, NAMELY JACKETS, COATS, SUITS,
                          TROUSERS, JUMPERS, SHIRTS AND TIES
MARK DRAWING CODE         (5) WORDS, LETTERS, AND/OR NUMBERS IN
                          STYLIZED FORM
SERIAL NUMBER             73-446850
FILING DATE               1983.10.06
CHANGE IN REGISTRATION    CHANGE IN REGISTRATION HAS OCCURRED
REGISTRATION NUMBER       1351766
REGISTRATION DATE         1985.07.30
OWNER NAME AND ADDRESS    (REGISTRANT) RITEX AG KLEIDERFABRIK ZOFINGEN
                          CORPORATION SWITZERLAND FUNKENSTRASSE 10
                          ZOFINGEN AARGAU SWITZERLAND
SECTION 44 INDICATOR      SECT 44
FOREIGN PRIORITY DATES    1983.06.20
DISCLAIMER                NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO
                          USE "LINEA" APART FROM THE MARK AS SHOWN
TYPE OF MARK              TRADEMARK
REGISTER                  PRINCIPAL

TM 559,196                73 446,850
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Linea Adriano

[1068 TMOG 7]

(221)

(221) **Trademark Drawings**

Effective July 3, 1989, the requirement of Trademark Rule 2.52(c) (37 CFR {g49 2.52(c)) that drawings in trademark applications be limited in size to 4 inches by 4 inches will be strictly enforced for the purpose of assigning a filing date, pursuant to Trademark Rule 2.21(a)(3) (37 CFR {g49 2.21(a)(3)). [This notice rescinds the prior notice concerning this issue in the *Official Gazette* of June 30, 1987, at 1079 TMOG 12.]

The drawing size limitation is necessary to permit entry of the drawing in the automated trademark search system (T-Search) as soon as possible after receipt of the application by the Patent and Trademark Office (PTO). Oversized or poor quality drawings require additional processing before they can be digitized (copied) and entered in T-Search. If the PTO must reduce a drawing, not only is there often a loss of detail and overall drawing quality, but drawing reduction processing lengthens the time before the mark and information about the application are available to the public. Furthermore, an oversized drawing that is not reduced by the PTO cannot be scanned in its entirety for entry in T-Search, resulting in the possible loss of portions of the mark.

Enforcement of the drawing size limitation rule as a requirement for receipt of a filing date will permit the PTO to expedite application processing and permit the applicant to control the reduction process and, thus, control the quality of the representation of the mark as it will appear in T-Search, in the *Official Gazette*, and on the registration certificate.

The Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)] will be implemented on Nov.16, 1989. Two important provisions of the new law are that (1) an application for registration of the Principal Register may be filed based upon a bona fide intention to use a mark in commerce (15 U.S.C. 1051(b), as amended), and (2) for all applications filed on or after Nov. 16, 1989, upon the registration of a mark on the Principal Register, the application filing date becomes a constructive date of first use of the mark (15 U.S.C. 1057(c), as amended). Therefore, expedited processing to permit timely public notification of the filing of an application on the Principal Register will be particularly important.

Apr. 3, 1989

JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

[1102 TMOG 6]

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(222) **Examination Guide**

The following examination guide concerns the implementation of The Trademark Law Revision Act of 1988, Public Law 100-667, 102 Stat. 3935, and the amended Rules of Practice in Trademark Cases, 37 C.F.R. Part 2, which take effect on November 16, 1989. The guide is to be used in conjuction with Revision 7 to The Trademark Manual of Examining Procedure.

The guide presents a comprehensive statement of the revisions to Office policy and procedure related to the referenced amendments to the Trademark Act and rules. To the extent that the policies stated in the guide conflict with policies set forth in Revision 7, the provisions of the guide are controlling. Those policies set forth in Revision 7 which do not conflict with the guide remain operative.

Oct. 16, 1989

JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

EXAMINATION GUIDE 3-89
IMPLEMENTATION OF THE TRADEMARK LAW REVISION ACT OF THE 1988 AND THE AMENDED RULES OF PRACTICE IN TRADEMARK CASES

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Preface

On November 16, 1988, the President signed The Trademark Law Revision Act of 1988 into law, Public Law 100-667, 102 Stat. 3935 (the 1988 amendments). The 1988 amendments, which take effect on November 16, 1989, represent the most significant reform in United States trademark law since the enactment of The Trademark Act of 1946, 15 U.S.C. Section 1051 *et seq.* (the Act). The principal purpose of this examination guide is to provide a comprehensive statement of revisions to Office policy and procedure associated with the 1988 amendments.

The Rules of Practice in Trademark Cases, 37 C.F.R. Section 2.1 *et seq.*, have also been revised effective November 16, 1989, principally to incorporate the provisions of the 1988 amendments. The rules were also revised to update Office policy in other respects. These additional revisions bring the rules into conformity with current Office practice in several areas and reflect changes in practice dictated by decisions such as the Trademark Trial and Appeal Board decision in *Crocker National Bank v. Canadian Imperial Bank of Commerce*, 223 USPQ 909 (TTAB 1984). This guide will also set forth these additional revisions to Office policy and procedure reflected in the rules. The revisions discussed here were published in final form on September 11, 1989, with the exception of the revisions to Trademark Rules 2.42 and 2.186, 37 C.F.R. Sections 2.42 and 2.186, which were published in final form on August 22, 1989, in conjunction with other revisions related to proceedings before the Trademark Trial and Appeal Board. All revisions published on both dates take effect on November 16, 1989. References in this guide to the rules relate to the rules as amended on November 16, 1989.

The most significant amendment to the Act is a provision permitting the filing of applications to register marks on the Principal Register based on a bona fide intention to use a mark in commerce, before actual use (intent-to-use applications). The examination guide will discuss the administration of this provision in detail. However, intent to use and other provisions of the 1988 amendments required revisions in policies and procedures affecting virtually all applications and all aspects of processing. Please read the entire guide carefully to become familiar with all of the provisions.

The first major section of the guide presents the requirements, policies and procedures related to intent-to-use applications. The second major section addresses provisions affecting all applications. The next two sections address provisions related to other specific types of applications, and the final section addresses multiple bases and changes in the basis for registration.

The policies set forth in this guide apply to all applications, affidavits and renewals filed on or after November 16, 1989, unless specifically indicated otherwise. The stated policies also apply to any action taken on or after November 16, 1989, with respect to applications filed before that date, unless specifically indicated otherwise. To the extent that the policies and procedures set forth in this examination guide conflict with policies or procedures set forth in the Trademark Manual of Examining Procedure (TMEP) or other statements of Office policy, the provisions of this examination guide are controlling. Note especially the discussion below concerning the application of the rule restricting amendments to the identification of goods and services to pending applications.

JAMES T. WALSH
Administrator for Trademark
Policy and Procedure

DAVID E. BUCHER
Director,
Trademark Examining Operation

A. INTENT-TO-USE APPLICATIONS

1. General Overview

a. Summary of Application Flow

The 1988 amendments revise Section 1 of the Act to permit filing of an application to register a mark on the Principal Register based on a statement of a bona fide intention to use the mark in commerce. Trademark Act Section 1(b), 15 U.S.C. Section 1051(b). The Act, as amended, further requires that such an applicant use the mark in commerce before issuance of the registration. The Act thus requires that the applicant file either an amendment to allege use or a statement of use before, and as a precondition to, the issuance of the registration. Trademark Act Sections 1(c) and 1(d), 15 U.S.C. Sections 1051(c) and (d).

The principal difference between the amendment to allege use and the statement of use is the time of filing. The amendment to allege use may be filed during initial examination, that is, after filing of the application but before either approval of the mark for publication or the expiration of the response period after issuance of a final action. Trademark Rule 2.76 (a), 37 C.F.R. Section 2.76(a). If the ammendment to allege use is acceptable and the application is otherwise in condition for publication, the mark will be published for opposition. After publication, the application will be processed in the same manner as an application based on use. If the application is not opposed, or if the applicant prevails in all oppositions filed, the application will proceed to registration.

If the applicant does not file an acceptable amendment to allege use during initial examination or if it is withdrawn, and the application is otherwise in condition for publication, the mark will be published for opposition. If the application is not opposed, or if the applicant prevails in all oppositions filed, the Office will issue a notice of allowance under Trademark Act Section 13 (b)(2), 15 U.S.C. Section 1063 (b)(2). The applicant must file a statement of use within six months of the issuance of the notice of allowance or within an extension of time granted for filing of the statement of use. Trademark Act Section 1(d), 15 U.S.C. Section 1051(d). The applicant may not file the statement of use before issuance of the notice of allowance. Trademark Rule 2.88(a), 37 C.F.R. Section 2.88(a). This period after approval for publication and before issuance of the notice of allowance during which the statement of use may not be filed is referred to as the blackout period. The statement of use will be examined as discussed below.

The applicant may request extensions of time for filing the statement of use under Trademark Act Section 1(d), 15 U.S.C. Section 1051(d). The applicant may request one six-month extension without a showing of good cause and four additional six-month extensions with a showing of good cause. Trademark Rule 2.89, 37 C.F.R. Section 2.89. Extensions of time are discussed below in detail (A.7.).

Please note that any reference to "initial examination" refers to examination of an intent-to-use application before approval for publication. The examination after filing of the statement of use will be referred to as "examination of the statement of use." Also, please note that the "notice of allowance" refers to a new document required under the 1988 amendments. To avoid confusion, the term "allowance" will be used only in reference to this document and this phase of processing intent-to- use applications. Therefore, this guide will use the term "approval for publication" rather than "allowance for publication" to avoid any confusion with the notice of allowance.

As discussed in more detail below, the examining attorney must raise and dispose of all possible issues in the application during the initial examination. During examination of the statement of use, the examining attorney may not issue requirements or refusals which could or should have been presented in the initial examination unless the failure to do so initially was a clear error as defined below (A.9.b.).

The Office has established a special intent-to-use unit (ITU Unit) to process certain papers. Paralegals in the ITU Unit will review all statements of use to determine whether they meet the minimum requirements to be forwarded for examination on the merits, in the same way that the Application Section reviews the initial application for compliance with filing requirements. If the statement of use meets the minimum requirements, it will be referred to the examining attorney in the law office for examination on the merits. The paralegals in the ITU Unit will also review and act on all requests for extensions of time to file stater ents of use.

b. Constructive Use Priority

Trademark Act Section 7 has also been amended to provide that the filing of *any* application for registration on the Principal Register, including an intent-to-use application, constitutes constructive use of the mark, provided the application matures into a registration. Trademark Act Section 7(c), 15 U.S.C. Section 1057(c). Upon registration, filing thus affords the applicant nationwide priority over others except parties who had used the mark before the applicant's filing date, parties who had filed in the Office before the applicant or parties who are entitled to an earlier priority filing date based on the filing of a foreign application under Trademark Act Section 44(d), 15 U.S.C. Section 1126(d).

The Office will not amend the filing date of any application filed before November 16, 1989, to a date on or after November 16, 1989, for the purpose of affording the applicant whatever benefit the constructive use date may provide.

c. Application Requirements

Intent-to-use applications must comply with all of the requirements of the Act and relevant regulations in all respects except as specifically noted in this guide. For example, the provisions of Sections 2(e)(1), 2(e)(2) and 2(e)(3) apply to intent-to-use applications as well as to other applications. This section of the guide will focus on those requirements, policies and procedures related to intent-to-use applications which differ from those related to the filing and processing of other applications.

d. Applications Not Accepted Until Effective Date

The Office will not accept any intent-to-use applications filed before November 16, 1989. If any such application is received before that date, the Office will return the application. If an intent-to-use application filed before the effective date reaches the examining attorney in error, the examining attorney should return the case to the Application Section for appropriate action. However, if the examining attorney has already issued an action, the examining attorney should issue a new action refusing registration because the application was void as filed.

Intent-to-use applications executed before the effective date, but filed on or after the effective date, will be accepted. However, the examining attorney will determine whether the time between execution and filing is within Office guidelines for all applications. *See* TMEP section 803.04. The applicant may reexecute the declaration verifying its statement of a bona fide intention to use the mark in commerce if the examining attorney determines that the delay between execution and filing was unreasonable.

All intent-to-use and Section 44 applicants must file the application within a reasonable time after execution to ensure the statement of intent is valid at the time of filing. The guidelines governing the reasonableness of the lapse of time are the same as those which apply to use applicants.

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e. Good Faith

The Act specifies that an applicant may file an application based on a bona fide intention to use a mark in commerce "...under circumstances showing the good faith of such person." Trademark Act Section 1(b), 15 U.S.C. Section 1051(b). The Office will *not* evaluate the good faith of an applicant in the ex parte examina- tion of applications. The applicant's sworn statement of a bona fide intention to use the mark in commerce will always be sufficient evidence of good faith in the ex parte context. Consideration of issues related to good faith is appropriate in an inter partes proceeding.

2. Filing-Date Requirements

Trademark Rule 2.21, 37 C.F.R. Section 2.21, sets forth the minimum requirements for receiving a filing date for an intent-to- use application as well as other types of applications. These minimum formal requirements do not include all of the requirements which may ultimately apply for registration of the mark, but merely those requirements which must be met to receive a filing date. Please note the discussion below of those requirements for receiving a filing date which apply to all applications, in particular, the requirement that the application include a declaration or verification signed by the applicant to receive a filing date (B.1.).

With specific reference to intent-to-use applications, the application must include the following elements to receive a filing date: the name of the applicant; the name and address to which communications can be directed; a drawing of the mark substantially meeting all of the requirements of Trademark Rule 2.52, 37 C.F.R. Section 2.52; an identification of goods or services; a claim of a bona fide intention to use the mark in commerce; a verification or declaration under Trademark Rule 2.33(b), 37 C.F.R. Section 2.33(b), *signed by the applicant;* and the required filing fee for at least one class of goods or services.

In the case of an intent-to-use application, as in the case of all applications, if the application lacks any of the elements specified as necessary to receive a filing date, the application will be denied a filing date and all papers returned to the applicant with an explanation as to the deficiency. TMEP section 704. If an application which lacks one or more of the elements required for receiving a filing date is referred to the law office for examination in error, the examining attorney should return the case to the Application Section for appropriate handling. If the examining attorney discovers that an element was lacking after taking an action in the case, the examining attorney should issue a refusal on the ground that the application was not eligible to receive a filing date. TMEP section 705.02.

The fee for filing an intent-to-use application is the same as the filing fee for any other application, $175.00 per class.

3. Application Requirements - Initial Examination

In an intent-to-use application, the examining attorney will potentially examine both the application and a statement of use. After receipt of the application, the Office will perform the initial examination of the application to determine whether the mark is eligible for registration, but for the lack of use. If it is found to be eligible, the mark will be approved for publication and published for opposition. If the applicant has not submitted an amendment to allege use before publication, and the application is not opposed or survives all oppositions filed, the Office will issue a notice of allowance. Trademark Act Section 13(b), 15 U.S.C. Section 1063(b); Trademark Rule 2.81, 37 C.F.R. Section 2.81. In such a case, the applicant must submit a statement of use. Trademark Act Section 1(d)(1), 15 U.S.C. Section 1051(d)(1); Trademark Rule 2.88, 37 C.F.R. Section 2.88. If an amendment to allege use is filed and accepted, the application will be processed in the same manner as a use application from that point forward.

This section addresses examination before publication only; a later section will discuss the filing and examination of the statement of use after issuance of the notice of allowance.

The examining attorney must examine and act on all possible issues in the initial examination of the application. The intent- to-use application is subject to the same requirements and examination procedures as all other applications, except as specifically noted.

a. Drawings

The examination of the drawing in initial examination, before submission of any amendment to allege use and specimens, will focus primarily on the form of the drawing and compliance with Trademark Rule 2.52, 37 C.F.R. Section 2.52. The examination of the drawing after submission of an amendment to allege use is discussed below (A.4.d.iv.). As in any other application, the applicant may not amend the mark in a drawing if the amendment constitutes a material alteration of the mark. *In re The Wine Society of America, Inc.*, Serial No. 662,515 (TTAB, April 6, 1989). The applicant may not add or delete matter if the amendment would alter the character of the mark.

Please note the discussion below concerning the requirement in all applications that special-form drawings not exceed four inches by four inches to receive a filing date (B.1.b.).

b. Statutory Averments and the Identification of Goods and Services

The application must include a statement that the applicant has a bona fide intention to use the mark in commerce with respect to specific goods and services as well as the other averments specified in Trademark Act Section 1(b), 15 U.S.C. Section 1051(b). Trademark Rule 2.33(b)(2), 37 C.F.R. Section 2.33(b)(2). If the application does not include the averments, the examining attorney must require a new verification including all necessary averments.

The general requirements related to identification of goods and services discussed below apply to intent-to-use applications as well as to all other applications. Under Trademark Rule 2.71(b), 37 C.F.R. Section 2.71(b), "the identification of goods or services may be amended to clarify or limit the identification, but additions will not be permitted." The policies governing the application of this revised rule are discussed in detail below (B.6.) with examples and merit special attention.

Furthermore, under long-standing Office policy, the identification of goods and services must be specific and definite. Cf. *In re Societe Generale des Eaux Minerales de Vittel S.A.*, 1 USPQ2d 1296 (TTAB 1986), *rev'd on other grounds*, 824 F.2d 957, 3 USPQ2d 1450 (Fed. Cir. 1987).

As noted above, the Office will not examine the applicant's good faith in relation to the identification of goods or services or otherwise. Consideration of this issue is more appropriate in an inter partes proceeding.

In suggesting identifications, examining attorneys should not be overly restrictive. See *In re Sentry Chemical Company*, 230 USPQ 556 (TTAB 1986).

Because applicants may only limit or clarify the goods and services, the examining attorney should provide appropriate cautions to the applicant in requiring amendment to the identification of goods and services. When appropriate, the examining attorney should advise the applicant that goods or services explicitly deleted by amendment may not be reinserted at a later point in prosecution. Examining attorneys should take particular attention in the case of pro se applicants to ensure that they are aware of the restrictions related to amendments to the identification of goods and services.

c. Examination for Use as a Trademark or Service Mark

The Office will *not* examine the issue of use as a trademark or service mark in the initial examination of an intent-to-use application unless the applicant has submitted specimens of use in conjunction with an amendment to allege use under Section 1(c). However, as noted below (A.4.d.), if the applicant withdraws an amendment to allege use, the specimens remain of record, but the examining attorney may not consider or act on any such specimens in relation to the issue of use.

d. Examination under Sections 1, 2(a), 2(b), 2(c) and 2(e)

To the fullest extent possible, the examining attorney will examine the intent-to-use application for registrability under Trademark Act Sections 1, 2(a), 2(b), 2(c) and 2(e), 15 U.S.C. Sections 1051, 1052(a), (b), (c) and (e), according to the same procedures and standards which apply to any other application. The examining attorney should investigate all possible issues regarding registrability under these sections through all available sources. If appropriate, the examining attorney should request that the applicant provide literature or explanation concerning these issues under Trademark Rule 2.61(b), 37 C.F.R. Section 2.61(b). The examining attorney should request such information relevant to the types of goods or services or the trade, in general, or similar general information. The examining attorney should not request information regarding use of the specific mark in relation to the goods or services.

First and foremost, the examining attorney must develop evidence during the initial examination from sources other than the applicant. The examining attorney may not make any inquiry or request any information premised on use of the mark before the applicant files an amendment to allege use. If the applicant submits an amendment to allege use during the initial examination, the examining attorney may then obtain relevant information from the applicant in the same manner as would apply in any application based on use unless the amendment to allege use is withdrawn.

The examining attorney must raise all possible issues under these sections in the initial examination of the application. As discussed more fully below (A.9.), Office policy precludes the issuance of a requirement or refusal during examination of the statement of use if the issue could or should have been treated in the initial examination, unless the failure to do so in initial examination constitutes a clear error. **"Clear error" means an error which, if not corrected, would result in issuance of a registration in violation of the Act.** The meaning and application of this standard are discussed in detail below (A.9.b.).

e. Examination under Section 2(d)

The examining attorney will perform a search and will issue refusals, as appropriate, under Trademark Act Section 2(d), 15 U.S.C. Section 1052(d), in the case of an intent-to-use application. The determination of likelihood of confusion under Section 2(d) in an intent-to-use application does not differ from the determination in any other type of application. The examining attorney should consider questions concerning the scope of the goods and services and related goods and services in determining likelihood of confusion under the standards which have historically governed in applications based on use or based on a foreign application or registration.

For the purpose of determining priority among pending applications, the intent-to-use application will be treated in the same manner as any other application. For purposes of publication for opposition, an intent-to-use application will receive priority over any application which has an effective filing date later than the intent-to-use application.

For the purpose of determining priority between two applications which have the same filing date, the application with the earlier date of execution will be accorded priority for purposes of publication for opposition. Trademark Rule 2.83(b), 37 C.F.R. Section 2.83(b). This would apply whether one or both of the applications are intent-to-use applications.

Also, an intent-to-use application, like any other application, cannot serve as the basis for a formal refusal under Section 2(d) until the application has matured into a registration.

f. Claims of Acquired Distinctiveness under Section 2(f)

An intent-to-use applicant may not assert that a nondistinctive designation has acquired distinctiveness under Trademark Act Section 2(f), 15 U.S.C. Section 1052(f), until the applicant has submitted an amendment to allege use or a statement of use. A claim of acquired distinctiveness, by definition, requires prior use. Section 2(f) is limited by its terms to "a mark used by the applicant." Therefore, the examining attorney should reject any claim of acquired distinctiveness filed before submission of an acceptable amendment to allege use or statement of use. The examining attorney should consider and act on any claim of acquired distinctiveness filed after such time in the same manner and according to the same standards which would apply to any other application.

Please note the discussion below of the revision regarding five-year claims of acquired distinctiveness (B.7.).

g. Intent-to-Use Applications and the Supplemental Register

An intent-to-use applicant may not seek registration on the Supplemental Register until the applicant has submitted either an acceptable amendment to allege use or statement of use. Trademark Rule 2.75(b), 37 C.F.R. Section 2.75(b). Only applications under Trademark Act Section 44, 15 U.S.C. Section 1126, are excepted from the use requirement in seeking registration on the Supplemental Register. Trademark Act Section 44(e), 15 U.S.C. Section 1126(e).

If an applicant submits an application for the Supplemental Register based on intent to use, the Office will reject the application because it was void as filed and will return all papers to the applicant with any fees submitted. If any such application reaches an examining attorney in error, the examining attorney should return the papers to the Application Section for appropriate action.

If an intent-to-use applicant does file an acceptable amendment to allege use or statement of use *and* an acceptable amendment to the Supplemental Register, the Office will change the effective filing date of the application to the date of the filing of the amendment to allege use or the statement of use. Trademark Rule 2.75(b), 37 C.F.R Section 2.75(b). The examining attorney must ensure that the effective filing date has been changed.

The amendment to allege use or statement of use should be examined before any action is taken on an amendment to the Supplemental Register.

4. Amendments to Allege Use under Section 1(c) of the Act

As stated earlier, an intent-to-use applicant must file either an amendment to allege use under Trademark Act Section 1(c), 15 U.S.C. 1051(c), or a statement of use under Trademark Act Section 1(d), 15 U.S.C. Section 1051(d), as a precondition to issuance of the registration. This section will discuss amendments to allege use only; the statement of use will be discussed below (A.8. and 9.).

a. Form and Permissible Time Period for Filing an Amendment to Allege Use under Section 1(c) of the Act

Any paper which includes an amendment to allege use under Section 1(c) of the Act should be entitled "Amendment to Allege Use" whether or not it includes other amendments. This title should appear at the top of the first page. Trademark Rule 2.76(d), 37 C.F.R. Section 2.76(d). This practice is recommended, not required. It will assist in the prompt and orderly processing of papers. The Office will not take any action to require a proper title.

An applicant may file an amendment to allege use under Section 1(c) of the Act at any time after filing the application and before the date the examining attorney approves the mark for publication or before the expiration of the six-month response period after issuance of a final action. Trademark Rule 2.76(a), 37 C.F.R. Section 2.76(a). If the applicant files an amendment to allege use after the time indicated, and before the permissible period for filing a statement of use, the review and amendment clerk will return the amendment to allege use and any fees to the applicant. The applicant may resubmit the amendment to allege use as a statement of use after issuance of the notice of allowance.

If the applicant submits a late amendment to allege use on the same paper with other amendments, the review and amendment clerk will retain the papers for appropriate processing of the other amendments and will advise the applicant that the amendment to allege use is late and must be resubmitted as a statement of use after issuance of the notice of allowance. The review and amendment clerk will arrange a refund of any fees in conjunction with this notification.

If the amendment to allege use is filed within the time permitted and complies with the minimum requirements to be referred for examination on the merits, but the application was approved for publication before the amendment to allege use was associated with the file, the examining attorney should withdraw the application from publication and examine the amendment to allege use.

If the applicant files the amendment to allege use in conjunction with a notice of appeal, the Trademark Trial and Appeal Board will institute the appeal, suspend action on the appeal and remand the case to the examining attorney to examine the amendment to allege use. The examining attorney should con-

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tinue examination according to standard examining procedures until final resolution of all new issues arising in the examination of the amendment to allege use.

If the application becomes abandoned in the course of the examination of the amendment to allege use, the examining attorney will advise the Trademark Trial and Appeal Board. If the application is not abandoned in the course of the examination of the amendment to allege use, that is all issues are resolved or made the subject of a final action, the examining attorney should return the application to the Trademark Trial and Appeal Board for resumption of the appeal or other action, as appropriate. Trademark Rule 2.142(f)(3), 37 C.F.R. Section 2.142(f)(3).

The Office will not accept an amendment to allege use during the pendency of an ex parte appeal unless the amendment to allege use was filed within the six-month response period after issuance of the final action from which the appeal was taken.

The applicant may file the amendment to allege use only after the applicant has made use of the mark on or in connection with all goods or services for which the applicant will ultimately seek registration in the application, unless the applicant specifically requests that the application be divided. Trademark Rule 2.76(c), 37 C.F.R. Section 2.76(c). Trademark Rule 2.87, 37 C.F.R. Section 2.87, permits an applicant to divide the application into two or more separate applications. While an applicant can request division for any reason, the purpose of dividing the application in this case would be to effect publication or issuance of a registration for goods or services on or in connection with which the applicant had already made use while maintaining an active application for the remaining goods or services. The requirements attendant to submission of a request to divide an application are discussed more fully below (B.15.).

The filing of an amendment to allege use does not relieve the applicant of the duty to file a response to an outstanding Office action or to take any other action required in the case, including the filing of a notice of appeal. As noted, in the case of an appeal, the Trademark Trial and Appeal Board will remand the case for examination of the amendment to allege use.

b. Necessary Elements in a Complete Amendment to Allege Use under Section 1(c) of the Act

The amendment to allege use must include the following elements:

i. a verified statement that the applicant is believed to be the owner of the mark and that the mark is in use in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used;
ii. three specimens or facsimiles of the mark as used in commerce conforming to the requirements of Trademark Rules 2.56, 2.57 and 2.58, 37 C.F.R. Sections 2.56, 2.57 and 2.58; and
iii. the prescribed fee.

Trademark Rule 2.76(b), 37 C.F.R. Section 2.76(b).

The fee for filing an amendment to allege use is $100.00 per class.

c. Minimum Requirements for an Amendment to Allege Use under Section 1(c) of the Act

The amendment to allege use must include the following minimum elements to be referred to the examining attorney for examination on the merits:

i. the prescribed fee;
ii. at least one specimen or facsimile of the mark as used in commerce; and
iii. a verification or declaration signed by the applicant stating that the mark is in use in commerce.

Trademark Rule 2.76(e), 37 C.F.R. Section 2.76(e).

The review and amendment clerk will conduct a preliminary review of the amendment to allege use to determine whether it is timely and complies with the minimum requirements. This preliminary review is similar to the review in the Application Section for filing-date requirements in a new application. If the amendment to allege use is timely and does comply with those requirements, the review and amendment clerk will refer the application to the responsible examining attorney for examination of the amendment to allege use on the merits.

If the amendment to allege use is untimely, the review and amendment clerk will return it to the applicant. If the applicant has submitted other amendments on the same paper with an untimely amendment to allege use, the review and amendment clerk will notify the applicant that the amendment to allege use is untimely and will not be considered and will process the other amendments, as appropriate, without consideration of the amendment to allege use. If a fee has been submitted, the review and amendment clerk will process the refund of the fee. The applicant may resubmit the amendment to allege use as a statement of use after issuance of the notice of allowance. Trademark Rule 2.76(f), 37 C.F.R. Section 2.76(f).

If the amendment to allege use is timely, but does not comply with the minimum requirements specified above, the review and amendment clerk will advise the applicant of the deficiency. The applicant may correct the deficiencies, provided the applicant does so before the mark has been approved for publication or the expiration of the response period after issuance of a final refusal. Trademark Rule 2.76(a), 37 C.F.R. Section 2.76(a). The review and amendment clerk should place the informal amendment to allege use in the file with copies of the relevant action advising the applicant of the deficiencies. If the applicant does not correct the deficiencies before approval of the mark for publication or before the expiration of the response period for a final refusal, the amendment to allege use will not be examined. In such a case, if the applicant has submitted the fee, the fee will not be refunded. If the mark is published for opposition, the applicant may file a statement of use after issuance of the notice of allowance.

If the amendment to allege use is not signed, the review and amendment clerk will hold it not in compliance with the minimum requirements and will require that the applicant submit a properly signed amendment to allege use. The review and amendment clerk will not inquire into the authority of the person who signed. The examining attorney will examine this issue if and when the amendment to allege use is referred for examination on the merits.

After the review and amendment clerk has taken appropriate action with respect to any deficient amendment to allege use, the review and amendment clerk will process any other amendments filed with the amendment to allege use and will refer the case to the responsible examining attorney for appropriate action on those other amendments.

As noted previously, the filing of an amendment to allege use does not constitute a response to any outstanding Office action in the case. The applicant must respond to any such action within the time provided to avoid abandonment of the application. Trademark Rule 2.76(g), 37 C.F.R. Section 2.76(g).

If the review and amendment clerk has issued an action holding the proposed amendment to allege use not in compliance with the minimum requirements, the examining attorney will act on any other amendments in the case without consideration of the amendment to allege use. The examining attorney should issue requirements or refusals in nonfinal or final form according to standard examination procedure without consideration of the amendment to allege use. Any specimens submitted, as in the case of specimens related to an amendment to allege use which is withdrawn, become part of the record and may be relied on in relation to issues unrelated to use.

If the examining attorney determines that the review and amendment clerk erred in holding that the amendment to allege use did not meet the minimum requirements to be referred for examination on the merits, the examing attorney should telephone to advise the applicant the the amendment to allege use will be examined on the merits and to disregard the review and amendment clerk's action citing deficiencies.

d. Examination of the Amendment to Allege Use by the Examining Attorney

The examing attorney must examine the amendment to allege use for compliance with all relevant sections of the Act. If the examination of the amendment to allege use raises any issues necessitating the issuance of requirements or refusals, the examining attorney must take appropriate action, as discussed below. The following sections present examples of issues which should be examined in relation to the amendment to allege use. These sections do not exhaust all possibilities, but present a general framework governing the areas for examination.

i. Ownership and Proper Execution

The examing attorney must confirm that the proper party has executed the amendment to allege use. The party submitting the amendment to allege use must be the same as the applicant or a valid assignee under Trademark Act Section 10, 15 U.S.C. Section 1060.

The person who executes the amendment to allege use must be entitled to do so on behalf of the applicant. The same persons identified as possessing the authority to sign the original application under Trademark Act Section 1, 15 U.S.S. Section 1051,are the only persons possessing the authority to sign the amendment to allege use. That is, only the individual owoner can sign for a partnership for an individual applicant, only a general partner can sign and only an officer can sign for a corporation or association. If the amendment to allege use is not signed by one of these persons, the examining attorney must require that the applicant submit a substitute amendment to allege use signed by a proper person, or that a proper person execute an affidavit or declaration verifying the facts as set forth in the amendment to allege use.

The color of authority provision of Trademark Rule 2.71 (c), 37 C.F.R. Section 2.71 (c), does not apply to amendments to allege use.However, the applicant need not demonstrate that the person who signed originally had color of authority because the applicant may submit a substitute declaration within the response period set in the examining attorney's action, whether or not the person who signed originally had color of authority. The specific date on which the applicant submits the amendment to allege use does not have the same importsance as the filing date for the application or the statement of use, since the amendment to allege use can be submitted up to the expiration of the six-month response period following a final action, including a final action requiring execution by a proper person.

ii. The Verified Statement and the Identification of Goods and Services

The examining attorney must examine the verified statement to ensure that the statement includes the necessary averments, that the dates are properly stated, that the type of commerce is indicated and that the mode of use is set forth. If the statement is defective, the examining attorney must require appropriate amendment.

The examining attorney must also examine the identification of goods and services to ensure that it conforms to the goods and services specified in the application. The applicant may limit or clarify the goods and services, but the applicant cannot add to or otherwise expand the identification of goods or services specified in the application.

If goods or services identified in the application are omitted from the amendment to allege use, but the applicant has not specifically indicated an intention to delete those goods or services from the application, the examining attorney should confirm that the applicant intends to delete the omitted goods or services. The applicant may amend the application to reinsert goods or services which have been omitted from the amendment to allege use, provided the applicant did not expressly delete the goods or services by amendment and provided the applicant verifies that it has used the mark in commerce on or in connection with the goods or services in an affidavit or declaration under Trademark Rule 2.20, 37 C.F.R. Section 2.20. Omission of goods or services in an amendment to allege use or statement of use is the only instance in which an applicant may reinsert goods or services. The general rule is that goods and services once deleted by express amendment or omitted from the identification of goods and services in a request for an extension of time to file a statement of use may not be reinserted in a later amendment.

iii. The Specimens

The examining attorney must review the specimens for compliance with all relevant requirements. The examining attorney must confirm that the designation is used as a mark on the specimens. The examining attorney must determine whether the specimens indicate descriptive or generic use of the mark. The examining attorney must examine the specimens to determine whether any issue concerning ownership of the mark is presented.

The clear-error standard which limits the issues that may be raised in examination of the statement of use does not apply to the examination of the amendment to allege use. However, the examining attorney must raise all possible issues, such as descriptiveness issues, in the initial examination without regard to whether the applicant will file an amendment to allege use or a statement of use. The applicant may do either, and the examining attorney may be precluded from raising an issue under the clear-error standard if the applicant files a statement of use.

If the applicant submits substitute specimens in conjunction with an amendment to allege use, the applicant need not verify that the substitute specimens were in use as of any specific date, but merely that the substitute specimens were used in commerce in connection with the goods or services.

iv. The Drawing

Trademark Rule 2.51, 37 C.F.R. Section 2.51, specifies that the drawing in an intent-to-use application must be a substantially exact representation of the mark as intended to be used *and* as actually used upon filing of the amendment to allege use before publication or the statement of use after issuance of the notice of allowance. Trademark Rule 2.88(j), 37 C.F.R. Section 2.88(j). An applicant may not amend the mark in a drawing if the amendment constitutes a material alteration of the mark. Also, the mark in the drawing must agree with the mark as used on the specimens. The same standards which apply to use applications in determining whether specimens support use of the mark and in determining whether amendments can be permitted apply in the examination of the amendment to allege use.

Therefore, in an intent-to-use application, the examining attorney must require amendment to the mark or the submission of new specimens if the mark in the drawing is not a substantially exact representation of the mark as used on the specimens. Trademark Rule 2.72(c), 37 C.F.R. Section 2.72(c). However, if amendment of the mark would constitute a material alteration of the mark, the examining attorney must require substitute specimens only. The same standards applied in use applications in determining whether the specimens support use of the applied-for mark apply to specimens in intent-to-use applications. See Examination Guide 2-89. *Cf. United Rum Merchants Ltd. v. Distillers Corp. (S.A.) Ltd.*, 9 USPQ2d 1481 (TTAB 1988).

e. Issuance of Actions by the Examining Attorney Related to the Amendment to Allege Use

If, upon examination, the examining attorney determines that the amendment to allege use is not acceptable, or that it raises new issues in the case, the examining attorney will issue an action stating all refusals and requirements arising in the examination of the amendment to allege use and incorporating all unresolved issues from any outstanding Office action in the case. The action related to the amendment to allege use thus supersedes any outstanding Office action, and the applicant's response on all issues is due six months from the date of the new action. The new action will be a nonfinal action since at least those issues arising from the examination of the amendment to allege use will have been raised for the first time.

If the amendment to allege use is received before any examination of the application, the review and amendment clerk will review the amendment to allege use to determine whether it complies with the minimum requirements and will take appropriate action. The review and amendment clerk will return the case to the new case docket after taking appropriate action. When the case is reached for examination, the examining attorney will examine the application as a whole, including the amendment to allege use, and will issue a first action addressing all issues in the case.

If the review and amendment clerk reviews the amendment to allege use and refers it to the examining attorney for examination on the merits, the examining attorney should examine the amendment to allege use regardless of the status of the applica-

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tion. If the application is in suspended status, the examining attorney should examine the amendment to allege use, and if any action is required, the examining attorney should remove the application from suspension and take appropriate action.

If the amendment to allege use is submitted at the same time as a response and it is referred for examination on the merits, the examining attorney should consider both the response and the amendment to allege use. If the examining attorney must take any action with respect to the amendment to allege use, the examining attorney should issue a nonfinal action incorporating any refusals or requirements which remain outstanding after the applicant's response. If the amendment to allege use is acceptable in all respects, the examining attorney should act on the response independent of the amendment to allege use. The examining attorney should proceed in the same manner if the amendment to allege use reaches the examining attorney when the case is in the examining attorney's amended docket after receipt of a response.

f. Amendment and Withdrawal of the Amendment to Allege Use

The applicant may amend the amendment to allege use to correct deficiencies, to overcome a refusal, to comply with a requirement or for any other purpose. *Cf.* Trademark Act Section 1(d)(3), 15 U.S.C. Section 1051(d)(3).

The applicant may withdraw the amendment to allege use. The applicant or the applicant's attorney may authorize withdrawal in an examiner's amendment. The applicant may do so at any time after submission of the amendment to allege use and before approval of the application for publication. The Office will not refund the fee for filing the amendment to allege use if it is withdrawn by the applicant.

If the applicant withdraws the amendment to allege use, the application will be processed as an intent-to-use application subject to publication, issuance of a notice of allowance and submission of a statement of use after issuance of the notice of allowance.

If the applicant wishes to request withdrawal of an amendment to allege use during an ex parte appeal, the applicant should direct the request to the Trademark Trial and Appeal Board for a determination by the Board on the request.

If the applicant withdraws the amendment to allege use, the examining attorney will withdraw any requirements or refusals specifically related to use of the mark, such as objections related to the form of the verified statement itself, objections related to the agreement of the mark as used with the drawing or objections related to use of the applied-for designation as a trademark or service mark on the specimens. The examining attorney should also withdraw any requirement or refusal related to the execution of the amendment to allege use. The examining attorney should maintain any requirement or refusal arising from the amendment to allege use not specifically related to the dates of use or use of the mark, such as ownership questions or refusals or requirements related to Sections 2(e)(1), 2(e)(2) or 2(e)(3) of the Act. The specimens or any other submission related to the amendment to allege use will remain part of the record for the purpose of determinations under these sections. Issues related to use include functionality, ornamentation and configuration issues.

If the applicant withdraws the amendment to allege use after issuance of the notice of final acceptance of the amendment to allege use, the examining attorney must withdraw the acceptance on the TRAM system.

g. Final Acceptance of the Amendment to Allege Use After Examination

If the amendment to allege use is acceptable in all respects, the Office will notify the applicant of its acceptance. The examining attorney will ensure that the computer-generated notice is issued. The examining attorney must also sign the file to indicate acceptance of the amendment to allege use. As noted above, after an amendment to allege use is accepted, the intent-to-use application will be processed in the same manner as a use application under Trademark Act Section 1(a), 15 U.S.C. Section 1051(a). The notification must be sent regardless of the status of the case, whether there is an outstanding Office action or not. Examination should continue on other issues in the case after the acceptance of the amendment to allege use.

5. Publication for Opposition and Issuance of the Notice of Allowance

In the case of an intent-to-use application, if the examining attorney determines that the mark is entitled to registration, but for the submission of a statement of use, that is, no amendment to allege use has been accepted, the examining attorney will approve the mark for publication and the mark will be published for opposition. In the case of an intent-to-use application where an amendment to allege use has been submitted and accepted, the application will be processed thereafter in the same manner as a use application. If the application is not opposed or survives all oppositions filed, the mark will proceed to registration.

In the case of an intent-to-use application where no amendment to allege use has been filed or where the applicant has withdrawn the amendment to allege use, the Office will issue a notice of allowance, provided the mark clears the opposition period or survives all oppositions. Trademark Act Section 13(b)(2), 15 U.S.C. Section 1063(b)(2); Trademark Rule 2.81(b), 37 C.F.R. Section 2.81(b).

The notice of allowance in an intent-to-use application will issue on the same date that a registration would issue in a use application. The Office will not publish any notice that a notice of allowance has been issued in the *Official Gazette*.

The notice of allowance will state the serial number of the application, the name of the applicant, the correspondence address, the mark, the identification of goods or services, and the date of issuance of the notice of allowance. The notice of allowance is a key document because the issuance date establishes the due date for submission of the statement of use required prior to registration. The information stated on the notice of allowance is also important. If the notice of allowance includes any errors, the applicant should notify the Office immediately.

6. Amendments between Issuance of the Notice of Allowance and Submission of the Statement of Use

The only amendment permitted between the issuance of the notice of allowance and the submission of the statement of use is an amendment to delete goods or services. Trademark Rule 2.77, 37 C.F.R. Section 2.77. "Deletion" means the elimination of an existing item in an identification of goods and services in its entirety. Deletion is distinct from other types of amendments to limit, such as amendments to limit the goods as to types, channels of trade or class of purchasers or to restrict an existing item in scope by the introduction of some qualifying language or the substitution of specific for more general terms. The Office will not consider any other amendment to the application during this period. If the applicant submits any other amendments during this period, the Office will place the amendments in the file for consideration at the time of examination of the statement of use. The ITU paralegal will advise the applicant of receipt of any such amendment and that the amendment will not be considered until the examination of the statement of use.

The Office will process any change of address or change of attorney at any time during the prosecution of an application, even during the period between issuance of the notice of allowance and the filing of the statement of use.

7. Requests for Extensions of Time to File the Statement of Use

Trademark Act Section 1(d)(2), 15 U.S.C. Section 1051(d)(2), permits the Office to extend the time for filing a statement of use upon a written request from the applicant. Trademark Rule 2.89, 37 C.F.R. Section 2.89, sets forth Office policy and procedure governing the filing and processing of such requests. Essentially, an applicant may request one six-month extension without a showing of good cause and up to four additional six- month extensions with a showing of good cause. Thus, the time available for filing the statement of use may not be extended beyond thirty-six months from the issuance of the notice of allowance.

The six-month period following issuance of the notice of allowance will not be cut short by the grant of an extension. The extension will begin to run from the expiration of the six-month period following the notice of allowance. Likewise, an applicant will receive the full benefit of each extension before a subsequent extension will begin to run. No extension will be granted

for more than six months. Trademark Rule 2.89(b), 37 C.F.R. Section 2.89(b).

The only amendment which is permitted in connection with the filing of a request for an extension of time is an amendment to delete goods or services. If any other amendment is submitted in conjunction with a request for an extension of time, the Office will place the amendment in the application file for consideration at the time of examination of the statement of use. The Office will process any change of address or change of attorney at any time during the prosecution of an application, even if filed in conjunction with a request for an extension of time.

Any request for an extension of time must be filed by the entity which owns the mark at the time the request is filed and must be executed by an individual possessing statutory authority to do so on behalf of the specific type of applicant entity. The individual must sign for an individual applicant, a general partner must sign for a partnership and an officer must sign for a corporation or association. If the party filing is different from the owner of record, the request should include the reel and frame number of any relevant assignment recorded in the Assignment Branch of the Office or other evidence that the party filing is the owner of the application in accordance with Trademark Rule 2.186, 37 C.F.R. Section 2.186. If the request does not include such evidence the ITU Unit will deny the request. The applicant may establish ownership within the time provided in the action advising the applicant of the denial, even if the time permitted for filing the statement of use has expired. However, the applicant must file another request for an extension of time before the time period related to the request which is under consideration expires to avoid abandonment.

As noted above (A.7.), only those individuals who possess statutory authority to sign the original application are permitted to sign the request for an extension of time. If the request is signed by any other person, the request for an extension of time will be denied. Because the request must include a statement of a continued bona fide intention to use the mark in commerce, only the applicant can execute the request under the Act. In the case of a request for an extension of time, the request cannot be reexecuted by one with proper authority after the expiration of the time permitted for filing the statement of use. The "color of authority" provision of Trademark Rule 2.71(c), 37 C.F.R. Section 2.71(c), does not apply to the filing of requests for extensions of time.

a. Requirements Related to the First Six-Month Extension

The applicant may request an initial six-month extension of time to file the statement of use by filing a request for such an extension before the expiration of the six-month period following the issuance of the notice of allowance. The request must include the prescribed fee of $100.00 per class and a verified statement signed by the applicant that the applicant has a continued bona fide intention to use the mark in commerce. The statement must specify those goods or services specified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce. Trademark Rule 2.89(a), 37 C.F.R. Section 2.89(a). The applicant may incorporate the goods and services specified in the notice of allowance by reference.

b. Requirements Related to Extensions Beyond the First Six-Month Extension - Good Cause Extensions

The applicant may request up to a maximum of four six-month extensions to file the statement of use in addition to the first six-month extension. Each request for such an extension must be filed before the expiration of the previously granted extension. The request must include the prescribed fee of $100.00 and a verified statement signed by the applicant that the applicant has a continued bona fide intention to use the mark in commerce. The statement must specify those goods or services specified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce. In addition, each such request must include a showing of good cause. Trademark Rule 2.89(b), 37 C.F.R. Section 2.89(b).

The showing of good cause must include an allegation that the applicant has not yet made use of the mark in commerce on or in connection with all of the goods or services specified in the notice of allowance for which the applicant has a continued bona fide intention to use the mark in commerce. The showing must also include a statement of applicant's ongoing efforts to use the mark in commerce on or in connection with the goods or services specified as those for which the applicant has a continued bona fide intention to use the mark in commerce. Trademark Rule 2.89(d), 15 U.S.C. Section 2.89(d).

Efforts to use the mark in commerce may include "...without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities." Trademark Rule 2.89(d)(2), 37 C.F.R. Section 2.89(d)(2). In the alternative, the applicant must submit a satisfactory explanation for the failure to make such efforts. The applicant's statement concerning good cause need only refer to the appropriate types of activities listed in the rule or similar types of activities. The applicant need not provide an explanation or evidence providing details as to specific activities related to the types delineated. For instance, the applicant may simply state that it is engaged in manufacturing activities and promotional activities.

Any request for an extension of time, including the showing of good cause, will become a part of the permanent Office record and open to the public as such. As noted, the showing of good cause need only provide general statements identifying the types of efforts the applicant has undertaken as stated in the rule. The showing need not state specific facts which would disclose confidential business information or other proprietary information. The Office will not require any evidence or explanation in a showing of good cause.

c. Identifying the Goods and Services in the Request for an Extension of Time

The goods and services identified in the request for an extension of time must conform to the goods and services identified in the notice of allowance. If appropriate, the applicant may incorporate the specification of goods and services in the notice of allowance by reference. If goods or services are to be deleted, the applicant should clearly specify those goods and services to be deleted.

If the applicant lists the goods and services specifically in the request for an extension of time, and omits any goods or services which were listed in the notice of allowance, the Office will delete those goods or services from the application and will not grant the request as to the omitted items. Likewise, if the applicant lists the goods and services specifically, and the wording in the listing of the goods and services in the request does not conform to the wording of the specification of goods and services in the notice of allowance, the Office will delete from the application any wording not expressly included in the request in conforming language and will not grant the request as to the deleted items. The applicant cannot amend the application later to reinsert the deleted goods or services once they have been so deleted. Trademark Rule 2.89(f), 37 C.F.R. Section 2.89(f).

The paralegal in the ITU Unit will examine the identification of goods and services specified in the extension request to determine whether the goods and services specified conform to the goods and services specified in the notice of allowance. The paralegal will delete any items from the identification of goods and services in the application which are not either incorporated by reference or specified in the extension request in conforming language.

As noted above, applicants may incorporate goods and services by reference in the request for an extension of time. It is advisable to do so, if appropriate, to avoid the possibility that goods or services will be deleted unintentionally. Thus, the applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or "those goods or services identified in the notice of allowance except..." followed by an identification of goods or services to be deleted.

The only amendment permitted between issuance of the notice of allowance and filing of the statement of use is an amendment to delete goods or services. Trademark Rule 2.77, 37 C.F.R. Section 2.77. "Deletion" means the elimination of an item from the identification of goods and services in its entirety as distinct from other types of amendments to limit, such as amendments to limit the goods as to types, channels of trade or class of purchasers or to restrict an existing item in scope by the introduction of

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some qualifying language or the substitution of specific for more general terms. The ITU paralegal will not process any proposed amendments filed with the request for an extension of time, other than deletions, and will place other amendments in the file for consideration at the time of examination of the statement of use. The paralegal will act on the extension request, apart from any such proposed amendment, as specified above.

d. Filing a Request for an Extension of Time in Conjunction with a Statement of Use

An applicant may file one final request for an extension of time at the time of filing the statement of use or during any time remaining in the existing six-month period in which a statement of use is filed. However, such a request is not permitted if the grant of such an extension would extend the time for filing more than thirty-six months beyond the issuance of the notice of allowance. Trademark Rule 2.89(e), 37 C.F.R. Section 2.89(e). The applicant may not request any further extensions of time after this request.

The purpose of such a request would be to secure additional time to correct any deficiency in the statement of use which is of a type which must be corrected before the expiration of the time permitted for filing the statement of use. Because the statement of use may not be withdrawn, the applicant must correct any such deficiency within the time provided to file the statement of use or the application will become abandoned.

The request must conform to all relevant requirements including payment of the applicable fee. If the request is not the first request for an extension of time, and thus a showing of good cause is required with the request for an extension of time filed with or after the statement of use, the applicant may satisfy the requirement for a showing of good cause by asserting that applicant believes that it has made valid use of the mark in commerce, as evidenced by the submitted statement of use, but that if the statement of use is found to be fatally defective, the applicant will need additional time to file a statement of use. Trademark Rule 2.89(e)(2), 37 C.F.R. Section 2.89(e)(2).

If the applicant files a final request for an extension of time in conjunction with a statement of use, and the applicant submits fees sufficient for one, but not both, the Office will apply the fees to the extension of time to avoid abandonment of the application.

e. Processing of the Request for an Extension of Time

The Office will notify the applicant of the grant or denial of the request for an extension of time. Trademark Rule 2.89(g), 37 C.F.R. Section 2.89(g). Any denial will specify the reasons for the denial. The Office's failure to notify the applicant of the grant or denial of the extension before the expiration of the existing period to file the statement of use or before the expiration of the period requested does not relieve the applicant of the responsibility to file the statement of use or a request for an extension of time within the relevant period. If the applicant fails to file the statement of use or a request for an extension of time within the time permitted, the application will become abandoned. Trademark Act Section 1(d)(4), 15 U.S.C. Section 1051(d)(4).

If the Office denies the request for an extension of time but time remains in the applicant's existing period for filing the statement of use, the applicant may file the statement of use or another request for an extension of time to file the statement of use. Otherwise, the applicant's only recourse after denial of the request for an extension of time is a petition to the Commissioner. A petition from the denial of a request for an extension must be filed within one month from the mailing date of the denial of the extension of time. Trademark Rule 2.89(g), 37 C.F.R. Section 2.89(g). The ITU Unit will not accept any request to reconsider a denial of a request for an extension of time. The ITU Unit will be responsible for processing all requests for extensions of time to file statements of use.

8. Submission of the Statement of Use under Section 1(d) of the Act

As noted earlier (A.1.a.), an intent-to-use applicant must file either an amendment to allege use under Trademark Act Section 1(c), 15 U.S.C. 1051(c), or a statement of use under Trademark Act Section 1(d), 15 U.S.C. Section 1051(d), as a precondition to issuance of the registration. This section will discuss statements of use only; the amendment to allege use is discussed above (A.4.).

a. Form and Permissible Time Period for Filing a Statement of Use under Section 1(d) of the Act

The statement of use should be entitled, "Statement of Use under Section 2.88." Trademark Rule 2.88(d), 37 C.F.R. Section 2.88(d). The title should be placed at the top of the first page. The mailing address should specify "Box ITU" also. Proper identification of the statement of use will expedite handling, but the Office will not take any action for failure to comply with these recommendations. The applicant may submit other amendments related to the application with the statement of use.

The statement of use must be filed within six months of the issuance date of the notice of allowance or within an extension of time for filing the statement of use granted under Trademark Rule 2.89, 37 C.F.R. Section 2.89. For purposes of establishing a date of receipt, the statement of use is not subject to the certificate-of-mailing procedure under Rule 1.8, 37 C.F.R. Section 1.8. The statement of use will be considered received on the date it is actually received or on the Express-Mail date under Rule 1.10, 37 C.F.R. Section 1.10.

Any statement of use filed before mailing of the notice of allowance is premature and will not be considered. In such a case, the ITU Unit will return the statement of use and refund the fee to the applicant. Trademark Rule 2.88(a), 37 C.F.R. Section 2.88(a). If the statement of use is not filed or is filed later than required, the application will be considered abandoned. Trademark Act Section 1(d)(4), 15 U.S.C. Section 1051(d)(4); Trademark Rule 2.88(h), 37 C.F.R. Section 2.88(h). A late statement of use will not be considered. The ITU Unit will return the late statement of use to the applicant with any fees paid.

The applicant may file the statement of use only after the applicant has made use of the mark on or in connection with all goods or services for which the applicant will ultimately seek registration in the application, unless the applicant specifically requests that the application be divided. Trademark Rule 2.88(c), 37 C.F.R. Section 2.88(c). Trademark Rule 2.87, 37 C.F.R. Section 2.87, permits an applicant to divide the application as filed into two or more separate applications. The purpose of filing a request to divide an application in conjunction with the filing of a statement of use would be to effect issuance of a registration for goods or services on or in connection with which the applicant has already made use while maintaining an active application for the remaining goods or services. After the division all applications retain the original filing date. The requirements attendant to submission of a request to divide an application are discussed below (B.15.).

b. Necessary Elements in a Complete Statement of Use under Section 1(d) of the Act

The statement of use must include the following elements:

i. a verified statement that the applicant is believed to be the owner of the mark and that the mark is in use in commerce, specifying the date of the applicant,s first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the notice of allowance on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used;
ii. three specimens or facsimiles of the mark as used in commerce; and
iii. the prescribed fee.

Trademark Rule 2.88(b), 37 C.F.R. Section 2.88(b).

The filing fee for a statement of use is $100.00 per class.

c. Minimum Requirements for a Statement of Use under Section 1(d) of the Act

The statement of use must include the following minimum elements to be referred to the examining attorney for examination on the merits:
i. the prescribed fee;
ii. at least one specimen or facsimile of the mark as used in commerce; and

iii. a verification or declaration signed by the applicant stating that the mark is in use in commerce.

Trademark Rule 2.88(e), 37 C.F.R. Section 2.88(e).

The ITU Unit will review the statement of use to determine whether it is timely and whether it complies with the minimum requirements. As noted above (A.8.a.), if the statement of use is untimely, either because it is premature or late, the ITU Unit will return the statement of use with any fees to the applicant.

If the statement of use is timely, but does not comply with one or more of the minimum requirements, the ITU Unit will advise the applicant of the deficiency. The applicant may correct the deficiency provided the time permitted for filing the statement of use has not expired. Trademark Rule 2.88(g), 37 C.F.R. Section 2.88(g). If the applicant does not correct the deficiency before the expiration of the relevant time period, the statement of use will not be examined and the application will be declared abandoned. In such a case, if the applicant has submitted the fee, the ITU Unit will not refund the fee.

The applicant may not withdraw the statement of use and return to the previous status of awaiting filing of the statement of use, even if the statement of use as filed fails to meet the minimum requirements. Trademark Rule 2.88(g), 37 C.F.R. Section 2.88(g). The applicant may request extensions of time to file the statement of use in accordance with Trademark Rule 2.89, 37 C.F.R. Section 2.89, as discussed above (A.7.e.), including a final request for an extension filed with a statement of use or during the time remaining in the existing period in which the statement of use is filed.

The Office will not issue a filing receipt to acknowledge receipt of a statement of use.

If an applicant files a statement of use and a request to divide the application at the same time, and the fees submitted are insufficient for both, the fees will be applied to the statement of use first and the applicant will be notified of the deficiency.

9. Examination of the Statement of Use

If the statement of use is timely and complies with the minimum requirements, the ITU Unit will refer the entire application with the statement of use to the responsible examining attorney for examination on the merits. The same examining attorney who examined the application initially will examine the statement of use unless the examining attorney has left the Office or assumed other duties.

a. Procedures Governing Examination of the Statement of Use

Examination of the statement of use follows the same procedural course as the initial examination of the application under Trademark Rule 2.61 et seq., 37 C.F.R. Section 2.61 et seq. The examining attorney should issue actions, as appropriate, stating requirements and refusals and culminating in final action or acceptance of the statement of use. The examining attorney may issue examiners amendments or priority actions, as appropriate. The applicant must respond to actions within six months under routine Office procedure. If the examining attorney ultimately finds the statement of use acceptable in all respects, the Office will notify the applicant of its acceptance. The Office will then publish notice of the registration of the mark and will issue the registration to the applicant. The application is not once again subject to opposition. Trademark Rule 2.151, 37 C.F.R. Section 2.151.

If the examining attorney issues any requirements or refusals, the applicant may respond under standard examination procedure. The applicant may appeal or petition matters in the same manner and subject to the same procedures which would apply in the initial examination of the application.

The applicant may amend or otherwise correct the statement of use during examination, provided the applicant had complied with the minimum requirements attendant to the statement of use before the expiration of the time permitted to file the statement of use.

i. Complying with Minimum Requirements within the Time Permitted

The applicant must make valid use of the mark in commerce and must file a statement of use meeting the minimum requirements, including at least one specimen, before the expiration of the time permitted to file the statement of use. Trademark Rule 2.71(d)(3), 37 C.F.R. Section 2.71(d)(3). The applicant can provide substitute specimens, during examination, after the expiration of the time permitted to file the statement of use. However, the applicant must verify that the specimens were in use before the expiration of the time permitted for filing the statement of use. If the applicant attempts to amend the dates of use to state a date of first use in commerce which is later than the time permitted for filing the statement of use, the examining attorney must refuse registration because the applicant failed to make use within the time permitted and, as a result, the application is abandoned. The examining attorney must refuse registration on the same grounds if the applicant cannot provide an acceptable specimen which was in use in commerce before the expiration of the time permitted for filing the statement of use.

Likewise, the party filing the statement of use must be the owner of the mark at the time of filing. However, even after the expiration of the time permitted for filing the statement of use, the applicant can provide information to establish that the party who filed was the owner at the time the statement of use was filed through a chain of title. Trademark Rule 2.186, 37 C.F.R. Section 2.186. The applicant must do so within the specified response period. However, if the party which did file was not the owner at the time of filing the statement of use, the applicant cannot provide a substitute statement of use or the equivalent to correct this error after the expiration of the time permitted for filing the statement of use. If the time permitted for filing the statement of use has not yet expired, the applicant may file a substitute statement of use in the name of the true owner.

Therefore, if the party filing the statement of use is not the owner of the mark at the time of filing the statement of use, the examining attorney must reject the statement of use. If no time remains within the time permitted for filing the statement of use, the examining attorney must refuse registration because the application is abandoned for failure to file the statement of use within the time permitted.

Also, the person who signs the statement of use must have the authority to do so under the Act. Only those persons who are authorized to sign the original application have authority to sign the statement of use: the individual for an individual applicant, a general partner for a partnership and an officer for a corporation or association. As in the case of the original application, the person who signs must have at least color of authority to sign in order for the statement of use to be considered received in the Office.

If the person who signed the statement of use lacked even color of authority to do so, the applicant cannot provide a statement of use or the equivalent, signed by a proper person, after the expiration of the time permitted to file the statement of use. If the person who signed the statement of use possessed at least color of authority, as discussed below (B.1.a.), the applicant can provide a substitute statement of use or an affidavit or declaration signed by the proper person verifying the facts as set forth in the statement of use after the expiration of the time permitted for filing the statement of use. Trademark Rule 2.71(c), 37 C.F.R. Section 2.71(c). The principles which govern the determination as to whether a person possesses color of authority are discussed below (B.1.a.) in relation to the signature requirements attendant to the filing of the original application.

If the person who signed the statement of use lacked even color of authority to so do, and the time permitted for filing the statement of use has expired, the examining attorney must refuse registration because the application is, therefore, abandoned for failure to file the statement of use within the time permitted.

ii. Correcting Defects

The applicant may correct defects in the statement of use after the expiration of the time permitted for filing the statement of use when compliance within the time permitted for filing the statement of use is not required by the Act. However, the applicant must respond to requirements related to these defects within the response periods established under standard examination procedure to avoid abandonment of the application.

As noted above (A.9.a.i.), the applicant may provide substitute specimens after the expiration of the time permitted for filing the statement of use. However, the applicant must verify that the

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substitute specimens were in use in commerce before the expiration of the time permitted for filing the statement of use.

As noted above (A.9.a.i.), the applicant may establish chain of title during examination, after the expiration of the time permitted for filing the statement of use. The applicant may establish color of authority of the person who signed the statement of use and provide a substitute statement of use signed by a proper person during examination after the expiration of the time for filing the statement of use. The applicant may correct the dates of use, subject to the limitations provided in Trademark Rule 2.71(d), 37 C.F.R. Section 2.71(d), or the method of use clause after the expiration of the time permitted for filing the statement of use. The applicant may amend the identification of goods and services, subject to the general restrictions governing such amendments under Trademark Rules 2.71(b) and 2.88(i)(1), 37 C.F.R. Sections 2.71(b) and 2.88(i)(1), after the expiration of the time permitted for filing the statement of use. The applicant may amend the drawing, subject to the restrictions generally governing amendments to drawings under Trademark Rule 2.72, 37 C.F.R. Section 2.72, during examination after the expiration of the time permitted for filing the statement of use.

iii. Withdrawal of the Statement of Use Prohibited

Once the applicant has filed the statement of use, the applicant may not withdraw the statement of use and return to the previous status of awaiting submission of the statement of use. Trademark Rule 2.88(g), 37 C.F.R. Section 2.88(g). The applicant may not do so, even if the Office determines that the statement of use does not comply with the minimum requirements. However, the applicant may amend the statement of use or file a substitute statement of use to correct even fatal defects within the time permitted for filing the statement of use.

b. The "Clear-Error" Standard in Examination of the Statement of Use

For the purpose of examination of the statement of use, the Office will issue requirements or refusals concerning matters specifically related to the statement of use only. The Office will not issue any requirements or refusals concerning matters which could have or should have been raised during initial examination, unless the failure to do so in initial examination constitutes a clear error. **"Clear error" refers to an error which, if not corrected, would result in issuance of a registration in violation of the Act.** *Cf. Century 21 Real Estate Corp. v. Century Life of America*, 10 USPQ2d 2034 (TTAB 1989); *Granny's Submarine Sandwiches, Inc. v. Granny's Kitchen, Inc.*, 199 USPQ 564 (TTAB 1978).

The examining attorney must act on all new issues in the examination of the statement of use. Examples of such issues are presented below (A.9.b.) in the discussion of various areas of examination related to the statement of use. For example, the examining attorney must issue an appropriate refusal if the specimens fail to show use of the designation as a mark. However, the examining attorney may not issue a refusal under Trademark Act Section 2(e)(1), 15 U.S.C. Section 1052(e)(1), unless the refusal is dictated by changed circumstances from the time of initial examination or the failure to issue such a refusal would constitute clear error.

If a significant length of time has elapsed since the initial examination, in some unusual circumstances, the mark may have become descriptive or even generic as applied to the goods or services. In such a case, the evidence of the descriptive or generic use would not have been available during initial examination.

However, if evidence that the mark is merely descriptive was available during initial examination, and thus the refusal could or should have been issued in initial examination, the examining attorney cannot issue the refusal unless clear error is present. That is, the evidence of descriptiveness must be substantial and unequivocal. The examining attorney should not issue such a refusal on the basis of information that was available during the initial examination unless clear error exists.

Likewise, the examining attorney must not issue requirements or refusals related to informalities which could or should have been addressed during the initial examination. For example, if the examining attorney determines that the initial declaration in support of the application was defective, the examining attorney should not issue a requirement for a new declaration.

If the goods or services were classified incorrectly and published for opposition in the wrong class, the examining attorney should require correction of the classification. In the case of any change of class after issuance of the notice of allowance, the mark must be republished for opposition unless the Petitions and Classification Attorney determines that republication is not necessary.

If a disclaimer could or should have been required during the initial examination, the examining attorney should not require a disclaimer during the examination of the statement of use unless there is clear error. For example, a disclaimer of all of the wording in a mark may be required under the clear-error standard where the mark consists of merely descriptive wording and distinctive design elements. Issuance of a registration without such a disclaimer would violate the Act by affording the applicant rights beyond those to which the applicant is entitled. In other cases where the requirement for a disclaimer is subject to greater discretion, the clear-error standard would not permit a disclaimer requirement when it could or should have been stated in initial examination. The determination that a term is descriptive or generic related to the requirement for a disclaimer is subject to the substantial-and-unequivocal-evidence standard stated above.

Generally, the Office will not conduct any search for conflicting marks, or issue any refusals on that basis, in the examination of the statement of use. However, if the examining attorney determines that a second search is necessary, due to an amendment of the mark or an amendment of the goods or services, the examining attorney will conduct a second search and take action, as appropriate. Likewise, the Office may discover a clear error under Trademark Act Section 2(d), 15 U.S.C. Section 1052(d), in the course of internal Office quality review or through a letter of protest. The Office will not issue any refusal under Section 2(d) in the examination of the statement of use unless the failure to do so constitutes a clear error. For the purposes of Section 2(d), the conflict between the application and registration at issue must be such that reasonable minds could not differ as to the necessity for the refusal, that is, failure to issue the refusal would result in issuance of a registration in violation of the Act.

In the case of an intent-to-use application, as in all applications, the Office will deny as untimely letters of protest which are filed more than thirty days after publication of a mark. *In re Pohn*, 3 USPQ2d 1700 (Comm'r Pats. 1987).

c. Examination of the Verified Statement of Use

The examining attorney should review the statement of use itself to confirm that the statement conforms to the requirements of the Act and the rules. As noted above (A.8.a.), the statement must include an averment that the applicant is the owner of the mark, the dates of use, an identification of the goods and services and the method of use. The statement must be verified. Trademark Act Section 1(d), 15 U.S.C. Section 1051(d); Trademark Rule 2.88(b), 37 C.F.R. Section 2.88(b).

The averment of ownership and use in commerce are essential elements of the statement. If the averment of ownership is omitted, the examining attorney must require the applicant to submit a verified statement including this averment.

If the statement of use was executed before the stated dates of use, the examining attorney must require that the statement be re-executed. The dates of use may not be amended to a date later than the expiration of the time permitted for filing of the statement of use. The applicant must verify amendments to the dates of use in the statement of use as in the application itself. Trademark Rule 2.71(d), 37 C.F.R. Section 2.71(d).

The date of first use in commerce must be no earlier than the date of first use anywhere. Office policies governing the correction of dates which do not conform to this requirement in use applications apply to statements of use also. TMEP section 806.03. The applicant must state dates of use for each class. The dates of first use for each class must apply to at least one item in the class but need not apply to more than one item. However, the applicant must have used the mark on all items covered by the statement of use before execution of the statement unless the applicant requests to divide the application under Trademark Rule 2.87, 37 C.F.R. Section 2.87.

The applicant must identify the type of commerce according to the same standards which govern use applications. TMEP section 806.05.

The applicant must indicate the method of use. Office policies governing this requirement relative to use applications apply to the statement of use as well. TMEP section 808.09. If the method of use indicated in the statement of use is inconsistent with the intended method of use stated in the initial application, the examining attorney should assume that the later statement is controlling and should not raise this inconsistency as an issue in examination.

d. The Identification of Goods and Services in the Examination of the Statement of Use

"The goods or services specified in a statement of use must conform to those goods or services identified in the notice of allowance." Trademark Rule 2.88(i)(1), 37 C.F.R. Section 2.88(i)(1). The referenced rule further recommends that, in appropriate cases, applicants specify the goods or services by stating "those goods or services identified in the notice of allowance" or "those goods or services identified in the notice of allowance except. . ." followed by an identification of the goods or services to be deleted.

The rules preclude additions to the identification of goods or services in all applications, as noted below. Trademark Rule 2.71(b), 37 C.F.R. Section 2.71(b). If the applicant proposes to add to the identification of goods or services in conjuncion with the statement of use, the examining attorney must reject the amendment.

If the applicant omits any goods or services specified in the notice of allowance from the identification of goods or services in the statement of use, and the applicant has not expressed a clear intention to delete those goods or services, the examining attorney must inquire as to the discrepancy. The examining attorney will permit the applicant to amend the statement of use to reinsert any omitted goods or services, provided the applicant did not delete the goods or services expressly in an amendment and provided the applicant verifies that the mark was in use in commerce with those goods or services before the expiration of the time permitted to file the statement of use. Trademark Rule 2.88(i)(2), 37 C.F.R. Section 2.88(i)(2).

The applicant may amend to delete items or to limit the identification of goods and services. For example, the applicant may amend to limit the goods as to types, channels of trade or class of purchasers or to restrict an existing item in scope by the introduction of some qualifying language or the substitution of specific for more general terms. The applicant may clarify the identification of goods or services, provided the amendment does not exceed the scope of goods or services specified in the notice of allowance. The principles which govern amendments to delete, limit or clarify in general also apply in the examination of the statement of use. If, due to any amendment to the identification of goods and services, the international class must be amended, the application must be republished for opposition unless the Petitions and Classification Attorney determines that republication is not necessary.

e. Examination of the Statement of Use Related to the Drawing

Trademark Rule 2.51, 37 C.F.R. Section 2.51, specifies that the drawing in an intent-to-use application must be a substantially exact representation of the mark as intended to be used *and* as actually used upon filing of the amendment to allege use before publication or the statement of use after issuance of the notice of allowance. Trademark Rule 2.88(j), 37 C.F.R. Section 2.88(j). An applicant may not amend the mark in a drawing if the amendment constitutes a material alteration of the mark. Also, the mark in the drawing must agree with the mark as used on the specimens. The same standards which apply to use applications in determining whether specimens support use of the mark and in determining whether amendments can be permitted apply in the examination of the statement of use.

Therefore, in an intent-to-use application, the examining attorney must require amendment to the mark or the submission of new specimens if the mark in the drawing is not a substantially exact representation of the mark as used on the specimens. Trademark Rule 2.72(c), 37 C.F.R. Section 2.72(c). However, if amendment of the mark would constitute a material alteration of the mark in such a case, the examining attorney must require substitute specimens only. The same standards applied in use applications in determining whether the specimens support use of the applied-for mark apply to specimens in intent-to-use applications. *See* Examination Guide 2-89. *Cf. United Rum Merchants Ltd. v. Distillers Corp. (S.A.) Ltd.*, 9 USPQ2d 1481 (TTAB 1988).

If the applicant submits substitute specimens in conjunction with a statement of use, the applicant must verify that the substitute specimens were in use in commerce before the expiration of the time permitted to file the statement of use. Trademark Rule 2.59(b), 37 C.F.R. Section 2.59(b). If the dates of first use change as a result of the submission of new specimens, the applicant must also amend the dates of first use in the statement of use with a supporting affidavit or declaration.

f. Consideration of the Specimens of Use in the Examination of the Statement of Use

Apart from the statement of use itself, the primary focus of examination of the statement of use is the specimens of use. The examining attorney must evaluate the specimens to confirm that the specimens exhibit appropriate use. Trademark Act Section 45, 15 U.S.C. Section 1127. The examining attorney must also examine the specimens to confirm that the specimens show use of the subject matter as a trademark or service mark on or in connection with the goods or services identified in the statement of use. The examining attorney will also consider any questions regarding ownership or control of the mark arising in the examination of the specimens. These issues are typical of those which are appropriate for action in examination of the statement of use. The examining attorney should issue requirements and refusals, as appropriate, based on the examination of the specimens, subject to the same standards which govern the examination of specimens in any other phase of examination. TMEP section 808.

10. Revival of Abandoned Intent-to-Use Applications

As noted below (B.13.), petitions to revive all abandoned applications must be filed promptly. Trademark Rule 2.66(d), 37 C.F.R. Section 2.66(d). Generally, a petition to revive should be filed within two months of abandonment. In any petition to revive an abandoned application, the applicant must show that the delay in responding was unavoidable. Delays due to circumstances which could have been avoided with the exercise of a modicum of care and attention will not be considered unavoidable delays.

In addition to the requirements which apply to all petitions to revive, a petition to revive an intent-to-use application, abandoned due to the failure to file the statement of use within the time allowed, is subject to additional requirements. The petition must include a fee equal to the required fees for the number of requests for extensions of time to file the statement of use which should have been filed if the application had not been abandoned *and* either a statement of use or a request for an extension of time. Trademark Rule 2.66(c), 37 C.F.R. Section 2.66(c).

The referenced fees are in addition to the standard petition and any statement of use fees. If an applicant has already filed a statement of use, the applicant need not file another statement of use with the petition. If a response to an outstanding Office action is due, the applicant must include that response with the petition.

However, the Office will not grant a petition to revive an intent-to-use application if the grant of the petition would extend the period for filing the statement of use beyond thirty-six months after issuance of the notice of allowance. Trademark Rule 2.66(d), 37 C.F.R. Section 2.66(d).

11. Assignment of Intent-to-Use Applications

The 1988 amendments to the Act provide as follows:

> However, no application to register a mark under section 1(b) shall be assignable prior to the filing of the verified statement of use under section 1(d), except to a successor to the business of the applicant, or portion thereof, to which the mark pertains, if that business is ongoing and existing.

Trademark Act Section 10, 15 U.S.C. Section 1060.

The Office will not examine proposed assignments to determine compliance with this provision as a general rule. However, the examining attorney will inquire to determine whether an

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assignment conforms to the requirements of this provision if the question is raised by the information of record. If the examining attorney issues an inquiry as to compliance, the applicant's response that the assignment was in compliance with the law is sufficient to resolve the issue.

As discussed in detail below (B.11.b.), the applicant bears the burden of recording and notifying appropriate Office personnel of assignments or changes of name to ensure that the registration issues in the name of a new owner. Trademark Rule 2.187, 37 C. F. R. Section 2.187.

12. Mailing Procedures and Fees Related to Intent-to-Use Applications

a. Use of the "Box ITU" designation

Applicants are encouraged to include "Box ITU" in the address when submitting the following:

i. statements of use under Section 1(d) of the Act, Trademark Rule 2.88, 37 C. F. R. Section 2.88, and

ii. requests for extensions of time to file statements of use under Trademark Rule 2.89, 37 C.F.R. Section 2.89.

Rule 1.1(h), 37 C. F. R. Section 1.1(h). Applicants should *not* use the "Box ITU" designation when filing the intent-to-use application itself, amendments to allege use or when filing routine responses to Offfice actions in intent-to-use applications because it may delay processing.

b. The Certificate-of-Mailing Procedure

The following intent-to-use papers are specifically excepted from the certificate-of-mailing procedure:

i. statements of use under Section 1(d) of the Act,

ii. requests for extensions of time to file statements of use under Trademark Rule 2.89, 37 C. F. R. Section 2.89, and

iii. amendments to allege use under Section 1(c) of the Act.

Rule 1.8(a), 37 C. F. R. Section 1.8(a). Also, the initial filing of all trademark applications, including intent-to-use applications, is excepted from this procedure. Thus, any of these papers will be considered filed on the date actually received or on the date specified under Rule 1.10, 37 C. F. R. Section 1.10, concerning the use of "Express Mail."

c. Fees Related to Intent-to-Use Applications

The filing fee for an intent-to-use application itself is $175.00 per class. The fee for filing an amendment to alleged use, statement of use or a request for an extension of time is $100.00 per class. Trademark Rule 2.6, 37 C. F. R. Section 2.6

B. PROVISIONS AFFECTING ALL APPLICATIONS

Certain changes in Office policy and procedure associated with the 1988 amendments and revisions to the rules affect all applications, that is, use applications under Tradfemark Act Section 1(a), 15 U. S. C. Section 1051(a), intent-to-use applications under Trademark Act Section 1(b), 15 U. S. C. Section 1051(b), as well as applications filed under Trademark Act Section 44, 15 U. S. C. Section 1126. Those changes will be set forth in this section.

1. Filing Date Requirements

Trademark Rule 2.21, 37 C. F. R. Section 2.21, sets forth the minimum requirements for receiving a filing date for all types of applications. These minimum requirements do not include all of the requirements which may ultimately apply for registration of the mark, but merely those formal requirements which must be met to receive a filing date.

a. Applicant's Signature

Under the rule, as revised, all applicants are required to provide a declaration or verification signed by the applicant to receive a filing date. Because the filing of an application for the Principal Register now establishes a constructive date of use, contingent on issuance of a registration, under Trademark Act Section 7(c), 15 U.S.C. Section 1057(c), the rule now imposes this requirement.

If an application is submitted unsigned, the Application Section will not grant a filing date and will return the papers to the applicant. If an unsigned application reaches the examining attorney in error, the examining attorney should return the application to the Application Section for appropriate action.

Under Trademark Act Section 1, 15 U.S.C. Section 1051, only the following persons have statutory authority to sign: the individual in an application filed by an individual, a general partner in a partnership application or an officer in an application filed by a corporation or association.

If the applicant submits a signed declaration or verification, the examining attorney will determine whether the person who signed had authority to sign for the applicant under the Act. If the person did not, the applicant may submit a substitute declaration and retain the filing date, provided the person who signed initially possessed color of authority to sign. Persons having color of authority are those who have firsthand knowledge of the truth of the statements in the application *and* who also have actual or implied authority to act on behalf of the applicant. Trademark Rule 2.71(c), 37 C.F.R. Section 2.71(c).

For example, in the case of a corporate applicant, a nonofficer, such as a manager, who had the requisite knowledge of the facts relevant to the application and actual or implied authority to act on behalf of the applicant, would possess color of authority, though not proper authority under the Act. In such a case, a substitute declaration could be submitted during prosecution of the application to correct this defect. An attorney who is an employee of a corporation might also satisfy the criteria.

On the other hand, the applicant's private attorney would not ordinarily be regarded as possessing color of authority to sign on behalf of an applicant. Private attorneys do not usually have firsthand knowledge of a client's business or the authority to act on behalf of a client, other than as legal representative. Here, the defect could not be corrected by filing a substitute verification or declaration, confirming the facts in tha application, signed by an appropriate person. If the person who signed the application lacked even color of authority to sign on behalf of the applicant, the examining attorney must refuse registration because the application did not meet the requirements of Trademark Rule 2.21, 37 C.F.R Section 2.21, for receiving a filing date.

If the examining attorney determines that the person who signed for the applicant lacked the requisite authority, but the person possessed at least color of authority, the examining attorney will require a substitute declaration or verification.

The Office will accept copies of signed applications for the purpose of granting a filing date. Applicants cannot send copies of applications by fax directly to the Office, but the Office will accept copies which have been produced by fax in the same manner as any other copy. However, if a copy is filed, the applicant must provide the signed original copy of the application during prosecution. If the applicant has not done so earlier, the examining attorney will require that the applicant do so in the first action in the case. In no case will anything other than a certificate or certified copy of a foreign registration be accepted for purposes of granting a filing date in an application based on Trademark Act Section 44(e), 15 U.S.C. Section 1126(e).

b. Drawing Size

Effective July 3, 1989, the Office requires that drawings conform to the size requirements specified in Trademark Rule 2.52(c), 37 C.F.R. Section 2.52(c), to receive a filing date. If the mark in a special-form drawing is displayed in an area larger than four inches by four inches, it will be regarded as not being in substantial conformity with the rule and the application will be denied a filing date and returned to the applicant. If an examining attorney discovers an application with a drawing which does not conform to this requirement, the examining attorney should return the application to the Trademark Services Division for appropriate handling. It should not be examined.

Other changes relating to the minimum requirements for receiving a filing date which relate to specific types of applications are noted under the discussion of those specific types of applications.

2. Identifying the Applicant and Applicant's Address

Trademark Rule 2.33(a)(1)(ii), 37 C.F.R. Section 2.33(a)(1)(ii), has been revised to state the requirements related to identifying a partnership. The rule now specifies that the application must identify "the state or nation under the laws of which the partnership is organized." This revision merely reflects long-standing Office practice. The applicant must also provide the names of all general partners and their state or nation of incorporation or their citizenship, as appropriate.

Also, an individual applicant may provide either a business or residence address. Both addresses are no longer required.

3. Drawings

Trademark Rule 2.51(d), 37 C.F.R. Section 2.51(d), has been added to provide guidance concerning the nature of drawings in the case of certain unusual types of marks. The rule provides as follows:

(d) Broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on the packaging, or to show matter not claimed as part of the mark, or both, as appropriate. In an application to register a mark with three-dimensional features, the drawing shall depict the mark in perspective in a single rendition.

This provision is intended to provide guidance to applicants wishing to register certain types of marks, such as configurations of goods or configurations of packaging for goods and similar marks. The provision brings the rules into conformity with current practice. The drawing should clearly define the matter the applicant claims as its mark. *See In re Famous Foods, Inc.*, 217 USPQ 177 (TTAB 1983). If the mark is three-dimensional, the drawing should present the mark in three dimensions. *In re Schaefer Marine, Inc.*, 223 USPQ 170 (TTAB 1984).

Trademark Rule 2.52(e), 37 C.F.R. Section 2.52(e), has been revised to simplify the color linings used to identify the colors orange and yellow or gold in drawings of marks. If an applicant employs the color linings formerly designated for these colors, the examining attorney should not require a new drawing. The revised rule has been adopted for the convenience of applicants, and the Office will allow a reasonable time for applicants to adjust to the new coding.

Trademark Rule 2.52(d), 37 CF.R. Section 2.52(d), has been amended to modify the content of the drawing heading. Specifically, it now requires that an applicant claiming the benefit of a foreign application under Trademark Act Section 44(d), 15 U.S.C. Section 1126(d), specify the priority date in the drawing heading. It also recommends that applicants provide, as a part of the heading, a description of the essential elements of the mark in the case of a special-form drawing.

4. Specimens - Requirements

Trademark Rules 2.56 and 2.57, 37 C.F.R. Sections 2.56 and 2.57, have been revised to reduce the number of specimens or facsimiles required in an application from five to three. In view of this rule, the public may remove only two surplus copies of specimens from the file permanently. At least one original of each type of specimen submitted must be retained in the file to ensure a complete record of the case. In the case of applications filed before November 16, 1989, the Office will not require more than three specimens per class in any action taken on or after that date.

The referenced rules have also been revised to reflect the provisions of the 1988 amendments revising Trademark Act Section 45, 15 U.S.C. Section 1127. Specifically, the definition of "use in commerce" has been revised to provide that when the nature of the goods makes placement of the mark on the goods, containers, tags, labels or displays associated with the goods impracticable, then placement of the mark on documents associated with the goods or their sale constitutes use in commerce. The referenced rules have been amended to reflect this change. *See In re E.A. Miller & Sons Packing Co.*, 225 USPQ 592 (TTAB 1985). Therefore, the examining attorney should accept documents associated with the goods or their sale, in the case of goods sold in bulk or in similar cases, where placement of the mark on the goods themselves is impracticable.

The referenced rules regarding specimens or facsimiles have also been revised to establish 8.5 by 11 inches as the maximum size permitted for such items. This revision brings the rule into conformity with the preferred size indicated for all filings and standards prevailing in federal practice in general.

5. Specimens - Examination

The 1988 amendments also revise the definition of "use in commerce" to adopt a stricter standard. The Act now states, "The term `use in commerce' means the bona fide use of a mark in the ordinary course of trade, and not merely to reserve a right in a mark." Trademark Act Section 45, 15 U.S.C. Section 1127. This stricter definition of "use in commerce" applies to all applications, affidavits of use and renewals filed on or after November 16, 1989. *Cf. Ralston Purina Company v. On-Cor Frozen Foods Inc.*, 746 F.2d 801, 223 USPQ 979 (Fed. Cir. 1984).

The Office will not inquire into the sufficiency of an applicant's or registrant's use in the examination of applications, amendments to allege use, statements of use, affidavits of use or renewals unless the specimens or other evidence of record clearly raise a question concerning the applicant's or registrant's use. The consideration of whether a particular use satisfies the statutory definition is more appropriate in an inter partes proceeding. The examining attorney should require new specimens generally under the same circumstances where the examining attorney would have required new specimens prior to the 1988 amendments. If the specimens appear to be temporary in nature, the examining attorney may require specimens of a more permanent nature.

Example ...If an applicant seeks to register a mark suggesting a Christmas theme for greeting cards and submits as specimens birthday cards with an additional pasted label displaying the mark, the specimens could not be regarded as exhibiting "use in commerce." The examining attorney should refuse registration and require substitute specimens exhibiting use in commerce or an explanation to establish use in commerce.

When action is necessary, in appropriate cases, the examining attorney should require additional product or sales literature concerning the use of the mark to permit full consideration of the issue. Trademark Rule 2.61(b), 37 C.F.R. Section 2.61(b).

6. Identifications of Goods and Services

Trademark Rule 2.71, 37 C.F.R. Section 2.71, restricts amendments to the identification of goods or services as follows, "The identification of goods or services may be amended to clarify or limit the identification, but additions will not be permitted." Trademark Rule 2.71(b), 37 C.F.R. Section 2.71(b).

This rule applies to applications filed on or after November 16, 1989. The rule also applies to applications filed before November 16, 1989, for the purposes of any action taken on or after that date. However, if the Office issued a requirement or suggested an amendment in an action prior to that date, and the applicant submits an amendment substantially complying with the requirement or suggestion on or after the effective date, the examining attorney should accept the amendment, even though it does not comply with the new rule, if it is otherwise proper.

As noted previously, Trademark Act Section 7(c), 15 U.S.C. Section 1057(c), provides that the filing of any application for registration on the Principal Register establishes constructive use and nationwide priority contingent on issuance of the registration. The identification of goods and services in an application, therefore, defines the scope of those rights established by the filing of an application for the Principle Register. The following sections discuss identification of goods and services in general; additional information relevant to the identification of goods and services in an intent-to-use application is presented above with the specific discussion of such applications.

a. Limiting the Identification of Goods and Services

As indicated above, the rules permit amendments to limit the identification of goods and services. The rules also refer to "deletion" in relation to the identification of goods and services. *See, e.g.*, Trademark Rule 2.74, 37 C.F.R. Section 2.74."Dele-

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tion" means the elimination of an existing item in an identification of goods and servbices in its entirety. Deletion is distinct from other types of amendments to limit, such as amendments to limit the goods as to types, channels of trade or class of purchasers or to restrict an existing item in scope by the introduction of some qualifying language or the substitution of specific for more general terms.

Deletions from the identification of goods and services are permitted. If the applicant wishes to amend the identification of goods and services to delete one or more items, the examing attorney should accept the amendment, provided it is timely and otherwise proper. However, once the applicant has expressly amended the identification of goods and services to delete an item it may not be reinserted in a later amendment.

If an applicant wishes to amend the identification of goods and services to insert an item which is equivalent to or logically encompassed by an item already included in the identification of goods and services, the examining attorney should permit the amendment, provided it is timely and otherwise proper.

If the applicant wishes to amend the identification of goods and services to restrict one or more of the items by inserting qualifying language or substituting more specific language, the examining attorney should accept the amendment, provided it is timely and otherwise proper.

Example —If the applicant initially identifies the goods as "publications," the applicant may amend to substitute one or more terms which fall under the definition of publications. Likewise, if an applicant identifies its goods as "pamphlets," the applicant may amend to indicate brochures or both because these terms are generally equivalent and interchangeable. In either case, the applicant must specify the subject matter.

Example — If the Applicant initially identifies the goods as "football uniforms, " the applicant may amend to indicate football uniforms in Class 25 and football helmets and shoulder pads in Class 28. These goods are logically included within the initial identification. Footballs, however, could not be added; this would add an item not logically included within the original identification.

Example — If the applicant initially identifies the services as "prepaid medical services" and wishes to amend to underwriting prepaid medical plans and health care services in the nature of a health maintenance organization, the amendment should be permitted. Both specific services are logically included under prepaid medical services.

On the other hand, an applicant may not amend an identification of goods or services to add or substitute a term which is not logically included within the scope of the terms originally stated or which is otherwise qualitatively different from the goods and services as originally stated.

Example —If the applicant identifies the goods as "computer programs," the applicant may not add or substitute computers or other types of computer hardware to the listing.

Example — If the applicant initially identifies the goods as "hats," the applicant may not add or substitute scarfs in the identification of goods. Likewise, the applicant may not add or substitute shirts for slacks.

Example — If the applicant identifies its services as "ophthalmologist's services" and proposes to amend the identification to medical services, the amendment should not be permitted. The amendment would expand the identification to include services beyond the scope of those identified initially.

The scope of the goods and services, as originally identified or as amended by an express amendment, establishes the outer limit for any later amendments.

Because the rule precludes additions to the identification of goods and services, examining attorneys should not require or suggest unduly restrictive identifications of goods and services. *See In re Sentry Chemical Company*, 230 USPQ 556 (TTAB 1986). Once the identification has been limited, it cannot be expanded later. Also, in requiring amendments to the identification of goods and services, examining attorneys should generally advise applicants that additions to the identification of goods and services are not permitted. This subject is discussed in greater detail above in conjunction with intent-to-use applications.

b. Clarifying the Identification of Goods and Services

Under the rule, an applicant may amend "to clarify" the identification of goods and services. The applicant may clarify an identification of goods and services which is indefinite or overly broad to identify goods or services which are within the scope of the goods and services as identified initially. As noted, the filing of an application for registration on the Principal Register establishes a constructive date of first use in commerce, contingent on issuance of the registration. Trademark Act Section 7, 15 U.S.C. Section 1057. Accordingly, the applicant may not expand those rights through amendment of the identification of goods and services.

Thus the applicant may amend from the more general to the specific, but the applicant may not amend the specific to the more general. The scope of the goods and services identified initially, or as limited by an express amendment, establishes the outer limit for permissible amendments. Classification may provide some guidance in determining whether an amendment exceeds the scope of the goods and services identified initially, but it is not controlling. The examining attorney may suggest and may permit amendments to the identification of goods and services resulting in a change of class, provided the amended identification does not exceed the scope of the original identification.

Example — If an applicant has erroneously identified its goods and services as "menus," but in fact, the applicant intends to register the mark for restaurant services, the applicant may not amend the identification of goods to "restaurant services." In such a case, the original identification, which is specific and narrow in scope, may not be expanded to services beyond the scope of that identification.

Example — If an applicant has erroneously identified its goods and services as "packaging and labels," but in fact, the applicant intends to register the mark for toys, the applicant may not amend to correct the identification. The initial identification failed to indicate the nature of the applicant's goods and services in any form, and therefore, the examining attorney must reject the amendment to insert an identification of goods and services beyond the scope of those stated initially.

Example — If an applicant has identified its goods and services as "advertising and business" the appplicant may not amend to specific goods or to services other than those within the scope of these terms, generally those services included in International Class 35.

7. Claims of Acquired Distinctiveness

The 1988 amendments revise Trademark Act Section 2(f), 15 U.S.C. Section 1052(f), to permit the filing of a prima facie showing of acquired distinctiveness based on five years use running up to the date the claim is made. The Act now states:

The Commissioner may accept as prima facie evidence that the mark has become distinctive, as used on or in connection with the applicant's goods in commerce, proof of substantially exclusive and continuous use thereof as a mark by the applicant in commerce for the five years before the date on which the claim of distinctiveness is made.

Trademark Act Section 2(f), 15 U.S.C. Section 1052(f).

The Act previously required that the relevant five-year period precede the filing date of the application. Under the new provision, therefore, any five-year claim submitted on or after November 16, 1989, is subject to the new time period. This will apply even if the application was filed before November 16, 1989. *See* Trademark Rule 2.41(b), 37 C.F.R. Section 2.41(b). Note the discussion above concerning claims of acquired distinctiveness in intent-to-use applications (A.3.f.).

8. Supplemental Register

The 1988 amendments eliminate the one-year- lawful-use requirement for eligibility for the Supplemental Register. Therefore, on or after November 16, 1989, an applicant may apply for registration on the Supplemental Register at any time after commencing use of the mark. Likewise, on or after November 16, 1989, an applicant may amend a pending application to seek registration on the Supplemental Register at any time after use of the mark has commenced. The applicant may do so even if the original application for the Principal Register was filed before November 16, 1989. *See* Trademark Rule 2.47, 37 C.F.R. Section 2.47. However, if the application was filed before November 16, 1989, and the applicant had not used the mark in commerce for one year before the filing date, and the applicant amends to the Supplemental Register on or after November 16, 1989, the date of the amendment to the Supplemental Register becomes the effective filing date of the application.

As noted above (A.3.g.), an intent-to-use applicant may file an amendment to the Supplemental Register only after use has commenced and after the filing of an acceptable amendment to allege use or a statement of use. In such a case, the effective filing date of the application will be changed to the date on which the applicant filed the amendment to allege use under Section 1(c) of the Act or the statement of use under Section 1(d) of the Act.

In requesting registration on the Supplemental Register in either the original application or in an amendment to the Supplemental Register, the applicant need not include an additional statement as to lawful use. Although Section 23 still includes an explicit reference to lawful use, any use which is the basis for an application on either the Principal or the Supplemental Register must be lawful. It need not be stated explicitly.

In an application under Section 44 of the Act, the applicant may seek registration on the Supplemental Register without alleging lawful use in commerce and without alleging use anywhere in the world. Trademark Rule 2.47(b), 37 C.F.R. Section 2.47(b).

The 1988 amendments also add the following language to Trademark Act Section 27, 15 U.S.C. Section 1095, "Registration of a mark on the Supplemental Register shall not constitute an admission that the mark has not acquired distinctiveness." Examining attorneys, therefore, should note this provision in presenting any refusals or requirements related to the nondistinctive character of a mark previously registered on the Supplemental Register.

9. Affidavits of Use under Section 8

The 1988 amendments modify the requirements for the content of an affidavit of use which must be filed between the fifth and sixth anniversaries of registration. Trademark Act Section 8, 15 U.S.C. Section 1058. Under the new provision, the registrant must identify the specific goods or services on or in connection with which the mark is in use in commerce. Similarly, if the registrant elects to present an explanation of excusable nonuse, this explanation must also relate to specific goods or services.

Formerly, the allegation of use in commerce related to one or more classes with no requirement to specify the goods or services within a class on or in connection with which the mark was in use. If the registrant fails to provide an allegation of use or a satisfactory explanation as to nonuse as to any goods or services in the registration, those goods or services will be cancelled from the registration. If the original affidavit of use fails to specify the goods and services, the registrant may not amend the affidavit to correct this omission after the expiration of the period during which the affidavit is due. The registrant may incorporate the goods and services by reference. For example, the registrant may state, "those goods and services specified in the registration" or "those goods and services specified in the registration except. . ." specifying any goods or services to be deleted.

The new provision also explicitly requires specimens of use to support the affidavit. Formerly, the Act required a "showing" and the Trademark Rules of Practice required as follows, "The statement must be supported by evidence which shows that the mark is in use, and normally such evidence consists of a specimen or a facsimile specimen which is currently in use, or a statement of facts concerning use." In view of the 1988 amendments, the rules have been revised to specify that specimens or facsimiles are required. Trademark Rules 2.161 and 2.162, 37 C.F.R. Sections 2.161 and 2.162.

Specimens of use must be provided before the expiration of the sixth year following registration. If the registrant fails to do so, the registration will be cancelled. If the registrant does provide specimens, but the Office determines that those specimens are unacceptable, the Office will require substitute specimens. In such a case, the registrant must provide specimens of use within the time provided. Substitute specimens may be filed after the expiration of the sixth year. If the registrant fails to do so, the registration will be cancelled. The registrant must also verify in an affidavit or a declaration under Trademark Rule 2.20, 37 C.F.R. Section 2.20, that the substitute specimens were in use in commerce before the expiration of the sixth year following registration.

Registrants filing affidavits under Section 8 should also note the revised rule concerning the establishment of ownership. Trademark Rule 2.186, 37 C.F.R. Section 2.186, permits a registrant to establish ownership either by recording an assignment in the Assignment Branch of the Office or by submitting proof of the assignment without recording.

10. Term and Renewal

The 1988 amendments reduce the registration and renewal term from twenty to ten years. Trademark Act Sections 8(a) and 9, 15 U.S.C. Sections 1058(a) and 1059. Accordingly, registrations issued on or after November 16, 1989, will be issued for ten-year periods and subject to renewal for ten-year periods. Registrations issued prior to that date remain in force for their existing term of twenty years, but are subject to renewal for ten-year periods. Trademark Rule 2.181, 37 C.F.R. Section 2.181. For the purpose of determining the relevant renewal period, the Office will adhere to the following policy during the transition.

i. If the registration expires on or after November 16, 1989, the registration will be renewed for ten years. The Office will not take final action to grant any such renewal until November 16, 1989.
ii. If the registration expires before November 16, 1989, and the Office takes final action to grant the renewal before that date, the registration will be renewed for twenty years.
iii. If the registration expires before November 16, 1989, and the Office takes final action to grant the renewal on or after November 16, 1989, the registration will be renewed for ten years.

All renewal terms run from the expiration date of the previous term.

Note Trademark Rule 2.186, 37 C.F.R. Section 2.186, regarding requirements related to the establishment of ownership of the registration for the purpose of renewals which permits a registrant to establish ownership either by recording an assignment in the Assignments Branch of the Office or by submitting proof of the assignment without recording.

11. Assignments

a. Content of Assignment Documents

Office policy governing trademark assignments provides that an assignment relating to an application or registration will be recorded, even if the assignment document itself does not identify the relevant application or registration numbers, provided certain conditions are met. Specifically, the policy requires as follows with respect to the identification of the properties assigned in such a case:

(i) The mark and the goods and services are identified in the assignment document (or the assignment is of all registrations and/or applications owned by the assignor), and the application or registration is identified by number and date in a transmittal letter or attachment to the assignment document, in which case, such letter or attachment shall become part of the record of the assignment; or

(ii) An assignment is executed concurrently with or subsequent to the filing of an application but before its serial number and filing date are ascertained, and the application is identified by its date of execution, name of the applicant, mark and goods or services.

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b. Issuance of Registration in Current Owner's Name

Trademark Rule 2.187, 37 C.F.R. Section 2.187, has also been revised to clarify Office policy concerning issuance of registrations in the name of assignees or in a new name of the applicant. The rule provides as follows:

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, provided that the party makes a written request in the application record, by the time the application is being prepared for issuance of the certificate of registration, and an appropriate document is of record in the Assignment Search Room of the Patent and Trademark Office. If the assignment or name change document is not of record in the Assignment Search Room, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the application file and in the recorded document.

Trademark Rule 2.187, 37 C.F.R. Section 2.187.

Any application where such a request has been submitted should be forwarded to the assigned examining attorney. The assigned examining attorney will ensure that the assignment or change of name is entered in the file after recording and will then return the application to processing.

If a party other than the applicant of record attempts to take any action in a case, the examining attorney must confirm that the new party is the owner in accordance with Trademark Rule 2.186, 37 C.F.R. Section 2.186. That is, the applicant must provide the reel and frame number of an assignment, or the applicant must submit other evidence of ownership.

c. Assignment Fees

Applicants should note that, effective April 17, 1989, the fee for recording assignments of trademarks is $8.00 per application or registration assigned. Trademark Rule 2.6, 37 C.F.R. Section 2.6.

12. Establishing Ownership of Applications or Registrations

Trademark Rule 2.186, 37 C.F.R. Section 2.186, as amended, provides:

Any action with respect to an assigned application or registration which may or must be taken by an applicant or registrant may be taken by the assignee provided that the assignment has been recorded or that proof of the assignment has been submitted.

The previous rule required recording of an assignment in a case where the applicant/assignee or registrant/assignee was required to take an action, such as filing a response to an Office action, filing an affidavit of use under Trademark Act Section 8 or filing a renewal. While it may be advisable for an applicant or registrant to record an assignment of an application or registration in view of the provisions of Trademark Act Section 10, 15 U.S.C. Section 1060, concerning subsequent purchasers, neither the Act nor the rules require recordation.

However, if the party taking the relevant action with respect to the application or registration is different from the applicant or registrant of record and the filing party has not recorded an assignment, the party taking the action must establish that it is the owner of the application or registration through appropriate evidence. This evidence may consist of a copy of a document transferring ownership from one party to another or an explanation in an affidavit or supported by a declaration under Trademark Rule 2.20, 37 C.F.R. Section 2.20, that a valid transfer of legal title has occurred.

13. Revival of Abandoned Applications

Trademark Rule 2.66, 37 C.F.R. Section 2.66, concerning petitions to revive abandoned applications, requires that all such petitions be filed "promptly." The Office will continue to consider each petition on the merits according to the circumstances of the case, but, as a general rule, all such petitions should be filed within two months of the abandonment date. The standard for granting a petition to revive continues to be "unavoidable delay." Please note the discussion above (A.10.) with specific reference to petitions to revive intent-to-use applications.

14. Concurrent Use

The 1988 amendments insert the following language in Trademark Act Section 2(d), 15 U.S.C. Section 1052(d), governing concurrent use applications which are subject to concurrent use proceedings in the Patent and Trademark Office:

Use prior to the filing date of any pending application or a registration shall not be required when the owner of such application or registration consents to the grant of a concurrent registration to the applicant.

The statute now provides greater flexibility to applicants seeking concurrent use registrations. Therefore, if the applicant is not entitled to a concurrent use registration on the basis of the jurisdictional requirement of use of its mark prior to the earliest filing date of any relevant pending application or registration, but the relevant prior applicant or registrant has consented to the applicant's concurrent use application, the examining attorney should approve the mark for publication, subject to a concurrent use proceeding, provided it is otherwise eligible.

Also, Trademark Rule 2.42, 37 C.F.R. Section 2.42, no longer requires that the stated exceptions in a concurrent use application be inserted in the verification or declaration. The exceptions need only be provided in the statement portion of the application.

15.Requests to Divide an Application

Trademark Rule 2.87, 37 C.F.R. Section 2.87, establishes procedures for dividing one application into two separate applications. The rule provides as follows:

(a) An application may be physically divided into two or more separate applications upon submission by the applicant of a request therefor, in accordance with paragraph (c) of this section. In the case of a request to divide out some, but not all, of the goods or services in a class, a fee for each new separate application to be created by the division must be submitted. Any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

(b) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under section 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action.

(c) A request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application." should appear at the top of the first page of the paper.

By dividing the application, the applicant preserves the filing date, and thus the potential constructive use date, as to all of the goods and services covered by the application.

Under the rule, the applicant may request that certain goods or services in a single class be divided, that is, that a separate application with the same filing date be created to cover those goods or services. The applicant may also request that an entire class or several classes be divided, that is, that one or more separate applications with the same filing date be created to cover certain classes.

An applicant may request division of an application for any reason. For example, in an intent-to-use application, the applicant may wish to proceed to publication or registration with certain goods and services on or in connection with which it has used the mark in commerce and retain an active application for any remaining goods or services. The applicant can do so by requesting division of the application.

If the applicant requests that the goods or services in a single class be divided into one or more separate applications, the applicant must submit an application fee for each new application to be created. The fee is the same as the fee for the filing of a new single-class application, $175.00. If an entire class is to be divided out from a multiple class application, there is no fee. Trademark Rule 2.87(a), 37 C.F.R. Section 2.87(a). There is no fee for the request to divide itself.

a. Processing Requests to Divide

Specially designated personnel in the ITU Unit will process all requests to divide. All requests to divide will be given priority in processing over any other paper in the case. All requests to divide should be forwarded to the ITU Unit immediately for processing. However, if the application is the subject of a proceeding before the Trademark Trial and Appeal Board, the request should first be forwarded to the Board for appropriate action. The ITU Unit will process the request as promptly as possible and will return the application or applications to regular processing after completing action on the request to divide.

If the request to divide does not include a necessary fee or is otherwise deficient, the ITU Unit will notify the applicant of the deficiency. The applicant must correct any such deficiency within thirty days or, if the division is a necessary component of a statement of use, within the time permitted for filing the statement of use, whichever is shorter. If the applicant fails to correct the deficiency within the time provided, the request will be considered abandoned and the application will be processed without regard to the request. The ITU Unit will advise the applicant of any such action and will refund any fees paid in conjunction with the request to divide.

If the applicant submits a request to divide along with a statement of use and a request for an extension of time, and the fees are insufficient to cover all three, the fees will be applied first to the request for an extension of time, second to the statement of use and lastly to the request to divide.

If the applicant submits a request to divide along with a statement of use, and the fees are sufficient for the statement of use only, and no time remains for filing additional fees, the applicant will be given the opportunity to amend the statement of use to include all goods or services in the application. The applicant must establish that the applicant used the mark in commerce on or in connection with all such goods or services within the time permitted for filing the statement of use. If time does remain in the existing period for filing the statement of use, the applicant will be permitted to submit the additional fees within that time period.

Filing a request to divide an application does not relieve an applicant of the duty to respond to any outstanding Office action or to take any other required action.

Likewise, the applicant should note that any outstanding time period for action by the applicant in effect at the time the application is divided applies not only to the original application, but also to each new application created in the division of the application. Therefore, if a response to an Office action is due in a case, the response is due likewise in each new application created through the division of the application.

Similarly, if a statement of use is due, the period for filing the statement of use relevant to the original application is likewise relevant to each new application created through the division.

If a request to divide an application is received at any time other than those specified, it will be returned to the applicant with any fees submitted for that purpose and the application will not be divided.

The Office will not consider a request to merge two separate applications into a single application once again after a proper request to divide has been granted.

b. Division of Registration Not Permitted

A registration cannot be divided into one or more separate registrations.

16. Correspondence with Applicants Not Domiciled in the United States

Trademark Rule 2.18, 37 C.F.R. Section 2.18, has been revised to clarify Office policy with respect to correspondence with applicants not domiciled in the United States. In such a case, the Office will send correspondence to the applicant's domestic representative unless the applicant has authorized an attorney or another qualified person to prosecute the application. If the applicant has authorized an attorney or other qualified person to prosecute the application, the Office will send correspondence to that authorized person.

17. Preferred Size for Application Papers

Trademark Rule 2.31, 37 C.F.R. Section 2.31, now specifies that the preferred size for application papers is letter size. This policy applies to all submissions related to all applications.

C. PROVISIONS AFFECTING APPLICATIONS UNDER SECTION 44 OF THE ACT

The 1988 amendments introduce relatively few changes affecting applications filed under Trademark Act Section 44, 15 U.S.C. Section 1126. The amended Rules of Practice incorporate changes dictated by decisions in the area and clarify Office policy related to the administration of Section 44 in other respects. The provisions are summarized in this section.

1. Filing-Date Requirements

As noted above (A.1.a.), the amended Rules of Practice institute a number of changes related to receipt of a filing date which affect all applications. This section addresses only those changes which relate specifically to applications under Section 44. Trademark Rule 2.21, 37 C.F.R. Section 2.21, sets forth the minimum formal requirements to receive a filing date for the various types of applications. These minimum requirements do not include all of the requirements which may apply to qualify for registration.

a. Statement of a Bona Fide Intention to Use the Mark in Commerce

The 1988 amendments require all applicants under Section 44 of the Act to allege a bona fide intention to use the mark in commerce, although use in commerce is not required as a condition to registration. Any application under either Section 44(d) or 44(e) of the Act must include such a statement to receive a filing date. Trademark Rule 2.21(a)(5)(ii) and (iii), 37 C.F.R. Section 2.21(a)(5)(ii) and (iii).

The Office will not presume that an application under Section 44 is also based on intent to use under Trademark Act Section 1(b), 15 U.S.C. Section 1051(b). If the applicant wishes to assert both bases, the applicant must indicate so specifically. If the applicant indicates that Section 44 is the basis, and nothing more, and the applicant fails to comply with the relevant Section 44 filing-date requirements, the applicant will be denied a filing date, even if the application includes a statement of a bona fide intention to use the mark in commerce.

b. Priority Claim or Certified Copy of a Foreign Registration

In the case of an application claiming the benefits of Section 44(d), the application must be filed in the U.S. within six months of the relevant foreign filing and must include a claim of the benefit of a prior foreign application to receive a filing date. Trademark Rule 2.21(a)(5)(iii), 37 C.F.R. Section 2.21(a)(5)(iii). Trademark Rule 2.39, 37 C.F.R. Section 2.39, sets forth the required content of such a claim, essentially, the filing date and country of the first regularly filed foreign application. The applicant should also indicate the serial number of that application, if it is available. The serial number is not required to receive a filing date, however.

In the case of an application under Section 44(e), the application must include a certification or certified copy of the foreign registration on which the United States application is based to receive a filing date. Trademark Rule 2.21(a)(5)(ii), 37 C.F.R. Section 2.21(a)(5)(ii). If the applicant submits any type of copy other than an original of a certified copy, the Office will not grant a filing date.

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2. Statement of Dates of Use and Method of Use and Specimens Not Required

In any application under Section 44, the applicant need not state a date of first use anywhere, nor a date of first use in commerce, nor the method of use. Also, the applicant need not provide specimens of use. *Crocker National Bank v. Canadian Imperial Bank of Commerce*, 223 USPQ 909 (TTAB 1984). Trademark Rules 2.21 and 2.33, 37 C.F.R. Sections 2.21 and 2.33, have been amended to reflect this change. In such a case, the mark need not be in use anywhere for the purposes of the U.S. application.

3. The Basis for Registration in Applications Claiming the Benefits of Section 44(d)

In *In re Daiwa Seiko, Inc.*, 230 USPQ 794 (Comm'r Pats. 1983), the Commissioner clarified the distinction between Sections 44(d) and (e) of the Act. The Commissioner held that Section 44(d) only provides a basis for receiving a priority filing date but does not provide a basis for registration. Therefore, an application claiming the benefit of a foreign application under Section 44(d) must include a basis for registration also. In most cases, the basis for registration will be the foreign registration which will issue from the foreign application relied upon for priority. The Office will presume that this is the basis for registration in any application under Section 44(d) unless the applicant indicates otherwise.

Furthermore, the assertion of a different basis for registration more than six months after the filing of the foreign application, including reliance on a different foreign registration under Section 44(e), will result in the loss of the priority filing date under Section 44(d) of the Act. In such a case, the Office will change the filing date in the United States to the date on which the applicant perfects the new basis for registration by providing either a proper statement of dates of use in commerce, a proper assertion of an intent to use in commerce under Section 1(b) of the Act or a certificate or certified copy of a foreign registration. *See* TMEP section 706 and Chapter 1000.

In an application filed under Section 44 before November 16, 1989, the applicant may amend to add Section 1(b) as a basis for registration on or after that date. However, if the applicant has claimed priority under Section 44(d) in such a case, and the applicant drops the original basis for registration to rely on Section 1(b) only, the applicant may not retain the priority date unless the amendment asserting Section 1(b) as a basis for registration was made within six months of the filing of the foreign application relied on for priority. If the amendment was made later and the applicant drops the original basis for registration, the effective filing date of the application is the date of the amendment to assert Section 1(b) as a basis for registration.

D. PROVISIONS AFFECTING APPLICATIONS BASED ON USE IN COMMERCE ONLY

The 1988 amendments and the amended Rules of Practice do not provide any changes, as such, related specifically to applications based on use in commerce under Trademark Act Section 1(a), 15 U.S.C. Section 1051(a), other than those noted above (Section B) affecting all applications. In one instance, noted here, the amended Rules of Practice merely set forth long-standing Office policy in the rules for the first time.

Trademark Rule 2.59(a), 37 C.F.R. Section 2.59(a), provides as follows:

In an application under section 1(a) of the Act, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens submitted are supported by applicant's affidavit or declaration in accordance with Section 2.20 (37 C.F.R. Section 2.20) verifying that the substitute specimens were in use in commerce at least as early as the filing date of the application. The verification requirement shall not apply if the specimens are duplicates or facsimiles, such as photographs, of specimens already of record in the application.

As noted, this provision merely states long-standing policy in the regulations for the first time.

E. FILING ON MORE THAN ONE BASIS AND CHANGING THE BASIS OF THE APPLICATION

Trademark Rule 2.33(d), 37 C.F.R. Section 2.33(d), precludes the filing of an application based on both use in commerce under Trademark Act Section 1(a), 15 U.S.C. Section 1051(a), and a bona fide intention to use the mark in commerce under Trademark Act Section 1(b), 15 U.S.C. Section 1051(b). This prohibition precludes applications in a single class alleging both use in commerce and intent to use as to either the same goods and services or different goods or services. Likewise, the prohibition precludes applications in more than one class alleging both use in commerce and intent to use. If an applicant submits an application asserting both Section 1(a) and 1(b) bases for registration, the Office will not grant a filing date and will return the papers to the applicant.

The rule also precludes amendments in applications initially based on use in commerce under Section 1(a) to change the basis to intent to use under Section 1(b). In an application under Section 1(b) of the Act, an applicant may assert dates of first use which are earlier than the filing date of the application in an amendment to allege use or a statement of use.

Applicants may allege Section 44 as an additional basis for registration in conjunction with either use in commerce under Section 1(a) or intent to use under Section 1(b). In such a case, an applicant may also allege different bases for the application as to specific goods or services within a class. If an applicant asserts more than one basis for registration, the applicant must satisfy all of the requirements for registration which apply to each basis asserted. The applicant must indicate clearly that it asserts two bases for registration.

If an applicant asserts both intent to use and Section 44(e) as the bases for registration, the Office will not approve the mark for publication until the applicant submits a certificate or certified copy of the foreign registration.

In an application filed under Section 44 before November 16, 1989, the applicant may amend to add Section 1(b) as a basis for registration on or after that date. However, if the applicant has claimed priority under Section 44(d) in such a case, and the applicant drops the original basis for registration to rely on Section 1(b) only, the applicant may not retain the priority date unless the amendment asserting Section 1(b) as a basis for registration was made within six months of the filing of the foreign application relied on for priority. If the amendment was made later and the applicant drops the original basis for registration, the effective filing date of the application is the date of the amendment to assert Section 1(b) as a basis for registration.

[1108 TMOG 30]

TRADEMARK POST REGISTRATION

(223) **Trademark Rule 2.165 Requirement Where A Section 8 Affidavit Or Declaration Is Held Insufficient**

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (*a*) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least respond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (*b*) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

Dec. 12, 1977. BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[966 TMOG 80]

(224) **Late-Filed Renewal Fees**

Sections 9 and 31 of the Lanham Act (15 U.S.C. §§ 1095 and 1113) require that an additional five dollar ($5.00) fee be submitted by a registrant who files a renewal application during the three-month period following expiration of its registration. The language of the statute requires that this additional fee be submitted within the three-month grace period. A number of registrants who have failed to submit the additional fee within the prescribed period have petitioned the Commissioner to allow their renewal applications. The Commissioner has granted petitions of this kind where the registrant or its attorney maintained a Patent and Trademark Office deposit account which contained, on the date the renewal application was filed, sufficient funds to cover the additional fee. Specifically, the Commissioner has exercised discretion under Trademark Rules 2.146(a)(3) and 2.147 to deem the authorizations to charge the deposit accounts to have taken place at the time the registrants filed their renewal applications, even though the authorizations were not confirmed until a later date. This Office policy was established by the Commissioner's decision in *In re Ralston Purina Co.*, 191 USPQ 154 (Comr. Pats. 1976).

The policy established by the *Ralston Purina* decision is being changed. Henceforth, the Commissioner will no longer exercise discretion to charge deposit accounts *nunc pro tunc* for trademark renewal application fees. To allow an authorization to charge a deposit account to relate back to a date on which no actual authorization existed is, in effect, to allow late payment. It is inequitable to permit those registrants who have deposit accounts (or those whose attorneys have such accounts) to make late payment of renewal fees, while those without deposit accounts may not.

Petitions relying on *Ralston Purina* will, after the date of this notice, be denied, unless the events that gave rise to those petitions occurred before publication of this notice.

Feb. 20, 1981. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1004 O.G. 29]

(225) **Renewal Applications and Section 8 Affidavits**

There has been a noticeable increase in the number of petitions requesting provisional acceptance of defectively executed Section 8 Affidavits and Renewal Applications under 35 U.S.C. § 26, the most common problem being a lack of notarization or a Rule 2.20 declaration. Often, such petitions are necessitated by the failure of registration owners to file the documents early enough to leave time in which to correct should they prove defective.

Section 8 Affidavits may be filed beginning with the fifth anniversary of the registration. The period for filing expires on the sixth anniversary of the registration. The period for filing Renewal Applications begins six months before the twentieth anniversary of the registration and extends three months beyond the expiration of the twenty year term. While the Post Registration Division may allow up to six months to respond to a notice of defect, it may not allow corrective action beyond the period for filing established by the Trademark Act. It is therefore in the registrant's best interest to file such documents as close to the opening date as possible to allow time for correction, if necessary. Provisional acceptance under 35 U.S.C. § 26 has been, and will continue to be, given narrow application. Registrants should not rely on 35 U.S.C. § 26 as a means of acquiring an extension of time.

We have also become aware of many delays caused by defects in the chain of title. Registrants are encouraged to keep Patent and Trademark Office assignment records current with regard to ownership of registrations.

The filing of Post Registration documents at the earliest date and maintenance of assignment records will help to avoid the cancellation or expiration of registrations of trademarks currently in use, and will result in a savings of time and expense for both the registrant and the Patent and Trademark Office.

Apr. 19, 1983. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1030 TMOG 37]

(226) **Trademark Examining Operation**

Effective Dec. 1, 1983, all requests presented to the Patent and Trademark Office under the provisions of Section 7 of the trademark statute (15 U.S.C. 1057) will be considered by the Post Registration Section of the Trademark Examining Operation.

Necessary telephone inquiries concerning procedure or status should be directed to 703-557-1986.

Dec. 2, 1983. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1038 TMOG 256]

(227) **Expedited Service for Certified Copies of Trademark Registrations**

On Oct. 4, 1986, expedited service for obtaining certified copies of trademark registrations will be available to the public. The cost of obtaining a certified copy showing title and/or status will be $10.00 plus $25.00 for the expedited service for a total

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of $35.00 per copy; a certified copy of the registered mark, not showing title or status, will be $5.00 plus $25.00 for expedited service for a total of $30.00. Requests received in the Post-Registration Section of the Trademark Services Division, Crystal Plz. 2-4C24, before 12:00 noon on U.S. Patent and Trademark Office scheduled work days will be filled within three work days.

Requests for expedited service which are hand carried to the Post-Registration Section located in Crystal Plz. 2-4C24 will be available for pickup at the same location after 12:00 noon three work days later. Requests for expedited service which are mailed to the Patent and Trademark Office will be processed and mailed back to the requester three work days after they are received in the Post-Registration Section from the U.S. Patent and Trademark Office mail room. All requests for expedited service will be machine stamped when received in the Post-Registration Section and machine stamped upon completion by the Post-Registration Section.

Anyone requesting expedited service will be limited to five registration numbers per day. Limits on the number of registrations being certified are needed in order to ensure that service is not disrupted for routine requests for certified copies. The guarantee of service in three work days is based on the ability of the Post-Registration Section to process up to 1,000 expedited copies out of an average of 16,000 copies processed each year.

Inquiries about the service should be addressed to:

Patricia M. Davis
Administrator for Trademark Operations
Trademark Examining Operation
Crystal Plz. 2-3C06
(703) 557-3268

Aug. 19, 1986. MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1070 TMOG 4]

(228) **Helpful Hints**

- *Trademark Post Registration - Failure to Specify Type of Commerce in Section 8 Affidavits or Declarations*—Section 8(a) of the Trademark Act requires that before the end of the sixth year following registration, an affidavit must be filed showing that the "mark is in use in commerce." [15 U.S.C. 1058a].

  The Trademark Rules require that all Section 8(a) affidavits or declarations "state that the registered mark is in use in commerce and specify the nature of such commerce." [37 C.F.R. Section 2.162(e)].

  The affidavit or declaration must be filed between the fifth and sixth year following the date of registration and it must contain a statement that the "mark is in use in commerce," with evidence thereof. There may be no extensions of time beyond the sixth year for submission of this statement and evidence of use of the mark in commerce. However, if the timely-filed affidavit or declaration does not set forth the *type* of commerce, the registrant will be given six months to submit that information even though the sixth year may have expired. The rules do not provide for any further extensions of time beyond the six months. (Carlisle Walters, 703-557-3061)

- *Backlogs in Trademark Renewals and Section 8 Affidavits and Declarations* — Registrants are advised that a backlog currently exists in the processing of Trademark Renewals and Section 8 affidavits and declarations. While the Patent and Trademark Office conducts a preliminary review of critical elements in order to notify registrants of statutory deficiencies prior to the expiration of the statutory period for the submission of required documents, the ultimate responsibility for complying with the requirements of the statute and the rules rests with the registrant. (Carlisle Walters, 703-557-3061)

July 1, 1988 THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1092 TMOG 11]

(229) **Section 8 Requirements For Trademark Registrations**

Any registrant who files in the Patent and Trademark Office, on or after November 16, 1989, an affidavit or declaration under Section 8 of the Trademark Act will be required to comply with the requirements of the Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U. S. C. 1051)], which takes effect on November 16, 1989. The Trademark Law Revision Act amends 15 U. S. C. 1058(a) by adding the requirement that a registrant submit an affidavit "setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark...."

For Section 8 affidavits or declarations filed on or after November 16, 1989, the Patent and Trademark Office will require registrants to specify the goods and services to which the Section 8 affidavit or declaration pertains. The registrant may comply with the requirement for specification of its goods and services by listing each of the goods and services to which the Section 8 affidavit or declaration pertains or by making an all-encompassing reference to the goods and services recited in the registration (e. g., *"The mark is in use in connection with all the goods and services recited in the registration."* or *"The mark is in use in connection with all the goods and services recited in the registration, with the exception of ..."*. The Patent and Trademark Office prefers that the registrant use an all-encompassing reference to its goods and services as the method of specification, especiallly where the mark is registered for numerous goods and services.

If the registrant fails to file, before the end of the sixth year following registration, a Section 8 affidavit or declaration that sets forth goods and services in connection with which the mark is in use, the registration will be cancelled. Similarly, those goods or services recited in the registration but not specified in a Section 8 affidavit or declaration filed before the end of the sixth year following registration will be deleted from the registration. After the end of the sixth year following registration, the Patent and Trademark Office will not accept a substitute Section 8 affidavit or declaration filed to correct registrant's failure to specify, or to specify completely, the goods and services on or in connection with which the mark is in use.

A Section 8 affidavit or declaration filed on or after November 16, 1989 must include a specimen or facsimile showing current use of the registered mark. The registrant will be required to file one specimen or facsimile for each class of goods or services to which the registration pertains. For a single-class registration covering multiple goods or services, only one specimen or facsimile showing current use of the mark on one of the goods or services in that class will be required. Similarly, for a mulitiple-class registration, the registrant will be required to file, for each class of goods or services covered by the multiple-class registration, one specimen or facsimile showing current use of the mark on one of the goods or services in that class.

If the registrant fails to file, before the end of the sixth year following registration, an affidavit or declaration that includes a proper specimen or facsimile for each class of goods or services to which the registration pertains, the registration will be cancelled as to that class of goods or services. After the end of the sixth year following registration, the Patent and Trademark Office will not accept a substitute Section 8 affidavit or declaration filed to correct the omission of a proper specimen or facsimile.

June 15, 1989 Jeffery M. Samuels
Assistant Commissioner for Trademarks

[1104 TMOG 22]

(230) **RENEWAL OF TRADEMARK REGISTRATIONS (Revised)**

This supersedes the notice that appeared in the *Official Gazette* on May 2, 1989; (1102 TMOG 5):

The Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)], which takes effect on November 16, 1989, amends 15 U.S.C. 1059(a) to reduce the renewal term of a registration from twenty years to ten years from the end of the expiring period of the registration.

Any registration whose expiration date is prior to November 16, 1989, shall be renewed, upon proper application, from the end of the expiring period for:

(a) twenty years if the renewal is granted prior to November 16, 1989, or
(b) ten years if the renewal is granted on or after November 16, 1989, regardless of the renewal application filing date.

Any registration whose expiration date is on or after November 16, 1989, shall be renewed, upon proper application, for ten years from the end of the expiring period, regardless of the renewal application filing date.

The present practice of notification of renewal will continue. However, the updated renewal certificate issued by the PTO will be modified to specifically indicate the length of the renewal period. The notice of renewal appearing in the *Trademark Official Gazette* will be modified to indicate the date of the acceptance of renewal.

August 16, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks.

[1106 TMOG 25]

TRADEMARK INFORMATION AND CORRESPONDENCE

(231) **Powers of Attorney in Registered Trademark Files**

On and after Feb. 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

Jan. 30, 1967. C.M. WENDT,
Director.

[835 TMOG 95]

(232) **Initial Processing of Application**

On Feb. 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.

2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.

3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.

4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective Feb. 1, 1972.

Jan. 11, 1972. RICHARD A. WAHL,
Acting Commissioner of Patents.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

Published in 37 F.R. 942; Jan. 21, 1972

[895 O.G. TM 193]

(233) **Dissemination Of Trademark Information**

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703-557-3268.

Feb. 15, 1978. BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[968 TMOG 9]

(234) **Requests for Information on Status of Trademark Registrations**

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The purpose of this notice is to explain the circumstances in which the Trademark Examining Operation can respond to written and telephone requests for information about the status of trademark registrations. Only limited information can be provided by telephone.

I. Orders for "Status" Copies

The most reliable means of obtaining status information concerning a registration is a written order for a "status" copy of the registration. Status copies show whether affidavits have been filed under Sections 8 and 15, whether the registration has been renewed or cancelled, and whether certain other actions have been taken with respect to the registration. The charge for copies of registrations showing status and/or title, if not certified, is $6.50, effective Oct. 1, 1982. The charge for a certified copy showing status and/or title is $10.00 effective the same date.

II. Telephone Information Available from the Search Library

If the caller has the registration number, he or she may leave a request for status information on an automatic answering machine in the Trademark Search Library (Search Room) at 703-557-3282. The Search Library staff will call back with the information requested within one working day. Callers are asked to limit their requests to two registration numbers per day. The Search Library staff is not permitted to make "searches" to determine if particular marks are in the Office's search files. Neither is the staff able to supply information as to the ownership or assignment of registrations, or to read over the telephone lengthy passages of a registration, such as the identification of goods or services.

III. Telephone Information on Receipt of Section 8 and 15 Affidavits and Renewal Applications

The Post Registration Section can be reached by calling 703-557-2923. The staff of this section can advise only on whether an affidavit or a renewal application has or has not been received. Inquiries as to whether affidavits and renewals have been accepted should be directed to the Search Library.

MARGARET M. LAURENCE,
Sept. 15, 1982. *Assistant Commissioner for Trademarks.*

[1023 TMOG 15]

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(235) **Transmittals for Use of Deposit Accounts**

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

THERESA A. BRELSFORD,
Nov. 21, 1983. *Assistant Commissioner for Administration.*

[1037 TMOG 15]

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(236) **Helpful Hints From The PTO**

- *Data To Be Included on Patent and Trademark Papers Filed In The PTO In Response To Office Actions*—Perhaps the greatest cause of delay and wasted time in the support sections of the PTO is in trying to match papers bearing incorrect or incomplete data with applications. Because some Trademark Papers are not clearly identified as pertaining to Trademark applications, they are frequently misrouted to the Patent Examining Groups.

On all papers related to *Patent* applications, type the word "PATENT" in the upper right-hand corner of the document. Also, please include the correct serial number, filing date, inventor's name, and title of the invention. Additionally, include the examiner's name, and group art unit number or other identifying data found on the most recent letter from the PTO. (37 CFR 1.1(a)).

However, please note that an organizational restructuring of the Patent Examining Corps has resulted in many applications being reassigned to new Groups and Art Units. Your attention is directed to the NOTICE OF CHANGES IN THE PATENT EXAMINING CORPS that appeared in the OFFICIAL GAZETTE on June 26, 1984, (1043 OG 23), which identifies the Group Art Unit of each examiner (1043 OG 40 through 1043 OG 67). Letters mailed from the Groups after Apr. 15, 1984, should reflect the current identifying data.

For all papers related to *Trademark* [ro applications, type the word "TRADEMARK" in the upper right-hand corner of the document. Also, please set forth the applicatant's name, correct serial number (including the series number which currently is "73"), filing date, law office, examining attorney and mark.

Documents for which no fee is required at the time of filing (e.g., amendments to applications and requests for extensions of time to file an opposition) continue to be addressed:

Box 5
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Mail directed to the Trademark Trial and Appeal Board should have mark "Attention: TTAB" on the envelope in additon to "Box 5."

- *Mailing Responses To The PTO*—In general, it would eliminate or greatly reduce processing steps by the PTO support staff, and will avoid interruption of the examiner's work, if a few simple, general rules were followed in regard to mailing of the responses to the PTO:

1. After a Patent or Trademark application is filed, please avoid filing additional papers (other than those requesting a filing receipt or those required by the Office) until the filing receipt or return post card identifying the Serial Number and Patent Examining Group Art Unit or Trademark Law Office has been received.
2. In *Patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response." In *Trademark* applications, change of address and powers of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel (37 CFR 1.4(c)). However, please include a statement in the amendment/response describing the paper being filed.
3. Where a supplemental or preliminary amendment is found necessary in *Patent* or *Trademark* applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.
4. File *Patent* and *Trademark* documents which have no particular time or sequence requirement, with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority and formal drawings in Patent applications or changes in Power of Attorney or Mailing Address following first action.
5. If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners are taking up new applications before an information statement is matched with the application.

THERESA A. BRELSFORD,
July 10, 1984. *Assistant Commissioner for Administration.*

[1044 TMOG 44]

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(237) **Published Trademark Applications**

Papers which are filed in the Patent and Trademark Office in connection with published trademark application files should be captioned to the attention of the Trademark Quality Review Clerk and addressed as follows:

Commissioner of Patents and Trademarks
Attention Box 5, Trademark Quality Review Clerk
Washington, D.C. 20231

This mailing should be used only for papers filed after publication but before issuance of the registration. This could include corrections to information which appears to have been inadvertently or incorrectly published in the Trademark Official Gazette, as well as changes of attorney or address papers or notification of filing an assignment. Corrections to information published in the TMOG must be received in the Office before the registration is issued.

Use of this mailing address for corrections will help ensure that such papers are properly routed within the Office. Telephone inquiries concerning corrections or other matters in relation to published trademark applications should be directed to (703) 557-4249.

MARGARET M. LAURENCE
Dec. 10, 1984. *Assistant Commissioner for Trademarks.*

[1050 TMOG 316]

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(238) **Notices of Abandonment**

The Trademark Operation has begun notifying trademark applicants when their pending applications have been abandoned by the Office. Under this new procedure, a computer-generated post card bearing the notice, serial number, applicant name and abandonment date will be sent to the correspondence address designated by the applicant. The post cards will be mailed within 2 to 4 weeks after the application is declared abandoned.

MARGARET M. LAURENCE
Jan. 13, 1986. *Assistant Commissioner for Trademarks.*

[1063 TMOG 4]

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(239) **Change of Correspondence Address in Trademark Applications**

Applicants are reminded that when an application is filed and a correspondence address is entered in the Official record, correspondence will continue to be sent to such address until the applicant or party, or the attorney-at-law or other authorized representative of the applicant or party, indicates *in writing* that correspondence is to be sent to another address. 37 CFR Section 2.18. The filing of a response to an Office action on letterhead stationery that indicates a different address from the correspondence address of record is insufficient notice that correspondence is to be sent to another address. Specific language is needed which can reasonably be interpreted to be a request to change the address. See TMEP Section 603.

If a power of attorney has been filed in an application, a subsequently filed power of attorney will be regarded as a written request to change the correspondence address, even if there is no specific language changing the address or revoking the prior power of attorney. See TMEP Section 603.

MARGARET M. LAURENCE,
May 15, 1986. *Assistant Commissioner for Trademarks.*

[1067 TMOG 7]

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(240) **Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies**

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscriptions and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557-3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557-3227.

THERESA A. BRELSFORD,
June 23, 1986. *Assistant Commissioner, for Administration.*

[1068 TMOG 4]

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(241) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 81024-9018]

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, to adjust patent fee amounts and to reduce certain trademark fee amounts. The Office will be extending the comment period on the proposed amendments of the rules of practice in patent cases which would clarify requirements in the filing of applications and provide for procedures for applicants to cure certain defects in the filing of applications. After comments are received, the PTO will issue a notice of final rulemaking addressing these proposals.

Establishment and adjustment of patent fees is provided for by sections 6 and 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is provided for by section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) and section 103(c) of Pub. L. 100-703.
Effective Date: Apr. 17, 1989.
For Further Information Contact :Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information : Patent fees were set on Oct. 1, 1982, in accordance with the provisions of Title 35, United States Code (Pub. L. 97-247). Patent fees were adjusted effective Oct. 5, 1985, in accordance with the provisions of Title 35, United States Code. Trademark fees were set on Oct. 1, 1982, in accordance with the provisions of section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. section 1113) and adjusted on Oct. 1, 1986, in accordance with the provisions of that Act and Title 35. On Nov. 6, 1986, legislation modifying the way fee adjustments could be made was enacted as Pub. L. 99-607. The fee adjustment provisions of Pub. L. 99-607, sections 3(a) and 3(b) expired on Sept. 30, 1988. On Nov. 19, 1988, legislation extending section 3(a) and section 3(b) of Pub. L. 99-607 was enacted as Pub. L. 100-703. Therefore, patent

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and trademark fee adjustments will be guided by the provisions of Title 35, United States Code, and the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), and by Pub. L. 100-703.

The Patent and Trademark Office is amending 37 CFR 2.6 to reduce the fee for filing an application for trademark registration from $200 to $175 per class. The Office also is reducing the fee for recording trademark assignments and agreements or other papers relating to the property in a registration or application from $100 to $8 for each mark in the same document.

Effective Oct. 1, 1982, trademark operations within the Office became 100 percent user-fee funded. Experience to date has demonstrated that the fees first established in Oct. 1982, and as later adjusted in Oct. 1986, are more than adequate to meet total trademark function costs. At the end of fiscal year 1988, total trademark function fees exceeded total trademark function costs by approximately $10 million. Left undisturbed, it is projected that the current trademark fee structure will result in an additional $12.7 million in excess fees over the course of the next three-year fee cycle. Thus, by the end of fiscal year 1991, total trademark fees are projected to exceed total trademark costs by almost $23 million if the current fee structure remains in place.

In this light, the Office is proposing to reduce both the trademark application and assignment fees. Reducing the application fee to $175 would be consistent with the legislative history surrounding passage of Pub. L. 97-247. In its report (H. Rep. No. 97-542, May 17, 1982), the House Committee on the Judiciary stated that, "It is expected that the Commissioner will set the [trademark] fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system." The application filing fee from Oct. 1982 to Oct. 1986 was $175. The filing fee was increased in 1986 to $200 in an effort to recover a greater percentage of the actual costs incurred in the processing of trademark applications. While the reduction will increase the discrepancy between the application filing fee and our projected unit cost, the size of the current "surplus," as well as the objective of encouraging filings, supports the action.

Reducing the fee for recording trademark assignments to $8 for each mark makes such fees consistent with those for the recording of patent assignments.

While the fee reductions still will leave a healthy "surplus," prudence suggests that further reductions be held in abeyance pending implementation of "The Trademark Law Revision Act of 1988" (Pub. L. 100-667). The Act, among other things, permits applicants to file applications for Federal trademark registrations based upon a bona fide "intent-to-use" the mark in commerce. Implementation of "intent-to-use" legislation will require the Office to incur additional expenditures, such as increased personnel costs and improved computer capabilities. The Office will review its trademark fee structure approximately 18 months from implementation and propose further fee adjustments if warranted but will not propose to adjust the application and assignment fees.

Even absent "intent-to-use," the Office will probably be required to upgrade its computer capabilities within the near future. Moreover, implementation of an automated trademark assignment system, now scheduled for fiscal year 1990, and other improvements in automated searching, will result in increased demands on trademark resources.

BACKGROUND:

Provisions of Title 35 and Title 15, United States Code, and Pub. L. 100-703 Which Affect This Notice of Final Rulemaking

Patent and Trademark Office fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. Section 41(a) of Title 35, United States Code, establishes a number of statutory fees. Among the more significant of these are fees for filing a patent application and issuing a patent. Certain other fees, such as appeal fees, the fee for filing a disclaimer, fees for filing petitions seeking to revive an abandoned application and for extensions of time also are set in 35 U.S.C. 41(a). Section 41(b) of Title 35, United States Code, sets forth the statutory fees for maintaining a patent in force if the application was filed on or after Aug. 27, 1982.

The provisions of Pub. L. 96-517 also establish maintenance fees for patents other than design and plant patents issued on applications filed on or after Dec. 12, 1980 and before Aug. 27, 1982. These maintenance fees are to recover 25 percent of the estimated cost to the Office of processing patent applications.

Section 1 of Pub. L. 97-247 authorized the reduction by 50 percent in the fees paid under 35 U.S.C. 41(a) and 35 U.S.C. 41(b) by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established. Section 1(a)(2) of Pub. L. 99-607 makes this provision permanent in 35 U.S.C. 41(h).

Section 41(f) of Title 35, United States Code, provides that fees established in 35 U.S.C. 41(a) and 35 U.S.C.41(b), "may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor." Section 41(f) also provides that changes of less than one percent may be ignored. Pub. L. 100-703 makes no modifications to 35 U.S.C. 41(f).

Section 41(d) of Title 35, United States Code, provides that the "Commissioner will establish fees for all other processing, services, or materials related to patents" which are not covered in 35 U.S.C. 41(a) and 35 U.S.C. 41(b), "to recover the estimated average cost to the Office of such processing, services or materials."

Section 103(b) of Pub. L. 100-703 changes the way fees established under 35 U.S.C. 41(d) can be adjusted. For fiscal years 1989, 1990, and 1991, the Commissioner cannot increase fees established under 41(d) except for the purposes of making adjustments which in the aggregate do not exceed fluctuations during the previous three years in the Consumer Price Index.

Section 103(b) of Pub. L. 100-703 provides that the Commissioner cannot establish additional fees under 35 U.S.C. 41(d) during fiscal years 1989, 1990, and 1991.

Section 376 of Title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty. The fees under the Patent Cooperation Treaty are keyed to full cost recovery of the processing costs under the Treaty. Pub. L. 100-703 makes no modifications to 35 U.S.C. 376.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) authorizes the Commissioner to establish fees for the filling and processing of an application for the registration of a trademark or other mark, and for all other services and materials relating to trademarks and other marks. No fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. The House Committee on the Judiciary, in a report that accompanied H.R. 6260, which ultimately was enacted as Pub. L. 97-247, recommended a trademark fee schedule to the Commissioner which was established by a rule published in the *Federal Register* on July 30, 1982 at 47 FR 33086, effective Oct. 1, 1982.

A final rule to increase the trademark application filing fee per class and the fee for copies of trademarks was published in the *Federal Register* on Aug. 4, 1986 at 51 FR 28052. The increased fees became effective on Oct. 1, 1986.

Section 103(a) of Pub. L. 100-703 changes the way fees established under the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) can be adjusted. For fiscal years 1989, 1990 and 1991, the Commissioner cannot increase fees established under the Act except for the purposes of making adjustments which in the aggregate do not exceed fluctuations during the previous three years in the Consumer Price Index.

Section 103(a) of Pub. L. 100-703 provides that the Commissioner cannot establish additional fees under the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) during fiscal years 1989, 1990, and 1991.

However, as described above, the Office is only reducing the fee for filing an application, per class, and the fee for recording trademark assignments and agreements or other papers relating to the property in a registration or application.

Final Rule Changes

General Procedures

Cost Calculations : The Office calculated unit costs for all fees based on OMB Circular A-25, "User Fees," and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, the 1987 end of fiscal year financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. To estimate costs for the three-year fee cycle Apr. 1989-Mar. 1992, the 1987 actual costs were adjusted by the inflation rates from Oct. 1988 through Mar. 1989, and then by a mid-cycle inflation rate for the period Apr. 1989-Mar. 1992. The total inflation rate was 12.644 percent derived from the Administration's inflation projection.

Workload Projections

Determination of future year workloads varies by fee code. Principal workload projection techniques are as follows:

Patent and trademark application workloads were projected from statistical regression models using recent application trends. Associated application workloads, for example, patent claims and extensions of time, grow relative to patent applications. Patent issues are projected from an in-house patent productivity model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 80 percent, 50 percent and 25 percent, respectively. Trademark affidavits and renewals are based on prior year registrations and renewal trends. Service fee workloads follow linear trends from prior year activities. All workload estimates are approved by the manager responsible for the fee program.

Policy for applying the Consumer Price Index : The Office of Management and Budget has determined that the Patent and Trademark Office should use Consumer Price Index-U (CPI) to adjust patent fees. The Department of Labor's Consumer Price Index is made public approximately twenty-one days after the end of the month being calculated. The time lag between the initiation and the completion of the rulemaking process dictates that the Dec. 1988 through Mar. 1989 inflation rate be projected. The Administration's projected cumulative CPI for the three-year period Apr. 1986-Mar. 1989 is 10.311 percent.

The fee amounts being adopted by this rule package were adjusted by the CPI that was projected in 1988, i.e., 10.303 percent. Since this is less than the amount the Office has determined to be the actual projected rate and that applying the updated projection of 10.311 percent would have a negligible effect on the fee amounts, no changes have been made.

Rounding Procedures : After application of the 10.303 percent projected fluctuation in the CPI to fees, amounts were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $10 and $99 were rounded to the nearest even number so that the comparable small entity fee would be a whole number. Fees under $2 were rounded for convenience.

Since the amounts of the patent fees that went into effect on Oct. 5, 1985 were rounded after application of the Consumer Price Index, a first step in calculating new fee amounts was to eliminate any effects of rounding prior years' fee adjustments. For example, 35 U.S.C. 41(a), sets the patent application filing fee at $300.00. Applying the 11.8 percent CPI for the period 1983-1985 resulted in an allowable increase to $335.40. This amount was rounded to $340.00. For purposes of this fee adjustment process, the base used to adjust fees for the next fee cycle was the "unrounded" fee amount; i.e., the $335.40 for patent application filing fees. Similarly, the cost for certifying Office records was $2.70. This amount was rounded to $3.00. For the purposes of this fee adjustment process, the base was unrounded amount of $2.70.

It should be noted that following routine rounding off practices can result in some fee items being adjusted by more or less than CPI. This divergence from the CPI ceiling will only exist in the short term because of the policy of applying the CPI adjustment factor to the unrounded amount from the previous fee cycle.

Proposed Rule Changes Under Title 35 and Title 15, United States Code and Pub. L. 100-703

Statutory patent fees established under 35 U.S.C. 41(a) and 35 U.S.C. 41(b) are adjusted in accordance with 35 U.S.C. 41(f) to reflect any fluctuations occurring during the previous three years in the CPI.

Non-statutory patent fees established under 35 U.S.C. 41(d) are adjusted in accordance with section 103(b) of Pub. L. 100-703 to reflect, in the aggregate, any fluctuations occurring during the previous three years (Apr. 1986-Mar. 1989) in the Consumer Price Index, as determined by the Secretary of Labor.

Fees established under 35 U.S.C. 376 are adjusted to recover the full cost of processing under the Patent Cooperation Treaty. International patent fees under 37 CFR 1.492 are related to patent fees established under 35 U.S.C. 41(a) and are adjusted to reflect fluctuations in the CPI.

For fees established under section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), the Office is reducing the fee for filing an application, per class, and the fee for recording trademark assignments and agreements or other papers relating to the property in a registration or application as fully described above.

Fee Adjustment Methodology

1. PROJECTED ACTUAL COSTS. The projected actual costs for all fee items were calculated by applying the principles of OMB Circulars A-25 and A-130.

a. Statutory patent fees were derived by: (1) identifying those operational units of the Office involved in, or contributing to, the processing of a patent application through all phases of examination; (2) identifying and certifying actual fiscal year 1987 obligations incurred by the operational units in processing an application; (3) projecting those obligations to the period of Apr. 1989 through Mar. 1992 in accordance with approved budgets and future year budget targets; and (4) increasing the obligations projected for the period of Apr. 1989 through Mar. 1992 by the Administration's estimates for federal pay raise adjustments and projected inflation. Projected actual costs for Apr. 1989-Mar. 1992, $729,810,051 less projected budget authority of $265,834,000, are $463,976,051.

b. For non-statutory patent fees, projected costs for each fee item were established by (1) identifying actual costs for 1987, and (2) projecting actual costs for fiscal years 1988 through Mar. 1992 by applying the Administration's inflation projection of 12.644 percent. This projected actual cost was then multiplied by the projected workload for each fee item. The sum of the projected costs for all fee items is the projected actual cost of operation during the three-year fee cycle. Projected actual costs for Apr. 1989-Mar. 1992 are $64,661,341.

c. The same methodologies as described in paragraphs (a) and (b) above were applied to Patent Cooperation Treaty fees. Projected actual costs for Apr. 1989-Mar. 1992 are $16,531,990.

d. The same methodology as described in paragraph (b) above was applied to Trademark fees. Projected actual costs for Apr. 1989-Mar. 1992 are calculated to be $74,329,783.

2. INCOME PROJECTIONS

a. The maximum amount of statutory fee income that the Office is authorized to recover under 35 U.S.C. 41f) was calculated as follows.

For each statutory patent fee, the unrounded base (i.e., the 1986 adjusted fee before rounding) was multiplied by the projected CPI fluctuation of 10.303 percent for the three-year period Apr. 1986-Mar. 1989. This amount was then multiplied by the projected workload for Apr. 1989-Mar. 1992 to project the income from that fee item during the Apr. 1989-Mar. 1992 fee cycle. The sum of the projected incomes from all statutory patent fees is the maximum amount that the Office is authorized by 35 U.S.C. 41(f) to recover during the fee cycle and is equal to $464,676,178.

b. The maximum amount of non-statutory fee income that

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the Office is authorized to recover under § 103(b) of Pub. L. 100-703 was calculated as follows.

For each non-statutory patent fee, the unrounded base (i.e., the 1986 adjusted fee before rounding) was multiplied by the projected CPI fluctuation of 10.303 percent for the three-year period Apr. 1986-Mar. 1989. This amount was then multiplied by the projected workload for Apr. 1989-Mar. 1992 to project the income from that fee item during the Apr. 1989-Mar. 1992 fee cycle. The sum of the projected incomes from all non-statutory patent fees is the maximum amount that the Office is authorized by section 103(b) of Pub. L. 100-703 to recover during the fee cycle and is equal to $62,101,874.

c. For Patent Cooperation Treaty fees, the Office is authorized by 35 U.S.C. 376 to recover the full cost of processing under the Treaty. Thus, the projected costs identified in paragraph 1(c) for Patent Cooperation Treaty fees of $16,531,990 would be the maximum level of recovery.

d. The maximum amount of trademark fee income that the Office is authorized to recover under section 103(a) of Pub. L. 100-703 was calculated as follows.

For each trademark fee, the unrounded base (i.e., the 1986 adjusted fee before rounding) was multiplied by the projected CPI fluctuation of 10.303 percent for the three-year period Apr. 1986-Mar. 1989. This amount was then multiplied by the projected workload for Apr. 1989-Mar. 1992 to project the income from that fee item during the Apr. 1989-Mar. 1992 fee cycle. The sum of the projected incomes from all trademark fees is the maximum amount that the Office is authorized by section 103(a) of Pub. L. 100-703 to recover during the fee cycle and is equal to $107,704,135.

e. Each statutory patent fee amount identified in paragraph 2(a), and each PCT amount identified in paragraph 2(c) above was rounded according to the de minimis rounding rules described above.

Sections 103(a) and 103(b) of Pub. L. 100-703 allow the Office to set fees "in the aggregate." The fee amounts proposed for non-statutory patent fees and trademark fees will recover the maximum amount of income determined in paragraphs (b) and (d) above.

Each of these fee amounts was multiplied by the projected workload during the fee cycle to project the income from that fee item. The sum of the projected income from all patent fees is $542,281,082, which is the sum of the projected incomes from statutory patent fees, $463,626,421, non-statutory patent fees, $62,047,763, and Patent Cooperation Treaty fees, $16,606,898.

f. The Office reduced two trademark fees, as described above. Each trademark fee amount was multiplied by the projected workload during the fee cycle to project the income from that fee item. The sum of the projected income from all trademark fees is projected to be $72,972,690.

Summary:

Fee Category	Projected Cost April 1989-Mar 1992	Maximun Allowable Recovery	Projected Income April 1989 - Mar 1992
Statutory Patent	$463,976,051	$464,676,178	$463,626,421
Non-Statutory Patent	$64,661,341	$62,101,874	$62,047,763
PCT	$16,531,990	$16,531,990	$16,606,898
Total - Patent	$545,169,382	$543,310,042	$542,281,082
Total - Trademarks	$74,329,783	$107,704,135	$72,972,690
Total - All Fees	$619,499,165	$651,014,177	$615,253,772

The unit costs by fee item are summarized in Appendix A. The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Bldg. 2, Crystal Park at 2121 Crystal Dr., Arlington, Va.

It is intended that the amount of any fee due and payable on or after Apr. 17, 1989 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under Section 1.8" is not "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. The provisions of 37 CFR 1.10, relating to filing of papers and fees by "Express Mail" with certificate, however, do apply to any paper or fee (including patent and trademark applications) to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of express mailing dated on and after the effective date of the rules, the amount of the fee to be paid is the fee established herein if a change is being made in the fee. In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below.

DISCUSSION OF SPECIFIC RULES

37 CFR § 1.12 Assignment records open to public inspection.

Section 1.12, paragraph (a) is amended to refer to the renumbered § 1.19(b)(4). Paragraph (c), is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.14 Patent applications preserved in secrecy.

Section 1.14, paragraph (e) is amended to would refer to the renumbered § 1.17(i)(1).

37 CFR § 1.16 National application filing fee.

Section 1.16 is amended to adjust patent application filing fees established in 35 U.S.C. 41(a) and set forth in 37 CFR 1.16(a)-(b), (d) and (f)-(i) to reflect fluctuations in the CPI.

Section 1.16, paragraph (e) is amended as to adjust the patent application surcharge fee authorized by 35 U.S.C. 111 to reflect fluctuations in the CPI.

37 CFR §1.17 Patent application processing fees.

Section 1.17 is amended to adjust patent application processing fees established in 35 U.S.C. 41(a) and set forth in 37 CFR 1.17(a)-(g) and (l)-(m) to reflect fluctuations in the CPI.

Section 1.17 is amended to adjust the patent application processing fees authorized by 35 U.S.C. 41(d) and set forth in 37 CFR 1.17(h)-(k) to reflect fluctuations in the CPI.

Section 1.17 is amended to establish one fee amount for filing a petition to the Commissioner under 37 CFR sections 1.12, 1.14, 1.47, 1.48, 1.55, 1.103, 1.177, 1.182, 1.183, 1.295, 1.312, 1.313, 1.314, 1.334, 1.377, 1378(e), 1.644(e), 1.644(f), 1.666(b), 1.666(c), 5.12, 5.13, 5.14, 5.15, and 5.25. The fee would recover the estimated average cost to the Office of processing all petitions to the Commissioner mentioned above. In addition, the single fee for all petitions is expected to facilitate pre-processing of petition requests.

Section 1.17 is amended to provide in new paragraph (i)(2) and $80 fee for filing a petition to the Commissioner under 37 CFR 1.102 to make an application special.

37 CFR § 1.18 Patent issue fees

Section 1.18 is amended to adjust patent issue fees established in 35 U.S.C. 41(a) and set forth in 37 CFR 1.18(a)-(c) to reflect fluctuations in the CPI.

37 CFR § 1.19 Document supply fees.

Section 1.19 is revised to adjust the fees authorized by 35 U.S.C. 41(d) for services and materials as set forth in 37 CFR 1.19 to reflect fluctuations in the CPI.

Section 1.19(a)(2) is revised to adjust the fees for copies of plant patents and statutory invention registrations to reflect fluctuations in the CPI.

Section 1.19, is revised to renumber paragraph (a)(5) as (a)(3) and provide for a flat fee for a certied copy of an Office document, for each 30 pages or fraction thereof.

Section 1.19 revises paragraphs (a)(4)-(a)(6) and (b)(4) to set the fees for the purchase of color copies of color drawings identified in utility patents and for expedited service for fulfillment of orders for patent copies and orders for copies of patent applications as filed. The provision for color drawings in utility patent applications is in § 1.84(p). Although color drawings may be permitted in a utility patent application by petition, copies of printed patents will only be provided in black and white. If a copy of the printed patent with copies of the drawings in color is desired, it must be separately ordered and accompanied by the fee proposed in paragraph (a)(4). The fees set forth in paragraphs (a)(5), (a)(6) and (b)(4) are for expedited processing of copy orders.

The Public Service Window (PSW) in the Patent Public Search Room referred to in proposed new paragraph 37 CFR 1.19(a)(5) is located on the lobby level of Crystal Plaza Bldg. 3. The Office rents numbered lock boxes (delivery boxes) to members of the public for copy order delivery purposes. Members of the public may place coupon orders at the PSW and request that the copies be delivered to their boxes at the PSW. PSW staff members receive and process the coupon orders and forward them to the copy fulfillment contractor. Upon receipt of the copies, PSW staff members place them in the appropriate delivery box for pickup by the box holder.

Section 1.19, paragraph (a) is revised to remove the charge for a microfiche copy of a microfiche.

Section 1.19 is revised to renumber paragraph (a)(3) as (b)(1) and provide for one fee for a certified copy of a patent application as filed.

Section 1.19 is revised to renumber paragraph (a)(4) as (b)(2) and provide for a flat fee for a certified copy of a patent file wrapper, and contents, with no limitation on the number of pages.

Section 1.19 is revised to renumber paragraph (a)(7) as (b)(3) and provide for one fee for a certified copy of a patent assignment record.

Section 1.19 is revised to renumber paragraph (b)(1) as (b)(5).

Section 1.19 is revised to renumber paragraph (b)(2) as (b)(6) and adjust the fee for a search of assignment records, abstract of title and certification, per patent to reflect fluctuations in CPI.

Section 1.19 is revised to remove paragraph (c) as the requirement for a special fee for providing subscription services has been eliminated. The Office will provide subscription services at no cost to the subscriber.

Section 1.19 is revised to renumber paragraph (d) as paragraph (c).

Section 1.19 is revised to renumber paragraph (e) to paragraph (d) and provide for a list of all United States patents and statutory invention registrations in a subclass, with no limit to the number at the proposed flat fee.

Section 1.19 is revised to remove paragraph (f).

Section 1.19 is revised to renumber paragraphs (g)-(j) as paragraphs (e)-(h) and adjust the fees to reflect fluctuations in the CPI.

37 CFR § 1.20 Post-issuance fees.

Section 1.20, paragraphs (a)-(c) are amended to adjust patent post-issuance fees authorized by 35 U.S.C. 41(d) to reflect fluctuations in the CPI.

Section 1.20 is amended to clarify the language in paragraph (a) that the fee charged is for a correction of an applicant's mistake.

Section 1.20, paragraphs (d) and (h)-(j) is amended to adjust patent post-issuance fees established in 35 U.S.C. 41(a) and 35 U.S.C. 41(b) to reflect fluctuations in the CPI.

Section 1.20, paragraphs (e)-(g) are amended to adjust post-issuance fees authorized by 2 of Publ. L. 96-517, as modified by 404 of Pub. L. 98-622. These fees must be set at a level to eventually recover 25 percent of the estimated cost to the Office of processing patent applications. In order to achieve this level of recovery, these maintenance fees are adjusted to reflect fluctuations in the CPI.

Section 1.20, paragraph (k) is amended to adjust the patent application surcharge fee authorized by 2 of Pub. L. 96-517.

Section 1.20, paragraph (l) is amended to adjust the post-issuance fee authorized by 35 U.S.C. 41(b).

Section 1.20, paragraph (m) is amended to adjust the post-issuance fee authorized by 35 U.S.C. 41(c)(1).

Section 1.20, paragraph (n) is amended to adjust the post-issuance fee authorized by Pub. L. 98-417 and 35 U.S.C. 156.

37 CFR § 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to adjust the miscellaneous fees and charges authorized by 35 U.S.C. 41(d) and set forth in 37 CFR 1.21(a)-(b), (d)-(j) and (l)-(m) to reflect fluctuations in the CPI.

Section 1.21(f) is further amended to establish a flat fee for conducting an inventor search of Office records for a ten-year period.

The CopiShare Card referred to in 37 CFR 1.21(g) relates to the photocopiers and reader/printers for use by members of the public in the Office's search facilities. Each photocopier and reader/printer is connected to an access device which affords access to the equipment through the use of a magnetic card which has been encoded with an amount pre-paid by the customer. The access devices, encoding equipment, and magnetic cards comprise an equipment access system called the CopiShare system. The magnetic CopiShare Cards are purchased by the public and encoded with an amount of funds paid to the Office. The customer places the encoded card in the device connected to the photocopier or reader/printer, and a pre-set amount is deducted for each copy produced.

The Office is planning to authorize the public to use credit cards for the purchase of CopiShare Cards. This will be a pilot program for accepting credit cards for fees, and if feasible, may be extended to other operations of the Office.

Section 1.21(h) is further amended to establish one fee for recording each property in an assignment, agreement or other paper relating to the property in a patent or application. The fee reflects increased costs to enhance the processing of assignments.

37 CFR § 1.26 Refunds.

Section 1.26 is amended to change pharagraph (c) to provide for a refund of $1,500 if the Commissioner decides not to institute reexamination proceedings. The $1,500 refund would apply to those instances where the proposed reexamination fee of $1,980 under 37 CFR 1.20(c) was paid. The current $1,300 refund will be made in those cases where the current $1,770 reexamination fee was paid.

37 CFR § 1.55 Claim for foreign priority.

Section 1.55 paragraph (a) is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.102 Advancement of examination.

Section 1.102, paragraph (d) is amended to refer to the petition fee set forth in proposed new paragraph 1.17(i)(2).

37 CFR § 1.103 Suspension of action.

Section 1.103, paragraph (a) is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.171 Application for reissue.

Section 1.171 is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.177 Reissue in divisions.

Section 1.177 is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.296 Withdrawal of request for publication of statutory invention registration.

Section 1.296 is amended to adjust the handling fee for withdrawal of a statutory invention registration to reflect fluctuations in the CPI.

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37 CFR § 1.313 Withdrawal from issue.

Section 1.313, paragraph (a) is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.314 Issuance of patent.

Section 1.314 is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.334 Issue of patent to assignee.

Section 1.334, paragraph (c) is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 1.445 International application filing and processing fees.

Section 1.445 is amended to adjust the fees authorized by 35 U.S.C. 376 for international application processing as set forth in 37 CFR 1.445(a)(2) and (a)(3) to recover the cost to the Office of such processing, as determined by fluctuations in CPI.

37 CFR § 1.451 The priority claim and priority document in an international application.

Section 1.451, paragraph (b) is amended to refer to the renumbered § 1.19(b)(1) and § 1.19(b)(6).

37 CFR § 1.482 International preliminary examination fees.

Section 1.482 is amended to adjust the fees authorized by 35 U.S.C. 376 for international application processing as set forth in 37 CFR 1.482(a) to recover the estimated average cost to the Office of such processing.

37 CFR § 1.492 National stage fees.

Section 1.492 is amended to adjust the fees authorized by 35 U.S.C. 376 for international application processing as set forth in 37 CFR 1.492(a)-(b) and (d)-(f) to recover the estimated average cost to the Office of such processing as determined by fluctuations in the CPI.

37 CFR § 1.666 Filing of interference settlement agreements.

Section 1.666, paragraph (b) is amended to refer to the renumbered § 1.17(i)(1).

37 CFR § 2.6 Trademark fees.

Section 2.6(a) and (q) are amended to adjust trademark fees established pursuant to the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113).

RESPONSE TO COMMENTS ON THE RULES

A notice of proposed rulemaking to adjust patent and trademark fees was published in the *Federal Register* on Nov. 30, 1988, at 53 FR 48402. Corrections of typographical errors were published in the *Federal Register* on Dec. 8, 1988, at 53 FR 49637. A notice also was published on Dec. 13, 1988 at volume 1097 of the *Official Gazette* of the United States Patent and Trademark Office, pages 16 through 29. A public hearing was conducted on Jan. 4, 1989. Six letters submitting written comments were received and oral testimony was presented by one person at the public hearing. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted, along with responses, appear below.

Comment :

A major patent law association requested an additional sixty (60) days to comment on proposed changes to the following rules that go beyond fees. Several other respondents also commented on the proposed changes to these rules.

37 CFR 1.53 Serial number, filing date, and completion of application.

37 CFR 1.55 Claim for foreign priority.

37 CFR 1.60 Continuation or divisional application for invention disclosed in a prior application.

37 CFR 1.62 File wrapper continuing procedure.

37 CFR 1.96 Submission of computer program listings.

Response :

The Office is not amending 37 CFR 1.53, 1.60, 1.62 and 1.96 and is extending the comment period until Mar. 3, 1989. The Office also is not adding new rule 37 CFR 1.21(n) which refers to 37 CFR 1.53, 1.60 and 1.62. The Office is amending only that portion of 37 CFR 1.55 which clarifies that the already established fee refers to the amount in the new 37 CFR 1.17(i)(1) and not the old § 1.17(i). After the extended comment period closes, the Office will issue a new notice of final rulemaking addressing these proposals.

Comment :

Two repondents requested that the Office provide for a comment period longer than the 30 days accorded in this rule package.

Response:

Office policy is to provide a 60 day comment period whenever possible. For fee-related rules, the comment period generally is limited to 30 days because the final rule must be in place 60 days before the fees are effective. This gives the public at least 90 days notice of a fee change.

In addition, the Office alerts, as far in advance as possible, major patent and trademark associations and organizations, and its advisory committees, that it will be proposing a fee adjustment. Finally, copies of the Nov. 30, 1988, *Federal Register* notice were mailed to 140 organizations, associations and the advisory committees only days after their publication in the *Federal Register*.

Comment :

One respondent asked whether maintenance fees that are paid after the effective date of the fee increase are payable in the increased amount or the amount that was payable when due.

Response :

The amount of any fee payment made on or after the effective date of this rule package is the amount set in the rulemaking.

Comment :

Two respondents, representing major trademark organizations, opposed the proposed reductions to the trademark application and assignment fees. The following major points were made: (1) No reductions should be made until Nov. 1989, when Pub. L. 100-667 (The Trademark Law Revision Act of 1988) is implemented; (2) Leading accounting firms recommend that a one year's operating reserve would be prudent; (3) It was Congressional intent that revenue generated from a $100 assignment fee be used to subsidize the trademark operation.

The respondents also questioned whether the PTO could make more than one adjustment every three years under the present authorization statute, even when such adjustments would result in a reduction of certain fee amounts.

Response :

After careful consideration of the comments received, the PTO has decided to implement the two fee reductions for the following reasons: (1) Careful analysis has confirmed that projected revenues will be sufficient to implement the Intent-to-Use legislation (Pub. L. 100-667) and still maintain an operating reserve within PTO's two percent fee policy. We believe it will take about 18 months experience with intent-to-use to be able to propose other changes to trademark fee amounts, and thus a delay in implementation of the proposed fee reductions to Nov. 1989 would not accomplish any useful purpose. (2) A one-year operating reserve for trademark programs is far too large an amount to address unforeseen expenses, would unfairly penalize users, is politically imprudent, especially given the current Federal deficit, and could be construed to constitute an unfair tax on the general user. (3) In the past, PTO has been critized for charging $100 for a trademark assignment and $7.00 for a patent assignment. For example, refer to public comments on the 1986 trademark fee adjustments published in the *Federal Register* on Aug. 4, 1986 at 51 FR 28055. While it is true that the trademark assignment fee was originally designed to help subsidize the trademark application fee, which is set at a level that does not recover actual costs, the PTO believes that the proposed reduction in the assignment fee will not result in subsequent increases in the application fee or jeopardize the financial health of trademark operations. Further, the Office wants to assure respondents that in proposing a reduction in the assignment fee, the costs of cleaning up the trademark assignment data base have been taken into account.

As noted above, the planning of fee adjustments has been such that we do not anticipate two adjustments within a fee cycle. The legislative history to Public Law 99-607 indicates that Congress intended the PTO to reduce fees whenever appropriate.

Comment :

One respondent, a representative of a major patent organization, raised the following points (1) The PTO should conduct an analysis of the impact of patent fees on independent inventors and small businesses; (2) the reduction of fees for individual inventors and small business should continue to be subsidized by taxpayer revenues; (3) the PTO should make every effort to increase its efficiency as a way of holding down the level of fees; (4) the PTO and the Administration should attempt to amend the Gramm-Rudman-Hollings Act as it relates to user fees; and (5) the Office should allow 90 days for the public to comment on proposed rules.

Response :

(1) The PTO continually has monitored the level of filings by small businesses and individual inventors, which has averaged 34 percent for the years 1986-1988. The Office will conduct a study to assess the impact of patent fees on individual inventors and small businesses.

(2) For the 1989-91 fee cycle, the reduction of patent fees individual inventors and small businesses will continue to be subsidzed by taxpayer revenues. As the PTO continues to progress to total financing by user fees, two options will be explored: (a) to continue to seek general taxpayer revenue for the subsidy to domestic and foreign users alike; or (b) to establish a two tier fee system for patent statutory fees. While the first option could mean lower overall patent fees, a taxpayer subsidy would be dependent upon Congressional action. If Congress were not to appropriate the necessary funds, the subsidy would not be available, in whole or in part. Full reliance on user fees could provide the PTO with additional flexibilities to meet user needs, especially in responding to growing workloads as the workloads occur.

(3) The PTO continues to scrutinize its operating budgets to identify ways to increase efficiency, to constrain costs, and to continue to provide better services to its users. The current fee package permits patent and patent service fees to be raised only with inflation. Trademark fees are held steady or are reduced. Despite these limited adjustments, user fees in 1989-1991 will allow the PTO to continue to pursue its major goals to improve the quality and timeliness of its goods and services.

(4) The Gramm-Rudman-Hollings sequestration of 1986 did affect PTO user fees. However, the Administration's budgets for 1987, 1988 and 1989 met all deficit reduction targets and did not require automatic sequestrations. We are confident that the Administration will continue to meet all deficit reduction targets prescribed by law and thus will continue to avoid the automatic sequestrations. The PTO is supportive of all efforts to reduce the Federal deficit.

(5) This issue was addressed above.

OTHER CONSIDERATIONS : The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to patent fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The principal impact of the major patent fees has already been taken into account in Pub. L. 99-607, which provided small entities with a 50 percent reduction in the major patent fees. The rule change adjust fees to reflect the change in the CPI and cost of processing services as provided by statute (35 U.S.C. 41(d) and 41(f)).

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions, because most major fees are being adjusted to reflect changes in the CPI over the past three years. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1 and Part 2

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the Office is amending Title 37 of the Code of Federal Regulations, Chapter 1, as set forth below.

Part 1 Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.12 is amended by revising paragraph (a) and (c) to read as follows:

§ 1.12 Assignment records open to public inspection.

(a) The assignment records, relating to original or reissue patents, including digests and indexes, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, are open to public inspection and copies of any instrument recorded may be obtained upon request and payment of the fee set forth in § 1.19(a)(3).

* * * * *

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in secrecy under § 1.14, or any information with respect thereto, must

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i)(1), or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

* * * * *

3. Section 1.14 is amended by revising paragraph (e) to read as follows:

§ 1.14 Patent applications preserved in secrecy.

* * * * *

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i)(1), or

(2) Include written authority granting access to the member

of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record. (Note, see § 1.612(a) for access by an interference party to a pending or abandoned application.)

4. Section 1.16 is amended by revising paragraphs (a)-(b) and (d)-(i) and the note at the end of the section to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant case:

By a small entity (§ 1.9(f)) $185.00
By other than a small entity. $370.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f{sf,1)) $18.00
By other than a small entity $36 00

* * * * *

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain a multiple dependent claim(s) per application:

By a small entity (§ 1.9(f)) $60.00
By other than a small entity $120.00

(If the additional fees required by paragraphs (b), (c), and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:

By a small entity(§ 1.19(f))$60.00
By other than a small entity $120.00

(f) For filing each design application:
By a small entity(§ 1.9(f)) $75.00
By other than a small entity $150.00

(g) Basic fee for filing each plant application:

By a small entity(§ 1.9(f)) $125.00
By other than a small entity $250.00

(h) Basic fee for filing each reissue application:

By a small entity(§ 1.9(f)) $185.00
By other than a small entity $370.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity(§ 1.9(f)) $18.00
By other than a small entity $36.00

* * * * *

(Note, see § 1.445 for international application filing and processsing fees.

5. Section 1.17 is amended by revising paragraphs (a)-(h) and (j)-(m), by designating existing paragraph (i) as (i)(1) and revising it, and by adding a new paragraph (i)(2), to read as follows:

§ 1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to § 1.136(a):

By a small entity(§ 1.9(f)) $31.00
By other than a small entity $62.00

(b) Extension fee for response within second month pursuant to § 1.136(a):
By a small entity(§ 1.9(f)) $90.00
By other than a small entity $180.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity(§ 1.9(f)) $215.00
By other than a small entity $430.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity(§ 1.9(f)) $340.00
By other than a small entity $680.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity(§ 1.9(f)) $70.00
By other than a small entity $140.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity(§ 1.9(f)) $70.00
By other than a small entity $140.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:

By a small entity(§ 1.9(f)) $60.00
By other than a small entity $120.00

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§ 1.47 - for filing by other than all the inventors or a person not the inventor.
§ 1.48 - for correction of inventorship
§ 1.182 - for decision on questions not specifically provided for.
§ 1.183 - to suspend rules.
§ 1.295 - for review of refusal to publish a statutory invention registration.
§ 1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.
§ 1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.
§ 1.644(e) - for petition in an interference.
§ 1.644(f) - for request for reconsideration of a decision on petition in an interference.
§ 1.666(c) - for late filing of interference settlement agreement.
§§ 5.12, 5.13, & 5.14 - for expedited handling of foreign filing license.
§ 5.15 - for changing the scope of a license.
§ 5.25 - for retroactive license.

(i) (1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§ 1.12 - for access to an assignment record.
§ 1.14 - for access to an application.
§ 1.55 - for entry of late priority papers.
§ 1.103 - to suspend action in application.
§ 1.177 - for divisional reissue to issue separately.
§ 1.312 - for amendment after payment of issue fee.
§ 1.313 - to withdraw an application from issue.
§ 1.314 - to defer issuance of a patent.
§ 1.334 - for patent to issue to assignee, assignment recorded late.

§1.666(b) - for access to interference settlement agreement.

(2) For filing a petition to the Commissioner under § 1.102 of this part to make application special $80.00

(j) For filing a petition to institute a public use proceeding under § 1.292 ..... $1,200.00

(k) {dn For processing an application filed with a specification in a non-English language (§ 1.52(d)) $30.00

(l) For filing a petition
(l) for the revival of an abandoned application under 35 U.S.C. 133, or 371 or
(2) for delayed payment of the issue fee under 35 U.S.C. 151:

By a small entity(§1.9(f)) $31.00
By other than a small entity $62.00

(m) For filing a petition
(l) for revival of an unintentionally abandoned application, or
(2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity(§1.9(f)) $310.00
By other than a small entity $620.00

* * * * *

6. Section 1.18 is revised to read as follows:

§1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity(§ 1.9(f)) $310.00
By other than a small entity$620.00

(b) Issue fee for issuing a design patent:

By a small entity(§ 1.9(f)) $110.00
By other than a small entity $220.00

(c) Issue fee for issuing a plant patent:

By a small entity(§ 1.9(f)) $155.00
By other than a small entity $310.00

7. Section 1.19 is revised to read as follows:

§1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Offices documents:

(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant or color statutory invention registeration $1.50

(2) Printed copy of a plant patent or statutory invention registration in color $10.00

(3) Copy of Office documents, except as otherwise provided in this section, for each 30 pages or a fraction thereof $10.00

(4) Copy of a utility patent with drawings in color (see § 1.84(p)) $20.00

(5) Expedited local service for copy of a patent as in paragraph (a)(1) of this section, fulfilled within one work day for orders delivered to the Public Service Window in the Patent Public Search Room $3.00

(6) Expedited service for copy of a patent as in paragraph (a)(1) of this section, ordered by electronic ordering service and delivered to the customer within two work days .. $25.00

(b) Certified copies of Office documents:

(1) Certified copy of patent application as filed. $10.00

(2) Certified copy of patent file wrapper $170.00

(3) Certified copy of patent assignment record $5.00

(4) Expedited service for certified copy of patent application as filed in paragraph (a)(3) of this section, fulfilled within 5 work days, excluding mailing time $20.00

(5) For certifying Office records, per certificate $3.00

(6) For a search of assignment records, abstract of title and certification, per patent $15.00

(c) Library service (35 U.S.C. 13): For providing to libraries copies of all patents issued annually, per annum .. $50.00

(d) For list of all United States patents and statutory invention registrations in a subclass $2.00

(e) Uncertified statement as to status of the payment of maintenance fees due on a patent or expiration of a patent $5.00

(f) Uncertified copy of a non-United States patent document, per document $10.00

(g) To compare and certify copies made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, per copy of document $10.00

(h) Additional filing receipts: duplicate or corrected due to applicant error $15.00

8. Section 1.20 is amended by revising paragraphs (a)-(n) to read as follows:

§1.20 Post issuance fees.

(a) For providing a certificate of correction for applicant's mistake (§ 1.323) $60.00
(b) Petition for correction of inventorship in patent (§ 1.324) $120.00

(c) For filing a request for reexamination (§ 1.510(a)) $2,000.00

(d) For filing each statutory disclaimer (§1.321):

By a small entity(§1.9(f)) $31.00
By other than a small entity $62.00

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond four years; the fee is due by three years and six months after the original grant $245.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond eight years; the fee is due by seven years and six months after the original grant $495.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond twelve years; the fee is due by eleven years and six months after the original grant $740.00

(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 four years; the fee is due by three years and six months after the original grant:

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By a small entity(§ 1.9(f)) $245.00
By other than a small entity $490.00

(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application, filed on or after Aug. 27, 1982, in force beyond eight years; the fee is due by seven years and six months after the original grant:

By a small entity(§ 1.9(f)) $495.00
By other than a small entity $990.00

(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond twelve years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $740.000
By other than a small entity $1,480.00

(k) Surcharge for paying a maintenance fee during the six-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 ..... $120.00

(l) Surcharge for paying a maintenance fee during the six-month grace period following the expiration of three years and six months, seven years and six months and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§ 1.9(f)) $60.00
By other than a small entity $120.00

(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $550.00

(n) For filing an application for extension of the term of a patent (§ 1.740) $600.00

9. Section 1.21 is amended by revising paragraphs (a), (b)(1), (d)-(j), (l)-(m), and the introductory text of the section and paragraph (b) are republished, to read as follows:

§1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:

(1) For admission to examination for registration to practice, fee payable upon application $270.00

(2) On registration to practice $90.00

(3) For reinstatement to practice $10.00

(4) For certificate of good standing as an attorney or agent $10.00
Suitable for framing $100.00

(5) For review of a decision of the Director of Enrollment and Discipline under § 10.2(c) $100.00

(6) For requesting regrading of an examination under 10.7(c) $100.00

(b) Deposit accounts:

(1) For establishing or reinstating a deposit account $10.00

* * * * *

(d) Delivery box: Local delivery box rental, per annum $50.00

(e) International type search reports: For preparing an international type search report of an international type search made at the time of the first action on the merits in a national patent application $30.00

(f) Search of Office records: For conducting an inventor search of Office records for a ten-year period $10.00

(g) CopiShare card: Cost per copy ..... $.15

(h) For recording each assignment, agreement or other paper relating to the property in a patent or application per property $8.00

(i) Publication in Official Gazette: For publication in the Official Gazette of a notice of the availability of an application or a patent for licensing or sale, each application or patent $20.00

(j) For a duplicate or replacement of a permanent Office user pass (There is no charge for the first permanent user pass) $10.00

* * * * *

(l) For processing and retaining any application abandoned pursuant to section 1.53(d) unless the required basic filing fee has been paid $120.00

(m) For processing each check returned "unpaid" by a bank $50.00

10. Section 1.26 is amended by revising paragraph (c) to read as follows:

§1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,500 will be made to the requestor of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

11. Section 1.55 is amended by revising paragraph (a) to read as follows:

§1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of interference (§ 1.630); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in § 1.17(i)(1).

* * * * *

12. Section 1.102 is amended by revising paragraph (d) to read as follows:

§1.102 Advancement of examination.

* * * * *

(d) A petition to make an application special on grounds other than those referred to in paragraph (c) of this section must be accompanied by the petition fee set forth in §1.17(i)(2).

13. Section 1.103, paragraph (a) is amended to read as follows:

§1.103 Suspension of action.

(a) Suspension of action by the Office will be granted for good and sufficient cause and for a reasonable time specified upon petition by the applicant and, if such cause is not the fault of the Office, the payment of the fee set forth in 1.17(i)(1). Action will not be suspended when a response by the applicant to an Office action is required.

* * * * *

14. Section 1.171 is amended to read as follows:

§1.171 Application for reissue.

An application for reissue must contain the same parts required for an application for an original patent, complying with all the rules relating thereto except as otherwise provided, and, in addition, must comply with the requirements of the rules relating to reissue applications. The application must be accompanied by a certified copy of an abstract of title or an order for a title report accompanied by the fee set forth in § 1.19(b)(6), to be placed in the file, and by an offer to surrender the original patent (§ 1.178).

15. Section 1.177 is amended to read as follows:

§1.177 Reissue in divisions.

The Commissioner may, in his or her discretion, cause several patents to be issued for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for each division. Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part of parts, subject to the provisions of §§ 1.83 and 1.84. On filing divisional reissue applications, they shall be referred to the Commissioner. Unless otherwise ordered by the Commissioner upon petition and payment of the fee set forth in § 1.17(i)(1) all the divisions of a reissue will issue simultaneously; if there be any controversy as to one division, the others will be withheld from issue until the controversy is ended, unless the Commissioner shall otherwise order.

16. Section 1.296 is amended to read as follows:

§1.296 Withdrawal of request for publication of statutory invention registration.

A request for a statutory invention registration, which has been filed, may be withdrawn prior to the date of the notice of the intent to publish a statutory invention registration issued pursuant to §1.294(c) by filing a request to withdraw the request for publication of a statutory invention registration. The request to withdraw may also include a request for a refund of any amount paid in excess of the application filing fee and a handling fee of $120.00 which will be retained. Any request to withdraw the request for publication of a statutory invention registration filed on or after the date of the notice of intent to publish issued pursuant to § 1.294(c) must be in the form of a petition pursuant to 1.183 accompanied by the fee set forth in §1.17(h).

17. Section 1.313, paragraph (a), is amended to read as follows:

§1.313 Withdrawal from issue.

(a) Applications may be withdrawn from issue for further action at the initiative of the Office or upon petition by the applicant. Any such petition by the applicant must include a showing of good and sufficient reasons why withdrawal of the application is necessary and, if the reason for the withdrawal is not the fault of the Office, must be accompanied by the fee set forth in 1.17(i)(1). If the application is withdrawn from issue, a new notice of allowance will be sent if the application is again allowed. Any amendment accompanying a petition to withdraw an application from issue must comply with the requirement of § 1.312.

* * * * *

18. Section 1.314 is amended to read as follows:

§1.314 Issuance of patent.

If payment of the issue fee is timely made, the patent will issue in regular course unless
(a) the application is withdrawn from issue (§ 1.313)
(b) issuance of the patent is deferred.
Any petition by the applicant requesting deferral of the issuance of a patent must be accompanied by the fee set forth in § 1.17(i)(1) and must include a showing of good and sufficient reasons why it is necessary to defer issuance of the patent.

19. Section 1.334 is amended by revising to read as follows:

§1.334 Issue of patent to assignee.

* * * * *

(c) If the assignment is recorded after the date of payment of the issue fee, the assignee may petition that the patent issue to the assignee as recorded. Any such petition must be accompanied by the fee set forth in § 1.17(i)(1).

20. Section 1.445 is amended by revising paragraph (a), (2), (3) and, the introductory text of paragaph (a) is republished, to read as follows:

§1.445 International application filing and processing fees.

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:

* * *

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with basic filing fee has been filed $550.00

(ii) A corresponding prior United States national application with basic filing fee has been filed $380.00

(3) A suppplemental search fee when required per additional invention $150.00

* * * * *

21. Section 1.451 is amended by revising paragraph (b) to read as follows:

§1.451 The priority claim and priority document in an international application.

* * * * *

(b) Whenever the priority of an earlier United States national application is claimed in an international application, the applicant may request in a letter of transmittal accompanying the international application upon filing with the United States Receiving Office or in a separate letter filed in the Receiving Office not later than 16 months after the priority date, that the Patent and Trademark Office prepare a certified copy of the national application for transmittal to the International Bureau

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(PCT Article 8 and PCT Rule 17). The fee for preparing a certified copy is stated in § 1.19 (b)(1)

* * * * *

22. Section 1.482 is amended by revising paragraph (a) to read as follows:

§1.482 International preliminary examination fees.

(a) The following fees and charges for international preliminary examination are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of $400.00

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of $600.00

(2) An additional preliminary examination fee when required, per additional invention:

(i) Where a supplemental search fee as set forth in § 1.445(a)(3) has been paid on the international application to the United States Patent and Trademark Office as an international Searching Authority $130.00

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office $200.00

* * * * *

23. Section 1.492 is amended by revising paragraphs (a)(1)-(3), (b), and (d)-(f), and the introductory text of the section and paragraph (a) are republished to read as follows:

§ 1.492 National stage fees.

The following fees and charges for international applications entering the national stage under 35 U.S.C. 371 are established by the Commissioner under 35 U.S.C. 376:

(a) The basic national fee:

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity(§ 1.9(f)) $165.00
By other than a small entity $330.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as in International Searching Authority:

By a small entity(§ 1.9(f)) $185.00
By other than a small entity $370.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity(§ 1.9(f)) $250.00
By other than a small entity $500.00

* * *

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity(§ 1.9(f)) $18.00
By other than a small entity 36.00

* * * * *

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claims(s), per application:

By a small entity(§ 1.9(f)) $60.00
By other than a small entity $120.00

(If the additional fees required by paragraphs (b),(c), and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic national fee or oath or declaration later than 20 months from the priority date pursuant to § 1.494(c) or later than 30 months from the priority date pursuant to § 1.495(c):

By a small entity (§ 1.9(f)) $60.00
By other than a small entity $120.00

(f) For filing an English translation of an international application later than 20 months after the priority date (§ 1.494(c)) or filing an English translation of the international application or of any annexes to the international preliminary examination report later than 30 months after the priority date (§ 1.495(c) and (e)): $30.00

24. Section 1.666 is amended by revising paragraph (b) to read as follows:

§ 1.666 Filing of interference settlement agreements.

* * * * *

(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in § 1.17(i)(1) and on a showing of good cause.

* * * * *

Part 2 Rules of Practice in Trademark Cases

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by revising paragraphs (a), (q) and the introductory text of the section is republished to read as follows:

§ 2.6 Trademark fees.

The following fees and charges are established by the Patent and Trademark Office for trademark cases:

* * * * *

(a) For filing an application, per class $175.00

* * * * *

(q) For recording trademark assignments and agreements or other papers relating to the property in a registration or application, per mark $8.00

* * * * *

Jan. 18, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1100 TMOG 7]

(242) **Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks**

1. *Service of court papers*

This notice supersedes the Solicitor's Notice of Sept. 10, 1982 [1023 *Official Gazette* 3 (Oct. 5, 1982)].

Court papers may be served on the Solicitor in the following manner:

A. By hand between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor located in Crystal Plz., Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Fl., Rm. 5-C-15, Arlington, Va.

B. By mail in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215.

Court papers mailed to an address other than the Solicitor's service address above, or hand-delivered to the Office of the Solicitor, are deemed to be served when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the Patent and Trademark Office in connection with an application or other proceeding pending in the Office should not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be filed in the Office and will be returned. No exceptions will be made to this policy.

2. *Filing of a notice of appeal to the Federal Circuit*

A notice of appeal from a decision of the Board of Patent Appeals and Interferences in an *ex parte* or *inter partes* patent matter or a decision of the Trademark Trial and Appeal Board in an *ex parte* or *inter partes* trademark matter must be timely filed.

A certificate of mailing under 37 CFR § 1.8 *cannot* be used for the purpose of effecting "filing" of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit. *In re Thrifty*, 231 USPQ 560 (Comm'r. Pat. 1986), *mandamus denied mem.*, Misc. No. 137 (Fed. Cir. Nov. 21, 1986) (unpublished). Thus, a notice of appeal which reaches the Patent and Trademark Office after the due date, is not considered to be timely filed, even though mailed prior to the due date with a certificate of mailing under 37 CFR § 1.8.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any of the following ways:

A. By mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service *only*) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

C. By hand to the Office of the Solicitor.

A notice of appeal to the U.S. Court of Appeals for the Federal Circuit should *not* be mailed to the Solicitor's mail service address.

June 8, 1987.

JOSEPH F. NAKAMURA,
Solicitor.

[1079 TMOG 5]

(243) **HELPFUL HINTS**

• *Correspondence with Certificate of Mailing Delivered by Commerical Carrier* — The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand carried or delivered to the PTO via commerical mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS'," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

[1080 TMOG 6]

(244) **Appeals to CAFC**

In every case of an appeal to the CAFC from a decision of the Board of Patent Appeals and Interferences or the Trademark Trial and Appeal Board, a copy of the notice of appeal should be separately transmitted to the Office of the Solicitor at the time the original notice is filed with the Commissioner. The Solicitor's copy should be sent in an envelope addressed as follows:

Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attn: Office of the Solicitor

In lieu of mailing, the copy for the Solicitor may be hand-delivered to the Office of the Solicitor. Sending a copy of the notice of appeal to the Solicitor's Office will prevent or reduce delays in docketing appeals in the CAFC.

July 17, 1987.

DONALD W. PETERSON,
Deputy Commissioner of Patents and Trademarks.

[1081 TMOG 5]

(245) **HELPFUL HINTS**

• *Certificate of Mailing AND Return Post Card* — Use of the Certificate of Mailing Procedure is strongly encouraged.

37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if deposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Post Card Receipt provision of MPEP 503 is used.

In those instances where the PTO never receives the correspondence, no post card receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is *not* received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the

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PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

[1082 TMOG 8]

(246) **Unpaid Fee Checks**

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§ 1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

Oct. 5, 1987. DONALD W. PETERSON,
Deputy Commissioner.

[1083 TMOG 7]

(247) **Service of Court Papers on the Commissioner of Patents and Trademarks**

The procedure set forth in M.P.E.P. § 1216 (5th ed., revs. 1 to 6) under the heading "Service of Court Papers on Commissioner of Patents and Trademarks" was superceded by the procedure set forth in the Solicitor's Notice of June 8, 1987 [1079 OG 72], which remains in effect and which also describes the procedure for filing a notice of a appeal to the Federal Circuit. The portion of that notice concerning service of court papers on the Commissioner is repeated below, as modified to include additional guidelines about supplementation of the mail service address.

Court papers may be served on the Commissioner in either of the following ways:

A. By *hand* between 8:30 A.M. and 5:00 P.M. at the Office of the Solicitor, located in Crystal Plaza Bldg. No. 2, 2011 Jefferson Davis Hwy., 5th Floor, Room 5-C-15, Arlington, Va.

B. By *mail* in an envelope addressed as follows:

Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must *not* be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office should not be mailed to the solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Feb. 22, 1988 JOSEPH F. NAKAMURA,
Solicitor.

[1088 TMOG 5]

(248) **HELPFUL HINTS**

- *Expediting Processing Trademark Assignments* — As noted in our statistics we are currently running behind in processing trademark assignment documents. We are working to eliminate the backlog in this area. We have recently eliminated a backlog in patent assignment processing. The following helpful hints are offered to aid us in eliminating backlogs and to allow us to provide better service for all assignment processing:

  Many individuals are submitting assignment documents and requests for assignment services, together with application prosecution papers, directly to the examiner. Often, these requests get placed in the file and are not forwarded to the assignment area for handling. Please send all assignment documents and requests through the mailroom in order that they may be properly routed to the assignment area.

  Please separate requests for certified copies of assignments from requests for other services including requests for certified copies of other documents. Certification of assignment documents is not performed by the same individuals as certification of other documents.

- *Expediting Handling of Trademark Applications* — To facilitate processing of new trademark applications, place them in a separate envelope apart from all other mail. Identify on the outside of the envelope "TRADEMARK APPLICATION ONLY." More than one new trademark application may be placed in the same envelope. Do not place any papers in the envelope other than those related to the new trademark applications.

Mar. 7, 1988. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1088 TMOG 8]

(249) **Weekly Summaries of Trademark Trial and Appeal Board Final Decisions**

The Patent and Trademark Office will begin publishing, in each issue of the Trademark Official Gazette, a weekly summary of final decisions issued by the Trademark Trial and Appeal Board. Publication of the summary is being undertaken on a discretionary basis, as a courtesy to interested members of the public.

Mar. 21, 1988. JEFFREY M. SAMUELS,
Assistant Commissioner for Trademarks.

[1091 TMOG 6]

(250) **Filing Receipt for Trademark Applications**

Effective immediately, the Trademark Examining Operation will replace its existing "FILING RECEIPT FOR TRADEMARK APPLICATIONS," PTO Form 100 (Rev. 8/78), with a filing receipt using a new format. The revised filing receipt will be printed on a single sheet of 8 1/2" x 11" paper and will contain information regarding the mark, applicant, International and U.S. classes, goods and/or services, and dates of use. If all of the information relating to a new application cannot be printed on the 8 1/2" x 11" filing receipt, it will be noted that additional information was contained in the application but was not printed. The addressee's name and address will be printed on the back of the filing receipt.

Sept. 6, 1988. JEFFREY M. SAMUELS,
Assistant Commissioner for Trademarks.

[1095 TMOG 6]

(251) **Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings**

The Patent and Trademark Office (PTO) is adding Parts 15 and 15a to Title 37 of the Code of Federal Regulations. Part 15 concerns service of process on the Commsssioner, the Patent and Trademark Office, and employees of the Patent and Trademark Office in their official capacity. Part 15a concerns the testimony of PTO employees regarding official matters and the production of official documents in legal proceedings. Parts 15 and 15a were effective upon publication in the Federal Register. 54 FR 3976-8 (Jan. 26, 1989).

In addition, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of ju the Trademark Manual of Examining Procedure are amended, as indicated below, effective immediately.

Parts 15 and 15a, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of the Trademark Manual of Examining Procedure are published in this notice as a convenience to the public. In addition to these materials, the Patent and Trademark Office alerts the public to its position with respect to *Standard Packaging Corp.* v. *Curwood, Inc* ., 365 F. Supp. 134, 180 USPQ 234 (N.D. Ill. 1973). In the past, parties have attempted, based on *Standard Packaging*, to obtain answers to questions which the Patent and Trademark Office has regarded to be improper. While the Patent and Trademark Office believes *Standard Packaging* accurately states the law, the Office believes that the court misapplied the law to the precise questions in issue. Accordingly, the Office agrees with the Federal Circuit's observation in *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg* , 860 F.2d 428, 432, 8 USPQ 2d 1853, 1857 (Fed. Cir. 1988), that there is considerable doubt whether *Standard Packaging* was correctly decided. The Patent and Trademark Office will not permit examiners to answer questions similar to those which the *Standard Packaging* court found acceptable.

* * * * *

Department of Commerce
Patent and Trademark Office
37 CFR Parts 15 and 15a

[Docket No. 9106-9006

Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office.
Action: Final rule.
Summary: The Patent and Trademark Office is adding 37 CFR Parts 15 and 15a to supplement 15 CFR Parts 15 and 15a. These new parts prescribe policies and procedures to be followed with respect to service of process on the Patent and Trademark Office, the Commissioner of Patents and Trademarks, and employees of the Office, the testimony of Office employees regarding official matters, and the production of official documents in legal proceedings. These regulations serve as a statement of Office policy and provide comprehensive guidelines for the Office and its employees, outside agencies, and other persons regarding the appropriate procedures for service of process, testimony, and production of documents.
Effective date: Jan. 26, 1989.
For Further Information Contact: Associate Solicitor John W. Dewhirst by mail at Box 8, U.S. Patent and Trademark Office, Washington, D.C. 20231 and by phone at (703) 557-4035.
Supplementary Information: These regulations are designed to supplement, and be construed consistent with, 15 CFR Parts 15 and 15a. The regulations in Part 15a state the views of the Office with respect to the permissible scope of testimony which may be given by Office employees in connection with their performance of quasi-judicial patent and trademark matters. These Office views are consistent with *United States* v. *Morgan* , 313 U.S. 409, 422 (1941); *Western Electric Co., Inc.* v. *Piezo Technology, Inc.* v. *Quigg*, No. 88-1216, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. Nov. 1, 1988); *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969), and *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970).

Because these regulations concern agency management and personnel, they are not rules or regulations within the meaning of section 1(a) of Executive Order 12291, and they are not subject to the requirements of that Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

These regulations, relating to agency management and personnel, are exempt from all requirements of section 553 of the Administrative Procedure Act [5 USC 553] (including a delayed effective date and therefore will be effective immediately upon publication in the Federal Register.

Because a notice of proposed rule making and an opportunity for public comments are not required to be given for these regulations by section 553 of the APA, or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Flexibility Act [5 U.S.C. 603(a) and 604(a)] .

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

List of subjects in 37 CFR Parts 15 and 15a: Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, 37 CFR is amended as follows:

1. Part 15 is added to read as follows:

Part 15
Service of Process

Sec.
15.1 Scope and purpose
15.2 Definitions
15.3 Acceptance of service of process
Authority: 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15.2(a).

§ 15.1 *Scope and Purpose.*

(a) This part supplements 15 CFR Part 15 and sets forth the procedures to be followed when a summons or complaint is served on the Office or the Commissioner or an employee of the Office in his or her official capacity. This part is to be construed consistent with 15 CFR Part 15.

(b) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding.

(c) This part does not apply to subpoenas. The procedures to be followed with respect to subpoenas are set out in Part 15a of this Title.

(d) This part does not apply to service of process made on an Office employee personally on matters not related to official business of the Office or to the official responsibilities of the Office employee.

§ 15.2 *Definitions.*

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.

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Without prior approval, no Office employee shall answer inquiries from a person not employed by the Department of Commerce regarding testimony or documents subject to a demand or a potential demand under the provisions of this Part. All inquiries involving a demand or potential demand on an Office employee shall be referred to the Solicitor.

(b) A certified copy of a document, not otherwise available under Chapter I of this Title, will be provided for use in a legal proceeding upon written request and payment of applicable fees required by law.

(c)(1) *Request for testimony or document.* A request for testimony of an Office employee or document shall be mailed or hand-delivered to the Office of the Solicitor. The mailing address of the Office of the Solicitor is Box 8, Patent and Trademark Office, Washington, D.C. 20231.

(2) *Subpoenas.* A subpoena for testimony by an Office employee or a document shall be served in accordance with the Federal Rules of Civil or Criminal Procedure as appropriate, or applicable state procedure, and a copy of the subpoena shall be sent to the Solicitor.

(3) *Affidavit.* Every request and subpoena shall be accompanied by an affidavit or declaration under 28 U.S.C. 1746 or, if an affidavit or declaration is not feasible, a written statement setting forth the title of the legal proceeding, the forum, the requesting party's interest in the legal proceeding, the reasons for the request or subpoena, a showing that the desired testimony or document is not reasonably available from any other source, and if testimony is requested, the intended use of the testimony, a general summary of the testimony desired, and a showing that no document could be provided and used in lieu of testimony. The purpose of this requirement is to permit the Solicitor to make an informed decision as to whether testimony or production of a document should be authorized.

(d) Any Office employee who is served with a demand shall immediately notify the Office of the Solicitor.

(e) The Solicitor may consult or negotiate with an attorney for a party or the party, if not represented by an attorney, to refine or limit a demand so that compliance is less burdensome or obtain information necessary to make the determination required by paragraph (c) of this section. Failure of the attorney or party to cooperate in good faith to enable an informed determination to be made under this part may serve as the basis for a determination not to comply with the demand.

(f) A determination under this part to comply or not to comply with a demand is not an assertion or waiver of privilege, lack of relevance, technical deficiencies or any other ground for noncompliance. The Commissioner reserves the right to oppose any demand on any legal ground independent of any determination under this part.

§ 15a.5 Testimony of Office employees in proceedings involving the United States.

(a) An Office employee may not testify as an expert or opinion witness for any party other than the United States.

(b) When appropriate, the Solicitor may authorize an Office employee to give testimony as an expert or opinion witness on behalf of the United States. Expert or opinion testimony on behalf of the United States will not be authorized in any legal proceeding involving the validity or enforceability of a patent or registered trademark.

(c) Whenever, in any legal proceeding involving the United States, a request is made by an attorney representing or acting under the authority of the United States, the Solicitor will make all necessary arrangements for the Office employee to give testimony on behalf of the United States. Where appropriate, the Solicitor may require reimbursement to the Office of the expenses associated with an Office employee giving testimony on behalf of the United States.

§ 15a.6 Legal proceedings between private litigants

(a) Testimony by an Office employee and production of documents in a legal proceeding not involving the United States shall be governed by § 15a.4.

(b) If an Office employee is authorized to give testimony in a legal proceeding, the testimony, if otherwise proper, shall be limited to facts within the personal knowledge of the Office employee. An Office employee is prohibited from giving expert or opinion testimony, answering hypothetical or speculative questions, or giving testimony with respect to subject matter which is privileged. If an Office employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Office, that employee is further prohibited from giving testimony in response to questions which seek:

(1) Information about that employee's:

(i) Background.
(ii) Expertise.
(iii) Qualifications to examine or otherwise consider a particular patent or trademark application.
(iv) Usual practice or whether the employee followed a procedure set out in any Office manual of practice in a particular case.
(v) Consultation with another Office employee.
(vi) Understanding of:
(A) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(B) Prior art.
(C) Registered subject matter, subject matter sought to be registered, or atrademark application, registration, opposition, cancellation, interference or concurrent use file.
(D) Any Office manual of practice.
(E) Office regulations.
(F) Patent, trademark, or other law.
(G) The responsibilities of another Office employee.
(vii) Reliance on particular facts or arguments.

(2) To inquire into the manner in and extent to which the employee considered or studied material in performing the quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

§ 15a.7 Procedures when an Office employee receives a subpoena.

(a) Any Office employee who receives a subpoena shall immediately forward the subpoena to the Office of the Solicitor. The Solicitor will determine the extent to which an Office employee will comply with the subpoena.

(b) If the Office employee is not authorized to comply with the subpoena, the Office employee shall appear at the time and place stated in the subpoena, produce a copy of Part 15a of Title 15 and a copy of this part, and respectfully refuse to provide any testimony or produce any document. *United States ex rel. Touhy v. Ragen*. 340 U.S. 462 (1951).

(c) When necessary or appropriate, the Solicitor will request assistance from the Department of Justice or a U.S. Attorney or otherwise assure the presence of an attorney to represent the interests of the Office or an Office employee.

Dec. 23, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Revisions to §§ 1701 and 1701.01 of MPEP

§ 1701 Office personnel not to express opinion on validity or patentability of patent

Every patent is presumed to be valid. 35 U.S.C. § 282, first sentence. Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity or invalidity of, or the patentability or unpatentability of any claim in any U.S. Patent, except to the extent necessary to carry out (a) examination of an application seeking to reissue the patent, (b) a reexamination proceeding to reexamine the patent, or (c) an interference involving the patent.

The question of validity or invalidity is otherwise exclusively a matter to be determined by a court. Members of the patent

(b) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, or an administrative law judge or hearing officer.

(c) "Office" means Patent and Trademark Office.

(d) "Office employee" means any officer or employee of the Office.

(e) "Official business" means the authorized business of the Office.

(f) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.

§ 15.3 Acceptance of service of process

(a) Any summons or complaint to be served in person or by registered or certified mail or as otherwise authorized by law on the Office or the Commissioner or an Office employee in his or her official capacity, shall be served on the Solicitor or an Office employee designated by the Solicitor.

(b) Any summons or complaint to be served by mail may be addressed to Solicitor, P.O. Box 15667, Arlington, Va. 22215. Any summons or complaint to be served by hand may be delivered to the Office of the Solicitor.

(c) Any Office employee served with a summons or complaint shall immediately notify and deliver the summons or complaint to the Office of the Solicitor.

(d) Any Office employee receiving a summons or complaint shall note on the summons or complaint the date, hour, and place of service and whether service was by personal delivery or by mail.

(e) When a legal proceeding is brought to hold an Office employee personally liable in connection with an action taken in the conduct of official business, rather than liable in an official capacity, the Office employee by law is to be served personally with process. Service of process in this case is inadequate when made upon the Solicitor or the Solicitor's designee. Any Office employee sued personally for an action taken in the conduct of official business shall immediately notify and deliver a copy of the summons or complaint to the Office of the Solicitor.

(f) An Office employee sued personally in connection with official business may be represented by the Department of Justice at its discretion. See 28 CFR 50.15 and 50.16 (1987).

(g) The Solicitor or Office employee designated by the Solicitor, when accepting service of process for an Office employee in an official capacity, shall endorse on the Marshal's or server's return of service form or receipt for registered or certified mail the following statement: "Service accepted in official capacity only." The statement may be placed on the form or receipt with a rubber stamp.

(h) Upon acceptance of service or receiving notification of service, as provided in this section, the Solicitor shall take appropriate steps to protect the rights of the Commissioner or Office employee involved.

2. Part 15a is added to read as follows:

Part 15a
Testimony by Employees and the Production of Documents in Legal Proceedings

Sec.
15a.1 Scope
15a.2 Definitions
15a.3 Office policy
15a.4 Testimony or production of documents: general rule
15a.5 Testimony of Office employees in proceedings involving the United States
15a.6 Legal proceedings between private litigants
15a.7 Procedures when an Office employee receives a subpoena
Authority: 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15a.1(e) and 15a.2(f).

§ 15a.1 Scope

(a) This part supplements 15 CFR Part 15a and prescribes the policies and procedures of the Office with respect to the testimony of Office employees as witnesses in legal proceedings and the production of documents of the Office for use in legal proceedings pursuant to a request, order, or subpoena. This part is issued pursuant to 15 CFR 15a.1(e) and is to be construed consistent with 15 CFR Part 15a.

(b) This part does not apply to any legal proceeding in which an Office employee is to testify, while on leave status, as to facts or events that are in no way related to the official business of the Office.

(c) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding and in no way affects the rights and procedures governing public access to records pursuant to the Freedom of Information Act or the Privacy Act. See 15 CFR 15a.4 and 37 CFR 1.15.

§ 15a.2 Definitions.

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.

(b) "Demand" means a request, order, or subpoena for testimony or documents for use in a legal proceeding.

(c) "Document" means any record, paper, and other property held by the Office, including without limitation official patent and trademark files, official letters, telegrams, memoranda, reports, studies, calendar and dairy entries, maps, graphs, pamphlets, notes, charts, tabulations, analyses, statistical or informational accumulations, any kind of summaries of meetings and conversations, film impressions, magnetic tapes, and sound or mechanical reproductions.

(d) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, an administrative law judge or hearing officer or any discovery proceeding in support thereof.

(e) "Office" means Patent and Trademark Office.

(f) "Office employee" means any officer or employee of the Office.

(g) "Official business" means the authorized business of the Office.

(h) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.

(i) "Testimony" means a statement given in person before a tribunal or by deposition for use before the tribunal or any other statement given for use before a tribunal in a legal proceeding, including an affidavit, declaration under 35 U.S.C. 25, or declaration under 28 U.S.C. 1746.

(j) "United States" means the Federal Government, its departments and agencies, and individuals acting on behalf of the Federal Government.

§ 15a.3 Office policy.

The Office policy is that its documents will not be voluntarily produced and Office employees will not voluntarily appear as witnesses or give testimony in a legal proceeding. The reasons for this policy include:

(a) To conserve the time of Office employees for conducting official business.

(b) To minimize the possibility of involving the Office in controversial or other issues which are not related to the mission of the Office.

(c) To prevent the possibility that the public will misconstrue variances between personal opinions of Office employees and Office policy.

(d) To avoid spending the time and money of the United States for private purposes.

(e) To preserve the integrity of the administrative process, minimize disruption of the decision-making process, and prevent interference with the Office's administrative functions.

§ 15a.4 Testimony or production of documents: general rule

(a) No Office employee shall give testimony concerning the official business of the Office or produce any document in any legal proceeding without the prior authorization of the Solicitor. Where appropriate, an Office employee may be instructed in writing by the Commissioner, Solicitor, or other appropriate Office employee not to give testimony or produce a document.

examining corps are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular patent should not have issued.

When a field of search for an invention is requested, examiners should routinely inquire whether the invention has been patented in the United States. If the invention has been patented, no field of search should be suggested.

Employees of the Patent and Trademark Office, particularly patent examiners who examined an application which matured into a patent or a reissued patent or who conducted a reexamination proceeding, should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain reference or other particular evidence was considered during the examination or proceeding and whether or not a claim would have been allowed over that reference or other evidence had it been considered during the examination or proceeding. Likewise, employees are cautioned against answering any inquiry concerning any entry in the patent or reexamination file, including the extent of the field of search and any entry relating thereto. The record of the file of a patent or reexamination proceeding must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the patent examining corps. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity or patentability.

§ 1701.01 Office personnel not to testify
[Reprint: 37 CFR 15a.1
37 CFR 15a.2
37 CFR 15a.3
37 CFR 15a.4
37 CFR 15a.5
37 CFR 15a.6
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including patent examiners, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a patent examiner, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Patent examiners and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any patent.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a patent examiner or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the +

Solicitor at least *ten working* days prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co.* v. *Corning Glass Works*. 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon a patent application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States* v. *Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co.* v. *Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. § 134 since board members need not be skilled in the art to render obviousness decision); *Lange* v. *Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in § 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

(1) Information about that employee's:
(A)Background.
(B)Expertise.
(C)Qualifications to examine or otherwise consider a particular patent or trademark application.
(D)Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
(E) Consultation with another Office employee.
(F) Understanding of:
(i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(ii) Prior art.
(iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(iv) Any Office manual of practice.
(v) Office regulations.
(vi) Patent, trademark, or other law.
(vii) The responsibilities of another Office employee.

(G) reliance on particular facts or arguments.
(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in *writing*. The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) if the party requesting the testimony further meets the following conditions:

(1) [dn The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:

(a) the style of the case,
(b) the civil action number,
(c) the district in which the civil action is pending,
(d) the judge assigned to the case, and
(e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).
(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired. Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.
(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.
(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

* * * * *

Revisions to §§ 1801 and 1801.01 of TMEP

§ 1801 Office personnel not to express opinion on validity of registered trademark

A certificate of registration of a trademark on the Principal Register is prima facie evidence of the validity of the registration. 15 U.S.C. § 1057(b). Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity of any registered trademark, except to the extent necessary to carry out *inter partes* proceedings at the Trademark Trial and Appeal Board in cancellation and similar proceedings authorized by law.

The question of validity of a registered trademark is otherwise exclusively a matter to be determined by a court. Members of the trademark examining operation are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular registration should not have been published or issued.

Employees of the Patent and Trademark Office, particularly trademark examining attorneys who examined an application should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain registration or other particular evidence was considered during the examination of the application or whether a trademark would have been published or registered if the registration or other evidence had been considered during the examination. Likewise, employees are cautioned against answering any inquiry concerning any entry in the trademark registration file, including the extent of the field of search and any entry relating thereto. The record of the file of a trademark registration or *inter partes* proceedings before the Trademark Trial and Appeal Board must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the trademark examining operation. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity of any registration.

§ 1801.01 Office personnel not to testify
[Reprint: 37 CFR 15a.1
37 CFR 15a.2
37 CFR 15a.3
37 CFR 15a.4
37 CFR 15a.5
37 CFR 15a.6
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including trademark examining attorneys, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a trademark examining attorney, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Trademark examining attorneys and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any registration.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a trademark examining attorney or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the Solicitor at least *ten working* days prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co.* v. *Corning Glass Works*, 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon an application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States* v. *Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 8 USPQ 2d 1583 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co.* v. *Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. [g49 134 since board members need not be skilled in the art to render obviousness decision); *Lance* v. *Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in Sec. 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

(1) Information about that employee's:
(A) Background.
(B) Expertise.
(C) Qualifications to examine or otherwise consider a particular patent or trademark application.
(D) Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
(E) Consultation with another Office employee.
(F) Understanding of:
(i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(ii) Prior art.
(iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(iv) Any Office manual of practice.
(v) Office regulations
(vi) Patent, trademark, or other law.
(vii) The responsibilities of another Office employee.

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(G) Reliance on particular facts or arguments.
(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.
(3) {dn To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in *writing* . The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) only if the party requesting the testimony further meets the following conditions:

(1) The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:

(a) the style of the case,
(b) the civil action number,
(c) the district in which the civil action is pending,
(d) the judge assigned to the case, and
(e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).
(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired.
Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.
(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.
(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

FRED E. McKELVEY,
Feb. 7, 1989. *Solicitor* .

[1099 TMOG 44]

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(252) **DEPARTMENT OF COMMERCE**
BILLING CODE: 3510-16
Patent and Trademark Office

37 CFR Parts 1 and 2

[Docket No. 90363-9063]
RIN: 0651-AA40
Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office proposes to amend the rules of practice in patent and trademark cases, Parts 1 and 2 to Title 37, Code of Federal Regulations, to set forth charges that will be made to users of the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office plans to provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available) hereinafter referred to as APS-Text, and T-Search in its Patent Search Room and Trademark Search Library located in Crystal City, Virginia. The Office does not plan to provide on-line access to its patent and trademark data bases at any other facilities at the present time.

The Office will be making both search systems available to the public free of charge during this rulemaking process for the purposes of self-education and training (familiarization).

The paper or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations continue to be available to the public free of charge as provided by section 104(b) of Pub. L. 100-703.

The proposed rule changes are intended to establish a basis for the charges for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.
Dates: Written comments must be submitted on or before June 30, 1989; a public hearing will be held on June 30, 1989 at 9:00 a.m. Requests to present oral testimony should be received on or before June 29, 1989.
Addresses: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Frances Michalkewicz, Suite 912 on the 9th floor of Building 2, Crystal Park, located at 2121 Crystal Drive, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The purpose of the proposed rule change is to establish new fees for the on-line use of APS- Text, and T-Search that are to be provided in the Office's facilities in Crystal City, Virginia. This is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which is being published separately in this issue of the *Federal Register* as a final rule. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is provided for by section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113) and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees also are presented for information.
Background: In response to Public Law 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve their integrity and quality; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registrations have been converted to an electronic data base and textual and digital image data. A computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and to retrieve and display all information as a substitute for paper file searches. Trademark examiners have been using T-Search exclusively since January 1988, and the capability is ready to be deployed for public use in the Trademark Search Library.

The T-Search "dead data base," trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. The trademark examining attorneys do not search this data base. The Office is soliciting the public's comments as to whether this data base should be compared to the paper copy and corrected for use by public searchers at a cost projected to be about $250,000.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected on July 1, 1986 to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from single screen text terminals located throughout the Office. The APS-Text capability is ready for deployment to the public in the Patent Search Room.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tabular data and chemical and mathematical equations will have been added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained on APS-Text during January, 1988 and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches.

A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December, 1988. Preliminary review indicates that public users considered T-Search to be valuable both as a primary source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Public Law 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Public Law 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest. The proposed Office policy retains the flexibility authorized by the enabling legislation to waive fees in appropriate circumstances.

The information contained in the automated data bases, which will be available to the public at the location of the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through private vendors on-line for a fee. At the present time, it is considered to be in the public interest to waive the proposed fee in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term paper, or a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate would include an individual doing work for remuneration — e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only where the terminals are available. It is not anticipated that fees will be waived for each individual except once or twice each year depending on the circumstances. The Commissioner reserves the right to control access to the data bases and deny a waiver to any individual.

In the course of developing criteria, consideration was given to charging reduced fees to an individual who could claim small entity status as defined in 35 U.S.C. § 41(h). However, since it is anticipated that the majority of people that will be using the automated data bases would be members of law firms or commercial search services, this approach was obviously flawed.

As proposed, the waiver policy would apply only to use of the automated system, and not to any service that may also be available to conduct a search or to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual. The Office encourages both comments and suggestions on the waiver policy that realistically address the public interest and the need to meet existing fiscal responsibilities.

COST CALCULATIONS: The Office calculated unit costs for all fees based on OMB Circular A-25, "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. Proposed user charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS-Text to the public, the Office followed Congressional direction that fees be reasonable by reflecting the marginal cost for providing the new service and not including the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the eight (8) month period October 1989 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected that an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The Office also is proposing to provide some free training and access time during training on the automated search systems in accordance with § 104(C) of Public Law 100-703 which reads, "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

Cost of equipment included in the fee calculations for public access include network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs are included for a portion of license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The usage rate estimates are based on the three month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected to be trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During the three month study period, use of the three terminals averaged approximately 50 per cent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempt to take into account such factors and assumptions as:

1. Future public users, on average, will use APS-Text less frequently than the 42 frequent users selected for the 1988 study, since the study group was weighted toward a small number of frequent public searchers, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) will reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes — the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a work day, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, will provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appears to be adequate for the forseeable future.

6. For purposes of actual use of available text terminals, the following estimates are used:

(a) In fiscal year 1990, up to ten terminals will be available during the first quarter. An estimate of 45 percent utilization of available text terminal time is projected. By increasing the number of text terminals to 15 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time is projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time is projected.

(b) During fiscal year 1991 and beyond, stable levels of usage should be achieved, yielding an estimated 35 per cent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, this anticipates a total of 286 search sessions per day.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Terminal Session Time
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$918,197
Hardware & Maintenance	$1,036,587
Software (license fees)	$300,357
Site Preparation	$38,118
Non-capital Furniture	$8,750
Supplies & Forms	$3,500
Sub-Total	$2,305,509
General & Adminstrative Overhead	$361,50
TOTAL COST	$2,667,013
Estimated Use (hours)	73,755
UNIT COST (per hour)	**$36.16**

The marginal cost for one hour of Office staff search assistance on APS-Text includes the costs of personnel compensation and benefits.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Office Staff Search Assistance
(September 1989-October 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	$45.65
TOTAL COST	$45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	**$25.71**

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, and supplies and forms. A summary is as follows:

APS-Text
Marginal Cost of
Each Printed Page
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$173,47
Hardware & Maintenance	$13,843
Non-capital Furniture	$5,000
Supplies & Forms	$41,27
Sub-Total	$233,589
General & Administrative Overhead	$36,627
TOTAL COST	$270,216
Estimated Use (pages)	5,028,750
UNIT COST (per page)	**$0.054**

The marginal cost for one hour terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, general and administrative overhead, and maintentance on the T-Search terminals.

The usage rate for T-Search during fiscal years 1990-1992 is projected to be 28 percent. This rate is extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search and about 24 to 28 public users were active on T-Search each month. Overall usage rate of these active users was 14 percent. It is anticipated that the overall number of users and the usage rate will double once T-Search is made available in the Trademark Search Library to all public users of that search facility and training is provided on a routine basis.

A summary of the fee calculations are as follows:

T-Search
Marginal Cost of One-Hour of
Terminal Session Time
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$195,171
Hardware & Maintenance	$28,809
Site Preparation	$1,000
Supplies & Forms	$3,298
Sub-Total	$228,278
General & Administrative Overhead	$30,932
TOTAL COST	$259,210
Estimated Use (hours)	5,985
UNIT COST (per hour)	**$43.31**

The marginal cost for one hour of Office staff search assistance on T-Search includes the costs of personnel compensation and benefits.

A summary of the fee calculations is as follows:

T-Search
Marginal Cost of One-Hour of
Office Staff Search Assistance
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	$45,659
TOTAL COST	$45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	**$25.71**

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms. A summary of the costs is as follows:

T-Search
Marginal Cost of
Each Printed Page
(October 1989-September 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$27,862
Hardware & Maintenance	$5,274
Supplies & Forms	$3,579
Sub-Total	$36,715
General & Adminstrative Overhead	$4,975
TOTAL COST	$41,690
Estimated Use (pages)	448,875
UNIT COST (per page)	**$0.093**

Rounding Procedures: Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate.

The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

PROCEDURES FOR PUBLIC USE OF APS-TEXT AND T-SEARCH

Patent Search Room Configuration

Initially ten (10) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and administration activities. Fifteen (15) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

Trademark Search Library Configuration

Initially three (3) T-Search terminals with associated printers will be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space for control and administration activities. Additional terminals and printers will be added as demand warrants and space permits.

Procedures for public use of APS-Text and T-Search have been made as similar as possible in order to provide for consistency in application and ease of administration. Unless specifically stated to apply to only one system, procedures apply to both APS-Text and T-Search.

Training

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. Ten (10) members of the public may be trained during each class. Training is expected to be held in the Crystal City complex, probably during evening hours.

To enable prospective users to become effective on T-Search, four (4) hours of basic training is being offered. T-Search training is expected to be held in the Crystal City complex.

Enrollment in all training classes will be on a lottery basis. Public users wishing to be trained on APS-Text or T-Search, will be required to submit an application form by a specific deadline to allow the Office adequate time to select, schedule and notify attendees.

System Use and Fee Procedures

To ensure equity of public access to the automated systems, as well as efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules as with other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search Room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Eight (8) of the initial ten (10) terminals in the Patent Search Room and two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in both the Patent Search Room and the Trademark Search Library will be available for walk-up users and for assisted searches for infrequent users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches is subject to change based upon operational experience.

All public use of APS-Text and T-Search with the exception of scheduled training classes is on a pre-payment basis. In prepaying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalize payment.

Discussion of Specific Rules

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, if amended as proposed, would add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21, if amended as proposed, would add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21, if amended as proposed, would add new paragraph (q) to set the fee for a printed copy from APS-Text.

37 CFR 2.6 Trademark fees

Section 2.6, if amended as proposed, would add new paragraph (u) to set the fees for access to the automated trademark search system (T-Search) and provide for the waiver of fees under certain circumstances.

Section 2.6, if amended as proposed, would add new paragraph (v) to set the fees for T-Search search assistance by Office staff.

Section 2.6, if amended as proposed, would add new paragraph (w) to set the fee for a printed copy from T-Search.

Other Considerations:

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entitites (Regulatory Flexibility Act, Pub. L. 96-354). The proposed rules make the Office's on-line, automated patent full-text search and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual indus-

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tries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Lists of Subjects in 37 CFR Parts 1 and 2

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the Office is proposing to amend Title 37 of the Code of Federal Regulations, Chapter I, as set forth below. All proposed additions are printed between arrows (© §) and all deletions are shown between brackets ([ ]).

PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is proposed to be amended by adding new paragraphs (o)-(q).

§ 1.21 Miscellaneous fees and charges.

* * * * *

© (o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest. $40.00

(p) Marginal cost, paid in advance, for each hour of Office staff search assistance to conduct a search using Automated Patent System full-text search capabilities (PTS-Text), prorated for the actual time used. $25.00

(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal . . . . . .$0.10§

PART 2-RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is proposed to be amended by adding new paragraphs (u)-(w).

§ 2.6 Trademark fees

* * * * *

© (u) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest. $40.00

(v) Marginal cost, paid in advance, for each hour of Office staff search assistance to conduct a search using T-Search capabilities, prorated for the actual time used $25.00

(w) Marginal cost, for each printed page generated from the T-Search terminal . . . . . .$0.10§

Mar. 7, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1102 TMOG 96]

(253)

DEPARTMENT OF COMMERCE
Billing Code: 3510-16
Patent and Trademark Office

[Docket No. 70470-9062]

Electronic Data Dissemination Policies and Guidelines

Agency: Patent and Trademark Office, Commerce

Action: Electronic Data Dissmenination Policies and Guidelines - Final Notice.

Summary: The U.S. Patent and Trademark Office (PTO) has undertaken a program to automate its operations. As a result, electronic patent and trademark data are being created and new techniques are being implemented to expand the use of the PTO's collection of electronic information, which will contain all U.S. patents and registered trademarks and selected foreign patents. These data bases comprise one of the largest information resources of the Nation.

Date: May 3, 1989.

Address: Comments should be addressed to: Donald J. Quigg, Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231.

For Further Information Contact: Bradford R. Huther at 703-557-1572.

Supplementary Information:

In response to Public Law 96-517, the 1980 legislation which amended patent and trademark laws, the PTO prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basis concepts: the creation of electronic data bases that (1) would eventually replace the PTO's all-paper patent and trademark files, and thereby improve their intregrity and quality; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. An IBM-based computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and to retrieve and display all information as a substitute for paper file searches. Trademark examiners have been using T-Search exclusively since January 1988, and the capability is ready to be deployed for public use in the Trademark Search Library.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS — large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers — were interconnected on July 1, 1986 to enable system test and evaluation to begin in the testbed group. Optical disk storage units were subsequently installed to house the test data base of digital images of U.S. and foreign patents. In December 1987, the testbed patent examiners began using the APS image search and retrieval capability (APS-Image) in a live production environment. Based on recommendations of an Industry Review Panel appointed by the Deputy Secretary of Commerce to review the Office's patent automation program, changes were made and the testbed examiners are using a stable, reliable system suited to their need. The digital image retrieval capability of APS has been stabilized in the testbed, which now is being used as an operational testbed for deployment to other patent examining groups. A decision on the next incremental deployment of the digital image retrieval and other electronic searching capabilities is planned to be made in mid-1989. Additional system capabilities for office automation and other administrative support will be added to those already installed in the testbed over the next several months to supplement the search and retrieval capabilities. Examiners will be provided access to commercial data bases, such as industry-specific data bases, from the electronic workstations.

PTO continues to digitize the entire backfile of almost five million U.S. patents. The source for the digital image scanning operation is the archival set of patent documents which is believed to contain the best available copy of each patent. First, images of all U.S. patents in the testbed group's search files were converted to digital form and placed on optical disks for use in electronic classification and combined text classification searches. Subsequently, the remaining patents were captured. These patents will be written to optical disk and loaded on APS before APS-Image can be deployed to the remaining patent examining groups and the public. Through exchange agreements with the European and Japanese Patent Offices, European patents issued since 1920 and all Japanese patents have been or will be converted to a common facsimile standard and key patents will be entered for on-line retrieval.

On-line access to the full-text of all U.S. patents granted after 1974 and the English language abstracts of Japanese and Chinese patents — a data base of more than two million records representing about 52 gigabytes of data — was deployed to the patent examining staff beginning in June 1986. Access to this full-text data base (APS-Text) permits examiner to search the text of more than one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process. Searches are conducted from single screen text terminals located throughout the Office, supported by a NAS-9080 dual processor. The APS-Text capability is ready for deployment to the public in the Patent Public Search Room.

The PTO intends to enter the text of U.S. patents issued after 1970.

To fulfill its mission to disseminate information and to guide the management of its electronic information resources, on June 8, 1984, the PTO issued guidelines and policies for dissemination and distribution of electronic patent data. These were published in 49 *Federal Register* 2485 (June 14, 1984). Subsequently, the Office of Management and Budget issued revised policies and expanded guidelines for electronic data dissmemination in OMB Circular A-130 dated December 1985 and entitled "Management of Federal Information Resources."

On August 20, 1987, PTO published in 52 *Federal Register* 31442 a notice (1) to inform the public of the PTO's intention to amend its pricing policy for data base products, and to expand the scope of its dissemination policies and guidelines to encompass patent and trademark electronic data; (2) to explain the current situation with regard to public access to automated patent and trademark search rooms and libraries; and (3) to solicit public comments on the intended proposals.

On December 10, 1987, PTO published in 52 *Federal Register* 46815 a notice amending the pricing policy for data base products and expanding the scope of the policies and guidelines to encompass patent and trademark data. That notice also extended the period to December 31, 1987, for receiving public comments on alternatives for funding public access to patent or trademark search rooms or libraries.

On June 23, 1988, PTO published in 53 *Federal Register* 23677 a notice informing the public of its intention to publish a comprehensive edition of the policies and guidelines to replace the versions published in the June 14, 1984 and December 10, 1987 notices.

In that notice, the PTO also published a summary of the comments received on the three alternatives for financing public access to the automated search systems in PTO's public search rooms and libraries. Subsequently, Public Law 100-703 was enacted on November 19, 1988. The law allows the Commissioner of Patents and Trademarks to establish reasonable fees for access by the public to the automated search systems.

Response to Comments

Comment: If user fees are established for public access to the automated patent and trademark systems, will those fees also be charged by the Patent Depository Libraries (PDLs)?

Response: Arrangements will be worked out between the PTO and individual libraries for providing access to the automated search system. Arrangements will depend on each library's authority to collect user fees for the service on their own or the PTO's behalf. Fees for access in PDLs would be adjusted to account for any different equipment costs, maintentance and added telecommunications costs.

Comment: How would PDLs administer the free access provision of Public Law 100-703?

Response: Based on PTO's policy for administering this provision, arrangements would be worked out with individual libraries.

Comment: One respondent asked if PTO conducted a study to determine the potential demand in PDLs for trademark information and patent information.

Response: Several surveys on the demand for patent and trademark information have been conducted which provide unofficial indications to the PTO for the need for patent and trademark information. Reports to the PTO indicate that the demand for trademark information is increasing.

Comment: One respondent wanted clarification of what will ultimately be available to the PDLs — paper, microfilm, electronic data.

Response: The form of the patent and trademark information in each PDL ultimately will depend on decisions made between the PTO and individual PDLs and the technology and economics of remote access for providing access to the automated search systems.

Comment: If PTO contracts for the provision of public access, who owns the PTO data base?

Response: The PTO will continue to own the PTO data base.

Comment: One respondent claimed that section B is inconsistent with OMB Circular A-130 and that the order of sub-paragraphs B(1) and B(2) should be reversed.

Response: Section B relates only to the PTO search facilities and PDLs. This policy is consistent with OMB Circular A-130 by providing an information "safety net" to the public through the dissemination of information in the search facilities and libraries. PTO states in paragraph F that, outside the search facilities and libraries, it will encourage the private sector to offer commercial patent and trademark search and retrieval services, and it will not compete with the private sector.

Sub-paragraphs B(1) and B(2) state that PTO will choose the most efficient means for providing search and retrieval services in its search facilities and PDLs, directly and/or through a contractor.

Comment: One respondent suggested that there might be misunderstanding between sections C and E.

Response: Section C specifically refers to commercial data bases whereas section E refers to PTO-owned data bases.

Comment: In section D, what does the term "existing collections in the PDLs" mean?

Response: In the June 23, 1988 edition of the *Federal Register*, the reference to "existing collections" meant the collections held by each individual library. Collections vary from library to library, and acquistion of collections is up to each individual PDL. Section D has been revised because section 104(c) of Public Law 100-703 allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

Comment: Section E provides for the possibility that a commercial search and retrieval service could be substituted for the PTO automated systems in the PDLs. Would the PDLs be required to absorb the cost?

Response: Arrangements would be worked out between the PTO and each individual library and would depend on the library's ability to provide commercial services on its premises.

Comment: One respondent asked for a brief explanation of OMB Circular A-76, entitled "Performance of Commercial Activities."

Response: The A-76 process enhances quality and efficiency by using competition to select the most cost-effective operation to perform a service. It requires that studies be conducted to see whether work should be performed by the Government or by industry. This program was formalized in 1955 and, in 1966, the Bureau of the Budget issued the policy as Circular No. A-76.

Comment: One respondent suggested that the word "indirectly" in section F should be removed since there already are many private trademark search enterprises. Another respondent suggested that the word "encouraged" in that same section should be changed to "allowed." A third resondent said that PTO should "directly encourage" the private sector by making its data available in electronic form.

Response: Section F as written expresses how the PTO will indirectly achieve its dissemination goals. No change has been made to the wording.

Comment: One respondent suggested that PTO should not even consider "exclusive" arrangements with regard to the sale of bulk data as suggested by Section H.

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Response: Paragraph H has been changed by deleting the word "normally."
Comment: One respondent suggested that marginal cost recovery described in section I should be limited to commercial entities seeking bulk data.
Response: All cost of goods and services are fully user-fee funded under the terms of OMB Circular A-25, "User Fees."
Comment: Several respondents asked for clarification of the statement that the trademark automated system could be ready for public deployment by September 30, 1988.
Response: Under a proposed rule package entitled Patent and Trademark Automated Search System Fees, the PTO is proposing to provide access to T-Search.
Comment: One respondent asked for clarification and more specificity to the response concerning the PTO's authority to automate PDLs.
Response: Section 13 of title 35, United States Code, authorizes the Commissioner to conduct a patent depository library program for disseminating patent information to the public. The Paperwork Reduction Act of 1980, as amended, 44 USC, chapter 35, requires each Federal agency to "implement applicable government-wide...information policies...with respect to...dissemination of information...and other information resource management functions..." OMB Circular A-130 establishes a Government-wide policy of disseminating Government Information products and services in the manner most cost effective for the Government. Accordingly, the Paperwork Reduction Act would authorize disseminating patent information to the PDLs in some electronic form, in lieu of paper or microfilm, if it is the most cost-effective mode. The authority for providing access to patent and trademark information in the PDLs like that for the Patent Search Room and Trademark Search Library is the authority inherent in various provisions of the patent law other than section 13 such as section 10 of title 35. The PDLs serve as extensions of the PTO for disseminating patent and trademark information in other geographic locations.
Comment: One respondent asked that PTO adhere to Rep. Kastenmeier's instructions reported in 134 Cong. Rec. H9676 (daily ed. Oct 5, 1988) (statement of Rep. Kastenmeier), to follow the letter and spirit of the copyright law regarding nonpatent literature.
Response: The PTO will adhere to the letter and the spirit of the copyright law as it applies to the inclusion of nonpatent literature in the Automated Patent System.

Other Considerations:

The PTO has determined that this notice is not a major rule within the meaning of section 1 (b) of Executive Order 12291. Therefore, a Regulatory Analysis has not nor will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this amended policy statement by the Administrative Procedure Act (5 U.S.C. 553(b) (A)), no initial or final Regulatory Flexibility Analysis has to be or will be prepared. The PTO also has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612. This notice does not contain a collection of information requirement for purposes of the Paperwork Reduction Act.

ELECTRONIC DATA DISSEMINATION POLICIES AND GUIDELINES

Dissemination in Government Public Search Facilities and Depository Libraries

It is the goal of the PTO to achieve effective, widespread dissemination of information concerning patents and Federally registered trademarks to all segments of the U.S. public.

A. The dissemination goal will be accomplished directly by the PTO by providing electronic search and retrieval services to the public in search facilities located in the PTO, in other facilities which may be established by the Government and in Patent Depository Libraries (PDLs). PDLs are Federal, State and local government, university or non-profit organization libraries designated by the PTO to offer public access to patent collections.

B. To the extent funding is authorized and appropriated, search and retrieval services will be provided in the PTO's search facilities and PDL's either:

(1) by the PTO, using its own data bases, computers, communications equipment, and software, and/or
(2) by PTO contractors.

C. Access to commercial data bases that are available to the PTO's examiners, for example industry-specific data bases, will be furnished either through an APS workstation or a terminal furnished by data base vendors in the PTO public search facilities at commercial rates, provided the user has established a commercial account with the data base vendor.

The PTO will not act as an agent for any data base vendor in providing training for, assisting in, or collecting fees for the use of such commercial data bases.

D. Services furnished in the PTO public search facilities and in PDLs will be at no cost to the public for access to paper and microform records. The cost of accessing PTO owned electronic data bases and systems will be recouped from user fees set to recover the marginal costs of such services.

E. The type of service for public search and retrieval, either PTO or commercial services, will be chosen based on the method and criteria established by the 1983 revision to OMB Circular A-76, entitled "Performance of Commercial Activities."

Distribution of PTO Data for Commercial Dissemination

F. In addition to B. and C. above, the PTO will pursue its dissemination goal indirectly by encouraging the private sector to offer commercial patent and trademark search and retrieval services and will seek to avoid competition with private sector firms in providing such services to the public outside the PTO search facilities and PDLs.

G. Fees charged for bulk data developed by the PTO will be based on the marginal cost of providing such distribution services.

H. Arrangements will be non-exclusive. Bulk resale of PTO data will be permitted subject to the terms of each bulk sales agreement.

I. Fees charged to the public for U.S. patent and trademark data products will be based on the marginal cost of providing such products.

J. The PTO will receive non-U.S. electronic patent data through exchange agreements with other patent offices and international intergovernmental organizations. In general, the PTO will not distribute such data, except in conjunction with services that may be provided by the PTO or its contractors in the PTO public search facilities and PDLs. Rather, it will seek to have contractual arrangements established directly between the organization and the commercial data base vendor and will not act as a service agent or representative unless there is a special need that cannot be met otherwise.

Mar. 7, 1989 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1102 TMOG 100]

TRADEMARK PUBLICATIONS

(254) **Separation of the Patent and Trademark Sections of the Official Gazette**

Effective February 2, 1971, the *Official Gazette* will be separated into two parts to be known as the *Patent Official Gazette and the Trademark Official Gazette.*

* * * * *

Orders for subscriptions should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the *Official Gazette* will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the *Official Gazette* will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the *Patent Official Gazette* and the *Trademark Official Gazette* will have identical "Patent Office Notices" sections containing notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

Dec. 29, 1970. WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents

[882 O.G. TM 33]

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(255) **Changes in Format for Publishing Trademarks for Opposition**

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see *Official Gazette* of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the *Official Gazette* of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the *Official Gazette* entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see *Official Gazette* of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

> The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.
> A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.
>
> Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:
>
> Section 1. International classification...Application in more than one class
> Section 2. International classification...Application in one class
> Section 3. Prior United States classification...Application in more than one class
> Section 4. Prior United States classification...Application in one class
>
> The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

Mar. 22, 1974. RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

[921 O.G. TM 122]

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(256) **Change in Official Gazette Entry to Show Cancellation of Fewer Than All Classes in a Multiple Class Registration**

Effective with the *Official Gazette* issue of December 16, 1980, there will be a change in the *Official Gazette* listing entitled "Trademark Registrations Cancelled." Beginning with that issue, "Trademark Registrations Cancelled" will list:

(1) single class registrations cancelled;
(2) multiple class registrations cancelled in all classes;
(3) multiple class registrations cancelled in fewer than all classes.

For every entry in the listing, the specific classes cancelled will be included in parentheses, next to the registration number and mark.

For a single class registration and for a multiple class registration in which every class has been cancelled, the class number(s) shown in parentheses will represent every class to which the registration applied.

For a multiple class registration in which fewer than all classes have been cancelled, the *Official Gazette* entry will include the word "only" following the notation of classes in parentheses, for example: (Int. Cls. 12 and 20, only). In this example, the addition of the word "only" would indicate that there are classes in the registration in addition to Classes 12 and 20, but only Classes 12 and 20 have been cancelled.

Oct. 29, 1980. MARGARET M. LAURENCE,
Assistant Commissioner, for Trademarks.

[1000 TM 21]

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(257) **Single Copies of the Trademark Official Gazette**

Members of the public ordering single copies of the Trademark Official Gazette from the Superintendent of Documents are reminded they must specify the date of the issue being ordered.

The date of the issue in which a mark will be published for opposition is shown on The Notice of Publication form mailed to applicants approximately two weeks before the publication date. This date must be included on each single copy order. Orders received without an issue date may be filled from current weekly stock. The Superintendent of Documents cannot check on whether a particular mark is published in the issue then in stock. If the stock is exhausted at the time the order is received, the order will be returned unfilled.

(258)

MARGARET M. LAURENCE,
Mar. 3, 1981. *Assistant Commissioner for Trademarks.*

[1004 O.G. 36]

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(258) **Inadvertently Issued Registration Numbers**

Effective Jan. 3, 1984, a new sub-section identified as "Inadvertently Issued Registration Numbers" will exist as the last category of cancellations listed under the "Trademark Registrations Canceled" section of the *Official Gazette*.

This new sub-section will provide public notice of the cancellation of registration numbers which have been inadvertently issued by the Patent and Trademark Office.

MARGARET M. LAURENCE,
Nov. 15, 1983. *Assistant Commissioner for Trademarks.*

[1037 TMOG 16]

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(259) **Availability of Patents and Trademarks Style Manual**

The latest edition of Patents and Trademarks Style Manual will be available to the patent and trademark community soon. This edition will be published as a separate supplement to the GPO Style Manual. It is the first revision since 1973, and will be available in looseleaf form. The cover of this supplement is illustrated below:

PATENTS AND TRADEMARKS STYLE MANUAL



A Supplement to the

UNITED STATES GOVERNMENT PRINTING OFFICE
Style Manual

1984

UNITED STATES PATENT AND TRADEMARK OFFICE

Orders are now being accepted by the Superintendent of Documents. The stock number is 003-004-00606-4. Direct inquiries to:

Superintendent of Documents
U.S. Goverment Printing Office
Washington, D.C. 20402

Checks for orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
June 29, 1984. *Assistant Commissioner for Administration.*

[1045 TMOG 3]

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(260) **USTA Publications of Looseleaf Rules of Practice**

The United States Trademark Association has published *US Trademark Law; Rules of Practice, Forms and Federal Statutes*. The book, in looseleaf format to allow for supplements, includes the trademark Rules of Practice, sample forms, the Lanham Act and applicable provisions and cites of other statutes that deal with trademarks and the Patent and Trademark Office. In content and format, the USTA publication generally replaces the Government Printing Office looseleaf edition of the Rules of Practice which has been discontinued.

Information on ordering copies of *US Trademark Law: Rules of Practice, Forms and Federal Statutes* may be obtained from:

The United States Trademark Association
6 East 45th St.
New York, N.Y. 10017
(212) 986-5880

The Government Printing Office continues to publish the Rules of Practice as Title 37, Code of Federal Regulations, every July. Effective July 1, 1983, however, the CFR edition no longer includes forms.

MARGARET M. LAURENCE,
Apr. 30, 1984. *Assistant Commissioner for Trademark.*

[1042 TMOG 58]

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(261) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent ofDocuments (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. if a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

THERESA A. BRELSFORD,
Aug. 3, 1984. *Assistant Commissioner for Administration.*

[1045 TMOG 24]

(262)

(262) **Notification of Errors in Trademark Official Gazette**

In view of the establishment of in-house photocomposition of the Trademark Official Gazette, it is important that errors noted by the public be directed to a single office within the Trademark Examining Operation for verification and correction.

Written notification of errors in the publication of marks in the Trademark Official Gazette should include the correspondent's telephone number and should be addressed to the Paralegal Specialist, Office of the Deputy Assistant Commissioner for Trademarks, United States Department of Commerce, Patent and Trademark Office, Washington, D.C. 20231. Error notification may also be done by telephone to the Paralegal Specialist in the Office of the Deputy Assistant Commissioner for Trademarks, at 202-557-3268.

Applicants may use this procedure to notify the Office of errors in relation to marks published in the Official Gazette if the error is purely clerical (e.g. typographical error, drawing printed upside down, or incorrectly stated data). This procedure should not be used to dispute information that is actually of record in the application file. The Paralegal Specialist will review the notification of error and verify the existence of the clerical error, determine whether the error can be corrected without jurisdiction being restored to the Examining Attorney or republication being required, and coordinate the appropriate correction procedure.

Notification must be received by the Office within one week after the Official Gazette publication date to permit processing by the Office.

MARGARET M. LAURENCE
Apr. 11, 1985. *Assistant Commissioner for Trademarks.*

[1054 TMOG 4]

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(263) **Subscription Pricing Information**

The subscription prices on the following publications have been changed as indicated below:

Title: Official Gazette, Patent Section	
First-class domesitc mailing	$384.00
Fourth-class domestic mailing	270.00
Fourth-class foreign mailing	337.50
Single copies each, domestic	18.00
Single copies each foreign	22.00
Title: Official Gazette, Trademark Section	
First-class domestic mailing	246.00
Surface mailing, foreign	307.50
Single copies each, domestic	7.00
Single copies, foreign	8.75

This change is effective with Government periodicals and Subscription Services Price List 36, dated Summer, 1986.

Foreign first-class mailing rates will be furnished upon request. Direct all inquiries and subscription requests to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for subscription orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number and expiration date. Subscriptions can also be charged to your Master Charge or VISA, include your Account Number and expiration date.

This notice supersedes the notice published June 10, 1986, at 1067 OG 12, and 1067 TMOG 13.

THERESA A. BRELSFORD,
June 25, 1986. *Assistant Commissioner, for Administration.*

[1068 TMOG 5]

(264) **Printing of Use in Another Form Claims**

Effective immediately, all claims of prior use of the subject mark in another form contained in applications for Trademark registrations will be printed in the *Official Gazette* and on the registration certificates according to the following formats:

First used in another form on
First used in commerce in another form on

MARGARET M. LAURENCE,
July 15, 1986. *Assistant Commissioner for Trademarks.*

[1069 TMOG 4]

TRADEMARK MISCELLANEOUS

(265) **Recording of Documents Affecting Title**

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

WILLIAM E. SCHUYLER, JR.,
June 16, 1971. *Commissioner of Patents.*

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2]

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(266) **International Protection of Government Emblems and Seals**

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one department seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of Dec. 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by Sept. 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1 1/2 inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6*ter* of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

C. MARSHALL DANN,
Aug. 18, 1976. *Commissioner of Patents and Trademarks.*

Published in 41 F.R. 35741

[950 O.G. TM 114]

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(267) **Recording of "Territorial Assignments" in the Assignment Division of the Patent and Trademark Office**

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

Oct. 7, 1977. BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

[964 TMOG 8]

(268) **Flexible Working Hours**

On Jan. 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:30 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

Dec. 13, 1978. DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[978 TMOG 141]

(269) **THE RETENTION SCHEDULE FOR TRADEMARK RECORDS**

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.	PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Trademark Adversary Proceedings Files. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.	The past schedule to destroy after 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.
Canceled Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after the date of cancellation.
Expired Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after expiration of registration.
Abandoned Trademark Application Files. Consists of original application and all related correspondence.	Destroy 2 years after date of abandonment.
Trademark Renewal Index. Index to trademark registration that are renewed.	PERMANENT. Offer to National Archives when no longer needed for reference.
Indexes to Trademark Applications. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.	
A. Applicant's Index.	PERMANENT. Offer to National Archives when no longer needed for reference.
B. Serial Index.	PERMANENT. Offer to National Archives when no longer needed for reference.
Proceedings Index to Trademark Adversary Proceedings. Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.	Destroy 3 years after termination of the proceeding.

Trademark Adversary Proceeding Records. Card file showing records of Trademark Adversary Proceedings.	PERMANENT. Offer to National Archives when no longer needed for reference.
Trademarks Published in Official Gazette. Clippings of marks from *Official Gazette.*	
a. Those which have been opposed.	*Retain in agency until no longer needed for reference.*
b. All others.	*Destroy when mark is registered.*
Trademark Registrant's Index. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.	PERMANENT. Offer to National Archives when no longer needed for reference.
Class of Goods Index. Card index used to indicate into what class any conceivable goods may fall.	Destroy after information transferred to magnetic media.
Index to Trademark Trial and Appeal Board Cases. Record of trademark trial and appeal board cases.	PERMANENT. Offer to National Archives when no longer needed for reference.
Public Advisory Committee for Trademark Affairs Files.	
a. Agenda, minutes, correspondence, reports and related supporting files.	PERMANENT. Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.
b. Paper and reference materials.	Destroy when 10 years old or no longer needed for reference, whichever is sooner.
Seminar in Trademark Practice and Procedure Files. Record set of training materials used in training trademark examiners.	PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.
Trademark Petitions Files. Petitions to the Commissioner relating to trademarks with related materials.	
a. Original Petitions in trademark case file.	Dispose of with related case file.
b. Other copies.	Destroy when 2 years old.
Trademark Protest Letters. Letters of protest to the Commissioner related to trademarks.	Destroy when no longer needed or when three years old, whichever is earlier.
International Patent and Trademark Activities Case Files. Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.	
a. Records that supplement the International Property Activities Case Files (Item 103).	PERMANENT. Transfer to office responsible for international affairs after case is closed.
b. Other materials.	Destroy 5 years after close of case or sooner if no longer needed.
International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents, trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.	PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Bulky Trademark Specimens. Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state: 1. That they be made of material suitable for being placed inside a manila file wrapper.	Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

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2. That they be capable of being arranged flat, such as being folded.

3. That they be of a size not to exceed 8 1/2 inches wide by 13 inches long. (Rule 2.56).

These requirements provide for specimens which will fit inside the application file wrapper, which is 9 x 14 inches in size and which will conveniently expand to about one inch thickness.

Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.

February 28, 1979.

SAUL LEFKOWITZ,
Acting Assistant Commissioner for Trademarks.

[980 TMOG 16]

(270) **Public Advisory Committee for Trademark Affairs**

Reestablishment

In accordance with the provisions of the Federal Advisory Committee Act 5 U.S.C. App. (1976) and Office of Management and Budget Circular A-63 of Mar. 1974, and after consultation with GSA, it has been determined that the reestablishment of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in Sept., 1970, and its present charter expired on Jan. 10, 1979. Since its inception the purpose of the Committee has been to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the government in the field of trademarks. Approximately seventy-five per cent of the over one hundred twenty-five specific recommendations have been implemented at least in part. There is no question that the Committee has contributed greatly to the efficiency and effectiveness of the administration of the statute. In reviewing the Committee, the Secretary has sought continued effort towards this objective. The Committee's function cannot be accomplished by any organizational element or other committee of the Department.

As it was initially established, the Committee will continue to comprise the members of the Advisory Committee for Trademark Affairs of the United States Trademark Association. The membership is balanced and is under the control of the President of the Association. The Committee will continue to operate in compliance with the provisions of the Federal Advisory Committee Act.

Copies of the Committee's revised charter will be filed with appropriate committees of Congress.

Any inquiries or comments may be addressed to Patricia M. Davis, Committee Control Officer, Office of Trademark Program Control, U.S. Patent & Trademark Office; Washington, D.C. 20231; telephone (703) 557-3881.

Mar. 15, 1979.

GUY W. CHAMBERLIN,
Assistant Secretary for Administration.

[FR Doc. 79-8929; Filed 3-22-79; 8:45 am]

[982 TMOG 14]

(271) **Certified Copies of Trademark Applications/Registrations**

The Trademark Operation is in the process of microfilming its records and, as this proceeds, requests for certified copies of applications and, eventually, registrations, will be furnished from the microfilmed records. Such certified copies will not contain copies of the file jacket.

Jan. 17, 1984.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

[1039 TMOG 140]

(272) **TABLE OF OFFICIAL GAZETTE VOLUME NUMBERS: 1872-1990**

A table which relates volume numbers of the Official Gazette comprising collections of weekly issues of that publication to the month of their publication has found good use in the Patent and Trademark Office and Patent Depository Libraries in a variety of applications. The need for such a table arises, in part, from the fact that Official Gazette volumes have not been uniformly numbered on a monthly basis over the 110 year history of that publication. From Jan. 1872 through June 1883, they were numbered on a semi-annual basis; from July 1883 through Dec. 1902, quarterly; from Jan. 1902 through Dec. 1908, bi-monthly; and since Jan. 1909, the volume of issues for each month has been separately numbered. To fulfill the interest which has been expressed in this table, it is published below:

TABLE OF OFFICIAL GAZETTE VOLUME NUMBERS: 1872–1990

A table which relates volume numbers of the Official Gazette comprising collections of weekly issues of that publication to the month of their publication has found good use in the Patent and Trademark Office and Patent Depository Libraries in a variety of applications. The need for such a table arises, in part, from the fact that Official Gazette volumes have not been uniformly numbered on a monthly basis over the 110 year history of that publication. From Jan. 1872 through June 1883, they were numbered on a semi-annual basis; from July 1883 through Dec. 1902, quarterly; from Jan. 1902 through Dec. 1908, bi-monthly; and since Jan. 1909, the volume of issues for each month has been separately numbered. To fulfill the interest which has been expressed in this table, it is published below:

Calendar Table of Official Gazette Volume Numbers
Month-by-Month Volume Numbers: Jan. 1872 to Present

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1872*	1	1	1	1	1	1	2	2	2	2	2	2
1873	3	3	3	3	3	3	4	4	4	4	4	4
1874	5	5	5	5	5	5	6	6	6	6	6	6
1875	7	7	7	7	7	7	7	8	8	8	8	8
1876	9	9	9	9	9	9	10	10	10	10	10	10
1877	11	11	11	11	11	11	12	12	12	12	12	12
1878	13	13	13	13	13	13	14	14	14	14	14	14
1879	15	15	15	15	15	15	16	16	16	16	16	16
1880	17	17	17	17	17	17	18	18	18	18	18	18
1881	19	19	19	19	19	19	20	20	20	20	20	20
1882	21	21	21	21	21	21	22	22	22	22	22	22
1883*	23	23	23	23	23	23	24	24	24	25	25	25
1884	26	26	26	27	27	27	28	28	28	29	29	29
1885	30	30	30	31	31	31	32	32	32	33	33	33
1886	34	34	34	35	35	35	36	36	36	37	37	37
1887	38	38	38	39	39	39	40	40	40	41	41	41
1888	42	42	42	43	43	43	44	44	44	45	45	45
1889	46	46	46	47	47	47	48	48	48	49	49	49
1890	50	50	50	51	51	51	52	52	52	53	53	53
1891	54	54	54	55	55	55	56	56	56	57	57	57
1892	58	58	58	59	59	59	60	60	60	61	61	61
1893	62	62	62	63	63	63	64	64	64	65	65	65
1894	66	66	66	67	67	67	68	68	68	69	69	69
1895	70	70	70	71	71	71	72	72	72	73	73	73
1896	74	74	74	75	75	75	76	76	76	77	77	77
1897	78	78	78	79	79	79	80	80	80	81	81	81
1898	82	82	82	83	83	83	84	84	84	85	85	85
1899	86	86	86	87	87	87	88	88	88	89	89	89
1900	90	90	90	91	91	91	92	92	92	93	93	93
1901	94	94	94	95	95	95	96	96	96	97	97	97
1902	98	98	98	99	99	99	100	100	100	101	101	101
1903*	102	102	103	103	104	104	105	105	106	106	107	108
1904	108	108	109	109	110	110	111	111	112	112	113	113
1905	114	114	115	115	116	116	117	117	118	118	119	119
1906	120	120	121	121	122	122	123	123	124	124	125	125
1907	126	126	127	127	128	128	129	129	130	130	313	131
1908	132	132	133	133	134	134	135	135	136	136	137	137
1909*	138	139	140	141	142	143	144	145	146	147	148	149
1910	150	151	152	153	154	155	156	157	158	159	160	161
1911	162	163	164	165	166	167	168	169	170	171	172	173
1912	174	175	176	177	178	179	180	181	182	183	184	185
1913	186	187	188	189	190	191	192	193	194	195	196	197
1914	198	199	200	201	202	203	204	205	206	207	208	209
1915	210	211	212	213	214	215	216	217	218	219	220	221
1916	222	223	224	225	226	227	228	229	230	231	232	233
1917	234	235	236	237	238	239	240	241	242	243	244	245
1918	246	247	248	249	250	251	252	253	254	255	256	257
1919	258	259	260	261	262	263	264	265	266	267	268	269
1920	270	271	272	273	274	275	276	277	278	279	280	281
1921	282	283	284	285	286	287	288	289	290	291	292	293
1922	294	295	296	297	298	299	300	301	302	303	304	305
1923	306	307	308	309	310	311	312	313	314	315	316	317
1924	318	319	320	321	322	323	324	325	326	327	328	329
1925	330	331	332	333	334	335	336	337	338	339	340	341

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Calendar Table of Official Gazette Volume Numbers
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Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1926	342	343	344	345	346	347	348	349	350	351	352	353
1927	354	355	356	357	358	359	360	361	362	363	364	365
1928	366	367	368	369	370	371	372	373	374	375	376	377
1929	378	379	380	381	382	383	384	385	386	387	388	389
1930	390	391	392	393	394	395	396	397	398	399	400	401
1931	402	403	404	405	406	407	408	409	410	411	412	413
1932	414	415	416	417	418	419	420	421	422	423	424	425
1933	426	427	428	429	430	431	432	433	434	435	436	437
1934	438	439	440	441	442	443	444	445	446	447	448	449
1935	450	451	452	453	454	455	456	457	458	459	460	461
1936	462	463	464	465	466	467	468	469	470	471	472	473
1937	474	475	476	477	478	479	480	481	482	483	484	485
1938	486	487	488	489	490	491	492	493	494	495	496	497
1939	498	499	500	501	502	503	504	505	506	507	508	509
1940	510	511	512	513	514	515	516	517	518	519	520	521
1941	522	523	524	525	526	527	528	529	530	531	532	533
1942	534	535	536	537	538	539	540	541	542	543	544	545
1943	546	547	548	549	550	551	552	553	554	555	556	557
1944	553	559	560	561	562	563	564	565	566	567	568	569
1945	570	571	572	573	574	575	576	577	578	579	580	581
1946	582	583	584	585	586	587	588	589	590	591	592	593
1947	594	595	596	597	598	599	600	601	602	603	604	605
1948	606	607	608	609	610	611	612	613	614	615	616	617
1949	618	619	620	621	622	623	624	625	626	627	628	629
1950	630	631	632	633	634	635	636	637	638	639	640	641
1951	642	643	644	645	646	647	648	649	650	651	652	653
1952	654	655	656	657	658	659	660	661	662	663	664	665
1953	666	667	668	669	670	671	672	673	674	675	676	677
1954	678	679	680	681	682	683	684	685	686	687	688	689
1955	690	691	692	693	694	695	696	697	698	699	700	701
1956	702	703	704	705	706	707	708	709	710	711	712	713
1957	714	715	716	717	718	719	720	721	722	723	724	725
1958	726	727	728	729	730	731	732	733	734	735	736	737
1959	738	739	740	741	742	743	744	745	746	747	748	749
1960	750	751	752	753	754	755	756	757	587	759	760	761
1961	762	763	764	765	766	767	768	769	770	771	772	773
1962	774	775	776	777	778	779	780	781	782	783	784	785
1963	786	787	788	789	790	791	792	793	794	795	796	797
1964	798	799	800	801	802	803	804	805	806	807	808	809
1965	810	811	812	813	814	815	816	817	818	819	820	821
1966	822	823	824	825	826	827	828	829	830	831	832	833
1967	834	835	836	837	838	839	840	841	842	843	844	845
1968	846	847	848	849	850	851	852	853	854	855	856	857
1969	858	859	860	861	862	863	864	865	866	867	868	869
1970	870	871	872	873	874	875	876	877	878	879	880	881
1971	882	883	884	885	886	887	888	889	890	891	892	893
1972	894	895	896	897	898	899	900	901	902	903	904	905
1973	906	907	908	909	910	911	912	913	914	915	916	917
1974	918	919	920	921	922	923	924	925	926	927	928	929
1975	930	931	932	933	934	935	936	937	938	939	940	941
1976	942	943	944	945	946	947	948	949	950	951	952	953
1977	954	955	956	957	958	959	960	961	962	963	964	965
1978	966	967	968	969	970	971	972	973	974	975	976	977
1979	978	979	980	981	982	983	984	985	986	987	988	989
1980	990	991	992	993	994	995	996	997	998	999	1000	1001
1981	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013
1982	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
1983	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037
1984	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049
1985	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061
1986	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073
1987	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085
1988	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097
1989	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109
1990	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121

• SUMMARY OF CHANGES IN VOLUME NUMBERING.

Semi-annual:	*Jan. 1872 through Jun. 1883*
Quarterly:	*Jul. 1883 through Dec. 1902*
Bi-monthly:	*Jan. 1903 through Dec. 1908*
Monthly:	*Jan. 1909 to the present*

The *Official Gazette* was published on successive Wednesdays from 3 Jan. 1872 through 17 Jan. 1872. From 23 Jan. 1872 to the present, it has been published weekly on Tuesday.

(273) Proposed Records Control Schedule

As with most government agencies, the Patent and Trademark Office periodically updates the schedule it uses to dispose of old files, papers and records. Set forth below is a recent update of the Patent and Trademark Office's Records Control Schedule. The schedule is currently being reviewed by the National Archives and Records Administration and, following its approval, will constitute the basis for disposing of Patent and Trademark Office records.

Any comments or questions related to the proposed schedule should be directed to John Hassett, (703) 557-0183. Written comments should be mailed to:

John Hassett, Director
Patent and Trademark Office
Crystal Plz. 1, Lobby
Washington, D.C. 20231

THERESA A. BRELSFORD,
June 17, 1986. *Assistant Commissioner for Administration.*

Commissioner's and Deputy Commissioner's Records

1. *Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Tradmark Office staff; reports; special investigations and survey reports; and related materials. (See index under Item 3).
PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.

2. *Reports to the Commissioner.* Reports received by the Commissioner from the Patent and Tradmark Office staff and maintained as separate series.
PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.

3. *Index to Commissioner's Correspondence and Subject Files.* Card index to records described under Item 1.
PERMANENT. Transfer to Federal Records Center with related files. Offer to National Archives with related files.

4. *Deputy Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff, with related materials (exclusive of records retained in Item 1).
PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.

5. *Policy Documentation Files.* Formal policy and procedural issuances, current and obsolete, such as organizational charts, regulations, orders, circulars, manuals, and other types of directives, with related forms, recommendations, endorsements, clearances and comments.
PERMANENT. Transfer to FRC when obsolete. Offer to National Archives when 25 years old.

6. *Work-Flow Control and/or Statistical Reports Files.* Various periodic statistical reports used to show the flow of work through the Patent and Trademark Office and the printers, such as PALM, TRAM, PMS Statistical Reports on Patents to printers, and similar reports.
Destroy when 5 years old or sooner if no longer needed.

7. *Production and Pendency Reports Files.* Quarterly, monthly, and biweekly statistical reports prepared to show the production and quality output of examiners and clerks and the status of the assigned projects. Reports are mainly used to evaluate the efficiency of personnel for promotion purposes.
a. Office of Assistant Commissioners or equivalent.
Transfer to FRC when 5 years old. Destroy when 10 years.
b. Other Offices.
Destroy when updated report is received.

8. *Special Studies Files.* Report on special studies surveys, and inspections of operations, management and systems with related papers showing their inception, scope, procedure and results.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.

9. *Narrative and Statistical Reports Files.* Annual or other periodic narrative and statistical reports.
a. Reports to the Office of the Commissioner and the Offices of the Assistant Commissioners.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 25 years old.
b. Other Offices.
Destroy when 5 years old.

10. *Internal Administrative Files.* Administrative operations files of organizational offices, consisting of:
a. Correspondence concerning routine or temporary internal administrative matters.
Destroy when 2 years old.
b. Office personnel files.
Destroy after separation of employee.
c. Completed requisitions for services, supplies and equipment, and travel documents.
Destroy 1 year after action is completed.
d. Records pertaining to charity drives, bond campaigns, blood donations, and other voluntary activities.
Destroy on completion of program.
e. Hand receipt files.
Destroy when property is accounted for.
f. Suspense files.
Destroy when purpose is served.
g. Chronological files.
Destroy when 2 years old.

11. *Program Planning and Evaluation Files.* Files showing the overall development of Patent and Trademark Office plans and the evaluation of their effectiveness. Included are one copy of each staff study, evaluation report, system study, and related correspondence and background materials.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

12. *Surplus Property Case Files.* Case files on disposal of surplus real and related personal property.
Transfer to FRC 3 years after close of file. Destroy 10 years after close of file.

13. *Excess Real Property Reports.* Reports of real property with related papers.
Destroy when 10 years old.

14. *Budget Policy and Procedure Correspondence Files.* Correspondence files showing Patent and Trademark Office policy and procedure governing budget administration, and reflecting expenditures for Patent and Trademark Office programs.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.

15. *Budget Estimates Files.* File copies of budget estimated comprising appropriation language sheets, narrative statements, and related schedules and data.
PERMANENT. Transfer to FRC after 10 years. Offer to National Archives when 25 years old.

16. *Records Disposition Files.* Descriptive inventories, disposal authorizations, schedules for retirement of records and correspondence or memoranda relating to revisions.
PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

17. *Forms Files.* One copy of each form with data showing the inception and scope of the form, the program or administrative purpose of the form, and the related procedure instituted, revised, superseded, or canceled.
PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

18. *Systems Development Program Files.* Program documents, schedules, and correspondence pertaining to the execution, review, and analysis of Patent Office research and development programs, and relating to the general planning and supervision of the programs.
PERMANENT. Transfer to FRC 5 years after completion to program. Offer to National Archives 20 years later or when 25 years old, whichever is sooner.

19. *Systems Development Task Force, Committee, and Board Files.* Agendas, directives, minutes of meetings, and related papers, of Task Forces, Committees, Board, etc. of which the Patent Office serves as Secretary, or Chairman thereof.
PERMANENT. Transfer to FRC 5 years after close of file. Offer

to National Archives 20 years later or after 25 years old, whichever is sooner.

20. *Technical Report Files*. One copy of each technical report of unpublished manuscript or report prepared in connection with a project, terminal narratives, statistical and graphic complications, summarizations, analyses, and related papers.
PERMANENT. Transfer to FRC when 5 years old. Offer to National Archives when 25 years old.
21. *Systems Development Project Case Files*. Project case files reflecting a complete history of each project from initiation through research, development, design, and testing to completion.
PERMANENT. Transfer to FRC 5 years after completion or termination of project. Offer to National Archives when 25 years old.

ADP Records
(also in GRS 20)

22. *ADP Planning Documents Files*. Planning documents consisting of master plan, feasibility studies with associated charts and diagrams, and supporting data that reflect on characteristics of the data automation activity.
PERMANENT. When no longer needed or used offer to National Archives with related materials.
23. *ADP Program Management Files*. Program management documents consisting of the development of plans, policy, and procedures governing the conversion of electrical machine operations and the supervision, control, coordination, and operation of the mechanization program.
PERMANENT. Offer to National Archives with related materials.
24. *ADP Standardizations Files*. Standardization files consisting of data elements and codes, standardization requests, and jusification for all data systems developed by or for the Patent Office.
PERMANENT. Offer to National Archives with related materials.
25. *ADP Data Systems Planning Files*. Documents containing definition of the system.
PERMANENT. Offer to National Archives with related materials.
26. *ADP Information Retrieval System Master Reference File*. Magnetic media containing an index to patents and trademarks and publications.
PERMANENT. Offer to National Archives on termination of Patent and Trademark Office.
27. *Publication Tape File*. Magnetic media which are reproduced and disseminated as publication or used for reproducing a printed publication.
PERMANENT. Offer to National Archives when publication needs cease.

Patent Records

28. *Advertising Files*. Copies of proposed advertising matter, circulars, letters, cards, and related correspondence intended to solicit patent business and submitted by registrants as required by regulations.
Destroy when 25 years old.
29. *Complaint Files*. Case files relating to complaints made against attorneys registered to practice before the Patent Office.
Destroy on death of attorney.
30. *Board of Appeals Decisions Files*. Copies of Board of Appeals decisions with related background materials.
a. Cases patented.
Destroy 10 years after patent issued.
b. All others.
Destroy 10 years after appeal is decided.
31. *Indexes to Appeal Cases*. Indexes, arranged in various ways, to the appeal cases.
Destroy 30 years after date of appeal.
32. *Declaration of Assistance Received Files*. Form received from applicants showing assistance received, if any, in the preparation of application for patent (PTOL-284).
33. *Academy Lecture Files*. Lectures prepared by the Staff for presentation at the Academy. (These lectures are updated periodically to reflect the changing views of the Patent and Trademark Office)
a. Historical Sample
PERMANENT. Retain 1 copy of each basic lecture and of any major changes made to it. Offer to NARS when 25 years old.
b. All other copies.
Destroy when obsolete.
34. *Academy Training Sessions Files*. Background materials relating to each session of the Patent Office Academy, including names of attendees and instructors, schedule of classes, evaluation sheets, and related materials.
PERMANENT. Offer to National Archives when 25 years old.
35. *Academy Examinations Files*. Completed examinations of persons attending the Academy.
Destroy when 1 year old.
36. *Academy Application Files*. Applications for training in the Academy, including memoranda of agreement and personal history statements.
Destroy when 2 years old.
37. *Academy Correspondence File*. Correspondence relating to the courses offered by the Patent Office Academy.
Destroy when 5 years old.
38. *Disclosure Document File*. Documents submitted by inventors as evidence of the date of conception of an invention.
a. Disclosure Documents referred to in a separate letter in a related patent application filed within two years.
Dispose of with related patent application.
b. Disclosure Documents *not* referred to.
Destroy when 2 years old.
39. *Disclosure Documents Index*. Cross-reference index to Disclosure Documents maintained by inventor's name and includes DD number and date of receipt.
Destroy with related DD's.
40. *Index to Patents Available for License or Sale*. Index created when a patent is made available for license or sale, issued to the U.S. Government or dedicated to the Public.
Destroy when no longer needed for reference.
41. *General Correspondence File*. Consists mainly of inquiries and requests for information and publications. Also includes correspondence regarding the "Register of Patents Available for License or Sale."
Destroy when 3 years old.
42. *Foreign Filing Licensing Documents*. Petitions to the Commissioner of Patents and Trademarks for license to file applications for patents in foreign countries.
Destroy 25 years after date of issue.
43. *Indexes to Foreign Filing Licensing Documents*. Indexes to licensing documents described in Item 43.
Destroy 25 years after issue.
44. *Transmittals to Other Agencies Files*. Copies of transmittal letters to other agencies enclosing correspondence and related enclosures sent to the Patent and Trademark Office for services rendered by other agencies, such as copyright information and requests for publications from the Government Printing Office.
Destroy when 1 year old.
45. *D-I Files*. Files relating to patent applications which may have a bearing on national security. Files usually consist of form listing serial number of application filing date, examining unit, title of invention, attorney assignee, and the concurrences listing the recommendation, signature, agency, and date; a memorandum summary indicating whether a secrecy order is required; the defense agency's request for a secrecy order; the secrecy order issued; and related materials.
Destroy 35 years after date of receipt for review.
46. *Drawing Correction Slips*. Index arranged by serial number of application and used to locate orders for correction of drawings.
Destroy when 2 years old.
47. *Inventor's Index to Patent Applications*. Index arranged alphabetically by name of the inventor. Each slip shows the inventor's name and residence, title of the invention, name and address of the attorney, application serial number and the filing date of the application.
PERMANENT. Offer to National Archives when no longer needed for reference.
48. *Numerical (serial) Index to Patent Applications*. Index arranged by the serial number assigned to the application.
PERMANENT. Offer to National Archives when no longer needed for reference.
49. *Assignment Document Files and Index*. Copies of documents assigning and transferring from one party to another the rights, title, and interest to trademarks and inventions and the letters patent obtained therefrom with related indexes.
PERMANENT. Offer to the National Archives when no longer needed for current business.
50. *Indexes to Government Interests*. Indexes to patents in which the Federal government has an interest by virtue of either of ownership of the application or resulting patent, thru assignment, or receipt of a license.
a. Government Agency Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Patent Number Index.
Destroy when no longer needed for reference.
c. Assignor Index.
Destroy when no longer needed for reference.
51. *Petitions to the Commissioner*. Petitions to the Commissioner concerning patent applications.
a. Original petitions in patent case file.
Dispose of with related case file.
b. Other copies.
Destroy when 2 years old.
52. *Patent Protest Letters*. Protest to the grant of a patent (Rule 291).
a. Letters filed in patent case file.
Dispose of with related case file.
b. Others.
Destroy when 5 years old.
53. *Patent Docket Cards*. Cards used to control patent applications.
Destroy when 6 months old.
54. *Classifications Definitions Files*. One copy of each issuance of *Classifications Definitions*, with related background papers.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
55. *Canceled Drawings*. Drawings that were canceled because they did not meet Patent and Trademark Office specifications. Copy of drawing is filed with application.
Destroy 5 years after filing date.
56. *Abandoned Patent Application Files*. Patent applications that did not result in a patent.
a. Those that are retained because they are referred to in another application that may have become patented.
Dispose of with patent file in which cited.
b. All others.
Destroy when 20 years old.
57. *Patent Files*. Case files showing the prosecution of application for, and the granting of, a patent. Includes the original application, copy of drawing, and all material relating to the prosecution of the application and subsequent actions by the Patent and Trademark Office.
a. Files selected by the Commissioner of Patents and Trademarks or the Archivist of the U.S.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
b. All others.
Destroy when 35 years old.
58. *Patent File Charge-out Records*. Record showing name of person charging out a patent file.
Destroy after file is returned and all papers are determined to be in file.
59. *Statistical Reports on Patents to Printers Files*. Weekly statistical report to management concerning the number of patents sent to the printers and the amount of backlog.
a. Original Report.
Destroy when 5 years old.
b. Operating Unit Copy.
Destroy when 2 years old.
60. *Quality Review of Sample of Allowed Applications*. Records relating to the examination of allowed applications sampled for quality review, includes query to the examining group and their reply.
Destroy 1 year after ultimate disposition of related case.
61. *Sample Pull-Rate Files*. Form showing which of the allowed applications are to be selected for the quality review sample, includes the pull rate and list of applications by serial number.
Destroy when 1 year old.
62. *Printer-Waiting Register Files*. Register showing status of Query Disposition Records return to a group for reply.
Destroy when 1 year old.
63. *Query Disposition Record Files*. Form used to return printer-waiting cases to a group for answer to a specific query.
Destroy 6 months after query is returned.
64. *Batch Control Sheet for Allowed Cases Files*. Form uses as input to PALM System showing routing control and batch contents, such as PTO Form 1238-1.
Destroy when 1 year old.
65. *Checklist for Applications Allowed by Examiner File*. Form used in completing a final review of allowed applications before sending to the printer, such as PTO Form 1167.
Destroy when 1 year old.
66. *Patent Interference Files*. Case files produced in the process of resolving of adjudicating conflicts arising between parties in this matter of priority of invention.
a. Cases that reach the hearing stage.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
b. Cases that are abandoned before reaching a hearing.
Destroy when 40 years old.
67. *Board of Interference Decisions*. Copies of Board of Interference Decisions.
PERMANENT. Offer to the National Archives when 40 years old.
68. *Index to Patent Interferences*. Arranged numerically by interference number. Shows names of parties involved, application serial number and/or patent numbers involved, subject of interference, sections, date of hearings, decisions rendered, and other remarks.
PERMANENT. Offer to National Archives when 40 years old.
69. *Index to Interference Exhibits*. Describes exhibits in each interference.
Destroy when 40 years old.
70. *Proceedings Under AEC and NASA Acts*. Separate series of interference files relating to the SEC and NASA Acts.
Dispose of with related patent files.
71. *Settlement Agreements*. Files relating to the settlement agreed to by parties in the interference.
Dispose of with related interference case file.
72. *Court Cases*. Proceedings in cases where the Commissioner is a party of a civil suit.
a. Cases selected by the Solicitor as being precedent setting or of historical or political significance.
PERMANENT. Offer to the National Archives when 30 years old.
b. All other cases.
Destroy when 30 years old.
73. *Index to Court Cases*. Card index to cases described under Item 72.
Retain in agency until no longer needed for reference.
74. *Roster of Registered Patent Attorneys and Agents*. Printout listing registered patent attorneys and agents.
Destroy after undated listing is received.
75. *Case Folders of Registered Attorneys and Agents*. Application folders of the attorneys, agents, or firms registered to practice before the Patent and Trademark Office.
Destroy on death of attorney or agent.
76. *Unsuccessful Application for Registration to Practice before the Patent and Trademark Office*. Application folders of those applicants who failed to be registered.
Destroy 5 years after date of examination.
77. *Examination Papers of Applicants for Registration*. Examination answer papers to applications for registration to practice before the Patent and Trademark Office.
Destroy after grades are recorded.

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Trademark Records

78. *Trademark Examiners Work Reports.* Records showing amount of work processed by examiners in a given time. Used to evaluate examiners work and progress.
Destroy when 5 years old.
79. *Trademark Adversary Proceedings Files.* Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.
Destroy when 25 years old. Check with the Chairman of the Trademark Trial and Appeal Board before destruction. General Services should generate a list of files to be destroyed and send to the Search Room to destroy matching cards in Adversary Proceeding file.
80. *Canceled Trademark Registration Files.* Consists of original application and all related correspondence.
Destroy 2 years after the date of cancellation.
81. *Expired Trademark Registration Files.* Consists of original application and all related correspondence.
Destroy 2 years after expiration of registration.
82. *Abandoned Trademark Application Files.* Consists of original application and all related correspondence.
Destroy 2 years after date of abandonment.
83. *Trademark Renewal Index.* Index to trademark registrations that are renewed.
PERMANENT. Offer to National Archives when no longer needed for reference.
84. *Indexes to Trademark Applications.* Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.
a. Applicant's Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Serial Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
85. *Proceedings Index to Trademark Adversary Proceedings.* Index in the Trademark Public Search Library arranged by type of proceeding.
Destroy card from list sent by the Warehouse after matching Adversary Proceeding file is destroyed.
86. *Trademark Adversary Proceedings Records.* Card file maintained at the Trademark Trial and Appeal Board, showing records of Trademark Adversary Proceedings, with information on mark, parties, disposition, termination date, etc.
PERMANENT. Offer to National Archives when no longer needed for reference.
87. *Trademark Registrant's Index.* Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.
PERMANENT. Offer to National Archives when no longer needed for reference.
88. *Index to Trademark Trial and Appeal Board Ex Parte Cases.* Record of Trademark Trial and Appeal Board cases in ex parte appeals.
PERMANENT. Offer to National Archives when no longer needed for references.
89. *Public Advisory Committee for Trademark Affairs Files.* Agenda, minutes, correspondence, reports, working papers, reference materials, and related supporting files.
Destroy when 10 years old or no longer needed for reference.
90. *Trademark Petitions Files.* Petitions and decisions to the Commissioner relating to trademarks, with related materials.
a. Original Petitions in trademark case file.
Dispose of with related case file.
b. Copies of petition decisions in petition number order and in subject order in the Assistant Commissioner's Office.
PERMANENT. Offer to the National Archives when no longer needed for references.
c. Other copies.
Destroy when 2 years old.
91. *Trademark Protest Letters.* Letters of protest to the Commissioner related to trademarks.
Destroy when no longer needed or when three years old, whichever is earlier.

Public Information and Service Records

92. *International Intellectual Property Activities Case Files.* Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.
PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
93. *Proposed Intellectual Property Legislation Files.* Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.
PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
94. *Printed Articles Files.* Articles submitted for clearance and printed in magazines, journals, and other information media, including related background materials.
Destroy when 10 years old.
95. *Public Affairs Report.* Weekly, monthly, and quarterly reports relating to public affairs activities prepared for the Department of Commerce.
Destroy when 6 months old.
96. *Speakers Files.* Correspondence, schedules, travel material and related records concerning the scheduling of Patent and Trademark Office speakers.
Destroy when 3 years old.
97. *Exhibit Files.* Correspondence, photographs, reports and related materials concerning major exhibits developed by the Patent and Trademark Office, such as the 175th anniversary exhibit.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.
98. *Photograph Files.* Photographs of key Patent and Trademark Office officials, major exhibits and other subjects that related to the functioning of the Patent and Trademark Office. Includes the negative and one positive print.
PERMANENT. Offer for transfer to the National Archives when 20 years old.
99. *Publications Files.* Official record copy of each publication that contributes to an understanding of the organization and functioning of the Patent and Trademark Office.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
100. *Speech Files.* Official records copy of each speech given by the Commissioner and other Patent and Trademark Office executives.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.
101. *News Release Files.* Official records copy of each new release.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 30 years old.
102. *Patents Received and Files Register.* Register showing date and number of patent cases received in search room and date filed.
Destroy 2 years after date of last entry in volume.
103. *Reports on Search Room Activities Files.* Weekly, monthly and other periodic reports showing production and general activities of the public search room, with related background papers.
a. Original Report.
Destroy when 1 year old.
b. Operating Office Copy.
Destroy when 2 years old.
104. *Patent and Trademark Reproduction Copy Files.* The master copy of patents and trademarks used for the photoreproduction of sales copies, includes original drawings and specifications.

Transfer to FRC when 10 years old. Destroy when 20 years old.
105. *Reprint Requisition File.* Requisitions, such as PTO Form 228, used for ordering the reprint or printed patents or trademarks after current stock is depleted.
Destroy when 1 year old.
106. *Sales Journal.* Shows statistical information on sales of copies of patents and trademarks.
Destroy when 5 years old.
107. *Correspondence and Sale Control Records.* Records used to control the flow of correspondence and sale of printed materials.
Destroy when 1 year old.
108. *Requests for Publications.* Correspondence requesting copies of certain publications and other printed materials. Return requests with ordered materials.
109. *Microform Files.* Microform copies of applications as filed, printed patent files and printed trademark files.
a. Master microfilm files. (Certified as processed under 41 CFR 101-11.504)
PERMANENT. Transfer to classified site. Offer to National Archives when 25 years old.
b. All other microform copies
Non-Records
110. *Charged-Out Slips File.* Slips recording the charge-out of records to Patent and Trademark Office employees and the public, such as PTO Forms 124, 125, and 271.
Destroy when records are returned.
111. *Binding Instructions.* Cards showing instructions on how the various publications received by the library are to be bound.
Destroy when no longer needed.
112. *Charge-out Files of Library Materials.* Sets of 3"x 5" cards showing records of library materials on temporary or indefinite loan to researchers or Patent and Trademark Office staff.
Destroy when obsolete or on return of book.
113. *Interlibrary Loans Files.* Records of books borrowed from other libraries.
Destroy 2 years after return of book.
114. *Library Serial Order Cards.* 3"x 5" cards used to record purchase of journals, magazines, etc.
Destroy when no longer needed for reference.
115. *Library Book Order Cards.* 3"x 5" cards showing book purchases.
Destroy when no longer needed for reference.
116. *Foreign Patent Accession Register.* Bound volumes arranged by country. Each shows the patent number and the date that copy was received in the Patent and Trademark Office.
Destroy when no longer needed for reference.
117. *Inventor's Index.* Arranged alphabetically by name of inventor. Shows name and address of inventor, title of invention, serial number of application, patent number, date of issuance, attorney, and assignee.
PERMANENT. Offer to National Archives when no longer needed for reference.
118. *PTO Procurement Files.* Contract, requisition, purchase order, lease, and bond and surety records, including correspondence and related papers pertaining to award, administration, receipt, inspection and payment (other than those covered in Items 1, 2, 13, and 15).
a. Procurement or purchase organization copy, and related papers.
1. Transactions of more than $10,000 and all construction contracts exceeding $2,000.
Destroy 6 years and 3 months after final payment.
2. Transactions of $10,000 or less and construction contracts under $2,000.
Destroy 3 years after final payment. (Close file at the end of the fiscal year, retain 3 years and destroy, except that files on which actions are pending shall be brought forward to the next fiscal years's files for destruction therewith.)
b. Obligation copy.
Destroy when funds are obligated.
c. Other copies of record described above used by component elements of a procurement office for administrative purposes.
Destroy upon termination or completion.
119. *Solicited and Unsolicited Bids and Proposals Files.*
a. Successful bids and proposals.
Destroy with related contract case files (see item 118 of this schedule.)
b. Solicited and unsolicited unsuccessful bids and proposals.
1. When filed separately from contract case files.
Destroy when related contract is completed.
2. When filed with contract case files.
Destroy with related contract case files (see item 118 of this schedule.)
c. Cancelled Solicitations Files.
1. Formal solicitations of offers to provide products or services (e.g., Invitations for Bids, Requests for Proposals, Requests for Quotations) which were cancelled prior to award of a contract. The files include presolicitation documentation on the requirement, any offers which were opened prior to the cancellation, documentation on any government action up to the time of cancellation, and evidence of the cancellation.
Destroy 5 years after date of cancellation.
2. Unopened Bids.
Return to bidder.
d. Lists or Card Files of Acceptable Bidders.
Destroy when superseded or obsolete.
120. *Public Printer Files.* Records relating to requisitions on the Printer, and all supporting papers.
a. Printing procurement unit copy of requisition, invoice, specifications, and related papers.
Destroy 3 years after completion or cancellation of requisition.
b. Accounting copy of requisition.
Destroy 3 years after period covered by related account.

Non Record Materials

The Records Disposal Act of 1943, as amended, states that "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included within the definition of the word 'records' as used in this Act." Non-record material is disposed of as soon as its purpose is served. The following list consists of those non-record materials that are unique to the Patent and Trademark Office.
121. *Foreign Patents.* Copies of patents issued by foreign countries.
122. *Translation of Foreign Patents and Publications and Related Indexes.* Typewritten copies of translations and related indexes.
123. *Card Catalogs.* 3"x 5" cards used as finding aids to the library.
124. *Patent Examiner's Search Files.* Reference file used by examiners in processing applications. Arranged by class and subclass and consist of U.S. patents, foreign patents, extracts from publications, and other materials relating to a certain class or subclass.
125. *Printed Trademark Registrations Reference Files.* Digest of Registered marks consisting of a set of registered work marks arranged alphabetically and secondarily by trademark registration number; a set of registrations comprising symbols, arranged according to the classification of the goods or services with which they are used; of registration arranged by registration number.
126. *Numerical Index to Patent Classification.* Arranged numerically by patent number and shows the class and subclass assignment of each patent.
127. *Shelf List of Classified Patents.* Listing of all U.S. Patent numbers comprising, respectively, the "original" and "cross reference" classification of patents according to the official classification of the Patent and Trademark Office.
128. *Public Search Files of U.S. Patents.* Printed or microfilm copies of U.S. Patents arranged in two series: 1) numerically by class and subclass assignment, and secondarily by patent number and 2) numerically by patent number.
129. *Legislative History Files.* Consist mainly of copies of published materials relating to legislation that is of interest to the Patent and Trademark Office. Includes copies of bills, public laws, Federal Register, Congressional Record, and similar materials.

Patent and Trademark Office Records Schedule Index

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[1068 TMOG 5]

(274) **Change in Legal Holidays**

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded in view of Public Law 98-144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC § 6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

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Section 6103, as amended, reads as follows:
New Year's Day, Jan. 1
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May
Independence Day, July 4
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

July 15, 1986. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1069 TMOG 5]

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(275) **Advisory Committee for Patents and Trademarks; Establishment**

In accordance with the provisions of the Federal Advisory Committee Act (5 U.S.C. App. 2.) and General Services Administration Interim Rule on Federal Advisory Committee Management, 41 CFR Part 101-6, as amended, and after consultation with GSA, the Secretary of Commerce has determined that the establishment of the Advisory Committee for Patents and Trademarks is in the public interest in connection with the performance of duties imposed on the Department by law.

1. The Committee will advise the Patent and Trademark Office on broad policy issues involving both patents and trademarks, and the overall operation of the Office including matters concerning office-wide Automation programs.

2. The Committee will consist of at least 10 but no more than 18 members to be appointed by the Assistant Secretary and Commissioner of Patents and Trademarks to assure a balanced representation among patent and trademark attorneys, corporate executives, technical research directors, inventors, the judiciary, professional patent and trademark searchers, information specialists and publishers, automation experts, consumer groups, entrepreneurs, and educators. The Committee will function solely as an advisory body and in compliance with the provisions of the Federal Advisory Committee Act. Its charter will be filed under the Act, 15 days from the date of the publication of this notice.

Interested persons are invited to submit comments regarding the establishment of the Advisory Committee for Patents and Trademarks. Such comments, as well as any inquiries, may be addressed to the Executive Assistant to the Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Department of Commerce, Washington, D.C. 20231, phone: 703- 557-3071, or the Department's Committee Management Analyst, phone: 202-377-4217.

Nov. 14, 1986. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[FR Doc. 86-26451 Filed 11-21-86; 8:45 am]
BILLING CODE 3510-16-M

[1073 TMOG 5]

(276) **Closing of the Patent and Trademark Office on Friday, Jan. 20, 1989**

In view of the fact that Federal and District of Columbia government offices in Washington, D.C. metropolitan area, including the Patent and Trademark Office were officially closed on Jan. 20, 1989, the Patent and Trademark Office will consider Jan. 20, 1989, a "holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purposes of e.g. 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Jan. 23, 1989. Papers deposited in U.S. Department of Commerce District Offices on Jan. 20, 1989, will similarly be considered timely for the purposes of 35 U.S.C. §§119, 133 and 151.

Jan. 6, 1989 DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

[1098 TMOG 552]

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(277) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated May 16,1989**

Copies of the Trademark Official Gazette dated May 16,1989 were not mailed until May 26,1989. Therefore, for marks published in the Trademark Official Gazette dated May 16,1989. Notices of Opposition filed by June 26,1989 will be considered timely.

June 30, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1104 TMOG 24]

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(278) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated May 23, 1989**

Copies of the Trademark Official Gazette dated May 16,1989 were not mailed until May 26,1989. Therefore, for marks published in the Trademark Official Gazette dated May 16,1989. Notices of Opposition filed by June 26,1989 will be considered timely.

June 30, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1104 TMOG 24]

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(279) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated June 27, 1989**

Copies of the Trademark Official Gazette dated June 27,1989 were not mailed until July 7, 1989 Therefore, for marks published in the Trademark Official Gazette dated June 27,1989 Notices of Opposition filed by Aug. 7, 1989 will be considered timely.

July 12, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1105 TMOG 21]

(280) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated July 4, 1989**

Copies of the Trademark Official Gazette dated July 4, 1989 were not mailed until July 11, 1989 Therefore, for marks published in the Trademark Official Gazette dated July 4, 1989 Notices of Opposition filed by Aug. 10, 1989 will be considered timely.

August 16, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1106 TMOG 12]

(281) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated October 17,1989**

Copies of the Trademark Official Gazette dated October 17, 1989, were not mailed until October 24, 1989. Therefore, for marks published in the Trademark Official Gazette dated October 17, 1989, Notices of Opposition filed by November 24, 1989 will be considered timely.

Oct. 25, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1108 TMOG 30]

(282) **Filing of Papers During Unscheduled Closings of the Patent and Trademark Office**

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open. When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Feb. 11, 1987. DONALD W. PETERSON,
Acting Assistant Secretary and Commissioner of Patents and Trademarks.

[1076 TMOG 6]

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SPECIAL GRANT COVERS COMMEMORATING THE BICENNTENNIAL OF THE UNITED STATES CONSTITUTION

The Patent and Trademark Office will use special grant covers depicting a United States Constitution motif on patents issued and trademarks registered beginning June 2, 1987, and continuing through the last seven months of 1987.

The patent covers will be printed in black and blue on off-white paper with a shadow print of the U.S. Constitution document, sealed with a red ribbon and gold seal.

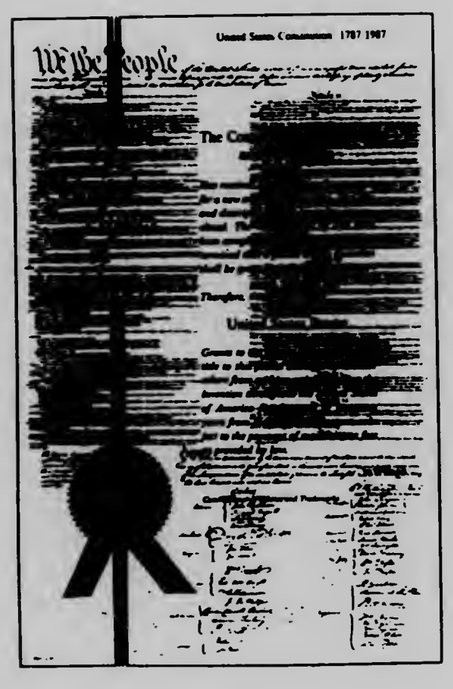
The trademark certificate of registration on the Principal Register covers will be printed in black on off-white paper with a gold eagle and gold seal, and with a shadow print of the U.S. Constitution document. The trademark certificate of registration on the Supplemental Register will be printed in black on yellow paper with a red eagle and red seal, and with a shadow print of the U.S. Constitution document. The trademark certificate of renewal will not be changed.

Reduced size samples of these special covers are illustrated below.

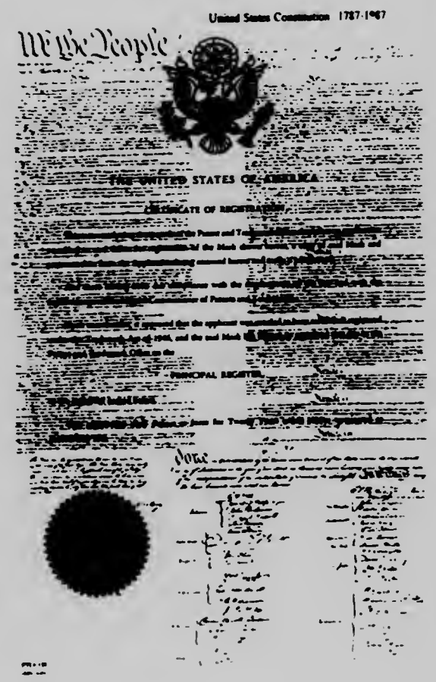
May 13, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commission of Patents and Trademarks.

(patent cover)



(trademark cover)



(284) Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilties and Enforcement Procedures

Agency: Patent and Trademark Office, Department of Commerce
Action: Notice
Summary: The Patent and Trademark Office is revising its regulations relating to use of Patent and Trademark Office records or search facilities and procedures for enforcing these regulations. These regulations and their enforcement are necessary to promote an atmosphere conducive to research and to maintain the integrity of the files and records in the Patent and Trademark Office.
Effective Date: July 1, 1987
For Further Information Contact: Theresa A. Brelsford, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.
Supplementary Information: The procedures will apply to all visitors to the Patent and Trademark Office.

Visitors are reminded that unauthorized removal of government material or property may be prosecuted as a criminal felony under the provisions of 18 U.S.C. 2071, in addition to the imposition of administrative sanctions contained in these procedures.

Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

These regulations are established for all persons using the facilities of the Patent and Trademark Office (PTO), and will be appropriately enforced as specified herein.

Smoking within PTO is prohibited except in designated areas (41 CFR 101-20.109-10).

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge of the General Services Administration which appear in 41 CFR Subpart 101-20.3 (41 CFR §§ 101-20.300 through 101-20.315).

Packages, briefcases and other personal effects brought into the PTO, as well as storage lockers provided for general use, are subject to search by authorized personnel for reasonable cause under the provisions of 41 CFR 101-20.301.

Unauthorized removal of PTO files, documents, reference materials, or any government property is prohibited. In addition to the administrative sanctions specified in these regulations, violators may also be subject to arrest and prosecution under the provisions of 18 U.S.C. 2071 which carries a possible "fine of $2,000 or imprisonment for not more than three years, or both", and/or the violator may be subject to discipline under the PTO Code of Professional Responsibility if he or she is a practitioner as defined in 37 CFR 10.1(r).

All persons must comply with posted Official Notices and with verbal requests made by PTO personnel for compliance with these regulations.

1. User Passes
   a. Individuals visiting any area of the PTO must obtain a valid, non-transferable user pass and wear it visibly displayed at all times while on the premises.
   b. Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first Permanent User Pass is issued at no charge. Permanent User Passes subsequently issued as replacements will be provided at a charge of $5.00 per Pass. The holder of a Permanent User Pass may be issued one (1) Temporary User Pass, within a ninety (90) day period at no charge. A request for a second Temporary User Pass during the same ninety day period will require the purchase of a Permanent User Pass at the required replacement fee.
   c. Temporary User Passes may be obtained by visitors at no charge from the managers of the Patent or Trademark Public Search Rooms and are valid through the expiration date stamped thereon.
   d. Permanent and Temporary User Passes must be surrendered to the PTO upon request for cause.

2. Use of Search Areas
   a. The Patent and Trademark Office facilities may be used by visitors only during the hours specified, Monday through Friday, and are closed to the public on Saturdays, Sundays and Legal Holidays:

Patent Public Search Rm., Mezzanine and Microfilm Center	8:00 a.m....8:00 p.m.*
Trademark Public Search Rm.	8:00 a.m....5:30 p.m.*
Assignment Search Rm., Public Service Center, and Scientific Library	8:30 a.m....5:00 p.m.*
Patent Examining Organizations, Trademark Examining Law Offices and all other public access areas of the PTO	8:30 a.m....5:00 p.m.*

* Clearing of these areas would begin prior to this time to ensure all visitors are out of the building by the time designated.

   b. Materials available for search purposes in the Patent and Assignment Search Rooms and patent application file histories shall not be removed from those areas.
   c. Trademark registrations in the Trademark Search Library shall not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.
   d. Trademark files shall not be removed from PTO space in Crystal Plz. Bldg. 2.
   e. Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.
   f. Visitors to a Patent Examining Group Search Area must register with the designated Group Search Area representative indicating the times entering and leaving the area, User Pass number, and the class(es) and subclass(es) to be searched.
   g. Documents removed from the files of Patent Examining Group search areas must be immediately returned to their proper location after use. Documents shall not be removed from the area in which they were obtained without specific written authorization from a Group Director or Supervisory Patent Examiner in the Examining Group where the material(s) reside. Such authorization will not be given for U.S. Patents and other material readily available through the Scientific Library.

3. PROHIBITIONS
   The following are prohibited:
   a. Conduct which is rude or abusive to PTO employees or others.
   b. Smoking and consumption of food or beverages in other than designated areas.
   c. Loud talking or any conduct which may be disruptive to others.
   d. Use of radios, televisions, typewriters, photographic equipment, dictation equipment and other mechanical, electrical or electronic items without specific authorization from an Assistant Commissioner of the PTO.
   e. Improper use, mutilation, destruction or unauthorized removal of PTO records, documents or government property.
   f. Reserving seats or work areas.
   g. Affixing messages to walls, telephone booths or other government property, except designated message boards.
   h. Use of the PTO as a mailing address, use of PTO stationery, and use of PTO emblem or seal.
   i. Use of PTO telephones and other office equipment, such as copiers, etc., except where specifically provided for public use. This includes the use of PTO telephones to receive incoming calls.
   j. Use of any computer terminal other than the TRAM terminals provided for public use in the Trademark

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Search Library, and the CASPIR and FOUR-PHASE terminals (or CASSIS terminal if the FOUR-PHASE terminals are not operating) provided in the Patent Public Search Room for public use.

k. Placing PTO files or documents, government property or government owned reference materials in rental storage lockers.

l. Use of rental storage lockers without depositing the required fee or holding the key to a storage locker beyond the specified maximum period of use.

[1079 TMOG 7]

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(285) **Procedures for Enforcement of the Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities**

Under applicable statutes and regulations, including 40 U.S.C. 486(c), 41 CFR 101-20.3, and appropriate sections of Department Organization Orders 10-14 and 30-3 of the Department of Commerce, the procedures appearing below are established.

1. Violations involving unauthorized removal of PTO files, documents, records or government property.

a. Each observed or reported violation will be investigated.

b. Persons found in possession of PTO material or government property, other than in areas or under circumstances where possession is specifically authorized, shall be required to immediately surrender the material or property and if appropriate, their User Pass. An oral explanation for the possession of such material or property will be requested by the PTO.

c. Each incident involving unauthorized possession of PTO material or government property shall be immediately reported by telephone or in person to the Office or Group Director of the area from which the material or property was taken.

d. If it appears to the Office or Group Director that possession of the materials was inadvertent or otherwise unintentional, no further action will be taken. The materials will be replaced appropriately and the person's User Pass will be returned.

e. If it appears to the Office or Group Director that possession of the materials was intentional, all persons involved shall be required to submit written statements detailing the circumstances and, in the case of a PTO User/visitor, show cause why the User Pass and visitor privileges should not be suspended or revoked. Statements will also be obtained from other witnesses where appropriate. The material or property shall be secured for possible use as evidence by the Office or Group Director, if appropriate.

f. If the involved person possesses a Permanent User Pass, it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration. A Temporary User Pass may be issued as replacement by the Assistant Commissioner for Administration, pending action on an alleged violation.

g. If the involved person possesses only a Temporary User Pass it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration within two weeks of the incident. No replacement will be provided pending action by the Assistant Commissioner for Administration.

2. Other violations of public use regulations.

a. Each observed or reported violation will be investigated. The persons involved shall be informed of the nature of the violation and requested to comply with regulations.

b. If it appears that the violation was inadvertent or otherwise unintentional and the involved person immediately conforms to the regulations, no further action will be taken.

c. If the violation appears to be intentional or if the person involved refuses to comply with a verbal request from a PTO employee or continues to violate the regulations after being requested to comply, the person shall be required to surrender his or her User Pass to the PTO. A written report of each violation and the User Pass will be submitted to the Assistant Commissioner for Administration for a final decision. User Pass replacement procedures shall be as specified in paragraphs 1.f. or 1.g.

d. If the Assistant Commissioner for Administration determines that a reported violation was inadvertent or otherwise not intentional, the User Pass will be returned and no further action will be taken. In all other cases, the Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass and visitor privileges should not be suspended or revoked.

e. A written decision will be rendered by the Assistant Commissioner for Administration after consideration of any timely submitted response.

f. In the case of a written decision by the Assistant Commissioner for Administration adverse to a practitioner as defined by 37 CFR 10.1(r), a copy of the written decision will be forwarded to the Director of the Office of Enrollment and Discipline for whatever further action, including sanctions, as may be appropriate under the PTO Code of Professional Responsibility.

3. Factors to be Considered in Assessing Penalties.

a. Penalties will be determined on a case by case basis.

b. Prior violations of regulations will be considered when assessing whether any violation is willful, deliberate or intentional, and when determining the penalty to be imposed.

c. Penalties may be assessed as follows, depending on circumstances:

(1) For a first offense: from a written warning to a 30 day suspension of the User Pass and visitor privileges.

(2) For a second offense: a suspension of the User Pass and visitor privileges from 5 days to one year.

(3) For a third or subsequent offense: from a suspension of 30 days to permanent revocation of the User Pass and visitor privileges.

(4) For any single serious or aggravated violation: suspension of the User Pass and visitor privileges for up to one year or permanent revocation of the User Pass and visitor privileges. A serious or aggravated violation is defined as *any instance involving multiple violations of regulations during a single event or acts which also constitute a violation of Federal or local criminal law.*

4. Record of Penalties Imposed.

A record of penalties imposed for given violations will be maintained by the Assistant Commissioner for Administration. These records will be made available to the public upon request.

5. Use of Public Facilities During Suspension or After Revocation of User Pass.

No individual will be permitted to use the facilities specified in these regulations while his or her User Pass is suspended or revoked.

6. Absence of Assistant Commissioner for Administration.

In the absence of the Assistant Commissioner for Administration, the Deputy Assistant Commissioner for Administration will carry out the responsibilities assigned by these regulations.

7. Absence of Designated PTO Officials.

In the absence of any Designated PTO Official, a Deputy or Acting Official will carry out the responsibilities assigned by these regulations.

8. Assistance.

PTO employees may, when necessary, request the Security Officer of the Patent and Trademark Office or the Federal Protective Service or their contractors to provide assistance in carrying out their assigned responsibilities in paragraphs 1. and 2.

9. Appeals.

Decisions rendered by the Assistant Commissioner for Administration may be reviewed on petition to the Commissioner.

May 11, 1987. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

[1079 TMOG 8]

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(286) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 10

[Docket No. 80866-9013]

Requests for Reconsideration in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: This final rule sets forth an amendment to 37 CFR 10.156. The purpose of the amendment is to prescribe a date on which the decision of the Commissioner of Patents and Trademarks in a Patent and Trademark (PTO) disciplinary proceeding becomes final agency action for purposes of judicial review, and to provide for one request for reconsideration or modification of such decision by a party.
Effective Date: Apr. 1, 1989
For Further Information Contact: Harris A. Pitlick by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Present rules do not explicitly provide for requests for reconsideration or modification of Commissioner's decisions in appeals from initial decisions of administrative law judges in PTO disciplinary proceedings. 37 CFR 10.156 presently provides that such a Commissioner's decision is a final agency action.

In a recent case, *Klein v. Peterson*, 6 USPQ 2d 1556 (D.D.C. 1988), a first decision of the Commissioner was withdrawn and ultimately replaced with a second decision. The respondent sought judicial review of the first decision under 35 U.S.C. 32 after its finality had already been withdrawn and then sought judicial review of the second decision. The authority of the Commissioner to, in effect, reconsider his decision in a disciplinary proceeding was challenged in the cited case. The district court held that since there was no express statutory authority proscribing the Commissioner from reconsidering the first decision, there was implicit authority to do so consistent with long-standing precedent in the area of federal administrative law.

While Klein confirmed that the Commissioner has inherent authority to reconsider a decision, at least before an appeal has been noted, the PTO believes that a rule explicitly providing for a time in which requests for reconsideration may be made by a party and a date certain for when Commissioner's decisions in disciplinary proceedings become final will both promote greater certainty in this area of disciplinary proceeding practice and eliminate the possibility of multiple appeals. The final rule is not intended to preclude the Commissioner from sua sponte reconsidering or modifying a decision in a disciplinary proceeding at any time where conditions warrant and a respondent's due process rights are not violated, consistent with long-standing federal administrative law precedent.

A notice of proposed rulemaking was published in the *Federal Register* on Oct. 3, 1988 (53 FR 38740) and the *Official Gazette* on Oct. 25, 1988 (1095 O.G. 44). Interested parties were requested to submit written comments on or before Dec. 1, 1988. No comments were received.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because in merely codifying the inherent right of the PTO to reconsider its decisions *sua sponte*, the rule extends the right to each party in a PTO disciplinary proceeding to seek reconsideration.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National government and the States as outlined in Executive Order 12612.

This rule change does not contain a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

List of Subject in 37 CFR Part 10

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Trademarks.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office amends 37 CFR Part 10 as follows:

PART 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.156 is amended by revising paragraph (a) and adding new paragraph (c) to read as follows:

10.156 Decision of the Commissioner.

(a) An appeal from an initial decision of the administrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Subject to paragraph (c) of this section, a decision by the Commissioner does not become a final agency action in a disciplinary proceeding until 20 days after it is entered. In making a final decision, the Commissioner shall review the record of those portions of the record as may be cited by the parties in order to limit the issues. The Commissioner shall transmit a copy of the final decision to the Director and to the respondent.

* * * * *

(c) A single request for reconsideration or modification of the Commissioner's decision may be made by the repondent or the Director if filed within 20 days from the date of entry of the decision. Such a request shall have the effect of staying the effective date of the decision. The decision by the Commissioner on the request is a final agency action in a disciplinary proceeding and is effective on its date of entry.

Jan. 11, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

[1100 TMOG 5]

(287) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 10
[Docket No. 81146-9134]
RIN: 0651-AA41

Exhaustion of Administrative Remedies in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: This final rule sets forth amendments to 37 CFR §§ 10.155 and 10.157. The purpose of the amendments is to clarify that a respondent dissatisfied with the initial decision by the administrative law judge in a Patent and Trademark Office (PTO) disciplinary proceeding must exhaust available administrative remedies, i.e., appeal to the Commissioner of Patents and Trademarks, before seeking judicial review under 35 U.S.C. 32.
Effective Date: August 1,1989
For Further Information Contact: Harris A. Pitlick by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: It is possible that present rules may be interpreted not to explicitly require a respondent dissatisfied with the decision of the administrative law judge (initial decision) in a PTO disciplinary proceeding to file an appeal with the Commissioner of Patents and Trademarks as a condition precedent to filing a petition for review in the United States District Court for the District of Columbia under 35 U.S.C. 32.

Under 37 CFR § 10.154(a), in the absence of an appeal to the Commissioner, the initial decision, without further proceedings, becomes the decision of the Commissioner thirty (30) days therefrom. Local Rule 213 of the United States District Court for the District of Columbia, 37 CFR § 10.157 and 35 U.S.C. 32, together provide for review of the final decision of the Commissioner by a petition in that court within 30 days of the date of that decision. Thus, the rules could be construed to permit a respondent dissatisfied with the initial decision to bypass review by the Commissioner and directly seek judicial review within 60 days of the date of the initial decision.

The purpose of 37 CFR §§ 10.154-10.157 is to outline the steps for seeking review of an initial decision in a disciplinary proceeding. There is no provision for bypassing a determination by the Commissioner unless both parties accept the decision and do not desire any further review of the initial decision. Sections 10.155 and 10.157 have been amended to clarify that a respondent must exhaust available administrative remedies by appeal to the Commissioner before judicial review can be considered ripe.

Subsequent to a notice of proposed rulemaking setting forth the proposed amendments now adopted by this Final Rule, an amendment to 37 CFR § 10.156 was adopted. *See* 54 FR 6659 (February 14, 1989). Section 10.156 now explicitly permits the respondent or the Director to make a single request for reconsideration or modification of the Commissioner's decision on appeal from an initial decision. Nothing in that rule, or in the rules adopted by this Final Rule, requires a respondent dissatisfied with the Commissioner's decision to seek reconsideration thereof. Thus, a respondent dissatisfied with the Commissioner's decision may directly seek judicial review under 35 U.S.C. 32. In other words, for purposes of 37 CFR Part 10, exhaustion of administrative remedies is complete upon appeal to the Commissioner from the initial decision.

A notice of proposed rulemaking was published in the *Federal Register* on December 28, 1988 (53 FR 52438) and the *Official Gazette* on January 17,1989 (1098 O.G. 527). Interested parties were requested to submit written comments on or before February 27, 1989. Comments from two (2) sources were received. None of the suggestions made in the comments have been adopted. A detailed analysis of the comments follows:

Comment: The proposed rules do not go quite far enough in order to comply with 5 U.S.C. 704, which specifies that

> agency action otherwise final is final for purposes of this section whether or not there has been presented or determined an application . . . unless the agency otherwise requires by rule and provides that the action meanwhile is inoperative, for an appeal to superior agency authority.

Since no rule specifies that the initial decision of the administrative law judge shall be inoperative, a sentence should be added to the end of 37 CFR § 10.154(a) stating that pending an appeal to the Commissioner in accordance with § 10.155 the decision of the administrative law judge will be inoperative. This would assure compliance with 5 U.S.C. 704 and remove any concern by practitioners subject to disciplinary proceedings that the initial decision has any binding effect prior to action by the Commissioner.

Response: The suggestion has not been adopted since it is not necessary. The above-quoted language from 5 U.S.C. 704 first appeared as part of section 10(c) of the original Administrative Procedure Act, 5 U.S.C. 1009(c) (Act of June 11, 1946, ch. 324, § 10(c), 60 Stat. 243). The meaning of the language in that section is explained in the Attorney General's Manual on the Administrative Procedure Act (1947) at 101-05. The purpose of the language quoted in the comment was to provide for judicial review at the time when agency action becomes operative, rather than at some later time, such as when further review available in the agency became exhausted. Under the regulatory scheme for review following an initial decision in a PTO disciplinary proceeding, agency action— i.e., imposition of discipline on a practitioner before the Office — cannot become operative before 20 days after the date of entry of the Commissioner's decision under 37 CFR § 10.156(a) or, if a request for reconsideration has been filed within those 20 days, before the date of entry of the decision on reconsideration under 37 CFR § 10.156(c). In other words, the initial decision cannot become operative until such time that judicial review becomes available to the affected practitioner. The suggested change to 37 CFR § 10.154(a) is, hence, unnecessary.

Comment: The evidence upon which the General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that this proposed rule change is not expected to have a significant adverse economic impact on a substantial number of small entities has not been disclosed to the public for review and comment.

Response: No law requires that such evidence, if any, be disclosed to the public for review and comment. *See* 5 U.S.C. 605(b). The basis for the certification was that the proposed rule changes would merely make explicit what was implicity intended by the rules as originally constituted.

Comment: The proposed rule change will have a significant adverse economic impact on a substantial number of small entities because it prolongs the time for judicial review for a person who has been refused registration to practice before the Office.

Response: Both the proposed rule changes and the rules affected thereby relate solely to practitioners already registered or otherwise permitted to practice before the Office and who have been subject to a PTO disciplinary proceeding. The rules and rule changes have no impact, economic or otherwise, on persons refused registration or permission to practice before the Office.

Other Consideratations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration that this rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because it merely makes explicit what was implicitly intended by the rules as originally constituted. Additionally, no more than a few small entities in a given year out of over 13,000 registered patent attorneys and agents and an unknown number of trademark attorneys are expected to be subject to an initial decision in a PTO disciplinary proceeding. Whatever the number of small entities, however, there would not be expected to be a significant impact on them because agency action does not take effect until after a final decision is made by the Commissioner.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less that $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This rule change does not contain a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Trademarks.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office amends 37 CFR Part 10 as follows:

PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

1. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31. 32, 41.

2. Section 10.155 is amended by adding new paragraph (d) as follows:

§ 10.155 Appeal to the Commissioner.

* * * * *

(d) In the absence of an appeal by the Director, failure by the respondent to appeal under the provisions of this section shall be deemed to be both acceptance by the respondent of the initial decision and waiver by the respondent of the right to further administrative or judicial review.

3. Section 10.157 is amended by revising paragraph (a) as follows:

§ 10.157 Review of Commissioner's final decision

(a) Review of the Commissioner's final decision in a disciplinary case may be had, subject to § 10.155(d), by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 213 of the United States District Court for the District of Columbia.

* * * * *

May 26, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

[1104 TMOG 22]

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(288) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90143-9144]
RIN 0651-AA35

Amendment of Patent and Trademark Rules concerning Judicial Review of Decisions of the Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board and other Miscellaneous Matters.

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.

Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, relating to (1) decisions of the Board of Patent Appeals and Interferences (BPAI), (2) requests for reconsideration of decisions of the BPAI and the Trademark Trial and Appeal Board (TTAB), (3) extensions of time in proceedings after a decision by the BPAI under §§ 1.196 and 1.197, (4) practices concerning judicial review of final decisions of the BPAI and TTAB, (5) extensions of time for seeking judicial review of BPAI and TTAB decisions and (6) miscellaneous changes in the practice before the BPAI and housekeeping amendments.

Two recent decisions of the U.S. Court of Appeals for the Federal Circuit have held that even though the BPAI includes a new ground for rejection in its decision under 37 CFR § 1.196(b)(3), appellants may appeal directly to the Federal Circuit without first seeking reconsideration at the BPAI. Where judicial review is sought without requesting reconsideration, the arguments against the new ground of rejection are developed for the first time during court proceedings. The amendments require that appellants seek reconsideration of the new ground of rejection prior to appeal or commencement of a civil action.

Experience under the previous rules relating to judicial review of final board decisions indicated that the rules may have been confusing in certain respects relating to the time in which judicial review must be sought and the manner in which extensions of time for seeking judicial review may be obtained. The rules eliminate any confusion as to when judicial review must be sought and standardize the manner of obtaining extensions of time to seek judicial review.

The rules also make clarifying and housekeeping amendments with respect to practice before the BPAI.

Effective Date: August 20, 1989.
For Further Information Contact: Richard E. Schafer by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:

Background

A notice of proposed rulemaking was published in the *Federal Register* at 54 Fed. Reg. 11009 (March 16, 1989) and at 1101 *Official Gazette* 6 (April 4, 1989). No oral hearing was held and no written comments were received.

Discussion of Specific Rules

(1) *Decisions of the BPAI and requests for reconsideration of BPAI and TTAB decisions*

Only final decisions of the BPAI and TTAB are subject to judicial review. 35 U.S.C. §§ 141, 145; U.S.C. § 1071; 28 U.S.C.§ 1295 (a)(4)(A) and (B).

Section 1.196(b) provides that if the BPAI has knowledge of any grounds, not involved in the appeal, for rejecting any appealed claim, it may include in its decision a statement to that effect. The statement then constitutes a new rejection of the claims. The previous rules permitted appellants to treat the decision as a final decision in the case and thus immediately appealable. 37 CFR § 1.196(b)(3) (1988). Therefore, when an appellant proceeded under this option, arguments against the new rejection were presented for the first time to the reviewing court.

A recent decision by the U.S. Court of Appeals for the Federal Circuit rejected the Commissioner's argument that an appellant should not be permitted to contest the BPAI's new ground for rejection because it had not requested reconsideration of that ground by the BPAI. *In re Evanega*, 829 F.2d 1110, 1113, 4 USPQ 2d 1249, 1252 (Fed. Cir. 1987). *See also In re Nielson*, 816 F.2d 1567, 1570, 2 USPQ 2d 1525, 1527 (Fed. Cir. 1987). In *Evanega*, the Commissioner urged that requiring appellants to request reconsideration, where the BPAI adopts a new ground for rejection, would provide the BPAI with an opportunity to consider appellant's arguments and correct any errors while the case was still in the PTO. This conserves judicial resources, and in any event, obtains the benefit of the BPAI's view should judicial review ultimately be sought. The court held, however, that in view of PTO regulations (37 CFR § 1.196(b)(3)) which

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"expressly provide that the board's decision, even if based on a new ground, is a final determination and thus may be appealed without seeking reconsideration," appellant could not be required to request reconsideration by the BPAI. *Id.*

The new rule changes eliminate 37 CFR § 1.196(b)(3). By removing § 1.196(b)(3), appellants no longer have the option of treating a new ground of rejection as final and immediately appealable. Appellants' options are limited to requesting remand to the examiner or requesting reconsideration by the BPAI as set forth in §§ 1.196(b)(1) and 1.196(b)(2). The preamble of § 1.196(b) has been amended to specifically recite that a new ground of rejection shall not be considered a final decision for judicial review.

Appellants still may elect further prosecution before the examiner under 37 CFR § 1.196(b)(1) or request reconsideration under § 1.196(b)(2). The option of § 1.196(b)(2) requires that any request for reconsideration address the new ground of rejection and specifically state the reasons why the new ground was in error. Section 1.196(b)(2) also provides that the BPAI will reconsider the new rejection and, if necessary, render a new decision. The decision on reconsideration will be deemed to incorporate the earlier decision except for any portions of the earlier decision specifically withdrawn.

Reconsideration or remand need not be requested if appellant does not contest the new ground. Appellants may seek judicial review as to claims not subject to the new ground.

Section 1.196(a) expressly provides for remands to the examiner for further consideration. The BPAI has inherent authority, as part of its role in reviewing standards of patentability applied in the PTO, to remand applications to the examiner for further consideration. *Cf.* Manual of Patent Examining Procedure (MPEP) §§ 1211 and 1212. The change merely makes express that which is inherent.

The amendments also delete the portion of former § 1.196(d) which provides (1) that any decision which includes a remand shall not be a final decision for the purposes of judicial review and (2) that upon conclusion of the proceedings on remand the BPAI may enter an order making its decision final. Those provisions have been included as new § 1.196(e). Under this paragraph, decisions pursuant to § 1.196(b) would not be final as to the claims subject to a new rejection.

The last sentence of former § 1.196(b)(1) has been deleted and placed in new § 1.196(e).

(2) *Requests for reconsideration of BPAI and TTAB decisions*

Section 1.197(b) provides that any request for reconsideration must specifically state the points believed to have been misapprehended or overlooked in the BPAI's decision. Experience has shown that many requests for reconsideration are nothing more than reargument of appellant's position on appeal. The provision, as adopted, limits requests to the points of law or fact which appellant feels were overlooked or misapprehended by the BPAI.

The amendments also clarify the exception found in the first sentence of § 1.197(b) by including specific references to the "original decision" and the "decision on reconsideration." Some confusion had been noted with respect to the meaning of the current language.

In order to simplify calculation of times for requesting reconsideration of the decisions of the boards, §§ 1.658(b), 2.129(c), and 2.144 specify a period of one month rather than the periods expressed in days. Section 1.197(a) already specified a one-month period.

(3) *Extensions of time after a decision by the BPAI to take action under §§1.196 and 1.197*

Appellants in patent cases may no longer use fee extensions under § 1.136(a) to extend the time for making an election under § 1.196(b) or seeking reconsideration under § 1.197.

Under previous rules appellants could request reconsideration of a BPAI decision up to five months after a decision or file a response to a new ground of rejection up to six months after the decision. This inordinately delayed final disposition of appeals. Section 1.136(a) provides that fee extensions are not available to file responses to a BPAI decision pursuant to §§ 1.196, 1.197 or 1.304. One month is deemed to be ample time to submit a request for reconsideration. Note that Fed. R. Civ. P. 59 provides 10 days and Fed. R. App. P. 40 provides 14 days for similar requests. Extensions under § 1.136(b) will be available to extend the time to file a response under §§ 1.196 and 1.197. Section 1.304(a) exclusively governs extensions of time to file a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See further discussion below.

Section 1.136(a) specifically refers to § 1.136(b) for extensions of time to file responses under §§ 1.196 and 1.197 and refers to § 1.304 for extensions of time to initiate judicial review. Sections 1.196(f) and 1.197(b) correlatively reference § 1.136(b) for extensions of time.

Fee extensions are not available to extend the time for electing further prosecution before the examiner under § 1.196(b)(1). Where an appellant elects further prosecution before the examiner, fee extensions under § 1.136(a) remain available to respond to the primary examiner's Office actions.

(4) *Time for seeking judicial review of decisions of the BPAI and TTAB*

Under previous rules, judicial review of final decisions of the BPAI or TTAB had to be sought within sixty days of the decision or thirty days after a decision on reconsideration. However, where a decision on reconsideration was, in effect, a new decision, it was not always clear whether the time for appeal was thirty or sixty days. Sections 1.304(a) and 2.146(d)(1) provide a two-month period to appeal from either the date of the decision or the decision on a timely filed request for reconsideration.

Some problems have been noted with respect to the time for seeking judicial review in days. Miscalculations of the statutory sixty-day time period have resulted in filing untimely requests for judicial review. In order to simplify calculation of the time for seeking judicial review, §§ 1.304(a) and 2.145(d)(1) specify two months. The two-month period meets the sixty-day requirement of 35 U.S.C. §§ 142, 145 and 146 and 15 U.S.C. §§ 1071(a)(2) and (b)(1) except for time periods which include February 28. In order to comply with the sixty-day requirement, §§ 1.304(b) and 2.145(d)(2) provide that an additional day shall be added to any two-month period for initiating judicial review which includes February 28. Appeals will always be timely if the judicial review is initiated within two months of the final decision.

Previously, the rules did not specify a time period for filing a cross-appeal or cross-action in *inter partes* cases. The absence of such a time period made it difficult for parties and their attorneys to make appropriate plans for judicial review. For example, in an interference where there has been a split judgment, one of the parties may be satisfied with the judgment but may desire to appeal the adverse judgment only if an appeal is noted by the other party. Where the appeal is filed on the last possible day, a cross-appeal is precluded. Sections 1.304(a) and 2.145(d)(1) specify that the time for filing a cross-appeal or commencing a cross-action expires (1) fourteen days after service of the notice of appeal or the summons and complaint or (2) two months after the decision to be reviewed, whichever is later.

Similarly, no provision for filing a cross-action was provided where an appellee elects to have further proceedings conducted in the district court pursuant to 35 U.S.C. § 146 or 15 U.S.C. § 1071(a)(1). Section 1.304(c) and 2.145(d)(3) provide that the time for filing a cross-action expires 14 days after service of the summons and complaint. The district court will determine whether any cross-action was timely filed since neither the complaint nor cross-action is filed in the PTO.

(5) *Extensions of time to seek judicial review*

In the past, standards for granting requests for extensions of time to take an appeal or commence a civil action varied depending upon which board was involved and upon the particular type proceeding before the board. For example, extensions relating to patent applications could be obtained by paying the appropriate fee under § 1.136(a). However, in reexamination proceedings or when judicial review was sought from a decision of the TTAB, the requester must demonstrate sufficient cause under § 1.550(c) or § 2.145(d)(1). The rules standardize the manner in which an extension of time to initiate judicial review may be obtained. The PTO has adopted a standard which is similar to the standard used in the Federal courts for granting extensions. Under the rules the Commissioner may extend the time (1) for good cause if requested before the expiration of the time provided for initiating judicial review or (2) upon a showing of excusable neglect in failing to initiate judicial review if requested after the expiration of the time period. This standard will be applicable in both trademark and patent proceedings (§§ 1.304(a) and 2.145(e)) once the "last" decision, i.e., either the decision (in circumstances where no timely reconsideration is sought) or the decision on reconsideration, of either board has been entered. In patent cases, extensions of time under § 1.136(b) and § 1.550(c) and fee extensions under 37 CFR § 1.136(a) are no longer available to extend the time for the purpose of judicial review once a decision or a decision on reconsideration has been entered. Section 1.304(a) states that the provisions of §§ 1.136 and 1.550(c) are not available to extend the time to initiate judicial review. Sections 1.136(a), 1.136(b), 1.191(d), 1.550(c), 1.645(a) and(b) refer to § 1.304 for extensions of time for seeking judicial review after a decision has been entered. Section 1.645(a) has been amended by (1) adding the introductory phrase "Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action," to the first sentence and (2) deleting the references to filing a notice of appeal or commencing a civil action in the second sentence.

In view of the amendments to §§ 1.197 and 1.304, relating to extensions of time to seek reconsideration or initiate judi-cial review, § 1.191(d) does not refer to §§ 1.196 and 1.197.

(6) *Miscellaneous amendments*

In the past, appellants could use fee extensions to delay the time for requesting an oral hearing at the BPAI. This delays final disposition of the appeal and causes administrative problems and duplication of effort due to the transfer of the appeal to the hearing docket. Section 1.191(d) no longer refers to § 1.194. Fee extensions are no longer available to extend the time for requesting an oral hearing. Extensions under § 1.136(b) are available to extend the time to request an oral hearing.

Section 1.191(b) has been rewritten as one sentence without any change in substance.

Some confusion has resulted as to who has jurisdiction over a patent application after a notice of appeal to the BPAI has been filed. Problems arose, for example, as to the appropriate PTO official to decide certain petitions and other matters after an appeal has been filed. MPEP § 1210 indicates that jurisdiction over the application normally passes at one of five possible times listed therein. Section 1.191 includes a new section (e) which provides that jurisdiction transfers to the BPAI when the application or reexamination file including all briefs and examiner's answers is transmitted to the BPAI. Thus, jurisdiction transfers to the BPAI when all written submissions by the applicant and the examiner have been entered and the application papers have been forwarded to the BPAI.

New paragraph 1.191(e) also includes a provision that the Commissioner, prior to the time the BPAI renders its decision, may *sua sponte* order that an application be remanded to the examiner for further consideration. This provision merely makes explicit the inherent authority of the Commissioner to direct and supervise the examination of patent applications.

Under previous rules there was some confusion as to when "termination of proceedings" occurs. Section 1.197(c) provides that proceedings are "terminated" when the Federal Circuit's mandate is received by the PTO or after the time for appeal from the judgment of the district court in a civil action under 35 U.S.C. § 145 has expired. The language "In such cases," in the second sentence of former § 1.197(c) has been eliminated since it was superfluous and may have been confusing.

The rules delete the phrase "that he or she elects" and substitutes "electing" therefor in §§ 1.304(c) and 2.145(c)(3), as amended. The amendment merely changes wording without any change in substance.

Section 1.196(b) changes the verb "make" to "makes" to conform the verb to the singular subject of the sentence.

Sections 1.301, 1.303, 2.145(a)(2) and 2.145(c)(3) no longer refer to transmittal of the certified list and certified copies of the notice of election to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. § 141 or 15 U.S.C. § 1071(a)(1). These procedures are required by applicable statutes or Court Rules and are unnecessary in the PTO's regulations.

Sections 1.304(a), 1.304(c), 2.145(c)(3) and 2.145(d)(1) include a statement that the certificate of mailing provisions of § 1.8 are *not* applicable. No substantive change is involved since the inapplicability of § 1.8 is already stated in §§ 1.8(a)(2)(viii) and (ix).

Sections 1.304(b) and 2.145(d)(2) recite "Federal holiday in the District of Columbia" rather than "legal holiday." These changes merely conform the language of these sections with the language of 35 U.S.C. § 21(b) and 37 CFR § 1.7.

Section 2.145(c)(2) and (3) include changes in wording without any change in substance.

Other Considerations

These rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 350 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change requiring appellants to request reconsideration under the specific circumstances set forth is not expected to result in an increase of fees charged by attorneys and agents to entities, including small entities, since the rule change is intended to eliminate erroneous grounds for rejection prior to appeal and in some instances is expected to eliminate the need for appeal.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR, Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

List of Subjects in 37 CFR, Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, Parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.136 is revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may

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respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action, (2) the application is involved in an interference declared pursuant to § 1.611 or (3) the response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.196 or 1.197, § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

3. Section 1.191 is amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences

* * * * *

(b) The appeal in an application or reexamination proceeding must identify the rejected claim or claims appealed, and must be signed by the applicant, patent owner or duly authorized attorney or agent.

* * * * *

(d) The time periods set forth in §§ 1.191 through 1.193 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings. See §1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

(e) Jurisdiction over the application or patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may *sua sponte* order the application remanded to the examiner.

4. Section 1.196 is amended by revising paragraphs (a), (b) and (d) and adding new paragraphs (e) and (f) to read as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner or remand the application to the examiner for further consideration. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for the purpose of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise either of the following two options with respect to the new ground:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

* * * * *

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.136(b) for extensions of time to take action under this section.

5. Section 1.197 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.197 Action following decision

* * * * *

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See 37 CFR § 1.136(b) for extensions of time for seeking reconsideration.

(c) Termination of proceedings. Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§ 1.304) except: (1) where claims stand allowed in an application or (2) where the nature of the decision requires further action by the examiner. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§ 1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.

6. Section 1.301 is revised to read as follows:

§ 1.301 Appeal to U.S. Court of Appeals for the *Federal Circuit*.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

7. Section 1.303 is amended by revising paragraph (c) to read as follows:

§ 1.303 Civil Action under 35 U.S.C. 145, 146, 306.

* * * * *

(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§ 1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146. The notice of election must be served as provided in § 1.646.

8. Section 1.304 is revised to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of § 1.136, 1.550(c) or 1.645(a) or (b). The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(b) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of the time specified for appeal of commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal of cross-appeal. See § 1.8(a)(2)(viii).

9. Section 1.550 is amended by revising paragraph (c) to read as follows:

§ 1.550 Conduct of reexamination proceedings

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

* * * * *

10. Section 1.645 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.645 Extension of time, late papers, stay of proceedings

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proven through the witness.

(b) Any paper belatedly filed, will not be considered except upon motion (§ 1.635) which shows sufficient cause why the paper was not timely filed. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

* * * * *

11. Section 1.658 is amended by revising paragraph (b) to read as follows:

§ 1.658 Final Decision

* * * * *

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the

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Board may designate the decision on the request for reconsideration as a new decision.

* * * * *

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

12. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

13. Section 2.129 is amended by revising paragraph (c) to read as follows:

§ 2.129 Oral argument; reconsideration

* * * * *

(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within one month from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

14. Section 2.144 is revised to read as follows:

§ 2.144 Reconsideration of decision on ex parte appeal

Any request for rehearing or reconsideration, or modification of the decision, must be filed within one month from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

15. Section 2.145 is amended by revising paragraphs (a), (c)(2), (c)(3), (d)(1), (d)(2) and (d)(3) and adding new paragraph (e) to read as follows:

§ 2.145 Appeal to court and civil action.

(a) Appeal to U.S. Court of Appeals for the Federal Circuit. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal:

(1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section);

(2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

* * * * *

(c) * * *

(2) Any applicant or registrant in an ex parte case who takes an appeal to the U.S. Court of Appeals for the Federal Circuit waives any right to proceed under section 21(b) of the Act.

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119. The certificate of mailing practice of § 1.8 is not available for filing a notice of election. See § 1.8(a)(2)(viii).

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(2) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act electing to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act. The time for filing a cross-action expires 14 days after service of the summons and complaint.

(e) Extensions of time to commence judicial review. The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

June 21, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

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DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR PART 2
[Docket No. 81268-9163]
RIN: 0651-AA36

Amendments of Trademark Rules Governing Inter Partes Proceedings; Miscellaneous Amendments of Other Trademark Rules

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office is amending the rules of practice in trademark cases to revise and/or codify procedures for the examination of applications; appeals from final refusals of registration; and the institution and conduct of trademark interference, concurrent use, opposition, and cancellation proceedings. The amendments will assist the orderly and prompt resolution of issues in proceedings before the Trademark Trial and Appeal Board.
Effective Date: November 16, 1989.
For Further Information Contact: Janet E. Rice by telephone at (703) 557-3551 or by mail marked to her attention and addressed to Box 5, Trademark Trial and Appeal Board, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Amendments to §§ 2.42, 2.68, 2.91, 2.92, 2.93, 2.102, 2.104, 2.106, 2.112, 2.113, 2.114, 2.119, 2.120, 2.121, 2.122, 2.123, 2.125, 2.127, 2.128, 2.129, 2.134, 2.135, 2.142, 2.145, and 2.186 were proposed in a notice of proposed rulemaking published in the *Federal Register* on March 7, 1989, at 54 FR 9514, the Patent and Trademark Office *Official Gazette* of March 28, 1989, at 1100 O.G. 137, and the Bureau of National Affairs' *Patent, Trademark & Copyright*

Journal, Vol. 37, No. 921, pp. 477-486 (March 9, 1989). Corrections to the *Federal Register* printing of the notice of proposed rulemaking were published in the *Federal Register* on April 4, 1989, at 54 FR 13605. The purpose of these proposed rule amendments was to revise, simplify, remove, or clarify existing rules or to codify in rules certain practices which are currently in effect. The rules involved included those relating to the requirements for concurrent use applications; abandonment of trademark applications; appeals to the Trademark Trial and Appeal Board (Board) from the final refusal of registration in ex parte applications; institution and conduct of interference, concurrent use, opposition, and cancellation proceedings before the Board; review by civil action of a decision of the Board; and allowing an assignee to take action with respect to the assigned application or registration. Written comments were submitted by two firms, five individuals, and one organization. The relevant committee of another organization stated that it had nothing to add to the comments of the first organization. Two other organizations submitted letters indicating that they accepted the proposed rule amendments in their entirety.

Discussion of Specific Sections Being Changed:

In this discussion, "Patent and Trademark Office" is abbreviated as "PTO" and "Trademark Trial and Appeal Board" is abbreviated as "Board."

Section 2.42(a), which specifies certain requirements for an application for registration as a lawful concurrent user, is amended to remove the designation "(a)" [because § 2.42(b) is removed] and to delete the qualifying phrase "to the extent of his knowledge" from the requirement that an applicant for registration as a lawful concurrent user state in the application the area, the goods, and the mode of use for which registration is sought. This information obviously is within the knowledge of the applicant and is essential for purposes of examination and publication.

Section 2.42(b), which requires that the verification or declaration in an application for registration as a lawful concurrent user "be made with the stated exceptions," is removed to simplify practice. The paragraph has been construed, in applications for registration based on concurrent use, as requiring that the portion of the verification or declaration which normally reads, "to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce," also include, after the word "association," the additional phrase "other than specified in the application." Because most applicants and/or their attorneys do not realize that this is the import of the paragraph, the examination process is often prolonged. Moreover, an applicant for registration based on concurrent use is required to list, in the statement portion of the application, the exceptions to applicant's right to exclusive use, so that it is clear that the verification or declaration is being made, in effect, with the stated exceptions. Therefore, the requirement for a verification or declaration which differs in form from that of an application for a geographically unrestricted registration is unnecessary.

Section 2.68, which pertains to the express abandonment of an application, presently provides, in the second sentence, that the fact that an application has been expressly abandoned shall not, in any proceeding in the PTO, affect any rights that the applicant may have in the mark which is the subject of the abandoned application. The section was proposed to be amended by inserting the phrase "during the ex parte prosecution thereof" immediately after the phrase "The fact that an application has been expressly abandoned." Instead, the section is being amended to include, at the beginning of the second sentence, a cross-reference to § 2.135 (i.e., "Except as provided in § 2.135, the fact that an application has been expressly abandoned shall not...."). The cross-reference to § 2.135 (which provides, in essence, that if an applicant whose application is the subject of an inter partes proceeding before the Board files a written abandonment of the application without the written consent of every adverse party, judgment shall be entered against the applicant) has been added, in lieu of the phrase specified in the notice of proposed rulemaking, and as a result of a written comment received thereon, to further clarify the section.

Section 2.91, which governs the declaration of interference proceedings, is amended to change the title of the section from "Interferences." to "Declaration of interference." The amendment is one of a series of amendments, involving §§ 2.91-2.93, intended to distinguish between the "declaration" of an interference by the Commissioner upon petition and the subsequent "institution" of the interference by the Board. *See* Sections 1208.04 and 1208.05 of the *Trademark Manual of Examining Procedure*.

Section 2.92, which pertains to certain matters preliminary to an interference, is revised to specifically indicate what must happen before an interference which has been "declared" by the Commissioner upon petition can be "instituted" by the Board.

Section 2.93, which governs the institution of an interference, is amended to, inter alia, change the title of the section from "Declaration of interference." to "Institution of interference.", and to revise the text of the paragraph to harmonize with §§ 2.91 and 2.92, as amended.

Section 2.102(c), which pertains to extensions of time for filing an opposition, was proposed to be amended to change the specified time period "120 days" to "four months." However, upon further consideration, it appears, for the reasons described hereafter in the "Response to Comments on the Rules" portion of this final rule notice, that the proposed amendment might add to confusion regarding the computation of extension periods. Accordingly, the proposal to amend this paragraph is withdrawn.

Section 2.104, which states certain requirements for a notice of opposition, is amended to redesignate the present paragraph as "(a)" and to add a new paragraph, designated "(b)," codifying the practice that oppositions to different applications owned by the same party may be joined in a consolidated opposition, when appropriate, provided that the required fees are paid. The proposed new paragraph parallels present § 2.112(b).

Section 2.106(b)(1), which contains provisions relating to opposition answers, is amended to include a short description of the content requirements for an answer to an opposition, just as present § 2.104 describes the content requirements for an opposition. The amendment parallels an amendment made herein to § 2.114(b)(1) concerning answers to petitions for cancellation. The description of the content requirements for an answer is modeled after portions of Rule 8 of the Federal Rules of Civil Procedure.

Section 2.106(c), which governs the withdrawal of an opposition, is amended to codify the practice that an applicant's written consent to the withdrawal of an opposition after answer may be signed by the applicant or by the applicant's attorney or other authorized representative. The amendment parallels amendments made herein to §§ 2.114(c), 2.134(a), and 2.135.

Section 2.112(a), which states requirements for a petition for cancellation, is revised to delete the requirement that a petitioner indicate in the petition "the respondent party to whom notification shall be sent," and to substitute a requirement that the petitioner indicate, to the best of the petitioner's knowledge, "the name and address of the current owner of the registration." The purposes of the revision are to provide the Board with information relating to the identity of the current owner of the registration sought to be cancelled, so that the Board can serve a copy of the petition on that party, and to remove any implication that the petitioner is permitted to designate who shall be the respondent. See also, in this regard, § 2.113, as amended herein.

Section 2.113, which concerns notification to the respondent of the filing of a petition for cancellation, is revised to codify the practice that the respondent shall be the party shown by the records of the PTO to be the current owner of the registration sought to be cancelled, except that the Board, in its discretion, may join or substitute as respondent a party who makes a showing of a current ownership interest in the registration. *See generally Gold Eagle Products Co. v. National Dynamics Corp.*, 193 USPQ 109 (TTAB 1976). The section is further revised to provide that when the party identified by the petitioner, pursuant to amended § 2.112(a), as the current owner of the registration or registrations is not the record owner thereof, a courtesy copy of the petition for cancellation shall be forwarded with a copy of the notification to the alleged current owner, which may file a motion to be joined or substituted as respondent.

Section 2.114(b)(1), which contains certain provisions relating to cancellation answers, is amended to include a short description of the content requirements for an answer to a petition for cancellation, just as present § 2.112(a) describes the content requirements for a petition for cancellation. The amendment parallels the amendment made herein to § 2.106(b)(1) concerning answers to oppositions.

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Section 2.114(c), which governs the withdrawal of a petition for cancellation, is amended to codify the practice that a registrant's written consent to the withdrawal of a petition for cancellation after answer may be signed by the registrant or by the registrant's attorney or other authorized representative. The amendment parallels amendments made herein to §§ 2.106(c), 2.134(a), and 2.135.

Section 2.119, which presently governs service of papers, is amended to change the title from "Service of papers." to "Service and signing of papers.", so that the section title will describe the contents of the section as amended herein by the revision of paragraphs (b) and (c), and by the addition of two new paragraphs, designated "(d)" and "(e)."

Section 2.119(b), which states, inter alia, methods for service of papers, is revised to provide for two additional methods of service, namely, transmission by the "Express Mail" service of the United States Postal Service and transmission by overnight courier. The amendment codifies existing practice.

Section 2.119(c), which presently provides that when service is made by mail, the date of mailing will be considered the date of service; and that whenever a party is required to take some action within a prescribed period after the service of a paper upon him by another party and the paper is served by mail, 5 days shall be added to the prescribed period, is revised to specify that when service is made by first-class mail, "Express Mail," or overnight courier, the date of mailing or of delivery to the overnight courier will be considered the date of service; and that whenever a party is required to take some action within a prescribed period after the service of a paper upon such party by another party, and the paper is served by first-class mail, "Express Mail," or overnight courier, 5 days shall be added to the prescribed period. The amendments codify existing practice.

Section 2.119(d) is added to require that when a party to an inter partes proceeding before the Board is not domiciled in the United States, and is not represented by an attorney or other authorized representative located in the United States, the party must appoint a domestic representative on whom may be served notices or process in the proceeding. The purpose of the paragraph is to facilitate the service of papers on foreign parties not represented by domestic counsel in proceedings before the Board.

Section 2.119(e) is added to provide that every paper filed in an inter partes proceeding before the Board, and every request for an extension of time to file an opposition, must be signed by the party filing it, or by the party's attorney or other authorized representative. An unsigned paper will be refused consideration unless a signed copy is submitted before or within a time limit set in the PTO's notification of this defect. The purpose of the amendment is to simplify practice, and to eliminate the necessity for a petition to the Commissioner in the case of an unsigned notice of opposition or request for extension of time to oppose. The final rule includes a phrase that was not included in the proposed rule, namely, the phrase "and every request for an extension of time to file an opposition." The phrase has been added to further clarify the intent of the paragraph (that is, the paragraph was intended to cover requests for extension of time to oppose, but such a request is not, strictly speaking, a "paper filed in an inter partes proceeding before the Board," since at the time of the filing of a request for extension of time to oppose, there is not yet an opposition).

Section 2.120(a), which contains certain general provisions relating to discovery in inter partes proceedings before the Board, is amended to include a new sentence specifying that the opening of discovery is governed by the Federal Rules of Civil Procedure. The amendment is a codification of current practice. *See generally* Saul Lefkowitz and Janet E. Rice, *Adversary Proceedings Before the Trademark Trial and Appeal Board*, 75 TMR 323, 381-382 (1985).

Section 2.120(d), which presently pertains to document production, is amended to change the title from "Request for production." to "Interrogatories; request for production."; to redesignate the present paragraph as "(2)"; and to add a new paragraph, designated "(1)." The new paragraph limits the total number of interrogatories which a party may serve upon another party in a proceeding before the Board to seventy-five, counting subparts, with additional interrogatories being allowed by the Board, in its discretion, upon motion to the Board showing good cause, or upon stipulation of the parties; requires that a motion for leave to serve additional interrogatories be accompanied by a copy of the interrogatories, if any, which have already been served by the moving party, and by a copy of the interrogatories proposed to be served; and provides that if a party upon which interrogatories have been served believes that the number of interrogatories served exceeds the limitation specified in the paragraph, and is unwilling to waive this basis for objection, the party shall, within the time for (and instead of) serving answers and objections to the interrogatories, file a motion for a protective order, accompanied by a copy of the interrogatories which together are said to exceed the limitation. The purpose of the new paragraph is to discourage parties from using written interrogatories for purposes of harassment, as exemplified in the case of *C. H. Stuart Inc. v. S. S. Sarna, Inc.*, 212 USPQ 386 (TTAB 1980). The amendment is believed to be in general harmony with corresponding local rules now prevalent in the federal district courts.

Section 2.120(g), which provides for the imposition of sanctions for failure to comply with an order of the Board relating to discovery, is amended to change the title from "Failure to comply with order." to "Sanctions."; to redesignate the present paragraph as "(1)"; and to add a new paragraph, designated "(2)," providing that if a party fails to attend its discovery deposition, after being served with proper notice, or fails to respond to a set of interrogatories or to a set of requests for production of documents and things, and the party or the party's attorney informs the party seeking discovery that no response will be made thereto, the Board may make any appropriate order by way of sanctions. The purpose of the amendment is to eliminate the expense and delay resulting from the present practice, embodied in present paragraphs (e) and (g) of § 2.120, that in situations of the type described in the new paragraph, a motion to compel must be filed and granted and the resulting order violated before the party seeking discovery may move for sanctions. The proposed practice is in harmony with Rule 37(d) of the Federal Rules of Civil Procedure.

Section 2.120(j)(3), which describes how a discovery deposition, interrogatory answer, or admission may be made of record by a party entitled to rely thereon, is amended to redesignate the present paragraph as "(i)" and to add a new paragraph, designated "(ii)." The new paragraph codifies the existing practice, exemplified in cases such as *Jeanne-Marc, Inc. v. Cluett, Peabody & Co., Inc.*, 221 USPQ- 58 (TTAB 1984); *Autac Inc. v. Viking Industries, Inc.*, 199 USPQ 367 (TTAB 1978); *Harvey Hubbell, Inc. v. Red Rope Industries, Inc.*, 191 USPQ 119 (TTAB 1976); and *MRI Systems Corp. v. Wesley-Jessen Inc.*, 189 USPQ 214 (TTAB 1975), that a party which has obtained documents from another party, pursuant to a request for production under Rule 34 of the Federal Rules of Civil Procedure, may not make the produced documents of record by notice of reliance alone, except to the extent that the documents fall within the provisions of § 2.122(e). The reason for the practice is that documents so obtained generally suffer from a lack of proper authentication, unless they are of the self-authenticating type admissible by notice of reliance under § 2.122(e).

Section 2.120(j)(4), which presently provides, in effect, that if an appropriate party files a notice of reliance upon only part of a discovery deposition, an adverse party may file a notice of reliance upon any other part of the deposition which should in fairness be considered so as to make not misleading what was offered by the submitting party, is amended to require that the notice of reliance filed by the adverse party be supported by a written statement explaining why the adverse party needs to rely upon each of the additional parts listed in the adverse party's notice, failing which the Board, in its discretion, may refuse to consider the additional parts. The amendment represents a codification of current practice. *Cf. Alabama Board of Trustees v. BAMA-Werke Curt Baumann*, 231 USPQ 408, 409 (TTAB 1986), and *Holiday Inns, Inc. v. Monolith Enterprises*, 212 USPQ 949, 950-951 (TTAB 1981).

Section 2.120(j)(5), which presently specifies who may make of record (by notice of reliance) an interrogatory answer or an admission, is amended to require that a party which seeks to rely upon certain of its own responses to interrogatories or requests for admissions, pursuant to the fairness exception presently provided in the paragraph, support its notice of reliance with a written statement explaining why it needs to rely upon each of the additional discovery responses listed in the notice, failing which the Board, in its discretion, may refuse to consider the additional parts. The amendment parallels the amendment made herein to paragraph (j)(4) of the section and represents a codification of current practice. *See The Board of Trustees of the University of Alabama v. BAMA-Werke Curt Baumann, supra.* and *Holiday Inns, Inc. v. Monolith Enterprises, supra.*

Section 2.120(j)(8), which presently provides that "[i]"nterrogatories, requests for production, requests for admissions, and materials or depositions obtained during the discovery period" should not be filed with the Board except under certain specified circumstances, one of which is "when submitted with a motion to compel," is revised to provide that "requests for discovery, responses thereto, and materials or depositions obtained through the discovery process" should not be filed with the Board except under certain specified circumstances; to change the phrase "when submitted with a motion to compel" to "when submitted with a motion relating to discovery;" and to state that papers or materials filed in violation of the paragraph may be returned by the Board. The purpose of the revision is to clarify the beginning of the paragraph, and to reduce the number of papers and materials which must be retained in a proceeding file and stored by the Board. The amendment changing the phrase "when submitted with a motion to compel" to "when submitted with a motion relating to discovery" did not appear in the notice of proposed rulemaking as a proposed amendment. However, the amendment is "housekeeping" in nature, being necessary to harmonize this paragraph with amended § 2.120(d)(1), which requires that copies of interrogatories be filed with the Board in connection with two additional discovery motions, namely, the motion for leave to serve additional interrogatories, and the motion for a protective order filed in response to interrogatories believed to be excessive in number.

Section 2.121(a)(1), which governs the scheduling of trial periods, is amended to include a new sentence codifying the practice that the resetting of a party's time to respond to an outstanding request for discovery will not automatically result in the rescheduling of the discovery and/or testimony periods, and that such dates will be rescheduled only upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board.

Section 2.122(e), which presently requires that a notice of reliance on a printed publication specify the printed publication and the pages to be read, indicate generally the relevance of the material being offered, and be accompanied by "the printed publication or a copy of the relevant portion thereof, including the title page and any other page needed to show the place and date of publication, the name and address of the publisher, and the name of the author or the editor," is amended to require that the notice of reliance specify the printed publication (including information sufficient to identify the source and the date of the publication) and the pages to be read; indicate generally the relevance of the material being offered; and be accompanied by the printed publication or a copy of the relevant portion. The purpose of the amendment is to simplify practice.

Section 2.123(c), which governs notices of depositions, is amended to clarify the paragraph and to codify the current practice that testimony depositions may be noticed for any reasonable time and place in the United States, but that a testimony deposition may not be noticed for a place in a foreign country except as provided in paragraph (a)(2) of the section. This codification of practice as to the place where testimony depositions may be taken roughly parallels § 1.673(a), which governs the taking of testimony depositions in patent interference proceedings in the PTO.

Section 2.123(e)(2), which pertains to the examination of witnesses during oral deposition, is amended to include a new sentence stating that exhibits which are marked and identified at a deposition will be deemed to have been offered into evidence, without any formal offer thereof, unless the intention of the party marking the exhibits is clearly expressed to the contrary. The purpose of the amendment is to revise existing practice, which requires, on the part of the party marking the exhibits, either a formal offer or a clear indication in the transcript of an intent to introduce the exhibits. See, e.g., *Roux Laboratories, Inc. v. Kaler*, 214 USPQ 134, 135-136 (TTAB 1982); *H. Betti Industries, Inc. v. Brunswick Corp.*, 211 USPQ 1188, 1189 (TTAB 1981); and *Kay Corp. v. Weisfield's, Inc.*, 190 USPQ 565, 567-568 (TTAB 1976). Under the existing practice, a party can lose a case simply because the party's attorney forgets to make a formal offer of the exhibits marked and identified during the party's testimony deposition. Under the practice set forth in the amended paragraph, the Board will be able to determine such cases on their merits, rather than on the basis of a technical defect.

Section 2.123(g)(1), which relates to the form of deposition transcripts, is amended to permit the use of paper with numbered lines as an alternative to consecutively numbering the questions propounded to a witness. The amendment, which parallels § 1.677(a), the provision governing the form of deposition transcripts in patent interference proceedings, will simplify practice.

Section 2.125(a), which governs the filing and service of testimony, is amended to codify the existing practice that if a copy of a deposition transcript, with exhibits, is not served upon each adverse party within thirty days after completion of the taking of the testimony or within an extension of time for that purpose, any adverse party which was not served may have remedy by way of a motion to the Board to reset the adverse party's testimony and/or briefing periods, as may be appropriate. The paragraph is further amended to provide that if the deposing party fails to serve a copy of the transcript with exhibits on an adverse party after having been ordered to do so by the Board, the Board may strike the deposition, or enter judgment by default against the deposing party, or take other action as may be deemed appropriate.

Section 2.127(e)(1) is added to codify the long-established practice that a motion for summary judgment should be filed prior to the commencement of the first testimony period, as originally set or as reset, and that the Board, in its discretion, may deny as untimely any motion for summary judgment filed thereafter. *See Rainbow Carpet, Inc. v. Rainbow International Carpet Dyeing & Cleaning Co.*, 226 USPQ 718 (TTAB 1985); *Allegro High Fidelity, Inc. v. Zenith Radio Corp.*, 197 USPQ 550 (TTAB 1977); *La Maur, Inc. v. Bagwells Enterprises, Inc.*, 193 USPQ 234 (Comm'r Pat. 1976); *Peterson's Ltd., Inc. v. Consolidated Cigar Corp.*, 183 USPQ 559 (TTAB 1974); *Cities Service Oil Co. v. Perfection American, Inc.*, 157 USPQ 209 (TTAB 1968); T. Jeffrey Quinn, *Tips From the TTAB: Inter Partes Summary Judgment Revisited*, 76 TMR 73 (1986); and David J. Kera, *Tips From the TTAB: Summary Judgment*, 71 TMR 59, 61-62 (1981).

Section 2.127(e)(2) is added to provide, in essence, that for purposes of summary judgment only, a party may rely on its own responses to requests for discovery served upon it by an adverse party. The new paragraph changes the Board's current practice, under which a party normally is not permitted to rely upon its own responses to discovery for purposes of summary judgment. It is believed that the new practice will be more consistent with the practice in the federal district courts.

Section 2.127(f) is added to codify the existing practice that the Board does not have authority to hold any person in contempt, or to award attorneys' fees or other expenses to any party. Although paragraphs (f), (g), and (h) of § 2.120, the section which governs the taking and use of discovery in inter partes proceedings before the Board, include provisions very similar in nature to the new paragraph, some litigants and/or their attorneys have mistakenly assumed that the Board has the authority to award attorneys' fees or other expenses in situations not involving a failure to provide discovery. The addition of this new paragraph to § 2.127, the section which governs motions in general, will clarify the matter.

Section 2.128(b), which presently provides, in pertinent part, that without leave of the Board, no brief shall contain more than fifty pages of argument, is amended to specify a minimum type or print size for a brief and to provide that without prior leave of the Board, a main brief on the case shall not exceed fifty-five pages in length in its entirety. Litigants before the Board, and their attorneys, are often confused as to exactly what is encompassed by the term "argument," as used in the present paragraph. The amendment simplifies and clarifies practice by specifying length limits for briefs in their entireties, followed by a list of the elements which are included within the length limit. The limit specified in the amended paragraph is five pages longer than that specified in the present paragraph, because the new length limit covers the entire brief, including the table of contents and index of cases, whereas the present length limit does not.

Section 2.129(a), which presently provides, in pertinent part, that oral arguments at final hearing will be heard by three Members of the Board, is amended to provide that such oral arguments will be heard by at least three Members of the Board. The purpose of the amendment, which parallels an amendment

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made herein to § 2.142(e)(1), is to reflect the Board's use of augmented panels in certain cases.

Section 2.134(a), which pertains to the surrender or voluntary cancellation of a registration which is the subject of a cancellation proceeding before the Board, is amended to codify the practice that in a cancellation proceeding, an adverse party's consent to the respondent's voluntary surrender of the involved registration may be signed by the adverse party or by the adverse party's attorney or other authorized representative. The amendment parallels amendments made herein to §§ 2.106(c), 2.114(c), and 2.135.

Section 2.135, which states the effect of the abandonment of an application which is the subject of an inter partes proceeding before the Board, is amended to codify the practice that in an opposition, concurrent use, or interference proceeding, an adverse party's consent to an applicant's abandonment of the applicant's involved application may be signed by the adverse party or by the adverse party's attorney or other authorized representative. The amendment parallels amendments made herein to §§ 2.106(c), 2.114(c), and 2.134(a).

Section 2.142(b), which governs ex parte appeal briefs, is amended to redesignate the present paragraph as "(1)" and to add a new paragraph, designated "(2)," codifying the form requirements and a length limit (twenty-five pages) for briefs filed in connection with ex parte appeals to the Board.

Section 2.142(e)(1), which presently provides that oral argument on an ex parte appeal to the Board will be heard by three Members of the Board, is amended to provide that oral argument will be heard by at least three Members of the Board. The purpose of the amendment, which parallels an amendment made herein to § 2.129(a), is to reflect the Board's use of augmented panels in certain cases.

Section 2.142(f)(6) is added to codify the practice that if, during an appeal to the Board from a refusal of registration, it appears to the examiner that an issue not previously raised may render the mark of the appellant unregistrable, the examiner may, by written request, ask the Board to suspend the appeal and to remand the application to the examiner for further examination.

Section 2.145(c)(4) is added to provide that a party to a proceeding before the Board which commences a civil action, pursuant to Section 21(b) of the Act, seeking review of a decision of the Board should file written notice with the Board, within one month after the expiration of the time for appeal or civil action, in order to avoid premature termination of the Board proceeding. The purpose of the amendment is to ensure that parties who seek review of Board decisions by way of civil action will be aware of the need for informing the Board thereof.

Section 2.186, which presently provides that any action with respect to an assigned application or registration which may or must be taken by a registrant or applicant may be taken by the assignee provided that the assignment has been recorded, is amended by adding at the end the phrase "or that proof of the assignment has been submitted." The purpose of the amendment is to bring the section into closer conformity with Section 10 of the Act.

Response to Comments on the Rules:

The written comments received in response to the notice of proposed rulemaking have been given careful consideration, and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

Comment: In the notice of proposed rulemaking, it was stated in the "Discussion of Specific Sections Proposed to be Changed" that § 2.68, which pertains to the express abandonment of an application, was proposed to be amended to indicate that the section applies only to the abandonment of an application during the ex parte prosecution thereof, i.e., an application not involved in an inter partes proceeding before the Board. Specifically, the proposed amendment was that the second sentence of the section, which presently reads, "The fact that an application has been expressly abandoned shall not, in any proceeding in the Patent and Trademark Office, affect any rights that the applicant may have in the mark which is the subject of the abandoned application," be amended by adding the phrase "during the ex parte prosecution thereof" immediately after the phrase "The fact that an application has been expressly abandoned." One firm commented that if the proposed amendment was intended to clarify the fact that this section applies only to ex parte applications, the phrase "during the ex parte prosecution thereof" should be added not to the second sentence of the section but rather after the words "An application" in the first sentence, which presently reads, "An application may be expressly abandoned by filing in the Patent and Trademark Office a written statement of abandonment or withdrawal of the application signed by the applicant, or the attorney or other person representing the applicant."

Response: The intent of the proposed amendment was to make it clear that the second sentence of the section (i.e., the sentence which provides, in essence, that the express abandonment of an application shall not, in any proceeding in the PTO, affect any rights which applicant may have in the mark which was the subject of the abandoned application) applies only to the abandonment of an application during ex parte prosecution (the effect of the abandonment of an application which is the subject of an inter partes proceeding before the Board being governed by § 2.135). Thus, the "Discussion of Specific Sections Proposed to be Changed" should have stated that § 2.68 was proposed to be amended to indicate that the "second sentence of the section" (not "the section") applies only to the abandonment of an application during the ex parte prosecution thereof. The first sentence of the section, which relates to the form of an express abandonment, is applicable both to applications which are the subject of an inter partes proceeding before the Board and to those which are not. Thus, the suggested modification has not been adopted. However, for purposes of added clarity, and in lieu of the amendment proposed in the notice of proposed rulemaking, the beginning of the second sentence of the section is being modified to include a cross-reference to § 2.135 (i.e., "Except as provided in § 2.135, the fact that an application has been expressly abandoned shall not. . . .").

Comment: Section 2.102(c) was proposed to be amended to change the specified time beyond which an extension of time to oppose will not be granted without the consent of the applicant or a showing of extraordinary circumstances, from "120 days from the date of publication" to "four months from the date of publication." The organization indicated its belief that since the proposed change would not affect the statutorily mandated "30 day" period for filing an opposition, the amendment would (at least initially) add to confusion regarding the computation of extension periods. In the same vein, one firm commented that the proposed amendment would make sense provided the Board allows potential opposers to request extensions of time to oppose in terms of months rather than days.

Response: It is true that under Section 13 of the Act of 1946, the statutorily mandated period for filing an opposition is "thirty days after the publication . . . of the mark sought to be registered." Section 13 further provides, in part, that the time for filing an opposition shall be extended for an additional thirty days upon written request prior to the expiration of the thirty-day opposition period, and that further extensions of time for filing an opposition may be granted by the Commissioner for good cause when requested prior to the expiration of an extension. Upon further consideration, it appears that the proposed amendment may encourage potential opposers to request the first and subsequent extensions of time to oppose in terms of months rather than days, causing confusion in the computation of extension periods. Accordingly, the proposal to amend § 2.102(c) is withdrawn. In the event that Section 13 of the Act is amended to change the time periods specified therein from "thirty days" to "one month," the proposal to amend § 2.102(c) to change the designation "120 days" to "four months" may be included in a future notice of proposed rulemaking.

Comment: With respect to the proposal to revise § 2.113 (which concerns notification to the respondent of the filing of a petition for cancellation) to indicate that the respondent "shall be the party shown by the records of the Patent and Trademark Office to be the current owner of the registration or registrations sought to be cancelled, except that the Board, in its discretion, may join or substitute as respondent a party who makes a showing of a current ownership interest in such registration or registrations," one individual suggested, in effect, that the section be further revised to provide that if the party identified by the petitioner as the current owner of the registration is not the party shown by the records of the PTO to be the owner, service of the notification and of the petition will be made on the identified current owner as well as on the record owner. The individual

notes that this revision would make § 2.113 consistent with proposed (and amended) § 2.112(a) (governing the contents of a petition for cancellation), which requires, in part, that the petitioner indicate, to the best of petitioner's knowledge, the name and address of the current owner of the registration. In addition, one firm suggested that § 2.113 be further revised to provide that a copy of a petition for cancellation will be sent (by the Board) both to the registrant and to the registrant's last attorney of record. The firm expressed its belief that sending a copy of the petition for cancellation to the registrant's last attorney of record as well as to the registrant "may serve to speed up cancellation proceedings, which are sometimes delayed by many months by reason of the fact that the registrant cannot be located and it is necessary to publish notice of the proceeding in the Office Gazette."

Response: Under present practice, when a petitioner informs the Board of petitioner's belief that the registration sought to be cancelled is currently owned by a party other than the party shown by the records of the PTO to be the owner, the Board sends a copy of the notification and of the petition to cancel both to the record owner, and to the party identified by the petitioner as the current owner. The current owner may file a motion, supported by evidence of its current ownership of the registration, to be joined or substituted as respondent. The paragraph has been modified, as suggested by the first individual, to reflect this practice.

As to the suggestion that § 2.113 be further revised to provide that a copy of the petition for cancellation will be sent both to the registrant and to the registrant's last attorney of record, it is the practice of the Board, in those cases where the respondent's copy of the petition for cancellation is returned to the Board as undeliverable, to send a written communication to the petitioner asking the petitioner for information concerning respondent's current address. If the petitioner files a response indicating that the respondent is no longer in business, notice of the proceeding is published in the *Official Gazette*. If the petitioner fails to file a response, or files a response indicating that it is unable to furnish respondent's current address, the Board attempts to locate the respondent. Typically, the Board will contact a telephone information operator in the city of respondent's last-known address; the respondent's last attorney of record, if there is an attorney and such attorney's last appearance of record on the respondent's behalf was within the last five years or so; and/or the Secretary of State of the respondent's state of incorporation. If the Board is unable to locate the respondent after reasonable investigation, notice of the proceeding is published in the *Official Gazette*.

The practice suggested by the firm would be burdensome to the Board since the Board would have to make an extra copy of the petition to cancel (and any exhibits attached thereto) to send to the attorney; this would have to be done for most cancellation proceedings, since most respondents have been represented by counsel at one time or another; and in those cases where the copy of the petition for cancellation mailed to the respondent's attorney was returned to the Board as undeliverable, the returns would be additional receipts to be processed by the Board.

Under the Board's present practice, on the other hand, the Board acts only in those cancellation proceedings in which the respondent's copy of the petition for cancellation is returned as undeliverable (a minority of cases).

Preliminary steps have been taken to begin giving notice, by publication in the *Official Gazette*, of the filing of every petition for cancellation soon after its filing date, thus eliminating the need for a later service by publication in cases where the Board's efforts to serve notice of the proceeding by mail are unsuccessful.

Accordingly, the modification suggested by the firm has not been adopted.

Comment: Section 2.119(b), which lists methods for service of papers by one party upon another in an inter partes proceeding before the Board, was proposed to be amended to specifically provide for the service of papers by two additional methods, namely, transmission by the "Express Mail" service of the United States Postal Service and transmission by overnight courier. One individual applauded the proposal but commented that on one occasion, a problem arose when an overnight courier delivered a paper directly to the PTO at its physical location in Virginia. The individual suggested that if the proposed amendment is adopted, "the overnight courier should be provided a physical address rather than Box 5 at Washington D.C. 20231."

Response: Section 2.119(b) pertains to the service of papers by one party upon another, not to the filing of papers with the PTO.

Comment: Section 2.119(c), which presently provides, in part, that whenever a party is required to take some action within a prescribed period after the service of a paper upon that party by another party and the paper is served by mail, 5 days shall be added to the prescribed period, was proposed to be amended to apply also to service by "Express Mail" or by overnight courier. One individual commented that when service is made by "Express Mail" or overnight courier, the addition of 5 days to any prescribed time period for taking action seems unjustified. This individual suggested that the paragraph be modified to provide for the addition of only one day to the prescribed time for taking action when service is made by "Express Mail" or by overnight courier.

Response: Since papers transmitted by "Express Mail" or by overnight courier are not always delivered in one day, it was determined that the number of added days for service should be the same for service by "Express Mail" or by overnight courier as for service by first-class mail. An attorney who does not want to give an adverse party the advantage of having 5 added days after service by "Express Mail" or by overnight courier can always elect to serve by first-class mail instead. Accordingly, the suggested modification has not been adopted.

Comment: New § 2.119(d) was proposed to be added to require, in essence, that a party to an inter partes proceeding who is not domiciled in the United States and is not represented by an attorney or other authorized representative located in the United States, appoint a domestic representative on whom may be served notices or process in the proceeding. One firm commented that the proposed paragraph might be redundant because any foreign applicant is required (by § 2.24) to designate a domestic representative in the application.

Response: In the notice of proposed rulemaking, the term "application" was inadvertently used instead of the correct term "proceeding" in the second sentence of the paragraph. Although § 2.24 requires that an applicant not domiciled in the United States appoint a domestic representative, there is no rule which makes any similar requirement in the case of a foreign opposer, petitioner, or respondent involved in an inter partes proceeding before the Board. The proposal to add new § 2.119 was intended to remedy that oversight and thus to facilitate the service of papers on foreign opposers, petitioners and respondents not represented by domestic counsel. Inasmuch as there is, in fact, a need for the proposed requirement, proposed § 2.119(d) is adopted herein as a final rule, and the second sentence has been corrected by substituting the term "proceeding" for the term "application."

Comment: Section 2.120(a), which contains certain general provisions relating to discovery in inter partes proceedings before the Board, was proposed to be amended to include a new sentence specifying that the opening of discovery is governed by the Federal Rules of Civil Procedure. One firm commented, in essence, that the proposed amendment "does not clarify the situation of when discovery opens;" that the opening of discovery as set forth in the Federal Rules of Civil Procedure does not work in opposition and cancellation proceedings because of the delay (of one to two months) between the filing of the complaint, i.e., the notice of opposition or petition for cancellation, and service of a copy of the complaint upon the defendant by the Board; that this delay gives the defendant, which may start to take discovery immediately after the complaint is filed, an advantage over the plaintiff, which cannot take discovery until a copy of the complaint has been served by the Board upon the defendant, and is not entitled to receive responses to its interrogatories, requests for production, and requests for admission until 45 days after such service by the Board; and that the "preferred situation would be for the Board to set forth a specific time before which discovery requests cannot be served," as, for example, to provide that discovery opens on the date that the Board notifies the defendant of the filing of the proceeding.

Response: It is apparent that the thrust of the firm's comments relating to this proposed amendment is not that the proposed new provision is unclear but rather that the firm would prefer a different practice with respect to the opening of discovery in proceedings before the Board. The proposed amendment codifies a long-standing practice which, in the experience of the Board, has worked smoothly. Although some defendants in

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Board opposition and cancellation proceedings learn about the existence of the proceeding, and serve discovery requests, before the Board serves them with a notice of the filing of the proceeding and a copy of the complaint, most do not. Nor does the plaintiff, who, after all, is the party which initiated the proceeding, and has had time to plan and prepare therefor, suffer any real prejudice (as opposed to a possible perceived tactical disadvantage) in those cases where the defendant does initiate discovery before the plaintiff can do so. Accordingly, the modification suggested by the firm has not been adopted.

Comment: Section 2.120(d) was proposed to be amended to include a new paragraph, designated "(1)," limiting the number of interrogatories which a party may serve upon another party to twenty-five, not counting subparts (required to be relevant, and reasonable in number), with additional interrogatories being allowed by the Board, in its discretion, only upon motion to the Board showing extraordinary circumstances, or upon stipulation of the parties.

One individual expressed his belief that the proposed "extraordinary circumstances" test is too harsh and suggested instead that the test be "substantial need in the preparation of the moving party's case."

A second individual expressed his belief that the "reasonable number of relevant subparts" provision is so subjective that it would lead to an increase in discovery disputes and motions. This individual suggested that the interrogatory limit be set at fifty rather than twenty-five, and that the "reasonable number of relevant subparts" provision be replaced with the sentence, "In computing the total number of interrogatories, each subdivision of separate questions shall be counted as an interrogatory."

A third individual commented that limiting interrogatories to twenty-five with a reasonable number of subparts would cause uncertainty over whether interrogatories, although numbered twenty-five or less, actually contain more than twenty-five separate questions, leading litigants to make their own count of the questions, answer twenty-five, and not answer fully the remainder on the ground that supernumerary questions are not authorized by the rules. To remedy this problem, the individual suggested that if the proposed rule is adopted, it might be advisable to add "a provision prescribing that relief for an excessive number of interrogatories is a protective order rather than an incomplete response to the interrogatories." The same individual also commented that in any event, the rule should not be applied to pending cases.

One firm commented that by stating that the twenty-five interrogatories may contain a reasonable number of relevant subparts, the whole purpose of the proposed rule (to discourage harassment by the use of too many interrogatories) has been defeated since the interrogatory limit can easily be avoided by using subparts. The firm suggested that the number of interrogatories be limited instead to a stated number, such as 125, including subparts; and that the rule be clarified to provide for extra interrogatories in cases where more than one mark is involved.

Another firm expressed its belief that the number of interrogatories should not be limited; that the proposed rule would make practice before the Board more expensive and less convenient; that the particular number limit proposed is even below the number allowed by some federal courts; that the "extraordinary circumstances" test is not practical because of the lack of specificity as to what constitutes "extraordinary" circumstances, and because of the delay involved in having to file a motion to obtain a ruling on the question; and that a better practice would be a provision which allows a party to move for a limitation on the number of interrogatories if a problem arises. This firm submitted copies of a number of different federal district court local rules pertaining to interrogatories.

Finally, an organization expressed its concern that the proposed limitation on the number of interrogatories could: (1) lead to an increase in motions to the Board in order to permit parties to serve valid follow-up interrogatories regarding prior responses and documents produced; or (2) result in increased reliance on depositions, generally a more costly and intrusive form of discovery. The organization recommended that the PTO monitor the impact of this amendment carefully and further amend the rule to make it less restrictive, if the circumstances warrant.

Response: Upon careful consideration of the comments, and supporting arguments, submitted with respect to proposed § 2.120(d)(1), it is concluded that the "reasonable number of relevant subparts" provision is so subjective that it would lead to a large increase in discovery disputes and motions, and hence be burdensome both to the Board and to litigants and their attorneys. Moreover, if unlimited subparts were allowed, the purpose of the proposed paragraph (to discourage parties from using written interrogatories for purposes of harassment) would, as noted by the firm, be defeated, since the interrogatory number limit could easily be avoided through the use of many subparts; whereas, if no subparts were allowed (or if each subpart were counted as an interrogatory), the limit in the proposed rule might lead to increased use of discovery depositions, a more costly form of discovery. The proposed limitation was not intended to deprive parties of interrogatories for which they have a legitimate need or to make it more expensive for parties to obtain discovery. Rather, it was intended to protect litigants from being harassed by excessive numbers of interrogatories. Accordingly, the proposed paragraph has been modified to limit the total number of interrogatories which a party may serve upon another party in a proceeding to seventy-five, *counting subparts*, with additional interrogatories being allowed by the Board, in its discretion, upon motion to the Board showing good cause, or upon stipulation of the parties. The words "total" and "in a proceeding," which were not included in the proposed rule, have been included in the final rule to make it clear that the number limitation refers to the total number of interrogatories served during an entire proceeding, not just per set of interrogatories.

The suggestion that the final rule include, in lieu of a specific limitation on the number of interrogatories which may be served, a provision allowing a party to move for a limitation on the number of interrogatories if a problem arises, has not been adopted. It is believed that such a provision would result in a large number of motions from parties which would not be willing to answer interrogatories without first obtaining a ruling from the Board as to whether the interrogatories were reasonable in number.

The amended paragraph has not been modified to provide for extra interrogatories in cases where more than one mark is pleaded by the plaintiff, or where the proceeding involves more than one mark registered or sought to be registered by the defendant, because in such cases the adverse party may simply request that each interrogatory be answered with respect to each mark, and the interrogatories will be counted the same as if they pertained to only one mark. In the same vein, the final rule does not provide for extra interrogatories in cases where there is a counterclaim for cancellation of a plaintiff's pleaded registration or registrations, because the discovery information needed by a defendant in a proceeding before the Board for purposes of defending itself against the plaintiff's claim usually encompasses any information which may be needed for a counterclaim. Thus, it is believed that in most cases, the mere fact that there may be a multiple mark situation, or a counterclaim, will not result in a need for interrogatories exceeding in total number the limitation specified in the final rule. However, in those cases where there is, because of a multiple mark or counterclaim situation, a legitimate need for interrogatories exceeding the specified limit in number, the party who wishes to serve additional interrogatories will be able to make the requisite showing of good cause in support of a motion for leave to do so.

For purposes of clarity, the final paragraph includes (as did several of the federal district court local rules submitted by one firm) a requirement that a motion for leave to serve additional interrogatories be accompanied by a copy of the interrogatories which have already been served by the moving party, if any, and by a copy of the interrogatories proposed to be served. Obviously, the Board cannot make an informed ruling on such a motion without these copies.

The final paragraph also includes, as suggested by one individual, a provision indicating that relief for an excessive number of interrogatories is a protective order rather than an incomplete response to the interrogatories. Specifically, the final paragraph states that if a party upon which interrogatories have been served believes that the number of interrogatories served exceeds the limitation specified in the paragraph, and is not willing to waive this basis for objection, the party shall, within the time for (and instead of) serving answers and objections to the interrogatories, file a motion for a protective order, accompanied by a copy of the interrogatories which together are said to exceed the limitation.

The suggestion that this rule not be applied to pending cases has not been adopted. By a final rule notice published in the *Federal Register* on April 18, 1972 at 37 FR 7605, the rules of practice in trademark cases were amended to substantially adopt the liberal discovery practice provided under the Federal Rules of Civil Procedure. Those rule amendments were made applicable to all proceedings filed on or after July 1, 1972. The result was that for a number of years, some inter partes cases before the Board were governed by one set of rules, providing a liberal discovery practice, and others were governed by another set of rules under which discovery was more restricted. This situation caused confusion among litigants and their attorneys and was burdensome to the Board. Further, it is desirable that other rule amendments herein be made effective in all cases as soon as possible, and it would be extremely confusing for all concerned if some of the rule amendments were made applicable to all cases pending before the Board on or after the effective date of the rule amendments, and others were made applicable only to proceedings which commenced on or after that date. For these reasons, it is believed that the better alternative is to make the new interrogatory rule applicable to all inter partes proceedings pending before the Board on or after the effective date of the rule amendments. However, the new rule will apply only to interrogatories served on or after that date (although interrogatories served prior to that date will, of course, be counted in determining whether interrogatories served after the effective date violate the limitation specified in the new rule; that is, a party who has served 100 interrogatories prior to the effective date of the new rule is not given license by the new rule to serve another 75 after the effective date).

Finally, as suggested by the organization, the PTO will monitor the impact of this rule amendment carefully and further amend the rule to make it less restrictive, if circumstances warrant.

Comment: One individual and one firm commented, with respect to proposed §§ 2.120(g)(2) and 2.120(j)(3)(i), that there appeared to be significant errors in the text as published in the *Federal Register* and in the *Patent, Trademark & Copyright Journal*.

Response: The noted errors were made in printing, when several pages of original text were transposed. On April 4, 1989, a correction notice pertaining to those errors, among others, was printed in the *Federal Register* at 54 FR 13605. The errors did not appear in the text as published in the *Official Gazette*.

Comment: Section 2.123(e)(2), which pertains to the examination of witnesses during oral deposition, was proposed to be amended to include a new sentence stating that exhibits which are marked and identified at a deposition will be deemed to have been offered into evidence, without any formal offer thereof, unless the intention of the parties is clearly to the contrary. The purpose of the proposed amendment was to revise existing practice, which requires, on the part of the party marking the exhibits, either a formal offer or a clear indication in the transcript of an intent to introduce the exhibits. One individual commented that the clause "unless the intention of the parties is clearly to the contrary" is somewhat inaccurate and ambiguous. The individual suggested that the proposed clause be modified to read, "unless the intention of the party marking the exhibit is clearly expressed to the contrary."

Response: The paragraph has been modified as suggested.

Comment: One individual commented that he applauded the proposal to amend § 2.123(g)(1), which relates to the form of deposition transcripts, to permit the use of paper with numbered lines as an alternative to consecutively numbering the questions propounded to a witness, but suggested that the paragraph be amended further to delete another requirement, namely, the requirement that the name of the witness be plainly and conspicuously written at the top of each page. The individual questioned whether "it is necessary to still require that the name of the witness be written at the top of each page provided that the testimony of each witness is bound into one or more volumes separately from the testimony of any other witness and clearly marked on the cover and at the first and last to indicate the name of that particular witness." The individual noted that many of the reporters available for use in this type of proceeding are retired former court reporters who have established independent businesses, and "who do not have elaborate word processing which could perform that task automatically during printing."

Response: The appearance of the name of the witness at the top of each page of a deposition transcript is quite helpful to the Board. For example, sometimes litigants submit, in connection with a motion, copies of several selected pages from one or more deposition transcripts. In such cases, the name at the top of the page is sometimes the only means the Board has of determining whose testimony is on each page. Moreover, often, while drafting an opinion, it is necessary for a Board Member to refer repeatedly to a number of open deposition transcripts, and it would be inconvenient for the Board Member to have to keep turning to the front of the transcripts to verify the identity of the witness in each one. Accordingly, the suggestion has not been adopted.

Comment: With respect to § 2.127(e)(1), which was proposed to be added to provide that a motion for summary judgment should be filed prior to the commencement of the first testimony period, and that the Board, in its discretion, may deny as untimely any motion for summary judgment filed thereafter, the organization commented that the language does not take into account the possibility that the trial periods may be reset; and recommended that the problem be corrected by substituting the phrase "opening trial date" for the phrase "first testimony period."

Response: The phrase "opening trial date" is somewhat ambiguous since "trial date" might be construed by some litigants as referring to the date on which testimony is actually scheduled to be taken, rather than the date of the commencement of the testimony period. Moreover, it is not believed that the substitution of the phrase "opening trial date" for the phrase "first testimony period" would solve the problem perceived by the organization. It appears that the organization may have construed the phrase "first testimony period" as meaning the opening testimony period as first set, when in fact the phrase was intended to signify the opening testimony period of the plaintiff, as distinguished from other testimony periods, such as the testimony period of the defendant (particularly where the defendant is also the plaintiff in a counterclaim, in which case the testimony period of the defendant as defendant in the main proceeding and as plaintiff in the counterclaim could be argued to be the "opening testimony period" for purposes of the counterclaim), the rebuttal testimony period of the plaintiff, etc. In any event, in order to further clarify the paragraph, the phrase "as originally set or as reset" has been included in the amended paragraph immediately after the phrase "first testimony period." This should not be construed as meaning, however, that when the Board denies a motion for summary judgment as untimely filed, but resets the plaintiff's main (i.e., "first") testimony period, the motion may be refiled before the commencement of the period as reset, and considered timely. *See La Maur, Inc. v. Bogwells Enterprises, Inc., supra*.

Comment: Section 2.127(e)(2) was proposed to be added to provide that for purposes of summary judgment only a party may rely upon its own responses to discovery requests. The organization stated that it opposes this amendment "because it could lead to discovery abuses and will create conflicting treatment of a party's own answers to discovery, depending upon whether the case is resolved on summary judgment or after a trial on the merits." The organization also expressed its belief that although the proposed paragraph follows practice in the federal district courts, the limited jurisdiction and sanctioning power of the Board "would tend to frustrate the self-policing effect of the rule as it operates in a federal court context." One individual commented that the proposed paragraph may mislead some lawyers into thinking that the filing, without more, of a party's own interrogatory answers, etc., in connection with a motion for summary judgment will make them probative; that Rule 56(e) of the Federal Rules of Civil Procedure specifies certain requirements for affidavits submitted in connection with a summary judgment motion; that these requirements (namely, that the affidavits be made on personal knowledge, set forth such facts as would be admissible in evidence, and show affirmatively that affiant is competent to testify to the matters stated therein) have been applied by the courts to answers to interrogatories filed in support of or in opposition to a summary judgment motion; and that the proposed paragraph should be modified to refer to these requirements, as, for example, by the addition of the phrase "and subject to the requirements of Rule 56(e) of the Federal Rules of Civil Procedure" after the introductory phrase "For purposes of summary judgment only."

Response: It is noted that the specific discovery abuses feared were not enumerated. To the extent that the proposed practice would create conflicting treatment of a party's own responses to

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discovery, depending upon whether a case is resolved upon summary judgment or after trial on the merits, it is not believed that this is a matter of great concern. Indeed, there is precedent for such a conflict in the treatment of evidence. Under present practice, there is conflicting treatment of affidavit "testimony," which is not admissible at trial except by agreement of the parties [see § 2.123(b)], but is admissible for purposes of a motion for summary judgment (subject to the requirements of Rule 56(e) of the Federal Rules of Civil Procedure).

Essentially, the matters raised by the organization and by the individual are factors to be considered by the Board in determining the probative value of a party's own discovery responses submitted for purposes of summary judgment. However, the proposed paragraph relates to the admissibility of this type of evidence, not to its probative value. The fact that a piece of evidence is admissible does not mean that it will necessarily be accorded great, or even any, probative value.

Over the years, many attorneys have argued, in briefs filed in connection with summary judgment motions, that a party's own discovery responses should be admissible for purposes of summary judgment. Under the circumstances, the paragraph is being adopted as proposed, without any modifications. However, the impact of the new rule will be monitored carefully, and the paragraph will be modified by future rulemaking, if necessary.

Comment: Section 2.128(b), which governs the form of briefs at final hearing, presently provides, in part, that without leave of the Board, no brief shall contain more than fifty pages of argument and, in the case of a reply brief, the entire brief shall not exceed twenty-five pages. The paragraph was proposed to be amended to provide that without prior leave of the Board, "a main brief on the case shall not exceed fifty-five pages in length in its entirety, including the table of contents, index of cases, description of the record, statement of the issues, recitation of facts, argument, and summary, and a reply brief shall not exceed twenty-five pages in its entirety." The two firms commented that the table of contents and index of cases should not be included in the page limitations for main briefs. They stated that these two elements do not actually constitute the brief, but clearly facilitate the use and reading of the brief, and hence are helpful to both the Board and the parties; that incorporation of these parts into the page limitation will encourage minimal use of these features; and that in most federal courts which have a limitation on the number of pages, these two elements are excluded from the limitation.

Response: The provision of present § 2.128(b), that no (main) brief shall contain more than fifty pages of argument, has always been deemed by the Board to exclude the table of contents and index of cases (as well as any attached exhibits or appendices, which are not considered to be part of the brief itself), but to include (the term "argument" being construed broadly) the description of the record, statement of the issues, recitation of facts, arguments based on the law and the facts, and summary.Because of confusion on the part of litigants and their attorneys as to which parts of the brief are included within the length limitation of the present provision, and for purposes of clarity, the paragraph was proposed to be amended to include all parts of the brief itself (again, any exhibits or appendices to the brief are not considered to be part of the brief). Since the proposed amendment included in the length limitation the two elements which had not been included before, namely, the table of contents and index of pages, the brief length limitation was proposed to be increased from fifty pages to fifty-five pages. It is believed that the allowance of an extra five pages is more than sufficient to cover the table of contents and index of cases in main briefs before the Board, and that a page limitation which is all-inclusive is simpler and less confusing than one which is not all-inclusive. Therefore, the suggested modification has not been adopted.

Comment: Section 2.142(b)(2) was proposed to be added to govern the form of briefs on the case in ex parte appeals before the Board. The proposed paragraph provides, in part, that without prior leave of the Board, a brief shall not exceed twenty-five pages in length in its entirety. The organization commented that the proposed provision would limit appeal briefs "to a maximum of 25 pages, including all appendices and exhibits;" that although the proposed rule aloows a party to seek prior leave to file a more extensive brief, it is likely that the need to seek such leave will arise too frequently, with the result being a counter-productive rule; and that if a page limit is required, it should either be increased or clarified to exclude exhibits and appendices.

Response: Exhibits and appendices to a brief are not considered by the Board to be part of the brief, and hence are not included within the length limitation. However, the inclusion in the paragraph of a reference to exhibits and appendices to an appeal brief may mislead some litigants and/or their attorneys into believing that new evidence may be submitted with an appeal brief by way of an exhibit or appendix thereto, when, in fact, an applicant may submit new evidence after appeal only with the consent of the Examining Attorney or in accordance with the provisions of § 2.142(d). Accordingly, the suggested modification has not been adopted.

Comment: Section 2.142(f)(6) was proposed to be added to provide, in part, that "if, during an appeal from a refusal of registration, it appears to the examiner that an issue not involved in the appeal may render the mark of the appellant unregistrable, the examiner may request the Board to suspend the appeal and to remand the application to the examiner for further examination." The organization commented that the paragraph should be modified to specify that the Examining Attorney must file a written request and show good cause before an application will be remanded for examination; that the situations in which remand is allowed by the Board should be closely scrutinized; that after an applicant has submitted its appeal brief, for example, remand should be allowed, if at all, only in the most exceptional circumstances; and that when a requested remand is for the purpose of curing technical problems previously overlooked, the consent of the applicant shall be sought.

Response: The proposed paragraph, which codifies present practice, has been modified to specify that the Examining Attorney's request for remand must be written (as is, in fact, the practice). The remainder of the organization's suggestions, if adopted, would make it much more difficult for the Examining Attorney to obtain a remand of the application for purposes of further examination with respect to an issue not involved in the appeal. However, it is in the interest of the public, the applicant, and the PTO to avoid the issuance of an invalid registration. Accordingly, the remainder of the organization's suggestions have not been adopted.

Comment: Section 2.145(c)(4) was proposed to be added to provide that a party to a proceeding before the Board who commences a civil action, pursuant to Section 21(b) of the Act, seeking review of a decision of the Board must file written notice thereof in the PTO, addressed to the Board, within one month after the expiration of the time for appeal or civil action, in order to avoid premature termination of the Board proceeding. The organization commented that the proposed paragraph requires further clarification to define what is meant by the term "premature termination;" that depending on the meaning, the result of a "premature termination" may be too harsh, e.g., where a party may have otherwise perfected an appeal of a Board decision with the exception of having timely filed written notice of the proceeding with the Board; and that the word "should" should be substituted for the word "must" in the proposed paragraph.

Response: When a decision of the Board has become final, that is, when the time for appeal therefrom has expired and no appeal has been filed, the PTO takes certain further steps, based on the final decision, including those steps necessary to give effect to the decision. This process is referred to as the "termination" of the proceeding. For example, when a decision of the Board dismissing an opposition has become final, the word "Terminated" is stamped on the file of the opposition proceeding, the opposition file is sent to the warehouse where terminated proceeding files are stored, and the registration sought by the applicant is issued. When a decision of the Board granting a petition for cancellation has become final, one of the further steps taken as a consequence thereof is the cancellation of the respondent's subject registration. If an "appeal" by way of civil action is taken from a decision of the Board, and the PTO is not notified, the PTO, believing the Board's decision to be final, will take the further steps which are appropriate based on the decision, i.e., the PTO will "terminate" the proceeding, not knowing that it is doing so prematurely.

The premature termination of a Board proceeding has no effect on the perfection of the "appeal" by way of civil action, and is not in the nature of a sanction, but rather occurs because the PTO has followed its normal procedures to give effect to a decision of the Board. The purpose of the proposed paragraph is simply to warn litigants who have filed a civil action seeking review of a decision of the Board that they need to give timely

notice to the PTO of the filing of the civil action so that the PTO will not take steps to give effect to the Board's decision in the mistaken belief that it is final, when in fact it is not.

However, it is possible that in some cases where a written notice of the commencement of a civil action is filed shortly after the time specified in the rule, the PTO will not yet have terminated the proceeding, and therefore the written notice, even though somewhat untimely, will serve to avoid premature termination of the proceeding. For this reason, the paragraph has been modified as suggested by substituting the word "should" for the word "must."

The adoption of the suggestion that the proposed paragraph be clarified to define what is meant by the term "premature termination" would result in a rule which is unduly lengthy. Moreover, a detailed explanation of the meaning of the term has been given in this final rule notice.

Comment: Two individuals and one firm submitted suggestions for changes to rules not involved herein.

Response: The suggested changes cannot be adopted without affording members of the public an opportunity to comment thereon. However, these suggestions will be considered in connection with any future amendments to the rules of practice in trademark cases.

Environmental, Energy, and other considerations:

The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rule change includes no additional or increased fees. Substantive rights to use valuable trademarks are not adversely affected.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the states as outlined in Executive Order 12612.

This rule contains collections of information subject to the Paperwork Reduction Act previously approved by OMB under ICB Number 0651-0009. Public reporting burden for this collection of information is estimated to average 25 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Commissioner of Patents and Trademarks, Washington, D.C. 20231 and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503.

List of Subject Terms in 37 CFR Part 2:

Administrative practice and procedures, Courts, Lawyers, Trademarks.

Amendment of Regulations:

For the reasons set forth in the preamble and pursuant to the authority contained in Section 41 of the Trademark Act of July 5, 1946, as amended, Part 2 of Title 37 of the Code of Federal Regulations is amended as set forth below.

PART 2...RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.42 is revised to read as follows:

§ 2.42 Concurrent use.

An application for registration as a lawful concurrent user shall specify and contain all the elements required by the preceding sections. The applicant in addition shall state in the application the area, the goods, and the mode of use for which applicant seeks registration; and also shall state, to the extent of the applicant's knowledge, the concurrent lawful use of the mark by others, setting forth their names and addresses; registrations issued to or applications filed by such others, if any; the areas of such use; the goods on or in connection with which such use is made; the mode of such use; and the periods of such use.

2. Section 2.68 is revised to read as follows:

§ 2.68 Express abandonment (withdrawal) of application.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written statement of abandonment or withdrawal of the application signed by the applicant, or the attorney or other person representing the applicant. Except as provided in § 2.135, the fact that an application has been expressly abandoned shall not, in any proceeding in the Patent and Trademark Office, affect any rights that the applicant may have in the mark which is the subject of the abandoned application.

3. Section 2.91 is amended by revising the section heading to read as follows:

§ 2.91 Declaration of interference.

* * * * *

4. Section 2.92 is revised to read as follows:

§ 2.92 Preliminary to interference.

An interference which has been declared by the Commissioner will not be instituted by the Trademark Trial and Appeal Board until the Examiner of Trademarks has determined that the marks which are to form the subject matter of the controversy are registrable, and all of the marks have been published in the Official Gazette for opposition.

5. Section 2.93 is revised as follows:

§ 2.93 Institution of interference.

An interference is instituted by the mailing of a notice of interference to the parties. The notice shall be sent to each applicant, in care of the applicant's attorney or other representative of record, if any, and if one of the parties is a registrant, the notice shall be sent to the registrant or the registrant's assignee of record. The notice shall give the name and address of every adverse party and of the adverse party's attorney or other authorized representative, if any, together with the serial number and date of filing and publication of each of the applications, or the registration number and date of issuance of each of the registrations, involved.

6. Section 2.104 is revised to read as follows:

§ 2.104 Contents of opposition.

(a) The opposition must set forth a short and plain statement showing why the opposer believes it would be damaged by the registration of the opposed mark and state the grounds for opposition. A duplicate copy of the opposition, including exhibits, shall be filed with the opposition.

(b) Oppositions to different applications owned by the same party may be joined in a consolidated opposition when appropriate, but the required fee must be included for each party joined as opposer for each class in which registration is opposed in each application against which the opposition is filed.

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7. Section 2.106 is amended by revising paragraphs (b)(1) and (c) to read as follows:

* * * * *

§ 2.106 Answer.

(b)(1) An answer shall state in short and plain terms the applicant's defenses to each claim asserted and shall admit or deny the averments upon which the opposer relies. If the applicant is without knowledge or information sufficient to form a belief as to the truth of an averment, applicant shall so state and this will have the effect of a denial. Denials may take any of the forms specified in Rule 8(b) of the Federal Rules of Civil Procedure. An answer may contain any defense, including the affirmative defenses of unclean hands, laches, estoppel, acquiescence, fraud, mistake, prior judgment, or any other matter constituting an avoidance or affirmative defense. When pleading special matters, the Federal Rules of Civil Procedure shall be followed. A reply to an affirmative defense need not be filed. When a defense attacks the validity of a registration pleaded in the opposition, paragraph (b)(2) of this section shall govern. A pleaded registration is a registration identified by number and date of issuance in an original notice of opposition or in any amendment thereto made under Rule 15, Federal Rules of Civil Procedure.

* * * * *

(c) The opposition may be withdrawn without prejudice before the answer is filed. After the answer is filed, the opposition may not be withdrawn without prejudice except with the written consent of the applicant or the applicant's attorney or other authorized representative.

8. Section 2.112 is amended by revising paragraph (a) to read as follows:

§ 2.112 Contents of petition for cancellation.

(a) The petition to cancel must set forth a short and plain statement showing why the petitioner believes it is or will be damaged by the registration, state the grounds for cancellation, and indicate, to the best of petitioner's knowledge, the name and address of the current owner of the registration. A duplicate copy of the petition, including exhibits, shall be filed with the petition.

* * * * *

9. Section 2.113 is revised to read as follows:

§ 2.113 Notification of cancellation proceeding.

When a petition for cancellation has been filed in proper form (see §§ 2.111 and 2.112), a notification shall be prepared by the Trademark Trial and Appeal Board, which shall identify the title and number of the proceeding and the registration or registrations involved and shall designate a time, not less than thirty days from the mailing date of the notification, within which an answer must be filed. A copy of the notification shall be forwarded to the attorney or other authorized representative of the petitioner, if any, or to the petitioner. The duplicate copy of the petition for cancellation and exhibits shall be forwarded with a copy of the notification to the respondent (see § 2.118), who shall be the party shown by the records of the Patent and Trademark Office to be the current owner of the registration or registrations sought to be cancelled, except that the Board, in its discretion, may join or substitute as respondent a party who makes a showing of a current ownership interest in such registration or registrations. When the party identified by the petitioner, pursuant to § 2.112(a), as the current owner of the registration or registrations is not the record owner thereof, a courtesy copy of the petition for cancellation shall be forwarded with a copy of the notification to the alleged current owner, which may file a motion to be joined or substituted as respondent. If the petition is found to be defective as to form, the party filing the petition shall be so advised and allowed a reasonable time for correcting the informality.

10. Section 2.114 is amended by revising paragraphs (b)(1) and (c) to read as follows:

§ 2.114 Answer.

* * * * *

(b)(1) An answer shall state in short and plain terms the respondent's defenses to each claim asserted and shall admit or deny the averments upon which the petitioner relies. If the respondent is without knowledge or information sufficient to form a belief as to the truth of an averment, respondent shall so state and this will have the effect of a denial. Denials may take any of the forms specified in Rule 8(b) of the Federal Rules of Civil Procedure. An answer may contain any defense, including the affirmative defenses of unclean hands, laches, estoppel, acquiescence, fraud, mistake, prior judgment, or any other matter constituting an avoidance or affirmative defense. When pleading special matters, the Federal Rules of Civil Procedure shall be followed. A reply to an affirmative defense need not be filed. When a defense attacks the validity of a registration pleaded in the petition, paragraph (b)(2) of this section shall govern. A pleaded registration is a registration identified by number and date of issuance in an original petition for cancellation or in any amendment thereto made under Rule 15, Federal Rules of Civil Procedure.

* * * * *

(c) The petition for cancellation may be withdrawn without prejudice before the answer is filed. After the answer is filed, the petition may not be withdrawn without prejudice except with the written consent of the registrant or the registrant's attorney or other authorized representative.

11. Section 2.119 is amended by revising the section heading, paragraphs (b) and (c), and adding new paragraphs (d) and (e) to read as follows:

§ 2.119 Service and signing of papers.

* * * * *

(b) Service of papers must be on the attorney or other authorized representative of the party if there be such or on the party if there is no attorney or other authorized representative, and may be made in any of the following ways: (1) By delivering a copy of the paper to the person served;
(2) By leaving a copy at the usual place of business of the person served, with someone in the person's employment;
(3) When the person served has no usual place of business, by leaving a copy at the person's residence, with a member of the person's family over 14 years of age and of discretion;
(4) Transmission by the "Express Mail Post Office to Addressee" service of the United States Postal Service or by first-class mail, which may also be certified or registered;
(5) Transmission by overnight courier.
Whenever it shall be satisfactorily shown to the Commissioner that none of the above modes of obtaining service or serving the paper is practicable, service may be by notice published in the *Official Gazette*.

(c) When service is made by first-class mail, "Express Mail," or overnight courier, the date of mailing or of delivery to the overnight courier will be considered the date of service. Whenever a party is required to take some action within a prescribed period after the service of a paper upon the party by another party and the paper is served by first-class mail, "Express Mail," or overnight courier, 5 days shall be added to the prescribed period.

(d) If a party to an inter partes proceeding is not domiciled in the United States and is not represented by an attorney or other authorized representative located in the United States, the party must designate by written document filed in the Patent and Trademark Office the name and address of a person resident in the United States on whom may be served notices or process in the proceeding. In such cases, official communications of the Patent and Trademark Office will be addressed to the domestic representative unless the proceeding is being prosecuted by an attorney at law or other qualified person duly authorized under § 10.14(c) of this subchapter. The mere designation of a domestic representative does not authorize the person designated to prosecute the proceeding unless qualified under § 10.14(a), or qualified under paragraph (b) or (c) of § 10.14 and authorized under § 2.17(b).

(e) Every paper filed in an inter partes proceeding, and every request for an extension of time to file an opposition, must be signed by the party filing it, or by the party's attorney or other authorized representative, but an unsigned paper will not be refused consideration if a signed copy is submitted to the Patent and Trademark Office within the time limit set in the notification of this defect by the Office.

12. Section 2.120 is amended by revising paragraphs (a), (d), (g), (j)(3), (j)(4), (j)(5), and (j)(8) to read as follows:

§ 2.120 Discovery.

(a) *In general.* The provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference and concurrent use registration proceedings except as otherwise provided in this section. The Trademark Trial and Appeal Board will specify the closing date for the taking of discovery. The opening of discovery is governed by the Federal Rules of Civil Procedure.

* * * * *

(d) *Interrogatories; request for production.* (1) The total number of written interrogatories which a party may serve upon another party pursuant to Rule 33 of the Federal Rules of Civil Procedure, in a proceeding, shall not exceed seventy-five, counting subparts, except that the Trademark Trial and Appeal Board, in its discretion, may allow additional interrogatories upon motion therefor showing good cause, or upon stipulation of the parties. A motion for leave to serve additional interrogatories must be accompanied by a copy of the interrogatories, if any, which have already been served by the moving party, and by a copy of the interrogatories proposed to be served. If a party upon which interrogatories have been served believes that the number of interrogatories served exceeds the limitation specified in this paragraph, and is not willing to waive this basis for objection, the party shall, within the time for (and instead of) serving answers and objections to the interrogatories, file a motion for a protective order, accompanied by a copy of the interrogatories which together are said to exceed the limitation.

(2) The production of documents and things under the provisions of Rule 34 of the Federal Rules of Civil Procedure will be made at the place where the documents and things are usually kept, or where the parties agree, or where and in the manner which the Trademark Trial and Appeal Board, upon motion, orders.

* * * * *

(g) *Sanctions.* (1) If a party fails to comply with an order of the Trademark Trial and Appeal Board relating to discovery, including a protective order, the Board may make any appropriate order, including any of the orders provided in Rule 37(b)(2) of the Federal Rules of Civil Procedure, except that the Board does not have authority to hold any person in contempt or to award any expenses to any party. The Board may impose against a party any of the sanctions provided by this subsection in the event that said party or any attorney, agent, or designated witness of that party fails to comply with a protective order made pursuant to Rule 26(c) of the Federal Rules of Civil Procedure.

(2) If a party, or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, fails to attend the party's or person's discovery deposition, after being served with proper notice, or fails to provide any response to a set of interrogatories or to a set of requests for production of documents and things, and such party or the party's attorney or other authorized representative informs the party seeking discovery that no response will be made thereto, the Board may make any appropriate order, as specified in paragraph (g)(1) of this section.

* * * * *

(j) *Use of discovery deposition, answer to interrogatory, or admission.*

* * * * *

(3)(i) A discovery deposition, an answer to an interrogatory, or an admission to a request for admission, which may be offered in evidence under the provisions of paragraph (j) of this section may be made of record in the case by filing the deposition or any part thereof with any exhibit to the part that is filed, or a copy of the interrogatory and answer thereto with any exhibit made part of the answer, or a copy of the request for admission and any exhibit thereto and the admission (or a statement that the party from which an admission was requested failed to respond thereto), together with a notice of reliance. The notice of reliance and the material submitted thereunder should be filed during the testimony period of the party which files the notice of reliance. An objection made at a discovery deposition by a party answering a question subject to the objection will be considered at final hearing.

(ii) A party which has obtained documents from another party under Rule 34 of the Federal Rules of Civil Procedure may not make the documents of record by notice of reliance alone, except to the extent that they are admissible by notice of reliance under the provisions of § 2.122(e).

(4) If only part of a discovery deposition is submitted and made part of the record by a party, an adverse party may introduce under a notice of reliance any other part of the deposition which should in fairness be considered so as to make not misleading what was offered by the submitting party. A notice of reliance filed by an adverse party must be supported by a written statement explaining why the adverse party needs to rely upon each additional part listed in the adverse party's notice, failing which the Board, in its discretion, may refuse to consider the additional parts.

(5) An answer to an interrogatory, or an admission to a request for admission, may be submitted and made part of the record by only the inquiring party except that, if fewer than all of the answers to interrogatories, or fewer than all of the admissions, are offered in evidence by the inquiring party, the responding party may introduce under a notice of reliance any other answers to interrogatories, or any other admissions, which should in fairness be considered so as to make not misleading what was offered by the inquiring party. The notice of reliance filed by the responding party must be supported by a written statement explaining why the responding party needs to rely upon each of the additional discovery responses listed in the responding party's notice, failing which the Board, in its discretion, may refuse to consider the additional responses.

* * * * *

(8) Requests for discovery, responses thereto, and materials or depositions obtained through the discovery process should not be filed with the Board except when submitted with a motion relating to discovery, or in support of or response to a motion for summary judgment, or under a notice of reliance during a party's testimony period. Papers or materials filed in violation of this paragraph may be returned by the Board.

13. Section 2.121 is amended by revising paragraph (a)(1) to read as follows:

§ 2.121 Assignment of times for taking testimony.

(a)(1) The Trademark Trial and Appeal Board will issue a trial order assigning to each party the time for taking testimony. No testimony shall be taken except during the times assigned, unless by stipulation of the parties approved by the Board, or, upon motion, by order of the Board. Testimony periods may be rescheduled by stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board. The resetting of the closing date for discovery will result in the rescheduling of the testimony periods without action by any party. The resetting of a party's time to respond to an outstanding request for discovery will not result in the automatic rescheduling of the discovery and/or testimony periods; such dates will be rescheduled only upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board.

* * * * *

14. Section 2.122 is amended by revising paragraph (e) to read as follows:

§ 2.122 Matters in evidence.

* * * * *

(e) *Printed publications and official records.* Printed publications, such as books and periodicals, available to the general public in libraries or of general circulation among members of the public or that segment of the public which is relevant under an issue in a proceeding, and official records, if the publication or official record is competent evidence and relevant to an issue, may be introduced in evidence by filing a notice of reliance on the material being offered. The notice shall specify the printed publication (including information sufficient to identify the source and the date of the publication) or the official record and the pages to be read; indicate generally the relevance of the material being offered; and be accompanied by the official record or a copy thereof whose authenticity is established under the Federal Rules of Evidence, or by the printed publication or a copy of the relevant portion thereof. A copy of an official record of the Patent and Trademark Office need not be certified to be offered in evidence. The notice of reliance shall be filed during the testimony period of the party that files the notice.

* * * * *

15. Section 2.123 is amended by revising paragraphs (c), (e)(2), and (g)(1) to read as follows:

§ 2.123 Trial testimony in inter partes cases.

* * * * *

(c) *Notice of examination of witnesses.* Before the depositions of witnesses shall be taken by a party, due notice in writing shall be given to the opposing party or parties, as provided in § 2.119(b), of the time when and place where the depositions will be taken, of the cause or matter in which they are to be used, and the name and address of each witness to be examined; if the name of a witness is not known, a general description sufficient to identify the witness or the particular class or group to which the witness belongs, together with a satisfactory explanation, may be given instead. Depositions may be noticed for any reasonable time and place in the United States. A deposition may not be noticed for a place in a foreign country except as provided in paragraph (a)(2) of this section. No party shall take depositions in more than one place at the same time, nor so nearly at the same time that reasonable opportunity for travel from one place of examination to the other is not available.

* * * * *

(e) *Examination of witnesses.*

* * * * *

(2) The deposition shall be taken in answer to questions, with the questions and answers recorded in their regular order by the officer, or by some other person (who shall be subject to the provisions of Rule 28 of the Federal Rules of Civil Procedure) in the presence of the officer except when the officer's presence is waived on the record by agreement of the parties. The testimony shall be taken stenographically and transcribed, unless the parties present agree otherwise. In the absence of all opposing parties and their attorneys or other authorized representatives, depositions may be taken in longhand, typewriting, or stenographically. Exhibits which are marked and identified at the deposition will be deemed to have been offered into evidence, without any formal offer thereof, unless the intention of the party marking the exhibits is clearly expressed to the contrary.

* * * * *

(g) *Form of deposition.* (1) The pages of each deposition must be numbered consecutively, and the name of the witness plainly and conspicuously written at the top of each page. The deposition may be written on legal-size or letter-size paper, with a wide margin on the left-hand side of the page, and with the writing on one side only of the sheet. The questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used, and each question must be followed by its answer.

* * * * *

16. Section 2.125 is amended by revising paragraph (a) to read as follows:

§ 2.125 Filing and service of testimony.

(a) One copy of the transcript of testimony taken in accordance with § 2.123, together with copies of documentary exhibits and duplicates or photographs of physical exhibits, shall be served on each adverse party within thirty days after completion of the taking of that testimony. If the transcript with exhibits is not served on each adverse party within thirty days or within an extension of time for the purpose, any adverse party which was not served may have remedy by way of a motion to the Trademark Trial and Appeal Board to reset such adverse party's testimony and/or briefing periods, as may be appropriate. If the deposing party fails to serve a copy of the transcript with exhibits on an adverse party after having been ordered to do so by the Board, the Board, in its discretion, may strike the deposition, or enter judgment as by default against the deposing party, or take any such other action as may be deemed appropriate.

* * * * *

17. Section 2.127 is amended by adding new paragraphs (e) and (f) to read as follows:

§ 2.127 Motions.

* * * * *

(e)(1) A motion for summary judgment should be filed prior to the commencement of the first testimony period, as originally set or as reset, and the Trademark Trial and Appeal Board, in its discretion, may deny as untimely any motion for summary judgment filed thereafter.

(2) For purposes of summary judgment only, a discovery deposition, or an answer to an interrogatory, or a document or thing produced in response to a request for production, or an admission to a request for admission, will be considered by the Trademark Trial and Appeal Board if any party files, with the party's brief on the summary judgment motion, the deposition or any part thereof with any exhibit to the part that is filed, or a copy of the interrogatory and answer thereto with any exhibit made part of the answer, or a copy of the request for production and the documents or things produced in response thereto, or a copy of the request for admission and any exhibit thereto and the admission (or a statement that the party from which an admission was requested failed to respond thereto).

(f) The Board does not have authority to hold any person in contempt, or to award attorneys' fees or other expenses to any party.

18. Section 2.128 is amended by revising paragraph (b) to read as follows:

§ 2.128 Briefs at final hearing.

* * * * *

(b) Briefs shall be submitted in typewritten or printed form, double spaced, in at least pica or eleven-point type, on letter-size paper. Each brief shall contain an alphabetical index of cases cited therein. Without prior leave of the Trademark Trial and Appeal Board, a main brief on the case shall not exceed fifty-five pages in length in its entirety, including the table of contents, index of cases, description of the record, statement of the issues, recitation of facts, argument, and summary; and a reply brief shall not exceed twenty-five pages in its entirety. Three legible copies, on good quality paper, of each brief shall be filed.

19. Section 2.129 is amended by revising paragraph (a) to read as follows:

§ 2.129 Oral argument; reconsideration.

(a) If a party desires to have an oral argument at final hearing, the party shall request such argument by a separate notice filed not later than ten days after the due date for the filing of the last reply brief in the proceeding. Oral arguments will be heard by at least three Members of the Trademark Trial and Appeal Board at the time specified in the notice of hearing. If any party appears at the specified time, that party will be heard. If the Board is prevented from hearing the case at the specified time, a new hearing date will be set. Unless otherwise permitted, oral arguments in an inter partes case will be limited to thirty minutes for each party. A party in the position of plaintiff may reserve part of the time allowed for oral argument to present a rebuttal argument.

* * * * *

20. Section 2.134 is amended by revising paragraph (a) to read as follows:

§ 2.134 Surrender or voluntary cancellation of registration.

(a) After the commencement of a cancellation proceeding, if the respondent applies for cancellation of the involved registration under section 7(d) of the Act of 1946 without the written consent of every adverse party to the proceeding, judgment shall be entered against the respondent. The written consent of an adverse party may be signed by the adverse party or by the adverse party's attorney or other authorized representative.

* * * * *

21. Section 2.135 is revised to read as follows:

§ 2.135 Abandonment of application or mark.

After the commencement of an opposition, concurrent use, or interference proceeding, if the applicant files a written abandonment of the application or of the mark without the written consent of every adverse party to the proceeding, judgment shall be entered against the applicant. The written consent of an adverse party may be signed by the adverse party or by the adverse party's attorney or other authorized representative.

22. Section 2.142 is amended by adding (f)(6); and revising paragraphs (e) and (e)(1), to read as follows:

§ 2.142 Time and manner of ex parte appeals.

* * * * *

(b)(1) The brief of appellant shall be filed within sixty days from the date of appeal. If the brief is not filed within the time allowed, the appeal may be dismissed. The examiner shall, within sixty days after the brief of appellant is sent to the examiner, file with the Trademark Trial and Appeal Board a written brief answering the brief of appellant and shall mail a copy of the brief to the appellant. The appellant may file a reply brief within twenty days from the date of mailing of the brief of the examiner.

(2) Briefs shall be submitted in typewritten or printed form, double spaced, in at least pica or eleven-point type, on letter-size paper. Without prior leave of the Trademark Trial and Appeal Board, a brief shall not exceed twenty-five pages in length in its entirety.

* * * * *

(e)(1) If the appellant desires an oral hearing, a request therefor should be made by a separate notice filed not later than ten days after the due date for a reply brief. Oral argument will be heard by at least three Members of the Trademark Trial and Appeal Board at the time specified in the notice of hearing, which may be reset if the Board is prevented from hearing the argument at the specified time or, so far as is convenient and proper, to meet the wish of the appellant or his attorney or other authorized representative.

* * * * *

(f) * * *

(6) If, during an appeal from a refusal of registration, it appears to the examiner that an issue not involved in the appeal may render the mark of the appellant unregistrable, the examiner may, by written request, ask the Board to suspend the appeal and to remand the application to the examiner for further examination. If the request is granted, the examiner and appellant shall proceed as provided by §§ 2.61, 2.62, 2.63 and 2.64. After the additional ground for refusal of registration has been withdrawn or made final, the examiner shall return the application to the Board, which shall resume proceedings in the appeal and take further appropriate action with respect thereto.

* * * * *

23. Section 2.145 is amended by adding new paragraph (c)(4) to read as follows:

§ 2.145 Appeal to court and civil action.

* * * * *

(c) * * *

(4) A party to a proceeding before the Trademark Trial and Appeal Board which commences a civil action, pursuant to section 21(b) of the Act, seeking review of a decision of the Board should file written notice thereof in the Patent and Trademark Office, addressed to the Board, within one month after the expiration of the time for appeal or civil action, in order to avoid premature termination of the Board proceeding.

* * * * *

24. Section 2.186 is revised to read as follows:

§ 2.186 Action may be taken by assignee of record.

Any action with respect to an assigned application or registration which may or must be taken by an applicant or registrant may be taken by the assignee provided that the assignment has been recorded or that proof of the assignment has been submitted.

July 6, 1989 Donald J Quigg
Assistant Secretary and Commissioner of Patents and Trademarks

[1106 TMOG 26]

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(290) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR PARTS 1 AND 2
[Docket No. 90374-9181]
[RIN: 0651-AA38]
Amendments to Patent and Trademark Rules to Implement Trademark Law Revision Act; Miscellaneous Trademark Rule Amendments

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in trademark cases, and the rules of practice in patent cases which are applicable to trademark cases, to implement the provisions of the Trademark Law Revision Act of 1988 [Title I of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)], codify changes in practice resulting from a Trademark Trial and Appeal Board decision commonly known as the "Crocker" decision, and otherwise codify, clarify, and/or revise certain procedures for the examination of applications.
Effective Date: November 16, 1989.
For Further Information Contact: Carlisle E. Walters by telephone at (703) 557-7464 or by mail marked to her attention and addressed to Box 5, Office of the Assistant Commissioner for Trademarks, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

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Supplementary Information: In a notice of proposed rulemaking published in the *Federal Register* on May 4, 1989, at 54 FR 19286, the Patent and Trademark Office *Official Gazette* of May 16, 1989, at 1102 O.G. 47-70, and the Bureau of National Affairs' *Patent, Trademark, & Copyright Journal*, at 38 PTCJ 43-71, (May 11, 1989), the Patent and Trademark Office proposed to amend Parts 1 and 2 of Title 37 of the Code of Federal Regulations by amending or revising §§ 1.1, 1.8, 2.6, 2.18, 2.21, 2.24, 2.31, 2.33, 2.38, 2.39, 2.41, 2.44, 2.45, 2.47, 2.51, 2.52, 2.53, 2.56, 2.57, 2.58, 2.61, 2.64, 2.65, 2.66, 2.69, 2.71, 2.72, 2.73, 2.75, 2.81, 2.82, 2.83, 2.84, 2.86, 2.87, 2.99, 2.101, 2.111, 2.129, 2.133, 2.161, 2.162, 2.181, 2.185 and 2.187; and adding §§ 2.2, 2.59, 2.76, 2.77, 2.88 and 2.89. The notice of proposed rulemaking was designed primarily to implement certain provisions of the Trademark Law Revision Act of 1988 [Title I of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051] (hereinafter "Pub. L. 100-667"), which was enacted on November 16, 1988, and will become effective on November 16, 1989. The text of the law was published in the *Congressional Record*, S. 1883, 100th Cong., 2d Sess., 134 Cong. Rec. 149, H10411 (daily ed. October 19, 1988), and in *BNA's Patent, Trademark & Copyright Journal*, at 36 PTCJ 751 (October 27, 1988).

Written comments were submitted by one firm, eight individuals, and six organizations. Six individuals testified at the oral hearing. Four of those individuals testified on behalf of two organizations, both of which also submitted written comments. Of the two individuals who testified on their own behalf, one also submitted written comments.

The following includes a summary of the "intent-to-use" provisions of Pub. L. 100-667, a summary of the other provisions of Pub. L. 100-667 which are relevant to PTO practice, a list of rules being changed as a result of Pub. L. 100-667, a brief discussion of other rules being changed and the reasons for those changes, a detailed section-by-section analysis of the final rules, and an analysis of all comments received in response to the notice of proposed rulemaking.

Discussion of "intent-to-use" provisions of Pub. L. 100-667:

Pub. L. 100-667 substantially revises the Trademark Act of 1946 ("Act"). Previously, the Act permitted the filing of an application for Federal registration of a trademark based upon use of the mark in commerce in connection with goods or services, under Section 1 of the Act; or, ownership of a foreign application or registration, under Section 44 of the Act. The new law adds a third basis for the filing of an application, namely, a bona fide intention to use a mark in commerce in relation to specific goods or services. For these "intent-to-use" applications, actual use of the mark in commerce will be a prerequisite to the ultimate issuance of a registration.

Section 103, Pub. L. 100-667, 102 Stat. 3935, amends Section 1 of the Act to permit the filing of an application for Federal registration of a trademark based upon either use of the mark in commerce or a bona fide intention to use the mark in commerce. Use-based applications will be governed by an amended and redesignated Section 1(a) of the Act. A new Section 1(b) of the Act authorizes the filing of "intent-to-use" applications and sets forth the filing requirements of such applications.

Section 113, Pub. L. 100-667, 102 Stat. 3940, amends Section 12 of the Act, concerning examination of applications and publication, to provide that if the Trademark Examining Attorney examines an "intent-to-use" application and finds that the applicant would be entitled to registration upon the acceptance of a statement of use, the mark will be published in the *Official Gazette* for purposes of opposition.

Section 114, Pub. L. 100-667, 102 Stat. 3940, amends Section 13 of the Act, concerning opposition to registration of marks on the Principal Register, to add a new Section 13(b) to govern the handling of applications which are not successfuly opposed. New Section 13(b) provides that, unless registration is successfully opposed, a notice of allowance will be issued to the applicant in an "intent-to-use" application.

Section 103, Pub. L. 100-667, 102 Stat. 3935, further amends Section 1 of the Act by adding a new Section 1(c), which permits an "intent-to-use" applicant, at any time during examination, to amend the application to bring it into conformity with the requirements for an application based on use; and by adding a new Section 1(d) which sets forth the registration requirements for an "intent-to-use" application following issuance of a notice of allowance.

Section 1(d)(1) of the Act requires that, within six months after the issuance of the notice of allowance, the applicant must file specimens evidencing use of the mark in commerce, the prescribed fee, and a verified statement which asserts that the mark is in use in commerce and contains certain averments related to that use.

Section 1(d)(2) provides that the time for filing the statement of use will be extended for a period of six months upon written request of the applicant, if the request is filed before expiration of the six-month period for filing a statement of use. The request must be accompanied by the prescribed fee and a verified statement that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance for which that intention exists.

Section 1(d)(2) provides that further extensions of time for filing a statement of use may be granted by the Commissioner, for periods aggregating not more than 24 months, upon a showing of good cause by the applicant. A written request must be filed before the expiration of the last granted extension and accompanied by the prescribed fee and by a verified statement (of continued bona fide intention to use the mark in commerce) as required for the first extension of time. The Commissioner is to issue regulations setting forth what constitutes good cause for a further extension of time for filing a statement of use.

Section 1(d)(3) of the Act provides that any applicant who files a statement of use will be notified of the acceptance or refusal thereof and, if the statement is refused, of the reasons for the refusal, and that the statement of use may be amended.

Section 1(d)(4) of the Act provides that the failure of an applicant to timely file a statement of use, as required under Section 1(d) of the Act, will result in the abandonment of the application.

Discussion of other provisions of Pub. L. 100-667:

The new law includes certain other provisions which significantly affect practice in the PTO. Section 104, Pub. L. 100-667, 102 Stat. 3937, amends Section 2(f) of the Act, pertaining to registration of a mark used by the applicant which has become distinctive of the applicant's goods in commerce. The amendment will permit the Commissioner to accept, as prima facie evidence that a mark has become distinctive, proof of substantially exclusive and continuous use as a mark by the applicant in commerce for "five years before the date on which the claim of distinctiveness is made." The Act previously permitted such a showing by the applicant to be only for "the five years next preceding the date of the filing of the application."

Section 109, Pub. L. 100-667, 102 Stat. 3938, adds a new Section 7(c) to the Act to provide, *inter alia*, that contingent on the registration of a mark on the Principal Register, the filing of an application to register such mark on the Principal Register shall constitute constructive use of the mark and confer nationwide priority.

Section 110, Pub. L. 100-667, 102 Stat. 3939, amends Section 8(a) of the Act to provide that each certificate of registration shall remain in force for ten (rather than twenty) years. Section 110 further amends Section 8(a) of the Act to require that the affidavit, which must be filed during the sixth year after issuance of a registration, set forth "those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark, ..." instead of the previous requirement for a "showing that said mark is in use in commerce ..."

Section 111, Pub. L. 100-667, 102 Stat. 3939, amends Section 9(a) of the Act to reduce the term for which a registration may be renewed from twenty years to ten years. Similarly, Section 135, Pub. L. 100-667, 102 Stat. 3948, amends the Act by adding a new section, Section 51, which provides that certificates of registration which issue from applications pending in the PTO on November 16, 1989, the effective date of the new law, shall remain in force for a period of ten years.

Section 118, Pub. L. 100-667, 102 Stat. 3941, amends Section 18 of the Act to expand a portion of the description of the actions which may be taken by the Trademark Trial and Appeal Board ("Board"), in an inter partes proceeding, from "may refuse to register the opposed mark, may cancel or restrict the registration of a registered mark, or may refuse to register any or all of several interfering marks,..." to "may refuse to register the opposed mark, may cancel the registration, in whole or in part, may modify the application or registration by limiting the goods or services specified therein, may otherwise restrict or rectify with respect to the register the registration of a registered mark, may refuse to register any or all of several interfering marks,..." The same section of the new law further amends Section 18 of the Act to provide, with respect to inter partes proceedings before the Board, that no final judgment shall be entered in favor of an intent-to-use applicant before the mark is registered, if such applicant cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act, as amended by Section 109, Pub. L. 100-667, 102 Stat. 3938.

Section 121, Pub. L. 100-667, 102 Stat. 3942, amends Section 23 of the Act, which governs applications for registration on the Supplemental Register, to delete the requirement that the mark must have been in lawful use in commerce for the year preceding the filing of the application; and to substitute a requirement that the mark must be in lawful use in commerce by the owner.

Section 122, Pub. L. 100-667, 102 Stat. 3943, amends Section 24 of the Act, which governs petitions to cancel registrations on the Supplemental Register, to delete the requirement that such a petition be verified, and to add a provision that (in such a cancellation proceeding) no final judgment shall be entered in favor of an intent-to-use applicant before the mark is registered, if such applicant cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act, as amended.

Finally, Section 133, Pub. L. 100-667, 102 Stat. 3946, amends Section 44 of the Act to require that an application filed pursuant to Section 44(d) or 44(e) of the Act include a statement that the applicant has a bona fide intention to use the mark in commerce. The new law further amends Section 44(e) of the Act to specify that use in commerce shall not be required prior to registration in the case of an application under that section of the Act.

Specific rules changed or added:

The existing rules of practice in Parts 1 and 2 of Title 37 of the Code of Federal Regulations which are amended as a result of the enactment of Pub. L. 100-667 are §§ 1.1, 1.8, 2.6, 2.21, 2.33, 2.38, 2.39, 2.41, 2.44, 2.45, 2.47, 2.51, 2.52, 2.53, 2.56, 2.57, 2.61, 2.64, 2.65, 2.69, 2.71, 2.72, 2.73, 2.75, 2.81, 2.82, 2.84, 2.86, 2.87, 2.99, 2.101, 2.111, 2.129, 2.133, 2.161, and 2.162. In addition, new §§ 2.2, 2.59, 2.76, 2.77, 2.88, and 2.89 are added. The amendments made to existing rules, and the provisions of the new rules which are added, are described in detail hereafter.

Other changes are made in the rules of practice in trademark cases as a result of the decision of the Board in *Crocker National Bank v. Canadian Imperial Bank of Commerce*, 223 USPQ 909 (TTAB 1984) ("*Crocker*"). Prior to *Crocker*, an applicant applying under Section 44 of the Act was allowed, under present § 2.39, to omit certain of the allegations required for an application based on use, namely, the allegation that the mark sought to be registered was in use in commerce, and the statements of the applicant's date of first use of the mark, and first use of the mark in commerce, on or in connection with the specified goods or services. Nevertheless, it was the practice of the PTO to require such an applicant to allege use of the mark (somewhere in the world) and to submit specimens of the mark as used on or in connection with the specified goods or services. The Board held in *Crocker*, however, that an applicant filing in accordance with Section 44 need not allege use or submit specimens. The practice of the PTO was thereafter modified to bring it into accordance with the Board's decision. The rules of practice which are amended to codify the present practice are § 2.21, 2.33, 2.39, 2.41, 2.44, 2.45, 2.47, 2.51, 2.56, and 2.72. As indicated above, those rules are also amended to implement changes in practice required as a result of the enactment of Pub. L. 100-667.

Additionally, certain miscellaneous amendments are made to codify, clarify, and/or revise procedures for the examination of applications. Specifically, § 2.18 is amended to clarify the practice of the PTO regarding correspondence with foreign applicants. Section 2.24 is amended to correct a cross-reference. Section 2.31 is amended to indicate that it is preferable that an application be on approximately "lettersize" (i.e., 8 1/2 inches by 11 inches) rather than legal-size, paper. Section 2.52(e) is amended to simplify the drawing color linings for the colors orange and yellow or gold. Sections 2.56 and 2.57 are amended to reduce the number of specimens or facsimiles required to be filed, in those instances where specimens are necessary, from five to three, and to indicate that specimens or facsimiles may not exceed eleven inches in length. When specimens exceeding the size limitations are submitted, the applicant will be required to submit proper substitute specimens. Section 2.83, which governs procedure in the case of conflicting marks, is amended to delete a provision which does not conform to present PTO practice, namely, the provision that a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the earliest-filed mark (or, if the conflicting applications have the same effective filing date, of the publication or issuance of the application with the earliest date of execution). Finally, § 2.187 is amended to revise the conditions under which a certificate of registration will be issued in the name of an applicant's assignee, or in an applicant's new name.

Discussion of Specific Sections Changed or Added:

In this discussion, "Patent and Trademark Office" is abbreviated as "PTO," "Trademark Trial and Appeal Board" is abbreviated as "Board," the Trademark Act of 1946 is abbreviated as "the Act," and all references to sections of the Act are as amended by Pub. L. 100-667, unless otherwise stated.

Section 1.1, which specifies the address to be used on communications intended for the PTO, and also provides special box designations which may be used on certain types of communications to the PTO, is amended to add new paragraph (h) which establishes a new separate receipt box for statements of use under Section 1(d) of the Act and requests for extensions of time to file such statements. The new paragraph encourages, but does not require, applicants to use the designation "Box ITU" when submitting the identified papers. Use of the box designation will permit prompt and efficient processing of the identified papers. The proposed rule also included amendments to allege use under Section 1(c) of the Act as papers which should be identified by the new "Box ITU" designation. However, as a result of a change in planned internal workflow, that proposal is withdrawn. Amendments to allege use under Section 1(c) of the Act should not be identified with the "Box ITU" designation.

Section 1.8, which provides that certain papers will be considered filed in the PTO on the date the papers are certified as mailed, subject to specified conditions, is amended to add new paragraphs (a)(2)(xiv) through (a)(2)(xvi) to exclude the following papers from the "Certificate of Mailing" procedure established under the section: statements of use under new § 2.88 (15 U.S.C. 1051(d)), requests for extensions of time to file such statements, and amendments to allege use under new § 2.76 (15 U.S.C. 1051(c)). The specified papers are excluded due to the nature and significance of the papers and the importance of their prompt receipt in the PTO. Before a registration can be issued in an application under Section 1(b) of the Act, either an amendment to allege use or a statement of use must be filed and accepted. An amendment to allege use may be submitted only during the examination of an application prior to approval of the mark for publication for opposition in the Trademark *Official Gazette*. After issuance of a notice of allowance in an application under Section 1(b) of the Act, applicant must file either a statement of use or request a six-month extension of time to file a statement of use within six months thereafter (successive extension requests may not aggregate more than 36 months from the notice of allowance). Each of these papers is required to be filed within tight time frames and should be processed by the PTO expeditiously. Thus, to avoid problems related to mail delays, these papers are excluded from the "Certificate of Mailing" procedure.

Section 2.2 is added to establish a definitions section for Part 2 of 37 CFR.

Section 2.2(a) is added to state that all references to "the Act" pertain to the Trademark Act of 1946, as amended.

Section 2.2(b) is added to state that all references, for example in §§ 2.101 and 2.111, to "entity" include both natural and juristic persons.

Section 2.6, which governs trademark fees, is amended to add paragraphs (u) and (v) to establish two new fees for the filing of papers required or permitted under Section 1(c) or 1(d) of the Act. Section 2.6(a) establishes the fee for filing an application, per class, and it is applicable to all new applications filed in the

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PTO, regardless of the basis asserted for filing. Section 2.6(u) is added to establish a filing fee of $100.00 for an amendment to allege use under new § 2.76 (15 U.S.C. 1051(c)) or for a statement of use under new § 2.88 (15 U.S.C. 1051(d)). Section 2.6(v) is added to establish a filing fee of $100.00 for any request, under new § 2.89 (15 U.S.C. 1051(d)), for a six-month extension of time to file a statement of use.

The PTO is amending § 2.6 to establish new fees required under provisions of Pub. L. 100-667. A fee is required under Section 1(b)(2) of the Act for the filing of an application under Section 1(b) of the Act ("intent-to-use"). A fee is required under Section 1(d)(1) of the Act for the filing of a statement of use in an application under Section 1(b) of the Act; and a fee is required under Section 1(d)(2) of the Act for the filing of a request for an extension of time to file a statement of use. A fee is being established for an amendment to allege use, which is filed under Section 1(c) of the Act, to bring an application under Section 1(b) of the Act into conformity with the requirements of Section 1(a) of the Act ("use in commerce"). These actions are consistent with Section 103(a) of Pub. L. 100-703 which governs the way fees established under Section 31 of the Act may be adjusted.

Section 103(a) of Pub. L. 100-703 provides that the Commissioner cannot establish additional fees under Section 31 of the Act during fiscal years 1989, 1990 and 1991. However, Pub. L. 100-667 requires that the fees for filing an application under Section 1(b) of the Act, a statement of use, and a request for an extension of time to file a statement of use be established. Further, Congressman Kastenmeier has stated that "the Commissioner is not precluded from charging a new fee for a new service or material or from charging a different fee where a significant and material improvement in service or material, such as in promptness or quality is offered. Under any circumstances, augmented fees ought to be clearly justified and reported to the Congress." *Congressional Record*, S. 1883, 100th Cong., 2d Sess., 134 Cong. Rec. 149, H9677 (daily ed. October 5, 1988). Amendments to allege use filed under Section 1(c) of the Act create a new examination practice that was not contemplated when the fees were established for activities performed under the Act and this fee is clearly not an increase in an existing fee.

On February 15, 1989, a final rule was published in the *Federal Register* at 54 FR 6893 to adjust patent and trademark fees. Effective April 17, 1989, three trademark fees were reduced: the fee for filing an application for trademark registration was reduced from $200 to $175 per class, and two fees for recording trademark assignments or other papers relating to a registered mark or application for registration were reduced from $100 to $8.

In establishing the new fees related to Pub. L. 100-667, the PTO followed the fee methodology which was described in the February 15, 1989, *Federal Register* notice (54 FR 6893), and is summarized as follows:

Cost Calculations: The PTO calculated unit costs for the new fees based on OMB Circular A-25, "User Fees," and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, the FY 1987 end-of-year financial statements for the Office) and included direct and indirect costs to the PTO for carrying out the activity, as directed by OMB Circular A-25. To estimate costs for the three-year period from November 1989 to October 1992, the 1987 actual costs were adjusted by the Administration's inflation projection (*Budget of the United States Government, Fiscal Year 1990*, Part 3, "The Economy and the Budget"). This methodology was utilized in conjunction with an analysis of the worksteps and procedures that will be involved in the processing of a new application to register a mark under Section 1(b) of the Act. The PTO has determined that the processing and examination of an application under Section 1(b) of the Act from the filing date through issuance of a notice of allowance is expected to cost the same as the processing and examination of an application under Section 1(a) of the Act from the filing date through issuance of the certificate of registration. Therefore, the fee for applications filed under Section 1(a) or 1(b) is the same.

Workload Projections: The PTO has estimated that there will be a one-time, twenty-five percent (25%) increase in trademark applications filed in FY 1990, bringing the estimated trademark application filings for FY 1990 to approximately 100,000. In FY 1991, the PTO estimates that approximately 86,700 trademark applications will be filed and that, thereafter, trademark application filing increases will drop to normal levels (approximately six percent (6%) over the previous year) for the remainder of the fee cycle. The PTO estimates that sixty percent (60%) of the total applications filed in FY 1990 and subsequent years in this fee cycle will be filed under Section 1(b) of the Act.

The PTO estimates that, beginning in FY 1991, the first requests for extensions of time to file a statement of use will be filed; and that these requests will be filed in approximately ten percent (10%) of the Section 1(b) applications filed in the prior year. In FY 1992, the filing of requests for extensions of time to file a statement of use will increase to sixteen percent (16%) of the new Section 1(b) applications filed in the previous year and remain at that level during the remainder of the fee cycle.

The PTO estimates that approximately twenty-five percent (25%) of all applications filed under Section 1(b) of the Act will be abandoned before the filing of either an amendment to allege use, under Section 1(c) of the Act, or a statement of use, under Section 1(d) of the Act.

The PTO estimates that twenty-five percent (25%) of all applications filed under Section 1(b) of the Act will be amended to conform to the provisions of Section 1(a) of the Act (by the filing of an amendment to allege use under new § 2.76) during the first examination of the application, before approval of the mark for publication for opposition; and that this filing will increase first examination processing by a factor of forty percent (40%).

The PTO estimates that a statement of use under new § 2.88 will be filed in fifty percent (50%) of all applications filed under Section 1(b) of the Act; and that the second examination required under Section 1(d)(1) of the Act will require additional processing time equal to forty percent of the processing time required for the first examination.

Fee Adjustment Methodology: Based on the fee methodology described in the February 15, 1989, *Federal Register* notice (54 FR 6893), the projected revenue from these fees, when coupled with the fees generated by all other trademark fees, does not exceed the costs associated with the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by, and materials furnished by, the PTO related to trademarks and other marks.

The PTO has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

Section 2.18, which specifies to whom correspondence will be sent by the PTO, is revised to add a new sentence to the section to clarify PTO policy regarding correspondence with foreign applicants. The new sentence provides that PTO correspondence will be sent to the domestic representative of a foreign applicant unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event correspondence will be sent to the attorney at law or other qualified person duly authorized. The section, as amended, conforms to present § 2.24.

Section 2.21(a), which governs the requirements for receiving an application filing date, is amended by revising paragraphs (a)(5) and (a)(6) and adding new paragraphs (a)(5)(i), (a)(5)(ii), (a)(5)(iii) and (a)(5)(iv) to revise the minimum filing requirements for applications under Section 1(a) or 44 of the Act, and to add minimum filing requirements for applications under Section 1(b) of the Act. A requirement that an application be verified by the applicant in order to receive a filing date is added for all types of applications. The minimum filing requirements for an application under Section 44 are revised to comply with the *Crocker* decision and to implement the provisions of Pub. L. 100-667.

Section 2.21(a)(5), which presently specifies the filing date requirement of at least one specimen or facsimile of the mark as actually used, is revised to delete that requirement from the paragraph and to indicate that the four new paragraphs added thereunder all relate to the assertion of a basis for filing.

Section 2.21(a)(5)(i) is added to specify all filing requirements which pertain only to the assertion of a basis for filing an application under Section 1(a) of the Act, namely, the statement of a date of first use in commerce and at least one specimen or facsimile of the mark as actually used.

Section 2.21(a)(5)(ii) is added to specify all filing requirements which pertain only to the assertion of a basis for filing an application under Section 44(e) of the Act, namely, a claim of a bona fide intention to use the mark in commerce and a certification or a certified copy of the foreign registration on which the application is based. In accordance with *Crocker*, the new paragraph contains no requirement for a statement of use of the mark anywhere or for the filing of a specimen or facsimile of the mark as used.

Section 2.21(a)(5)(iii) is added to specify all filing requirements which pertain only to the assertion of a basis for filing an application pursuant to Section 44(d) of the Act, namely, a claim of a bona fide intention to use the mark in commerce and a claim of the benefit of a prior foreign application. In accordance with *Crocker*, the new paragraph contains no requirement for a statement of use of the mark anywhere or for the filing of a specimen or facsimile of the mark as used.

Section 2.21(a)(5)(iv) is added to specify all filing requirements which pertain only to an assertion of a basis for filing an application under Section 1(b) of the Act, namely, a claim of a bona fide intention to use the mark in commerce.

Section 2.21(a)(6), which presently includes certain of the filing requirements incorporated in new paragraphs (a)(5)(i), (a)(5)(ii), and (a)(5)(iii), is revised to require that an application include a verification in accordance with § 2.33(b), signed by the applicant, as a condition for receiving a filing date. The proposed requirement is in accordance with Sections 1 and 44 of the Act.

Section 2.24, which relates to the designation of a representative by a foreign applicant, is revised to clarify language concerning official communications from the PTO to indicate that such communications will be addressed to the domestic representative unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event the communication will be sent to the attorney at law or other qualified person duly authorized. Additionally, the section is revised to correct cross-references. Cross-references to § 10.14 of the subchapter, which now governs qualifications of individuals to practice before the PTO in trademark and other non-patent cases, are substituted for the cross-references to § 2.12, which has been removed.

Section 2.31, which presently states that it is preferable that an application be on legal or lettersize paper, is revised to state that it is preferable that an application be on lettersize (i.e., 8 1/2 inches by 11 inches) paper. This amendment conforms generally to the standards of Federal court practice.

Section 2.33, which specifies the complete requirements for a written application, is amended by changing the section title from "Requirements for application." to "Requirements for written application.," revising certain existing paragraphs, redesignating and revising certain other existing paragraphs, and adding three new paragraphs to, *inter alia*, incorporate in this section the requirements for an application under Section 44 of the Act, and add the requirements for an application under Section 1(b) of the Act. The application requirements for an application under Section 44 of the Act are in accordance with the *Crocker* decision.

Section 2.33(a)(1)(ii), which requires a statement of applicant's citizenship, is revised to clarify the language of the section and to codify the requirement that an applicant which is a partnership must specify in the application the state or nation under the laws of which the partnership is organized.

Section 2.33(a)(1)(iv), which presently requires a statement that applicant has adopted and is using the mark shown in the accompanying drawing, is revised to limit this requirement to an application under Section 1(a) of the Act; and to add, for an application under Section 1(b) or 44 of the Act, a requirement for a statement that applicant has a bona fide intention to use the mark shown in the accompanying drawing in commerce.

Section 2.33(a)(1)(v), which presently requires an identification of the particular goods on or in connection with which the mark is used, is revised to include a reference to services, as well as goods; to limit the requirement to an application under Section 1(a) of the Act; and to add, for an application under Section 1(b) or 44 of the Act, the requirement for an identification of the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark. The paragraph is further amended to incorporate the provision, presently included in § 2.39, that the goods or services specified in an application under Section 44 may not exceed the scope of the goods or services covered by the foreign application or registration.

Section 2.33(a)(1)(vi), which presently requires a statement of the class of merchandise according to the official classification, if known to the applicant, is revised to substitute the words "goods or services" for the word "merchandise."

Section 2.33(a)(1)(vii), which presently requires a statement of the date of applicant's first use of the mark as a trademark on or in connection with goods specified in the application, is revised to include references to a service mark, as well as a trademark, and to services, as well as goods; to limit the requirement to an application under Section 1(a) of the Act; and to add for such an application the requirement, presently stated in paragraph (a)(1)(viii) of the section, for a statement of applicant's date of first use of the mark in commerce on or in connection with the goods or services listed in the application, specifying the nature of such commerce.

Section 2.33(a)(1)(viii), which presently requires a statement of the date of applicant's first use in commerce of the mark as a trademark on or in connection with goods specified in the application, specifying the nature of such commerce, is revised to remove this requirement, which is added to paragraph (a)(1)(vii); and to incorporate the requirements, presently stated in § 2.39(a), concerning submission, with an application under Section 44(e) of the Act, of a certificate of the trademark office of the applicant's country of origin and, if the certificate is not in the English language, of a translation thereof.

Section 2.33(a)(1)(ix), which presently requires a statement of the mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods specified, is redesignated as (a)(1)(x); revised to indicate that this requirement pertains only to an application under Section 1(a) of the Act; and amended to include a requirement, for an application under Section 1(b) of the Act, for a statement of the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

A new Section 2.33(a)(1)(ix) is added to require, for an application claiming the benefit of a foreign application in accordance with Section 44(d) of the Act, that the application comply with the requirements of § 2.39.

Section 2.33(a)(2), which presently provides that if more than one item of goods is specified in the application, the dates of use required in present paragraphs (a)(1)(vii) and (viii) of the section need be for only one of the items specified, provided the particular item to which the dates apply is designated, is revised to refer to services as well as goods and to delete the cross-reference to paragraph (a)(1)(viii), the present substance of which is incorporated in paragraph (a)(1)(vii).

Section 2.33(b), which presently states the requirement that an application include certain averments concerning ownership of the mark, use of the mark in commerce, and the truth of the statements contained in the application, is redesignated as (b)(1); revised to indicate that the requirement of the paragraph pertains only to an application under Section 1(a) of the Act; and revised to clarify the language of the paragraph and to make such language gender neutral.

Section 2.33(b)(2) is added to specify, for an application under Section 1(b) or 44 of the Act, a requirement that the application include certain averments concerning ownership of the mark, the truth of the statements contained in the application, and applicant's bona fide intention to use the mark in commerce on or in connection with the specified goods or services.

Section 2.33(c), which concerns the applicability of this section to an application for the registration of a mark for goods or services falling within multiple classes, is revised to correct a cross-reference which presently is correct but would be incorrect when the amendments to §§ 2.86 and 2.87 become effective. Specifically, § 2.33(c) is revised to refer to § 2.86 rather than § 2.87.

Section 2.33(d) is added to state that an applicant may not file under both Sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under Section 1(a) of the Act amend that application to seek registration under Section 1(b) of the Act. An application which is filed under both Sections 1(a) and 1(b) of the Act will not be accorded a filing date and will be returned to the applicant. The provision that an applicant under Section 1(a) of the Act is precluded from amending the application to seek registration under Section 1(b) of the Act is based upon the language of Section 1(b) of the Act which requires that an application under the section include, upon filing, a verified statement of a bona fide intention to use the mark

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in commerce; however, an application filed under Section 1(a) of the Act does not include such a statement and cannot be based on a bona fide intention to use a mark. There is no prohibition against amending the basis for an application from Section 1(b) to Section 1(a) of the Act because Section 1(a) requires that an application assert use in commerce prior to the filing date of the application. This is a factual assertion that is verifiable at any time.

Section 2.38 is revised to change a cross-reference which presently is correct but would be incorrect when the amendments to § 2.33 become effective. Specifically, § 2.38 is revised to refer to § 2.33(a)(1)(vii) rather than § 2.33(a)(1)(vii) and (viii).

Section 2.39, which presently contains provisions concerning the omission of an allegation of use in commerce and statements of dates of first use in applications filed under Section 44 of the Act, as well as provisions specifying certain requirements for such applications, is amended by changing the section title from "Omission of allegation of use in commerce by foreign applicants." to "Priority claim based on foreign application.," and revising paragraphs (a) and (b). The purpose of the amendments is to delete the omission provisions and the provisions specifying requirements for applications under Section 44(e) of the Act which are subsumed by $ 2.33 as amended; and to add certain provisions concerning applications claiming the benefit of a prior foreign application in accordance with Section 44(d) of the Act.

In the notice of proposed rulemaking, present paragraphs (a) and (b) of § 2.39 were proposed to be revised and a new paragraph (c) was proposed to be added. As the result of a written comment concerning proposed paragraph (a) (*see* "Response to Comments on the Rules"), paragraph (a) is withdrawn, and proposed paragraphs (b) and (c) are redesignated (a) and (b), respectively.

Section 2.39(a), which presently contains provisions concerning the omission of an allegation of use in commerce and statements of dates of first use by applicants filing under Section 44(e) of the Act, as well as provisions specifying requirements for such applications, is revised to delete those provisions, which are subsumed by § 2.33 as amended; to add requirements, presently specified in paragraph (b) of the section, for filing an application in accordance with Section 44(d) of the Act.

Section 2.39(b), which presently contains provisions concerning the omission of an allegation of use in commerce and of statements of dates of first use by applicants filing under Section 44(d) of the Act, and a statement of certain other requirements for an application in accordance with Section 44(d) of the Act, is revised to delete the omission provisions, which are subsumed by § 2.33 as amended. The paragraph is further revised to provide that before an application filed in accordance with Section 44(d) of the Act can be approved for publication, a basis for registration under Section 1(a), 1(b) or 44(e) of the Act must be established.

Section 2.41(a), which relates to proof of distinctiveness of a mark, pursuant to Section 2(f) of the Act, is revised to indicate that allegations and evidence of acquired distinctiveness must be based upon use of the mark on or in connection with goods or services "in commerce."

Section 2.41(b) is revised in the same manner as § 2.41(a) above, and is revised further to implement Section 104 of Pub. L. 100-667. Section 2(f) of the Act presently requires an applicant relying upon an allegation of five years of substantially exclusive and continuous use of a mark in commerce in support of a claim of distinctiveness to assert that such use was made during the five years next preceding the filing date of the application. Section 104 of Pub. L. 100-667 amends Section 2(f) of the Act to permit an applicant to rely upon such use made for the five years before the date on which the claim of distinctiveness is made.

Section 2.44, which presently requires that an application to register a collective mark include certain statements concerning the class of persons entitled to use the mark, their relationship to the applicant, and the nature of applicant's control over the use of the mark, is amended to redesignate the present paragraph as (a); revise redesignated paragraph (a) to indicate that it pertains only to applications under Section 1(a) of the Act; and add a new paragraph (b) which requires, for collective mark applications under Section 1(b) or 44 of the Act, that the application include certain statements concerning the class of persons entitled to use the mark, their relationship to the applicant, and the nature of applicant's control over the use of the mark.

Section 2.45, which presently requires that an application to register a certification mark include certain statements concerning the use of the mark, applicant's control thereover, and that applicant is not engaged in the production or marketing of the goods or services to which the mark is applied, is amended to redesignate the present paragraph as (a); revise redesignated paragraph (a) to indicate that it pertains only to applications under Section 1(a) of the Act; and add a new paragraph (b) which requires, for certification mark applications under Section 1(b) or 44 of the Act, that the application include certain statements concerning the intended use of the mark, applicant's intended control thereover, and that applicant will not engage in the production or marketing of the goods or services to which the mark is applied.

Section 2.47, which governs applications to register on the Supplemental Register, is amended to redesignate the present paragraph as (a); revise redesignated paragraph (a); and add new paragraphs (b), (c) and (d) to implement certain provisions of Pub. L. 100-667.

Section 2.47(a), as redesignated, is revised to implement Section 23 of the Act by eliminating provisions pertaining to the requiement for one year of use of the mark for an application for registration on the Supplemental Register.

Section 2.47(b) is added to provide, in accordance with the *Crocker* decision, that in an application to register on the Supplemental Register under Section 44 of the Act, the statement of lawful use in commerce may be omitted.

Section 2.47(c) is added to provide that a mark in an application to register on the Principal Register under Section 1(b) of the Act is eligible for registration on the Supplemental Register only after an acceptable allegation of use under Section 1(c) or (d) of the Act has been timely filed. Section 23 of the Act requires lawful use in commerce as a prerequisite for an application for registration on the Supplemental Register. This requirement bars an application under Section 1(b) of the Act from the Supplemental Register until an acceptable allegation of use has been submitted.

Section 2.47(d) is added to provide that an application for registration on the Supplemental Register must conform to the requirements for registration on the Principal Register under Section 1(a) of the Act so far as applicable.

Section 2.51, which specifies certain general requirements for drawings, is amended by redesignating present paragraph (a) as (a)(1), revising paragraph (a)(1), adding new paragraphs (a)(2) and (a)(3), redesignating present paragraph (b) as (b)(1), revising paragraph (b)(1), adding new paragraphs (b)(2) and (b)(3), revising paragraph (c), redesignating and republishing present paragraph (d) as (e), and adding a new paragraph (d) to codify existing practice and to specify certain drawing requirements for applications under Sections 1(b) of the Act and applications under Section 44 of the Act.

Section 2.51(a), which presently requires that the drawing of a trademark be a substantially exact representation of the mark as used on or in connection with the goods, is redesignated as (a)(1) and revised to indicate that it pertains only to applications under Section 1(a) of the Act.

Section 2.51(a)(2) is added to provide that, in an application under Section 1(b) of the Act, the drawing of a trademark shall be a substantially exact representation of the mark as intended to be used on or in connection with the goods specified in the application and, that once an amendment to allege use under new § 2.76, or a statement of use under new § 2.88 has been filed, the drawing of the trademark shall be a substantially exact representation of the mark as used.

Section 2.51(a)(3) is added to provide that, in an application under Section 44 of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of the applicant.

Section 2.51(b), which presently specifies, for service marks, requirements similar to those specified in paragraph (a) for trademarks, is amended by redesignating the present paragraph as (b)(1) and adding paragraphs (b)(2) and (b)(3) to parallel, for service marks, the provisions of new paragraphs (a)(1), (a)(2) and (a)(3).

Section 2.51(c), which presently provides that, when appropriate and necessary, the drawing in an application for registration on the Supplemental Register may be the drawing of a

package or configuration of goods, is revised to delete that provision, which is outdated, and to add a provision codifying the practice that the drawing of a service mark may be dispensed with in the case of a mark not capable of representation by a drawing, but in any such case the application must contain an adequate description.

Section 2.51(d) is redesignated as (e) and a new paragraph (d) is added to provide that broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on the packaging, or to show matter not claimed as part of the mark, or both, as appropriate, and to provide further that, in an application to register a mark with three-dimensional features, the drawing shall depict the mark in perspective in a single rendition. These proposed provisions codify existing practice.

Section 2.52(a), which pertains to the character of drawings, is revised to correct a cross-reference which presently is correct but would be incorrect when the amendments made herein to § 2.51 become effective. Specifically, § 2.52(a) is amended to refer to paragraph (e), rather than (d), of § 2.51.

Section 2.52(d), which pertains to drawing headings and which presently includes, *inter alia*, a requirement that the heading of a drawing (except for a drawing in an application under Section 44 of the Act) not exceed one-fourth of the sheet and specify dates of use, is revised to indicate that the heading should not exceed one-third of the sheet and that the dates of use requirement pertains only to an application under 1(a) of the Act; to add a requirement that the heading of a drawing in an application filed in accordance with Section 44(d) of the Act specify the priority filing date of the relevant foreign application; and to add a provision that, if a drawing is in special form, the heading of the drawing should include a description of the essential elements of the mark.

Section 2.52(e), which pertains to drawing linings for color, is revised to simplify the conventional color linings for orange and yellow or gold.

Section 2.53 is revised to change a cross-reference which presently is correct but would be incorrect when the amendments made herein to § 2.51 become effective. Specifically, § 2.53 is amended to refer to paragraph (e), rather than (d), of § 2.51.

Section 2.56, which concerns specimens for trademarks, is revised to indicate that the requirement for the filing of specimens pertains only to an appication under Section 1(a) of the Act, an amendment to allege use under new § 2.76, and a statement of use under new § 2.88; remove the redundant word "actually," in accordance with Section 1(a)(1)(C) of the Act; add a provision, in accordance with Section 45 of the Act, that if placement of the mark on labels, tags, containers or displays associated with the goods is impracticable, then specimens may be documents associated with the goods or their sale; and reduce the maximum size limit for specimens (the proposed maximum size limit parallels the preferable size of paper for a trademark application as specified in amended § 2.31). When specimens exceeding the size limitations are submitted, the applicant will be required to submit proper substitute specimens. The paragraph is revised further to reduce the number of specimens required from five to three. The present requirement for five specimens was adopted to permit members of the public to obtain specimens directly from the application file. Advances in copying technology have rendered the requirement for five specimens unnecessary because members of the public may now obtain quality photocopies of the specimens in the file, making removal of specimens unnecessary in most cases. The requirement for three specimens will provide one specimen for the file and make two specimens available for removal by third parties.

Section 2.57, which pertains to facsimiles in the case of a trademark, is amended to revise paragraph (a) to reduce the number of facsimiles required from five to three, and to reduce the maximum size limit for specimens (the maximum size limit parallels the preferable size of paper for a trademark application as specified in amended § 2.31); and to revise paragraph (b) by removing the redundant word "actually," in accordance with Section 1(a)(1)(C) of the Act. When facsimiles exceeding the size limitations are submitted, the applicant will be required to submit proper substitute specimens.

Section 2.58, which concerns the filing of audio cassette tape recordings as specimens for service marks not used in written or printed form, was proposed to be amended to reduce the number of audio tapes required from three to two. As a result of comments received with respect to this proposal, it has been withdrawn.

Section 2.59, entitled "Filing substitute specimens," is added to specify the requirements related to the filing of substitute specimens for applications under Section 1(a) or 1(b) of the Act. The new section codifies existing practice with respect to applications under Section 1(a) of the Act and sets forth the requirements which will apply to applications under Section 1(b) of the Act.

Section 2.59(a) is added to provide that, in an application based upon use in commerce, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens are properly verified as to their use in commerce at least as early as the filing date of the application; and that the verification requirement shall not apply if the specimens are duplicates or facsimiles, such as photographs, of specimens already of record in the application.

The new provision is in accordance with Section 1(a) of the Act, which requires use in commerce, evidenced by specimens, as a prerequisite to the filing of an application thereunder.

Section 2.59(b) is added to provide that, after filing either an amendment to allege use under new § 2.76 or a statement of use under new § 2.88, in an application under Section 1(b) of the Act, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that the use in commerce of any substitute specimens submitted is supported by applicant's affidavit or declaration in accordance with § 2.20; and to provide further that, in the case of a statement of use under new $ 2.88, the applicant must verify that the substitute specimens were in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use. Since use in commerce is not required before filing an application under Section 1(b) of the Act, there is no requirement that a substitute specimen have been in use at the time of the filing of the application. Furthermore, because an applicant may file a statemnt of use at any time during the six-month period following the notice of allowance, or at any time during any extension of time for filing a statement of use, a substitute specimen need not be in use any earlier than the expiration of the relevant period.

Section 2.61, which concerns the examination of an application, is amended to provide also for the examination of amendments to allege use under Section 1(c) of the Act and statements of use under Section 1(d) of the Act.

Section 2.61(a) is revised to indicate that not only applications for registration, but also amendments to allege use under Section 1(c) of the Act and statements of use under Section 1(d) of the Act will be examined.

Section 2.61(c) is revised to clarify the language.

Section 2.64, which relates to final action by the Trademark Examining Attorney and the applicant's permissible responses thereto, is amended by adding new paragraphs (c)(1), (c)(2), and (c)(3) concerning examination of an amendment to allege use under new § 2.76, filed during the six-month response period after issuance of a final action.

Section 2.64(c)(1) is added to provide that if an amendment to allege use under new § 2.76 is filed during the six-month response period after issuance of a final action, the Trademark Examining Attorney shall examine the amendment, but that the filing of such an amendment will not extend the time for filing an appeal or petitioning the Commissioner.

Section 2.64(c)(2) is added to provide that if the amendment to allege use under new § 2.76 is acceptable in all respects, the applicant will be notified of its acceptance.

Section 2.64(c)(3) is added to provide that if a new refusal or requirement is necessary as a result of the examination of the amendment to allege use under new § 2.76, the final action will be withdrawn and all unresolved refusals or requirements will be stated in a new non-final action.

Section 2.65(c) is added to provide that if an applicant in an application under Section 1(b) of the Act fails to timely file a statement of use under new § 2.88, the application shall be deemed to be abandoned. The new paragraph is in conformity with Section 1(d)(4) of the Act.

Section 2.66, which governs the revival of abandoned applications, is amended by redesignating the present paragraph as (a), and revising redesignated paragraph (a), which presently

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provides for the filing of a petition to revive an application abandoned for failure to respond, to pertain also to an application abandoned for failure to timely file a statement of use under new § 2.88, in an application under Section 1(b) of the Act. Section 2.66 is further amended by transferring the last sentence of paragraph (a), which states the requirements for a petition to revive for failure to respond, to new paragraph (b), and by adding new paragraphs (c) and (d).

Section 2.66(c) is added to state the requirements for a petition to revive an application abandoned for failure to timely file a statement of use under new § 2.88, in an application under Section 1(b) of the Act. The requirements parallel those stated in present § 2.66 and new paragraph (b).

Section 2.66(d) is added to provide that a petition to revive must be filed promptly, but that no petition to revive will be granted in an application under Section 1(b) of the Act if granting the petition would permit the filing of a statement of use more than 36 months after the issuance of a notice of allowance under Section 13(b)(2) of the Act. The 36-month limit for the filing of a statement of use is in accordance with the provisions of Section 1(d) of the Act. Usually a petition to revive will be considered filed promptly if it is filed within two months of the date the application was abandoned for failure to respond.

Section 2.69, which pertains to inquiry by a Trademark Examining Attorney as to the applicant's compliance with other laws, is revised to delete the words "before allowance." The word "allowance," as presently used in the section, signifies approval of a mark for publication. The purpose of the deletion is to prevent confusion between this word and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.71, which concerns amendments to correct informalities in applications, is amended by changing the section title from "Amendments to application." to "Amendments to correct informalities."; revising paragraphs (a), (b), and (c); and adding new paragraphs (d)(1), (d)(2), and (d)(3) to govern amendments to the dates of use.

Section 2.71(a), which presently provides for the amendment of applications to correct informalities and for other reasons, and also contains a provision concerning amendments to dates of use, is revised by deleting the provision concerning dates of use, which is transferred to a new paragraph designated as (d)(1).

Section 2.71(b), which presently provides that additions to the identification of goods or services will not be permitted unless certain specified conditions are met, is revised to provide that the identification of goods or services may be amended to clarify or limit the identification, but that additions thereto will not be permitted. The purposes of the requirement for the identification of goods or services are to give notice to third parties of the scope of the rights claimed by the applicant and to permit an accurate search for conflicting marks. Addition of goods or services to the identification, after the filing of an application, would frustrate these purposes. Moreover, Section 7(c) of the Act provides that, contingent on the registration of a mark on the Principal Register, the filing of the application to register such mark shall constitute constructive use of such mark on or in connection with the goods or services specified in the registration.

Section 2.71(c), which presently provides, in essence, that a defect in the verification or declaration may be corrected only by filing a substitute or supplemental verification or declaration, is revised to clarify the language. The paragraph is further revised to provide that a verification or declaration required under §§ 2.21(a)(6), 2.76(e)(3) or 2.88(e)(3), to be properly signed, must be signed by the applicant, a member of the applicant firm, or an officer of the applicant corporation or association; that a verification or declaration which is signed by a person having color of authority to sign is acceptable for the purpose of determining the timely filing of the paper; but that a properly signed substitute verification or declaration must be submitted before the application will be approved for publication or registration, as the case may be. Persons having color of authority to sign are those who have first-hand knowledge of the truth of the statements in the verification or declaration and who also have actual or implied authority to act on behalf of the applicant. In the case of a corporate applicant, a person having color of authority might include, within the contemplation of the amended section, managers or similar persons who are in positions of authority, although not actually officers, if they have first-hand knowledge of the truth of the statements in the application and actual or implied authority to act on behalf of the applicant. However, an applicant's attorney ordinarily will not be considered a person having color of authority to sign.

Section 2.71(d)(1) is added to provide that no amendment to the dates of use will be permitted unless the amendment is supported by applicant's affidavit or declaration in accordance with § 2.20 and by such showing as may be required. This provision, which is the second sentence of present § 2.71(a), is transferred to new paagraph (d)(1) to be grouped with two other new paragraphs, designated (d)(2) and (d)(3), relating to amendments to the dates of use.

Section 2.71(d)(2) is added to codify the practice that, in an application under Section 1(a) of the Act, no amendment to specify a date of use which is subsequent to the filing date of the application will be permitted. The new provision is in accordance with Section 1(a) of the Act, which requires use in commerce as a prerequisite to the filing of an application thereunder.

Section 2.71(d)(3) is added to provide that after the filing of a statement of use under new § 2.88, in an application under Section 1(b) of the Act, no amendment will be permitted to the statement of use to recite dates of use which are subsequent to the expiration of the time allowed to applicant for filing a statement of use. The reason for this limitation is that Section 1(d) of the Act requires use of the mark in commerce, in an application under Section 1(b) of the Act, within a specified period of time and imposes certain absolute limitations on extensions of that period. Any use later than the time permitted would not comply with the requirements of Section 1(d) of the Act.

Section 2.72, which governs amendments to the description or drawing of a mark, is amended by redesignating the present paragraph as (b), revising redesignated paragraph (b), and adding new paragraphs (a), (c), and (d).

Section 2.72(a) is added to provide that amendments may not be made to the description or drawing of the mark if the character of the mark is materially altered, and that the Trademark Examining Attorney will determine whether a proposed amendment materially alters the character of the mark by comparing the proposed amendment with the description or drawing of the mark as originally filed. Concerning material alteration of a mark *see Torres v. Cantine Torresella S.r.l.*, 808 F.2d 46, 1 USPQ 2d 1483 Fed. Cir. 1986); *In re Holland American Wafer Co.*, 737 F.2d 1015, 222 USPQ 273 (Fed. Cir. 1984); *United Rum Merchants, Ltd. v. Distillers Corp.(S.A.) Ltd.*, 9 USPQ 2d 1481 (TTAB 1988); *Visa International Service Assn. v. Life-Code Systems, Inc.*, 220 USPQ 740 (TTAB 1983). The first of these two provisions is the last sentence of present § 2.72. The second provision is added to codify present practice, the purpose of which is to prevent an applicant from repeatedly amending the mark sought to be registered until it bears little resemblance to the mark as originally filed.

Section 2.72(b), as redesignated, is revised to transfer the last sentence, which specifies the general rule concerning amendments to marks, to new paragraph 2.72(a). The remainder of the paragraph, which presently provides that amendments to the description or drawing of the mark may be permitted only if warranted by the specimens (or facsimiles) as originally filed, or supported by additional specimens (or facsimiles) verified as to their use prior to the filing date of the application, is further revised to indicate that the provisions of the paragraph pertain only to applications under Section 1(a) of the Act. The amendment is in accordance with Section 1(a) of the Act, which requires use in commerce as a prerequisite to the filing of an application thereunder.

Section 2.72(c) is added to provide that, in applications under Section 1(b) of the Act, amendments to the description or drawing of the mark, which are filed after submission of an amendment to allege use under new § 2.76 or a statement of use under new § 2.88, may be permitted only if warranted by the specimens (or facsimiles) filed, or supported by additional specimens (or facsimiles) and a supplemental affidavit or declaration in accordance with § 2.20 alleging that the mark shown in the amended drawing is in use in commerce; and that in the case of a statement of use under new § 2.88, applicant must verify that the mark shown in the amended drawing was in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use. The reason for the latter requirement, in the case of a statement of use, is that Section 1(d) of the Act requires use of the mark in commerce, in an application under Section 1(b) of the Act,

within a specified period of time and imposes certain absolute limitations on extensions of that period. Any use later than the time permitted would not comply with the requirements of Section 1(d) of the Act.

Section 2.72(d) is added to codify the practice that in applications under Section 44 of the Act, amendments to the description or drawing of the mark may be permitted only if warranted by the description or drawing of the mark in the foreign registration certificate.

Section 2.73, which governs amendments to recite concurrent use, is amended by redesignating the present paragraph as (a), revising redesignated paragraph (a), and adding new paragraph (b).

Section 2.73(a), as redesignated, which presently provides that an application may be amended so as to be treated as an application for a concurrent registration, provided the application as amended satisfies the requirements of § 2.42, is revised to indicate that this provision pertains only to an application under Section 1(a) of the Act. The Trademark Examining Attorney will determine whether the application, as amended, is acceptable.

Section 2.73(b) is added to provide that an application under Section 1(b) of the Act may not be amended so as to be treated as an application for a concurrent registration until an acceptable amendment to allege use under new § 2.76 or statement of use under new § 2.88 has been filed in the application, after which time such an amendment may be made, provided the application as amended satisfies the requirements of § 2.42. To provide otherwise would be to permit an application for concurrent registration based on an intent to use concurrently, which would be in conflict with the well-established legal principle that an applicant for concurrent registration must have adopted and used the mark in good faith without knowledge of the prior right of another in the same or similar mark for the same or similar goods or services. The Trademark Examining Attorney will determine whether the application, as amended, is acceptable.

Section 2.75, which governs amendments to change register, is amended to redesignate the present paragraph as (a), revise redesignated paragraph (a), and add new paragraph (b).

Section 2.75(a), as redesignated, which presently provides for amendments to change applications from one register to another and also contains provisions relating to the effect of such an amendment on the filing date of an application, is revised to indicate that the paragraph pertains only to applications under Section 1(a) or 44 of the Act; and to delete the provisions concerning the effect on the filing date. Prior to the enactment of Pub. L. 100-667, Section 23 of the Act required that the mark in an application for registration on the Supplemental Register have been in use for one year prior to the filing of the application, whereas there is no such requirement for an application to register on the Principal Register. However, Section 23, as amended, does not require use of a mark for one year prior to application on the Supplemental Register. Thus, under the Act, as amended, an amendment to change registers has no effect on the filing date of an application under Section 1(a) or 44 of the Act.

Section 2.75(b) is added to provide that an application under Section 1(b) of the Act may be amended to change the application to a different register only after submission of an acceptable amendment to allege use under new § 2.76 or statement of use under new § 2.88, and that when such an application is changed from the Principal Register to the Supplemental Register, the effective filing date of the application is the date of the filing of the allegation of use under Section 1(c) or 1(d) of the Act. The amendment is in accordance with Section 23 of the Act, both in its prior and amended forms, which requires use in commerce as a prerequisite to filing an application thereunder.

Section 2.76, entitled "Amendment to allege use.," is added to govern amendments to allege use under Section 1(c) of the Act in an application under Section 1(b) of the Act.

Section 2.76(a) is added to specify the time when such an amendment may be filed, namely, at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action, and to specify further that, thereafter, an allegation of use may be submitted only as a statement of use under new § 2.88 after the issuance of a notice of allowance under Section 13(b)(2) of the Act. If an amendment to allege use is filed outside the time period specified, it will be returned to the applicant. The paragraph is in accordance with Section 1(c) of the Act, which provides that an amendment to allege use may be filed at any time during examination of an application. The examination of an application extends from the filing of the application to the date the mark is approved for publication or the expiration of the six-month response period after issuance of a final action. The date a mark is approved for publication is the date the approval is entered into the TRAM (Trademark Reporting and Monitoring) System. The date of approval for publication is immediately available to the public through TRAM.

Section 2.76(b) is added to specify the elements of a complete amendment to allege use, namely, three specimens or facsimiles, conforming to the requirements of §§ 2.56, 2.57 and 2.58, of the mark as used in commerce; the fee prescribed in § 2.6; and a verified statement by the applicant containing certain averments concerning applicant's ownership of the mark and use of the mark in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services.

Section 2.76(c) is added to provide that an amendment to allege use may only be filed when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the application, for which applicant will seek registration in that application, unless the amendment is accompanied by a request, in accordance with amended § 2.87, to divide out from the application the goods or services to which the amendment pertains; and that if more than one item of goods or services is specified in the amendment to allege use, the dates of use required in paragraph (b)(1) of the section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated. The first provision in the paragraph prevents piecemeal prosecution of an application. The second provision in the paragraph is in conformity with both present and amended § 2.33(a)(2).

Section 2.76(d) is added to provide that the title "Amendment to allege use under § 2.76." should appear at the top of the first page of the paper.

Section 2.76(e) is added to specify minimum requirements for an amendment to allege use, namely, that the amendment be filed within the time period specified in paragraph (a) of the section, and include the fee prescribed in § 2.6, at least one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce. The paragraph corresponds in principle to § 2.21, which sets forth minimum requirements for the filing of an application.

Section 2.76(f) is added to provide that a timely filed amendment to allege use which meets the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the amendment to alleqe use, applicant is found not entitled to registration for any reason not previously stated, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The notification shall incorporate all unresolved refusals or requirements previously stated. The amendment to allege use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the amendment to allege use is acceptable in all respects, the applicant will be notified of its acceptance. The filing of such an amendment shall not constitute a response to any outstanding action by the Trademark Examining Attorney.

Section 2.76(g) is added to provide that if the amendment to allege use is filed within the permitted time period but does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. The deficiency may be corrected provided the mark has not been approved for publication or the six-month response period after issuance of a final action has not expired. If an acceptable amendment to correct the deficiency is not filed prior to approval of the mark for publication or prior to the expiration of the six-month response period after issuance of a final action, the amendment will not be examined.

Section 2.76(h) is added to provide that an amendment to allege use may be withdrawn for any reason prior to approval of a mark for publication or expiration of the six-month response period after issuance of a final action.

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Section 2.77, entitled "Amendments between notice of allowance and statement of use.", is added to provide that an application under Section 1(b) of the Act may not be amended during the period between the issue date of the notice of allowance under Section 13(b)(2) of the Act and the filing of a statement of use under new § 2.88, except to delete specified goods or services. Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined.

The heading entitled "PUBLICATION AND ALLOWANCE," for §§ 2.80 through 2.84, is changed to "PUBLICATION AND POST PUBLICATION." The amended heading more accurately reflects the scope of the sections which follow. The word "allowance," as presently used in the heading, signifies approval of a mark for registration. The purpose of the deletion is to prevent confusion between the word "allowance" and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.81 is amended by changing the section title from "Allowance of application." to "Post publication."; redesignating the present paragraph as (a); revising redesignated paragraph (a), which presently concerns the preparation of an application for registration after publication, to indicate that it does not apply to applications under Section 1(b) of the Act for which no amendment to allege use under new § 2.76 has been submitted and accepted; and adding new paragraph (b) concerning the post-publication processing of applications under Section 1(b) of the Act for which no amendment to allege use under new § 2.76 has been submitted and accepted. The word "allowance," as presently used in the section title, signifies approval of a mark for registration. The purpose of the title change is to prevent confusion between this word and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.81(b) is added to provide that, in a application under Section 1(b) of the Act, for which no amendment to allege use under new § 2.76 has been submitted and accepted, if no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared, a notice of allowance will issue stating the serial number of the application, the name of the applicant, the correspondence address, the mark, the identification of goods or services, and the issue date of the notice of allowance; that the mailing date that appears on the notice of allowance will be the issue date of the notice of allowance; and that thereafter, the applicant shall submit a statement of use under new § 2.88. The paragraph is in accordance with the provisions of Section 13(b)(2) of the Act.

Section 2.82, which concerns the processing of an application for registration on the Supplemental Register after the examiner has approved the application for issuance, is revised to clarify the language of the section.

Section 2.83, which concerns the processing of conflicting marks, is amended by revising paragraph (a) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the earliest filed mark," and by revising paragraph (b) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the application with the earliest date of execution." These provisions are deleted because they do not conform to present practice.

Section 2.84, which concerns jurisdiction over published applications, is amended by deleting the words "or allowed" from the section title, which presently reads "Jurisdiction over published or allowed applications."; and revising paragraphs (a) and (b) to clarify the provisions and to add provisions concerning jurisdiction over applications under Section 1(b) of the Act which have been published. The words "allowed" and "allowance," as presently used in the section title and in paragraphs (a) and (b), signify approval of a mark for registration. The purpose of the amendments deleting these words is to prevent confusion between the words "allowed" and "allowance" and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.86, which presently concerns applications with a plurality of goods or services comprised in a single class, is amended by changing the section title from "Plurality of goods or services comprised in single class may be covered by single application." to "Application may include multiple goods or services comprised in single class or multiple classes."; redesignating the present paragraph as (a); and adding new paragraphs (b) and (c).

Section 2.86(a), as redesignated, which presently provides that an application may recite a plurality of goods or services comprised in a single class provided the particular identification of goods or services is stated and the mark has actually been used in connection with all of the goods or services specified, is revised to clarify the language of the paragraph and to add, as an alternative to the requirement of use, a requirement that the applicant have a bona fide intention to use the mark on or in connection with all the goods or services specified.

Section 2.86(b) is added to incorporate in § 2.86 the provisions of the present § 2.87, which governs the filing of an application to register a mark for goods and/or services which fall within a plurality of classes; clarify the language of those provisions; and add certain requirements relating to multiple class applications under section 1(b) of the Act.

Section 2.86(c) is added to prohibit applicants from alleging use as to certain goods or services and a bona fide intention to use as to other goods or services in the same application, regardless of the number of classes contained therein.

Section 2.87, which presently governs the filing of an application to register a mark for goods and/or services which fall within a plurality of classes, is amended by changing the section title from "Combined applications." to "Dividing an application."; redesignating the present paragraph as (a); revising redesignated paragraph (a); and adding new paragraphs (b) and (c), to govern the division of applications.

Section 2.87(a), as redesignated, is revised by deleting the existing paragraph, which is incorporated in revised form in new paragraph (b) of amended § 2.86, and adding the new provisions that an application may be physically divided into two or more separate applications upon submission by the applicant of a request therefor; that in the case of a request to divide out some, but not all, of the goods or services in a class, a fee for each new separate application to be created by the division must be submitted; and that any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

Section 2.87(b) is added to provide that an application may be divided at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Board. The paragraph provides further that an application under Section 1(b) of the Act also may be divided upon request filed with a statement of use under new § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action. The date a mark is approved for publication is the date the approval is entered into the TRAM (Trademark Reporting and Monitoring) System. The date of approval for publication is immediately available to the public through TRAM.

Section 2.87(c) is added to provide that a request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application." should appear at the top of the first page of the paper. Failure to make the request to divide in a separate paper or to title it as a "Request to divide application" will delay action on the request.

A new heading, entitled "POST NOTICE OF ALLOWANCE," and two new sections, designated §§ 2.88 and 2.89, are added to govern the filing of statements of use, and requests for extensions of time, under Section 1(d) of the Act, in applications under Section 1(b) of the Act, after issuance of a notice of allowance under Section 13(b)(2) of the Act.

Section 2.88, entitled "Filing statement of use after notice of allowance.", is added to govern statements of use under Section 1(d) of the Act in an application under Section 1(b) of the Act.

Section 2.88(a) is added to specify the time when such an amendment may be filed, namely, within six months after the date on which the notice of allowance under Section 13(b)(2) of the Act is issued to an applicant under Section 1(d)(2) of the Act. A statement of use filed prior to the issue date of a notice of allowance is premature, will not be considered, and will be returned to the applicant.

Section 2.88(b) is added to specify the elements of a complete statement of use under Section 1(d) of the Act, namely, three specimens or facsimiles, conforming to the requirements of §§ 2.56 and 2.57, as amended, and § 2.58, of the mark as used in commerce; the fee prescribed in amended § 2.6; and a verified statement by the applicant containing certain averments concerning applicant's ownership of the mark and use of the mark in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services.

Section 2.88(c) is added to provide that a statement of use under Section 1(d) of the Act may only be filed when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the application, for which applicant will seek registration in that application, unless the statement of use is accompanied by a request in accordance with amended § 2.87 to divide out from the application the goods or services to which the statement of use pertains; and that if more than one item of goods or services is specified in the statement of use, the dates of use required in proposed paragraph (b)(1) of this section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated. The latter provision in the paragraph is in conformity with both present and amended § 2.33(a)(2).

Section 2.88(d) is added to provide that the title "Statement of use under § 2.88." should appear at the top of the first page of the paper.

Section 2.88(e) is added to specify minimum requirements for a statement of use, namely, that the statement be filed within the time period specified in paragraph (a) of the section, and include the fee prescribed in amended § 2.6, at least one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce. The paragraph corresponds in principle to amended § 2.21, which sets forth minimum requirements for the filing of an application.

Section 2.88(f) is added to provide that a timely filed statement of use which meets, at least, the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the statement of use, applicant is found not entitled to registration, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The statement of use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the statement of use is acceptable in all respects, the applicant will be notified of its acceptance. The provision of the new paragraph permitting amendment of the statement of use is in accordance with section 1(d)(3) of the Act, which specifically provides that an applicant may amend the statement of use.

Section 2.88(g) is added to provide that if the statement of use does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. If the time permitted for applicant to file a statement of use has not expired, applicant may correct the deficiency. After the filing of a statement of use during a permitted time period for such filing, the applicant may not withdraw the statement to return to the previous status of awaiting submission of a statement of use, regardless of whether the statement is in compliance with paragraph (e) of this section.

Section 2.88(h) is added to provide that the failure to timely file a statement of use which meets the minimum requirements specified in paragraph (e) of this section shall result in the abandonment of the application. The new paragraph is in conformity with section 1(d)(4) of the Act.

Section 2.88(i)(1) is added to provide that the goods or services specified in a statement of use must conform to those goods or services identified in the notice of allowance; and that an applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or, if appropriate, "those goods or services identified in the notice of allowance except. . ." followed by an identification of the goods or services to be deleted. The requirement that the goods or services specified in the statement of use must conform to those goods or services identified in the notice of allowance is in accordance with Section 1(d)(1) of the Act. The suggested format for specifying goods or services in the statement of use will prevent inadvertent errors in the applicant's recital of the goods or services and facilitate examination of statements of use by the PTO.

Section 2.88(i)(2) is added to provide that if any goods or services specified in the notice of allowance are omitted from the identification of goods or services in the statement of use, the Trademark Examining Attorney shall inquire about the discrepancy and permit the applicant to amend the statement of use to include any omitted goods or services, provided that the amendment is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use. The paragraph is in accordance with Section 1(d)(3) of the Act, which specifically provides that the applicant may amend the statement of use.

Section 2.88(i)(3) is added to provide that the statement of use may be accompanied by a separate request to amend the identification of goods or services in the application, as stated in the notice of allowance, in accordance with amended § 2.71(b). The paragraph is in conformance with new § 2.77, which provides that an application under Section 1(b) of the Act may not be amended during the period between issuance of the notice of allowance under Section 13(b)(2) of the Act and the filing of a statement of use, except to delete specified goods or services. Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined.

In the notice of proposed rulemaking, § 2.88(j) was proposed to be added to provide that the mark shown in the specimens submitted with the statement of use must be materially the same as the mark depicted in the drawing of record. However, because this provision duplicates requirements already stated in §§ 2.51 and 2.72, the provision is withdrawn. The provision that was proposed as § 2.88(k) is redesignated as § 2.88(j).

Section 2.88(j) is added to provide that the statement of use may be accompanied by a separate request to amend the drawing in the application in accordance with amended §§ 2.51 and 2.72.

Section 2.89, entitled "Extensions of time for filing a statement of use," is added to govern the filing and examination of requests for extensions of time for filing statements of use under new § 2.88.

Section 2.89(a) is added to provide that an applicant may request a six-month extension of time to file the statement of use under new § 2.88 by submitting a written request, before the expiration of the six-month period following the issue date of a notice of allowance under Section 13(b)(2) of the Act, accompanied by the fee prescribed in amended § 2.6 and a verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce. The paragraph is in conformity with Section 1(d)(2) of the Act.

Section 2.89(b) is added to provide that an applicant may request further six-month extensions of time for filing the statement of use by submitting a written request, prior to the expiration of a previously granted extension of time, accompanied by the fee prescribed in amended § 2.6; a verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce; and a showing of good cause, as specified in paragraph (d) of this section.

Section 2.89(c) is added to provide that extensions of time, for good cause, under § 2.89(b) will be granted only in six-month increments and may not aggregate more than 24 months. The provision is in conformity with Section 1(d)(2) of the Act.

Section 2.89(d) is added to provide that the showing of good cause which is required as part of a request for an extension of time under § 2.89(b) must include certain specified elements listed in paragraphs (d)(1) and (d)(2).

Section 2.89(d)(1) is added to require that the showing of good cause which is required as part of a request for an extension of time under §§ 2.89(b) must include, in part, an allegation that the applicant has not yet made use of the mark in commerce on all the goods or services specified in the notice of allowance on or in

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connection with which the applicant has a continued bona fide intention to use the mark in commerce.

Section 2.89(d)(2) is added to require that the showing of good cause which is required as part of a request for an extension of time under § 2.89(b) must include, in part, a statement of applicant's ongoing efforts to make use of the mark in commerce on or in connection with each of the goods or services specified in the verified statement of continued bona fide intention to use required under § 2.89(b); that the efforts may include, without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities; and that, in the alternative, a satisfactory explanation for the failure to make such efforts must be submitted. The paragraph is in compliance with Section 1(d)(2) of the Act, which requires the Commissioner to issue regulations setting forth what constitutes good cause for a request for an extension of time for filing a statement of use under Section 1(d)(2) of the Act. The listing in the paragraph of examples of efforts to make use of the mark in commerce is intended to be illustrative rather than exhaustive. The inclusion in the examples of "steps to obtain required governmental approval" is not intended to imply that any use of a mark prior to such approval may not constitute "use in commerce" as that term is defined in Section 45 of the Act.

Section 2.89(e)(1) is added to provide that at the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, the applicant may file one request, in accordance with paragraph (a) or (b) of the section, for a six-month extension of time for filing a statement of use, provided that the time requested would not extend beyond 36 months from the issue date of the notice of allowance; and that, thereafter, applicant may not request any further extension of time. This paragraph permits an applicant to obtain additional time to submit a substitute statement of use in case the original statement of use is rejected, as fatally defective, by the PTO near or after the expiration of the six-month period in which such original statement was filed.

Section 2.89(e)(2) is added to provide that a request for an extension of time that is filed at the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, must comply with all the requirements of paragraph (a) of this section, if it is applicant's first extension request, or paragraph (b) of this section, if it is a second or subsequent extension request. The new rule further provides that in a request under paragraph (b), applicant may satisfy the requirement for a showing of good cause by asserting that applicant believes it has made valid use of the mark in commerce, as evidenced by the submitted statement of use, but that if the statement of use is found by the PTO to be fatally defective, applicant will need additional time in which to file a new statement of use.

Final § 2.89(e)(2) includes a provision which was not included in the proposed rule, namely, a request for an extension of time that is filed at the time of the filing of the statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, must comply with all of the requirements of paragraph (a) of this section if it is applicant's first extension request, or paragraph (b) of this section, if it is a second or subsequent extension request. The additional provision was included in the final rule in order to clarify the rule. It is not a material change since proposed and final paragraph (e)(1) of this section requires that an extension request be filed "in accordance with paragraph (a) or (b)" of the section.

Section 2.89(f) is added to provide that the goods or services specified in a request for an extension of time for filing a statement of use must conform to those goods or services identified in the notice of allowance. The requirement is in accordance with Section 1(d)(2) of the Act. The paragraph also provides that any goods or services specified in the notice of allowance which are omitted from the identification of goods or services in the request for extension of time will be presumed to be deleted and the applicant may not thereafter request that the deleted goods or services be reinserted in the application. Finally, the paragraph provides that an applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or, if appropriate, "those goods or services identified in the notice of allowance except . . ." followed by a list of the goods or services to be deleted. The format will prevent inadvertent errors in the applicant's recital of the goods or services and facilitate examination of such a request by the PTO.

Section 2.89(g) is added to provide that the applicant will be notified of the grant or denial of a request for an extension of time, and of the reasons for a denial; that failure to notify the applicant of the grant or denial of the request prior to the expiration of the existing or requested extension does not relieve the applicant of the responsibility of timely filing a statement of use under new § 2.88; that if, after denial of an extension request, there is time remaining in the existing six-month period for filing a statement of use, applicant may submit a substitute request for extension of time; that otherwise, the only recourse available after denial of a request for an extension of time is a petition to the Commissioner in accordance with amended § 2.66 or § 2.146; that a petition from the denial of a request for an extension of time to file a statement of use shall be filed within one month from the date of mailing of the denial of the request; and that if the petition is granted, the term of the requested six-month extension of time which was the subject of the petition will run from the date of the expiration of the previously existing six-month period for filing a statement of use. The paragraph parallels §§ 2.163 through 2.165, concerning affidavits and declarations under Section 8 of the Act, except that the paragraph does not permit a request for reconsideration, but rather provides a petition to the Commissioner as the only recourse after a denial of a request for an extension of time.

Section 2.99(g), which presently lists the types of applications and registrations that are not subject to concurrent use registration proceedings, is revised to provide, additionally, that applications to register under Section 1(b) of the Act are subject to concurrent use registration proceedings only after an acceptable amendment to allege use under new § 2.76 or statement of use under new § 2.88 has been filed.

Section 2.99(h) is added to provide that the Board will consider and determine concurrent use rights only in the context of a concurrent use registration proceeding. The amendment parallels an amendment to add § 2.133(c) to provide that geographic limitations will be considered and determined only in the context of a concurrent use registration proceeding.

Section 2.101(b), which pertains to the filing of an opposition, is amended to be gender neutral, and to specify that an opposition need not be verified and may be signed by the opposer or the opposer's attorney or other authorized representative. The amendment parallels an amendment to § 2.111(b) relating to petitions to cancel. At one time, Sections 13, 14 and 24 of the Act required verification for oppositions, petitions to cancel registrations on the Principal Register, and petitions to cancel registrations on the Supplemental Register, respectively. The verification requirement was deleted from Sections 13 and 14 of the Act by Pub. L. 97-247, enacted August 27, 1982. Through inadvertence, a provision deleting, from Section 24 of the Act, the verification requirement for petitions to cancel registrations on the Supplemental Register was omitted from Pub. L. 97-247. The omitted provision was incorporated, however, in Pub. L. 100-667. Accordingly, it is now appropriate to amend §§ 2.101(b) and 2.111(b) to indicate that verification is not necessary.

Section 2.111(b), which pertains to the filing of a petition for cancellation, is amended to be gender neutral, and to specify that a petition to cancel need not be verified and may be signed by the petitioner or the petitioner's attorney or other authorized representative. This amendment parallels an amendment to § 2.101(b) relating to oppositions. The section is amended further to indicate that a petition may seek to cancel a registration in whole or in part. It has been the practice of the Board to entertain a petition which seeks to "partially cancel" a registration by restricting the identification of goods or services therein. *See Alberto-Culver Co. v. F.D.C. Wholesale Corp.*, 3 USPQ2d 1460 (TTAB 1987), and *U.S. Steel Corp. v. National Copper & Smelting Co.*, 131 USPQ 397 (TTAB 1961). *Cf. Stanspec Co. v. American Chain & Cable Co., Inc.*, 531 F.2d 563, 566 n.9, 189 USPQ 420, 423 n.9 (CCPA 1976), and *Pegasus Petroleum Corp. v. Mobil Oil Corp.*, 227 USPQ 1040, 1043-1044 (TTAB 1985). However, there has been some question as to the Board's authority, under Section 18 of the Act, to "partially cancel" a registration in a cancellation proceeding. *See Selfway, Inc. v. Travelers Petroleum, Inc.*, 579 F.2d 75, 198 USPQ 271 (CCPA 1978). Section 118 of Pub. L. 100-667 resolves this question by amending Section 18 of the Act (which specifies the actions that the Board, acting on behalf of the Commissioner, may take in inter partes proceedings) to provide that the Board may, *inter alia*, "cancel the registration, in whole or in part," "modify the application or registration by limiting the goods or services specified therein," and "otherwise restrict or rectify with respect to the register the registration of a registered mark." Accordingly, § 2.111(b) is amended to indicate the availability of a petition for "partial cancellation."

Section 2.129(d) is added to provide that when a party to an inter partes proceeding before the Board cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act in an application under Section 1(b) of the Act, the Board will enter judgment in favor of that party, subject to the party's establishment of constructive use; and that the time for seeking judicial review under Section 21 of the Act shall run from the date of the judgment.

Section 2.133, which governs the amendment of an application or registration involved in an inter partes proceeding before the Board, is amended to redesignate and republish the present paragraph as (a) and to add new paragraphs, designated (b), (c), and (d), to reflect the expanded authority granted to the Board under Section 18 of the Act, as amended. At present, the Board, in determining an inter partes proceeding other than a concurrent use registration proceeding, is bound to determine the proceeding based on the defendant's application or registration as presented, including the identification of goods or services specified therein, and cannot consider restrictions or limitations to defendant's use (such as restrictions or limitations as to types of goods, trade channels, or classes of purchasers) which may exist although not incorporated in the identification of goods or services in the application or registration. *See*, for example, *Canadian Imperial Bank v. Wells Fargo Bank*, 811 F.2d 1490, 1 USPQ2d 1813 (Fed. Cir. 1987); *CTS Corp. v. Cronstoms Manufacturing, Inc.*, 515 F.2d 780, 185 USPQ 773 (CCPA 1975); USTA Trademark Review Commission, *Report and Recommendations on the United States Trademark System and the Lanham Act*, 77 TMR 375, 452-453 (1987); and Daniel L. Skoler, *Trademark Identification — Much Ado About Something ?*, 76 TMR 224, 237-239 (1986). As a result, the Board must often decide, for example, the issue of likelihood of confusion on a hypothetical rather than "real world" basis. Section 118 of Pub. L. 100-667 remedies this situation by amending Section 18 of the Act to confer upon the Board (acting on behalf of the Commissioner) the authority to "cancel the registration in whole or in part," "modify the application by limiting the goods or services specified therein," and "otherwise restrict or rectify with respect to the register the registration of a registered mark."

Section 2.133(b) is added to provide that if, in an inter partes proceeding, the Board finds that a defendant is not entitled to registration in the absence of a specified restriction to the defendant's involved application or registration, the Board will allow the defendant time in which to amend the application or registration to conform to the findings of the Board, failing which judgment will be entered against the defendant.

Section 2.133(c) is added to provide that geographic limitations will be considered and determined by the Board only in the context of a concurrent use registration proceeding. The amendment parallels an amendment to add § 2.99(h) to provide that the Board will consider and determine concurrent use rights only in the context of a concurrent use registration proceeding.

Section 2.133(d) is added to provide that a plaintiff's pleaded registration will not be restricted in the absence of a counterclaim or another proceeding between the same parties or their privies to cancel the registration in whole or in part.

Section 2.161, which concerns the cancellation of a registration for failure to file an affidavit or declaration during the sixth year of the registration pursuant to Section 8 of the Act, is revised to clarify the language of the section and to implement the provisions of Section 110 of Pub. L. 100-667. Section 8(a) of the Act presently requires, *inter alia*, that the registrant file in the PTO an affidavit "showing that said mark is in use in commerce, or showing that its nonuse is due to special circumstances . . . Section 110 of Pub. L. 100-667 amends Section 8(a) of the Act to require, *inter alia*, that the registrant file in the PTO an affidavit "setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark, or showing that any nonuse is due to special circumstances . . ."

Section 2.162, which concerns requirements for the affidavit or declaration which must be filed during the sixth year of a registration pursuant to Section 8 of the Act, is amended by revising paragraphs (e) and (g) to implement the above-specified provisions of Section 110 of Pub. L. 100-667, and by revising paragraph (f) to clarify the language of the paragraph.

Section 2.181, which concerns the terms of original registrations and renewals, is amended by redesignating present paragraph (a) as (a)(1), revising redesignated paragraph (a)(1), and adding new paragraph (a)(2) to implement the provisions of Sections 110 and 111 of Pub. L. 100-667. Section 110 of Pub. L. 100-667 amends Section 8(a) of the Act to reduce the term of a registration from twenty years to ten years, and Section 111 of Pub. L. 100-667 amends Section 9(a) of the Act to reduce the term of a renewal from twenty years to ten years.

Section 2.181(a)(1), as redesignated, is revised to indicate that registrations issued or renewed under the Act prior to November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for twenty years from their date of issue or expiration, and may be renewed for periods of ten (rather than twenty) years from the expiring period unless previously cancelled or surrendered.

Section 2.181(a)(2) is added to indicate that registrations issued or renewed under the Act on or after November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for ten years from their date of issue or expiration, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered. The paragraph is in conformity with Section 51 of the Act, added by Section 135 of Pub. L. 100-667.

Section 2.187 presently provides that a certificate of registration will be issued to the assignee of an applicant, or in a new name of applicant, provided that an appropriate document is of record in the Assignment Search Room of the PTO no later than the time the notice of publication is mailed, or if such document is not of record, then if a statement that such document has been filed for recordation is in the application file by the time the application is being prepared for issuance of the certificate of registration; and that the address of the assignee must be made of record in the application file or in the recorded document. The paragraph is revised to provide that a certificate of registration will be issued to an assignee of an applicant, or in a new name of an applicant, provided that the party makes a written request in the application record by the time the application is being prepared for issuance of the certificate of registration, and the appropriate document is of record in the Assignment Search Room of the PTO, or if the assignment or name change document is not of record in the Assignment Search Room, the written request must state that the document has been filed for recordation. The purpose of the revision is to permit an assignee or an applicant whose name has been changed to ensure, by complying with the requirements of the paragraph, that the certificate of registration will be issued in the name of such party. The paragraph is revised further to provide that the address of the assignee must be made of record in both the application file and the recorded document. This revision will help to ensure that the certificate of registration, and any subsequent papers which the PTO may need to send to the owner of the registration, will be mailed to the proper address.

Response to Comments on the Rules:

The comments received in response to the notice of proposed rulemaking have been given careful consideration, and a number of the suggested modifications have been adopted. The comments and responses are discuseed below.

Comment: Section 1.8 was proposed to be amended to exclude three new papers from the certificate of mailing procedure established under the section, namely, statements of use under new § 2.88, requests for extensions of time to file such statements, and amendments to allege use under new § 2.76. The certificate of mailing procedure permits papers to be mailed later than they otherwise could be and still be considered timely filed.

Two organizations and one individual expressed concern that this proposal was too restrictive. They suggested that the certificate of mailing procedure should be extended to cover these new papers, if possible.

Response: An amendment to allege use may be submitted only during the examination of an application prior to approval of the

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mark for publication for opposition in the Trademark *Official Gazette*. An amendment to allege use which is filed immediately before approval of the mark for publication may not be received in the Law Office until after the application is in the publication cycle. In such a case, the mark would have to be withdrawn from publication. Withdrawal of a mark from publication is a significant administrative problem. Use of the certificate of mailing procedure to file amendments to allege use would result in an increase in the number of applications which would have to be withdrawn from the publication cycle.

Both statements of use and requests for an extension of time to file such a statement are required to be filed during specified six-month periods. If a statement of use or an extension request is not filed during the time allowed, the application stands abandoned as a matter of law and the PTO amends its public records to reflect the abandonment. A statement of use or an extension request which is filed immediately before the expiration of the six-month period for filing a statement of use may not be received by the ITU Unit, which processes such papers, until after the application has been "abandoned" by the PTO. In such a case, the application would have to be reinstated. Reinstatement of an application is a significant administrative problem. Use of the certificate of mailing procedure to file statements of use and extension requests would result in an increase in the number of applications which would have to be reinstated. Moreover, during the time prior to reinstatement, the public records of the PTO would incorrectly indicate that these applications stood abandoned.

Accordingly, the suggestion that the certificate of mailing procedure be extended to cover these three papers has not been adopted.

Comment: Section 2.6 was proposed to be amended to establish two new fees for the filing of papers required or permitted under Section 1(c) or 1(d) of the Act, namely, a filing fee of $100.00 for an amendment to allege use under new § 2.76 or for a statement of use under new § 2.88, and a filing fee of $100.00 for any request, under new § 2.89, for a six-month extension of time to file a statement of use. In addition, § 2.6(a) establishes the fee for filing an application, per class, and it was proposed to be made applicable to all new applications filed in the PTO, regardless of the basis asserted for filing.

Two organizations commented that the proposed amendment favors foreign Convention "intent-to-use" applicants over domestic applicants because foreign Convention applicants who perfect a basis for registration under Section 44 of the Act do not need to submit evidence of actual use to support an application and, hence, will not need to avail themselves of the "intent-to-use" process beyond the initial application filing fee; whereas, domestic "intent-to-use" applicants will have to pay not only the initial application filing fee, but also the fee for an amendment to allege use or a statement of use and for any extensions of time they may request. To ameliorate this perceived inequity, the organizations recommended that the basic filing fee for an application asserting "intent-to-use" as a basis for filing should be increased to approximately $400.00 for all applicants and that the fees for the other three new papers be reduced to truly token amounts. An alternative suggestion was to require foreign applicants to pay an additional fee for reliance on a foreign registration without use in commerce.

Response: The proposed fee increase would be inconsistent with the trademark fee schedule that took effect on April 17, 1989 as described in the February 15, 1989 *Federal Register* notice (54 FR 6893). The PTO will review the trademark fee structure approximately 18 months from implementation and propose fee adjustments, if warranted. Neither the Act nor the Paris Convention permit the PTO to charge a Section 44 applicant an additional fee to register without asserting use in commerce. Accordingly, the suggested fee modifications have not been adopted.

Comment: Section 2.21(a)(5)(ii) was proposed to be added to specify all the filing requirements which pertain only to the assertion of a basis for filing an application under Section 44(e) of the Act, including a certification or certified copy of the foreign registration on which the application is based. Section 7(c) of the Act states, in part, that contingent upon registration of the mark on the Principal Register, the filing of the application to register such mark shall constitute constructive use of the mark, conferring a right of priority.

One individual commented that in view of the provisions of Section 7(c) of the Act and the delay which is sometimes encountered in receiving a certified copy of a foreign registration from a foreign applicant, it would be more equitable to foreign applicants if they could obtain a filing date without the certified copy of the foreign registration.

Response: Section 44(e) of the Act specifically requires that an application filed thereunder "shall be *accompanied* (emphasis added) by a certification or a certified copy of the registration in the country of origin of the applicant." In view thereof, the PTO believes that the statute requires submission of a certification or certified copy of the foreign registration as a necessary condition for receipt of a filing date. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.21(a)(6) was proposed to be revised to require that an application include the verification in accordance with § 2.33(b), signed by the applicant, as a condition for receiving a filing date. One organization and four individuals objected to the proposed requirement.

The organization suggested that the PTO reconsider the necessity for imposing this requirement in the case of use-based applications under Section 1(a) of the Act, where the verification of the applicant's bona fide intent is not at issue.

One individual suggested that the proposed rule be modified to allow an applicant who seeks registration on the basis of foreign trademark rights, and/or on use of a mark in commerce, to receive a filing date for the application even without the applicant's personal signature. This individual stated that one can, in virtually any country of the world, file a trademark application through counsel and obtain an effective filing date; that this has been the practice in the United States for many decades; that no reason exists to change the current practice; and that the proposed practice would be more burdensome to foreign nationals.

One individual suggested that signature by applicant's attorney or agent should be sufficient to receive a filing date and that when the signature is by applicant's agent or attorney, a substitute verification or declaration signed by the applicant could be required thereafter. This individual expressed his belief that requiring signature by the applicant in order to obtain a filing date would frustrate one of the purposes of Pub. L. 100-667 (namely, to encourage the earliest possible filing of applications) by unnecessarily delaying the filing of applications, especially in the case of foreign applicants.

One individual noted that, at present, a trademark applicant is allowed to file an unsigned application and receive a filing date, and to submit the verification later. The individual expressed his belief that obtaining a filing date without signature is in accordance with Sections 1 and 44 of the Act, and that no change has been made to the Act which would require this amendment to the rules.

Another individual also objected to the proposed requirement, noting that in dealing with foreign applicants there may be a delay in obtaining a signed declaration. This individual suggested that the proposed requirement be deleted or, in the alternative, that a filing date be allowed on the basis of a facsimile copy, to be ratified and confirmed subsequently by a paper copy.

Response: Section 7(c) of the Act provides, in part, that contingent upon registration of a mark on the Principal Register, the filing of the application to register the mark shall constitute constructive use of the mark, conferring a right of priority. Thus, upon registration, all registrants on the Principal Register obtain a new substantive right, effective from the filing date of the application. For this reason a verified assertion, signed by the applicant, of the basis for filing the application is believed to be essential. However, for the purpose of determining the timely filing of a paper which must contain applicant's verification or declaration, amended § 2.71(c) permits the verification or declaration to be signed by a person having color of authority to sign for the applicant.

Although the Trademark Operation cannot receive any documents by "fax," for filing date purposes, a "fax" copy of an appropriately signed written application statement will be accepted, provided that the original document is later submitted.

Accordingly, the suggested changes have not been adopted.

Comment: Section 2.31, which presently states that it is preferable that an application be on legal or lettersize paper, was proposed to be amended to delete the reference to legal-size paper. One individual questioned whether the PTO could also allow the use of A-4 size paper.

Response: It is understood that A-4 size paper is 8 9/32 inches by 11 11/16 inches. The processing of papers of differing sizes is an administrative problem for the PTO. However, it should be noted that the paper size is expressed in the rule as a preference rather than as a mandatory requirement. An application filed on paper of a different size will not be denied a filing date for that reason. Accordingly the suggested change has not been adopted.

Comment: Section 2.33(a)(1)(vii) was proposed to be amended, and § 2.88(b) was proposed to be added, to require, in part, that an application under Section 1(a) of the Act, and a statement of use under Section 1(d) of the Act, respectively, include a statement of applicant's date of first use of the mark in commerce on or in connection with the applicant's goods or services, specifying the nature of such commerce.

One individual commented that the proposed rules could be improved by including acceptable descriptions of "such commerce." The descriptions suggested by the individual were "interstate, federal (in the case of commerce in the District of Columbia), territorial (in the case of Puerto Rico and similar geographic areas) or foreign (when the nature of the commerce on the date of first use is of more than one type, then any of such types may be specified)."

Response: Section 45 of the Act defines commerce as "all commerce which may lawfully be regulated by Congress." The types of commerce which fall within this definition are many and varied, and are the subject of a large body of case law. Any attempt to include descriptions of such commerce in the rules could be perceived as limiting the types of commerce falling within the definition, and would also make the rules unduly lengthy. Accordingly, the suggested change has not been adopted.

Comment: Section 2.33(d) was proposed to be added to provide, in part, that an applicant in an application under Section 1(a) of the Act may not amend that application to seek registration under Section 1(b) of the Act.

Two organizations objected to this proposed provision. The organizations commented that a bona fide intention to use a mark in commerce is manifested clearly by the filing of an application based upon use of that mark in commerce; that the proposed provision would result in a loss of the application filing date (and the constructive use priority which would attach thereto, pursuant to Section 7(c) of the Act, upon registration) if the use forming the basis for an application under Section 1(a) proves to be defective; and that this provision discriminates against domestic applicants.

Response: Section 1(b) of the Act provides, in part, that a person who has a bona fide intention to use a mark in commerce may apply to register the mark on the Principal Register by filing in the PTO a written application, verified by the applicant and specifying, *inter alia*, applicant's bona fide intention to use the mark in commerce. Since the statement of a bona fide intention to use the mark in commerce is the sole statutory basis for filing an application under Section 1(b) of the Act, the statement must be included in the application at the time of its filing. An application filed pursuant to Section 1(a), based upon use of a mark in commerce, does not include such a statement and, hence, does not meet the requirements for an application under Section 1(b) of the Act.

If an applicant has any doubt concerning the sufficiency of its use of a mark in commerce, the applicant may file its application under Section 1(b) of the Act. Thereafter, the applicant may submit an amendment to allege use under Section 1(c) of the Act, claiming use prior to the application filing date.

Accordingly, the suggested changes have not been adopted.

Comment: One individual commented, with respect to proposed §§ 2.33(a)(1)(ix) and 2.39(a), that the two rules contain cross-references to each other which are confusing.

Response: Upon further consideration, it is believed that the cross-reference in proposed § 2.39(a) to § 2.33 is unnecessary. The cross-reference to § 2.33 has been deleted from § 2.39(a).

Comment: Section 2.39(b) (redesignated in the final rule as § 2.39(a)) was proposed to be revised to provide, in part, that an application claiming the benefit of a foreign application in accordance with Section 44(d) of the Act shall specify the foreign application upon which it is based. One organization suggested that the rule should specify that the foreign application must be for a substantially identical mark and include the same goods or services as set forth in the U.S. application.

Response: The requirements concerning conformance of mark and goods in a U.S. application to its underlying foreign application are addressed in the rules. Section 2.33(a)(1)(v) provides, in part, that the goods or services asserted in an application under Section 44 may not exceed the scope of the goods or services covered by the foreign application or registration. Sections 2.51(a)(3) and (b)(3) provide that, in an application under Section 44 of the Act, the drawing of a mark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of applicant. Accordingly, the suggested changes have not been adopted.

Comment: Section 2.39(c) (redesignated in the final rule as §§ 2.39(b)) was proposed to be added to provide that before an application filed in accordance with Section 44(d) of the Act can be approved for publication, a basis for registration under Section 1(a), 1(b) or 44(e) of the Act must be established; that the PTO will assume that basis to be Section 44(e) unless otherwise stated in the application within six months of the filing date of the foreign application forming the basis of the Section 44(d) claim; and that the filing of a paper, which claims a different basis for registration, more than six months after the filing date of the foreign application will result in a loss of priority under Section 44(d).

One individual commented that the proposed paragraph is inconsistent with Pub. L. 100-667 "in requiring that U.S. applications claiming the priority of a foreign application, must forfeit the claim of priority in the event that registration is based on anything other than a foreign registration issuing on the priority application," and that it is also inconsistent with the Paris Convention. The individual expressed his belief that the basis for receiving a filing date under the Act can be separated into two categories, namely, use of a mark in commerce under Section 1(a) of the Act and a bona fide intention to use a mark in commerce under Section 1(b) of the Act; and that the second category includes applications under Section 44 of the Act.

One individual commented that the assertion of a different basis might destroy not only the priority claim, but also the jurisdictional basis of the application as of the filing date; and that even if a different basis is asserted within six months of the filing date of the foreign application, a different basis might result in the loss of a priority claim. The individual suggested that the paragraph be revised to indicate that the loss of priority is not the only possible consequence that might follow from assertion of a different basis for registration.

One individual commented (without reference to a specific proposed rule) that "since Section 44 applications are now required to include a statement of a bona fide intention to use a mark, it would appear equitable to permit such applicants to convert Section 44 applications to Section 1(b) applications." The individual noted that "this is especially true where the applicant may begin to use the mark prior to the date on which a registration from its home country issues."

Response: The proposed paragraph did not require "that U.S. applications claiming the priority of a foreign application must forfeit the claim of priority in the event that registration is based on anything other than a foreign registration issuing on the priority application." Rather, the proposed paragraph provided only that assertion of a different basis for registration, including reliance on a different registration under Section 44(e) of the Act, *more than six months after the filing date of the foreign application* would result in a loss of priority. This provision was intended to apply to applications which, at the time of their filing, contained only a claim of priority pursuant to Section 44(d), and no other asserted basis for filing under Section 1(a), 1(b) or 44(e) of the Act. There is no provision in either Pub. L. 100-667 or the Paris Convention which prohibits the PTO from requiring an applicant, who filed an application in the U.S. asserting only a claim of priority under Section 44(d) of the Act, to assert a basis for registration (i.e., under Section 1(a), 1(b) or 44(e) of the Act) within a certain period of time after the filing date of the foreign priority application. Thus, this provision is not contrary to either Pub. L. 100-667 or the Paris Convention.

The PTO believes that the subject matter of these sentences may be addressed more appropriately in the *Trademark Manual of Examining Procedure*. Accordingly, the proposal to add these two sentences to § 2.39 is withdrawn.

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It should be noted that although an application filed under Section 44 of the Act is required to include a statement that the applicant has a bona fide intention to use the mark in commerce, the PTO will not construe such an application to be an application filed also under Section 1(b) of the Act unless the applicant specifically asserts Section 1(b) as a basis for filing. An application asserting only a claim of priority under Section 44(d) may not be amended to assert Section 1(b) of the Act as a basis for filing without loss of the foreign priority date unless the amendment is submitted within six months of the filing date of the foreign application. *Cf. In re Daiwa Seiko, Inc.*, 230 USPQ 794 (Comm'r Pats. 1983).

Comment: Section 2.44, which presently specifies the requirements for an application to register a collective mark, including the requirement that an applicant state the nature of applicant's control over the use of the mark, was proposed to be amended to indicate that the present paragraph pertains only to applications under Section 1(a) of the Act, and to add a new paraqraph specifying the requirements for an application to register a collective mark under Section 1(b) or 44 of the Act, including the requirement that an applicant state the nature of the control applicant intends to exercise over the use of the mark.

One individual commented that there are some types of collective organizations, such as a university alumni association, which cannot reasonably be expected to exercise control over use of their indicia of membership once it has been given to a new member upon enrollment. The individual suggested that § 2.44 should be amended "so that only in appropriate cases would it be necessary for the applicant to show the exercise of control."

Response: Proposed new paragraph (b) requires only that the applicant specify, *inter alia*, "the nature of the control applicant intends to exercise over the use of the mark." Thus, the rule does not require that a particular degree of control be exercised, or intended to be exercised, over the use of a mark. This reflects the requirement under Section 4 of the Act that an applicant exercise legitimate control over the use of the mark that it seeks to register. Accordingly, the suggested modification has not been adopted.

Comment: One individual commented (without reference to a specific proposed rule) that the proposed rules do not specify the procedure for filing a statement of use if the applicant amends to the Supplemental Register.

Response: Section 2.47(c) was proposed to be added to provide that a mark in an application to register on the Principal Register under Section 1(b) of the Act is eligible for registration on the Supplemental Register only after an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been timely filed. Section 23 of the Act requires lawful use in commerce as a prerequisite for an application for registration on the Supplemental Register. This requirement bars an application under Section 1(b) of the Act from the Supplemental Register until an acceptable allegation of use has been submitted. Moreover, Section 1(b) of the Act only provides for filing an application based upon a bona fide intention to use a mark in commerce on the Principal Register. Accordingly, no modification of the rules is necessary.

Comment: Section 2.51(d) was proposed to be revised to provide that broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on packaging, or to show matter not claimed as part of the mark, or both, as appropriate, and to provide further that, in an application to register a mark with three-dimensional features, the drawing shall depict the mark in perspective in a single rendition. One individual commented that when a mark is three-dimensional, or when placement of the mark on the goods or packaging is significant, multiple drawings should be permitted; each drawing should be labeled with figure numbers as in the case of utility and design patent applications; and the trademark application should include a description of the figures.

Response: A drawing with multiple renditions, although suitable for a patent application, is not satisfactory for trademark purposes. The drawing of a trademark should depict the mark as it is seen by the consumer; the consumer does not see the mark in multiple renditions or from more than one perspective at a time. For the same reason, the labeling of a trademark drawing with figure numbers would be inappropriate. It has been the experience of the PTO that a three-dimensional mark can be adequately depicted in a single rendition, particularly when the application includes an appropriate description of the mark. *Cf. In re Weber-Stephen Products Co.*, 3 USPQ2d 1659, 1661 (TTAB 1987); *In re Vico Products Mfg. Co., Inc.*, 229 USPQ 364, 366 (TTAB 1985); *In re Pierre Faber S.A.*, 221 USPQ 1210, 1211 (TTAB 1984); *In re Ovation Instruments, Inc.*, 201 USPQ 116, 123 (TTAB 1978). Accordingly, the suggested modification has not been adopted. If an applicant believes that its mark is incapable of being depicted in a single rendition, it may file a petition to the Commissioner, pursuant to § 2.146(a)(5), to waive the requirement of the rule.

Comment: Section 2.52(d), which pertains to drawing headings and which presently includes, *inter alia*, a requirement that the heading of a drawing (except for a drawing in an application under Section 44 of the Act) specify dates of use, was proposed to be revised to indicate that the requirement pertains only to an application under Section 1(a) of the Act; and to add a requirement that the heading of a drawing in an application filed in accordance with Section 44(d) of the Act specify the priority filing date of the relevant foreign application.

One individual commented that proposed § 2.52(d) does not reflect current practice because it continues the existing requirement that the heading must not exceed one fourth of the sheet; whereas, in the individual's experience, the PTO routinely accepts drawings when the heading occupies one-half or, in some cases, even two-thirds of the sheet. The individual suggested that the paragraph be modified to enlarge the heading size limit from one-fourth to one-half of the sheet.

One organization suggested that § 2.52(d) be amended to provide that when a significant element of a special form drawing is unclear or ambiguous, the heading should include a brief description of the mark in the drawing. The organization noted that such a description would provide more accurate information in the paper search file and facilitate accurate coding of marks for entry into the computer search system. The organization emphasized, however, that the suggested provision should be encouraging rather than mandatory in nature.

Response: The suggested modifications have been adopted, except that the heading size limit has been enlarged only to one-third of the sheet instead of the suggested one-half of the sheet. If a drawing had a heading of one-half of the sheet and a special form depiction of the mark which was four inches by four inches in size, there would not be enough room remaining for the required margins.

Comment: Sections 2.56, 2.57 and 2.58, which pertain to the specimens of use in an application, were proposed to be amended to reduce the number of specimens required from five to two in §§ 2.56 and 2.57 and from three to two in § 2.58. Similarly, the PTO proposed to require that two specimens be filed in connection with an amendment to allege use under proposed § 2.76 and a statement of use under proposed § 2.88.

Four organizations objected to the reduction in the required number of specimens from five to two. They commented that original specimens show color and detail more effectively than photocopies and provide valuable information enabling practitioners to better evaluate potential conflicts. One of the organizations recommended requiring at least three specimens, while the other three organizations favored maintaining the present requirement for five specimens.

Response: Having five specimens in an application or registration file increases the amount of storage space required for these files. Moreover, it is unusual for more than one party to ask to remove a specimen from the same application or registration file. A requirement for three specimens would provide one specimen to remain in the file and make two specimens available for removal by third parties. The PTO believes that this number requirement will meet the needs of both the public and the PTO. Since § 2.58(b) presently requires three audio cassettes, no change to that rule is required and the proposed amendment is withdrawn. Accordingly, the suggestion that the PTO require three specimens has been adopted in the final rules.

Comment: Section 2.59(a) was proposed to be added to provide that, in an application based upon use in commerce, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens are properly verified as to their use in commerce at least as early as the filing date of the application.

One individual commented that there should be no need to submit a verification in support of substitute specimens which are, in fact, "faithful photographic reproductions" of the specimens already of record and recommended that proposed § 2.59(a) be modified to indicate that a verification will not be required in such circumstances.

Response: This suggestion codifies present practice set out in Section 808.10 of the *Trademark Manual of Examining Procedure* and has been adopted.

Comment: Section 2.66(d) was proposed to be added to provide that a petition to revive an abandoned application must be filed promptly, but that no petition to revive will be granted in an application under Section 1(b) of the Act if granting the petition would permit the filing of a statement of use more than 36 months after the issuance of a notice of allowance under Section 13(b)(2) of the Act.

One organization commented that "in view of the constructive use awarded applications under the new law, it will be more important than ever for practitioners to be able to rely on the fact that an application uncovered in a search has truly been abandoned in the PTO without the specter of its revival after an indeterminate period of time." The organization recommended that "the rules should place an outside limit of six months or one year on petitions to revive either 1(a) or 1(b) applications."

Response: Usually a petition to revive will be considered filed promptly if it is filed within two months of the date the application was abandoned for failure to respond. Section 12(b) of the Act provides, in part, that an application "shall be deemed to have been abandoned, unless it can be shown to the satisfaction of the Commissioner that the delay in responding was unavoidable, whereupon such time may be extended." The Commissioner cannot determine in advance that facts asserted beyond a certain time limit cannot show unavoidable delay. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.71(b), which presently provides that additions to the identification of goods or services will not be permitted unless certain specified conditions are met, was proposed to be revised to provide that the identification of goods or services may be amended to clarify or limit the identification, but that additions will not be permitted. It was indicated in the notice of proposed rulemaking that the purposes of the requirement for the identification of goods or services are to give notice to third parties of the scope of the rights claimed by the applicant and to permit an accurate search for conflicting marks; and that addition of goods or services to the identification, after the filing of an application, would frustrate these purposes. It was also noted that Section 7(c) of the Act provides that, contingent on the registration of a mark on the Principal Register, the filing of the application to register such mark shall constitute constructive use of such mark on or in connection with the goods or services specified in the registration.

One individual commented that he agreed in principle with the proposed rule and the reasoning offered, but that the PTO should not apply the proposed amendment without some flexibility that allows an applicant to minimally enlarge the scope of the initially claimed goods or services in an application. The individual expressed his belief that such flexibility would not defeat either of the two legitimate reasons cited for the proposal and that "strict adherence to the proposed change would result in additional workload due to refiled or additional applications to comprehensively cover goods or services that the applicant inadvertently failed to claim." The individual suggested that the rule be modified to provide that the identification of goods or services may be amended to clarify or limit the identification, but that "substantive additions" will not be permitted.

Response: For the reasons stated in the notice of proposed rulemaking, the PTO believes that it would be inappropriate to allow any additions to the identification of goods or services in an application. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.71(c), which presently provides that a defect in the verification or declaration may be corrected only by filing a substitute or supplemental verification or declaration, was proposed to be revised to clarify the language. The paragraph was proposed to be further revised to provide that a verification or declaration required under §§ 2.21(a)(6), 2.76(e)(3) or 2.88(e)(3), to be properly signed, must be signed by the applicant, a member of the applicant firm, or an officer of the applicant corporation or association; that a verification or declaration which is signed by a person having color of authority to sign, is acceptable for the purpose of determining the timely filing of the paper; but that a properly signed substitute verification or declaration must be submitted before the application will be approved for publication or registration, as the case may be. It was indicated in the notice of proposed rulemaking that persons having color of authority to sign are those having first-hand knowledge of the truth of the statements in the verification or declaration; that in the case of a corporate applicant, a person having color of authority might include, within the contemplation of the amended section, managers or similar persons who are in positions of authority, although not actually officers, if they have first-hand knowledge of the truth of the statements in the application; and that an applicant's attorney ordinarily will not be considered a person having color of authority to sign, unless he/she is an officer.

One individual expressed his belief that the language "amendment of the verification or declaration will not be permitted" in the present and proposed rule could lead some people to believe that there is no way in which an amendment of a declaration or verification can be effected when, in fact, it can be effected by the submission of a substitute document. The individual suggested that the rule be revised to state that changes may not be made in the verification or declaration document already in the PTO file, but that any amendment would have to be made by the filing of a substitute or supplemental amendment.

Three organizations commented that the definition in the proposed rule of persons having color of authority to sign a verification or declaration could include many persons not authorized to act on behalf of the applicant. One of the organizations suggested that the proposed definition ("those having first-hand knowledge of the truth of the statements in the verification or declaration") should be clarified by adding "and who are authorized to act on behalf of the applicant."

Response: In response to the comment by the individual, the beginning of the final rule has been modified to read: "If the verification or declaration filed with the application is defective, the defect may be corrected only by the submission of a substitute or supplemental verification or declaration in accordance with §§ 2.20."

In response to the comments of the organizations, the definition of persons having color of authority to sign has been modified in the final rule to read: "Persons having color of authority to sign are those who have first-hand knowledge of the truth of the statements in the verification or declaration and who also have actual or implied authority to act on behalf of the applicant."

Comment: Section 2.77 was proposed to be added to provide, in part, that an application under Section 1(b) of the Act may not be amended during the period between the issue date of the notice of allowance under Section 13(b)(2) of the Act and the filing of the statement of use under § 2.88, except to delete specified goods or services.

Four organizations expressed their concern that the word "delete" may be unnecessarily limiting and may restrict the ability of parties to negotiate settlement of potential conflicts. The organizations suggested that the rule be modified to allow amendments "to delete or restrict" the specified goods or services during this time period.

Response: An amendment seeking to restrict the specified goods or services would require examination by the Trademark Examining Attorney. However, the application file will not be in the possession of the Examining Attorney during the time between issuance of the notice of allowance and submission of the statement of use. Inasmuch as this rule applies only to the specified time period, it will not affect the settlement of oppositions or potential oppositions, which take place prior to issuance of the notice of allowance. Moreover, the last sentence of new § 2.77, which in the notice of proposed rulemaking read:
"Other amendments filed during this period will not be considered unless resubmitted at, or after, the time of filing the statement of use," has been modified to read: "Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined." This change has been made so that the applicant will not have to resubmit the proposed amendment at the time of filing the statement of use. Thus, during the period covered by the rule, amendments restricting the goods may be filed for later consideration by the Trademark Examining Attorney at the time of examination of the statement of use. Accordingly, the proposed modification has not been adopted.

Comment: Section 2.83, which concerns the processing of conflicting marks, was proposed to be amended by revising

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paragraph (a) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the earliest filed mark," and by revising paragraph (b) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the application with the earliest date of execution."

One individual commented that interferences are sometimes declared, and that the rule ought to make provision for interferences so that the declaration of an interference cannot be challenged on the ground that there is no provision for interferences in the rules.

One individual commented that the rule should not be amended to delete the notice provisions presently set forth in paragraphs (a) and (b). The individual expressed his belief that such notice is helpful to applicants who do not subscribe to the *Official Gazette* and that "providing notice does not in any way inconvenience the PTO or add to the workload of Examiners who are aware of the conflicting applications and, as a matter of good practice, have both files before them when they act on either one."

Response: Provision is made in § 2.91 for the declaration of interferences.

The provisions concerning notice were proposed to be deleted because they do not conform to present practice. The Trademark Examining Attorney notifies applicants of conflicting applications during examination. To provide a second notice upon publication of the earlier filed, or earlier executed, application would require that a system be developed for monitoring the progress of that application and for sending the second notice. Thus, sending second notices would be unduly burdensome to the PTO.

Accordingly, the suggestion has not been adopted.

Comment: Section 2.84, which governs jurisdiction over published applications, was proposed to be revised to provide, in part, that after publication of an application under Section 1(b) of the Act, the examiner may exercise jurisdiction over the application after issuance of the notice of allowance under Section 13(b)(2) of the Act.

One individual suggested that the phrase "the examiner may exercise jurisdiction" be modified to read "the examiner must exercise jurisdiction." In this regard, the individual noted that after the issuance of the notice of allowance the examiner must exercise jurisdiction over the application to examine the statement of use, and that jurisdiction must also be exercised over requests for extensions of time to file a statement of use.

Response: The purpose of both present and proposed § 2.84 is to specify when an examiner is allowed to exercise jurisdiction over an application, not to specify when an examiner must exercise jurisdiction over an application. Accordingly, the proposed modification has not been adopted.

Comment: Section 2.86, which presently provides that an application may recite a plurality of goods or services comprised in a single class, provided the goods or services are specifically identified and the mark has actually been used in connection with all of the specified goods or services, was proposed to be amended by, *inter alia*, redesignating the present paragraph as (a); and to add, as an alternative to the requirement of use, a requirement that the applicant have a bona fide intention to use the mark on or in connection with all the specified goods or services.

Two organizations expressed their concern about the requirement that applicants state a bona fide intention to use the mark on all goods recited in the application. The organizations noted that registration will be granted to domestic applicants only for those goods for which actual use in commerce is made, but that foreign applicants could specify overly extensive lists of goods, secure registration for them, and, if no use occurs during the first six years of registration, simply re-file for these same goods to circumvent the requirements of Section 8 of the Act. The organizations recommended that the PTO "require use at least somewhere for all goods specified prior to granting registrations to Section 44 applicants."

One organization recommended that the beginning of the proposed paragraph, which states "an application may recite more than one item of goods, or more than one service comprised in a single class provided the goods or services are specifically identified and...," be revised by inserting thereafter the phrase "and in accordance with subsection (c) of this rule." Proposed subsection (c) provides that the applicant may not allege use as to certain goods or services and a bona fide intention to use as to other goods or services in the same application, regardless of the number of classes contained therein.

Response: To require "use at least somewhere for all goods specified prior to granting registration to Section 44 foreign applicants" would be inconsistent both with the Act and the Paris Convention.

The PTO believes that the suggested modification of proposed paragraph (a) to include a reference to proposed paragraph (c) would not further clarify the rule and is unnecessary.

Accordingly, the suggested modifications have not been adopted.

Comment: Section 2.86(b), which governs multiple class applications, provides, in part, that "A single certificate of registration for the mark shall be issued."

The organization suggested that the phrase "unless the application is divided pursuant to Rule 2.87" be added to the provision.

Response: The suggested modification is adopted.

Comment: Sections 2.76 and 2.88 were proposed to be added to govern amendments to allege use under Section 1(c) of the Act and statements of use under Section 1(d) of the Act, respectively. Proposed paragraphs (d) and (e) of the new sections required that an amendment to allege use and a statement of use be made in a separate paper from any other filing.

Three organizations and one individual expressed their belief that the proposed requirement would be unduly harsh since violation could result in the abandonment of the application.

Response: The proposed requirement has been withdrawn.

Comment: Sections 2.76(c) and 2.88(c) were proposed to be added to provide, *inter alia*, that if more than one item of goods or services is specified in an amendment to allege use or a statement of use, the dates of use required to be specified need be for only one of the items specified, provided the particular item to which the dates apply is designated.

One individual commented that under the proposed paragraphs dates of use are apparently not required to be stated for each class of goods or services. The individual questioned whether this was an inadvertent omission.

Response: The PTO did not intend to imply that dates of use did not need to be specified for each class of goods or services. A requirement for a specification of dates of use for each class has been included in the final rules.

Comment: Section 2.88(f) was proposed to be added to provide, in part, that if a statement of use does not comply with all of the requirements specified in paragraph (e) of the proposed section, applicant will be notified of the deficiency.

One organization recommended that the proposed paragraph be modified to require that applicant be given "a statement of reasons for finding a statement of use to be defective."

Response: The proposed paragraph specifically provides that "applicant will be notified of the deficiency." A "notification of a deficiency" *is* a description of the nature of the deficiency, i.e., of the reason why the statement of use was found to be defective. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.88(e) was proposed to be added to specify minimum requirements (in addition to timeliness) for a statement of use, namely, the prescribed fee, one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce, and specifying the date of the applicant's first use of the mark in commerce and the goods or services on or in connection with which the mark is used in commerce. Proposed § 2.88(f) provided, in part, that if a statement of use does not comply with the requirements of proposed paragraph (e), applicant may correct the deficiency only if the time permitted for applicant to file a statement of use has not expired; and that after the filing of a statement of use during a permitted time period for such filing, the applicant may not withdraw the statement to return to the previous status of awaiting submission of a statement of use.

Section 2.89, governing extensions of time for filing a statement of use, was proposed to be added to, *inter alia*, specify the requirements for a request for an extension of time for filing a statement of use; permit an applicant to file, during the six-month period in which a statement of use is filed, one last request for a six-month extension of time; and provide that any defect in an extension request may be corrected only if there is time remaining in the six-month period for filing a statement of use.

Comments relating to these proposed provisions and their interrelationship were submitted by six organizations, one firm and three individuals.

One organization commented that the proposed sections require an applicant to remedy defects in a statement of use or a request for an extension of time to file a statement of use "within the original or an extended six-month period" for filing a statement of use; and that failure to remedy a defect within the specified period causes the application to become abandoned in the case of a statement of use, or requires the applicant to file a petition to the Commissioner in the case of a request for extension of time. The organization expressed its concern that "an applicant's valuable trademark rights will be destroyed or jeopardized for minor informalities in a statement of use or request for an extension of time." The organization recommended that a new § 2.65(d) be added to provide, in effect, that when a timely filed statement of use "is a bona fide attempt to respond to a notice of allowance, and is substantially complete, but compliance with some requirement has been inadvertently omitted, opportunity to explain and supply the omission should be given before the question of abandonment is considered."

Another organization and a firm offered comments to the same effect and also expressed their belief that the provision in proposed § 2.89 for the filing of one last extension request during the six-month period in which a statement of use is filed is not "an acceptable solution" because, *inter alia*, an applicant would have to submit a fee for such a request which might otherwise not be needed, and because the extension request might be rejected as informal and, therefore, be useless.

Three other organizations and one individual recommended that the applicant be afforded an automatic one or two-month period to respond to a notice of a deficiency in a statement of use. One of these organizations commented that an applicant should not be forced to either risk abandonment, or undergo the inconvenience and expense of filing an additional and probably unnecessary request for an extension of time. This organization expressed its belief that the plain language of the Act "requires that the PTO permit the applicant to amend the statement of use regardless of the expiration of any extension period, including the last one;" and that Section 1(d)(2) of the Act provides for an aggregate of 36 months for an applicant to file a statement of use.

One individual commented with respect to proposed § 2.88(g), that "it is not clear what will happen in cases where the statement of use is filed near the end of the total 36 months from the notice of allowance if the statement of use is deficient but does include the fee, a specimen and a verification or declaration of use."

One individual commented, in effect, that it is not clear why requirements for amendments to allege use and statements of use are specified in both paragraphs (b) and (e) of proposed §§ 2.76 and 2.88, respectively, and why the specified requirements vary.

One organization expressed its belief "that an intent-to-use applicant should be allowed to withdraw a statement of use and restore the application to its prior status;" that "such withdrawal, while prohibited by proposed § 2.88(f), is not prohibited by the statute;" and that allowance of such a withdrawal would parallel the permissible withdrawal of an amendment to allege use.

Response: Paragraphs (b) of proposed §§ 2.76 and 2.88 specify the requirements for a *complete* amendment to allege use and statement of use, respectively. Paragraphs (e) of the proposed sections specify the *minimum requirements* for such papers. The provisions of the proposed rules have been modified in the final rules to clarify this distinction. Moreover, the minimum requirements specified in proposed §§ 2.76(e) and 2.88(e) have been reduced in the final rule to the prescribed fee, at least one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce.

Section 1(d) of the Act sets forth certain minimum requirements for a statement of use. In view of the statutory requirements, § 2.88 provides that a timely statement of use which does not meet the minimum requirements specified in paragraph (e) may be corrected only if the time permitted for applicant to file a statement of use has not expired.

Further, Section 1(d) of the Act requires that a statement of use be filed within six months after the issuance of the notice of allowance, and provides that the time for filing the statement of use may be further extended upon proper request, but that such time may not be extended beyond 36 months after the issuance of the notice of allowance. The Act, as amended, does not allow every applicant a period of 36 months from the notice of allowance in which to make use of its mark in commerce and file a statement of use; rather, only those applicants who file proper requests for five successive extensions of time, and are able to meet the specified requirements for such extensions, will have the benefit of the full 36-month period. Nor does the Act provide that an applicant may file a statement of use, then withdraw the statement of use and ask for an extension of time for filing a statement of use.

In view of the statutory requirements in Section 1(d) of the Act, a statement of use must be filed within the six months after the issuance of a notice of allowance, or within an extension of time granted to applicant for filing a statement of use. Use of the mark in commerce must be made during such period. If the use upon which a statement of use is based is not valid trademark use, applicant may make a new use, and amend the statement of use to rely upon the new use, only if the new use is made prior to the expiration of applicant's time for filing a statement of use. Once a statement of use has been filed, applicant may not withdraw the statement of use and request an extension or a further extension of time for filing a statement of use. Section 1(d) of the Act permits amendment of the statement of use, but does not provide for withdrawal of the statement of use once it is filed.

The fears of some commenters that, under proposed § 2.88, an applicant's trademark rights would be destroyed or jeopardized for minor informalities in a statement of use, are not well-founded. The intent of § 2.88 is to permit a timely statement of use which meets the minimum requirements specified in paragraph (e) to be amended, in accordance with §§ 2.59 and 2.71 through 2.75, at any time during examination to meet any of the remaining requirements for a complete statement of use specified in paragraph (b) of the section or to overcome other refusals or requirements which may be raised by the examiner. See proposed §§ 2.88(g) and (h) and final § 2.88(f). The time period for filing a statement of use and the right to amend a statement of use are independent of each other.

For example, under final § 2.88, a timely statement of use which meets the specified minimum requirements may be amended to, *inter alia*:

(1) Add or correct dates of use (provided that the amendment is in accordance with § 2.71(d), i.e., that it is properly verified and the amended dates are not subsequent to the expiration of the time allowed to applicant for the filing of a statement of use);

(2) Specify the type of commerce in which the mark is used;

(3) State the goods or services specified in the notice of allowance on or in connection with which the mark is in use (provided that the amendment is in accordance with § 2.88(i)(2), i.e., that it is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use);

(4) State the mode or manner in which the mark is used on or in connection with the goods or services;

(5) Substitute a statement of use verification signed by the applicant for a verification signed by a person having color of authority (see § 2.71(c)); and

(6) Submit substitute specimens (provided that the amendment is in accordance with § 2.59(b), i.e., that the use in commerce of any substitute specimen submitted is supported by applicant's verification that the substitute specimens were in use in commerce prior to the filing of the statement of use or prior to the time allowed to applicant for filing a statement of use).

Once the minimum requirements are met, the rules allowing amendment to a statement of use, in accordance with §§ 2.59 and 2.71 through 2.75, are more liberal than the proposal by several commenters suggesting an applicant should receive an automatic one to two-month period to respond to a notice of deficiency in a statement of use.

For the foregoing reasons, the modifications suggested by the commenters have not been adopted in § 2.88. The rule was revised to clarify the rule and reduce the minimum requirements for a statement of use. Section 2.76, concerning amendments to allege use, has been revised to be consistent with § 2.88 as appropriate.

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Comment: One individual questioned why, in a verification for an amendment to allege use or a statement of use, the applicant is required, under proposed §§ 2.76(b)(1) and 2.88(b)(1), respectively, to state that it believes it is the owner of the mark sought to be registered. The individual noted that there is no such requirement "for other types of applications provided for in the Act or the rules."

Response: Section 22 of the Act provides that registration on the Principal Register "shall be constructive notice of the registrant's claim of ownership [of the mark]." Therefore, the PTO believes that each application must contain a claim of ownership, and that ownership should be reaffirmed upon the filing of an allegation of use under § 2.76 or § 2.88.

Comments: Section 2.89(d)(2) was proposed to be added to provide that a showing of good cause for a request for an extension of time for filing a statement of use must include, in part, a statement of facts demonstrating ongoing efforts to make use of the mark in commerce on or in connection with each of the goods or services specified in applicant's verified statement of continued bona fide intention to use the mark in commerce. The proposed paragraph further provides that those efforts may include, without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities.

One organization expressed its concern that this rule may be administered by the PTO to require an applicant to disclose details of highly sensitive or confidential market research or business plans. The organization noted that Section 1(d)(2) of the Act requires only that applicant provide "a showing of good cause" to support a request for an extension of time. The organization suggested "facts demonstrating ongoing efforts to make use of the mark" could be sensitive or confidential market research or business information. It recommended that the first sentence of proposed § 2.89(d)(2) be amended to substitute the word "applicants" for the words "facts demonstrating." One individual submitted comments to the same general effect.

Response: The rule does not require a particular showing to establish good cause for a request for an extension of time to file a statement of use. The suggested modification has been adopted in the final rule.

Comment: Section 2.89(f) was proposed to be added to provide, in part, that the goods or services specified in a request for an extension of time for filing a statement of use must conform to those goods or services identified in the notice of allowance; and that any goods or services specified in the notice of allowance which are omitted from the identification of goods or services in the request for extension of time will be presumed to be deleted and the applicant may not thereafter request that the deleted goods or services be reinserted in the application.

Section 2.89(g) was proposed to be added to provide, in part, that the applicant will be notified of the grant or denial of a request for an extension of time; that if, after denial of an extension request, there is time remaining in the existing six-month period for filing a statement of use, applicant may submit a substitute request for extension of time; and that otherwise, the only recourse available after denial of a request for an extension of time is a petition to the Commissioner in accordance with §§ 2.66 or 2.146.

One individual pointed out that proposed § 2.88(i)(2) provides that if any goods or services specified in the notice of allowance are omitted from the identification of goods or services in the statement of use, the examiner shall inquire about the discrepancy and permit the applicant to amend the statement of use to include any omitted goods or services, provided that the amendment is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use. The individual noted that there is no comparable provision in proposed § 2.89 relating to requests for extensions of time to file a statement of use. The individual commented that "an applicant could unwittingly forfeit rights by failing to specify all goods and services for which the extension is sought," and that "if Examiners can ask about the completeness of statements of use, they can ask about the completeness of extensions to file such statements."

Two organizations commented, with respect to proposed § 2.89(g), that it is unduly harsh and time consuming for the PTO to permit the only recourse from a denial of an extension request to be a petition to the Commissioner. The organizations recommended that the examiner should be required to state what is needed for acceptance of the extension request and reasonable time should be allowed for response. The organizations also recommended that the filing of a petition concerning the denial of an extension request should allow an automatic extension of time in connection with the application (subject to the caveat that the Act "appears to provide 36 month maximum pendency permitted for an 'intent to use' application regardless of the difficulty encountered in prosecution")

Response: Although § 2.88 includes certain provisions relating to the amendment of timely statements of use, § 2.89 includes no analogous provisions with respect to a request for an extension of time to file a statement of use. This is because the Act, as amended, specifically provides that a statement of use may be amended, but makes no provision for the amendment of an extension request. Moreover, the inclusion in § 2.89 of amendment provisions similar to those in § 2.88 would require that the PTO track not only extension period deadlines, but also deadlines for responding to PTO notifications of extension request deficiencies. This would create a serious administrative problem.

Furthermore, to avoid inadvertently omitting goods or services from a request for an extension of time to file a statement of use, the PTO permits and encourages applicants to identify goods or services in an extension request by incorporating by reference the goods or services listed in the notice of allowance.

The Act permits extension of the time for filing a statement of use only upon proper written request. The Act does not provide for an automatic extension of time upon the filing of a petition, pursuant to § 2.89(g), from the denial of an extension request.

Accordingly, the suggested modifications have not been adopted.

Comment: One organization recommended that the first sentence of proposed § 2.89(g), which provides that the applicant will be notified of the grant or denial of a request for an extension of time to file a statement of use, be modified by inserting at the end of the sentence the words "and if denied, the reasons for denial." The organization also noted that the rule fails to clarify when the new extension period will begin when a petition to the Commissioner from a denial of an extension request is granted.

Response: The organizations's suggestion for modification of the first sentence of proposed § 2.89(g) has been adopted. It is understood that a denial would include the reasons for denial. A six-month extension of time in which to file a statement of use will always run from the expiration of the preceding six-month period regardless of whether applicant has been notified of the grant or denial of the request, or of a petition to the Commissioner relating thereto, prior to the expiration of the existing period. Accordingly, final § 2.89(g) includes the following new sentence: "If the petition is granted, the term of the requested six-month extension which was the subject of the petition will run from the date of the expiration of the previously existing six-month period for filing a statement of use."

Comment: Section 2.111(a), which pertains to the filing of petitions for cancellation, was proposed to be amended to provide, in part, for the filing of a petition to cancel a registration "in whole or in part." One individual expressed his concern that the phrase "in whole or in part" could perhaps be interpreted as a reference to a geographical cancellation. The individual suggested that it might be helpful to revise the paragraph to provide for cancelling the registration "for all or part of the goods or services."

The individual also suggested that § 2.101(b), which pertains to the filing of oppositions, should be amended to provide for opposing an application for "all or part of the goods or services."

Response: The language "in whole or in part" parallels the language of Section 18 of the Act. Further, § 2.99(h) provides that the Board will consider and determine concurrent use rights only in the context of a concurrent use proceeding, and § 2.133(c) provides that geographic limitations will be considered and determined by the Board only in the context of a concurrent use proceeding. Accordingly, the suggestion pertaining to § 2.111(b) has not been adopted.

The language of § 2.101(a) parallels the language of Section 13(a) of the Act. Modification of the section to provide for opposing an application for "all or part of the goods or services" is unnecessary in view of the Board's authority, under Section 18 of the Act, to modify the application by limiting the goods or services specified therein. Accordingly, the suggestion pertaining to § 2.101(b) has not been adopted.

Comment: Section 2.129(d) was proposed to be added to provide that when a party to an inter partes proceeding before the Board cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act in an application under Section 1(b) of the Act, the Board will enter a "declaratory judgment" in favor of that party, subject to the party's establishment of constructive use; and that the time for filing an appeal or for commencing a civil action under Section 21 of the Act shall run from the date of the declaratory judgment.

Four organizations and one individual commented variously that "declaratory judgment" is a term of art for a different type of proceeding; that use of the term "declaratory" is inconsistent with the language of Sections 18 and 21(a)(4) of the Act, which refers only to "judgments"; and that a phrase such as "conditional judgment," "contingent judgment," or "judgment" should be substituted for the phrase "declaratory judgment."

One individual commented that the better procedure would be for the Board to acknowledge the rights of the intent-to-use applicant, but then suspend proceedings until after the intent-to-use applicant has established its right to a constructive date of first use, following which a final judgment could be issued.

One individual suggested that the language of the proposed paragraph should be clarified by inserting the phrase "but will prevail in whole or in part upon establishing constructive use" after the opening phrase "When a party to an inter partes proceeding before the Trademark Trial and Appeal Board cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act in an application under Section 1(b) of the Act, . . ."

One individual expressed a belief that where a situation of the type described in the proposed paragraph arises in a cancellation or an interference proceeding, the opinion of the Board might be advisory, but that in an opposition proceeding it would not, because in such a proceeding there is "a case or controversy involving *present* rights of two parties." The individual suggested that the last sentence of the proposed paragraph be amended to read:

> The time for filing an appeal or for commencing a civil action under section 21 of the Act shall run from the date of the entry of the declaratory judgment in an opposition proceeding, and from the date of acceptance of a statement of use in all other inter partes proceedings.

Response: The PTO believes that the use of the term "judgment" is more appropriate in this situation. Accordingly, the word "declaratory" has been omitted from the final rule.

Sections 18 and 21(a)(4) of the Act prohibit the entry of a final judgment in favor of an applicant under Section 1(b) of the Act before the applicant's mark is registered in those cases where an applicant cannot prevail without establishing constructive use under Section 7(c). If possible, the time for appeal should not be deferred until use has been established. If the time for appeal is deferred until after acceptance of the statement of use, appellant would be deprived of a speedy determination of the issues on appeal. Accordingly, the suggestions to defer the time for seeking judicial review have not been adopted.

The purpose of "intent-to-use" would be best accomplished if judicial review can occur promptly after entry of a judgment by the Board. Nevertheless, the PTO recognizes, as have other commentators, that there is an issue whether a Board decision is "ripe" for judicial review prior to the time an applicant under Section 1(b) of the Act establishes its right to register its mark. This issue was called to the public's attention in the notice of proposed rulemaking, 54 Fed. Reg. at 19300. The PTO also published a notice in the *Official Gazette* calling attention to the issue and asking for comments. 1102 OG 58 (May 16, 1989). The Subcommittee on Courts, Civil Liberties and the Administration of Justice expressed concern with respect to any provision which permitted an intent-to-use applicant to sue before it made use of the mark and the mark was granted registration. "Permitting a plaintiff to sue before use occurs . . . raises serious questions about whether Federal jurisdiction and a case or controversy exists, and about whether such a case is 'ripe.'" See H.R. Rep. 1028, 100th Cong., 2d Sess., at 4 (1988).

Ultimately, the issue will be resolved by Federal courts. In order to permit early resolution of the issue, it has been decided to provide in § 2.129(d) that the 60-day time period for seeking judicial review runs from the date the Board enters its judgment.

With respect to the suggestion that the phrase "but will prevail in whole or in part upon establishing constructive use" be inserted in the rule, the PTO does not believe that the phrase is necessary or would serve to clarify the rule. Accordingly, the suggested modification has not been adopted.

Comment: One individual suggested that § 2.162, which governs the requirements for an affidavit or declaration during the sixth year after registration, should be amended to require that each affidavit or declaration include the current street address of the person submitting the declaration. The individual commented that "while many registrants currently do this, the fact remains that it is not required, and it should be mandatory."

Response: While the PTO encourages registrants to state their current address in a Section 8 affidavit, it is not a statutory requirement for an acceptable affidavit and it would be an administrative burden to process substitute affidavits. Accordingly, the suggested modification has not been adopted. However, the *Trademark Manual of Examining Procedure* will be amended to recommend that this useful information be included in an affidavit or declaration under Section 8 of the Act.

Comment: Section 2.162(f), which specifies certain of the requirements for an affidavit or declaration during the sixth year, was proposed to be revised to provide, in part, that if the registered mark is not in use in commerce on or in connection with the goods or services recited in the registration, the affidavit or declaration must recite facts to show that nonuse as to those goods or services is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark as to those goods or services.

One organization suggested that after the phrase "on or in connection with," the phrase "any or all" should be substituted for the word "the."

Response: The suggested language could be construed to imply that an allegation of use on less than all of the goods or services will suffice to maintain the registration for all of the goods or services; or that if the affidavit or declaration does not include an allegation of use or excusable nonuse as to all of the goods or services, the affidavit or declaration will not be accepted and the registration will be cancelled in its entirety. In fact, in the latter situation, the affidavit or declaration would be accepted and those goods or services not included in the allegation of use or excusable nonuse would be deleted from the registration. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.181, which concerns the terms of original registrations and renewals, was proposed to be amended by redesignating present paragraph (a) as (a)(1); revising redesignated paragraph (a)(1) to provide that registrations issued under the Act prior to November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for twenty years from their date of issue or renewal, if that date is prior to November 16, 1989, and may be renewed for periods of ten (rather than twenty) years from the expiring period unless previously cancelled or surrendered; and adding new paragraph (a)(2) to provide that registrations issued under the Act on or after November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for ten years, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered.

Four organizations and two individuals commented that the renewal term provisions in the proposed rule are ambiguous because "renewal" may be deemed to take place either (a) on the twentieth anniversary of the registration's issuance, or (b) when a proper renewal application is filed, or (c) when the renewal application is processed and a renewal certificate is issued. They recommended that the rule be revised and clarified to provide that the anniversary of the date of the original registration will control the length of the renewal term.

One organization recommended that, if the rule is not amended to reflect the aforesaid comments, the words "or renewed" should be inserted in proposed paragraphs (a)(1) and (2) of the rule after the words "Registrations issued."

Response: The PTO believes that the date of the grant of the renewal application controls whether the term of renewal of a registration is 20 years or ten years. Accordingly, the recommendation that the rule be modified to provide that the anniversary of the date of the original registration will control the length of the

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renewal term, has not been adopted. However, with respect to registrations due to expire before November 16, 1989, the PTO will do everything possible to maximize the chance that the renewal will be granted prior to November 16, 1989, so that the term of renewal will be twenty years. Registrations due to expire on or after November 16, 1989, will be renewed, on or after that date, for periods of ten years from the date of expiration, regardless of the filing date of the renewal application.

The recommendation that the words "or renewed" be inserted at the beginning of paragraphs (a)(1) and (2) after the words "Registrations issued" has been adopted and the paragraphs have been further modified for purposes of clarity. Specifically, the word "expiration" has been substituted in paragraph (a)(1) for the words "renewal, if that date is prior to November 16, 1989" and the phrase "from their date of issue or expiration" has been inserted in paragraph (a)(2) after the words "remain in force for ten years."

Comment: Section 2.185(a)(1) was proposed to be revised to liberalize certain requirements for the recordation in the PTO of assignments.

One organization recommended that, since any documents affecting title to registrations and applications are recorded pursuant to this rule, the words "and other documents affecting title" should be added to the section title. The organization also recommended that the proposed rule be revised and reorganized to eliminate lengthy, confusing and redundant wording. The organization submitted a suggested substitute draft of the rule.

Response: To permit further review of the language of this section, the proposal is withdrawn.

Comment: Several comments were submitted which do not relate to any rule amendment proposed in the notice of proposed rulemaking.

Response: To the extent that the comments suggest changes to existing rules, the changes cannot be made without affording members of the public an opportunity to comment.

Environmental, Energy, and other considerations

The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because the rule change includes no additional or increased fees for existing filings. Pub. L. 100-667 creates a new statutory right to file an application based upon a bona fide intention to use a mark in commerce ("intent-to-use"). The rule change includes fees for intent-to-use applications. However, filing an intent-to-use application under the new law is permissive. Such a filing will reduce the substantial burden of securing and protecting trademark rights by enabling small entities to obtain trademark rights prior to the use of a mark and the expending of funds in relation thereto. Thus, substantive rights to use valuable trademarks are not adversely affected and, in some instances, can be established prior to the expenditure of large amounts of funds.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. in relation to any existing filings. However, Pub. L. 100-667 creates a new additional basis for filing an application, as well as certain other new filings in relation thereto, namely, an amendment to allege use under Section 1(c) of the Act, a statement of use under Section 1(d) of the Act, and requests for extensions of time, under Section 1(d) of the Act, to file a statement of use. The public reporting burden for these new collections of information is estimated to vary from .25 hours to .50 hours per filing, with an average of .35 hours per filing, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding the burden estimate or any other aspect of these collections of information, including suggestions for reducing this burden, to the Commissioner of Patents and Trademarks, Office of Management and Organization, Washington, D.C. 20231; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503, Attention: Paperwork Reduction Project 0651-0023.

List of Subject Terms in 37 CFR Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

List of Subject Terms in 37 CFR Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble and pursuant to the authority contained in Section 41 of the Act (15 U.S.C. 1123), parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is amended by adding new paragraph (h) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(h) In applications under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), all statements of use filed under section 1(d) of the Act, and requests for extensions of time therefor, should be additionally marked "Box ITU."

3. Section 1.8 is amended by adding new paragraphs (a)(2)(xiv) through (a)(2)(xvi) to read as follows:

§ 1.8 Certificate of Mailing.

(a) ***

* * * * *

(2) ***

* * * * *

(xiv) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of a statement of use under § 2.88 (15 U.S.C. 1051(d)).

(xv) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of a request, under § 2.89 (15 U.S.C. 1051(d)), for an extension of time to file a statement of use under § 2.88 (15 U.S.C. 1051(d)).

(xvi) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of an amendment to allege use in commerce under § 2.76 (15 U.S.C. 1051(c)).

* * * * *

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

4. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

5. Section 2.2 is added to read as follows:

§ 2.2 Definitions.

(a) "The Act" as used in this Part means the Trademark Act of 1946, 60 Stat. 427, as amended, codified in 15 U.S.C. 1051 et. seq.

(b) "Entity" as used in this Part includes both natural and juristic persons.

6. Section 2.6 is amended by adding new paragraphs (u) and (v) to read as follows:

§ 2.6 Trademark fees.

The following fees and charges are established by the Patent and Trademark Office for trademark cases:

* * * * *

(u) For filing an amendment to allege use under section 1(c) of the Act or a statement of use under section 1(d)(1) of the Act, per class 100.00

(v) For filing a request under section 1(d)(2) of the Act for a six-month extension of time for filing a statement of use under section 1(d)(1) of the Act, per class 100.00

7. Section 2.18 is revised to read as follows:

§ 2.18 Correspondence, with whom held.

Correspondence will be sent to the applicant or a party to a proceeding at its address unless papers are transmitted by an attorney at law, or a written power of attorney is filed, or written authorization of other person entitled to be recognized is filed, or the applicant or party designates in writing another address to which correspondence is to be sent, in which event correspondence will be sent to the attorney at law transmitting the papers, or to the attorney at law designated in the power of attorney, or to the other person designated in the written authorization, or to the address designated by the applicant or party for correspondence. Correspondence will continue to be sent to such address until the applicant or party, or the attorney at law or other authorized representative of the applicant or party, indicates in writing that correspondence is to be sent to another address. Correspondence will be sent to the domestic representative of a foreign applicant unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event correspondence will be sent to the attorney at law or other qualified person duly authorized. Double correspondence will not be undertaken by the Patent and Trademark office, and if more than one attorney at law or other authorized representative appears or signs a paper, the Office reply will be sent to the address already established in the file until another correspondence address is specified by the applicant or party or by the attorney or other authorized representative of the applicant or party.

8. Section 2.21 is amended by revising paragraphs (a)(5) and (a)(6) to read as follows:

§ 2.21 Requirements for receiving a filing date.

(a) ***

* * * * *

(5) A basis for filing:

(i) A date of first use of the mark in commerce, and at least one specimen or facsimile of the mark as used, in an application under section 1(a) of the Act, or

(ii) A claim of a bona fide intention to use the mark in commerce and a certification or certified copy of the foreign registration on which the application is based in an application under section 44(e) of the Act, or

(iii) A claim of a bona fide intention to use the mark in commerce and a claim of the benefit of a prior foreign application in an application filed in accordance with section 44(d) of the Act, or

(iv) A claim of a bona fide intention to use the mark in commerce in an application under section 1(b) of the Act;

(6) A verification or declaration in accordance with § 2.33(b) signed by the applicant;

* * * * *

9. Section 2.24 is revised to read as follows:

§ 2.24 Designation of representative by foreign applicant.

If an applicant is not domiciled in the United States, the applicant must designate by a written document filed in the Patent and Trademark Office the name and address of some person resident in the United States on whom may be served notices or process in proceedings affecting the mark. If this document does not accompany or form part of the application, it will be required and registration refused unless it is supplied. Official communications of the Patent and Trademark Office will be addressed to the domestic representative unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event Official communications will be sent to the attorney at law or other qualified person duly authorized. The mere designation of a domestic representative does not authorize the person designated to prosecute the application unless qualified under paragraph (a), (b) or (c) of § 10.14 of this subchapter and authorized under § 2.17(b).

10. Section 2.31 is revised to read as follows:

§ 2.31 Application must be in English.

The application must be in the English language and plainly written on but one side of the paper. It is preferable that the application be on lettersize (i.e., 8 1/2 inches, 21.6 cm., by 11 inches, 27.9 cm.) paper, typewritten double spaced, with at least a one and one-half inch (3.8 cm.) margin on the left-hand side and top of the page.

11. Section 2.33 is amended by revising the section title, revising paragraphs (a)(1)(ii), (a)(1)(iv), (a)(1)(v), (a)(1)(vi), (a)(1)(vii), and (a)(1)(viii), redesignating paragraph (a)(1)(ix) as (a)(1)(x), revising redesignated paragraph (a)(1)(x), adding a new paragraph (a)(1)(ix), revising paragraphs (a)(2), (b), and (c), and adding new paragraph (d) to read as follows:

§ 2.33 Requirements for written application.

(a)(1) The application shall include a request for registration and shall specify:

* * * * *

(ii) The citizenship of the applicant; if the applicant is a partnership, the state or nation under the laws of which the partnership is organized and the names and citizenship of the general partners or, if the applicant is a corporation or association, the state or nation under the laws of which the corporation or association is organized;

* * * * *

(iv) In an application under section 1(a) of the Act, that the applicant has adopted and is using the mark shown in the accompanying drawing, or, in an application under section 1(b) or 44 of the Act, that the applicant has a bona fide intention to use the mark shown in the accompanying drawing in commerce;

(v) In an application under section 1(a) of the Act, the particular goods or services on or in connection with which the mark is used or, in an application under section 1(b) or 44 of the Act, the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark, which in an application under section 44 may not exceed the scope of the

goods or services covered by the foreign application or registration;

(vi) The class of goods or services according to the official classification, if known to the applicant;

(vii) In an application under section 1(a) of the Act, the date of applicant's first use of the mark as a trademark or service mark on or in connection with goods or services specified in the application and the date of applicant's first use in commerce of the mark as a trademark or service mark on or in connection with goods or services specified in the application, specifying the nature of such commerce (see § 2.38);

(viii) In an application under section 44(e) of the Act for registration of a mark duly registered in the applicant's country of origin, as that term is defined in section 44(c), accompanying the application, a certificate of the trademark office of the applicant's country of origin showing that the mark has been registered in such country and also showing the mark, the goods or services for which the mark is registered, the date of filing of the application on the basis of which registration was granted and that said registration is in full force and effect and, if the certificate is not in the English language, a translation thereof;

(ix) In an application claiming the benefit of a foreign application in accordance with section 44(d) of the Act, compliance with the requirements of § 2.39;

(x) In an application under section 1(a) of the Act, the mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified or, in an application under section 1(b) of the Act, the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

(2) If more than one item of goods or services is specified in the application, the dates of use required in paragraph (a)(1)(vii) of this section need be for only one of the items specified, provided the particular item to which the dates apply is designated.

* * * * *

(b)(1) In an application under section 1(a) of the Act, the application must include averments to the effect that the applicant is believed to be the owner of the mark sought to be registered; that the mark is in use in commerce, specifying the nature of such commerce; that no other entity, to the best of the declarant's knowledge and belief, has the right to use such mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; that the specimens or facsimiles show the mark as used on or in connection with the goods or services; and that the facts set forth in the application are true; or

(2) In an application under section 1(b) or 44 of the Act, the application must include averments to the effect that the applicant is believed to be the owner of the mark sought to be registered; that the applicant has a bona fide intention to use the mark in commerce on or in connection with the specified goods or services; that no other entity, to the best of the declarant's knowledge and belief, has the right to use such mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; and that the facts set forth in the application are true.

(c) For an application for the registration of a mark for goods or services falling within multiple classes, see § 2.86.

(d) An applicant may not file under both sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under section 1(a) of the Act amend that application to seek registration under section 1(b) of the Act.

12. Section 2.38(a) is revised to read as follows:

§ 2.38 Use by predecessor or by related companies.

(a) If the first use, the date of which is required by paragraph (a)(1)(vii) of § 2.33, was by a predecessor in title, or by a related company (sections 5 and 45 of the Act), and such use inures to the benefit of the applicant, the date of such first use may be asserted with a statement that such first use was by the predecessor in title or by the related company as the case may be.

* * * * *

13. Section 2.39 is revised to read as follows:

§ 2.39 Priority claim based on foreign application.

(a) An application claiming the benefit of a foreign application in accordance with section 44(d) of the Act shall specify the filing date and country of the first regularly filed foreign application or, if the application is based upon a subsequent regularly filed application in the same foreign country, the application shall so state and shall show that any prior filed application has been withdrawn, abandoned or otherwise disposed of, without having been laid open to public inspection and without having any rights outstanding, and has not served as a basis for claiming a right of priority.

(b) Before the application can be approved for publication, a basis for registration under section 1(a), 1(b) or 44(e) of the Act must be established.

14. Section 2.41 is revised to read as follows:

§ 2.41 Proof of distinctiveness under section 2(f).

(a) When registration is sought of a mark which would be unregistrable by reason of section 2(e) of the Act but which is said by applicant to have become distinctive in commerce of the goods or services set forth in the application, applicant may, in support of registrability, submit with the application, or in response to a request for evidence or to a refusal to register, affidavits, or declarations in accordance with § 2.20, depositions, or other appropriate evidence showing duration, extent and nature of use in commerce and advertising expenditures in connection therewith (identifying types of media and attaching typical advertisements), and affidavits, or declarations in accordance with § 2.20, letters or statements from the trade or public, or both, or other appropriate evidence tending to show that the mark distinguishes such goods.

(b) In appropriate cases, ownership of one or more prior registrations on the Principal Register or under the Act of 1905 of the same mark may be accepted as prima facie evidence of distinctiveness. Also, if the mark is said to have become distinctive of applicant's goods by reason of substantially exclusive and continuous use in commerce thereof by applicant for the five years before the date on which the claim of distinctiveness is made, a showing by way of statements which are verified or which include declarations in accordance with § 2.20, in the application may, in appropriate cases, be accepted as prima facie evidence of distinctiveness. In each of these situations, however, further evidence may be required.

15. Section 2.44 is revised to read as follows:

§ 2.44 Collective mark.

(a) In an application to register a collective mark under section 1(a) of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks, but shall, in addition, specify the class of persons entitled to use the mark, indicating their relationship to the applicant, and the nature of the applicant's control over the use of the mark.

(b) In an application to register a collective mark under section 1(b) or 44 of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks, but shall, in addition, specify the class of persons intended to be entitled to use the mark, indicating what their relationship to the applicant will be, and the nature of the control applicant intends to exercise over the use of the mark.

16. Section 2.45 is revised to read as follows:

§ 2.45 Certification mark.

(a) In an application to register a certification mark under section 1(a) of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks. It shall, in addition, specify the manner in which and the conditions under which the certification mark is used; it shall allege that the applicant exercises legitimate control over the use of the mark and that the applicant is not engaged in the production or marketing of the goods or services to which the mark is applied.

(b) In an application to register a certification mark under section 1(b) or 44 of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks. It shall, in addition, specify the manner in which and the conditions under which the certification mark is intended to be used; it shall allege that the applicant intends to exercise legitimate control over the use of the mark and that the applicant will not engage in the production or marketing of the goods or services to which the mark is applied.

17. Section 2.47 is revised to read as follows:

§ 2.47 Supplemental Register.

(a) In an application to register on the Supplemental Register under section 23 of the Act, the application shall so indicate and shall specify that the mark has been in lawful use in commerce, specifying the nature of such commerce, by the applicant.

(b) In an application to register on the Supplemental Register under section 44 of the Act, the application shall so indicate. The statement of lawful use in commerce may be omitted.

(c) A mark in an application to register on the Principal Register under section 1(b) of the Act is eligible for registration on the Supplemental Register only after an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been timely filed.

(d) An application for registration on the Supplemental Register must conform to the requirements for registration on the Principal Register under section 1(a) of the Act, so far as applicable.

18. Section 2.51 is revised to read as follows:

§ 2.51 Drawing required.

(a)(1) In an application under section 1(a) of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as used on or in connection with the goods; or

(2) In an application under section 1(b) of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as intended to be used on or in connection with the goods specified in the application, and once an amendment to allege use under § 2.76 or a statement of use under § 2.88 has been filed, the drawing of the trademark shall be a substantially exact representation of the mark as used on or in connection with the goods; or

(3) In an application under section 44 of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of the applicant.

(b)(1) In an application under section 1(a) of the Act, the drawing of a service mark shall be a substantially exact representation of the mark as used in the sale or advertising of the services; or

(2) In an application under section 1(b) of the Act, the drawing of a service mark shall be a substantially exact representation of the mark as intended to be used in the sale or advertising of the services specified in the application and, once an amendment to allege use under § 2.76 or a statement of use under § 2.88 has been filed, the drawing of the service mark shall be a substantially exact representation of the mark as used in the sale or advertising of the services; or

(3) In an application under section 44 of the Act, the drawing of a service mark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of applicant.

(c) The drawing of a mark may be dispensed with in the case of a mark not capable of representation by a drawing, but in any such case the application must contain an adequate description of the mark.

(d) Broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on the packaging, or to show matter not claimed as part of the mark, or both, as appropriate. In an application to register a mark with three-dimensional features, the drawing shall depict the mark in perspective in a single rendition.

(e) If the application is for the registration of only a word, letter or numeral, or any combination thereof, not depicted in special form, the drawing may be the mark typed in capital letters on paper, otherwise complying with the requirements of § 2.52.

19. Section 2.52 is amended by revising paragraphs (a), (d) and (e) to read as follows:

§ 2.52 Requirements for drawings.

(a) *Character of drawing.* All drawings, except as otherwise provided, must be made with the pen or by a process which will provide high definition upon reproduction. A photolithographic reproduction or printer's proof copy may be used if otherwise suitable. Every line and letter, including color lining and lines used for shading, must be black. All lines must be clean, sharp, and solid, and must not be fine or crowded. Gray tones or tints may not be used for surface shading or any other purpose. The requirements of this paragraph are not necessary in the case of drawings permitted and filed in accordance with paragraph (e) of § 2.51.

* * * * *

(d) *Heading.* Across the top of the drawing, beginning one inch (2.5 cm.) from the top edge and not exceeding one third of the sheet, there must be placed a heading, listing in separate lines, applicant's complete name; applicant's post office address; the dates of first use of the mark and first use of the mark in commerce in an application under section 1(a) of the Act; the priority filing date of the relevant foreign application in an application claiming the benefit of a prior foreign application in accordance with section 44(d) of the Act; and the goods or services recited in the application or a typical item of the goods or services if a number of items are recited in the application. This heading should be typewritten. If the drawing is in special form, the heading should include a description of the essential elements of the mark.

(e) *Linings for color.* Where color is a feature of a mark, the color or colors employed may be designated by means of conventional linings as shown in the following color chart:

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20. Section 2.53 is revised to read as follows:

§ 2.53 Transmission of drawings.

Drawings transmitted to the Patent and Trademark Office, other than those typed in accordance with § 2.51(e), should be sent flat, protected by a sheet of heavy binder's board, or should be rolled for transmission in a suitable mailing tube to prevent mutilation or folding.

21. Section 2.56 is revised to read as follows:

§ 2.56 Specimens.

An application under section 1(a) of the Act, an amendment to allege use under § 2.76, and a statement of use under § 2.88 must each include three specimens of the trademark as used on or in connection with the goods in commerce. The specimens shall be duplicates of the labels, tags, or containers bearing the trademark, or the displays associated with the goods and bearing the trademark (or if the nature of the goods makes use of such specimens impracticable then on documents associated with the goods or their sale), when made of suitable flat material and of a size not to exceed 8 1/2 inches (21.6 cm.) wide and 11 inches (27.9 cm.) long.

22. Section 2.57 is revised to read as follows:

§ 2.57 Facsimiles.

(a) When, due to the mode of applying or affixing the trademark to the goods, or to the manner of using the mark on the goods, or to the nature of the mark, specimens as above stated cannot be furnished, three copies of a suitable photograph or other acceptable reproduction, not to exceed 8 1/2 inches (21.6 cm.) wide and 11 inches (27.9 cm.) long, and clearly and legibly showing the mark and all matter used in connection therewith, shall be furnished.

(b) A purported facsimile which is merely a reproduction of the drawing submitted to comply with § 2.51 will not be considered to be a facsimile depicting the mark as used on or in connection with the goods or in connection with the services.

23. Section 2.59 is added to read as follows:

§ 2.59 Filing substitute specimens.

(a) In an application under section 1(a) of the Act, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens submitted are supported by applicant's affidavit or declaration in accordance with § 2.20 verifying that the substitute specimens were in use in commerce at least as early as the filing date of the application. The verification requirement shall not apply if the specimens are duplicates or facsimiles, such as photographs, of specimens already of record in the application.

(b) In an application under section 1(b) of the Act, after filing either an amendment to allege use under § 2.76 or a statement of use under § 2.88, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that the use in commerce of any substitute specimens submitted is supported by applicant's affidavit or declaration in accordance with § 2.20. In the case of a statement of use under § 2.88, the applicant must verify that the substitute specimens were in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use.

24. Section 2.61 is amended by revising paragraphs (a) and (c) to read as follows:

§ 2.61 Action by examiner.

(a) Applications for registration, including amendments to allege use under section 1(c) of the Act, and statements of use under section 1(d) of the Act, will be examined and, if the applicant is found not entitled to registration for any reason, applicant will be notified and advised of the reasons therefor and of any formal requirements or objections.

* * * * *

(c) Whenever it shall be found that two or more parties whose interests are in conflict are represented by the same attorney, each party and also the attorney shall be notified of this fact.

25. Section 2.64 is amended by adding new paragraph (c) to read as follows:

§ 2.64 Final action.

* * * * *

(c)(1) If an applicant in an application under section 1(b) of the Act files an amendment to allege use under § 2.76 during the six-month response period after issuance of a final action, the examiner shall examine the amendment. The filing of such an amendment will not extend the time for filing an appeal or petitioning the Commissioner.

(2) If the amendment to allege use under § 2.76 is acceptable in all respects, the applicant will be notified of its acceptance.

(3) If, as a result of the examination of the amendment to allege use under § 2.76, the applicant is found not entitled to registration for any reason not previously stated, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The Trademark Examining Attorney shall withdraw the final action previously issued and shall incorporate all unresolved refusals or requirements previously stated in the new non-final action.

26. Section 2.65 is amended by adding new paragraph (c) to read as follows:

§ 2.65 Abandonment.

* * * * *

(c) If an applicant in an application under section 1(b) of the Act fails to timely file a statement of use under § 2.88, the application shall be deemed to be abandoned.

27. Section 2.66 is revised to read as follows:

§ 2.66 Revival of abandoned applications.

(a) An application abandoned for failure to timely respond, or for failure to timely file a statement of use under § 2.88 in an application under section 1(b) of the Act, may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable.

(b) A petition to revive an application abandoned for failure to timely respond must be accompanied by (1) the required fee, (2) a showing which is verified or which includes a declaration in accordance with § 2.20 of the causes of the delay, and (3) the proposed response, unless a response has been previously filed.

(c) A petition to revive an application abandoned for failure to timely file a statement of use under § 2.88 in an application under section 1(b) of the Act must be accompanied by (1) the required petition fee, (2) a showing which is verified or which includes a declaration in accordance with § 2.20 of the causes of the delay, (3) the required fees for the number of requests (in accordance with § 2.89 for extensions of time to file a statement of use) which should have been filed if the application had not been abandoned, and (4) either a statement of use in accordance with § 2.88 (unless the same has been previously filed) or a request in accordance with § 2.89 for an extension of time to file a statement of use.

(d) The petition must be filed promptly. No petition to revive will be granted in an application under section 1(b) of the Act if granting the petition would permit the filing of a statement of use more than 36 months after the issuance of a notice of allowance under section 13(b)(2) of the Act.

28. Section 2.69 is revised to read as follows:

§ 2.69 Compliance with other laws.

When the sale or transportation of any product for which registration of a trademark is sought is regulated under an Act of Congress, the Patent and Trademark Office may make appropriate inquiry as to compliance with such Act for the sole purpose of determining lawfulness of the commerce recited in the application.

29. Section 2.71 is revised to read as follows:

§ 2.71 Amendments to correct informalities.

(a) The application may be amended to correct informalities, or to avoid objections made by the Patent and Trademark Office, or for other reasons arising in the course of examination.

(b) The identification of goods or services may be amended to clarify or limit the identification, but additions will not be permitted.

(c) If the verification or declaration filed with the application is defective, the defect may be corrected only by the submission of a substitute or supplemental verification or declaration in accordance with § 2.20. A verification or declaration required under §§ 2.21(a)(6), 2.76(c)(3) or 2.88(e)(3), to be properly signed, must be signed by the applicant, a member of the applicant firm, or an officer of the applicant corporation or association. A verification or declaration which is signed by a person having color of authority to sign, is acceptable for the purpose of determining the timely filing of the paper. Persons having color of authority to sign are those who have first-hand knowledge of the truth of the statements in the verification or declaration and who also have actual or implied authority to act on behalf of the applicant. However, a properly signed substitute verification or declaration must be submitted before the application will be approved for publication or registration, as the case may be.

(d)(1) No amendment to the dates of use will be permitted unless the amendment is supported by applicant's affidavit or declaration in accordance with § 2.20 and by such showing as may be required.

(2) In an application under section 1(a) of the Act, no amendment to specify a date of use which is subsequent to the filing date of the application will be permitted.

(3) In an application under section 1(b) of the Act, after the filing of a statement of use under § 2.88, no amendment will be permitted to the statement of use to recite dates of use which are subsequent to the expiration of the time allowed to applicant for filing a statement of use.

30. Section 2.72 is revised to read as follows:

§ 2.72 Amendments to description or drawing of the mark.

(a) Amendments may not be made to the description or drawing of the mark if the character of the mark is materially altered. The determination of whether a proposed amendment materially alters the character of the mark will be made by comparing the proposed amendment with the description or drawing of the mark as originally filed.

(b) In applications under section 1(a) of the Act, amendments to the description or drawing of the mark may be permitted only if warranted by the specimens (or facsimiles) as originally filed, or supported by additional specimens (or facsimiles) and a supplemental affidavit or declaration in accordance with § 2.20 alleging that the mark shown in the amended drawing was in use prior to the filing date of the application.

(c) In applications under section 1(b) of the Act, amendments to the description or drawing of the mark, which are filed after submission of an amendment to allege use under § 2.76 or a statement of use under § 2.88, may be permitted only if warranted by the specimens (or facsimiles) filed, or supported by additional specimens (or facsimiles) and a supplemental affidavit or declaration in accordance with § 2.20 alleging that the mark shown in the amended drawing is in use in commerce. In the case of a statement of use under § 2.88, applicant must verify that the mark shown in the amended drawing was in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use.

(d) In applications under section 44 of the Act, amendments to the description or drawing of the mark may be permitted only if warranted by the description or drawing of the mark in the foreign registration certificate.

31. Section 2.73 is revised to read as follows:

§ 2.73 Amendment to recite concurrent use.

(a) An application under section 1(a) of the Act may be amended so as to be treated as an application for a concurrent registration, provided the application as amended satisfies the requirements of § 2.42. The examiner will determine whether the application, as amended, is acceptable.

(b) An application under section 1(b) of the Act may not be amended so as to be treated as an application for a concurrent registration until an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been filed in the application, after which time such an amendment may be made, provided the application as amended satisfies the requirements of § 2.42. The examiner will determine whether the application, as amended, is acceptable.

32. Section 2.75 is revised to read as follows:

§ 2.75 Amendment to change application to different register.

(a) An application for registration on the Principal Register under section 1(a) or 44 of the Act may be changed to an application for registration on the Supplemental Register and vice versa by amending the application to comply with the rules relating to the appropriate register, as the case may be.

(b) An application under section 1(b) of the Act may be amended to change the application to a different register only after submission of an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88. When such an application is changed from the Principal Register to the Supplemental Register, the effective filing date of the application is the date of the filing of the allegation of use under section 1(c) or 1(d) of the Act.

33. Section 2.76 is added to read as follows:

§ 2.76 Amendment to allege use.

(a) An application under section 1(b) of the Act may be amended to allege use of the mark in commerce under section 1(c) of the Act at any time between the filing of the application and the date the examiner approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action. Thereafter, an allegation of use may be submitted only as a statement of use under § 2.88 after the issuance of a notice of allowance under section 13(b)(2) of the Act. If an amendment to allege use is filed outside the time period specified in this paragraph, it will be returned to the applicant.

(b) A complete amendment to allege use must include:

(1) A verified statement that the applicant is believed to be the owner of the mark sought to be registered and that the mark is in use in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services;

(2) Three specimens or facsimiles, conforming to the requirements of §§ 2.56, 2.57 and 2.58, of the mark as used in commerce; and

(3) The fee prescribed in § 2.6.

(c) An amendment to allege use may be filed only when the applicant has made use of the mark in commerce on or in connection wth all of the goods or services, as specified in the application, for which applicant will seek registration in that application unless the amendment to allege use is accompanied by a request in accordance with § 2.87 to divide out from the application the goods or services to which the amendment pertains. If more than one item of goods or services is specified in the amendment to allege use, the dates of use required in paragraph (b)(1) of this section need be for only one of the items

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specified in each class, provided the particular item to which the dates apply is designated.

(d) The title "Amendment to allege use under § 2.76" should appear at the top of the first page of the paper.

(e) The Office will review a timely filed amendment to allege use to determine whether it meets the following minimum requirements:

(1) The fee prescribed in § 2.6;

(2) At least one specimen or facsimile of the mark as used in commerce; and

(3) A verification or declaration signed by the applicant stating that the mark is in use in commerce.

(f) A timely filed amendment to allege use which meets the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the amendment to allege use, applicant is found not entitled to registration for any reason not previously stated, applicant will be so notified and advised of the reasons and of any formal requirements or refusals. The notification shall restate or incorporate by reference all unresolved refusals or requirements previously stated. The amendment to allege use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the amendment to allege use is acceptable in all respects, the applicant will be notified of its acceptance. The filing of such an amendment shall not constitute a response to any outstanding action by the Trademark Examining Attorney.

(g) If the amendment to allege use is filed within the permitted time period but does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. The deficiency may be corrected provided the mark has not been approved for publication or the six-month response period after issuance of a final action has not expired. If an acceptable amendment to correct the deficiency is not filed prior to approval of the mark for publication or prior to the expiration of the six-month response period after issuance of a final action, the amendment will not be examined.

(h) An amendment to allege use may be withdrawn for any reason prior to approval of a mark for publication or expiration of the six-month response period after issuance of a final action.

34. Section 2.77 is added to read as follows:

§ 2.77 Amendments between notice of allowance and statement of use.

An application under section 1(b) of the Act may not be amended during the period between the issuance of the notice of allowance under section 13(b)(2) of the Act and the filing of a statement of use under § 2.88, except to delete specified goods or services. Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined.

35. The undesignated center heading for §§ 2.80 through 2.84 is revised to read as follows:

PUBLICATION AND POST PUBLICATION

36. Section 2.81 is amended by revising the section title, redesignating the present paragraph as (a), revising redesignated paragraph (a), and adding new paragraph (b) to read as follows:

§ 2.81 Post publication.

(a) Except in an application under section 1(b) of the Act for which no amendment to allege use under § 2.76 has been submitted and accepted, if no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared and no concurrent use proceeding is instituted, the application will be prepared for issuance of the certificate of registration as provided in § 2.151.

(b) In an application under section 1(b) of the Act for which no amendment to allege use under § 2.76 has been submitted and accepted, if no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared, a notice of allowance will issue. The notice of allowance will state the serial number of the application, the name of the applicant, the correspondence address, the mark, the identification of goods or services, and the issue date of the notice of allowance. The mailing date that appears on the notice of allowance will be the issue date of the notice of allowance. Thereafter, the applicant shall submit a statement of use as provided in § 2.88.

37. Section 2.82 is revised to read as follows:

§ 2.82 Marks on Supplemental Register published only upon registration.

In the case of an application for registration on the Supplemental Register the mark will not be published for opposition but if it appears, after examination or reexamination, that the applicant is entitled to have the mark registered, a certificate of registration will issue as provided in § 2.151. The mark will be published in the *Official Gazette* when registered.

38. Section 2.83 is amended by revising paragraphs (a) and (b) to read as follows:

§ 2.83 Conflicting marks.

(a) Whenever an application is made for registration of a mark which so resembles another mark or marks pending registration as to be likely to cause confusion or mistake or to deceive, the mark with the earliest effective filing date will be published in the *Official Gazette* for opposition if eligible for the Principal Register, or issued a certificate of registration if eligible for the Supplemental Register.

(b) In situations in which conflicting applications have the same effective filing date, the application with the earliest date of execution will be published in the *Official Gazette* for opposition or issued on the Supplemental Register.

* * * * *

39. Section 2.84 is revised to read as follows:

§ 2.84 Jurisdiction over published applications.

(a) The examiner may exercise jurisdiction over an application up to the date the mark is published in the *Official Gazette*. After publication of an application under section 1(a) or 44 of the Act the examiner may, with the permission of the Commissioner, exercise jurisdiction over the application. After publication of an application under section 1(b) of the Act, the examiner may exercise jurisdiction over the application after the issuance of the notice of allowance under section 13(b)(2) of the Act. After publication, and prior to issuance of a notice of allowance in an application under section 1(b), the examiner may, with the permission of the Commissioner, exercise jurisdiction over the application.

(b) After publication, but before the printing of the certificate of registration in an application under section 1(a) or 44 of the Act, or before the printing of the notice of allowance in an application under section 1(b) of the Act, an application which is not the subject of an inter partes proceeding before the Trademark Trial and Appeal Board may be amended if the amendment does not necessitate republication of the mark or issuance of an Office action. Otherwise, an amendment to such an application may be submitted only upon petition to the Commissioner to restore jurisdiction of the application to the examiner for consideration of the amendment and further examination. The amendment of an application which is the subject of an inter partes proceeding before the Trademark Trial and Appeal Board is governed by § 2.133.

40. Section 2.86 is revised to read as follows:

§ 2.86 Application may include multiple goods or services comprised in single class or multiple classes.

(a) An application may recite more than one item of goods, or more than one service, comprised in a single class, provided the goods or services are specifically identified and the applicant either has used the mark on or in connection with all of the specified goods or services, or has a bona fide intention to use the mark on or in connection with all of the specified goods or services.

(b) An application also may be filed to register the same mark for goods and/or services comprised in multiple classes provided the goods or services are specifically identified; a fee equaling the sum of the fees for filing an application in each class is submitted; and the application includes either dates of use and three specimens for each class, or a statement of a bona fide intention to use the mark on or in connection with all of the goods or services specified in each class. An amendment to allege use under § 2.76 or a statement of use under § 2.88, filed in a multiple class application under section 1(b) of the Act, must include, for each class, the required fee, dates of use and three specimens. A single certificate of registration for the mark shall be issued, unless the application is divided pursuant to § 2.87.

(c) The applicant may not allege use as to certain goods or services and a bona fide intention to use as to other goods or services in the same application, regardless of the number of classes contained therein.

41. Section 2.87 is revised to read as follows:

§ 2.87 Dividing an application.

(a) An application may be physically divided into two or more separate applications upon submission by the applicant of a request therefor, in accordance with paragraph (c) of this section. In the case of a request to divide out some, but not all, of the goods or services in a class, a fee for each new separate application to be created by the division must be submitted. Any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

(b) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action.

(c) A request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application." should appear at the top of the first page of the paper.

42. A new undesignated center heading, and two new sections, designated §§ 2.88 and 2.89, are added to read as follows:

POST NOTICE OF ALLOWANCE

§ 2.88 Filing statement of use after notice of allowance.

(a) In an application under section 1(b) of the Act, a statement of use, required under section 1(d) of the Act, must be filed within six months after issuance of a notice of allowance under section 13(b)(2) of the Act, or within an extension of time granted under § 2.89. A statement of use that is filed prior to issuance of a notice of allowance is premature, will not be considered, and will be returned to the applicant.

(b) A complete statement of use must include:

(1) A verified statement that the applicant is believed to be the owner of the mark sought to be registered and that the mark is in use in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the notice of allowance on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services;

(2) Three specimens or facsimiles, conforming to the requirements of §§ 2.56, 2.57 and 2.58, of the mark as used in commerce; and

(3) The fee prescribed in § 2.6.

(c) The statement of use may be filed only when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the notice of allowance, for which applicant will seek registration in that application, unless the statement of use is accompanied by a request in accordance with § 2.87 to divide out from the application the goods or services to which the statement of use pertains. If more than one item of goods or services is specified in the statement of use, the dates of use required in paragraph (b)(1) of this section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated.

(d) The title "Statement of use under § 2.88." should appear at the top of the first page of the paper.

(e) The Office will review a timely filed statement of use to determine whether it meets the following minimum requirements:

(1) The fee prescribed in § 2.6;

(2) At least one specimen or facsimile of the mark as used in commerce;

(3) A verification or declaration signed by the applicant stating that the mark is in use in commerce.

(f) A timely filed statement of use which meets the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the statement of use, applicant is found not entitled to registration, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The statement of use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the statement of use is acceptable in all respects, the applicant will be notified of its acceptance.

(g) If the statement of use does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. If the time permitted for applicant to file a statement of use has not expired, applicant may correct the deficiency. After the filing of a statement of use during a permitted time period for such filing, the applicant may not withdraw the statement to return to the previous status of awaiting submission of a statement of use, regardless of whether it is in compliance with paragraph (e) of this section.

(h) The failure to timely file a statement of use which meets the minimum requirements specified in paragraph (e) of this section shall result in the abandonment of the application.

(i)(1) The goods or services specified in a statement of use must conform to those goods or services identified in the notice of allowance. An applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or, if appropriate, "those goods or services identified in the notice of allowance except . . ." followed by an identification of the goods or services to be deleted.

(2) If any goods or services specified in the notice of allowance are omitted from the identification of goods or services in the statement of use, the Trademark Examining Attorney shall inquire about the discrepancy and permit the applicant to amend the statement of use to include any omitted goods or services, provided that the amendment is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use.

(3) The statement of use may be accompanied by a separate request to amend the identification of goods or services in the application, as stated in the notice of allowance, in accordance with § 2.71(b).

(j) The statement of use may be accompanied by a separate request to amend the drawing in the application, in accordance with §§ 2.51 and 2.72.

§ 2.89 Extensions of time for filing a statement of use.

(a) The applicant may request a six-month extension of time to file the statement of use required under § 2.88 by submitting:

(1) A written request, before the expiration of the six-month period following the issuance of a notice of allowance under section 13(b)(2) of the Act;

(2) The fee prescribed in § 2.6; and

(3) A verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce.

(b) The applicant may request further six-month extensions of time for filing the statement of use by submitting:

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(1) A written request, prior to the expiration of a previously granted extension of time;
(2) The fee prescribed in § 2.6;
(3) A verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce; and
(4) A showing of good cause, as specified in paragraph (d) of this section.
(c) Extensions of time under paragraph (b) of this section will be granted only in six-month increments and may not aggregate more than 24 months.
(d) The showing required by paragraph (b)(4) of this section must include:
(1) An allegation that the applicant has not yet made use of the mark in commerce on all the goods or services specified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce, and
(2) A statement of applicant's ongoing efforts to make use of the mark in commerce on or in connection with each of the goods or services specified in the verified statement of continued bona fide intention to use required under paragraph (b) of this section. Those efforts may include, without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities. In the alternative, a satisfactory explanation for the failure to make such efforts must be submitted.
(e)(1) At the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, applicant may file one request, in accordance with paragraph (a) or (b) of this section, for a six-month extension of time for filing a statement of use, provided that the time requested would not extend beyond 36 months from the issuance of the notice of allowance. Thereafter, applicant may not request any further extensions of time.
(2) A request for an extension of time that is filed at the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, must comply with all the requirements of paragraph (a) of this section, if it is applicant's first extension request, or paragraph (b) of this section, if it is a second or subsequent extension request. However, in a request under paragraph (b), applicant may satisfy the requirement for a showing of good cause by asserting that applicant believes that it has made valid use of the mark in commerce, as evidenced by the submitted statement of use, but that if the statement of use is found by the Patent and Trademark Office to be fatally defective, applicant will need additional time in which to file a new statement of use.
(f) The goods or services specified in a request for an extension of time for filing a statement of use must conform to those goods or services identified in the notice of allowance. Any goods or services specified in the notice of allowance which are omitted from the identification of goods or services in the request for extension of time will be presumed to be deleted and the applicant may not thereafter request that the deleted goods or services be reinserted in the application. If appropriate, an applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or "those goods or services identified in the notice of allowance except. . ." followed by an identification of the goods or services to be deleted.
(g) The applicant will be notified of the grant or denial of a request for an extension of time, and of the reasons for a denial. Failure to notify the applicant of the grant or denial of the request prior to the expiration of the existing period or requested extension does not relieve the applicant of the responsibility of timely filing a statement of use under § 2.88. If, after denial of an extension request, there is time remaining in the existing six-month period for filing a statement of use, applicant may submit a substitute request for extension of time. Otherwise, the only recourse available after denial of a request for an extension of time is a petition to the Commissioner in accordance with §§ 2.66 or 2.146. A petition from the denial of a request for an extension of time to file a statement of use shall be filed within one month from the date of mailing of the denial of the request. If the petition is granted, the term of the requested six-month extension which was the subject of the petition will run from the date of the expiration of the previously existing six-month period for filing a statement of use.

43. Section 2.99 is amended by revising paragraph (g) and adding new paragraph (h) to read as follows:

§ 2.99 Application to register as concurrent user.

* * * * *

(g) Registrations and applications to register on the Supplemental Register and reistrations under the Act of 1920 are not subject to concurrent use registration proceedings. Applications to register under section 1(b) of the Act of 1946 are subject to concurrent use registration proceedings only after an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been filed.
(h) The Trademark Trial and Appeal Board will consider and determine concurrent use rights only in the context of a concurrent use registration proceeding.

44. Section 2.101 is amended by revising paragraph (b) to read as follows:

§ 2.101 Filing an opposition.

* * * * *

(b) Any entity which believes that it would be damaged by the registration of a mark on the Principal Register may oppose the same by filing an opposition, which should be addressed to the Trademark Trial and Appeal Board. The opposition need not be verified, and may be signed by the opposer or the opposer's attorney or other authorized representative.

* * * * *

45. Section 2.111 is amended by revising paragraph (b) to read as follows:

§ 2.111 Filing petition for cancellation.

* * * * *

(b) Any entity which believes that it is or will be damaged by a registration may file a petition, which should be addressed to the Trademark Trial and Appeal Board, to cancel the registration in whole or in part. The petition need not be verified, and may be signed by the petitioner or the petitioner's attorney or other authorized representative. The petition may be filed at any time in the case of registrations on the Supplemental Register or under the Act of 1920, or registrations under the Act of 1881 or the Act of 1905 which have not been published under section 12(c) of the Act, or on any ground specified in section 14(c) or (e) of the Act. In all other cases the petition and the required fee must be filed within five years from the date of registration of the mark under the Act or from the date of publication under section 12(c) of the Act.

* * * * *

46. Section 2.129 is amended by adding new paragraph (d) to read as follows:

§ 2.129 Oral argument; reconsideration.

* * * * *

(d) When a party to an inter partes proceeding before the Trademark Trial and Appeal Board cannot prevail without establishing constructive use pursuant to section 7(c) of the Act in an application under section 1(b) of the Act, the Trademark Trial and Appeal Board will enter a judgment in favor of that party, subject to the party's establishment of constructive use. The time for filing an appeal or for commencing a civil action under section 21 of the Act shall run from the date of the entry of the judgment.

47. Section 2.133 is revised to read as follows:

§ 2.133 Amendment of application or registration during proceedings.

(a) An application involved in a proceeding may not be amended in substance nor may a registration be amended or disclaimed in part, except with the consent of the other party or parties and the approval of the Trademark Trial and Appeal Board, or except upon motion.
(b) If, in an inter partes proceeding, the Trademark Trial and Appeal Board finds that a party whose application or registration is the subject of the proceeding is not entitled to registration in the absence of a specified restriction to the involved application or registration, the Trademark Trial and Appeal Board will allow the party time in which to file a request that the application or registration be amended to conform to the findings of the Trademark Trial and Appeal Board, failing which judgment will be entered against the party.
(c) Geographic limitations will be considered and determined by the Trademark Trial and Appeal Board only in the context of a concurrent use registration proceeding.
(d) A plaintiff's pleaded registration will not be restricted in the absence of a counterclaim to cancel the registration in whole or in part, except that a counterclaim need not be filed if the registration is the subject of another proceeding between the same parties or anyone in privity therewith.

48. Section 2.161 is revised to read as follows:

§ 2.161 Cancellation for failure to file affidavit or declaration during sixth year.

Any registration under the provisions of the Act and any registration published under the provisions of section 12(c) of the Act (§ 2.153) shall be cancelled as to any goods or services recited in the registration at the end of six years following the date of registration or the date of such publication, unless within one year next preceding the expiration of such six years the registrant shall file in the Patent and Trademark Office an affidavit or declaration in accordance with § 2.20 setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching a specimen or facsimile showing current use of the mark, or an affidavit or declaration under § 2.20 showing that its nonuse as to any goods or services recited in the registration is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark as to those goods or services.

49. Section 2.162 is amended by revising paragraphs (e), (f), and (g) to read as follows:

§ 2.162 Requirements for affidavit or declaration during sixth year.

* * * * *

(e) State that the registered mark is in use in commerce, list the goods or services recited in the registration on or in connection with which the mark is in use in commerce, and specify the nature of such commerce (except under paragraph (f) of this section). The statement must be accompanied by a specimen or facsimile, for each class of goods or services, showing current use of the mark. If the specimen or facsimile is found to be deficient, a substitute specimen or facsimile may be submitted and considered even though filed after the sixth year has expired, provided it is supported by an affidavit or declaration pursuant to § 2.20 verifying that the specimen or facsimile was in use in commerce prior to the expiration of the sixth year;
(f) If the registered mark is not in use in commerce on or in connection with the goods or services recited in the registration, recite facts to show that nonuse as to those goods or services is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark as to those goods or services. If the facts recited are found insufficient, further evidence or explanation may be submitted and considered even though filed after the sixth year has expired; and
(g) Contain the statement of use in commerce or statement as to nonuse and appropriate specimen or facsimile, as required in paragraphs (e) and (f) of this section, for each class to which the affidavit or declaration pertains in this registration.

50. Section 2.181(a) is revised to read as follows:

§ 2.181 Term of original registrations and renewals.

(a)(1) Registrations issued or renewed under the Act, prior to November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for twenty years from their date of issue or expiration, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered.
(2) Registrations issued or renewed under the Act on or after November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for ten years from their date of issue or expiration, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered.

* * * * *

51. Section 2.187 is revised to read as follows:

§ 2.187 Certificate of registration may issue to assignee.

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, provided that the party makes a written request in the application record, by the time the application is being prepared for issuance of the certificate of registration, and an appropriate document is of record in the Assignment Search Room of the Patent and Trademark Office. If the assignment or name change document is not of record in the Assignment Search Room, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the application file and in the recorded document.

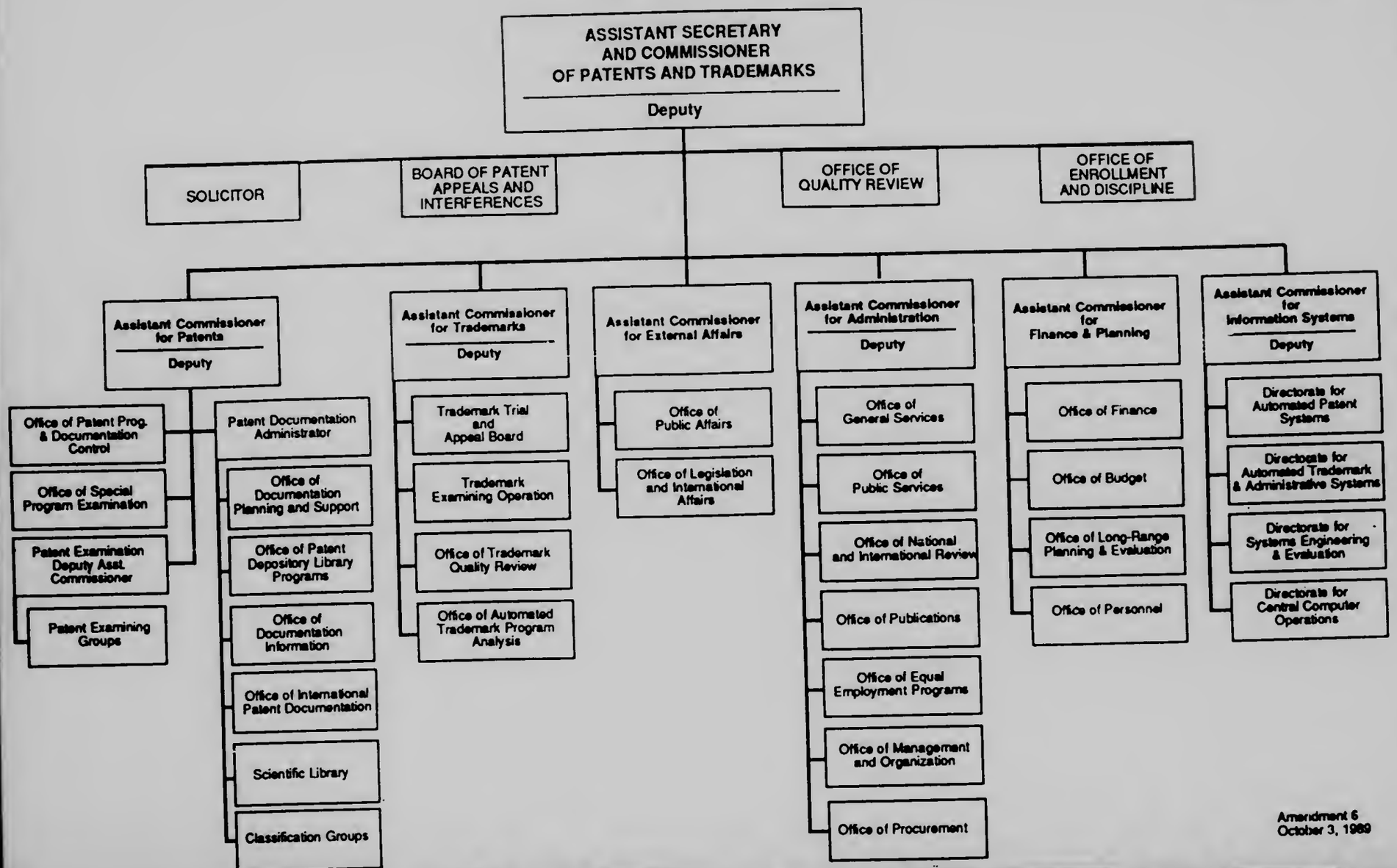
Aug. 2, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

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U.S. DEPARTMENT OF COMMERCE
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	
—If paid before Jan. 1, 1990	1040.00
—If paid on or after Jan. 1, 1990	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

Nov. 7, 1989. JEFFREY M. SAMUELS,
Acting Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of November 30 , 1989.

Chemical Discipline - May 1, 1989
Mechanical Discipline - July 8, 1988
Electrical Discipline - June 1, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of November 30, 1989.

Chemical - December 3, 1987
Electrical - January 5, 1987
Mechanical - September 14, 1987

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of November 1989.

Affirmed 196
Affirmed-in-Part 60
Reversed 137
Total Decided 393

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

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Attention is drawn to the patents which were issued on December 30, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,631,752 through 4,633,525
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on December 28, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,365,351 through 4,366,578
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 15, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,294,839	06/215,987	10/13/81
4,546,493	06/428,871	10/15/85
4,546,496	06/619,590	10/15/85
4,546,498	06/472,437	10/15/85
4,546,505	06/601,074	10/15/85
4,546,507	06/634,055	10/15/85
4,546,517	06/585,857	10/15/85
4,546,521	06/599,170	10/15/85
4,546,524	06/584,777	10/15/85
4,546,527	06/445,270	10/15/85
4,546,530	06/504,365	10/15/85
4,546,531	06/567,760	10/15/85
4,546,545	06/556,547	10/15/85
4,546,554	06/445,740	10/15/85
4,546,555	06/477,052	10/15/85
4,546,562	06/483,096	10/15/85
4,546,563	06/582,164	10/15/85
4,546,569	06/550,577	10/15/85
4,546,570	06/447,208	10/15/85
4,546,571	06/469,921	10/15/85
4,546,578	06/640,853	10/15/85
4,546,579	06/466,531	10/15/85
4,546,587	06/438,567	10/15/85
4,546,607	06/489,584	10/15/85
4,546,611	06/564,113	10/15/85
4,546,624	06/488,035	10/15/85
4,546,635	06/456,785	10/15/85
4,546,637	06/550,258	10/15/85
4,546,640	06/503,726	10/15/85
4,546,652	06/333,480	10/15/85
4,546,659	06/596,910	10/15/85
4,546,664	06/446,921	10/15/85
4,546,667	06/462,092	10/15/85
4,546,671	06/490,714	10/15/85
4,546,676	06/600,887	10/15/85
4,546,679	06/531,441	10/15/85
4,546,684	06/521,591	10/15/85
4,546,688	06/561,541	10/15/85
4,546,689	06/490,256	10/15/85
4,546,700	06/567,619	10/15/85
4,546,705	06/463,836	10/15/85
4,546,708	06/519,262	10/15/85
4,546,709	06/629,460	10/15/85
4,546,710	06/509,449	10/15/85
4,546,715	06/517,284	10/15/85
4,546,718	06/606,288	10/15/85
4,546,719	06/577,303	10/15/85
4,546,720	06/528,177	10/15/85
4,546,722	06/677,844	10/15/85
4,546,727	06/605,940	10/15/85
4,546,730	06/650,138	10/15/85
4,546,739	06/636,828	10/15/85
4,546,743	06/364,574	10/15/85
4,546,744	06/577,013	10/15/85
4,546,754	06/479,021	10/15/85
4,546,756	06/330,512	10/15/85
4,546,758	06/668,684	10/15/85
4,546,777	06/583,083	10/15/85
4,546,782	06/629,272	10/15/85
4,546,785	06/433,408	10/15/85
4,546,793	06/453,434	10/15/85
4,546,804	06/463,305	10/15/85
4,546,807	06/580,682	10/15/85

Patent Number	Serial Number	Issue Date
4,546,815	06/687,078	10/15/85
4,546,822	06/546,388	10/15/85
4,546,825	06/461,773	10/15/85
4,546,826	06/699,400	10/15/85
4,546,836	06/545,794	10/15/85
4,546,845	06/441,455	10/15/85
4,546,846	06/601,975	10/15/85
4,546,851	06/438,942	10/15/85
4,546,853	06/627,185	10/15/85
4,546,854	06/503,289	10/15/85
4,546,867	06/432,642	10/15/85
4,546,868	06/478,842	10/15/85
4,546,875	06/511,545	10/15/85
4,546,877	06/586,031	10/15/85
4,546,879	06/688,270	10/15/85
4,546,880	06/500,496	10/15/85
4,546,881	06/520,024	10/15/85
4,546,896	06/565,579	10/15/85
4,546,901	06/576,449	10/15/85
4,546,907	06/469,030	10/15/85
4,546,912	06/696,393	10/15/85
4,546,913	06/553,396	10/15/85
4,546,914	06/532,836	10/15/85
4,546,919	06/600,385	10/15/85
4,546,922	06/508,673	10/15/85
4,546,925	06/530,179	10/15/85
4,546,934	06/633,921	10/15/85
4,546,940	06/570,423	10/15/85
4,546,942	06/597,846	10/15/85
4,546,946	06/593,553	10/15/85
4,546,951	06/523,748	10/15/85
4,546,962	06/631,549	10/15/85
4,546,967	06/460,934	10/15/85
4,546,971	06/647,712	10/15/85
4,546,972	06/568,931	10/15/85
4,546,974	06/528,977	10/15/85
4,546,975	06/356,485	10/15/85
4,546,986	06/586,983	10/15/85
4,546,989	06/593,508	10/15/85
4,546,992	06/649,068	10/15/85
4,546,997	06/518,203	10/15/85
4,547,036	06/417,588	10/15/85
4,547,041	06/312,193	10/15/85
4,547,046	06/464,862	10/15/85
4,547,059	06/436,796	10/15/85
4,547,064	06/645,961	10/15/85
4,547,068	06/472,026	10/15/85
4,547,070	06/246,952	10/15/85
4,547,078	06/587,772	10/15/85
4,547,082	06/392,492	10/15/85
4,547,091	06/641,788	10/15/85
4,547,092	06/582,177	10/15/85
4,547,096	06/519,457	10/15/85
4,547,099	06/606,837	10/15/85
4,547,109	06/502,088	10/15/85
4,547,119	06/567,136	10/15/85
4,547,124	06/483,899	10/15/85
4,547,135	06/558,919	10/15/85
4,547,136	06/668,402	10/15/85
4,547,150	06/608,722	10/15/85
4,547,153	06/681,387	10/15/85
4,547,158	06/627,079	10/15/85
4,547,171	06/561,397	10/15/85
4,547,175	06/570,768	10/15/85
4,547,185	06/644,384	10/15/85
4,547,187	06/492,134	10/15/85
4,547,199	06/473,898	10/15/85
4,547,207	06/634,294	10/15/85
4,547,236	06/385,495	10/15/85
4,547,242	06/493,546	10/15/85
4,547,267	06/525,874	10/15/85
4,547,271	06/649,682	10/15/85
4,547,272	06/561,469	10/15/85
4,547,273	06/618,014	10/15/85
4,547,288	06/606,148	10/15/85
4,547,294	06/572,227	10/15/85
4,547,320	06/417,091	10/15/85
4,547,356	06/454,988	10/15/85
4,547,367	06/563,369	10/15/85
4,547,368	06/637,880	10/15/85
4,547,388	06/620,529	10/15/85
4,547,391	06/612,125	10/15/85
4,547,464	06/588,537	10/15/85
4,547,468	06/509,991	10/15/85
4,547,499	06/609,035	10/15/85
4,547,505	06/583,324	10/15/85
4,547,508	06/556,684	10/15/85
4,547,516	06/543,713	10/15/85
4,547,519	06/464,193	10/15/85
4,547,524	06/466,101	10/15/85
4,547,546	06/507,875	10/15/85
4,547,555	06/528,498	10/15/85
4,547,561	06/635,957	10/15/85
4,547,569	06/620,801	10/15/85
4,547,572	06/577,153	10/15/85
4,547,587	06/564,199	10/15/85
4,547,601	06/219,475	10/15/85
4,547,618	06/686,961	10/15/85
4,547,624	06/557,640	10/15/85
4,547,629	06/577,105	10/15/85
4,547,634	06/512,931	10/15/85
4,547,652	06/560,776	10/15/85
4,547,660	06/473,077	10/15/85
4,547,679	06/483,348	10/15/85
4,547,686	06/537,614	10/15/85
4,547,693	06/497,757	10/15/85
4,547,697	06/516,022	10/15/85
4,547,718	06/415,432	10/15/85
4,547,721	06/620,039	10/15/85
4,547,723	06/407,572	10/15/85
4,547,726	06/519,335	10/15/85
4,547,729	06/380,880	10/15/85
4,547,742	06/639,063	10/15/85
4,547,756	06/554,444	10/15/85
4,547,761	06/559,731	10/15/85
4,547,773	06/459,083	10/15/85
4,547,779	06/532,335	10/15/85
4,547,819	06/491,349	10/15/85
4,547,822	06/520,149	10/15/85
4,547,833	06/565,067	10/15/85
4,547,834	06/566,735	10/15/85
4,547,836	06/576,085	10/15/85
4,547,841	06/570,963	10/15/85
4,547,843	06/670,916	10/15/85
4,547,858	06/503,921	10/15/85
4,547,863	06/502,029	10/15/85
4,547,883	06/533,387	10/15/85
4,547,889	06/503,357	10/15/85

NOTIFICATION OF ACCEPANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(C); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,526,575	06/428,877	07/02/85	09/30/82	11/22/89

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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,648,532, Re. S.N. 233,866, Filed Aug. 15, 1988, Cl. 222/82, MIXING AND DISCHARGE CAPSULE Russell D. Green, Owner of Record: *Dentsply Research & Development Corp., Milford Del.*, Attorney or Agent: David E. Wheeler, et al., Ex. Gp.: 311

4,680,353, Re. S.N. 378,846, Filed July 12, 1989, cl. 526/160, PROCESS FOR PRODUCTION OF STYRENE POLYMERS Nobuhide Isthihara, et al., Owner of Record: *Idemitsu Kosan Co. Ltd., Tokyo, Japan*, Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 155

4,686,581, Re. S.N. 391,288, Filed Aug. 9, 1989, Cl. 358/294, DOCUMENT SCANNING SYSTEM Charles W. Spherley, Jr., et al., Owner of Record: *Ana Tech Corp.*, Attorney or Agent: Bruce D. Sunstein, et al., Ex. Gp.: 262

4,693,713, Re. S.N. 405,616, Filed sept. 11, 1989, Cl. 604,368, ABSORBENTS FOR BLOOD AND SEROUS BODY FLUIDS Miroslav Chmelir, et al., Owner of Record: *Chemische Fabrikstockhausen, Kref, Germany*, Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 336

4,758,241, Re. S.N. 440,507, Filed Nov. 22, 1989, Cl. 604,387, MENSTRUAL AND INCONTINENCE PAD Elissa D. Papjohn, Owner of Record: *Inventor*, Attorney or Agent: Myron Amer, Ex. Gp.: 336

4,846,458, Re. S.N. 441,011, Filed Nov. 20, 1989, Cl. 272/65, UPPER BODY EXERCISE APPARATUS Lanny L. Potts, Owner of Record: *Tri-Tech* Inc., Xanthus, Okla., Attorney or Agent: Thomas F. Smegal, et al., Ex. Gp.: 332

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,424,695, Reexam. No. 90/001,892, Requested Nov. 16, 1989, Cl. 72/128, ARRANGEMENT FOR FABRICATING DOUBLE CONICAL SPRINGS Ernst Kirchhoff, et al., Owner of Record: *Hoesch Aktiengesellschaft, Dortmund, West Germany*, Attorney or Agent: Max Fogiel, Ex. Gp.: 320, Requester: Owner

4,489,022, Reexam. No. 90/001,894, Requested Nov. 20, 1989, Cl. 264/30, FORMING COHERENT REFRACTORY MASSES Pierre Robyn, et al., Owner of Record: *Glaverbel, SA, Brussels, Belgium*, Attorney or Agent: Spencer & Frank, Ex. Gp.: 130, Requester: Northlake Marketing & Supply, Inc., Hobart, Ind.

4,509,916, Reexam. No. 90/001,893, Requested Nov. 22, 1989, Cl. 431/273, DEVICE FOR PRODUCING IGNITION SPARKS WHEN FALLING ON A PYROPHORIC FLINT . Owner of Record: *Laforest, SA, Barcelona, Spain*, Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 340, Requester: Owner

3,684,560, Reexam. No. 90/001,895, Requested Nov. 20, 1989, Cl. 427/140, METHOD OF FORMING REFRACTORY MASSES Edgar Brichard, et al., Owner of Record: *Glaverbel, SA, Brussels, Belgium*, Attorney or Agent: Spencer & Frank, Ex. Gp.: 130, Requester: Northlake Marketing & Supply, Inc., Hobart, Ind.

Errata

The following registration number was inadvertently listed as cancelled in the "Trademark Registrations Cancelled Section 8" section of the Trademark Official Gazette of Nov. 1, 1988:

TM 160 1,234,946 Nov. 1, 1988

Consequently, the above-identified registration is still active.

Dec. 6, 1989 PATRICIA M. DAVIS
Adminstrator for Trademark Operations

The following registration number was inadvertently listed as cancelled in the "Trademark Registration Cancelled Section 18" section of the Trademark Official Gazette of June 13, 1989:

TM 184 1,204,629 June 13, 1989

Consequently, the above-identified registration is still active.

Dec. 6, 1989 PATRICIA M. DAVIS
Adminstrator for Trademark Operations

In the "Trademark Registrations Issued" section of the Trademark Official Gazette of Nov. 7, 1989, was listed inadvertently:

TM 224 1,564,919 Nov. 7, 1989

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

Dec. 6, 1989 PATRICIA M. DAVIS
Administrator for Trademark Operations

The Registrant of Registration No. 867,818 listed in the "Index of Registrants" section of the Trademark Official Gazette of May 23, 1989, at TMI 41, was incorrectly identified as "RICHARDSON-MERRELL INC.".

The Registrant's name as correctd is "RICHARDSON-VICKS INC.".

Dec. 6, 1989 PATRICIA M. DAVIS
Administrator for Trademark Operations

In the "Trademark Registrations Renewed" section of the trademark Official Gazette of June 13, 1989, the mark was incorrectly identified as "THEMO-CAL".

The mark as corrected is "THERMO-CAL".

Dec. 6, 1989 PATRICIA M. DAVIS
Adminstrator for Trademark Operations

Removal From Register

Pursuant to the provisions of 37 CFR $10.11 (b), a letter was directed on November 18, 1988 to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding had expired.

Accordingly, the names of the following person have been removed from the Register of Patent Attorneys and Agents.

CAMERON WEIFFENBACH
Director,
Office of Enrollment & Discipline
November 30, 1989

Casey P. August, 7 Hauteview Court, Don Mills, Ont., Canada M3A 2Z8
John Y. Clowney, 319 Overwood Rd., Akron, Ohio 44313
George M. Cole, 1254 Bank of Calif. Center, Seattle, Wash 98164
Jack Darrell, 7505 Fanin, Suite 214, Houston, Tex. 77054
George G. Dower, 3016 Lindberg Ave., Allentown, Pa. 18103
Douglas J. Drummond, 309 N. 6th St., Flagler Beach, Fla. 32036
Hill, William S., 955 Alton Rd., Port Charlotte, Fla. 33952
Jeffrey M. Kaden, Blum, Kaplan, Friedman Silverman & Beran, 1120 Ave. of the Americas, New York, N.Y. 10036
Konrad H. Kaeding, Willian, Brinks, Olds, Hofer, Gilson & Lione,One IBM Plaza, Suite 4100, Chicago, Ill. 60611
Evans Kahn, 105 Shore Rd., Greenwich, Conn. 06870
Robert L. Kahn, 189 West Madison St., Suite 1200, Chicago, Ill. 60602
Thomas A. Kahrl, Connecticut National Bank, 777 Main St., Hartford, Conn. 06115
Wallace M. Kain, AT&T Co., Box 25000, Greensboro, N.C. 27420
Lee H. Kaiser, Allis Chalmers Corp., Box 512, Milwaukee, Wis. 53201
Vernon F. Kalb, Prutzman, Kalb, Chilton & Alix, 750 Main St., Hartford, Conn. 06103
James M. Kanagy, Syntex (U.S.A.) Inc., 3401 Hillview Ave.,P.O. Box 10850, Palo Alto, Calif.94303
David S. Kane, Kane, Dalsimer, Kane, Sullivan & Kurucz, 420 Lexington Ave., New York, N.Y. 10170
Samuel Kane, 2 Spring Court, Cherry Hill, N.J. 08003
Alexander T. Kardos, 1557 Ashbrook Dr., Scotch Plains, N.J. 07076
Geoffrey M. Karny, Finnegan, Henderson, Farabow, Garrett & Dunner, 1775 K Street N.W., Washington, D.C. 20006
Horst M. Kasper, 13 Forest Drive, Warren, N.J. 07060
Koichiro Kato, Westinghouse Elec. Corp., 1310 Beulah Road Churchill, Pittsburgh, Pa. 15235
Neil F. Katz, Hill International, Inc., Suite 1072, 6809 Mayfield Rd., Mayfield Heights, Ohio 44124
Robert D. Katz, Hume, Clement, Brinks, Willian & Olds, Ltd., One IBM Plaza, Suite 4100, Chicago, Ill. 60611
Walter Katz, Congoleum Corp., 195 Belgrove Dr., Kearny, N.J. 07032
Howard Katzoff, 520 C Lombard St., Philadelphia, Pa. 19147
William Kaufman, 74 Kimberly Pl., New Canaan, Conn. 06840
Donald A. Kaul, Brownstein, Zeidman & Schomer, 1025 Connecticut Ave., N.W., Washington, DC 20036
Richard A. Kay, Schmidt, Howlett, Van't Hof, Shell & Van, 700 Frey Bldg., Grand Rapids, Mich. 49502
Leonard Kean, Johnson & Johnson, One Johnson & Johnson Plaza, New Brunswick, N.J. 08933,
Francis A. Keegan, Ward, Lalos, Leeds, Keegan & Lett, 1200 17th St., N.W., Washington, DC 20036
Richard J. Keegan, 4312 Hamilton St., Hyattsville, Md. 20781
Walter C. Kehm, Dweck & Sladkus, 666 Fifth Ave., New York, N.Y. 10103
Howard T. Keiser, 2525 Ranchvale Dr., Cincinnati, Ohio 45230
Deane E. Keith, Gulf Oil Corp., 715 Gulf Bldg., P.O. Box 1166 Pittsburgh, Pa. 15230
Henry B. Kellog, 511 Verdi Street, Venice, Fla. 33595
David B. Kellom, The Dow Chemical Co., Patent Dept., 1776 Bldg., Midland, Mich. 48640
Fred L. Kelly, 11325 Canterbury Rd., Chester, Va. 23831
William F. Kelly, Jr., 6 Village Rd., Florham Park, N.J. 07932
John T. Kelton, Darby & Darby, 405 Lexington Ave., New York, N.Y. 10174
Sherman J. Kemmer, Diamond Point Int'l Inc., 15300 Pearl Rd., Cleveland, Ohio 44136
Joseph D. Kennedy, Monsanto Co., G4ND 800 N. Lindbergh Blvd., St. Louis, Mo. 63167
William B. Kerkam, Jr., Kirkam, Stowell, Kondrack & Clarke P.C., Crystal Gateway 1, Suite 411, 1235 S. Jefferson Davis Hwy., Arlington, Va. 22202
Don M. Kerr, E.I. DuPont De Nemours & Co., 1007 Market Street, Wilmington, Del. 19898
Gordon W. Kerr, 321 Sawmill Rd., Bricktown, N.J. 08723
Paul A. Kerstein, Conlon & Kerstein, 205 West Randolph Street, Suite 1220, Chicago, Ill. 60606
Kenneth S. Kessler, 543 Broadway, Tacoma, Wash 98402
Casimir R. Kiczek, 27109 Kingswood Drive, Dearborn Hgts, Mich. 48127
Billy C. Killough, 14 N. Adgers Wharf, Charleston, S.C. 29401
Barnwell R. King, 73-40 188 St., Flushing, N.Y. 11366
Paul N. King, 623 Fuji Bldg., 2-3, Marunouchi 3-chome, Chiyoda-Ku, Tokyo 100, Japan
William H. King, Nasa, Langley Research Center, Hampton, Va. 23665
William E. Kinnear, 1810 Washington Blvd., Beaumont, Tex. 77705
Harold J. Kinney, Kinney, Lange, Braddock, Westman & Fairbairn, P.A., Suite 1500, 635 Fourth Ave., Minneapolis, Minn 55415
Samuel W. Kipnis, 100 Sands Point Rd., Apt. 105, Longboat Key, Fla. 33548
Nelson E. Kimmelman, Edelson, Udell, Kimmelman & Farrell, 1328 Land Title Bldg., Philadelphia, Pa. 19110
Michael E. Kiteck, Jr., 5050 Excelsior Blvd., Minneapolis, Minn 55416
Edmund T. Kittleman, French & Doescher, P.O. Box 2443, Bartlesville, Okla. 74005
Felix Klass, Celanese Corp., 1211 Avenue of the Americas, New York, N.Y. 10036
David Klein, 11418 Monterrey Dr., Silver Spring, Md. 20902
Ronald C. Klett, Post Office Box 232, Greendale, Wis. 53129
Larry H. Kline, 18 Broad St., Suite 805, Charleston, S.C. 29401
Michael J. Kline, 209 N. Dithridge Ave., Pittsburgh, Pa. 15213
Richard G. Kline, Beveridge, DeGrandi & Kline, 1819 H Street, N.W., Washington, D.C. 20006
Dale O. Kluck, 201 W. St. Andrews, Midland, Mich. 48640
Carl E. Kneuertz, 1204 Washington St., Suite 114, Alexandria, Va. 22314
Stuart W. Knight, Suite 201, 13522 Newport Avenue, Tustin, Calif. 92680
Eugene C. Knoblock, OltS.C.h, Knoblock & Hall, 625 JMS Bldg., South Bend, Ind. 46601
Frederick L. Knop, Jr., 100 N.E. Adams St., Peoria, Ill. 61629
Leonard S. Knox, 2300 Lincoln Park West, Suite 707, Chicago, Ill. 60616
Robert Knox, Jr., Texaco Development Corp., 2000 West Chester Ave., White Plains, N.Y. 10650
Herbert D. Knudsen, Standard Oil Co., Patent & License Division, Midland Bldg., - 928 TT, Cleveland, Ohio 44115
John M. Koch, 23108 Village 23, Camarillo, Calif. 93010
Steven P. Koda, Seed & Berry, 6300 Columbia Center, 701 Fifth Ave., Seattle, Wash 98104
George H. Kohlmann, Cipher Data Products, Inc., 9715 Businesspark Ave., P.O. Box 85170, San Diego, Calif. 92138
Waino M. Kolehmainen, 1218 Oak St. Winnetka, Ill. 60093
Phillip D. Koontz, 1472 N. 5th St., P.O. Box 820, Laramie, Wyo. 82070
Glenn H. Korfhage, Dow Chemical Co., P.O. Box 1965, Midland, Mich. 48640
Richard Kornutik, Nabisco Brands, Inc., 15 River Rd., Wilton, Conn. 06897
Joseph C. Kotarski, Conoco Inc., P.O. Box 1267, Patent & Liscensing Division, 1000 South Pine, Ponca City, Okkla 74603
Howard K. Kothe, One Beekman Pl., New York, N.Y. 10022
Earl F. Kotts, 9114 W. Linden Rd., Watsonville, Calif. 95076
John G. Kovalich, 11 Carteret Rd., Livingston, N.J. 07039
Charles L. Kraft II, P.O. Box 18122, Baltimore, Md. 21220
Jill H. Krafte, Leydig, Voit, Osann, Mayer & Holt, Ltd., One IBM Plaza, Suite 4600, Chicago, Ill. 60611
Bernard L. Kramer, 21 Kristin Drive - #414, Schaumburg, Ill. 60195
Charles Krassov, 220 McEwan Ave., Windsor, Ont., Canada, N9B 2E4

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John H. Kraus, 3040 Larkin Rd., Pebble Beach, Calif. 93953
Otto R. Krause, Hill, VanSanten, Steadman, Chiara & Simpson, 7000 Sears Tower, Chicago, Ill. 60606
Cyril A. Krenzer, Moran & Krenzer, P.C., 18 Lake St., P.O. Box 161, Owego, N.Y. 13827
Gerald H. Kreske, Hoover Co., 101 E. Maple Street, North Canton, Ohio 44720
Bernard Kriegel, 953 North Highland Ave., Los Angeles, Calif. 90038
John A. Krieger, American Can Technical Center, 433 N. Northwest Highway, Barrington, Ill. 60021
Robert D. Krohn, Los Alamos National Lab., Box 1663 MS 674, Los Alamos, N. Mex. 87545
John Krout, Gipple & Hale, Suite 905, 1925 North Lynn Street, Rosslyn, Va. 22209
Frederick J. Krubel, International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611
Cedric H. Kuhn, 5605 Equestrian Dr., N.W., Albuquerque, N. Mex 87120
Carol K. Lackenbach, 507 Maguire Avenue, Staten Island, N. Y., 10309
Armand E. Lackenbach, Lackenbach, Siegel, Marzullo, Presta & Aronson, One Chase Rd., Scarsdale, N.Y. 10583
Elliot A. Lackenbach, 311HH Gates Rd., Somerset, N.J. 08873
Edwin V. Ladd, Jr., 184 Maxine Rd., Bristol, Conn. 06010
Frank R. LaFontaine, Shell Dev. Co., Pats. & Licensing P.O. Box 4248, Modesto, Calif. 95352
Robert I. Lainof, 1413 King Street, Alexandria, Va. 22314
Peter N. Lalos, Lalos, Leeds, Keegan, Lett & Marsh 1200 Seventeenth St., N.W., Washington, D.C. 20036
Michael A. Lamanna, General Electric Co., Bldg. 500-Rm 218, 1 River Road, Schenectady, N.Y. 12345
Frank J. Lamattina, HQ U.S. Air Force, Bldg. 104,424 Trapelo Rd., Waltham, Mass 02154
Wayne H. Lang, 60 Lee Place, Wellsville, N.Y. 14895
Lewis H. Lanman, Emery Industries, 1300 Carew Tower, Cincinnati, Ohio 45202
Roberts B. Larson, Larson & Taylor, 727 - 23rd Street, South, Arlington, Va. 22202
Roy W. Latham, 6812 Jarvis Ave., Newark, Calif. 94560
Lynn H. Latta, 431 Indio Drive, Pismo Beach, Calif. 93449
Bradford Laughlin, 15410 Artesian, Detroit, Mich. 48223
Don C. Lawrence, Poms, Smith, Lande & Rose, 1888 Century Park East, Suite 1000, Los Angeles, Calif. 90067
James W. Lawrence, 10237 Brigade Dr., Fairfax, Va. 22030
Peter E. Lawrence, 223 Edgemont Drive, Winnipeg, Manitoba, Canada R2J 3H5
Stanton T. Lawrence, Jr., Pennie & Edmonds, 330 Madison Ave., New York, N.Y. 10017
William R. Lawton, 1436 S.E. 12th Ave., Deerfield Beach, Fla. 33441
John M. Leach, Box 544, Walpole, N.H. 03608
Nicholas N. Leach, Morris, Nichols, Arsht & Tunnel, 12th & Market Sts. (P.O. Box 1347) Wilmington, Del. 19899
Michael V. Leahy, Klarman-Leahy Associates, Inc., 9 Boulevard Ave., Greenlawn, N.Y. 11740
James E. Ledbetter, Sandler & Greenblum, 701 S. 23rd St., Arlington, Va. 22202
George F. Lee, Emrich, Lee, Brown & Hill, 150 North Wacker Drive, Chicago, Ill. 60606
Newton H. Lee, Jr., Gradco Systems, Inc., 7 Morgan, Irvine, Calif. 92718
Simon K. Lee, IBM Corporation, Intellectual Property Law, Dept. 951/029, 5600 Cottle Rd., San Jose, Calif. 95193
Susan Lee, Pennie & Edmonds, 1155 Avenue of the Americas, New York, N.Y. 10036
Kleon M. Le Fever, North American Philips Corp., 100 East 42nd Street, New York, N.Y. 10017
Joseph A Legris, 21 Aylesbury Rd., Islington, Ontario Canada M9A 2M3
Edwin C. Lehner, 1224 Hillview Rd., Homewood, Ill. 60430
Michael R. Leibowitz, 125 East 18th Street, Brooklyn, N.Y. 11226
Bernard H. Lemlein, 173 Mason Ter., Brookline, Mass 02146
Lewis J. Lenny, 1301 - 20th St., N.W., Apt. 704, Washington, D.C. 20036
Glenn H. Lenzen, Jr., Cambridge Systems Group, 24275 Elise, Los Altos Hills, Calif. 94022
Henry K. Leonard, 2132 Burroughs Drive, Toledo, Ohio 43614
John E. Leonarz, P.O. Box 12011, Research Triangle Park, N.C. 27709
David H. Leroy, 70 Yuwpo Avenue, Oakland, N.J. 07436
Norton Lesser, Square D. CompaN.Y., 1415 S. Roselle Rd., Palatine, Ill. 60067
Herbert Levine, 522 Hayes Bldg., 2361 Jefferson Davis Hwy., Arlington, Va. 22202
Donald Levy, 1849 B Bough Ave. Clearwater, Fla. 33520
Edward F. Levy, 136 LaSalle Drive, Yonkers, N.Y. 10710
Harry M. Levy, Dithmar, Stotland, Stratman & Levy, Suite 1200, 189 West Madison St., Suite 1200, Chicago, Ill. 60602
Maurice W. Levy, 102 Morningside Rd., Verona, N.J. 07044
Sidney Levy, 4433 Dawn Avenue, La Verne, Calif. 91750
Fred O. Lewis, U.S. Department of Energy, Federal Office Bldg., P.O. Box E, Oak Ridge, Tenn. 37830
Irwin M. Lewis, 1800 N. Alanton Dr., Virginia Beach, Va. 23454
Jon M. Lewis, 205 Coulter Bldg., Greensburg, Pa. 15601
Walter Lewis, 12 Wakefield Rd., Scarsdale, N.Y. 10583
Basil J. Lewris, Finnegan, Henderson, Farabow, Garrett & Dunner, 1775 K Street N.W., Washington, D.C. 20006
John S. Lieb, 4251 N. Brown Ave., Suite A-1, Scottsdale, Ariz. 85251
Bette M. Light, 1191 East 3075 North, North Ogden, Utah 84404
Donald S. Lilly, United States Postal Service, 475 L'Enfant Plaza SW, Washington, D.C. 20260
Merton B. Lilly, 4601 Bristol Ct., Midland, Mich. 48640
Maria C.H. Lin, Celanese Corp., 1211 Avenue of the Americas, New York, N.Y. 10036
Theodore D. Lindgren, GTE Service Corp., One Stamford Forum, Stamford Conn. 06904
Charles M. Lindrooth, Hill, Van Santen, Steadman Chiara & Simpson, 333 N. Wacker Drive, Chicago, Ill. 60606
Roland A. Linger, 6912 Fisk Avenue, San Diego, Calif. 92122
John W. Linkhauer, 1425 Porter Bldg., Pittsburgh, Pa. 15219
Thomas D. Linton, Atrium Bldg., Suite 600, 16530 Ventura Boulevard, Encino Calif. 91436
John J. Lipari, Lipari, Mulken, Keefe & Champi 6 North Avenue, Cranford, N.J. 07016
Carl R. Lippert, 513 Guyasuta Rd., Pittsburgh, Pa. 15215
Joseph H. LipS.C.hutz, 440 E 79, New York, N.Y. 10021
Nelson Littell, Jr., Hammond & Littell, Weissenberger & Muserlian, 420 Lexington Ave., New York, N.Y. 10170
Katherine Lloyd, 34 Chabot Terrace, San Francisco, Calif. 94118
Leslie K. Loehr, 530 Georgine Rd., Fallbrook, Calif. 92028
Hugh L. Logan, 50 Fern Place, Berkeley Heights, N.J. 07922
Morris B. Lore, 851 Seminole Lane, Vero Beach, Fla. 32960
David W. Lotterer, P.O. Box 3175, Gaithersburg, Md. 20878
Regina A. Loughran, Stiefel, Gross & Kurland, 551 Fifth Avenue, New York, N.Y. 10176
Katherine P. Lovingood, 2242 Knollcrest Lane, Knoxville, Tenn. 37920
Frank C. Lowe, Klaas & Law, 738 Pearl Street, Denver, Colo. 80203
Harry R. Lubcke, 2443 Creston Way, Hollywood, Calif. 90068
Louis V. Lucia, 5200 N. Ocean Blvd., Ft. Lauderdale, Fla. 33308
Lawrence M. Lunn, Wick, White & Lunn, 6125 U.S. Highway 31 South, Indianapolis, Ind. 46227
Charles L. Lunsford, 8410 S. Quebec, Tulsa, Okla. 74136
Kenneth G. Lupo, 4407 Vintage Way, Garland, Tex. 75042
Paul F. Lynch, 240 Commercial St., Boston Mass. 02109
Robert D. Lyon, Lyon & Lyon, 611 W. Sixth St., 34th Floor, Los Angeles, Calif. 90017
Gary F. Lyons, 3M Center, P.O. Box 33428, St. Paul, Minn 55133
Thomas F. Lysaught, Jr., GTE Directories Corp., 1865 Miner St., Des Plaines, Ill. 60016
William N. Mace, 69 Kenilworth Avenue, Ottawa, K1Y 375, Canada
Terrence MacLaren, Siemens Corporate Research & Support, Inc. 767 Fifth Avenue, New York, N.Y. 10153
Thomas R. Madden, Reichhold Chemicals, Inc., 525 North Broadway, White Plains, N.Y. 10603
Joseph M. Maguire, St. Regis Paper Company., Technical Center, West Nyack Rd., West Nyack, N.Y. 10994
Frank M. Mahon, Merck & Co., Inc., P.O. Box 2000, Rahway, N.J. 07065
Eugene J. Mahoney, Porter, Wright Norris & Arthur, Suite 1100 37 W. Broad St., Columbus, Ohio 43215

Raymond T. Majesko, Dresser Industries, Inc., 1505 Elm, Dallas Tex. 75201
Frank Makara, 29 Orange Drive, Jericho, N.Y. 11753
Stephen P. Malak, Spring-Mornne, Inc., 2040 W. WiS.C.onsin, Milwaukee, WiS.C.e 53233
Donald Malcolm, 40 East 17th St., Brooklyn, N.Y. 11226
Vincent A. Mallare, Hydrocarbon Research, Inc., 134 Franklin Corner Rd., P.O. Box 6047, Lawrenceville, N.J. 08648
Sara Lynn Mandel, Lyon & Lyon, 611 West Sixth Street, 34th Flr., Los Angeles, Calif. 90017
Debra A. Mangus, 5326 Pocusset Street, #24, Pittsburgh, Pa. 15217
Karl Michel Manheim, 2321 Zeno Place, Venice, Calif. 90291
Jacob A Manian, 39 Acorn Cir. Apt. 202, Towson, Md. 21204
John P. Mann, Dresser Industries Inc., Jeffery Minn. Mach. Div., 274 E. First Ave., Columbus, Ohio 43201
Ralph F. Manning, Allied Corporation, Trumbull Industrial Park, Trumbull, Conn. 06609
Arthur A. March, Rogers, Hoge & Hills, 5350 South DTC Parkway, Englewood, Colo. 80111
James G. Markey, Doyle and Roth Mfg. Co. Inc., 26 Broadway, New York, N.Y. 10004
Frank H. Marks, 4940 East End Avenue, Chicago, Ill. 60615
Thomas M. Marshall, IT&T Corp., 320 Park Ave., New York, N.Y. 10022
Arthur J. Martin, Boone, Knudsen & Martin, P.C., 862 Folsom Street, San Francisco, Calif. 94107
Charles F. Martin, Jr., 928 So. Forrest Dr., Birmingham, Ala. 35209
John T. Marvin, 3 Blythewood Rd., Doylestown, Pa. 18901
Julius Marx, 68 Wooleys Lane, Great Neck, N.Y. 11023
Leonhard F. Marx, 386 Hartshorn Dr., Short Hills, N.J. 07078
Nicholas J. Masington, Jr., Exide Electronics, 2 Penn Center Plaza, Philadelphia, Pa. 19102
Gregory J. Mason, Long Island Rail Road, Jamaica Station, Jamaica, N.Y. 11435
Clinton L. Mathis, 360 Central Building, Seattle, Wash 98102
John J. May, 790 Lucerne Dr., Sunnyvale, Calif. 94086
William E. Maycock, Corning Glass Works, Sullivan Park FR-212 Corning, N.Y. 14831
Eugene D. Mays, Ethyl Corp., 451 Florida Street, Baton Rouge, La 70801
Joseph M. Mazzarese, Kenyon & Kenyon, One Broadway, New York, N.Y. 10004
Shelton B. McAnelly, 1340 Monterrey Blvd., Baton Rouge, La 70815
Roe D. McBurnett, 12970 Ballad Drive, Sun City West, Ariz. 85375
Edward T. McCabe, Swift & Company, 115 Vest Jackson Blvd., Chicago, Ill. 60604
John W. McCaffrey, 1200 Greenwood Avenue, Wilmette, Ill. 60091
Hal H. McCaghren, 120 South Olive Avenue, Suite 555, West Palm Beach, Fla. 33402
James W. McClain, Brown, Martin, Haller & Meador, 110 West "C" Street, 13th Floor, San Diego, Calif. 92101
William T. McClain, Standard Oil Co., 200 East Randolph Dr., Chicago, Ill. 60601
John W. McClenahan, McFadden, Fincham & Co., 251 Bank Street, Suite 503, Ottawa, Ontario, Canada K1P 1X3
Kenneth F. McClure, 306 Lawton St., Falls Church, Va. 22046
John B. McCord, 20 N. Wacker Dr., Rm. 2200, Chicago, Ill. 60606
Michael D. McCoy, Neuman, Williams, Anderson & Olson, 77 West Washington St., Chicago, Ill. 60602
Charles A. McCrae, One Riverside Plaza, P.O. Box 332, Greenup, Ky. 41144
Neil McDermid, Fetherstonhaugh & Co., Montreal Dorval Airport, P.O. Box 248, Dorval, H4Y 1A8 Canada
James V. McDonald, Apt. 312, 2345 N. Craycroft Road, Tucson, Ariz. 85712
Barbara A. McDowell, IBM Corp., Suite 605, 1755 So. Jefferson Davis Hwy., Ste. 605, Arlington, Va. 22202
Ronald K. McFadden, McFadden, Fincham & Co., 251 Bank Street, Ottawa, Ontario K2P 1X3, Canada
Hansel L. McGee, New York City Civil Court, 851 Grand Concourse, New York, N.Y. 10451
Andrew M. McGinnis, 489 Common Street, Belmont, Mass 02178
Clement L. McHale, Westinghouse Electric Corp., 1310 Beulah Road, Pittsburgh, Pa. 15235
Arthur McIlroy, 3425 South Zunis, Tulsa, Okla. 74105
Robert McKay, Pennie & Edmonds, 1155 Avenue of the Americas, New York, N.Y. 10036
James J. McKeever, 20 Flower Lane, Greenwich, Conn. 06830
David D. McKenney, ITT Grinnell Corporation, 260 West Exchange Street, Providence, R.I. 02901
Robert M. McKinney, 52 Ridge Road, Westiminster, Md. 21157
James T. McMillan, McDonnell Douglas Finance Corp., 100 Oceangate, Ste. 900, Long Beach, Calif. 90802
Gary L. McMinimee, Wunschel, Eich & McMinimee, P.C., 805 North Main, Carroll, Iowa 51401
Robert J. McNair, Jr., 2920 Blue Haven Terrace, Cincinnati, Ohio 45238
Warren D. McPhee, Mason, Kolehmainen, Rathburn & Wyss, 20 North Wacker Dr., Chicago, Ill. 60606
Paul F. McQuade, Finnegan, Henderson, Farabow, Garrett & Dunner, 1775 K Street N.W., Washington, D.C. 20006
John T. Meaney, 184 Summer Street, Framingham, Mass 01701
Nina L. Medlock, Baker, Miller, Mills & Murray, 1000 Pacific Place, 1910 Pacific Ave., Dallas, Tex. 75201
Donald W. Meeker, P.O. Box 8 Prudential Center Station, Boston, Mass 02199
Fred L. Mehlhoff, Beckman Instruments Inc., 2500 Harbor Blvd., Fullerton, Calif. 92634
Maureen C. Meinert, Peterson, Ross, S.C.hloerb & Seidel, 200 East Randloph Dr., Ste. 7300, Chicago, Ill. 60601
Angelo J. Mele, 4007 N. 27th St., Arlington, Va. 22209
Thomas P. Melia, Raytheon Missile Systems Division, Hartwell Road, Bedford, Mass 01730
John H. Merchant, 9115 Grant Ave., Manassas, Va. 22110
Kenneth E. Merklen, Gulf & Western Industries, Inc., One Gulf & Western Plaza, New York, N.Y. 10023
Charles F. Meroni, Sr., Hill, Van Santen, Steadman, Chiara & Simpson, 70th Floor Sears Tower, Chicago, Ill. 60606
Henriette Mertz, 5425 East View Park, Chicago, Ill. 60615
John G. Mesaros, 540 N. Golden Circle Drive., Ste. 210, Santa Ana, Calif. 92705
Raymond E. Metter, The Boeing Co., M/S 20-75 P.O. Box 3707, Seattle, Wash 98124
Harold S. Meyer, 1154 Jefferson Ave., Akron, Ohio 44313
Thomas V. Michaelis, 104 Seale Ave., Palo Alto, Calif. 94301
Charles Mikulka, Polaroid Corp., 549 Technology Square, Cambridge, Mass 02139
Calvin H. Milans, Jones, Tullar & Cooper, 2001 Jefferson Davis Hwy., Arlington, Va. 22202
Bennett G. Miller, P.O. Box 155, Cobb Island, Md. 20625
Carl Miller, 3612 Woolworth Bldg., 233 Broadway, New York, N.Y., 10007
Byron D. Miller, Banner, Birch, McKie & Beckett, Sixth Flr., One Thomas Circle, N.W., Washington, D.C. 20005
David B. Miller, Arthur, Dry & Kalish P.C., 1230 Avenue of the Americas, New York, N.Y. 10020
Jeffrey J. Miller, Seed & Berry, 6300 Columbia Center, Seattle, Wash 98104
Robert P. Miller, Western Electric Co., Inc., 2600 Warrenville, Rd., Lisle, Ill. 60532
Roy Miller, 2801 C Ocean Front Walk, San Diego, Calif. 92109
Wm. V. Miller, 145 N. High St., Columbus, Ohio 43215
Allen F. Millikan, 800 West Virginia Ave., Parkersburg, W. Va. 26101
Martha F. Mims, Cox & Smith Inc., 600 NBC Bldg., San Antonio, Tex. 78205
George J. Minish, 614 Eagle Rock Ave., P.O. Box 236, West Orange, N.J. 07052
Cyrus G. Minkler, Harness, Dickey & Pierce, 1500 N. Woodward, Ste. 300, Bloomfield Hills, Mich. 48013
Anthony J. Mirabito, Cesari & McKenna, 312 Union Wharf East, Boston, Mass 02109
George H. Mitchell, Jr., 304 Crystal Plaza One, 2001 Jefferson Davis Hwy., Arlington, Va. 22202
Maurice A. Moffat, Moffat & Co., Ste. 505, 350 Sparks St., P.O. Box 2088 Station "D", Ottawa, Ont., Canada KIP 5W3
Mark Mohler, Townsend & Townsend, Steuart Street Tower, 20th Flr., One Market Plaza, San FranciS.C.o, Calif. 94105
Franklin Mohr, 145 N. Halifax Ave., Apt. 711, Daytona Beach, Fla. 32018

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Donald D. Mondul, Illinois Tool Works, Inc., 8501 West Higgins Road., Chicago, Ill. 60631
James H. Monroe, Pfizer, Inc., 235 E. 42nd St., New York, N.Y. 10017
Ralph G. Monsees, 450 B Street, Suite 1490, San Diego, Calif. 92101
Robert J. Mooney, 736 Second Street Pike, Southampton, Pa. 18966
Philemon J. Moore, Valley Stream Apts., Q-101, Lansdale, Pa. 19446
Davis T. Moorhead, 4 Holiday East, Clemson, S.C. 29631
Marie F. Morency, Rogers, Bereskin & Parr, P.O. Box 313, Commerce Court Postal Station, Toronto, Ont., Canada M5L 1G1
Ethel L. Morgan, Appleby Drive, Bedford, N.Y. 10506
Dennis M. Morganstein, Rose Morgenstern, Schmidt, Dixon & Hasley, Suite 900, Oliver Bldg., Pittsburgh, Pa. 15222
Armand G. Morin, 197 Giddings Ct., San Jose, Calif. 95139
Walter C. Morrison, Route 4, Meadowyck Lane 28, Vincentown, N.J. 08088
Darrell K. Morse, Morse, Clinton & O'Gorman, 7200 - 80th Street South, Cottage Grove, Minn 55016
Jonathan W. Morse, Dow Chemical Co., 1776 Washington, Midland, Mich. 48640
Shirley K. Morse, Krumkill Rd., Slingerlands, N.Y. 12159
David L. Moseley, Arnold, White & Durkee, 750 Bering Drive, Suite 400, Houston, Tex. 77057
Serle I. Mosoff, 22000 Halburton Rd., Beachwood, Ohio 44122
Richard J. Mossburg, Lord Motor Credit Co., P.O. Box 1732, Dearborn, Mich. 48128
Charles J. Moxley, Roe, Fowler & Moxley, 340 East Fourth South, Salt Lake, Utah 84111
George F. Mueller, 701 Knox Road, Villanova, Pa. 19085
Herman S. Muir, 2217 Cambridge Place, Lynchburg, Va. 24503
Edwin C. Mulcahy, Pharmaceutical Mfg. Ass., 1100 15th St.,N.W., Washington, DC 20005
Richard T. Muller, 5 Wall St., Bethlehem, Pa. 18018
Ronald V. Muller, 10736 Blue Ridge Blvd., Kansas City, Mo. 64134
Frederick F. Mumm, Walter, Finestone, Richter & Kane, 10920 Wilshire Blvd., #1400, Los Angeles, Calif. 90024
John S. Munday, 386 Conestoga Rd., Malvern, Pa. 19355
Francis X. Murphy, Pfizer Inc., 235 E. 32nd St., New York, N.Y. 10017
Gerard E. Murphy, AT&T, One Oak Way, Berkeley Heights, N.J. 07922
Peter J. Murphy, 3000 Southland Center, Dallas, Tex. 75291
Allan J. Murray, 3120 Lindenwood Dr., Dearborn, Mich. 48120
Kittie A. Murray, Felfe & Lynch, 805 Third Ave., 25th Flr., New York, N.Y. 10022
Michael M. Murray, Banner, Birch, McKie & Beckett, One Thomas Circle, N.W., Washington, D.C. 20005
Andrea G. Nace, 6208 Garnett Drive, Chevy Chase, Md. 20815
Joseph Nachay, 1975 Bathgate Ave., (2H), Bronx, N Y 10457
John C. Nahrwold, American Bar Association, 1155 E. 60th Street, Chicago, Ill. 60637
Roger Nash, 5123 Cavanagh Road, Los Angeles, Calif. 90032
James R. Naughten, 17485 Almond Rd., Castro Valley, Calif. 94546
William J. Navin, 81 Ivy Way, Port Washington, N.Y. 11050
James L. Neal, Thermo Electron Corp., 101 First Avenue, P.O. Box 459, Waltham, Mass 02254
Charles S. Neave, One Aberystwyth Pl., Binghamton, N.Y. 13905
David L. Neer, 7329 Keeler, Lincolnwood, Ill. 60646
Meyer Neishloss, 1010 Summer Place, Pittsburgh, Pa. 15243
Arthur L. Nelson, Allis-Chalmers Corp., P.O. Box 512, Milwaukee, WiS.C. 53201
Francis D. Neruda, Baeder Neruda Interests, Inc., 1300 Post Oak Blvd., Suite 765, Houston, Tex. 77056
John R. Nesbitt, Purdue Nat'l Bank Bldg., Suite 1014, Lafayette, Ind. 47906
Bruce E. Newell, Enserch Engineers & Constructors, 10375 Richmond Ave., Houston, Tex. 77042
Alan L. Newman, Friedman Homes Inc., 4455 Rowland Ave., Elmonte, Calif. 91731
E. Robert Newman, Henderson & Sturm, 990 Woodmen Tower, Omaha, Neb 68102
Pauline Newman, FMC Corp., 2000 Market Street, Philadelphia, Pa. 19103
Simon M. Newman, 1411 Hopkins St., N.W., Washington, DC. 20036
Theron H. Nichols, 8723 Nairn St., Houston, Tex. 77074
Olaf Nielsen, 1427 Hillandale Dr., Bath, Ohio 49210
Mitchell B. Nisonoff, Mudge Rose Guthrie & Alexander, 20 Broad St., New York, N.Y. 10005
William E. Nobbe, 375 Colony Rd., Rossford, Ohio 43460
William R. Nolte, 191 Baldwin, Birmingham, Mich. 48009
William F. Norris, P.O. Box 470012, Tulsa, Okla. 74147
Richard E. Norton, 300 Central Avenue S.W., Suite 2500-W, Albuquerque, NM 87102
Andrew J. Nugent, 403 Colonial Road, Ridgewood, N.J. 07450
Casmir A. Nunberg, RR#1 Box 167, Rixeyville, Va. 22737
Leslie G. Nunn, Jr., Diamond Shamrock Chemicals Co., 350 Mt. Kemble Avenue, CN 1931, Morristown, N.J. 07960-1931
Neal K. Nydegger, 1332 Sun Valley Rd., Solana Beach, Calif. 92075
Abraham J. Nydick, Stoney Ford Rd., 1008 Morton Towers, 1500 Bay Road, Miami Beach, Fla. 33139
Gerald Richard O'Brien, Jr., Union Carbide Corporation, Old Ridgebury Rd., Danbury, Conn. 06817
Edward F. O'Connor, 121 Witney Ave., New Haven Conn. 06510
James R. O'Connor, TRW Assemblies and Fasteners Group, 31 Burlington Mall Rd., Burlington, Mass 01803
Harry B. O'Donnell, III, Suite 606B Portland Federal Building, 200 W. Broadway, Louisville, Ky. 40202
John A. Odozynski, GTE Services, Inc. 100 Endicott St. Danvers, Mass 01923
Thomas P. O'Hara, Morgan & Finnegan, 345 Park Avenue, New York, N.Y. 10154
Franz O. Ohlson, Aerospace Industries Association of America, Inc., 1725 Desales Street N.W., Washington, D.C. 20036
Robert L. Oldham, 1250 Weathervane Lane, Akron, Ohio 44313
James E. Olds, 7401 Metro Blvd., Suite 445, Edina, Minn 55435
Donald S. Olexa, Brunswick, Corp., One Brunswick Plaza, Skokie, Ill. 60077
Finn G. Olsen, Manchester, 15820 Sharon Valley Rd., Manchester, Mich. 48158
Henry T. Olsen, 6514 N. 85th Pl., Scottsdale, Ariz. 85253
James D. Olsen, Sun Exploration and Production Co., P.O. Box 2880, Dallas, Tex. 75221
Spencer E. Olson, CBS Inc., 227 High Ridge Rd., Stamford, Conn. 06905
Elliot M. Olstein, Carella, Byrne, Bain & Gilfillan, 6 Becker Farm Rd., Roseland, N.J. 07068
John R. O'Malley, University of Florida, Larsen Hall, Gainesville, Fla. 32611
Norman J. O'Malley, 163 Fox Fun Road, New Canaan, Conn. 06840
Thomas R. O'Malley, 4018 Bloomfield Ave., Drexel Hill, Pa. 19026
Herschell C. Omohundro, Sr., 5631 East Windsor Ave., Scottsdale, Ariz. 85257
Harold W. Ordway, Pfizer Inc.,235 East 42nd St., New York, N.Y. 10017
David O'Reilly, 23603 Park Sorrento, Suite 103, Calabasas, Calif. 91302
Gerald J. Orman, 51 Town & Country Business Plaza, 1111 Town & Country Rd., Orange, Calif. 92668
Charles F. Osgood, 508 Gurney Rd., Franklin, Pa. 16323
Milton Osheroff, 1316 Fenwick Lane, Silver Spring, Md. 20910
William E. Otto, Westinghouse Electric Corp., 1310 Beulah Road, Churchill, Pittsburgh, Pa. 15235
Robert P. Outerbridge, Spraco, Inc., 2 East Spit Brook Road, Nashua, N.H. 03060
Bernard Ouziel, 430 Park Avenue, New York, N.Y. 10022
James W. Ove Jr., 50 West 57th Street, Westmonut, Ill. 60559
John L. Palmer, Sr., Eastman Kodak Co., 6300 Cedar Springs Rd., Dallas, Tex. 75235
Warley L. Parrott, P.O. Box 594, Camden, S.C. 29020
David J. Pasz, Kraig, DeWolfe & Pasz, 33 Public Square, Suite 1117, Cleveland, Ohio 44113
Mark G. Paulson, Nabisco Brands Inc., 15 River Rd. Wilton, Conn. 06897
John W. Pease, 1730 Winchester Dr., Winter Park, Fla. 32789
Donald Penprase, 11355 Orrs Ct., Cypress, Calif. 90630

Robert G. Pierce, 2910 S. Glebe Rd., Suite 209, Arlington, Va. 22206
Lloyd E.K. Pohl, 56020 Santa Fe Trail, Suite 0, Yucca Valley, Calif. 92284
Roy M. Porter, Jr., Box 426, 444 E. Main St., Chester, N.J. 07930
William O. Quesenberry, P.O. Box 117, Merry Point, Va. 22513
Joseph J.C. Ranalli, Pennie & Edmonds, 330 Madison Ave., New York, N.Y. 10017
John D. Randolph, 7100 Baltimore Ave., College Park, Md. 20740
Robert C. Rasche, 2437 Federal Ave., Los Angeles, Calif. 90064
David G. Rasmussen, Burroughs Corp., 1235 Jeff. Davis Hwy., Suite 1304, Arlington, Va. 22202
Robert N. Richards, 1130 Lookout Drive., Oxnard, Calif. 93033
Robert J. Rickett, 3304 Skycroft Dr., Minneapolis, Minn 55418
Theodore B. Roessel, 2933 Clover St., Pittsford, N.Y. 14534
Arne Ros, c/o Loichot Army Navy Dr., Arlington, Va. 22202
Sidney N. Rosenfeld, Borg-Warner Corp., Air Conditioning Gp., P.O. Box 1592, York, Pa. 17405
Martha L. Ross, 3540 Van Ness St., N.W., Washington, DC 20008
Edgar E. Ruff, 2809 Wales Rd., Columbia, S.C. 29206
Joseph E. Ryan, 4449 Fondell Dr., Edina, Minn 55435
Kenneth B. Salomon, 1652 Balboa Way, Burlingame, Calif. 94010
Richard I. Samuel, Patlex Corp., 533 S. Avenue W., Westfield, N.J. 07090
Daniel M. Schaeffer, 6 Frederick Dr., Shoreham, N.Y. 11786
George E. Schmitkons, 4511 Simmons Lane, Temple Hill, Md. 20784
Elliot N. Schubert, 10585 Porto Court, San Diego, Calif. 92124
James S. Shannon, 410 Delaware Ave., Dayton, Ohio 45405
Cheryl L. Shavers, 2026 Klamath Ave., #1, Santa Clara, Calif. 95051
William F. Simpson, P.O. Box 1255, New York, N.Y. 10008
Robert G. Slick, 22780 E. Cliff Dr., Santa Cruz, Calif. 95062
Jack L. Slobodin, Cartwright, Sucherman & Slobodin, Inc., 160 Sansome St., Suite 900, San Francisco, Calif. 94104
James J. Smolen, 5959 W. Loop South, Suite 500, Bellaire, Tex. 77401
Edward J. Stachura, 5709 18th Rd., N., Arlington, Va. 22205
John Stan, U.S. Dept. of Navy, Naval Ocean Sys. Ctr., San Diego, Calif. 92152
Frank A. Steinhilper, Stonehedge, Lincoln, Mass 01773
Alan R. Stempel, Hoffmann-La Roche, Inc., Kingsland St., Nutley, N.J. 07110
J. Bruce Synnott, Jr., 4960 Edmondson Pike, #S-4, Nashville, Tenn. 37211
Frederick A. Tecce, 216 W. Pomfret St., Carlisle, Pa. 17013
Charles H. Thieman, Kremblas, Foster, Millard & Watkins, 50 W. Broad St., Suite 3400, Columbus, Ohio 43215
Harry B. Thornton, 1829 Upshur St., N.W., Washington, DC 20011
Peter J. Van Bergen, Schwartz, Jeffery, Schwaab, Mack, Blumenthal & Evans, 111 N. Alfred St., Alexandria, Va. 22314
Robert Velgos, 1211 S. Osage, Barlesville, Okla. 74003
Donald L. Waller, 801 Ironwood Drive, #250, Rochester, Mich. 48063
Dennis J. Williamson, McDougall, Hersh & Scott, 135 S. La Salle St., Chicago, Ill. 60603
Henry O. Wright, 769 Entrada Dr. S., Ft. Myers, Fla. 33907

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90363-9221]
RIN: 0651-AA40

Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, to set forth fees for public access to the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office will provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available), hereinafter referred to as APS-Text, in its Patent Search Room and to T-Search in its Trademark Search Library, located in Arlington, Virginia. Except for a series of pilot experiments which may occur over the next one or two years, the Office does not plan to provide routine remote on-line access to these data bases at any other facilities at the present time. A separate rulemaking process will be followed when the Office determines to provide such remote on-line access.

Both search systems have been made available to the public free of charge since April 3, 1989, for the purposes of education and training (familiarization).

The paper and/or microfilm collections of U.S. patents, foreign patents documents and U.S. trademark registrations continue to be available to the public free of charge, as provided by section 104(b) of Pub. L. 100-703. The Office reaffirms its commitment to hold a public hearing prior to making any decision concerning the elimination of the paper files.

This final rule establishes fees for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.

In response to the notice of proposed rulemaking published in the *Federal Register* on May 3, 1989 (54 FR 18907), and at a public hearing held on June 30, 1989, the Office received many comments regarding problems encountered by the public in the use of T-Search. The Office believes that T-Search has proven effective for searches performed by Trademark examining attorneys in connection with their examination of applications for the registration of marks. Although the Office is establishing a fee for accessing the T-Search system, the Commissioner is immediately suspending collection of that fee to provide additional time for the public to familiarize themselves with T-Search. The Office will provide the public with sixty days notice before starting to collect the fee.

Effective Date: February 12, 1990. Rule 2.6(w) will take effect February 12, 1990 but immediately be suspended by the Commissioner. The Office will provide written notice in the *Federal Register* sixty days before starting to collect fees for accessing T-Search.

For Further Information: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The purpose of this final rule is to establish new fees for the on-line use by the public of APS-Text, and T-Search that are to be provided in the Office's facilities in Arlington, Virginia. This final rule is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which were published in final form in the *Federal Register* on May 3, 1989, at 54 FR 18920. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is authorized by section 31 of the Trademark (Lanham) Act 1946, as amended (15 U.S.C. 1113), and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees, also is presented.

Background: In response to Pub. L. 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve the integrity and quality of Office records; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable trademark examining attorneys to search the data base for registered and

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pending trademarks and associated textual data, including marks containing designs, and to retrieve, display and print all information as a substitute for paper file searches. Trademark examining attorneys have been using T-Search exclusively since January 1988 via a network of approximately 40 terminals. After a six-month experimental T-Search evaluation program conducted between June and December 1988, the capability was deployed for public use in the Trademark Search Library on April 3, 1989.

The T-Search "dead data base", trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. Trademark examining attorneys do not search this data base in connection with examining activities.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from approximately 71 single screen text terminals located throughout the Office. The APS-Text capability was deployed to the public in the Patent Search Room on April 3, 1989.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tubular data and chemical and mathematical equations will be added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained an APS-Text during January 1988, and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches.

A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December 1988. Preliminary review indicated that public users considered T-Search to be useful both as a source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Pub. L. 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest.

The information contained in the automated data bases, which will be available to the public at the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through commercial vendors. The Office believes it to be in the public interest to waive the fee for public access to its text data bases in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term paper, a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate would include an individual doing work for renumeration — e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only when terminals are available. It is not anticipated that fees will be waived for any one individual more than once or twice each year. The Commissioner reserves the authority to control access to the data bases and deny a waiver to any individual.

The waiver policy would apply only to use of the automated system, and not to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual.

Cost Calculations: The Office calculated unit costs for all fees based on OMB Circular A-25 "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. User charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS- Text to the public, the Office followed Congressional direction that fees be resonable by reflecting the marginal cost for providing the new service and not include the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

Prior to preparation of this final rule, all of the cost assumptions and cost calculations were reviewed and modified to ensure that they included the Office's best estimates and projections.

APS-Text

The Office is establishing the $40.00 fee for each hour of terminal session time on APS-Text. The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the three (3) month period March 1990 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected than an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The fee calculations for public access also include the costs for equipment: network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs include a portion of the license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The Office is providing free access time during training on the automated search systems in accordance with ? 104(c) of Public Law 100-703 which reads. "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

The usage rate estimates are based on the three-month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected to be

trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During the three-month study period, use of the three terminals averaged approximately 50 percent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempted to take into account the following factors and assumptions:

1. Future public users, on averge, would use APS-Text less frequently than the 42 frequent users selected for the 1988 study, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) would reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes — the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a workday, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, would provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appeared to be adequate for the foreseeable future.

6. For purposes of actual use of available text terminals, the following estimates were used:

(a) In fiscal year 1990, between four (4) and six (6) terminals would be available during the first quarter. An estimate of 45 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 10 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time was projected.

(b) During fiscal year 1991 and beyond, stable levels of usage were projected to be achieved, yielding an estimated 35 percent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, a total of 286 search sessions per day.

Although usage rates since the system was made available to the public in April 1989 have been higher than projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Terminal Session Time
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 918,196
Hardware & Maintenance	$ 691,289
Software (license fees)	$ 295,676
Site Preparation	$ 38,118
Non-capital Furniture	$ 8,750
Supplies & Forms	$ 3,500
Sub-Total	$ 1,955,529
General & Administrative Overhead	$ 361,773
TOTAL COST	$ 2,317,302
Estimated Use (hours)	65,946
UNIT COST (per hour)	$ 35.14

The marginal cost for one hour of Office staff search assistance on APS-text includes the costs of personnel compensation and benefits.

A summary of the fee calculation is as follows:

APS-Text
Marginal Cost of One-Hour of
Office Staff Search Assistance
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	
TOTAL COST	$ 45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	$ 25.71

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, furniture for the printers, supplies and forms, and general and administrative overhead.

A summary is as follows:

APS-Text
Marginal Cost of
Each Printed Page
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 173,472
Hardware & Maintenance	$ 13,483
Non-capital Furniture	$ 5,000
Supplies & Forms	$ 35,882
Sub-Total	$ 227,837
General & Administrative Overhead	$ 42,150
TOTAL COST	$ 269,987
Estimated Use (pages)	4,496,325
UNIT COST (per page)	$0.060

T-Search

The marginal cost for one hour of terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, maintenance of the T-Search terminals, routine site preparation, supplies and forms, and general and administrative overhead. The Office is establishing the $40.00 fee for each hour of terminal session time on T-Search, but is immediately suspending collection of that fee in order to provide public users additional time to familiarize themselves with the system.

The comments submitted in response to the proposed rule-making indicate that the public users have not adequately adjusted to the T-Search system. During the period collection of the fee is suspended, the public will have an opportunity to better learn the system so as to perform more effective searches than they may be experiencing now. The Office will publish a notice in the *Federal Register* sixty days before it begins collecting a fee for public access to T-Search.

Usage rates for T-Search during fiscal years 1990-1992 were projected to be 28 percent of the hours the system would be available to the public. This rate was extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search, and about 24 to 28 public users were active on T-Search each month. The overall usage rate of these active users was 14 percent of the hours the system was available to the public. In projecting usage rates on which to base a fee amount, it was anticipated that the overall number of users and the usage rate would double once T-Search was made available in the Trademark Search Library to all users of that search facility and training was provided on a routine basis. Although usage rates since the system was made available to the public in April 1989 have been higher projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations are as follows:

T-Search
Marginal Cost of One-Hour of
Terminal Session Time
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 154,451
Hardware & Maintenance	$ 28,809

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Site Preparation	$ 1,000
Supplies & Forms	$ 3,298
Sub-Total	$ 187,558
General & Administrative Overhead	$ 34,698
TOTAL COST	$ 222,256
Estimated Use (hours)	5,985
UNIT COST (per hour)	$ 37.14

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms. A summary of the costs is as follows:

T-Search
Marginal Cost of
Each Printed Page
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 27,862
Hardware & Maintenance	$ 5,274
Supplies & Forms	$ 3,579
Sub-Total	$ 36,715
General & Administrative Overhead	$ 6,792
TOTAL COST	$ 43,507
Estimated Use (pages)	448,875
UNIT COST (per page)	$ 0.097

The proposed fee of $25.00 for each hour of Office staff search assistance to conduct a search using T-Search has been withdrawn. The T-Search system can be used by the public with routine assistance provided by the regular staff of the Trademark Search Library. This is similar to assistance on how to use the paper files now provided free of charge by the Trademark Search Library staff. Office employees will neither work one-on-one with members of the public in conducting searches, nor conducted searches for members of the public.

Rounding Procedures: Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate.

The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

PROCEDURES FOR PUBLIC USE OF APS-TEXT AND T-SEARCH

Patent Search Room Configuration

Initially four (4) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and adminstrative activities. Up to twenty-one (21) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

Trademark Search Library Configuration

Initially three (3) T-Search terminals with associated printers all be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space for control and administration activities. Additional terminals and printers will be added as demand warrants and space permits.

Training

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. For those familiar with automated search systems, a shorter course of six (6) hours is provided. Ten (10) members of the public can be trained during each class. Training is being held at the Office's Arlington, Va. complex during normal work hours.

Four (4) hours of basic training is being offered on the use of T-Search. For those familiar with automated search systems, a shorter course of one (1) hour is available. T-Search training is being held in the Office's Arlington, Va. complex during morning, evening and weekend hours.

Enrollment in all training classes initially was on a lottery basis. Public users who wished to be trained on APS-Text or T-Search were required to submit an application form. The Office is now accepting requests for training and adding the names to the list. As of August 31, 1989, 696 people or 70 percent of all those requesting training have been trained.

System Use and Fee Procedures

To ensure equity of public access to the automated systems, as well an efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules and with all other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Up to three (3) of the initial four (4) terminals in the Patent Search Room and up to two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in the Patent Search Room will be available for walk-up users and for assisted searches for infrequent users. The remaining terminal in the Trademark Search Library will be available for walk-up users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches (in the Patent Search Room) is subject to change based upon operational experience.

All public use of APS-Text and T-Search, with the exception of scheduled training classes, is on a pre-payment basis. In prepaying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalized payment.

Discussion of Specific Rules

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21 is amended to add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21 is amended to add new paragraph (q) to set the fee for a printed copy from APS-Text.

37 CFR 2.6 Trademark fees

Section 2.6 is amended to add new paragraph (w) to set the fees for access to the automated trademark search system (T-Search) and to provide for the waiver of fees under certain circumstances.

Section 2.6 is amended to add new paragraph (x) to set the fee for a printed copy from T-Search.

A final rule package establishing two new fees under the provisions of Pub. L. 100-667, the Trademark Law Revision Act of 1988, has been published which added paragraphs (u) and (v) to section 2.6. Therefore, the rule has been modified from the proposal to add paragraphs (w) and (x) instead of paragraphs (u), (v) and (w).

Response to Comments on the Rules

A notice of proposed rulemaking to establish a basis for the charges for use of the on-line automated search systems in the

Patent Search Room and Trademark Search Library located at the Patent and Trademark Office in Arlington, Virginia was published in the *Federal Register* on May 3, 1989, at 54 FR 18907. Corrections were published in the *Federal Register* on May 12, 1989, at 54 FR 20670. A notice also was published on May 30, 1989, in volume 1102 of the *Official Gazette* of the United States Patent and Trademark Office, pages 94 through 98 for patents, and pages 96 through 100 for trademarks.

A public hearing was conducted on June 30, 1989. A total of 25 comments were received: 24 respondents submitted written comments and five people presented oral testimony (four of whom also submitted written comments) at the public hearing. On the 25 comments, twelve (12) were from individuals, seven (7) from libraries, five (5) from organizations and one (1) from business. All of the written and oral comments were considered in adopting the rules set forth herein.

Many of the comments from the representatives of the Patent Depository Libraries raised questions or commented on the proposed rules from the perspective of their impact on Patent Depository Libraries. The proposed rules and policies set forth in the *Federal Register* Notice of May 3, 1989 are applicable only to the automated search systems provided in PTO's facilities located in Arlington, Virginia. When the Office is prepared to offer the automated search systems at the Patent Depository Libraries, a proposed notice will be published for public comment. Therefore, any comments relating to procedures for accessing the automated search systems in the Patent Depository Libraries will not be addressed at this time.

Comment: Overall, nine respondents acknowledged the usefulness of the automated search systems, particularly APS-Text. Although seven respondents alleged that T-Search is not adequate to meet the needs of the public, that its response time is too slow, and that it is not sufficiently accurate to meet the specific needs of the commentor, most of these respondents acknowledged that T-Search had the potential for being a useful tool. Documentaton of specific problems, for example, those associated with conducting a phonetic search, were provided. Two respondents said that T-Search is flawed and the decision to require examiners to use the system on an exclusive basis was ill-advised and regrettable.

Response: Trademark examining attorneys have been using T-Search for word mark searches since August 1987, and for word mark and design searches since January 1988. The public has been using the system since Apri 3, 1989.

The minutes to the September 27, 1988, meeting of the Public Advisory Committee for Trademark Affairs, express the view that: "...T-Search searches are more thorough than manual searches." The transcript to that meeting contains the following comments: "I don't think there is any question, but a T-Search [sic] properly done gives an excellent result" and "...from the corporate point of view, ... I am pleased to say that I like what I see. I like the very fast action we're getting on the first action." From the transcript to the February 23, 1988 meeting: "I'd like to start with a glowing report. I think that the registration process is working very well. From my own personal experience in terms of what the examiners are doing, they get an A plus. They're really doing a good job."

The concensus of the management of the Trademark Examining Operation is that the T-Search system meets the needs of the Office at this time. There is no indication in any records or activities in the PTO which would indicate that the use of T-Search has caused a deterioration in the quality of searches conducted by Trademark examining attorneys.

The difference between the perceptions of the Trademark examining attorneys and the public may be attributed to several factors; Trademark examining attorneys use the system on a daily basis; they know what the system can do and what it cannot do and avoid the latter; and they know how to utilize the system's functionalities to perform the best search possible. Further, Trademark examining attorneys do different types of searches, and have different needs, than the public. T-Search use statistics for the period April 1989 through August 1989 demonstrate that the public is making extensive use of the system. Following is a summary of those statistics:

Month	Available Hours	Hours Used By Public	Rate of Usage	Average Session Time
April	513	108	21%	13.02 min.
May	513	126	24%	12.25 min.
June	627	183	29%	10.84 min.
July	570	186	33%	12.51 min.
August	656	217	33%	9.66 min.

This usage rate compares favorably to the projected usage rate of 28 percent.

Comment: Seven respondents claimed that the paper Trademark files have been allowed to deteriorate and, therefore, are not reliable for use by the public.

Response: The Office contracts for file maintenance sevices in both the Trademark Search Library and the Patent Search Room. Among the tasks performed by the contractor in the Trademark Search Library are maintaining the pending files, filing newly registered Trademarks, pulling erroneous registrations from the file, etc. The contract for the Trademark Search Library includes a monitoring system based on MIL-STD 105, which is a sampling plan that provides a 97 percent accuracy level. Once the contractor completes a task, Office staff check the required sample levels to ensure that filing was performed accurately. The Office is constantly monitoring the status of the paper files, but notes that maintenance of paper file integrity is subject to inherent limitations.

Comment: In view of the above comments about the inadequacy of the Trademark paper search files and T-Search, six respondents advocated the need for T-Search, at no charge to the user, as an adjunct or back-up to the paper files. One respondent suggested a similar arrangement in the Patent Search Room.

Response: The Office has adopted the $40.00 fee amount for one hour of terminal session time on both APS-Text and T-Search. In order to give the public more time to become familiar with the T-Search system, the Commissioner is immediately suspending collection of that fee. This will enable users to learn the system so as to perform more effective searches. The Office will publish a notice in the *Federal Register* announcing its decision regarding the imposition of the fee at least 60 days before starting to collect the fee amount. At that time, the Office also will publish validated cost estimates based on usage rates and actual costs documented from the present time to the time the decision to collect a fee is made.

Comment: Two respondents claimed that the objective of automation necessarily comtemplated a free search system to give meaning to the constructive notice provisions of the Trademark Act.

Response: Registration of a trademark constitutes constructuve notice and records of all active trademark registrations and pending applications are available for searching free of charge in the paper file and on TRAM (Trademark Reporting and Monitoring System) data base.

Comment: One respondent claimed that PTO is required to provide access to disclosed patent information as the information is made public; four respondents were opposed to the Office charging fees for accessing the automated search systms; two other respondents commented that the Office should not charge fees for using systems designed to be the sole searching source of the public records which the Office is charged by law to provide; and one respondent commented that the proposal to limit access to the automated data bases only to those who can pay a fee is deplorable policy at a time when there is concern about industrial competitiveness with Japan.

Response: The Office will continue to make the paper and/or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations available for pubic access free of charge. The Office also has adopted a policy whereby the hourly terminal session fee for access to the data base can be waived when it is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. In this way, the Office will continue to provide public access to all available information free of charge.

Comment: One respondent commented that user fees for electronic data is a form of dual taxation when information was gathered, organized and produced at taxpayers expense; and two respondents claimed that users of information have contributed up to 30 percent of the $120 milllion for development of the APS system to date — in other words, the public already has paid for APS.

Response: In calculating the proposed fees, the Office is consistent with the Office of Management and Budget's pro-

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posed policy on user charges for Government information products, as clarified in the June 15, 1989 *Federal Register* notice entitled "Second Advance Notice of Further Policy Development on Dissemination of Information." In that notice, OMB's stated policy is that user charges for Government Information products should be no higher than a level sufficient to recover the costs of disseminating, not collecting, the information.

The costs associated with the fees for accessing APS-Text and T-Search are directly related to the public's use of the systems; for example, the costs associated with the acquisition of the APS-Text terminals that are being used by the public. No costs associated with designing or installing the automated system for use by Office examiners, or the development of the new systems have been included. Neither have costs been included for gathering, organizing or producing information.

The *Federal Register* notice of June 15, 1989 (54 FR 25554, 25558) dealing with policy development on dissemination of information states that: "As to double taxation, OMB notes that user charges policy has a basis in statute (31 U.S.C. 9701), and the Congress has not viewed user charges as double taxation because they are applied when the recipient receives special benefits."

Comment: Two respondents stated that Government information is the same, whether it is provided in printed or electronic form.

Response: Charging fees for access to the automated search systems is consistent with PTO's fee policy. For example, fees are charged for manual search services (e.g., for a search of Office records or for a search of assignment records), and for printed copies of patents and trademarks and for copies of Office documents.

Comment: The Japanese system is available at four locations at no cost, and includes U.S. information made available at U.S. taxpayer expense.

Response: The Japanese automated search system, like the automated search systems in the PTO's search facilities, is being made available free of charge at the present time. The costs of such use, however, are being paid from general fee revenues collected by the Japanese Patent Office. Additionally, the APS-Text system currently includes Japanese English language abstracts and the Office is in the process of acquiring Japanese patent information in digital facsimile form.

Comment: One respondent commented that PTO has no responsibility to provide an expensive, complex, internal Government on-line value-added computer service, that this is far beyond the requirements of public access to patent files; and another respondent commented that it is in the public interest to have the same system that is being used by the examiners also available to the public.

Response: The Office agrees that it is in the public interest to provide the same search system capability to the public that is being used by the examiners.

Comment: One respondent stated that providing free access is not competing with the private sector, and that there always is a place for the private sector to provide value-added information.

Response: The user charges adopted for public access to the APS-Test and T-Search systems are consistent with OMB Circulars A-25 "User Charges" and A-130 "Management of Federal Information Resources", and with the PTO's Electronic Data Dissemination Policies and Guidelines. The PTO's user's fees are designed to recover the marginal costs associated with providing access to the automated search systems to the public.

Comment: Five respondents stated that the proposed fees are not "reasonable" and the Office does not have documented cost estimates and usage rates to support the proposed fee amounts.

Response: The Office is meeting Congressional direction to establish "reasonable" fees by recovering only the marginal costs associated with providing public access to the automated search systems. Costs and projected usage rates were determined from the best available records, for example, financial statements for the Office and the results of the public evaluations of the APS-Text and T-Search systems. A summary of the costs used in the fee calculations is included above under "Cost Calculations." Full details of these cost calculations are available for public inspection at the Patent and Trademark Office in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.

Comment: Two respondents questioned the proposed fees for search assistance. If the search assistance is similar to that which is provided free now, there should be no fee. If the search assistance entails doing searches, the Office should not be getting into that business.

Response: The PTO is withdrawing the proposed fee for staff search assistance to conduct a search using T-Search capabilities. The fee for staff search assistance to conduct a search using APS-Text capabilities is being adopted, because an untrained user cannot conduct a search without significant help from Office staff. Users of course, have the option of obtaining free training on the system.

Comment: One respondent commented that user fees cannot be justified under the theory that electronic search provides a new service or offers an enhancement to the public's ability to search the patent data base, and that the public has an option of paying the fee or using the paper files. Another respondent commented that APS-Text and T-Search represent enhancements to services already provided.

Response: The fees are specifically authorized under $ 104 (c) of Pub. L. 100-703 and are calculated to allow recovery of only the marginal cost for providing the system to the public.

Comment: Two respondents claimed that the Office should ask Congress for funding to offer free access here and at the PDLs.

Response: It continues to be PTO policy, consistent with OMB Circular A-130, that costs for access to the automated search systems be borne by those who actually use the automated search systems.

Comment: One respondent claimed that the accuracy of the trademark data base is suspect.

Response: All of the backfile data base elements (registrations issued prior to September 9, 1980) have been corrected except owner information. As originally planned, the owner field will be cleaned up the active registrations issued prior to September 9, 1980. It is projected that this owner field will be cleaned up by the third quarter of fiscal year 1991.

Comment: Three respondents claimed that the public requires access to the dead data base.

Response: The Office will consider this proposal further. The dead data base is now available in electronic format for all applications and registrations that were active on January 1, 1983 and are now inactive. However, many of these records are of poor quality. Costs for cleaning up these records would be significant, and those costs would likely be reflected in the T-Search user fee.

Comment: Four respondents addressed the fee waiver policy. The proposal to waive fee appears inconsistent wih PTO's position that the free paper search files provide an equal and viable resource to anyone not wanting to pay for the automated files. If paper records are inferior, then anyone seeking access to T-Search should be able to qualify for the fee waiver. If the paper records are adequate, then there should be no need to waive the access fee for anyone.

Response: The waiver policy authorized by Pub. L. 100-703 is designed for those individuals who, for some reason in the public interest, such as an educational purpose, need the capabilities of the automated system, for example, to manipulate the data.

Comment: One respondent commented that the procedure to enroll people in training classes by the use of a lottery was unfair and that everyone who wants to be trained should be enrolled.

Response: The lottery was a method for establishing the initial schedules to provide training. Everyone who requests training will be trained. As of August 31, 1989, 449 out of 623 people requesting training on APS-Text, and 247 out of 376 people requesting training on T-Search have been trained.

Comment: One respondent commented that advance registration is an unrealistic approach for many searchers.

Response: At least one terminal in the Patent Search Room and one in the Trademark Search Library will be available for walk-up users. The other terminals will be available first for users with a reservation and then, if needed, for walk-up users. The system is designed to ensure equity of public access to the automated systems.

Comment: Two respondents asked for information justifying that this is not a "Major Rule" as defined by Executive Order 12291, and that the rule will not have a significant adverse impact on small entities.

Response: The no "major rule" determination and no significant adverse impact on small entities was based on the fact that the automated systems are being offered only at the Patent and Trademark Office's public search facilities located in Arlington, Virginia. The total number of users of these facilities averages less than 400 a day, and many of these users are members of law firms or commercial search services. The annual effect on the economy is expected to be about $1 million, far less than the $100 million annual threshold specified in the Executive Order. The fees for accessing the automated search systems are reasonable and should not burden small entities and, at the same time, the Office is continuing to maintain the paper search files which are available to the public free of charge. Finally, there should be no significant adverse effects on competition, because the systems are being offered only at one location, the Patent and Trademark Office in Arlington, Virginia, and the public may continue to use paper files without payment of any fee.

Comment: Five respondent commented that user fees burden small entities and run counter to a fundamental objective of the patent system which is to advance technology through dissemination of the technical information contained in patents.

Response: The Office does not believe that the fee amounts adopted will burden small entities or negatively impact the dissemination of technical information. The Office also will continue to maintain the paper search files using taxpayer funds, and provide access to the public free of charge. Further, the Office has adopted a fee waiver policy whereby the fee amount can be waived where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. Full details are included above under "Background".

Comment: One respondent commented that the Office needs a policy to ensure that no user of the patent and trademark information is disenfranchised due to an inability to pay for the services necessary to its access.

Response: The Commissioner will consider a fee waiver for users with a genuine financial hardship.

Other Considerations:

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rules make the Office's on-line, automated patent full-text search and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Parts 1 and 2

37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the permeable, the Office is proposing to amend Title 37 of the code of Federal Regulations, Chapter 1, as set forth below.

PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is amended by adding new paragraphs (o)-(q).

§1.21 Miscellaneous fees and charges.

* * * * *

(o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waiver the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest $40.00

(p) Marginal cost, paid advance, for each hour of Office staff search assistance to conduct a search using Automated Patent System full-text search capabilities (APS-Text), prorated for the actual time used $25.00

(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal $0.10

PART 2- RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by adding new paragraphs (w)-(x).

§2.6 Trademark fees

* * * * *

(w) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest $40.00

(x) Marginal cost, for each printed page generated from the T-Search terminal $0.10

Dec. 4, 1989

JEFFREY M. SAMUELS
ActingCommissioner of Patents and Trademarks

PATENT AND TRADEMARK OFFICE
Docket No. 91281-9281
EXTENSION OF EXISTING INTERIM ORDERS

Agency: Patent and Trademark Office
Action: Extension of existing interim orders issued under section 914 of the Semiconductor Chip Protection Act (SCPA), 17 U.S.C. 914.
Summary: The Assistant Secretary and Commissioner of Patents and Trademarks has determined that the existing interim orders issued under section 914 of the SCPA should be extended.
Date: Existing interim orders for Japan and Sweden are hereby extended until July 31, 1991. Interim orders for the Member States of the European Communities, Australia, Austria, Canada,Finland and Switzerland are extended until December 31, 1990.
Address: Address correspondence to Assistant Commissioner for External Affairs, United States Patent and Trademark Office, Box 4, Washington, D.C. 20231.

For Further Information Contact: Michael K. Kirk, Assistant Commissioner for External Affairs, United States Patent and Trademark Office, Box 4, Washington, D.C. 20231.

Supplementary Information: The Commissioner of Patents and Trademarks has been delegated the task of determining when and under what conditions interim protection in the United States will be extended under section 914 of the SCPA to foreign "mask works," the series of related images representing a three-dimensional pattern in the layers of a semiconductor chip. In international parlance, mask works are also known as "integrated-circuit layout designs" or as "topographies." To be eligible for interim mask work protection, it must be established that a foreign government is making good faith efforts and reasonable progress toward establishing a regime of protection substantially similar to that established under the SCPA, and that U.S. mask works are not subject to unauthorized distribution or commercial exploitation in the country concerned.

The Congress extended the Executive's authority to issue interim orders until July 31, 1991. Pub.L. 100-159 (1987). In doing so, Congress expressed its belief that "this process is promoting the protection of U.S. mask works abroad." H.R. Rep. No. 100-388, 100th Cong., 1st Sess. (1987).

Interim orders have been issued extending protection to 19 States. *See* 54 FR 13931 (April 6, 1989); *see also* 54 FR 22351 (May 23, 1989). Among those countries, Japan, Sweden, Austria and several Member States of the European Communities (EC) have laws in force.

On September 26, 1989, a Notice of Initiation of Proceeding was published at 54 FR 39491, whereby the Commissioner requested comments on the extension of interim orders issued under section 914. To allow sufficient time for a thorough review in the present proceeding, the Commissioner also extended the expiration date for the existing orders until December 31, 1989.

Comments were received from the Governments of Australia and Canada.

Summary of Comments

In its comments, the Government of Australia states that the "Circuit Layouts Act 1989" was passed by the Australian Parliament in May 1989. The Act, which will come into force sometime during 1990, will extend protection to mask works first commercially exploited in the United States, and works made by a U.S. citizen, national or resident. Prior to the Act's effective date, U.S. mask works will be protected on the basis of national treatment as artistic works under the "Copyright Act 1968.

The Government of Canada notes that a bill for the protection of "integrated-circuit topographies" is now being finalized and will be introduced in the Canadian Parliament in the near future, having been approved by the Canadian Cabinet in May 1988. The Canadian Government refers to the May 1989 diplomatic conference held in Washington under the auspices of the World Intellectual Property Organization (WIPO) to conclude a treaty for the protection of integrated-circuit layout designs. The Government states that its delegation was among those that sought to achieve a multilateral instrument that set adequate and effective minimum standards of protection. The compromises reached at the diplomatic conference, however, especially on the issues of compulsory licensing and term of protection, led Canada to reject the treaty, as did the United States and Japan. The Canadian Government affirms its hope that negotiations on trade-related aspects of intellectual property rights (TRIPS) within the General Agreement on Tariffs and Trade (GATT) will establish adequate standards of protection for integrated-circuit layout designs.

Discussion and Findings of the Commissioner

When the Commissioner last extended the interim orders in April 1989, he noted that all countries then subject to interim protection had closely cooperated with the United States to work toward establishment of the new "Treaty on Intellectual Property in Respect of Integrated Circuits," then under preparation within the WIPO. *See* 54 FR at 13932. In May 1989, a diplomatic conference for conclusion of the WIPO treaty was held in Washington at the invitation of the United States. Despite years of careful preparatory work intended to produce an effective multilateral system of chip layout-design protection, substantial compromises struck at the diplomatic conference resulted in a treaty with levels of protection that fall below international norms reflected in the laws of those countries subject to section 914 orders that have enacted chip protection legislation.

Among the treaty's deficiencies are a term of protection of insufficient duration, lack of sufficient negotiating history to support a clear prohibition against importation of products containing infringing chips, absence of any obligation for innocent infringers to pay a royalty after notice of infringement, overly-broad compulsory licensing provisions, and an inadequate framework for dispute settlement among signatories.

As has been noted by Representative Robert W. Kastenmeier, Chairman of the House Subcommittee on Courts, Intellectual Property and the Administration of Justice, the transition provisions in section 914 were "intended to encourage the rapid development of a new worldwide regime for the protection of semiconductor chips." 133 Cong. Rec. E1283 (daily ed. April 6, 1987). The legislative history of section 914 evinces Congressional intent that the Executive use the issuance of interim protection orders as a means to encourage other nations to move expeditiously to establish regimes with levels of protection substantially similar to the SCPA. *See* H.R. Rep. No. 100-388, *supra*, at 3-4 (1987).

Based on the information available in this proceeding, the Commissioner has determined that the interim protection orders for Japan and Sweden should be extended until the expiration of statutory authority to grant such orders under section 914, that is, until July 31, 1991. Those countries have enacted laws providing protection on a level substantially similar to that of the SCPA, these laws have been in force for longer than one year, and practice under the laws reveals a high degree of effective protection for U.S. mask works.

The interim protection orders for all other countries — the Member States of the EC, Australia, Austria, Canada, Finland and Switzerland — will be extended for one year, until December 31, 1990. This will enable the Commissioner to review chip protection legislation as it comes into force in those countries, and as practice under such legislation evolves. The Commissioner notes with approval that legislation is nearing completion in all countries subject to section 914 orders, and that the legislative texts reviewed would establish protection substantially similar to the SCPA.

In regard to the Member States of the EC, the Commissioner notes that legislation is already in force in a majority of the States. Interim orders for all twelve States will be extended for one year, however, to permit the Commissioner to evaluate the system of chip design protection to be provided in the Community as a whole when all laws are in place.

No evidence has been presented that nationals, domiciliaries or sovereign authorities of any country subject to interim protection orders are engaged in the misappropriation, unauthorized distribution, or unauthorized commercial exploitation of mask works.

ORDER EXTENDING THE EXPIRATION DATE FOR INTERIM PROTECTION ORDERS ISSUED UNDER CHAPTER 9 OF TITLE 17, UNITED STATES CODE

In accordance with the authority vested in me by Amendment 2 to Department Organization Order 10-14 regarding 17 U.S.C. 914, and based on the record of this proceeding commenced on September 26, 1989, I find that the governments of Australia, Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom have made and are making good-faith efforts toward providing protection for U.S. mask works. I find further that nationals, domiciliaries, and sovereign authorities of those countries, and persons controlled by them, are not engaged in the misappropriation, unauthorized distribution or unauthorized commercial expolitation of mask works. I find further that the extension of the expiration dates for interim orders will promote the purposes of the Semiconductor Chip Protection Act of 1984 and international comity with respect to the protection of mask works.

Accordingly, the existing interim orders for Japan and Sweden are hereby extended and shall terminate on July 31, 1991. The existing interim orders for Australia, Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Switzerland and the United Kingdom are hereby extended and shall terminate on December 31, 1990.

December 30, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

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PATENT NOTICES

Certificates of Correction For Week of January 2, 1990

PP. 6,633	4,787,031	4,811,306	4,822,849
PP. 6,752	4,788,121	4,812,320	4,822,866
D. 296,725	4,788,649	4,812,384	4,823,011
4,309,442	4,789,618	4,812,530	4,823,278
4,431,328	4,790,610	4,812,556	4,823,352
4,575,667	4,791,241	4,812,562	4,823,471
4,624,687	4,791,448	4,812,676	4,823,478
4,628,240	4,791,469	4,813,576	4,823,733
4,648,020	4,792,068	4,814,690	4,823,804
4,691,245	4,792,320	4,814,705	4,823,958
4,693,265	4,792,615	4,814,784	4,824,049
4,701,170	4,792,853	4,816,551	4,824,078
4,701,172	4,794,236	4,816,709	4,824,089
4,701,174	4,794,348	4,816,934	4,824,864
4,701,176	4,794,691	4,817,065	4,825,227
4,705,039	4,795,407	4,817,635	4,825,232
4,715,881	4,801,341	4,817,719	4,825,319
4,721,723	4,801,344	4,817,784	4,825,342
4,725,960	4,801,442	4,817,821	4,825,693
4,734,246	4,801,462	4,817,845	4,826,126
4,742,070	4,801,468	4,817,931	4,826,413
4,744 650	4,801,572	4,817,995	4,826,446
4,745,625	4,801,715	4,818,051	4,826,561
4,750,211	4,803,079	4,818,098	4,826,970
4,752,878	4,803,386	4,818,274	4,827,006
4,758,347	4,803,515	4,818,696	4,827,110
4,761,132	4,803,827	4,818,745	4,827,446
4,765,070	4,804,921	4,818,754	4,828,928
4,774,542	4,805,069	4,819,182	4,829,275
4,777,104	4,805,086	4,819,933	4,829,961
4,779,944	4,805,433	4,819,976	4,831,636
4,780,126	4,806,670	4,820,095	4,837,295
4,780,404	4,809,217	4,820,588	4,844,235
4,781,032	4,809,557	4,820,704	4,845,396
4,782,481	4,809,625	4,820,891	4,848,091
4,784,487	4,809,957	4,821,912	4,877,491
4,785,017	4,811,047	4,822,373	4,884,998
4,786,424	4,811,206	4,822,592	

Disclaimers

4,597,001.—*Jacob C. Bortscheller*, Ballaston Spa; *Jack D. Kingsley*, Schenectady; *William W. Piper*, Scotia, all of N. Y. THIN FILM FIELD-EFFECT TRANSISTORS WITH TOLERANCE TO ELECTRODE MISALIGNMENT. Patent dated June 24, 1986. Disclaimer filed Oct. 23, 1989, by the assignee, General Electric Company.

Hereby enters this disclaimer to all claims of said patent.

4,666,457.—*Michael E. Hayes*, Fernandina Beach; *Kevin R. Hrebenar*, Jacksonville; *James F. Deal,III*, Amelia Island; *Paul L. Bolden,Jr.*, Fernandina Beach, all of Fla. METHOD FOR REDUCING EMMISSIONS UTILIZING PRE-ATOMIZED FUELS. Patent dated May 19, 1987. Disclaimer filed Oct. 17, 1989, by the assignee, Petroleum Fermentations N. V.

The terms of this patent subsequent to Oct. 21, 2003, has been disclaimed.

4,714,112.—*Andrew Nigrini*, La Habra Heights; *Liming Hseuh*, Beuna Park, both of Calif. METHOD FOR CONTROLLING ROCK DISSOLUTION AND PIPE CORROSION DURING OIL WELL STEAM INJECTION. Patent dated Dec. 22, 1987. Disclaimer filed Oct. 13, 1989, by the assignee, Chevron Research Company.

Hereby enters this disclaimer to the entire term of said patent.

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PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF November 18, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110...D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120...S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130... R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150...J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180...J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210...D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220...K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230...G. GOLDBERG, Director	11-16-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240...TRYGVE M. BLIX, Director	6-7-88-88AND
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250...EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	9-21-87
DESIGN, GROUP 290...K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310...B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320...N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330...J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340...C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350... A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during November 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,702,012 to 3,704,468 inclusive
Plant Patents ..... None

REEXAMINATIONS

JANUARY 2, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,545,780 (1190th)
APPARATUS AND METHOD OF MAKING CARTONS
William E. Martin, 6378 N. McKinley, Flushing, Mich. 48333
Reexamination Request No. 90/001,693, Jan. 23, 1989.
Reexamination Certificate for Patent No. 4,545,780, issued Oct. 8, 1985, Ser. No. 456,550, Jan. 10, 1983.
Continuation-in-part of Ser. No. 377,345, May 12, 1982, abandoned.
Int. Cl.[4] B31B *1/10, 1/88*
U.S. Cl. 493—11

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-18 is confirmed.

7. Apparatus for making printed corrugated boxes comprising: means for making a corrugated web of single-backed paper, means for printing a continuous web of material with uniformly spaced areas of printing, means bonding said single-backed web and printed web together to form a corrugated continuous printed web, a conveyor for transporting said corrugated continuous web continuously and at a speed varying between minimum and a maximum, a reciprocating press including dies engageable with said web to cut and score a blank for forming a box, said press being reciprocated continuously at a substantially uniform rate, supply means operable to deliver said web to said press, means for sensing said areas of printed material on said web for regulating the speed of said supply means in timed sequence with said press, accumulator means between said conveyor and said supply means for receiving and storing a variable length of said continuous printed web in a draped condition between said conveyor and said supply means, and means sensing the length of web in said accumulator means and operative to control the rate of delivery of said web from said conveyor to said accumulator means.

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STATUTORY INVENTION REGISTRATIONS

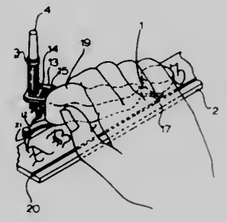
PUBLISHED JANUARY 2, 1990

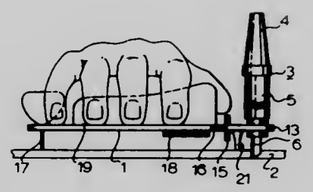
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H720
SIMPLIFIED LETTERING SYSTEM

Andrew J. Lomascio, 448 San Fernando Dr., Palm Springs, Fla. 33461

Filed May 9, 1988, Ser. No. 191,426
Int. Cl.[4] B43L *13/10*
U.S. Cl. 33—23.04 3 Claims





1. A lettering system which facilitates the production of Old English characters on a receiving surface, comprising:

(a) an Old English template having thin lines and being of elongate rectangular shape and having equidistantly situated characters at the frame surface as well as a bottom surface exposed guideline to support a scriber guide pin;

(b) a finger contoured and hand manipulable scriber having a pivotal arm equipped with a downwardly projecting tracer pin at its end, having a pivotal arm with a slideable locking fastener to secure a lettering pen, and both pivotal arms being secured by a screw clamp, and a downwardly projecting guide pin for engaging the template guideline; and

(c) a lettering pen having situated at its top end, a cartridge ink reservoir, an intermediately disposed cylinder which houses the ink reservoir plunger, a needle solidly affixed to the plunger at its top end and extended into the pen nib at its bottom end,

the improvement in which consists of a rectangular shaped chisel point pen nib equipped with a longitudinally and centrally disposed capillary ink channel that axially terminates at a bottom most semi-ellipsoidal detent in the nib.

H721
PRODUCTION OF 10 MICRON DIAMETER HOLLOW CERAMIC FIBERS

Barry W. McQuillan, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 5, 1988, Ser. No. 220,136
Int. Cl.[4] B05D *3/00*
U.S. Cl. 264—56 8 Claims

1. A method for making a hollow ceramic fiber, comprising the steps of:

(a) providing a low density ceramic fiber;

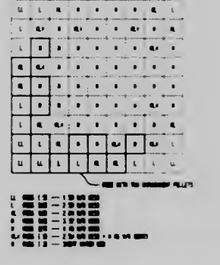
(b) soaking the ceramic fiber in a sintering aide; and,

(c) heating the fiber to make a hollow ceramic fiber.

H722
NUCLEAR REACTOR FUEL WITH RADIALLY VARYING ENRICHMENT

George A. Soder, Bellevue, and James L. Maryott, Richland, both of, assignors to Advanced Nuclear Fuels Corporation, Bellevue, Wash.

Filed Sep. 30, 1988, Ser. No. 252,292
Int. Cl.[4] G21C *3/16, 3/32*
U.S. Cl. 376—428 1 Claim



1. A nuclear reactor fuel assembly, comprising:

a cylindrical fuel cladding tube having a longitudinal axis, and

fissionable nuclear fuel inside said tube, said fuel comprising an enriched material, the concentration of the enriched material being less in the radial region of the longitudinal axis than in the radial region remote from the longitudinal axis.

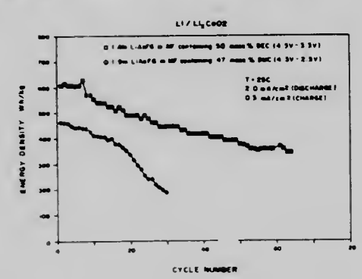
H723
LITHIUM ELECTROCHEMICAL CELL CONTAINING DIETHYLCARBONATE AS AN ELECTROLYTE SOLVENT ADDITIVE

Edward J. Plichta, Freehold, and Steven M. Slane, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 6, 1988, Ser. No. 215,664
Int. Cl.[4] H01M *6/16*
U.S. Cl. 429—197 5 Claims

1. An electrochemical cell comprising lithium as the anode,

the lithium intercalating compound Li_xCoO_2 ($0<x<1$) as the cathode, and a solution of a lithium salt in a mixed organic



solvent of methylformate and diethylcarbonate as the electrolyte.

H724

BLENDS OF THERMOPLASTIC POLYMERS AND MODIFIED BLOCK COPOLYMERS

William P. Gergen, 11311 Hylander St., Houston, Tex. 77007; Robert G. Lutz, 632 Vista Grande Pl., Santa Rosa, Calif. 95401; Carl L. Willis, 15922 Red Willow, Houston, Tex. 77084, and Lorelle A. Pottick, 727 Bunker Hill Rd. #48, Houston, Tex. 77024

Continuation-in-part of Ser. No. 766,215, Aug. 16, 1985, Pat. No. 4,783,505, and a continuation-in-part of Ser. No. 766,216, Aug. 16, 1985, Pat. No. 4,797,447. This application Feb. 17, 1988, Ser. No. 157,350

Int. Cl.[4] C08L *53/00*

U.S. Cl. 525—92 **32 Claims**

1. A multiphase polymer composition comprising:

(a) one phase containing at least one condensation polymer; and

(b) at least one other phase containing at least one functionalized block copolymer to which has been grafted on the average an effective amount of amin ®functional groups for toughening said multiphase polymer composition, said composition comprising:

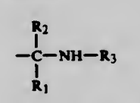
(1) a base block copolymer which comprises

(i) at least one polymer block A, said A block being at least predominantly a polymerizing alkenyl arene block, and

(ii) at least one selectively hydrogenated polymer block B, said B block prior to hydrogenation being at least predominatly a polymerized conjugated diene block, and

(2) wherein substantially all of said amine functional groups are grafted to said base block copolymer on said A blocks, and

(3) wherein said amine functional groups are represented by the general formula



wherein R_1 and R_2 are the same or different alkyl, cycloalkyl or aryl radicals and wherein R_3 is a hydrogen, alkyl, cycloalkyl, aryl or silyl radical, and

(c) said one phase (a) being present in a weight ratio of about 99:1 to about 1:99 relative to said at least one other phase (b).

H725

UREIDO AMINO AND IMINO ACIDS, COMPOSITIONS AND METHODS FOR USE

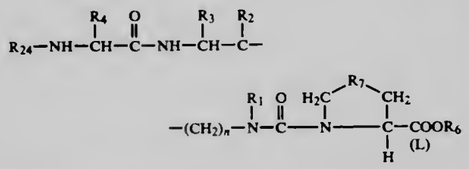
Eric M. Gordon, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 26, 1987, Ser. No. 19,469

Int. Cl.[4] C07D *207/09*

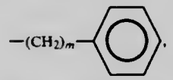
U.S. Cl. 548—533 **6 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein

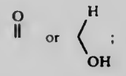
R_1 is hydrogen, lower alkyl,



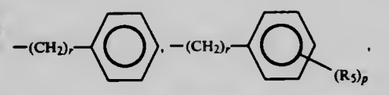
$-(CH_2)_m$-cycloalkyl, $-(CH_2)_2-NH_2$, $-(CH_2)_3-NH_2$, $-(CH_2)_4-NH_2$;

n is one or two;

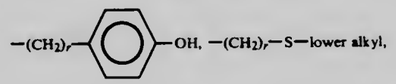
R_2 is



R_3 and R_4 are independently selected from hydrogen, lower alkyl,

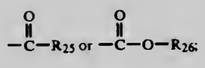


$-(CH_2)_r$-cycloalkyl, $-(CH_2)_r-NH_2$, CF_3,

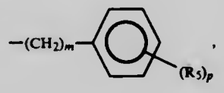


$-(CH_2)_r-NH-C(=NH)-NH_2$, or $-(CH_2)_r-C(=O)-NH_2$;

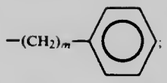
R_{24} is hydrogen,



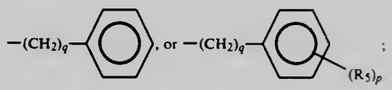
R_{25} is hydrogen, lower alkyl,



$-(CH_2)_m$-cycloalkyl, or



R_{26} is lower alkyl, $-(CH_2)_q$-cycloalkyl,



m is zero or an integer from 1 to 4,

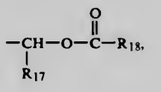
r is an integer from 1 to 7,

q is an integer from 1 to 4,

R_7 is hydrogen or lower alkyl;

R_5 is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy,

R_6 is hydrogen, lower alkyl, benzyl, benzhydryl, alkali metal salt ion, alkaline earth metal salt ion



or $-(CH_2)_2Si(CH_3)_3$; and

p is one, two or three provided that p is more than one only if Rs is methyl, methoxy, chloro, bromo or fluoro.

H726

2,4-BIS-ARYLOXY-M-PHENYLENEDIAMINES AND THEIR USE AS COUPLERS IN OXIDATION DYE COMPOSITIONS

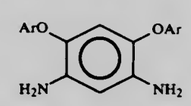
Keith C. Brown, New Canaan, and James E. Kijek, Danbury, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Jan. 9, 1987, Ser. No. 1,721

Int. Cl.[4] C07C *93/14, 149/42*

U.S. Cl. 564—428 **15 Claims**

1. A compound of the formula:



wherein the Ar's are the same or different and are substituted or unsubstituted aryl radicals, selected from the group consisting of phenyl groups substituted with one or more of dialkyl, amino, alkoxy, hydroxyalkoxy, halo, and hydroxy groups and substituted or unsubstituted naphthyl groups wherein the substituents on the naphthyl group are one or more groups selected from the group consisting of C_{1-5} alkoxy groups, C_{1-5} hydroxy alkyl groups containing 1 to 5 amino, halo, or hydroxy groups, and mixtures thereof.

H727

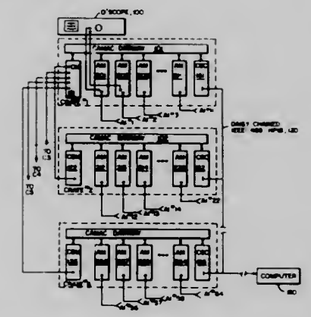
PATIENT MONITORING DEVICE

George E. Pax, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1988, Ser. No. 198,951

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413.05 **6 Claims**



1. A data acquisition system comprising:

a plurality of inputs, each of which is capable of monitoring a life function of a patient and outputting analog signals indicative of acquired signals;

a means for processing said analog signals, from said plurality of inputs, into filtered digital signals, said processing means filtering said analog signals to attenuate unwanted frequencies above and below a range of interest to produced filtered analog signals, said processing means converting said filtered analog signals into said filtered digital signals;

a memory which receives and stores said filtered digital signals;

a means for controlling the data acquisition system, said controlling means receiving and conducting the filtered digital signals from the processing means to the memory; and

a means for displaying the analog signals, said displaying means being electrically connected with and displaying said analog signals received by said processing means.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,138

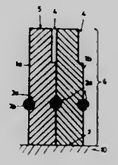
ROLL MANUFACTURING METHOD AND ROLL, PARTICULARLY FOR PAPER MACHINES

Vaino Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Finland

Original No. 4,104,773, dated Aug. 8, 1978, Ser. No. 802,316, Jun. 1, 1977. Continuation of Ser. No. 165,055, Jul. 1, 1980, abandoned. Application for reissue Jul. 25, 1984, Ser. No. 634,062

Int. Cl.[4] B30B *3/00*

U.S. Cl. 29—127 9 Claims



9. In a roll of the type which is adapted to be used in a paper machine, an inner roll body of cylindrical configuration having an elongated central axis and an exterior cylindrical surface, and an elongated strip having successive portions circumferentially surrounding said inner roll body and engaging said exterior surface thereof with said circumferential portions of said strip having opposed side surfaces, said opposed side surfaces of successive circumferential portions of said strip respectively being formed with registering grooves, and an elongated interlocking member situated in said registering grooves.

Re. 33,139

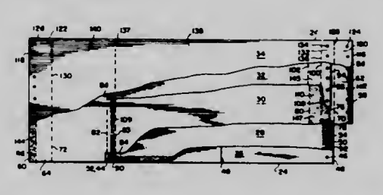
PACKING FORM

Robert E. Ashby, Quakertown, Pa., assignor to Moore Business Forms, Grand Island, N.Y.

Original No. 4,475,747, dated Oct. 9, 1984, Ser. No. 470,530, Feb. 28, 1983. Application for reissue Oct. 3, 1986, Ser. No. 914,991

Int. Cl.[4] B41L *1/20, 1/26*

U.S. Cl. 282—11.5 A 7 Claims



1. An improved, continuous business *envelop* form assembly [providing product packing slips in adhesive-backed envelopes, and corresponding records of the packing slips, adapted to be fed through automatic printing means for simultaneous printing of the packing slips of the envelopes, and the corresponding records], comprising:

a longitudinally continuous back web having *first and second* opposed marginal edges, a transverse width, a marginal row of registry holes along [a] *the* first of the marginal edges, a front, and longitudinally spaced, transverse lines of perforations extending between the marginal edges, the web forming [product packing slip] envelope back panels;

a longitudinally continuous insert web superimposed over the back web, having opposed *first and second* marginal edges outward of the corresponding back web *first and second* marginal edges, a transverse width substantially greater than the back web width, *a first* marginal feed [strips] *strip* along the insert web *first* marginal [edges] *edge* including *a first* marginal [rows] *row* of feed holes along the insert web *first* marginal [edges] *edge, a second marginal feed strip along the insert web second marginal edge including a second marginal row of feed holes along the insert web second marginal edge,* [and] *a first* marginal [lines] *line* of perforations transversely inward of the insert web *first* marginal feed holes, *and a second marginal line of perforations transversely inward of the insert web second marginal feed holes,* a non-marginal registry strip transversely inward of [a]ep *the* first of the insert web marginal feed strips including a non-marginal row of registry holes superimposed on the back web registry holes, and a longitudinal, first non-marginal line of perforations transversely inward of the insert web non-marginal registry holes and [one] *the first of* the back web marginal edges, a longitudinal, second non-marginal line of perforations transversely inward of the first non-marginal *lines of* perforations, a longitudinal, third non-marginal line of perforations transversely outward of the second of the back web marginal edges, a longitudinal, fourth non-marginal line of perforations transversely inward of the second, back web marginal edge, longitudinally spaced, transverse die cuts extending between the first *of the* insert web marginal *lines of* perforations and the third non-marginal *line of* perforations, and superimposed over portions of the back web transverse *lines of* perforations, longitudinally spaced, transverse lines of perforations between the insert web marginal edges and the die cuts superimposed on portions of the back web transverse *line of* perforations, a face and a back, the insert web forming [product] packing slips between the insert web second and [third] *fourth* non-marginal *line of* perforations and the die cuts, the *packing* slips superimposed over the back web [packing slip] envelope back panels;

a first set of [longitudinal] lines of adhesive, *the first set* joining the insert web back to the back web face, one such adhesive line *extending longitudinally and* being transversely inward of the third non-marginal *line of* perforations *of the insert web* and another such adhesive line *extending longitudinally and* being between the first *of the* marginal *lines of* perforations and the first non-marginal *line of* perforations *of the insert web;*

a longitudinally continuous front web superimposed over the insert web, having *first and second* opposed marginal edges, a transverse width substantially equal to the back web width, a marginal row of registry holes along [one] *the first* of the front web marginal edges, superimposed on the insert web non-marginal registry holes and the back web registry holes, a marginal line of perforations transversely inward of the front web *marginal* registry holes and [transversely outward of] *superimposed on* the first non-marginal *line of* perforations *of the insert web,* a longitudinally extending, non-marginal line of perforations transversely inward of the front web marginal *line of* perforations and transversely inward of the second non-marginal *line of* perforations of the insert web, a face, a back, longitudinally spaced, transverse lines of perforations superimposed over the back web and insert web transverse *lines of* perforations, the front web forming [product packing slip] envelope front panels superim-

posed over the insert web [packing slips] and the back web [packing slip] back panels; [and]

a second set of [longitudinal and longitudinally spaced, transverse] lines of adhesive , *the second set* joining the front web back to the insert [and back] web [faces] *face*, one such [longitudinal] *adhesive* line *extending longitudinally and* being transversely outward of the insert web first non-marginal *line of* perforations, [another] *a second* of such [*longitudinal*] *adhesive lines extending longitudinally and* being transversely between the insert web first and second non-marginal *lines of* perforations, and a third such [longitudinal] adhesive line *extending longitudinally and* being transversely between the insert web third and fourth non-marginal *lines of* perforations[.]; *and* the transverse adhesive lines being longitudinally adjacent in both longitudinal directions the transverse perforations of the back and front webs in the area of the die cuts.]

a third set of lines of adhesive, the third set joining the front web back to the back web face, one such adhesive line extending transversely adjacent one side of the transverse line of perforations in the area of the die cut and another such adhesive line extending transversely adjacent to the other side of the transverse line of perforations in the area of the die cuts.

Re. 33,140

METHODS AND APPARATUS FOR CONTROLLING THE ENGAGEMENT OF GAP-TYPE ELECTROMAGNETIC COUPLINGS

Dwight E. Booth, Janesville, Wis., assignor to Dana Corporation, Toledo, Ohio

Original No. 4,509,091, dated Apr. 2, 1985, Ser. No. 581,108, Feb. 17, 1984. Application for reissue Mar. 31, 1987, Ser. No. 32,897

Int. Cl.[4] H01F *7/18*

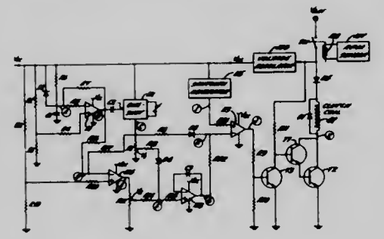
U.S. Cl. 361—154 **32 Claims**

1. Apparatus for energizing the multiple-turn winding of an electromagnetic coupling having an armature and a rotor separated by an air gap, said apparatus comprising:

first means for initially energizing said winding for a period of time sufficient to build magnetic flux between said armature and rotor and across said air gap so as to cause said armature and rotor to close the air gap between them;

second means for reducing the energization of said winding after termination by said first means of said initial energization so as to allow slippage between said armature and rotor; and

third means, operative after the reducing effected by said second means, for gradually increasing the energization of said winding so as to increase the coupling torque and



decrease the slippage between said armature and said rotor.

Re. 33,141

MOISTURE RESISTANT POLYURETHANES DERIVED FROM NON-AROMATIC DIISOCYANATES AND POLYDIORGANOSILOXANES AND A METHOD FOR PREPARING SAME

Gerald A. Gornowicz, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Original No. 4,631,329, dated Dec. 23, 1986, Ser. No. 802,880, Nov. 29, 1985. Application for reissue Jan. 4, 1988, Ser. No. 140,700

Int. Cl.[4] C08G *18/38*

U.S. Cl. 528—28 **16 Claims**

1. A method for preparing a polyurethane exhibiting a hardness of less than 90 on the Shore A durometer scale and retention of useful tensile properties at a relative humidity greater than 50%, said method comprising heating a reaction mixture comprising an aliphatic or cycloaliphatic diisocyanate, a diol or diamine chain extender [and], at least one polyol, *and up to an equivalent amount, based on said polyol, of a polydiorganosiloxane having two isocyanate-reactive terminal groups* for a period of time sufficient to form said polyurethane, wherein the molar ratio of the combination of said diisocyanate and chain extender to all isocyanate-reactive ingredients other than said chain extender is at least 4:1, respectively, and isolating the resultant polyurethane from said reaction mixture.

PLANT PATENTS

GRANTED JANUARY 2, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,089

ROSE PLANT AROMIFI

Jack E. Christensen, Ontario, and Thomas F. Carruth, Altadena, both of Calif., assignors to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Nov. 23, 1988, Ser. No. 276,424

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, characterized particularly as to novelty by a strong color contrast between the dark red petal front and white reverse, dark green, highly glossy foliage, an upright plant habit with strong straight stems, a good vase life and a better than average disease resistance, essentially as described and illustrated herein.

7,090

INTERSPECIFIC TREE "FLAVOR DELIGHT"

Chris F. Zaiger, 537 Rossmore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Jan. 23, 1989, Ser. No. 302,795

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of interspecific (Apricot×Plum Cot) tree substantially as illustrated and described, characterized by its large size, vigorous growth and a regular and productive bearer of medium size, yellow flesh, freestone fruit, with a good balance between acid and sugar giving it excellent flavor and eating quality; the fruit is further characterized by having typical apricot flesh near the pit cavity which becomes firmer as the distance toward the skin increases, this firm flesh characteristic holds the fruit shape when fully tree ripe and the canned halves also maintain the attractive upright appearance after being processed.

7,091

LILY PLANT NAMED MONTE ROSA

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J.A. den Haan, Netherlands

Filed Oct. 24, 1988, Ser. No. 261,252

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of lily plant named Monte Rosa, substantially as shown and described.

7,092

VARIETY OF GERANIUM NAMED CARNIVAL

Blair L. Wisner, Lompoc, Calif., assignor to Denholm Seeds, Lompoc, Calif.

Filed Jan. 9, 1989, Ser. No. 295,244

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of geranium characterized by its brilliant color, short compact plant, substantial basal branching, close internodes and small leaves, free and early flowering and bright pink coloring accentuated by a red blotch on each petal as herein shown and described.

7,093

LILY PLANT NAMED ROTE HORN

Yoshito Asano, Tsukuba, Japan, assignor to Hokkaido University, Sapporo, Japan

Filed Feb. 7, 1989, Ser. No. 306,992

Int. Cl.[4] H01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of lily named Rote Horn, as illustrated and described.

7,094

AFRICAN VIOLET PLANT LUCY

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,525

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Lucy, as described and illustrated, and particularly characterized by its single, occasionaiiy semi-double, dark lilac flowers with darker center; strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves; medium green, oval to round leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long-lasting and non-dropping flowers.

7,095

AFRICAN VIOLET PLANT NAMED LITTLE KUNZITE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,754

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Little Kunzite, as described and illustrated, and particularly characterized by its miniature growth habit; single violet-shaped, dark pink flowers with intensive pink center; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, heart-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

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PATENTS

GRANTED JAN. 2, 1990

ERRATA

For CLASS	See PATENT NO.
007-118	4,890,387
062-238	4,890,463
101-415	4,890,555
606-051	4,890,610
606-159	4,890,611
606-220	4,890,613
606-226	4,890,614
606-146	4,890,615
606-059	4,890,631
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560-052	4,891,167
252-008	4,891,177
423-248	4,891,187
429-053	4,891,270
523-200	4,891,399
428-137	4,891,454
381-045	4,891,602
357-023	4,891,747
382-021	4,891,750

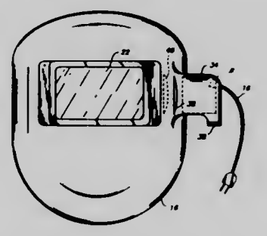
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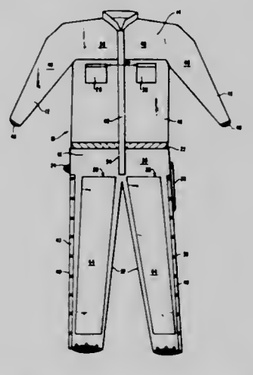
4,890,335
VENTILATED WELDING SHIELD
Arnold E. Crowson, Box 40 West Rte., Northome, Minn. 56661
Filed Jul. 27, 1988, Ser. No. 224,745
Int. Cl.[4] A61F 9/06
U.S. Cl. 2—8 **1 Claim**



1. A new and improved ventilated welding helmet construction comprising:
- a welding face shield having an elongate light filtering viewing lens mounted on a forward wall of the welding shield, said forward wall integrally mounted to first and second side walls,
- blower means integrally mounted on said second side wall for generating a flow to direct ventilating air only longitudinally of said elongate viewing lens;
- a power supply means for operating said blower means;
- connection means for directing said flow of air from said blower means to said welding face shield; and
- air directing means for directing said flow of air longitudinally only across interior and exterior surfaces of said viewing lens, and
- wherein said air directing means includes first and second nozzles forming a part of said connections means, and
- wherein said first nozzle directs said flow of air across said interior surface of said viewing lens and said second nozzle directs said flow of air across said exterior surface of said viewing lens, and
- wherein said connection means comprises an integral manifold attached to the second side of said welding face shield adjacent said viewing lens, said blower means being retained within said manifold.

4,890,336
WELDING PROTECTED COVERALLS
Barry Worton, 72 Schooner Ave., Barnegat, N.J. 08005
Filed May 2, 1988, Ser. No. 189,056
Int. Cl.[4] A41D 1/06
U.S. Cl. 2—79 **7 Claims**

1. A welder's pair of coveralls comprising a front section having chest, arm, and leg areas and a lower torso area below said chest area, all composed of fabric material, an overlay of fire-proof material atop said fabric material at substantially the entire regions of said chest, arm and leg areas of said front section, a back section composed of fabric material, and with said back section and said lower torso area of said front section being devoid of any overlay of fire-proof material for affording



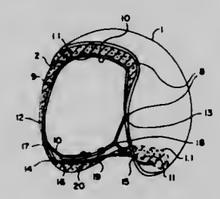
protection to said front section against sparks being thrown off during welding in use of the coveralls.

4,890,337
PANTS-LIKE GARMENT INCORPORATING A STRETCHABLE CONSTRUCTION
Bert Greenberg, 1201 S. Ocean Dr., Hollywood, Fla. 33019, assignor to Bert Greenberg and Jodee K. Greenberg, both of Hollywood, Fla.
Filed Dec. 27, 1988, Ser. No. 290,626
Int. Cl.[4] A41D 11/02
U.S. Cl. 2—236 **5 Claims**



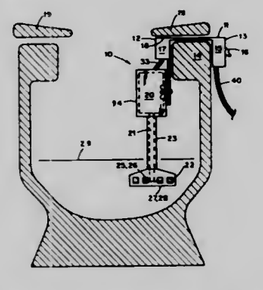
1. A pants-like garment comprising:
- a waistband configured to encircle the waist of a wearer; and
- a covering portion confirgured to encircle the trunk of the wearer;
- said covering portion having a front section connected adjacent its top edge to said waistband, and a rear section connected to said front section; and
- stretchable means for elastically connecting said rear section, adjacent its top edge, to said waistband;
- said stretchable means having an elasticity in at least one direction, substantially perpendicular to said waistband, so that when the wearer bends over, said elastic means stretch to prevent downward deformation of said garment and said waistband thereby to prevent exposure of the buttocks of the wearer.

4,890,338
SUPPORTIVE FASTENING MEANS FOR A PROTECTIVE HELMET
Balz Knabenhans, Ennethirgen, Switzerland, assignor to Dragerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany
Filed Dec. 8, 1988, Ser. No. 282,017
Claims priority, application Switzerland, Jan. 8, 1988, 00061/88
Int. Cl.[4] A42B *3/00, 7/00*
U.S. Cl. 2—421 10 Claims



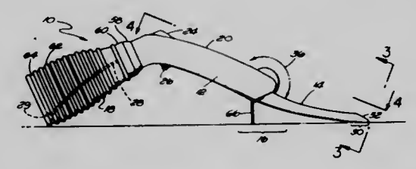
1. A fastening device for a protective helmet comprising a helmet-forming shell with a face encompassing rim portion and a neck encircling rim portion, a length adjustable chin strap connected to said shell, means defining a guide channel around the rim of said helmet, a first drawstring loop arranged in said shell guide channel in the forehead/temple area of the protective helmet, a second drawstring loop in the neck area, both said first and second loops being tensionally rigid being movable in said guiding channel, said first drawstring loop having an exterior portion extending outside of said guiding channel, and a second drawstring loop having ends connected to the outside portion of said first drawstring loop adjacent the respective outside ends of said loop and forming a closed drawstring system therewith, said outside portion of said loop forming said length adjustable chin strap.

4,890,339
SPLASH SUPPRESSOR
William C. Clark, P.O. Box 2777, Knoxville, Tenn. 37901
Filed Jul. 20, 1988, Ser. No. 221,887
Int. Cl.[4] E03D *9/00*
U.S. Cl. 4—300.3 7 Claims



1. A splash suppressor in combination with a toilet bowl containing liquid, said suppressor comprising:
turbulence means including a rotatable impeller for submergence within the liquid of the toilet bowl;
means for rotating said impeller and thereby creating hydraulic turbulence in the toilet bowl liquid to suppress the splashing of liquid when a substance is dropped on the upper surface of the liquid; and
a housing associated with said turbulence means having a fluid-impervious portion covering said impeller so that when said impeller is operatively submerged within the liquid and rotated in a manner creating hydraulic turbulence as aforesaid, said fluid-impervious portion is positioned between the rotating impeller and the upper surface of the toilet bowl liquid so as to prevent atmospheric air from being drawn into the liquid and prevent liquid from being thrown above the level of the upper surface by the rotating impeller.

4,890,340
SELF-CONTAINED HAND-HELD BIDET
Harold B. Lovitt, 8427 Kirkwood Dr., Los Angeles, Calif. 90046
Filed Sep. 26, 1988, Ser. No. 249,053
Int. Cl.[4] A61H *35/00*
U.S. Cl. 4—443 10 Claims

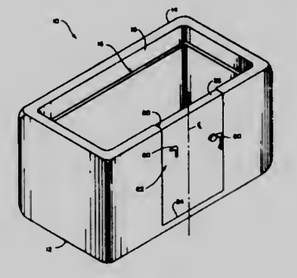


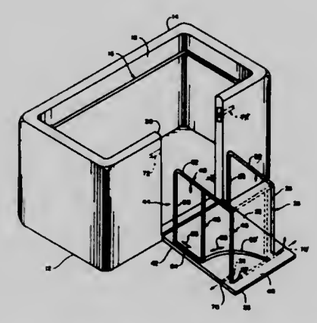
1. A self-contained hand-held bidet device for discharging a stream of fluid comprising:
a rigid elongate slender housing adapted to be held in the hand of a user defining an internal space between first and second ends;
a nozzle means defining an elongate conduit to carry and direct said stream of fluid;
a fluid-seal pivot means rigidly affixing said nozzle means to said first end of said housing, said nozzle means accordingly being mounted to move between extended and retracted positions relative to said housing said pivot means and said nozzle means, when in the extended position, being sized and shaped to spray said stream of fluid away from said conduit toward its longitudinal direction to impact said genital area of said user;
a reservoir means for receiving said fluid, said reservoir means being attached to said second end of said housing; and
pump means affixed in said internal space of said housing for drawing fluid from said reservoir means and forcing a fluid stream through said fluid seal pivot means to emerge from said nozzle means.

4,890,341
INVALID'S BATHTUB
Joycelyn Forbes, 115 Lenox Rd., #D-6, Brooklyn, N.Y. 11226
Filed Apr. 25, 1989, Ser. No. 342,796
Int. Cl.[4] A47K *3/022*
U.S. Cl. 4—555 8 Claims

1. An invalid's bathtub comprising:
(A) a bottom;
(B) a wall surrounding said bottom;
(C) an access opening in said wall through which an invalid who may be in a wheelchair passes to enter the bathtub;
(D) a door for closing said access opening, said door having a longitudinal axis that is oriented to extend into the bathtub and being connected to said wall at a bottom end to form a ramp into the bathtub when said door is in an open position uncovering said access opening, said door being movable into a closed position covering said access opening with said longitudinal axis extending essentially vertically upright;

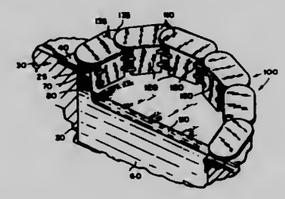
(E) a support rail mounted on said door to be movable between a first position extending along said longitudinal





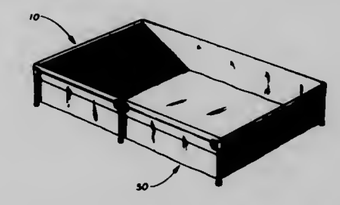
axis and a second position extending perpendicular to said door longitudinal axis.

4,890,342
SWIMMING POOL PROTECTOR AND CONVERTER
R. Rand Cushing, 536 Broad St., Weymouth, Mass. 02189
Continuation-in-part of Ser. No. 126,610, Nov. 30, 1987, Pat. No. 4,807,309. This application Nov. 28, 1988, Ser. No. 276,915
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—494 3 Claims



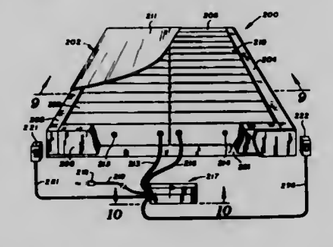
1. Apparatus for converting a swimming pool into a skating rink and preserving the structural integrity of the pool, the pool comprising a water basin having a rim extending around the top edge of the basin, the basin being filled with water up to a predetermined level below the rim, the apparatus comprising:
a plurality of impact resistant cornices overlying the rim and extending around the circumference of the pool in sequential array;
each cornice comprising a top plate overlying the top edge of the pool, the top plate having a forward edge to be located over said basin and a flange plate attached to and extending the length of the forward edge of the top plate, the flange plate extending downwardly into the basin a predetermined level below the surface of the water within the basin;
the cornices being sequentially arranged around the rim of the pool such that the left side of the flange plate of each cornice is aligned substantially parallel to and closely adjacent to the right side of the flange plate of each immediately adjacent cornice;
wherein the left and right side edges of immediately adjacent flange plates are rotatable connected.

4,890,343
PORTABLE DECONTAMINATION TANK
Michael L. Schlagg, 377 Oak Tree Way, Basilton, Calif. 93427
Filed Jan. 20, 1988, Ser. No. 289,883
Int. Cl.[4] A47K *3/06*
U.S. Cl. 4—585 8 Claims



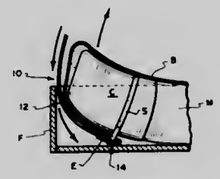
1. A knockdown decontamination apparatus for use in cleansing hazmat operators special clothing, which apparatus comprises:
(a) a superstructure and
(b) a vessel forming foldable plastic structure made of self supporting film adapted to form a vessel open at the top, upon engagement with said superstructure, and sized to receive at least one human being therein in a standing position,
said superstructure comprising:
a plurality of corner portions, each having a 90 degree connector secured to a corner leg,
and tubular means severably connecting each corner portion to another corner portion,
said vessel forming structure comprising a one piece plastic film vessel forming structure including a bottom wall and panels attached thereto adapted to form upstanding walls to define in conjunction with said bottom wall, a vessel adapted to receive a human and water; upon the engagement of said superstructure with said vessel forming structure, each wall having a sleeve therein,
said corner portions disposed external to said vessel forming structure upon engagement of said superstructure with said vessel forming structure, wherein the vessel forming portion has four upstanding walls upon assembly of the apparatus, each of which has a sleeve formed therein, and a notch in the wall at each end thereof thereby providing access to said sleeves, and wherein at least a pair of the upstanding walls of said vessel forming portion include a cutout in the sleeve for an intermediate portion of said superstructure.

4,890,344
AIR CONTROL SYSTEM FOR AIR BED
Robert A. Walker, 8939 Vinewood Lane North, Maple Grove, Minn. 55369
Division of Ser. No. 96,932, Sep. 14, 1987, Pat. No. 4,829,616, which is a continuation-in-part of Ser. No. 791,397, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 455,664, Jan. 5, 1983, abandoned. This application Jan. 31, 1989, Ser. No. 304,172
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[4] A47C 27/08
U.S. Cl. 5—453 11 Claims



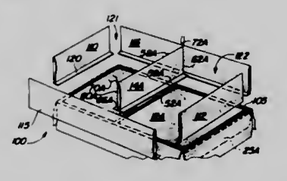
1. An apparatus for selectively supplying air under pressure to first and second air mattresses and selectively regulating the pressure of the air mattresses comprising: casing means having a first internal chamber, a second internal chamber, first opening allowing ambient air to flow into the first chamber, a second opening allowing air to flow from the first chamber to the second chamber, first tubular connector means open to the second chamber, second tubular connector means open to the second chamber, first hose means connecting the first air mattress to the first tubular connector means for carrying air to and from the first air mattress, second hose means connecting the second air mattress to the second connector means for carrying air to and from the second air mattress, a rotatable impeller located in said first chamber operable to move air from the first chamber through the second opening into the second chamber, an electric motor operable to rotate the impeller means, first valve means located in the second chamber operable to close the opening in the first tubular connector means, first solenoid means connected to the first valve means operable to open said first valve means, second valve means operable to open said first valve means, second valve means located in said second chamber operable to close the opening to the second tubular connector means, second solenoid means connected to the said valve means operable to open said second valve means, said first and second solenoid means each having a movable plunger and first and second coils for generating a common magnetic field to move said plunger, a normally closed first switch connected to the first coil, rectifier means connected to first switch and second coil to provide DC power to the first and second coils, second switch means for connecting the rectifier means to the electric motor, first switch, and second coil to energize said first and second coils thereby move the plunger and valve means connected thereto from a closed position to an open position and to energize said electric motor whereby the impeller means moves air into the air mattress connected to the tubular connector associated with the open valve means, said first switch being opened by said plunger when the valve means is in the open position to de-energize the first coil, said plunger and valve means connected thereto being held in the open position by the continued energization of the second coil, said second switch being movable to position for only connecting the rectifier means to the first switch and second coil to energize said first and second coils and the valve means connected to the plunger from a closed position to an open position to allow air to vent from the mattress.

4,890,345
BED SHEET STUFFING DEVICE
Angelo J. Sessa, 1262 Centennial Ave., Camarillo, Calif. 93010
Filed Nov. 17, 1988, Ser. No. 272,452
Int. Cl.[4] A47C 21/02
U.S. Cl. 5—508 25 Claims



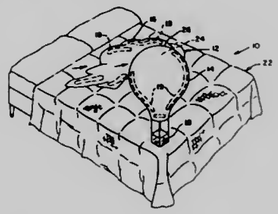
1. A bed sheet stuffing device, comprising:
(a) an elongated, relatively narrow and thin, flat shaft member having opposite leading and trailing end portions as defined when said shaft member is oriented for use in stuffing an edge of a bed sheet under a waterbed mattress; and
(b) a clamp element having opposite forward and aft ends, said clamp being attached at its aft end to said leading end portion of said shaft member and disposed at its forward end adjacent a forward edge of said shaft member leading end portion;
(c) said shaft member and said clamp element both being composed of resiliently flexible material and configured to be flexible about respective axes extending across respective widths thereof such that said shaft member can flex and bend around the mattress so as to extend partially thereunder and said clamp member at its forward end can be forceably flexed away from said shaft member to receive the bed sheet edge thereunder and past its forward end and releasably hold the bed sheet edge to pull the same along as said shaft member is inserted alongside, and at its leading end portion under, the mattress, said clamp element being adapted to release the bed sheet edge from under its forward end upon withdrawal of said leading end portion of said shaft member from under the mattress.

4,890,346
INFANT CRIB ENCLOSURE
Judith Rist, 7855 E. Evans, Scottsdale, Ariz. 85260
Filed Jan. 25, 1988, Ser. No. 147,541
Int. Cl.[4] A47D 7/01
U.S. Cl. 5—508 12 Claims



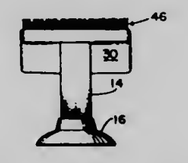
1. An infant enclosure for use with a crib having opposite ends and opposite sides defining an area supporting a bed surface therein having a width and length, said enclosure comprising:
(a) a substantially planar panel having a width at least corresponding to the width of the bed surface and having a predetermined length extending along the length of said bed surface, said panel being provided with a first fastener section extending transversely and substantially continuously across the width of said panel; and
(b) a bumper member generally perpendicular to said panel having a bottom edge, said bumper member having a casing containing a resilient material, said bumper member having a second fastener section detachably securable to said first fastener section, said second fastener section extending substantially continuously along said bottom edge whereby said bumper member is detachably securable to said panel to divide the panel into two infant-receiving compartments.

4,890,347
INTERCHANGEABLE DETACHABLE DECORATIVE APPLIQUE
Claudia A. Fuller, 1050 Waverly Ave., Holtsville, N.Y. 11742
Filed Jun. 2, 1988, Ser. No. 201,465
Int. Cl.[4] A47C 31/10
U.S. Cl. 5—508 3 Claims



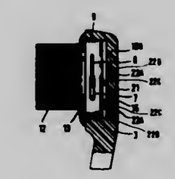
1. An interchangeable detachable decorative applique for an article such as a bedspread, comforter or the like, comprising:
(a) a first fabric piece having a top surface and a bottom surface;
(b) a second fabric piece fixedly inserted to the top surface of said first fabric piece;
(c) a plurality of braided pipe cleaners fixedly secured to the top of said second fabric piece; and,
(d) first and second fastener means, one of said fastener means including a hook pile fastener and the other of said fastener means including a loop pile fastener, a plurality of said first fastener means being fixedly attached at spaced locations to the bottom surface of said first fabric piece and a plurality of said second fastener means being fixedly attached to said article at a location immediately opposite said first fastener means whereby said first and second fastener means removably adhere to each other.

4,890,348
RAZOR CLEANING DEVICE
Richard J. Racioppi, R.R. 1, Box 195, Mahomet, Ill. 61853
Continuation of Ser. No. 51,937, May 19, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 240,474
Int. Cl.[4] A46B 9/02
U.S. Cl. 15—160 13 Claims



1. A razor cleaning device supportable on a support surface within a wash basin, sink, bathtub or the like which have a faucet and a drain stopper, to facilitate cleaning razors of the type having two parallel blades having adjacent, staggered edges, comprising:
a cleaning head having a plurality of substantially straight bristles substantially aligned in a bristle dirction, each bristle having a fixed end connected to the cleaning head and a free end, the free ends of the bristles being positioned to subtantially define a single continuous wiping plane which tapers downwardly relative to the support surface at a first acute angle with respect to the support surface and a second acute angle with respect to the bristle direction, said first acute angle being less than said second acute angle; and
support means for securing the cleaning head on a support surface and for orienting the cleaning head so that the bristle direction defines an acute bristle direction angle of approximately 55° with respect to the support surface, the first acute angle of the wiping plane with the support surface being less than 35° and whereby a user can naturally and simultaneously position the razor blades substantially parallel to the bristle direction and press edges of the blades equally against the bristle free ends when wiping the razor against the bristles.

4,890,349
TOOTH CARE ATRICLE SUCH AS A TOOTHBRUSH WITH REPLACEABLE INSERT
Klaus Nitzsche, De-La-Fosse-Weg 1a, 6100, Darmstadt, Fed. Rep. of Germany
Filed Jun. 21, 1988, Ser. No. 209,568
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724640
Int. Cl.[4] A46B 9/04
U.S. Cl. 15—167.1 6 Claims



1. A tooth care article comprising:
a handle including a manual gripping portion at one end and a forwardly opening socket at the other end, said socket terminating in a forwardly facing rim, and
a brush insert removably mounted in said socket, said insert comprising a body which includes a rearwardly extending tongue removably mounted in said socket, a tooth care member extending forwardly of said body, and a sealing flange projecting laterally outwardly adjacent a region where said body and tooth care member are joined, said sealing flange elastically abutting said socket rim,
said socket including a rear wall having an opening extending therethrough and arranged eccentrically relative to a longitudinal axis of said socket, said tongue including a pressure projection extending into said opening, whereby a rear surface of said pressure projection is exposed to manual pressure,
said socket including a locking groove formed in an inner surface thereof, said tongue carrying laterally projecting ledges elastically received in said groove, said tongue including two long side surfaces and two short end surfaces, said ledges projecting from both side surfaces and one end surface,
each of said ledges which project from said side surfaces including a tall ledge portion and a short ledge portion, said tall ledge portions disposed adjacent said pressure

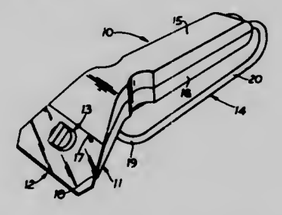
protrusion and projecting from said tongue farther than said short ledge portions, said ledge on said end surface comprising a short ledge.

4,890,350
EMERGENCY PAINT BRUSH
William F. O'Keefe, Sr., 2211 O'Keefe Pl., Zephyrhills, Fla. 34248
Filed Dec. 2, 1988, Ser. No. 278,798
Int. Cl.[4] A46B *3/00, 3/02*
U.S. Cl. 15—176.6 4 Claims



1. An article of manufacture, comprising:
a first elongate strip of flexible material;
a first layer of adhesive disposed in overlying relation to a first surface of said flexible material;
a plurality of bristle members disposed in abutting parallel alignment with one another;
said plurality of bristle members being adhered to one another at a first end thereof;
said first end of said bristle members being disposed in overlying relation to said first surface of said material at a predetermined position along the extent thereof; and
said plurality of bristle members being aligned normal to a longitudinal axis of said strip of flexible material, and being disposed substantially parallel to the plane of said strip of flexible material;
whereby a brush is made by selecting a handle means, positioning a preselected end of said handle means in overlying relation to said first end of said plurality of bristle members, and wrapping said flexible material about said handle means.

4,890,351
SCRAPERS, ESPECIALLY FOR GRIDDLES, HOTPLATES AND THE LIKE
Gordon Wilson, Moor Lodge, England, assignor to Christopher G. Gibbs, Ravensfield, England
Filed Jul. 22, 1988, Ser. No. 222,840
Claims priority, application United Kingdom, Jul. 30, 1987, 8718093
Int. Cl.[4] B26B *27/00*; A47L *13/08*
U.S. Cl. 15—236.01 8 Claims



1. A hand scraper consisting of a handgrip, a blade support extending from the handgrip, a replaceable scraper blade engageable with the blade support, and securing means for the blade with respect to the blade support, with an operative edge of the blade projecting forwardly and downwardly with respect to a generally horizontal disposition of the handgrip and blade support, together with a guard formed in a U-shaped configuration with elongate limbs of the U extending generally parallel with the handgrip and curving back on themselves to anchorages within the handgrip, the space between the guard and the handgrip being in excess of the thickness of fingers of a hand used to grip the handgrip.

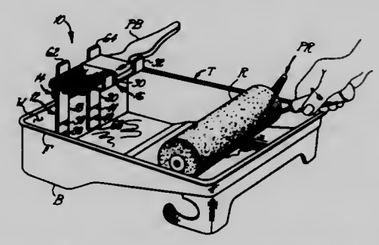
4,890,352
BACKWASHER
George E. Stowers, 720 St. Marks Ave., 3f, Brooklyn, 11216, and George Spector, 233 Broadway, Rm. 3815, New York, both of N.Y. 10007
Filed Aug. 11, 1988, Ser. No. 231,253
Int. Cl.[4] A47K *7/03*
U.S. Cl. 15—244.1 2 Claims



1. A backwasher which comprises:
(a) a flat flexible rubber base plate having a front washing surface and rear surface;
(b) a sponge rubber washing member affixed to said front washing surface of said base plate;
(c) means for removably mounting said rear surface of said base plate to a flat surface so that a person can wash their back against said washing member when in shower and bathtub, wherein said removably mounting means is a plurality of suction cups formed on the rear surface of said base plate which will stick to the flat surface;
(d) each of said suction cups having a hollow chamber therein;
(e) said base plate having a plurality of rearwardly angular holes, each fluidly connected to said hollow chamber of said suction cups; and
(f) a plurality of curved rigid lips, each formed about each of said angular holes to guide some liquid soap that is applied onto said washing member into said hollow chamber of said suction cups so that when a person presses their back against said washing member, the liquid soap will be squeezed and pushed out into said washing member to help wash the back of the person.

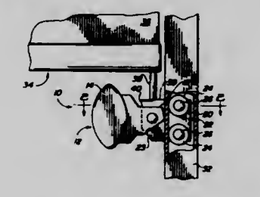
4,890,353
PAINT BRUSH AND PAINT ROLLER HOLDER
Gilbert A. Shannon, 800 Stewart St., and Betty L. Hines, 801 Stewart St., both of Englewood, Fla. 34223
Continuation-in-part of Ser. No. 174,227, Mar. 28, 1988, abandoned. This application Sep. 8, 1988, Ser. No. 242,049
Int. Cl.[4] A47G *29/00*
U.S. Cl. 15—257 R 11 Claims

8. A paint brush and paint roller holder adapted to be releasably connectable onto the upright end wall of a paint tray comprising:
a first molded member having a first pair of elongated, relatively thin legs connected and held in generally spaced apart, coplaner, upright relation and also having a generally horizontal platform positioned above the tray and formed by the extensions from adjacent the upper ends of each of said first pair of legs;
a second molded member having a second pair of elongated, relatively thin legs connected and held in generally spaced apart, coplaner, upright relation;
each of said second pair of legs adapted at their lower ends to engage around the outwardly extending paint tray flange;
said first and second pairs of legs each having at least one aperture in alignment and registry one to another for receiving a clamping member cooperatively adapted to draw said first and second pairs of legs toward one another and supportively against the inside end wall surface and the flange of the paint tray respectively;



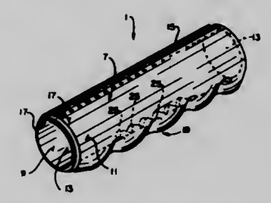
said first pair of legs extending above said platform and cooperating with opposing upwardly turned distal ends of said extensions to laterally restrain a paint brush placed generally horizontally atop said platform;
said platform structured to receive and laterally support a paint roller head placed generally horizontally atop said platform;
each of said first pair of legs having a distal end extending downwardly sufficiently to contact and receive support from the inner surface of the paint tray bottom and extends upwardly sufficiently to position said platform over and above the paint tray flange sufficiently to allow free access to the liquid paint contents of the tray by either paint brush or paint roller;
said extensions spaced apart to allow liquid paint to drip from the paint brush and paint roller directly downwardly into the paint tray.

4,890,354
WINDOW SHADE LOCK DEVICE
David Cooper, North Hollywood, Calif., assignor to Castec, Inc., North Hollywood, Calif.
Filed Sep. 2, 1988, Ser. No. 239,945
Int. Cl.[4] E05D *15/00*; A47H *3/00*; E06B *9/17*
U.S. Cl. 16—87 R 7 Claims



1. An improved window shade lock device, said device comprising, in combination:
(a) a handle having a hand grip and a slide connector extending forwardly thereof; and,
(b) a slide pivotally secured to the front end of said slide connector at a pivot point for movement between a locked and an unlocked position, said slide being adapted to slide on the inside of a channeled window shade side frame and to extend outwardly thereof through an opening in said side frame for connection with said slide connector outside said side frame, whereby in said locked position said slide connector front end is wedged between the frame and said pivot point to thereby bias said slide tightly against said frame to hold it in locked position, and in said unlocked position said slide connector front end is not wedged between the frame and said pivot point to thereby allow spacing of said slide from said frame for free movement therein; at least one of said handle and said slide being secured by a shade connector to the lower end of a window shade for simultaneous movement of said lock device and window shade.

4,890,355
RELEASABLY MOUNTABLE HAND GRIP FOR HANDLES
Elizabeth W. Schaiten, 415 Sorrento Dr., St. Louis, Mo. 63021
Filed Oct. 26, 1988, Ser. No. 262,832
Int. Cl.[4] A45F *5/10*
U.S. Cl. 16—111 R 3 Claims



1. A hand grip for releasable attachment to a carrying unit, comprising:
an elongated tubular body having an inner wall, an outer wall, and a material thickness therebetween, said tubular body being open ended and having an axial opening extending through it, said body being oriented with respect to said carrying unit so as to define an upper portion and a lower portion, said body having a longitudinal opening in it which communicates with said axial opening for enabling said body to receive an associated part of said carrying unit through said longitudinal opening, said longitudinal opening being positioned along said upper portion;
exterior gripping means defined by the outer wall of said tubular body, said outer wall defining a hand gripping grip conformed to the shape of a user's hand to enable a user to grip said elongated tubular body comfortably when said tubular body is mounted on an associated part of said carrying unit, said exterior gripping means being positioned along the lower portion of said tubular body opposite said longitudinal opening; and
a plurality of serrations arranged in a single row longitudinally or said inner wall and aligned opposite said longitudinal opening in said hand grip and adjacent said exterior gripping means, said serrations, longitudinal opening, and exterior gripping means aligned in a common plane said serrations adapted to engage at least a portion of said associated part of said carrier unit when said hand grip is attached to said carrier unit.

4,890,356

HINGE FOR THE CONNECTION OF THE SHAFT OF A TEMPLE WITH A HINGE PIECE OF SPECTACLE FRAMES AS WELL AS A PROCESS FOR THE PRODUCTION OF SUCH A HINGE

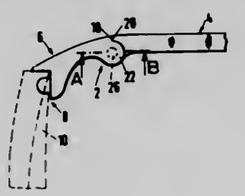
Gunther Czech, Filderstadt, and Joachim Baum, Radolfzell, both of Fed. Rep. of Germany, assignors to Eyemetrics-Systems AG, Pfaffikon, Switzerland

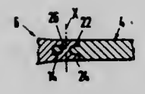
Filed Aug. 19, 1988, Ser. No. 234,434

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727861

Int. Cl.[4] E05D 7/00; G02C 5/22

U.S. Cl. 16—228 **9 Claims**





1. A hinge for the connection of a temple shaft to a hinge piece of a spectacle frame, with at least one hinge eye in the form of an uninterrupted ring, which is attached to a first of the two connected elements, and with a hinge bolt, uninterrupted and having the shape of a cylinder constricted in the middle in axial section, with said hinge bolt extending through the opening of the hinge eye and extending between two plates on the second of the two connected element, in which case at least the hinge bolt or the hinge eye comprises a plastic that is injection molded, the hinge bolt and the second element being designed in one piece and that either the hinge bolt comprised of the plastic is injection molded into the opening of the hinge eye or that the hinge eye comprised of the plastic is injection molded around the hinge bolt.

4,890,357

APPARATUS FOR CLEANING TEXTILE FIBER MATERIAL

Akiva Plato, Duesseldorf; Guenter Lucassen, Halstern, and Bernhard Beckt, Neubeuleck, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

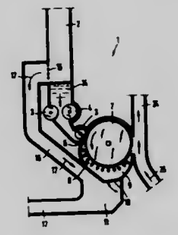
Filed Oct. 11, 1988, Ser. No. 255,811

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734485

Int. Cl.[4] D01B 3/00

U.S. Cl. 19—64.5 **11 Claims**

1. Apparatus for cleaning textile fibers such as cotton and the like in which the fibers are conveyed by a transport air current through a feed box to an opening roller, a cleaning grate is disposed in working relation to said opening roller, said transport air is separated at said feed box, and waste accumulating as contaminants beneath said cleaning grate is discharged, characterized in that means are provided for using said separated transport air for discharging said contaminants accumulating in a space beneath said cleaning grate.



4,890,358

SYSTEM FOR AUTOMATICALLY CONVEYING COTTON LAPS FROM A RIBBON-LAP MACHINE TO A COMBING MACHINE ASSEMBLY

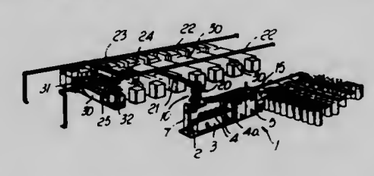
Pietro B. Marzoli, Via Durante, 1-25036 Palazzolo sull'Oglio (Brescia), Italy

Filed Sep. 23, 1988, Ser. No. 248,359

Claims priority, application Italy, Oct. 13, 1987, 22255 A/87

Int. Cl.[4] D01B 3/04

U.S. Cl. 19—115 R **2 Claims**



1. A system for automatically conveying cotton laps from a ribbon-lap machine to a combing machine assembly comprising, downstream of said ribbon-lap machine, a sliding cradle lifting device adapted to take up a lap roller from a lap roller collecting frame, a gripper take up device adapted to take up said lap roller from said cradle lifting device and to discharge an empty roller on an empty roller collecting frame arranged above said lap roller collecting frame, said gripper take up device being supported on a carriage sliding on a guiding path so as to selectively reach a combing machine selected from said combing machine assembly to discharge said lap roller on a lap roller supplying frame while simultaneously taking up said empty roller, said gripper take up device being provided with a supporting frame thereon there are pivoted roller engaging jaw pairs, said system further comprising a pair of spaced rails slidingly supporting a bridge crane, wherein said guiding path consists of a further rail extending in a continuous manner above said combing machine assembly and slidingly supporting said carriage, and arranged substantially perpendicular to said pair of spaced rails, said bridge crane supporting a transfer rail arranged as an extension of said further rail, and being driven for displacement above said combing machine assembly.

4,890,359

APPARATUS FOR MONITORING LAP FORMATION ON A ROLL FOR GUIDING A TEXTILE SLIVER

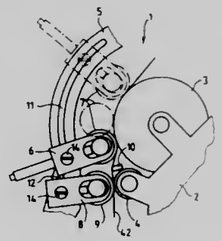
Beat Kägi, Oberuzwil, and Peter Oswald, Matzingen, both of Switzerland, assignors to Rieter Maschinenfabrik AG, Winterthur, Switzerland

Filed Jan. 9, 1989, Ser. No. 294,719

Claims priority, application Switzerland, Jan. 11, 1988, 00074/88

Int. Cl.[4] D01H 5/60

U.S. Cl. 19—265 **27 Claims**



1. An apparatus for monitoring lap formation on a roll of a pair of rolls guiding a fiber sliver in a textile machine, comprising:

a drive roll;

a pressure roll;

said pressure roll being arranged in cooperating relationship with said drive roll;

said drive roll and said pressure roll defining said pair of rolls;

means for pressing said pressure roll against said drive roll;

at least one switching means for stopping said drive roll in the event of lap formation on one roll of said pair of rolls;

means for supporting said pressure roll together with said pressing means and said at least one switching means;

said supporting means serving to lift said pressure roll away from said drive roll;

said at least one switching means being actuated by said pressing means;

said pressing means having a predetermined pressure stroke in a predetermined pressing direction and a predetermined contact-making travel in a predetermined switching direction; and

said predetermined contact-making travel in said predetermined switching direction remaining substantially constant irrespective of the length of said predetermined pressure stroke in said predetermined pressing direction.

4,890,360

BAND CLAMP WITH TIGHTENING ELEMENTS FORMED SEPARATELY

Lionel Calmettes, and Michel André, both of Romorantin Lanthenay, France, assignors to Etablissements Caillau, Issy-les-Moulineaux, France

Filed Jun. 13, 1988, Ser. No. 205,817

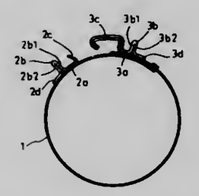
Claims priority, application France, Jun. 23, 1987, 87 08831

Int. Cl.[4] B65D 63/02

U.S. Cl. 24—20 R **8 Claims**

1. In a clamp, adapted to be dismounted and reused, constituted by a metal band wound on itself, comprising respectively in the vicinity of each of its ends, on the one hand, two radial stops directed outwardly of the band to constitute complementary tightening means adapted to be gripped by a tool of the pliers type, and on the other hand, complementary joining means generally in the form of hooks which, in the non-tightened state of the clamp, are at a distance from each other,

each assembly of a tightening means and of a joining means is constituted by respective, separate portions of metal band, in which the two ends of each portion of metal band are suitably bent to form one hook at a first section and one U-shaped, substantially back to back stop at a second



section, each of said band portions being independent of the band constituting the clamp and being fixed thereon by affixing means, with the stops extending outwardly of the clamp to a height substantially the same as the hooks to prevent unintentional releasing of the clamp.

4,890,361

TELEPHONE CORD STRAIGHTENER

Carter C. Crookham, 10888 N. 70th St., Scottsdale, Ariz. 85254, and Bernard W. Shouka, Scottsdale, Ariz., assignors to Carter C. Crookham, Scottsdale, Ariz.

Filed Nov. 7, 1988, Ser. No. 268,794

Int. Cl.[4] F16G 11/00

U.S. Cl. 24—129 R **5 Claims**

1. A telephone and cord straightener in combination comprising,

a phone base unit having a coiled cord extending therefrom and a handset on the outer end of said coiled cord, said cord having an outside diameter,

an integral elongated floating anchor sleeve on said coiled cord and having a straight cylindrical passageway therethrough, with open opposite ends said passageway having a smooth continuous inside surface and an inside diameter sufficiently larger than the outside diameter of said cord that said anchor sleeve freely moves by gravity along the length of said cord and seeks the low spot in the cord between the base unit and the handset thereby keeping the cord on opposite sides of said anchor taut and from interengaging and becoming twisted and tangled.

4,890,362

EYELET AND METHOD OF ATTACHING THE SAME

Ketoku Odajima, and Kazuhiro Sasaki, both of Waga, Japan, assignors to Morito Co., Ltd., Osaka, Japan

Filed Dec. 23, 1988, Ser. No. 289,195

Int. Cl.[4] A43C 5/00

U.S. Cl. 24—713.7 **2 Claims**

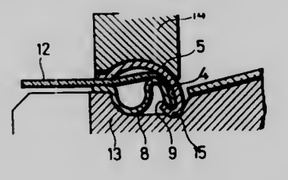
2. A method of attaching an eyelet to a sheet member comprising the steps of:

placing a seat member having a central hole made of a tapered cylindrical portion extending and narrowing in the

opposite direction of insertion, a curved annular crest extending in the inserting direction from the cylindrical portion, a curved annular trough extending from the annular crest, and a flat portion extending from the annular trough, on a punching machine lower mold having a recess and an annular groove,

covering the seat member with a sheet member to which the eyelet is attached,

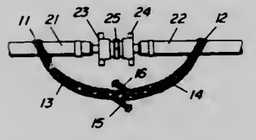
placing an eyelet body having an annular flat base and a tapered cylindrical portion extending from the flat base and narrowing in the inserting direction, an edge of the cylindrical portion being sharp enough to stamp out a



sheet to which the eyelet is attached, on the seat member and the sheet, and

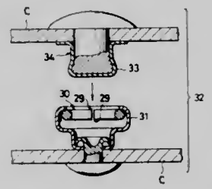
punching the seat member and the eyelet body via the sheet member with a punching machine upper mold having a recess, thereby the sharp edge of the eyelet body stamping out the sheet member and the cylindrical portion of the eyelet body sliding down along the tapered portion of the seat body, a front part of the eyelet body including the sharp edge exceeding over a tip of the tapered portion, contacting a wall of the groove of the lower mold and then being bent inward by the groove wall so as to enclose the tip of the seat member.

4,890,363
SAFETY WHIP CHECKS FOR HOSES
Jerry R. Cross, 65092 Solar Rd., Montrose, Colo. 81401
Filed Mar. 20, 1989, Ser. No. 325,517
Int. Cl.[4] A44B *15/00*
U.S. Cl. 24—298 1 Claim



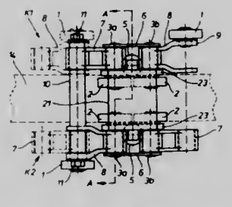
1. A safety attachment for restraining inadvertently uncoupled hoses, comprising; a piece of hollow braid polypropylene rope in which the ends are fed back through the hollow center section of the rope and passed through the outer braid at the midway point of the rope, where each end is passed through a flat washer and then melted, this forms two loops joined together, these loops, at the time of installation, increase in size to accommodate the coupling element of the hose, once installed, the loops are adjusted to tightly engage the hose or an anchor element, an uncoupled hose applies tension to the loops, causing the outer braid to squeeze the rope passing through the center, a "Chinese finger trap" effect, the more tension applied, the tighter the squeeze, therefore; securing the hose from whipping.

4,890,364
SPLIT RING SPRINGS FOR SNAP FASTENERS AND METHOD OF MANUFACTURING THE SAME
Akira Tanaka, Kurobe, and Kenji Hasegawa, Uozu, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Division of Ser. No. 109,514, Oct. 19, 1987, Pat. No. 4,809,532.
This application Jan. 17, 1989, Ser. No. 297,395
Claims priority, application Japan, Oct. 20, 1986, 61-249294
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—673 2 Claims



1. A split ring spring for snap fasteners, comprising an interrupted circular strip of resilient material having confronting opposite end faces extending parallel to the imaginary central axis of said interrupted circular strip, and a pair of burrs extending from said opposite end faces, respectively, in a direction parallel to said imaginary central axis and lying flush with the respective end faces.

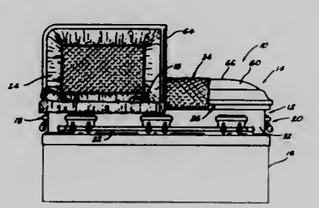
4,890,365
APPARATUS FOR HEATING FILM WEBS SIMULTANEOUSLY IN TWO AXIAL DIRECTIONS
Rudolf Langer, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany
Filed May 18, 1988, Ser. No. 195,725
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716603
Int. Cl.[4] D06C *3/00*
U.S. Cl. 26—73 7 Claims

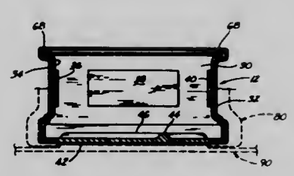


1. An apparatus for treating a film web simultaneously in two axial directions, comprising endless tentering chain means, including chain links and chain link journal shafts interconnecting said chain links, chain track means for supporting said endless tentering chain means along both edges of said film web, tentering clamps (20) for gripping a web edge, means for rigidly mounting said tentering clamps to said tentering chain means at a first spacing (y) between any two tentering clamps directly following each other in a row, and means for varying said spacing (y), said means for varying comprising, as part of said chain links, a pair of chain links for each of said tentering clamps, each pair of chain links including a first freely pivotable chain link (8) and a second freely pivotable chain link (7), and, as part of said journal shafts, a first journal shaft (3*b*) for pivotally connecting said first chain link (8) to one tentering clamp of said two tentering clamps, a second journal shaft (3*a*) for pivotally connecting said second chain link (7) to the other tentering clamp of said two tentering clamps, and a third journal shaft (10) for journalling said first and second chain links (8 and 7) to each other to bridge said first spacing (y), one of said

first and second chain links forming a bellcrank lever having a chain link arm (8) and an angled lever arm (9) extending at an angle relative to a chain moving direction, said third journal shaft (10) passing through an intersection between said chain link arm (8) and said angled lever arm (9), said means for varying further comprising a guide roller (1) rotatably secured to a free end of said angled lever arm, and guide control track means (16) arranged for moving said guide roller (1) to position said first and second freely pivotable chain links (8,7) at an angle relative to each other, whereby said first spacing (y) is varied to a second spacing (x) depending on a distance between said guide control track means and said chain moving direction of said tentering chain means.

4,890,366
CULTURED MARBLE CASKET AND METHOD OF PRODUCING SAME
Kenneth L. Schaapveld, 1605 Brown Oaks Dr., Oklahoma City, Okla. 73127
Filed Oct. 21, 1988, Ser. No. 260,884
Int. Cl.[4] A61G *17/00*
U.S. Cl. 27—7 44 Claims





1. A cultured marble casket comprising:

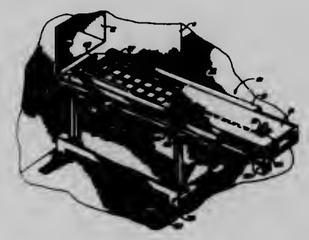
a base member;

a body member having an exterior portion, the body member and base member cooperating to define a cavity therebetween, the exterior portion of the body member fabricated of a cultured marble composition comprising from about 40 to about 60 parts by weight of a polyester casting resin, from about 80 to about 120 parts by weight of a particulate material, a catalytic amount of a catalyst capable of cross-linking the polyester casting resin, and an effective minor amount of a pigment capable of providing the cultured marble composition with the desired color and texture appearance;

closure means pivotally connected to the body member for selectively sealing the cavity of the body member, and for permitting access thereto; and

securing means for securing the closure means to the body member when the closure means is in the closed position.

4,890,367
CREMATORY LOADER
James P. Crawford, P.O. Box 13243, Orlando, Fla. 32859
Filed May 8, 1989, Ser. No. 348,870
Int. Cl.[4] A63G *17/00*
U.S. Cl. 27—27 15 Claims



1. A crematory loader comprising:

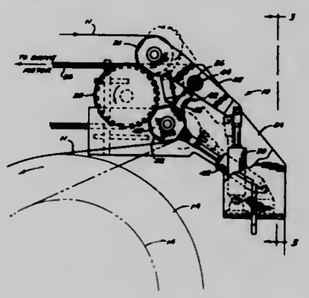
a frame;

slidable support means attached to said frame for supporting an object thereon, said slidable support means having a slidable top surface and a track for supporting said slidable top surface during sliding of said top surface between first and second positions whereby an object placed thereon may be moved from a first to a second position;

at least one leg attached to said frame supporting said frame; and

stop means movably attached to said frame, said stop means having a first position out of the path of an object on said sliding top surface and a second position blocking the path of an object for blocking the movement of an object supported on said slidable support means when said slidable top surface is moved from said second to said first position thereby pushing said object off one end of said slidable top surface.

4,890,368
WARPER WITH TENSION ISOLATOR AND TENSION CONTROLLER
Richard A. Schewe, Lovas Park, Ill., assignor to Reed-Chatwood, Inc., Rockford, Ill.
Filed Sep. 29, 1988, Ser. No. 250,534
Int. Cl.[4] D02H *13/14*; B65H *59/00*
U.S. Cl. 28—185 8 Claims



1. A textile machine having a beam rotatable about a predetermined axis and adapted to wind strands delivered to the beam from a supply, said beam being operable when rotated to draw strands from said supply, and means located between said beam and said supply for guiding said strands to said beam, for isolating the tension in the strands at the supply from the ten-

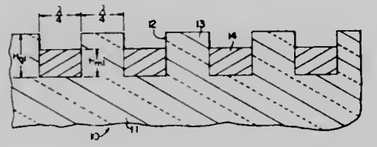
sion of the strands at the beam and for controlling the tension of the strands at the beam, said means comprising first, second and third rollers rotatable about laterally spaced axes paralleling the axis of said beam, said strands being guided around said first roller to said second roller, being guided around said second roller to said third roller and being guided around said third roller to said beam, said first and third rollers being substantially tangent to said second roller and in contact with the strands thereon, means connected to said third roller and operable in response to changes in force exerted on said third roller by said strands to produce a signal which varies as a function of changes in tension of the strands between said third roller and said beam, a drive for rotating said second roller and means responsive to said signal for causing the torque applied by said drive to said second roller to change as a function of changes in said signal.

4,890,369

METHOD OF MANUFACTURING SAW DEVICES

William J. Tanski, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 28, 1988, Ser. No. 263,933
Int. Cl.[4] H01L *41/22*
U.S. Cl. 29—25.35 **3 Claims**



1. A method of manufacturing surface acoustic wave devices, comprising the steps of

providing a dielectric substrate with a plurality of channels which open onto a substrate surface region and each of which accommodates a metallic electrode, the electrodes being recessed below the substrate surface region by an actual distance which at least equals a desired distance at which the electrodes have a minimum acoustic reflectivity;

testing the performance of the device to ascertain at least the acoustic reflectivity of the electrodes; and

etching at least the dielectric substrate, when it is ascertained during said testing step that the acoustic electrode reflectivity is excessive, at least at the substrate surface region to a predetermined etching depth, with attendant reduction in the difference between the actual and desired distances and commensurate reduction in the post-etching acoustic electrode reflectivity.

4,890,370

MANUFACTURING METHOD FOR INTEGRATED RESONATOR

Susumu Fukuda, Osaka; Hiroshi Ariyoshi, Tokyo, and Toru Kasanami, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 7, 1988, Ser. No. 255,054
Claims priority, application Japan, Oct. 9, 1987, 62-255851
Int. Cl.[4] H01L *41/22*
U.S. Cl. 29—25.35 **1 Claim**

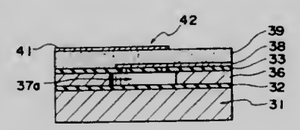
1. A manufacturing method for an integrated resonator comprising the following steps:

(a) implanting O^+ ions into a silicon monocrystal substrate from one side thereof,

(b) annealing the ion implanted substrate to form a buried SiO_2 layer therein,

(c) oxidizing the surface of the substrate to form an SiO_2 layer thereon,

(d) forming at least one slit on the SiO_2 layer formed by step (c),



(e) etching an area of the silicon monocrystal layer defined between the SiO_2 layer and the buried SiO_2 layer through the at least one slit to form a cavity therein, and

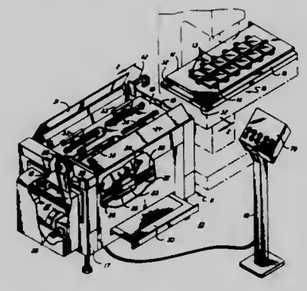
(f) forming a piezo-electric resonator on an area of the SiO_2 layer corresponding to the cavity formed by etching.

4,890,371

PALLET CHANGER FOR MACHINING CENTER

William J. Camloh, Lafayette, and Charles Alcott, Canastota, both of N.Y., assignors to Camloh Industries, Inc., Tully, N.Y.

Filed Nov. 5, 1987, Ser. No. 116,956
Int. Cl.[4] B23B *5/28*
U.S. Cl. 29—33 P **11 Claims**



1. Universal, field installable pallet changing, loading and cleaning apparatus for automatically bringing and precisely locating a workpiece in position at an automatic machining device and thereafter retrieving the machined workpiece, cleaning it and exchanging it with another, comprising:

at least one flat pallet having an upper side with means for holding at least one workpiece and an underside with rails that extend in a longitudinal direction thereon;

a work station disposed adjacent said machining device and including rail means for slidably receiving said pallet rails, stop means for locating said pallet accurately at a predetermined position, and cam means biasing said pallet upwards when said pallet is at said predetermined position to lock said rails against said rail means; and

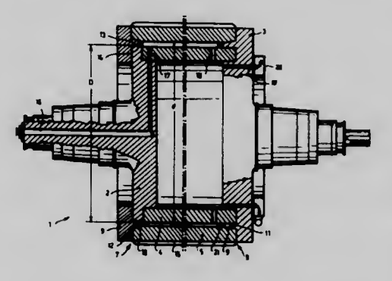
a loading and cleaning station including a housing, an invertable table journalled on a horizontal axis and having opposite sides, rail means on at least one side of said table for slidably engaging said at least one pallet to permit transfer to and from said work station, cam means selectively biasing said pallet away from said table to engage said rails and the rail means of said table when the pallet is disposed on said table; displacement means for engaging said pallet and moving the same between said table and said work station, means for rotating said table about said horizontal axis with said pallet thereon to invert the same, washing means within the housing for washing debris from the inverted pallet and any workpiece mounted thereon, and control means for controllably actuating said work station and said loading and cleaning station so that in operation said pallet with said workpiece mounted thereon is moved to said work station to commence a machining operation, when said machining operation is complete said pallet is returned by said displacement means to said table and the cam means thereof is actuated to hold said pallet, said table is inverted 180° so that said pallet and the machined workpiece thereon faces said washing means whereupon the latter is actuated to perform a wash cycle, and said table is again inverted to return the pallet and the cleaned workpiece to an upward position so that the machined and cleaned workpiece can be removed from said pallet and replaced with a fresh workpiece.

4,890,372

PRESS ROLL FOR A PAPER MACHINE

Kyösti Halttula, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Sep. 6, 1988, Ser. No. 241,510
Claims priority, application Finland, Sep. 16, 1987, 874035
Int. Cl.[4] B21B *27/00*
U.S. Cl. 29—123 **8 Claims**



1. A press roll for a paper or paper board machine, comprising a body forming by end pieces and a body cylinder mounted between the end pieces and attached thereto, and a press jacket surrounding the body cylinder and spaced apart therefrom,

said press jacket being a substantially rigid press cylinder and being supported stationary in the direction of rotation of the roll and at both ends thereof in the radial direction of the roll when mounted in place; and

at least one end piece of the roll, attached to the body cylinder, having an outermost diameter that is smaller than an inner of diameter of the press cylinder;

whereby the press cylinder and the body of the roll are detachable from each other and mountable in place with respect to each other by displacing them relative to each other in the axial direction of the roll.

4,890,373

PIPE REPAIR APPARATUS AND METHOD

William G. Hunt, 1210 E. Main St., Sunset Beach, N.C. 28459

Filed Jun. 20, 1988, Ser. No. 208,769
Int. Cl.[4] B23P *7/00*; B21D *37/00*
U.S. Cl. 29—402.09 **10 Claims**

1. A method of permanently repairing a rupture in the wall of a copper water pipe having a mound of outwardly expanded metal surrounding the rupture with portions of the mound on opposite sides of the rupture, said method comprising the steps of:

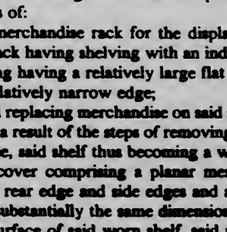
(a) providing a tool movable against selected portions of the mound;

(b) positioning the tool to move against the portion of the mound on a first side of the rupture;

(c) moving the portion of the mound on said first side of the rupture to its intended position in line with the wall of the pipe;

(d) positioning the tool to move against the portion of the mound on the second side of the rupture;

(e) moving the portion of the mound on the second side of the rupture to its intended position in line with the pipe



without moving the portion of the mound on the first side of the rupture, whereby a slit is defined in line with the wall of the pipe;

(f) providing a rigid cover;

(g) positioning the rigid cover over the slit; and

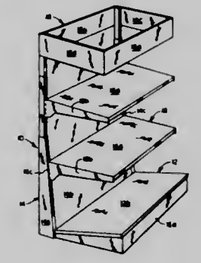
(h) adhering the rigid cover to the pipe in sealing relation to the slit.

4,890,374

METHOD FOR UTILIZING MERCHANDISE DISPLAY SHELVES

Jerry C. Messick, Jr., Rte. 1, Box 393-A, Julian, N.C. 27283

Continuation of Ser. No. 248,303, Sep. 21, 1988, abandoned, which is a continuation of Ser. No. 20,168, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 767,439, Aug. 20, 1985, abandoned. This application Mar. 10, 1989, Ser. No. 323,256
Int. Cl.[4] B23P *7/00, 19/04*
U.S. Cl. 29—402.09 **1 Claim**



1. A process for utilizing merchandise display shelves comprising the steps of:

providing a merchandise rack for the display of merchandise, said rack having shelving with an individual shelf of said shelving having a relatively large flat surface and an adjacent relatively narrow edge;

removing and replacing merchandise on said shelf, said shelf wearing as a result of the steps of removing and replacing merchandise, said shelf thus becoming a worn shelf;

providing a cover comprising a planar member having a front edge, rear edge and side edges and a generally flat surface as substantially the same dimensions as the corresponding surface of said worn shelf, said planar member having a front flange depending downwardly from said edge and non-penetrating attachment means comprising

an inwardly bent portion of said front flange for attaching said front flange to the worn shelf;

placing said planar member on said worn shelf by coinciding said planar member to said worn shelf and positioning said inwardly bent front portion of said flange into a locking relationship with said relatively narrow edge; and

said planar member obscuring said worn shelf from view and thereby improving the quality of the appearance of the display rack.

4,890,375

REPAIR OF STEEL-MAKING VESSELS

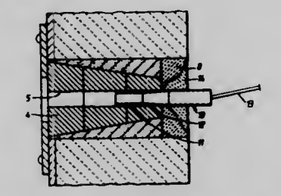
Richard J. Browning, Porthcawl, United Kingdom, assignor to Gerken Metallurgical Services Limited, Bridgend, United Kingdom

Filed Apr. 8, 1988, Ser. No. 179,071

Claims priority, application United Kingdom, Apr. 8, 1987, 8708414

Int. Cl.[4] B22D *19/10*

U.S. Cl. 29—402.16 **7 Claims**



1. A method of repairing an enlarged approach region of a tap hole in a side wall of a steel-making vessel, the tap hole having a predetermined normal diameter, by using an iron pipe having a larger diameter at one end, and having a tapered entry end, such that the larger diameter end of the pipe is only a little larger than the predetermined normal tap hole diameter, the method comprising the steps of seating the tapered entry end of the pipe within the tap hole, filling the enlarged approach region in the side wall of the vessel around the larger diameter end of the pipe with a settable refractory material, and allowing that material to set.

4,890,376

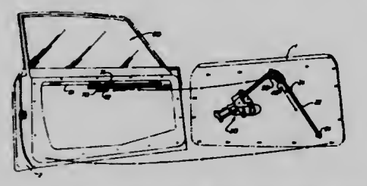
METHOD OF ASSEMBLING AND INTERFACING MODULAR DOOR COMPONENTS ON A VEHICLE

Daniel E. Bolleau, Dearborn Heights, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Division of Ser. No. 97,230, Sep. 15, 1987, Pat. No. 4,766,697. This application May 2, 1988, Ser. No. 189,449

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—434 **5 Claims**



1. A method of assembling and interfacing components of a modular vehicle assembly made up of an exterior door panel, a repeateably moveable assembly positioned for movement within said exterior panel, and a separate interior door panel attachable to said exterior panel, drive means included on said interior panel for repeatably moving said moveable assembly after said panels are attached together, comprising the steps of:

(a) providing a coupling element on said moveable assembly, a coupling element on said drive means, and a mechanical guide associated with one of said coupling elements for automatically guiding said two coupling elements together into coupling engagement as they are moved toward each other;

(b) attaching said panels together covering over said coupling elements, while said coupling elements are out of coupling engagement; and

(c) after at least the initial attachment of said two panels together, moving at least one of said coupling elements toward the other, by actuating said drive means to produce at least in part the relative movement between said coupling elements and using said mechanical guide to automatically bring them into coupling engagement, completing the coupling engagement of said moveable assembly to said drive means after panel assembly without requiring an assembler to see or directly reach the coupling elements in order to achieve the coupling engagement.

4,890,377

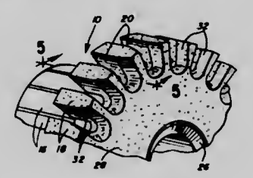
METHOD OF MAKING CUMMUTATORS

Howard A. Ebner, Glencoe, Ill., assignor to Reinold Engineering Corporation, Newark, Ohio

Continuation of Ser. No. 895,307, Aug. 11, 1986, abandoned, which is a division of Ser. No. 774,710, Sep. 11, 1985, Pat. No. 4,638,202. This application Feb. 29, 1988, Ser. No. 165,390

Int. Cl.[4] H01R *43/06*

U.S. Cl. 29—597 **14 Claims**



1. A method of fabricating a commutator assembly, comprising the steps of:

providing a core of insulating material with a plurality of generally flat commutator segments disposed around and extending longitudinally substantially the entire length of the core, the segments combining to define an outside, generally cylindrical surface means with the segments being disposed substantially within the cylindrical surface; and

molding riser means which are formed independent of the commutator segments to one end of the core and commutator segments, projecting radially outwardly beyond said surface means, with radially opening peripheral slots through which the coil ends of an appropriate motor armature are joined with respective ones of the commutator segments.

4,890,378

METHOD FOR MANUFACTURING A MAGNETIC HEAD CORE HAVING A MAGNETIC FILM

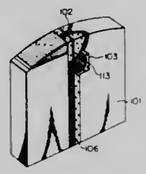
Takashi Suzuki, Yokohama; Toshio Yamanaka, Kawasaki; Hiroyuki Suzuki, Yokohama; Tsuyoshi Orikasa, Kasukabe; Takeshi Sawada, Yamato; Makoto Kameyama, Urayasu, and Kiyozumi Niizuma, Ohmiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 900,881, Aug. 27, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 235,824

Claims priority, application Japan, Aug. 28, 1985, 60-187486; May 16, 1986, 61-112061; Jan. 6, 1986, 61-131435; Jul. 25, 1986, 61-174976; Jul. 25, 1986, 61-174977; Jul. 25, 1986, 61-174978; Jul. 25, 1986, 61-194979

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **17 Claims**



1. A manufacturing method of a magnetic head core, comprising:

(a) a first step of forming a groove for a winding in one surface of a magnetic block which is made of a first magnetic material of high permeability;

(b) a second step of depositing a first magnetic film made of a second magnetic material of high saturation magnetic flux density on the surface of the magnetic block on which the groove is formed;

(c) a third step of depositing a nonmagnetic film made of a nonmagnetic material for serving as a magnetic gap on the first magnetic film deposited on the surface of the magnetic block;

(d) a fourth step of depositing a second magnetic film made of the second magnetic material on the nonmagnetic film deposited on the first magnetic film;

(e) a fifth step of bonding a reinforcing block with the second magnetic film deposited on the nonmagnetic film, the reinforcing block including a nonmagnetic exposure portion, and said fifth step follows said fourth step; and

(f) a sixth step of forming a magnetic head core which includes the magnetic block, the first magnetic film, the nonmagnetic film, the second magnetic film and the reinforcing block, so that the nonmagnetic exposure portion exposes to a sliding face for sliding a recording medium of the magnetic head core.

4,890,379

METHOD FOR MANUFACTURING MAGNETIC HEAD

Hiroshi Yohda, Hirakata; Ken Takahashi, Osaka; Eisuke Sawai; Syunsaku Murasoka, both of Hirakata, and Keita Ihara, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 1, 1988, Ser. No. 278,172

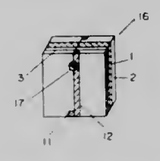
Claims priority, application Japan, Dec. 4, 1987, 62-307868

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **20 Claims**

1. A method of manufacturing a magnetic head comprising:

joining plural magnetic core halves with a nonmagnetic gap material formed therebetween, each of said plural magnetic core halves comprising a magnetic alloy; said joining including heat treatment in a magnetic field; and then



machining a wire-wiinding window into the thus joined plural magnetic core havles.

4,890,380

METHOD OF MANUFACTURING A FUSE WITH AN ENVELOPE OF NON-POROUS RIGID CERAMIC

Vnjislav Narancic, Ville d'Anjou, and Gilles Fecteau, Boucherville, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Division of Ser. No. 46,535, May 6, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 270,465

Claims priority, application Canada, Mar. 20, 1987, 532649

Int. Cl.[4] H01C *17/02*

U.S. Cl. 29—623 **13 Claims**

1. A method of manufacturing a current-limiting fuse comprising the steps of:

producing an elongated fusible element designed to conduct an electric current and to melt and thereby interrupt said electric current when the same reaches a given value;

producing a solid envelope that is made of a non-porous rigid ceramic and defines a cavity having the same shape and dimensions as the fusible element, said ceramic having a high dielectric resistivity at the high temperature of an electric arc produced within the envelope upon melting of the fusible element, as well as a high resistance to shocks of internal pressure and high temperature caused by said electric arc;

said step of producing the envelope comprising the production of two complementary pieces made of said ceramic and each having a surface of contact with the other of the two complementary pieces, the contact surface of at least one of said two complementary pieces comprising a groove having the same shape and dimensions as the fusible element;

inserting said fusible element within the cavity defined in said envelope so that said ceramic closely surrounds the fusible element; said fusible element inserting step comprises inserting said fusible element within said groove and in assembling together the two complementary pieces, said assembly comprising (a) joining said two contact surfaces of the two complementary pieces by means of an inorganic cement, and (b) subjecting the so joined complementary pieces to a pressure to press said contact surface against each other, and to a heat treatment at a temperature lower than the melting point of the fusible element for thereby forming a rigid and impervious envelope; and

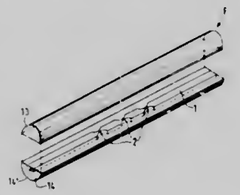
mounting on said envelope a pair of terminals interconnected together through the fusible element, said pair of terminals providing for connection of the fusible element in an electric circuit to be protected against an overcurrent.

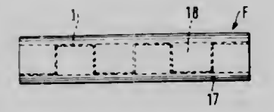
8. A method of manufacturing a current-limiting fuse, comprising the steps of:

producing a solid envelope made of non-porous rigid material and defining a cavity, said material having a high dielectric resistivity at high temperatures as well as a high resistance to shocks of internal pressure and high temperature;

injecting a molten metal within said cavity of the envelope

to form a fusible element designed to conduct an electric current and to melt and thereby interrupt said electric current when the same reaches a given value; and







mounting on said envelope a pair of terminals interconnected together through the fusible element, said pair of terminals providing for connection of the fusible element in an electric circuit to be protected against an overcurrent.

4,890,381

CONTACTING DEVICE AND METHOD FOR CONNECTING A CONDUCTIVE FOIL

Dieter Dubois, Augsburg, Fed. Rep. of Germany, and Helge-Detlev Breite, Espen, Belgium, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

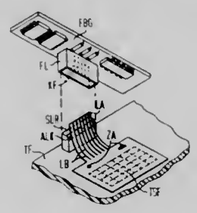
Filed Mar. 25, 1988, Ser. No. 173,581

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710593

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—832 **7 Claims**

1. A method for automatic contacting of a conductive foil lying against a carrying surface to a spring strip, wherein at least one side of a clip projection connected to the conductive foil comprises a plurality of electrical contact surface to which individual contact springs of the spring strip are respectively allocated; comprising the steps wherein the clip projection of the conductive foil is first applied against the strip-shaped longitudinal rib, which is arranged at a fixed position relative to the carrying surface and which is forcing the clip projection out of the plane of the carrying surface, the conductive foil is then secured on the carrying surface in that, subsequently, the clip projection is clamped between the strip-shaped longitudinal rib and the contact springs of the spring strip, whereby the clip projection engages against said strip-shaped longitudinal rib upon contact pressure of the contact springs.



4,890,382

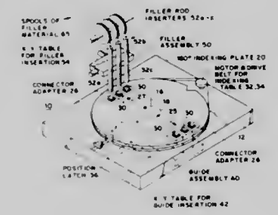
APPARATUS FOR USE IN ASSEMBLING ELECTRICAL CONNECTORS

Leslie A. Anderson, Bothell; Eric J. Selby, Everett; David L. Wagner, Kent, and Alfred E. Walter, Jr., Everett, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1988, Ser. No. 291,557

Int. Cl.[4] H05K *3/30;* **B21P** *21/00*

U.S. Cl. 29—833 **22 Claims**



1. In a method for assembling multiple electrical conductors into an electrical connector having multiple holes for receiving said conductors including the steps of identifying conductors and in response thereto ascertaining via electronic data lookup means the location of holes wherein given conductors are to be inserted, extending an illuminating rod into holes in response to data lookup so that a given hole is visually recognizable by an operator, and inserting a given conductor in the last mentioned hole, the improvement comprising the steps of:

electronically ascertaining the locations of the holes within said electrical connector which are to be left vacant and into which filler rod elements are required to be inserted via reference to an electronic data lookup means;

positioning a filler rod insertion tool over each of said vacant holes by controlling the movements of an X-Y table on which said tool is mounted; and

feeding filler rod material into said vacant holes.

4. An apparatus for assembling filler rod elements into an electrical connector having multiple holes for receiving electrical contacts, comprising:

control means for specifying the locations of said holes within said connector into which filler elements are required to be inserted;

means for automatically inserting filler rod elements into said holes in said connector in response to control signals from said control means, including means for separately feeding a continuous strand of filler rod material into each of the holes in said connector, and means for clipping off said strand of filler rod material after it has been fed into each of said holes; and

translation means for transversely positioning said means for inserting filler rod elements in response to control signals from said control means.

4,890,383

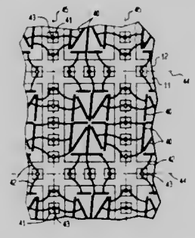
METHOD FOR PRODUCING DISPLAYS AND MODULAR COMPONENTS

Marvin Lumbard, Los Gatos, and Lynn K. Wiese, Santa Clara, both of Calif., assignors to Simens Corporate Research & Support, Inc., Iselin, N.J.

Division of Ser. No. 144,370, Jan. 15, 1988, Pat. No. 4,843,280. This application Apr. 14, 1989, Ser. No. 338,720

Int. Cl.[4] H01L *21/56;* **H05B** *43/00*

U.S. Cl. 29—841 **17 Claims**



1. A method of manufacturing modular components, comprising the steps of:

(a) providing an electrically insulating, generally planar substrate having two opposing major surfaces, the first of said two major surfaces including a plurality of land areas for receiving devices to be mounted thereon and a plurality of connection pads, the second of said two major surfaces including a plurality of terminal pads serving as external terminals for mounted devices, and plated through holes for providing electrical connections between some of the external terminals to the land areas and between the remaining external terminals to the connection pads;

(b) mounting at least one device having at least two terminals on individual land areas so that one terminal is electrically and mechanically coupled to one of said land areas and electrically connected to its corresponding external terminal;

(c) electrically connecting any remaining terminals of each device to respective ones of said connection pads;

(d) depositing a curable layer of insulative material onto said first major surface for encapsulating said devices including electrical connections made in step (c);

(e) curing said layer of insulative material at least partially; and

(f) dividing the planar substrate including the layer of insulative material into individual modular components, each individual modular component including at least one device mounted therein and encapsulated by the layer of insulative material and electrically connected to its external terminals.

4,890,384

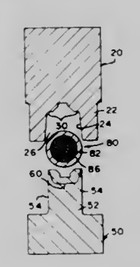
METHOD OF CRIMPING AN ELECTRICAL CONNECTION

Howard R. Shaffer, Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 237,684, Aug. 25, 1988, Pat. No. 4,828,516, which is a continuation of Ser. No. 567,024, Dec. 30, 1983, abandoned. This application Jan. 13, 1989, Ser. No. 297,817

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—863 **9 Claims**



1. A method for crimping a contact terminal having a wire-receiving barrel to an electrical conductor having a stripped portion disposed within the barrel, to form an electrical connection, comprising:

placing said wire-receiving barrel of said terminal to be crimped to said stripped portion of said electrical conductor contained therewithin, between a pair of opposing crimping dies secured in a crimping apparatus and aligned with respect to each other along an axis and movable relative to each other along said axis to within a preselected distance from each other, which crimping dies each have a crimping surface disposed transverse to said axis and containing a central recessed relief area between two barrel-engaging portions spaced apart to straddle said wire-receiving barrel, the barrel-engaging portions of the crimping dies being arranged in adjacent opposing pairs associated with respective pairs of barrel sections on both sides of said wire-receiving barrel;

applying a predetermined compressive force with said crimping dies to said wire-receiving barrel of said terminal containing said portion of said conductor and to outer surfaces of said pairs of barrel sections on both sides of said terminal from above and below thereof and obliquely at an angle to said outer barrel section surfaces, thus deforming one of each of said pairs of barrel sections directly toward the respective other of said pair and indirectly against and into said wire portion at four angularly spaced locations forming four indentations in said wire portion, thereby directly deforming the portions of said wire-receiving barrel between said barrel section pairs and indirectly deforming said wire portion to flow toward other sections of said wire-receiving barrel, whereby substantially the entire wire portion has been subjected to deformation forming an assured termination, and

removing said crimped connection from said dies.

4,890,385

AUTOMATIC FEED SYSTEM FOR A TUBE CUTTER

Jerald VanderPol, Eldorado Hills, and Cory J. Silber, Sacramento, both of Calif., assignors to Tri Tool Inc., Rancho Cordova, Calif.

Filed Feb. 29, 1988, Ser. No. 161,972

Int. Cl.[4] B23D *21/06*

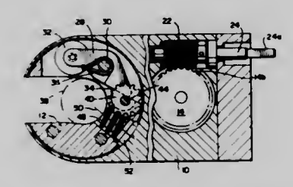
U.S. Cl. 30—101 **25 Claims**

1. An automatic feed system for a tube cutter having a rotatable cutting head and a cutting means attached to a cutting arm pivotally attached to the cutting head wherein the cutting head

defines means to accommodate a tube therein, the feed system comprising:

(a) a cam element mounted on the cutting head so as to rotate about an axis, the cam element having an eccentric cam surface;

(b) cam follower means on the cutting arm;



(c) biasing means biasing the cam follower means into contact with the eccentric cam surface; and,

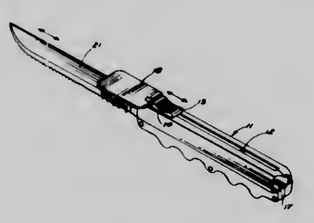
(d) drive means to rotate the cam element at least a portion of a revolution for each revolution of the cutting head such that the cutting arm pivots, thereby urging the cutting means into contact with a tube located in the tube cutter.

4,890,386

RECIPROCATING KNIFE APPARATUS

Doris B. Collier, Rte. 3, Box 625, Wilson, N.C. 27893

Filed Aug. 10, 1988, Ser. No. 230,528
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—136 **1 Claim**



1. A reciprocating knife comprising a knife blade and a case means for securing said knife blade from a first retracted position wherein said knife blade is completely retracted within said case to a second extended position enabling reciprocation of said knife blade by manually manipulatable reciprocation means, and

a flange extending outwardly and secured integrally to an upper forwardmost portion of said case, and said flange including a plurality of teeth extending downwardly from said flange to engage an article to be severed, and

wherein said flange projects in a plane generally parallel to an upper surface of said case wherein said upper surface further includes a slot slidably containing said reciprocation means. and

wherein said reciprocation means includes a slider formed with a concave ribbed recess for manual engagement to enable reciprocation of said knife blade, and

wherein said teeth extend orthogonally downwardly relative to said flange to position below a cutting edge of said knife blade, and

wherein a plurality of spring biased fingers are secured interiorly of said case and maintained at a rearward portion of said knife when said knife is in said first retracted position to engage said knife blade, and maintain said knife blade, in said first retracted position, and

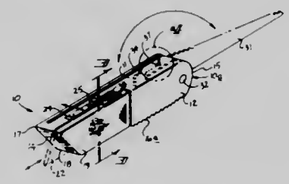
wherein said case includes a series of ribs along a lower face of said knife to enhance manual grasping of said case, and where said plurality of teeth include a matrix of teeth formed with a spacing medially thereof for accepting said knife blade to reciprocate between said teeth.

4,890,387

DRYWALL UTILITY KNIFE

Serafino S. Canino, 94 Roosevelt Ave., Torrington, Conn. 06790

Filed Mar. 10, 1989, Ser. No. 321,791
Int. Cl.[4] B26B *11/00*
U.S. Cl. 7—118 **10 Claims**



1. A drywall utility knife comprising, in combination,

a main elongate housing including a left side surface spaced from a discontinuous right side surface wherein said right side surface includes an inwardly stepped recess surface, and

a top surface overlying and spaced from a bottom surface, a forward surface, and an arcuate rear surface, and

said top surface including a first elongate slot spaced from said forward surface and extending into said arcuate rear surface, and

a serrated drywall saw pivotally mounted adjacent a forward surface and pivotal from a first position interiorly of said housing to a second position exterior of said housing aligned with said housing wherein said position, and

a lock member positioned within said first elongate slot adjacent a rear blunt surface of said saw to lock said saw in said second position, and

a trapezoidal utility knife telescopingly mounted through said forward surface, and

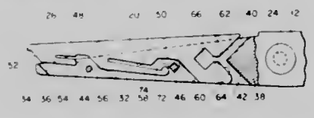
a drywall texturing means formed on said bottom surface to texture a drywall portion when severed by said saw or said utility knife.

4,890,388

CUTTING IMPLEMENT WITH DETACHABLE BLADES

Anthony T. Rose, 741 Lakefield Rd., Westlake Village, Calif. 91361

Filed Oct. 5, 1988, Ser. No. 253,501
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—260 **5 Claims**



1. A cutting implement having a pair of elongated shanks pivoted together midway between their opposite ends so that the opposing edges converge together as the shanks are closed toward one another, the improvement which comprises:

at least one of said shanks having a shaped recess provided in a selected side of said shank and said recess being defined between contoured surfaces defining the respective ends of said recess;

a blade having a cutting edge and shaped forward and tail ends conformal to said contoured surfaces whereby retention of said blade is produced when said blade is inserted into said shank recess;

guide means cooperatively carried on said shank and said blade for positioning said blade into said shank recess to effect conformal mating of said shaped forward and tail ends of said blade with said contoured surfaces;

said guide means comprises a pair of posts laterally projecting outwardly from said shank recess in fixed spaced-apart relationship with respect to each other and with respect to said end contoured surfaces;

slots provided on said blade angularly disposed from the edge of said blade opposite from said cutting edge; and

said posts being insertably received within said slots to guide and retain said blade in captive position on said shank exposing said cutting edge.

4,890,389

CUTTER GUARD

George H. Whitkop, 10 Ridge Rd., East Longmeadow, Mass. 01028

Filed Mar. 8, 1989, Ser. No. 320,545
Int. Cl.[4] A01G *3/06*
U.S. Cl. 30—276 **2 Claims**



1. In a power trimming device having a rotating cutting element partially enclosed about a short arcuate extent by a housing, the improvement comprising:

a generally circular guard formed from a rigid bar and secured to said housing, said guard surrounding said cutting element and having an open front portion formed by outwardly flared ends;

an adjustable mounting bracket securing said guard to said housing, said mounting bracket including:

a first plate having at least one elongated slot receiving a threaded fastener for adjustably securing said first plate to said housing;

a second plate pivotally connected to said first plate;

an arcuate guide having a first end secured to said first plate, said arcuate guide having an arcuate slot receiving a clamp screw engaged with said second plate for securing said second plate in a pivotally adjusted position;

and

fastening means securing said guard to said second plate.

4,890,390

SWORD BLADE

Jean A. Begon, Loire, France, assignor to Begon S.A., Loire, France

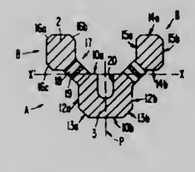
Filed Apr. 25, 1988, Ser. No. 186,258
Claims priority, application France, Apr. 23, 1987, 87 06042
Int. Cl.[4] F41B *13/02*
U.S. Cl. 30—346 **8 Claims**

1. A sword blade comprising

a longitudinal member which comprises, in cross section at each point along its length, a first part and second part connected together and being located effectively on respective opposite sides of a plane of inertia of the blade transverse to the cross section and containing a neutral axis of the blade, said first part having a moment of inertia with respect to said plane of inertia that is approximately equal to the respective moment of inertia of said second part,

said first part including a rib having a polygonal elementary section with at least two first faces oriented parallel to said plane of inertia, and two first lateral faces oriented perpendicular to said two first faces,

said second part including a pair of wings of two further elementary sections, said further elementary sections being equally spaced on both sides of a vertical median plane of the blade perpendicular to said plane of inertia,



each said further elementary section having a polygonal shape with at least two second faces parallel to said plane of inertia and two second lateral faces perpendicular to said two second faces, each said wing thus constituting an extension strip extending along said rib for the length of the blade, and

stress concentration means for concentrataion of stresses at a plurality of points in the blade along the length thereof, and for accumulating fatigue from said stresses, a first plurality of points of said stress concentration means connecting said rib and the first of said wings, and a second plurality of points of said stress concentration means connecting said rib and the second of said wings, each said stress concentration means being placed at respective points along the length of the blade so as to be intersected by said plane of inertia for the respective cross section.

4,890,391

COMMERCIAL ELECTRICAL BOX TOOL

Donald Warren, P.O. Box 7000-515, Redondo Beach, Calif. 90277

Filed Feb. 7, 1989, Ser. No. 306,983
Int. Cl.[4] B25B *3/00, 11/00*
U.S. Cl. 33—613 **11 Claims**

1. An alignment tool for simultaneously and accurately installing a commercial electrical box on each side of a stud, comprising:

a frame having at least one frame stud standoff; and

a rectangular tube mounted to said frame so that said rectangular tube is held parallel to and away from the front of a stud by an amount set by said frame stud standoff; and

a box holder assembly mounted on said rectangular tube and having first and second side surfaces extending away from and parallel to said frame and parallel to one another with said first and second side surfaces separated to by about 2 1/16 inches to accommodate the width of a stud and bracket offsets for two electrical boxes; and

at least one depth tab on both the first and second side surfaces of said box holder assembly placed with respect to said frame stud standoff to provide for an electrical box setback of about ¼ inch from the front of the stud to account for a plaster ring flange depth; and

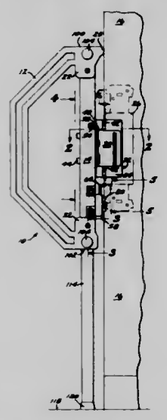
a box bolding spring mounted on said box holder assembly and maintaining tension on the first and second side surfaces of said box holder assembly; and

a first binary gauge mounted to said rectangular tube below

said first side of said box holder assembly for selecting the centerline alignment for either 4 inch or 4 11/16 inch square electrical boxes; and

a second binary gauge mounted to said rectangular tube below said second side of said box holder assembly for selecting the centerline alignment for either 4 inch or 4 11/16 inch square electrical boxes; and

a height gauge mounted on said frame for setting the vertical distance between a plane such as a floor or ceiling and the centerline alignment of said electrical boxes determined by said first and second binary gauges; and



wherein when said frame stud standoff gauge is aligned along the front length of a stud and said first and second side surfaces of said box holder assembly are along the two sides of a stud that an electrical box can be placed on either side of said box holder assembly and held on said box holder assembly by said box holding spring with the horizontal depth of the electrical boxes with respect to the stud determined by said depth tabs on said box holder assembly first and second side surfaces and with the centerline alignment of one electrical box determined by the selection on said first binary gauge and with the centerline alignment of the other electrical box determined by the selection on said second binary gauge.

4,890,392

DIGITAL TAPE MEASURE

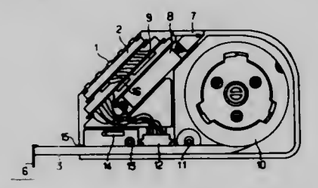
Masaharu Komura, Uji; Kunio Hirai; Tatsuaki Nakai, both of Kyoto; Kazuyoshi Okumura, Joyo, and Nobuyuki Yamamoto, Kyoto, all of Japan, assignors to Kyoto Measuring Instruments Corp., Kyoto, Japan

Continuation of Ser. No. 763,815, Aug. 8, 1985, abandoned. This application Apr. 10, 1987, Ser. No. 37,106

Claims priority, application Japan, Jan. 8, 1985, 60-001667

Int. Cl.[4] G01B *3/10*

U.S. Cl. 33—762 **2 Claims**



1. A digital tape measure comprising:

a case having an aperture therethrough and an elongated tape supported within said case in coiled condition so as to be withdrawable therefrom through said aperture with a free end adapted to be moved toward and away from said case to traverse a distance to be measured;

a series of detection marks of equal length spaced by equal intervals along the length of said tape, said marks being twice as long as a minimum unit length which can be digitally displayed and said intervals between marks having a length equal to that of said marks;

means for detecting said detection marks and outputting a detection signal including photoelectric sensing means supported in said case over and in close proximity to the surface of the tape on which said marks are carried and operatively associated with said detection marks on said tape for providing output signals at constant increments of distance during movement of said tape relative to said case indicating transitions between said marks and the intervals therebetween, said photoelectric sensing means comprising a pair of reflective-type photoelectric transfer elements spaced along the direction of movement of said tape at a phase difference of 90° for producing in response to a given detection mark respective output signals differing in phase by 90°, each said transfer element comprising a light-emitting element positioned to directly and unobstructedly irradiate said tape in combination with a light-receiving element positioned adjacent said light-emitting element in a common structure to directly and unobstructedly receive light reflected from said tape when said marks are irradiated by said light-emitting element, said means for detecting further including a battery providing a voltage for operating said detecting means;

readout means operatively connected to said transfer elements for converting said detection signal to an indication of the distance traversed by said tape and displaying said indication;

means operatively connected to said batteries for indicating its voltage when it is below a specified value; and

alarm circuit means operatively connected to said battery for stopping detection by said means for detecting when said voltage is below said specified value.

4,890,393

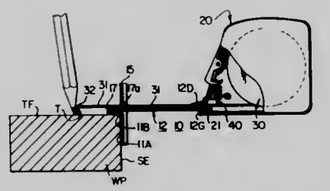
MEASURING TAPE GUIDE ATTACHMENT

Joseph D. P. St. Jean, P.O. Box 377, Morrow Street, Greaville, Quebec, Canada J0V 1J0

Filed May 31, 1988, Ser. No. 200,559

Int. Cl.[4] G01B *3/08, 3/10;* **B43L** *13/00, 13/04*

U.S. Cl. 33—768 **7 Claims**



1. An attachment for a tape measure that provides a guide for marking when moving the tape along a path on a work piece where the path is perpendicular to the length of the tape;

said attachment being in the form of a T-square and comprising a stem part that projects at one end thereof into a tape dispensing opening of a casing that houses the tape measure and at the other end has an angle head part at right angles to the stem, said stem having tab means projecting therefrom and located at a position from the end of the stem that projects into said tape dispensing opening so as to limit the depth of penetration into the casing;

said head part having a first flange means resting and sliding on the surface of the work piece being marked and a second flange means at right angles thereto engaging and sliding along an edge of the work piece during use of the attachment.

4,890,394

METHOD AND APPARATUS FOR DRYING FLAT STRUCTURAL COMPONENTS

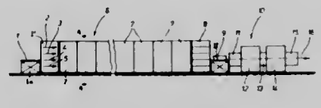
Gerhard Troetscher, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft m.b.H., Lindau, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,580

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735242

Int. Cl.[4] F26B *3/34*

U.S. Cl. 34—1 **11 Claims**



1. A drier for drying flat structural components, especially wall boards, comprising convection first drying means for applying convection heat to said flat structural components, said convection first drying means comprising several convection drying stages arranged in sequence between an inlet and an outlet of said convection drying means, and means for controlling the temperature of said convection heat provided by said convection drying stages so that said temperature decreases from said inlet to said outlet, and high frequency second drying means for applying heat internally to said flat structural components after the convection drying.

4,890,395

HAIR DRYER

Yücel Yamac, Graz, Austria, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

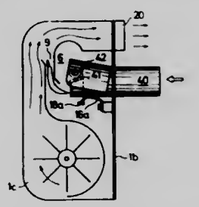
PCT No. PCT/DE87/00087, § 371 Date Jan. 4, 1988, § 102(e) Date Jan. 4, 1988, PCT Pub. No. WO87/05194, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 3, 1987, Ser. No. 127,668

Claims priority, application Austria, Mar. 5, 1986, 560/86

Int. Cl.[4] A45D *20/06*

U.S. Cl. 34—96 **20 Claims**



1. A hair dryer comprising a housing, structure in said housing defining an air inlet, an air outlet and an airflow channel between said inlet and said air outlet,

blower structure in said housing and coupled to said air flow channel,

receptacle structure in said housing for receiving fuel tank structure,

actuator structure coupled to said receptacle structure and responsive to insertion of fuel tank structure into said receptacle structure for igniting a flow of fuel flow from said fuel tank, and

structure in said housing defining a connecting passage between said receptacle structure and said airflow channel for producing a flow of hot air in said air flow channel in response to the ignited flow of fuel.

4,890,396

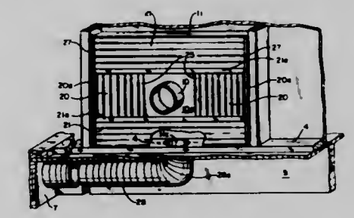
ADJUSTABLE CLOTHES DRYER VENT CONNECTION

Timothy P. King, 2087 Northwest 140th St., Shakopee, Minn. 55379

Filed Aug. 12, 1988, Ser. No. 231,341

Int. Cl.[4] F24F *13/18*

U.S. Cl. 34—235 **4 Claims**



1. An adjustable clothes dryer vent comprising,

a housing defining a communication chamber there within,

an adjustable connector sleeve mounted on one side of said housing for connection to the exhaust vent of a clothes dryer when the housing has been mounted between the wall studs of a building,

sealing means between said sleeve and the housing chamber, said sealing means including means for adjusting the sleeve both vertically and horizontally to permit registration and connection with the dryer vent opening,

exhaust conduit connected to said housing to provide a discharge outlet from the housing chamber, and

wherein the adjustment for said connector sleeve is provided by apparatus which includes a pair of horizontally disposed spaced apart channel rails forming a horizontal track and a pair of spaced apart vertically disposed channel members receiving the ends of said horizontal rails to permit vertical adjustment of said horizontal members and means for sealing the open areas of the side of the housing surrounding said sleeve while permitting said vertical and horizontal adjustment thereof.

4,890,397

SHOE FOR SPORTS INVOLVING RUNNING

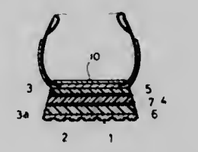
Masasuke Harada, Kurume; Hiroshi Kumagawa, Chikugo, and Junji Izumi, Okuma, all of Japan, assignors to Nippon Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 749,831

Claims priority, application Japan, Jun. 30, 1984, 59-135818

Int. Cl.[4] A43B *13/12, 13/14*

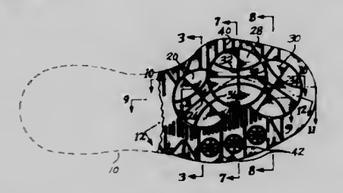
U.S. Cl. 36—30 R **8 Claims**



1. A shoe for use in sports involving running, said shoe

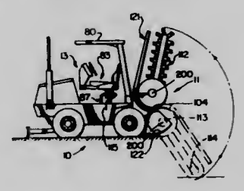
comprising, an outer ground engaging sole, an inner foot engaging sole and an intermediate cushioning midsole, characterized in that a shock absorbing member comprising a shock absorbable synthetic resin foam layer having a SRIS-0101 compression hardness of not substantially less than 40 and not substantially more than 80 interposed between and adhered to a pair of upper and lower non-shock absorbing plates having a Shore hardness of not substantially less than 50 and not substantially more than 90 is provided between the outer sole and the midsole in a heel portion of said shoe.

4,890,398
SHOE SOLE
Robert Thomasson, 20200 87th Ave. South, Kent, Wash. 98032
Continuation-in-part of Ser. No. 124,024, Nov. 23, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,174
Int. Cl.[4] A43B *5/00*
U.S. Cl. 36—114 **12 Claims**



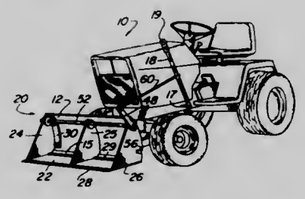
1. A shoe, comprising:
a sole having a floor contacting bottom including:
a primary pivot pad that is substantially circular in plan form, located generally below the ball region of the user's foot, and presenting a downwardly directed convex pivot surface having a pivot center;
at least one secondary pivot pad adjacent said primary pivot pad;
said primary pivot pad extending laterally into and truncating said secondary pivot pad;
said secondary pivot pad having a concave side boundary adjacent the primary pivot pad and otherwise having a substantially circular plan form; and
said secondary pivot pad presenting a downwardly directed convex pivot surface having a pivot center.

4,890,399
RIDER TYPE TRENCHING MACHINE
Rodney A. Stiff; Malcolm J. Baker, and Graham G. Yates, all of Bundaberg, Australia, assignors to Austoft Industries Limited, Bundaberg, Australia
Filed Jun. 30, 1987, Ser. No. 68,566
Claims priority, application Australia, May 26, 1987, PI.2153
Int. Cl.[4] E02F *5/06*
U.S. Cl. 37—86 **11 Claims**



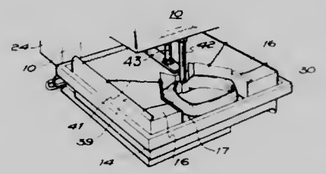
6. A trencher comprising:
(a) a frame,
(b) first and second mounting means connected to said frame below said frame, said second mounting means being located rearwardly of said first mounting means, a filling blade positioned forwardly of said trencher and said first and second mounting means, an axle pivotably connected to said first mounting means, a support arm for said filling blade extending between said second mounting means and said filling blade and below said axle, a steerable wheel assembly mounted to each side of said axle and at least one hydraulic motor means mounted to each of said steerable wheel assemblies, and
(c) a mounting bracket connected to said frame, a trenching head pivotally connected to said mounting bracket, hydraulic cylinder means mounted between said mounting bracket and said trenching head for raising and lowering the trenching head about a first axis of rotation, said trenching head including hydraulic motor means, drive sprocket means having a second axis of rotation for driving a digging chain, and an auger rotatable about said second axis of rotation, said first and second axes of rotation being spaced from one another, said auger being raised and lowered about said first axis of rotation as part of said trenching head.

4,890,400
BUCKET ATTACHMENT FOR TRACTOR BLADE
Jeffrey D. Long, 6244 Groveland Rd., Pipersville, Pa. 18947
Filed Oct. 27, 1988, Ser. No. 263,003
Int. Cl.[4] E02F *3/00*
U.S. Cl. 37—117.5 **17 Claims**



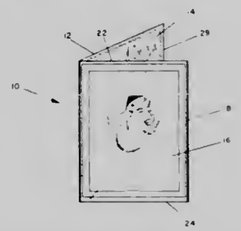
12. An easily attached and removable attachment for a garden-type tractor or the like having a snow blade or the like mounted on the front end thereof to extend across the front of the tractor in a generally vertically extending position, said snow blade having a smooth arcuate front face without sides or other forward projections obstructing flow of material from the ends thereof,
said attachment being constructed and arranged to cooperate with the snow blade to provide a dump bucket at the front end of the tractor thereby converting the same into a dumping device and comprising
a generally flat bottom adapted to extend forwardly from and along the length of the snow blade when attached thereto,
a first side member mounted on one end of said bottom to extend transversely thereto,
a second side member mounted on the other end of said bottom to extend transversely thereto,
said bottom and said first and second side members being constructed and arranged to form a rigid bucket structure having a shape to cooperate with the snow blade to form a bucket for carrying material with said first and second side members forming the entire side walls of said bucket, and
means for pivotally mounting said bucket structure on said snow blade to extend forwardly therefrom including bracket means mounted to the blade front face adjacent the upper edge thereof.

4,890,401
SHIRT PRESSING APPARATUS EMPLOYING COOPERATIVE PLATENS
David Weisfeld, 81 Wood Vale, London, England N10 3DL
Filed Jul. 14, 1988, Ser. No. 218,903
Claims priority, application United Kingdom, Jul. 15, 1987, 8716719
Int. Cl.[4] D06F *71/06, 71/22*
U.S. Cl. 38—43 **9 Claims**



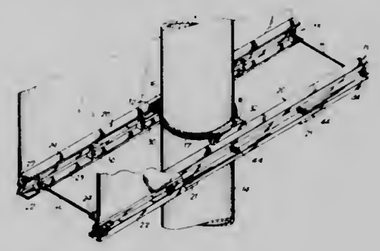
1. Apparatus for pressing shirts including:
(a) upper and lower platens movable into and out of a pressing position for pressing a shirt;
(b) electric means for heating at least one of said platens;
(c) a cut-out in one of said platens to provide a space for the collar of the shirt to be pressed;
(d) heat resistant resilient material attached to the pressing surface of at least one of the platens; and
(e) a first wide shallow groove in one of said platens which acts as a recess for the placket of the shirt, at least one second narrow shallow groove located centrally within said first groove which acts as a recess for the buttons of the shirt, and an approximately square recessed portion at one corner of said one platen which acts as a recess for a cuff of the shirt.

4,890,402
PHOTOGRAPH HOLDING GREETING CARD
Philip C. Carroll, 5300 Hayes, NW., Albuquerque, N. Mex. 87120
Filed Oct. 31, 1988, Ser. No. 265,048
Int. Cl.[4] A47G *1/06;* **G09F** *1/10*
U.S. Cl. 40—159 **20 Claims**



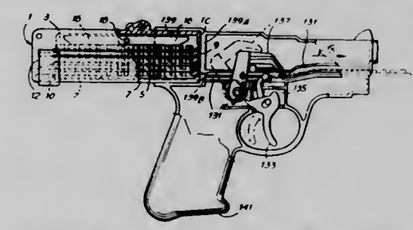
1. A photograph holding greeting card kit comprising:
a jacket made of cardstock comprising an exterior surface, an interior surface, at least one fold in said cardstock, and a front face on said exterior surface;
transparent pocket means disposed on said front face of said exterior surface of said jacket for receiving and holding a photograph of a predetermined size, provided by a user;
a selection of a plurality of inserts, each of said inserts comprising an exterior surface and an interior surface, said interior surface of said insert comprising distinctive message indicia preprinted thereon; and
means for adhering said exterior surface of a selected one of said selection of a plurality of inserts to said interior surface of said jacket to provide a greeting card with a message appropriate to the photograph selected to be positioned and held within said transparent pocket means on said front face of said exterior surface of said jacket.

4,890,403
POLE SIGN CONSTRUCTION
James M. Dinan, Irvington, N.Y., assignor to Dinaco, Inc., Irvington-on-Hudson, N.Y.
Filed Aug. 12, 1988, Ser. No. 231,727
Int. Cl.[4] G09F *17/00*
U.S. Cl. 40—604 **3 Claims**



1. A pole sign construction comprising
(a) a vertical pole member,
(b) upper and lower identical frame rail members mounted in spaced relation to one another on said pole,
(c) said frame rail members comprising an elongated structural foam member having a trapezoidal channel formed in an outer wall thereof, having a mating trapezoidal member hinged thereto by spaced hinging straps integrally formed therebetween, said clamping member being pivotable with respect to said rail member to selectively engage the free ends of a flexible film sign, and
(d) said frame rail means further include bolt means mounted in and projecting through said channel means and said clamping means,
(e) threaded nut means associated with said bolt means for securely locking said clamping means against said channel means.

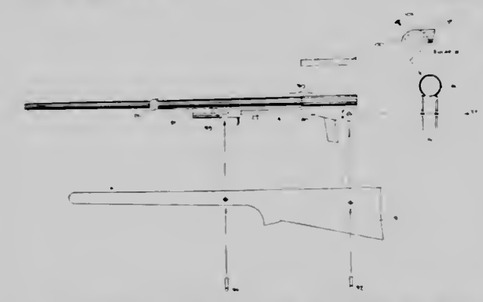
4,890,404
MAGAZINE FOR STRIP AMMUNITION, WITH RECTANGULAR PRISMATIC HOUSING AND SLIDING EXTRACTION DETENT
Giampiero Ferri, Via Vecchia Fiesolana No. 74 S. Domenico Fraz. com. di Fiesole, Florence, Italy
Filed Jun. 6, 1988, Ser. No. 203,011
Claims priority, application Italy, Jun. 11, 1987, 9409 A/87
Int. Cl.[4] F41B *7/08*
U.S. Cl. 42—57 **14 Claims**



1. A magazine for strip ammunition for use with a toy firearm, said magazine comprising:

a rectangularly shaped housing for containing a plurality of ammunition strips resting one on top of another,
said plurality of strips characterized by a top portion and a bottom portion when loaded in the housing,
said housing having a bottom sliding surface along which a strip ammunition is caused to slide during discharge,
a discharge aperture located at the bottom of said housing and aligned with said sliding surface through which strip ammunition is slidingly discharged,
pressure applying means located in said housing for applying pressure to the top portion of said plurality of strips to prop said strips against said sliding surface,
said sliding surface having a slotted opening therealong extending to said aperture,
and an extraction device cooperably and slidingly associated with said slotted opening along said sliding surface which when actuated to move from its home position toward said aperture along said opening will cause a strip to discharge through said aperture,
said extraction device being characterized in that, when returned to home position in the opposite direction of discharge, it does not drag a strip along with it.

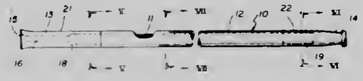
4,890,405
STOCK FLEXURE ISOLATING GUN BARREL MOUNT
Edwin E. Krouse, 2722 Lookout Dr., Owensboro, Ky. 42301
Division of Ser. No. 912,787, Sep. 29, 1986, Pat. No. 4,727,670.
This application Oct. 23, 1987, Ser. No. 111,930
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—75.03 **6 Claims**



1. In a rifle with a barrel, a receiver, and a stock; said barrel having a muzzle and a barrel bore centerline; said barrel and receiver are assembled together as a barrel/receiver assembly and said barrel/receiver assembly is attached to said stock by a fastening mechanism; said fastening mechanism comprised of at least two connections;
one said connection located on the said receiver allowing rotation of said barrel/receiver assembly in said stock around a horizontal axis that is perpendicular to said barrel bore centerline;
the second connection, located closer to the said muzzle than said first connection, allows displacement of said barrel/receiver assembly in said stock along a line parallel to said barrel bore centerline.

4,890,406
RAMROD
Kendrick L. French, Lebanon, Me., assignor to K. W. Thompson Tool Co., Inc., Rochester, N.H.
Filed May 17, 1989, Ser. No. 353,079
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **4 Claims**

1. A ramrod, comprising:
(a) an elongated rod having a first and a second end and formed of a rigid material, and
(b) a tube covering a substantial portion of the rod, the tube being formed of a non-abrasive substance wherein the rod



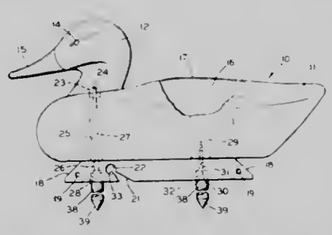
is formed of a glass-fibre reinforced polymer, and wherein the tube is formed of a heat-shrinkable polymer.

4,890,407
DOVETAIL GUN SIGHT MOUNT
Joseph W. Nichols, P.O. Box 23, Mehoopany, Pa. 18629
Filed Jul. 13, 1988, Ser. No. 219,082
Int. Cl.[4] F41G *1/38*
U.S. Cl. 42—100 **17 Claims**



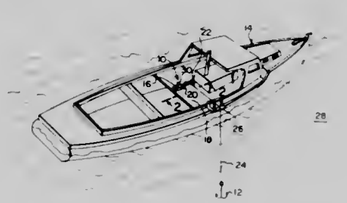
1. A sight mount for a firearm, comprising:
an elongated first member;
an elongated second member;
fastening means for adjustably fastening said first member to said second member to form said mount, when fastened together said first and second members defining a dovetail sight mount at a top region thereof and defining a clamping attachment portion at a bottom region thereof, said clamping attachment portion being sized to receive a portion of the firearm and clamp the mount thereto; and
a rear thrust member extending through said mount and contacting the firearm.

4,890,408
WATERFOWL DECOY
Charles W. Heiges, 2156 E. State Rd., Port Clinton, Ohio 43452, and Richard L. Hamrick, Jr., Toledo, Ohio, assignors to Charles W. Heiges, Port Clinton, Ohio
Filed Mar. 9, 1989, Ser. No. 321,085
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **14 Claims**



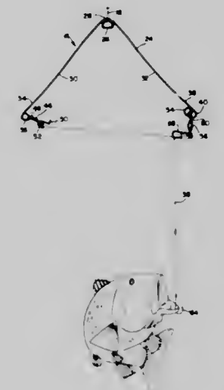
1. A waterfowl decoy including an elongated body having an exterior surface, a fabric covering adhesively secured over substantially all of said surface, said fabric covering comprising a coarse, woven material, a head affixed to said body, and an elongated keel extending longitudinally along the bottom of said body, said keel comprising an elongated member terminating at each end in a portion tapering upwardly and inwardly toward the bottom of said body, a base along its marginal edge opposite said body, and a slot tapering inwardly from said base and terminating in an enlarged opening extending transversely through said keel.

4,890,409
ELECTRICAL COD JIGGER
Lloyd A. Morgan, P.O. Box 272, La Scie NF, Canada A0K 3M0, and George Spector, 233 Broadway Rm 3815, New York, N.Y. 10007
Filed Dec. 29, 1988, Ser. No. 291,579
Int. Cl.[4] A01K *89/017*
U.S. Cl. 43—15 **1 Claim**



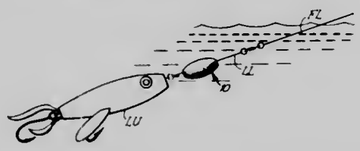
1. An apparatus for operating a jig from a fishing boat which comprises:
(a) an electric motor mounted to deck of the fishing boat, said motor having a sufficiently flexible shaft extending therefrom;
(b) a reel rotatably affixed to said shaft of said motor;
(c) an elongated cable wound at an upper end onto said boat with a lower end of said cable attached to the jig;
(d) a control box which includes a forward switch electrically connected in a circuit to said motor to forwardly operate said motor turning said reel on said shaft to unwind said cable therefrom and a reverse switch electrically connected in the circuit to said motor to reversely operate said motor turning said reel on said shaft to wind said cable thereon;
(e) a clutch on said shaft for disengaging said motor from said reel; and
(f) a fixed bearing on said shaft between said clutch and said reel for rotatably supporting said reel above the deck of the fishing boat;
(g) a spring biased telescopic bearing support at distal end of said shaft, said bearing support having an actuating arm on moveable portion thereof;
(h) a reverse button switch affixed to a stationary portion of said telescopic bearing support and electrically connected in the circuit to said motor;
(i) an indicator electrically connected in the circuit to said motor; and
(j) a battery electrically connected in the circuit to supply electricity current to said indicator and said motor so that a tug on the jig by a fish will cause said flexible shaft to bend sufficiently in order to cause said actuating arm to depress the reverse button switch to reverse said motor and activate said indicator to show that the fish is caught.

4,890,410
AUTOMATIC FISHING HOOK SETTING DEVICE
Andrew J. Pratscher, Hobart, and Michael Grynecki, East Chicago, both of Ind., assignors to Speedhook Specialists, Inc., Hobart, Ind.
Filed Jan. 30, 1989, Ser. No. 303,121
Int. Cl.[4] A01E *97/12*
U.S. Cl. 43—15 **18 Claims**



10. A fishing rig, comprising:
a resilient wire leg assembly having an upper central spring loop for attachment to a line of a fishing rod and substantially symmetrical elongated legs integrally connected to said spring loop, said legs being moveable from an expanded spread released normally open hook setting position for hooking a fish to an arcuate convex bent cocked biased closed latched trapping position, said spring loop urging said legs to said open position, said legs being substantially the same size and including a left leg and a right leg, said left leg having a lower end portion terminating in a latch-supporting loop, and said right leg having a lower end terminating in a swivel-supporting loop;
a unitary wire latch assembly pivotally connected to said latch supporting loop, said unitary wire latch assembly having a terminal loop at one end pivotally and slidably linked to said latch-supporting loop, an intermediate line-engaging loop integrally connected to said terminal loop, and a hooked finger at the other end comprising a latch cantilevered and integrally extending from said intermediate line-engaging loop;
a moveable split ring comprising a ringlet slidably linked and pivotally connected to said swivel-supporting loop, said split ring latchingly connected and lockingly engaging said latch in said closed position and being spaced from said latch in said open position;
a swivel having an upper swivel ringlet slidably linked and pivotally connected to said swivel-supporting loop in proximity to said split ring and having a lower line-receiving eyelet providing a guide, said eyelet being positioned lower than said split ring and said intermediate line-engaging loop in said closed position;
a hook; and
a hook-engaging line slidably extending through said eyelet of said swivel, said hook-engaging line having a lower end connected to said hook and an upper end connected to said intermediate line-engaging loop of said latch assembly.

4,890,411
FISH ATTRACTING PELLET
Theodore A. Baccilli, 1421 E. Crest Dr., Englewood, Fla. 34223, and Frederick G. Hartland, 6423 Brookridge St., Englewood, Fla. 34224
Filed Sep. 9, 1988, Ser. No. 242,968
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.06 **13 Claims**



1. A fish attracting pellet interconnectable to a fishing line, said pellet comprising:
an elongated main body formed of solidified and scented fish attractant material which is soluble and slowly dissolvable in water;
said main body having a longitudinal aperture therethrough to receive a fishing line passed therethrough;
a length of wire embedded and secured within, and extending in either direction from, said aperture;
said wire having an openable loop at one end of said wire;
said wire having a closed eyelet at the other end of said wire.

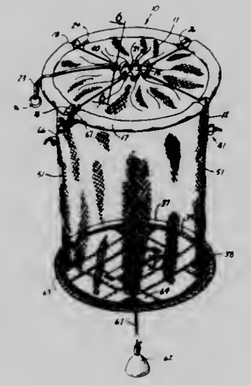
4,890,412
LIFE-LIKE FISH LURE
Thomas K. Tsao, 4441 Discovery Rd., Virginia Beach, Va. 23451, and Paul C. Cole, 5404 Chatham Hall Dr., Virginia Beach, Va. 23464
Filed Nov. 30, 1988, Ser. No. 279,459
Int. Cl.[4] A01H *85/00*
U.S. Cl. 43—42.24 **28 Claims**



1. A fish lure comprising an elongated annelid-simulating body of soft and flexible plastic material with a central longitudinal axis, said body having a head end, a tail end and a radially enlarged simulated clitellum disposed spaced from said head and tail ends, said clitellum being weighted to cause the lure to fall through a body of water in an orientation where the clitellum is below the head and tail ends.

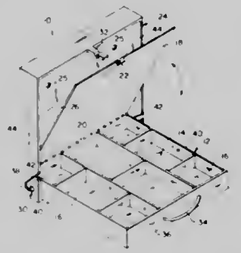
4,890,413
FLOATING FISH CONTAINER WITH ADJUSTABLE LENGTH MEANS AND BIASED OPENING MEANS
Daniel E. Nelson, and Mickey C. Nelson, both of 417 Herschel, St. Paul, Minn. 55104
Filed Feb. 3, 1989, Ser. No. 305,691
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **32 Claims**

1. A fish holding apparatus comprising: a container of open mesh fabric having a bottom wall, a generally cylindrical flexible side wall, having an upper end and a lower end, and an expandable flexible top wall with an inner portion having a generally central opening, said walls surrounding a chamber for retaining fish, annular casing means surrounding the top wall secured to said top wall and upper end of the side wall, said casing means having a passage, a top ring having buoyant material located in said passage adapted to retain the top of the container adjacent the surface of a body of water, a flexible band secured to the inner portion of the top wall surrounding said opening, said band being foldable to close said opening, elongated string means movably mounted on said band operable to contract the band and move the top wall to close said opening, lock means mounted on the string means engagable with the band to hold the string means and retain the top wall in position to close said opening, said lock means being releasable from the string means whereby the band and top wall can



be moved to open the opening therein, biasing means connected to the band and top ring operable to bias the top wall in a direction to open the opening therein when the lock means is released whereby fish can be placed into and removed from the chamber of the container, a bottom ring surrounding the bottom wall secured to said bottom wall and lower end of the side wall, and adjustable means mounted on the side wall for moving the side wall between an extended position and a retracted position whereby the height of the container can be adjusted.

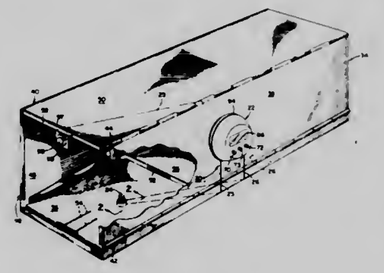
4,890,414
BOATSIDE BAIT HOLDER
George Bridenthal, 321 Walnut Dr., Gas City, Ind. 46933, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007
Filed Apr. 17, 1989, Ser. No. 339,514
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—54.1 **5 Claims**



1. A holder for artificial fishing bait which comprises:
(a) a container being box-shaped and having a chamber with a plurality of compartments to receive the artificial fishing bait;
(b) a lid hinged to said container movable between an open position and a closed position to close the chamber against entrance when said lid is in the closed position;

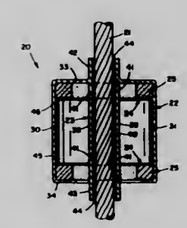
(c) a first latch member formed on said lid opposite the hinge to releasably lock said lid in the closed position until intended force is applied to intentionally move said lid to the open position;
(d) a mounting bracket being box-shaped and sized to receive said container therein, said mounting bracket attachable to and removable from side of a boat;
(e) means for removably and pivotly attaching said container opposite said first latch member to said mounting bracket in such a way so that said container can pivot down into a usable condition and up into a stored condition, wherein said means for removably and pivotly attaching said container includes:
(a) a pair of stub shafts, each carried on one side of said container adjacent the hinge; and
(b) said mounting bracket having a pair of J-shaped curved slots, each angularly extending inwardly from one side opposite from said second latch member so as to receive one of said stub shafts;
(f) a second latch member formed on said mounting bracket opposite said pivotly attaching means to releasably lock said container in the stored condition until intended force is applied to intentionally move said container to the usable condition; and
(g) a carry handle carried on end of said container opposite the hinge so that when said container is removed from said mounting bracket, said container can be transported to other locations.

4,890,415
TIMING DEVICE FOR LIVE ANIMAL TRAPS
Alfred A. Fressola, 40 Todds Way, Easton, Conn. 06612, and Ronald E. Barry, Jr., 240 Armstrong Ave., Frostburg, Md. 21532
Filed Dec. 19, 1988, Ser. No. 286,387
Int. Cl.[4] A01M *23/00*
U.S. Cl. 43—61 **17 Claims**



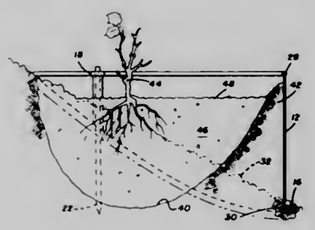
12. A timing device for use with a live animal trap having a trap door so as to determine the elapsed time since animal entry into the trap causing closure of the trap door, comprising:
(A) means, mountable to the trap, for switching the electrical conductivity state of the said means when the trap door closes;
(B) a timing module, mountable to the trap, for performing a timing function when activated, the timing module having a numeric timing display and means for allowing the numeric timing display to be maintained in a constant state, the timing module having a pair of electrical contact areas which when electrically connected to each other will activate the timing function of the timing module; and
(C) means for electrically connecting the electrical conductivity switching means to the pair of electrical contact areas of the timing module;
whereby animal entry into the live trap causes the sprung trap door to switch the electrical conductivity switching means and thereby activate the timing module timing function and its associated numeric timing display.

4,890,416
TRAP-GUARD FOR VERMIN REPELLANT DESTRUCTION
Ernest H. Roberts, 2200 N. Ridge Rd. East, Elyria, Ohio 44036
Continuation-in-part of Ser. No. 123,310, Nov. 20, 1987, Pat. No. 4,782,622. This application Nov. 1, 1988, Ser. No. 264,191
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.
Int. Cl.[4] A01M *25/00*
U.S. Cl. 43—131 **18 Claims**



1. A barrier against vermin crawling along an elongated structure, the barrier comprising:
an outer shell having a fully closed vermin impervious end wall and a generally continuous side wall assembly defining a cavity, the continuous side wall further defining a fully open, unobstructed, barrier-free access opening axially opposite the closed end wall, said access opening defined by an end of the generally continuous side wall;
mounting means for connecting the outer shell to the elongated structure with the elongated structure extending generally axially through said outer shell, said mounting means further including means for preventing relative motion between the outer shell and the elongated structure; and,
a pesticide disposed in the cavity for creating a vermin-deterring environment inside the cavity.

4,890,417
BANK PLANTER
John E. Futch, 3633 Echo Springs Rd., Lafayette, Calif. 94549, and James J. Corbett, 30 Hetfield Pl., Moraga, Calif. 94556
Division of Ser. No. 76,871, Jul. 23, 1987, Pat. No. 4,809,460. This application Nov. 23, 1988, Ser. No. 276,204
Int. Cl.[4] A01G *1/00*
U.S. Cl. 47—58 **2 Claims**



1. A method of planting a plant on a bank using an arucate soil retainer comprising the steps of:
(a) placing said arcuate soil retainer against said bank so that

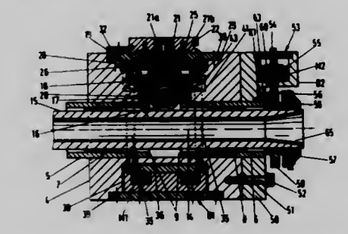
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the arcuate lower edge is on the bank in order to trace the outline of said arcuate soil retainer on the bank;
(b) scoring a semi-circular line on the surface of the bank coincident with the traced outline with the open side of said semi-circle facing uphill;
(c) placing the arcuate soil retainer in the scored semi-circle;
(d) fixing the arcuate soil retainer to the bank with at least two spikes;
(e) excavating a pit behind said soil retainer on the uphill side thereof;
(f) forming a berm around the inside of said arcuate soil retainer;
(g) placing a plant in said excavated pit; and
(h) filling said excavated pit with planting material.

4,890,418
ACCESS PANEL ASSEMBLY WITH DOOR AND MULTI-FUNCTIONAL FRAME
Steve H. Sachs, 24264 Ocean Ave., Torrance, Calif. 90505
Filed Jul. 18, 1988, Ser. No. 220,322
Int. Cl.[4] E06B *3/32*
U.S. Cl. 49—463 **12 Claims**

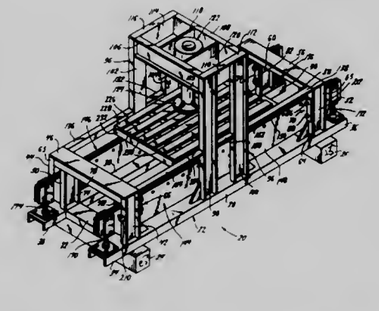
1. An improved access panel assembly comprising;
a frame including a narrow edge face and a wide edge face for being mounted within a surface of a building structure;
a door suitable for being press-fitted within said frame; and
securing means incorporated in said frame and said door for enabling said door to be flush-mounted with either the narrow edge face or the wide edge face of said frame thereby holding said door firmly within said frame.

4,890,419
DEVICE FOR GRINDING CUTTING TOOLS HAVING STRAIGHT AND SPIRAL GROOVES
Volker Zaug, Westerheimer Strasse 30, Post Laichingen 4, D-7903 Feldstetten, Fed. Rep. of Germany
Filed Feb. 6, 1988, Ser. No. 161,158
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706948
Int. Cl.[4] B24B *47/02*
U.S. Cl. 51—95 LH **9 Claims**



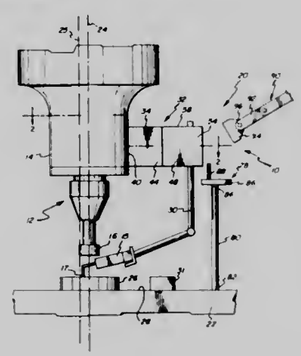
1. In a device for grinding cutting tools having straight and spiral grooves, including a housing, a workpiece or tool spindle having an axis and an outer surface, the spindle being rotatable and longitudinally movably mounted in the housing such that the spindle can be set in a combined turning and advancing motion, a roller defining an adjusting axis, the roller capable of engaging the outer surface of the spindle with a certain definable contact pressure, the roller being rotatable and being adjustable about an axis which extends in radial direction relative to the spindle, and an indexing means for fixing the angular position of the spindle, the improvement comprising the roller being mounted so as to be movable back and forth in the direction of the adjusting axis by means of a first actuating unit, the roller being held in frictional contact engagement with the spindle against the force of spring means, the indexing means being movable by means of a second actuating unit from a first position in which it releases the spindle into a second position in which it locks the spindle, the locking unit being spring-biased in the first position thereof, the indexing means including means for releasing the first actuating unit in dependence upon the second position of said indexing means.

4,890,420
GRINDING MACHINE
Hossein Azimi, P.O. Box 781585, Wichita, Kans. 67278
Filed Mar. 21, 1988, Ser. No. 170,905
Int. Cl.[4] B24B *7/02*
U.S. Cl. 51—122 **25 Claims**



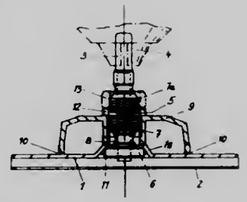
1. A grinding machine comprising a stationary base frame and two relatively movable members, a first member comprising a grinder having a grinding wheel with a grinding surface on the grinding wheel, means for supporting the grinding wheel from the base frame with the grinding surface in predetermined orientation relative to the base frame, a second member comprising a deck for supporting an object to be ground, means for supporting the deck from the base frame, wherein the means for supporting the deck comprises a plurality of supporting means having movable elements allowing movement of the second member relative to the first member to establish a grinding pass between the grinding surface and the object, said means for supporting the deck from the base frame comprises two beams assemblies supported from the base frame and having tracks thereon, wherein the plurality of supporting means comprise wheels which are supported on the tracks, means for adjusting the relative angular orientation of the grinding surface and the deck to maintain them in planes that are parallel to one another, a means for adjusting the beam assemblies relative to the base frame to locate the tracks parallel to one another and inclined relative to said planes, a means for adjusting the wheels relative to the second member so that the planes are parallel in spite of the inclination of the tracks, and means for decreasing the distance between the planes in proportion to wear on the grinding surface during movement of the second member relative to the first member in a grinding pass between the grinding surface and the object.

4,890,421
AUTOMATIC MEASUREMENT SYSTEM
Wayne R. Moore, Jr., Trumbull, and Kevin S. Barney, Monroe, both of Conn., assignors to Moore Special Tool Co., Inc., Bridgeport, Conn.
Filed Sep. 21, 1987, Ser. No. 98,078
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165 R **21 Claims**



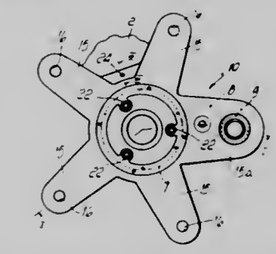
19. The automatic measuring system adapted for use with a cutting tool device, comprising:
a tool holder for mounting a cutting tool;
a measurement probe;
a work support table having said tool holder affixed thereto;
a measurement probe support platform affixed to said work support table to hold said measurement probe; and
means for automatically mounting and dismounting said measurement probe to and from said tool holder, said means for mounting and dismounting includes a coupling mechanism, said coupling mechanism, comprising:
a first coupling component affixed to said measurement probe;
a second coupling component affixed to said tool holder; and
means for joining said first and second coupling components together in a mating relationship whereby the first and second coupling components are securely affixed to each other.

4,890,422
ABRASIVE TOOL
Reinhold Reiling, and Karl Reiling, both of Remchinger Str. 4, D-7537 Koenigsbach-Stein, Fed. Rep. of Germany
Filed May 31, 1988, Ser. No. 200,611
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 8716321[U]
Int. Cl.[4] B24B *45/00*
U.S. Cl. 51—168 **6 Claims**



1. In an abrasive tool comprising
a disk having a central aperture and forward and rear surfaces,
a grippable shaft having first and second rigid shaft sections and a flexible shaft section connected between said first and second rigid shaft sections for a transmission of torque between them, said first rigid shaft section extending through said central aperture and being formed with first external screw threads behind said aperture,
a flange detachably connected to said first rigid shaft section in front of said disk,
a rigid fixing member, which comprises a sleeve, which surrounds said shaft on the rear of said disk and is formed with internal screw threads interengaging with said first external screw threads and is adapted to be tightened against said rear surface of said disk so that said disk is gripped between said flange and said sleeve, and
stiffening means, which are selectively operable to rigidly connect said rigid fixing member to said second rigid shaft section for a transmission of torque from said second rigid shaft section to said disk via said fixing member whereas said flexible shaft section is relieved from torque,
the improvement residing in that
said fixing member comprises a bowl, which is open toward said disk and has a rim which is smaller in diameter than said disk and faces said rear surface of said disk, said bowl having at one end an annular rib and at another end an end flange,
said second rigid shaft section has second external screw threads extending beyond the annular rib of said bowl,
said stiffening means comprise a stiffening nut, which has internal screw threads, which interengage with said second external screw threads on the rear of said bowl and is adapted to be tightened against said annular rib of said bowl for a transmission of torque from said second rigid shaft section via said nut and said bowl to said disk whereby said flexible shaft section is relieved from torque.

4,890,423
SUPPORTING HEAD PARTICULARLY FOR MACHINING PLATES OF GLASS, MARBLE OR THE LIKE OF ANY SIZE
Franco Bavelloni, Appiano Gentile, Italy, assignor to Z. Bavelloni S.P.A., Bregnano, Italy
Filed Aug. 15, 1988, Ser. No. 232,812
Claims priority, application Italy, Aug. 27, 1987, 21735 A/87; Jan. 12, 1988, 19054 A/88
Int. Cl.[4] B24B *5/02, 47/12;* B23B *19/00*
U.S. Cl. 51—235 **4 Claims**



1. Supporting head, particularly for machining panes of glass, marble and the like, comprising a frame supporting a main head and a main shaft, said main head comprising a plate, said plate supporting an auxiliary head, said main shaft being a driving shaft and having a first gear, said auxiliary head having an auxiliary shaft connected to said plate, said auxiliary shaft having a second gear, said main shaft and auxiliary shaft being parallel, said first gear engaging a transmission gear, said transmission gear engaging said second gear, said plate having a

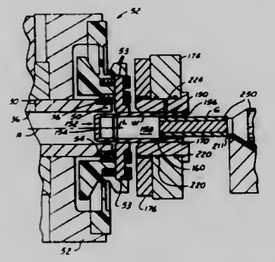
plurality of arms extending radially and perpendicularly to said main shaft, said plate being rotatable with a center of rotation at said main shaft, one of said arms bearing said auxiliary head, said arms having securing members adapted to secure a pane on said plate, said auxiliary head having a securing member adapted to secure a pane,

said plate having locking means for selectively locking said plate to said first gear for a rotation of said plate at said center of rotation and for locking said plate to said frame for a rotation of said auxiliary head at said auxiliary shaft, said pane being selectively secured to said securing members of said plate, when said plate rotates at said center of rotation, or to said securing member of said auxiliary head, when said plate is locked to said frame and said auxiliary head rotates at said auxiliary shaft.

4,890,424
WORKHEAD WITH WORKPART CHUCK AND WORKPART FLUID BEARING

Victor F. Dzewaltowski, Springfield, Vt., assignor to Bryant Grinder Corporation, Springfield, Vt.

Filed Sep. 4, 1987, Ser. No. 93,218
Int. Cl.[4] B27B 3/16
U.S. Cl. 51—289 R **10 Claims**



1. A workhead for fixturing and rotating an elongated workpart having a thin-wall defining a cylindrical bore between opposite ends while the bore is machined by a tool, comprising:

(a) spindle means rotatable about a rotational axis and including chuck means for fixedly clamping a closed end of the workpart with the longitudinal axis of the bore substantially coaxial with the rotational axis, and

(b) fluid bearing means in stationary position adjacent an opposite open end of the workpart during machining of said bore and extending around said opposite open end for providing pressurized fluid at sufficient locations around the opposite open end to resist machining forces thereon tending to deflect said opposite open end off the rotational axis relative to the fixedly clamped closed end and thereby improve roundness and straightness of the machined bore.

4,890,425
AIRTIGHT SUMP CROCK COVER

Ned Mamula, Aldie, Va., assignor to Terrashield, Incorporated, Aldie, Va.

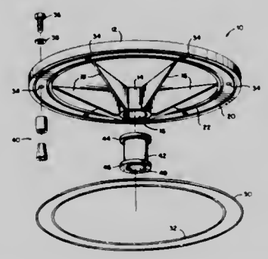
Filed Jul. 5, 1988, Ser. No. 215,321
Int. Cl.[4] A16J 13/02
U.S. Cl. 52—19 **6 Claims**

1. A sump crock cover for airtight installation on the surface of a floor directly over a sump pump opening having sump discharge piping and electrical wiring extending therefrom, said cover being capable of reducing indoor radon levels in residential and commercial buildings, comprising:

a planar sump lid base member of a generally circular shape and having a raised central portion of cylindrical shape with a plurality of vertical ribs extending outwardly therefrom, said ribs tapering toward said planar lid base member outwardly of said central portion, and with a central opening extending through said lid member so as to be coaxial with said cylindrical central portion;

said raised central portion and ribs being shaped so as to taper outwardly and downwardly to the plane of said lid member to provide a flat planar surface on the side of said lid member adjacent said raised central portion, said flat planar surface extending around the circumference of said lid outwardly of said raised central portion thereof;

a grommet member mounted within said central opening of the lid member, said grommet member being of a deformable material capable of forming an airtight seal around said piping and electrical wiring;



a pair of concentric grooves located in said flat planar surface outwardly of the raised central portion of said base member;

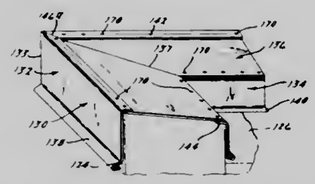
an O-ring gasket positioned in each groove; and

bolt means for securing said base member to the floor, said bolt means including a plurality of bolts mounted around the circumference of said sump lid base member at an equidistant radius for all bolts and wherein one of said pair of concentric grooves is located radially outwardly of said radius and the other concentric groove is located radially inwardly of said radius.

4,890,426
FASCIA ASSEMBLY AND METHOD OF MAKING SAME

John B. Hickman, Biltmore Forest, and Nelson M. Ferg, Asheville, both of N.C., assignors to W. P. Hickman Company, Asheville, N.C.

Filed Sep. 19, 1988, Ser. No. 246,214
Int. Cl.[4] E04D 13/15, 1/36
U.S. Cl. 52—58 **15 Claims**

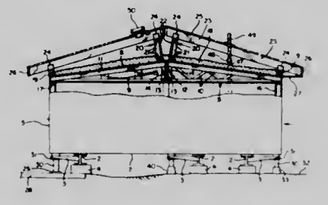


1. A fascia assembly adapted for installation on a building structure, said fascia assembly comprising: a longitudinally-extending generally vertical outer face member; a longitudinally-extending generally vertical inner face member spaced laterally apart from said outer face member; and an intermediate member disposed between said spaced-apart inner and outer face members to laterally interconnect said inner and outer face members, said intermediate member having an inner longitudinally-extending edge and an outer longitudinally-extending edge, each of said inner and outer face members having longitudinally-elongated flange portions extending therealong and located generally at their respective upper edges, said flange portions on said inner and outer face members protruding generally laterally toward one another, and said intermediate member being secured to said flange portions of said inner and outer face members, one of said flange portions overlapping one of said inner and outer edges on said intermediate member and the other of said flange portions underlapping the other of said inner and outer edges of said intermediate member.

4,890,427
ROOFING FRAMEWORK

Lee W. Rayburn, 220 Olson Rd., Silverton, Oreg. 97381

Filed Jun. 29, 1984, Ser. No. 626,418
Int. Cl.[4] E04B 7/02
U.S. Cl. 52—90 **8 Claims**



1. A mobile home roof apparatus comprising:

a. an existing mobile home roof to which are attached base plates;

b. two box beams attached upon the existing mobile home roof located on a center beam;

c. hurricane clips attach common rafters to the said box beam and said base plates;

d. a composition roof attached on said common rafters;

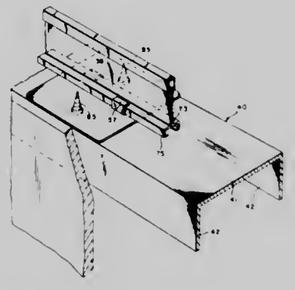
e. solid pier blocks upon which posts and wedges support mobile home outriggers; and

f. a rear solid pier block.

4,890,428
PARTITION CLIP

William J. Platt, Collingdale, Pa., assignor to National Rolling Mills, Inc., Malvern, Pa.

Filed Sep. 2, 1988, Ser. No. 240,169
Int. Cl.[4] E04B 1/38
U.S. Cl. 52—238.1 **3 Claims**



1. A connection between

(1) a suspended ceiling of the grid type having

(a) interlocking grid beams, a beam having

(1) an inverted, generally T-shaped cross section that includes an upper web portion and a lower opposing flange portion at the bottom of the web portion,

wherein the suspended ceiling extends continuously horizontally over a given certain area, and

(2) a partition wall

(a) extending vertically within and below the given ceiling area,

(b) having an inverted upper U-shaped channel

(1) intended to abut against and extend horizontally beneath the suspended ceiling,

(2) forming the top structural member of the partition wall; and

(3) intended to be erected before the remainder of the partition wall is erected;

comprising, in combination,

(A) a clip having

(1) a flat metal base having a maximum dimension less than the width of the channel,

(2) a pair of hooks positioned diagonally from one another in the base,

(a) integral with the flat metal base,

(b) having a portion on each of the hooks extending toward each other,

(c) spaced laterally apart a distance generally conforming to the width of the opposing flanges of the beam,

(d) adapted to be hooked onto the flanges of the beam by rotating the base, and

(3) locking tabs

(a) integral with the base

(b) that permit the base to be rotated to apply the clip on the beam, but

(c) prevent the clip from being rotated to unhook the clip from the beam after the clip has been applied, and

(B) fastening means for securing the clip to the partition wall extending through the base of the U-shaped channel into the base of the clip, wherein said means can be applied

(1) after the clip has been locked to the grid member,

(2) from inside the inverted U-shaped channel, and

(3) before the remainder of the partition wall is erected.

4,890,429
BUILDING TRUSS

Bruno G. Gatzka, Porepunkah, and Christopher J. Olsen, East Lavington, both of Australia, assignors to Starch Industries, Pty. Ltd., Albury, Australia

Continuation of Ser. No. 872,577, Jun. 10, 1986, abandoned. This application Nov. 24, 1987, Ser. No. 135,490
Claims priority, application Australia, Mar. 13, 1986, PH5022
Int. Cl.[4] E04B 1/343
U.S. Cl. 52—640 **4 Claims**



1. A truss able to be used in the erection of a structure, said truss comprising at least one upper chord, at least one lower chord, and a plurality of diagonal web members joining said at least one upper chord to said at last one lower chord;

said truss having first and second relatively rigid end sections, said first end section being pivotally attached to a stationary ground base, and said second end section being slidable over the ground, said first and second end sections being joined by a relatively flexible intermediate section;

said at least one lower chord of said intermediate section being formed of a plurality of lengths of tube through which is threaded at least one high-tensile cable adapted for movement through the lengths of the tube, said at least

one lower chord of said intermediate section being downwardly bowed prior to the erection of the structure;

wherein, by tensioning said at least one high tension cable, said at least one lower chord of said intermediate section is shortened to cause said at least one lower chord and said at least one upper chord of said intermediate section to bow upwardly and to shorten said at least one lower chord as to place said truss in an erect position, and wherein said at least one high-tensile cable emerges from said at least one lower chord of said intermediate section and is directed toward said at least one upper chord of the first and second end sections so as to intersect said at least one upper chord of said first and second end sections adjacent the ends of the truss.

4,890,430

DEVICE AND METHOD FOR PROTECTING A BUILDING AGAINST EARTHQUAKE TREMORS

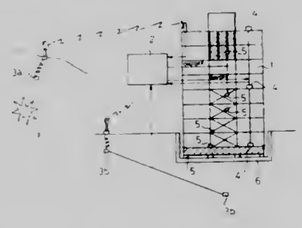
Takuji Kobori; Shunichi Yamada, and Shuichi Kanagata, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 96,012

Claims priority, application Japan, Sep. 12, 1986, 61-215402; Sep. 19, 1986, 61-221143; Oct. 30, 1986, 61-258794; Oct. 30, 1986, 61-258795; Nov. 21, 1986, 61-278427; Dec. 17, 1986, 61-301036

Int. Cl.⁴ E02D *27/34*

U.S. Cl. 52—167 CB **13 Claims**



1. In combination with structural members of a building subject to stresses caused by seismic tremors, seismic detector means; mechanical rigidity control devices adapted to relieve said stresses secured between first and second structural members; actuating means adapted to activate said devices; and control means adapted to activate said actuating means responsive to seismic tremors when said seismic tremors reach a predetermined level of intensity; a preselected number of said first and second building structural members being equipped with said devices; said actuating means being further adapted to selectively actuate said devices to vary the rigidity of said building; said actuating means including computer means in communication with said seismic detector means, adapted to selectively actuate said rigidity control devices responsive to communication between said computer and said seismic detector means whereby the natural vibration period of said building is varied as required to protect it from destructive earthquake induced vibration.

4,890,431

WINDOW MOLDING

Kenji Katayama, Aajyo, Japan, assignor to Inoue MTP Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 7, 1988, Ser. No. 241,430

Claims priority, application Japan, Jul. 31, 1987, 62-118732

Int. Cl.⁴ E06B *3/62*

U.S. Cl. 52—208 **6 Claims**

1. A window molding of nonrigid plastics and attached to a vehicle body and/or a window glass, wherein said molding has contract portions which come into with the vehicle body and/or window glass and which are made of softer nonrigid



plastics, said softer nonrigid plastics of which said contact portions are made contains a lubricant.

4,890,432

ROOF TILE

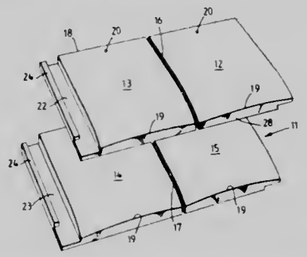
Michael C. Shepherd, Colchester, United Kingdom, assignor to Hopedelta Limited, Peterborough, England

Filed Mar. 21, 1988, Ser. No. 170,735

Claims priority, application United Kingdom, Mar. 25, 1987, 8707160

Int. Cl.⁴ E04F *3/24*

U.S. Cl. 52—314 **6 Claims**



1. An interlocking roof tile for use in constructing a roof formed of a plurality of tile elements side-by-side in overlapping horizontal rows, said roof tile comprising:

a plurality of similar whole tile elements located with at least one of said tile elements in a first row and at least one of said tile elements in a second row, each tile element having lateral edges to form a junction with an adjacent tile element in the same row, the tile elements in said first row being offset laterally from tile elements in said second row;

an elongated step formed along the roof tile between said first and second rows such that the tile elements in said first row lie in a different plane from the tile elements in said second row; and

a lateral interlock structure at opposite side edges of each roof tile, said lateral interlock structure including first and second interlocks respectively provided on opposite side edges of whole tile elements at opposite ends of said first row, and third and fourth interlocks respectively provided on opposite side edges of whole tile elements at opposite ends of said second row, said first and third interlocks being located on one side of said roof tile laterally offset from each other and said second and fourth interlocks being located the opposite side of said roof tile laterally offset from each other, both side edges of said roof tile thereby being staggered, first and third interlocks of one roof tile interlocking with second and fourth interlocks of an adjacent roof tile.

4,890,433

TILE MOUNTING PLATE AND TILED WALL STRUCTURE

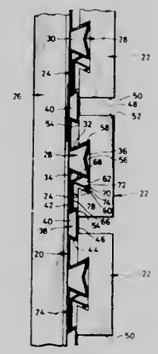
Motokatsu Funaki, 430 Shimotsuchidana, Fujisawa-shi, Kanagawa-ken, Japan

Filed Jun. 21, 1988, Ser. No. 210,478

Claims priority, application Japan, Dec. 15, 1987, 62-315096; Dec. 15, 1987, 62-315097; Feb. 2, 1988, 63-21304

Int. Cl.⁴ E04F *13/08*

U.S. Cl. 52—386 **17 Claims**



1. A tile mounting plate for a tiled wall structure comprising:

a plurality of first laterally extending projections vertically arranged at intervals corresponding to intervals of vertical arrangement of tile blocks on the tile mounting plate, each of said tile blocks being formed on an inner surface thereof with a dovetail groove;

said first projection being formed into dimensions sufficient to cause it to be loosely fitted in said dovetail groove of said tile block; and

a plurality of second laterally extending projections each arranged below each of said first projections so as to form tile support means for fixedly supporting said tile blocks thereon in cooperation with the first projection adjacently positioned above said second projection;

each of said first projections being expandedly formed so as to include an obliquely upwardly extending upper wall for engagedly supporting an upper surface of said dovetail groove of said tile block thereon, an obliquely downwardly extending lower wall and a front wall for connecting said upper wall and lower wall to each other therethrough and abuttedly supporting a bottom surface of said dovetail groove of said tile block thereon, resulting in a dovetail groove therein;

each of said second projections being formed into a shape sufficient to cause tile holding means to be fixedly interposed between said lower wall of said first projection and said second projection to securely hold said tile block on said tile holding means and cause said second projection to abuttedly support said inner surface of said tile block;

each of said second projections being formed into a height smaller than that of said first projection so that a difference between the heights of said first and second projection is substantially equal to a depth of said dovetail groove of said tile block.

4,890,434

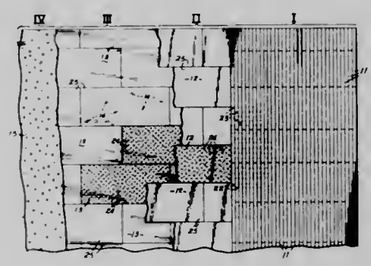
HARDWOOD FLOOR SYSTEM

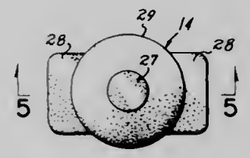
Michael W. Niese, Cincinnati, Ohio, assignor to Robbins, Inc., Cincinnati, Ohio

Filed Feb. 8, 1989, Ser. No. 308,243

Int. Cl.⁴ E04F *13/08*

U.S. Cl. 52—393 **21 Claims**





1. A floor system comprising:

a lower subfloor having top and bottom surfaces, one of said lower subfloor top or bottom surfaces having kerfs formed therein;

an upper subfloor disposed above said lower subfloor and having top and bottom surfaces, one of said upper subfloor surfaces having kerfs formed therein;

a plurality of floorboards disposed above said upper subfloor, said floorboards having respective top and bottom surfaces, said floorboard bottom surfaces having kerfs formed therein; and

a plurality of pads supporting the subfloors and floorboards above a base.

4,890,435

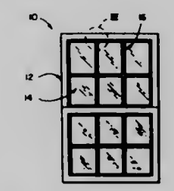
WINDOW GRILLE AND RETAINER ASSEMBLY

Steven R. Wilkening, Grand Rapids, and Lawrence Mulder, Holland, both of Mich., assignors to ODL, Incorporated, Zeeland, Mich.

Filed Dec. 27, 1988, Ser. No. 289,743

Int. Cl.⁴ E06B *3/30*

U.S. Cl. 52—456 **30 Claims**

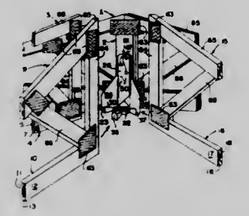


1. A window comprising:

a panel;

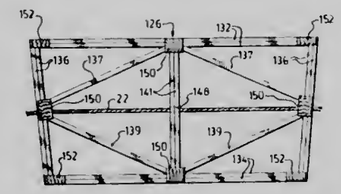
a frame having first means for supporting said panel, and second means for defining a gap between said panel and said frame;
a grille overlying said panel and including at least one grille bar having an end positioned closely adjacent said frame and defining a slot; and
a retainer having a first portion received within said slot for movably mounting said retainer on said end of said grille bar and a second portion received within said gap for releasably securing said grille to said frame.

4,890,436
MULTIPLE WOOD TRUSS CONNECTION
Karen W. Colonias, Lafayette, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed Aug. 3, 1988, Ser. No. 227,727
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—643 **4 Claims**



1. In a multiple wood truss connection including:
a. a carrying wood truss girder having a vertical wood king post member;
b. a first carried wood hip truss having a wood bottom chord member having first and second sides and a bottom edge and said first carried wood hip truss is disposed at an angle to said carrying wood truss girder of less than 90°;
c. a carried wood jack truss having a wood bottom chord member having first and second sides and a bottom edge and said carried wood jack truss is disposed at an angle to said carrying wood truss girder of approximately 90°;
d. a second carried wood hip truss having a wood bottom chord member having first and second sides and a bottom edge and said second carried wood hip truss is disposed at an angle to said carrying wood truss girder of less than 90°, and is disposed at an angle of about 90° to said first carried wood hip truss;
e. the improvement including a metal connector comprising:
(1) a common seat member;
(2) a first hip seat member extending from said common seat member for receiving said bottom edge of said bottom chord of said first carried wood hip truss;
(3) a first hip sidewall connected to and disposed at an angle of generally 90° to said common seat member and said first hip seat member for receiving said first side of said wood bottom chord of said first carried wood hip truss;
(4) a first back member connected to and disposed at an angle to said first hip side wall along a first back bend line, and said first back member is formed with a plurality of fastener boles therethrough;
(5) a first hip tab connected to and disposed at an angle of generally 90° to said first hip seat member and laterally disposed from said first hip sidewall for receiving said second side of said wood bottom chord of said first carried wood hip truss;
(6) a jack seat extending from said common seat member for receiving said bottom edge of said bottom chord of said carried wood jack truss;
(7) a first jack tab connected to and disposed at an angle of generally 90° to said jack seat for receiving said first side of said bottom chord of said carried wood jack truss;
(8) a second jack tab connected to and disposed at an angle of generally 90° to said jack seat and laterally disposed from said first jack tab for receiving said second side of said bottom chord of said carried wood jack truss;
(9) a second hip seat member extending from said common seat member for receiving said bottom edge of said bottom chord of said second carried wood hip truss;
(10) a second hip sidewall connected to and disposed at an angle of generally 90° to said common seat member and said second hip seat member, and disposed at an angle of generally 90° to said first hip sidewall, for receiving said second side of said wood bottom chord of said second carried wood hip truss;
(11) a second back member connected to and disposed at an angle to said second hip side wall along a second back bend line, and said second back member is formed with a plurality of fastener holes, at least one of which is in registration with one of said fastener holes in said first back member, and said second back member is disposed in overlapped registration with said first back member;
(12) a second hip tab connected to and disposed at an angle of generally 90° to said second hip seat member and disposed laterally from said second hip sidewall for receiving said first side of said wood bottom chord of said second carried wood hip truss;
f. girder fastener means dimensioned for insertion through said fastener holes in said first and second back members and into said vertical wood king post member of said carrying wood truss girder;
g. first hip sidewall fastener means joining said first hip sidewall of said metal connector and said wood bottom chord of said first carried wood hip truss;
h. second hip sidewall fastener means joining said second hip sidewall of said metal connector and said wood bottom chord of said second carried wood hip truss;
i. first hip tab fastener means joining said first hip tab to said wood bottom chord of said first carried wood hip truss;
j. second hip tab fastener means joining said second hip tab to said wood bottom chord of said second carried wood hip truss; and
k. jack tab fastener means joining said first and second jack tabs to said bottom wood chord of said first carried wood jack truss.

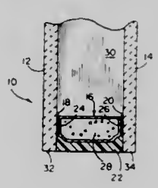
4,890,437
SEGMENTED ARCH STRUCTURE
Allan T. Quaile, 21 Vega Starway, Willowdale, Ontario, Canada M2J 1N6
Filed Jul. 9, 1987, Ser. No. 71,427
Int. Cl.[4] E04C *3/12*
U.S. Cl. 52—690 **5 Claims**



1. An arch structure segment of substantially trapezoidal side profile, for assembly with similar segments, positioned end to end, in assembled relation with at least one elongated tensile pre-stressing unit, said segment having a plurality of short, stiff, substantially straight wooden wall members, comprising:

a first, radially outer chord member of a first predetermined length;
a second, radially inner chord member of a second, lesser length;
at least two end members extending between said inner and said outer chord members in spacing relation between the ends thereof;
mechanical fastening means securing said members in mutually fastened relation; and
locating means for receiving said at least one pre-stressing tensile unit in located, load transfer relation relative to said wall members;
said segment including racking-resistant bracing means including struts joining substantially the mid-points of adjacent sides of said segment, and truss plate means in securing relation therewith.

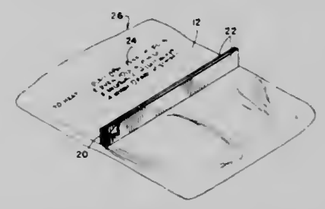
4,890,438
INSULATED GLASS CONSTRUCTION AND METHOD OF MAKING SAME
Thomas F. Tosa, Grand Haven, and Lawrence Mulder, Holland, both of Mich., assignors to ODL, Incorporated, Zeeland, Mich.
Filed Sep. 30, 1988, Ser. No. 251,331
Int. Cl.[4] E04C *2/54*
U.S. Cl. 52—790 **7 Claims**



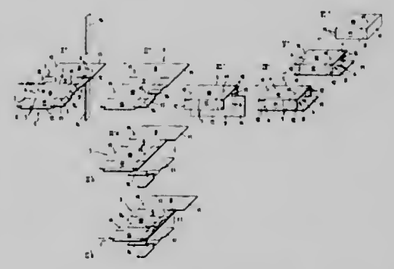
1. An insulated glass panel comprising:
a pair of rectangular transparent sheets each having an edge;
a spacer means for spacing said sheets a substantially uniform distance from one another, said spacer means being recessed from said edges to form a recess between said spacer means and said edges;
a sealant between said spacer means and each of said sheets to hermetically seal said spacer means to said sheets; and
an adhesive means between said sheets for adhesively bonding said sheets to one another, said adhesive means located within said recess and contacting said transparent sheets and said spacer means, said adhesive means arranged in discontinuous segments along said spacer means, the bond provided by said adhesive means being relatively stronger than the bond provided by said sealant, whereby said adhesive means provides enhanced structural integrity.

4,890,439
FLEXIBLE DISPOSABLE MATERIAL FOR FORMING A FOOD CONTAINER FOR MICROWAVE COOKING
Allen A. Smart, Pleasant Hill, Calif.; and, assignors to James River Corporation, Richmond, Va.
Filed Nov. 9, 1988, Ser. No. 268,851
Int. Cl.[4] B65B *29/08, 51/02, 43/02;* **H05B** *9/06*
U.S. Cl. 53—410 **40 Claims**

1. A packaging material for forming a flexible, disposable food container adapted to contain and maintain food in a fresh and sanitary condition, to ship the food from a factory to a warehouse to a store to a home, to display the food to the consumer in the store in a presentable fashion, to heat and brown the food when exposed to microwave energy in a microwave oven, and to serve the food to the consumer after removal from the microwave oven, the packaging material comprising:
a first layer of material;
a layer of microwave interactive material formed as patches on the first layer of material;
a layer of structural stock material laminated to the first layer of material so as to sandwich the patches of microwave interactive material between the first layer of material and the layer of structural stock material; and
sealant disposed on portions of the first layer of material in registry with the patches of microwave interactive material, the sealant being located to seal ends of the packaging material to form the container and to prevent the heat of the microwave interactive material from disrupting the seal during cooking in the microwave oven.



4,890,440
METHOD OF PRODUCING PACKAGING BOXES AND PACKAGING BOXES OBTAINED WITH THIS METHOD
Andrea Romagnoli, San Lazzaro Di Savena, Italy, assignor to Cestind - Centro Studi Industriali - S.R.L., San Pietro Terme, Italy
Filed Jan. 23, 1988, Ser. No. 210,716
Claims priority, application Italy, Jul. 29, 1987, 3577 A/87
Int. Cl.[4] B65B *43/10, 19/20*
U.S. Cl. 53—456 **3 Claims**



1. A method of fabricating boxes, comprising the steps of:
(a) forming a stack of sheets of individual planar cootainer blanks joining one another by break lines between strips of said blanks and between blanks of said strips whereby said break lines extend generally longitudinally and transversely of each sheet, each of said blanks being further formed with score lines between side panels, a cover panel, a bottom panel, a front panel, a rear panel, and gluing tabs enabling said panels to be glued upon erection into a box shape, each of said blanks being additionally formed with a separation line between a respective flange strip and a remaining portion of the respective blank;
(b) individually removing said sheets from said stack;
(c) separating a strip from a sheet removed from said stack

along a respective one of said break lines extending in a direction transverse to said one of said break lines;

(d) displacing said strip separated in step (b) in a direction parallel to said one of said break lines and successively separating individual ones of said blanks from the displaced strip along respective break lines transverse to said one of said break lines;

(e) repeating steps (b) through (d) for all of the sheets of said stack;

(f) for each blank individually separated in step (d), separating the respective flange therefrom by relatively displacing the respective flange and the respective remaining portion in a direction perpendicular to a plane of the respective blank and thereafter reapplying said flange to the respective remaining portion by a relative movement of said flange and said remaining portion so that said flange projects beyond an edge of said remaining portion and overlaps said remaining portion along a side thereof adapted to form an interior of the respective box; and

(g) for each blank provided with an overlapping flange in step (f), thereafter folding said panels and said tabs and folding same into said box shape with said flange being located so as to be exposed upon opening of a cover of the box.

4,890,441

METHOD AND APPARATUS FOR PACKAGING FLUENT SOLID MATERIAL, IN PARTICULAR COFFEE

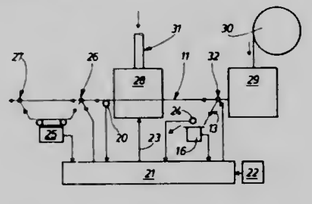
Joachim Meerkatz, Berlin, and Gerhard Clausing, Sottrum, both of Fed. Rep. of Germany, assignors to Jacobs Suchard GmbH, Bremen, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,297

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644713

Int. Cl.[4] B65B *1/46*

U.S. Cl. 53—456 **28 Claims**



1. A method of packaging fluent solid material, particularly coffee, in packets through use of a filling machine in order to produce filled packets, wherein the filing quantity of the filling machine is set according to the gross weight of the filled packets and a tare allowance, the method comprising the steps of:

determining a tare weight by taking an average of several random samples of empty packets and using the averaged random samples as a basis for a control;

determining the gross weight of filled packets;

inputting into the filling machine as a nominal value in a closed control loop the difference between the value of the gross weight determined and the value of the tare weight determined; and

filling the empty packets with the fluent solid material based on the inputted nominal value.

4,890,442

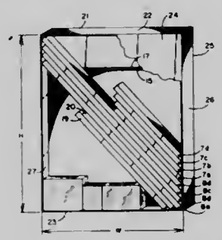
COLLAPSIBLE EASEL AND A METHOD FOR PACKING COLLAPSIBLE EASEL

Stephen A. Curry, Edina, Minn., assignor to Curry Sales, Inc., Minneapolis, Minn.

Filed May 6, 1988, Ser. No. 191,040

Int. Cl.[4] B65B *25/00*

U.S. Cl. 53—474 **5 Claims**



1. A method of packing a collapsible easel, including two leg pairs, each said leg of each said leg pair having a shorter leg member and a longer leg member, first and second planar members each having a writing surface, and a tray, within a box having a planar top and bottom and four planar sides, said top and bottom parallel and spaced apart and each side perpendicular to and contiguous with said top and said bottom, the method comprising the steps of:

(1) positioning said writing surfaces of said planar members face to face with said box;

(2) nesting the leg members together within said box so that the four longer members are coplanar and parallel, abutting one against the other generally diagonally within the box so that each of the uppermost and lowermost nested longer members has one end substantially at one corner of said box with the opposite end against a side of the box a distance generally equal to $3t/\cos\alpha + t\cos\alpha$ from the diagonally opposite corner, and the two other longer leg members are firmly retained within said box between said uppermost and lowermost members, wherein α represents the angle subtended by the longer leg members and the bottom side, and t represents the thickness of each longer leg member.

4,890,443

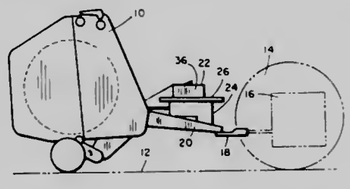
PLASTIC SHEET FEED ATTACHMENT FOR ROUND BALER

Martin R. Diehm, Rte. 1, Box 93, Red Rock, Okla. 74651

Filed Sep. 26, 1988, Ser. No. 229,711

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—118 **4 Claims**



1. In a hay baler of the type adapted to be drawn over the surface of the ground so as to scoop up cut hay from the surface of the ground, means within the hay baler to form a round bale of hay of continuously increasing diameter as the hay baler progresses over the ground, wherein the hay baler is provided with an arm, means to pivot said arm from one side of the baler to the other in a forward portion of the baler and forward of the growing round bale of hay being formed within the baler and wherein the baler is provided with a sensing means responsive to the growth of round bale of hay to a first predetermined diameter to initiate the pivotal action of the arm such that the arm moves from a position of rest at one side of the baler towards a second position at the opposite side of the baler and wherein the baler is provided with means responsive to the growth of the round bale of hay to a second predetermined diameter to actuate a cutter when the arm next thereafter reaches its position of rest; the improvement which comprises a housing mounted on the forward portion of the baler, a table resting on the housing and extending horizontally across the width of the baler, said table being provided with a pair of spaced horizontal tracks extending transversely across the table at right angles to the direction of movement of the baler, a carriage mounted on the table and slidably movable in the tracks from one side of the tables to the other, a cartridge containing a length of plastic sheet material mounted on the carriage, a plastic sheet guide pivotally mounted at the outer end of the arm opposite from its pivotal end, and means for moving the carriage from side to side across the table in synchronism with the movement of the arm whereby plastic sheet material can be fed from the carriage to and through the plastic sheet guide such that a piece thereof is disposed in trailing relation with respect to the end of the arm and whereby, when the pivotal movement of the arm is initiated by the sensing means within the hay baler, the arm will proceed to pivot from side to side and whereby the trailing end of the plastic material held by said sheet guide will be grasped by the growing bale of hay as the guide passes in close proximity to the growing bale to wrap the sheet material around the bale as the bale increases in diameter within the baler until the bale reaches its second pre-determined diameter at which time the arm will be returned to its position of rest and the cutter will sever the end of the plastic sheet material.

4,890,444

BONDED FLUTED FILTER MEDIA TO END CAP

Michael J. Vander Giessen, Blaine; Robert M. Hume, III, Cottage Grove, and Leonard C. Janusch, New Brighton, all of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Division of Ser. No. 829,420, Feb. 13, 1986, Pat. No. 4,769,096.

This application Jun. 17, 1988, Ser. No. 208,061

Int. Cl.[4] B01D *39/00*

U.S. Cl. 55—498 **24 Claims**



1. A fluid filter manufactured by bonding a fluted filter media to an end cap, which comprises the steps of:

(a) forming, between one end cap having a bonding surface and an edge of a fluted filter medium, an effective bonding amount of a coating of a bonding composition, the bonding composition comprising, in adhesive latex, an effective bonding amount of a thermoplastic resin and an amount of ungelatinized granular starch effective to complex a major portion of the latex water;

(b) heating the bonding composition coating to or above the gel point of the bonding composition to coalesce the bonding composition and form a continuous filter media to end cap bond; and

(c) drying the bonding composition coating.

4,890,445

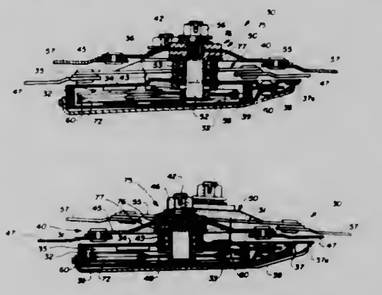
DISC CUTTER CONSTRUCTION

Jack W. Crane, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Sep. 2, 1988, Ser. No. 240,884

Int. Cl.[4] A01D *34/66, 55/00*

U.S. Cl. 56—13.6 **15 Claims**



1. In a disc cutterbar for harvesting crop material and having an elongated support bar; a plurality of disc cutters rotatably mounted on said support bar, each said disc cutter having at least one knife connected thereto for rotation therewith about a generally upright axis to engage and sever standing crop material by impact action; and a drive means associated with each said disc cutter to effect rotation thereof, said drive means including a rotatably driven shaft member corresponding to each respective disc cutter, an improved diso cutter comprising:

a hub member connected to each said corresponding shaft member to be rotatable therewith:

a disc member carrying said at least one knife and being mounted on said hub member to be movable relative to said shaft member; and

a fastening means associated with each said disc member and operable to exert a biasing force on said disc member to bias said disc member into frictional engagement with said hub member so that said disc member is rotatable with said hub member, said disc member being capable of movement relative to said hub member when a restraining force greater than said biasing force is exerted on said diso member to restrict rotational movement of the disc member relative to said hub member.

4,890,446

MULCHING ATTACHMENT FOR LAWN MOWERS

Bert L. Israel, 609 Cumberland Rd., Fredericksburg, Va. 22405

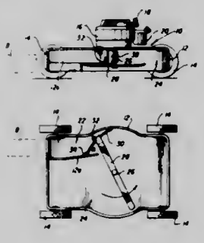
Filed Jan. 25, 1989, Ser. No. 301,140

Int. Cl.[4] A01D *34/64, 34/73*

U.S. Cl. 56—17.5 **19 Claims**

19. In combination, a lawn mowing machine comprising a cutting blade, a housing for said cutting blade defining a cavity in which said blade rotates and including a discharge chute including a discharge opening through which materials cut by said cutting blade exit from said housing, a plurality of wheels secured to said housing, drive means for causing rotation of said cutting blade within said cavity of said housing; and an imperforate, substantially vertically disposed mulching member secured to said housing within said cavity, in spaced relation to said discharge chute opening, so as to permit air flow thereby, said mulching member being disposed above the plane of the path of travel of said cutting blade and extending generally transverse to the longitudinal axis of the discharge chute so as to guide said materials to an area below the lower edge of

the plate, adjacent to the inlet end of the chute and spaced inwardly from the wall of the housing and at least a portion of the lower edge of the mulching member being disposed closely



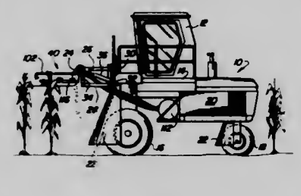
adjacent to the upper surface of the said cutting blade during rotation of the cutting blade so as to cooperate with the rotating blade to provide a shearing or scissoring cutting action in said area.

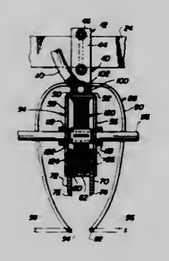
4,890,447

CORN DETASSELER MACHINE

Dennis L. Grandinetti, 203 S. Fifth, Burlington, Iowa 52601

Filed May 22, 1989, Ser. No. 354,704
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—63 **10 Claims**





1. A detasseling machine for removing tassels from corn stalks planted in rows, comprising: a mobile vehicle movable forwardly over a field of corn; a main transverse supporting structure mounted on the vehicle and extending transversely over the expanse of several rows of corn; a plurality of detasseling units supported on said supporting structure generally at the height of tassels on corn stalks and in alignment with a row of corn stalks, each detasseling unit comprising a pressurized air-carrying conduit terminating in a discharge nozzle positioned above a respective row of corn and directing a downwardly directed stream of air onto the upper portion of each stalk for moving the upper leaves on the stalk downwardly and outwardly from their normal disposition, each detasseling unit further including a pair of opposed fore-and-aft extending vertical wall members positioned on opposite sides of and for passing between them the upper portions of a row of stalks, said wall members having forward ends adjacent the nozzle so as to receive the respective tassels and upper portions of the stalks as they pass from under said stream of air and prior to the leaves regaining their normal disposition, and said walls having lower edges generally at the height of but vertically above the upper leaves of the respective stalks so that said leaves are blocked from regaining their normal disposition as the stalks pass between said wall members; each detasseling unit further including a tassel removing structure at the rear portions of the walls that engage and remove the tassels from the respective stalks as they pass between the wall members; and stalk gathering means projecting forwardly of and positioned beneath the wall members for engaging the stalks in the row and guiding the stalks to pass between the wall members as the vehicle advances.

10. A method of removing tassels from corn stalks comprising the steps of: moving over a row of tasseled corn stalks; directing a stream of air downwardly on each successive stalk so as to blow the upper leaves on the stalk downwardly from their normal disposition; blocking said leaves momentarily as they move from under the effect of the stream of air from reestablishing their normal dispositions; removing the tassel from the stalks while the leaves are so blocked; and permitting said leaves to regain their normal disposition after the tassel is removed.

4,890,448

MOWING BLADE UNIT

Hachiro Doi, Saitama, Japan, assignor to Ahresty Corporation, Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,289
Claims priority, application Japan, Apr. 13, 1987, 62-56629[U]; Sep. 10, 1987, 62-139214[U]; Nov. 4, 1987, 62-169143[U]
Int. Cl.[4] A01D *34/73*
U.S. Cl. 56—255 **5 Claims**



1. A grass mowing blade unit comprising, a housing, an upper fixed blade mounted on said housing, and a lower rotary blade co-axial with said fixed blade and mounted to said housing for rotation in one direction about a central axis of said blades,

said rotary blade comprising a multi-sided, saucer-shaped, flat plate having corners, said plate having circumferential raised edge portions extending toward said fixed blade, said edge portions being interconnected at said corners and defining blade edge forming portions of substantially V-shape or U-shape in cross-section at said corners, and free ends of said blade edge forming portions extending in said one direction,

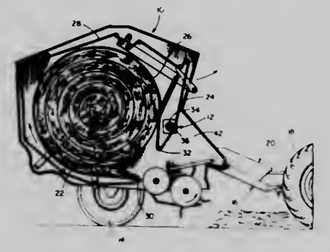
said fixed blade comprising a flat plate having a plurality of convex-shaped blade portions outwardly extending from the periphery thereof, said blade edges forming portions sliding along said convex-shaped blade portions upon rotation of said rotary blade for the mowing of grass.

4,890,449

ATTACHMENT FOR ROUND HAY BALER

Walton C. Hering, Rte. #2, Box 33, Lott, Tex. 76656

Filed Apr. 8, 1988, Ser. No. 179,249
Int. Cl.[4] A01D *75/00*
U.S. Cl. 56—341 **2 Claims**



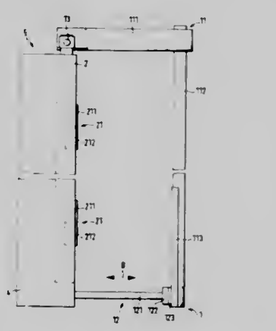
1. An attachment for a round hay baler in which the hay baler includes a plurality of relatively wide hay bale forming belts including outermost belts, each of said belts having a hay bale engaging surface and a surface opposite thereto, said attachment comprising an elongated generally cylindrical roller, said roller being journaled from the baler with the roller engaging and being rotatably driven by contact with the belt surfaces opposite to the belt surfaces engaging the hay bale and a plurality of polygonal plates rigidly fixed to said roller in mutually spaced relation throughout the length thereof and including a plurality of intermediate plates and two endmost plates, said intermediate plates projecting between adjacent belts for deflecting hay from between the belts and deflecting loose hay from the interior portions of the belts and guiding the belts, said endmost plates positioned alongside the side edges of the outermost belts, each end of said roller including an axial shaft projecting therefrom for journaling from the hay baler in spaced relation to all guide and drive rollers on the hay baler.

4,890,450

SPINNING MACHINE WITH A DEVICE TO SERVICE SPINNING AND WINDING STATIONS

Rupert Karl, and Rudolf Becker, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,231
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734568
Int. Cl.[4] D01H *13/00*
U.S. Cl. 57—1 R **11 Claims**



1. In a yarn spinning machine having a plurality of yarn spinning and winding stations and a servicing unit which travels alongside said spinning machine for servicing said stations, said servicing unit having control and drive elements disposed thereon for controlling the travel of said servicing unit, and an anti-collision device comprising:

(a) A first collision element pivotally supported on said servicing unit in a position to contact any obstruction in the path of said servicing unit during its travel alongside said spinning machine;

(b) a second collision element supported for reciprocal movement on said servicing unit and disposed between a portion of said first element and said servicing unit in a position to contact any obstruction in the path of said servicing unit and having a portion in contact with said first element; and

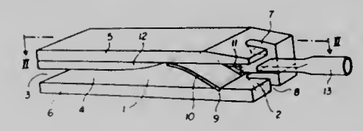
(c) means connected to said second element to actuate said control and drive elements when said first or second collision elements contact an obstruction in the path of said servicing unit to stop the travel of said servicing unit.

4,890,451

METHOD FOR LOOSENING AND UNRAVELLING A TEXTILE YARN

Rémi Cottenceau, Viry, France, and Erwin Zurcher, Le Lignon, Switzerland, assignors to Meadan S.p.A., Salo, Italy

Filed Jan. 25, 1989, Ser. No. 301,345
Claims priority, application Switzerland, Feb. 20, 1987, 653/87
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—22 **6 Claims**



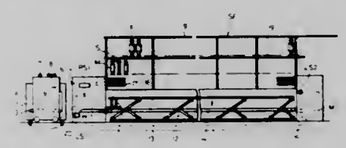
1. A method for loosening and unravelling a textile yarn by putting the free end of the yarn in a flowing stream of air, and by holding the yarn upstream of this flow, characterized in subjecting the yarn to a plurality of alternate twist and untwist actions at a frequency of several hecto-Hz and modulating said air stream to generate, at the free end of the yarn, a pulsed regime of pulls in synchronization with the frequency of said alternate twist and untwist action.

4,890,452

APPARATUS FOR CONTROLLING OPERATION OF SPINNING FRAME IN ROVING BOBBIN EXCHANGE SYSTEM

Hirotaka Nishikawa, Ichinomiya; Sadao Ukai, Nagoya, and Kanehiro Ito, Aichi, all of Japan, assignors to Howa Machinery, Ltd., Japan

Filed Dec. 6, 1988, Ser. No. 280,580
Claims priority, application Japan, Dec. 10, 1987, 62-312941
Int. Cl.[4] D01H *9/14, 13/24*
U.S. Cl. 57—276 **6 Claims**



1. In a roving bobbin exchange system for a group of con-

ventional spinning frames producing yarn wound on cops wherein almost exhausted roving bobbins suspended by respective bobbin hangers of a creel of said spinning frame are exchanged for full packaged roving bobbins suspended by respective bobbio hangers of a bobbin carriage on a supply rail arranged at a position close to and above said spinning frame, in cooperation with a roving piecing operation between each one of said almost exhausted roving bobbins and a corresponding one of said full packaged roving bobbins, by an apparatus for exchanging roving bobbins which is capable of displacing along a spindle rail of said spinning frame, an apparatus for controlling a drive of each one of said group of spinning frames, comprising:

a residual roving quantity indicating means for detecting a quantity of roving supplied from said roving bobbins and emitting a roving bobbin exchange signal when said roving quantity detected thereby approaches a predetermined wound quantity suitable for said roving bobbin exchange operation;

further indicating means for detecting a quantity of yarn wound on said cop and emitting a signal, when a yarn quantity detected thereby reaches a value suitable for carrying out said roving bobbin exchange operation,

said two indicating means being disposed on each of said spinning frames;

a control circuit for emitting a calling signal for calling said roving bobbin exchange apparatus based on a logical product of said first and second signals;

an approach confirmation switch for confirming an arrival of said roving bobbin exchange apparatus disposed at an outer end frame of a spinning frame, being capable of emitting a third signal which confirms the arrival of said roving bobbin exchange apparatus;

an allowable time setting means capable of being actuated when said calling signal is issued from said spinning frame, for setting an allowable time from a time of issuing said calling signal to a time limit at which said roving bobbin exchange apparatus should have arrived;

said approach confirmation switch and allowable time setting means being arranged to cooperate with said control circuit;

said control circuit being further provided with electric means for starting and stopping a drive of said spinning frames and cooperating with said approach confirmation switch and said allowable time setting means,

whereby, when said third signal is not outputted within said allowable time set by said allowable time setting means after an output of said calling signal in said control circuit, said electric means for stopping and starting a drive of said spinning frame stops the drive of said spinning frame.

4,890,453

METHOD AND APPARATUS FOR BURNING GASEOUS FUEL, WHEREIN FUEL COMPOSITION VARIES

Kazumi Iwai, Mito; Akira Arai, Tsukuba; Hiromi Koizumi, and Katuo Wada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

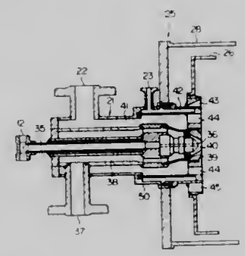
Filed Feb. 8, 1988, Ser. No. 153,607

Claims priority, application Japan, Feb. 6, 1987, 62-24573

Int. Cl.[4] F02C *7/22*

U.S. Cl. 60—39.465 **7 Claims**

1. An apparatus for burning gaseous fuel which comprises: main fuel injection ports formed in an end wall of a cylindrical combustion chamber and having an opening portion directed toward the inner part of said chamber; sub-injection ports arranged annularly outside the group of said main injection ports so as to surround the arrangement of said main injection ports and having and opening portion directed toward the inner part of said chamber; a fuel pass for conducting the gaseous fuel to said main injection ports and said sub-injection ports; a means of detecting and analyzing combustible components in the gaseous fuel which is passing through said fuel pass so as to give a signal in response to the combustion speed of the gaseous fuel which is given by the analysis of the combustible components; a means of controlling the ratio of the fuel flow through said main injection ports to the fuel flow through said sub-injection ports, the control of said ratio being carried out in



response to a signal from said means of detecting and analyzing so as to increase the proportion of the fuel to be injected through said main injection ports with the increase in the combustion speed of the gaseous fuel.

4,890,454

WALL SURFACE STRUCTURE HAVING AN IMPROVED RADIANT HEAT DISCHARGE CAPABILITY

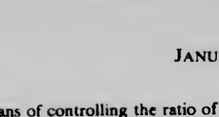
Guenther Schmidt, Taufkirchen, and Peter Schmid, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

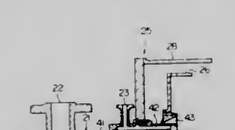
Filed Mar. 30, 1989, Ser. No. 331,276

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811613

Int. Cl.[4] F02K *9/64;* **F28F** *13/18;* **B64G** *1/26;* **H01L** *23/36*

U.S. Cl. 60—266 **7 Claims**





1. A surface structure for a wall of a structural component subject to high thermal and mechanical stress, comprising a plurality of substantially parallel closely spaced grooves having a substantially U-type cross-sectional shape with parallel side walls and with a substantially rounded groove bottom for avoiding a notching effect, said grooves having a groove depth (t) of about 100 μm and such a groove width (b) that the ratio (t/b) is at least five, each groove having a given total groove length, each groove having a maximally permissible shape tolerance of ±1 μm along said total groove length, said surface structure further comprising ribs between neighboring grooves, said ribs having a minimal rib width (a) of about 10 μm, whereby an improved heat discharge by radiation emission is achieved.

4,890,455

COAGULATOR FOR AN EXHAUST GAS SCRUBBING SYSTEM FOR INTERNAL COMBUSTION ENGINES

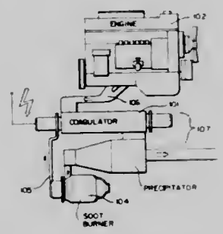
Rolf Leonhard, Schwieberdingen, and Bernhard Lucas, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1988, Ser. No. 236,814

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731110

Int. Cl.[4] F01N *3/00*

U.S. Cl. 60—275 **20 Claims**



1. A coagulator for an exhaust gas scrubbing system for internal combustion engines, comprising a housing (10) which forms a first electrode means, a second electrode means, said first and second electrode means being concentrically arranged and spaced from each other, with said first electrode means surrounding said second electrode means, at least one insulator (13, 13') comprising a plate element provided with an axial duct (14) for receiving a portion of a length of said second electrode means (11), said at least one insulator is joined at its circumference to the housing (10), and at least one spiral conduit (24) is provided in said plate which forms a heating conduit (30, 30') through which hot gases flow, said spiral conduit having an inlet and outlet through which hot exhaust gases are permitted to flow through said spiral conduit between said second electrode means and said housing, which gases heat said insulator in order to prevent soot formation thereon which prevents a short-circuiting bridge from forming between said first electrode means and said second electrode means.

4,890,456

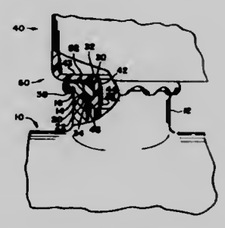
MASTER CYLINDER AND RESERVOIR CONNECTION

David D. Jordan, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jan. 6, 1988, Ser. No. 202,615

Int. Cl.[4] B60T *11/26*

U.S. Cl. 60—585 **4 Claims**



1. A connection between a fluid-containing reservoir and a master cylinder housing, comprising a reservoir extension extending from the reservoir and an end of the extension having an abutment thereat, the master cylinder housing having a housing extension with an end of the housing extension having an abutment thereat and an enlarged interior diameter section defining with a reduced interior diameter section a housing shoulder, a seal disposed within the enlarged and reduced interior diameter sections and having a rectangular cross section which includes a flat edge received by the housing shoulder, the flat edge extending radially inwardly beyond the shoulder, the abutment of the reservoir extension engaging the flat edge of the seal which extends radially inwardly beyond the shoulder, and a rectangular member disposed between said reservoir and end of the housing extension, the retained member having a horizontal portion which extends between the reservoir and seal, the horizontal portion extending into a side portion disposed substantially orthogonally relative to the horizontal portion, and the side portion including a plurality of fingers, the fingers engaging retainably the abutment of the housing extension, whereby the fingers engagement of the abutment of the housing extension secures the seal and reservoir to the housing extension.

4,890,457

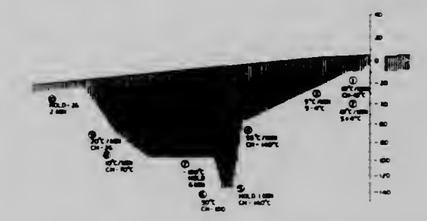
METHOD FOR CRYOPRESERVING HEART VALVES

Robert T. McNally; Albert Heacox; Kelvin G. M. Brockbank, all of Marietta, Ga., and Harvey L. Bank, Charleston, S.C., assignors to CryoLife, Inc., Atlanta, Ga.

Filed Jan. 2, 1987, Ser. No. 95

Int. Cl.[4] F25D *13/04*

U.S. Cl. 62—65 **10 Claims**



1. A method of cryopreserving heart valves comprising the sequential steps of:

a. dissecting a heart valve from a heart;

b. placing the dissected heart valve into an isotonic medium with antibiotics and a cryopreservative;

c. freezing the heart valve according to a freezing schedule that will maintain cell viability comprising the sequential steps of:

(1) placing the dissected heart valve in a freezing chamber,

(2) lowering the temperature of said freezing chamber at a rate of approximately 0.01° C./minute to a sample temperature of approximately +4° C.;

(3) lowering the temperature of said freezing chamber at a rate of approximately 1.5° C./minute to a sample temperature of approximately −3° C.;

(4) lowering the temperature of said freezing chamber at a rate of approximately 95° C./minute to a chamber temperature of approximately −140° C.;

(5) holding the temperature of said freezing chamber at approximately −140° C. for approximately one minute;

(6) raising the temperature of said freezing chamber to approximately −100° C. at a rate of approximately 20° C./minute;

(7) holding the temperature of said freezing chamber at approximately −100° C. for approximately six minutes;

(8) raising the temperature of said freezing chamber to approximately −70° C. at a rate of approximately 10° C./minute;

(9) raising the temperature of said freezing chamber to approximately −26° C. at a rate of approximately 20° C./minute;

(10) holding the temperature of said freezing chamber at approximately −26° C. for approximately 2 minutes; and

(11) lowering the temperature of said freezing chamber at a rate of 1° C./minute until the temperature of the freezing chamber is approximately −80° C.; and

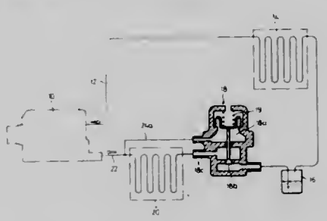
d. transferring the heart valve to a storage receptacle maintained at a temperature below −132° C.

4,890,458

REFRIGERATING CIRCUIT FOR CAR AIR CONDITIONING

Hisao Kobayashi; Katsunori Kawai; Masayuki Tanikawa, and Hiroyuki Deguchi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jul. 5, 1988, Ser. No. 215,212
Claims priority, application Japan, Jul. 6, 1987, 62-168334
Int. Cl.⁴ F25B *1/00*
U.S. Cl. 62—204 **4 Claims**



1. In a closed refrigerating circuit for a car air conditioning system for circulating a refrigerant through a variable displacement refrigerant compressor to compress the refrigerant, a condenser for condensing the refrigerant after compression, a refrigerant receiver for storing the liquid refrigerant after condensation, an expansion valve for regulating the flow of the refrigerant after condensation, and an evaporator for effecting a heat exchange between air for cooling a car compartment and the refrigerant flowing from the expansion valve, and a suction conduit connecting an evaporator outlet with a suction portion of the variable displacement refrigerant compressor the improvement which comprises:

a first means which cooperates with said expansion valve for controlling the flow of the refrigerant flowing therethrough to maintain a pressure in the evaporator at a constant value; and

a means for continuously varying the compressor displacement of the variable displacement compressor having incorporated therein a second means for maintaining a superheating temperature of the refrigerant, before compression, entering the variable displacement compressor from the evaporator, at a constant value.

4,890,459

MONITOR FOR REFRIGERATION SYSTEM

Robert K. Havemann, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Dec. 8, 1988, Ser. No. 281,143
Int. Cl.⁴ F25B *49/00*
U.S. Cl. 62—126 **5 Claims**

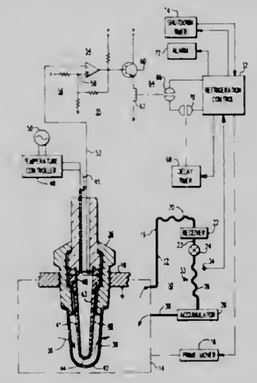
1. A monitor for detecting air leaks during the operation of a closed refrigeration system which includes a refrigerant and a compressor having a discharge manifold, comprising:

an oxygen sensor disposed in contact with refrigerant in the discharge manifold of the compressor,

said oxygen sensor providing an output voltage indirectly proportional to the amount of oxygen in the refrigerant,

comparator means for detecting a predetermined change in the voltage provided by said oxygen sensor,

said comparator means providing a predetermined signal in response to the detection of said predetermined sensor voltage change,



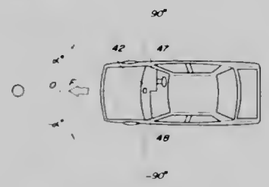
and control means responsive to the predetermined signal provided by said comparator means.

4,890,460

AIR CONDITIONING APPARATUS FOR CAR

Ozawa Takasi, Saitama, and Katsumi Iida, both of Saitama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,740
Claims priority, application Japan, Nov. 21, 1987, 62-294598; Nov. 21, 1987, 62-294599
Int. Cl.⁴ F25D *17/00*; F24J *2/38*
U.S. Cl. 62—180 **2 Claims**



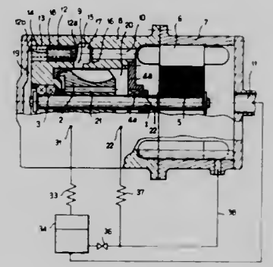
1. Air conditioning apparatus for car comprising a solar radiation sensor having at least one right side light receiving element and at least one left side light receiving element, these light receiving elements being mounted on right and left sides of a car body with their light receiving surfaces being inclined towards the front of said car body, arithmetic solar radiation value correcting means adapted to, when the detection value output from said right side light receiving element is larger than the detection value output from the left side light receiving element, compares a value corresponding to a sum of said both detection values multiplied by a coefficient with the detection value of the right side light receiving element and then output the larger value of these both values as the arithmetically corrected solar radiation value, on one hand, and adapted to, when the detection value output from said right side light receiving element is smaller than the detection value output from said left side light receiving element, compare a value calculated in the same manner as mentioned above with the detection value output from the left side light receiving element and then output the larger value of these both values as the arithmetically corrected solar radiation value, on the other hand, and control means adapted to drive various air conditioning devices on the basis of the arithmetically corrected solar radiation value output from said arithmetic solar radiation value correcting means.

4,890,461

HERMETIC OR SEMI-HERMETIC REFRIGERATION MOTOR-COMPRESSOR UNIT

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855

Filed Jul. 11, 1988, Ser. No. 217,223
Claims priority, application France, Jul. 21, 1987, 87 10273
Int. Cl.⁴ F25B *41/00*
U.S. Cl. 62—197 **8 Claims**



1. A refrigeration motor-compressor unit comprising a positive displacement rotary compressor driven by a motor, means for injecting refrigerating fluid in an innerspace of the motor for cooling the motor, said innerspace being connected by a piping to an economiser hole of said compressor, a closure means disposed in said piping for at least partially obturating said piping, duct means for subjecting one face of said closure means to an intake pressure of the compressor, said closure means being responsive to a pressure difference between said intake pressure and the pressure at said economiser hole for adjustably restricting flow in said piping when said pressure difference is below a predetermined differential level and for opening said piping when said pressure difference exceeds said predetermined differential level, and biasing means biasing said closure means towards a position of maximum flow area restriction in said piping.

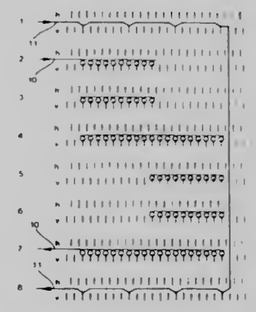
4,890,462

KNITTED FABRIC

Horst Essig, Frickenhausen, Fed. Rep. of Germany, assignor to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 241,117
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729662
Int. Cl.⁴ D04B *7/04*
U.S. Cl. 66—196 **12 Claims**

1. In a knitted fabric comprising at least one profiled fabric area, a tension thread bordering said fabric area, which tension thread before the first stitch row and after the last stitch row of said fabric area is tied by means of tuck loops into the fabric adjoining said area such that the two ends of the said tension thread are located on the same edge side of the said fabric area and, as a result of a pull on the two ends of the tension thread,



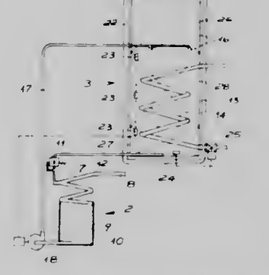
the said fabric area contained thereby can be curved out of the plane of the fabric.

4,890,463

ABSORPTION-TYPE REFRIGERATION SYSTEM WITH THERMAL ENERGY RECOVERY, PARTICULARLY FOR VEHICLES PROVIDED WITH AN INTERNAL COMBUSTION ENGINE

Angelo Cantoni, Rome, Italy, assignor to Ital Idee s.r.l., An Italian Limited Liability Company, Rome, Italy

Continuation-in-part of Ser. No. 860,021, May 6, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 120,784
Claims priority, application Italy, May 13, 1985, 48073 A/85
Int. Cl.⁴ F25B *27/00*
U.S. Cl. 62—238.3 **14 Claims**



1. An absorption-type vehicle refrigeration system with thermal energy recovery, for vehicles provided with an internal combustion engine having a cooling system containing an engine cooling liquid, comprising a vapour generator connected to a condenser which is itself connected, by way of a pressure reduction valve, to an evaporator connected to an absorber which receives liquid present in a lower zone of the generator and from which the liquid is fed to an upper zone of the generator, there being provided in the generator a heat exchanger connected to the engine cooling system and through which the engine cooling liquid flows, the engine cooling liquid flowing through the heat exchanger constituting the primary source of heat for operating the generator, the generator and absorber containing a refrigerant fluid and an absorbent fluid, the absorbent fluid being able to absorb or dissolve the refrigerant fluid, which can itself be distilled or separated from the absorbent fluid by the addition of heat which is supplied to the generator by the heat exchanger in the

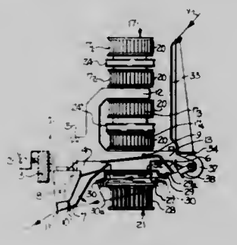
generator, and be condensed and vaporised under the temperature and pressure conditions prevailing in the condenser and evaporator, respectively, and the absorber and the generator including means for precluding displacement of the absorbent fluid and the refrigerant fluid from respective portions of the refrigeration system as a result of vehicle movements so as to cause consequent inversion of the system operating cycle.

4,890,464

POSITIVE FEEDING DEVICE FOR CIRCULAR KNITTING MACHINE

Koji Tsuchiya, and Yoshiaki Igarashi, both of Hyogo, Japan, assignors to Precision Fukuhara Works, Ltd., Hyogo, Japan

Filed Sep. 12, 1988, Ser. No. 242,492
Claims priority, application Japan, Mar. 18, 1988, 63-67013
Int. Cl.[4] D04B *15/48, 35/10*
U.S. Cl. 66—132 T **10 Claims**



1. In a yarn feeding apparatus for a circular knitting machine including rotatable drive wheel means (17), driven endless tape means (20) in driving engagement with said drive wheel means (17), yarn feed wheel means (21) drivingly connected to said drive wheel means (17) for rotating said yarn feed wheel means (21), the combination therewith wherein said yarn feed wheel means (21) includes a first yarn feed surface (27) providing comparatively high friction with the yarn engaged thereby and adaptable for use when the rate of yarn feeding varies, such as in the case of Jacquard pattern knitting, a second yarn feed surface (28) providing comparatively low friction against the yarn engaged thereby and adapted for use when the rate of yarn feeding is constant, such as in the case of plain knitting, and manually adjustable yarn guide means (29, 30) supported for circumferential movement around said yarn feed wheel means (21), said yarn guide means (29, 30) being movable to spaced-apart circumferential positions for selectively guiding yarn to said first yarn feed surface (27) to feed yarn to said circular knitting machine under variable feed rates, and said yarn guide means (29, 30) being movable to substantially circumferentially aligned positions for selectively guiding yarn to said second yarn feed surface (28) to feed yarn to said circular knitting machine under a constant feed rate.

4,890,465

TANG CLUTCH FOR PLANETARY AUTOMATIC WASHER DRIVE

Jeffrey L. Burk, Lincoln Township, Berrien County, and Douglas E. Wood, Hagar Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

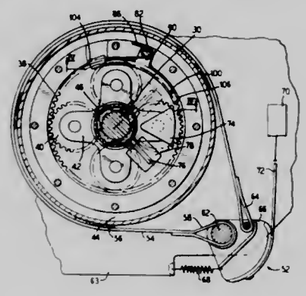
Filed Jan. 9, 1988, Ser. No. 204,228
Int. Cl.[4] D06F *37/40*
U.S. Cl. 68—23.7 **18 Claims**

1. In an automatic washer having a vertical axis agitator, a concentrically mounted wash basket, a motor drivingly connected to said agitator to selectively oscillate and rotate said agitator about said vertical axis, and a clutch mechanism to permit oscillatory motion of said agitator and rotary motion of said agitator and basket, said clutch mechanism comprising:

first engagement means connected to move with said agitator;

second engagement means connected to move with said basket;

said first engagement means being adapted for selective engagement with said second engagement means upon rotation of said agitator to a predetermined angular position relative to said basket;



said first and second engagement means being disposed such that oscillatory motion of said agitator of less than a 360° stroke angle will result in no continuous contact between said first and second engagement means, and rotary motion of said agitator will cause engagement of said engagement means and resulting rotary motion of said basket after no more than 360° rotation of said agitator; and

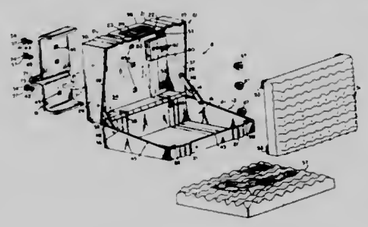
means for biasing said first and second engagement means into engagement during rotary motion of said agitator and basket.

4,890,466

LOCKBOX AND CARRYING CASE FOR PISTOLS

Daniel M. Cislo, 3413 Rambla Pacifico, Malibu, Calif. 90265

Continuation-in-part of Ser. No. 19,518, Jul. 18, 1968, Pat. No. 4,788,838. This application Oct. 5, 1988, Ser. No. 253,581
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[4] E05B *65/52*
U.S. Cl. 70—63 **20 Claims**



1. A handgun lockbox to prohibit unauthorized access to a handgun and lock the lockbox to a stationary object, the lockbox comprising:

(a) a coupling means;

(b) a pair of complementary housings coupled together by said coupling means to form a compartment therebetween of sufficient size to hold the handgun and wherein said housings can be secured together to prevent the unauthorized access to the handgun, unless the housings are in an open position;

(c) a latch means for latching adjacent sides of said complementary housings to lock the complementary housings in alignment preventing unauthorized access to the said compartment therebetween;

(d) a bracket means for bracketing one of said housings to the stationary object, wherein said bracket means is of a predetermined length and geometric shape to fit around the stationary object and wherein said bracket means fixedly attaches to one of said housings holding the stationary object between said bracket means and said one of said housings when in an installed condition.

4,890,467

SWITCH LOCK

Barry Krause, 178 Ni River Dr., Spotsylvania, Va. 22553, and Eric M. Fredrickson, 113 Highland St., Taunton, Mass. 02780

Filed May 31, 1988, Ser. No. 200,436
Int. Cl.[4] E05B *29/00;* **H01H** *19/58*
U.S. Cl. 70—369 **4 Claims**



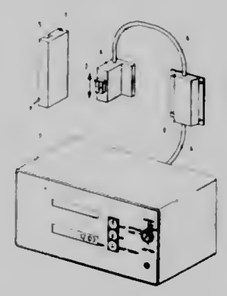
1. A lock actuated switch comprising a housing and a lock cylinder, the housing including a terminal housing portion and a support portion, the terminal housing having a lower terminal end, the support portion having an open terminal end and being in integral coaxial relationship at its other end with the terminal housing portion, the support portion having a wall defining a longitudinal bore, the lock cylinder including a body portion, a switch portion and a shaft portion, the switch portion being integral with and extending axially from the body portion, the switch portion including a tubular housing portion, the tubular housing portion having a channel formed therein, the tubular housing portion having sides and having a first opening fabricated through one side thereof and a second opening fabricated through the other side thereof and in opposed relation with the first opening, the channel formed in the tubular housing portion opened at one side by the first opening and at the other side by the second opening, the channel having an upper inner surface, a lower inner surface and a pair of side surfaces, the upper and lower inner surfaces being in spaced parallel relation to each other and the pair of side surfaces being in spaced parallel relation to each other and in right angle relationship with the upper inner and lower inner surfaces a first stop portion extending from the lower inner surface adjacent the first opening and a second stop portion extending from the lower inner surface adjacent the second opening, a rectangular third stop portion extending from the upper inner surface adjacent the first opening and a fourth stop portion extending downward from the upper inner surface adjacent the second opening, a first contact holder comprising a back, the back having a first side edge and a second side edge, a first arm extending in right angle relation from the first side edge thereof and a second arm extending in right angle relation from the second side edge, each of the arms including an open key hole slot, the arms being in spaced parallel relation to each other and each of them having an external surface, the external surface of the first arm including an integral ramp portion positioned on one side thereof, the ramp portion merging therewith in close proximity to the back and terminated at its other end by a first stop remote from the back, the external surface of the second arm including an integral wedge shaped ramp portion positioned on the the external surface, merging into the external surface in close proximity to the back and terminating at its other end by a second stop remote from the back, a first movable contact moveable mounted in the area defined by the back, first arm and second arm of the first contact holder and the housing having fixed contacts, the first moveable contact engaging the fixed contact, a second contact holder of similar construction as the first contact holder and having a second movable contact mounted therein, the second movable contact similar in all respects to the first movable contact, the assembly of first contact holder and first movable contact positioned within the channel of the switch portion with the first stop of the ramp portion abutting the fourth stop portion of the upper inner surface, the second stop of the ramp portion abutting the second stop portioo of the lower inner surface and a portion of the first movable contact extending through the second opening, a helical spring having a first terminal end and a second terminal end being positioned within the cavity of the switch portion with first terminal end bearing against the back of the first contact holder and the second terminal end bearing against the back of the second contact holder, the assembly of the second contact holder and second movable contact being positioned within the cavity of the switch portion with the first stop bearing against the third stop portion and the second stop abutting the first stop portion of the lower inner surface and a portion of the second movable contact extending through the first opening, the first and second moveable contact engaging the fixed terminals.

4,890,468

METHOD FOR MEASURING AND CORRECTING THE PLUNGER ADJUSTMENT IN HIGH-SPEED STROKE PRESSES

Helmuth Frisch, Schönberg; Johann Hartinger, Grafenau, and Alois Weber, Freyung, all of Fed. Rep. of Germany, assignors to S & S Electronike Geratebau Gmbit., Schonberg, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,164
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3739023
Int. Cl.[4] B21D *55/00*
U.S. Cl. 72—21 **6 Claims**



1. In a method for measuring and correcting the plunger adjustment of of a high-speed stroke press, the press including a lower tool and an upper plunger movable with respect to the lower tool for performing a machining operation on semi-finished material with high tolerance requirements, in which the plunger must be readjusted depending on the number of strokes per unit of time, and the actual value of the plunging depth of the plunger is measured and compared with a specified plunging depth; the improvement which comprises

(a) guiding a sensor head provided with a plurality of induction loops with the plunger stroke along a permanent-

magnetic ruler, said ruler being subdivided into a plurality of alternating North/South poles along its longitudinal axis;

(b) scanning the induced voltage for each predetermined path length unit by means of cosine and sine functions of said induction loops, and

(c) measuring and evaluating the amplitudes of the two functions at a turning point of the plunger from one direction to another, so that one of the amplitudes or the maximum neighboring amplitude measured at the turning point serves as reference voltage and the other amplitude advances the measured value.

4,890,469

BENDING MACHINE FOR BENDING BARS, CHANNELS, SECTIONS AND THE LIKE

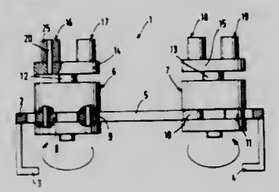
Helmut Diechler, Droste-Huelshoff-Str. 9, D-4040 Neuss, Fed. Rep. of Germany

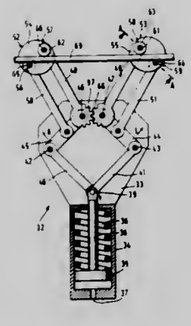
Division of Ser. No. 941,650, Dec. 15, 1986, Pat. No. 4,798,073. This application Jan. 17, 1989, Ser. No. 297,399

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544056

Int. Cl.[4] B21D *11/04*

U.S. Cl. 72—218 **13 Claims**





1. A bending machine, comprising:

(a) support means;

(b) first and second spaced bending means rotatably mounted to said support means;

(c) each of said bending means comprises first and second spaced cooperating bending components rotatable on parallel axes, the components of said first and second bending means define a first axis extending between said bending means and second and third axes extending generally transverse to said first axis and about which a length to be bent may pivot and each of said second and third axes is disposed between the components of one of said bending means and the components of each bending means are sufficiently spaced apart to receive therebetween a length to be bent which extends also between said bending means on said first axis; and,

(d) drive means operably associated with each of said bending means for causing oppositely directed rotation thereof relative to said support means so that the associated bending components may move relative to said first axis and engage a length to be bent extending between said bending means and received between the associated bending components and thereby impress first and second torques on the length while permitting the length to move relative to the engaged rotatable bending components so that the length pivots about said second and third axes and is bent intermediate said bending means.

4,890,470

LOOP TRANSPORT SYSTEM FOR A PLURALITY OF BASKETS CONTAINING MATERIAL TO BE DRAWN THROUGH A DRAWING MACHINE

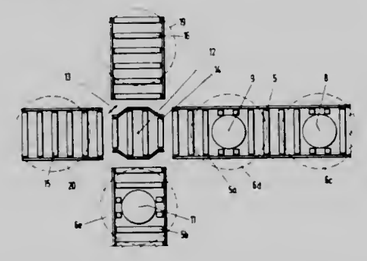
Josef Gerretz, Viersen, and Ewald Hess, Mönchengladbach, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Deuseldorf, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 225,683

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725511

Int. Cl.[4] B21C *1/32*

U.S. Cl. 72—289 **11 Claims**



1. A looped rod transporting system for moving in a predetermined sequential manner a plurality of baskets which contain therein looped rod material to be drawn through a die member of a wire drawing machine, said looped rod transporting system comprising:

(a) a feeder station in which a forward end of said looped rod material contained in one of said plurality of baskets is prepared for introduction into said die member of said wire drawing machine;

(b) a looped rod payoff station from which said looped rod material to be drawn is fed through said die member and then wound around a drawing block of said wire drawing machine a predetermined number of wraps;

(c) a looped rod delivery station in which said looped rod material is deposited in one of said plurality of baskets positioned substantially adjacent to said drawing block after having passed through said die member of said wire drawing machine;

(d) a basket removal station from which a basket containing drawn looped rod material deposited therein at said delivery station can be removed;

(e) a substantially closed looped conveying mechanism for sequentially conveying and guiding each of said plurality of baskets containing said looped rod material to said feeder station, said looped rod payoff station, said looped rod delivery station and said basket removal station so that functions performed in each individual station can take place in at least one of a simultaneous and a partially simultaneous fashion; and

(f) a basket handling conveyor intersecting said looped rod transporting system generally laterally of said substantially closed loop conveying machine and having at least a portion thereof positioned intermediate said looped rod payoff station and said looped rod delivery station for directing one of said plurality of baskets containing said looped rod material in a predetermined direction so that it can be at least removed from and introduced into said looped rod transporting system.

4,890,471

PUNCH PRESS FORMING CRT SHADOW MASKS

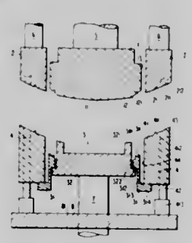
Hideya Ito, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 297,283

Claims priority, application Japan, Jan. 21, 1988, 63-11208

Int. Cl.[4] B21D *24/00*

U.S. Cl. 72—348 **7 Claims**



1. A method of forming a color CRT shadow mask of high yield strength material, comprising the successive steps of:

(a) horizontally clamping a periphery of a planar blank of said material,

(b) applying a punch (1) to an upper surface of the blank to draw-form a main spherical surface (9*a*) of the mask,

(c) releasing the peripheral clamping,

(d) bending the periphery of the blank upwardly to form a skirt (9*c*) surrounding the main spherical surface of the mask, and

(e) press-forming a border spherical surface (9*e*) surrounding the main spherical surface of the mask inwardly of the skirt and inclined at a greater angle to the horizontal than edges of said main spherical surface such that said border spherical surface prevents spring-back of the thus formed mask upon release and the attendant formation of creases or dimples in the main spherical surface of the mask.

4,890,472

FLARING TOOL FOR HOLLOW WORKPIECES

Helmut Rothenberger, Wiesenhang, Fed. Rep. of Germany, assignor to Rothenberger Werkzeugmaschinen GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,351

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732628

Int. Cl.[4] B21D *39/20*

U.S. Cl. 72—393 **4 Claims**

1. A flaring tool for hollow, especially cylindrical, workpieces, comprising, in combination:

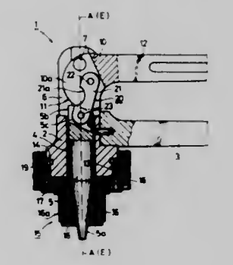
a tool body with a linear bore;

a flaring punch, mounted for axial displacement in the tool body, having an outer tapered end protruding from the bore;

a set of flaring dies joined to the tool body surrounding the tapered end of the flaring punch;

a cam journaled in the tool body on a fulcrum axis perpendicular to the bore axis and operated by a hand lever to displace the flaring punch by a given amount away from the tool body into the set of flaring dies; and

a flaring punch extractor coupling the flaring punch to the hand lever, said extractor comprising a rigid link which is journaled at one end to the flaring punch and at the other end to the hand lever, the point of engagement with the hand lever being excentric from the fulcrum axis, the cam and the end of the flaring punch facing the cam being each provided with a central, slot-like recess in which the ends



of the link are guided, the recesses in the cam being in alignment with the recess in the flaring punch.

4,890,473

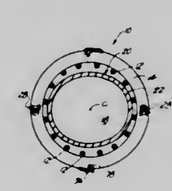
CONTRACTING RIM CLAMP

William J. Westerman, Columbia; Warren B. Depperman, Lugoff, and Philip G. Smith, Jr., Camden, all of S.C., assignors to Cogsdill Tool Products, Inc., Camden, S.C.

Filed May 11, 1988, Ser. No. 192,864

Int. Cl.[4] B21D *41/00*

U.S. Cl. 72—402 **21 Claims**





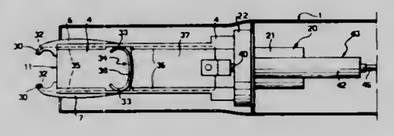
1. Apparatus to encircle and reform the cross-section of a tubular pipe, said apparatus comprising a frame having an opening greater than the outer periphery of the pipe to be encircled, a plurality of angularly spaced force applying assemblies pivotally mounted on said frame with each including a force applying member, drive means including a chain connecting each of the force applying assemblies together for driving the force applying member of each assembly into engagement with the outer periphery, and idler means disposed between a pair of said assemblies for movement radially inwardly against the chain, said idler means and chain being operable independently of one another and each simultaneously pivoting each assembly such that the force applying members move inwardly of the opening and relative to one another from a nonengaging first position relative to the pipe and to a pipe engaging second position, the members at said second position engaging the periphery and applying inward radial forces for reforming the cross-section of the pipe.

4,890,474

MOTOR-DRIVEN PORTABLE TONGS FOR CLAMPING CRAMPS OR THE LIKE

Raffaele Agostini, Via del Greto 2/3, Bologna, and Lorenzo Prioli, Via Scacciani 2, Pesaro, both of Italy

Filed Aug. 18, 1988, Ser. No. 233,556
Claims priority, application Italy, Dec. 18, 1986, 3615-A/86
Int. Cl.[4] B21F *45/16*; B23P *11/00*
U.S. Cl. 72—416 **13 Claims**



1. A portable grip for the irreversible clamping of "C" clips having curved opposing parts, an open front side and a back side, said grip comprising:
- a supporting structure comprising an elongated supporting plate (4) extending in longitudinal direction along a first plane;
- a pair of jaws (6, 7) having a free end section (30) and being identical in mirror image, pivotally mounted at intermediate points along the length thereof to said supporting plate, said jaws being arranged symmetrically in relation to a plane (8) extending parallel with said longitudinal direction and intersecting said first plane at a right angle;
- a semi-circular seat (32) located in each of said free end sections (30) of said jaws (6, 7) for holding said curved opposing parts (33) of said "C" clips;
- a pair of guide grooves (35) on said supporting plate (4) extending longitudinally along the outer edges thereof, said guide grooves being fixed relative to one another and spaced to guide a "C" clip along said supporting plate;
- a thrust plate (37) slidably movable within said guide grooves (35) for reciprocating movement therein whereby, when said thrust plate is moving toward said free end sections (30) of said jaws, said "C" clip is moved along said guide grooves and transferrred toward said seats (32) so that the open side of said clip is pointing from said grooves to said end sections of said jaws and said back of said clip (39) is abutting said thrust plate;
- a rod connected to said thrust plate for carrying out said reciprocating longitudinal movement within said guide grooves; and
- said free end sections (30) of said jaws (6, 7) protruding beyond said supporting structure in said first plane and extending perpendicularly thereto so that said seats (32) located therein from an extension of said guide grooves (35) for receiving said clip.

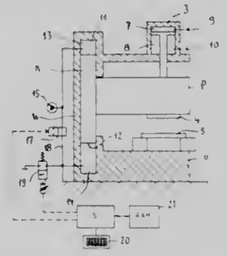
4,890,475

PRESTRESSED HYDRAULIC PRESS

Horst Baltschun, Ruizheim, Fed. Rep. of Germany, assignor to Maschinenfabrik Lauffer GmbH & Co. KG, Horb, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,462
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728418
Int. Cl.[4] B21D *37/12*
U.S. Cl. 72—455 **10 Claims**

1. A hydraulic press comprising a press ram; a press base; a first motor means for vertically moving said press ram from a non-working position to a working position; second motor means for biasing said press ram during its working stroke, said second motor means comprises first and second pistons each having a pair of end faces, said pistons being secured to said press ram and mounted for vertical movement within first and second cylinders wherein each end face of the pistons defines with each cylinder a first and second chamber; a tie rod rigidly interconnecting the ends of each of said first and second cylinders defining said chambers; and pressure generator means for



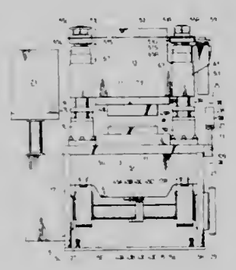
selectively controlling the pressure in said first and second chambers such that said tie rods are under substantially constant stress during all operating phases of the hydraulic press.

4,890,476

PRECISION PLATE BENDING MACHINE HAVING A PLAY REMOVING DEVICE

Hideaki Takahashi, Atsugi; Takashi Wakahara, Hatano, and Yasuhiro Harashima, Atsugi, all of Japan, assignors to Amada Company, Limited, Japan

Continuation of Ser. No. 37,145, Apr. 10, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 180,692
Claims priority, application Japan, Apr. 11, 1986, 61-082372; Apr. 14, 1986, 61-054662[U]
Int. Cl.[4] B21D *37/12*
U.S. Cl. 72—456 **3 Claims**



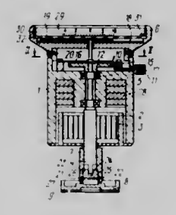
1. A plate bending machine for performing precise bending operations comprising:
- a machine pedestal having two opposite side sections;
- a pair of guide members provided at each side section of said machine pedestal;
- a pair of guide posts vertically movably supported by said guide member;
- a lower bending tool supported by said machine pedestal;
- an upper table having two side sections each supported by said guide post;
- an upper bending tool supported by said upper table and adapted to vertically move with said upper table to operate in cooperation with said lower bending tool;
- an eccentric shaft supported in a freely rotatable manner on said machine pedeatal and having an eccentric section with which said guide post at its lower section is engaged, wherein there is play between said guide post and said eccentric section; and
- play removing means mounted on said machine pedestal, for removing the play between said guide post and said eccentric section;
- wherein said play removing means further comprises a pair of resilient members, one of each of said resilient members being mounted on one of each of the guide members in a manner such that each of the resilient members surrounds the respective guide member in a horizontal plane.

4,890,477

DEVICE FOR TESTING SKI SLIDING SURFACE

German P. Losev, ulitsa Tsvillinga, 42, kv.16.; Vasily A. Kamenskikh, ulitsa Belorechenskaya, 7, kv.16.; Pavel M. Vaisberg, ulitsa Bardina, 49, kv.40., and Boris N. Kharin, prospekt Lenina, 48, kv.95., all of Sverdlovsk, U.S.S.R.

PCT No. PCT/SU87/00003, § 371 Date Aug. 18, 1988, § 102(e) Date Aug. 18, 1988, PCT Pub. No. WO88/05326, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 15, 1987, Ser. No. 265,805
Int. Cl.[4] G01N *19/02*
U.S. Cl. 73—9 **14 Claims**



1. A device for testing the ski sliding surface, comprising:
- a case housing accommodating a spiral spring having one end thereof attached to the case and the other end attached to an axle;
- a support bushing, an exterior one end of said bushing holding a disk whose end face is intended for interaction with a snow or snow imitation surface and is made of a material forming a ski test sliding surface;
- measuring surface means for measuring relative rotation of the disk and the case; and wherein
- the axle (4) is rotatably mounted at one end thereof and a support bushing (7) for supportedly mounting said other end;
- said measuring means for measuring relative rotation of the disk (8) and said case (1) includes a ratchet-and-pawl mechanism (10) and a gear (12) secured on said axle (4);
- a switch (11) for step-by-step engagement of spring-loaded pawls (13, 14) with the gear (12);
- a scale (18) for sliding capacity measurement disposed on the case (1); and
- a pointer (19) fixed on the other end of the axle (4).

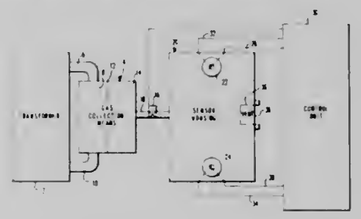
4,890,478

GAS-IN-OIL MONITORING APPARATUS AND METHOD

C. Clair Claiborne, Sharpsville; Robert A. Kurz, Hermitage; Henry A. Pearce, Jr., Stoneboro, and Harry R. Sheppard, Hermitage, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 11, 1987, Ser. No. 95,745
Int. Cl.[4] G01N *1/22*
U.S. Cl. 73—19 **19 Claims**

1. An on-line gas-in-oil monitoring apparatus for oil-filled electrical apparatus which indicates substantially simultaneously the amount of at least two predetermined gases in the oil comprising:
- means for separating said predetermined gases from said oil;
- a sensor housing;
- means for periodically introducing a sample of said predetermined gases separated from said oil into said housing;
- a first gas sensing means disposed in said sensor housing which is predominantly sensitive to a first of said predetermined gases;
- a second gas sensing means disposed in said sensor housing which is predominantly sensitive to a second of predetermined gases;
- vent means for venting said sensor housing to the atmosphere for purging said predetermined gases from the sensor housing and to admit oxygen to said sensor housing to resensitize said sensing means to said predetermined gases;
- control means which are responsive to a change in conductivity of said first and second sensing means in response to the presence of said first and second predetermined gases respectively, and generate an indication of the levels of the first and second predetermined gases;



- said first sensing means is predominantly sensitive to carbon monoxide;
- said second sensing means is predominantly sensitive to hydrogen;
- said sensing means are sintered metal oxide semiconductors with adsorbed oxygen;
- heating means which provide heat or voltage to said sensing means;
- said heating means provides a first heating voltage to said first sensing means to heat said second sensing means to a temperature which renders said first sensing means sensitive to the first of said predetermined gases; and
- a second heating voltage to said second sensing means to heat said second sensing means to a temperature which renders said second sensing means sensitive to the second of said predetermined gases.

4,890,479

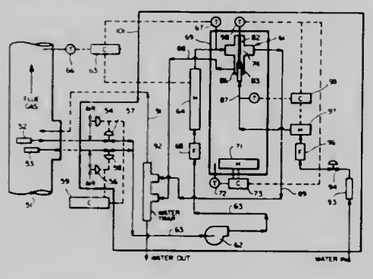
SYSTEM AND METHOD FOR MONITORING WET BULB TEMPERATURE IN A FLUE GAS STREAM

Robert L. Glover, Lockport, N.Y., and Verle V. Bland, Evergreen, Colo., assignors to Electrict Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 5,109, Jan. 20, 1987, Pat. No. 4,809,537. This application Feb. 13, 1989, Ser. No. 310,268
Int. Cl.[4] G01N *31/00*
U.S. Cl. 73—29 **13 Claims**

1. In a system for monitoring wet bulb temperature in a flue gas stream: means for extracting a sample of the gas from the flue, means for heating the sample to maintain the sample at substantially the same temperature as the gas in the flue, a sensor for measuring the wet bulb temperature of the sample,

a reservoir of liquid, a liquid absorbent wick surrounding the sensor and extending into the liquid in the reservoir, and means



for maintaining the liquid in the reservoir at a substantially constant level.

4,890,480

RELATING TO DEVICES FOR MEASURING FLUID DENSITY

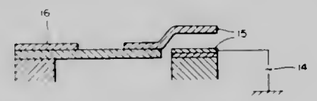
Donald C. Young, Pangbourne, England, assignor to Thorn EMI plc, London, England

Filed Aug. 29, 1988, Ser. No. 237,808

Claims priority, application United Kingdom, Aug. 28, 1987, 8720355

Int. Cl.[4] G01N *9/00*

U.S. Cl. 73—32 A **6 Claims**



1. A device for measuring the density of a fluid, the device comprising:

a semiconductor substrate;

a micro-engineered structure which is manufactured on the semiconductor substrate and is adapted to be capable of vibration in the fluid;

a hole having two ends extending through the substrate with the micro-engineered structure located at one end thereof, the dimensions of the hole being small compared with the wavelength of sound waves created in the fluid by the vibrating structure;

means for causing the structure to vibrate and means for detecting a characteristic of said vibration, the said characteristic being dependent on the density of said fluid.

4,890,481

SYSTEM FOR MEASURING FOREIGN MATERIALS IN LIQUID

Masayoshi Ezawa; Shigeru Wakana; Akira Misumi; Yoshifumi Tomita, all of Mobara, and Yutaka Hiratsuka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 14,787, Feb. 13, 1987, Pat. No. 4,779,451. This application Jul. 29, 1988, Ser. No. 226,204

Claims priority, application Japan, Feb. 17, 1986, 61-30811; Feb. 17, 1986, 61-30812; Feb. 17, 1986, 61-30813

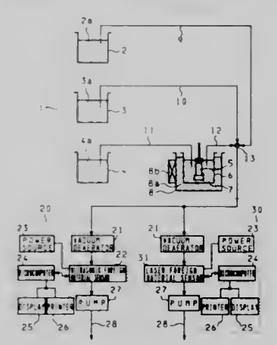
The portion of the term of this patent subsequent to Oct. 25, 2006, has been disclaimed.

Int. Cl.[4] G01N *15/07*

U.S. Cl. 73—53 **3 Claims**

1. A system for measuring a foreign material in a liquid, comprising:

sampling means for preparing a sample liquid containing various foreign materials having particles of different sizes and numbers and a calibration standard liquid containing particles of known sizes and numbers;



vacuum deaerating means for deaerating gases mixed in the sample and calibration standard liquids; and

foreign material measuring means for detecting the foreign materials in the deaerated liquids.

4,890,482

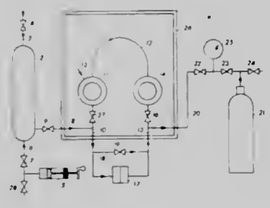
METHOD AND APPARATUS FOR MEASURING FLUID VISCOSITY

Brij B. Maini, Calgary, Canada, assignor to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Aug. 22, 1988, Ser. No. 234,759

Int. Cl.[4] G01N *11/04*

U.S. Cl. 73—55 **6 Claims**



1. A transient flow capillary viscometer for establishing a measure of the viscosity of a test fluid comprising:

a capillary tube having upstream and downstream ends;

first means, communicating with the downstream end of the capillary tube, for receiving fluid exiting the capillary tube and maintaining a substantially constant elevated pressure at said end;

second means, communicating with the upstream end of the capillary tube, for maintaining the tube filled with test fluid during testing and inducing, in a pulsed manner, a pressure differential across the tube whereby test fluid may be caused to flow therethrough at a diminishing rate under a diminishing pressure differential; and

third means for monitoring the thus generated diminishing pressure differential as a function of time to obtain information which may be used to calculate a measure indicative of the viscosity of the test fluid.

4,890,483

APPARATUS FOR TESTING THE WATERTIGHT CAPACITY OF PIPES

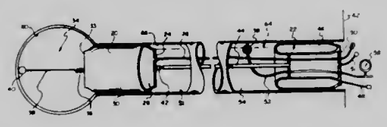
Manfred Vetter, Burg Langendorf, D-5352 Zuelpich, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,923

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643489

Int. Cl.[4] G01M *3/28*

U.S. Cl. 73—40.5 R **7 Claims**



1. An apparatus for testing whether sections of pipe have sprung a leak, which apparatus at its front end is fitted with a front pipe sealing pad having a cylindrical sleeve and two circular walls at each end of the sleeve, said sleeve and said two walls defining an internal compartment, a hose being attached to the rear wall of the said two walls by means of which the internal compartment can be filled or emptied, and a connection for a distancing rod being attached to the said rear wall for pushing and pulling the said pad, the rod being connected to a mug-shaped rear pipe sealing pad which is composed of two concentric sleeves, a radial, circular shaped wall, and a sealing wall at one end which two sleeves and two walls define a ring-shaped internal area which can be hermetically sealed and which can be filled or emptied by means of a connection; the apparatus further comprising a tubing for removing air having an end between the two pipe sealing pads, a float being attached to this end of said tubing for emptying out air, and a filling tube; wherein the hose, the tubing for removing air and the filling tube are routed through the circular wall, which rear pipe sealing pad can be connected to the distancing rod.

4,890,484

AUTOMATED METHOD AND APPARATUS FOR DETERMINING TOTAL SUSPENDED SOLIDS IN LIQUIDS

Alexander Telfer, and Joseph C. Raia, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1988, Ser. No. 149,317

Int. Cl.[4] G01N *1/10*

U.S. Cl. 73—61 R **18 Claims**

1. An automated robotic method for determining total suspended solids in liquid samples wherein the liquid samples are contained in individual sample vessels, and the following steps are all executed by means of an automated robotic manipulator, comprising:

(a) weighing a fresh, dry, filter-containing vessel to determine its initial weight;

(b) inverting a sample-containing sample vessel over the filter-containing vessel to pour the sample into the filter-containing vessel;

(c) detecting conclusion of the filtration of the liquid sample through the filter-containing vessel;

(d) adding clean rinse liquid to the sample vessel;

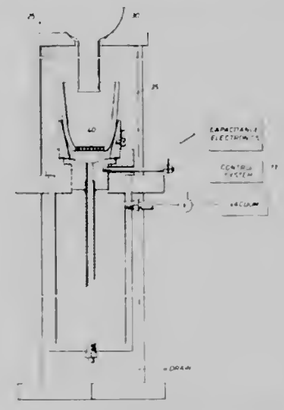
(e) again inverting the sample vessel over the filter-containing vessel to pour residual sample solids and rinse liquid from the sample vessel into the filter-containing vessel;

(f) again detecting conclusion of the filtration of the liquid through the filter-containing vessel;

(g) heating the filter-containing vessel until it is dry;

(h) cooling the filter-containing vessel;

(i) re-weighing the filter-containing vessel; and



(j) calculating the difference between the initial and final weights to determine the weight of the suspended solids removed by the filter from the liquid sample.

4,890,485

MECHANISM WHICH REACTS TO THE PRESENCE OF OIL AND/OR WATER

Charles J. Hsu, P.O. Box 460, Grand Central Station, New York, N.Y. 10017

Division of Ser. No. 941,996, Dec. 15, 1986. This application Jan. 25, 1988, Ser. No. 147,702

Int. Cl.[4] G01N *33/22, 19/10;* **F03G** *7/06;* **F26B** *5/10*

U.S. Cl. 73—61.1 R **11 Claims**



1. A release mechanism which reacts to the presence of water at a temperature which is present in a quench oil tank, comprising:

a flour-polyacrylonitrile graft polymer composition as an absorbent material, said flour-polyacrylonitrile graft polymer composition being treated by being soaked in water and then subsequently dried; and,

a multi-ply porous container for substantially enclosing said absorbent material.

4,890,486

IN SITU DETERMINATION OF HYDROCARBON CHARACTERISTICS

Michael M. Herron, Ridgefield, Conn., assignor to Schlumberger Technology Corp., New York, N.Y.

Continuation-in-part of Ser. No. 574,753, Jan. 26, 1984, and Ser. No. 262,133, Oct. 24, 1988, which is a continuation of Ser. No. 574,481, Jan. 26, 1984, abandoned. This application Jan. 13, 1989, Ser. No. 297,735

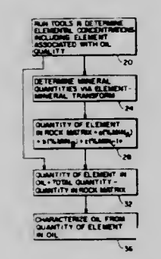
Int. Cl.[4] E21B *49/00*

U.S. Cl. 73—152 **20 Claims**

1. A method for investigating in situ a characteristic of oil in an earth formation traversed by a borehole, comprising:

(a) logging said earth formation with a borehole tool and

determining an indication of the total formation content of at least one element other than oxygen, carbon, and uranium associated with said oil characteristic for at least one depth in said borehole;



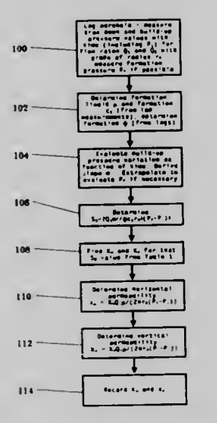
(b) deriving from said total formation content of said at least one element, a content of said at least one element in said oil at said depth in said borehole.

4,890,487

METHOD FOR DETERMINING HORIZONTAL AND/OR VERTICAL PERMEABILITY OF A SUBSURFACE EARTH FORMATION

Elizabeth B. Dussan V., Ridgefield, and Yogeshwar Sharma, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 7, 1987, Ser. No. 35,563
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—152 **52 Claims**



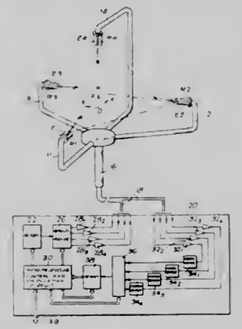
1. A method of estimating horizontal and/or vertical permeability of a formation traversing a borehole, said method comprising the steps of:
drawing fluid from the formation at a first rate Q_1 through a probe having a radius r_p for a first time period T_1;
measuring a pressure P_1 of the fluid substantially at the end of said first time period;
drawing a fluid from the formation at a second rate Q_2 through said probe for a second time period T_2;
measuring a pressure P_2 of the fluid substantially at the end of said second time period;
recording the build-up pressure of the fluid in the formation over a third time period, the pressure measured substantially at the end of said third time period being P_f;
calculating a first factor m which correlates a predetermined pressure build-up model to said recorded build-up pressure;
calculating a second factor S_D based on said flow rate Q_1, pressure P_1, probe radius r_p, pressure P_f and first factor m;
calculating a dimensionless quantity K_H, representative of the horizontal permeability of the formation, based on said second factor S_D; and
calculating a horizontal permeability k_H of the formation based on said quantity K_H, probe radius r_p and pressure P_f.

4,890,488

ULTRASONIC ANEMOMETER

Bernard Pincent, Chevreuse; Paul Journe, and Gérard Brugnot, both of Grenoble, all of France, assignors to Simecsol, Le Plessis Robinson, France

Filed Mar. 3, 1989, Ser. No. 318,691
Claims priority, application France, Mar. 3, 1988, 88 02722
Int. Cl.[4] G01W *1/04*
U.S. Cl. 73—189 **6 Claims**



1. An ultrasonic anemometer comprising a plurality of ultrasonic signal emitting probes and a plurality of ultrasonic signal receiving probes mounted in such a way as to define at least three paths for the propagation of ultrasonic signals through the air, and means for measuring the time of propagation of ultrasonic signals along the different paths and for calculating the speed and the direction of the wind based upon the propagation times measured, wherein the emitting and receiving probes are low frequency probes, each emitting probe capable of producing an ultrasonic signal in the form of a predetermined wave train at an ultrasonic frequency between 10 and 200 kHz, and wherein the means for measuring and calculating comprises means for measuring the propagation time by correlation of a signal produced by an emitting probe and the signal received by at least one receiving probe.

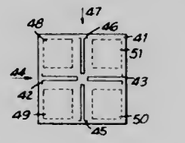
4,890,489

DIRECTION-SENSITIVE FLOW-RATE INDICATOR

Johan H. Huijsing, Schipluiden, Netherlands, assignor to Broukhorst High-Tech B.V., Vordes, Netherlands

Filed Sep. 16, 1988, Ser. No. 245,769
Claims priority, application Netherlands, Sep. 18, 1987, 8702229
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.24 **5 Claims**

1. In a direction-sensitive flowo velocity meter for gaseous or liquid media comprising a single semiconductor substrate on which a first thermocouple is arranged, said first thermocouple comprising a strip of a first conductive material connected at its two ends with two strips of a second conductive material so as to form two junctions of said thermocouple, an imaginary line through said junctions of said first thermocouple extending parallel to the direction of a first flow velocity component of the medium, and a heating element for generating a flow velocity dependent temperature difference in the flowing medium in the direction of said imaginary line resulting in a flow velocity dependent thermo-voltage between the junctions ends of the said first thermocouple, the improvement comprising at least one second thermocouple, substantially similar to the first, arranged in the single substrate such that an imaginary line through its junction ends extends parallel to the direction of a second flow velocity component of the medium, said direction



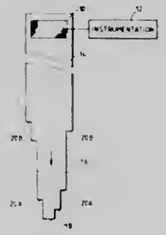
of the second flow velocity component being perpendicular to the direction of the first flow velocity component, said imaginary lines through the junction ends of the first and second thermocouples being symmetrically arranged on the single substrate with respect to first and second mutually perpendicular axes of symmetry respectively, and electronic means for processing the thermocouple voltages or supplying the heating element being arranged on thermocouple-free surfaces of the substrate between said thermocouples.

4,890,490

LIQUID LEVEL MONITORING

David W. Telford, Caithness, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 13, 1988, Ser. No. 205,829
Claims priority, application United Kingdom, Jul. 6, 1987, 8715841
Int. Cl.[4] G01F *23/28*
U.S. Cl. 73—290 V **8 Claims**



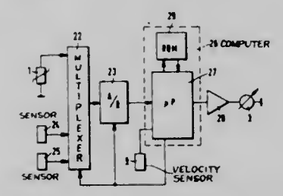
1. A method of monitoring liquid level within a containment vessel, comprising transmitting acoustic wave pulses from transducer means along a waveguide which extends beneath the upper surface of the body of contained liquid and which has at least one pulse-reflecting discontinuity for exposure to the liquid, and analysing the reflected pulse or pulses to detect any loss of acoustic energy as a result of immersion of said discontinuity or discontinuities in the liquid, said method being characterised in that the acoustic wave energy is in the form of Lamb waves injected into the waveguide, said transducer means is located wholly external to the vessel interior, and the waveguide passes through a sealed penetration in a wall of the vessel said analysing comprising using progressive reduction of the amplitude of the reflected pulse and selecting a mode of said waves having an energy distribution having less energy at the surface of the waveguide than at the center of the waveguide.

4,890,491

METHOD AND DEVICE FOR INDICATING THE LEVEL OF LIQUID IN AN AUTOMOBILE FUEL TANK

Egon Vetter, Hofheim; Thomas Pfeifer, Eppstein; Heinz-Georg Burghoff, Reichenbach, and Werner Daub, Stuttgart, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,219
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725752
Int. Cl.[4] G01F *23/00, 23/22*
U.S. Cl. 73—290 R **5 Claims**



1. A method of indicating the level of liquid in an automobile fuel tank, the method employing a liquid-level detector and a display device which are disposed in an automobile vehicle, the method comprising steps of:
provisionally storing values of the level of the liquid measured at successive predeterminable time intervals;
comparing said measured values with values subsequently measured;
cancelling subsequently measured values which upon travel are determined by the comparing step to have increased, so as not to indicate increased measured values on the display device;
sensing longitudinal and transverse accelerations and an inclined position of the vehicle during travel; and
rejecting measured values obtained during longitudinal and transverse accelerations and obtained during an inclined position of the vehicle during travel.

3. A system for indicating the level of a liquid in an automotive fuel tank, disposed in a vehicle, the system comprising:
a liquid level detector in said tank;
a display device carried upon the vehicle;
a computer with an analog-to-digital converter;
a sensor of the longitudinal inclination and longitudinal acceleration of the vehicle;
a sensor of the transverse inclination and transverse acceleration of the vehicle, both said sensors being connected to the analog-to-digital converter;
a velocity sensor carried by the vehicle; and wherein
the liquid-level detector is connected via the analog-to-digital converter to the computer, an input of the computer being connected to the velocity sensor, the display device being connected to an output port of the computer; and
said computer is operative to suppress changes in liquid level in the tank detected by said detector as a result of longitudinal and transverse accelerations obtained during an inclined position of the vehicle during travel

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4,890,492

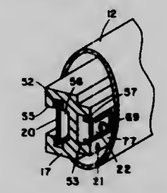
DIFFERENTIAL PRESSURE LEVEL SENSOR WITH TEMPERATURE SENSING ELEMENTS

Raymond J. Andrejasich, Carmel; Laurence S. Slocum, and Sara M. Mussman, both of Indianapolis, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 6, 1988, Ser. No. 240,499
Int. Cl.[4] G01F *23/00*
U.S. Cl. 73—292 **8 Claims**

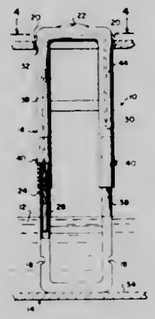
1. A flowable substance level sensor comprising:
a first longitudinal strip comprising a continuous strip of

resistive material;
a second longitudinal strip comprising a continuous strip of material having relatively high conductivity compared to said resistive material;
envelope means for forming a longitudinal envelope having a longitudinal cavity, said first and second strips being supported by said envelope and oppositely disposed in said cavity, said envelope being sufficiently rigid to hold said strips apart under normal atmospheric pressures and sufficiently flexible to permit the weight of flowable substance incident of the exterior surface of said envelope to force said strips together; and



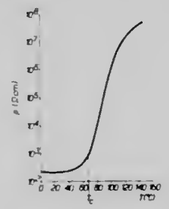
temperature sensor means for sensing the temperature at one or more levels along said longitudinal strips;
said temperature sensor means comprising one or more temperature sensor elements and one or more temperature sensor carriers, each temperature sensor element carried by a carrier and said flowable substance level sensor further comprising a rigid frame having a first longitudinal slot for receiving said envelope and a second longitudinal slot for receiving said one or more temperature sensor carriers.

4,890,493
AUTOMATIC TANK READING GAUGE
Robert M. Johnson, Box 1251, Clermont, Fla. 32711, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007
Filed Aug. 25, 1988, Ser. No. 236,173
Int. Cl.[4] G01F *23/30*
U.S. Cl. 73—321 **4 Claims**



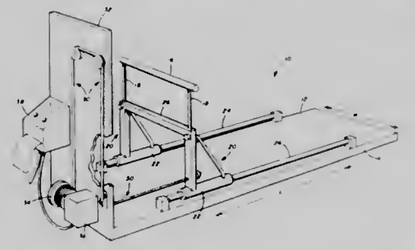
1. An automatic reading gauge for fluid within a tank comprising:
(a) an O-shaped hollow body having at least one weep hole at a lower end to allow the fluid to enter said body, at least one air check valve at an upper end to allow air to exit said body and a top sight area;
(b) an elongated flexible measuring member having a scale thereon, said measuring member disposed with said body so that said scale can be viewed through said top sight area;
(c) a float affixed to one end of said measuring member within said body;
(d) a counterweight affixed to other end of said measuring member within said body to keep said measuring member taut so that when said body is placed through a filler hole in the tank to extend to bottom of the tank the fluid entering said body will cause said float to rise giving a reading of said scale of said measuring member at said sight area thus indicating the amount of fluid within the tank; wherein said body is telescopic and includes:
(e) a lower hollow U-shaped tubular member having said at least one weep hole therein;
(f) an upper hollow U-shaped tubular member having said at least one air check valve and said top sight area therein, ends of said upper tubular member fits into ends of said lower tubular member so as to be adjustable to compensate for different height tanks; and
(g) a pair of set screws for locking the ends of said upper tubular member to the ends of said lower tubular member.

4,890,494
ATMOSPHERIC SENSOR
Paul C. Osbond, Northampton, Great Britain; Roger W. Whatmore, Milton Keynes, and John P. Autos, Cambridge, both of England, assignors to Plessey Overseas Limited, Ilford, England
Continuation of Ser. No. 657,586, Oct. 4, 1984, abandoned. This application May 17, 1988, Ser. No. 196,786
Claims priority, application United Kingdom, Oct. 8, 1983, 8326982
Int. Cl.[4] G01N *25/64*; G01W *1/02*
U.S. Cl. 73—338 **20 Claims**



1. A device for measuring a liquid content of a gas, the device including a probe comprising a sensor formed by ceramic material which is thermally self-stabilising because it has a known resistance/temperature characteristic, the probe ceramic material having an electrical resistance and a heat loss rate at a surface of the ceramic material, the electrical resistance changing in response to the heat loss rate resulting from integrated evaporation of liquid droplets in said gas from the surface of the ceramic material, means for heating the probe to a required temperature, means for detecting a change in the electrical resistance of the probe, in response to a change in the heat loss rate due to the integrated evaporation of liquid droplets in said gas from the surface of the ceramic material, means for maintaining the temperature of the probe substantially constant during operation whereby the change in the electrical resistance indicates a variation in power used to maintain the temperature of the probe substantially constant, and means for processing the variation of power for determining the liquid content of the gas.

4,890,495
DEVICE FOR DETERMINING THE PUSH/PULL CAPABILITIES OF A HUMAN SUBJECT
Stephen M. Slane, 1526 Maple Ave., Verona, Pa. 15147
Filed Sep. 16, 1988, Ser. No. 245,712
Int. Cl.[4] A61B *5/22*
U.S. Cl. 73—379 **16 Claims**



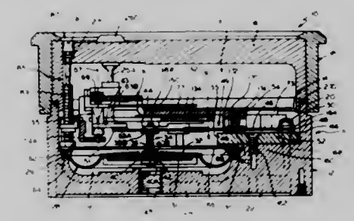
1. A device for determining the functional push/pull capability of a human subject comprising:
a fixed walking surface for said subject;
a push/pull bar extending horizontally and transversely of said walking surface and disposed above said walking surface;
said push/pull bar being mounted for horizontal movement along said walking surface by said subject;
selectively variable means for resisting said horizontal movement of said push/pull bar; and
means for evaluating said horizontal movement as a function of said means for resisting.

4,890,496
METHOD AND MEANS FOR DETECTION OF HYDROGEN ATTACK BY ULTRASONIC WAVE VELOCITY MEASUREMENTS
Anmol S. Birring; David G. Alcazar; Gary J. Hendrix, and John J. Hanley, all of San Antonio, Tex., assignors to Electric Power Research Institute, Palo Alto, Calif.
Filed Sep. 7, 1988, Ser. No. 241,504
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—597 **9 Claims**



1. A method of nondestructively testing for hydrogen attack in a steel body comprising the steps of
(a) placing first and second ultrasound transducers on an outer surface of said body, said transducers being in fixed relationship to each other to define a fixed path length therebetween,
(b) transmitting ultrasound waves from one of said transducers,
(c) receiving said ultrasound waves by the other of said transducers,
(d) determining velocities of the received waves with an accuracy of 0.1 percent of said ultrasound waves in said body from the fixed path length divided by time of travel of said ultrasound waves from said one transducer to said other transducer, a first of said received ultrasound waves being indicative of velocity through normal steel and a later of said received ultrasonic waves being indicative of hydrogen attack, and
(e) determining the presence of hydrogen attack in the body from the difference in velocities of said received ultrasound waves through said body.

4,890,497
DIFFERENTIAL PRESSURE GAUGE TRANSMITTER
John M. Cahill, Michigan City, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.
Filed Aug. 25, 1988, Ser. No. 236,231
Int. Cl.[4] G01L *9/06, 13/02, 19/04*
U.S. Cl. 73—708 **7 Claims**

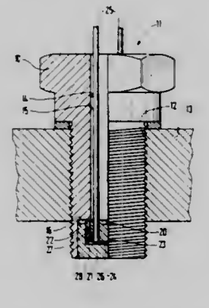


1. In a control loop for process control including an external power source connected in series to an indicating transmitter that is in turn series connected to a load resistance of fixed value that is in turn series connected to the external power source, the improvement wherein the indicating transmitter comprises:
a pressure gauge that comprises a housing having a pressure cavity across which is mounted a flexible diaphragm separating high and low pressure chamber,
a helix journaled in said housing for rotation about its axis, with the helix having an indicator connected thereto,
a leaf spring secured to the housing cantilever fashion adjacent one end thereof in overlying relation to said diaphragm on one side of said diaphragm, and having a magnet mounted on the other end thereof,
said magnet producing rotational movement of said helix in response to linear movement of said magnet longitudinally of said helix axis,
said securement of said leaf spring to said housing being by clamping means for clamping said leaf spring to define the live length of same and a fulcrum about which said live length moves,
a link connecting said diaphragm to said live length of said leaf spring for deflection of said leaf spring in response to differential pressures acting on either side of said diaphragm,
said live length of said leaf spring having a strain gauge mounted on each side thereof,
said strain gauges each comprising a sensing element in the form of a generally rectilinear silicon sensor strip,
with the strip of one side of said leaf spring being parallel to the longitudinal axis of said leaf spring, and the strip of the other side of said leaf spring being disposed normally of said longitudinal axis of said leaf spring,
said strain gauges being electrically connected in wheatstone bridge, self temperature compensation, fashion, and in an electronic circuit mounted in said housing with the sensing elements of said bridge being balanced when the diaphragm and leaf spring are free of deflection,
a circuit board fixedly mounted in said housing on said one side of the diaphragm and overlying and spaced from said leaf spring in substantial parallelism thereto,
said electronic circuit being mounted on said circuit board and including means for supplying a constant DC current to said strain gauges and means for amplifying the strain gauge signal generated by deflection of said leaf spring live length from the deflection free relation thereof to an output for effecting sensing of the action of the differential pressures acting on either side of the diaphragm.

4,890,498
PRESSURE SENSOR

Klaus Dobler, Gerlingen, and Jürgen Wendel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00093, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO87/05997, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 5, 1987, Ser. No. 271,754
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610351
Int. Cl.[4] G01L *7/08, 9/06*
U.S. Cl. 73—727 9 Claims

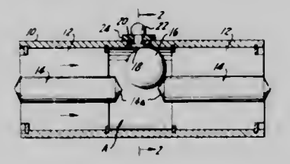


1. Pressure sensor for detecting the pressure of a medium defined by a wall comprising, in combination:
a pressure-sensitive film resistor which changes its electrical properties under the influence of pressure;
a housing for supporting said pressure-sensitive film resistor, said housing having a hollow space which is formed by a continuous bore hole;
a closing member sealing said continuous bore hole relative to the medium whose pressure is to be determined, said closing member having an inner side which contacts said film resistor in such a way that mechanical stress is produced at said film resistor; and
at least one electrical conductor extending through said hollow space for carrying electrical signals from said pressure-sensitive film resistor.

4,890,499
FLUID FLOW DETECTORS

Murray F. Feller, Dunnellon, Fla., assignor to Model Screw Products, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 851,803, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 677,873, Dec. 4, 1984, Pat. No. 4,581,943. This application Nov. 6, 1987, Ser. No. 119,299
Int. Cl.[4] G01F *1/05*
U.S. Cl. 73—861.05 33 Claims



25. Apparatus for sensing the flow of fluid having appreciable electrical conductivity, including a tubular wall that defines a flow passage, vane means that establishes a spiralling fluid-flow pattern in said passage along and around the axis of the tubular wall at an orbital region of the passage, a ball of electrical insulation in said orbital region, the resistivity of the ball being substantially higher than that of the fluid whose flow is to be monitored, said apparatus including means forming outer and inner circular tracks extending about said axis and being disposed at greater and lesser radii from said axis, respectively, all of the foregoing being arranged so that the ball is induced by said spiralling fluid-flow pattern to orbit about the axis of said tubular wall and to bear against and thereby define said inner and outer circular tracks, a localized sensing electrode in the orbital region and a return electrode, an electrical insulator forming a barrier between said sensing electrode and said passage except for a cavity in said insulator that opens into the passage and exposes the sensing electrode to the flow passage so that the sensing electrode is recessed from said passage, said sensing electrode and the opening of said cavity into the passage being much smaller than the ball's cross-section and being so related to said outer track that the ball overhangs said opening of the cavity at least in close proximity thereto consistently in the course of its orbits, and circuit means for providing excitation between said sensing electrode and said return electrode for establishing an electric field pattern in said orbital region concentrated at said sensing electrode and for deriving flow-representing signals as the ball orbits past the sensing electrode.

4,890,500
MEASURING APPARATUS

Alan F. Giles, St. Neots, Great Britain, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Nov. 14, 1988, Ser. No. 271,177
Claims priority, application United Kingdom, Nov. 12, 1987, 8726478
Int. Cl.[4] G01F *1/74*
U.S. Cl. 73—861.41 7 Claims



1. Apparatus for detecting and counting flowable particulates comprising means for feeding particulates at a substantially uniform speed through a measuring area, defined by radiation emitting and radiation sensing means being arranged in a plane transverse to the direction of travel of the particulates an connected to computing means, wherein the radiation emitting and sensi g means are arranged such that at least one pair of fan shaped, overlapping arrays of sensing beams can be generated, each pair of arrays having two lines of symmetry: the one connecting the convergence points of the fan shaped arrays, the other being the perpendicular bisector thereof.

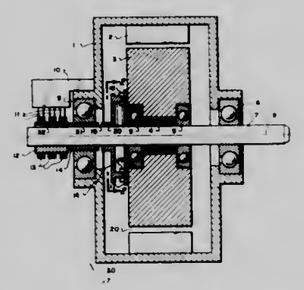
4,890,501
TORQUE TRANSDUCER FOR ELECTRIC MOTORS

Larry L. Schumacher, 18876 Tenderfoot Trail, Newhall, Calif. 91321

Filed Mar. 23, 1989, Ser. No. 327,788
Int. Cl.[4] G01L *3/14*
U.S. Cl. 73—862.33 8 Claims

1. An improved torque transducer for electric motors of the type with a motor stator attached to a motor housing, the motor housing supporting in shaft support bearings a motor shaft attached to a motor rotor, the motor rotor being rotationaly separated from the motor stator by a small air gap, the improvement comprising:

rotor bearings radially supporting the motor rotor on the motor shaft preserving the small air gap;
a torsional spring rotationally transmitting torque between the motor rotor and the motor shaft between the rotor bearings;
a rotationally balanced torsional spring deformation measurement means transforming a rotational angular difference between the motor rotor and the motor shaft into electrical characteristics;



a passage through the motor housing transporting electrical conductors between the rotationally balanced torsional spring deformation measurement means and slip rings;
an electronic circuit transforming the rotationally balanced torsional spring deformation measurement means electrical characteristics into a voltage representing the electric motor torque.

4,890,502
SORBENT TUBE TRACE SAMPLE RELEASING APPARATUS

Lorne Elias, Nepean, and André H. Lawrence, Gloucester, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D'Exploitation Limitee, Ottawa, Canada

Continuation of Ser. No. 268,489, Nov. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 108,532, Oct. 15, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,162
Claims priority, application Canada, Oct. 16, 1986, 520694
Int. Cl.[4] G01N *35/00*
U.S. Cl. 73—864.85 2 Claims



1. A sorbent tube trace sample releasing apparatus comprising:
(A) tubular casing having:
(1) a sample outlet end for connecting to a sample analyzing apparatus;
(2) a sorbent tube receiving end for receiving and passing a sorbent tube;
(3) a bore connecting said ends; and
(4) a valve seat disposed in said bore;
(B) a valve having:
(1) an elongated valve stem extending in said bore and entirely disposed between said valve seat and said sample outlet end;
(2) a valve seal fixedly attached to one end of the valve stem and engagable with said valve seat; and
(3) spring means associated with said valve stem for urging said valve seal into engagement with said valve seat;
(C) a purging gas inlet disposed through said tubular casing and being positioned between said valve seat and said sample outlet end and positioned such that when said valve seal is engaged with said valve seat, the purging gas inlet is between the valve seal and the sample outlet end, said purging gas inlet having associated therewith a valve for opening and closing said purging gas inlet;
(D) a sorbent tube having sorbent therein and having a length and configuration so that a first trace sample receiving end is passable from said sorbent tube receiving end, through said bore and is engagable with said valve seal while an opposite end thereof protrudes from said sorbent tube receiving end;
(E) a carrier gas connecting means for connecting the said sorbent tube opposite end with a carrier gas supply for passing a carrier gas through said sorbent tube;
(F) sorbent tube sealing means for passing therethrough and sealing said sorbent tube in said bore when the said first end of the sorbent tube is engaged with said valve seal, said sealing means being disposed in said bore between said valve seat and said sorbent tube receiving end, but nearer said valve seat; and
(G) a heating means associated with said casing for heating said casing, the valve seal and at least the first end of the sorbent tube when said first end is engaged with said valve seal;
wherein the said first end of the sorbent tube is engagable with and can displace the valve seal from the valve seat by urging the valve stem against the spring means toward said sample outlet end, the heating means can heat and release a trace sample contained in the sorbent tube, and a carrier gas can pass through said sorbent tube and convey the released trace sample through said valve seat, said bore, out of said sample outlet end and into said sample analyzer;
whereby substantially only the valve seat, valve seal and bore between the valve seat and sample outlet end contact said released trace sample, a purging gas passing through said purging gas inlet contacts substantially only the bore between the valve seal and sample outlet end, and, therefore, the loss of trace sample in the said trace sample releasing apparatus is minimized.

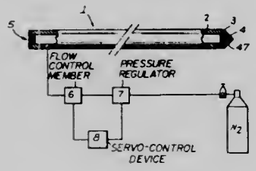
4,890,503
METHOD FOR PROBING INSIDE A BLAST FURNACE WITH A PRESSURIZED PROBE

Jean-Claude Daverio, Bas-Saint-Martin, and Dominique Rocchi, Pienaes, both of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), Maizieres-les-Metz, France

Division of Ser. No. 68,161, Jun. 30, 1987, Pat. No. 4,829,836. This application Apr. 7, 1989, Ser. No. 320,616
Claims priority, application France, Jun. 30, 1986, 86 09809
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—866.5 2 Claims

1. A method for implanting a tubular probe having a nose in a smelting furnace, the nose of said probe being temporarily closed off by a plug inserted therein, the plug including a substantially cylindrical body force fitted in the probe nose and an internal conduit extending through the plug, said method comprising the steps of:
implanting the probe into the smelting furnace;
injecting a gas into the probe;

controlling the flow rate of the injected gas until the probe nose has reached a required position; and



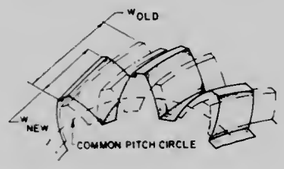
regulating gas supplying pressure to keep the flow rate between a minimum value, under which furnace gas may penetrate into the probe, and a maximum value, above which the plug may be prematurely ejected.

4,890,504

HELICAL GEARSETS

Erwin R. Carrigan, Manchester; Harold R. Johnson, III, Aberdeen, both of Ohio, and Allyn E. Phillips, Maysville, Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 891,860, Jul. 30, 1986, Pat. No. 4,794,811. This application Dec. 22, 1988, Ser. No. 288,673
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[4] F16H *55/08*
U.S. Cl. 74—458 **2 Claims**



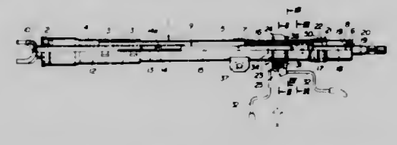
1. A helical gearset comprising a pinion and a gear wherein the pinion has a normal operational rotation speed of up to 2400 rpm or more, said pinion and said gear each having a plurality of teeth, said pinion having 13 or fewer teeth, and said gearset having an axial overlap ranging between 1.001 and 1.2.

4,890,505

STRUCTURE OF TELESCOPIC STEERING APPARATUS FOR A VEHICLE

Satoshi Kinoshita; Shyogo Kachi, and Yoshiyuki Shimizu, all of Shizuoka, Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,190
Claims priority, application Japan, Mar. 27, 1987, 62-46118[U] May 30, 1987, 62-83304[U]
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 **20 Claims**



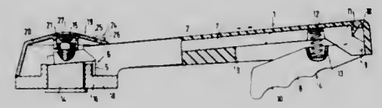
1. A structure of a telescopic steering apparatus, comprising:
(a) a steering column jacket having a first fixed portion and a second movable portion which is linked to the first portion and is movable in an axial direction thereof;
(b) a steering shaft having a third portion rotatably fitted to the first fixed portion of the column jacket and fourth portion which is linked to the third portion and is movable in the axial direction of the column jacket within a predetermined range of movement;
(c) first means for operatively fixing and unfixing the second portion to the first portion; and
(d) second means fixed to the first portion for guiding the first means to the second portion via the first portion.

4,890,506

LOCKING HAND LEVER FOR OPERATING A VALVE OR THE LIKE

Fritz Müller, Neuer Wasen 6, 7118 Irgelfingen-Criesbach, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,554
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710982
Int. Cl.[4] G05G *1/04;* F16K *35/00*
U.S. Cl. 74—523 **20 Claims**



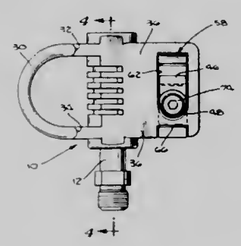
1. A hand lever for actuating an element such as a butterfly valve or the like; comprising
an inner lever portion having one end adapted to be fixedly connected to the element;
an outer lever portion being movable relative to said inner lever portino and having one end facing the element;
locking means arranged at said one end of said outer lever portion for selectively engaging said outer lever portion with the element; and
actuating means separate from and connected to said outer lever for moving said outer lever portion in longitudinal direction thereof relative to said inner lever portion for allowing engagement and disengagement of said outer lever portion.

4,890,507

BICYCLE PEDAL BINDING

Mark S. Farris, and Michael A. Harrison, both of Newport Beach, Calif., assignors to Avante Sport, Newport Beach, Calif.

Filed Feb. 16, 1988, Ser. No. 155,970
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 **13 Claims**



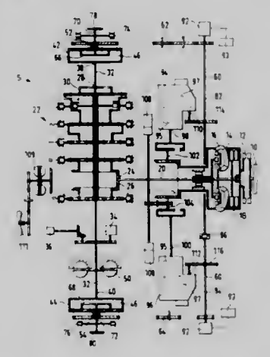
1. In a bicycle pedal binding:
a. bicycle pedal;
b. means mounting said pedal for pivotal movement about an axis; said pedal having a rear pad area and a front hoop area on opposite sides of said axis, the weight of said pedal normally orienting said hoop upwardly and said pad area downwardly;
c. a thin cleat for attachment to the cyclist's shoe, and having a pivot plate projecting forwardly of said cleat, said pivot plate having the shape of a circular segment, the periphery of said pivot plate extending arcuately for more than 180 degrees, said pivot plate fitting inside said hoop to register therewith, said cleat also having a sole portion at its rearward end for contacting said rear pad area for transmission of downward thrust to said pedal;
d. a hook extending forwardly of said plate for capturing said hoop whereby said hoop and plate mutually guide each other into registry; and
e. means located rearwardly of said hoop and at said pad area and operable hy the foot of the cyclist for releasably locking said sole portion to said pad area to maintain said pivot plate and said hoop in registry, said locking means and said registering pivot plate and hoop together operating to transmit upward, downward, forward and rearward thrust from said cleat to said pedal.

4,890,508

TRACKED VEHICLE DRIVE SYSTEM

Franz X. Zaunberger, Augsburg, Fed. Rep. of Germany, assignor to Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 113,748
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636211; Oct. 24, 1986, 3636267; Oct. 24, 1986, 3636153
Int. Cl.[4] F16H *47/04;* B62D *11/00, 11/02, 11/20*
U.S. Cl. 74—687 **4 Claims**



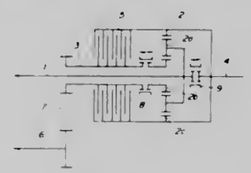
1. A tracked vehicle drive system, including:
(a) a propulsion drive having a speed change gearing with an output,
(b) a steering drive having hydrostatic torque transmitting means, the steering drive having an output,
(c) means drivingly interconnecting an engine output with the propulsion drive and the steering drive,
(d) a pair of summing differential gears, the gears each having a first input element and a second input element, means drivingly interconnecting the speed change gearing output with the first input element of each summing differential gear, means drivingly interconnecting the second input element of each summing differential gear with the steering drive output, each summing differential gear further having an output element, each output element rotating at a speed which is a function of the speeds of the two input elements, and
(e) a neutral shaft and means connecting the second input element of each summing differential gear with the neutral shaft, characterized in that:
(f) the neutral shaft is comprised of segments, the drive system including switchable means for selectively interconnecting the neutral shaft segments, the segments being connected when the vehicle drive system is in a travel mode and being uncoupled when the drive system is in a work mode adapted for slow speed travel,
(g) the speed change gearing is comprised of a multiple stage shiftable gearing and the means drivingly interconnecting the speed change gearing output with the first input element of each summing differential gear comprises a unitary propulsion drive shaft,
(h) the hydrostatic torque transmitting means comprising two continuously variable hydrostatic units, the means drivingly interconnecting the engine output with the steering drive including means operatively engaging an input of each hydrostatic unit, the second input element of one summing differential gearing being nonreleasably drivingly engaged with the output of one hydrostatic unit and the second input element of the other summing differential gear being nonreleasably drivingly engaged with the output of another hydrostatic unit and,
(i) the system further including means for selectively disengaging the speed change gearing from the means drivingly interconnecting the propulsion drive with the engine output and means for selectively blocking the first input element of the summing differential gears from rotating, the speed change gearing input being interrupted and the first input elements being blocked when the drive system is in a work mode, the steering drive transmitting, through the hydrostatic units, the propulsion drive torque for advancing the vehicle when in the work mode.

4,890,509

TRANSFER UNIT FOR FOUR WHEEL DRIVE AUTOMOTIVE VEHICLE DRIVE TRAIN

Tomoyuki Hara, Hadano, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed May 18, 1988, Ser. No. 196,334
Claims priority, application Japan, May 27, 1987, 62-130196
Int. Cl.[4] F16H *1/44.5*
U.S. Cl. 74—710.5 **11 Claims**



1. A transfer unit, suitable for a four wheel vehicle drive train, comprising:
a first output shaft;
a differential gear means, said differential gear means having first, second and third elements;
a viscous coupling, said viscous coupling operatively interconnecting said first output shaft and the first element of said differential gear;
a first selectively operable coupling device, said first coupling device being operatively disposed between said first output shaft and the second element of said differential gear, said first coupling device being arranged to provide a drive connection between said first output shaft and the second element of said differential gear;
a second selectively operable coupling device, said second coupling device being disposed between the first and third elements of said differential gear, said second coupling device being arranged to provide a drive connection between said first and third elements when engaged;

an input shaft, said input shaft being connected to one of said first and third elements of said differential gear; and

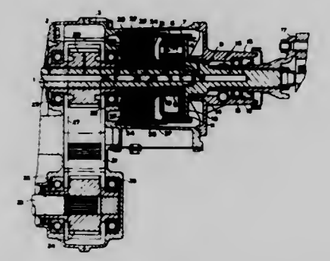
a second output shaft, said second output shaft being continuously connected with one of said first and third element and selectively connectable with the other of said first and third elements.

4,890,510

CENTER DIFFERENTIAL FOR FOUR-WHEEL DRIVE VEHICLE

Masaki Inui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 17, 1988, Ser. No. 156,792
Claims priority, application Japan, Feb. 20, 1987, 62-37198
Int. Cl.[4] F16H *1/42, 1/44*
U.S. Cl. 74—711 **28 Claims**



1. A center differential for a fourwheel drive vehicle including a transmission unit, comprising a planetary gear mechanism comprising a helical sun gear, a helical ring gear, a helical pinion gear in mesh with the sun gear and the ring gear, and a carrier holding the pinion gear,

a first member from the group consisting of said sun gear, said ring gear, and said carrier being coupled to an input shaft for transmitting a drive force from the transmission unit, a second member from said group being coupled to a rear wheel output shaft, and a third member from said group being coupled to a front wheel output shaft.

a clutch hub disposed coaxially of said sun gear and formed integral with said sun gear, said clutch hub being mounted so as to allow for axial reciprocal motion,

a plurality of clutch plates in spline engagement with an outer periphery of said clutch hub,

a clutch drum disposed coaxially of said clutch hub and formed integral with said ring gear, said clutch drum being mounted so as to allow for axial reciprocal motion,

a plurality of clutch discs in spline engagement with the inner periphery of said clutch drum, said clutch discs and said clutch plates being alternately disposed,

a first back plate disposed on one axial end of the alternately disposed clutch plates and clutch discs, and mounted to said clutch drum without allowing axial movement away from said clutch plates and said clutch discs, and

a second back positioned opposite to said first back plate with respect to said clutch plates and said clutch discs, and mounted to said clutch hub without allowing axial movement away from said clutch plates and said clutch discs.

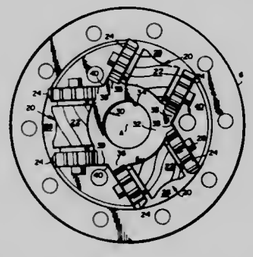
4,890,511

FRICTION REDUCTION IN A DIFFERENTIAL ASSEMBLY

Harry Pedersen, Rochester, N.Y., assignor to D-K Gleason, Inc., Rochester, N.Y.

Filed Oct. 22, 1987, Ser. No. 111,226
Int. Cl.[4] F16H *1/38*
U.S. Cl. 74—715 **36 Claims**

1. A differential gear assembly of the type which includes a differential gear housing having means for receiving a pair of axle ends together with a pair of substantially axially aligned side gears coupled to said pair of axle ends for rotation therewith, said side gears having confronting end faces and helix angles inclined in the same direction with respect to the axes of rotation thereof, and friction reducing means having opposite



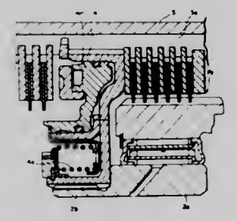
sides in engagement with said confronting end faces of said side gears, said friction reducing means including means for preventing rotation of said friction reducing means relative to said gear housing, characterized in that said opposite sides of said friction reducing means include surfaces with different coefficients of friction.

4,890,512

HYDRAULIC SERVO FOR FRICTION COUPLING ELEMENT OF AUTOMATIC TRANSMISSION

Takenori Kano, Anjo; Koji Kobayashi, Toyota; Koji Sumiya, Nishio; Seitoku Kubo, and Kazuaki Watanabe, both of Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 763,005, Aug. 6, 1985, abandoned. This application Jan. 12, 1988, Ser. No. 144,703
Claims priority, application Japan, Aug. 7, 1984, 59-166157
Int. Cl.[4] F16H *37/00, 3/44, 57/10*
U.S. Cl. 74—740 **1 Claim**



1. A hydraulic servo for a friction coupling element of an automatic transmission comprising

(a) a brake arranged to be engaged in second, third and fourth speed, and including:

(1) an annular drum connected to an automatic transmission case with a spline and having an outer cylinder, an inner cylinder, and inner spline formed on an inner periphery of said inner cylinder and a side wall connected between the outer and inner cylinders;

(2) a piston provided in the annular drum;

(3) a return biasing means mounted in the annular drum for returning the piston; and

(b) a one-way brake arranged to be unlocked in second, third and fourth speed and including:

(1) an inner race having a sleeve portion and an outer spline formed on an outer peripheral side of said sleeve portion to engage with the inner spline of the inner cylinder;

(2) an outer race connected to one element of a planetary gear set forming part of said transmission and being connected to the transmission case in first speed;

(3) an end bearing disposed between said inner race and said outer race; and

(4) a plurality of sprags disposed between the inner race and the outer race.

4,890,513

VARIABLE SPEED TRANSMISSION

Lee V. Way, Jr., 1022 Kismet Dr., Aiken, S.C. 29801

Filed Jan. 10, 1988, Ser. No. 205,116
Int. Cl.[4] F16H *1/36, 3/68, 57/10*
U.S. Cl. 74—781 R **14 Claims**



1. An apparatus for slowing the rotation of a holding shaft of a variable speed transmission, wherein the transmission includes a rotatable drum coupled in driven relationship with an input shaft, and a gearing assembly in the rotable drum connected to the holding shaft and output means, the apparatus comprising:

(1) a first selectively actuatable means for slowing the rotation of the holding shaft, including:

(a) a control disk fixedly mounted on the holding shaft; and

(b) a clamp assembly adjacent the control disk and operable to close on the control disk, thereby slowing rotation of the holding shaft; and

(2) a second selectively actuatable means for slowing the rotation of the holding shaft, including:

(a) a rotor, mounted on the holding shaft, having means for rotatably supporting a flexible fluid-containing tube; and

(b) valve means for controlling the flow of fluid through the tube, whereby the holding shaft rotation is slowed as the flow of fluid through the tube is reduced.

4,890,514

ROTARY INDEXING MECHANISM

John L. Wickham, Glenarm, Md., assignor to The J. L. Wickham Co., Inc., Baltimore, Md.

Continuation of Ser. No. 879,623, Jun. 27, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 170,088
Int. Cl.[4] B23Q *16/00*
U.S. Cl. 74—822 **5 Claims**

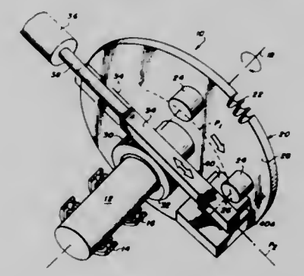
1. A rotary indexing mechanism comprising:

a rotatably mounted shaft carrying at least two first stop members that revolve about the shaft along an orbital path in response to rotation of said shaft;

a one-way clutch coupled to said shaft, said clutch drivable in a first direction to couple rotation to said shaft and in the opposite direction in which said shaft is uncoupled;

linearly reciprocating means coupled to said clutch for driving said clutch in the first and opposite directions to cause incremental rotation of said shaft when driven in the first direction, said linearly reciprocating means reciprocable along a second path that periodically intersects said orbital path of said first stop members; and

a second stop member integrally connected to said reciprocating means and reciprocable along said second path in response to driving of said clutch in the first and opposite directions, said second stop member intersecting said



orbital path between two of said first stop members when said clutch is driven in the first direction;

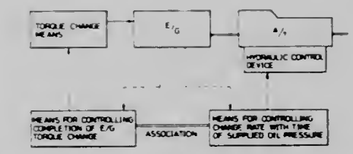
one of said first stop members and the second stop member mechanically engaging one another as said clutch is driven in the first direction to stop rotation of said shaft at a predetermined rotary position.

4,890,515

SYSTEM FOR INTEGRALLY CONTROLLING AUTOMATIC TRANSMISSION AND ENGINE

Hiroji Taniguchi, and Kunihiro Iwatsuki, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 30, 1987, Ser. No. 68,210
Claims priority, application Japan, Jul. 7, 1986, 61-159401
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 **11 Claims**



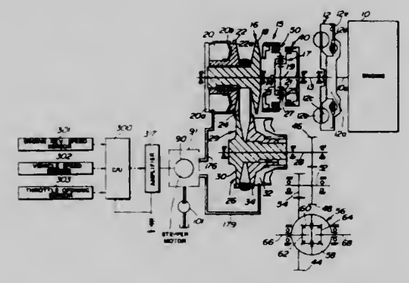
1. A system for integrally controlling an automatic transmission and an engine, wherein a hydraulic control device is operated and engagements of frictionally engaging devices are selectively switched, to thereby achieve shifting between gear stages, and wherein a change in engine torque is controlled during said shifting, said system comprising change-control means for changing and controlling a rate of change with time of oil pressure supplied to said frictionally engaging devices, said change-control means comprising rate reducing means for temporarily reducing said rate of change with time in association with the completion of said engine torque change.

4,890,516

RATIO CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION

Yutaka Suzuki, Hatano, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 16, 1987, Ser. No. 121,564
Claims priority, application Japan, Nov. 18, 1986, 61-274930
Int. Cl.[4] B60K 41/12
U.S. Cl. 74—866 12 Claims



1. A ratio control system of a continuously variable transmission for an automotive vehicle having an engine drivingly coupled with the continuously variable transmission and an accelerator pedal manually operable to vary a power demand on the engine, comprising:

a sensor means for sensing the power demand on the engine and generating a power demand indicative sensor output signal;

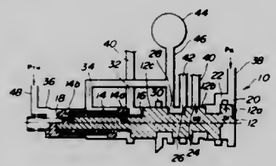
control means responsive at least to said power demand indicative signal for varying a reduction ratio of the continuously variable transmission in such a predetermined pattern that if the direction of a present change in the power demand is different from the direction of the prior change and the present change is less than a predetermined value, this present change does not cause any change in the reduction ratio.

4,890,517

SHIFT VALVE FOR AUTOMATIC AUTOMOTIVE TRANSMISSION OR THE LIKE

Akihiro Ueki, Zama, and Kazuhiko Segano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 25, 1988, Ser. No. 185,404
Claims priority, application Japan, Jun. 15, 1987, 62-147141
Int. Cl.[4] B60K 41/06
U.S. Cl. 74—868 5 Claims



1. In a hydraulic control system having a friction element, a shift valve comprising:

means defining a valve bore;

a first spool valve element reciprocatively disposed in said bore, said first spool valve element being arranged to control the communication between a first port and a source of line pressure, said first port being arranged to communicate with said friction element, said first spool having a first land which is exposed to chamber means into which governor pressure is supplied;

a second spool valve element reciprocatively disposed in said bore, said second spool valve element having second and third lands thereon, said second and third lands having different diameters in a manner to define a pressure differential area;

a second port, said second port being arranged to communicate with said bore in a manner to constantly communicate with the space defined in said bore between said second and third lands, said second port constantly communicating with said first port;

a first spring, said first spring being disposed between said first and second spool valve elements and arranged to bias said first and second spool valve elements apart;

a second spring, said second spring being disposed in said valve bore and arranged to bias said second spool valve element toward said first spool valve element; and

a third port, said third port being arranged to admit throttle pressure into said bore in a manner to act on said second spool valve element and to bias said second spool valve element toward said first spool valve element.

4,890,518

HAMMER

Ted J. Floyd, 453 Grand Ave., Spring Valley, Calif. 92071

Filed Jun. 12, 1989, Ser. No. 364,855
Int. Cl.[4] B25D 1/00
U.S. Cl. 81—20 10 Claims



1. An improved hammer comprising:

an elongated handle having a longitudinally extending x-axis, said handle having a top end and a bottom end;

a hammer head assembly having a head portion, a shank portion and a claw portion; and

said head portion having a front face having a triangular configuration, said front face having a substantially flat surface that lays in a vertical plane that is parallel to the x-axis of said handle, said head portion having a top wall and two side walls that meet at their bottom end, the center point of said front face lays on a horizontal y-axis that intersects said x-axis at substantially the center of gravity of said hammer head assembly.

4,890,519

ADJUSTABLE PLIERS

Don Le Duc, 2405 Alvarado Dr., Santa Clara, Calif. 95051

Filed Sep. 2, 1988, Ser. No. 239,949
Int. Cl.[4] B25B 7/14
U.S. Cl. 81—328 2 Claims

1. In pliers having a pair of crossed members and a pivotal joint between the members one first member comprising a handle having a top end thereof formed into an intermediate portion that terminates into a first jaw constructed at substantially right angles thereto;

a second member having a handle, an intermediate portion with a bore therethrough, an arcuate rib radial to said bore and a second jaw extended from said intermediate portion opposite the handle;

said pivotal joint being a pin extending laterally through the bore in said second member and having a circular head concentric to a shank, said shank having an opening transverse to the axis of the pin to a hole with an outline com-

plementary to the cross section of the intermediate portion of the first member to provide a tracking connection that prevents lateral shifting of one member relative to the other in a direction crosswise of the intermediate portion but allowing unrestricted sliding lengthwise of the first member;

said first member having a plurality of arcuate ribs of equal lengths with in line vertical walls at the ends of said ribs defining a plurality of spaced grooves projected on one side of the intermediate portion of the first member and receiving the rib on the pin carrying member, a non-grooved portion between the handle and the arcuate ribs that is formed to the same elevation of said ribs with a width that equals the lengths of said ribs and having a vertical side wall in-line with the vertical walls of said ribs;

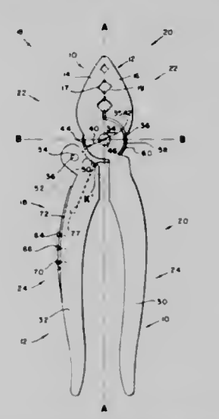
a tracking geometry on the intermediate portion of the first member being defined by three tracking edges, the first tracking edge being the edge of the intermediate portion from which the first jaw projects at substantially right angles thereto, the second tracking edge created by the vertical walls of the arcuate ribs and the vertical wall of said non-grooved portion, the third tracking edge comprising the side of the intermediate portion opposite the ribbed side, the second and third tracking edges directed parallel to the first edge.

4,890,520

SELF ADJUSTING GRIPPING TOOL

Eustathios Vassiliou, 12 S. Towaview La., Newark, Del. 19711

Filed Jan. 5, 1989, Ser. No. 293,707
Int. Cl.[4] B25B 7/04
U.S. Cl. 81—365 34 Claims



1. A gripping tool comprising an assembly of:

(a) a first and a second member;

the first member comprising,

a first substantially circular hub having a radius, a center, a center axis, and a perimeter,

a first jaw extending from the perimeter of the first hub,

a first handle also extending from the perimeter of the first hub in a direction generally opposite to the direction of the first jaw, and

first engaging means located along the perimeter of the first hub, for preventing any relative movement of the first and second members with respect to each other, when the first engaging means is in an engagement mode,

the second member comprising,

a second hub having a center and a center axis substantially coinciding with the center axis of the first hub,

a first interconnecting arm integrally connected to the second hub,

a second jaw extending from the second hub in a direction generally opposite to the direction of the first interconnecting arm,

a second handle extending away from the first interconnecting arm in a direction generally opposite to the direction of the second jaw, and

second engaging means on the second handle along a concave curvature, the concave curvature being part of an arc of a circle of a radius substantially equal to the radius of the first hub, the second engaging means being complementary to the first engaging means,

(b) first pivoting means having a center and a center axis for rotatably connecting the first and the second hubs through their center axes, whereby the handles are pivoted from a free open to a forced closed configuration where the first and second jaws are substantially in contact with each other, and the first and second engaging means are also in contact with each other, for preventing any relative movement of the first and second members with respect to each other, when the second engaging means is in an engagement mode,

(c) second pivoting means having a center and a center axis for rotatably connecting the second handle to the first interconnecting arm and

(d) first spring bias means for applying a first bias force between the first interconnecting arm and the second handle in order to maintain the second engaging means to a first position spaced away from the first engaging means, the first bias force selected such that upon application of a predetermined counter force to the first spring bias means, the second engaging means pivots to a second position and engages the first engaging means preventing any relative movement of the first and second members until such time as the predetermined force is removed from the first spring bias means, the first and second positions of the second engaging means being the limits of a continuum of intermediate positions located on a continuum of arcs of a first set of circles having radii equal to the radius of the first hub and centers lying on the perimeter of a second circle having as center the center of the second pivoting means and radius the distance between the centers of the first and second pivoting means,

the gripping tool also having:

a common center point substantially coinciding with the projection of the centers and the center axes of the first and second hubs and the first pivoting means on a plane perpendicular to the center axes of the first and second hubs and the first pivoting means,

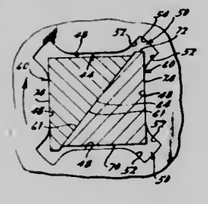
an axis of symmetry perpendicular to the center axes of the first and the second hubs, and parallel to the general direction of the first and second jaws and the first and second handles when the gripping tool is in the forced closed configuration, the axis of symmetry also separating the gripping tool into a left side and to a right side, and

an axis of segregation perpendicular to the axis of symmetry and passing through the common center, the axis of segre-

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gation separating the gripping tool to a jaw side and to a handle side.

4,890,521
SELF-GRIPPING POWER SCREW DRIVER BIT
Alfred A. Bien, West Bloomfield, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed May 15, 1989, Ser. No. 352,534
Int. Cl.[4] B25B *23/08*
U.S. Cl. 81—448 **3 Claims**



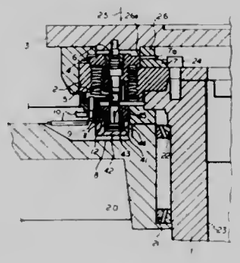
1. A bit for a power-operated screw driver formed with a square cross section driver end and a shank end aligned on a central axis, said bit driver end portion for use with a screw having a combined socket that accepts the driver of either a square-sectioned bit or a cross-point bit, the socket having four substantially vertical faces that together define a square-sectioned recess, and having four wings disposed diagonally across the corners of the square, the wings being defined each by a pair of nearly vertical side walls, and an end wall, the wings defining a cross-slot recess, said screw driver provided with a cylindrical housing having a tubular open-ended cavity telescopically receiving one shank end of the bit, a collar having internal threads engaging external threads on said housing, means for preventing relative rotational movement between said bit shank and said housing cavity, biasing means operative to resiliently capture said shank end in said cavity such that said bit principal axis is aligned with the principal axis of said cavity, the improvement comprising:

a composite bit being composed of first and second mirror image halved elements which are symmetrical with each other relative to an axially extending oblique plane, each said halved element being formed with a driver portion having a trapezoid cross section, each said halved element driver portion having a trapezoid cross section defined by major and minor parallel exterior side surfaces, a complete exterior side surface oriented at right angles to said major and minor side surfaces, and an interior diagonal-like interface, said halved element interfaces in opposed flush contact defining said axially extending oblique plane which includes the principal axes of both said composite bit and the screw driver bit holder;

said biasing means normally resiliently urging the halved element driver portion interfaces into flush coextensive contact so as to define said square cross section driver end for reception in a screw combined socket such that each halved element complete side surface and each element major side surface is positioned in opposed spaced relation with an associated square recess face and each said halved element minor side surface positioned in opposed spaced relation with an associated wing side wall;

whereby upon said composite bit receiving a predetermined screw threading driving torque from the power operated screw driver overcoming said biasing means causing said halved element interfaces to slip along said common oblique plane such that the halved element complete side surfaces expand in opposite directions and wedgingly engage their associated opposed recess faces thereby positively holding said composite bit driver end portions in the screw combined socket obviating slippage of said composite bit driver end portions from the screw combined socket.

4,890,522
CLAMPING HEAD FOR THE RELEASABLE ATTACHMENT OF A WORKPIECE CARRIER TO A MACHINE TOOL SPINDLE
Hans Nader, Stockerau, and Karl Steiner, Vienna, both of Austria, assignors to Maschinenfabrik Heid Aktiengesellschaft, Stockerau, Austria
Filed Mar. 25, 1988, Ser. No. 173,728
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 8704411[U]
Int. Cl.[4] B23B *19/02*
U.S. Cl. 82—142 **4 Claims**



1. An apparatus for securing a workpiece to a rotatable spindle journaled in a stock of a machine tool, a central hollow passage being formed within said spindle, said apparatus comprising:

a clamping head mounted on said spindle and having a surface lying generally in a plane perpendicular to an axis of rotation of said spindle and formed with an annular array of serrations surrounding said axis;

a plurality of clamps spaced apart around said axis, each having an axially displaceable member biased by respective spring means for urging the respective member into a clamping position;

a workpiece carrier adapted to receive a workpiece to be machined on said machine tool and provided with respective axially extending elements positioned for engagement in the respective clamps and retention against said clamping head under the action of said spring means, said workpiece carrier having an annular array of serrations mating with the serrations of said clamping head for transmission of torque between said clamping head and said workpiece carrier; and

respective actuators on said stock having shifters engageable with said members in at least one predetermined relative position of said spindle and said stock for displacing said members against the forces of the respective spring means axially to release said elements from the respective clamps,

said shifters being stems aligned with axes of said members in said predetermined position,

said serrations being arrays of Hirth teeth,

said members each being provided with claw-like clamp jaws and are spaced apart along a circle centered on said axis, said elements being pins respectively engageable in the jaws of the respective clamp, said spring means of each clamp including a stack of spring disks acting upon the respective member,

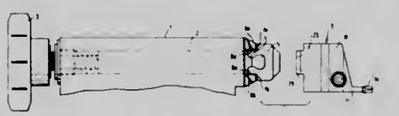
said stems each being provided with a respective piston displaceable by a fluid medium and received in a respective cylinder on said stock,

said pins having surfaces engaged by the jaws of the respective clamp which diverge toward said clamping head,

said clamping head having an inwardly extending underhang engaging in an undercut of a respective cylinder for taking up reaction force when said cylinder is pressurized with said medium to displace the respective piston, thereby relieving said spindle of said force, and

said members being provided with at least one signal pin projecting on said clamping head to an extend indicating whether the respective clamp is engaged or disengaged, at least one switch being provided on said stock and responsive to said signal pin.

4,890,523
TOOL CUTTER HEAD
Amir Satran, Kiryat Bialik, Israel, assignor to Iscar Ltd., Nahariya, Israel
Filed Jul. 13, 1988, Ser. No. 218,658
Int. Cl.[4] B23B *29/04*
U.S. Cl. 82—158 **5 Claims**



1. A tool cutter head adapted to be releasably mounted on a tool holder and comprising a body portion; cutting insert mounting means located at a first end of the body portion; a substantially U-shaped bushing articulatedly mounted in a recess formed in a second end of the body portion and defining a receiver socket adapted to receive and engaging head of a drawbar longitudinally displaceable within the tool holder; juxtaposed surfaces of said recess and said bushing constituting a first pair of coacting cam surfaces; constituent limbs of said bushing being capable of limited displacement towards and away from each other along paths determined by said coacting cam surfaces; limb terminal portions projecting out of said second end and defining at their extremities a socket entry slot having transverse dimensions less than those of the socket and greater than those of a neck portion of said drawbar adjacent said engaging head; transverse abutment surfaces formed on said second end of said body portion on either side of said limb terminal portions and adapted to be juxtaposed with respect to corrsponding transverse abutment surfaces formed on said tool holder; outer surfaces of said limb terminal portions constituting respective, longitudinally directed abutment surfaces adpated to be juxtaposed with respect to corresponding longitudinally directed, abutment surfaces formed on said tool holder; inner surfaces of said terminal portions being adapted to be juxtaposed with respect to corresponding surfaces on said engaging head and adapted to constitute a second pair of coacting cam surfaces; the arrangement being such that with said engaging head of said drawbar located in said receiver socket, a traction force exerted on said drawbar results in the transverse abutting surfaces of said limb terminal portions being displaced into a clamping abutment with the corresponding transverse abutment surfaces formed on said tool holder.

4,890,524
TRIM PRESS WITH COUNTERBALANCE
Gaylord W. Brown, Punta Gorda, Fla., and Albert Areads, Gladwin, Mich., assignors to John Brown Inc.
Filed Aug. 31, 1988, Ser. No. 238,525
Int. Cl.[4] B26D *5/18*
U.S. Cl. 83—615 **20 Claims**

1. A trim press for severing articles which have been differentially pressure formed in a thermoplastic sheet comprising:

a frame;

a pair of trim platens, including a pair of trim dies, mounted on said frame;

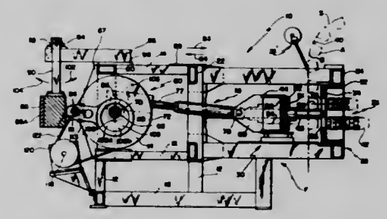
one of said trim platens being movably mounted on said frame for movement between a removed position and a closed position in which said trim dies engage opposite sides of a thermoplastic sheet to sever an article from said sheet;

means for reciprocably moving said one trim platen between said removed position and said closed position including;

a rotatable drive shaft, having a rotational axis;

means for rotating said drive shaft;

coupling rod means pivotally coupled to said one platen and eccentrically coupled to said rive shaft for moving



said one platen in a to-and-fro path of travel between said removed position and said closed position as said shaft rotates; and

balance means comprising

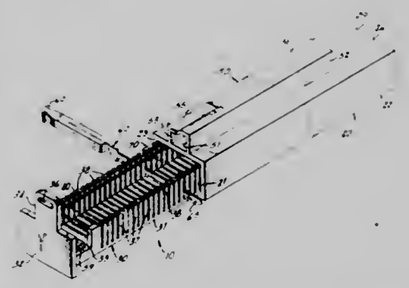
a counterbalance weight;

means mounting said counterbalance weight on said frame for to-and-fro movement on said frame; and

means pivotally coupled to said counterbalance weight and eccentrically coupled to said drive shaft for moving said counterbalance weight in a direction opposite to, but concurrent with, the to-and-fro movement of said one platen;

said drive shaft being disposed between said counterweight and said one movable platen.

4,890,525
SLICING AND STORAGE BOX
Francisco Bilbao, 9245 SW 43 St., Miami, Fla. 33165
Continuation-in-part of Ser. No. 142,428, Jan. 11, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 299,196
Int. Cl.[4] B26D *3/16*
U.S. Cl. 83—762 **7 Claims**



1. A device for storing and slicing foodstuff in the shape of an elongated bar, comprising:

A. elongated housing means including two side walls parallel to each other and in a spaced apart relationship, a bottom wall and a top wall parallel to each other in a spaced apart relationship and perpendicularly mounted

with respect to said side walls and a rear wall perpendicularly mounted at the end of said side, bottom and top walls thereby defining a compartment with an opening;

B. carrier means having an elongated and flat base member with an upperside and having two ends and two lateral edges and being slidably receivable within said housing means, and said carrier means including a cover member perpendicularly mounted at one end of said ends for cooperatively closing said opening of said housing means when said carrier means is completely housed within said housing means and said base member having a plurality of upwardly mounted post members along said lateral edges, by opposing pairs, so that a separation is maintained between adjoining post members and said channels being positioned between adjoining post members so that said cutting utensil is allowed to cut completely through said bar thereby separating the resulting slice from the rest of the bar;

C. means for cutting said bar including a handle and a blade; and

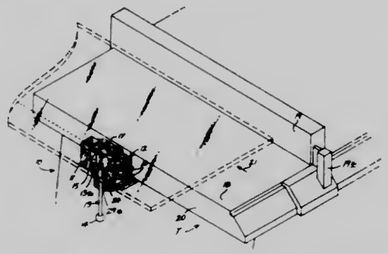
D. means for guiding said cutting utensil and including an elongated flat member, having an underside and an upperside, and said flat member is slidably positioned over said post members and said elongated flat member includes two ends and each of said ends comes in contact with the upper terminations of said post members.

4,890,526

GLASS SCORING AND CUTTING APPARATUS

Kevin J. Slodic, 19007 Bella Dr., Cleveland, Ohio 44119

Filed Apr. 13, 1988, Ser. No. 181,171
Int. Cl.[4] B26D *3/08*
U.S. Cl. 83—886 **8 Claims**



1. A glass cutting apparatus for use in combination with a work table including a substantially horizontal planar upper surface, an elongate edge surface, and a planar guide surface positionable substantially parallel to said edge surface and substantially orthogonal to said upper surface wherein said apparatus comprises,

a second part means including at least one clamping member for securement to said edge surface and reciprocatingly securing a first part means, and

a first sliding member integrally formed to said first part means and a second sliding member integrally formed to said second part means wherein said first sliding member and said second sliding members are configured of complementary shapes for permitting vertical adjustment of said first part means to said second part means relative to said horizontal planar upper surface, and

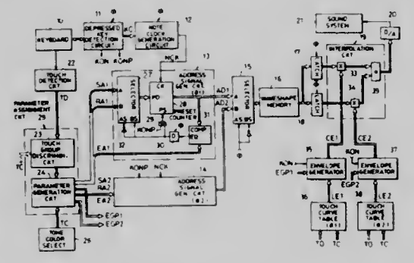
a recess means formed within a forward face of said first part means for securement of a glass cutting tool therein wherein said tool includes a rotary glass cutting wheel including a cutting edge projecting above said first part means when said glass cutting tool is secured within said recess means.

4,890,527

MIXING TYPE TONE SIGNAL GENERATION DEVICE EMPLOYING TWO CHANNELS GENERATING TONES BASED UPON DIFFERENT PARAMETER

Hideo Suzuki, and Yasushi Kurakake, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 26, 1987, Ser. No. 19,024
Claims priority, application Japan, Feb. 28, 1986, 61-43036
Int. Cl.[4] G10H *1/08, 7/00*
U.S. Cl. 84—697 **13 Claims**



1. A tone signal generation device comprising:

a first tone signal generation channel for generating a first tone signal having a wavelength characteristic corresponding to a parameter assigned to said first tone signal generation channel;

a second tone signal generation channel for generating a second tone signal having a waveshape characteristic corresponding to a parameter assigned to said second tone signal generation channel;

tone color change control information generation means for generating tone color change control information representing a manner of change of a tone color of a tone to be produced;

waveshape characteristic parameter assigning means for selecting, in accordance with said tone color change control information, two parameters from among at least three parameters determining waveshape characteristics which are different from one another as first and second waveshape parameters and for assigning said first and second waveshape parameters to said first and second tone signal generation channels respectively, thereby causing said first and second tone signal generation channels to generate said first and second tone signals whose waveshape characteristics are determined by said first and second waveshape parameters respectively; and

synthesizing means for synthesizing a third musical tone signal using said first and second tone signals, said third tone signal being for said tone to be produced.

4,890,528

MUSIC BOX HAVING A GENERATOR

Tadashi Kamijima, Nagano, Japan, assignor to Kabushiki Kaisha Saakyo Seiki Seisakusho, Nagano, Japan

Filed Jun. 10, 1988, Ser. No. 205,441
Claims priority, application Japan, Jun. 15, 1987, 62-90801[U]; Jun. 17, 1987, 62-91999[U]
Int. Cl.[4] G10F *1/06*
U.S. Cl. 84—95.2 **8 Claims**

1. A music box which can generate electricity, comprising a drive mechanism, electricity-generating means driven by said drive mechanism for generating electricity, music generating means driven by said drive mechanism for producing a sequence of audible sounds at a production speed, damper means for preventing said production speed from exceeding a predetermined speed, distributon means having a plurality of outputs and operatively coupled to said electricity-generating means for intermittently supplying electricity from said electricity-generating means to each of said outputs according to a predetermined sequence synchronized to said sequence of audible



sounds, and a display assembly having a plurality of selectively actuable visible display elements which are each connected to and selectively actuated by a respective said output of said distributor means.

4,890,529

LUMINESCENTLY OUTLINED STRING INSTRUMENT

Bruce M. Grant, 6701 Sands Point #116, Houston, Tex. 77074

Continuation of Ser. No. 61,546, Jun. 15, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 244,606
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—291 **10 Claims**



1. A luminescently outlined string instrument body comprising:

a. a string instrument;

b. a continuous channel disposed just inside of the outer edge of said instrument body;

c. a continuous illumination source, mounted continuously about the periphery of said instrument within said channel; and

d. an electrical power means for energizing said illumination source.

4,890,530

STRINGED MUSICAL INSTRUMENT

Keizo Tatsumi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 10, 1988, Ser. No. 269,597
Claims priority, application Japan, Nov. 12, 1987, 62-173589
Int. Cl.[4] G10D *1/08*
U.S. Cl. 84—291 **7 Claims**

1. A stringed musical instrument having a front side, comprising:

(a) a body portion having a front surface located on said front side, an end surface and a concave back surface, said body portion being a solid body without resonator;

(b) a neck portion projecting from the end surface of said body portion and having a leading end; and



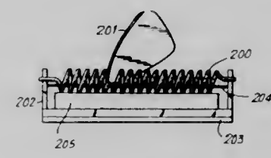
(c) a plurality of strings stretched over said front surface and said neck portion, in which said concave back surface has a peripheral zone generally coplanar with a virtual surface and in which said leading end is located on the front side with respect to said virtual surface.

4,890,531

MUSICAL INSTRUMENT PICK HOLDER

Steven N. Tischer, 2330 Colonial Dr. NE., Atlanta, Ga. 30319

Filed Jun. 21, 1988, Ser. No. 209,531
Int. Cl.[4] G10G *7/00*
U.S. Cl. 84—329 **4 Claims**



1. A musical instrument pick holder comprising:

attachment means for mounting on a surface, including a bracket having two spaced-apart ends, and including means for mounting the bracket on the surface;

a plurality of substantially parallel vanes connected to the attachment means, each of said vanes being delimited by a coil of a helical spring, adjacent vanes being resiliently displaceable by insertion of a pick therebetween, each end of the bracket being connected to the helical spring; and

rod means for limiting distortion and displacement of the helical spring, said rod means passing through the coils of the helical spring substantially parallel to the axis of the helix of the helical spring, and connected to the bracket.

4,890,532

FOOT ACTIVATED MUSICAL DRUM PEDAL DEVICE

Karl Carlson, Fairbanks, Ak., assignor to Garrison & Stratton, Seattle, Wash.

Filed Jan. 25, 1988, Ser. No. 148,034
Int. Cl.[4] G10D *13/00*
U.S. Cl. 84—422.1 **2 Claims**

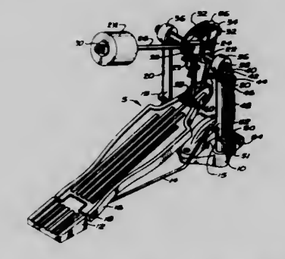
1. In a drum pedal device having in combination a forward base, a pair of uprights at the sides of the forward base, a crossarm rotatively mounted between the uprights, a mallet with a soft head rigidly mounted by a handle to rotate with the crossarm, a bias means to urge the crossarm with mallet in a rearward direction, a rearward base separated from the forward base, a pedal pivotally attached by a heel end to the rearward base assuming generally an upwardly inclined slope to a toe end position generally between the uprights above the forward base and below the crossarm, and a flexible linkage member, the improvement comprising:

a pulley wheel rotatively attached to a toe end of said pedal; and

a nonconcentric curved lever means affixed generally to the mid portion of the crossarm, a forward portion of said

lever means extending generally upwards and forwards of the crossarm, a rearward portion of the lever means extending generally downward and rearward of the crossarm, said forward portion of said lever means extending generally farther from the crossarm than said rearward portion of said lever means, the upper surface of said lever means indented with a pulley grooved means;

wherein the flexible linkage member interrelates the toe end and the curved lever means by extending the linkage



member from the rearward portion of the lever means through the pulley grooved means around the forward portion of the lever means downwardly along a bottom portion of the circumferential pulley groove in the pulley wheel and thence upwardly to the rearward portion of the lever, both ends of the linkage means attached to the rearward portion of the lever means, whereby a downward rotational movement of the pedal is translated into a forward rotational movement of the crossarm with mallet.

4,890,533

KEY DEVICE FOR ELECTRONIC KEYBOARD MUSICAL INSTRUMENT

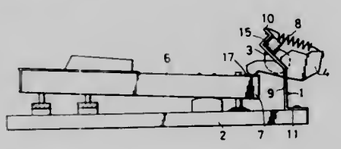
Masanori Katsuta; Tsutomu Yamaguchi, both of Iwata; Yutaka Tamai, and Noriso Kamimura, both of Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Filed Oct. 11, 1988, Ser. No. 255,873

Claims priority, application Japan, Oct. 12, 1987, 62-154732[U]; Dec. 2, 1987, 62-182977[U]

Int. Cl.[4] G10C *3/12*

U.S. Cl. 84—439 **1 Claim**



1. In a key device for an electronic keyboard musical instrument having a key mounted rotatably on a fulcrum member mounted on a support, a rotor provided with a recessed portion into which a rotary shaft member is fitted, said rotor rotating with respect to said rotary shaft member, and a key-returning coil spring serving to put one end of said rotor in contact under pressure with an after-fulcrum end of said key, the improvement wherein said rotor has a heavy mass portion attached at the other end thereof and located beyond the rotation center of said rotary shaft member from said one end, wherein a chassis is mounted on said support and is provided with said rotary shaft member and a stopper means designed to suppress vibrations of said rotor generated when said key is depressed, wherein said rotor is attached to said rotary shaft member, wherein one end of said coil spring is fastened to said chassis, the other end of said coil spring being fastened to said rotor, and wherein a contact point of said fulcrum and said key, a contact point of said key and said rotor, said rotation center of said rotary shaft member, a point at which said key-returning coil spring acts on said rotor, a point at which said key-returning coil spring is fastened to said chassis, and a center of gravity for said heavy mass portion are all arranged so as to provide a condition in which the key touch load remains substantially unchanged between the beginning and the end of the key stroke.

4,890,534

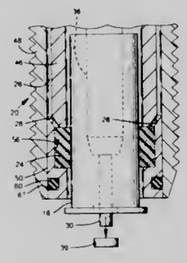
LUBRICATING DIE FOR CARTRIDGE RELOADER

Walter W. Bender, Oroville, Calif., assignor to Blount, Inc., Portland, Oreg.

Filed Mar. 2, 1989, Ser. No. 318,008

Int. Cl.[4] F42B *31/02, 33/10, 11/20;* **F16N** *1/00*

U.S. Cl. 86—19 **6 Claims**



1. A lubricating die for lubricating a cartridge case in a cartridge reloading operation comprising; a housing having a cavity and a bottom entry to the cavity for receiving a spent cartridge case directed upwardly through the entry, a ring-shaped lubricating pad mounted in the entry of the cavity and configured to fully encircle and slide over the cartridge case periphery upon insertion of the cartridge case into the cavity, a reservoir in the housing positioned above the entry and liquid lubricant in the reservoir, and multiple ports in the housing between the reservoir and lubricating pad, said ports arranged around the lubricating pad periphery to direct gravity flow of the liquid lubricant from the reservoir to the lubricating pad to achieve uniform wetting of the lubricating pad and thereby uniform coating of the cartridge case periphery.

4,890,535

APPARATUS AND METHOD FOR MEASURING AND DISPENSING POWDER

William J. Bieber, 21901 Adler Dr., California City, Calif. 93505

Filed Jan. 24, 1989, Ser. No. 301,187

Int. Cl.[4] F42B *33/02*

U.S. Cl. 86—31 **14 Claims**

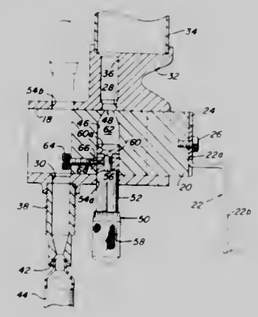
1. Apparatus for measuring and dispensing a precise quantity of granular material comprising, in combination;

a cylinder having an inlet port and an outlet port radially disposed 180° apart and offset from each other along the cylindrical axis of said cylinder for passing the material therethrough, and a helical slot through the side of said cylinder communicating at the ends thereof with said inlet and outlet ports respectively;

plug means rotatable about and translatable along said axis and slidably contacting the interior surface of said cylinder, said plug means having an elongate bore therethrough and transverse to the cylindrical axis; and

guide means axially extending from one end of said bore

through said slot and slidably contacting the sides of said slot;



whereby said other end of said bore communicates with either of said ports when said plug means is rotated 180° in said cylinder.

4,890,536

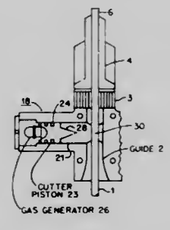
FLOATING FITTING CABLE ATTACHMENT

Brian A. Floyd, Kent, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 27, 1988, Ser. No. 202,656

Int. Cl.[4] F41F *3/04*

U.S. Cl. 89—1.8 **20 Claims**



1. A missile support unit coupled to a missile silo, for supporting a missile comprising:

(a) cable means having a terminal portion coupled to cable fitter means which is decoupled from said silo and includes a block affixed to the terminal portion of said cable means, said block having sufficient mass to maintain said cable means in tension by virtue of the mass of said block upon the rapid downward acceleration of said silo, thereby to prevent kinking of said cable means;

(b) cable fitter support means rigidly coupled to said silo for supporting said block; and

(c) energy absorbing means positioned between said cable fitter means and said cable fitter support means for absorbing sufficient kinetic energy of said cable fitter support means to prevent snapping of said cable means upon upward silo rebound following downward silo acceleration accompanying a blast.

4,890,537

ELEVATABLE FIRING WEAPON WITH A DEVICE FOR SETTING THE ELEVATION OF THE WEAPON BARREL

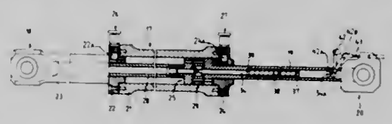
Roland Streit, Opfikon; Peter Mannhart, Eschenbach, and Samuel Schmid, Dietlikon, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Mar. 7, 1988, Ser. No. 165,094

Claims priority, application Switzerland, Mar. 10, 1987, 00888/87

Int. Cl.[4] F41F *21/08*

U.S. Cl. 89—37.11 **7 Claims**



1. An elevatable firing weapon containing a weapon barrel and provided with a device for setting the elevation of the weapon barrel, comprising:

two parts;

one of said two parts comprising a cylinder;

the other one of said two parts comprising piston means;

said piston means subdividing said cylinder into two chambers;

a stationary weapon mounting;

means for pivotably mounting one of said two parts at said weapon barrel;

means for pivotably mounting the other of said two at said stationary weapon mounting;

said two parts moving relative to one another when said weapon barrel is elevated;

said piston means comprising a piston having oppositely situated sides;

said piston being provided with means defining a closable passage through which a pressure medium can flow, when said closable passage is open, from one of said two chambers which is located at one side of said piston into the other one of said two chambers which is located at the other side of said piston;

means for closing said closable passage for locking said weapon barrel at a predeterminate elevational position;

means for operating said closing means; and

said closing means blocking said piston in said cylinder in order to lock said weapon barrel in said predeterminate elevational position;

said means defining said closable passage comprising:

a radial bore extending through said piston;

a first channel flow communicating with said radial bore and one side of said piston; and

a second channel flow communicating with said radial bore and the other side of said piston.

4,890,538

BRAKE CYLINDER

Georg Kehl, and Heinz Siegel, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,045

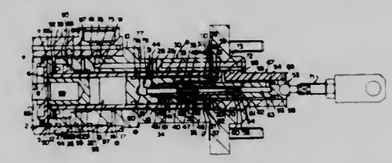
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728921

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R **20 Claims**

1. A brake cylinder having at least one brake chamber and a brake booster actuatable by a piston rod, in which a pressure chamber (59) communicates via a brake valve assembly with both an inlet and an outlet for power brake fluid, said brake valve assembly (45/46), (49/50) is disposed in a stepped bore (34) of a rod (15), said rod is slidably supported in a sheath (14),

said rod (15) has a diameter along its length which is slightly less than an inner diameter of said sheath (14), said sheath in turn slides in a housing section (9), wherein said sheath (14) and



said rod (15) are disposed as a servo piston between said pressure chamber (59) for receiving power brake fluid and a pressure element (6) for a buildup of brake pressure in a brake chamber (88).

4,890,539

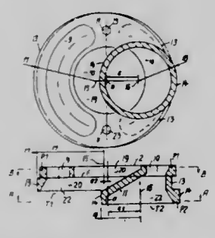
CONTROL BODY ARRANGEMENT FOR AXIAL FLOW APPLYABLE IN PUMPS, MOTORS OR ENGINES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 802,408, Nov. 27, 1985, Pat. No. 4,723,477, which is a continuation-in-part of Ser. No. 573,743, Jan. 25, 1984, abandoned, which is a division of Ser. No. 171,697, Jul. 24, 1980, abandoned. This application Feb. 1, 1988, Ser. No. 150,865

Int. Cl.[4] F01B *1/00*

U.S. Cl. 91—485 **4 Claims**



1. A control arrangement in a device which takes in and expels fluid through passages and ports and through working spaces located in a rotor which is revolvably borne in a housing, at least one rotary slide face is formed on a portion of the rotor, at least one pressurized fluid containing thrust chamber formed in a portion of the housing and communicated to at least one of the passages, a control body inserted at least partially into the thrust-chamber with a rear shoulder towards the interior of the thrust chamber and forming a non-rotary control face on the front end of the control body with said control face interrupted by first and second control ports to control the flow of fluid to and from the working spaces and through said rotary slide face while the pressurized fluid in the respective thrust chamber presses the control body towards the rotor to seal with said control face along said rotary slide face when the rotary slide face slides and revolves over said control face of said control body, wherein the respective thrust chamber forms a pressure center axially behind the respective pressure center of the respective pressure zone of the control face,

wherein said control face is provided with a medial recess, said control body has exclusively one front seat and one rear seat in said portion of said housing, at least said rear seat is eccentric relative to the axis of said rotor, a first chamber is formed between said seats and a second chamber is formed on the rear of said rear seat, said first chamber is communicated to the second control port and to said medial recess, said chambers have different cross-sectional areas, each of said chambers communicates separately with the respective control port of said control face and the cross sectional area of said first chamber covers the area of the control zone around said second control port plus the area of the said medial recess and its seal face while the cross-sectional area of said second chamber covers the area of the control zone around the first control port of said control ports, with said first control port communicated to said second chamber, and;

wherein said front seat is concentrically located around a first eccentric axis of said front seat with said first eccentric axis slightly radially distanced from the concentric axis of said rotor by a first eccentricity, while the rear seat is concentrically located around a second eccentric axis which is parallel to said first eccentric axis and parallel to said concentric axis of said rotor but radially distanced from both of said axes while all said three axes are parallel to each other, whereby said first chamber has an eccentric outer diameter and an eccentric inner diameter respective to said concentric axis of said rotor, while said second chamber has an outer diameter which is located eccentrically relative to said concentric axis of said rotor but circular around said second eccentric axis.

4,890,540

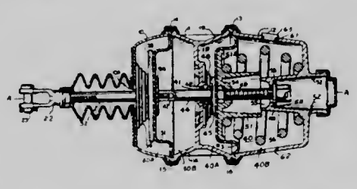
BREATHER HOLES AND PLUG MEMBER FOR A SERVICE/EMERGENCY BRAKE ACTUATOR

Tommy D. Mullins, Murfreesboro, Tenn., assignor to Nuturn Corporation, Nashville, Tenn.

Filed Dec. 5, 1988, Ser. No. 279,792

Int. Cl.[4] F01B *7/00*

U.S. Cl. 92—63 **6 Claims**



1. A pneumatic service/emergency brake actuator for actuating a brake system of a wheeled vehicle having an air environment containing contaminants such as dust, dirt, or the like, comprising:

a rigid housing structure having a longitudinal axis with an upper and a lower hemisphere defined, respectively, above and below said axis,

said housing structure further having emergency diaphragm means and service diaphragm means mounted therein for independent movement between brake-applying and brake-releasing positions;

said emergency diaphragm means defining with said housing structure a variable volume spring chamber and a variable volume air chamber on opposite sides of said emergency diaphragm means;

compression spring means in said spring chamber resiliently biasing said emergency diaphragm means into its brake-applying position wherein said spring chamber is of maximum volume and said air chamber is of minimum volume;

said air chamber being operable to receive air under pressure therein sufficient to move said emergency diaphragm means from its brake-applying position into its brake-releasing position wherein said spring means is compressed and said spring chamber is of minimum volume and said air chamber is of maximum volume;

said service diaphragm means defining with said housing structure a variable volume control chamber on one side of said service diaphragm means;

said control chamber being operable (1) to have air under pressure introduced therein to move said service diaphragm means from its brake-releasing position into its brake-applying position, and (2) to have air under pressure discharged therefrom to allow said service diaphragm mans to move from its brake-applying position into its brake-releasing position;

brake-applying means movable (1) in response to the introduction and discharge of air under pressure into and out of said control chamber and the resultant movements of said service diaphragm means when said air chamber is filled with air under pressure and said emergency diaphragm means is retained thereby in its brake-releasing position and (2) in response to the movement of said emergency diaphragm means under the bias of said spring means into its brake-applying position when air pressure is discharged from both the air chamber and control chamber;

mounting means attached to said housing structure for orienting said actuator in said wheeled vehicle in more than one position;

a plurality of air flow opening means extending through said housing structure defining said variable volume spring chamber for maintaining said spring chamber at atmospheric pressure, said openings being arranged such that, regardless of how said brake actuator is oriented, at least one of said plurality of opening means will be located in the upper hemisphere of said spring chamber housing and another of said opening means will be located in the lower hemisphere of said spring chamber housing;

flow restrictive plug means adapted to be inserted into any of said air flow opening means so that, regardless of the orientation of the actuator, the opening means arranged in the upper hemisphere of said spring chamber housing can be plugged to minimize the likelihood that contaminants will enter said spring chamber when said emergency diaphragm means is moved into its brake-applying position and when said emergency actuator is not in use.

4,890,541

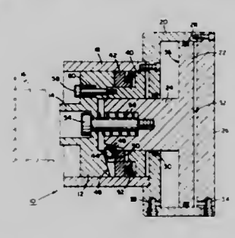
FLUID-OPERATED ACTUATOR WITH FORCE MULTIPLICATION

Richard C. Spooner, Guilford Rd., Durham, Conn. 06422

Filed Jan. 20, 1988, Ser. No. 208,874

Int. Cl.[4] F16J *1/10*

U.S. Cl. 92—84 **13 Claims**



1. A mechanism to actuate workpiece engagement means to engage a workpiece, comprising:

(a) first actuator means to move said engagement means a selected distance to cause engagement of said workpiece by said engagement means and engagement of said workpiece with a first force;

(b) second actuator means cooperating with said first actuator means to cause engagement of said workpiece by said engagement means with a second force after engagement of said engagement means with said workpiece, said second force being a multiple of said first force; and

(c) locking means cooperating with said second actuator means to maintain said second force, said locking means being selected from the group consisting of locking cone washers, a slotted bushing having internal tapers, and a resilient ring.

4,890,542

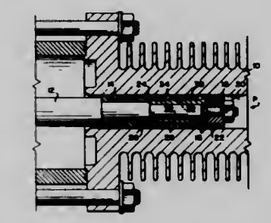
HIGH-PRESSURE-FLUID MACHINE, A SEAL

Bernard F. Miller, Corning, N.Y.; John A. Sawyer, Trout Run, Pa., and Wayne F. Webber, Horseheads, N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 6, 1988, Ser. No. 240,646

Int. Cl.[4] F16J *1/06*

U.S. Cl. 92—194 **11 Claims**



1. In a high-pressure-fluid machine, a seal, comprising:

a cylinder, having an inner, bore surface; and

a piston, having an outer, cylindrical surface; wherein

said piston is reciprocably disposed in said cylinder; and

a seal interposed between said piston and said cylinder, for sealing against one of said surfaces; wherein

said seal comprises a one-piece, continuous sleeve;

said seal has (a) a sealing surface at only one end thereof, and (b) a bearinhg surface at an end thereof which is opposite said one end; and

means confined within said cylinder, and engaged with said bearing surface end of said seal, for urging said one sealing end of said seal into sealing engagement with said one surface; wherein

said piston has a shoulder formed thereon;

said urging means compriaes a compression spring in envelopment of said piston; and

said spring has an end thereof engaged with said shoulder.

4,890,543

LIGHT METAL PISTON FOR INTERNAL COMBUSTION ENGINES AND METHOD OF MAKING THE SAME

Masaaki Kudou, Kamagaya, and Tosio Ogiwara, Gyoda, both of Japan, assignors to Izumi Automotive Industry Co., Ltd., Kawagoe, Japan

Filed Sep. 4, 1987, Ser. No. 93,242

Claims priority, application Japan, Nov. 25, 1986, 61-179773[U]

Int. Cl.[4] F16J *1/04*

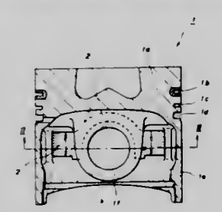
U.S. Cl. 92—228 **19 Claims**

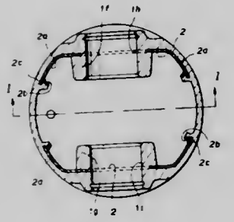
1. A light metal piston for internal combustion engines, having a crown, a skirt integrally connected to said crown, a pair of gudgeon pin bosses, and a pair of expansion control inserts made of a material of lower thermal expansion coefficient than that of the light metal, each insert conforming to the internal shape of the piston skirt, each said insert having:

a connecting portion embedded in a gudgeon pin boss;

a pair of bands, being joined by said connecting portion, and each extending from said connecting portion and conforming to said internal shape of said skirt to form a bimetallic element therewith; each band having a free end, and

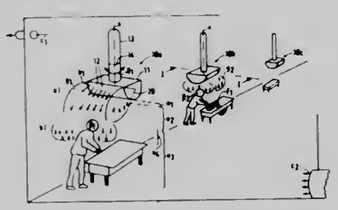
a pair of bent portions, one at the free end of each band, each free end being bent inwardly so that said free ends fit into





grooves in a moldcore and form means for fastening said bands to a moldcore during a casting operation.

4,890,544
AIR DISTRIBUTION SYSTEM
Erkki Aalto; Teuvo Pellinen, and Jouko Eloranta, all of Kausala, Finland, assignors to Halton Oy, Finland
PCT No. PCT/FI87/00173, § 371 Date Aug. 17, 1988, § 102(e) Date Aug. 17, 1988, PCT Pub. No. WO88/05147, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 28, 1987, Ser. No. 572,358
Claims priority, application Finland, Dec. 30, 1986, 865351
Int. Cl.[4] F24F *9/00*
U.S. Cl. 98—36 **12 Claims**



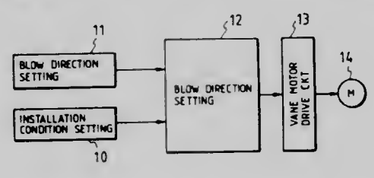
1. An air distribution system for distributing air downwardly from above with very low velocity, said air distribution system comprising

(i) air distribution terminal means (10) arranged to direct the air therefrom to descend substantially merely by gravity effect with very low velocity, and

(ii) means for producing a temperature differential between ambient air and the air that is conducted from said air distribution terminal means,

whereby the desired velocity of descent of the air descending from said air distribution terminal means (10) is attained.

4,890,545
AIR CONDITIONER
Kenji Matsuda; Tetsuji Okada; Hiroyuki Umemura; Hidenori Ishioka, and Katsuyuki Aoki, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 15, 1988, Ser. No. 219,408
Claims priority, application Japan, Oct. 1, 1987, 62-248421; Oct. 6, 1987, 62-251998
Int. Cl.[4] F24F *11/02*
U.S. Cl. 98—39.1 **6 Claims**



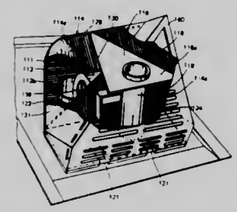
1. An air conditioner having an indoor unit positioned in a room, comprising:

means for setting an installation position of said indoor unit with respect to said room;

means for setting the direction of air flow produced from said indoor unit; and

means for adjusting the direction of air flow provisionally set by said air flow condition setting means based on the actual installation position to obtain uniform room temperature distribution.

4,890,546
VENTILATION COWL
Vidar Venge, Porsvegen 1, N-5355 Knarrevik, Norway
PCT No. PCT/NO87/00051, § 371 Date Feb. 18, 1988, § 102(e) Date Feb. 18, 1988, PCT Pub. No. WO88/00269, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 24, 1987, Ser. No. 162,336
Claims priority, application Norway, Jun. 27, 1986, 862600
Int. Cl.[4] F24F *7/02*
U.S. Cl. 98—42.06 **7 Claims**



1. A ventilation cowl comprising

a plate-shaped member having a pair of openings therein for passage of air ducts therethrough;

a superstructure mounted on said plate-shaped member in overlying relation to said openings;

a partition wall within said superstructure sealingly separating an inner chamber in communication with one of said openings in said plate-shaped member from an outer chamber in communication with the other of said openings;

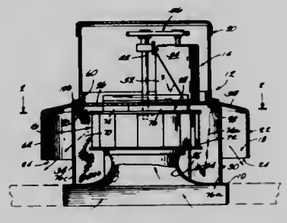
a plurality of drain openings in a lower edge of said partition wall for passage of condensate from said inner chamber;

an outer wall within said superstructure spaced from said partition wall to define said outer chamber, said outer wall having a plurality of apertures for passage of air therethrough;

at least one outlet union mounted in said partition wall, said union being directed towards said outer wall; and

a fan in said inner chamber, having an intake opening in communication with said inner chamber and an outlet opening in communication with said outlet union in said partition wall.

4,890,547
VENTILATOR SCROLL ARRANGEMENT
Todd M. Wagner, Verona; Hardin T. James, Jr., Mt. Horeb; Thomas G. Ayers, Mt. Horeb; Dennis B. Breese, Mt. Horeb, and Gordon A. Durand, Verona, all of Wis., assignors to Carnes Company, Inc., Verona, Wis.
Filed Jan. 27, 1989, Ser. No. 303,732
Int. Cl.[4] F24F *7/06*
U.S. Cl. 98—42.13 **23 Claims**



1. A rooftop ventilator comprising, in combination,

fan means arranged for rotation about a generally vertical axis,

curb means having an inner opening associated with said fan means and through which air is drawn to said fan means when said fan means is energized,

outer housing means extending from above and providing an outer enclosure for said fan means,

said outer housing terminating above and spaced from said curb means to define therewith a discharge opening for air drawn from said curb means and discharged by said fan means toward said outer housing,

scroll means above said curb means ad arranged around the periphery of said fan means for receiving air discharged by said fan means and directing said air toward said discharge opening,

said scroll means comprising a plurality of scroll elements equally spaced around the periphery of said fan means,

each of said scroll elements comprising

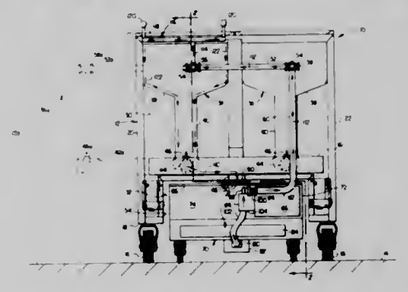
a first elongated element having one end generally adjacent said fan periphery and extending away from said fan periphery,

a second elongated element,

means connecting said first and second elements in a generally continuous extension from said one end of said first elongated element through said second element to the end of said second element remote from said one first element end, and

said second element characterized in that a length thereof remote from said fan periphery is generally linear and said linear length is disposed generally at an angle to said first elongated element, and said linear length of each of said second scroll elements defining an air discharge opening with an adjacent scroll element so that said scroll elements extend from said fan periphery in a non-linear configuration and the scroll elements and the defined discharge openings effectively direct the air discharge from said fan means without substantial loss of kinetic energy.

4,890,548
DEEP FAT FRYING APPARATUS HAVING AN IMPROVED COOKING FLUID FILTRATION SYSTEM
James T. Grob, and John M. Kinch, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.
Filed Mar. 15, 1988, Ser. No. 168,164
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—408 **8 Claims**



1. Deep fat frying apparatus comprising:

a floor supportable housing having a pair of opposite side walls, a front wall, an open lower end, a lower internal portion, an upper internal portion positioned directly above said lower internal portion, and means for defining a horizontally facing access opening through said front wall into said lower internal portion, said access opening extending from the floor to the upper end of said lower internal portion;

a pair of frypots each adapted to receive and heat a cooking liquid in which food items may be cooked, said pair of frypots being mounted in a closely adjacent side-by-side relationship within said upper internal portion of said housing, each of said frypots being sized to hold approximately the melted product of a fifty pound block of cooking lard or an equivalent volume of cooking oil and having an upper cooking portion with a narrowed cold well portion depending therefrom, each of said upper cooking portions having a width and an outer side wall positioned closely adjacent one of said side walls of said housing, whereby the side-to-side floor space dimension of said housing is not substantially greater than the sum of the widths of said upper cooling portions of said pair of frypots;

drainage conduit means, positioned in said upper internal portion of said housing, for draining cooking liquid from said well portions of said frypots, said drainage conduit means having inlets operatively connected to said well portions to receive cooking liquid therefrom, and an outlet for discharging the received cooking fluid;

drainage valve means interposed in said drainage conduit means and operative to selectively initiate and terminate cooking fluid draining from said well portions outwardly through said drainage conduit means;

supply conduit means for flowing cooking liquid from a source thereof into said frypots, said supply conduit means having an upper portion disposed within said upper internal portion of said housing and having an outlet communicating with the interiors of said upper cooking portions of said frypots, and an inlet end portion extendable downwardly into said lower internal portion of said housing adjacent said access opening;

supply valve means interposed in said supply conduit means and operative to selectively permit or preclude flow of cooking fluid into said frypots through said supply conduit means; and

cooking fluid filtration means for receiving cooking fluid discharged from said outlet of said drainage conduit

means, filtering the discharged cooking fluid, and returning the filtered cooking fluid to said frypots through said supply conduit means, said cooking fluid filtratioo means including:

a wheel-supported cooking fluid receiving container having a top opening, a bottom wall from which a drain sump depends, a front side portion, and a rear side portion, said cooking fluid receiving container being sized to receive and hold the entire cooking fluid content of either of said pair of frypots,

a cooking fluid filter element operatively carried by said cooking fluid receiving container,

a pump and associated drive motor carried by said cooking fluid receiving container for movement therewith, said pump having an inlet communicating with the interior of said drain sump, and an outlet, and

cooperating quick-disconnect means on said pump outlet and said inlet end portion of said supply conduit means for removably connecting said pump outlet to said inlet end portion of said supply conduit means,

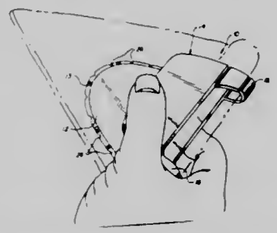
said cooking fluid receiving container being rearwardly rollable through said access opening into said lower internal portion of said housing to position said container directly beneath said cold well portions of said frypots, position said open top of said container beneath said outlet of said drainage conduit means, and position said pump outlet adjacent said inlet end portion of said supply conduit means for connection thereto, said container being forwardly rollable outwardly through said access opening for periodic cleaning purposes,

whereby said cooking fluid filtration means may be operatively associated with the balance of said deep fat frying apparatus without requiring additional floor space beyond that occupied by said housing, and said pump and its associated drive motor, with said container moved outwardly from said housing means, are readily accessible for maintenance, repair and replacement purposes.

4,890,549
FOOD HANDLING DEVICE

Gregory Steiner, 5107 Indiana Ave., Lisle, Ill. 60532, and Hari Matsuda, 3915 Howard St., Skokie, Ill. 60076

Filed Aug. 24, 1988, Ser. No. 235,424
Int. Cl.[4] A47J *43/28*
U.S. Cl. 99—450 16 Claims



1. A food handling device for handling individual slices of a food product thereby to avoid direct contact with the food product, comprising,

base support means forming a food support surface, food gripping means associated with said base support means, flexible means interconnecting said food gripping means with said base support means,

said base support means, gripping means, and flexible means being formed integrally, and said elements assuming an initial rest position wherein said elements are planar with respect to one another,

said gripping means being movable into a use position substantially overlying and parallel to said base support means thereby to be positioned to arrest a food product between said base support means and said gripping means,

said flexible means being relatively resilient such as to permit said food gripping means to be reciprocable toward and away from said base support means to permit said device to have a rest position where said elements are planar with respect to one another and a use position wherein said gripping means is positioned into a use position substantially overlying and parallel to said base support means thereby to be positioned to arrest a food product between said base support means and said gripping means,

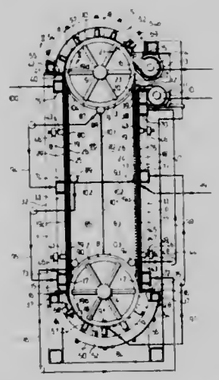
said base support means, food gripping means, and flexible means being integrally formed thereby to provide a food handling device which is unitary in construction,

whereby said food handling device may be adapted to have an initial rest position wherein said base support means, food gripping means, and flexible means are planar with respect to one another, and a use position whereby said food gripping means may be manipulated via said flexible means to ovelie and be parallel to said base support means in order to grasp an individual food product slice therebetween and afford the user the opportunity to handle said food product slice via said food handling device and avoid direct contact with the food product.

4,890,550
APPARATUS FOR TREATING FIBRE MATERIAL CONTAINING LIQUID

Sture Eriksson, Karlstad; Ann-Sofi Jönsson, and Bengt Jönsson, both of Genarp, all of Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

PCT No. PCT/SE87/00263, § 371 Date Oct. 28, 1988, § 102(e) Date Oct. 28, 1988, PCT Pub. No. WO87/07662, PCT Pub. Date Dec. 17, 1987
PCT Filed May 27, 1987, Ser. No. 267,130
Claims priority, application Sweden, Jan. 3, 1986, 8602500
Int. Cl.[4] D21C *1/02*
U.S. Cl. 100—37 16 Claims



1. An apparatus for treating fibre material containing liquid, comprising at least two drums (2, 3) rotatably journalled on horizontal shafts (4, 5) in a stand (1), an endless driven belt (17) pervious to liquid and gas and extending between and passing around the cylindrical surfaces (8, 9) of the drums, a feeding means (10) for the supply and a discharging means (13) for the removal of the fibre material, at least one collecting container for collecting liquid and if applicable gas, the liquid and gas being displaced from the fibre material through the endless driven belt (17), a continuous wall means (18) impervious to liquid and gas and extending along a main part of and at a distance from the endless, moving belt (17) from the feeding means (10) to the discharging means (13) in such a manner that a continuous space (19) is defined for the liquid containing fibre material between said wall means (18) and the endless, moving belt (17), and at least a part of the space (19), seen in the direction of movement of the belt (17), forms one or more treating zones where liquid and gas if any are displaced from the fibre web through the movable belt (17) to one or more collecting containers, characterized in that the distance between the movable belt (17) and the wall means (18) is selected so that the fibre material is moved by the moving belt (17) in the form of a fibre web substantially continuously in all direction through said space (19) in sliding contact with the wall means (18) with substantially no relative movement between the endless, moving belt (17) and the fibre web or a layer thereof, said distance being between about 5–100 mm, depending upon fibre concentration.

15. In a method of treating a fibre material containing liquid, the steps of:

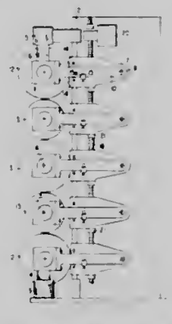
providing at least two drums rotatably journalled on horizontal shafts in a stand, and including an endless drive belt pervious to liquid and gas extending between and passing around cylindrical surfaces of the drums, and a continuous wall means impervious to liquid and gas and extending along a main part of and spaced from the endless moving belt; and

adjusting the distance between the movable belt and the wall means to between about 50–100 mm, dependent upon the fibre concentration of the fibre material being treated, so that the fibre material is moved by the moving belt in the form of a fibre web substantially continuously in all directions in sliding contact with the wall means, with substantially no relative movement between the endless moving belt and the fibre web or a layer thereof.

4,890,551
APPARATUS FOR GUIDING THE ROLLS OF AN ESSENTIALLY VERTICAL CALENDER

Hans Dahl, Ravensburg, and Josef Schneid, Vogt, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,292
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711334
Int. Cl.[4] B30B *3/04*
U.S. Cl. 100—163 A 25 Claims



1. An apparatus for guiding superimposed rolls of an essentially vertical roll calender comprising a roll stand equipped with a plurality of the superimposed rolls, each of said superimposed rolls having opposite roll ends and a lengthwise axis, said guiding apparatus comprising:

a movable substantially lever-shaped element provided for the compensation of overhanging loads at each roll end of an associated one of said superimposed rolls;

each of said movable substantially lever-shaped elements being provided with a bearing for a related roll end of the associated roll;

means for pivotably mounting for substantially vertical pivotable movement each said movable substantially lever-shaped element;

said pivotably mounting means defining a pivot axis extending substantially parallel to the lengthwise axis of the associated roll;

a force-applying element provided for each said movable substantially lever-shaped element and acting upon said movable substantially lever-shaped element;

said force-applying element being capable of producing a force needed for compensation of overhanging loads and, when necessary, rendering such force ineffectual such that the associated roll can be lowered;

a base element provided for said each roll end;

means mounting each said base element at the roll stand of the roll calendar so as to be substantially vertically adjustable;

means for positionally fixing and supporting each base element in its substantially vertically adjusted position at least during a calendering operation;

said pivotably mounting means for the movable substantially lever-shaped element of the associated roll being arranged at said base element of the associated roll; and

said force-applying element of the associated roll being arranged between said base element and said movable substantially lever-shaped element of the associated roll.

4,890,552
CAN CRUSHER

Lawrence Yelczyn, W6630 County Trunk E, Burnett, Wis. 53992

Filed Dec. 15, 1988, Ser. No. 284,738
Int. Cl.[4] B30B *7/00, 1/02*
U.S. Cl. 100—233 14 Claims



1. A crusher comprising:

a. base means for defining first and second axes having a first predetermined spacing therebetween;

b. support means for selectively rotating about the base means first axis;

c. handle means having a longitudinal axis and a first end fixed to the support means and a second end for having an external force applied thereto to cause the handle means and support means to rotate about the first axis;

d. a generally planar top plate slidingly received on the handle means and lying in a plane generally perpendicular to the handle longitudinal axis; and

e. link means pivotable about the base means second axis for controlling the sliding of the top plate on the handle means in response to the rotation of the handle means and support means about the base means first axis, the link means causing the top plate to slide toward the support means when the handle means and support means are rotated about the base means first axis under the external force applied to the handle means second end,

so that the top plate approaches the support means to crush an object placed therebetween when the handle

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means and support means are rotated about the base means first axis.

4,890,553

POSITIONING AND ATTACHMENT MEANS FOR FLEXIBLE PRINTING PLATES

Michael R. Turner, Tacoma, Wash., assignor to Heath Custom Press, Inc., Wash.

Filed Feb. 16, 1989, Ser. No. 310,882
Int. Cl.[4] B41F *27/00*
U.S. Cl. 101—389.1 **11 Claims**



1. Apparatus for positioning and securing a flexible plate to the surface of a cylinder comprising in combination:

plate holding means mounted by said cylinder for movement between extended and retracted positions respectively toward and away from the surface thereof,

plate register means mounted by said cylinder for movement between extended and retracted positions respectively toward and away from the surface thereof, and

bidirectional operating means connected to said plate holding means and said plate register means to simultaneously move said holding means and said register means alternately in opposite directions toward and away from the cylinder surface respectively,

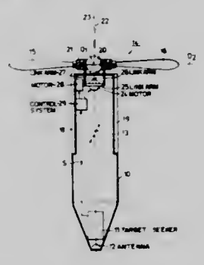
whereby said plate register means and said plate holding means may be simultaneously operated alternately in both directions to sequentially position, hold and release said plate.

4,890,554

SYSTEM FOR GUIDING A FLYING OBJECT TOWARDS A TARGET

Lars J. Schleimann-Jensen, Ekbacksvägen 33A, 182 34 Danderyd, Sweden

Filed Mar. 16, 1988, Ser. No. 168,850
Claims priority, application Sweden, Mar. 20, 1987, 8701160
Int. Cl.[4] F42B *13/00*; F42G *9/00*
U.S. Cl. 102—384 **4 Claims**



1. A projectile guiding system for changing the trajectory of a projectile comprising:

a guidance blade pivotally supported to a hub, said guidance blade extending laterally to the axis of said hub;

means connecting said hub to the rearward end of the projectile, permitting said blade and hub to rotate, and for varying the angular position of the rotational axis of said hub about two orthogonal axes;

first and second actuating means coupled to said means connecting said hub for varying the position of said rotational axis of said hub and connected blade about said two orthogonal axes, whereby a lateral force is exerted on said projectile;

a seeker for determining a heading error for said projectile; and,

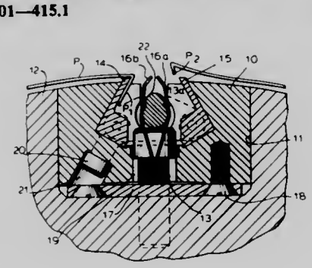
a drive stage connected between said seeker and said first and second actuating means for varying said rotational axis in response to said heading error, whereby said rotational axes is varied to impart a correction force to said projectile.

4,890,555

PRINTING PRESS PLATE LOCKUP

Jack Bryer, York; Jan Lindstrom, Landesville, and Rex D. Stone, York, all of Pa., assignors to Motter Printing Press Co., York, Pa.

Continuation-in-part of Ser. No. 57,756, Jun. 3, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 209,855
Int. Cl.[4] B41F *27/06, 27/12*
U.S. Cl. 101—415.1 **3 Claims**



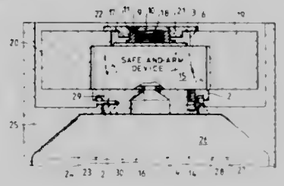
1. A plate lockup for locking a plate on a rotary cylinder of a printing press, comprising a pair of registers carried by the rotary cylinder for registering the leading end of a plate, the register used depending on the direction of rotation of the cylinder, a pair of deflectable, symmetrical springs carried by the rotary cylinder, the springs having outwardly extending, resilient ends, one for locking the trailing end of a plate and the other cooperating with a register for locking the leading end of the plate against the register, a rotatable cam interposed between the springs, said cam having a raised portion rotatable in one direction into engagement with one spring and in the other direction into engagement with the other spring to deflect the springs toward different registers, the raised portion of the cam being rotatable past an on-center position to an over-center position with respect to each spring, and a stop for limiting the rotation of the cam in the over-center position, in which position the cam locks the spring in clamping position with the register and the spring locks the cam in the over-center position determined by the stop.

4,890,556

AMMUNITION HOUSING

Roland Ottmann, Neunkirchen/S., and Wolfgang von Entress-Fursteneck, Leinburg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Naremberg, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,406
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 8712460[U]
Int. Cl.[4] F42B *13/12*
U.S. Cl. 102—499 **5 Claims**



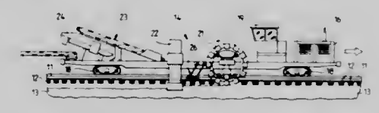
1. Ammunition housing including a cover part for the closure of an explosives chamber; a booster charge and a mechanical safe-and-arm device, said cover part comprising a closure plate having a central cutout receiving said booster charge, and bracket means integrally formed on said closure plate including a pair of spaced upstanding arm members straddling said cutout; a clamping device on said bracket means distant from said closure plate, said clamping device including a cross-member of said bracket means extending between and connecting the arm members, said cross-member having an internal screw thread and an external screw thread, said safe-and-arm device being positioned intermediate said arm members beneath said clamping device a threaded bolt being screwed into said internal screw thread for pressing the safe-and-arm device against the closure plate; a receiving member for an ignition circuit being mounted on and encompassing said safe-and-arm device; and a threaded nut engaging said external screw thread on said cross-member, said nut having an external shoulder for pressing said receiving member against said safe-and-arm device.

4,890,557

INTERSTITIAL BALLAST VIBRATOR

John B. Whitaker, Jr., Wetumpka, Ala., assignor to Kershaw Manufacturing Company, Inc., Montgomery, Ala.

Filed Jan. 13, 1989, Ser. No. 296,670
Int. Cl.[4] E01B *29/04*
U.S. Cl. 104—7.3 **23 Claims**



1. Apparatus for aiding in the removal of ballast from beneath a railroad track during reballasting operations wherein the railroad track remains intact and the ballast is removed by an undercutter underlying the railroad crossties of the track with the undercutter propelled along on a driven carriage comprising in combination:

(a) a vibrating unit resting atop said crossties and the ballast therebetween;

(b) means for attaching said vibrating unit to said carriage for concomitant motion therewith along said railroad track with said vibrating unit preceding said undercutter;

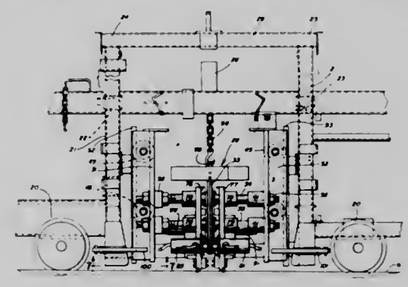
(c) means for raising or lowering said vibrating unit into engagement with said crossties.

4,890,558

ANCHOR SPREADER

Daniel C. Quella, Racine, and Michael E. Beach, East Troy, both of Wis., assignors to Racine Railroad Products, Inc., Racine, Wis.

Filed Sep. 14, 1988, Ser. No. 244,870
Int. Cl.[4] E01B *29/06*
U.S. Cl. 104—9 **15 Claims**



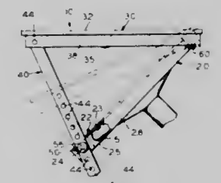
1. An anchor spreader for spreading one or more rail-mounted anchors away from a tie comprising, a frame, a head assembly movably mounted on said frame for vertical movement toward and away from a tie, and spreader means movably mounted on said head assembly for engaging a pair of rail-mounted anchors at a level above the tie and moving the anchors oppositely along the rail away from the tie to spread the anchors.

4,890,559

STEERING WHEEL TABLE

Gail E. Martin, 204 Yale St., Nampa, Id. 83651

Filed Jan. 17, 1989, Ser. No. 297,343
Int. Cl.[4] A47B *23/00*
U.S. Cl. 108—44 **13 Claims**



1. A steering wheel table device for mounting upon a steering wheel, said device comprising:

steering wheel engagement means including a box-like structure having a top panel and side members downwardly depending therefrom to define a bottom opening for placement over and receiving the steering wheel;

a table pivotally engaging said engagement means;

at least one support leg pivotally engaging said table; and

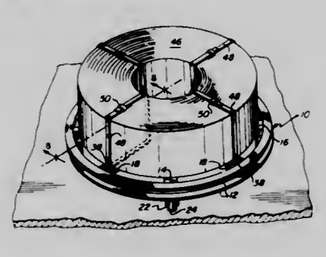
latch means for latching said support leg to said wheel engagement means to hold said table at a selected angle relative to said steering wheel engagement means.

4,890,560

STACKABLE CIRCULAR SKID

Bruce R. Good, 54 Tanya Ct., Plantsville, Conn. 06479

Filed Jun. 26, 1989, Ser. No. 371,252
Int. Cl.[4] B65D *19/00*
U.S. Cl. 108—53.1 **17 Claims**



1. A skid adapted for carrying a coiled product, and adapted for stacking with other, like skids in unloaded condition, comprising:

a circular ring member providing circumferential edge structure disposed outermost on said skid, said edge structure being adapted for rolling of said skid thereon;

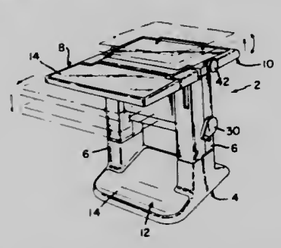
a multiplicity of elongated arm members extending radially with respect to the geometric center of said ring member, said arm members being joined to one another at their inner ends and being joined to said ring member at the outer ends thereof, each of at least certain of said arm members being at least substantially hollow and being open at both of its ends to permit passage of banding material therethrough and upwardly therefrom; and a plurality of legs downwardly extending on said skid and cooperating to support said skid on a flat surface, said skid having openings dimensioned, configured and located so as to receive the legs of an overlying like skid stacked thereupon, and having uppermost surface elements disposed in a common plane, whereby a coil of product, supported by said surface elements, can be secured to said skid by a band of banding material passed through at least one of said certain arm members.

4,890,561

EXTENDABLE KEYBOARD SUPPORT ASSEMBLY

James F. Hampshire, Stephens City, Va.; Hugh F. Groth, Richfield, and John M. Collins, Sagamore Hills, both of Ohio, assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Feb. 20, 1985, Ser. No. 703,380
Int. Cl.[4] A47B *21/03*
U.S. Cl. 108—137 **14 Claims**



1. In an extendable keyboard support assembly for a computer work stand, of the type comprising a sub-plate, a keyboard support plate mounted over the sub-plate so as to be reciprocably moveable forward and backward in relation thereto, and a locking device for selectively inhibiting relative movement between the sub-plate and the keyboard support plate; the improvement comprising:

the sub-plate having a profiled opening covered by the keyboard support plate, and said locking device being attached to the keyboard support plate to depend into said sub-plate profiled opening, and reciprocably move with said keyboard support plate, and said locking device selectively engaging against an underside surface of said sub-plate.

4,890,562

METHOD AND APPARATUS FOR TREATING SOLID PARTICLES

Gregory M. Gitman, Duluth, Ga., assignor to American Combustion, Inc., Norcross, Ga.

Filed May 26, 1988, Ser. No. 199,248
Int. Cl.[4] F23G *7/00*
U.S. Cl. 110—236 **26 Claims**



1. An apparatus for high intensity treatment of solid particles comprising:

(a) a combustion chamber;

(b) means for introducing said particles into said combustion chamber as a plurality of streams;

(c) first means for introducing fuel to said combustion chamber within the area formed by said streams of particles;

(d) second means for introducing fuel into said combustion chamber surrounding said streams of particles; and

(e) means for introducing oxidizing gas into said combustion chamber so that said oxidizing gas mixes with and combusts said fuel to produce a first high intensity flame located within the space formed by said particle streams and a second high intensity flame surrounding said particle streams.

4,890,563

TREATMENT OF WASTE AND ROTARY KILN THEREFOR

Kenneth L. White, Kenmore, and Harold B. Wight, Glen Waverley, both of Australia, assignors to Neutralysis Industries Pty. Ltd., Rocklean, Australia

PCT No. PCT/AU87/00338, § 371 Date May 20, 1988, § 102(e) Date May 20, 1988, PCT Pub. No. WO88/02284, PCT Pub. Date Apr. 7, 1988
PCT Filed Oct. 2, 1987, Ser. No. 240,127
Claims priority, application Australia, Oct. 2, 1986, PH8282
Int. Cl.[4] A47D *36/00, 36/24*
U.S. Cl. 110—246 **18 Claims**

1. A method for the treatment of waste materials including the steps of:

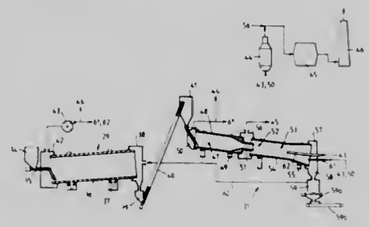
mixing solid and/or liquid wastes with a binding material;

passing the mixture through an extruder to form pellets of waste;

passing the pellets through a dryer, and directing a countercurrent flow of hot gas through said drying from at least one of the zones of a kiln located downstream of said dryer;

passing the pellets through a pyrolysis zone in the kiln to drive off at least a portion of the volatile gases in the waste;

passing the pellets through an oxidation zone in the kiln where the excess oxygen causes the remaining volatile gases and at least a portion of the fixed carbon in the waste to be oxidized;



passing the pellets through a vitrification zone in the kiln to vitrify the silicates present in the pellets to form a solid aggregate, and wherein

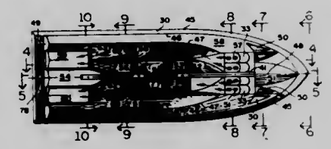
exhaust wherein gas from said dryer is split into two streams, at least one of the streams being fed to the oxidation and-/or vitrification zones of the kiln.

4,890,564

EXTENDED BOW AND CONTROLLABLE AIR CUSHION AIR RIDE BOAT HULL

Donald E. Burg, 15840 SW. 84th Ave., Miami, Fla. 33157

Continuation-in-part of Ser. No. 737,403, Nov. 1, 1976, abandoned, Ser. No. 818,303, Jul. 25, 1977, Pat. No. 4,165,703, Ser. No. 69,771, Aug. 27, 1979, abandoned, Ser. No. 207,789, Nov. 17, 1980, abandoned, Ser. No. 269,908, Jun. 3, 1981, Pat. No. 4,392,445, Ser. No. 289,769, Aug. 3, 1981, abandoned, Ser. No. 343,287, Jan. 27, 1982, abandoned, Ser. No. 458,738, Jan. 17, 1983, abandoned, Ser. No. 465,670, Feb. 10, 1983, abandoned, Ser. No. , , Ser. No. 584,728, Feb. 29, 1984, Pat. No. 4,587,918, Ser. No. 844,529, Mar. 27, 1986, Pat. No. 4,735,164, and Ser. No. 862,300, May 12, 1986, Pat. No. 4,739,719. This application Apr. 19, 1988, Ser. No. 183,588
Int. Cl.[4] B63B *1/38*
U.S. Cl. 114—67 A **102 Claims**



1. In an improved boat hull having a recess in its underside, said recess being pressurized with gas supplied by artificial means to create a restrained gas cushion between portions of the hull and a water surface, wherein said gas cushion is of sufficient pressure to support a significant portion of a weight of said boat hull, with a forward portion of said gas cushion restrained by a forward movable seal, the improvement comprising:

stabilizing, load carrying catamaran like sidehulls beginning at a forward portion of and extending downwardly from the hull, said sidehulls have keels that are substantially parallel to each other over at least part of their forward portions and said keels diverge aft of their forward portions, and a forwardly extending bow member disposed, at least in part, both inwardly of a sidehull and forwardly of said gas cushion forward movable seal, wherein said forwardly extending bow member is connected to a seal separator member that, at least in part, passes between elements of said gas cushion forward movable seal.

95. In an improved boat hull having a recess in its underside, said recess being pressurized with gas supplied by artificial means to create a restrained gas cushion between portions of the hull and a water surface, wherein said gas cushion is of sufficient pressure to support a significant portion of a weight of said boat hull, with a forward portion of said gas cushion restrained by a forward movable seal, the improvement comprising:

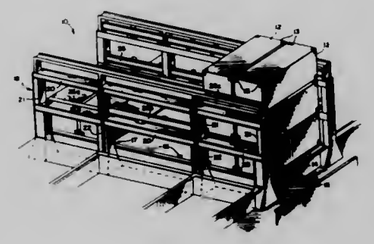
a side bead fastener on an element of the forward movable seal whereby said side bead fastener slides into a track where said track is fastened to the hull and extends over a length of a rear portion of said side bead fastener, and wherein there is a forward movable seal element top cap attachment means that, at least in part, attaches a seal element to the hull.

4,890,565

APPARATUS FOR SECURING ON-DECK CONTAINERS

Eugene M. Kelly, Runson, N.J., and Robert B. Barnett, Mobile, Ala., assignors to Sea-Land Service, Inc., Iselin, N.J.

Continuation of Ser. No. 688,285, Jan. 7, 1985, abandoned, which is a continuation of Ser. No. 475,377, Mar. 14, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,956
Int. Cl.[4] B63B *25/00*
U.S. Cl. 114—72 **6 Claims**



1. A system for securing a plurality of intermodal containers to a container ship, said system comprising:

(a) a container ship for shipping a plurality of intermodal containers between ports, said container ship having a plurality of removable hatch covers mounted on a deck of the container ship to provide access therethrough;

(b) a plurality of removable intermodal cargo containers to be secured above deck during transit of the container ship between ports, wherein the containers are arrayed in a plurality of rows of stacks of containers, each stack having at least three containers, a first lowermost tier, and a last uppermost tier, each of said containers having castings for moving and securing the containers;

(c) a plurality of dowel means mounted on said hatch covers for securing the first lowermost tier of containers thereto;

(d) at least two tower assemblies spanning at least one of the hatch covers to define a stowage bay thereabove, each of said tower assemblies having a plurality of vertical towers mounted on said deck and aligned athwartship along said hatch cover(s) with a plurality of cross-members extending between said towers to create a rigid free-standing assembly which defines a plurality of protective wells therewithin;

(e) a plurality of rows of nestable and pivotable platform means mounted on said tower assemblies, said platform means arrayed for association with the rows and stacks of containers, each of said platform means pivotable from a horizontal position for engagement of said containers to a vertical position completely nested within a protective well of the tower assembly;

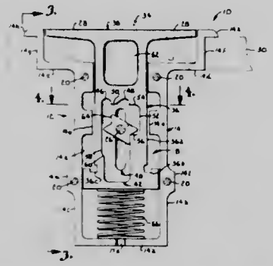
(f) a plurality of container-engaging plates mounted on each of said pivotal platform means, each plate having at least one dowel means thereon for engaging the corner castings of associated container(s), wherein said plate(s) are placed between adjacent tiers of associated containers when the container ship is loaded to transmit vertical load forces directly therethrough, from container to container, to the hatch cover therebelow;

(g) at least one locking means mounted on the container engaging plate(s) mounted on the last and uppermost row of pivotable platform means, whereby the last and uppermost tier of containers is secured and locked to its associated pivotable platform;

(h) a plurality of motor means mounted wholly within said protective wells for selectively pivoting said platform means between their container-engaging position and their nested and protected position within said wells,

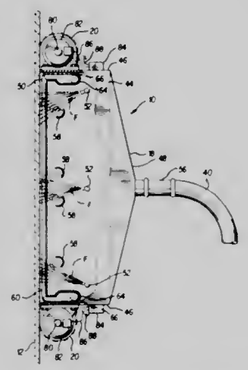
wherein said rows of pivotable platform means are nested within and protected by said towers during removal and installation of said hatch covers and containers, and selectively and successively lowered into their horizontal container engaging position after the tier of containers immediately therebelow has been loaded.

4,890,566
RETRACTABLE CLEAT
John L. Morris, 1640 E. Delmar, Springfield, Mo. 65804
Filed Mar. 28, 1988, Ser. No. 173,878
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—218 **10 Claims**



6. A device for securing a boat line or the like, comprising:
a housing presenting a cavity therein;
a cleat having a shank and a bead on the shank for receiving the boat line, said cleat being received in said cavity for movement between an extended position wherein the cleat is accessible to receive the boat line and a retracted position wherein the cleat is retracted into the cavity;
spring means for continuously urging said cleat toward the extended position; and
latch means for alternatively latching said cleat in the retracted position and releasing the cleat for movement to the extended position in response to successive depressions of the cleat, said latch means comprising a latch member mounted on the housing for pivotal movement between a latching position wherein the latch member engages the cleat in a manner to hold same in the retracted position and a release position wherein the latch member is released from the cleat to permit movement of same to the extended position under the influence of said spring means, said cleat presenting a surface thereon engageable with said latch member to alternatively pivot same between the latching and release positions in response to successive depressions of the cleat.

4,890,567
ROBOTIC ULTRASONIC CLEANING AND SPRAYING DEVICE FOR SHIPS' HULLS
Edward A. Caduff, 258 West Deer Park Rd., Gaithersburg, Md. 20877
Filed Dec. 1, 1987, Ser. No. 127,181
Int. Cl.[4] B63B *59/08*
U.S. Cl. 114—222 **18 Claims**



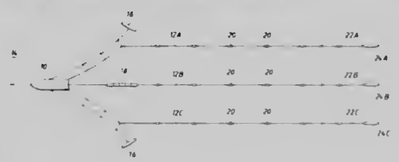
1. A robotic ultrasonic device for cleaning ships' hulls while in dry dock comprising:
a housing having an open face adapted to confront a ship's hull;
means disposed in said housing for impinging a flow of fluid through said open face onto said ship's hull while in dry dock;
ultrasonic means disposed in said housing for impinging a flow of ultrasonic energy through said open face onto said fluid dlow impinging on said ship's hull while in dry dock;
means connected to the outside of said housing for retaining said housing on the ship's hull and moving said housing on the ship's hull.

15. A device for continuously spraying paint or other chemicals on a dry docked ship's hull while moving said device on said ship's hull comprising:
a housing having an open face adapted to confront the ship's hull;
spray means disposed in said housing for continuously spraying paint or other chemicals through said open face onto the ship's hull;
air curtain means disposed in said housing for containing within said housing the paint or other chemicals which have been sprayed; and
means connected to the outside of said housing for retaining said housing on the ship's hull and moving said housing on the ship's hull while continuously spraying paint or other chemicals onto said ship's hull, whereby said sprayed paint or other chemicals are contained within said housing during said continuous spraying.

4,890,568
STEERABLE TAIL BUOY
George A. Dolengowski, Bellaire, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Aug. 24, 1988, Ser. No. 236,107
Int. Cl.[4] B63B *21/00*
U.S. Cl. 114—246 **15 Claims**

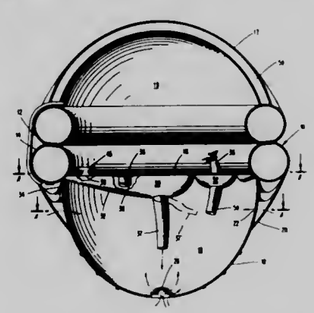
1. A remotely controllable tail buoy for use in marine towing operations, said tail buoy being attached to an object being towed by a vessel in a body of water so as to indicate the approximate location of said object, said tail buoy comprising:
a buoyant float;

at least two substantially vertical and substantially parallel rudders each rotatably attached by a shaft to said buoyant float and extending generally downwardly into said body of water;
a communication system adapted to receive and decode signals transmitted from said vessel; and



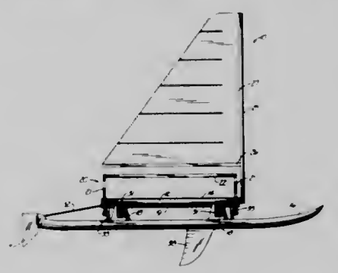
a steering mechanism being electrically attached to said communication system and operatively attached to said shafts so that said steering mechanism will respond to said signals that are received and decoded by said communication system by simultaneously rotating said shafts, thereby shifting the angular orientation of said rudders relative to the course of said vessel causing said tail buoy to change directions.

4,890,569
LIFE RAFT
James A. Givens, Tiverton, R.I., assignor to Givens Booy Liferaft Co., Inc., Tiverton, R.I.
Division of Ser. No. 884,916, Jul. 14, 1986, Pat. No. 4,790,784.
This application May 31, 1988, Ser. No. 200,453
Int. Cl.[4] B63C *9/04*
U.S. Cl. 114—349 **14 Claims**



2. A self-bailing, stabilized life raft comprising:
a flotation platform for carrying at least one life raft occupant, including a peripheral buoyant member and a floor spanning said buoyant member and supported thereby;
at least one stabilizing chamber located beneath the flotation platform, said stabilizing chamber being adapted to be filled with water when the life raft is deployed; and
a bailing chamber located between said stabilizing chamber and said flotation platform, for receiving water from the floor, and for exhausting water from the bailing chamber in response to intermittent compression of the bailing chamber due to wave interaction with the life raft causing water in the at least one stabilizing chamber to exert an upward force on the bailing chamber which is opposed by the weight of the at least one occupant, said bailing chamber having a lower wall mounted for generally upward movement relative to said flotation platform responsive to exertion of said upward force, thereby to expel water present in said bailing chamber therefrom.

4,890,570
WIND PROPELLED SAILING CRAFT
Rodney V. Hofmeister, 13338 Stephenson, Anchorage, Ak. 99515
Filed Feb. 7, 1989, Ser. No. 307,003
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—39.1 **12 Claims**

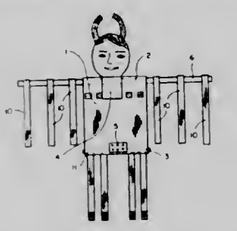


1. A wind propelled sailing craft, comprising:
a frame including fore-and-aft beams interconnected by transverse beams;
a deck attached to said frame;
a wind propulsion structure attached to said frame and disposed to extend above said deck;
a pair of elongated hulls disposed in laterally spaced relationship, each of said hulls including a pair of fore-and-aft spaced upwardly extending pedestals adapted to receive one of said fore-and-aft beams of the frame for pivotal movement with respect thereto about a horizontal axis, each of said hulls including a nose, a tail, an inside rail and an outside rail;
a rudder pivotally attached to each of said hulls at said tail;
a tiller having an operator bar pivotally attached to one of said transverse beams, said operator bar including a drive section disposed to extend above said transverse beams and a driven section disposed to extend below said transverse beams;
tie rods pivotally attached to a lower portion of said driven section, said tie rods being laterally disposed to extend to a point of pivotal attachment on each of said hulls offset from said horizontal axis; and
rudder bars pivotally attached to and interconnecting each of said hulls and the rudder attached to the opposite hull, whereby movement of the operator bar of the tiller by a pilot is translated to simultaneous pivotal movement of both hulls and both rudders to facilitate turning of the craft.

4,890,571
DEER SCARECROW
John S. Gaskill, 203 Second St., Collinsville, Ill. 62234
Filed Dec. 5, 1988, Ser. No. 280,306
Int. Cl.[4] A01M *29/02*; A47F *8/00*; G08B *15/00*
U.S. Cl. 116—22 A **10 Claims**

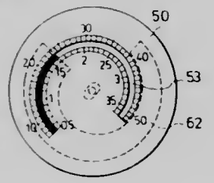
1. A deer scarecrow, comprising:
(1) a flaccid main body having a bead attached at the top thereof and at least two pouches thereon;
(2) a collapsible shoulder rod attached to the top of said main body, forming two arms when in an extended position, each of said arms having a plurality of arm streamers attached thereto;
(3) a waist rod attached to the bottom of said main body;
(4) a plurality of leg streamers attached to the bottom of said main body and dangling underneath said main body;
(5) a scent means located in at least one of said main body pouches;

(6) a sound-making means located in at least one of said main body pouches;



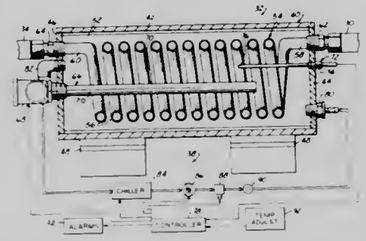
(7) a means for fastening said deer scarecrow to an upright support.

4,890,572
MEASUREMENT INDICATING GAUGE
Tien T. Huang, No. 4, Lane 30, Wu-Chuan St., Pan-Chiao City, Taiwan
Filed Jun. 9, 1988, Ser. No. 204,518
Int. Cl.[4] G01D *3/00, 13/12*
U.S. Cl. 116—298 **4 Claims**



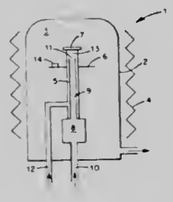
1. A measurement indicating gauge comprising:
(a) a dial plate provided with at least one measurement scale on a front face thereof;
(b) a central shaft connectable to a sensing means for rotation thereby;
(c) an indicating plate mounted on the shaft and disposed behind the dial plate, whereby the shaft axis of rotation defines a central axis through the dial and indicating plates;
(d) an arcuate slot opening formed in the dial plate, the opening including a beginning and an end, wherein the distance of the opening from the central axis progressively decreases along the opening from the beginning to the end to define a segment of a spiral extending around an angular distance of greater than one hundred eighty degrees; and
(e) the indicating plate being provided with an arcuate color band including a beginning edge and a terminal edge, wherein during rotation of the indicating plate by the central shaft the beginning edge of the color band may move from the beginning to the end of the opening so that the color band is exposed through the opening and cover same to an extent determined by the degree of rotation imparted to the central shaft.

4,890,573
SYSTEM FOR APPLYING THERMAL-CURE MATERIALS
Robert J. Zaber, Detroit, Mich., assignor to Technadyne Engineering Corporation, Detroit, Mich.
Filed Jul. 25, 1988, Ser. No. 223,630
Int. Cl.[4] B05C *11/10*
U.S. Cl. 118—667 **26 Claims**



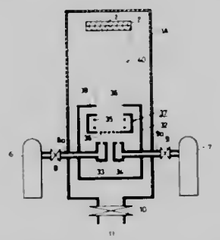
1. A system for applying a fluent thermal-cure material to a substrate that includes means for supplying the material under pressure, means for heating the material to elevated temperature above ambient, means for applying the material at said elevated temperature to a substrate, and conduit means for feeding the material from said supplying means to said heating means and thence to said applying means, characterized in that said means for heating the material comprises:
a hollow enclosure having a substantially cylindrical internal volume, a spirally coiled tube having axially opposed first and second ends suspending said tube substantially coaxially within said volume and being coupled to said conduit means, a heater positioned within said enclosure and having means responsive to application of electrical power for heating said volume, temperature sensing means positioned within said volume for supplying electronic signals as a function of temperature thereof, said heater and said temperature sensing means being positioned within said coiled tube substantially centrally of said volume and said tube, and electronic control means including means responsive to said electronic signals for selectively applying electrical power to said heater to maintain temperature within said volume at said elevated temperature.

4,890,574
INTERNAL REACTOR FOR CHEMICAL VAPOR DEPOSITION
Vinod K. Saria, Lexington; Charles D'Angelo, Southboro, and Helen E. Rebenne, Westboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Continuation-in-part of Ser. No. 5,003, Jan. 14, 1988, Pat. No. 4,751,109. This application Jun. 14, 1988, Ser. No. 206,400
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—719 **11 Claims**



1. A chemical vapor deposition reactor comprising means for enclosing a reaction chamber, means for heating the reaction chamber, and at least one internal reactor disposed within the enclosing means, the internal reactor comprising:
first containing means for containing a first solid precursor material;
second containing means disposed within the first containing means for containing a second solid precursor material;
first gas inlet means for directing at least one precursor gas, reactive with the solid precursor materials to produce at least two first reactant gases, from a source outside the enclosing means to both the first and second containing means; and
gas outlet means to allow the at least two first reactant gases to flow from the first and second containing means to react with one or more additional reactants in the reactant chamber;
wherein the relative positions of the first and second containing means and the heating means are selected to permit reaction temperatures both within the reaction chamber and within the first and second containing means suitable for reactions occurring therein.

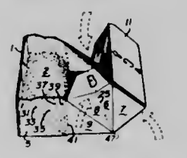
4,890,575
THIN FILM FORMING DEVICE
Hiroki Ito, and Teruo Ina, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 14, 1987, Ser. No. 73,249
Claims priority, application Japan, Jul. 14, 1986, 61-165141; Mar. 25, 1987, 62-69035
Int. Cl.[4] C23C *16/48*
U.S. Cl. 118—723 **18 Claims**



1. A thin film forming device comprising: a vacuum tank for holding a predetermined degree of vacuum; means for supporting a substrate in said vacuum tank; an internal tank for holding a vacuum disposed in said vacuum tank and having an opening opposite to said substrate; a plurality of gas jet nozzles arranged in said internal tank and connected to a plurality of reactive gas sources located outside said vacuum tank, for jetting reactive gases of different types toward said substrate through said opening; and electron beam irradiation means disposed close to a passage through which the reactive gases jetted from sad gas jet nozzles pass, for irradiating electron beams into the reactive gases.

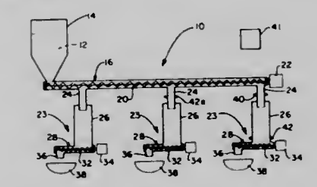
4,890,576
TRANSFORMABLE CONTAINER
David F. James, Redondo Beach, Calif., assignor to Paw Products, Inc., Los Angeles, Calif.
Filed Oct. 14, 1987, Ser. No. 108,061
Int. Cl.[4] A01K *29/00;* **B65D** *5/42*
U.S. Cl. 119—1 **30 Claims**

1. An animal sanitary system for transporting, using and disposing of litter material free of spillage, which comprises: a quantity of litter material; configurable container means formed of paperboard sheet means for confining said litter material; said sheet means comprising a unitary sheet containing fold line means, said fold line means alternately defining within said sheet means: first closed package means and second open tray means; said package means defining an enclosed cavity of predetermined volume, V1, for holding said litter material; said cavity having an essentially square shape cross section along at least one axis of said cavity; said tray means having upstanding continuous side walls and a generally rectangular base defining an open cavity of predetermined volume, V2, for holding said litter material and for receiving there within in addition a litter material using animal to use said litter material, where said volume V2 being at least twice as large as volume V1, and said base having three sections of approximately equal area, including a left, center and right section; said fold line means for permitting folding of said sheet means between said first configuration as a closed package means to said second configuration as an open tray means responsive to pivotal movement of said left base section about said center



base section in one direction and pivotal movement of said right base section about said center base section in another direction opposite to said one direction with portions of two opposed walls moving outwardly from said enclosed cavity responsive to movement of said right base section and with said litter material being carried from said package means cavity into said tray means cavity and for permitting folding of said sheet means between said second configuration as a tray means to said first configuration as a package means responsive to pivotal movement of said right base section in said one direction about said base center section followed by pivotal movement of said left base section about said base center section in said another direction with said litter material being carried from said tray means cavity to said package means cavity with said two opposed wall portions moving inwardly of said defined open cavity responsive to pivotal movement of said right base section in said one direction.

4,890,577
ANIMAL FEED DISTRIBUTION DEVICE
Bruce A. Maibach, Sterling, Ohio, assignor to W. G. Dairy Supply, Inc., Ohio
Filed May 17, 1988, Ser. No. 194,928
Int. Cl.[4] A01K *39/00*
U.S. Cl. 119—52.1 **7 Claims**



1. An animal feed distribution device comprising:
at least one animal feeding station feed storage bin;
a feed conveyor system for filling said feed storage bin;
at least one feed detection means, and
an electrical control system circuit, wherein said feed detection means comprises an end-looking, infra-red emitting diode, and an end-looking photo-transistor sensor, said

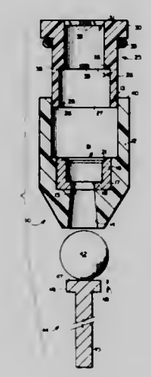
detection means being mounted in said storage bin, and wherein, said electrical control circuit is designed to control activation of said conveyor system based on signals caused by said detection means, and wherein further, said electrical control system circuit includes a first delay circuit which prevents the interruption of an infra-red beam transmitted by said detection means from causing a control signal capable of deactivating said feed conveyor system as a consequence of said interruption for a predetermined period of time following said interruption, a second delay circuit which delays a control signal caused by transmission of an uninterrupted infra-red beam by said detection means, from activating said conveyor system for a predetermined period of time after commencement of its uninterrupted transmission, and a third delay circuit which limits the period of time during which a control signal caused by commencement of beam by said detection means can activate said conveyor system.

4,890,578

POULTRY NIPPLE DRINKER

Helmut Rader, McLean, Va., assignor to Monoflo International, Inc., McLean, Va.

Filed Sep. 25, 1987, Ser. No. 100,788
Int. Cl.[4] A01K *7/06*
U.S. Cl. 119—72.5 **11 Claims**



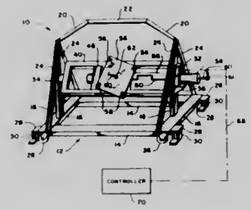
1. A nipple drinker comprising:
a body of thermoplastic acetal, and including means defining a first through extending passage extending from a first to a second end thereof in a dimension of elongation;
a metal valve seat disposed in said body and having a second through extending passage in line with said first passage, and having first and second portions;
a metal ball seated on said valve seat first portion;
a metal valve pin including a stem and a head, said head and pin elongated in said first dimension and aligned with said passages; said head having a first surface engaging said ball and extending essentially perpendicular to said first dimension, and a second surface engaging said valve seat second portion, and extending essentially perpendicular to said first dimension, and an annular spacing being provided between the circumferential periphery of said head and said valve seat;
said body including a portion extending downwardly from said valve seat a significant distance, the volume between the downwardly extending portion and the valve stem being open; and
a cap means of thermoplastic material cooperating with said body for maintaining said ball and said valve pin within said body, and having a third through extending passage in aligment with said first and second passages.

4,890,579

TIMED PRIMATE ROTO-POSITIONER

Clarence M. Oloff, Dayton; William G. Moss, Enon; Garry N. Holder, Dayton, all of Ohio, and Linda M. Hermann, Norcross, Ga., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1985, Ser. No. 788,199
Int. Cl.[4] A61G *7/00*; A01R *1/00*
U.S. Cl. 119—103 **11 Claims**



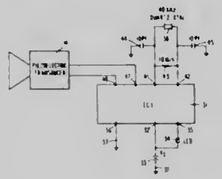
1. A primate restraint system positioning apparatus, comprising:
a frame;
a subframe rotatably attached to the frame;
carrier means for attaching a test animal restraint system rotatably attached to the subframe, the carrier rotating on an axis at an angle to the axis of rotation of the subframe;
first motor means for rotation the subframe;
second motor means for rotating the carrier; and,
means for controlling the operation of the first and second motor means, the controlling means including means for automatically causing rotation of the subframe and of the carrier according to a preselected sequence, wherein the preselected sequence averages the net gravitational loading over the time on test animal body parts to substantially zero.

4,890,580

ELECTRONIC FLEA-REPELLING DEVICE INCLUDING AN INTEGRATED CIRCUIT

Charles W. Owen, and Roberto A. Garcia, both of Miami, Fla., assignors to Elexis Corporation, Miami, Fla.

Filed Jun. 7, 1988, Ser. No. 203,446
Int. Cl.[4] A01K *29/00*; H04B *1/02*
U.S. Cl. 119—156 **25 Claims**



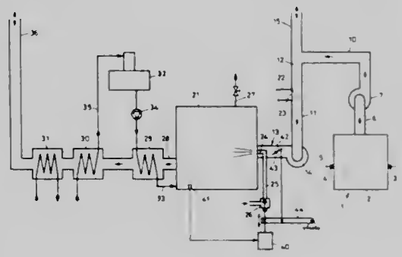
1. A portable electronic flea-repelling device adapted to be mounted on a domestic animal and activated by a self-contained battery comprising a printed circuit board, an electrical to ultrasonic transducer, means including an integrated circuit for deriving periodic electric pulses having a relatively low duty cycle and an ultrasonic carrier frequency, the printed circuit board carrying the transducer and a housing in which the integrated circuit is located so the transducer and integrated circuit housing areas are superimposed on each other, the printed circuit board including deposited leads for interconnecting the battery, transducer and integrated circuit so the electric pulses derived from the integrated circuit are connected to drive the transducer, the period, amplitude, duty cycle and carrier frequency of ultrasonic pulses derived from the transducer in response to the electric pulses derived from the integrated circuit being such as to repel fleas from the animal.

4,890,581

METHOD AND PLANT FOR PURIFYING THE EXHAUST AIR FROM A TENTERFRAME OR A SINGER

Arthur Natter, Wolfurt, Austria, assignor to Peter Koenig, Arbon, Switzerland

Filed Nov. 25, 1988, Ser. No. 276,000
Claims priority, application Switzerland, Dec. 1, 1987, 4689/87
Int. Cl.[4] F22B *33/00*
U.S. Cl. 122—1 A **10 Claims**



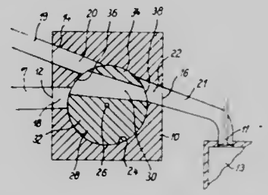
1. A method for purifying the exhaust air from a tenterframe (1) or a singer by thermal combustion, the exhaust air being supplied as combustion air to a heat-supply device (21), wherein the heat-supply device (21), in its partial-load operation, is operated with a large excess of air of $\lambda = 1,5$ to $\lambda = 3,5$.

4,890,582

METHOD FOR POSTCHARGING AN IC ENGINE OF THE PISTON TYPE AND AN APPARATUS FOR PERFORMING THE METHOD

Oskar Schatz, Waldpromenade 16, D-8035 Gauting, and Thomas Steidele, Hanzenbergerstrasse 29, D-8000 Munich, both of Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,087
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3737826
Int. Cl.[4] F02B *17/00*
U.S. Cl. 123—26 **20 Claims**



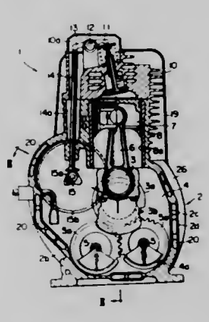
2. An apparatus for postcharging an internal combustion engine comprising:
a housing including means adapted for coupling with an induction air source and with a pressurized air source and with a combustion chamber, and passage means including an induction duct, pressure duct and exhaust duct for enabling air to pass from both said air sources through said housing;
valve means in said passage means for opening and closing said induction and pressure ducts to enable air flow from said induction and pressurized air sources to pass through said air passage means to exit to said combustion chamber such that during opening and closing of said induction and pressurized ducts the opening and closing of the ducts is overlapped to enable simultaneous drawing of air from both the induction and pressurized air sources through said passage means to exit through said exhaust duct to said combustion chamber.

4,890,583

CRANKCASE OF AN ENGINE

Katsuhiko Ohno; Keisuke Ishii, and Motoaki Etoh, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,889
Claims priority, application Japan, Dec. 28, 1987, 62-200305
Int. Cl.[4] F01P *1/02*
U.S. Cl. 123—41.7 **7 Claims**



1. A crankcase of an engine of forced air cooled type which is provided with a cooling fan fixedly mounted on an end of a crankshaft within a blower housing of said fan, and which has a plurality of meshed gears, said crankcase constituting the lower part of an outer structure of the engine to enclose said gears and having a double-wall construction with cooling air passages thus formed therein in at least the part thereof enclosing said gears, said cooling air passages having upstream ends communicating with an outlet of said blower housing and downstream ends positioned to direct cooling air against and along the outer surface of the crankcase.

4,890,584

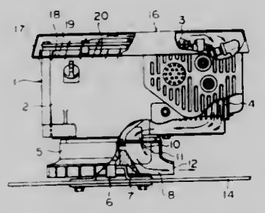
ENGINE HAVING VERTICAL CRANKSHAFT

Shinichi Tamba, Kobe; Yoshiro Yamane, Akashi, and Tetsuhiro Yamakawa, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1988, Ser. No. 290,299
Claims priority, application Japan, Dec. 28, 1987, 62-201334[U]
Int. Cl.[4] F01P *1/02*
U.S. Cl. 123—41.7 **3 Claims**

1. An engine having a vertically disposed crankshaft, including an engine cover for closing a whole upper area of an engine body and having a skirt portion protruding downwardly from a periphery of said engine cover, and a cooling fan with a flywheel fixed to an output shaft of the engine below said engine body, wherein:
a protruded shroud is formed integrally on a wall portion of

said engine body to completely close an annular clearance between said wall portion and said skirt portion of said engine cover; and



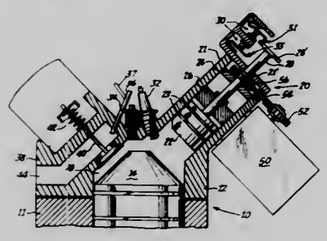
a plurality of apertures are formed in said protruded shroud to constitute a cooling air intake inlet.

4,890,585

INTERNAL COMBUSTION ENGINE WITH VALVE

William Hathorn, Brooksville, Fla., assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 28, 1988, Ser. No. 276,998
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—48 A **5 Claims**



1. In a conventional internal combustion engine having at least one combustion chamber, the combination of a first means for varying the volume of said combustion chamber, an intake valve operated solely by vacuum forces occurring within said combustion chamber, and a second means for varying the volume of said combustion chamber, said second means for varying the volume of said combustion chamber being selectively movable in response to pressure conditions within said combustion chamber.

4,890,586

INTAKE DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Takaaki Fujii; Seishi Miura, both of Saitama, and Takaaki Tsukui, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

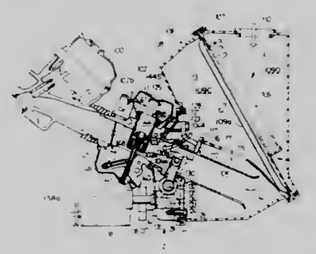
Continuation-in-part of Ser. No. 81,133, Aug. 3, 1987, Pat. No. 4,759,320. This application Apr. 4, 1988, Ser. No. 177,447
Claims priority, application Japan, Aug. 6, 1986, 61-185616; Dec. 28, 1986, 61-309961; May 14, 1987, 62-117966; May 14, 1987, 62-117967
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 M **35 Claims**

13. An intake system for an internal combustion engine having at least one intake port for receiving a charge mixture and mixture development means for preparing said charge mixture, said intake system supplying air thereto and comprising:

a relatively short fixed intake pipe forming a high speed inlet tract tuned for high engine speed operation, said fixed intake pipe having a high speed intake opening;

a guide pipe separated from said intake opening of said fixed intake pipe and having an intake tract terminating in a low speed intake opening;

a moveable intake pipe movably mounted on said guide pipe so as to selectively abut said fixed intake pipe to collectively form a low speed inlet tract with said fixed intake pipe and said guide pipe, said low speed inlet tract being tuned for low engine speed operation;



said moveable intake pipe moving from a low speed position spaced away from said fixed intake pipe to a high speed position in abutment with said fixed intake pipe, said internal combustion engine being susceptible to a transient power drop during movement of said moveable intake pipe through positions intermediate therebetween; and

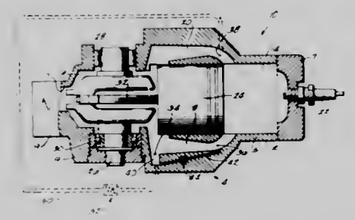
transient power drop reduction means for reducing at least the duration of transient power drop relative to the speed of movement of said moveable intake pipe.

4,890,587

FUEL RESIDUAL HANDLING SYSTEM

Theodore J. Holtermann, Brookfield, Wis., assignor to Outboardmarine Corporation, Waukegan, Ill.

Filed Jan. 29, 1988, Ser. No. 150,226
Int. Cl.[4] F02B *33/04*; F02M *25/00*
U.S. Cl. 123—73 A **23 Claims**



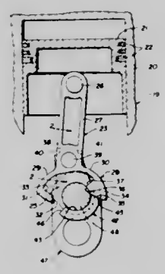
1. An internal combustion engine comprising a crankcase, cylinder, a transfer passage communicating between said crankcase and said cylinder, a sump communicating with said transfer passage independently of the communication of said transfer passage with said crankcase, and means for pumping fluid from said sump to said transfer passage.

4,890,588

MEANS TO CONTROL PISTON MOVEMENT IN RELATIONSHIP TO CRANK ARM ROTATION IN AN INTERNAL COMBUSTION ENGINE

John E. Tillman, 1207 Dakota N.E., Albuquerque, N. Mex. 87110

Filed Jan. 29, 1988, Ser. No. 150,386
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—78 E **9 Claims**



1. In an internal combustion engine having a crank arm and a piston within a cylinder, a two-piece connecting arm linkage apparatus for controlling piston movement in relation to crank arm rotation comprising:

a con rod link and a crank arm link, said con rod link being substantially longer than said crank arm link;

said con rod link being integrally formed with two ends, one end which is rotatably affixable to the piston with pivot pin means, the other end comprising a yolk having a base and two arms extending downward therefrom and means for linking said yoke base of said con rod link to said crank arm link using link pin means;

said crank arm link comprising means disposed at one end thereof for linking said crank arm link to said yoke base of said con rod link using said link pin means and means disposed at the other end thereof for rotatably affixing said crank arm link to the crank arm;

cam means affixed on said crank arm for selectively engaging surfaces on said yoke of said con rod link; and

means for controlling the amount of rotation of said crank arm link about said link pin means, whereby said rotation controlling means and said yoke engaging cam means, during operation, act cooperatively to provide an effective top position for the piston within the cylinder after the crank arm affixing means has moved a predetermined amount past a top dead center position, thereby providing for fuel ignition to occur after the crank arm has passed its point of top dead center.

4,890,589

VARIABLE CAPACITY TYPE RECIPROCATING PISTON DEVICE

Hiroo Miyate, Kanagawa, Japan, assignor to Nissan Shatai Company, Limited, Kanagawa, Japan

Filed Sep. 14, 1988, Ser. No. 244,840
Claims priority, application Japan, Sep. 18, 1987, 62-234026
Int. Cl.[4] F01L *1/02*; F02B *75/32*
U.S. Cl. 123—197 R **10 Claims**

1. In a device

a first piston, said first piston being reciprocatively disposed in a first cylinder;

a first connecting rod, said first connecting rod being connected at a first end thereof to said first piston;

a first drive disc, said first drive disc being connected to a first drive shaft for synchronous rotation therewith;

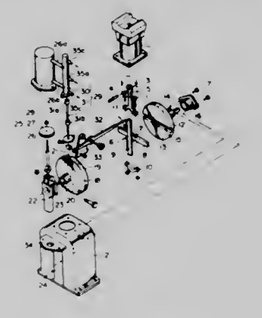
means defining a guide slot in said first drive disc which slot extends diametrically across a face of said first drive disc;

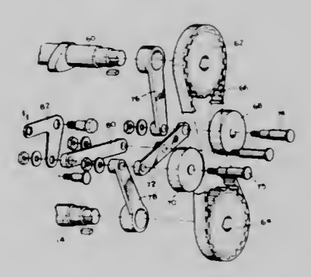
a first control disc, said first control disc being connected with a first control shaft for synchronous rotation therewith;

means defining a guide slot in said first control disc which guide slot extends diametrically across a face of said second disc;

a first slider, said first slider being slidably received in the guide slot formed in said first drive disc;

a second slider, said second slider being slidably received in the guide slot formed in said first control disc;





a first pin, said first pin being operatively connected to a second end of said first connecting rod and fixedly connected to said first and second sliders, said first and second sliders being connected to the axial ends of said first pin and arranged to extend in first and second directions, said first and second directions being arranged at right angles with respect to one and other; and

a control device, said control device being operatively connected with said control shaft in a manner which enables the axis of rotation of said first control disc to be selectively displaced with respect to the axis of rotation of said first drive disc.

4,890,590

FAIL-SAFE METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINES

Shinichi Iwamoto; Shigenori Isomura; Mitsunori Takao, and Kenichiro Kamai, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

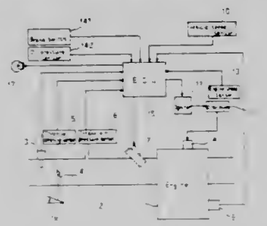
Filed Nov. 15, 1988, Ser. No. 271,597
Claims priority, application Japan, Nov. 16, 1987, 62-288748
Int. Cl.[4] F02B *77/00*
U.S. Cl. 123—198 D **24 Claims**

1. Apparatus for preventing uncontrolled acceleration in an engine for a motor vehicle, said engine having an intake system with a throttle valve, said engine being controlled on the basis

of intake air pressure and engine speed, said apparatus comprising:

first means for detecting a position of said throttle valve and non-opening of said throttle valve on the basis of said position;

second means for detecting a speed of said engine and determining when a value related to engine speed exceeds a predetermined criterion based upon said speed;



judging means, coupled to said first and second means, for judging abnormal operation of said intake system when said first means detects that said throttle valve is not opening and said second means detects that said value related to engine speed exceeds said predetermined criterion; and

power decreasing means for decreasing engine power on the basis of a result of a judgement by said judging means.

4,890,591

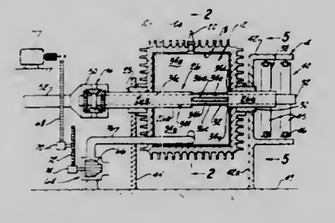
ROTARY INTERNAL COMBUSTION ENGINE AND METHOD OF STARTING THE ENGINE

John E. Stauffer, 6 Pecksland Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 773,636, Sep. 9, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 118,546

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—213 **11 Claims**



1. An internal combustion engine comprising:

(A) a housing defining a combustion chamber having an intake port;

(B) a first vane mounted for rotation in said combustion chamber about a fixed axis;

(C) a second vane mounted for rotation in said combustion chamber about said fixed axis independently of said first vane;

(D) control means preventing rotation of either vane in one direction about said axis while allowing free rotation in the other direction about said axis so that said vanes may rotate freely in said other direction about said axis and may simultaneously undergo relative rotation;

(E) converter means, including an output shaft, drivingly connected to said vanes and operative to convert such rotation of said vanes in said other direction and such relative rotation into unidirectional rotation of said output shaft in said other direction; and

(F) starter means for said engine including means for generating relative rotation of said vanes by delivering a charge to said intake port under a boost pressure.

4,890,592

IGNITION TIMING CONTROL SYSTEM FOR ENGINES

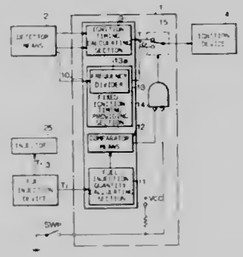
Masaaki Furuyama, and Kunihiro Abe, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 247,086

Claims priority, application Japan, Oct. 1, 1987, 62-249506

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—417 **2 Claims**



1. A system for controlling ignition timing of an engine for a motor vehicle, comprising:

detector means for detecting engine operating conditions and for producing output signals dependent on detected conditions;

ignition timing calculating means responsive to the output signals for producing an ignition timing signal;

fixed ignition timing providing means for producing a fixed ignition timing signal;

a fuel injection device for injecting fuel of a quantity dependent on engine operating conditions at an ignition time into cylinders of the engine;

an ignition device for igniting air-fuel mixture;

means for determing the quantity of the injected fuel and for producing a vehicle driving signal when the quantity is larger than a predetermined value which is sufficient for starting the motor vehicle;

an ignition timing fixing switch which is manually operated to produce a fixing signal for adjustment of ignition timing;

gate means responsive to the fixing signal to produce a first switching signal and responsive to the vehicle driving signal to produce a second switching signal;

a changeover switch responsive to the first switching signal for connecting an output of the fixed ignition timing providing means to the ignition device and responsive to the second switching signal for connecting an output of the ignition timing calculating means to the ignition device.

4,890,593

FUEL INJECTION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Carl R. Goulet, Daphne, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 17, 1988, Ser. No. 169,637

Int. Cl.[4] F02M *51/00*; **F02B** *3/00*

U.S. Cl. 123—489 **9 Claims**

1. A fuel injection system for an internal combustion engine of the type having an intake manifold, a rotary output shaft and at least one fuel injector, said at least one injector having a valve which, when open, enables the injection of fuel into a combustion chamber for the engine, said fuel injection system comprising:

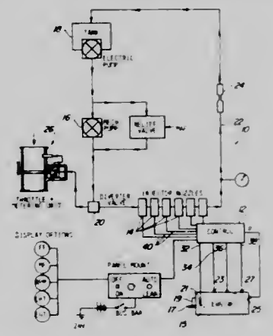
means located proximate to and associated with said shaft for producing at least one pulse per revolution of said shaft at a predetermined rotational position of said shaft,

means for measuring the pressure in the manifold and for providing a pressure output signal,

means for opening said valve in synchronism with said pulse,

means responsive to said pressure signal for generating a VALVE OPEN signal having a duration during a cruising condition solely proportional to said pressure signal, said VALVE OPEN signal being operable to open said at least one valve during the duration of said VALVE OPEN signal,

wherein the fuel injection is initiated at the same rotational position of the rotary output shaft and wherein the termination of the fuel injection per rotation of the shaft is varied to vary the amount of fuel injected into the engine.



4,890,594

DEVICE FOR THE PNEUMATIC INJECTION OF FUEL INTO A CYLINDER OF AN INTERNAL COMBUSTION ENGINE

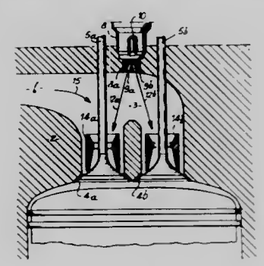
Pierre Duret, Paris, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Nov. 23, 1988, Ser. No. 275,521

Claims priority, application France, Nov. 27, 1987, 87 16613

Int. Cl.[4] F02M *23/00*

U.S. Cl. 123—531 **8 Claims**



1. A device for the pneumatic injection of fuel into a cylinder of an internal combustion reciprocating engine, comprising an injection chamber which may be placed in communication with the inner chamber of the cylinder through at least one valve controlled for injection at a given time in the operating cycle of the engine, the injection chamber being fed with pressurized gas through a duct and with liquid fuel through a liquid injector, opening in the injection chamber, wherein said injection chamber comprises two orifices opening into the chamber of the cylinder, with each of which is associated a valve and said injector comprises two outlet channels each directed to one of the orifices of the injection chamber.

4,890,595

MOTOR-DRIVEN CHAIN SAW HAVING AN ARRANGEMENT FOR PREHEATING FRESH INTAKE AIR

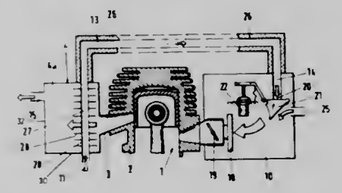
Hartmut Fischer, Winnenden, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,466

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729814

Int. Cl.[4] F01D *7/10*; **F02M** *31/08*

U.S. Cl. 123—556 **21 Claims**



1. A handheld portable tool such as a chain saw, the portable tool comprising:

a housing;

an internal combustion engine mounted in said housing;

said engine including a cylinder and a piston movably mounted in said cylinder to conjointly define a combustion chamber wherein exhaust gases are developed during operation of the engine;

an exhaust gas conduit for conducting said exhaust gases away from said combustion chamber, said exhaust gas conduit defining a cross section through which the exhaust gases flow;

a muffler mounted on the engine and defining a collecting chamber connected to said exhaust gas conduit for receiving said exhaust gases therein;

said collecting chamber having an exhaust outlet for passing the exhaust gases to the ambient and having a cross section greater than said cross section of said exhaust gas conduit thereby permitting the heated exhaust gases to collect in said collecting chamber before said exhaust gases pass to the ambient via said exhaust outlet;

a carburetor mounted on said engine for supplying a mixture of fuel and air to said combustion chamber;

an air intake conduit for conducting intake air to said carburetor; and,

said air intake conduit being mounted so as to pass directly through said collecting chamber whereby the heat of the exhaust gases collected in said chamber is transferred through said conduit to the intake air.

4,890,596

ARROW REST

William J. Barlow, Rte. 1, Box 504, Norwood, N.Y. 13668

Filed Aug. 8, 1988, Ser. No. 229,266

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—41 A **1 Claim**

1. The arrow rest for an archery bow that includes:

an arrow window defined by an arrow shelf and a vertically disposed sidewall,

a first coil spring connected to the bow sidewall and projecting into the arrow window, said first coil spring having its outer coil bent to slidably support a shaft of an arrow thereon,

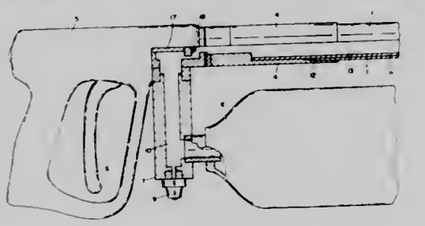
an elongated support arm removably connected at one end

to the bow sidewall on the side thereof opposite the arrow window,
a rod element slidably mounted in the outer end of said mounting support arm, said rod element being spaced from the bow sidewall and being disposed at substantially right angles to the support arm,
a bar member having a circular section rotatably secured at its proximal end in said outer end of said rod element for rotation about its own axis, said bar member being disposed so as to extend into the arrow window,
a second coil spring mounted on the distal end of said bar



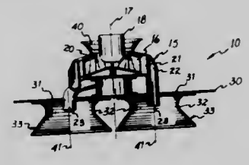
member to form a gap between said first and second coil springs, said second coil spring having its outer coil bent outwardly to slidably support the shaft of said arrow thereon whereby the shaft is supported between the two springs,
said support arm, said rod element and said bar member providing three directions of adjustment to said second coil spring in reference to said first coil spring to position said second coil spring obliquely below said first coil spring in arrow supporting relationship to enable a feather on the back of said shaft to pass freely through the gap between the coil springs.

4,890,597
ARROW GUN
Glen Ekstrom, Unionville, Canada, assignor to Swivel Machine Works, Inc., Unionville, Ontario, Canada
Filed May 17, 1988, Ser. No. 194,847
Int. Cl.[4] F41B *11/06, 11/08, 11/10*; A01K *81/06*
U.S. Cl. 124—74 **21 Claims**



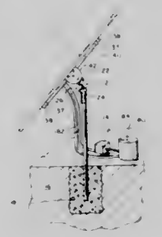
1. An arrow gun for propelling an arrow, harpoon or the like, comprising
a handle including a trigger;
an elongated barrel extending from said handle;
collar means for securing said barrel to said handle, said collar means being fixedly secured at a first end to said handle and circumferentially engaged about said barrel, said collar means having an inner diameter which tapers such that a seating gap is provided at a second end of said collar distant from said handle;
a compressed gas source; and
connection means including an air passageway for linking said compressed gas source to said barrel;
whereby said arrow is hollow and sealed at one end forming a tip and is frictionally disposed over said barrel prior to being propelled, said arrow being secured over said barrel by said tapered seating gap, said arrow being under pressure only upon actuation of said trigger.

4,890,598
HIGH EFFICIENCY BLOWER
Donald D. Kinsworthy, Dayton, Ohio, assignor to Nu-Tech Industries, Inc., Dayton, Ohio
Filed Jul. 29, 1988, Ser. No. 225,924
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 D **7 Claims**



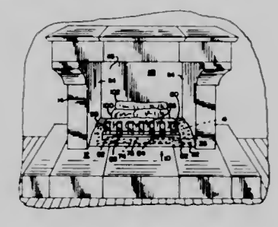
1. A jet blower comprising:
a blower wheel, and means for rotating said blower wheel,
a housing, said housing having
(a) a generally cylindrical chamber receiving said blower wheel on an axis,
(b) a plurality of tangential discharge passageways tangentially connected to said blower wheel chamber,
(c) each passageway terminating in a nozzle directed parallel to said axis,
and a Venturi surrounding each said nozzle,
whereby jets of air discharging from said nozzles entrain air passing through said Venturis and blow said air generally parallel to said axis.

4,890,599
SOLAR PANEL MOUNTING ASSEMBLY
Glenn E. Elden, 302 U.S. 30 East, New Haven, Ind. 46774
Continuation-in-part of Ser. No. 40,368, Apr. 16, 1987, Pat. No. 4,794,909. This application May 11, 1988, Ser. No. 193,292
Int. Cl.[4] F24J *2/38*
U.S. Cl. 126—424 **19 Claims**



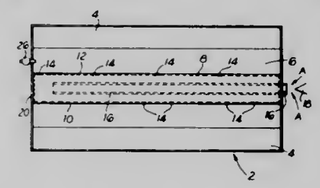
19. A mounting assembly for pivotally connecting a solar panel or collector to a base, said mounting assembly comprising:
a frame whereupon the solar panel or collector can be mounted;
a first plate connected to said frame, said plate having a pivot hole and a plurality of angle displacement holes each being equidistant from said pivot hole;
a second plate connected to the base and situated substantially parallel to said first plate, said second plate having a pivot hole and an angle displacement hole being situated substantially the same distance apart from said second plate pivot hole as said distance between said pivot and displacement holes of said first plate;
a pivot shaft received through said first plate pivot hole and said second plate pivot hole whereby said frame and first plate can pivot with respect to said second plate and the base;
an angle displacement shaft selectively received through said second plate angle displacement hole and any one of said first plate angle displacement holes whereby said frame and first plate can be selectively angularly fixed with respect to said second plate and the base;
a U-member having two legs, said second plate being connected to said U-member; and,
a selectively rotatable shaft situated substantially perpendicular to the axis of rotation between said first and second plates and being pivotally mounted on the base, said two legs connected to the selectively rotatable shaft whereby the frame is pivoted about the selectively rotatable shaft axis of rotation by pivoting said rotatable shaft.

4,890,600
FIREPLACE BURNING SIMULATOR UNIT
Wayne E. Meyers, Batavia, Ill., assignor to Genesis Technology, Batavia, Ill.
Filed Oct. 26, 1988, Ser. No. 262,800
Int. Cl.[4] F24C *5/02*
U.S. Cl. 126—512 **9 Claims**



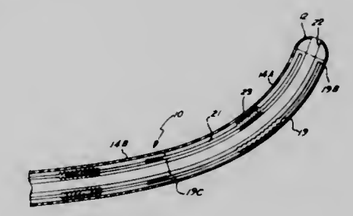
1. A unit to create an illusion of burning of natural wood logs in a fireplace, said unit comprising:
an enclosure defined in part by a bottom and a top panel spaced thereabove,
a reflective plate fitting on said enclosure bottom,
a reflection wheel including an elongated shaft carried by said enclosure and spaced between said enclosure bottom and said top panel to align with said reflective plate, said wheel having numerous, individual reflective strips attached to and positioned along said shaft and radially spaced thereabout in a spiral-like pattern,
rotating means operatively connected to said wheel to slowly rotate said wheel,
an elongated light source carried by said enclosure and positioned to proximately align with said reflection wheel and form an unobstructed space between said reflective plate, said light source and said wheel for direct passage of light therebetween,
lens means positioned over an opening in said enclosure top panel with said opening aligning with said reflective plate and said wheel, said lens means prepared to transmit light from said light source therethrough having an amber-red like color, and
fireplace paraphernalia carried on said enclosure top panel, said paraphernalia including a set of spaced apart log portions positioned over said lens means with said log portions having enhanced reflective lower edges,
wherein during use of said unit light from said source, light reflection from said reflective plate and light selectively reflecting from said slowly rotating reflective strips of said wheel may mix to create patterns of light that illuminate upward to pass through said lens means and reflect from said bottom edges of said log portions to create said illusion of burning of said log portions.

4,890,601
GAS BURNER
Barry C. Potter, Brailsford, United Kingdom, assignor to Gas Logs (Brailsford) Ltd., Derby, Great Britain
Filed Aug. 15, 1988, Ser. No. 232,287
Claims priority, application United Kingdom, Aug. 20, 1987, 8719655
Int. Cl.[4] F24C *3/00*; F23D *14/12*
U.S. Cl. 126—512 **20 Claims**



1. A gas burner comprising a tray, a first tube mounted in the tray, the tube being closed at both ends and having front and rear faces and a plurality of holes formed in at least the front face at spaced intervals along its length, a second tube housed within the first tube, and means for introducing a combustible mixture of gas and air into the second tube at a first end portion thereof, the second tube being open at the end remote from said first end portion so that in use said combustible mixture travels along the second tube and back along the first tube which it leaves through the holes and the first tube being mounted in the tray such that heat-resistant material can be arranged in the tray to dissipate gas expelled from the first tube through said holes in the operation of the burner.

4,890,602
ENDOSCOPE CONSTRUCTION WITH MEANS FOR CONTROLLING RIGIDITY AND CURVATURE OF FLEXIBLE ENDOSCOPE TUBE
Lawrence W. Hake, R.R. #2, Box 108, Grand Island, Nebr. 68803
Filed Nov. 25, 1987, Ser. No. 125,534
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **13 Claims**



1. In a flexible endoscope of the type including:
an elongate flexible tube having a distal end and a proximal end; and

a medical procedure system having at least a part thereof extending through the tube from the proximal end to the distal end, said system being capable of transmitting diagnostic data from the distal end to the proximal end or conducting a medical procedure at the distal end from the proximal end;

the improvement comprising, in combination: means within the tube for controlling the rigidity of a longitudinal segment of the tube; and

means external the tube for controlling the means within the tube segment;

said means for controlling rigidity comprising at least one flexible tube segment, said segment having a longitudinal center axis, said segment further including at least one longitudinal, flexible, hollow conduit generally parallel to the axis; and

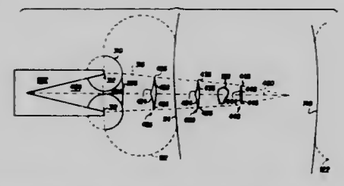
said means for controlling the means within the tube segment comprising means for inflating the conduit below the elastic limit to effect making the tube segment rigid by increasing fluid pressure within the conduit.

4,890,603

EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY EMPLOYING NON-FOCUSED, SPHERICAL-SECTOR SHOCK WAVES

William S. Filler, 7420 Westlake Ter. No. 1402, Bethesda, Md. 20817

Filed Nov. 9, 1987, Ser. No. 118,325
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A **14 Claims**



13. An apparatus for treating one or more hardened accumulations in the body of a living patient, comprising:

a source of shock wave energy, said energy being greater than a predetermined magnitude;

a sector shock tube, connected to said source, for generating sectors of classical diverging spherical shock waves from the shock wave energy generated by said source, said sector shock tube comprising a surface adapted for channelling said sectors in a non-focused but directional manner into the body of the patient;

said predetermined magnitude being large enough so that when said surface channels said sectors, said sectors comprise sufficient shock wave energy to disintegrate the hardened accumulation; and

a coupling means adapted to be disposed between said sector shock tube and the body of the living patient, through which said sectors are channelled for transmitting shock wave energy between said sector shock tube and the body of the patient.

4,890,604

TRACTION ASSEMBLY

Dorand N. Nelson, 1074 Iowa St., St. Paul, Minn. 55117

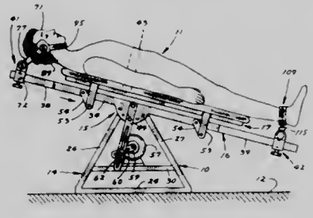
Filed Sep. 14, 1987, Ser. No. 95,998
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—74 **27 Claims**

20. A traction assembly comprising:

frame means having a first end including head restraint means and a second end including ankle restraint means fixed with respect to the head restraint means;

single platform having first and second ends and a generally flat surface and a sufficient length for support of the trunk portion of a patient between the lower neck and mid-leg region;

connecting means connecting the frame means to the platform with the first end of the platform located proximate the head restraint means and the second end of the platform located proximate the ankle restraint means and permitting longitudinal movement of the platform with respect to the first end and the second end of the frame means under the influence of gravity;



said head and ankle restraint means fixedly connected to the frame means and connectable to patient extremities to secure the extremities of the patient from movement with respect to the frame means;

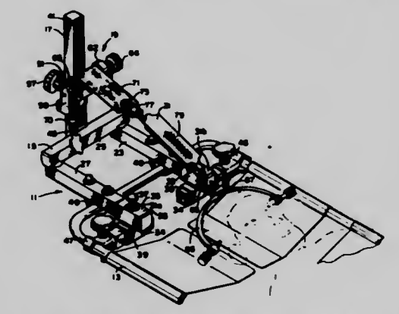
support means to supply rotational support to the frame means including rotational axis means to move the frame means between horizontal and inclined positions, the frame being fixed longitudinally with respect to the rotational axis means.

4,890,605

CERVICAL TRACTION DEVICE

Robert W. Rosendale, 181 Barnsbury Rd., Langhorne, Pa. 19047

Filed Dec. 4, 1987, Ser. No. 128,610
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—75 **6 Claims**



6. A cervical traction device for use with a stretcher, especially with the type of stretcher that is used for transporting trauma patients with spinal cord injuries by helicopter, for providing traction to an injured person having a fractured neck comprising

a frame having a U-shape with two parallel legs connected by a base portion and a vertical bar extending upwardly from the base portion,

attachment means for attaching the frame to the stretcher,

traction means for applying traction to the cervical spine of the injured person and for adjusting the amount of said traction,

vertical adjustment means for adjustably securing the sleeve at a desired position on the vertical bar to allow vertical height adjustment of the sleeve to obtain proper traction alignment with the injured person lying on the stretcher,

the traction means including a ratchet device mounted on the sleeve for applying traction to the cervical spine of the injured person and for adjusting the amount of said traction,

the ratchet device including,

a ratchet wheel rotatably mounted on a shaft in a bracket,

a movable pin mounted on the bracket and held in contact with the teeth of the ratchet wheel by a spring that is housed in the bracket,

a strap having a first end portion and a second end portion,

the first end portion of the strap being mounted on the shaft of the ratchet wheel,

a measuring device for measuring the traction applied to the cervical spine,

a connecting ring connecting the second end portion of the strap to the measuring device, and

an S-hook mounted at the end of the measuring device adapted to be connected to a tong that is secured to the head of the patient,

the frame being made of aluminum and being hollow,

said attachment means for attaching the frame to the stretcher including

a first clamp attached to the frame that connects the frame to one side of the stretcher,

a second clamp attached to the frame that connects the frame to another side of the stretcher, and

a pair of U-bolts that engage the head rail of the stretcher to increase the stability of the frame,

the vertical adjustment means for adjustably securing the traction means at a desired position on the vertical bar including a threaded bolt having a handle on its outer end, and having an inner end that presses against the vertical bar and

a nut mounted on a sleeve slideably mounted on the frame and through which the threaded bolt is screwed,

whereby the threaded bolt may be screwed through the nut and sleeve into pressing contact with the vertical bar to secure the sleeve at the desired position,

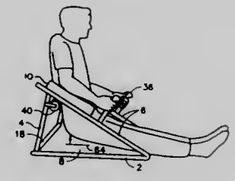
the weight measuring device being a dial scale or a spring-loaded weight scale.

4,890,606

USER CONTROLLED DEVICE FOR DECOMPRESSING THE SPINE

John F. Iams, Poway, and Robson L. Splane, Jr., Granada Hills, both of Calif., assignors to Superspine, Poway, Calif.

Filed Apr. 21, 1987, Ser. No. 40,841
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—75 **22 Claims**



1. An apparatus for decompressing the spine of a user positioned in a generally seated posture, which comprises:

a. a frame disposed to rest on an underlying generally rigid subsurface, and having two parallel spaced apart sides, each side having an elevation leg and a support leg supported by said subsurface, and a base leg, said legs forming a generally triangular side, and said sides being interconnected by cross members;

b. arm rest means with each support leg to provide support to a user's forearm, each arm rest means comprising:

b.1 grip means, projecting upwardly from said support leg, to provide a gripping surface for a user's hand, and

b.2 cushion rest means, lying along said support leg above the grip means, to provide a surface supporting the elbows and forearms,

wherein the elbows, forearms, wrists and hands wedge into the structure of the grip means and cushion means; and

c. each support leg being elevated at an angle of about 20° to about 45° above the horizontal, with the angle being maintained by said respective elevation leg;

wherein a user can by pushing with his forearms and hands against said arm rest means elevate himself with respect to said subsurface and thereby at least partially decompress his spine; and

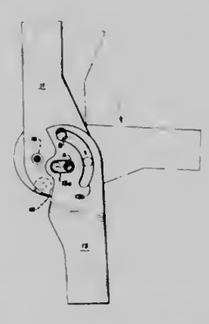
wherein the user's forearms and hands wedge into the arm rest means so that the user's upper body weight as transferred through his shoulder girdle is at least partially spread throughout the length of his forearms, reducing fatigue of the hands and wrists.

4,890,607

MULTIAXIS CONTROLLED MOTION KNEE ORTHOSIS

Jeffrey H. Townsend, 7106 Crestwood St., Bakersfield, Calif. 93308

Filed Sep. 28, 1988, Ser. No. 250,068
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 C **20 Claims**



1. In an appliance for stabilizing a knee joint in sagittal, coronal and transverse planes, having leg grasping means for clasping the appliance to the wearer's leg above and below the knee,

means defining a mechanical joint at the medial and lateral sides of the knee, each comprising

a pair of depending opposed femoral links, each said link terminating in an end portion,

a pair of opposed upwardly extending tibial links terminating in an end portion; each said end portion of said, tibial links being disposed in overlapping relation to a respective said end portion of said femoral links,

cam means interconnecting each said end portion of said femoral links to a respective said end portion of said tibial links. said cam means being disposed at lateral and medial sides of the knee,

each said cam means comprising a first and a second cam pin follower and a first and a second camming slot means, each said cam pin follower being fixedly positioned relative to a link of one of said pairs of femoral and tibial links and being relatively displaceable with respect to a link of the other of said pairs of femoral and tibial links within a respective camming slot means, said first and second cam pin followers and first and second camming slot means

forming a means for constraining the tibia to slide rearwardly relative to the femur for a predetermined distance during an initial range of flexion of the knee from a straight leg position, by a pivotal movement of one of said femoral and tibial links relative the other of said femoral and tibial links about said second cam follower means, and said first and second cam follower means and said first and second camming slot means forming a means for constraining beyond said initial range of flexion, one of said femoral and tibial links to rotate relative to the other of said femoral and tibial links in a predetermined arcuate path about said first cam follower means.

4,890,608

ATTACHMENT ASSEMBLY FOR USE ON THE HUMAN SKIN

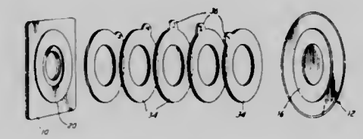
Peter L. Steer, Surrey, England, assignor to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed Jun. 4, 1986, Ser. No. 870,592

Claims priority, application United Kingdom, Jun. 20, 1985, 8515632

Int. Cl.[4] A61F *5/44*

U.S. Cl. 128—156 **6 Claims**



1. A wound management appliance for treating a wound of a patient comprising:

a medical grade adhesive pad for attachment to the skin surrounding the wound;

a plurality of adhesive annuli, one on top of the other and carried by the pad and surrounding the wound, for attaching a plurality of wound covers in sequence to the pad by exposing a fresh region of adhesive each time it is desired to attach a fresh wound cover; and

a plurality of sequentially peelable cover annuli separating said adhesive annuli.

4,890,609

AIR-DIRECTING APPARATUS FOR AIR MASK

Robert H. Wilson, II, 236 S. Carol Blvd., Upper Darby, Pa. 19082

Filed Jun. 27, 1988, Ser. No. 211,712

Int. Cl.[4] A61M *16/06*

U.S. Cl. 128—206.29 **3 Claims**

1. An apparatus for orally directing air through a face mask to remove dust from a work piece or work surface, comprising:

(a) a face mask having a convex outer surface and a concave inner surface made of an air-permeable material thereby preventing a wearer from inhaling irritants;

(b) a tube extending from outside said mask's convex outer surface and through said mask to its concave inner surface, so that an end of said tube may be placed in a mask wearer's mouth, a one-way valve attached to said tube to prevent aspiration of dust through said tube; and

(c) means for attaching and sealing said tube to said mask said means comprising concentric threaded members sealingly engaging both said outer and said inner surfaces of said face mask; so that the mask wearer may orally direct air away from a workpiece or surface by blowing through said tube.

4,890,610

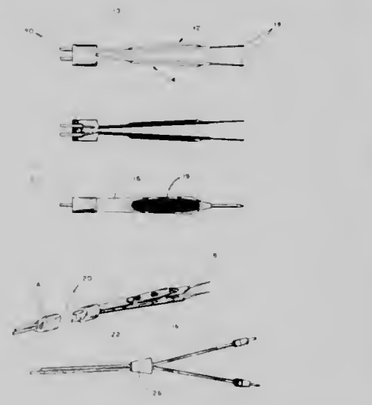
BIPOLAR FORCEPS

Lawrence T. Kirwan, Sr., 81 Island Creek Rd., Duxbury, Mass. 02332, and Lawrence T. Kirwan, Jr., 203 Indian Pond Rd., Kingston, Mass. 02364

Continuation-in-part of Ser. No. 232,559, May 15, 1988, abandoned, which is a continuation of Ser. No. 83,375, Aug. 15, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,837

Int. Cl.[4] A61B *17/36*

U.S. Cl. 606—51 **11 Claims**



1. A microsurgical bipolar forceps comprising elongated, unitary, coined, first and second tine portions and a first and second housing portions, each of tine portions having a first and second terminal ends and the first tine portion having a first blade, and the second tine portion having a second blade, each of the first and second blades including a front terminal end and a rear terminal end and the first blade positioned within the first housing and the second blade positioned within the second housing, the first terminal end providing a tip and the second terminal end providing a connector pin, the tip extending longitudinally from the front terminal end and the connector pin extending longitudinally from the rear terminal end, the first and second tine portions being formed of a material capable of carrying an electric current, the first housing portion overmolded and covering the first blade and the second housing portion overmolded and covering the second blade and the first and second housing portions formed of a material that will distort the first and second tine portions when the forceps are exposed to steam at 250 degrees F. and pressure for a period of twenty minutes, the connector pin of each blade adapted to engage an electric socket.

4,890,611

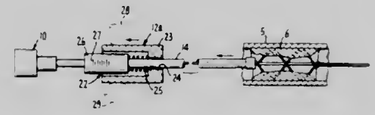
ENDARTERECTOMY APPARATUS AND METHOD

Michelle Y. Monfort, Los Altos; Albert K. Chin, Palo Alto, and Kenneth H. Mollenauer, Santa Clara, all of Calif., assignors to Thomas J. Fogarty, Portola Valley, Calif.

Filed Apr. 5, 1988, Ser. No. 178,029

Int. Cl.[4] A61B *17/22*

U.S. Cl. 606—159 **3 Claims**



1. An endarterectomy instrument for removing an arteriosclerotic deposit adhered around the interior of an artery, said instrument comprising:

a flexible catheter having a proximal and a distal end;

a flexible guidewire having a proximal and a distal end, said guidewire slidably extending through and protruding from said catheter and having affixed to its proximal end a handle;

collapsible plaque gripping and shearing means comprising at least one flexible wire having a first end affixed to the distal end of said guidewire and a second end affixed to the distal end of said catheter, said means being variably expansible and contractible by longitudinal movement of said guidewire relative to said catheter between a first reduced diameter condition of a cross-section enabling the means to be passed through the artery and into the deposit without abrading the artery and a second expanded diameter condition embedded in gripping engagement with the deposit without substantial contact of the means with the artery; and,

a shear force gauge to apply pulling force to the catheter and measure the pulling force applied to the plaque gripping and shearing means through the catheter, said gauge comprising:

a gauge block affixed to the proximal end of the catheter, said block having gradation indicia on the external surface thereof;

a pulling member slidably and rotatably received on the catheter adjacent the distal end thereof, said member having a portion thereof alignable with the indicia on the block; and

a compression coil spring received on the catheter intermediate the gauge block and pulling member.

4,890,612

DEVICE FOR SEALING PERCUTANEOUS PUNCTURE IN A VESSEL

Kenneth Kensey, Hinsdale, Ill., assignor to Kensey Nash Corporation, Exton, Pa.

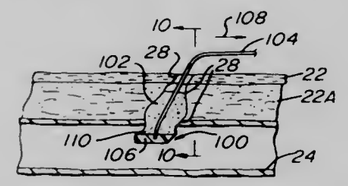
Continuation-in-part of Ser. No. 15,267, Feb. 17, 1987, Pat. No. 4,744,364. This application May 16, 1988, Ser. No. 194,641

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[4] A61B *17/04*

U.S. Cl. 606—213 **42 Claims**

1. A closure device for sealing a puncture or incision formed percutaneously in tissue separating two internal portions of the body of a living being, said device comprising plug means arranged for placement at a predetermined position within the body of said being and having a first holding portion adapted to engage portions of the tissue adjacent said puncture or incision to hold said plug means in place and a second sealing portion formed of an expandable material which expands automatically in response to the ambient surroundings when in said predetermined position and extending through said puncture or incision to engage the tissue contiguous therewith to seal



said puncture or incision from the flow of a body fluid therethrough between said two internal portions.

4,890,613

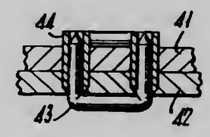
TWO PIECE INTERNAL ORGAN FASTENER

Donald M. Golden, Cherry Hill, N.J., and William P. McVay, New Milford, Conn., assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 909,348, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 736,917, May 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 648,094, Sep. 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 359,443, Mar. 18, 1982, abandoned. This application Aug. 12, 1987, Ser. No. 84,665

Int. Cl.[4] A61F *13/00*; F16B *21/00*

U.S. Cl. 606—220 **8 Claims**

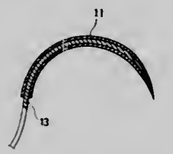


1. A sterile internal organ fastening device, for joining human or animal tissue, said device comprising a staple having improved penetration characteristics and a receiver for said staple, said staple having a pair of substantially round, spaced apart legs connected together at one end of the staple, each of said legs having a straight rounded portion adjacent said connected area and a tapered portion extending from said straight portion, said tapered portion terminating in a sharp point, the length of the tapered portion, measured from the start of the taper to the sharp point, being at least three times the diameter of the straight rounded portion whereby said staple leg has improved penetration characteristics, said receiver having a pair of spaced apart legs connected together at one end of the receiver, the free end of each of said receiver legs having a substantially round opening therein for accepting the leg of said staple, said opening adapted to engage said staple leg to hold said staple and receiver together.

4,890,614
SUTURE NEEDLE AND ITS MANUFACTURING PROCESS

Tsutomu Kawada, Tokyo, and Yasuo Nakamura, c/o Nakamura Co., Ltd, 3-3, Nihonbashi Honcho Chuo-Ku, both of Japan, assignors to Yasuo Nakamura, Tokyo, Japan

Continuation of Ser. No. 29,058, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 830,926, Feb. 19, 1986, Pat. No. 4,672,734. This application Aug. 24, 1988, Ser. No. 236,274
Int. Cl.[4] A61B *17/06*
U.S. Cl. 600—339 **1 Claim**

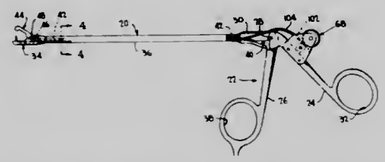


1. A suture needle structure comprising a suture and curved metal needle body in which the needle body has a hollowed portion extending from a back end of the needle body toward a point front end of the needle body over substantially the entire length of the needle body, said suture extending into and along substantially the entire length of the hollow portion and the suture being caulked in the hollow portion, the needle body comprising a plate surrounding the suture with opposite lengthwise edges of the plate being in contact substantially along the entire length of the needle body.

4,890,615
ARTHROSCOPIC SUTURING INSTRUMENT

Richard B. Caspari, Maidens, Va.; Arthur F. Trott, Largo, and F. Barry Bays, Seminole, both of Fla., assignors to Concept, Inc., Largo, Fla.

Filed Nov. 5, 1987, Ser. No. 117,158
Int. Cl.[4] A61B *17/06, 17/04*
U.S. Cl. 606—146 **22 Claims**

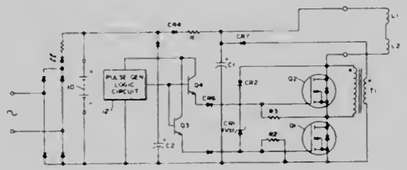


1. A suturing instrument for use in surgery comprising
a member including an elongate tube having a proximal end and a distal end and a handle member extending from said proximal end of said tube and adapted to be gripped by a surgeon;
a hollow needle extending from said distal end of said member for penetrating tissue to be sutured; and
suture material feeding means for feeding suture material along said tube and through said needle whereby suture material can be passed through tissue to be sutured, said suture material feeding means including a roller feed mechanism mounted on said member having inlet means for receiving suture material, outlet means for supplying suture material to said tube and roller means rotatable for drive suture material from said inlet means through said outlet means and said tube to said hollow needle for passage therethrough.

4,890,616
ENERGY SAVING TECHNIQUE FOR BATTERY POWERED INDUCTOR

B. Hubert Pinckaers, Edina, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 624,873, Jun. 27, 1984, abandoned. This application Oct. 18, 1985, Ser. No. 788,379
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 R **5 Claims**

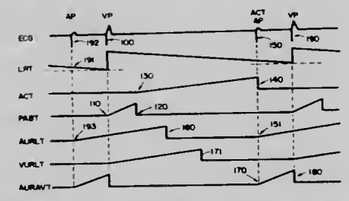


1. Medical treatment apparatus comprising:
(a) means for applying an electromagnetic field to a treatment site of a patient;
(b) means responsively coupled to said applying means for generating a flow of current and a subsequent flow of current in said applying means;
(c) means responsively coupled to said generation means for interrupting said flow of current in said applying means;
(d) means responsively coupled to said applying means for storing excess energy present in said applying means upon interruption of said flow of current by said interrupting means; and
(e) means responsively coupled to said generating means and said storing means for enabling said generating means to utilize said excess energy for generating said subsequent flow of current.

4,890,617
DUAL CHAMBER ACTIVITY RESPONSIVE PACER

H. Toby Markowitz, Roseville; Kevin Prest-Berg, Stillwater, and David L. Thompson, Fridley, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 25, 1987, Ser. No. 125,422
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG **8 Claims**

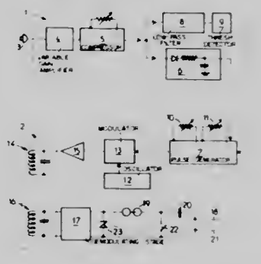


1. A pacemaker for implantation in a patient, said pacemaker of the type comprising:
ventricular output means for generating ventricular pacing stimuli;
atrial output means for generating atrial pacing stimuli;
first timer means coupled to said ventricular and atrial output means for determining an A-V interval following the generation of an atrial pacing stimulus by said atrial output means and for triggering a ventricular stimulus at the expiration of said A-V interval; and
second timer means responsively coupled to said atrial and ventricular output means for determining a V-A time interval following generation of a ventricular pulse by said ventricular output means, and for triggering an atrial pacing stimulus by said atrial output means at the expiration of said V-A time interval, said pacemaker characterized in that it further comprises:
third timer means responsively coupled to said atrial and ventricular output means for determining a second V-A time interval following generation of a ventricular pacing stimulus by said ventricular output means and for triggering generation of an atrial pacing stimulus by said atrial output means at the expiration of said second V-A interval, said atrial output stage triggering an atrial pacing stimulus in response to the first of said first V-A interval and said second V-A interval to expire following the immediately preceding ventricular pacing stimulus; and
sensor means responsive to the physical activity of the patient in which said pacemaker is implanted for regulating the duration of said second V-A interval.

4,890,618
NERVE-STIMULATING DEVICE FOR AUDITORY PROSTHESIS

Jean-Luc M. Weber, Salon de Provence; Serge Bloch, Aix en Provence; Jean-Claude Noack, Cabries; Claude-Henri Chouard, 10, Boulevard Flandrin, 76016 Paris, and Patrick MacLeod, 424 Avenue de la Division Leclerc, 92290 Chatenay Malabry, all of France, assignors to Bertin & CIE, Plaisir Cedex; Claude-Henri Chouard, Paris and Patrick MacLeod, Chatenay-Malabry, all of, France

Filed Sep. 12, 1986, Ser. No. 906,520
Claims priority, application France, Sep. 12, 1985, 85 13528; Sep. 12, 1985, 85 13529
Int. Cl.[4] A61N *1/18*
U.S. Cl. 128—420.6 **12 Claims**

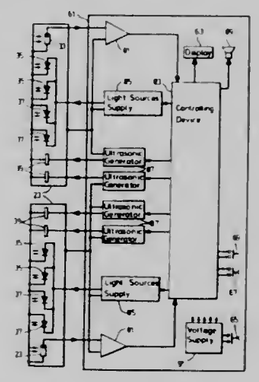


1. A single channel-stimulating device for an auditory prosthesis comprising:
a single-channel electrode means for electrically stimulating an auditory nerve,
transducer means for receiving a sound signal and providing a corresponding electrical input signal,
patient externally worn electronic processor means connected to said transducer means for processing said electrical input signal, said processor means including
first processing means including a low-pass filter for filtering said input electrical signal and producing a first output electrical signal having a frequency representative of the pitch of a voiced sound signal received by said transducer means,
second processing means connected in parallel with said first processing means and including rectifying and filtering means for rectifying and filtering said electrical input signal and generating a second output signal having a level representative of the total energy of the sound signal received by said transducer means, and
third processing means connected to said first and second processing means and including modulating and/or encoding means for generating an electrical control signal as a function of said first and second output electrical signals,
a patient implantable electrical exciting circuit connected to said single-channel electrode means and driven by said electrical control signal for applying to said electrode means an electrical stimulation pulse signal which represents both the total energy and the pitch of a voiced sound signal received by said transducer means, and
transmitting means for transmitting said electrical control signal from said processor means to said exciting circuit.

4,890,619
SYSTEM FOR THE MEASUREMENT OF THE CONTENT OF A GAS IN BLOOD, IN PARTICULAR THE OXYGEN SATURATION OF BLOOD

Rudolf A. Hatschek, P.O. Box 64; 3, rue Jacques-Vogt, CH-1700 Fribourg, Switzerland

Filed Apr. 14, 1987, Ser. No. 38,296
Claims priority, application Switzerland, Apr. 15, 1986, 1497/86; Apr. 15, 1986, 1498/86
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—633 **19 Claims**



1. System for the measurement of the content of a gas in the blood of a living being in a region of the body thereof, the system comprising:
radiation means adapted to radiate waves into the region of the body for heating the region;
controlling means provided for controlling the power output of the waves radiated by said radiating means;
at least one light receiver for optically measuring the gas, and wherein said controlling means are adapted to control said radiating means in a way to have a value representing a measure for the changes in the intensity of light emitted from the bodily region and received by said light receiver which, at least one of, lie within a predetermined desired value range and equal a desired value.

4,890,620
TWO-DIMENSIONAL DIFFUSION GLUCOSE SUBSTRATE SENSING ELECTRODE

David A. Gough, Cardiff by the Sea, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 79,169, Jul. 28, 1987, abandoned, which is a continuation of Ser. No. 778,861, Sep. 20, 1985, abandoned. This application Feb. 17, 1988, Ser. No. 161,214
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—635 **25 Claims**

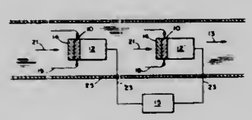
1. A sensor system for determining the concentration of a predetermined first material in a body fluid, which first material reacts stoichiometrically in said body fluid in the presence

of a catalyst or enzyme with a second material to form a third material, which system comprises:

first sensor means and second sensor means, each having a surface sensitive to either said second material or said third material and each producing a signal indicative of the concentration of said second or third material in said body fluid in contact with said surface of said sensor means;

a first permeable layer disposed completely across the surface of said first sensor means and containing said catalyst or enzyme, said first layer being permeable to all of said first, second and third materials;

a like first permeable layer disposed completely across the



surface of said second sensor means but not containing said catalyst or enzyme;

a second permeable layer disposed completely across each of said first layers distal to said surface of said sensor means, said second layer being permeable to said second material but substantially impermeable to said first material;

the disposition of said first and second layers thus permitting said second material to enter said layers for migration to said sensor means through the periphery of both of said layers and the distal surface of said second layer but essentially permitting like entry of said first material only through the periphery of said first layer; and

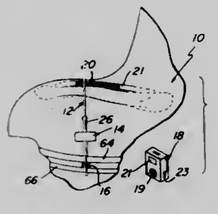
means to compare said signals to determine the concentration of said first material in said body fluid.

4,890,621

CONTINUOUS GLUCOSE MONITORING AND A SYSTEM UTILIZED THEREFOR

Said I. Hakky, Largo, Fla., assignor to Northstar Research Institute, Ltd., Philadelphia, Pa.

Filed Jan. 19, 1988, Ser. No. 145,066
Int. Cl.[4] A61B *5/14*
U.S. Cl. 128—635 **12 Claims**



1. A method of continuously monitoring the glucose level in a patient including the steps of:

establishing a negative pressure for aiding in separating a clear liquid component of the patient's blood from the blood cells and proteins thereof and for continuously passing the clear liquid component in a predetermined path by connecting a pressure regulating device to spaced-apart ribs of the patient, whereby the breathing activity of the patient is employed to establish the negative pressure;

detecting an optical property of the clear component as it moves along said predetermined path; and

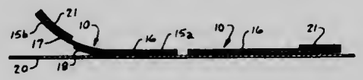
employing information obtained regarding the detected optical property to determine the glucose level in the blood.

4,890,622

DISPOSABLE BIOMEDICAL ELECTRODE

Robert K. Ferrari, 100 S. 13th St., P.O. Box 578, Herrin, Ill. 62948

Filed Oct. 27, 1988, Ser. No. 263,372
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—640 **5 Claims**



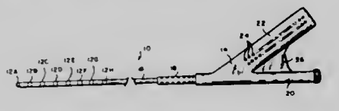
1. A disposable biomedical electrode of the type adapted for connection by a clip-on connector assembly to a lead wire, comprising, a semi-flexible composite sheet member having a non-conductive upper layer at an upper side and a conductive lower current distributing layer at a lower side, the semi-flexible sheet member having an electrode section and an integral tab section, a layer of biomedical electrically conductive, pressure sensitive adhesive adhered to the conductive lower current distributing layer of the sheet member only on the electrode section such that the conductive lower current distributing layer remains exposed on the tab section, the improvement comprising a layer of resilient foamed plastic fixed on the non-conductive upper layer of the electrode on only a portion of the tab section of the semi-flexible sheet member that is spaced along the tab section in a direction away from the pressure sensitive adhesive on the electrode section to enhance gripping of the tab section by the clip-on type connector assembly and facilitate flexing of the tab section in the area intermediate the electrode section and the layer of resilient foamed plastic.

4,890,623

BIOPOTENTIAL SENSING DEVICE AND METHOD FOR MAKING

William Cook, Billerica; Jack Herman, Andover; Donald Rowe, Lowell, and John Sylvanowicz, Andover, all of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Mar. 14, 1988, Ser. No. 167,878
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 **24 Claims**



1. A biopotential sensing device comprising:

a thin flexible substrate having a proximal end and a distal end;

a predetermined printed circuit pattern formed on said substrate, said pattern having at least one electrode pad at its distal end, at least one terminal pad at its proximal end and conductor means selectively interconnecting said electrode pads and said terminal pads;

an elongated support member; and

means for mounting and securing said substrate to said support member, said means causing the covering of said conductor means while leaving said electrode pads and said terminal pads exposed.

4,890,624

FETAL HEART RATE COUNTING SYSTEM USING DIGITAL SIGNAL PROCESSING

Dipankar Ganguly, Redmond, and Gary B. Sanders, Carnation, both of Wash., assignors to Air-Shields, Inc., Hatboro, Pa.

Filed Mar. 22, 1988, Ser. No. 171,762
Int. Cl.[4] A61B *8/02*
U.S. Cl. 128—661.07 **25 Claims**



1. A system for determining fetal heart rate data for use in a fetal monitor, comprising:

means for transmitting a signal into the fetal heart while the fetus is in utero;

means for receiving a returning Doppler signal from the fetus, frequency-shifted by action of the fetal heart;

means for processing the returning Doppler signal so as to produce simultaneously a plurality of processed Doppler signals occupying a common band of frequencies, each processed Doppler signal representing a different component of the returning Doppler signal and containing fetal heart rate data;

means for obtaining fetal heart rate data from each of said processed Doppler signals; and

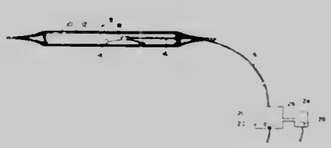
means for selectively combining the fetal heart rate data obtained from said processed Doppler signals in such a manner as to produce composite fetal heart rate data which is more accurate than the fetal heart rate data obtained from any of the processed Doppler signals individually.

4,890,625

BLOOD PRESSURE CUFF WITH INTEGRAL ACOUSTIC PICKUP CUP

Jay R. Sorensen, Aloha, Oreg., assignor to SpaceLabs, Inc., Bothell, Wash.

Filed Mar. 24, 1988, Ser. No. 172,718
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—680 **12 Claims**



1. A blood pressure cuff comprising:

a flexible casing having a rectangular pocket formed therein;

a relatively thin, flexible rectangular bladder positioned in the pocket of said casing;

an acoustic pickup cup mounted in said bladder in a manner that allow said cup to pick up Korotkoff sounds when said blood pressure cuff is placed on a patient, said cup having an aperture formed therein between the interior of said cup and the interior of said bladder to allow the pressure in the interior of said cup to equalize; and

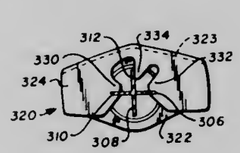
a pneumatic tube extending from the interior of said cup through said bladder, whereby the pressure in said bladder and acoustic signals picked up by said cup are both coupled through said tube.

4,890,626

REMOVABLE LOCKING DEVICE FOR USE WITH SYRINGES

Ko P. Wang, 11006 Nacirema La., Stevenson, Md. 21153

Division of Ser. No. 897,936, Aug. 19, 1986, Pat. No. 4,791,937.
This application Jul. 18, 1988, Ser. No. 222,096
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—752 **2 Claims**



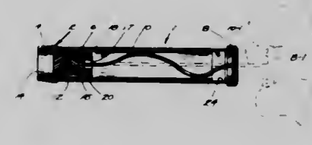
1. A removable attachment for use with a syringe, said syringe including an elongated barrel having a planar end wall at one end thereof and a separate plunger slidably received in said barrel, said plunger being formed from opposing webs having a cruciform cross section, at least one pair of notches being formed in opposing webs, said planar end wall being oriented at approximately 90? to a barrel axis, said attachment comprising two spaced apart end wall members joined together by at least one side wall member, each of said end walls including means defining an opening for receiving portions of said syringe therein, one of said end walls including first and second flanges extending into said opening means on said one end wall at substantially diametrically opposed locations, and a third member extending into said opening means on said one end wall and positioned at a location intermediate to said first and second flanges, the opening means in the other end wall opening to an edge of said other end wall so that said attachment can be slidably mounted on said planar end wall and about the barrel to properly position the plunger relative to the barrel and to look the plunger in at least one desired position.

4,890,627

MANUALLY EVACUATED SUCTION TUBE

Terry M. Haber, Lake Forest; Clark B. Foster, El Toro, and William H. Smedley, Lake Elsinore, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Nov. 9, 1987, Ser. No. 118,759
Int. Cl.[4] A61B *5/14*
U.S. Cl. 128—765 **18 Claims**



1. A suction tube in which a vacuum is to be established, said suction tube comprising:

a tube body having distal and proximal ends;

sealing means connected to said tube body to close the distal end thereof and to seal said distal end from the atmosphere;

end cap means detachably connected to said tube body to close the proximal end thereof and to seal said proximal end from the atmosphere;

piston means located at the interior of said tube body between said sealing means and said end cap means; and

linking means extending through said tube body between said piston means and said detachable end cap means, such

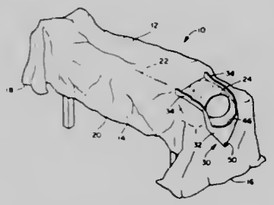
that the detachment of said end cap means from said tube body and the application of an axial pulling force to said end cap means causes a corresponding axial movement of said piston means towards the proximal end of said tube body, said piston means resealing the proximal end of said tube body from the atmosphere after the detachment therefrom of said end cap means.

4,890,628

SURGICAL DRAPE WITH MEANS FOR CHANNELING AND COLLECTING FLUIDS

Elizabeth M. Jackson, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 3, 1987, Ser. No. 128,554
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—849 **6 Claims**



1. A surgical drape for channeling and collecting fluids comprising:

a main sheet having a front surface, a back surface, a top edge and a bottom edge joined by a pair of opposed side edges and a fenestration located therein, and

a fluid collection bag for receiving such fluids attached to said front surface of said main sheet, said fluid collection bag having a front panel and a rear panel joined along common side edges and defining a fluid receiving chamber therein with an open top end positioned adjacent said fenestration in said main sheet,

said front and rear panels further forming a trough on either side of said bag extending upwardly from said open top end along said common side edges of said bag and being integrally formed therewith, each trough having an upper flap formed from said front panel and a lower flap formed from said rear panel, said upper and lower flaps being joined along a common edge such that said troughs and said open top end of said bag surround at least a portion of said fenestration, said troughs opening inwardly toward said fenestration so as to contain and channel such fluids into said open top of said fluid collection bag.

4,890,629

HUMAN CENTRIFUGATION MACHINE

Elida S. Izaui Capelo, and María E. Izaui Capelo, both of Arenal Grande 2777 St., Montevideo, Uruguay

Filed Jun. 8, 1987, Ser. No. 61,230
Claims priority, application Uruguay, Jun. 6, 1986, U2249; Argentina, Mar. 25, 1987, 307110
Int. Cl.[4] A61M *21/00*
U.S. Cl. 128—897 **5 Claims**

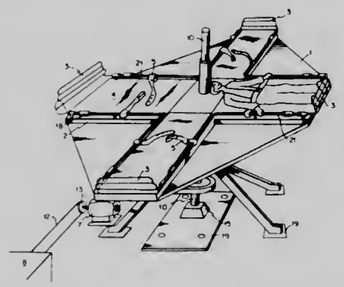
1. A human centrifugation machine comprising

a shaft mounted for rotation about its longitudinal axis;

a plurality of first support means connected to said shaft for rotation therewith and extending radially of said shaft and transversely to said axis, said plurality of first support means adapted to at least partially support at least two humans during rotation;

restraint means for holding each human respectively in position on one of said first support means during rotation;

second support means removably attached to said first support means, said second support means when attached providing a plurality of sloped surfaces, each said sloped surface extending from each said first support means toward said shaft and being acutely angled relative to both said shaft and each said first support means, each human being positioned either to lie in a supine position on one of said first support means with the head of said human



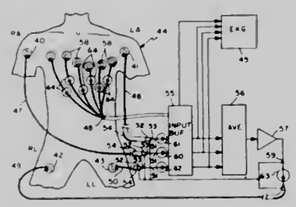
adjacent said shaft when said second support means is removed, or being positioned on one of said first support means in a half-seated position with said second support means attached, the back of the human from hips upward resting against one of said sloped surfaces, the rear end and feed of said human being supported by one of said first support means; and means for rotating said shaft.

4,890,630

BIO-ELECTRIC NOISE CANCELLATION SYSTEM

Mark W. Kroll; Kenneth M. Olson, both of Minnetonka, and Patrick S. Flynn, West St. Paul, all of Minn., assignors to Cherne Medical, Inc., Minneapolis, Minn.

Filed Jan. 23, 1989, Ser. No. 299,086
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—901 **20 Claims**



1. A system for cancelling bio-electric noise on a human body, comprising:

(a) a plurality of monitoring electrodes for reception of bio-electric signals, each said monitoring electrode having a conductive monitoring lead and a monitoring shield around said monitoring lead;

(b) at least one driving electrode for transmission of a noise cancelling correction voltage, said at least one driving electrode having a conductive driving lead and a driving shield around said driving lead;

(c) signal averaging means having an input and an output, said monitoring leads being connected to said signal averaging means input;

(d) an amplifier providing said correction voltage and being connected to said signal averaging means output, said amplifier having an output connected to said at least one driving lead; and

(e) a conductive connection between said at least one driving shield and said amplifier output.

4,890,631

EXTERNAL FIXATION DEVICE INTENDED FOR ORTHOPEDIC USE

Jean-Marie Hardy, Larches, France, assignor to Societe De Realisations Electro-Mecaniques Sorem, Toulon Cedex, France

Continuation of Ser. No. 830,654, Feb. 18, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 153,516
Claims priority, application France, Feb. 22, 1985, 85 02577
Int. Cl.[4] A61F *5/04*
U.S. Cl. 606—59 **8 Claims**



1. An external fixation device for orthopedic use adapted to be used with the so-called ILIZAROV method, comprising:

at least two hoops for a substantially cross-shaped attachment of pins,

cross-pieces connecting said hoops in spaced relation, each cross-piece including a first end connected to one hoop and a second end connected to another hoop,

means for adjusting the length of said cross-pieces for putting under traction or compression, at least a bone fragment to which said cross-pieces connect respectively, through the hoops and the pins,

first clamp means for clamping a first end of each pin;

second clamp means for clamping a second opposite end of each pin; said first clamp means and said second clamp means are connected to said hoops diametrically; and

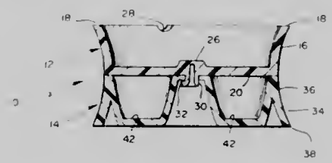
means for moving said first clamp means away from said second clamp means to tension the respective pin.

4,890,632

ROTATABLE SMOKELESS ASHTRAY

Israel Diamond, Franklin Square, N.Y., assignor to Merchandising Display Corporation, Englewood, N.J.

Filed Jul. 21, 1988, Ser. No. 223,894
Int. Cl.[4] A24F *19/08*
U.S. Cl. 131—237 **14 Claims**



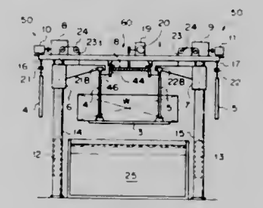
1. A two component rotatable smokeless ashtray for receiving and containing discarded smoker's materials, the ashtray comprising a base component and a receptacle component including means for supporting a smoker's article, the base component including an upper bearing plate, means forming an opening in the contour of the plate for receiving discarded smoker's materials, the receptacle including a bottom surface, the bottom surface substantially conforming in contour with the bearing plate, the bottom surface of the receptacle abutting the bearing plate, one of the components including journal means interconnecting the components for rotation about an axis, the journal means including means for preventing separation of the components except in a selected position of relative rotation of the components, the other component including means forming an orifice concentric with the rotation axis, the orifice receiving the journal means, the bottom surface including an aperture, the aperture and opening being spaced from the orifice and being registered with one another in at least one position of relative rotation of the components whereby access to the base for depositing smoker's materials is provided through the aperture, the bottom surface of the receptacle sealing the opening in at least one other position of relative rotation of the components whereby the deposited smoker's materials are sealed within the base, each component being formed of one piece unitary molded construction.

4,890,633

TREATING APPARATUS EQUIPPED WITH A SWING MECHANISM

Fumio Yasui, Omiya, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 12, 1988, Ser. No. 284,060
Claims priority, application Japan, Dec. 26, 1987, 62-328406
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—76 **3 Claims**



1. An apparatus for transferring a workpiece to be treated along a path through a series of successive treating zones with the workpiece being immersed in dipping baths or sprayed with treating liquid within the respective zones, said apparatus comprising:

a plurality of rod hangers disposed in pairs along the path with one hanger of each pair on one side of the path and the other hanger of each pair on the other side of the path for supporting a workpiece on each pair;

a pair of hanger traveling rails extending parallel with said path, one rail movable supporting the upper end of a corresponding hanger of each of said pairs of hangers and the other rail movable supporting the upper end of the other hanger of each of said pairs of hangers;

a hanger advancing means for advancing said hangers along said rails; and

a plurality of pairs of hanger raising and lowering assemblies, at least one adjacent each of said treating zones, with one hanger raising and lowering assembly of each pair on one side of said path and the other hanger raising and lowering assembly on the other side of said path;

each of said hanger traveling rails having movable rail portions located at each corresponding treating zone and fixed rail portions extending between said treating zones, said hanger raising and lowering assemblies being con-

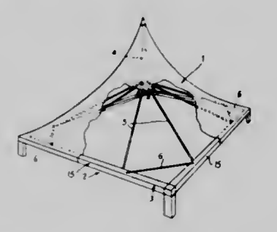
nected to said movable rail portions and operable for, when a pair of right and left hangers is moved onto movable rail portions corresponding to the right and left hanger raising and lowering assemblies, simultaneously or alternately moving said movable rail portions for moving said hangers up and down for causing a workpiec being carried by the hangers to move downwardly into the treating zone and to tilt or oscillate within the treating zone and to move upwardly out of the treating zone, the distance said movable rail portions are movable in the downward direction from the fixed rail portions being less than the vertical distance from said fixed rail portions to the top of the treating zone, whereby said movable rail portions are kept out of the treating zones.

4,890,634

FRAMEWORK FORMING SUPPORT FOR A TENT CANVAS OF A LIGHT SHELTER

Jean Dalo, 1, rue Beaurepaire, 91410 Roinville-sur-Dourdan, and Pierre Dalo, ZAC du Bel-Air - Rue Pierre Métairie, 78120 Rambouillet, both of France

Filed May 2, 1988, Ser. No. 189,428
Claims priority, application France, May 7, 1987, 87 06477
Int. Cl.[4] E04H *15/26*
U.S. Cl. 135—99 **20 Claims**



1. A framework forming a support for a tent canvas for a light shelter, the tent canvas being stretched in a substantially pyramidal form on the top of a vertical central pole, comprising:

a rigid frame having sides connected together in the form of a regular polygon lying in a horizontal plane and defining a base of a pyramid;

means for hooking the sides of the tent canvas to said rigid frame;

the lower end of said central pole being located at a level higher than the horizontal plane of said polygonal frame;

rigid arms for maintaining said pole vertically, said rigid arms being inclined and having upper ends rigidly coupled in common to the lower end of said vertical central pole;

a bisectrix bisecting the angle formed by two adjacent sides of said frame, the points of connection of two adjacent inclined arms with said two adjacent sides of the frame being symmetrical with respect to said bisectrix of the angle formed by said two sides and displaced from the vertex of said angle;

the said hooking means on the sides of said frame displaced from the vertex of said angle, said hooking means on two adjacent sides of said frame being symmetrical; and

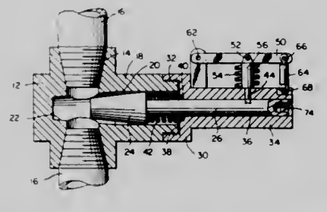
crosspieces extending respectively across the angles of said frame between said hooking means defining points of hooking on the sides of said frame which are symmetrical with respect to said bisectrix of each angle.

4,890,635

FIRE CONTROL VALVE

Charles H. Gray, Jr., 606 E. X St., Deer Park, Tex. 77536

Filed May 11, 1988, Ser. No. 192,640
Int. Cl.[4] F16K *31/64*
U.S. Cl. 137—75 **2 Claims**



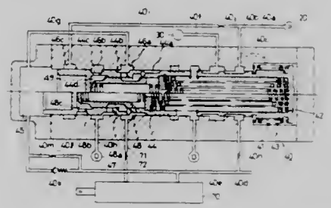
1. A fire control valve comprising a valve body having a flow passage therethrough and adapted to be connected to a flow line through which flammable material flows, said valve body including a valve seat extending perpendicular to said flow passage, a valve member including a valve plug selectively engageable with the seat and forming a closure for the flow path when engaged with the seat, spring means biasing the valve plug into engagement with the valve seat, means releasably retaining the valve member in a position with the valve plug in a position to enable flow through the flow path, and temperature responsive means disabling the means retaining the valve member in flow enabling position to automatically release the valve member to move to a flow interrupting position in the event of temperature conditions exceeding a predetermined temperature, said valve body including a lateral extension having a bore provided with an open outer end reciprocally receiving the valve member, said means biasing the valve member including a coil spring engaged with the valve plug and extension and biasing the valve plug towards engagement with the valve seat, said valve member including an elongated valve stem having a diameter substantially less than the diameter of the larger end of the valve plug to form a shoulder engaged by said coil spring, said stem extending outwardly in the bore in the lateral extension, seal means in the bore in the lateral extension in sealing engagement with the valve stem to prevent leakage of material past the valve stem, said temperature responsive means including a fusible link having one end connected to the outer end of the lateral extension, said means retaining the valve member in flow enabling position including a spring biased pin biased into disengagement with the valve stem, said valve stem including a lateral socket receiving the inner end of the pin, a coil spring encircling the pin outwardly of the extension with one end of the spring engaging the outer surface of the extension, a pivot arm connected to the extension at one end, connected to the pin at a central portion thereof and connected to the fusible link at the other end thereof to hold the pin in engagement with the valve stem and release the pin when the fusible link is ruptured by high temperature conditions, said coil spring around the pin having its outer end engaged with said pivot arm to bias said pin outwardly to retract the pin from the socket when the fusible link is ruptured.

4,890,636

FLUID PRESSURE CONTROL FOR USE IN TRANSMISSION

Shunichiro Higuchi, Yokohama, Japan, assignor to Okamura Corporation, Yokohama, Japan

Filed Dec. 8, 1988, Ser. No. 282,016
Claims priority, application Japan, Aug. 15, 1988, 63-201872
Int. Cl.[4] F15B *13/02*
U.S. Cl. 137—115 **5 Claims**



1. A fluid pressure control for use in a transmission provided with a fluid pressure operated clutch comprising:

a pressure regulating piston communicating with fluid from a pressurized fluid source for affording fluid pressure to said clutch;

a load piston and a spring for pressing said pistons away from each other, wherein said load piston and said pressure regulating piston are reciprocally disposed in a common bore;

a signal pressure chamber is formed between an end wall of said load piston and an end of said bore and communicates with a fluid passage to said clutch from said pressurized fluid source;

in a sliding face of the load piston in said bore, there are provided a first concave groove communicating with said signal pressure chamber, a second concave groove communicating with a discharge port and a third concave groove communicating with the pressurized fluid source via a timing orifice; and

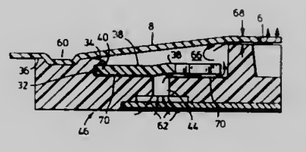
a shifting piston which reciprocatingly moves between open and closed positions is provided within said load piston, thereby increasing and reducing pressure within said signal pressure chamber in accordance with positions of said load piston and said shifting piston.

4,890,637

ONE WAY VALVE

Adolf Lamparter, Etobicoke, Canada, assignor to Flavorcoffee Co. Inc., Concord, Canada

Filed Jan. 19, 1989, Ser. No. 299,091
Claims priority, application Canada, Dec. 12, 1988, 585690
Int. Cl.[4] F16K *51/00, 15/16*
U.S. Cl. 137—246 **14 Claims**



1. A one way valve for flexibly walled packages, said valve comprising:

a unitary valve body having an outer face comprising a raised anvil having a first valve seat, a generally planar surface adjacent said anvil forming a second valve seat, said second valve seat terminating in an outer wall, said outer wall including a first marginal portion extending towards said anvil and a second marginal portion extending away from said anvil,

an elastic diaphragm seated on said second valve seat, at least a part of said diaphragm being below said first marginal portion of said outer wall,

at least one aperture through said valve body from said outer face to an inner face, said aperture opening at one end onto said second valve seat and at the other end onto an indented portion of said inner face, and

a filter housed in said indented portion across said other end of said aperture,

said valve body being securable to a web of said flexibly walled packaging around said second marginal portion, said web, when said valve body is so secured, being stretched across said first valve seat and having a hole punched therein, whereby pressure in at least one of said apertures can raise a portion of said elastic diaphragm away from said second valve seat, and subsequently raise a portion of said web above said first valve seat.

4,890,638

COVER FOR BACKFLOW PREVENTION DEVICE

Ronald D. Davenport, 3221 Earhart Rd., Hermitage, Tenn. 37076

Filed Jan. 31, 1989, Ser. No. 304,787
Int. Cl.[4] F16K *27/08*
U.S. Cl. 137—382 **10 Claims**



1. A protective enclosure for a backflow prevention device including a check valve assembly in fluid communication with an inlet pipe and an outlet pipe, comprising:

(a) an elongated platform member having a substantially planar level floor surface mounted upon the ground beneath the backflow prevention device, and having an opening through said platform member for the passage of each inlet pipe and each outlet pipe into the ground,

(b) an elongated cover member having a top wall and connecting side walls having bottom edge portions resting upon said floor surface, the height of said side walls being greater than the height of the backflow prevention device above said floor surface, so that said cover member and said platform member enclose a space receiving the entire backflow prevention device,

(c) a drain opening through the bottom edge portion of one of said side walls adjacent said floor surface,

(d) a closure member large enough to cover said drain opening,

(e) hinge means connecting said closure member to said side wall adjacent said drain opening for swinging movement between a closed position covering said drain opening and an open position away from said drain opening, and

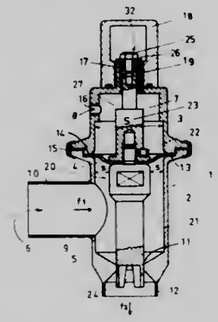
(f) means biasing said closure member to said closed position.

4,890,639

PRESSURE REGULATING VALVE

Willi Löliger, and Rudolf Schmied, both of Kaiseraugst, Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Filed May 18, 1988, Ser. No. 195,687
Claims priority, application European Pat. Off., Jun. 6, 1987, 87108238.4
Int. Cl.[4] F16K *31/365*
U.S. Cl. 137—510 **11 Claims**



1. A fluid-controlled back-pressure and expansion fluid flow control device comprising:

a first housing portion having walls defining a first chamber, the first housing portion having one open end, an inlet orifice and an outlet orifice for receiving and distributing liquid flow to be regulated, the outlet orifice being positioned opposite the open end;

a second housing portion having walls defining a second chamber, the second housing portion having one open end abutting the open end of the first chamber, the walls of the first and second housing portions being configured at their open ends for mating engagement, an orifice for providing regulating fluid to the second chamber and a bore in linear alignment with the outlet orifice of the first housing portion;

a flexible membrane positioned and maintained between the walls and open ends of the two housing portions for hermetically sealing the mated open end of the first chamber from the open end of the second chamber;

a two-portion guided elongated pin, one portion extending from the first housing portion outlet orifice and the other extending from the second housing portion bore, each portion of the pin extending to a convergence with the other portion at the membrane and being coupled by a male-female coupling with the membrane for gripping the membrane, the pin having a hollowed portion abutting the outlet orifice and being movable in a reciprocal manner along its longitudinal axis for blocking and opening the first chamber outlet orifice for regulating liquid flow to be regulated while blocking the second housing portion bore from regulating fluid flow; and

wherein an active surface of the membrane affected by pressure of regulating fluid in the second chamber is larger than an active surface of the membrane affected by pressure of liquid to be regulated in the first chamber.

4,890,640

DRAINAGE VALVE

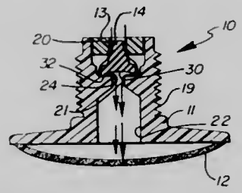
Lloyd H. King, Sr., 5222 Green Farms Rd., Edina, Minn. 55436

Continuation-in-part of Ser. No. 215,397, Jul. 5, 1988, abandoned. This application May 8, 1989, Ser. No. 347,441
Int. Cl.[4] F16K *15/14*; E03B *7/08*
U.S. Cl. 137—512.4 **20 Claims**

1. A drainage valve for underground water systems that can withstand pressure surges produced by opening and closing the water supply yet still permit the drainage valve to close under normal water line pressures and to open when the water pressure is shut off to permit drainage of the underground water system when the underground water system is not in use and to close when the underground water system during use of the underground water system comprising:

a housing for attachment to an underground water system, said housing having an inlet for attachment to an underground water line and an outlet for draining water into the soil surrounding said housing;

a support surface for supporting a resilient plug to prevent blowout of said resilient plug from said drainage valve;



a drain passage located in said housing to permit water to drain into said outlet; and

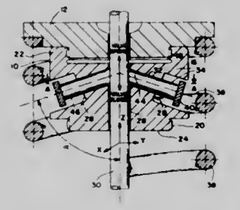
a resilient plug for opening and closing said drain passage, said resilient plug having resilient means to hold said resilient plug in a spaced position from said supporting surface to permit water to drain from said drain passage when the water pressure is shut off to said underground water system, said resilient plug having a nonextrudable portion proximate said support surface to being blown out of said drainage valve if pressure line surges are encountered.

4,890,641

FRICTIONAL DAMPER SUITABLE FOR PRESSURE RELIEF VALVES

Gela N. Gavrila, Parsippany, N.J., assignor to Teledyne Inc., Teledyne Farris Eng. Div., Palisades Park, N.J.

Filed Dec. 6, 1988, Ser. No. 280,574
Int. Cl.[4] F16K *21/06*
U.S. Cl. 137—514 **32 Claims**



30. A uni-directional frictional damper system for pressure relief valves, comprising:

at least one damper stage adapted to be attached to the pressure relief valve, said damper stage having a body which includes a through-hole adapted to receive therethrough a movable stem of the pressure relief valve;

at least two friction contact members positioned in an inclined position within said body relative to said through hole; and

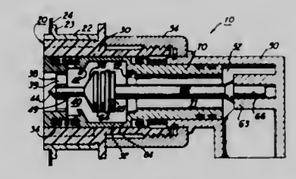
biasing means for biasing said friction contact members into abutment with the stem passing through the through-hole in said body.

4,890,642

DISCONNECT FOR A BAG VALVE

Kenneth G. Smazik, Marietta, Ga., and Alfred A. Schroeder, San Antonio, Tex., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 16, 1988, Ser. No. 285,139
Int. Cl.[4] F16L *29/00*
U.S. Cl. 137—614.03 **11 Claims**



1. A disconnect coupling for a juice concentrate conduit comprising:

(a) a disconnect body having an L-shaped juice concentrate passageway therethrough;

(b) a coupling nut rotatable connected to the outside surface of a proximal end of said body and having internal screw threads;

(c) a poppet valve connected to said disconnect body in fixed position therein and including a stem and a head, with said stem being fixedly connected to said body and extending in said passageway and terminating at said head at a location beyond said proximal end of said body, said stem being parallel to said passageway in the distal end of said sleeve and said head being at one end of said stem and said stem being connected to said body soley by the other end of said stem extending into contact with said body;

(d) a disconnect sleeve slidably mounted inside of said passageway in said disconnect body in sealing engagement with an inside surface of said proximal end of said body, said sleeve having: (i) a completely open passageway therethrough in communication with said body passageway (ii) a poppet valve seat on its proximal end in sealing engagement wih said poppet valve head, and (iii) a spring retaining flange on its external surface; and

(e) a spring mounted on the outside of said disconnect sleeve between said flange and the distal end of said body, such that said sleeve can be moved toward said body and away from said poppet valve head, against said spring, to open said passageway;

(f) an annular O-ring groove in an outside surface of said disconnect sleeve adjacent its proximal end and an O-ring in said groove facing the inside surface of and protected by said coupling nut; and

(g) an annular opening between the outside surface of said disconnect sleeve and the inside surface of said nut.

4,890,643

BI-DIRECTIONAL SEALING VALVE

John P. Oliver, Houston, Tex., assignor to Mogas Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 201,635, Jun. 2, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 306,692
Int. Cl.[4] F16K *25/00*
U.S. Cl. 137—614.11 **5 Claims**

1. A bi-directional sealing valve, comprising

a body having a flowway therethrough,

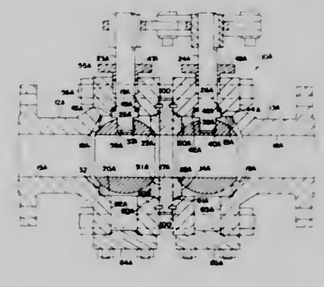
a pair of ball type closure members each having a port therethrough and mounted for rotation within the valve body between positions opening and closing the flowway,

said body including a pair of outer body members each having an end portion of the flowway therein and an inwardly opening cavity in which a closure member is received, and

a central body member having a central portion of the flowway therein and including a plate disposed between the outer body members, and means providing metal seating surfaces on opposite sides of the plate for engaging the inner sides of the ball closure members,

means sealing between each outer body member and the central body member,

means carried within the flowway between the outer end of the cavity of each outer body member and the outer side of the closure member within the cavity for yieldably urging the inner side of the closure member against the seating surface on one side of the central body member,



a pair of stems each rotatably mounted on an outer body member and having a tongue and groove connection to the closure member in the cavity thereof to permit the closure member to move axially of the flowway in its closed position, and

means directly connecting the outer body members to one another to hold inner end surfaces of the outer body members tightly against outer side surfaces of the plate of the central body member,

said connecting means being releasable to permit the central body member to be removed from between the outer body members and the closure members to be removed from within the cavities of the outer body members.

4,890,644

MULTIPLE MODE METERING VALVE

Herbert W. Hoeptner III, and Casey M. Hoekstra, both of Morgan Hill, Calif., assignors to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Apr. 6, 1989, Ser. No. 334,204
Int. Cl.[4] F16K *11/067*
U.S. Cl. 137—625.41 **16 Claims**

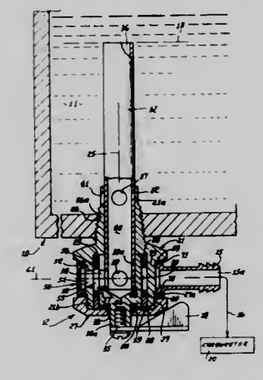
1. In valve apparatus for controlling flow of fluid via one or the other of two inlets defined by said apparatus, and via one or the other of two outlets defined by said apparatus,

(a) body means defining cavity means; and rotor means defining porting, and rotatable in the cavity means between a first position in which porting in the rotor means communicates between one of said inlets and at least one of said outlets, and a second position in which porting in the rotor means communicates between the other of said inlets and the other of said outlets, there being O-ring means sealing off between said body means and rotor means and extending partly about the rotor means.

(b) and collector means extending about the rotor means and having a substantially annular plenum with a discharge opening, the collector means adjustably rotatable about the rotor means to angularly orient said discharge opening.

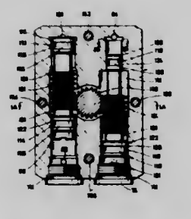
(c) the body means having a through passage remaining in communication with said substantially annular plenum as said collector means is adjustably rotated, said through

passage selectively alignable with one of said outlets in said first position of the rotor means, and selectively align-



able with the other of said outlets in the second position of said rotor means.

4,890,645
ROTARY SHEAR SEAL HYDRAULIC VALVE
Roger K. Andersen, Anaheim Hills, Calif., assignor to Baroid Technology, Inc., Houston, Tex.
Continuation of Ser. No. 106,633, Oct. 8, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,873
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—625.66 **9 Claims**



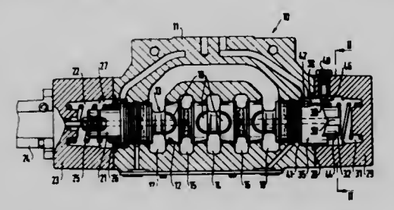
1. A rotary shear seal hydraulic comprising:
a valve housing and valve body, together defining a generally cylindrical cavity with a stepped profile;
first and second passages in said valve body intersecting said cavity along a chord thereof, a port opening into each end of each of said first and second passages;
at least two bores in said valve housing intersecting said cavity parallel to the axis thereof and with at least one bore situated on a curve concentric with said axis;
a profiled rotor received in said cavity, said rotor having an axial face with at least two ports therein, conduits within said rotor connecting said ports in pairs, said ports being spaced to align respectively with said bores upon proper rotational positioning of said rotor, said rotor having a portion profiled to define a pinion;
first and second pistons mounted in said first and second passages, respectively, each said piston having a portion defining a rack engaging said pinion portion of said rotor;
means connected to each of the said ports opening into each end of said first and second passages to fluid drive each of the said pistons in said first and second passages in opposite directions, each of said ports being hydraulically independent of each other; and
a shear seal assembly in each said at least two bores, each said shear seal assembly having an annular seal body mounted in a respective bore and a spring biasing said seal body into engagement with said axial face of said rotor, and annular seal means forming a wiping seal with walls of said bore.

4,890,646
FLEXIBLE SIPHON PIPE FOR TANK CAR
Paul J. Dumser, St. Charles County, assignor to ACF Industries, Incorporated, Earth City, Mo.
Filed Apr. 17, 1989, Ser. No. 338,862
Int. Cl.[4] B61D *5/00*
U.S. Cl. 137—590 **14 Claims**



1. An eduction or siphon pipe in a railway tank car, the latter having a horizontally disposed tank having a bottom, a top, and a sump at the bottom of the said eduction pipe extending from adjacent said bottom sump to a fitting at the top area of the tank, said tank having an inner wall, and said eduction pipe having a shape corresponding to said inner wall and being supported in proximity thereto, with said eduction pipe accommodating distortions of said tank.

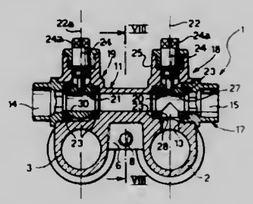
4,890,647
HYDRAULIC CONTROL VALVE
Berthold Pfuhl, Markgröningen; Volkmar Leutner, Friolzheim, and Eckard Schuttenberg, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Sep. 30, 1988, Ser. No. 252,441
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737392
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—625.66 **8 Claims**



1. A hydraulic control valve, comprising, a housing having a slider opening and at least two pressure medium chambers, a control member having two opposite ends and being formed as a pre-controlled main control slider provided with a plurality of control notches, said control member having an end portion which is formed as a piston portion and has a smaller diameter than the diameter of the remaining part of said control mem-

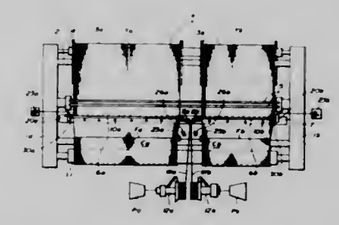
ber; a return unit associated with said control member and having a spring plate; a rotation preventing element provided on one of said ends of said control member; a one-piece integral coupling part which is arranged on said control member non-rotatably and longitudinally displaceably relative to the latter, said copuling part being guided on said piston portion of said control member and provided with an abutment for said control member, said coupling part being formed as a sleeve-shaped part with a stepped throughgoing opening having an end side with a small diameter and two parallel cuts which form a guiding part in form of two projections, and with an inner opening portion having a greater diameter and opening toward said cuts for guiding on a control member; an abutment fixed on said housing; a return spring which presses said coupling part against said abutment of said housing; a structural member which is arranged radially to said control member so as to guide said coupling part longitudinally displaceably and non-rotatable relative to said housing; means for nonrotatably connecting said piston portion with said coupling part and including longitudinal groove means provided on said piston portion for receiving said guiding part; and means for non-rotatably connecting said coupling part with said housing and including a further longitudinal groove provided on an outer periphery of said coupling part and formed so that said structural member, engages in said further longitudinal groove, said structural member being fixed with an extending radially to said housing.

4,890,648
DISTRIBUTION AND SHUT-OFF DEVICE FOR HYDRAULIC SYSTEMS, PARTICULARLY FOR DOMESTIC WATER SYSTEMS
Vincenza Giordano, Via S. Crocifissa di Rosa 3, Brescia, Italy
Filed Oct. 3, 1988, Ser. No. 252,406
Claims priority, application Italy, Oct. 13, 1987, 67860 A/87
Int. Cl.[4] F16K *11/20*
U.S. Cl. 137—594 **4 Claims**



1. A distribution and shut-off device for hydraulic systems having a body which comprises:
at least one main pipe section formed at each end so as to enable it to be coupled to the main pipe section of an identical device, to produce a continuous main pipe which is intended to be connected to a hydraulic network;
at least one auxiliary pipe having an axis which is not coplanar with the axis of the main pipe section, and leading at its ends to two distribution outlets for connection to two user units;
a passage which connects the main pipe section to the auxiliary pipe;
two valves for shutting off the flow of fluid towards the two distribution outlets;
wherein a first said shut-off valve is situated at the junction of the passage with the auxiliary pipe and is movable between an open position in which the two branches of the auxiliary pipe situated on the two sides of the valve communicate with each other and with the connecting passage, and a closed position in which the connection between the two branches of the auxiliary pipe is shut off and the passage only communicates with the branch of the auxiliary pipe leading to the outlet with which the second shut-off valve associated;
a second main pipe section parallel to the first main pipe section, a second auxiliary pipe parallel to the first auxiliary pipe and provided with two further distribution outlets, a passage connecting the second pipe section to the second auxiliary pipe, and two further valves for shutting off the flow of fluid towards the two further distribution outlets, the further shut-off valves being formed and arranged identically to the two shut-off valves associated with the first auxiliary pipe;
wherein the axes of the two auxiliary pipes are contained in a plane parallel to and spaced from the plane of the two main pipe sections, and axes of the auxiliary pipes are perpendicular to the axes of the main pipe sections; and
the first shut-off valve having a valve member with a spherical body mounted in the body of the device for rotation about an axis perpendicular to the axis of the auxiliary pipe, and the valve member defining a first diametral hole which passes through the valve member in a direction perpendicular to the axis of rotation, a second hole which has an axis coincident with the axis of rotation and which extends from the first hole and opens facing the connecting passage, and a third hole which has an axis perpendicular both to the axis of the first hole and to the axis of the second hole and which extends from the first hole and opens on the external surface of the valve member.

4,890,649
FAULTY PICK REMOVAL FOR A MULTIPLE-PHASE LOOM
Takao Takahashi, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Mar. 21, 1988, Ser. No. 171,444
Claims priority, application Japan, Mar. 23, 1987, 62-65782
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—116 A **8 Claims**



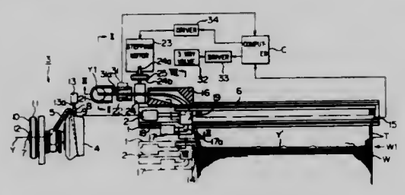
1. An operation control method of a loom of a type wherein a plurality of fabrics are woven by simultaneously picking weft yarns respectively to a plurality of warp yarn arrays, said method comprising the following steps in the order named:
stopping the loom in case a mispick is made in any of the warp yarn arrays;
removing a mispicked weft yarn in the warp yarn array and a weft yarn which is normally picked in another warp yarn array simultaneously with said mispicked weft yarn;
detecting an absence of said mispicked weft yarn and said normally picked weft yarn respectively at predetermined positions; and
restarting the loom upon detecting the absence of said mispicked weft yarn and said normally picked weft yarn.

4,890,650

DETECTING AND REMOVING FAULTY WEFT IN A JET LOOM

Kinpei Mitsuya, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 11, 1988, Ser. No. 231,086
Claims priority, application Japan, Aug. 25, 1987, 62-211577; Sep. 16, 1987, 62-233517; Sep. 18, 1987, 62-235888; Sep. 21, 1987, 62-238085; Oct. 26, 1987, 62-270042
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—116 A **8 Claims**



1. A method for disposing of a faulty weft appearing during operation of a fluid jet loom, comprising the steps of:
- detecting a misinserted weft in a weft insertion path before said misinserted weft is beat into the fell and cut from the yarn supply,
- upon detecting a misinserted weft, deenergizing the loom while maintaining jet fluid power and preventing the cutting of said misinserted weft from said yarn supply which cutting would otherwise occur as inertia causes the loom to continue motion;
- blowing into a duct, disposed laterally of the normal weft insertion path, the length of yarn that would otherwise become the next succeeding weft after the detected misinserted weft, and carrying said length of yarn over a take-over path to take-over means including stepping-motor-driven rollers for positive transport of said yarn;
- operating said stepping motor a predetermined number of steps and cutting from the yarn supply said length of yarn; and
- thereafter determining if said misinserted weft was properly withdrawn by detecting whether yarn is present within said take-over path.

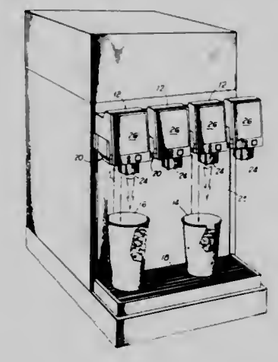
4,890,651

ULTRASONIC AUTOMATIC CUP FILLING METHOD OPERATING ADJACENT VALVES ON DIFFERENT A.C. HALF CYCLES

William F. Stembridge, College Park; W. Frank Stembridge, East Point, both of Ga., and James C. Sturrock, Espanola, N. Mex., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 12,760, Feb. 9, 1987, Pat. No. 4,798,232, which is a division of Ser. No. 684,215, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 629,397, Jul. 10, 1984, abandoned. This application Jun. 10, 1988, Ser. No. 205,263
Int. Cl.[4] B65B *1/30, 3/04*
U.S. Cl. 141—1 **2 Claims**

1. A method for automatically filling beverage containers comprising the steps of:
- (a) operating each of a pair of adjacent valve assembles by:
  - (1) transmitting ultrasonic energy down from each valve assembly toward a container supporting surface located below a beverage dispensing nozzle of each valve assembly from an ultrasonic transmitter on each valve assembly;
  - (2) receiving ultrasonic energy reflected back up from the direction of said surface with an ultrasonic receiver on each valve assembly and separate from and spaced apart from said transmitter and generating said corresponding signals;
  - (3) detecting the presence of a container when placed on said surface and below said nozzle; and
  - (4) controlling the filling of said container with beverage from said nozzle; and



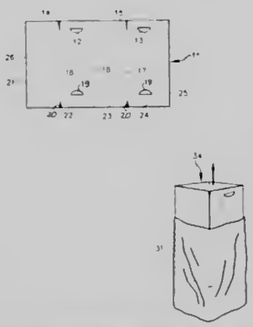
- (b) operating said adjacent valve assemblies separated in time by synchronizing their operation to different half cycles of an a.c. power supply, to prevent interference therebetween.

4,890,652

TRASH BAG SUPPORT SLEEVE

L. Jeanne Hoerner, 1247 Emerald Way, Visalia, Calif. 93277

Filed Mar. 23, 1987, Ser. No. 29,616
Int. Cl.[4] B65B *5/12*
U.S. Cl. 141—10 **16 Claims**



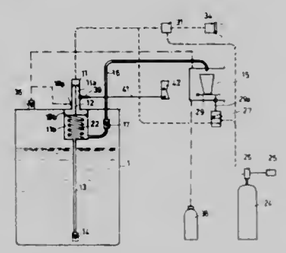
15. A method for retaining upright and filling a collapsible refuse bag with an enhanced amount of debris, some of which may be irregularly shaped, without causing damage to the bag walls, said method comprising the steps of:
- inserting into the bag an open ended, unitary, four-similar-shaped-paneled, closed sided sleeve in a flat, closed condition with all four panels being in mutually parallel confronting relationship, said sleeve being generally coextensive in length with the bag, the outer circumference of said sleeve being substantially similar to and less than the inner circumference of the bag, the top edge of said sleeve being formed with at least one narrow slit therein extending toward the bottom open end for a relatively short distance;
- opening said sleeve by unfolding it to form a square cross section to generally expand the bag walls and spread them into a fully open condition;
- bringing the open end of the bag up around said sleeve so that the edge of the open end of the bag is adjacent the top open end of said sleeve, the bottom open end of said sleeve being against the closed bottom of the bag;
- pulling a gathered fractional portion of the top edge of the bag tightly into said at least one slit, whereby said sleeve self supports the bag in an open condition and positively holds the bag upright due to the engagement of said bag portion with said at least one slit; then
- stuffing refuse of any description into said sleeve that can be fit therein;
- disengaging said bag portion from said at least one slit; and then
- withdrawing said sleeve from the bag, leaving the refuse within the bag.

4,890,653

DISTRIBUTOR PERMITTING DISTRIBUTION OF DOSES OF LIQUID AND INTENDED FOR USE AS A BEVERAGE DISTRIBUTOR

René Sartulairi, Villa Le Gingko - Avenue de Latécoére, 31700 Cornebarrieu, France

Filed Feb. 4, 1988, Ser. No. 152,117
Claims priority, application France, Feb. 4, 1987, 87 01883
Int. Cl.[4] B65B *3/18;* F04B *35/02;* A47J *31/40*
U.S. Cl. 141—82 **16 Claims**



1. A distributor permitting dispensing of doses of liquids and intended for use as a beverage dispenser comprising a sealed storage receptacle (1) a pump (11) comprising a body having a dosing chamber (11*b*) and a member (12) moveable in the interior of said chamber in such a manner as to vary the capacity of said dosing chamber, means (22, 24, 26–35) for actuating said moveable member (12) between top and bottom extreme positions corresponding respectively to maximum and minimum capacities of said dosing chamber (11*b*), withdrawal conduit means (13) connected to said dosing chamber (11*b*) and the bottom of said receptacle (1), distribution conduit means (16) connected to said dosing chamber (11*b*) for dispensing liquid, a one way withdrawal valve (14) at a pressure threshold Po, interposed in said withdrawal conduit (13) and adapted to open communication from said receptacle to said dosing chamber under the effect of reduced pressure in said dosing chamber upon displacement of said moveable member (12) toward its top position, a unidirectional distribution valve (17) having an opening threshold pressure Pi interposed in said distribution conduit (16) and adapted to open said conduit under the effect of overpressure existing in said dosing chamber (11*b*) at the time of displacement of said moveable member (12) toward its bottom position, a first communication means (18*a*, 18*b*) for establishing fluid communication between the interior and exterior of said receptacle and positioned so as to open above the maximum liquid level in said receptacle, closure means (12*c*) for said first communication means (18*a*, 18*b*) controlled by said moveable member (12), in such a manner as to close said first communication means in the top position of said moveable member and to assure introduction of free air into said receptacle for other positions of said moveable member, second communication means (36, 37) between the interior and exterior of said receptacle (1) adapted to open above the maximum liquid level in said receptacle and provided with a one way safety valve (36) at a pressure threshold Pc adapted to permit an outlook to ambient air from said receptacle when said receptacle is subjected to greater than the threshold pressure Pc determined such that:

$$Ph < Pc < Po + Pi$$

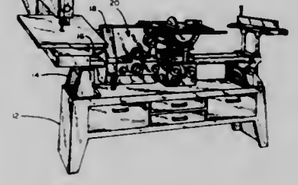
where Po and Pi are the threshold opening pressures of said distribution valve (17) and said withdrawal valve (14) and, Ph is the hydrostatic pressure of the liquid at the level of the safety valve (36) in a reclined position of said receptacle (1).

4,890,654

BAND SAW ATTACHMENT FOR MULTIPURPOSE POWER TOOL

Anthony Fox, Bloomington, Minn., assignor to TFC Corporation, Bloomington, Minn.

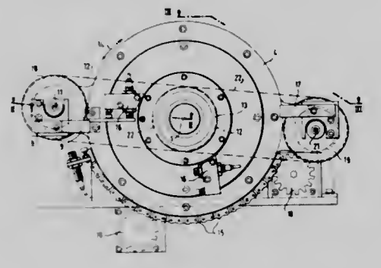
Filed Feb. 27, 1989, Ser. No. 315,932
Int. Cl.[4] B27C *9/02;* B23P *23/02;* B23Q *1/14*
U.S. Cl. 144—1 D **5 Claims**



1. In the multipurpose power tool of the type including an elongated bench having a first pedestal attached to said bench at one end thereof and a second pedestal attached to said bench at a location intermediate said one end and the opposed end thereof, a pair of spaced, parallel elongated tubular ways, pivotally secured at one end of each to said first pedestal for rotation between a horizontal disposition and a vertical disposition; a power head assembly attached to said pair of tubular ways for axial movement therealong, said power head assembly including motor means disposed therein for driving a spindle assembly and including a power take-off shaft, a band saw attachment for said multipurpose power tool comprising:
- (a) a third pedestal attached to said bench proximate said opposed end thereof;
- (b) a transmission housing removably affixed to said third pedestal, said transmission housing including means for journaling a drive shaft and a blade band drive wheel therein, said drive shaft and blade band drive wheel being coupled together by belt and pulley means;
- (c) A generally C-shaped support plate fixedly attached to said transmission housing and extending vertically upward therefrom;
- (d) first and second blade band idler wheels journaled for rotation in a vertical plane on said support plate, one of said idler wheels being vertically aligned with said blade band drive wheel and said other idler wheel being laterally offset to define a throat zone;
- (e) a saw table support affixed to said transmission housing;

(f) a saw table removably coupled to said saw table support and disposed in said throat zone;
(g) a band saw blade surrounding said blade band drive wheels and said first and second blade band idler wheels with one flight of said blade passing vertically through said saw table; and
(h) coupler means for removably coupling said drive shaft to said power take-off shaft when said power head assembly is positioned proximate said second pedestal.

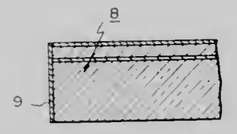
4,890,655
BUTT-END WOOD HOLDING SYSTEM
Siegfried Zweig, Oberkochen, Fed. Rep. of Germany, assignor to Okoma Oberkochener Machinen GmbH, Oberkochen, Fed. Rep. of Germany
Continuation of Ser. No. 197,135, May 13, 1988, abandoned. This application Apr. 18, 1989, Ser. No. 342,623
Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717412
Int. Cl.[4] B27F *5/00*
U.S. Cl. 144—82 8 Claims



1. In a butt-end wood holding system for woodworking machines having at least one tenoning-and-mortising spindle including a relatively fixed support, and having at least one means for pivoting a butt-end wood holder in a horizontal plane into an operational position against an end of a workpiece, said butt-end wood holder mounted to a horizontally displaceable holder, the improvement comprising:
a ring (4) rotatably mounted on said relatively fixed support of said tenoning-and-mortising spindle (1) and concentrically with said spindle, said ring having an external circumference comprising at least one bearing (6,7) supporting a first rotatably supported disk (10) bearing said butt-end wood holder (9), said first disk (10) connected by a flexible, locking link (12) with a second fixed disk (13) of the same size as said first disk and mounted concentrically with said spindle (1).

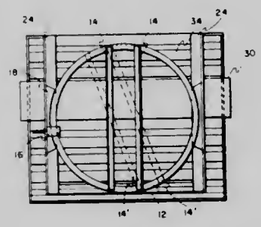
4,890,656
METHOD FOR PRODUCING WOODEN DECORATIVE ARTICLES
Hisayoshi Ohsumi, and Taichi Ikeya, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan
Filed Oct. 23, 1987, Ser. No. 112,820
Claims priority, application Japan, Oct. 25, 1986, 61-254456; Oct. 25, 1986, 61-254457; Dec. 29, 1986, 61-311176
Int. Cl.[4] B27D *1/00*
U.S. Cl. 144—350 25 Claims

1. An improved method for producing a decorative plywood, said method comprising the steps of:
forming a powdery resin sheet on a material sheet;
heatpressing said powdery resin sheet with said material sheet to form a decorative sheet; and



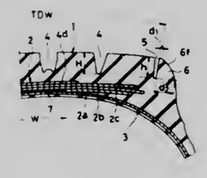
attaching said decorative sheet to a base board to form a decorative plywood.

4,890,657
APPARATUS AND METHOD FOR EMPLOYING A PORTABLE WORKSHOP
Dennis Shelhorse, Sayville, N.Y., assignor to The Shelhorse Corporation, Sayville, N.Y.
Filed Dec. 16, 1988, Ser. No. 285,654
Int. Cl.[4] B27B *1/00*; B27M *1/00*; B27H *1/00*
U.S. Cl. 144—363 13 Claims



1. A portable workshop for operating upon workpieces having means for the positioning of said workpieces comprising at least a pair of moveable arms for clamping said workpiece, a first pair of rails positioned upon said arms, a circular hollow rim positioned upon said first pair of rails for rotatable movement over the workpiece, and a second pair of rails affixed at their ends to said circular rim to form a turntable for operating a portable electrical tool mounted above said workpiece.

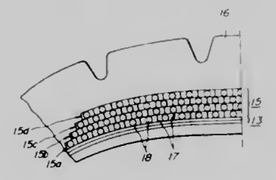
4,890,658
PNEUMATIC RADIAL TIRE
Kazuyuki Kabe, Tokyo; Masataka Koishi, Hiratsuka, and Ken Takahashi, Atsugi, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 139,560, Dec. 30, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 252,721
Claims priority, application Japan, Jan. 26, 1987, 62-13959
Int. Cl.[4] B60C *11/03, 9/18*
U.S. Cl. 152—209 D 5 Claims



1. A pneumatic radial tire comprising a carcass, a tread, a reinforcing belt layer having a structure composed of at least three metallic cord layers, and narrow grooves extending in the circumferential direction of the tire respectively provided on left and right shoulder portions of said tread surface, wherein among said layers constituting said reinforcing belt layer, a second reinforcing belt layer and a third reinforcing belt layer spaced outwardly from said carcass towards said tread cross each other at a cord angle of 10° to 30° relative to the circumferential direction of the tire; and a first reinforcing belt layer located outwardly adjacent said carcass towards said tread has a cord angle of 40° to 75° relative to the circumferential direction of the tire and is split into axially spaced apart left and right portions in the central region of a crown and provided with an organic fiber cord layer having a cord angle of 0° to 10° relative to the circumferential direction of the tire between said left and right split portions of said first reinforcing belt layer, said narrow groove having a depth h as determined in the radial direction of the tire, and a distance d_1 measured between the internal edge on said shoulder side of an opening portion of said narrow groove and the radially outermost surface of said shoulder portion as determined along a parallel line to the surface of said tread, and a distance d_2 measured between the internal wall surface on the shoulder side of the bottom of said narrow groove and the radially outermost surface of said shoulder portion as determined along a parallel line to the surface of said tread, wherein d_1 is less than 15 mm and is smaller than d_2, and a shape factor m defined by the following equation is 0.8 to 1.2:

$$m = \frac{d_2 - d_1}{h}.$$

4,890,659
REINFORCING LAMINATE FOR TIRE AND HEAVY DUTY PNEUMATIC RADIAL TIRE USING THE SAME
Katsuyuki Harakon, Higashiyamato, and Shigeki Yamada, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Apr. 26, 1988, Ser. No. 186,405
Claims priority, application Japan, Apr. 28, 1987, 62-103358; May 15, 1987, 62-118157
Int. Cl.[4] B60C *9/22*
U.S. Cl. 152—531 2 Claims



1. A heavy duty pneumatic radial tire comprising: a pair of bead portions, a carcass extending between said bead portions, a carcass extending between said bead portions and comprised of carcass plies each containing cords substantially arranged in parallel to the axial direction of the tire and covered with a coating rubber, and a belt superimposed about a crown portion of said carcass and composed of at least two belt layers each containing at least one cord helically wound substantially in parallel to the equator of the tire and covered with a coating rubber, said belt comprising a reinforcing laminate having plural reinforcing layers piled one upon the other, each of said reinforcing layers containing the same material and high elasticity cords substantially arranged in parallel to each other and covered with a coating rubber; the cords of the adjoining reinforcing layers being arranged in parallel to each other and a center axis of the cords in one of the reinforcing layers being axially shifted by approximately one-half pitch form that of the other reinforcing layer in a transversely sectional direction of the cord; and a lower face of an upper-side reinforcing layer in said reinforcing laminate always contacting an upper face of a lower-side reinforcing layer in said laminate wherein cords of each reinforcing layer do not penetrate into the other reinforcing layer.

4,890,660
PNEUMATIC TIRE HAVING A REVERSED BEAD TIE-IN
André Lamock, Fauvillers, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 132,228, Dec. 11, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,914
Int. Cl.[4] B60C *15/05, 09/06*
U.S. Cl. 152—545 2 Claims



1. A pneumatic tire for heavy duty use comprising a bias ply carcass and two bead regions, each bead region having two bead cores, the carcass comprises at least three sets of at least two textile plies each, each carcass ply having a main portion extending between the bead regions, in each said bead region the plies of the first set are wrapped around the axially inner bead core from an adjacent axially inner most side towards an adjacent axially outermost side of the tire and the plies of the second set are wrapped around the axially outer bead core from the an adjacent axially innermost side towards an adjacent axially outermost side of the tire and the plies of the third set are wrapped around both bead cores from the an adjacent axially outermost side towards an adjacent axially innermost side of the tire, the endings of the plies in each of the first and second sets of plies are staggered and are arranged to terminate successively radially outwardly further as each ply ending is located axially closer to an adjacent axially innermost side of the tire, the radially outermost ply ending of the first set of plies is located at a height which is greater than the height of the radially outermost ply ending of the second set of plies and the radially outermost ply ending of the second set of plies being located at a height which is between the heights of the two radially innermost ply endings of the first set of plies, the height of the ply endings of the first set of plies being between 0.40 and 0.60 times the height of the tire cross-section, and the height of the ply endings of the second set of plies being between 0.25 and 0.45 times the height of the tire cross-section, and the height of a ply ending being the distance as measured from a reference point which is located at the intersection of a plane perpendicular to the tire's axis of rotation passing through the center of the axially outermost bead core and the radially inner surface of the bead region, a reinforcing layer comprising at least one non-folded ply of textile reinforcing cords being sandwiched between the fold of the ply of the first set of plies having the radially outermost ply ending, said reinforcing layer extending radially outwardly from a radially inner edge which is disposed radially inwardly of the radially outermost ply ending of the second set of plies to a radially outer edge which is disposed radially outwardly of the radially outermost ply ending of the first set of plies.

4,890,661

TIRE DEMOUNTING TOOL

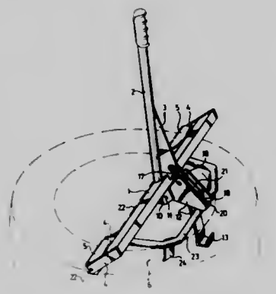
Eickhart Goebel, Pfungstadt, Fed. Rep. of Germany, assignor to Hofmann Werkstatt-Technik GmbH, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,525

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726409

Int. Cl.⁴ B60C *25/04*

U.S. Cl. 157—1.3 **14 Claims**



1. A tire demounting apparatus for a tire secured to a wheel having a flange and a rim, comprising:

an actuating means pivotably supported on the wheel about a first pivot axis;

a tire bead holder pivotably supported on the actuating means about a second axis, the tire bead holder having an engagement portion to engage a tire bead of a said tire, so that upon pivoting of the actuating means in a demounting direction the tire bead holder engaging the tire bead pivots in a direction opposite to the demounting direction moving said tire bead initially radially inward, out of range of the wheel flange, and then in the axial direction away from the wheel, the tire bead holder disposed about the second pivot axis creating a motion component oriented axially away from he rim during the radially inwardly direction motion, the tire bead holder being biased by a spring means disposed about the second pivot axis in the demounting pivoting direction; and

a first stop means connected to said tire bead holder for limiting the motion of said tire bead holder at a predetermined position, said engagement portion being disposed in such a way relative to the first pivot axis that upon engagement of the stop, further motion of the actuating means in the demounting pivoting direction causes the engagement portion of the demounting tool to produce an axial motion component, so that the tire bead is guided past the wheel flange in the axial direction.

4,890,662

MIXING AND COOLING TECHNIQUES

Luis E. Sanchez-Caldera, Hudson; Arthur K. Lee, Clinton; Nam P. Suh, Sudbury, and Jung-Hoon Chun, Hopedale, all of Mass., assignors to Sutek Corporation, Hudson, Mass.

Filed Jul. 15, 1988, Ser. No. 219,317

Int. Cl.⁴ B22D *11/10*

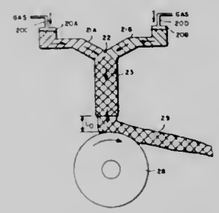
U.S. Cl. 164—46 **18 Claims**

15. A system for forming a composite mixture of at least two materials, at least one of which includes a metal or a metal alloy, said system comprising

a mixing region;

at least two inlet channels for supplying said at least two materials, respectively, substantially simultaneously to said mixing region in a manner such as to cause said at least two materials to indirectly impinge upon one another to form a composite mixture thereof, the sum of the cross-sectional areas of said at least two inlet channels being A_i;

an outlet channel having a diameter D for supplying said



composite mixture from said mixing region, said outlet channel having a cross-sectional area of A_o, the cross-sectional areas A_i and A_o being arranged to have the following relation:

$$\frac{A_o}{A_i} < 32$$

and

a cooling system for providing a rapid solidification of the composite mixture directly supplied from said outlet channel to said cooling system in a continuous manner, the input to the cooling system being at a distance L from the input of said outlet channel at said mixing region, the relationship between the diameter D and the distance L being arranged so that

$$\frac{L}{D} > 5$$

4,890,663

METHOD FOR PRODUCING A CERAMIC-COATED METALLIC COMPONENT

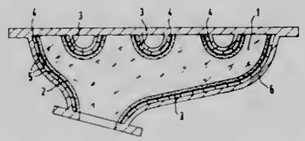
Mohamed Yarahmadi, Fulda, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,264

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717152

Int. Cl.⁴ B22D *19/00*

U.S. Cl. 164—98 **16 Claims**



1. A method for producing a metallic component provided with a ceramic lining which comprises the steps of:

(a) applying a first ceramic layer to a removable core;

(b) applying a sliding layer to the first ceramic layer;

(c) applying a second ceramic layer divided by joints into individual zones to the sliding layer; and

(d) melt casting around the second ceramic layer with metal to form said finished component.

4,890,664

AUTOMATIC MATCHPLATE MOLDING SYSTEM

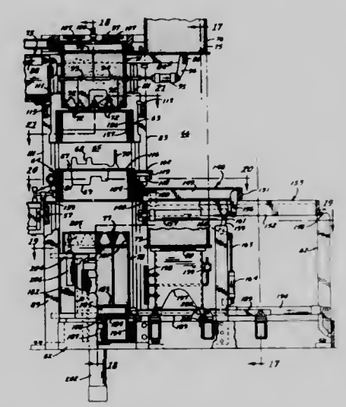
William A. Hunter, Inverness, Ill., assignor to Hunter Automated Machinery Corporation, Schaumburg, Ill.

Division of Ser. No. 33,177, Apr. 1, 1987, Pat. No. 4,840,218.

This application May 15, 1989, Ser. No. 352,057

Int. Cl.⁴ B22C *15/22, 15/28*

U.S. Cl. 164—182 **6 Claims**



1. A matchplate molding machine comprising a drag flask for making a sand mold having a lower end portion and having an inwardly tapered upper end portion, said flask being mounted for lateral movement between a molding station in which the mold is formed in the flask and a laterally spaced standby position, said mold being located in said molding station when said flask is located in said standby position, mechanism for moving said flask laterally back and forth between said molding station and said standby position, and means on said flask for pushing said mold laterally out of said molding station when said flask is shifted from said standby position to said molding station, said means comprising lower and upper vertically spaced pushers for engaging the lower and upper end portions, respectively, of said mold, a driver extending laterally from said flask, and means connecting said driver to said pushers to cause said lower pusher to engage the lower end portion of said mold and to cause said upper pusher to automatically move laterally relative to said lower pusher and engage the tapered upper end portion of said mold when said flask is shifted laterally from said standby position to said molding station.

4,890,665

PROCESS FOR MAINTAINING OPEN A THROTTLED DISCHARGE PASSAGE OF A SLIDING CLOSURE UNIT DURING CONTINUOUS CASTING

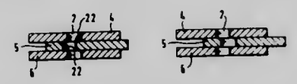
Walter Vetterli, Winterthur, Switzerland, assignor to Metacon AG, Zurich, Switzerland

Filed Dec. 8, 1988, Ser. No. 281,053

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1987, 3742215

Int. Cl.⁴ B22D *11/18*

U.S. Cl. 164—453 **9 Claims**



1. In a process for discharging molten metal from a metallurgical vessel through a discharge passage of a sliding closure unit into a continuous casting mold, establishing the molten metal level in said mold within a predetermined range by throttling said passage by a sliding plate of said sliding closure unit, during which throttling deposits gradually form in said sliding closure unit to restrict the size of said throttled passage and thereby reduce said molten metal level, and maintaining said molten metal level within said predetermined range by the controlled opening movement of said sliding plate to compensate for restriction of said throttled passage by the formation of said deposits, the improvement comprising removing said deposits from said sliding closure unit by:

in a single and continuous operation moving said sliding plate from a compensating throttling position to which said sliding plate had been moved due to the formation of said deposits, through an open unthrottled position of said sliding plate during which a surge of molten metal through said discharge passage flushes away said deposits, to a throttling position necessary to maintain said molten metal level within said predetermined range without the presence of deposits; and

controlling the speed of said single and continuous moving operation of said sliding plate to ensure that said molten metal level remains within said predetermined range.

4,890,666

METHOD FOR CONTROLLING AN AIR DISTRIBUTION SYSTEM USING ΔT

William E. Clark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 762,002, Aug. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 691,730, Jan. 16, 1985, Pat. No. 4,533,080, which is a continuation of Ser. No. 528,813, Sep. 2, 1983, abandoned. This application Aug. 26, 1987, Ser. No. 91,370

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.⁴ F24F *7/00*; F25B *29/00*

U.S. Cl. 165—16 **1 Claim**

1. A method for controlling an air distribution system comprising the steps of:

continuously supplying either heated or cooled conditioned air in accordance with the overall demand in a plurality of zones;

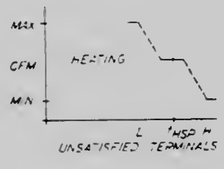
continuously supplying at least an amount of heated or cooled conditioned air sufficient for ventilation purposes through each of a plurality of terminals in a plurality of zones whereby each of the plurality of zones is being continuously heated or each of the plurality of zones is being continuously cooled;

comparing the temperature in each zone with the set point for that zone to determine the difference which defines the terminal satisfaction in each zone;

operating each of the terminals so as to achieve terminal satisfaction by controlling the amount of conditioned air supplied to each zone in excess of the amount sufficient for ventilation purposes responsive to the difference between the temperature in the zone and the set point and whether heated or cooled air is being supplied; and

controlling the air handler responsive to terminal satisfac-

tion while preventing a number of terminals within a predetermined range from achieving terminal satisfaction



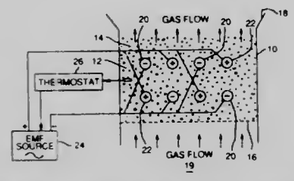
by supplying an insufficient amount of conditioned air to produce satisfaction of all of the zones.

4,890,667

METHOD AND APPARATUS FOR IMPROVING HEAT TRANSFER IN A FLUIDIZED BED

Delbert L. Lessor, and Robert J. Robertus, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Oct. 17, 1988, Ser. No. 259,240
Int. Cl.[4] F28D *13/00*; F28F *13/14*
U.S. Cl. 165—1 **21 Claims**



20. A method of improving the transfer of heat from a heat source to particles of a first type, comprising:

providing particles of a second type known to acquire a charge polarity upon contact opposite to the charged polarity acquired by particles of the first type upon contact, said contact occurring between particles of the two types or between particles of either type and structure or fluid present in the apparatus;

passing a fluid through a mixture of the two particle types to produce a fluidized region of particles, said particles of each type acquiring opposite charges in the fluidized state; and

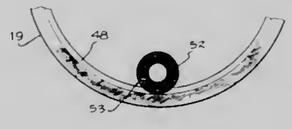
applying an alternating electric field across the fluidized region to move particles of the first type relative to particles of the second type and relative to the fluid to improve the transfer of heat to said particles of the first type.

4,890,668

WICK ASSEMBLY FOR SELF-REGULATED FLUID MANAGEMENT IN A PUMPED TWO-PHASE HEAT TRANSFER SYSTEM

Richard M. Cima, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 56,845, Jun. 3, 1987. This application Nov. 7, 1988, Ser. No. 267,869
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.25 **5 Claims**



1. A closed-loop heat transfer system comprising:

(a) an evaporator having a capillary channel on an interior heat-exchange surface thereof for distributing working fluid in liquid phase over said heat-exchange surface by capillary action;

(b) a condenser;

(c) a vapor conduit connecting said evaporator to said condenser, said vapor conduit enabling working fluid in vapor phase to pass from said evaporator into said condenser;

(d) a wick assembly disposed within said evaporator, said wick assembly enabling delivery of working fluid in liquid phase to said capillary channel on said interior heat-exchange surface of said evaporator for evaporation therefrom to vapor phase, said wick assembly also enabling withdrawal from said evaporator of working fluid in liquid phase in excess of an amount needed to keep said capillary channel continuously wetted within working fluid in liquid phase, said wick assembly comprising:

(i) a wick of relatively high permeability with respect to working fluid in liquid phase;

(ii) a dual open-sided tubular structure that is substantially nonpermeable with respect to working fluid in liquid phase; and

(iii) a pair of elongate wall members that are of relatively low permeability with respect to working fluid in liquid phase; said dual tubular structure and said pair of wall members forming an assembly that defines a first duct and a second duct, with a dividing wall separating said first duct from said second duct; one end of said first duct being closed and another end of said first duct being open, the open end of said first duct communicating with said feed line; one end of said second duct being closed and another end of said second duct being open, the open end of said second duct communicating with said return line; a first one of said pair of wall members having a permeability such that liquid-phase working fluid delivered into said first duct from said feed line is able to seep therethrough from said first duct into said wick, a second one of said pair of wall members having a permeability such that liquid-phase working fluid in excess of said amount needed to keep said capillary channel continuously wetted with working fluid in liquid phase is able to seep therethrough from said wick into said second duct; said assembly formed by said dual tubular structure and pair of wall members being embedded in said wick, said dividing wall extending into said wick so as to prevent liquid-phase working fluid that seeps out of said first duct through said first one of said pair of wall members into said wick from passing directly to said second one of said pair of wall members for seepage into said second duct without first passing through a substantial portion of said wick; said wick assembly being disposed within said evaporator so that said wick is in contact with ridges defining a portion of said capillary channel on said interior heat-exchange surface of said evaporator, said substantial portion of said wick through which liquid-phase working fluid passes being adjacent said ridges, so that liquid-phase working fluid can be delivered from said substantial portion of said wick into said capillary channel by capillary action;

(e) a condensate line for withdrawal from said condenser of working fluid that has condensed from vapor phase to liquid phase in said condenser;

(f) a return line for withdrawal from said evaporator of working fluid in liquid phase in excess of said amount needed to keep said capillary channel continuously wetted with working fluid in liquid phase, said return line bypassing said condenser and merging with said condensate line;

(g) a pump, an inlet of said pump communicating with said condensate and return lines, said pump providing sufficient suction to withdraw from said condenser working fluid that has condensed to liquid phase therein, and to withdraw from said evaporator working fluid in liquid phase in excess of said amount needed to keep said capillary channel continuously wetted with working fluid in liquid phase; and

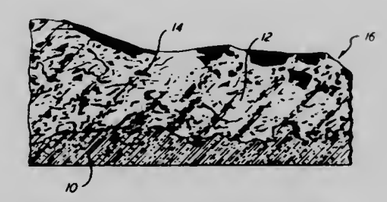
(h) a feed line connecting an outlet of said pump to said evaporator, said feed line delivering working fluid in liquid phase from said pump to said evaporator.

4,890,669

POROUS COATING FOR ENHANCED TUBES

Steven R. Zohler, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 881,437, Jul. 2, 1986, Pat. No. 4,753,849. This application Mar. 28, 1988, Ser. No. 174,291
Int. Cl.[4] F28F *13/18*
U.S. Cl. 165—133 **2 Claims**



1. An enhanced evaporator tube for transferring heat between a liquid refrigerant in contact with the exterior surface of the tube and a fluid flowing through the tube, comprising:

a first metal substrate tube having an unenhanced exterior surface; and

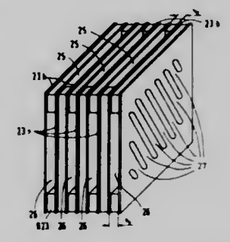
a layer of metal particles generally similar to said first metal bonded in thermal conducting relationship to said substrate tube, said layer of metal particles having random voids in every direction through said layer of metal particles wherein said voids form interconnecting subsurface channels which communicate with the liquid refrigerant to vaporize the liquid refrigerant in said voids forming interconnecting subsurface channels.

4,890,670

CROSS-FLOW HEAT EXCHANGER

Gerhard Schlenzl, Augsburg, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,887
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423736
Int. Cl.[4] F28F *21/08, 3/10*
U.S. Cl. 165—76 **13 Claims**



1. High-temperature cross-flow heat exchanger for transfer of heat from an initially hot, heat releasing fluid medium to an initially cool, heat absorbing fluid medium having a plurality of plates assembled in a plate package with adjacent plates defining therebetween flow ducts or channels (25, 26, 27, 28) for the fluid media, said package (5, 6) having inlets and outlets, wherein the plate package comprises:

a plurality of thin plates of good heat conductive material, said plates being formed with parallel corrugations (24), the corrugations terminating short of the edge zones of the plates and having a corrugation height (h_S) extending from a median plane of said plates which is half the thickness (h_K) of the flow ducts (25, 26) formed between adjacent plates, each of said plurality of plates having a top side (29) and a bottom side (30), said edge zones of the plates being flat and extending along the entire periphery of said plates, and

flat, elongated edge strips (23, 23v, 23h) having a thickness (h_R) corresponding to the thickness (h_K) of the flow ducts, said plates (21) being assembled into the respective packages with the corrugations (24) of one surface (29) of a plate (21) crossing the corrugations (24) on a facing surface (30) of an adjacent plate, the corrugations (24) of the adjacent plates, at crossing points, being in point contact with each other, said plates being so stacked that the top side (29) of a plate (21) is opposite a top side (29) of a further plate (21) rotated by 180° relative thereto, and the then uppermost bottom side (30) of said further plate (21) engaging the bottom side (30) of another plate and so on, in all following plates, so that the corrugations (24) of two respectively superposed plates (21) cross each other and form said point contact;

the inlets and outlets of the packages being located in alignment with each other to define the respective flow directions of the respective medium, said flow directions extending at an angle with respect to and crossing the corrugations of the plates,

a first set of two of said edge strips (23h) being fitted between adjacent plates at opposite respective edge zones thereof to define each heat accepting duct (28) for the heat absorbing medium to flow therethrough in a direction parallel to the respective edge strips (23h) at the sides of the ducts, and a second set of two of said edge strips (23v) being fitted between adjacent plates at opposite respective edges thereof to define each heat releasing duct (27) adjacent a heat accepting duct for heat releasing medium to flow therethrough at an angle with respect to the flow of the medium through the heat accepting duct and in a direction

parallel to the respective edge strips (23*v*), the edge strips of said first set overlapping, respectively, the edge strips of said second set only at corners of said plates,

wherein, to accomodate extreme temperature differences between the heat-releasing medium and the heat-absorbing medium at adjacent corners of said heat exchanger, the corner regions of the plates (21) and the overlapping regions of said edge strips (23*v*, 23*h*) interposed between adjacent plates, are welded together whereby the corner regions of the plates and the overlapped regions of the edge strips will form weld-connected corners, and

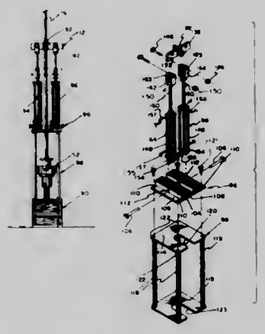
wherein the plates (21) and the edge strips (23*v*, 23*h*) interposed between adjacent plates are soldered along the longitudinal edges of the edge strips (23) and along the sides of the plates (21), whereby said edge strips and plates will be joined between said welded corners and along the length of the edge strips by soldering.

4,890,671

POLISHED ROD LINER PULLER ASSEMBLY

Bill V. Baxter, 401 Princeton, Liberal, Kans. 67901

Filed Jan. 9, 1989, Ser. No. 294,422
Int. Cl.[4] E21B *19/02*
U.S. Cl. 166—250 **15 Claims**



1. A polished rod liner puller assembly operable with a well casing head assembly to remove a polished rod liner member of a polished rod liner assembly from a well, comprising:

(a) a work table assembly operable to be placed around the well casing head assembly and enclose the polished rod liner assembly;

(b) a base plate assembly mounted on said work table assembly;

(c) a piston and cylinder jack assembly mounted on said base plate assembly and extended upwardly therefrom; and

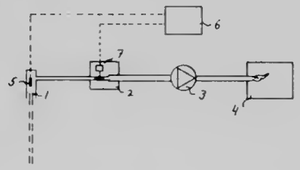
(d) a winged rod clamp assembly connectable to said piston and cylinder jack assembly and to a polished rod member of the polished rod liner assembly and operable on actuation of said piston and cylinder jack assembly to axially move the polished rod member and the polished rod liner member to remove the polished rod liner member from the well.

4,890,672

METHOD OF CONTROLLING THE FLOW OF LANDFILL GAS FROM SANITARY LANDFILLS AND APPARATUS FOR PERFORMING THE METHOD

Lars Hall, Lidingö , Sweden, assignor to RAGN-SELLS-FORETAGEN AB, Sweden

Filed Oct. 24, 1988, Ser. No. 261,712
Claims priority, application Sweden, May 26, 1987, 87022174
Int. Cl.[4] E21B *43/12, 47/06*
U.S. Cl. 166—250 **8 Claims**



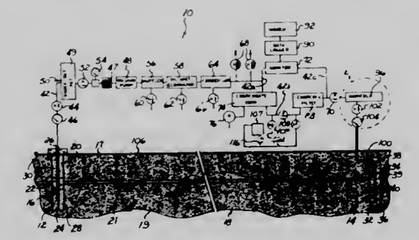
1. A method of controlling the flow of landfill gas from sanitary landfills for domestic refuse and industrial waste, comprising the steps of (a) drawing landfill gas out of gas wells, (b) measuring the temperature of the gas withdrawn from each gas well, (c) detecting and utilizing a temperature increase as an indication of too much landfill gas being withdrawn from the well, i.e. air having been drawn into the sanitary landfill at the gas well, and (d) utilizing information obtained by step (b) for controlling the flow of gas.

4,890,673

METHOD OF REMOVING VOLATILE CONTAMINANTS FROM CONTAMINATED EARTH STRATA

Frederick C. Payne, Charlotte, Mich., assignor to Midwest Water Resource, Inc., Charlotte, Mich.

Continuation-in-part of Ser. No. 22,105, Mar. 4, 1987, Pat. No. 4,730,672. This application Feb. 1, 1988, Ser. No. 151,065
Int. Cl.[4] E21B *43/40*
U.S. Cl. 166—266 **11 Claims**



1. A method of recovering and controlling a volatile contaminant from a contaminated layer of earth above a water table comprising the steps of:

establishing a first borehole in said earth, said first borehole terminating in said contaminated layer;

establishing a second borehole spaced from said first borehole in said earth and which terminates within said water table below said contaminated layer;

positioning a first conduit in said first borehole, with said first conduit being of smaller diameter than said first borehole;

positioning a second conduit in said second borehole, with said second conduit being of smaller diameter than said second borehole;

packing a fill material about each first and second conduit in their respective boreholes;

operatively connecting said first and second conduits by a third conduit wherein said first conduit is in fluid flow communication with said second conduit;

positioning means for neutralizing said volatile contaminant along said third conduit in flow communication therewith;

positioning means for drawing air from said contaminated earth in flow communication with said first and second conduits;

activating said means for drawing wherein air is drawn out of said contaminated layer to create an area of substantially reduced pressure which causes substantial quantities of said volatile contaminant to vaporize and be drawn up through said first conduit into said means for neutralizing to produce clean air;

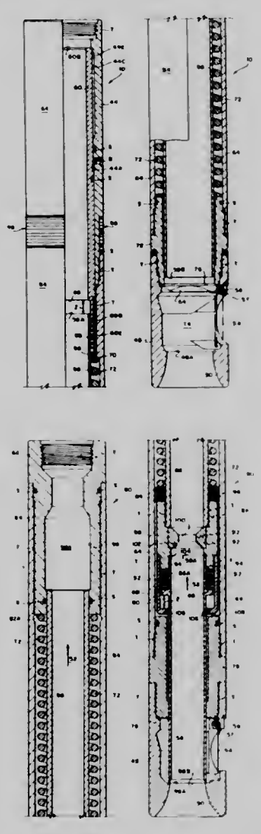
positioning a pump means between said means for neutralizing and said second conduit in flow communication therewith wherein said clean air is passed from said means for neutralizing into said second conduit.

4,890,674

FLAPPER VALVE PROTECTION

Nam V. Le, Lewisville, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Dec. 16, 1988, Ser. No. 285,517
Int. Cl.[4] E21B *34/08, 34/10*
U.S. Cl. 166—319 **12 Claims**



1. A subsurface safety valve adapted to be placed in a well tubing string to control flow therethrough comprising, in combination:

a valve housing having a bore therethrough;

a valve closure member mounted in the housing and movable between an open bore and a closed bore position;

an operator tube movably disposed for longitudinal extension and retraction within said housing for controlling movement of said valve closure member;

a tubular piston movably disposed for longitudinal extension and retraction within said housing for controlling movement of said operator tube;

a return spring interposed between said housing and said piston for yieldably urging said piston for longitudinal retraction movement;

a compression spring interposed between said operator tube and said piston for yieldably opposing longitudinal retraction of said operator tube relative to said piston;

said piston and operator tube having overlapping end portions disposed in telescoping engagement, said compression spring being radially confined between said overlapping end portions; and,

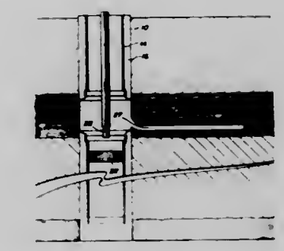
mutually engagable coupling means disposed on said pistons and said operator tube, respectively, for limiting longitudinal extension and retraction movement of said operator tube relative to said piston through a predetermined travel range.

4,890,675

HORIZONTAL DRILLING THROUGH CASING WINDOW

Edward G. Dew, 15314 Barbarossa, Houston, Tex. 77083

Filed Mar. 8, 1989, Ser. No. 321,414
Int. Cl.[4] E21B *7/04, 17/00, 29/02*
U.S. Cl. 166—376 **7 Claims**



1. In a process for drilling and completing a well traversing a formation wherein casing is set in the well to a point below said formation, wherein a section of casing that is more soluble in a selected chemical than the remainder of said casing is located in said casing adjacent said formation, and wherein said more soluble section of casing is contacted with said selected chemical solution in an amount and for a time sufficient to substantially dissolve said more soluble casing section, the improvement comprising:

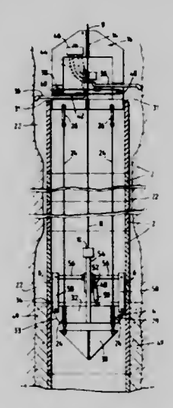
(a) drilling at least one generally horizontal borehole segment into said formation through the opening created by dissolving said more soluble casing section.

4,890,676

APPARATUS AND METHOD FOR LINING BORE HOLES WITH PRE-FORMED LINING SHELLS

Benjamin Mason, Normanton-on-Trent, Great Britain, assignor to Caledonian Mining Co. Ltd., United Kingdom

Filed Oct. 12, 1988, Ser. No. 256,703
Int. Cl.[4] E21B *43/10*; E21D *5/01*
U.S. Cl. 166—380 **16 Claims**



1. A method of producing a bore hole lining from pre-formed shells, said method comprising the steps of

assembling more than one of said shells one by one onto a lower frame which is lowered into said bore hole by a predetermined distance in a series of steps, each step being of a length corresponding to the depth of each shell loaded, thereby providing a batch of shells on said lower frame,

lowering an upper frame onto said batch of shells before said batch is lowered down the bore hole,

drawing said upper frame and lower frames together before said batch is lowered down said bore hole to clamp together said shells forming said batch,

lowering said batch of assembled shells so formed until the bottom surface of the lowermost shell contacts either the bottom of said bore hole or the top of a previously lowered shell,

causing grout to be discharged around said batch of shells and allowing said grout to set,

disassembling said lower frame from said batch, and

drawing said lower frame up through said batch of shells preparatory to assembling a new batch of shells thereon.

4,890,677

CHECK VALVE SYSTEM FOR FIRE EXTINGUISHER

William A. Scofield, Clifton, N.J., assignor to Pem All Fire Extinguisher Corporation, Cranford, N.J.

Filed Aug. 24, 1988, Ser. No. 235,658
Int. Cl.[4] A62C *23/10*
U.S. Cl. 169—75 **15 Claims**

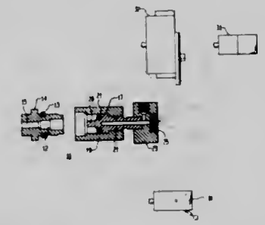
1. In a chemical fire extinguisher system, a chemical flow check system comprising:

check valve means having selectably open and closed states, said check valve means having associated therewith a resilient biasing element for urging flow control surfaces of said check valve means into communication with one another, whereby said check valve means is urged in the direction of said closed state;

carrier means having a first chemical flow channel therein, said first chemical flow channel being adapted to engage sealingly with said check valve means for controlling chemical flow through said first chemical flow channel in response to said selectably open and closed states of said check valve means;

actuator means having a check valve engagement portion arranged to be in communication with said first chemical flow channel of said carrier means for actuating said check valve means, said actuator means further having a second chemical flow channel therein and arranged to communicate with said first chemical flow channel;

coupler means for removably coupling said carrier means and said actuator means in a predetermined orientation with respect to one another whereby, when said coupler means is completely coupled with said carrier means, said actuator means is in an engaged relationship with said check valve means, and as said coupler means is uncoupled from said carrier means, said actuator means assumes



a disengaged relationship with said check valve means, said engaged and disengaged relationships corresponding to open and closed states, respectively, of said check valve means;

pressure chamber means coupled to said coupler means and arranged to be in fluid communication with said second chemical flow channel of said actuator means, for receiving at least a portion of said chemical flow through said first and second chemical flow channels when said check valve means is in said open state; and

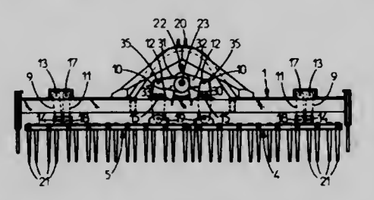
control valve means arranged in fluid communication with said pressure chamber means, said control valve means having a closed state for permitting a static pressure to be retained in said pressure chamber means, and an open state for venting said pressure in said pressure chamber means.

4,890,678

SOIL-WORKING FARM MACHINE

Edmond Oberle, and Bernard Wattron, both of Saverne, France, assignors to Kuhn S.A., Saverne, France

Filed Apr. 1, 1988, Ser. No. 177,481
Claims priority, application France, Apr. 13, 1987, 87 05336
Int. Cl.[4] A01B *19/06*
U.S. Cl. 172—54.5 **19 Claims**



1. A soil-working farm machine comprising:

(a) a frame;

(b) a device for hitching said frame to a tractor vehicle;

(c) at least two transverse rows placed behind one another, considering the working direction of said soil-working farm machine, each one of said two transverse rows comprising two tool bars, each one of said tool bars being equipped with a plurality of soil-working tools;

(d) a plurality of oscillating arms connecting each one of said tool bars to said frame in such a manner that each one of said tool bars is connected to said frame by at least two oscillating arms at least one of which is a driven oscillating arm; and

(e) means for giving said two tool bars in each one of said two transverse rows phase opposition movement, said means comprising a mechanism for the transformation of rotary movement received from a driving source into a reciprocating movement of said tool bars crosswise to the working direction of said soil-working farm machine, said mechanism comprising a connecting rod-eccentric device supported by said frame, said connecting rod-eccentric device comprising a plurality of connecting rods each one of which serves, during use of said soil-working farm machine, to transmit the reciprocating movement to a corresponding one of said tool bars via a corresponding driven oscillating arm, wherein:

(f) each one of said plurality of oscillating arms is connected to said frame by a connection having an axis directed at least approximately parallel to the working direction of said soil-working farm machine and is connected to the corresponding one of said tool bars by a connection having an axis directed at least approximately parallel to the working direction of said soil-working farm machine;

(g) each one of said plurality of connecting rods is connected to the corresponding eccentric by a first connection and to the corresponding driven oscillating arm by a second connection, said first connection and said second connection having each an axis directed at least approximately parallel to the working direction of said soil-working farm machine and said connecting rod exhibits a plane of symmetry containing the axis of said first connection and the axis of said second connection;

(h) said driven oscillating arm of each one of said tool bars is the oscillating arm which extends closest to said connecting rod-eccentric device;

(i) said connecting rod-eccentric device comprises a shaft having an axis of rotation at least approximately parallel to the working direction of said soil-working machine and on which are mounted said eccentrics; and

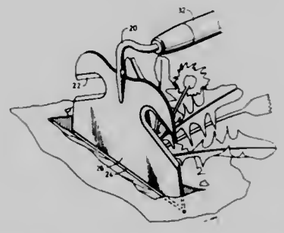
(j) said connecting rods of said two tool bars in each one of said two transverse rows are arranged so that, when said connecting rods are at a dead center of their crosswise reciprocating movement, their planes of symmetry are merged, are horizontal, and contain the axis of rotation of said shaft of said connecting rod-eccentric device.

4,890,679

GARDEN HOES FOR HOEING, SICKLEING, CHIPPING, AND CUTTING

Robert C. Jacobs, 305 E. McMillan #2, Cincinnati, Ohio 45219

Filed May 17, 1989, Ser. No. 293,089
Int. Cl.[4] A01B *1/08*
U.S. Cl. 172—371 **4 Claims**



1. A garden hoe for performing controlled hacking strokes or oblique upward cuts, as well as downward chipping and chopping on weeds and small plants and limbs, or the like, comprising:

a one-piece generally rectangular steel plate, one edge thereof being horizontal and sharpened, and with opposite vertical side edges thereof each having a single inwardly and upwardly extending recessed portion with sharpened generally parallel edges adapted to be used selectively with the sharpened horizontal edge,

means for attaching said one-piece tool to a handle comprising a prong extending from the top central portion of said tool with a holding ferrule means secured thereto,

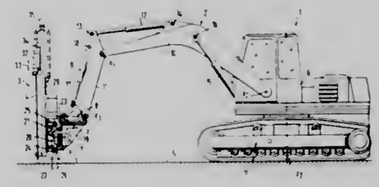
handle means secured to said attaching means whereby a user may manually manipulate said plate so that said sharpened recess edges may be used in a down stroke to cut weeds and woody plants, or in a generally oblique upward stroke to cut plants stems or small limbs, or by using a chipping downward stroke to cut earth using said horizontal edge.

4,890,680

MACHINE FOR WORKING ROCK, ESPECIALLY A BLOCK DRILLING MACHINE

Friedhelm Porsfeld, Passau, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,455
Int. Cl.[4] E21B *15/04*
U.S. Cl. 173—42 **24 Claims**



1. A machine for working rock comprising:

a supporting means being capable of rotating about a first axis which is approximately normal to the ground and a second axis which is approximately parallel to the ground;

a crossmember mounted to said supporting means;

a cradle mounted on said cross member to be reciprocally movable along said crossmember and approximately normal to said crossmember; and

a drilling unit connected to the reciprocally movable along said cradle, said drilling unit being connected to said supporting means via said cradle and said crossmember in such a manner so as to be rotatable, relative to said supporting means, about three axes which are respectively normal to one another.

4,890,681

METHOD AND APPARATUS FOR ROTARY POWER DRIVEN SWIVEL DRILLING

Michael Skelly, P.O. Box 2687, Pampa, Tex. 79066

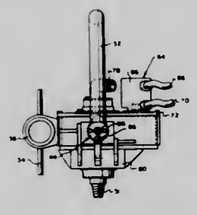
Continuation of Ser. No. 178,554, Apr. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 40,983, Apr. 21, 1987, which is a continuation of Ser. No. 629,263, Jul. 10, 1984, abandoned. This application Apr. 5, 1989, Ser. No. 333,782
Int. Cl.[4] E21B *19/02*
U.S. Cl. 173—163 **4 Claims**

1. A power driven system for imparting rotary motion to a drill string through a first drill pipe for use in a drilling rig of the kind presenting a suspended hook, said power drive system comprising:

(A) a rotary drive swivel unit having a center of gravity, said rotary drive unit comprising:

(1) drive means for imparting rotary motion;

(2) an output shaft in rotational connection with said drive means;
(B) means for connecting said output shaft to said drill string at the first drill pipe for imparting rotational motion thereto;
(C) means for controlling the drive means;
(D) means connected to said rotary drive swivel unit for resisting torque upon said rotary drive swivel unit when said drill string is rotated;
(E) means for connecting the rotary swivel drive unit to the hook of the drilling rig, said means having a horizontal

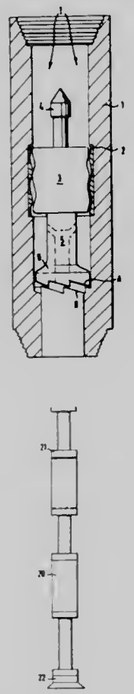


pivotal axis the center of gravity of the rotary drive swivel unit being below said horizontal pivot axis and within the circumference of said connecting means;
(F) means for disconnecting the output shaft from the drill string at the first drill pipe;
(G) means for easily tilting the rotary drive swivel means about the horizontal pivotal axis to present the disconnected output shaft in a substantially horizontal orientation whereby said rotary drive swivel is tiltable with a minimum of force; and
(H) means for connecting the output shaft to a second drill pipe which is horizontally presented.

4,890,682
APPARATUS FOR VIBRATING A PIPE STRING IN A BOREHOLE
Robert N. Worrall, and Ivo P. J. M. Stulemeijer, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.
Filed May 5, 1989, Ser. No. 348,186
Claims priority, application United Kingdom, May 16, 1986, 8612019
Int. Cl.[4] E21B *4/02, 7/04, 7/24*
U.S. Cl. 175—61 **20 Claims**

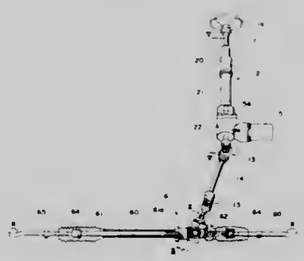
1. An apparatus for vibrating a drill string having a central axis in a borehole, the apparatus comprising means for generating at a downhole location longitudinally directional vibrations along the central axis of the drill string in response to flow of fluid through the interior of said drill string and a shock absorbing element mounted in the drill string between the apparatus and a drill bit carried by said drill string effective to substantially isolate the drill bit from the vibration induced in the drill string.

19. A method of feeding a drill string through a non-vertical section of borehole comprising:
generating at a downhole location a longitudinally directional vibration along the central axis of the drill string by oscillating a body in an axial direction relative to the drill string in response to flow of fluid through the interior of the drill string, said vibrations preventing frictional sticking of the drill string against the borehole wall;



isolating a drill bit at the end of the drill string from the effects of the vibration during drilling operations; and moving the pipe longitudinally in the borehole.

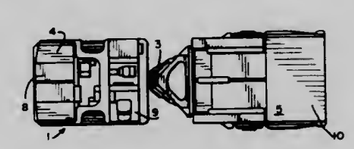
4,890,683
POWER STEERING APPARATUS
Akinobu Matsuda, and Masamitsu Sakai, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan
Filed Apr. 15, 1988, Ser. No. 182,124
Claims priority, application Japan, Oct. 20, 1987, 62-266027
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **2 Claims**



1. A power steering apparatus, in which a steering shaft is

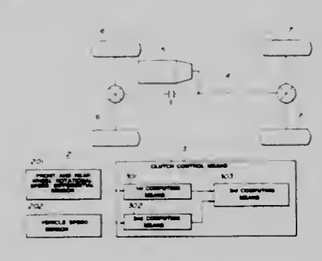
connected at one end to a steering wheel disposed in the cab of a car, said steering shaft is connected at an opposite end to one side of a universal joint, the other side of said universal joint is connected to a pinion shaft disposed outside the cab, a rack-pinion type steering mechanism is provided for steering in such a way that the rotation of said pinion shaft caused by the turning operation of the steering wheel is converted into the transverse movement of a rack shaft engaging with said pinion shaft, a steering assisting motor driven on the basis of sensed steering torque exerted on said steering wheel, a torque sensor means disposed on a middle part of said steering shaft between said steering wheel and said pinion shaft for sensing said steering torque, a driving means disposed between said torque sensor means and said mechanism adjacent to said torque sensor for transmitting the rotation of said motor to said steering shaft, and a housing enclosing at least a portion of said steering shaft containing said driving means and torque sensor means therewithin and having said motor attached to the outside thereof, said rack shaft having a plurality of teeth formed along the axial direction of said rack shaft, each of said rack teeth provided with pinion shaft engaging pressure angles, such pressure angles reduce in magnitude with the advance from the middle part of the rack shaft outwardly toward the ends of the rack shaft, said rack shaft engaging pinion teeth on the outer periphery of the pinion shaft, said steering shaft having input and output sides with the input side extending to said steering wheel and said output side extending to said pinion shaft, said driving means including a worm wheel fixedly attached to said output side of said steering shaft and a worm gear associated with said motor and being rotatable upon activation of said motor, said worm gear engaging said worm wheel, said driving means further including a clutch means operatively associated with the motor and positioned between said motor and said worm gear for selectively transmitting the rotational power of said motor to the worm gear, said worm gear includes teeth and has a tip end portion with a diameter which is smaller than the diameter of the gear at the bottom of its said teeth, said tip end and an opposite end of said worm gear being supported by said housing, said opposite end of the worm gear being located at an opening of said housing, said clutch means being mounted within said housing opening.

4,890,684
ARTICULATED VEHICLE WITH HINGED JOINT
Jack L. Simmons, Richlands, Va., assignor to Simmons-Rand Company, Bristol, Va.
Filed Apr. 22, 1988, Ser. No. 184,767
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—135 **10 Claims**



1. In an articulated vehicle including a pair of mobile vehicle sections interconnected together by a hinge having a substantially vertical axis allowing the vehicle sections to pivot horizontally relative to each other with said pair of vehicle sections and hinge being arranged so that all relative movement between the pair of vehicle sections takes place through the hinge, the invention comprising: means on said hinge allowing said vehicle sections to pivot vertically relative to each other about an axis transverse to said vertical axis, intersecting with said vertical axis and located in a general horizontal plane, a power-operated reciprocal strut interconnecting said two vehicle sections together in a plane offset from said transverse axis and pivoted at opposite ends to said vehicle sections by joints allowing pivoting of the strut about three axes located at right angles to each other whereby said strut can be extended or retracted to adjust the angular orientation of the two vehicle sections relative to each other in a vertical plane while allowing said sections to pivot relative to each other about both said vertical and transverse axes.

4,890,685
DEVICE FOR CONTROLLING DRIVING FORCE DISTRIBUTION IN FOUR-WHEEL DRIVE VEHICLE
Genpei Naito, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 29, 1988, Ser. No. 277,377
Claims priority, application Japan, Nov. 30, 1987, 62-302472
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—233 **6 Claims**

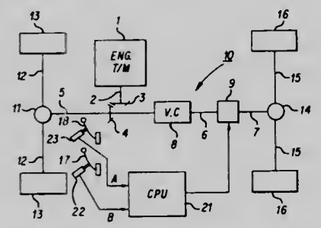


4. A driving force distribution control device for a four wheel drive vehicle comprising:
a transfer mechanism for transmitting a driving force from an engine to front and rear wheels, said transfer mechanism including a transfer clutch variable in engagement depending on variation of a clutch engaging force supplied thereto for varying distribution of said driving force to said front and rear wheels;
an actuator for supplying said clutch engaging force to said transfer clutch;
a rear wheel rotational speed sensor for sensing a rear wheel rotational speed and producing a signal representative thereof;
a first front wheel rotational speed sensor for sensing a rotational speed of one of said front wheels;
a second front wheel rotational speed sensor for sensing a rotational speed of the other of said front wheels;
a controller for controlling said actuator in response to said signals from said rear wheel rotational speed sensor and said first and second front wheel rotational speed sensors, said controller including means for computing a vehicle speed using smaller one of said front wheel rotational speeds, means for computing a rotational speed differential between said front and rear wheels using said rear wheel rotational speed and the average of said front wheel rotational speeds, means for computing a rotational speed differential between said front wheels using said front wheel rotational speeds, means for computing a lateral acceleration using said rotational speed differential between said front wheels and then computing a clutch engaging force component using said lateral acceleration and said rotational speed differential between said front and rear wheels when said rotational speed differential between said front and rear wheels is equal to or larger than zero, means for computing a clutch engaging force component using said vehicle speed and said rotational speed differential between said front and rear wheels when said rotational differential is smaller than zero, means for computing a clutch engaging force component using only said vehicle speed, means for computing a target clutch engaging force from the sum of said clutch engaging force components, and means for producing a

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singal for allowing said actuator to supply said target clutch engaging force to said transfer clutch.

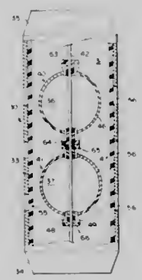
4,890,686
DRIVE MODE SELECTING SYSTEM FOR FOUR-WHEEL-DRIVE MOTOR VEHICLE
Tetsurou Hamada; Katsuhiko Masuda; Kazunori Shibuya; Kazuhiko Shimada, and Shoiji Tokushima, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1988, Ser. No. 247,191
Claims priority, application Japan, Sep. 22, 1987, 62-238359
Int. Cl.[4] B60K *23/08*
U.S. Cl. 180—233 **5 Claims**



1. A drive mode selecting system for a four-wheel-drive motor vehicle, comprising:
a drive system for driving a first axle drive mechanism and a second axle drive mechanism;
clutch means selectively rigidly connecting said first and second axle drive mechanisms through said drive system for transmitting relative torque between the first and second axle drive mechanisms, and disconnecting said first and second axle drive mechanisms;
brake operation detecting means for detecting operation of a brake of the motor vehicle;
accelerator operation detecting means for detecting operation of an accelerator of the motor vehicle; and
control means responsive to detected signals from said brake operation detecting means and said accelerator operation detecting means for applying a disengaging signal to said clutch means to disconnect said first and second axle drive mechanisms when said detected signals indicate that said brake is operated and said accelerator is not operated, and wherein said control means further includes means for applying an engaging signal to said clutch means to connect said first and second axle drive mechanisms when at least the detected signal from said accelerator operation detecting means indicates that the accelerator is operated.

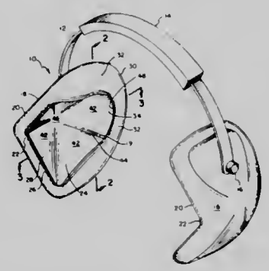
4,890,687
BOREHOLE ACOUSTIC TRANSMITTER
William L. Medlin, Dallas, and Gary A. King, Sanger, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 17, 1989, Ser. No. 338,793
Int. Cl.[4] G01V *1/40*
U.S. Cl. 181—106 **30 Claims**

1. An acoustic transmitter for a borehole logging tool, comprising:
(a) a liquid-filled, pliable boot,
(b) a plurality of liquid-filled, closed shells of piezoelectric material linearly stacked within said pliable boot,
(c) a pair of apertures positioned in opposite sides of each of said shells, said shells being linearly stacked such that all of said apertures are in alignment thereby providing acoustic coupling between said shells,
(d) electrical contacts to the inner and outer surfaces of said shells to which differing electrical polarities are applied, and
(e) means for modulating the application of said differing electrical polarities to said shells to excite said shells to vibrate at resonant frequencies controlled by the sizes of



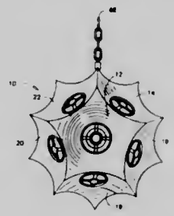
said shells and said apertures to produce an acoustic energy wave in subsurface formations surrounding a borehole in which the borehole logging tool is placed.

4,890,688
ANECHOIC EAR PIECE
David Baker, 15 W. Notredame, Glens Falls, N.Y. 12801
Filed Apr. 14, 1989, Ser. No. 338,240
Int. Cl.[4] H05R *25/00*
U.S. Cl. 181—136 **6 Claims**



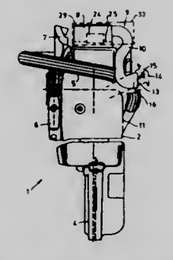
1. An anechoic ear piece comprising:
an ear piece body adapted to be placed over a human ear, said body extending upwardly from a perimeter thereof such that a pinnacle of the body is held in a spaced apart relation opposite said ear, and forming a cavity about said ear, a portion of the body being cut away forming an exterior opening into said cavity;
a padding provided about a predetermined portion of the perimeter adapted to contact a user; and
a lining of acoustic foam on an inner surface of said ear piece body for absorbing sound waves impacting said inner surface, wherein said inner surface extends downwardly from the pinnacle toward the perimeter forming a cone shaped inner surface.

4,890,689
OMNIDIRECTIONAL SPEAKER SYSTEM
Stephen H. Smith, Solana Beach, Calif., assignor to TBH Productions, Inc., La Costa, Calif.
Continuation-in-part of Ser. No. 869,359, Jun. 2, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 132,908
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—144 **11 Claims**



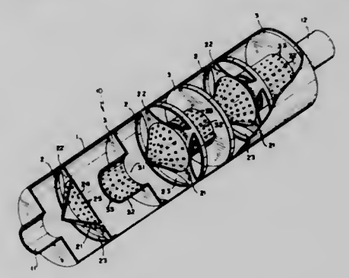
1. A system of speakers comprising:
an enclosed housing defined by a plurality of intersecting horns having a hyperboloid configuration and equally spaced around and from one another in an omnidirectional array and directed outward from a common point; and
wherein each of said horns has an apex and a focal point, a transducer of a first frequency mounted at the apex thereof, and a transducer of a higher frequency mounted at the focal point thereof.

4,890,690
EXHAUST GAS MUFFLER FOR A TWO-STROKE ENGINE
Hartmut Fischer, Winnenden; Jürgen Grassmuck, Stuttgart; Michael Wissmann, Schorndorf-Weiler, and Albert Dreher, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany
Filed Sep. 6, 1988, Ser. No. 240,818
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729477
Int. Cl.[4] F01N *1/14, 3/15*
U.S. Cl. 181—240 **17 Claims**



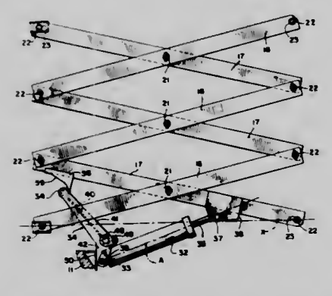
1. An exhaust gas muffler for a two-stroke engine, especially for a handheld portable tool such as a chain saw, the engine including a cylinder and a piston conjointly defining a combustion chamber wherein combustion gases are generated during operation of the engine, the exhaust gas muffler comprising:
a housing having an inner housing wall surface defining an interior space;
a catalyzer disposed in said interior space and including an enclosure wall having an outer enclosure wall surface;
mounting means for mounting said catalyzer in said interior spacer so as to cause said outer enclosure wall surface to be in spaced relationship to said inner housing wall surface on all sides of said catalyzer;
said mounting means and said catalyzer conjointly partitioning said interior spacer into first sand second chambers;
said housing having an inlet in said first chamber communicating with the combustion chamber of the engine so that the exhaust gases can pass into first chamber;
said catalyst defining a catalytic chamber for interconnecting said first and second chambers and for exothermally converting the exhaust gas and passing the converted exhaust gas to said second chamber;
said housing having an outlet in said second chamber for passing the exothermally converted exhaust gas out of said muffler;
said housing including a first housing part having said inlet formed therein and a second housing part having said outlet formed therein;
said housing parts being joined together at a common interface;
said mounting means being a partition wall supporting said catalyzer therein; and,
said partition wall being welded gastight to said second housing part thereby placing said partition wall downstream of said common interface.

4,890,691
MUFFLER
Chen Ching-ho, 5F, No. 10, Lane 197, Sec. 1,Jy Yuh Rd.,Shyh Lin, Taipei, Taiwan
Filed Nov. 16, 1988, Ser. No. 271,908
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—264 **10 Claims**



1. A muffler comprising:
(a) a hollow cylindrical body having an input end and an output end;
(b) a plurality of cone assemblies longitudinally spaced along an interior of the body, each cone assembly including a conical member having an apex directed towards the input end of the body and aligned with a longitudinal axis thereof;
(c) a plurality of barrier assemblies longitudinally spaced along the interior of the body and alternately disposed between the cone assemblies, each barrier assembly including a round plate provided with a central circular opening and an open ended hollow cylindrical portion surrounding the opening and extending outwardly of the plate towards the input end of the body; and
(d) each cone assembly and each barrier assembly being provided with a plurality of exhaust flow paths therethrough.

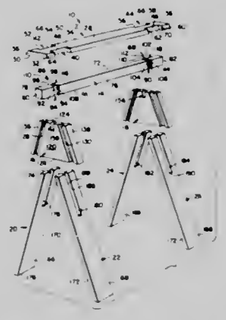
4,890,692
PLATFORM ELEVATING APPARATUS
Willard R. Oakman, McConnellsburg, Pa., assignor to JLG Industries, Inc., McConnellsburg, Pa.
Filed Dec. 6, 1988, Ser. No. 280,645
Int. Cl.[4] E04G 1/22
U.S. Cl. 182—141 **6 Claims**



1. An elevating device for a workman's platform having a base and a platform vertically movable between a fully retracted position and a raised position, comprising:
(a) a plurality of interconnected lift arms having central and end pivotal interconnecting points, certain lower of said lift arms being adapted for pivotal connection to the base and certain upper of said lift arms being adapted for pivotal connection to the platform;
(b) a power lift cylinder mounted entirely below said lift arms when said arms are fully retracted, said cylinder having an extendible piston pivotally connected at one end to one of said lower lift arms;
(c) a cam plate connected to said one lower lift arm at a point on the opposite side of said central interconnection point of said one lower lift arm, said cam plate having a cam surface,
(d) pivot arm means mounted for rotation about a horizontal fixed axis, one end of said pivot arm means being operatively connected to the end of said lift cylinder opposite said piston, and the other end of said pivot arm means having mounted thereon a cam roller for engaging said cam surface when said lift arms are retracted and during initial lifting movement of said arms from such retracted position, said cam roller and cam surface being so oriented as to provide a vertical lifting force on said one lower lift arm when said power lift cylinder is actuated, whereby actuation of said lift cylinder to raise said arms and platform results in rotation of said pivot arm means and lifting of said cam roller whereby said one lower lift arm is raised both at its connection to the cylinder piston and at the point of engagement between said cam surface and said cam roller.

4,890,693
KNOCK-DOWN SUPPORT STAND AND KIT FOR ASSEMBLY THEREOF
Charles E. O'Brien, 26 Guild Rd., Saugus, Mass. 01906
Filed Feb. 6, 1989, Ser. No. 306,093
Int. Cl.[4] B27B 21/00; B25H 1/06
U.S. Cl. 182—151 **10 Claims**

1. A knock-down support stand for use for supporting various articles in horizontal disposition comprising:
(a). an elongated, horizontally disposed, top support member having a trapezoidal shaped cross section and being defined by horizontally disposed, planar, top and bottom surfaces parallel to one another, non-parallel side surfaces which taper inwardly and upwardly from said bottom surface at equal angles defining inclined surfaces and terminating at the said top surface, and end edges;
(b). an elongated cross-bar having a rectangular-shaped cross section and defined by horizontally disposed, planar, top and bottom surfaces parallel to one another, vertically disposed, planar, sides parallel to one another and of somewhat greater width than the width of the said top and bottom surfaces, and vertically disposed, parallel, planar ends, said cross-bar being so located as to be disposed in contiguous engagement with the said bottom surface of the elongated top support member along its lengthwise direction;
(c). first and second brace members each having a trapezoidal shape spaced apart from one another and being located adjacent the ends of said cross-bar and in interlocking engagement therewith for supporting said elongated top support member; and

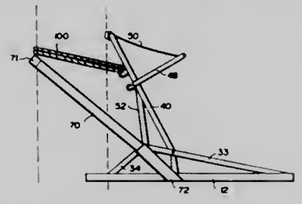


(d). four elongated, rectangular-shaped leg members each of which is defined by inner and outer, parallel, planar surfaces, parallel, planar side surfaces intersecting therewith, and top and bottom, planar edges parallel to one another and lying in planes inclined at an angle less than 90 degrees with respect to the planes defined by the planar inner and outer surfaces of the leg member whereby on being in assembled disposition the top edges of the leg members in opposition to one another will lie in a plane which includes that of the top surface of said elongated support member and the planar bottom edges of the leg members will all lie in the same plane, said leg members being disposed in pairs in opposition to one another adjacent the respective ends of the cross-bar and being in interlocking engagement with respective brace members.

4,890,694
COMBINED CLIMBING AND HANG-ON TREE STAND WITH OPTIONAL CLIMBING AID
Ralph D. Williams, Haughton, La., assignor to Loggy Bayou Industries, Shreveport, La.
Division of Ser. No. 78,677, Jul. 28, 1987, Pat. No. 4,802,552.
This application Nov. 29, 1988, Ser. No. 277,638
Int. Cl.[4] A45F 3/26; A47C 9/10
U.S. Cl. 182—187 **30 Claims**

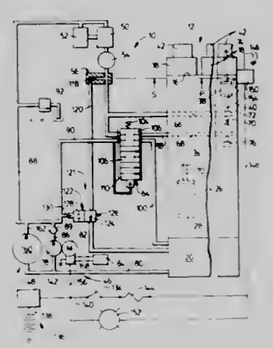
1. A tree stand, comprising:
a generally rectangular platform having opposite side and end frame members with one of said end frame members engageable with a tree, each of said side frame members including a flange extending inwardly toward the opposite side frame member;
a plurality of longitudinally spaced slats extending between said opposite side members with opposite ends engaging and overlapping with said flanges;
means for securing said slats and said side frame members one to the other to form an open platform grid; and
elongated means secured at its opposite ends to said platform

and extendable about the tree for engagement with the other side of the tree from the platform and at an elevation



above the elevation at which said one end frame member is engageable with the tree.

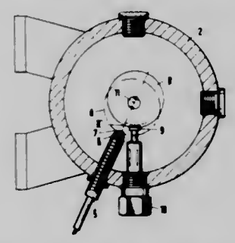
4,890,695
ENGINE LUBRICATION SYSTEM
Leslie C. Morris, Washington, and Craig W. Riediger, Pekin, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed May 30, 1989, Ser. No. 358,055
Int. Cl.[4] F01M 9/00
U.S. Cl. 184—6.3 **14 Claims**



1. A lubrication system for an engine having an upper rocker arm area and including a first pressurized source for supplying a lubrication fluid to the engine when the engine is not running, and a second pressurized source for supplying the lubrication fluid to the engine when the engine is running, comprising:
first means for preventing the supply of the lubrication fluid from the first pressurized source from reaching the upper rocker arm area when the engine is not running; and,
second means for disabling the first means when the engine is running and allowing the supply of lubrication fluid to reach the rocker arm area from the second pressurized source.

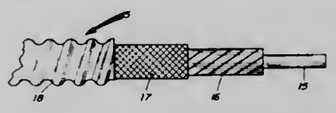
4,890,696
METHOD OF ADJUSTING THE LUBRICATING TIME OF A LUBRICATION PUMP AND APPARATUS FOR CARRYING OUT THE METHOD
Günter Skarupa, Pegnitz, Fed. Rep. of Germany, assignor to Baier & Köppel GmbH & Co., Pegnitz, Fed. Rep. of Germany
Filed May 18, 1989, Ser. No. 353,454
Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818256
Int. Cl.[4] F16N 27/00
U.S. Cl. 184—7.4 **6 Claims**

1. A method for adjusting the lubricating time of a lubrication pump which is driven by a motor having a drive shaft whose rate of rotation varies, the lubrication pump being used in a centralized lubrication of a utility vehicle and preferably by means of lubricants which are difficult to press and have a high penetration, the method comprising carrying out the



adjustment within a cycle time which includes a lubricating time and a non-lubricating time, and adjusting the lubricating time in dependence upon the number of rotations of the drive shaft.

4,890,697
SENSING APPARATUS FOR MONITORING A STRUCTURE SUBJECT TO WEAR
Werner Fischer, Markt Schwaben; Friedrich Schauer, Heroldsberg, and Kurt Kramer, Nuremberg, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany
Filed Dec. 1, 1988, Ser. No. 278,357
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743254
Int. Cl.[4] F16D 66/02
U.S. Cl. 188—1.11 **9 Claims**



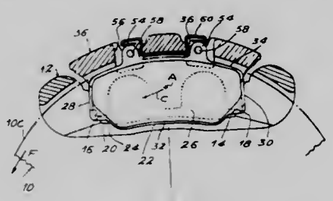
1. A sensing apparatus for monitoring a structure subject to wear, comprising:
a sensing device insertable into a recess in one surface of said structure, said sensing device having at least a portion of its length that corresponds to a predetermined minimum thickness between said one surface and an opposite surface of said structure;
a first coaxial electrical cable comprising an inner conductor, a heat resistant means positioned about said inner conductor, and a metallic tubular sheath positioned about said heat resistant means, an end of said first coaxial cable extending into said sensing device so as to dispose an end portion thereof into an area of an end face of said sensing device, said end portion of said coaxial electrical cable being formed into a loop having a tubular sheath portion an outer surface of which is adjacent to said end face of said sensing device, and an inner conductor portion disposed within said sensing device; and
a contact means connected to the other end of said first coaxial electrical cable so as to make electrical contact with said inner conductor and electrical contact with said tubular sheath, said contact means including a measuring circuit for detecting the electrical characteristics between said inner conductor and said tubular sheath.

4,890,698

DISK BRAKE AND BRAKE PAD UTILIZABLE IN SUCH A BRAKE

Gérard Le Deit, Courtry, France, assignor to Bendix France, Drancy, France

Filed Jan. 9, 1989, Ser. No. 294,237
Claims priority, application France, Feb. 5, 1988, 88 01332; Nov. 25, 1988, 88 15403
Int. Cl.[4] F16D *66/02*
U.S. Cl. 188—1.11 **6 Claims**



1. A disc brake comprising a caliper straddling a brake disc and equipped with clamping means designed to move at least two brake pads toward opposing faces of the disc, each pad being accommodated and anchored inside an opening formed in a support member and consisting of a lining carrier plate and a friction lining, said lining carrier plate having at least one part projecting radially beyond a peripheral edge of the disc and having mounted on the plate at least one stud made of a wear-resistant material projecting axially toward said disc and beyond a peripheral edge of the disc, said radially projecting part penetrating, with a given circumferentially play, inside an aperture formed in said caliper, the support member and each side of the disc defining predetermined gaps therebetween so that when the disc and at least one friction lining of a respective brake pad are worn the respective radially projecting part engages during braking the perimeter of the aperture in the caliper as a result of the respective brake pad rotating, and the respective stud engaging and irreversibly damaging the disc when both the disc and one friction lining are worn.

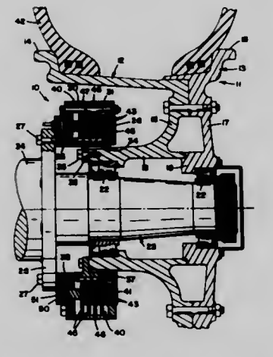
4,890,699

WET DISC FRICTION BRAKE WITH CASING RODS EXTENDING THROUGH STATOR BORES

George W. Meggimson, Thomasville, Ala.; Philip D. Redenbarger, Centerpoint, and David H. First, Bloomington, both of Ind., assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 225,124, Jul. 28, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 361,899
Int. Cl.[4] B60T *1/06;* **F16D** *55/36, 65/78*
U.S. Cl. 188—18 A **3 Claims**

1. A liquid-cooled disc brake assembly consisting of a casing with a chamber having a quanity of liquid disposed therin; said casing consisting of an inner annular flange, a cylindrical housing and an outer annular flange; said casing being held together as an integral unit by a plurality of circumferentially spaced rods, said rods extend through said annular flanges and securely retain said flanges to said cylindrical housing that acts as a spacer; said rods extend through said chamber; a rotatable wheel with a cylindrical support; said cylindrical support journaled for rotation between the radial innermost portions of said annular flanges to define said chamber; annular seals mounted between said cylindrical support and said radial innermost portions of said annular flanges to seal said chamber for the retention of fluid within said chamber; a plurality of rotor discs mounted in said casing for rotation relative to said casing about an axis or rotation within said casing, means for connecting said rotor discs via splines to said cylindrical support which is connected to said rotatable wheel which is to be selectively braked; a plurlaity of stator discs disposed within said casing and being interleaved with said rotor discs for relative movement along said axis of rotation, all of said stator discs have a circumferentially extending outer periphery, each of said stator discs and each of said rotor discs having solid annular braking surfaces, means for moving said rotor discs and said stator discs toward each other to effect a braking action to said rotatable wheel, all of said stator discs having a plurality of circumferentially spaced bores lying closely adja-



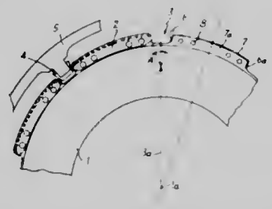
cent to said outer periphery of said stator discs but radially inwardly thereof, said rods being circumferentially spaced and extending through said casing and through said bores of said stators in a direction parallel to said axis of rotation, each of said rod having their radial outermost portion disposed radially inwardly of said outer periphery of all of said stators; and a liquid is located within said fluid tight chamber for the transfer of heat energy away from annualr braking surfaces.

4,890,700

CARBON DISK BRAKE ROTOR FITTED WITH REINFORCING RIDERS

Jean Guichard, La Gareane Colombes, France, assignor to Messier-Hispano-Bugatti, Montrouge, France

Filed Mar. 24, 1989, Ser. No. 328,548
Claims priority, application France, Apr. 8, 1988, 88 04689
Int. Cl.[4] F16D *65/12*
U.S. Cl. 188—73.2 **1 Claim**



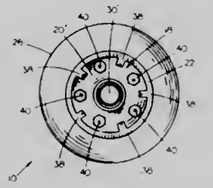
1. A carbon disk brake rotor for transmitting a braking couple to a wheel, the rotor including n regularly distributed drive notches hollowed out of its periphery in order to receive keys for providing rotary connection between the rotor and the wheel, each notch being substantially trapezium-shaped and having at least two drive faces disposed symmetrically about the midplane of the notch containing the axis of rotation of the disk, the rotor also having reinforcing riders fitted over the peripheral portions of the disk situated between the notches, wherein the drive faces of each notch form an angle of (360/2n) degrees with the midplane of the corresponding notch, and each rider includes two parallel fitted end walls.

4,890,701

FIVE-RIB DISK BRAKE ROTOR

James J. Swoboda, Platte Center, Nebr., assignor to International Wholesale, Inc., Yankton, S. Dak.

Filed Nov. 17, 1988, Ser. No. 272,347
Int. Cl.[4] F16D *65/10;* **A63C** *17/12*
U.S. Cl. 188—218 XL **2 Claims**



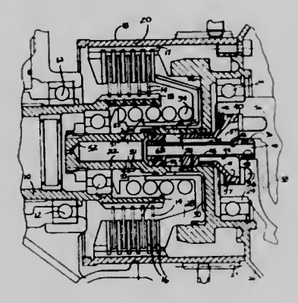
1. In combination;
a disk brake rotor having a generally cylindrical inner body with a solid forward face and a center longitudinal aperture oriented perpendicularly to said face;
a peripheral ring extending forwardly from said face;
a double-flange assembly projecting radially from said inner body;
five rib portions projecting radially inwardly from said peripheral ring, and evenly-spaced therealong;
said inner body having five bolt holes therethrough parallel to said center aperture and equidistant therefrom, said bolt holes being arranged on the front face of said inner body equally spaced from each other and equidistant from said center aperture, and located such that each bolt hole is equidistant between two adjacent rib portions and diametric to another of said rib portions.

4,890,702

BRAKE OR CLUTCH ASSEMBLY

Richard Baker, Santee, and Tuan Nguyen, San Diego, both of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 14, 1988, Ser. No. 271,440
Int. Cl.[4] F16D *25/00*
U.S. Cl. 188—264 D **15 Claims**



1. A brake or clutch assembly comprising:
a rotatable shaft;
a first plurality of annular friction plates coupled to said shaft for rotation therewith;
a second plurality of annular friction plates, said friction plates being arranged so that friction plates of said first plurality alternate with the friction plates of said second plurality to form a pack; means for axially compressing said pack to drive said friction into engagement with each other;
a drum coupled to said second plurality of friction plates comprising an outer member and an inner member;
means including a transfer tube for supplying hydraulic fluid to said drum which is relatively rotatable with respect thereto;
sealing means, including a rigid sealing ring on and rotatable with said transfer tube, in sealing engagement with said drum inner member to seal the interface of said drum inner member and said transfer tube to provide correction for misalignment between said transfer tube and said drum inner member as relative rotation between said sealing ring and said drum occurs; and
said sealing ring being allowed to cant relative to said transfer tube without losing sealing engagement between said sealing means and said transfer tube and between said sealing means and said drum inner member.

4,890,703

RETENTION DEVICE FOR APPLICATION TO CONTROL CYLINDERS

Richard C. Hathaway, Greenville, Ohio, assignor to C. R. & I., Inc., Greenville, Ohio

Filed May 16, 1988, Ser. No. 194,513
Int. Cl.[4] F16F *9/32;* **F15B** *15/26;* **F16M** *13/00*
U.S. Cl. 188—300 **17 Claims**



1. Apparatus for application to the piston rod of a control cylinder to selectively limit and prevent the retraction of its piston rod into its housing comprising two distinct elements, one said element being bar-shaped, longitudinally extended and having, with reference to its application, inner and outer surfaces, inner and outer ends, a block shaped base portion to its inner end and a major portion of the length of its inner surface to the outer end thereof transversely concave and substantially uniformly arcuate in cross section, the other of said elements having a substantial thickness, being short in length, having therein adjacent one end thereof a through aperture shaped to accommodate a portion of the piston rod to which it applies and at the opposite end thereof a recess accommodating therein said base portion of said one element, means releasably interconnecting and pivotally interrelating said base portion of said one element with and in nesting relation to said recess in said opposite end of said short element and spring means interposed between said base end portion of said one element and the said opposite end portion of said short element to firmly and resiliently bias said longitudinally extended bar-shaped element to normally position over and in inclined relation to said short element to inherently and firmly bias at least a portioo of said transversely concave and substantially uniformly arcuate surface portion of said one element into a portion of the circumferential extent of the piston rod of the cylin-

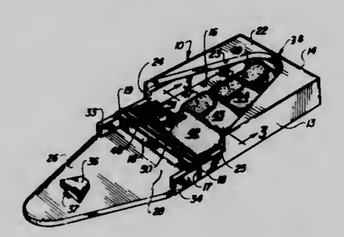
der to which said short element applies when at least a predetermined portion of the length of such piston rod is extended from the cylinder of which it forms a part.

4,890,704

FOLDING IRONING BOARD

Robert L. Harris, 16500 Patton St., Detroit, Mich. 48219

Filed Sep. 13, 1988, Ser. No. 243,624
Int. Cl.[4] A47B *85/00*; A45G *9/00*
U.S. Cl. 190—11 **3 Claims**



1. A portable, folding ironing board comprising:
(a) a generally rectangular case section, having an interior compartment and which includes an outer side panel, an inner side panel, a top panel, a bottom panel, a front side panel, and a first partial rear side panel, said case section panels being fixedly secured together to form said interior compartment;
(b) a nose section having a panel with a nose shaped front end and a transverse rear end, and a second partial rear side panel being fixedly secured to the rear end of the nose section panel, said second partial rear side panel being hingedly attached to the first partial rear side panel and said nose section panel, being manually movable between a closed, inoperative position and an open, operative position relative to the case section;
(c) the case section inner side panel being provided with a nose shaped opening formed therein and which extends from the rear end of the case section to a point adjacent the front end of the case section and which nose shaped opening permits access to the interior compartment when the nose section panel is in the operative position;
(d) the nose shaped panel of the nose section nests in the nose shaped opening in the case section inner side panel when the nose section panel is in the closed position;
(e) latch means for releasably retaining the nose shaped panel of the nose section in the nose shaped opening in the case section when the nose section panel is in the closed position;
(f) said case section being provided with handle means for transporting the folding ironing board, and said folding ironing board being adapted to be placed on a supporting surface, as a table, in an upright position, with the nose section panel in an open position to provide an ironing board operative surface formed by the outer surfaces of the nose section panel and the case section front side panel; and,
(g) support leg means for retaining the nose section panel level with the case section front side panel during use of the ironing board.

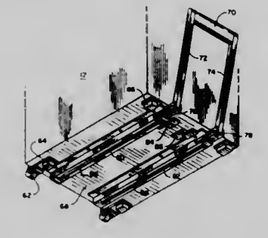
4,890,705

PORTABLE FILE WITH RETRACTING HANDLE

Jose J. Pineda, P.O. Box 942, Kingston, Tenn. 37763-0942

Filed Jun. 10, 1988, Ser. No. 204,887
Int. Cl.[4] A45C *5/00*, *13/00*
U.S. Cl. 190—18 A **12 Claims**

1. A new and improved portable file, comprising:
a generally rectangular file cabinet;
a hinged lid secured to an open upper end of said cabinet;
a pair of generally rectangular channel tracks extending in spaced parallel relation on a bottom surface of said file cabinet, said channel tracks having respective and openings disposed adjacent a first end of said bottom surface;
a pair of generally rectangular slide blocks mounted for sliding movement in said channel tracks, said slide blocks each having an outer end extendable through a respective one of said channel track end openings;
an elongated groove formed through each of said channel tracks;
a stop pin secured to each of said slide blocks, said stop pins each extending through a respective one of said elongated grooves to retain said slide blocks in said channel tracks;
a pair of handle support bars each having a first end pivotally secured to said outer end of a respective one of said slide blocks;
a handle mounted between said handle support bars, said handle securing said support bars for simultaneous parallel pivotal movement;



at least one handle retaining bracket mounted on said bottom surface of said file cabinet, between said channel tracks adjacent said end openings, said retaining bracket dimensioned to selectively frictionally retain said handle in a retracted position, between said retaining bracket and said bottom surface;
a support pad secured adjacent each corner on said bottom surface for supporting said file cabinet in a stationary position on a horizontal surface; and
a pair of wheels secured in spaced aligned relation on said bottom surface, adjacent a second end of said bottom surface opposite said first end, whereby said handle support bars are receivable in said channel tracks with said handle disposed in said retaining bracket in said retracted position and said handle support bars and said handle are movable to extend outwardly and upwardly from said first end of said bottom surface in an extended position to transport said file cabinet on said wheels.

4,890,706

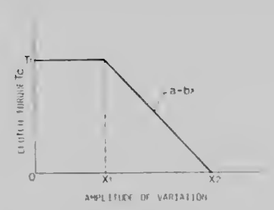
UNBALANCE CORRECTION MECHANSM IN A LOCK-UP DAMPER

Hideki Miura, Hirakata, and Mamoru Ookubo, Neyagawa, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP87/00904, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/04000, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 20, 1987, Ser. No. 217,920
Claims priority, application Japan, Nov. 21, 1986, 61-179549[U]
Int. Cl.[4] F16D *39/00*, *3/50*
U.S. Cl. 192—3.28 **3 Claims**

1. An unbalance correction mechanism in a lock-up damper for a torque converter having a front cover, a turbine, a pump and a lock-up damper between said turbine and said front cover, said pump being connected to said cover and said cover being connected to the input shaft of said torque converter,

said turbine being connected to the output shaft of said torque converter, said lock-up damper having a clutch plate axially movable and frictionally engageable with said front cover, said clutch plate and said turbine being relatively rotatably connected to each other by circumferentially spaced damper springs; characterized in that, said clutch plate is provided at the side surface facing said turbine with rims and support walls for engaging the radially outer and inner sides of said damper springs and spring receivers disposed between adjacent of said



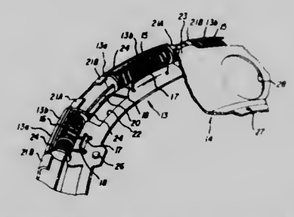
damper springs for receiving the ends of said adjacent damper springs, a driven ring fixed to said turbine and having claws disposed adjacent said spring receivers, said claws facing said ends of said adjacent damper springs, and spring seats for said damper springs, said spring seats each having a leg fitted into said ends of said adjacent of said damper springs, said leg on each said spring seat on said end of each said adjacent damper spring being of a selected length such that, when said lock-up damper is assembled, said spring seats balance said assembled lock-up damper.

4,890,707

CONTROL SYSTEM FOR A LOCKUP CLUTCH FOR AN AUTOMATIC TRANSMISSION

Hosei Suzuki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,395
Claims priority, application Japan, May 30, 1987, 62-137851
Int. Cl.[4] F16D *47/02*, *25/14*
U.S. Cl. 192—3.3 **13 Claims**



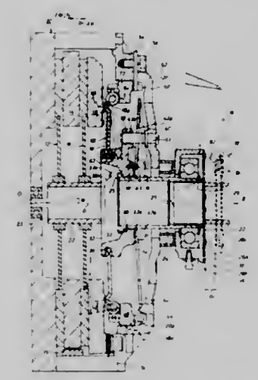
1. A control system for a torque converter for an automatic transmission of a motor vehicle driven by an engine, the torque converter having a lockup clutch provided with a release side chamber and an apply side chamber, comprising:
a lockup control valve having a displaceable spool for controlling oil supplied to the release side chamber and apply side chamber, respectively;
spool control means for controlling position of the spool to control pressure of oil supplied to the release side and apply side chambers, respectively;
a sensor for sensing rotational speed of an output member of the automatic transmission;
means for calculating amplitude of variation of said rotational speed and for producing a signal representing said amplitude;
operating means responsive to the signal for operating the spool control means so as to control the pressure of the oil to increase slipping of the lockup clutch with increase of the amplitude;
said operating means includes a table for comparing said amplitude with a first predetermined amplitude and for producing, via the spool control means, clutch torque of full engagement when said amplitude is less than said predetermined amplitude and a decreasing clutch torque only as said amplitude increases greater than said first predetermined amplitude but less than a second predetermined amplitude which is greater than said first predetermined amplitude.

4,890,708

CLUTCH HAVING AN ADJUSTABLE LEVER MATING WITH A DIAPHRAGM SPRING

Seiichi Kitano, and Masaaki Asada, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

PCT No. PCT/JP87/00746, § 371 Date Jun. 14, 1988, § 102(e) Date Jun. 14, 1988, PCT Pub. No. WO88/03233, PCT Pub. Date May 5, 1988
PCT Filed Oct. 5, 1987, Ser. No. 221,828
Claims priority, application Japan, Oct. 21, 1986, 61-251324
Int. Cl.[4] F16D *19/00*
U.S. Cl. 192—70.3 **10 Claims**



1. A pull-type clutch having a clutch disc mounted between a flywheel and a pressure plate in which releasing and engaging operations are carried out by pulling a release bearing away from said flywheel by means of a release lever interconnected to a clutch pedal for releasing said clutch and for releasing said release bearing to return toward said flywheel for engaging said clutch; characterized by a clutch disc spline fitted onto an output shaft at a transmission side of said clutch disc, a sleeve on a outer periphery of said input shaft, a release bearing secured to a transmission side end of said sleeve, a flange portion on said sleeve extending radially outwardly of said sleeve at a flywheel end of said sleeve, a load transmission retainer for transmitting a pressing force from said sleeve to said clutch disc fitted onto said sleeve into engagement with said flange portion of said sleeve so as to be retained thereby, a flange portion arcuate surface and a retainer arcuate seat between said retainer and said flanged portion for maintaining contact between said arcuate surface and said arcuate seat over the entire circumferences thereof even when said retainer is not coaxial with said sleeve, a clutch cover fastened to said flywheel and covering said pressure plate, a spring member disposed between said clutch cover and said retainer, a lever between said retainer and said pressure plate for transmitting a spring force therebetween, and a connecting member between said retainer and said clutch cover for connecting said clutch

cover with said retainer and for allowing said retainer to slide in the axial direction of said retainer.

4,890,709

TORQUE TRANSMITTING AND TORSION DAMPING APPARATUS FOR USE IN MOTOR VEHICLES

Wolfgang Reik, Bühl, and Hans-Dieter Elison, Offenburg, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

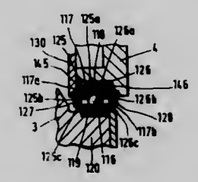
Division of Ser. No. 132,909, Dec. 14, 1987, abandoned, which is a division of Ser. No. 470, Jan. 5, 1987, Pat. No. 4,727,970, which is a continuation-in-part of Ser. No. 716,838, Mar. 28, 1985, abandoned, and a continuation-in-part of Ser. No. 799,006, Nov. 18, 1985, abandoned, and a continuation-in-part of Ser. No. 848,732, Apr. 4, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,858

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421709; Nov. 23, 1984, 3442679; Apr. 15, 1985, 3513449; Apr. 16, 1985, 3513479

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] F16F *15/12, 15/30*

U.S. Cl. 192—70.17 **22 Claims**



1. Apparatus for transmitting torque between an output shaft of a combustion engine and a transmission, comprising a composite flywheel including a first flywheel fixedly connectable to the output shaft of the engine and a second flywheel having a friction surface engageable with a clutch plate of a friction clutch with attendant generation of heat, said first and second flywheels being rotatable relative to each other and the friction clutch being connectable with said second flywheel and being arranged to couple said second flywheel with and to detach said second flywheel from the transmission; antifriction bearing means between said first and second flywheels; damper means for opposing rotation of said first and second flywheels relative to each other; means for at least reducing the tranafer of heat from said friction surface to said bearing means, including heat insulating means interposed between said friction surface and said bearing means for substantially thermally insulating said bearing means from said friction surface; and sealing means engaging said insulating means to seal said antifriction bearing means.

4,890,710

TORQUE TRANSMITTING AND TORSION DAMPING APPARATUS FOR USE IN MOTOR VEHICLES

Wolfgang Reik, Bühl, and Hans-Dieter Elison, Offenburg, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

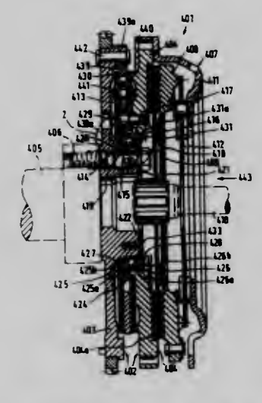
Division of Ser. No. 132,909, Dec. 14, 1987, abandoned, which is a division of Ser. No. 470, Jan. 5, 1987, Pat. No. 4,727,970, which is a continuation-in-part of Ser. No. 716,838, Mar. 28, 1985, abandoned, Ser. No. 799,006, Nov. 18, 1985, abandoned, and Ser. No. 848,732, Apr. 4, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,793

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421709; Nov. 23, 1984, 3442679; Apr. 15, 1985, 3513449; Apr. 16, 1985, 3513479

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] F16F *15/12, 15/30*

U.S. Cl. 192—70.17 **13 Claims**



1. Torque transmitting apparatus with an arrangement for taking up and for compensating for variations of torque, particularly for fluctuations of torque between a combustion engine and input means of a transmission, comprising a plurality coaxial flywheels which are rotatable within limits relative to each other and include a first flywheel connectable with the engine and a second flywheel connectable with the input means of the transmission by way of a friction clutch having a clutch plate engageable by a friction surface of the second flywheel with attendant generation of hear; bearing means interposed between said first and second flywheels; and heat insulating means for at least reducing the transfer of heat from said friction surface to said bearing means, said insulating means constituting the sole means for offering frictional resistance to rotation of said first and second flywheels relative to each other and including axially acting resilient means for generating said frictional resistance.

4,890,711

CLUTCH CONTROL SYSTEM FOR AN AUTOMOBILE VEHICLE, AND A CLUTCH RELEASE BEARING THEREFOR

Roger Carnillet, Franklin, Mich., and Philippe Lasziaz, Boulogne, France, assignors to Valeo, Paris, France

Filed Jun. 9, 1988, Ser. No. 204,234

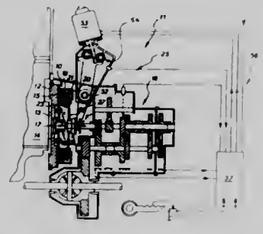
Claims priority, application France, Jun. 9, 1987, 8708003

Int. Cl.[4] F16D *23/02, 19/00*

U.S. Cl. 192—98 **6 Claims**

1. A clutch release bearing for an automobile vehicle, said release bearing comprising an operating member adapted to be moved in a first direction and a second direction by activating

means, and a drive member being axially connected to the operating member and through which the drive member is adapted to act axially positively in both the first and second directions on clutch release means of the clutch, said bearing having a pair of substantially rigid operating parts turned



axially towards one another, with a gap between the pair of substantially rigid operating parts for engagement with the clutch release means of the clutch, said operating parts each bearing axially positively on a corresponding transverse shoulder provided on said drive member.

4,890,712

TORSIONAL VIBRATION DAMPING DEVICE FOR CLUTCH PLATES

Paul Maucher, Sasbach, and Rudolf Hönemann, Ottersweier, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

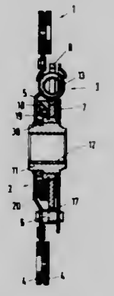
Continuation-in-part of Ser. No. 853,720, Apr. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 863,614, May 15, 1986, abandoned, and a continuation-in-part of Ser. No. 931,943, Nov. 19, 1986, Pat. No. 4,700,822, which is a continuation of Ser. No. 801,565, Nov. 25, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 946,496

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606710

The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.

Int. Cl.[4] F16D *3/12, 3/66*

U.S. Cl. 192—106.2 **113 Claims**



35. A torsional vibration damping device, particularly for use in a clutch plate of a clutch of a motor vehicle, comprising a hub connectable with input means of a transmission and having external teeth; and first and second dampers respectively arranged to transmit a relatively small first moment and a larger second moment, said first damper comprising a torque-receiving first input element, a first output element non-rotatably mounted on said hub and first energy storing means arranged to oppose rotation of said elements relative to each other, at least one of said elements containing a non-metallic synthetic material, said second damper comprising a metallic second input element, a metallic second output element having internal teeth mating with a predetermined play with the external teeth of said hub, and second energy storing means arranged to oppose angular movements of said second elements relative to each other, said one first element being in frictional arrangement with at least one of said second damper elements.

4,890,713

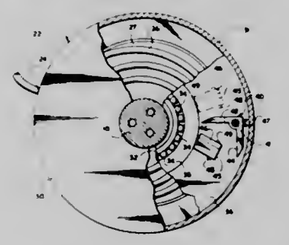
PAN AND TILT MOTOR FOR SURVEILLANCE CAMERA

Raymond V. Pagano, P.O. Box 802, Lithonia, Ga. 30058

Filed Jul. 22, 1988, Ser. No. 223,104

Int. Cl.[4] H04N *5/232;* **H01R** *35/00;* **G05G** *5/04*

U.S. Cl. 192—142 R **8 Claims**



1. In a pan and tilt mechanism for a surveillance camera, a bracket for mounting a pan and tilt mechanism, said mechanism including a camera mounting plate, said camera mounting plate being rotatable about a vertical axis for panning motion of the camera, a pan motor for causing panning motion of the camera, said mechanism being rotatable with respect to said bracket, the combination therewith of switch means for causing reversal of said pan motor, means for indicating one full revolution of said mechanism about said vertical axis, and means for actuating said switch means on two full revolutions of said mechanism, wherein said means for indicating one full revolution of said mechanism comprises an arm having a first position and a second position, and including means for moving said arm from said first position to said second position as said mechanism completes one full revolution about said vertical axis.

4,890,714

CONVEYING SYSTEM

H. Gary Brown, 2009 S. Range Rd., Hammond, La. 70401

Continuation of Ser. No. 829,795, Feb. 14, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 225,639

Int. Cl.[4] B65G *13/12*

U.S. Cl. 193—35 R **8 Claims**

1. A system for transporting wall board or like material on edge, comprising:

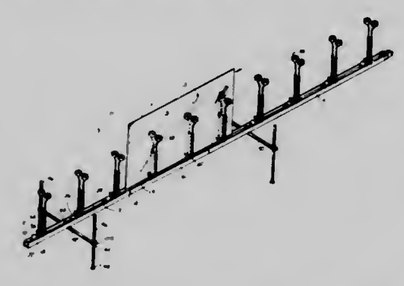
(a) a frame extending substantially horizontally, including at least two interconnectable sections;

(b) a plurality of rollers spaced along the length of the frame for defining a continuous track upon which the wall board is conveyed on edge;

(c) a first, lower plurality of pairs of rollers spacedly positioned up from the frame, each pair of rollers making contact with the front and rear face of the sedtions of wall board at a point adjacent the frame as the wall board is conveyed along the rollers;

(d) a second, upper plurality of pairs of rollers mounted on vertical arms extending upward from the frame so that at least two pairs of rollers make contact with the front and rear face of the wall board at all times during transport of the wall board, the point of contact being substantially midway along the width of the wall board for maintaining the wall board in the upright position on edge while being

conveyed, each vertical arm having an upper portion and including a bend in its upper portion to allow the two rollers in each pair of rollers in the second plurality of pairs of rollers to laterally separate a sufficient distance to allow the wall of board to pass between the two rollers;



(e) means on each of the sections of the system to engage one another for providing the continuous track upon which the wall board is conveyed;

(f) means for positioning the second plurality of rollers to a position substantially parallel with the length of the frame so that the sections may be packed within a confined area during storage.

4,890,715

METHOD OF AND A DEVICE FOR CODING WORKPIECE CARRIERS IN A PRODUCTION PLANT

Walter Sticht, Karl-Heinrich-Waggerl-Strasse 8, A-4800 Attnang-Puchheim, Austria

Continuation-in-part of Ser. No. 695,838, Jan. 28, 1985, abandoned. This application Feb. 4, 1987, Ser. No. 11,059

Claims priority, application Austria, Feb. 6, 1984, 363/84; Feb. 6, 1984, 361/84

Int. Cl.[4] B65G *43/00*

U.S. Cl. 198—340 **9 Claims**



1. An apparatus for coding workpiece carriers supporting assembly parts and fed to successive work processing stations arranged in a conveying direction along a conveyor track, at which stations the assembly parts are processed in a processing position, which comprises a displaceable coding element arranged on each one of the workpiece carriers in an initial switching position corresponding to a reject coding and displaceable to another switching position corresponding to an accept coding, a detector device preceding the processing position in the conveying direction at each one of the work processing stations for detecting the switching position of the coding element on a respective one of the workpiece carriers at said station, a switching element succeeding the detector device for displacing the coding element from the reject to the accept switching position, and a coding device succeeding the processing position in the conveying direction, the coding device comprising a switching element for displacing the coding element from the accept to the reject switching position, control means for activating said switching element if processing has been acceptably performed, whereby if processing has not been acceptably performed at a work processing station, the assembly parts on the workpiece carrier are no longer processed when fed to successive work processing stations or are fed to a delivery station for scrap parts or post processing.

4,890,716

MACHINE TOOL

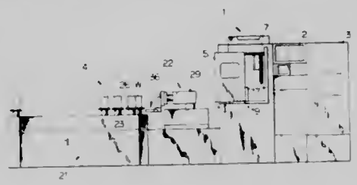
Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan

Filed Oct. 15, 1986, Ser. No. 918,888

Claims priority, application Japan, Oct. 15, 1985, 60-227839; Oct. 15, 1985, 60-227840; Oct. 15, 1985, 60-227841; Oct. 15, 1985, 60-227842

Int. Cl.[4] B65G *47/00*

U.S. Cl. 198—346.1 **7 Claims**



1. A machine tool, comprising:

a machine tool body;

a spindle provided at the machine tool body for holding a tool, the spindle being movable in a vertical direction;

a bed provided in the machine tool body;

a plurality of workpiece holders each holding one workpiece, each of the workpiece holders having first and second grooves located in opposing positions;

movable table means provided on the bed for holding detachably a workpiece holder and moving the workpiece holder to a predetermined position near the tool so that the workpiece can be machined by the tool;

a workpiece station for storing many workpiece holders;

a workpiece changer for changing selectively the workpiece holders between the table means and the workpiece station;

the workpiece station including an endless type transfer means having a series of setting openings positioned at regular intervals, said workpiece holders being detachably set in the setting openings; and

spring means placed at each of the setting openings for forcibly holding the workpiece holder in the setting openings,

wherein exchange of the workpieces can be made by changing one workpiece holder to another workpiece holder at the workpiece station,

wherein the transfer means is an endless chain type conveyor, wherein the conveyor includes a plurality of holder pins in series and a plurality of pairs of plates for joining adjacent hollow pins, wherein the setting openings are formed in main holders, respectively which are placed in at least every two hollow pins, and wherein the spring means has a plurality of balls and a plurality of springs radially extending for pressing the balls against a ball stud of the workpiece holder when said workpiece holder is inserted into the setting opening;

wherein said workpiece changer comprises a workpiece holder supporting means having a pair of first and second fingers for holding at least one of said workpieces at a front portion thereof against a spring tension force, a lock pin inserted between back portions of said first and second fingers for locking said workpiece for preventing said first and second fingers from inadvertent opening, and means for actuating said lock pin when said first and second fingers are opened or closed, and

wherein said machine tool further comprises first stop means fixed to the conveyor for preventing the workpiece holder from rotating in the setting opening when the first stop means engages the first groove of the workpiece holder, and second stop means fixed to the workpiece holder supporting means for preventing the workpiece holder from rotating with respect to the first and second fingers when the second stop means engages the second groove of the workpiece holder.

4,890,717

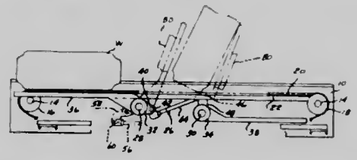
WHEEL TURNOVER DEVICE

John P. Kane, Sterling Heights, Mich., assignor to Allied Automation Systems, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 120,936, Nov. 16, 1987, Pat. No. 4,793,463. This application Apr. 20, 1988, Ser. No. 183,790

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—403 **12 Claims**



1. Article handling apparatus comprising conveying means for conveying tire wheel assemblies along a generally horizontal path with a first side surface of said assemblies uppermost during transit of a first portion of said path, a turnover device located at the downstream end of said first portion of said path for engaging a tire-wheel assembly and turning the assembly over upon said conveying means to position the article on said conveying means with said first side surface lowermost, said tire-wheel assemblies projecting outwardly from opposite sides of said conveying means;

said turnover device comprising first and second arm means each mounted for pivotal movement about respective first and second generally horizontal axes extending normal to said path and spaced from each other by a distance at least equal to the distance between said opposed side surface of said tire-wheel assembly, each of said arm means comprising a shaft mounted for rotation about one of said axes and a pair of elongate parallel arms fixedly mounted at opposite ends of said shaft at locations spaced outwardly from the opposite sides of said conveying means, said arms being normally disposed in respective rest positions below the path of movement of articles along said first path wherein the arms of said first arm means extend generally horizontally upstream from said first axis and the arms of said second arm means extend generally horizontally downstream from said second axis, drive means coupled to the shaft of said first arm means operable to drive said first arm means in pivotal transfer movement about said first axis from its rest position to a transfer position wherein the arms of said first arm means are inclined from said first axis upwardly above and downstream of said conveying means and to drive said first arm means in return movement to return said first arm means from its transfer position to its rest position, and motion transmission means coupling the shaft of said first arm means to the shaft of said second arm means to drive said second arm means in transfer movement coordinated with the transfer movement of said first arm means from its rest position to a transfer position wherein the arms of said second arm means are in spaced, parallel opposed relationship to said arms of said first arm means in response to transfer movement of said one of said arm means and to drive said second arm means in return movement to return said second arm means from its transfer position to its rest position in response to return movement of said first arm means to its rest position; and

overload release means operable to uncouple said one of said arm means from said drive means during the return movement of said arm means toward their respective rest positions in response to an abnormal resistance to said return movement encountered by either of said arm means.

4,890,718

HIGH-CAPACITY PHYSICAL AND/OR CHEMICAL TREATMENT APPARATUS IN AN AUTOMATIC PRODUCT PRODUCTION PLANT

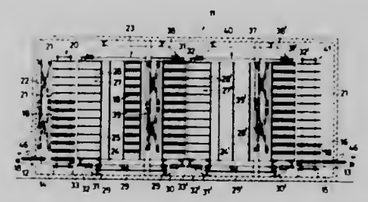
Arturo Colamussi, Ferrara, Italy, assignor to Vortex Systems S.r.l., Fossalta Di Copparo, Italy

Filed Jul. 1, 1988, Ser. No. 214,414

Claims priority, application Italy, Jul. 21, 1987, 21367 A/87

Int. Cl.[4] B65G *49/00*

U.S. Cl. 198—465.3 **10 Claims**



1. A high-capacity product treatment apparatus for use in an automatic product production plant; said apparatus comprising a first horizontal feed conveyor, a tunnel and a second horizontal discharge conveyor; said first horizontal feed conveyor feeds into said tunnel a plurality of modular supports; said second horizontal discharge conveyor carries from said tunnel the modular supports; said modular supports carry the products; a vertical support arrangement device being positioned within said tunnel adjacent said first horizontal feed conveyor for intercepting a number of modular supports and arranging each of the modular supports into spaced vertical alignment with another of the modular supports to form a group of modular supports; at least one cylindrical rotary storage container being positioned adjacent said vertical support arrangement device and said second horizontal discharge conveyor; said at least one cylindrical rotary storage container being divided into radial sectors; each radial sector having a plurality of parallel guides positioned in a superposed plane with the group of modular supports carried by said vertical support arrangement device; a first pusher device being positioned adjacent said vertical support arrangement device, said first pusher device causing movement of the group of modular supports from said vertical support arrangement device onto said at least one cylindrical rotary storage device; a vertical support rearranging device being positioned adjacent said at least one cylindrical rotary device and said second horizontal discharge conveyor; said at least one cylindrical rotary storage device being rotatable to bring one of the groups of modular supports into superposed position with said vertical support rearranging device; a second pusher device positioned adjacent said at least one cylindrical rotary storage device; said second pusher device moving a group of modular supports from said at least one cylindrical storage device onto said vertical support rearranging device; said vertical support rearranging device moving the group of modular support into contact with said second horizontal discharge conveyor whereby individual modular supports of the group are discharged in succession onto said

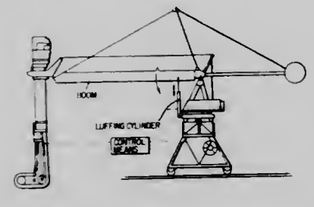
second horizontal discharge conveyor and exited from said tunnel.

4,890,719

EXCAVATOR FOR BUCKET ELEVATOR TYPE CONTINUOUS UNLOADER

Yoshitaka yagi, Nilhama; Toramasa Matsugi, Toyo, and Mitsuhige Kiyama, Nilhama, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 121,509
Claims priority, application Japan, Dec. 20, 1985, 60-195259
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—507 **1 Claim**



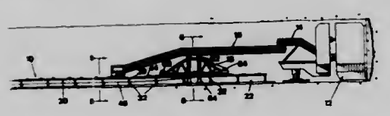
1. A bucket elevator type continuous unloader comprising:
a boom having a distal end;
a luffing cylinder operatively connected to an moving said boom;
an elevator post suspended from the distal end of said boom;
a shuttle frame supported by said elevator post;
a horizontal frame having opposite ends;
sprockets pivotally supported on said opposite ends of said horizontal ends;
a parallel link mechanism having an upper end portion and a lower end portion and being coupled to said shuttle frame at said upper end portion by pivot pins and to said horizontal frame at said lower end portion;
an actuator for swinging said parallel link mechanism about said upper pivot pins;
an endless bucket chain wound around said two sprockets and run in such a manner that said chain moves up along one side of said elevator post and that said chain lowers along the other end thereof;
an angle detector provided on one of the pivot pins for detecting the swing angle of said parallel link mechanism and producing a detection signal; and
means for controlling said luffing cylinder in accordance with the detection signal of said angle detector so that said horizontal frame remains at a same level.

4,890,720

EXTENSIBLE CONVEYOR SYSTEM

Raymond Brais, Montreal, Canada, assignor to Walsh & Brais Inc., Brossard, Canada

Filed Dec. 30, 1988, Ser. No. 292,006
Int. Cl.[4] B65G *15/26*
U.S. Cl. 198—592 **6 Claims**



1. A continuously extensible conveyor having an inby section and an outby section, the conveyor comprising an elongated rigid frame, a plurality of return reach idler rollers mounted in a return reach plane on the frame and a plurality of first conveying reach idler rollers mounted in a conveying reach plane above the return reach plane; supplementary frame means including frame support means and roller support means adapted to be added to the inby section of the elongated rigid frame in order to extend the elongated rigid frame, said return reach rollers being also mounted to said supplementary frame means; carriage means having an inby end and an outby end, mobile support means for supporting and moving the carriage means in a path above the elongated rigid frame for advance movement along a longitudinal axis of the elongated rigid frame including over the supplementary frame means, the carriage means including a conveyor belt pulley at the inby end thereof and second conveying reach rollers mounted thereon, and side access means provided downstream of the pulley between the second conveying reach rollers on the carriage frame and the return reach rollers on the supplementary frame means; an endless conveyor belt extending on the return reach rollers and said first and second conveying reach rollers on the elongated frame, the supplementary frame, and the carriage frame, and about the inby pulley on the carriage means whereby the conveyor system can be extended by adding supplementary frame means at the inby end of the elongated frame while advancing the carriage means, and inserting first conveying reach rollers through the access means onto the supplementary frame means between the conveying reach and return reach of the conveyor belt.

4,890,721

BELT CLAMP TYPE UNLOADER

Tadayoshi Kamiwaki, and Takumi Hoshika, both of Niihama, Japan, assignors to Sumimoto Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 15, 1988, Ser. No. 144,133
Claims priority, application Japan, Jan. 16, 1987, 62-7689
Int. Cl.[4] B65G *15/14*
U.S. Cl. 198—626 **5 Claims**

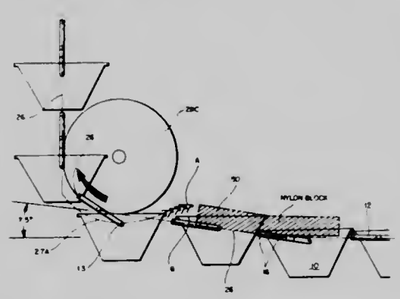
1. A substantially L-shaped unloader comprising:
a pair of endless belt conveyors each having an endless belt and arranged in parallel along substantially a whole longitudinal length thereof while contacting an outside surface of one endless belt with an outside surface of the other endless belt, said pair of endless belt conveyors extending vertically from a first end thereof and further extending horizontally from substantially a middle section thereof, said pair of endless belt conveyors being gradually separated from each other at a vicinity of said first end toward said first end such that a clearance therebetween forms substantially an isosceles triangle;
a pair of paddle feeders positioned immediately below said first end such that a bulk material fed by said pair of paddle feeders can be raised and conveyed by a wedge effect produced by the gradual separation of said pair of endless belt conveyors;
a pair of opposing first pulleys provided at said vicinity for holding said pair of endless belts of said endless belt conveyors therebetween, each of said pair of first pulleys having small diameter sections at a center thereof and a pair of large diameter sections at both ends thereof such that said pair of endless belts held by said pair of first pulleys forms a substantially clearance at a middle section thereof;
a pair of covering means for covering side clearances between said pair of endless belts, each having a shape of a substantially isosceles triangle for covering said first end;
a second pulley arranged at an intersection between said vertical extending portion and said horizontally extending portion of said endless belt conveyors, said second pulley having a small diameter section at a center thereof and a pair of large diameter sections at both ends thereof; and
a plurality of side pressing rollers arranged in staggered relationship along the vertically extending portion of said endless belt conveyors between said pair of first pulleys and said second pulley to claim both sides of said pair of endless belts, wherein said pair of first pulleys, said pair of covering means and said pair of paddle feeders are symmetrically arranged around a central axis of said vertically extending portion of said endless belt conveyors.

4,890,722

METHOD AND APPARATUS FOR CONVEYING MATERIALS

George T. Gough, Charlotte, N.C., assignor to REFAC International, Limited, West Palm Beach, Fla.

Continuation-in-part of Ser. No. 906,539, Sep. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,268, Jul. 26, 1985, Pat. No. 4,722,433. This application Jul. 19, 1988, Ser. No. 222,337
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] B65G *47/40*
U.S. Cl. 198—706 **8 Claims**



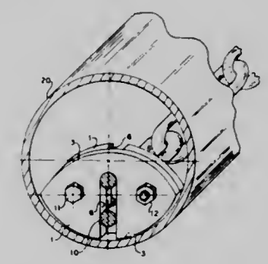
1. A conveyor system comprising,
(a) a series of buckets supported by an entrainment means defining a predetermined endless path having straight portions and at least one internal curve;
(b) an individual elongate pivoting arm supporting a respective bucket on the entrainment means, each said pivoting arm being attached to the entrainment means at a first end thereof in fixed orientation to said entrainment means, and pivotally supporting the bucket at an opposite, free, second end thereof; and
(c) guidance means engaging said entrainment means in advance of said at least one internal curve in the endless path to cause the free, second end of the pivoting arm to which the bucket is attached to pivot outwardly and the buckets in turn to follow a diverging curved path of greater radius than the radius of said internal curve in the endless path of the entrainment means being transited and thereby space the buckets further apart prior to and while negotiating said internal curve in the endless path than when the buckets are proceeding along a straight portion of the endless path.

4,890,723

PLATE TYPE CLIP CONVEYOR

Michael Debuisson, Trazegnies; Jose, Joseph A., Thuin, and Marcel Rigo, Roselies, all of Belgium, assignors to Caterpillar Inc., Peoria, Ill.

Filed May 26, 1988, Ser. No. 199,089
Claims priority, application Belgium, Sep. 16, 1987, 8701044
Int. Cl.[4] B65G *19/14*
U.S. Cl. 198—716 **12 Claims**



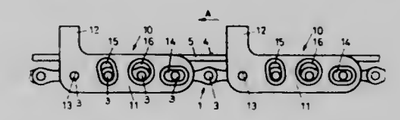
1. A conveyor composed of an assembly of straight and curved conduit sections in which moves drive means having a plurality of spaced drive plate assemblies mounted thereon, characterized in that the drive plate assemblies have a substantially oval shape comprising a major axis and a minor axis and an axis of symmetry substantially coinciding with the axis of the drive means, each of said drive plate assemblies comprising two identical plates each having a notch disposed along the minor axis and closed at a first end and open at a second end, and wherein the closed end of the notch is non-perpendicular with respect to the surface of the plate.

4,890,724

CONVEYOR WITH ARTICLES CARRIERS MOUNTED ON AN ENDLESS CHAIN

Horst Loeweathal, Tiengen, Fed. Rep. of Germany, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 13, 1988, Ser. No. 193,781
Claims priority, application Switzerland, May 13, 1987, 1833/87
Int. Cl.[4] B65G *19/26*
U.S. Cl. 198—732 **19 Claims**



1. In a conveyor including a conveyor track extending in a conveying direction and arranged for supporting articles to be advanced thereon; a throughgoing slot provided in said conveyor track and extending in the conveying direction; an endless sprocket chain having a flight adjoining said conveyor track and extending parallel to said conveying direction; said sprocket chain being composed of chain links articulated to one another by link pins; support pins mounted on said chain and constituting an axial extension of at least some of the link pins; a plurality of article carrier units inserted on said support

pins and arranged consecutively in said conveying direction; an article carrier lug forming part of each said article carrier unit and arranged for projecting through said slot for engaging an article supported on said conveyor track for imparting a conveying force on the article; the improvement wherein each said article carrier unit comprises

(a) a carrier body having opposite ends spaced from one another in a direction parallel to a length dimension of said chain; said carrier lug being a one-piece part of said carrier body and being situated at one of said ends;

(b) a centering bore provided in said carrier body and being centered on a first one of said support pins; said carrier body being pivotal about said first support pin;

(c) a control slot provided in said carrier body and receiving and being guided by a second one of said support pins; said control slot having opposite first and second ends; said second end being more remote from said centering bore than said first end; said control slot being obliquely oriented relative to an imaginary line connecting said centering bore with said second end of said control slot; said first and second support pins being at least two consecutive said chain links apart from one another; and

(d) an arcuate slot provided in said carrier body between said centering bore and said control slot; said arcuate slot having a center of curvature coinciding with a center of said centering bore; said arcuate slot receiving a third one of said support pins; said third support pin being situated between said first and second support pins; and said first and third support pins being one chain link apart.

4,890,725

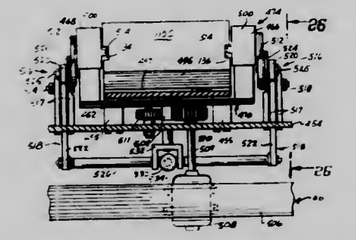
AUTOMATIC CONTINUOUSLY CYCLEABLE MOLDING SYSTEM AND METHOD

Richardus H. J. Fierkens, Herwen, and Irenaeus J. T. M. Pas, Rosendaal, both of Netherlands, assignors to ASM Fico Tooling B.V., Netherlands

Continuation of Ser. No. 798,678, Nov. 15, 1985, abandoned, which is a division of Ser. No. 586,855, Mar. 6, 1984, Pat. No. 4,575,328. This application Jul. 20, 1988, Ser. No. 222,361

Int. Cl.[4] G65G *25/02*

U.S. Cl. 198—774 **4 Claims**



1. An apparatus for steppingly transporting articles having groove means in opposing sides, comprising, in combination:

(a) at least a pair of unitarily cooperating walking beams in spaced apart parallel relationship with respect to each other on opposite sides of at least one of the articles to be steppingly transported thereby, said pair of walking beams having an article engaging means for engaging with said article to be steppingly transported, said article engaging means being positioned on opposing inner surfaces of said pair of walking beams and being disposed to remain a constant distance apart, said article engaging means comprising horizontally oriented inwardly directed continuous ledge portions extending linearly the full length of one of said opposing inner surfaces of said walking beams and the article, said ledge portions engaging with said groove means to position said articles;

(b) drive means coupled to said pair of walking beams for reciprocal movement of said pair of walking beams in a horizontal movement path between an article pick-up position and an article set-down position; and

(c) elevating means coupled to said pair of walking beams for reciprocal movement of said pair of walking beams in a vertical movement path between an elevated position and a lowered position.

4,890,726

CARRIER FOR BOTTLE PREFORMS

Siegfried R. Wissmann, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Sep. 1, 1988, Ser. No. 239,267

Int. Cl.[4] B66C *1/54*

U.S. Cl. 198—803.12 **15 Claims**

1. A preform carrier for supporting and carrying tubular container preforms having an open end defining a container opening, said carrier comprising:

(a) a cylindrical central body member adapted to be received through the open end of the preform and extending into the interior of the preform;

(b) a resilient annular gripping member carried by the body member, the gripping member being a flexible ring having a substantially U-shaped cross section defined by a base portion and a pair of spaced, depending legs;

(c) annular spring means positioned with the gripping member and against the respective legs to resiliently urge the legs apart; and

(d) retaining means for retaining the gripping member on the body member.

4,890,727

METHOD AND APPARATUS FOR PLATING THROUGH HOLES IN GRAPHITE COMPOSITES

Ross O. Downing, Renton, and David S. Benis, Seattle, both of Wash., assignors to Osteo-Dyne, Inc., Charlotte, N.C.

Filed Jul. 27, 1988, Ser. No. 224,994

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—224 R **22 Claims**

1. Apparatus for plating materials, comprising:

a plating cell having first and second halves, each said half including a hollow cylinder and an end cap sealably attachable to a first end of said cylinder and having an aperture therethrough, said plating cell further including first and second ring seals for sealably mounting said first and second cylinders to the material to be plated;

an elongate, electrically conducting rod sized to fit the aperture of each said end cap and sealably mountable thereto;

first and second disk shaped anodes, each said anode being sized to fit within said cylinder of a respective one of said cell halves and including an aperture sized to receive said rod, said rod being electrically coupleable to said first and second anodes;

first and second disk shaped baffles each including an aperture sized to receive said rod, said first and second baffles being respectively positionable within said cylinder of said first and second plating cell halves to define first and second plating chambers between the material and said



first and second baffles, respectively, and to define respective first and second anode chambers between said first and second baffles and said first and second end caps, respectively, each said first and second baffle further including at least one flow aperture providing a fluid flow path from its respective anode chamber to its plating chamber;

electric power means for providing electrical power to said rod and the material to be plated; and

fluid supply means for supplying a plating fluid to said plating cell.

4,890,728

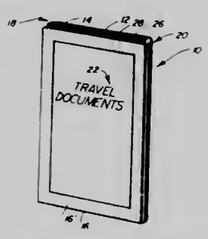
TRAVEL KIT ASSEMBLY

John Grimsley, 201 NW. 41 St., Pompano Beach, Fla. 33064

Filed Apr. 10, 1989, Ser. No. 335,747

Int. Cl.[4] A45C *1/06*

U.S. Cl. 206—0.81 **14 Claims**



1. A travel kit assembly designed to hold a plurality of documents, currency and like objects in separated, readily accessible location, said assembly comprising:

a. a base comprising three elongated panels each pivotally connected to a next adjacent panel along either a first or a second fold portion,

b. an insert assembly mounted on said base along a length of one of said first or second fold portion and comprising a plurality of pages each pivotal about said one fold portion between correspondingly adjacent ones of said panels,

c. each of said pages comprising opposite surfaces including containment means formed thereon for removable holding of at least one object on the correspondingly positioned opposite surfaces,

d. said base and said insert assembly selectively foldable into and out of a closed or an open position,

e. said open position defined by at least one of said panels disposed in spaced non-overlapping position thereof relative to a next adjacent panel,

f. said closed position defined by successive overlapping disposition of said insert assembly and each outside one of said three panels relative to a middle one of said three panels,

g. said containment means also formed on inner surfaces of each of said three panels, whereby a plurality of different objects may be removably contained on exposed surfaces of said panels and said plurality of pages in readily accessible position.

4,890,729

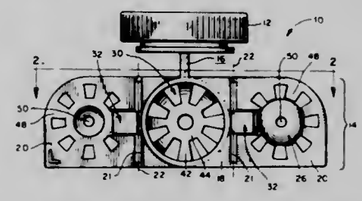
LENS RETAINING APPARATUS

Joseph V. Ranalletta, Guntersville, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Apr. 25, 1989, Ser. No. 342,979

Int. Cl.[4] B65D *85/38*

U.S. Cl. 206—5.1 **21 Claims**



1. A lens storing/cleaning appliance for contact lenses or the like, wherein said lenses may be disposed within a storage/-cleaning solution, said appliance comprising: a container having a body with an open end; a removable cap means for closing said container open end; lens retaining means associated with said cap means for captively retaining at least one of a pair of contact lenses for disposition within said container body and a storage/cleaning solution contained therein; said lens retaining means comprising a base portion, a cover means and hinge means by which said cover means is hingedly attached to said base portion; a concave lens supporting surface formed in one of said base portion and cover means for receiving the convex surface of a contact lens placed thereagainst; a convex lens supporting surface formed on the other of said base portion and said cover means for receiving the concave surface of a contact lens placed thereagainst; said cover means being hingedly closable about said hinge means for securely holding said contact lens between said convex surface and said concave surface; said hinge means comprising an over center hinge which is operatively coupled to both said base portion and said cover means, upon hingedly moving said cover means about said hinge means towards said base portion to retain a contact lens therebetween or away from said base portion to remove a lens therefrom, said over-center hinge providing a snap action for retaining said cover means in a closed position when said cover means is hingedly moved towards said base portion and in an open position when said cover means is hingedly moved away from said base portion.

4,890,730

ELASTIC BAND HOLDER

John Kovac, 29 Pheasant Dr., Brick, N.J. 08724

Filed Jun. 23, 1988, Ser. No. 210,349

Int. Cl.[4] B65L *75/06*; B65D *85/02*

U.S. Cl. 206—303 **4 Claims**

1. Apparatus for holding elastic bands which comprises a body having at least two sections:

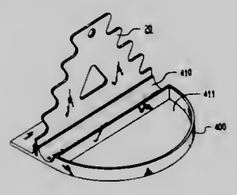
one of the at least two sections is comprised of a restraining

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region and a storage slot, the circumference about the body in the restraining region being greater than the circumference about the body in the storage slot;

another one of the at least two regions is comprised of a restraining region and a storage slot, the circumference about the body in the restraining region being greater than the circumference about the body in the storage slot;

wherein the one of at least two sections is disposed adjacent the another one of the at least two sections so that the storage slot of the one of the at least two sections is disposed adjacent the restraining region of the another one of the at least two sections; and



the circumference of the storage slot of the one of the at least two sections is different from that of the storage slot of the another one of the at least two sections;

further, the at least two sections are sequentially disposed so that the circumferences of the second regions of each section decrease from one end of the body to the other;

still further, the body is substantially planar;

yet still further, the body is formed from a material which is substantially resistant to deformation caused by elastic bands stored thereon; and

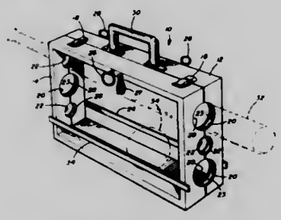
the body is formed from wire.

4,890,731

PERSONAL SPORTS EQUIPMENT CARRIER

Edward J. Mroz, 139 4th St., Oakmont, Pa. 15139

Filed Jan. 6, 1989, Ser. No. 294,272
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—315.9 **17 Claims**



1. A personal sports equipment carrier adapted for carrying baseball or softball equipment of an individual player comprising:

a rigid rectangular frame having recesses formed therein to receive one or more bats positioned longitudinally relative to said frame and extending beyond the ends thereof;

means to maintain said bats within said frame while transporting said frame and said bats;

glove and shoe retaining means attached to said frame for retaining a baseball or softball glove; said glove and shoe retaining means comprising an eyelet through which the strap on a glove and the laces of shoes may be passed;

means to retain one or more balls in the bottom of said frame while transporting said frame; and

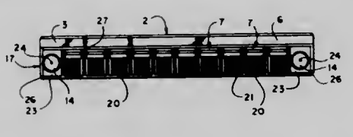
handle means attached to said frame to enable said player to carry said frame.

4,890,732

APPARATUS FOR BRUSHING TEETH WITH HYGIENIC DISPOSABLE BRISTLES

Renee M. F. Shackelford, 1830 Garraux Rd., N.W., Atlanta, Ga. 30327

Filed Mar. 18, 1988, Ser. No. 170,339
Int. Cl.[4] A46B *9/04, 7/04*
U.S. Cl. 206—362.1 **32 Claims**



1. Apparatus for brushing teeth, comprising:

(a) a reusable handle unit;

(b) a disposable brush unit having a base from which extends a plurality of bristles;

(c) means for said handle unit manually releasably engaging with said disposable brush unit; and

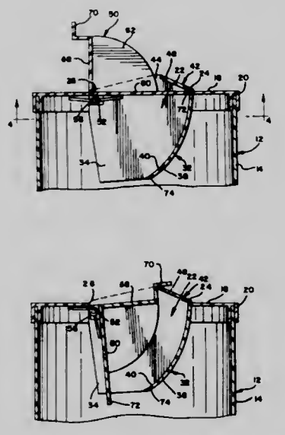
(d) storage means for receiving said bristles, said base defining a closure for said storage means.

4,890,733

DISPOSAL RECEPTACLE FOR USED, SHARP, MEDICAL INSTRUMENTS OR OTHER BIOHAZARDS

Robert S. Anderson, 27213 N. Fairfield Rd., Wauconda, Ill. 60084

Filed Mar. 1, 1988, Ser. No. 162,614
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—365 **7 Claims**



1. A receptacle for disposal of used, sharp, medical instruments, or other biohazards, comprising:

an upright container including a top wall provided with a slot having front, back, and side margins, said container being closed, except for said slot;

chute means mounted integrally to said top wall, said chute means including side panel means depending from the side margins of said slot into said container, and front panel means depending from the front margin of the slot into said container;

shroud means affixed to the top wall, said shroud means including side panel means extending upwardly from the side margins of said slot, and front panel means extending upwardly and backwardly from the front margin of said slot to overlie a portion thereof; and

scoop means mounted pivotally to said top wall at the back margin of the slot for pivotal movement between a first position for receiving instruments deposited therein, and a second position for discharging instruments therefrom into said container;

said scoop means including generally planar floor panel means, generally planar back panel means formed integrally with said floor panel means and disposed at an angle thereto and extending therefrom a point adjacent to said pivotal mounting of said scoop to said top wall, and a pair of side panel means extending between and connected to said floor panel means and said cover panel means; said scoop side panel means fitting closely adjacent to and between said shroud side panel means and said chute side panel means;

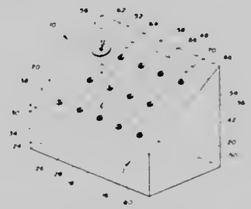
the respective panel means of said scoop means and said shroud means cooperating to define tray means for receiving and holding one or more of such deposited instruments prior to discharge thereof into said container and interacting to impede an object from extending through the slot into the container and from reaching any instruments disposed within said container and any liquid contents within the container from splattering outside thereof.

4,890,734

DISPOSABLE HOLDER FOR HYPODERMIC NEEDLES AND SHEATHS

Jerald Gach, 5385 Terence Ct., Bloomfield Hills, Mich. 48013

Filed Feb. 15, 1989, Ser. No. 311,112
Int. Cl.[4] A65D *83/10*
U.S. Cl. 206—366 **14 Claims**



1. A hypodermic needle and sheath holder comprising:

a base having a front edge, a back edge opposing the front edge, and a pair of opposing side edges extending between the front and back edges;

an anterior wall extending upwardly from the front edge of the base, the anterior wall having a bottom edge connected to the front edge of the base, a top edge, and a pair of opposing lateral edges extending between the bottom edge and the top edge of the anterior wall;

a pair of side walls, each side wall extending upwardly from the associated side edges of the base, each side wall having a forward edge connected to one of the lateral edges of the anterior wall, a rearward edge opposing the forward edge, a basal edge connected to one of the side edges of the base, and an upper edge opposing the basal edge;

a posterior wall extending upwardly from the back edge of the base, the posterior wall having a bottom edge connected to the back edge of the base, a top edge, and a pair of opposing lateral edges extending between the bottom edge and the top edge of the posterior wall; and

a roof extending between the top edge of the anterior wall and the top edge of the posterior wall, the base, the anterior wall, the pair of side walls, the posterior wall and the roof defining therebetween a storage location, the roof defining

a plurality of disposal orifices communicating with the storage location and allowing passage into the storage location of the hypodermic needles and sheaths for safe discarding in the holder after use; and

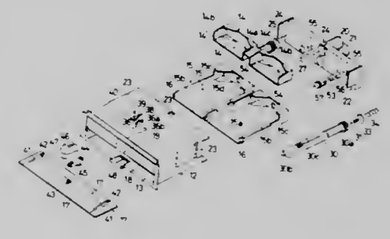
a plurality of retaining orifices for engaging the hypodermic needles and sheaths in an interim storage position for safety, stability, and ease of access between uses.

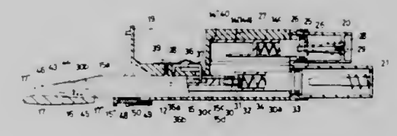
4,890,735

APPARATUS FOR ACCOMMODATING BOX-LIKE ARTICLES

Masumi Fukumoto, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Apr. 13, 1988, Ser. No. 181,049
Claims priority, application Japan, Apr. 13, 1987, 62-88725; Apr. 13, 1987, 62-88726; Apr. 13, 1987, 62-88727; Apr. 13, 1987, 62-88728; Apr. 13, 1987, 62-88729; Apr. 13, 1987, 62-88730; Aug. 4, 1987, 62-193699
Int. Cl.[4] B65D *35/676*
U.S. Cl. 206—387 **9 Claims**





1. An apparatus for accommodating box-like articles comprising a case open at least at the front, a slide holder slidably accommodated in said case for supporting on a support surface a box-like article inserted into said case through said front opening, a lid pivotably coupled to the front end of said slide holder for opening and closing said front opening, said lid being forwardly pivotally turned down about the point of its pivotal support to open said front opening, biasing means for forwardly urging said slide holder and lid together, locking means for locking said slide holder in a retreated position in said case against the biasing force of said biasing means and also locking said lid in an upright state closing said front opening of said case, stopper means for restricting the foremost position of said slider holder pushed out by the biasing force of said biasing means, and angle restriction means for restricting the maximum open angle of said lid when the inner surface of said lid having been forwardly turned down lies substantially in the same plane as said support surface of said slide holder wherein said locking means includes a cylinder secured to said case, a piston rod slidable in said cylinder and being connected with said lid, said piston rod being biased toward the front end having a heart-like cam groove formed in the upper surface of an intermediate portion in the length thereof, and a locking pin having a stem portion secured to said case and a tracing por-

tion extending to swing along said cam groove, wherein the engagement of said tracking portion in said cam groove holds said slide holder in a retreated position.

4,890,736
BAGS

Lourence C. Johannes, 150 Senior Drive, Northcliff, 2195 Johannesburg, South Africa

Continuation of Ser. No. 75,836, Jul. 20, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 366,309
Claims priority, application South Africa, Jul. 23, 1986, 86/5477; Dec. 15, 1986, 86/9414
Int. Cl.[4] B65D *33/16, 77/10, 30/10*
U.S. Cl. 206—390 **4 Claims**



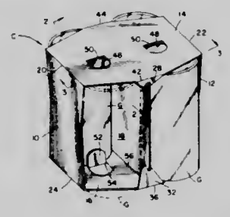
1. A roll of tubular plastics material from which is formed a plurality of refuse bags used for storing and/or transporting material such as garbage or refuse prior to collection or transport to disposal comprising:
(a) front and rear panels of material;
(b) straight end welds that weld the panels together at suitably spaced locations, transversely to the direction of the bag;
(c) an end cut adjacent to each end weld, and
(d) a transverse separating cut forming an open end for two bags between two pairs of end welds, the said separating cut being so shaped that four cut-outs are formed in the said open ends to leave projecting tie parts which in each bag are capable of being tied together to close the opening whereby each bag has a capacity substantially equal to a rectangular refuse bag having no tie parts and is formed by substantially less bag forming material than a rectangular refuse bag by up to 10%.

4,890,737
CARDBOARD DISPLAY CONTAINER WITH CONTENTS RETAINING MEANS

Richard G. Kadleck, Berea, and William W. Nowak, Broadview Heights, both of Ohio, assignors to The Shelby Paper Box Co., Westlake, Ohio

Continuation of Ser. No. 140,158, Dec. 31, 1987, abandoned, which is a division of Ser. No. 897,498, Aug. 18, 1986, Pat. No. 4,735,314. This application Nov. 14, 1988, Ser. No. 274,695
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—427 **3 Claims**

1. In a folded packaging carton having a planar divider piece defining adjacent interior sections of said carton on opposite planar sides of said divider piece, and a carton panel generally perpendicular to said divider piece, the improvement comprising:
means for retaining packaged objects in said sections, said retaining means comprising a folding line extending partially across the surface of said carton panel and generally perpendicularly to the plane of said divider piece, a slot in said divider piece having an open end adjacent said folding line, and, a unitary flat planar tab component of said carton panel having edges extending from the ends of said

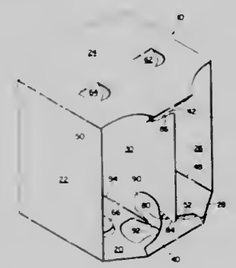


folding line to a free tab end narrower than the length of said folding line, said tab component being pivotal about said folding line out of the plane of said carton panel into a folded position received in said slot with said tab component in said folded position having a flat planar configuration between said folding line and said free tab end.

4,890,738
COLLAPSIBLE DISPLAY CARRIER AND METHOD OF MAKING

Robert G. Carver, Ashland, Ohio, assignor to Coburn, Inc., Ashland, Ohio

Filed Jun. 9, 1989, Ser. No. 364,265
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—434 **24 Claims**



1. A display carrier foldable from a generally flat collapsed condition for shipping and storage to an erect position for retaining at least a pair of articles, said carrier being formed of a flexible material and comprising
top and bottom walls;
a pair of side walls, each side wall being hingedly attached to each of said top and bottom walls, to form a carrier sleeve;
a reinforcing wall extending between and hingedly
a planar retaining tab resiliently connected along a fold line to one of the top and bottom walls and having a single contoured edge joining opposite ends of the fold line, the contoured edge being shaped to engage a portion of the surface of the retained articles;
the reinforcing wall having a tab-receiving bight at one end portion of the reinforcing wall and adapted to limit rotation of the tab about the fold line in one direction when the carrier sleeve is in the erect position;
the sleeve being foldable along the hinged connections between the top, bottom, side and reinforcing walls between a collapsed condition for storage in which the walls are

generally parallel and the reinforcing wall holds the tab flattened against the one of the top and bottom walls to which the tab is connected and an article receiving position in which the tab extends angularly along its fold line toward the interior of the carrier sleeve and abuts the bight in the retaining wall.

4,890,739
SEALED INTERNAL PACKAGE LABEL

James Mize, Jr., 204 Percheron Path, Simpsonville, S.C. 29681; Kent A. Davis, 200 Old Hwy. 11, Travelers Rest, S.C. 29690-8904, and Henry W. Stockley, 1454 D. Dover Rd., Spartanburg, S.C. 29301

Filed Dec. 21, 1987, Ser. No. 135,870
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—459 **5 Claims**

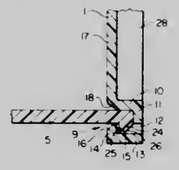


1. A package having a sealed, internal label comprising:
(a) a product having a relatively flat, horizontal surface;
(b) a heat sealable label positioned on said surface;
(c) a heat sealable web of heat formable, substantially unshrunken film formed at least partially around said product, said web covering and heat being sealed to said label, and
(d) a support or closure member enclosing the uncovered portion of said product and being sealed to said covering web.

4,890,740
SNAP TOGETHER PICKING CONTAINER

Charles P. Tabler, Hamilton, Ohio, assignor to Buckhorn, Inc., Milford, Ohio

Filed Oct. 25, 1988, Ser. No. 261,756
Int. Cl.[4] B65D *6/34*
U.S. Cl. 206—509 **14 Claims**

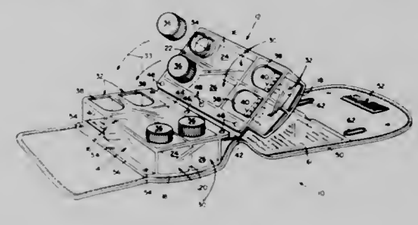


1. A synthetic resin picking and storage container, comprising:
two separate side members that are mirror images of each other, and each of said sides being a single one-piece homogenous molded synthetic resin part;
a front wall, a bottom wall, a rear wall, and reduced thickness hinge means integrally connecting together all of said walls to constitute a single one-piece homogenous molded synthetic resin folded blank;
said side members and walls each having interengaging connection means integrally formed in one piece on said side member and walls for connecting one side of said front, bottom and rear walls to one of said side members and the other side of said front, bottom and rear walls to the other of said side members;
said connection means including a U-shaped channel around the front, bottom and rear edges of each of said side members containing therein the adjacent edge of said front wall, bottom wall and rear wall, respectively; and
said connection means including channel hook means extending from the free edge of said channel inwardly of said channel in one direction, and wall hook means extending in the opposite direction from the edge of each of said front wall, bottom wall and side wall within said channel between the web portion of said channel and said channel hook means.

4,890,741
CAPSULE PACKAGE

Alan D. Edelstein, 41 Highland Ave., Winchester, Mass. 01890

Filed Aug. 17, 1988, Ser. No. 232,939
Int. Cl.[4] B65D *83/04, 85/56*
U.S. Cl. 206—534 **20 Claims**



1. A medication container comprising,
receptacles, each receptacle formed with a coverable opening adjacent an area for carrying large indicia readable by a person with relatively poor eyesight designating instructions for taking medication stored in said receptacle on a relatively rigid panel secured to said receptacle adjacent to said opening;
a child-resistant cap assembly for each receptacle that is easily opened by a patient with malfunctioning fingers for selectively closing said coverable opening; and
flexible material for interconnecting adjacent ones of said receptacles for permitting the interconnected receptacles to be assembled in overlapping relationship to form a convenient package.

4,890,742
CHILD-RESISTANT MOISTURE-PROOF CONTAINER

Blaine M. Allison, Pemberville, Ohio, assignor to Lamelite Corporation, Pawling, N.Y.

Continuation-in-part of Ser. No. 926,556, Nov. 4, 1986, Pat. No. 4,730,731. This application Feb. 16, 1988, Ser. No. 155,871
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] B65D *83/04*
U.S. Cl. 206—540 **4 Claims**

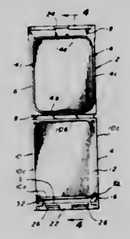
1. A child-resistant moisture-proof container for pills and the like, comprising:
(a) a body member having a bottom wall, and chamber wall means extending upwardly from said bottom wall to define an open-topped chamber;
(b) a top closure member pivotally connected at one end with one end of said body member by integral hinge means for pivotal movement between open and closed positions relative to said body member, said top closure member in said closed position extending across the upper end of said chamber wall means, thereby to close said chamber, said body and top closure members being formed from a synthetic plastic material;
(c) means carried by said top closure member for hermetically sealing said chamber when said top closure member is in said closed position, including sealing wall means extending downwardly from said top closure member and

having a cross-sectional configuration corresponding with that of chamber wall means, said sealing and chamber wall means being in concentric frictional moisture-proof engagement when said top closure member is in said closed position;

(d) and latch means for releasably locking together said top closure and body members when said top closure member is in said closed position, said latch means including:

(1) a generally-planar first front wall extending upwardly from said body member bottom wall at the end thereof remote from said one end, said first front wall being parallel with the axis of said integral hinge means and spaced from said chamber wall means;

(2) a second front wall extending downwardly from said top closure member parallel with said first front wall



and adjacent the side thereof that is remote from said first front wall, at least said first front wall being deformable;

(3) at least one latch projection extending horizontally from one of said front walls into a corresponding recess contained in the other of said front walls when said top closure member is in the closed position; and

(4) means for deforming at least one of said front walls to separate said front walls and to release said latch projection from said recess, thereby to unlock said top closure member, said deforming means including an operating button mounted on said first front wall and extending horizontally forwardly through and slightly beyond a corresponding opening contained in said second front wall.

4,890,743

SYSTEM AND PALLET FOR PACKAGING YARN SPOOLS

Stephen S. Powel, and Robert J. Darby, both of Greensboro, N.C., assignors to Cad/Cam Tooling, Inc., Greensboro, N.C.

Filed Mar. 11, 1988, Ser. No. 166,972
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—595 **1 Claim**

1. An apparatus for palletizing multiple individual packages of core wound strand material wherein the strand material is wound on a hollow cylindrical tube; said apparatus comprising:

(a) a supporting pallet having a planar support surface, and a plurality of feet arranged in spaced relationship underneath said planar surface;

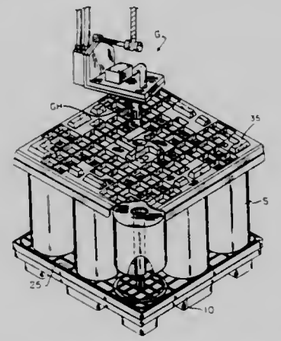
(b) a separator grid for insertion between said planar support surface and the individual packages; said grid including a plurality of integrally molded vertical projections depending therefrom for engagement in said hollow tubes;

(c) detachable projection members for selectively mounting on the surface of said grid opposite each of said integral vertical projections;

(d) an intermediate separator grid for insertion between multiple layers of individual packages; said intermediate grid including a plurality of said detachable projection members mounted thereon for engagement in adjacent upper and lower packages;

(e) a covering pallet for overlying the uppermost layer of yarn packges; and

(f) each of said supporting and covering pallets including a centrally disposed aperture defined by a cylindrical wall



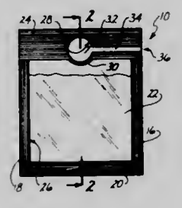
member extending through said pallet; said cylindrical wall having an inner diameter substantially equivalent to the inner diameter of the tubes on which said yarn packages are wound.

4,890,744

EASY OPEN PRODUCT POUCH

William A. Lane, Jr., Lake Arrowhead, and Steven D. Davis, Yucaipa, both of Calif., assignors to W. A. Lane, Inc., San Bernardino, Calif.

Filed Oct. 28, 1988, Ser. No. 264,025
Int. Cl.[4] B65D *75/58*
U.S. Cl. 206—632 **2 Claims**



1. A pouch formed from thin film which comprises:

front and back films joined together about juxtaposed portions of said front and back films to form

(1) an initially sealed product chamber,

(2) a dispensing cavity, and

(3) a control means for first isolating and subsequently connecting said dispensing cavity and said product chamber;

said product chamber forming a product reservoir for storage of a product in said pouch;

said dispensing cavity having an opening to the exterior of said pouch for dispensing said product from said pouch;

said control means located in association with said product chamber and said dispensing cavity and first forming a temporary barrier between said product chamber and said dispensing cavity and further subsequently connecting said product chamber to said dispensing chamber for transferring said product from said product chamber through said dispensing cavity to said dispensing cavity opening;

said control means comprising a plurality of temporary seals between said front and back films;

at least one of said temporary seals initially forming a portion of a continuous seal between said front and back films; and

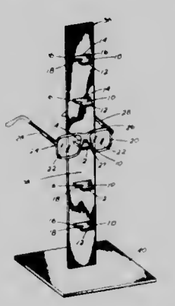
said continuous seal circumscribing and defining said product chamber.

4,890,745

DISPLAY HOLDER FOR EYEGLASSES

W. Bruce Holden, 500 Cohasset Rd. Suite 34, Chico, Calif. 95926

Filed Nov. 21, 1988, Ser. No. 273,905
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **7 Claims**



1. A display holder for eyeglasses, comprising:

a platform;

said platform sized to support a single pair of eyeglasses at the bridge area;

said platform being a flattened quadrilateral structure substantially trapezoidal shaped;

said platform having wide surfaces horizontally disposed and narrow surfaces vertically disposed with said narrow surfaces being exposed vertical edges thereof,

said platform, said quadrilateral structure thereof, including a short side paralleling a long side and two sides of equal length angled from said short side to said long side;

eyeglasses retaining means;

said eyeglasses retaining means being parallel semicircular notches cut one in each said angled side of said platform;

said notches sized to accept eyeglass nose rests and hold said eyeglasses firmly in display attitude, temples folded and temples unfolded, with

said platform affixed along said long side, said vertical edge thereof, perpendicularly to a supporting structure;

means for attaching said platform to said supporting structure.

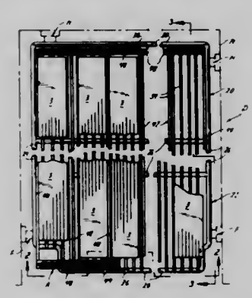
4,890,746

GRAVITY FEED SHELF

Robert J. Trulaske, Sr., Frontenac, Mo., assignor to True Manufacturing Co., Inc., O'Fallon, Mo.

Filed Jul. 6, 1988, Ser. No. 215,571
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—59.2 **7 Claims**

1. In a gravity feed container dispenser, the dispenser having a rack on which the containers are placed with the rack comprising a series of longitudinally extending rails which are parallel to each other and spaced apart a distance less than the diameter of the containers, the rack being adapted for installation so as to slope from rear to front when installed and having at least two guide bars extending longitudinally of the rack and positioned above the rails, the guide bars being spaced apart a distance at least slightly greater than the diameter of the containers so the containers are formed in rows when placed on the rack, and a stop means extending transversely of the rail across the forward end thereof and positioned above the rails so as to block forward movement of the containers when the forwardmost container in a row is removed and the other containers in the row feed forward, the improvement comprising friction reducing means to facilitate forward feeding of the



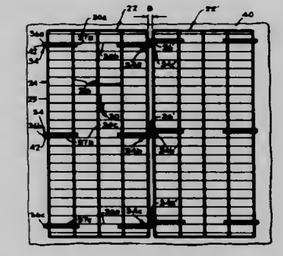
containers, the friction reducing means including a removable overlay placeable over a rail and integrally formed attachment means for securing the overlay to the rack, the attachment means comprising a single, non-circular U-shaped channel extending from the underside of the overlay and snap-fitting onto one of the rails and providing the sole means of attachment for the overlay to the rail.

4,890,747

MAGNETIC TAPE STORAGE SYSTEM

Richard C. Sayers, Opelika, Ala., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 12, 1988, Ser. No. 243,570
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—106 **3 Claims**

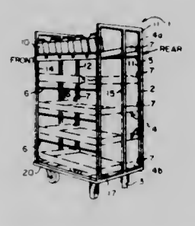


1. In a wall-mounted rack storage system, a storage rack comprising a primary storage area defined by a rectangular frame and an array of horizontally aligned, generally equally spaced, generally parallel, storage rails mounted to the frame, each rail disposed between opposite sides of the frame; and

rack support brackets mounted on the side of the frame opposite the storage rails, the brackets mounted on one side of the frame in generally horizontal alignment with the brackets mounted on the other side of the frame, but displaced from a central horizontal axis of the rack, so that in a serial arrangement of more than one storage rack, a second rack placed bottom to top can be mounted adjacent a first rack mounted top to bottom, disposing the side brackets of the second rack above and supported by the side brackets of the first rack to minimize the spacing therebetween, and to extend the generally horizontal,

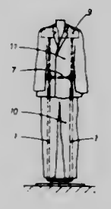
equi-spaced, parallel array of storage rails from the first rack to the second rack.

4,890,748
PRODUCT DISPLAY AND TAKE-OUT CART
John G. Visser, 9703 W. Cuba Rd., Cuba, N.Y. 14727
Continuation-in-part of Ser. No. 103,346, Oct. 1, 1987, abandoned. This application Mar. 1, 1989, Ser. No. 317,594
Int. Cl.[4] A47F *3/14*
U.S. Cl. 211—133 **17 Claims**



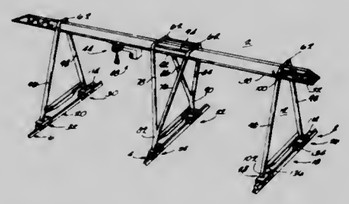
1. A product display and take-out cart comprising:
an upright, open frame;
a plurality of trays arranged one over the other;
pivot means supporting and connecting each tray with the frame so as to be tiltable as between a horizontal product load position and an angled product take-out position, the trays being tiltable independent of one another;
each tray being molded from plastic material; and
the structure of each tray including a full bottom, vertically oriented, beam-like sections, and metal rod means, the metal rod means being disposed on one side of the tilt axis; and
the plastic material, the vertical beam-like sections, the metal rod means, and the pivot means all cooperating to minimize tray flexure and the weight distribution provided by the tray structure and the plastic material of the tray which is respectively disposed on opposite sides of the pivot axis causing the tray to tilt to the product load position when the tray is not carrying product and causing the tray to tilt to the product take-out position when the tray has product thereon.

4,890,749
DECORATIVE CLOTHES STAND
Herbert Walter, Müllheim, Fed. Rep. of Germany, assignor to Protoned, B.V., Amsterdam, Netherlands
Filed Jan. 5, 1988, Ser. No. 141,008
Claims priority, application Switzerland, Jan. 19, 1987, 176/87
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—189 **3 Claims**



1. A decorative clothes stand for displaying clothing comprising:
a bottom element
at least two column members standing on said bottom element at or on which an attachment element for presenting articles of clothing is removeably fixed,
at least one cross piece distancing and connecting together two of said column members,
each said column member having an extension tube, a column fixture and a tubular column,
a sleeve member provided at each end of each said extension tube and tubular column, each sleeve member having a clamping section with a sleeve bore having an inside diameter equal to the outside diameter of the extension tubes and a head section having the outside diameter set to the outside diameter of the tubular columns,
each said sleeve bore of said clamping section of said sleeve member capable of receiving said extension tube for extending the length of said column member, and capable of receiving a supporting member on which said attachment element is fixed, wherein each end of said extension tube is inserted into the sleeve bore of said column fixture and said tubular column, respectively, to form a column member of said clothing stand, wherein the attachment element comprises a shaped clothes hanger shaped like a bust and comprising a plastic hollow body with downwardly open mounting openings for accommodating tubular column ends, wherein two mounting openings are available which are arranged at the spacing of the tubular columns and their inside diameter is adapted to the outside diameter of the tubular columns, and wherein a further mounting opening is available which lies in a plane of the central vertical axis of said stand, and its inside diameter is adapted to the outside diameter of an extension tube in one of the tubular columns and is provided with means for firmly clamping the shaped clothes hanger on the extension tube.

4,890,750
PORTAL CRANE
Joseph E. Stern, Franklin, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.
Filed Dec. 9, 1988, Ser. No. 281,721
Int. Cl.[4] B66C *5/02*
U.S. Cl. 212—153 **13 Claims**



1. A crane supported on and travelable along a plurality of generally parallel rails, the crane being susceptible to becoming skewed relative to the rails, comprising:
a frame overlying and extending transversely of the plurality of rails;
a plurality of legs including first, second and third spaced apart legs affixed to the frame, each leg extending between the frame and a different one of said plurality of rails, each leg having a base end and at least two rail engaging rotatable wheels attached to the base end and spaced apart in the direction of the length of the rails whereby the crane travels along the rails as the wheels rotate;
the first leg having a higher level of rigidity than the second and third legs;
sensing means mounted on the base end of the first leg adjacent the rail engaged by the wheels attached to the base end of the first leg for determining the skew of the crane at the first leg; and
the first leg is positioned between the second and third legs such that, for a predetermined amount of skew of the crane determined by the sensing means, the skew movement of the second and third legs relative to the first leg is less that the skew movement of the second and third legs relative to each other whereby the sensing means determines that the crane is skewed at such lesser amount of skew movement of the second and third legs.

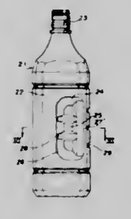
4,890,751
DEPLOYMENT/RETRIEVAL SYSTEM
Everett W. Opdahl, Lutherville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 12, 1984, Ser. No. 588,594
Int. Cl.[4] B66C *13/00*
U.S. Cl. 212—271 **15 Claims**



1. A deployment/retrieval system for a tethered body comprising:
(A) a base member;
(B) a first elongated hollow arm having a longitudinal axis and supported by said base member;
(C) a sheave member rotatable about an axle spaced from and disposed a predetermined distance below said first arm;
(D) a second elongated hollow arm having a longitudinal axis and rotatable about said axle, between a first position wherein the longitudinal axes of said first and second arms are aligned, and a vertical position;
(E) a winch;
(F) a cable wound upon said winch and extending through said first and second arms and operable to contact said sheave during rotation of said second arm; and
(G) a tethered body connected to the end of said cable.

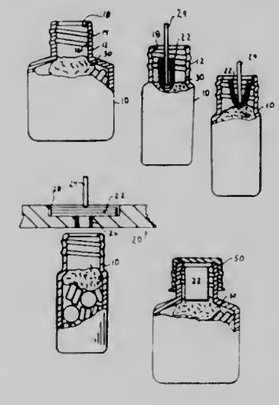
4,890,752
BIAXIAL-ORIENTATION BLOW-MOLDED BOTTLE-SHAPED CONTAINER WITH LATERALLY EXTENDING GRIP RIBS
Akiho Ota; Hiroaki Sagiura, and Hiroichi Ishii, all of Koto, Japan, assignors to Yoshino Kogyosho Co. Ltd., Tokyo, Japan
Continuation of Ser. No. 49,515, May 14, 1987, abandoned, which is a division of Ser. No. 836,109, Mar. 4, 1986, abandoned.
This application Dec. 5, 1988, Ser. No. 281,896
Claims priority, application Japan, Apr. 17, 1985, 60-57180; Oct. 4, 1985, 60-152099; Oct. 4, 1985, 60-152100
Int. Cl.[4] B65D *1/02*
U.S. Cl. 215—1 C **4 Claims**

1. A blow-molded bottle-shaped container of biaxially oriented synthetic resin integrally molded with a neck at the top of a multi-sided shaped body, comprising:
a pair of recesses depressed inwardly on opposing wall portions of the body, each of said recesses being defined by a pair of tapered walls inwardly inclined toward a center of each recess;
a grip comprising a first multi-sided shaped body portion between said recesses;
a second multi-sided shaped body portion opposite to said grip; and
at least one laterally extending reinforcing rib of projecting strip shape crossing both tapered walls of each of said recesses, said at least one laterally extending reinforcing



rib having a length substantially equal to a lateral length of said recess and a height less than the depth of said recess.

4,890,753
PHARMACEUTICAL CONTAINER AND METHOD AND APPARATUS FOR ASSEMBLY
George Duryee, Oakland, and Allen M. Bartlo, Bridgewater, both of N.J., assignors to Creative Automation, Inc., Passaic, N.J.
Filed May 4, 1988, Ser. No. 189,980
Int. Cl.[4] B65B *1/24, 55/00, 61/22;* B65D *1/40*
U.S. Cl. 215—231 **21 Claims**

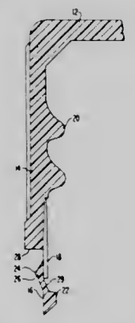


1. A pharmaceutical bottle having a neck region with an open end, pills therein, a fibrous hygroscope member in the neck region of said bottle and a closure means sealing the bottle opening, said neck region having on its inner surface a leaflet retaining surface discontinuity, a leaflet, said leaflet being in compression engagement with said fibrous hygroscope member, whereby said pills are substantially prevented from moving relative to one another.

4,890,754
PILFER-RESISTANT PLASTIC CLOSURE
Henry J. Dora, Frackville, and Bruno Zaubuhl, Conyngham, both of Pa., assignors to Zapata, Industries, Inc., Frackville, Pa.
Filed May 26, 1989, Ser. No. 357,716
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **15 Claims**

1. A plastic closure comprising a top wall, a sidewall, and a tamper-resistant band, said band being connected to said side wall by a plurality of elongated bridges that extend inwardly

from and longitudinally along internal surfaces of said sidewall and said band, each of said bridges being tapered along its



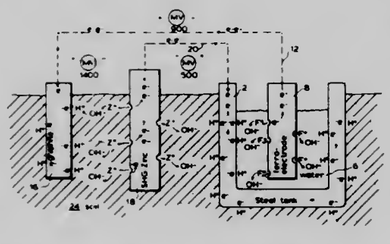
length and increasing in cross-section from a side wall end of the bridge to a band end of the bridge.

4,890,755

INTERNAL CORROSION PROTECTION OF METAL TANKS

Hank St. Onge, 226 Catalina Dr., Scarborough, Ontario, Canada M1E 1B7

Filed Aug. 25, 1988, Ser. No. 236,166
Claims priority, application Canada, Aug. 25, 1987, 545337
Int. Cl.[4] B65D *6/00*; C23F *13/00*
U.S. Cl. 220—5 A **21 Claims**



1. In the corrosion protection of steel tanks, a system for reducing external and internal corrosion of the tank comprising;

first and second electrodes located externally of the tank and in contact with the surrounding soil environment,

means electrically connecting said first electrode to the steel of said tank, said first electrode having a negative potential relative to steel to impart a positive charge to the exterior steel of the tank when said first electrode and an exterior steel surface of the tank are connected by a suitable electrolyte,

the second electrode being associated with said first electrode and electrically connected to a suitable internal sacrificial electrode located within and insulated from said tank,

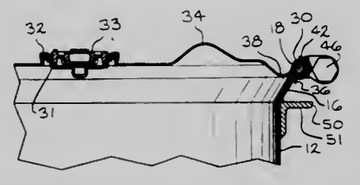
said second electrode cooperating with said first electrode as said second electrode is depleted such that the electrons flow from said internal sacrificial electrode to said second electrode and positive ions associate themselves with the interior of the tank when a corrosive liquid electrically connects said sacrificial electrode with the interior steel of said tank.

4,890,756

CYLINDRICAL TANK WITH FLARED UPPER END

David L. Waltke, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.

Filed Aug. 15, 1988, Ser. No. 232,383
Int. Cl.[4] B65D *88/08*
U.S. Cl. 220—66 **2 Claims**



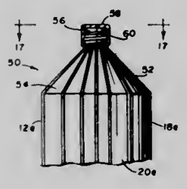
1. An upright generally cylindrical tank for transporting and storing liquids comprising a tubular container body having an upper end through which said container body is filled and discharged, an upward and outwardly projecting extension on said upper end of said container body of generally inverted frusto-conical shape, said extension terminating at the upper end thereof in an annular rim member of circular rod shape secured to said extension, a cover member having a circumferential rim section shaped to nest and engage said rim member so that it extends downwardly and substantially circumferentially engages the radially outer side of said rod shape rim member, an aanular clamp ring positioned in a nested relation on and substantially encircling the radially outer side of said nested rim member and said rim section so as to releasably clamp and further secure said cover member on said extension, a lifting ring positioned and secured at the juncture of said body and said extension such that said lifting ring will allow the stable lifting of said tank regardless of the amount of liquid therein, said lifting ring extending radially outwardly from said tubular container body a greater distance than does said upwardly and outwardly projecting extension such that said lifting ring will receive impact loads in the event said tank falls over onto its side.

4,890,757

RIBBED CONTAINER WITH CLOSURE

Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630

Division of Ser. No. 39,950, Apr. 20, 1987, Pat. No. 4,781,880, which is a continuation-in-part of Ser. No. 13,627, Feb. 11, 1987.
This application Sep. 20, 1988, Ser. No. 246,621
Int. Cl.[4] B65D *8/08, 8/14*
U.S. Cl. 220—72 **19 Claims**



1. An enclosure comprising:

a generally tubular side wall having a predetermined linear extent and defining an enclosure axis, said side wall terminating in an upper end and a bottom wall enclosing the lower end of said tubular side wall;

said side wall being formed of a one-piece plastics material and including a plurality of one-piece extruded ribs extending upwardly along said side wall at laterally spaced positions thereabout and a plurality of flexible non-self-supporting webs interconnecting and disposed between adjacent pairs of ribs;

said ribs being formed of an extrudable plastics material and having a thickness t_2 which is greater than thickness t_1 of said webs so that said ribs are substantially non-deformable along said elongated linear extent of said side wall, said side wall being movable away from and toward said axis, respectively, between a first position forming said enclosure and a collapsed storage position;

said side wall in said first position having said ribs spaced laterally one from the other generally parallel to said axis whereby said substantially non-deformable ribs provide means by which said side wall is self-supporting in the direction of said elongated linear extent of said side wall in said first position thereof;

said side wall in said second position having said ribs lying in generally parallel closely-spaced relation one to the other and to said axis and with the webs folded between said ribs; and

a cover for the enclosure extending about the upper end of said side wall and being fixed to said side wall in both said first and second positions thereof, said cover including a substantially rigid closure portion.

12. An enclosure comprising:

a side wall having a predetermined linear extent and upper and lower edges and defining an enclosure axis, said side wall being formed of a one-piece plastics material and including a plurality of extruded ribs extending substantially between said edges at laterally spaced positions thereabout and flexible non-self-supporting sheet material interconnecting adjacent pairs of ribs to form webs therebetween, said ribs and said webs cooperating one with the other to provide a self-supporting side wall;

said ribs being formed of an extrudable plastics material and having a thickness t_2 which is greater than a thickness t_1 of said webs so that said ribs are substantially non-deformable along said elongated linear extent of said side wall;

said substantially non-deformable ribs providing means by which said side wall is self-supporting in the direction of said elongated linear extent of said side wall;

a bottom wall formed about the lower edges of said side wall for closing the bottom of said enclosure; and

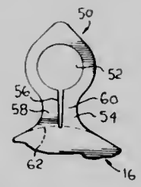
a closure for the upper end of the enclosure, said closure including a wall connected at its lower edge to the upper edge of said side wall and, adjacent its upper edge, a substantially rigid self-supporting neck defining an opening and connected to its lower edge to the upper edge of said closure, and means cooperable with said neck for closing said opening.

4,890,758

CLOSURE WITH IMPROVED PULL TAB

Walter J. Gailus, Chicago, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Sep. 2, 1988, Ser. No. 239,689
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 **20 Claims**



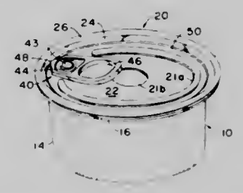
1. A closure having opening means in the form of a pull tab projecting therefrom, said closure being of the type adapted to have a rupturable bond with a container with such bond extending generally transversely of said pull tab in two opposite directions, said closure during application to said container having said pull tab projecting radially outwardly therefrom, said closure being improved by having at least one void adjacent such bond defining current density focus means and force directing means for dividing the force exerted by said pull tab on said closure during closure removal in two or more paths to facilitate initial bond rupture.

4,890,759

RETORTABLE CONTAINER WITH EASILY-OPENABLE LID

Theodore P. Scanga, Lower Burrell; Matthew P. Kiley, Tarentum; Robert J. Metz, Pittsburgh, and Fred R. Schultz, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 26, 1989, Ser. No. 302,016
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—273 **25 Claims**



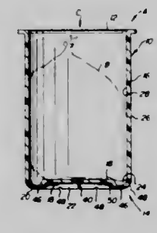
1. A container lid made from a laminate material which includes a thick outer thermoplastic layer, a thin intermediate gas barrier layer and a heat-sealable inner coating layer, said lid having a score line that extends only partially through the outer thermoplastic layer to define an openable lid section and having a tab for severing the laminate material along its score line, said tab attached to the openable lid section by a hollow integral rivet formed from the laminate material.

4,890,760

TRASH RECEPTACLE WITH VACUUM BREAKING MEANS

Douglas Nicoll, Sr., and Tammy Nicoll, both of 3801 Piping Rock La., Virginia Beach, Va. 23452

Filed Apr. 14, 1989, Ser. No. 338,150
Int. Cl.[4] B65D *90/34*
U.S. Cl. 220—404 **6 Claims**



1. A trash receptacle for receiving a flexible, removable plastic liner, comprising:

(a) said receptacle being upstanding and having an open top and a closed bottom and an impervious side wall;

(b) said bottom having an outer peripheral area and a central area;

(c) said bottom having an inside surface and an outside surface;
(d) said central area having a concavity in said outside surface;
(e) said peripheral area providing principal support means for said receptacle when positioned upright on a support surface;
(f) said central area having a vent extending from said inside surface to said outside surface of said bottom;
(g) said bottom inside surface i the area of said vent having a smooth surface;
(h) valve means for sealing said vent and including a flexible circular diaghragm and means for securing said diaphragm against said smooth inside surface in the area of said vent;
(i) said vent including means engageable with said diaphragm securing means for securing said valve means in said vent and for maintaining said flexible diaphragm when positioned in said vent in normal sealable engagement with said inside surface of said bottom;
(j) said diaphragm having a concavity facing said smooth inside surface;
(k) said circular diaphragm having its entire periphery engageable with said smooth inside surface and under compression at all times to form a seal between said diaphragm and said smooth surface to prevent fluid from escaping from inside the bottom of the receptacle to the exterior of the receptacle under normal loading of trash in said liner; and
(l) said diaphragm being sufficiently flexible so that said diaphragm will disengage from said smooth surface when a flexible liner positioned in said trash receptacle and which clings to the receptacle wall is lifted for the purposes of removal to permit air to enter into and pass from the outside through said vent thereby breaking the suction created upon removal of said liner.

4,890,761

RESEALABLE POUCH/BOX COMBINATION

James W. Gaves, Chateauguay, Canada, assignor to Rolf C. Hagen Inc., Montreal, Canada

Filed Jan. 8, 1988, Ser. No. 204,116
Int. Cl.[4] B65D *5/54, 5/56*
U.S. Cl. 220—404 **14 Claims**



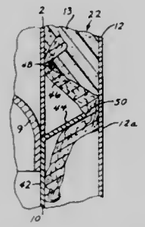
1. A package particularly intended for use with dry flowable materials comprising
a semi-rigid box having a top wall, a bottom wall, and a plurality of side walls, each of said walls being defined by a plurality of edges, said walls being joined together at their edges,
a flexible bag-like pouch disposed in the box for holding the flowable material to be packaged, said pouch having a top end openable by cutting or tearing to define a pouring port at the top end when the material is to be removed therefrom, said port being surrounded by margins in the top end,
a removable tab closure provided in the top wall and at least one of said side walls of the box and spanning the edges which join them, said tab having a generally V-shaped portion defining an apex, said tab closure being defined by a weakened line which enables the tab to be torn form the box to form an opening in the box through which the packaged material in the pouch may be discharged,
and a slot, having first and second ends, defined by a weakened line provided in the top wall or said one side wall of the box, said first slot end extending to the weakened line which defines the tab apex and into which the margins of the top end which surround the pouring port may be drawn to close the port to seal the pouch.

4,890,762

WATER HEATER WITH DAM DRAPED OVER FLANGE

John D. Pfeffer, Brookfield, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 5, 1989, Ser. No. 293,815
Int. Cl.[4] B65D *90/02*
U.S. Cl. 220—444 **2 Claims**



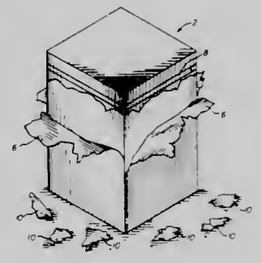
1. An insulated fluid storage unit comprising:
an inner unit comprising an inner storage tank and a lower skirt ring supporting and spacing said inner storage tank above a support surface;
a flange extending radially outwardly from said inner unit;
an outer jacket around said inner storage tank and spaced outwardly therefrom to define an annular space therebetween, said outer jacket extending downwardly past said flange;
sealing means between said flange and said outer jacket forming a dam sealing said annular space, comprising sealing material secured to said inner storage tank above said skirt ring and draped over and around the outer edge of said flange;
foamed insulation introduced as a liquid into said annular space and hardening to form an annular insulation layer around said inner storage tank, said dam preventing leakage of said liquid therepast,
wherein said outer jacket is slid downwardly over said inner storage tank, and wherein said flange of said skirt ring extends radially outwardly and upwardly at an inclinded angle from said sidewall and engages said sealing material at the outer edge of said flange and aids in maintaining said sealing material at said outer edge of said flange while said outer jacket is slid downwardly therepast.

4,890,763

TAMPER RESISTANT PACKAGE AND METHOD OF MAKING SAME

Yoram Curiel, Aurora, Colo., assignor to TSL, Incorporated, Aurora, Colo.

Continuation-in-part of Ser. No. 6,756, Jan. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 891,517, Jul. 29, 1986, abandoned. This application Jun. 22, 1988, Ser. No. 209,822
Int. Cl.[4] B65D *53/06;* **B05D** *3/06*
U.S. Cl. 220—455 **25 Claims**



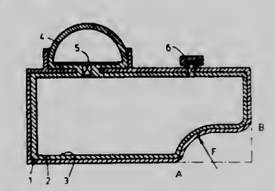
1. A tamperproof package comprising:
an inner container, and
an outer protective cured brittle layer disposed adjacent to the exterior of said inner container, characterized in that physical penetration of said layer will cause a readily visible, irreversible change in said layer through separation of at least portions of said brittle layer from said inner container.
17. A tamper resistant package comprising:
a product, and
a cured, brittle packaging material at least partially surrounding said product, characterized in that physical penetration of said packaging material will cause a readily visible irreversible change in said brittle packaging material by fracture thereof and separation of at least portions of said material from said product.

4,890,764

STATIONARY OR MOBILE CONTAINER FOR CONTAINING OR SHIPPING SUBSTANCES THAT ARE TOXIC, DANGEROUS, CONTAMINATED OR, IN ANY CASE, HARMFUL TO HEALTH AND THE ENVIRONMENT

Alberto Rossini, Casa Stella, 6951 Insone, Switzerland

Filed Mar. 14, 1989, Ser. No. 323,335
Claims priority, application Switzerland, Apr. 11, 1988, 1317/88
Int. Cl.[4] B65D *90/32*
U.S. Cl. 220—460 **7 Claims**



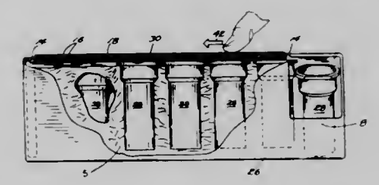
1. Stationary or mobile container for containing or shipping of solid, liquid, powdery, granular or gaseous substances and in particular that are toxic, dangerous, polluted or in any case harmful to health and the environment characterized by a mechanically resistant outside wall (1) of any shape, size and material, by an protective inside wall in one or more layers (2, 3), unattackable or, in any case, inert with respect to the substances contained in it, nonconducting, self-sealing in case of perforation or tearing of outside wall (1) and elastically deformable to compensate for the change in volume caused by deformations of outside wall (1) in case of impact so that the inside pressure remains almost constant and, for the same purpose, characterized by an optional expanding additional container (4, 4', 4'') connected by a check valve (5) to protective inside wall (2, 3).

4,890,765

STORAGE CONTAINER FOR BLOOD COLLECTION DEVICES

Terry M. Haber, and Clark B. Foster, both of El Toro, Calif., assignors to Habley Medical Technology Corp., Laguna Hills, Calif.

Filed Jan. 5, 1988, Ser. No. 141,018
Int. Cl.[4] B65H *3/00, 5/28*
U.S. Cl. 221—25 **30 Claims**



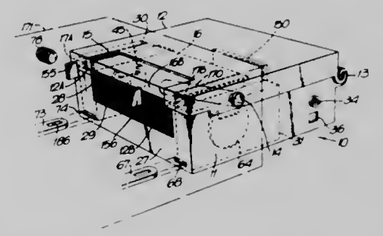
1. A packaging device for storing, dispensing and disposing units, said packaging device comprising a container adapted to hold the units, means for dispensing a single unused unit at a time, means for receiving and holding said unit after use in said container, and means for segregating and preventing contamination of the unused units from the used units, said means for segregating forming an impermeable physical barrier between said means for dispensing unused units and said means for receiving and holding said unit.

4,890,766

SHEET STORE

Harvey G. Martin, West Sussex; Roger Pilling, and Steven M. Hosking, both of Hampshire, all of England, assignors to De La Rue Systems Limited, England

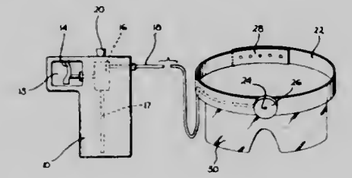
Filed Oct. 7, 1987, Ser. No. 106,136
Claims priority, application United Kingdom, Oct. 8, 1986, 8625192; Jan. 13, 1987, 8700704; Jan. 21, 1987, 8701253
Int. Cl.[4] B65H *1/24*
U.S. Cl. 221—198 **12 Claims**



1. A sheet store adapted for selectively dispensing sheets and accepting sheets, said store comprising:

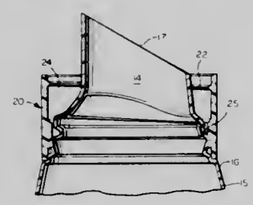
a container, said container having a plurality of walls, said container defining a first opening and a second opening adjacent to and communicating with one another;
first and second closure members associated with said first and second openings, respectively, said first closure member being mounted for linear movement along one of said walls of said container, said second closure member being mounted for linear movement along another of said walls of said container, each of said closure members being movable between closed and open positions in which said openings are closed and open respectively; and
control means for controlling the operation of both of said closure members in accordance with the sheet handling operation to be performed, whereby when said store is to be used to dispense sheets said control means enables both of said closure members to open but when said store is to be used to accept sheets said control means enables only one closure member to open.

4,890,767
HEADBAND SQUIRTER
Barry Burlison, Santa Monica, Calif., assignor to C & S Distributing Co., Gardena, Calif.
Continuation of Ser. No. 20,852, Mar. 2, 1987, abandoned. This application May 4, 1988, Ser. No. 191,860
Int. Cl.[4] A63H *33/30*
U.S. Cl. 222—78 **5 Claims**



1. A water squirting device comprising:
a water reservoir having at least one orifice for expelling water;
a headband for encircling an operator's head, said headband having an orifice for squirting water in a direction away from the operator and approximately parallel to the operator's straight-ahead line of vision;
means for drawing water from said reservoir and expelling it through said reservoir orifice, said means contained within said reservoir;
a flexible water-conducting tube having a first end coupled to said reservoir orifice and a second end coupled to said headband orifice, and wherein a length of said water-conducting tube extends from said headband orifice and along the inside surface of said headband, and means for securing said length of said water-conducting tube to said inside surface of said headband so that when the headband is in position on the operator's head, said length of said tube extends from said headband orifice along the operator's forehead and curves generally toward the operator's ear in a generally horizontal direction, and is thereby out of the operator's line of sight and concealed from those in position to be squirted by water emerging from said headband orifice.

4,890,768
SELF DRAINING CONTAINER
Gerald R. Robinson, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Filed Oct. 1, 1987, Ser. No. 103,334
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—109 **9 Claims**

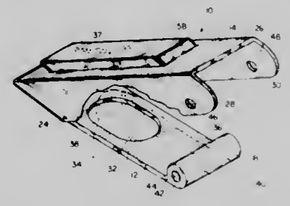


1. A self-draining plastic container comprising:
(a) a bottle having a blow molded body portion for containing liquids, an integrally blow molded funnel portion formed in situ with and extending generally upwardly from said body portion, said funnel portion including a first wall portion having a circular cross-sectional configuration of predetermined diameter extending upwardly from the upper end of the body portion to a radially inwardly extending ledge, a second wall portion extending upwardly and flaring outwardly from the inner portion of said ledge, the diameter of said second wall portion at its upper end being no greater than said predetermined diameter, and an integrally blow molded spout formed in situ with and extending upwardly from said funnel portion, said bottle including the body, funnel and spout formed solely by blow molding followed by cutting excess plastic; and,
(b) a separately molded ring member engaged to said bottle, said ring member having a circular cross-sectional configuration and having
(i) a lower portion, the inner surface of which is substantially the same size as said predetermined diameter and positioned adjacent to said first wall portion,
(ii) an intermediate portion of reduced diameter sealingly engaged with said second wall portion at its upper end, and
(iii) an upper portion encircling the spout in spaced relationship thereto and cooperating therewith to form a flowback chamber for capturing liquid draining down the spout following pouring of liquid through the spout, and
(c) aperture means for directing liquid from said flowback chamber to the body portion.

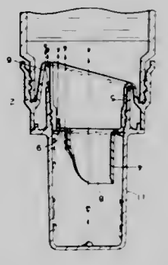
4,890,769
BEVERAGE DISPENSER LOCK
Richard R. Armstrong, 564 Ka Awakea Rd., Kailua, Hi. 96734
Filed May 26, 1989, Ser. No. 357,096
Int. Cl.[4] B67D *5/32*
U.S. Cl. 222—153 **4 Claims**

1. In combination with a hand holdable beverage dispenser for dispensing a plurality of different beverages, said beverage dispenser having a handle section and a spout section, a flexible beverage supply conduit connecting with said handle section, manually activatable means mounted on said handle section for selecting and causing a particular beverage to be dispensed through and from said spout section, a dispenser lock comprising:
a base plate having an enlarged opening, said base plate having an upper edge and an oppositely located lower edge;

an enclosing cover defining an interior chamber, said cover having a top edge and an oppositely located bottom edge;
a hinge connection between said cover and said base plate, said hinge connection located directly adjacent said top edge and said upper edge, said cover being pivotable relative to said base plate between an open position and a closed position, with said cover in said open position said beverage dispenser to be insertable into and removable from said interior chamber, with said beverage dispenser located in said interior chamber said spout section being located within said enlarged opening, when said cover is in said closed position said beverage dispenser is confined within said interior chamber; and
disengageable locking means connecting said cover and said base plate, said locking means located directly adjacent said bottom edge and said lower edge, activation of said locking means fixes said cover in said closed position.



4,890,770
DISPENSING AND CLOSING PACKAGE FOR LIQUID PRODUCTS
Tomoyuki Haga; Naotake Ozaki, both of Yokohama; Kazushi Koinuma, Tokyo; Masatoshi Fujima, Tokyo, and Seishi Suzuki, Tokyo, all of Japan, assignors to Shiseido Company Limited and Toppan Printing Company Limited, both of Tokyo, Japan
Filed Jun. 8, 1988, Ser. No. 203,923
Claims priority, application Japan, Jun. 17, 1987, 62-93141[U]
Int. Cl.[4] B67D *1/16*
U.S. Cl. 222—109 **7 Claims**



1. A dispensing and closing package for liquid products comprising:
a container body having a mouth;
a dispensing adapter mounted on the mouth of the container body and including a setting cylinder and a dispensing cylinder interconnected to the setting cylinder by a valley wall having a bottom;
a sloped drain provided on the bottom of the valley wall, and including a return hole provided on a lowest point of the drain;
a cap having an open bottom fitting over an outer circumference of the dispensing cylinder; and
a passageway formed adjacent to a common point between the dispensing cylinder and the cap, for communicating an inside of the container body with an inside of the cap, and being operative to return dripped liquid products over an outer face of the dispensing cylinder into the container body through the return hole along the sloped drain and also adapted to return liquid products remaining in the inside of the cap into the container body through the passageway.

4,890,771
CARTRIDGE FOR INJECTING A MIXTURE OF TWO LIQUID CONSTITUENTS
Jacques Morel, Fontaine Les Ribouts, and Didier Morel, Favieres, both of France, assignors to Etablissements Morel - Ateliers Electromecaniques De Favieres, Chateauneuf-en-Thymerais, France
Filed Aug. 1, 1988, Ser. No. 226,950
Claims priority, application France, Jul. 31, 1987, 87 10932
Int. Cl.[4] B67D *5/52*
U.S. Cl. 222—137 **11 Claims**



1. A cartridge for injecting a mixture of two liquid constituents, comprising a reservoir (1) which has a compartment (2) for one of the constituents and a compartment (3) for the other constituent and means for propelling these two constituents toward a mixing chamber (4) which opens to the outside by way of an outlet opening (5), the reservoir (1) comprising two concentric cylindrical compartments (2, 3), respectively containing the first and the second constituent, a piston (6, 7) being mounted in sliding manner in each of the two compartments (2, 3), the two pistons (6, 7) comprise an annular piston (7) mounted in the exterior compartment (3), of complementary annular section, this annular piston (7) surrounding the second piston (6), which is mounted in the interior cylindrical compartment (2), which is surrounded by the exterior compartment, these two pistons (6, 7) being connected to one another such that it is possible to slide them simultaneously, wherein the annular piston (7) is carried by a tube (12) of which the diameter is greater than the diameter of the interior compartment (2), wherein the second piston (6) is carried by a tube (14) of which the diameter is smaller than the diameter of the interior compartment (2), wherein the ends of these two tubes (12, 14) opposite the pistons (6, 7) are connected to one another, wherein, inside the tube (14) carrying the second piston (6), there is mounted a screw (16) which is screwed into a nut (17) which is secured to the two ends (12a, 14a) of the tubes (12, 14) opposite the pistons, wherein this screw (16) comprises an element (18) which is capable of bearing against a stop (19) located beyond the nut (17), this stop (19) being secured to a

body (20) which is connected to the end (1a) of the reservoir (1) which is adjacent to the annular piston (7), means being provided to slide the two pistons (6, 7) simultaneously, and wherein each of the compartments (2, 3) opens into a common mixing chamber (4) which comprises partitions (8, 9) defining a sinuous path of the mixture of the two constituents between the two compartments (2, 3) and the outlet opening (5) of the mixing chamber (4), the body (20) surrounding and covering in sealed manner the tubes (12, 14) of the pistons and the screw (16).

4,890,772

TRANSPORT AND STORAGE CONTAINER FOR CONCENTRATES OF BEVERAGES OR THE LIKE

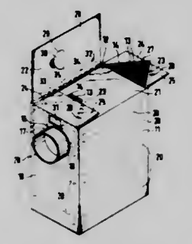
Erich Hesberger, Tragenhofen; Wolf-Dieter Knörrich, and Joachim W. Dziallas, both of Heidenheim, all of Fed. Rep. of Germany, assignors to Carl Edelmann Verpackungstechnik, Heidenheim/Brenz, Fed. Rep. of Germany and Coca Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 932,294, Nov. 19, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 121,636

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3541010; European Pat. Off., Jul. 28, 1987, 87110947.6

Int. Cl.[4] B67D *5/38*

U.S. Cl. 222—156 **10 Claims**



1. An improved transport and storage container for concentrates of beverages or the like, for making a ready-to-drink beverage, said container being insertable into a drink-making machine and connectable to its system, wherein a dose of concentrate from the container, a dose of water and, if applicable, carbon dioxide are added; said container consisting of an inner bag package with two narrow side walls and two wide side walls with a folding box type outer cardboard casing (11) having a top and bottom end and two narrow side walls (19) interconnected with two wide side walls (28) each wide side wall (28) of the casing, having integral top and bottom flaps (21, 22) folded toward and overlapped with each other and each narrow side wall (19), of the casing, having integral top and bottom flaps (24) folded toward each other, the folded wide side wall top flaps (21, 22) sandwiching the folded narrow side wall top flaps (24), the folded wide side wall bottom flaps sandwiching the folded narrow side wall bottom flaps, and the sandwiched flaps at each end being glued together and respectively constituting top and bottom end closures of the cardboard casing; the inner bag package comprising a liquid-tight inner bag (12) closed at both of its upper and lower ends by a transverse sealed weld seam (13), each said end weld seam and the adjacent parts of the inner bag ends being folded to provide two triangular corner gussets (23) at each of the top and bottom ends and said inner bag corner gussets (23) being folded inwardly in the area of the bottom and top closures and disposed to lie between respective associated two bottom casing flaps and two top casing flaps (21, 22, 24), the sides and the bottom and the top end closures, both of the inner bag (12) and of the cardboard casing (11), forming essentially identically shaped enclosures; the side walls and ends of the bag having interior surfaces; a concentrate removal and machine-connection piece (16), with an inlet and outlet, is provided and includes a flange (17) sealed and connected to a narrow side wall inner surface of and adjacent the top end of the inner bag (12), and an inner bag narrow side wall and the adjacent cardboard casing narrow side wall (19) having aligned orifices adjacent one end of the container; said connection piece (16) having a short tubular portion between said inlet and said outlet which projects outwardly through said orifices, the improved inner bag package being constructed with the two triangular wall portions of each of the inner bag triangular gussets (23), located in the bottom and top planes of the package, sealed together by welding, the two narrow side walls (19) as well as the top and bottom surfaces (22) of the container are respectively parallel to each other, and with the narrow side wall (19), containing the removal and connection piece (16), and the opposite narrow side wall being connected to the upper and lower casing ends to form angles of respectively aproximately 93° and 87° with the casing bottom end surface and angles of respectively approximately 87° and 93° with the casing top end surface.

4,890,773

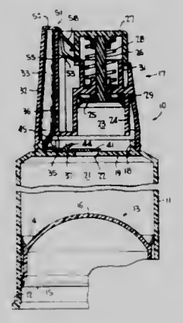
VISCOUS PRODUCT DISPENSER

Douglas F. Cornette, Los Angeles, Calif., assignor to Calmar, Inc., Watchung, N.J.

Division of Ser. No. 168,248, Mar. 15, 1988. This application May 25, 1989, Ser. No. 357,899

Int. Cl.[4] B67D *5/42*; **G01F** *11/00*

U.S. Cl. 222—380 **5 Claims**



1. A viscous product dispenser, comprising an elongated container having at one end a stationary, transversely offset, longitudinally extending product discharge spout terminating in a discharge opening, a depressible discharge pump actuator mounted on said container adjacent said spout for movement between extended and retracted positions, and a spring biased, pivotable spout cover having a body, a cap at one end of said body overlying said discharge opening when said actuator is in said extended position, and a lever at the opposite end of said body in engagement and movable with said actuator, means on said spout defining a fulcrum for said body, whereby said cover pivots about said fulcrum to uncover said cap from said discharge opening upon movement of said actuator to said retracted position.

4,890,774

BEVERAGE DISPENSING SYSTEM

John W. Poore, South Pasadena, Calif., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 116,118, Oct. 29, 1987, abandoned. This application Apr. 26, 1988, Ser. No. 186,492

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—640 **13 Claims**

1. A beverage dispensing apparatus comprising:

(a) a dispensing valve and nozzle for mixing together syrup and carbonated water and dispensing the mixture as a beverage out the nozzle;

(b) a syrup conduit connected to said dispensing valve for delivering syrup thereto;

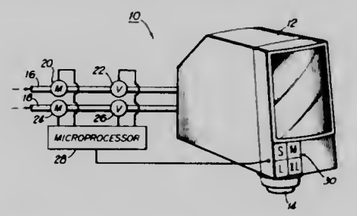
(c) a carbonated water conduit connected to said dispensing valve for delivering carbonated water thereto;

(d) a flow meter and a control valve in each of said conduits;

(e) microprocessor control means connected to each of said flow meters and control valves for delivering said syrup and carbonated water to said dispensing valve at a desired ratio;

(f) said microprocessor control means including portion control means for carrying out a primary pour cycle for dispensing any one of several different selected volumes of beverage from said dispensing valve; and

(g) said microprocessor control means including topping off means for carrying out a pre-programmed topping off pour cycle after a period of time after said primary pour cycle has been terminated.



4,890,775

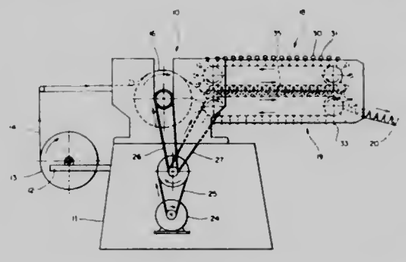
APPARATUS FOR MAKING DEEP FLUTE SHADE

Jamee Kao, 2400 S. Whitehall Dr. - #2060, Mundelein, Ill. 60060, and Joseph C. S. Hsu, 35 Lane 461 Chung-Shan N. Road Sec. 5, Taipei, Taiwan (111)

Continuation of Ser. No. 34,057, Apr. 3, 1987. This application Dec. 19, 1988, Ser. No. 286,369

Int. Cl.[4] D06J *1/04*

U.S. Cl. 223—32 **5 Claims**



1. A pleating machine, comprising: means for web-feeding a sheet of material, two opposed, adjacent endless forming conveyors for receiving and pleating the sheet material, each of said forming conveyors including at least one endless chain, said chains including a plurality of pivotally inter-connected links, one of said conveyors having a plurality of forming rollers mounted on the links associated therewith, the other of said conveyors having a plurality of forming plates supported on the links associated with that conveyor, at least some of said other conveyor chain links including integral flanges extending in a direction generally perpendicular to the links, said forming plates having integral base flanges extending generally perpendicular to the plates, and means for fastening the base flanges directly to the link flanges, whereby the forming plates are simply supported by the chain on the said other conveyor.

4,890,776

NEEDLE THREADING DEVICE

Mark Bruskin, 376 Madison St., New York, N.Y. 10002

Filed Jan. 17, 1989, Ser. No. 297,330

Int. Cl.[4] D05B *87/02*

U.S. Cl. 223—99 **13 Claims**



1. A needle threading device, comprising

a housing which bounds an inner chamber, said housing having a housing portion which forms an elongated passage for inserting a needle, said housing also having a receiving portion located close to said elongated passage and formed with a recess for receiving a thread, said recess communicating with said passage;

means for introducing a thread received in said recess into said elongated passage and therefore into an eye of a needle inserted in said passage, said introducing means including a pivotable lever having one lever portion which is permanently located outside of said housing and actuatable by a user and another lever portion, said lever being pivotable between a first position in which the other portion of said lever is completely confined in said housing and a second position in which an end of said other portion pushes a portion of a thread from said recess into said elongated passage and therefore through an eye of a needle located in said elongated passage; and

means for limiting a path of pivoting of said lever and including two stops arranged so that one of said stops determines said first position while the other of said stops determines said second position, said housing being composed of two substantially similar halves which are connected with one another, said stops being formed integrally with one of said housing halves while the other of said housing halves is provided with two depressions which receive ends of said stops with a snap action so as to form means for connecting said housing halves with one another.

4,890,777

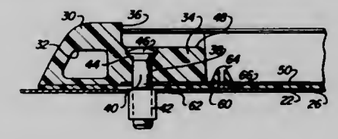
LUGGAGE CARRIER SLAT

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Filed Aug. 25, 1988, Ser. No. 236,155

Int. Cl.[4] B60R *9/04*

U.S. Cl. 224—326 **15 Claims**



1. In an article carrier for an automotive vehicle, an article

supporting slat adapted to be mounted in contiguous relation to a surface portion of the vehicle,

said slat extending generally parallel to the surface portion,

said slat having a bottom wall and a pair of upwardly extending side walls, said side walls defining an upwardly presenting groove,

a one-piece end cap member interfitted with one end of said slat and including a tongue adapted to be received within said groove;

a mounting pad disposed between said end cap member and said bottom wall of said slat and the surface portion; and

said mounting pad including means for releasably retaining said mounting pad and said slat together as an integral unit, wherein said slat includes means forming an aperture, said retaining means comprising a pair of longitudinally spaced resilient fingers extending upwardly from said mounting pad and through said aperture to retain said mounting pad and said slat together as an integral unit.

4,890,778

HAMMER-ACTIVATED FASTENER TOOL FOR DRIVING FASTENER PROJECTILES

Robert E. Hawkins, P.O. Box 430, Arcadia, Ind. 46030

Filed Apr. 29, 1988, Ser. No. 188,455

Int. Cl.[4] B25C *1/14*

U.S. Cl. 227—10 **55 Claims**



1. A cartridge-actuated fastener-driving tool of a type having a generally tubular housing body means in which is slidably carried a generally tubular barrel means having a muzzle, the barrel means carrying adjacent its breechward end a chamber body having a bore within which may be placed a power cartridge which is operative, when struck, to forcibly drive the fastener outwardly of a muzzle, a firing pin being slidably carried by the housing body means, and operative when struck by an associated hammer means to strike the power cartridge to cause its fastener-driving tool operativity by propelling a piston means slidably carried in the bore of the barrel means to forcibly engage the fastener,

the improvement for such a tool, comprising:

the housing body means being provided with an axially-extending offset wall means having an abutment at the muzzleward end thereof,

the barrel means being provided with an axially-extending slot,

and the piston means being provided with a pin means which has a position in which it extends through the barrel means slot and toward the offset wall means far enough to abuttingly engage the said abutment,

the abutting engagement of the pin means with the muzzleward abutment providing, depending on the relative position of the relatively movable housing body means, barrel-means and piston means: (a) a force means which pulls the piston means breechwardly to achieve ejection of a spent power cartridge and achieve maximal effect of the explosion of the next power cartridge if the operator pulls the housing body means and the barrel means relatively apart, or (b) a force means which limits relatively apart movement of the housing body means and the barrel means.

4,890,779

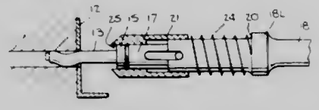
AUTOMATIC SETTING TOOL FOR MASONRY ANCHORS

Louis N. Giansuzzi, 59 Dingletown Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 643,392, Aug. 23, 1984, Pat. No. 4,828,445. This application Aug. 3, 1988, Ser. No. 227,676

Int. Cl.[4] B25D *17/00*

U.S. Cl. 227—139 **7 Claims**



1. An automatic setting tool adapted to be operatively coupled to the chuck of a drill-hammer for driving the shank of an anchor having a head into a hole drilled in masonry by a drill bit which is grippable by the jaws of the chuck, said tool comprising:

A a rod having a front striker section and a rear holder section, said holder section being adapted either to slip onto a drill bit held by the jaws of the chuck or to be directly gripped thereby, whereby the rod as it is actuated by the drill-hammer is caused to periodically undergo a forward hammering stroke;

B a location sleeve telescoped over the striker section and slidable thereon from an initial position to a retracted position; and

C compressible means interposed between the sleeve and a point on the rod urging said sleeve to said initial position at which the sleeve projects beyond the front end of the rod to define therewith a socket for nesting the head of the anchor, whereby when the shank of the anchor is inserted into the entry of the drilled hole and the head thereof nested in said socket is struck by the striker section, then during each forward stroke of the rod the shank is driven further into the hole, said means being compressed to cause said sleeve to assume said retracted position at which the depth of the socket is reduced without dislodging the head therefrom, as a consequence of which the alignment between the tool and the anchor is maintained in the course of the driving action.

4,890,780

MANUFACTURING APPARATUS

Tsutomu Mimata, Akikawa; Toshihide Uematsu, Hinode, and Katsuhiro Tabata, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

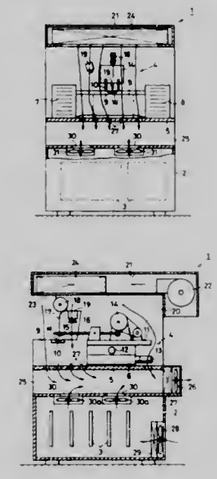
Continuation of Ser. No. 808,708, Nov. 22, 1985, abandoned. This application Sep. 8, 1987, Ser. No. 93,715

Claims priority, application Japan, Nov. 22, 1984, 59-246025

Int. Cl.[4] H01L *21/60, 21/56*

U.S. Cl. 228—4.5 **6 Claims**

2. In an assembly method carried out on a semiconductor workpiece comprising bonding wires to said semiconductor workpiece on a bonding stage of a wire bonder mechanism, said semiconductor workpiece having been processed by a wafer fabrication process at a location separate from said bonder mechanism before said bonding, the improvement comprising the steps of supplying clean air from a clean air supply means disposed above at least the bonding stage of the bonder mechanism and formed integrally with a part of said bonder mechanism and disposed in a location facing said clean air supply means on a side of said workpiece opposite to said first



side to thereby produce a downward flow of clean air toward said semiconductor workpiece set on said bonding stage.

4,890,781

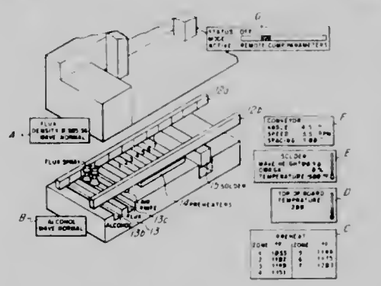
AUTOMATED FLOW SOLDER MACHINE

Paul B. Johnson, Plano, Tex.; Robert F. Mininger, Johnson City, Tenn.; Steven R. Lane, Tucker, and Edwin Lamb, Lilburn, both of Ga., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 4, 1988, Ser. No. 228,906

Int. Cl.[4] B23K *3/04;* H05K *3/34;* H05B *7/16*

U.S. Cl. 228—7 **53 Claims**



1. A computer controlled flow solder machine for applying solder to printed circuit boards, comprising, at least one computer for controlling the flow solder machine and its process parameters, a flux system for applying flux to two sides of the printed circuit boards processed through the flow solder machine, a preheat system for preheating the printed circuit boards, including a plurality of heating zones, each zone having one or more heating tubes, and each zone including a thermocouple within a closed-loop feedback temperature control system, and an automatic positioning pyrometer to measure the temperature of the topside of each circuit board, a solder system including a solder pot for applying solder to the printed circuit boards, and a conveyor system for moving printed circuit boards through the flow solder machine.

4,890,782

PROCESS FOR THE PRODUCTION OF A COMPOSITE TOOL

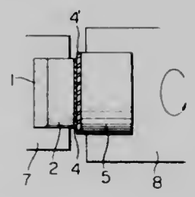
Tetsuo Nakai; Akio Hara, and Shuji Yaza, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 5,619, Jan. 7, 1987, abandoned, which is a continuation of Ser. No. 717,099, Mar. 28, 1985, abandoned. This application Apr. 25, 1988, Ser. No. 186,082

Claims priority, application Japan, Apr. 3, 1984, 59-66125; Jun. 1, 1984, 59-113706; Jun. 1, 1984, 59-113707; Nov. 21, 1984, 59-247493

Int. Cl.[4] B23K *20/12*

U.S. Cl. 228—112 **5 Claims**



1. A process for producing a composite tool which comprises previously bonding a high strength metal or high strength alloy selected from the group consisting of Ni, Co and alloys thereof to at least one of the end surfaces of an insert and a support of a hard metal or hard alloy selected from the group consisting of steel and a hard sintered alloy, said support having a larger volume than the insert, revolving at least one of the insert and support at high speed, subjecting the high strength metal or alloy previously bonded onto at least one of said revolving end surfaces to friction and heating by contacting said revolving end surfaces with each other to cause the high strength metal or high strength alloy to flow and form an intermediate layer, thereby bonding the insert and support, said insert being selected from the group consisting of (1) a sintered alloy containing, as a predominant component, at least one member selected from the group consisting of WC, (Mo, W)C, TiC, TiN and Cr_3C_2, (2) a composite compact consisting of a diamond compact containing at least 50% by volume of diamond powder and a substrate of a hard sintered alloy bonded during sintering under an ultra-high pressure and high temperature directly or through an interlayer with a thickness of at most 0.5 mm to the diamond compact, and (3) a composite compact consisting of a BN compact containing at least 20% by volume of BN powder and a substrate of a hard sintered alloy bonded during sintering under an ultra-high pressure and high temperature directly or through an interlayer with a thickness of at most 0.5 mm to the BN compact; wherein the hard sintered alloy of the substrate of (2) or (3) is a cemented carbide consisting of at least one member selected from the group consisting of carbides, nitrides, carbonitrides of Group 4*a*, 5*a* and 6*a* elements of the Periodic Table, solid solutions and mixtures thereof, bonded with an iron group metal.

4,890,783

CERAMIC-METAL JOINING

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Filed Nov. 29, 1988, Ser. No. 277,666

Int. Cl.[4] B23K *31/00, 35/22*

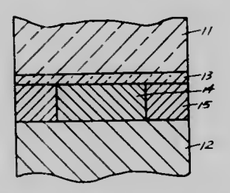
U.S. Cl. 228—122 **38 Claims**

1. A method for improving the reliability of a joint between a first body of a first solid material and a second body of a second solid material, said first solid material being dissimilar from and relatively weaker than said second solid material, said method comprising reducing the dynamic mismatch stresses on the relatively weaker first solid material body due to dynamic mismatches in thermal expansions between the two solid materials during transient heating or cooling of the joint

so that the relatively weaker first solid material is no longer subjected to high stresses, comprising:

providing a metal layer on a selected surface of the body of the first solid material;

bonding with the metal layer the second solid material body to the selected surface of the first solid material body thereby forming with the metal layer a joint or bonding interfacial region between the two bodies; and



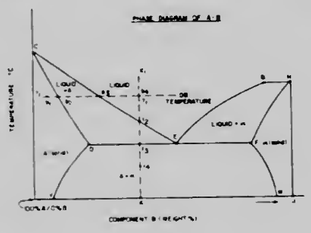
grading from a central portion toward a peripheral portion of the joint at least one thermomechanical property of the material of the metal layer in the interfacial region to ensure that the maximum residual mismatch stresses will not exceed the local material strength in the first solid material at any point and time, said one thermochemical property being selected from the group consisting of thermal conductivity, thermal expansion coefficient, and softness or shock-absorbing ability.

4,890,784

METHOD FOR DIFFUSION BONDING ALUMINUM

Clifford C. Bampton, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 28, 1983, Ser. No. 479,225
Int. Cl.[4] B23K *20/14*
U.S. Cl. 228—194 **26 Claims**



1. A method of diffusion bonding which comprises:

providing two aluminum alloy members to be diffusion bonded within a temperature range suitable for solid state diffusion bonding, said aluminum alloy members each having at least one alloy additive therein;

providing an interlayer of alloy which comprises aluminum and an alloy additive which is also in said alloy members, the percentage of said aluminum in said interlayer being less than the percentage of said aluminum in said alloy members, the percentage of said additive being large enough to assure that said interlayer will be at least partially liquid within said diffusion bonding temperature range for said alloy members, said interlayer having a surface oxide layer, said interlayer having a melting point below said temperature range, said alloy of said members being soluble in said interlayer when said interlayer is in a liquid phase;

positioning said alloy members and said interlayer in an assembly such that said interlayer is sandwiched between the surfaces of said alloy members to be bonded;

heating said assembly to within said temperature range such that said interlayer is transformed into a liquid phase and said surface oxide layer disrupted; and

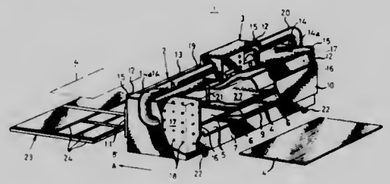
maintaining said assembly within said temperature range such that portions of said aluminum alloy members dissolve into said interlayer at a faster rate than said interlayer diffuses into said members, said interlayer eventually solidifies between said alloy members primarily due to its resulting increased aluminum content, said diffusion bonding of said alloy members and said interlayer occurs.

4,890,785

PREVENTIVE METHOD FOR PLATE DEFORMATION DUE TO WELDING IN FLAT PLATE WELDED STRUCTURE

Akira Sakaguchi, Kobe, and Hideaki Koie, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation nf Ser. No. 917,311, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 650,249, Sep. 13, 1984, abandoned. This application Jul. 1, 1988, Ser. No. 214,859
Claims priority, application Japan, Sep. 16, 1983, 58-172010
Int. Cl.[4] B23K *31/02*; B23P *11/02*
U.S. Cl. 228—232 **5 Claims**



1. A preventive method for plate deformation due to welding in constructing flat plate welded structures made of thin-gage plates and frame comprises the steps of:

(a) preheating a whole plate uniformly in a heating box to a given temperature at a first location, heating said plate in said heating box with flowing hot air;

(b) unloading the preheated plate from said heating box to the atmosphere at a second locatio which is spaced apart from said first location;

(c) permitting said unloaded preheated plate to begin cooling to the atmosphere; and

(d) during such cooling to the atmosphere at said second location,

(1) placing said plate onto a top surface of a frame which has not been preheated;

(2) tack welding said preheated plate to said frame at a plurality of points along the outline of said plate, which points are set apart from each other at a substantial distance, during the process of cooling to the atmosphere and during the time in which the temperature of said preheated plate is higher by a predetermined degree than that of said frame, so as to cause tensile stresses between said plate and said frame;

(3) fully welding the tack welded plate to said frame at a plurality of points between the tack welded points; whereby

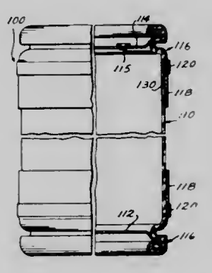
(4) thermal shrinkage deformation occurs when the fully welded plate cools.

4,890,786

FIBRE DRUM WITH REINFORCEMENT COLLAR

Lanny A. Oberhofer, Homewood, and Donald E. Miller, Mt. Prospect, both of Ill., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Oct. 11, 1988, Ser. No. 255,561
Int. Cl.[4] B65D *3/10*
U.S. Cl. 229—5.7 **14 Claims**



1. In a fiber drum of predetermined height, a fiber tube wall with first and second ends, an end member overlying said first end, a metal chime encircling said tube wall at said first end and extending inwardly of said first end along an end portion of the tube wall immediately adjacent said first end, said tube end portion and chime being formed to define a stabilized end portion for reception of said end member, said chime including a free peripheral edge about said tube wall inward of said first tube wall end; the improvement comprising reinforcement means for precluding tube wall fracture adjacent said chime, said reinforcement means being dimensioned to partially underlie the free edge of said chime peripherally about said tube wall and extend a minor distance beyond said chime for a distribution of destructive forceinduced stresses outward of said chime.

4,890,787

SHIPPING CONTAINER

Henry L. Liebel, Cincinnati, Ohio, assignor to Shippers Paper Products Company, Loveland, Ohio

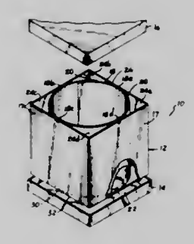
Filed Oct. 17, 1988, Ser. No. 258,461
Int. Cl.[4] B65D *6/10*
U.S. Cl. 229—23 BT **3 Claims**

1. A shipping container for transporting particulate material comprising:

a four-sided outer paper tube having generally rectangular sides; and

generally cylindrical inner tube means within said outer paper tube having a diameter generally equal to the width separating at least a pair of sides of said outer paper tube and being adapted to extend toward the said pair of sides of said outer paper tube and defining areas for receiving said particulate material to be contained including the interior of said inner tube means and the areas between said inner tube means and said sides of said outer paper tube for resisting bulging of said container by the weight of the particular material to be contained therein;

said inner tube means being adhererd to the said pair of sides of said outer paper tube, said outer paper tube and said inner tube means being foldable to a knockdown position



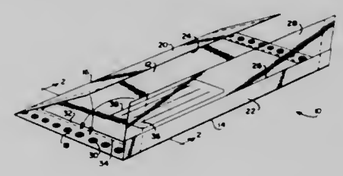
to be stacked and shipped in a substantially flat condition and then to be erected for use.

4,890,788

MAILING SYSTEM

Thomas G. Peanock, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,982
Int. Cl.[4] B65D *27/04*
U.S. Cl. 229—71 **20 Claims**



1. A mailer comprising:

a single paper ply foldable about generally parallel, transversely spaced, longitudinally extending, fold lines to form a pair of flaps extending generally toward one another to overlie a central web portion of said ply and having longitudinally extending edges terminating short of one another to define a space therebetween, said paper ply having generally parallel edges along opposite sides thereof forming end edges of said flaps and said central web portion at opposite ends of said mailer;

a closure web disposed between said flaps to close said space therebetween and overlying said central web portion, said closure web being coextensive in length with said central web portion and having a transparent portion, said closure web having end edges in substantially parallel relation to and substantially in registration with the end edges of said ply at respective opposite ends of said mailer;

means for securing said flaps and said closure web one to the other; and

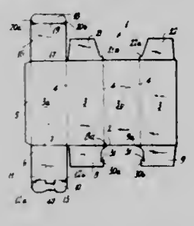
an insert disposed in said mailer with said flaps and said closure web on one side thereof and said central web portion on another side thereof and having address information thereon for viewing through said transparent portion.

4,890,789

BOX STRUCTURE WITH INCREASED RESISTANCE TO BASE OPENING

Carmelo Lo Duca, Milan, Italy, assignor to Gl.Bl.Effe. S.R.L., Milan, Italy

Filed Nov. 21, 1988, Ser. No. 274,007
Claims priority, application Italy, Nov. 27, 1987, 22805 A/87
Int. Cl.[4] B65D *5/10*
U.S. Cl. 229—102 **1 Claim**



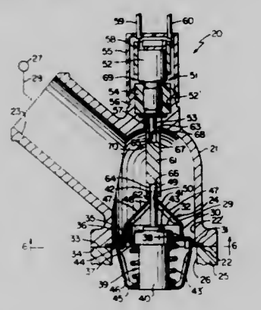
1. A box structure with increased resistance to base opening, consisting of a punched sheet element formed from four side-by-side first portions separated transversely by folding lines to form a side surface of a prismatic-shaped box, and with at least one second portion at a longitudinal end of one of said first portions and separated therefrom by a folding line to form a box base, at least two of the remaining first portions comprising, at their longitudinal end and on the same side of said punched sheet element as said second portion, foldable cover tabs internally superposable on said base, the second portion being provided at its farthest end with a foldable closure tab characterized in that said closure tab has a central curved recess, the closure tab comprising a shaped notch which when the box is closed forms a slot parallel and adjacent to a folding line of the closure tab, in correspondence with said slot there projects from each of the relative two cover tabs a tooth which touches an inner side wall of the box when this is closed, the overall width of said teeth when the cover tabs are closed being just smaller than the length of said slot, the teeth having an inner side thereof reentering in the manner of a sawtooth.

4,890,790

ENGINE COOLING SYSTEM, STRUCTURE THEREFOR AND METHODS OF MAKING THE SAME

Joseph P. Wagner, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 3, 1988, Ser. No. 252,693
Int. Cl.[4] F01P *7/02*
U.S. Cl. 236—34.5 **6 Claims**



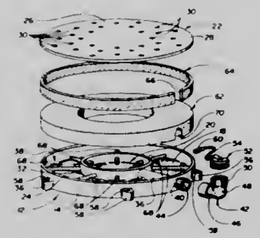
1. In an engine cooling system comprising a housing means having an inlet and an outlet, and a thermostat construction disposed in said housing means between said inlet and said outlet for controlling the degree of fluid flow therebetween, said thermostat construction comprising a valve seat unit, a valve closure unit for opening and closing said valve seat unit, spring means operatively interconnected to said valve closure unit to tend to close the same against said valve seat unit, and a temperature responsive device comprising a piston member and a cylinder member that are adapted to provide relative movement therebetween when the device senses certain temperatures, one of said members being interconnected to said valve closure unit to move the same in unison therewith in opposition to the force of said spring means when the other of said members is fixed from movement relative to said housing means, a movable stop means carried by said housing means and having a plurality of different set positions relative to said other member so as to be engaged by said other member at the particular set position of said stop means and thereby fix said other member to said housing means at that particular set position so that once said other member has been moved against said stop means by said device sensing a particular temperature, said device will cause said one member to move to open said valve closure unit relative to said valve seat unit when said device senses a certain higher temperature than said particular temperature, said stop means comprising a second temperature responsive device that has a piston member and a cylinder member, one of said members of said second device being fixed to said housing means whereby the other of said members thereof is movable relative to said housing means to said different set positions thereof in relation to the temperature sensed by said second device, said second temperature responsive device having a heating means adapted to heat said second device to cause said other member thereof to move to a first certain set position thereof when said heating means is operating, said heating means comprising an electrically operated heating means, the improvement wherein said piston members of said temperature responsive devices face each other in spaced apart axially aligned relation.

4,890,791

DEVICE FOR ELIMINATING MALODOROUS SMELLS

Craig O. Hoffman, 10364 Newport Dr., Eden Prairie, Minn. 55344

Filed Sep. 30, 1988, Ser. No. 252,258
Int. Cl.[4] A61L *9/12*
U.S. Cl. 239—44 **4 Claims**



1. Apparatus for eliminating malodorous smells in a confined area by distributing a liquid neutralizing agent for exposure to the air in the area, comprising:

(a) a circular housing having at least one air flow port formed therein;

(b) an annular, fibrous, porous material insert received within said housing so that air flow through said port will pass through said insert, the fibrous structure of said insert being such as to facilitate dispersal of liquid neutralizing agent coming in contact therewith throughout said insert;

(c) an enclosure within said housing, defining a reservoir for receiving the liquid neutralizing agent, said reservoir being replenishable as liquid neutralizing agent therein becomes depleted; and

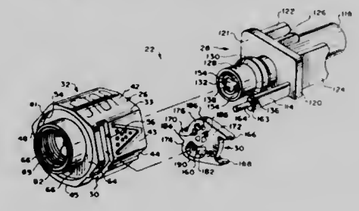
(d) an annular ring of wicking material circumferentially enclosing said annular porous material insert, and a plurality of angularly-spaced, radial spokes of wicking material extending from said reservoir to said annular ring of wicking material.

4,890,792

NOZZLE ASSEMBLY

Douglas S. Martin, Forest City, N.C., and Joseph W. J. Maas, Someren, Netherlands, assignors to AFA Products Inc., Forest City, N.C.

Continuation-in-part of Ser. No. 158,329, Feb. 19, 1988. This application Apr. 13, 1988, Ser. No. 181,143
Int. Cl.[4] B05B *7/30*
U.S. Cl. 239—343 **15 Claims**



1. A nozzle assembly for mounting to a trigger sprayer having a body with a front portion and a passage therein and a trigger mounted thereto, said nozzle assembly comprising: a cap, a bushing for mounting to a front portion of a body of a trigger sprayer in communication with a passage in the trigger sprayer; said bushing having first passage means for communicating the passage in the body with said cap and said cap having second passage means for communicating with said first passage means in said bushing, said cap being mounted to and on said bushing and being rotatable on said bushing between three positions, they being a stop position where the first passage means does not communicate with the second passage means, a spray position where said first passage means is in communication with said second passage means and a foam generating position where said first passage means is in communication with said second passage means, said respective first and second passage means of said bushing and said cap being arranged to communicate with each other in the rotated spray position and in the rotated foam generating position of the nozzle assembly, and foam generating means movably mounted within said cap and arranged to be moved into communication with said second passage means when said cap has been rotated to said foam generating position for generating foam on actuation of a trigger of the trigger sprayer to which the nozzle assembly is mounted.

4,890,793

ATOMIZER NOZZLE

Cornel Füglistaller, Jonen; Jakob Keller, Dottikon, and Thomas Sattelmayer, Mandach, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Feb. 2, 1988, Ser. No. 151,612
Claims priority, application Switzerland, Feb. 13, 1987, 545/87
Int. Cl.[4] B05B *1/28, 7/06;* **F23D** *11/12*
U.S. Cl. 239—427 **8 Claims**

1. An atomizer nozzle for atomizing liquid fuel with air supply, comprising:

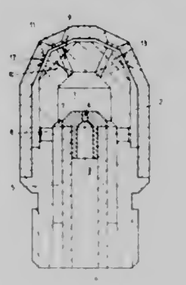
an internal chamber, an approximately hemispherical shell-shaped external chamber surrounding the internal chamber, a central fuel duct and an air duct surrounding the central fuel duct and having the same axis as the central fuel duct;

the central fuel duct and the air duct having inlet openings communicating with the internal chamber;

the air duct also connected to the external chamber via at least one connecting opening;

the internal chamber having, opposite its inlet openings, several outlet openings which open into the external chamber;

the external chamber having a corresponding number of outlet openings which are in alignment with the outlet openings of the internal chamber and lead to the outside;



wherein:

the outlet openings of the internal chamber, opening into the outlet chamber, have a smaller cross-section than the outlet openings of the external chamber leading towards the outside;

the outlet openings of the external chamber expand conically towards the outside;

the smallest cross-section of the outlet openings of the external chamber in each case corresponds to the sum of the cross-section of the outlet openings of the internal chamber and the annular cross-section of the opening of the external chamber to its outlet openings.

4,890,794

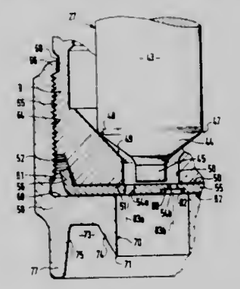
PERFORATED BODY FOR A FUEL INJECTION VALVE

Ichiei Imafuku, Kanagawa, Japan, and Waldemar Hans, Bamberg, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 242,663
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733604
Int. Cl.[4] F02M *61/18, 51/06*
U.S. Cl. 239—533.12 **14 Claims**

1. A perforated body for use downstream of a valve seat of a fuel injection valve for fuel injection systems of internal combustion engines, having a first face (59) located in a first plane, a second face (62) located in a second plane, and at least one step located in a third plane, between which step and one of said first and second faces, at least one injection opening extends penetrating the perforated body, at least one further injection opening (54*a*) extends between the two faces (59, 62) from said first face (59) to said second face (62), and a length of

the at least one further injection opening (**54***a*) differs from a length of the at least one injection opening (**54***b*) extending



between the step (**80**) and one of said first and second faces (**59**, **62**).

4,890,795

METHOD FOR THE PRODUCTION OF WOOD FLOUR BASED FILLERS FOR PLASTIC MATERIALS

Mario Da Re' , Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Sep. 30, 1988, Ser. No. 252,071
Claims priority, application Italy, Sep. 30, 1987, 67826 A/87
Int. Cl.[4] B02C *19/12, 23/18*
U.S. Cl. 241—3 **3 Claims**

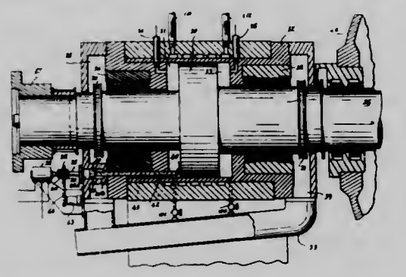
1. A method for production of a wood flour based granular material for use as a filler for plastic materials, comprising the steps of impregnating a mass of wood flour with an aqueous solution of melamine resin and a ketone selected from the group consisting of dimethyl ketone and methyl-ethyl ketone, drying the impregnated wood flour, thereby yielding a dried mass, and milling the dried mass to a particle size suitable for inclusion as a filler in plastic material, thereby yielding a milled dried mass.

4,890,796

COMBINED HYDROSTATIC/HYDRODYNAMIC BEARING SYSTEM FOR GRINDING APPARATUS

Rolf B. Reichelt, Bellevue, Wash., assignor to Sunds Defibrator AB, Sundsvall, Sweden

Division of Ser. No. 647,412, Sep. 5, 1984, Pat. No. 4,801,099. This application Oct. 21, 1988, Ser. No. 260,944
Int. Cl.[4] B02C *7/14*
U.S. Cl. 241—30 **1 Claim**



1. In a material grinding apparatus, a method of counteracting axial thrust forces on an axially displaceable rotating shaft carrying a grinding member which rotates relative to a facially opposed grinding member, which grinding members define between them a grinding clearance range for material to be ground, said rotating shaft having a cylindrical piston having opposed ends rotating with said shaft within a pressure chamber, said method comprising the steps of:

a) applying a hydrostatic stabilizing force on said rotating shaft in an axial direction within said pressure chamber by supplying pressure to said opposed ends of said cylindrical piston by means of an external fluid pressure medium supplied to said pressure chamber, thereby counteracting fluctuating axial thrust forces exerted on said shaft during grinding of the material, and thereby maintain a predetermined grinding clearance range with consequent generation of fluctuating pressure differentials between said opposed ends in said pressure chamber; and

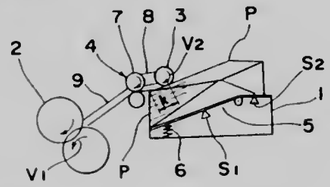
b) generating a hydrodynamic stabilizing force on said rotating shaft in a radial direction by passing said fluid pressure medium under pressure between said opposed piston ends in said pressure chamber by effect of said pressure differentials and effect of centrifugal force generated by said rotating shaft and imparted to said fluid pressure medium by the rotation of said cylindrical piston within said pressure chamber.

4,890,797

AUTOMATIC PAPER FEEDER FOR DOCUMENT SHREDDER

Yoshikalu Fujii, Sakurai; Yukitoshi Fujita, and Hiroshi Moriyama, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 9, 1988, Ser. No. 166,054
Claims priority, application Japan, Mar. 9, 1987, 62-54965
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—34 **3 Claims**



1. An automatic paper feeder and document shredder, comprising:

a paper feeding table for placing thereon, a stack of paper sheets to be shredded;

a feeding roller for feeding the paper sheets to be shredded on the paper feeding table, to a set of shredding blades which rotate at a rotational peripheral speed;

a driving device for driving said feeding roller for rotation at a rotational peripheral speed, said rotational speed of said feeding roller being faster than the rotational speed of said shredding blades;

size detecting sensors for detecting sizes of large paper sheets and small paper sheets placed on the paper feeding table; and

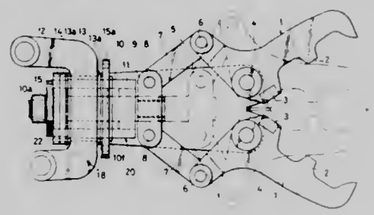
a control circuit which outputs a rotational speed changing signal for the feeding roller, to the driving device according to paper size signals of said sensors, said control circuit comprises paper size judging means for judging large sized paper sheets and small sized paper sheets by the outputs from the paper size detecting sensors, proper feeding speed calculating means for calculating a proper rotational peripheral speed V_2 of the feeding roller by the output signal of the judging means, feeding motor driving signal output means for driving a motor for the feeding roller by the output signal of the calculating means, shredding motor driving signal output means for driving a motor for the shredding blades and paper presence/absence judging means for judging whether the paper sheet is present or absent by the output of paper presence/absence detecting sensors coupled therewith.

4,890,798

STRUCTURE CRUSHING EQUIPMENT

Itsuo Tagawa, Tokyo; Yukiharu Kanari; Samon Kanno, both of Saitama, and Takaharu Kozaki, Tokyo, all of Japan, assignors to Sangojnuki Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,817
Int. Cl.[4] B02C *1/06, 1/10*
U.S. Cl. 241—266 **17 Claims**



1. An equipment adapted to be installed on a working machine, for crushing a structure, said equipment comprising:

bracket means to be mounted to said working machine;

hydraulic piston-cylinder means having a cylinder and a piston rod and mounted to said bracket means for angular movement relative thereto about an axis of said piston rod;

frame means associated with said hydraulic piston-cylinder means for angular movement therewith about the axis of said piston rod;

a pair of opposed arms mounted to said frame means for pivotal movement relative thereto, between a closed position and an open position, toward and away from each other and toward and away from a plane including the axis of said piston rod of said hydraulic piston-cylinder means, said piston rod being operatively connected to said pair of arms for moving the same between said closed and open positions, at least one of said pair of arms having its forward end portion provided with crushing means, said crushing means on the forward end portion of said one arm cooperating with the other arm to clamp therebetween the structure for crushing the same;

passage means provided in a wall of said cylinder, wherein hydraulic fluid from hydraulic-fluid supply hose means of said working machine can be supplied into said cylinder through said passage means; and

rotatable coupling means associated with said cylinder for enabling said passage means and said hydraulic-fluid supply hose means to communicate with each other even when said piston-cylinder means moves angularly about the axis of said piston rod relatively to said bracket means.

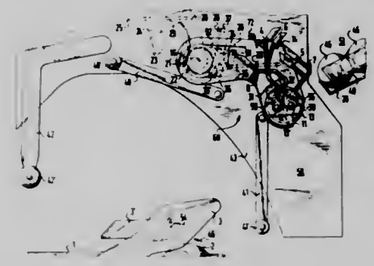
4,890,799

APPARATUS FOR REMOVING A TUBE FROM A TUBE MAGAZINE AND FOR TRANSFERRING THE TUBE TO THE CREEL OF A WINDING STATION

Hans Grecksch, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,826
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1987, 3719025; Aug. 8, 1987, 3726508
Int. Cl.[4] B65H *67/04, 54/20*
U.S. Cl. 242—35.5 A **23 Claims**

1. In a cheese or cross-wound bobbin producing machine having winding stations with creels, an assembly comprising a tube magazine and an apparatus disposed on a movable service carriage for removing a tube from said tube magazine and transferring the tube to a creel, said apparatus including a feeder having individual fingers being mutually spaced apart along the longitudinal axis of the tube, means for encompassing the tube between said individual fingers, means for moving said individual fingers transversely to the longitudinal axis of the tube, means for moving said individual fingers between said tube magazine and the creel, and a cheese changer having a



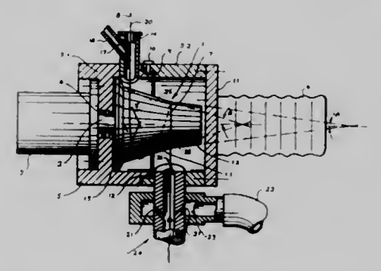
device for forming a reserve winding on a tube end, and said feeder having a detent for holding said individual fingers in a tube receiving position, and a detent for holding said individual fingers in a tube releasing position, and a detent for holding said individual fingers in an intermediate position for forming a reserve winding, said tube encompassing means opening and subsequently closing said individual fingers in said intermediate position.

4,890,800

YARN WITHDRAWAL APPARATUS AND METHOD

Erich Lenk, Remscheid, and Albert Stitz, Kurten, both of Fed. Rep. of Germany, assignors to Barmag, AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 38,334, Apr. 14, 1987, Pat. No. 4,817,880, which is a continuation-in-part of Ser. No. 8,490, Jan. 29, 1987, Pat. No. 4,784,344. This application Jul. 12, 1988, Ser. No. 218,089
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725208
Int. Cl.[4] B65H *51/20*
U.S. Cl. 242—47.01 **33 Claims**



1. Apparatus for withdrawing continuously advancing yarn, comprising

a support,

a tapered yarn winding roll mounted to said support for rotation about a central axis and including a yarn entry portion and a yarn exit portion, with the yarn entry portion having a cone angle which is greater than the cone angle of the yarn exit portion,

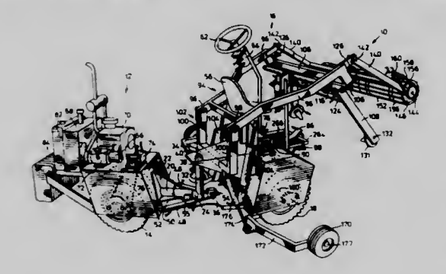
yarn inlet means for guiding the advancing yarn substantially tangentially onto said roll at said yarn entry portion,
yarn outlet means for withdrawing the advancing yarn substantially tangentially from said roll at a withdrawal location axially spaced from said inlet means in a direction toward said yarn exit portion,
drive means mounted to said support for rotating said roll about said central axis at a rate such that the initial point of contact of the yarn upon said yarn entry portion has a linear speed at least equal to that of the advancing yarn, and wherein
the cone angle of said yarn entry portion has a tangent which is less than the coefficient of static friction between the yarn and the surface of the roll but greater than the coefficient of sliding friction, and the cone angle of said yarn exit portion has a tangent which is less than the coefficient of sliding friction.

4,890,801

CUTOFF MECHANISM FOR A SOD LAYING MACHINE

Gerardus J. Brouwer, Keswick, and Henry Zwambag, Sutton, both of Canada, assignors to Brouwer Turf Equipment Limited, Keswick, Canada

Division of Ser. No. 776,242, Sep. 26, 1995, Pat. No. 4,754,815. This application Apr. 5, 1988, Ser. No. 177,759
Claims priority, application Canada, Sep. 17, 1984, 463424
Int. Cl.[4] A01B *45/00*
U.S. Cl. 242—56 B **4 Claims**



1. A cutoff mechanism for severing a strip of sod from a roll of sod, said cutoff mechanism comprising:
(a) support means adapted to extend laterally across a roll of sod,
(b) a cutter mounted for movement back and forth across said support means,
(c) means for driving said cutter laterally across said support means to cut through a layer of sod in said roll, and
(d) adjustable depth gauge means for adjustably limiting the depth of penetration of said roll by said cutter.

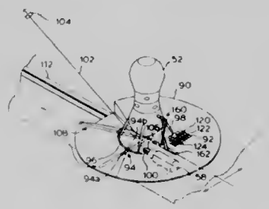
4,890,802

APPARATUS FOR CAPTURING SECURING AND TRAVERSING REMOTELY PILOTED VEHICLES AND METHODS THEREFOR

R. Anthony Burgess, Toronto; Geoffrey Cauliffe, Mississauga, and Atef Tadros, Brampton, all of Canada, assignors to Indal Technologies Inc., Mississauga, Canada

Filed Jun. 1, 1988, Ser. No. 200,925
Claims priority, application Canada, Jun. 1, 1987, 538532
Int. Cl.[4] B64C *25/32*; B64F *1/12*
U.S. Cl. 244—115 **3 Claims**

1. A remotely piloted vehicle comprising a lower support comprising a plurality of broad pads suitable for sitting on a remotely piloted vehicle securing system, without the pads penetrating through the securing system, the pads carrying a downwardly extending probe of sufficient length to pass through the grid securing system, each probe carrying within the probe a pair of laterally extending wings for securing the remotely piloted vehicle to a securing system when the pads sit on the securing system and are retractable into the probe when the remotely piloted vehicle is to be launched, wherein the pair



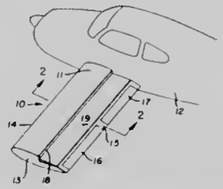
of laterally extendable wings are spring loaded and urged to extend normally laterally from the probe and which wings may be held in a folded vertically extending position within the probe by a pin.

4,890,803

AIRFOIL WITH FIXED AND VARIABLE UPPER CAMBER PORTIONS

Larry L. Smith, 5 Court St., Canfield, Ohio 44406

Filed Jul. 29, 1987, Ser. No. 78,975
Int. Cl.[4] B64C *3/48*
U.S. Cl. 244—219 **8 Claims**



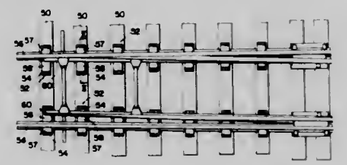
1. An airfoil comprising a leading edge; a trailing edge located longitudinally rearward of said leading edge; a continuous lower surface extending from said leading edge to said trailing edge, said lower surface defining a lower camber; a first fixed upper surface extending rearwardly from said leading edge and terminating in at least one continuous vertical surface defining an offset forwardly of said trailing edge, said first fixed upper surface defining a first positive upper camber portion; a second fixed upper surface extending rearwardly from said continuous vertical surface of said offset and defining a second upper camber portion, a planar member positioned on and coextensive with said second fixed upper surface, means attaching a rearward edge of said planar member to said airfoil inwardly of said trailing edge and means for moving said planar member from a first position in substantial alignment with said first fixed upper surface to form an extension of said first positive upper camber portion to second positions on and above said second fixed upper surface.

4,890,804

TURNOUT UNIT FOR RAILWAY TRACK

Tomihiko Teramoto; Hidehiko Ono, both of Nagoya; Sadanobu Ito, and Kiyoshi Nishino, both of Tokyo, all of Japan, assignors to Nippon Sharyo Seizo Kabushiki Kaisha, Nagoya and Kanto Bunkiki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jan. 21, 1988, Ser. No. 146,676
Claims priority, application Japan, Jan. 22, 1987, 61-8074[U]; Aug. 21, 1987, 61-127191[U]
Int. Cl.[4] E01B *7/00*
U.S. Cl. 246—453 **9 Claims**



1. A turnout unit, comprising:
a base plate;
a stock rail fixed on said base plate;
a spray-coated ceramic layer formed on said base plate;
a tongue rail slidably mounted on said ceramic layer, said tongue rail sliding on said ceramic layer;
a bonding coat layer interposed between said base plate and said spray-coated ceramic layer, said bonding coat layer being made of a metal,
wherein said base plate includes a recessed portion with substantially non-recessed portions existing between said stock rail and said recessed portion and along longitudinal edges of said base plate, said bonding coat layer being formed on said recessed portion and said non-recessed portions, and
further wherein said spray-coated ceramic layer is formed on a portion of said bonding coat layer formed on said recessed portion such that an upper surface of said ceramic layer is made substantially flush with an upper surface of said bonding coat layer formed on the non-recessed portions of said base plate.

4,890,805

ELECTRICAL CORD CLAMP

Katsuyuki Morita, Kasugai, Japan, assignor to Kitagawa Industries Co., Ltd., Japan

Filed Jul. 15, 1988, Ser. No. 219,303
Claims priority, application Japan, Jul. 29, 1987, 62-116439
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.2 **15 Claims**



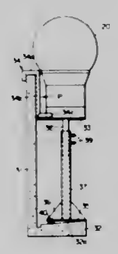
1. A cord clamp comprising:
an arm;
a cord support member connected to one end of the arm for holding a cord;
an arm support member comprising a base portion and a wall portion attached to and extending at a non-zero angle with respect to said base portion;
a hinge joining the arm to said base portion, adjacent to said wall portion, said hinge allowing the arm to swing from a first position substantially parallel to said base portion and away from said wall portion to a second position substantially parallel to said wall portion and away from said base portion;
a first hook means provided on said base portion and a second hook means provided on said wall portion, the first and second hook means for releasably locking an engaging tooth of the arm when said arm is in said first and second positions, respectively; and
a fixing member extending from the arm support member to fasten the cord clamp on a base plate.

4,890,806

STAND FOR A SOLAR RAY COLLECTING DEVICE

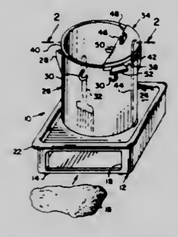
Kei Mori, 3-16-3-501, Kamimoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,708
Claims priority, application Japan, Apr. 20, 1988, 63-98768
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—125 **7 Claims**



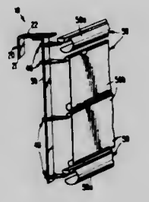
1. The combination comprising a solar ray collecting device and a stand means for mounting said solar ray collecting device on a veranda structure having a base portion and an upper edge portion, said solar ray collecting device comprising a cylindrical body having a longitudinal axis and upper and lower longitudinal ends, a transparent dome mounted on said upper longitudinal end of said cylindrical body, solar ray collecting means disposed within said transparent dome, said stand means comprising a base member secured to said lower longitudinal end of said cylindrical body, said stand means further comprising a vertical upright support having an upper end secured to said base member and a lower end supported on said base portion of said veranda structure such than said vertical upright support supports said base member in a position overlying said base portion of said veranda structure, said stand means further comprising a hanging means adapted to be hung from said upper edge portion of said veranda structure, said hanging means comprising an inverted U-shaped section having two spaced upright legs and a connecting base connecting said two spaced upright legs, one of said two spaced upright legs having a transverse arm, said transverse arm being connected to said base member, whereby said vertical upright support and said hanging means are operable to support said solar ray collecting device on said base portion and on said upper edge portion of said veranda structure.

4,890,807
LIQUID TOOL CADDY
Warren Desjardins, 18 Bonita Rd., East Quogue, N.Y. 11942
Filed Oct. 14, 1988, Ser. No. 258,010
Int. Cl.[4] A47G *23/02*
U.S. Cl. 248—146 **4 Claims**



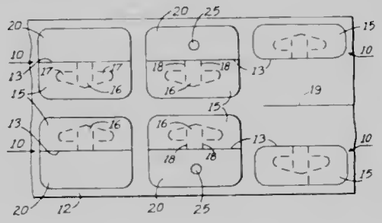
1. A liquid tool caddy, which comprises;
(a) a base, for storage of articles such as sponges or cloths;
(b) a container received on said base, for placement of liquids and supporting brushes;
(c) a tool support device removably secured to said container; and
(d) means for holding said container to said base, wherein a side opening is provided through said base and provides entry for said articles, and said means comprises a beaded lip provided on an upper end of said base that snappingly engages an interior of a channel rim on a bottom wall of said container, and said channel rim is integrally attached to said bottom wall and said bottom wall is integrally attached to said container.

4,890,808
MULTIPLE ROD CENTER SUPPORT
Alan A. Ford, 62669 Balk Road, Sturgis, Mich. 49091
Filed Feb. 10, 1989, Ser. No. 308,620
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—263 **22 Claims**



1. A rod center support system for supporting a portion of at least one rod comprising:
a support base having a first end and a second end, said first end being configured for attachment to a supporting structure;
a drop strap having a first portion for connection to the second end of the support base and a second portion downwardly depending from said first portion;
an adjustable, self-locking member for slidably engaging the second portion of the drop strap, said member defining a tab for supporting a portion of a rod, said selflocking member configured to slide along the length of said second drop strap portion and be locked into a predetermined position; and
wherein said adjustable, self-locking member comprises a substantially flat, middle portion, a drop strap engaging end section disposed at a predetermined angle with respect to said middle portion and defining a surface that at least partially circumscribes a second portion of the drop strap.

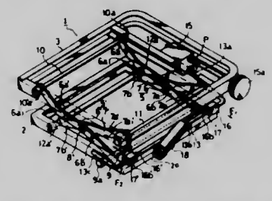
4,890,809
FOLDED HANG TAB
David M. Good, Peachtree City, Ga., assignor to Voxcom, Inc., Peachtree City, Ga.
Filed Jul. 13, 1988, Ser. No. 218,267
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—317 **9 Claims**



1. A hang tab system for applying a foldable and unfoldable hang tab to an object that is hung up for display, said system comprising:
a. a single flat piece of resin material serving as a support strip of said hang tab, said support strip being divided between a stick-on region and a hanging region separated by a hinge line;
b. said stick-on region of said support strip being permanently adhered to a face of said object that is vertically oriented when said object is hung up for display;
c. said stick-on region being adhered to said object face in a position that disposes said hinge line along an upper region of said object at an upper end of said object face;
d. said support strip being folded approximately 180° along said hinge line between said stick-on region and said hanging region so that said hanging region is folded against said stick-on region and lies in a plane parallel with and adjacent to said stick-on region;
e. adhesive securing said hanging region to said stick-on region for holding said tab in folded condition against said object face during shipment; and
f. said hanging region being unfoldable to an upstanding position after shipment, said hanging region in said upstanding position extending vertically upward from said stick-on region to a region above said object face, where said hanging region is deployed approximately in the plane of said stick-on region for hanging said object on a hanger wire.

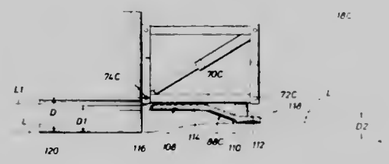
4,890,810
SEAT SUSPENSION DEVICE
Takao Sakamoto, Akishaima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Apr. 14, 1988, Ser. No. 181,689
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—588 **6 Claims**

1. A seat suspension device comprising:
an upper frame to be fixed at the seat;
a lower frame to be fixed on a floor;
a pair of linkage mechanisms provided between said upper and lower frames so as to permit vertical movement of said upper frame relative to said lower frame, wherein said pair of linkage mechanisms comprises a pair of X-shaped links so constructed that a pair of first link members are rotatably pivotally fixed with a pair of second link members in a crossed manner, said pair of first link members being rotatably connected at respective upper ends thereof to an upper movable spindle provided movably within said upper frame and rotatably connected at respective lower ends thereof to alower fixed spindle provided within said lower frame, said pair of second link members being rotatably connected at respective lower ends thereof to a lower movable spindle provided movably within said lower frame and rotatably connected at respective upper ends thereof to an upper fixed spindle provided within said upper frame, and upper portions of said first and second link members respectively being formed long in a downwardly arced shape with respect to the respective lower portions thereof so that respective



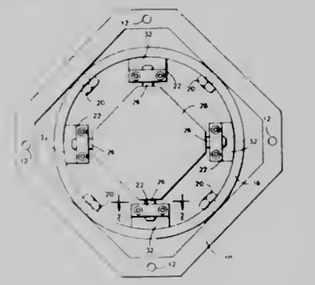
pivot points of said pair of X-shaped links are located low relative to a central point of said pair of X-shaped links; and
a torsion bar including a support end portion and a base end portion, said torsion bar having a lateral portion along which said torsion bar is secured on one of said upper frame and lower frame,
said base end portion of said torsion bar being secured at the other of said upper and lower frames and said support end portion thereof being secured at said one of said upper and lower frames,
whereby said upper frame is resiliently supported by said torsion bar with respect to the lower frame.

4,890,811
OUTBOARD MOTOR MOUNTING MEANS FOR BOATS
Scott M. Ehni, 8500 Lenore, Houston, Tex. 77017
Continuation-in-part of Ser. No. 98,922, Sep. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 198,687, May 20, 1988, abandoned. This application Dec. 23, 1988, Ser. No. 289,029
Int. Cl.[4] B63H *21/26*; F16M *1/00*
U.S. Cl. 248—642 **10 Claims**



1. In a power boat having a transom and adapted to be powered from an outboard motor; an improved mounting device for mounting the outboard motor on the transom comprising:
a linkage having a front support bracket mounted on the outer surface of the transom above the bottom of the boat and a rear support bracket on which the outboard motor is mounted, and upper and lower pairs of generally parallel links extending between and pivotally connected to said front and rear bracktes;
a plate secured to said pair of lower links for movement therewith having a front end adjacent the transom of the boat and a rear end adjacent the outboard motor, said front end of said plate being positioned above the bottom of the boat with said plate sloping downwardly from said front end to said rear end during operation of the boat in both non-planing and planing attitudes of the boat, the spacing of said forward end of said plate above the bottom of the boat forming a space adjacent the transom duing planing of the boat to receive splashing water with said plate deflecting such water downwardly, said plate having a forward end portion thereof mounted on said pair of lower links and a rear end portion spaced downwardly from said pair of lower links, and means extending between said lower links and said rear end portion for mounting said rear end portion on said lower links at a distance spaced greater than the mounting of the forward end portion to said pair of lower links; and
power means connected to said linkage to raise and lower said linkage and associated plate relative to said transom.

4,890,812
TEMPERATURE COMPENSATED MOUNT FOR SUPPORTING A RING LASER GYRO
Robert A. Chechile, Thousand Oaks; Agop H. Cherbettchian, Santa Monica; Sampson Spry, III, Thousand Oaks, and Khalig F. Baig, Canoga Park, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Filed Feb. 1, 1988, Ser. No. 151,807
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—674 **4 Claims**

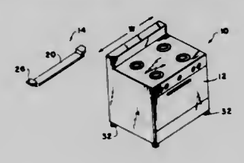


1. In combination:
a plurality of mounts;
a frame, surrounding and supporting said mounts symmetrically about a first axis; and
a case surrounding and rigidly attached to said frame at a set of points equal in number to the number of said mounts and said attachment points being equiangularly symetrically distributed about said first axis at angular positions substantially midway between said mounts;
said case having a higher coefficient of thermal expansion than the coefficient of thermal expansion of said frame to cause the motions of said case and said frame under changes of temperature to compensate for each other and cause said mounts to remain substantially stationary over a range of temperatures.

4,890,813
ANTI-TIP BRACKET FOR RANGES
Chris Johnson, Goodlettsville; Larry Keefover, Springfield, and Buddy J. Austin, Portland, all of Tenn., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Dec. 5, 1988, Ser. No. 279,779
Int. Cl.[4] A47B *97/00*
U.S. Cl. 248—680 **4 Claims**

1. A combination of a an anti-tip bracket and rear levelling

feet for a major appliance, said appliance having a front door which is adapted to be opened to a position substantially horizontal to a floor comprising: said bracket having an elongated body portion provided with opposite vertically extending end walls, means for securing said bracket to the floor, a horizontal flange extending outwardly from each end wall in opposite directions forming a confined space between each horizontal flange and the respective adjacent floor surface, the distance



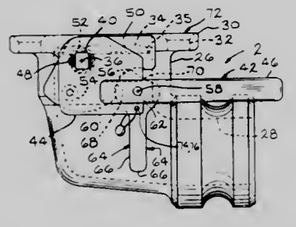
between said rear levelling feet being substantially the same distance between the end walls of said body portion of the bracket said horizontal flanges engaging respective rear leveling feet when the rear levelling feet of said appliance is moved toward said bracket and each of the rear levelling feet correctly slide in the respective confined space so that the appliance is prevented from tipping when an unbalancing load is applied to said door.

4,890,814

DISCHARGE VALVE WITH HANDLE LOCK

Larry D. Thomas, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.

Filed Sep. 26, 1988, Ser. No. 248,593
Int. Cl.[4] F16K *31/60, 35/00*
U.S. Cl. 251—95 **8 Claims**



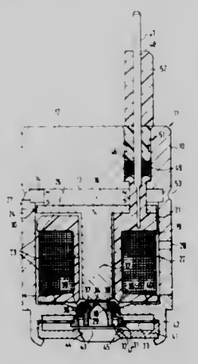
1. A discharge valve for a portable tank for storage and transport of liquids comprising:
- a bollow valve body having a bore therethrough for passage of said liquid and an aperture in said body along an axis transverse of said bore;
- an operating shaft member in said bore oriented along said axis and having an end extending through said aperture;
- a valve disk fixed to said shaft within said bore, said valve disk being movable with said shaft about said axis between a closed position closing said bore and an open position allowing fluid passage through said bore;
- a stationary locking plate member fastened to the exterior of said body adjacent said aperture in a plane generally perpendicular to said axis, said plate member having a concave arcuate edge portion with a first radius of curvature in said plane having a center spaced from said plate a predetermined distance from said axis and a convex arcuate edge portion with a second radius of curvature in said plane centered about said axis;
- an elongated handle having one end fastened to said end of said shaft member for rotating said shaft to move said disk between said open and closed positions, said handle having an outwardly projecting pivot pin member spaced from said one end said predetermined distance from said axis, said pin member projecting parallel to said axis; and
- a locking lever for locking said handle in a predetermined position, said lever being rotatably secured to said pin member and lying in said plane adjacent said locking plate member, said lever having an elongated handle portion, a convex arcuate portion in said plane centered about said pivot pin member, and a concave arcuate portion having a center in said plane spaced from said lever, said lever being operable to engage said locking plate member locking said handle in said predetermined position when said handle is rotated to locate said pivot pin member at the center of curvature of said concave arcuate edge portion of said plate, said handle being movable from said predetermined position when said lever is rotated to position said center of said concave arcuate portion of said lever on said axis.

4,890,815

VALVE WITH MEMBRANE SPRING

Asta Hascher-Reichl, Stuttgart, and Hans Kubach, Korntal-Münchingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 540,610, Oct. 7, 1983, abandoned. This application Aug. 23, 1985, Ser. No. 769,786
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237532
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—129.15 **6 Claims**



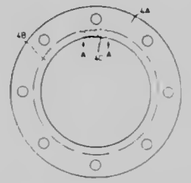
1. A magnetic valve for controlling a flow of liquid, comprising a coil having an axis; an armature; a permanent magnet arranged coaxially with said coil and so that its poles are spaced from one another in an axial direction of said coil, said permanent magnet being formed as a plate, and said armature being formed as a valve body opening in a flow direction so that its opening force is provided by the liquid flow and its closing force is provided by a force of said permanent magnet; a disc-shaped membrane spring, said membrane spring having a central opening in which said valve body is supported, and also having an inner side mounted on said valve body, so that said valve body is supported only by said membrane spring, and said membrane spring does not apply any opening or closing force to said valve body; and a housing having a wall and arranged so that an intermediate space for controlling the magnetix flux is formed between said permanent magnet and said wall of said housing.

4,890,816

VALVE SEATS

Terence P. Nicholson, Derwentside, Great Britain, assignor to Specialist Sealing Limited, Channel Islands, Channel Islands

Filed Jun. 15, 1988, Ser. No. 206,744
Claims priority, application United Kingdom, Jul. 13, 1987, 8716445
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—174 **13 Claims**



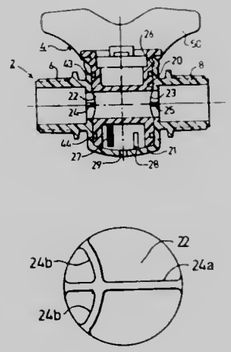
1. A metal valve seat for a valve selected from the group consisting of butterfly valves and ball valves, and having a closure member selected from the group consisting of a butterfly valve disc and a ball valve ball, said valve seat having the form of an apertured disc with a radially outward part by which it is securable to a valve body and with a radially inward dished part which projects laterally around the disc aperture, characterized in that the radially inward dished part is formed with a plurality of circumferentially spaced portions of alternately greater and lesser thickness whereby said portions of greater thickness form radial fingers and said portions of lesser thickness form webs laterally interconnecting said fingers, and said fingers and webs have a radially inward concave sealing surface of varying generative radius adapted to be interference fit with said closure member.

4,890,817

QUARTER-TURN VALVE

Ehud Uri, Kibbutz Maagan Michael, Israel, assignor to Plasson Maagan Michael Industries, Ltd., Kibbutz Maagan Michael, Israel

Filed Feb. 8, 1988, Ser. No. 153,180
Claims priority, application Israel, May 15, 1987, 82540
Int. Cl.[4] F16K *5/04*
U.S. Cl. 251—312 **11 Claims**



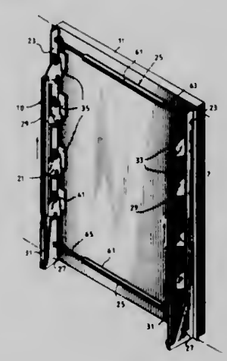
1. A quarter-turn valve comprising:
a housing formed with a cylindrical socket, an inlet nipple at one side of the socket, and an outlet nipple at the diametrically opposite side of the socket;
and a cylindrical plug receivable within said socket and having a bore extending diametrically through the plug for establishing communiation between the inlet and outlet nipples in the open position of the plug, but terminating said communication when the plug is turned to its closed position one-quarter turn from said open position, said plug being formed with a finger-piece projecting from the housing for manually rotating the plug to its open, closed or an intermediate position;
said plug being closed at its bottom, such that the fluid flowing through said bore subjects the plug to a fluid pressure which is balanced on all sides of the plug, thereby facilitating turning of the plug and preventing its accidental ejection when subjected to a high pressure;
said cylindrical plug being formed with a circular recess for receiving an annular sealing ring on each of the two diametrically opposite sides of the plug midway between the ends of said bore, said sealing rings being aligned with the passageways through the inlet and outlet nipples in the closed position of the plug;
said housing being formed with cross-bars extending across the nipple openings to prevent unseating of said sealing rings during the rotation of the plug from its closed to its open positions.

4,890,818

DOOR FORCING APPARATUS

Marc G. Williams, 12 Kobb Blvd., N. Babylon, N.Y. 11703

Filed Dec. 27, 1988, Ser. No. 291,218
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 R **8 Claims**



7. A door forcing apparatus for forcing a door mounted in a door jamb set in a wall comprising:
- two side rails each having a substantially L-shaped cross section engagable with a beveled edge between said door jamb and said door;
- a plurality of wedge assemblies mounted on said side rails pivotable toward and engagable with said door, each of said wedge assembly comprising a drive wedge pivotally mounted on one of said side rails, said drive wedge essentially comprising a portion of a circular disk having a circular-arc-shaped edge and two wedge edges converging to a vertex and being oriented substantially perpendicular to said door, and a substantially flat foot positioned between said drive wedge and said door, oriented substantially perpendicular to said drive wedge and pivotally attached to said drive wedge adjacent said circular-arc-shaped edge so as to remain flat against said door while pressing on said door, said drive wedge being pivotally attached to said side rail on a wedge pivot pin adjacent

said vertex and having a guide attached to said side rail adjacent said circular-arc-shaped edge of said drive wedge having a guide plate which acts to restrain said drive wedge from swinging away from said side rail when said drive wedge is pivoted:

a plurality of adjustable braces each comprising a bracing hydraulic cylinder which is pivotally attached between each of said side rails so that said door forcing apparatus may be collapsed when stored and so that said door forcing apparatus may be adjusted to fit various door widths; two U-shaped cross sectioned drive rod, each having twin arm portions between which said drive wedges pivotally mounted on one of said side rails are pivotally mounted, said wedge assemblies being spaced as uniformly as possible from each other allowing for a knob assembly of said door; and

two driving hydraulic cylinders, each of which has a piston rod pivotally attached to an end of one of said drive rods and is pivotally mounted on a support bracket at one end of said side rail connected to said drive rod so that, when said piston rods are extended from said driving hydraulic cylinders, said drive rods move pivoting said drive wedges pivotally mounted on both of said side rails, pressing said feet against said floor and thus forcing said door.

4,890,819

MACHINE FOR HEAT TREATING CAMSHAFTS

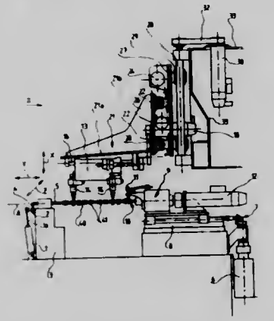
Jean-Pierre Grand, La Celle-Saint-Cloud, France, assignor to Automobiles Peugeot and Automobiles Citroen, both of, France

Filed Apr. 28, 1988, Ser. No. 187,217

Claims priority, application France, May 7, 1987, 87 06503

Int. Cl.⁴ C21D *9/30*

U.S. Cl. 266—78 **11 Claims**



1. A machine for heat treating through remelting cams carried by a cam shaft comprising:

means for rotating the shaft around its horizontally disposed axis,

at least one torch adapted to perform a fusion with an electric arc on a point of the surface to be treated, and

means for moving this torch with respect to the camshaft along three orthogonal directions, namely

a first vertical direction perpendicular to the axis of the camshaft,

a second horizontal direction parallel to the axis of the camshaft, and

a third horizontal direction perpendicular to the axis of the camshaft,

this machine comprising independent binary control means performing respectively the rotation of the shaft and the displacements of said torch along the aforesaid three axes, and in such a manner that the independent binary control means actuating the torch along the third direction permits the point of impact of this torch to be located on a generating line of the cam in contact with the horizontal tangent plane.

4,890,820

HEATING APPARATUS FOR A METALLIC STRAND

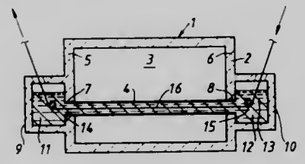
Robert J. Tucker, Stratford upon Avon, England, assignor to British Gas plc, London, England

Continuation of Ser. No. 125,332, Nov. 25, 1987, abandoned. This application May 15, 1989, Ser. No. 352,608

Claims priority, application United Kingdom, Dec. 5, 1986, 8629088

Int. Cl.⁴ C21D *9/58*

U.S. Cl. 266—107 **3 Claims**



1. Apparatus for heating a metallic strand using molten metal as the heat transfer medium, the apparatus comprising a tube through which, in use, the strand is passed and which, in use, is filled with molten metal, a container located at each end of the tube for holding a reserve of molten metal for supply to the tube, each container being capable of holding a reserve of molten metal at a level above the level of the tube and means for heating the external wall of the tube.

4,890,821

METALLURGICAL PROCESSES

Ivor G. Nixon, ler Stock Ost, "Matterhorngruss", Steinmattstrasse, 3920 Zermatt, Valais, Switzerland

Continuation of Ser. No. 809,290, Dec. 16, 1985, abandoned, which is a division of Ser. No. 705,204, Feb. 25, 1985, Pat. No. 4,575,394, which is a continuation of Ser. No. 510,926, Jul. 5, 1983, Pat. No. 4,531,973, which is a continuation of Ser. No. 249,495, Mar. 31, 1981, abandoned. This application May 20, 1988, Ser. No. 196,732

Claims priority, application United Kingdom, Aug. 4, 1980, 8011546

Int. Cl.⁴ C21B *3/00*

U.S. Cl. 266—267 **5 Claims**



1. A burner for use in metallurgical processes, said burner being selected from the class consisting of oxy-fuel and air-fuel burners, comprising means to permit the fuel used in the burner to act as coolant for the burner walls and the burner tip before said fuel reaches said burner tip, wherein the wall of said burner is surrounded by insulation sufficient to prevent coking and blockage of the burner in use.

4,890,822

CAR SUSPENSION SYSTEM

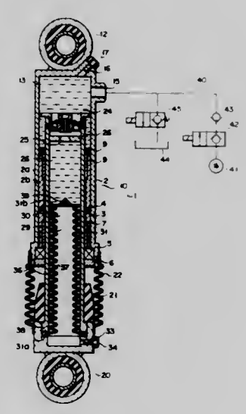
Nobuya Ezare, Zama; Ichiro Takaders, Tokyo, and Kohei Taguchi, Yokahama, all of Japan, assignors to NHK Spring Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 010,336, Feb. 3, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 253,887

Claims priority, application Japan, Feb. 13, 1986, 61-18184[U]; Sep. 19, 1986, 61-221348

Int. Cl.⁴ F16F *9/04, 9/43, 5/00*; F01B *19/00*

U.S. Cl. 267—64.24 **14 Claims**



1. A suspension system comprising:

a cylinder assembly including at least one cylinder housing and a rod, said rod being fitted in said at least one cylinder housing and being movable in the axial direction of said at least one cylinder housing, said cylinder assembly further including an oil chamber for containing oil and a gas chamber for containing gas;

damping-force generating means arranged inside said cylinder assembly, and adapted to damp reciprocation of said rod by utilizing viscous resistance, produced when the oil in said oil chamber is circulated; and

a multi-layered bellows located between said oil chamber and said gas chamber, and being capable of extending and contracting in the axial direction of said cylinder housing, said bellows including a first layer comprising an oil-resistant body made of a soft, flexible elastomer, and a second layer comprising a gas-barrier film made of a synthetic resin impermeable to said gas in said gas chamber, said elastomer body being located on that side of said bellows which is in contact with the oil in said oil chamber, and said gas-barrier film being harder and thinner than said elastomer body and being coated on the opposite side of said elastomer body so as to be out of contact with said oil and in contact with said gas in said gas chamber, said elastomer body and said gas-barrier film separating the oil of said oil chamber from said gas of said gas chamber.

4,890,823

PLUNGER PISTON SYSTEM WITH SEPARATE PLASTIC PLUNGER PISTON AND SUPPORTING MEMBER

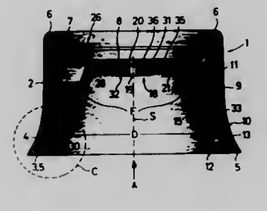
B. Hubert Koschinat, Hösbach-Winzenhohl, and Manfred Fröhlke, Ottweiler, both of Fed. Rep. of Germany, assignors to Otto Sauer Achsenfabrik Keilberg, Besenbach-Keilberg, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,412

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824542

Int. Cl.⁴ F16F *9/04*; B25G *3/00*

U.S. Cl. 267—64.27 **21 Claims**



1. A plunger piston system for supporting and guiding a pneumatic spring bellows, said plunger piston system comprising:

a plastic plunger piston, said plunger piston having a downwardly opening pot-like shape with a substantially cylindrical skirt at a central portion thereof, a lower foot region at the bottom portion thereof, and an upper edge adjoining the skirt at an upper portion thereof;

means on said lower foot region for attaching said plunger piston system;

a trough base being located at an upper central portion of said plunger piston, an upwardly radially outwardly extending trough section integrally connecting said trough base to said upper edge to said skirt, and said trough base and said upwardly radially outwardly extending trough section jointly defining a trough for receiving a lower portion of the pneumatic spring bellows;

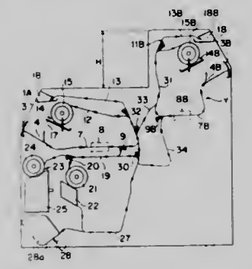
a plastic supporting member, said plastic supporting member having a downwardly substantially truncated cone-like shape and being a separate part of said plunger piston system from said plunger piston, a central portion thereof being downwardly and outwardly sloping, a lower supporting foot region at the bottom portion thereof, and an upper base plate adjoining said central portion at the top thereof, said plastic supporting member being received within a cavity defined by said cylindrical skirt of said plunger piston, said upper base plate of said supporting member contacting and supporting the underside of the trough base of said plunger piston, and said supporting foot region of said supporting member contacting and supporting said foot region of said plunger piston; and

means on said trough base of said plunger piston and on said upper base plate of said supporting member for attaching said trough base and said upper base plate to the pneumatic spring bellows when the pneumatic spring bellows is received in said trough.

4,890,824
RECIRCULATION-TYPE BILL RECEIVING AND DISPENSING MACHINE

Shinya Uchida, Chigasaki; Akira Hirata, Kawagoe, and Eiichi Yoshikawa, Hanuta, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,379
Claims priority, application Japan, Dec. 24, 1986, 61-313634
Int. Cl.[4] B07C *5/34*; B65H *29/12*
U.S. Cl. 271—3.1 **1 Claim**



1. A circulation-type bill receiving and dispensing machine that reuses received bills as dispensation bills, said circulation-type bill receiving and dispensing machine comprising:

a single machine body;

a bill receiving and bill dispensing port and an operating section at each of two sides of said single machine body, one bill receiving and bill dispensing port and operating section at one side of said single machine body being for use by customers and the other bill receiving and bill dispensing port and operating section at the other side of said single machine body being for use by tellers,

a received-bill transfer route communicating with each said bill receiving and dispensing port and having a separate bill discriminating section for the exclusive use of a respective bill receiving and dispensing port for simultaneously carrying out bill receiving or dispensing operations by both the customer and the teller through their respective bill receiving and dispensing port and operating section, and

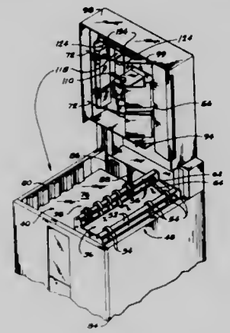
a single pooling section in direct communication with both of said bill receiving and bill dispensing ports for transferring bills to and for receiving bills from either of said bill receiving and bill dispensing ports.

4,890,825
PAPER SHEET STACKING AND JOGGING APPARATUS

Walter A. (Sunny) McCormick, Bellevue; Douglas W. Langton, Seattle; Wilbur J. Kelham, III, Redmond; Thomas C. Saunders, Snohomish, and Gregory Phillips, Seattle, all of Wash., assignors to EMF Corporation, Redmond, Wash.

Filed Jan. 15, 1988, Ser. No. 144,539
Int. Cl.[4] B65H *29/70, 31/10, 31/36*
U.S. Cl. 271—188 **24 Claims**

16. A jogging apparatus for jogging individually fed sheets into distinct job stacks comprising the combination of: a powered, elongated, flexible primary jogging finger and a powered, elongated, flexible auxiliary jogging finger, each rotatably secured to a support frame having a receiving surface, said primary and said auxiliary jogging fingers being rotated into alternating contact with the upper surface of each of said sheets as said sheets are deposited upon said receiving surface, said primary and said auxiliary jogging fingers rotating to contact said sheets in a wiping movement and jog said sheets against either a first set of orthogonally oriented stopping means or a second set of orthogonally oriented stopping means such that the jogging fingers do not continually rotate, said

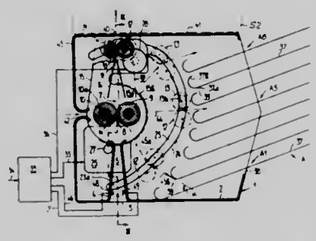


first and said second set of stopping means being non-coincidental.

4,890,826
SORTING APPARATUS FOR SHEETS

Thomas Rutishauser, Uerikon, Switzerland, assignor to Rutishauser Data AG, Stäfa, Switzerland

Filed Aug. 3, 1988, Ser. No. 227,827
Claims priority, application Switzerland, Aug. 7, 1987, 03045/87
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—296 **7 Claims**



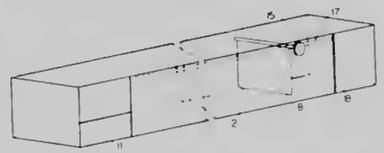
1. An apparatus for sorting sheets, in particular sheets delivered from an office machine, comprising a support mounted for rotation about a swiveling axis, a pair of driven circulating members mounted to said support and defining a straight, elongated feed channel therebetween for receiving and feeding sheets to be sorted, said feed channel having an inlet and for receiving sheets and an outlet end for discharging sheets, said swiveling axis lying in the plane of said straight feed channel, drive means connected to said support for rotating said support about said swiveling axis, a take-up site positioned adjacent said support for receiving sheets to be sorted, a plurality of output sites spaced at least partly around said support for receiving sheets to be sorted, control means connected to said drive means for rotating said support on said swiveling axis between a position with said inlet end aligned with said take-up site for receiving sheets from said take-up site into said feed channel, to a position aligning said outlet end with one of said output sites for discharging a sheet from said feed channel into said one output site, said pair of circulating members comprising a first pair of rollers having a nip on said feed channel adjacent said inlet end, a second pair of rollers having a nip on said feed channel adjacent said outlet end, said swiveling axis lying near said first pair of rollers, and roller drive means

operatively connected to said first and second pairs of rollers for jointly rotating said first and second pairs of rollers, and steering means operatively connected to said support for steering a sheet into a selected one of said output sites with said support rotated to align said outlet end of said feed channel with said selected output site, said steering means being connected to one of said second pair of rollers for changing the position of the nip of said second pair of rollers depending on the selected one of said output sites which is aligned with said outlet end of said feed channel, said support comprising a pair of spaced-apart shield plates to which said first and second pairs of rollers are rotatably mounted, said shield plates being rigidly connected to each other for rotation about said swiveling axis, said drive means for said support including a stepping motor engaged with at least one of said shield plates and connected to said control means for pivoting of said shield plates, said one of said second pair of rollers which is connected to said steering means having a pair of axle ends, said steering means including a curved slot in each of said shield plates for receiving each axle end so as to allow translation between each axle end and said shield plates.

4,890,827
RODENT RACEWAY

Robert L. Tottey, P.O. Box 4843, Ithaca, N.Y. 14852

Filed Jan. 29, 1988, Ser. No. 149,708
Int. Cl.[4] A63L *1/00*
U.S. Cl. 272—4 **4 Claims**



1. Escape-free apparatus for racing rodents or other small creatures, comprising:

(a) a track board containing more than one enclosed racing lanes positioned in a substantially vertically stacked relationship and each having a see through front for viewing said racing rodents or other small creatures;

(b) each of said racing lanes having a starting end and a finish line end with no access ports therein except through a drawer port located immediately at the starting end such that access to the drawer port is through the said see through front;

(c) a removable completely enclosed starting box adopted to contain one of the aforesaid small creatures for each of said racing lanes having a sliding gate for positioning within the drawer port for the assigned enclosed lane with said sliding gate being movable sideways away from the see through front so as to open the previously completely enclosed stating box giving the small creature access to the assigned lane so as to start the race for that creature;

(d) means for simultaneously opening all of each of said sliding gates in all of said racing lanes;

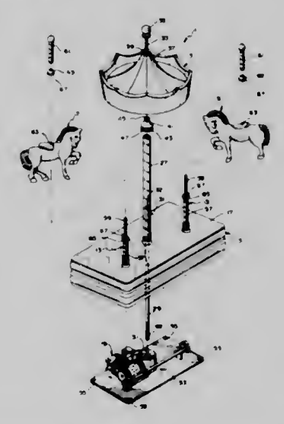
(e) means in each of said lanes for returning said racing creatures to said starting boxes.

(f) said apparatus cooperating so that the said small creature in each lane never leave the enclosed space formed by either one of the said removable starting boxes of the said lane enclosure with which it is associated.

4,890,828
ORNAMENTAL DISPLAY ASSEMBLY

Jack Hou, P.O. Box 78-95, Taipei, Taiwan

Filed Mar. 27, 1989, Ser. No. 329,330
Int. Cl.[4] A63H *13/20*
U.S. Cl. 272—31 R **15 Claims**



1. An ornament display assembly of the type wherein movement is imparted to at least one ornament by a wind.up drive mechanism having a main spring, which assembly comprises:

(a) a base;

(b) a wind.up drive mechanism including a power output shaft and a wind-up shaft housed within the base;

(c) a first tappet rod assembly including a stationary sleeve extending upwardly from the base and a support rod rotatably housed within the sleeve, the support rod including upper and lower ends;

(d) a first attachment means for securing a first ornament on the upper end of the support rod and permitting the ornament and support rod to rotate together;

(e) the lower end of the support rod being secured to the wind-up shaft whereby rotation of the support rod in one direction causes the mechanism to be wound and unwinding of the mechanism causes the support rod to rotate in the opposite direction;

(f) a second tappet rod assembly slidably mounted on the base and including a second attachment means for securing a second ornament thereon; and

(g) a first eccentric cam member driven by the power output shaft of the mechanism for imparting a vertical reciprocating movement to the second tappet rod assembly.

4,890,829
JUMP ROPE

Priscilla Barton, 12 University Ave., Providence, R.I. 02906

Filed Sep. 19, 1988, Ser. No. 246,331
Int. Cl.[4] A63B *5/20*
U.S. Cl. 272—75 **5 Claims**

1. A jump rope convertible to a closed ring for use as a game comprising a single length of a core material,

a. said core material covered with a first jacket of helically wound tape so as to completely cover the core,

b. said first jacket covered with a helically wound tape forming a second jacket wound about the first jacket in a direction opposite to the wind of the first jacket,

c. wherein said jump rope exhibits an elastic modulus of between 18,000 and 30,000 p.s.i. (ASTM D790),

d. wherein said jump rope exhibits a Shore hardness of between 50 and 90 on the A scale,

e. and wherein said jump rope has handles at each end

thereof, said handles having male and female terminal portions to permit the rope to be converted into a closed ring,



whereby the rope may be used as a jump rope or as a hoop and the rope exhibits stiffness to maintain hoop shape and elastically to be used as a jump rope.

4,890,830

BODY FITNESS TRAINING APPARATUS TO EXERCISE MUSCLES

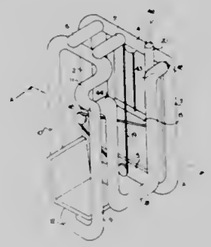
Berahard Kera, Kropsburgstrasse 10, 6800 Mannheim 81, Fed. Rep. of Germany

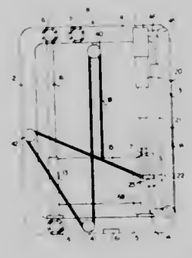
Filed Aug. 12, 1988, Ser. No. 231,476

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1988, 3819276

Int. Cl.[4] A63B *21/06*

U.S. Cl. 272—117 **8 Claims**





1. An exercising apparatus, comprising:
(a) a frame including a plurality of cable guide rolls;
(b) a single weight plate movably attached to the frame;
(c) a lever movably mounted to the frame to be moved by the user of the apparatus during exercising;
(d) a telescope movably connected relative to the frame and operatively connected to the lever, said telescope being remotely controllable by the user to create variable weight power for the apparatus;
(e) a seat adjustably mounted to the frame, upon which the user sits;
(f) a cable connected between the weight, the telescope and the frame via the plurality of cable guide rolls; and
(g) a power transmission element connected to the lever via a turnable roll,
wherein the power transmission element is a sleeve which surrounds the telescope and is connected with the cable.

4,890,831

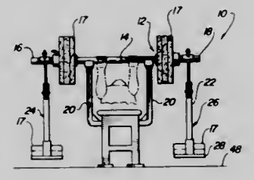
BARBELL EXERCISING DEVICE

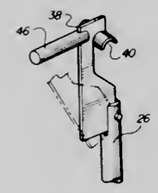
Richard D. Craig, 56 64½ S. Ninth, Kalamazoo, Mich. 49009

Filed Jul. 5, 1988, Ser. No. 215,376

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 **5 Claims**





1. A device for use with a barbell comprising:
an elongated stand having an upper end and a lower end,
means at the upper end of the stand for attaching said stand to the barbell,
means for disengaging said attaching means from said barbell as said lower end of the stand engages and is supported by a ground support surface,
said attaching means comprising a book, means for pivotally securing said hook to said upper end of said stand so that said hook is pivotal between a first position in which said hook extends around said barbell and a second position in which said hook pivots away and disengages from said barbell, and means for urging said hook towards said second position,
wherein said urging means comprises a weighted handle secured to and extending outwardly from said hook.

4,890,832

COMPACT ELECTRONIC APPARATUS WITH REMOVABLE PROCESSING UNITS

Shigeki Komaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 898,819, Aug. 18, 1986, abandoned, which is a continuation of Ser. No. 539,190, Oct. 5, 1983, abandoned. This application Apr. 22, 1988, Ser. No. 186,718

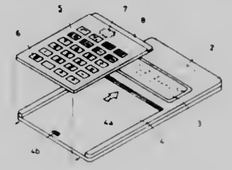
Claims priority, application Japan, Oct. 13, 1982, 57-179452

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—1 E **18 Claims**

1. A compact electronic apparatus comprising:
a main unit;
a removably, detachable processing unit; and
connecting means for connecting said processing unit to said main unit to render said main unit and said processing unit operable;

said main unit and said processing unit being inoperable as separate units;
said main unit including,
power supply means for supplying power to said main unit and for supplying power to said processing unit when said processing unit is connected to said main unit, and
display means for displaying information on said main unit;
said processing unit including,



key input means for inputting information into said processing unit, and
memory means for storing data to be used by said processing unit;
said connecting means including a recessed portion:
said processing unit forming a coplanar surface with said main unit when said recessed portion has received said processing unit.

4,890,833

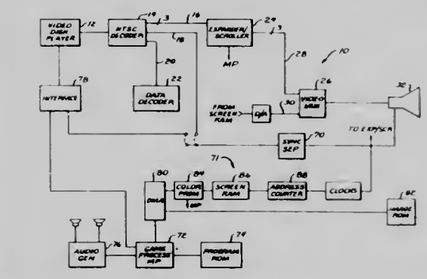
APPARATUS FOR GENERATING ENHANCED INTERACTIVE VIDEO GAME PLAYFIELD ENVIRONMENTS

Kenneth F. Lantz; Scott C. Hershbler, both of Chicago; Charles R. Bleich, Palatine; Walter E. Smolucha, Melrose Park, and Gregory W. Wegner, Clarendon Hills, all of Ill., assignors to Williams Electronics, Inc., Chicago, Ill.

Division of Ser. No. 54,094, May 22, 1987, Pat. No. 4,766,541. This application Apr. 18, 1988, Ser. No. 182,387

Int. Cl.[4] A63F *9/22*

U.S. Cl. 273—1 E **9 Claims**



1. In a video display system having a raster scan display monitor, a processor, means for generating a raster scan video signal for display on the monitor, the raster scan video signal comprised of a plurality of video scan lines, means for expanding each scan line and for transmitting only a portion of such expanded scan line to the display monitor.

4,890,834

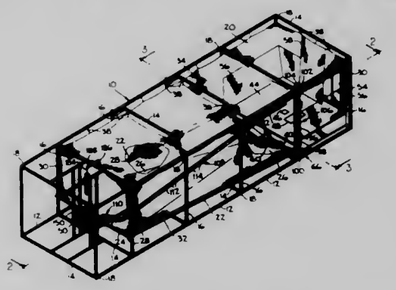
BATTING PRACTICE APPARATUS

Lorenzo J. Pozza, Santa Cruz, Calif., assignor to Athletic Training Equipment Company, Clackamas, Oreg.

Continuation of Ser. No. 727,610, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 363,031, Mar. 29, 1982, abandoned. This application Apr. 30, 1987, Ser. No. 44,344

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—26 R **19 Claims**



1. Batting practice apparatus which comprises
a movable open framework including an assembly of longitudinal, transverse, and upright frame members adapted to be placed and supported on a supporting surface,
a batting cage supported interiorly of and spaced from said framework an amount sufficient to preclude any batted ball from contacting any of said frame members and including a top, bottom, side walls and end walls composed substantially entirely of a flexible material connected at all their edges to said frame members to exert an inward pull on said frame members, said bottom being of resilient material and supported above the supporting surface to slope toward a lowest point only sufficiently so that batted balls will move by gravity and cause flexing of said material toward said lowest point, the support of said bottom from said framework being arranged around the perimeter to create a taut support of said resilient flexible material,
means defining a batter's position adjacent one end of said batting batting cage, and
means adjacent the opposite end of said batting cage for throwing a ball to the batter's position.

4,890,835

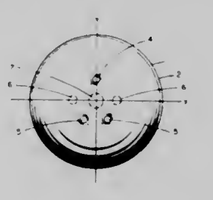
BOWLING BALL

William R. Calhoon, 219 Sandy Clr., South Daytona, Fla. 32019

Filed Aug. 29, 1988, Ser. No. 237,882

Int. Cl.[4] A63B *37/10*

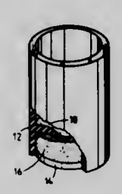
U.S. Cl. 273—63 E **5 Claims**



1. An improved bowling ball with a thumb hole and two finger holes comprising:
a core;
a cover surrounding and enclosing said core;
three weights spaced apart from each other within the core

of the ball and disposed adjacent, between and spaced from said thumb hole and said two finger holes and having upper end surfaces terminating below said cover.

4,890,836
BOWLING BALL INSERT
Steve D. Goldie, 278 Camino Lobo, Paso Robles, Calif. 93446
Filed Dec. 5, 1988, Ser. No. 280,234
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—63 A 4 Claims



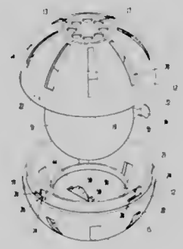
1. An insert for a finger hole or thumb hole in a bowling ball comprising:
a tube of cylindrical form composed of a resilient material, having a first end and a second end, and a bore and a central axis;
a plenum located within said tube, extending in a plane perpendicular to the central axis of said tube and spanning the bore of said tube;
an end plug located at the first end of said tube and spanning the bore of said tube, whereby a closed chamber is defined within said tube between said plenum and said end plug.

4,890,837
GOLF PUTTER
Harry A. Keeler, 385 High Crest Dr., West Milford, N.J. 07480
Filed Jan. 15, 1988, Ser. No. 144,566
Int. Cl.[4] A63B *53/14*
U.S. Cl. 273—81.4 3 Claims



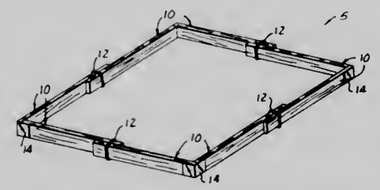
1. A golf putter comprising
a club head having a flattened surface for striking a golf ball; and
attached to said head a shaft devoid of substantial material performations and extending from a point where the shaft attaches to the head to an upper integral handle end and designed for a two handed grip which has over the majority of the shaft length, including said handle end, a plurality of discrete deformations which improve the feel and comfort of the putter whereby a golfer using said putter any grip the shaft at any place along the length of the shaft, including said deformations, where feel and comfort dictate.

4,890,838
TIMED WATER RELEASE TOY
Elliot Rudell, 6556 Sattes Dr., Rancho Palos Verdes, Calif. 90274; George Foster, Signal Hill, and Joseph Cernansky, Lomita, both of Calif., assignors to Elliot Rudell, Rancho Palos Verdes, Calif.
Filed Jan. 23, 1989, Ser. No. 299,225
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—138 R 30 Claims



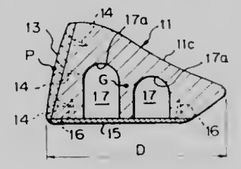
1. A ball comprising:
a. an outer foraminous shell;
b. an inner membrane member supported by said outer shell and forming a sealed enclosure therein;
c. sealable port means in said inner membrane to permit filling of said sealed enclosure with an aqueous medium;
d. timer means fixedly received within said outer foraminous shell; and
e. aqueous medium release means also received within said outer foraminous shell and responsive to said timer to open said sealed enclosure and permit discharge of its contents through said foraminous shell.

4,890,839
ADJUSTABLE FRAME FOR PUZZLES
Erik Ayotte, 600 E. Lincoln, Madison Heights, Mich. 48071
Filed Oct. 3, 1988, Ser. No. 251,732
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—157 R 8 Claims



1. An adjustable frame for protecting and enclosing a puzzle of irregular interlocking pieces which when properly fitted together form a picture or the like, said adjustable frame defining the exterior parameters of the properly completed puzzle, said adjustable frame comprising:
a plurality of side members interconnected to define a geometric configuration, said geometric configuration having three or more interior acute angles, each of said angles being formed by two rigidly fixed, adjacent non-parallel side members; and
means for adjustable interconnecting at least three of said side members to at least three adjacent parallel said side members such that said interconnected members may be moved with respect to one another at points other than at said acute interior angles;
whereby said frame may be adjusted to define variously sized geometric configurations and accommodate various sizes of puzzles by moving said adjustably connected side members with respect to one another, said side members being received entirely within, and not extending outwardly beyond, said geometric configuration.

4,890,840
WOOD-TYPE GOLF CLUB HEAD FOR NUMBER ONE GOLF CLUB
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Feb. 23, 1988, Ser. No. 159,095
Claims priority, application Japan, Feb. 25, 1987, 62-40436
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 H 3 Claims



1. A number one wood-type golf club i.e., a driver, which comprises:
a club head made of persimmon and having a bottom surface and a sole plate secured to said bottom surface;
said club head having a front surface to which a front plate is secured to constitute a face for hitting a golf ball and a length between said front plate and a rear end thereof, from the viewpoint of the swing of the golf club, of more than 83 millimeters;
said club head having at least one cavity therein opening at the bottom surface thereof to be covered by said sole plate, said at least one cavity having a blind end with a semispherical shape; and
whereby said golf club has an increased moment of inertia and an increase in the possibility of obtaining a square hit with said golf club.

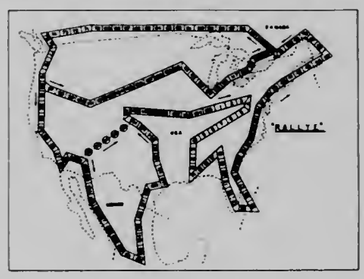
4,890,841
GOLF SWING AID
Mark Brooks, 1320 Virginia Pl., Fort Worth, Tex. 76107
Filed Feb. 10, 1989, Ser. No. 308,535
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—188 R 10 Claims

1. A golf swing aid for improving the swing of a golfer, comprising:
an elongated, shoulder encircling elastic band for encircli.. , both shoulders of a golfer and for providing the primary directive force for the swing, said shoulder encircling band including an inner surface which engages said shoulders, an outer surface and upper and lower edges;
fastening means for securing said shoulder encircling band about said shoulders to thereby define a closed loop;
positioning means located on said shoulder encircling band for maintaining the position of said shoulder encircling band about the shoulders during use, whereby the swing



of a golfer is controlled and coordinated with the body and not by the arms.

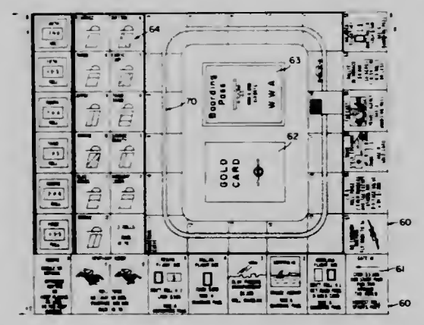
4,890,842
BOARD GAME APPARATUS
Wim C. Plange, 2225 NE. 16th Ave., Wilton Manors, Fla. 33305
Filed Nov. 8, 1988, Ser. No. 268,875
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—246 17 Claims



1. In combination, a board game apparatus comprising: a gameboard, pawns for two to six players with each player having a separate and distinct pawn, each of said pawns being the means by which a player contemporaneously races and moves the cars he owns on said gameboard, rallye cards, scrip money, number cards bearing discrete numbers thereon, a scoreboard, pegs for two to six players with each player having separate and distinct pegs, and title cards; said gameboard being provided with a playing area having interconnected routes throughout the United States, through Canada and through Mexico, said interconnected routes having separate and distinct enumerated spaces by means of which a player moves his pawn on said gameboard, said pawns being the means by which all the players race all their cars contemporaneously and indicate their respective moves on said gameboard, said enumerated spaces defining a start space upon which the players place their respective pawns to start the game, spaces where a car of a specific group, if available, can be purchased upon a player's pawn landing thereon, spaces where, upon a player's pawn landing thereon, one of the players with the highest bid has the opportunity to acquire a car by auction, spaces where a player loses a car of his choice upon his pawn landing thereon, spaces where a player, upon his

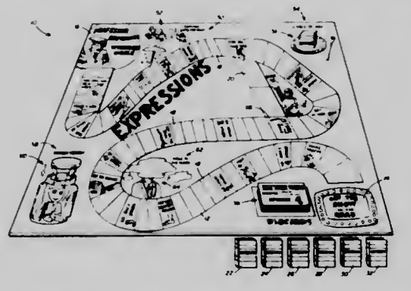
pawn landing thereon, must pick one of said rallye cards imposing duties or penalties, providing rewards or bonuses, or providing exercisable options, spaces where a player, upon his pawn landing thereon, advances his pawn on said gameboard as directed by such space, spaces where a player, upon his pawn landing thereon, merely rest his pawn, spaces where a player, upon his pawn landing thereon, collects money, spaces where a player, upon his pawn landing thereon, has the option of continuing on his course or taking a different route, a space where a player, upon his pawn landing thereon, has the option of gambling for points, a space where a player, upon his pawn landing thereon, races only to collect bonus points, a score-line space where a player, upon his pawn landing thereon or passing same, collects points, a player, at his turn in the order of play, picking one of said number cards and advancing his pawn the number of spaces on said gameboard corresponding to the discrete number on said number card, said scoreboard having indicia thereon by which each of the players records his accumulated point score, said pegs being utilized by the players to record their respective accumulated point scores on said scoreboard, said scoreboard having further indicia thereon by which ownership of the cars is indicated, the value of each car is indicated and the credit limit for financing or charging debt to each of said owned cars is indicated, said pegs further being utilized by the players to indicate on said scoreboard their respective ownership of said cars and the extent to which the players financed or charged debt to their respectively owned cars, said scrip money being the means by which the players purchase cars outright or by part payment, pay penalties, exercise options, pay expenses or mandatory obligations, each of said title cards possessed by a player representing said player's ownership of one of said cars and indicating the group number of each car, team number of each car in said group, the car's country of origin, the city where each said car is manufactured or can be acquired, the name/model of said car, the value of said car, and the credit limit for financing or charging debt to said car, and the game being won by the first player to collect and accumulate a certain number of points on said scoreboard.

4,890,843
BOARD GAME HAVING MASTER COURSE AND REGIONAL GAMES
Lionel Chauve, 75 Highland Ave., Glen Cove, N.Y. 11542
Continuation of Ser. No. 878,192, Jun. 25, 1986, abandoned. This application Nov. 24, 1987, Ser. No. 129,378
Int. Cl.[4] A63F *3/00, 3/08*
U.S. Cl. 273—246 **9 Claims**



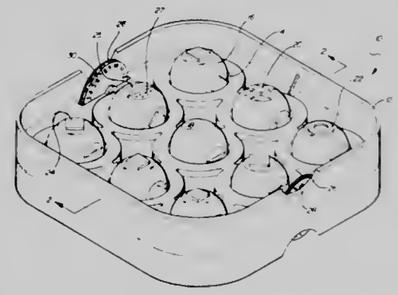
1. A game in which the players seek to accumulate money comprising:
a game board having a master course and having a plurality of regional game courses, said master course subdivided into a first sequence of spaces and forming a path of progression about said game board, at least some of the spaces of the master course designating the site of a regional game course to be played when a player lands on that space;
said plurality of regional game courses for games of chance along the master course provide that a player can win sums of money, each regional game course including one of a plurality of second sequences of spaces, each of the plurality of second sequence of spaces being different than the first sequence of spaces of said master course, each regional game course defining a betting board or a regional game and having the first space of the sequence located adjacent the space of the master course designating the site of that regional game course, each regional game providing a complete discrete game separate from the game of the master course,
means operated by a player to generate a number which directs the player to advance a specified number of spaces along the master course and, when on a space of the master course designating the site of the regional game course, to further generate at least one additional number which directs the player along the regional course or determines the player's success or failure at a regional betting board; and
means to identify movement of the player along the master course and the regional game course.
wherein each regional game course is independent of the master course so that the player cannot progress in the master course until completion of the regional game course.

4,890,844
EDUCATIONAL BOARD GAME
Adrienne J. Weiss, 707 Pine Valley Dr., Pittsburgh, Pa. 15239
Filed Apr. 14, 1988, Ser. No. 181,501
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 **13 Claims**



1. A method for playing a game comprising the steps of,
distributing to each participant a game piece for progressive incremental advancement along a course from a start point to a finish point on a game board,
arranging a plurality of cards in a deck with each card having written on one face an idiomatic expression, a definition of the idiomatic expression as understood in the language of the expression and a number for determining incremental advancement along the course and on the opposite card face an illustration symbolic of the idiomatic expression,
allowing each participant in turn to draw an individual card from the deck for providing an answer,
concealing from the answering participant the face of the card bearing the idiomatic expression and exposing to the answering participant the opposite face of the card bearing the illustration symbolic of the idiomatic expression,
requiring the answering participant to abstractly interpret the illustration on the opposite face of the card and translate the illustration into a known idiomatic expression,
announcing aloud as the answer the idiomatic expression represented by the illustration,
comparing the answer given by the answering participant with the idiomatic expression written on the one face of the card,
rewarding the answering participant upon giving a correct answer by movement of the game piece of the answering participant a selected incremental advancement along the course, and
designating as the winner of the game as the result of giving correct answers the first participant to incrementally advance along the course from the start point to the finish point.

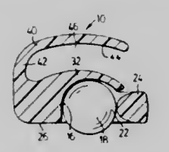
4,890,845
GAME APPARATUS WITH ROTATING ELEMENTS
Sidney Gatewood, 25170 Waldorf, Roseville, Mich. 48066
Filed Dec. 15, 1988, Ser. No. 284,598
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—271 **18 Claims**



18. A game apparatus comprising:
(a) a plurality of spherical members, each having a pair of diametrically opposed axles projecting therefrom and a plurality of indicia disposed about the equatorial periphery thereof, said spherical members freely rotatable about an axis of rotation parallel to said pair of axles;
(b) a frame member including a plurality of stations, each station configured to receive one of said spherical members therein, said frame member including counter means operative to indicate a player's score comprising a disk-shaped member having reversibly opposed, embossed characters so that a player can determine an opponent's score by reading the embossed characters on said disk, said frame member further including bearing means for supporting each of said axles so that the spherical member is freely rotatable in its corresponding station, whereby rotation of said spherical member allows for selectable display of a particular indicium; and
(c) detent means for biasing the rotation of said spherical member to a preselective position, said position corresponding to a display of indicium.

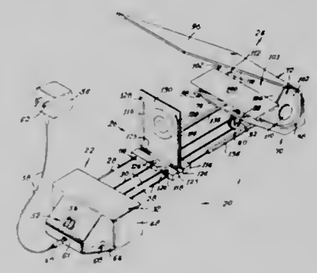
4,890,846
TOY FOR BALL GAME
Boguslaw M. Spanski, 2565 Robinson St., Mississauga, Ontario, Canada L5C 2P5
Filed Jun. 12, 1989, Ser. No. 364,852
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—324 **10 Claims**

1. Ball game apparatus comprising a ball-holding device having a ball-receiving cavity, said cavity being open at the bottom and having a sidewall for engaging said ball on one or more sides; and a flexible, resilient arm connected to said device and located on one side of said cavity opposite at least a



portion of said sidewall, said arm being engagable with a side of said ball when the latter is in said cavity in order to hold the ball therein.

4,890,847
TARGET RETRIEVAL SYSTEM
Larry A. Cartee, and Harry A. Barot, both of Schaumburg, Ill., assignors to Detroit Armor Corporation, Schaumburg, Ill.
Filed Jan. 14, 1988, Ser. No. 144,417
Int. Cl.[4] F41J *7/02*
U.S. Cl. 273—406 **15 Claims**

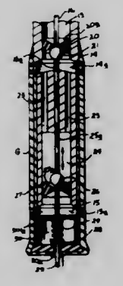


6. In a system for placement and retrieval of gun targets and including a power drive unit for location at a firing line, a bullet trap assembly for location at a remote target position, and a target carriage shiftably disposed on trolley cables between the power drive unit and the bullet trap assembly and arranged for being driven by the power drive unit between the firing line and the target position, the improvement comprising:
(a) a drive pulley operatively mounted in said power drive unit and substantially centered with respect to the sides of said unit,
(b) an idler pulley secured to said bullet trap assembly, and
(c) a drive cable drivingly looped between said drive pulley and said idler pulley and secured to said target carriage, whereby rotation of said drive pulley exerts a force on said drive cable to shift said target carriage and whereby the load on said power drive unit is centered as the result of the centered mounting of said drive pulley.

4,890,848
RACKET HANDLE AND DESICCANT DISPENSER
Wilmer G. Hayes, 3500 Burlingame Dr., and Gina K. Hayes, 3500 Burlingame Rd., both of Topeka, Kans. 66611
Filed Nov. 14, 1988, Ser. No. 270,617
Int. Cl.[4] A63B *49/00*
U.S. Cl. 273—73 J **10 Claims**

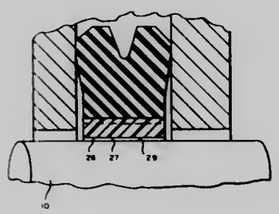
1. A racket handle and desiccant dispenser apparatus for use in combination with a handle and an elongate downwardly extending handle, said apparatus comprising,

an elongate magazine cavity formed in said handle for containment of desiccant powder;
said magazine cavity including a removable filling means allowing filling of said magazine cavity, and a first chamber underlying the magazine cavity,
a first resiliently biased plunger axially aligned with said magazine cavity with a first valve plug displaceable upon displacement of said first plunger to allow desiccant powder within said magazine cavity to flow through a first valve into an underlying first chamber,
said first chamber includes a plurality of first chamber passageways enabling flow of that same powder from interiorly of said chamber to an upper exterior portion of said handle, and



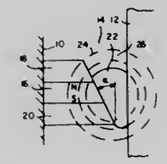
a central cavity in said handle underlying said first chamber, a second chamber underlying said central cavity, and a second valve defining a lowermost wall of said central cavity including a second valve plug displaceable from said valve by a second biased plunger axially aligned with said first plunger to enable flow of desiccant powder from said central cavity to said second chamber, and
means between said first chamber and said central cavity to enable flow of desiccant powder from said first chamber to said central cavity, and
said second chamber including a plurality of second chamber passageways to allow flow from said second chamber to a lower exterior portion of said handle displaced from said upper exterior portion of said handle.

4,890,849
SHAFT SEALS
Raymond J. H. Eason, Farnborough, England, assignor to James Walker & Company Limited, Woking, England
Filed May 9, 1984, Ser. No. 608,190
Claims priority, application United Kingdom, May 17, 1983, 8313606; Sep. 20, 1983, 8325070
Int. Cl.[4] F16J *15/32, 15/44, 15/46, 15/54*
U.S. Cl. 277—27 **14 Claims**



1. Apparatus for sealing the space between a rotating shaft and a stationary member surrounding the shaft, thereby to reduce leakage of fluid under pressure along the shaft, comprising a housing surrounding the shaft, having at least one axially-facing internal wall on the low pressure side of the housing and a generally cylindrical internal wall facing the shaft, a sealing ring contained in the housing and having an overall radial depth less than that of the housing so that the ring can float radially in the housing, the sealing ring comprising a flexible sleeve of plastic material and an elastomeric ring surrounding the sleeve, the sleeve having an inner surface which in the relaxed state of the sealing ring has a diameter greater than that of the shaft so that a positive clearance exists between the sleeve and the shaft, the elastomeric ring being in sealing engagement with said axially-facing internal wall and means being provided on the elastomeric ring to allow the fluid being sealed to flow from the high pressure side of the housing to the space between the elastomeric ring and the said cylindrical wall of the housing, so as to apply fluid pressure between the housing and the elastomeric ring thereby to apply radially inward pressure to the sleeve to reduce the clearance between the sleeve and the shaft while maintaining a positive clearance between the sleeve and the shaft so as to maintain a stable film of fluid between the sleeve and the shaft.

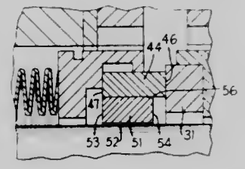
4,890,850
TAPERED FERROFLUID SEAL
Kuldip Raj, Merrimack; Ronald Moskowitz, Hollis, and Frank Bloom, Windham, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.
Filed Apr. 18, 1988, Ser. No. 182,510
Int. Cl.[4] F16J *15/40, 15/54*
U.S. Cl. 277—80 **20 Claims**



1. A ferrofluid seal between facing walls of a shaft and a shaft and a housing, the shaft and housing being rotated relative to each other, the seal comprising:
an annular magnet which is mounted to one of said walls;
means, including in part said magnet, for providing a complete magnetic flux path, at least part of said means including said magnet being spaced by a predetermined gap from the other wall to which the magnet is not mounted, the flux path passing through said gap; and
ferrofluid retained in and substantially filling said gap;
the width of said gap tapering in the same direction from one end of the gap to the other.

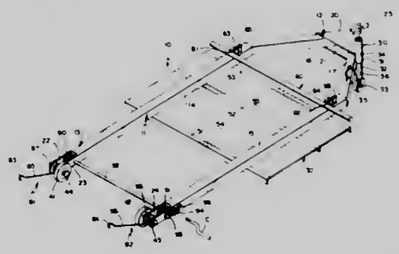
4,890,851
BELLOWS SEAL WITH VIBRATION DAMPER
Louis H. Avard, Lawton, and Harry L. Mason, Kalamazoo, both of Mich., assignors to Durametallic Corporation, Kalamazoo, Mich.
Filed Jan. 19, 1989, Ser. No. 300,475
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—89 **5 Claims**

1. A mechanical seal construction for sealing a shaft which is relatively rotatable with respect to a houring, said seal construction having collar means surrounding and nonrotatably fixed to said shaft, a rotary seal portion disposed in surrounding relationship to the shaft and including a rotary support ring and a rotary carbide face ring fixed to said support ring, said rotary support and face rings being radially spaced from said shaft to define a substantial annular clearance therebetween, an axially elongate metal bellows disposed in surrounding relationship to said shaft and extending axially between said collar means and said rotary support ring, said bellows means having one end thereof fixedly anchored to said collar means and the other end thereof fixedly anchored to said rotary support ring, and a stationary seal portion including a gland ring fixed relative to said housing and a stationary carbide face ring fixed to said gland ring, said gland and stationary face rings being disposed in surrounding relationship to said shaft and spaced radially therefrom by substantial annular clearance spaces therebetween, said rotary and stationary face rings defining thereon axially opposed and generally planar seal faces which



are maintained in relatively rotatable sliding engagement with one another to create a seal radially thereacross, comprising the improvement wherein a vibration dampening ring is concentrically disposed within said rotary face ring in surrounding relationship to said shaft, said vibration dampening ring being constructed of carbon and fixedly secured within said rotary face ring by means of an interference or press fit therebetween, said vibration dampening ring having an inner diameter which is only slightly larger than the outer diameter of said shaft to define a small radial clearance therebetween, said vibration dampening ring being of substantial axial extent to function as a vibration damper.

4,890,852
TOW MECHANISM FOR VEHICLES
Gerald C. Chapman, Rte. 2, Box 153, Somerville, Ala. 35670
Filed Feb. 22, 1989, Ser. No. 313,415
Int. Cl.[4] B60P *3/06*
U.S. Cl. 280—402 **19 Claims**



1. A tow mechanism for vehicles comprising a frame having forward and rearward opposite frame portions, means at said forward frame portion for securing said frame to a towing vehicle, means at said forward frame portion for underlyingly supporting the front end of a towed vehicle through the front wheels thereof, means at said rearward frame portion for connecting said rearward frame portion to a rear end of a towed vehicle when the front wheels of the towed vehicle rest upon said supporting means and said rearward frame portion is spaced a predetermined distance from the towed vehicle rear end, and means for pulling said rearward frame portion toward the towed vehicle rear end thereby pivoting said frame about said securing means and lessening said predetermined distance whereby said rearward frame portion is elevated in spaced relationship to a supporting surface and said towed vehicle rear wheels establish rolling support for the frame during a towing operation.

4,890,853
WHEELCHAIR WALKER
Luanne Olson, 6005 W. Roscoe, Chicago, Ill. 60634
Filed Mar. 7, 1988, Ser. No. 165,177
Int. Cl.[4] A47C *7/50*
U.S. Cl. 280—87.021 **13 Claims**



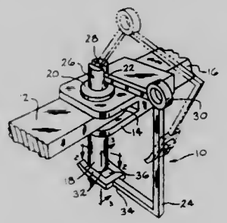
1. A wheelchair-walker device for use by a user requiring assistance in walking or moving about, said device being intended to receive and support the user alternatively in sitting and standing positions and facilitating movement by the user in desirable, erect anatomical positions, said device being adjustable for the proportions and desired position of the user, and device comprising:
a base having an opening adapted to facilitate the user's entry to and exit from the device and having wheels to provide for mobility of said device;
a standard connected to said base opposite said opening;
a seat frame having a U-shape, said frame being secured to said standard and having an opening facing away from said standard and aligned with said opening in said base;
a seat suspended from said seat frame and adapted to receive said user, said seat having a front seat edge opposite said standard;
arms projecting from said seat frame and each of said arms having a portion extending beyond said front seat edge defining a handle;
a retaining bar adapted to restrain the user in the device, said restraining bar being attachable to said handles to close said seat frame opening;
a strap extending between said front seat edge and said retaining bar, said strap adapted to extend between the legs of the user; and,
lift means for adjusting the height of the seat frame to accommodate the user in seated and standing positions.

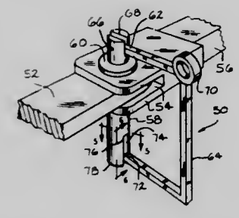
4,890,854
HITCH PIN
Steven J. Hoover, 7331 W. County Rd. 38, Fostoria, Ohio 44830
Filed Aug. 31, 1988, Ser. No. 238,593
Int. Cl.[4] B60D *1/02*
U.S. Cl. 280—504 **6 Claims**

1. A hitch pin for releasably connecting a towing vehicle to a towed vehicle, wherein the vehicles have members with apertures that can be aligned, said hitch pin comprising
a cylindrical shaft member having a first end and a second end, said shaft having means defining a slot adjacent to said second end thereof,
a C-shaped arm member having a first end and a second, distal end opposite said first end,
a foot portion connected to said second end of said arm member, said foot portion being received in said means defining a slot, when said arm member is in the first position, so that coaction between said foot portion and said

means defining a slot restricts lateral movement of said second end of said arm relative to said second end of said shaft,

pivot means connecting said first end of said shaft member and said first end of said arm member so that said arm member can be rotated, relative to said shaft member, between a first position in which said second end of said arm member engages said second end of said shaft member





to restrain removal of the hitch pin from the apertured vehicle members and a second position in which said second end of the arm member is remote from said second end of said shaft member and removal of the hitch pin from the apertured vehicle members is not restrained, and

magnet means for exerting an attractive force between said second end of said shaft and said foot portion of said arm member, when said arm member is in the first position.

4,890,855

RELEASABLE SKI STOP

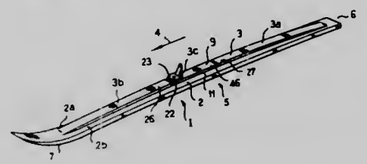
Gérard Graillat, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France

Filed Oct. 23, 1986, Ser. No. 922,418

Claims priority, application France, Oct. 30, 1985, 85 16153

Int. Cl.[4] A63C *9/086*

U.S. Cl. 280—615 **52 Claims**



1. An apparatus for retaining a boot on a ski comprising:

a first longitudinal element comprising means for engaging a groove in the sole of said boot; and

means for attaching said element to said ski and for permitting displacement of said element with respect to said ski in response to a force on said element which exceeds a predetermined threshold, wherein said attaching means comprises means for permitting lateral displacement of said element with respect to said ski in response to a lateral force on said element which exceeds a predetermined threshold, wherein said attaching means further comprises means for preventing substantial lateral displacement of said element with respect to said ski in response to a lateral force on said element which is below said predetermined threshold,

wherein said ski comprises first and second longitudinal surfaces which immediately laterally border said means for engaging said groove of said element when said element is attached to said ski, and wherein said element is not unitary with said first and second longitudinal surfaces and is displaceable at least laterally with respect to said first and second longitudinal surfaces.

4,890,856

GOLF CART

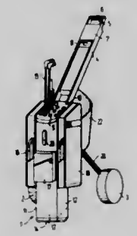
Michael Mursch, and Karl-Heinz Schwaiger, both of Munich, Fed. Rep. of Germany, assignors to SMM Sportive Management und Marketing GmbH, Martinsried, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 157,512

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705187

Int. Cl.[4] B62B *3/02*

U.S. Cl. 280—646 **9 Claims**



1. A golf cart, comprising:

an undercarriage for receiving a bag;

a center pole hinged to the undercarriage and adapted to fold down against the front of the bag into a stored position and capable of being swung forward and up into a working position;

two legs which are hinged to the undercarriage and can be swung in toward the undercarriage, said legs being movable laterally apart and downwardly from a swung-in storage position to a swung-out working position and carrying running wheels, the running wheels being parallel to each other in both the swung-out and swung-in positions, the wheels in the swung-in position closely laterally flanking the bag and having their bottoms flush with or above the base of the bag and projecting beyond the front side of the bag, the center pole in its folded down stored position extending down along the front side of the bag, each leg being constructed as a parallelogram linkage comprising two bars, the legs in their swung-in storage position lying along the center portion of the front side of the bag;

a generally L-shaped wheel carrier provided on the bottom of each leg, each said generally L-shaped wheel carrier having first and second arms joinedsubstantially at a right angle to each other, the first arm being pivotally supported on the lower ends of the two bars of the associated leg and extending laterally outward therefrom, said second arm being fixed to the laterally outboard end of said first arm and extending generally rearward therefrom to a free end on which is rotatably supported the associated wheel, the two generally L-shaped wheel carriers in their swung-in positions wrapping snugly around the front and sides of the bottom portion of the bag, the center pole being plate-shaped and sized to cover the legs when the legs are in their swung-in position against the center portion of the front side of the bag and the center pole is folded down against the front of the bag;

wherein the plate-shaped center pole is provided at its free end with an end recess closed by a handle to form a hand opening for pulling the cart in said workirg position, each L-shaped wheel carrier having a respective lead-shaped thickened portion fixed thereon where it pivotally engages the bottom ends of the corresponding two bars of the corresponding leg, each thickened portion having a respective recess therein pivotally receiving the bottom ends of the corresponding two bars of the corresponding leg, the two bars being pivotally secured to the corresponding thickened portion on a pair of axes which pair of axes pass through the corresponding recess in the corresponding thickened portion of the corresponding wheel carrier, the thickened portions of the wheel carriers being received in said hand opening of the center pole with the legs ard center pole in their storage position folded against the front of the bag.

4,890,857

STEERABLE WHEELS OF LAND VEHICLES

Andre de Cortanze, St. Cloud, France, assignor to Elf France, Courbevoie, France

Filed Jan. 11, 1988, Ser. No. 142,536

Claims priority, application France, Jan. 12, 1987, 87 00207

Int. Cl.[4] B62K *21/02*

U.S. Cl. 280—663 **8 Claims**



1. A suspension and steering device for a steerable wheel mounted on a stub axle of a motorcycle, the stub axle having an axis, the motorcycle having a body, an axial longitudinal plane of symmetry, a steering axis and a steering control kinematic chain, said device comprising a stub axle bracket pivotally mounted on said stub axle, said stub axle bracket having the general shape of a tetrahedron with first through fourth apices, said first apex being positioned on the axis of said stub axle, said second and third apices defining the steering axis and said fourth apex being at the center of a pivoting joint connection with the steering control kinematic train, and two arms, each arm being pivoted by a pivoting joint at one end thereof to the stub axle bracket at a respective one of said second and third apices so as to support said stub axle bracket and pivoted at an opposite end thereof to the motorcycle body about an axis of the motorcycle body substantially orthogonal to the axial longitudinal plane of symmetry, such that pivotal centers of said opposite ends of said two arms are located at an orthogonal projection of said second and third apices with the tetrahedron, said arms each being linearly configured and defining a plane parallel to the axial longitudinal plane of symmetry of the motorcycle which contains the steering axis, wherein imaginary extensions of said arms intersect at a point which is the instantaneous center of rotation of said tetrahedron and of the stub axle with respect to the motorcycle body at any instant of time, with an imaginary axis passing through said instantaneous center of rotation and being orthogonal to the axial longitudinal plane of symmetry of the motorcycle, said motorcycle further including a crank driven by the steering control kinematic train about a crank axis and a link pivotally connected between said crank and the pivoting joint at the fourth apex of the tetrahedron, said link having a longitudinal axis passing through a point substantially located on said imaginary axis at the instantaneous center of rotation.

4,890,858

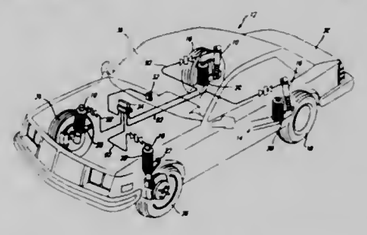
METHOD AND APPARATUS FOR CONTROLLING SHOCK ABSORBERS

David R. Blankenship, Dearborn Heights, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Feb. 16, 1988, Ser. No. 156,533

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—707 **48 Claims**



1. An apparatus for controlling shock absorbers comprising:

a pressure cylinder forming a working chamber having first and second portions operable to store damping fluid;

first valve means for establishing a first plurality of flow passages, said first valve means being disposed within said pressure cylinder;

a second valve means for establishing a second plurality of flow passages, said second valve means being disposed within said pressure cylinder and being displaceable with respect to said first valve means, the displacement of said second valve means with respect to said first valve means operable to vary the flow of damping fluid between said first and second portions of said working chamber;

actuator means for displacing said second valve means with respect to said first valve means, said actuator means operable to provide an accelerating and decelerating force to said second valve means; and

control means for controlling the displacement of said second valve member with respect to said first valve means.

4,890,859

LEVEL REGULATOR FOR AUTOMOTIVE VEHICLES

Peter Drott, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,420

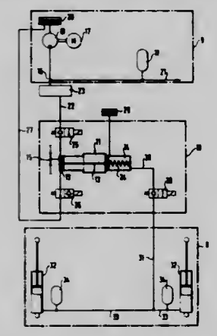
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731279

Int. Cl.[4] B60G *17/04*; B60T *8/00*

U.S. Cl. 280—714 **17 Claims**

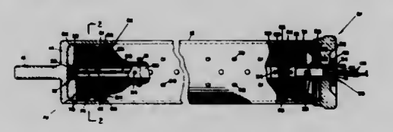
1. A level regulator for automotive vehicles, comprising, in combination: a hydraulically operating level adjusting device associated with at least one axle of the automotive vehicle, a fluid separator provided with a hydraulic cylinder wherein at least one inlet pressure chamber, through a hydraulic piston to which a restoring force acting against the pressure in the inlet pressure chamber is applied is separated from at least one outlet pressure chamber connectable to the level adjusting device, the inlet pressure chamber through at least one switch valve being connectable temporarily to a hydraulic pressure source of the vehicle, said level adjusting device being nor-

mally connected to a bydraulic fluid return reservoir, wherein the fluid separator comprises an input cylindrical housing in which is disposed a first piston portion adapted to close the first inlet pressure chamber, an output cylindrical housing



attached to the input cylindrical housing and accommodating a second piston portion adapted to close the outlet pressure chamber, the first piston portion mounted to apply pressure to the second piston portion through a pushrod.

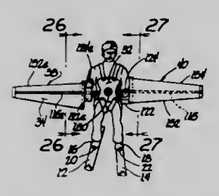
4,890,860
WAFER GRAIN GAS GENERATOR
Fred E. Schneiter, North Ogden, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.
Filed Jan. 13, 1988, Ser. No. 143,908
Int. Cl.[4] B60R *21/26*; B01J *7/00*
U.S. Cl. 280—741 **20 Claims**



20. An automobile gas bag inflator comprising a combustion chamber means, a plurality of wafers of combustible gas generating material disposed within said combustion chamber means and spaced from each other and arranged in a side by side array, a plurality of meshed cushion members disposed in alternating relation between said wafers and compressed between said wafers, means for igniting said wafers, and means for routing generated gas from said combustion chamber means.

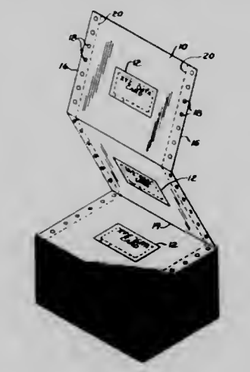
4,890,861
WING APPARATUS FOR SKIERS
William V. Bachmann, 22517 Ten Mile Rd., St. Clair Shores, Mich. 48080
Continuation-in-part of Ser. No. 12,659, Feb. 9, 1987, Pat. No. 4,756,555. This application Jul. 6, 1988, Ser. No. 215,526
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] A63C *11/00*
U.S. Cl. 280—810 **37 Claims**

1. Apparatus for creating aerodynamic lift to a downhill skier, comprising harnes means adapted to be worn by said skier, a left wing structure operatively carried by said harness means, a right wing structure operatively carried by said harness means, connecting means carried by said harness means for operatively connecting said left wing structure as to thereby have said left wing structure operatively carried by said harness means and for operatively connecting said right wing structure as to thereby have said right wing structure operatively carried by said harness means, said left wing structure having a first longitudinal axis extending generally transversely of said skier, said right wing structure having a second longitudinal axis extending generally transversely of said skier, wherein said connecting means enables said left wing structure to be selectively rotatable about said first longitudinal axis while operatively carried by said harness means, wherein said connecting means enables said right wing structure to be selectively rotatable about said second longitudinal axis while operatively carried by said harness means, wherein said connecting means enables said left and right wing structures to be respectively rotatable about said first and second axes independently



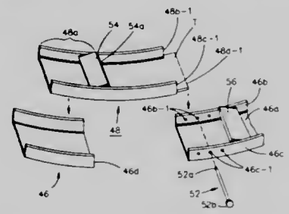
of each other by said skier to respective selected positions while operatively carried by said harness means, wherein said connecting means is effective for establishing and maintaining a fixed relationship of said first longitudinal axis with respect to said harness means even during rotation of said left wing structure about said first longitudinal axis, wherein said connecting means is effective for establishing and maintaining a fixed relationship of said second longitudinal axis with respect to said harness means even during rotation of said right wing structure about said second longitudinal axis, and wherein each of said left and right wing structures comprises additional means for mechanically imparting an airfoil configuration to each of said left and right wing structures.

4,890,862
BUSINESS FORM WITH REMOVABLE, ADHESIVE FREE DATA CARD
William T. Buchholz, Crystal Lake, Ill., assignor to UARCO Incorporated, Barrington, Ill.
Filed Sep. 6, 1988, Ser. No. 240,535
Int. Cl.[4] B42D *15/00*; B42F *5/00*; B41L *1/20*; B65D *27/22*
U.S. Cl. 283—62 **7 Claims**



1. A business form comprising:
an elongated carrier web having feed openings along at least one longitudinal margin and fold lines extending generally transversely across the carrier web to permit the same to be zigzag folded; and
a plurality of information receiving sheets or cards adhered to said carrier web at generally regular intervals along the length thereof and between the fold lines, each sheet or card having an outer periphery and a peripheral cut within said outer periphery so as to define an outer frame and an interior removable section within said frame; each said frame being adhered to the carrier web and each said removable section being free of adhesion to said carrier web and removably connected to its associated frame by a frangible connection.

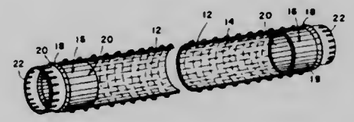
4,890,863
METALLIC ADJUSTABLE CLAMPING BAND FOR GASKETS
James Westhoff, Langhorne, and James A. Kelly, Warrington, both of Pa., assignors to A-Lok Products, Inc., Tullytown, Pa.
Filed Mar. 28, 1988, Ser. No. 174,076
Int. Cl.[4] F16L *5/02*, *41/08*
U.S. Cl. 285—39 **13 Claims**



1. An internal clamping apparatus including a clamping band inserted within the interior of a hollow, resilient, annular gasket for clamping said resilient gasket against an opening in a sidewall to form a fluid-tight seal between said gasket and said opening in said sidewall, said clamping band comprising;
a substantially annular-shaped metallic member having a discontinuity so as to define first and second ends thereof;
said metallic member having a substantially channel-shaped cross section defined by a base portion and integral upright sides;
an extension having a curved configuration and a cross-section generally conforming to the channel-shaped cross-section of said clamping band;
one of the ends of said extension engaging one end of said clamping band and being secured thereto;
the opposite end of said extension slidably engaging the remaining end of said clamping band; and
locking means for locking said clamping band to said extension to maintain the clamping band in a desired expanded position to urge said gasket radially outwardly and against said opening.

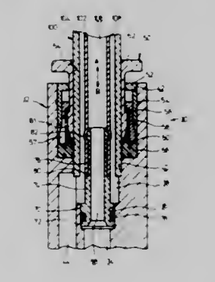
4,890,864
INSULATED DUCT END SYSTEM
Charles B. Anderson, Jacksonville, Tex., and C. Robert Kearick, Spring Lake, Mich., assignors to C-System Incorporated, Fort Worth, Tex.
Division of Ser. No. 902,863, Sep. 2, 1986, Pat. No. 4,735,235. This application Jan. 19, 1988, Ser. No. 145,298
Int. Cl.[4] F16L *45/00*
U.S. Cl. 285—121 **14 Claims**

1. A transition component for a duct system comprising:
a plurality of rigid metallic elements interfitted into a skeletal framework, said framework defining a pair of end planar portions in planes generally parallel to each other and peripheral planar portions in the form of a polygon between said end portions, said elements having connector means for interconnecting such elements to form said skeletal framework;
a pair of duct board panels within said end portions and a plurality of duct board panels within said peripheral portions, said panels each having edges, a portion of each edge of each panel abutting an adjacent portion of an edge



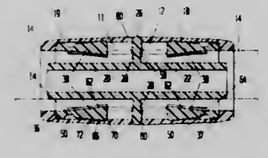
of another panel, panel holding means on each of said elements providing means for engaging said abutting panel edges for holding said panels in place to enclose the space within said framework and panels, said panels being individually capable of having an opening cut therein for insertion of the end of a duct.

4,890,865
TUBE JOINT FOR USE WITH MULTI-WALLED TUBE ASSEMBLY
Masayuki Hosono; Jun Hiramoto, and Takashi Tozaki, all of Sohka, Japan, assignors to SMC Corporation, Tokyo, Japan
Filed Nov. 17, 1987, Ser. No. 121,841
Claims priority, application Japan, Nov. 18, 1986, 61-176988[U]; May 29, 1987, 62-134186
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—133.1 **13 Claims**



1. A tube joint for connecting a multi-walled tube assembly including a plurality of tubes defining a plurality of fluid passages to an object, said tube joint comprising a joint body having a hole for inserting the tube assembly therein and said joint body defining a plurality of passages such that there are as many passages as the number of the fluid passages, a tube connector mechanism for engaging all tubes of said tube assembly within said hole, and a coupling having a rod for being fitted into said tube assembly within said hole and a passage for communicating said tube assembly with one of said passages of said joint body, said rod having on a distal end thereof a substantially spherical projection projecting radially outwardly for being fitted in an inner surface of said tube assembly to connect said tube assembly to said coupling, said inner surface of said tube assembly and said rod being slidable with respect to each other.

4,890,866
TUBING CONNECTOR
Robert A. Arp, Eden Prairie, Minn., assignor to Mentor Corporation, Minneapolis, Minn.
Filed Mar. 14, 1989, Ser. No. 323,343
Int. Cl.[4] F16L *33/22*
U.S. Cl. 285—243 **27 Claims**



1. A connector for flexible plastic tubing comprising:

a. a connector body having:

(1) a tubular mandrel with a smooth, entirely cylindrical outside wall of a diameter slightly larger than the internal diameter of said plastic tubing to provide a frictional engagement with an end of said tubing placed thereover;

(2) a radial flange surrounding said mandrel to serve as a tubing stop;

(3) a tubular cage integral with and extending from said radial flange, coextensive with said mandrel, and comprising a cylindrical body having an internal diameter greater than the outside diameter of said tubing with a plurality of angularly-spaced-apart apertures, and having an axial length which extends substantially the length of said mandrel;

(4) a plurality of chuck members, one each positioned in a respective one of said apertures, and hinged to the laterally distal edge of its respective aperture, said chuck members comprising a wedge of thickness increasing axially towards said radial flange and a length less than the axial length of its respective aperture; and

b. a collet member having:

(1) a distal end with a diameter closely conforming to the outside diameter of said tubing to be slidably received thereover;

(2) a medial end facing said connector body with an internal diameter permitting it to be received over said tubular cage to compress said chuck members radially inwardly and into the wall of tubing surrounding said mandrel; and

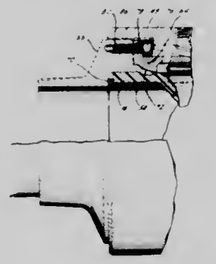
(3) detent means on its inside wall to lock said collet member to said connector body and prevent the axial dislodgement of said collet member when placed over said connector body and end of tubing.

4,890,867
INTEGRAL FERRULE
Kerry D. Briggs, South Berwick, Me., and Hadfield, Donald A., Hampton, N.H., assignors to Simplex Wire & Cable, Portsmouth, N.H.
Filed Dec. 11, 1987, Ser. No. 131,748
Int. Cl.[4] F16L *33/20*
U.S. Cl. 285—256 **6 Claims**

1. In a coupling adapted to be mounted and assembled on an end of a deformable pipe and to compress the outer surface of said pipe with respect to the inner surface of said pipe to provide a leak-proof seal, the combination prior to said assembly comprising:

a ferrule ring having a portion outwardly of the outer surface of said pipe and having a seamless deformable ferrule arm integrally formed from said ring and extending longitudinally therefrom adjacent to the outer surface of said pipe, said arm having an outer surface with only a portion of said outer surface tapering toward the outer surface of the pipe said ring being placed over said pipe such that said ring surrounds an end portion thereof;

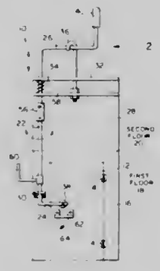
a cam ring also located outwardly of the outer surface of said pipe and longitudinally placed from said deformable ferrule arm, and having a single inner curved surface, said surface being curved with respect to a longitudinally extending axis along said pipe and arranged to deform said



ferrule arm in the area of said tapered outer surface into said pipe upon longitudinal movement of said cam ring against said ferrule; said curved surface having an axial extent substantially equal to the axial extent of said tapered outer surface and

means for effecting such longitudinal movement, thereby deforming said ferrule and compression deforming said pipe and creating said leak-proof seal.

4,890,868
DOOR LATCH
Edward Horvath, 1737 Libby Pl., Bronx, N.Y. 10461, and George Spector, 233 Broadway, Ste. 3815, New York, N.Y. 10007
Filed Mar. 30, 1989, Ser. No. 330,780
Int. Cl.[4] E05C *5/00*
U.S. Cl. 292—67 **4 Claims**



1. A safety door latch for a door hinged to a door frame in a building having a first and second floor, said latch comprising:

(a) an elongated vertically disposed C-shaped rod having a lower horizontal arm and an upper horizontal arm, said rod extending from the door frame opposite the hinged portion of the door on the first floor up along a wall onto the second floor;

(b) a lower bracket mounted to the door frame for supporting said rod for rotation about the vertical axis of said rod and allowing said rod to shift upwardly and downwardly

(c) an upper bracket mounted to the second floor wall for supporting said rod for rotation about the vertical axis of said rod and allowing said rod to shift upwardly and downwardly;

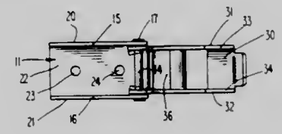
(d) a spring mounted on said rod adjacent said upper bracket for biasing said rod upwardly;

(e) a hook member affixed to said upper bracket to capture and hold said upper arm;

(f) an adjustable wheel carried on free end of said lower arm to face away and bear against the door; and

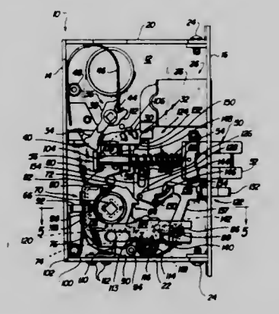
(g) a handle extending at right angle up from said upper arm so as to be manually pressed downwardly to release said upper arm from said hook member to open said door latch.

4,890,869
OVER-CENTER DRAW LATCH
Richard B. Langkamp, Jr., Rochester, N.Y., assignor to Southco, Inc., Concordville, Pa.
Continuation of Ser. No. 32,736, Mar. 31, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 248,336
Int. Cl.[4] F05C *3/03*
U.S. Cl. 292—113 **11 Claims**



1. An over-center draw latch of the type comprising a base, a lever and a catch, with the base and lever being pivotally connected to each other for relative movement through a predetermined angular range and with the lever and catch being pivotally connected to each other, the improvement comprising lever resistance means disposed between and comprising at least one detent portion of any of said base and said lever and formed integrally as one piece therewith for providing frictional resistance against relative movement therebetween, through most of the predetermined range of angular positions thereof, including catch resistance means for providing frictional resistance between said lever and catch.

4,890,870
MORTISE LOCK ASSEMBLY WITH AUTOMATIC DEAD BOLT AND INCREMENTAL STOP
William L. Miron, Bloomfield Hills, Mich., assignor to Computerized Security Systems, Inc., Troy, Mich.
Filed Apr. 18, 1988, Ser. No. 182,919
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—333 **11 Claims**



1. A mortise lock assembly disposed within a housing for mounting in a door opposite a strike plate on a door jamb, said assembly comprising:

a latch bolt movably mounted within said housing and reciprocal between an extended position out of said housing and a retracted position within said housing,

latch bolt biasing means for continuously biasing said latch bolt to said extended position,

a dead bolt movably mounted within said housing and reciprocal between an extended position out of said housing and a retracted position within said housing,

dead bolt biasing means for continuously biasing said dead bolt to said extended position,

a bolt retractor means for moving said latch bolt and said dead bolt to said retracted position, said bolt retractor means including inner and outer hubs journaled for independent rotation relative to each other within said housing and a hub lever means operatively adapted to move said latch bolt and said dead bolt to said retracted position in response to rotational movement of either of said inner and outer hubs,

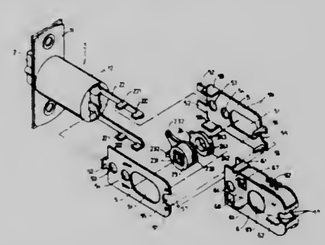
the improvement comprising:

trigger means movably mounted within said housing and reciprocal between an extended position out of said housing and retracted position within said housing for sensing a strike plate when the door is closed,

a dead bolt stop means movable between a dead bolt engaged position and a release position for restraining said dead bolt in said retracted position against the biasing force of said dead bolt biasing means, said stop means including a stop element and a cam link operatively connected to said stop element and rotatable about a pivot point spaced from said connection to said stop element,

said trigger means operatively moving said dead bolt stop means from said dead bolt engaged position to said dead bolt release position allowing said dead bolt to be moved automatically to said extended position by the biasing force of said dead bolt biasing means when said trigger means is moved from said extended position to said retracted position within said housing when the trigger means senses the strike plate on the door, said trigger means being adapted to operatively rotate said cam link about said pivot point to operatively move said stop element from said dead bolt engaging position to said released position.

4,890,871
TUBULAR DOOR LOCK WITH AN ADJUSTABLE DEVICE FOR SETTING THE DEAD BOLT
Jui C. Lin, 297, Bor Ay Rd., Kaohsiung, Taiwan, China (800)
Filed Nov. 17, 1988, Ser. No. 272,383
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—337 **2 Claims**



1. A tubular door lock with a cylinder having a face plate at one end thereof, a dead bolt mounted in the cylinder, and an adjustable device for setting the dead bolt comprising a pulling plate having two pairs of protrusions for meshing selectably with a two-tooth gear that is confined in a hole of a movable shell, the gear having a shaft aperture and able to move hori-

zontally along an elliptical hole in one of two assembling plates, said one assembling plate having a fixing notch, said movable shell having a protrusion for locking in the fixing notch of said assembling plate so that said gear can be moved horizontally by the moving of said movable shell to change the distance between the face plate and the shaft aperture of said gear and still mesh with said protrusions of said pulling plate for moving the dead bolt, and two holes being provided in said movable shell for corresponding with the holes of said assembling plates when said movable shell is moved to either of its positions so as to enable a foot post of the door lock to penetrate through.

4,890,872

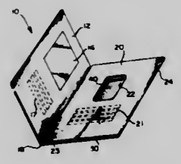
FLAT PAPER SHEET ITEM FOR DISTRIBUTING A THIN LAYER OF MATERIAL

Michael A. Parrotta, Hamilton Square; Frederick Grainger, West Greenbrook, and Donald W. Schoenleber, Bellemead, all of N.J., assignors to Webcraft Technologies, Inc., No. Brunswick, N.J.

Continuation of Ser. No. 246,942, Sep. 20, 1988, abandoned, which is a continuation of Ser. No. 17,593, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 917,079, Oct. 8, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 325,117

Int. Cl.[4] G09F *5/00;* **B65D** *73/00*

U.S. Cl. 283—56 **18 Claims**



1. A flat paper-sheet item containing a thin removable layer of a given material, comprising:

(a) a paper base panel with an upper face having at least one material-containing section with a smooth and impervious surface,

(b) a relatively thin uniform cohesive layer of spreadable material which is disposed on the material-containing section from which it is readily removable upon application of light sliding contact by another surface,

(c) a paper spacer piece which is integrally connected to the base panel and extends adjacent and along at least a portion of the periphery of each material-containing section to limit contact of other surfaces with the surface of the layer of spreadable material,

(d) a solid plastic foam spacer layer disposed between the base panel and the spacer piece immediately adjacent to the material-containing section for providing additional spacing between the engaging surface of the spacer piece and the upper surface of the base panel.

4,890,873

HAND-HELD CARRIER FOR A ROLL OF BLUEPRINTS AND CUT BLANK THEREFOR

Camilo Prada, 2222 NE. 37th St., Lighthouse Point, Fla. 33064, and Jack R. Paoli, 4900 N. Ocean Blvd. #511, Ft. Lauderdale, Fla. 33308

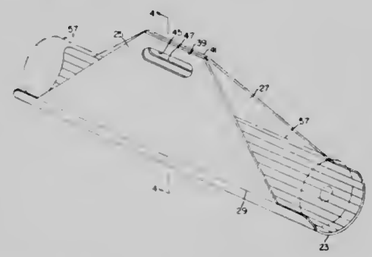
Filed Apr. 21, 1988, Ser. No. 184,611

Int. Cl.[4] B65D *71/02*

U.S. Cl. 294—152 **20 Claims**

1. A carrier for a roll of blueprints or the like, said roll having a roll length and a roll circumference, said carrier comprising a single piece of stiff sheet material including:

a rectangular center section having substantially parallel long sides, a width therebetween and a length parallel to said long sides, said center section having a plurality of substantially parallel fold lines along and between said long sides, whereby said center section is bent to a semicircular shape substantially conforming to said roll circumference, and



a pair of lateral sections integral with said center section, said lateral sections having distal edges and proximal edges, said proximal edges being shorter than and centered on said long sides, each lateral section having a handle means closely spaced from said distal edge of each lateral section.

4,890,874

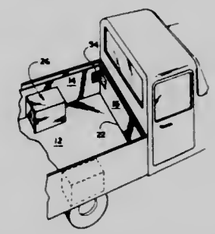
LINER FOR A PICKUP TRUCK BED

Cecil Davis, P.O. Box 113, Mayfield, Ky. 42066

Filed Jan. 3, 1989, Ser. No. 293,921

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—39.2 **23 Claims**



21. A liner for a pickup truck bed, comprising:

a foldable blank in a generally cruciform shape defined by a pair of side flaps, a front flap and a tailgate flap integral with a substantially rectangular sheet, each flap foldably connected to the sheet along a score line; and

a pair of wheel well knockouts, each defined by a pair of perforated lines which extend from the respective side score lines into the side flap and the sheet and by a pair of wheel well knockout score lines, one said score line connecting the ends of the perforated lines in the side flap and the other said score line connecting the ends of the perforated lines in the sheet, whereby breaking the perforated lines and folding the respective side flap perpendicular to the sheet permits the wheel well knockout to extend perpendicular from the side flap and the sheet to form an open ended rectangular cover.

4,890,875

SUN VISOR FOR AUTOMOBILE

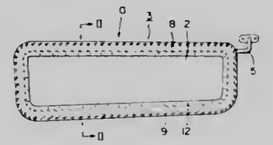
Taneyuki Takahashi, 34-9, Koshigoe 2-Chome, Kamakura-Shi, Kanagawa, Japan

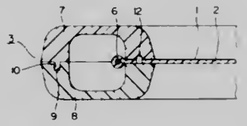
Filed Feb. 26, 1986, Ser. No. 832,882

Claims priority, application Japan, May 16, 1985, 60-72457[U]; May 16, 1985, 60-72485[U]

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97.2 5 Claims





1. A sun visor for an automotive vehicle comprising:

A. a transparent sheet

(1) having peripheral portions which are adjacent to edges of the sheet and which surround a central portion thereof, and

(2) having an opaque coating printed on said central portion of said sheet, and opaque coating having a reticulated pattern formed with a number of small holes through which the outside scene can be viewed; and

B. a rigid supporting frame of synthetic resin split into two portions for gripping therebetween the edges of the sheet and surrounding said central portion thereof to maintain said central portion substantially flat and to provide a connection between the sheet and a vehicle structure whereby the sheet is swingable to and from an operative position overlying a windshield;

C. wherein holes are formed through the sheet, at spaced intervals along at least certain of its edges and adjacent to those edges, and wherein one of said portions of the frame has pegs projecting therefrom which extend through said holes and are positively engaged in apertures in the other of said frame portions to positively secure the frame portions to one another and positively engage the pegs of the frame portion with the holes of the sheet.

4,890,876

PORTABLE ROADSTER COVER

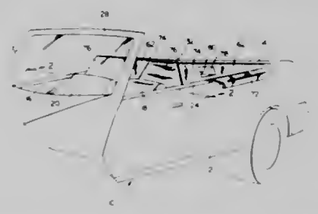
Van G. Gaines, Rte. 5, Box 522, Magnolia, Ark. 71753

Filed Jan. 4, 1989, Ser. No. 293,352

Int. Cl.[4] B60J *7/20*

U.S. Cl. 296—136 **15 Claims**

1. In combination, a vehicle of the type defining an upwardly opening interior portion between laterally spaced front-to-rear extending body side wall portions and forward of a rear upwardly facing transverse surface portion of said vehicle extending between rear portions of said body side wall portions, a transverse wall extending between said body side wall portions forward of said rear transverse surface portion and including an upper surface portion, a driver's seat for said vehicle disposed closely forward of said transverse wall, said transverse wall and side wall portions, rearward of said transverse wall, including upwardly facing surface portions generally horizontally registered with said transverse surface portion, a removable cover assembly for said interior portion, said cover assembly including front and rear transverse margins and opposite side margins extending between said front and rear margins and being removably positioned over said interior portion rearward of said driver's seat with said front and rear margins supported from said transverse wall upper surface



portion and said upwardly facing surface portion, respectively, and said side margins supported from said body side wall upwardly facing surface portions, said cover assembly and vehicle including coacting means releasably securing said cover assembly to said body, said cover assembly including a raised forward portion in front-to-rear alignment with and disposed closely rearward of said driver's seat for disposition closely behind the head of a driver disposed in said driver's seat.

4,890,877

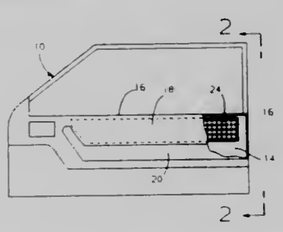
ENERGY ABSORPTION SYSTEM FOR VEHICLE DOOR AND METHOD OF MAKING

Mansour Ashtiani-Zarandi, Birmingham; Youssef Tishbi, Farmington Hills, and Jeffrey A. Welch, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1988, Ser. No. 217,803

Int. Cl.[4] B60J *5/04*

U.S. Cl. 296—146 **1 Claim**



1. An energy absorbing vehicle door comprising:

inner and outer panels joined together in

spaced apart relation and having upper marginal portions defining a window opening;

an arm rest mounted on the inner panel in spaced relation beneath the window opening;

a door trim panel mounted on the inside of the inner panel between the window opening and the arm rest and concealing the inner panel;

and an energy absorbing structure interposed between the door trim panel and the inner panel beneath the window opening and above the arm rest and including a plurality of energy absorbing sheets of stretchable lightweight textile fabric having a generally planar base and a plurality

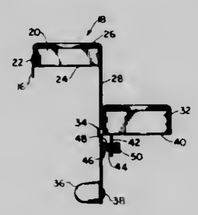
of resin rigidified spaced apart conical shaped projections stretched from the base, and an interface sheet of generally planar material interleaved between the adjacent sheets of stretchable lightweight textile fabric and adhesively secured thereto to define an energy absorbing structure whereby the application of a predetermined load thereto causes the collapse of the resin rigidified stretched projections and absorbs energy.

4,890,878

VEHICULAR ARMREST

Eli D. Harary; Cathy Harary, both of 7630 Aston Ct., West Hills, Calif. 91304; Peter A. Madnick, 627 Valley Oak La., Thousand Oaks, Calif. 91360, and Russell W. Sherwood, 3719 N. Wells, Kingman, Ariz. 86401

Filed Nov. 28, 1988, Ser. No. 276,481
Int. Cl.[4] B60J *9/00*
U.S. Cl. 296—153 **6 Claims**



1. In combination with a vehicle, said vehicle having a passenger compartment formed by an enclosing wall, a window forming part of said enclosing wall, said enclosing wall having a ledge, said ledge located directly adjacent said window, the improvement comprising:

an armrest having a mounting flange protruding from a main body member, said mounting flange to engage with said ledge and be located against said window;

a first cushioning pad fixedly mounted on said main body member and located directly adjacent said mounting flange; and

a second cushioning pad supported by connecting means on said main body member, said connecting means permitting adjusting movement of said second cushioning pad relative to said main body member, said connecting means including position fixing means including a retractable pin engaging said main body for fixing an established position of said second cushioning pad on said main body member, said connecting means comprising a U-shaped arm member enclosing a gap, said main body member being located within said gap adjacent lateral sides of said U-shaped arm member in a manner to substantially prevent said second cushioning pad from rotating about said pin

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4,890,879

CAMPER SHELL

Arthur C. Hurlock, 3020 E. Main, E-8, Mesa, Ariz. 85213

Filed Apr. 11, 1989, Ser. No. 336,117
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.2 **5 Claims**



1. Apparatus for streamlining the flow of air from a pick up truck over a mobile living unit being towed by the pick up truck having a truck bed and a tailgate, said apparatus comprising:

a. means defining a camper shell having a first end and a second end, said shell comprising a roof connecting said first and second ends of said shell, said roof registering substantially with the top of the cab of the truck at said first end and registering substantially with the top of the living unit at said second end;

b. means in said camper shell defining an end wall having entrance means; and

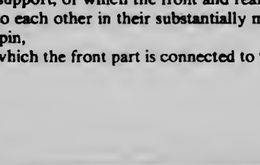
c. means for attaching said shell to the bed of the pick up truck.

4,890,880

SUNSHADE ASSEMBLY OF MOTOR VEHICLE

Manabu Sakamoto, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 2, 1988, Ser. No. 201,790
Claims priority, application Japan, Jun. 29, 1987, 62-99910[U]
Int. Cl.[4] B60R *13/02*
U.S. Cl. 296—214 **16 Claims**



1. In a motor vehicle having a roof equipped with a sun roof construction and a ceiling panel having an upper surface placed below the roof,

a sunshade assembly comprising:

means defining in said ceiling panel an opening which faces an opening of said sun roof construction;

a shading panel slidable between a first position wherein the shading panel closes said opening of the ceiling panel and a second position wherein the shading panel opens the opening of the ceiling panel and is contained in a container space defined between said roof and said ceiling panel;

holding means for holding said shading panel relative to said ceiling panel when said shading panel assumes said first position; and

a slide shoe connected to a given portion in the vicinity of the rear edge of said shading panel to move therewith, said slide shoe having a contact portion which slidably contacts the upper surface of said ceiling panel to suppress said shading panel from contacting said ceiling panel when said shading panel assumes said second position.

4,890,881

MULTI-POSITION, FOLDABLE ARMCHAIR WITH ADJUSTABLE BACKREST INCLINATION AND SEAT HEIGHT

Marc Ollat, Oyonnax, and Norbert Kleinklaus, Vaux Les Saint Claude, both of France, assignors to Groupillex S.A.R.L., Oyonnax, France

Filed Jan. 8, 1989, Ser. No. 363,958
Claims priority, application France, Jan. 21, 1988, 88 00319
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—26 **9 Claims**

1. In a multi-position, foldable armchair, of which the backrest inclination and seat height are adjustable, comprising on each side of the seat and the backrest:

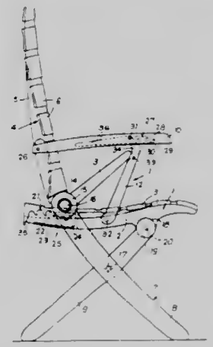
a crossed support, of which the front and rear legs are connected to each other in their substantially median part by a pivot pin,

a seat, of which the front part is connected to the upper part of the rear leg by a pivot pin and of which the rear part is provided with a rack adapted to cooperate with a finger projecting from the upper part of the front leg,

a compass element, of which the rear arm is mounted to pivot about a pivot pin connecting the lower part of the backrest to the upper part of the front leg, and of which the front arm is connected to the seat by a pivot pin, the two arms being connected together at their upper ends by a pivot pin,

an armrest, of which the rear part is connected to an intermediate part of the backrest by a pivot pin and the front part is provided with a rack capable of cooperating with a finger projecting from a part of the compass element,

on each side, the rack of the seat is disengageable from the finger of the front leg and the rack of the armrest is releasable relatively to the finger of the compass element, so that, in order to fold the armchair, the backrest may be brought into line with the front legs and, concomitantly, on the one hand, the armrests may be folded down on the backrest, whilst the compass elements flatten and, on the other hand, the seat is applied on the flattened assembly: backrest/front legs, whilst the rear legs fold on the front legs.

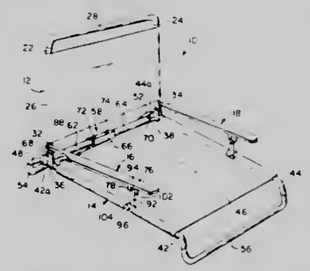


4,890,882

COLLAPSIBLE BEACH CHAIR

Christopher T. Harrington, 86 Spiral Rd., Holtsville, N.Y. 11742

Filed Dec. 27, 1988, Ser. No. 290,233
Int. Cl.[4] A47C *4/28*
U.S. Cl. 297—45 **5 Claims**



1. A collapsible beach chair comprising:

a. seat means comprising a first pair of spaced, parallel tubular members and a cloth like material spanning said members to support a user in said chair;

b. folding means connected between said first pair of tubular members for maintaining said members apart and to permit said members to be collapsed together;

c. means removably attached to the front ends of said first pair of tubular members for supporting the front end of said seat means when said chair is in use and preventing said first pair of tubular members from collapsing toward each other;

d. means removably attached to the rear ends of said first pair of tubular members for supporting the rear end of said seat means when said chair is in use to prevent the collapse of said first pair of tubular members toward each other;

e. collapsible back means comprising a second pair of tubular members the bottom ends of which are pivotally connected to the rear ends of said first pair of tubular members rotatable between an upright position when said chair is in use and a forwardly dropped position parallel to said first pair of tubular members, a cloth like material spanning said second pair of parallel spaced tubular members for providing support to a user of said chair;

f. means removably attached to the top of said back means for preventing the second pair of tubular members from collapsing toward each other while said chair is in use;

g. arm rest means mounted above each of said first pair of tubular members having the rear ends thereof pivotally attached to said back means and the forward portions thereof pivotally attached to said first pair of tubular members so that said arm rest means is in a raised position while said chair is in use;

h. all of said removably attached means being identical and interchangeable;

i. said chair being collapsed for ease of storage and transportation by the removal of all of said removably attached means, collapsing of said folding means connected between said first pair of tubular members to permit said back means and seat means to collapse transversely and by having said back means move from its upright position to its forward dropped position, thereby forming a compact collapsed and disassembled beach chair;

j. the folding means connected between said first pair of tubular members of said seat means comprising a pair of arms pivoted at one end each respectively to one of said first pair of tubular members, the opposite ends of said arms being pivotally connected to and within a U-shaped member, said member being movable toward said seat means to permit each of said two pair of tubular members to collapse in a transverse direction toward each other so that said beach chair both collapses transversely and folds into a compact unit suitable for transport and storage; and

k. each of said arm rest means comprising an angle, an arm rest mounted on one leg of said angle, and a vertically extending strut providing the pivoted attachment between said angle and the tubular member in said seat means.

4,890,883

UPHOLSTERY SYSTEM

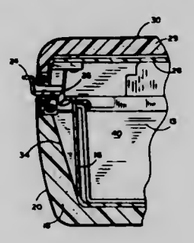
Thomas L. Boerema, Hudsonville; Alan L. Kindig, and Jeffrey D. Gras, both of Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Nov. 25, 1988, Ser. No. 276,917
Int. Cl.[4] A47C *31/02*
U.S. Cl. 297—227 **11 Claims**

1. A vehicle accessory comprising a substrate having a generally U-shaped channel formed along an edge portion and including a plurality of alternately staggered apertures and slots formed in said channel for lockably receiving a trim member therein; and

a trim member including a plurality of pins and locking tabs which are alternately staggered and which align with said apertures and slots respectively of said U-shaped channel for securing upholstery material between said trim mem-

ber and said U-shaped channel with said pins piercing the upholstery material and extending into said apertures and



said tabs lockably securing said member within said channel.

4,890,884
CANTILEVER SUPPORTS
Ronald D. Olson, 1489 S. 84th St., West Allis, Wis. 53214
Filed Nov. 14, 1988, Ser. No. 271,048
Int. Cl.[4] A47C *15/00*
U.S. Cl. 297—232 **9 Claims**

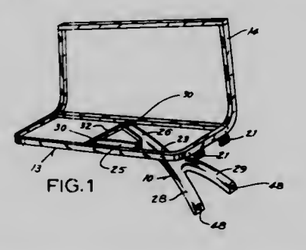
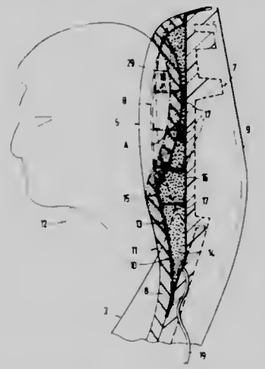


FIG.1

5. The combination of a mass transit vehicle seat having a frame, said frame having a pair of opposite ends and being constructed and arranged to be attached at one end to and cantilevered from the vehicle in which the seat is to be mounted, said frame including a seat portion and a back rest portion, a support member having an X-shaped configuration and including a center section, a pair of spaced apart and generally divergent lower arms extending from the center section and constructed and arranged to be attached to the vehicle generally below the one end of the seat frame, said support member extending upwardly and outwardly and having a pair of spaced apart and generally divergent upper arms extending from the center section and secured to the seat portion of the frame and intermediate the ends thereof, said arms being comprised of channel sections which are open either upwardly or downwardly along the longitudinal direction of said arms.

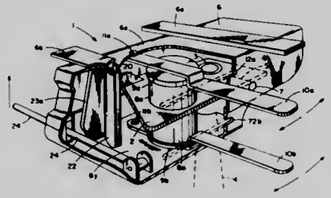
4,890,885
SEAT FOR A VEHICLE, AIRCRAFT OR THE LIKE
Kay Grossmann, Flacht, Fed. Rep. of Germany, assignor to Dr. Ing. H.c.F. Porsche AG, Weissach, Fed. Rep. of Germany
Filed Dec. 23, 1988, Ser. No. 275,370
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739752
Int. Cl.[4] A47C *4/54, 3/00*
U.S. Cl. 297—284 **12 Claims**

1. A seat for a vehicle, aircraft or the like comprising seat means, backrest means including a backrest frame and an integrated headrest means, a continuously changeable vacuum cushion means being arranged at the backrest means within the area of the headrest means, and means including an extraction pump and at least one valve means for individually matching



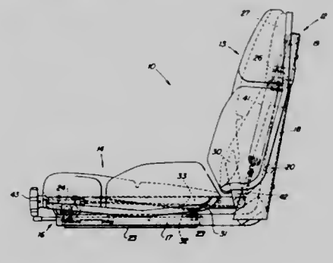
the vacuum cushion means to the physiological cervical spinal column-lordosis of the respective seat user.

4,890,886
TILTING MECHANISM, PREFERABLY FOR A CHAIR SEAT OR SIMILAR ARTICLE
Peter Opsvik, Asker, Norway, assignor to Peter Opsvik A/S, Asker, Norway
PCT No. PCT/NO88/00004, § 371 Date Aug. 16, 1988, § 102(e) Date Aug. 16, 1988, PCT Pub. No. WO88/05276, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 31, 1988, Ser. No. 235,900
Claims priority, application Norway, Jan. 23, 1987, 870301
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—313 **36 Claims**



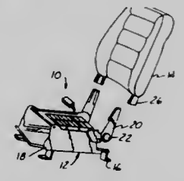
1. Tilting mechanism (1), preferably for a chair seat or similar article, comprising a rigid element (2) which via a mounting means (3) can be attached to a chair base (4), a supporting means (6) adapted to the chair seat and pivotably connected in relation to said mounting means (3), resilient means (8*a*, 8*b*) which is so arranged between said supporting means (6) and said rigid plate (2) that such supporting means (6) can be tilted in relation to said rigid plate (2) under the influence of said resilient means (8*a*, 8*b*), as well as locking means (20, 21, 24) for adjusting said seat supporting means (6) to various tilting position, characterized in that at least one of said resilient means (8*a*, 8*b*) is arranged displaceable in relation to the tilting shaft (5) of the supporting means (6), for thereby adjusting the power influencing the resilient means (8*a*, 8*b*) and thereby the tilting stiffness to which the supporting means (6) is subjected during tilting.

4,890,887
SUSPENSION SEAT FOR VEHICLES WITH RESTRICTED OPERATOR ENVIRONMENT
L. John Koutsky, Milan, Ill., and J. Scott Shovar, Davenport, Iowa, assignors to Sears Manufacturing Company, Davenport, Iowa
Filed Mar. 6, 1989, Ser. No. 319,763
Int. Cl.[4] A47C *1/032*
U.S. Cl. 297—320 **1 Claim**



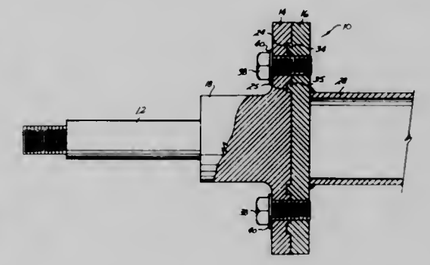
1. A suspension seat, comprising:
frame means having leg frame portions, generally upright frame portions contiguous with said let frame portions, and support bar means spanning said leg frame portions;
backrest means slidably and pivotally attached to said upright frame portions;
seat means pivotally attached to said backrest means; and
pivot block means attached to said set means and selectively engageable with said support bar means to alter the position of said backrest and seat means, said pivot block means including serpentine means for providing a plurality of engagement points, said serpentine means resting upon said support bar means and being elevatable and movable to alter which of said plurality of engagement points bear against said support bar means, and said serpentine means is disposed at such an angle to said seat means that said engagement points are spaced successively farther from said seat means as they are spaced closer to said backrest means, whereby the included angle between said seat and backrest means is maintained at a more constant value during seat adjustments.

4,890,888
SEAT BACK ATTACHMENT
Richard M. Kostin, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sep. 12, 1988, Ser. No. 243,000
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—443 **10 Claims**



1. An attachment mechanism for securing a seat back to the seat base of an automotive seat comprising:
a pair of support arms formed as channel members laterally spaced proximate the rear edge of the seat base and extending upwardly therefrom,
a pair of laterally spaced support brackets formed as channel members encapsulatingly engagable with the support arms and depending downwardly from the seat back,
means defining complementary tapered surfaces on the support arms and the support brackets to permit wedging engagement therebetween,
means defining an aperture extending through a wall of one support bracket, and
a resilient detent member carried with the corresponding support arm, the detent member being deflectable to permit wedging engagement of the support bracket over the arm and thereupon swinging outwardly through and exteriorly of the bracket aperture to prevent removal of the seat back from the seat base.

4,890,889
REPLACEABLE SPINDLE ASSEMBLY
Paul D. Bargett, 1330 - 14th St., NW., Canton, Ohio 44703
Continuation of Ser. No. 613,817, May 25, 1984, abandoned. This application Jul. 31, 1986, Ser. No. 891,067
Int. Cl.[4] B60B *35/14*
U.S. Cl. 301—132 **2 Claims**

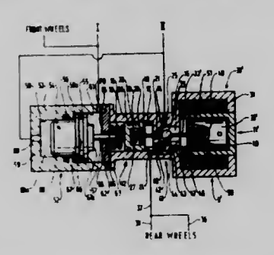


1. A removable spindle in combination with an axle assembly, said spindle including a first plate member, a second plate member secured to the end of an axle, annularly positioned fasteners securing said first plate member at its inner face to said second plate member at its inner face, the improvement wherein said first plate member has an annular groove in its said inner face, said second plate member includes an annular rib extending from its said inner face, said rib fitting complementally within said groove.

4,890,890
VEHICLE BRAKE SYSTEM HAVING AN ANTI-SKID APPARATUS
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Division of Ser. No. 750,453, Jul. 1, 1985, Pat. No. 4,840,434. This application May 19, 1989, Ser. No. 349,749
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431326
Int. Cl.[4] B60T *8/34, 13/00, 8/26*
U.S. Cl. 303—9.63 **15 Claims**

1. A vehicle brake system comprising a brake fluid pressure means for applying a brake pressure in said brake system having front wheel brakes, rear wheel brakes and an anti-skid apparatus between a master cylinder and said brake fluid pressure means and said front and rear wheel brakes, at least one brake pressure regulating valve and one brake pressure maintenance valve in which said at least one brake pressure regulating valve and said one brake pressure maintenance valve are dis-

posed between said brake fluid pressure means and said rear wheel brakes and a bypass valve bypass said brake pressure



regulating valve which in an anti-skid situation is controlled into its open position.

4,890,891

ANTILOCK SYSTEM FOR A ROAD VEHICLE

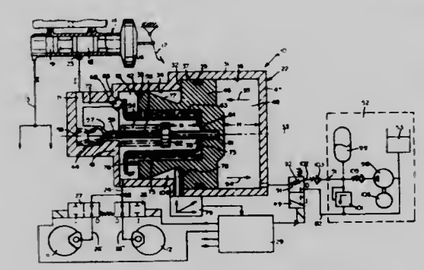
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 116,867

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637781

Int. Cl.[4] B60T *8/42, 8/88*

U.S. Cl. 303—115 **20 Claims**



1. An antilock system for a road vehicle having a hydraulic multiple circuit brake system; having at least one static brake circuit; a brake unit; a wheel brake cylinder which is acted upon by a pressure that is generated in an output pressure space of a brake unit and which is proportional to a brake actuating force; a pressure modulator means for controlling pressure reduction and pressure buildup phases of an antilock brake control; said pressure modulator means having a step piston means for displacement in a housing and with two piston steps of different sized diameters with one being smaller than the other, the smaller diameter piston step delimiting a primary chamber and the larger diameter piston step delimiting a driving pressure space; the wheel brake cylinder being connected to said primary chamber of the pressure modulator means; a control valve means, in alternative opening positions, connecting the driving pressure space either with a high pressure output of an auxiliary pressure source for forcing the step piston into its initial position corresponding to the minimum volume of the primary chamber, or with an unpressurized storage reservoir of the auxiliary pressure source for displacing the step piston to enlarge the volume of the primary chamber and reduce the pressure in the connected brake circuit; an intake valve means connecting the output pressure space of the brake unit with the primary chamber of the pressure modulator means during normal braking operation and blocking off the output pressure space of the brake unit with respect to the primary chamber of the pressure modulator means as a result of pressure removal from the driving pressure space during activation of the antilock control; output signals of an electronic antilock system control unit means for moving said control valve means into alternative operating positions required for pressure reduction and pressure buildup phases of the antilock control; the pressure modulator means also including at least one restoring spring means for bringing the step piston means into an end position corresponding to a maximum volume of the primary chamber and minimum pretensioned condition of the restoring spring means; and wherein the primary chamber is sized such that a maximum volume enlargement of the primary chamber is achieved by the shifting of the step piston means from its initial to its end position and is smaller than a volume of brake fluid that is displaced at maximum brake pressure into the wheel brake cylinder connected to the pressure modulator means;

wherein the maximum change of the volume of the primary chamber resulting from a shifting of the step piston between its initial and end positions amounts to between 25% and 50% of the maximum brake fluid volume that is displaced into the brake circuit that is subjected to the antilock control; and

wherein the brake circuit includes brake line branches that are subjected to the antilock control and that lead from the primary chamber of the pressure modulator means to the connected wheel brakes; and a respective magnetic value means for each brake line branch that is controlled by output signals from the electronic antilock control unit means for alternatively or jointly blocking a respective brake line branch during a phase of an anti-skid control cycle in which brake fluid is displaced from the modulator means to the output pressure space of the brake unit.

4,890,892

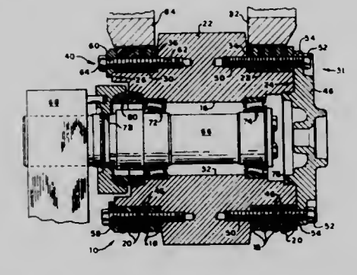
TRACK ROLLER ASSEMBLY

Glenn M. Haslett, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Oct. 3, 1988, Ser. No. 253,272

Int. Cl.[4] B62D *55/14*

U.S. Cl. 305—25 **10 Claims**



1. A track roller assembly for guiding and supporting an endless track of a track laying vehicle, comprising:

a roller shell having a radially extending flange portion and first and second support surfaces, said flange portion having first and second wall surfaces, said wall surfaces being adjacent and substantially perpendicular to said first and second support surfaces respectively;

a plurality of non-metallic resilient rings encircling each of said first and second support surfaces;

a plurality of metallic rings encircling each of said first and second support surfaces, each of said metallic rings being in frictional surface contact with at least one different non-metallic ring; and

first and second means for securing said non-metallic and said metallic rings to said first and second wall surfaces respectively, said non-metallic rings being compressed and expanded radially outwardly by said first and second securing means.

4,890,893

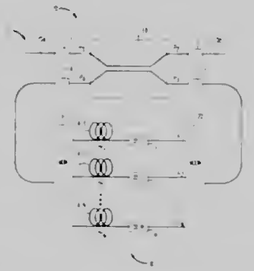
DARK FIBER SWITCHED BANDWIDTH FILTER

Lanny S. Smoot, Morristown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Mar. 2, 1989, Ser. No. 317,920

Int. Cl.[4] G02B *6/28;* H04B *9/00*

U.S. Cl. 350—96.15 **10 Claims**



1. A device for affecting an individual bit rate limitation for each of a plurality of wavelength channels propagating in an optical fiber link, said device comprising:

a directional coupler inserted into said optical fiber link, and

a recirculation path extending between an output of said coupler and an input of said coupler, said coupler serving to direct a fraction of the power propagating in said optical fiber link to said recirculation path,

said recirculation path including a wavelength division multiplexing means for the purpose of separating said fraction of said power into said plurality of wavelength channels and a plurality of delay elements for delaying each of said wavelength channels in said recirculation path by an individual amount.

4,890,894

OPTICAL CONNECTOR

Peter T. H. Kwa, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 16, 1988, Ser. No. 207,569

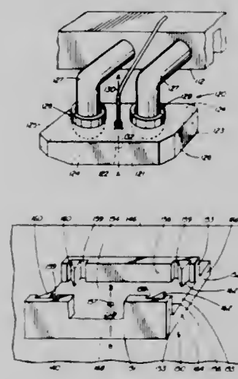
Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **25 Claims**

25. An optical connector comprising:

a first connector body carrying a first optical element having a first optical axis, the first connector body having a first guide formation extending in a direction transverse to the first optical axis, the first guide formation being spaced a first predetermined distance from the first optical axis in a direction transverse to the first guide formation, and a first stop means extending in a direction transverse to the first guide formation, the first stop formation being spaced a second predetermined distance from the first optical axis in a direction parallel to the first guide means; and

a second connector body carrying a second optical element having a second optical axis, the second connector body having a second guide formation extending in a direction transverse to the second optical axis, the second guide formation being spaced the first predetermined distance from the second optical axis in a direction transverse to the second guide formation, and a second stop means extending in a direction transverse to the second guide formation, the second stop formation being spaced the second predetermined distance from the second optical axis in a direction parallel to the second guide means, sliding engagement of the first guide formation with the second guide formation, guiding movement of the first connector body with respect to the second connector body in a direction transverse to the first and second



optical axes to bring the first stop means into engagement with the second stop means and the first optical axis into alignment with the second optical axis.

4,890,895

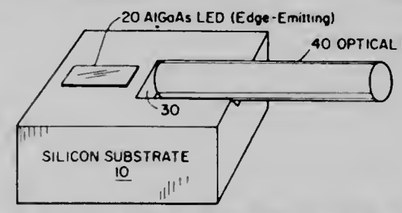
OPTOELECTRONIC INTERCONNECTIONS FOR III-V DEVICES ON SILICON

Paul M. Zavracky, Norwood; Matthew M. Zavracky, North Attleboro; John C. C. Fan, Chestnut Hill, and Jack P. Salerno, Wabun, all of Mass., assignors to Kopin Corporation, Taunton, Mass.

Filed Nov. 13, 1987, Ser. No. 120,021

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.20 **4 Claims**



1. An integrated GaAs light emitting structure and light detection structure including a Si semiconductor substrate with epitaxial layers deposited thereon in which one of the epitaxial layers is an active light emitting GaAs layer extending in a longitudinal direction, the light being emitted through an edge of said layer and another layer comprises a light detecting layer for detecting externally generated light; the improvement comprising:

(a) an optical fiber coupled to said light from said edge for transmitting light from said light emitting layer;

(b) an area of the Si semiconductor substrate extending beyond the edge; and,

(i) an etched groove in the surface of aid area of extended Si substrate and extending in said longitudinal direction and centered in line with the edge, said groove being of a depth compatible with the diameter of said optical fiber so that when such fiber is positioned in said groove, the core of said fiber is at the same elevation as said edge,

(ii) a silicon amplifier device formed on said extended Si substrate,

(iii) a GaAs light detector formed on said extended Si substrate and electrically coupled to said silicon device

such that externally generated light is detected by said GaAs detector and converted to electrical signals and coupled to said silicon device and amplified.

4,890,896

CONNECTING DEVICE FOR OPTICAL FIBERS

Michael A. Meis, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 26, 1988, Ser. No. 198,872
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 **19 Claims**

19. A block containing a plurality of optical fiber connectors, each of which includes an elongated mount, wherein:

each mount is elongated and has a longitudinal v-groove into which a free end of an optical fiber can be nested to position it with precision;

a deformable housing envelops the mount and normally is substantially cylindrical and pinches a free end of an optical fiber against the v-groove and, when deformed to become elliptical, permits an optical fiber to be inserted into and removed from the groove;

the block is formed with a channel adjacent to and extending substantially parallel to the elongated direction of each mount;

a slide is positioned within each channel and is slidable in the channel between advanced and retracted positions;

a lug projects from the block between each channel and the adjacent housing;

a post projects from the block adjacent said channel at a position remote from said housing; and

each slide has a protrusion which, when the slide is in its advanced position, presses said lug to deform the housing and thus permit an optical fiber to be inserted or released and, when the slide is in its retracted position, presses said post against an intermediate portion of the optical fiber when its free end is being pinched by the housing.

4,890,897

SINGLE MODE CONNECTOR

John S. Cook, Rumson, N.J., assignor to Minnesota Mining and Manufacturing Company (3M), Saint Paul, Minn.

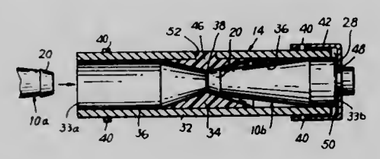
Filed May 18, 1988, Ser. No. 195,233
Int. Cl.[4] G02B 6/00, 6/36
U.S. Cl. 350—96.21 **9 Claims**

1. A single mode optical fiber connector assembly comprising:

a first single mode optical plug containing an optical fiber therein;

a second single mode optical plug containing an optical fiber therein;

positioning means for optically coupling said first single mode optical plug and said second single mode optical plug and automatically securing each of said optical plugs in angular alignment with each other, said positioning means including a housing having a first end and second end, a respective single mode optical plug being received in a respective end, a septum integrally formed within said single mode optical plug being conical in shape to rest within said septum and an inner surface of said housing coming in contact with a tail end of each of said first and



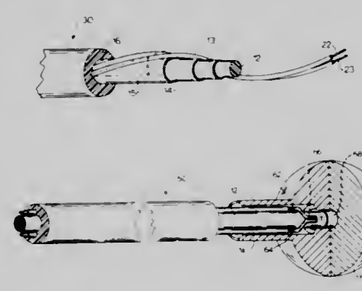
second single mode optical plugs thereby automatically angularly aligning each of said single mode optical plugs with the other.

4,890,898

COMPOSITE MICROSIZE OPTICAL FIBER-ELECTRIC LEAD CABLE

Joseph R. Bentley, Holiday, Utah, and Steven W. Kovalcheck, San Diego, Calif., assignors to HGM Medical Laser Systems, Inc., Salt Lake City, Utah

Filed Aug. 18, 1988, Ser. No. 233,478
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **23 Claims**



1. A composite microsize optical fiber-thermocouple lead cable for transmitting heat producing radiation to an operative site in a human body cavity as in an arterial or venous channel into which the cable is fed and transmitting from the same site electrical signals indicative of the site temperature, and cable comprising:

(a) a microsize flexible optical fiber having a diameter of substantially 600 microns or less and having a first substantially thin buffer coating providing a bendable mechanical support and protective barrier for the fiber, said fiber establishing an optical path extending for the length of the cable, said optical fiber including said coating having a temperature rating accomodating the temperature generated during fabrication and use thereof;

(b) a pair of microsize flexible electrical conductors, each conductor being formed of a material having a thermocouple property and each being of a diameter not exceeding one-tenth (0.1) millimeter and each being separately encased within a protective casing of electrically insulating material and assembled with said optical fiber so as to overlie said buffer coating and extend in a non-overlapping relation for the length of the cable and providing electrical thermocouple signal paths extending alongside and between the ends of the optical path established by said fiber; and

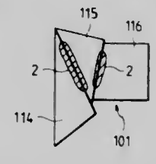
(c) a light shielding flexible casing material extruded over said first buffer coating, optical fiber and encased conductors surrounding and substantially fixedly positioning said optical fiber and conductors with respect to each other within an outer jacket formed by said casing material and extending for the length of the cable, said casing material forming an overall microsize cable of substantially circular cross-section and of an overall outside diameter of substantially 1000 microns or less suited for insertion in and bending without substantial directional preference to accommodate a vessel of changing curvature within the body for an angioplasty procedure or the like.

4,890,899

COLOR SEPARATION OPTICAL SYSTEM WHICH UTILIZES GLASS FRIT FOR BONDING

Shinichiro Aoki, Kawasaki; Koichi Kawata, Tokyo; Yasuyuki Morita, Yokohama; Akitoshi Mori, Kawasaki; Yuji Hashidate, Tokyo; Tatsuki Tsukada, Yokohama, and Hiroshi Nakamura, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 13, 1988, Ser. No. 193,614
Claims priority, application Japan, May 18, 1987, 62-120469; May 18, 1987, 62-120471; May 18, 1987, 62-120472; May 29, 1987, 62-135232
Int. Cl.[4] G02B 27/14, 5/04
U.S. Cl. 350—173 **2 Claims**



1. A color separation optical system comprising:

(a) a set of first, second, and third prisms separating incident light into components having different wavelengths, a gap extending between the first and second prisms;

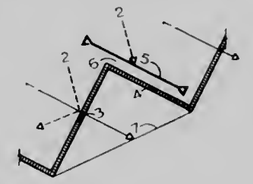
(b) and means for bonding the first, second, and third prisms, the bonding means comprising glass frit.

4,890,900

SOLAR CORRUGATION WITH SHIELD

James H. Walsh, P.O. Box 924, Longmont, Colo. 80502

Filed Feb. 23, 1989, Ser. No. 313,896
Int. Cl.[4] G02B 27/00
U.S. Cl. 350—263 **1 Claim**



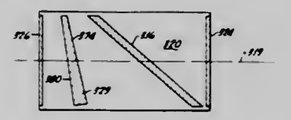
1. A Solar corrugation comprising a plurality of elongated, light-transmitting panes converging along their greater dimensions to form a series of V-shaped Louvres joined at approximately 90 degrees, alternating ones of said panes having substantially identically oriented slope provided with light absorbing, opaque material attached thereto in spaced relationship to form an air space therebetween, whereby solar radiant energy may be passed through the corrugation or absorbed in accordance with the season of the year.

4,890,901

COLOR CORRECTOR FOR EMBEDDED PRISMS

Eugene W. Cross, Jr., Escondido, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 22, 1987, Ser. No. 137,486
Int. Cl.[4] G02B 5/04, 7/18; G02F 1/13
U.S. Cl. 350—168 **1 Claim**



1. An embedded prism comprising:

a prism body formed of a liquid material having a first index of refraction at a selected wavelength and having a light beam exit area,

a first transparent window coupled to the prism body for transmitting light to said prism body along an optical axis,

a thin transparent plate mounted within said body at a distance from said exit area and forming an interface with said liquid material, said plate being formed of a second material having a second index of refraction substantially equal to said first index of refraction at said selected wavelength, the indices of refraction of said liquid and second materials varying with wavelength, whereby light transmitted through the plate is subject to a complex lateral chromatic aberration that increases with increase in distance from said optical axis,

said plate being positioned in said body with said interface extending at an angle to said optical axis to cause a light beam entering said body through said window along said axis to be transmitted to said exit area through said plate with said color aberration, and

correcting means coupled with said prism body for correcting the transmitted light beam for said color aberration, said correcting means comprising a transparent wedge positioned at said exit area on a side of said plate remote from said first transparent window and having one surface thereof inclined to said optical axis and in contact with said liquid material and having a second surface perpendicular to said optical axis, said wedge being formed of said second material and being spaced from said plate.

4,890,902

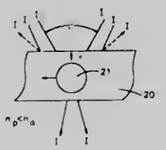
LIQUID CRYSTAL LIGHT MODULATING MATERIALS WITH SELECTABLE VIEWING ANGLES

J. William Doane; Eugene P. Wenninger, both of Kent; John West, Stow, all of Ohio, and Bao-Gang Wu, Richardson, Tex., assignors to Kent State University, Kent, Ohio

Continuation-in-part of Ser. No. 60,184, Jun. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 776,831, Sep. 17, 1985, Pat. No. 4,688,900, and a continuation-in-part of Ser. No. 866,216, May 22, 1986, Pat. No. 4,685,771, and a continuation-in-part of Ser. No. 879,269, Jun. 27, 1986, Pat. No. 4,673,255, and a continuation-in-part of Ser. No. 879,327, Jun. 27, 1986, Pat. No. 4,671,618, said Ser. No. 879,269, and Ser. No. 879,327, is a continuation of Ser. No. 866,216, May 22, 1986, Pat. No. 4,685,771, and a continuation-in-part of Ser. No. 776,831, Sep. 17, 1985, Pat. No. 4,688,900, said Ser. No. 866,216, is a continuation-in-part of Ser. No. 776,831, Sep. 17, 1985, Pat. No. 4,688,900, which is a continuation-in-part of Ser. No. 590,996, Mar. 19, 1984, abandoned. This application Feb. 23, 1988, Ser. No. 159,223
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—347 V **39 Claims**

1. In a light modulating material comprising microdroplets of liquid crystal dispersed in a light transmissive synthetic resin

matrix, the liquid crystal being soluble in the matrix-providing composition and the microdroplets being formed spontaneously by phase separation therefrom, the improvement wherein the ratio of the ordinary index of refraction of the liquid crystal microdroplets to the index of refraction of the matrix has a value such that when the optical axes of the microdroplets are aligned perpendicular to the surface of the material, incident light is transmitted through the material through a narrow viewing-angle about the perpendicular to the surface or through a viewing-angle oblique to the surface or such that when the optical axes of the microdroplet are aligned oblique to the surface of the material, incident light is transmitted through the material at a viewing-angle oblique to the surface or is transmitted through a viewing-angle about the perpendicular to the surface.

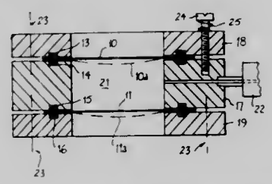


4,890,903

SUSPENSION SYSTEM FOR A FLEXIBLE OPTICAL MEMBRANE

Michel Treisman, 18 Lakeside, Oxford, OX2 8JG, United Kingdom 0X2 8JG, and Joshua D. Silver, 19 Cumnor Rise Road, Oxford, OX2 9HD, United Kingdom

Filed May 19, 1988, Ser. No. 196,385
Int. Cl.[4] G02B *3/12*
U.S. Cl. 350—419 **17 Claims**



1. A suspension system for a flexible membrane serving as a boundary surface of an optical device selected from the group consisting of a liquid lens and a flexible membrane mirror, characterised in that the system comprises two resilient O-rings supported opposite one another in a frame with the membrane placed between the two O-rings, and in that pressure is applied to the O-rings via the frame to cause the line of contact each O-ring makes with the membrane to become an annular zone producing an outwardly directed radial tension at all points in the membrane, thereby holding it in the frame under tension.

4,890,904

ZOOM LENS SYSTEM CAPABLE OF WIDE-ANGLE VIEWING FOR HIGH ZOOM RATIO

Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,421
Claims priority, application Japan, May 19, 1986, 61-115487; Sep. 13, 1986, 61-216831
Int. Cl.[4] G02B *15/14, 9/64*
U.S. Cl. 350—427 **12 Claims**

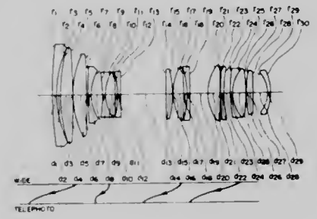
1. A zoom lens system capable of wide-angle viewing for a high zoom ratio that comprises, in order from the object side, a first lens group having a positive focal length, a second lens group having a negative focal length, a third lens group having a positive focal length, and a fourth lens group having a positive focal length, with all of these groups being displaced to change the focal length of the overall system while the position of the image plane is held constant, characterized in that:

said second lens group includes a three-unit-four-element configuration comprising, in order from the object side, a negative lens element having a concave surface of large curvature on the image side, a biconcave negative lens element that is cemented to a positive lens element to provide a cemented surface that has a large curvature and which convex toward the object, and a negative lens element whose surface on the object side has a large curvature and is concave toward the object;

said fourth lens group comprises, in order from the object side, a front subgroup having a positive focal length which is composed of at least one positive lens element having a convex surface on the object side and at least one negative lens element, a middle subgroup comprising a negative lens element that is cemented to a positive lens element to provide a cemented surface that has a large curvature and which is divergent and convex toward the object, and a rear subgroup comprising a positive lens element and a negative meniscus lens element whose surface on the object side has a large curvature and is concave toward the object;

said lens system satisfying the following conditions:

$$0.1<X_{IIL}/X_{IL}<0.4 \quad (1)$$



$$1.7<N_{IIn} \quad (2)$$

$$0.08<r_{IIC}/f_L<0.15 \quad (3)$$

$$0.09<r_{IVa}/f_L<0.18 \quad (4)$$

$$0.07<r_{IVC}/f_L<0.14 \quad (5)$$

$$-0.12<r_{IVEa}/f_L<-0.06 \quad (6)$$

where

X_{IL}: the amount of displacement for bringing the first lens group to be positioned at the long focal distance end;

X_{IIL}: the amount of displacement for bringing the second lens group to be positioned at the long focal distance end;

N_{IIn}: the average of the refractive indices, at the d-line of the negative lens elements in the second lens group;

f_L: the focal length of the overall system when it is at the long focal distance end;

r_{IIC}: the radius of curvature of the cemented surface of the cemented lens in the second lens group;

r_{IVa}: the radius of curvature of the surface on the object side of the positive lens element that is closest to the object of the lens elements in the fourth lens group;

r_{IVC}: the radius of curvature of the cemented surface of the middle subgroup (cemented lens) of the fourth lens group; and

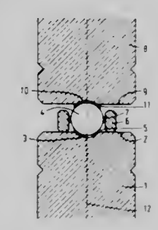
r_{IVEa}: the radius of curvature of the surface on the object side of the negative lens element that is closest to the image of the lens elements in the fourth lens group.

4,890,905

REPLICA LENS AND METHOD OF MANUFACTURING SAME

Gerard E. Van Rosmalen; Renso J. M. Zwiers, and Gerardus C. M. Dortant, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 5, 1986, Ser. No. 871,015
Claims priority, application Netherlands, Jun. 10, 1985, 8501665; Aug. 12, 1985, 8502225
Int. Cl.[4] G02B *3/02*
U.S. Cl. 350—482 **15 Claims**



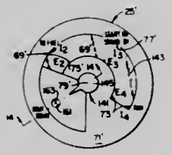
1. A replica lens having a transparent lens body at least one refractive surface of which has a correction layer of a light-cured synthetic resin which gives the lens body the desired optical profile, characterized in that the lens body has at least one member selected from the group consisting of auxiliary means and optical components which member is bonded to the lens body by using a bonding layer of a light-cured synthetic resin.

4,890,906

ROTARY OPTICAL SWITCH HAVING MAKE-BEFORE-BREAK FEATURE

Harry D. Wills, Mentor, Ohio, and Joseph L. Betthauser, San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 743,001, Jun. 10, 1985, Pat. No. 4,716,297. This application Sep. 4, 1987, Ser. No. 93,275
Int. Cl.[4] G02B *6/00*
U.S. Cl. 350—486 **5 Claims**



1. An optical rotary switch comprising:

a switch base having a central pivot;

means for optically coupling portions of said base, rotatably mounted at said central pivot to said base;

a first optical exciter port and a first optical indicator port disposed on said base;

a second optical exciter port and a second optical indicator port disposed on said base, said second optical exciter port and said second optical indicator port spaced apart from said first optical exciter port and said first optical indicator port by a preselected angular interval with respect to said central pivot on said base;

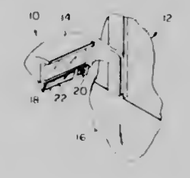
said optical coupling means sized with respect to said central pivot to optically couple all said ports in a first rotational position and optically couple only said first or said second ports in other rotational positions.

4,890,907

AUTOMATIC MIRROR LIGHT

Thuan D. Vu, 323 18th St., Brooklyn, N.Y. 11215, and George Spector, 233 Broadway, #3815, New York, N.Y. 10007

Filed Jul. 10, 1989, Ser. No. 377,600
Int. Cl.[4] B60R *1/06, 1/12*; B60Q *1/22*
U.S. Cl. 350—605 **4 Claims**



1. An automatic sideview mirror light for a motor vehicle which comprises:

(a) a framed sideview mirror adapted for attachment to a door of the motor vehicle;

(b) a movable housing pivotally mounted o the underside of said sideview mirror so that said movable housing can go between a closed position and an open position;

(c) an auxiliary back up light mounted within said housing to face rearwardly of the motor vehicle;

(d) a curbview mirror mounted within said housing to face rearwardly of the motor vehicle; and

(e) means for activating said movable housing to go into the open position by traveling down about twenty five degrees and simultaneously activating said auxiliary back up light whereby direct light beams from said auxiliary back up light are directed rearwardly to illuminate the rear fender of said motor vehicle allowing a driver to see at night when looking into said curbview mirror during parking of the motor vehicle.

4,890,908

READILY ATTACHABLE AUXILIARY WIDE ANGLE OUTSIDE REARVIEW MIRROR

Everett R. Casey, 5845 Old Orchard Trail, Orchard Lake, Mich. 49033

Filed Feb. 8, 1989, Ser. No. 307,547
Int. Cl.[4] A47G *1/17*
U.S. Cl. 350—606 **13 Claims**



1. An auxiliary, wide angle, convex-glass, blind-spot mirror for ready association with a vehicle-mounted outside rearview mirror having a reflective glass mounted within a mirror shell having a peripheral lip projecting rearwardly of the vehicle

from the plane of the surface of the glass, comprising the combination of a wide-angle convex-glass mirror member, and support means for supporting said convex-glass mirror member wholly laterally outboard of the rearview mirror and proximate to the peripheral lip of the rearview mirror, comprising a securing surface disposable substantially parallel with and overlying a portion of the surface of the reflective glass proximate to an edge thereof and adhesively bondable thereto, and connecting means for connecting said securing means to said convex mirror member.

4,890,909

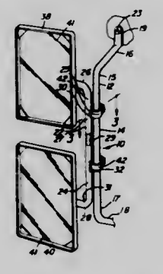
DUAL MOUNTING ASSEMBLY FOR MIRRORS

William P. Schmidt, 21000 Woodruff, Rockwood, Mich. 48173; Frank D. Hutchinson, 28000 Bell Rd., New Boston, Mich. 48164, and Kirk Malcomson, 3329 Elizabeth Dr., Trenton, Mich. 48183

Continuation-in-part of Ser. No. 81,796, Aug. 5, 1987, and a continuation-in-part of Ser. No. 83,281, Aug. 10, 1987. This application Feb. 13, 1989, Ser. No. 310,241

Int. Cl.[4] B60R *1/06*

U.S. Cl. 350—616 **17 Claims**



1. A dual mounted dual mirror assembly for attachment to a vehicle, comprising:

(a) a pair of spaced apart mirrors each having at least one visual reflective surface;

(b) a first attachment means to be mounted to a vehicle surface;

(c) a second attachment means for securing the pair of mirrors to the first attachment means, the second attachment means having a pair of spaced apart slots formed therein;

(d) at least one clamping bracket associated with each slot, each bracket being removable and emplaceable within its associated slot, each bracket interconnecting an associated mirror with an associated slot; and

(e) a fastening means to secure the clamping bracket about the first attachment means.

4,890,910

OPTICAL ACCESSORY FOR SPECTACLES

Albert E. Gazeley, Hong Kong, Hong Kong, assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 19, 1985, Ser. No. 777,640

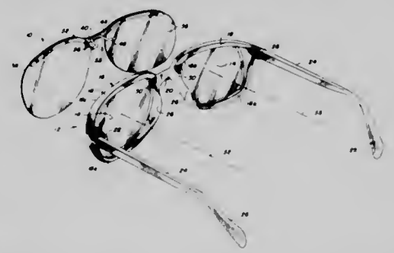
Int. Cl.[4] G02C *9/00*

U.S. Cl. 351—47 **5 Claims**

1. The invention comprising:

prescription glasses including a pair of lenses, a pair of lens frames each mounting one of said lenses and means for connecting said pair of lens frames together in spaced apart orientation, inwardly facing portions of each of said lens frames being respectively provided with a groove along a rearwardly facing side thereof so that said grooves are in general alignment with respect to each other along a line extending parallel to the plane including the longitudinal extent of the optical axes of both said lenses; and

a sunshade device including a pair of sunshades, means for connecting said pair of sunshades together in spaced apart orientation and means for releasably attaching said sunshade device to said prescription glasses with said pair of sunshades positioned over respective ones of said lenses, said attaching means including a rearwardly extending substantially planar wire-like member including a generally U-shaped central portion and a pair of yieldable and resilient prongs projecting outwardly in opposite directions from the respective ends of said generally U-shaped



central portion, said wire-like member further being configured and arranged to extend over said lens frames with said prongs respectively releasably seated in said grooves of said prescription glasses to effect a snap-fit connection with said lens frames and urge said sunshades towards respective forwardly facing sides of said lens frames and to limit lateral movement of said sunshades relative to said glasses.

4,890,911

CONTACT LENS AND THE METHOD OF MANUFACTURING THEREOF

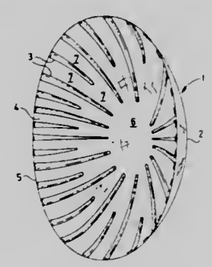
Jiri Sulc, and Zuzana Krcova, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

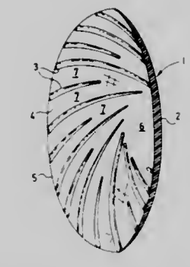
Filed Jul. 11, 1988, Ser. No. 217,414

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—160 H **21 Claims**

1. A contact lens consisting of a carrier optical portion and a hydrophilic supporting portion which mediates the contact of the lens with an eye surface, wherein both portions are made from different materials; the supporting portion is divided into at least two independent pieces which protrude above the concave side of the lens and lead from the lens circumference towards the center of said lens which is left free, with gaps being left between individual pieces of the supporting portion; the supporting portion being made from a water-swelling synthetic crosslinked hydrogel which has, in the state of full swelling with physiological saline, a swelling capacity of about 40 to 95 percent; the carrier optical portion being made from a transparent material having a modulus of elasticity at least about twice that of the modulus of elasticity of the supporting portion; and the supporting portion forming a gap of at least





0.01 mm between the eye surface and the uncovered carrier portion of the lens.

4,890,912

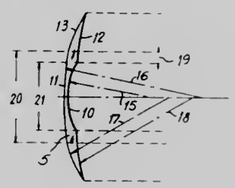
TRIFOCAL EYE-CONTACT LENS

Rients Visser, Twaalf Apostelenweg 8, 6524LW Nijmegen, Netherlands

Continuation of Ser. No. 822,895, Jan. 24, 1986, abandoned. This application Aug. 9, 1988, Ser. No. 229,787

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—161 **3 Claims**



1. An eye-contact lens composed of one optical material and comprising three mainly-concentric parts including a central part (4) for distance or far vision, an outer or brim part (6) for near or reading vision, and a transitional part (5) extending between the central and outer parts and connecting together their inner and outer surfaces, said three parts having different focal distances, said central part having an inner concave surface (10) and an outer convex surface (11), said brim part having an annular inner concave surface (12) and an annular outer convex surface (13), the radius of curvature of the central inner surface (10) being shorter than the radius of curvature of the central outer surface (11), the radius of curvature of the brim outer surface (13) being shorter than the radius of curvature of the brim inner surface (12), said central part (4) having a thickness measured between its inner (10) and outer (11) surfaces that is smallest at the center and gradually increases outwardly until the transitional part (5) is reached, said brim part (6) having a thickness between its inner (12) and outer (13) surfaces that is largest where it adjoins the transitional part (5) and gradually decreases to the periphery, said transitional part (5) bveing formed by the combined larger-diameter outer convex surfaces of the central part (4) and transitional part (5) overlapping the central part inner surface (10), whereby a bitrifocal lens results.

4,890,913

ZONED MULTI-FOCAL CONTACT LENS

John T. De Carle, Lowicks House, Sandy Lane, Rusmoor, Tilford, Nr. Farnham, Surrey, United Kingdom

Continuation-in-part of Ser. No. 541,454, Oct. 13, 1983, Pat. No. 4,704,016. This application Oct. 26, 1987, Ser. No. 113,244

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—161 **6 Claims**





1. A contact lens having an anterior convex and a posterior concave lens surface comprising:

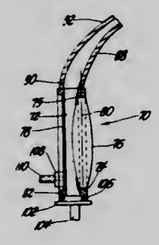
a central viewing portion which has an area larger than the maximum pupil size of the wearer and has a posterior surface spaced no more than 0.05 mm from the anterior surface of the cornea of the wearer which is adapted to contain a continuous layer of tear fluid between said cornea and said central viewing portion,

said central viewing portion including a central refractive circular zone having a first focal length surrounded by a plurality of annular concentric refractive zones which alternate between a second focal length and said first focal length as they extend outwardly from said central zone, said zones being formed by variations in the curvature of the posterior concave surface of said central viewing portion, there being between about 2 and 8 zones of each focal length located in said central viewing portion such that the ratio of the total area of said zones of said first focal length to the total area of said zones of said second focal length is about 60:40, and,

a peripheral lens portion having a posterior curvature corresponding to the anterior curvature of the cornea of the wearer, said peripheral portion adapted to float upon the cornea of the wearer's eye adjacent its pupil.

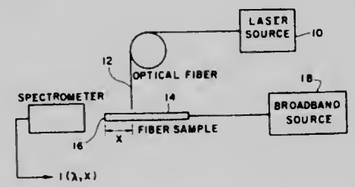
VOL 1110 ISS 1 JA 2 1990 UMI

4,890,914
HYBRID LENS APPARATUS USED FOR SHEAROGRAPHIC ANALYSIS
Douglas W. Templeton, Macomb County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 11, 1989, Ser. No. 295,674
Int. Cl.[4] G01B *11/16, 9/02*; G02B *3/14*
U.S. Cl. 356—35.5 **17 Claims**



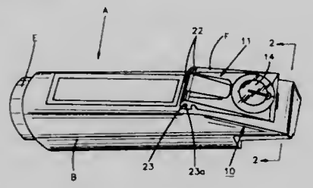
1. A lens apparatus for use in a shearographic imaging system wherein light rays from a point light source pass through the lens apparatus, strike an object to be imaged, and reflect from the object to a shearographic camera, the lens apparatus comprising:
- a receptacle defining a generally planar rectangular chamber therein, the receptacle fixed relative to the light source, object and camera;
- a lens frame;
- a circular solid lens in the lens frame, the lens and lens frame together forming one side of the planar chamber;
- a window frame;
- a thin planar window in the window frame, the window and window frame together defining another side of the planar chamber faced toward the solid lens;
- a pair of opposed elongated wall sections of the receptacle for connecting the frames together;
- the receptacle defining narrow rectagular openings at the upper and lower ends thereof, the periphery of the rectangular openings being formed by the frames and the wall sections;
- a dump door sealingly closing the rectangular opening at the lower end of the chamber, the door movable relative to the receptacle to open the lower end of the chamber;
- means for supplying gas to the chamber, the supplying means including a pressurized source of gas and a gas transfer means for communicating the source of gas to the rectangular opening at the upper end of the chamber, the gas transfer means including a duct whose proximal end is mated with the rectangular opening at the upper end of the chamber and whose distal end is communicated to the source of gas, the duct gradually flaring outward at the proximal end, thereby reducing turbulence in the flow of gas from the source of gas into the receptacle;
- a vent in the gas transfer means for allowing gas to escape from the chamber;
- a two-way valve in the gas transfer means having a first position wherein the two-way valve simultaneously shuts the vent and opens communication between the source of gas and the receptacle, the two-way valve having a second position wherein the two-way valve simultaneously opens the vent and shuts off communication between the source of gas and the receptacle;
- a pressurized source of liquid;
- a liquid transfer means for communicating the pressurized source of liquid to the receptacle, the liquid transfer means defining a liquid entry port in the receptacle located at the lower end of the receptacle;
- a shut off valve in the liquid transfer means to control the flow of liquid through the liquid transfer means.

4,890,915
METHOD AND APPARATUS FOR DETERMINING OPTICAL ABSORPTION AND EMISSION CHARACTERISTICS OF A CRYSTAL OR NON-CRYSTALLINE FIBER
Charles E. Byvik, Hampton, and A. Martin Buoncristiani, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Aug. 16, 1988, Ser. No. 232,735
Int. Cl.[4] G01N *21/64, 21/84*
U.S. Cl. 356—73 **9 Claims**



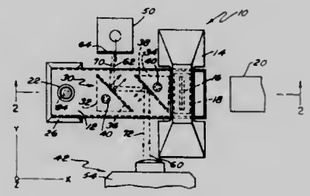
1. A method of determining optical absorption and emission spectra from a crystal or non-crystalline fiber sample having opposite sides and opposite ends, comprising the steps of:
- measuring fluorescence induced in the crystal or non-crystalline fiber sample by a laser light side-lighting the fiber sample; and
- measuring absorption resulting from a direct transmission of a broadband light transmitting directly through the ends of the fiber.

4,890,916
ILLUMINATOR FOR A REFRACTOMETER
E. H. Rainer, 3401 Viginia Rd., Cleveland, Ohio 44122
Filed Sep. 7, 1988, Ser. No. 241,321
Int. Cl.[4] G01N *21/41*
U.S. Cl. 356—135 **9 Claims**



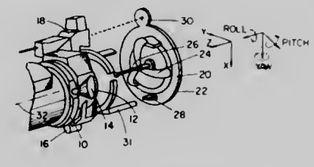
1. An illuminator for use in a refractometer having a body housing a prism assembly and measuring assembly for measuring the composition and density of a substance, said illuminator comprising,
- (a) a light source;
- (b) a power source for operating the light source;
- (c) operating means for selectively activating the light source;
- (d) said light source, power source and operating means together defining an illuminator assembly for supporting the light source in a position on or about said prism assembly to illuminate a fluid substance to be measured; and,
- (e) said illuminator assembly being housed in a cover removably mounted on the refractometer body and on or about said prism assembly.

4,890,917
SMALL ANGLE GENERATING APPARATUS
Robert J. Magee, Concord, and Jian P. Marchi, Littleton, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jul. 5, 1988, Ser. No. 215,199
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—138 **8 Claims**



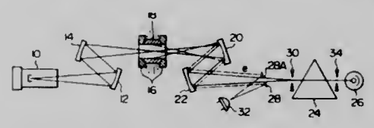
1. A small angle generator for deviating an optical beam through accurately measurable small angles to calibrate autocollimators, said small angle generator comprises:
- an optically rigid elongated mechanical beam having a first end and a second end;
- a flexural pivot connected to said first end of said elongated mechanical beam;
- a rigid support adjacent said first end of said elongated mechanical beam and said flexural pivot attached to said rigid support so as to enable said mechanical beam to rotate about a horizontal axis through said flexural pivot;
- means for rotating said elongated mechanical beam about said horizontal axis;
- means for measuring rotational angle of said mechanical beam after rotation thereof;
- a double mirror combination mounted on said elongated mechanical beam for deviating a beam of light falling thereon; and
- an autocollimater under test for generating said beam of light as a line of sight, said beam of light arranged to pass through said double mirror combination to cause a reduced angular deviation thereof having a linear relationship to the annular rotation of said elongated mechanical beam whereby said deviation of said beam of light of said autocollimator under test is measured in terms of calibration of said beam of light using an auxiliary autocollimator.

4,890,918
DOCKING ALIGNMENT SYSTEM
Leo G. Monford, Dickinson, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Sep. 15, 1988, Ser. No. 246,595
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—150 **20 Claims**



1. Apparatus for real-time alignment of a first object with respect to a second object, the apparatus comprising:
- camera means mounted to the first object and having an optical axis fixed with respect to the first object;
- a reflective surface fixedly mounted to the second object and having a visible pattern thereon; and
- monitor means for displaying in real-time images from the camera means and having a point optically fixed with respect to the optical axis of the camera means, such that the monitor means displays both the reflected image of the camera means and the visible pattern on the reflective surface each in relation to the fixed point on the monitor means when the reflective surface is perpendicular to the optical axis of the camera means.

4,890,919
ATOMIC ABSORPTION SPECTROPHOTOMETER
Masamichi Tsukada, Ibaraki; Konosuke Oishi, Mito; Katsuhito Harada, and Toyoharu Okumoto, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 4, 1988, Ser. No. 140,715
Claims priority, application Japan, Jan. 7, 1987, 62-428
Int. Cl.[4] G01N *21/74*
U.S. Cl. 356—312 **8 Claims**



1. An atomic absorption spectrophotometer comprising:
- a light source for emitting measuring light;
- a graphite cuvette for atomizing a sample;
- first optical means for focusing the measuring light from said light source, on a position within said graphite cuvette;
- second optical means for focusing the measuring light having passed through said graphite cuvette, on a slit;
- separation means disposed between said second optical means and said slit for separating radiation which is emitted from the inner wall of said graphite cuvette, from the measuring light with substantially no reduction of the energy of the measuring light;
- detection means for detecting the radiation which has been separated form the measuring light;
- a spectroscope for separating the measuring light having passed through said slit, into spectral components; and
- a detector for detecting light which emerges from said spectroscope;
- wherein said separation means includes a reflecting plate having a through hole at a central portion thereof and being disposed between said second optical means and said slit, and the measuring light passes through said through hole.

4,890,920
IN SITU PARTICLE SIZE MEASURING DEVICE
James M. Niziolek, Enfield, and James P. Sutton, III, Middletown, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Continuation of Ser. No. 828,480, Feb. 12, 1986. This application Apr. 23, 1987, Ser. No. 41,495
Int. Cl.[4] G01N *15/02*
U.S. Cl. 356—336 **2 Claims**

1. A particle size measuring device for obtaining measurements in situ of the size of particles present in a fluid substance having a specific refractive index comprising:
- (a.) a probe head portion including a first lensholder mounted therewithin at a first location and a second lensholder mounted therewithin in spaced relation to said first lensholder at a second location, said first lensholder and said second lensholder defining therebetween an open area in said probe head portion operative as a sample path,

said first lensholder having an aperture formed therein, said second lensholder having an aperture formed therein, said aperture is said second lensholder being aligned with and being larger in size than said aperture in said first lensholder;

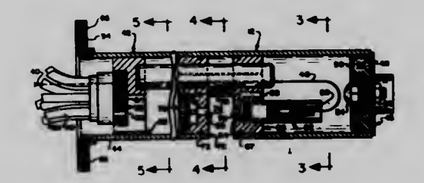
(b.) means for locating said probe head portion within the fluid substance with said probe head portion positioned such that the fluid substance containing the particles to be measured passes through said sample path of said probe head portion;

(c.) a helium neon laser operative for producing a beam of light consisting of a multiplicity of individual light rays;

(d.) first light conveying means comprising a fiberoptic cable, said fiberoptic cable being optically coupled to said belium neon laser so as to be operative to convey the bead of light from said belium neon laser;

(e.) a first achromatic lens having a first face and a second face, said first achromatic lens being mounted in said first lensholder so that said first face thereof is positioned in juxtaposed relation to said aperture in said first lensholder, said first achromatic lens being optically coupled to said fiberoptic cable for receiving the beam of light therefrom said first achromatic lens being operative to focus the beam of light through said aperture formed in said first lensholder and across said sample path such that the particles contained in the fluid substance present in said sample path are operative to cause a scattering of the individual light rays of the beam of light as the beam of light crosses said sample path;

(f.) first purging means including a first passage means formed in said first lensholder so as to be connected in



fluid flow relation with said first achromatic lens, said first purging means further including a first purging fluid supply tube supported in said probe portion so as to have one end thereof connected in fluid flow relation with said first passage means, said first purging fluid supply tube being operative to supply to said first passage means a first flow of purging fluid having a refractive index substantially the same as the refractive index of the fluid substance present in said sample path, said first passage means being operative to cause said first flow of purging fluid supplied thereto to flow past said first face of said first achromatic lens for purposes of keeping said first face of said first achromatic lens free of contaminants whereupon said first flow of purging fluid is made to exit through said aperture in said first lensholder;

(g.) a second achromatic lens having a first face and a second face and being larger in size than said first achromatic lens, said second achromatic lens being mounted in said second lensholder so that said first face thereof is positioned in juxtaposed relation to said aperture in said second lensholder, said second achromatic lens being operative to capture those light rays scattered in the course of the passage thereof across said sample path that are received by said aperture formed in said second lensholder;

(h.) second purging means including a second passage means formed in said second lensholder so as to be connected in fluid flow relation with said second achromatic lens, said second purging means further including a second purging fluid supply tube supported in said probe head portion so as to have one end thereof connected in fluid flow relation with said second passage means, said second purging fluid supply tube being operative to supply to said second passage means a second flow of purging fluid having a refractive index substantially the same as the refractive index of the fluid substance present in said sample path, said second passage means being operative to cause said second flow of purging fluid supplied thereto to flow past said first face of said second achromatic lens for purposes of keeping said first face of said second achromatic lens free of contaminants wherein said second flow of purging fluid is made to exit through said aperture in said second lensholder; and

(i.) detector means including a ring-like member having a multiplicity of radial rings formed therein, said multiplicity of radial rings being optically coupled to said second achromatic lens for receiving therefrom the light rays scattered in the course of the passage thereof across said sample path captured by said second achromatic lens, said detector means further including a plurality of photodiodes and second light conveying means, said second light conveying means comprising a plurality of groups of fiberoptic cables, said plurality of groups of fiberoptic cables being operative to optically couple said multiplicity of radial rings to said plurality of photodiodes, said plurality of photodiodes being operative based on the intensity of the light of the scattered light rays received by said multiplicity of radial rings and transmitted by means of said plurality of groups of fiberoptic cables to said plurality of photodiodes to generate signals relating to the size of the particles that cause the light rays to be scattered while crossing said sample path.

4,890,921
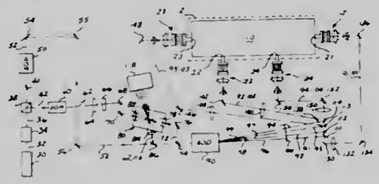
SCANNING INTERFEROMETER

Charles R. Pond, Federal Way; Patrick D. Texeira, Renton, and Robert W. Rudeen, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 895,259, Aug. 11, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 253,362

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **19 Claims**



1. A scanning interferometer for measuring the movement of a plurality of measurement sites on a test structure, the interferometer comprising:

a source of coherent radiation for producing an input beam travelling in a first direction;

beam splitter means for dividing the radiation into a reference beam travelling in a second direction and a signal beam travelling in a third direction, the second and third directions being fixed when the first direction is fixed;

deflection means including means for bidirectionally deflecting the signal beam through a set of discrete incremental angles in response to a control signal, to sequentially produce a plurality of deflected signal beams such that each deflected signal beam is directed to a different one of the respective measurement sites, said deflection means being further operative to bidirectionally deflect the reference beam through the set of incremental angles;

reflection means at each measurement site for reflecting the deflected signal beam to produce a reflected signal beam;

combining means for combining each reflected signal beam with the reference beam to produce an interference pattern;

detection means including a photodetector positioned to measure the irradiance at a point in the interference pattern to thereby produce a fringe signal; and

signal processing means including means for periodically measuring the phase of the fringe signal for each deflected signal beam, to thereby measure the movement of each measurement site.

4,890,922

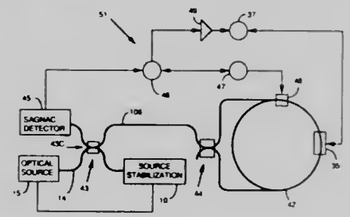
THERMALLY COMPENSATED REFERENCE INTERFEROMETER AND METHOD

Keith E. Wilson, Arcadia, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 17,425, Feb. 20, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,183

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—350 **18 Claims**



1. A fiber optic rotation sensing system, comprising: an optical source;

a first optical fiber for receiving light from the optical source;

a second optical fiber having a sensing coil formed therein;

optical coupling means for coupling light between the first and second optical fibers; and

means for controlling the frequency of an optical signal output from an optical signal source, comprising:

a first birefringent material positioned to receive an optical signal output from the optical source so that the signal propagates therethrough;

means for modulating the birefringence of the first birefringent material;

a second birefringent material positioned to receive the signal output from the first birefringent material;

detector means for forming an electrical signal indicative of the phase shift produced by the first and second birefringent materials between a pair of orthogonal polarizations in the optical signal received by the first birefringent material; and

means for processing the electrical signal for adjusting the frequency of the optical signal output from the signal source.

4,890,923

APPARATUS FOR SUPERPOSING TWO LIGHT BEAMS

Hans J. Büschelberger, Kirchzarten, Fed. Rep. of Germany, assignor to LITEF GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 137,876

Claims priority, application European Pat. Off., Jul. 30, 1987, 87111057

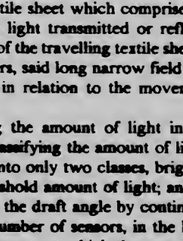
Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 **7 Claims**

1. Apparatus for superposing two light beams that interfere at an angle of divergence and form a pattern of interference fringes at an observation location comprising, in combination:

(a) two prism parts, said parts being cemented to one another at a common internal connecting surface and having slightly different base angles, each base angle being within the range of seventy to eighty degrees and differing from one another by ten to twenty seconds of arc;

(b) an internal, light-transmitting mirror coating covering partial regions of said connecting surface at at least one of said prism parts; and



(c) a reflecting partial coating at both outer surfaces of said prism parts, said partial coating having a larger refractive index than the internal medium of the prism parts and covering the regions of the possible first light incidence points of light beams passing through the prism parts from predetermined light entrance points at said base.

4,890,924

PROCESS AND APPARATUS FOR MEASURING THE WEFT THREAD OR COURSE POSITION OF TEXTILE SHEETS

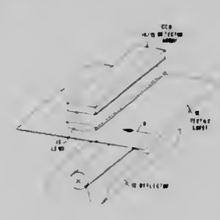
Hellmut Beckstein, Bad Abbach, Fed. Rep. of Germany, assignor to Mahlo GmbH & Co. KG., Saal/Donau, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,495

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717305

Int. Cl.[4] G01N *21/88*

U.S. Cl. 356—429 **13 Claims**



1. A process for measuring the draft angle α of a weft thread in a travelling textile sheet which comprises:

(a) intercepting light transmitted or reflected from a long narrow field of the travelling textile sheet by a linear array of light sensors, said long narrow field having a predetermined angle in relation to the movement of the textile sheet;

(b) determining the amount of light intercepted by each sensor and classifying the amount of light intercepted by each sensor into only two classes, bright or dark, in relation to a threshold amount of light; and

(c) determining the draft angle by continuously monitoring at least the number of sensors, in the linear array, in the same class, the rate at which the sensor in the same array

change class or a total length of all sensors in an array with the same class.

4,890,925

METHOD AND APPARATUS FOR DETECTING PARTICULAR PARTICULATE SUBSTANCE

Takehiko Kitamori, Hitachi; Kazuo Yasuda, Katsuta; Yasushi Nomura; Kazumichi Suzuki, both of Mito, and Haruo Fujimori, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,197
Claims priority, application Japan, Aug. 11, 1986, 61-186808
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—432 64 Claims



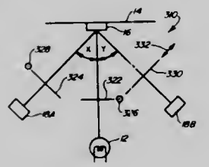
1. A method of detecting a particular particulate substance comprising the steps of:
adjusting or selecting a wavelength of a ray of light to be substantially equal to the size of the particular particulate substance;
radiating the ray of light to the particulate substance; and
measuring the magnitude of a photoacoustic signal generated from the particulate substance.

4,890,926

REFLECTANCE PHOTOMETER

Andrew Dosmann, Mishawaka; Willis Howard, Osceola, both of Ind., and Alfred Zembrod, Gladbach, Fed. Rep. of Germany, assignors to Miles Inc., Elkhart, Ind.

Filed Dec. 21, 1987, Ser. No. 135,252
Int. Cl.[4] G01N *21/47*
U.S. Cl. 356—369 4 Claims



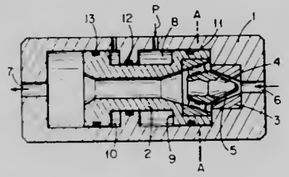
1. A method for determining the quantity of a selected fluid component in a sample of fluid placed on a reagent strip impregnated with a chemical reactive with said selected fluid component, comprising the steps of:
directing polarized light onto said sample;
determining the magnitude of at least a portion of unpolarized light reflected from said sample, said magnitude being correlative to the quantity of said selected fluid component,
determining the magnitude of at least a portion of polarized light reflected from said sample; and
comparing the magnitude of said unpolarized light to the magnitude of said polarized light.

4,890,927

CEMENT MIXING APPARATUS

Andre Salvaire, 4 ter, Rue Emile Clermont, 42100 St. Etieane; Jean-Paul Jour, 56, Rue Georges Plasse, 42300 Roanne, both of France, and Jacques Orban, 13607 Runney Meade Dr., Sugar Land, Tex. 77478

Division of Ser. No. 694,379, Jan. 24, 1985, Pat. No. 4,838,699.
This application May 2, 1989, Ser. No. 346,041
Claims priority, application France, Feb. 21, 1984, 84 02594
Int. Cl.[4] B28C *1/16;* B01F *5/08*
U.S. Cl. 366—1 7 Claims



1. Apparatus for homogenizing abrasive fluid comprising means for applying to said fluid an energy between 4.8 and 6.3 kJ/kg including a high pressure pump having at least one annular restriction, in line, at an outlet of said pump and mixing means in said one annular restriction whereby a pressure drop through said at least one annular restriction is substantially independent of flow rate.

4,890,928

METERING DEVICE FOR SOFT ICE CREAM FREEZERS

John L. McDonald, P.O. Box 338, Eclectic, Ala. 36024

Filed Nov. 10, 1988, Ser. No. 269,709
Int. Cl.[4] B01F *13/02*
U.S. Cl. 366—101 4 Claims



1. A metering valve for a soft ice cream freezer comprising:
a hollow exterior housing adapted for insertion in the discharge port of a liquid mix reservoir;
a port adjacent the reservoir bottom communicating with the reservoir interior and the hollow interior of the exterior housing;
an upper end with an adjacent indicia mark;
an inner hollow cylindrical valve body slidably fitted within the hollow interior of the exterior housing and having a lower end in the same plane as the exterior housing lower end;
an upper end having an adjacent faceted tool-engaging section;

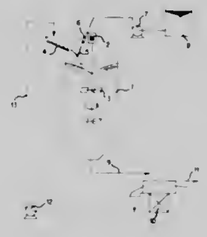
indicia on the facets adjacent the indicia mark on the exterior housing;
a plurality of metering orifices in a plane perpendicular to the valve body axis and communicating with its inner bore and the hollow interior of the exterior housing, whereby the alignment of a single metering orifice with the bore in the outer housing provides communication with the reservoir interior, and
rotation of the inner body by tool-engaging means alternately aligns a selected aperture or a closed space between apertures with the bore; and
the upper end of the valve body including a removable plug having an inner concentric bore and air orifice, said orifice communicating with the fluid reservoir and the valve body interior.

4,890,929

METHOD AND APPARATUS FOR MANUFACTURING COAGULATED GRAINS FROM POLYMER LATEX

Wataru Okada; Hideo Yasui, both of Kobe, and Yasuhiro Miki, Himeji, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1988, Ser. No. 183,811
Claims priority, application Japan, Apr. 21, 1987, 62-98088
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—160 4 Claims



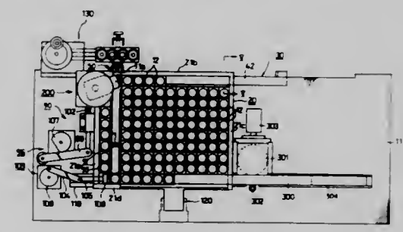
1. An apparatus for manufacturing from polymer latex nearly spherical coagulated grains with a uniform grain size, comprising:
(a) a tank for holding said polymer latex;
(b) means for forming a down-flowing swirl of said polymer latex in said tank;
(c) means for providing a film of down-flowing polymer latex from above the surface of the swirling polymer latex in said tank onto said surface of the swirling polymer latex, said means for providing a film of down-flowing polymer latex being provided with an inlet into which polymer latex is fed;
(d) means for continuously metering a flow of coagulant to impact said film of down-flowing polymer latex at an angle and at a position above said surface of the swirling polymer latex, said means for metering being provided with means for regulating the discharge pressure of said flow of coagulant so that the flow of coagulant does not pass through said film of down-flowing polymer latex; and
(e) means for separating coagulated grains of polymer latex from said polymer latex.

4,890,930

AUTOMATIC SAMPLING APPARATUS

Hidenori Nohso, Kakogawa, Japan, assignor to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 142,953
Claims priority, application Japan, Jan. 16, 1987, 62-7555
The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.
Int. Cl.[4] B01F *9/00*
U.S. Cl. 366—208 5 Claims



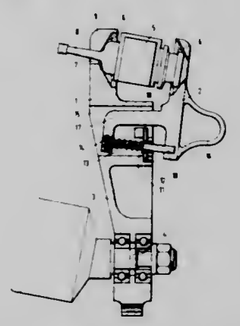
1. In an automatic sample supply apparatus which holds a plurality of sample vessels in a waiting station in a matrix pattern including a plurality of rows of sample vessels, and which sends out the sample vessels in the front row laterally one by one to a sampling station, returns the sample vessels which have finished the required treatment to the waiting station, and advances the sample vessels in a rearmost row in the waiting station collectively as a whole in one step one row at a time when all the sample vessels in the front row of the waiting station have been sent out, the improvement comprising the sampling station being provided with a suction needle assembly for sampling the sample in a sample vessel and which comprises a single needle for penetrating a stopper secured to the sample vessels and a holding block for said single needle.

4,890,931

MIXER FORK FOR DENTAL CAPSULES

Wolf-Dietrich Herold, Seefeld, Fed. Rep. of Germany, assignor to ESPE Stiftung & Co. Produktions - und Vertriebs KG, Seefeld, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,787
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 8796965[U]
Int. Cl.[4] B01F *11/00;* A61C *5/06*
U.S. Cl. 366—209 11 Claims



1. A mixer fork for holding a dental capsule during an oscillatory mixing motion of said fork, comprising:
first and second arms for holding a capsule therebetween,

said first and second arms each defining a capsule holding location;
a pin provided on said first arm and a hole provided in said second arm, said pin passing through said hole and extending substantially parallel to a capsule being held between said capsule holding locations; and
spring means disposed between said first and second arms for resiliently holding said capsule and for generating a tilting moment between said arms about one of said capsule holding locations, said spring means causing said pin to catch and consequently lock said pin in said hole during the oscillatory mixing motion of said fork.

4,890,932

THERMAL ENVIRONMENT SENSOR WITH MEANS TO SIMULATE EMISSIVITY OF HUMAN BODY

Masahiro Kobayashi; Noboru Kobayashi; Kunikazu Torikoshi, and Shigehiro Uemura, all of Sakai, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 917,943, Oct. 4, 1986, Pat. No. 4,747,699. This application Oct. 22, 1987, Ser. No. 111,796
Claims priority, application Japan, Feb. 6, 1985, 60-22328; Nov. 26, 1985, 60-181871; Nov. 26, 1985, 60-181870; Nov. 26, 1985, 60-265324; Nov. 26, 1985, 60-265325; Nov. 26, 1985, 60-265326; Nov. 26, 1985, 60-265327; Nov. 26, 1985, 60-181869; Feb. 6, 1986, 60-22327
Int. Cl.[4] G01J *5/02;* **G01K** *3/02*
U.S. Cl. 374—109 **4 Claims**



1. A thermal-environment sensor comprising:
a heating element having an outer surface, said heating element adapted for placement in a room and being heated by thermal quantity (M);
a layer of radiant materials, covering the outer surface of said heating element and having a spectral emissivity closely conforming to that of the surface of human skin or clothes thereon;
a temperature detector adapted to detect surface temperature (Tg) of said heating element;
a humidity detector adapted to detect humidity (RH) in the room;
means for calculating effective temperature (y) in the room, said means adapted to receive the output of both the humidity and temperature detectors, based on a formula $y=Tg-C_1+f_1(RH)$; wherein C_1=correction constant and f_1(RH) is a function of humidity (RH).

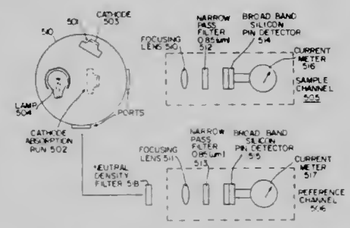
4,890,933

TRANSMISSION METHOD TO DETERMINE AND CONTROL THE TEMPERATURE OF WAFERS OR THIN LAYERS WITH SPECIAL APPLICATION TO SEMICONDUCTORS

Avraham Amith; Charles Naselli, both of Roanoke, Va., and C. Scott Nevin, Albion, Ind., assignors to ITT Corporation, New York, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,196
Int. Cl.[4] G01J *5/00;* **G01K** *11/00*
U.S. Cl. 374—121 **14 Claims**

1. An improved temperature detection apparatus for a workpiece of a material having a direct bandgap energy which varies as a function of temperature, said apparatus comprising:
a source of optical energy having a first spectral component with a photon energy greater than said bandgap energy at a given workpiece temperature;
an optical detection means for detecting said first spectral component of said energy from said source;
positioning means for causing said workpiece to be between said source and said detection means whereby optical



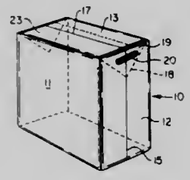
energy from said source passes through said workpiece prior to detection of said first spectral component of said optical energy by said detection means; and
processing means for receiving a signal from said detection means and for providing an output indicative of the temperature of said workpiece as a function of the energy level of optical energy absorbed by said workpiece.

4,890,934

PLASTIC CARRIER BAG WITH CUT-OUT CARRY HANDLE

Francis R. Feaver, Burlington, and Walter K. Teetzel, Ancaster, both of Canada, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 28, 1988, Ser. No. 264,284
Claims priority, application Canada, Oct. 30, 1987, 551572
Int. Cl.[4] B65D *33/08*
U.S. Cl. 383—10 **3 Claims**



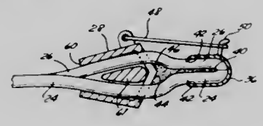
1. A carrier bag of heat-sealable plastic film having a front panel joined along side edges by weld lines to a rear panel, an opening at the bottom end of said panels, an inwardly foldable gusset integral in one piece with and joining the top ends of said panels, said gusset being joined at the ends thereof to said weld lines such that in collapsed position the gusset lies flat with the panels and weld lines and in the expanded position the gusset opens to form a top panel of the bag with inner triangular gussets at the ends thereof lying adjacent double-layer triangular film portions joined through the apexes thereof by said weld lines, and a cut-out handle for the bag formed in at least one of said double-layer triangular portions.

4,890,935

LEAK RESISTANT ZIPPER

Steven Ausnit, New York, and Paul Tilman, New City, both of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 16, 1988, Ser. No. 232,751
Int. Cl.[4] A44B *19/28, 19/32;* **B65D** *33/16*
U.S. Cl. 383—59 **26 Claims**



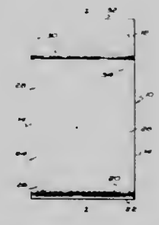
1. A leak resistant zipper comprising:
a first strip including a first longitudinally extending profile element;
a second strip including a second longitudinally extending profile element configured to matingly engage said first profile element; a slider member having portions positioned about and between said profile elements and configured to guide said profile elements into engagement when moved from an open end of said zipper toward a closed end of said zipper;
clamp means at said zipper closed end retaining said first and second profile elements in engagement; and,
gasket means extending from and beyond said clamping means toward said zipper open end for sealingly engaging with said slider member when said slider member is drawn against said gasket wherein said gasket comprises a resilient member disposed about said first and second profile elements and retained in position by said clamp means.

4,890,936

WASTE BAG

Christopher Cooper, London, England, assignor to Guardine Disposable Limited, Hemel Hempstead, Great Britain

Filed May 3, 1988, Ser. No. 189,941
Claims priority, application United Kingdom, Nov. 20, 1987, 8727228
Int. Cl.[4] B65D *30/08*
U.S. Cl. 383—109 **8 Claims**



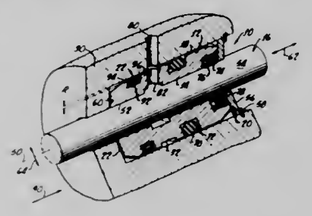
1. A waste bag made of a synthetic thermoplastic plastics material and having an inner bag made of a liquid-absorbent material which constitutes an internal lining of the waste bag, in which the mouth of the inner bag is spaced from the mouth of the waste bag, so that the internal lining terminates inwardly of the mouth of the waste bag and so that the latter is free of lining in the region of its mouth to enable that region to be gathered and tied, and in which the mouth of the inner bag is heat sealed to the synthetic thermoplastic plastics material of the waste bag.

4,890,937

SPRING-LOADED BEARING

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, Santa Ana, Calif.

Filed Sep. 14, 1988, Ser. No. 244,078
Int. Cl.[4] F16C *29/02, 33/74*
U.S. Cl. 384—16 **14 Claims**



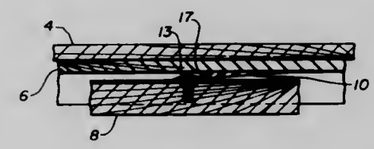
1. A cartridge bearing assembly for reciprocating shafts comprising:
a non-resilient tubular bearing element having means defining an inside dynamic surface for engaging a reciprocating shaft;
spring means for engaging an outside static surface of the tubular bearing element for causing the tubular bearing element and shaft to float within a surrounding housing, said tubular bearing element remaining stationary with regard to shaft reciprocal movement but moving with the shaft in any off-axial movement;
first seal means for proving a seal between the tubular bearing element inside dynamic surface and said shaft, and
second seal means for providing a seal between the tubular bearing element outside static surface and the surrounding housing.

4,890,938

WOODEN DRAWER GUIDE

Thomas E. Allen, Thomasville; Matt C. Scalf, and John G. Lampe, both of High Point, all of N.C., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Oct. 6, 1988, Ser. No. 254,223
Int. Cl.[4] F16C *33/02*
U.S. Cl. 384—21 **1 Claim**



1. A slide guide for a drawer adapted to be positioned within the base frame of a piece of case goods, said slide guide comprising:
the combination of a first elongated upper slide guide member with upper and lower surfaces and a dovetail mortise groove cut in the lower surface and a drawer fastened to the upper surface, a second elongated lower slide guide member with upper and lower surfaces and a dovetail tenon cut in the upper surface and the lower surface being supported on the midregion of the base frame of said piece of case goods, said tenon and mortise having inclined sidewalls whereby the tenon is slideably retained in the mortise due to the inclined sidewalls and the surface of the tenon between its sidewalls being spaced slightly from and parallel to the surface of the base of the mortise between

its sidewalls, said tenon being capable of sliding out of the mortise when said drawer is drawn from within said case goods, a means preventing said tenon from sliding out of the mortise, but otherwise permitting the first and second guide members to slide relative to each other in engagement with each other when the drawer is partly drawn from said case goods, said aforesaid means being a two part structure having a first part being a raised projection extending from the tenon into said space between the tenon and mortise, said second part being a wedge shaped structure near one end of mortise groove with the wedge shaped structure having a surface projecting into said space between the tenon and mortise so that the wedge projecting surface engages said raised projection to prevent the separation of the mortise and tenon, the wedge shaped structure is tapered from the top of the surface projecting into said space at one end of the wedge to the opposite end of the wedge located near the end of the mortise whereby the mortise and tenon can be moved from a separated state to an engaged state and the sliding of the tenon into the mortise can be carried out with said raised projection riding up the tapered surface of the wedge and passing over the wedge surface projecting into said space between the mortise and tenon, said wedge shaped structure being sufficiently resilient to yield under the pressure of said projection when the slide guide members are engaged with each other, but not yield when the projection on the tenon and wedge projection surface on the mortise engage when there is movement to separate the engaged slide guide members.

4,890,939

DEVICE FOR MOUNTING THE CAM SHAFT FOR ACTUATING THE BRAKE SHOES OF A DRUM BRAKE FOR VEHICLES AND THE LIKE

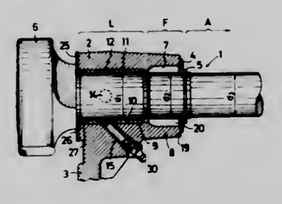
B. Hubert Koschinat, Hösbach-Winzenhohl, Fed. Rep. of Germany, assignor to Otto Sauer Achsenfabrik Keilberg, Bessenbach-Keilberg, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,418

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730191

Int. Cl.⁴ F16C *33/10*

U.S. Cl. 384—322 **16 Claims**



1. In combination, a bearing means for rotatably mounting a cam shaft for actuating brake shoes of a vehicle drum brake, and a cam shaft having an S-shaped cam, said combination comprising:

a bearing means for rotatably supporting said cam shaft, said bearing means including a brake bracket having a bearing eye defined thereon, a bearing section defined in said bearing eye, a bushing received in said bearing section for rotatably receiving a section of said cam shaft thereon, an extension on said bearing eye for jointly defining a first grease chamber with a tightening disk, said first grease chamber being adjacent to said bearing section and around a part of said cam shaft, and said first grease chamber being on a side of said brake bracket other than the side adjacent which said S-shaped cam of said cam shaft is received;

a cam shaft having an S-shaped cam for actuating brake shoes of a vehicle, and said cam shaft being received in said bearing eye and rotatably supported on said bushing in said bearing section;

a tightening disk adjacent to said extension on said bearing eye; and

a guard disk mounted on said cam shaft and retaining said tightening disk adjacent to said extension of said bearing eye, and said guard disk and said tightening disk jointly axially restraining said cam shaft.

4,890,940

MAGNETIC LIQUID SEALING RING INSTALLED IN AN ANTIFRICTION BEARING

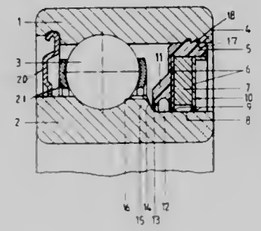
Anton Schmidt, Hassfurt; Wilhelm Walter, Oberthulma, and Focko Bruns, Poppenhausen, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,661

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 8801298[U]

Int. Cl.⁴ F16C *33/82*

U.S. Cl. 384—446 **11 Claims**



1. A magnetic liquid sealing ring for being installed in an antifriction bearing wherein the bearing includes an inner ring, an outer ring and a row of rolling elements between the inner and the outer rings; the magnetic liquid sealing ring comprising:

a sealing ring having an annular outer portion for engaging the outer ring and the sealing ring extending toward the inner ring; the sealing ring including an axial inner side facing axially-inwardly toward the row of rolling elements;

a pre-seal element affixed to the inner side of the sealing ring; the pre-seal element having an end surface spaced axially inwardly closer to the rolling elements than the inner side of the sealing ring; and the pre-seal having an annular groove defined in its radially inner surface and located between the end surface of the pre-seal element and the inner side of the sealing ring for trapping escaping liquid therein.

4,890,941

BEARING PROTECTOR WITH SLINGER RING

Dag O. Calafell, II, Portage, and Kenneth G. Kakabaker, Kalamazoo, both of Mich., assignors to Durametallic Corporation, Kalamazoo, Mich.

Filed Apr. 14, 1989, Ser. No. 338,969

Int. Cl.⁴ F16C *33/72, 33/80*

U.S. Cl. 384—480 **6 Claims**

1. In combination, a shaft rotatable about its longitudinally extending axis, a housing disposed in surrounding relationship to the shaft and defining therein a cylindrical bore which concentrically surrounds the shaft, bearing means coacted between said housing and said shaft for rotatably supporting said shaft, and a bearing protector associated with said cylindrical bore at a location spaced axially outwardly from said bearing means and coacting between said shaft and said housing for sealingly isolating the bearing means from a region which is disposed exteriorly of the bearing protector, said bearing protector including a one-piece ring-shaped rotor sealingly and nonrotatably carried on said shaft and disposed for cooperation with a one-piece ring-shaped stator which is sealingly and nonrotatably mounted on said housing at least partially within said cylindrical bore, said stator being disposed radially in concentric and surrounding relationship to said rotor, said stator and rotor respectively having first and second annular surface means formed thereon and disposed in concentric and closely adjacent relationship to one another so as to define therebetween an elongate annular pathway which extends axially over a significant extent and at its inner end communicates with a bearing compartment and at its outer end communicates with the exterior region, said pathway including an inner passageway which is of very narrow width as defined between opposed portions of said first and second annular surface means for inhibiting flow therethrough, said inner passageway having a length which exceeds its width and defining the inner end of said pathway for direct communication with the bearing compartment, said pathway including an outer passageway which is of very narrow width as defined between opposed portions of said first and second annular surface means for inhibiting flow therethrough, said outer passageway having a length which exceeds its width and defining the outer end of said pathway for direct communication with the exterior region, the improvement comprising:

said stator having a channellike collecting chamber formed

therein, said collecting chamber being disposed in communication with said pathway substantially at the inner ends of said inner and outer passageways, said channellike chamber projecting radially outwardly from said first annular surface means in surrounding relationship thereto, said collecting chamber having axial and radial cross-sectional dimensions which are large in relationship to the width of said passageways;

said rotor having a channellike groove formed therein in encircling relationship thereto, said channellike groove projecting radially inwardly from said second annular surface means and being of shallow radial depth, said channellike groove being generally radially aligned with said channellike chamber;

a one-piece slinger ring stationarily seated within said channellike groove and projecting radially outwardly therefrom a substantial radial extent into said channellike chamber, said slinger ring having an axial cross-section which closely approximates the axial cross-section of said channellike chamber so that the slinger ring is axially closely confined within said chamber, said slinger ring being constructed of a relatively hard plastics material having limited elasticity so as to be snap fit into said channellike groove, said slinger ring being sufficiently radially outwardly elastically deformable so as to be slidably displaced axially over a portion of said second annular surface means as disposed directly adjacent said groove during assembly of said stator and rotor.

4,890,942

SUPPORT DISK ASSEMBLY FOR THE ROTOR SHAFT OF AN OPEN END SPINNING MACHINE

Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 93,008

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630257

Int. Cl.⁴ F16C *19/00*; D01H *1/24*

U.S. Cl. 384—549 **12 Claims**



1. In an open end spinning machine having a spinning rotor mounted on a rotor shaft, a support disk assembly rotatably mounted alongside another support disk assembly as a bearing for rotatably supporting said rotor shaft, each said support disk assembly comprising a disk body for rotatable mounting alongside said shaft, said disk body including a disk member and a carrier member detachably connectable to one another, an annular tread member for disposition about the periphery of said body for peripheral contact frictionally with said shaft, and clamping means at the periphery of said disk body for grippingly retaining said tread member in a substantially fixed disposition radially with respect to said disk body and being selectively releasable for permitting removal and replacement of said tread member, said clamping means including a pair of flange members respectively affixed at the periphery of said disk and carrier members for cooperative clamping retention with one another when said disk members are connected, said flange members cooperatively defining a tapered channel for receiving said tread member when said disk and carrier members are connected and said tread member is compatibly configured with tapered axially-facing side surfaces.

4,890,943

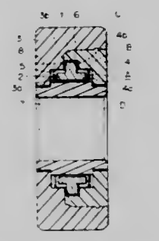
BEARING

Koichi Tanaka, Aichi, Japan, assignor to Kabushiki Kaisha Chubu Bearing Seisakusho, Japan

Filed May 17, 1988, Ser. No. 195,631

Int. Cl.⁴ F16C *33/46*

U.S. Cl. 384—572 **10 Claims**



1. A bearing comprising an outer race through which a shaft extends, a retainer which is rotatably supported within said outer race, and a plurality of needle rollers rotatably supported by said retainer, wherein said retainer includes:

a ring-shaped connecting member; and

a plurality of elongate roller supporters respectively connected integrally with said connection member therewithin substantially at longitudinal mid-points of the supporters and extending sideways beyond said ring-shaped connecting member in parallel to an axis of said ring-shaped connecting member, said roller supporters being radially inwardly spaced from the connecting member with substantially equispaced distances therebetween to provide spaces for supporting said needle rollers by captivating major portions of the rollers therewithin with a portion of each roller adapted to extend radially inwardly out of the space; and

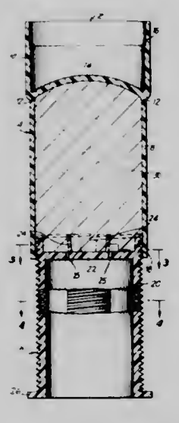
said ring-shaped connecting member being coaxially rotatably supported in said outer race.

4,890,944

CONTAINER AND DELIVERY SYSTEM FOR STICK COMPOSITIONS

Michael A. Cousins, New York, and June Lee, Woodside, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,051
Int. Cl.[4] A45D *40/00, 40/08, 40/16*
U.S. Cl. 401—98 **9 Claims**



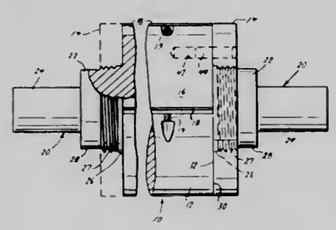
1. A container and delivery system for storing and delivering material for application to a surface, comprising a product holding portion having a hollow interior with inner and outer surfaces and a product advancing portion, (a) said product bolding portion being open at each end and divided into a product section and cap forming section which are molded together in a single piece, the division into two sections being by means of a partition that extends across said hollow interior of said product holding portion, said product section containing the material to be stored and dispensed, said cap forming section being adapted to be separated from said product section and to carry with it on the separation said partition which will serve as the roof for the cap that is formed upon separation, the cap formed thereby being adapted to fit onto and close the open end of said product section, said open end being formed by the separation of said cap forming section from said product section, (b) said product advancing portion being inserted into said product holding portion through said open end of said product bolding portion that is remote from said cap forming section, said product advancing portion being adapted to cooperate with said product holding portion to advance said material through said product holding portion.

4,890,945

ROTARY DIE CYLINDER BEARER ATTACHMENT

James B. Arter, Breese, Ill.; Daniel A. Parsons, Kirkwood, Mo.; Thomas M. Serra, High Ridge, Mo., and Bruce L. Thomas, Ellisville, Mo., assignors to Allied Gear & Machine Company, St. Louis, Mo.

Filed Feb. 12, 1987, Ser. No. 13,661
Int. Cl.[4] F16B *3/00*
U.S. Cl. 403—2 **8 Claims**



1. A rotary die cylinder assembly, comprising:

(a) a cylinder having a longitudinal axis and opposed ends, and said cylinder including an intermediate cylindrical body and opposed reduced diameter concentric shafts at each end, each shaft having an externally threaded portion, said shaft and said body defining an annular engagement face of the cylindrical body,

(b) a pair of cylindrical bearers, each bearer including an inner face and an outer face and a concentric bore extending between said faces, said bore having an internally threaded portion mating with the externally threaded portion of an associated shaft, each bearer being threadedly received on an associated shaft with said bearer inner face engaged in tight, face-to-face contact with an adjacent cylindrical body annular engagement face,

(c) each cylinder end and each associated bearer including a pin-receiving opening, said associated openings being continuous and said opening in said bearer extending completely through the bearer to the adjacent cylinder end, said openings being in register when a bearer inner face is engaged in said tight, face-to-face contact with an associated cylindrical annular face, and

(d) a pair of pins, each pin being receivable within an associated opening of one bearer only to provide a counter-rotational shear connection between said bearer and said contacting faces.

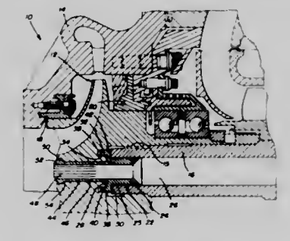
4,890,946

TURBOMACHINERY SHAFT INSERT

George L. von Pragenau, Huntsville, Ala., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed May 26, 1989, Ser. No. 358,028
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—13 **11 Claims**

1. An insert for insertion into an axial bore at the end of a hollow rapidly rotatable shaft having a rotor mounted at said end, said rotor and said shaft having cooperating connecting splines and said rotor having a bore opening into the bore of said shaft, said insert comprising a hollow cylindrical portion receivable within said axial bore, means for securing said cylindrical portion within said axial bore, a web adjacent said cylindrical portion abutting said end of said shaft, said web having an outer peripheral annular flange extending in a direction remote from said shaft, said flange having a radially inner annular surface and a radially outer annular surface, said rotor having an annular recess spaced from the bore thereof, said recess including a radially inner surface for tightly abutting the radially inner annular surface of said flange and a radially outer surface for tightly abutting the radially outer annular surface of



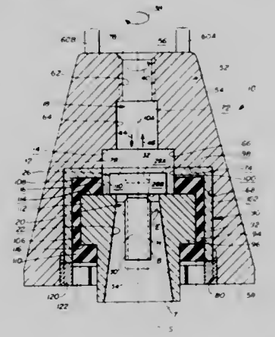
said flange, a tubular portion extending from said web and received within the bore of said rotor, and securing means for fastening said tubular portion to said rotor.

4,890,947

MOUNTING ADAPTER HAVING LOCKING TAPER REMOVAL ARRANGEMENT

John F. Williams, New Canaan, and George F. Silver, Newtown, both of Conn., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1988, Ser. No. 262,996
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—16 **5 Claims**



1. A mounting adapter for a centrifuge rotor, the mounting adapter being receivable on the end of the drive spindle itself having a threaded bore therein and a frustoconical locking taper surface thereon, the mounting adapter comprising;

a spud member having an internal chamber therein, the chamber being defined in part by a first, locking, surface and a second, lifting, surface, the spud member having an threaded access bore and a mounting bore extending therethrough, the mounting bore being bounded by a tapered surface corresponding in shape to the frustoconical locking taper surface on the spindle, both the access bore and the mounting bore being in communication with the internal chamber; and

a connecting member having a head and a threaded shank thereon, the head being confined within the internal chamber with the shank extending into the mounting bore, the connecting member being rotatable in first and second opposed angular directions by a tool extendable through the access bore into engagement with the head of the connecting member,

rotation of the connecting member in the first angular direction threadedly engaging the shank with a threaded bore disposed in a drive spindle and bringing the head into abutting contact with the locking surface thereby to impose a locking force acting in a first direction on the spud member to hold the mounting surface thereon and the frustoconical surface on the spindle in locking engagement,

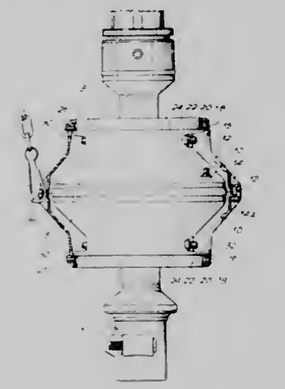
rotation of the threaded member in the second angular direction unthreading the shank from the threaded bore in the spindle and causing the head to abut against the lifting surface thereby to impose a lifting force acting in a second, opposed, direction on the spud member to assist in separating the mounting surface on the spud member from the frustoconical surface on the spindle.

4,890,948

ACCIDENT PREVENTIVE MODULAR DEVICE FOR HOMOKINETIC, WIDE-ANGLE JOINTS INTENDED FOR USE IN AGRICULTURE OR OTHER

Edi Bondioli, Via Gina Bianchi 18, 46029 Suzzara, Mantova, Italy

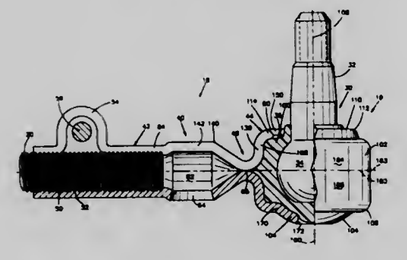
Continuation of Ser. No. 876,235, Jun. 19, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 98,758
Claims priority, application Italy, Jun. 20, 1985, 9442A/85
Int. Cl.[4] F16B *11/00, 3/00*
U.S. Cl. 403—23 **3 Claims**



1. In a wide-angle, constant-velocity, universal joint comprising an end fork, an inner fork, and a central body extending between the end fork and the inner fork, said central body having a pair of opposite ends spaced apart along a rotational driving axis of the joint pivotally connected respectively to said end fork and said inner fork and surrounding a portion of each of said end fork and said inner fork thereby interconnecting said inner fork and said end fork and rotating with said inner fork and said end fork; said central body having a pair of annular seats thereon which defines bearing tracks at the respective opposite ends; an accident prevention guard comprising a bipartite shell including first and second substantially identical parts having opposite ends, one end being smaller than the other end and having annular side walls extending in divergent manner from the respective one ends to the respective other ends and having radially extending flanges at respective other ends and bolt receiving recesses defined in said radially extended flanges, first and second mounting ring portions defining circumferentially extending bearing surfaces, complementary attachment means on the respective one ends of the shell parts and the respective ring portions which attachment means are interengaged to attach the shell parts to the ring portions; bolt means extending through said first and second radially extending end flanges and concealed within said recesses holding said shell parts together with the first and

second radially extending end flanges in opposed relation and the bearing surfaces of the ring portions in circumferential sliding engagement with the bearing tracks of the respective annular seats of the central body and thereby to completely supporting the shell parts on the central body, the first and second shell of the bipartite shell parts cooperating to completely cover a substantial portion the central body; and, means for preventing rotation of said shell upon rotation of said central body.

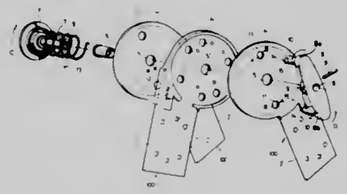
4,890,949
TIE ROD END
Ruey E. Wood, Jr., St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio
Filed Apr. 7, 1988, Ser. No. 178,926
Int. Cl.[4] F16C *11/00*
U.S. Cl. 403—77 **23 Claims**



1. A tie rod end comprising:
a socket defining a chamber and having an opening therein;
a ball stud having a head end portion located in the socket and a shank portion projecting through the opening and having an axis;
a preloaded elastomeric bearing interposed between said socket and said head end portion;
said chamber being at least in part defined by a first surface of said socket which encircles said head end portion and engages said elastomeric bearing and by second and third surfaces which engage opposite ends of said elastomeric bearing and hold said elastomeric bearing in said chamber;
a longitudinally extending tie rod receiving portion defining a chamber for receiving a tie rod therein;
means for securing the tie rod in the chamber defined by said tie rod receiving portion;
a connecting portion interconnecting said socket portion and said tie rod receiving portion and including surfaces extending transverse to the axis of said shank portion and which abut each other to close said chamber adjacent said connecting portion;
said socket, said tie rod receiving portion and said connecting portion comprising one piece of sheet metal having said first, second and third surfaces.

4,890,950
POSITIONING JOINT FOR A FOLDING LADDER
Hoe G. Yoo, Deungchon-Dong, Kangseo-ku, Seoul, Rep. of Korea
Filed Nov. 8, 1988, Ser. No. 268,447
Int. Cl.[4] F16C *11/00*
U.S. Cl. 403—96 **2 Claims**

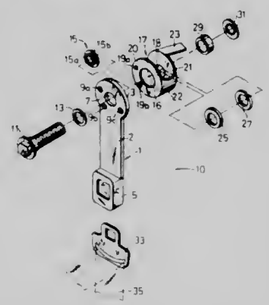
1. A positioning joint for a folding ladder comprising:
a pair of first joint members each having a first circular plate and a fixing portion to be fixed to a ladder frame, each said first circular plate being formed with an axial hole and a pair of locking holes for engaging with locking bars;
a second joint member having a second circular plate and a fixing portion to be fixed to a ladder frame, said second circular plate being formed with an axial hole, and several pairs of positioning holes for allowing a pair of locking bars to pass therethrough;
a button mechanism having an axial shaft formed with a pin hole at the end thereof for combining with a locking member and a coil spring being placed around the shaft;
a locking member having a pair of locking bars each of which is formed with a notch thereon, and a body portion



formed with a central opening for receiving said axial shaft and a pin hole for combining the shaft to the body portion by inserting a pin thereto;
said first and second joint members being pivotally interconnected together by a bushing passing through the axial holes hereof and combining the shaft of button mechanism passing through the bushing to the body portion of locking member by inserting the pin into the aligned pin holes

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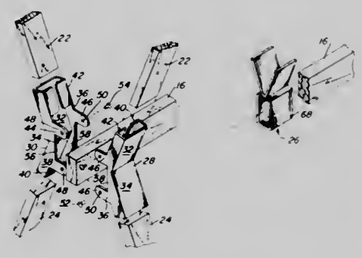
4,890,951
WEBBING SUPPORTING DEVICE
Masaru Morinaga, Yamato, and Kazuhiko Sasaki, Kawasaki, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 11, 1987, Ser. No. 84,025
Claims priority, application Japan, Aug. 13, 1986, 61-123410
Int. Cl.[4] F16B *2/00*; A62B *35/00*
U.S. Cl. 403—96 **12 Claims**



1. A webbing supporting device comprising:
a bolt, said bolt having a longitudinal axis which defines a direction;
a base plate supported pivotally at one end thereof on the bolt so that the base plate is displaceable between at least two positions which are a first position and a second position;
a slip joint supporting a webbing thereon and provided on the other end of the base plate;
a resilient member which is composed of a first plate portion fit loosely on the bolt and arranged close to the base plate, a second plate portion provided at a predetermined distance from the first plate portion in the direction of the longitudinal axis of the bolt, and a connecting part which connects parts of an outer circumference of the first and

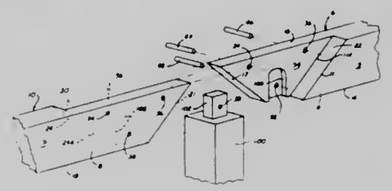
second plate portions to each other, said second plate portion of said resilient member defining a connecting portion to be connected to a vehicle body in order to prevent the resilient member from turning about the longitudinal axis of the bolt; and
cooperating holding means provided respectively on the base plate and the first plate portion of the resilient member so as to hold the base plate on the resilient member at a desired one of said at least two positions, said holding means on said first plate portion being oppositely disposed to the connecting part relative to the bolt.

4,890,952
SAWBUCK CONSTRUCTION AND BRACKET
Richard G. Jones, 200 Sunset Hollow Rd., West Chester, Pa. 19380
Filed Mar. 11, 1988, Ser. No. 166,995
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—172 **2 Claims**



1. For use in a sawbuck comprising end supports having supporting legs and load-retaining arms and a horizontal rail member interconnecting said end supports, end supports comprising a sleeve bracket having angularly upwardly and angularly downwardly oriented socket portions therein, said upwardly and downwardly oriented socket portions being angularly oriented with respect to each other, said downwardly oriented socket portions being adapted to receive upper ends of respective supporting legs and said upwardly oriented socket portions being adapted to receive lower ends of respective load-retaining arms, said sleeve brackets comprising a pair of shell-like open-mouthed channel members having spaced side wall portions thereon, and means interconnecting respective side wall portions thereon of said channel members so that the open mouths of said channel members are juxtaposed and said channel members together form a unitary bracket, said channel members comprising rear wall portions, said side wall portions extending from said rear wall portions, and flange portions extending from said rear wall portions, and flange portions extending from said side wall portions and juxtaposed to said rear wall portions, said rear wall portions, said side wall portions and said flange portions providing said upwardly and downwardly oriented socket portions, said rear wall portions of said channel members having portions thereof angularly disposed with respect to each other by an obtuse angle, whereby said angularly upwardly oriented socket portions are angularly offset with respect to each other by an acute angle and said angularly downwardly oriented socket portions are angularly offset with respect to each other by an acute angle, and said side wall portions of said channel members providing an enclosed socket adapted to receive an end of said horizontal rail member.

4,890,953
WOOD BEAM JOINT AND METHOD OF FORMING
Natale D. Malatesta, Sexton Hill Rd., East Hampton, Conn. 06424
Filed Jul. 23, 1987, Ser. No. 76,917
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—178 **14 Claims**



1. A long wood beam including two short wood beams being connected in line, a first beam having a first attaching end, a second beam having a mating second attaching end, said first beam having a top and bottom, said second beam having a top and bottom, said first attaching end having a first tongue projecting from one side thereof in line with said second beam, said first tongue being one-half of the width of the frist beam, said first beam having a first matching recess adjacent said first tongue, said first tongue having an end surface, said end surface of said first tongue having a 45° angle tapering from the end of the top of the first attaching end of said first beam inwardly into said first beam to the bottom of said first beam, the first matching recess adjacent said first tongue having an end surface, said end surface of said first matching recess having a 45° angle extending upwardly from the end of the bottom of the first attaching end of said first beam to the top of said first beam, said mating second attaching end having a second tongue projecting from one side thereof in line with said first beam, said second tongue being one-half of the width of the second beam, said second beam having a second matching recess adjacent said second tongue, said second tongue having an end surface, said end surface of said second tongue having a 45° angle tapering from the end of the top of the second attaching end of said second beam inwardly into said second beam to the bottom of said second beam, the second matching recess adjacent said second tongue having an end surface, said end surface of said second matching recess having a 45° angle extending upwardly from the end of the bottom of the second attaching end of said second beam to the top of said second beam, said first and second tongues being located against each other, said first tongue occupying said second matching recess and said second tongue occupying said first matching recess, separate means fixing said tongues together.

4,890,954
JOINT CONSTRUCTION AND MOUNTING STRUCTURE
Peter S. Richards, Issaquah, Wash., assignor to Progressive Fastening, Inc., Seattle, Wash.
Continuation-in-part of Ser. No. 47,439, May 6, 1987, Pat. No. 4,802,785, which is a continuation-in-part of Ser. No. 811,939, Dec. 20, 1985, Pat. No. 4,667,916. This application Aug. 22, 1988, Ser. No. 234,700
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—260 **16 Claims**

1. A joint construction, comprising:
a first member including a cylindrical sidewall defining a socket having an inner surface; a second member;
a connector assembly on said second member, said connector assembly comprising:
a threaded stud projecting from said second member having a base and a free end;
a lower locking disk having a center opening through which the stud extends and a plurality of edged wings spaced

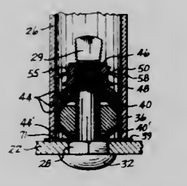
around the disk and bent to extend away from the base of the stud, said lower locking disk having a plan form sized to allow the locking disk to slip fit into said socket;

a cam ring having a center opening through which the stud extends and having upper and lower beveled edges spaced radially outwardly from said stud at opposite ends, said cam ring being smaller in diameter than the inside diameter of said socket;

at least one upper locking disk having a center opening through which the stud extends, and a plurality of edged wings spaced around the disk and bent to extend toward the upper beveled edge of the cam ring, said at least one upper locking disk having a plan form sized to slip fit into said socket;

a nut threaded onto the stud axially outwardly of the at least one upper locking disk;

a nut wing washer on said nut and secured against rotation relative to the nut, said nut wing washer having a plurality of wings bent to extend toward the cam ring, and having



a plan form that is larger than the inside diameter of said socket,

means for holding the nut wing washer against axial movement off of the nut; and

wherein the first and second members are connected together by an insertion movement of the connector assembly on the second member into the socket of the first member, such movement causing a bending of the wings of the nut wing washer, attended by outer edges of such wings gripping the inner surface of the socket and holding the nut wing washer against rotation, followed by a rotation of the second member relative to the first member, with the nut wing washer holding the nut in position relative to the first member during such rotation, causing relative axial travel of the nut on the stud toward the cam ring, and with such axial travel causing the beveled edges of the cam ring to push the wings of the upper and lower locking disks outwardly, so as to press their edges into tight gripping engagement with the inner surface of the socket.

4,890,955

CONTROL DEVICE FOR UNDERGROUND DRAINAGE NETWORK

Francois Mercier, Montreal, Canada, assignor to Innotag Inc., Quebec, Canada

Filed Feb. 22, 1989, Ser. No. 313,495

Claims priority, application United Kingdom, Feb. 22, 1988, 8804009

Int. Cl.[4] E02B *11/00*

U.S. Cl. 405—37 **8 Claims**



1. A control device for use with an underground drainage network of main collectors and adjacently disposed water-collecting pipes, comprising:

one or more head control stand means disposed at one or more predetermined locations of said network;

valve means in a main collector associated with each said stand means; and

water table depth-measuring means disposed between two adjacent water-collecting pipes of said network; said measuring means being associated with said stand means to open or close said valve means when the level of water between two adjacent pipes reaches a desired value for optimal plant growth.

4,890,956

ROCK CHAMBER STRUCTURE FOR STORING GAS OR LIQUID

Torbjörn Hahn, Myggdalsvägen 77, Tyresö S-135 42, Sweden

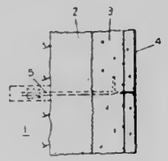
PCT No. PCT/SE86/00323, § 371 Date Nov. 2, 1987, § 102(e) Date Nov. 2, 1987, PCT Pub. No. WO87/00151, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 2, 1986, Ser. No. 44,508

Claims priority, application Sweden, Jul. 3, 1985, 8503322

Int. Cl.[4] B65G *5/00*; E21D *21/00*

U.S. Cl. 405—55 **5 Claims**



1. A structure for storing liquid or gas at high pressure, comprising a storage space surrounded by rock, and multilayer lining means lining said storage space for transmitting pressure of the stored liquid or gas to the surrounding rock while preventing external water pressure build-up on said lining means, said lining means including a concrete layer enclosing said storage space, a compressible drainage layer of loose granules disposed between said concrete layer and the surrounding rock and enclosing said concrete layer, and a layer of thin-sheet sealing material mounted to said concrete layer on a side thereof that faces said storage space and sealingly enclosing said storage space, said concrete layer being anchored to the surrounding rock by expandible bolt means, said expandible bolt means being movable relative to the surrounding rock so as to permit displacement of the concrete layer toward the surrounding rock under pressure of the stored liquid or gas.

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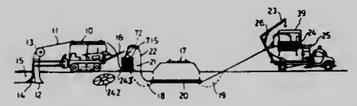
CABLE LAYING APPARATUS

David E. Rinas, 4618-35th Street, Lloydminster, Saskatchewan, Canada S9V 1S9

Continuation-in-part of Ser. No. 829,914, Feb. 18, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 239,869

Int. Cl.[4] E02F *5/10*; B65H *49/02*

U.S. Cl. 405—174 **8 Claims**



1. A method of laying a cable in the ground from a supply reel of the cable on which the cable is wound in revolutions around the reel from an inner end outwardly to an exposed outer end, the method comprising transporting the supply reel across the ground on a transport vehicle, withdrawing cable from the outer end on the supply reel so as to unwind from the reel, laying the withdrawn cable in a first laying step continuously in the ground along a path followed by the transport vehicle up to a position adjacent an obstruction, halting the unwinding of cable at the obstruction, excavating an opening to pass the obstruction, removing the supply reel from the vehicle, extracting and withdrawing the inner end of the cable from the reel, passing the inner end through the opening, unwinding cable from the reel with the inner end of the cable leading such that, as the cable unwinds, one turn of twist is inserted into the cable for each revolution unwound, attaching the inner end of the cable onto a second reel positioned downstream of the obstruction, and rewinding the cable onto the second reel as it unwinds from the supply reel, attaching the second reel to the transport vehicle so as to be transported across the ground, withdrawing cable from the second reel, laying the withdrawn cable in a second laying step in the ground along a path followed by the transport vehicle carrying the second reel from the obstruction, and arranging the direction of winding of the cable onto the second reel relative to the direction of unwinding of the cable from the supply reel at the obstruction and relative to the direction of unwinding of the cable from the second reel as it is transported in the second laying step such that the cable is free from twist as it is laid.

4,890,958

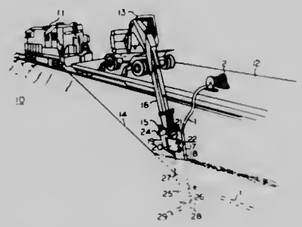
RAILROAD CABLE/PIPE PLOW AND METHOD THEREFOR

Jerry N. Dancer, 821 Rockefeller Rd., Adrian, Oreg. 97901

Filed Jan. 17, 1989, Ser. No. 297,332

Int. Cl.[4] F02F *5/10*

U.S. Cl. 405—180 **11 Claims**



1. A plowing tool for attachment to a hydraulic boomed vehicle being secured to a railed railroad car which is in turn coupled to a railed locomotive, which comprises:

a vertical blade having a leading edge and a trailing edge;

pivotal attachment means for attaching said vertical blade to a hydraulic boom; and

a cable secured at its first end to said vertical blade and at its second end to the locomotive for reducing a moment about a connection between the rails and the railroad car which is due to a moment about the attached boomed vehicle created while plowing.

4,890,959

TRANSPORTATION AND CONSTRUCTION METHOD

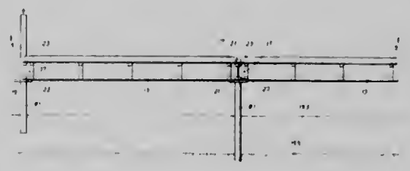
Alces P. Robishaw, 9333 Memorial #210, Houston, Tex. 77024, and Paul A. Robishaw, 10122 Meadow Lake La., Houston, Tex. 77042

Continuation-in-part of Ser. No. 757,631, Jul. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 642,181, Aug. 17, 1984, Pat. No. 4,610,215, and Ser. No. 704,500, Feb. 22, 1985, Pat. No. 4,647,257. This application Feb. 6, 1986, Ser. No. 825,416

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—204 **32 Claims**



1. A transportation and construction method comprising the steps of:

transporting a plurality of construction components to a construction site at least party way in the manner of ISO standard freight containers;

emplacing a plurality of first such general construction components at the construction site with said first components connected in side-by-side relation to form a first span supported by an underlying earth formation in a fixed position as part of a structure to be built;

then positioning a plurality of second such general construction components with each of said second components adjacent a respective one of said first components, and with said second components connected in side-by-side relation to form a second span;

temporarily supporting said second components in cantilever fashion on said first components to generally locate said second components as part of said structure;

then extending second support means downwardly from said structure adjacent said second components into load bearing engagement with said earth formation in a fixed position as part of said structure;

then interlocking said second components to said second support means for support thereby in a fixed position as part of said structure;

then positioning a plurality of third such general construction components with each of said third components adjacent a respective one of said second components distal said first components, and with said third components connected in side-by-side relation to form a third span;

temporarily supporting said third components in cantilever fashion on said second components to generally locate said third components as part of said structure;

then extending third support means downwardly from said structure adjacent said third components into load bearing engagement with said earth formation in a fixed position as part of said structure;

then interlocking said third components to said third support means for support thereby in a fixed position as part of said structure;

and continuing to enlarge said structure by temporarily supporting additional spans of general construction components in cantilever fashion on already fixed portions of said structure to generally locate said additional spans as parts of said structure, then extending respective support means downwardly from said structure adjacent said additional spans into load bearing engagement with said

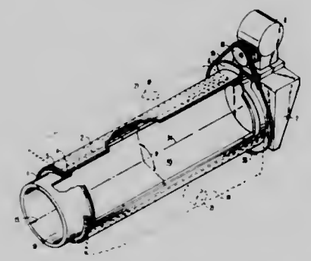
earth formation in fixed positions as part of said structure, and then interlocking said additional spans to the respective support means for support thereby in fixed positions as parts of said structure, until said structure is enlarged generally to a desired size.

4,890,960

VACUUM METERING DRUM ASSEMBLY

Elliott D. Brown, Salinas, Calif., assignor to Raymond Production Systems Corporation, Hollister, Calif.

Filed Oct. 11, 1988, Ser. No. 255,768
Int. Cl.[4] B41F *13/04*
U.S. Cl. 406—80 **12 Claims**



1. A drum device for the rotation of can-shaped objects over a curved surface from a first to a second location comprising:

(a) an inner, hollow, non-rotating, cylindrical member possessing a substantially horizontal longitudinal axis and circular cross section;

(b) an onter, hollow, rotating, cylindrical member oriented along substantially the same longitudinal axis and possessing a slightly larger circular cross section as said non-rotating, cylindrical member to enable said outer hollow, rotating, cylindrical member to rotate about said inner, hollow, non-rotating, cylindrical member, said outer, rotating, cylindrical member being further characterized as being perforated to enable low pressure established within said inner, hollow, non-rotating, cylindrical member to draw air through said outer, hollow, rotating, cylindrical member in an amount sufficient to secure said can-shaped objects thereto;

(c) an open segment within the surface of said inner, hollow, non-rotating, cylindrical member, said open segment being dimensioned along said longitudinal axis for a length substantially contiguous to said outer, hollow, rotating, cylindrical member and of a circumferential dimension to enable air to he drawn through the open segment and through the perforated outer, hollow, rotating, cylindrical member to adhere said can-shaped objects to the surface of said outer, hollow, rotating, cylindrical member from said first to second locations; and

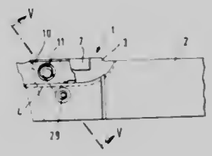
(d) means for rotating said outer, hollow, rotating, cylindrical member about said substantially horizontal longitudinal axis.

4,890,961

LATHE TOOL EQUIPPED WITH REVERSIBLE PLATES FOR CUTTING GROOVES OR THREADS

Hans-Georg Carl, Asperg, and Roland Beuchler, Höfendorf, both of Fed. Rep. of Germany, assignors to Montanwerke Walter GmbH, Tübingen, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 101,865
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639672
Int. Cl.[4] B23B *27/08*
U.S. Cl. 407—105 **14 Claims**



1. In a lathe tool comprising a holder and a reversible cutting plate for cutting a groove or thread, the holder being formed to have a holder recess for accommodating the cutting plate, the holder recess having a bottom face and a side face, and the cutting plate having a longitudinal dimension, two longitudinally spaced frontal end faces each having a cutting edge, a narrow longitudinally extending face extending between the frontal end faces and arranged to bear against the bottom face of the holder recess, a longitudinally extending broad side extending between the frontal end faces and transversely to the narrow face and arranged to bear against the side face of the holder recess, and a fastening bore having an axis extending transversely to the broad side, the lathe tool further including clamping means for holding the cutting plate in the recess with the narrow face and broad side of the cutting plate bearing against the bottom face and side face, respectively, of the holder recess, the clamping means including a clamping element disposed in the region of the side face of the holder recess and passing through the fastening bore in the cutting plate, and the cutting plate being reversible in position relative to the holder about the axis of the fastening bore, the improvement wherein:

said cutting plate has substantially the form of a parallelogram in the plane of said broad side, with said frontal end faces forming two opposed sides of said parallelogram;

each said frontal end face of said cutting plate is provided with a planar abutment surface portion, a transition face and a cutting edge portion, said cutting edge portion carrying said cutting edge and being disposed adjacent said transition face, at least part of said transition face being noncoplanar with at least part of said abutment surface portion, said abutment surface portion extending over only a part of said frontal end face and being set back in the direction of the longitudinal dimension from said cutting edge portion to define, with said transition face, a cutting plate recess which is open along its edges;

said abutment surface portions of said two frontal faces are in symmetry to one another with respect to said bore axis; and

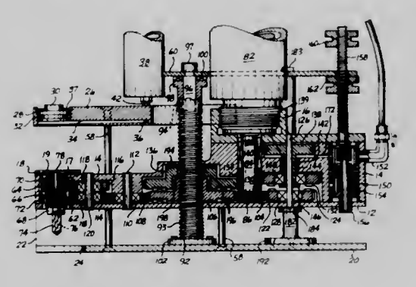
said holder comprises an axial abutment member which is accommodated in said cutting plate recess and against which said abutment surface portion of said one frontal end face is pressed when said clamping means holds said cutting plate in said holder recess.

4,890,962

PORTABLE POSITIVE FEED DRILL

Daniel L. Nydegger, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 16, 1989, Ser. No. 312,615
Int. Cl.[4] B23B *41/00*
U.S. Cl. 408—14 **27 Claims**



1. A positive feed drill comprising:

a housing elongated along a main axis;

a drill spindle carried by a forward end portion of the housing, said spindle being perpendicular to said axis and adapted to hold a drill bit;

a motor carried by the housing and having a drive shaft spaced rearwardly from said spindle along said axis;

a foot positioned to engage a workpiece;

an elongated feed member parallel to said spindle, positioned between said spindle and said drive shaft, and having an outer end attached to said foot;

drive train means in the housing for transmitting rotation of said drive shaft to rotate said spindle, and to translate the housing relative to said feed member toward and away from said foot;

at least one leader pin parallel to and spaced rearwardly from said feed member and having an outer end attached to said foot; and

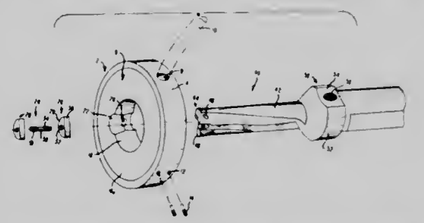
bearing means carried by the housing for engaging said pin to allow the housing to slide freely along said pin, said bearing means cooperating with said pin to provide stiffness between the housing and said foot.

4,890,963

CUTTING FLUID TRANSPORTING DEVICE AND CUTTING TOOLS EMPLOYING THE SAME

George Keritsis, Knoxville, Tenn., assignor to Carboloy Inc., Warren, Mich.

Filed Jun. 21, 1988, Ser. No. 209,539
Int. Cl.[4] B23B *27/10*; **F16L** *27/08*
U.S. Cl. 408—59 **34 Claims**



1. A collar adapted to be engaged about a rotating cutting tool for transporting a cutting fluid from a stationary source to the rotating cutting tool comprising:

(a) an outer ring comprising means for receiving the cutting fluid from the stationary source;

(b) an inner ring having a cutting tool contacting surface and means for transporting the cutting fluid to the cutting tool, said inner ring adapted to be inserted within the outer ring in sealed engagement, wherein the sealed outer and inner rings form a first channel for passage of the cutting fluid from the cutting fluid receiving means of the outer ring to the transport means of the inner ring and at least one second channel comprising means for enabling the inner ring to rotate within the outer ring in concert with the rotation of the cutting tool while the outer ring remains stationary;

(c) sealing means positioned between the cutting tool contacting surface of the inner ring and the cutting fluid receiving means of the cutting tool and adapted to provide flat face to face pressure contact between the inner ring and the cutting tool to thereby provide a sealed passageway for the flow of the cutting fluid from the first channel to the cutting tool and to prevent rotational slip between the inner ring and the cutting tool; and

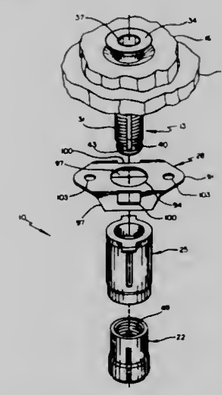
(d) locking means secured to the inner ring and adapted to exert additional pressure contact on the cutting tool in the direction of the sealing means to thereby secure the collar about the cutting tool.

4,890,964

SELF-LOCKING FASTENER APPARATUS

Adrian Q. Lindley, Grantham, England, and Frank J. Cosenza, Santa Barbara, Calif., assignors to Rexnord Inc., Torrance, Calif.

Filed Jun. 24, 1988, Ser. No. 211,430
Int. Cl.[4] F16B *37/08, 39/36*
U.S. Cl. 411—270 **16 Claims**



1. A fastener apparatus comprising:

a nut including a forward cylindrical section and a coaxial rearward cylindrical section, and further including a threaded bore extending axially through the forward and rearward sections, for threadedly receiving a bolt, wherein the rearward section of the nut has an outer diameter greater than the outer diameter of the forward section, and wherein the nut further includes means defining a plurality of longitudinal through-slot spaced uniformly around its periphery, the through-slots all extending along the entire length of the nut's rearward section and projecting partially into the nut's forward section, such that the rearward section of the nut is deformable radially inwardly in response to a uniform radial compressive force;

a locking sleeve including a forward section with a cylindri-

cal recess having a diameter intermediate the outer diameters of the forward and rearward sections of the nut and further including a rearward section with a cylindrical recess having a diameter greater than the outer diameters of both the forward section and the rearward section of the nut, wherein the cylindrical recesses of the sleeve's forward and rearward sections are axially aligned with each other and are adapted to receive the nut;

wherein the locking sleeve further includes means defining a plurality of longitudinal through-slots spaced uniformly around its periphery, the through-slots extending along a substantial portion of the sleeve's forward section such that the sleeve's forward section is deformable radially outwardly when the nut is threadedly advanced to a location where the nut's rearward section is compressively engaged by the sleeve's forward section; and

means for preventing the nut from rotating relative to the locking sleeve, about the axis of the nut's threaded bore;

wherein rotation of the bolt relative to the nut threadedly moves the nut axially toward the forward section of the locking sleeve, to bring the rearward section of the nut into radially compressive engagement with the forward section of the locking sleeve, to radially compress the nut against the bolt and thereby resist unthreading of the bolt.

4,890,965

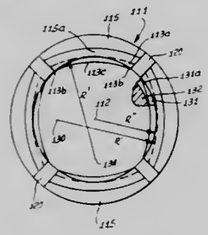
FASTENER WITH RELIEVED THREAD SECTION ENDS

Robert W. Dietlein, 1963 Glenbrook House Rd., Glenbrook, Nev. 89413

Continuation-in-part of Ser. No. 118,479, Nov. 9, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,117

Int. Cl.⁴ F16B *39/28*

U.S. Cl. 411—280 **7 Claims**



1. In a lock nut, the combination comprising:

(a) an annular body defining an axis and having an internal thread along its axial length,

(b) locking members integral with and projecting generally axially of the body, at one end thereof, the members being circumferentially spaced about said axis, to define at least three radial slots between the members, the slots equally spaced about said axis,

(c) the members having internal thread segments at their sides facing the axis,

(d) the thread segments having opposite ends, circumferentially with inner edges spaced further from the body axis than the thread segment mid portions,

(e) the members being cantilever members that taper toward said axis along member length between the slots,

(f) each member further deformed so that thread segments thereon extend along generally circular arcs that have axes offset from said body axis,

(g) said thread segments having arc curvature, and said body outwardly of said segments having an outward surface with curvature, said arc curvature being less than said body outward surface curvature.

4,890,966

SECURING CLIP

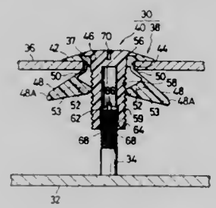
Takashi Umezawa, Sagamihara, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Aug. 3, 1988, Ser. No. 227,854

Claims priority, application Japan, Aug. 7, 1987, 62-121328

Int. Cl.⁴ F16B *21/00*

U.S. Cl. 411—340 **15 Claims**



1. A clip for securing a member to a stud or similar support member, comprising:

a first member having a head portion for engagement with a first surface of said member to be secured; a through-hole defined within said head portion; radially outwardly expansible locking portions operatively connected to said head portion and engageable with a second surface of said member to be secured when moved to a radially outwardly expanded position so as to cooperate with said head portion whereby said member to be secured is clampingly engaged between said head portion and said locking portions; and first locking means defined upon said locking portions; and

a second member comprising an insertion portion to be inserted through said through-hole of said head portion of said first member so as to engage said locking portions of said first member and thereby move said locking portions to said radially outwardly expanded position; second locking means defined upon said insertion portion of said second member for lockingly engaging said first locking means of said locking portions of said first member when said insertion portion has been inserted through said through-hole of said head portion of said first member and has engaged said locking portions of said first member so as to move said locking portions to said expanded position, whereby said member to be secured will be lockingly clamped between said head and locking portions of said first member and said first and second members will be locked together; and bore means defined within an end portion of said insertion portion for lockingly receiving said stud-type support member whereby said clip, comprising said first and second members, is able to secure said member to be secured to said stud-type support member.

4,890,967

BOLT CAP DEVICE

Amir P. Rosenbaum, Cupertino, Calif., assignor to Spectre Industries, Inc., San Jose, Calif.

Filed Oct. 6, 1987, Ser. No. 106,551

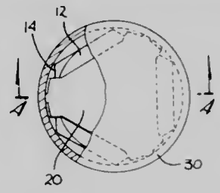
Int. Cl.⁴ F16B *19/00, 33/00*

U.S. Cl. 411—372 **11 Claims**

1. A removable and reusable cover for covering an exposed portion of a fastener, said exposed portion including a plurality of radially disposed external flat surfaces, said cover comprising:

a retainer having a plurality of legs that align with at least two of said flat surfaces, and

a removable cap for compressing and elastically deforming said legs between said flat surfaces and said cap, said cap



retained in place by said retainer and substantially immobile with respect to said fastener.

4,890,968

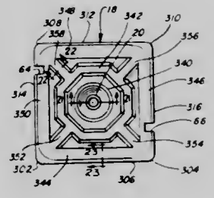
STACKABLE ROOFING WASHER

John R. Beach, Elmhurst; Syed R. Hasan, Palatine; Donald W. Noren, Glenview; Craig A. Hindman, and Ernest S. Santi, both of Palatine, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 15, 1989, Ser. No. 311,013

Int. Cl.⁴ F16B *43/00*

U.S. Cl. 411—531 **6 Claims**



1. A stackable, individually machine-dispensable, roofing washer for use with roofing material, such as a blanket of roofing insulation or a roofing membrane, said washer having a periphery, having a central aperture adapted to receive a fastener, and being formed with at least one notch at the periphery, the notch adapting said washer when stacked with a plurality of other washers in a stack to fit into a washer stack-receiving chute of a washer-dispensing machine, in which the chute is provided with a rib corresponding to each such notch and being fittable into each such notch to restrain said washer and the other washers in the stack received by the chute against cascading from the stack if said chute is tipped so as to tip the stack.

4,890,969

FLEXIBLE MANUFACTURING APPARATUS HAVING SEVERAL PARALLEL, SPACED-APART PROCESSING MACHINES

Karl-Josef Esser, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Scharmann GmbH & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,232

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715032; May 26, 1987, 3717683

Int. Cl.⁴ B23Q *3/157*

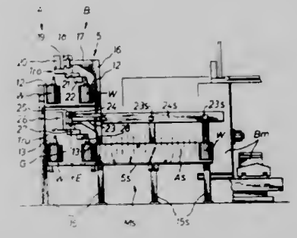
U.S. Cl. 414—277 **19 Claims**

1. A flexible manufacturing apparatus having several parallel, spaced-apart yet side-by-side processing machines, several shelf-like magazines disposed a the rear of said processing machines and extending transverse thereto, and transport means for conveying tools from said magazines to said processing machines or to magazines thereof; said apparatus further comprises:

two magazine rows, each of which is comprised of lower and upper magazine sections having superimposed bottoms, including a lower shelf bottom and an upper shelf bottom, for holding tools;

an upper transport rail;

a lower transport rail;



transport means in the form of a first upper transport mechanism, which, above the height of a person, is disposed on said upper transport rail, and a second lower transport mechanism, which, below said upper transport mechanism end at approximately half the height thereof, is disposed on said lower transport rail; and

at least one means for conveying tools suspended vertically for horizontal transporting and transferable in a vertical plane from said lower to said upper magazine sections, and vice versa.

4,890,970

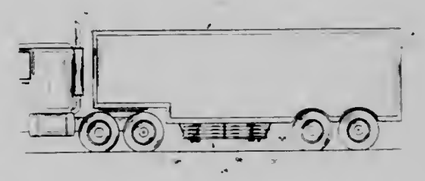
PORTABLE PALLET CARRIER

Michael B. Willits, 18132 Highway 392, Greeley, Colo. 80631

Filed Dec. 14, 1988, Ser. No. 284,179

Int. Cl.⁴ B60R *9/00;* **B62D** *25/20*

U.S. Cl. 414—462 **7 Claims**



1. In combination:

a wheeled trailer having a floor means spaced above ground level, said floor means having an underside,

a wheeled pallet support means adapted to support a plurality of stacked pallets thereon beneath the underside of said floor means, and

at least a pair of spaced apart belt and winch means operatively interconnecting said pallet support means and said trailer for selectively raising and lowering said pallet support means and the pallets thereon with respect to said floor means,

each of said belt and winch means comprising:

a first bracket means operatively secured to said trailer at one side thereof beneath said floor means,

an elongated flexible strap means secured at one end thereof to said first bracket means and extending downwardly therefrom and thence beneath said pallet support means towards the other side of said trailer,

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a second bracket means operatively secured to said trailer at the other side thereof beneath said floor means, and

a winch means operatively secured to said second bracket means adapted to engage the other end of said strap means whereby said strap means may be selectively rolled upon said winch means to raise said pallet support means or selectively unrolled therefrom to lower said pallet support means.

4,890,971

WARP-BEAM LIFTING AND TRANSPORT CARRIAGE

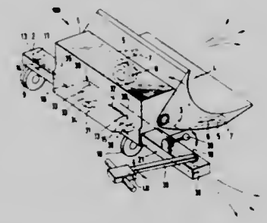
Winfried Heger, Hofbiber, Fed. Rep. of Germany, assignor to Hubtex Maschinenbau GmbH, Fulda, Fed. Rep. of Germany

Filed Sep. 25, 1986, Ser. No. 911,802

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 8527486[U]

Int. Cl.⁴ D02H *13/38*

U.S. Cl. 414—546 **3 Claims**



1. A warp-beam lifting and transport carriage with an undercarriage having wheels which are arranged on both sides of the longitudinal axis and of which at least one is driven and at least some are steerable, with a drawbar which is pivotable about a vertical axle and which is steerably connected to the steerable wheels, with a coupling device for changing the steering connection between the drawbar and the steerable wheels, and with a supporting device which is intended for the warp-beam and which projects laterally relative to a longitudinal axis of the warp-beam lifting and transport carriage and is pivotable up and down, wherein,

(a) two steerable wheels are arranged in succession in the longitudinal direction on the side facing away from the supporting device;

(b) a wheel fixed in a direction of longitudinal travel is provided between the wheels on the side facing the supporting device;

(c) by means of the coupling device the steering connection of the two steerable wheels can be changed over from steering in the same direction to steering in the opposite direction;

(d) the steering connection of the steerable wheels comprises a chain arrangement acting on pinions on the steering pivots of the steerable wheels, wherein two pinions surrounded respectively by an open chain and a crossed chain are arranged above one another on the steering pivot of one wheel, and werein the steering connection to the other steerable wheel can be changed over from the open chain to the crossed chain by means of the coupling device;

(e) the coupling device comprises three pinions which are arranged above one another on an intermediate shaft and are rotatable independently of one another and of which the upper and the lower are connected respectively via the open and crossed chains to the pinions on the steering pivot of one steerable wheel and the middle pinion is connected via a further chain to a pinion on the steering pivot (12) of the other steerable wheel, and wherein the middle pinion can be connected in terms of rotation either to the upper pinion or to the lower pinion or via a claw coupling.

4,890,972

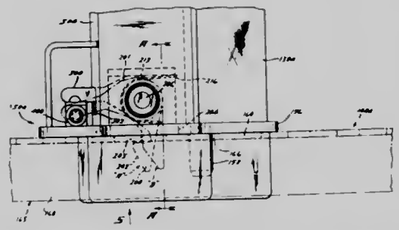
QUICK CONNECT/DISCONNECT WHEEL CRADLE ARRANGEMENT FOR WHEEL LIFT TOWING SYSTEMS

Randy A. Nekola, Soddy, Tenn., and Fleming V. Cannon, Jr., Flintstone, Ga., assignors to Century Wrecker Corporation, Ooltewah, Tenn.

Filed Jun. 30, 1988, Ser. No. 213,875

Int. Cl.⁴ B60P *3/12*

U.S. Cl. 414—563 **16 Claims**



1. In a wheel lift towing system having a cross arm assembly and a wheel cradle member including a side arm extending transversely of the cross arm assembly, apparatus for enabling quick connection and disconnection of the side arm to and from the cross arm assembly, the apparatus comprising:

socket means on one of an end portion of the cross arm assembly and a lateral peripheral surface of the side arm, the socket means including a socket opening shaped for receipt of one of the lateral peripheral surface of an associated side arm and the end portion of the cross arm assembly, such that the wheel cradle members may be releasably coupled to the cross arm assembly via an inwardly lateral sliding action of the side arm substantially parallel to a longitudinal axis of the cross arm assembly while the side arm extends transversely to the longitudinal axis, latch means in one of the side arm and the socket means and latch engaging means in the other of the side arm and the socket means for coupling the side arm to the socket means, the latch means comprising a pivotable latching member coupled for rotation about pivot means, said pivot means for biasing the latching member to a latched position, the pivotable latching member including an engaging notch adjacent to a camming surface of the latching member and lever means for permitting rotation of the pivotable latching member away from its latched position, and the latch engaging means comprising a series of positioning holes each shaped to permit engagement of the camming surface of the pivotable latching member with a surface surrounding the positioning hole so as to cause rotation of the pivotable latching member such that the engaging notch of the pivotable latching member captures a portion of the surface surrounding the positioning hole upon the inwardly lateral sliding action of the side arm, thereby releasably coupling the side arm to the socket means, the series of positioning holes providing means for adjusting the length of the side arm relative to the cross arm assembly.

4,890,973

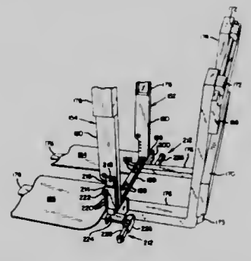
UNIVERSAL FORK-SUPPORTED PUSH-PULL SLIP SHEET HANDLING ATTACHMENT FOR FORKLIFT TRUCKS

Emmett C. Frison, Portland, Oreg., and Daniel F. Chase, Kelso, Wash., assignors to Brudi Equipment, Inc., Kelso, Wash.

Continuation-in-part of Ser. No. 692,285, Jan. 16, 1985, Pat. No. 4,828,450. This application Nov. 20, 1987, Ser. No. 123,536

Int. Cl.⁴ B66F *9/14*

U.S. Cl. 414—607 **26 Claims**



1. A push-pull attachment for mounting on a forklift truck having a lift carriage means including a pair of load lifting forks mounted on a lift carriage, the forks including generally horizontally extending load-supporting fork portions and upright fork portions, the attachment comprising:

an upright base frame;

load-engaging platen means connected to and extending forwardly from said base frame;

a push-pull assembly connected to said base frame above said platen means including an upright push plate, extensible and retractable means for moving said push plate inwardly and outwardly from said base frame above said platen means, and gripping means associated with said push plate to grip a slip sheet and pull it and a load supported thereon onto said platen means;

connecting means for connecting said base frame to the lift carriage means of the forklift truck to resist forward movement of the base frame relative to the lift carriage while the base frame, platen means and push-pull assembly are vertically supported on the forks;

said base frame comprising an open framework including a pair of transversely spaced upright side frame members having substantially greater fore-and-aft width dimensions than their transverse thickness dimensions and top and bottom cross frame members joining said side frame members;

said platen means comprising a relatively thin planar platen plate means connected directly to the underside of said bottom cross frame member with an upper face of the platen plate means engageable with a lower face of the bottom cross frame member, and with the lower face of the platen plate means engageable by upper faces of the load lifting forks.

4,890,974

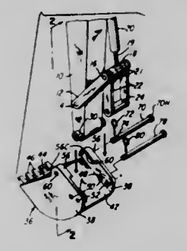
EASY CONNECTION OF DIPPER STICK TO TOOL OF AN EARTH WORKING MACHINE

David Kistner, 4028 Mohegan Ave., Huber Heights, Ohio 45424

Filed Feb. 6, 1989, Ser. No. 306,051

Int. Cl.⁴ E02F *3/40*

U.S. Cl. 414—723 **2 Claims**



2. A tool attachable by means of a connection pin to a dipper stick of a machine, the dipper stick having a lower end portion which is provided with a tubular connection member, the tool being provided with a pair of spaced-apart elongate connection plates parallel to each other, each of the connection plates having an opening therethrough, a pair of elongate guide members, each of the elongate guide members having an abutment portion, each of the elongate guide members having a length portion, each elongate guide member being attached to one of the connection plates with the abutment portion thereof adjacent the opening therethrough and with the length portion of the guide member substantially normal to its respective connection plate and with the length portion projecting laterally from its respective connection plate and parallel to an upper edge thereof whereby the tubular connection member of the dipper stick can be positioned between the connection plates and moved into close relationship to the elongate guide members, and guidingly moved along the length portion of the guide members until the tubular connection member engages the abutment portions of the guide members, whereby the tubular connection member is positioned in alignment with the openings through the connection plates and whereby the connection pin can be inserted through the openings in the connection plates and through the tubular connection member, whereby tubular connection member and the dipper stick are attached to the tool.

4,890,975

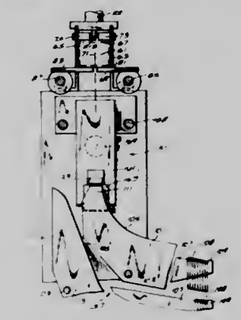
LOOP SPRING STACKING MACHINE

Jeffrey H. Hoff; Michael L. Kozak, and Horst F. Wentzek, all of Kenosha, Wis., assignors to Frank L. Wells Company, Kenosha, Wis.

Filed Mar. 31, 1988, Ser. No. 176,212

Int. Cl.⁴ B65G *57/16*; C21D *9/02*

U.S. Cl. 414—788.9 **22 Claims**



1. Apparatus for stacking loop springs which include a series of oppositely oriented U-shaped loops, said apparatus comprising a frame, a chamber on said frame for temporary and one-at-a-time storage of the springs, means on said frame for guiding and supporting springs into an aligned stack, said spring guiding and supporting means being located below said chamber and having spring guiding and supporting surfaces extending transversely downwardly and outwardly with respect to said chamber, and means on said frame and operative independently of said guiding and supporting means for effecting

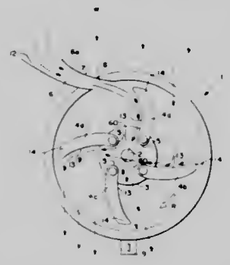
spring discharge from said chamber and directly onto said guiding and supporting means.

4,890,976

WIND TURBINE

Peter Jamson, 33 Peakivil Street, Willoughby, New South Wales, 2068, Australia

Continuation of Ser. No. 125,589, Nov. 25, 1987, abandoned. This application May 9, 1989, Ser. No. 349,909
Int. Cl.[4] F03D *1/04*
U.S. Cl. 415—4.4 **3 Claims**



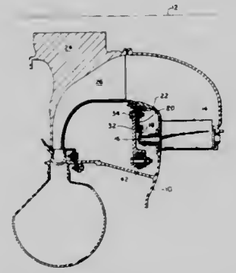
1. A wind turbine comprising:
a rotor plate;
a plurality of vanes mounted to and extending outwardly from said rotor plate, said rotor plate and said plurality of vanes being adapted to rotate about a vertical axis and each of said plurality of vanes being formed with an elongate trailing face;
said plurality of vanes being mounted to said rotor plate in at least two pairs of oppositely mounted vanes;
butt ends provided in connection with each of said plurality of vanes, said butt ends being juxtaposed and staggered relative to each other;
said plurality of vanes, when viewed in transverse cross-section, each comprising a substantially U-shaped portion defining a trailing face of each of said plurality of vanes, said U-shaped portion being positioned within an outer and substantially V-shaped member which forms a leading edge of each of said plurality of vanes, said U-shaped portion diminishing in depth from the inner rounded butt end towards an outer end of each of said plurality of vanes and being dished in configuration adjacent each said outer end;
wind deflection means for defining a primary venturi, said wind deflection means gathering and directing wind through the primary venturi and against a concave trailing face of at least one of said plurality of vanes as said rotor and the at least one of said plurality of vanes rotate away from the primary venturi; and
a plurality of secondary venturi is formed between the juxtaposed, staggered and rounded butt ends of said plurality of vanes;
whereby wind passes through said primary ventrui to be directed against and along the elongate concave trailing face of said at least one of said plurality of vanes as they rotate away form said primary venturi, the wind being further directed radially inwardly of said at least one of said plurality of vanes for passage through said plurality of secondary venturi is to be directed along the elongate concave trailing face of one or more opposite vanes rotating toward said primary venturi.

4,890,977

VARIABLE INLET GUIDE VANE MECHANISM

Eric Tremaine, and Allan B. Newland, both of Quebec, Canada, assignors to Pratt & Whitney Canada, Inc., Quebec, Canada

Filed Dec. 23, 1988, Ser. No. 289,114
Int. Cl.[4] F01D *17/00*
U.S. Cl. 415—164 **7 Claims**



1. An actuator system for simultaneously pivoting a plurality of guide vanes in a turbomachine having an annular gas flow path, the guide vanes spaced circumferentially about the gas flow path and pivotally secured to a nonrotating annular housing of said turbomachine, each of the plurality of vanes including a spindle portion, coincident with the pivot axis thereof and extending through the housing, wherein the system comprises:
a ring gear, disposed about the annular housing and supported radially with respect thereto, the ring gear further including a circumferentially extending toothed track,
a plurality of vane gears, each gear secured to a vane spindle and including an arcuate toothed portion engaged with the toothed track,
means, disposed between the housing and the ring gear, for selectively rotating the ring gear circumferentially within an operating range of motion,
means, disposed between the housing and the ring gear, for axially restraining the ring gear during movement within the operating range of motion, said retaining means further being releasable when the ring gear is circumferentially rotated into a release position lying outside of the operating range of motion.

4,890,978

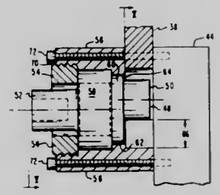
METHOD AND APPARATUS FOR VANE SEGMENT SUPPORT AND ALIGNMENT IN COMBUSTION TURBINES

Leroy D. McLaurin, Winter Springs; Roland E. Williams, Altamonte Springs; John P. Doulan, Oviedo, all of Fla., and Kent G. Hultgren, Swarthmore, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1988, Ser. No. 259,811
Int. Cl.[4] F03B *3/18*; F01D *25/00*
U.S. Cl. 415—209.4 **19 Claims**

1. A gas turbine having an apparatus for supporting and aligning a vane segment comprising:
a torque plate having a center hole;
a rotatable, eccentric bushing disposed within said center hole of said torque plate; and

a pin in cooperative relation to said rotatable bushing such that when said rotatable bushing is rotated said pin engages said vane segment thereby aligning said vane segment.

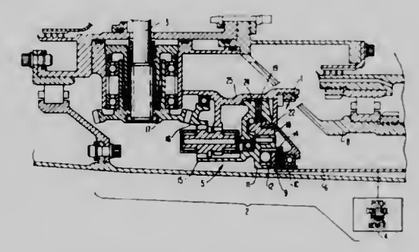


4,890,979

NO-BACK APPARATUS FOR PROPELLER PITCH CONTROL

John E. Ames, Rockford; Bruce A. Krandel, Cherry Valley, and Allyn M. Aldrich, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 28, 1988, Ser. No. 225,383
Int. Cl.[4] B64C *11/34*
U.S. Cl. 416—46 **11 Claims**



1. A no-back apparatus for preventing substantial back driving of the blade pitch of an adjustable pitch propeller from windage in the event of loss of use of a pitch control prime mover normally used for adjusting the blade pitch of the propeller by way of a drive means driveably connecting the pitch control prime mover to the adjustable pitch propeller said no-back apparatus comprising a first member, means resisting motion of said first member and means for coupling said first member and said drive means so as to permit limited movement of said drive means with respect to said first member during back driving as in dither cycling of the propeller blade during normal operation while coupling said drive means and said first member for resisting back driving after said limited movement.

4,890,980

CENTRIFUGAL PUMP

Charles C. Heald, Nazareth, and Trygve Dahl, Easton, both of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 8, 1988, Ser. No. 229,256
Int. Cl.[4] F04D *29/22*
U.S. Cl. 416—181 **11 Claims**

1. A centrifugal pump comprising: a centrifugal pump casing including an impeller chamber connected between an inlet and an outlet; a shaft mounted in said casing and adapted to be driven; an impeller located in said chamber and mounted on said shaft; said impeller including a central hub mounted on the shaft, a circular shroud fixed on the hub having a circular periphery axially aligned with the axis of the hub, a plurality of relatively long vanes fixed on the shroud and spaced around the hub at equally spaced intervals, a series of shorter vanes extending radially and spaced around the hub with at least one shorter vane located between each pair of longer vanes, the inner end of each shorter vane being located radially outward from the inner ends of the adjacent longer vanes, each pair of adjacent longer vanes forming between them a single passage extending radially outward from the hub and flowing into a plurality of smaller passages formed between said pair of adjacent longer vanes and bordered on at least one side by at least one shorter vane located between said pair of adjacent longer vanes, and a series of pressure balancing holes located in said shroud and opening into said passages.

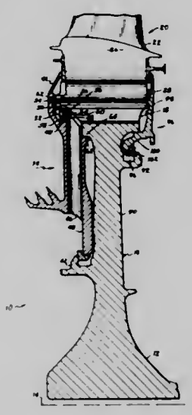


4,890,981

BOLTLESS ROTOR BLADE RETAINER

Robert J. Corsmeier, Cincinnati; Ronald E. Schlechtweg, Loveland; Richard W. Albrecht, Jr., Fairfield, and Dennis P. Dry, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 30, 1988, Ser. No. 292,084
Int. Cl.[4] F01D *5/32*
U.S. Cl. 416—220 R **14 Claims**



1. Apparatus for axially retaining rotor blades on a rotor disk having a hub, a web extending radially outwardly from said hub and rotor blade mounting posts carried on said web each having a body portion spaced from one another forming axial slots therebetween which mount said rotor blades, said apparatus comprising:
a radially inwardly extending hook formed on each of said rotor blade mounting posts, said hooks each having a first surface spaced from said body portion of said rotor blade

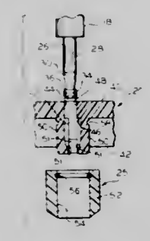
mounting posts forming a cavity therebetween, said first surface facing in a first direction;
a blade retainer having an outer end engagable with said rotor blades, said blade retainer being formed with a flange having a second surface facing in a second direction opposite to said first surface of said hooks;
a retaining ring located within said cavity and being interposed between said first surface of said hooks and said second surface of said flange for securing said outer end of said blade retainer in an axially fixed position with respect to said rotor disk, said outer end of said blade retainer preventing axial movement of said rotor blades relative to said rotor disk.

4,890,982

PUMP IMPELLER AND ROTOR SHAFT ATTACHMENT CONSTRUCTION

Richard Riback, 930 North Ave., Deerfield, Ill. 60015

Filed Jun. 20, 1988, Ser. No. 208,884
Int. Cl.[4] F04D *29/20*
U.S. Cl. 416—241 A **9 Claims**



1. A pump including an impeller adapted to be removably mounted on a powered shaft, said impeller including a bore opening for complimentary reception of said shaft, said bore opening having a first torque inducing means which is complimentary to a second torque inducing means on said shaft, said impeller including a plurality of circumferentially spaced flexible finger members disposed in axially extending relation about said bore opening, said finger members having inwardly directed boss means for axially securing said impeller to said shaft, said finger members being restricted in radial movement by a flexible cap member releasably fitting over said finger members, and said shaft being received in said bore opening.

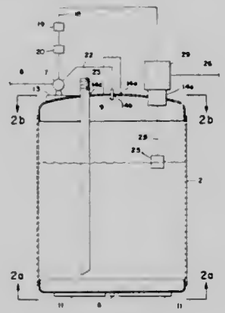
4,890,983

ABOVE-GROUND STORAGE SYSTEM

Stuart G. Solomon, and David C. Whitman, both of San Jose, Calif., assignors to Pacific Environmental Industries, San Jose, Calif.

Filed Aug. 17, 1988, Ser. No. 233,314
Int. Cl.[4] F04B *49/04*
U.S. Cl. 417—41 **10 Claims**

1. An above-ground waste oil storage system comprising:
(a) an outer tank, said outer tank having an open top;
(b) a substantially closed inner tank, said inner tank placed within said outer tank, said inner tank further comprising a tank oil inlet port, a tank oil discharge port, a vent port, and a level detection port, all of said ports in a top surface of said inner tank, said inner tank and said outer tank forming an annulus between said inner and said outer tanks;
(c) an air-operated diaphragm pump having a system oil inlet, a pump oil outlet, and a pump air inlet, said oil outlet connected to said tank oil inlet port;
(d) a disposal pipe extending upwards from said tank oil discharge port and downwards into said inner tank;
(e) a float valve assembly, said float valve assembly comprising:
(i) a float in said inner tank, said float having an arm extending through said level detection port; and



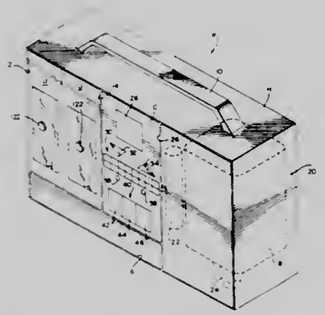
(ii) an air shut-off valve in said pump air inlet, said air shut-off valve positioned in an open position by said arm when said float is not immersed in oil, said valve in a closed position when said float is immersed in oil; and
(f) a substantially frustroconical cover over said annulus.

4,890,984

INFUSION PUMP SYSTEM AND CONDUIT THEREFOR

Richard K. Alderson, 4525 E. Nancy La., Phoenix, Ariz. 85040; Ronald D. Sleater, 302 E. El Caminito Dr., Phoenix, Ariz. 85020, and James R. Talley, 102 Oak Cir., Monroe, La. 71203

Division of Ser. No. 218,963, Jul. 14, 1988, which is a division of Ser. No. 36,639, Apr. 10, 1987, Pat. No. 4,781,548. This application Apr. 14, 1989, Ser. No. 337,877
Int. Cl.[4] F04B *23/06, 39/12*
U.S. Cl. 417—234 **2 Claims**



1. An infusion pump kit, comprising:
(a) a housing having top, bottom, rear and endwalls and a carrying handle to permit the user to ambulate with said housing;
(b) a first chamber in said housing adjacent a first endwall thereof for receipt of a first modular infusion pump unit;
(c) a second chamber in said housing adjacent to said first chamber for receipt of a like second modular infusion pump unit;
(d) a third chamber in said housing adjacent a second opposite endwall thereof for receipt of a first medicant container;

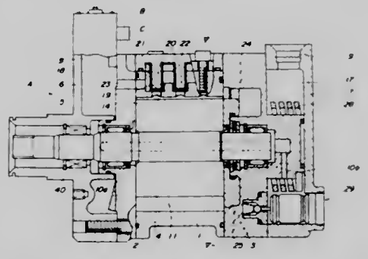
(e) first means for establishing flow communication from said first container to said second pump system;
(f) a fourth chamber in said housing adjacent a bottom wall thereof and below said first and second chambers for receipt of a second medicant container;
(g) second means for establishing flow communication from said second container to said first pump system;
(h) a fifth chamber in said housing disposed between said second and third chambers and above said fourth chamber;
(i) pump system control means positioned in said fifth chamber and including a video display and means for controlling said first and second pump units;
(j) third means for establishing control connection between said control means and/or the first and second pump unit; and,
(k) power supply means for providing operating power for said control means and the first and second pump units.

4,890,985

AIR CONDITIONING SYSTEM WITH VARIABLE CAPACITY COMPRESSOR

Hiroyuki Sugiura, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1988, Ser. No. 236,001
Claims priority, application Japan, Nov. 25, 1987, 62-298609
Int. Cl.[4] F04B *49/00;* F04C *29/08*
U.S. Cl. 417—295 **9 Claims**



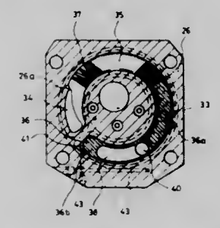
1. In an air conditioning system including a refrigerating circuit, and a variable capacity compressor forming part of said refrigerating circuit, said compressor having means for defining a high pressure zone into which discharge pressure is supplied, means for defining a low pressure zone in which suction pressure is created, and means for varying the delivery quantity thereof in dependence on a difference between the discharge pressure in said high pressure zone and the suction pressure in said low pressure zone,
the improvement comprising:
a high pressure communication passage communicating said high pressure zone of said compressor with said refrigerating circuit; and
a pressure control valve associated with said high pressure zone of said compressor and said high pressure communication passage, said pressure control valve being operable in response to the discharge pressure in said high pressure zone of said compressor to reduce the opening degree of said high pressure communication passage when the discharge pressure in said high pressure zone is lower than a predetermined value, said predetermined value being set such that said means for varying the delivery quantity effects predetermined capacity control in dependence on the difference between the discharge pressure in said high pressure zone and the suction pressure in said low pressure zone when the discharge pressure in said high pressure zone exceeds said predetermined value.

4,890,986

VARIABLE CAPACITY COMPRESSOR

Tatsuhisa Taguchi, Katano; Yoshikazu Abe, Hirakata, and Kiyoji Aburaya, Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan.

Filed Oct. 22, 1987, Ser. No. 111,314
Claims priority, application Japan, Oct. 23, 1986, 61-252209
Int. Cl.[4] F04B *49/02;* F04C *29/08*
U.S. Cl. 417—295 **2 Claims**



1. A variable capacity compressor comprising:
an enclosure having cylindrical internal space, a cylindrical-shaped rotor which is rotatably held in said enclosure and driven by an external force, the rotor having vanes, plural return ports formed in a wall of said enclosure within a volume-decrease-step space in said internal space wherein a volume of sectioned space formed by movements of said rotor and said vanes is changed cyclically, and, a C-shaped guide passage formed in said wall for communicating said plural return ports with said exit;
an arc-shaped slider which is slidably disposed in said C-shaped guide passage to control communication between said plural return ports and said exit, said slider having an arc-shaped aperture for opening said return ports and an inner passage for communicating said plural return ports with said exit through said aperture;
urging means for urging said arc-shaped slider in a circumferential direction relative to said slider, to close said return ports; and
pressure control means for adjusting pressure of gas which pushes said arc-shaped slider in a reverse direction to said urging means.

4,890,987

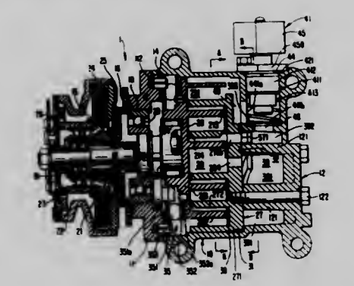
SCROLL TYPE COMPRESSOR WITH SEAL SUPPORTING ANTI-WEAR PLATE PORTIONS

Tadashi Sato, and Atsushi Mabe, both of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 18, 1988, Ser. No. 170,300
Claims priority, application Japan, Mar. 20, 1987, 62-67353
Int. Cl.[4] F04B *49/02;* F04C *18/04, 27/00*
U.S. Cl. 417—310 **18 Claims**

1. In a scroll type fluid compressor including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed within said housing and having an end plate from which a first spiral wrap extends into the interior of said housing, an orbiting scroll having an end plate from which a second spiral wrap extends, said first and second wraps interfitting at an angular and radial offset to form a plurality of line contacts which define at least one pair of sealed off fluid pockets, a driving mechanism operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll, rotation preventing means for preventing the rotation of said orbiting scroll during orbital motion whereby the volume of the fluid pockets changes during orbital motion to compress the fluid in the pockets and the compressed fluid from a central fluid pocket formed by said scrolls is discharged through an outlet aperture formed in one of said end plates, displacement adjusting means including at least one pair of holes formed through said end plate of one of said scrolls to form a fluid

channel between the pair of sealed off fluid pockets and the opposite side of said end plate of said one scroll from its respective wrap, said pair of holes located at symmetrical locations along said respective wrap so that the wrap on the other of said scrolls simultaneously crosses over both of said holes during orbital motion of said orbiting scroll, control means for controlling flow of fluid through said at least one pair of holes, the axial end surface at least of the wrap of the other of said scrolls being provided with a seal element having a predetermined width and extending along the length of said axial end surface, the improvement comprising:



an anti-wear plate being disposed on the front end surface of the end plate of said one of said scrolls, said anti-wear plate having cut-out portions adjacent each of said holes, each of said cut-out portions of said anti-wear plate having a longitudinal edge extending completely across the adjacent hole and, in the relative disposition of said scrolls when the wrap of said other of said scrolls completely overlaps a respective hole, said longitudinal edge of the adjacent cut-out portion located in the area between the center of the width of said seal element and the outermost edge of said seal element with respect to the portion of the wrap along which said respective hole is located.

4,890,988

CANNED MOTOR PUMP

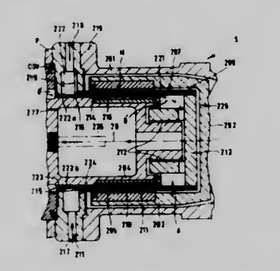
Roland Krämer, Gundelfingen, and Robert Neumaier, Glottertal, both of Fed. Rep. of Germany, assignors to Heyko Reinecker, Freiburg, Fed. Rep. of Germany

Filed Nov. 18, 1987, Ser. No. 122,111

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639720; Nov. 20, 1986, 3639719; European Pat. Off., Jun. 4, 1987, 87108088.3; Jul. 11, 1987, 87110038.4

Int. Cl.[4] F04B *39/06*

U.S. Cl. 417—372 **33 Claims**



1. A canned motor pump, comprising a hollow driving unit; a rotary driven unit at least partly surrounded by said driving unit; means for sealing said units from each other, including a can interposed between said units and including a plurality of walls defining at least one space; means for admitting a heat exchange fluid into said space; and flange means mounted on said walls in sealing relationship therewith, said admitting means being provided in said flange means.

4,890,989

POSITIVE DISPLACEMENT MACHINE WITH A PLASTIC GATE PINTON

Bernard Zimmern, 6 New Street, East Norwalk, Conn. 06855

Filed Feb. 11, 1988, Ser. No. 154,594

Claims priority, application France, Feb. 12, 1987, 87 01745

Int. Cl.[4] F01C *3/02, 3/08, 5/02;* **F16F** *1/00*

U.S. Cl. 418—153 **10 Claims**



1. A positive displacement machine, belonging to the group comprising compressors, pumps or expansion machines, said machine comprising a globoid screw meshing with at least one composite pinion rotatably mounted in a stationary casing, said composite pinion comprising a plastic pinion provided with sealing teeth sealingly meshing with the screw, and a metal backing pinion provided with backing teeth against which a back face of the sealing teeth lies, the plastic pinion being mounted on the metal backing pinion for relative rotation about an axis of rotation of said composite pinion, wherein a connection between the plastic pinion and the backing pinion is provided by a spring, arranged between the plastic pinion and the backing pinion and at least partly surrounding the axis of the composite pinion, and wherein:

the spring is connected to the plastic pinion by first connecting means and to the backing pinion by second connecting means;

stop means which are fixedly secured to the backing pinion limit angular travel of the first connecting means with respect to the backing pinion to a predetermined angular stroke;

when the spring is at rest, the first connecting means are substantially at half-way of said predetermined angular stroke;

the stiffness of the spring is such that the torque to be applied to the plastic pinion with respect to the backing pinion for abutting the first connecting means against the stop means is about 70 to 160% of the maximum torque needed to accelerate and decelerate the backing pinion at start up of the machine and respectively during stopping of the machine.

4,890,990

ROTARY INTERNAL COMBUSTION ENGINE WITH MUTUALLY INTERENGAGING ROTATABLE ELEMENTS

Michael L. Zettner, Nelkenstrasse 3, 8500 Nürnberg 70, Fed. Rep. of Germany

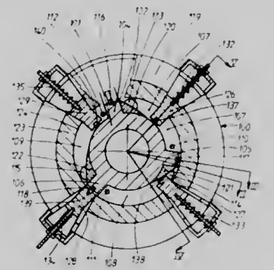
Continuation-in-part of Ser. No. 66,357, May 7, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 181,356

Claims priority, application PCT Int'l Appl., Oct. 2, 1985, PCT/EP85/00513

Int. Cl.[4] F01C *1/356, 1/344, 21/08, 21/10*

U.S. Cl. 418—173 **14 Claims**

1. A rotary engine comprising an inner element having an outwardly-facing circumferential surface, an outer element surrounding the inner element and having an inwardly-facing circumferential surface disposed opposite said circumferential surface of the inner element and concentric therewith, one of said inner and outer elements being provided with at least one recess in said circumferential surface thereof to define a gas expansion chamber and with a respective drive projection which adjoins said at least one recess and which is sealed relative to said circumferential surface of the other element to serve for transmission to said one element of the pressure of gas when expanding in the adjoining chamber, means defining an inlet port and an exhaust port respective to and communicating with said chamber, bearing means mounting the elements to be relatively rotatable, at least one reaction member mounted on said other element to be movable into said chamber to close a



flow path for gas to the associated exhaust port and to serve for transmission of said gas expansion pressure to said other element thereby to cause opposite relative rotation of the elements and to be movable out of such chamber to open said flow path, and control means to cause said movement of said at least one reaction member out of said chamber, wherein one of said circumferential surfaces is of generally parabolic concave cross-sectional shape and the other of complementary, generally parabolic convex cross-sectional shape, wherein said circumferential surfaces are disposed in close sliding fit, and wherein said generally parabolic concave cross-sectional shape and said generally parabolic convex cross-sectional shape are each defined in cross-section by a curve and by two lines which each extend from a respective end of said curve and which diverge from each other in a direction away from said curve.

4,890,991

SCREW ROTOR ASSEMBLY FOR SCREW COMPRESSOR

Shoji Yoshimura, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 5, 1988, Ser. No. 228,467

Claims priority, application Japan, Sep. 1, 1987, 62-218951

Int. Cl.[4] F04C *17/12*

U.S. Cl. 418—201 B **1 Claim**

1. A screw rotor assembly for a screw compressor or the like, comprising:

a male rotor having male rotor teeth each formed in a profile consisting of curves a-b, b-c, c-d, d-e, e-f and f-g; and

a female rotor having female rotor teeth each formed in a profile consisting of curves A-B, B-C, C-D, D-E, E-F and F-G; wherein

(a) the curve a-b is an arc of the root circle of the male rotor teeth with its center on the center O of the male rotor,

(b) the curve b-c is a generated curve corresponding to the curve B-C of the female rotor tooth,

(c) the curve c-d is a generated curve corresponding to the curve C-D of the female rotor tooth,

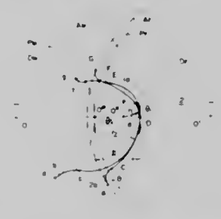
(d) the curve d-e is a curve with its origin at a point O'' on a straight line connecting the center O of the male rotor and the center O' of the female rotor and with a radius $r1=R1+R2(\theta_1/\theta_3)^n$, merging with the tip circle of the male rotor, where θ_1 is a variable, $R2<0$, $|R2|>|R1|/2$, $0<\theta_3<90$, and $1<n<1.5$,

(e) the curve e-f is a generated curve corresponding to the curve E-F of the female rotor,

(f) the curve f-g is an arc of a circle with its center on the pitch circle of the male rotor, merging with the root circle of the male rotor,

(g) the curve A-B is an arc of the tip circle of the female rotor,

(h) the curve B-C is an arc of a circle,



(i) the curve C-D is a curve with its origin at a pitch point O''' and with a radius $r2=R+R3a(\theta_2/\theta_0)^n/\{b+(\theta_2/\theta_0)^n\}$, merging with the root circle of the female rotor, where θ_2 is a variable, $a=\beta(1-\alpha^n)$, $b=\alpha^n(1-\beta)/(\beta-\alpha^n)$, and when $\beta=0.5$, $0.7\leqq\alpha\leqq0.85$ and $2.5\leqq n\leqq3.5$,

(j) the curve D-E is a generated curve corresponding to the curve d-e of the male rotor,

(k) the curve E-F is a part of a hyperbola having a pole normal to the male rotor tooth at a point E, and

(l) the curve F-G is an arc of a circle with its center on the pitch circle of the female rotor and merging with the tip circle of the female rotor.

4,890,992

SCREW-ROTOR MACHINE WITH AN ELLIPSE AS A PART OF ITS MALE ROTOR

Hou-Teng Lee, Taipei, Taiwan, assignor to Fu Sheng Industry Co., Ltd., Taipei, Taiwan

Filed Apr. 22, 1988, Ser. No. 184,942

Int. Cl.[4] F04C *18/16*

U.S. Cl. 418—201 **3 Claims**



1. A screw rotor machine having a female rotor meshing with a male rotor, helical lands and intervening grooves and adapted for rotation around parallel axis in a working space of the machine, the profile of the rotors comprising:

a first curve of the male rotor having an arc of a first circle tangent externally to the dedendum circle of the male

rotor and with a center outside the pitch circle of the male rotor,

a second curve of the male rotor being part of an ellipse with a long axis laid on a line segment connecting the central axis of the male rotor and female rotor, the second curve intersecting the line segment and tangent externally to the dedendum circle of the female rotor and internally to the addendum circle of the male rotor, wherein the second curve of the male rotor is between the first curve of the male rotor, and the point where the line segment connecting the central axis of the male and female rotor intersects with the dedendum circle of the female rotor and the addendum circle of the male rotor,

a first curve of a female rotor being an arc of a second circle tangent internally to the addendum circle of the female rotor, the center of which lies on a line which forms a modulated angle with the line segment connecting the central axis of the male rotor and female rotor, wherein the radius of curvature of the first circle is within the range of 2 to 5 times the radius of curvature of the second circle,

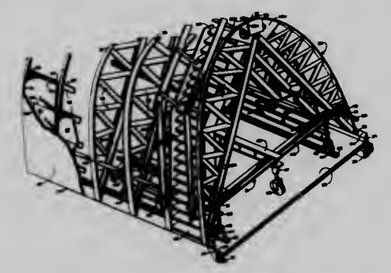
a second curve of the female rotor internally tangent to the addendum circle of the female rotor at one end, internally tangent to the second curve of the male rotor and externally tangent to the dedendum circle of the female rotor at a point where the dedendum circle of the female rotor intersects the line segment connecting the central axis of the male rotor and female rotor at the other end, wherein the second curve of the female rotor is generated by the second curve of the male rotor.

4,890,993

APPARATUS FOR FORMING CONCRETE STRUCTURES

T. Woodrow Wilson, S. 1600 Dishman-Mica Rd., Spokane, Wash. 99206-3356

Filed Jan. 11, 1988, Ser. No. 141,980
Int. Cl.[4] E04G *11/40*
U.S. Cl. 425—63 **5 Claims**



1. A forming system for concrete structures of substantially uniform arched cross-section comprising, in combination:

a primary forming member having a plurality of interconnected spaced, parallel primary forming arches positioned in linear array, each primary forming arch having an upper arcuate element;

a carriage supporting said primary forming arches and having first means for motion of the carriage in a direction perpendicular to a plane parallel to the forming arches and second means for vertically moving said forming arches vertically relative to said carriage;

a secondary supporting member including a plurality of rigid support arches having the shape of the upper surface of the arcuate elements of the primary forming arches and supported thereon,

means to releasably support a plurality of rigid elongate cross-supports between adjacent support arches, and

a plurality of rigid cross-supports extending between and supported by adjacent support arches; and

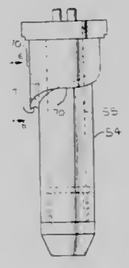
a plurality of rigid insulating panels supported by the cross-supports to provide a concrete forming surface, said rigid insulating panels having a length less than the distance between adjacent support arches to create a channel between vertical columns of insulating panels to allow formation of arches between adjacent panel columns against the support arches to incorporate the insulation panels therebetween and provide depending arches in a formed structure.

4,890,994

APPARATUS FOR FORMING A PARISON WITH A VIEW STRIPE

Thomas A. Shapler, Bowling Green, Ohio; Thomas R. Buehler, Adrian, Mich., and Michael Hirschberger, Sylvania, Ohio, assignors to Hoover University, Inc., Ann Arbor, Mich.

Filed Sep. 30, 1988, Ser. No. 251,698
Int. Cl.[4] B29C *47/22*
U.S. Cl. 425—131.1 **12 Claims**



1. Apparatus for producing a tubular parison of a first plastic resin having a longitudinal stripe for a second plastic resin extending radial through said tubular parison, said parison having inner and outer surfaces, comprising:

a die head having a longitudinal axis;

a mandrel sleeve within said die head and spaced therefrom to define a tubular cavity;

an annular outlet orifice from the cavity at one end of the die head;

a first inlet for directing a first plastic resin into the side of said cavity;

means operatively associated with said mandrel sleeve for dividing said first resin into two flow streams which flow through said cavity in opposite directions around said mandrel sleeve and toward said annular outlet orifice;

a second inlet for directing a second resin into said cavity on the opposite side of said cavity from said first inlet; and

means operatively associated with said mandrel sleeve for diverting said second resin downward between said two first resin flow streams to form a weld of said second resin in a circumferential direction between the two first resin flow streams thereby forming a tubular parison in said cavity of said first resin having a longitudinal stripe of said second resin extending radially through the parison.

4,890,995

MOLD APPARATUS FOR FORMING SHAPED PLASTIC SHELLS

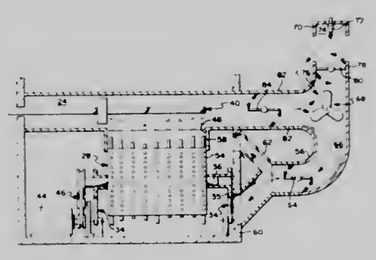
John D. Gray, New Durham, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 63,837, Jun. 19, 1987, Pat. No. 4,851,177. This application Mar. 30, 1989, Ser. No. 332,019
Int. Cl.[4] B29C *35/00, 41/18*
U.S. Cl. 425—144 **4 Claims**

1. In apparatus for casting plastic shells heating mold having a casting surface for receiving heat fusable thermoplastic material and an outer surface with a profile that corresponds to the shape of the casting surface, the outer surface heated by hot air flow thereagainst from a tube sheet having a plurality of tubes extending therefrom with outlets that define a profile corresponding to that of the outer surface of the mold, the outlets discharging into an enclosure having a mold heating chamber therein and wherein a plurality of molds of different outer surface profile are sequentially positioned in the heating chamber to have the casting surface temperature raised to a level at which the material will adhere to the mold to form a plastic shell thereon, the improvement comprising:

means forming a feed chamber having a outlet in communication with said heating chamber;

a drum supported in said feed chamber having a plurality of



tube sheets formed thereon, each of said tube sheets having a plurality of tubes formed thereon of a predetermined height which define a plurality of tube outlets defining an air discharge profile that corresponds to the outer surface profile of molds which are positioned in the heating chamber;

means for selectively positioning the drum to index one of said tube sheets into alignment with said feed chamber outlet for matching the profile of one of the outer surface profiles with the air discharge profile of the indexed tube sheet;

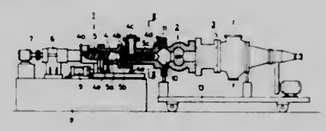
and means for directing heated air through the indexed tube sheet for causing the mold casting surface to be uniformly heated there across prior to placing heat fusable thermoplastic material thereon.

4,890,996

CONTINUOUS GRANULATING MACHINE

Nobuaki Shimizu, Hiroshima, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,810
Claims priority, application Japan, Nov. 18, 1981, 56-183863
Int. Cl.[4] B29B *7/48*
U.S. Cl. 425—145 **10 Claims**



1. A continuous granulating machine comprising:

a double screw kneader including a pair of cylinders each having a rear portion and a forwardly extending front portion with an end outlet and an inside diameter smaller than that of said rear portion of the cylinder and with said front portions defining independent cylinder chambers without any lateral mutual communication, a pair of screws mounted for rotation in said cylinders with each screw having a large diameter rear portion and a relatively short reduced diameter front portion disposed in one of said independent chambers, complementary conical shoulders on said cylinders and said screws between said front and rear portions respectively defining a clearance slot for controlling the passage of material from said rear portion to said front portion of each cylinder and means for axially moving said cylinders and said screws relative to each other to adjust said clearance to adjust the degree to which a material is kneaded by said kneader;

vent means in communication with the front portion of each cylinder;

a gear pump having an outlet connected to said outlet of each of said cylinders,

pressure sensor means disposed intermediate said cylinders and said gear pump and operatively connected to said gear pump to control said gear pump in response to the pressure of the material being kneaded to maintain the pressure substantially constant within the range of 5-10 Kg/cm^2, and

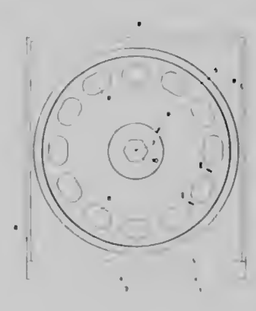
a cutting unit connected to said outlet of said gear pump.

4,890,997

PHOTOPOLYMERIZATION IRRADIATION APPARATUS

Wolfgang Beins, Bad Homburg; Helmut Röhrig, Usingen; Ulrich Salz, Wehrheim; Lutz Gwinner, Mainz, and Steffen Oppawsky, Bad Homburg, all of Fed. Rep. of Germany, assignors to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,607
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3707398
Int. Cl.[4] B05D *3/06; B29C 35/08*
U.S. Cl. 425—174 **28 Claims**





1. Photopolymerization irradiation apparatus for plastic-embedding masses, especially for histological specimens and preparations in a holding dish (11) comprising

a rotary support plate (5) defining an axis of rotation (7);

light-pervious preparation holding means (6) for retaining a plurality of holding dishes (11) on circumferential regions of the support plate, with the centers of the holding dishes being located substantially on a circle concentric with said axis of rotation (7) of the rotary plate; and

a plurality of radiation-generating lamp pairs (21, 25) in which the lamps of the pairs are positioned at circumferential intervals above and below said rotary plate and adapted to at least partially polymerize an embedding preparation, in each holding dish, which surrounds a specimen, and

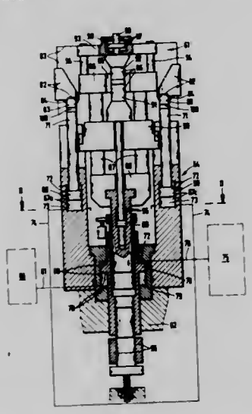
wherein said lamp pairs are located, with respect to the holding means (6) on the rotary support plate (5), such that, upon rotation of the support plate, the holding dishes (11) located on the holding mans sequentially pass alternately between the lamps of respective circumferentially positioned irradiation lamp pairs and through less-irradiated spaces in the circumferential intervals between lamps pairs, thereby enjoying a recovery period before further polymerization by a subsequent one of said lamp pairs.

4,890,998

PRESS FOR MANUFACTURE OF DIMENSIONALLY STABLE ARTICLES FROM POWDERED MATERIAL

Thomas Grübener, Siegen, and Theodor Grübener, Netphen, both of Fed. Rep. of Germany, assignors to Theodor Grubener Pressensysteme GmbH & Co. KG, Wertenbach, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,927
Claims priority, application European Pat. Off., Sep. 2, 1987, 87112788.2
Int. Cl.[4] B29C *43/04*; B30B *11/02*
U.S. Cl. 425—193 **8 Claims**



1. An auxiliary hydraulic subpress for molding dimensionally stable articles from powdered material, said subpress being constructed as a module adapted to be installed in, and to be driven by the ram of, a pre-existing host press, and comprising

a frame adapted to be mounted upon the platen of the host press, such frame supporting an upwardly directed lower die plunger;

an opposing movable frame member adapted to be secured to the ram of the host press and having thereon a downwardly directed upper die plunger in co-axial opposition to said upwardly directed lower die plunger;

a hydraulic ram within said first-mentioned frame supporting a molding die for movement relative to and co-axially of said opposing die plungers;

a hydraulic drive carried by said frame and driven by the movement of the ram of the host press and connected hydraulically to drive said hydraulic ram; and

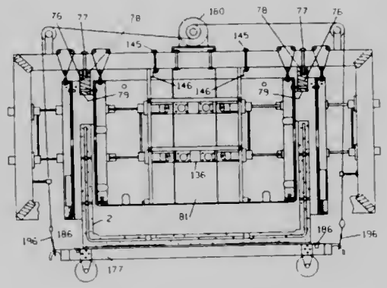
means to vary the transmission ratio between the movement of the ram of the host press and the resulting movement of the hydraulic ram.

4,890,999

MOLDING MACHINE

Ernest J. Del Monte, 46 Harwood La., East Rochester, N.Y. 14445

Filed Dec. 20, 1988, Ser. No. 287,280
Int. Cl.[4] E04G *11/02*; B28B *7/08*
U.S. Cl. 425—439 **13 Claims**



1. A molding machine for casting a concrete product comprising:

(a) a stationary support system;

(b) a pair of bearings fixed on said stationary support system on an axis of rotation;

(c) a rotatable apparatus interposed between said pair of bearings and having an open apparatus top rotatable thereon at least 180 degrees between a casting position and a discharge position about said axis of rotation;

(i) said rotatable apparatus having an apparatus bottom diametrically opposed to said open apparatus top;

(d) rotational means for rotating said rotatable apparatus about said axis of rotation;

(e) a mold having a mold bottom and a mold open top;

(i) said mold having a configuration form having the shape of a cross-section of the product mounted to said bottom of said rotatable apparatus;

(ii) said apparatus further including exterior wall-forming panels of a first height, and interior wall-forming panels and interior corner-forming panels having a second height shorter than said first height of said exterior wall-forming panels;

(iii) said mold having means for moving said exterior wall-forming panels, said interior wall-forming panels, and said interior corner-forming panels in contact with said configuration form and away from said configuration form;

(iv) said mold having a floor panel resting in cooperative relationship on said interior wall-forming panels and said interior corner-forming panels;

(f) a transporter;

(g) hoisting means fixed to said bottom of said rotatable apparatus and cooperating with said transporter for lifting and locking said transporter to said open top of said mold for rotation therewith; and

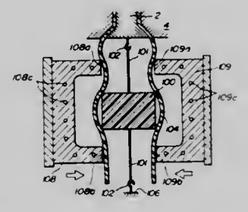
(h) storage means for storing said transporter off said mold when said apparatus is disposed in said casting position.

4,891,000

APPARATUS FOR BLOW MOULDING HOLLOW ARTICLE

Tatsushi Ishii, Fujisawa City, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Feb. 5, 1988, Ser. No. 152,449
Claims priority, application Japan, Feb. 6, 1987, 62-24701
Int. Cl.[4] B29C *49/20*
U.S. Cl. 425—522 **3 Claims**



1. In a blow moulding apparatus:

means for forming a parison, said parison forming means including a die and a core;

a mould, said mould including dies which can be closed together on said parison in a manner to form a hollow article;

a structure; and

means for suspending said structure within said parison so that, when said mould is closed, said structure and said parison are pressed into contact in a manner wherein the structure becomes fixedly connected to the portion of said parison which is shaped into said hollow article, said suspending means comprising:

a first attachment device which is attached to the lower face of the core;

a suspension line which is connected to said structure at one end and to said attachment means at the other, said suspension line being made of a thermoplastic material which can be fused and become integral with the parison when said mould is closed; and

means for inhibiting heat being transferred from said core to said suspension line.

4,891,001

SPRUE GATED STACK INJECTION MOLDING SYSTEM

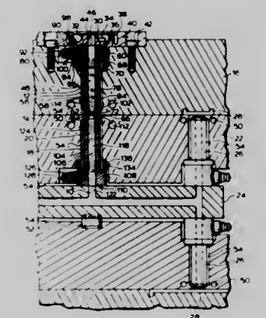
Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Feb. 6, 1989, Ser. No. 306,159
Claims priority, application Canada, Jan. 31, 1989, 589614
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—549 **5 Claims**

1. A stack injection molding system for conveying melt from a fixed platen through a sprue gate to a movable platen, the movable platen being actuated according to an operating cycle between a closed position; wherein the fixed and movable platens abut and an open position wherein the fixed and movable platens separate along a parting line, the system comprising:

an upstream heated nozzle having an outer surface, a rear end, a front end and a nose portion with a forward face located at the front end, the upstream nozzle having a melt bore which extends centrally therethrough from an inlet at the rear end to an outlet at the forward face of the nose portion, the upstream nozzle having an electrically insulated heating element with a first portion extending from a terminal, a second portion integrally brazed in a spiral channel in the outer surface and a circular third portion integrally brazed in the nose portion of the nozzle to substantially encircle the central melt bore extending therethrough, the upstream nozzle being seated in the fixed platen with the nose portion extending through an opening in the fixed platen to the parting line, and

a downstream heated nozzle having an outer surface, a rear end, a front end and a nose portion with a forward face located at the front end, the downstream nozzle having a melt bore which extends centrally therethrough from an inlet at the forward face of the front end to an outlet at the rear end, the downstream nozzle having an electrically insulated heating element with a first portion extending



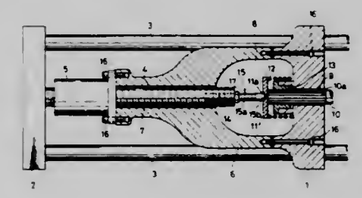
from a terminal and a second portion integrally brazed in a spiral channel in the outer surface, the downstream nozzle being seated in the movable platen with the melt bore through the downstream nozzle in alignment with the melt bore through the upstream nozzle and the nose portion of the downstream nozzle extending through an opening in the movable platen to a position wherein the forward face of the nose portion of the downstream nozzle abuts against the forward face of the nose portion of the upstream nozzle in the closed position.

4,891,002

PRODUCT EJECTOR FOR INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki, and Shigeo Tokunaga, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00797, § 371 Date Apr. 15, 1988, § 102(e) Date Apr. 15, 1988, PCT Pub. No. WO88/03471, PCT Pub. Date May 19, 1988
PCT Filed Oct. 16, 1987, Ser. No. 204,554
Claims priority, application Japan, Nov. 5, 1986, 61-261929
Int. Cl.[4] B29C *45/42, 45/66*; B28B *7/10*
U.S. Cl. 425—556 **14 Claims**



1. A direct-acting type mold clamping system for an injection machine comprising:

a stationary rear platen;

a ball screw rotatably but axially immovably supported by said rear platen;

means for rotating said ball screw;

a ball nut threadably engaged with said ball screw;

a moving platen having a mold mounted thereto;

means for fixedly connecting said ball nut to said moving platen, said ball nut being unrotatable with respect to said ball screw whereby rotation of said ball screw effects movement of said moving platen to carry out mold clamping and unclamping; and

a mold product ejector, said product ejector comprising:

a rod mounted to a rearward end of said ball screw;

an ejector bar arranged within a bore provided in said moving platen such that the ejector bar extends through the bore and is slidable therein to project into the mold and eject a product therefrom;

an ejector plate fixedly mounted to an end of said ejector bar and engageable with said rod upon movement of said moving platen; and

a spring positioned between said ejector plate and said moving platen, for biasing said ejector bar toward said ball screw.

4,891,003

PULSE COMBUSTION DEVICE

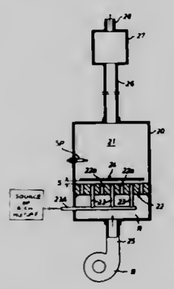
Katsusuke Ishiguro, Nagoya, Japan, assignor to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 15, 1988, Ser. No. 232,020

Claims priority, application Japan, Jul. 15, 1987, 62-176710

Int. Cl.[4] F23C *11/04*

U.S. Cl. 431—1 **4 Claims**



1. A pulse combustion device comprising a housing forming therein a combustion chamber, a spark plug mounted on said housing and having an electrode located in the combustion chamber, an air intake nozzle plate formed with at least one air intake port and fixedly coupled within said housing in a fluid-tight manner to form an air intake chamber in open communication with the combustion chamber through the air intake port, at least one gas intake nozzle coupled with said air intake nozzle plate at one end thereof and connected to a source of a rich mixture of primary air and gaseous fuel at the other end thereof to admit the rich mixture of primary air and gaseous fuel under pressure therethrough into the combustion chamber, and means for supplying secondary air under pressure into said air intake chamber,

wherein a baffle plate is secured in place within said housing at a position spaced from an inside surface of said air intake nozzle plate with a predetermined clearance from said air intake nozzle plate, wherein said baffle plate prevents the reverse flow of combustion products from the combustion chamber into the air intake port and gas intake nozzle, said baffle plate being formed smaller in diameter than said housing to form an annular passage in open communication with the combustion chamber.

4,891,004

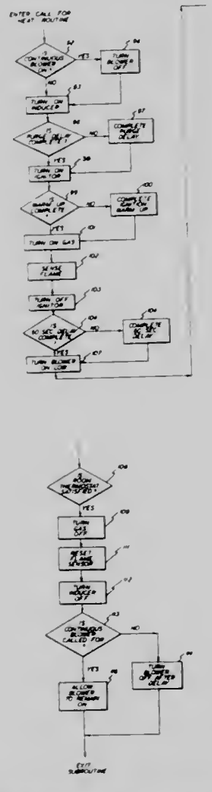
CONTROL OF ENERGY USE IN A FURNACE

Gary W. Ballard, Indianapolis, and Daniel J. Dempsey, Carmel, both of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 67,501, Jun. 29, 1987, Pat. No. 4,815,524. This application Mar. 7, 1988, Ser. No. 164,936

Int. Cl.[4] F23N *5/00*; **F24H** *3/00*

U.S. Cl. 431—6 **11 Claims**



1. In a residential furnace of the type which is responsive to a thermostat and has an electronic ignitor, and a circulating air blower that may be operated on a continuous basis, an improved process of controlling said thermostat, electrical ignitor and blower in an ignition sequence of said furnace comprising the steps of:

upon receiving a call for heat from a thermostat, checking to determine if the circulating air blower is on;

if the blower is on, turning it off; and

only after the blower is turned off, turning on the ignitor to initiate the combustion process.

4,891,005

PORTABLE IGNITER FOR FIREPLACE LOGS

Ralph E. Carter, 2242 Old Mill Road, Carrollton, Tex. 75007

Filed Aug. 23, 1988, Ser. No. 235,379

Int. Cl.[4] F23D *11/36*

U.S. Cl. 431—343 **1 Claim**

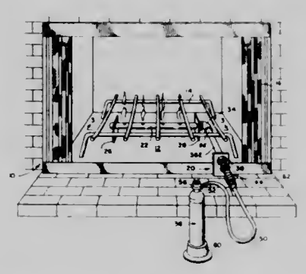
1. A portable igniter for ignition of logs to a flame burning state comprising:

a tubular burner having a plurality of spaced apart ports from which a gaseous fuel can be emitted for burning;

fuel delivery means for internally communicating received gaseous fuel under pressure to said burner;

connector means operable to effect a coupled connection to said fuel delivery means;

a controlled source of bottled fuel gas under pressure in communication with said connector means and adapted



when said connector means is coupled to said fuel delivery means to supply gaseous fuel for combustion to said burner;

an elongated metal nipple connected to said burner and extending transversely therewith;

first and second support brackets coupled to said burner and nipple, respectively; and,

a third support bracket coupled to one of said burner or nipple near the union thereof.

4,891,006

PILOT FLAME GAS BURNERS AND BURNER CAP FOR THESE IMPROVED BURNERS

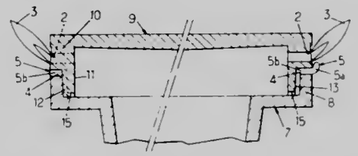
Jean-Bernard Le Mounier de Gouville, and Bernard Dané, both of Veigne, France, assignors to Sourdillon-Airiadex, France

Filed Sep. 8, 1988, Ser. No. 242,106

Claims priority, application France, Sep. 8, 1987, 8712429

Int. Cl.[4] F23D *14/58*

U.S. Cl. 431—349 **8 Claims**



1. A pilot flame gas burner, particularly for a domestic appliance, comprising:

a side wall having main orifices distributed peripherally thereabout for main flames,

and a peripheral supply means for supplying gas below said main orifices which generates an annular secondary flame collar below said main orifices, wherein in first zones located below intervals between the main orifices the annular secondary flame projects only a minimal distance from the said side wall, and in second zones located below each main orifice the annular secondary flame is more active and projects farther from the side wall than the flames in said first zones, such that the flames of the second zones heat the feet of the corresponding main flames located thereabove.

4,891,007

METHOD AND APPARATUS FOR THE MANUFACTURE OF CEMENT FROM RAW CEMENT MEAL

Horst Herchenbach, St. Johann; Albrecht Wolter, and Fritz Rodenhäuser, both of Köln, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

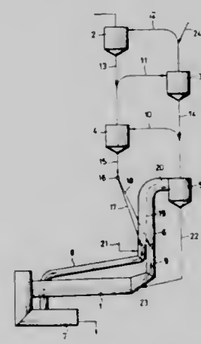
Continuation-in-part of Ser. No. 925,273, Oct. 31, 1986, Pat. No. 4,747,879. This application Feb. 3, 1988, Ser. No. 151,915

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703596

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—14 **16 Claims**



1. An apparatus for the manufacture of cement from raw meal comprising in combination:

a plurality of cyclone heat exchangers adapted to receive and preheat raw meal;

a rotary sintering furnace connected to receive meal from the last of said heat exchangers;

a cooler connected to receive meal from said furnace;

a calcining chamber divided to include first and second calcining zones to receive divided flow of meal from a penultimate of said heat exchangers and to deliver meal to said last exchanger;

a flow apportioning valve between said penultimate heat exchanger and said calcining chamber dividing the flow from the heat exchanger into subflows to flow respectively into said first and second calcining means;

means conducting air from said cooler into the first calcining zone to mix with a first subflow of meal;

means conducting gas from the furnace into the second calcining zone to mix with a second flow of meal; and

fuel delivery means in said first calcining zone delivering a quantity of difficult to burn fuel heating the zone to temperatures sufficient to cause the substantial complete combustion of said fuel.

4,891,008

HIGH TEMPERATURE CONVECTION FURNACE

Klaus H. Hemsath, Toledo, Ohio, assignor to Columbia Gas Service System Corporation, Columbus, Ohio

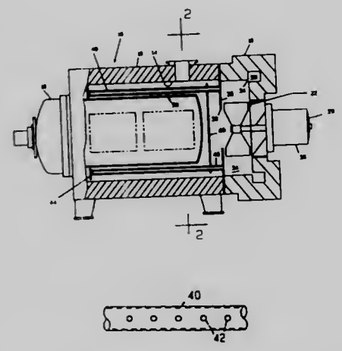
Filed May 21, 1986, Ser. No. 865,839

Int. Cl.[4] F27B *9/00*

U.S. Cl. 432—148 **5 Claims**

1. An industrial heat treating furnace comprising: an outer housing having a refractory lining, an imperforate heat exchange shell within said housing, said shell being spaced inwardly from the inner surface of said housing lining, a means for directing a multiplicity of hot combustion gas streams towards said shell, said means having a plurality of hot combu-

sion gas distributor tubes arranged symmetrically, side by side around said shell in a spaced relationship with respect to each



other and to said lining and to said shell, said tubes having a plurality of jet stream apertures, and means for supplying hot combustion gases under pressure to said tubes.

4,891,009

APPARATUS FOR HOLDING WORKPIECES

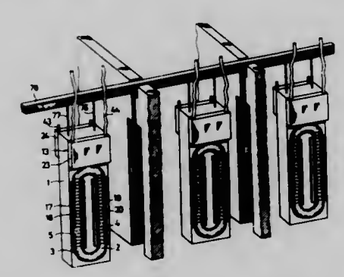
Werner Pivit, Frankfurt, and Ralf Nachtsheim, Hanau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 118,955

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717712

Int. Cl.[4] F24H *1/00*

U.S. Cl. 432—223 **11 Claims**



1. Apparatus for mounting workpieces or substrates for transport between a receiving or issuing station and a coating station in the interior of a vacuum coating chamber and for controlling the temperature of the workpieces during the coating process, said apparatus comprising a coating source which faces said workpieces when said workpieces are at said coating station, characterized by a workpiece carrier filled at least partially with a heat transfer medium, which carrier has on a lateral surface facing the coating source outwardly open workpiece socket means, movable holding means being provided on the same surface which lock the workpieces in the workpiece socket means, and wherein at least a portion of said carrier forms a heat transfer head which during the coating process cooperates with a cooling body which is connected via one or more pressure fluid lines to a coolant source or a coolant circuit.

4,891,010

SIMULATOR FOR AN INSTALLATION FOR LOCATING AND GUIDING AN AERIAL BODY IN MOTION AND INSTALLATION OF THIS TYPE PROVIDED WITH SUCH A SIMULATOR

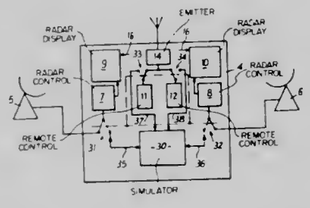
Georges Chassaigne, Begles, and Jean R. Saffores, Martignas, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Continuation of Ser. No. 826,563, Feb. 6, 1986, abandoned. This application Nov. 18, 1987, Ser. No. 122,511

Claims priority, application France, Feb. 8, 1985, 85 01843

Int. Cl.[4] G09B *4/08*

U.S. Cl. 434—2 **5 Claims**



1. A simulator for an installation (1) for locating and guiding a self-propelled, remote-controlled aerial body (2) in motion, said installation comprising:

electronic calculating means (16);

means for continuously locating said body in motion during its flight, comprising at least one radar (5,6) and one radar control panel (7,8), adapted for the control and exploitation of the information from said radar;

means for displaying the map (17) of a geographical region to be flown over by said body in motion;

means for displaying a theoretical predetermined path (20) that said body in motion must follow during its flight, said theoretical predetermined path being superposed on said map;

means for progressively plotting the real path (22) followed by said body in motion as its flight progresses, said real path being superposed on said map;

and remote-control means for acting on the position of said body in motion during flight, so that said real path is as close as possible to said theoretical predetermined path, said remote-control means comprising an emitter (14) and at least one remote-control panel (11,12) of said emitter,

said simulator comprising means (39) providing signals simulating said radar (5,6), said aerial body (2) in motion and said remote-control emitter (14) adapted to be connected, in place of said radar and said remote-control emitter respectively, at the input of said radar control panel (7,8) and at the output of said remote-control panel (11,12), by means of a switching system (31,32,33,34),

wherein said signal providing means (39) produces step by step, a simulated path appearing in place of said real path (22) in superposition on said map (17) and said simulator further comprises means (40) for introducing unexpected changes in said simulated path.

4,891,011

SYSTEM FOR ASSISTING THE LEARNING OF A SUBJECT

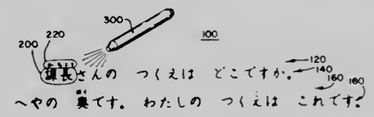
Graham D. Cook, 99 Alden La., Lake Forest, Ill. 60045

Filed Jul. 13, 1988, Ser. No. 218,667

Int. Cl.[4] G09B *19/06*

U.S. Cl. 434—157 **2 Claims**

1. A system for aiding the teaching of a language to a human being comprising a substrate with first and second sides; a first text displayed upon said first side of said substrate, said first text being visible to said human being; a second text also displayed upon said first side of said substrate, said second text being invisible to said human being; and a portable light source for providing light in a nonvisible frequency range in a select, small area on said substrate to render a portion of said second



text visible to said human being; said second text being related to said first text; portions of said first text, and of said second text being arrayed in substantially adjacent lines; portions of said second text being selectively visible only where illuminated by said light source.

4,891,012

BUNCH OF ELECTRIC CONDUCTORS FOR MOTOR VEHICLES

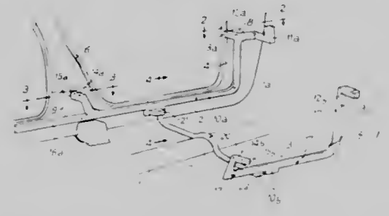
Jean-Claude Pajot, Auvers sur Oise, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly/-Seine, both of, France

Filed Mar. 18, 1988, Ser. No. 170,256

Claims priority, application France, Mar. 18, 1987, 87 03754

Int. Cl.[4] H01R *25/06, 33/00*

U.S. Cl. 439—34 **8 Claims**



1. A bunch of electric conductors for a motor vehicle comprising a plurality of interconnected sections, each section grouping a plurality of conductor wires, at least one of the sections comprising a rigid body which contains the wires and has ends, and multiple connectors connected to said ends and interconnected by said wires, the rigid body being made from an insulating plastics material moulded onto the wires and onto the connectors.

4,891,013

CONNECTOR FOR A THIN ELECTRONIC APPLIANCE

Shigeki Komaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1989, Ser. No. 319,295

Claims priority, application Japan, Mar. 7, 1988, 63-30057

Int. Cl.[4] H01R *9/09, 4/58, 13/44*

U.S. Cl. 439—66 **3 Claims**

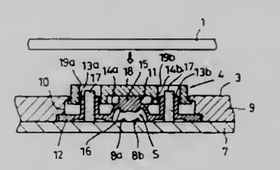
1. A connector for a thin electronic appliance for electrically connecting the thin electronic appliance with its receiving member, said connector comprising:

a key body of insulation rubber having a connector base adapted to be rigidly secured to a base of said receiving member, a plurality of resilient leg portions extending from said connector base and a key top portion supported by said leg portions;

a plurality of contact electrodes of electrically conductive rubber securely held by said connector base; and

a push button portion securely mounted on said key top portion and having a plurality of openings through which said contact electrodes extend;

whereby, when said thin electronic appliance is properly set in said receiving member, connection terminals thereof are electrically connected to said contact electrodes upon



depression of said key top portion of said key body and upon deformation of said leg portions, and when said thin electronic appliance is not in use, said contact electrodes are hidden inside said openings of said push button portion by virtue of resiliency of said leg portions.

4,891,014

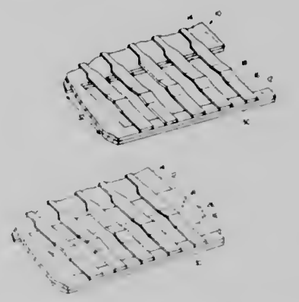
METHOD OF FORMING CONTACT BUMPS IN CONTACT PADS

Scott S. Simpson, and Bruce G. Koza, both of Woodstock, Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Mar. 3, 1989, Ser. No. 319,130

Int. Cl.[4] H01R *9/07*

U.S. Cl. 439—67 **14 Claims**



9. A contact bump in an electrically conductive contact pad having top and bottom surfaces supported on a dielectric substrate prepared by

removing a portion of said substrate underlying said contact pad to form an aperture and thereby expose a portion of the bottom surface of said pad;

upwardly deforming said pad by applying force to its exposed bottom surface to form said bump; and

filling said aperture behind said bump with a supporting substance.

4,891,015

UNIVERSAL CONNECTOR WITH INTERCHANGEABLE MALE AND FEMALE SLEEVES FOR USE IN NETWORK ANALYZERS AND MICROWAVE DEVICES

William W. Oldfield, Redwood City, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Jan. 9, 1989, Ser. No. 294,879

Int. Cl.[4] H01R *29/00*

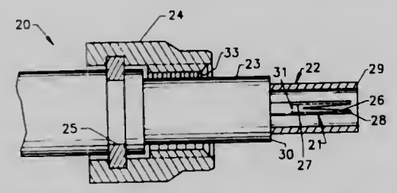
U.S. Cl. 439—172 **5 Claims**

1. A universal connector assembly for use in microwave apparatus comprising:

a first cylindrical member, said first cylindrical member having a first and a second section, each having a bore centrally located therein, said first section having a first outside diameter and said second section having a second outside diameter, said second diameter of said second section being less than said first diameter of said first section for forming a radially extending shoulder therebetween;

a second cylindrical member centrally located within said bore of and spaced from said first and said second sections of said first cylindrical member, said second cylindrical member having a pin receiving bore centrally located therein;

a cylindrical sleeve member, said sleeve member having a first section with a first bore having a first diameter centrally located therein and a second section with a second



bore having a second diameter centrally located therein for forming a radially extending shoulder therebetween, said first and said second sections of said sleeve member being adapted to be closely fitted over said first and said second sections, respectively, of said first cylindrical member, said length of said second bore in said sleeve member being less than the length of said second section in said first member so that the end of said second section in said first member extends beyond the end of said second bore in said sleeve member when said shoulder in said first member abuts said shoulder in said sleeve member;

first means for removably coupling said cylindrical sleeve member to said first cylindrical member such that said shoulder in said sleeve member abuts said shoulder in said first member; and

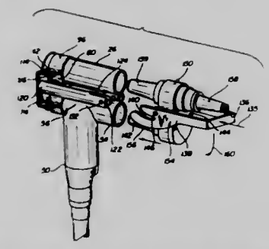
second means for removably coupling said sleeve member to a mechanically compatible connector.

4,891,016

600-AMP HOT STICK-OPERABLE PIN-AND-SOCKET ASSEMBLED CONNECTOR SYSTEM

Glenn J. Lazzi, Mt. Bethel, Pa., and James E. Cole, Phillipsburg, N.J., assignors to Amerace Corporation, Parsippany, N.J.

Filed Mar. 29, 1989, Ser. No. 329,972
Int. Cl.[4] H01R *13/53*
U.S. Cl. 439—183 **15 Claims**



1. A high voltage hot-stick operable pin-and-socket assembled connector system for selectively coupling together a source of high voltage and a high voltage cable comprising:

a support member;

an apparatus bushing mounted upon said support member and electrically coupled to a source of high voltage;

a high voltage cable;

bracket means coupled between said apparatus bushing and said high voltage cable to position said cable with respect to said apparatus bushing;

selectively applicable pin-and-socket operated link member when applied n a first arrangement joining said apparatus bushing to said cable to apply high voltage thereto or when not applied between said apparatus bushing and said cable, providing a visible separation between said bushing and said cable;

said pin-and-socket operated link means comprising a first and a second housing assembly each containg a metallic insert, one of said first and said second housing assemblies pin-and socket coupled to said apparatus bushing and the other pin-and-socket coupled to said high voltage cable;

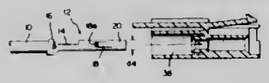
a conductive metal buss coupling said metallic inserts of said first and said second housing assemblies and a lever-operating system for selectively applying said link member in said first arrangement and for withdrawing said link member from such application.

4,891,017

SOCKET CONNECTOR WITH PIN ALIGNING HOUSING

Brent A. Kuhn, Winston-Salem, and Garold M. Yurko, Greensboro, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 26, 1988, Ser. No. 186,514
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—380 **16 Claims**



1. An electrical connector for establishing an electrical interconnection to an array of pins comprising:

a plurality of sockets positioned within passages extending from a mating end toward a rearward end of an insulative housing;

each passage having a first portion intermediate the ends of the housing with a diameter substantially equal to the outer diameter of the socket and a second portion, adjacent the first portion, being larger than the first portion to form a shoulder therebetween facing the mating end;

each socket having deflectable lances engagable with the shoulder after insertion of the lances through the first portion;

at least a first passage having a third portion adjacent the mating end of the housing with a minimum inner diameter less than the outer diameter of the socket, the third portion comprising means for guiding entry of a pin into engagement with a socket in the first passage without stubbing the socket disposed therein, the second portion of the first passage having an opening on one side with a width greater than the inner diameter of the third portion of the first passage, the shoulder extending around the first portion peripherally beyond the opening, the opening being

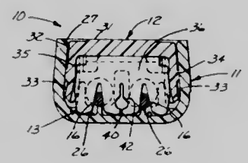
formed by a mold piece shiftable transversely to a core pin forming the third portion of the first passage when the insulative housing is molded.

4,891,018

SOLDERLESS ELECTRICAL CONNECTOR

Martin G. Afflerbaugh, and George J. Knox, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1988, Ser. No. 207,761
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—402 **13 Claims**



1. A wire connector for connecting a pair of wires comprising;

a translucent polyolefin base member having a plurality of side-by-side elongate wire-receiving channels having extended surfaces to support a corresponding plurality of wires, said base member being doubly deeply grooved across said surfaces and generally perpendicular to said channels, an opening above said grooves and wall members extending from the inner peripheral edge of said opening toward said channels to define a truncated conical cavity with the walls of the cavity diverging from the opening at an angle of at least about 6^0 from said peripheral edge to the base of said cavity,

a U-shaped resilient connecting member formed from about 0.4mm thick conductive metal, the legs of the U being wide thin closely spaced and deeply grooved plates adapted to fit within the parallel grooves and with a groove in each plate in line with each of said channels, said grooves being of the same size, and a clearance slot in each plate disposed between each of the grooves in line with the channels, and

a cap supporting said connecting member and shaped to fit in said cavity, said cap comprising a circular end wall and depending side walls having two legs extending beyond the free edges of the side walls at generally diametrically spaced locations, said connecting member being positioned between said legs and against the interior surface of said end wall, the outer peripheral dimension of the free edges of said depending side walls being slightly greater than the inside dimension of the opening in said base member, and said legs of said cap being disposed inside said cavity,

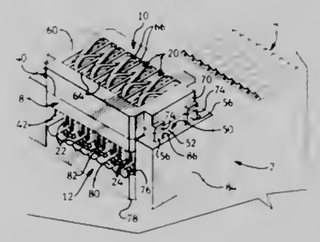
whereby when force is applied against said end wall of the cap forcing it in a direction toward said base member said opening in the base member will be forced to expand allowing entry of said cap and connecting member into said cavity whereby said plates of said connecting member are forced against said legs as a wire enters said grooves in said plates forcing said legs into engagement with said wall members to restrict said cap from being displaced from said cavity and further afford fully effective spring reserve contact with the wires disposed in said channels.

4,891,019

ELECTRICAL CONNECTOR FOR INTERCONNECTING A PRINTED CIRCUIT BOARD TO A RIBBON CABLE

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1989, Ser. No. 318,780
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—404 **14 Claims**



1. An electrical terminal for electrically connecting conductors of a ribbon cable to respective conductive areas of a printed circuit board, the electrical terminal comprising:

an intermediate portion having a first end and a second end;

a cable mounting section extending from the first end of the intermediate portion, the cable mounting section having a slot provided therein, the slot cooperating with a respective conductor of the ribbon cable when the conductor is inserted into the slot, such that the slot removes the insulation of the conductor to place the conductor in electrical engagement with the terminal;

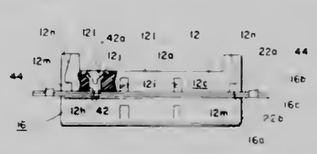
a board mounting section extending from the second end of the intermediate portion, the board mounting section having a board engagement area provided thereon, such that as the board is moved into engagement with the board engagement area, the resilient characteristics of the board mounting section will maintain the board engagement area in electrical engagement with the conductive areas of the printed circuit board.

4,891,020

LOW PROFILE METAL SHELL ELECTRICAL CONNECTOR

James S. Dunn, Doylestown, Pa., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Mar. 28, 1988, Ser. No. 174,259
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—405 **6 Claims**



1. In an electrical connector of the type having an insulative housing supporting a plurality of insulation displacement contacts for electrical engagement to insulated conductors and a metal shell secured to said housing, a portion of said metal shell surrounding said contacts, the improvement wherein:

said housing is elongate and includes two transversely spaced side walls, two longitudinally spaced end walls and an upper surface from which insulation displacement ends of said contacts project, said housing including interiorly thereof securement means holding said metal shell fixed thereto; wherein

said metal shell comprises a substantially planar longitudi-

nally extending flange, said flange being disposed generally parallel to and spaced from said upper surface, said metal shell including thereon at least one locking member having an extent projecting interiorly into said housing and cooperating with said securement means to fixedly hold said metal shell onto said housing, and wherein

said securement means comprises a pocket located adjacent one of said side walls of said housing and interiorly thereof, said pocket being defined by an interior surface engaging said locking member, said locking member including a deformable projection extending from said flange upwardly into said pocket into deformed relation with said interior surface of said pocket, said deformable projection comprising two bendable, spaced prongs and wherein said pocket has an interior surface adjacent each prong and in engagement therewith, said pocket defining an opening receiving said projection, said opening extending through said upper surface of said housing for access to said projection, said interior surface adjacent each prong being disposed at an obliquie angle relative to said opening, wherein deformation of said prongs against such oblique surfaces causes said prongs to be in a position dimensionally greater than said opening.

4,891,021

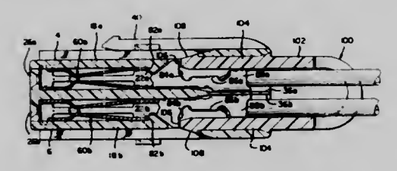
HIGH DENSITY SOCKET CONTACT RECEPTACLE

Earl J. Hayes, Mechanicsburg, Pa., and Allen F. VanDerStuyf, Kernersville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 151,040, Feb. 1, 1988, abandoned, Continuation-in-part of Ser. No. 873,652, Jun. 12, 1986, Pat. No. 4,722,704. This application Mar. 28, 1989, Ser. No. 331,050

Int. Cl.[4] H01R *13/40*

U.S. Cl. 439—599 **3 Claims**



1. A multicontact electrical connector comprising:

a plurality of contact terminals, each having a contact portion and a conductor termination portion,

an insulative housing having a plurality of cavities extending between a rear face and a mating face, each cavity being dimensioned to receive one contact terminal, each cavity having a constricted opening adjacent the mating face, the contact terminal being larger than the constricted opening so that each contact terminal can only be inserted into a corresponding cavity through the rear face of the housing;

the housing further including a plurality of resilient cantilever beam contact latches each having a fixed end adjacent the mating face and a free end between the mating face and the rear face, the free end of each cantilever beam contact latch being accessible from the exterior of the housing, the free end being outwardly deflectable for disengagement from the corresponding contact terminal, each cantilever beam contact latch having a ramp surface at the free end and a locking surface adjacent the ramp surface, the ramp surface and the locking surface extending inwardly from the cantilever beam contact latch for engagement with a corresponding contact terminal, the corresponding contact terminal engaging the ramp surface during insertion to flex the cantilever beam contact latch ontwardly, the locking surface engaging the contact terminal upon complete insertion, each latch comprising at least a portion of an exterior wall of a corresponding cavity;

first overstress means on the housing extending transversely between the fixed end and the free end of the plurality of cantilever beam contact latches on the exterior of the housing; and

a receptacle latch located on the exterior of the housing adjacent at least one cantilever beam contact latch, the receptacle latch having second overstress means thereon extending transversely relative to the at least one cantilever beam contact latch, whereby each resilient cantilever beam contact latch is outwardly deflectable to allow insertion of a corresponding contact terminal into a corresponding cavity.

4,891,022

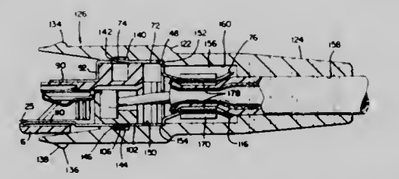
SHIELDED DATA CONNECTOR

Curtis S. Chandler, King, and Edward K. Marsh, Kernersville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 945,403, Dec. 22, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 262,142

Int. Cl.[4] H01R *9/03*

U.S. Cl. 439—610 **2 Claims**



1. An electrical connector for electrical interconnection with a shielded multiconductor data cable comprises:

an insulative housing means having terminal supporting means including a platform for the receipt of a plurality of electrical terminals, and sidewalls upstanding from the platform, the platform and the sidewalls defining an open upper face of the housing means,

a plurality of electrical terminals including base portions for mounting on the platform, the base portions being in transition with reversely bent portions forming resilient contact portions, the contact portions extending rearwardly to free ends of the terminals, the contact portions being intermatable with like contact portions in a complementary connector, the terminals further comprising wire connecting portions extending from ends of the terminal base portions,

shield means securable to the housing means, and surrounding the exterior of the sidewalls, the exterior of the platform, and enclosing the open upper face of the housing means, the shield means further comprising semicircular shielding extensions which integrally extend from a rear of the shield means, and

a one-piece ferrule having two semicircular portions having at least one collapsible portion interconnecting the two semicircular portions, whereby

when the ferrule is slid over an end of the multiconductor data cable and the individual conductors of the multiconductor data cable are terminated to the wire connecting portions of the terminals, and the shield means is enclosed over the insulative housing means, the ferrule can be slid forward to overlie the semicircular shielding extensions, and the collapsible portion of the ferrule can be crimped thereby moving the semicircular portions of the ferrule uniformly radially inward to electrically trap a shielding braid of the data cable in electrical connection with the shield means.

4,891,023

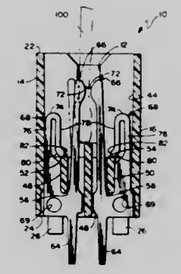
CIRCUIT CARD EDGE CONNECTOR AND TERMINAL THEREFOR

John E. Lopata, Naperville, Ill., assignor to Molex Incorporated

Filed Aug. 22, 1988, Ser. No. 234,770

Int. Cl.[4] H01R *23/70*

U.S. Cl. 439—637 **20 Claims**



1. An edge connector comprising a nonconductive housing having a pair of opposed external side walls, a top and a bottom, a slot extending into said top and dimensioned to receive an edge of a circuit card, a center wall intermediate the opposed external side walls, a plurality of terminal receiving cavities extending into the bottom of said housing and extending to said slot, each said terminal receiving cavity being disposed intermediate the center wall and one of said side walls and comprising a latch wall having a top and a bottom, each said latch wall being spaced from the external side walls and from the top and the bottom of said housing, said edge connector further comprising a terminal mounted in each said cavity, each said terminal comprising a base dimensioned for mounting in said cavity intermediate the bottom of the latch wall and the bottom of the housing, a connecting means connected to said base of said terminal and extending from said housing for electrically connecting said terminal to a circuit, a resilient deflectable contact beam extending from said base intermediate the center wall and the latch wall and into the slot of said housing, and a resilient deflectable mounting beam extending from said base and extending intermediate one said external side wall of said housing and the latch wall of said cavity, said mounting beam comprising a generally U-shaped portion comprising a mounting arm and a latch arm connected to one another at a bight, the bight defining the location on said mounting beam most distant from said base of said terminal, the mounting arm of said mounting beam being adjacent the external side wall of said cavity, and the latch arm of said mounting beam being lockingly engaged with the top of the latch wall of said cavity to lockingly retain said terminal in said housing.

4,891,024

PEDAL BOAT PROPULSION SYSTEM

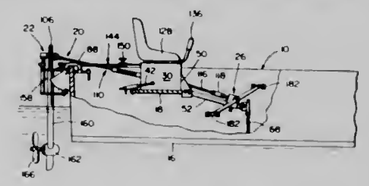
Robert J. Benjamin, Box 1148, Fort Benton, Mont. 59442

Filed Apr. 20, 1988, Ser. No. 184,070

Int. Cl.[4] B63H *16/20*

U.S. Cl. 440—28 **11 Claims**

1. In combination with a boat having an aft transom and a support forward of said transom and spaced above a bottom structure of said boat, a pedal propulsion system including a pedal persons operator seat, mounting means mounting said operator seat stationary from said support, a drive unit mounted from said transom and including a lower rotary output shaft disposed to the rear of said transom and an upper rotary input shaft disposed above said transom, rotary torque transfer means drivingly connecting said input shaft to said output shaft, said output shaft having a marine propulsion member mounted thereon for rotation therewith to react upon water in which said boat is floating for propelling said boat through said water upon rotation of said output shaft, a pedal crank assembly stationarily mounted in said boat forward of said support and including a pedal crankshaft journaled for rotation about a horizontal axis extending transversely of said boat a drive shaft assembly extending between and drivingly connecting said pedal crankshaft to said input shaft, said operator seat including a seat base having a lower portion supported on and removably anchored relative to said support and an



upper portion, said upper portion including a seat unit mounted therefrom, a support arm having front and rear ends, means mounting said rear end from said seat base for angular displacement about a horizontal axis extending transversely of said boat and support arm, the front end of said support arm including a depending adjustable length support leg supported from said bottom structure, support means mounting said pedal crank assembly on the front end of said support arm.

4,891,025

ARRANGEMENT IN BOAT PROPELLER INSTALLATIONS

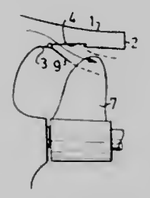
Lennart Brandt, Fjärås, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Mar. 7, 1988, Ser. No. 165,114

Claims priority, application Sweden, Mar. 27, 1987, 8701282

Int. Cl.[4] B63H *21/32*

U.S. Cl. 440—66 **3 Claims**



1. An arrangement for boat propellor installations, comprising gaseous supply means for supplying a gaseous medium to the vicinity of a propeller whose blades pass close to a wall structure of said boat, said gaseous supply means including an outlet in said wall structure positioned forward of the tips of said propellor and said outlet including guide means to direct said flow of said gaseous medium rearwardly and radially inwardly towards said sweep of said propellor tips, said guide means being movable from a position in which said outlet is completely closed to a position in which said outlet is completely open to serve as a means to control the amount of gaseous medium supplied by said gaseous supply means.

4,891,026

MARINE PROPELLER INCLUDING FISH LINE TRAP

David F. Hansen, and Mark C. Noble, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

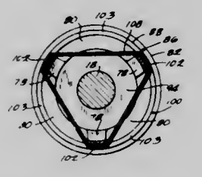
Filed Jul. 22, 1988, Ser. No. 223,222

Int. Cl.[4] B63H *1/28*

U.S. Cl. 440—73 **15 Claims**

1. A marine propulsion device comprising a lower unit

including a gear case normally submerged in water and having a rearward end, a propeller shaft rotatably supported in said gear case and having a rear portion extending rearwardly of the rearward end of said gear case, a propeller mounted on the rear portion of said propeller shaft for common rotation therewith and including an outer hub carrying a radially extending blade having a leading edge, said outer hub including a forward portion in front of the leading edge of said blade and having a forward end, an outer surface, and an inner surface defining a hollow interior area, and means for trapping fish line or similar material including a groove extending around at least a portion of said outer surface of said hub forward portion and wholly in spaced relation to said forward end thereof and having a portion which opens through said inner surface of said outer hub and into said interior area.

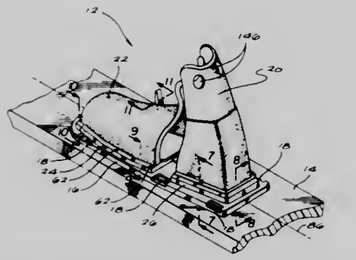


4,891,027

WATER SKI BINDING

Michael D. Plunkett, 5931 Bellfield, Huntington Beach, Calif. 92648

Continuation of Ser. No. 43,898, Apr. 29, 1987, abandoned. This application May 5, 1989, Ser. No. 351,252
Int. Cl.[4] A63C *9/00*
U.S. Cl. 441—70 **33 Claims**



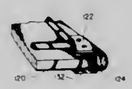
1. A water ski binding comprising:
a flexible boot member for the foot of the skier;
a first boot member mounting structure having wall surface structure to rise generally upwardly with respect to the top surface of the ski; and
a second boot member mounting structure, having wall surface structure to rise generally upwardly with respect to the top surface of the ski, to press said boot member between said wall surface structures by slidable movement relative to said first mounting structure, to mount said boot member on the ski;
said wall structure of one of said boot member mounting structures including a first portion to face generally inwardly and extend generally along the length of the ski toward one side of the ski, a second portion to face generally inwardly and extend generally along the length of the ski toward the other side of the ski and a third portion to face generally inwardly and extend generally along the width of the ski; and
said wall structure of said other one of said boot member mounting structures including a first portion to face generally outwardly and extend generally along the length of the ski toward one side of the ski, a second portion to face generally outwardly and extend generally along the length of the ski toward the other side of the ski and a third portion to face generally outwardly and extend generally along the width of the ski.

4,891,028

SHIELDING MEANS AND PROCESS FOR USE IN THE MANUFACTURE OF TENSION MASK COLOR CATHODE RAY TUBES

Allan D. Kautz, Naperville, and Johann Steiner, Des Plaines, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 11, 1989, Ser. No. 336,283
Int. Cl.[4] H01J *9/20*
U.S. Cl. 445—30 **6 Claims**



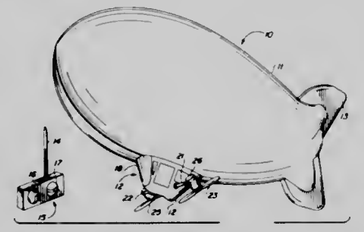
4. For use in the manufacture of a tension mask color cathode ray tube having a glass faceplate and a substantially rectangular mask support structure with outwardly tapered sides for intercepting a mask-trimming laser beam except in corner areas of said support structure, a process comprising:
providing shielding means for attachment in said corner areas of said mask support structure, said shielding means being configured to bridge said corner areas and intercept said beam; and
detachably engaging said shielding means to said faceplate and support structure for shielding said glass of said beam.

4,891,029

REMOTE CONTROL LIGHER-THAN-AIR TOY

Jack M. Hutchinson, Rte. 3, Box 667B, Shawnee St., Bay St. Louis, Miss. 39520

Continuation-in-part of Ser. No. 12,314, Feb. 9, 1987, Pat. No. 4,799,914. This application Sep. 12, 1988, Ser. No. 242,638
Int. Cl.[4] A63H *27/00, 3/06, 29/22;* **B64D** *27/00*
U.S. Cl. 446—58 **5 Claims**



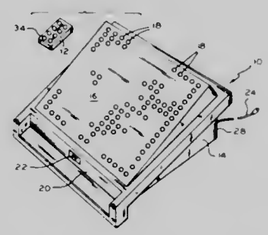
1. A remote controlled lighter-than-air toy comprising:
an inflatable container having a predetermined shape for holding a lighter-than-air gas;
a gondola having front and rear portions and being removably attached to said inflatable container;
a shaft extending through said gondola and rotatable supported thereto;
a reversible electric motor attached to each end portion of said shaft, each electric motor having a propeller attached thereto for rotation upon actuation of the electric motor, each said electric motor and propellor being rotatable attached to said shaft;
a radio receiver located in said gondola and operatively coupled to said electric motors through a plurality of conductor wires;
a remote control box having a transmitter therein for transmitting to said radio receiver for remotely controlling each said electric motor separately; whereby said lighter-than-air toy can be remotely controlled with two propellers;
a rechargebable battery pack located in said gondola and connected to said receiver and to said electric motors for powering said receiver and electric motors;
a battery charger means connectable to an alternating electric power source and to said battery pack for recharging said battery pack, said battery charger means including a battery charger positioned in said gondola and having a pair of AC plug prongs protruding therefrom for insertion into an AC receptacle for recharging said batteries; and
said gondola having a removable portion positioned over said battery charger pair of AC plug prongs, whereby said gondola can be positioned adjacent an AC receptacle and said battery charger prongs plugged thereinto.

4,891,030

TOY WITH LIGHTED PLAYPIECES

Sheldon G. Gertzfeld, Northbrook, Ill., assignor to Superior Toy & Manufacturing Company, Inc., Chicago, Ill.

Filed Apr. 28, 1988, Ser. No. 187,424
Int. Cl.[4] A63H *33/04*
U.S. Cl. 446—118 **8 Claims**



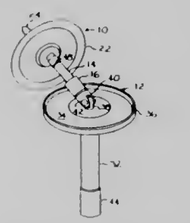
1. An electrically lighted construction toy comprising a light box, said box having a translucent top with a plurality of uniformly distributed upstanding pegs integrally formed thereon in a grid pattern, a plurality of blocks made of a light transmitting material and having sockets on one side and pegs integrally projecting from an opposite side, said sockets and pegs on said blocks and said pegs on said top being uniformly distributed to complement each other so that they may be plugged into each other, said sockets on said blocks being adapted to receive said pegs on said translucent top, said sockets on the blocks also being adapted to receive the pegs on other blocks, whereby said blocks may be stacked on each other to make three dimensional figures, and means inside said box for back lighting said translucent top whereby said translucent top and blocks thereon transmit light and wherein all electrical connections are encased within said light box.

4,891,031

SPINNING TOP AND DRIVING DEVICE FOR ACTUATING THE SAME

Normand A. Beaudry, 2082, Chapdelaine St., Ste-Foy, Quebec, Canada G1V 1M3

Filed Mar. 14, 1988, Ser. No. 167,951
Int. Cl.[4] A63H *1/00*
U.S. Cl. 446—259 **13 Claims**



1. A driving control device adapted to actuate a spinning top which is provided with an axial post, a flywheel concentrically secured to said post, and with a rotatable sleeve member axially mounted at one end of said post, said device comprising a tubular member having a central longitudinal axis, a riding rim secured to said tubular member at one end thereof, said rim being concentrically located relative to said longitudinal axis, a shaft rotatably mounted inside said tubular member, said shaft being longitudinally fixed relative to said tubular member, part of said shaft being exposed through said tubular member for allowing manual contact with said shaft, a pivoting member hingely secured at one end of said shaft adjacent said rim and adapted to pivot about a transversal axis relative to said shaft from a substantially horizontal position to a vertical position, said pivoting member adapted to hook onto the sleeve member of the spinning top, whereby said riding rim is adapted to frictionally engaged said post when said pivoting member is in the horizontal position.

4,891,032

FLEXIBLE TOY WAND

David C. Davis, 74 Christmas Ave., Washington, Pa. 15301

Filed Sep. 12, 1988, Ser. No. 242,498
Int. Cl.[4] A63H *29/22, 33/26*
U.S. Cl. 446—484 **1 Claim**



1. A toy wand having a flexible, hollow, tubular body of

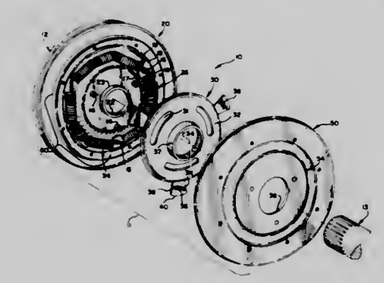
relative small diameter, a battery case integrally connected to the lower end of said body serving as a handle and enclosing a battery and a switching means, an elongated cylindrical casing integrally attached to said battery case, one end of said elongated casing extending past the housing of said battery case, said tubular body housed within said cylindrical casing so that the portion of said cylindrical casing extending past said battery housing reinforces said tubular body during movement, a light source positioned at the upper end portion of said body, and connected in series through said body with said battery and switching means, whereby when the battery case is grasped and moved in a circular or elliptical path, said tubular body will flex, said end piece being made of flower-like, flexible, translucent plastic strips, surrounding said light source, so as to make visible the light source.

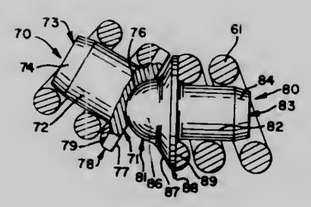
4,891,033

DEVICE FOR COUPLING COIL SPRINGS COMPRESSED IN SERIES IN A CLUTCH DAMPER

William M. Heyser, Northbrook, Ill., assignor to Automatic Spring Coiling Co., Chicago, Ill.

Filed Apr. 20, 1988, Ser. No. 183,924
Int. Cl.[4] F16D *3/12*
U.S. Cl. 464—68 **4 Claims**





1. In a clutch damper having at least two coil spring members arranged end-to-end within an arcuate channel and operably interposed between a drive and a driven member, wherein the improvement comprises:

a first means for coupling an adjacent coil spring member, said first means being radially dimensioned to present an interference fit with an inner radius of one end of a coil spring member and presenting a ball, said ball extending outwardly from the end of the spring member; and,

a second means for coupling an adjacent coil spring member, said second means being radially dimensioned to present an interference fit with an inner radius of an adjacent spring member on the end adjoining to said first means and presenting a socket, said socket facing outwardly from the spring end toward said first means;

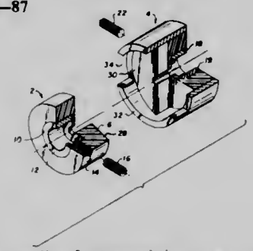
whereby, said first means and said second means being attached to adjoining ends of at least two adjacent coil spring members cooperatively engage one another to pivotally couple the adjoining coil spring members.

4,891,034

DRIVE COUPLING

Arne Wilhelmsen, 4897 Patrick Pl., Burnaby, British Columbia, Canada

Filed Nov. 6, 1987, Ser. No. 118,114
Int. Cl.[4] F16D *1/02*
U.S. Cl. 464—87 **7 Claims**



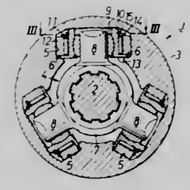
1. A drive coupling for transmitting rotary motion between a pair of shafts to be coupled comprising a male member and a female member formed from a rigid plastic material, each member having a longitudinal axis co-axial with the axis of the shafts, an attachment face with means for securing the member to the end of a shaft to be coupled comprising a recess formed in said attachment face, a threaded channel extending through said member at right angles to the longitudinal axis of said member to intersect said recess; and a threaded fastener housed in said channel for tightening into said channel to protrude into said recess in order to abut and clamp a shaft inserted into said recess and a mating face, said mating face of said male member having a semi-cylindrical flange, and said mating face of said female member having a semi-cylindrical flange and an outer sleeve about the periphery of said mating face to define a tubular cavity to accept said male semi-cylindrical flange, said outer sleeve being formed with apertures therein to allow access to said threaded fasteners when said drive coupling is operatively installed such that the semi-cylindrical flanges of said male and female members interfit within said tubular cavity to transmit rotary motion.

4,891,035

SLIDE TYPE UNIVERSAL JOINT HAVING LONGITUDINAL GROOVES IN WHICH ROLLERS TRAVEL WITHOUT TILTING

Akira Sasaki; Seiji Esaki; Shigeo Kurita, and Masahiro Shimizu, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,625
Claims priority, application Japan, Feb. 5, 1987, 62-25098
Int. Cl.[4] F16D *3/20*
U.S. Cl. 464—111 **28 Claims**



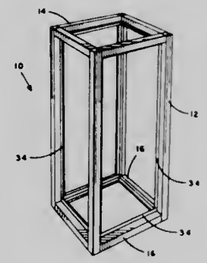
1. A slide type universal joint for connecting first and second transmission shafts, said joint comprising a hollow cylindrical outer member connected to one of the transmission shafts and having a plurality of angularly spaced, axially extending transmission grooves in its inner peripheral surface, an inner member connected to the other of the transmission shafts and projecting into the hollow outer member, a plurality of trunnions radially extending on said inner member to project into corresponding transmission grooves, an inner roller slidably fitted on each of said trunnions, a holder fitted on said inner roller for universal movement thereon, an outer roller rotatably fitted on said holder and rollably engaged in a corresponding transmission groove, and regulating means between said outer member and said holder for preventing inclination of said holder relative to said outer member about an axis extending longitudinally of the corresponding groove, said regulating means comprising first means between the outer member and the holder for opposing relative movement of said holder radially inwards of said outer member and second means between the outer member and the holder for opposing relative movement of said holder radially outwards of said outer member, one of said first and second means opposing relative rotation of said holder with respect to said outer member.

4,891,036

MODIFIED DERAILLEUR

John J. Stammetti, 22636 Ocean Ave., #20, Torrance, Calif. 90505

Filed May 26, 1989, Ser. No. 358,562
Int. Cl.[4] F16H *9/00*
U.S. Cl. 474—82 **51 Claims**



1. A derailleur assembly comprising:

(a) a hanger plate for mounting a derailleur to a frame of a bicycle,

(b) an upper pivot member pivotally mounting a rear end support to the hanger plate,

(c) a lower pivot member pivotally mounting a front end support to the chain cage,

(d) a parallelogram joining the rear end support to the front end support,

(e) an upper lock for securing the upper pivot member against rotation, and

(f) a lower lock for securing the lower pivot member against rotation.

4,891,037

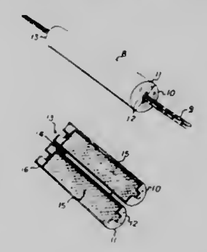
CONTINUOUS CHAIN LUBRICATING DEVICE

Paul D. Maples, 772 S. Sierra Ave., Solana Beach, Calif. 92075

Filed Nov. 7, 1988, Ser. No. 267,933
Int. Cl.[4] F16H *57/04*
U.S. Cl. 474—91 **14 Claims**

1. In combination with a power-transmission chain, a lubricating device which comprises:

a container partially enclosing a lubricant, said container having a transversal bore slidingly engaging the chain; wherein said container comprises two mating half sections joined about a plane intersecting said bore; and



means to impede one direction of movement of the container when the chain is in motion.

4,891,038

DRIVE AND BEARING ARRANGEMENT FOR TWO OPPOSITELY ROTATING, ADJACENTLY LOCATED ROTOR SYSTEMS

Klaus-Dietrich Nickel, Frankfurt am Main, Fed. Rep. of Germany, assignor to Kaus-Technoplan GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 220,482
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644448
Int. Cl.[4] F16H *55/32*
U.S. Cl. 474—166 **26 Claims**



1. A drive and bearing arrangement for two rotor systems which rotate in opposite directions and mounted next to each other, wherein each rotor system has a rotor support member and a drive hub, each drive hub having first and second ends, the first end connected to the rotor support member, comprising a common vibration absorbing and elastically mounted support and supply tube, the support and supply tube having an axis, the rotor support member of each rotor system rotatably mounted through a rotor bearing directly on the support and supply tube, and the second end of each hub rotatably mounted through a drive bearing on an axially movable shaft stub mounted in a bearing block.

4,891,039

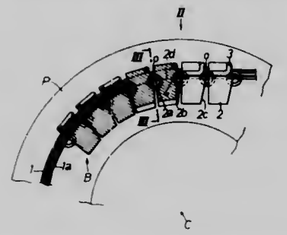
POWER TRANSMITTING V-BELT

Toraо Hattori, and Shigeru Kanehara, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,899
Claims priority, application Japan, Jun. 5, 1987, 62-86769[U]; Jun. 5, 1987, 62-86770[U]
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—242 **15 Claims**

1. A power transmitting V-belt comprising an endless metal band mounted on supporting surfaces of a multiplicity of V-shaped metal blocks which are aligned with one another with each V-shaped metal block being rotatable relative to an adja-

cent V-shaped metal block around an axis extending in a widthwise direction of said metal band, said axis being located



on a block contact surface of the metal band which is in engagement with the supporting surfaces of the metal blocks.

4,891,040

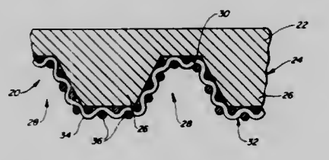
WOVEN FABRIC BELT

Takaji Nagai, Kobe; Hiroyuki Okawa, Hyogo; Takahide Mizuno, and Fumihito Nakagawa, both of Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Japan

Continuation of Ser. No. 510,435, Jul. 1, 1983, abandoned. This application Jul. 20, 1988, Ser. No. 221,523

Int. Cl.[4] F16G *1/04*

U.S. Cl. 474—267 **14 Claims**



1. A power transmission belt comprising:
a load carrying rubber section;
a tooth rubber section on said load carrying section defining a toothed surface; and
a woven belt fabric on said toothed surface including
warps of shrinkable yarns obtained by aligning and twisting sole shrinkable mixed twisted yarns including elastic yarn elongated more than 10% and comprising more than approximately 1/15 of said Yarns, and
wefts made of twisted yarns.

4,891,041

DEVICE FOR SEPARATING SOLIDS FROM LIQUIDS IN A DENTAL APPARATUS

Eugen Hohmann, Bensheim; Wolfgang Behringer, Bensheim-Wilmshausen, and Manfred Preuss, Lautertal, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

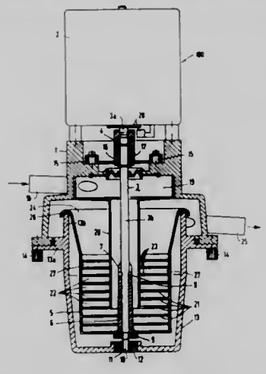
Filed May 12, 1988, Ser. No. 192,938

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3716008; Jul. 27, 1987, 3724841

Int. Cl.[4] B04B *7/02*

U.S. Cl. 494—62 **15 Claims**

1. In a device for use with a dental apparatus for separating solids from a liquid with centrifugal forces, said device including a housing, a centrifuge having a rotating container with a peripheral centrifugal wall being disposed in the housing and driven by a motor, said housing having an admission channel and an outlet channel so that liquid enriched with solids can be introduced through the admission channel into the housing and the rotating container with the solids being forced against the peripheral centrifugal wall as a consequence of centrifugal force and the liquid being pressed out of the container by overflow and being conducted into the outlet channel, the improvement comprising a collecting vessel being a component part of the rotating container of the centrifuge and having a container wall forming the centrifugal wall, said collecting vessel having a closed bottom and having a plurality of partitions extending transversely to an axis of the vessel to from a plurality of axially spaced chambers along the centrifugal wall



of the vessel, said chambers being connected both to one another, as well as to the outlet channel by an opening in the center of each of the partitions so that a fluid flows from a chamber around an opening in the partitions to the next chamber and eventually out of the vessel as the particles are collected in each of the chambers, and said device having coupling means for detachably connecting the collecting vessel to a drive shaft of the motor with a torsionally rigid and axially detachable connection.

4,891,042

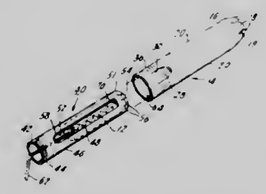
PORTABLE TAMPON APPLICATOR

Wayne D. Melvin, Camden, and Jamshid Rejai, Dover, both of Del., assignors to Playtex Family Products, Inc., Stamford, Conn.

Filed May 6, 1988, Ser. No. 191,313

Int. Cl.[4] A61F *13/20*

U.S. Cl. 604—18 **19 Claims**



1. In a tampon applicator, comprising: a hollow cylindrical barrel having interior and outer cylindrical walls extending between opposed insertion and barrel grasping ends, and a hollow cylindrical plunger telescopically slidable within said barrel between first and second positions;
said plunger having outer and interior cylindrical walls, extending between opposed tampon ejecting and actuating ends, said plunger interior cylindrical wall initially holding a tampon therein at said first position, said tampon ejecting end abutting the rear end of the tampon at said second position for pushing the tampon, and said actuating end being manually movable towards said barrel insertion end to urge said tampon ejecting end against the rear end of the tampon to eject the tampon from the insertion end of the barrel;
at least one closed ended elongate slot in the plunger wall which extends from adjacent the ejection end of the plunger towards the actuating end; and
the improvement comprising
said barrel being of substantially uniform cross sectional thickness between is opposed insertion and barrel grasping ends, at least one slit positioned along and extending through the tubular cylindrical barrel,
said slit including a pair of longitudinally opposed cuts extending from a first end adjacent the barrel grasping end to a second end in the direction of the barrel ejection end and a forward terminus cut at said second end to define therebetween a tongue integrally formed from and being of the same thickness as the uniform cross section thickness material of the tubular barrel wall,
said tongue overlying the area defined by said pair of longitudinally opposed and forward terminus cuts and cantilevered forwardly towards the insertion end of the barrel from its connection to the barrel at said first end of the longitudinally opposed cuts, said tongue forming an acute angle with respect to, the insertion end of the barrel and deflected inwardly into the interior of the plunger through said elongate slot, in non-interference relationship with respect to the outer cylindrical wall of the plunger, the deflected tongue being effective in said first position for restraining the tampon against rearward movement and for ejecting the tampon from the plunger as the plunger is being retracted from the barrel toward said second position and for engaging the closed end of the elongate plunger slot to prevent the plunger from separating from the barrel during retraction of the plunger.

4,891,043

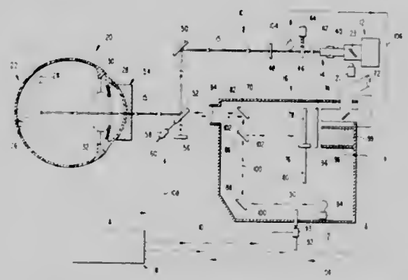
SYSTEM FOR SELECTIVE RELEASE OF LIPOSOME ENCAPSULATED MATERIAL VIA LASER RADIATION

Ran C. Zeimer, Chicago; Bahram Khoobehi, River Forest, and Gholam A. Peyman, Chicago, all of Ill., assignors to Board of Trustees of the University of Illinois, Chicago, Ill.

Filed May 28, 1987, Ser. No. 55,047

Int. Cl.[4] A61M *1/30*

U.S. Cl. 604—20 **11 Claims**



1. A method of selectively and repetitively releasing a material at a specific site in the blood stream inside the body of an animal, comprising the steps of
encapsulating the material in heat-sensitive lipid vesicles,
injecting the lipid vesicles into the blood stream of the animal so that the blood stream carries the lipid vesicles throughout the body including the specific site,
generating a laser beam having a wavelength in the visible or infrared part of the electromagnetic spectrum, and
applying the laser beam to the lipid vesicles located at the specific site so as to heat and rupture the lipid vesicles so that the material therein is released within milliseconds therefrom at the specific site.

4,891,044

OPHTHALMIC ASPIRATING/IRRIGATING DEVICE

David Mitchell, Redditch, England, assignor to Coats Vyella Medical Limited, Worcestershire, England

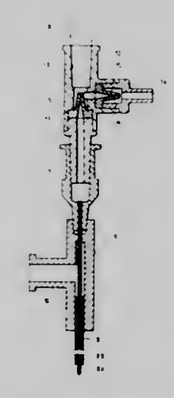
PCT No. PCT/GB87/00291, § 371 Date Jan. 4, 1988, § 102(e) Date Jan. 4, 1988, PCT Pub. No. WO87/06455, PCT Pub. Date Nov. 5, 1987

PCT Filed May 1, 1987, Ser. No. 141,604

Claims priority, application United Kingdom, May 3, 1986, 8610896

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—27 **3 Claims**



1. An ophthalmic aspirating/irrigating device having, in use, a distal end and a proximal end and comprising a needle comprising two tubes disposed in close proximity, and terminating at one end close to one another at the distal end of the device, said one end of said tubes being insertable into an eye to be treated; and a valve assembly connected between the other end of one tube and a syringe including a plunger, said valve assembly comprising a first one way valve means, comprising two flexible lips normally in contact with one another and separable by a pressure rise across the first valve means to present a first orifice, for providing passage only from the syringe to a discharge opening of the device and a second one way valve means, comprising two flexible lips normally in contact with one another and separable by a pressure rise across the second valve means to present a second orifice and disposed relative to said first valve means such that when the device is in a vertical position with the needle projecting downwardly the orifice of said first valve means is located at a distance of at most 1 mm below the level of the orifice of said second valve means, for normally providing passage only in the direction from said one tube to the syringe and for also providing passage of a small pressure wave, produced by momentarily depressing the plunger of the syringe, through the second valve means prior to the closing of said second valve means and the opening of the first valve means.

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4,891,045

2,4-DIAMINO-1,3,5-TRIMETHOXYBENZENE, PROCESS FOR ITS PREPARATION AND ITS USE AS A COUPLER IN OXIDATION DYES FOR KERATINOUS FIBRES

Alex Junino, Livry-Gargan; Jean J. Vandenbossche, Aulnay-sous-Bois; Herve Borowiak, Tremblay-les-Gonesse, and Gerard Lang, Saint-Gratien, all of France, assignors to L'Oreal, Paris, France

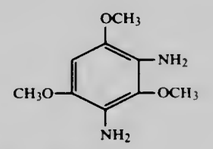
Filed Apr. 27, 1988, Ser. No. 212,318

Claims priority, application Luxembourg, Jun. 25, 1987, 86931

Int. Cl.[4] A61K *7/13;* **C07C** *91/40, 91/42*

U.S. Cl. 8—411 **21 Claims**

1. 2,4-Diamino-1,3,5-trimethoxybenzene of formula:



(I)

and acid addition salts thereof.

4. A keratinous fiber dye composition which contains 2,4-diamino-1,3,5-trimethoxybenzene or an acid addition salt thereof as a coupler, in combination with at least one oxidation dye precursor of the para type. which contains 0.05 to 3.5% by weight of 2,4-diamino-1,3,5-trimethoxybenzene or of one of its acid addition salts, based on the total weight of the composition.

4,891,046

TINTED CONTACT LENS AND METHOD FOR PREPARATION WITH DICHLOROTRIAZINE REACTIVE DYE

Joseph W. Wittmann, Rochester, and John M. Evans, Greece, both of N.Y., assignors to CooperVision, Inc., San Jose, Calif.

Filed Mar. 15, 1984, Ser. No. 589,747

Int. Cl.[4] D06P *5/00;* **C09B** *62/00*

U.S. Cl. 8—507 **20 Claims**

1. A process for coloring hydrophilic soft contact lenses comprised of a synthetic resin containing substantial proportions of an hydroxyl group-containing acrylic ester and N-vinylpyrrolidone comprising

impregnating the lens with an aqueous solution of a dichlorotriazine dye, and

contacting the impregnated lens with an aqueous alkaline solution for a period of time sufficient to fix the dye within the lens.

4,891,047

PROCESS FOR DYEING FIBERS WITH A DYE LIQUOR CONTAINING GRANULES OF SILICA GEL

Hrioshi Kato, Abiko, and Keiichi Komatsu, Yatabe, both of Japan

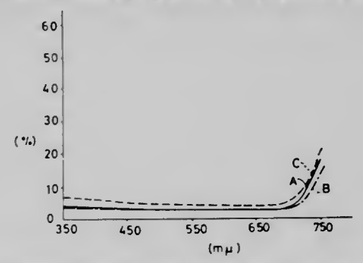
Filed Nov. 19, 1986, Ser. No. 932,241

Claims priority, application Japan, Nov. 19, 1985, 60-257695

Int. Cl.[4] D06P *1/67, 3/14*

U.S. Cl. 8—632 **4 Claims**

1. A process for dyeing silk, wool, nylon, cotton, rayon or polyvinyl alcohol fibers comprising contacting the fibers to be dyed with a dye in a dye liquor containing granules of silica gel, wherein the silica gel granules have a diameter in the range



of 3 to 40 micrometers and wherein the dye is one that comes dye anions in a dye liquor.

4,891,048

METHOD OF MANUFACTURING A TERMINAL LEAD-THROUGH FOR A BATTERY CONSISTING OF CELLS PILED ON EACH OTHER

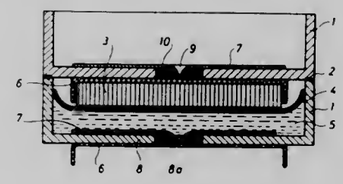
Karen Kümmel, Lyngby, and Bjorn Eiriksson, Herfolge, both of Denmark, assignors to A/S Hellesens, Koge, Denmark

Continuation of Ser. No. 912,847, Sep. 29, 1986. This application Apr. 25, 1988, Ser. No. 186,744

Claims priority, application Denmark, Oct. 4, 1985, 4547/85

Int. Cl.[4] H01M *6/00, 6/46*

U.S. Cl. 29—623.1 **3 Claims**



1. A method of manufacturing a terminal lead-through for a battery having first and a second cell casing, each said cell casing having a top and a bottom, an aperture in the bottom of said first cell casing, a first terminal plate on the bottom of each cell casing, an anode on the first terminal plate in each cell casing, a cathode in each cell casing, a separator between said cathode and said anode in each cell casing, and a second terminal plate on the cathode; comprising the steps of:

placing said first cell casing on top of said second cell casing;

connecting said first cell casing and said second cell casing together;

placing a sealing mass in the aperture of said first cell casing; and

spot welding through the sealing mass into the aperture of said first cell casing so that the sealing mass is pressed sideways and penetrates into all areas of the aperture and so that a projecting knob forms on the first terminal plate and projects into the aperture so that it is in contact with the second terminal plate of the second cell casing.

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4,891,049
HYDROCARBON FUEL COMPOSITION CONTAINING CARBONATE ADDITIVE

Diane M. Dillon, Fullerton, and Ross Y. Iwamoto, Huntington Beach, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Dec. 20, 1985, Ser. No. 811,953
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—53 **34 Claims**

1. A composition comprising:

a particulate reducing amount of an additive comprising two carbonates of the formula:



wherein R^1 and R^2 in the first carbonate and R^1 in the second carbonate are monovalent, non-aromatic organic radicals containing between about 1 and 10 carbon atoms and R^2 in the second carbonate is a carbalkoxy radical

and a liquid hydrocarbon fuel heavier than gasoline.

4,891,050
GASOLINE ADDITIVES AND GASOLINE CONTAINING SOLUBLE PLATINUM GROUP METAL COMPOUNDS AND USE IN INTERNAL COMBUSTION ENGINES

Wayne E. Bowers, Clearwater, Fla., and Barry N. Sprague, West Haven, Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 796,428, Nov. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,954, Dec. 4, 1984, abandoned, and Ser. No. 790,738, Oct. 24, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 897,869
Int. Cl.[4] C10L *1/30*
U.S. Cl. 44—67 **18 Claims**

1. A method of reducing emissions from or increasing the utilizable energy of gasoline for powering internal combustion engines, comprising admixing with gasoline a fuel soluble organo-metallic fuel additive composition in an amount effective to supply from 0.01 to 1.0 parts per million of platinum per part of fuel, said composition comprising a compound having the general formula

$$XPtR_1R_2$$

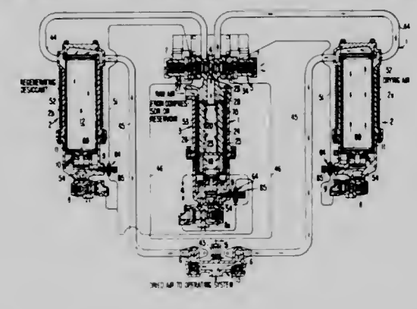
wherein X is a ligand containing at least one unsaturated carbon-to-carbon bond with an olefinic, acetylenic or aromatic pi bond configuration and R_1 and R_2 are, independently, benzyl, phenyl, nitrobenzyl or alkyl having from 1–10 carbons.

4,891,051
SYSTEM FOR DECONTAMINATING COMPRESSED GAS

Virgil L. Frantz, Salem, Va., assignor to Roanoke College, Salem, Va.

Filed Jan. 11, 1989, Ser. No. 295,528
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—162 **6 Claims**

1. A system for decontaminating compressed gas, comprising twin desiccant-containing towers each alternatable between and relatively alternatable in decontaminating and regenerating cycles, a coalescer-containing precoalescer upstream and connected to an inlet port on an inlet manifold of the towers and alternatable between coalescing and purge cycles, a pair of inlet valves and a pair of solenoid valves in said manifold one for each tower, said towers having in a common outlet manifold an outlet valve having a restricted axial bore adapted when the valve is closed to pass gas under reduced pressure to the tower being regenerated, said towers and precoalescer each having a drain valve and in a lower part of a housing thereof an upwardly acting compactor supplied with actuating gas from an outlet in said inlet manifold, means for cycling said towers and precoalescer in response to timer-control of said solenoid valves, and means for preventing said

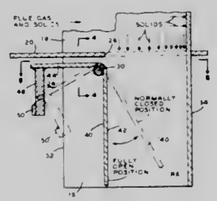


cycling when the pressure of said gas is below a predetermined minimum.

4,891,052
IMPINGEMENT TYPE SOLIDS COLLECTOR DISCHARGE RESTRICTOR

Felix Belin, Brecksville, and David J. Walker, Wadsworth, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 21, 1989, Ser. No. 312,165
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—429 **17 Claims**



1. A discharge restrictor for a flow-through impingement type solids collector comprising:

(a) a rod pivotally secured to the lower end region of a generally vertically supported impingement member, said rod extending between spaced supports forming a part of said impingement member;

(b) a pivotable baffle plate secured to said rod and sized to effectively block a preselected area immediately adjacent said impingement member;

(c) pivoting means for alternately pivoting said baffle plate between select closed and open positions thereby alternately blocking and unblocking said preselected area;

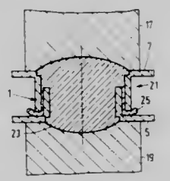
(d) stopping means secured to said baffle plate for selectively stopping the rotation of said baffle plate; and

(e) bias means secured to said baffle plate for normally biasing said baffle plate in the said closed position whereby said preselected area immediately adjacent said impingement member is essentially blocked by said baffle plate.

4,891,053
METHOD OF MANUFACTURING BICONVEX LENS ELEMENTS AND ELEMENT FORMED THEREBY

Gerrit E. Bartman; Nicodemus Hattu; Willem J. Lindhout, and Sebastiaan F. M. Trommelen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,661
Claims priority, application Netherlands, Nov. 10, 1987, 8702679
Int. Cl.[4] C03B *23/00*
U.S. Cl. 65—64 **9 Claims**



1. A method of manufacturing biconvex lens elements having a biconvex lens and a two part holder, comprising the steps of:

providing a two part holder of coaxial metal rings of differing diameters, said rings being slidable within one another and having an annular gap therebetween;

providing a heat moldable lens blank having an overdimensioned volume of material;

heating said holder and said lens blank to a temperature at which the material of the lens blank flows;

positioning the holder and lens blank in the heated dies of a mold with the rings of the mold in an extended position;

pressing the dies of said mold together to slide the two parts of the holder within one another and to press the excess material from the central part of the lens blank into the annular gap; and

cooling the holders and the lens blank to form the completed lens element.

4,891,054
METHOD FOR CUTTING HOT GLASS

Jack A. Bricker, Tarentum; Earl L. May, Irwin, both of Pa.; Donald P. Michelotti, Rochester Hills, Mich.; John R. Dahlberg, Jeannette, Pa.; James J. Oravitz, Jr., Chesnick, Pa., and William R. Siskos, Delmont, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 30, 1988, Ser. No. 292,083
Int. Cl.[4] C03B *21/00*
U.S. Cl. 65—105 **11 Claims**

1. A method of cutting a glass sheet along a desire line of cut comprising:

providing a portion of a glass sheet, including a desired line of cut, at a temperature at least about its annealing point temperature;

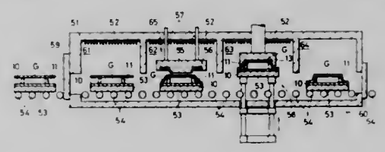
scoring a surface of said portion of said glass sheet along said desired line of cut; and

opening said score through the glass sheet thickness, while;

4,891,055
METHOD OF FORMING GLASS PRODUCT HAVING SMOOTH SURFACE

Kazuo Shibaoka, Itami; Takao Miwa; Toshio Akimoto, both of Yokkaichi, and Noriaki Eto, Itami, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,161
Claims priority, application Japan, Nov. 6, 1987, 62-280374; Nov. 6, 1987, 62-280375
Int. Cl.[4] C03B *23/03*
U.S. Cl. 65—106 **6 Claims**



1. A method of forming a glass product having a smooth surface comprising the steps of:

placing a glass plate on a male mold which is formed to have dimensions corresponding to the inner dimensions of the glass product and which contacts an inner peripheral edge portion thereof;

heating the central portion of the glass plate to a temperature corresponding to a viscosity indication (log η, η is the poise) falling within a range of 14.5 and 11.5;

heating the outer peripheral portion to be deformed of the glass plate to a temperature equal to or higher than a temperature correspouding to a viscosity indication of 7.5, so that the outer peripheral portion of the glass plated is deformed on said male mold by the force of gravity;

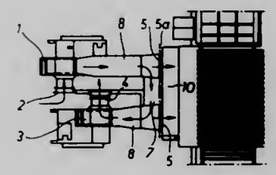
pressing the deformed glass plate with a female mold formed to have dimensions corresponding to the outer dimensions of the glass product; and

after formation of the glass product, during gradual cooling or at the beginning of cooling, setting the temperature of the central portion of the glass plate, which serves as the smooth surface of the glass product, to a temperature corresponding to a viscosity indication falling within a range of 14.5 and 12.4 so as to reduce a temperature difference in the glass molded piece to 30° C. or less.

4,891,056
ADJUSTING DEVICE FOR THE BLAST PRESSURE IN THE COOLING NOZZLES OF A GLASS TEMPERING APPARATUS

Pauli T. Reunamäki, and Erkki P. J. Yli-Vakkuri, both of Tampere, Finland, assignors to Tamglass Oy, Tampere, Finland

Filed Mar. 7, 1988, Ser. No. 165,175
Claims priority, application Finland, Mar. 16, 1987, 871132
Int. Cl.[4] C03B *27/04*
U.S. Cl. 65—348 **12 Claims**



1. A device for adjusting the blast pressure of a glass tempering apparatus, said device comprising an air-distribution chamber for supplying blast air to nozzle blocks of a glass tempering

apparatus, at least two blowers, each of said blowers having a corresponding vane adjuster, blast ducts interconnecting each of the blowers with the air-distribution chamber, a by-pass duct interconnecting said blast ducts, throttle valve means pivotably mounted in said blast ducts at the interconnection with said air-distribution chamber and downstream of said by-pass duct for throttling air flow into the air-distribution chamber, whereby the blast pressure is adjustable within a sufficiently wide range for 4–19 mm glasses by adjustment of said vane adjuster.

4,891,057

PHENYLPYRAZOLECARBOXYLIC ACID DERIVATIVES, THEIR PREPARATION, AND THEIR USE AS PLANT-GROWTH REGULATORS AND SAFENERS

Erich Soha, Esslingen; Reinhard Handte, Gablingen; Hilmar Mildenberger, Kelkheim; Helmut Bürstell, Frankfurt am Main; Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

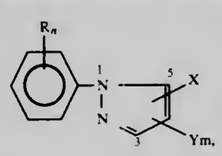
Filed Oct. 2, 1987, Ser. No. 104,820

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 3633840

Int. Cl.[4] **A01N** *43/56;* **C07D** *231/14*

U.S. Cl. 71—72 **14 Claims**

1. A compound of formula I, and agriculturally acceptable salts and quaternization products thereof,

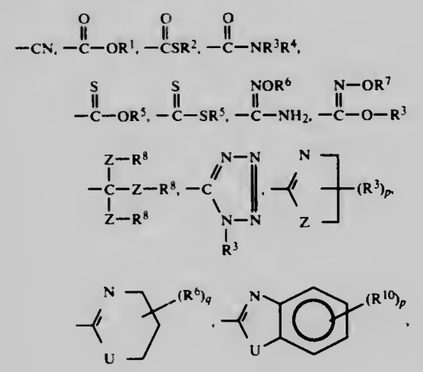


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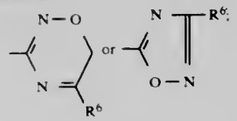
in which:

R, in each case independently of one another, is halogen, hydroxyl, cyano, nitro, (C_1–C_4)alkyl, halo(C_1–C_4)alkyl, (C_1–C_4)alkoxy(C_1–C_4)alkyl, (C_1–C_4)alkoxy, (C_1–C_6)alkoxy(C_1–C_4)alkoxy, halo(C_1–C_6)alkoxy, (C_1–C_4)alkylthio, halo(C_1–C_4)alkylthio, carboxyl, (C_1–C_4)alkoxycarbonyl, (C_1–C_4)alkylsulfinyl, halo(C_1–C_4)alkylsulfinyl, (C_1–C_4)alkylsulfonyl, halo(C_1–C_4)alkylsulfonyl, (C_1–C_4)alkylsulfonyloxy, halo(C_1–C_4)alkylsulfonyloxy, phenyl, halophenyl, phenoxy or halophenoxy,

X is oriented in the 3- or 5-position of the pyrazole ring and is a radical of the formula



-continued



Z is O or S;

U is O, S or N-R^6;

R^1 is hydrogen, (C_1–C_{12})alkyl, (C_1–C_{12})alkyl which is monosubstituted or polysubstituted by halogen and/or monosubstituted or disubstituted by hydroxyl, (C_1–C_6)alkoxy, (C_1–C_4)alkoxy-(C_1–C_4)alkoxy, (C_1–C_4)alkylthio, (C_1–C_4-)alkylsulfinyl, (C_1–C_4)alkylsulfonyl, mono- or di-(C_1–C_4-alkyl)amino, cyano, aminocarbonyl, (C_1–C_4)alkylcarbonyl, (C_1–C_4-alkoxy)carbonyl, cyclo(C_3–C_7)alkyl, tri(C_1–C_4)alkylsilyl, benzyloxy, benzyloxyethoxy, phenyl, phenyl which is substituted by halogen or (C_1–C_4)alkyl, phenoxy or phenylthio which both are unsubstituted or substituted by halogen or (C_1–C_4)alkyl; by oxiranyl, tetrahydrofuryl, triazolyl, pyridinyl, imidazolyl, carboxyl, carboxylate with a cation which can be employed for agriculture, or the —O—N=C(CH_3)$_2$ radical; or is (C_3–C_6)alkenyl, halo(C_3–C_6)alkenyl, cyclo(C_3–C_7)alkyl which is unsubstituted or substituted by halogen or (C_1–C_4)alkyl; cyclo(C_5–C_7)alkenyl which is unsubstituted or substituted by halogen or (C_1–C_4)alkyl; or is (C_3–C_6)alkynyl, 1,2-epoxyprop-3-yl, phenyl or phenyl which is monosubstituted or disubstituted by halogen, nitro, cyano, (C_1–C_4)alkyl, (C_1–C_4-alkoxy)carbonyl or (C_1–C_4)alkoxy; or is (C_1–C_4-alkyl)carbonyl, phenylcarbonyl with a phenyl ring which is unsubstituted or substituted by halogen, nitro, cyano or (C_1–C_4)alkyl, or is a radical of the formula t,0540

or an agriculturally acceptable cation;

R^2 is (C_1–C_{12})alkyl or (C_1–C_{12})alkyl which is monosubstituted or disubstituted by (C_1–C_4)alkoxyethoxy, cyclo(C_3–C_6)alkyl, benzyloxy, phenyl, phenoxy, (C_1–C_4)alkylthio, (C_1–C_4-alkoxy)carbonyl, carboxyl or carboxylate with an agricuturally acceptable cation;

R^3, in each case independently of one another, is (C_1–C_6)alkyl, phenyl or (C_3–C_6)alkenyl;

R^4 is hydrogen, (C_1–C_{12})alkyl or (C_1–C_{12})alkyl which is monosubstituted or disubstituted by (C_1–C_6)alkoxy, (C_1–C_4)alkoxyethoxy, hydroxyl, hydroxyimino, (C_1–C_4-)alkoxyimino, halogen; cyclo (C_3–C_6)alkyl, benzyloxy, cyano, aminocarbonyl, carboxyl, (C_1–C_4-alkoxy)carbonyl, formyl, phenyl or phenoxy, or is phenyl or phenyl which is monosubstituted or disubstituted by halogen, or is (C_1–C_4)alkoxy; (C_1–C_4) alkylnitro, (C_3–C_6)alkenyl, (C_3- C_6-)cycloalkyl, or a radical of the formula:

—NR^3R^{12}, —O—R^6, —NH—$CONH_2$, —NH—CS—NH_2 or —SO_2R^{13} or

R^3 and R^4, together with the nitrogen atom to which they are bound, are a ring selected from the group consisting of piperidine, morpholine, 2,6-dimethyl morpholine, piperazine, triazole, imidazole, pyrazole, thiazole and benzimidazole;

R^5 is hydrogen, (C_1–C_6)alkyl or phenyl, or in the case where X is —CS—OR^5, is an agriculturally acceptable cation;

R^6, in each case independently of one another, is hydrogen, (C_1–C_4)alkyl or benzyl;

R^7, in each case independently of one another, is hydrogen, (C_1–C_{12})alkyl which is unsubstituted or substituted by phenyl which is unsubstituted or substituted by halogen, nitro, cyano, (C_1–C_4)alkyl or (C_1–C_4)alkoxy, by hydroxyl, cyano, (C_1–C_4-alkoxy)carbonyl, (C_1–C_4)alkylthio, (C_1–C_4)alkoxy, cyclo(C_5–C_7)alkyl or benzyloxy, or is (C_3–C_6)alkenyl, halo(C_3–C_6)alkenyl, (C_3–C_6)alkynyl, cyclo(C_5–C_8)alkyl, cyclo(C_5–C_6)alkenyl, (C_1–C_6-alkyl)carbonyl, halo(C_1–C_6-alkyl)carbonyl, ((C_1–C_6-alkyl)amino)carbonyl, benzoyl, halobenzoyl or methylbenzoyl;

R^8, in each case independently of one another, is (C_1–C_6)alkyl which is unsubstituted or substituted by phenyl, cyclo(C_5–C_7)alkyl, (C_1–C_4)alkoxy, (C_1–C_4)alkylthio or halogen, or two radicals R^8, together with Z and the carbon atom to which they are bound, are a 5- or 6-membered saturated heterocyclic ring which is unsubstituted or substituted by (C_1–C_4)alkyl, hydroxy(C_1–C_4)alkyl, halo(C_1–C_4)alkyl or phenyl;

R^9, in each case independently of one another, is hydrogen, halogen, (C_1–C_4)alkyl, nitro or cyano;

R^{10}, in each case independently of one another, is hydrogen, (C_1–C_6)alkyl which is unsubstituted or substituted by (C_1–C_4)alkoxy, triazolyl or imidazolyl; or is cyclo-(C_3–C_6)alkyl, (C_3–C_6)alkenyl, phenyl or benzyl, or in the radical —N=C(R^{10})$_2$ both radicals R^{10}, together with the carbon atom to which they are bound, are a cyclo(C_5–C_7)alkyl which is unsubstituted or substituted by methyl or halogen;

R^{11} is (C_1–C_4)alkyl, phenyl, (C_1–C_6-alkyl)carbonyl, benzyl, benzoyl, halobenzyl, halobenzoyl or methylbenzoyl;

R^{12} is hydrogen, (C_1–C_4)alkyl, formyl (C_1–C_6-alkyl)carbonyl, benzoyl, halobenzoyl, methylbenzoyl or trihaloacetyl;

R^{13} is (C_1–C_4)alkyl, phenyl or methylphenyl;

n is an integer from 0 to 5;

p is an integer from 0 to 4; and

q is an integer from 0 to 6.

10. A method for regulating plant growth, wherein a plant growth regulating effective amount of a compound of formula I as claimed in claim 1 is applied to a plant or to a cultivated area.

11. A method for protecting crop plants against phytotoxic side effects of a herbicide, wherein a phytotoxic side effect protecting effective amount of a compound of formula I as claimed in claim 1 is applied to the crop plants or a cultivated area before, after or at the same time the herbicide is applied.

4,891,058

1-ALKYL-3-ARYL IMIDAZOLIDINE-2,4-DIONES AND HERBICIDAL USE

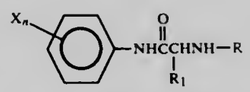
Siok H. H. Wee, Berkeley, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jul. 18, 1988, Ser. No. 220,299

Int. Cl.[4] **A01N** *37/18;* **C07C** *103/28*

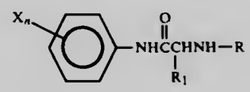
U.S. Cl. 71—118 **32 Claims**

1. A compound having the formula



wherein R is C_1–C_3 lower alkyl; R_1 is phenyl substituted with phenoxy, benzyloxy, nitro or one or more C_1–C_3 lower alkyl, C_1–C_3 lower alkoxy, halo, haloalkyl or combinations thereof; X is halo, haloalkyl or combinations thereof; and n is an integer from 0–3, inclusive.

16. A method of controlling undesirable vegetation comprising applying to said vegetation or the locus thereof, an herbicidally effective amount of a compound having the formula



wherein

R is C_1–C_3 lower alkyl;

R_1 is hydrogen, C_1–C_3 lower alkyl, phenyl, phenyl substituted with phenoxy, benzyloxy, nitro or phenyl substituted with alkyl, alkoxy, haloalkyl, one or more halo or combinations thereof;

X is alkyl, halo, haloalkyl or combinations thereof; and

n is an integer from 0–3, inclusive.

4,891,059

PHASE REDISTRIBUTION PROCESSING

Sidney Diamond, Dublin, and Aspi N. Patel, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Aug. 29, 1988, Ser. No. 238,959

Int. Cl.[4] **B21B** *1/46;* **C22C** *1/04*

U.S. Cl. 75—0.5 R **9 Claims**

1. A process for making composite powder comprising the steps of

providing a molten mixture comprising at least two metals which upon rapid solidification form a solid having segregated phases,

rapidly solidifying the molten mixture to a solid having segregated phases,

reducing the solid to a blendable particle size, and

redistributing and refining the segregated phases to produce a homogeneous microstructure by high-energy solid state blending.

4,891,060

PROCESS FOR THE RECOVERY OF GOLD USING PLASMA

Gerhardus Overbeek, Horison, South Africa; John K. Williams, Stanford in the Vale, United Kingdom, and Charles P. Heasley, Little Coxwell, United Kingdom, assignors to Tetronics Research and Development Company Ltd., Oxfordshire, United Kingdom and Anglovaal Ltd., Johannesburg, South Africa

Filed Aug. 22, 1988, Ser. No. 234,686

Claims priority, application United Kingdom, Aug. 27, 1987, 8720279

Int. Cl.[4] **C22B** *11/00*

U.S. Cl. 75—10.19 **8 Claims**

1. A process for the recovery of gold from a refractory or non-refractory gold containing concentrate which contains sulphide minerals and which contains arsenic and/or antimony, or to which an arsenic bearing material is added, which process consists essentially of:

(i) heating the gold containing concentrate to a temperature of above 1150° C. in order thermally to decompose the sulphide minerals contained therein and to form a slag phase, a metal/metal sulphide (matte) phase and a speiss phase,

(ii) separating the slag phase from the matte and speiss phases,

(iii) reacting the matte and speiss phases obtained from step (ii) with oxygen using a plasma arc column generated in a plasma arc furnace to maintain a temperature of above 1150° C., and

(iv) processing the matte and speiss phases after reaction in step (iii) in order to recover gold therefrom.

4,891,061

PROCESS FOR TREATING SPEISS

Thomas P. Clement, II, Belle Mead; John R. Wettlaufer, Asbury, and Jack A. Scott, Somerville, all of N.J., assignors to ASARCO Incorporated, New York, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,237

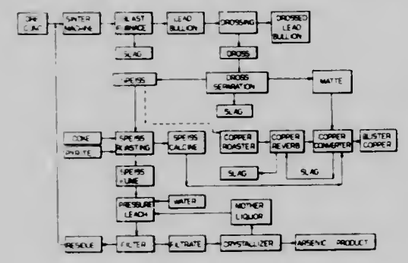
Int. Cl.[4] **C22B** *7/04*

U.S. Cl. 75—24 **7 Claims**

1. A process for separating arsenic and antimony from speiss in an apparatus having an inlet, an outlet, heating means and a hearth comprising:

(a) supplying the speiss, a solid sulfur source which com-

bines with the copper of the speiss and a solid carbon source selected from the group consisting of coal and coke to the inlet of the apparatus forming a bed on the hearth;
(b) moving the bed over the hearth to the outlet of the



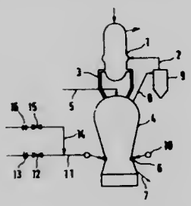
apparatus while maintaining the bed at a temperature of about 900° F. to 1300° F. for a sufficient time to volatilize arsenic and antimony oxides; and
(c) separating the volatilized arsenic and antimony oxides from the heated bed on the hearth.

4,891,062

METHOD FOR OPERATING AND MELT-DOWN GASIFIER HAVING WATER-COOLED NOZZLES FOR OXYGEN AND MEANS FOR MONITORING WATER AND OXYGEN

Bogdan Vuletic, Duesseldorf, Fed. Rep. of Germany, assignor to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 6, 1988, Ser. No. 280,596
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3742156
Int. Cl.[4] F27D *19/00*; C21B *13/14*
U.S. Cl. 75—28 **10 Claims**



1. A method for the operation of a melt-down gasifier or other apparatus for making liquid pig iron or steel starting material, which apparatus includes water cooled nozzles for introducing a measured quantity of oxygen-containing gas into the apparatus at a normal operating pressure, the method comprising the steps of:
detecting any reduction of the supply of water to the nozzles below a predetermined quantity,
terminating the supply of oxygen-containing gas to the nozzles in response to the detected reduction,
feeding an inert gas into the nozzles in an initial amount sufficient to maintain the pressure within the apparatus for an initial period of time following the terminating step, and
reducing the quantity of inert gas fed into the nozzles after the initial period of time.

4,891,063

PROCESS FOR STIRRING STEEL IN A LADLE WITH THE AID OF CARBON DIOXIDE

Francois Weisang, Antony, France, assignor to L'Air Liquide, Paris, France

Filed Aug. 8, 1988, Ser. No. 229,440
Claims priority, application France, Aug. 12, 1987, 87 11458
Int. Cl.[4] C21C *5/32, 5/34*
U.S. Cl. 75—51.1 **6 Claims**

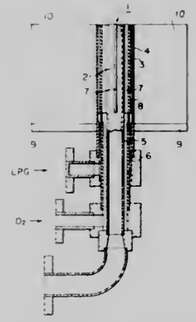
1. A process for stirring killed steel in a ladle, comprising injecting an inert gas into a bath of molten steel in the ladle, said injecting being so effected that bubbles of gas rise through at least a part of the bath of molten steel thereby putting the molten steel in motion by the effect of the rising gas, said bath of molten steel having previously been killed by incorporating a sufficient quantity of deoxidizer that an excess of the deoxidizer remains in the dissolved state in the bath of molten steel, said process further comprising adding a supplementary quantity of deoxidizer to the excess of deoxidizer in the bath of molten steel and thereafter effecting the stirring of the molten steel by injecting carbon dioxide in a gaseous form, the rate of supply of carbon dioxide in the gaseous form remaining at the most equal to 10% of the excess of dissolved deoxidizer.

4,891,064

METHOD OF MELTING COLD MATERIAL INCLUDING IRON

Kazushige Umezawa; Tatsuro Kawabara; Tetsuya Oh-hara; Tsuzaru Naibe, and Kousaku Ozawa, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 306,176
Claims priority, application Japan, Sep. 30, 1988, 63-247121
Int. Cl.[4] C21C *7/00*
U.S. Cl. 75—51.2 **7 Claims**



1. A method of melting an iron-containing cold material and simultaneously obtaining a low phosphorous and high carbon molten iron while maintaining a high post combustion rate, comprising the steps of:
preparing a converter having a lance for top-blowing oxygen, and a bottom-blowing triple pipe nozzle disposed at a bottom of the converter which nozzle is provided with an inner pipe, an intermediate pipe and an outer pipe;
supplying the iron-containing cold material into the converter in which a hot heel exists;
introducing into the converter all of a carbonaceous material together with a non-oxidizing gas through the inner pipe of the triple pipe nozzle, oxygen through a space defined between the inner pipe and the intermediate pipe, and a non-oxidizing cooling gas through another space defined between the intermediate pipe and the outer pipe, and additional oxygen through the oxygen top-blowing, lance so that the cold material is melted into a molten iron under an existence of slag;

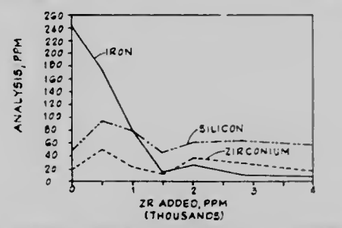
maintaining both the content of carbon dissolved in the molten iron at a level of 3 to 4% in most of a period of time for the melting and the rate of bottom-blown oxygen in a range of not less than 10% but less than 20% of the total amount of the oxygen; and
adding intermittently or successively iron oxide into the slag in most of a melting period of time while keeping a slag basicity defined by CaO/SiO_2 in a range of 1.5 to 3.0.

4,891,065

PROCESS FOR PRODUCING HIGH PURITY MAGNESIUM

William G. Green, Freeport, and James E. Hillis, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1988, Ser. No. 237,928
Int. Cl.[4] C22B *26/22*
U.S. Cl. 75—63 **34 Claims**



1. A process for producing magnesium low in metallic contaminants comprising:
(a) forming a binary intermetallic phase by contacting a zirconium material and silicon material at a ratio sufficient to control the mutual solubilities of zirconium and silicon in a magnesium melt;
(b) contacting a magnesium melt containing iron contamination with the binary intermetallic phase;
(c) reacting said binary intermetallic phase with the iron in the melt to form a ternary intermetallic precipitate consisting essentially of zirconium, silicon and iron, whereby the iron contamination in the magnesium melt solution phase is reduced without simultaneously introducing significant levels of soluble zirconium and silicon; and
(d) separating the precipitate from the magnesium melt to provide a high purity magnesium.

4,891,066

HIGHLY PURE TITANIUM

Kazumi Shimotori, Kawasaki; Yoshiharu Ochi, Ichihara; Hideo Ishihara; Takenori Umeki, both of Yokohama, and Takashi Ishigami, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 51,772, May 20, 1987, Pat. No. 4,793,854.
This application Jul. 15, 1988, Ser. No. 219,799
Claims priority, application Japan, May 30, 1986, 61-123463
Int. Cl.[4] C22B *34/12*
U.S. Cl. 75—84 **8 Claims**

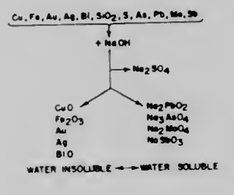
1. A highly pure titanium comprising not more than 200 ppm of oxygen; not more than 30 ppm each of elements consisting of iron, nickel and chromium, and not more than 0.1 ppm each of elements consisting of sodium and potassium, wherein said highly pure titanium has a residual resistance ratio RRR_{273} of 45 or more.

4,891,067

PROCESSES FOR THE TREATMENT OF SMELTER FLUE DUST

Alkis S. Rappas, Chagrin Falls, and Brett T. Waterman, Bedford, both of Ohio, assignors to Kennecott Utah Copper Corporation, Wilmington, Del.

Filed May 13, 1988, Ser. No. 193,873
Int. Cl.[4] C01G *21/02*
U.S. Cl. 75—101 R **39 Claims**



1. A process for the treatment of acid flue dust containing copper, lead, arsenic, sulfur and molybdenum comprising the steps of:
raising the pH of an acidic slurry of water and flue dust to about 9–10with an alkali hydroxide to form a first liquids soluble sulfate solution and a first solids portion containing copper, lead and arsenic;
separating said first liquids portion from said first solids;
subjecting said first solids portion to a caustic leach strong enough to solubilize lead and arsenic but not copper in a second liquids portion; and
precipitating said arsenic from said second liquids portion by reaction with lime.

4,891,068

ADDITIVE POWDERS FOR COATING MATERIALS OR PLASTICS

Tsuyoshi Masumoto; Akihisa Inoue, both of Sendai; Masahiro Ogachi, and Yoshio Harakawa, both of Tokyo, all of Japan, assignors to Teikoku Piston Ring Co., Ltd. and Tsuyoshi Masumoto, both of Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,972
Claims priority, application Japan, May 12, 1988, 63-115485; May 12, 1988, 63-115486; Jun. 17, 1988, 63-149450; Jun. 17, 1988, 63-149451; Jul. 22, 1988, 63-183098
Int. Cl.[4] B22F *1/02*
U.S. Cl. 75—251 **16 Claims**

1. A leaf-shaped additive powder for coating materials or plastics, comprising a particle of a metal or glass, wherein said particle has a thickness of 0.5 5 μm, a minor axis of at least 5

μm and a major axis not more than 500 μm, an aspect ratio which is the ratio of the major axis to the thickness of not less than 5:1, and a ratio of the minor axis to the major axis, of from 1:1 to 1:10.

4,891,069

COMPOSITION FOR THE ELECTROLYTIC COATING OF CIRCUIT BOARDS WITHOUT AN ELECTROLESS METAL COATING

Abraham M. Holtzman, Bat Yam, and Joseph Relis, Ramat Gan, both of Israel, assignors to Techno Instruments Investments 1983 Ltd., Bat-Yam, Israel

Filed Jun. 6, 1986, Ser. No. 872,093
Int. Cl.[4] C23C *30/00*
U.S. Cl. 106—1.15 **21 Claims**

1. A catalyst composition comprising a metal catalyst for use in a process for depositing metals on a non-conductive substrate by using the reductive capacity of hydrogen in the presence of said metal catalyst on such substrate, said metal catalyst being capable of combining with hydrogen where hydrogen is generated electrolytically from a protic bath, said metal catalyst being in association with a stabilizer, said metal catalyst being present in an amount sufficient so that when it is applied to a non-conductive substrate immersed in a protic bath it will combine with hydrogen generated electrolytically from said bath so that said hydrogen combined with said metal catalyst will reduce a metal coating compound brought into contact with said catalyst and form a metal coating on said substrate, said stabilizer being present in an amount sufficient to stabilize said metal catalyst in an aqueous environment.

2. The catalyst composition of claim **1** further comprising a promoter selected from the group consisting of:

(a) organic hydroxy compounds
(b) surfactants
(c) thiourea compounds
(d) amino acids
(e) polycarboxylic acids and
(f) water soluble polymers

or combinations thereof.

14. A catalyst for applying an electrolytic coating to a non-conductive substrate comprising:

(a) a metal which can combine with hydrogen,
(b) an acid;
(c) an Sn^{2+} salt;
(d) a member selected from the group consisting of an alkali metal stannate and an Sn^{4+} salt;
(e) a metal salt stabilizer;

said metal which can combine with hydrogen being present in an amount sufficient so that when it is applied to a non-conductive substrate immersed in a protic bath is will combine with hydrogen generated electrolytically from said bath so that said hydrogen combined with said metal will reduce a metal coating compound brought into contact with said catalyst and form a metal coating on said substrate, said metal salt stabilizer being present in an amount sufficient to stabilize said metal which can combine with hydrogen in an aqueous environment

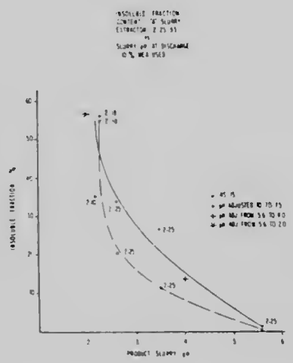
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4,891,070

LIGNIN AMINE SALT AS BINDER FOR AQUEOUS PRINTING INK COMPOSITION

Peter Dilling, Isle of Palms, and Mitchell S. Dimitri, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Apr. 13, 1987, Ser. No. 37,526
Int. Cl.[4] C09D *11/14*
U.S. Cl. 106—26 **6 Claims**



1. An improved aqueous printing ink composition comprising a water-soluble, storage stable lignin by-product of a kraft pulping process wherein the improvement comprises a lignin amine salt exhibiting improved water-solubility and stability and prepared by the steps comprising:

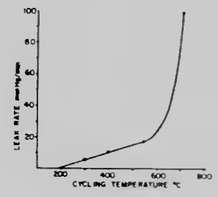
(a) lowering the pH of a black liquor residue of the kraft pulping process to a pH of about 9.5 to precipitate the lignin material therefrom;
(b) acidifying the lignin precipitate in aqueous slurry to an acidic pH level above about 5;
(c) washing the acidified lignin precipitate with water to remove inorganic salts and other impurities therefrom; and
(d) adding an organic amine to an aqueous slurry of the washed lignin to form a lignin amine salt solution having a pH in excess of 5.

4,891,071

CEMENTITIOUS COMPOSITE MATERIAL WITH VACUUM INTEGRITY AT ELEVATED TEMPERATURES

Randall P. Bright, Bowie; Sean Wise, Millersville, and Mark L. MacKenzie, Laurel, all of Md., assignors to Cemcom Corporation, Lanham, Md.

Filed Nov. 21, 1984, Ser. No. 673,841
Int. Cl.[4] C04B *24/00, 28/04*
U.S. Cl. 106—90 **6 Claims**



1. In a process for producing an article comprising a high strength cementitious tooling/molding material containing a filler wherein a major constituent of the filler comprises stainless steel aggregate in a cementitious binder; and which exhibits vacuum integrity at temperatures up to about 350° C.; the improvement which consists in heating said article to a temperature of at least about 300° C. and up to the temperature at which said stainless steel aggregate oxidizes and for a time sufficient to develop surface porosity in said article, thereafter impregnating the surface portions of the resulting porous article with a crosslinkable organic prepolymer of a high termperature resistant resin and thereafter polymerizing and curing the polymer in the surface pores of said article to produce a product which exhibits vacuum integrity at temperatures up to about 350° C. and with enhanced flexural strength at elevated temperatures as compared with an otherwise similar product without said impregnation with said prepolymer, polymerization and curing.

4,891,072

MULTI-COMPONENT GROUTING SYSTEM

John Cooper, Dundonald, Scotland, assignor to Imperial Chemical Industries PLC, London, England

Filed Jul. 5, 1983, Ser. No. 511,003
Claims priority, application United Kingdom, Jul. 23, 1982, 8221417
Int. Cl.[4] C04B *7/02, 24/00, 24/08*
U.S. Cl. 106—90 **25 Claims**

1. A storable packaged multi-component grouting system wherein the components are disposed in direct side-by-side contact in a single-compartment frangible casing, said components providing a setting composition when the components are intimately mixed together, said grouting system comprising: a first component which is a water-in-oil emulsion, said emulsion comprising a polar liquid as the dispersed phase in a liquid of lower dielectric constant, at least one active ingredient of the grouting system being contained in the dispersed phase of said emulsion; and a second component containing at least one other active ingredient reactable with said one active ingredient to produce the setting composition, said components being disposed in direct contact with each other, the oil phase of said emulsion being inert to the second component and forming a frangible barrier between the two active ingredients thus preventing the formation of a setting composition until the two components are intimately mixed with each other and the emulsion broken.

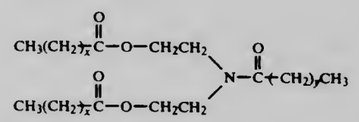
4,891,073

METHOD OF TREATING SURFACE WITH WATER-IN-OIL EMULSION COMPOSITION

Alexandra B. Shortt, Houston, and D. V. Satyanarayana Gupta, The Woodlands, both of Tex., assignors to Pennzoil Products Company, Houston, Tex.

Division of Ser. No. 144,463, Jan. 19, 1988, which is a continuation of Ser. No. 76,993, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 806,773, Dec. 9, 1985, abandoned. This application Apr. 13, 1989, Ser. No. 337,706
Int. Cl.[4] B08B *3/08, 3/10*
U.S. Cl. 134—20 **52 Claims**

1. A method of treating a surface, comprising applying to the surface a water-in-oil emulsion composition comprising water, at least one liquid hydrocarbon solvent and as the sole emulsifying agent a N-alkanoyl-2,2'-iminobis(ethyl alkanoate) (NAIBEA) of the formula



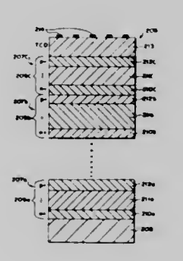
wherein x and y are integers of 6 to 16.

4,891,074

MULTIPLE CELL PHOTORESPONSIVE AMORPHOUS ALLOYS AND DEVICES

Stanford R. Ovshinsky, Bloomfield Hills, Mich., and David Adler, Lexington, Mass., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 427,757, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 206,580, Nov. 13, 1980, abandoned. This application Mar. 13, 1985, Ser. No. 710,947
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—249 **8 Claims**



1. An improved photoresponsive tandem multiple solar cell device, said device comprising:

at least a first and second superimposed cell of various materials,

said first cell being formed of a silicon alloy material,

said second cell including an amorphous silicon alloy semiconductor cell body having an active photoresponsive region in which radiation can impinge to produce charge carriers, said amorphous cell body including at least one density of states reducing element, said element being fluorine, said amorphous cell body further including a band gap adjusting element therein at least in said photoresponsive region to enhance the radiation absorption thereof, said adjusting element being germanium, the band gap of said cell being adjusted for a specified photoresponse wavelength threshold function different from said first cell,

said second cell being a multi-layer body having deposited semiconductor layers of opposite (p and n) conductivity type, the n-type layer being formed by introducing during the deposition of the layer an n-dopant element and the p-type layer being formed by introducing during deposition of the layer a p-dopant element, and having deposited between said p and n doped layers a substantially intrinsic amorphous alloy layer with at least a portion of said intrinsic layer containing said amorphous cell body, and

said first cell being formed with said second cell in substantially direct junction contact therebetween, said first and second cells designed to generate substantially matched currents from each cell from a light source directed through said first cell and into said second cell.

4,891,075

PHOTOVOLTAIC CELL INCLUDING WAVELENGTH SHIFTER COMPRISING LANTHANIDE CHELATE FLUOROPHORES BASED ON DIHYDROPYRIDINE CONDENSATION PRODUCTS

Salifu Dakubu, Winchester, Mass., assignor to Golight, Inc., Winchester, Mass.

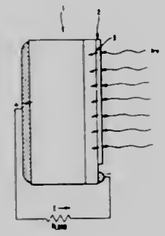
PCT No. PCT/US87/00206, § 371 Date Jul. 15, 1988, § 102(e) Date Jul. 15, 1988, PCT Pub. No. WO87/04716, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 30, 1987, Ser. No. 243,303

Claims priority, application United Kingdom, Jan. 30, 1986, 8602304

Int. Cl.⁴ H01L *31/04*; C09K *11/06*

U.S. Cl. 136—257 **11 Claims**



11. A photovoltaic device of the type comprising a photovoltaic cell having a face wherein the improvement comprises a wavelength-shifting coating on its face, the wavelength-shifting coating comprising the reaction product of a β-diketone, an aldehyde, an amine, and a lanthanide metal ion, said reaction product being a lanthanide metal ion chelate and said wavelength-shifting coating increasing the portion of the solar spectrum available to the cell for conversion into electricity.

4,891,076

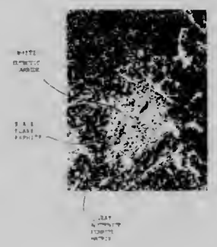
GRAY CAST IRON HAVING BOTH INCREASED WEAR RESISTANCE AND TOUGHNESS

Bela V. Kovacs, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 945,145, Dec. 22, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 255,309

Int. Cl.⁴ C21D *5/00*

U.S. Cl. 148—3 **13 Claims**



13. A method of making gray cast iron with high wear resistance and impact strength, comprising:

(a) solidifying a gray iron melt having less than 3.0% carbon and to which has been added (i) a carbide forming first agent in an amount of 0.3–0.8% by weight, selected from the group consisting of titanium, vanadium and chromium, and (ii) a high carbon austenite/ferrite forming agent in an amount of 0.5–3.0%, selected from the group consisting of nickel and copper, said solidification being at a rate to form an austenite matrix with a mixture of flake graphite and eutectic carbide suspended in said matrix; and

(b) heat treating said solid by (i) heating to a temperature and for a period of time to fully austenitize the solid, (ii) quenching said solid to an austenite decomposition temperature level and holding at said level for a period of time to decompose austenite to form essentially a high carbon austenite and ferrite matrix carrying in suspension a mixture of 40–60% flake graphite and the remainder eutectic carbide particles, and (iii) air cooling the solid to room temperature.

4,891,077

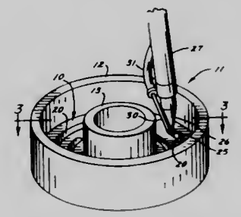
METHOD OF MAKING AN ELECTROMAGNETIC COUPLING DISC

Thomas P. Roll, Brighton, Mich., and Dwight E. Booth, Janesville, Wis., assignors to Dana Corporation, Toledo, Ohio

Filed Oct. 27, 1988, Ser. No. 263,371

Int. Cl.⁴ H01F *41/02*

U.S. Cl. 148—9 R **4 Claims**



1. A method of forming a multiple pole coupling disc for an electromagnetic coupling, said method comprising the steps of, providing a disc made of magnetic material, directing a laser beam toward one face of said disc at a location between the center of the disc and the outer periphery thereof, causing said laser beam to strike said disc at a point spaced from the focal point of the laser beam whereby said beam is defocused relative to said disc, effecting relative turning between said disc and said laser beam to cause said defocused laser beam to melt portions of said disc and form relatively wide curved slot means in the disc, and injecting a jet of pressurized gas against said disc during formation of said slot means, said jet being closely adjacent to said laser beam.

4,891,078

RARE EARTH-CONTAINING MAGNETS

Mohammad H. Ghandehari, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 856,701, Apr. 28, 1986, abandoned, which is a division of Ser. No. 595,298, Mar. 30, 1984, Pat. No. 4,601,754. This application Jan. 25, 1988, Ser. No. 148,144

Int. Cl.⁴ H01F *1/04*

U.S. Cl. 148—301 **18 Claims**

1. A rare earth-ferromagnetic metal alloy permanent magnet, produced by the method comprising the steps of:

(a) mixing a particulate additive material selected from the group consisting of refractory oxides, carbides, and nitrides, in an amount which provides about 0.1 percent to about 2 percent by weight additive material in the mixture, with a major amount of a particulate rare earth-ferromagnetic metal alloy having an empirical formula corresponding approximately to RM_5, wherein R is rare earth selected from the group consisting praseodymium and mixtures of praseodymium and samarium and M is ferromagnetic metal, and a minor amount of a particulate rate earth-ferromagnetic metal sintering aid alloy;

(b) aligning magnetic domains of the mixture in a magnetic field;

(c) compacting the aligned mixture to form a shape;

(d) sintering the compacted shape; and wherein said method produces a magnet composition containing a major phase amount of said particulate rare earth-ferromagnetic metal alloy, a minor phase amount of said particulate rare earth-ferromagnetic metal sintering aid alloy, and added oxide, carbide or nitride from said particulate additive.

4,891,079

HIGH SATURATED MAGNETIC FLUX DENSITY ALLOY

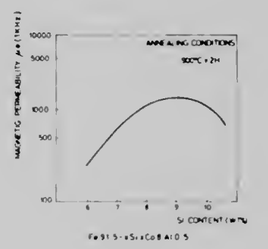
Mikio Nakajima, and Akihiro Makino, both of Nagaoka, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,827

Claims priority, application Japan, Jan. 14, 1988, 63-6410; Jun. 3, 1988, 63-136791

Int. Cl.⁴ H01F *1/04*

U.S. Cl. 148—307 **3 Claims**



1. High saturated magnetic flux density alloy having a chemical composition of

3–20% by weight of Co,

6–12% by weight of Si,

0.1–3% by weight of Al and

the remaining % by weight of Fe.

4,891,080

WORKABLE BORON-CONTAINING STAINLESS STEEL ALLOY ARTICLE, A MECHANICALLY WORKED ARTICLE AND PROCESS FOR MAKING THEREOF

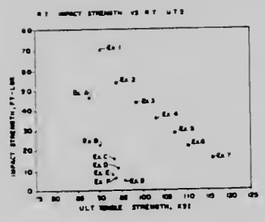
Gregory J. Del Corso; James W. Martin, both of Sinking Springs, and David L. Strobel, Leesport, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Jun. 6, 1988, Ser. No. 203,282

Int. Cl.⁴ C22C *38/54*; B22F *3/00*

U.S. Cl. 148—326 **20 Claims**

1. An article formed of an austenitic stainless steel alloy consisting essentially of, in weight percent, about



	w/o
Carbon	0.10 max.
Manganese	2.00 max.
Silicon	1.00 max.
Phosphorus	0.045 max.
Sulfur	0.010 max.
Chromium	16.00–22.00
Nickel	10.00–15.00
Molybdenum	0–3.0
Boron	0.2–2.0
Nitrogen	0.075 max.

and the balance consisting essentially of iron, said article having a boride particle areal density per weight percent boron (A_N) defined by the relationship

$$A_N \geq 58{,}080 - 18{,}130\ (\%\ B)$$

and said article further having a Charpy V-notch impact strength (CVN) defined by the relationship

$$CVN \geq 85.917 \times e^{-1.20297(\%\ B)}.$$

4,891,081

METHOD FOR PRODUCING A FOAMED RESIN MOLDING

Shuichi Takahashi, Kani, and Kiyomi Nishida, Inuyama, both of Japan, assignors to Toksi Chemical Industries, Ltd., Komaki, Japan

Filed Nov. 28, 1986, Ser. No. 935,856

Claims priority, application Japan, Dec. 4, 1985, 60-273797; Dec. 28, 1985, 60-299559; Dec. 28, 1985, 60-299560; Jan. 17, 1986, 61-008442; Feb. 18, 1986, 61-034469; Feb. 24, 1986, 61-038920; Aug. 8, 1986, 61-187059; Aug. 8, 1986, 61-187060

Int. Cl.⁴ B32B *5/18*

U.S. Cl. 156—78 **12 Claims**

1. A method for producing a foamed resin molding, comprising the steps of:

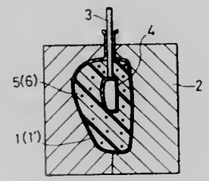
interposing a bag-shaped expansible film in a cavity of a mold with an opening in alignment with a parting line of said mold;

interposing an insert in said bag-shaped expansible film;

extracting air from said bag shaped film to conform the film to the shape of the insert prior to charging with a foamable resin;

charging a foamable resin into said bag-shaped expansible film from said opening;

molding a foamed resin body by foaming said foamable resin while concurrently shaping said bag-shaped expansible film by expanding same by pressure generated by said foaming against and into conformity with the shape of said



mold cavity, thereby connecting said insert integrally with the foamed resin body; and

ejecting said foamed resin body covered with a skin layer of the expanded said bag-shaped expansible film and containing said insert as a core from said mold.

4,891,082

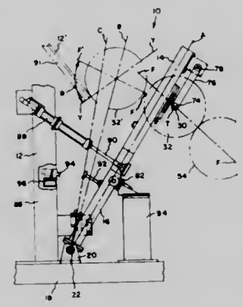
TRANSFER ROLL SYSTEM

Henry D. Broyles, Uniontown, and Steven J. Portalupi, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 26, 1986, Ser. No. 935,508

Int. Cl.⁴ B29D *30/08*

U.S. Cl. 156—123 **6 Claims**



1. Apparatus for transferring strip components from a conveyor to a tire building drum member comprising a supporting structure, a swinging arm member pivotally mounted on said supporting structure, a pair of transfer rolls mounted on said swinging arm member in spaced-apart relation for rotation about a single axis, said swinging arm member including pivot

means connected to said supporting structure for swinging of said swinging arm member from a conveyor position with said pair of transfer rolls in engagement with said conveyor for receiving said strip components at a conveyor spacing to an application position with said transfer rolls in engagement with said tire building drum member for applying said strip components to said tire building drum member at a tire spacing different from said conveyor spacing and to an intermediate position with said transfer rolls located between and spaced from said conveyor position and said application position, and means not connected to said conveyor to move said transfer rolls axially along said single axis in said intermediate position to adjust the spacing of said transfer rolls to said tire spacing at a point in the course of swinging of said swinging arm member from said conveyor to said tire building drum member for application of said strip components to said tire building drum member at said tire spacing and adjust said transfer rolls to conveyor spacing at a point in the course of swinging of said swinging arm member from said tire building drum member to said conveyor for receiving said strip components from said conveyor without requiring adjustment of said conveyor to said tire spacing including a stop member mounted on said supporting structure and engageable with said swinging arm member in said application position for supporting the weight of said arm member, each of said transfer rolls having a hub member mounted on a shaft coaxial with said single axis, an outer rim member spaced radially from said hub member and movable relative to said hub member toward said tire building drum member in said application position for engagement of said outer rim member with said tire building drum member and pressure means for urging said outer rim member against said tire building drum member at a predetermined pressure, said stop member being mounted on said supporting structure such that none of the weight of said swinging arm member in said application position is pressed against said strip components and said tire building drum member prior to movement of said outer rim member against said tire building drum member.

5. A method of transferring strip components from a conveyor to a tire building drum member by a pair of transfer rolls mounted in spaced-apart relation on one end of a swinging arm member having the other end pivotally mounted on a supporting structure comprising:

(a) swinging said swinging arm to a conveyor position for moving said transfer rolls into engagement with said conveyor;

(b) rotating an outer rim member of each of said transfer rolls a predetermined amount to apply strip components of predetermined length to said outer rim member at a conveyor spacing;

(c) swinging said swinging arm member to an intermediate position spaced from said conveyor and said tire building drum member;

(d) axially moving said transfer rolls with said strip components applied thereto without moving said conveyor to adjust the position of said strip components in said intermediate position to a tire spacing different from said conveyor spacing for application to said tire building drum member;

(e) swinging said swinging arm member to an application position for moving said transfer rolls into contact with said tire building drum member at said tire spacing; and

(f) rotating said tire building drum member to apply said strip components to said tire building drum member without requiring adjustment of said conveyor to said tire spacing.

4,891,083

METHOD FOR PRODUCING A LAMINATED COMPOSITE STRUCTURE INCLUDING TUBULAR BRAIDED REINFORCEMENT

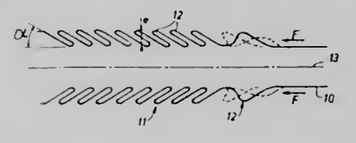
Jean D. Denoel, Valence, France, assignor to Societe Anonyme:- Societe Europeenne de Propulsion, Suresnes, France

Division of Ser. No. 35,659, Mar. 26, 1987, Pat. No. 4,780,346. This application Jul. 27, 1988, Ser. No. 224,742

Claims priority, application France, Mar. 28, 1986, 86 04531

Int. Cl.⁴ B32B *1/08*

U.S. Cl. 156—148 **10 Claims**



1. A method for forming a composite-laminated structure containing tubular braided-reinforcement, comprising the steps of:

folding a length of tubularly braided reinforcement material into a plurality of superposed corrugations applied against one another at a predetermined frequency along an axial direction of said length, the braided corrugated material thereby being formed into wrinkles providing a plurality of superimposed layers each of a predetermined amplitude radially of the axial direction and extending from an inside surface to an outside surface of the resultant corrugated shape; and

densifying the folded braided reinforcement material by controllably applying thereto a selected densifying material to bond with said braided material to form a composite matrix providing a reinforced, generally tubular resultant structure.

4,891,084

METHOD OF MAKING A CURVED COMPOSITE ARTICLE

John M. Senior, Swindon, England, assignor to Raychem Limited, England

Continuation of Ser. No. 21,863, Mar. 4, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 287,586

Claims priority, application United Kingdom, Mar. 11, 1986, 8605960

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 156—196 **9 Claims**

1. A method of making a composite article comprising (a) a curved body reinforced with a fiber reinforcement and (b) a substantially fiber-free curved surface layer formed by fusion and consolidation under heat and pressure of a fabric substantially composed of poly(aryl ether ketone) fibers of diameter less than 150 micrometers, the poly(aryl ether ketone) fibers having a softening temperature at least 50° C. lower than the softening temperature of the fiber reinforcement; comprising placing the said fabric in contact with the said body or an assembly which can be consolidated to form the said body, and applying heat and pressure to fuse and consolidate the fabric and produce the said surface layer.

4,891,085

METHOD OF MAKING AN AUTOMOBILE ROOF CAP

David C. Mulligan, Blissfield, Mich., assignor to Roto Plastics, Inc., Adrian, Mich.

Filed Nov. 4, 1988, Ser. No. 266,843

Int. Cl.⁴ B32B *3/04*

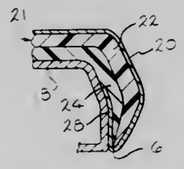
U.S. Cl. 156—216 **2 Claims**

1. A method of manufacturing at least a portion of a cap for the roof of an automotive vehicle, said cap having a predeter-

mined shape with at least one edge and being fastenable to a vehicle roof of complementary shape, comprising the steps of:

a. laminating a flexible thermoplastic sheet cover member onto a core layer wherein said core layer is a sheet of thermoplastic foam having an upper layer and a lower layer of differing densities, said lower layer being of higher density than said upper layer and said cover member is laminated to said upper layer to form a composite;

b. thermoforming said composite into said predetermined shape including pinching said foam together compressing



said foam against said cover member along said edge leaving a portion of said composite adjacent said edge and heating said foam along said edge to fuse said compressed foam to said cover member;

c. trimming a portion of said core layer adjacent said edge leaving behind a flap portion of said cover member along said edge;

d. wrapping said flap portion around said edge so as to enclose said edge; and

e. securing said flap portion to said core layer so as to finish said edge.

4,891,086

STRAND COATING METHOD

Thomas H. Austin, Austin, and Dudley J. Primeaux, II, Elgin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 39,035, Apr. 16, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 252,214

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—296 **3 Claims**

1. A method for coating wires which comprises spraying onto a first set of wires a formulation comprising amine-terminated polyethers of greater than 1500 molecular weight having greater than 50% of their active hydrogens in the form of amine hydrogens prepared by the reductive amination of polyols, a chain extender and an aromatic polyisocyanate.

3. A method as in claim 1 wherein additional wires are layered over the preceding sprayed first set of wires thus forming multiple layers of wires coated with the reacted components of the spray.

4,891,087

ISOLATION SUBSTRATE RING FOR PLASMA REACTOR

Cecil J. Davis, Greenville; John E. Spencer, Plano; Thomas D. Bonifield, Dallas; Rhett B. Jucha, Celeste; William J. Stiltz, Anna; Randall E. Johnson, Carrollton; Joseph E. Whetsel, Richardson, and John L. Jones, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 663,805, Oct. 22, 1984, abandoned. This application Jun. 25, 1987, Ser. No. 67,055

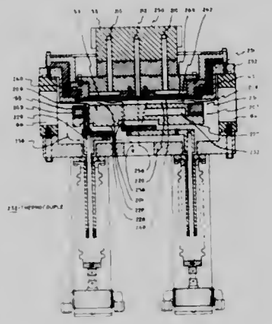
Int. Cl.[4] C23C *16/00*

U.S. Cl. 156—345 **11 Claims**

1. A substrate ring assembly for use with a substrate, wherein the substrate is for supporting a semiconductor wafer and for serving as an electrode for a plasma discharge to process the supported semiconductor wafer, comprising:

a floating electrically conducting substrate ring circling the substrate; and

a conductive electrically grounded collimator which rings and is insulated from the first electrode to contain the



plasma within a space defined by substrate ring, substrate, collimator and first electrode.

4,891,088

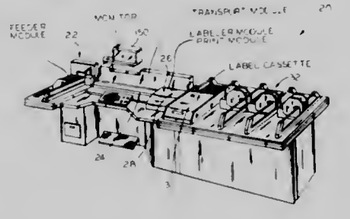
DOCUMENT FORWARDING SYSTEM

Eduard Svyatsky, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 16, 1987, Ser. No. 109,216

Int. Cl.[4] B65H *39/02*

U.S. Cl. 156—350 **34 Claims**



1. A computer enhanced document forwarding system including means for feeding individual generally flat documents from a generally horizontally disposed edge stack of documents; transporter means for accepting desirably disposed end to end individual documents one at a time and sequentially moving each document to at least one station for observation by an operator; electronic information storage means with an interconnected input and retrieval means disposed adjacent to said at least one observation means station; means providing a supply of self-adhering labels disposed in end to end fashion; an electronically controlled printer wherein the labels pick up ink in predetermined array, and continuous label applying means for serially applying corrective labels to serially disposed documents with both labels and documents moving in the same direction, thereby carrying corrective information supplied by said storage means to individual pieces of incorrectly designated documents, said horizontal feeder means for feeding documents including means for fanning said documents to assist in the sequential delivery of a single document to said transporter, said horizontal feeder means further including a generally horizontally disposed receptacle having an elongated substantially planar base and at least one side restraining means adapted to accept a plurality of documents each having the lower one edge engaging said base in generally transverse vertically oriented document disposition, means providing a bias of force against the stack of said plurality of documents, said fanning means further including a plurality of movable

means exposed in said planar base and adapted to contact said lower document edge at spaced points and said movable means having differing velocities of motion in the same direction, said spaced movable means having a relatively progressive increase in velocity as measured transversely from one edge of said base to the opposite edge.

4,891,089

APPARATUS FOR ADHERING RIBBONS TO CARTRIDGE SHELL PLATE

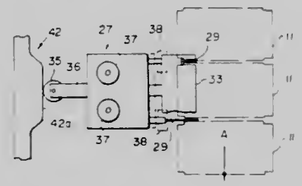
Koichi Takahashi; Kazuo Okutsu, both of Kanagawa; Yoshihiro Ide, Tokyo; Hiroshi Takei; Yukio Ishida, both of Kanagawa, and Kazumasa Harada, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 98,656, Sep. 18, 1987. This application May 9, 1988, Ser. No. 190,800

Claims priority, application Japan, Sep. 18, 1986, 61-219942; Sep. 30, 1986, 61-231422; Sep. 30, 1986, 61-231423

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—522 **6 Claims**



1. An apparatus for adhering ribbons to a cartridge shell plate wherein velvet ribbons are adhered to opposite edge portions of sheets which are to be bent to constitute cartridge shell plates, the apparatus for adhering ribbons to a cartridge shell plate comprising:

(i) a conveyance means for continuously conveying a plurality of said sheets disposed side by side so that a leading edge of each of said sheets is next to a trailing edge of the preceding sheet,

(ii) a pressure adherence means for pushing two continuous length velvet ribbon webs, on which an adhesive has been applied, respectively against opposite edge portions of said sheets which are being conveyed, thereby to continuously adhere said velvet ribbon webs to said opposite edge portions of said sheets, and

(iii) a ribbon cutting mechanism comprising a plurality of cutter units, said cutter units having cutters, said cutting mechanism circulating said plurality of cutter units so that said cutter units are moved beside said sheets, to which said velvet ribbon webs have been adhered, in the same direction as the direction of conveyance of said sheets in synchronization which said sheets, and said cutting mechanism swinging said cutters of said cutter units, which are being moved in synchronizatioo which said sheets, so that said cutters enter between the leading edge and the trailing edge of said sheets adjacent to each other and cut said velvet ribbon webs.

4,891,090

TWO-REEL DISPENSER FOR A TRANSFER ADHESIVE

Eugene M. Lorincz, Cinnaminson, N.J., and Ronald J. Steele, Wyndmoor, Pa., assignors to Moore Push-Pin Company, Wyndmoor, Pa.

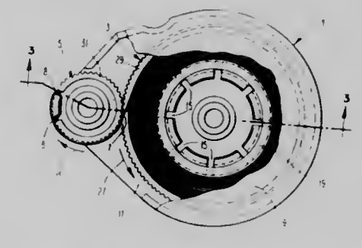
Filed Oct. 4, 1988, Ser. No. 253,118

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—577 **37 Claims**

1. A dispenser for a transfer adhesive, the dispenser comprising a supply reel, a take-up reel, and a tape of transfer adhesive, the supply reel and the take-up reel being geared together such that rotation of the take-up reel causes rotation of the supply reel, the tape being wound on the supply reel and on the take-up reel, the take-up reel having means for attachment of the tape thereto, the portion of the tape wound on the supply reel being disposed around a core, wherein the supply reel includes slip clutch means for frictional engagement of the supply reel with the core, and wherein the diameter of the supply reel is greater than that of the take-up reel.

22. A dispenser for a transfer adhesive, the dispenser com-



prising a supply reel and a take-up reel, the supply reel and take-up reels being geared together such that rotation of the take-up reel causes rotation of the supply reel, and a roll of transfer adhesive tape, the tape being wound on the supply reel and onto the take-up reel, wherein the take-up reel comprises means for applying the transfer adhesive to a surface, and wherein the dispenser includes means for maintaining a constant spacing between the centers of the supply reel and take-up reel while the reels are rotating.

4,891,091

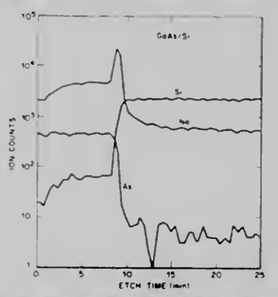
METHOD OF EPITAXIALLY GROWING COMPOUND SEMICONDUCTOR MATERIALS

Shambhu K. Shastry, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 885,343, Jul. 14, 1986, Pat. No. 4,699,688. This application Jan. 8, 1987, Ser. No. 59,441

Int. Cl.[4] C30B *25/02*

U.S. Cl. 156—606 **16 Claims**



1. The method of epitaxially growing a compound semiconductor material on a substrate comprising

providing a substrate of essentially single crystal insulating or semiconducting material having exposed surface areas; and

introducing sodium ions onto said surface areas; and

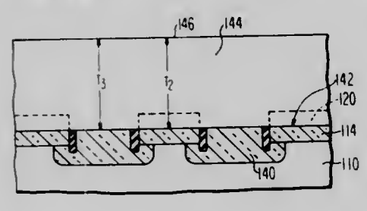
metalorganic vapor phase epitaxially growing single crystal compound semiconductor material on said surface areas of the substrate to form an interface with the substrate while incorporating sodium ions in the single crystal structure of the growing single crystal compound semiconductor material.

4,891,092

METHOD FOR MAKING A SILICON-ON-INSULATOR SUBSTRATE

Labomir L. Jastrzebski, Plainsboro, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 13, 1986, Ser. No. 818,032
Int. Cl.[4] C30B *25/04*
U.S. Cl. 156—610 **7 Claims**



1. A method for forming an electrically isolated layer of monocrystalline silicon on a semiconductor substrate, comprising:
(a) providing a semiconductor substrate having a major surface;
(b) forming a mask of insulating material on the major surface, the mask including an aperture therethrough to the surface;
(c) forming a layer of monocrystalline silicon through the aperture and over the mask;
(d) forming a first oxidation-barrier layer on the monocrystalline silicon layer and a barrier-protection layer, of a different material, on the first oxidation-barrier layer, the first oxidation-barrier layer and barrier-protection layer including an aperture therethrough in a location corresponding to the aperture in the underlying insulator mask;
(e) removing the monocrystalline silicon layer within the aperture in the insulator mask and between that aperture and the aperture in the first oxidation-barrier layer so as to form a cavity that exposes the substrate;
(f) forming a second oxidation-barrier layer on the surface of the monocrystalline silicon layer exposed within the cavity;
(g) thermally oxidizing the exposed portion of the substrate so as to yield an insulating plug having a surface which is coplanar with the insulator mask;
(h) removing the portions of the first and second oxidation-barrier layers that are in contact with the monocrystalline silicon layer; and
(i) epitaxially growing silicon from the remaining portions of the monocrystalline silicon layer so as to form a continuous monocrystalline silicon sheet overlying the insulator mask and plug.

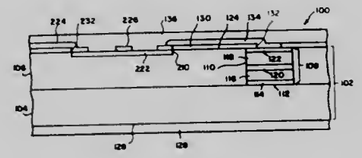
4,891,093

PROCESSES FOR THE MANUFACTURE OF LASER INCLUDING MONOLITHICALLY INTEGRATED PLANAR DEVICES

Frank T. J. Smith, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1986, Ser. No. 908,743
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] C30B *25/04*
U.S. Cl. 156—613 **19 Claims**

1. A process comprising
(i) providing a monocrystalline substrate having first and second major surfaces and epitaxially growing on said substrate a laterally restricted lasing region comprising superimposed P and N conductivity type cladding layers, an active layer therebetween, and a capping layer having greater than 10^{19} conductivity imparting ions per cm^3,
(ii) laterally offset from said lasing region providing on said substrate a semiconductive surface layer having a conductivity imparting ion concentration less than that of said capping layer,
said substrate and said layers together forming a monocrystalline III–V compound structure, wherein the group V ions are ions of arsenic and the group III ions are ions of at least one of gallium and aluminum, and
(iii) providing a conduction path between said surface layer and said capping layer, characterized in that
(a) an isolating portion of said substrate adjacent said first major surface separating said lasing region and said surface layer is formed of monocrystalline gallium aluminum arsenide having a resistivity greater than 10^5 ohm-cm and
(b) said capping layer, said surface layer, and said separating portion of said substrate are formed to present a planar surface by the steps of
(c) forming on said first major surface a protective layer defining an opening,
(d) through the opening creating a first channel in said substrate to expose an unprotected portion of said substrate beneath said first major surface, the first channel having walls at least in part defined by the gallium aluminum arsenide isolating portion of said substrate,



(e) epitaxially depositing vapor phase reactants to form the laser region layers of step (i) on only said unprotected substrate portion defining said first channel, at least said active layer being comprised of gallium arsenide or gallium aluminum arsenide of a higher refractive index than said monocrystalline gallium aluminum arsenide of said isolating portion of said substrate,
(f) terminating epitaxial deposition when said lasing region forms with said first major surface a portion of said planar surface,
(g) forming a second channel at a location laterally offset from said lasing region and forming said surface layer in the second channel to complete said planar surface, and
(h) depositing on said planar surface at least one conductive means providing the conduction path of step (iii) between said surface layer and said capping layer.

4,891,094

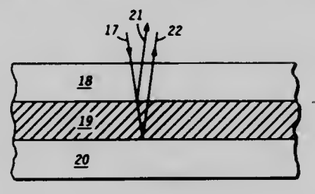
METHOD OF OPTIMIZING PHOTORESIST CONTRAST

Whitson G. Waldo, III, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 25, 1989, Ser. No. 356,488
Int. Cl.[4] B44C *1/22*; B29C *37/00*; H01L *21/306*
U.S. Cl. 156—626 **14 Claims**

1. Optimizing the contrast of a photoresist layer used in the manufacture of integrated circuits by a lithographic process including:
determining the nonlinear relationship of said photoresist contrast with regard to the thickness thereof, and

placing over a substrate a thickness of photoresist corresponding to a desired value of contrast indicated by said nonlinear relationship of contrast with photoresist thickness.

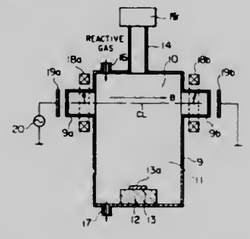


4,891,095

METHOD AND APPARATUS FOR PLASMA TREATMENT

Tomoaki Ishida, and Kyosuke Nishioka, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 28, 1989, Ser. No. 325,917
Claims priority, application Japan, Jul. 15, 1988, 63-177511
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C23C *14/00*; B05B *5/02*
U.S. Cl. 156—643 **16 Claims**



1. A method for plasma treatment comprising the steps of:
forming a mirror field which faces a surface of a specimen to be treated and which has its field axis parallel to said surface in an atmosphere of a reactive gas;
generating a plasma of said reactive gas by introducing a microwave energy into a region where said mirror field is formed, said plasma being confined in said mirror field; and
treating said specimen by supplying activated neutral particles which are produced by said plasma to said surface of said specimen.

4,891,096

PROCESS FOR BIOCHEMICAL RETTING OF PHLOEM-FIBER PLANTS

Jean-Sony Akkawi, La Gambretiere, France, assignor to Comite Economique Agricole De La Production Du Chanvre, Le Mans, France, a part interest

Continuation of Ser. No. 68,270, Jun. 11, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 327,403
Claims priority, application France, Oct. 18, 1985, 85 15788
Int. Cl.[4] D01C *1/04*
U.S. Cl. 162—1 **19 Claims**

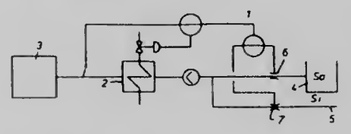
1. A process for biochemical retting of hemp, in order to degrade the cements which bind the fibers within fiber bundles and thus permit the physical separation of such fibers, wherein said process comprises the step of contacting hemp plants with a mixture of enzymes comprising soluble polysaccharide-ase, β-glucanase and pectinase, wherein said contacting comprises impregnating said plants followed by maceration of the impregnated plants in an aqueous medium containing then enyzmes, wherein said maceration occurs for a time period of between 1 hour and 48 hours, at a temperature of between 20° C. and 70° C. and wherein said mixture of enzymes comprises between 0.01 and 2% of pectinase, between 0.10 and 3% of β-glucanase, and between 0.25 and 5% of soluble polysaccharide-ase.

4,891,097

METHOD FOR REGULATING THE FEEDING-IN OR COMBUSTION CONDITIONS OF CONCENTRATED SPENT LIQUORS

Paavo Hyöty; Erik Uppstu, and Erik Selin, all of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Continuation of Ser. No. 839,622, Mar. 14, 1986, abandoned. This application Dec. 4, 1987, Ser. No. 129,863
Claims priority, application Finland, Mar. 18, 1985, 851071
Int. Cl.[4] D21C *7/12, 11/12*
U.S. Cl. 162—31 **1 Claim**



1. A method for providing feedback control for maximizing soda-ash output of a recovery boiler furnace for soda-ash, in which droplets of at least one spent digesting liquor from at least one sulfite-type or sulfate-type wood pulp digester are sprayed so as to fall through a combustion zone, thus being dried and burned to form solid particles, and in being dried or burned, undergo an expansion of a variable amount,
(a) establishing in a computer a body of data correlating droplet-to-particle expansion with a variable parameter which can be monitored while conducting said method;
(b) monitoring said variable parameter for variations, while conducting said method, to provide results and providing said results to said computer;
(c) comparing said results with said body of data in said computer to provide a feedback control output; and
(d) providing the feedback control output to an equipment controller for automatically increasing and decreasing the size of droplets sprayed into said furnace to be dried and burned, depending on said feedback control output so as to smoothout variations in said soda-ash output, said variable parameter being one selected from the group consisting of the pH of said spent liquor and the ratio of spent sulfite liquor to spent sulfate liquor in said spent liquor.

4,891,098

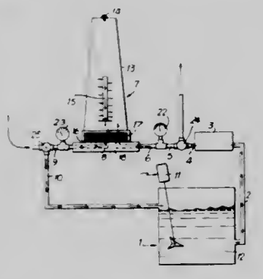
DYNAMIC FILTRATION SIMULATOR

Armen Reajilian, Colonie, and Francis L. Davenport, Ballston Lake, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Jan. 18, 1989, Ser. No. 298,657
Int. Cl.[4] G01N *15/00*; B01D *37/00*
U.S. Cl. 162—198 **18 Claims**

1. A method to determine the interaction and effect on liquid flow of additives to paper stock in a papermaking machine, which comprises:
(a) admixing one or more additives to be tested with paper stock in a slurry tank to form an aqueous paper stock slurry;
(b) pumping said slurry from step (a) to a filtration means having an interior space and comprising permeable filter material, the interior space of said filtration means being in fluid communication with an exit pipe which is in fluid communication with said slurry tank, whereby aqueous

slurry permeates said filter material to form a permeate and said permeate flows through said exit pipe back to said slurry tank;



(c) measuring the pressure and volume flow of the aqueous paper stock slurry into the filtration means; and
(d) measuring the pressure and volume flow of the aqueous paper stock permeate.

4,891,099

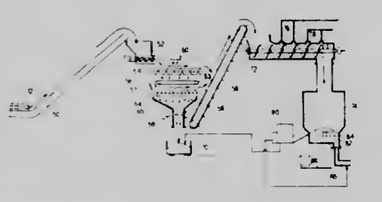
APPARATUS FOR SECONDARY FIBRE PROCESSING

Luigi Silveri, and Stavros Paraskevas, both of Pittsfield, Mass., assignors to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 148,456, Jan. 25, 1988, Pat. No. 4,812,205. This application Dec. 22, 1988, Ser. No. 290,606

Int. Cl.[4] D21B *1/32*

U.S. Cl. 162—261 **8 Claims**



1. An apparatus for processing secondary fibre furnish comprising:
means for conveying baled furnish;
a means for breaking and reducing the baled furnish;
the means for conveying and furnish conveying the baled furnish to the means for breaking and reducing;
screening means for separating fibrous material from rejected material, said screening means including a disc screen;
means for conveying the furnish from the means for breaking and reducing to the screening means;
a repulper vessel including means for separating plastic contaminants and for repulping the fibrous material to crate a pulp; and
means for conveying the fibrous material from the screening means to the repulper vessel.

4,891,100

APPARATUS FOR RETAINING A PARTITION FOIL

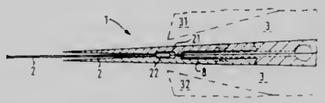
Otto Hildebrand, Ravensburg-Taldorf, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Mar. 3, 1989, Ser. No. 318,548

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 3807629

Int. Cl.[4] D21F *1/02*

U.S. Cl. 162—343 **5 Claims**



1. In a multi-ply headbox of a papermaking machine, an apparatus for retaining a partition foil at the multi-ply headbox of the papermaking machine and through which travels paper stock in a predetermined direction, comprising:
a partition element;
said partition element dividing a nozzle chamber of the headbox;
a partition foil secured at said partition element;
the partition foil serving to maintain apart plys of paper stock through a predetermined distance as viewed in said predetermined direction of travel of the paper stock;
an upper retaining strip and a lower retaining strip for clamping therebetween a part of the partition foil and each strip being separately secured at said partition element; and
pressure means having a pressure chamber provided between said upper retaining strip and said lower retaining strip and connected to a source of pressurized fluid medium and structured and arranged such that upon pressurizing the pressure chamber said upper retaining strip and said lower retaining strip are spread apart relative to one another and leave free between them a region which is required and sufficient for assmebly and disassembly of the partition foil between the upper and lower retaining strips.

4,891,101

PURIFICATION OF TERTIARY HYDROPEROXIDES CONTAINING PRIMARY AND SECONDARY HYDROPEROXIDE CONTAMINANTS

Carl J. Sullivan, Exton, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Nov. 23, 1988, Ser. No. 275,483

Int. Cl.[4] B01D *3/36*

U.S. Cl. 203—36 **19 Claims**

1. A process for purifying a tertiary hydroperoxide composition comprised of a tertiary hydroperoxide and an undesired primary or secondary hydroperoxide contaminant which comprises the steps of:
(A) contacting the tertiary hydroperoxide composition with
(a) a basic compound selected from the group consisting of alkali metal oxides, alkali metal hydroxides, alkali metal carbonates, alkali metal bicarbonates, alkaline earth oxides, alkaline earth hydroxides, alkaline earth carbonates, alkaline earth bicarbonates, and amines, and
(b) a carboxylic acid derivative selected from the group consisting of anhydrides, esters, acid halides, and amides
at a temperature of between about 20° C. and 175° C. and for a period of from about 30 seconds to 1 hour to decompose said primary or secondary hydroperoxide contaminant, and
(B) separating a purified tertiary hydroperoxide composition from said basic compound, said carboxylic acid derivative, and said primary or secondary hydroperoxide decomposition product.

17. A process for purifying a tertiary butyl hydroperoxide composition comprising tertiary butyl hydroperoxide and an undesired primary or secondary hydroperoxide contaminant which comprises the steps of:
(A) contacting the tertiary butyl hydroperoxide composition with
(a) from about 0.3 to 5.0 milliequivalents of maleic anhydride per gram of total hydroperoxide present and
(b) from about 1.5 to 3.5 milliequivalents of sodium hydroxide per milliequivalent of maleic anhydride at a temperature of between about 30° C. to 80° C. for a period of from about 1 to 30 minutes to decompose said primary or secondary hydroperoxide contaminant; and
(B) separating a purified tertiary butyl hydroperoxide composition from said maleic anhydride, said sodium hydroxide, and said primary or secondary hydroperoxide decomposition product.

4,891,102

METHOD OF DETERMINING CARBON DIOXIDE IN THE PRESENCE OF OXYGEN

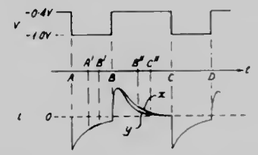
Wyndham J. Albery; Anthony J. M. Coombs, both of London, England; Humphrey J. J. Drummond, Perth, Scotland, and Clive Hahn, Radley, England, assignors to National Research Development Corporation, London, United Kingdom

Continuation of Ser. No. 873,453, Jun. 6, 1986, abandoned, which is a continuation of Ser. No. 730,209, May 3, 1985, abandoned. This application Apr. 23, 1987, Ser. No. 41,636

Claims priority, application United Kingdom, May 4, 1984, 8411448

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **7 Claims**



1. A method of determining a first gas in the presence of a second gas, provided that the two gases fall into a class such that a product produced by the second gas at an electrode in a liquid electrolyte upon application of an electrical potential to the electrode is reactive with said first gas, the method comprising the steps of:
(a) applying the second gas by itself in a known concentration to one side of a membrane permeable to the two gases, the other side of the membrane retaining a solvent for both gases and for said product,
(b) applying, for a predetermined duration through a working electrode in contact with the solvent, a potential which electrolyses the dissolved second gas to form said product produced at the working electrode when the potential is applied,
(c) during the application of the electrolysing potential of step (b) measuring or integrating over a predetermined time slot the current flowing during step (b),
(d) applying, through the working electrode, a reconversion potential which, by reversing the electrolysis of step (b), reconverts the product to the gas,
(e) during the application of the reconversion potential, measuring or integrating over a predetermined time slot the current flowing during step (d),
(f) applying the second gas in the known concentration of step (a) with the first gas in a known concentration to the said side of the said membrane,
(g) repeating step (b),
(h) repeating step (d),
(i) repeating step (e),
(j) subtracting the current measured in step (i) from the current measured in step (e) and recording the difference as characteristic of the known concentration of the first gas applied in step (f),
(k) applying the gases to be determined to the said side of the said membrane,
(l) applying, for said predetermined duration through said working electrode, the electrolysing potential of step (b) to form said product,
(m) during the application of the electrolysing potential of step (l) measuring or integrating over a predetermined time slot the current flowing during step (l),
(n) determining by comparison of the respective currents measured during steps (c) and (m) the concentration of the second gas present during step (k) in relation to the known concentration thereof applied during step (a),
(o) applying through the working electrode, the reconversion potential of step (d) which reconverts the product to the gas,
(p) during the application in step (o) of the reconversion potential, measuring or integrating over the predetermined time slot the current flowing during step (o),
(q) subtracting the current measured in step (p) from the current that would have been expected in step (o) if the first gas had been absent, and
(r) determining by comparison of the respective differences found in the substractions of steps (j) and (q) the concentration of the first gas present during step (k) in relation to the known concentration thereof applied during step (f).

4,891,103

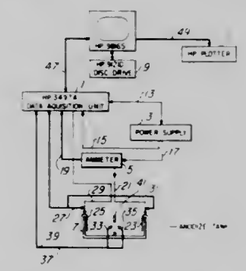
ANADIZATION SYSTEM WITH REMOTE VOLTAGE SENSING AND ACTIVE FEEDBACK CONTROL CAPABILITIES

Eldon J. Zorinsky, and David B. Spratt, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 23, 1988, Ser. No. 235,130

Int. Cl.[4] C25D *11/32/21/12*

U.S. Cl. 204—1 T **16 Claims**



13. A method for anodizing a semiconductor element, comprising the steps of:
(a) providing a tank containing an electrolyte solution therein;
(b) providing a controlled flow of electrons through said electrolyte under controlled voltage and current density;
(c) holding a semiconductor element in said electrolyte in the path of said electrons;
(d) positioning a pair of voltage probes in said electrolyte at locations spaced from and on opposite sides of said element to provide a voltage measurement therebetween; and

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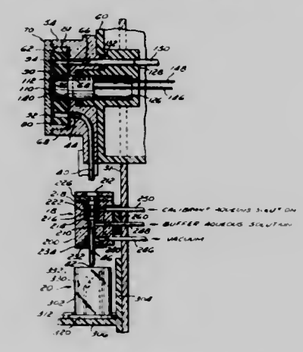
(e) controlling said controllable voltage and current in response to said voltage measurement.

4,891,104

ENZYMATIC ELECTRODE AND ELECTRODE MODULE AND METHOD OF USE

Max D. Liston, Irvine; Paul K. Hsei, Huntington Beach, and Christopher C. Feistel, Laguna Beach, all of Calif., assignors to SmithKline Diagnostics, Inc., San Jose, Calif.

Filed Apr. 24, 1987, Ser. No. 42,266
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **44 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 111 Pages)



1. An enzymatic sensor assembly for use in an analyzer device comprising:

a membrane chamber having an inlet and outlet;

an enzyme bearing membrane disposed within said membrane chamber between said inlet and outlet;

a sensor disposed within said membrane chamber and located on one side of said membrane;

a membrane holder sized to carry said membrane, said holder formed to releasably mount said membrane within said membrane chamber adjacent said sensor and define on the opposite side of said membrane a fluid flow path within said membrane chamber between said inlet and outlet; and

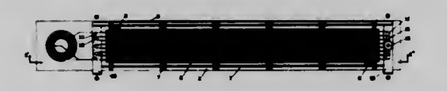
a gasket insertable within said membrane holder to form a fluid-tight seal between said membrane holder and said membrane chamber, wherein the fluid flow path comprises a flow channel formed in said gasket.

4,891,105

METHOD AND APPARATUS FOR ELECTROLYTIC REFINING OF COPPER AND PRODUCTION OF COPPER WIRES FOR ELECTRICAL PURPOSES

Carlos E. Reggero Soin, P.O. Box 18-0212, Lima, Peru

Continuation-in-part of Ser. No. 7,764, Jan. 28, 1987, abandoned. This application Oct. 13, 1987, Ser. No. 107,218
Int. Cl.[4] C25D *7/06*
U.S. Cl. 204—28 **5 Claims**



1. A method for the continuous production of round copper stock wire by refining impure copper anodes to produce wire for electrical purposes of a diameter of about 0.2 inches by electrodeposition comprising the steps of:

providing a bath of electrolytic fluid with dissolved copper therein;

providing a plurality of anodes made of impure copper arranged in spaced and parallel relation with respect to one another in said bath and defining spaced parallel pathways;

introducing a clean starting copper wire of a first diameter of about 0.12 inch into said bath at a first station and threading said wire through the bath and along each of the pathways in a serpentine path to successive stations with the wire traversing the pathways between each station;

continuously drawing said wire through said bath between the stations to a final station including the steps of withdrawing said wire from the bath after each pathway is traversed and reintroducing said wire a plurality of times into said bath, repeatedly passing said wire through said bath for travel along the pathways between successive stations, so that pure copper is electrodeposited on the wire on travel along each pathway between the stations; and

simultaneously applying an electrical current to said starting wire and to said anodes at a current density less than 55 amps/feet^2 of surface area of the wire so that the wire, while in the bath, acts as a cathode and copper ions are progressively and uniformly electrodeposited on the wire, thereby progressively increasing the cross-sectional area thereof while maintaining the surface of the wire smooth at all times; and

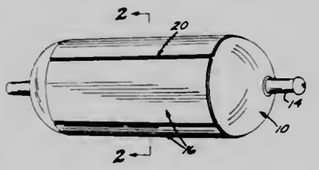
continuously withdrawing the enlarged smooth copper wire from said bath at said final station as it reaches the desired engrossed size of about 0.2 inches.

4,891,106

METHOD OF FORMING NONMAGNETIC SILVER ELECTRODES ON QUARTZ GLASS

Larissa Domnikov, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 18, 1987, Ser. No. 86,344
Int. Cl.[4] C25D *5/54*
U.S. Cl. 204—30 **10 Claims**



1. A method for applying a nonmagnetic electrically conductive coating to a quartz glass surface, comprising the steps of:

furnishing a clean quartz glass surface;

depositing a layer consisting of gold on the quartz glass surface, the layer having a thickness of less than about 5 microinches, the step of depositing including the substeps of

applying to the quartz glass surface on organometallic compound containing gold, and

firing the quartz glass surface and applied compound to form a coherent gold coating;

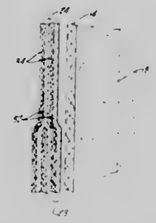
electrodepositing a silver layer over the gold layer, thereby forming a coherent, nonmagnetic, electrically conductive coating on the quartz glass surface.

4,891,107

POROUS DIAPHRAGM FOR ELECTROCHEMICAL CELL

Dennis F. Dong, Kingston, and Arthur L. Clifford, Harrowsmith, both of Canada, assignors to H-D Tech Inc., Woodbridge, Canada

Filed Sep. 19, 1985, Ser. No. 777,483
Int. Cl.[4] C25B *13/00*
U.S. Cl. 204—296 **4 Claims**



1. A porous diaphragm for use in electrochemical cells having at least one electrode characterized as porous and self-draining, said diaphragm consisting of an assembly having variable layers of a microporous polyolefin film or an assembly having variable layers of a composite diaphragm comprising said microporous polyolefin film and a support fabric resistant to deterioration upon exposure to an aqueous solution of an ionizable compound and electrolysis products thereof, said support fabric being laminated to said microporous polyolefin film, the number of variable layers of said diaphragm varying from the top of said porous diaphragm to the bottom of said porous diaphragm, and said porous diaphragm being adapted for use in the electrolysis of an aqueous solution comprising an alkali metal halide or an alkali metal hydroxide.

4,891,108

PROCESS FOR PREPARING TETRAHALOPYRIDINES

Steven C. Kilpatrick, and Billy J. Watson, both of Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 768,292, Aug. 22, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 27,993
Int. Cl.[4] C07D *211/72*
U.S. Cl. 204—157.71 **21 Claims**

1. A process for preparing 2,3,5,6-tetrachloropyridine which comprises contacting 3,5-dichloropyridine with chlorine to obtain a mixture and irradiating with ultraviolet light and heating the mixture at a temperature of between 60° C. and the boiling point of 3,5-dichloropyridine, in the liquid phase, for a sufficient amount of time to form a product of which at least about 92 percent of the tetrachloropyridines produced is 2,3,5,6-tetrachloropyridine.

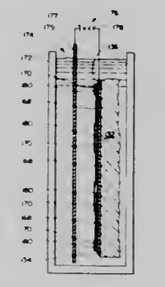
4,891,110

CATAPHORETIC PROCESS FOR SCREENING COLOR CATHODE RAY TUBES

Philomena C. Libman, Mt. Prospect, and Charles J. Prazak, III, Elmhurst, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 10, 1986, Ser. No. 929,037
Int. Cl.[4] C25D *13/02*
U.S. Cl. 204—181.1 **14 Claims**

1. For use in the manufacture of a color cathode ray tube, an improved cataphoretic process for depositing in sequence on the screening surface of the tube faceplate at least two separate patterns of substantially round phosphor elements, with each pattern of elements capable of emitting light of a different color when excited, the process comprising first depositing an electrically conductive coating over said screening surface for use as an electrode during each deposition operation, and secondly, depositing an electrically insulative barrier over said



conductive coating and selectively and sequentially removing portions of said barrier for controlling patterned, sequenced cataphoretic access to said electrically conductive coating.

4,891,111

CATIONIC ELECTROCOATING COMPOSITIONS

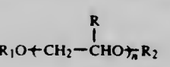
Gregory J. McCollum, Gibsonia; Robert R. Zwack, Allison Park, and Roger L. Scriven, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1988, Ser. No. 185,618
Int. Cl.[4] C25D *13/06, 13/10*; C08K *5/06*
U.S. Cl. 204—181.7 **7 Claims**

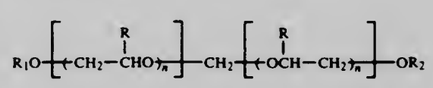
1. A cationic electrocoating composition comprising a resinous phase dispersed in an aqueous medium, said resinous phase comprising:

(a) a cationic electrodepositable resin and

(b) a hydroxyl-free, fully alkylated polyether containing at least 3 ether oxygens per molecule and from 1 to 4 saturated hydrocarbon groups separating the ether oxygens; the alkyl groups containing an average at least 2 carbon atoms; said polyether having a solubility of 0.01 to 50 parts by weight in 100 parts by weight of water at 25° C. and having a boiling point greater than 250° C., wherein the fully alkylated polyether is selected from a group consisting of fully alkylated polyethers having the structure



where n is at least 2; R is hydrogen or methyl; R_1 and R_2 are the same or different and are alkyl groups containing on average at least 2 carbon atoms, and fully alkylated polyethers having the structure



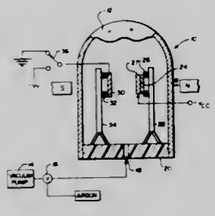
where n is 1 to 4; R is hydrogen or methyl; R_1 and R_2 are the same or different and are alkyl groups containing on average from 2 to 10 carbon atoms.

4,891,112

SPUTTERING METHOD FOR REDUCING HILLOCKING IN ALUMINUM LAYERS FORMED ON SUBSTRATES

Kwok Y. Wong, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 12, 1985, Ser. No. 797,095
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.3 **5 Claims**



1. A method of reducing hillocks occurring in the layer of metal sputtered onto a substrate comprising the steps of:
(a) sputtering metal from a target onto the surface of a substrate to deposit a metal layer on such substrate surface; and
(b) during such deposition, resputtering metal from the deposited layer to reduce metal grain size in the layer being deposited to an extent that relieves stress causing the reduction of hillock formation in the deposited layer.

4,891,113

METHOD OF MAKING ARCHITECTURAL COATING WITH INTERFERENCE COLORS

Russell C. Criss, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 682,136, Dec. 17, 1984. This application May 19, 1986, Ser. No. 864,394
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.15 **10 Claims**

1. A method of making a solar energy reflecting coated article comprising the steps of:
a. sputtering onto a surface of a substrate a first transparent coating of a metal compound which exhibits color by absorption and interference effects;
b. sputtering a highly infrared reflective transparent metallic film on said colored metal compound coating; and
c. sputtering a transparent protective metal film on said infrared reflective metallic film.

4,891,114

MAGNETIC RECORDING MEDIA

Michael Hitzfeld, Gruenstadt; Werner Grau, Bobenheim-Roxheim, and Joachim Hack, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,883
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1986, 3644823
Int. Cl.[4] C23C *4/00*; G11B *5/64*
U.S. Cl. 204—192.15 **1 Claim**

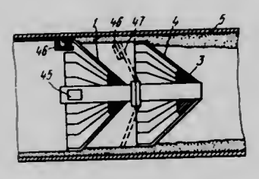
1. A process for the production of a magnetic recording medium consisting of a flexible disk-shaped nonmagnetic base, a cobalt/chromium alloy layer applied thereto and suitable for vertical recording, and a friction-reducing layer present on this alloy layer, wherein a 5–100 um thick amorphous carbon layer produced by a DC magnetron sputter process is applied as the friction-reducing layer and wherein the DC magnetron sputter process is carried out at an RKP value of from 1 to 10.

4,891,115

APPARATUS FOR CLEANING THE INNER SURFACE OF A PIPELINE FROM DEPOSITS AND FOR FORMING A PROTECTIVE COATING

Viktor V. Shishkin, ulitsa Festivalnaya, 1, kv. 5, Krasnodar; Jury D. Samuliev, Petropavlovsk ulitsa Bostandyzkaya, 3, kv. 10, Severo-Kazakhstanskaya oblast; Jury P. Shapovalov, ulitsa Alma-Atinskaya, 196, Krasnodar; Yaroslav P. Sushkov, ulitsa Kommunisticheskaya, 47/1, kv. 73, Eisk; Valery P. Panchenko, ulitsa Kotovskogo, 96, kv. 64, Krasnodar; Evgeny G. Lukin, ulitsa Melnikaite, 18, kv. 2; Alexandr I. Chernyai, I-v mikroraion, 17, kv. 27, both of Alma-Ata, and Nikolai F. Kryazhevskikh, ulitsa Krasnvkb partizan, 559, kv. 13, Krasnodar, all of U.S.S.R.

PCT No. PCT/SU85/00075, § 371 Date Jun. 9, 1986, § 102(e) Date Jun. 9, 1986, PCT Pub. No. WO86/02293, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 16, 1985, Ser. No. 878,275
Claims priority, application U.S.S.R., Oct. 17, 1984, 3797502; Oct. 17, 1984, 3797508; Oct. 17, 1984, 3797503; Oct. 17, 1984, 3798007; Oct. 17, 1984, 3797504; Oct. 17, 1984, 3797507; Oct. 17, 1984, 3797501; Oct. 17, 1984, 3797657; Oct. 17, 1984, 3797505; Oct. 17, 1984, 3798008
Int. Cl.[4] C25D *17/12*; B08B *9/04*
U.S. Cl. 204—212 **22 Claims**



14. An apparatus for cleaning the inner surface of a pipeline from deposits and for forming a protective coating, comprising a cleaning tool (10) which is caused to move in the interior of the pipeline by a flow of fluid containing an inhibitor and which comprises spring blades (4) engaging the pipeline surface (5) and mounted on a hub (3) in at least one inner and outer row, the blades in the rows being spaced with respect to one another so as to define apertures along the periphery of the cleaning tool (1), characterized according to the invention in that, the blades (4) of the cleaning tool (I) are mounted at an angle of 40° to 50° with respect to the longitudinal axis of the tool, and the angle between every two adjacent blades being 10°–25° C., the cleaning tool (1) having a support member (11) engaging the inner surface of the pipeline, wherein the support member (11) comprises a rotatable arm having a counterweight (31) and mounted on the hub (3) of the cleaning tool (1) by means of a pipe (34) mounted for rotation and having a turbine, (37) the blades of the turbine engaging the support member (11) during rotation of the turbine under the action of fluid flow.

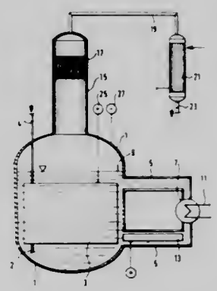
15. An apparatus according to claim 14, characterized in that the cleaning tool is provided with a source of electric current having the anode of said source being connected to plates secured to the blades of the inner row and the cathode of said source being connected to the blades of the outer row.

4,891,116

METHOD AND APPARATUS FOR ELECTROCHEMICALLY DECOMPOSING INORGANIC MATERIALS CONTAINED IN AN AQUEOUS RADIOACTIVE WASTE SOLUTION

Detlef Stritzke, Bruchsal, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen GmbH, Hannover, Fed. Rep. of Germany

Division of Ser. No. 264,615, Oct. 31, 1988, Pat. No. 4,849,074. This application May 8, 1989, Ser. No. 349,423
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1987, 3738769; Feb. 24, 1988, 3805741
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—241 **6 Claims**



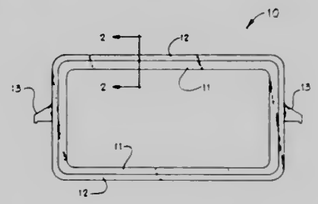
1. An apparatus for electrochemically decomposing compounds of inorganic materials contained in an aqueous radioactive waste solution, the apparatus comprising:
an evaporator for receiving and vaporizing said aqueous radioactive waste solution to form a distillate and concentrate for further treatment; and,
said evaporator including electrolytic means for electrochemically decomposing said compounds while said waste solution is in said evaporator.

4,891,117

METHOD AND APPARATUS FOR INSTALLING GASKET MEMBERS BETWEEN FLAT PLATE STRUCTURES

Gary L. Gardner Sr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 15, 1988, Ser. No. 220,059
Int. Cl.[4] C25B *9/00, 13/00*
U.S. Cl. 204—253 **14 Claims**



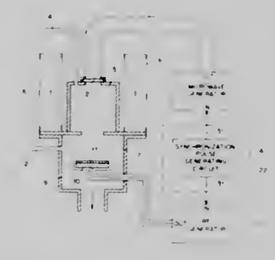
14. A system for installing gasket members between two adjacent electrolysis cell frame members comprising:
(a) a means for removably attaching a gasket member on each side of a frame member having a rib portion around the outer periphery of the frame member to form a frame member and gasket member assembly;
(b) interposing the frame member and gasket assembly between at least two electrolysis cell frame members disposed adjacent to each other; and
(c) contacting the electrolysis cell frame members with the frame member and gasket assembly such that the gasket members adhere to the electrolysis cell frame members diametrically opposed to each other.

4,891,118

PLASMA PROCESSING APPARATUS

Kiyoshi Ooiwa, Yokosuka, and Masahiko Doki, Sagamihara, both of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 23, 1988, Ser. No. 275,352
Claims priority, application Japan, Nov. 25, 1987, 62-296312; Oct. 31, 1988, 63-275786
Int. Cl.[4] H01H *1/46*
U.S. Cl. 204—298 **3 Claims**



1. A plasma processing apparatus comprising:
a cylindrical plasma generating chamber having openings at the opposite ends thereof;
a cylindrical processing chamber communicating with said plasma generating chamber via the opening at one end of said plasma chamber;
means for evacuating said plasma generating chamber and said processing chamber;
a microwave generator for generating pulses of microwaves;
a waveguide means for transferring said pulses of microwaves through an opening at the end of said plasma chamber;
a means for supplying a gas into said plasma generating chamber;
an excitation solenoid surrounding said plasma generating chamber for generating lines of magnetic force within said plasma chamber substantially coaxially with the openings at the ends thereof for transforming said gas, by resonance effects with said microwaves, into a plasma of active atoms, molecules or ions;
support means positioned within said processing chamber for supporting a substrate to be processed in a position to be bombarded by active atoms, molecules or ions flowing out of said plasma chamber along said lines of magnetic force;
RF generating means for applying an RF bias to said substrate; and
RF generation optimizing means for applying said RF bias voltage to said substrate during periods when said microwave pulses are generated, and for maintaining the voltage of the substrate below a predetermined threshold level during intervals between said microwave pulses.

VOL 1110 ISS 1 JA 2 990 UMI

4,891,119

MEDIUM FOR ELECTROPHORESIS HAVING IMPROVED PHYSICAL PROPERTIES

Masashi Ogawa, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1984, Ser. No. 651,211
Claims priority, application Japan, Sep. 14, 1983, 58-169579
Int. Cl.⁴ B01K *5/00*
U.S. Cl. 204—299 R **7 Claims**

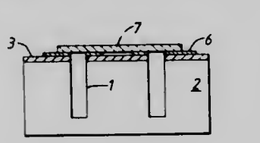
1. In a medium for electrophoresis comprising a polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound and a crosslinking agent in the presence of water, the improvement which comprises said polyacrylamide gel containing a water-soluble polymer of a molecular weight in the range of 10,000 to 1,000,000 selected from the group consisting of a polymer of an addition polymerization type and a polymer of a polycondensation type, said water-soluble polymer being incorporated into the gel in the form of a polymer in an amount of 1 to 100 wt. % based on the total weight of the acrylamide compound and crosslinking agent.

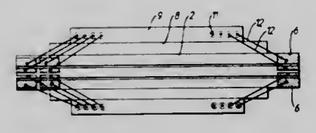
4,891,170

CHROMATOGRAPHIC SEPARATION DEVICE

Rajinder S. Sethi, 38 Norman Road, Northampton, Great Britain (NN3 2SG); Jack Brettle, 7 Clavert Road, Green Norton, Towcester, Northampton, and Christopher Lowe, The Limes, Hempstead, Saffron Waldon, Essex, both of Great Britain

PCT No. PCT/GB87/00393, § 371 Date Apr. 12, 1988, § 102(e) Date Apr. 12, 1988, PCT Pub. No. WO87/07953, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 8, 1987, Ser. No. 175,389
Claims priority, application United Kingdom, Jun. 6, 1986, 8613785
Int. Cl.⁴ G01N *27/26, 30/02, 30/62, 30/64*
U.S. Cl. 204—299 R **8 Claims**





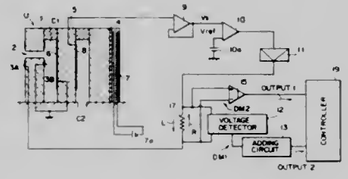
1. A chromatographic/electrophoretic separation and sensing device comprising a semiconductor chip mounting package carrying electrically insulated contact pins for making electrical connections with an external measurement circuit, the package supporting at least one alumina strip, said alumina strip carrying a silicon wafer body which includes a narrow longitudinal channel capable of accommodating a low volume of a sample medium for a relevant gas or liquid test process, said channel being closed on its open side by a cover plate, and said channel being associated with a first and a second electrode area being spaced from one another in the longitudinal direction of the channel such that both electrode areas are in contact with said sample medium when said sample medium is present in the channel, and each electrode area being connected to a respective contact pin of the package for integration with the said measurement circuit.

4,891,121

AIR FUEL RATIO DETECTING DEVICE

Osamu Hirako; Yoshiaki Danno, and Makoto Shimada, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,329
Claims priority, application Japan, Jul. 30, 1986, 61-179210
Int. Cl.⁴ G01N *27/58*
U.S. Cl. 204—406 **15 Claims**



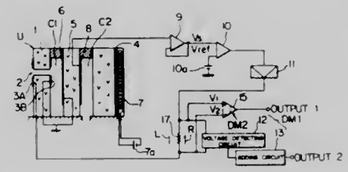
1. An air fuel ratio detecting device, comprising:
a sensor cell, for developing an electrical signal in response to the difference between the concentration of oxygen present in an exhaust gas after an air fuel mixture has been burned within a combustion chamber, and the concentration of oxygen present in a reference gas, including a sensor electrode located upon one of a pair of opposite side walls of said sensor cell which is exposed to a detecting chamber into which said exhaust gas is introduced, and a reference electrode located upon the other side wall of said sensor cell which is exposed to a reference chamber into which said reference gas is introduced;
a controlling means for developing an electrical signal having a polarity determined from an output of said sensor cell;
a pump cell, for moving oxygen ions in response to an electrical control signal received from said controlling means, having one of a pair of opposite side walls thereof exposed to a path of said exhaust gas from said combustion chamber and the other side wall thereof exposed to said detecting chamber, a diffusion hole formed within said pump cell so as to provide fluidic communication between said path of said exhaust gas and said detecting chamber, and a pair of pump electrodes located upon said opposite side walls thereof;
a control current detecting means for detecting control current flow transmitted between said controlling means and said pump cell;
a stoichiometric air fuel ratio detecting means for detecting the direction of said control current flow so as to determine the stoichiometric air fuel ratio;
a storage means for storing therein a linear air fuel ratio value which is determined in a predetermined functional relationship with respect to the magnitude of said control current flow;
a linear air fuel ratio detecting means for detecting the magnitude of said control current flow detected by said control current detecting means so as to compare said detected control current flow with said stored linear air fuel ratio value from said storage means; and
a correcting means for correcting said predetermined functional relationship stored in said storage means when a stoichiometric air fuel ratio signal is developed from said stoichiometric air fuel ratio detecting means.

4,891,122

AIR FUEL RATIO DETECTING DEVICE

Yoshiaki Danno, and Takashi Dogahara, both of Kyoto, Japan, assignors to Misubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 933,850
Claims priority, application Japan, Nov. 22, 1985, 60-262982
Int. Cl.⁴ G01N *27/56*
U.S. Cl. 204—406 **7 Claims**



1. An air fuel ratio detecting device for a combustion engine, comprising:
a cell unit having a detecting chamber, a diffusion hole defined within said cell unit for fluidically communicating an exhaust conduit of said engine with said detecting chamber, and a reference chamber fluidically communicating with an atmosphere;
a sensor cell provided within said cell unit for producing a first output signal in response to a difference between the concentration of oxygen within said detecting chamber and the concentration of oxygen within said reference chamber;
a first comparator for comparing said first output signal with a reference value and for producing a second output signal having one of two logic levels;
integrator means for integrating said second output signal and for producing a control signal having a predetermined polarity depending upon a particular one of said two logic levels of said second output signal;
a pump cell responsive to said control signal for moving oxygen ions in one of two directions with respect to said detecting chamber;
a resistor interposed between said integrator means and said pump cell for detecting control current flow of said control signal;
a second comparator for detecting the direction of said control current and for producing a comparator signal;
stoichiometric air fuel ratio detecting means responsive to said comparator signal for producing a lean state signal or a rich state signal in response to said direction of said control current; and
air fuel ratio detecting means responsive to a voltage value across said resistor for producing a linear air fuel ratio signal representing an air fuel ratio of an air fuel mixture burned within said engine.

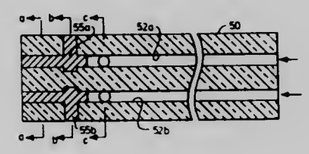
4,891,123

ELECTROCHEMICAL ANALYZER FOR MEASURING THE CONCENTRATION OF ATOMS OR MOLECULES IN A FLUID AND METHOD OF MAKING SAME

Ilan Riess, Moshav Beit Shearim, Israel, assignor to Frantztech Ltd., New York, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,584
Claims priority, application Israel, Apr. 10, 1987, 82160
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—427 **32 Claims**

1. A solid state electrochemical analyzer for measuring the concentration of atoms or molecules in a first fluid as compared to a second fluid and to a third fluid, comprising:
an insulating tube **(30, 40)** formed with at least three longitudinal bores **(31, 32; 41, 42, 43)** therethrough extending from one end, constituting the fluid inlet end **(12)** of the tube, to the opposite end **(13, 23, 33)** of the tube;
means for directing said first, second and third fluids to flow into respective first, second and third ones **(41, 42, 43)** of said longitudinal bores so that said longitudinal bores constitute respective paths of flow for said first, second and third fluids;
means **(36, 46; 37, 47; 48)** defining outlets for said first, second and third fluids;



a single solid electrolyte **(35, 45)**, conductive to the ions of said atoms or molecules to be measured, deposited in a cavity formed in said tube **(30, 40)**, contacting sidewalls of said cavity, and bridging said paths of flow of said first, second, and third fluids;
and a respective electrode **(15, 17; 25, 27; 38, 39)** at each of the interfaces of the solid electrolyte **(35, 45, 55)** with the respective fluid for outputting an electrical signal, generated in said solid electrolyte, corresponding to the concentration of the atoms or molecules in the fluids.

4,891,124

REFERENCE ELECTRODE FOR STRONG OXIDIZING ACID SOLUTION

Lester P. Rigdon, Livermore; Jackson E. Harrar, Castro Valley; Jack C. Bullock, Sr., Pleasanton, and Raymond R. McGuire, Brentwood, all of Calif., assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed May 23, 1989, Ser. No. 355,523
Int. Cl.⁴ G01N *27/26*
U.S. Cl. 204—435 **20 Claims**



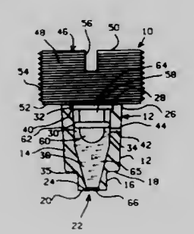
1. A reference electrode suitable for long-term, reproducible measurement of the oxidation-reduction potential (ORP) of strong oxidizing acid solutions, comprising a half cell of Metal/Ce(IV)/Ce(III)/Mineral Acid Solution.

4,891,125

REFERENCE ELECTRODE AND METHOD OF MAKING IT

Steven G. Schultz, Winthrop Harbor, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 12, 1989, Ser. No. 336,944
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—435 **7 Claims**



1. A miniature reference electrode providing both electrical connection and a liquid junction between a reference liquid solution and a solution to be tested comprising:

cup means including a cavity to hold the reference liquid solution having a sample contacting orifice at one end and an opposed open second end, said orifice being defined by a peripheral sidewall;

a membrane comprising cellulose acetate extending across said orifice and interdigitatedly anchored to said peripheral sidewall;

means for applying a generally fixed control potential to said reference liquid solution; and

means for hermetically closing the second open en of said cavity.

7. In a miniature reference electrode half-cell, a method for making a reference liquid junction membrane for providing an electrical connection and a liquid junction between a reference liquid solution and a solution to be tested comprising:

(a) providing a cup means of a dielectric thermoplastic material including a cavity to hold the reference liquid solution having a sample contacting orifice at one end and an opposed second end, said orifice being defined by a peripheral sidewall;

(b) preparing a liquid junction membrane composition by

(1) dissolving about 0.3% to about 5.0% by weight of cellulose acetate having an acetyl content of from about 25% to about 50% in 70% to 90% by weight of a first polar organic solvent capable of at least partially dissolving said thermoplastic material;

(2) dissolving from about 1% to about 5% by weight of an inorganic metal salt selected from Li, Na, Mg, Ca, Zn, K, Al, Cu salts in from about 5% to about 15% by weight of a second solvent comprising a C_1 to C_{10} alcohol;

(3) mixing the solutions of step (1) and (2) together;

(4) thereafter, optionally adding from about 1% to about 5% by weight of a flexibility improving agent selected from C_5–C_{10} cyclic hydrocarbons; C_5–C_{10} cyclic monohydric alcohols and lower C_1–C_4 alkyl esters of aliphatic and aromatic carboxylic acids, based on the weight of the overall composition, to the mixture of step (3) to form the membrane composition;

(c) depositing a drop of said liquid junction membrane composition through said cavity and into said orifice in contact with the peripheral sidewall;

(d) curing and interdigitatedly anchoring said membrane to said orifice by permitting the solvents to evaporate until membrane formation is substantially complete; and

(e) thereafter contacting said membrane with a solvent for said metal salt to create micropores therein by removal of said metal salt from the membrane.

4,891,126

MESOPHASE PITCH FOR USE IN THE MAKING OF CARBON MATERIALS AND PROCESS FOR PRODUCING THE SAME

Isao Mochida, Fukuoka; Yukio Sakai, and Hiroyuki Otsuka, both of Okayama, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 276,468
Claims priority, application Japan, Nov. 27, 1987, 62-297760; Apr. 4, 1988, 63-81219
Int. Cl.[4] C10C *1/20*
U.S. Cl. 208—39 **24 Claims**

1. Mesophase pitch for use in the production of a carbon material which is produced by polymerizing a condensed polycyclic aromatic hydrocarbon or a substance that contains it in the presence of a hydrogen fluoride/boron trifluoride catalyst to form mesophase, and vaporizing the catalyst after completion of the polymerization reaction so that it will be separated and recovered from the reaction system, said pitch having a hydrogen-to-carbon atomic ratio of from about 0.5 to about 1.0 with the naphthenic carbon content being at least about 7% of the total carbon, and said pitch containing at least about 90% of an optically anisotropic phase.

4,891,127

PREPARATION AND USE OF CATALYSTS COMPRISING A MIXTURE OF TUNGSTEN OXIDE AND SILICA SUPPORTED ON A BOEHMITE-LIKE SURFACE

Lawrence L. Murrel, South Plainfield, and Nicholas C. Dispenziere, Jr., Wall, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 815,202, Dec. 31, 1985, Pat. No. 4,831,007. This application Feb. 15, 1989, Ser. No. 310,984
Int. Cl.[4] C10G *47/04, 11/04*
U.S. Cl. 208—111 **12 Claims**

1. A process for hydrocracking a feed comprising a hydrocarbon which comprises contacting said feed and hydrogen at elevated temperature with a hydrocracking catalyst for a time sufficient to hydrocrack at least a portion of said feed wherein said catalyst is prepared by (i) forming a composite of a mixture of (a) particles of tungsten oxide or one of more suitable tungsten oxide precursors, (b) particles of silica or silica precursor and (c) particles of porous boehmite, and (ii) steaming said composite at an elevated temperature of at least about 500° C. in a non-reducing environment and the presence of steam for a time sufficient for at least a portion of the tungsten oxide and silica to react with the boehmite surface and for at least a portion of the boehmite to convert to gamma alumina.

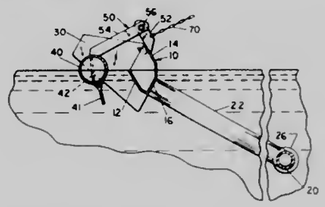
7. A process for cracking a feed comprising a hydrocarbon which comprises contacting said feed at elevated temperature with a catalyst prepared by (i) forming a composite of tungsten oxide or one or more suitable tungsten oxide precursors, (b) particles of silica or silica precursor and (c) particles of porous boehmite, and (ii) steaming said composite at an elevated temperature of at least about 500° C. in a non-reducing environment and the the presence of steam for a time sufficient for at least a portion of the tungsten oxide and silica to react with the boehmite surface and for at least a portion of the boehmite to convert to gamma alumina.

4,891,128

SOLIDS EXCLUDING SURFACE SKIMMER

Mervyn C. Goronszy, Cremorne, Australia, assignor to Transfield, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 252,561, Sep. 30, 1988, abandoned. This application Nov. 28, 1988, Ser. No. 276,790
Int. Cl.[4] B01D *21/24*
U.S. Cl. 210—121 **4 Claims**



1. A skimmer for decanting treated liquid from a sewage settling basin, comprising:

an elongate weir which comprises an input weir lip means over which liquid from the basin may flow;

conduit means in liquid communication with the weir for removing liquid from the basin;

means for raising and lowering the weir relative to the liquid level in the basin;

extended end plates on the ends of the weir;

an elongate floatable scum and solids barrier means disposed generally parallel to the weir, said barrier means comprising an elongate floatable structure and an elongate surface scum intersector secured along the length of the barrier means and extending downwardly therefrom, said barrier means being constructed and arranged to seal against the weir when the skimmer is raised above the liquid in the basin and to intersect surface scum cleanly upon entry of the skimmer into such liquid in the basin to prevent entry of scum into the weir when, in use, the skimmer enters the liquid;

means forming a moveable solids barrier seal between the respective ends of the solids barrier means and the respective end plates; and

linkage means mounting the solids barrier means to said weir, said linkage means being constructed and arranged to allow for movement of said solids barrier means away from the weir during lowering of the weir;

the weir, end plates, seal means and barrier means being so constructed and arranged to permit the barrier means to move away from the weir as the liquid level in said basin lowers to thereby define a solids-free decantation zone of increasing size between said weir and said barrier means during lowering of the skimmer during decantation.

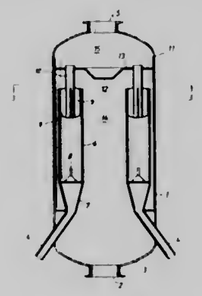
4,891,129

PROCESS FOR SOLIDS-FLUID SEPARATION EMPLOYING SWIRL FLOW

Peter H. Barnes, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 15, 1986, Ser. No. 907,338
Claims priority, application United Kingdom, Oct. 28, 1985, 8526540
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—161 **6 Claims**

1. A process for separating solid particles from fluid which comprises passing a mixture of solid particles and fluid upwardly into a space exterior to and between tubular elements and subsequently downwardly entering into annular spaces provided with swirl imparting means interior to the tubular elements, which annular spaces are defined between the upper sections of the tubular elements and the lower sections of tubular fluid outlet means arranged substantially coaxially within said upper sections, imparting a helical movement to the solids-fluid mixture in the tubular elements to separate solids



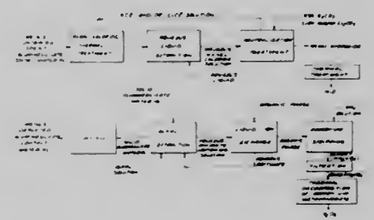
from fluid, removing solids through the lower sections of the tubular elements and removing fluid upwardly through the upper sections of the tubular fluid outlet means.

4,891,130

PROCESS FOR REMOVING METALS FROM ALUMINOSILICATE MATERIALS

Frank Pitts, Magalas, France, assignor to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 628,695, Jul. 6, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 883,004
Int. Cl.[4] C10G *25/05, 25/12, 31/00*; B01J *29/38*
U.S. Cl. 208—305 **40 Claims**



30. A process for removing nickel and vanadium values from aluminosilicate materials comprising the steps of:

(a) contacting an aluminosilicate material with an alkali chloride selected from the group consisting of potassium chloride, lithium chloride, and mixtures thereof, in the substantial absence of moisture, at a temperature above the melting point of the chloride or chlorides, under conditions effective to convert the nickel in the aluminosilicate material to an acid soluble form; and

(b) removing the nickel and vanadium values from the aluminosilicate material.

40. The process according to claim 30, wherein the aluminosilicate material that contains nickle and vanadium comprises a particulate contact material that was contacted with a petroleum feedstock in a selective vaporization process and further wherein after step (b), at least a portion of the resulting aluminosilicate material is contacted with a petroleum feedstock in a selective vaporization process.

4,891,131

SONICATION METHOD AND REAGENT FOR TREATMENT OF CARBONACEOUS MATERIALS

Mohammad-Ali Sadeghi, Pasadena; Kazem Sadeghi, Goleta; Jih-Fen Kuo, Los Angeles; Long-Kuan Jang, Long Beach, and Teh Fu Yen, Altadena, all of Calif., assignors to Tar Sands Energy Ltd., Santa Barbara, Calif.

Filed Dec. 21, 1984, Ser. No. 684,945
Int. Cl.[4] C10G *1/04*
U.S. Cl. 208—390 38 Claims

1. A method of recovering a lighter, hydrocarbon liquid oil from an asphaltene-containing solid carbonaceous material comprising the steps of:

dispersing particles of the solid material in an aqueous solution of an inorganic base selected from at least one member of the group consisting of alkali metal hydroxides, carbonates, phosphates and silicates at ambient temperature and in the absence of organic solvent;

adding a water-miscible separation reagent formed of a reaction product between said inorganic base and polar components of bitumen to the suspension;

applying sonic energy to the suspension for a time sufficient to remove from the solid particles an organic phase which separates into a lighter, hydrocarbon liquid oil which is essentially free of asphaltene and has an ash content below 1 percent by weight which floats to the top of the suspension to form a layer and into solid agglomerates containing a major portion of the asphaltene content of the material and containing a higher metal content than the oil layer which fall to the bottom of the suspension;

recovering the hydrocarbon liquid oil from the top of the suspension; and

recovering the agglomerates from the bottom of the suspension.

4,891,132

OIL SHALE WET OXIDATION PROCESS

Edward L. Czenkusch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 24, 1986, Ser. No. 832,619
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—428 15 Claims

1. A process for producing hydrocarbonaceous liquid from oil shale be wet oxidation comprising:

(a) contacting (1) a reaction mixture of an aqueous slurry of comminuted oil shale containing pyritic sulfur and (2) oxidizing gas with sufficient agitation at oxidation conditions comprising a temperature of about 275° F. to about 325° F. to provide a product mixture comprising treated oil shale and liquid portion said liquid portion comprising hydrocarbonaceous liquid, water, and dissolved mineral salts;

(b) separating treated shale solids from the liquid portion of the product mixture; and

(c) recovering a hyrocarbonaceous liquid from the liquid portion of the product mixture.

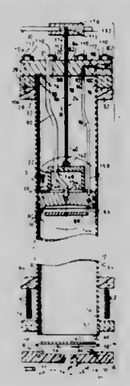
4,891,133

CHROMATOGRAPHY APPARATUS

Arthur E. Colvin, Jr., Mount Airy, Md., assignor to Cerex Corporation, Gaithersburg, Md.

Filed Sep. 15, 1987, Ser. No. 96,506
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 5 Claims

1. Liquid chromatography apparatus comprising an elongated hollow member having two open end portions for receiving a chromatography packing or filling material and end closure means for closing an end of said elongated hollow member having a centrally located aperture for a conduit, said end closure means having means for separating a gas from a liquid comprising an inclined surface and a centrally located substantially uninterrupted ring shaped groove located in said inclined surface close proximity to and around the centrally located conduit aperture with a substantial portion of the inclined surface sloping inward toward said substantially uninterrupted ring shaped groove and the central portion of said closure means and means in fluid communication with said



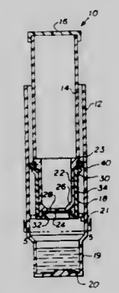
substantially uninterrupted ring shaped groove for drawing off gases from said substantially uninterrupted ring shaped groove, a disk to establish and maintain even liquid distribution radially, and means to vary the position of an end closure means to vary the size of a bed of said packing or filling material.

4,891,134

SAMPLE FILTRATION DEVICE

John L. Vcelka, Zion, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 25, 1988, Ser. No. 148,260
Int. Cl.[4] B01D *33/00*
U.S. Cl. 210—359 5 Claims



4. In a sample filtration device of the differential pressure type having a hollow plunger slidable into an outer container of liquid to be filtered, a filter disposed in one end of said plunger, and sealing means disposed in an annular groove about the plunger to sealably engage said outer container wall, the improvement comprising:

a plunger having a collector portion and a retaining portion, wherein said collector portion includes an annular shoulder and said retaining portion includes a first annular ring dimensioned to slidably fit around said plunger, said annular shoulder and said annular ring defining said annular groove; and wherein said retaining portion further comprises a second annular ring dimensioned to slidably fit into said one end of the hollow plunger to abut said filter and leg means rigidly connecting said first and second annular rings.

4,891,135

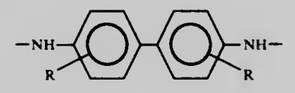
MACROPOROUS, ASYMMETRIC, HYDROPHILIC POLYARAMIDE MEMBRANE

Michael Haube, Bad Kreuznach; Friedrich Herold, Hofheim; Claus-Peter Krieg, Frankfurt am Main; Detlef Skaletz, Mainz-Bretzenheim, and Wildhardt Juergen, Huenstetten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

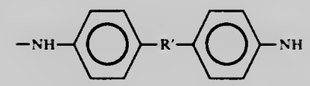
Filed Jan. 23, 1989, Ser. No. 299,339
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802030
Int. Cl.[4] B01D *13/00, 13/04*
U.S. Cl. 210—500.38 28 Claims

1. A macroporous, asymmetric, hydrophilic membrane, comprising polyaramid comprising a copolyamide having at least the following recurring structural units:

(A) —OC—Ar—CO—
(B) —NH—Ar'—NH
(C)



(D)



where

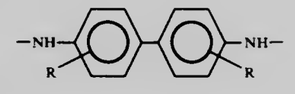
Ar and Ar' denote divalent aromatic radicals in which the valence bonds are in the para or comparable coaxial or parallel position,

R denotes a lower alkyl radical or a lower alkoxy radical in each case having up to 4 carbon atoms, or a halogen radical, and

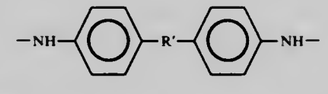
R' denotes an unsubstituted or substituted methylene radical or an —O—Ar—O— group where Ar has the structure as given above.

13. A process for the production of a macroporous, asymmetric, hydrophilic membrane, comprising polyaramid comprising a copolyamide having at least the following recurring structural units:

(A) —OC—Ar—CO—
(B) —NH—Ar'—NH—
(C)



(D)



where

Ar and Ar' denote divalent aromatic radicals in which the valence bonds are in the para or comparable coaxial or parallel position,

R denotes a lower alkyl radical or a lower alkoxy radical in each case having up to 4 carbon atoms, or a halogen radical, and

R' denoted an unsubstituted or substituted methylene radical or an —O—Ar—O— group where Ar has the structure as given above,

comprising the steps of:

spreading a layer of a solution comprising the copolyamide and an aprotic, polar amide solvent on a planar substrate;

applying a precipitation liquid miscible with the aprotic, polar amide solvent to the layer; and

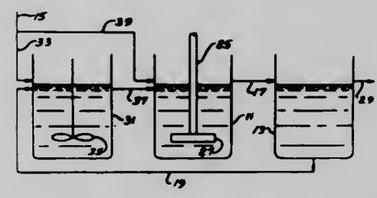
precipitating the copolyamide as a membrane.

4,891,136

METHOD FOR CONTROLLING FILAMENTOUS ORGANISMS IN WASTEWATER TREATMENT PROCESSES

Walter F. Voyt, Joliet, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 935,027, Nov. 26, 1986, Pat. No. 4,772,396. This application Jun. 29, 1988, Ser. No. 212,778
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—605 3 Claims



1. A method of reducing the growth of filamentous organisms in an aerobic wastewater treatment process in which the wastewater is deficient in nitrogen comprising the step of:

adding to wastewater deficient in nitrogen, a nitrogen source selected from the group of nitrogen sources consisting essentially of an oxidized nitrogen source and reduced nitrogen source being added alternately and to the substantial exclusion of each other, and said oxidized nitrogen source being added for periods not exceeding approximately two sludge ages, wherein said nitrogen source supplies substantially all the nitrogen requirements of said aerobic process, said oxidized nitrogen source is selected from the group of nitrogen compounds consisting of sodium nitrate, nitric acid, nitrous acid, sodium nitrite, and calcium nitrate, and said reduced nitrogen source is represented by the formula:

$$X—NH_Z$$

wherein "X" is an organic or inorganic moiety capable of disassociation or being metabolized to release the NH_Z moiety and "Z" is the integer 1, 2, 3, or 4.

4,891,137

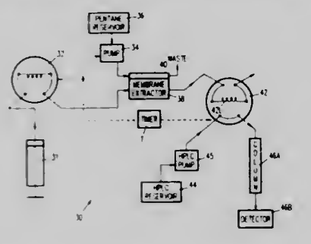
METHOD AND APPARATUS FOR MEMBRANE EXTRACTION OF HYDROLYSIS CONTAMINATES

Andre Nohl, San Jose, and Ronald V. Perkins, Union City, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 3, 1989, Ser. No. 319,208
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—644 10 Claims

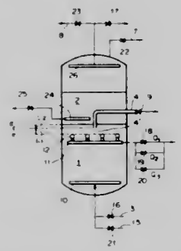
1. A method for extracting FMOC—OH from a sample comprising the steps of:

providing an FMOC—OH permeable membrane having first and second sides;
providing a sample contacting the first side; and



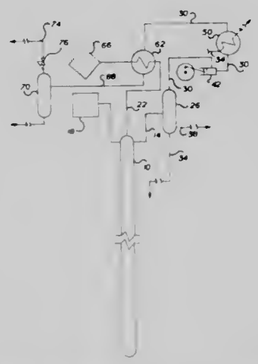
providing an extractant including pentane on the second side.

4,891,138
METHOD OF SEPARATING AND TRANSFERRING ION-EXCHANGE RESIN
Kanroku Chonan, Kanagawa; Kazuyuki Koyama, Saitama, and Masahiro Hagiwara, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan
Filed Dec. 24, 1987, Ser. No. 137,714
Claims priority, application Japan, Dec. 25, 1986, 61-307763; Mar. 18, 1987, 62-61384
Int. Cl.[4] B01J *47/04, 49/00*
U.S. Cl. 210—675 **5 Claims**



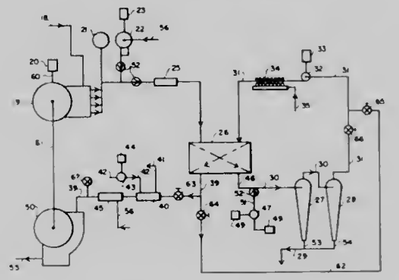
1. A method for separating and transferring an ion-exchange resin from a separation tank packed with a mixed bed of two ion-exchange resins having different specific gravities, said method comprising:
(A) A first stage comprising the following steps:
(1) separating the mixed ion-exchange resin bed into two layers in said separation tank, and upper layer and a lower layer, wherein the upper layer has a lower specific gravity than the lower layer;
(2) settling the two layers,
(3) adding sluicing water to said separation tank at a flow rate of 2–4 m/h through a perforated separating and transferring intermediate sluicing pipe positioned below the interface between the separated resin layers,
(4) adding pressurized water to said separation tank from above, the pressure of which is such that the greater part of the ion-exchange resin in the upper layer having the smaller specific gravity can be transferred from the separation tank to another tank though the opening of a resin transfer pipe positioned above the intermediate sluicing pipe in said separation tank,
(5) transferring said greater part of the ion-exchange resin in the upper layer through the opening of said resin transfer pipe to an anion regeneration tank,
(B) a second stage which comprises introducing backwashing water into said separation tank, through a lower water collecting unit located at the lower portion of the separation tank or through both said intermediate sluicing pipe, and said water collecting unit;
(C) a third stage in which, after resin settling, the residual ion-exchange resin having a smaller specific gravity which remains unseparated from the ion-exchange resin of a higher specific gravity is separated by introducing sluicing water in said separation tank at a flow rate of 5–20 m/h through the intermediate sluicing pipe so that the ion-exchange resin having the smaller specific gravity is lifted as particles in water in freeboard above the resin layer of higher specific gravity, while introducing said pressurized water from above the tank so as to direct the ion-exchange resin having the smaller specific gravity to the opening of the resin transfer pipe to be transferred therethrough to the regeneration tank.

4,891,139
METHOD FOR WET OXIDATION TREATMENT
Joseph E. Zeigler, 9915 Raleigh, Westminster, Colo. 80030, and Hermann W. Peterscheck, 2201 Fourteenth Ave., Apt. 4-300, Longmont, Colo. 80501
Division of Ser. No. 95,987, Sep. 14, 1987, Pat. No. 4,822,394. This application Jan. 17, 1989, Ser. No. 300,009
Int. Cl.[4] C02A *1/74*
U.S. Cl. 210—747 **4 Claims**



1. A method for the wet oxidation reaction of diluted organic waste in a down-hole reaction apparatus to recover effluent off-gases, said effluent off-gases principally containing carbon dioxide, the method comprising the steps of:
(a) flowing said diluted organic waste downwardly into said down-hole reaction apparatus as a stream of influent waste;
(b) injecting gaseous oxygen into said influent waste;
(c) reacting said influent waste and said gaseous oxygen in said wet oxidation reaction to form reaction products, said reaction products including said effluent off-gases principally containing said carbon dioxide;
(d) flowing said effluent off-gases into a heat-exchanger;
(e) providing a supply of liquid oxygen;
(f) flowing said liquid oxygen into said heat-exchanger such that the effluent off-gases and said liquid oxygen are in heat transfer relation with each other;
(g) allowing a sufficient quantity of heat to flow from said effluent off-gases to said liquid oxygen such that said effluent off-gases are liquified to form a liquid product, said liquid product principally containing liquid carbon dioxide, and so that said liquid oxygen is gasified;
(h) flowing said liquid product out of said heat exchanger;
(i) flowing said gasified liquid oxygen out of said heat exchanger; and
(j) using said gasified oxygen in said oxygen injecting step.

4,891,140
DESALINATION PROCESS
Jerry A. Burke, Jr., 2541 Stratford Rd., Richmond, Va. 23225
Filed Jan. 9, 1989, Ser. No. 295,147
Int. Cl.[4] B01D *17/00, 17/038, 21/26*
U.S. Cl. 210—748 **2 Claims**



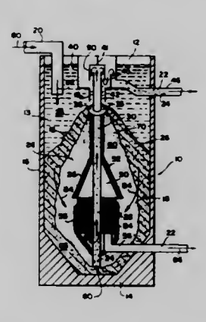
1. In a process including the steps of subjecting a feed to critical conditions to pyrolize organic components therein and to precipitate inorganic components therefrom, sufficient for forming a solid phase suspended therein, and gravitationally removing said solid phase, the improvement comprising: magnetically pretreating the feed by dividing said feed into an even number of streams, positively charging half of said streams, negatively charging the other half of said streams, recombining said streams, sufficient for substantially reducing scale formation in the down stream piping carrying said feed.

2. In a system including means for subjecting a feed to critical conditions to pyrolize organic components therein and to precipitate inorganic components therefrom, sufficient for forming a solid phase suspended therein, and means for gravitationally removing said solid phase, the improvement comprising: means for magnetically pretreating the feed including means for dividing said feed into an even number of streams, means for positively charging half of said streams, means for negatively charging the number half of said streams sufficient for substantially reducing scale formation in the downstream piping carrying said feed.

4,891,141
OXYGEN SCAVENGER FOR BOILER WATER AND METHOD OF USE
Ronald J. Christensen, Montgomery, and Lyle H. Steimel, Forest Park, both of Ohio, assignors to DuBois Chemicals, Inc., Cincinnati, Ohio
Filed Dec. 11, 1987, Ser. No. 131,754
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[4] C02F *1/20;* **C23F** *11/14*
U.S. Cl. 210—750 **4 Claims**

1. A method of removing dissolved oxygen from boiler feedwater, providing metal passivation and condensate treatment comprising:
adding to said boiler feedwater an oxygen scavenging amount of a solution of ascorbic acid neutralized with diethylaminoethanol
wherein said solution has a ratio of ascorbic acid to diethylaminoethanol at of 1/1 to about 1/5 on a molar basis; and
wherein said solution has a pH of at least about 10; and
maintaining said solution in said boiler to remove said dissolved oxygen and provide said passivation and condensate treatment.

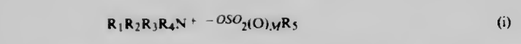
4,891,142
MOVING BED FILTRATION APPARATUS AND METHOD
C. J. Hering, Jr., Houston, Tex., assignor to Ashbrook-Simon-Hartley Corporation, Houston, Tex.
Filed Sep. 21, 1988, Ser. No. 247,397
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—792 **13 Claims**



11. A method of filtering a liquid comprising the steps of:
providing a bed of particulate filter material comprising particles contained within a vessel, the bed having an upper and a lower region;
introducing unfiltered liquid above the bed, which liquid is filtered through the bed in a downward direction, said unfiltered liquid collecting above the bed such that the top of the unfiltered liquid is at a level above the bed;
removing one portion of clean, filtered liquid from a position in the lower region of the bed, wherein the removing portion of said clean, filtered liquid forms a transport liquid;
withdrawing dirty, particulate filter material from the lower region of the bed;
transporting the dirty filter material entirely with said clean filtered transport liquid from a position in the lower region of the bed to a location at the center of the upper region of the bed and below the level of the unfiltered liquid above the bed, said transporting step being independent of said introducing step;
separating dirt from the dirty particulate material at said location at the center of the upper region of the bed and below the level of the dirty liquid above the bed; and
depositing clean, separated filter material at the center of the upper region of the bed.

4,891,143
WATER INSOLUBLE ANTISTATIC COMPOSITIONS
Fred E. Woodward, 200 Churchill Rd., West Palm Beach, Fla. 33403, and Alice P. Hudson, 728 W. Kalusia Dr., Lake Park, Fla. 33403
Continuation-in-part of Ser. No. 568,817, Jan. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 321,742, Nov. 16, 1981, abandoned. This application Jun. 10, 1985, Ser. No. 742,848
Int. Cl.[4] C11D *1/62, 1/65, 3/28*
U.S. Cl. 252—8.75 **19 Claims**

1. A particulate laundry softener-antistatic composition wherein the particles are from about 50 to about 500 microns in diameter consisting essentially of a water insoluble, nondispersible undissociated organic salt substantially free from other ingredients and with no water soluble components having the structure



(i)

wherein

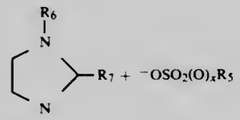
R_1 is an alkyl, alkenyl, alkoxyalkyl or acylamidoalkyl group containing about 12 to 22 carbon atoms with the alkyl radical or the acylamidoalkyl being ethyl or propyl;

R_2 is R_1, hydroxyethyl, hydroxypropyl, ethyl, or methyl;

R_3 and R_4 are methyl, ethyl, propyl, hydroxyethyl, hydroxypropyl, or benzyl;

R_5 is an alkyl, alkenyl, alkaryl, or monohydroxyalkyl group containing about 10 to 22 carbon atoms; and

x is 0 or 1; (and) or



wherein

R_6 is methyl or ethyl;

R_7 is alkyl or alkenyl containing about 14 to 22 carbon atoms; and

R_5 and x are as defined above.

4,891,144

POLYMERS AND LUBRICANT ADDITIVES OF ALKYLENE DITHIOTHIADIAZOLES AND ALKYLENE CYANODITHIOIMIDOCARBONATES

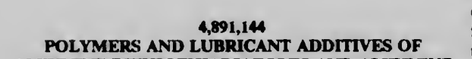
Sameeh Toukan, Schuylkill, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 69,910, Jul. 6, 1987, which is a continuation-in-part of Ser. No. 737,121, May 23, 1985, Pat. No. 4,678,592. This application Aug. 10, 1988, Ser. No. 230,733

Int. Cl.[4] C10M *103/00*

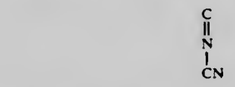
U.S. Cl. 252—47 **5 Claims**

1. An oil soluble lubricant additive produced by the reaction of a polymeric composition having the formula



wherein

Z is any thiadiazolyl isomer and can be



if p is zero;

X is any dimercapto thiadiazolyl isomer;

R is selected from the group consisting of:

(a) methylene, alkylene of 2–10 carbons which can be straight or branched chain;

(b) cyclic hydrocarbon of 5–7 carbons;

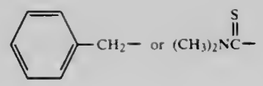
(c) aralkylene of 8–30 carbons;

(d) aromatic of 5–7 carbons;

(e) heterocyclic of 2–6 carbons; and

(f) any one of (a)–(e) above substituted with aralkyl of 8–30 carbons, cyclic hydrocarbon of 5–7 carbons, aromatic of 5–7 carbons, or heterocyclic groups of 2–6 carbons each;

Y is



p is zero or 1;

m is zero or 1 provided m is zero when p is 1; and

n is an integer of 4–1000; with a polyalkylene succinimide, an aliphatic carboxylic acid, and a mercaptan.

4,891,145

LUBRICATING OIL COMPOSITION

Ramah J. Brod, Marcham, Nr. Abingdon; Robert D. Tack, Oxford; Kenneth Lewtas, Wantage, all of United Kingdom, and Robert L. Elliott, Baton Rouge, La., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jan. 29, 1986, Ser. No. 823,678

Claims priority, application United Kingdom, Jan. 31, 1985, 8502458

Int. Cl.[4] C10M *145/38*

U.S. Cl. 252—52 A **9 Claims**

1. A lubricating oil composition adapted for use in the crankcase of an internal combustion engine comprising a lubricating oil, dispersant; and (1) a polymeric, ester containing, lubricating oil pour depressant derived from at least one unsaturated esterifiable monomer; and (2) at least one member selected from the group consisting of polyoxyalkylene ether, ester/ether and derivatives thereof containing at least one C_{10} to C_{30} saturated alkyl group, and a polyoxyalkylene glycol group of molecular weight 100 to 5000, the alkylene group of said polyoxyalkylene glycol containing from 1 to 4 carbon atoms; the total weight of (1) and (2) being less than 3% by weight based on the weight of lubricating oil composition.

4,891,146

HYDROPEROXIDIZED ETHYLENE COPOLYMERS AND TERPOLYMERS AS DISPERSANTS AND V. I. IMPROVERS

Jeffrey E. Stemke, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 422,320, Sep. 23, 1982, abandoned. This application Jan. 26, 1988, Ser. No. 149,466

Int. Cl.[4] C10M *107/16*

U.S. Cl. 252—55 **15 Claims**

1. A lubricating oil composition comprising an oil of lubricating viscosity and from about 0.05 to 2% of a dispersancy and viscosity index improving hydroperoxidized copolymer of ethylene and one or more alpha-olefins or hydroperoxidized terpolymer of ethylene, one or more alpha-olefins and one or more non-conjugated diolefins wherein said hydroperoxidized copolymer and hydroperoxidized terpolymer have an excess of carboxylic acid to hydroxy groups and are prepared by dissolving in a solvent a copolymer of ethylene and a C_3–C_{18} alpha-olefin or a terpolymer of ethylene, a C_3–C_{18} alpha-olefin and a C_5–C_{12} non-conjugated diolefin, wherein said copolymer or terpolymer has molecular weight in the range of 20,000 to 1,000,000, reacting the copolymer or terpolymer with oxygen in the presence of a free radical initiator, the reaction being carried out at a temperature of from 60° to 250° C. and under a pressure of 0 to 1000 psig.

4,891,147

STABLE LIQUID DETERGENT CONTAINING INSOLUBLE OXIDANT

Robert L. Gray, Brewster, N.Y.; David Peterson; Loren Chen, both of Pleasanton, and Gregory van Buskirk, Danville, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Nov. 25, 1988, Ser. No. 276,599

Int. Cl.[4] C11D *1/83, 3/12, 3/39, 3/43*

U.S. Cl. 252—104 **16 Claims**

1. A phase stable liquid detergent containing at least one insoluble oxidant, comprising:

(a) a liquid phase which comprises: (i) an effective amount of at least one surfactant selected from the group consisting of anionic, nonionic, cationic, amphoteric, zwitterionic surfactants, and mixtures thereof; (ii) a liquid carrier therefor, comprising a water soluble or dispersible organic solvent, water, or a mixture thereof;

(b) an effective amount of a water insoluble oxidant stably suspended in said liquid phase, which maintains oxidative stability, said water insoluble oxidant being an alkaline earth metal peroxide or a Group 11B peroxide.

4,891,148

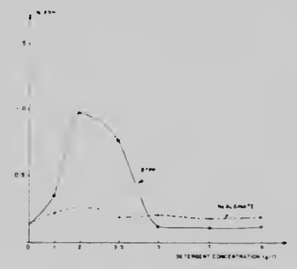
LOW PHOSPHATE OR PHOSPHATE FREE NONAQUEOUS LIQUID NONIONIC LAUNDRY DETERGENT COMOPSITION AND METHOD OF USE

Trazollah Ouhadi, Liège; Louis Dehan, Seraing, and Lucie Fellen, Grivegnee, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,162

Int. Cl.[4] C11D *3/39, 3/43*

U.S. Cl. 252—99 **23 Claims**



1. A nonaqueous liquid heavy duty laundry detergent composition which comprises

10 to 60 percent of at least one liquid nonionic surfactant detergent and

5 to 50 percent of an alkali metal alginic acid builder salt particles, and

at least one of

5 to 25 percent of a polycarboxylic acid terminated nonionic surfactant and

5 to 15 percent of a C_2 to C_3 alkylene glycol mono C_1 to C_5 alkyl ether.

4,891,149

COMPOSITIONS CONTAINING LIME SOAP DISPERSING POLYMERS AND THEIR USE

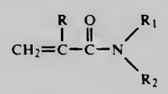
Madukkarai K. Nagarajan, Avon Lake, and William R. Masler, III, Hinckley, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 536,478, Sep. 28, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,163

Int. Cl.[4] C11D *1/83, 3/37, 9/10*

U.S. Cl. 252—110 **4 Claims**

1. Bar soap composition for personal use comprising at least one organic water-soluble surfactant selected from alkali metal salt of tallow/coconut soap in amount of 60–80 weight parts, 10–20 weight parts of a lime soap dispersant (LSD) selected from the group consisting of copolymers and water-soluble salts of said copolymers, said copolymers being copolymers of acrylic acid methacrylic acid, or mixtures thereof, and an acrylamide or mixtures of acrylamides, said copolymers having molecular weight (Mw) in the range of about 20,000 to 100,000 and contain 35 to 75% by weight of said acrylamide or a mixture thereof, and water to 100 weight parts of total composition, said acrylamide is selected from substituted and unsubstituted acrylamides defined by the following formula:



where R is either hydrogen or a methyl group and R_1 and R_2 are individually selected from hydrogen, alkyl groups of 1 to 2 carbon atoms, and alkylol groups of 1 to 2 carbon atoms, said water-soluble salts of said copolymers are selected from alkali metal sals, ammonium salts, and substituted ammonium salts, the relative ratio of surfactant to said lime soap dispersant is 100/1 to $\frac{1}{2}$.

4,891,150

LIQUID SANITARY CLEANSING AND DESCALING AGENTS AND PROCESS FOR THEIR PRODUCTION

Wolfgang Gross, Mutterstadt; Manfred Mueller, Frankenthal-Moersch; Harald Ahnsorge, Ludwigshafen-Oppau, and Andrea Zott, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,379

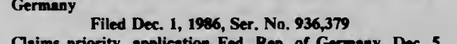
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3542970

Int. Cl.[4] C11D *3/20, 7/26; C23F 4/04*

U.S. Cl. 252—142 **12 Claims**

1. A cleansing and descaling agent, consisting essentially of: organic carboxylic acid in aqueous solution and a thickener, wherein said organic carboxylic acid comprises citric acid in a quantity of between about 5% and about 10% and wherein said thickener consists essentially of at least one member selected from the group consisting of:

(a) from about 0.1 to about 10% of an alkyl alcohol ether-sulfate of the formula 1



(1)

wherein

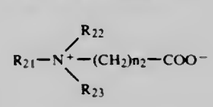
R is an alkyl chain having from 10 to 22 carbon atoms,

n is a number from 1 to 5 and

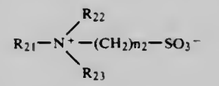
m is a number from 2 to 4;

in combination with an inorganic water-soluble salt in a quantity between about 1.0 and 10%

(b) from about 0.1 to about 10% of an amphoteric surfactant of the formula 2 or 3



(2)



(3)

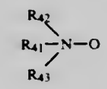
wherein

R_{21} is an alkyl chain having from 10 to 22 carbon atoms, and

R_{22} and R_{23} are a short-chain alkyl radical $(CH_2)_n$ where n_2 is a number from 1 to 4 or an ethoxylated or propoxylated chain $(CH_2CH_2O)_{n3}$ wherein n_3 is a number from 1 to 5;

(c) a combination of from about 0.1 to about 5% ethoxylated or propoxylated long chain alcohols with from about 0.1 to about 5% of at least one selected from the group consisting of ethoxylated amines, propoxylated amines, quaternary amines, ethoxylated quaternary amines and propoxylated quaternary amines; or

(d) a combination of an amine oxide or alkoxylated amine oxide of the formula 4



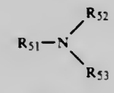
(4)

wherein

R_{41} is an alkyl chain having from 10 to 22 carbon atoms, and

R_{42} and R_{43} can be an H, a lower alkyl radical having from 1 to 4 carbon atoms or an ethoxylated or propoxylated chain $(CH_2CH_2O)_{n4}$ or $(CH_2—CH_2—CH_2O)_{n4}$ wherein n_4 is a number from 1 to 5;

with an amine or alkoxylated amine of the formula 5



(5)

wherein

R_{51} is an alkyl chain having from 10 to 22 carbon atoms, and

R_{52} and R_{53} can be an alkyl radical having from 1 to 4 carbon atoms or an ethoxylated or propoxylated chain $(CH_2CH_2O)_{n5}$ or $(CH_2CH_2CH_2O)_{n5}$ where n_5 is a number from 1 to 5;

wherein the thickener is present in a quantity sufficient provide an agent viscosity of at least between about 50 and 350 mPa.

4,891,151

LIQUID-CRYSTALLINE PHENYLPYRIMIDINYL CYCLOHEXANECARBOXYLATES HAVING A SMECTIC PHASE, A PROCESS FOR THEIR PREPARATION, AND THEIR USE IN LIQUID-CRYSTAL MIXTURES

Rainer Wingen, Hattersheim am Main; Hans-Rolf Dübal, Königstein/Taunus; Claus Escher, Mühltal; Wolfgang Hemmerling, Sulzbach (Taunus); Ingrid Müller, Hofheim am Taunus, and Dieter Ohlendorf, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

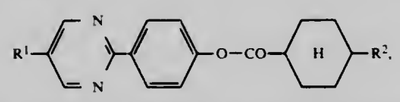
Filed Sep. 16, 1988, Ser. No. 245,452

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 3731639

Int. Cl.⁴ G02F *1/13*; C09K *19/34*; C07D *239/26*; G09F *9/35*

U.S. Cl. 252—299.61 **5 Claims**

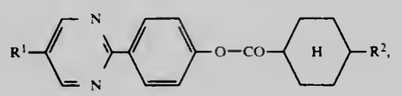
1. A phenylpyrimidinyl trans-cyclohexanecarboxylate of the formula (I)



(I)

in which R^1 is an alkyl radical having 11 to 16 carbon atoms, or an alkoxy radical having 8 to 14 carbon atoms, and R^2 is an alkyl radical having 2 to 9 carbon atoms.

2. A liquid-crystalline mixture having at least one smectic phase, and containing at least one compound of the formula (I)



(I)

in which R^1 is an alkyl radical having 10 to 16 carbon atoms or an alkoxy radical having 8 to 14 carbon atoms, and R^2 is an alkyl radical having 2 to 9 carbon atoms.

4,891,152

DISPERSION OF LIQUID CRYSTAL DROPLETS IN A PHOTOPOLYMERIZED MATRIX AND DEVICES MADE THEREFROM

Leroy J. Miller, Canoga Park; Camille van Ast, and Frederick G. Yamagishi, both of Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 28, 1987, Ser. No. 138,413

Int. Cl.⁴ C09K *19/52*

U.S. Cl. 252—299.01 **14 Claims**



1. A composite material, comprising a plurality of droplets of a liquid crystal material within a matrix of a copolymer of a multifunctional acrylate and a multifunctional mercaptan, the liquid crystal having a solubility in the copolymer that is less than its solubility in a mixture of the unpolymerized constituents.

4,891,153

MIXTURES OF FLUORESCENT WHITENING AGENTS

Leonardo Guglielmetti, Bottmingen, Switzerland; Hans R. Meyer, Binningen, Switzerland; Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Kurt Weber, Basel, Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

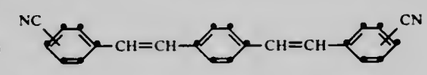
Division of Ser. No. 25,023, Mar. 12, 1987, Pat. No. 4,778,622. This application Aug. 5, 1988, Ser. No. 228,643

Claims priority, application Switzerland, Mar. 21, 1986, 1142/86

Int. Cl.⁴ C09K *11/06*

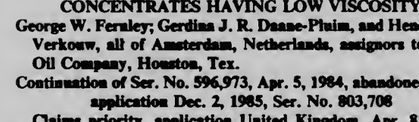
U.S. Cl. 252—301.22 **5 Claims**

1. A process for the preparation of a mixture of fluorescent whitening agents consisting of 51 to 99% by weight of a symmetrically or unsymmetrically substituted first compound of formula



(I)

and 49% to 1% by weight of an unsymmetrically substituted second compound of formula (I) that differs from the first compound, which comprises condensing, in the presence of aqueous alkali, terephthalaldehyde with a di(C_1-C_4)alkylphosphonomethylbenzonitrile and further condensing the cyano-4-formylstilbene of formula



(5)

obtained as intermediate, either direct or after isolation thereof, with at least one other (C_1-C_4)alkylphosphonomethylbenzonitrile.

4,891,154

DEFOAMING AGENTS AND PROCESS OF DEFOAMING

Holger Tesmann, Duesseldorf; Hans U. Hempel, Vilkerath; Heinz Mueller, Wuppertal-Vohwinkel; Margarete Gruenert, Kaarst, and Adolf Asbeck, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 603,400, Apr. 24, 1984. This application Jun. 11, 1987, Ser. No. 59,170

Claims priority, application Fed. Rep. of Germany, May 4, 1983, 3316249

Int. Cl.⁴ B01D *0/00*

U.S. Cl. 252—321 **21 Claims**

1. In the process of defoaming an aqueous foaming system comprising adding to said aqueous foaming system a foam-inhibiting amount of a foam inhibitor and recovering an aqueous foaming system having substantially less foam, the improvement consisting of employing a substantially water-insoluble silicic acid ester having the formula



wherein X and Y, independently, are selected from the group consisting of methyl or —OR and R is a polypropylene glycol ether containing at least three propylene glycol ether groups and optionally containing polyethylene glycol ether groups, which optionally may be terminally substituted, in a foam-inhibiting amount as said foam inhibitor.

4,891,155

PREPARATION OF ALKYL ARYL SULFONATE CONCENTRATES HAVING LOW VISCOSITY

George W. Feruley; Gerdina J. R. Daane-Pluim, and Hendrik T. Verkouw, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

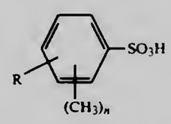
Continuation of Ser. No. 596,973, Apr. 5, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 803,708

Claims priority, application United Kingdom, Apr. 8, 1983, 8309632

Int. Cl.⁴ B01F *17/00, 17/30*; C07C *143/24*; E21B *43/16*

U.S. Cl. 252—354 **20 Claims**

1. In a process for preparing an alkyl aryl sulfonate concentrate which comprises neutralizing at least one alkyl aryl sulfonic acid of the formula



wherein n is one or two and R is an alkyl group having a carbon number in the range from 8 to 18, inclusive, by mixing the acid with a neutralizing agent, the improvement which comprises simultaneously mixing the sulfonic acid with an aqueous solution of the neutralizing agent and with at least one saturated alcohol having a carbon number in the range from 2 to 9, inclusive, under the provisions (i) that the said aqueous solution has a concentration of at least about 10 percent by weight of the neutralizing agent, (ii) that the alcohol is mixed with the acid in such a quantity that the resulting mixture contains between about 5 and 40 parts by weight of alcohol for each 100 parts by weight of neutralized alkyl aryl sulfonate, and (iii) that the aqueous neutralizing agent and alcohol are mixed with the acid in such a quantity that the resulting mixture contains at least about 53 percent by weight of neutralized alkyl aryl sulfonate.

4,891,156

N-ALKYL-BENZENESULPHONAMIDE COMPOSITIONS

Willi Schossler, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

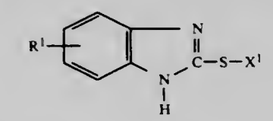
Filed Mar. 23, 1988, Ser. No. 172,103

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711689

Int. Cl.⁴ C23G *5/00*

U.S. Cl. 252—364 **7 Claims**

1. A composition comprising (i) one or more 2-mercaptobenzimidazole compound(s) of the formula



wherein

R^1 denotes hydrogen or a C_1-C_4-alkyl group and X^1 denotes hydrogen or 1 equivalent of the metals Zn, Cd or Mn(II), in an amount of 10–1,000 ppm, relative to the total quantity of the composition, and (ii) one or more N-alkyl-benzenesulphonamide(s), the alkyl group of which is open-chain C_1-C_{12}-alkyl or C_5-C_7-cycloalkyl and the benzene nucleus of which can be substituted by C_1-C_4-alkyl, said N-alkyl-benzenesulphonamides as the remainder makes up to 100% of the total quantity of the composition.

4,891,157

PARTIAL OXIDATION PROCESS

Enrique F. dePaz, Poughkeepsie; Roger J. Corbeels, Wappingers Falls, and Charles G. Sengebarger, Hopewell Junction, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,710

Int. Cl.⁴ C01B *3/36, 3/02*

U.S. Cl. 252—373 **9 Claims**

1. A process for the partial oxidation of an ash-containing heavy liquid hydrocarbonaceous fuel, an ash-containing solid carbonaceous fuel, or mixtures thereof comprising: reacting said fuel with a free-oxygen containing gas and optionally with a temperature moderator to produce an effluent gas stream having a temperature in the range of about 2000° F. to 3000° F. and comprising H_2+CO and entrained molten slag; and cooling said effluent gas stream to a temperature in the range of about 350° F. to 1500° F. in a radiant or quench cooling zone located down-stream from said reaction zone; wherein said molten slag is prevented from sticking to the internal metal surfaces of a gas transfer line or a gas transfer line and a convective cooler connected thereto and which surfaces are contacted by the partially cooled gas stream leaving said radiant or quench cooling zone by covering said metal surfaces of the gas transfer line or the gas transfer line and said convective cooler with a high temperature carbon-containing material.

4,891,158

OXIDE SEMICONDUCTOR FOR THERMISTOR AND MANUFACTURING METHOD THEREOF

Takuoki Hata, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

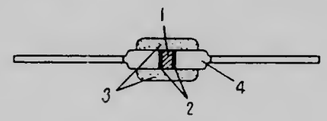
PCT No. PCT/JP85/00616, § 371 Date Jul. 8, 1986, § 102(e) Date Jul. 8, 1986, PCT Pub. No. WO86/03051, PCT Pub. Date May 22, 1986

PCT Filed Nov. 6, 1985, Ser. No. 902,445

Claims priority, application Japan, Nov. 8, 1984, 59-235711; Nov. 8, 1984, 59-235708; Nov. 8, 1984, 59-235716; Nov. 20, 1984, 59-245099; Jan. 21, 1985, 60-7351; Jan. 21, 1985, 60-7352

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—518 **20 Claims**



1. An oxide semiconductor for a thermistor made of a sintered mixture of metal oxides and useful as a temperature sensor in a middle temperature range of about 200° C. to at least 500° C., comprising 60.0–98.5 atomic % of manganese (Mn), 0.1–5.0 atomic % of nickel (Ni), 0.3–5.0 atomic % of chromium (Cr), 0.2–5.0 atomic % of yttrium (Y) and 0.5–28.0 atomic % of zirconium (Zr), to the sum total of 100 atomic %.

2. An oxide semiconductor for a thermistor in accordance with claim 1 wherein said oxide semiconductor for a thermistor is constituted by utilizing stabilized zirconia (ZrO_2) containing yttria (Y_2O_3) therein as solid solution.

4,891,159

LOW-FOAM ALKALI-STABLE AMPHOTERIC SURFACE ACTIVE AGENTS

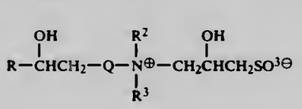
Richard J. Nadolsky, Plainsboro, N.J., assignor to Miranol Inc., Dayton, N.J.

Filed Aug. 27, 1986, Ser. No. 901,268

Int. Cl.⁴ C11D *1/92, 1/94*

U.S. Cl. 252—545 **23 Claims**

1. An aqueous formulation comprising from 10 to 60 percent by weight of an alkali and a surface active effective amount of surface active agent of the formula

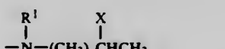


wherein

R is selected from the group consisting of alkyl, aryl, alkylaryl groups of 4–18 carbons and alkoxymethyl wherein the alkoxy group is of 4–8 carbon atoms,

R^2 and R^3 are individually selected from the group consisting of methyl; alkyl of 2 to 6 carbon atoms wherein said alkyl group is substituted by an electron-donating group on the beta carbon atoms thereof; polyoxyethylene and polyoxypropylene or R^2 and R^3 may jointly form a $—CH_2CH_2OCH_2CH_2—$ or $CH_2CH_2SCH_2CH_2—$ group so as to form, together with the nitrogen atom to which they are bound, a morpholine or thiomorpholine ring

Q is a covalent bond or



wherein R^1 is independently selected from the same groups as R^2 and R^3 or is



wherein M is hydrogen or an alkali metal cation, n is 1, and

X is hydrogen or an electron-donating group.

4,891,160

DETERGENT COMPOSITIONS CONTAINING ETHOXYLATED AMINES HAVING CLAY SOIL REMOVAL/ANTI-REDEPOSITION PROPERTIES

James M. Vander Meer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 125,723, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 709,960, Mar. 8, 1985, abandoned, which is a continuation of Ser. No. 452,646, Dec. 22, 1982, Pat. No. 4,597,898. This application Nov. 17, 1988, Ser. No. 273,128

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.⁴ C11D *1/44, 3/32*

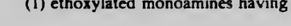
U.S. Cl. 252—545 **25 Claims**

1. A laundry detergent composition, which comprises:

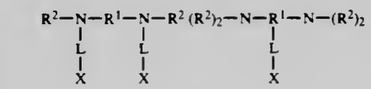
(a) from about 1 to about 75% by weight of a detergent surfactant selected from the group consisting of nonionic, anionic, ampholytic, zwitterionic or cationic detergent surfactants and mixtures thereof;

(b) from about 0.05 to about 95% by weight of a water-soluble ethoxylated amine having clay soil removal/anti-redeposition properties selected from the group consisting of

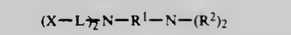
(1) ethoxylated monoamines having the formula:



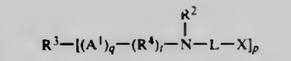
(2) ethoxylated diamines having the formula:



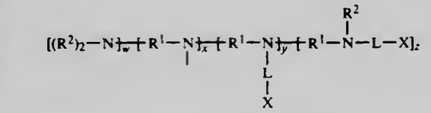
or



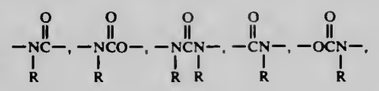
(3) ethoxylated polyamines having the formula:



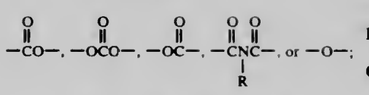
(4) ethoxylated amine polymers having the general formula:



and (5) mixtures thereof; wherein A^1 is



-continued



R is H or C_1–C_4 alkyl or hydroxyalkyl; R^1 is C_2–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—N bonds are formed; each R^2 is C_1–C_4 alkyl or hydroxyalkyl, the moiety —L—X, or two R^2 together form the moiety $—(CH_2)_r—A^2—(CH_2)s—$, wherein A^2 is —O— or $—CH_2—$, r is 1 or 2, s is 1 or 2, and r+s is 3 or 4; X is a nonionic group selected from the group consisting of H, C_1–C_4 alkyl or hydroxyalkyl ester or ether groups and mixtures thereof , an anionic group selected from the group consisting of SO_3^- and PO_3^{-2}, or mixtures thereof; R^3 is a substituted C_3–C_{12} alkyl, hydroxyalkyl, alkenyl, aryl, or alkaryl group having p substitution sites; R^4 is C_1–C_{12} alkylene, hydroxyalkylene, alkenylene, arylene or alkarylene, or a C_2–C_3 oxyalkylene moiety having from 2 to about 20 oxyalkylene units provided that no O—O or O—N bonds are formed; L is a hydrophilic chain which contains the polyoxyalkylene moiety $—[(R^5O)_m(CH_2CH_2O)_n]—$, wherein R^5 is C_3–C_4 alkylene or hydroxyalkylene and m and n are numbers such that the moiety $—(CH_2CH_2O)_n—$ comprises at least about 50% by weight of said polyoxyalkylene moiety; for said monoamines, m is from 0 to about 4, and n is at least about 12 for said diamines, m is from 0 to about 3, and n is at least about 6 when R^1 is C_2–C_3 alkylene, hydroxyalkylene, or alkenylene, and at least about 3 when R^1 is other than C_2–C_3 alkylene, hydroxyalkylene or alkenylens; for said polyamines and amine polymers, m is from 0 to about 10 and n is at least about 3; p is from 3 to 8; q is 1 or 0; t is 1 or 0, provided that t is 1 when q is 1; w is 1 or 0; x+y+z is at least 2; and y+z is at least 2; provided that when w and x are 0, said amine polymers are cyclic; and

(c) an optical brightener.

4,891,161

COLD ROLLING MILL LUBRICANT

Keiichi Tanikawa, Yokohama; Yuji Fujioka; Yuzo Higaki, both of Tokyo, and Hiroyuki Goto, Yokohama, all of Japan, assignors to Nisshin Oil Mills, Ltd. and Nippon Steel Corp., both of, Japan

Filed Feb. 24, 1986, Ser. No. 832,179

Claims priority, application Japan, Feb. 27, 1985, 60-36645; Feb. 27, 1985, 60-36646; Apr. 9, 1985, 60-74787; Apr. 9, 1985, 60-74788

Int. Cl.⁴ C10M *105/18, 105/34*

U.S. Cl. 252—56 S **11 Claims**

1. A method of manufacturing cold rolling milled steel sheets which comprises cold rolling milling the steel sheets while lubricating the sheets with a lubricant and annealing the sheets on which the lubricant is attached whereby the annealing is done in the presence of the lubricant; said lubricant being an ester oil represented by the formula:

$$R^1COO—(R^2—O)_n—R^3$$

wherein R^1 is an alkyl, alkenyl, hydroxyalkyl, or hydroxyalkenyl group having 7 or more carbon atoms; R^2 is an alkylene group; R^3 is an alkyl group having not more than 8 carbon atoms or phenyl group; and n is an integer of 1 to 5 whereby annealing the sheets in the presence of the above defined lubricant results in mill clean performance.

4,891,162

MACHINING FLUID FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Danielle Schnellmann, St-Julien en Genevois, France, assignor to Charmilles Technologies SA, Geneva, Switzerland

Continuation of Ser. No. 631,446, Jul. 16, 1984, abandoned. This application Mar. 21, 1988, Ser. No. 170,033

Claims priority, application Switzerland, Jul. 29, 1983, 4165/83

Int. Cl.⁴ H01B *3/02*; B23K *9/16*

U.S. Cl. 252—570 **20 Claims**

1. An electrical discharge machining method including the steps of disposing an EDM machining fluid between an EDM electrode and an EDM workpiece, and machining said workpiece by electrical discharge, wherein said EDM machining fluid is a dielectric liquid which comprises 0.2% to 10% by volume of a salt of triethanolamine and a fatty acid in deionized water.

8. A dielectric machining fluid for electrical discharge machining comprising a mixture of deionized water and at least one additive, said additive being a salt of triethanolamine and a fatty acid at a concentration of 0.2% to 10% by volume.

4,891,163

METHOD OF PROCESSING NUCLEAR FUEL SCRAPS

Cyuzaburo Tanaka, Kitaibaraki; Teruyoshi Yazawa, Katsuta; Yoshiki Miyajima, Naka; Masaharu Kashiwa, Hitachi, and Hiroshi Sagai, Saginami, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Oct. 1, 1986, Ser. No. 914,445

Claims priority, application Japan, Aug. 29, 1986, 61-204572

Int. Cl.⁴ G21C *19/46*

U.S. Cl. 252—627 **8 Claims**

1. A method of processing nuclear fuel scraps which contain gadolinium oxide, said method comprising the following steps: (1) dissolving said nuclear fuel scraps containing gadolinium oxide in a mineral acid and extracting uranium from the resulting solution with an organic solvent to transfer it into an organic phase; said organic solvent consisting of tributyl phosphate (TBP) which is used in a molar ratio of TBP/U of 2 to 3; (2) washing said organic phase with water or a dilute mineral acid at an aqueous-phase/organicphase volume ratio less than 1/10; (3) repeating step (2) at least once, and (4) recovering the uranium from said organic phase by counter-extraction with water or a dilute mineral acid.

8. A process for recovering gadolinium from an acid solution containing gadolinium and small amounts of radioactive elements, which process comprises adding an alkali to said acidic solution containing gadolinium and small amounts of radioactive elements until the pH falls to between 5 and 7; removing the precipitate which separates out; lowering the pH of the solution from which said precipitate has been removed to 2 or less by addition of an oxalic acid source; and recovering the precipitate of gadolinium oxalate thus formed.

4,891,164

METHOD FOR SEPARATING AND IMMOBILIZING RADIOACTIVE MATERIALS

Thomas R. Gaffney, Allentown, Pa.; JoAnn Henry, Bedford Heights, and Michael J. Desmond, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 900,961, Aug. 28, 1986, abandoned. This application Jan. 6, 1989, Ser. No. 294,951

Int. Cl.⁴ G21F *9/16*

U.S. Cl. 252—629 **65 Claims**

1. A method for separating and immobilizing a radioactive material comprising:

contacting an acidic aqueous medium containing said radioactive material with an acid stable reactive composition comprising at least one alkali metal, at least one Group IIIB metal and at least one phosphorus oxide;

maintaining said reactive composition in contact with said aqueous medium for an effective period of time to react a desired amount of said radioactive material with said acid stable reactive composition to form an amorphous or essentially amorphous radioactive-material-containing compositions; and

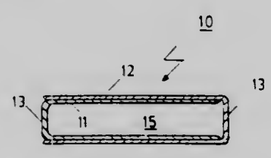
separating said amorphous or essentially amorphous radioactive-material-containing composition from said aqueous medium.

4,891,165

DEVICE AND METHOD FOR ENCAPSULATING RADIOACTIVE MATERIALS

Krishnan Sathanthiran, Lorton, Va., assignor to Best Industries, Inc., Springfield, Va.

Filed Jul. 28, 1988, Ser. No. 225,384
Int. Cl.[4] G21F *9/12, 9/24;* A61B *17/06;* B65D *85/84*
U.S. Cl. 252—633 **22 Claims**



1. A small, metallic capsule for encapsulating radioactive materials for medical and industrial diagnostic, therapeutic and functional applications, comprising:

at least first and second metallic sleeves, each of said sleeves comprising a bottom portion having a circumferential wall extending therefrom, and having an open and opposite said bottom portion;

wherein said first sleeve has an outer surface which is complementary to and substantially the same size as the inner surface of said second sleeve, said second sleeve fitting snugly over the open end of said first sleeve, thereby forming a substantially sealed, closed capsule, having an inner cavity, with substantially uniform total wall thickness permitting substantially uniform radiation therethrough.

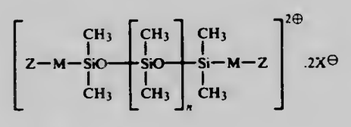
4,891,166

DIQUATERNARY POLYSILOXANES, THEIR SYNTHESIS AND USE IN COSMETIC PREPARATIONS

Dietmar Schaefer, and Manfred Krakenberg, both of, Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,409, May 12, 1988, abandoned. This application May 3, 1989, Ser. No. 348,089
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719086
Int. Cl.[4] C07F *7/10*
U.S. Cl. 260—404.5 **11 Claims**

1. A compound of the general formula



wherein Z is

R^1, R^2, R^3 are alkyl with 1 to 22 carbon atoms or alkenyl with 2 to 22 carbon atoms, at least one of the R^1, R^2 or R^3 groups having at least 10 carbon atoms,

R^4, R^5, R^7 are alkyl with 1 to 22 carbon atoms or alkenyl with 2 to 22 carbon atoms,

R^6 is —O— or NR^8, R^8 being alkyl or hydroxyalkyl with 1 to 4 carbon atoms or hydrogen,

x is 2 to 4,

M is a bivalent hydrocarbon with at least 4 carbon atoms and having a hydroxyl group,

n is a number from 1 to 200, and

$X^{\ominus}$ is an inorganic or organic anion.

4,891,167

BLOCK POLYMERS CONTAINING A POLY(ARYL ETHER KETONE) AND METHODS FOR THEIR PRODUCTION

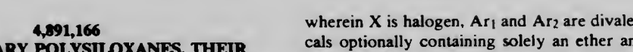
Robert A. Cleodinning, New Providence; James E. Harris, Piscataway; Donald R. Kelsey, Somerville; Markus Matzner, Edison; Lloyd M. Robeson, Whitehouse Station; Paul A. Winslow, Warren, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 729,580, May 2, 1985, Pat. No. 4,774,296. This application Mar. 11, 1988, Ser. No. 167,034
Int. Cl.[4] C07C *63/33*
U.S. Cl. 560—52 **11 Claims**

1. A dihalo terminated precursor of the following formula:

wherein X is halogen, Ar_1 and Ar_2 are divalent aromatic radials optionally containing solely an ether and/or a carbonyl function, Ar_3 is Ar_4CO, Ar_4 is 1,4 or 1,2 phenylene, and n is such that the molecular weight is below about 10,000.

3. A diacid halide terminated precursor of the following formula:



wherein X is halogen, Ar_1 and Ar_2 are divalent aromatic radicals optionally containing solely an ether and/or a carbonyl function, Ar_3 is Ar_4CO, Ar_4 is 1,4 or 1,2 phenylene and n is such that the molecular weight is below about 10,000.

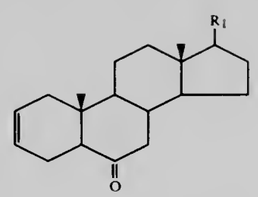
4,891,168

PROCESS FOR PRODUCING STEROID DERIVATIVES

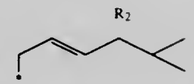
Sei-ichi Hayashi; Tadashi Hohjoh, both of Ageo; Tokuo Furuse, Isehara; Hiroki Kuriyama, Naka; Tsuyoshi Watanabe, Isehara, and Suguru Takatsuto, Joetsu, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha and Tama Biochemical Co., Ltd., both of Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,433
Claims priority, application Japan, Sep. 25, 1986, 61-224843; Oct. 21, 1986, 61-248408; Oct. 21, 1986, 61-248409
Int. Cl.[4] C07J *9/00*
U.S. Cl. 260—397.2 **7 Claims**

1. A process for producing a steroid compound represented by the general formula:

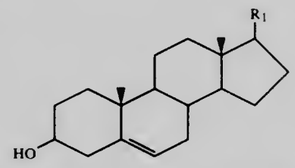

(5)

wherein R_1 is

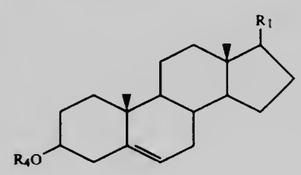


in which R_2 is a methyl or ethyl, and • indicates the binding site of R_1 to a steroid nucleus,

which comprises reacting a compound represented by the formula:


(1)

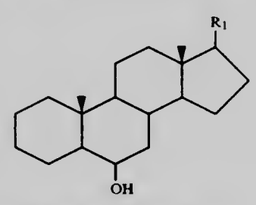
wherein R_1 is as defined above, with a compound of the formula: R_3SO_2X, wherein R_3 is a lower alkyl or a phenyl which may substituted by methyl or chlorine, and X is a chlorine or fluorine atom, in the presence of an organic base in an aromatic or aliphatic hydrocarbon to produce a compound represented by the formula:


(2)

wherein

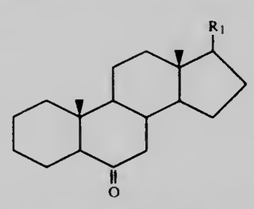
R_4 is R_3SO_2-, and

R_1 and R_3 are as defined above, then reacting the above compound with water in the presence of an inorganic or organic base in a solvent mixture of an aromatic or aliphatic hydrocarbon and an inert and watermiscible organic solvent to produce a compound represented by the formula:


(3)

wherein R_1 is as defined above,

and subsequently oxidizing the above compound, (1) in the presence of a ketone compound in an aromatic or aliphatic hydrocarbon, or (2) in the presence of a quaternary ammonium halide in an appropriate solvent by means of an N-halocarboxyamide to produce a steroid compound represented by the formula:


(4)

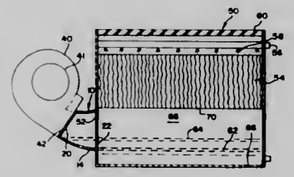
wherein R_1 is as defined above, and finally heating the above compound in the presence of an amine salt of an organic or inorganic sulfonic acid or a compound having both sulfo group and amino group in a molecule, in an organic solvent.

4,891,169

TRANSITION DUCT FOR CENTRIFUGAL FAN

Vladimir Kaplan, Silver Spring, and Richard H. Harrison, Jr., Columbia, both of Md., assignors to AMSTED Industries Inc., Chicago, Ill.

Filed Nov. 16, 1988, Ser. No. 271,693
Int. Cl.[4] B01D *47/00*
U.S. Cl. 261—30 **11 Claims**



1. A centrifugal fan coupled to a transition duct,

said centrifugal fan comprising a generally cylindrical body having a generally rectangular fan outlet having sides, a bottom and a top cutoff,

said transition duct comprising

a bottom plate section,

two side plate sections extending upwardly from and joined to lateral edges of said bottom plate sections,

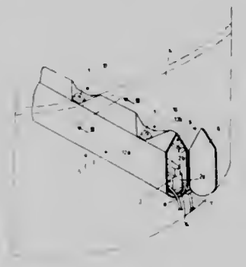
and a top plate section having a concave shaping along the longitudinal direction of the transition duct and having lateral edges joined to top edges of said side plate sections,

said bottom, side and top plate sections forming a generally rectangular inlet opening at one longitudinal side of said transition duct and a generally rectangular outlet opening at the other longitudinal side of said transition duct,

wherein said bottom plate section is of a greater longitudinal length than said top plate section such that a first plane in contact with the edges of said inlet opening intersects a second plane in contact with the edges of said outlet opening at an angle of 1° to 60°,

and said fan outlet has an open area confined between the sides and the bottom of the fan and the top cutoff of the fan outlet coupled to the top plate of the inlet opening of said transition duct.

4,891,170
NOZZLE ASSEMBLY
Kari Kokkonen, Tampere; Martti Lethimäki, Sarkola; Seppo Tuominiemi, Pirkkala, and Hannu Alppi, Tampere, all of Finland, assignors to Oy Tampella Ab, Tampere, Finland
Filed Oct. 14, 1988, Ser. No. 257,906
Claims priority, application Finland, Oct. 15, 1987, 874544
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—116 **23 Claims**



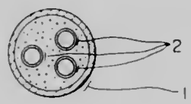
1. A nozzle assembly, comprising:
at least one nozzle for spraying a liquid moistening medium into a flow of flue gas;
means for passing the moistening medium to said nozzle; said nozzle and said means for passing the moistening medium being substantially disposed in a flue-gas flow duct, and enclosed in a housing;
an aperture provided in said housing for directing a jet of moistening medium issuing from said nozzle into a flow of flue gas;
wherein said nozzle and said means for passing the moistening medium are movably disposed within said housing and substantially removable from within said housing to the outside of said flue-gas flow duct; and
a closing means for closing said aperture when said nozzle and said means for passing medium are removed from within said housing.

4,891,171
HUMIDIFIER CONTAINER
Gerhard H. Weiler, South Barrington, and Henry Komendowski, Des Plaines, both of Ill., assignors to Automatic Liquid Packaging, Inc., Woodstock, Ill.
Division of Ser. No. 909,191, Sep. 19, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 221,935
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—124 **9 Claims**



1. A sealed, unitary liquid container of a thermoplastic material and suitable for use with an inhalation therapy apparatus, comprising:
a body portion defined by an upstanding, walled chamber having a bottom and a sidewall, constituting a reservoir for an aqueous liquid and containing a predetermined amount thereof;
a gas inlet duct means unitary with the body portion, extending alongside the walled chamber, having an upper end portion situated above usable liquid level in said container and defining a sealed gas inlet, and having a lower end portion situated below said usable liquid level in said container;
a gas diffuser means defined by the container sidewall and communicating with the walled chamber near but above the bottom thereof as well as with said gas inlet duct means; and
a sealed humidified gas outlet means unitary with the container and communicating with the walled chamber above usable liquid level in said container;
wherein the lower end portion of the gas inlet duct means includes a gas manifold means unitary with the container defining a plurality of spaced-apart channels, and said gas diffuser means is a plenum defined by the container sidewall.

4,891,172
PROCESS FOR PRODUCING DOUBLE-CAPSULES
Toshihiko Matsushita, Funabashi, and Sadao Morishita, Ibaraki, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan
Continuation of Ser. No. 175,740, Aug. 6, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 464,603
Claims priority, application Japan, Oct. 15, 1979, 54-132543
Int. Cl.[4] B01J *13/02*
U.S. Cl. 264—4.33 **6 Claims**



1. An improved process for producing double-capsules which comprises the following steps:
(a) preparing a dispersion of primary microcapsules containing as a core material a hydrophilic substance or a hydrophobic substance;
(b) mixing said dispersion of primary microcapsules with a second hydrophobic substance which may be the same as or different from the first names hydrophobic substance to disperse said primary microcapsules in the second hydrophobic substance which displaces a medium of the dispersion of primary microcapsules, the viscosity of the second hydrophobic substance being from 40 to 150,000 cps at 25° C.;
(c) enclosing the primary microcapsules dispersed in the second hydrophobic substance with a wall membrane formed by in-situ polymerization using wall membrane-forming monomers all of which are included in a medium dispersing or emulsifying said second hydrophobic substance to form double capsules.

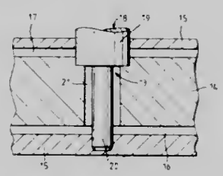
4,891,173
PROCESS FOR PRODUCING A CROSSLINKED AND ORIENTED POLYETHYLENE FILM
Keichiro Saitoh, Iruma; Yasushi Itaba, Higashi-Kurume; Minoru Izawa, Iruma, and Tadao Yoshino, Minami-Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 8, 1988, Ser. No. 241,573
Claims priority, application Japan, Sep. 9, 1987, 62-223854
Int. Cl.[4] B29C *35/08*
U.S. Cl. 264—22 **11 Claims**

1. A process for producing a crosslinked and oriented polyethylene film such that the degree of crosslinking inwardly decreases across the thickness of the film to form outer layer portions of the film each having gel fractions of between 20 to 70% and a middle layer portion of the film having a gel fraction between 0 to 5%, comprising using a polyethylene having a density of at least 0.935 g/cm^3, a melt of 0.5 to 20 g/10 min and a high-load melt index to melt index ratio of 40 to 200.

4,891,174
PROCESS FOR PREPARATION OF MICRO-CELLULAR POROUS CERAMIC BODY
Yachiho Seki, Kawanishi; Saburo Kose, and Teruo Kodama, both of Ikeda, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan
Filed Oct. 28, 1988, Ser. No. 263,924
Claims priority, application Japan, Dec. 25, 1987, 62-331193
Int. Cl.[4] C04B *38/06*
U.S. Cl. 264—44 **11 Claims**

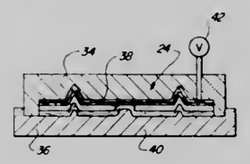
1. A process for the preparation of a microcellular porous ceramic body produced with ultrafine ceramic powder, which comprises adding 65 to 330 parts by weight of an α-olefin oligomer, based on 100 parts of the ultrafine ceramic powder, as a molding assistant to the ultrafine ceramic powder, kneading the mixture, compression-molding the kneaded mixture to give a molded body, and firing the molded body.

4,891,175
GAMES RACKET
Robert C. Haines, Huddersfield, United Kingdom, assignor to Dunlop Limited, United Kingdom
Filed Mar. 8, 1988, Ser. No. 165,292
Claims priority, application United Kingdom, Mar. 17, 1987, 8706234
Int. Cl.[4] A63B *51/10*
U.S. Cl. 264—154 **6 Claims**



1. A method of making a frame for a games racket, the frame comprising a hollow head and a shaft, said head being defined by inner and outer circumference walls and having stringing holes through said walls, which method comprises the following steps:
forming a fusible core and forming stepped holes through said core corresponding to the locations of the stringing holes in the inner and outer circumference walls of the head, so that the hole in one face of the core is larger than the hole in the opposite face of the core,
placing the core in a mould having inner and outer walls with holes of sizes corresponding to those of the core,
forming mould pins that are stepped to have two different diameters on the same pin and inserting the mould pins into the holes through one of the walls of the mould and through the core so that the bore of the larger hole in the mould is completely filled by the larger diameter portion of a pin and that larger diameter contacts the fusible core to positively locate the core within the mould; the bore of the smaller hole in the core being of greater diameter than that of its corresponding portion of a pin, thus forming a stringing hole in one wall of the head that is larger than its corresponding hole in the opposite wall of the head so that it will form, when filled with molten material, a tubular projection integral with said opposite wall and extending toward said larger hole from the smaller hole and only partially across the width of the racket head between said inner and outer circumference walls,
injecting thermoplastics material reinforced with short filament reinforcing material into said mould and around the core and allowing the thermoplastics material to set,
raising the temperature sufficiently to melt the core without melting or distorting the moulding, and removing the molten core material, the core having a melting point below the injection temperature.

4,891,176
RESIN TRANSFER MOLDING PROCESS
James P. Drysdale, Clarkston, and L. David Landrith, Lake Orion, both of Mich., assignors to Auto-Fab, Inc., Auburn Hills, Mich.
Filed May 31, 1988, Ser. No. 200,241
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—250 **9 Claims**

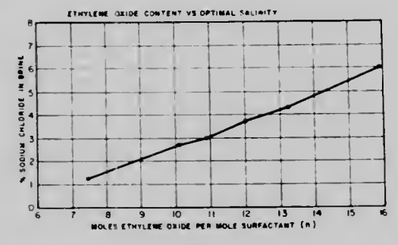


1. A method for manufacturing a panel comprising the steps of:
preforming a first mat of glass fibers into a shape approximating one side of the panel,
preforming a second mat of glass fibers into a shape approximating a second side of the panel,
sandwiching a core in between said preformed mats to thereby form a premolded assembly,
placing said premolded assembly in a mold,
injecting a settable resin into said mold, and
placing a flexible sheet between the core and one of said mats prior to forming the premolded assembly wherein said sheet minimizes shrinkage lines on said panel.

4,891,177
WATER-FLOOD SURFACTANT
Charles A. Stratton, Dewey, Okla., assignor to Mary Rose Stratton, Dewey, Okla.
Filed May 26, 1987, Ser. No. 54,188
Int. Cl.[4] C07C *143/24, 43/11, 43/18, 43/20*
U.S. Cl. 252—8.515 **19 Claims**

1. A method of making a non-ionic surfactant having a hydrophobic part and a hydrophilic part which comprises the steps of mixing, in a reactor, sodium hydroxide with a sulfonated product of a natural petroleum crude, the sodium hydroxide being in excess of the amount required to convert the sulfonate to phenol; heating the mixture while stirring to about 140° to 319° C. for a period of at least one hour; passing a current of inert gas through the top of the reactor during the heating step; cooling the mixture to a temperature of approxi-

mately 200° C. while continuing to pass an inert gas through the top of the reactor; and passing ethylene oxide gas through



the mixture in the reactor while maintaining the temperature in the reactor between 120° and 220° C. and allowing the use of pressure to increase the rate of reaction.

4,891,178

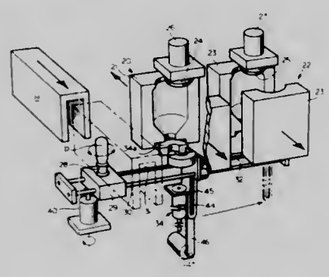
METHOD OF MAKING PARTIALLY CRYSTALLINE BIAXIALLY ORIENTED HOLLOW PLASTIC FREE STANDING CONTAINERS

Prakash R. Ajmera, Toledo, and Saleh A. Jabarin, Holland, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 20,830, Mar. 2, 1987, abandoned. This application May 5, 1988, Ser. No. 201,267

Int. Cl.[4] B29C *49/18, 49/64*

U.S. Cl. 264—521 **6 Claims**



1. A method for making a partially crystalline, biaxially oriented heatset hollow polyethylene terephthalate free standing container from a hollow parison having an open end and a closed end comprising

engaging the open end of a polyethylene terephthalate parison which is at a temperature within its molecular orientation temperature range,

axially positioning a heated mold base in axial alignment with said engaged hot parison, said heated mold base having a configuration to form a free standing base on a container,

enclosing a hot mold about the heated mold base, said mold being at heatsetting temperature, said heated mold base being at a heatsetting temperature substantially less than the temperature of said hot mold,

expanding said plastic parison within said hot mold by internal pressurization through the open end to induce biaxial orientation of the plastic parison and force the parison into intimate contact and conformance with the hot mold and to maintain contact by such internal pressurization between the mold and the biaxially oriented container for a time sufficient to induce partial crystallization in the sidewalls of biaxially oriented container and a lesser heat setting and crystallization in the free standing base of the container sufficient such that the bottom of the free standing base will not deform or revert to a hemispherical shape under the internal pressure when the mold is opened and the mold base is moved axially out of engagement with the heated hollow container,

reducing the internal pressure in the blown container,

opening the hot mold while maintaining engagement with the open end of the hot blown hollow container,

moving the heated mold base axially out of engagement with the hot blown hollow container,

maintaining a lower internal pressurization within the hot container sufficient to prevent the container from expanding so that it will be pinched when a cold mold is closed about it and sufficient to prevent a significant shrinkage, and

transferring the biaxially oriented container while maintaining engagement with the open end of the hot container adjacent a cold mold which is at a temperature substantially less than the temperature of the hot mold by relatively moving the container and while maintaining the reduced internal pressurization;

the temperature of the heated mold base ranging between 100° C. and 160° C. such that the temperature is sufficiently high that the base of the container will not deform and will not revert to a hemispherical configuration due to the pressure in the blown container during transfer to the cold mold and the temperature of the mold base is sufficiently low that the base of the blown container will not stick to the mold base and will not revert to a hemispherical configuration during transfer of the blown container to the cold mold,

bringing a cold mold base into engagement with the base of the container, said cold mold base being at a temperature not greater than 100° C.

enclosing the container in a cold mold by closing the cold mold about said cold mold base, said cold mold being at a temperature not greater than 100° C.,

holding the container against the confines of the cold mold by maintaining pressure within the container for a time sufficient to cool the container and to prevent shrinkage upon removal from the cold mold,

exhausting the pressure in the container,

opening the cold mold,

removing the container,

said heat setting temperature of said sidewall ranging between about 120°-250° C.,

said heat set time ranging between about 1-30 seconds,

the time for transferring ranging between about 0.8-15 seconds.

4,891,179

METHOD OF CONSOLIDATING COMPOSITE ARTICLES

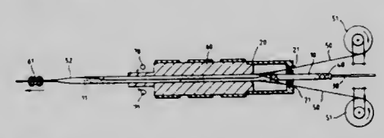
Donald G. Peacock, Paradise, and Stanley W. Kirkham, Swindon, both of England, assignors to Textilver S.A., Crepy-en-Valois, France

Filed Nov. 6, 1987, Ser. No. 118,381

Claims priority, application United Kingdom, Dec. 22, 1986, 8630552

Int. Cl.[4] B29C *43/22, 43/30*

U.S. Cl. 264—565 **6 Claims**



1. A method of consolidating a tubular composite article of polymeric matrix material and fibrous reinforcing material, comprising completely enclosing a length of the tubular composite article in a tubular protective carrier member and maintaining the tubular composite article substantially free from longitudinal forces by advancing the protective carrier member to carry the length of the article thus enclosed through a consolidation zone wherein the article is progressively subjected to consolidating temperature and pressure, wherein the protective carrier member comprises at least one sheet which is progressively wrapped around the tubular composite article as it is being fed by the protective carrier member into the consolidation zone.

4,891,180

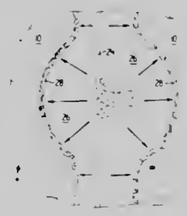
METHOD AND APPARATUS FOR GENERATING AND UTILIZING A COMPOUND PLASMA CONFIGURATION

Paul M. Koloc, Box 222, College Park, Md. 20740

Continuation of Ser. No. 261,546, May 7, 1981, abandoned, which is a continuation of Ser. No. 902,839, May 4, 1978, abandoned, which is a continuation of Ser. No. 706,454, Jul. 19, 1976, abandoned, which is a division of Ser. No. 409,060, Oct. 24, 1973, Pat. No. 4,023,065. This application Jul. 23, 1984, Ser. No. 632,690

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—144 **8 Claims**



1. An apparatus for producing a compound plasma configuration comprising:

vessel means for containing said compound plasma configuration, said vessel adapted to contain a fluid medium including fusionable nuclei, said vessel including means for permitting ionizing energy to pass into said fluid medium,

a pair of spaced electrodes positioned within said vessel,

a high voltage power source coupled to said electrodes for producing a discharge current through said fluid medium,

control means coupled to said high voltage power source for controlling the initiation of said discharge current

means cooperating with said vessel for causing said discharge current to follow a controlled path through said fluid medium,

compression chamber means coupled to and communicating with said vessel for withstanding internal pressures,

means cooperating with said compression chamber means for non-magnetically compressing any fluid in said compression chamber means,

means cooperating with said vessel and said compression chamber means for moving a compound plasma generated in said vessel into said compression chamber means; and,

energy exchange means coupled to said compression chamber means for removing energy therefrom.

4,891,181

APPARATUS FOR CONTROLLED COMBUSTION OF IGNITABLE HYDROGEN-AIR MIXTURES IN THE CONTAINMENT OF WATER-COOLED NUCLEAR REACTOR PLANTS

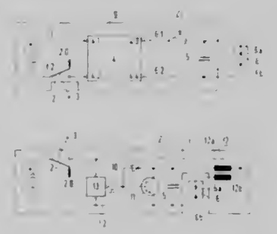
Reinhard Heck, Hanau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,274

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715469

Int. Cl.[4] G21C *9/00*

U.S. Cl. 376—300 **4 Claims**



4. Apparatus for the controlled combustion of ignition hydrogen-air mixtures in the containment of water-cooled nuclear reactor plants, comprising at least one ignition source in the form of a high-voltage ignition unit including a self-sufficient energy reservoir in the form of a dry battery having a current circuit and having a charge status being monitorable at regular time intervals, said ignition unit also including a spring-loaded switch connected in said current circuit of said dry battery, a high-voltage module connected to said switch (2), and a charge capacitor connected to said module; a spark ignitor connected to said charge capacitor; and a tripping element responding as a function of temperature for tripping an ignition process, said tripping element triggering a discharge of said energy reservoir in said ignition source, during a predetermined period of time and said tripping element being associated with said switch for closing said switch in a response situation, said tripping element being part of a fast-response sprinkler element having a surface bursting upon attainment of a threshold temperature value for releasing and discharging said energy reservoir for closing said spring-loaded switch.

4,891,182

PROCESS FOR MAKING POROUS MASSES OF IRON, NICKEL, TITANIUM, AND OTHER METALS

Michiru Sakamoto; Akira Kitahara; Hidetoshi Ueno, and Sumio Nagata, all of Tosu, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,976

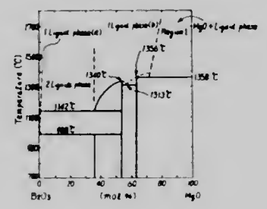
Claims priority, application Japan, Mar. 31, 1988, 63-81045

Int. Cl.[4] B22F *3/10*

U.S. Cl. 419—2 **10 Claims**

1. A process for making a porous mass of a metal which comprises steps of putting a sinter of magnesia or calcia particles formed into a desired shape in a heat-insulating case, heating the sinter to a given temperature together with the case, putting the heated sinter in a metal mold, pressing in a

melt of iron, nickel, titanium or an alloy of each of said metals or a composite alloy thereof into the sinter to make a compos-



ite mass, and eluting only the sinter from the cooled and solidified composite mass by use of a solvent.

4,891,183

METHOD OF PREPARING ALLOY COMPOSITIONS

John M. Corwin, Royal Oak, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 3, 1986, Ser. No. 938,181
Int. Cl.[4] C22C *1/02, 19/00*
U.S. Cl. 420—435 **66 Claims**

1. A method of improving the oxidation resistance of an existing crystalline nickel-based alloy composition, comprising the steps of:

(a) providing an existing crystalline nickel-based alloy comprising:

(i) nickel;

(ii) chromium; and

(iii) at least one additional alloy element selected from the group consisting of nickel, chromium, molybdenum, manganese, silicon, carbon, vanadium, cobalt, copper, nitrogen, titanium, zirconium, aluminum, and mixtures thereof, wherein any addition of nickel from said group includes a further addition of a second element selected from said group; and

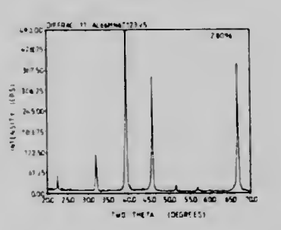
(b) adding to said nickel-base alloy a dopant selected from the group consisting of lithium, sodium, potassium, and mixtures thereof, said dopant being added in an amount sufficient to show a significant and reproducible improvement in one or more oxidation resistant properties of the final composition of said nickel-based alloy.

4,891,184

LOW DENSITY HEAT RESISTANT INTERMETALLIC ALLOYS OF THE AL_3TI TYPE

Donald E. Mikkola, 206 Clark St., Houghton, Mich. 49931

Filed Dec. 23, 1988, Ser. No. 289,543
Int. Cl.[4] C22C *21/00, 30/00*
U.S. Cl. 420—553 **5 Claims**



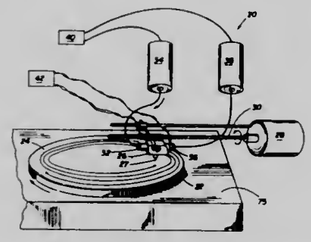
1. A low density heat resistant aluminum-titanium alloy composition comprising from about 15 to about 35 atomic percent titanium, from about 3 to about 15 atomic percent manganese, or chromium, and the balance substantially aluminum.

4,891,185

HIGH RESOLUTION MONITORING DEVICE

Stanley M. Goldin, 10 Russell Rd., Lexington, Mass. 02173

Filed Jan. 22, 1968, Ser. No. 146,818
Int. Cl.[4] B01L *3/00;* **G01N** *1/10, 23/00*
U.S. Cl. 422—69 **18 Claims**



1. A device for monitoring the release of a substance from a substrate, said device comprising

a sample chamber adapted to be connected to a solution source and through which a solution supplied by said solution source can flow, said sample chamber comprising a retainer for holding a substance immobilized by a substrate while said supplied solution flows in contact with said immobilized substance and removes any said substance released from said substrate;

a solution collector positioned to receive the solution flowing from said sample chamber and including a substance absorbant having an exposed face and means for supporting said substance absorbant,

said sample chamber including means for directing a stream of said solution from said sample chamber into contact with a portion only of said exposed face of said substance absorbant; and

means for continuously moving the location of said contact of said stream with respect to said exposed face of said substance absorbant.

4,891,186

REACTOR ANALYSIS SYSTEM

Raymond P. Roberge, Chappaqua; Arthur W. Francis, Jr., Monroe, both of N.Y., and Thomas G. Wolfe, Cos Cob, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 865,005, May 20, 1986, abandoned. This application May 9, 1988, Ser. No. 193,196
Int. Cl.[4] G01N *33/00*
U.S. Cl. 422—83 **23 Claims**

1. An analysis system for monitoring a feed gas stream passing to and a gas present within a process reactor comprising:

(a) conduit means for continually withdrawing samples of a gas present within a reactor;

(b) conduit means for continually withdrawing samples from a feed gas stream passing to the reactor;

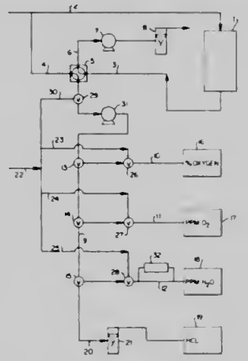
(c) a first valve means continually receiving samples from said conduit means containing samples of the gas present within the reactor and from said conduit means containing samples of the feed gas passing to the reactor, wherein said first valve means in a first position passes the sample of the gas present within the reactor downstream for analysis while discharging the sample of the feed gas from the system, and wherein said first valve means in a second position passes the sample of the feed gas stream downstream for analysis while discharging the sample of the gas present within the reactor;

(d) a main gas supply flow line for passing the gas sample to be analyzed from said first valve means to individual gas analyzer feedlines;

(e) a second gas sample valve means for tapping one or more individual samples of the gas sample to be analyzed from the main flow line, said second valve means being adapted for continuous straight through flow of the gas sample from said main flow line, said second valve means also being adapted to periodically tap the individual sample to be analyzed from said main flow line, with essentially no dead volume being created upon closing of said periodic tap means of said second valve means to discontinue the tapping of the gas sample for analysis;

(f) gas analyzer feed lines for withdrawing the individual gas samples from said second sample valve means for analysis;

(g) gas analyzer means for separately analyzing the individ-



ual gas samples present in said gas analyzer feed lines for a particular gas stream component;

(h) purge gas supply means adapted to pass purge gas to said gas analyzer feed lines for each individual gas sample for analysis; and

(i) control means in said gas analyzer feed lines for selecting either the individual samples of the gas to be analyzed or the purge gas to be passed to said gas analyzer means, whereby said system enables gas samples from the feed gas passing to the reactor and samples taken from the gas present within the reactor to be accurately monitored with rapid response time, the purge gas being available to rapidly and essentially completely purge said gas analyzer feed lines and said gas analyzer means between analyses, thus enabling accurate gas analysis to be carried out rapidly during the course of operation.

4,891,187

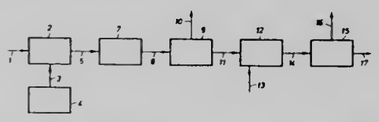
PLURAL ABSORPTION STAGES FOR HYDROGEN PURIFICATION

Hans Jungfer, Munich, and Olaf Brauer, Pullach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 620,786, Jun. 15, 1984, abandoned. This application Oct. 19, 1984, Ser. No. 662,760
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321909
Int. Cl.[4] C01B *1/26, 3/24*
U.S. Cl. 423—248 **12 Claims**

1. In a process for the production of hydrogen from sulfur containing hydrocarbons, wherein hydrocarbons are subjected to a partial oxidation to form a synthesis gas containing H_2, CO, CO_2, H_2S and COS, the resulting gaseous fraction is subjected to a CO shift conversion with steam, and the acid gases are removed by absorption, the improvement which comprises removing sulfur compounds in a first absorption stage with an organic, physical solvent, subjecting the desulfurized gas to a selective catalytic CO oxidation step with oxygen, the catalyst employed in said step being effective for the selective oxidation of CO to CO_2 in the presence of hydrogen, and then subjecting the resultant desulfurized Co-depleted gas to a second absorption stage with an organic, physical solvent to remove the CO_2 wherein the solvent from the second absorption stage, charged with CO_2, is used partly for absorption of the sulfur compounds in the first absorption stage.

12. In a process for the purification of hydrogen from a gas containing 50 to 90% hydrogen, 0.1 to 5% sulfur compound and 0.2 to 2.0% CO, by volume, wherein the gas is subjected



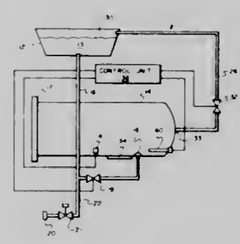
to a CO shift conversion with steam, and the acid gases are removed by absorption, the improvement which comprises removing sulfur compounds in a first absorption stage with an organic, physical solvent, subjecting the desulfurized gas to a selective catalytic CO oxidation step with oxygen the catalyst employed in said step being effective for the selective oxidation of CO to CO_2 in the presence of hydrogen, and then subjecting the resultant desulfurized CO-depleted gas to a second absorption stage with an organic, physical solvent to remove the CO_2, wherein the solvent from the second absorption stage, charged with CO_2, is used partly for absorption of the sulfur compounds in the first absorption stage.

4,891,188

UNPLUMBED STERILIZER

Donald W. Albright, Rochester, and Raymond J. Miller, Penfield, both of N.Y., assignors to MDT Corporation, Rochester, N.Y.

Filed May 21, 1987, Ser. No. 52,057
Int. Cl.[4] G05D *9/00*
U.S. Cl. 422—114 **9 Claims**



1. In an unplumbed sterilizer in which a sterilizing chamber is connected in fluid circuit with a reservoir through piping and a flow control device to effect repetitive cycles during which a load is introduced to the chamber, the chamber is sealed, liquid is introduced through an inlet to the chamber from the reservoir and is heated in the chamber to create steam, thereby to displace air from the chamber, the load is exposed to steam at elevated pressure and temperature, the steam is thereafter exhausted through an outlet from the chamber and the chamber is opened to remove the load, the improvement comprising: a temperature sensor positioned within said chamber; and control means in circuit with

said temperature sensor,

a first said flow control device operative to control the flow of liquid from said reservoir to said inlet, and

a second said flow control device operative to control the passage of steam from said outlet;

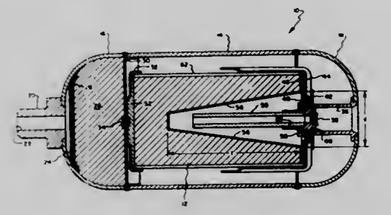
said control means being operable to open both said first and second flow control devices during a first period until a predetermined quantity of liquid flows from said reservoir to said chamber, to thereafter close said first flow control device while holding said second flow control device open during an air exhaust period during which said liquid is converted to steam and thereafter to hold both said first and second flow control devices closed until the end of an exposure period.

4,891,189

HIGH FLOW CHEMICAL OXYGEN GENERATOR ASSEMBLY

Van N. Harwood, Jr., Williamsville, N.Y., assignor to Figgie International, Inc., Willoughby, Ohio

Filed Jul. 6, 1988, Ser. No. 215,712
Int. Cl.[4] A62B *7/08*
U.S. Cl. 422—165 **3 Claims**



1. A high flow chemical oxygen generator assembly comprising:

a containment vessel (14, 16, 18);

a pressed cylindrical block (12) of pyrotechnic materials mounted within the containment vessel and which is capable upon ignition of generating oxygen, said cylindrical block being provided with a deep inwardly extending conical surface at its ignition end;

rapidly combustible material (56) thinly coated over the entire conical surface, said material being capable of igniting the pressed block of materials when burning; and,

firing means (38, 58) carried by the containment vessel and capable, when operated, of initially igniting the rapidly combustible material at the center of the conical surface;

the assembly being so designed and constructed that, after initial ignition of the rapidly combustible material, burning of the rapidly combustible material will spread rapidly from the center of the conical surface over the entire area of the conical surface causing ignition of the conical surface of the cylindrical block which will then burn essentially radially whereby a larger burning area is provided by the conical surface, the heat flux within the burning area being intense to further increase the oxygen flow output of the assembly.

4,891,190

INCRUSTATION RESISTIVE CRYSTALLIZER EMPLOYING MULTIFREQUENCY VIBRATIONS

Don E. Carter, Creve Coeur, and Yung C. Hsu, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 466,445, Feb. 15, 1983, abandoned. This application May 29, 1985, Ser. No. 738,899
Int. Cl.[4] B01D *9/00*
U.S. Cl. 422—251 **13 Claims**

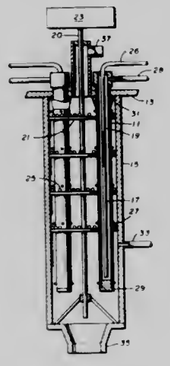
1. A crystallizer apparatus comprising in combination:

(a) a crystallizer housing having conduit means for ingress of solution to be crystallized, separate conduit means for ingress and egress of cooling fluid, means for recovery of mother liquor and product crystals either together or separately;

(b) at least one substantially horizontal plate having apertures, said plate disposed within said crystallizer, said plate substantially conforming to the interior shape of the crystallizer;

(c) at least one support member fixed to said plate such that said plate is maintained in position described in part (b), said member being capable of translational movement along the length of the crystallizer;

(d) a plurality of mobile bodies disposed on the upper surface of said plate;



(e) heat transfer means within said housing disposed substantially parallel to said support member;

(f) excitation means cooperating with said support member and adapted to impart a first waveform to cause translational plate movement for scraping the surface of said heat transfer means; and

(g) excitation means cooperating with said support member and adapted to impart a second waveform to cause said plate to vibrate causing said bodies thereon to agitate and collide with each other, the surface of said beat transfer means, the support member and the inner wall of the crystallizer.

4,891,191

HIGH EFFICIENCY COLUMN CRYSTALLIZER

Don E. Carter, Creve Coeur; Yung C. Hsu, Chesterfield, and Jason J. Tang, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 558,142, Dec. 5, 1983, abandoned. This application May 1, 1985, Ser. No. 728,462
Int. Cl.[4] B01D *9/00*
U.S. Cl. 422—254 **13 Claims**

1. A column crystallization apparatus comprising in combination:

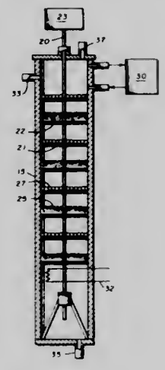
(a) a crystallizer housing having conduit means for ingress of solution to be crystallized, conduit means for recovery of mother liquor and conduit means for recovery of product crystal melt;

(b) a cooling means in fluid communication with the top portion of said housing adapted to generate crystals;

(c) a plurality of platens positioned at predetermined intervals along and essentially perpendicular to the major axis of said housing, said platens substantially conforming to the interior shape of said housing and having apertures of sufficient size to permit passage of crystals and solution therethrough;

(d) at least one support member fixed to said platens such that said platens are maintained in position described in part (c), said member being capable of translational movement along the length of the crystallizer;

(e) a crystal bed support means stationarily positioned at a predetermined distance below said platens and substantially parallel to said platens, said support means adapted to support a crystal bed and having an aperture to permit the platen support member to pass therethrough and having apertures of sufficient size to permit solution to pass therethrough and crystals to pass therethrough by movement of an adjacent platen;



(f) a first excitation means cooperating with said platen support member and adapted to impart a first waveform to cause said semipermeable platens to vibrate thereby aiding the passage of crystals therethrough;

(g) a second excitation means cooperating with said support member and adapted to impart a second waveform to cause slow translational movement of said platens for positive transport of crystals; and

(h) melting means in fluid communication with the bottom portion of said housing adapted to melt purified crystals from the bottom of said crystallizer housing.

4,891,192

PROCESS FOR THE PURIFICATION OF TRACES OF RADIOACTIVE ELEMENTS GENERATED DURING THE STORAGE OF URANIUM RESULTING FROM THE REPROCESSING OF IRRADIATED NUCLEAR FUELS

Alain Sarda, St Saturnin les Avignon, and Jean-Pierre Segand, Orange, both of France, assignors to Uranium Pechiney, Courbevoie, France

Filed Aug. 26, 1988, Ser. No. 236,907
Claims priority, application France, Sep. 1, 1987, 87 12705
Int. Cl.[4] G21F *9/12, 9/02*; C01G *43/00*; B01D *43/00*
U.S. Cl. 423—6 **14 Claims**

1. Process for treating stored ex-reprocessing uranium containing trace amounts of fissionable U-232 which have given rise to radioactive daughter products, comprising converting ex-reprocessing uranium prior to storage or after storage to the hexafluoride form and passing said ex-reprocessing uranium in hexafluoride form in a gaseous or liquid state containing said daughter products through a chemically inert porous metal or sintered ceramic material, thereby removing said daughter products from said ex-reprocessing uranium, by fixing said daughter products in said metal or ceramic material.

4,891,193

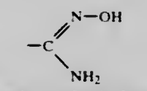
PROCESS FOR THE SEPARATION OF MOLYBDENUM BY A RESIN ROUTE

Didier Bentier, and Yves Le Quesne, both of Paris, France, assignors to Compagnie Francaise De Mokta, Velizy Villacoublay, France

Continuation of Ser. No. 6,189, Jan. 23, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 237,681
Claims priority, application France, Jan. 23, 1986, 86 00993
Int. Cl.[4] C01G *39/00*
U.S. Cl. 423—54 **6 Claims**

1. A process for the selective separation of molybdenum present in a sulfuric solution having a pH under 2 and containing molybdenum and at least one of the elements selected from the group consisting of uranium, iron, arsenic, phosphorus, silicon and vanadium comprising:

(a) contacting said sulfuric solution with a stationary phase comprising a resin having a reticulated, three-dimensional structure and an active group containing an amid-oxime group of the general formula:



immobilized on said resin to selectively separate molybdenum from at least one of said elements; and

(b) eluting said stationary phase with an alkaline solution to recover molybdenum.

4,891,194

METHOD FOR SCRUBBING FLUE GASES FROM A FIRING UNIT

Ryszard Kubisa, and Helmut Voos, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Oct. 9, 1986, Ser. No. 916,838
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536893
Int. Cl.[4] C01B *7/00, 17/00*; B01J *8/00*
U.S. Cl. 423—240 **13 Claims**

1. A method of scrubbing flue gases coming from a firing unit, comprising the steps of adding to said flue gases dry, fine-grained absorbent that comprises at least one alkaline earth metal in the form of carbonate, hydroxide, or oxide, and subsequently separating dust from said flue gases, with initial reaction between said flue gases and absorbent commencing with the addition of said absorbent; said method comprises the steps of:

after said step of adding absorbent, and without separately removing any absorbent from said firing unit and prior to any separation of dust, dividing said flue gases into at least one first stream, and at least one second stream;

conveying said first stream directly to a dust separator;

conveying said second stream through a finishing reaction section of sufficient length to essentially complete reaction between said second stream and said absorbent during a finishing reaction time; and only then

conveying said second stream to a dust separator.

4,891,195

SYNERGISTIC EFFECT OF OIL-SOLUBLE SURFACTANTS AND DIBASIC CARBOXYLIC ACIDS ON SO_2 REMOVAL ENHANCEMENT IN FLUE GAS DESULFURIZATION PROCESS

Mei-Jan L. Lin, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 1, 1988, Ser. No. 176,564
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—243 **8 Claims**

1. A method of improving the SO_2 scrubbing efficiency of

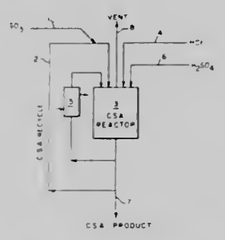
flue gas desulfurization scrubbers which comprises conducting the scrubbing operation in such scrubbers in the presence of a dibasic carboxylic acid and an oil-soluble surfactant combined in a weight ratio of at least 1:3 to 50:1.

4,891,196

CHLOROSULFONIC ACID COMPOSITION

Norman A. Carlson, Hockessin, and Glenn R. Evers, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1986, Ser. No. 942,558
Int. Cl.[4] C01B *17/46*
U.S. Cl. 423—269 **8 Claims**



1. A process for making an improved chlorosulfonic acid which comprises causing hydrogen chloride and sulfur trioxide to react in the presence of chlorosulfonic acid at a temperature of 65 to 80° C wherein the hydrogen chloride is present at from about 100 to 110 weight percent of stoichiometric quantities and 0.75 to 1.5 weight percent sulfuric acid (as 93% sulfuric acid) based on the stoichiometric rate of chlorosulfonic acid production is injected into the reactor at the point of reaction between the hydrogen chloride and the sulfur trioxide.

4,891,197

SILICOPHOSPHOALUMINATES AND RELATED CRYSTALLINE OXIDES

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 642,925, Aug. 21, 1984, abandoned, and a continuation-in-part of Ser. No. 685,186, Dec. 21, 1984, Pat. No. 4,623,527, which is a continuation-in-part of Ser. No. 562,909, Dec. 19, 1983, abandoned, said Ser. No. 642,925, is a continuation-in-part of Ser. No. 562,673, Dec. 19, 1983, abandoned, and a continuation-in-part of Ser. No. 615,391, May 25, 1984. This application Jun. 26, 1986, Ser. No. 878,754
Int. Cl.[4] C01B *33/12, 33/20, 33/28, 25/36*
U.S. Cl. 423—279 **6 Claims**

1. A method for synthesizing a crystalline oxide, which method comprises:

(1) providing a reaction mixture comprising sources of X oxide, Y oxide and Z oxide, wherein X represents one or more elements of valence plus 3 selected from the group consisting of aluminum, iron, chromium, vanadium, molybdenum, arsenic, antimony, manganese, gallium and boron, Y represents one or more elements of valence plus 5 selected from the group consisting of phosphorus, arsenic, antimony and vanadium, Z represents one or more elements of valence plus 4 selected from the group consisting of silicon, germanium and titanium, one of said oxide sources being unstable in water, an organic directing agent D, inorganic cations M and anions N, and a substantially water-immiscible organic solvent for said oxide source unstable in the water, the components of said reaction mixture having the following relationship:

$$(D)_a:(M_2O)_b:(X_2O_3)_c:(ZO_2)_d:(Y_2O_5)_e:(\text{Solvent})_f:(N)_g:(H_2O)_h$$

wherein a, b, c, d, e, f, g and h are numbers satisfying the following relationships:
a/(c+d+e) is less than 4,
b/(c+d+e) is less than 2,
d/(c+e) is less than 2,
f/(c+d+e) is from 0.1 to 15,
g/(c+d+e) is less than 2, and
h/(c+d+e) is from 3 to 150,
wherein upon initial provision of said reaction mixture said oxide source unstable in the water is dispersed or dissolved in the water-immiscible organic solvent;

(2) heating said reaction mixture at a rate of from 5° C. to 200° C. per hour to a temperature of from 80° C. to 300° C.;

(3) agitating said reaction mixture in a manner sufficient to intimately admix the water-immiscible organic solvent and the water with each other, thereby progressively hydrolyzing the oxide source unstable in water;

(4) maintaining said agitated reaction mixture at a temperature of from 80° C. to 300° C. and a pH of from 2 to 9 until crystals of oxide material are formed; and

(5) recovering from said reaction mixture oxide material characterized by a composition, in the anhydrous state, as follows:

$$D'_v:M_{x/m}{}^{m+}:(XO_2)_{1-y}{}^{-}:(YO_2)_{1-x}{}^{+}:(ZO_2)_{x+y}:N_{y/n}{}^{n-}$$

wherein D' represents the total of organic directing agent D plus organic solvent, v is the number of moles of D', m is the valence of cation M, n is the valence of anion N, and x and y are numbers of from greater than −1 to less than +1 which satisfy the relationships:
(1) if x is 0, then y is not 0,
(2) if y is 0, then x is not 0,
(3) if the atomic ratio of X/Y is greater than 1, then (x+y) is greater than 0 and y+0.6x is less than 0.4, and
(4) if the atomic ratio of X/Y is less than 1, then (x+y) is greater than 0 and 0.5 is greater than 0.5y+x,
said oxide having an ion exchange capacity of at least about 0.002 meq/g.

4,891,198

PREPARATION OF TRICALCIUM PHOSPHATE

Joseph A. Ackilli, So. Salem; Fouad Z. Saleeb, Pleasantville; Philip Morreale, Mt. Vernon, all of N.Y., and Randal P. McKay, Paramus, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 7, 1986, Ser. No. 894,609
Int. Cl.[4] C01B *15/16, 25/26*
U.S. Cl. 423—308 **4 Claims**

1. A method for the preparation of tricalcium phosphate which is rapidly soluble in acidic food solutions comprising the steps of:

(a) forming an aqueous suspension of calcium hydroxide;

(b) rapidly adding said suspension to aqueous phosphoric acid, with continuous agitation, to form a reaction slurry having a pH of from 8 to 12, the phosphorus acid and the suspension each having an initial temperature of from about 40° F. to about 80° F.;

(c) keeping the temperature of the slurry at or below 160° F. at all times, the reacted slurry containing no more than 2% hydroxyapatite; and

(d) spray drying or freeze drying the reacted slurry.

4,891,199

PREPARATION OF ZEOLITES OF TYPE ZSM-5

Bertrand Latourrette, Le Raincy, and Claude Magnier, Paris, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 655,076, Sep. 27, 1984, abandoned. This application Dec. 22, 1986, Ser. No. 943,861
Claims priority, application France, Sep. 28, 1983, 8315404
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **8 Claims**

1. A process for the preparation of a zeolite of type ZSM-5, comprising (i) combining an alumina source with acid; (ii) intimately admixing said acidified source of alumina with a source of silica, in aqueous reaction medium having a pH ranging from 2 to 5 and wherein the molar ratio SiO_2/Al_2O_3 ranges from 5 to 100, (ii) adding a source of alkali metal oxide to the reaction mixture resulting from said stage (ii), said combined reaction mixture having a pH ranging from 8 to 12, and thence (iv) crystallizing a zeolite of type ZSM-5 therefrom, said reaction mixture capable of being crystallized in the absence of seeds and in a period of time between about 8 and 48 hours.

4,891,200

OMEGA TYPE ZEOLITE HAVING HIGH THERMAL STABILITY, ITS PROCESS OF PREPARATION AND ITS UTILIZATION

Francois Fajula, Teyran; Francois Figueras, Montpellier, both of France; Latifa Moudafi, Djemaa Casablanca, Morocco; Mercedes Vera Pacheco, Mexico City, Mexico; Serge Nicolas, Montpellier, France; Pierre Dufresne, Rueil Malmaison, France, and Claude Gueguen, Septeme Pont Eveque, France, assignors to Centre National de la Recherche Scientifique, Elf France, Paris and Institut Francais du Petrole, Rueil Malmaison Cedex, both of, France

Filed May 19, 1986, Ser. No. 865,179
Claims priority, application France, May 23, 1985, 85 07772
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **20 Claims**



1. A process for the synthesis of the zeolite of claim 1 which comprises: forming a mixture comprised of:

(1) from 2 to 15% by weight of a mixture A containing in molar proportions:

$$2\text{-}8M_{2/n}O;\ 0.1\text{-}2Z_2O;\ Al_2O_3;\ 2\text{-}20SiO_2;\ 120\text{-}400H_2O$$

which has been maintained for from 3 to 200 days at a temperature of from 10° to 80° C. and,

(2) from 85 to 98% by weight of a mixture B containing in molar proportions:

$$1.25\text{-}16M_{2/n}O;\ Al_2O_3;\ 5\text{-}20SiO_2;\ 120\text{-}400H_2O.$$

wherein:
M is a metal of valency n: Z is an organic cation, and wherein the alumina source is a crystalline aluminosilicate at least one part of which is in suspension in the mixture, and wherein the size of the crystalline aluminosilicate particles in suspension is comprised between 0.5 and 100 μm;
maintaining the mixture at between 10 and 250° C. to form the zeolite at a speed of growth of the crystals lower than 9 g/h for 100 ml of the mixture.

4,891,201

ULTRA-PURE EPITAXIAL SILICON

John C. Schumacher, Carlsbad, Calif., assignor to Diamond Cubic Liquidation Trust, Oceanside, Calif.

Continuation of Ser. No. 397,445, Jul. 12, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 648,339
Int. Cl.[4] C01B *33/02*
U.S. Cl. 423—348 **4 Claims**

1. Homoepitaxial silicon film having an undoped resistivity of 20,000 ohm-cm or greater.

2. A process for manufacturing homoepitaxial silicon film having a high undoped resistivity of at least 10,000 ohm-cm comprising the steps of:

(a) thermally decomposing tribromosilane or triiodosilane at a temperature of from about 800° C. to about 1,200° C., and

(b) collecting silicon atoms at a growth rate of from 200 to 500 Angstroms/minute from the decomposition produce of step (a) as a film of homoepitaxial silicon having a resistivity of at least 10,000 ohm-cm.

4,891,202

METHOD FOR MAKING AMMONIA BY THE REDUCTION OF MOLECULAR NITROGEN

Norman N. Lichtin, Newton, and Kallambella M. Vijayakumar, Boston, both of Mass., assignors to Boston University, Boston, Mass.

Continuation of Ser. No. 634,332, Jul. 25, 1984, Pat. No. 4,612,096. This application Aug. 7, 1986, Ser. No. 877,060
Int. Cl.[4] C01C *1/00*
U.S. Cl. 423—352 **10 Claims**

1. A method for making ammonia by the reduction of molecular nitrogen in the absence of photoenergy comprising the step of:

combining a solid metal oxide catalyst with molecular nitrogen and an aqueous preparation of an organic compound as a reaction mixture in the absence of photoenergy at a temperature not more than 60° C.

4,891,203

FLAKE-LIKE CARBON BODIES FROM SEMICOKE

Leonard S. Singer, Berea, and David T. Orient, Medina, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1985, Ser. No. 750,532
Int. Cl.[4] C01B *31/00, 31/02, 31/04*; C09C *1/48*
U.S. Cl. 423—449 **33 Claims**

1. A process for producing an anisotropic carbonaceous body comprising the steps of:

(a) providing a carbonaceous pitch-based semicoke having a volatile content less than 10 weight percent and a TMA deformation temperature of at least 400° C.; and

(b) plastically deforming said semicoke at temperature above said TMA deformation temperature to align the internal semicoke structure and form an anisotropic flake-like semicoke body.

4,891,204

PURIFICATION OF ALUMINUM CHLORIDE

Michael Robinson, Wooton, England, assignor to SCM Chemical Limited, United Kingdom

Continuation of Ser. No. 751,293, Jul. 2, 1985, abandoned. This application Aug. 20, 1986, Ser. No. 898,869

Claims priority, application United Kingdom, Jul. 21, 1984, 18639

Int. Cl.[4] C01F 7/62

U.S. Cl. 423—495 14 Claims

1. In a process for purifying aluminium chloride contaminated with iron chloride, comprising:

contacting a vaporous stream of aluminium chloride containing iron chloride at a temperature below the melting point of aluminum but at least 350° C. with a packed bed comprising bed solids of aluminium metal particles interpersed with particles of non-reactive material where both types of particles have a particle size between 2 millimeters and 10 millimeters, the volumetric ratio of said inert material particles to said aluminium metal particles being between 0.8:1 and 2:1;

depositing iron chloride on aluminium particles to produce iron-aluminium particles;

removing iron-aluminium particles from the packed bed;

removing the metallic iron from the iron-aluminium particles to produce clean aluminium particles.

4,891,205

STABILIZED CHELATING AGENTS FOR REMOVING HYDROGEN SULFIDE

Stephen A. Bedell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1986, Ser. No. 831,969

Int. Cl.[4] C01B 17/05

U.S. Cl. 423—576.6 9 Claims

1. A method for removing hydrogen sulfide from gas streams, comprising the steps of:

passing a gas containing hydrogen sulfide through a stabilized aqueous solution initially comprising:

metal ions in a concentration of at least about 100 ppm;

a chelating agent in an amount of at least equimolar to said metal ions;

a buffering compound in a concentration sufficient to provide a pH between 4 and 11; and

an inhibitor in a concentration sufficient to retard degradation of the chelating agents, the inhibitor being selected from a group consisting of iodide ions, bromide ions, nitrites, amino acids, alkyl amines, and combinations thereof;

continuously oxidizing said sulfide to elemental sulfur while reducing said metal ions, a portion of the inhibitor combining with free hydroxyl radicals formed in the solution;

removing said elemental sulfur from said solution; and

oxidizing said metal ions with oxygen to regenerate the solution.

4,891,206

PROCESS FOR THE REMOVAL OF UNDESIRABLE METAL IONS, ESPECIALLY VANADIUM IONS, IN THE CONCENTRATION OF DILUTE IRON(II) SULFATE-CONTAINING SULFURIC ACID SOLUTIONS

Achim M. Kulling, Odenthal-Gloebusch, and Helmut Steinhausen, Odenthal, both of Fed. Rep. of Germany, assignors to Kronos Titan, GmbH, Leverkusen, Fed. Rep. of Germany

Filed Aug. 17, 1984, Ser. No. 641,708

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329842

Int. Cl.[4] C01B 17/90; C01G 33, 00, 77/04, 49/14

U.S. Cl. 423—531 15 Claims

1. A process for the removal of vanadium ions during the concentration of a dilute iron (II) sulfate-containing sulfuric acid solution resulting from the hydrolysis of a titanyl sulfate solution in the production of titanium dioxide comprising adjusting the trivalent titanium content of said dilute iron (II) sulfate-containing sulfuric acid solution to obtain a trivalent iron content of not more than 0.1 g/l, concentrating the solution to a sulfuric acid content of 60 to 70% H_2SO_4 by the evaporation of water whereby iron (II) sulfate monohydrate and vanadium compounds are precipitated and separating recipitated iron (II) sulfate monohydrate and vanadium compounds from the concentrated solution.

4,891,207

MANUFACTURE OF ARSENIC ACID

Andrew D. J. Broome, c/o Laporte Industries Ltd., Group Patent Dept., P.O. Box 2, Moorfield Road, Widnes, Cheshire, WA8 OJU, England

Continuation of Ser. No. 678,839, Dec. 6, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 839,530

Claims priority, application United Kingdom, Dec. 10, 1983, 8333042

Int. Cl.[4] C01G 28/00

U.S. Cl. 423—617 14 Claims

1. A process for the manufacture of aqueous arsenic acid having a concentration of at least 65% by weight by reaction between arsenic trioxide and aqueous hydrogen peroxide, the process comprising introducing arsenic trioxide and a solution containing 35% to 75% w/w hydrogen peroxide with agitation into a body of fluid, said H_2O_2 being present in an amount sufficient to provide up to 125% of the stoichiometric amount of hydrogen peroxide required to convert all of the arsenic trioxide present to arsenic acid, said body of fluid into which the reagents are introduced comprising an aqueous solution of arsenic acid having a concentration of at least 65% by weight and comprising at least half the volume of the mixture after all the reagents have been introduced thereinto, and maintaining the temperature below 70° C., to effect reaction between said arsenic trioxide and hydrogen peroxide to form in said body of fluid as a reaction product of the reaction an aqueous product solution comprising arsenic acid having a concentration of at least 65% by weight.

4,891,208

STEROIDAL LIPOSOMES

Andrew S. Janoff, Yardley, Pa.; Mircea C. Popescu; Alan L. Weiner, both of Plainsboro; Lois E. Bolacak, Lawrenceville; Paul A. Tremblay, Hamilton, and Christine E. Swenson, Plainsboro, all of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 721,630, Apr. 10, 1985, Pat. No. 4,721,612, which is a continuation-in-part of Ser. No. 599,691, Apr. 12, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 773,429

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[4] A61K 43/00

U.S. Cl. 424—1.1 46 Claims

6. A steroidal liposome comprising a bioactive agent, and wherein bilayers of the liposome comprise a salt form of a carboxylic acid derivative of a sterol, a salt form of a dicarboxylic acid derivative of a sterol, a salt form of a polycarboxylic acid derivative of a sterol, a salt form of an hydroxyl carboxylic acid derivative of a sterol, a salt form of an aminoacid derivative of a sterol, or a salt form of a poly(amino acid) derivative of a sterol; or a salt form of an organic acid derivative of cholesterol, a vitamin D, a phytosterol, or a steroidal hormone.

40. Steroidal liposomes comprising completely closed bilayers comprising a salt form of an organic acid derivative of a sterol and a bioactive agent wherein the bioactive agent is a radiolabel, radio-opaque compound or fluorescent compound.

4,891,209

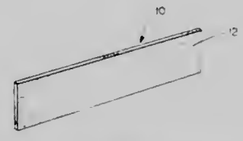
INTERNATIONAL NON-STICK CHEWING MATERIAL

Moses L. Heim, Casablanca Hotel 6345 Collins Ave., Miami Beach, Fla. 33141

Filed Sep. 21, 1988, Ser. No. 247,362

Int. Cl.[4] A61K 9/68

U.S. Cl. 424—48 1 Claim



1. A chewing material consisting of a body of flexible, resilient, non-toxic, water-insoluble, sugar-free, salt-free cured latex rubber adapted to be positioned in the oral cavity and chewed without deterioration for an extended period of time, said latex rubber being non-adhering by to surfaces in the oral cavity and externally of the oral cavity, said body of latex rubber being an elongated, thin, rectangular stick similar in shape, size and weight to a stick of conventional chewing gum with the flexibility and resiliency enabling the stick to be inserted into the oral cavity and folded, rolled and otherwise manipulated during mastication without deterioration from the mastication.

4,891,210

USE OF BACTERIOPHAGES IN DENTAL HYGIENE

Alan H. Norris, 120 Saddle Mountain Rd., Rome, Ga. 30161

Filed Jan. 3, 1989, Ser. No. 292,960

Int. Cl.[4] A61K 7/16, 9/68, 39/02

U.S. Cl. 424—50 8 Claims

1. A method of improved dental hygiene in which bacteriophages are used to reduce the number of harmful bacteria in the interdental spaces.

4,891,211

STABLE HYDROGEN PEROXIDE-RELEASING DENTIFICE

Anthony E. Winston, East Brunswick, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jun. 29, 1988, Ser. No. 212,913

Int. Cl.[4] A61K 7/16, 7/18, 7/20

U.S. Cl. 424—52 20 Claims

1. A hydrogen-peroxide releasing dentifrice, comprising a toothpaste or gel containing a mixture of 10 to 70% sodium bicarbonate with from 1 to 10% sodium percarbonate, in a carrier which consists essentially of a polyethylene glycol humectant in an amount of from 20 to 75% of the dentifrice, said dentifrice being substantially free of glycerin and containing less than 3% water.

4,891,212

ULTRAVIOLET RADIATION ABSORBING CYCLOHEXENYLIDENE CYANOACETATE ESTER AND AMIDE COMPOSITIONS

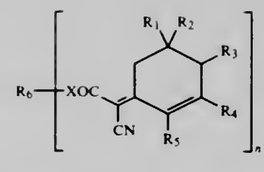
Donald J. Gosciniak, West Chester, Pa.; Thomas P. Cleary, and Charlambos J. Phalangas, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Dec. 28, 1988, Ser. No. 290,800

Int. Cl.[4] A61K 31/275; C07C 121/48, 121/52

U.S. Cl. 424—59 14 Claims

7. A sunscreen composition comprising a pharmaceutically acceptable carrier containing 0.5-30% by weight of a compound selected from Formula I



I

wherein

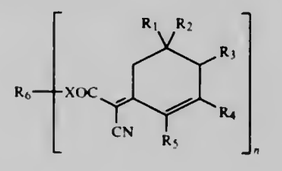
X is selected from O or NH and R_1-R_5 are selected from H or alkyl groups having 1-5 carbon atoms,

n is 2 or 3; but when

n=2, R_6 is selected from divalent alkylene groups of 2-16 carbon atoms, cycloalkylene groups of 5-8 carbons atoms, arylene groups of 6-12 carbon atoms or alkylarylene groups of 7-13 carbon atoms, and when

n=3, R_6 is selected from trivalent alkylene groups of 3-16 carbon atoms.

9. A compound having the Formula I



I

wherein

X is selected from O or NH and R_1-R_5 are selected from H or alkyl groups having 1-5 carbon atoms;

n is 2 or 3; but when

n=2, R_6 is selected from divalent alkylene groups of 2-16 carbon atoms, cycloalkylene groups of 5-8 carbons atoms, arylene groups of 6-12 carbon atoms or alkylarylene groups of 7-13 carbon atoms, and when

n=3, R_6 is selected from trivalent alkylene groups of 3-16 carbon atoms.

4,891,213

NAIL ENAMEL CONTAINING MICROCRYSTALLINE CELLULOSE

Harry W. Gordon, Wantagh, and Kenneth Chung, Greenlawn, both of N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Continuation of Ser. No. 658,420, Oct. 5, 1984, abandoned. This application May 15, 1986, Ser. No. 863,927

Int. Cl.[4] A61K 7/043

U.S. Cl. 424—61 2 Claims



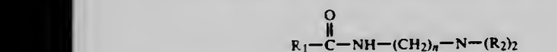
1. A non-aqueous liquid nail polish composition for one-time application on a human nail to provide, upon drying, a smooth, ridge-free, lustrous, high-gloss, dried coating resistant to water removal, said non-aqueous composition comprising:

a solvent in the range of about 60% to about 80% by weight of the composition;

a hardener in the range of about 5% to about 20% by weight of the composition;
a film former in the range of about 2% to about 15% by weight of the composition;
a plasticizer in the range of about 0.5% to about 8% by weight of the composition;
a coloring agent in the range of about 0.1% to about 5% by weight of the composition; and
hydrolyzed, alpha-cellulose, microcrystalline cellulose powder in the range of about 0.1% to about 3% by weight of the composition, said cellulose powder being constituted of particles on the order of no more than 50 microns in their maximum dimension, said particles being dispersed and colloidally suspended in the non-aqueous liquid composition, said particles forming an intermeshed grid embedded within said dried coating to resist removal by water as well as peeling, cracking and chipping of said dried coating.

4,891,214
PARTICULATE EMULSIFIABLE HAIR CONDITIONING COMPOSITION
Frank H. Stevens, Columbus, and Sheila E. Vetter, Powell, both of Ohio, assignors to Sherex Chemical Company, Inc., Dublin, Ohio
PCT No. PCT/US86/02236, § 371 Date Aug. 22, 1988, § 102(e) Date Aug. 22, 1988, PCT Pub. No. WO88/03016, PCT Pub. Date May 5, 1988
PCT Filed Oct. 23, 1986, Ser. No. 251,228
Int. Cl.[4] A61K *7/08, 7/06*
U.S. Cl. 424—70 **9 Claims**

1. A particulate emulsifiable hair conditioning composition comrising: (a) from 40–80% by weight of aliphatic alcohol of 8 or more carbons, or mixtures thereof; and (b) from 20–60% of a quaternary ammonium compound or mixtures thereof miscible with said alcohol mixture; and (c) from 2–10% of a fatty alkylamido alkyldialkylamine of the general formula



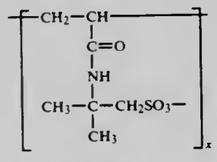
where;
n is 1–6
R_1 is C8 to C28 alkyl group,
R_2 is a C1 to C5 alkyl group;
such that said composition melts at or above 30° C.

4,891,215
DEODORIZING MATERIAL
Taro Kato, Iwate, Japan, assignor to Kitakamiseishi Kabushiki Kaisha, Iwate, Japan
Continuation of Ser. No. 932,001, Nov. 18, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 171,384
Int. Cl.[4] A01N *59/16;* **A61K** *33/26*
U.S. Cl. 424—76.5 **12 Claims**

1. A method for manufacturing deodorizing materials comprising cellulosic substances containing iron salts, comprising the steps of:
(a) spraying an aqueous ferrous sulfate solution on a cellulosic substance; and
(b) drying the sprayed cellulosic substances at a temperature of approximately 105° C. for a period of time sufficient to form an oxidizing Fe+++/cellulosic substance complex.

4,891,216
DISINFECTING COMPOSITIONS AND METHODS THEREFOR
Robert D. Kross, Bellmore, and Carol A. Zamojcin, Floral Park, both of N.Y., assignors to Alcide Corporation, Norwalk, Conn.
Filed Apr. 14, 1987, Ser. No. 38,016
Int. Cl.[4] A61K *31/74, 31/78;* **A01N** *59/00*
U.S. Cl. 424—78 **14 Claims**

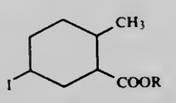
1. A composition for disinfecting substrates and for forming a protective barrier comprising two gels adapted to be mixed and applied so as to adhere onto said substrate, said first gel comprising an aqueous solution containing suitable amounts of a protic acid, and said second gel comprising an aqueous solution of a metal chlorite such that, when the gels are combined, the chlorite ion concentration in the form of chlorous acid is no more than about 15% by weight of the total amount of chlorite ion concentration and wherein said second gel also contains a polysulfonic acid salt wherein the anion of said salt has the formula:



wherein X has a value such that the molecular weight of the anionic portion of the polymer is no greater than about 5,000,000, with the proviso that the composition contain from about 2.5% to about 7.5%, by weight, polysulfonic acid salt.

4,891,217
PERSISTANT ATTRACTANTS FOR THE MEDITERRANEAN FRUIT FLY, THE METHOD OF PREPARATION AND METHOD OF USE
Terrence P. McGovern, Bowie, Md., and Roy T. Cunningham, Hilo, Hi., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Continuation-in-part of Ser. No. 42,920, Apr. 27, 1987, Pat. No. 4,764,366. This application Apr. 27, 1988, Ser. No. 186,990
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—84 **22 Claims**

1. A composition to attract the Mediterranean Fruit Fly having, as an attractant, comprising an effective amount of a compound of the formula



wherein —CH_3 and —COOR are in the trans-configuration and the iodo atom is equatorial, and wherein R is selected from the group consisting of ethyl, 2,2,2-trifluoroethyl, propyl, 1-methylethyl, and 1-methyl-2,2,2-trifluoroethyl, wherein said composition essentially is free of isomers of said compound having the iodo atom in the axial position.

4,891,218
RODENTICIDE BAIT BLOCK
Daniel A. Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90069
Continuation of Ser. No. 761,904, Aug. 2, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 841,426
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—84 **2 Claims**

1. A rodenticide bait block containing an active rodenticide capable of killing a target rodent such as a rat or mouse; said block having on one or more of its exterior surfaces a series of protuberances and grooves; said protuberances and grooves cooperating with each other to form geometrical ridges as a primary biting edge that rodent can attack and gnaw off in consuming said block; said block having running through its body a series of vertical holes that are relative to the exterior protuberances and grooves so as to produce continuous irregular rough biting edges as said block is consumed by the rodent and the exterior protuberances and grooves are eaten away.

4,891,219
METHOD FOR IMMUNIZATION AGAINST AND TREATMENT OF INFECTION BY ECTOPARASITES AND ENDOPARASITES
Stephen L. Karr, Jr.; Elizer Benjamini, both of Davis; Robert J. Scibienski, Woodland, and Stephen Grimes, Davis, all of Calif., assignors to Ajinomoto Corporation, Woodland, Calif.
Continuation-in-part of Ser. No. 839,892, Mar. 14, 1986, Pat. No. 4,814,170. This application Sep. 14, 1987, Ser. No. 96,699
Int. Cl.[4] A61K *37/24, 39/395*
U.S. Cl. 424—85.8 **11 Claims**

1. A pharmaceutical composition for use in a vertebrate host as a vaccine or a medicament for immunizing against or treating for infection by an invertebrate ectoparasite or endoparasite comprising an immunogen that is capable of eliciting antibodies in the host that bind to the native form of juvenile hormone or beta-ecdysone and have a biological effect on the ectoparasite or endoparasite, wherein the immunogen comprises an endocrine product of the ectoparasite or endoparasite selected from the group consisting of juvenile hormone, beta-ecdysone or analogs thereof, conjugated to a protein selected from the group consisting of mino acids or chains of amino acids, straight chain hydrocarbons, aromatic derivatives, gallic acid, or polyvinyl alcohol carrier by means of a spacer molecule and a pharmaceutically acceptable carrier.

7. A pharmaceutical composition for use in a host vertebrate as a vaccine or medicament for immunizing against or treating for infection by invertebrate endoparasites or ectoparasites comprising an immunologically effective amount of antibodies produced from hybridomas of the cell line ATCC 9529 which specifically bind to the native form of juvenile hormone and a pharmaceutically acceptable carrier.

4,891,220
METHOD AND COMPOSITION FOR TREATING HYPERLIPIDEMIA
Byron A. Douzis, Houston, Tex., assignor to ImmuDyne, Inc., Palo Alto, Calif.
Filed Jul. 14, 1988, Ser. No. 219,336
Int. Cl.[4] A61K *35/72*
U.S. Cl. 424—88 **16 Claims**

1. A composition for treating lipid-associated cardiovascular disorders in a mammal, which composition comprises:
an effective amount of a water soluble yeast cell wall extract, obtained by subjecting disrupted yeast cell wall material to extraction with from 10 to 100 times the amount by volume of a mixture of substantially equal amounts of water and phenol, and separating and dialyzing the aqueous phase to remove any low molecular weight sugars, amino acids, peptides, lipids and yeast metabolites, and isolating said extract from the dialysis retentate; and an effective amount of a cholesterol regulating agent selected from the group consisting of gemfibrozil and niacin.

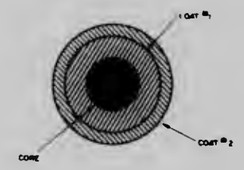
4,891,221
WHOLE BLOOD ANTIVIRAL PROCESS AND COMPOSITION
Edward Shanborm, 2252 Liane La., Santa Ana, Calif. 92705
Continuation-in-part of Ser. No. 276,113, Nov. 23, 1988. This application Dec. 28, 1988, Ser. No. 209,161
Int. Cl.[4] A61K *35/14*
U.S. Cl. 424—101 **20 Claims**

1. Transfusion blood comprising a transfusion container of human blood containing one or more glycyrrhizic triterpenoid compounds in an amount of from 0.005 to 10 wt/% effective to substantially inactivate susceptible viruses found in animal fluids and tissues.

4,891,222
PINE OIL FIRE ANT INSECTICIDE
Gerald W. Eichhoefer, 809 Magnolia Ct., Liberty, Mo. 64068
Filed Feb. 24, 1987, Ser. No. 17,739
Int. Cl.[4] A01N *65/00*
U.S. Cl. 424—196.1 **6 Claims**

1. A composition for controlling fire ants consisting of pine oil in amount effective in killing fire ants in combination with an emulsifying amount of a surfactant containing anionic and non-ionic surfactants including a dispersant and stabilizer, with water, said mixture of pine oil/surfactant/water being in the ratio of between about 1 to 1 to 128, to between 1 to 1 to 8, respectively.

4,891,223
CONTROLLED RELEASE DELIVERY COATING FORMULATION FOR BIOACTIVE SUBSTANCES
Anil S. Ambegaonkar, Hatfield, and Roger A. Howells, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Sep. 3, 1987, Ser. No. 92,743
Int. Cl.[4] A01N *25/34*
U.S. Cl. 424—408 **6 Claims**



1. A bioactive composition having a controlled, sustained release delivery pattern when contacted with a suitable surrounding media comprising:
(a) a pharmaceutically, insecticidally, herbicidally or fertilizing bioactive material core, soluble in the surrounding media, the core present in an amount at least sufficient for a total dosage during a specified treatment period;
(b) a first coating enveloping the bioactive material core comprising a polymer or a blend of polymers, said polymer or blend of polymers being water-soluble and swellable upon penetration by the surrounding media; and
(c) a second coating enveloping the first coating, the second coating comprising a polymer or a blend of polymers; said polymer or blend of polymers being water-insoluble and forming a semi-permeable barrier permitting inward diffusion of the surrounding media and outward diffusion of the bioactive material dissolved in the surrouding media;
whereby when the composition is exposed to the surrounding

media, the exposure will result in the controlled release of the bioactive material.

4,891,224

MULTIPLE STEP ENTRAPMENT/LOADING PROCEDURE FOR PREPARING LIPOPHILIC DRUG-CONTAINING LIPOSOMES

Eric A. Forssen, La Canada, Calif., assignor to Vestar, Inc., San Dimas, Calif.

Filed Nov. 18, 1987, Ser. No. 122,354
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—422 **30 Claims**

1. A method of preparing a phospholipid-entrapped cationic, lipophilic drug composition which comprises:
   a. forming liposomes in an aqueous medium containing an acid which has at least one ionizable functional group, is of sufficient polarity to be highly soluble in water and exhibits a low permeability through the vesicle membranes to give an acidic liposome-containing aqueous medium in which the acid is present in the internal and external liposome phases, said liposome being prepared from hydroxyamino(lower)aliphatic-substituted phosphatidyl carboxylic acid diesters of a tri- or higher functional aliphatic polyol in which the ester moieties are derived from a saturated or ethylenically unsaturated aliphatic monocarboxylic acid having at least 14 carbon atoms,
   b. adding to the thus-obtained acidic liposome-containing aqueous medium a cationic, lipophilic drug, and
   c. then adding a base whose cations cannot pass through the liposomes' lipid bilayers to charge neutralize the acid anions in the external aqueous phase, thereby inducing the cationic, lipophilic drug to pass into the liposomes' internal aqueous phase.

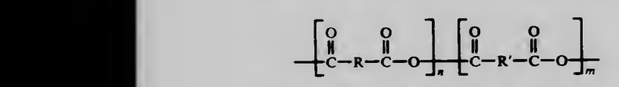
4,891,225

BIOERODIBLE POLYANHYDRIDES FOR CONTROLLED DRUG DELIVERY

Robert S. Langer, Somerville, Mass., and Howard Rosen, Montara, Calif., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 613,001, May 21, 1984, which is a continuation of Ser. No. 477,710, Mar. 22, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,290
Int. Cl.[4] A61M *31/00*; A61F *5/46*; A61K *31/78*
U.S. Cl. 424—428 **17 Claims**

1. A zero-order release rate polymeric device comprising a hydrophobic polyanhydride polymeric composition degrading by surface erosion, said composition having the formula



wherein R and R' are selected from the group consisting of compositions having a molecular weight not substantially greater than 500 daltons and wherein m and n are at least 1, and at least one biologically active substance; wherein the polyanhydride is polymerized from prepolymers formed from dicarboxylic acids purified by recrystallization until the contaminants and degradation products present in the prepolymer are removed, said polymer being characterized by biocompatibility that results in minimal tissue irritation when implanted in vasculated tissue, and approximately zero order erosion and release rates of substance in vivo as a function of hydrolysis of the anhydride linkages in the polyanhydride.

4,891,226

PHARMACEUTICAL WHICH CAN BE ADMINISTERED NASALLY, A PROCESS FOR ITS PREPARATION, AND ITS USE

Klaus-Dieter Bremecker; Klaus-Dieter Hungerer, and Hanajörg Rosneberger, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 5,640, Jan. 21, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,812
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 3601923
Int. Cl.[4] A61K *9/00, 39/02, 39/12, 37/24*
U.S. Cl. 424—434 **10 Claims**

1. A pharmaceutical gel composition for vaccination through nasal administration, which contains a high molecular weight active compound, in a concentration effective to vaccinate, in a gel-forming agent and, where appropriate, auxiliaries.

4,891,227

MEDICATED CLEANSING PADS

Lauren A. Thaman, Milford; James P. SaNogueira, Newtown, and Teresa M. Petraia, Ansonia, all of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Feb. 2, 1988, Ser. No. 151,339
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[4] B01B *31/26*
U.S. Cl. 424—443 **17 Claims**

1. A medicated cleansing pad comprising:
   (a) from about 50% to about 75% by weight of two or more layers of nonwoven fabric materials;
   (b) from about 20% to about 75% by weight (on dry solids basis) of a water soluble polymeric resin of the formula:

$$(A_x)_m \quad (B_y)_n$$

wherein A is one or more monomers selected from styrene or styrene derivatives and B is one or more monomers selected from butadiene or butadiene derivatives, x is the number of different A monomer components present in the copolymer chain, with x being an integer of 1 or more and y is the number of B monomer components present in the copolymer chain, with y being an integer of 0 or more and m:n is the weight ratio of A monomer components to B monomer components, and is from about 10:1 to about 1:5; and
   (c) from about 0.1% to about 50.0% by weight of a salicylic acid active composition.

4,891,228

MEDICATED CLEANSING PADS

Lauren A. Thaman, Milford; James P. SaNogueira, Newtown, and Teresa M. Petraia, Ansonia, all of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Feb. 2, 1988, Ser. No. 151,338
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[4] C01B *31/26*
U.S. Cl. 424—443 **17 Claims**

1. A medicated cleansing pad comprising:
   (a) from about 50% to about 75% by weight of one layer of a nonwoven fabric material;
   (b) from about 20% to about 75% by weight (on dry solids basis) of a water soluble polymeric resin of the formula:

$$(A_x)_m(B_y)_n$$

wherein A is one or more monomers selected from styrene or styrene derivatives and B is one or more monomers selected from butadiene or butadiene derivatives, x is the number of different A monomer components present in the copolymer chain, with x being an integer of 1 or more and y is the number

of B monomer components present in the copolymer chain, with y being an integer of 0 or more and m:n is the weight ratio of A monomer components to B monomer components, and is from about 10:1 to about 1:5; and
   (c) from about 0.1% to about 50% by weight of salicylic acid active composition.

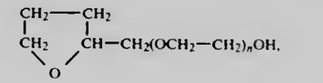
4,891,229

SOFT GELATIN CAPSULES AND PROCESSES FOR THEIR MANUFACTURE

Werner Brox, Kätchen-Paulusstrasse 6, 6124 Beerfelden, and Wilfried Gabler, Neckarstaden 18, 6900 Heidelberg, both of Fed. Rep. of Germany

PCT No. PCT/EP85/00679, § 371 Date Aug. 11, 1986, § 102(e) Date Aug. 11, 1986, PCT Pub. No. WO86/03406, PCT Pub. Date Jun. 19, 1986
Continuation of Ser. No. 912,585, Aug. 11, 1986, abandoned. This PCT application Dec. 6, 1985, Ser. No. 258,114
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445237
Int. Cl.[4] A61K *9/64*
U.S. Cl. 424—456 **2 Claims**

1. Processes for the manufacture of soft gelatin capsules with a gelatin shell, at least one plasticizer and a capsule filling that contains at least one pharmacologically-active substance and a solvent, characterized in that at least 50% by weight of a mixture of polyethylene glycol ethers of tetrahydrofurfuryl alcohol having the formula I



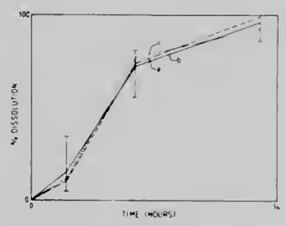
where n = 1 to 6, is used as the solvent, encapsulated in a wet gelatin shell, and that the capsules obtained are dried for 5 to 10 days.

4,891,230

DILTIAZEM FORMULATION

Edward J. Geoghegan; Seamus Mulligan, both of Athlone, Ireland, and Donald E. Panoz, Tuckerstown, Bermuda, assignors to Elan Corporation plc, Athlone, Ireland

Continuation-in-part of Ser. No. 684,661, Dec. 20, 1984, Pat. No. 4,721,619. This application Nov. 16, 1987, Ser. No. 120,952
Claims priority, application Ireland, Dec. 22, 1983, 3057/83
Int. Cl.[4] A61K *9/62, 9/16, 9/26*
U.S. Cl. 424—461 **20 Claims**



1. A diltiazem pellet formulation for oral administration, said pellet comprising a core of diltiazem or a pharmaceutically acceptable salt thereof in association with an organic acid, the diltiazem component and the organic acid being present in a ratio of from 50:1 to 1:1, and a multi-layer membrane surrounding said core and containing a major proportion of a pharmaceutically acceptable film-forming, water insoluble synthetic polymer and a minor proportion of a pharmaceutically acceptable film-forming, water soluble synthetic polymer, the number of layers in said membrane and the ratio of said water soluble to water insoluble polymer being effective to permit release of said diltiazem from said pellet at a rate allowing controlled absorption thereof over a twelve hour period following oral administration, said rate being measured in vitro as a dissolution rate of said pellet, which when measured in a dissolution apparatus (paddle) according to U.S. Pharmacopoeia XXI in 0.05M KCl at pH 7.0 substantially corresponds to the following dissolution pattern:
   (a) from 5 to 35% of the total diltiazem is released after 2 hours of measurement in said apparatus;
   (b) from 55 to 80% of the total diltiazem is released after 6 hours of measurement in said apparatus;
   (c) not less than 85% of the total diltiazem is released after 13 hours of measurement in said apparatus.

4,891,231

PROCESS FOR INHIBITING LIQUID OXIDATION IN FOOD

Jimbin Mai, New Milford; Laura J. Chambers, New Preston, and Richard E. McDonald, Brookfield Center, all of Conn., assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 65,616, Jun. 30, 1987, Pat. No. 4,839,187, which is a continuation of Ser. No. 620,154, Jun. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 561,678, Dec. 15, 1983, abandoned. This application May 4, 1989, Ser. No. 347,483
Int. Cl.[4] A23B *4/14*; A23F *3/16*; A23L *3/34*
U.S. Cl. 426—52 **13 Claims**

1. A process for inhibiting lipid oxidation in a food susceptible to lipid oxidation comprising:
   heating an aqueous extract of black tea leaves at a temperature of from 130° C. to 210° C. and recovering an extract having at least 5% by weight phenol compounds based upon the weight of tea solids in the recovered extract; and
   incorporating the recovered extract in a food susceptible to lipid oxidation such that the food contains from 0.005% to 1.5% tea solids by weight based upon the weight of food.

4,891,232

BEVERAGE INFUSION DEVICE

Derek W. Dahl, 14641 NE. 35th St., Bellevue, Wash. 98007

Filed Oct. 11, 1988, Ser. No. 255,953
Int. Cl.[4] B65D *30/06, 33/06*
U.S. Cl. 426—78 **1 Claim**



1. A beverage infusion device comprising in combination,
   a hand-held, elongate planar rigid stirring member of a constant cross-sectional configuration to enhance agitation of an infusion liquid, said stirring member having first and second opposed terminal ends, and an elongate liquid permeable bag integrally secured to said stirring member proximate said first terminal end of said stirring member, said bag containing beverage infusable solids therein, said porous bag extending below and in longitudinal alignment with said stirring member, and wherein a first removable wrapper is wrapped transversely around said stirring member and encompasses a first food additive compatible

with said beverage infusion solids, which first food additive encompasses said stirring member thereunder such that upon removal of said wrapper, said first food additive is releasable into an infusion liquid, and wherein an additional removable wrapper is wrapped transversely around said stirring member and is positioned adjacent to but separate from said first removable wrapper and encompasses a second food additive compatible with said beverage infusion solids, which second food additive encompasses said stirring member thereunder such that upon removal of said additional wrapper, said second food additive is separately releasable from said first additive into an infusion liquid, said first and additional removable wrappers being provided with gripping means to enable ease of gripping said first and additional wrappers and wherein said first and additional removable wrappers are positioned adjacent each other but spaced from said terminal end sufficient to provide a gripping surface on said stirring member when used to make a beverage and wherein said first removable wrapper is positioned adjacent said porous bag on said infusion device.

4,891,233

FLAKES OF BAKING SHORTENING OR LARD

Robert J. Belanger, Orleans, and Robert A. Mignacca, Willowdale, both of Canada, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1988, Ser. No. 253,796
Claims priority, application Canada, Oct. 6, 1987, 548707
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—94 **9 Claims**

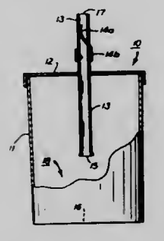
1. A pastry making composition comprising, in combination, a premeasured amount of pastry-making flour, a premeasured amount of flakes of fat, said flakes of fat having a minimum solids content index of about 50% at about 50° F., and a maximum solids content index of about 10% at about 105° F., and a sufficient amount of a liquid fat generally distributed throughout the composition for coating at least portions of said flakes to promote adherence of said composition to facilitate making a pastry dough.

4,891,234

SPAGHETTI SIPPER

Nicholas A. Ruggieri, 5 Braddock St., Rochester, N.Y. 14612

Filed Sep. 19, 1988, Ser. No. 245,810
Int. Cl.[4] B65B *83/00*
U.S. Cl. 426—115 **6 Claims**



1. A device for serving prepared pasta products comprising in combination (1) an open ended container, (2) a removable closure for closing the open end of said container, and (3) tubular means for removing said pasta by suction said means being attached to said removable closure, the improvement comprising providing said tubular means with a pawl mechanism so positioned within said tubular means so as to prevent prepared pasta from returning to said container, whereby when said suction is applied to the exterior end of said tubular means pasta is withdrawn from said container, but when said suction is released said pasta is maintained in place by the gripping action of said pawl.

4,891,235

METHOD FOR EXPANSION TREATMENT OF FOODS

Takeshi Mizuguchi, and Kiyoshi Shibuya, both of Higashiosaka, Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

PCT No. PCT/JP86/00656, § 371 Date Jul. 8, 1987, § 102(e) Date Jul. 8, 1987, PCT Pub. No. WO87/04054, PCT Pub. Date Jul. 16, 1987
PCT Filed Dec. 26, 1986, Ser. No. 80,533
Claims priority, application Japan, Dec. 27, 1985, 60-294830; Dec. 27, 1985, 60-294831
Int. Cl.[4] A23G *9/00*; A23L *1/212, 1/31*; A23P *1/14*
U.S. Cl. 426—281 **8 Claims**

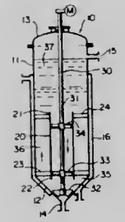
1. A method for expanding and solidifying foods which consists essentially of forcing carbon dioxide gas into a moisture containing food under a pressure of not less than 15 kg/cm^2 in a pressure vessel, wherein the temperature of the food during said forcing step ranges from 5° to 25° C., increasing the pressure in the vessel to liquefy the carbon dioxide gas, maintaining the liquefied gas around the food and then reducing the pressure in the vessel at a rate of pressure drop of 1.5 to 150 kg/cm^2/min to cause expansion of the food and to evaporate the liquefied gas so as to cool and solidify the food by utilizing the endothermic effect associated with the said pressure reducing step.

4,891,236

METHOD FOR TARTAR SEPARATION

Naotake Obta, Takarzaka; Masahiro Yotsumoto, Ibaraki; Haruo Nishino, Takatsuki; Hiroshi Tanahashi, Osaka; Hajime Kato, Toyonaka; Toshiaki Tazawa, Ibaraki; Hideo Noda, and Yuzuru Wakabayashi, both of Amagasaki, all of Japan, assignors to Suntory Limited, Osaka and Kansai Chemical Engineering Co., Ltd., Amagasaki, both of, Japan

Division of Ser. No. 909,329, Sep. 19, 1986, Pat. No. 4,798,131. This application Oct. 7, 1988, Ser. No. 256,147
Claims priority, application Japan, Sep. 24, 1985, 60-208914
Int. Cl.[4] C12H *1/02*
U.S. Cl. 426—330.4 **9 Claims**



1. A method for removing tartar from wine or grape juice by use of seed crystals, said method comprising the steps of:
(a) providing a crystallizing vessel having an inlet at the bottom thereof and an outlet at the top thereof;
(b) positioning a draft tube having a height of ⅓ to ¼ the height of said crystallizing vessel and open at its bottom and at its top inside said crystallizing vessel so that:
(i) said draft tube is centered in the bottom half of said crystallizing vessel and
(ii) said draft tube and said crystallizing vessel together define an outer flow zone therebetween;
(c) disposing a stirrer within said crystallizing vessel, said stirrer being sized, shaped, and positioned to make a flow in one direction inside said draft tube and a flow in the other direction in said outer flow zone;

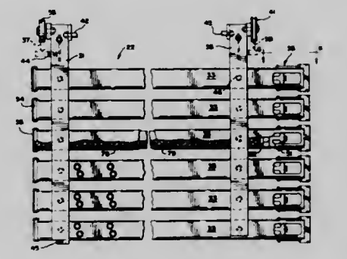
(d) cooling said crystallizing vessel;
(e) introducing wine or grape juice and seed crystals into said crystallizing vessel;
(f) actuating said stirrer to produce:
(i) a flow in one direction inside said draft tube;
(ii) a flow in the other direction in said outer flow zone; and
(iii) a calm section in said crystallizing vessel between the flow over the top of said draft tube and said outlet; and
(g) withdrawing product from said calm section through said outlet as fresh wine or grape juice is introduced through said inlet.

4,891,237

EXPANSION AND COMPRESSION COMPENSATION MECHANISM AND LOAF MOLDING INCORPORATING SAME

John Rabotski, Pardeeville, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Continuation of Ser. No. 166,804, Mar. 3, 1988, abandoned, which is a continuation of Ser. No. 904,150, Sep. 5, 1986, abandoned. This application Sep. 27, 1988, Ser. No. 250,020
Int. Cl.[4] A22C *7/00*; A23P *1/00*
U.S. Cl. 426—513 **23 Claims**



1. A generally tubular loaf mold apparatus adapted for receiving a stuffable food material to be processed for producing a molded loaf food product, the mold apparatus comprising:
an elongated generally hollow and generally tubular body member having a cover member for closing one end of said elongated body member and closing means for closing another end of said elongated body member;
an expansion and contraction compensation mechanism of said closing means, said expansion and contraction compensation mechanism including a plug assembly located within said elongated body member; and
said expansion and contraction compensation mechanism further includes:
biasing means for permitting slidable movement of said plug assembly in one direction in opposition to biasing forces provided by said biasing means and in response to a predetermined force of expansion of stuffable food material while being heated and cooked within the elongated body member,
ratchet means for permitting controlled-increment movement of the plug assembly in said one direction in response to a stuffed food material heating and cooking expansion force generally in excess of said predetermined expansion force, and
said biasing means further is for slidably moving said plug assembly in a direction generally opposite to said one direction in order to compensate for contraction of said food material while being cooled and chilled within the elongated body member.

22. A method for making a molded loaf food product within a system for movably supporting an elongated loaf mold for movement along a path transverse to the longitudinal axis of the elongated loaf mold, said path including a cooking station and a chilling station, the method comprising:
stuffing a stuffable food material within a loaf mold and closing both ends thereof, said closing of one end being with an expansion and contraction compensation mechanism having a plug assembly generally located within the loaf mold;
heating and cooking said stuffable food material within the loaf mold to develop a predetermined expansion force to thereby effect sliding movement of a portion of the plug assembly in one direction in opposition to biasing forces provided by the plug assembly;
permitting further heating and cooking of the stuffable food material within the loaf mold, when carried out, to develop expansion forces in excess of said predetermined expansion force to thereby effect sliding movement of the plug assembly in said one direction in a controlled-increment ratchet-like movement; and
thereafter cooling and chilling said food material within the loaf mold to contract the food material therewithin while substantially simultaneously slidably moving the plug assembly automatically in a direction generally opposite to said one direction in order to compensate for said food material contraction.

4,891,238

PROCESS FOR PRODUCING SWOLLEN FOODS

Toru Kurokawa, Fuchu; Hiroyuki Watanabe, Hachioji; Shoichi Tanaka, Shizuoka, and Fumito Mitsui, Koganei, all of Japan, assignors to Kewpie Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 128,698
Claims priority, application Japan, Jan. 29, 1987, 62-159634
Int. Cl.[4] A21D *2/34*; A23J *3/00*; A23L *1/18*
U.S. Cl. 426—559 **7 Claims**

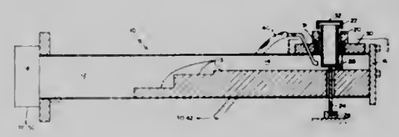
1. A process for producing swollen foods which comprises heating and pressurizing through an extruder a powder comprising eggshell powder having a maximum particle size of 100 μ and a food material predominantly comprising a starchy material or a protein or mixtures thereof and thereafter releasing said powder and food material thereby causing the same to swell.

4,891,239

METHOD AND APPARATUS FOR ULTRAFAST MICROWAVE TISSUE FIXATION

Kenneth W. Dudley, Sudbury; Wesley W. Teich, Wayland, and John S. Skleenk, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 215,168, Jul. 5, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 339,908
Int. Cl.[4] A01G *5/06*; A01N *1/00*; A61N *1/00*; H05B *6/64*
U.S. Cl. 427—4 **36 Claims**



14. The method of fixating tissue in a waveguide having an aperture and a cavity with a first and second section formed therein, said cavity having a transitional section formed between said first and second section, said cavity having an opening at one end and a wall at the other end, comprising the steps of:
placing the tissue to be fixated into a fixation solution in a vial;
placing the vial into said aperture;
providing radio frequency energy into said waveguide such

that substantially uniform E field forms through said vial; and

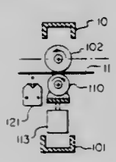
providing a conductive post within said cavity second section adjacent said aperture, said post being positioned between said aperture and said wall.

4,891,240

MICR CHARACTER COATING SYSTEM

Leonard G. Ward, Melbourne; Ronald R. Reidenauer, Palm Bay, and Donald J. Kleinschnitz, Melbourne, all of Fla., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Sep. 6, 1988, Ser. No. 240,932
Int. Cl.[4] B05D *5/08;* **B05C** *9/00, 11/00*
U.S. Cl. 427—11 **21 Claims**



6. Apparatus for producing, on a document that has a length and width, a wear resistant set of MICR characters printed in a predefined area thereon, the length of said predefined area being less than said document length comprising:

means for applying a lubricant coating exclusively to said predefined area on said document containing said printed set of MICR characters;

means for positioning said predefined area of said document containing said printed set of MICR characters opposite said applying means subsequent to the printing of said set of MICR characters thereon;

means for identifying the juxtaposition of said predefined area of said document containing said printed set of MICR characters opposite said applying means; and

applicator means responsive to said identifying means for coating only said predefined area of said document containing said printed set of MICR characters with a lubricant.

20. A method of producing a wear resistant set of MICR characters in an area of predetermined width and length and predetermined location on a document, where said area is of length less than said document, comprising the steps of:

positioning said area opposite a lubricant applicator of width at least equal to the width of said area;

activating said lubricant applicator at the leading edge of said length of said area to apply a lubricant exclusively to said area of render said printed set of MICR characters wear resistant.

4,891,241

METHOD OF INCREASING THE DYNAMICAL STRENGTH OF GLASS CONTAINER

Yutaka Hashimoto, Sakai; Masanobu Yamoto, Izumi; Toshihiko Umeha, Takaishi; Yutaka Kamada; Tsutomu Matsubara, both of Nishinomiya, and Sigeo Kawaguchi, Osaka, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo and Yamamura Glass Co., Ltd., Hyogo, both of, Japan

Filed Apr. 28, 1988, Ser. No. 187,365
Claims priority, application Japan, Apr. 28, 1987, 62-103074
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **17 Claims**

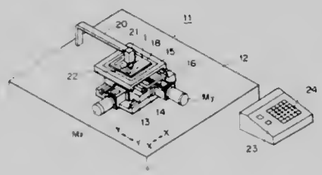
1. A method of increasing the pressure-resistant strength and impact strength of a glass container, which consists essentially of treating the surface of the glass container with a silane coupling agent, applying a coating material consisting essentially of a reactive compound having at least two (meth)acryloyl groups in the molecule to the treated glass container, and subjecting it to irradiation of an activated energy ray to cure the coating material applied.

4,891,242

SUBSTRATE OF A HYBRID IC, METHOD OF FORMING A CIRCUIT PATTERN AND APPARATUS OF FORMING THE SAME

Takatoshi Ito; Akihiro Yoshida; Kazunori Shimazaki, all of Kariya, and Shuzo Hattori, Asa-Musassh, Oaza-Nagakute, Nagakute-cho, Aichi-gun, Aichi-ken, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Shuzo Hattori, Aichi, both of, Japan

Filed Jul. 1, 1987, Ser. No. 68,914
Claims priority, application Japan, Jul. 5, 1986, 61-158185
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 **14 Claims**



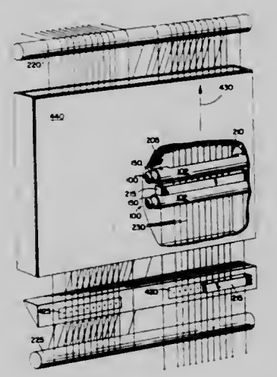
9. A method of forming a circuit pattern, comprising steps of forming a retaining film coated on an IC substrate body, the retaining film enabling a solution including a circuit-element-forming material to permeate therethrough and to be retained thereby at the position at which the solution contacts said film, drawing a predetermined pattern on said substrate using said solution, enabling said solution contacting the retaining film surface to permeate, and baking said substrate, thereby forming a film comprising said circuit-element-forming material on said IC substrate body.

4,891,243

DIE BAR CARRIER

Mohammad F. Zaman, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 947,167, Dec. 29, 1986, Pat. No. 4,773,353.
This application May 31, 1988, Ser. No. 200,487
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—117 **6 Claims**



1. A method for locating at least one threaded die bar within the process path of a filament coating, drying and curing apparatus having movable parallel transport means comprising the steps of:

providing at least two die bar carriers, said die bar carriers comprising:

a sleeving having at least one open end;

at least two transport notches operatively formed in said sleeve;

at least one filament notch operatively positioned therebetween;

at least one rod, operatively positioned within said sleeve, said rod having at least two transport notches corresponding to said sleeve transport notches and at least one filament notch formed therein;

spring means, operatively positioned in said sleeve so that one end thereof contacts said rod, for urging said rod transport notches out of correspondence with said sleeve transport notches;

engaging at least one die bar carrier upon the parallel transport means beneath and at least one die bar carrier above the at least one threaded bar;

moving the parallel transport means until the at least one threaded die bar has reached a suitable location within the process path;

disengaging the die bar carrier beneath the at least one threaded die bar from the parallel transport means by depressing the rod which compresses the spring thereby releasing the die bar carrier from engagement with the transport means; and

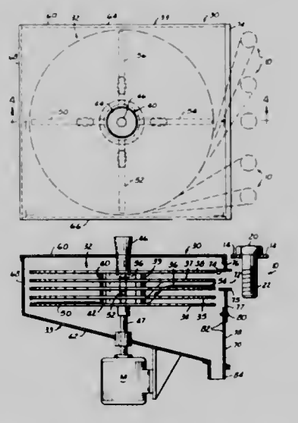
removing the die bar carrier from the process path.

4,891,244

METHOD AND APPARATUS FOR MAKING SELF-LOCKING FASTENERS

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed Feb. 21, 1989, Ser. No. 312,216
Int. Cl.[4] B05C *19/00;* **B05D** *3/00*
U.S. Cl. 427—195 **5 Claims**



1. Apparatus for making locking threaded fasteners having on the threaded surfaces thereof locking patch material formed by an accumulation of fused thermoplastic resin particles applied thereto, comprising means for advancing a series of fasteners along a predetermined patch through a heating zone followed by an application zone, heating means for heating said fasteners while in said heating zone to a temperature sufficient to fuse thermoplastic resin particles received on the threaded surfaces of said fasteners in said application zone, and means for applying a locking patch of fused thermoplastic resin particles on the heated threaded surfaces of said fasteners as they traverse said application zone, said applying means comprising a mechanical propelling device including a slinger adjacent said predetermined path, means supporting said slinger for rotation, means for supplying thermoplastic resin particles in powder form to said slinger, and means for rotating said slinger to propel said thermoplastic resin particles by centrifugal force against the heated threaded surfaces of said fasteners in said application zone, causing those particles which are received on said heated threaded surfaces to melt and fuse and build up into a locking resin patch.

4,891,245

ELECTROPHORETIC DISPLAY PARTICLES AND A PROCESS FOR THEIR PREPARATION

Fortunato J. Micale, Bethlehem, Pa., assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Mar. 21, 1986, Ser. No. 842,608
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[4] B32B *7/02;* **H01B** *1/06*
U.S. Cl. 427—213.3 **10 Claims**

1. A process for producing submicron sized electrophoretic display particles comprising a polymer matrix surrounding a core of solid active ingredient, said process comprising the steps of:

A. Mixing together an organic solvent, a polymer with characteristics of a non-solubilized latex that is soluble in said solvent but substantially insoluble in water and an active ingredient with characteristics of a pigment substantially insoluble in water to form a homogeneous mixture, wherein said solvent is characterized by a vapor pressure higher than water and said miing is continued under conditions which enable said active ingredient to be dispersed homogeneously in said solvent, without appreciable agglomeration; and

B. Adding said solvent/polymer/active ingredient mixture to water, in a concentration range of 1.0% to 50.0% by weight, and dispersing until an emulsion results where solvent/polymer/active ingredient comprises a discontinuous liquid phase with an average droplet size less than 5 microns and water is the continuous phase, wherein said dispersing step is done under conditions of interfacial tension between the organic solvent and the water less than approximately 10 dynes/cm.; and

C. Removing substantially all of said solvent to define an aqueous suspension substantially comprising polymer encapsulated particles of active ingredient with an average diameter less than 2 microns; and

D. Separating out a fraction of said encapsulated particles with a density substantially equivalent to the density of a given electrophoretic carrier fluid.

4,891,246

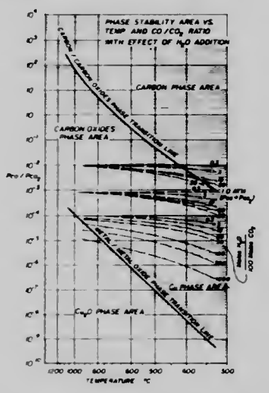
CONTROLLED ATMOSPHERE FIRING PROCESS

Craig S. McEwen, and Noel C. Scrivner, both of Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 918,303, Oct. 14, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,273
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—229 **18 Claims**

1. A process for firing an oxidizable base metal in the presence of a volatilizable organic medium to effect volatilization of the organic medium without substantial oxidation of the metal comprising heating the metal and the organic medium in an atmosphere consisting essentially of CO, CO_2 and from 0.1 to 90 mole % H_2O on basis CO_2, to a temperature above the thermal decomposition temperature of the organic medium and below the melting point of the base metal between the

metal/metal oxide and carbon/carbon oxides phase transition lines of the resultant mixture of the atmospheres with gaseous



produces from decomposition of the organic medium for a time sufficient to volatilize the organic medium therefrom.

4,891,247

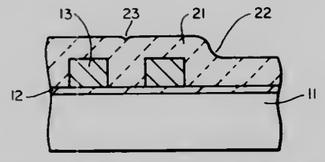
PROCESS FOR BOROSILICATE GLASS FILMS FOR MULTILEVEL METALLIZATION STRUCTURES IN SEMICONDUCTOR DEVICES

Peter C. Shamshoian, Aptos, Calif., assignor to Watkins-Johnson Company, Palo Alto, Calif.

Continuation of Ser. No. 907,503, Sep. 15, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 214,909

Int. Cl.[4] C23C *16/30*

U.S. Cl. 427—255.3 **5 Claims**



1. A process for providing a dielectric layer on a sharply profiled surface of a semiconductor device comprising the steps of elevating the temperature of the device, conveying the device through a deposition chamber, directing silane gas, diborane gas and oxygen into said chamber and on the surface of the heated device where they react and form a borosilicate glass layer on the surface and forming smooth corners in said borosilicate glass layer over said sharply profiled surface of said semiconductor devices.

4,891,248

CATALYST-CONTAINING COATING TO PROMOTE RAPID CURING OF POLYURETHANE LACQUERS

Wayne A. Kraus, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 172,615, Mar. 24, 1988. This application Feb. 13, 1989, Ser. No. 310,185

Int. Cl.[4] B05D *1/36, 7/00, 3/04, 3/10*

U.S. Cl. 427—340 **4 Claims**

1. A process for promoting the rapid curing of a coating of a two component polyurethane lacquer that has been applied to a substrate, said process comprising

(1) coating the polyurethane lacquer while it is in a semi-dry or wet state with a composition consisting essentially of
   a. from about 0.5% to about 20% of a hydroxy functional polymer,
   b. from about 99.4% to about 70% of a solvent for the hydroxy functional polymer, and
   c. from about 0.1% to about 10% of a catalyst for the reaction of hydroxyl groups with isocyanate groups to form urethane linkages, all percentages being by weight based on the total weight of the composition, and
(2) drying the coated polyurethane lacquer.

4,891,249

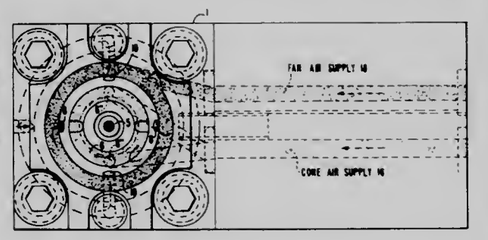
METHOD OF AND APPARATUS FOR SOMEWHAT-TO-HIGHLY VISCOUS FLUID SPRAYING FOR FIBER OR FILAMENT GENERATION, CONTROLLED DROPLET GENERATION, AND COMBINATIONS OF FIBER AND DROPLET GENERATION, INTERMITTENT AND CONTINUOUS, AND FOR AIR-CONTROLLING SPRAY DEPOSITION

Frederic S. McIntyre, Wellesley, Mass., assignor to Acumeter Laboratories, Inc., Marlboro, Mass.

Continuation of Ser. No. 36,254, May 26, 1987, abandoned. This application Mar. 24, 1988, Ser. No. 198,689

Int. Cl.[4] B05D *1/02;* **B05B** *1/02*

U.S. Cl. 427—421 **60 Claims**



1. A method of controlling the generation of somewhat-to-highly viscous fluid fibers, droplets and combinations of the same, that comprises, extrudingly spraying a stream of such pressurized fluid through a fine orifice and along a predetermined direction in free flight, and simultaneously funneling a cone of pressurized air symmetrically about and against said stream, intersecting the same in its free flight below said orifice to control the nature, dimensions and pattern of the resulting fluid coating on surfaces passing said orifice at variable line speeds, the flow rates of both said fluid and said air being adjusted proportionally with the line speed of said surfaces passing the orifice.

4,891,250

ELECTRONIC COMPONENT OPERATING TEMPERATURE INDICATOR

Edward W. Weibe, 215 Magnolia Ave., and Shane S. Truffer, 7698 Briar La., both of Pasadena, Md. 21122

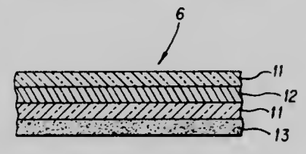
Filed Feb. 17, 1988, Ser. No. 156,842

Int. Cl.[4] C09K *19/00*

U.S. Cl. 428—1 **6 Claims**

1. An electric/electrical component temperature monitoring package, comprising, a layer of nematic crystal material, a layer of transparent material positioned on opposite sides of

said nematic crystal material and in juxtaposition therewith, and an adhesive layer of opaque material positioned adjacent



said lower layer of said transparent material and in juxtaposition therewith.

4,891,251

FLORAL CENTERPIECE CONSTRUCTION

Maria L. Fletcher, P.O. Box 934, Roseburg, Oreg. 97470-0218

Filed Feb. 10, 1989, Ser. No. 308,641

Int. Cl.[4] B32B *5/08;* **B44C** *3/02*

U.S. Cl. 428—7 **6 Claims**



1. A decorative centerpiece comprising in combination,
a mass of matrix material in the general shape of the centerpiece,
a stiffener element embedded in said mass,
a strip of material having a first margin at least partially embedded in said matrix material and an unencumbered margin disposed outwardly from said material,
said mass of matrix material having portions above and below said strip, and
moss partially embedded in said matrix material and concealing same material.

4,891,252

THERMOMETER HOOD ORNAMENT

Elmar Kaiser, Jr., 6 Route de Meyrin - CH 1202, Geneva, Switzerland

Continuation-in-part of Ser. No. 100,898, Sep. 25, 1987, Pat. No. 4,783,352. This application Jul. 26, 1988, Ser. No. 224,330

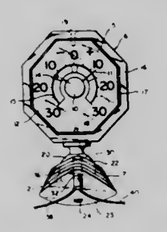
Claims priority, application World Int. Prop. O., Oct. 6, 1987, DM/009416

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] B60R *13/04*

U.S. Cl. 428—31 **23 Claims**

1. A thermometer for showing the driver of an automobile the outside temperature, said thermometer comprising:
a case including measuring means for measuring air temperature and a temperature dial display,
a support including a frame surrounding said case and a pedestal located below said frame,
means for supporting and separating said case from said frame to form a gap for permitting passage of air therebetween and to impede transmission of heat between said frame and said case, said means pivotably mounting said case with respect to said frame for rotation of said case,
fastening means for fastening said case onto the exterior of a hood of an automobile, said fastening means including a base having a flat lowermost surface equipped to be fastened onto the exterior of the automobile, and said pedestal being movably mounted on said base so that said case is movable to an erect position with respect to said lower surface and for movement to prevent damage in the event of a shock, and



illumination means for illuminating said case so as to light up said temperature dial.

4,891,253

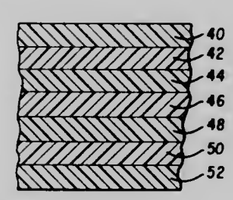
MOISTURE BARRIER MEDICAL FILM

Walter B. Mueller, Inman, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Nov. 17, 1988, Ser. No. 273,386

Int. Cl.[4] B29D *22/00*

U.S. Cl. 428—35.2 **11 Claims**



1. A flexible film comprising:
(a) a core layer of high density polyethylene;
(b) two intermediate layers, each layer bonded to a respective surface of the core layer, and comprising very low density polyethylene;
(c) an outer layer comprising an ethylene propylene copolymer or flexible copolyester;
(d) a sealant layer comprising a heat sealable polymeric material; and
(e) two polymeric adhesive layers, each layer disposed between and bonding an intermediate layer to the outer and sealant layers respectively.

4,891,254

ARTICLE WITH EMBEDDED OPTICALLY-READABLE IDENTIFICATION MEANS AND METHOD FOR MAKING SAME

James S. Bianco, 217 Brainard Rd., Enfield, Conn. 06082

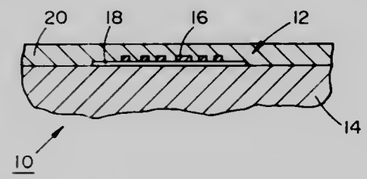
Filed Jun. 17, 1988, Ser. No. 208,088

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—78 **14 Claims**

1. An article having embedded therein optically-readable identification means, comprising:
(a) a base member, said base member having a surface;
(b) identification means disposed upon a high-temperature-resistant polymeric carrier substrate;
(c) said carrier substrate being disposed upon said surface; and

(d) an integral protective layer disposed upon said surface, said protective layer covering at least said identification



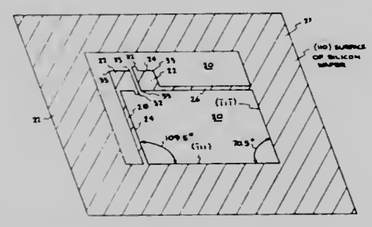
means to embed said identification means within said aritcle.

4,891,255

(110) ORIENTED SILICON WAFER LATCH ACCELEROMETER AND PROCESS FOR FORMING THE SAME

Dino R. Ciarlo, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1988, Ser. No. 250,591
Int. Cl.[4] B32B *3/10;* **G01P** *15/00;* **H01L** *21/306;* **B44C** *1/22*
U.S. Cl. 428—131 **20 Claims**



1. An apparatus, comprising:
a (110) silicon wafer with a thickness, comprising:
a frame;
a first cantilever beam, with a first end attached to the frame and a second end, which is a free end which is not attached to the frame, and with a length dimension from the first end to the second end, and a thickness, wherein the length and the thickness are substantially parallel to the (110) plane, and a width substantially perpendicular to the (110) plane and substantially equal to the thickness of the wafer;
a second cantilever beam, with a first end attached to the frame and a second end, which is a free end which is not attached to the frame, and with a length dimension from the first end to the second end, and a thickness, wherein the length and the thickness are substantially parallel to the (110) plane, and a width substantially perpendicular to the (110) plane and substantially equal to the thickness of the wafer, and where the length of the first cantilever forms an angle with the length of the second cantilever, where the value of the angle is substantially 70.5° or 109.5°.

4,891,256

WRAPAROUND CLOSURE DEVICE AND A METHOD OF MAKING SAME

Joseph S. Kite, III, Glenmore, Pa.; Thomas B. Conaghan, III, Rockhall, Md.; John P. Cattell, Coatesville, and Richard B. Develin, Plymouth Meeting, both of Pa., assignors to The Bentley-Harris Manufacturing Co., Lionville, Pa.

Filed Apr. 26, 1983, Ser. No. 488,862
Int. Cl.[4] H01D *3/06*
U.S. Cl. 428—36.1 **4 Claims**

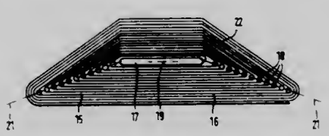
1. A method of making a closure device, comprising the steps of:
forming an axially compressible, radially expansible elongate tubular member from braided fibers of engineering plastics;
adjusting the tubular member to of the desired radius;
connecting a fastening means to the tubular member axially along its length, the fastening means being capable of being selectively axially opened along its length; and
after connecting the fastening means, splitting the tubular member axially along a line adjacent to the opening in the fastening means.

4,891,257

CARRIER MATRIX, PARTICULARLY FOR A CATALYTIC REACTOR FOR THE EXHAUST EMISSION CONTROL IN THE CASE OF INTERNAL-COMBUSTION ENGINES

Bohumil Humpolik, Ludwidgsbrug, and Josef Mielke, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Suedeutsche & Koehlerfabrik Julius Fr. Behr GmbH, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 905,590
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532408
Int. Cl.[4] B01J *35/04;* **B21D** *53/00;* **F01N** *3/28*
U.S. Cl. 428—592 **37 Claims**



1. A catalytic converter carrier matrix arrangement for exhaust emission control in internal combustion engines comprising:
carrier strip means wound into winding layers with adjacent layers abutting one another to form a carrier matrix, said carrier strip means including undulations which serve to space adjacent winding layers from one another and provide exhaust gas flow accommodating openings which extend transversely of the carrier strip means,
wherein said carrier strip means are wound with a plurality of deflections in each winding layer to form said carrier matrix into a geometric shape with at least one non-curvilinear side, whereby said carrier matrix can be inserted in corresponding geometric shape sheath means.

4,891,258

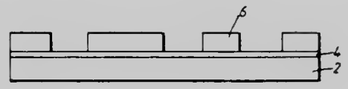
STRETCHABLE ABSORBENT COMPOSITE

Anne M. Fahrenkrug, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 22, 1987, Ser. No. 137,291
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—138 **30 Claims**

1. An absorbent composite comprising:
(a) a first layer;
(b) a second layer;

(c) an absorbent positioned between said first and second layers; and
(d) an elastic layer positioned between said first layer and said absorbent, said elastic layer being resiliently stretchable in at least one direction from about 25% to 80% of an



initial unstretched length with an elastic recovery of at least 10%, said elastic layer being bonded to both said first layer and said absorbent in at least a partially stretched condition wherein rugosities are formed in a substantial portion of both said absorbent and said first layer when said elastic layer is relaxed.

4,891,259

MULTILAYER SYSTEMS AND THEIR METHOD OF PRODUCTION

Peter L. Moran, 21 Windermere Drive, Alderley Edge, Cheshire SK8 7UP, United Kingdom

Continuation of Ser. No. 897,503, Aug. 18, 1986, abandoned, Division of Ser. No. 756,818, Jul. 18, 1985, Pat. No. 4,657,778. This application May 12, 1988, Ser. No. 195,348
Claims priority, application United Kingdom, Aug. 1, 1984, 8419649; Oct. 31, 1984, 8427578
Int. Cl.[4] B22B *3/00*
U.S. Cl. 428—209 **11 Claims**

1. An electrical device comprising a multilayer structure, said multilayer structure comprising:
a substrate having at least one surface composed of an electrically insulating material;
a solid pattern of electrically conductive material bonded to said surface, the surface only of the pattern being superficially oxidised; and
a coating of an air firing glassy insulator fused both on said superficially oxidised surface of the pattern and on that part of said substrate surface not bonded to said pattern.

4,891,260

MULTILAYER FLEXIBLE TRANSFER RIBBON

Ernst Kunkel, Hanover; Petra Bubolz, Garbsen; Wolfhard Rutz, and Sigo Muschter, both of Hanover, all of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,858
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3741022
Int. Cl.[4] B32B *7/06*
U.S. Cl. 428—220 **11 Claims**

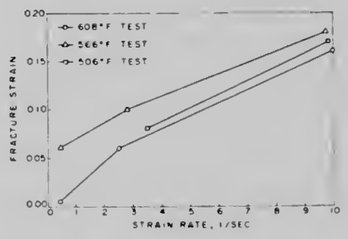
1. A multilayer flexible transfer ribbon for transferring a cover material to a substrate upon contact therewith, said ribbon comprising:
a flexible carrier-foil strip;
a synthetic-resin bonded cover layer containing said cover material and bonded to said flexible carrier-foil strip; and
an adhesive layer of an elastic, tacky pressure-contact adhesive on said synthetic-resin-bonded cover layer and bonded thereto with a bonding force greater than a bonding force bonding said synthetic-resin-bonded cover layer to said carrier-foil strip whereby, upon application of said ribbon to a substrate, said adhesive layer retains said cover layer thereon while said carrier-foil strip is drawn away, thereby covering an area of said substrate with said cover material, said adhesive layer being an organic polymer selected from the group consisting of rubber, polyvinylether, polyvinylisobutylene, acrylate-based polymer and mixtures thereof, and wherein said adhesive layer and said cover layer have relative thicknesses in a ratio of about 1:6 to about 1:12.

4,891,261

THERMOPLASTIC STOCK SHAPE AND METHOD FOR MAKING THE SAME

Mohammad A. Zaidi, Monroeville, and Leo A. Vivola, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 29, 1988, Ser. No. 161,526
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—220 **15 Claims**



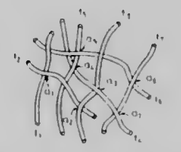
1. An extruded shape having substantially uniform tensile strength properties in its surface and core regions, having a cross-sectional region with minimum dimensions of about 0.5 inch and having substantial internal fibrousness, said stock shape comprising a liquid crystal polymer having a crystallization temperature above about 500° F.

4,891,262

HIGH STRENGTH WET-LAID NONWOVEN FABRIC AND PROCESS FOR PRODUCING SAME

Kenji Nakamae, and Tsukasa Shima, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Dec. 12, 1988, Ser. No. 282,645
Claims priority, application Japan, Dec. 16, 1987, 62-316091
Int. Cl.[4] D04H *1/46*
U.S. Cl. 428—224 **7 Claims**



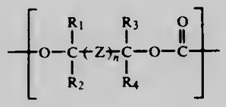
1. A high strength wet-laid nonwoven fabric composed of staple fibers having a single fiber diameter D of from 7 μm to 25 μm and a ratio L/D between a fiber length L and the single

fiber diameter D of from 0.8×10^3 to 2.0×10^3, said staple fibers being entangled in a three-dimensioned state.

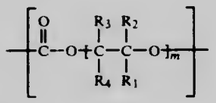
4,891,263
POLYCARBONATE RANDOM COPOLYMER-BASED FIBER COMPOSITIONS AND METHOD OF MELT-SPINNING SAME AND DEVICE
Abraham M. Kotliar, Westfield; William J. Boyle, Jr., Deaville; Reginald T. Tung, Warren; Frank Mares, Whippany; Kundubhai M. Patel, Landing, and Tin-Ho Chiu, Millburn, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Dec. 17, 1987, Ser. No. 134,321
Int. Cl.[4] C08G *63/64, 63/62*
U.S. Cl. 428—225 **43 Claims**

1. A copolymer of fiber forming molecular weight comprising as a major component one or more recurring monomeric units selected from the group consisting of recurring monomeric units of the following General Structure I and Structure II:

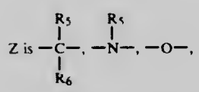
Structure I



Structure II



wherein:



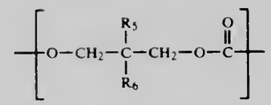
combination thereof, where Z is selected such that there are no adjacent heteroatoms;

n and m are the same or different at each occurrence and are integers from about 1 to 8; and

R_1, R_2, R_3, and R_4 are the same or different at each occurrence and are hydrogen, aryloxyalkyl, alkoxyaryl, aryloxyaryl, arylalkyl, alkylarylalkyl, arylalkylaryl, alkylaryl, arylcarbonylalkyl, aryloxyalkyl, alkyl, aryl, alkylcarbonylalkyl, cycloalkyl, arylcarbonylarly, alkylcarbonylaryl, alkoxyalkyl, or phenyl or alkyl substituted with one or more biologically compatible substituents;

R_5 and R_6 are the same or different and are R_1, R_2, R_3 R_4, dialkylamino, diarylamino, alkylarylamino, alkoxy, aryloxy, alkanoyl, or arylcarbonyl; or any two of R_1 to R_6 together can form an alkylene chain completing a 3, 4, 5, 6, 7, 8 or 9 membered alicyclic, spiro, bicyclic and/or tricyclic ring system, which system may optionally include one or more non-adjacent carbonyl, oxa, alkylaza or arylaza groups; with the proviso that at least one of R_1 to R_6 is other than hydrogen; wherein the amount of said major component in said copolymer is at least about 77.4% by weight based on the total weight of recurring monomeric units in said copolymer.

26. A bioresorbable fiber forming copolymer comprising as a major component one or more recurring monomeric units of the formula:



wherein:

R_5 and R_6 are the same or different and are hydrogen or alkyl having from 1 to about 7 carbon atoms;

wherein the amount of said major component in said copolymer is at least about 77.4% by weight based on the total weight of recurring monomeric units in the copolymer.

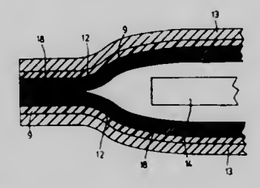
4,891,264
ELECTROCONDUCTIVE THERMOPLASTIC RESIN SHEET
Takashi Daimon; Hideshi Sakamoto, and Osamu Akimoto, all of Ichiharashi, Japan, assignors to Chisso Corporation, Japan
Filed Dec. 15, 1988, Ser. No. 284,726
Claims priority, application Japan, Jan. 5, 1988, 63-542; Jan. 11, 1988, 63-3515
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—246 **8 Claims**

1. An electroconductive thermoplastic resin sheet comprising a thermoplastic resin film;

a non-woven fabric consisting of hot-melt-adhesive fibers and electroconductive fibers irregularly entangled with each other and applied and integrally melt-adhered onto one surface or both the surfaces of said film and then subjected to surface treatment; and

a coating having a curing composition composed mainly of an unsaturated resin and a reactive diluent applied onto the treated surface and crosslinked and cured and having a coating thickness of 1 to 10 μm.

4,891,265
PACKAGED SHEET FOR CLEANING FACSIMILE MACHINES
William N. Samagalsky, Toronto, Canada, assignor to XLNOW Trading Corporation, Toronto, Canada
Filed Nov. 15, 1988, Ser. No. 271,510
Int. Cl.[4] D04H *1/08*
U.S. Cl. 428—280 **7 Claims**



1. Individually packaged sheet material for cleaning facsimile machine conveyer rollers for either transmitted copy or received copy, said packaged sheet material comprising a single planar, felted mat sheet impregnated with an amount of cleaning fluid and having stiffness whereby it is adapted to be passed volatization thereof, and once the package is opened the cleansing sheet therein should be used immediately because there is a predetermined amount of cleaning fluid impregnated in the sheet material, and that cleaning fluid is volatile.

4,891,266
SCULPTING MATERIAL AND METHOD OF MANUFACTURE AND USE
Barry Keith, 355 Summit St., Lebanon, Ohio 45036
Filed Oct. 15, 1987, Ser. No. 108,465
Int. Cl.[4] G09B *11/00;* **C08K** *9/00;* **B32B** *5/16*
U.S. Cl. 428—331 **20 Claims**

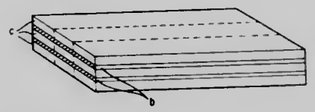


1. A dry, three-dimensional, sculptable solid comprising:

(a) a quantity of granular material comprising grains individually coated with paint; and

(b) water-resistant binder binding the grains of the granular material together into a solid, dry, carvable block having a hardness between about 0.25 and about 4.0 on the Moh's scale.

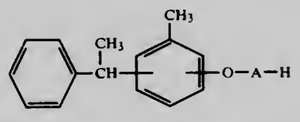
4,891,267
CARBON FIBER CORD FOR RUBBER REINFORCEMENT AND PROCESS FOR PRODUCING THE SAME
Shuji Takahashi; Yasuo Suzuki, both of Kanagawa; Hiroyasu Ogawa, and Kazuhiro Ichimaru, both of Shizuoka, all of Japan, assignors to Toho Rayon Co., Ltd. and The Yokohama Rubber Co., Ltd., both of Tokyo, Japan
Filed Dec. 16, 1986, Ser. No. 942,335
Claims priority, application Japan, Dec. 16, 1985, 61-280984; Dec. 16, 1985, 61-280985; Dec. 24, 1985, 61-289305; Dec. 24, 1985, 61-289307; Dec. 24, 1985, 61-289308
Int. Cl.[4] B32B *9/00;* **D02G** *3/00*
U.S. Cl. 428—367 **18 Claims**



1. A carbon fiber cord for rubber reinforcement, comprising (A) a bundle of carbon fibers having coated thereon from 0.1 to 1% by weight based on the weight of the carbon fibers of at least one epoxy resin composition, and (B) a phenol-formalin-rubber latex type adhesive for rubber impregnated within said carbon fiber bundle in an amount of from 10 to 30% by weight based on the weight of the carbon fiber bundle, and wherein the amount of adhesive on the peripheral portion of the cord is from 10 to 30 wt % based on the total amount of adhesive,

said epoxy resin composition being selected from the group consisting of

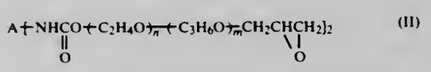
(I) a composition comprising an epoxy resin and from 5 to 20% by weight, based on the weight of the solid components in the composition, of a compound having alkylene oxide moieties represented by formula (I)



(I)

wherein A represents $—C_2H_4O)_l$ or $—C_2H_4O)_n(C_3H_6O)_m$, wherein l and n each represents an integer of from 18 to 50, m represents an integer of from 1 to 50, and n/m is from 1 to 25,

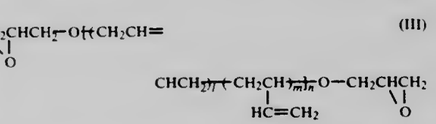
(2) a composition comprising a urethane-modified epoxy resin represented by formula (II)



(II)

wherein A represents an aliphatic or aromatic hydrocarbon group, m and n each represents O or an integer of 1 or more, and the sum of n and m is from 1 to 10, and

(3) a composition comprising polybutadiene epoxide resin containing a glycidyl group and having an epoxy equivalent of from 1,000 to 2,000, which is represented by formula (III)



(III)

wherein n represents an integer of from 4 to 22, and l/m is from 2.3 to 9.

4,891,268
COATED METAL SUBSTRATES WITH ANTICORROSION COATING COMPOSITION
Michel Fourez, Montstnire; Michel Louca, Rantilly, and Patrick Pichant, Avilly, all of France, assignors to Metal Coatings International Inc., Chardon, Ohio
Division of Ser. No. 22,818, Mar. 6, 1987, Pat. No. 4,799,959, which is a continuation-in-part of Ser. No. 715,009, Mar. 22, 1985, abandoned. This application Oct. 27, 1988, Ser. No. 263,393
Int. Cl.[4] B32B *15/04, 15/08;* **C09B** *9/02*
U.S. Cl. 428—421 **6 Claims**

1. A coated metal substrate protected against corrosion with a lubricious coating which, exclusive of lubricant, is resin-free and phosphate free, which coating contains metal in particulate form plus lubricant, with said coating being established from heat cured aqueous coating composition containing hexavalent-chromium-providing component, said particulate metal, organic liquid vehicle and less than about 10 percent by volume for said coating of said lubricant which is solid at the temperature of use of the substrate.

3. The coated metal substrate of claim 1, wherein said coating composition contains molybdenum disulfide, graphite, fluorinated polymer or their mixtures as solid lubricant.

4,891,269
BONDING METHOD EMPLOYING THERMALLY STABLE HOT MELT MOISTURE-CURE POLYURETHANE ADHESIVE COMPOSITION
Virginia C. Markevka, Maplewood; Sandra J. Mackey, St. Paul, and William L. Bunnelle, Stillwater, all of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.
Division of Ser. No. 823,608, Jan. 29, 1986, Pat. No. 4,775,719. This application Mar. 7, 1988, Ser. No. 164,588
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—423 **12 Claims**

1. A method of joining at least two substrates, which comprises:

(a) forming an assembly comprising at least two substrates having therebetween a sufficient bonding amount of an adhesive having both hot melt and thermosetting urethane properties; and

(b) curing the adhesive; wherein the adhesive comprises:

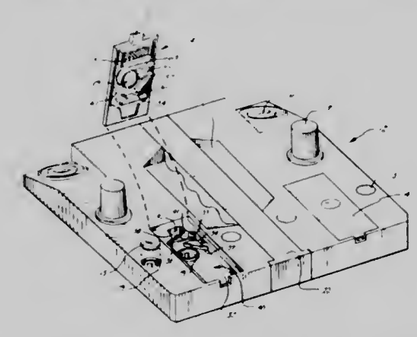
(i) an effective film-forming amount of thermoplastic ethylene-vinyl monomer copolymer base wherein the vinyl monomer comprises an acrylate monomer or a vinyl ester of a carboxylic acid compound;
(ii) an effective bonding amount of a liquid polyurethane prepolymer composition having a viscosity of less than 25,000 cP at 25° C. comprising the reaction product of a polyfunctional hydroxy compound having a number of average molecular weight of at least 1,000 and a polyfunctional isocyanate compound having an isocyanate functionality of about two or more, at a ratio of hydroxyl to isocyanate of 0.1 to 0.7:1, sufficient to form a rigid moisture cure bond;
(iii) a phenol-free polymeric tackifier composition comprising the polymerization product of aromatic monomers, aliphatic monomers, or mixtures thereof, said aromatic monomers being selected from the group consisting of an indene monomer, a styrene monomer, or a dicyclopentadiene monomer, said aliphatic monomer comprising a C_5 diene; and
(iv) about 0 to 5 wt-% of an antioxidant.

4,891,270

PRESSURE RELEASE SYSTEM FOR ELECTRIC STORAGE BATTERIES

Joseph J. Jergl, Minneapolis, and William H. Kump, Mendota Heights, both of Minn., assignors to GNB Incorporated, Mendota Heights, Minn.

Division of Ser. No. 770,945, Aug. 30, 1985, Pat. No. 4,613,550. This application Apr. 28, 1986, Ser. No. 856,254
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.[4] H01M *2/12*
U.S. Cl. 429—53 **5 Claims**



1. A recombinant, multi-cell, lead-acid electric storage battery comprising a container, a cover assembly, one or more partition walls dividing the space within the container and cover assembly into two or more cells, and a pressure release system, which pressure release system comprises:
(a) one or more manifolding apertures in one or more of said partition walls, which apertures are of a size which allows passage of gases and minimizes passage of electrolyte and which define one or more sets of manifolded cells;
(b) a single trapping chamber associated with each set of manifolded cells;
(c) a pressure release valve between each set of manifolded cells and its respective trapping chamber; and
(d) a single exhaust port associated with each of said trapping chambers, which exhaust ports allow passage of gas from said trapping chambers to the ambient.

4,891,271

BILAYER WINDSHIELD AND PREFORMED TWO-PLY SHEET FOR USE THEREIN

Jean L. Bravet; Daniel Colmon, both of Thourotte; Gerard Daude, Villeneuve d Oron, and Michel J. Moncheaux, Compiegne, all of France, assignors to Saint-Gobain Vitrage, Paris, France

Continuation of Ser. No. 33,873, Apr. 2, 1987, Pat. No. 4,784,916, which is a continuation of Ser. No. 629,370, Jul. 10, 1989, abandoned. This application Aug. 25, 1988, Ser. No. 236,240
Claims priority, application France, Jul. 11, 1983, 83 11506; Jul. 11, 1983, 83 11507; Jul. 11, 1983, 83 11508
Int. Cl.[4] B32B *17/10, 27/40*
U.S. Cl. 428—423.1 **3 Claims**

1. A preformed flexible multi-ply transparent sheet, effective for use in a bilayer glazing laminate, having optical, moisture-resistant, and energy-absorbent properties effective for use in a bilayer glazing laminate, one ply which comprises a self-healing thermosetting polymeric material, the other ply which comprises an energy-absorbing polyurethane ply which is substantially non-tacky at room temperature but which is capable of being adhesive under the influence of heat and pressure, wherein said sheet is capable of maintaining, in the absence of an adhesion promoter, effective adhesion as measured by the temperature and moisture conditions of ANSI-Z26 test nos. 3 and 4, said energy-absorbing polyurethane being prepared by reactive casting a solvent-free mixture of monomers; and wherein said multi-ply transparent sheet is produced by:
(1) depositing on a horizontal support a liquid film comprising a solvent-free mixture of monomers capable of forming a thermosetting polymeric material;
(2) forming a solid film of said thermosetting polymeric material by polymerizing the monomers while on said support;
(3) depositing on said supported film a liquid film comprising:
(a) an aliphatic or a cycloaliphatic diisocyanate,
(b) a polyol component including:
(i) about 30 to about 45 OH equivalent percent of a polymeric diol having a molecular weight of about 500 to about 3,000;
(ii) about 20 to about 70 OH equivalent percent of a chain extender diol having a molecular weight of less than about 300, the molar ratio of said polymeric diol (i) to said chain extender diol (ii) being about 0.3:1 to about 1:1, and
(iii) about 0.05 to about 35 OH equivalent percent of a polyol having an OH functionality greater than 2, the molar ratio of said polymeric diol (i) to said polyol (iii) being about 1.5:1 to 4:1; and
(c) a polyurethane catalyst,
wherein the NCO/OH ratio of said mixture is about 0.8:1 to about 1:1;
(4) forming a solid, optical, energy-absorbing overlaid polyurethane ply within about an hour, thereby forming said multi-ply sheets; and
(5) removing said multi-ply sheet from said support.

4,891,272

WATERPROOFING MEMBRANES BASED ON BITUMEN

Vittorio Ciaccia, Ferrara, Italy, assignor to Ausimont S.r.l., Milan, Italy

Filed Apr. 5, 1989, Ser. No. 333,231
Claims priority, application Italy, Apr. 7, 1988, 20112 A/88
Int. Cl.[4] B32B *11/00, 27/08*
U.S. Cl. 428—489 **3 Claims**

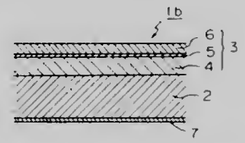
1. Waterproofing sheets or membranes formed by, or comprising a sheet of a vulcanized elastomeric ethylene/propylene copolymer or ethylene/propylene/diene terpolymer enclosed to form a structure of sandwich type between two layers, or surfaces, of a bituminous composition selected from:
(1) compositions comprising by weight:
(A) from 60 to 90% of bitumen
(B) from 3.5 to 20% of elastomeric ethylene/propylene copolymer or ethylene/propylene/diene terpolymer containing from 30 to 45% by weight of combined propylene and from 0 to 10% by weight of a combined diene monomer, and having a Mooney |ML (1+4) at 100° C.| viscosity higher than 5
(C) from 3 to 12% of polyethylene having a density comprised between 0.96 and 0.98 g/cm^3, a M.I. greater than 5, and optionally containing up to 10% by weight of copolymerized propylene units
(D) from 1.5 to 10% of ethylene-vinylacetate copolymer containing from 60 to 95% by weight of ethylene, and having a M.I. higher than 0.1
(E) from 0 to 10% of isotactic polypropylene having M.I. greater than 1
(F) from 0 to 20% of inorganic filler
(2) compositions comprising by weight:
(A) from 60 to 90% of bitumen
(B) from 40 to 10% of a styrene/butadiene elastomeric copolymer
(C) from 0 to 20% of amorphous polypropylene
(D) from 0 to 20% of inorganic filler

4,891,273

MULTIPLE COATED COMPOSITE STEEL STRIP

Hisao Odashima; Yoshihiko Hirano, and Teruyoshi Hiraoka, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,375
Claims priority, application Japan, May 18, 1987, 62-120531
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—623 **14 Claims**



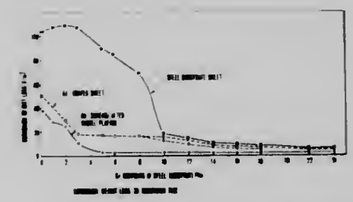
9. A multiple coated composite steel strip, comprising:
(A) a substrate consisting of a steel strip;
(B) a composite coating layer formed on a surface of the steel strip substrate, and comprising;
(a) a first coating layer formed on the surface of the steel strip substrate and comprising a plated metallic material,
(b) a second coating layer formed on the first coating layer and comprising an electrolytically deposited chromate material having a total content of chromium of 40 to 120 mg/m^2 and a content of Cr_2O_3 of 45% by weight or more; and
(c) a third coating layer formed in a thickness of 0.5 to 3.0 um on the second coating layer, and comprising a polymeric matrix consisting essentially of at least one copolymer selected from the group consisting of copolymers of 70 to 95 molar % of at least one type of olefin having 2 to 6 carbon atoms with the balance consisting of acrylic acid, and 15% to 40%, based on the weight of the polymeric matrix, of colloidal silica particles having a size of 1 to 12 m μm; and
(C) an additional electrolytically deposited chromate layer formed on the other surface of the steel strip substrate and having a total content of chromium of 6 mg/m^2 or less and a content of Cr_2O_3 of 45% by weight or more.

4,891,274

HOT-DIP ALUMINUM COATED STEEL SHEET HAVING EXCELLENT CORROSION RESISTANCE AND HEAT RESISTANCE

Seijun Higuchi; Kenichi Asakawa; Takayuki Obmori; Koji Umeno; Nobuyoshi Okada; Minoru Fujisaga; Fumio Yamamoto, all of Kitakyushu, and Katsuhiko Yabe, Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 927,708
Claims priority, application Japan, Feb. 13, 1986, 61-27884
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—653 **11 Claims**



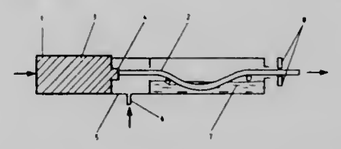
1. A hot-dip aluminum coated steel sheet having excellent corrosion resistance and heat resistance, comprising a steel substrate consisting essentially of 3 to 18% chromium, not more than 0.02% carbon, 0.1 to 1.5% manganese, 0.005 to 0.08% aluminum, not more than 0.1% silicon, and 0.005 to 0.003% B with the balance being iron and unavoidable impurities, and an aluminum coating on said sheet substrate.

4,891,275

ALUMINUM SHAPES COATED WITH BRAZING MATERIAL AND PROCESS OF COATING

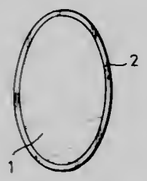
Richard Knoll, Cocoa Beach, Fla., assignor to Norsk Hydro a.s., Oslo, Norway

Continuation of Ser. No. 570,845, Jan. 16, 1984, Pat. No. 4,615,952, Continuation-in-part of Ser. No. 437,884, Oct. 29, 1982, abandoned. This application Jun. 27, 1986, Ser. No. 879,581
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.[4] F28F *21/08*; C23C *2/00*; B23K *1/20*
U.S. Cl. 428—650 **10 Claims**



1. A composite shape suitable for use in the manufacture of heat exchangers, said shape comprising an aluminum or aluminum alloy core formed by a process in which the surface of the core which is formed is substantially free of oxide, and an outer layer of fluxless soldering material of zinc or zinc base alloy which has been deposited on the said aluminum core in a thickness sufficient for acting as a fluxless solder in a subsequent operation of joining the core to another member, the deposition having been carried out with the soldering material in a molten state while the metal of the core is in a nascent state such that a portion only of the soldering material which is toward the core surface is diffused into the aluminum core, thereby interbonding the soldering material to the aluminum core.

4,891,276
ARTICLE OF JEWELRY OF PLATINUM AND FINE GOLD
Ursula Exner, Batenwall 113, 4426 Vreden, Fed. Rep. of Germany
Continuation of Ser. No. 482,625, Apr. 6, 1983, abandoned. This application Oct. 24, 1984, Ser. No. 664,925
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213543
Int. Cl.[4] B32B *15/01*
U.S. Cl. 428—670 **5 Claims**



1. An article of jewelry of platinum and fine gold, the platinum and fine gold connected by applying the fine gold in the solid state on the platinum and heating the fine gold to its melting temperature, wherein the improvement comprises the the article of jewelry comprises and area portion of a single thin sheet of fine gold having a circumferential outer edge, at least one platinum reinforcement bordering said outer edge so as to surround and reinforce said area portions of said sheet of fine gold, and an internal platinum reinforcement arranged spaced from said outer edge within said sheet of fine gold.

4,891,277
PHOSPHOR, AND RADIATION IMAGE STORAGE PANEL
Takashi Nakamura, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 11, 1986, Ser. No. 850,689
Claims priority, application Japan, Apr. 12, 1985, 60-78153; Apr. 12, 1985, 60-78154
Int. Cl.[4] C09K *11/61*
U.S. Cl. 428—691 **10 Claims**

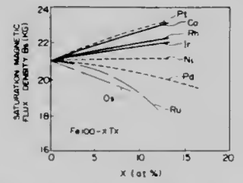
1. A divalent europium activated complex halide phosphor having the formula (I):

$$M^{II}X_2 \cdot aM^{I}X' : xEu^{2+} \quad (I)$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; M^{I} is at least one alkali metal selected from the group consisting of Li, Rb and Cs; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I; and a and x are numbers satisfying the conditions of $0.1 \leqq a \leqq 20.0$ and $0 < x \leqq 0.2$, respectively.

4,891,278
FERRROMAGNETIC THIN FILM AND MAGNETIC HEAD USING IT
Shigekazu Otomo, Sayama; Ryoichi Nakatani, Akigawa; Noriyuki Kumasaka, Ome; Noritoshi Saito; Toshio Kobayashi, both of Tokyo, and Masahiko Fujishiro, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 19, 1987, Ser. No. 16,402
Claims priority, application Japan, Feb. 21, 1986, 61-35146; Mar. 28, 1986, 61-68325
Int. Cl.[4] G11B *5/127*
U.S. Cl. 428—681 **25 Claims**

1. A ferromagnetic thin film having a high saturation magnetic flux density of not less than 18 KG, a magnetostriction constant close to zero, excellent corrosion resistance, and containing Fe as a main component and at least one additive element selected from the group consisting of Co, Ni, Ru, Rh, Pd, Os, Ir and Pt, in which the total content of said at least one



additive element is not less than 0.1 at%, and additive contents a, b, c, d, e, f, g and h (at%) respectively of said Co, Ni, Ru, Rh, Pd, Os, Ir and Pt satisfy

$$\frac{a}{4} + \frac{b}{3.5} + \frac{c}{10} + \frac{d}{7} + \frac{e}{13} + \frac{f}{11} + \frac{g}{8} + \frac{h}{2.5} < 1.$$

4,891,279
FUEL CELL PLATE SEPARATOR
Louis A. Joó, Johnson City; Kenneth W. Tucker, Elizabethton, and Jay R. Shaner, Johnson City, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.
Continuation of Ser. No. 878,905, Jun. 26, 1986, abandoned, Division of Ser. No. 723,419, Apr. 15, 1985, Pat. No. 4,611,396. This application Apr. 11, 1988, Ser. No. 183,303
Int. Cl.[4] H01M *4/96;* **C25B** *11/12*
U.S. Cl. 429—40 **5 Claims**

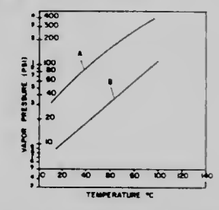
1. An integral monolithic porous graphite electrode having a differential porosity by volume increasing from the perimeter inward to the center of said electrode, wherein the base raw material is a cellulosic filter paper with a nominal thickness of from 0.5 to 5 mm. impregnated with the residue of a low coke yield impregnant, and wherein the edge of the electrode is impregnated with the residue of a medium to high coke yield impregnant in an amount effective to reduce the porosity by volume at the perimeter of the electrode to less than about 30%.

4,891,280
CATHODE FOR MOLTEN CARBONATE FUEL CELL
Thomas D. Kaun, New Lenox, and Franklin C. Mrazek, Hickory Hills, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Apr. 25, 1986, Ser. No. 855,548
Int. Cl.[4] H07M *4/86, 8/14*
U.S. Cl. 429—41 **13 Claims**



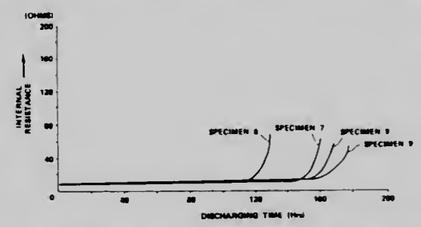
1. A porous sintered cathode useful for a molten carbonate fuel cell comprising a sintered mixture and electrolyte, said sintered mixture being of a first particulate material slightly soluble in the electrolyte present in the molten carbonate fuel and a second particulate material insoluble in the electrolyte present in the molten carbonate fuel cell, said first material forming a skeletal structure coated by particles of said second material, said first and second particulate materials initially having average diameters not greater than about 10 microns, said sintered mixture having a porosity in the range of from about 60% to about 70% by volume at steady-state cell operating conditions and including macro-pores in the range of from about 25 to about 50 microns and micro-pores of about 0.1 microns.

4,891,281
ELECTROCHEMICAL CELLS HAVING LOW VAPOR PRESSURE COMPLEXED SO_2 ELECTROLYTES
Han C. Kuo, Burlington, and Donald L. Foster, Somerville, both of Mass., assignors to Duracell Inc., Bethel, Conn.
Continuation of Ser. No. 405,980, Aug. 9, 1982, abandoned. This application Feb. 13, 1986, Ser. No. 830,231
Int. Cl.[4] H01M *4/36, 6/14*
U.S. Cl. 429—105 **12 Claims**



1. A non-aqueous, electrochemical cell having an active metal anode, a solid active cathode and a liquid electrolyte characterized in that said electrolyte consists essentially of a low vapor pressure, liquid solvate-complex of (a) sulfur dioxide annd (b) one or more alkali or alkaline earth metal salts soluble in said sulfur dioxide and also capable of forming a complex therewith, wherein said one or more salts consists essentially of a stoichiometric reaction product of a Lewis acid and a Lewis base, with the equivalent ratio of said one or more salts to SO_2 in said liquid electrolyte ranging from 1:1 to 1:7, and wherein all of said one or more alkali or alkaline earth metal salts is complexed with said sulfur dioxide.

4,891,282
ORGANIC ELECTROLYTE CELL
Toru Nagaura, and Shigeru Oishi, both of Fukushima, Japan, assignors to Sony-Eveready Inc., Tokyo, Japan
Continuation of Ser. No. 842,180, Mar. 21, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 138,347
Claims priority, application Japan, Mar. 22, 1985, 60-58044; Jan. 21, 1986, 59-10904
Int. Cl.[4] H01M *6/16*
U.S. Cl. 429—194 **4 Claims**



1. An organic electrolyte cell comprising an anode mainly composed of Li and containing Al and a cathode mainly composed of manganese dioxide, wherein the amount of manganese dioxide is determined based on the ratio of Li to Al, the amount of Li, Al and manganese dioxide being determined such that they are included within a region surrounded by:

$$y = 0.2x + 0.055$$

$$y = 0.2x + 0.080$$

$$0.10 \geqq x \geqq 0.03$$

where x represents the ratio t2/t1 between the thickness t1 for Li and the thickness t2 for Al for expressing the ratio of the amounts between Li and Al constituting said anode; and y represents the weight ratio (Li/MnO_2) between Li and manganese dioxide.

4,891,283
INSOLUBLE MIXED HEAVY METAL POLYSULFIDE CATHODES
William L. Bowden, Nashua, N.H.; David L. DeMuth, Maynard, Mass., and Laverne H. Barnette, Derry, N.H., assignors to Duracell Inc., Bethel, Conn.
Filed Apr. 17, 1986, Ser. No. 853,098
Int. Cl.[4] H01M *4/58*
U.S. Cl. 429—194 **14 Claims**

1. An electrochemical cell comprising an anode, an electrolyte, and a solid
active cathode; wherein said cathode is comprised of one or more mixed heavy metal polysulfides having the formula

$$M(1)_w + {}^nM(2)_x + {}^m(S_y)_z{}^{-2}$$

wherein M(1) and M(2) are different heavy metal atoms, n and m are integers representing the valence states of M(1) and M(2) respectively, w and x are non zero integers representing the stoichiometry of M(1) and M(2) respectively in the polysulfide, S is sulfur, $nw + mx = 2z$ and y is greater than 4.5.

4,891,284
LEAD-ALUMINUM MATERIAL
Frank E. Goodwin, Chapel Hill, N.C., assignor to International Lead Zinc Research Organization, Inc., Research Triangle Park, N.C.
Filed Sep. 27, 1988, Ser. No. 249,708
Int. Cl.[4] H01M *4/66;* **C22C** *11/00*
U.S. Cl. 429—226 **14 Claims**

1. A composition of led and aluminum, wherein the aluminum weight percent content is approximately 4.5 percent, further characterized in that the aluminum is present as substantially uniformly dispersed regions substantially no longer than about 30 microns.

4,891,285
IMAGED COPY FILM
Darrin J. Page, Wivenhoe, and Stuart C. Rennison, Hadleigh, Nr Ipswich, both of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Nov. 1, 1988, Ser. No. 265,503
Claims priority, application United Kingdom, Nov. 3, 1987, 8725673
Int. Cl.[4] G03G *7/00*
U.S. Cl. 430—14 **10 Claims**

1. An imaged copy film comprising
(a) a film substrate of a synthetic polymeric material having, on at least one surface thereof,
(b) a receiving layer, and, on a surface of the receiving layer remote from the substrate,
(c) an electrostatic copying toner image layer, wherein the receiving layer comprises a terpolymer of
(i) from 60 to 98 weight % of a vinyl halide,
(ii) from 1 to 20 weight % of a vinyl ester of a saturated aliphatic carboxylic acid the molecule of which contains from 2 to 6 carbon atoms, and

(iii) from 1 to 20 weight % of a functional group-containing ethylenically-unsaturated termonomer.

4,891,286

METHODS OF USING LIQUID TOWER DISPERSIONS HAVING ENHANCED COLORED PARTICLE MOBILITY

George A. Gibson, Vandalia, Ohio, assignor to AM International, Inc., Chicago, Ill.

Filed Nov. 21, 1988, Ser. No. 274,253
Int. Cl.[4] G03G 9/18
U.S. Cl. 430—38 28 Claims

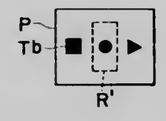
1. In a high speed electrophotographic printing process wherein successive images are formed on an electroconductive material by the attraction of negatively charged pigment or dye particles dispersed in a carrier liquid of a liquid toner dispersion to the image areas of the electroconductive material and wherein said images are transferred to a carrier substrate traveling at speeds of about 100 feet per minute or greater, the improvement comprising increasing the electrophoretic mobility of said negatively charged pigment or dye particles by adding to said liquid toner an effective amount for the purpose of an effective organic, monomeric acid that is insoluble in said carrier liquid.

4,891,287

IMAGE EDITING METHOD

Naoki Toyoshi; Hiroshi Okamoto; Kenji Tabuchi; Kaoru Takebe, and Tomoaki Yokoyama, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1988, Ser. No. 201,195
Claims priority, application Japan, Jun. 3, 1987, 62-140494
Int. Cl.[4] G03G 15/046
U.S. Cl. 430—54 3 Claims



3. An image editing method of erasing a portion of an image formed on a paper, with the use of an electrophotographic image forming device, which method comprises the steps of:

charging a photosensitive medium;

radiating rays of light onto the charged photosensitive medium to deplete an electrostatic charge set up at a predetermined area corresponding to a portion of the image formed on the paper;

developing the predetermined area on the photosensitive medium with the use of toner particles having the same color as that of the paper and also having the same polarity as that of the electrostatic charge, thereby to form a powder image; and

transferring the powder image onto the image on the paper so as to cover said portion of the image on the paper.

4,891,288

PHOTORECEPTOR FOR POSITIVE ELECTROSTATIC CHARGE

Yoshihide Fujimaki; Yasuo Suzuki, and Masataka Takimoto, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 765,062, Aug. 12, 1985, abandoned. This application Feb. 24, 1988, Ser. No. 163,215
Claims priority, application Japan, Aug. 17, 1984, 59-171745
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—58 9 Claims

1. A photoreceptor comprising a carrier generation layer and a carrier transport layer, wherein said carrier generation layer contains an organic carrier generating substance having a photosensitivity at a time of negative charging which is higher than that at a time of positive charging,

a carrier transporting substance selected from the group consisting of an oxazole derivative, an oxadiazole derivative, a thiazole derivative, a thiadiazole derivative, a triazole derivative, an imidazole derivative, an imidazolone derivative, an imidazolidine derivative, a bisimidazolidine derivative, a styryl compound, a hydrazone compound, a pyrazoline derivative, an oxazolone derivative, a benzothiazole derivative, a benzimidazole derivative, a quinazoline derivative, a benzofuran derivative, an acridine derivative, a phenazine derivative, an aminostilbene derivative, poly-N-vinylcarbazole, poly-1-vinylpyrene and poly-9-vinylanthracene,

and a binder,

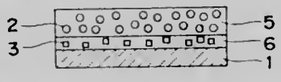
said carrier generation layer having a thickness of 1 to 10 μm, said carrier transport layer comprising a carrier transport substance and a binder, said carrier transport layer being formed on the lower surface of said carrier generation layer.

4,891,289

PHOTOSENSITIVE MEMBER

Hideaki Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 185,996
Claims priority, application Japan, Apr. 27, 1987, 62-105432
Int. Cl.[4] G03G 5/14, 5/06
U.S. Cl. 430—59 13 Claims



1. A photosensitive member of the function divided type having a charge generating layer and a charge transporting layer which are formed on an electrically conductive substrate, wherein the charge transporting layer comprises a styryl compound represented by the following formula (I), wherein Z is a residual group forming a cyclic ring together with a benzene ring, which may have substituents; Ar_1 and Ar_2 are independently an alkyl group, an aromatic hydrocarbon group or an aromatic heterocyclic group, each of which may have substituents; R_1 is hydrogen, halogen, an alkyl group; or an aralkyl group, an alkoxy group or a disubstituted amino group, each of which may have substituents; and n is 0 or 1.

4,891,290

PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY

Mitsuru Narita, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 10, 1988, Ser. No. 192,470
Claims priority, application Japan, Jun. 10, 1987, 62-144546
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—58 6 Claims

1. A photosensitive material for electrophotography, which comprises in sequence

(a) an aluminum substrate;

(b) a charge transport layer;

(c) a hole injection layer;

(d) a charge generation layer;

(e) a buffer layer comprising an arsenic-selenium alloy, said buffer layer having a gradient in arsenic concentration, the concentration of arsenic increasing in the direction of the surface protection layer; and

(f) a surface protection layer, wherein the surface protection layer comprises an arsenic-selenium alloy containing from 35 atomic percent to 45 atomic percent arsenic.

4,891,291

PHOTOSENSITIVE MEMBER HAVING AN AMORPHOUS CARBON OVERCOAT LAYER

Kenji Masaki; Izumi Osawa; Masanori Fujiwara, and Yumiko Takedomi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1988, Ser. No. 165,086
Claims priority, application Japan, Mar. 9, 1987, 62-53624; Mar. 9, 1987, 62-53625; Mar. 9, 1987, 62-53626
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—66 6 Claims

1. A photosensitive member comprising:

an electrically conductive substrate;

a photoconductive layer comprising a selenium-arsenic alloy layer or comprising a selenium layer and selenium-tellurium layer formed in this order; and

an overcoat layer formed on said photoconductive layer and comprising amorphous carbon containing hydrogen, said overcoat layer containing at least one element selected from the group consisting of chalcogen and elements in Group III and IV of the periodic table, said ovrcoat layer having a thickness of from about 0.01 to about 5 microns and being formed by plasma polymerization.

4,891,292

PHOTOSENSITIVE MEMBER HAVING AN AMORPHOUS CARBON OVERCOAT LAYER

Kenji Masaki; Izumi Osawa; Isao Doi, and Masanori Fujiwara, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1988, Ser. No. 165,074
Claims priority, application Japan, Mar. 9, 1987, 62-53627; Mar. 10, 1987, 62-54794; Mar. 10, 1987, 62-54795; Mar. 10, 1987, 62-54796; Mar. 10, 1987, 62-54797; Mar. 10, 1987, 62-54798
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—66 8 Claims

1. A photosensitive member comprising:

an electrically conductive substrate;

a photoconductive layer comprising a selenium-arsenic alloy layer or comprising a selenium layer and selenium-tellurium layer formed in this order; and

an overcoat layer formed on said photoconductive layer and comprising amorphous carbon containing hydrogen, said overcoat layer containing at least one element selected from Group V of the periodic table in an amount of from about 0.1 to about 20 atomic % based on all the constituent atoms therein, said overcoat layer having a thickness of from about 0.01 to about 5 microns and being formed by plasma polymerization.

4,891,293

TONER AND DEVELOPER COMPOSITIONS WITH THERMOTROPIC LIQUID CRYSTALLINE POLYMERS

Guerino Sacripante, Cambridge, and Lupu Alexandru, Toronto, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1988, Ser. No. 252,472
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—109 35 Claims

1. A toner composition comprised of the thermotropic liquid crystalline random polymers of FIGS. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16, wherein m, n, and o represent the number of monomer segments present; x, y, and z are independently selected from the group consisting of alkyl, substituted alkyl, alkylene, and substituted alkylene; and R is independently selected from the group consisting of hydrogen, alkyl, hydroxyl, nitro, alkoxy, and arylalkoxy; and pigment particles.

4,891,294

ELECTROSTATIC DEVELOPMENT TONER

Koji Nogachi, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,048
Claims priority, application Japan, Jul. 9, 1987, 62-171897; Jul. 9, 1987, 62-171937
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—110 4 Claims

1. Electrostatic development toner comprising toner particles each including a binder resin, 1–10 weight % of fine calcium carbonate particles having an average particle size of 1 μm or less, and 0.3–3.5 weight % of fine ceramic particles dispersed in said toner particles and also 0.2–1.0 weight % of fine ceramic particles disposed on the surfaces of said toner particles, said fine ceramic particles having high hardness and high abrasion characteristics and an average particle size of 0.1–3 μm, at least some of said fine calcium carbonate particles and said fine ceramic particles being partially exposed on the surfaces of said toner particles.

4,891,295

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Fujio Kakimi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,433
Claims priority, application Japan, Mar. 11, 1986, 61-52993
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] G03C 5/54, 1/42, 1/68
U.S. Cl. 430—138 9 Claims

1. A light-sensitive material comprising a light-sensitive layer provided on a support wherein the light-sensitive layer contains silver halide, a polymerizable compound containing carbon to carbon unsaturation, a reducing agent and an organic solvent which is miscible with the polymerizable compound, said silver halide, said polymerizable compound and said reducing agent being present together in microcapsules to form light-sensitive microcapsules, and wherein said organic solvent is present in microcapsules which are different from the light-sensitive microcapsules.

4,891,296

PATTERN TRANSFER METHOD AND SILVER HALIDE PHOTOGRAPHIC PLATE TO BE USED FOR SAID METHOD

Shigeru Tsurukiri; Hiroshi Sugita, both of Hino; Toshio Yamamoto, Hikone; Masaru Kawasaki, and Eiji Horie, both of Shiga, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1987, Ser. No. 44,947
Claims priority, application Japan, May 7, 1986, 61-103126
Int. Cl.[4] G03C 5/08, 1/78
U.S. Cl. 430—142 4 Claims

1. A pattern transfer method comprising forming an original picture pattern on a first photographic plate having a silver halide emulsion layer on a glass support and transferring said original picture pattern by contact exposure onto a substrate having a photoresist layer,

characterized in that said first photographic plate comprises a silver halide emulsion contained in the emulsion layer which is a silver iodobromide emulsion containing 8 mol % or less of silver iodide and having a mean grain size of 0.1 μm or less; or contains a silver halide emulsion in said emulsion layer which contains 50 mol % or more of silver chloride; and

that said first photographic plate has an emulsion layer with surface roughness of 0.3 μm to 3 μm, said surface roughness obtained by roughening the surface of said glass support.

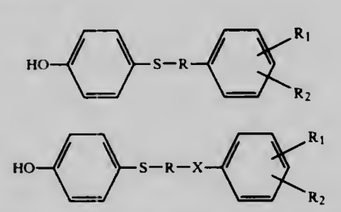
4,891,297

HEAT-SENSITIVE DIAZO RECORDING MATERIAL WITH THIOHYDROQUINONE

Masanobu Takashima; Ken Iwakura; Masato Satomura, and Kimio Ichikawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co.,Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 14,744, Feb. 13, 1987, abandoned. This application Mar. 25, 1988, Ser. No. 178,834
Claims priority, application Japan, Feb. 13, 1986, 61-29623
Int. Cl.[4] G03C *1/60*; B41M *5/18*
U.S. Cl. 430—177 **2 Claims**

1. A heat-sensitive recording material comprising a support having provided thereon a recording layer consisting essentially of one or more light-fixible diazo salts, a coupling component capable of forming color upon a coupling reaction with said diazonium salt and at least one thiohydroquinone derivative which acts as both a density improving agent and a stabilizing agent, wherein any one of the one or more diazo salts and the coupling component is contained in a microcapsule, and said at least one thiohydroquinone derivative is represented by the



(I-a)

(I-b)

wherein R_1 and R_2 each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, a halogen atom, an acyl group, a carbamoyl group, a sulfamoyl group, a substituted amino group, a cyano group, a nitro group, a carboxyl group or a sulfo group; R represents a substituted or unsubstituted alkylene group having 6 or less carbon atoms; and X represents an oxygen atom or sulfur atom.

4,891,298

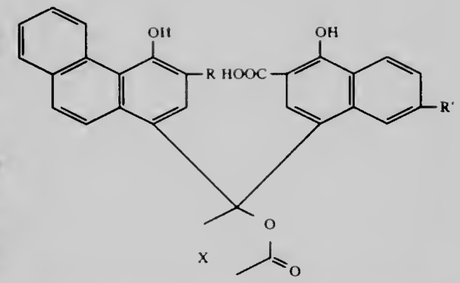
PHOTOGRAPHIC PRODUCTS AND PROCESSES

David P. Waller, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1988, Ser. No. 252,663
Int. Cl.[4] G03C *5/54, 5/26*; C07D *311/78*
U.S. Cl. 430—221 **30 Claims**

1. In a photographic film unit adapted for forming a transfer image viewable as a reflection print including a negative component comprising a photosensitive silver halide emulsion carried on a support; a positive component comprising an image-receiving layer carried on a transparent support; an acid-reacting layer disposed in at least one of said negative and positive components; and an aqueous alkaline processing composition comprising a light-reflecting pigment and at least one light-absorbing, pH sensitive optical filter agent releasably contained in a rupturable container positioned to release said composition for distribution between said negative and said positive components, the combination of said light-reflecting pigment and said optical filter agent being effective to prevent further exposure of said photosensitive emulsion during processing in the presence of radiation actinic to said emulsion and said light-reflecting pigment providing a layer after development which is effective to mask said photosensitive layer and provide a background for viewing the transfer image by reflected light;

the improvement which comprises employing as said processing composition, an aqueous alkaline solution comprising a light-reflecting pigment and as at least one said light-absorbing pH-sensitive optical filter agent, a pH-sensitive phthalein of the formula



wherein R is alkyl having 1 to 6 carbon atoms, R'is alkoxy having at least 12 carbon atoms and X represents the carbon atoms necessary to complete phthalide or naphthalide.

4,891,299

IMAGE-FORMING METHOD EMPLOYING LIGHT-SENSITIVE MATERIAL AND A TRANSPARENT IMAGE-RECEIVING MATERIAL

Makoto Yamada, Minami, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,483
Claims priority, application Japan, Mar. 11, 1986, 61-52991
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] G03C *5/54, 11/12*
U.S. Cl. 430—202 **13 Claims**

1. An image-forming method which comprises:

imagewise exposing a light-sensitive material comprising a light-sensitive layer which contains silver halide, a reducing agent and an ethylenic unsaturated compound provided on a support to form a latent image of the silver halide;

simultaneously or thereafter developing the light-sensitive material to polymerize the ethylenic unsaturated compound within the area where the latent image of the silver halide has been formed; and

pressing the light-sensitive material on an image-receiving material having a transparent support to transfer the obtained image to the image-receving material, wherein said image-receiving material comprises an image-receiving layer containing a polymer provided on the transparent support; and

thereafter heating the image-receiving material to make the transferred image more transparent.

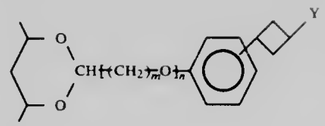
4,891,300

SAPONIFIED POLYVINYL ACETATE DERIVATIVES WHICH ARE PHOTOSENSITIVE RESIN COMPOSITIONS

Kunihiro Ichimura, 630-2, Matshiro 5-chome, Yatabe-cho, Tsukuba-gun, Ibaraki; Hiroshi Itoh; Shuichi Nakazato, and Hideaki Takazawa, all c/o Oji Kako Co., Ltd. Shohin Kenkyujo, 27-2, Hiraide Kogyo Danchi, Utsunomiya-shi, Tochigi, all of Japan

Filed Sep. 23, 1987, Ser. No. 99,959
Claims priority, application Japan, Sep. 25, 1986, 61-224997
Int. Cl.[4] G03C *1/70, 1/71*
U.S. Cl. 430—283 **9 Claims**

1. A photosensitive resin composition comprising a photosensitive saponified poly(vinyl acetate) derivative containing in the backbone thereof at least one of a first group of photosensitive units which are represented by the general formula (I)



(I)

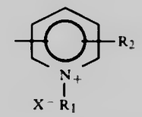
wherein



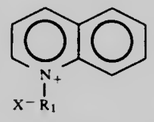
represents a vinyl alcohol residue in the backbone of the saponified polyvinyl acetate derivative:



represents ethenyl; Y represents a member selected from the group consisting of the following general formulae (II) and (III)

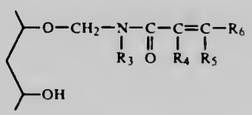


(II)



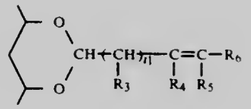
(III)

m denotes an integer of 1–6; n denotes 0 or 1; R_1 represents a member selected from the group consisting of a hydrogen, and unsubstituted alkyl and unsubstituted aralkyl, and alkyl and aryl containing a member selected from the group consisting of a hydroxyl, carbamoyl, and an ether bond and an unsaturated bond; R_2 represents a member selected from the group consisting of hydrogen and lower alkyl; and X^- represents an anion, and at least one of a second group of photosensitive units having an ethylenic unsaturated double bond which are represented by the general formulae (IV) amd (V)



(IV)

and



(V)

wherein



is as defined above; R_3 represents a member selected from the group consisting of a hydrogen, lower alkyl, nitrophenyl, halogen, an aminophenyl and phenyl; R_4, R_5 and R_6 respectively represents a member selected from the group consisting of hydrogen lower alkyl halogen and phenyl; and t_1 represents 0 or 1.

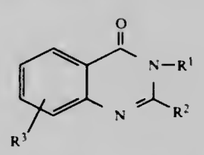
4,891,301

PHOTOPOLYMERIZABLE RECORDING MATERIALS, PHOTORESIST LAYERS AND LITHOGRAPHIC PRINTING PLATES BASED THERON, AND NOVEL 4-QUINAZOLONE COMPOUNDS

Reinhard Aldag, Ludwigshafen; Peter Neumann, Wiesloch; Andreas Boettcher, Leimen; Thomas Bluemel, Erpolzheim, and Friedrich Seitz, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 196,078
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717034
Int. Cl.[4] G03C *1/71, 7/00*
U.S. Cl. 430—281 **15 Claims**

1. A photopolymerizable recording material which comprises; one or more photopolymerizable olefinically unsaturated organic compounds, one or more photopolymerization initiators, a color-forming system which on irradiation with actinic light causes an increase in the color intensity of the recording material, one as a sensitizer, comprises one or more compounds of the formula (I)



(I)

where R^1 is C_1-to C_{12}-alkyl, cycloalkyl, phenyl or halogen-, gen-, C_1- to C_{12}-alkyl-, nitrile-, trifluoromethyl-, $C_1$to C_{12}-alkoxy-, -O-CO—$_1$- to —$_{12}$-alkyl-, —CO—O—$_1$- to —$_{12}$-alkyl- or NR^4R^5-substituted aryl or hetaryl, where R^4 and R^5 are identical or different and each is $C_1$to C_8-alkyl, aryl—$_1$- to —$_6$-alkyl, where the aryl can be monosubstituted or polysubstituted by halogen, C_1- to C_6-alkyl or C_1- to C_6-alkoxy, or each is unsubstituted or C_1- to C_6-alkyl-, C_1- to C_6-alkoxy-, nitrile-, tri- fluoromethyl- or halogen-monosubstituted or -polysubstituted phenyl, unsubstituted or OH-, halogen-, CN-, —O—CO—$_1$- to —$_6$-alkyl- or —CO—O—$_1$- to —$_6$-alkyl-substituted C_1- to C_{12}-alkyl or oxaalkyl of 3 to 12 carbon atoms and 1 to 5 oxygen atoms, or R^4 and R^5 together form a saturated or unsaturated heterocyclic ring system, R^2 is C_1- to C_{12}-alkyl, cycloalkyl, phen—$_1$- to —$_6$-alkyl, aryl or hetaryl or C_1- to C_{12}-alkyl-, which may be substituted by OH, halogen, CN, —O—CO—$_1$- to —$_6$-alkyl or -CO-0—$_1$to —$_6$-alkyl, C_1- to C_6-alkoxy-, OH-, halogen-, CN- or —O—CO—$_1$- to —$_6$-alkyl-, -CO-0—$_1$- to —$_6$-alkyl-, oxa- alkyl- of 2 to 12 carbon atoms and 1 to 6 oxygen atoms or NR^6R^7 substituted aryl oi hetaryl, where R^6 and R^7 are identical or different and each is C_1 - to C_8-alkyl, allyl, aryl—$_1$- to —$_6$-alkyl, where the aryl can be monosubstituted or polysubstituted by halogen, C_1- to C_6-alkyl or C_1- to C_6-alkoxy, or each is phenyl which is unsubstituted or monosubstituted or polysubstituted by C_1- to C_6alkyl, C_1- to

C_6-alkoxy or halogen, or each is OH-, halogen-, CN-, —O—CO—$_t$- to —$_6$-alkyl- or -CO-0—$_t$- to —$_6$- alkyl-substituted C_1- to C_{12}-alkyl or oxaalkyl of 3 to 12 carbon atoms and 1 to 5 oxygen atoms, or R^6 and R^7 together form a saturated or unsaturated heterocyclic ring system, and R^3 is hydrogen, C_1- to C_{12}-alkyl, C_1- to C_{12}alkoxy, OH-, halogen-, CN-, -0-CO—$_1$ to —$_6$-alkyl- or —CO—O—$_1$- to —$_6$-alkyl-substituted C_1- to C_{12}-alkyl or oxaalkyl of 2 to 12 carbon atoms and 1 to 5 oxygen atoms, halogen, trialkylsilyl or perfluoro—$_t$- to -C7-alkyl, with the proviso that the maximum of the long-wave absorption bands of these compounds is below 420 nm, preferably below 400 nm.

4,891,302

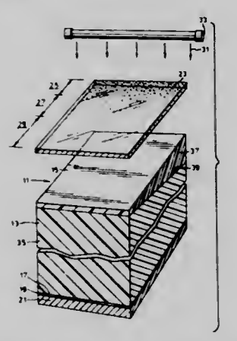
METHOD OF PREPARING A CONTOURED PLATE

Douglas C. Gordon, R.R. 1, Kinburn, Ontario, Canada K0A 2H0, and David W. Rapkins, 6283 Steamer Lane, Gloucester, Ontario, Canada K1C 1C8

Continuation-in-part of Ser. No. 46,568, May 6, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,226

Int. Cl.[4] G03F *7/02*

U.S. Cl. 430—300 **20 Claims**



1. Method of preparing a contoured plate comprising: providing a photopolymer printing plate which is selectively hardenable in a zone extending from its lower surface to a region intermediate the thickness of the plate on exposure of an upper surface of the plate to a controlled quantity of light energy; selectively hardening the photopolymer in a hardened zone which is adjacent the lower surface of the plate and which increases continuously in thickness from one portion of the plate to another, while leaving an upper unhardened zone of the photopolymer which continuously varies in depth above the hardened zone, by a first exposure of the upper surface of the plate to a quantity of light energy which increases continuously per unit area of the surface from said one portion to the other; terminating said first exposure; masking discrete portions of the upper surface of the plate whereon it is desired to form a recessed design; hardening the non-masked portions of the plate by a second exposure of its upper surface to light energy whereby the masked portions remain unhardened from the upper surface of the plate to the upper region of said hardened zone; terminating the second exposure; and removing the unhardened portions to provide a contoured design in the upper surface of the plate.

4,891,303

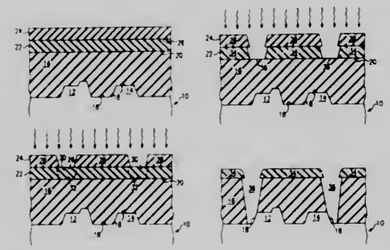
TRILAYER MICROLITHOGRAPHIC PROCESS USING A SILICON-BASED RESIST AS THE MIDDLE LAYER

Cesar M. Garza, Plano; Monte A. Douglas, Coppell, and Roland Johnson, Sachse, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 26, 1988, Ser. No. 199,087

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—312 **13 Claims**



1. A process for applying a pattern to a workpiece used in fabricating an integrated circuit, comprising the steps of:

depositing a thick organic layer on a surface of the workpiece;

depositing a second layer containing an at least partially silicon-based polymer on the thick organic layer;

depositing an organic photoresist resolution layer on the second layer;

projecting a pattern image onto the resolution layer with a light source to which the resolution layer is sensitive;

developing the resolution layer to leave patterned orifices therethrough and to expose patterned areas of the outer surface of the second layer;

exposing the resolution layer and the patterned areas of the second layer to light to which the second layer is sensitive but which will be strongly absorbed by the resolution layer;

developing the second layer to create orifices therein extending from the patterned areas of the outer surface of the second layer to corresponding patterned areas on the outer surface of the thick organic layer; and

differentially etching exposed portions of the thick organic layer much faster than the second layer until the surface of the workpiece is reached.

4,891,304

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Koki Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

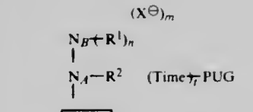
Continuation of Ser. No. 157,357, Feb. 18, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 353,144

Claims priority, application Japan, Feb. 18, 1987, 62-34953

Int. Cl.[4] G03C *5/54, 7/26, 1/06, 1/42*

U.S. Cl. 430—448 **14 Claims**

14. A method for forming an image comprising developing silver halide photographic material in the presence of a reducing agent after imagewise exposure of said silver halide photographic material, wherein said silver halide photographic material comprises a support having provided thereon at least one silver halide emulsion layer containing a compound represented by formula (I):



(I)

wherein EAG represents an aromatic group bonding to N_A and capable of accepting an electron;
N_A and N_B each represents a nitrogen atom;
R^1 represents a lone pair, a π-bond, a σ-bond, or a substituent other than a hydrogen atom;
n represents 2 or 3;
m represents 0 when n represents 2, or m represents 1 and N_B has a positive charge when n represents 3;
$X^\ominus$ represents an anion;
the groups or bond represented by R^1 may be combined with each other or may be combined with EAG to form a ring;
R^2 represents R^3—CO—, R^3—SO_2—, R^3—CO—N=CH—, or R^3—SO_2—N=CH—, wherein R^3 represents an alkyl group, an aryl group or a heterocyclic group;
the group represented by R^2 may be combined with at least one of R^1 and EAG to form a ring;
Time represents a group releasing PUG via subsequent reaction triggered by the cleavage of the nitrogen-nitrogen bond in said compound represented by formula (I);
PUG represents a photographically useful group;
(Time)-PUG is a group which is released by a trigger of the N-N single bond cleaving reaction which is caused by acceptance of an electron by the EAG group;
t represents 0 or 1; and
dotted lines indicate that at least one of them represents a bond.

4,891,305

OPTICAL INFORMATION RECORDING ELEMENT

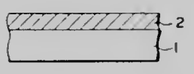
Hideaki Oba; Tsutomu Sato; Masaakira Umehara; Yutaka Ueda, all of Yokohama; Tetsu Yamamuro, Tokyo, and Michiharu Abe, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 33,920, Apr. 1, 1987, abandoned, which is a continuation of Ser. No. 789,065, Oct. 18, 1985, abandoned. This application Jul. 7, 1988, Ser. No. 217,125

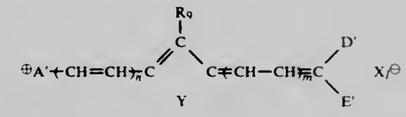
Claims priority, application Japan, Oct. 23, 1984, 59-221254; Oct. 26, 1984, 59-223849

Int. Cl.[4] G03C *1/00*

U.S. Cl. 430—495 **15 Claims**



1. An optical information recording element, comprising a substrate and an organic, thin-film, recording layer on said substrate, said recording layer having a thickness of 100 Å-10 μm and containing at least one compound of the formula,



wherein A' represent (1) a heterocyclic group selected from the group consisting of thiazole, oxazole, pyrrole, 3,3-dialkyl indolenine, imidazole, pyridine and quinoline, or (2) said heterocyclic group condensed with a substituted or unsubstituted benzene ring or a substituted or unsubstituted naphthalene ring; D' and E' are the same or different and represent a substituted or non-substituted aromatic hydrocarbon group; X represents an acid anion; l represents 0, 1 or 2 and m and n represent 0, 1, 2 or 3; R_9 represents hydrogen, alkyl, amino or halogen; and Y represents atomic groups necessary for forming a substituted or non-substituted five-membered ring or six-membered ring, said recording layer containing an amount of said compound effective to cause said recording layer to undergo optical changes in areas irradiated with laser radiation so that information is recorded based on these optical changes.

4,891,306

PHOTOGRAPHIC LIGHT-SENSITIVE SILVER HALIDE MATERIAL CONTAINING AN ANTISTATIC BLOCK COPOLYMER

Shigeki Yokoyama, and Yukio Maekawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 144,635, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 915,838, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 719,407, Apr. 3, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 270,461

Claims priority, application Japan, Apr. 3, 1984, 59-66464

Int. Cl.[4] G03C *1/82*

U.S. Cl. 430—527 **14 Claims**

1. A silver halide photographic light-sensitive material comprising from 0.5 to 3 mg/m^2 of a fluorine-containing block polymer, derived from a polymerizable hydrophobic monomer containing at least one fluorine atom and a polymerizable hydrophilic monomer, as an antistatic agent in at least one layer thereof, wherein said fluorine-containing block polymer comprises repeating units selected from the following formulae (I), (II) or (III):

$$-A_rB_s- \quad (I)$$

wherein A is a repeating unit of a polymer segment obtained by polymerizing a polymerizable hydrophobic monomer containing at least one fluorine atom; B is a repeating unit of a polymer segment obtained by polymerizing a polymerizable hydrophilic monomer; r is an average degree of polymerization between 5 and about 1,000; and s is an average degree of polymerization between 5 and about 5,000;

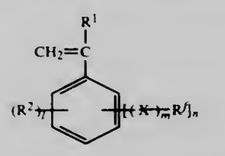
$$-A_tB_uA_v- \quad (II)$$

wherein A and B are repeating units as claimed above; t and v each is an average degree of polymerization between 5 and about 1,000; and u is an average degree of polymerization between 5 and about 5,000; and

$$-B_wA_xB_y- \quad (III)$$

wherein A and B are repeating units as claimed above; w and y each is an average degree of polymerization between 5 and about 5,000 and x is an average degree of polymerization between 5 and about 1,000;

wherein said A is an addition-polymerizable monomer containing an ethylenically unsaturated group selected from the monomers represented by formulae IV and V:

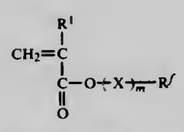


(IV)

wherein R^1 is a hydrogen atom, a chlorine atom, or an alkyl group containing from 1 to 3 carbon atoms; R^2 is a monovalent substituent group or two R^2s can jointly form

a ring; R/ is an alkyl, aralkyl, aryl, or alkylaryl group containing from 1 to 30 carbon atoms and having one or more of its hydrogen atoms replaced with fluorine atoms; X is a divalent linking group represented by the formula —R_eL— or —L—R_e, wherein R is an alkylene, arylene or aralkylene group containing from 1 to 10 carbon atoms, —L— is —O—, —S—, —NR^3— (R^3 is an alkyl group containing from 1 to 4 carbon atoms), —CO—, —OCO—, —SCO—, —$CONR^3$—, —SO_2—, —NR^3SO_2—, —SO_2NR^3—, or —SO—, e is 0 or 1, l is an integer of 0 to 4, m is an integer of 0 to 4, and n is an integer of 1 to 5; and

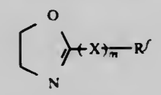
(V)



wherein R^1, R/, X and m are defined the same as their definition above; or

A is a ring-opening polymerizable monomer selected from the monomers represented by formula (VI)

(VI)



wherein X, R/ and m are defined the same as their definition above;

and wherein said repeating unit represented by B is an addition-polymerizable monomer containing an ethylenically unsaturated group selected from a nonionic monomer selected from acrolein, acrylamide, methyacrylamide, N-methylolacrylamide, N,N-dimethylaminoethylacrylamide, N,N-dimethylaminopropyl-acrylamide, hydroxyethyl methacrylate, N,N-dimethylaminoethyl acrylate, N,N-dimethylaminoethyl methacrylate, poly(ethyloxy)-acrylate, poly(ethyloxy)-methacrylate, 2-vinylpyridine, 4-vinylpyridine, 1-vinyl-2-pyrrolidone, 1-vinylimidazole and 1-vinyl-2-methyl-imidazole; a cationic monomer selected from vinylbenzyltrimethylammonium, vinylbenzyl-triethylammonium, vinylbenzyltripropylammonium, vinylbenzyl-dimethylamine hydrochloride, methacryloxyethyltrimethylammonium, methacryloxyethyldimethylethylammonium and N,N-dimethylaminoethyl methacrylate hydrochloride; or an anionic monomer selected from acrylic acid, methacrylic acid, maleic acid, styrenesulfonic acid, 2-acrylamido-2-methylpropanesulfonic acid, and salts thereof; or said repeating unit represented by B is a ring-opening polymerizable monomer selected from a substituted or unsubstituted cyclic ether, 2-oxazoline, a substituted 2-oxazoline and a lactone.

4,891,307

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yasuo Makuuoki; Yukio Maekawa, and Shuzo Suga, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 178,814, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 929,021, Nov. 10, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 368,949
Claims priority, application Japan, Nov. 8, 1985, 60-249021
Int. Cl.[4] G03C *1/82*
U.S. Cl. 430—527 **5 Claims**

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer and another constituent layer selected from the group consisting of a surface protective layer, a backing layer, an interlayer, and undercoat layer and an overcoat layer, wherein at least one of said least one silver halide emulsion layer and another constituent layer contains a surface active effective amount of:

(A) a fluorine-containing nonionic surface active agent,

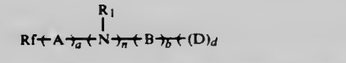
(B) a fluorine-containing ionic surface active agent, and

(C) a fluorine-free nonionic surface active agent,

wherein the surface active agents can be added to the same or different layers,

wherein said fluorine-containing nonionic surface active agent (A) is a compound represented by formula (I):

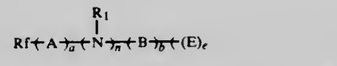
(I)



wherein Rf represents a perfluoroalkyl, perfluoroaryl, or perfluoroalkenyl group, having 4 to 20 carbon atoms; R_1 represents a hydrogen atom, or a substituted or unsubstituted alkyl, or alkenyl group; A represents —Co—, —COO—, —SO—, —SO_2—, or —OCO—, B represents a substituted or unsubstituted alkylene, aralkylene, or arylene group; D represents a substituted or unsubstituted oxyalkylene group; a and n each represents 0 or 1; b represents, 0, 1, or 2; and d represents 2 to 50,

wherein said fluorine-containing ionic surface active agent (B) is a compound represented by formula (II);

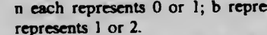
(II)



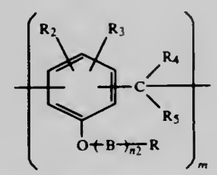
wherein Rf represents a perfluoroalkyl, perfluoroaryl, or perfluoroalkenyl group, having 4 to 20 carbon atoms; R_1 represents a hydrogen atom, or a substituted or unsubstituted alkyl, or alkenyl group; A represents —CO—, —COO—, —SO—, —SO_2—, or —OCO—; B represents a substituted or unsubstituted alkylene, aralkylene, or arylene group; E represents an ionic hydrophilic group; a and n each represents 0 or 1; b represents 0, 1, or 2; and e represents 1 or 2.

wherein said fluorine-free surface active agent (C) is a compound represented by formula (III), (III'), or (III''):

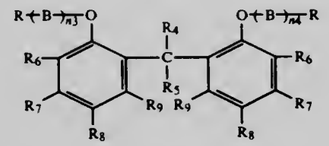
(III)



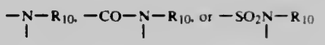
(III')



(III'')



wherein R represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an alkylcarbonyl group having 1 to 5 carbon atoms; R_1 represents a substituted or unsubstituted alkyl, alkenyl, or aryl group, having 1 to 30 carbon atoms; A represents —O—, —S—, —COO—,



(wherein R_{10} represents a hydrogen atom, or a substituted or unsubstituted alkyl group); B represents an oxyalkylene group having 8 or less carbon atoms; R_2, R_3, R_7, and R_9 each represents a hydrogen atom, or a substituted or unsubstituted alkyl, aryl, alkoxy, or aryloxy group, a halogen atom, an acyl group, an amide group, a sulfonamide group, a carbamoyl group, or a sulfamoyl group; R_6 and R_8 each represents a substituted or unsubstituted alkyl, aryl, alkoxy, or aryloxy group, a halogen atom, an acyl group, an amide group, a sulfonamide group, a carabamoyl group, or a sulfamoyl group; R_4 and R_5 each represents a hydrogen atom, a substituted or unsubstituted alkyl or aryl group; n_1, n_2, n_3, and n_4 each represents an average degree of polymerization of the oxyalkylene group, which is a number of 2 to 50; and m represents the average degree of polymerization, which is a number of 2 to 50,

wherein the amount of the fluorine-containing nonionic surface active agent (A) is 0.0001 to 0.2 g per 1 m^2 of the photographic light-sensitive material,

wherein the amount of the fluorine-containing ionic surface active agent (B) is 0.0001 to 0.05 g per 1 m^2 of the photographic light-sensitive material,

wherein the amount of the fluorine-free nonionic surface active agent (C) is 0.0002 to 0.5 g per 1 m^2 of the photographic light-sensitive material,

wherein the weight ratio of the amount of the fluorine-containing nonionic surface active (A) agent to that of the fluorine-containing ionic surface active agent (B) is from 1/100 to 100/1 and wherein the weight ratio of the total amount of fluorine-containing surface active agents (A) and (B) to that of the fluorine-free ionic surface active agent (C) is from 10/1 to 1/100.

4,891,308

PHOTOGRAPHIC FILM ANTISTATIC BACKING LAYER WITH AUXILIARY LAYER HAVING IMPROVED PROPERTIES

Thomas B. Cho, East Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 198,596, May 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,524, Nov. 30, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 344,974
Int. Cl.[4] G03C *1/82*
U.S. Cl. 430—527 **16 Claims**

1. A photographic element consisting essentially of a support, at least one silver halide emulsion layer on one side of said support, and on the opposite side of said support in order are (a) a layer containing an antistatic agent and (b) an auxiliary layer consisting essentially of at least one crosslinkable conductive polymer having frunctionally attached carboxylic acid groups selected from the group consisting of poly(sodium styrene sulfonate-maleic anhydride), hexadecyl betaine, alkyldimethyl betaines, carboxylated imidazolines, coco amido betaines, and mixtures thereof and a crosslinking agent for the conductive polymer selected from the group consisting of a polyfunctional aziridine, chrome alum, carbodiimides, and isoxazolinium salts dispersed in a gelatin binder, the auxiliary layer coated from an aqueous solution on said antistatic layer at a pH of 3 to 12, the crosslinkable conductive polymer being present in an amount of 0.5 to 30% by weight based on the weight of the gelatin binder, and the crosslinking agent being present in an amount of 0.5 to 5% by weight based on the weight of gelatin binder, whereby the antistatic properties of the antistatic layer are conducted through the auxiliary layer.

4,891,309

PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC PAPER

Yutaka Uesawa; Akira Kobayashi, and Izuma Morimoto, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,889
Claims priority, application Japan, Jun. 4, 1987, 62-141200; Jul. 21, 1987, 62-182946
Int. Cl.[4] G03C *5/16, 1/02, 7/26*
U.S. Cl. 430—627 **17 Claims**

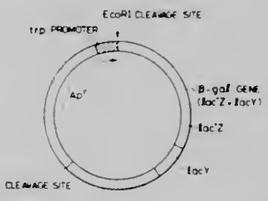
1. A process for producing a silver halide photographic paper having, on a support, at least one photographic constituent layer incorporating a silver halide developing agent, and at least one photographic constituent layer containing both a polymer latex and an emulsified dispersion of an oil-soluble fluorescent brightener dissolved in a high-boiling point organic solvent which comprises preliminarily mixing said emulsified dispersion with said polymer latex, and then incorporating the resulting mixture in a selected photographic constituent layer.

4,891,310

METHOD OF CONTROLLING CULTURE

Norio Shimizu; Shinichi Fukuzono, both of Hitachi; Nobuko Nishimura, Katsuta; Yoji Odawara, Hitachi, and Tomoaki Sumitani, Hachiooji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,613
Claims priority, application Japan, Mar. 25, 1985, 60-58480
Int. Cl.[4] C12Q *3/00*
U.S. Cl. 435—3 **17 Claims**



1. A method of controlling culture wherein cells are aerobically cultured in a culture broth to produce metabolite, comprising the steps of:

detecting a first parameter based on the amount of carbon dioxide evolved by the cells;

detecting a second parameter based on the amount of oxygen consumed by the cells;

calculating the ratio of said first parameter and said second parameter thereby obtaining a value representing a respiratory quotient of the cells; and

adding a substrate to the culture broth under the guidance of said value in a period of time from a rapid rise of said value until immediately after termination of said rise and in a period when initially fed substrate is reduced to a substrate concentration at which concentration of the cells reaches about a maximum, said substrate being at least one selected from the group consisting of casamino acid, glucose, amino acids other than trytophan and yeast extract.

4,891,311

STABILIZED ENZYME CONJUGATE COMPOSITION

Mark A. Anawis, Gurnee, and Roger E. Lindberg, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 775,882, Sep. 13, 1985, Pat. No. 4,782,023, which is a continuation of Ser. No. 576,824, Feb. 3, 1984, abandoned. This application Jul. 26, 1988, Ser. No. 224,592

Int. Cl.[4] G01N *33/535;* **C12N** *9/96*

U.S. Cl. 435—7 **8 Claims**

1. In an enzyme immunoassay employing antibodies or antigens conjugated with horseradish peroxidase to form enzyme conjugates for detecting the presence and/or amount of analyte in a test sample, the improvement comprising addition of a stable enzyme conjugate composition comprising a horseradish peroxidase conjugate and a stablizing effective amount of a calcium salt and a polyethylene glycol.

4,891,312

MONOCLONAL ANTIBODY SPECIFIC FOR HUMAN COLON FIBROBLAST-DERIVED T-PA

Jon P. Schaumann, Kirkwood; Jitka V. Olander, University City; Nicholaos K. Harakas, Chesterfield, and Joseph Feder, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 896,362, Aug. 13, 1986. This application Jan. 6, 1989, Ser. No. 294,031

Int. Cl.[4] C01N *33/53, 33/543*

U.S. Cl. 435—7 **1 Claim**

1. An immunoassay method for determing the level of t-PA in a biological sample containing t-PA comprising contacting said sample with a known amount of a monoclonal antibody against human colon fibroblast-derived tissue plasminogen activator and produced by a hybridoma having the characteristics of cell lines 63-4 (ATCC HB 9155), 54-2 (ATCC HB 9157) or 79-7 (ATCC HB 9156) and measuring the amount of adsorbed monoclonal antibody.

4,891,313

METHOD FOR DETERMINATION OF A COMPONENT OF A SAMPLE

Johann Berger; Fern DeLaCroix; Harvey Buck, and Juergen Schrenk, all of Indianapolis, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Jan. 21, 1988, Ser. No. 146,574

Int. Cl.[4] G01N *33/53*

U.S. Cl. 436—7 **11 Claims**

1. Method for determining a component of a liquid sample comprising contacting said sample with a solid support, said support having incorporated therein a removable first monoclonal antibody which binds to said component and a labeled monoclonal antibody or fragment of a monoclonal antibody which binds to said component wherein said first monoclonal antibody and said labeled monoclonal antibody or monoclonal antibody fragment are derived from the same species under conditions favoring formation of a complex of said first monoclonal antibody said component and said labeled monoclonal antibody or fragment, contacting said complex with an immobilized second receptor which binds to said first monoclonal antibody but not to said labeled monoclonal antibody or fragment under conditions favoring formation of a quaternary complex between said first complex and said immobilized receptor, and measuring label either in said quaternary complex or in a residue of said sample as a measure of said component.

4,891,314

AGENT FOR THE DETERMINATION OF PEROXIDASE ACTIVITY, WITH STABILIZER, A PROCESS FOR ITS PREPARATION AND ITS USE

Hans E. Paniy, Dastphetal, and Herbert Schwarz, Edsdorfergrund, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,332

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3541979

Int. Cl.[4] C12Q *1/28*

U.S. Cl. 435—28 **8 Claims**

4. A method of determining the presence of peroxidase activity in a material comprising:

bringing said material into contact with an agent according to claim 1 to form a mixture;

allowing said mixture to stand for a predetermined period of time; and

examining said mixture for the presence of a colored product indicative of the presence of peroxidase.

4,891,315

PRODUCTION OF HERPES SIMPLEX VIRAL PORTEINS

Roger J. Watson, Minneapolis; John H. Weis, Brookline, and Lynn W. Enquist, Excelsior, all of Minn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 436,368, Oct. 25, 1982, which is a continuation-in-part of Ser. No. 400,028, Jul. 20, 1982. This application Jul. 6, 1983, Ser. No. 510,551

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] C12P *21/00, 21/02, 21/04;* **C12N** *15/00, 5/00, 1/00, 1/20, 1/16, 1/18;* **C07H** *21/04*

U.S. Cl. 435—69.3 **59 Claims**

1. A process for producing a polypeptide comprising the amino acid sequence of a Herpes Simplex Virus type 2 gD glycoprotein or a fragment of said amino acid sequence, wherein said fragment comprises at least seven contiguous amino acids, said polypeptide containing at least one immunological and antigenic determinant of a Herpes Simplex Virus type 2 gD glycoprotein, comprising:

(a) culturing a unicellular organism containing a recombinant vector comprising a DNA sequence coding for a polypeptide comprising the amino acid sequence of a Herpes Simplex Virus type 2 gD glycoprotein or a fragment of said amino acid sequence, wherein said fragment comprises at least seven contiguous amino acids, said polypeptide containing at least one immunological and antigenic determinant of a Herpes Simplex Virus type 2 gD glycoprotein, and said recombinant vector capable of being replicated in said unicellular organism and said unicellular organism capable of producing said polypeptide; and

(b) isolating said polypeptide from the culture.

4,891,316

DNA SEQUENCES ENCODING THE VARIOUS ALLELIC FORMS OF MATURE THAUMATIN, AND CLONING VEHICLES, ETC.

Cornelis T. Verrips, Maassluis; Adrianus M. Ledeboer, Rotterdam; Luppo Edens, Maassluis; Robert Klok, Vlaardingen, and Jan Maat, Monster, all of Netherlands, assignors to Unilever Patent Holdings B.V., Netherlands

Continuation of Ser. No. 329,829, Dec. 11, 1981, abandoned. This application Jun. 7, 1985, Ser. No. 742,139

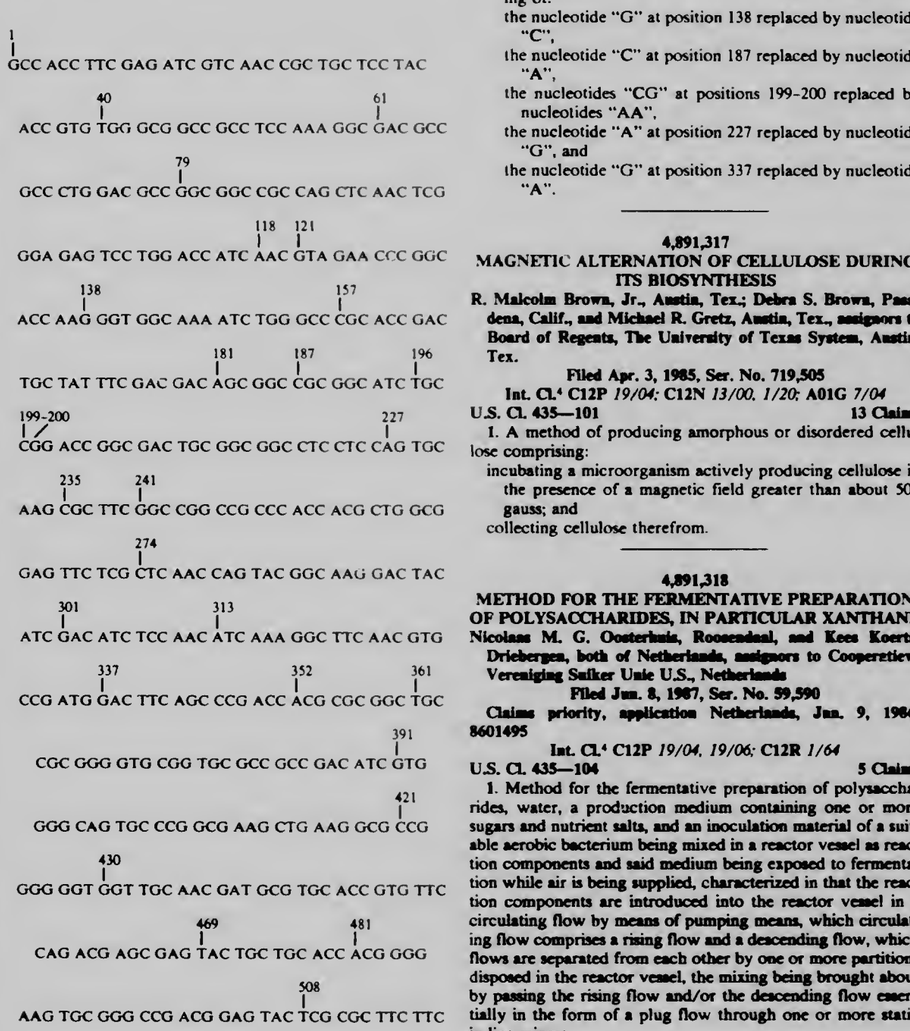
Claims priority, application United Kingdom, Dec. 12, 1980, 8039855

Int. Cl.[4] C12P *21/02, 21/00, 19/34;* **C12N** *15/00, 1/20;* **C07H** *21/04*

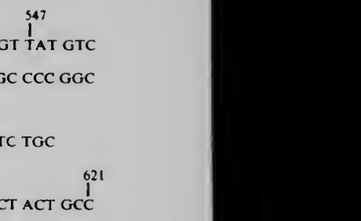
U.S. Cl. 435—69.1 **13 Claims**

1. A recombinant DNA sequence selected from the group consisting of

(i) a thaumatin II gene, of which the coding strand is



-continued



and

(ii) variations of said thaumatin II gene given in (i) which variations consist of at least one, but not more than four nucleotide replacements in said thaumatin II gene said nucleotide replacements, selected from the group consisting of:

the nucleotide "G" at position 138 replaced by nucleotide "C",

the nucleotide "C" at position 187 replaced by nucleotide "A",

the nucleotides "CG" at positions 199-200 replaced by nucleotides "AA",

the nucleotide "A" at position 227 replaced by nucleotide "G", and

the nucleotide "G" at position 337 replaced by nucleotide "A".

4,891,317

MAGNETIC ALTERNATION OF CELLULOSE DURING ITS BIOSYNTHESIS

R. Malcolm Brown, Jr., Austin, Tex.; Debra S. Brown, Pasadena, Calif., and Michael R. Gretz, Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 3, 1985, Ser. No. 719,505

Int. Cl.[4] C12P *19/04;* **C12N** *13/00, 1/20;* **A01G** *7/04*

U.S. Cl. 435—101 **13 Claims**

1. A method of producing amorphous or disordered cellulose comprising:

incubating a microorganism actively producing cellulose in the presence of a magnetic field greater than about 500 gauss; and

collecting cellulose therefrom.

4,891,318

METHOD FOR THE FERMENTATIVE PREPARATION OF POLYSACCHARIDES, IN PARTICULAR XANTHANE

Nicolaas M. G. Oosterhuis, Roosendaal, and Kees Koerts, Driebergen, both of Netherlands, assignors to Cooperatieve Vereniging Suiker Unie U.S., Netherlands

Filed Jun. 8, 1987, Ser. No. 59,590

Claims priority, application Netherlands, Jan. 9, 1986, 8601495

Int. Cl.[4] C12P *19/04, 19/06;* **C12R** *1/64*

U.S. Cl. 435—104 **5 Claims**

1. Method for the fermentative preparation of polysaccharides, water, a production medium containing one or more sugars and nutrient salts, and an inoculation material of a suitable aerobic bacterium being mixed in a reactor vessel as reaction components and said medium being exposed to fermentation while air is being supplied, characterized in that the reaction components are introduced into the reactor vessel in a circulating flow by means of pumping means, which circulating flow comprises a rising flow and a descending flow, which flows are separated from each other by one or more partitions disposed in the reactor vessel, the mixing being brought about by passing the rising flow and/or the descending flow essentially in the form of a plug flow through one or more static in-line mixers.

4,891,319

PROTECTION OF PROTEINS AND THE LIKE

Bruce J. Roser, Baldham, Great Britain, assignor to Quadrant Bioresources Limited, Bedfordshire, England

PCT No. PCT/GB86/00396, § 371 Date May 7, 1987, § 102(e) Date May 7, 1987, PCT Pub. No. WO87/00196, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 9, 1986, Ser. No. 26,695

Claims priority, application United Kingdom, Jul. 9, 1985, 8517352; May 29, 1986, 8613066

Int. Cl.[4] C12N *9/96*

U.S. Cl. 435—188 **12 Claims**

1. A method of protecting proteins or other biological macromolecules against denaturation during drying, comprising subjecting an aqueous system containing the protein or other biological macromolecule to drying at a temperature above freezing in the presence of trehalose in an amount between about 0.05 and 20 weight percent based on the total weight of said aqueous system.

3. A method according to claim 1, in which the protein or other biological macromolecule forms part of a substance selected from the group including an enzyme serum, serum complement, an antibody, an antigen, a fluorescent protein, a vaccine component and a polysaccharide.

11. A method for protecting a protein or other biological macromolecule against denaturation during drying comprising subjecting an aqueous system containing said protein or other biological macromolecule to drying at a temperature above freezing in the presence of trehalose in an amount of at least about 1.4 time greater by weight than the amount of said protein or other biological macromolecule.

4,891,320

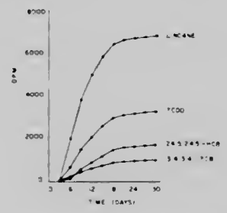
METHODS FOR THE DEGRADATION OF ENVIRONMENTALLY PERSISTENT ORGANIC COMPOUNDS USING SHITE ROT FUNGI

Steven D. Aust; John A. Bumpus, both of North Logan, Utah, and Ming Tien, State College, Pa., assignors to Utah State University Foundation, Logan, Utah

Continuation-in-part of Ser. No. 702,944, Feb. 19, 1985, abandoned. This application Apr. 19, 1988, Ser. No. 183,114

Int. Cl.[4] C12N *01/38*; **C12R** *01/645*; **C02F** *03/34, 03/02*

U.S. Cl. 435—262 **67 Claims**



1. A method for degrading environmentally persistent halogenated organic compounds, the method comprising the steps of:

(a) reacting at least one environmentally persistent polyhalogenated hydrocarbon compound having two or more aromatic rings with fungal enzymes containing at least one lignin-degrading enzyme expressed by white rod fungi in an environment containing hydrogen peroxide; and

(b) allowing the degradation reaction to proceed until said environmentally persistent polyhalogenated hydrocarbon compound is converted to substantially less toxic degradation products.

4,891,321

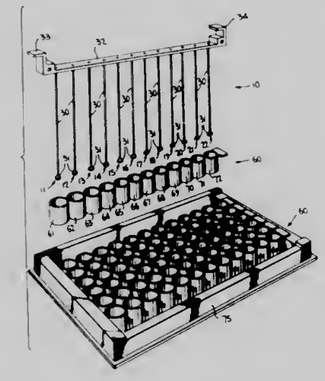
APPARATUS FOR PERFORMING DETERMINATIONS OF IMMUNE REACTANTS IN BIOLOGICAL FLUIDS

Thomas T. Hubscher, 18912 Glendower Rd., Gaithersburg, Md. 20879

Filed Oct. 21, 1987, Ser. No. 110,846

Int. Cl.[4] C12M *1/32*

U.S. Cl. 435—293 **3 Claims**



2. Apparatus for performing in vitro semi-quantitative determinations of allergen-specific antibodies in human serum comprising:

a plurality of test units, each test unit including an elongated rod having proximal and distal ends and a tip secured to said distal end;

wherein said tips have different respective allergen coatings, each allergen coating being of the type that reacts in a known manner with a respective allergen binding antibody in human serum;

holder means for supporting said plurality of test units in spaced parallel side-by-side relation;

wherein said tips include a first multi-faceted section having a transverse configuration that expands as a function of length away from proximal end, and a second multi-faceted section having a transverse configuration that contracts as a function of length away from said proximal end, said second section being disposed further than said first section from said proximal end.

4,891,322

ASSAYING OF POLYNUCLEAR AROMATIC COMPOUNDS

Gary R. Blackburn, Washington Crossing, Pa.; Carl R. Mackerer, Pennington, N.J., and Celnwen A. Schreiner, Meadowbrook, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 24, 1987, Ser. No. 18,111

Int. Cl.[4] G01N *33/00, 21/00*

U.S. Cl. 436—64 **2 Claims**

1. A method for evaluating the mutagenic activity of a petroleum oil substantially free of material boiling below 500° F. and of material boiling above 1000° F., which method comprises:

contacting a sample of said petroleum oil with nitric acid under conditions effective to nitrate the aromatic components thereof;

recovering from said nitric acid contacted petroleum oil a mixture including any nitrated aromatics present;

determining the light absorbance of said recovered mixture; and

determining the mutagenicity index from a standard curve relating absorbance of nitrated oils at 340 nm with the corresponding mutagenicity index of unnitrated oils determined by the modified Ames Test, said standard curve being obtained from a random set of samples of varying mutagenicity.

4,891,323

METHOD FOR ASSAYING PRIMARY AMINES, SECONDARY AMINES AND PEPTIDES USING FLUOROGENIC DERIVATIZATION REAGENTS

John F. Stobaugh, and Sunil Kakodkar, both of Lawrence, Kans., assignors to Oread Laboratories, Inc., Lawrence, Kans.

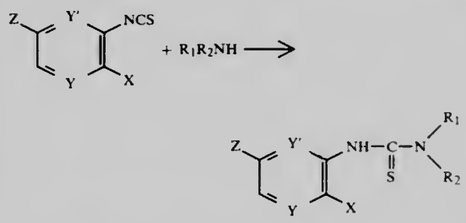
Filed Mar. 11, 1987, Ser. No. 24,479

Int. Cl.[4] G01N *21/77, 33/68*

U.S. Cl. 436—86 **7 Claims**

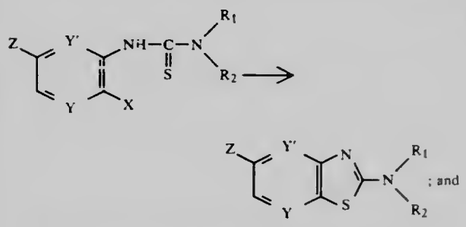
1. A method of fluorometrically assaying primary amines, secondary amines or peptides in a sample comprising the steps of:

(i) contacting a sample containing a primary amine, a secondary amine, or a peptide with an isothiocyanate so that the isothiocyanate couples with the primary amine, secondary amine or peptide in the sample to form a thiourea as follows:



wherein Z is an electron withdrawing group or a fused benzene ring, Y and Y', which are identical or different, are nitrogen or carbon and X is a halogen or other leaving group, R_1 is H or an alkyl and R_2 is an alkyl or a peptide residue;

(ii) cyclizing the thiourea into a cyclization product exhibiting fluorescence as follows:



(iii) fluorometrically assaying the product exhibiting fluorescence.

4,891,324

PARTICLE WITH LUMINESCER FOR ASSAYS

John Pease, Los Altos; Litai Weng, Mountain View; Hrair Kirakossian, San Jose, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 7, 1987, Ser. No. 925

Int. Cl.[4] G01N *33/533*

U.S. Cl. 436—519 **56 Claims**

1. An assay method for determining an analyte in a sample suspected of containing said analyte wherein said analyte is a member of a specific binding pair (sbp) consisting of ligand and its complementary receptor, which method comprises the steps of

(a) combining in an assay medium a sample suspected of containing an analyte and a conjugate of a first sbp member with a particle wherein said particle is selected from the group consisting of liposomes, latex particles and cells and wherein a fluorescer is reversibly associated with a nonaqueous phase of said particle by dissolving said fluorescer in said nonaqueous phase of said particle; with the proviso that when said first sbp member is not complementary to said analyte, a second sbp member capable of binding to the analyte and said first sbp member is added;

(b) separating the unbound conjugate from conjugate that is bound to said analyte or said sbp member;

(c) adding to said bound conjugate or said unbound conjugate a reagent for reversing the association of said fluorescer;

(d) after reversing the association of said fluorescer by the addition of said reagent, exposing said fluorescer to a light source at a wavelength which causes excitation of said fluorescer;

(e) measuring the light emission of said fluorescer acted upon by said light source; and

(f) relating the measured light emission to the amount of analyte in said sample.

4,891,325

METHOD FOR RE-USING SILICON BASE MATERIAL OF A METAL INSULATOR SEMICONDUCTOR (MIS) INVERSION-LAYER SOLAR CELL

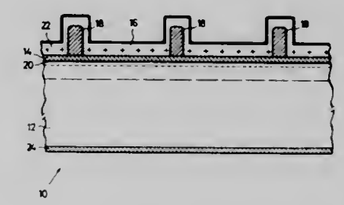
Rudolf Hezel, Spardorf; Winfried Hoffmann, Hanau, and Berthold Schum, Biebergemünd, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,449

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725346

Int. Cl.[4] B01J *17/00*

U.S. Cl. 437—2 **10 Claims**



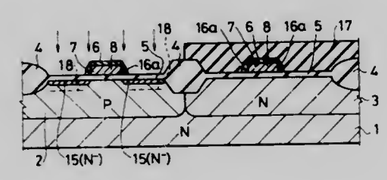
1. A method for re-using silicon base material (S) of a metal insulator semiconductor (MIS) inversion-layer solar cell, where a first electrically conductive contact of full-area or partial type is arranged on one side of the base material and the MIS solar cell-specific layers are arranged on the opposite side, said MIS layers being in the form of a first insulating layer (I) such as a silicon oxide layer, a second electrically conductive contact (M) provided on said first insulating layer and designed preferably in finger or lattice form, and a further insulating layer such as a silicon nitride or silicon oxynitride layer, characterized in that at least MIS solar cell-specific layers in the form of the second insulating layer (16) and the second electrically conductive contact (18) are stripped off and replaced by corresponding new layers.

4,891,326

SEMICONDUCTOR DEVICE AND A PROCESS FOR MANUFACTURING THE SAME

Mitsumasa Koyanagi, Higashimurayama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 731,975, May 8, 1985, abandoned. This application Jan. 8, 1988, Ser. No. 206,896
Claims priority, application Japan, May 16, 1984, 59-96462
Int. Cl.[4] H01L *21/265, 29/78*
U.S. Cl. 437—29 **24 Claims**



1. A process for fabricating a semiconductor device having n-channel MISFET'S with source and drain regions each of LDD construction and p-channel MISFET'S with source and drain regions each of a single region, formed in a first semiconductor region having p-type conductivity and in a second semiconductor region having n-type conductivity, respectively, in a semiconductor substrate, comprising:

(a) a step of forming a gate electrode for each of said n-channel MISFET'S and p-channel MISFET'S, each said gate electrode having two sides, the gate electrode for each n-channel MISFET being formed over the first semiconductor region in said semiconductor substrate and the gate electrode for each p-channel MISFET being formed over the second semiconductor region in said semiconductor substrate;

(b) a step for forming first regions by introducing n-type impurities into the first semiconductor region, in which said n-channel MISFET'S will be formed, using said gate electrodes as masks;

(c) a step for forming a sidewall insulator on each of the sides of each of said gate electrodes of said n-channel MISFET'S and said p-channel MISFET'S;

(d) a step for forming second regions by introducing n-type impurities into the first semiconductor region, in which said n-channel MISFET'S will be formed, using said gate electrodes and said sidewall insulators as masks so as to form said second regions at both, sides of each said gate electrode for the n-channel MISFET'S, said second regions being deeper than said first regions and having a higher impurity concentration than said first regions, and said second regions forming a source region and a drain region of said n-channel MISFET'S together with said first regions, said first regions and said second regions forming said LDD construction; and

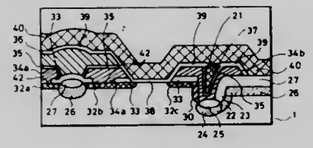
(e) a step for forming third single p-type regions by introducing p-type impurities into the second semiconductor region, in which said p-channel MISFET'S will be formed, using said gate electrodes and said sidewall insulators as masks so as to form said third single p-type regions at both sides of each said gate electrode for the p-channel MISFET'S, said third regions being formed such that the ends thereof are located under the gate electrode, said third regions forming a source region and a drain of each said p-channel MISFET, whereby the source and drain regions of the p-channel MISFET'S are single p-type regions formed using the gate electrodes and sidewall insulators as masks.

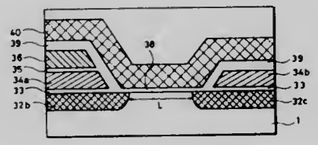
4,891,327

METHOD FOR MANUFACTURING FIELD EFFECT TRANSISTOR

Yoshinori Okumura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,841
Claims priority, application Japan, Aug. 4, 1987, 62-195704
Int. Cl.[4] H01L *27/04, 29/78*
U.S. Cl. 437—41 **12 Claims**





1. A method for manufacturing a field effect transistor, comprising the steps of:

preparing a semiconductor substrate of a first conductivity type having a major surface,

forming a film having a predetermined width on the major surface of said semiconductor substrate,

wherein the step of forming said film comprises the steps of:

forming a first insulating film on the major surface of said semiconductor substrate,

forming on said first insulating film a second insulating film having said film as a part thereof, and

patterning said second insulating film,

implanting impurities of a second conductivity type opposite to said first conductivity type into the major surface of said semiconductor substrate utilizing said film as a mask, to form first and second impurity regions,

removing said film and then, forming a conductor over a region of said semiconductor substrate serving as a channel region between said first and second impurity regions; wherein the step of forming said conductor comprises the steps of:

removing said film and said first insulating film,

forming a third insulating film on the major surface of said semiconductor substrate exposed by removing said first insulating film,

forming first and second conductive layers on said third insulating film and over said first and second impurity regions, respectively,

forming a fourth insulating film on the surfaces of said first and second conductive layers,

forming a third conductive layer on said fourth insulating film and over said first conductive layer,

removing said third insulating film on the major surface of said semiconductor substrate,

forming a fifth insulating film to cover the surfaces of said first, second and third conductive layers including the major surface of said semiconductor substrate exposed by removing said third insulating film,

forming on said fifth insulating film a fourth conductive layer having said conductor as a part thereof, and

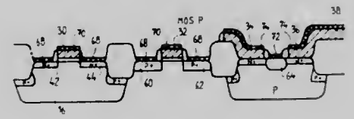
patterning said fourth conductive layer.

4,891,328

METHOD OF MANUFACTURING FIELD EFFECT TRANSISTORS AND LATERAL BIPOLAR TRANSISTORS ON THE SAME SUBSTRATE

Yvon Gris, Les Obdonniers, France, assignor to Societe Pour l'Etude et la Fabrication de Circuits Integres Speciauxefcis, Grenoble, France

Filed Apr. 23, 1986, Ser. No. 855,104
Claims priority, application France, Apr. 26, 1985, 85 06442
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—59 **7 Claims**



1. A method of manufacturing an integrated circuit incorporating N and P channel MOS transistors and bipolar transistors, comprising the steps of:

(a) providing an N type monocrystalline silicon substrate in which P type caissons are formed for N channel MOS transistors and for lateral NPN bipolar transistors;

(b) forming active zones in the substrate which are separated by thick silicon oxide;

(c) forming a thin isolating layer in the active zones which serves as gate oxide for the MOS transistors;

(d) etching the thin oxide isolating layer so as to lay bare the silicon of the active zones in regions where the bipolar transistors will be formed;

(e) depositing a polycrystalline silicon layer doped with an N impurity and capable of serving as source for diffusing this impurity towards the monocrystalline silicon;

(f) etching the polycrystalline silicon layer so as to define a pattern of MOS transistors gates, emitter and collector contacts for the bipolar transistors and interconnections;

(g) masking the bipolar transistors and the P channel MOS transistors and implanting an N type impurity in the source and drain regions of the N channel transistors;

(h) forming isolating embankments against the lateral edges of the etched portions of the silicon layer and laying bare the monocrystalline silicon at the surface of the drain and source regions of the MOS transistors and of the base region of the bipolar transistors;

(i) masking the N channel transistors and P type impurities in the source and drain regions of the P channel transistors and in the base region between the emitter and collector contacts of the bipolar transistors;

(j) uniformly depositing a metal layer capable of forming a conducting silicide with the silicon, particularly where it is in contact with the silicon, but not where it is in contact with the isolating embankments and the isolating walls; and

(k) annealing the device to form said conductive silicide.

4,891,329

METHOD OF FORMING A NONSILICON SEMICONDUCTOR ON INSULATOR STRUCTURE

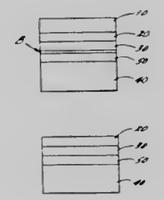
Arnold Reisman, Raleigh, and Wei-Kan Chu, Chapel Hill, both of N.C., assignors to University of North Carolina, Chapel Hill and Microelectronics Center of North Carolina, Research Triangle Park, both of, N.C.

Filed Nov. 29, 1988, Ser. No. 277,168
Int. Cl.[4] H01L *7/50*
U.S. Cl. 437—61 **19 Claims**

1. A method of forming a nonsilicon semiconductor layer on an insulating layer comprising the steps of:

(a) forming a heteroepitaxial nonsilicon semiconductor layer on a first substrate;

(b) forming a first insulating layer on said heteroepitaxial nonsilicon semiconductor layer;



(c) forming a second insulating layer on a second substrate;

(d) bonding together said first and second insulating layers; and,

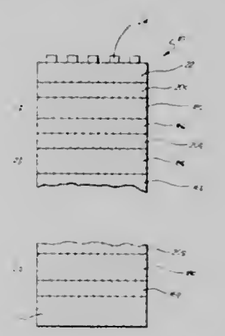
(e) removing said first substrate.

4,891,330

METHOD OF FABRICATING N-TYPE AND P-TYPE MICROCRYSTALLINE SEMICONDUCTOR ALLOY MATERIAL INCLUDING BAND GAP WIDENING ELEMENTS

Subhendu Guha, Troy, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 77,722, Jul. 27, 1987, Pat. No. 4,775,425. This application Mar. 28, 1988, Ser. No. 174,267
Int. Cl.[4] H01L *21/20, 21/14, 21/306*
U.S. Cl. 437—81 **11 Claims**



1. A method of fabricating doped microcrystalline semiconductor alloy material which includes a band gap widening element, said method including the steps of:

providing a deposition chamber;

providing a substrate in said deposition chamber;

vacuumizing said deposition chamber;

providing a precursor mixture including a semiconductor-containing gas, a dopant-containing gas and a band gap widening element-containing gas; said mixture further including a diluent gas;

coupling a source of a.c. energy into the interior of the deposition chamber;

subjecting said precursor mixture to an a.c. glow discharge in the absence of a magnetic field of sufficient strength to induce electron cyclotron resonance, said magnetic field not caused solely by said a.c. initiated glow discharge; and

depositing doped microcrystalline semiconductor alloy material, said material formed by a random network of rela-

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tively low conductvity, disordered regions surrounding highly ordered crystalline inclusions, said volume fraction of crystalline inclusions being sufficient to provide a relatively low resistance current path through the random network, whereby the material exhibits dark electrical conductivity of at least 0.5 $ohm^{-1}cm^{-1}$ and a band gap of at least 1.9 eV.

4,891,331

METHOD FOR DOPING SILICON WAFERS USING AL_2O_3/P_2O_5 COMPOSITION

James E. Rapp, Oregon, Ohio, assignor to OI-NEG TV Products, Inc., Toledo, Ohio

Filed Jan. 21, 1988, Ser. No. 146,503
Int. Cl.[4] H01L *21/225*
U.S. Cl. 437—164 **11 Claims**

1. A method for doping a silicon wafer, the method comprising the steps of:

(A) forming a flowable doping composition paste of (1) a Al_2O_3/P_2O_5 compound product in which the mole ratio of P_2O_5 to Al_2O_3 is about 1/1 to 4/1 in (2) a vehicle for the product to provide a paste, the compound being a reaction product of phosphoric acid or phosphorous acid and an organic aluminum compound or a hydrolyzed derivative thereof;

(B) coating the silicon with the doping composition paste as a thin powdery layer on the silicon wafer without vapor transport; and

(C) heating the coating of step (B) without forming a glassy layer for a time sufficient and a temperature at about 800° C. to 1250° C. that is sufficient to diffuse the phosphorus from the powdery layer into the silicon wafer.

4,891,332

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE COMPRISING A CIRCUIT ELEMENT FORMED OF CARBON DOPED POLYCRYSTALLINE SILICON

Jan Bloem, and Wilhelmus A. P. Claassen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 664,635, Oct. 25, 1984, abandoned, Continuation of Ser. No. 396,921, Jul. 9, 1982, abandoned. This application Apr. 11, 1986, Ser. No. 851,904
Claims priority, application Netherlands, Aug. 3, 1981, 8103649
Int. Cl.[4] H01L *21/223*
U.S. Cl. 437—165 **2 Claims**

1. A method of manufacturing a semiconductor device having a semiconductor body comprising a circuit element formed of polycrystalline silicon doped with carbon in a concentration higher than 1 part per million, said method comprising forming said carbon doped polycrystalline silicon by heating a mixture of a gaseous silicon compound and a gaseous unsaturated hydrocarbon compound to a temperature above 700° C.

4,891,333

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Hiroyuki Baba, and Takashi Matsuzaki, both of Hyogo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

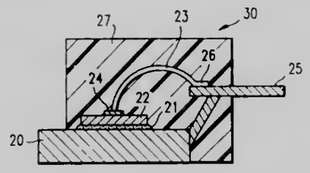
Continuation of Ser. No. 776,804, Sep. 17, 1985, abandoned. This application Feb. 1, 1988, Ser. No. 150,499
Claims priority, application Japan, Oct. 9, 1984, 59-211960
Int. Cl.[4] H01L *23/50*
U.S. Cl. 437—173 **13 Claims**

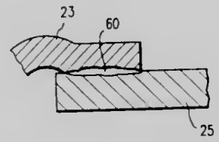
1. Semiconductor device manufacturing method comprising the steps of:

connecting one end of a bonding wire made of aluminum to a bonding pad of a semiconductor element mounted on a lead frame made of a material selected from the group consisting of copper and copper alloy;

bonding the other end of said bonding wire to a lead electrode of said lead frame, said lead electrode made of a material selected from the group consisting of copper and copper alloy;

heating said bonding portion of said other end of said wire connected to said lead electrode at a temperature below the melting point of said bonding wire for a predetermined





time period until a reaction layer with a thickness of 0.2 micron or more is formed by said copper or copper alloy and aluminum; and

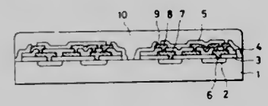
molding said semiconductor element, said bonding pad, and said bonding wire including the bonding portion of said other end thereof with a resinous material entirely.

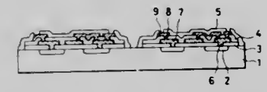
4,891,334

PROCESS FOR PRODUCTION OF ELECTRONIC DEVICES UTILIZING NOVOLAK RESIN AS PROTECTIVE MATERIAL

Masaki Satoh, Yokohama; Shigemitsu Kamiya; Nobuo Fujie, both of Kawasaki, and Shuji Tabuchi, Kuwana, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Filed Nov. 8, 1988, Ser. No. 268,402
Claims priority, application Japan, Nov. 10, 1987, 62-282207
Int. Cl.[4] H01L *21/304, 21/306*
U.S. Cl. 437—228 **6 Claims**





1. A process for the production of electronic parts, which comprises the following steps A to C:

A. covering a device side surface of a semiconductor plate on which semiconductor elements are mounted with a film of a protective material for electronic parts comprising a novolak resin prepared by reacting a monoalkyl phenol having 6 to 12 carbon atoms in the alkyl group with formaldehyde;

B. finishing the other or backside surface of the semiconductor plate, not covered with the film of protective material, to reduce the thickness of the plate; and

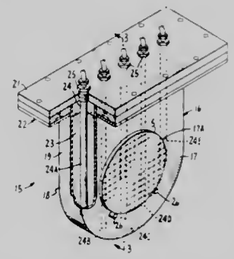
C. removing the film of protective material with a solvent.

4,891,335

SEMICONDUCTOR SUBSTRATE HEATER AND REACTOR PROCESS AND APPARATUS

Michael A. McNeilly, Palo Alto, Calif., assignor to Advantage Production Technology Inc., Sunnyvale, Calif.

Division of Ser. No. 919,313, Oct. 15, 1986, Pat. No. 4,778,559. This application Sep. 29, 1988, Ser. No. 251,115
Int. Cl.[4] H01L *21/00, 21/02;* C30B *1/04, 23/02*
U.S. Cl. 437—247 **12 Claims**



1. A process for transferring heat uniformly to the surfaces of semiconductor substrates, said process comprising the steps of:

heating a low melting point, high boiling point, highly thermally conductive heat transfer medium to a liquid temperature; and

conducting heat from said transfer medium through the walls of a container to the surface of a semiconductor substrate mounted in contact with the walls of said container.

4,891,336

HIGH INDEX PHOTOCHROMIC GLASSES

Michel Prassas, Avon, France, assignor to Corning Incorporated, Corning, N.Y.

Filed Dec. 9, 1988, Ser. No. 281,637
Claims priority, application France, Jul. 29, 1988, 8810269
Int. Cl.[4] C03C *4/06*
U.S. Cl. 501—13 **6 Claims**

1. A photochromic glass having a refractive index greater than 1.585, an Abbe number greater than 42, a density lower than 2.80 g/cm^3, a liquidus viscosity of at least 200 poises, and, at a thickness of 2 mm, exhibits photochromic properties of

(I) a luminous transmission in the unexposed state greater than 84%,

(II) a luminous transmission in the darkened state after 15 minutes' exposure to actinic radiation at a temperature between 0°–25° C. of less than 40%,

(III) a fading rate at 20°–25° C. such that five minutes after removal from the actinic radiation the glass has a luminous transmission of at least 55%, and

(IV) a difference between the luminous transmissions of the darkened state over the temperature range 25°–40° C. of less than 23 points of transmission,

said glass consisting essentially of:

(a) a base glass composition consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	33–50	MgO	0–5
B_2O_3	15–25	CaO	0–5

-continued

$SiO_2 + B_2O_3$	58–66	SrO	0–10
Al_2O_3	2–9	BaO	0–10
ZrO_2	1–5	ZnO	0–5
$Al_2O_3 + ZrO_2$	4–10	MgO + CaO + SrO + BaO + ZnO	1–15 (XO)
Li_2O	1 5–6	$X_2O + XO$	10–24
Na_2O	0–4	La_2O_3	0–5
K_2O	2–9	Nb_2O_5	8–16
$Li_2O + Na_2O + K_2O$	7–16 (X_2O)	TiO_2	2–8
Li_2O/X_2O	0.20–0.50	$ZrO_2 + TiO_2 + Nb_2O_5 + La_2O_3$	14–23

and

(b) photochromic elements consisting essentially, as analyzed in weight percent, of

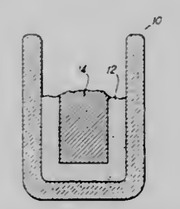
Ag	0.130–0.280
Br	0.130–0.220
Ag + Br	>0.270
Cl	0.170–0.360
CuO	0.0070–0.0350

4,891,337

SHAPED REFRACTORY PRODUCTS AND METHOD OF MAKING SAME

Kathryn V. Logan, Roswell, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Aug. 28, 1986, Ser. No. 901,766
Int. Cl.[4] C04B *38/00, 35/10, 35/58*
U.S. Cl. 501—80 **4 Claims**



1. The method of making a shaped refractory product in which the product is of foamed nature having a density substantially less than the theoretical density of the composition of the product, the composition of the product consisting of TiB_2 in Al_2O_3, which comprises the steps of:

forming an exothermic reaction mixture of components consisting of TiO_2, B_2O_3 and all, which all of the components are of particle size to pass through a 50 mesh screen, a substantial portion of the Al is of a particle size which will not pass through a 300 mesh screen, and at least a substantial amount of the TiO_2 passes through a 300 mesh screen,

loading the reaction mixture into a self sustaining desired shape,

locally igniting the shaped reaction mixture in air at ambient conditions, and

recovering the shaped foamed refractory product after the reaction has been completed.

4,891,338

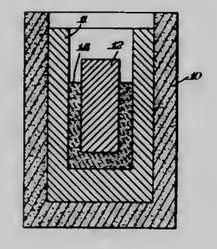
PRODUCTION OF METAL CARBIDE ARTICLES

Adam J. Gesing; Edward S. Lace; Narashima S. Raghavan, all of Kingston, Canada, and Danny R. White, New Castle, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Jan. 13, 1987, Ser. No. 2,823

Int. Cl.[4] C04B *35/52*; C22C *32/00*

U.S. Cl. 501—87 **12 Claims**



1. A method for producing a self-supporting ceramic composite comprising carbide, which method comprises:

(a) stablishing in a substantially inert atmosphere a body of molten parent metal comprising a metal selected from the group consisting of titanium, hafnium and zirconium in surface contact with a permeable mass comprising (i) a filler, and (ii) a carbon source for reaction with said molten metal toform a carbide of the molten metal, the carbon moiety of said carbon source being present in no more thana stoichiometric amount;

(b) maintaining said surface contact for a time sufficient to effect infiltration of molten parent metal into said permeable mass and to permit reaction of saidmolten parent metal with said carbon source to form a parent metal carbide; and

(c) continuing said infiltration and reaction for a time sufficient to at least substantially complete said reaction and to thereby produce said self-supporting ceramic composite.

4,891,339

PROCESS AND APPARATUS FOR THE FLAME PREPARATION OF CERAMIC POWDERS

Hartwell F. Calcote, Princeton, and William Felder, Lawrenceville, both of N.J., assignors to AeroChem Research Laboratories, Inc., Princeton, N.J.

Filed Oct. 23, 1987, Ser. No. 113,215

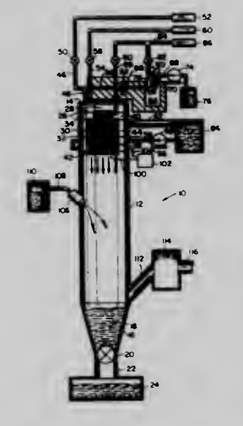
Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501—87 **15 Claims**

1. A continuous process for producing a ceramic powder from a compound selected from the group consisting of silane and diborane and a gaseous reactant including a molecular form of carbon or nitrogen, which comprises:

(a) continuously admixing in a gaseous phase said compound and said gaseous reactant, said gaseous reactant capable of a self sustaining reaction with said compound;

(b) forming and continuously maintaining a stabilized flat flame of said admixture of step (a) thereby to produce uniform, very fine ceramic powder; and



(c) recovering said ceramic powder under non agglomerating conditions during step (b).

4,891,340

PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS

John Semen, and John J. Rogers, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 120,102, Nov. 13, 1987, Pat. No. 4,835,207.

This application Aug. 18, 1988, Ser. No. 233,369

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—88 **9 Claims**

1. A molded SiC ceramic having a density of about 2.0–2.4 g/cc and a specific strength of at least 14 $(kg/mm^2)/(g/cc)$ which is derived form a preceramic composition consisting essentially of an intimate mixture of (A) about 50–85% by weight of SiC powder and (B) about 15–50% by weight of a preceramic polysilazane binder.

4,891,341

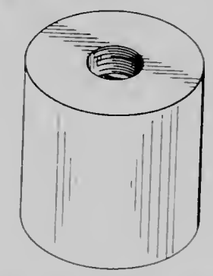
FINE-GRAINED CERAMICS AND METHOD FOR MAKING THE SAME

Raymond A. Cutler, and Anil Virkar, both of Salt Lake City, Utah, assignors to Ceramatec, Inc., Salt Lake City, Utah

Continuation of Ser. No. 4,814, Jan. 9, 1987, abandoned, which is a continuation of Ser. No. 778,252, Sep. 20, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 142,347

Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501—89 **16 Claims**



13. The method according to claim 1 wherein said sintering occurs at a temperature between 1500° and 2400° C.

4,891,342

PROCESS FOR PREPARING A SILICON NITRIDE SINTERED BODY

Kiyoshi Yokoyama, Hayato, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Nov. 18, 1986, Ser. No. 932,196

Claims priority, application Japan, Nov. 20, 1985, 60-262133; Nov. 29, 1985, 60-269807; Nov. 29, 1985, 60-269807; Mar. 17, 1986, 61-59892; Mar. 25, 1986, 61-67682; Jun. 12, 1986, 61-137920

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—97 **15 Claims**

1. A process for the preparation of a silicon nitride sintered body, which comprises: providing a starting material mixture consisting essentially of 5 to 10% by weight of zirconia and 1 to 10% by weight of yttria, with the balance being silicon nitride, each percent being based on the three components, and further containing silica in an amount of 1 to 10 parts by weight per 100 parts by weight of the sum of said three components; molding said starting material mixture to form a molded body; and sintering the molded body in a nitrogen atmosphere, wherein said sintering is carried out subsequent to or simultaneously with said molding.

4,891,343

STABILIZED ZIRCONIA

Taria Quadair, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Aug. 10, 1988, Ser. No. 230,634

Int. Cl.[4] C04B *35/48*

U.S. Cl. 501—103 **12 Claims**

1. A stabilized tetragonal ziroconia composition comprised on a molar basis of:

(A) between 0.3 - 1.3 percent dysprosia;

(B) between 7.0 - 8.5 percent ceria;

(C) a third stabilizer selected from the group consisting of

(i) between 0.5 - 0.8 percent yttria;

(ii) between 0.8 - 1 5 percent titania; and

(iii) mixtures thereof containing up to a combined total of 2.3 percent; and

(D) the balance being tetragonal zirconia.

4,891,344

LOW DIELECTRIC CONSTANT CERAMIC SUBSTRATE

Yasumasa Wakasugi, Kawasaki, and Masahiro Sugimoto, Yokosuka, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 19, 1986, Ser. No. 943,350

Claims priority, application Japan, Dec. 20, 1985, 60-285772

Int. Cl.[4] G04B *35/02*

U.S. Cl. 501—128 **2 Claims**

1. A low dielectric constant mullite ceramic substrate for carrying semiconductor elements comprised of 90 to 98% of mullite and 10 to 2% of a sintering promotor, which promoter is comprised of 0.5 to 3% of magnesia and 1.5 to 7% of calcium oxide said substrate having a flexural strength of more than 1900kg/cm2 and a dielectric constant of less than 6.5.

4,891,345

METHOD FOR PRODUCING COMPOSITE CERAMIC STRUCTURES USING DROSS

S. K. Nadkarni, Jonquiere, and Narasimha S. Raghavan, Kingston, both of Canada, assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Sep. 16, 1986, Ser. No. 907,935

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] C04B *35/00*

U.S. Cl. 501—155 **16 Claims**

1. A method for producing a self-supporting ceramic composite body, said self-supporting body comprising (1) a ceramic matric obtained by oxidation of a parent metal to form a polycrystalline material comprising (i) an oxidation reaction product of said parent metal with at least one oxidant and (2) at least one filler embedded by said ceramic matrix, the method comprising the steps of:

(a) providing at least one comminuted dross material as at least a portion of a permeable mass of filler material, said dross material being obtained from a metal melting operation;

(b) orienting said parent metal and said permeable mass of filler material containing dross relative to each other so that formation of said oxidation reaction product will occur in a direction towards and into said mass of filler material; and

(c) heating said parent metal to a temperature above its melting point but below the melting point of said oxidation reaction product to form a body of molten parent metal and reacting the molten parent metal with said at least one oxidant at said temperature to form said oxidation reaction product, and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said oxidant, to draw molten metal through the oxidation reaction product towards said at least one oxidant and towards and into the adjacent mass of filler material containing dross so that fresh oxidation reaction product continues to form within the mass of filler material containing dross at an interface between said at least one oxidant and previously formed oxidation reaction product, and continuing said reacting for a time sufficient to infiltrate at least a portion of said mass of filler material containing dross with said oxidation reaction product, whereby said dross material has an affinity for said oxidation reaction product thereby enhancing formation of oxidation reaction product into said mass of filler material containing dross.

4,891,346
REDISPERSAL OF RU, OS, RH AND PD CATALYSTS AND PROCESSES THEREWITH
Dennis A. Hucul, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Feb. 25, 1986, Ser. No. 833,642
Int. Cl.[4] B01J *23/96, 38/42;* **C07C** *67/36*
U.S. Cl. 502—35 **9 Claims**

1. A process for redispersing and reducing a supported metal catalyst wherein the catalyst metal is ruthenium, osmium, rhodium or palladium supported by a refractory support and wherein

(1) the catalyst had been prepared by impregnating a metal salt of the catalyst metal on the refractory support and activated by passing hydrogen gas over the catalyst at a temperature of between about 150° C. and 350° C. for a period of time sufficient to reduce the metal salt on the refractory support;

(2) the supported metal catalyst had been deactivated in a vapor phase process for the preparation of an α-substituted acrylate ester which comprised contacting

(a) a haloalkene, wherein the halogen is substituted on an olefinic carbon atom which is further substituted with a C_{1-10} alkyl, C_{3-10} cycloalkyl, C_{6-10} aryl, C_{7-10} alkaryl, C_{7-10} aralkyl, cyano, or trihalomethyl group;

(b) an alcohol or an ether; and

(c) carbon monoxide,

in the presence of the catalyst under conditions sufficient to have prepared an α-substituted acrylate ester and a hydrocarbyl halide with a catalyst producivity of 0.06 g of product per gram of catalyst per hour or greater; and

(3) the above-mentioned deactivated catalyst is redispersed and reduced by contacting the catalyst serially with:

(a) a reducing agent under conditions sufficient to at least partially reduce the catalyst metals,

(b) gaseous chlorine or bromine under conditions sufficient to redisperse the catalyst metal on the support, and

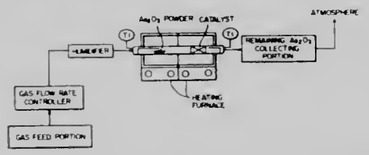
(c) reducing the agent under conditions sufficient to finally reduce the catalyst metal essentially to its metallic state,

thereby producing a redispersed catalyst having an activity for the conversion of 2-chloropropene, methanol and carbon monoxide into methylmethacrylate and chloromethane which is at least 110 percent of the activity of the catalyst initially prepared as described above.

4,891,347
PROCESS FOR THE PREPARATION OF CATALYST USED IN THE PRODUCTION OF UNSATURATED CARBOXYLIC ACIDS
Motomu Oh-Kita; Kazuhiro Ishii; Masaaki Kato, and Masao Kobayashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Filed Nov. 7, 1985, Ser. No. 795,820
Claims priority, application Japan, Nov. 8, 1984, 59-234140
Int. Cl.[4] B01J *27/185, 27/188, 27/19, 27/198*
U.S. Cl. 502—206 **4 Claims**

1. In a process for the preparation of catalyst for use in the production of unsaturated carboxylic acids, said catalyst having a multi-component composition comprising phosphorus, molybdenum, and antimony, wherein the method for producing said catalyst comprises first dissolving or dispersing the catalytic components in water, except for antimony trioxide, subsequently adding antimony trioxide and driving off the water either before or after the antimony trioxide is added, and then heat treating said catalytic components containing antimony trioxide in the presence of oxygen, the improvement comprising using antimony trioxide having an average particle size of not more than 0.2 micron as a starting material.

4,891,348
CATALYST FOR REMOVING NITROGEN OXIDES IN EXHAUST GASES
Makoto Imanari; Takeo Koshikawa, both of Ami; Akihiro Yamauchi, Koganei; Masayuki Hanada, Kitakyushu; Morio Fukuda, Kitakyushu, and Kiyoshi Nagano, Kitakyushu, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo; Sakai Chemical Industry Co., Ltd., Osaka; Catalysts & Chemicals Industries, Co., Ltd. and Mitsubishi Petrochemical Engineering Co., Ltd., both of Tokyo, all of, Japan
Filed Jul. 24, 1987, Ser. No. 77,644
Claims priority, application Japan, Jul. 25, 1986, 61-173812; Jul. 29, 1986, 61-178346; Oct. 24, 1986, 61-251587
Int. Cl.[4] B01J *21/06, 23/30, 23/28;* **C01B** *21/00*
U.S. Cl. 502—309 **7 Claims**



1. A catalyst for removing nitrogen oxides in an exhaust gas, said catalyst containing a first group of pores having a diameter of 1×10^2Å to less than 1×10^3 Å and a second group of pores having a diameter of 1×10^3 Å to 1.2×10^5 Å, the pore volume of the first group being 10% to 90% based on the total pore volume of the first group and the second group, and said catalyst comprising a catalytically effective amount of titanium oxide and at least one metal oxide selected from molybdenum oxide, tungsten oxide and vanadium oxide and having a total pore volume of 0.1 to 0.7 ml/g of catalyst, the atomic ratio of titanium to the other metal being 1:0.001-1.

4,891,349
CATALYST FOR PREPARING AMINES
Robert G. Bowman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 732,978, May 13, 1985, Pat. No. 4,806,690.
This application Nov. 7, 1988, Ser. No. 268,908
Int. Cl.[4] B01J *21/06, 23/72, 23/80*
U.S. Cl. 502—329 **10 Claims**

1. A catalyst for preparing amines from at least one alcohol, aldehyde or ketone, or a mixture thereof, the catalyst comprising, calculated on an oxide-free basis:

(1) from about 1 to less than about 20 percent cobalt;

(2) from about 75 to about 95 percent copper; and

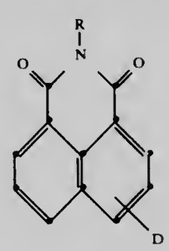
(3) from about 1 to about 16 percent of a third component selected from the group consisting of iron, zinc, zirconium and mixtures thereof.

4,891,350
CATALYST SUPPORTS AND PROCESS FOR THEIR PREPARATION
Thierry Chopin, Saint Denis; Francois Garreau; Magali Knipper, both of Paris; Patrice Nortier, Romainville, and Jean-Luc Schuppiser, Claye Souilly, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Oct. 27, 1987, Ser. No. 113,120
Claims priority, application France, Oct. 27, 1986, 86 14888
Int. Cl.[4] B01J *32/00*
U.S. Cl. 502—439 **10 Claims**

1. A catalyst support which comprises a monolithic substrate adherently coated with at least one oxide layer, said at least one oxide layer containing the residue of a gum or biogum interspersed therein.

4,891,351
THERMALLY-TRANSFERABLE FLUORESCENT COMPOUNDS
Gary W. Byers, Rochester, and Richard P. Henzel, Webster, both of N.Y., assignors to Eastman Kodak Co., Rochester, N.Y.
Filed Dec. 12, 1988, Ser. No. 282,707
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **12 Claims**

5. In a process of forming a transfer image comprising imagewise-heating a donor element comprising a support having on one side thereof a layer comprising a material dispersed in a polymeric binder, and on the other side thereof a slipping layer comprising a lubricant, and transferring an image to a receiving element to form said transfer image, the improvement wherein said material is a fluorescent derivative of a 1,8-naphthalimide compound having the formula:



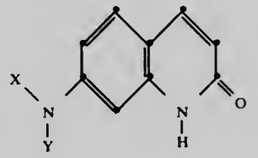
wherein:

R is hydrogen; a substituted or unsubstituted alkyl group of 1 to about 6 carbon atoms; or a carbocyclic or heterocyclic ring of about 5 to about 10 atoms; and

D is a monovalent, nonionic, nonquenching moiety.

4,891,352
THERMALLY-TRANSFERABLE FLUORESCENT 7-AMINOCARBOSTYRILS
Gary W. Byers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 23, 1988, Ser. No. 290,605
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **12 Claims**

7. In a process of forming a transfer image comprising imagewise-heating a donor element comprising a support having on one side thereof a layer comprising a material dispersed in a polymeric binder, and on the other side thereof a slipping layer comprising a lubricant, and transferring an image to a receiving element to form said transfer image, the improvement wherein said material is a fluorescent 7-aminocarbostyril compound having the formula:



wherein:

each X and Y independently represents hydrogen; a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms; a substituted or unsubstituted aryl group having from about 6 to about 10 carbon atoms; or the atoms necessary to complete, along with the nitrogen to which it is attached, a 5- or 6-membered heterocyclic ring.

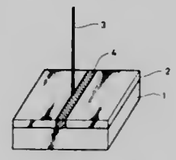
4,891,353
THIAZOLYLMETHYLENE-3,5-PYRAZOLIDINEDIONE DYE-DONOR ELEMENT FOR THERMAL DYE TRANSFER
Steven Evans, Rochester, and Helmut Weber, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 23, 1988, Ser. No. 290,603
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **20 Claims**

9. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye comprises a 2-amino-thiazol-5-ylmethylene-3,5-pyrazolidinedione.

4,891,354
THIAZOLYLMETHYLENE-2-PYRAZOLINE-5-ONE DYE-DONOR ELEMENT FOR THERMAL DYE TRANSFER
Steven Evans, Rochester, and Helmut Weber, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 23, 1988, Ser. No. 290,604
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **20 Claims**

9. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye comprises a 2-amino-thiazol-5-ylmethylene-2-pyrazoline-5-one, said pyrazoline ring being substituted in the 3-position by an amino group or an alkoxy group.

4,891,355
METHOD FOR PRODUCING SUPERCONDUCTING CIRCUIT
Noriki Hayashi; Satoshi Takano; Kenji Miyazaki, and Noriyuki Yoshida, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Aug. 22, 1988, Ser. No. 234,976
Claims priority, application Japan, Aug. 22, 1987, 62-208882
Int. Cl.[4] H01L *39/00*
U.S. Cl. 505—1 **9 Claims**



9. A method in accordance with a superconducting circuit formed by a superconducting phase showing superconductivity at a prescribed working temperature and a non-superconducting phase showing no superconductivity at said prescribed working temperature, said method comprising:

a step of forming a film of a Y-Ba-Cu oxide on a substrate by sputtering and performing heat treatment of said film in an oxygen atmosphere to convert the same into a superconducting film having said superconducting phase; and

a step of applying a laser beam from a YAG laser to a part of said superconducting phase of said superconducting film to cause transition of said part of said superconducting phase into said non-superconducting phase.

4,891,356
PROTEINASE INHIBITORS FOR TREATMENT OF GASTROINTESTINAL ULCER DISEASE
Sander Szabo, Brookline, Mass., assignor to Brigham & Women's Hospital, Boston, Mass.
Filed Jul. 15, 1987, Ser. No. 73,668
Int. Cl.[4] A61K *35/22, 35/14*
U.S. Cl. 514—2 12 Claims

1. A method of treating an animal with gastrointestinal ulcer disease induced by an ulcerogenic chemical or drug comprising administration of a cysteine proteinase inhibitor or an analogue thereof to said animal in an amount sufficient to ameliorate or eliminate said disease.

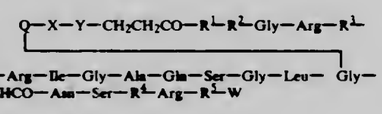
4,891,357
METHODS AND COMPOSITIONS FOR STIMULATION OF APPETITE
Satya P. Kalra, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.
Division of Ser. No. 700,870, Feb. 11, 1985, Pat. No. 4,701,441.
This application Jan. 6, 1987, Ser. No. 760
Int. Cl.[4] A61K *37/02, 35/30*
U.S. Cl. 514—12 14 Claims

1. A method for the stimulation of appetite in human or non-human vertebrate animals in need of appetite stimulation or body weight gain comprising administering to the brain of said animal an effective appetite stimulating amount of NPY or a pharmaceutically acceptable derivative, analog, salt or complex thereof.

12. A pharmaceutical composition in unit dosage form adapted for administration to the brain of a human animal in need of appetite stimulation or body weight gain comprising an effective appetite stimulating amount of NPY or a pharmaceutically acceptable derivative, analog, salt or complex thereof and a pharmaceutically acceptable carrier therefor.

4,891,358
ANE DERIVATIVES WITH NOVEL BRIDGING
John DiMaio, Montreal; Dominik M. Wernic, Laval, and Jorge Jaramillo, Dollard des Ormeaux, all of Canada, assignors to Bio-Mega Inc., Laval, Canada
Filed Dec. 15, 1988, Ser. No. 284,556
Claims priority, application Canada, Dec. 16, 1987, 554516
Int. Cl.[4] C07K *7/00, 5/02, 7/08*
U.S. Cl. 514—13 15 Claims

1. A peptide of formula I



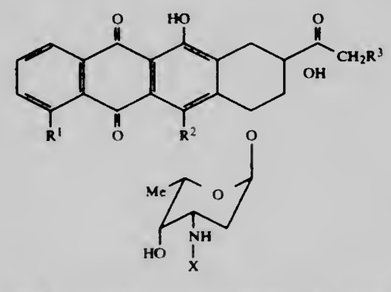
wherein
Q is methylene, ethylene or CR'R" wherein
R' and R" each independently lower alkyl;
R^1 and R^4 each independently is Phe, 2FPhe, 3FPhe, 4FPhe, $2CF_3$Phe, $3CF_3$Phe or $4CF_3$Phe;
R^2 is Gly, Ala or D-Ala;
R^3 is Ile or Met;
R^5 is Tyr or des-R^5;
X is oxy or thio;
Y is methylene or des-Y; and
W is hydroxy, lower alkoxy, amino or lower alkylamino;
with the proviso that when Q is CR'R" as defined herein, then X is thio;
or a therapeutically acceptable salt thereof.

4,891,359
HEMOSTATIC COLLAGEN PASTE COMPOSITION
Lowell Saferstein, Edison, and Stephen J. Wolf, Manville, both of N.J., assignors to Johnson & Johnson Patient Care, Inc., New Brunswick, N.J.
Filed Dec. 8, 1988, Ser. No. 282,224
Int. Cl.[4] A61K *37/12*
U.S. Cl. 514—21 12 Claims

1. A hemostatic collagen paste composition comprising a mixture, by weight of the total composition, of 5 to 30% of a water insoluble crosslinked collagen powder of 10 to 100 mesh particle size and 70 to 95% of water or an aqueous saline solution.

4,891,360
6-AMINO ANTHRACYCLINES, PROCESS FOR THEIR PREPARATION AND USE THEREOF
Francesco Angelucci, Milan; Mauro Gigli, Merano, and Sergio Penco, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy
Filed Jul. 14, 1987, Ser. No. 73,109
Claims priority, application United Kingdom, Jul. 21, 1986, 8617742
Int. Cl.[4] A61K *31/70;* C07H *15/24*
U.S. Cl. 514—34 18 Claims

1. An anthracycline glycoside of formula (A):



wherein R_1 is hydrogen, hydroxy or methoxy; R_2 is amino, R_3 is hydrogen or hydroxy; X is hydrogen; and pharmaceutically acceptable salts thereof.

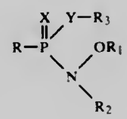
18. A pharmaceutical composition having antitumor activity against colon adenocarcinoma comprising an effective amount of an anthracycline glycoside of formula (A) as defined in claim 1, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier or diluent.

4,891,361
METHOD OF MINIMIZING ERYTHEMA AND ELASTOSIS
Shinkichi Hatae, Ohnojo, Japan, assignor to Sansho Seiyaku Co., Ltd., Ohnojo, Japan
Continuation of Ser. No. 869,746, Jun. 2, 1986, abandoned. This application May 18, 1988, Ser. No. 198,637
Claims priority, application Japan, Jul. 2, 1985, 60-146029
Int. Cl.[4] A61K *31/735*
U.S. Cl. 514—58 5 Claims

1. A method of minimizing erythema or elastosis resulting from UV irradiation comprising applying to skin a composition comprising from 0.1 to 5% by weight of kojic acid included in β-cyclodextrin.

4,891,362
SUBSTITUTED AMIDOPHOSPHONATES AND AMIDOPHOSPHATES
Odd Kristiansen, Möhlin, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jun. 27, 1988, Ser. No. 212,392
Claims priority, application Switzerland, Jul. 8, 1987, 02585/87; May 6, 1988, 01732/88
Int. Cl.[4] A01N *57/02, 57/08;* C07F *9/24, 9/36*
U.S. Cl. 514—90 15 Claims

1. A compound of formula I

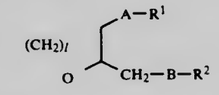


wherein:
R is C_1-C_4alkyl,
R_1 and R_2 are each methyl or, when taken together, form the radical $—(CH_2)_4—$,
R_3 is C_3-C_4alkyl;
X is oxygen or sulfur, and
Y is sulfur.

11. A method of controlling insects and representatives of the order Acarina, which comprises contacting or treating said pests or the different development stages thereof and/or the locus thereof with a pesticidally effective amount of a compound of formula I as claimed in claim 1, or with a composition which contains a pesticidally effective amount of such a compound, together with adjuvants and carriers.

4,891,363
CYCLIC ETHER DERIVATIVES AND THEIR USE
Norio Nakamura; Nobuyuki Ookawa; Hiroyuki Koike; Toshio Sada; Takeshi Oshmia; Yoshio Iizuka, and Hideki Miyazaki, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 69,041, Jul. 1, 1987, abandoned, and Ser. No. 147,081, Jan. 20, 1988, abandoned, which is a continuation of Ser. No. 888,155, Jul. 18, 1986, abandoned. This application Feb. 4, 1988, Ser. No. 152,068
Claims priority, application Japan, Jul. 26, 1985, 60-163965; Jul. 4, 1986, 61-157319; Jan. 26, 1987, 62-15484
Int. Cl.[4] A61K *31/665;* C07F *9/58, 9/65, 9/142*
U.S. Cl. 514—94 51 Claims

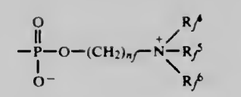
1. A compound of formula (I):



in which:
l is an integer of from 2 to 4;
A and B are independently selected from the group consisting of oxygen atoms and sulfur atoms;
one of R^1 and R^2 represents a group of formula (II):



in which
R^3 is R_f^3 wherein R_f^3 represents an alkyl group containing from 10 to 22 carbon atoms, and
R^5 represents a hydrogen atom,
and the other of R^1 and R^2 represents a group of (IIf):

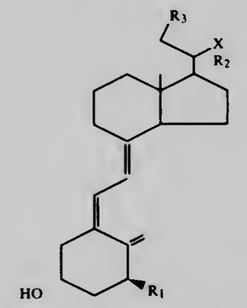


wherein
n_f is an integer of from 2 to 10;
R_f^4, R_f^5 and R_f^6 are independently selected from the group consisting of hydrogen atoms and C_1-C_6 alkyl groups, or R_f^4 and R_f^5 or R_f^4, R_f^5 and R_f^6, together with the nitrogen atom to which they are attached, form a heterocyclic ring which may be aromatic or partly or wholly saturated;
said heterocyclic groups in formula (IIf) having from 3 to 10 ring atoms, of which from 1 to 4 atoms are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur atoms, at least one of these being a nitrogen atom, and said heterocyclic group being unsubstituted or having at least one substituent selected from the group consisting of substituents (c):
substituents (c):
C_1-C_6 alkyl groups, C_1-C_5 hydroxyalkyl groups, C_1-C_6 alkoxy groups, carbamoyl groups, mono- and di-alkylcarbamoyl groups in which the or each alkyl part is C_1-C_5 and halogen atoms; or a pharmaceutically acceptable salt or ester thereof.

41. A method for the treatment of prophylaxis of asthma, inflammation or shock comprising administering an amount of a PAF antagonist to an animal sufficient to effect treatment or prophylaxis of inflammation or shock, wherein said PAF antagonist is selected from the group consisting of compounds of claim 1.

4,891,364
VITAMIN D DERIVATIVES, PROCESS FOR PRODUCING THE SAME AND THEIR USE IN THE DIFFERENTIATION OF TUMOR CELLS
Noboru Kubodera, Saitama; Katsuhito Miyamoto, Tokyo; Kiyoshige Ochi, Saitama; Isao Matsunaga, Tokyo, and Eigoro Murayama, Chiba, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 802,607, Nov. 25, 1985, abandoned. This application Jun. 13, 1988, Ser. No. 211,096
Claims priority, application Japan, Nov. 27, 1984, 59-250291; Dec. 28, 1984, 59-278616
Int. Cl.[4] A61K *31/59;* C07J *9/00*
U.S. Cl. 514—167 23 Claims

1. A vitamin D derivative of the formula:



where R_1, R_2 and R_3, which may be the same or different, each represents a hydrogen atom or a hydroxyl group; X is an oxygen atom, the group of the formula OR_4 (where R_4 is either a hydrogen atom or a lower alkyl group having 4 to 6 carbon

atoms that may or may not be substituted by a hydroxyl group), or the group of the formula N—OR_5 (where R_5 is either a hydrogen atom or a lower alkyl group having 1 to 5 carbon atoms that may or may not be substituted by a hydroxyl group, an amino group or a lower alkylamino group having 1 3 carbon atoms), provided that the carbon atom at the 20-position in linked to X by a single bond when X is the group of the formula OR_4, and by a double bond in other cases, with the proviso that X is not an oxygen atom or a hydroxyl group when all or R_1, R_2 and R_3 are hydrogen.

4,891,365

17-SUBSTITUTED ESTRADIENES AND ESTRATRIENES

Rudolf Wiechert; Sybille Beier; Walter Elger, all of Berlin; Klaus Annen, Muenster-Albachtes; Klaus Nickisch, and Henry Laurent, both of Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

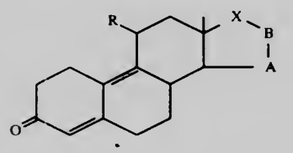
Continuation of Ser. No. 714,420, Mar. 21, 1985, abandoned. This application Jul. 2, 1987, Ser. No. 69,061

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410080

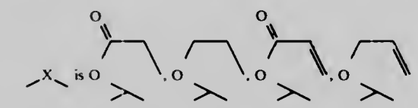
Int. Cl.[4] A61K *31/58, 31/585, 31/56;* **C07J** *1/00*

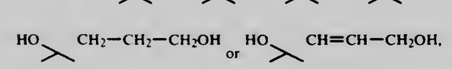
U.S. Cl. 514—173 **27 Claims**

1. A 17-substituted estradiene or estratriene of the formula

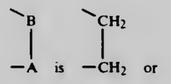


wherein

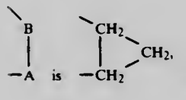




R is alkyl, alkenyl or cycloalkyl each of up to 5 carbon atoms, when



R is hydrogen or alkyl, alkenyl or cycloalkyl each of up to 5 carbon atoms, when



and



a CC-single or CC-double bond.

4,891,366

NOVEL 2β,16β-DIAMINO-ANDROSTANES

Thomas Sleigh, Wishaw; David S. Savage, Newton Mearns, and Robert Taylor, Airdrie, all of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

Filed Apr. 20, 1988, Ser. No. 184,547

Claims priority, application United Kingdom, Apr. 23, 1987, 8709565

Int. Cl.[4] A61K *31/58, 31/56;* **C07J** *1/00, 43/00*

U.S. Cl. 514—176 **9 Claims**

1. 2β, 16β-diamino-3α, 17α-oxygenated androstanes having one quaternized amino group as a 16β-substituent, and acid addition salts thereof.

4,891,367

17β-(CYCLOPROPYLOXY)ANDROST-5-EN-3β-OL AND RELATED COMPOUNDS USEFUL AS C_{17-20} LYASE INHIBITORS

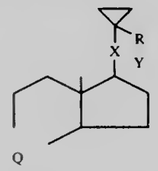
Michael R. Angelastro, Loveland, and Thomas R. Blohm, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Apr. 22, 1987, Ser. No. 41,170

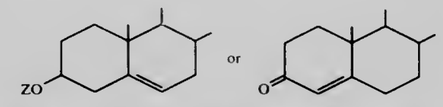
Int. Cl.[4] C07J *31/00, 1/00;* **A61K** *31/565*

U.S. Cl. 514—178 **6 Claims**

1. A compound of the formula



wherein R is hydrogen or methyl; X is O or S; Y is hydrogen or C_1-C_4 alkyl; and Q is



wherein Z is hydrogen or alkanoyl of 1–10 carbon atoms, or cyclopentane- and benzene-alkanoyl wherein the alkanoyl portion contains up to 4 carbon atoms.

4,891,368

USE OF ANTIGESTAGENS FOR SOFTENING THE NONPREGNANT CERVIX

Krzysztof Chwalisz; Sybille Beier; Angelika Esch, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 287,258

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3744054

Int. Cl.[4] A61K *31/56, 31/135*

U.S. Cl. 514—179 **10 Claims**

1. A method of preparing a nonpregnant mammalian female for a uterine medical procedure comprising administering to said individual prior to said procedure an antigestagen in an amount effective to soften the cervix.

4,891,369

2β-SUBSTITUTED-METHYLPENICILLANIC ACID DERIVATIVES, AND SALTS AND ESTERS THEREOF

Sigeru Torii; Hideo Tanaka; Motoaki Tanaka, all of Okayama; Shozo Yamada, Honjyo; Akira Nakai, Okayama; Hisashi Ohbayashi, and Tomoyasu Ohno, both of Honjyo, all of Japan, assignors to Taiho Pharmacentical Company, Limited, Tokyo, Japan

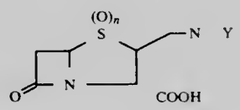
Filed Nov. 23, 1987, Ser. No. 123,631

Claims priority, application Japan, Dec. 3, 1986, 61-289595; Jan. 14, 1987, 62-6759; Jun. 26, 1987, 62-160278; Aug. 11, 1987, 62-201536

Int. Cl.[4] C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **19 Claims**

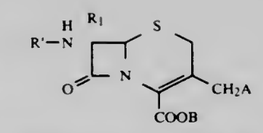
1. A 2β-substituted-methylpenicillanic acid compound of the formula



(1)

wherein n is 0, 1 or 2, and

is imidazolyl, pyrazolyl, tetrazolyl, 1,2,3-triazol-2-yl, 1,2,4-trialzolyl, benzotriazolyl or benzimidazolyl, each of which may be optionally substituted with alkyl, alkoxycarbonyl, phenyl, formyl or benzyloxycarbonyl which may optionally have alkyl, nitro or a halogen atom on the benzene ring; a pharmaceutically acceptable salt thereof; or an ester thereof formed by protecting the carboxyl group at the 3-position of the compound of the formula (I) by a protective group selected from the class consisting of lower alkyl, lower alkoxymethyl, lower alkylcarbonyloxy-lower alkyl, (C_{5-7} cycloalkyl)carbonyloxy-lower alkyl, benzylcarbonyloxy-iower alkyl, benzoyloxy-lower alkyl, 3-phthalidyl, crotonolacton-4-yl, γ-butyrolacton-4-yl, halogenated lower alkyl substituted with 1 to 3 halogen atoms, methyl group which is substituted with 1 or 2 phenyl groups optionally having lower alkoxy or nitro on the benzene ring, tetrahydropyranyl, dimethylaminoethyl, dimethylchlorosilyl, trichlorosilyl, tert-butylsilyl and (5-substituted or unsubstituted-2-oxo-1,3-dioxoden-4-yl)methyl.



(I)

or a pharmaceutically acceptable salt thereof wherein:

R′ is

(1)



wherein R″ represents

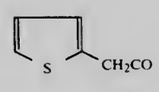
(a) straight or branched chain alkyl having from 1 to 20 carbon atoms;

(b) aryl having from 6 to 10 carbon atoms;

(c) cycloalkyl having from 3 to 8 carbon atoms;

(d) aralkyl;

(e)



(f) hydrogen;

groups (a)–(f) above being unsubstituted or substituted by alkyl, alkoxy, halo, cyano, carboxy, amino or substituted amino;

A is

(1) acyloxy;

(2) acylthio;

(3) ZR_5 where

Z represents oxygen or sulfur; and

R_5 is

(a) acyl;

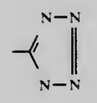
(b) straight, branched or cyclic loweralkyl;

(c) straight, branched or cyclic loweralkenyl;

(d) aryl;

(e) aralkyl;

(f)



the above group being unsubstituted or substituted with alkyl, alkoxy, halo, cyano, carboxy, amino, substituted amino, haloalkyl, carboxyalkyl; or alternatively CH_2A represents formyl;

R_1 is

(1) XR_1' where X represents oxygen or sulfur, R_1' is straight or branched loweralkyl;

(2) hydrogen;

(3) straight or branched or cyclic loweralkyl; or

(4) monocyclic aryl;

and

B is

(1) straight or branched loweralkyl;

(2) straight or branched loweralkenyl;

(3) cycloalkyl;

(4) aryl;

(5) aralkyl;

(6) phthalidyl;

(7) alkanoylalkyl;

(8) alkanoyloxyalkyl;

4,891,370

CEPHALOSPORIN DERIVATIVES AS ANTI-INFLAMMATORY AGENTS

Morris Zimmerman, Watchung; Bunnie M. Ashe, Scotch Plains, and James B. Doherty, New Milford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 14, 1981, Ser. No. 330,544

Int. Cl.[4] A61K *31/545*

U.S. Cl. 514—201 **9 Claims**

1. The method of treating inflammatory conditions caused by the action of an elastase comprising the administration to a mammalian species in need of said treatment as effective anti-inflammatory amount of a compound of formula:

(9) alkanoyl; or
(10) alkoxyalkyl;
groups (1) to (10) above being unsubstituted or substituted with one or more groups selected from the group consisting of:
(a) halo;
(b) hydroxy;
(c) alkoxy;
(d) mercapto;
(e) amino;
(f) substituted amino;
(g) nitro;
(h) alkanoyloxy;
(i) carbamoyloxyl;
(j) carboxy;
(k) alkanoyl;
(l) carboxamido; and
(m) cyano.

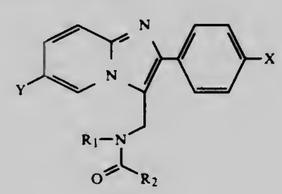
4,891,371

3-(ACYLAMINOMETHYL)IMIDAZO[1,2-a] PYRIDINE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPY

Pascal George, Vitry sur Seine; Claudie Giron, Antony, and Jacques Froissant, Moree, all of France, assignors to Synthelabo, Paris, France

Continuation of Ser. No. 10,703, Feb. 4, 1987, Pat. No. 4,767,755. This application Jun. 10, 1988, Ser. No. 204,748
Claims priority, application France, Feb. 5, 1986, 86 01553
Int. Cl.[4] A61K *31/44, 31/535;* **C07D** *471/04*
U.S. Cl. 514—212 **4 Claims**

1. A compound of formula



in which

R_1 denotes hydrogen, linear or branched C_1–C_4 alkyl, or benzyl, R_2 denotes linear or branched C_1–C_6 alkyl, cyclohexyl, trichloromethyl; 1-propenyl, allyl, phenyl, 4-chlorophenyl, or benzyl, or R_1 and R_2 together denote a C_3–C_5 aliphatic chain, X denotes halogen; C_1–C_3 alkyl; methylthio; optionally esterified carboxy of formula —COOR in which R denotes hydrogen or C_1–C_6 alkyl; cyano; optionally mono- or dialkylated aminocarbonyl of formula $—CONR_3R_4$ in which R_3 and R_4 independently denote hydrogen or C_1–C_4 alkyl or together denote a chain of formula $—(CH_2)_2—Z—(CH_2)_2—$ in which Z denotes a direct bond, oxygen, sulphur, or a divalent group of formula $—CH_2—$, —NH— or $—N(C_1–C_4$ alkyl)—; alkylamino of formula NHR_5 in which R_5 denotes C_2–C_6 alkyl; or dialkylamino of formula $—NR_6R_7$ in which R_6 and R_7 independently denote C_2–C_6 alkyl or together denote a chain of formula $—(CH_2)_2—Z—(CH_2)_2—$ in which Z denotes a direct bond, oxygen, sulphur, or a divalent group of formula $—CH_2—$, —NH— or $—N(C_1–C_4$ alkyl)—: and Y denotes trifluoromethyl or $—NR_{11}R_{12}$ in which R_{11} and R_{12} independently denote hydrogen or C_1–C_4 alkyl or a pharmaceutically acceptable acid addition salt.

4. A sleep-inducing, hypnotic, anxiolytic or anti-stress ulcer composition comprising an effective sleep-inducing, hypnotic, anxiolytic or anti-stress amount of a compound according to claim 1 and a pharmaceutically suitable excipient.

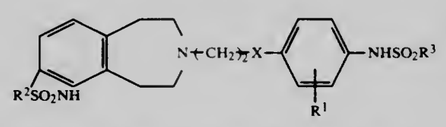
4,891,372

ANTIARRHYTHMIC AGENTS, COMPOSITIONS AND METHOD OF USE THEREAS

John E. Arrowsmith, Deal, and Peter E. Cross, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 21, 1988, Ser. No. 170,499
Claims priority, application United Kingdom, Mar. 25, 1987, 8707120
Int. Cl.[4] C07D *223/16;* **A61K** *31/55*
U.S. Cl. 514—213 **21 Claims**

1. A compound of the formula:



(I)

or a pharmaceutically acceptable salt thereof; wherein
R^1 is H, C_1–C_4 alkyl or C_1–C_4 alkoxy;
X is O,



or a covalent bond; and
R^2 and R^3, which are the same or different, are each C_1–C_4 alkyl, with the proviso that when X is



R^2 and R^3 are the same.

18. A method of treating cardiac arrhythmias in mammals comprising administering to a mammal in need of such treatment an antiarrhythmic effective amount of a compound as claimed in claim 1.

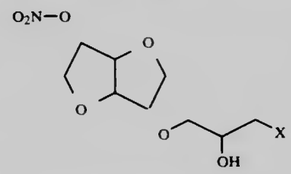
4,891,373

AMINOPROPANOL DERIVATIVES OF 1,4:3,6-DIANHYDROHEXITOL NITRATES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Peter Stoss, Illertissen; Matyas Leitold, Biberach, and Rodney Yeates, Tiefenbach, all of Fed. Rep. of Germany, assignors to Pfizer Inc., New York, N.Y.

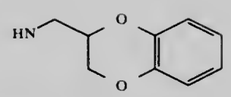
Filed Nov. 23, 1988, Ser. No. 275,315
Int. Cl.[4] A61K *31/34, 31/455;* **C07D** *493/04*
U.S. Cl. 514—228.2 **21 Claims**

1. A compound of the formula I

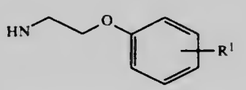


(I)

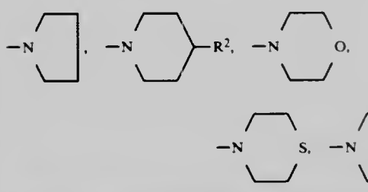
in which X is a benzo[1,4]dioxinyl-2-methylamine radical of the formula



a phenoxyethylamino radical of the formula



in which R^1 is hydrogen, hydroxyl or a C_1–C_3-alkoxy radical, and the substituent R^1 can be in the o-, m- or p-position, or X is one of the following radicals:



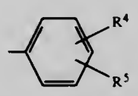
in which R^2 represents hydrogen or an unsubstituted or mono-, di- or tri- substituted phenyl radical, wherein the substituents on the phenyl can be the same or different and are selected from C_1–C_3 alkyl, C_1–C_3 alkoxy, halogen, nitro and trifluoromethyl, and in which R^3 represents straight chain or branched C_1–C_6 alkyl, hydrogen,



wherein R^6 is C_1–C_7 alkyl, phenyl, phenyl substituted with C_1–C_4 alkyl, or



benzyl, benzhydryl, pyridyl, pyrimidinyl, or unsubstituted or substituted phenyl of the formula



in which R^4 and R^5 can be identical or different and each represents hydrogen, hydroxyl, C_1–C_6 alkyl C_1–C_6 alkoxy, halogen, nitro or trifluoromethyl, or in which R^4 and R^5 together form a methylenedioxy group, and pharmaceutically acceptable salts thereof.

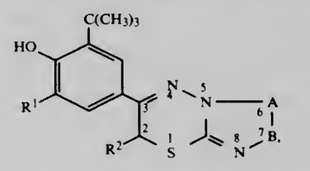
4,891,374

IMIDAZO- AND TRIAZOLOTHIADIAZINES

Werner Thorwart, Hochheim am Taunus; Ulrich Gebert, Kelkheim; Rudolf Schleyerbach, Hofheim am Taunus, and Robert R. Bartlett, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,546
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702757
Int. Cl.[4] C07D *513/04;* **A61K** *31/54*
U.S. Cl. 514—222.8 **10 Claims**

1. An imidazo- or triazolothiadiazine of the formula I



(I)

in which
R^1 is a straight-chain or branched alkyl group having 1 to 4 carbon atoms,
R^2 is a hydrogen atom or an alkyl radical having 1 to 3 carbon atoms, and
—A—B is a two-membered structural element in the five-membered ring and represents $—CH_2—CH_2—$, —CH=CH—, —CH=N—, $—CH_2—CO—$or $CO—CH_2—$, or a physiologically acceptable acid-addition salt thereof.

5. A pharmaceutical composition for the treatment or prevention of an inflammatory disorder in a warm blooded animal comprising an effective amount for said treatment or prevention of a compound of formula I of claim 1, or a physiologically acceptable acid-addition salt thereof, with a physiologically acceptable carrier.

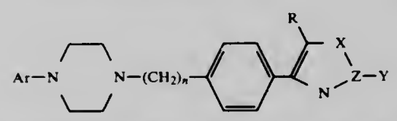
4,891,375

ARYLPIPERAZINYL-ALKYLENE-PHENYL-HETEROCYCLIC COMPOUNDS

John A. Lowe, III, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 13, 1988, Ser. No. 143,909
Int. Cl.[4] C07D *417/10, 403/14, 403/04;* **A61K** *31/495*
U.S. Cl. 514—252 **13 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein
Ar is phenyl or 3-trifluoromethylphenyl; 3-cyanopyridyl; naphthyl; or a heterocyclic ring selected from the group consisting of furyl; pyrrolyl; pyrazolyl; imidazolyl; oxazolyl; thiazolyl; isothiazolyl; pyridyl, and pyrimidyl; or a benzoheterocyclic ring selected from the group consisting of quinolyl; quinazolinyl; benzoxazolyl; benzimidazolyl; benzothiazolyl; and benzisothiazolyl;; each of said naphthyl, heterocyclic ring or benzoheterocyclic ring optionally substituted by one fluoro, chloro or trifluoromethyl, said substitution in the case of said naphthyl or benzoheterocyclic ring being in the ring not attached to the piperazinyl group;
n is 2, 3 or 4;
R is hydrogen or (C_1–C_3) alkyl;

X is nitrogen, oxygen or sulfur, and
Z-Y is C-H, C-OH, C-SH, C-NH_2, C-(C_1-C_3) alkyl, C-(C_1-C_3) alkylamino or N, with the proviso that when Z-Y is nitrogen then X is not oxygen.

7. A pharmaceutical composition comprising a compound according to claim 1 in an amount effective for removing or ameliorating the symptoms of psychotic schizophrenia, and a pharmaceutically acceptable carrier or diluent.

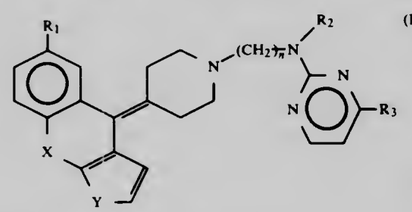
4,891,376

1-((2-PYRIMIDINYL)AMINOALKYL)PIPERIDINES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPY

Philippe Manoury, Verrieres le Buisson, and Alfred Saarmets, Sacy en Brie, both of France, assignors to Synthelabo, Paris, France

Filed Sep. 8, 1988, Ser. No. 242,430
Claims priority, application France, Sep. 9, 1987, 87 12502
Int. Cl.[4] A61K *31/505*; C07D *409/14*
U.S. Cl. 514—272 **7 Claims**

1. A compound which is a pyrimidinylamino derivative of piperidine of formula (I)



(I)

in which:
X ix a $(CH_2)_2$, CH=CH or CH_2—CO group;
Y is a CH=CH group or sulphur;
n is 2, 3 or 4;
R_1 is hydrogen or a halogen;
R_2 is hydrogen or a (C_{1-4}) alkyl group; and
R_3 is hydrogen or a hydroxy group;
or a pharmaceutically acceptable acid addition salt thereof.

7. A method for the treatment of migraine which comprises administering to a subject suffering therefrom or liable to suffer therefrom an effective amount of a compound as defined in claim 1.

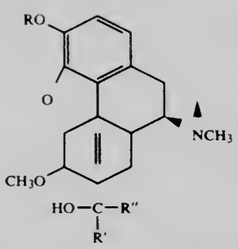
4,891,377

TRANSDERMAL DELIVERY OF THE NARCOTIC ANALGESICS ETORPHINE AND ANALOGS

Charles Shipman, Jr., Dexter; Mohammad R. Nassiri, and Gordon L. Flynn, both of Ann Arbor, all of Mich., assignors to Board of Regents Acting for and on behalf of University of Michigan, Ann Arbor, Mich.

Filed Dec. 2, 1988, Ser. No. 278,971
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—282 **22 Claims**

1. A process for relieving pain comprising the application to mammalian skin of an effective amount of a compound of the formula:



or a pharmacologically acceptable acid addition salt thereof, where R is —CH_2, —C—CH_3 or —H and R' and R'' are C_1 to C_6 hydrocarbons or —H, in association with a topical pharmaceutical carrier selected from the group consisting of solutions, ointments, lotions, pastes, jellies, sprays and aerosols.

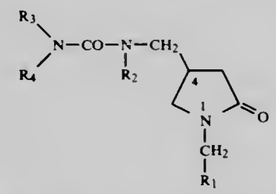
4,891,378

NORTROPANYL CONTAINING PYRROLIDINONES, PHARMACEUTICAL COMPOSITIONS AND USE

Karl-Heinz Weber, Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen am Rhein; Dieter Hinzen, Bingen; Franz J. Kuhn, Gau-Algesheim; Erich Lehr, Waldalgesheim; Helmut Ensinger, Wackernheim, and Wolfgang Tröger, Stromberg, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim Zentrale GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 183,819, Apr. 20, 1988, Pat. No. 4,857,528, which is a division of Ser. No. 943,532, Dec. 18, 1986, Pat. No. 4,762,832, which is a division of Ser. No. 738,152, May 24, 1985, Pat. No. 4,670,456. This application Jun. 12, 1989, Ser. No. 365,169
Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420193
Int. Cl.[4] A61K *31/46*; C07D *451/02*
U.S. Cl. 514—304 **5 Claims**

1. Substituted pyrrolidinones of the formula



(I)

wherein
R_1 is a phenyl group which can be momo- or di-substituted by methyl, methoxy, fluorine, chlorine, bromine or trifluoromethyl, or a pyridyl group;
R_2 is hydrogen or a straight-chained or branched alkyl group with 1–4 carbon atoms;
R_3 and R_4 taken together are the nortropanyl group;
as well as physiologically acceptable acid addition salts thereof.

4. A pharmaceutical composition for treating cerebral insufficiency comprising a pharmaceutically acceptable carrier and an effective amount of a compound in accordance with claims 1 or 2.

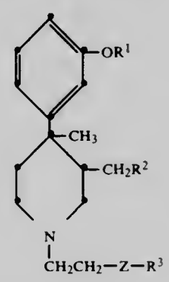
4,891,379

PIPERIDINE OPIOID ANTAGONISTS

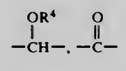
Dennis M. Zimmerman, Mooresville, and Charles H. Mitch, Indianapolis, both of Ind., assignors to Kabushiki Kaisha Kobe Seikosho, Kobe and Japan LSI Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 39,121, Apr. 16, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,504
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—315 **5 Claims**

1. A method for blocking mu or kappa receptors in mammals comprising administering to a mammal requiring blocking of a mu or kappa receptor a receptor blocking dose of a trans-3,4 isomer of a compound of the formula



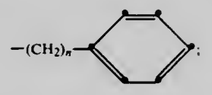
wherein:
R^1 is hydrogen or C_1–C_4 alkanoyl;
R^2 is hydrogen, C_1–C_4 alkyl or C_2–C_6 alkenyl;
R^3 is C_4–C_6 alkenyl, C_1–C_4 alkyl substituted C_4–C_8 cycloalkyl, C_1–C_4 alkyl substituted C_4–C_8 cycloalkenyl or thiophene;
Z is



or a bond;
R^4 is hydrogen, C_1–C_6 alkyl,



R^5 is C_1–C_4 alkyl or



n is 1, 2 or 3; and
the pharmaceutically acceptable salts thereof.

4,891,380

NOVEL TREATMENT

Andrew J. Williams, and Derek R. Buckle, both of Epsom, England, assignors to Beecham Group p.l.c., Middlesex, England

Filed Jul. 5, 1988, Ser. No. 214,776
Claims priority, application United Kingdom, Jul. 7, 1987, 8715944; Aug. 6, 1987, 8718587
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—353 **6 Claims**

1. A method for the treatment of disorders associated with pulmonary hypertension or right heart failure in mammals, which method comprises administering to a mammal in need of such treatment a therapeutically effective amount of pinacidil, a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate thereof.

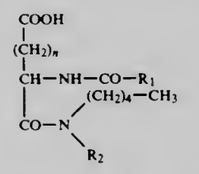
4,891,381

DERIVATIVES OF 5-PENTYLAMINO-5-OXOPENTANOIL AND 4-PENTLAMINO-4-OXOBUTANOIC ACIDS WITH ANTAGONISTIC ACTIVITY TOWARDS CHOLECYSTOKININ

Francesco Makovec; Rolando Chiste'; Walter Peris, and Luigi Rovati, all of Milano, Italy, assignors to Rotta Research Laboratorium, Milano, Italy

Division of Ser. No. 133,844, Dec. 16, 1987, Pat. No. 4,826,878. This application Dec. 7, 1988, Ser. No. 284,002
Claims priority, application Italy, Dec. 16, 1986, 67937 A/86
Int. Cl.[4] C07D *209/12*; A61K *31/405, 31/40*
U.S. Cl. 514—119 **6 Claims**

1. Pharmaceutically active compounds of 5-pentylamino-5-oxopentanoic and 4-pentylamino-4-oxobutanoic acids having the formula:



(I)

in which n is selected from 1 and 2, R_1 is 2-indolyl or 3-indolyl, and R_2 is selected from the pentyl group and alkoxyalkyl groups having 4 or 5 carbon atoms, or a pharmaceutically-acceptable salt thereof.

6. A method for the treatment of spastic conditions, pancreatitis, pathological conditions of the CNS linked to deficiencies in the physiological neuron levels of cholecystokinin or other bio-active polypeptides in the human or animal body, the method comprising administering to said body an effective amount of a compound of claim 1.

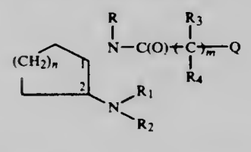
4,891,382

METHOD OF PREVENTING PANCREATITIS UTILIZING 2-AMINO-CYCLOALIPHATIC AMIDES

Cleo Lancaster, and Andre Robert, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 22, 1988, Ser. No. 184,647
Int. Cl.[4] A61K *31/40, 31/495*
U.S. Cl. 514—429 **10 Claims**

1. A method for the prevention of pancreatitis in a patient susceptible thereto which comprises administering to a patient a preventative amount of a compound of the formula



(I)

wherein
the ~ at the 1-position of the cycloaliphatic ring denotes trans-stereoconfiguration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring;
R is C_1 to C_3-alkyl;
R_1 and R_2, taken separately, are C_1 to C_3-alkyl, or when R_1

is C_1 to C_3-alkyl, R_2 is C_1 to C_6-alkyl, $-CH_2CF_3$, C_3 to C_6-(allylic)-alkenyl, C_2 to C_5-hydroxyalkyl, C_3 to C_6-cycloalkyl, C_3 to C_6-cycloalkyl, C_3 to C_4-cycloalkyl-methyl, phenyl-C_1 to C_3-alkyl, or R_1 and R_2 taken together with the nitrogen to which they are bonded complete a saturated, monocyclic, mononitrogen heterocyclic ring containing only carbon and nitrogen ring atoms and containing from 3 to 4 carbon atoms; said saturated monocyclic nitrogen heterocyclic rings having 3 to 4 ring carbon atoms permissively being substituted in the 3-position of the ring with hydroxy, C_1 to C_3-alkyloxy, or C_1 to C_3-alkanoyloxy; or N-piperazinyl ring, permissively substituted on the N'-nitrogen with a C_1 to C_3-alkyl;

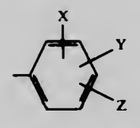
R_3 is hydrogen or methyl;

R_4 is hydrogen or methyl, R_3 and R_4 can be taken together with the carbon to which they are bonded to complete a cyclopropylene ring;

m is 1 to 4 and is 2 to 4 only when R_3 and R_4 are both hydrogen;

n is 2 to 4; and

Q is 1-naphthyl, 2-naphthyl or



wherein each of X, Y and Z is hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_2 to C_3-alkyl, C_1 to C_3-alkyloxy, azido or phenyl, and at least one of X, Y and Z is a substituent other than hydrogen, and when one of X, Y and Z is azido, phenyl C_1 to C_3-moieties are hydrogen, or the pharmaceutically acceptable salts thereof.

4,891,383

DERIVATIVES OF 5-PENTYLAMINO-5-OXOPENTANOIC AND 4-PENTYLAMINO-4-OXOBUTANOIC ACIDS WITH ANTAGONISTIC ACTIVITY TOWARDS CHOLECYSTOKININ AND A METHOD FOR THEIR PREPARATION

Francesco Makovec; Rolando Chiste, both of Monza; Walter Peris, Milan, and Luigi Revati, Monza, Italy, assignors to Recta Research Laboratorium S.p.A., Milan, Italy

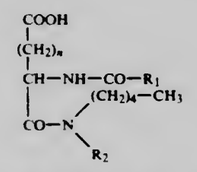
Division of Ser. No. 133,844, Dec. 16, 1987, Pat. No. 4,826,878. This application Dec. 7, 1988, Ser. No. 284,138

Claims priority, application Italy, Dec. 16, 1986, 67937 A/86

Int. Cl.[4] A61K *31/385;* **C07D** *333/56, 307/78*

U.S. Cl. 514—443 **6 Claims**

1. Pharmaceutically active compounds of 5-pentylamino-5-oxopentanoic and 4-pentylamino-4-oxobutanoic acids having the formula:



(I)

in which n is selected from 1 and 2, R_1 is 2-benzofuranyl, 3-benzofuranyl, 2-benzothiophenyl or 3-benzothiophenyl, and R_2 is selected from the pentyl group and the alkoxyalkyl groups having 4 or 5 carbon atoms, or a pharmaceutically-acceptable salt thereof.

4,891,384

VALEPOTRIATE HYDRIN CONTAINING MEDICINES USED TO TREAT UCLERS AND MOTILITY DISTURBANCES

Peter W. Thies; Samuel David; Inan Heil, all of Hannover, and Klaus U. Wolf, Hasnigsen, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hannover, Fed. Rep. of Germany

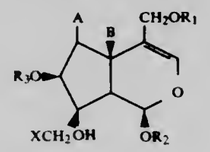
Division of Ser. No. 68,715, Jun. 30, 1987, abandoned, which is a continuation of Ser. No. 636,414, Jul. 31, 1984, abandoned. This application May 3, 1988, Ser. No. 191,819

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327811

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—456 **15 Claims**

1. A method of treating or inhibiting disorders selected from the group consisting of motility disturbances and ulcers in the gastrointestinal tract of a mammal, comprising administering an effective gastrointestinal tract-normalizing or ulcer-inhibiting amount of an active compound having the formula:



wherein

A denotes a hydrogen

B denotes a hydrogen or a hydroxy; or

A and B together denote a bond; of R_1, R_2 and R_3,

(i) one denotes an isovaleroyl group,

(ii) another an acetyl group, and

(iii) the other denotes an aceyl group of an acid selected from the group consisting of isovalerianic acid, β-methylvalerianic acid, α-isovaleroyloxyisovalerianic acid, α-acetoxyisovalerianic acid, β-acetoxyisovalerianic acid, β-acetoxy-β-methylvalerianic acid and β-hydroxyisovalerianic acid; and

X denotes a halogen, a cyano, a rhodano, an azido or an acyloxy group having the formula

R_4COO

wherein R_4 denotes

(a) an unsubstituted or hydroxy-substituted alkyl group with 1 to 20 carbon atoms,

(b) an alkenyl group with 3 to 20 carbon atoms, or

(c) a constituent selected from the group consisting of a phenyl, a phenylalkyl with an alkylene chain containing up to 3 carbon atoms, and a phenylalkenyl group wherein the alkenylene chain contains up to carbon atoms, said constituent being unsubstituted or substituted on the phenyl ring by a halogen, a trifluoromethyl, a hydroxy, lower alkyl, or a lower alkoxy.

4,891,385

INSECTICIDAL COMPOSITIONS

Joseph Synek, Overland Park, Kans., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 23, 1981, Ser. No. 324,169

Int. Cl.[4] A01N *47/10*

U.S. Cl. 514—490 **9 Claims**

1. A stable, substantially clear sprayable aqueous insecticidal solution comprising per hundred part of solution

(a) between about 8 and 12 parts of an emulsifying agent which comprises

(i) fatty acid amide acidified to a pH of less than about 7 with a water soluble acid; and

(ii) up to about 50 wt. % of alkyl substituted phenols ethoxylated with between 6 and 10 mols of ethylene oxide;

(b) between about 0.15 and 0.25 parts of a cellulose based thickening agent with a 20° C. viscosity as a 25 wt. % solution in water of between about 10 and 20 Pa.S; and

(c) between about 0.4 and 0.8 parts of 2(1-methyl-ethoxy)-phenyl methyl carbamate,

said solution having a pH of between about 3.5 and 7.

4,891,386

LIDOCAINE DERIVATIVE AND THERAPEUTIC COMPOSITIONS WHICH CONTAIN IT AS PRINCIPAL ACTIVE INGREDIENT

Franca A. Gasparotti, Florence, Italy, assignor to Molteni & C. Dei F.lli Alitti S.p.A., Florence, Italy

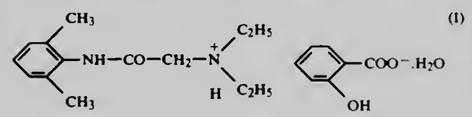
Continuation of Ser. No. 291,774, Aug. 10, 1981, abandoned. This application Sep. 17, 1984, Ser. No. 651,651

Claims priority, application Italy, Aug. 8, 1980, 24104 A/80

Int. Cl.[4] A61K *31/205*

U.S. Cl. 514—555 **4 Claims**

1. Lidocaine salicylate monohydrate of formula:



(I)

4,891,387

BULK POLYMERIZED CYCLOOLEFIN MONOMERS CONTAINING MICROENCAPSULATED BLOWING AGENTS

Dennis J. Janda, Parma, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 212,703, Jun. 28, 1988. This application Jan. 31, 1989, Ser. No. 304,215

Int. Cl.[4] C08J *9/00, 9/32*

U.S. Cl. 521—54 **16 Claims**

1. A reactive formulation for a bulk polymerization reaction which comprises:

(a) cycloolefin monomers having a norbornene functional group;

(b) a metathesis catalyst system in an amount capable of bulk polymerizing said cycloolefin monomers by ring-opening polymerization; and

(c) an encapsulated blowing agent wherein said blowing agent has a boiling point below the softening point temperature of the encapsulant and the encapsulant is a synthetic resinous thermoplastic which

(i) does not inactivate the metathesis catalyst system,

(ii) is substantially impermeable to the blowing agent, and

(iii) has a softening point at a temperature below 180° C.

4,891,388

SOLID GEL DISPENSERS FOR ACHIEVING CONTROLLED RELEASE OF VOLATILE LIQUID MATERIALS AND METHOD FOR PREPARING SAME

Daniel Graiver, Midland, and Robert E. Kalinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 309,280, Jan. 26, 1989, abandoned. This application Jan. 14, 1989, Ser. No. 366,119

Int. Cl.[4] C08J *9/28*

U.S. Cl. 521—64 **3 Claims**

1. In a method for preparing a dispenser for achieving controlled release of a volatile liquid into the atmosphere, the method consisting essentially forming by heating a solution comprising polyvinyl alcohol, said volatile liquid and a solvent for both the polyvinyl alcohol and the volatile liquid, and then cooling sid solution to form a gel in the shape of said dispenser, the improvement consisting essentially of

A. dissolving under atmospheric pressure with heating a polyvinyl alcohol in a solvent comprising water, dimethyl sulfoxide or a mixture thereof to form a first solution,

B. as a second step, adding to said first solution a second miscible solution comprising said volatile liquid and a solvent comprising (a) water or dimethyl sulfoxide and (b) a monohydric alcobol containing from 1 to 8 carbon atoms, where the concentration of polyvinyl alcobol in the final solution does not exceed about 15 percent by weight;

C. obtaining a self-supporting gel in the shape of said dispenser, where said gel is free standing and possesses an exterior surface that is initially dry to the touch and remains so throughout the useful life of said dispenser.

4,891,389

SOLID GEL DISPENSERS FOR ACHIEVING CONTROLLED RELEASE OF VOLATILE LIQUID MATERIALS AND METHOD FOR PREPARING SAME

Daniel Graiver, Midland, and Robert E. Kalinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 337,671, Apr. 13, 1989, which is a continuation-in-part of Ser. No. 309,280, Jan. 26, 1989, abandoned. This application Jan. 26, 1989, Ser. No. 371,481

Int. Cl.[4] C08J *9/28*

U.S. Cl. 521—64 **3 Claims**

1. In a dispenser for achieving controlled release over an extended period of time of a volatile liquid selected from the group consisting of fragrances, disenfectants, biologically active materials, perfumes, deodorizers and physiologically and biologically active materials into the environment adjacent to the dispenser, the dispenser comprising a hydrogel formed from an aqueous solution of polyvinyl alcohol, the improvement comprising (1) the presence in said hydrogel of from 1 to 20 percent, based on the total weight of said hydrogel, of a polyelectrolyte which is capable of being ionized and dissociated on contact with water, but is insoluble in the liquid polyvinyl alcobol used to prepare said hydrogel, where said polyelectrolyte is present as a finely divided dispersed phase within a continuous phase of said hydrogel, and a monohydric alcohol containing from one to four carbon atoms in an amount sufficient to solubilize said volatile liquid and without precipitating the polyvinyl alcobol, (2) a method for preparing said dispenser whereby at least a portion of said volatile liquid is incorporated into said dispenser by immersing it in an aqueous solution of said volatile liquid and (3) a free standing dispenser possessing an exterior surface that is initially dry to the touch and remains so throughout the useful life of said dispenser.

4,891,390

DENTAL IMPRESSION MATERIAL

Heidrun Ott, Wiesbaden-Auringen, and Werner Kuhlmann, Mainz-Hechtsheim, both of Fed. Rep. of Germany, assignors to Blendax GmbH, Mainz, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,797

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525054

Int. Cl.[4] B61K *6/10;* **C08G** *77/06*

U.S. Cl. 523—109 **9 Claims**

1. A dental impression material which comprises: a mixture of crosslinkable organosilicones, aluminum salts of C_{12}–C_{18} fatty acids, and an inorganic filler.

4,891,391

COMPOSITIONS CONTAINING ANTIMICROBIAL AGENTS IN COMBINATION WITH STABILIZERS

Thomas C. McEntee, Topsfield, Mass., assignor to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 897,487, Sep. 22, 1986, abandoned, which is a division of Ser. No. 688,490, Jan. 3, 1985, Pat. No. 4,624,679. This application Feb. 19, 1988, Ser. No. 158,177

Int. Cl.[4] C08K *5/59, 5/13;* **A01N** *11/02*

U.S. Cl. 523—122 **3 Claims**

1. A solid composition comprising a homogeneous melt-blended mixture of (a) a solid thermoplastic resin selected from the group consisting of polyvinyl chloride, vinyl chloride/vinyl acetate copolymers, polyurethanes, and polyamides, (b) from 1 to 80 weight percent of a microbiocide based upon the weight of said solid composition which is present in the mixture at a concentration of at least about 20 times greater than the normal upper usage concentration of the microbiocide and wherein said microbiocide is immobilized and rendered physiologically inert in said resin, the concentration of said microbiocide in said mixture being sufficient to render a second thermoplastic composition resistant to microbiological degradation when said mixture is added to said second thermoplastic composition at a sufficiently low concentration to render said mixture and said second thermoplastic composition compatible, and (c) an amount of an antioxidant effective to reduce degradation of said microbiocide due to exposure to heat.

4,891,392

PRODUCTION PROCESS OF POLYOLEFIN RESIN COMPOSITION CONTAINING INORGANIC FILLER

Masaru Abe; Yoichi Kawai, both of Yokohama; Minoru Hoshino, Kawasaki, and Katsumi Sekiguchi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,460

Claims priority, application Japan, Feb. 24, 1987, 62-39175

Int. Cl.[4] C08J *3/20;* **C08L** *23/00;* **B29B** *9/12*

U.S. Cl. 523—200 **13 Claims**

1. A process for the production of a granular moldable polyolefin resin composition containing an inorganic filler, comprising the steps of

(a) pulverizing the inorganic filler with a surface treatment agent in an amount of 0.01–15 parts by weight per 100 parts by weight of the organic filler by a jet stream pulverizing means in a dry or semi-dry state;

(b) mixing the thus-treated inorganic filler with a polyolefin resin at a filler to resin ration of 3:1 to 9:1 by weight;

(c) granulating the resultant mixture by an agitation granulating means; and

(d) mixing the thus-granulated mixture with an unfilled polyolefin resin which is granular or pellet-like at a weight ratio of 1:99 to 80:20.

4,891,393

THERMOSETTING ORGANOPOLYSILOXANE COMPOSITION

Kazuo Hirai, Ichihara, and Takao Matsushita, Kisarazu, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,324

Claims priority, application Japan, Jul. 30, 1987, 62-191446

Int. Cl.[4] C08K *9/06*

U.S. Cl. 523—212 **5 Claims**

1. A thermosetting organopolysiloxane composition comprising;

(A) 100 parts by weight of organopolysiloxane gum having the following average unit formula

$$R_nSiO_{(4-n)/2}$$

in the formula, R is a substituted or unsubstituted monovalent hydrocarbon group, and n=1.9 to 2.1,

(B) 5 to 100 weight parts reinforcing silica which has a specific surface area of at least 200 m^2/g, which contains at least 2.0 weight percent methoxy groups, and which consists of the SiO_2 unit and organosiloxane units selected from the group consisting of the $R_3SiO_{\frac{1}{2}}$ unit, R_2SiO unit, $RSiO_{3/2}$ unit, and their mixtures, where R is defined as above, with the proviso that the molar ratio of organosiloxane units/SiO_2 unit is from 0.08:1 to 2.0:1,

(C) 1 to 10 parts by weight organohydrogenpolysiloxane having at least 3 silicon-bonded hydrogen atoms in each molecule, and

(D) a curing catalyst for curing the composition and in a quantity sufficient to cure the instant composition.

4,891,394

COATING COMPOSITION CONTAINING METALLIC PIGMENTS EXHIBITING EXCELLENT RESISTANCE TO ENVIRONMENTAL ATTACK

Ronald R. Savin, 10448 Chester Rd., Cincinnati, Ohio 45215

Continuation-in-part of Ser. No. 73,981, Jul. 16, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,529

Claims priority, application France, Jul. 30, 1986, 86 11238

Int. Cl.[4] C08K *3/08, 3/36*

U.S. Cl. 523—442 **17 Claims**

1. A coating composition for the protection of metallic and non-metallic substrates against environment attack, comprising a film-forming polymer selected from the group consisting of epoxy resins having an epoxide value of about 250 to 2500, vinyl chloride resins copolymerized with polyisocyanates, vinyl chloride resins copolymerized with melamines, and mixtures thereof; particulate metallic zinc in amount ranging from about 30% to about 60% by weight based on the total weight of said composition; an agent for control of electrical conductive characteristics comprising a crystalline silica having an oil absorption value of less than 20 measured by ASTM standard test D281-84, the volumetric ratio of said agent to said metallic zinc ranging from about 0.7:1 to about 1.25:1; an agent for control of rheological characteristics; and at least one solvent compatible with said polymer.

4,891,395

HIGH STYRENE CONTENT, STABLE POLYMER USING EPOXY RESIN-MODIFIED POLYOLS AS DISPERSANTS

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed May 24, 1988, Ser. No. 198,035

Int. Cl.[4] C08K *5/04;* **C08L** *75/04*

U.S. Cl. 523—456 **22 Claims**

1. Stable, low viscosity polymer polyols made by a process comprising polymerizing, via a free-radical reaction, an addition polymerizable monomer component with ethylenic unsaturation, in the presence of a polyol mixture comprising a base polyol unmodified with an epoxy resin and an epoxy resin-modified polyol as a dispersant, where the ratio of base polyol to epoxy resin-modified polyol dispersant ranges from about 50/50 to about 99/1, and where the wt.% of epoxy resin in the epoxy resin-modified polyol dispersant ranges from about 0.25 to about 5.0 wt.% based on the total epoxy resin-modified polyol dispersant.

4,891,396

NEW BENZTRIAZOLYL COMPOUNDS

Lajos Avar, Biel-Benken, Switzerland, and Helmut Böhnke, Bad, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

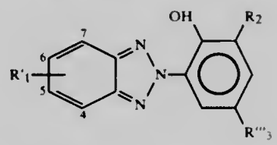
Filed Aug. 26, 1988, Ser. No. 237,122

Claims priority, application United Kingdom, Aug. 28, 1987, 8720365

Int. Cl.[4] C07D *249/20;* **C08K** *5/34*

U.S. Cl. 524—91 **24 Claims**

1. A compound of formula I



(I)

in which R_1' is C_{9-22}alkyl, C_{9-22}alkenyl or C_{9-22}alkoxy;

R_2 is selected from C_{9-32}alkyl, C_{9-32}alkenyl, C_{9-32}alkoxy, —CO—R_4 and —$(CH_2)_{1-6}$—$COOC_{6-18}$alkyl, where R_4 is C_{8-31}alkyl, C_{8-31}alkenyl or C_{8-31}alkoxy; the alkyl group of each of the above significances of R_2 being uninterrupted or interrupted by one —O—, —S— or —SO_2-group and being unsubstituted or substituted by —$N(R_5)_2$, OH or halogen, where each R_5, independently, is selected from hydrogen, C_{1-6}alkyl, C_{2-6}alkenyl and C_{1-6}alkoxy;

or R_2 is —COOH, hydrogen, hydroxyC_{1-6}alkyl, hydroxyC_{1-6}alkoxy, —$COOC_{1-6}$alkyl, $OCOC_{1-6}$alkoxy; Cl, Br, I, OH, C_{1-8}alkyl, C_{1-8}alkoxy or C_{2-8}alkenyl; and R_3''' is C_{1-4}alkyl.

4,891,397

NUCLEATED THERMOPLASTIC POLYETHERIMIDE ESTER ELASTOMER MOLDING COMPOSITIONS

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 2, 1987, Ser. No. 127,329

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] C08K *3/26, 3/34, 5/09, 5/52*

U.S. Cl. 524—141 **15 Claims**

1. A thermoplastic molding composition comprising about 94 to about 97.9 percent by weight polyetherimide ester elastomer, about 0.1 to about 1.0 percent by weight inert, particulate nucleating agent selected from the group consisting of metal salts of monocarboxylic acids, metal salts of dicarboxylic acids, hydrous magnesium silicates, metal salts of organophosphates, sodium carbonate and polyol acetals, and about 2.0 to about 5.0 percent by weight poly(butylene terephthalate), percent by weight based on the total weight of the composition.

4,891,398

FIBER TREATMENT COMPOSITION

Masaki Tanaka, and Hiroshi Ohashi, both of Anaaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1988, Ser. No. 231,471

Claims priority, application Japan, Aug. 14, 1987, 62-202757

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—188 **9 Claims**

1. A fiber treatment composition comprising an aqueous dispersion containing;

(A) 100 parts by weight of a finely particulate epoxy group-containing organosilasesquioxane substantially represented by general unit formula (I):

$$R^1SiO_{3/2} \quad (I)$$

wherein R^1 is an admixture of a monovalent hydrocarbon group having 1 to 20 carbon atoms which may be substituted with a halogen atom, and a monovalent organic group having an epoxy group, and said organic group having an epoxy group comprises from 0.1 to 50 mol % of the whole R^1; and;

(B) from 10 to 900 parts by weight of an amino group-containing organopolysiloxane represented by general unit formula (II):

$$(R^2)_aZ_bSiO_{\frac{4-a-b}{2}} \quad (II)$$

wherein R^2 is at least one group selected from the group consisting of a monovalent hydrocarbon group having 1 to 20 carbon atoms which may be substituted with a halogen atom and a group represented by the formula —OR^3 where R^3 is an alkyl group having 1 to 5 carbo atoms or a hydrogen atom; Z is a group represented by formula (III):



(III)

where R^4 is a divalent hydrocarbon group having 1 to 6 carbon atoms, R^5, R^6 and R^7 may be the same or different and each are a hydrogen atom or a monovalent hydrocarbon group having 1 to 20 carbon atoms, and c is an integer of 0 to 3; and a and b are numbers satisfying $1<a<3$, $0<b<1$ and $1<a+b<3$; and having at least one said group Z in its molecule.

4,891,399

THERMOPLASTIC RESIN-BASED MOLDING COMPOSITION

Hideo Ohkawa, Higashimatsuyama; Masakuni Chikushi; Hironori Nakamura, both of Fujimi; Shinji Funayama, Higashimatsuyama; Takashi Hashimoto, and Takahiro Hirai, both of Fujimi, all of Japan, assignors to CALP Corporation, Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 110,129

Claims priority, application Japan, Oct. 28, 1986, 61-254680; Jun. 23, 1987, 62-156296; Jun. 26, 1987, 62-159356; Jul. 3, 1987, 62-166464

Int. Cl.[4] C08K *3/22, 9/06*

U.S. Cl. 523—200 **25 Claims**

1. A thermoplastic polymeric molding composition which comprises:

(A) from 2 to 70 parts by weight of a thermoplastic polymer as the matrix phase;

(B) from 98 to 30 parts by weight of a metallic filler, of which the particles have a surface coated with a water repellent agent, the amount of the water repellent agent being in the range from 0.01 to 5% by weight based on the metallic filler before coating therewith;

(C) a polypropylene-based polymer which is selected from the group consisting of a low-molecular weight polypropylene containing carboxyl groups which have been introduced into the polypropylene by oxidation thereof, added in an amount in the range of from 0.1 to 2% by weight based on the total amount of the components (A) and (b); and a polypropylene modified by a monomer selected from the group consisting of unsaturated organic acids, anhydrides thereof, esters thereof and amides thereof, added in an amount in the range of 1 to 10% by weight based on the total amount of components (A) and (B); and

wherein the metallic filler as the component (B) is a powder of zinc oxide.

4,891,400

SILICONE MOLDING COMPOUNDS

Peter Schwabe; Reiner Voigt, and Ottfried Schlak, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 903,010, Sep. 2, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 204,952

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532687

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—745 **15 Claims**

1. An addition cross-linking molding or lining compound based on silicones consisting essentially of

(a) an organo polysiloxane containing two or more vinyl reactive end groups,

(b) a catalyst comprising a platinum complex prepared from hexachloroplatinic - (IV) acid,

(c) a filler,

(d) an isoparaffin having 8 to 24 carbon atoms and

(e) a cross-linking agent comprising a organohydrogen polysiloxane.

4,891,401

PIGMENT DISPERSANT RESIN WITH P-CONTAINING ACID

Jozef T. Huybrechts, Oud-Turnhout; Guido R. Louis van den Bosch, Hever-Schiplaken, and Rudolf F. Landriette Verhaegen, Duffel, all of Belgium, assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 209,465, Jun. 21, 1988, abandoned, which is a division of Ser. No. 934,254, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 913,402, Sep. 30, 1986, abandoned. This application Mar. 22, 1989, Ser. No. 326,936

Int. Cl.[4] C08F *230/02*; C08K *3/00*

U.S. Cl. 524—807 **2 Claims**

1. An aqueous dispersion of a resin containing tertiary amine in an amount from 50% to 150% of the amount needed for stoichiometric neutralization of said resin, said resin comprising copolymerized units of the following monomers in weight percent based on the polymer solids:

(a) 1.5–4% of methacryloxy phosphate,

(b) 1–10% of at least one organic-acid-functional acrylic monomer selected from acrylic acid, methacrylic acid,

(c) 86–96% of at least one monomer selected from methyl methacrylate and butyl acrylate, and hydroxyethyl methacrylate, said resin having a weight average molecular weight in the range of about 5,500–30,000 and an acid number in the range of about 30–120 prior to neutralization.

4,891,402

ORGANIC SILICON-NITROGEN COMPOSITIONS AND THEIR USE AS ADHESION PROMOTERS IN ROOM TEMPERATURE VULCANIZABLE POLYDIORGANOSILOXANE COMPOSITIONS

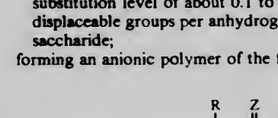
Jeffrey H. Wengrovius, Scotia; Virginia M. VanValkenburgh, Albany, both of N.Y., and Steven J. Valenty, Tempe, Ariz., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 85,835, Aug. 17, 1987, abandoned. This application May 9, 1988, Ser. No. 192,038

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—863 **22 Claims**

1. A method for improving adhesion to a substrate of a room temperature vulcanizable composition comprising a polyalkoxy-terminated polydiorganosiloxane and a catalytic amount of a curing catalyst, said method comprising incorporating therein an effective amount of a silicon-nitrogen composition prepared by effecting reaction at a temperature in the range of about 30°–100° C. between approximately equimolar amounts of a glycidoxyalkyltrialkoxysilane of the formula



(I)

and a primary amine of the formula

$$R^3—NH_2, \qquad \text{(II)}$$

wherein R^1 is C_{1-8} alkyl, each R^2 is independently hydrogen or C_{1-4} primary or secondary alkyl, R^3 is an alkyl or cycloalkyl radical containing about 3–10 carbon atoms and n is from 2 to about 10.

4,891,403

CURABLE THERMOSETTING EPOXY-POLYESTER RESIN COMPOSITION

Robert D. Farris, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 945,272, Dec. 22, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 213,444

Int. Cl.[4] C08L *63/02, 67/06*

U.S. Cl. 525—26 **14 Claims**

1. A curable thermosetting resin composition comprises a blend of:

(A) bisphenol based epoxy resin compound containing at least one bisphenol epoxy group in the molecule and with a curing amount of an imidazole curing agent; and

(B) an ethylenically unsaturated polyester resin containing an ethylenically unsaturated diluent with an effective amount of a free radical initiator,

where (A) and (B) are blended in a ratio from about 20:80 to about 80:20 parts by weight.

4,891,404

BIODEGRADABLE GRAFT COPOLYMERS

Ramani Narayan; George T. Tsao, both of West Lafayette, Ind., and Christopher J. Biermann, Corvallis, Oreg., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 27, 1988, Ser. No. 199,999

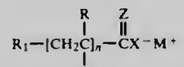
Int. Cl.[4] C08F *251/00, 251/02*; C08G *83/00*

U.S. Cl. 525—54.2 **22 Claims**

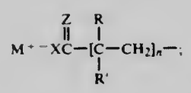
1. Method for converting a polysaccharide to a biodegradable thermoplastic graft copolymer capable of forming homogeneous blends with synthetic thermoplastic polymers, said method comprising the steps of

chemically treating said polysaccharide to form on said polysaccharide nucleophilically displaceable groups at a substitution level of about 0.1 to about 0.75 nucleophilic displaceable groups per anhydroglucose unit of said polysaccharide;

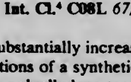
forming an anionic polymer of the formula



wherein R_1 is C_1–C_6 alkyl or a group of the formula



by (1) anionic polymerization of a compound of the formula $R—CR=CH_2$ and (2) treatment with a compound of the formula $X=C=Z$, wherein in the above formulas R and R' are independently hydrogen, C_1–C_6 alkyl, phenyl, substituted phenyl or methoxycarbonyl; X and Z are each independently O or S; M^+ is an alkali metal cation; and n is an integer such that the group



has a molecular weight between about 3000 and about 25,000;

reacting said anionic thermoplastic polymer with said polysaccharide-bearing nucleophilically displaceable groups under conditions conducive to nucleophilic displacement of said groups by said anionic polymer; and

isolating the resulting biodegradable thermoplastic graft copolymer.

4,891,405

MOLDABLE STYRENE-MALEIC ANHYDRIDE/POLYBUTYLENE TEREPHTHALATE COMPOSITION

Russell J. McCready, Downingtown, Pa., assignor to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Sep. 1, 1988, Ser. No. 239,473

Int. Cl.[4] C08L *67/02, 35/06*

U.S. Cl. 525—64 **24 Claims**

1. A moldable composition comprising:

(a) a styrene-maleic anhydride copolymer;

(b) a polybutylene terephthalate ester; and

(c) a styrene-maleimide copolymer having pendant carboxyl or hydroxyl groups, wherein the weight ratio of copolymer (a) to polyester (b) is from about 90:10 to about 10:90, and the amount of copolymer (c) in parts by weight is from about 1 to about 20 parts per each 100 parts by weight of total (a) +(b) +(c).

4,891,406

HIGH IMPACT STRENGTH MOLDING COMPOSITIONS BASED ON POLYALKYLENE TEREPHTHALATES

Josef Bittscheidt, Marl; Gernot Horlbeck, Haltern, and Salih Mumcu, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 912,202, Sep. 25, 1986, abandoned, which is a continuation of Ser. No. 638,798, Aug. 8, 1984, abandoned. This application Jul. 9, 1987, Ser. No. 71,597

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328565; Aug. 8, 1983, 3328566; Aug. 8, 1983, 3328567; Aug. 8, 1983, 3328568

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—64 **45 Claims**

1. A process for substantially increasing the impact strength of molding compositions of a synthetic resin mixture containing predominantly a polyalkylene terephthalate with a minor amount of an impact strength modifier, the synthetic resin mixture containing:

A. 70–95% or 60–97% by weight of a polyethylene terephthalate, polypropylene terephthalate or polybutylene terephthalate having a viscosity number (J) of about 55–100 cc/g and

B. when A is 70–95%, 5–30% by weight of an elasticizing acrylate graft copolymer, an α-olefin copolymer or polyether amide, or when A is 60–97%, 3–40% of a polyether ester amide, the latter being obtained by condensation of at least one omega-aminocarboxylic acid or lactam of at least 10 carbon atoms with a polyalkylene glycol having a number average molecular weight of 400–6,000 and at least one dicarboxylic acid,

said process comprising maintaining the synthetic resin mixture in the solid form at temperatures of 15°–60° C. below the melting point of the pure component A in an inert gas atmosphere for a time sufficient to effect recondensation of the synthetic resin mixture and to achieve a substantially higher impact strength than the non-recondensed synthetic resin mixture.

4,891,407

INTERPENETRATING POLYMERIC NETWORKS COMPRISING POLYTETRAFLUOROETHYLENE AND POLYSILOXANE

Tyrone D. Mitchell, Albany, N.Y., assignor to Tetratec Corporation, Feasterville, Pa.

Division of Ser. No. 083,885, Aug. 6, 1987, Pat. No. 4,764,560, which is a division of Ser. No. 797,575, Nov. 13, 1985, abandoned. This application May 20, 1988, Ser. No. 197,017

Int. Cl.[4] C08L *27/18*

U.S. Cl. 525—104 **3 Claims**

1. A method for making a composition capable of being processed into a material having a porous microstructure of interpenetrating matrices in cured form, comprising the steps:

(a) dissolving a curable polydiorganosiloxane composition in a solvent, and

(b) mixing the solution obtained in (a) with polytetrafluoroethylene powder wherein the weight ratio of said polydiorganosiloxane to said polytetrafluoroethylene powder is from 1:100 to about 20:80.

4,891,408

EPOXY RESINS BASED ON TETRAGLYCIDYL DIAMINES

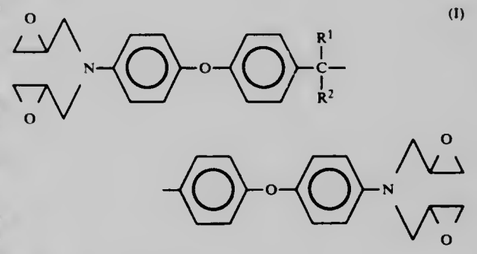
Richard H. Newman-Evans, Somerville, N.J., assignor to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 835,735, Mar. 3, 1986, Pat. No. 4,721,799. This application Aug. 13, 1987, Ser. No. 84,883

Int. Cl.[4] C08G *59/28*

U.S. Cl. 525—113 **19 Claims**

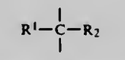
1. Epoxy resin systems comprising (a) a tetraglycidate of the formula



(I)

wherein

R^1 and R^2 are independently hydrogen, alkyl of 1 to 8 carbon atoms, perfluoroalkyl, or



taken together form a cycloalkylidene ring of 5 to 7 carbon atoms, and

(b) a polyamine curing agent.

4,891,409

SINGLE PHASE SHAPE-TRANSFORMABLE ELASTOMERIC COMPOUNDS

Tiong H. Kuan, Hudson; Raymond C. Srail, Parma, and Thomas R. Szczepanski, North Royalton, all of Ohio, assignors to R.J.F. International, Brecksville, Ohio

Continuation of Ser. No. 855,242, Apr. 24, 1986, abandoned. This application May 3, 1988, Ser. No. 189,937

Int. Cl.[4] C09L 9/02, 9/06

U.S. Cl. 525—237 **18 Claims**

1. A single phase thermally activatable shape transformable elastomeric composition consisting essentially of:

the composition, said composition having a single phase, a single Tg within a range of from about −10° C. to about −60° C., and a single thermally activatable shape transformable melting temperature, said composition being a blend of at least one crystalline polymer and at least one low Tg elastomeric polymer in an effective amount as to form said single phase, said single Tg, and said single thermally activatable shape transformable melting temperature, said melting temperature being from about 40° C. to about 100° C., said low Tg elastomeric polymer having (a) an elongation of at least 150% at break after crosslinking, (b) a large recoverable deformation of less than said break elongation, and (c) a Tg of −30° C. or less, said crystalline polymer having (a) a crystallinity of from about 5% to about 95%, (b) a Tg of from −30° C. to about 110° C., and (c) a melting temperature of from about 35° C. to about 175° C., wherein the amount of said crystalline polymer is from about 25 percent to about 60 percent by weight based upon the total weight of said elastomer polymer and said crystalline polymer and wherein the amount of said elastomer polymer is from about 40 percent to about 75 percent by weight based upon a total weight of said elastomer polymer and said crystalline polymer.

4,891,410

BUTADIENE/SYTRENE BLOCK COPOLYMERS HAVING AN ASYMMETRIC STRUCTURE, THEIR PREPARATION AND THEIR USE AS MOLDING MATERIALS

Klaus Bronstert, Carlsberg; Daniel Wagner, Bad Durkheim, and Horst Schuch, Ilvesheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 184,068

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714711

Int. Cl.[4] C08F 297/04

U.S. Cl. 525—314 **9 Claims**

1. A block copolymer of the formula A—B—A′ which has a mean molecular weight of less than 300,000 and consists of from 18 to 40% by weight of a vinylaromatic hydrocarbon and from 60 to 82% by weight of one or more partially or completely hydrogenated diene hydrocarbons, wherein A and A′ are each a polymer block of a styrene monomer selected from styrene and styrenes alkylated in the nucleus and B is a polymer block of one or more partially or completely hydrogenated diene hydrocarbons, and wherein the weight ratio of the polymer blocks A to A′ is less than or equal to 1:5 and greater than 1:10, the mean molecular weight of the polymer block A is from 2,000 to 20,000, that of the polymer block A′ is from 10,000 to 110,000 and that of the polymer block B is not less than 18,000.

4,891,411

PROCESS FOR PRODUCING OLEFIN POLYMERS AND CATALYST USED THEREIN

Toshio Sasaki; Masaaki Katao, both of Ichihara; Kiyoshi Kawai, Chiba, and Akinobu Shiga, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 872,900, Jun. 11, 1986, Pat. No. 4,771,023. This application Jul. 8, 1988, Ser. No. 216,501

Claims priority, application Japan, Jun. 25, 1985, 60-139951

Int. Cl.[4] C08F 4/64

U.S. Cl. 526—119 **2 Claims**

1. A process for producing olefin polymers which comprises homopolymerizing or copolymerizing olefins in the presence of a catalyst system comprising:

(A) A solid catalyst component containing a trivalent titanium compound, which is obtained by reducing a titanium compound represented by the general formula $Ti(OR^1)_nX_{4-n}$ (wherein R^1 is a hydrocarbon group having 1 to 20 carbon atoms, X is a halogen atom and n is a number satisfying $0<n\leqq 4$) with an organo magnesium compound in the presence of an organo silicon compound having Si-O bonds represented by the following formula:

$$Si(OR^3)_mR^4_{4-m},$$

$$R^5(R^6_2SiO)_pSiR^7_3$$

or

$$(R^8_2SiO)_q$$

(wherein R^3 is a hydrocarbon group having 1 to 20 carbon atoms; R^4, R^5, R^6, R^7 and R^8 are each a hydrocarbon group having 1 to 20 carbon atoms or a hydrogen atom; m is a number satisfying $0<n\leqq 4$); p is an integer of 1 to 1,000; and q is an integer of 2 to 1,000),

and then treating the resulting solid product with a mixture of dialkyl ether and titanium tetrachloride, and

(B) an organo aluminum compound, at a temperature of −30° C. to 200°C. under a pressure of 3 to 100 atm.

4,891,412

OPTICALLY ACTIVE STYRENE DERIVATIVES, POLYMERS OBTAINED FROM THESE, COMPLEXES WITH IRIDIUM(I) AND THEIR USE

Jürgen Kaschig, Freiburg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 47,099, May 8, 1987, Pat. No. 4,800,224. This application Oct. 17, 1988, Ser. No. 258,368

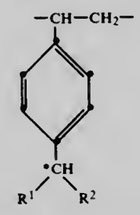
Claims priority, application Switzerland, May 16, 1986, 1985/86

Int. Cl.[4] C08F 26/06

U.S. Cl. 526—265 **11 Claims**

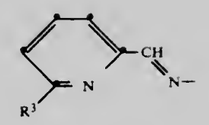
1. A homopolymer or copolymer having optically active side groups and containing, relative to the polymers,

(a) 0.005 to 100 mol % of at least one repeating structural element of the formula VII

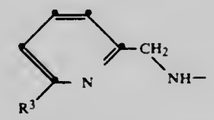


(VII)

in which R^1 is C_1-C_4-alkyl, phenyl or benzyl, R^2 is a radical of the formula II or IIa

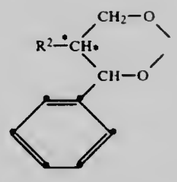


(II)



(IIa)

in which R^3 is H or $-CH^3$, or R^1 and R^2 together form a radical of the formula



in which R^2 has the meaning given above; and * represents predominantly R or predominantly S configuration, and (b) 99.995 to 0 mol % of at least one structural element which is derived from an olefinic comonomer and differs from component (a).

4,891,413

CYCLOPENTANE DIESTER VINYLENE POLYMERS

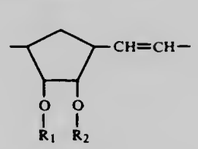
Jawed Asrar, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 54,656, May 27, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,171

Int. Cl.[4] C08F 24/00

U.S. Cl. 526—269 **4 Claims**

1. A polymer comprising units of diester of cylcopentane diol vinylene of the formula



where R_1 and R_2 are acyl groups.

4,891,414

CYCLOPENTANE DIOL VINYLENE POLYMERS

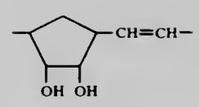
Jawed Asrar, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 54,656, May 19, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 300,883

Int. Cl.[4] C08F 24/00

U.S. Cl. 526—269 **4 Claims**

1. A polymer comprising units of cylcopentane diol vinylene of the formula



4,891,415

PROCESS FOR GRAFTING LIGNIN WITH VINYLIC MONOMERS USING SEPARATE STREAMS OF INITIATOR AND MONOMER

Stephen Y. Lin, and Lori L. Basher, both of Wausau, Wis., assignors to Daishowa Chemicals Inc., Wausau, Wis.

Filed Jan. 23, 1989, Ser. No. 299,131

Int. Cl.[4] C05G 3/04, 3/02

U.S. Cl. 527—400 **17 Claims**

10. A process for grafting lignin with a vinylic monomer wherein said vinylic monomer and a suitable initiator compound are continuously and simultaneously but separately fed to a solution of the lignin.

4,891,416

NOVEL THIOETHER AMIDE DIOLS AND POLYURETHANE POLYMERS THEREFROM

Anil B. Goel, Marlboro, N.J., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 852,588, Apr. 16, 1986, Pat. No. 4,804,781. This application Oct. 31, 1988, Ser. No. 264,650

Int. Cl.[4] C08G 18/32; C07C 103/00

U.S. Cl. 528—85 **4 Claims**

1. A thioether amide diol composition produced by the process comprising reacting a bicyclic amide acetal with hydrogen sulfide at a temperature in the range of from 20° to 200° C. wherein the mole ratio of bicyclic amide acetal to hydrogen sulfide is in the range of from about 1:1 to about 2:1.

4,891,417

EPOXY RESINS PREPARED FROM PERFLUOROALKYLENE TELOMERS

Alberto Re, and Mario Alfieri, both of Milan, Italy, assignors to Ausimont S.r.l., Milan, Italy

Division of Ser. No. 131,108, Dec. 10, 1987, Pat. No. 4,833,227. This application Mar. 10, 1989, Ser. No. 321,300

Claims priority, application Italy, Dec. 15, 1986, 22678 A/86

Int. Cl.[4] C08G 59/42

U.S. Cl. 528—112 **2 Claims**

1. Cross-linked resins obtained by means of treatment with anhydrides of dicarboxylic acids of fluorinated polymers containing at least 10% by weight of fluorine and characterized by the structural units represented by the following formula:



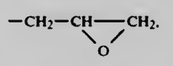
(I)

wherein:

X = an integer from 0 to 20,

y = an integer from 1 to 20,

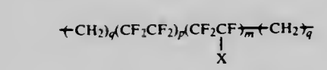
B, B′, equal to or different from each other, are H or



A = a radical of a fluorinated or non-fluorinated diol, containing one or more aromatic or cycloaliphatic or polycyclic rings,

R_f = a perfluoroalkylene radical of formula: $-(CH_2-$

$)_q$—$(CF_2CF_2)_n$—$(CH_2)_q$— wherein n is an integer from 2 to 8 and q=1 or 2, or of formula:



wherein p and m are integers from 1 to 8, and X is a perfluoroalkyl group having from 1 to 3 carbon atoms or a halogen other than F, and
D=A or R_f,

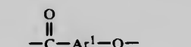
4,891,418

CHOLESTERIC LIQUID CRYSTAL POLYESTER

Hajime Hara, Fujisawa; Tomohiro Taya; Shigeki Iida, both of Yokohama, and Tetsuo Satoh, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,952
Claims priority, application Japan, Sep. 7, 1987, 62-222073; Sep. 30, 1987, 62-243696
Int. Cl.[4] C08G 63/02
U.S. Cl. 528—195 **8 Claims**

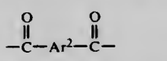
1. A cholesteric liquid crystal polyester comprising the following structural units (A), (B) and (C):



(A)



(B)



(C)

wherein Ar^1 and Ar^2 represent each independently a divalent aromatic hydrocarbon group having 6 to 20 carbon atoms, the aromatic group is unsubstituted or substituted by one or more substituents, selected from a member of the group of halogen atoms, alkyl or alkoxy groups, wherein the alkyl groups has from 1 to 4 carbon atoms, provided that at least 60 mol % of Ar^1 in the polymer is constituted by at least one group selected from 1,4-phenyl group, 2,6-naphthyl group or 4,4'-biphenyl group.

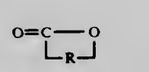
4,891,419

MODIFIED POLYESTER RESIN COMPOSITION CONTAINING ISONANOIC ACID AND A CYCLIC ESTER

Ryozo Takagawa, Osaka; Hiroki Tanabe, Kyoto; Koichi Inoue, Hyogo, and Hirotoshi Umemoto, Kyoto, all of Japan, assignors to Nippon Paint Company, Ltd., Osaka, Japan

Filed Nov. 12, 1987, Ser. No. 119,834
Int. Cl.[4] C08G 63/04
U.S. Cl. 528—274 **3 Claims**

1. A modified polyester resin composition useful as a coating comprising a polyester resin modified with 5 to 30% by weight of the total solid content of isononanoic acid and with 5 to 30% by weight of the total solid content of a cyclic ester represented by the formula:



wherein R represents an alkylene group having 4 to 10 carbon atoms, the resin having a hydroxyl value of 70 to 300.

4,891,420

CONTINUOUS PROCESS FOR THE HYDROLYTIC PRODUCTION OF POLYCAPROLACTAM BY TEMPERING UNEXTRACTED GRANULAR POLYMER MATERIAL WITH MOIST INERT GAS

Wolfgang K. Martin, Williamsburg, Va.; James R. Ryffel, Lake Jackson, Tex.; Hans H. Schuster, Erpolzheim, Fed. Rep. of Germany, and Chih-Peng Wen, Lake Jackson, Tex., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,776
Int. Cl.[4] C08G 69/16
U.S. Cl. 528—315 **11 Claims**

1. In a process for the hydrolytic polymerization of caprolactam into polycaprolactam in the presence of a chain regulator, the improvement comprising:
(a) employing, during said polymerization, a chain regulator selected from the group consisting of
(i) alkylammonium carboxylates and
(ii) hexamethylenediamine/monocarboxylic acid mixtures wherein the mole ratio of hexamethylenediamine to monocarboxylic acid is from about 0.5:1 to about 1.1:1, to form crude polycaprolactam;
(b) preparing granules from the crude, unextracted polycaprolactam thus produced; and
(c) tempering said granules at a temperature of from about 130° C. to about 200° C. for a period of from 8 to about 100 hours in a stream of inert gas containing from 2 to about 15 weight percent water;
whereby the granules thus tempered exhibit a higher polymer relative viscosity and lower extractables content than the crude unextracted granules while maintaining stable relative viscosity, amino end groups, and dyeability under extrusion conditions.

4,891,421

PROCESSES FOR PRODUCING POLYCARBONATE POLYOLS

Katsuhide Nishimura, Sakai; Motoyasu Kunugiza, Suita; Hiroharu Shirota, and Hideyuki Ishizu, both of Izumi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,575
Claims priority, application Japan, Jun. 22, 1987, 62-155040; Jun. 24, 1987, 62-155370; Jun. 25, 1987, 62-156605
Int. Cl.[4] C08G 63/62
U.S. Cl. 528—370 **17 Claims**

1. A process for producing a polycarbonate polyol which comprises ester-interchange reaction of a dialkyl, diaryl or alkylene carbonate and a polyhydroxy compound having terminal alcoholic hydroxy groups, wherein the dialkyl, diaryl or alkylene carbonate is purified by adsorption treatment with an inorganic adsorbent prior to use in the reaction.

4,891,422

COMPOSITIONS OF INORGANIC-ORGANIC ALLOY WITH HIGH NITROGEN CONTENT POLYMERS AND THEIR MANUFACTURE

John J. Waldmann, Charlotte, N.C., assignor to Maxichem, Inc., Charlotte, N.C.

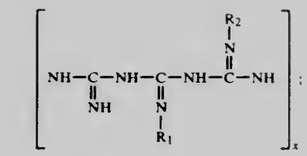
Filed Jun. 27, 1985, Ser. No. 749,343
Int. Cl.[4] C08G 73/00
U.S. Cl. 528—422 **8 Claims**

1. Water-soluble inorganic-organic alloy polymer adduct composition for purification of potable water, acid rain water, paper mill effluent, industrial waste water, industrial waste liquids, solids and semiliquids, water-borne waste and paint, said composition having the formula:

A·B·C·D

wherein
$A=Me_m^{II}Me_n^{III}(OH)_p(SO_4)_y(Aci)_{(2m+3n)-p-2y}$;

B=



$C=(PAM)_z(PAM\text{-}PAD)_{t+z}$;
$D=(PQAM)_w$;
Me_m^{II} is selected from the divalent cation group comprising Mg, Zn, Ca, and Fe^{2+};
m=0 to 5;
Me_n^{III} is a tri- or more valent metal selected from the group comprising Fe, Al, and Al-Zr complexes;
n=1 to 20;
Aci is selected from the monovalent anionic group comprising Cl^-, Br^-, I^-, and NO_3;
PAM=polyamine;
PAD=polyamide;
PQAM=polyquaternized polymer;
p=0 to 75;
x=2 to 98;
y=0 to 15
z=0 to 95% percent by weight of polyamine;
t=0 to 95% percent by weight of polyamide;
w=0 to 98% percent by weight of polyquaternized polymer;
R_1=bridge cationic or multiple organic cationic charge or mixture thereof.

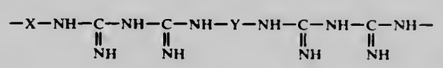
4,891,423

POLYMERIC BIGUANIDES

Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807

Filed Mar. 20, 1989, Ser. No. 325,872
Int. Cl.[4] C08G 73/00
U.S. Cl. 528—422 **16 Claims**

1. A linear, polymeric polyoxyalkylenediamine biguanide or water-soluble salt thereof which in the form of its free base comprises recurring units of the general formula



wherein X is a polyoxyalkylene radical and Y is a polymethylene radical of 2 to 18 carbon atoms or is the same as X.

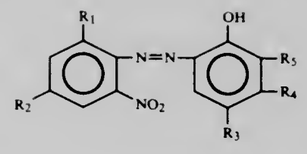
4,891,424

4-ARALKYL-2-NITRO-2'-HYDROXY-3',5'-DIALKYL (OR CUMYL)-AZOBENZENES

Raymond Seltzer, New City, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

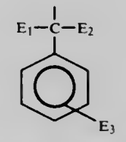
Division of Ser. No. 772,221, Sep. 3, 1985, Pat. No. 4,760,148. This application Apr. 1, 1988, Ser. No. 176,557
Int. Cl.[4] C07C 107/06; C09D 29/01, 29/12
U.S. Cl. 534—649 **8 Claims**

1. A compound of the formula



wherein
R_1 and R_2 are independently hydrogen, halogen, alkyl of 1 to 18 carbon atoms or a group of formula II

(II)



wherein E_1 and E_2 are independently hydrogen or alkyl of 1 to 4 carbon atoms and E_3 is hydrogen, halogen or alkyl of 1 to 4 carbon atoms, with the proviso that at least one of R_1 and R_2 must be a group of formula II;
R_3 is hydrogen, hydroxyl, alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenyl substituted by one, two or three alkyl groups having 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, chlorine, carboxyethyl or a group of formula II,
R_4 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 12 carbon atoms, chlorine or hydroxyl, and
R_5 is hydrogen, hydroxyl, alkyl of 1 to 12 carbon atoms, chlorine, cycloalkyl of 5 to 6 carbon atoms or a group of formula II,
with the proviso that R_3, R_4 and R_5 cannot each be hydrogen at the same time, and that only one of R_3, R_4 and R_5 can be hydroxyl at the same time.

4,891,425

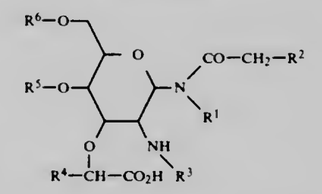
N-GLYCOSYLAMIDE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Oswald Lockhoff, Cologne; Yutaka Hayanchi, Leverkusen; Peter Stadler, Haan, and Helmut Brunner, Langenfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,703
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604681
Int. Cl.[4] C07H 15/12, 5/06; A61K 31/70
U.S. Cl. 536—22 **21 Claims**

1. A compound of the formula (I)

(I)



in which
R^1 denotes hydrogen or a saturated or mono- or polyunsaturated alkyl radical with one to 50 carbon atoms,
R^2 denotes hydrogen or a saturated or mono- or polyunsaturated alkyl radical with one to 50 carbon atoms,

R^3 denotes hydrogen or an acyl radical with up to 20 carbon atoms, said acyl radical being selected from the group consisting of formyl, acetyl, propionyl, butyryl and valeryl,

R^4 denotes hydrogen or an alkyl radical with up to 4 carbon atoms and

R^5 and R^6 independently of one another denote hydrogen or an acyl radical with up to 10 carbon atoms, said acyl radical being selected from the group consisting of formyl, acetyl, propionyl, butyryl, valeryl, benzoyl and p-methoxybenzoyl, an alkyl or a saturated or unsaturated radical or an aralkyl with up to 10 carbon atoms, or

R^5 and R^6 together denote a grouping



wherein

R^7 and R^8 independently of one another denote hydrogen or lower alkyl with up to 5 carbon atoms or an unsubstituted or substituted aryl radical with up to 10 carbon atoms in the aromatic part, or a physiologically acceptable salt thereof.

21. An immunostimulating composition comprising an immunostimulating effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

4,891,426

16α-METHYL-17α 20-EPOXYSTEROID AND PROCESS

Verlan H. VanRheenen, Portage, and Joel E. Huber, Texas township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

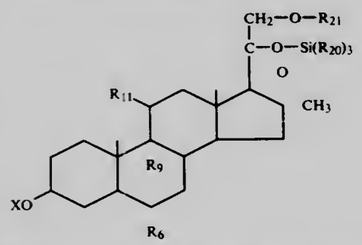
Division of Ser. No. 870,364, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 724,380, Apr. 18, 1985, Pat. No. 4,704,455, which is a continuation-in-part of Ser. No. 618,986, Jun. 11, 1984, abandoned. This application Dec. 15, 1988, Ser. No. 284,509

Int. Cl.[4] C07J *71/00*; A61F *31/58*

U.S. Cl. 540—4 **12 Claims**

1. A 17α,20-epoxy steroid of the formula

(III A-C)



and the C_3-protected forms of the 3β-hydroxy-Δ5-(C) A-ring where

R_6 is a hydrogen or fluorine atom or methyl group;

R_9 is nothing, a hydrogen, fluorine or oxygen atom which makes the C-ring

(a) Δ9(11) when R_9 is nothing and

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are an oxygen atom;

R_{11} is a hydrogen or oxygen atom; two hydrogen atoms, or α- or β-hydroxyl group or trimethylsilyl ether thereof which makes the C-ring

(a) Δ9(11) when R_{11} is a hydrogen atom,

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are an oxygen atom and between C_{11} and R_{11} is a single bond, and

(c) a ketone when R_{11} is an oxygen atom and between C_{11} and R_{11} is a double bond;

R_{20} is alkyl of 1 thru 4 carbon atoms or phenyl, the R_{20}'s can be the same or different;

R_{21} is a hydrogen atom, —CO—R_{21}' or —Si(R_{121})$_3$;

R_{21}' is alkyl of 1 thru 4 carbon atoms or phenyl;

R_{121} is alkyl of 1 thru 4 carbon atoms or phenyl, the R_{121}'s can be the same or different;

~ indicates that the attached group can be in either the α or β configuration;

is a single or double bond; and

X is a hydrogen atom or nothing; when X is nothing the at C_3 is a double bond and when X is a hydrogen atom the at C_3 is a single bond.

4,891,427

TRICYCLIC CEPHAM COMPOUNDS

Akira Morimoto; Noriyoshi Noguchi, and Nobuo Choh, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

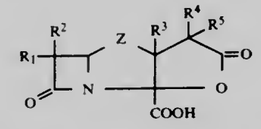
Division of Ser. No. 72,144, Jul. 10, 1987. This application May 12, 1989, Ser. No. 351,040

Claims priority, application Japan, Jul. 15, 1986, 61-167283

Int. Cl.[4] C07D *513/14*; A61K *31/54*

U.S. Cl. 540—216 **5 Claims**

1. A compound of the formula



wherein R^1 represents an amino group; R^2 represents hydrogen, a methoxy group or a formylamino group; R^3, R^4 and R^5 independently represent hydrogen or an alkyl group; and Z represents a group represented by the formula —S—CH_2— or —CH_2—S—, its ester at the 2-carboxyl group, or its pharmacologically acceptable salt.

4,891,428

IMIDAZOLINYL DERIVATIVES, HAVING HERBICIDAL ACTIVITY

Erhard Nordhoff; Wilfried Franke, and Friedrich Arndt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 911,004, Sep. 24, 1986, Pat. No. 4,776,876. This application Jul. 11, 1988, Ser. No. 220,368

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3534391; Feb. 17, 1986, 3605343

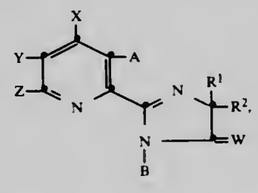
The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.[4] C07D *401/04*

U.S. Cl. 546—278 **1 Claim**

1. 2-(2-imidazolin-2-yl)-pyridin-3-carboxylic acid derivative of the formula I

(I)



in which

R^1 is C_1–C_4-alkyl,

R^2 is C_1–C_6-alkyl or C_3–C_6-cycloalkyl, or

R^1 and R^2 together with the adjacent carbon atom are C_3–C_6-cycloalkyl or C_3–C_6-cycloalkyl substituted by methyl,

W is an oxygen atom or a sulfur atom,

A is one of the groups CH_2OH, $COOR^3$ or $CONR^4R^5$,

R^3 is hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkyl interrupted by one or more oxygen or sulfur atoms, C_1–C_{12}-alkyl substituted by C_1–C_3-alkoxy, halogen, hydroxy, C_3–C_6-cycloalkyl, benzyl, furyl, tetrahydrofuryl, phenyl, halogenphenyl, C_1–C_4-alkylphenyl, C_1–C_4-alkoxyphenyl, nitrophenyl, cyano, carboxyl, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkylthio, C_3–C_8-alkenyl, C_3–C_8-alkenyl substituted by C_1–C_3-alkoxy, phenyl or halogen, C_3–C_8-alkinyl, C_3–C_8-alkinyl substituted by C_1–C_3-alkoxy, phenyl or halogen, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl substituted by methyl, or a cation selected from the group consisting of alkali metals, alkali earth metals, manganese, copper, iron, zinc, ammonium and organic ammonium compounds,

R^4 and R^5 are the same or different and are each hydrogen, hydroxy or C_1–C_4-alkyl, and for the case in which R^4 is hydrogen, R^5 is also amino, dimethylamino, acetylamino or anilino, X is hydrogen, nitro, C_1–C_3-alkyl, C_1–C_3-halogenalkyl or C_1–C_3-alkoxy, and

one of groups Y and Z is SR^6 or OR^7, while the other of groups Y and Z is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-halogenalkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio,

R^6 is halogenphenyl, di-C_1–C_3-alkylphenyl, nitrophenyl, C_1–C_3-alkoxyphenyl, pyridyl, C_1–C_3-alkyl-pyridyl, C_2–C_8-alkyl interrupted by oxygen, C_3–C_8-cycloalkyl,

R^7 is C_3–C_8-cycloalkyl, C_3–C_8-cycloalkyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, C_5–C_8-cycloalkenyl,

B is hydrogen, and for the case in which A = $COOR^3$, with the proviso that R^3 is not hydrogen, B is also COR^8 or SO_2R^9,

R^8 is C_1–C_8-alkyl, C_1–C_6-halogenalkyl, phenyl or phenyl substituted one or more times the same or differently by halogen, nitro, methyl or methoxy and

R^9 is C_1–C_6-alkyl, trifluoromethyl, trichloromethyl, phenyl or phenyl substituted by halogen, nitro or C_1–C_6-alkyl.

4,891,429

ANTIARRHYTHMIC AGENTS

John G. Mullin, Jr., Hawthorne, N.J.; Keiji Nakamura, Kamakura, Japan; Jefferson W. Tilley, North Caldwell, N.J., and Hiroshi Watanabe, Chigasaki, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

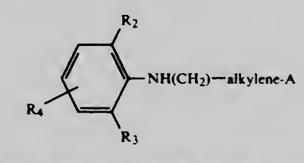
Division of Ser. No. 722,650, Apr. 12, 1985, Pat. No. 4,696,930. This application Jun. 15, 1987, Ser. No. 62,028

Int. Cl.[4] C07D *213/38*

U.S. Cl. 546—329 **2 Claims**

1. A compound of the formula

VI



wherein alkylene is a straight chain alkylene of 1–5 carbon atoms optionally substituted with one or more lower alkyl substituents, R_2, R_3 and R_4 are, independently, hydrogen or methyl;

A is 3-pyridinyl which is unsubstituted or substituted by lower alkyl, phenyl or naphthyl.

4,891,430

PROCESS FOR SYNTHESIZING ACTIVE ESTERS OF CARBOXYLIC ACIDS, NEW ALPHA-HALOGENATED CARBONATES WHICH ARE USEFUL FOR THIS SYNTHESIS AND THE METHOD OF PRODUCING THEM

Gérard Barcelo, Sainte-Genevieve Des Bois; Bertrand Castro, Saint-Aunes, both of France; Mahmoud Jaouadi, G. de Sfax, Tunisia; Jean Martinez, Caux, France; Jean-Pierre Senet, La Chapelle La Reine, France, and Gérard Sennyey, Gif Sur Yvette, France, assignors to Societe Internationale Des Poudres et Explosifs, Paris, France

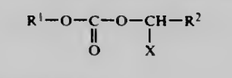
Division of Ser. No. 801,081, Nov. 22, 1985, Pat. No. 4,782,164. This application Sep. 13, 1988, Ser. No. 243,885

Claims priority, application France, Dec. 4, 1984, 84 18433

Int. Cl.[4] C07D *207/404, 249/18*

U.S. Cl. 548—259 **13 Claims**

1. An alpha-chlorinated carbonate of formula



wherein R^1 is:

(1) N-succinimidyl;

(2) N-phthalimidyl;

(3) 1-benzotriazolyl;

R^2 is:

a saturated alkyl of 1 to 5 carbon atoms, unsubstituted or substituted by chlorine atoms, or an unsubstituted phenyl or phenyl substituted by chlorine atoms or wherein R^1 is phenyl substituted by 1–5 chlorine, fluorine or one or two nitro groups; and R^2 is a perchlorinated alkyl of 1 to 5 carbon atoms and X is chlorine.

4,891,431

PROCESS FOR PREPARING 2-UNSUBSTITUTED IMIDAZOLES

Sanehiro Yamamoto, Iwakuni; Mitsuki Yasuhara, Ichihara; Fujihisa Matsunaga, Ichihara; Masato Okano, Ichihara, and Mitsunori Nakamura, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00057, § 371 Date Sep. 25, 1987, § 102(e) Date Sep. 25, 1987, PCT Pub. No. WO87/04431, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 28, 1987, Ser. No. 107,799

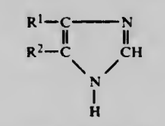
Claims priority, application Japan, Jan. 28, 1986, 61-16617; Mar. 31, 1986, 61-73397; Dec. 18, 1986, 61-302633

Int. Cl.[4] C07D *233/58*

U.S. Cl. 548—335 **14 Claims**

1. A process for preparing 2-unsubstituted imidazoles represented by the following general formula (II)

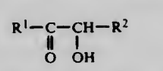
(II)



wherein R^1 and R^2 may be the same or different, and each represents: a hydrogen atom, an alkyl 1 to 14 carbon atoms; a cycloalkyl group having a carbon ring member of 4 to 8 carbon atoms, which may be unsubstituted or substituted by an alkyl group of 1 to 3 carbon atoms; an aryl group selected from the group consisting of phenyl, naphthyl and anthranyl, wherein said phenyl naphthyl or anthranyl may be unsubstituted or substituted by an alkyl group of 1 to 10 carbon atoms or an alkoxy group of 1 to 10 carbon atoms; or an arylalkyl group wherein said aryl moiety is selected from the group consisting of phenyl, naphthyl and anthranyl, wherein said phenyl, naphthyl or anthranyl may be unsubstituted or substituted by an

alkyl group having 1 to 10 carbon atoms or an alkoxy group of 1 to 10 carbon atoms, and said alkyl moiety of said arylalkyl group has 1 to 14 carbon atoms; said process comprising:

reacting an α-hydroxycarbonyl compound represented by the following formula (I)



(I)

ps wherein R^1 and R^2 are the same as defined above, with a formamide at a reaction temperature of 100°–170° C. in an atmosphere of ammonia gas, wherein the molar ratio of said formamide to said α-hydroxycarbonyl compound is not more than 2.

4,891,432

PHENOXY IMIDAZOLE COMPOUND

Noriki Ito, Saitama; Yoshinobu Nagano; Akihiro Tanaka, both of Tokyo; Yoso Numasaki, Saitama, and Koichiro Takahashi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,290

Claims priority, application Japan, Jul. 24, 1986, 61-174774

Int. Cl.⁴ C07D *233/54*

U.S. Cl. 548—341 **1 Claim**

1. Benzyl 6-[p-[5-(1-imidazolyl)pentyloxy]phenoxy]-2,2-dimethylhexanoate.

4,891,433

PROCESS FOR THE PREPARATION OF DIBENZOTHIEPIN DERIVATIVE

Mitsuo Masaki, Chiba; Hiromitsu Takeda, Kitakatsushika; Naoya Moritoh, Kuki, and Toshihiro Takahashi, Misato, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Japan

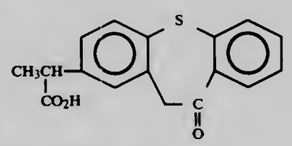
Filed Sep. 30, 1987, Ser. No. 102,981

Claims priority, application Japan, Jun. 10, 1986, 61134682; Jun. 21, 1986, 61-145641; Jul. 2, 1986, 61-155432

Int. Cl.⁴ C07D *337/14*; C07C *149/40*

U.S. Cl. 549—12 **23 Claims**

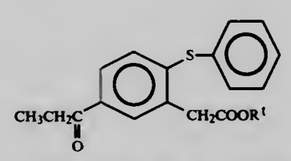
1. A process for the preparation of 2-(10,11-dihydro-10-oxodibenzo[b,f]thiepin-2-yl)propionic acid having the formula (I):



(I)

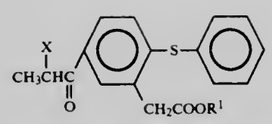
which comprises the steps:

reacting a propiophenone derivative having the formula (II):



(II)

wherein R^1 is hydrogen or a lower alkyl group, with a halogenating agent to form a haloketone compound having the formula (III):



(III)

wherein R^1 has the same meaning as defined above;

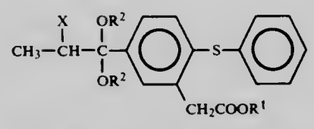
reacting the haloketone compound with a primary alcohol having the formula (IV):

R^2OH (IV)

wherein R^2 is a lower alkyl group, and an orthoformate having the formula (V):

$HC(OR^2)_3$ (V)

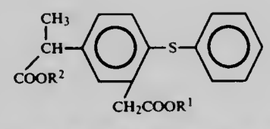
wherein R^2 has the same meaning as defined above, to form a haloacetal compound having the formula (VI):



(VI)

wherein R^1 and R^2 both have the same meanings as defined above, and R^1 is the same as R^2 where R^1 of the formula (II) is hydrogen, and X is a halogen atom;

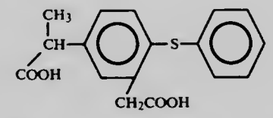
converting the haloacetal compound in the presence of a zinc halide into a dicarboxylic acid ester having the formula (VII):



(VII)

wherein R^1 and R^2 both have the same meanings as defined above; and

hydrolyzing the dicarboxylic acid ester to give a dicarboxylic acid having the formula (VIII):



(VIII)

and

converting the dicarboxylic acid in the presence of a condensing agent into the 2-(10,11-dihydro-10-oxodibenzo[b,f]thiepin-2-yl)propionic acid.

4,891,434

NOVEL ORGANOSILICON COMPOUND

Toshio Takago; Masatoshi Arai, and Koji Futatsumori, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

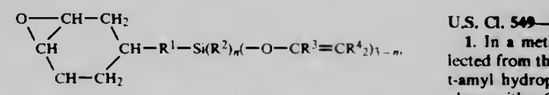
Continuation of Ser. No. 829,290, Feb. 13, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 120,249

Claims priority, application Japan, Feb. 15, 1985, 60-27979

Int. Cl.⁴ C07D *303/02*

U.S. Cl. 549—215 **3 Claims**

1. An organosilicon compound represented by the general formula



in which R^1 is $—CH_2—CH_2—$, R^2 and R^3 are each methyl, R^4 is hydrogen, and the subscript n is 0, 1, or 2.

4,891,435

PREPARATION OF 4,4-DIMETHYLTETRAHYDROFURAN-2,3-DIONE

Klaus Halbritter, Mannheim, and Manfred Eggersdorfer, Gruenstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 519,093, Aug. 1, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,332

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229026

Int. Cl.⁴ C07D *307/08*

U.S. Cl. 549—313 **15 Claims**

1. A process for the preparation of 4,4-dimethyltetrahydrofuran-2,3-dione which comprises reacting an alkanol ester of dimethylpyruvic acid, said alkanol containing 1 to 8 carbon atoms, with formaldehyde or paraformaldehyde as a formaldehyde donor at a temperature of 80°–150° C.

4,891,436

PROCESS FOR PREPARING BIS-METHYLENE SPIROORTHOCARBONATE

Murray S. Cohen, Morristown, and Morris Dunkel, Paramus, both of N.J., assignors to Epolin, Inc., Newark, N.J.

Filed Nov. 21, 1988, Ser. No. 273,577

Int. Cl.⁴ C07D *319/04*

U.S. Cl. 549—335 **6 Claims**

1. A process of preparing a spiroorthocarbonate comprising the steps of:

(a) forming a mixture of chlorinated hydrocarbons, one of which is 1,1-dichloromethyl ethylene, from the chlorination of methallyl chloride;

(b) treating the mixture in (a) above, with an alkali metal carboxylate and isolating the diester of 1,1-dihydroxy methyl ethylene by fractional distillation;

(c) transesterifying the diester of 1,1-dihydroxy methyl ethylene to convert the same to bis-methylene spiroorthocarbonate.

4,891,437

OLEFIN EPOXIDATION OF OLEFINS IN A POLAR MEDIUM

Edward T. Marquis; Kenneth P. Keating; John F. Knifton; William A. Smith, all of Austin; John R. Sanderson, Leander, and Jonathan Lastri, Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 797,079, Nov. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,709, Dec. 31, 1984, abandoned, Ser. No. 687,678, Dec. 31, 1984, abandoned, Ser. No. 687,790, Dec. 31, 1984, abandoned, and Ser. No. 687,702, Dec. 31, 1984, abandoned. This application Dec. 16, 1987, Ser. No. 133,664

Int. Cl.⁴ C07D *301/19*

U.S. Cl. 549—529 **25 Claims**

1. In a method wherein a hydroperoxide charge stock selected from the group consisting of t-butyl hydroperoxide and t-amyl hydroperoxide is reacted in a reaction zone in liquid phase with a C_3 to C_{20} olefin charge stock in the presence of a catalytically effective amount of a soluble molybdenum catalyst to form a product olefin epoxide corresponding to the olefin charge stock and a product alcohol selected rom the group consisting of t-butyl alcohol and t-amyl alcohol corresponding to the hydroperoxide charge stock, the improvement which comprises:

maintaining in said reaction zone a reaction medium containing less than about 1wt. % of water and comprising said olefin charge stock, and more than 60 wt. % of polar components comprising said corresponding product olefin epoxide, said hydroperoxide charge stock, said corresponding product alcohol, said water and said catalyst, by feeding to said reaction zone at least a 30 wt. % solution of said hydroperoxide charge stock in solution in aid corresponding product alcohol, and

feeding said olefin charge stock to said reaction zone in an amount relative to the hydroperoxide charge stock in said solution such that the mole ratio of said olefin charge stock to said hydroperoxide charge stock is within the range of about 0.5 to about 2 moles of olefin charge stock per mole of hydroperoxide charge stock, and

maintaining reaction conditions in said reaction zone including a reaction temperature of about 50° to about 150° C., a reaction time of about 0.5 to about 4 hours and a catalyst concentration in solution in said reaction medium of about 50 to about 1,000 ppm of molybdenum.

4,891,438

DIRECT CONVERSION OF EPICHLOROHYDRIN TO GLYCIDYL AZIDE POLYMER

Elie Ahad, Ste-Foy, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ontario, Canada

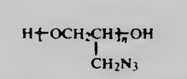
Continuation of Ser. No. 59,524, Jun. 8, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 376,170

Claims priority, application Canada, Dec. 1, 1986, 524263

Int. Cl.⁴ C07C *117/00*

U.S. Cl. 552—11 **14 Claims**

1. A process for the preparation of a hydroxy-teminated aliphatic polyether having alkyl azide substitutents, having a structural formula:



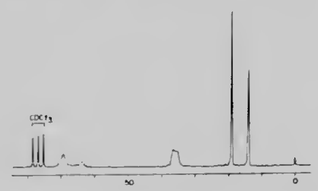
wherein n is an integer from 5 to 10, consisting essentially of the single step of reacting epichlorohydrin with an ionic azide, selected from the group consisting of sodium azide, potassium azide and lithium azide, in a suitable polar organic solvent at elevated temperature for about 15 to about 24 hours, while agitating, to directly prepare a hydroxy-terminated aliphatic polyether.

4,891,439

ALCOHOL-FREE ORTHOESTERS OF ZIRCONIUM AND HAFNIUM AND METHOD FOR THE PREPARATION THEREOF

Udo Horns, Rheinfelden; Hans-Günther Srebny, Stolzenau, and Hans-Joachim Yahlenzieck, Wehr, all of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Cologne, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 217,643
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723713
Int. Cl.[4] C07F *7/00*
U.S. Cl. 556—54 **4 Claims**



1. A method for the preparation alcohol-free of an orthoester of the formula

$$M(OR)_4 \quad (I)$$

in which M is selected from the group consisting of zirconium and hafnium and R represents an alkyl or cycloalkyl moiety of 1 to 20 carbon atoms, the method comprising:

reacting a metal halide with an alcohol in a hydrocarbon or chlorinated hydrocarbon solvent wherein the metal is M and the amount of alcohol substantially corresponds with the stoichiometric amount required for formation of the orthoester of formula I to form a reaction mixture containing the orthoester and halogen hydride;

neutralizing the halogen hydride; and

recovering the orthoester.

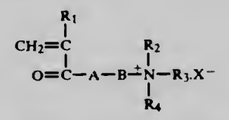
4,891,440

PROCESS FOR PRODUCING UNSATURATED QUATERNARY AMMONIUM SLATS

Yoshirou Nagatsu; Akiyoshi Nagamoto; Kazuya Harada, and Hideaki Mukouyama, all of Ystsushiro-city, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

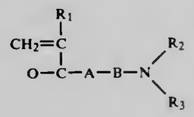
PCT No. PCT/JP88/00165, § 371 Date Oct. 13, 1988, § 102(e) Date Oct. 13, 1988, PCT Pub. No. WO88/06152, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 18, 1988, Ser. No. 290,045
Claims priority, application Japan, Feb. 18, 1987, 62-33192
Int. Cl.[4] C07L *69/52*
U.S. Cl. 560—222 **3 Claims**

1. A process for producing unsaturated quaternary ammonium salts of very high quality represented by the following General Formula II:



II

(in which R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each independently represents an alkyl group containing 1 to 4 carbon atoms; A represents an oxygen atom or an —NH—group; B represents an alkylene group containing 1 to 4 carbon atoms; R_4 represents an alkyl group containing 1 to 4 carbon atoms or a benzyl group; and X^{31} represents a halogen atom) which comprises reacting a cationic vinyl monomer represented by the following General Formula I:



1

(in which R_1, R_2, R_3, A and B have the same meanings as defined above) with an alkyl halide or an aralkyl halide in a medium consisting of water and an aprotic organic solvent under a condition that the concentration of oxygen dissolved in the reaction system is lower than 1.8 ppm but not less than 0.3 ppm.

4,891,441

PROCESS FOR THE PREPARATION OF POLYMERIC TERTIARY ARALKYL ISOCYANATES FROM 1,3- OR 1,4-BIS(1-CHLORO-1-METHYLETHYL)BENZENE

Frederic C. Schaefer, Columbia, S.C., assignor to American Cyanamid, Stamford, Conn.

Filed May 17, 1984, Ser. No. 611,276
Int. Cl.[4] C07K *71/00*
U.S. Cl. 560—339 **9 Claims**

1. A process for the preparation of oligomers and homopolymers from 1,3- or 1,4-bis(1-chloro-1-methylethyl)benzene, said process comprising:

polymerizing a 1,3- or 1,4-bis(1-chloro-1-methylethyl)benzene and an alkali metal or alkaline earth metal cyanate in a solvent for the organic reactant and in the substantial absence of a catalyst at temperatures of between about 15° C. and about 60° C. until formation of said oligomers and homopolymers is substantially complete.

4,891,442

PROCESS FOR SYNTHESIS OF β-PHENYLALANINE

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 9, 1987, Ser. No. 23,326
Int. Cl.[4] C07C *99/00*
U.S. Cl. 562—450 **3 Claims**

1. A process for producing N-acetyl-β-phenylalanine which comprises reacting phenylacetaldehyde, acetamide and synthesis gas with a catalyst consisting essentially of dicobalt octacarbonyl and a cocatalyst comprising a rhodium carbonyl triphenylphosphine complex, at a temperature of 80° to 100° C. and a pressure of 800 to 2500 psi in the presence of a solvent from the group consisting of methyl acetate, ethyl acetate and p-dioxane.

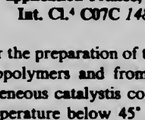
4,891,443

N,N'-DICYANOCYCLOPROPANECARBAMIDINES AND A PROCESS FOR THEIR PREPARATION

Heary Szczepanski, Wallbach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 43,720, Apr. 29, 1987, Pat. No. 4,778,889, which is a continuation-in-part of Ser. No. 821,174, Jan. 21, 1986, Pat. No. 4,670,559, which is a continuation-in-part of Ser. No. 693,641, Jan. 22, 1985, abandoned, which is a division of Ser. No. 535,527, Sep. 26, 1983, Pat. No. 4,515,626. This application Jul. 20, 1988, Ser. No. 221,848
Claims priority, application Switzerland, Oct. 6, 1982, 5874/82
Int. Cl.[4] C07C *125/08*
U.S. Cl. 564—103 **2 Claims**

1. N,N'-dicyano-cyclopropanecarbamidines of formula II



(II)

wherein M is hydrogen or an equivalent of an alkali or earthalkali ion.

4,891,444

OXA-ORGANIC SULFUR COMPOUNDS, THEIR PREPARATION AND USE

John S. Roberts, and Tod K. Shioyama, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 19, 1988, Ser. No. 234,315
Int. Cl.[4] C07C *148/00, 149/14*
U.S. Cl. 568—44 **4 Claims**

1. An oxa-organic sulfur compound having the structural formula



wherein R is an alkyl or aryl group containing a halide, nitro, sulfide or ether substituent and R' is hydrogen or an alkyl or aryl group containing a halide, nitro, sulfide or ether substituent.

2. The compound of claim 1 wherein R is $-CH_3$ and R' is —H.

4,891,445

SYNTHESIS OF TERTIARY MERCAPTANS FROM ISOBUTYLENE HOMOPOLYMERS

Emmanuel Arretz, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Filed Dec. 22, 1988, Ser. No. 288,135
Claims priority, application France, Feb. 17, 1987, 88 01880
Int. Cl.[4] C07C *148/00*
U.S. Cl. 568—72 **9 Claims**

1. A process for the preparation of tertiary mercaptans from isobutylene homopolymers and from hydrogen sulphide by means of heterogeneous catalystis comprising a reaction carried out at a temperature below 45° C. in the presence of a catalyst comprising a dry cation exchange resin.

4,891,446

PROCESS FOR PREPARING ALDEHYDES FROM ALCOHOLS

Lyan H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1988, Ser. No. 252,284
Int. Cl.[4] C07C *45/00*
U.S. Cl. 568—485 **11 Claims**

1. A process for converting saturated aliphatic primary alcohols having numbers ranging from about 5 to about 20 to the corresponding aldehydes which comprises passing said alcohols over a fixed bed of brass catalyst particles at a temperature ranging from about 375 to about 550° C. in the presence of hydrogen passing over the bed at a gaseous hourly space velocity of greater than about 250 $hour^{-1}$ and recovering the product aldehydes from an effluent passing out of the fixed bed.

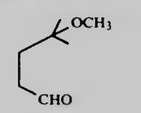
4,891,447

SANDALWOOD ODORANTS

Robert Eilerman, Merrick, N.Y.; Philip Christenson, Midland Park, N.J.; John Yurecko, Jr., Dayton, N.J., and Thomas Zebovitz, Colonia, N.J., assignors to BASF K&F Corporation, Parsippany, N.J.

Filed Dec. 16, 1988, Ser. No. 285,782
Int. Cl.[4] C07C *47/198*
U.S. Cl. 568—496 **1 Claim**

1. A compound having the structure



4,891,448

ALKYLATION OF POLYCYCLIC AROMATIC COMPOUNDS TO ALKYLATES ENRICHED IN THE PARA-SUBSTITUTED ISOMERS

Juan Garces; Joseph J. Maj; G. John Lee, all of Midland, and Stephen C. Rocke, Mt. Pleasant, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 23, 1987, Ser. No. 123,741
Int. Cl.[4] C07C *41/18*
U.S. Cl. 568—628 **22 Claims**

1. A process of alkylating a polycyclic aromatic compound to a mixture of substituted polycyclic aromatic compounds enriched in the linear alkylated isomers comprising contacting a polycyclic aromatic compound with an alkylating agent in the presence of a catalyst under conditions such that a mixture of substituted polycyclic aromatic compounds enriched in the linear alkylated isomers is formed, said catalyst comprising an acidic mordenite zeolite having a silica/alumina molar ratio of at least 15:1 and a crystalline structure which is determined by X-ray diffraction to be a matrix of Cmcm symmetry having dispersed therein domains of Cmmm symmetry.

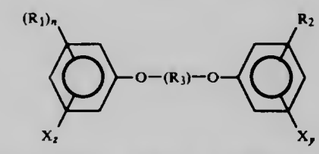
4,891,449

HALOGENATED UNSYMMETRICAL HIGHER ALKYL PHENOXY ALKANES

Dennis M. Borden, West Lafayette; Nicolai A. Favstritsky, and Enrico J. Termine, both of Lafayette, all of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Jun. 30, 1988, Ser. No. 213,540
Int. Cl.[4] C07C *43/225*
U.S. Cl. 568—645 **8 Claims**

1. A halogenated unsymmetrical higher alkyl bisphenoxy alkane of the structure:



Wherein X is bromine or chlorine; R_1 is straight (C_1 to C_{12}) or branched alkyl selected from the group consisting of methyl (CH_3), ethyl (C_2H_5), propyl (C_3H_7), butyl (C_4H_9), pentyl (C_5H_{11}), hexyl (C_6H_{13}), heptyl (C_7H_{15}), octyl (C_8H_{17}), nonyl (C_9H_{19}), decyl ($C_{10}H_{21}$), undecyl (C_9H_{19}), and dodecyl ($C_{12}H_{25}$); z is an integer from 2 to 5; n is 0, 1, or 2; R_2 is a straight or branched alkyl selected from the group consisting of secondary butyl (sec C_4H_9), pentyl (C_5H_{11}), hexyl (C_6H_{13}), heptyl (C_7H_{15}), octyl (C_8H_{17}), nonyl (C_9H_{19}), decyl ($C_{10}H_{21}$), undecyl ($C_{11}H_{23}$) and dodecyl ($C_{12}H_{25}$); y is 0, 1, or 2; R_3 is a straight or branched alkylene group selected from the group

consisting of methylene (CH_2), ethylene (C_2H_4), propylene (C_3H_6), butylene (C_4H_8), pentylene (C_5H_{10}), hexylene (C_6H_{12}), heptylene (C_7H_{14}), octylene (C_8H_{16}), nonylene (C_9H_{18}), decylene ($C_{10}H_{20}$), undecylene ($C_{11}H_{22}$), and dodecylene ($C_{12}H_{24}$), and if n is 1, R_1 is not R_2.

4,891,450

PROCESS FOR INTERMEDIATES FOR INSECTICIDAL COMPOUNDS

Robin A. E. Carr, Nr Camberley, and Lyn Powell, Macclesfield, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

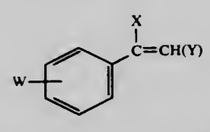
Filed Jan. 25, 1988, Ser. No. 147,868

Claims priority, application United Kingdom, Feb. 6, 1987, 8702717

Int. Cl.⁴ C07C *43/225*

U.S. Cl. 568—649 **3 Claims**

1. A compound of formula:



wherein W represents one, two, three of four substituents independently selected from halo, alkyl or up to six carbon atoms, alkoxy of up to six carbon atoms, haloalkyl of up to six carbon atoms, haloalkoxy of up to six carbon atoms and alkoxyalkyl of up to a total of six carbon atoms, X represents a fluoroalkyl group of up to two carbon atoms and Y is selected from chlorine, bromine and alkoxy.

4,891,451

PREPARATION OF VINYL ETHERS

Wolfgang Hoeldesich, Frankenthal; Norbert Goetz, Worms 1, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

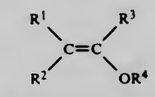
Filed Jan. 30, 1988, Ser. No. 213,589

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 37228919

Int. Cl.⁴ C07C *41/28*

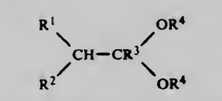
U.S. Cl. 568—691 **3 Claims**

1. A process for the preparation of a vinyl ether of the formula (I)



(I)

where R^1 to R^3 are identical or different and are each hydrogen, a straight-chain or branched alkyl or alkenyl radical of not more than 12 carbon atoms, halogen-substituted alkyl, a cycloalkyl or cycloalkenyl radical of 5 to 8 carbon atoms, an aryl, alkylaryl, alkenylaryl, aralkyl or aralkenyl radical of 6 to 16 carbon atoms or a halogen-substituted aryl and furthermore R^1 and R^2 or R^1 and R^3, together with the carbon atom to which they are bonded, may form a cycloalkane or cycloalkene, and R^4 is alkyl, alkylaryl or aralkyl which process comprises: eliminating an alcohol from an acetal or ketal of the formula (II)



(II)

where R^1 to R^4 have the above meanings, in the presence of a borosilicate zeolite having a pentasil structure or an iron silicate zeolite having a pentasil structure as a catalyst.

4,891,452

PROCESS FOR THE PREPARATION OF HYDROXYBIPHENYLS

Alain Noan, Sainte Foy Les Lyon, and Jean R. Desmurs, Communay, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 10, 1988, Ser. No. 154,194

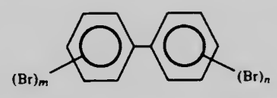
Claims priority, application France, Feb. 12, 1987, 87 01967

Int. Cl.⁴ C07C *39/12, 37/02*

U.S. Cl. 568—730 **20 Claims**

1. A process for the preparation of a hydroxybiphenyl comprising the step of:

reacting a bromobiphenyl of the formula (1):



in which m and n are identical or different integers equal to 0, 1, 2 to 3 and the sum n+m of which is greater than or equal to 1 and less than or equal to 4, in an aqueous liquid phase at a temperature less than or equal to 230° C., with a base of the formula $M(OH)_p$, wherein M is a metal selected from the alkali metals and alkaline-earth metals and p is an integer equal to 1 or 2 depending on the valency of the metal M, in the presence of a copper-based catalyst, and wherein the hydroxyl ion concentration in the reaction medium ranges from 0.1 to about 1.6 molar equivalents per liter of aqueous solution and further wherein the hydroxyl ion concentration, relative to the bromobiphenyl concentration, is sufficient to provide at least two hydroxyl radicals for each bromine atom of said bromobiphenyl.

4,891,453

PROCESS FOR PRODUCING P,P'-BIPHENOL

Michio Tanaka; Yoshito Kurano; Katsuo Taniguchi, all of Iwakuni, and Masayasu Ishibashi, Kuga, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,333

Claims priority, application Japan, Sep. 22, 1987, 62-238230; Sep. 30, 1987, 62-246317; Oct. 15, 1987, 62-261272; Nov. 2, 1987, 62-278102

Int. Cl.⁴ C07C *37/50, 39/12*

U.S. Cl. 568—805 **5 Claims**

1. A process for producing p,p'-biphenol by the dealkylation reaction of 3,3',5,5''-tetra-t-butyl-4,4'-dihydroxybiphenyl, said reaction being carried out in the presence of at least one acid catalyst selected from the group consisting of sulfuric acid, a sulfonic acid, a heteropoly acid, a Lewis acid and a solid acid, using a solvent selected from the group consisting of a saturated hydrocarbon having a boiling point of 190° C. or above, an alicyclic hydrocarbon having a boiling point of 190° C. or above, a hydrocarbon with an iodine value of no more than 1, sulfonane, and a mixture of these solvents, at a temperature of from 150° to 300° C. when each of said solvents except for sulfolane is used, and at a temperature from 150° to 285° C. when sulfolane is used.

4,891,454

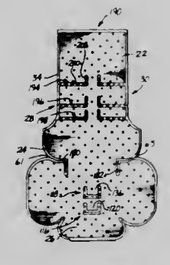
INFANT CAR SEAT LINER

Lee E. Perdelwitz, Jr., Tacoma, Wash., and David E. Hanke, San Diego, Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 29, 1988, Ser. No. 187,990

Int. Cl.⁴ B05C *1/16*

U.S. Cl. 428—137 **25 Claims**



1. A disposable infant seat liner having a peripheral edge for car seats of the type having a pair of shoulder straps comprising a body of sheet material including a liquid impermeable backing, a liquid permeable facing and an absorbent core, the body including a shoulder supporting section and shoulder strap receiving slotways in the shoulder supporting section, the shoulder strap receiving slotways being positioned on the liner for insertion of shoulder straps from the peripheral edge of the liner into the shoulder strap receiving slotways.

4,891,455

PROCESS FOR PREPARING MONOHALOGENATED CYCLOBUTARENES

Ming-Biaun Liu, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 64,714, Jun. 22, 1987, Pat. No. 4,822,930. This application Jun. 17, 1988, Ser. No. 207,802

Int. Cl.⁴ C07C *21/24, 17/00*

U.S. Cl. 570—206 **34 Claims**

1. A method of preparing monohalogenated cyclobutarenes consisting essentially of halogenating a cyclobutarene with a halogenating agent in the presence of an organic complexing agent, an acid scavenger, or water.

4,891,456

METHOD FOR PREPARING NORBORNENE STRUCTURE COMPOUND

Hitoshi Yuasa; Mitsuo Matsuno, both of Yokohama, and Tetsuo Satoh, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

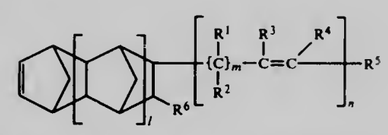
Filed Jun. 30, 1988, Ser. No. 213,547

Claims priority, application Japan, Jul. 6, 1987, 62-166868

Int. Cl.⁴ C07C *5/02, 5/05*

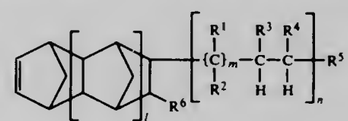
U.S. Cl. 585—275 **8 Claims**

1. A method for preparing a norbornene structure compound comprising hydrogenating a compound represented by the formula of



(1)

wherein l, m and n are integers of $0 \leqq l \leqq 3$, $0 \leqq m \leqq 8$ and $1 \leqq n \leqq 3$, respectively, and each of R^1 to R^6 is a hydrogen atom or a hydrocarbon residue having 1 to 3 carbon atoms with or without R^6 forming a ring with R^4 or R^5, in the presence of a Ziegler type catalyst containing in combination a compound of a transition metal of Groups IV to VI of the periodic table and an organometallic compound of Groups I to III of the periodic table, to thereby convert the compound of the formula (1) into a compound represented by the following formula of



(2)

wherein l, m and n are the same as above.

4,891,457

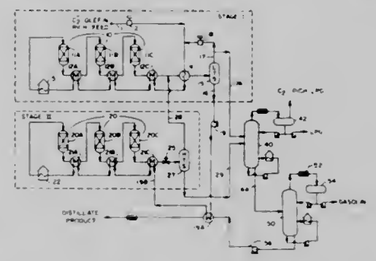
MULTISTAGE PROCESS FOR CONVERTING OLEFINS TO HEAVIER HYDROCARBONS

Hartley Owen, 5 Riverview Ter., Belle Mead, N.J. 08502, and Bernard S. Wright, 13 Shagbark La., East Windsor, both of N.J. 08520

Filed Sep. 13, 1985, Ser. No. 775,907

Int. Cl.⁴ C07C *2/12*

U.S. Cl. 585—312 **8 Claims**



1. A continuous multi-stage catalytic process for converting ethene-rich lower olefinic feedstock to heavier liquid hydrocarbon product, comprising the steps of

contacting ethene-rich feedstock at elevated temperature and moderate pressure in a primary stage high severity reaction zone with shape selective medium pore zeolite oligomerization catalyst to convert at least a portion of the lower olefinic components to intermediate olefinic hydrocarbons;

cooling primary stage oligomerization reaction effluent from the high severity reaction zone to condense at least a portion of the intermediate hydrocarbons, separating the cooled and partially condensed high severity reactor effluent stream in a primary phase separation zone into a light gas phase stream comprising unreacted light olefin and a condensed liquid intermediate hydrocarbon stream;

recycling a major portion of the primary gas stream to the primary stage reaction zone;

pressurizing and contacting the intermediate liquid stream from the primary stage with shape selective medium pore zeolite oligomerization catalyst in a secondary stage distillate mode catalytic reactor system at elevated temperature and high pressure to provide a heavier hydrocarbon effluent stream comprising distillate and lighter hydrocarbons;

flashing and cooling the secondary stage effluent stream for separating in a secondary phase separation zone to recover a distillate-rich product stream and a lighter hydrocarbon vapor stream comprising intermediate hydrocarbons, wherein the secondary phase separation zone is

maintained at operating pressure between the primary and secondary stage reactors and wherein the temperature of said secondary separation zone is maintained higher than said primary separation zone to vaporize a major amount of the C_9^- hydrocarbons in the secondary stage effluent; and

recycling at least a portion of the recovered secondary stage vapor stream for combining in the primary stage effluent prior to phase separation.

4,891,458

LIQUID PHASE ALKYLATION OR TRANSALKYLATION PROCESS USING ZEOLITE BETA

Robert A. Innes, 15 Shannon La., San Rafael, Calif. 94901; Stacey I. Zones, 1874-9th Ave., San Francisco, Calif. 94122, and Gerald J. Nacamuli, 4 Oak St., Mill Valley, Calif. 94941

Filed Dec. 17, 1987, Ser. No. 134,410

Int. Cl.[4] C07C *2/66, 5/22*

U.S. Cl. 585—323 **45 Claims**

1. A process for the alkylation of an aromatic hydrocarbon which comprises contacting a stoichiometric excess of the aromatic hydrocarbon with a C_2 to C_4 olefin under at least partial liquid phase conditions and in the presence of a catalyst comprising zeolite beta.

19. A process for the transalkylation of an aromatic hydrocarbon which comprises contacting the aromatic hydrocarbon with a polyalkyl aromatic hydrocarbon under at least partial liquid phase conditions and in the presence of a catalyst comprising zeolite beta.

33. A process for preparing monoalkylated aromatic hydrocarbons which comprises:

(a) contacting a stoichiometric excess of an aromatic hydrocarbon feed with a C_2 to C_4 olefin in an alkylation zone under at least partial liquid phase conditions and in the presence of a catalyst comprising zeolite beta;

(b) separating the product from step (a) into fractions comprising (1) an aromatic hydrocarbon fraction, (2) a monoalkyl aromatic hydrocarbon fraction and (3) a polyalkyl aromatic hydrocarbon fraction; and

(c) contacting the polyalkyl aromatic hydrocarbon fraction with additional aromatic hydrocarbon feed in a transalkylation zone under at least partial liquid phase conditions and in the presence of a catalyst comprising zeolite beta.

4,891,459

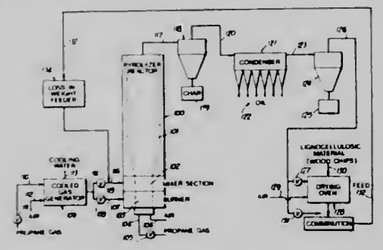
OIL PRODUCTION BY ENTRAINED PYROLYSIS OF BIOMASS AND PROCESSING OF OIL AND CHAR

James A. Knight, and Charles W. Gorton, both of Atlanta, Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jan. 17, 1986, Ser. No. 819,592

Int. Cl.[4] C07C *1/00, 4/00*

U.S. Cl. 585—240 **19 Claims**



1. A method of pyrolyzing lignocellulosic material to produce a high yield of pyrolysis oil, which comprises the steps of :

(a) providing an entrained flow reactor tube;

(b) subjecting the lignocellulosic material to a pyrolytic temperature and substantially atmospheric pressure while the material is entrained within the reactor tube in a column of flowing gases, wherein the flowing gases consist essentially of gases generated by burning a quantity of fuel and are substantially free of oxygen;

(c) withdrawing the entraining gas containing the pyrolysis products from the reactor tube;

(d) cooling the flowing gases including pyrolysis products entrained therein when pyrolysis has been substantially completed and recovering pyrolysis oil condensed by the cooling; and

(e) controlling the temperature of the flowing gases at the onset of pyrolysis, the feed size of the lignocellulosic material, and the space time during which the material is subjected to pyrolysis to recover in excess of 35% of the pyrolysis oil in step (d) on the basis of dry lignocellulosic material, the space time being in the range of about 0.8 to less than about 7 seconds and being controlled in inverse relation to the temperature of the flowing gases.

4,891,460

PROCESS FOR PRODUCING ALKYLIDENENORBORNENES

Yasutaka Ishii, Takatsuki, Japan, assignor to San-Petrochemicals Co., Ltd., Japan

Filed Mar. 4, 1985, Ser. No. 707,601

Claims priority, application Japan, Mar. 9, 1984, 59-44929

Int. Cl.[4] C07C *2/76*

U.S. Cl. 585—360 **20 Claims**

1. A process for producing alkylidenenorbornenes by reacting C_4–C_6 acyclic conjugated dienes with cyclopentadiene, dicyclopentadiene, or a methyl- or dimethyl-substituted derivative thereof, in the presence of a catalyst composed of:

(A) a titanium-containing compound, and

(B) at least one metallic reducing agent containing a group IA, group IIA, or group IIIA metals in the periodic table.

4,891,461

PROCESS FOR THE PRODUCTION OF AN ISOBUTENYLCYCLOHEXENE

David Lyons, Hull, and Derek K. MacAlpine, Haywards Heath, both of England, assignors to BP Chemicals Limited, London, England

Filed Mar. 7, 1988, Ser. No. 164,834

Claims priority, application United Kingdom, Mar. 10, 1987, 8705564

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—376 **4 Claims**

1. A process for the production of an isobutenylcyclohexene by reacting under disproportionation conditions 2,4,4-trimethylpentene-2 and 4-vinylcyclohexene in the presence of a supported rhenium heptoxide disproportionation catalyst, said catalyst being promoted with at least one transition metal promoter selected from the group consisting of copper and zinc and extending throughout the pores of the support or over the surface of the support, said transition metal promoter being in the form of the elemental metal or an oxide thereof.

4,891,462

CYCLIZATION-DEHYDROGENTATION OF 1-ETHYL-NAPHTHALENE OVER COPPER ALUMINUM BORATE

Patrick E. McMahon, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 925,326, Nov. 30, 1986, Pat. No. 4,740,647. This application Apr. 25, 1988, Ser. No. 186,358

Int. Cl.[4] C07C *12/00*

U.S. Cl. 585—411 **7 Claims**

1. A cyclization-dehydrogenation process which comprises contacting a polynuclear fused ring aromatic compound, said compound having an ethyl group bonded to a first ring carbon adjacent a bridging carbon, with a catalyst comprising at least one member selected from the group consisting of copper aluminum borate and zero valent copper on a support comprising aluminum borate which process effects cyclization across said bridging carbon, the cyclization taking place between (a) the ethyl carbon furthest from the ring and (b) a second ring carbon located two carbons from said first ring carbon and separated therefrom by said bridging carbon.

4,891,463

AROMATIZATION OF ALIPHATICS OVER A ZEOLITE CONTAINING FRAMEWORK GALLIUM

Cynthia T-W. Chu, Princeton Junction, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 882,875, Jul. 7, 1986, abandoned, and a continuation-in-part of Ser. No. 882,863, Jul. 7, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 229,052

Int. Cl.[4] C07C *12/02, 2/52*

U.S. Cl. 585—415 **29 Claims**

1. In a process for producing aromatic compounds from aliphatic hydrocarbons under conditions effective to produce aromatic product, methane and ethane, the improvement which comprises in combination contacting under said conditions, a feed containing at least 50 weight percent of C_3 to C_{12} aliphatic hydrocarbons with a catalyst comprising a crystalline zeolite characterized by a Constraint Index within the approximate range of 1 to 12 and a silica to alumina ratio of at least 550 and an added metal comprising at least 50 weight percent of gallium, the weight of added metal in said catalyst being between about 0.5 to about 10 percent based on the total weight of catalyst whereby aliphatic hydrocarbons present in said feed are converted to aromatic compounds; and thereby increasing the selectivity of the process for said aromatic compounds and decreasing its selectivity for methane and ethane production.

4,891,464

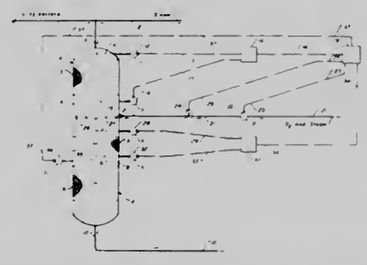
CONTROL METHOD FOR OXYGEN ADDITION TO OXIDATIVE REHEAT ZONE OF HYDROCARBON CONVERSION PROCESS

Darrell W. Staggs, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 813,432, Dec. 26, 1985, abandoned. This application Nov. 14, 1986, Ser. No. 930,631

Int. Cl.[4] C07C *5/333*

U.S. Cl. 585—440 **14 Claims**



1. A method of controlling the rate at which an oxygen-containing gas stream is passed into a catalytic oxidative reheating zone of an endothermic hydrogen-producing hydrocarbon conversion process which comprises the steps of:

(a) measuring a first temperature differential based on the temperature difference between a first process stream, which comprises a feed hydrocarbon and which enters a first catalyst bed comprising a hydrocarbon conversion catalyst, and a first effluent stream, which comprises hydrogen produced within and emerges from the first catalyst bed;

(b) measuring a second temperature differential, based on the temperature difference between a second process stream, which is formed by admixing said oxygen-containing gas stream with said first effluent stream, and which enters a second catalyst bed comprising a selective hydrogen oxidation catalyst and a second effluent stream, which emerges from the second catalyst bed;

(c) measuring the actual rate of flow of said oxygen-containing gas stream; and,

(d) adjusting the rate of flow of said oxygen-containing gas stream based upon a maximum allowable rate of flow set by selecting the lower rate of a first allowable maximum rate based upon the first temperature differential and a second allowable maximum rate based upon the second temperature differential.

4,891,465

PROCESS FOR PRODUCTING ALKYL GROUP-SUBSTITUTED AROMATIC HYDROCARBONS

Katsuo Tanigaichi; Michio Tanaka, both of Iwakuni; Kazunori Takahata, Hiroshima; Naoya Sakamoto, Ootake; Toshihiro Takai, Ootake; Yoshito Karano, Iwakuni, and Masuyasu Ishibashi, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00864, § 371 Date Jul. 6, 1988, § 102(e) Date Jul. 6, 1988, PCT Pub. No. WO88/03523, PCT Pub. Date May 19, 1988

PCT Filed Nov. 10, 1987, Ser. No. 221,246

Claims priority, application Japan, Nov. 11, 1986, 61-268049

Int. Cl.[4] C07C *2/70*

U.S. Cl. 585—463 **16 Claims**

1. A process for producing a dialkyl-substituted aromatic hydrocarbon which comprises the step of reacting (i) an aromatic hydrocarbon with (ii) an alkylating agent selected from the group consisting of olefins, lower aliphatic alcohols and alkyl halides in the presence of a mordenite zeolite catalyst treated with a fluorine-containing compound selected from the group consisting of an aqueous ammonium fluoride solution, chlorofluorocarbons, fluorohydrocarbons, chlorofluorohydrocarbons, bromofluorocarbons, perfluorocarbons, SF_4, SF_6 and BF_3.

4,891,466

HF ALKYLATION PROCESS

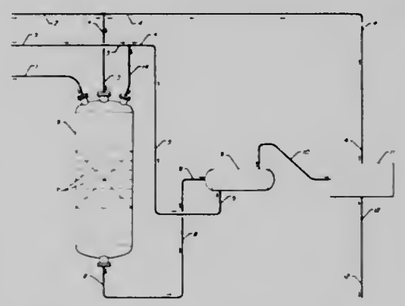
Joseph A. Kocal, Garnee, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 123,828, Nov. 23, 1987, Pat. No. 4,783,567. This application Aug. 29, 1988, Ser. No. 237,815

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] C07C *2/68, 2/58*

U.S. Cl. 585—464 **17 Claims**



1. A process for the liquid phase alkylation of an olefin acting agent with a hydrocarbon substrate in the presence of a

liquid acid alkylation catalyst comprising a surfactant and a liquid acid which comprises the steps of:

(a) introducing reactants comprising an olefin acting agent, a hydrocarbon substrate, and a liquid acid alkylation catalyst into an alkylation reaction zone operating at alkylation reaction conditions and containing a fixed bed of activated carbon to create a reaction mixture;

(b) passing the reaction mixture through the fixed bed of activated carbon in the alkylation reaction zone and into a separator;

(c) separating the liquid acid alkylation catalyst from the product and unreacted feed hydrocarbons;

(d) withdrawing the hydrocarbons from the separator and purifying and recovering the product hydrocarbons and the unreacted hydrocarbons of the liquid phase alkylation reaction; and

(e) recycling at least a portion of the separated acid alkylation catalyst back to the alkylation reactor inlet.

4,891,467

SELECTIVE SYNTHESIS OF PSEUDOCUMENE AND DURENE

David L. Sikkenga, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 660,918, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 507,058, Jun. 23, 1983, abandoned. This application Sep. 16, 1985, Ser. No. 776,221

Int. Cl.⁴ C07C *2/68*

U.S. Cl. 585—467 **25 Claims**

1. A process for the selective production of pseudocumene and durene which comprises contacting a hydrocarbon feed comprising benzene or a methyl-substituted benzene under methylating conditions and in the presence of a methylating agent with a catalyst comprising AMS-1B crystalline borosilicate.

4,891,468

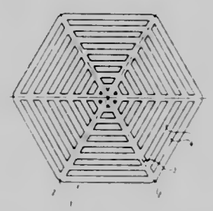
DEVICE TO SHIELD AGAINST AN ELECTROMAGNETIC FIELD

Franz Andrae, Marienlugasse 2-6, Vienna, Austria

Filed Oct. 26, 1988, Ser. No. 262,622

Int. Cl.⁴ H05K *9/00*

U.S. Cl. 174—35 M S **6 Claims**



1. Device to shield against an electromagnetic field, comprising a shielding film made of metal, said shielding film being provided with openings, said shielding film having an essentially hexagonal outline with sides, corners, and a center, said shielding film being subdivided into six triangular fields by ridges connecting the corners to the center of said shielding film, said openings comprising slits which are parallel to the hexagonal side of each triangular field and to each other, said slits extending over the entire triangular field.

4,891,469

PIEZOELECTRIC RESONATOR HOUSING FOR SURFACE MOUNTING

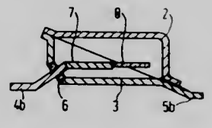
Franz L. Fick, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1988, Ser. No. 244,443

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731785

Int. Cl.⁴ H05K *5/06*

U.S. Cl. 174—52.3 **5 Claims**



1. A hermetically sealable electrical component housing having electrical connection conductors outside said housing which render it suitable for surface mounting, said housing having a planar base and being divided along a plane which is inclined with respect to the plane of the base into upper and lower housing parts adaptable for connection to each other, at least one electrical connection conductor being led through the lower housing part and being insulated therefrom, at least one further electrical connection conductor being connected to said lower housing part, said at least one further electrical connection conductor being located on the opposite side of said lower housing part from said at least one electrical connection conductor, whereby said lower housing part can be mounted on a surface without said upper housing part being connected to it, which renders an electrical component connected to at least one of said electrical connection conductors accessible while said lower housing part is so mounted on said surface, said electrical connection conductors comprising legs for mounting said lower housing part on said surface.

4,891,470

SCREW-TYPE CABLE FITTING

Udo Studenski, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to U. I. Lapp KG, Stuttgart, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,923

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730686

Int. Cl.⁴ H02G *15/007*

U.S. Cl. 174—65 SS **9 Claims**



1. Screw-type fitting for holding an elongated member, comprising a threaded socket, a cap nut and at least one elastomeric clamping ring which will be pressed against an outer surface of the elongated member by screwing the cap nut onto the threaded socket, wherein edged grains of hard, electrically insulating material are fixedly arranged on first portions of the inner surface of the clamping ring which will be pressed against the outer surface of the elongated member when the cap nut is screwed onto the threaded socket, said grains digging into the outer surface in a positively connected manner when pressed against the outer surface, second portions of the inner surface of the clamping ring being free of said edged grains.

4,891,471

WIRING HARNESS PROTECTOR

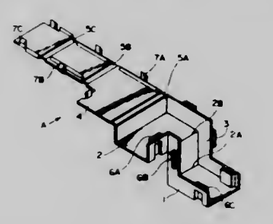
Mamoru Ono; Norihiro Yoneyama, and Toshio Okazaki, all of Toyota, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,966

Claims priority, application Japan, Jul. 2, 1987, 62-100917

Int. Cl.⁴ H02G *3/04*

U.S. Cl. 174—68.3 **7 Claims**



1. A wiring harness protector comprising: a U-shaped housing having a bottom wall including three-dimensional bends therein and a pair of side walls upstanding from the longitudinal sides of said bottom wall, and a cover member connected to a portion of said side walls by a hinge so as to close the opening of said housing and being releasably secured to said side walls by locking means which engages said cover member with said side walls under a snapping action, wherein said cover member includes hinges at positions corresponding to the locations of the bends of said bottom wall.

4,891,472

INTERCONNECTS ON A PRINTED CIRCUIT BOARD HAVING CONNECTING POINTS FOR AN ELECTRONIC COMPONENT WITH A PLURALITY OF TERMINALS

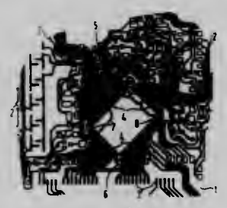
Johannes Veurman, Winterswijk, Netherlands, and Bernd Boeing, Bocholt, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,337

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730455

Int. Cl.[4] H05K *1/00, 3/34*

U.S. Cl. 174—68.5 4 Claims



1. A printed circuit board for minimizing formation of solder bridges between closely adjacent contacts for rectangular, multi-terminal electronic components during flow soldering in a solder bath by moving said circuit board in a direction relative to said solder bath, comprising:

a plurality of connecting points on said printed circuit board arranged in a rectangle, said connecting points positioned relative to terminals of multi-terminal electronic components to make a solder connection with said terminals during said flow soldering;

a plurality of draw-off surfaces for attracting excess solder accumulated during said flow soldering respectively located at corners of said rectangle formed by said connecting points; and

said connecting points being disposed at an angle of 45° relative to said output direction so that a portion of said plurality of draw-off surfaces lie opposite each other in said output direction and a portion of said plurality of draw-off surfaces lie opposite each other perpendicularly to said output direction, and wherein said draw-off surfaces in said output direction are larger than said draw-off surfaces perpendicular to said output direction.

3. A method of minimizing formation of solder bridges between closely adjacent contacts for rectangular, multi-terminal electronic components on a printed circuit board during flow soldering, comprising the steps of:

arranging a plurality of connecting points on a printed circuit board in a rectangle positioned relative to terminals of multi-terminal electronic components to make solder connections with said terminals during said flow soldering;

positioning a plurality of draw-off surfaces for attracting excess solder accumulated during said flow soldering at corners of said rectangle formed by said connecting points;

disposing said connecting points at an angle of 45° relative to said output direction so that a portion of said plurality of draw-off surfaces lie opposite each other in said output direction and a portion of said plurality of draw-off surfaces lie opposite each other perpendicular to said output direction;

making said draw-off surfaces perpendicular to said output direction;

conducting said flow soldering in a solder bath; and moving said printed circuit board in an output direction relative to said solder bath.

4,891,473

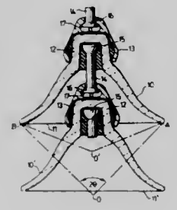
HIGH VOLTAGE INSULATORS CONSTRUCTED TO HAVE PLURAL DRY BANDS IN USE

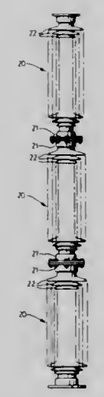
Olaf Nigol, 272 Markland Drive, Toronto, Ontario, Canada M9C 1R7

Filed May 22, 1989, Ser. No. 354,717

Int. Cl.[4] H01B *17/04, 17/48*

U.S. Cl. 174—150 6 Claims





1. An outdoor high voltage glass or porcelain suspension insulator of the single disc type adapted to withstand a continuous operating voltage of at least 60 kV, comprising a vertical string of axially aligned petticoats, each petticoat having an annular rim and upper and lower non-conductive surfaces which slope uninterruptedly downwardly and outwardly to the rim, wherein the configuration and spacing of the petticoats are such that the upper petticoat of each adjacent pair shrouds a predetermined area of surface of the adjacent lower petticoat lying within an inverted cone of cone angle 2θ, where $90° \leqq 2\theta \leqq 140°$, which intersects the rim of the upper petticoat, and wherein the minimum air clearance between the rim of each petticoat and the next unshrouded area of the insulator is at least 100 mm.

5. An outdoor high voltage glass or porcelain insulator of the station post type adapted to withstand a continuous operating voltage of at least 60 kV, comprising an assembly of vertically aligned interconnected insulator units, each unit having a plurality of axially spaced annular skirts arranged in sets forming a recurring pattern, each set comprising an uppermost skirt and a plurality of lower skirts axially aligned therewith, and each skirt having an annular rim and upper and lower non-conductive surfaces which slope uninterruptedly downwardly and outwardly to the rim, wherein the configuration and spacing of the skirts are such that the upper skirt of each adjacent pair shrouds a predetermined area of surface of the adjacent lower skirt lying within an inverted cone of cone angle 2 θ, where $90° \leqq 2\theta \leqq 140°$, which intersects the rim of the upper skirt, and wherein the minimum air clearance between the rim of each said uppermost skirt and the next unshrouded area of the insulator is at least 100 mm.

4,891,474

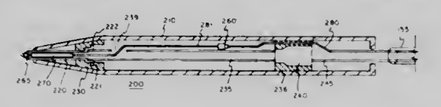
SPARKING STYLUS FOR ACOUSTIC DIGITIZER

William Kelly, Seymour, Conn., assignor to Science Accessories Corp., Stratford, Conn.

Filed Feb. 23, 1989, Ser. No. 314,562

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 20 Claims



1. For use in an acoustic digitizer system wherein an operator-designated stylus position is determined from measurements performed on acoustic energy generated at a stylus, an improved stylus, comprising:

a stylus body having a generally elongated shape;

a tip member which extends from the front of said stylus body, said tip member narrowing to a point at its front end;

a pair of spaced conductive wires disposed in said tip member with their front ends terminating forwardly in said tip member, said wires extending rearwardly in said tip member; and

means for coupling said wires to a source of electrical potential.

4,891,475

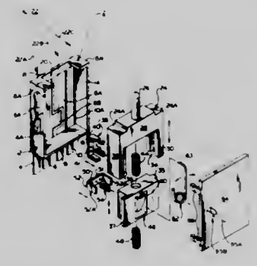
AUTOMOTIVE BEAM SELECTOR SWITCH SYSTEM WITH FLASH-TO-PASS

Jeffrey K. Wiersing, Novi, Mich., and Stephen R. Christian, Lindley, N.Y., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 24, 1988, Ser. No. 261,433

Int. Cl.[4] H01H *9/00, 3/42, 13/00*

U.S. Cl. 200—5 R 18 Claims



1. A headlight beam selector switch system with a "flash-to-pass" mode, comprising:

a terminal block having a contact pad panel;

at least three longitudinally extended, profiled terminal pads located on said contact pad panel, at least one of which has a laterally extending, side portion which extends over to the longitudinal axis of extension of one of the other of said pads;

a carrier structure having an upper member and including at least one, linearly movable carrier having

a contact pad terminal side,

an upper portion, and

a downwardly extending portion, said downwardly extending portion providing a latching member, said one carrier being linearly movably disposed in said terminal block and being temporarily latchable in a lowered, high beam selected position;

a switch actuating member associated with said upper member of said carrier structure and dimensioned and positioned to be contacted from outside of said terminal block to cause actuation from outside of said terminal block and cause movement of said one carrier to move down to its lowered, high beam selected position;

a "flash-to-pass" and beam selector contactor structure having at least three, separate, electrical contact areas carried thereby and positioned and dimensioned to bear in sliding contact on said profiled contact pads as said one carrier is linearly moved along said contact pad panel causing differing combinations of said pads to be electrically interconnected by said contact points in association with said contactor structure;

contactor structure mounting means mounting said "flash-to-pass" and beam selector contactor structure on said contact pad terminal side of said carrier structure including biasing means urging said contact areas toward said profiled terminal pads;

a co-acting latching structure associated with said one carrier and said terminal block capable of latching said one carrier down in its lowered, high beam selected position and unlatching when said actuating member is cyclically again moved down to the high beam selected position; and

beam selector return carrier biasing means associated with said one carrier biasing the longitudinal, linear positioning of said beam selector contact areas with respect to said profiled terminal pads away from said latching position toward their "home" positions.

4,891,476

INDEX ROTARY SWITCH

Melvin S. Nation, Elmhurst, and Robert W. Krawczyk, Rolling Meadows, both of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed May 9, 1988, Ser. No. 191,359

Int. Cl.[4] H01H *19/28*

U.S. Cl. 200—11 R 20 Claims



1. An index rotary switch, comprising:

an electrically insulative housing;

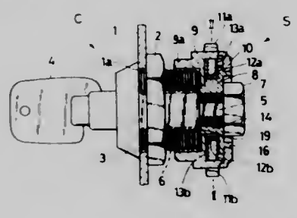
first stationary contact means fixedly mounted within said housing for defining part of a first control circuit;

second stationary contact means fixedly mounted within said housing for defining part of a second control circuit and electrically isolated from said first stationary contact means;

third stationary contact means fixedly mounted within said housing, and electrically isolated from said first and second stationary contact means, for alternatively cooperating with said first and second stationary contact means so

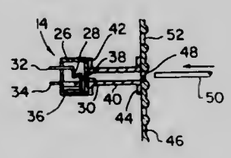
as to alternatively define said first and second control circuits;
rotary contact means rotatably mounted within said housing for alternatively interconnecting said first and third stationary contact means and said second and third stationary contact means so as to alternatively complete said first and second control circuits; and
pushbutton-operated actuator means mounted within said housing and operatively connected to said rotary contact means for sequentially rotating and indexing said rotary contact means between predetermined rotary positions at which said rotary contact means alternatively interconnects said first and third stationary contact means, and said second and third stationary contact means, so as to alternatively complete said first and second control circuits upon successive actuations of said pushbutton-operated actuator means.

4,891,477
KEY SWITCH
Isamu Matsuzawa, c/o G.S.K. Sales Company, Limited, 12-2, Sotokanda 2-chome, Chiyoda-ku, Tokyo, Japan
Filed Jun. 3, 1988, Ser. No. 201,693
Claims priority, application Japan, Jun. 18, 1987, 62-93798[U]
Int. Cl.⁴ H01H *27/06*
U.S. Cl. 200—61.64 **1 Claim**



1. A key switch comprising:
(A) a lock mechanism that includes
(a) a hollow outer cylinder (3),
(b) a hollow inner cylinder (6) mounted within the hollow portion of said outer cylinder (3) and being adapted to be rotated with respect to said outer cylinder 3 upon insertion and turning of a key that is operatively connected to said hollow inner cylinder (6),
(c) a notched belt (5) extending from the rear end portion of said inner cylinder (6), and
(B) a switching mechanism (S) removably engaged with said lock mechanism that includes
(a) a case (9) which is removably fitted to said hollow outer cylinder (3),
(b) a cam member (8) closely surrounding the exterior surface of said notched bolt (5) and rotatably supported within said case (9) so that it can be rotated from a first position to a second position, and
(c) a first pair of contacts consisting of a fixed contacts (11*a*), a bridging contact (12*a*) spring biased toward said first pair of fixed contacts (11*a*), and a second pair of contacts consisting of fixed contacts (11*b*), a bridging contact (12*b*) spring biased toward said second pair of fixed contacts (11*b*), said first and second pairs of contacts being mounted within said case (9) on opposite sides of said cam member (8) so that upon rotation of said cam member to a first position only said first pair of contacts (11*a*, 11*a*), will be in contact with each other, and upon rotation of said cam member (8) to a second position only said second pair of contacts (11*b*, 11*b*) will be in contact with each other, and
(C) holding means to hold said lock mechanism and said switching mechanism together in an operative relationship,
whereby when a key is inserted and turned the notched bolt (5) will turn, which also causes cam member (8) to turn and thereby move one or the other of said two pairs of contacts and its bridging contact (11*a*, 12*a* or 11*b*, 12*b*) into contact with each other, and the other pair of said contacts and bridging contact out of contact with each other, and
whereby either said lock mechanism or said switching mechanism may be individually replaced by simply releasing said holding means and separating the two mechanisms.

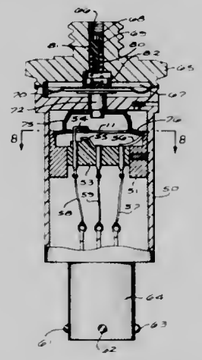
4,891,478
ANTI-THEFT SYSTEM
Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570; Louis M. Vagnone, 2492 Wantagh Ave., Wantagh, N.Y. 11793, and Richard Rabeb, 1900 Horatio Ave., Merrick, N.Y. 11566
Continuation of Ser. No. 939,409, Dec. 8, 1986, Pat. No. 4,762,198. This application May 9, 1988, Ser. No. 191,959
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.⁴ B60R *25/04*
U.S. Cl. 200—61.66 **1 Claim**



1. A switch for use in a security system comprising a cooperating pair of electrical contacts consisting of a first stationary contact and a second movable contact normally in a spaced clearance position therefrom so as to correspondingly provide said switch with a normally open condition, a switch mounting member in the form of a hollow tube bounding a smooth cylindrical operative compartment oriented lengthwise thereof having a first opening at a distal end of said compartment and a second opening at an opposite proximal end thereof, said pair of contacts being mounted in said distal end first opening of said compartment and said hollow tube being attached with said proximal end second opening adjacent to and affixed to a support wall, so as to position said pair of contacts in a rearwardly spaced relation behind said support wall, said support wall having an opening aligned with said second opening and of the same cross-section, and a probe, sized to project into said compartment and electrically close said contacts, whereby the presence of said switch is undetectable except for said support wall opening.

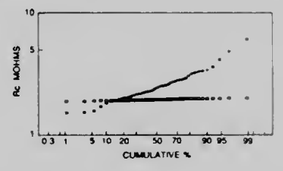
4,891,479
CONTROL ACTUATOR AND SWITCH
Allen V. C. Davis, Chatsworth, Calif., assignor to The Kathryn L. Acuff Trust No. 2 and The Heather Ruth Davis 1982 Trust, both of Chatsworth, Calif.
Filed Dec. 14, 1988, Ser. No. 284,947
Int. Cl.⁴ H01H *35/34*
U.S. Cl. 200—81 R **1 Claim**

1. A fluid pressure actuated electrical switch comprising:
a switch casing;
a switch base mounted in said casing;
a motion transmitting and amplifying device carried by said switch base including:
a spring metal strip configured to resemble the letter W and including
a pair of driver loops having parallel legs and an output loop having parallel legs; one leg of each of said driver loops being connected to a different leg of said output loop, and
means connecting the ends of the driver loops opposite their conections with the output loop, against outward movement with respect to each other;
the legs of the output loop being stressed by deformation while so connected so that the space between the legs of the output loop increases from their connection with the driver loops to the opposite end of said space,



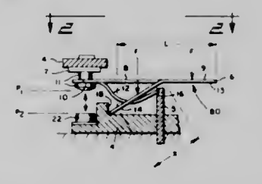
a first electrical contact carried by said switch base;
a second electrical contact carried by said output loop engageable with said first contact;
means for admitting fluid pressure to the interior of said casing; and
means responsive to the admission of fluid pressure to the interior of said casing for actuating said motion transmitting and amplifying device to close said contacts.

4,891,480
APPARATUS INCLUDING ELECTRICAL CONTACTS
Clarence A. Holden, Jr., Morris Township, Morris County, and Henry H. Law, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Feb. 1, 1989, Ser. No. 305,212
Int. Cl.⁴ H01H *1/02*
U.S. Cl. 200—262 **16 Claims**



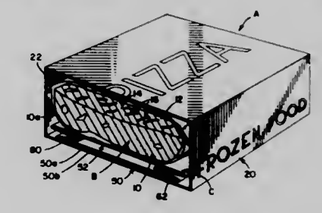
1. An electrical device with contacts, in which said contacts comprise a conductive region, characterized in that:
said region comprises a conductive matte-finish surface with a Knoop hardness number of at least 300, a diffuse reflectance of less than about 20 percent, and a specular reflectance of less than about 2 percent; and
said conductive region has a contact resistance of less than about 50 milliohms, under a 50-gram load, after exposure to 50° C. and 95% relative humidity for a period of 20 days.

4,891,481
SWITCH CONTACT BLADE
John Comerford, Glendale Heights, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Jun. 13, 1988, Ser. No. 205,879
Int. Cl.⁴ H01H *5/30, 5/18*
U.S. Cl. 200—409 **6 Claims**



1. A snap-action contact blade for mounting on an electrical switch having a frame having spaced-apart first and second anchoring means and effective in a pre-loaded condition to move an electrical contact region thereof from a first position to a second position in response to an actuating force imparted thereagainst and to resiliently return the contact region to the first position upon removal of the actuating force therefrom, said blade comprising:
a base portion having a side thereof adapted to receive the actuating force thereagainst and having a pair of spaced-apart support legs respectively extending angularly away from an opposite side thereof to respective free-ends adapted to releasably engage the first anchoring means;
a central portion extending between the base portion and contact region intermediate the support legs;
an opening through the central portion;
a tongue portion extending arcuately away from the contact region within said opening on the same side of the base portion from which the support legs extend and thence towards the base portion and ending in a free-end that is spaced apart from the base portion and adapted to releasably engage the second anchoring means;
said blade adapted such that when the support leg free-ends engage the first anchoring means and the tongue free-end engages the second anchoring means, the blade is releasably resiliently secured to the switch frame; and
said support legs respectively having a section thereof operative t receive the actuating force thereagainst for a predetermined distance from the base portion therealong.

4,891,482
DISPOSABLE MICROWAVE HEATING RECEPTACLE AND METHOD OF USING SAME
Kirk A. Jaeger, Twinsburg; Yigal Peleg, Solon, and David R. Popp, Bay Village, all of Ohio, assignors to The Stouffer Corporation, Solon, Ohio
Filed Jul. 13, 1988, Ser. No. 218,205
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 E **40 Claims**



1. In a disposable receptacle for combined baking and cook-

ing of a generally flat food article, having a given thickness and an outer peripheral shape in a microwave oven having a lower wall, said receptacle being constructed from a first sheet of microwave susceptor surrounding said food article stock having an outwardly exposed, dielectric support layer and an inwardly facing heater layer of microwave interactive material allowing passage of microwave energy as it is heated thereby, said receptacle further including a lower flat portion for supporting said food article, the improvement comprising: at least one additional layer of microwave susceptor sheet stock secured onto said inwardly facing layer of said lower flat portion of said receptacle and having an outer peripheral shape generally at least as large as said peripheral shape of said food article whereby said receptacle has at least two layers of microwave susceptor sheet stock at said lower portion thereof.

4,891,483

HEATING APPARATUS FOR HYPERTHERMIA

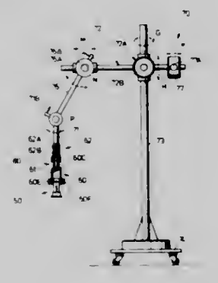
Makoto Kikuchi, Mitaka; Shinsaku Mori, Tokyo; Yoshio Nikawa, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co. Ltd., Tokyo, Japan

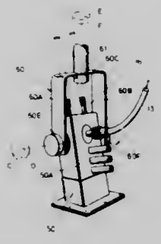
Filed Jun. 25, 1986, Ser. No. 878,327

Claims priority, application Japan, Jun. 29, 1985, 60-143555; Jun. 29, 1985, 60-143559; Jun. 29, 1985, 60-143560

Int. Cl.⁴ A61N *5/00*

U.S. Cl. 219—10.55 A **18 Claims**





2. A heating apparatus for inducing hyperthermia, comprising: an applicator having an output end for focusing and outputting electromagnetic waves to a portion of a patient undergoing treatment for heating such portion; applicator means for erectingly and rotatably engaging and holding said applicator; and a mechanism for supporting said applicator holding means; a mechanism for cooling the outer surface of said portion to be heated and a coolant circulating mechanism including a pressurizing pump for effecting the flow of coolant in and out of said mechanism which is located at the electromagnetic wave output end of said applicator, and deaerator means for deaerating said coolant.

4,891,484

VARIABLE WIDTH APPARATUS FOR INDUCTION HEATING OF MOVING WORKPIECES

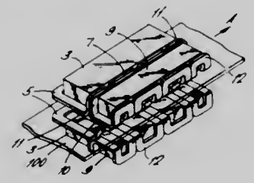
Ralph Waggott, Great Mollington, and Robert C. J. Ireson, Bournemouth, both of United Kingdom, assignors to The Electricity Council, London and Davy (Poole) Limited McKee, Poole, both of, England

Filed Sep. 9, 1988, Ser. No. 242,301

Claims priority, application United Kingdom, Sep. 15, 1987, 8721663

Int. Cl.⁴ H05B *6/40*

U.S. Cl. 219—10.61 R **6 Claims**



1. Induction heating apparatus comprising a pair of opposed coil assemblies between which a workpiece to be heated is moved, wherein each of said coil assemblies includes a plurality of loop windings arranged generally in a plane parallel to the plane of movement of the workpiece between said coil assemblies, said windings being arranged in groups with the windings in each of said groups being aligned transversely of the direction of movement of the workpiece, said windings of each of said groups having turned end portions that extend substantially perpendicularly to the plane of the remainder of said windings and away from the plane of movement of the workpiece, core members carrying said windings, each of said core members carrying a plurality of said windings aligned in the direction of movement of the workpiece, said core members of each of said coil assemblies being mounted for movement relative to each other in a direction transverse to the direction of movement of the workpiece to vary the spacing between said turned end portions of adjacent said windings, said adjacent turned end portions of said windings of each of said groups being separated by passive spacer members of magnetically permeable material which serve to maintain the flux pattern generated by associated said windings.

4,891,485

DEVICE FOR FASTENING AN EDM TOOL IN PLURAL ORIENTATIONS

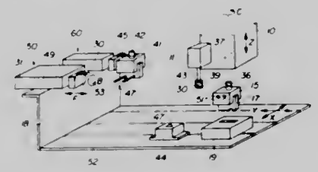
Jean-Paul Briffod, Lacinges, France, assignor to Charmilles Technologies S.A., Meyrin, Switzerland

Filed Jun. 6, 1988, Ser. No. 203,019

Claims priority, application Switzerland, Jun. 10, 1987, 2189/87; Oct. 12, 1987, 3979/87

Int. Cl.⁴ B23D *1/08*

U.S. Cl. 219—69.15 **21 Claims**



1. A device for automatically fixing a tool on a machining head alternately in either a working position or in a second position oriented differently from said working position, comprising:

a tool holder to which said tool is mounted;

first means for detachably securing said holder to said machining head so as to orient said tool in said working position;

second means for detachably securing said holder to said machining head so as to orient said tool in said second position; and

means for grasping said holder and moving said holder between securement to said machining head by one of said first and second securing means and securement by the other of said second and first securing means.

4,891,486

DEVICE FOR FEED CONTROL OF ELECTRODE-TOOL IN SPARK EROSION MACHINES

Vadim A. Rasulev, USSR, Tashkent, massiv Kara-Su-1, 22, kv. 15, Tashkent, U.S.S.R.; Vladimir I. Khainov, USSR, Tashkent, ulitsa Levanevsko-go, 41, kv. 4, Tashkent, U.S.S.R., and Erkin T. Abdukarimov, USSR, Tashkent, TS-1, 52, kv.6, Tashkent, U.S.S.R.

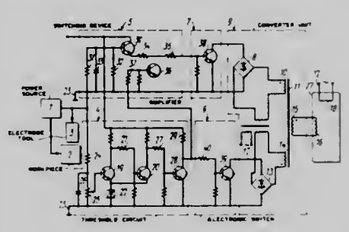
PCT No. PCT/SU87/00100, § 371 Date May 24, 1988, § 102(e) Date May 24, 1988, PCT Pub. No. WO88/02293, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 17, 1987, Ser. No. 236,529

Claims priority, application U.S.S.R., Sep. 25, 1986, 4119672

Int. Cl.⁴ B23H *7/18*

U.S. Cl. 219—69.16 **1 Claim**



1. A device for electrode-tool feed control in electro-erosion machines, comprising a power source (1) equipped with reservoir capacitors and having one output thereof connected to a workpiece and the other to the electrode-tool, a switching device (5) having its input connected to the output of the power source (1), an amplifier (7) whose input is connected to the output of the switching device (5), and a controlled reversible AC motor (17), an electronic switch (6), and a converter unit (9) including a transformer (11) featuring two primary windings (10, 14) connected in series with an AC supply line (12) via diode bridges (8,13), one of said diode bridges being connected to the electronic switch (6) and the other, via the amplifier (7), to the switching device (5), while the electronic switch (6) is connected to the output of the threshold circuit (4) and one of the inputs of the switching device (5) whose other input is connected to the input of the threshold circuit (4) coupled to the reservoir capacitors of the power source (1) and the electrode-tool (3), and a winding (16) of the reversible AC motor (17) is connected to a secondary winding (15) of the transformer (11) of the converter unit (9) and the other winding thereof is connected to the AC supply line (12).

4,891,487

ELECTRODE RETURN CONTROL FOR ELECTRIC SPARK MACHINE

Masahiro Nakata, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1989, Ser. No. 351,263

Claims priority, application Japan, Feb. 21, 1986, 61-35348

Int. Cl.⁴ B23H *7/18*

U.S. Cl. 219—69.17 **3 Claims**

1. A method of electrode return control for an electric spark machine for machining a workpiece with an electrode by moving said electrode with respect to said workpiece, said method being responsive to the occurrence of a short-circuit signal produced upon contact between said electrode and said workpiece to move said electrode in a direction in which said contact condition is broken, comprising the steps of:

(a) continuously monitoring the progress of the machining operation,

(b) successively updating a spatial objective point towards which said electrode is to be moved in the event of a shortcircuit signal in accordance with the monitoring of the machining operation progress, and

(c) selectively moving said electrode away from a surface of said workpiece being machined and either:

(1) directly toward said updated spatial objective point in a straight line, or

(2) back along a path over which said electrode was moved during the machining operation,

in response to the occurrence of a short-circuit signal.

4,891,488

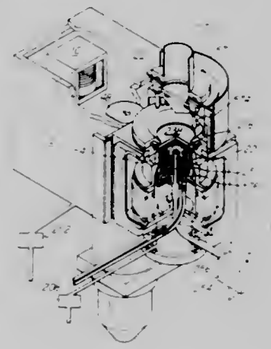
PROCESSING APPARATUS AND METHOD

Cecil J. Davis, Greenville, and Rhett B. Jucha, Celeste, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 73,944

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121.4 **5 Claims**



1. A vacuum process module capable of receiving a workpiece comprising:

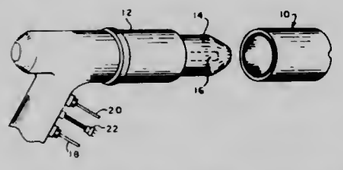
(a) a process chamber;
(b) a support device including an RF electrode capable of supporting a workpiece with a face to be processed facing downward in said chamber; said electrode comprising silicon in the area said workpiece is to be supported;
(c) an in situ plasma generator including said electrode;
(d) a separately controlled radiant heater; and
(e) a transparent vacuum wall between said radiant heater and said electrode which forms a portion of the boundary of the process chamber.

4,891,489

SHIELD CUP PROTECTOR APPARATUS FOR PLASMA ARC TORCH

Lawrence A. Bollinger, Gibsonia, and Mark A. Tarbay, Arnold, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1988, Ser. No. 266,747
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—121.48 **4 Claims**



1. A shield cup protector apparatus for protecting a plasma arc torch body end portion consisting of a shield cup formed of brittle ceramic material, said shield cup protector apparatus comprising an elongated cylinder having first and second open ends, said first open end of the elongated cylinder being dimensioned to be slidable over and seat firmly about a peripheral portion of the shield cup with the shield cup being insertable into an inner cylindrical cavity formed by said cylinder, said inner cylindrical cavity of said cylinder is a smooth cylindrical surface forming a uniform load transfer surface by which the cylinder is supported on and engaged along the entirety of a mating outer cylindrical surface of said shield cup, said mating outer cylindrical surface thereby providing a continuous support surface for said cylinder with said smooth cylindrical surface and said mating out cylindrical surface co-acting to prevent localized breakage forces against said shield cup, the elongated cylinder being of sufficient length to extend beyond the shield cup to protect the shield cup during at least one of welding and cutting operations to be performed with the plasma arch torch.

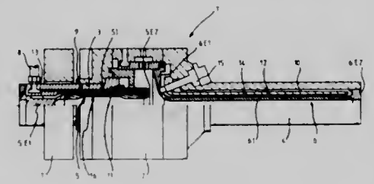
4,891,490

TUBULAR ELECTRODE FOR PLASMA TORCH AND PLASMA TORCH PROVIDED WITH SUCH ELECTRODES

Maxime Labrot; Didier Pineau, and Jean Feuillerat, all of Bordeaux, France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Apr. 29, 1988, Ser. No. 188,483
Claims priority, application France, Apr. 29, 1987, 87 06085
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—121.52 **9 Claims**

1. A plasma torch comprising: at least one electrode constituted by a tubular intermediate part intended for catching arc feet; end parts intended for use in connecting said electrode to other parts of said torch; and an enclosed fluid circulation chamber within which a cooling fluid circulates, wherein the intermediate and end parts of said electrode have a thickness of at least equal to ten millimeters, and said individual parts of said electrode are connected together by mechanical assembly means, whereby said intermediate and end parts of said electrode may be assembled together to form a tight, disassemblable, moisture-impervious electrode and comprising for each part of said electrode to be assembled:
(i) a peripheral shoulder which is disposed near said enclosed fluid circulation chamber, said peripheral shoulder disposed at right angles to the axis of said tubular intermediate part of said electrode;
(ii) a thread coaxial to said tubular intermediate part of said electrode;



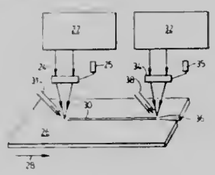
(iii) a centering cylindrical surface coaxial to said tubular intermediate part of said electrode and extending in a direction coplanar to said thread and perpendicular to said peripheral shoulder; and
a seal disposed between the cooperating mechanical assembly means of two assembled parts of said electrode.

4,891,491

MEANS OF ENHANCING LASER PROCESSING EFFICIENCY OF METALS

Walter W. Duley, P.O. Box 453, King City, Ontario, Canada L0G 1K0, and Grant Kinsman, York University, 4700 Keele St., Downsview, Ontario, Canada (M3J 1P3)

Division of Ser. No. 8,656, Jan. 30, 1987. This application May 12, 1988, Ser. No. 192,919
Int. Cl.[4] B23K 26/00
U.S. Cl. 219—121.64 **3 Claims**



1. A method of welding adjacent marginal edges of two workpieces to one another by a first laser emitting radiation of a first wavelength comprising the step of reducing the reflectivity of the adjacent marginal edges of each workpiece by directing radiation of a second wavelength from a second laser to the area of the workpiece defining said marginal edge, and subsequently directing radiation from said first laser to said marginal edges to weld said edges to one another.

4,891,492

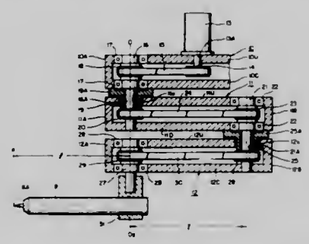
MECHANISM FOR A ROBOT TOOL SUPPORT

Sadao Nakanishi; Hiroshi Nagashima, and Kazuhiro Tomiyasu, all of Ise-shi, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 193,273
Claims priority, application Japan, May 11, 1987, 114284
Int. Cl.[4] B23K 9/12
U.S. Cl. 219—125.1 **2 Claims**

1. A tool support mechanism for a robot, comprising:
a frame;
a first cylindrical stationary shaft fixed to said frame;

a first ring-shaped pulley fixed to a free end of said first stationary shaft;
a rotary drive shaft extending from said frame and through said first stationary shaft and said first pulley, said first stationary shaft and said first pulley being substantially concentric to and spaced from said drive shaft;
a first arm fixed to a free end of said drive shaft at a first end of said first arm;
a second cylindrical stationary shaft fixed to a second end of said first arm;
a second ring-shaped pulley fixed to a free end of said second stationary shaft;
a first support shaft rotatably mounted in said second end of said first arm and extending from said first arm and through said second stationary shaft and said second pulley, said second stationary shaft and said second pulley



being substantially concentric to and spaced from said first support shaft;
a first support pulley fixed to said first support shaft;
a first belt connecting said first pulley and said first support pulley;
a second arm fixed to a free end of said first support shaft at a first end of said second arm;
a second support shaft rotatably mounted in and extending from a second end of said second arm;
a second support pulley fixed to said second support shaft;
a belt connecting said second pulley and said second support pulley; and
a tool support fixed to a free end of said second support shaft, whereby rotation of said drive shaft causes rotation of said first and second arms with respect to said frame for moving said tool support about a workpiece.

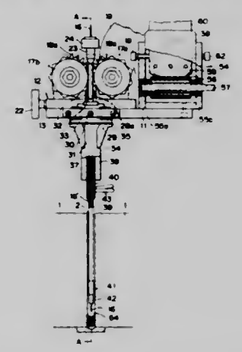
4,891,493

NARROW GAP ARC WELDING PROCESS AND APPARATUS THEREFOR

Shozo Sato; Toshikazu Shimoyama; Susumu Shono; Osa Matsumoto; Hiromasa Kamei, and Takehiko Imada, all of Takasago, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 306,514, Sep. 28, 1981, abandoned. This application Dec. 11, 1986, Ser. No. 943,840
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—137 R **2 Claims**

1. A narrow gap arc welding process which comprises steps of defining a narrow gap having a width of 9 to 14 mm and an elongated length, said gap being between a pair of members to be welded which are arranged so as to face each other at a predetermined distance, plastically deforming a consumable elongated electrode between a pair of gears driven with synchronous rotation to form said consumable electrode into a wavelike pattern with opposite crests and with a pitch of about 10 to 20 mm and a molding width as measured from said opposite crests of about 2 to 5 mm, feeding said consumable electrode into a guide cylinder which is movable along the length of said narrow gap so that said consumable electrode is fed and consumed along the length of the gap, and generating an electric arc between the tip of the consumable electrode and the members to be welded to unite them with each other, wherein said consumable electrode, after having been deformed plastically, is fed into said narrow gap with the direction of the tip



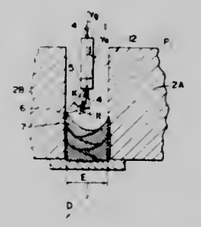
of said consumable electrode being changed at a high frequency rate in the range of 290–880 cycles/min. so the welding arc is pointed to one after the other facing edges of said members which are alternately welded at said high frequency.

4,891,494

PROCESS AND DEVICE FOR NARROW-GAP WELDING

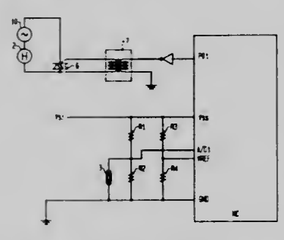
Vincent .Baujat, Manche, France, assignor to Etat Francais, Paris Armees, France

Filed Jan. 20, 1988, Ser. No. 146,106
Claims priority, application France, Jan. 29, 1987, 87 01043
Int. Cl.[4] B23K 9/12
U.S. Cl. 219—137.8 **3 Claims**



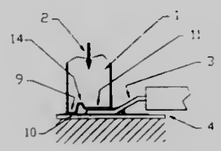
1. A process of electric welding comprising depositing successive beads between a first piece and a second piece facing each other and separated by a narrow gap using at least one electrode wire and one wire guide tube having an axis, by advancing said electrode wire in a direction of advance inside the gap, wherein a tip of said electrode wire, in cooperation with the wire guide tube, oscillates in a plane perpendicular to said direction of advance and to either side of a line in said plane and positioned at an angle with respect to the axis of the wire guide tube, the oscillation being bounded alternately by an edge of one of said pieces and a previously formed bead.

4,891,495
TEMPERATURE CONTROL DEVICE FOR HEAT-ROLL FUSING APPARATUS
Kazuhiro Araki,Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 872,388, Jun. 10, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 249,276
Claims priority, application Japan, Jun. 14, 1985, 60-130642
Int. Cl.[4] G03G *15/00*
U.S. Cl. 219—216 **6 Claims**



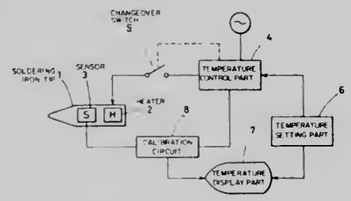
1. A temperature control device for a heat roll fusing apparatus including a heat roll having a heating element therein, a pressure roll in contact with said heat roll and a sensing element for sensing a fusing temperature, said temperature control device comprising:
detecting means for detecting an initial temperature at initiation of power supplying; and
temperature control means for supplying a current to the heating element so as to warm up the heat roll to a fixing temperature and operable in a first mode when the intial temperature is lower than a reference temperature and in a second mode when the initial temperature is higher than the reference temperature, wherein the current is supplied in the first mode until a time when the sensing element senses a predetermined temperature which is lower than the fixing temperature, whereas the current is supplied in the second mode during a predetermined time.

4,891,496
HEATED TOOL WITH MULTIPLE HEATING SURFACES
Gero Zimmer, Munich, Fed. Rep. of Germany, assignor to Productech Reflow Solder Equipment Inc., Rolling Hills Estates, Calif.
Filed Jul. 6, 1988, Ser. No. 215,630
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722729
Int. Cl.[4] B23K *3/00, 35/12*
U.S. Cl. 219—233 **15 Claims**



1. An apparatus for heating two objects including a first object having a thickness and an end, and being engaged against a second object, the apparatus comprising:
a support for supporting the second object on a side thereof opposite from the first object; and
a heated tool having a first heating surface for engaging the first object on a side thereof opposite from the second object, and a second heating surface which is offset from the first heating surface by at least the thickness of the first object, for directly engaging and heating the second object, with a slot in said heated tool between said first and second heating surfaces.

4,891,497
SOLDERING IRON TEMPERATURE REGULATOR
Hiroshi Yoshimura, Oriono, Japan, assignor to Hakko Metal Industries Limited, Osaka, Japan
Filed Aug. 23, 1988, Ser. No. 235,226
Claims priority, application Japan, Apr. 2, 1988, 63-82054
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—241 **4 Claims**

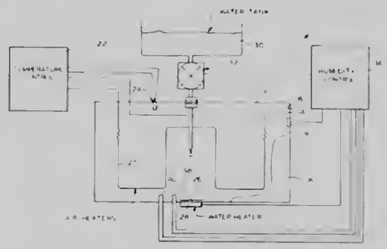


1. A soldering iron temperature regulator comprising:
a soldering iron composed of a heater for heating its tip and a resistance bulb, said soldering iron having a temperature sensor for measuring the tip temperature incorporated near the tip;
a temperature setting means for setting the tip temperature of said soldering iron by varying the heating temperature of said heater;
a temperature display means for displaying the set temperature of said temperature setting means, and the temperature detected by said temperature sensor;
a temperature control means for adjusting the heating temperature of said heater on the basis of the set value of said temperature setting means and the detected temperature of said temperature sensor;
a calibration circuit having a variable resistor connected to said temperature sensor for matching the measured temperature displayed in said temperature display means with the ambient tip temperature when the tip of said soldering iron is at room temperature; and
a changeover switch for cutting off the current supply to said heater when a supply voltage is applied to said temperature control part.

4,891,498
FOOD TREATMENT CABINET WITH FLASH STEAMER
Robert C. Fortmann, Mundelein, and Curtis C. Pinnow, Libertyville, both of Ill., assignors to Carter-Hoffman Corporation, Mundelein, Ill.
Continuation-in-part of Ser. No. 126,248, Nov. 27, 1987, Pat. No. 4,835,368. This application Mar. 21, 1989, Ser. No. 326,690
Int. Cl.[4] F27D *7/02*; F24C *7/06*
U.S. Cl. 219—401 **18 Claims**

1. A food treating/holding apparatus comprising:
a cabinet defining a storage space for food to be treated, said cabinet having an access opening to permit placement of food items in and removal of food items from said storage space and a door mounted for selective movement between a closed position wherein the access opening is covered and an opened position;
means for sensing if the door is in the open position;
a heater having a surface that can be heated to a sufficiently high temperature to vaporize water in said storage space;
means for delivering water against the heater surface to provide water vapor in said storage space; and

control means coupled to said sensing and said delivering means for causing said delivering means to deliver a preselected metered quantity of water to the heater surface

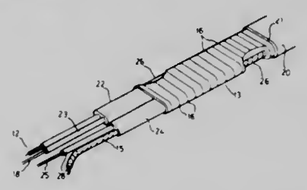


according to an amount of time that said door is in said open position to compensate for humidity loss to the atmosphere upon said door being opened.

4,891,499
METHOD AND APPARATUS FOR REAL-TIME WAFER TEMPERATURE UNIFORMITY CONTROL AND SLIP-FREE HEATING IN LAMP HEATED SINGLE-WAFER RAPID THERMAL PROCESSING SYSTEMS
Mehrdad M. Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 9, 1988, Ser. No. 242,404
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—502 **32 Claims**

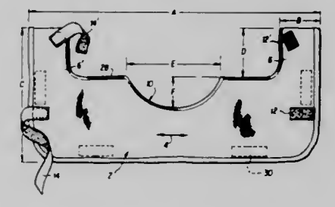
1. Apparatus for controlling temperature uniformity of a semiconductor wafer in a single wafer rapid thermal processing reactor having a heating lamp module comprising:
a first laser beam reflected from an edge point on the wafer;
a first infrared photo-detector to receive said first laser beam;
a second laser beam reflected from a center point on the wafer;
a second infrared photo-detector to receive said second laser beam;
a differential amplifier to evaluate output from said first and second photo-detectors; and
a heating element proximate the wafer, responsive to said amplifier, to control the temperature uniformity of the wafer.

4,891,500
SELF-HEALING PARALLEL HEATING TAPE
Frederick W. Bloore, 27 Quail Green, Wightwick, Wolverhampton, West Midlands WV6 8DF, United Kingdom
Filed Sep. 2, 1988, Ser. No. 239,902
Claims priority, application United Kingdom, Sep. 5, 1987, 8720898
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—505 **12 Claims**



1. A parallel heating tape, comprising:
(a) two electrical power conductors extending generally alongside but spaced apart from one another;
(b) a plurality of heating elements extending between and being electrically connected to each of the two power conductors along the length of tape;
(c) the heating elements each being thinner and of higher resistance than the power conductors and providing a current path from one of the power conductors to the other whereby the heating elements dissipate heat;
(d) a temperature monitoring conductor extending alongside one of the power conductors but being separated from the respective power conductor by a substance which electrically insulates the temperature monitoring conductor from the power conductor when the temperature is below one of the specified temperatures and a temperature within a transition temperature range; and
(e) the substance providing a current path between the power conductor and the temperature monitoring conductor when the temperature is above the respective one of the specified temperature and a temperature within the transition temperature range, and the substance again insulating the power conductor from the temperature monitoring conductor when the temperature falls below the respective specified temperature or a temperature within the transition temperature range.

4,891,501
THERAPEUTIC TREATMENT PAD
Barry Lipton, 11433 Flints Grove La., Gaithersburg, Md. 20878
Continuation-in-part of Ser. No. 909,332, Sep. 19, 1986, Pat. No. 4,742,827. This application Apr. 12, 1988, Ser. No. 180,458
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[4] H05B *3/06*
U.S. Cl. 219—527 **13 Claims**



1. A therapeutic treatment pad comprising:
a flexible pad member including:

(a) a flat, substantially rectangular central portion defining two elongate and substantially parallel sides extending along a direction of elongation and two ends shorter than said elongate sides and spaced in the direction of elongation of said central portion, said elongate sides being spaced in a direction transverse to said direction of elongation,

(b) a concave cut-out in said central portion, said cut out extending from an intermediate portion of one of said sides towards the other of said sides,

(c) flat extending portions projecting from said one of said sides adjacent each of said ends and in said direction substantially transverse to said direction of elongation of said central portion, said flat extending portions being spaced from said cut-out in said direction of elongation;

means for selectively connecting opposite ones of said ends; and

means for modifying the temperature of the entirety of said central portion of said pad member.

4,891,502

CASH DISPENSER OF THE TYPE TRANSPORTING A SLIP AND BILLS TOGETHER

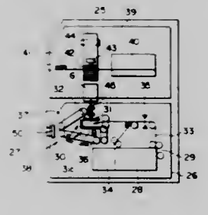
Nobuhiro Motoi; Yoshinori Koshida; Isao Miyake, and Yasuo Okazaki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,268

Claims priority, application Japan, Oct. 12, 1987, 62-254717; Nov. 2, 1987, 62-166814[U]

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—379 **8 Claims**



1. A cash dispenser for dispensing bills in response to customer's operations, said dispenser including a disbursing mechanism comprising:

a bill outlet for producing bills from said dispenser;

temporary-stacking means for temporarily stacking bills to be dispensed and for positioning on the top of the bills a slip which is printed with particulars of an account, said temporary-stacking means including a first stage for stacking bills and a second stage located above said first stage for positioning a slip;

transferring means for delivering the printed slip onto said second stage from one side of and at an angle of substantially 90 degrees relative to said second stage; and

bundle transporting means including lower transport belts interposed between said bill outlet and said temporary-stacking means and upper transport belts movable in a rotational motion relative to said lower transport belts;

whereby the bills and the slip are stacked on temporary-stacking means and then transported to said bill outlet while being held between said lower belts and said upper belts.

4,891,503

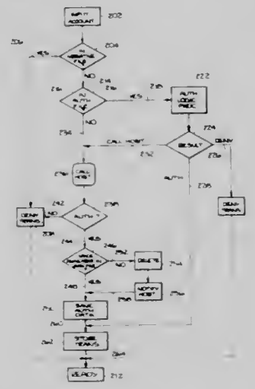
DISTRIBUTED AUTHORIZATION SYSTEM

Thomas L. Jewell, Carlsbad, Calif., assignor to Gascard, Inc., Carlsbad, Calif.

Filed Mar. 29, 1988, Ser. No. 174,839

Int. Cl.[4] G06F *15/21*

U.S. Cl. 235—380 **9 Claims**



1. A distributed authorization system for authorizing and denying requested transactions concerning an account, said system utilizing a host computer communicating with at least one electronic terminal remote from the host computer, comprising:

means for storing data in a negative file residing in the electronic terminal for containing information based on previous transactions specific to that terminal used to identify accounts for which requested transactions are to be denied authorization;

means for storing data in an authorization file residing in the electronic terminal containing information based on previous transactions specific to that terminal used to determine whether to authorize a requested transaction concerning an account;

means for entering transaction data into the electronic terminal for requesting a transaction concerning a specific requested account;

means for checking said transaction request data against said terminal negative file data, said checking means generating terminal output denying said transaction request when said requested account is contained in said terminal negative file;

means for performing authorization logic in the electronic terminal in the event said transaction request is not denied at the terminal, said logic means including means for checking whether said requested account is contained in said terminal authorization file,

said logic means being responsive to said requested account being found in said terminal authorization file for generating a terminal output signal (i) denying the request, or (ii) authorizing the request,

said logic means further being responsive to said requested account not being found in said terminal authorization file for establishing an electronic connection from the electronic terminal to the host computer to obtain authorization from the host computer, in which new account data for said requested account is transmitted from the host computer back to the electronic terminal resulting in terminal output (i) denying the request, or (ii) authorizing the request;

means for adding said new account data to said terminal authorization file; and

means for storing completed transaction data in a transaction queue file residing in the electronic terminal for subsequent transmission to the host computer.

4,891,504

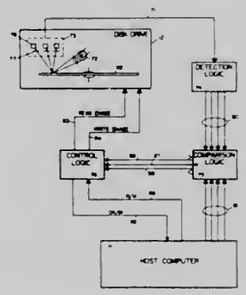
SECURITY LEVEL IDENTIFICATION METHOD FOR COMPUTER BASED INFORMATION

Om P. Gupta, Ithaca, N.Y., assignor to Digicomp Research Corp., Ithaca, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,799

Int. Cl.[4] G06K *7/10, 19/08*

U.S. Cl. 235—462 **10 Claims**



1. In a computer information system of the type having a plurality of input/output devices adapted to read from and/or write information to input/output medium means for input and/or output of information, the information and the medium being associated with one or more of a plurality of security levels, the information being coded as to the level of security associated therewith, the improvement comprising the method of providing multi-level security comprising the steps of:

a. coding the input/output medium by applying one of a plurality of machine and visually detectable indicia indicating the level of security of information to be read and/or written thereon;

b. detecting the security level of the input/output medium through a detector means located in the input/output device for reading the machine and visually detectable indicia and providing the computer information system with a security code corresponding to the security level coded on the input/output medium through the indicia applied thereto;

c. determining from the computer the security level of information which is to be subject to output from the computer or the security level of the user who wishes to use input information from the medium;

d. Comparing the security level determined in step c with the input/output medium security level detected in step b;

e. permitting the information to be read from or written to the input/output medium only if the security level of the information and the security code of the media are compatible.

4,891,505

SECURITY MARKINGS, MATERIAL PROVIDED WITH SECURITY MARKS, AND APPARATUS TO DETECT THE SECURITY MARK

Michel Jalon, Paris, France, assignor to Petrel, Paris, France

Division of Ser. No. 74,351, Jul. 16, 1987, Pat. No. 4,833,311.

This application Mar. 20, 1989, Ser. No. 325,935

Claims priority, application France, Aug. 19, 1986, 86 11878

Int. Cl.[4] B32B *23/00*

U.S. Cl. 235—491 **4 Claims**

1. Apparatus to check a marking product comprising rare-earth chelates or substrates including rare-earth chelates, the rare-earth ion being present in the chelates arising from at least two different rare-earths, an energy transfer taking place between the two rare-earths and causing a change in fluorescence wavelength of the chelates when exposed to ultraviolet radiation as a function of the temperature of the chelate so made and/or of the substrate including the chelate, the apparatus comprising:

(a) an ultraviolet exciting source,

(b) a thermal device allowing the temperature of the substrate to be varied between −273° C. and +50° C., and

(c) an electro-optical sensor to detect the fluorescence wavelengths of the substrate.

4,891,506

MULTI-USE PORTABLE ELECTRONIC DEVICE

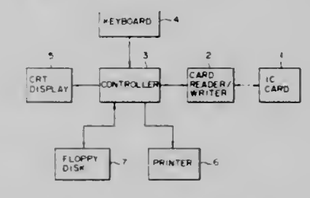
Kenzo Yoshimatsu, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 10, 1988, Ser. No. 154,372

Claims priority, application Japan, Feb. 20, 1987, 62-37073

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—492 **20 Claims**



1. A portable electronic device into which data can be input and from which data can be output, said device comprising:

data memory means having at least a first area and a second area, said second area having a plurality of data-storing areas for storing data, and said first area having a directory area for storing pointer data pointing to the data-storing areas of the second area, said pointer data being divided into a plurality of groups of area-defining data pointers, each group including at least one data pointer which defines one data-storing area;

selection means for selecting one of the groups of area-defining data pointers as a group pointing to data-storing areas which can be used; and

control means for controlling said data memory means so as to store data supplied from an external device into, and to output data to the external device from, a selected one of the data-storing areas of said data memory means pointed to by the selected group of area-defining data pointers.

4,891,507

APPARATUS FOR EXTENDING THE INFRARED RESPONSE OF PHOTOCATHODES

Joseph Lindmayer, Potomac, and Charles Y. Wrigley, Ijamsville, both of Md., assignors to Quantex Corporation, Rockville, Md.

Filed Dec. 9, 1988, Ser. No. 281,634

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **12 Claims**

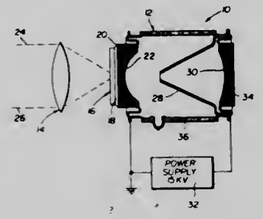
1. Photodetection apparatus comprising:

photosensitive means usefully responsive to electromagnetic energy in a first wavelength region;

active pre-charged photon energy conversion means for receiving electromagnetic energy of wavelengths longer than said first wavelength region and in a region to which said photosensitive means is insensitive and emitting electromagnetic energy in said first wavelength region in response thereto, said energy conversion means being substantially optically transparent to radiations over a substantial portion of said first wavelength region; and

means optically coupling said energy conversion means to

said photosensitive means, including direct physical contact thereto, whereby said photosensitive means pro-



vides information concerning incident electromagnetic energy in both said first wavelength region and at said longer wavelengths.

4,891,508

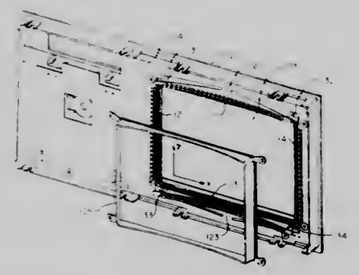
PRECISION INFRARED POSITION DETECTOR APPARATUS FOR TOUCH SCREEN SYSTEM

John W. Campbell, Monument, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 30, 1988, Ser. No. 213,405

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—221 **14 Claims**



1. Infrared touch control apparatus for accurately registering the position of a user activated stylus comprising:

means for displaying a plurality of indicia, wherein said display means has a screen that is substantially in the shape of a segment of a cylinder, including first and second spaced apart parallel curved sides and third and fourth spaced apart parallel straight sides, such that said first, second, third, fourth sides form a substantially rectangular shaped screen;

a plurality of infrared light source means disposed in a row along with first side of said screen of said displaying means for emitting a plurality of parallel infrared light beams along said screen of said displaying means a predetermined distance above said screen of said displaying means;

flexible printed circuit board means connected to said plurality of infrared light source means for positioning said plurality of infrared light source means to conform to the curvature of said screen of said displaying means such that each of said plurality of infrared light source means is a predetermined distance above said screen of said displaying means;

a like plurality of infrared light detector means disposed in a row along said second side of said screen of said displaying means in spaced apart parallel mating relationship to said plurality of infrared light source means, each of said infrared light detector means for receiving a corresponding one of said parallel infrared light beams; and

flexible printed circuit board means connected to said plurality of infrared light detector means for positioning said plurality of infrared light detector means along said screen of said displaying means a predetermined distance above said screen of said displaying means.

4,891,509

DEVICE AND METHOD FOR DETERMINING DISPLACEMENT

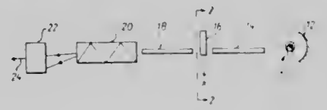
Gordon R. Jones; James L. Moruzzi, both of Heswall, and Akkanapragada N. Prasad, West Kirby, all of England, assignors to The University of Liverpool, Liverpool, England

Continuation of Ser. No. 903,656, Sep. 5, 1986, Pat. No. 4,835,384. This application May 12, 1989, Ser. No. 351,055

Claims priority, application United Kingdom, Sep. 6, 1985, 8522202; Nov. 25, 1985, 8528982

Int. Cl.[4] G01J *3/50*

U.S. Cl. 250—226 **4 Claims**



1. Apparatus for monitoring and quantifying the displacement of a movable object, comprising a color detecting means, a light source adapted to propagate polychromatic light along a path to said color detecting means; means for translating a change in the position of said movable object into a change in the color of the polychromatic light incident on said color detecting means, the color detecting means comprising at least two discrete color detectors which have respective response characteristics such that the output signals X, Y . . . of the detectors correspond respectively to $X=\int P(\lambda)\,\bar{x}(\lambda)\,d\lambda$, $Y=\int P(\lambda)\bar{y}\lambda)\,d\lambda\ldots$, where $P(\lambda)$ is the spectral power distribution at wavelength λ and $\bar{x}(\lambda)$, $\bar{Y}(\lambda)$ . . . are color matching functions corresponding to the respective response characteristics of the detectors, and means for analogue manipulation of X, Y . . . to enable the values of x and y in the Chromaticity Diagram corresponding to the incident color to be calculated, thereby enabling quantification of the change in color at the color detecting means and hence quantification of the displacement of said movable object.

4,891,510

DEVICE AND METHOD FOR DETERMINING DISPLACEMENT

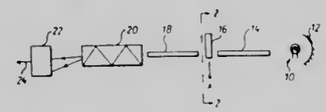
Gordon R. Jones; James L. Moruzzi, both of Heswall, and Akkanapragada N. Prasad, West Kirby, all of England, assignors to The University of Liverpool, Liverpool, England

Continuation of Ser. No. 903,656, Sep. 5, 1986, Pat. No. 4,835,384. This application May 12, 1989, Ser. No. 350,763

Claims priority, application United Kingdom, Sep. 6, 1985, 8522202; Nov. 25, 1985, 8582982

Int. Cl.[4] G01J *3/50*

U.S. Cl. 250—226 **4 Claims**



1. Apparatus for monitoring a variable parameter, comprising a color detecting means, a light source adapted to propagate polychromatic light along a path to said color detecting means; means for monitoring and translating a change in said variable parameter into a change in the color of the polychromatic light incident on said color detecting means, the color detecting means comprising at least two discrete color detectors which have respective response characteristics such that the output signals X, Y . . . of the detectors correspond respectively to $X=P(\lambda)\,\bar{x}(\lambda)\,d\lambda$, $Y=P(\lambda)\,\bar{y}(\lambda)\,d\lambda\ldots$, where $P(\lambda)$ is the spectral power distribution at wavelength λ and $\bar{x}(\lambda)$, $\bar{y}(\lambda)$ . . . are color matching functions corresponding to the respective response characteristics of the detectors and means for analogue manipulation of X, Y . . . to enable the values of x and y in the Chromaticity Diagram corresponding to the incident color to be calculated, thereby enabling quantification of the change in color at the color detecting means and hence quantification of the change in said variable parameter.

4,891,511

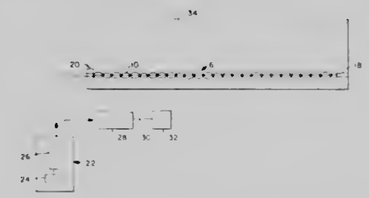
FIBER OPTIC MICROBEND SENSOR WITH BRAIDED FIBERS

Stuart E. Reed, Homeworth, Ohio, assignor to The Babcock & Wilcox Co., New Orleans, La.

Filed Aug. 31, 1988, Ser. No. 238,695

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **7 Claims**



1. A fiber optic microbend sensor, comprising:

a plurality of fibers braided together into an interwoven strand with at least one of said braided fibers being an optical fiber, said strand being tensioned in application to modulate an optical signal in said optical fiber, said interwoven strand having a spatial bend frequency corresponding to a microbend frequency for each optical fiber to obtain microbending loss in the optical fiber;

means for applying an optical signal to said optical fiber; and

means for detecting the modulations of the optical signal transmitted through said optical fiber.

4,891,512

THERMO-OPTIC DIFFERENTIAL EXPANSION FIBER SENSOR

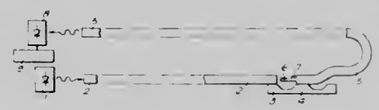
James M. Naden, Dartford, Great Britain, assignor to STC PLC, London, England

Filed Feb. 21, 1989, Ser. No. 313,378

Claims priority, application United Kingdom, Feb. 20, 1988, 8803997

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **3 Claims**



1. An optically addressed optical waveguide sensor system in which a change in the magnitude of the sensed parameter effects a displacement of the mounting of an optical waveguide cantilever in a direction at right angles to the equilibrium axis of the cantilever and in the place of bending of the cantilever that results from differential absorption of light guided by it, wherein light is directed into the free end of the cantilever from the adjacent end of a second optical waveguide and from the cantilever to a photodetector, and means are provided for analysing the components of the detected signal at the fundamental frequency of light-induced oscillation of the cantilever and at twice this frequency to determine the magnitude of the mean displacement of the free end of the cantilever with respect to the adjacent end of the second optical waveguide.

4,891,513

PHOTOSENSOR BLOCK HAVING AN ADJUSTABLE MOUNTING STRUCTURE TO PERMIT FINE POSITIONING OF THE PHOTOSENSOR BLOCK INCLUDED IN THE PHOTOSENSOR BLOCK

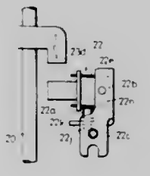
Masao Okita; Tadami Sugawara, and Hiroshi Yoshida, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 868,998, May 30, 1986, Pat. No. 4,774,613. This application Jul. 12, 1988, Ser. No. 217,744

Claims priority, application Japan, May 30, 1985, 60-115269

Int. Cl.[4] G11B *5/596, 5/12*

U.S. Cl. 250—239 **7 Claims**



1. A photosensor block including an adjustable mounting structure for a photosensor included in said block, said photosensor block comprising:

a photosensor;

a photosensor mounting member for receiving and supporting said photosensor, said photosensor mounting member including a pair of parallel elastic members each in the form of a plate with an integral mounting plate extending between adjacent ends of said elastic members; and

a base member adapted to support said photosensor mounting member with said elastic members extending from said base member, said base member including an adjusting member mounted on said base member in operative relationship with said elastic members such that a portion of said adjusting member presses against a side face of one of said elastic members to permit fine adjustment of the position of said photosensor.

4,891,514

DEVICE FOR MONITORING RADON EXPOSURE

David Gjerdrum, 559 Barron Ave., Palo Alto, Calif. 94306, and Joseph Decuir, Albany, Calif., assignors to David M. Gjerdrum, Palo Alto, Calif.

Filed Nov. 5, 1987, Ser. No. 117,059

Int. Cl.[4] G01T *1/24*

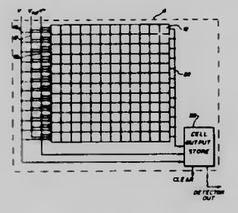
U.S. Cl. 250—255 **18 Claims**

1. A device for monitoring radon exposure, comprising:

means forming a photon impenetrable detection chamber of a predetermined volume for continuously receiving a sampling flow of fluid from an environment being monitored;

at least one alpha particle detector being an integrated circuit disposed within said chamber, said detector having a plurality of radiation sensitive capacitance means positioned to be exposed to alpha particles within said sampling flow, said alpha particle detector being responsive to said alpha particles contacting said capacitance means and operative to develop a detection signal; and

a monitoring system for receiving a plurality of input signals including said detection signal, calculating the level of



radon concentration within said environment, and generating an output signal commensurate therewith.

4,891,515

SOLUTION ANALYZING MASS SPECTROMETER

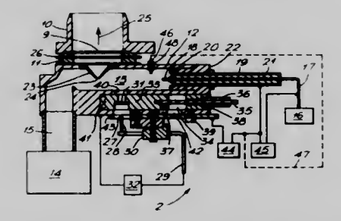
David Jones, Sale; Russel P. Atherton, Timperley, and Mark A. McDowall, Atrincham, all of United Kingdom, assignors to VG Instruments Group Limited, Crawley, United Kingdom

Filed Feb. 1, 1988, Ser. No. 151,062

Claims priority, application United Kingdom, Jan. 30, 1987, 8702058; Jul. 10, 1987, 8716252

Int. Cl.[4] D01D *59/44*

U.S. Cl. 250—288 **10 Claims**



1. A mass spectrometer arranged for analysis of a sample in a fluid solution, said spectrometer comprising a mass analyzer, a sample ion generating means comprising an ionization chamber, and means for heating said fluid solution and expanding it into said chamber, said chamber being provided with an exit aperture through which ions may pass to said mass analyzer, an entrance aperture through which electrons or particles may pass into said chamber to cause ionization of molecules therein, and aperture closing means operable to close said entrance aperture.

4,891,516

DEVICE FOR AXIALLY AND ANGULARLY POSITIONING A BEAM OR THE LIKE IN A SEALED CHAMBER

Valentin Balter, Cupertino, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.

Filed Feb. 27, 1989, Ser. No. 316,487

Int. Cl.[4] H01J *37/20*

U.S. Cl. 250—310 **32 Claims**

1. A device for axially and angularly positioning an object in a sealed chamber, comprising:

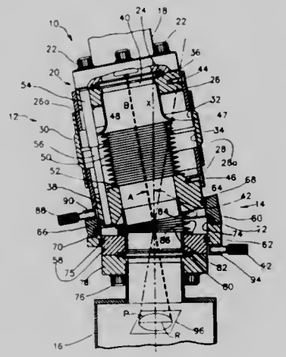
a sealed housing having an opening and a longitudinal axis;

an object to be positioned, said object being connected to said housing so that said axis passes through said object;

a sealed chamber for holding and treating said object in said chamber, said sealed chamber being connected to said sealed housing at said opening;

means for axially displacing said object, said axially-displacing means being sealingly connected at one end to said housing through a seal ring and having a first sealing device which surrounds said longitudinal axis;

an adjustable connector unit at the other end of said axial-displacement means, said adjustable connector comprising a first ring element which is rotatably installed on said other end of said axial-displacement means in a first rotary guide, and a second ring element, which rotatably supports said first ring element in a second rotary guide and is



rotatably installed on said sealed chamber in a third rotary guide, said adjustable connector having means for changing the angular position of said angular-displacement means and hence of said axis with respect to said sealed chamber; and

a second sealing device which surrounds said axis and is located inside said adjustable connector unit, so that said axis passes from said housing to said sealed chamber through a sealed space.

4,891,517

HEAT SENSITIVE COPYING MACHINE

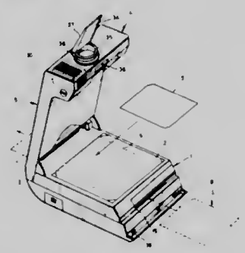
Seimei Ushiro; Kenta Namioka; Hiroshi Ohmura; Michio Cho; Kimiaki Nakada; Tokuji Sato; Takeshi Watanabe, all of Tokyo, Japan; Michio Cho; Kimiaki Nakada; Tokuji Sato, and Takeshi Watanabe, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 22, 1988, Ser. No. 222,821

Claims priority, application Japan, Jul. 22, 1987, 62-183046; Aug. 28, 1987, 62-214660; Aug. 28, 1987, 62-131292[U]; Aug. 31, 1987, 62-217514; Sep. 8, 1987, 62-224637

Int. Cl.[4] G03C *5/66*

U.S. Cl. 250—318 **27 Claims**



1. A heat sensitive copying machine for making a transparent copy from a reflecting original, comprising;

an image sensor for reading an image of a reflecting original to provide image signals;

thermal printing means for printing a mirror image of said reflecting original on a transparent heat sensitive sheet responsive to said image signals read by said image sensor, thereby providing a transparent secondary original;

said image sensor and said thermal printing head being incorporated in an overhead projector comprising a Fresnel plate on which said transparent secondary original is placed with its image surface down;

a light source for illuminating said transparent secondary original from said image surface side; and

a projection lens assembly supported by an arm above said Fresnel plate for projecting an image of said transparent secondary original onto a remote screen.

4,891,518

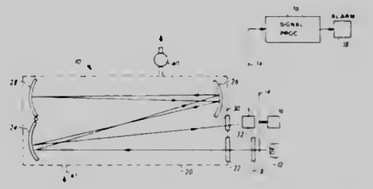
APPARATUS FOR DETECTING A PLURALITY OF GASES

Stephen Day, Trumbull, Conn., assignor to The Foxboro Company, Foxboro, Mass.

Filed Aug. 21, 1987, Ser. No. 87,872

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—339 **4 Claims**



1. A gas detection apparatus for detecting at least three gasses, said at least three gasses including absorption spectra each having at least one absorption maximum comprising:

a source of a radiant energy;

said source of radiant energy having a band of wavelengths substantially broader than a spectral region containing said at least one absorption maximum for each of said gasses;

a sample cell;

means for admitting said radiant energy into said sample cell;

a detector;

means for impinging said radiant energy onto said detector after said radiant energy passes at least once along a path through said sample cell;

means for drawing a sample of a gas into said sample cell for determining a presence of one or more of said gasses;

filter means for filtering said radiant energy;

said filter means having a filter spectrum including a cut-on slope, a cut-on maximum, a cut-off maximum and a cut-off slope; and

said filter spectrum enclosing substantially equal areas of absorption spectra of said gasses, whereby said detector is enabled to respond to a sum of said at least three gasses in said path.

4,891,519

PHOTOMETERING APPARATUS

Tadeshi Nohira, Chiba; Tsuneo Imatsu, Misato, and Ikuzo Kagami, Tokyo, all of Japan, assignors to Komatsugawa Chemical Engineering Co., Ltd., Tokyo, Japan

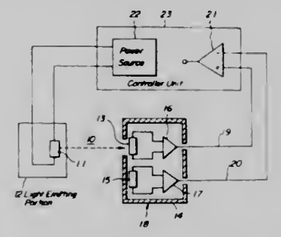
Filed Oct. 14, 1988, Ser. No. 257,635

Claims priority, application Japan, Oct. 19, 1987, 62-261774

Int. Cl.[4] G01J *1/42*; G01N *21/82*

U.S. Cl. 250—349 **12 Claims**

1. In a photometering apparatus including a light emitting portion having a light emitting element for projecting a radiation beam to a substance to be measured, and a light receiving portion having a first light receiving element for receiving radiation emanating from the substance and converting it into an electric signal, the improvement comprising a second light receiving element which has the same construction as that of the first light receiving element; a housing in which said first and second light receiving elements are installed such that the first light receiving element receives the radiation emanating from the substance, but the second light receiving element does not receive said radiation; first and second operational amplifiers having the same construction and being arranged in said housing, said first and second operational amplifiers being connected to receive and amplify output signals from the first and second light receiving elements to derive first and second amplified output signals, respectively; and a differential amplifier arranged remote from the housing and having first and second input terminals connected to said first and second operational amplifiers and deriving a difference between said amplified first and second output signals as a photometered output signal.



4,891,520

RADIATION DETECTOR

Hiroyuki Ishibashi; Kazushi Shimizu; Kenzo Susa, all of Tsukuba, and Shinzou Kubota, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,988

Claims priority, application Japan, Sep. 5, 1987, 62-222840; Sep. 5, 1987, 62-222841

Int. Cl.[4] G01T *1/202*

U.S. Cl. 250—367 **9 Claims**

1. A radiation detector comprising a scintillator and a photodetector for detecting the light from said scintillator, said scintillator comprising a combination of two or more single crystals of cerium doped gadolinium silicate represented by the formula:

$$Gd_{2(1-x)}Ce_{2x}SiO_5 \quad (I)$$

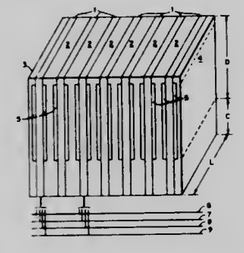
wherein x is in the range of $5\times10^{-4}\leqq x\leqq 1\times10^{-2}$, and said single crystals having x values in the formula (I) that differ from each other by 20% or more.

6. A radiation detector comprising a scintillator and a photodetector for detecting light from said scintillator, said scintillator comprising a single crystal of cerium doped gadolinium silicate represented by the formula:

$$Gd_{2(1-x)}Ce_{2x}SiO_5 \quad (I)$$

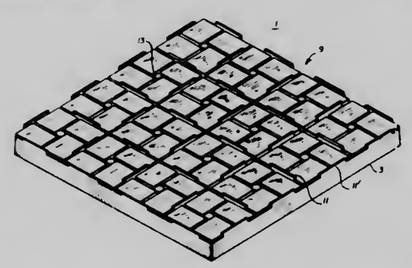
wherein x is in the range of $5\times10^{-4}\leqq x\leqq 1\times10^{-2}$, and said crystal having portions with x values that differ from each other by 20% or more.

4,891,521
PHOTON COUNTING STRUCTURE AND SYSTEM
Michael Danos, 4820 Hutchins Pl., Washington, D.C. 20007
Filed Oct. 20, 1987, Ser. No. 110,444
Int. Cl.[4] H01L 27/14
U.S. Cl. 250—370.09 **12 Claims**



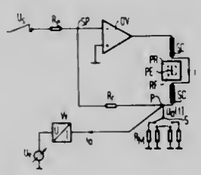
1. A structure for counting low levels of photons comprising
a plurality of thin wafers of solid state material stacked in parallel,
said wafers having a width of 0.1 mm to 2.0 mm perpendicular to the direction of travel of the photons to be detected,
electrodes disposed on opposed sides of each said wafers and with thin layers of insulation overlying said electrodes,
said wafers producing a change in an electrical parameter when impinged upon by a photon,
each said wafer having a depletion region of a depth in line with incident photons to be detected, sufficient to provide depletion of the maximum energy level of photons to be detected,
a further region of each wafer lying beyond said depletion region providing sufficient volume for an integrated circuit that interfaces with external equipment to provide to such equipment an indication of the number of photons detected by the wafer over a specified period of time, and
an integrated circuit formed on said further region.

4,891,522
MODULAR MULTI-ELEMENT HIGH ENERGY PARTICLE DETECTOR
Darryl D. Coon, and John P. Elliott, both of Pittsburgh, Pa., assignors to Microtronics Associates, Inc., Pittsburgh, Pa.
Filed Oct. 11, 1988, Ser. No. 255,729
Int. Cl.[4] G01T 1/24
U.S. Cl. 250—370.10 **22 Claims**



1. A high energy particle detector module comprising;
a planar heavy metal carrier having first and second planar surfaces;
a plurality of planar particle detector units substantially evenly distributed across the first planar surface of said carrier;
electrically conductive attachment means securing one face of each planar particle detector unit to said first planar surface of said carrier;
an electrical terminal associated with each planar particle detector unit extending through said carrier from said first planar surface to said second planar surface;
means electrically insulating the terminals from said carrier; and
connecting means electrically connecting the other face of each planar particle detector unit to the associated terminal at the first planar surface.

4,891,523
CIRCUIT FOR IMAGE DISPLACEMENT IN A PARTICLE BEAM APPARATUS INDEPENDENTLY OF MAGNIFICATION
Reinhold Schmitt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 21, 1988, Ser. No. 260,581
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 37372874
Int. Cl.[4] H01J 37/28
U.S. Cl. 250—396 R **5 Claims**

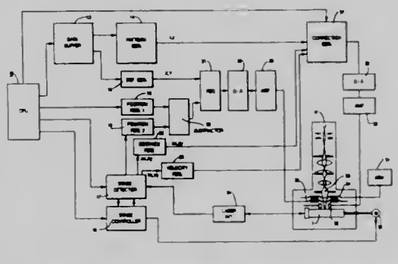


1. A circuit for image displacement independently of magnification in a particle beam apparatus, comprising:
a negative feedback current amplifier having an input connected to receive a time dependent signal for deflecting a particle beam;
a deflection unit having an input connected to receive an output signal of said negative feedback current amplifier, said deflection unit for deflecting said particle beam of said particle beam apparatus;
a circuit for changing the amplification of said current amplifier, said circuit having an input connected to an output of said deflection unit; and
a constant current source having an output connected to feed an output current to a connection between said output of said deflection unit and said input of said circuit for changing amplification.

4,891,524
CHARGED PARTICLE BEAM EXPOSURE SYSTEM AND METHOD OF COMPENSATING FOR EDDY CURRENT EFFECT ON CHARGED PARTICLE BEAM
Hiroshi Yasuda, Yokohama, and Masahiko Suzuki, deceased, late of Aichi, both of Japan (by Yoshikazu Suzuki, Fumie Suzuki, heirs), assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 12, 1988, Ser. No. 243,274
Claims priority, application Japan, Sep. 16, 1987, 61-231804
Int. Cl.[4] H01J 37/04
U.S. Cl. 250—398 **20 Claims**

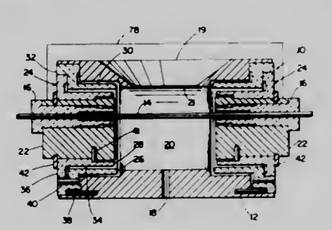
1. A method for compensating for an eddy current effect in a charged particle beam exposure system, the eddy current effect being due to leakage flux of a magnetic lens and motion of a stage carrying a substrate on which a focused charged particle beam is irradiated while the stage is moving at a velocity, the charged particle beam being deflected in first and second directions in accordance with pattern signals to deflect the charged particle beam to a position on a pattern, said method comprising the steps of:

(a) determining proportional constants for the relationship between the deviation in the path of the charged particle beam caused by the eddy current, and the velocity of the stage, the deviation being substantially proportional to the velocity of the stage;



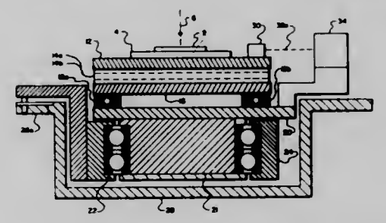
(b) generating a correction signal which is a negative product of the velocity of the stage and the proportional constants; and
(c) superposing the correction signal on the pattern signals, so as to correct the deviation in the path of the charged particle beam.

4,891,525
SKM ION SOURCE
Larry E. Frisa; Monroe L. King, both of Austin, Tex., and Stephen E. Sampayan, Livermore, Calif., assignors to Eaton Corporation, Cleveland, Ohio
Filed Nov. 14, 1988, Ser. No. 271,241
Int. Cl.[4] H01J 27/00
U.S. Cl. 250—423 R **14 Claims**



1. In an ion source comprising a housing having a cylindrical bore, a cathode extending axially within said housing, first insulator means supporting said cathode within said housing, a first electrode at least a portion of which is proximate to said cathode adjacent one end thereof, a second electrode at least a portion of which is proximate to said cathode adjacent the opposite end thereof, biasing means operable to apply potentials to said first and second electrodes, and second insulator means electrically isolating said first and second electrodes from said cathode and from said housing; the improvement wherein said second insulator means comprises an inner insulator and an outer insulator, said inner and outer insulators being disposed relative to one another to define a space between at least portions thereof.

4,891,526
X-Y-θ-Z POSITIONING STAGE
John W. Reeds, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Continuation of Ser. No. 218,521, Jul. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 947,201, Dec. 29, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,150
Int. Cl.[4] H10J 37/20; G01B 11/00
U.S. Cl. 250—442.1 **30 Claims**



1. An X-Y-θ-Z positioning apparatus for positioning an semiconductor wafer during processing, comprising:
an upper translational plate for supporting a semiconductor wafer during processing,
a lower translational plate supporting the upper plate,
a rotatable platform supporting the lower plate,
a first set of bearings between the upper and lower plates enabling translation of the upper plate along a first axis with respect to the lower plate,
a second set of bearings between the lower plate and rotatable platform enabling translation of the lower plate along a second axis with respect to the rotatable stage which is orthogonal to said first axis,
means for moving the upper plate along said first axis by controlled amounts,
means for moving the lower plate together with the upper plate along said second axis by controlled amounts,
means for rotating the platform together with the upper and lower plates by controlled amounts, and
means for elevating and tilting the platform together with the upper and lower plates by controlled amounts.

4,891,527
SPHERICAL PHOSPHOR AGGREGATES, THEIR PREPARATION AND USE IN X-RAY SCREENS
Jacob G. Rabatin, Montville, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Aug. 9, 1988, Ser. No. 230,227
Int. Cl.[4] G03C 5/17
U.S. Cl. 250—483.1 **26 Claims**

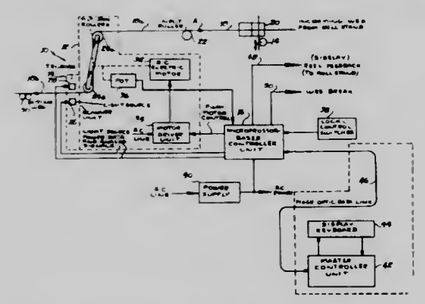
17. An X-ray screen comprising a substrate which supports a layer of phosphor material comprising spherical aggregates of a binder material and phosphor particles having plate or needle shapes, or mixture thereof, randomly oriented within said aggregate and having an aspect ratio greater than one to one.

4,891,528

MICROPROCESSOR-CONTROLLED APPARATUS FOR DETECTING AND GUIDING A WEB WHEREIN RIGHT AND LEFT EYESPOTS ARE FORMED TO DETERMINE RIGHT AND LEFT EDGES

Charles A. Knecker, Cary, and Gary M. Klawinski, McHenry, both of Ill., assignors to Crosfield Ebway, Inc., Wauconda, Ill.

Filed Mar. 23, 1989, Ser. No. 328,053
Int. Cl.[4] G01N *21/86*; G01V *9/04*
U.S. Cl. 250—548 **20 Claims**



1. An apparatus for detecting and guiding a web comprising:
steering mechanism means for controlling the lateral position of a web with respect to a desired line of travel;
a light source array formed of a plurality of individual light sources positioned on one side of the web and extending across the entire width of a path to be travelled by the web for directing a light beam onto the web;
a light-responsive array formed of a plurality of photosensitive elements positioned on the opposite side of the web and extending across the entire width of the path to be travelled by the web for receiving the light beam;
first logic means for grouping a first selected number of photosensitive elements together to form a right eyespot;
second logic means for grouping a second selected number of photosensitive elements together to form a left eyespot;
electronic processing means for sequentially scanning the right eyespot across the width of the web to provide a first signal indicative of the right edge of the web;
said processing means sequentially scanning the left eyespot across the width of the web to provide a second signal indicative of the left edge of the web;
said processing means including means for calculating an error signal from said first and second signals indicative of any deviation between the desired line of travel and the actual lateral position of the web; and
said steering mechanism means responsive to said error signal for repositioning the lateral position of the web so as to cause it to move along the desired line of travel.

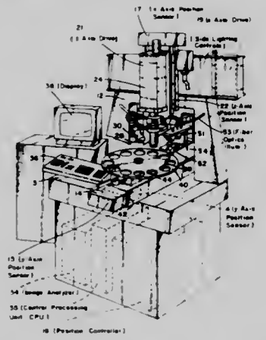
4,891,529

SYSTEM AND METHOD FOR ANALYZING DIMENSIONS OF CAN TOPS DURING MANUFACTURE

Paul A. Braun, Simi Valley; Michael W. Ormsby, Thousand Oaks, and Gary L. De Zotell, Simi Valley, all of Calif., assignors to View Engineering, Inc., Simi Valley, Calif.

Filed Aug. 22, 1988, Ser. No. 234,893
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—560 **31 Claims**

1. A system for making precision measurements of different parameters of a metal can top as it is progresses through various stages in a manufacturing process involving multiple forming steps, comprising:
a base having a working area surface and including a bridge spanning across the working area surface;
stage means movable in X and Y directions in a horizontal plane on the base over the working area surface;
rotary table means disposed on the X,Y stage means and including means in a number of positions in a horizontal plane for receiving can tops following various forming steps, the rotary table means including drive means for controlling angular position;
video camera means coupled to the bridge and movable along a Z axis for presenting electronic signals representing an image of the can top at the working surface level;



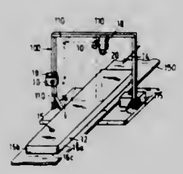
data processor means responsive to the electronic signals from the video camera means for providing measurements thereof, the data processor means providing signals to control the positions of the stage means, the video camera means and the angular position of the rotary table means; and
optical sensing means mounted along the plane of the working surface on opposite sides of the rotary table means for measuring Z-axis dimensions of a can top.

4,891,530

TESTING OR INSPECTING APPARATUS AND METHOD FOR DETECTING DIFFERENTLY SHAPED SURFACES OF OBJECTS

Günter H. Hatji, Hamburg, Fed. Rep. of Germany, assignor to Helmut K. Pinsch GmbH & Co., Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 223,690, Jul. 22, 1988, Pat. No. 4,827,142, which is a continuation-in-part of Ser. No. 846,591, Mar. 31, 1986, abandoned. This application Feb. 24, 1987, Ser. No. 17,353
Int. Cl.[4] G01N *21/88*
U.S. Cl. 250—572 **17 Claims**



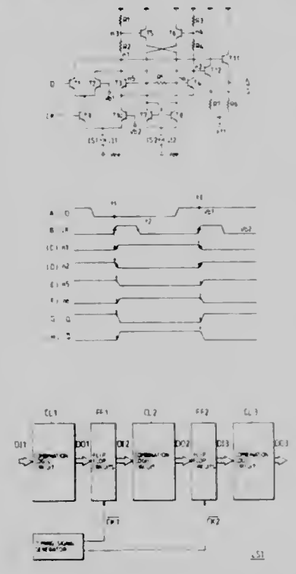
1. Testing apparatus for detecting differently formed surfaces of objects, such as ceramic articles, articles made from glass, wood, plastics, objects packed in see-through foil, comprising:
an illuminating device
a conveyor for moving the object to be tested and the illuminating device relative to each other in a main movement direction, said illuminating device serving for simultaneously illuminating the object along an illuminated plane at right angles to the main movement direction with substantially uniform intensity,
an optical detection device located adjacent said plane for simultaneously detecting a reflected optical characteristic of the object along the entire illuminated plane, and
means for responding to changes of the reflected optical characteristic in the illuminated plane of the object detected by said detection device during the relative movement of object and said optical detection device.

4,891,531

ECL FLIP-FLOP WITH IMPROVED α-RAY RESISTANT PROPERTIES

Tohru Kobayashi, Iruma; Masato Hamamoto, Ohme, and Toshio Yamada, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,863
Claims priority, application Japan, Oct. 20, 1987, 62-264541
Int. Cl.[4] H03K *3/013, 3/037, 3/287, 19/086*
U.S. Cl. 307—278 **7 Claims**



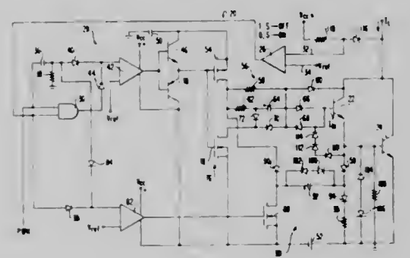
1. A semiconductor integrated circuit device comprising a flip-flop circuit which includes:
a first differential bipolar transistor;
a second differential bipolar transistor coupled to said first differential bipolar transistor to form a differential switching means in combination with said first differential bipolar transistor;
input means coupled to said first differential bipolar transistor to supply the collector of said first differential bipolar transistor with a potential in accordance with input data; and
feedback means coupled to said first and second differential bipolar transistors to feed back a potential corresponding to a potential at the collector of said first differential bipolar transistor to the base of said second differential bipolar transistor and also to feed back a potential corresponding to a potential at the collector of said second differential bipolar transistor to the base of said first differential bipolar transistor, wherein said feedback means has resistor means coupled in series between the respective bases of said first and second differential bipolar transistors, first bias means for supplying the base of said second differential bipolar transistor with a potential in accordance with a potential at the collector of said first differential bipolar transistor, second bias means for supplying the base of said first differential bipolar transistor with a potential in accordance with a potential at the collector of said second differential bipolar transistor, and first switching means coupled to the bases of said first and second differential bipolar transistors and a predetermined potential point to couple selectively the base of either said first or second differential bipolar transistor to said predetermined potential point in accordance with a potential at the collector of each of said first and second differential bipolar transistors.

4,891,532

DARLINGTON CONNECTED SWITCH HAVING BASE DRIVE WITH ACTIVE TURN-OFF

Sampat S. Shekhawat, and John J. Dhyanchand, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 8, 1988, Ser. No. 268,879
Int. Cl.[4] H03K *17/04, 17/60*
U.S. Cl. 307—300 **27 Claims**



26. A switching circuit having a driver transistor and at least one bipolar driven transistor with a base of the at least one driven transistor being coupled to a non-inverting output of the driver transistor and inverting outputs of the driver transistor and at last one driven transistor being connected together comprising:
means for producing a control signal for controlling a time at which the driven transistor turns off as a function of a collector to emitter potential of the driven transistor with the control signal being produced at a time which is determined by a reference potential magnitude chosen as a function of at least the switching characteristics of the at least one driven transistor; and
means, responsive to the control signal for conducting minority carriers from a base of the driven transistor in response to the control signal.

4,891,533

MOS-CASCODED BIPOLAR CURRENT SOURCES IN NON-EPITAXIAL STRUCTURE

Peter R. Holloway, Andover, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Feb. 17, 1984, Ser. No. 581,288

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.⁴ H03K *3/20, 3/353;* **G05F** *3/04*

U.S. Cl. 307—303 **7 Claims**



1. In a monolithic integrated circuit having a P-type substrate with an N-well therein;

a P-type MOS-cascoded bipolar current source connected in said circuit and comprising:

first and second separate P-type diffusions in said N-well to serve as the drain and source of a PMOS device;

a gate positioned between said first and second P-type diffusions;

a third P-type diffusion in said N-well separate from said first and second diffusions and serving as the emitter of a lateral PNP transistor having said second P-type diffusion as its collector and said N-well as its base;and

electrodes making connection with said first and third P-type diffusions and said N-well;

whereby said PMOS source and said bipolar collector are electrically connected without requiring a diffusion-to-metal-to-diffusion interconnection.

4,891,534

CIRCUIT FOR COMPARING MAGNITUDES OF BINARY SIGNALS

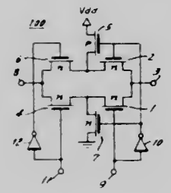
Toshiyuki Kanoh, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 5, 1988, Ser. No. 229,337

Claims priority, application Japan, Aug. 7, 1987, 62-196460

Int. Cl.⁴ H03K *5/24*

U.S. Cl. 307—355 **14 Claims**



1. A circuit for comparing first and second binary signals, comprising:

a first n-channel MOS transistor having a gate electrode to which the first binary signal is applied;

a second n-channel MOS transistor having a source electrode connecting to a source electrode of said first MOS transistor, and a gate electrode to which a third binary signal different in logical level from the first binary signal is applied;

a third n-channel MOS transistor having a source electrode connecting to a drain electrode of said first MOS transistor, and a gate electrode to which the second binary signal is applied;

a fourth n-channel MOS transistor having a source electrode connecting to a drain electrode of said second MOS transistor, and a gate electrode to which a fourth binary signal different in logical level from the second binary signal is applied;

an output port connected to a drain electrode of said third MOS transistor and a drain electrode of said fourth MOS transistor;

a fifth n-channel MOS transistor having a drain electrode connecting to the drain electrode of said first MOS transistor and the source electrode of said third MOS transistor, a gate electrode to which the third binary signal is applied, and a source electrode maintained at ground; and

an element for supplying a supply voltage to the drain electrode of said second MOS transistor and the source electrode of said fourth transistor.

4,891,535

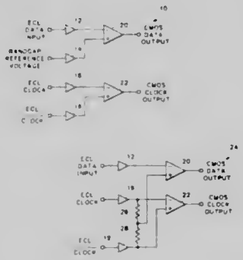
SINGLE SUPPLY ECL TO CMOS CONVERTER

Eric P. Etheridge, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 20, 1988, Ser. No. 287,826

Int. Cl.⁴ H03K *19/092, 19/086, 17/10, 3/013*

U.S. Cl. 307—475 **2 Claims**



1. A single supply ECL to CMOS converter comprising:

(a) means for shifting ECL data to produce a shifted output;

(b) means for shifting an ECL clock to produce a first output;

(c) means for shifting an inverted ECL clock to produce a second output;

(d) means for generating a reference output from the first and second outputs; and

(e) means for comparing the shifted output with the reference output to produce CMOS output data.

4,891,536

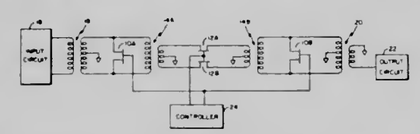
SOLID STATE SWITCH

Ernest I. Fox, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1988, Ser. No. 290,221

Int. Cl.⁴ H03K *5/00, 3/30;* **H03H** *7/01*

U.S. Cl. 307—521 **4 Claims**



1. In an electronic switching arrangement wherein FETs are effectively disposed in a balanced pi configuration to pass, or to inhibit from passing, a radio frequency signal in accordance with the state of control signals applied to such FETs, the electronic switching arrangement including an input transformer to convert the radio frequency signal from a single-ended to a balanced signal and an output transformer to reconvert from a balanced signal to a single-ended signal, the improvement comprising:

(a) a first isolating transformer connected to the input transformer;

(b) a second isolating transformer connected to the output transformer;

(c) a first and a second FET, each serially connected between the secondary winding of the first and the primary winding of the second isolating transformer;

(d) a third and a fourth FET, one connected across the primary winding of the first isolating transformer and the other connected across the secondary winding of the second isolating transformer; and

(e) means for producing control signals for each one of the FETs, the control signals being effective to turn "ON" the first and the second FETs and to turn "OFF" the third and the fourth FETs when the radio frequency signal is to pass and to turn "OFF" the first and the second FETs and to turn "ON" the third and the fourth FETs when the radio frequency signal is to be inhibited from passing.

4,891,537

1-PHASE ENERGIZED DISK-TYPE BRUSHLESS MOTOR

Manabu Shiraki, Yamato, and Osami Miyao, Sagamihara, both of Japan, assignors to Shicoh Engineering Co. Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 905,309, Sep. 9, 1986, Pat. No. 4,757,222. This application Apr. 13, 1988, Ser. No. 181,072

Claims priority, application Japan, Nov. 7, 1984, 59-168023

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 B **5 Claims**

1. A 1-phase energized disk-type brushless motor, comprising: a magnet rotor having 2p-poles (p is an integer equal to or greater than 1) with magnetic north and south poles arranged in an alternate relationship; a printed circuit board provided on a stationary side at a position opposing the magnet rotor with an axial gap left between the printed circuit board and a surface of the magnet rotor; a stator armature including one or more armature coils having a width substantially equal to the width of each pole of said magnet rotor and disposed on a surface of the printed circuit board at a position of an identical phase without overlapping, said surface of the printed circuit board opposing said magnet rotor; a single position detecting element provided with the stator armature at a position of a phase identical to magnetically effective conductor portions of each of the armature coils, said conductor portions contributing to the generation of a torque; a cogging generating magnetic plate having between both angular edges thereof an angular width substantially equal to the width of each pole of said magnet rotor and arranged on said printed circuit board such that an angular center line thereof is spaced by about three fourths of the width of each pole of said magnet rotor from a position of a phase identical to one of said magnetically effective conductor portions of one of said armature coils in a direction opposite to the direction of rotation of the magnet rotor, whereby electric parts of an energization controlling circuit for controlling said motor are arranged on said printed circuit board in such a way that terminals of the electric parts do not oppose said magnetic plate.

4,891,538

SYNCHRONOUS MOTOR WITH SINUSODIAL TORQUE VARIATION IN EACH PHASE

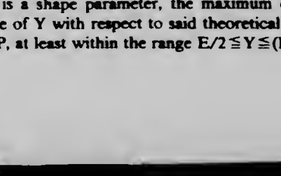
Claude Oudet, Besancon, France, assignor to Portescap, Switzerland

Filed Jun. 24, 1988, Ser. No. 211,386

Claims priority, application Switzerland, Jan. 26, 1987, 2417/87

Int. Cl.⁴ H02K *19/02, 16/00*

U.S. Cl. 310—162 **4 Claims**



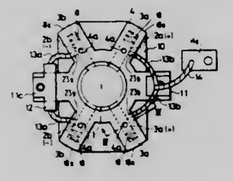
1. In an electric synchronous motor of the type comprising a movable permanent magnet member and a stator, wherein the stator comprises a magnetic circuit or an assembly of magnetic circuits coupled with at least one electric control coil, and wherein said movable member comprises a multipolar permanent magnet having two planar surfaces arranged parallel to the direction of movement of said movable member and spaced from each other by a distance substantially smaller than the dimensions of said permanent magnet in said planar surfaces, said permanent magnet having a practically linear demagnetization characteristic in its working range and being magnetized perpendicularly to said planar surfaces so as to exhibit on each of these surfaces, in the direction of movement of said movable member, at least one series of magnetic poles of same polarity, the centers of which are spaced by P along their path of movement, said magnetic circuit comprising polar parts facing each other and forming an air-gap in which said multipolar permanent magnet is arranged, said air-gap being symmetrical with respect to the middle-plane of the said two planar surfaces of the permanent magnet and having a variable height along the paths of movement X of a point of said middle-plane, said variable height having a value of 2 Y and being measured perpendicularly to said middle-plane, said variable height having a series of minima E, the improvement according to which said polar parts have a shape such that the theoretical value of Y is the solution of the equation

$$\mathrm{LN}\left[\frac{ch\,(2\,\pi\,Y/P+c)-\cos\,(2\,\pi\,X/P)}{ch\,(2\,\pi\,Y/P-c)-\cos\,(2\,\pi\,X/P)}\right]-$$

$$2\,\mathrm{LN}\left[\frac{sh\,(c/2+\pi\,E/2P)}{sh\,(c/2-\pi\,E/2P)}\right]=0$$

wherein c is a shape parameter, the maximum error of the actual value of Y with respect to said theoretical value being +/−0.05 P, at least within the range $E/2 \leqq Y \leqq (E/2+0.4\ P)$.

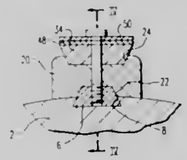
4,891,539
BRUSH DEVICE
Kyoichi Okamoto; Hiroyuki Morikane, and Shigeru Shiroyama, all of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Nov. 2, 1987, Ser. No. 115,730
Claims priority, application Japan, Oct. 31, 1986, 61-168428; Nov. 4, 1986, 61-169318
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—239 **6 Claims**



1. A brush device for a rotary electric machine having a rotation axis and including brush accommodating means containing both brushes, first end portions of which are brought into slide-contact with a rotatable commutator of said rotary electric machine, and also brush springs adapted to urge said brushes against said commutator; said brushes being electrically connected to respective external lead wires passing at points through elongated side portions of said brush accommodating means; said brush accommodating means comprising:
- a plurality of hollow elongated brush holding means for accommodating said brushes and brush springs, each of said brush holding means containing one of said elongated side portions and having an elongated side opening extending perpendicular to said rotation axis and in the longitudinal direction of an elongated side portion of said each brush holding means; and
- an insulating board which covers said elongated side opening in each of said brush holding means in such a manner that said brushes are electrically insulated from a substrate on which said brush device is adapted to be mounted;
- said brush accommodating means being provided, in said elongated side portions thereof, with a plurality of air through-holes located adjacent respective ones of said points through which said lead wires pass, said through-holes extending in a direction parallel to said rotation axis and functioning to permit external air to contact, and remove heat from, said brushes with the air of the convection of air caused by rotation of said rotary electric machine; and
- each of said hollow brush holding means being substantially air-sealed except for its respective through-hole.

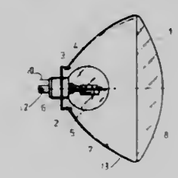
4,891,540
GENERATOR CORE SUPPORT SYSTEM
Glenn D. Cooper, Orlando; Felix M. Detinko, Winter Park, both of Fla.; Gurdev Singh, Monroeville, and Andre J. Levino, Jeannette, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 1, 1988, Ser. No. 265,741
Int. Cl.[4] H02K *1/18, 5/24*
U.S. Cl. 310—254 **8 Claims**

1. A spring support system for supporting a stator core in a frame of an electrical machine, the core having a longitudinal axis and an outer periphery provided with a plurality of circumferentially spaced, axially extending dovetail grooves, and the frame including a plurality of circular flanges which surround the core when the core is installed in the frame, said system comprising:
- a plurality of key bars each having a portion formed to mate with a respective dovetail groove and each seated in a respective groove of the core;
- a plurality of spring bars each extending parallel to a respective key bar and each secured to said flanges;
- a plurality of key blocks for securing said key bars to said spring bars, each said key block having a first groove



receiving a portion of its respective key bar, and each said key block further having a second groove receiving a portion of its respective spring bar; and
- fastening means mechanically fastening each said key block to a respective key bar and to a respective spring bar.

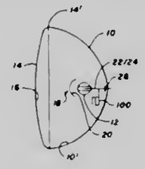
4,891,541
HEADLIGHT SYSTEM FOR MOTOR CARS
Gyorey Szekacs, Budepest, Hungary, assignor to Egyesult Izzolampa es Villamossagi RT, Hungary
Continuation of Ser. No. 820,079, Nov. 26, 1985, abandoned, which is a continuation of Ser. No. 553,381, Nov. 18, 1983, abandoned. This application Aug. 2, 1988, Ser. No. 229,800
Int. Cl.[4] H01J *61/34*
U.S. Cl. 313—25 **26 Claims**



1. A headlight system for vehicles comprising a light-emitting body arranged in a reflector unit, said reflector unit including a housing, light-reflecting means surrounding said light-emitting body, a closing plate arranged opposite to said light-emitting body and electric input terminals for connecting said light-emitting body to an electric current source, said light-emitting body being a lamp, said lamp comprising a discharge vessel of the high-pressure sodium vapor type, said discharge vessel having a wall made of ceramic material, said discharge vessel containing a pair of electrodes and being of the type where the discharge arc is positioned substantially along a line between the electrodes of the discharge vessel, whereby the volume of an effective light emitting region is much smaller than the volume defined by the inside surface of said wall of ceramic materials.

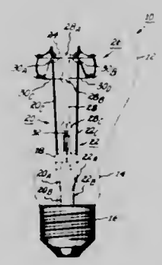
4,891,542
DICHROIC COATED LAMP WITH GETTERED OUTER JACKET
Charles Mellor, Salem, and Timothy Fohl, Carlisle, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Dec. 1, 1988, Ser. No. 278,692
Int. Cl.[4] H01J *5/16, 61/26;* **H01K** *1/54*
U.S. Cl. 313—112 **12 Claims**

1. A lamp comprising in combination:
- (a) an hermetically sealed reflector and lens, said sealed reflector and lens defining an envelope having an interior surface and exterior surface, the interior surface of at least one of said lens and said reflector, bearing a dichroic coating;
- (b) at least one inert gas disposed within the interior of said envelope;



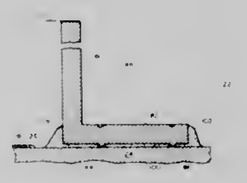
- (c) electrically energizeable source means for providing a source of light disposed within the interior of said envelope; and
- (d) means for gettering hydrogen disposed within the interior of said envelope, said gettering means comprising barium peroxide and copper.

4,891,543
INCANDESCENT LAMP HAVING AN IMPROVED ARBOR
James R. DeBleyker, Lyndhurst, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 28, 1988, Ser. No. 187,168
Int. Cl.[4] H01B *5/48*
U.S. Cl. 313—315 **3 Claims**



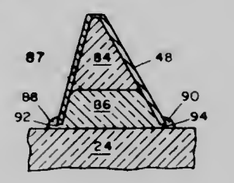
1. A rough service incandescent lamp comprising:
- (A) a glass envelope having a neck portion:
- (B) an electrically conductive base joined to said neck portion:
- (C) a glass stem affixed to said conductive base and encasing portions of inleads appropriately and electrically connected to said base:
- (D) a structure for mounting a filament, said mounting structure being connected to a portion of said inleads which axially extend within said envelope and connect to said filament, said mounting structure further having a glass cane member having encased therein members for supporting the mounting of said filament; and
- (E) a flexible arbor for joining said glass cane member to said glass stem, said flexible arbor comprising a stainless steel member having a coefficient of expansion selected to match the coefficient of expansion of each of said glass cane member and said glass stem.

4,891,544
FRONT ASSEMBLY FOR A TENSION MASK COLOR CATHODE RAY TUBE HAVING A PRE-SIZED MASK SUPPORT STRUCTURE
Raymond G. Capek, Elmhurst; Lawrence W. Dougherty, Sleepy Hollow, and James L. Kraner, Barrington, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Aug. 19, 1988, Ser. No. 234,450
Int. Cl.[4] H01J *29/07, 9/18*
U.S. Cl. 313—402 **20 Claims**



1. A faceplate assembly for a color cathode ray tube including a glass faceplate having on its inner surface a centrally disposed phosphor screen, and a foil shadow mask mounted in tension on a mask-support structure of tightly controlled uniform height extending between said mask and said faceplate which is located on opposed sides of said screen and secured to said inner surface by a layer of devitrified solder glass, said assembly having spacing elements also of tightly controlled uniform height located between said support structure and said inner surface of said faceplate, and extending through said layer of solder glass to provide intimate contact with said inner surface, whereby the tightly controlled uniform heights of said support structure and said spacing elements provide for tightly controlled uniform spacing between said mask and said screen throughout the length of said support structure.

4,891,545
FACEPLATE FRONT ASSEMBLY WITH IMPROVED TENSION MASK SUPPORT STRUCTURE
Raymond G. Capek, Elmhurst, and David B. Danielson, Elk Grove, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Filed Apr. 6, 1988, Ser. No. 178,175
Int. Cl.[4] H01J *29/81*
U.S. Cl. 313—407 **6 Claims**



1. A faceplate assembly for a color cathode ray tube including a glass faceplate having on its inner surface a centrally disposed phosphor screen, and a metal foil shadow mask mounted in tension on a mask-supported structure located on opposed sides of the screen and secured to said inner surface, said support structure comprising a hollow shell filled with at

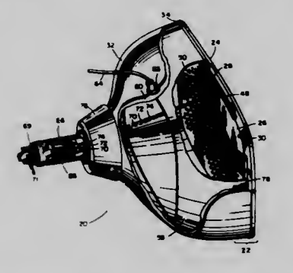
least two devitrified solder glass compositions each having a different viscosity when in the form of an undevitrified paste.

4,891,546

FRONT ASSEMBLY FOR A TENSION MASK COLOR CATHODE RAY TUBE HAVING A LASER-DEFLECTING SHADOW MASK SUPPORT STRUCTURE

Lawrence W. Dougherty, Sleepy Hollow; James R. Fendley, Arlington Heights; Charles J. Prazak, Elmhurst, and Paul Strauss, Chicago, all of Ill., assignors to Zenith Electronics Corporation

Filed Nov. 10, 1988, Ser. No. 269,822
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—407 **18 Claims**



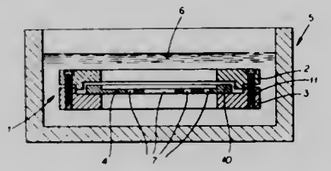
1. A front assembly for a tension mask color cathode ray tube comprising a faceplate having a tensed foil shadow mask supported by mask support means, and means for shielding said faceplate from a high-energy beam used to trim waste material from said mask following its attachment to said mask support means.

4,891,547

PARTICLE OR RADIATION BEAM MASK AND PROCESS FOR MAKING SAME

Gerhard Stengl, Villach, and Hans Löschner, Wien, both of Austria, assignors to IMS Ionen Mikrofabrikations Systeme Gesellschaft GmbH, Wien, Austria

Continuation of Ser. No. 930,806, Nov. 13, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 205,535
Claims priority, application Austria, Nov. 13, 1985, A3310/85
Int. Cl.[4] H01J *29/07*; G01J *1/00*
U.S. Cl. 313—407 **7 Claims**



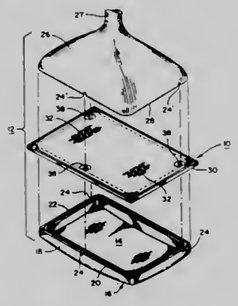
1. A method of providing a planarity-retaining image forming mask assembly adapted to form images by the passage of a high energy medium through at least one preselected region thereof comprising: providing a generally planar metal foil, having a first coefficient of thermal expansion and having at least one high energy medium permeable region therein; providing a frame member having a second, lower coefficient of thermal expansion than said foil; providing mechanical clamping means adapted to coincide with the outside edges of said foil when said clamping means is at a preselected elevated temperature; heating both of said frame member and said foil to said preselected elevated temperature such that said frame member clamping means and said foil outer edge regions coincide while maintaining the planarity of said foil; while in said heated condition, clamping said foil in said frame such that said foil is substantially planar and such that said foil outer edge regions and said clamping means coincide; and cooling said frame clamped foil mask assembly to ambient temperature thereby causing said foil to shrink more than said frame and thus causing said cooled foil to be planar and tensile stressed within said clamping means, the difference between said preselected elevated temperature and said ambient temperature, and the difference between said first and said second coefficients of thermal expansion, considered together, being insufficient to permit said cooling to plastically deform said foil.

4,891,548

TENSION MASK COLOR CATHODE RAY TUBE COMPONENT WITH EXTERNAL REGISTRATION-AFFORDING MEANS

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 801,119, Nov. 22, 1985, Pat. No. 4,723,089, which is a division of Ser. No. 538,003, Sep. 30, 1983, abandoned. This application Nov. 20, 1987, Ser. No. 199,402
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—408 **7 Claims**



1. A front assembly for a tension mask color cathode ray tube, comprising:

a faceplate having an inner surface thereon for receiving a pattern of luminescent phosphor elements; and

a foil mask supported in tension by said faceplate and having a pattern of apertures registered with said pattern of phosphor elements;

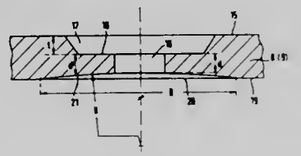
said assembly being characterized by said faceplate having registration affording means disposed on the external periphery of the faceplate outside the tube vacuum enclosure constructed and arranged to permit repeatable precise registration between said foil mask and said faceplate to facilitate screening said pattern of phosphor elements upon said inner surface, whereby having the provision of said registration affording means externally of the tube enclosure, the viewable area of said inner surface is maximized and the faceplate size for a given screen area is reduced.

4,891,549

ELECTRON GUN SYSTEM

Karl Kaiesser, Aichwald; Walter Kornaker, Ulm/Donau; Bernhard Lau, Eichingen, and Werner Schanz, Esslingen-Zell, all of Fed. Rep. of Germany, assignors to Nokia Graetz, Pforzheim, Fed. Rep. of Germany

Filed May 20, 1987, Ser. No. 52,714
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617432
Int. Cl.[4] H01J *29/52*
U.S. Cl. 313—414 **7 Claims**



1. An electron gun system for a color picture tube, comprising:

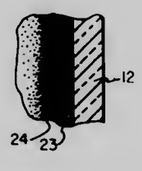
at least one grid electrode having coined depressions on two opposing surfaces, said temperatures being formed about an aperture formed for an electron beam, said coined depression in one surface of the grid electrode being formed with a continuous surface extending in all directions about said aperture, from an edge of said aperture to the electrode surface.

4,891,550

PHOSPHOR BLEND FOR BROAD SPECTRUM FLUORESCENT LAMP

Donald Northrop, Glen Rock; Gerald Schiazzano, Livingston, and Arpad Pirovic, Montvale, all of N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

Continuation of Ser. No. 108,895, Oct. 15, 1987, abandoned. This application May 1, 1989, Ser. No. 346,317
Int. Cl.[4] H01J *61/44*
U.S. Cl. 313—487 **17 Claims**



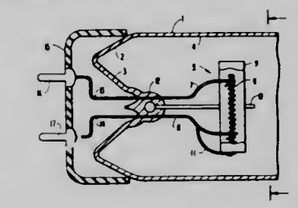
1. A fluorescent lamp for general illumination purposes operable from a source of voltage comprising an envelope capable of transmitting light in the visible, and middle and near ultraviolet ranges, a pair of electrodes for connection to said voltage source and an ionizable medium upon operation of the lamp producing an electrical arc stream discharge, first and second phosphor blend groups on the wall of said envelope, the phosphors of said first group excited by the radiant power of the electrical discharge for producing radiation having a spectrum in the visible light range with a C.I.E. color rendering index of at least 80, radiation in the near ultraviolet range, and radiation in the middle ultraviolet range, said visible and said ultraviolet radiation produced being transmitted through said envelope in the quantities of between about 6–50 microwatts of middle range ultraviolet radiation and between about 150–700 microwatts of near range ultraviolet radiation per lumen of visible light with the radiant power ratio of near ultraviolet/middle ultraviolet radiation being in the range from between 8 to 40, said ultraviolet radiation transmitted through said envelope being of a total quantity substantially the same per lumen of visible light transmitted through said envelope as found in natural daylight of the same correlated color temperature, phosphors of said second group when excited by said electrical discharge producing at least narrow bands of visible radiant energy in the range of from about 5 nm to about 60 nm for increasing the lumens per watt output of visible light from the lamp.

4,891,551

FLUORESCENT LAMP WITH GROUNDED AND FUSED ELECTRODE GUARD

Jerald D. Will, Lexington, Ky., and Frank M. Latasse, Morgantown, W. Va., assignors to North American Philips Corporation, New York, N.Y.

Filed May 31, 1988, Ser. No. 200,382
Int. Cl.[4] H01J *61/10*
U.S. Cl. 313—492 **14 Claims**



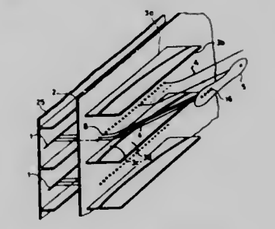
1. In a fluorescent lamp having an electrode, conductive elements for supplying a voltage to said electrode, and a metallic guard partially surrounding said electrode for shielding material ejected from said electrode, the improvement comprising a metallic conductive link defining a conductive path free of rectifying elements between said metallic guard and one of said conductive elements supplying voltage to said electrode to maintain said metallic guard substantially at the same potential of said electrode irrespective of the polarity of the electrode voltage.

4,891,552

IMAGE DISPLAY APPARATUS WITH MEANS FOR CORRECTING IMAGE DISTORTION

Yuichi Moriyama, Ibaraki, and Toshinobu Sekihara, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 864,598, May 19, 1986, abandoned. This application May 10, 1988, Ser. No. 195,388
Claims priority, application Japan, May 20, 1985, 60-107448
Int. Cl.[4] H01J *29/74*
U.S. Cl. 313—495 **2 Claims**



1. An image display apparatus comprising:

linear cathodes for emitting electron beams,

an electron beam extraction electrode having apertures for extracting electron beams, said electron beam extraction electrode being disposed in parallel with said linear cathodes,

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a fluorescent screen disposed in parallel with said electron beam extraction electrode, and

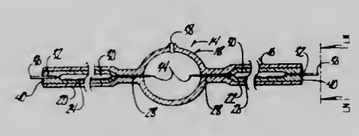
electrostatic deflection electrodes which are composed of at least two pairs of plates, said electrostatic deflection electrodes being disposed between said electron beam extraction electrode and said fluorescent screen, wherein said plates of each electrostatic deflection electrode are isolated from each other and different voltages are applied to each plate, said plates having widths which vary along a direction parallel to electron beam paths between said linear cathodes and said fluorescent screen with respective concave and convex shapes for each plate of said pair of plates.

4,891,553

LEAD METALLIZING PROCESS TO AVOID SEAL OXIDATION

William I. Bamberg, San Jose, and Keith P. Cordero, Santa Clara, both of Calif., assignors to Wolfram, Inc., Scotts Valley, Calif.

Filed Jun. 28, 1988, Ser. No. 213,072
Int. Cl.[4] H01J *9/32, 61/36*
U.S. Cl. 313—623 **15 Claims**



1. An improved high wattage mercury halide lamp comprising:

(a) a vitreous quartz arc tube envelope having a pair of opposing side arms, each adapted for partial receipt and containment of an electrode ribbon assembly;

(b) said electrode ribbon assembly having a tungsten electrode which protrudes into said arc tube at one end and at its other end is attached to a molybdenum foil ribbon sealed in the side arm which is electrically connected to an electrode follower rod which partially extends out of the side arm;

(c) said follower rod being brazed to said side arm of said tube and to an electrical lead for attachment to an electrical power source for said lamp with an alloy brazing material which effectively seals said side arm, said electrical lead and said electrode follower rod to prevent ribbon assembly oxidation and attendant expansion damage to the integrity of said lamp.

4,891,554

ARC DISCHARGE LAMP HAVING IMPROVED PERFORMANCE

Victor A. Levand, Jr., Lyndhurst, and Mark E. Duffy, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

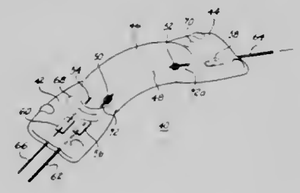
Filed Oct. 31, 1988, Ser. No. 264,477
Int. Cl.[4] H01J *61/30*
U.S. Cl. 313—634 **15 Claims**

1. A high intensity arc discharge lamp comprising:

(a) an outer light transmissive envelope having a base member affixed thereto which includes terminal means electrically connected to first inlead conductors,

(b) a bowed shape arc tube of vitreous light transmissive material which includes a central cavity having curved ends, said arc tube being sealed within the outer envelope and having discharge electrodes sealed at opposite ends of the central cavity in pinch seal regions, the discharge electrodes further being electrically connected to second inlead conductors extending outwardly from the arc tube and being electrically connected to the first inlead conductors, with the arc tube further containing a gaseous discharge medium which includes mercury, and

(c) the arc tube further having curved projection means



located in each pinch seal region adjacent to the central cavity with each having substantially the same contour as the curved central cavity ends and which are formed when the pinch seals are provided.

4,891,555

METAL VAPOR DISCHARGE LAMPS

Frederic F. Ahlgren, Shaker Heights; John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike, and John J. Karikas, Shelby, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 798,646, Nov. 15, 1985, Pat. No. 4,810,932.
This application Dec. 16, 1988, Ser. No. 285,576
Int. Cl.[4] H01J *61/30, 61/34*
U.S. Cl. 313—634 **6 Claims**



1. A tipless light source for a vapor discharge lamp comprising a double-ended tubular envelope having portions housing first and second electrodes located at opposite ends of said tubular envelope, a mercury metal and a halogen additive, said tubular envelope having a lower portion with a length which is substantially greater than the length of an upper portion of said tubular envelope, the function of the lower portion is to support the light source from an electrically conductive base of a lamp so that no other mount member or sealing arrangement is needed when the light source is lodged within the lamp, said first and second electrodes being respectively connected to first and second seal members sealed in opposite ends of said double-ended tubular envelope, said first electrode having means extending out of the upper portion of said tubular envelope by a predetermined amount, said second electrode extending out of the lower portion of said tubular envelope by a predetermined amount.

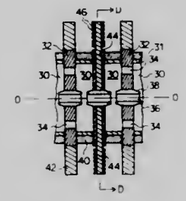
4,891,556

COUPLED-CAVITY DELAY LINE FOR TRAVELING-WAVE TUBE

Mitoshi Iwamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 1, 1987, Ser. No. 56,539
Claims priority, application Japan, May 31, 1986, 61-127050
Int. Cl.[4] H01J *25/34*
U.S. Cl. 315—3.5 **16 Claims**

1. A coupled-cavity delay line for a traveling-wave tube which includes a device for focusing an electron beam along the axis of the delay line for interaction between the electron beam and an electromagnetic wave propagating along the delay line, the focusing device including an alternate series of permanent magnets and pole pieces which confine resonant cavities on each side, each of the pole pieces being common to a pair of adjacent cavities and being provided with a drift tube which is positioned at a center thereof and which has a central aperture for passage of the electron beam, each of the pole pieces being also pierced by at least one intercavity coupling aperture, wherein the improvement comprises a heat transfer member provided in at least one of the pole pieces to extend



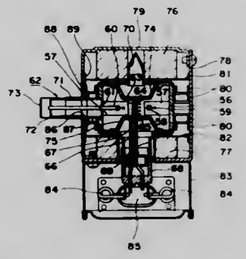
from the drift tube to the outside of the pole piece, and embedded in the pole piece so that the heat transfer member does not expose to the space defined in the resonant cavity, the heat transfer member being made of copper which is having a heat conductivity higher than that of the pole piece. The heat transfer member is composed of a plate sandwiched by a pair of magnetic material plates each of which confines one resonant cavity, the heat transfer plate being brazed at its center portion to be drift tube and extending at least to the periphery of the magnetic material plates; and the heat transfer plate has a plurality of heat radiation fins integrally extending therefrom to project from the periphery of the magnetic material plates.

4,891,557

MAGNETRON DEVICE

Tomotaka Nobue, Yamatokoriyama; Tomohide Matsumoto, Yamatotakada, and Tadashi Hikino, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 16, 1987, Ser. No. 109,024
Claims priority, application Japan, Oct. 16, 1986, 61-245743
Int. Cl.[4] H01J *25/50*
U.S. Cl. 315—39.51 **4 Claims**



1. A magnetron comprising:

an anode cylinder defined by a cylindrical anode, a coupling hole extending through said cylindrical anode, and end faces defined, respectively, at opposite ends of said cylindrical anode;

a plurality of vanes extending radially within said cylindrical anode, each of said vanes having a plurality of through-holes extending therethrough;

a set of strap rings extending through said vanes in said through-holes thereof, respectively;

said strap rings having different diameters, and said strap rings alternately connected to every other one of said vanes in said through-holes;

an output antenna portion supported in the magnetron and extending in a direction normal to the central longitudinal axis of said cylindrical anode;

an antenna lead fixed within said output antenna portion and extending therefrom through the coupling hole of said anode cylinder, and said antenna lead having an end thereof directly connected to one of said strap rings at a location disposed approximately intermediate of two adjacent ones of said plurality of vanes; and

and an exhaust pipe through which said anode cylinder has been evacuated,

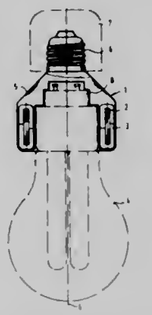
said exhaust pipe in communication with and extending from said anode cylinder at one of said end faces thereof, and spaced from said output antenna portion.

4,891,558

ADAPTER FOR GAS DISCHARGE LAMPS AND/OR LOW VOLTAGE LAMPS

Robert Tschuk, Aschaffenburg, Fed. Rep. of Germany, assignor to May & Christe GmbH Transformatorenwerke, Bundesrepublik, Fed. Rep. of Germany

Continuation of Ser. No. 678,526, Dec. 5, 1984, abandoned. This application Jan. 20, 1988, Ser. No. 147,096
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343914
Int. Cl.[4] H01J *17/34*
U.S. Cl. 315—62 **14 Claims**



14. An adapter for gas discharge lamps comprising:

a housing having a longitudinal axis with a socket for connection to a Mains holder and a holder for said gas discharge lamp aligned on said longitudinal axis in which a magnetic circuit with a coil connected as a series reactor is arranged in said housing surrounding the holder for the gas discharge lamp, the coil being wound in a circumferential direction as a circular toroidal coil around said longitudinal axis of the adaptor; and

the magnetic circuit comprising a hollow sheet laminated closed cylindrical ring surrounding and enclosing the toroidal coil on all sides and being secured on said coil, said closed cylindrical ring including yoke rings having legs parallel to the longitudinal axis, said yoke rings being formed by involuted sheet laminations layered perpendicular to the longitudinal axis and superimposed in the circumferential direction of the coil with said sheet laminations having I, U or L-shaped cross-sections.

4,891,559

APPARATUS FOR CONTROLLING A HEADLIGHT OF A VEHICLE

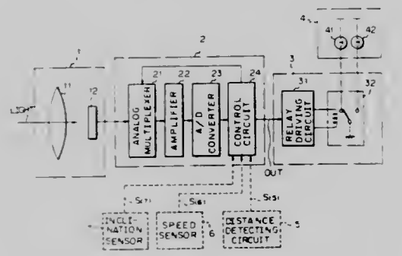
Muneaki Matsumoto, Okazaki; Koji Numata, Toyokawa; Shigeyuki Akita; Minoru Nishida, both of Okazaki, and Mitsuhiko Masegi, Aichi, all of Japan, assignors to Nippondenso Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Continuation of Ser. No. 874,155, Jun. 13, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 139,111

Claims priority, application Japan, Jun. 13, 1985, 60-129000; Jun. 13, 1985, 60-129001; Jun. 13, 1985, 60-129002

Int. Cl.[4] G08B *21/00*; B60Q *1/26, 1/10*

U.S. Cl. 315—82 9 Claims



1. A computer-controlled apparatus for controlling a headlight of a vehicle comprising:

light detecting means for receiving a light impinging on a front end of the vehicle, including a photosensor having a plurality of photoelectric elements at least one of which is a special photoelectric element, said light detecting means for generating a plurality of light detection signals, each said light detection signal corresponding respectively to a quantity of the light received in each of said photoelectric elements, said special photoelectric element being arranged in a central portion of said photosensor and receiving an increased incident range of angles of light on the upper side thereof as compared with others of said photoelectric elements;

control means, coupled to receive said light detection signals from said light detecting means, for:

(1) comparing a level of at least one of said light detection signals corresponding to a quantity of light received in a predetermined photoelectric element with a predetermined level;

(2) discriminating a presence or absence of a preceding vehicle or an oncoming vehicle based on a distribution of a quantity of light received at said plurality of photoelectric elements;

(3) selecting a high beam mode or low beam mode as an illumination mode of a headlight of said vehicle based on a result of said comparing and discriminating; and

(4) generating a control signal for commanding said selected high beam mode or low beam mode; and

illumination switching means for receiving said control signal from said control means and switching the illumination mode of said headlight to obtain said selected high beam mode or low beam mode.

4,891,560

MAGNETRON PLASMA APPARATUS WITH CONCENTRIC MAGNETIC MEANS

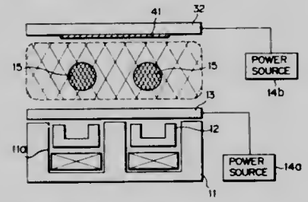
Katsuya Okumura, Yokohama, and Atsumu Tezaki, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 96,457, Sep. 15, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 330,933

Claims priority, application Japan, Sep. 18, 1986, 61-220738

Int. Cl.[4] C23C *15/00*

U.S. Cl. 315—111.41 10 Claims



1. A magnetic plasma apparatus comprising:

magnetic field generating means for generating a magnetic field, said magnetic field generating means including a concentric first magnet having a periphery pole piece of one polarity and a center pole piece of an opposite polarity with a ring-like recess formed therebetween, and a ring-like second magnet arranged in the ring-like recess of said concentric first magnet, said ring-like second magnet having a polarity opposite that of the first magnet for forming a magnetic field distribution having an intensity distributed in a direction perpendicular to a plane of said periphery and center poles of the first magnet to produce at a first portion of said magnetic field distribution near the plane of the first magnet a first magnetic field generated by the first magnet and weakened by a second magnet field of the opposite polarity generated by the second magnet and at a second portion of said magnetic field distribution next to the first portion in the perpendicular direction a maximum intensity field produced by only the first magnetic field; and

plasma generating means for generating a plasma, said plasma generating means including an electrode arranged at the first portion of the magnetic field distribution and connected to a plasma power source to form a maximum density portion of the plasma at the maximum intensity field of the second portion of said magnetic field distribution.

4,891,561

NEON TUBE LIGHTING DEVICE

Shintetsu Amano, and Yoshinori Mizuhata, both of Gifu, Japan, assignors to Metalaser Pty. Limited, Pymble, Australia

Filed Mar. 9, 1988, Ser. No. 165,958

Claims priority, application Japan, Nov. 27, 1987, 62-181376[U]

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—223 6 Claims

1. A neon tube lighting device comprising:

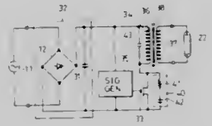
a leakage transformer having at least a primary winding and a secondary winding;

a resonance capacitor connected across the primary winding of said leakage transformer, said capacitor and primary winding forming a resonance circuit;

a switching element connected in series with said primary winding;

a DC power supply connected across said series connected primary winding and switching element; and

a signal generator which generates a signal and supplies the signal to said switching element for effecting ON-OFF control of said switching element, said signal having a constant frequency substantially equal to the resonance frequency of said resonance circuit.



4,891,562

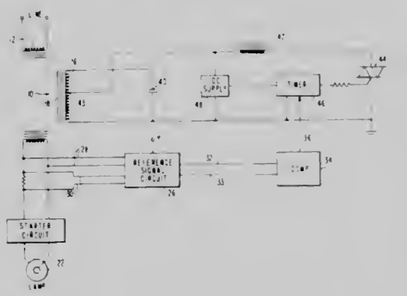
HYBRID REGULATOR-BALLAST CIRCUIT FOR HIGH INTENSITY DISCHARGE LAMPS

Joe A. Nuckolls, Blacksburg, and Paul J. Buckley, II, Christiansburg, both of Va., assignors to Hubbell Incorporated, Orange, Conn.

Filed Dec. 16, 1987, Ser. No. 134,459

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—277 10 Claims



1. A regulator circuit for controlling and regulating the operation of a high intensity discharge lamp having electrical operating characteristics which vary as a function of lamp operating variables, manufacturing tolerances and line voltage fluctuations, the circuit comprising

a magnetic regulator having first, second and third winding portions and magnetically permeable means for magnetically coupling said winding portions to each other, said first winding portion being connectable to a line voltage source and said second winding portion being connectable to a high intensity discharge lamp;

a storage capacitor connected in parallel circuit relationship with said third winding portion;

a reactor circuit connected in parallel with at least a portion of said magnetic regulator, said reactor circuit including an inductive reactor for extracting stored energy from said storage capacitor, and

a gate-controlled semiconductor switch having a switchable conductive path connected in series circuit relationship with said reactor and having a gate;

circuit means for producing a signal representative of a lamp operating parameter; and

control circuit means having an output connected to provide a trigger signal to said gate and an input connected to receive said signal representative of said lamp operating parameter for causing said switchable path to become conductive at a time in each half-cycle which is a function of said lamp operating parameter whereby the time at which said trigger signal is provided is earlier as said lamp operating parameter is greater and later as said lamp operating parameter is smaller.

4,891,563

CIRCUIT ARRANGEMENT FOR ADJUSTING THE OPERATING VOLTAGE OF HIGH-PRESSURE GAS DISCHARGE LAMPS

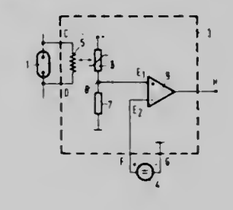
Hans G. Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans P. Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1985, Ser. No. 732,479

Claims priority, application Fed. Rep. of Germany, May 14, 1984, 3417794

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—309 20 Claims



1. A circuit arrangement for adjusting the operating voltage of high-pressure gas discharge lamps to a given nominal value comprising, a controllable current limiter connected in series with the lamp and an adjustment circuit for controlling the current limiter, an output signal of the adjustment circuit being determined by the difference between a given desired value determining the nominal lamp operating voltage and an actual value dependent upon the instantaneous lamp operating voltage, characterized in that a heating element is connected parallel to the lamp, said heating element being in thermal contact with a temperature-dependent electrical element which produces the actual voltage dependent upon the instantaneous lamp operating voltage.

4,891,564

DYNAMIC FOCUS CIRCUIT

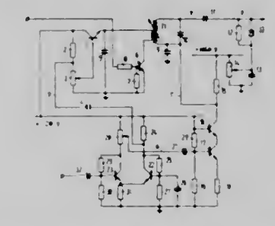
Gregory T. B. Crowley, Whitby, Canada, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1989, Ser. No. 301,006

Claims priority, application Canada, Jan. 28, 1988, 557,604

Int. Cl.[4] H01J *29/58, 29/56, 29/70*

U.S. Cl. 315—382 2 Claims



1. A circuit for producing a dynamic focussing voltage varying at vertical and horizontal sweep frequencies for a cathode ray tube video display, comprising:

a collector voltage modulator having an input to which is applied a pulse waveform voltage at said horizontal sweep frequency, said modulator including a transistor amplifier

in which a collector voltage of the transistor amplifier is modulated at said vertical sweep frequency, and a supply circuit for said transistor amplifier, said supply circuit including a series voltage regulator which is dynamically controlled by a parabolic waveform voltage at said vertical sweep frequency;

a resonant voltage step-up transformer to which an output current of the modulator is applied, said resonant voltage step-up transformer producing a sinusoidal waveform voltage, a further parabolic waveform voltage at said vertical sweep frequency also being supplied to said resonant voltage step-up transformer in summing relation with a sinusoidal voltage resulting from the output current of the modulator thereby producing a dynamic focus voltage including both sinusoidal horizontal and parabolic vertical frequency waveform components, said components being individually adjustable with respect to each other; and

a clamping circuit for superimposing and clamping said dynamic focus voltage onto a direct current focussing voltage to provide said dynamic focussing voltage for overall-screen focus.

4,891,565

FIELD DEFLECTION CIRCUIT IN A PICTURE DISPLAY DEVICE

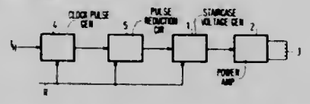
Hendrik Ten Pierick; Edward M. Poate, both of Eindhoven, and Alko F. E. De Vries, Arnhem, all of Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,306

Claims priority, application Netherlands, Jul. 17, 1987, 8701692

Int. Cl.[4] H01J *29/70*; H04N *5/04*

U.S. Cl. 315—408 **12 Claims**



1. A circuit for the field deflection in a picture display device suitable for receiving and processing a signal comprising line and field pulses, said field deflection circuit comprising a sawtooth generator, a power amplifier coupled to the sawtooth generator, a field deflection coil connected to an output of the amplifier, and a clock pulse generator for applying clock pulses to the sawtooth generator, said sawtooth generator, for generating an essentially sawtooth-shaped signal, being provided with a storage element for storing information under the influence of applied clock pulses and having reset means for resetting the storage element under the influence of field pulses, characterized in that the circuit also comprises a pulse reduction circuit connected to the clock pulse generator for reducing to a predetermined value the number of times per field period that the content of the storage element is changed under the influence of said clock pulses applied to the sawtooth generator.

4,891,566

METHOD FOR SPEED REGULATION AND SWITCH ARRANGEMENT FOR PERFORMING THE METHOD

Wilhelm Stürwald, Stuttgart, and Stefan Wieczorek, Fellbach, both of Fed. Rep. of Germany, assignors to SKF Textilmaschinen-Komponenten GmbH, Fed. Rep. of Germany

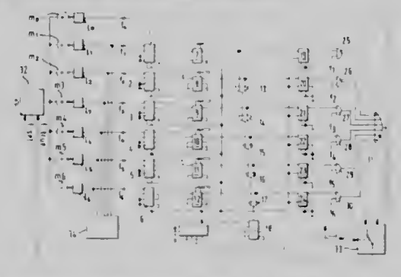
Filed Aug. 5, 1988, Ser. No. 228,609

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726295

Int. Cl.[4] H02P *5/50*

U.S. Cl. 318—78 **11 Claims**

1. A method of speed regulation of spindles of a textile machine, which spindles are individually driven by independent asynchronous motors fed by means of a converter having a variable output frequency and out-put voltage and having a load-dependent slip comprising the steps of:



(a) counting pulses produced by an indicating means connected to each of said motors, said counting is performed by a counting means, with continuous repetition and with continually simultaneous beginnings for said counting toward an end value that is the same for each counting means,

(b) conducting a counting cycle which depends on the rotational frequency of a group of asynchronous motors selected from the total number of asynchronous motors present, and

(c) transmitting the rotational frequency of a selected asynchronous motor from said group to the converter as a control value when a nth end value is attached, whereby n is a present value that is smaller than the number of asynchronous motors forming the selected group.

4,891,567

BRUSHLESS DC MOTOR HAVING AN OUTER ROTOR

Sakae Fujitani; Yuzuru Suzuki; Masanao Okuda; Hitoshi Takahashi, and Junichiro Fukazawa, all of Shizuoka, Japan, assignors to Minebea Co., Ltd., Nagano, Japan

Filed Jul. 12, 1988, Ser. No. 217,570

Claims priority, application Japan, Jul. 16, 1987, 62-177399; Jan. 30, 1988, 63-20043; Feb. 6, 1988, 63-26335; Apr. 25, 1988, 63-101653

Int. Cl.[4] H02K *29/06*

U.S. Cl. 318—254 **20 Claims**



20. A brushless DC motor having an outer rotor comprising:

a plurality of magnetic poles disposed in the rotating direction on an inner surface of the rotor, said rotor being mounted rotatably in a bearing housing,

a stator disposed coaxially with the rotor and inside of the magnetic poles so as to maintain an even air gap between the stator and the magnetic poles for generating a magnetic field which drives the magnetic poles of the rotor when an electric current is fed to an annular coil of the stator; and

a magnetic pole detector for detecting the positions of the magnetic poles of said rotor to control the electric current to be fed to said stator,

wherein said stator includes:

a bobbin provided coaxially with the rotor and wound with the annular coil for passing the electric current therethrough; and

two stator yokes made of a magnetic material, each having magnetic elements in a number half as many as that of the magnetic poles of said rotor, said stator yokes being arranged to face each other at their magnetic element forming sides through said annular coil, said magnetic elements being so combined with each other as to establish a magnetic unbalance in said air gap with respect to the magnetic poles of said rotor and being magnetically shorted through a shorting member.

4,891,568

SERVO MOTOR SYSTEM FOR TRANSPORTATION

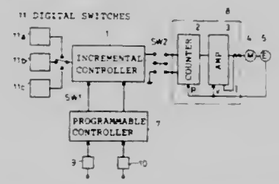
Yoichi Shibata; Naoto Tazuke, both of Toyota; Yoshio Shinohara, Owariasahi, and Akira Shima, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 1, 1988, Ser. No. 239,368

Claims priority, application Japan, Sep. 4, 1987, 62-221327

Int. Cl.[4] G05B *19/28*

U.S. Cl. 318—560 **6 Claims**



1. A servo motor system for controlling a servo motor of a transportation line, the system comprising:

a distance setting means for setting a distance to be traveled by an article and for generating a distance signal representative of the distance;

an incremental detector for generating an incremental distance signal representative of an incremental distance the article is actually moved by the servo motor;

a controller responsive to the set distance signal and the incremental distance signal for generating a control signal for operating the servo motor to move the article as far as the set distance based on a coordinate system corresponding to a total movable space of the article;

an external signal generator provided at a destination point for generating a stop signal responsive to an arrival of the article at the destination point; and

an initial setting means for transmitting the stop signal to the controller one time subsequent to the starting of the operation of the servo motor system at times when the article is located at a position other than the destination point, for establishing the coordinate system.

4,891,569

POWER FACTOR CONTROLLER

David P. Light, Howell, Mich., assignor to Versatex Industries, Brighton, Mich.

Filed Aug. 20, 1982, Ser. No. 409,930

Int. Cl.[4] G05F *1/70*

U.S. Cl. 323—210 **7 Claims**

1. For use in conjunction with an alternating current power distribution system having a voltage signal and a current signal, a power factor controller comprising:

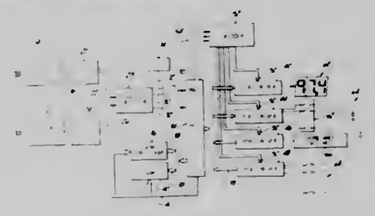
a plurality of capacitors, wherein the number of capacitors can be varied,

means for generating a first signal representative of the number of said capacitors,

switch means comprising a plurality of switches, one switch being electrically connected with each capacitor and operable, upon activation, to electrically connect its associated capacitor to the power distribution system, and operable, upon deactivation, to electrically disconnect its associated capacitor to the power distribution system,

means for determining the direction and magnitude of a phase shift between the voltage signal and the current signal in the power distribution system and for generating a magnitude output signal and a LEAD/LAG representative thereof,

means for comparing said magnitude output signal with a preset phase shift signal, and



switch control means responsive to said first signal and to said comparing means for selectively activating one of said switches in said switch means to electrically connect the capacitor in said plurality of capacitors which has been disconnected from the power distribution system for the longest period of time when the magnitude output signal exceeds said preset signal and when said LEAD/LAG is in a first direction and for selectively deactivating one of said switches in said switch means to electrically disconnect the capacitor of said plurality of capacitors which has been electrically connected to said power distribution system for the longest period of time when either said preset signal exceeds said magnitude output signal or said LEAD/LAG signal is in the opposite direction.

4,891,570

STATIC VAR COMPENSATOR WITH THYRISTOR CONTROL

Tomoharu Nakamura, Hitachi; Hiroyuki Irokawa, Mashiko; Syoichi Mashiko; Hidehiko Shimamura, both of Hitachi, and Hirofumi Tsutsumi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,904

Claims priority, application Japan, Dec. 5, 1986, 61-288955; Dec. 9, 1986, 61-293258; Jun. 2, 1987, 62-138760

Int. Cl.[4] G05F *1/70*

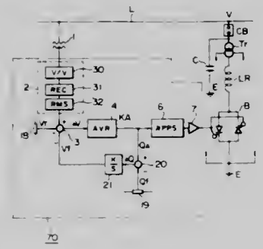
U.S. Cl. 323—210 **3 Claims**

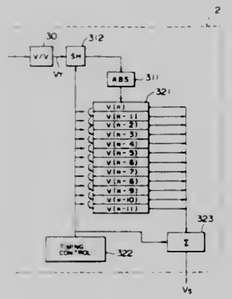
1. A static var compensator control apparatus having a transformer with its one end connected to an electric power system, and a series circuit constituted by a reactor and a thyristor bulb and connected between the other end of said transformer and ground, a control apparatus for controlling said static var compensator comprising:

a voltage detection means for detecting a voltage of said electric power system;

a harmonic deletion means for deleting at least the second harmonics from an output of said voltage detection means, in which said harmonic deletion means is constituted by a sampling means for sampling the output of said voltage detection means an even number of times for every cycle of said voltage, a register for storing sampled values of the most recent cycle in an output of said sampling means, and an adder means for adding absolute values of the samples values in one cycle stored in said register; and

a control means for controlling a firing angle of said thyristor bulb in accordance with a deviation of an output of





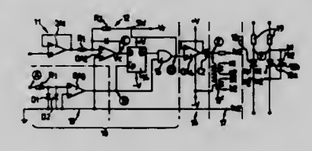
said harmonic deletion means from an output of a setting device.

4,891,571

CONTROL DEVICE FOR SWITCHING A THYRISTOR

Tak-Tai Wong, Block A, 20th Flr., Braemar Hill Mansion, 43 Braemar Hill Road, North Point, Hong Kong

Filed Jul. 27, 1988, Ser. No. 224,902
Claims priority, application China, Jul. 29, 1987, 87105303
Int. Cl.⁴ G05F *1/455*
U.S. Cl. 323—322 **15 Claims**



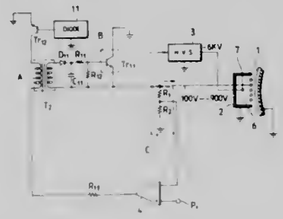
1. A control device for switching a thyristor or the like in a circuit including an a.c. voltage source, comprising firing signal means having an input for receiving control signals, an output for providing firing signals for a said thyristor, and a detector for detecting zero-crossings of an a.c. voltage provided by the a.c. voltage source, wherein said firing signal means further comprises accumulating means for accumulating the control signals and for providing a said firing signal when both the detector detects a zero-crossing of the a.c. voltage and the value of the accumulated control signals is equal to or exceed a first predetermined value, and subtracting means for subtracting a second predetermined value from the value of the accumulated control signals when a said firing signal is provided.

4,891,572

POWER SOURCE APPARATUS

Koji Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1988, Ser. No. 238,837
Claims priority, application Japan, Aug. 31, 1987, 62-215428; Oct. 22, 1987, 62-265318
Int. Cl.⁴ G05F *1/46*
U.S. Cl. 323—284 **16 Claims**



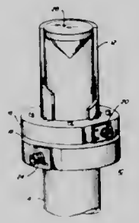
1. A power source apparatus comprising:
high-voltage applying means for applying a high voltage to a charger;
detecting means for detecting a voltage of a grid of said charger; and
regulator means, inserted between ground and said grid, for controlling the voltage of said grid to be constant in accordance with an output from said detecting means.

4,891,573

EVANESCENT MODE TESTER FOR CERAMIC DIELECTRIC SUBSTRATES

Gordon D. Kent, Cazenovia, N.Y., assignor to Dielectric Labs, Inc., Cazenovia, N.Y.

Filed Apr. 1, 1988, Ser. No. 177,475
Int. Cl.⁴ G01R *27/04*
U.S. Cl. 324—58 R **11 Claims**



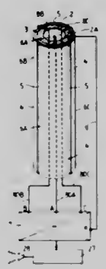
1. An evanescent mode tester for measuring the dielectric constant of a ceramic substrate comprising:
a length of waveguide of a predetermined inner diameter 2a defining a cutoff frequency below which said waveguide will not propagate electromagnetic energy;
a holder disposed at a center of said length of waveguide for holding a sheet of said substrate whose dielectric constant K is to be measured, such that the substrate extends across and beyond the diameter of the waveguide, said substrate having a predetermined thickness 2d;
signal injection means for injecting a frequency-swept signal into said waveguide at one side of said holder, said signal injection means sweeping through a range of frequencies below said cutoff frequency; and
signal extraction means disposed in said waveguide at one or the other side of said holder for detecting the frequency-swept signal in said waveguide;
wherein said dielectric constant is calculated from the relationship of said diameter 2a, said thickness 2d, a resonant frequency and bandwidth of transmission of said injected signal through said substrate, and said cutoff frequency.

4,891,574

HYGROMETER WITH PLURAL MEASURING BONES AND REDUNDANCY SYSTEM CIRCUIT

Kazuhiko Nagaya, Tokyo; Hiroshi Sakurai, Yokohama, both of Japan, and Andrew K. Michell, Cambridge, England, assignors to Mitchell Instruments Ltd., Cambridge, England and Kabushiki Kaisha Tekuse Yohkoh, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,099
Claims priority, application Japan, Dec. 23, 1987, 62-325797
Int. Cl.⁴ G01R *27/26*
U.S. Cl. 324—61 P **15 Claims**



1. In a hygrometer of the electrical impedance type comprising a sensing element including an electrically conducting substrate, a porous moisture adsorbing layer the electrical properties of which vary with the quantity of water vapour adsorbed onto it formed on said electrically conducting substrate, and a porous conducting electrode formed on top of porous moisture adsorbing layer; the improvement wherein said porous conducting electrode is divided into a number of separate measuring zones and said hygrometer also includes a redundancy system circuit, said redundancy system circuit receiving separate outputs one from each of said respective measuring zones and only produces an output indicative of the humidity when said outputs from at least two of said separate zones are in agreement.

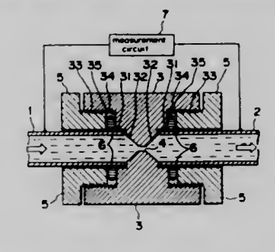
4,891,575

PARTICLE DETECTOR USING INLET AND OUTLET PIPES AS ELECTRODES

Katsuyuki Kogo, and Shinji Miyasaka, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 180,619, Apr. 4, 1988, abandoned, which is a continuation of Ser. No. 815,645, Jan. 2, 1986, abandoned. This application Jul. 6, 1989, Ser. No. 376,152
Claims priority, application Japan, Jan. 8, 1985, 60-1931
Int. Cl.⁴ G01N *27/07*
U.S. Cl. 324—71.4 **8 Claims**

1. A particle detector which comprises:
first and second pipe means for feeding liquid to be treated;
means for coupling said first and second pipe means to one another, said coupling means being an elongated cylindrical shape having two end portions in an axial direction that define two threaded holes, defining an aperture to communicate liquid from one of the pipe means to the other pipe means with a diameter to pass only one particle at a time and being tapered between said aperture and each of said end portions;
means for applying voltage or current to the liquid present in both sides of said aperture;
at least one connecting screw which is detachably and threadingly engaged with each threaded hole of said coupling means and has a through hole to receive and pass said pipe means;
means for detecting change of the voltage or current occurring across the liquid present in both sides of the aperture,



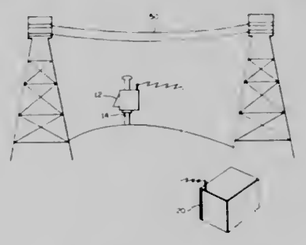
whereby particles passing through the aperture may be detected; and
an O-ring disposed in a space between said coupling means and said connecting screw so that said O-ring is clamped between an end face of said connecting screw and an end face of said coupling means and is deformed when said connecting screw completely engages said coupling means to further secure said pipe means.

4,891,576

GROUND-BASED TRANSMISSION LINE CONDUCTOR MOTION SENSOR

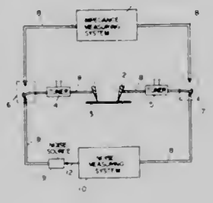
Malin L. Jacobs, and Umberto Milano, both of Littleton, Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 22, 1988, Ser. No. 234,768
Int. Cl.⁴ G01R *31/02*
U.S. Cl. 324—72 **10 Claims**



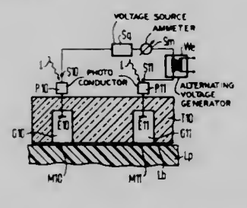
1. A ground-based conductor motion sensing apparatus for remote sensing of movement of electric power transmission lines comprising:
a ground based motion detector comprising a conductor motion sensing means capable of sensing changes in the electric field surrounding an energized transmission line due to the motion of the transmission line and an alarm signal generation means capable of generating an alarm signal when a condition of transmission line motion is sensed; and
an alarm signal receiving means capable of receiving the signal generated from said alarm signal generating means and triggering an alarm in response to said signal which indicates that transmission line motion has been sensed.

4,891,577
APPARATUS FOR MEASURING NOISE CHARACTERISTICS
Osamu Ishikawa, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 27, 1987, Ser. No. 113,112
Claims priority, application Japan, Oct. 31, 1986, 61-261244; Nov. 20, 1986, 61-277187
Int. Cl.[4] G01R *31/02, 27/00, 1/06*
U.S. Cl. 324—73 R **9 Claims**



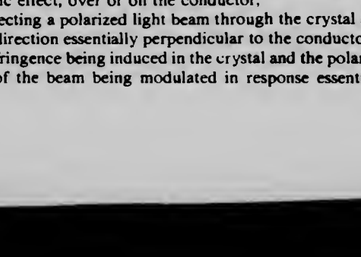
1. A system for measuring characteristics of a semiconductor device using a noise measuring system and an impedance measuring system, said system comprising:
an input probing means and an output probing means for providing connection to the semiconductor device;
first and second variable impedance means for respectively varying a source and a load impedance, and respectively connected to said input probing means and said output probing means;
first and second switching means respectively connected to said first and second variable impedance means and each having means for connection to the noise measuring system and the impedance measuring system, said first and second switching means for selectively connecting said first and second variable impedance means to one of the noise measuring system and the impedance measuring system.

4,891,578
DEVICE FOR THE ELECTRICAL FUNCTION TESTING OF WIRING MATRICES, PARTICULARLY OF PRINTED CIRCUIT BOARDS
Guenter Doemens, Holzkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 16, 1988, Ser. No. 168,965
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710595
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—73 R **23 Claims**



1. A device for use in a system for the electrical function testing of wiring matrices, the device having a carrier plate located adjacent the wiring matrix and provided with a plurality of gas discharge channels, whereby at least two selected measuring locations of the wiring matrix are ionically contacted via the associated gas discharge channels, comprising every gas discharge channel selectable by an associated busbar of at least two busbars on the carrier plate and for at least each selected gas discharge channel a photoconductor on the carrier plate connected between the selected gas discharge channel and the associated busbar, the photoconductor being controlled by charging with light, wherein the system has means for providing the light and means for testing the two selected measuring locations via the busbars.

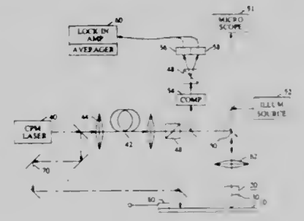
4,891,579
VOLTAGE DETECTOR
Shinichiro Aoshima, and Yutaka Tsuchiya, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan
Filed Jun. 29, 1988, Ser. No. 212,984
Claims priority, application Japan, Jun. 30, 1987, 62-163540
Int. Cl.[4] G01R *29/12*
U.S. Cl. 324—96 **14 Claims**



1. A voltage detector for detecting the voltage at the parts of an object to be measured, comprising:
an electro-optic material having a plurality of portions whose refractive indexes are changed according to the voltages at a corresponding plurality of parts of said object, respectively;
means for applying parallel light beams having a first predetermined polarization component to said electro-optic material, the polarizations of said parallel light beams applied to said electro-optic material being changed according to said refractive indexes of said plurality of portions; and
guide means for extracting emergent light beams having a second predetermined polarization component from a plurality of emergent light beams which emerge from said electro-optic material, and applying said emergent light beams having said second predetermined polarization component to a photo-electric detector in parallel, one-dimensionally.

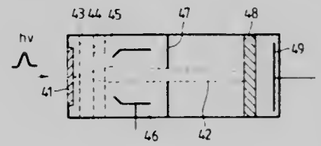
4,891,580
ELECTRO-OPTIC MEASUREMENTS OF VOLTAGE WAVEFORMS ON ELECTRICAL CONDUCTORS
Janis A. Valdmanis, Westfield, N.J., assignor to American Telephone and Telegraph Co., AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 29, 1988, Ser. No. 182,063
Int. Cl.[4] G01R *31/00, 33/00, 23/16*
U.S. Cl. 324—96 **20 Claims**

1. A method of measuring a voltage waveform of an electrical signal on an electrical conductor comprising:
generating the signal oon the conductor;
positioning a crystal, which exhibits longitudinal electro-optic effect, over or on the conductor,
directing a polarized light beam through the crystal along a direction essentially perpendicular to the conductor, birefringence being induced in the crystal and the polarization of the beam being modulated in response essentially to only those components of the electric field generated by the signal which are perpendicular to the conductor, and



detecting the modulated polarization of the beam to generate a voltage waveform corresponding to that on the conductor.

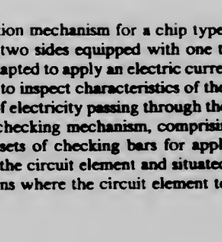
4,891,581
APPARATUS FOR SAMPLING, ANALYZING AND DISPLAYING AN ELECTRICAL SIGNAL
Yoshihiro Takiguchi, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan
Filed Jul. 14, 1988, Ser. No. 218,795
Claims priority, application Japan, Jul. 14, 1987, 62-175509; Jul. 14, 1987, 62-175510
Int. Cl.[4] G01R *13/00*
U.S. Cl. 324—96 **29 Claims**



1. A photoelectron sampling apparatus comprising:
a light pulse source;
a photocathode for receiving a light pulse emitted by said light pulse source;
an acceleration electrode for accelerating a photoelectron pulse emitted by said photocathode after receiving said light pulse;
a signal electrode for receiving a signal to be measured and for modulating the accelerated photoelectron pulse using said signal be measured; and
an anode electrode for collecting the modulated photoelectron pulse;
wherein the waveform of said signal to be measured is sampled by said photoelectron pulse based on a photoelectric effect.

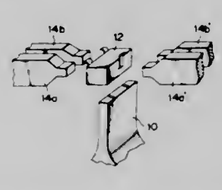
4,891,582
OPTICAL APPARATUS AND METHOD FOR PHOTOCARRIER DIFFUSION LENGTH MEASUREMENT
Kurt Weiser, Haifa; Elia Zeldov, Herzlia, and Dan Ritter, Haifa, all of Israel, assignors to Technion Research & Development Foundation, Haifa, Israel
Continuation of Ser. No. 100,324, Sep. 23, 1987, abandoned. This application May 3, 1989, Ser. No. 348,127
Claims priority, application Israel, Sep. 24, 1986, 80143
Int. Cl.[4] G01R *29/02*
U.S. Cl. 324—158 R **17 Claims**

1. An optical apparatus for measuring the diffusion length in an insulating photoconductor or a semiconductor sample material, said apparatus comprising;
a source of coherent light;
means for splitting said light source and providing transmitted and reflected beams each having a variable light intensity, one of said transmitted and reflected beams being incident as a background beam at a location on the sample material;
means for directing the other of said transmitted and reflected beams so as to be incident at said location as a probe beam, said directing means establishing a predetermined angle between said background and probe beams at said location;



polarizing means disposed in the path of said background beam and having one of two predetermined orientations corresponding to polarized and non-polarized states of the beam passing therethrough;
means disposed in the path of said probe beam for periodically blocking the passage thereof; and
means for measuring changes in the periodic photocurrent supplied by a power source through the sample material in response to the operation of said periodic blocking means for each of said polarized and non-polarized states to thereby determine the diffusion length of the sample material.

4,891,583
INSPECTION MECHANISM FOR CHIP TYPE CIRCUIT ELEMENT
Masanori Ohta, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan
Continuation of Ser. No. 936,871, Dec. 2, 1986. This application Dec. 30, 1988, Ser. No. 294,973
Claims priority, application Japan, Dec. 23, 1985, 60-197978
Int. Cl.[4] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **10 Claims**



1. An inspection mechanism for a chip type circuit element having at least two sides equipped with one to two terminals on each side, adapted to apply an electric current to a chip type circuit element to inspect characteristics of the circuit element based on flow of electricity passing through the circuit element by means of a checking mechanism, comprising:
at least two sets of checking bars for applying an electric current to the circuit element and situated on at least two side portions where the circuit element to be inspected is

placed, each set having two checking bars situated close to each other without causing electrical connection therebetween, each checking bar having a tip end adapted to be contacted to one of terminals of the circuit element;

a suction pin for supporting the circuit element at a position to be inspected, said suction pin having a pad mounted on its top and formed of a shock-absorbing material, so that said suction pin absorbs through said pad force applied to the circuit element when said tip end of each checking bar is contacted to the terminal of the circuit element supported by said suction pin; and

at least two switch devices connected to the respective sets of the checking bars for electrically connecting and disconnecting the checking bars in each set;

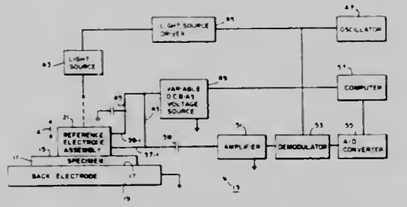
wherein in case the circuit element has one terminal on one side, two checking bars on that side are electrically integrated with each other, thereby applying an electric current to the terminal through the two checking bars electrically integrated together, and in case the circuit element has two terminals on one side, two checking bars on that side are electrically isolated from each other, thereby applying an electric current to the two terminals through the electrically separated two checking bars, respectively.

4,891,584

APPARATUS FOR MAKING SURFACE PHOTOVOLTAGE MEASUREMENTS OF A SEMICONDUCTOR

Emil Kamieniecki, Lexington; William C. Goldfarb, Melrose, and Mike Wollowitz, Cambridge, all of Mass., assignors to Semitest, Inc., Billerica, Mass.

Filed Mar. 21, 1988, Ser. No. 171,677
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 R **37 Claims**



1. Apparatus for use in making ac surface photovoltage measurements of a specimen of semiconductor material under variable dc bias voltage conditions, said specimen having first and second major surfaces, said apparatus comprising:

a. means for illuminating at least a portion of said first major surface of said specimen with a beam of intensity modulated light,

b. a back electrode adapted to receive said second major surface of said specimen,

c. a reference electrode assembly positionable in the path of said light beam in close proximity to said first major surface of said specimen, said reference electrode assembly comprising:

i. a rigid transparent plate, and

ii. a flexible diaphragm mounted on said rigid transparent plate, said flexible diaphragm comprising a first sheet of transparent flexible insulating material and a coating of transparent conductive material on at least a portion of a surface of said first sheet of transparent flexible insulating material, said coating constituting a reference electrode, said first sheet of transparent flexible insulating material insulating said reference electrode from said specimen, and

iii. means for transmitting pressure applied to said rigid transparent plate to said flexible diaphragm so as to push said flexible diaphragm against the first major surface of the specimen and hold said reference electrode in uniform compliance with said first major surface of said specimen, and

e. means for applying a variable dc bias voltage between said back electrode and said reference electrode,

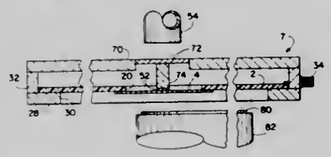
f. the ac surface photovoltage signals generated by said light beam appearing between said reference electrode and said back electrode.

4,891,585

MULTIPLE LEAD PROBE FOR INTEGRATED CIRCUITS IN WAFER FORM

Bozidar Janko, Portland, and Kenneth R. Smith, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 5, 1986, Ser. No. 904,600
Int. Cl.[4] G01R *31/02, 1/06*
U.S. Cl. 324—158 P **9 Claims**



1. A probe assembly for use in testing an integrated circuit embodied in an integrated circuit chip that is incorporated in a wafer, comprising:

a stiff support member having at least one face and formed with an aperture in that face, the support member comprising dielectric material and portions of conductive material supported by the dielectric material in electrically-insulated relationship, the portions of conductive material of the support member comprising a plurality of inner contact elements distributed about said aperture in a first pattern, and a plurality of transmission lines extending from the inner contact elements of the support member for connection to testing apparatus, and

a membrane having first and second opposite main faces and comprising dielectric material and portions of conductive material supported by the dielectric material in electrically-insulated relationship, the portions of conductive material of the membrane constituting a plurality of inner contact elements distributed over said first main face of the membrane in a pattern that corresponds to the pattern in which contact areas are distributed over the contact face of the chip under test, a plurality of outer contact elements distributed about a peripheral region of the membrane in a pattern corresponding generally to said first pattern, and a plurality of transmission lines extending from said inner contact elements to said outer contact elements respectively,

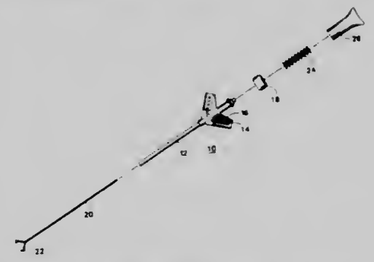
the membrane being secured at one of its main faces to the support member in a manner such that the membrane overlies said aperture, the outer contact elements of the membrane being in electrically-conductive contact with the respective inner contact elements of the support member and the inner contact elements of the membrane including contact bumps that project from the membrane at the first main face thereof beyond other elements of the probe assembly that lie at a distance of less than twice the maximum linear dimension of the wafer from the contact bumps.

4,891,586

IC GRABBER PROBE

David C. Leber; William B. Tuff, both of Vancouver, Wash., and Paul L. Verstrate, Cornelius, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 13, 1989, Ser. No. 310,403
Int. Cl.[4] G01R *1/06*
U.S. Cl. 324—158 P **11 Claims**



1. An electrical probe, comprising

a body including an elongate, narrow tubular nose section having an electrically conductive inner surface and an electrically insulative outer surface,

an elongate, thin conductive shaft having gripping means adjacent one end thereof for establishing conductive, gripping contact with a probed device, said shaft being received within said nose section for axial movement relative thereto alternately to extend said gripping means from and retract the same into one end of said nose section, said shaft including means for maintaining low resistance contact with the inner surface of said nose section during such movement, and

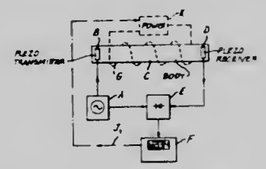
contact means proximate the opposite end of said nose section and in electrical contact with said inner surface for attaching a test lead to said probe.

4,891,587

MAGNETIC FIELD SENSOR USING VARIATIONS IN ULTRASOUND TO DETERMINE MAGNETIC FIELD

Patrick T. Squire, Bradford-on-Avon, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 102,328, Sep. 29, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 267,618
Claims priority, application United Kingdom, Sep. 30, 1986, 8623435
Int. Cl.[4] G01R *33/02*
U.S. Cl. 324—244 **15 Claims**



1. A magnetic field sensor comprising:

a body of magneto-elastic metallic glass material of a defined thickness;

transmitter means coupled to said body, for propagating ultrasound in said body as a zero-mode shear wave;

said mode being controlled by having said thickness of the body below a critical value which is a quotient of velocity of the ultrasound in said body divided by frequency;

means, magnetically coupled to said body, for applying a specific magnetic field to the body, to bias an operating point of the sensor;

receiver means, coupled to said body, for responding to ultrasound propagated through said body; and

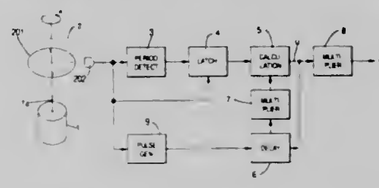
phase difference means, coupled to said receiver means and responsive to said ultrasound detected thereby for determining an ambient magnetic field strength by detecting an effect of the magnetic field on the propagation of ultrasound in said body.

4,891,588

DEVICE FOR DETECTING ROTATION SPEED HAVING FEEDBACK CIRCUITRY AND IMPROVED FREQUENCY-RESPONSE

Souichiro Fujioka, Sakai, and Hiroshi Okamoto, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 30, 1988, Ser. No. 213,620
Claims priority, application Japan, Jul. 1, 1987, 62-164550; Jul. 1, 1987, 62-164551
Int. Cl.[4] G01P *3/481*; G01R *23/02*
U.S. Cl. 324—166 **13 Claims**



1. An apparatus for detecting a rotating speed of a rotating object, comprising:

pulse generating means for generating a pulse train having a frequency proportional to the rotating speed of the rotating object;

period detecting means, coupled to said pulse generating means, for detecting a period of said pulse train at each occurrence of a pulse of said pulse train;

latching means, coupled to said period detecting means, for latching a value of said period detected by said period detecting means until a next occurrence of a pulse of said pulse train;

calculation means, coupled to said latching means, for subtracting a multiplied value from said value latched by said latching means to obtain a signal indicative of the rotating speed of the rotating object;

delaying means, coupled to said calculation means, for delaying an output of said calculation means for one period of said pulse train; and

multiplication means, coupled to said delaying means and said calculation means, for multiplying an output of said delaying means by a specified coefficient to obtain said multiplied value, said specified coefficient being a real number having a value which is less than 1.

4,891,589

DISPLACEMENT GAUGE THAT COMBINES VECTOR SIGNALS

Donald L. Van Zeeland, Franklin, Wis., assignor to Eaton Corporation, Cleveland, Ohio

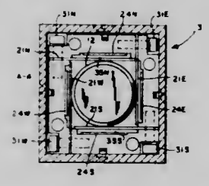
Continuation-in-part of Ser. No. 137,845, Dec. 23, 1987. This application Jan. 27, 1989, Ser. No. 302,485
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—207 **7 Claims**

1. A displacement gauge (3) for sensing displacement of an object (12), comprising:

a plurality of proximity sensing means (24N & 37N, 24E & 37E, etc) positioned at angularly-spaced-apart directions

from said object, for producing a set of primary direction signals (from **45**, **54**), each dependent upon the vector component of the object's displacement along a respective directional line (e.g. N-S, E-W);

means (**48**, **57**) receiving said set of primary direction signals, for converting them, in the event that the signals are not all of the same sign originally, to a second set of direction signals (at **48T**, **57T**) that are all of the same sign;



addition means (FIG. **6**, **62***a*, **62***b*, **51***a*) that scalarly add at least two of the direction signals of said second set, with predetermined appropriate weighting factors, for providing at least one composite direction signal (at **51T**);

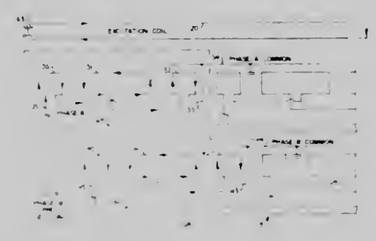
whereby a first-order array of signals (at **59**, **61**, **62**) is provided, comprising both said second set of direction signals (at **61**, **62**) and said composite signal (at **59**), each signal of said first-order array indicating the magnitude of the object's displacement along a respective directional line.

4,891,590

LINEAR RESOLVER UTILIZING PLURAL NULLED COIL SETS

William S. Hammel, Franksville; Donald B. Lawson, South Milwaukee, and Keith W. Van Patten, Racine, all of Wis., assignors to Unico, Inc., Franksville, Wis.

Filed Jun. 8, 1988, Ser. No. 204,132
Int. Cl.[4] **G01B** *7/14*; **G08C** *19/06*; **H01F** *21/00*
U.S. Cl. 324—207 **4 Claims**



1. A linear resolver for determining the position of an edge of an article of magnetically permeable material along a predetermined path, comprising:

an excitation coil;

an excitation source for producing an excitation signal in the excitation coil;

a first group of secondary coils comprising a first coil set, the first coil set including a first plurality of individual coils arranged sequentially along the predetermined path and magnetically coupled to the excitation coil and arranged so that varying positions of the edge of the magnetically permeable object along the predetermined path causes a change in the magnitude of the magnetic coupling between the excitation coil and one of the individual coils in the first coil set, the first plurality of individual coils being electrically connected in series, with at least one of the individual coils being connected in the series with a polarity opposite to that of the remainder of the individual coils in the first plurality of individual coils, and with the ends of the series connection defining a first output for the first coil set, wherein the magnitude of the first output varies in a first cyclical pattern with respect to the position of the edge of the magnetically permeable object along the predetermined path;

a second group of secondary coils comprising a second coil set, the second coil set including a second plurality of individual coils arranged sequentially along the predetermined path and parallel to the first coil set, the second coil set being magnetically coupled to the excitation coil and arranged so that varying positions of the edge of the magnetically permeable object along the predetermined path causes a change in the magnitude of the magnetic coupling between the excitation coil and one of the individual coils in the second coil set, the second plurality of individual coils being electrically connected in series, with at least one of the individual coils being connected in the series with a polarity opposite to that of the remainder of the individual coils in the second plurality of individual coils, and with the ends of the series connection defining a second output for the second coil set, wherein the magnitude of the second output varies in a second cyclical pattern with respect to the position of the edge of the magnetically permeable object along the predetermined path, and wherein the second cyclical pattern is approximately the same shape as the first cyclical pattern and displaced from the first cyclical pattern by one quarter of one complete cycle of either cyclical pattern; and

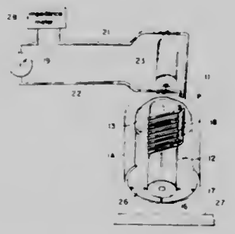
detection means connected to the first and second outputs, the detection means comprising input means for measuring the first and second outputs to produce first and second current magnitude values, respectively, and resolving means for calculating an angular value representing a point in the first and second cyclical patterns utilizing the first and second current magnitude values of the first and second outputs as sine and cosine function values, respectively, wherein the position of the edge of the magnetically permeable object corresponds to the angular value in the first and second cyclical patterns.

4,891,591

NONINTRUSIVE METHOD AND APPARATUS FOR MONITORING THE CURE OF POLYMERIC MATERIALS

David F. Johnston, Hampton, and Robert L. Fox, Hayes, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 16, 1988, Ser. No. 133,413
Int. Cl.[4] **G01N** *27/72*; **G01R** *33/12, 27/00*
U.S. Cl. 324—234 **10 Claims**



5. In an apparatus for monitoring the cure of a sheet of polymeric material the resistance R of which varies from an uncured to a cured value during curing the improvement comprising;

an electromagnetic sensing head including an inductor coil for passing a magnetic field through one or more selected portions of said sheet of polymeric material when said inductor coil is energized;

a series connected alternating voltage supply circuit for energizing said inductor coil, said electromagnetic sensing head sensing the variation in resistance R from said uncured to said cured value in said one or more selected portions of said sheet of polymeric material and changing the impedance of said series connected supply circuit; and

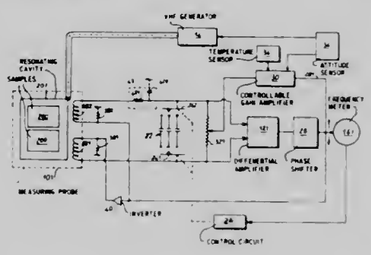
means for measuring said changes in said impedance of said supply circuit to non-intrusively monitor the cure of said sheet of polymeric material in said one or more selected portions thereof.

4,891,592

NUCLEAR MAGNETIC RESONANCE MAGNETOMETER

Robert Verdier, Barbieres, France, assignor to Crouzet (Société Anonyme francaise), Montrouge, France

Filed Jun. 10, 1988, Ser. No. 207,918
Claims priority, application France, Jun. 11, 1987, 87 08172
Int. Cl.[4] **G01R** *33/24*
U.S. Cl. 324—301 **3 Claims**



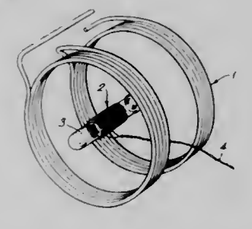
1. Nuclear magnetic resonance magnetometer comprising two semi-coils for picking up and reinjecting precessional signals of the nuclear spins of two samples of a material having gyromagnetic properties, disposed in the magnetic field to be measured and energized by a VHF generator, including an oscillator comprising said two semi-coils, a capacitor connected to the terminals of the two semi-coils, and a differential amplifier connected to the terminals of the capacitor, a means for phase-shifting the output of said differential amplifier connected to the output of the differential amplifier, and means for reinjecting into each semi-coil a current controlled by the output signal from the phase-shifting means, and a frequency meter for measuring the frequency of the oscillations of said oscillator, which frequency is proportional to the magnetic field to be measured, wherein the phase-shifting means is adapted for introducing a constant phase-shift equal to 90° throughout the whole frequency range of the oscillatons, and wherein the capacitor forms part of a battery of capacitors and wherein means are provided for controlling the switching of the capacitors of said battery of capacitors in response to the value of the frequency measured by the frequency meter whereby parasite phase-shifts between the signals picked up and the signals reinjected into the two semi-coils always remain less than a predefined threshold.

4,891,593

METHODS OF OBTAINING IMAGES REPRESENTING THE DISTRIBUTION OF PARAMAGNETIC MOLECULES IN SOLUTION

John Lurie; David M. Bussell, and John R. Mallard, all of Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Filed Aug. 4, 1988, Ser. No. 228,218
Claims priority, application United Kingdom, Aug. 5, 1987, 8718515
Int. Cl.[4] **G01R** *33/20*
U.S. Cl. 324—307 **5 Claims**



1. A method of obtaining image information representing the distribution of paramagnetic molecules in solution comprising the steps of:

(1) applying radio-frequency radiation to excite EPR resonance in the solute and obtaining an NMR image signal of selected nuclei of the solvent, the signal from those selected nuclei which interact with electrons excited by the rf radiation being enhanced;

(2) obtaining a separate NMR image signal of said selected nuclei which is unenhanced; and

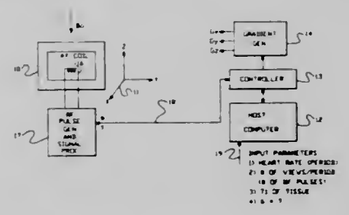
(3) deriving image information representing the difference between the enhanced and unenhanced image signals.

4,891,594

METHOD OF OPTIMIZING FLIP ANGLES IN MRI FOR UNEQUAL DELAY TIMES

Brian P. Wilfley, Los Gatos, and Robert J. Perlmutter, Palo Alto, both of Calif., assignors to Resonex, Inc., Sunnyvale, Calif.

Filed Aug. 19, 1988, Ser. No. 234,458
Int. Cl.[4] **G01R** *33/20*
U.S. Cl. 324—309 **3 Claims**



1. A method of optimizing radio frequency (RF) flip angles in a magnetic resonance imaging (MRI) system where multiple sequential and equal RF output signals in time of a specimen are desired and the times between RF excitation pulses which provide said output signals may be unequal comprising the following steps:

determining a mathematical relationship relating the effect of flip angle in a sequence of RF pulses, with an unequal time between at least some of said pulses, to the magnitude of the RF output signals of the MRI system due to said RF

pulses; said relationship modeling effects of T_1, the relaxation time of said specimen,
utilizing said relationship to derive flip angle durations for each RF pulse of said sequence to provide said output signals which are constrained to be equal in amplitude and maximized.

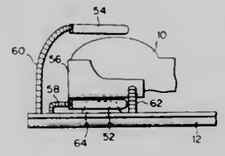
4,891,595
RESTRICTED VOLUME IMAGING
Joseph Granot, Holon, Israel, assignor to Elscint Ltd., Haifa, Israel
Filed May 26, 1987, Ser. No. 53,484
Claims priority, application Israel, Jun. 10, 1986, 79076
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **20 Claims**



1. A method for performing restricted volume magnetic resonance (MR) imaging comprising the steps of:
aligning spins in a subject by positioning the subject in a strong static magnetic field,
irradiating said subject with a first RF pulse in the presence of a first magnetic gradient so as to nutate the aligned spins in a first selected volume of said subject,
irradiating said subject with a second RF pulse in the presence of a second magnetic gradient normal to said first magnetic gradient so as to further nutate the nutated spins in a portion of said first selected volume of said subject,
irradiating said subject with a third RF pulse in the presence of a third magnetic gradient normal to said first and second magnetic gradients to still further nutate the further nutated spins in a section of said portion of said first selected volume, to thereby select a particular volume of the subject,
selecting said first, second and third RF pulses to generate stimulated echo signals from said still further nutated spins at a time after the third RF pulse equal to the time between said first and said second RF pulses,
applying encoding gradient pulses to provide image data, and
sampling the stimulated echo signals for use as the image data in presence of a view gradient pulse.

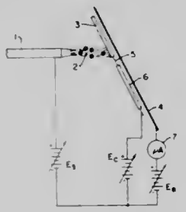
4,891,596
MAGNETIC RESONANCE IMAGING APPARATUS
Michio Mitomi, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 7, 1988, Ser. No. 203,099
Claims priority, application Japan, Jun. 11, 1987, 62-144058
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—318 **10 Claims**

1. A magnetic resonance imaging apparatus comprising:
a bed for laying an object to be examined thereon;
static magnetic field generating means for generating a uniform static magnetic field at a desired portion of the object to be examined laid on said bed;
gradient magnetic field generating means for generating a gradient magnetic field superposed on the static magnetic field generated by said static magnetic field generating means;
means for supplying a rotating magnetic field to the object to be examined laid on said bed;
receiving means for detecting a magnetic resonance signal induced by the object; and



preventing means, formed to be electrically endless and arranged to oppose said transmitting/receiving means through the object to be examined laid on said bed, for preventing an eddy current from flowing in the object to be examined.

4,891,597
SYNCHRONOUS DETECTION AND LOCATION OF INSULATION DEFECTS
Juris A. Asars, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 4, 1988, Ser. No. 267,138
Int. Cl.⁴ G01R *31/12*
U.S. Cl. 324—557 **16 Claims**

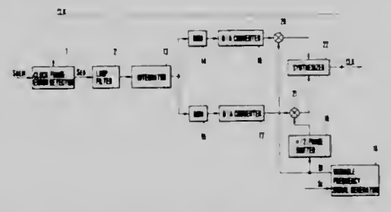


1. An insulation defect detector comprising an ion source which generates a plurality of gas ions; an insulated cable under test which has a potential waveform thereon; a sense conductor connected to a measuring device which synchronously measures the current flowing in the sense conductor due to the gas ions from the ion source as a function of the potential waveform on the insulated cable to detect the presence of a defect in the insulated cable.

4,891,598
VARIABLE BIT RATE CLOCK RECOVERY CIRCUIT
Shousei Yoshida, and Susumu Otani, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Sep. 8, 1988, Ser. No. 241,669
Claims priority, application Japan, Sep. 9, 1987, 62-224148
Int. Cl.⁴ H03L *7/00*
U.S. Cl. 328—61 **2 Claims**
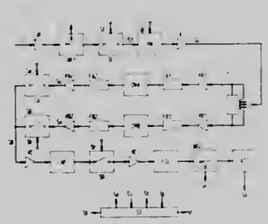
1. A variable bit rate clock recovery circuit comprising:
a clock phase error detector for receiving a demodulated signal of a digitally modulated signal and a reference clock signal, detecting a phase error between the input signals, and outputting a clock phase error signal;
a loop filter for removing a high-frequency component from the clock phase error signal;

an integrator for integrating an output signal from said loop filter;
first and second ROMs for storing data of cosine and sine waves in a digital form in advance, said first and second ROMs being accessed by an output from said integrator;
first and second D/A converters for respectively converting output digital signals from said first and second ROMs into analog signals;
a variable frequency signal generator, controlled by a frequency control signal, for generating signals having various frequencies;



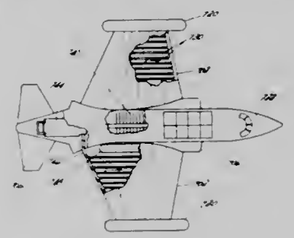
a phase shifter for shifting a phase of each signal from said variable frequency signal generator by $\pi/2$ radians;
a first multiplier for modulating each output from said variable frequency signal generator by using an output signal from said first D/A converter;
a second multiplier for modulating an output from said phase shifter by using an output signal from said second D/A converter; and
a synthesizer for adding outputs from said first and second multipliers together and outputting the reference clock signal.

4,891,599
EXPANDER SYSTEM FOR PULSE SIGNALS
Alfred Lauper, Obfelden, and Andreas Steffen, Schlieren, both of Switzerland, assignors to Siemens-Albis, AG, Zurich, Switzerland
Continuation of Ser. No. 876,145, Jun. 19, 1986, Pat. No. 4,812,771. This application Nov. 7, 1988, Ser. No. 268,120
Claims priority, application Switzerland, Oct. 23, 1985, 04566/85
Int. Cl.⁴ H03K *5/22, 5/00*
U.S. Cl. 328—109 **5 Claims**



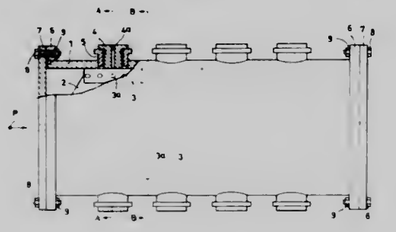
1. An expander system comprising:
a source of repetitive pulse signals, having pulse widths Ti, genererated from an input AC-signal;
an output terminal;
a phase modulator, coupled to said source, and having a control input terminal;
an expander filter and amplifier means serially coupled in order between said phase modulator and said output terminal; and
a control stage, coupled between said source and said control input terminal of said phase modulator, for generating a control signal selectively enabling and inhibiting said phase modulator such that, within the time length Ti of a one of said repetitive pulse signals, at least two phase changes of at least approximately 180 degrees are produced.

4,891,600
DIPOLE ACCELERATING MEANS AND METHOD
James E. Cox, 1415 Mountain Ave., Pomona, Calif. 91766
Division of Ser. No. 401,526, Jul. 26, 1982, Pat. No. 4,663,932. This application Apr. 30, 1987, Ser. No. 45,040
Int. Cl.⁴ G21K *1/00*
U.S. Cl. 328—233 **9 Claims**



1. Means for controllable accelerating a particle of matter having a selected dipole characteristic comprising
means for generating an alternating electric field which varies at a selected frequency and extends in a first direction, said electric field having a predetermined magnitude which is less than the characteristic field ionization potential limit of a particle;
means for generating an alternating magnetic field which extends in a second direction which is at a predetermined angle to said first direction and which crosses and intercepts said electric field at a predetermined location to define a spatial force field region, said magnetic field having a frequency of oscillation which is substantially equal to said selected frequency and is at a predetermined phase angle relative to said alternating electric field, said magnetic field having a flux density which, when multiplied times said selected frequency, is less than the characteristic field ionization limit of a particle;
means for establishing a particle at a selected temperature below the thermal ionization level thereof and for transporting a particle into said spatial force field region defined by said crossed electric field and magnetic field; said crossed electric field and magnetic field coacting with and causing the dipole of a particle to be driven into cyclic motion at substantially said selected frequency to produce a reactive force which accelerates a particle in a direction which is substantially normal to said first direction of said electric field and said second direction of said magnetic field; and
control means operatively coupled to said means for generating an alternating electric field and to said means for generating an alternating magnetic field and which is responsive to the dielectric properties of a particle at said selected temperature located in said spatial force field region for establishing a predetermined spatial and time relationship between the electric field, magnetic field, and dipole cyclic motion for a selected frequency to control the reactive force which acclerates a particle.

4,891,601
RADIO FREQUENCY MULTIPOLE LINEAR ACCELERATOR
Masatoshi Asari, Uji; Ikuo Konishi; Hiroyuki Fujita, both of Takatsuki; Akira Hirakimoto, Kyoto, and Hiroaki Nakanishi, Ohtsu, all of Japan, assignors to Shimadzu Corporation, Osaka, Japan
Filed Nov. 29, 1988, Ser. No. 277,192
Claims priority, application Japan, Dec. 21, 1987, 62-194185[U]; Feb. 5, 1988, 63-14745[U]
Int. Cl.[4] H05H *9/00*
U.S. Cl. 328—233 **6 Claims**

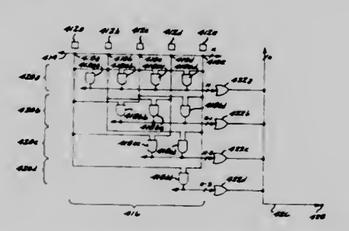


1. A radio frequency multipole linear accelerator substantially made up of a resonant cavity fundamentally consisting of a cavity drum and a plurality of electrodes enclosed therein for accelerating charged particles with the same bunched along the central axis of said resonant cavity, said electrodes being provided with head position adjusting means for fine adjusting the head positions of said electrodes, said radio frequency multipole linear accelerator comprising:

electrode supporting elements for supporting each of said electrodes from below at intervals of a predetermined distance, said electrode supporting elements being inserted in through holes provided along generatrices of said cavity drum;

electrode tilting plates arranged in series along root portions on both side of each of said electrodes so as to slantwise interpose between the inner surface of said cavity drum and said root portions in a brace-like form, said electrode tilting plates being devised so as to generate a force to pull up the bottom on either side of the electrode concernned by tightening screw studs provided to said electrode tilting plates.

4,891,602
VISUAL/VOICE INPUT RECOGNITION SENSOR
Bernard Strehler, 2235 25th St., #217, San Pedro, Calif. 90732
Filed Jan. 7, 1987, Ser. No. 1,161
Int. Cl.[4] H03K *5/00*
U.S. Cl. 381—45 **11 Claims**



1. A circuit for detecting the presence of feature signal ratios in a pattern of input data bits, comprising:

(a) a plurality of input data port means, each for receiving an element of said pattern of input data bits;

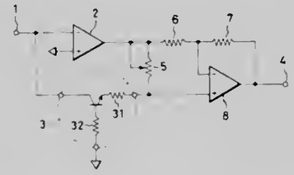
(b) a plurality of ratio detector means, each for detecting the presence of a predetermined feature signal ratio in said pattern of input data bits, and for generating a ratio detector output signal in response thereto, each comprising:

(1) a plurality of first logic function means, each responsive to a pair of elements related by said predetermined feature signal ratio, for detecting the presence of said predetermined feature signal ratio in said pattern of input data bits, and for generating an intermediate output signal in response thereto;

(2) a second logic function means, responsive to said intermediate output signals from said plurality of first logic function means, for detecting at least one positive intermediate output signal, and for generating said ratio detector output signal in response thereto; and

(c) a plurality of output port means for transmitting said ratio detector output port means for transmitting said ratio detector output signals generated by said plurality of ratio detector means.

4,891,603
LOGARITHMIC AMPLIFIER
Minoru Oda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 5, 1988, Ser. No. 279,773
Claims priority, application Japan, Jun. 20, 1988, 63-149984
Int. Cl.[4] G06G *7/24;* **H03F** *1/30*
U.S. Cl. 330—110 **8 Claims**



1. A logarithmic amplifier for generating an output voltage proportional to a logarithmic value of an input current, comprising:

an operational amplifier including inversion and noninversion input terminals and an output terminal, said input current being applied to said inversion input terminal;

a logarithmic conversion element connected between said inversion input terminal and said output terminal, said conversion element having a logarithmic current to voltage characteristic;

resistance means coupled to said output terminal for developing a voltage thereacross substantially equal to a logarithmic conversion error voltage produced by an internal resistance of said logarithmic conversion element; and

error compensating means for subtracting the voltage developed by said resistance means from an output of said logarithmic conversion element to generate said output voltage.

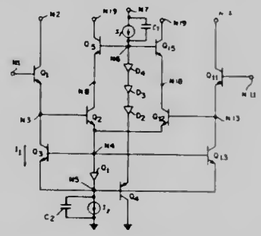
4,891,604
HIGH SPEED LOW INPUT CURRENT VOLTAGE FOLLOWER STAGE
Gerald M. Cotreau, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed Dec. 27, 1988, Ser. No. 289,747
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—252 **23 Claims**

1. Low input current voltage follower stage comprising:

first transistor having a base connected to an input terminal and having an emitter-collector path connected at a first end to a first reference terminal;

a current source means connecting a second end of said first transistor's emitter-collector path to a second reference terminal and including a parasitic capacitance between a first and second terminal;

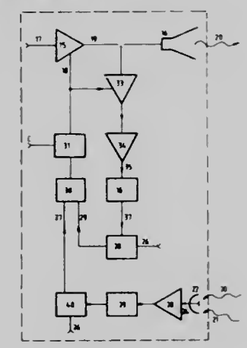
said bootstrap means connected in parallel to said current source means first and second terminal for causing both



sides of said parasitic capacitance to follow changes of voltage at said second end of said first transistor's emitter-collector path; and

bootstrap means including a second transistor having a base connected to said second end of said first transistor's emitter-collector path and said first terminal of said current source means and having a second end of said second transistor's emitter-collector path connected to said second terminal of said current source means.

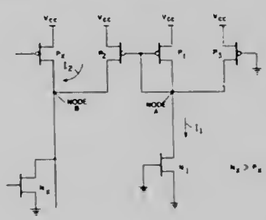
4,891,605
ADAPTIVE GAIN CONTROL AMPLIFIER
Anatol Z. Tirkel, 21 Walstab Street, East Brighton, 3187 Victoria, Australia
PCT No. PCT/AU87/00259, § 371 Date Apr. 11, 1988, § 102(e) Date Apr. 11, 1988, PCT Pub. No. WO88/01453, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 12, 1987, Ser. No. 198,997
Claims priority, application Australia, Aug. 13, 1986, PH7468
Int. Cl.[4] H03G *3/32*
U.S. Cl. 330—279 **6 Claims**



6. A method of processing an input signal to produce a controlled output signal when said output signal has an interference signal mixed therewith to produce a corrupted signal at a receiver, said method comprising:

sensing and processing said corrupted signal to produce a first control signal for controlling processing of said input signal to compensate for said interference signal, said processing of said corrupted signal comprising (a) producing a time-averaged version of said controlled output signal, (b) producing a time-averaged version of said corrupted signal, (c) computing a ratio of the modulus of said time averaged version of said corrupted signal and the modulus of said time averaged version of said controlled output signal to produce said first control signal, (d) employing said control signal to control an amplification stage of an adaptive gain control amplifier which produces said output signal, (e) providing a second control signal proportional to said first control signal, and (f) prescaling said controlled output signal in response to said second control signal prior to computing said ratio.

4,891,606
PHOTOCURRENT COMPENSATION USING ACTIVE DEVICES
Jack E. Clark, II; Jeffrey C. Lee, and Brent R. Doyle, all of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed Feb. 9, 1989, Ser. No. 307,944
Int. Cl.[4] H03F *3/08*
U.S. Cl. 330—288 **8 Claims**



1. A photocurrent compensation circuit for a node having a greater photocurrent related to the junction area of a first conductivity type devices than a second conductivity type devices by a factor of J, comprising:

first and second transistors of said second conductivity type connected to each other to form a current mirror, said second transistor, which is an output transistor connected to said node, has a device width which is a factor of K times the device width of said first transistor, which is an input transistor, so that said current mirror has an amplification factor K; and

third transistor of said first conductivity type connected as a load to said first transistor, said third transistor having a device width 1/K times the first conductivity type device width at said node and having a junction photocurrent J times the junction photocurrent of said first transistor so that the current mirror provides a current at said node to compensate for net photocurrent at said node due to junction photocurrent mismatch.

4,891,607
LOW DISTORTION DRIVE AMPLIFIER
Jimmie D. Felps, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 6, 1988, Ser. No. 203,230
Int. Cl.[4] H03F *1/14*
U.S. Cl. 330—296 **17 Claims**

1. A low distortion amplifier circuit for driving a load comprising:

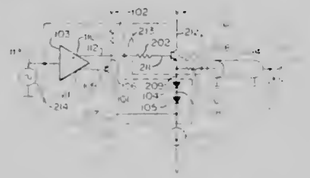
emitter follower circuit of a first conductivity type and having input and output and bias terminals;

common emitter amplifier circuit of a conductivity type opposite of said emitter follower circuit and having input and output terminals;

input amplifier having differential outputs, and responsive to an input signal for applying said input signal to said input

terminal of said emitter follower circuit and the complement of said input signal to said input terminal of said common emitter amplifier circuit;

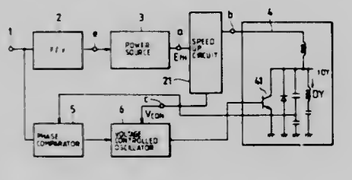
constant current means connected to said bias terminal of said emitter follower circuit and said output terminal of



said common emitter amplifier circuit for drawing a fixed current from said bias terminal of said emitter follower circuit and said output terminal of said common emitter amplifier circuit;

means for connecting said load to said output terminal of said emitter follower circuit.

4,891,608
#6 CONTROL CIRCUIT FOR HORIZONTAL OSCILLATOR
Miyuki Ikeda, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 13, 1988, Ser. No. 218,649
Claims priority, application Japan, Jul. 13, 1987, 172757/87
Int. Cl.[4] H03L *7/08*; H04N *5/12*
U.S. Cl. 331—20 **6 Claims**



1. A control circuit for a horizontal oscillator wherein horizontal synchronizing signals having different horizontal scan frequencies are inputted, and signals for driving a horizontal output circuit are generated in synchronization with the horizontal synchronizing signals, the control circuit for the horizontal oscillator comprising:

a frequency-to-voltage (F/V) converter for receiving the horizontal synchronizing signals and for generating an output voltage corresponding to the frequency of said horizontal synchronizing signals:

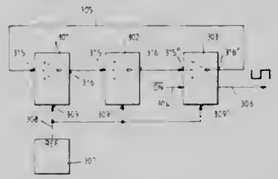
a power source means connected to said F/V converter for supplying a power source voltage corresponding to said output voltage of said F/V converter to a power source voltage terminal of the horizontal output circuit;

a phase comparing means for detecting phase difference between said horizontal synchronizing signals and a sawtooth wave of horizontal period produced by the horizontal output circuit;

a voltage controlled oscillation means for receiving an output of said phase comparing means, for generating horizontal drive pulses having a frequency corresponding to a control voltage supplied to a control voltage terminal thereof, and for supplying said horizontal drive pulses to the horizontal output circuit; and

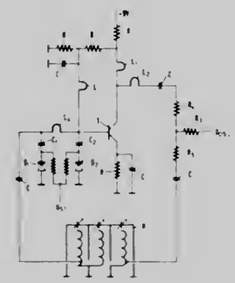
a speed-up circuit, which has an output end terminal connected to said control voltage terminal of said voltage controlled oscillation means, for decreasing the rise time of said control voltage in response to detection of rapid increase of said power source voltage.

4,891,609
RING OSCILLATOR
Edward S. Eilley, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 2, 1988, Ser. No. 279,388
Claims priority, application United Kingdom, Dec. 22, 1987, 8729915
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—57 **18 Claims**



1. A ring oscillator comprising, a plurality of cascaded inverting stages, each stage comprising an input circuit for detecting an output voltage of a preceding stage, characterized in that at least one inverting stage further comprises an output circuit having a current source that is controlled by said input circuit for supplying an output current to an input circuit of a succeeding stage.

4,891,610
UHF-FEEDBACK OSCILLATOR
Peter E. Veith, Vienna, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H., Wien, Austria
Filed Feb. 16, 1989, Ser. No. 311,699
Claims priority, application Australia, Feb. 17, 1988, 376/88
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—96 **5 Claims**



1. A UHF-feedback oscillator for a frequency range of at least 300 MHz to 1000 MHz comprising an amplifier stage, a voltage controlled tuning filter connected to said amplifier stage and a feedback quadripole connected between said amplifier stage and said filter, said feedback quadripole comprising one of a two- and three-loop helical waveguide resonator.

4,891,611
VIBRATION COMPENSATED CRYSTAL OSCILLATOR
Marvin E. Frerking, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 9, 1989, Ser. No. 321,490
Int. Cl.[4] H03B *5/04, 5/32*
U.S. Cl. 331—158 **19 Claims**



1. An electrical oscillator circuit, comprising:

a voltage controlled crystal oscillator (VCXO) providing an RF output;

means for sensing mechanical vibration of said VCXO that induces noise in said RF output and for generating an acceleration signal;

means for digitizing said acceleration signal;

means for filtering said digitized signals to provide a control signal to said VCXO; and

said control signal stablizing said RF output by compensating for said vibration induced noise.

4,891,612
OVERLAP INTERFACES BETWEEN COPLANAR TRANSMISSION LINES WHICH ARE TOLERANT TO TRANSVERSE AND LONGITUDINAL MISALIGNMENT
K. Reed Gleason, Portland; Keith E. Jones, Beaverton, and Eric W. Strid, Portland, all of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.
Filed Nov. 4, 1988, Ser. No. 267,398
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—33 **10 Claims**



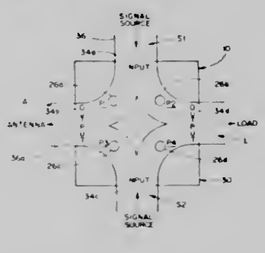
1. An interface structure connecting a pair of controlled-impedance, elongate coplanar transmission lines in end-to-end overlapping relation to each other comprising:

(a) a pair of dielectric substrates, each substrate mounting at least a pair of elongate planar ground lines with at least an elongate planar signal line therebetween in transversely-spaced, side-by-side, coplanar relation to one another so as to form said transmission lines, said signal and ground lines defining the planes of the respective transmission lines, each of said ground and signal lines having a planar end portion of conductive material which electrically contacts and overlaps in a variable alignment a corresponding end portion of a line of the other transmission line so as to form a region of respective combined overlapped corresponding end portions and overlapped respective dielectric substrates, both of said substrates together overlapping said overlapping corresponding end portions;

(b) an end portion of at least one line of one of said transmission lines being shaped relative to the overlapped corresponding end portion of a line of the other transmission line so as to have excess conductive material, extending in the plane of said one of said transmission lines, beyond the conductive material of said overlapped corresponding end portion, for causing the characteristic impedance of said interface structure to be independent of variations in said alignment along a direction transverse to the length of said elongate coplanar transmission lines;

(c) said excess conductive material including means for maintaining the transverse dimension of the combined overlapped correspondingly end portions of said signal lines, and the transverse spacing between said combined overlapped corresponding end portions of said signal lines and the respective combined overlapped corresponding end portions of said ground lines, constant despite variations in said alignment along a direction transverse to the length of said elongate coplanar transmission lines.

4,891,613
TRANSFER DEVICE FOR COMBINING, DIVIDING, AND SWITCHING MICROWAVE SIGNALS
Victor Nelson, 8 Midvale Ct., East Northport, N.Y. 11731
Filed Jan. 9, 1989, Ser. No. 294,829
Int. Cl.[4] H01P *1/12*
U.S. Cl. 333—108 **10 Claims**



1. A microwave transfer device for combining and dividing and switching microwave signals comprising:

a rigid, metallic, hollow body having internal walls defining a cavity,

a plurality of spaced input and output openings in said body communicating with said cavity for passing said microwave signals into said cavity through said input openings and out of said cavity through said output openings,

partition means in said cavity dividing the same into a plurality of passages each extending between one of said input openings and one of said output openings;

support means adjacent said body; and

a plurality of movable shorting members carried by said support means, said shorting members being selectively extensible into said passages for effectively closing them against passage of said microwave signals therethrough and selectively retractable from said passages thereby permitting transmission of said microwave signals therethrough between said input openings and said output openings;

so that first microwave signals applied at a first one of said input openings can pass through only a first one of said passages to a first one of said output openings,

so that said first microwave signals can be cut off from said first passage and switched to pass through only a second one of said passages to a second one of said output openings,

so that said first microwave signals applied at said first input opening can be divided to pass through said first and second passages simultaneously to both said first and second output openings,

so that second microwave signals applied at a second one of said input openings can pass through only a third one of said passages to combine with said first microwave signals if present at said first output opening,

so that said second microwave signals applied at said second

input opening can be cut off from said third passage and switched to pass through only a fourth one of said passages to combine with said first microwave signals at said second output opening if present at said second output opening,

so that said second microwave signals applied at said second input opening, can be divided to pass through both said third and fourth passages simultaneously to said first and second output openings, and so that said second microwave signals at said first and second output openings can combine with said first microwave signals if present thereat.

4,891,614

MATCHING ASYMMETRICAL DISCONTINUTIES IN TRANSMISSION LINES

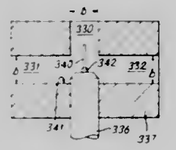
Frans C. De Roode, Bath, England, assignor to National Research Development Corporation, London, England

Filed May 28, 1987, Ser. No. 55,131

Claims priority, application United Kingdom, May 29, 1986, 8613028; United Kingdom, Apr. 8, 1987, 8708373

Int. Cl.[4] H01P *1/00, 3/00, 5/00, 5/20*

U.S. Cl. 333—122 **49 Claims**



38. Two sections of transmission path for electromagnetic waves, each comprising:

a group of asymmetrical discontinuities having a reference plane defined as a plane at which a reflection coefficient for waves transmitted towards the plane in one direction is equal, but of opposite sign, to the reflection coefficient for waves transmitted towards the plane in the other direction, the reference plane not, in general, being located at the positional mean of the discontinuities, and in general, varying in position with frequency; and

matching means, the matching means being constructed and positioned to have a reflection coefficient at said reference plane which is substantially equal and opposite to the reflection coefficient at said reference plane of said group of discontinuities, for each direction of transmission along the path, over a predetermined frequency band;

the said two sections of transmission path together forming a waveguide tee, each section being in the form of a right-angle waveguide corner, the two corners being back-to-back with one end of each section forming one respective port for the tee and the other ends of the sections together forming a third port.

43. A waveguide tee according to claim 39 in the form of a complete waveguide "magic tee" including a fourth waveguide opening into the junction of the first and second waveguides at right angles thereto and along one narrow side of the junction, and further matching means for matching the fourth waveguide to the junction.

4,891,615

DIELECTRIC FILTER WITH ATTENUATION POLE

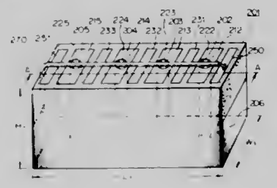
Tomokazu Komazaki; Katsuhiko Gunji; Norio Onishi; Yoshimitu Sakurai; Hiroyuki Horii, and Akira Mashimo, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,527

Claims priority, application Japan, Dec. 28, 1987, 62-329513

Int. Cl.[4] H01P *1/202*

U.S. Cl. 333—206 **22 Claims**



1. A dielectric filter with an attenuation pole comprising:

a dielectric block having a top surface and a bottom surface and side surfaces, said bottom surface and side surfaces being covered by an outer conductor;

a plurality of resonators arranged in a row and each having respective inner conductors extending from said top surface toward said bottom surface;

a plurality of coupling means for respectively capacitively coupling adjacent ones of said plurality of resonators to each other;

two electrodes for supplying a voltage to said dielectric block; and

an insulated cable disposed over said plurality of resonators so as to be coupled thereto.

4,891,616

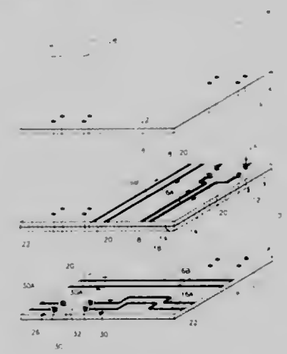
PARALLEL PLANAR SIGNAL TRANSMISSION SYSTEM

Gerald W. Renken, Edina; Kimberly J. Gray, Lakeville, and Michael W. Greenwood, Maplegrove, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 1, 1988, Ser. No. 201,001

Int. Cl.[4] H01P *3/02*

U.S. Cl. 333—236 **9 Claims**



1. A signal transmission system for differential-mode signal transmission, comprising:

(a) a circuit board composed of more than a pair of dielectric board substrates having opposite surfaces and being bounded by a plurality of opposite edges, said substrates being disposed in pairs having face-to-face layered contact with one another at inner ones of said opposite surfaces thereof; and

(b) at least one pair of spaced apart conductive parallel planar signal transmission lines arranged for transmission of differential-mode signals being disposed between each pair of said substrates along said inner surfaces thereof and extending between corresponding pairs of said edges of said substrates for providing pass-through transmission of differential-mode signals from one edge to another edge of said pair of substrate edges through each conductive transmission line.

4,891,617

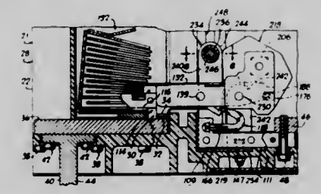
RUBBER STOPS IN OUTSIDE POLES

William E. Beatty, Jr., Beaver; Lawrence J. Kapples, West Mifflin; Lance Gula, Aliquippa, and Joseph F. Changle, Carnegie, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1988, Ser. No. 226,500

Int. Cl.[4] H01H *75/00, 77/00, 3/06*

U.S. Cl. 335—46 **22 Claims**



1. A rubber stop assembly for a multipole circuit breaker having a housing which includes a base portion and a cover portion, a center pole pair of separable contacts disposed between a pair of sideplates, one or more pairs of outside pole separable contacts, an operable mechanism and a crossbar assembly; wherein at least one separable contact of said pair of center pole contacts and said one or more pairs of outside pole separable contacts is carried by one portion of a pivotally mounted contact arm adapted to move in a path between an open position and a closed position comprising:

first supporting means for supporting a shock absorber assembly in a spaced apart relationship from the circuit breaker cover in a position within the path of said one portion of said pivotally mounted contact arm for said one or more outside poles;

wherein said shock absorber assembly is mounted in said first supporting means between the circuit breaker cover and the pivotally mounted contact arm; and

means for securing said first supporting means to the circuit breaker housing.

4,891,618

LAMINATED COPPER ASSEMBLY

Charles R. Patoa, New Brighton, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1988, Ser. No. 226,649

Int. Cl.[4] H01H *77/10*

U.S. Cl. 335—195 **19 Claims**

1. A laminated contact assembly for a circuit breaker having a housing including a base and an operating mechanism comprising:

one or more fasteners for securing said laminated contact assembly to said base;

one or more flexible conductors;

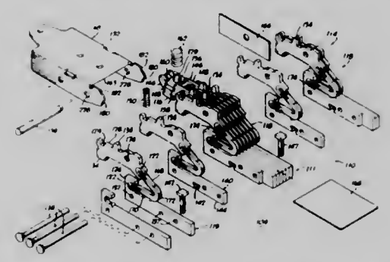
a plurality of first contact arms carrying first contacts;

a plurality of first stationary conductors preformed to receive one or more fasteners, coupled to said first contact arms by way of said flexible conductors forming a first assembly;

a plurality of second contact arms carrying second contacts;

a plurality of second stationary conductors coupled to said second contact arms by way of a flexible conductor forming a second assembly, said second assemblies disposed adjacent said first assemblies to capture said fasteners within said first assemblies; and

means for securing said first and second assemblies together.



4,891,619

ELECTROMAGNETIC COUPLING DISC

Dwight E. Booth, Janesville, and Gerry N. Lippincott, Milton, both of Wis., assignors to Dana Corporation, Toledo, Ohio

Division of Ser. No. 133,145, Dec. 14, 1987, Pat. No. 4,814,480. This application Oct. 24, 1988, Ser. No. 261,112

Int. Cl.[4] H01F *7/00*

U.S. Cl. 335—296 **8 Claims**

1. A multiple pole coupling disc for an electromagnetic coupling, said disc being made of magnetic material and having a central axis, through slot means formed through said disc, said through slot means being open across the entire thickness of the disc and defining high reluctance air gaps, said through slot means being defined by walls which are inclined obliquely relative to said central axis across the entire thickness of said disc.

4,891,620

INSULATING TUBELESS TRANSFORMER

Bruce C. H. Cheng, No. 15-2, Lane 324, Sec. 2, Shih Pai Road, Taipei, Taiwan

Filed Jul. 22, 1988, Ser. No. 222,926

Int. Cl.[4] H01F *27/30*

U.S. Cl. 336—198 **6 Claims**

1. A electrical transformer, comprising:

first and second substantially identical winding support members, said first support member including

a first winding tube having a first axis extending in an axial direction and

a first seat mounted to said first tube at a first end of said first tube and surrounding a first passageway, said first passageway extending in said axial direction in said first tube and through said first seat;

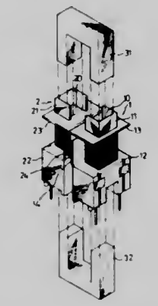
said second support member including

a second winding tube disposed side-by-side with said first tube and having a second axis extending in said axial direction and

a second seat mounted to second first tube at a first end of said second tube and surrounding a second passageway, said second passageway extending in said axial direction in said second tube and through said second seat;

first and second flexable and foldable insulating partitions respectively connected to said first winding support member respectively adjacent the first end of said first tube and a second end of said first tube opposite said first end,

third and fourth flexable and foldable insulating partitions respectively connected to said second winding support member respectively adjacent the first end of said second tube and a second end of said second tube opposite said first end,



a primary wire wound on said first tube about said first axis axially between said first and second partitions;

a secondary wire wound on said second tube about said second axis axially between said third and fourth partitions so as to oppose said primary wire; and

an iron core formed of first and second U-shaped core members, said first core member being inserted into said first and second passageways at said first ends, said second core member being inserted into said first and second passageways at said second ends;

said first and second partitions respectively having free ends folded toward each other, and third and fourth partitions having free ends folded toward each other, so that said first, second, third and fourth partitions separate and insulate said primary wire from said secondary wire.

4,891,621

AMBIENT COMPENSATOR FOR THERMAL OVERLOAD RELAY

Daniel P. Heckenkamp, Sussex, and Roger J. Briggs, Colgate, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 21, 1989, Ser. No. 312,521

Int. Cl.[4] H01H *37/70*

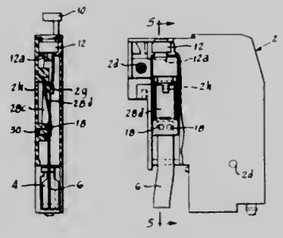
U.S. Cl. 337—49 **11 Claims**

1. A thermal overload relay having ambient compensating means which are mechanically adjustable to also provide a current range within which said relay operates comprising:

manually operable adjustment means, pivot means and locating means supported on a housing, said locating means being intermediate said adjustment means and said pivot means;

a spring comprising first and second transverse ends joined by lateral arms defining a central opening, a cantilever integral with said second end extending into said central opening, and a thermally responsive elongated member attached to said second end and projecting away from said spring oppositely to said cantilever;

said spring being disposed in said housing wherein said lateral arms extend along opposite sides of said locating means, said first end overlies said adjustment means and said second end overlies said pivot means, and



a distal end of said cantilever engaging said housing and holding said cantilever deflected from a normal position thereof, thereby biasing said first end against said adjustment means and said second end against said pivot means.

4,891,622

ENCAPSULATED ELECTRONIC COMPONENTS

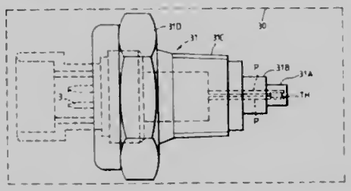
Alan D. Llewellyn, Taunton, Great Britain, assignor to Bowthrope Components Limited, London, England

Filed Jun. 30, 1988, Ser. No. 214,120

Claims priority, application United Kingdom, Jul. 11, 1987, 8716383

Int. Cl.[4] H01C *7/10*

U.S. Cl. 338—22 R **10 Claims**



1. An electronic component including an electronic component element having two electrical connections and two electrical connection terminals making pressure electrical contact with the electrical connections, characterised in that the element is a temperature sensing element and in that a plastics material directly injection moulded over the component element and the electrical connection terminals maintains and enhances the pressure contacts, and further characterised in that each connection terminal comprises an elongate springy metal member.

4,891,623

ELECTRIC REGULATOR UNIT

Kazufumi Obara, Tokyo, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,183

Claims priority, application Japan, Feb. 26, 1988, 63-24871[U]

Int. Cl.[4] H01C *10/32*

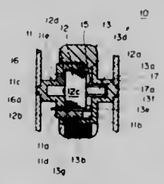
U.S. Cl. 338—163 **12 Claims**

1. An electric regulator unit comprising:

a variable electric component having a body and an operating shaft supported by said body for angular movement relative thereto about an axis of said operating shaft, said operating shaft having an end portion which projects axially from one axial end face of said body;

a holder for said variable electric component, said holder having one axial end face formed therein with a recess, said body of said variable electric component being accommodated in said recess against angular movement relative to said holder about said axis of said operating shaft in such a manner that said end portion of said operating shaft extends away from a bottom of said recess;

a knob for moving said operating shaft of said variable electric component angularly about said axis of said operating shaft relatively to said body of said variable electric component, said knob having a cylindrical outer peripheral surface concentric to said axis of said operating shaft, said knob having one axial end face formed therein with a recess, wherein an assembly of said variable electric component and said holder is accommodated in said recess in said knob in such a manner that said one axial end face of said body of said variable electric component and said one



axial end face of said holder are opposed to a bottom of said recess in said knob, and wherein said end portion of said operating shaft is engaged with said bottom of said recess in said knob such that said operating shaft is movable, together with said knob, about said axis of said operating shaft, the arrangement being such that said outer peripheral surface of said knob is manipulated to move said knob angularly about said axis of said operating shaft relatively to said holder and said body of said variable electric component, thereby moving said operating shaft about said axis thereof relatively to said body; and

friction-torque imparting means arranged between said knob and said assembly for imparting friction torque to the angular movement of said knob relative to said holder and said body of said variable electric component.

4,891,624

REARWARD VEHICLE OBSTRUCTION DETECTOR USING MODULATED LIGHT FROM THE BRAKE LIGHT ELEMENTS

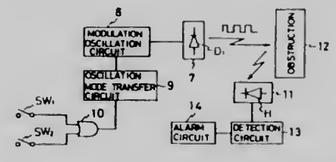
Kiyomitsu Ishikawa, Tokyo; Tohru Tanabe; Shigeru Kimura, both of Yokohama, and Kazuhiko Yamada, Kawasaki, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,773

Claims priority, application Japan, Jun. 12, 1987, 62-145330; Jun. 12, 1987, 62-145331; Jun. 12, 1987, 62-145332; Jun. 12, 1987, 62-145333

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—436 **14 Claims**



1. A detection system for detecting obstructions to a vehicle comprising: a plurality of light emitting elements which also operate as stop signal lamps or tail lamps disposed in the rear of the vehicle, a modulator which causes the light emitting elements to emit modulated light, a plurality of light receiving elements for receiving the modulated light that is transmitted and reflected off an external obstruction, a detection circuit which determines the presence of obstructions and produces an output signal indicating that an obstruction is detected.

4,891,625

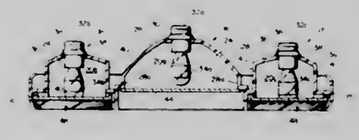
COMBINATION CENTER HIGH MOUNTED STOP LAMP AND CARGO LAMP

Bradley C. VanRiper, Kennedy, and Martin Ong, Lakewood, both of N.Y., assignors to Truck-Lite Co., Inc., Falconer, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,579

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—479 **14 Claims**



1. A combined center high mounted stop lamp and cargo lamp assembly for vehicles to be mounted on a rearwardly facing wall surface of the vehicle body near the top thereof at the transverse center of the vehicle, comprising a unitary integral molded laterally elongated casing member to be mounted on said rearwardly facing wall surface, the casing member being formed with an exterior hood-like collar formation defining an encircling surround about a horizontal transverse elongated plural lamp zone for three side-by-side lamps and the casing member including three substantially parabolic reflector cellular formations extending from the collar formation toward the front of the vehicle as three protruding reflector-forming bulges, the walls of said reflector cellular formations being shaped to define lamp-bulb-housing reflector cavities directing light rearwardly of the vehicle and being provided with reflective metal coatings on the inner surfaces thereof, a lamp bulb removably mounted in the forwardmost portion of the bulge-forming wall of each cellular formation along a principal optical axis of each, and a lens supported by said collar formation in rearwardly covering relation to each respective reflector cavity of the cellular formations, the lens for the centermost cellular formation being a red lens and the lenses for the other two cellular formations in flanking relation therewith being clear lenses, the walls of the cellular formations being of substantially parabolic contour in horizontal cross-section extending along a convex path protruding toward the front of the vehicle from the collar formation and joining a transverse substantially vertical interior partition thereof by short wall sections perpendicular thereto.

4,891,626

REFRIGERATOR DOOR AJAR DETECTION SYSTEM

Charles E. Neuman, Delphos, Ohio, assignor to Neuman Industries, Inc., Delphos, Ohio

Filed Jan. 18, 1989, Ser. No. 298,031

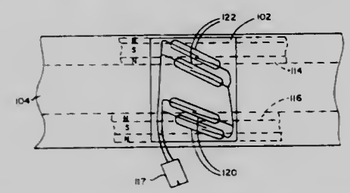
Int. Cl.[4] G05B *21/00*

U.S. Cl. 340—547 **20 Claims**

1. A door status detection system for use in a refrigerator having a cabinet defining a food storage compartment and a door hingedly mounted to said cabinet for selectively closing said compartment, said door including a magnetic sealing strip secured thereto for sealing said door to said cabinet and for maintaining said door in a closed position, said door status detection system comprising:

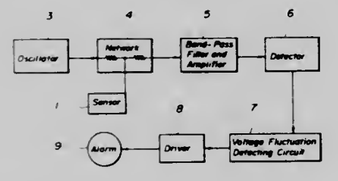
switch array means installed into said cabinet generally adjacent a section of said magnetic sealing strip when said door is in a closed position for signaling the opened/-

closed status of said door, said switch array means being operated by said magnetic sealing strip; and



circuit means connected to said switch array means for signaling a user of said refrigerator if said door remains in an opened position for a defined period of time.

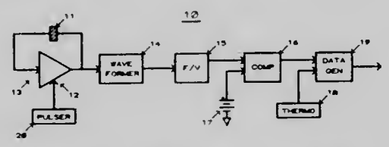
4,891,627
DEVICE FOR DETECTING OBJECT
Eiji Murao, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 129,861, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 20,238, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 734,805, May 15, 1986, abandoned. This application May 9, 1989, Ser. No. 349,914
Claims priority, application Japan, Nov. 22, 1983, 58-220412
Int. Cl.[4] G08B *13/26*
U.S. Cl. 340—562 **4 Claims**



1. A device for detecting an object, comprising:
a first means for converting a variation of a floating capacity between a sensor consisting of an electrode plate and an object to be detected into a variation of a frequency signal;
a second means for converting said frequency signal into a voltage signal;
a third means including first and second amplifiers arranged so that said voltage signal is supplied to both first and second amplifiers which then produce a first amplified signal and a second amplified signal with a delay, respectively; and
a fourth means for comparing said first and second amplified signals and detecting the state of approach of the object in accordance with the attenuation of said voltage signal.

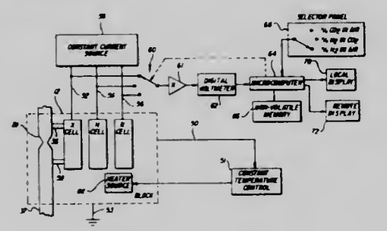
4,891,628
ENVIRONMENTAL MATTER DETECTION SYSTEM
Leonard Zackerman, 1 Westcliff Dr., Dix Hills, N.Y. 11746
Filed Dec. 29, 1988, Ser. No. 291,528
Int. Cl.[4] G08B *19/02*
U.S. Cl. 340—582 **10 Claims**

1. An apparatus for sensing matter accretions on a surface comprising:
an electro-mechanical transducer having a face directly exposed to matter accretions at said surface and a vibration frequency responsive to matter accretions on said face;
oscillator means coupled to said transducer for oscillating at a frequency controlled by said vibration frequency;
means coupled to said oscillator means for providing first signals representative of said oscillating frequencies;
thermostat means for providing second signals representative of temperatures of said surface; and



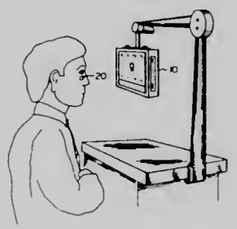
means responsive to said first and second signals for providing signals representative of matter conditions on said face.

4,891,629
BINARY GAS ANALYZER INSTRUMENT AND ANALYSIS METHOD
Jagdish T. Gajjar, Clifton Park; Edwin C. Underkoffler; Craig A. Wroblewski, both of Schenectady, and Michael F. Roman, Rotterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed May 16, 1988, Ser. No. 194,635
Int. Cl.[4] G01N *27/18*
U.S. Cl. 340—632 **45 Claims**



1. A gas analyzer instrument capable of determining the percent composition of a binary gas mixture of known constituents, said analyzer instrument comprising:
a first reference cell having a first gas therein, said first gas having a thermal conductivity near the thermal conductivity of one of said constituent gases;
a measurement cell having said binary gas mixture therein;
means for maintaining said cells at a substantially constant temperature;
a thermistor positioned within each of said cells;
means for supplying a substantially constant electrical current to each of said thermistors for heating thereof, the gas in each of said cells conducting heat away from the thermistor;
voltage measuring means selectably connectable across each of said thermistors to measure voltage drop across said thermistors; and
computational means for automatically translating the voltage drop across said measurement cell thermistor into a percent compositional reading of said binary gas constituents, said computational means utilizing the voltage drop across said first cell thermistor as a reference.

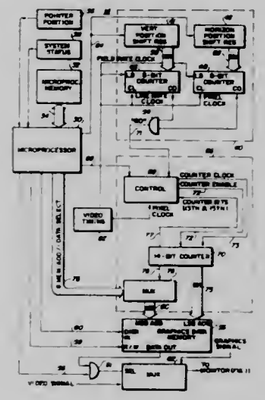
4,891,630
COMPUTER VISION SYSTEM WITH IMPROVED OBJECT ORIENTATION TECHNIQUE
Mark B. Friedman, 5539 Darlington Rd., Pittsburgh, Pa. 15217, and Gary J. Kiliany, 5030 Centre Ave., Apt. 459, Pittsburgh, Pa. 15213
Filed Apr. 22, 1988, Ser. No. 185,062
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—706 **24 Claims**



1. A system for computer vision based upon an image sensor that maps an image to memory cells to association with a computer comprising:
an object orientation and position patch for being attached to an object to be observed comprising a planar substantially nonreflective surface, at least three substantially coplanar and non-collinear reflective locations (a, b, and c) positioned upon the patch and a reflector (d) having the reflective properties of the surface of a regular curved surface intersecting the planar surface,
an image sensor comprising means for generating a two-dimensional digital representation of the image stored in an array of memory cells arranged in a plurality of rows and column, each cell having an associated row and column address and being accessible for reading,
a lens for focusing an image of the object including the orientation and position patch upon the image sensor, said lens defining an optical axis extending through the center of the lens and intersecting the image sensor near the center thereof,
a light source fixed relative to the sensor and lens and being directed outwardly therefrom;
a computer having a processor and main memory, and means for reading the row and column addresses of the memory cells corresponding to the images (a', b', and c') of reflective locations a, b, and c and an image (dls) of the light source reflected from the reflector d, and
said computer having a task stored in main memory for detecting and quantifying a change in orientation and position of the object, said task detecting changes in the position along the optical axis and in directions perpendicular thereto by computing changes in the row and column addresses of the memory cells corresponding to the images a', b', and c', and said task detecting change in rotation about axes perpendicular to the optical axes by computing differences in the row and column addresses of the memory cells corresponding to the image dls and the images a', b', and/or c'.

4,891,631
GRAPHICS DISPLAY SYSTEM
John R. Fredlund, Rochester, and Raymond E. Wess, Holley, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 11, 1988, Ser. No. 142,095
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—709 **10 Claims**

1. A graphics generator for use in a video display system, said video display system including a video monitor and means for applying a video signal to said video monitor to provide a video picture on said video monitor, said graphics generator comprising:
video timing means for providing a line rate clock signal and a pixel rate clock signal to synchronize said video signal for display on said video monitor;
a microprocessor configured to provide digital data representative of graphical icons for display on said video monitor, a memory load clock signal of slower frequency than said pixel rate clock signal, and position data indicating the line and pixel on said video monitor at which selected ones of the graphical icons are to be displayed;
graphics memory means for selectively writing in, storing, and reading out said digital data;
graphics positioning means operating in synchronism with said line rate and pixel rate clock signals for generating an actuating signal at a time determined by said position data;



addressing means responsive to said microprocessor for generating write addresses to address said graphics memory means and write said digital data serially into said graphics memory means bit-by-bit in synchronism with said load clock signal, said addressing means further responsive to both said microprocessor and said actuating signal for generating read addresses to address said graphics memory means and read said digital data serially out of said graphics memory means bit-by-bit in synchronism with said pixel rate clock signal;
means for providing a graphics signal to display a selected color on said video monitor; and
means responsive to the digital data read from said graphics memory means for selecting said video signal or said graphics signal for display on said video monitor.

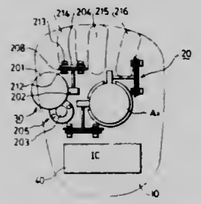
4,891,632
COMPUTER GRAPHIC DRAWING APPARATUS WITH COARSE AND FINE CONTROLS
David Chang, Taipei, Taiwan, assignor to King Phoenix Co., Ltd., Taipei, Taiwan
Filed Jan. 20, 1988, Ser. No. 146,293
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **7 Claims**

1. A computer graphic drawing apparatus having a housing unit adapted to be suitably held in hand for graphic drawing operation with a plurality of push buttons provided at a front portion thereof, a coarse adjusting device rotatably installed in the housing unit for drawing long lines and making coarse adjustments according to the movement of the housing unit, means for detecting said movement and producing electrical signals corresponding to said movement in the x and y direc-

tions, and an IC arrangement disposed in the housing unit and electrically connected to the push buttons and the coarse adjusting device for being coupled with a host computer through a transmission interface, said drawing apparatus comprising:

a fine adjusting means rotatably provided at one side of the housing unit for being continuously manipulated in all directions for making fine adjustments by a user's thumb during graphic drawing operations, said fine adjusting means being spaced apart from said push buttons and said coarse adjusting device, the distance between said fine adjusting means and said push buttons being determined to allow said manipulation of said fine adjusting means by the user's thumb while said user's middle fingers are in position adjacent said push buttons for operation thereof and movement of said housing;

a first rotary means of an X coordinate axis is disposed in the housing unit, having one end portion rotatably engaged with said fine adjusting means for being rotated along with said manipulation of said fine adjusting means in the X-axis direction;



a second rotary means of a Y coordinate axis disposed in the housing unit, having one end portion rotatably engaged with said fine adjusting means for being rotated along with said manipulation of said fine adjusting means in the Y-axis direction;

a first encoding means provided at another end portion of said first rotary means and electrically connected to the IC arrangement for producing encoding signals therefrom along with rotations of said first rotary means in the X-axis direction; and

a second encoding means provided at another end portion of said second rotary means and electrically connected to the IC arrangement for producing encoding signals therefrom along with rotations of said first rotary means in the Y-axis direction, when said fine adjusting means is rotatably and continuously manipulated through a user's thumb to make fine movement in all directions during a computer graphic drawing operation, fine adjustment in the X-axis and Y-axis directions will be effected on an associated CRT of the host computer.

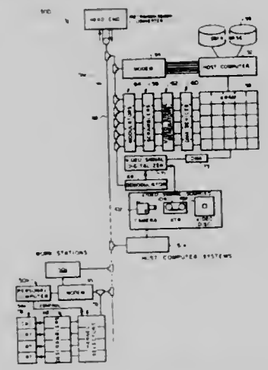
4,891,633

DIGITAL IMAGE EXCHANGE SYSTEM

Kazuyoshi Imazeki, and Yasuo Nagazumi, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,587
Int. Cl.[4] H04K *1/00*
U.S. Cl. 340—717 21 Claims

1. A digital image exchange system comprising: a single bidirectional data transmission line for exchanging digital images; video RAM means; video signal generator means for accessing data from said video RAM means and for developing at least two video signals corresponding respectively to the accessed data; a plurality of modulator means for modulating said video signals to form transmitted signals in a least two different frequency bands to be transmitted on said data transmission line; a plurality of demodulator means coupled to said transmission line at a location remote from said modulator means for demodulating said transmitted signals in each of said



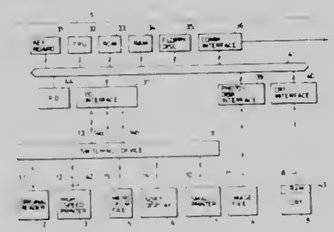
at least two frequency bands to form at least two corresponding video signals; and at least one video display device operatively coupled with said each of said demodulator means for displaying visual images corresponding to the respective video signals.

4,891,634

IMAGE PROCESSING SYSTEM WITH DESIGNATABLE OUTPUT LOCATION AND OUTPUT RESOLUTION CONTROL

Kenzoh Ina; Yasuhisa Ishizawa, both of Yokohama, and Hideo Kuo, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 658,760, Oct. 9, 1984, abandoned. This application Apr. 1, 1988, Ser. No. 177,899
Claims priority, application Japan, Oct. 17, 1983, 58-193872; Oct. 17, 1983, 58-193873
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—723 16 Claims



1. An image processing system comprising:

input means for inputting image information

storage means for storing the image information input by said input means;

a plurality of output means for outputting the image information read out from said storage means, said output means being selectably connected to said system;

connecting means for connecting said input means and said storage means to each of said output means; and

control means connected to said connecting means and having a function of detecting a parameter associated with the operation of each of said plurality of output means,

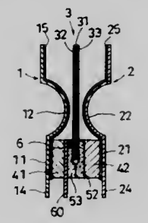
wherein said control means controls input processing by said input means in response to a detected parameter of at least one of said output means to perform output processing, and controls said storage means such that the input information is stored in said storage means in accordance with said detected parameter.

4,891,635

ELECTROSTATIC DISPLAY ELEMENT

Kazuo Hata, Kakogawa, Japan, assignor to Daiwa Shinku Corp., Osaka, Japan

Continuation of Ser. No. 88,692, Aug. 24, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 328,813
Claims priority, application Japan, Aug. 25, 1986, 61-129690
Int. Cl.[4] G09G *3/16*
U.S. Cl. 340—783 4 Claims



1. An electrostatic display element operating under an electrostatic force produced by an electric voltage imposed between a pair of color-faced fixed electrodes and a bendable film-like electrode positioned between said color-faced fixed electrodes and made of a plastic film plated on both surfaces with a mirror-faced metallic layer, said electrostatic display element comprising:

a film holder for providing electric connection between both surfaces of said bendable electrode, said film holder consisting of two electrically conductiing contact plates made to contact respectively with both surfaces of said bendable electrode at its lower portion and extending downwardly over the lower end of said bendable electrode in order to come into contact with each other below the lower end of said bendable electrode, at least one of said electrically conducting contact plates being made of an electrically conducting elastomer, and said film holder being sandwiched between the lower portions of said color-faced fixed electrodes with electrically insulating spacers interposed; and

an electric lead plate inserted between said film holder and one of said spacers so as to be in electrical connection with said film holder, said electric lead plate extending downwardly over the lower end of said film holder;

whereby said film-like bendable electrode not only has both its surfaces connected electrically but also is mechanically held so as to be free from wrinkles.

4,891,636

ELECTRONIC KEYLOCK SYSTEM

David A. Rieker, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 123,430, Nov. 20, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 338,500
Int. Cl.[4] H04Q *1/00, 3/02*
U.S. Cl. 340—825.310 14 Claims

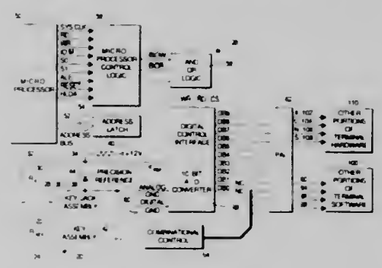
1. An electronic lock and key system comprising:

a plurality of key means including a plurality of different first precision resistor means;

receiving means for receiving said key means, said receiving means comprising a receptacle for said key means, a precision source of potential, second precision resistor means and precision reference means, said receiving means being capable of producing a plurality of output voltages representative of a plurality of first precision resistor means of different resistances in said plurality of different key means which are received by the receptacle of said receiving means;

analog-to-digital conversion means operatively coupled to said receiving means and capable of converting said plurality of output voltages representing different key means to a corresponding plurality of digital output values and having a plurality of outputs for outputting a plurality of different digital values greater than zero;

first control means for controlling said analog-to-digital conversion means to cause it to measure the resistances of the first precision resistor means of said key means which are operatively engaged with the receptacle of said receiving means, said first control means comprising control logic means; address latch means; microprocessor means coupled to said control logic means and said address latch



means for applying inputs thereto; and additional logic means coupled to said control logic means and said address latch means to receive inputs therefrom and to provide output signals to said analog-to-digital conversion means;

programmable array logic means operatively coupled to said plurality of outputs of said analog-to-digital conversion means for receiving said digital output values from said analog-to-digital conversion means and decrypting said digital values to provide information on output means of said programmable array logic means relating to identification of different key means which are operatively engaged with the receptacle of said receiving means; and

second control means for controlling the programmable array logic means.

4,891,637

ACKNOWLEDGE BACK PAGER WITH APPARATUS FOR CONTROLLING TRANSMIT FREQUENCY

Kazimierz Siwiak, Coral Springs; James M. Keba, Sunrise, and Francis R. Steel, Parkland, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,655
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.44 7 Claims

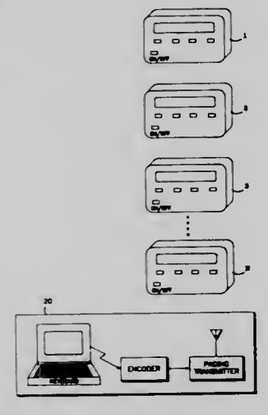
1. In a radio paging system including a central paging station for transmitting paging signals including a group of pager addresses on a paging channel frequency F_{RX} to a group of corresponding remotely located acknowledge back radio pagers, said central station transmitting said pager addresses in a predetermined order over a first time interval, each acknowledge back pager capable of controlling a sub channel frequency F_{TX} on which it transmits acknowledge back signals, an acknowledge back pager of said system comprising:

receiving means for receiving said paging signal on the channel frequency F_{RX};

measuring means, coupled to said receiving means, for measuring the channel frequency of the received paging signal;

selecting means for selecting a sub-band frequency from a plurality of frequency sub-bands within a predetermined

range of frequencies in accordance with a predetermined relationship based on the predetermined order in which said pager's address is being transmitted in said group, said selected frequency sub-band being the sub-channel frequency for transmission on an acknowledge back signal by said pager;



determining means for determining a frequency offset F_D of the measured channel frequency corresponding to said selected sub-band frequency;

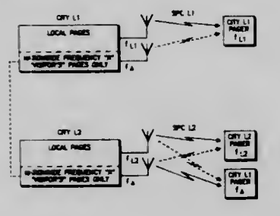
transmitter means, coupled to said determining means, for generating an acknowledge back signal at said selected sub-band frequency including both the measured channel frequency and the determined offset frequency.

4,891,638

NATIONWIDE DISPLAY PAGER WITH LOCATION READOUT

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 30, 1987, Ser. No. 114,923
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.440 **13 Claims**



1. A selective call receiver for receiving and displaying transmitted coded message signals on a plurality of channels, said coded message signals including channel identification information identifying a source of transmission for each of said plurality of channels, said selective call receiver comprising:

detecting means for detecting transmitted coded message signals;

decoding means responsive to said coded message signals for decoding said channel identification information;

memory means containing a table including the channel identification information identifying each source of transmission for each of the plurality of channels, and further containing displayable location indicia corresponding thereto, and predetermined channel identification information identifying at least one predetermined channel;

channel selecting means responsive to said decoding means for selecting the at least one predetermined channel when said decoded channel identification information is the same as said predetermined channel identification information, and further for selecting a second channel of the plurality of channels when said decoded channel identification is different than said predetermined channel identification information;

comparison means, coupled to said memory means and said decoding means, for detecting identity between the decoded channel identification information and said stored channel identification information for identifying the transmission source on the selected channel in response thereto; and

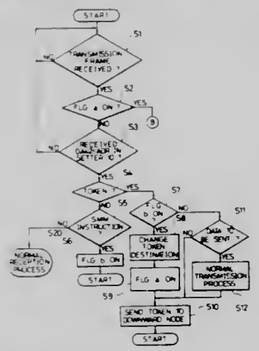
interrogation means, coupled to said comparison means, and accessible to the receiver user to cause the receiver to display said location indicia corresponding to the channel identification information received on the selected channel, thereby positively identifying the source of the coded message signal transmission.

4,891,639

MONITORING SYSTEM OF NETWORK

Yasuo Nakamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,313
Claims priority, application Japan, Jul. 1, 1987, 62-162475
Int. Cl.[4] H04J *3/02*; **G06F** *11/00*
U.S. Cl. 340—825.500 **5 Claims**



1. A network monitoring system in which a plurality of data transmitting apparatuses are connected to a communication medium and only one of said plurality of data transmitting apparatuses to which a communication right was transferred can acquire a transmission right of data, each of said plurality of data transmitting apparatuses being capable of operating in a normal operating mode and a communication medium monitoring mode, wherein each data transmitting apparatus can receive and transmit data in the normal mode, and can receive data determined to be transmitted to any one of said plurality of data transmitting apparatuses but cannot transmit data in the communication medium monitoring mode, each of said plurality of data transmitting apparatus comprising:

first discriminating means for discriminating, in the normal operating mode, whether received data is addressed to said data transmitting apparatus;

second discriminating means for discriminating whether the received data discriminated to be addressed to said data transmitting apparatus by said first discriminating means includes a communication right transfer instruction;

memory means for discriminating and storing a communication medium monitoring instruction; and

control means for, when the communication medium monitoring instruction is stored in said memory means, changing from the normal operating mode to the communication medium monitoring mode, transmitting the communication right transfer instruction to a downward data transmitting apparatus, and instructing an upward data transmitting apparatus previously having said data transmitting apparatus as the destination of the communication right transfer instruction to change the destination of the communication right transfer instruction.

4,891,640

HIGH TEMPERATURE AND PRESSURE FIBER OPTIC FEEDTHROUGH FOR BOREHOLE USAGE

Matthew Ip, Austin, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Nov. 3, 1988, Ser. No. 266,185
Int. Cl.[4] G02B *6/38*
U.S. Cl. 340—853 **3 Claims**



1. An optical feedthrough connector and tool for insertion into a tool housing suitable for use in a well borehole at pressures to 25,000 psi and temperatures to 450° F. with an optical fiber having an outer protective fluorocarbon coating, comprising:

(a) an elongate connector body member having an upper end and a lower end and a connecting bore therethrough, said bore being sized to receive an optical fiber having an outer protective coating, said upper end of said connector body member having an elastomer retaining cavity therein;

(b) a retaining nut member threadedly connected to the upper end of said connector body and having a bore therethrough in coaxial alignment with said connecting bore in said body member;

(c) a wear washer sized to fit in the upper end of said cavity of said connector body member;

(d) elastomer seal means disposed in said elastomer retaining cavity adjacent to an elastomer support means disposed at the lower end of said elastomer retaining cavity arranged so that, when said retaining nut member is tightened on said body member, said elastomer seal means is sealingly urged against the exterior of the optical fiber as said elastomer seal means is compressed between said wear washer and said elastomer support means to thereby form a sealing engagement between said elastomer seal means and the optical fiber; and

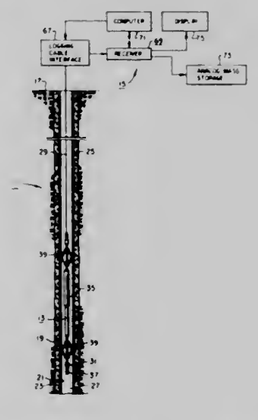
(e) an insertion tool for inserting said fiber through said elastomeric sealing means and into said connecting bore, said insertion tool comprising a syringe having a funnel entry into a bore extending therethrough and a detachable needle means aligned with said bore, said bore being sized to receive the optical fiber.

4,891,641

METHOD FOR TRANSMITTING DATA OVER LOGGING CABLE

Michael F. Gard, and Donald G. Kyle, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1988, Ser. No. 291,568
Int. Cl.[4] G01V *1/40*
U.S. Cl. 340—857 **9 Claims**



1. A method of transmitting data over a logging cable, said logging cable connecting a logging apparatus operating in a well borehole to surface equipment, said logging cable providing an electrical Communications channel between said logging apparatus and said surface equipment, said logging cable communications channel having a bandwidth, said cable channel bandwidth having an upper end portion which attenuates signals, comprising the steps of:

(a) operating said logging apparatus to produce a logging signal for transmission to said surface equipment, said logging signal having variations in amplitude which variations contain logging information, said logging signal comprising frequencies that are located within said cable channel bandwidth upper end portion;

(b) providing a carrier waveform, said carrier waveform having a first center frequency;

(c) producing a frequency-modulated waveform to contain said logging information, said frequency-modulated waveform having an instantaneous frequency that differs from the first center frequency by an amount that corresponds to the instantaneous amplitude of said logging signal;

(d) relocating said frequency-modulated waveform to a second center frequency, said second center frequency being located in the upper end portion of said cable channel bandwidth so as to preserve the high frequencies of said logging signal which are within said cable channel bandwidth upper end portion;

(e) transmitting said frequency-modulated waveform over said logging cable from said logging apparatus to said surface equipment;

(f) receiving said frequency-modulated waveform from said logging cable on the surface of said well borehole;

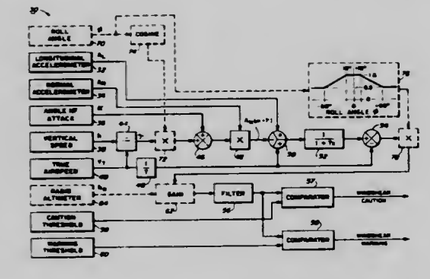
(g) reconstructing said logging signal on the surface by converting said instantaneous frequency changes in said frequency-modulated waveform to instantaneous amplitude changes.

4,891,642

WIND SHEAR DETECTION SYSTEM

Hans R. Muller, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 11, 1988, Ser. No. 142,463
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—968 **15 Claims**



1. A wind shear detection system for an aircraft comprising:
means for receiving a longitudinal accelerometer signal;
means for receiving a normal accelerameter signal;
means for receiving a signal representative of the air speed of the aircraft;
means for receiving a signal representative of the flight path angle of the aircraft;
means for receiving a signal representative of the angle of attack of the aircraft;
means for multiplying the normal accelerometer signal with the sum of the flight path angle and angle of attack representative signals, taking the difference between the resulting product and the sum of the longitudinal accelerometer signal and the airspeed representative signal and integrating the difference to provide a composite signal; and
means for comparing the signal representative of airspeed with the composite signal and generating a signal representative of the difference therebetween indicative of wind shear.

4,891,643

ARITHMETIC CODING DATA COMPRESSION/DE-COMPRESSION BY SELECTIVELY EMPLOYED, DIVERSE ARITHMETIC CODING ENCODERS AND DECODERS

Joan L. Mitchell, Ossining, and William B. Pennebaker, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,700
Int. Cl.[4] H03M *7/30*
U.S. Cl. 341—107 **33 Claims**



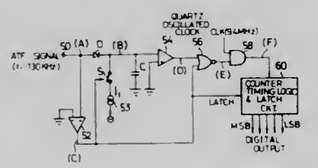
1. Data compression apparatus using arithmetic coding wherein a data stream is input and decision events are generated in response to an encoding convention producing a code stream with values identifiable in terms of code points along a probability line, comprising:
a first arithmetic coding encoder means for generating, in response to decision events being entered as input, a first code stream according to a first encoding convention;
a second arithmetic coding encoder means for generating, in response to decision events being entered as input, a second code stream according to a second encoding convention;
pointer means, responsive to a given set of decision events entered as input to said first and second encoder means, for identifying corresponding code stream values output by each encoder means as different code points along a probability line, with the identified point of each encoder means being in a respective interval in the probability line in accordance with the respective coding convention; and
means for altering the value of the first code stream so that the identified point of the first code stream and that of the second code stream are in the same interval along the probability line in response to the given set of decision events being entered as input to each encoder means.

4,891,644

DEVICE FOR DETERMINING PICK-UP HEAD TRACKING ERROR IN A DIGITAL TAPE PLAYER

Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 1,877, Jan. 8, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 207,882
Claims priority, application Japan, Jan. 14, 1986, 61-6081
Int. Cl.[4] H03M *1/52*; G11B *21/10*
U.S. Cl. 341—128 **6 Claims**



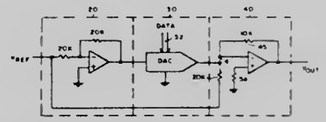
1. A device for determining pick-up head tracking error in a digital tape player which uses tape having plural parallel tracks recorded diagonally across the tape comprising:
a pick-up head for reading from the tape a pilot signal of multiple cycles;
conversion means for sampling the pilot signal during each cycle thereof to obtain a single analog signal proportional to the peak value of each cycle of the pilot signal and for converting each analog signal to a digital signal representative of each peak value;
sampling clock generation means for generating a sampling clock in synchronism with the pilot signal to control the timing of the sampling of the pilot signal by the conversion means; and
means of determining pick-up head tracking error based on the digital signal.

4,891,645

DIGITAL-TO-ANALOG CONVERTER WITH ON-BOARD UNITY GAIN INVERTING AMPLIFIER

Stephen R. Lewis, Reading, and Scott A. Lefton, Melrose, both of Mass., assignors to Analog Devices Inc., Norwood, Mass.

Filed Oct. 4, 1988, Ser. No. 253,072
Int. Cl.[4] H03M *1/78*
U.S. Cl. 341—154 **10 Claims**



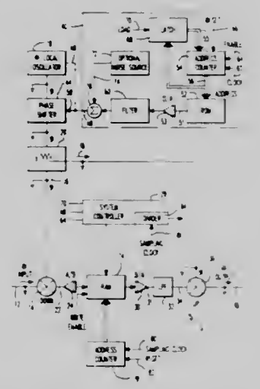
1. A digital-to analog converter comprising:
a first inverting operational amplifier having an input coupled to receive a reference voltage and an output;
a resistive ladder array for converting digital words to corresponding analog currents, having an input coupled to said first inverting amplifier and an output coupled to a summing junction, said resistive ladder array being of the type that divides a current supplied at its input, in accordance with a digital word, and transmits a first portion of said input current to the output of said resistive ladder array and a second portion to an analog ground connection;
a second inverting operational amplifier having an input and an output, the input being coupled to the output of said resistive ladder at said summing junction.

4,891,646

MODULATED SINGLE CHANNEL DIGITAL RADIO FREQUENCY MEMORY (DRFM)

Richard J. Wiegand, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1988, Ser. No. 290,391
Int. Cl.[4] G01S *7/38*
U.S. Cl. 342—15 **11 Claims**



1. A modulated digital radio frequency memory suitable for use as a coherent radio frequency memory in a military electronic countermeasure system, said memory including an RF local oscillator for producing local oscillator signal;
means for modulating a local oscillator signal with a modulating analog waveform and optionally containing discrete digital levels in a pattern for ease of replication;
a first mixer for converting an RF input signal and modulated local oscillator signal into an intermediate frequency signal representative of both the RF input and the modulated LO;
an analog-to-digital converter for converting the intermediate frequency signal into digital values;
digital memory means for storing the digital values in accordance with the occurrence of the RF input signal for later retrieval;
digital-to-analog converter means for converting the retrieved digital values into an analog signal;
an intermediate frequency filter for filtering the analog signal;
a second mixer for converting the filtered analog signal and said modulated local oscillator signal into a demodulated RF output signal; and
means for controlling the modulating and memory means such that the pattern of the modulation of the local oscillator signal which is applied to the second mixer when specific digital values are being retrieved and converted from the digital memory means is reproduced identical to the pattern of the modulation which is in the local oscillator signal applied to the first mixer when the specific digital values are converted and stored in the digital memory means so that the output RF signal resembles the input RF signal in form and duration, said means for controlling the modulating and memory means including a waveform generator comprising a digital ROM having stored therein an addressably retrievable string of a pseudo randomly arranged sequence of one bit words, any successive number of such words retrieved from the ROM in a bit pattern, digitally representing the pattern of the modulating analog waveform to be reproduced;
a resettable address counter coupled to the ROM for addressably calling the bit pattern beginning at any random starting address chosen in accordance with the occurrence of an input signal pulse, and setting the counter to that random address with a load pulse;
the address counter being enabled thereafter to call the bit pattern during a time interval corresponding to the RF input pulse width;
said address counter being resettable to the starting address upon the occurrence of a reset pulse occurring after programmed storage length of the converted intermediate frequency signal in the digital memory means;
said address counter being enabled to call the bit pattern during a subsequent time interval corresponding to the occurrence of the demodulation of the RF output.

4,891,647

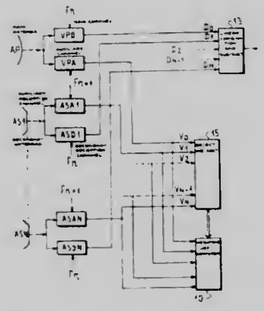
METHOD AND A DEVICE FOR REDUCING THE POWER OF JAMMING SIGNALS RECEIVED BY THE SECONDARY LOBES OF A RANDOM FREQUENCY RADAR ANTENNA

Gérard Auvray, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 5, 1983, Ser. No. 460,076
Claims priority, application France, Jan. 22, 1982, 82 01012
Int. Cl.[4] H04K *3/00*; G01S *7/36*
U.S. Cl. 342—16 **20 Claims**

1. A method for reducing the power of jamming signals received by the secondary lobes of a main antenna of a radar at the random frequency $f_e(n)$, said radar including a plurality N of secondary antennas and main and secondary processing channels for each of said main and secondary antennas, said method in which, when the length Δt of the recurrence trains at the fixed frequency $f_E(n)$ is at the most equal to the stationariness of the jamming signals received, a weighted linear combination is made of the complex signals formed by the various range slots, which are delivered by the main and secondary processing channels, the weighting coefficients being so determined as to reduce the resulting jamming power, and the weighting coefficients relating to the transmission frequency $f_E(n+1)$ of the next recurrence train are calculated from signals received by the main and secondary antenna

secondary channels and processed at the said transmission frequency $f_E(n+1)$ during the period of reception of the radar



signals at the transmission frequency $f_E(n)$ of the preceding recurrence train so as to eliminate parasitic interference signals in the calculation of the weighting coefficients.

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AIRCRAFT RADAR ARRANGEMENT

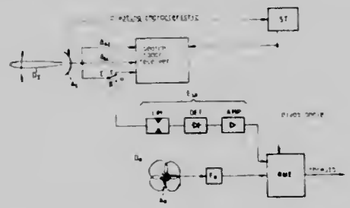
Franz Jehle, Ulm, and Roland Drescher, Voehringen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 18, 1988, Ser. No. 195,324

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716857

Int. Cl.[4] G01S *7/40*

U.S. Cl. 342—20 **8 Claims**



1. In an on-board radar arrangement for an aircraft including a search radar having a sharply focused transmit/receive antenna oriented generally in the direction of travel of said aircraft for providing a first reception signal, and an antenna direction control for providing an antenna orientation signal and further including a radar warning system for detection and analysis of remote radar having an omnidirectional receiving antenna for providing a second reception signal, the improvement comprising;

a first circuit for providing said first reception signal to the radar warning system,

a second circuit for providing said orientation signal to said radar warning system, and

means associated with said radar warning system including means for utilizing said first and second reception signals to enhance the reception resolution in the direction of flight of said aircraft in order to achieve increased sensitivity of remote radar detection in said direction of flight of said aircraft, and means for utilizing said orientation signal and said first and second reception signals to distinguish between the detection of radar located in said direction of flight and the detection of radar not located in said direction.

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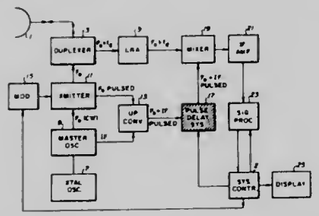
NOISE SUPPRESSOR FOR PULSED SIGNAL RECEIVERS

Frederik Labaar, Long Beach, and Algie L. Lance, deceased, Los Angeles, both of Calif. (by Helen E. Lance, executrix), assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 2, 1988, Ser. No. 239,918

Int. Cl.[4] G01S *7/30*

U.S. Cl. 342—203 **22 Claims**



1. An improved pulse type radar system, comprising:

RF transmitter means for generating RF energy pulses, said pulses being repeated at regular intervals defining a pulse repetition time;

RF receiver means for receiving and processing RF energy pulses;

antenna means for radiating RF energy pulses supplied by said transmitter means into space and for receiving RF energy pulses propagated from space and coupling said received RF energy pulses to said receiver means;

said transmitter means including:

RF generator means for supplying an RF carrier of principal frequency, F_o, and including phase noise, $\phi(t)$, represented by slight random phase changes with time of said RF carrier from said principal frequency;

pulse generating means for enabling said RF generator means for a predetermined pulse width interval and at a predetermined pulse repetition rate, whereby RF pulses of said carrier frequency spaced apart in time by said pulse repetition time are consecutively generated by said transmitter means and are propagated into space by said antenna means;

said receiver means for receiving such portion of said transmitted RF energy pulses as may be reflected from an RF energy reflecting object located within the space upon which object said transmitted pulses are incident, whereby said reflected RF pulse is received following an interval of time, T, said time being the period taken for a transmitted RF pulse to travel from said transmitter to said object and return to said receiver means;

said receiver means, including:

front end means for detecting RF energy at said antenna means and supplying said detected RF energy at an output;

RF mixer means, having at least two inputs and an output, for combining RF energy applied at said inputs to an intermediate frequency (IF) RF, F_{if}, at an output; said intermediate frequency energy having a frequency which is the difference of the frequencies of the two RF signals applied to said respective inputs;

said receiver front end means output being coupled to an input of said mixer means for supplying said receive detected RF pulses to a first input of said mixer means;

local oscillator means for supplying an RF signal to one input of said mixer of a frequency equal to the sum of said carrier and IF comprising:

frequency upconverter means for upconverting each transmitted RF energy pulse coupled from the transmitter means to produce a copy of the transmitted RF pulse, including the latter's phase noise;

duplicate pulse generating means coupled to the output of said upconverter for providing a contiguous train of RF pulses that are copies of the RF pulse inputted by said upconverter means, said train extending over an interval of time, T_2, said interval T_2 being at least as great as said time T, said pulse width interval, but less than said transmitter means pulse repetition time;

and coupling means for coupling the output of said local oscillator means to said local oscillator input of said RF mixer means;

whereby said phase noise contained in said duplicate RF pulse essentially cancels the corresponding phase noise contained in the received reflected RF pulse to provide an intermediate frequency RF output from said mixer of reduced phase noise content;

amplifier and display means for processing and displaying pulses appearing in the IF frequency output from said RF mixer means, representing received RF pulses;

range gating means for enabling said processing said display means at selected time intervals, T_a, T_b, $T_c \ldots T_n$, which intervals covers partially or wholly said pulse repetition interval, following the transmission of each RF pulse by said transmitter means, whereby pulse information displayed may be limited to those received within a period commencing with or in an interval of time in which a reflected RF pulse is received; and

control means for controlling said selected time intervals of said range gating means and said time period T_2 of said duplicate RF pulse generating means.

4,891,650

VEHICLE LOCATION SYSTEM

Eliezer A. Sheffer, Plainview, N.Y., assignor to TrackMobile Inc., San Diego, Calif.

Filed May 16, 1988, Ser. No. 194,479

Int. Cl.[4] G01S *3/02*

U.S. Cl. 342—457 **36 Claims**

1. A system for determining a location of at least one selected vehicle from which a signal such as an alarm signal is generated:

a fixed array of a plurality of individual wireless signal detecting means, each of said individual wireless signal detecting means for receiving an input alarm signal having a strength which is a function of the distance between the position of the selected vehicle generating said alarm signal and the position of each of said individual one of said plurality of wireless signal detecting means;

each of said individual wireless signal detecting means of said array including a wireless signal generating means for transmitting an output signal which is a function of the strength of said input alarm signal;

a main wireless signal detecting means for receiving an output signal from each of said individual wireless signal generating means; and

a control monitoring means, coupled to said main wireless signal detecting means, for receiving output signal there from, each of said output signals which is a function of the strength of said received input alarm signal, for calculating the approximate location of said selected vehicle from which an alarm signal is generated and for continuously recalculating the approximate location of said selected vehicle as its location changes.

4,891,651

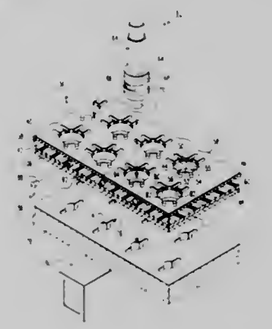
LIGHT PLANE COMMUNICATION SYSTEM FOR USE IN A PHASED ARRAY ANTENNA

John H. Staehlin, Latherville, and John R. Colgan, Lothian, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 6, 1988, Ser. No. 254,016

Int. Cl.[4] H01Q *3/30*

U.S. Cl. 343—853 **19 Claims**



1. A light plane assembly for passing an information signal provided from a phased array antenna control system to a plurality of individual phase control modules forming the antenna array comprising:

a translucent member for placement within a phased array antenna housing;

said translucent member having a plurality of openings therethrough, each of said openings adapted to receive at least a portion of a phase control module having optic signal receiving means thereon;

light transmitting means positioned in optic communication with said translucent member and connected with said phased array antenna control system, said light transmitting means being operable to convert an electrical information signal provided from said antenna control system to an equivalent optic information signal;

said light transmitting means providing said optic information signal to said translucent member for transmission through an interior portion of said translucent member; and

said optic information signal transmitted through said translucent member interior portion being received by said phase control module optic signal receiving means.

4,891,652

IMAGE RECORDING APPARATUS USING PLURAL TYPES OF ENERGY AND REVERSIBLE TRANSFER RECORDING MEDIUM CONVEYANCE

Tadashi Sato, Kokubunji, and Shinnosuke Tanishi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,051

Claims priority, application Japan, Mar. 10, 1986, 61-50568

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **28 Claims**

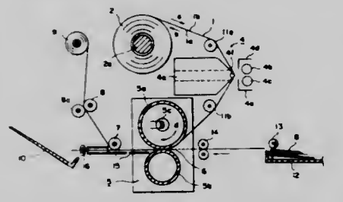
10. An image recording apparatus comprising:

conveying means capable of conveying a transfer recording medium having a transfer recording layer whose transfer characteristics change on application of a first energy and a second energy different from said first energy thereto;

a recording section having first and second energy applying means disposed along a conveying path for said transfer recording medium conveyed by said conveying means, said first and second energy applying means each applying

said first energy and said second energy to said transfer record medium;

a transfer section for transferring an image formed on said transfer recording medium in said recording section onto a recording medium; and



control means for controlling such that said conveying means conveys said transfer recording medium either in a recording direction from said recording section to said transfer section or in a non-recording direction from said transfer section to said recording section

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4,891,653

IMAGE RECORDER WITH MICROSTEP DRIVEN MOTOR TRANSPORT

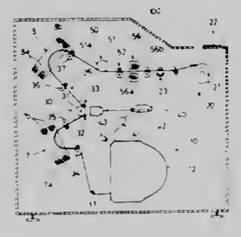
Akiyoshi Hamada, and Mitsutoshi Yagoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

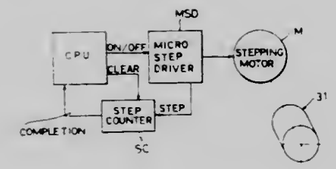
Filed Apr. 25, 1988, Ser. No. 185,904

Claims priority, application Japan, Apr. 27, 1987, 62-103781; Apr. 27, 1987, 62-103782

Int. Cl.[4] G01D *15/24, 15/14;* **H04N** *1/23*

U.S. Cl. 346—108 **4 Claims**





2. An image forming apparatus for forming in series a plurality of images on a photosensitive film of the long roll type comprising:

feeding means for feeding the film;

discharging means for discharging an image-recorded film;

transporting means interposed between said feeding means and said discharging means for transporting the film from said feeding means to said discharging means;

a stepping motor for driving said transporting means;

a microstep driver for controllably driving said stepping motor in a plurality of microsteps constituting one step unit of said stepping motor;

imaging means for scanning and exposing the film being transported by said transporting mean in a direction normal to a film transporting direction whereby when an imaging operation is completed, a stop position for said stepping motor is determined; and

initial control means for re-setting said stepping motor to said stop position determined at the completion of the immediately preceding imaging operation before re-energizing said stepping motor for a next imaging operation.

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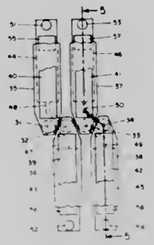
INK JET ARRAY

Paul A. Hoisington, Norwich, Vt.; Robert R. Schaffer, Canaan, and Kenneth H. Fischbeck, Hanover, both of N.H., assignors to Spectra, Inc., Hanover, N.H.

Continuation of Ser. No. 94,665, Sep. 9, 1987, Pat. No. 4,835,554. This application Feb. 28, 1989, Ser. No. 316,978

Int. Cl.[4] G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—140 R **7 Claims**



1. An ink jet system comprising an aligned plurality of ink jet orifices, a plurality of ink sources connected to supply different inks to different selected orifices in the array, a corresponding plurality of pressure chamber means having parallel central axes, each communicating with one of the ink jet orifices, and a plurality of ink supply lines, each of which supplies ink to one of the pressure chamber means, wherein the pressure chamber means and ink supply lines for supplying ink to adjacent pairs of ink jet orifices are disposed on opposite sides of a line joining the aligned orifices with the central axes of the pressure chamber means on one side of the line extending between the central axes of the pressure chamber means on the other side of the line, the supply lines for supplying ink to the pressure chamber means communicating with each adjacent pair of orifices being connected to the same ink source, whereby each adjacent pair of orifices in the aligned plurality receives ink from the same ink source.

4,891,655

THERMAL COLOR PRINTER

Tetsuo Watanabe, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,334

Claims priority, application Japan, Dec. 28, 1987, 62-330255; Apr. 25, 1988, 63-100371

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—151 **17 Claims**

1. A thermal color printer comprising:

a platen drum which is rotatable;

driving means for rotating said platen drum in a predetermined rotating direction;

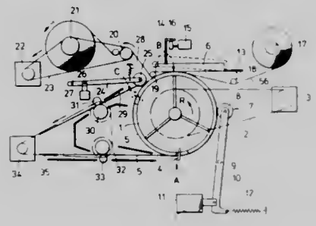
clamp means provided on said platen drum for clamping a tip end of a sheet of paper which is wrapped around an outer peripheral surface of said platen drum;

a thermal printing head having a release position separated from the outer peripheral surface of said platen drum and a print position for printing an image on the paper;

moving means for moving said thermal printing head between said release position and said print position;

feeding means for feeding an ink sheet between said thermal printing head and the paper on said platen drum, said ink sheet having portions of n different colors so that a printing in n different colors completes while said platen drum is driven by said driving means to undergo n revolutions; and

paper pushing means including at least a sliding member which has an active position for holding down the paper on said platen drum by making sliding contact with the



paper while said platen drum rotates and an inactive position which is separated from the outer peripheral surface of said platen drum,

said platen drum and said paper pushing means respectively having first and second portions which cooperate to separate said sliding member from the outer peripheral surface of said platen drum giving a sufficient clearance between said sliding member and the outer peripheral surface of said platen drum for said clamp means to pass when said clamp means passes a position of said paper pushing means,

said paper pushing means being located at a position leading said print position in said predetermined rotating direction.

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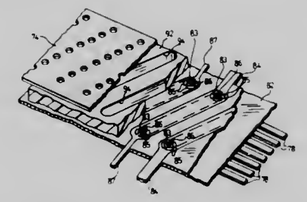
PRINT CARTRIDGE WITH NON-DIVERGENT ELECTROSTATIC FIELD

Igor Kubelik, Mississauga, Canada, assignor to Delphax Systems, Mississauga, Canada

Filed Dec. 14, 1988, Ser. No. 284,268

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—155 **18 Claims**



1. In a print cartridge for use in charge transfer imaging having a layer of dielectric material, a plurality of first electrodes extending in a first direction along one side of the dielectric layer, a plurality of second electrodes extending in a second direction along the opposite side of the dielectric layer, and edge structures provided in the second electrodes disposed at locations opposite said first electrodes, the improvement comprising substantially surrounding the edge structures with a dielectric material inserted in each second electrode at each of said locations and spaced from the respective edge structures.

4,891,657

APPARATUS FOR FORMING AN IMAGE

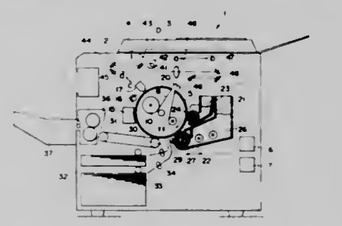
Toshihiro Kasai, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,312

Claims priority, application Japan, Apr. 6, 1988, 63-84766

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160.1 **14 Claims**



1. An image forming apparatus comprising:

image-converting means for converting the image into an electrostatic latent image on an image holding member;

first developing means for developing the electrostatic latent image on the image holding member, with a first developing agent, thereby to form a first developer image;

first fixing means for fixing the first developer image on the image holding member, thereby to form a master image;

magnetizing means for magnetizing the master image;

second developing means for developing the magnetized master image with a second developing agent, thereby to form a second developer image;

storing means for storing a number of sheets;

image-transferring means for transferring one of the first and second developer images onto a sheet supplied from the storing means; and

second fixing means for fixing the transferred image on the sheet.

4,891,658

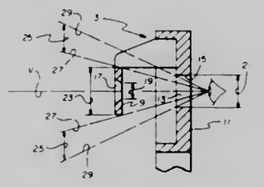
OPEN FRAME SIGHT VIEWFINDER

William H. Goddard, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 30, 1989, Ser. No. 303,619

Int. Cl.[4] G03B *13/04*

U.S. Cl. 354—219 **5 Claims**



1. An improved open frame sight viewfinder for a photographic camera, wherein an aiming sight having an aiming aperture for aiming the camera at a subject to be photographed is positioned forward of a viewing aperture to view said aiming

sight within the periphery of said viewing aperture, and wherein the improvement comprises:

said aiming sight being exteriorly dimensioned to be dimensionally greater than the viewing size of said viewing aperture to permit only a relatively narrow zone of ambient light to be viewed between the aiming sight and said periphery of the viewing aperture when the camera is correctly aimed at a subject to be photographed, but eclipsing a section of said narrow zone of ambient light when the camera is incorrectly tilted relative to the subject.

4,891,659

CONTINUOUS PLATE MAKING METHOD FOR PHOTOSENSITIVE RESIN PLATE AND DEVICE THEREOF

Haruo Kubo, and Kosaku Onodera, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

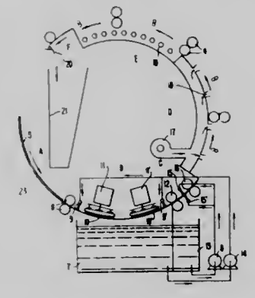
Continuation-in-part of Ser. No. 707,268, Mar. 1, 1985, Pat. No. 4,733,260. This application Jan. 21, 1988, Ser. No. 146,599

Claims priority, application Japan, Mar. 5, 1984, 59-42651; Mar. 6, 1984, 59-43614

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] G03D *5/04*

U.S. Cl. 354—317 **7 Claims**



1. A continuous plate making method for a photosensitive resin plate, which comprises the steps of: setting the photosensitive resin plate on an inside surface of a setting plate which moves in a substantially circular orbit so that the inside surface thereof is radially faced to the inside of the orbit; and continuously subjecting the photosensitive resin plate to, at least, washing out, drying and then post light exposure as the setting plate moves continuously.

4,891,660

AUTOMATIC PHOTOGRAPHIC SYSTEM AND FRAME DISPENSER

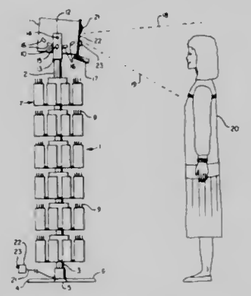
John V. Biondo, Jr., Los Angeles, Calif., assignor to PVI, Inc., San Diego, Calif.

Filed Nov. 29, 1988, Ser. No. 277,297

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—412 **28 Claims**

1. A photographic system comprising a camera; a camera housing; means for mounting said camera within said camera housing; positioning means for customer viewing whereby said customer may position himself within the desired camera field of view; a stand-alone support for said housing means; means for mounting said housing on said support; electrical to acoustical transducer means; electrical control circuits mounted within said housing, said circuits including payment verification means, and means for generating electrical signals representing: instructions for use of said camera, announcements of predetermined content, and customer entertainment; and means for connecting said electronic circuits with said transducer means whereby upon receipt of said electrical signals,



said transducer means responds to produce audible transductions thereof.

4,891,661

COLOR IMAGE COPYING DEVICE

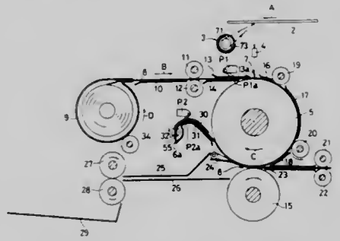
Hironori Tanaka, Nara; Matahira Kotani, Ikoma, and Masafumi Matsumoto, Takaichi, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1988, Ser. No. 164,337

Claims priority, application Japan, Mar. 5, 1987, 62-51752; Mar. 5, 1987, 62-51753; Mar. 5, 1987, 62-51754; Mar. 5, 1987, 62-51755

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—27 **4 Claims**



1. A color image copying device comprising:

exposure means for exposing an original document with red, blue, and green light;

a photosensitive film having a substrate and an ink coating which includes ink particles of multiple colors carried on said substrate, and on which a reproduction of the original document is formed, in response to the light exposure, through a reaction of ink particles of the color which corresponds to the wavelength of the light reflected from the original document;

film case means for storing said photosensitive film, said film case means being made of a lightproof material;

image forming means for forming an image of said original document on said photosensitive film by focusing the reflected light;

copy paper feeding means for feeding a copy paper;

fixing means for fixing the image formed on said photosensitive film on said copy paper;

separation means which separates said photosensitive film from said copy paper after the fixing of said image;

a film take-up shaft for winding thereon said photosensitive film, said film take-up shaft being located downstream from said separation means in the direction of paper transport, and being formed with an insertion slot for inserting a leading edge of said photosensitive film;

take-up shaft driving means for driving said take-up shaft to take-up said film after insertion in said slot of the leading edge of said film;

detection means for detecting the leading edge of the photosensitive film at a position between said separation means and said take-up shaft; and

control means for controlling said take-up shaft drive means to rotate after a predetermined time which is sufficient for the leading edge of the film being inserted in said insertion slot after said film detection means detects said leading edge of the film.

4,891,662

IMAGE FORMING APPARATUS

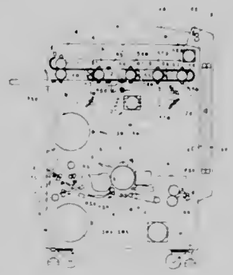
Takashi Noda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1988, Ser. No. 178,016

Claims priority, application Japan, Apr. 9, 1987, 62-87336; Apr. 9, 1987, 62-87337; Apr. 9, 1987, 62-87338; Apr. 9, 1987, 62-87339; Apr. 10, 1987, 62-89621; Jan. 21, 1988, 63-11150

Int. Cl.[4] G03B *29/00*

U.S. Cl. 355—29 **9 Claims**



1. An image forming apparatus comprising:

an image forming means having a photosensitive member for forming a latent image of an image of a document, and a developing means for developing said latent image;

an optical means having a projecting means for projecting said image onto said photosensitive member, and a magnification varying means for varying the projection magnification of said image to be projected;

a scanning means for relatively moving said document and said optical means at a speed corresponding to said projection magnification;

a paper feeding means for feeding roll paper to said image forming means;

a cutting means for cutting said roll paper to one of a first fixed length and a second fixed length which is double said first length;

an image signal generating means for generating an image length signal on the basis of the length of said document in the direction of its relative movement and the projection magnification;

a paper width detecting means for detecting the width size of said roll paper; and

a cut controlling means for controlling said cutting means in order to cut said roll paper to one of the first fixed length and the second fixed length in response to the width of said roll paper and said image signal.

4,891,663

PROJECTION EXPOSURE APPARATUS

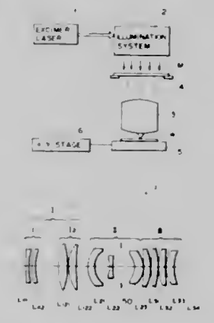
Ryuzo Hirose, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 139,137, Dec. 23, 1987, abandoned, which is a continuation of Ser. No. 48,508, May 11, 1987, abandoned, which is a continuation of Ser. No. 682,232, Dec. 17, 1984, abandoned. This application Jun. 24, 1988, Ser. No. 212,081

Claims priority, application Japan, Dec. 28, 1983, 58-245904; Jul. 9, 1984, 59-142059; Jul. 9, 1984, 59-142060; Nov. 28, 1984, 59-252277

Int. Cl.[4] G03B *27/52;* **G02B** *9/14*

U.S. Cl. 355—53 **9 Claims**



1. A projection exposure apparatus, comprising:

a light source for providing an excimer laser beam;

means for supporting an original so that it is illuminated by the excimer laser beam emitted from said light source, the original having a substrate which is transmissiv ®to the excimer laser beam and having a pattern formed on its surface by a material which is non-transmissive to the excimer laser beam;

an imaging optical system for projecting an image of the pattern of the original onto a wafer, said imaging optical system having a plurality of lenses of non-cemented type, said plurality of lenses being made of at least one of fused silica and calcium fluoride, having transmissibility with respect to the excimer laser beam, and having substantially the same refractive index, said imaging optical system including, in an order from an object side to an image plane side, a first lens group of positive refracting power, a second lens group of negative refracting power and a third lens group of positive refracting power; and

means for supporting the wafer on which the pattern of the original is to be projected.

4,891,664

ILLUMINATION DEVICE FOR COPYING APPARATUS AND THE LIKE

Nobuo Kanai, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 10, 1988, Ser. No. 205,219

Claims priority, application Japan, Jun. 15, 1987, 62-148847

Int. Cl.[4] G03B *27/54, 27/72*

U.S. Cl. 355—67 **10 Claims**

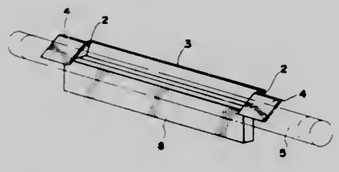
1. An illumination device comprising:

an elongated light source for illuminating an original;

a lens array extended to the longitudinal direction of the elongated light source for transmitting the light from the illuminated original to a receiving plane; and

reflection means disposed at each side of the optical path

from the original to the lens array with respect to the longitudinal direction of the elongated light source for



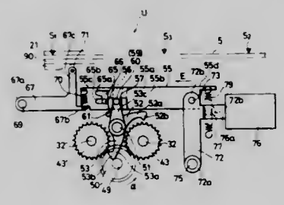
reflecting the light from the light source toward the original.

4,891,665

FORWARD AND REVERSE ROTATION MECHANISM

Morikazu Mizutani, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 13,118, Feb. 10, 1987, abandoned. This application May 30, 1989, Ser. No. 358,502
Claims priority, application Japan, Feb. 19, 1986, 61-34726
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 **26 Claims**



1. A forward and reverse rotation mechanism for transmitting the rotational force of a drive source rotating in one direction to a forwardly and reversely moving member through one of first spring clutch means for forward rotation and second spring clutch means for reverse rotation, comprising:

control lever means for controlling the operation of both said first spring clutch means and said second spring clutch means, said control lever means having a first lever member for said first spring clutch means and a second lever member for said second spring clutch means;

actuating means for actuating said first or said second lever member of said control lever means, said actuating means disengaging the drive source from said forwardly and reversely moving member when neither of said first and second lever members is actuated; and

selected means for selecting the lever member actuated by said actuating means.

4,891,666

COPY INDICATOR FOR A DOCUMENT

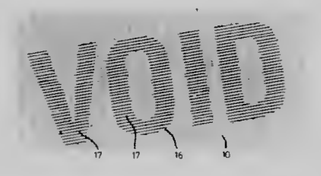
Douglas C. Gordon, Kinburn, Canada, assignor to Quebecor Publitech Inc., Toronto, Canada

Filed Nov. 28, 1988, Ser. No. 276,895
Int. Cl.[4] B42D *15/00*
U.S. Cl. 355—133 **9 Claims**

1. A printed background pattern for a document having masked within the pattern a copy indicator which is revealed upon making a copy of the document using an apparatus having high resolution digital optical scanning means, the printed background pattern comprising:

an area of symbol microprinting having a line resolution of between about 20% and about 80% of the line resolving power of the digital scanning means; and

an area of solid line printing within the area of symbol microprinting, wherein a plurality of solid lines are arranged



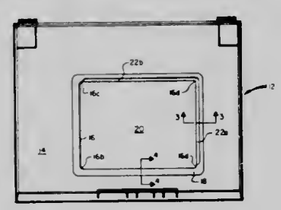
to define the copy indicator, the solid lines having a visual value approximating that of the microprinting so that the indicator defined by the lines is masked by the microprinting, the solid line printing being capable of resolution by the digital scanning means.

4,891,667

DOCUMENT PLATEN FOR ELECTROSTATOGRAPHIC REPRODUCTION APPARATUS

Bruce, Jr. William H., Walworth, and Gary A. Porter, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1988, Ser. No. 233,510
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—230 **6 Claims**



4. A document supporting platen for an electrostatographic apparatus, said platen comprising:

a transparent member; and a planar member having an opening defined in such planar member, three corners of said opening having a generously rounded configuration and one corner defining a right angle, said transparent member being attached to the underside of said planar member so that said transparent member completely spans said opening, whereby a document can be supported on said transparent member and said right angle corner of said opening facilitates proper location of the document on such transparent member.

4,891,668

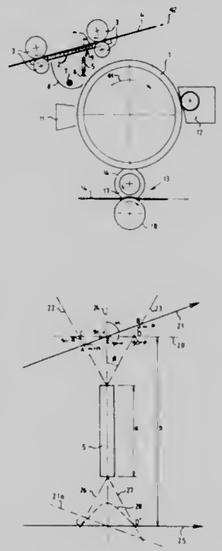
OPTICAL IMAGING SYSTEM FOR A COPYING MACHINE

Johan J. Zweedijk, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Continuation of Ser. No. 778,148, Sep. 20, 1985, abandoned. This application Jan. 15, 1988, Ser. No. 145,732
Claims priority, application Netherlands, Sep. 24, 1984, 8402912
Int. Cl.[4] G03G *15/28;* G03B *27/68*
U.S. Cl. 355—233 **4 Claims**

1. In an optical imaging system for a copying machine capable of producing images having a reduced size in one direction, wherein the optical system projects an image of an original

moving relative to the optical system in an object space onto a light-sensitive element moving relative to the optical system in an image space and wherein the speed of an image point in an image plane corresponding to an original point is greater than the speed of the light-sensitive element, the improvement comprising the light-sensitive element forming an acute angle



with the image plane wherein the acute angle is set to a value of from 3° to 16.3° for an average speed difference between an image point in the image plane and the light-sensitive element of from 0.14% to 4%, such that the imaging of the image point on the light-sensitive element passes through at least a part of the image space in the same time as an arbitrary point of the light-sensitive element.

4,891,669

SCANNING APPARATUS

Masashi Hiroki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1988, Ser. No. 212,482
Claims priority, application Japan, Jun. 30, 1987, 62-163047
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—235 **7 Claims**

1. An apparatus for scanning an original comprising:

means, located movably along the original, for scanning the original;

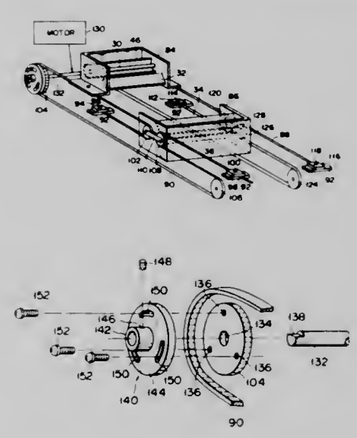
means for generating a drive force to move said scanning means along the original;

means for transmitting drive force from said generating means to said scanning means; and wherein said transmitting means includes:

a rotatable shaft to be rotated by the drive;

a first rotatable member fixed to said rotatable shaft to be rotated therewith;

a second rotatable member attached to said first rotatable member to be rotated with said first rotatable member, at least one of said first and second rotatable members having a portion for changing the relative angular positions of said first and second rotatable members.

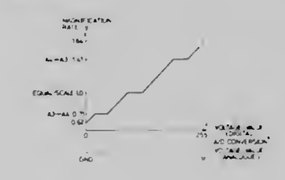


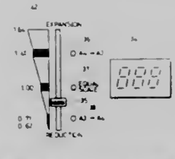
4,891,670

COPYING MACHINE IN WHICH COPYING MAGNIFICATION CAN BE EASILY SET

Hideyuki Kanbayashi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 24, 1988, Ser. No. 210,805
Claims priority, application Japan, Jun. 26, 1987, 62-158863
Int. Cl.[4] G03G *15/04;* G03B *27/52*
U.S. Cl. 355—243 **10 Claims**





1. A copying machine in which copying magnification can be easily changed, comprising:

a shiftable member manually movable in a prescribed direction for setting copying magnification;

travel amount detecting mans for detecting the amount of travel of said shiftable member;

magnification setting means responsive to an output detected by said travel amount detecting means for setting magnification to be copied;

fixed magnification holding means coupled to said magnification setting means for holding said set magnification at a fixed value irrespective of said amount of travel in a prescribed range of said amount of travel; and

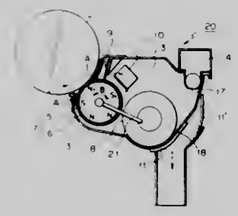
set magnification displaying means for displaying said set magnification.

4,891,671

MAGNETIC BRUSH DEVELOPING DEVICE

Akiyoshi Iwamasa, Zama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 10, 1988, Ser. No. 204,907
Claims priority, application Japan, Jun. 10, 1987, 62-144274
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—245 **12 Claims**



1. A developing device for use with a photosensitive drum having a surface, comprising:
a developing agent holding vessel for holding a developing agent;
a developing roller consisting of a rotating non-magnetic sleeve and a magnetic roller which is surrounded by said rotating non-magnetic sleeve and has magnetic poles;
a blade disposed at an outlet of said developing agent holding vessel for uniformizing a feed quantity of the developing agent; and
a stirring roller for stirring the developing agent, the developing agent consisting of a toner and a carrier in said developing agent holding vessel, said developing roller being provided with a moving means for shifting a position of said magnetic poles of said magnetic roller between an operating position and a developing agent replacement position, whereby in the operating position one of said magnetic poles faces the surface of the photosensitive drum during normal use of the developing agent, and no magnetic pole faces the surface of the photosensitive drum when said magnetic poles of said magnetic roller are in the developing agent replacement position.

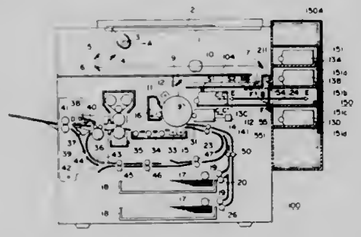
4,891,672

IMAGE FORMING APPARATUS WITH DEVELOPING DEVICE ACCOMMODATING APPARATUS

Masafumi Takagi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 166,003
Claims priority, application Japan, Mar. 10, 1987, 62-52925
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—245 **9 Claims**

1. An image forming apparatus, comprising:
a main assembly including an image bearing member and means for forming a latent image on said image bearing member;
accommodating means for accommodating a plurality of developing means;
said main assembly further including first moving means for moving said developing means;
said accommodating means including second moving means for moving said developing means to a position at which said developing means can be supplied into said main assembly and third moving means for moving said developing means from said supplying position into said main assembly;
means for selecting one of said developing means for developing a latent image formed by said image forming means;
means for starting an image forming operation by said image forming means; and
control means for controlling said second and third moving means, said control means operating said second moving



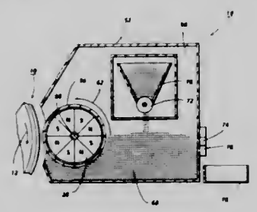
means in response to a signal from said selecting means to place the developing means selected by said selecting means to said supplying position and operating said third moving means in response to a signal from said image forming starting means to move the selected developing means into the main assembly.

4,891,673

DEVELOPMENT SYSTEM

Kim S. Buell, Sodus, N.Y., assignor to Xerox Corporation, Stamford, N.Y.

Filed Aug. 4, 1988, Ser. No. 229,072
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—245 **11 Claims**



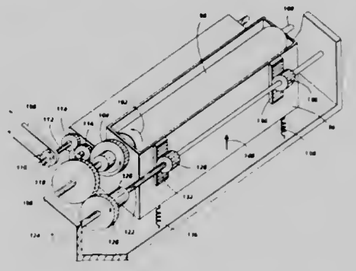
1. An apparatus for developing an electrostatic latent image used in a printing machine, including:
means for transporting a developer material comprising at least carrier granules having toner particles adhering thereto into contact with the electrostatic latent image;
a housing defining a chamber having a supply of developer material therein, said transporting means being in communication with the chamber of said housing for receiving developer material, said housing having an exit port located at a selected position in the chamber of said housing to enable developer material to exit from the chamber when the level of developer material therein covers at least a portion of the exit port;
means for discharging toner particles and carrier granules into the chamber of said housing; and
means for sealing the exit port of said housing with a substantially impervious toner particle seal, said sealing means being previous to developer material and carrier granules so as to prevent the passage of toner particles through the exit port while permitting the passage of developer material and carrier granules therethrough to maintain a predetermined quantity of developer material and carrier granules in the chamber of said housing.

4,891,674

RETRACTABLE DEVELOPMENT APPARATUS

Joseph A. Seyfried, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1988, Ser. No. 204,332
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—245 **14 Claims**



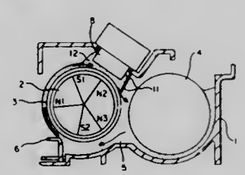
8. An electrophotographic printing machine of the type in which an electrostatic latent image recorded on a photoconductive member is developed with a developer material, wherein the improvement includes:
an applicator roller mounted rotatably about its longitudinal axis and having developer material adhering releasably to at least a portion of the exterior surface thereof; and
means for rotating said applicator roller about its longitudinal axis, and, as said applicator roller rotates about its longitudinal axis through an initial angle of rotation, translating said applicator roller from a nonoperative position, spaced from the photoconductive member, to an operative position, closely adjacent the photoconductive member, so that said applicator roller transports developer material to the electrostatic latent image recorded on the photoconductive member.

4,891,675

DEVELOPER DENSITY DETECTION DEVICE

Masato Asanuma, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 129,949, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 819,629, Jan. 17, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 240,400
Claims priority, application Japan, Feb. 4, 1985, 60-20292
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—246 **12 Claims**



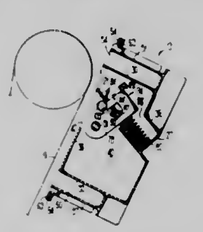
1. A developer density detection device comprising
a developing tank for holding a developer therein,
a cylindrical magnet,
a sleeve which covers said magnet circumferentially and serves by rotating to transport said developer upward on its outer surface,
a density detection sensor disposed at an elevated position with respect to said magnet and proximately opposite said sleeve so as to be capable of measuring the density of said developer on said sleeve, and
a baffle plate for controlling the flow of said developer, said baffle plate being disposed downstream with respect to said sensor along the direction of flow of said developer, said baffle plate having a bottom end part disposed below the surface level of said developer in said developing tank.

4,891,676

TRANSFER MEDIUM CLEANING STATION FOR USE IN AN ELECTROPHOTOGRAPHIC PRINT ENGINE

David R. Davis, Buford, and Danny L. Slayton, Lilburn, both of Ga., assignors to Colorocs Corporation, Norcross, Ga.

Filed May 17, 1988, Ser. No. 194,805
Int. Cl.[4] G03G *15/21*
U.S. Cl. 355—271 **9 Claims**



1. An electrophotographic print engine comprising:
a transfer medium for transferring toner;
means for cleaning toner from the transfer medium;
means for selectively positioning the cleaning means at a predetermined location within the electrophotographic print engine, and for alternatively removing the cleaning means from the electrophotographic print engine;
means for selectively moving the cleaning means into contact with the transfer medium, and for alternatively moving the cleaning means away from the transfer medium;
means for locking the cleaning means in a position away from the transfer medium; and
means for controlling the locking means so the cleaning means remains in the locked position away from the transfer medium while the positioning and removing means is operating, whereby damage to the transfer medium by the cleaning means is prevented while removing or installing the cleaning means, and so that the cleaning means is unlocked from the locked position while the cleaning means is secured within the electrophotographic print engine whereby the cleaning means can selectively move into contact with the transfer medium.

4,891,677

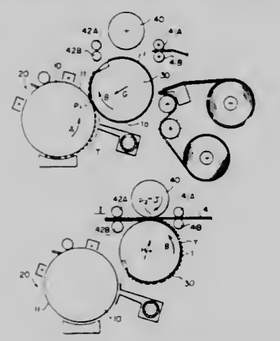
ADHESIVE TRANSFER APPARATUS, AND IMAGE RECEIVING WEB FOR ADHESIVE TRANSFER

Etsuo Shiozawa; Keishi Kato, and Yoshiki Yoshimi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 133,458, Dec. 15, 1987, Pat. No. 4,863,543. This application Jan. 9, 1989, Ser. No. 295,171
Claims priority, application Japan, Dec. 16, 1986, 61-299168; Dec. 16, 1986, 61-299169
Int. Cl.[4] G03G *15/14, 8/00*
U.S. Cl. 355—280 **4 Claims**

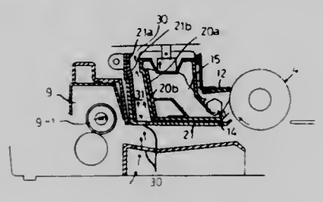
1. An adhesive transfer apparatus comprising:
(i) a photosensitive material drum,
(ii) a toner image forming means for forming a toner image on said photosensitive material drum,
(iii) a push roller,

(iv) a supporting sheet conveyance means for conveying a supporting sheet toward said push roller,
(v) a separation means for separating a transfer sheet, which has been formed in a predetermined shape in advance and is provided with an adhesive surface and which is adhered to a release agent coated paper, from said release agent coated paper, and
(vi) a transfer roller which is moveable with respect to said photosensitive material drum and said push roller so that said transfer roller takes a first position spaced away from both said photosensitive material drum and said push



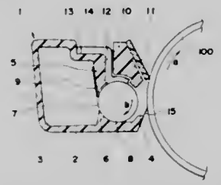
roller, a second position contacting said photosensitive material drum alone under pressure, and a third position contacting said push roller alone under pressure, winds up said transfer sheet separated by said separation means with said adhesive surface facing out at said first position, transfers said toner image from said photosensitive material drum to said adhesive surface of said transfer sheet at said second position, and adheres said transfer sheet carrying said toner image transferred thereonto and said supporting sheet conveyed by said supporting sheet conveyance means to each other at said third position.

4,891,678
ELECTROSTATIC RECORDING APPARATUS HAVING A COOLED AND INSULATED WASTE TONER CONTAINER
Hisao Ishizu, Tokyo; Tomobumi Shibano, Kawasaki; Yasuhiro Sagawa, Yamato, and Hiroshi Komai, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 9, 1988, Ser. No. 204,273
Claims priority, application Japan, Jun. 17, 1987, 62-149168
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—285 **5 Claims**



1. An electrostatic recording apparatus comprising:
(a) a photosensitive member;
(b) first means for supplying toner to said photosensitive member;
(c) a thermally fixing apparatus;
(d) a waste toner container having a first wall on the side of said waste toner container adjacent said thermally fixing apparatus;
(e) second means for discharging waste toner from said photosensitive member to said waste toner container; and
(f) an image forming case containing said waste toner container, said image forming case having a second wall on the side of said image forming case adjacent said thermally fixing apparatus,
wherein:
(g) an open space is provided between said first wall and said second wall;
(h) vent ports are provided communicating with the top and the bottom of said open space; and
(i) heat insulating material is applied to said first wall and to said second wall.

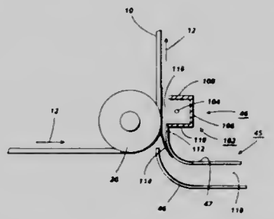
4,891,679
CLEANING APPARATUS FOR AN IMAGE FORMING MACHINE
Hiromitsu Saijo, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 2, 1988, Ser. No. 278,725
Claims priority, application Japan, Dec. 4, 1987, 62-307955
Int. Cl.[4] G03G *15/00, 15/08*
U.S. Cl. 355—298 **10 Claims**



1. A cleaning apparatus for removing toner particles remaining on an electrostatic latent image bearing member, said cleaning apparatus comprising:
first removing means for removing the toner particles by contacting the surface of the electrostatic latent image bearing member;
a rotatable collecting member to collect the removed toner particles;
an accommodating means for accommodating the removed toner particles disposed adjacent to said rotatable collecting member;
second removing means for removing the toner particles from the surface of the rotatable collecting member and for guiding the toner particles into the accommodating means;
supply means for supplying non-volatile material onto the rotatable collecting member wherein said non-volatile material has an affinity for the toner particles, said supply means is so disposed upstream of the location where the removed toner particles are collected by the collecting member and downstream of the location where the second removing means makes contact with the rotatable collecting member with respect to the rotating direction of the rotatable collecting member.

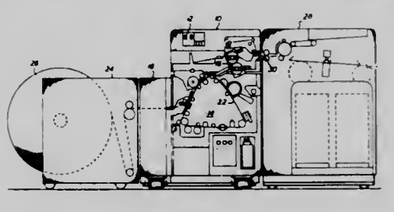
4,891,680
TRANSFER APPARATUS
Robert A. Gross, Penfield, and James E. Hogle, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 25, 1988, Ser. No. 185,727
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—309 **3 Claims**

1. An electrophotographic printing machine of the type in which a developed image is transferred from a photoconductive surface to a copy sheet at a transfer station, wherein the improvement includes:
means for advancing a copy sheet to the transfer station;
a corona generating device, positioned at the transfer station, for charging the copy sheet to establish a transfer field that is effective to attract the developed image from the photoconductive surface to the copy sheet; and
a sheet guide, positioned between said advancing means and



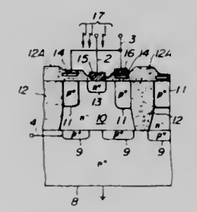
said corona generating device, having a generally planar region with one end thereof contiguous with said corona generating device to flatten the copy sheet as the copy sheet contacts the developed image on the photoconductive surface so that a substantially wrinkle free copy sheet contacts the developed image during transfer of the developed image from the photoconductive surface thereto to prevent the formation of voids in the transferred developed image.

4,891,681
HARD COPY APPARATUS FOR PRODUCING CENTER FASTENED SHEET SETS
John M. Fiske, Medford, Mass., and Robert P. Crandall, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 9, 1988, Ser. No. 281,588
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—322 **20 Claims**



1. Apparatus for providing bound sheet sets containing a plurality of hard copy sheets having applied images thereon, with the sets being bound together at the center of the sheets, said apparatus comprising:
means for applying the images to the sheets;
means for providing a plurality of sheets to the applying means, with each sheet destined for the same bound sheet set having a different length;
means for stacking the plurality of sheets comprising the same sheet set into a trapezoidal shape with the sides of the stack being defined by edges of progressively shorter sheets stacked together; and
means for fastening the stacked sheet set together at the common centers of the sheets.

4,891,682
SOLID STATE IMAGE PICK-UP DEVICE HAVING A NUMBER OF STATIC INDUCTION TRANSISTOR IMAGE SENSORS
Atsushi Yusa, Ina; Hidetoshi Yamada, Tokyo; Takashi Mizusaki, Hamamatsu; Jun-ichi Nishizawa, and Takashige Tamamushi, both of Sendai, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Dec. 1, 1983, Ser. No. 557,004
Claims priority, application Japan, Dec. 14, 1982, 57-217764
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 357—30 **14 Claims**

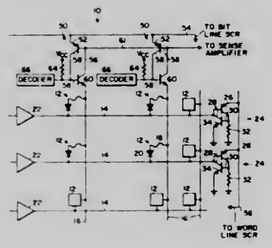


1. In a solid state image pick-up device comprising a plurality of static induction transistors each transistor having a source region of one conductivity type, a drain region of one conductivity type separated from said source region by means of a channel region of one conductivity type and a gate region of a second conductivity type separated from at least one of said source and drain regions by means of said channel region, said channel region capable of generating photocarriers with light input; and
means for driving said static induction transistors selectively to derive an image signal; each static induction transistor further comprising an overflow drain region of a second conductivity type separated from said gate region by means of said channel region, said overflow drain region having a potential, said overflow drain region being formed below said gate region and immediately adjacent said channel region; and
said pick-up device further comprising means for externally controlling said potential of said overflow drain region to adjust a time period which photocarries induced in said channel region due to light input are stored in said gate region to effect a shutter function.

4,891,683
INTEGRATED SCR CURRENT SOURCING SINKING DEVICE
Hua-Thye Chua, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 737,911, May 28, 1985, abandoned, which is a continuation of Ser. No. 382,812, May 28, 1982, abandoned, which is a continuation of Ser. No. 120,539, Feb. 11, 1980, abandoned, which is a continuation of Ser. No. 946,353, Sep. 27, 1978, abandoned, which is a division of Ser. No. 792,940, May 2, 1977, Pat. No. 4,130,899. This application May 11, 1988, Ser. No. 193,232
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **27 Claims**

1. A semiconductor integrated circuit comprising:
a semiconductor body;
a first plurality of silicon controlled rectifiers formed in the body for sourcing current;

a second plurality of silicon controlled rectifiers formed in the body for sinking current; and



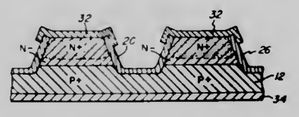
connecting means for providing one electrical connection between each of the sourcing rectifiers and each of the sinking rectifiers.

4,891,684
SEMICONDUCTOR DEVICE
Yasushiro Nishioka, New Haven, Conn.; Hiroshi Shinriki; Noriyuki Sakuma, Tokyo, and Kiichiro Mukai, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 4, 1987, Ser. No. 81,231
Claims priority, application Japan, Aug. 4, 1986, 61-181916
Int. Cl.[4] H01L *27/02, 29/78, 29/34*
U.S. Cl. 357—51 **39 Claims**

1. A semiconductor device having a capacitor, which comprises a lower electrode, a capacitor insulating film formed on said lower electrode and made of a high dielectric constant material, an upper electrode formed on said capacitor insulating film, and a reaction-preventing film interposed between said capacitor insulating film and said upper electrode, said reaction-preventing film having a thickness so as to prevent a reaction between material of said capacitor insulating film and material of said upper electrode, the capacitor insulating film being made of a member selected from the group consisting of Ta_2O_5, Nb_2O_5, TiO_2, ZrO_2, Al_2O_3, HfO and Y_2O_3.

4,891,685
RECTIFYING P-N JUNCTION HAVING IMPROVED BREAKDOWN VOLTAGE CHARACTERISTICS AND METHOD FOR FABRICATING SAME
Willem G. Einthoven, Belle Mead, N.J., and Muni M. Mitchell, Huntington, N.Y., assignors to General Instrument Corporation, New York, N.Y.
Division of Ser. No. 784,451, Oct. 4, 1985, Pat. No. 4,740,477. This application Jan. 11, 1988, Ser. No. 142,737
Int. Cl.[4] H01L *29/12*
U.S. Cl. 357—56 **10 Claims**

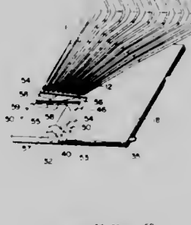
1. A rectifier having a rectifying P-N junction with improved breakdown voltage characteristics, comprising:
a mesa in at least the epitaxial layer of an epitaxially grown P-N wafer with the top of the mesa at the top surface of the epitaxial layer and the side wall of the mesa sloping outwardly from the top of the mesa toward the wafer substrate and extending into said substrate;
a high concentration semiconductor region in the surface of the epitaxial layer, said high concentration region having the same polarity as the remainder of said epitaxial layer and the opposite polarity as said substrate, and covering an area sufficient to extend across the top of said mesa whereby a junction between said high concentration region and the remainder of said epitaxial layer intersects the side wall of said mesa; and
an oxide layer on the side wall of said mesa to passivate said mesa, said oxide layer covering the P-N junction between said epitaxial layer and said substrate and said junction

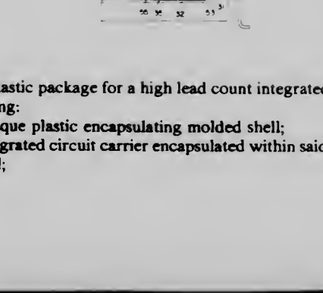


between said high concentration region and the remainder of said epitaxial layer;
said high concentration region extending from the top of said mesa into said epitaxial layer, but not beyond the base of said mesa; and
the high concentration region having a generally concave shape at the side wall of the mesa such that the distance between the high concentration region and the wafer substrate gradually increases in the direction of the sloping side wall of the mesa.

4,891,686
SEMICONDUCTOR PACKAGING WITH GROUND PLANE CONDUCTOR ARRANGEMENT
George J. Krausse, III, Fort Collins, Colo., assignor to Directed Energy, Inc., Fort Collins, Colo.
Filed Apr. 8, 1988, Ser. No. 179,489
Int. Cl.[4] H01L *23/48, 29/44*
U.S. Cl. 357—68 **15 Claims**

1. A high power MOSFET semiconductor package comprising:
(a) a ceramic substrate having a planar upper surface and opposite side edges;
(b) a MOSFET semiconductor die secured to said upper surface of said ceramic substrate; said die including gate, source and drain areas and having connection pads on said gate, source and drain areas;
(c) a gate signal carrying conductor electrically connected to said connection pad on said gate area;
(d) a drain signal carrying conductor electrically connected to said connection pad on said drain area;
(e) ground plane conductors disposed one each side, and separated from, and parallel to each of said signal carrying conductors; wherein each said ground plane conductor is electrically connected to said connection pad on said source area;





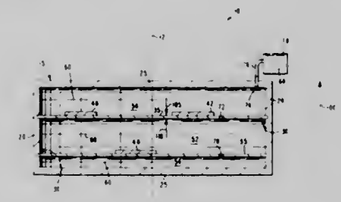
wherein said ground plane conductors are disposed in the same plane as said signal carrying conductors.

4,891,687
MULTI-LAYER MOLDED PLASTIC IC PACKAGE
Debendra Mallik, Mesa, and Bidyut K. Bhattacharyya, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.
Continuation of Ser. No. 2,144, Jan. 12, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,035
Int. Cl.[4] H01L *23/10, 23/48, 23/12*
U.S. Cl. 357—70 **10 Claims**



1. A plastic package for a high lead count integrated circuit, comprising:
an opaque plastic encapsulating molded shell;
an integrated circuit carrier encapsulated within said molded shell;
a substantially planar leadframe comprised of a plurality of leads;
said plurality of leads, which includes a power lead and a power return lead, extending into said molded shell and coupled to said carrier;
said carrier comprising:
(a) a first conducting plate, wherein said integrated circuit is disposed on and supported by said first plate;
(b) a second conducting plate overlaying said first conducting plate and disposed about said integrated circuit;
(c) a first insulator adhesive tape disposed between and bonded to said first and second conducting plates;
(d) a second insulator adhesive tape disposed between and bonded to said second plate and said plurality of leads;
(e) wherein power terminals of said integrated circuit and said power lead are electrically coupled to one of said conducting plates, and wherein power return terminals of said integrated circuit and said power return lead are electrically coupled to the other of said conducting plates.

4,891,688
VERY HIGH-ACCELERATION TOLERANT CIRCUIT CARD PACKAGING STRUCTURE
Ernest P. Longerich, Chatsworth, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jan. 21, 1988, Ser. No. 146,634
Int. Cl.[4] H01L *23/38, 23/44, 23/46*
U.S. Cl. 357—82 **11 Claims**

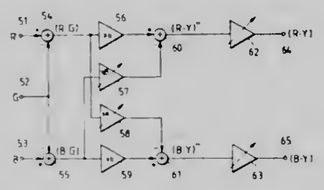


1. A very high acceleration tolerant circuit packaging structure comprising:
a housing, said housing including rigid side walls and rigid end walls;
at least one planar member for supporting electronic circuitry thereon, said planar member being suitably formed for mounting within said housing, said housing being divided into at least two chambers by said at least one planar member;
an incompressible fluid, said fluid completely filling all of said chambers; and
means for compressing for thermal expansion of said fluid said compensating means includes an orifice.

4,891,689
COLOR SIGNAL MATRIX CIRCUITS
Tetsuya Senda, Kanagawa; Tokuya Fukuda, Tokyo, and Hiroaki Matsumoto, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Feb. 6, 1989, Ser. No. 306,381
Claims priority, application Japan, Feb. 16, 1988, 63-033736
Int. Cl.[4] H04N *9/67*
U.S. Cl. 358—30 **7 Claims**

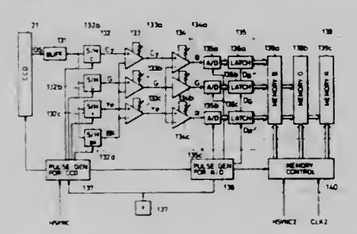
1. A color signal matrix circuit for producing color difference signals from red, green, and blue primary color signals, comprising:
first signal subtracting means for producing a first subtraction output signal representing a difference between red and green primary color signals,

second signal subtracting means for producing a second subtraction output signal representing a difference between blue and green primary color signals,
first level adjusting means receiving the first subtraction output signal,
second level adjusting means having a variable level factor and receiving the second subtraction output signal,
third signal subtracting means receiving the first subtraction output signal adjusted in level by said first level adjusting means and the second subtraction output signal adjusted in



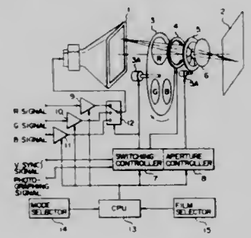
level by said second level adjusting means for producing therefrom a first color difference signal,
third level adjusting means receiving the second subtraction output signal,
fourth level adjusting means having a variable level factor and receiving the first subtraction output signal, and
fourth signal subtracting means receiving the second subtraction output signal adjusted in level by said third level adjusting means and the first subtraction output signal adjusted in level by said fourth level adjusting means for producing a second color difference signal.

4,891,690
COLOR IMAGE READING APPARATUS WITH PLURAL LINEAR SENSORS WHICH CAN READ DIFFERENT LINES OF THE IMAGE
Shizuo Hasegawa, Tokyo, and Nobuo Matsuoka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 804,110, Dec. 3, 1985, abandoned. This application May 11, 1988, Ser. No. 193,227
Claims priority, application Japan, Dec. 4, 1984, 59-256752; Dec. 4, 1984, 59-256755; Dec. 4, 1984, 57-256756
Int. Cl.[4] H04N *1/46, 1/40*
U.S. Cl. 358—75 **11 Claims**



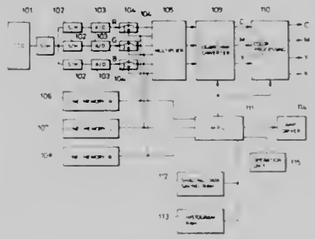
8. A color image reading apparatus, comprising:
reading means for reading a color image, wherein said reading means includes plural linear sensors each capable of generating plural analog color component signals arranged such that said plural linear sensors read a line of the color image in a divided manner and such that adjacent linear sensors read mutually different lines of the color image;
means for providing relative motion between said plural linear sensors and the color image in a sub-scanning direction perpendicular to a main-scanning direction of said plural linear sensors;
separating means for separating the plural color component signals generated by said plural linear sensors into color component signals of each color;
plural forming means for correcting a discrepancy between the color component signals of each color separated by said separating means due to the reading of mutually different lines of the color image by adjacent linear sensors, and for forming continuous color component signals representing a line of the color image; and
color processing means for color processing of the continuous color component signals to form color image signals usable for reproduction of the color image.

4,891,691
STILL IMAGE COLOR SEQUENTIAL PHOTOGRAPHIC APPARATUS
Tatsuro Baba, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 13, 1988, Ser. No. 143,653
Claims priority, application Japan, Jan. 14, 1987, 62-4916
Int. Cl.[4] H04N *1/46, 5/84*
U.S. Cl. 358—75 **12 Claims**



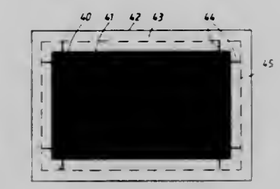
1. A color sequential photographic apparatus comprising:
monochrome display means on which an image is scanned and displayed with an adjustable display luminance;
an optical system for guiding the displayed image on said display means onto a color film;
filter means, having three primary color filters, for sequentially inserting said primary color filters in said optical system;
variable aperture means located within said optical system and capable of varying an aperture value of said optical system;
display control means for controlling the display luminance of said display means;
exposure time control means for controlling a film exposure time of each of three images corresponding to three primary colors by sequentially displaying the images on said display means during a predetermined interval while simultaneously using said filter means in associated with the images displayed on said display means; and
photographing control means for controlling at least one of said display control means, said variable aperture means, and said exposure time control means, in accordance with a desired photographing condition;
said photographing control means including:
film information input means for detecting and inputting information indicating the type of said color film; and
characteristic control means for controlling a control characteristics of at least one of said display control means, said variable aperture means, and said exposure time control means, in accordance with the information input from said film information input means.

4,891,692
COLOR IMAGE READING APPARATUS HAVING VARIABLE EXPOSURE CONTROL
Kenichi Outa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 6, 1987, Ser. No. 117,752
Claims priority, application Japan, Nov. 13, 1986, 61-271468
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **39 Claims**



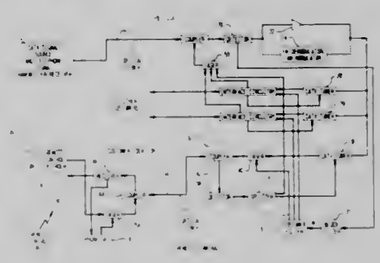
1. An image reading apparatus comprising:
exposing means for exposing an original image;
reading means for reading an image by photoelectrically converting a light from the exposed original image;
detecting means for detecting a density of said image on the basis of a histogram of an output from said reading means; and
control means for controlling an exposure light quantity of said exposing means in accordance with the image density detected by said detecting means.

4,891,693
REFERENCE MARKING DEVICE FOR IMAGE TRANSMITTERS
Folke Bergquist, Hindås, Sweden, assignor to Victor Hasselblad AB, Göteborg, Sweden
Filed Dec. 11, 1987, Ser. No. 131,891
Claims priority, application Sweden, Dec. 11, 1986, 8605306
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **1 Claim**



1. A reference marking device for image transmitting devices, comprising: a receiver, and a transmitter for transmitting to the receiver a transmission signal comprising an image signal and first and second border reference signals,
said transmitter comprising:
a transmission unit;
a scanner comprising a plurality of photosensors for repeatable optical scanning of an image as a sequence of image scan lines, and for generating the image signal in correspondence with the scanned image;
said image signal including a sequence of consecutive scan line signals, each corresponding to a respective image scan line;
signal generation means for electronically generating said first border reference signals including first reference mark signals at positions corresponding to first scan positions in a first scan direction, said first scan positions being invariant relative to a scan origin position, and for generating said second border reference signals including neutral reference signals and second reference mark signals;
said second border reference signals being generated between the consecutive scan line signals, said second reference mark signals being generated at positions corresponding to second can positions in a second scan direction, said second scan positions being invariant relative to said scan origin;
scanner control and drive means for moving the scanner relative to the scanned image and for alternate activation and deactivation of said photosensors during generation of said image signal and said first and second border reference signals, respectively;
said receiver comprising
image reproduction means for recording on an image base a reproduction of the scanned image in correspondence with the image signal; for recording on the image base a neutral border region corresponding to said first and second border reference signals and, in correspondence with the first and second reference mark signals, reference marks in the neutral border region; and for registration of a series of separate, associated image reproductions;
said reference marks being recorded in positions which are invariant relative to the content of the series of associated image reproductions and to the neutral border region, each of the associated image reproductions corresponding to a scanning of the image filtered with respect to color.

4,891,694
FIBER OPTIC CABLE TELEVISION DISTRIBUTION SYSTEM
Winston I. Way, Tinton Falls, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.
Filed Nov. 21, 1988, Ser. No. 274,303
Int. Cl.[4] H04N *7/10*; H04B *9/00*
U.S. Cl. 358—86 **2 Claims**



1. A CATV signal distribution system comprising
a first optical fiber,
source means for applying multiple-channel CATV signals to one end of said fiber,
a remote terminal connected to the other end of said first fiber, said terminal being adapted to serve multiple customer locations each of which includes at least one TV set equipped for CATV reception,
multiple second optical fibers each connected between said remote terminal and a respective one of said customer locations for carrying single-channel CATV signals from the remote terminal to each TV set at a customer location and for carrying channel-selection signals from each TV set in a customer location to said remote terminal,
means associated with each TV set in a customer location

for applying channel-selection signals to the fiber connected to said location,

and means, including multiple tuners in said remote terminal each responsive to the multiple-channel CATV signals applied to said remote terminal via said first fiber and each respectively responsive to the channel-selection signals from a different TV set in a customer location, for applying selected single-channel CATV signals to the second fibers that are respectively connected to said customer locations,

wherein said means for applying selected single-channel CATV signals to said second fibers includes lasers in said remote terminal respectively responsive to said tuners for applying to said second fibers modulated signals at a first CATV carrier frequency, and wherein said means in a customer location for applying channel-selection signals to the one of said second fibers connected to said customer location also includes a laser, said customer location lasers being adapted to provide modulated channel-selection signals at a second carrier frequency that is different from said first carrier frequency,

further including means for carrying telephone signals to and from said multiple customer locations via said first and second fibers and said remote terminal,

wherein said carrying means includes the lasers in said remote terminal, which lasers are modulated to carry telephone signals at a first telephone carrier frequency from said terminal to customer locations,

wherein said carrying means further includes the lasers in customer locations, which lasers are modulated to carry telephone signals at a second telephone carrier frequency from said locations to said remote terminal,

and wherein said first telephone carrier frequency is sufficiently different from said first CATV carrier frequency to avoid beat frequencies, arising from nonlinearities in the lasers in said remote terminal, that fall within the frequency spectrum of CATV signals delivered to a TV set at a customer location.

4,891,695

ELECTRONIC ENDOSCOPE APPARATUS PROVIDED WITH A PLURALITY OF ENDOSCOPES HAVING SOLID STATE IMAGING DEVICES WITH AT LEAST ONE IDENTICAL PIXEL FORMING ELEMENT

Akinobu Uchikubo; Masao Uehara; Masahide Kanno, all of Hachioji; Jun Hasegawa, Hino; Masahiko Sasaki, Hachioji; Katsuyuki Saito, Hachioji; Katsuyoshi Sasagawa, Hachioji, and Shinji Yamashita, Hachioji, all of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Dec. 30, 1988, Ser. No. 292,144

Claims priority, application Japan, Feb. 23, 1988, 63-40166

Int. Cl.[4] A61B *1/04*; K04N *7/18*

U.S. Cl. 358—98 **17 Claims**

3. An electronic endoscope apparatus comprising:

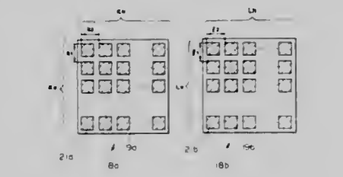
a first endoscope apparatus having a solid state imaging device wherein an object image obtained from an observing window provided at a tip of an insertable part inserting into a body cavity is formed and is converted to an electric signal to be output;

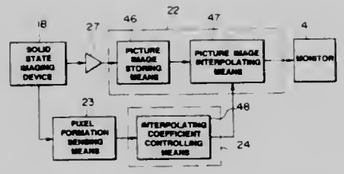
a second endoscope apparatus having a solid state imaging device which is different from the solid state imaging device provided in said first endoscope apparatus in shape or number of pixels but the same in at least one pixel forming element;

a video processing means, to which said first and second endoscope apparatuses can be connected, for processing the electric signal output from said solid state imaging device to be a video signal;

a displaying means for receiving the signal processed by said video processing means and for displaying said object image as a picture image;

a pixel formation sensing means for sensing the solid state imaging device provided in the first or second endoscope apparatus and for outputting a control signal; and





a video processing controlling means for receiving the control signal output by said pixel formation sensing means and for controlling said video processing means.

4,891,696

ELECTRONIC ENDOSCOPE APPARATUS PROVIDED WITH IMAGE FORMING POSITION DETECTING MEANS

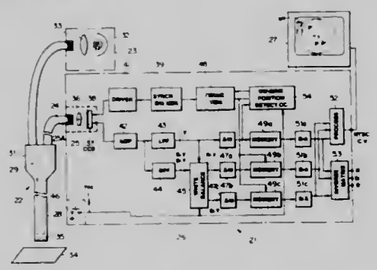
Akihiko Miyazaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,097

Claims priority, application Japan, Apr. 7, 1988, 63-86376; Nov. 21, 1988, 63-294227

Int. Cl.[4] A61B *1/04*; H04N *7/18*

U.S. Cl. 358—98 **25 Claims**



1. An electronic endoscope apparatus comprising:

a fiber scope formed of:

an elongate insertable part,

a light guide means inserted through said insertable part, for transmitting an illuminating light and for emitting the illuminating light from an exit end surface,

an objective optical system arranged on a tip side of said insertable part, and

an image transmitting means having an entrance end surface arranged in a focal plane of said objective optical system and for transmitting an optical image;

a light source apparatus feeding an illuminating light to an entrance end surface of said light guide means;

an imaging unit formed of:

an imaging forming optical system fitted with said image transmitting means at an exit end and forming the optical image transmitted to said exit end, and

an imaging device photoelectrically converting the optical image formed by said image forming optical system;

a drive signal producing means, outputting a driving signal, for reading out a photoelectrically converted picture image signal to said imaging device;

a signal processing means for processing said picture image signal to produce a standard video signal;

a display means for displaying said standard video signal;

an image forming position detecting means for detecting a signal period in which a signal corresponding to the picture image signal read linearly out of said imaging device first exceeds a fixed level, a signal period in which said signal is first below the fixed level, a signal period in which said signal last exceeds the fixed level or a signal period in which said signal is last below the fixed level, to detect an image forming position in at least one direction of an optical image imaged by said imaging device; and

a display position correcting means for correcting an output timing of the standard video signal output from said signal processing means based upon an output signal from said image forming position detecting means and for displaying the standard video signal in a predetermined position of said displaying means.

4,891,697

ELECTRONIC ENDOSCOPE HAVING FUNCTION OF EFFECTING ENLARGEMENT/REDUCTION PROCESSING

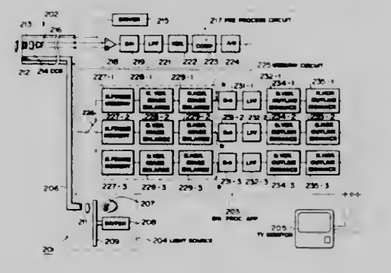
Katsuyuki Saito; Masahide Kanno; Masao Uehara; Masahiko Sasaki; Katsuyoshi Sasagawa; Shinji Yamashita; Akinobu Uchikubo, all of Hachioji, and Jun Hasegawa, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,727

Claims priority, application Japan, Jan. 7, 1988, 63-1844

Int. Cl.[4] A61B *1/04*; H04N *7/18*

U.S. Cl. 358—98 **13 Claims**



1. An electronic endoscope apparatus comprising:

(a) an electronic endoscope including:

an elongated inserting portion;

illuminating-light emitting means arranged to emit illuminating light from the distal end of said inserting section;

an objective lens system disposed at the distal end of said inserting portion; and

a solid state imaging device disposed in the focal plane of said objective lens system and having the function of photoelectric conversion;

(b) a signal processing device including:

a drive circuit for applying a drive signal to said solid state imaging device so as to read out an image signal;

memory means for storing the image signal read from said solid state imaging device by the application of said drive signal;

image size changing means for selectively effecting enlargement or reduction of the period of the image signal which is read from said memory means, by changing one of the frequency of a readout clock and the number of clocks; and

outline enhancing means for effecting outline enhancement, in an arbitrary direction, of said image signal which has been passed through said image size changing means; and

(c) display means for displaying said image signal passed through said outline enhancing means.

4,891,698

ARRANGEMENT FOR DPCM-CODING OF VIDEO SIGNALS

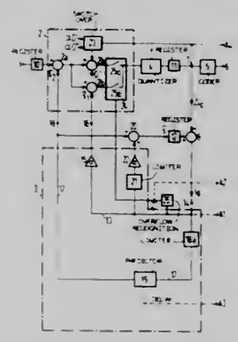
Hans J. Mattausch, Kirchheim; Fred Matthiesen, and Matthias Schoebinger, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 346,083

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820233

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—135 **8 Claims**



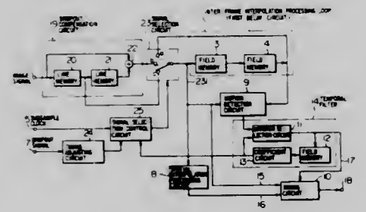
1. An arrangement for DPCM coding of video signals, whereby estimated values (s) are subtracted from respective digitized picture element signals (s) and the difference signals thus obtained are utilized for signal transmission after a quantization and coding, the arrangement having a recursive signal path that contains a first adder (8) for forming reconstructed picture element signals (s_R) from the quantized difference signals and the estimated values, means for limiting which is a predictor (3) for forming the estimated values (s) and a subtraction means (2) for the formation of the difference signals, whereby the subtraction means (2) has first and second subtractors (2*b*, 2*b'*) and a multiplexer (24), the two subtractors each having an output connected via a multiplexer (24) to an input of at least one quantizer (4) that carries out the quantization, whereby a control input of the multiplexer is connected to a means for overflow recognition (26) controlled by an output of the first adder (8), comprising the two subtractors (2*b*, 2*b'*) having first inputs connected in parallel and receiving picture element signals or signals derived therefrom via a preceding subtractor (2*a*); a second input of the first subtractor (2*b*) of the subtraction means (2) connected to the output of the first adder (8); a second input of the second subtractor (2*b'*) of the subtraction means (2) connected to a means for switch-over (23); the switch-over means (23) receiving a lower limit value (α-G$^-$) of the first adder (8) weighed with α and an upper limit value (α-G$^+$) of the first adder (8) weighed with α; the switch-over means (23) also connected to a first input of the first adder (8) when signals at a second input of G$^-$ through G$^+$; the switch-over means (23) connecting one of the lower and upper limit values (G$^-$, G$^+$) to the second input of the second subtractor

(2b') dependent on the operational sign of a signal at the first input of the first adder (8).

4,891,699
RECEIVING SYSTEM FOR BAND-COMPRESSION IMAGE SIGNAL

Masanori Hamada, Kadoma; Takeshi Inoue, Matsuyama; Mitsuo Isobe, Osaka; Yuichi Nisomiya; Yoshimichi Ohtsuka, both of Kawasaki, and Yoshinori Izumi, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1989, Ser. No. 314,088
Int. Cl.[4] H04N *7/12, 7/18, 9/88, 5/94*
U.S. Cl. 358—136 **4 Claims**



1. A receiving system for a band-compression image signal having input means supplied with an image signal subjected to band-compression processing like multiple sub-Nyquist sampling and a dropout signal representing a dropout portion of the image signal, said receiving system comprising: a first delay circuit for inter-frame interpolation; a dropout compensation circuit including a second delay circuit for delaying at least one horizontal scanning period; a signal selection circuit connected to respective outputs of said first delay circuit and said dropout compensation circuit for selecting one of an image signal and outputs of said first delay circuit and said dropout compensation circuit; a motion detection circuit connected to said first delay circuit; a temporal filter including a third delay circuit for expanding an output of said motion detection circuit along the time axis; and a signal selection control circuit producing an output for controlling said signal selection circuit, the output of said signal selection control circuit being processed by an output signal of said third delay circuit and the dropout signal.

4,891,700
SYSTEM FOR INSERTING A TEST SIGNAL IN A VIDEO IMAGE SCANNING LINE

Thierry Meunier, Oskar-Joos-Strasse 10, D-7730 VS-Oberschach, Fed. Rep. of Germany

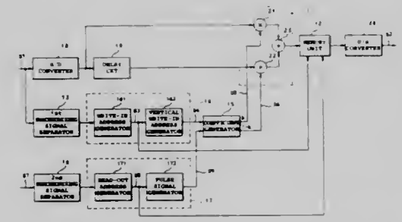
Filed Sep. 22, 1988, Ser. No. 247,644
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732866
Int. Cl.[4] H04N *17/04*
U.S. Cl. 358—139 **6 Claims**

1. In a video signal processing system including an image display device for displaying an image in response to an image component of a video signal, apparatus comprising:
- a video signal path for conveying said image component to said image display device;
- means for generating a test signal for use in automatically adjusting a system parameter affecting the magnitude of current conducted by said display device;
- means for selectively inserting said test signal into said video signal path during a scanning line image display interval in an initial visible portion of an image scanning field; and
- control means coupled to said inserting means for enabling said test signal to be inserted into said video signal path when the brightness of a displayed image exceeds a given level, and for inhibiting the insertion of said test signal at other times.

4,891,701
TELEVISION SIGNAL FRAME NUMBER CONVERTER CAPABLE OF DETERMINING AN OPTIMUM INTERPOLATION COEFFICIENT

Chokei Shikina; Masashi Onosato; Masakazu Tsuji; Takeo Tsutsui; Masatoshi Yorozu, and Yutaka Tanaka, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 23, 1988, Ser. No. 289,188
Claims priority, application Japan, Dec. 25, 1987, 62-331803
Int. Cl.[4] H04N *7/01, 11/20, 7/18*
U.S. Cl. 358—140 **3 Claims**



1. A television signal frame number converter for converting an input television signal having a first frame number per second into an output television signal having a second frame number per second, said converter comprising coefficient generating means for generating a coefficient signal representing an interpolation coefficient, processing means for processing two successive frames of said input television signal by a frame interpolation process in accordance with said coefficient signal to produce a processed signal, and memory means for memorizing said processed signal in synchronism with a write-in address signal given by a first synchronizing signal of said input television signal, said memory means being accessed by a read-out address signal given by a second synchronizing signal of a reference television signal having said secood frame number per second, wherein the improvement comprises:
- first signal generating means for generating a first timing signal defined by said write-in address signal; and
- second signal generating means for generating a second timing signal representing a start timing of said read-out address signal in accordance with said read-out address signal;
- said coefficient generating means being connected to said first and said second signal generating means to vary said interpolation coefficient in response to the first timing signal generated when said second timing signal is generated.

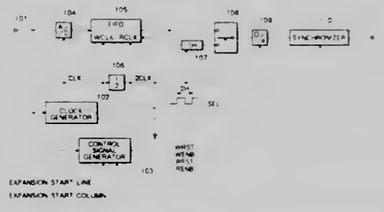
4,891,702
IMAGE EXPANSION APPARATUS

Tadayoshi Nakayama, Tokyo, and Chikara Sato, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 300,931
Claims priority, application Japan, Jan. 29, 1988, 63-017413
Int. Cl.[4] H04N *5/262, 1/393*
U.S. Cl. 358—140 **21 Claims**

1. An image expansion apparatus for expanding an image two-dimensionally, comprising:
- an image memory for temporarily storing image data inclusive of an area to be expanded;
- reading means for successively reading image data, which has been written in said image memory, out of said image memory at a speed different from that at which the image data was written in said image memory;

delay means for delaying, by a predetermined period of time, the image data read out of said image memory; and

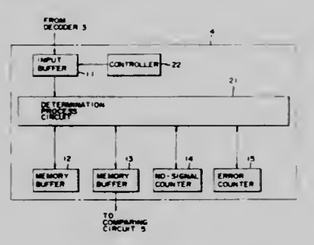


selecting means for alternately selecting, at a predetermined time interval, image data which has and has not passed through said delay means.

4,891,703
METHOD AND SYSTEM FOR DETERMINING VIDEO PROGRAM SYSTEM SIGNALS

Yoshimasa Nondan, Kumagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1988, Ser. No. 247,604
Claims priority, application Japan, Sep. 30, 1987, 62-246034
Int. Cl.[4] H04N *7/087, 7/08*
U.S. Cl. 358—142 **8 Claims**

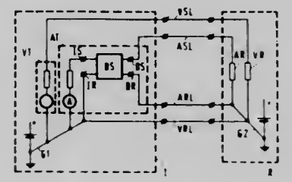


2. A system for determining a video program system signal detected from a television signal, the system comprising:
- input buffer means for storing the video program system signal detected from the television signal;
- determining means for determining whether the video program system signal stored in the input buffer means is a normal signal in accordance with predetermined criteria;
- memory buffer means for storing the video program system signal stored in the input buffer means in accordance with a determination result obtained by the determining means;
- error count means for counting an error count value in accordance with the determination result obtained by the determining means; and
- no-signal counter means for counting a no-signal count value in accordance with another determination result obtained by the determining means.

4,891,704
SYSTEM FOR ASYMMETRICAL SIGNAL TRANSMISSION

Franciscus T. J. Vonk, and Cornelis A. M. Weeche, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 850,808, Apr. 10, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 246,896
Claims priority, application Netherlands, Apr. 17, 1985, 8501120
Int. Cl.[4] H04N *5/21*
U.S. Cl. 358—143 **11 Claims**

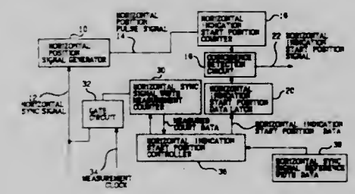


6. A system for asymmetrical signal transmission of a video signal and a first audio signal, said system comprising:
- (a) means for transmitting said video signal;
- (b) means for receiving said video signal coupled to said video signal transmitting means by a video signal path,
- (c) means for transmitting said first audio signal, said first audio signal transmitting means being coupled to said video signal transmitting means through a common supply reference potential;
- (d) means for receiving said first audio signal, coupled to said first audio signal transmitting means by a first audio signal path separate from said video signal path; and
- (e) a first differential stage coupled to said first audio signal path to provide common mode suppression of cross-talk components of said video signal in said first audio signal path due to said common supply reference potential.

4,891,705
APPARATUS FOR GENERATING A PICTURE SIGNAL AT PRECISE HORIZONTAL POSITION

Hiroyuki Suzuki, and Kazuhide Kawata, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,816
Claims priority, application Japan, Nov. 30, 1987, 302185
Int. Cl.[4] H04N *5/04, 5/272;* **G09G** *1/06*
U.S. Cl. 358—148 **4 Claims**



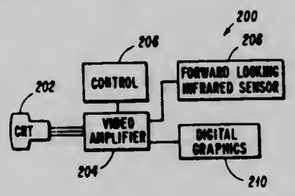
1. An apparatus for use in for a system indicating at least first and second pictures in a screen of a horizontal scan type display, comprising a first circuit for measuring the pulse width of a horizontal synchronism signal for the first picture, and a second circuit for determining a horizontal indication start position of the second picture on the basis of the measured pulse width of a horizontal synchronism signal.

4,891,706

ANALOG AND DIGITAL VIDEO DISPLAY SYSTEM

Gregory L. Morud, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 15, 1989, Ser. No. 324,288
Int. Cl.[4] H04N 5/14, 5/33
U.S. Cl. 358—184 5 Claims



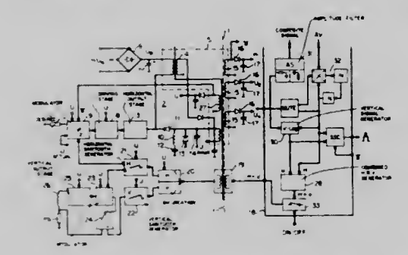
1. A video display system comprising:
a linear video signal source for generating a linear video signal in response to some external stimuli;
a digital video signal source, for outputting a digital video signal in response to some external stimuli;
a video amplifier coupled with said linear video source and said digital video source for amplifying the linear video signal and the digital video signal and thereby generating an amplified linear video signal and an amplified digital video signal;
said video amplifier having a resistor, a first means for controlling current through said resistor in response to a linear video signal, and a second means for controlling current through said resistor in response to a digital video signal;
a cathode ray tube coupled with said video amplifier for displaying information in response to the amplified linear video signal and the amplified digital video signal.

4,891,707

TELEVISION RECEIVER WITH A CONTROLLED, LINE-SEPARATING, SWITCHED EXTERNAL-POWER SUPPLY

Franz Dieterle, St. Georgen; Uwe Hartmann, and Udo Mai, both of Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 164,100
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707915
Int. Cl.[4] H04N 5/06, 5/63
U.S. Cl. 358—190 5 Claims



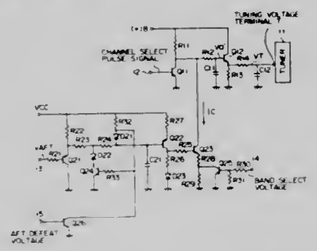
1. A television receiver comprising a controlled switched external power supply separating circuits in said television receiver from a utility power supply line; said external power supply having a first part connected to said utility power supply line and a second part separated from said supply line; horizontal output stage for generating horizontal deflection current and a vertical output stage for generating vertical deflection current; a driving stage for each said output stage for triggering the output stages; modulator means for supplying a triggering signal to the driving stage for said horizontal output stage and controlling separation of said circuits; vertical and horizontal sawtooth signal generators; means for generating a horizontal frequency control signal and a vertical frequency control signal; means for supplying said horizontal frequency control signal to said horizontal sawtooth signal generator; means for supplying said vertical frequency control signal to said vertical sawtooth signal generator; said vertical output stage having one input connected to said horizontal sawtooth signal generator; said vertical output stage having a second input connected to said vertical sawtooth signal generator through an error amplifier for vertical deflection in said first part of said external power supply connected to said utility power supply line; means for synchronizing said external power supply in said second part of said external power supply.

4,891,708

VOLTAGE SUPERPOSING CIRCUIT FOR AN ELECTRONIC TUNER

Mitsuhiro Baba, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 21, 1989, Ser. No. 312,947
Claims priority, application Japan, Feb. 26, 1988, 63-25522[U]
Int. Cl.[4] H04N 5/50
U.S. Cl. 358—195.1 15 Claims



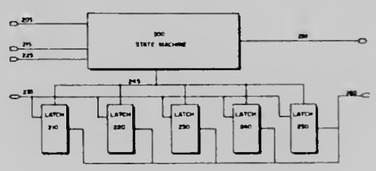
1. A voltage superposing circuit for supplying a tuning signal including the superposition of a channel select voltage on an automatic fine tuning (AFT) voltage to a tuning voltage terminal of an electronic tuner, said voltage superposing circuit comprising:
a first transistor, with a switching function, for inverting the channel select pulse signal, the base of said first transistor being supplied with a channel select pulse signal, the collector thereof being connected through a load resistor to a voltage source, and the emitter thereof being connected to a reference potential point, said channel select pulse signals of the respective channels having different duty ratios and hence the ratios of the on- and off-periods of said first transistor differing for the respective channels;
voltage supply means for rectifying and smoothing a pulse signal at the collector of said first transistor and supplying the rectified and smoothed pulse signal to the tuning voltage terminal of the electronic tuner, said voltage supply means containing capacitive means, being coupled with said voltage source in a DC mode, for charging and discharging under control of the switching operation of said first transistor; and
transistor means of which the base is supplied with a DC voltage proportional to said AFT voltage, and the collector-emitter major current path is connected between a charge/discharge path of said capacitive means and the reference potential point.

4,891,709

FLEXIBLE FORMATTING INTERFACE FOR PICTORIAL DATA TRANSFER

Andrew D. Adams, Bedford, Mass., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1989, Ser. No. 332,343
Int. Cl.[4] H04N 1/00
U.S. Cl. 358—256 11 Claims



1. In a pictorial information processor/previewer system including at least one input device which digitizes pictorial information in pixel values corresponding to n (greater than zero) colors and including intermediate storage means for pixel values received from the input device, an interface between the input device and the intermediate storage means comprising:
a. a first data bus suitable for transmitting pixel values from the input device;
b. a second data bus suitable for transmitting pixel values to the intermediate storage means;
c. n+1 latches connected at their inputs to the first data bus and at their outputs to the second data bus and each capable of storing a pixel value received from the input device on the first data bus and capable of transmitting that pixel value on the second data bus to the intermediate storage means; and
d. a multi-mode, fully programmable state machine connected to each latch, which is programmed to control the storage and transmission operations of the individual latches according to sequences associated with each mode, which is clocked at a clock rate several times greater than the rate of pixel value transmission on the first data bus, and the mode of operation which is selectable by electrical signal.

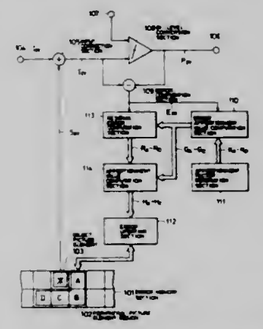
4,891,710

BI-LEVEL IMAGE DISPLAY SIGNAL PROCESSING APPARATUS

Katsuo Nakazato, Tokyo; Toshiharu Kurosawa, Yokohama; Yuji Maruyama, Tokyo; Kiyoshi Takahashi, and Hiroyoshi Tsuchiya, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1987, Ser. No. 136,486
Claims priority, application Japan, Dec. 19, 1986, 61-304249; Dec. 19, 1986, 61-304198; Dec. 19, 1986, 61-304243; Dec. 19, 1986, 61-304248; Feb. 27, 1987, 62-45577; Jul. 14, 1987, 62-175171
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—443 11 Claims

1. An image signal processing apparatus for sequentially processing input level values representing respective density levels of an array of picture elements representing an image, to produce corresponding bi-level values, comprising:
error memory means for storing a bi-level error of an object picture element in a set of memory locations respectively corresponding to a set of picture elements which have not yet been processed by the signal processing apparatus and are peripherally adjacent to a position of the object picture element in the image;
input correction means for adding an input level value of the object picture element to an accumulated error which is stored at a location in the error memory means corresponding to the object picture element position, to thereby produce a corrected input level value;
bi-level conversion means for comparing the corrected input level value with a predetermined level value to thereby determine a bi-level value for the object picture element;
difference computing means for obtaining a bi-level error which is the difference between the corrected input level value and the bi-level value determined for the object picture element;
apportionment factor generating means for generating apportionment factors for apportioning the bi-level error among the set of picture elements which have not yet been processed;
error apportionment value computing means for computing, based on the bi-level error of the object picture element and on the apportionment factors, a set of error apportionment values respectively corresponding to the set of picture elements which have not yet been processed;



residual error computing means for computing the sum total of the error apportionment values and for subtracting the sum total from the bi-level error produced by the difference computing means, to obtain a residual error, and for apportioning the residual error to respective ones of the set of unprocessed picture elements as a set of residual error apportionment values by utilizing specific factors to determine the respective residual error apportionment values;
apportionment value computing means for computing respective apportionment values for the set of unprocessed picture elements, based on the error apportionment values and the residual error apportionment values; and
error updating means for adding the apportionment values to respective accumulated error values which are stored at respectively corresponding locations in the error memory means, and for storing results of the additions in the error memory means as updated accumulated error values.

4,891,711

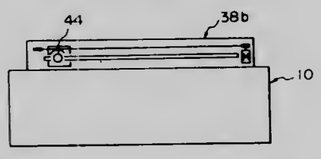
DOCUMENT READER FOR A DIGITAL COPIER

Kan Tomita, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,809
Claims priority, application Japan, Oct. 29, 1987, 62-274099
Int. Cl.[4] H04N 1/04
U.S. Cl. 358—448 5 Claims

1. In a document reader capable of reading at least transmissive documents and for sensing, when reading a transmissive document, a reflection from a reference member of a predetermined color and having predetermined density and located outside an effective image area assigned to a reflective document on a glass platen as a reference voltage for output voltages of an image sensor and, based on the reference voltage,

normalizing an output assoicated with each scanning, the improvement wherein an effective image area narrower than the effective area assigned to a reflective document is defined for a transmissive document so that, when a transmissive document is read with light passing therethrough, light transmitted through a differential area defined by a difference between the two effective image areas is sensed in the form of a reference voltage, and a timing for sensing the reference voltage is changed.



4,891,712

METHOD OF CONDUCTING MARKETING RESEARCH BY USING VIDEO TAPE PRODUCTIONS

Rich A. Spitzer; Melanie A. Mumper, both of Toledo, Ohio, and Karen A. Stanley, Chesterfield, Mo., assignors to NFO Research, Inc., Toledo, Ohio

Filed Dec. 3, 1987, Ser. No. 128,110
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—335 **2 Claims**

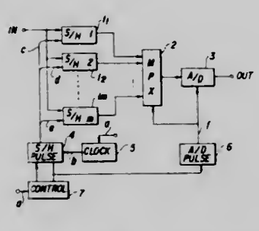
1. A marketing research method comprising, preparing a video tape having images for viewing by a defined research sample; placing the tape in a video cassette having erasing means; supplying the cassette and tape to a member of the defined research sample; viewing the tape on a one time basis by the member of the defined research sample; erasing the tape while within the cartridge; and collecting the survey material from the member of the defined research sample.

4,891,713

METHOD OF SAMPLING PICTURE SIGNALS AND APPARATUS THEREFOR

Seiichi Mizukoshi, Kanagawa, and Tomonori Satoh, Tokyo, both of Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,132
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—445 **3 Claims**



1. Apparatus for collecting data of a picture which is made up of K frames by sampling picture signals N times (N being a positive integer) on each of a plurality of scanning lines in synchronism with synchronization signals for line and frame scnnings, said picture signals being obtained by line scanning a picture along said scanning lines, and converting the signals obtained at each of the sampling points into digital signals, comprising:

a. a pulse generator for generating time pulses each shifted in timed relationship with respect to one another, said timing pulses being M in number within the period of one line scanning (M being equal to N/K and K being an integer of 2 or more);

b. sample and hold means adapted to receive said picture signals and said M timing pulses to perform sample and hold operations on said picture signals M times for every line scanned and produce an output signal;

c. control means responsive to the synchronization signals for controlling the generation of said timing pulses from said pulse generator so that the points at which said sample and hold means achieves the sampling of said picture signals on the respective scanning lines do not overlap on the respective frame scans and wherein said control means causes frame scanning to be achieved K times; and

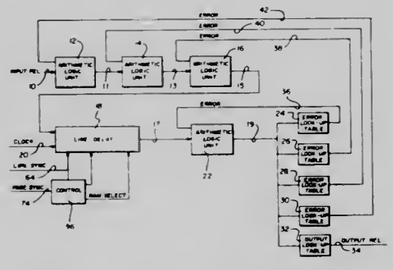
d. analog-digital converter means for converting the output signal of said sample and hold means to a digital signal during a period between the time when said sample and hold means completes the sample and hold of said picture signals M times and the time when it initiates the sample and hold for a subsequent M number of times; whereby the data for one picture is collected by frame scanning K frames.

4,891,714

APPARATUS FOR NON-LINEAR ERROR DIFFUSION THRESHOLDING OF MULTILEVEL VIDEO IMAGES

Kevin J. Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,425
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—456 **6 Claims**



1. Apparatus for performing error diffusion thresholding of multiple level digital video images into bi-level images using non-linear error signals for error diffusion, said apparatus comprising:

means for scanning a halftone image and detecting the density levels of individual pixels;

means for formulating a grayscale matrix of pixels;

means for delaying input pixels by a predetermined number of pixel locations per line;

means for delaying input pixels by a predetermined number of scan lines;

means for geneating non-linear error values containing either positive or negative sign information;

means for adding or subtracting said error values from said predetermined number of delayed pixel values and checking to insure that the calculated value is within a predetermined range; and

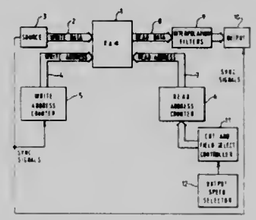
means for generating an output value.

4,891,715

DIGITAL VIDEO SIGNAL PROCESSING WITH CUT EDITING FEATURE

David F. Levy, Andover, England, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,229
Claims priority, application United Kingdom, Feb. 18, 1987, 8703730
Int. Cl.[4] G11B *27/02;* **H04N** *5/91, 5/76*
U.S. Cl. 360—14.1 **10 Claims**



1. A method of processing a digital video signal, the method comprising the steps of;

storing a segment of an input digital video signal in a random access memory;

repetitively writing said input digital signal in said memory at a standard speed, said writing proceeding cyclically from the start of said memory to the finish of said memory, then returning to the start of said memory;

reading said digital video signal from said memory at said standard speed, said reading normally lagging behind said writing by an amount substantially equal to the capacity of said memory;

effecting a cut edit of the read digital video signal by step reducing said amount by which said reading lags behind said writing; and

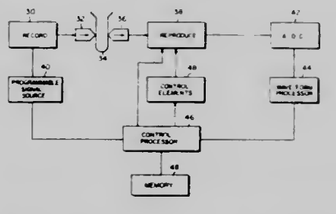
subsequent to said cut edit, reducing the reading speed below said standard speed until the amount by which said reading lags behind said writing is restored to said normal amount.

4,891,716

AUTOCALIBRATION OF A DATA SIGNAL CHANNEL THROUGH SIMULTANEOUS CONTROL SIGNALS

Robert D. Andersen, West Covina, Calif., assignor to Datatape Incorporated, Pasadena, Calif.

Filed Oct. 3, 1988, Ser. No. 252,843
Int. Cl.[4] G11B *27/36, 15/14*
U.S. Cl. 360—31 **4 Claims**



1. A method of automatically calibrating a data channel having a plurality of adjustable control elements which are sensitive to respective different frequencies of a signal transmitted over the channel, the method comprising the steps of

setting the adjustable control elements of said data channel at predetermined values;

stimulating the data channel to be calibrated with a complex waveform having harmonic content at the frequencies at which such adjustable control elements are effective;

measuring the channel response to said stimulation and analyzing the waveform to produce a set of measured response values at the desired frequencies of interest;

determining a set of error values constituting an error value between said measured response value and a target response value at each of said frequencies;

comparing the set of error values to allowable error limits, and if the set of error values are within allowable limits terminating the calibration procedure;

but, if the set of error values are not within allowable limits, simultaneously determining a new set of control values for the adjustable control elements from multiple control equations;

generating and simultaneously applying said set of new control values to the adjustable control elements to reset said elements; and

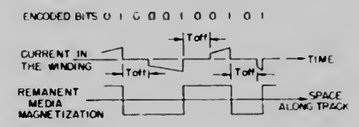
repeating each of the above steps, except the first step, until said error values are within the allowable predetermined limits for each of the desired frequency components.

4,891,717

METHODS AND APPARATUS FOR PERFORMING HIGH DENSITY ISOTROPIC/PERPENDICULAR DIGITAL MAGNETIC RECORDING

Vadim B. Minubin, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Sep. 22, 1986, Ser. No. 909,797
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—41 **31 Claims**



1. Apparatus for performing high density digital magnetic recording of a binary code string using isotropic/perpendicular media, comprising:

(a) means for generating a current;

(b) means, including a magnetic head which further includes a winding coupled to said means for generating a current, for generating a magnetic field having a polarity corresponding to the polarity of the current coupled to said winding;

(c) means for inductively coupling said magnetic head and said media as said head and said media move longitudinally with respect to one another; and

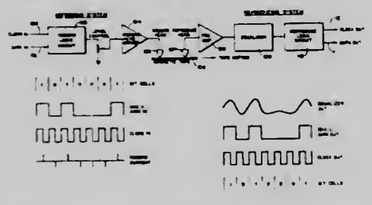
(d) control means, for switching said current off in said winding in response to detecting a one in said binary code string to thereby cause part of the fringing field of said head to be imprinted on said media leaving a horseshoe type magnetic remanent thereon, and for reenabling said switched off current, in the opposite polarity, after a time delay T_{off}.

4,891,718

MAGNETIC RECORDING

R. Kent White, 420 Kinkonko Tura, Ft. Washington, Md. 20744

Continuation of Ser. No. 898,217, Aug. 20, 1986, abandoned, which is a continuation of Ser. No. 669,357, Nov. 8, 1984, which is a continuation-in-part of Ser. No. 560,103, Dec. 12, 1983, abandoned. This application Sep. 13, 1988, Ser. No. 244,589
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—46 17 Claims



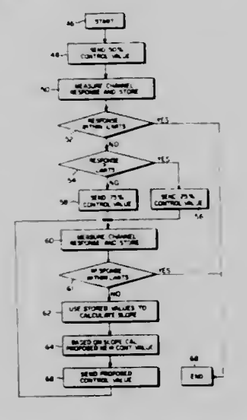
1. A method of magnetic recording by means of a magnetic recording head having a recording gap and a magnetic recording medium having a recording surface, wherein a relative traverse is effected between said head and said medium across said gap, said head providing a determined length of effective recording field along the line of said traverse, comprising applying to said recording head a sequence of electrical impulses of short time duration and at spaced time intervals for effecting magnetic recording thereof in said medium as recorded increments, the time duration of each of said impulses being a small fraction of the time period for said traverse across said gap, and the length of each of said time intervals between impulses being approximately equal to the time period of traverse over said length of effective recording field.

4,891,719

FAST CLOSURE METHOD FOR A DATA SIGNAL CHANNEL

Robert D. Andersen, West Covina, Calif., assignor to Datatape Incorporated, Pasedena, Calif.

Filed Oct. 3, 1988, Ser. No. 252,842
Int. Cl.[4] G11B *15/14*
U.S. Cl. 360—65 1 Claim



1. In conjunction with an autocalibration procedure for a data signal channel having an adjustable control element for varying the response characteristics of the channel, wherein said control element is adjustable by means of a digital control signal which has a range between 0–100%, a fast closure method comprising the steps of

setting the control value of the adjustable control element at 50% control value;

stimulating the data signal channel and measuring the system response which is stored as a first value;

comparing the measured response to acceptable tolerance limits and if the response is within said limits ending the calibration procedure;

but if the response is greater than the acceptable limits, then, setting the control element at a 25% control value, if the measured response is greater than the desired response and setting the control value of the control element at a 75% control value, if the measured response less than the desired response;

stimulating the data signal channel a second time and measuring the response and storing said response as a second value;

if the second measured value is not within acceptable limits, using said first and second measured values to calculate a linear slope;

based on the calculated slope, projecting a new control value as a function of the desired channel response;

stimulating the channel a third time and measuring the resultant response as a third value;

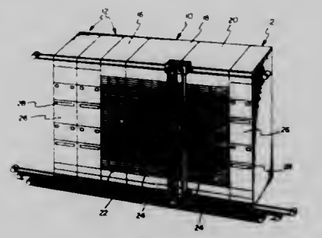
if the measured response is within acceptable tolerance limits, then ending the procedure, but if the measured response is again outside of acceptable limits, then repeating the latter steps until an acceptable channel response is measured.

4,891,720

BELT DRIVE SYSTEM FOR A MAGNETIC TAPE CASSETTE TRANSPORT/ACCESSOR

Frederic F. Grant, Bellflower, and John P. Grant, Downey, both of Calif., assignors to Datatape Incorporated, Pasedena, Calif.

Filed Dec. 16, 1988, Ser. No. 285,832
Int. Cl.[4] G11B *15/68*
U.S. Cl. 360—92 7 Claims



1. For use with magnetic tape cassette storage and utilization apparatus, wherein a magnetic tape cassette is stored and/or utilized in at least two separate locations, the invention comprising:

magnetic tape cassette accessor means for accessing a magnetic tape cassette at said two locations of said cassette storage and utilization apparatus;

transport means for transporting said accessor means in first, second and third mutually orthogonal directions;

first belt drive means coupled to said transport means for causing said accessor means to travel in said first direction, said first belt drive means including a first perforated belt assembly coupled to said transport means and first stationary sprocket motor drive means for driving said first belt assembly;

second belt drive means coupled to said transporting means for causing said accessor means to travel in said second direction, said second belt drive means including a second perforated belt assembly coupled to said transport means and second stationary sprocket motor drive means for driving said second belt assembly; and

third belt drive means coupled to said transport means for causing said accessor means to travel in said third direction, said third belt drive means including a third perforated belt assembly coupled to said transport means and third stationary sprocket motor drive means for driving said third belt assembly;

wherein said first, second, and third belt drive means are cooperatively actuated to cause said transport means to transport said accessor means to access a magnetic tape at one of said locations of said cassette storage and utilization apparatus and to transport it to the other of said locations

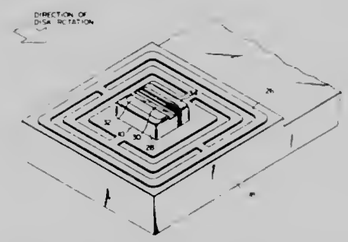
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4,891,721

MAGNETIC HEAD DEVICE

Hiroshi Ohashi, Higashiyamato, and Masahiro Kusuaoki, Tachikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 3, 1988, Ser. No. 201,932
Claims priority, application Japan, Jun. 5, 1987, 62-141005
Int. Cl.[4] G11B *5/60*
U.S. Cl. 360—103 6 Claims



1. A magnetic head device used for a magnetic disk recording/reproducing apparatus, in which a flexible magnetic disk can be loaded, and said magnetic head is contacted with said loaded magnetic disk for writing data in or reading out data from said magnetic disk, said device comprising:

a core having a read/write gap for writing data in or reading out data from said magnetic disk; and

a slider for effecting contact with said magnetic disk, said slider being provided with said core and having a flat contact surface to be in contact with said magnetic disk, said read/write gap being arranged in said flat contact surface, said flat contact surface extending in the direction of relative movement between said magnetic head and said magnetic disk, the width of said flat contact surface being 1 mm or less, said width constituting a size of said flat contact surface in a direction perpendicular to the direction of relative movement between said magnetic head and said magnetic disk.

4,891,722

INCREMENTAL STEPPING ASSEMBLY FOR A ROTARY ACTUATOR

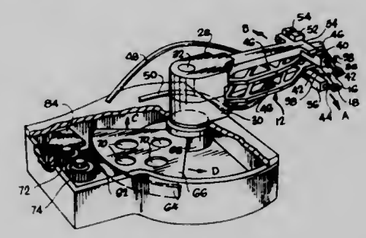
Donald L. Ekhoff, 14137 Hidden Spring La., Morgan Hill, Calif. 95037

Filed May 27, 1988, Ser. No. 199,614
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 17 Claims

1. A rotary actuator for the recording and reading of information on a magnetic disk, comprising,

a rotary arm having at least one transducer at a first end, said rotary arm having a second end pivotally supported at an axis of arm rotation, the movement of said rotary arm about said axis of arm rotation effecting travel of the transducer along an arcuate path,

a drive roller in rotation transfer communication with said rotary arm,



at least two free-spinning pressure wheels, each in frictional contact with the circumferential periphery of said drive roller, and

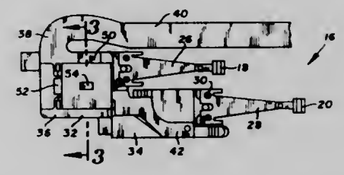
a motor means in engagement with said drive roller for rotating the drive roller about an axis parallel said axis of arm rotation, thereby pivoting said rotary arm.

4,891,723

MULTIPLE STAGE HEAT SHIELDING FOR TRANSDUCER SUPPORT ARM

Brian S. Zak, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Sep. 22, 1988, Ser. No. 247,722
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 11 Claims



1. In a magnetic transducing apparatus including a substantially rigid transducer support arm movable with respect to a magnetic data recording surface, a magnetic transducing head mounted to the arm for movement with the arm and positioned for interaction with the recording surface, an integrated circuit mounted with respect to the arm, a flexible electrical circuit electrically connected to the transducing head and to the integrated circuit, said flexible circuit mounted with respect to the arm between the arm and the integrated circuit, a means for mounting the integrated circuit to thermally isolate the integrated circuit from the arm and dissipate heat generated in the integrated circuit, said mounting means including:

a plurality of mounting stages cooperating to support the integrated circuit in longitudinally spaced apart relation to the transducer support arm, each of said stages disposed with its major dimensions substantially in a lateral plane, said stages comprising:

first and second thermally conductive foil stages between said integrated circuit and said flexible circuit;

an electrically insulative and thermally conductive first adhesive stage between said integrated circuit and said first foil stage for bonding the integrated circuit with respect to the first foil stage;

a thermally insulative second adhesive stage between said first and second foil stages for bonding the first and second foil stages with respect to one another;

a thermally and electrically insulative third adhesive stage between the second foil stage and the flexible circuit for bonding the second foil stage with respect to the flexible circuit; and

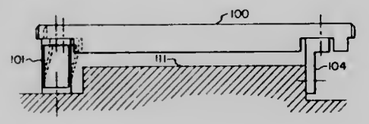
a thermally insulative fourth adhesive stage between the flexible circuit and the transducer support arm for bonding the flexible circuit with respect to the arm.

4,891,724

DISK DRIVE READ/WRITE HEAD RACK FLEXIBLE RAIL MOUNT APPARATUS

Lester M. Yeakley, and Hessam Taqhdir, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Aug. 29, 1988, Ser. No. 237,765
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 **4 Claims**



1. In a disk drive system having a frame and a spindle on which revolves one or more circular data storage media, each of which data storage media includes a plurality of concentrically arranged circular data storage tracks, said disk drive system having one or more read/write heads movable on a carriage along a rail between a first and a second end of said rail in a radial direction above the surface of said data storage media for reading/writing data on said data storage tracks, read/write head rail mount apparatus for providing precise movement of said read/write heads in said radial direction comprising:

first rail mount means connected to said first end of said rail for rigidly connecting said first end of said rail to said frame in a location on said frame proximate to the periphery of said circular data storage media;

second rail mount means connected to said second end of said rail in a location on said frame proximate to said spindle of said circular data storage media for radially flexibly connecting said second end of said rail to said frame including:

top, base, first side and second side sections connected in the shape of a rectangle for supporting said second end of said rail a predetermined distance from the surface of said circular data storage media, and deformable in said radial direction into the shape of a parallelogram for maintaining said top section of said second rail mount means parallel to said surface of said data storage media.

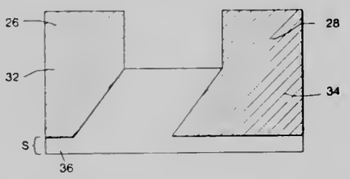
4,891,725

MAGNETORESISTIVE SENSOR HAVING ANTIFERROMAGNETIC EXCHANGE-BIASED ENDS

Greg S. Mowry, Burnsville, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Continuation of Ser. No. 15,203, Feb. 17, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 221,479
Int. Cl.[4] G11B *5/39*
U.S. Cl. 360—113 **13 Claims**

1. An elongated magnetoresistive sensor strip having a sense region and exchange-biasing antiferromagnetic material exchange-coupled to the magnetoresistive sensor strip only outside the sense region, the sense region being stabilized in a



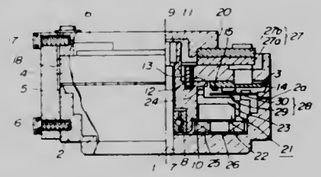
single magnetic domain state through exchange interaction outside the sense region.

4,891,726

ROTARY MAGNETIC HEAD AND GUIDE DRUM ASSEMBLY WITH REDUCE MOUNTING HEIGHT

Hisashi Suwa, Kanagawa; Seiji Sato, Kanagawa; Susumu Matsubara, Kanagawa; Eiji Yano, Tokyo, and Katsuyuki Koizumi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 130,329, Dec. 8, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 339,859
Claims priority, application Japan, Dec. 30, 1986, 61-312917
Int. Cl.[4] G11B *15/60*
U.S. Cl. 360—130.23 **7 Claims**



1. A rotary magnetic head device for magnetic tape comprising:

a first tape guide drum fixedly supported on a supporting shaft;

a second tape guide drum supported for rotation relative to said supporting shaft in a facing relation to said first tape guide drum having a surface arranged for engagement with said magnetic tape, said second tape guide drum having an interior and having a magnetic head mounted thereon;

a third tape guide drum mounted in a facing relation to said second tape guide drum;

a connecting member for connecting and securing said third tape guide drum to said first tape guide drum, thereby forming a drum assembly with said second guide rotatably arranged between said first and third guide drums;

wherein a peripheral edge portion of said third tape guide drum not contacted by the magnetic tape is cut-away, whereby a first diagonal dimension of said drum assembly from a point on said third tape guide drum whereat said peripheral edge portion is cut-away to a peripheral edge portion of said first tape guide drum in a cross-section through the axis of rotation thereof is reduced relative to another diagonal dimension substantially normal to said first diagonal from a peripheral edge portion of said third tape guide drum to a peripheral edge portion of said first tape guide in said cross-section thereof, thereby to reduce the height of the rotary head device in an inclined orientation with said cut-away edge portion forming an uppermost edge of said assembly; and

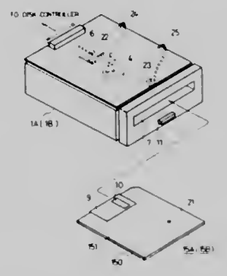
a rotary transformer having a rotor part mounted within the interior of said second tape guide drum and having a stator part attached to said third tape guide drum in a facing relation to said rotor part, so that said rotary transformer is enclosed by said second tape guide drum.

4,891,727

MEMORY DEVICE

Tadashi Sato; Keiichi Nishikasa, and Masayoshi Kamo, all of Kanagawa, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

PCT No. PCT/JP87/00988, § 371 Date Jun. 15, 1988, § 102(e) Date Jun. 15, 1988, PCT Pub. No. WO88/04803, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 18, 1987, Ser. No. 231,836
Claims priority, application Japan, Dec. 18, 1986, 61-302579
Int. Cl.[4] G11B *17/02, 5/02;* G06K *7/00*
U.S. Cl. 360—137 **12 Claims**



1. A memory device comprising:

memory medium holding means for holding either a disk cartridge housing a disk memory medium which is mechanically accessible or a semiconductor cartridge housing a semiconductor memory medium which is statically accessible;

a disk memory medium control circuit for controlling said disk memory medium;

a semiconductor memory medium control circuit for controlling said semiconductor memory medium;

discrimination means for discriminating the type of a memory medium of an inserted cartridge; and

a switching circuit responsive to an output of said discrimination means to select either said disk memory medium control circuit or the semiconductor memory medium control circuit.

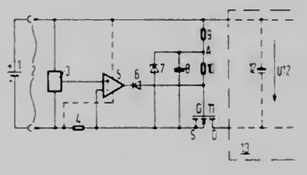
4,891,728

CIRCUIT ARRANGEMENT FOR LIMITING THE SWITCH-ON CURRENT AND FOR PROVIDING AN OVER VOLTAGE PROTECTION IN SWITCH MODE POWER SUPPLY DEVICES

Josef Preis, Munich; Ulf Schwarz, Pullach, and Gerhard Stolz, Germering, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 2, 1987, Ser. No. 127,370
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644321
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—18 **13 Claims**

1. A circuit arrangement for limiting switch-on current and for providing an over voltage protection in switch mode power supply devices, having a storage capacitor which forms a low-ohmic voltage source for a connected power supply arrangement, and having connecting means for connecting the storage capacitor to a supply voltage source, comprising: between the supply voltage source and the storage capacitor a series circuit consisting of a source-drain path of a field-effect transistor and a current measuring resistor, a gate of the field-effect transistor connected to an output of an OR-circuit whose first input is connected to an output of an amplifier which has a first input connected to the current measuring resistor and which forms a current limiter, and whose other input is connected to an output of a delay component, the delay component being connected between the connecting means and the storage capacitor and which, when the storage capacitor has no charge and is connected to the supply voltage source at the end of a predetermined delay time, the delay component emits from its output a positive potential which renders the field-effect transistor conductive.

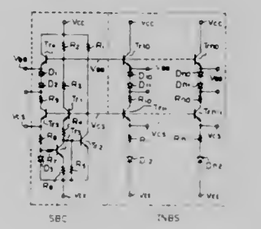


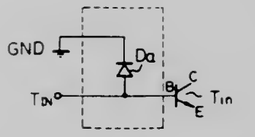
4,891,729

SEMICONDUCTOR INTEGRATED-CIRCUIT APPARATUS

Eiji Sugiyama, Kawasaki; Mitsuaki Natsume, Machida, and Toshiharu Saito, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 229,724, Aug. 4, 1988, which is a continuation of Ser. No. 861,670, May 7, 1986, abandoned, which is a continuation of Ser. No. 509,399, Jun. 30, 1983, abandoned. This application Mar. 20, 1989, Ser. No. 325,913
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **3 Claims**





1. An integrated circuit device formed on a substrate having a conduction layer formed therein, comprising:

a first power supply line formed on said substrate;

a second power supply line formed on said substrate having a voltage different from a voltage of said first power supply line;

a plurality of ECL gate cells formed on said substrate, each of said ECL gate cells comprising:

a pair of emitter coupled transistors having a base, having an emitter and having a collector, the collector of said emitter coupled transistors being operatively connected to said first power supply line;

a current source means, connected between the emitters of said emitter coupled transistors and said second power supply line; and

an output transistor having a base operatively connected to the collector of said emitter coupled transistors, having an emitter, and having a collector operatively connected to said first power supply line;

a plurality of input-output pads formed on said substrate and selectively connected to the base of one of said emitter coupled transistors and to the emitter of said output transistor through the conduction layer formed on the substrate; and

a plurality of electrostatic preventing means formed on the substrate and adjacent to said input-output pads respectively, each of said electrostatic preventing means including an electrostatic preventing element and a resistor, said electrostatic preventing means connected to one of said input-output pads such that when one of said input-output pads is connected to the base of one of said emitter coupled transistors said electrostatic preventing element is connected between one of said input-output pads and said first power supply line and said resistor is connected between one of said input-output pads and the base of one of said emitter coupled transistors, and when one of said input-output pads is connected to the emitter of said output transistor said electrostatic preventing element is connected between said one of said input-output pads and said first power supply line, the emitter of said output transistor being connected to said one of said input-output pads and said resistor not connected to said one of said input-output pads.

4,891,730

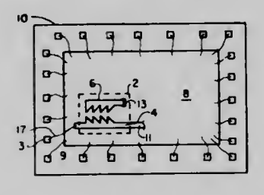
MONOLITHIC MICROWAVE INTEGRATED CIRCUIT TERMINAL PROTECTION DEVICE

Stephen E. Saddow, Howard County; Robert V. Garver, Boyds, and Roger Kaul, Olney, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1989, Ser. No. 351,114

Int. Cl.[4] H02H 9/06

U.S. Cl. 361—111 **6 Claims**



1. A terminal protection device for protecting a monolithic microwave integrated circuit from high energy incident RF power comprising:

a sealed housing;

an ionizable gas enclosed within said housing;

a semiconductor substrate having a surface area enclosed within said housing;

a photon generating region extending within said semiconductor substrate along said surface area that facilitates the ionizing of said gas; and

first and second electrodes disposed in contact with said surface area each having a plurality of protrusions thereon equally spaced from one another forming spark-gaps therebetween, said first and second electrodes disposed on opposite sides of said photon generating region so that as spotential difference between said first and second electrodes increases towards a predetermined value said photon generating region is biased by the incident RF power to emit photons which ionize said gas resulting in a voltage discharge across said spark-gaps to occur at a lower voltage than the semiconductor substrate breakdown voltage.

4,891,731

GAS DISCHARGE OVER-VOLTAGE ARRESTOR HAVING A LINE OF IGNITION

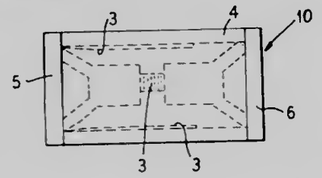
Peter Bobert, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,201

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1986, 3642818; European Pat. Off., Nov. 12, 1987, 87730142.4

Int. Cl.[4] H02H 3/04

U.S. Cl. 361—118 **2 Claims**



1. A gas discharge over-voltage arrestor having a housing closed relative to an outside space and composed of at least two electrodes of a wall of insulting material on an inner side of which at least one ignition coating in the form of a line of ignition or a surface of ignition is located, whereby said ignition coating is essentially composed of carbon particles which are applied to the inner side of the wall of insulating material in non-contacting fashion, comprising the carbon particles having a particle size less than or equal to 10 μm, whereby the carbon particles are applied to the inner side of the wall via a nozzle by means of an arc-erosion method.

4,891,732

ANTI-LIGHTING STRIKE FASTENERS FOR COMPOSITE MATERIAL AIRCRAFT STRUCTURES

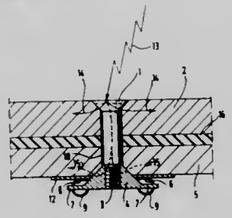
Christopher C. Jones, Lancs, United Kingdom, assignor to British Aerospace PLC, London, England

Filed Nov. 30, 1987, Ser. No. 126,332

Claims priority, application United Kingdom, Nov. 28, 1986, 8628555

Int. Cl.[4] H05F 3/02

U.S. Cl. 361—218 **6 Claims**



1. A fastener for joining a first structure made of composite material to a second structure made of composite material comprising:

a bolt bevelled at one end so it can be countersunk into the surface of said first structure and having a threaded portion at the other end,

a captive nut which is capable of co-operating with the threaded portion of the bolt and which is bevelled so it can be countersunk into the surface of said second structure,

insulating material on the bolt between the bevel and threaded portion, and

a cage adapted to be secured to said second structure for holding the nut loosely captive so as to permit limited movement thereof and for facilitating fastening of the nut to the bolt by initially limiting rotation of the nut and permitting sufficient movement so that the nut may be engaged with the bolt even when the nut and bolt are initially slightly off axis,

whereby in use the bolt may be tightened into the captive nut so as to draw the beveled surfaces of nut and bolt into intimate contact with said first and second surfaces providing thereby a good electrically conductive path between the fastener and said first and second surfaces.

4,891,733

THIN FILM ALL POLYMER CAPACITOR AND METHOD OF MAKING

Robert J. Mammone, South Plainfield, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 11, 1989, Ser. No. 351,131

Int. Cl.[4] H01G 1/01, 7/00

U.S. Cl. 361—323 **8 Claims**

5. A thin film, all polymer capacitor comprising an electrochemically formed insulating polymer sandwiched between two electochemically formed conducting polymers.

4,891,734

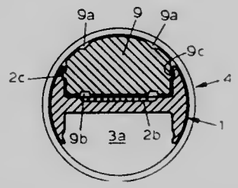
VIBRATION MOUNT FOR ELECTRONIC ASSEMBLIES

Henry S. More, Los Altos, and John L. Marsh, Cupertino, both of Calif., assignors to Quantum Solutions, Inc., Santa Clara, Calif.

Filed Jun. 15, 1988, Ser. No. 206,837

Int. Cl.[4] H05K 5/06, 7/20

U.S. Cl. 361—417 **12 Claims**



1. A mounting with enclosed electronic components for supporting the components when the mounting is situated in closed cavities in structure subject to the acceleration forces caused by vibration and shock, the mounting comprising:

(a) a housing, having an opening;

(b) a strongback, arranged to be supported in said opening, having at least one open cavity opening from said strongback, said open cavity arranged to be closed by cooperating structure to form the closed cavity;

(c) a separately molded elastomeric body, enclosing the electronic components, shaped to generally fit and approximately fill said closed cavity in said cavity;

an improvement comprising,

(d) indentations in the surface of said body arranged to receive elastomeric material from said body when said body expands relative to said closed cavity.

4,891,735

HEAT SINK FOR ELECTRICAL COMPONENTS

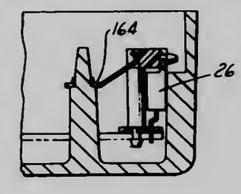
Christopher Mikolajczak, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Division of Ser. No. 115,951, Nov. 2, 1987, Pat. No. 4,845,590.

This application Mar. 10, 1989, Ser. No. 322,324

Int. Cl.[4] H05K 7/20

U.S. Cl. 361—419 **3 Claims**



1. A carrier retaining electrical components having leads within a housing comprising:

a first non-conductive member;

means retaining electrical components on said first member, said retaining means integral with said first member; and

a second non-conductive member having means receiving the leads from said electrical components and aligning the leads of said electrical components such that they are inserted into a circuit board within the housing, said second member coupled with said first member forming said carrier wherein said first member includes a pair of projecting posts coupled with said second member and retaining said first and second members in the circuit board.

4,891,736

SIGNAL HELMET

Adam Gouda, 11693 San Vicente, Suite 189, Los Angeles, Calif. 90049

Filed Feb. 4, 1988, Ser. No. 152,353

Int. Cl.[4] F26C 15/14

U.S. Cl. 362—105 **6 Claims**



1. A sigaling helmet comprising:

a shell having a bottom rim, two side portions, a back portion, a front portion, an inner surface and an outer surface;

at least one signal light for radiating outwardly from said shell;

each said at least one signal light comprising at least one electrically fed radiation source in said at least one cavity in said outer surface and at least one lens having an outer surface covering each said at least one cavity and said at least one radiation source;

said at least one signal light including two directional signal lights and one tail and brake light between said two directional lights;

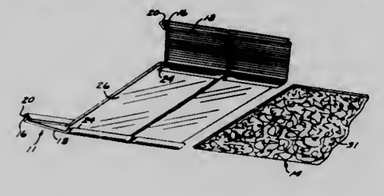
wherein one lens covers said directional lights and said tail and brake light;

at least one reflecting means situated along at least one of said side portions;

said lens cover and reflecting means defining a unit covering said back and side portions, said unit being detachably

attached by adhesive means to said outer surface of said shell;
a composite outer surface opposite the lens cover of said unit and the outer surface of said shell in immediate proximity to each other contoured free of inflection points, wherein all change of curvature taken along said composite outer surface is continuous, as is the lens cover;
means for shielding radiation from each of said directional and said tail and brake light from the adjacent of said lights; and
a radio and electrical source means adapted to communicate with a radio frequency source coupled to the signal system of a vehicle for controlling radiation intensity of said at least one signal light thereby freeing the signal helmet of external cabling.

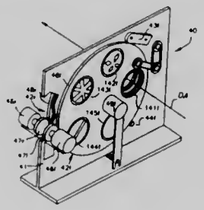
4,891,737
QUICK FIT DIFFUSER LENS APPARATUS
Donald D. Szymanek, Westlake, Calif., assignor to Thin-Lite Corporation, Camarillo, Calif.
Filed Dec. 9, 1988, Ser. No. 282,033
Int. Cl.[4] F21S *3/00*
U.S. Cl. 362—223 **6 Claims**



1. Lens apparatus for use in combination with a fluorescent light fixture of the type including an elongated housing formed with oppositely disposed inturned lens flanges, said apparatus comprising:
a lens body of unitary construction including a transparent face wall formed with a front face, said lens body further including a pair of oppositely disposed, resilient side walls, formed along their free extremities with rails defining respective oppositely opening grooves for receiving such lens flanges and angling inwardly toward one another to join with the opposite sides of said face wall and then projecting beyond the front face thereof to turn inwardly and form inturned retaining lips spaced a predetermined distance from said front face to cooperate with said front face to form an open ended receiving channel; and
a diffuser panel sized to be removably received and held within said receiving channel and including diffuser means for diffusing light projecting therethrough whereby said lens body may be fabricated to form said receiving channel and said diffuser panel slid thereonto, and said side walls may be flexed such that said free sides may be drawn toward one another to clear said lens flanges such that said lens flanges may be received in the respective grooves.

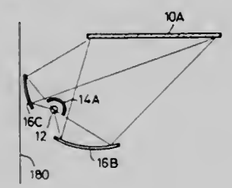
4,891,738
SELECTABLE APERTURE MODULE
Brian E. Richardson, San Jose, and John R. Richardson, Los Gatos, both of Calif., assignors to Morpheus Lights, Inc., San Jose, Calif.
Filed Jul. 26, 1988, Ser. No. 224,438
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—282 **7 Claims**

1. Selectable aperture apparatus for use across a beam of light projected in a spotlight, comprising:
a base;
carriage means movably suspended on said base and having a surface defining a first plurality of openings;
a second no greater plurality of pattern aperture means having circular rims, disposed co-axially and rotatably adjacent respective ones of said openings;
carriage drive means supported by said base for controllably



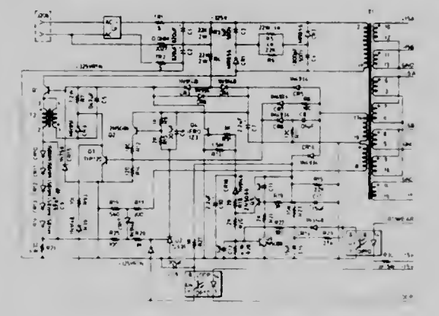
positioning said carriage means so that a selected one of said openings is co-axially intersected by the optical axis of said beam of light; and
aperture drive means for controllably spinning a pattern aperture means disposed adjacent an opening then intersected by said optical axis to spin the apparent pattern of light in said beam.

4,891,739
ILLUMINATING DEVICE
Yuji Yasuda, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 159,235, Feb. 23, 1988, abandoned, which is a division of Ser. No. 787,110, Oct. 15, 1985, Pat. No. 4,747,033. This application May 24, 1989, Ser. No. 357,631
Claims priority, application Japan, Oct. 12, 1984, 59-213975; Oct. 25, 1984, 59-224983
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—296 **7 Claims**



1. An illuminating device for uniformly illuminating a planar object comprising:
a reflecting mirror having a reflecting surface defined as a curved surface of revolution and a point light source, said reflecting surface having an axis of revolution extending perpendicularly to a plane to be illuminated and disposed outside of an illuminated zone, said reflecting surface being shaped in a cross-sectional plane containing said axis so as to reflect light from said light source toward said plane to be illuminated at a luminous flux density proportional to the distance from said axis, said point light source being positioned on the axis of revolution of said reflecting surface.

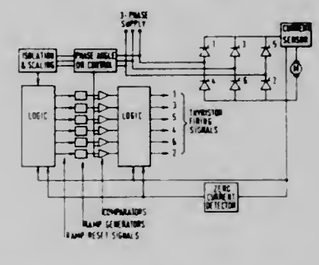
4,891,740
DC POWER SUPPLY WITH DIGITALLY CONTROLLED POWER SWITCH
Alan E. Brown, Magnolia, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Continuation of Ser. No. 57,535, Jun. 2, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 333,775
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **8 Claims**



1. A regulated DC power supply comprising:
a DC voltage source;
a power transformer coupled to the DC source;
a power switching transistor coupled in series with the power transformer;
a control switching transistor coupled to the power switching transistor;
a shunt regulator operatively coupled to the control switching transistor to provide a control signal to the control switching transistor to turn the switching transistor off in a quasi digital fashion in response to an analog reference signal; and
a means to reverse bias the base emitter junction of the control switching transistor to turn off the power switching transistor whereby the power switching transistor is rapidly turned off to limit the peak electric current at the power switching transistor.

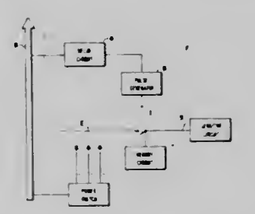
4,891,741
AC/DC CONVERTERS
Daniel T. Slattery, Duncton, and Jeremy D. Watson, Worthing, both of England, assignors to SSD Limited, West Sussex, England
PCT No. PCT/GB86/00755, § 371 Date Aug. 10, 1988, § 102(e) Date Aug. 10, 1988, PCT Pub. No. WO87/03752, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 10, 1986, Ser. No. 203,991
Claims priority, application United Kingdom, Dec. 10, 1985, 8530402; Jan. 22, 1986, 8601512
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **9 Claims**

1. A polyphase AC/DC converter comprising controlled rectifier devices and phase-dependent commutation control means associated therewith for transferring conduction between the controlled rectifier devices, the commutation control means comprising rectifier controlling means operative under load current for controlling the respective controlled rectifier devices within a control range, and limiting means for limiting said control range by an inversion limit beyond which commutation will not successfully transfer conduction from one phase to the next, wherein the commutation control means further comprises load detecting means for detecting a condition of instantaneous zero load current and means responsive to such detection for extending the control range limit by no



greater than $\pi/2p$ radians from the inversion limit, where $p \geq 3$ denotes the number of phases.

4,891,742
PROCEDURE AND DEVICE FOR ELIMINATING INTERFERENCE GENERATED BY POWER SWITCHES
Philippe J. Pradat, Les Ulis, France, assignor to Compagnie de Signaux et d'Equipements Electroniques, France
Filed Dec. 7, 1988, Ser. No. 281,242
Claims priority, application France, Dec. 18, 1987, 87 17749
Int. Cl.[4] H02J *1/02*
U.S. Cl. 363—39 **7 Claims**

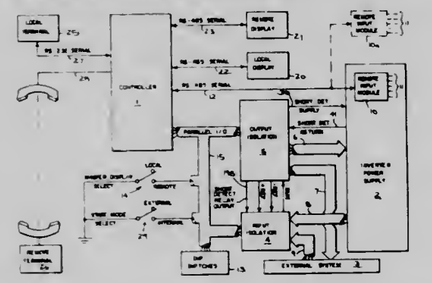


1. A method of preventing interference generated by the operation of at least one power switch, which opens and closes in response to a control signal, from affecting an electrical signal, the method including the step of blocking the transmission of said electrical signal in response to said control signal for the duration of said interference.

4,891,743
POWER SUPPLY CONTROLLER
Ronald F. May, Lannon; Kenneth G. Kafer, New Berlin; Gregory W. Schaelke, Hartford, and Michael T. Verstegen, Appleton, all of Wis., assignors to Enercon Industries Corporation, Menomonee Falls, Wis.
Filed Nov. 9, 1987, Ser. No. 118,829
Int. Cl.[4] H02M *5/42*
U.S. Cl. 363—87 **29 Claims**

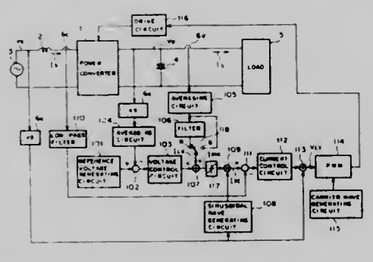
1. A control system in combination with an inverter power supply comprising:
input means for measuring at least one operational signal from within the inverter power supply, the input means producing at least one operational value based on the operational signals measured;
controller means for generating a set of operational information elements, each operational information element being calculated by the controller means according to a predetermined formula based on at least one of the operational values received from the input means, wherein the con-

troller means periodically samples each operational value and updates the set of operational information elements;
display means for providing operator interface for the controller means, the display means including visual indicates means, the visual indicating means including a first indicating area for sequentially displaying the value of one operational information element at a time from the set of operational information elements; and



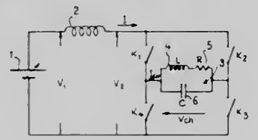
sequencing means in the controller means for alternating the operational information element value being displayed in the first indicating area on a cyclical basis by sequentially displaying the value of one operational information element for a predetermined period of time and then automatically changing the first indicating area to display a different operational information element value.

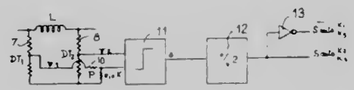
4,891,744
POWER CONVERTER CONTROL CIRCUIT
Yamamoto, Yushin, and Takeshi Miyashita, both of Hyogo,, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 29, 1988, Ser. No. 250,565
Claims priority, application Japan, Nov. 20, 1987, 62-239646
Int. Cl.[4] H02M *7/12*
U.S. Cl. 363—89 **7 Claims**



1. A control circuit for a power converter which converts a.c. power to d.c. power, comprising:
voltage control means for controlling d.c. output voltage from a power converter to be constant;
current control means for controlling input current to said power converter to be in-phase with input voltage to said power converter;
a first averaging circuit which averages a detected load current of said power converter and supplies the result of said averaging as a selectable output to said voltage control means for use in said d.c. output voltage control;
a filter coupled to said averaging circuit for filtering said result and outputting said filtered result as a selectable output to said voltage control means; and
switch means for selecting one of said outputs from said averaging circuit and said filter to be supplied to said voltage control means in the control of said d.c. output voltage.

4,891,745
AUTOCONTROL CIRCUIT FOR A RESONANCE UNDULATOR
Dominique Lafore, Gemenos; Joël Redoutey, Marseille, and Yves Servet, St. Maximin/Ste Baume, all of France, assignors to Electricite de France: Service National, Paris; Ecole Superieure d'Ingenieurs de Marseille S.A., Marseille and Compagnie Francaise d'Electrothemie Industrielle (CFEI), Seyssinet-Pariset, all of, France
Filed Apr. 26, 1988, Ser. No. 186,406
Claims priority, application France, Apr. 29, 1987, 87 06129
Int. Cl.[4] H02M *7/521, 7/523*
U.S. Cl. 363—98 **10 Claims**

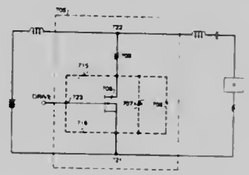


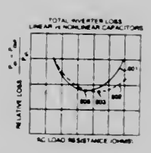


1. Autocontrol circuit for a resonance undulator, said undulator comprising a power supply having output terminals, a resonant circuit having input terminals connected to said output terminals of said supply so as to be fed by said supply, and means for reversing the polarity of connection of said resonant circuit to said power supply, said power supply comprising a DC voltage generator and a storage element, said autocontrol circuit comprising means connected to said storage element of said supply for detecting and outputting a first reference value selected from one of voltage and current of said generator, and a second value selected respectively from one of voltage and current at the output of said supply, means for outputting signals produced by comparing said output signals of said detecting means, differences between said first and second values being related to the load variations at said terminals of said resonant circuit, and control means for producing signals for controlling said means for reversing the polarity of said connection of said resonant circuit to said power supply as a function of said output signals of said comparing means.

4,891,746
METHOD OF OPTIMIZING THE EFFICIENCY OF A HIGH FREQUENCY ZERO VOLTAGE SWITCHING RESONANT POWER INVERTER FOR EXTENDED LINE AND LOAD RANGE
Wayne C. Bowman; William A. Nitz, both of Rockaway, and Norman G. Zieese, Chester, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 5, 1988, Ser. No. 280,075
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—131 **5 Claims**

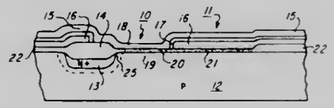
1. A method of optimizing efficiency of a high frequency zero voltage switching resonant converter having a power switching device operating into an effective load comprising an inductive reactive component;
comprising the steps of:
utilizing a non-linear capacitance shunting the power switching device to reduce overall power dissipation by;
determining a switching loss characteristic of the power switch;





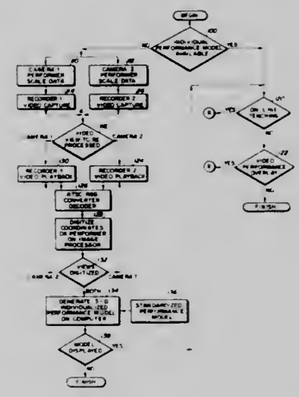
determining a conduction loss characteristic of the high frequency converter circuit including conduction loss in the power switch;
determining a set of component values defining an operating point for the high frequency converter that minimizes a sum of combined losses related to switching loss conduction loss and switching the power switching device at a frequency to achieve a high overall operating efficiency for the converter.

4,891,747
LIGHTLY-DOPED DRAIN TRANSISTOR STRUCTURE IN CONTACTLESS DRAM CELL WITH BURIED SOURCE/DRAIN
David A. Baglee, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 624,082, Jun. 25, 1984, abandoned.
This application Aug. 22, 1986, Ser. No. 900,223
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.6 **3 Claims**



1. A field-effect transistor comprising:
a silicon body having a drain region in a face thereof, the drain region having a heavily-doped region doped with impurity of one conductivity type, the drain region being adjacent a channel area of said face,
a thick thermal oxide layer over said drain region, and said drain region containing arsenic as a slow-diffusing impurity of said one type to form a lightly-doped region diffused ahead of said heavily-doped region toward said channel area to produce a lightly-doped-drain transistor,
a field plate in the form of a conductor layer over said face, insulated from said drain region by said thick oxide, and insulated from the remainder of said face by a thin oxide layer much thinner than said thick thermal oxide layer,
a hole in said plate over said channel area adjacent said drain region, said hole also overlapping said thick oxide layer,
and a conductive strip extending along said face over said field plate but insulated therefrom, said conductive strip also extending into said hole to provide the gate of a transistor.

4,891,748
SYSTEM AND METHOD FOR TEACHING PHYSICAL SKILLS
Ralph V. Mann, 1515 S. E. 27 Ter., Ocala, Fla. 32671
Filed May 30, 1986, Ser. No. 869,046
Int. Cl.[4] A63B *69/00*
U.S. Cl. 364—410 **22 Claims**



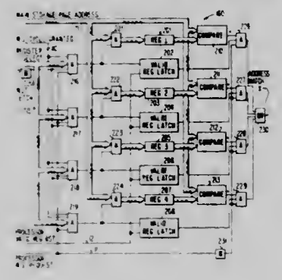
1. A method for teaching a physical skill to a person, said method comprising the steps of:
permitting the person to perform the physical skill without attaching radiation emissive devices to the parts of the person's body involved in the skill;
capturing a video image of the person performing the physical skill without detecting radiation emissions from devices attached to the parts of the person's body involved in the skill;
projecting onto a video display a first video image of the person endeavoring to accomplish the skill;
projecting simultaneously on the same video display a second video image of a model accomplishing the same skill while scaling the second video image of the model to the physical dimensions of the first video image of the person;
comparing the second video image of the model to the first video image of the person; and
attempting to correct the person's performance of the physical skill to coincide with that of the model.

4,891,749
MULTIPROCESSOR STORAGE SERIALIZATION APPARATUS
Roy L. Hoffman, Pine Island; Merle E. Houdek, and Frank G. Soltis, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 28, 1983, Ser. No. 479,281
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **3 Claims**

1. Storage serialization apparatus for a multiprocessor computer system including a plurality of processors coupled to a common main storage having a plurality of page portions accessible by at least two processors, the serialization apparatus comprising:
registering means for registering the page portion of a storage address during a granted storage access indicating which page in storage is being addressed, said registering means comprising a first page address register for storing

the page address of a first operand or of the first portion of a first operand, a second page address register for storing the page address of the second portion of a first operand, a third page address register for storing the page address of a second operand or of the first portion of a second operand, a fourth page address register for storing the page address of the second portion of a second operand;

comparing means coupled to the registering means for comparing the page portion of a storage address for a subsequently requested storage access with said page portion of



a storage address registered by said registering means and providing a comparison signal having a first value when said addresses match and a second value when said addresses do not match, and

means coupled to the comparing means for generating a storage request reject signal when said comparison signal has the first value and for generating a storage request granted signal when said comparison signal has the second value such that at least one page portion of storage is locked as a function of granted storage access.

4,891,750

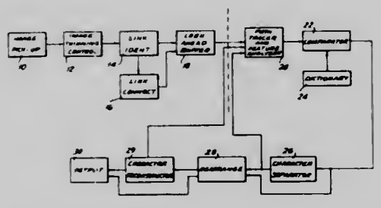
OPTICAL CHARACTER RECOGNITION BY FORMING AND DETECTING MATRICES OF GEO FEATURES

Jose Pastor, Westport, and Evelina I. Zemelman, Wilton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 29, 1986, Ser. No. 924,473

Int. Cl.[4] G06K *9/62*

U.S. Cl. 382—21 **34 Claims**



1. A method of recognizing alphanumeric characters, comprising the steps of:

scanning a character;

detecting the occurrence of predetermined geographical features in the scanned character;

forming a matrix representation representing the juxtapositions of the detected geographical features;

comparing the formed matrix with stored predetermined matrices, each stored matrix representation representing a respective alphanumeric character; and

identifying the scanned character as the alphanumeric character represented by the matrix to which the formed matrix compares.

4,891,751

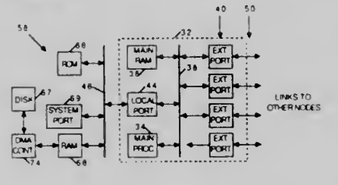
MASSIVELY PARALLEL VECTOR PROCESSING COMPUTER

Duane B. Call, Provo; Alfred Mudrow; Randall C. Johnson, both of Orem, and Robert F. Bennion, Provo, all of Utah, assignors to Floating Point Systems, Inc., Beaverton, Oreg.

Filed Mar. 27, 1987, Ser. No. 31,697

Int. Cl.[4] G06F *15/16, 13/00*

U.S. Cl. 364—200 **13 Claims**



1. A vector processing node for a computer of the type having a network of simultaneously operating vector processing nodes interconnected by bidirectional external busses for conveying parallel data words between said vector processing nodes, the vector processing node comprising:

a bi-directional first bus for conveying parallel data words;

a bi-directional second bus for conveying parallel data words;

vector memory means connected for read and write access through said second bus for storing vectors comprising sequences of parallel data words conveyed on said second bus;

vector processing means connected to said second bus for transmitting parallel data words to and receiving parallel data words from said vector memory means for generating output vectors comprising functions of input vectors stored in said vector memory means and for storing said output vectors in said vector memory means; and

control means including a computer processor connected to said first bus, external port means controlled by said computer processor and connected between said first bus and said external busses, and local port means controlled by said computer processor connected between said first and second busses, for transmitting parallel data words to and receiving parallel data words from said first bus, said second bus, said external busses, and said vector memory means for selectively transferring parallel data words from a selected one of said external busses to said first bus, from said first bus to a selected one of said external busses, between said first bus and said second bus, and between said second bus and said vector memory means.

4,891,752

MULTIMODE EXPANDED MEMORY SPACE ADDRESSING SYSTEM USING INDEPENDENTLY GENERATED DMA CHANNEL SELECTION AND DMA PAGE ADDRESS SIGNALS

Bruce A. Fairman, Woodside; Allen J. Larsen, Campbell; William G. Swinton, and Robert G. Taylor, Jr., both of Santa Cruz, all of Calif., assignors to Tandon Corporation, Moorpark, Calif.

Filed Mar. 3, 1987, Ser. No. 20,964

Int. Cl.[4] G06F *12/00, 12/02, 12/06, 12/10*

U.S. Cl. 364—200 **3 Claims**

1. A computer comprising:

a central processing unit;

a computer address modification system receiving memory address signals, DMA channel selection signals and memory address signals and selectively outputting translated memory address signals and DMA page address signals in response thereto:

a CPU address bus coupled to the central processing unit, to the computer address modification system and through a first gate to a system address bus;

a main memory;

A DMA controller that is operates during a DMA cycle to provide a plurality of direct memory access address signals;

an interrupt controller;

a system address bus providing addresses to the main memory;

a DMA address bus coupled to receive address signals from the DMA controller, the DMA address bus being coupled through a second gate to the system which address bus and to an output for a plurality of address signals from the computer address modification system which correspond to a most significant plurality of the address signals from the DMA controller;

a local I/O bus coupled to communicate information with I/O devices including the DMA controller and the interrupt controller and with the computer address modification system;

a system data bus coupled to the main memory;



a CPU data bus coupled to communicate data with the central processing unit and with the compute address modification system;

a third gate coupling the CPU data bus to the system data bus;

a fourth gate coupling the system data bus to the local I/O bus;

a latch coupled to receive and store data from the local I/O bus including address signals which correspond to said most significant plurality of the address signals from the DMA controller;

a DMA extension bus coupled to transfer the address signlas stored by the latch which correspond to said most significant plurality of the address signals from the DMA controller to the computer address modification system;

a fifth gate coupling the DMA extension bus to corresponding signals on the CPU address bus;

a translated address bus receiving translated address signals from the computer address modification system and coupling the translated address signals to the main memory;

a sixth gate coupling signals from the translated address bus which correspond to said most significant plurality of the address signals form the DMA controller to corresponding signals of the DMA address bus; and

a seventh gate coupling the translated address bus to the system address bus.

4,891,753

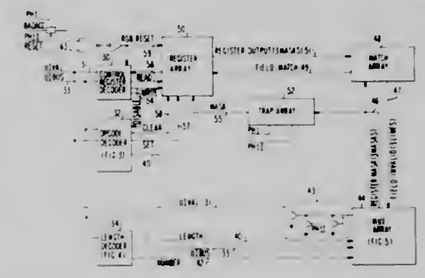
REGISTER SCORBOARDING ON A MICROPROCESSOR CHIP

David Budde, Portland; Robert Riches, Hillsboro; Michael T. Imel, Beavertoe; Glen Myers, and Konrad Lai, both of Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 26, 1986, Ser. No. 935,193

Int. Cl.[4] G06F *9/18*

U.S. Cl. 364—200 **3 Claims**



1. For use in a data processor capable of being connected to a main memory and a microinstruction bus (**33**) for carrying a current microinstruction including an opcode field which specifies an operation to be performed, a resource scoreboarder comprising:

a register array (**50**) having a plurality of registers stored therein, each one of said plurality of registers containing a mask entry, thereby providing a plurality of mask entries in said register array (**50**):

a microinstruction valid line (**31**) which, when asserted, validates said current microinstruction on said microinstruction bus (**33**) and when unasserted invalidates said current microinstruction on said microinstruction bus (**33**);

first decoding means (**30, 32**) connected to said register array (**50**), to said microinstruction valid line (**31**) and to said microinstruction bus (**33**);

second decoding means (**34**) connected to said microinstruction bus (**33**);

said first decoding means (**30, 32**) being operative upon assertion of said microinstruction valid line (**31**) for decoding said opcode field to provide a first value (**40**) corresponding to which operand field contains a valid register address,

said second decoding means (**34**) including means for decoding said opcode field to generate a second value (**42**) related to the operand length of an instruction indicated for each of a plurality of operand-length-encoding methods; and,

combining means (**43, 44**) connected to said microinstruction valid line (**31**, to said first decoding means (**30, 32**), and to said second decoding means (**32, 34**), for combining said first value (**40**) and said second value (**42**) to produce a third value (**60, 62-FIG. 5**) corresponding to the number of registers needed for said operation to be performed;

said combining means (**43, 44**) including mask generation means (**64-FIG. 5**) responsive to said third value (**60, 62-FIG. 5**) for generating a register mask (**46**); and,

register match means (**48**) connected to said register array (**50**) and to said combining means (**43, 44**) responsive to said register mask (**46**) for comparing said register mask (**46**) with said plurality of mask entries stored in said register array (**50**), to select the one of said plurality of mask entries in said register array (**50**) that matches said register mask (**46**);

said first decoding means (**30, 32**) including control register decoder means (**30**) for decoding a first (Read Memory) microinstruction on said microinstruction bus (**33**) for

causing said register array (50) to write a new mask into said one of the entries of said register array (50) selected by said register match means (48), to thereby mark said one of said plurality of registers "busy" for said operation to be performed;

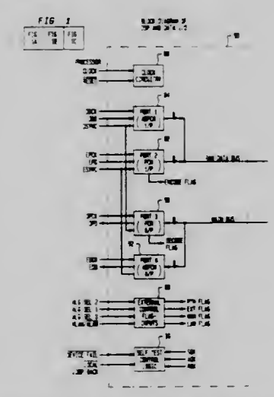
said combining means (43, 44) including means (43) for unasserting said microinstruction valid line (31) immediately after said current microinstruction appears on said microinstruction bus upon the condition that said opcode field of said current microinstruction specifies a register that has been marked "busy".

4,891,754

MICROINSTRUCTION SEQUENCER FOR INSTRUCTING ARITHMETIC, LOGICAL AND DATA MOVE OPERATIONS IN A CONDITIONAL MANNER

Charles P. Boreland, Waterbury, Conn., assignor to General DataComm Inc., Middlebury, Conn.

Filed Jul. 2, 1987, Ser. No. 69,430
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 **26 Claims**



1. A microinstruction sequencer for conditionally instructing an arithmetic-logic unit means to conduct one of a first and a second operation, where said first and second operations differ, comprising:

(a) ROM having a memory of m bits wide and n microinstruction words long, wherein for an m bit wide microinstruction word in said ROM which defines a conditional operation, a first plurality of bits of said m bits define said first operation for said arithmetic-logic unit to conduct, a second plurality of bits of said m bits define said second operation for said arithmetic-logic unit to conduct, and a third plurality of bits of said m bits are one or more control bits; and

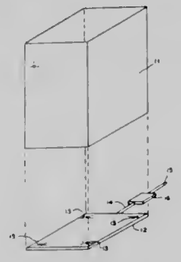
(b) selecting means for selecting one of said first and a second pluralities of bits, including control means for controlling said selection, wherein in response to at least said one or more control bits, said control means causes said selecting means to select from said first and second pluralities of bits so as to define which of said first and second operations said arithmetic-logic unit means is to conduct.

4,891,755

SYSTEM FOR DETECTING REMOVAL OF ITEMS FROM A HOTEL MINIBAR AND FOR THE AUTOMATIC CHARGING OF THE BILL OF THE GAS FOR ITEM REMOVED FROM THE MINIBAR

Amram Asher, House 54, Moshav Sitriya, Israel

Filed May 5, 1988, Ser. No. 195,784
Claims priority, application Israel, May 6, 1987, 82433
Int. Cl.[4] A47F *1/04*; F25D *25/02*; G06F *15/21*
U.S. Cl. 364—406 **8 Claims**



1. A system for detecting removal of items from a hotel minibar and for the automatic charging of the bill of the guest for each item removed from the minibar, comprising means for accurately detecting the removal of each item by establishing the resulting change of weight of the minibar, means for identifying the removed item according to a number of subclasses differing in weight from each other, and for charging the account of the guest according to the identified item removed.

4,891,756

NUTRITIONAL MICROCOMPUTER AND METHOD

William B. Williams, III, 946 Montgomery Ave., Albemarle, N.C. 28001

Filed Sep. 26, 1988, Ser. No. 248,608
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—413.29 **33 Claims**



1. A nutritional microcomputer apparatus comprising:

memory means for receiving and retaining a data base of information regarding foodstuffs,

accessing means for accessing from said memory means foodstuff identifying information regarding a selected group of foodstuffs from among those in the data base,

display means for displaying a plurality of lines of information for a corresponding plurality of foodstuffs accessed from said memory means by said accessing means,

selection means for selecting from the display of a plurality of lines of information that foodstuff identifying and nutritional value information which relates to a specific foodstuff, and

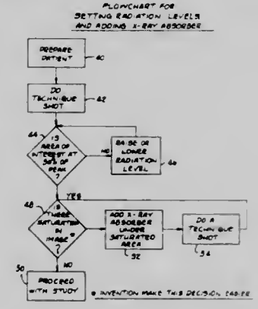
register means for registering the information selected from the display regarding a specific foodstuff and for accumulating over an interval of time the information regarding additional selected foodstuffs.

4,891,757

MEDICAL IMAGING SYSTEM AND METHOD HAVING GRAY SCALE MAPPING MEANS FOR INDICATING IMAGE SATURATION REGIONS

Robert E. Shroy, Jr., Willoughby; Karen L. Lauro, South Euclid, and Richard A. Sones, Cleveland Heights, all of Ohio, assignors to Picker International, Inc., Cleveland, Ohio

Filed Apr. 14, 1986, Ser. No. 852,023
Int. Cl.[4] G06F *15/42*; H04N *7/18*
U.S. Cl. 364—413.13 **24 Claims**



1. A digital medical diagnostic imaging system comprising:

(a) structure defining a subject examination station for accommodating a patient to be examined;

(b) a source means for causing radiation to pass through and emerge from a portion of a patient's body when situated at said station;

(c) imaging means responsive to a pattern of said emergent radiation to produce a set of digital signals each bearing a brightness value of a portion of n image of said pattern;

(d) display means including digital to analog conversion means for producing a visual image corresponding to that represented by said digital signals;

(e) first control means for controlling said source, imaging and display means to produce a study image in accordance with a predetermined protocol corresponding to a desired anatomical study, and for producing a technique image prior to the production of said study image when desired;

(f) means responsive to brightness values of said digital signals exceeding a predetermined level for altering brightness values of digital signals not corresponding to patient anatomy said alteration being performed in digital form and prior to conversion of said digital signals to analog form, without altering the brightness values of

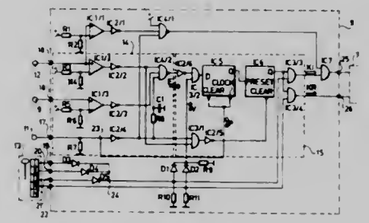
(g) means for modifying said technique image prior to its display by deliverate introduction of at least one artifact in response to a characteristic of said technique image;

4,891,758

PROCESS AND APPARATUS FOR REALIZING SAFE START-UP SHIFTING AND ENERGY SAVING IDLING OF MOTOR VEHICLES PROVIDED WITH AUTOMATIC TRANSMISSIONS

Sándor Simonyi, Salgótarján; László Törócsik, Budapest, and György Válóczi, Salgótarján, all of Hungary, assignors to Csepel Autógyár, Szigetszentmiklós, Hungary

Filed Jan. 21, 1988, Ser. No. 146,521
Int. Cl.[4] B60K *41/18*; F16H *5/40*
U.S. Cl. 364—424.1 **6 Claims**



4. Apparatus for the safe start-up shifting of a motor vehicle of the type having an internal combustion motor, an automatic transmission, a transmission control means, and a manual fuel control movable from an idle position through variable running positions, which comprises

(a) a first sensor for detecting engine rotational speed,

(b) a second sensor for detecting vehicle motion,

(c) a third sensor for detecting the position of said fuel control,

(d) a fourth sensor for detecting the actuated condition of said transmission control means,

(e) a first control device responsive to said first sensor sensing an "idle" speed condition of said engine, together with said second sensor detecting vehicle motion below a first predetermined speed, together with said third sensor sensing an idle position of said fuel control, to generate a shift-enabling signal,

(f) a shift control device responsive to detecting a "forward" or "reverse" condition of said transmission control means for generating a control signal,

(g) shift output control means responsive to the simultaneous existence of said shift-enabling and said control signals, together with the actuation of said fuel control to a running position, to generate a shift output command signal for actuating said automatic transmission into a selected "forward" or "reverse" condition.

4,891,759

CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION INCLUDING DOWNSHIFT SELECT SHOCK SUPPRESSION ARRANGEMENT

Yuji Kato, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 12, 1988, Ser. No. 192,972
Claims priority, application Japan, May 14, 1987, 62-118483
Int. Cl.[4] B60K *41/18*, *41/06*
U.S. Cl. 364—424.1 **13 Claims**

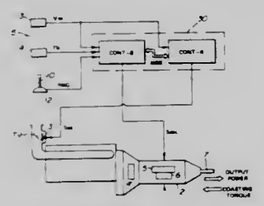
1. A transmission control system for a vehicle having an engine and a transmission which is operatively interposed between the engine and the driven wheels of the vehicle, comprising:

a vehicle speed sensor;

an engine load sensor;

a manually controllable gear select device, said gear select device being selectively movable between a D range position and an I range position;

an engine control device, said engine control device being arranged to control the rotational speed of said engine;
a transmission control unit, said transmission control unit being arranged to control the shifting of the transmission;
an engine control circuit, said engine control circuit being operatively connected to said vehicle speed sensor, said engine load sensor and said gear select device, said engine control circuit being arranged to product first and second control signals based on the inputs from said vehicle speed sensor, said engine load sensor and said gear select device, said first control signal being applied to said transmission control unit;



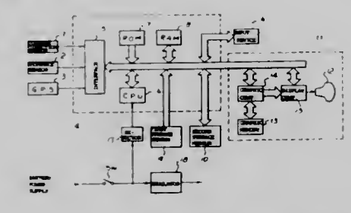
said control unit including means for:
modifying said second control signal in a manner which increases the engine rotational speed in a timed relationship with the downshifting induced by the first control signal when the gear select device is moved from said D range position toward said I range position for inducing an engine braking producing downshift, and when the engine speed is lower than that which will be induced by the reverse flow of torque which passes from the driven wheels through the transmission to the engine.

4,891,760

ON-BOARD NAVIGATION SYSTEM FOR MOTOR VEHICLES

Takashi Kashiwazaki, and Hitoshi Ando, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,092
Claims priority, application Japan, Sep. 29, 1987, 62-245615; Sep. 29, 1987, 62-245617
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—443 **2 Claims**



1. An on-board navigation system for a motor vehicle, said on-board navigation system comprising:
first memory means for storing map data in digital form;
control means for gathering map data of a region having a given area including a present location of the vehicle from said first memory means, and to display a map on a display screen on the basis of the gathered map data; and
second memory means of a non-volatile type into and from which said map data is written and read-out, wherein said second memory means is operated by said control means to memorize, at the time of a turn-off of a power supply of the vehicle, said map data gathered immediately before a fall of the power supply of the vehicle , and said display screen displays the map at the time of a return of the power supply on the basis of the map data memorized in the second memory means.

4,891,761

METHOD FOR ACCURATELY UPDATING POSITIONAL INFORMATION PROVIDED ON A DIGITAL MAP

Donald R. Gray, Carmel, Ind.; Anthony J. Spadafora, Boca Raton, Fla., and Lawrence R. Green, III, Carmel, Ind., assignors to Metz, Inc., Indianapolis, Ind.

Filed Mar. 31, 1988, Ser. No. 176,163
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—452 **15 Claims**



1. A method for updating a digitized street and terrain map to be displayed on a visual display screen in communication with a central computer provided with a memory, said map provided with address information related to geographical information provided on said map, said map displayed on the screen utilizing a digital data baser stored in the memory of said central computer including the steps of:
first, determining geographical, street and address information for one or more locations which must be added to the digital data base;
second, determining positional location provided in said digital data base proximate to one piece of geographical, street or address information generated by said first determining step;
dispatching a vehicle controlled by an operator, said vehicle provided with an onboard computer and navigational tracking system, both of which are in communication with a central facility to said position determined in said second determining step;

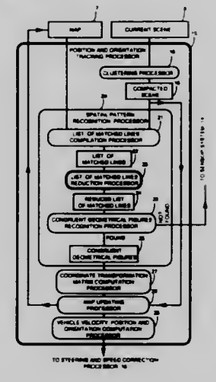
initiating computer communication between said vehicle and said central facility wherein reference coordinates related to said positional location determined in said second determining step are logged into said onboard computer;
driving said vehicle to one location generated by said first determining step proximate to the location determined by said second determining step, while coordinate data utilizing said navigational tracking system is logged by the central facility as said vehicle traverses from the location determined in said second determining step to the location determined by said first determining step;
inputting information to said onboard computer from said operator indicating that said vehicle has reached the location generated by said first determining step;
transferring information collected by said onboard computer to said central computer; and
incorporating said data collected by said onboard computer of said vehicle to said digital data base.

4,891,762

METHOD AND APPARATUS FOR TRACKING, MAPPING AND RECOGNITION OF SPATIAL PATTERNS

Nicholas P. Chotiros, 1508 Charolais Dr., Austin, Tex. 78758

Filed Feb. 9, 1988, Ser. No. 154,048
Int. Cl.[4] G06F *15/50, 15/70*
U.S. Cl. 364—456 **5 Claims**



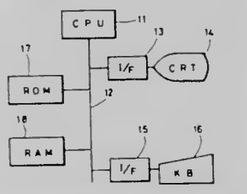
1. A pattern recognition system comprising:
means for periodically generating a scene comprising a plurality of data points, each said data point comprising the position of and a unique identifier assigned to a point in space;
means for prestoring a map comprising a plurality of said data points representing reference points;
means for determining a coordinate transformation matrix between said scene and said map, said determining means including:
means for recognizing a geometrical figure in said scene that is exclusively congruent with another geometrical figure in said map, said recognizing means including:
means for generating a list of matched lines, including:
means for calculating the length of the straight line between any two said data points;
means for determining if a said straight line in said scene matches another said straight line in said map in length within the limits of accuracy of said generating means;
means for systematically searching for said matched lines; and
means for storing said matched lines according to said identifiers of their terminations; and
means for searching said list of matched lines for a geometrical figure in said scene that is exclusively congruent with a geometrical figure in said map; and
means for computing said coordinate transformation matrix from the relative displacements in position and orientation between said congruent geometrical figures.

4,891,763

NC PROGRAM EDITING AND PROGRAMMING DEVICE

Jyuzo Kuriyama, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 23, 1987, Ser. No. 41,743
Claims priority, application Japan, Apr. 24, 1986, 61-95797; Apr. 30, 1986, 61-99719
Int. Cl.[4] G05B *19/42*
U.S. Cl. 364—474.25 **3 Claims**



1. An NC program editing and automatic programming device comprising:
temporary memory means for storing graphical data which includes pattern information defining a pattern of a tool path and tool path information defining a route of the tool path;
automatic programming means, coupled to said temporary memory means for automatically generating an NC processing program from said graphical data by converting said graphical data in said temporary memory means into numerical control data;
reading means for reading an input NC processing program generated in a numerical control data language, said input NC processing program being one which is generated by either of said automatic programming means or a programming device other than said automatic programming means;
pattern-calculation means, responsive to said input NC processing program for calculating tool path information indicative of the tool path by said graphical data;
display means for displaying said graphical data calculated by said pattern-calculation means; and
analyzing-calculation means for creating new pattern information and new tool path information by modifying and editing each block of the NC processing program which is read by said reading means and displayed as a pattern on said display means via said pattern-calculation means;
wherein said automatic programming means automatically generates a new NC processing program from the new pattern information and the new tool path information created by said analyzing-calculation means.

4,891,764

PROGRAM CONTROLLED FORCE MEASUREMENT AND CONTROL SYSTEM

James L. McIntosh, Westminster, Colo., assignor to Tensor Development Inc., Westminster, Colo.

Continuation-in-part of Ser. No. 805,719, Dec. 6, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 131,991
Int. Cl.[4] G05D *17/02, 13/02;* **G05F** *1/10*
U.S. Cl. 364—508 **25 Claims**

4. An improved variable force exerting system of the type

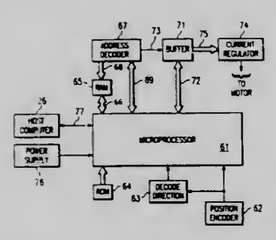
which includes a force exerting member adapted for engagement with a load to effect movement thereof, means for connecting the force exerting member to the driveshaft of a DC motor in which the torque thereof is controlled by the current through the windings, wherein the improvement comprises:

a current mode power supply connected to the windings of said DC motor, said power supply having means for controlling the positive and negative current produced thereby to change the direction and value of the current flow through the motor windings and vary the torque thereof and thereby change the force applied by the driveshaft to the force exerting member to effect movement of the load.

12. A method for determining the value of an unknown mass attached to the driveshaft of an electric actuator of the type in which the force applied to the driveshaft is a linear function of the current through the actuator, comprising:

supplying current to the actuator with a current mode controlled regulator having a plurality of discrete selectable current values;

producing signals indicative of the direction and extent of the movement of the driveshaft of the actuator;



providing regular periodic timing pulses;

providing a program controlled processor for receiving said driveshaft movement signals and said timing pulses;

periodically calculating with said processor the acceleration of the driveshaft from said driveshaft movement signals and said timing pulses;

calibrating the actuator by calculating driveshaft acceleration values with no load and a known load for a plurality of discrete current values being supplied to the actuator to determine the force applied to a load by the driveshaft of the actuator for each of said discrete selectable current values from the regulator;

setting a selected value of current supplied by the regulator to the actuator with the unknown mass connected to the driveshaft thereof and measuring the acceleration of the driveshaft; and

calculating the unknown mass from the measured value of acceleration and the force value applied to the shaft at the selected value of current set to be supplied by the regulator to the actuator.

4,891,765

CONTROL SYSTEM

Kenichi Hatori, Funabashi, and Reiji Shimomura, Sakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,522

Claims priority, application Japan, Mar. 4, 1987, 62-47501

Int. Cl.[4] G06F *9/00*

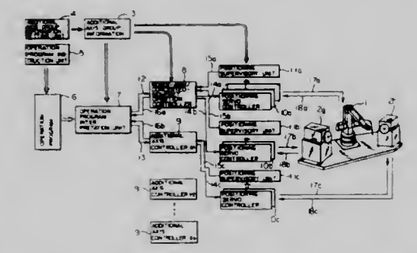
U.S. Cl. 364—513 **9 Claims**

1. A control system for controlling a plurality of machine units each having a plurality of axes and each carrying out a specific working operation, comprising:

interpretation means for interpreting an operation program having operative instructions for said machine units;

first control means, responsive to said interpretation means, for operating said first machine unit independently and alternatively in concert with a second one of said plurality of said machine units;

second control means, responsive to said interpretation means, for independently operating at least one of said second and a third of said plurality of said machine units when said first machine unit is independently operated in response to said first control means;



plural servo control means, each responsive to one of said first and second control means, each for operating a respective machine unit; and

plural supervisory means, each for supervising the operation of a respective machine unit, wherein said first and second control means control said servo control means on the basis of outputs of said supervisory means.

4,891,766

EDITOR FOR EXPERT SYSTEM

Andrew G. Derr, and Charles A. McLaughlin, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 61,832, Jun. 15, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 368,071

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—513 **4 Claims**

1. A context sensitive editor for generating expert systems by an operator comprising:

a plurality of screens, each of said screens having different categories of information entered therein,

a first controlling means presenting a first series of said screens, said first series of said screens having a definition of a class of information entered therein, said first controlling means providing a proper sequence of said screens to completely define, for said expert system, said class of information,

said definition of said class of information including a name, a scope, a designation of a procedure required to obtain said class of information, parameters required by said procedure, and allowable values for said class of information, said scope being local, global, or external,

a second controlling means presenting a second series of screens, said second series of screens having logical nodes and a logical rule structure defining an interrelationship between said logical nodes in a set of said logical nodes entered therein, said logical nodes having individual types, said types having individual sets of attributes, said individual sets of attributes comprised of different combinations of individual attributes, said individual combination of attributes determined by a combination of parameters including said type of logical node and said logical rule structure.

said second controlling means providing a proper sequence of said screens to completely define said interrelationship between said logical nodes in said set of said logical nodes,

a tree structure screen displaying the graphical interrelation of the logical nodes, and

a presentation means for presenting said tree structure screen following said definition of said interrelationship between said logical nodes.

4,891,767

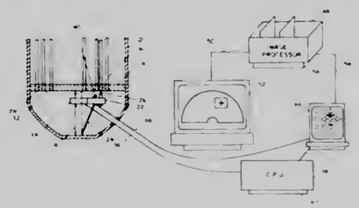
MACHINE VISION SYSTEM FOR POSITION SENSING

Peter W. Rzasa, W. Granville, Mass.; Matthew D. Allen; Carl H. Neuschaefer, both of Enfield, Conn.; Joseph E. Kowles, S. Glastonbury, Conn.; Thomas D. Williams, Shutesbury, and Frank Glazer, Wellesly, both of Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 2, 1988, Ser. No. 201,608

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—513 **23 Claims**



1. A system for sensing the position of an end effector on a remotely manipulated robot arm, comprising:

a manipulator arm having at least two degrees of freedom for displacing an end effector;

an arm control system responsive to input signals generated remotely from the arm, for positioning the arm relative to a stationary work surface;

means for illuminating the work surface in the vicinity of the end effector;

means for generating a video image of the end effector and the illuminated surface;

means for establishing a reference coordinate of the end effector for a known reference position of the arm relative to the work surface;

means for generating a digitized image of at least a portion of the generated video image when the video image includes the reference position;

means for calibrating the digitized image to the video image by associating the reference coordinate of the end effector in the video image with a reference coordinate of the end effector in the digitized image;

means for continually processing changes in the digitized images resulting from changes in the video images accompanying displacement of the arm from the reference position by the arm control system, to continually track the path of movement of the arm; and

means responsive to the means for processing changes, for continually generating an index indicative of the actual coordinate of the end effector relative to the work surface as the arm is displaced along the work surface.

4,891,768

RASTER IMAGE PROCESSOR

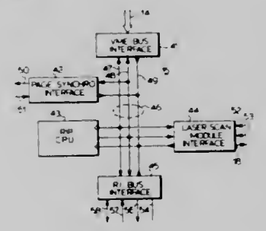
Theodorus H. M. Willems, Horst, and Franciscus H. J. Tunnissen, Venlo, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Sep. 26, 1986, Ser. No. 912,544

Claims priority, application Netherlands, Sep. 27, 1985, 8502642

Int. Cl.[4] G06F *15/66*

U.S. Cl. 364—518 **5 Claims**



1. In a raster image processor for filling and reading out a page-size raster image memory with bit representations of graphical and type characters using codes of said graphical and type characters which are expanded with said bit representations of each character stored in the form of n-bit words in consecutive addresses in a second memory adapted for input by an asynchronous bus connected to said raster image processor, said processor being adapted for conversion of said data stored in said raster image memory into a serial pixel-bit stream for a raster output scanner to obtain a printed page, the improvement therein comprising a synchronous raster image bus for connecting said processor to said raster image memory; said raster image processor including:

a. a microprogrammable central processing unit;

b. a raster image bus interface connected to said synchronous raster image bus;

c. a raster output scanner interface connected to said raster output scanner;

d. an VME interface connected to said asynchronous bus; and

e. a synchronous raster image processor bus connecting said microprogrammable central processing unit (CPU) to said raster image bus interface, to said raster output scanner interface and to said interface which is connected to the asynchronous bus.

4,891,769

PRINTER HAVING PRIORITIZED ON-LINE AND OFF-LINE MODES

Shigemitsu Tasaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,712

Claims priority, application Japan, Apr. 18, 1986, 61-89681; Apr. 24, 1986, 61-95484

Int. Cl.[4] G01D *15/00*

U.S. Cl. 364—519 **10 Claims**

1. A printer for connection to an external apparatus so as to receive information input therefrom, comprising:

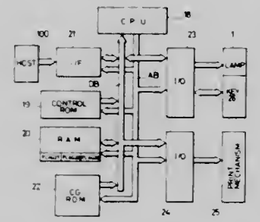
setting means for setting information regarding printing to be performed by said printer;

said setting means having a first mode in which said information regarding the printing is designatable irrespective of information which is input from said external apparatus and a second mode in which said information regarding the printing is designated in response to the information which is input from the external apparatus;

deciding means for deciding whether said information re-

garding the printing has been set to predetermined information by said setting means; and

control means for controlling the printer so as to give priority to said first mode in response to a decision by said deciding means that said information regarding the printing has been set to information other than said predetermined information.



4,891,770

APPARATUS AND PROCESS FOR CREATING VARIABLY SIZED BLOCK DIAGRAMS TO ACCOMMODATE VARIABLE TEXT CONTENTS WHILE YET RETAINING OVERALL BLOCK SHAPE

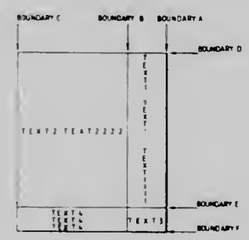
Raymond M. Hollett, Woodbridge, England, assignor to British Telecommunications public limited company, London, England

Filed Jul. 27, 1987, Ser. No. 77,918

Claims priority, application United Kingdom, Jul. 31, 1986, 8618664

Int. Cl.[4] G06F *3/153*

U.S. Cl. 364—521 **8 Claims**



5. Apparatus for machine creating variably sized block diagrams to accommodate variable text contents while yet retaining overall block shape, said apparatus comprising:

first means for defining a block having predetermined shape and size and including plural contiguous sub-blocks therewithin of predetermined respective sizes and shapes;

further means operatively associated with said first means for assigning variable mounts of text to the individual sub-blocks requiring changes to the size and shape of at least one sub-block to retain the assigned text within its boundaries; and

means operatively associated with said first and further means for changing the size and shape of at least one other said sub-block to maintain the predetermined shape of the overall block while increasing the size of said overall block.

4,891,771

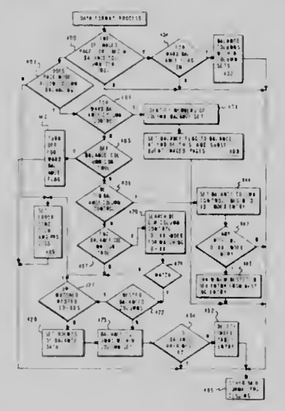
COLUMN BALANCING CONTROL

Thomas R. Edel, Austin, and Robert A. Pascoe, Grapevine, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1987, Ser. No. 136,163

Int. Cl.[4] G06F *3/12, 15/626;* **B41J** *11/44;* **B41B** *17/00*

U.S. Cl. 364—523 **18 Claims**



1. In an information processing system for displaying a data stream of encoded data in more than one column, a method for dividing said data into a plurality of columns comprising:

referring to a stored page model which describes areas in which said data is to be displayed;

identifying in said page model a plurality of column balance set areas into which said data is to be evenly distributed;

detecting a balance column command associated with said data; and

evenly distributing said data among said identified column balance set areas in response to the detection of said balance column command.

4,891,772

POINT AND LINE RANGE SENSORS

Steven K. Case; Robert E. Keil, both of St. Louis Park, and Jeffrey A. Jalkio, St. Paul, all of Minn., assignors to CyberOptics Corporation, Minneapolis, Minn.

Filed Apr. 15, 1987, Ser. No. 38,399

Int. Cl.[4] G01C *3/08;* **G06F** *15/20*

U.S. Cl. 364—562 **33 Claims**

33. A system including processing means for determining the range of an object surface comprising:

a plurality of sensors, each sensor comprising:

a laser light source which emits both visible and infra-red radiation;

means for varying the intensity of the light source;

means for focusing the light source onto an object surface;

an anamorphic optical system comprising a plurality of prisms for receiving light reflected from the object source and anamorphically magnifying the reflected light beam in an orthogonal plane; and

an optical detector comprising a plurality of light detecting elements configured in an N×M pixel array, each pixel element being selectably addressable;

multiplexing means connected to the plurality of sensor heads the multiplexing means comprising:

means for selectably addressing any one of the plurality of sensor heads;

means for varying power to the light source in the selected sensor head;

means for delaying energization of the light source for a preselected period of time; and

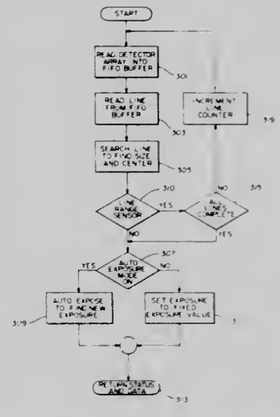
means enabling the sensor to be remote from the processing means;

the processing means being connected to the sensor heads through the multiplexing means, the processing means including software means and means for displaying the data and further comprising:

means for controlling the exposure time of the detector array to the focused light beam;

means for selectively reading all or a selected portion of the detector array;

means for refreshing the detector array; and



means for storing data from the detector array;

the software means being used to control the operation of the processing means and comprising:

means for adjusting the intensity of the light;

means for adjusting the exposure time of the light source;

means for causing the detector array to be read;

means for storing the data from the detector array;

means for determining the spot size and spot location on the detector array;

means for adjusting the spot size of the light reflected onto the detector array; and

means for calculating the range of the object surface and for displaying the data read from the detector array.

4,891,773

LOGIC SIMULATION

Kimio Ooe, Kawasaki; Nobutaka Amano, Tokyo; Takashige Kubo, Hachioji, and Kaoru Moriwaki, Hadano, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,233

Claims priority, application Japan, Apr. 25, 1986, 61-94545

Int. Cl.[4] G06F *15/20, 11/22*

U.S. Cl. 364—578 **4 Claims**

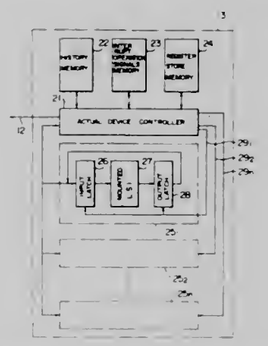
2. A logic simulation apparatus for a circuit including a first circuit, comprising:

logic simulation means for performing a logic operation of the first circuit based on a simulation circuit model thereof, so as to generate a first simulated output signal of said first circuit to be supplied to an actual device having a second circuit and internal registers;

register store means for holding previous contents of said internal registers of said actual device generated when said actual device was last operated; and

control means, connected to said logic simulation means and said register store means, for supplying the first simulated output signal to said actual device and for operating said actual device to generate a second simulated output signal in response to said first simultated output;

said control means including interrupt means for recovering previous contents of said internal registers held in said register store means, storing said previous contents in said



internal registers before supplying said first simulated output signal to said actual device and for storing new contents of said internal registers in said register store means as previous contents of said internal register after operation of said actual device.

4,891,774

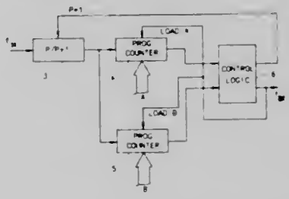
DUAL MODULUS FRACTIONAL DIVIDER

Donald A. Bradley, Morgan Hill, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Mar. 31, 1988, Ser. No. 175,759

Int. Cl.[4] G06F *7/68*

U.S. Cl. 364—703 **6 Claims**



1. A dual modulus fractional divider having an effective modulus N, an input and an output, comprising:

a prescaler coupled to said input, having a modulus P and a modulus (P+1);

a programmable divider coupled to said prescaler;

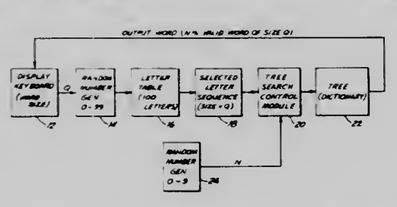
means for selectively programming said programmable divider with a modulus A, a modulus B, a modulus (A−1) and a modulus (B+1); and

control means, including a rate multiplier, coupled to said prescaler, said programmable divider and said programming means for providing on said output of said fractional divider an output signal having a plurality of cycles with a frequency f_{out} from an input signal applied to said input of said fractional divider having a plurality of cycles with a frequency f_{in} wherein:

$$f_{out} = \left(\frac{W}{Z(N+1)+(W-Z)N}\right) \cdot f_{in}$$

N=A×P+B×(P+1)
N+1=(A−1)P+(B+1)(P+1)
W=the radix of said rate multiplier, and
Z=any number from 0 to (W−1)
A=H−M−B
B=L+P×H
H=INT (N/P)=N(MOD P)
M=INT {[N/P(2P+1)]−[L/P]+0.5 }, and
L=N−P×H.

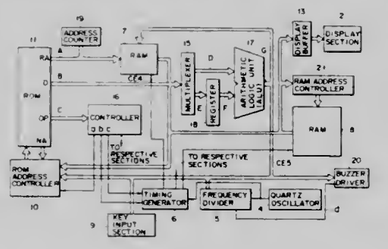
4,891,775
ELECTRONIC WORD GAME MACHINE
David McWherter, Bensalem, Pa., assignor to Franklin Computer Corporation, Mt. Holly, N.J.
Filed May 27, 1988, Ser. No. 200,000
Int. Cl.[4] G06F *15/16*; A63F *7/06*; G09B *5/00*
U.S. Cl. 364—705.06 **9 Claims**



1. A word selection device for use in a word game machine having a memory containing a word list arranged in a tree format and a tree search control module to compare an input word against the tree memory to provide a valid output word, the word selection device comprising:
input means to provide a word size command;
a first random number generator responsive to said word size command to provide a random number for each letter position commanded by said word size command; and
a predetermined letter table having a set of letters in a predetermined relative frequency;
said letter table being responsive to the output of said first random number generator to provide a selected letter sequence having a size Q equal to the word size command;
said three search control module responsive to said selected letter sequence to continue the search through words in the tree adjacent to said selected letter sequence to provide, as a valid output word, an Nth valid word having the size Q.

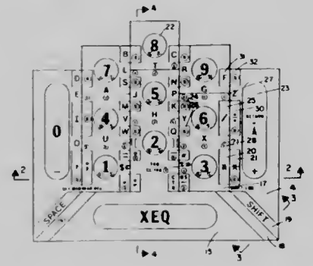
4,891,776
ELECTRONIC TIMEPIECE
Yasuo Kuroki, and Fusao Suga, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Aug. 3, 1987, Ser. No. 81,324
Claims priority, application Japan, Aug. 15, 1986, 61-125226[U]; Aug. 15, 1986, 61-125227[U]
Int. Cl.[4] G04B *47/00*; G10L *3/02*
U.S. Cl. 364—705.07 **6 Claims**

1. An electronic timepiece, comprising:
time count means for counting a reference signal to obtain present time data;
converting means for converting an external speech sound into voice data and for outputting the converted voice data;
voice data storage means, having a plurality of storage areas, for storing said voice data outputted by said converting means in said plurality of storage areas;
alarm time data storage means for storing alarm time data and designation data for designating at least one of said plurality of storage areas, said designation data designating a smaller number of said storage areas of said voice data storage means than said plurality of storage areas in which said voice data is stored;



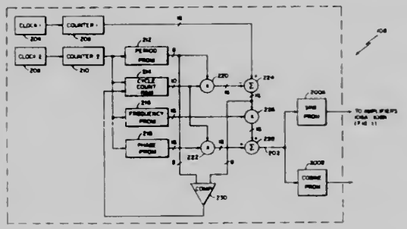
read control means for detecting a coincidence between present time data obtained by said time counter means and said alarm time data stored in said alarm time data storage means and for reading out the voice data from the at least one storage area designated by said designation data; and
sound generating means for generating speech corresponding to said voice data read out by said read control means.

4,891,777
SINGLE HAND KEYBOARD ARRAYS PROVIDING ALPHANUMERIC CAPABILITIES FROM TWELVE KEYS
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Continuation of Ser. No. 528,975, Sep. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 493,613, May 11, 1983, abandoned. This application May 13, 1986, Ser. No. 862,647
Int. Cl.[4] G06F *3/02*
U.S. Cl. 364—706 **25 Claims**



1. A keyboard system comprising in combination, a plurality of manually actuable keys utilizable for manual entry of designated unique data selections such as numerical digits by strokes of a single finger of single keys, utility means comprising an electronic computer for initiating a multiplicity of different data processing operations uniquely selectable as entries by manual actuation with said single finger of said keys, communication means linking the keys to the utility means to effect said data processing operations from unique sets of keys actuated in sequence, means for establishing different ones of said operations in response to a sequence of a fixed number (X) of sequential manual actuations of said keys by said single finger, X being at least two, whereby X and only X sequential key strokes serves to select the different ones of said operations, and means for establishing a program entry mode of computer operation providing selected ones of said data processing operations as program steps in response to manual actuation of said keys thereby to actuate individual ones of said program steps in said program entry mode, thereby providing for entry of a program from the keyboard by a set of defined selection codes each consisting of a sequence of X sequential finger strokes.

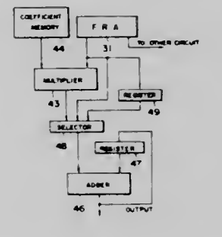
4,891,778
DISCRETE COHERENT CHIRP GENERATOR
Behshad Baseghi, and Oscar Lowenschuss, both of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.
Filed Dec. 23, 1988, Ser. No. 289,130
Int. Cl.[4] G06F *1/02*
U.S. Cl. 364—721 **8 Claims**



1. Apparatus for producing digital words on an output line at a periodic rate, said digital words having values representing a plurality of periods of a sinusoid at a predetermined frequency, said apparatus comprising:
(a) timing means for producing a digital word representing the passage of time;
(b) memory means for storing digital words representing:
(i) the length of one period of the sinusoid;
(ii) the number of periods of the sinusoid that have been generated;
(iii) the predetermined frequency; and
(iv) an offset
(c) arithmetic means, responsive to the timing means and the memory means, for computing an address; and
(d) second memory means, responsive to the address computed by the arithmetic means, for storing digital words representing a sinusoid and for applying selected ones of the stored digital words to the output line at the periodic rate.

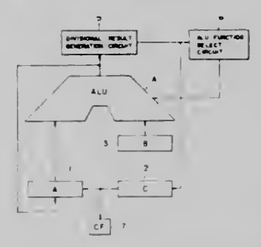
4,891,779
APPARATUS FOR ARITHMETIC PROCESSING
Atsushi Hasebe, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 30, 1987, Ser. No. 43,749
Claims priority, application Japan, Apr. 30, 1986, 61-100036
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—754 **11 Claims**

1. An arithmetic processor for multiplying a first number that has an absolute value that can exceed one by a second number that has an absolute value not exceeding one; said processor comprising:
means for providing said first and second numbers;
a multiplier;
control means connected to said providing means and responsive to an absolute value of said first number equal to or exceeding one for dividing said first number into an integer and a part having a value less than one;
accumulating means for accumulating said second number as an addend a number of times equal to said integer to produce a sum;
storage means for supplying said second number and said part to said multiplier to produce a partial product; and



adder means for adding said partial product to said sum, thereby obtaining a final product of said first and second numbers.

4,891,780
DIVISIONAL OPERATION SYSTEM FOR OBTAINING A QUOTIENT BY REPEATED SUBTRACTION AND SHIFT OPERATIONS
Akio Miyoshi, Ome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 11, 1988, Ser. No. 167,173
Claims priority, application Japan, Mar. 31, 1987, 62-79158
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—766 **4 Claims**



1. A divisional operation system for obtaining a quotient by repeating subtraction and shift operations, comprising:
a first register for storing higher order digits or figures of a dividend;
a second register for storing lower order digits or figures of said dividend;
a third register for storing a divisor;
an arithmetic and logic unit for performing subtraction between the contents of said first register and the contents of said third register or addition of both of the contents;
a divisional result generation circuit indicating that the operation result of said arithmetic and logic unit is negative or positive;
said divisional result generation circuit outputting a "0" or a "1" to the least significant bit of the second register, after said arithmetic and logic unit has completed one operation, according to whether the operation result indicates a negative state or a positive state, so as to store the operation result in said first register and shift the contents of said first and second registers to the respective upper digits by one bit, shifting the most significant bit of the second register to the least significant bit of the first register, thereby to repeatedly perform operations the number of

times necessary until the quotient is obtained at said second register;

an arithmetic and logic unit function select circuit for allowing said arithmetic and logic unit to perform addition only when said divisional result generation circuit outputs a "0"; and

an overflow indication circuit for holding a bit shifted from the most significant bit of said second register after the necessary number of operations have been completed to indicate that the division is in an overflow state when the last-mentioned bit represents a "1".

4,891,781

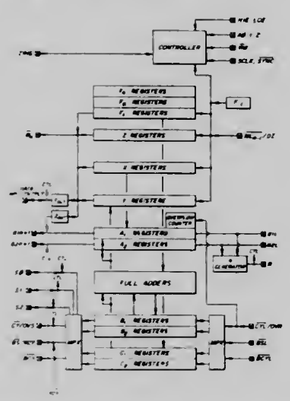
MODULO ARITHMETIC PROCESSOR CHIP

Jimmy K. Omura, Cupertino, Calif., assignor to Cylink Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 142,328, Jan. 4, 1988, abandoned, which is a continuation of Ser. No. 21,660, Mar. 4, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,124

Int. Cl.[4] G05F *7/05*

U.S. Cl. 364—768 **44 Claims**



1. An apparatus for computing multiplication in the ring of integers modulo an integer number, p, comprising:

an X register having L-bits for storing an n-bit integer X;

a Y register having L-bits for storing an n-bit integer Y;

first and second A registers for storing L-bits each;

means for transforming the n-bit integer X from X register into first and second alternate integers having L-bits each and storing first and second alternate integers in said first and second registers A;

control means connected to said first and second A registers for generating a control signal;

first and second B registers for storing L-bits each;

first and second C registers for storing L-bits each;

a full adder coupled to said first and second B registers, said first and second C registers, and said control logic, and responsive to the control signal being a 1-bit for shifting left and adding data stored in said first and second B registers to data stored in said first and second C registers, respectively, and responsive to the control signal being a 0-bit for shifting left data in said first and second B registers;

a feedback register having L-bits for storing an n-bit feedback number;

means for generating feedback number from the integer number, p, having n-bits and storing the feedback number in the feedback register;

modulo means coupled to said feedback register and said first and second C register for reducing data bits stored in said first and second C registers modulo the integer number p; and

means for converting data bits in said first and second C registers to an L-bit integer and storing the L-bit integer in said Y register.

4,891,782

PARALLEL NEURAL NETWORK FOR A FULL BINARY ADDER

John L. Johnson, Huntsville, Ala., assignor to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 17, 1987, Ser. No. 135,404

Int. Cl.[4] G06F *7/50*

U.S. Cl. 364—786 **3 Claims**

1. A method for adding a first binary number to a second binary number wherein said first binary number is contained in a first register and said second binary number is contained in a second register comprising the steps of (A) comparing the same significant bit of each of the bits of said first and second registers and only when said first register has a one value and said second register has a zero value, changing the one value in the first register to a zero value and the zero value in the second register to a one value; (B) comparing the same significant bit of each of the first and second registers and the next higher significant bit of said first register, and only when the next higher significant bit has a value of zero and the other bits have a one value, changing the zero value to a one value and the one values to zero values; and (C) repeating steps A and B until the first register has all zero values whereby the second register contains the digital sum of said first and second registers.

4,891,783

DATA TERMINAL DEVICE

Akitoshi Aritaka, Kasuga, and Norio Komaki, Kurume, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 8, 1987, Ser. No. 1,968

Claims priority, application Japan, Jan. 8, 1986, 61-1716

Int. Cl.[4] G06F *13/42*

U.S. Cl. 364—900 **3 Claims**

1. A data terminal device, which is connected to an other data terminal device, said data terminal device comprising:

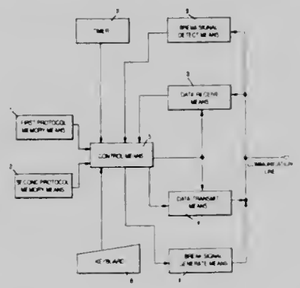
a data memory means for storing data representing a plurality of protocols;

a break signal detecting means for detecting a break signal from said other data terminal device;

a data receiving means for receiving data from said other data terminal device according to one of said protocols;

a data transmitting means for transmitting a data signal to said other data terminal device; and

a control means, coupled to said data memory means, said break signal detecting means, said data receiving means, and said data transmitting means, for causing said data transmitting means to transmit a feed back signal when a protocol of a data signal from said other data terminal device coincides with a protocol of said data receiving means, and for changing said protocol of said data receiving means when said break signal detecting means detects a break signal.



4,891,784

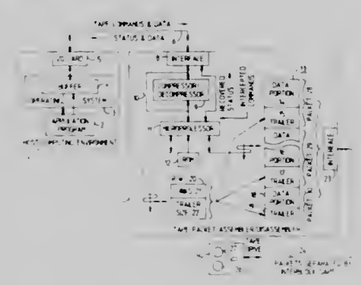
HIGH CAPACITY TAPE DRIVE TRANSPARENTLY WRITES AND READS LARGE PACKETS OF BLOCKED DATA BETWEEN INTERBLOCK GAPS

Jeff J. Kato; David W. Ruska, both of Greeley, and David J. Van Maren, Fort Collins, all of Colo., assignors tn Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 8, 1988, Ser. No. 142,180

Int. Cl.[4] G06F *3/06*

U.S. Cl. 364—900 **1 Claim**



1. Apparatus for assembly and disassembly of packets of data communicated between a host computing environment and a sequentially accessed mass storage device, the apparatus comprising:

first interface means for coupling to the host computing environment, for receiving host-transmitted records to be written to the mass storage device, and for sending to the host computing environment data and status information read from the mass storage device;

packet assembly/disassembly means coupled to the first interface means for assembling into a buffer packets comprising data portions and trailer portions of information corresponding to host-transmitted records, the data portions containing data from the host-transmitted records and the trailer portions containing descriptive information about the structure of the data portions, including the location of any tape mark that occurred in the host-transmitted record, and for disassembling back into host-transmitted records and associated status indications packets comprising data portions and trailer portions; and

second interface means coupled to the packet assembly/disassembly means for coupling to the mass storage device, for writing packets in the buffer thereto, and for reading packets therefrom into the buffer.

4,891,785

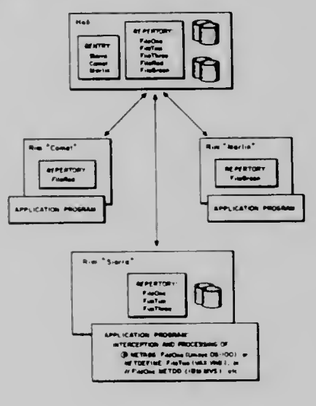
METHOD FOR TRANSFERRING DATA FILES BETWEEN COMPUTERS IN A NETWORK RESPONSE TO GENERALIZED APPLICATION PROGRAM INSTRUCTIONS

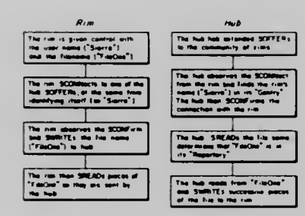
Theodore J. Donoboo, 1027 Evergreen Trail, Lino Lakes, Minn. 55014

Filed Jul. 8, 1988, Ser. No. 216,770

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 **2 Claims**





1. A method of transferring data files between computer processors linked together in a computer network, under application program control, comprising the steps of

(a) designating one or more computer processors having data files stored therein as HUB processors;

(b) designating one or more computer processors as RIM processors, each of said RIM processors having need for potential access to said data files;

(c) assigning a unique identity to each of said RIM processors and said data files potentially accessible by said RIM processors;

(d) tabulating the unique identities of all of said RIM processors and tabulating the unique identities of said data files in said HUB processor;

(e) devising a plurality of special application program instructions for execution by any of said RIM processors, each of said special application program instructions having a portion containing a unique data file identity;

(f) providing, in each of said RIM processors, means for decoding said plurality of special application program instructions, and for signaling said HUB processor with

the identity of the RIM processor and the unique data file identity; and

(g) providing, in said HUB processor, means for transferring data files to the RIM processor identified as a result of step (f).

4,891,786

STROKE TYPING SYSTEM

Eric P. Goldwasser, 993 Barberry Rd., Yorktown Heights, N.Y. 10598

Continuation-in-part of Ser. No. 719,060, Apr. 2, 1985, and a continuation-in-part of Ser. No. 648,386, Sep. 7, 1984, and a continuation-in-part of Ser. No. 468,493, Feb. 22, 1983. This application Jun. 25, 1985, Ser. No. 748,618

Int. Cl.[4] G06F *15/21*

U.S. Cl. 364—900 **97 Claims**



1. A method of creating written text consisting of individual words, punctuation marks and spaces formed of symbolic characters and including prescribed linguistic expressions, said method using a digital computer system having a central processing unit, a memory, a character imaging device and a character keyboard capable of sensing keypresses by a system operator that designate respective ones of said characters, each character being identified in said computer system by an associated character code, said method comprising the steps of:

(a) storing in said memory a vocabulary of said linguistic expressions, each linguistic expression comprising at least two characters, each linguistic expression being stored in said vocabulary as a respective first group of character codes;

(b) storing in said memory a vocabulary of keystrokes, each keystroke being associated with at least one linguistic expression and comprising at least two characters, each keystroke being stored in said vocabulary as a respective second group of character codes;

(c) accepting keypresses from said keyboard and storing in said memory, in response to each keypress, a third character code identifying the character designated by that keypress;

(d) determining with respect to each successive keypress whether such successive keypress is associated with one of said stored keystrokes, by determining whether its respective third character code designates, at least in part, a particular keystroke, and

(1) if such keypress is determined to be associated with a keystroke then

(i) identifying such keystroke, and thereby its associated linguistic expression, by retrieving the second character codes of such keystroke; and

(ii) imaging the characters comprising the associated linguistic expression on said character imaging device using said first character codes which identify such characters, the imaged characters being concatenated with text characters previously imaged on said character imaging device; and

(2) if such keypress is determined not to be associated with a keystroke, whereby its respective third character code designates an associated individual character, then imaging the character associated with said keypress, using the third character code which identifies such character, the imaged character being concatenated with text characters previously imaged on said character imaging device.

4,891,787

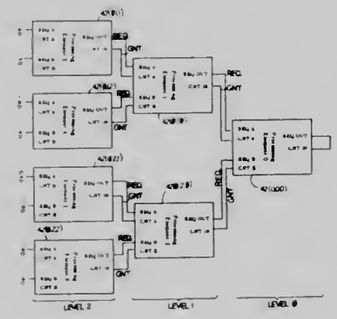
PARALLEL PROCESSING SYSTEM WITH PROCESSOR ARRAY HAVING SIMD/MIMD INSTRUCTION PROCESSING

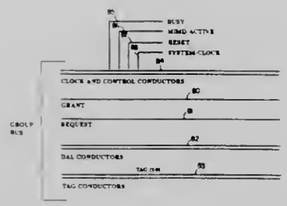
David K. Gifford, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 17, 1986, Ser. No. 943,376

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 **4 Claims**





1. A control mechanism for generating instructions to be used in operating a digital data processing system including a plurality of processing means operating in parallel to execute a conditional statement to perform one of a plurality of conditional responses in response to the value of a conditional proposition, each instruction belonging to one of two classes and each of said processing means including an enabling flag for controlling the operation of said processing means in response to the class of each instruction, said control mechanism comprising:

A. conditional response instruction generating means for compiling instructions for each of said conditional responses and enabling said instructions for each conditional response to be stored in a separate instruction list;

B. transmission instruction generating means responsive to the generation by said conditional response instruction generating means of the instruction lists for generating instructions processed by said processing means regardless of the condition of said enabling flag for storing the consequent list and the alternative list;

D. proposition instruction generating means for compiling proposition instructions to be executed by all of the processing means, said processing means conditioning their enabling means in response thereto;

E. condition instruction generating means for generating instructions for iteratively enabling said processing means to execute instructions from their conditional response instruction lists if their enabling flags have a selected condition, and instructions executed by all processing means to enable them to adjust the condition of their enabling flags between execution of instructions from the respective lists.

4,891,788

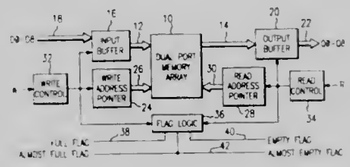
FIFO WITH ALMOST FULL/ALMOST EMPTY FLAG

Gerard A. Kreifels, 7304 Amsterdam Ave., Citrus Heights, Calif. 95621

Continuation of Ser. No. 191,555, May 9, 1988, abandoned. This application Jul. 11, 1989, Ser. No. 378,451

Int. Cl.[4] G11C *15/00*

U.S. Cl. 365—49 **11 Claims**



1. An almost full flag for a FIFO, comprising:

a Read pointer for determining the location in the FIFO for reading information therefrom and for being incremented for each Read operation in response to application of an external Read signal;

a Write pointer for determining the location in the FIFO for writing information thereto and for being incremented for each Write operation in response to application of an external Write signal;

counter means for determining the proximity of said Read and Write pointer and outputting a compare signal when said Read and Write pointers have a predetermined difference therebetween, said counter means making a transition from a first logic state to a second logic state when said compare signal is generated;

set means for determining when the output of said counter means changes from said second logic state to said first logic state in response to the proximity of said Read and Write pointers changing as a result of application of said external Write signal;

reset means for determining when said compare signal is present and generating a reset signal in response thereto; and

an almost full flag having a set position and reset position, said almost full flag for being placed in the set position in response to generation of said set signal and for being placed in the reset position in response to generation of said reset signal.

4,891,789

SURFACE MOUNTED MULTILAYER MEMORY PRINTED CIRCUIT BOARD

Victor L. Quattrini, Westford, and Edwin P. Fisher, Abington, both of Mass., assignors to Bull HN Information Systems, Inc., Billerica, Mass.

Filed Mar. 3, 1988, Ser. No. 163,682

Int. Cl.[4] G11C *5/02*; H05K *3/30*

U.S. Cl. 365—63 **18 Claims**

1. A multilayer printed circuit board for mounting a plurality of integrated circuit packages containing devices, each having a plurality of input pins for receiving a corresponding number of signals, said board comprising:

a top layer, a bottom layer and a number of intermediate layers, said top and bottom layers having repetitive patterns of pads which are mirror images of each other, each of said pad patterns including pads for plated through holes contained in said circuit board with a predetermined spacing between the centers of said holes;

a plurality of conductors of minimum length connecting predetermined ones of said pads to said plated through hole pads on said top and bottom layers of said board so that a plurality of said plated through holes are connected



by corresponding ones of said conductors to be shared between corresponding integrated circuit packages mounted on said top and bottom layers; and,

said plurality of integrated circuit packages being mounted on said pads on said top and bottom layers of said board in a paired fashion for enabling an exchange of input pin signal assignments based upon an operational characteristic of said devices included in said packages so as to reduce the number of plated through holes.

4,891,790

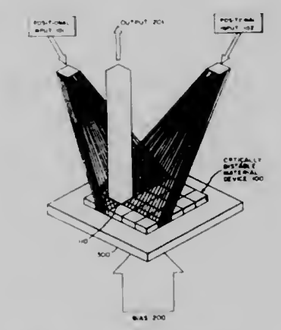
OPTICAL SYSTEM WITH AN OPTICALLY ADDRESSABLE PLANE OF OPTICALLY BISTABLE MATERIAL ELEMENTS

Lee O. Webster; Larry Z. Kennedy, and Joseph G. Duthie, all of Huntsville, Ala., assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 28, 1988, Ser. No. 173,915

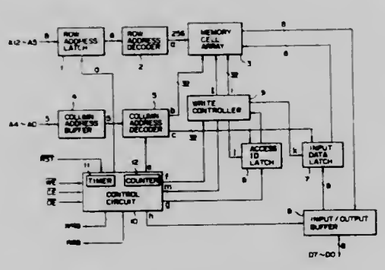
Int. Cl.[4] G11C *11/42, 13/04*

U.S. Cl. 365—127 **6 Claims**



1. An optical system comprising a plurality of discrete optically bistable material elements each having a material transmission threshold illumination level and being arranged in an array having rows and columns of the elements; said elements being normally opaque to light but being switchable to a transparent-to-light state when said threshold level of illumination is exceeded; first and second signal light beams positioned on one side of the array with each having a strength of illumination such that when combined onto a single element, the threshold level is exceeded and that element will allow illumination to pass through, but when only one signal is on a single element, the threshold level is not exceeded and that element will block illumination from flowing therethrough; and said signal beams being directed on said array such that the first beam will illuminate a single row and the second beam will illuminate a single column whereby a single element in the array will have its threshold level exceeded.

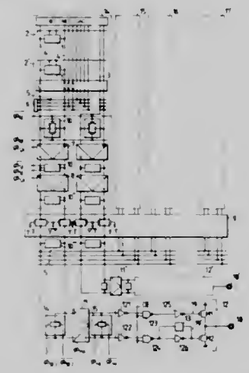
4,891,791
DATA WRITING SYSTEM FOR EEPROM
Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 15, 1988, Ser. No. 182,021
Claims priority, application Japan, Apr. 30, 1987, 62-104506
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.01 **17 Claims**



1. A data writing system comprising:
memory means for storing data having at least one bit per word to be stored therein, the memory means having 2^m divided regions, where m is a positive integer, said memory means recognizing that divided region which is to be accessed by m bits of address data including m+n bits, and said memory means recognizing 2^n words in said recognized divided region, where n is a positive integer;
data storage means for receiving data of said 2^n words at a time of data writing in said memory means, said data storage means being recognized by said memory means; and
writing means for writing said data stored in said data storage means into said memory means, after said data of 2^n words or smaller is received by said data storage means, said writing means writing said data received in said data storage means within a predetermined time into said memory means.

4,891,792
STATIC TYPE SEMICONDUCTOR MEMORY WITH MULTI-STAGE SENSE AMPLIFIER
Shoji Hanamura, Kokubunji; Masaaki Kubotera, Fuss; Katsuro Sasaki, Fuchu; Takao Oono, Kodaira, and Kiyofumi Ueda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Kodaira and Hitachi VLSI Engineering Corp., Tokyo, both of, Japan
Filed Jul. 6, 1988, Ser. No. 215,824
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.05 **5 Claims**

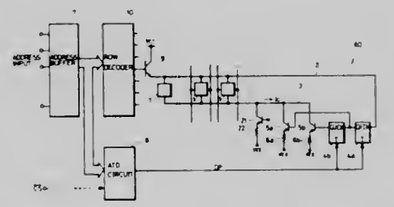
1. A static type semiconductor memory comprising:
(1) a plurality of memory arrays each of which includes a plurality of memory cells, a plurality of complementary data line pairs, a first complementary data bus line pair, first switch connected between said plurality of complementary data line pairs, and first amplifier responding to complementary signals on said first complementary data bus line pair, each of said plurality of complementary data line pairs being connected to a selected group of said plurality of memory cells;
(2) a second complementary data bus line pair;
(3) a second switch connected between complementary outputs of said first amplifier and said second complementary data bus line pair;
(4) a second amplifier responding to complementary signals on said complementary outputs of said first amplifier;
(5) a third amplifier generating an output signal in response to complementary outputs for said second amplifier;
(6) a first equalizer minimizing a level difference of complementary inputs of said first amplifier in response to a first control signal;
(7) a second equalizer minimizing a level difference of complementary inputs of said second amplifier in response to a second control signal; and
(8) a third equalizer minimizing a level difference of complementary inputs of said third amplifier in response to a third control signal;
wherein an operation of said first amplifier is controlled by a fourth control signal;
wherein an operation of said second amplifier is controlled by a fifth control signal;
wherein an address signal for accessing a selective one from among said plurality of memory cells is supplied to said static type semiconductor memory,



wherein levels of said first, second and third control signals are of such values that level difference minimizing operations of said first, second and third equalizers are executed in response to a change of level of said address signal, and thereafter levels of said first, second and third control signals are of values that said level difference minimizing operations of said first, second and third equalizers are not effective, and
wherein levels of said fourth and fifth control signals are of such values that said amplifiers operate in high amplification gain conditions in response to the change of level of said address signal, and thereafter levels of said fourth and fifth control signals are of such values that said first and second amplifiers operate in low power consumption conditions.

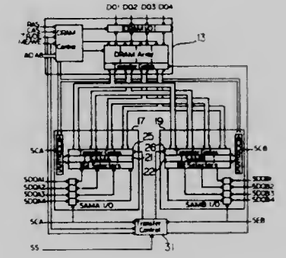
4,891,793
DISCHARGE CIRCUIT FOR A SEMICONDUCTOR MEMORY INCLUDING ADDRESS TRANSITION DETECTORS
Kenji Anami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 19, 1988, Ser. No. 183,713
Claims priority, application Japan, Apr. 20, 1987, 62-96412
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—204 **9 Claims**

1. A semiconductor memory device comprising memory cells respectively connected to a plurality of first and second word lines, the device further comprising:
address input means for receiving a row address signal required for designating selected ones of said memory cells;
decoder means for decoding the row address signal from said address input means and, in response thereto, selecting one of said plurality of first word lines;
transition detection means for detecting a transition of a level of the row address signal applied to said address input means and outputting a transition detection signal; and
a plurality of discharge control means connected to respective ones of said plurality of first word lines and to said transition detection means, each of said discharge control means receiving the voltage of an associated first word line in response to the transition detection signal from said transition detection means;



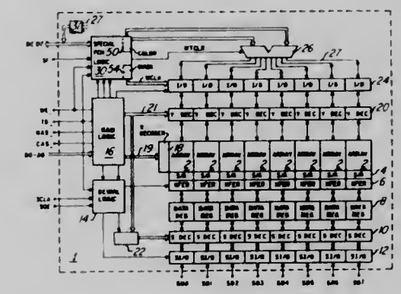
a corresponding one of said discharge control means continuing to output a discharge control signal in response to the next transition detection signal when a voltage level of a previously selected first word line of said plurality of first word lines is equal to a voltage level of said selected first word line; and
switching means which continues to discharge a selected one of said second word lines in response to the discharge control signal.

4,891,794
THREE PORT RANDOM ACCESS MEMORY
Glen E. Hush; Jeffrey S. Mailloux, and Eugene H. Cloud, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Jun. 20, 1988, Ser. No. 208,676
Int. Cl.[4] G11C *7/00, 11/40, 8/00*
U.S. Cl. 365—189.04 **20 Claims**



1. Solid state memory device capable of receiving and transmitting data in a serial format and permitting random access to the data, characterized by:
(a) a random access memory array containing a plurality of data bits;
(b) a plurality of serial access memories;
(c) transfer circuitry including a plurality of transfer gates communicating with the random access memory array, the transfer circuitry communicating between the transfer gates and the serial access memories in order to transfer data between the random access memory and the serial access memories;
(d) the transfer circuitry transferring said data selectively to any one of said plurality of serial access memories;
(e) the transfer circuitry including a transfer control circuit controlling with which serial access memory said transfer of data is performed; and
(f) a serial address connection for at least two of the serial access memories.

4,891,795
DUAL-PORT MEMORY HAVING PIPELINED SERIAL OUTPUT
Raymond Pinkham, and Daniel F. Anderson, both of Missouri City, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 114,887, Oct. 29, 1987, which is a continuation-in-part of Ser. No. 53,200, May 21, 1987, Pat. No. 4,817,058. This application Apr. 7, 1989, Ser. No. 334,970
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230.03 **9 Claims**

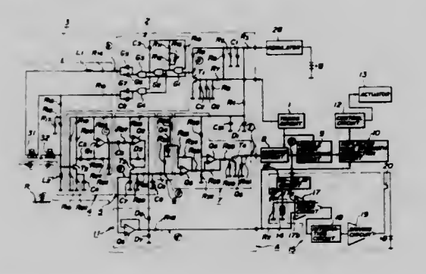


1. A memory circuit of the type which stores binary data among a plurality of cell locations arranged in rows and columns, said circuit comprising:
a data register into which the contents of a plurality of cell locations in a row are transferable and simultaneously storable among a plurality of register locations;
counting means for sequentially selecting groups of register locations for outputting data from the register in groups, each data group corresponding to the contents of a group of register locations;
a latch coupled to sequentially receive data groups from corresponding groups of register locations according to data selection with said counting means;
intermediate data lines for effecting sequential transfer of data groups from the register to the latch;
a multiplexer for serially outputting data stored in the latch; and
circuitry for isolating a first of the groups of data when present on the intermediate data lines from the latch while a second of the groups of data is being serially output from the latch.

4,891,796
ICING PREVENTIVE DEVICE FOR ULTRASONIC WAVE TRANSMITTING AND RECEIVING UNIT FOR VEHICLE
Takao Sekine, Yokohama, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan
Filed Mar. 10, 1986, Ser. No. 837,773
Claims priority, application Japan, May 13, 1985, 60-70453
Int. Cl.[4] G01S *15/93*
U.S. Cl. 367—96 **5 Claims**

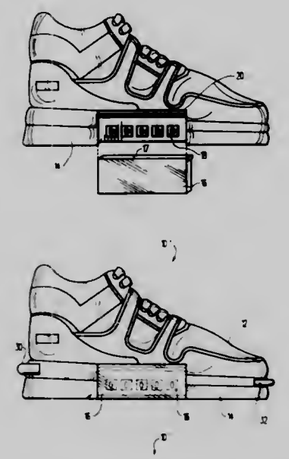
1. A vehicle borne supersonic wave transmitting and receiving device for determining vehicle height with respect to a road surface comprising:
timing means for outputting a timing signal;
supersonic wave transmitting and receiving means for transmitting a supersonic wave and receiving a reflected wave

derived from said transmitted wave in response to said timing signal;
processing means for amplifying and processing said received reflected wave;
control means for controlling a vehicle load in response to said amplified and processed received reflected wave
temperature sensing means for sensing a temperature outside said vehicle;



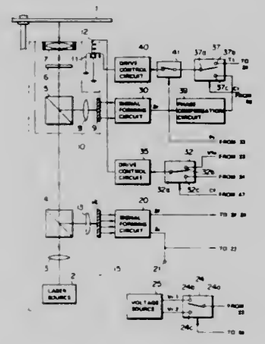
heater operating means for energizing a heater in response to said temperature sensing means and a level of the received reflected wave; and
a heater connected to said heater operating means and arranged in said supersonic wave transmitting and receiving device.

4,891,797
RUNNING SHOE WITH INTEGRAL TIMER
Joselean Woodfaiks, 15811 Ridgebrook Path, Romulus, Mich. 48174
Filed Mar. 29, 1989, Ser. No. 329,964
Int. Cl.[4] G04B 47/00; A43B 5/00
U.S. Cl. 368—10 **14 Claims**



1. A running shoe with an integral timer, comprising:
said shoe having an upper body portion and a lower sole portion;
said sole portion having a forward toe portion and a rearward heel portion separated by a recessed central arch portion;
timing means in said recessed arch portion;
a removable flexible cover for covering said recessed arch portion and said timing means, said cover having parallel side wall portions connected by a transverse bottom portion;
a pair of projecting ribs extending inwardly along a top edge of each of said side wall portions; and
cooperating recesses formed on opposite side wall portions of said central recessed arch portion for securing said cover on said timing means.

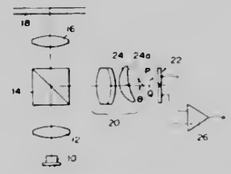
4,891,798
OPTICAL DISC PLAYER WITH FOCUS CONTROL FOR PREVENTING ERRONEOUS FOCUS ON OUTER SURFACE OF OPTICAL DISC
Mitsutoshi Shinkai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 759,102, Jul. 25, 1985, abandoned. This application Mar. 5, 1987, Ser. No. 22,545
Claims priority, application Japan, Jul. 25, 1984, 59-154550
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—45 **1 Claim**



1. An optical disc player for playing an optical disc adapted to have information recorded thereon and having a surface with radially separated high light reflectivity and relatively low light reflectivity portions, said optical disc player being adapted to perform an initial focusing operation prior to recording and/or readout and comprising:
a focusing operation command means for setting the initial focusing operation;
first means for generating and emitting a light beam;
second means having a focal point at a predetermined distance therefrom for focusing the light beam emitted from said first means toward said optical disc;
third means for detecting the light beam reflecting from the optical disc and generating a first signal indicating said information and a second signal indicating a focused state of the light beam on the optical disc through said second means
fourth means responsive to said focus operation command means for traversing the light beam incident on the optical disc through said second means across the high light reflectivity portion in a direction parallel to said surface of the optical disc during said initial focusing operation;
fifth means responsive to said focus operation command means for controlling movement of said second means during said initial focusing operation along a light axis of the light beam so as to place focused position of the light beam through said second means within a predetermined focusing capture range;

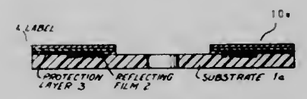
sixth means for controlling movement of said second means along the light axis of the light beam so as to adjust the focused position of the light beam through said second means in response to the second signal from said third means;
seventh means for detecting during said initial focusing operation in response to the first and second signals that the focused position of the light beam through said second means is placed within the predetermined focusing capture range; and
eighth means for switching the control of movement of said second means from said fifth means to said sixth means in response to the detection that said focused position of the light beam is within said focusing capture range to end said initial focusing operation;
wherein said seventh means includes envelope detector means for detecting an envelope signal of the first signal from said third means, signal generating means for generating two reference signals having different voltage levels, and comparator means for comparing an output of the envelope detector means with a selected one of the two reference signals.

4,891,799
OPTICAL HEAD APPARATUS FOR WRITING AND READING DATA ON AN OPTICAL DISK HAVING A LENS WITH AN INCLINED OPTICAL AXIS
Takayuki Nakano, Kosai, Japan, assignor to Fuji Electrochemical Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1987, Ser. No. 122,230
Claims priority, application Japan, Mar. 13, 1987, 62-36844; Mar. 16, 1987, 62-60655
Int. Cl.[4] G11B 7/09
U.S. Cl. 369—45 **7 Claims**



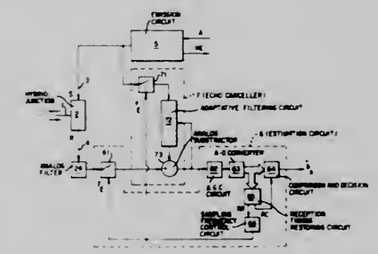
1. An optical head apparatus for writing and reading data onto and from an optical disk using an optical beam emitted from a light-emitting element, comprising:
a lens actuator including a lens casing for retaining an objective, magnetic circuits provided on two sides of said lens casing, and a coil disposed in said lens casing and having a part placed in gaps of said magnetic circuits; and
a focus detection means including a detection lens means having a plurality of lenses for correcting aberration, a divided photodetector receiving a light beam which has been converged by being passed through said detection lens means, and a differential amplifier for providing a differential output from said-divided photodetector, said detection lens means, said divided photodetector and said differential amplifier being disposed in an optical path of light reflected from said optical disk,
wherein said detection lens means has a lens which is the closest lens to the divided photodetector, and the optical axis of said lens is inclined with respect to the optical axes of the other lenses to thereby form a substantially linear diffraction pattern.

4,891,800
OPTICAL RECORDING DISC
Syoji Sugaya, Nishinomiya, Japan, assignor to Sanyo Electric Company, Ltd., Moriguchi, Japan
Filed Dec. 15, 1987, Ser. No. 133,030
Claims priority, application Japan, Aug. 5, 1987, 62-196118
Int. Cl.[4] G11B 7/24
U.S. Cl. 369—275 **12 Claims**



1. An optical recording disc, comprising:
a substrate having a side with a surface on which data is recorded and another side with an opposite surface, said substrate having a single pass transmissivity within a predetermined wavelength region of a laser beam which enables the laser beam to reach the data for at least reading out the data when the laser beam is incident on the opposite surface; and
means for suppressing effects of natural light during at least a reading out of the recorded data, said supressing means including a colorant within said substrate, said colorant having a light absorption edge at a wavelength less than said predetermined wavelength region so as to reduce transmissivity through said substrate of all wavelengths of visible natural light that are less than said wavelength of said light absorption edge.

4,891,801
TERMINAL FOR THE TRANSMISSION OF DATA OVER A BIDIRECTIONAL ANALOG CHANNEL WITH ECHO CANCELLATION CONTROLLED BY THE RECEPTION RATE
Sylvie L. Marcos, Antony; Odile M. M. Macchi, Orsay, and Jean-Bernard L. P. Pintaux, Lesigny, all of France, assignors to S.A.T. (Societe Anonyme de Telecommunications), Paris, France
Filed Dec. 30, 1987, Ser. No. 139,751
Claims priority, application France, Dec. 30, 1986, 86 18334
Int. Cl.[4] H04B 3/23
U.S. Cl. 370—32.1 **14 Claims**



1. A terminal for transmitting data over a bidirectional analog channel, simultaneously in both directions, including:
a hybrid coupler connected to the bidirectional channel and to two unidirectional analog channels, one for emitting and the other for receiving,
means, connected to the emitting channel, for generating at least one analog emitted signal from local data to be emitted towards another terminal,
means, connected to the receiving channel, for estimating, from a analog received signal, distant digital data coming

from the other terminal, coded by means of symbols, at a modulation rate expressed in bauds, non synchronous with said means for generating said analog emitted signal, and at least one echo canceller having an input, and disposed between said means for generating said analog emitted signal, and said means for estimating the distant data, adapted so as to estimate an echo signal resulting from parasite reflections of said analog emitted signal and to subtract an estimated echo signal from said analog received signal,

said means for estimating the distant data include first means for sampling said analog received signal, means for processing the samples of said analog received signal, which are adapted for restoring estimated distant symbols and a timing signal whose frequency is equal to said modulation rate, and means, synchronized by said timing signal, for controlling the sampling frequency of said first sampling means, and

said echo canceller includes second sampling means for sampling said analog emitted signal, connected to said control means and controlled at the same frequency as said first sampling means, first filtering means for filtering the samples of said analog emitted signal and delivering samples of the estimated echo signal, and first subtraction means for subtracting said samples of the estimated echo signal from said samples of said analog received signal.

4,891,802

METHOD OF AND CIRCUIT ARRANGEMENT FOR CONTROLLING A SWITCHING NETWORK IN A SWITCHING SYSTEM

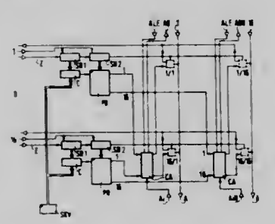
Wolfgang E. Jasmer, Hamburg; Johann E. W. Krüger, Quickborn, and Ulrich R. P. Killat, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1988, Ser. No. 189,275

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714385

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—60 **16 Claims**



1. A method for switching packets through a bus system, the method comprising the steps of:

(a) receiving and storing at least one respective packet at a respective at least one of a plurality of feeder lines, which feeder lines are respective rows of a space-division multiplex switching arrangement, each packet including routing information;

(b) simultaneously comparing, at each respective feeder line, any routing information received on the respective feeder line with addresses of trunk lines which are columns of the arrangement;

(c) activating at least one junction point between one respective feeder line and one respective intended trunk line based on a result of said comparing step; and

(d) when more than one packet is received simultaneously on different feeder lines, and said more than one packet are intended for a single trunk line, determining an order of the different feeder lines to be switched through using a plurality of decision circuits, one associated to each trunk line of the arrangement, so that the more than one packet are switched through the arrangement according to an asynchronous time-division technique.

4,891,803

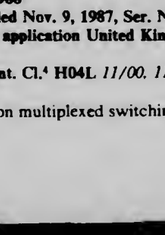
PACKET SWITCHING NETWORK

Alan Huang, Middletown; Scott C. Knauer, Mountainside; Jay H. O'Neill, Freehold; Charles W. Rutledge, Whitehouse, all of N.J.; Sheng L. Lin, Lisle, Ill.; Maurice N. Ransom, Plainfield, Ill., and Ronald A. Spanke, Wheaton, Ill., assignors to American Telephone and Telegraph Company and AT&T Bell Laboratories, both of Murray Hill, N.J.

Filed Nov. 7, 1988, Ser. No. 267,606

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—60 **9 Claims**



1. A network for routing packets that contain a destination designation and a priority designation comprising:

a sorter responsive to applied signal packets, for developing a sorted set of packets;

a merge network responsive to said sorted set of packets and to a delayed set of packets;

a trap network responsive to output signals of said merge network (a) for identifying packets sets S(A), with a common destination designation where S designates the set of packets and a designates the address, and (b) for separating each of said packet sets, S(A), into a first subset, S1(A), and a second subset, S2(A), such that the number of packets in said second subset, S2(A), is zero as long as the number of packets in said first subset, S1(A), is less than a preselected number N and the priority designation of packets in said first subset, S1(A), is not lower than the priority designation of packets in said second subset, S2(A);

a delay network responsive to outputs of said trap network, for developing said delayed set of packets;

an expander network having N of appearances of each destination address responsive to output signals of said trap network, for routing packets of said first subsets in accordance with destination addresses of routed packets; and

a plurality of memory means, each having an output and N inputs connected to said appearance of a chosen destination at the output of said expander, for delivering packets to said output.

4,891,804

DATA SWITCHING ARRANGEMENT

David J. Lake, Nottingham, England, assignor to GEC Plessey Telecommunications, Limited, Coventry, England

PCT No. PCT/GB87/00793, § 371 Date Sep. 2, 1988, § 102(e) Date Sep. 2, 1988, PCT Pub. No. WO88/03732, PCT Pub. Date May 19, 1988

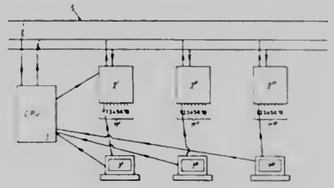
PCT Filed Nov. 9, 1987, Ser. No. 216,545

Claims priority, application United Kingdom, Nov. 13, 1986, 8627108

Int. Cl.[4] H04L *11/00, 11/16*

U.S. Cl. 370—61 **7 Claims**

1. A time division multiplexed switching system comprising a plurality of data switching groups interconnected by a time division multiplexed data highway and coupled to central processing means, each of said switching groups comprising a plurality of data terminals connected to data interface means, the interface means comprising buffer storage means in respect of connected data terminals and control means responsive to control signals from the central processing means to transfer data to and from the data highway, each terminal in the system accessing the central processing means only when data therein



is assembled for transmission, the central processing means allocating a transmit and/or a received timeslot when so accessed and transferring control signals to allocate each time slot to the respective control means associated with the transmitting and receiving data terminals, the control means in each group causing data from the transmitting terminal to be held in the buffer storage means and to segmented that data into data segments each data segment in turn being combined with control data and transmitted to the data highway in the allocated timeslot.

4,891,805

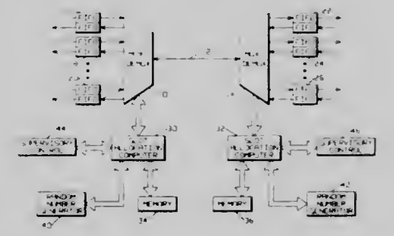
MULTIPLEXER WITH DYNAMIC BANDWIDTH ALLOCATION

David B. Fallin, Sunrise, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

Filed Jun. 13, 1988, Ser. No. 207,558

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—95.1 **14 Claims**



1. In a time division multiplex system for communicating information from a plurality of channels over a common communications medium, wherein said information is carried in a number of time slots which are allocated according to bandwidth requirements of each said channels, a method of assigning positions for said time slots in a repetitive frame of said time slots, said time slots being representable as a position within said frame, comprising the steps of:

determining a quantity of said time slots which are required to provide enough bandwidth to carry information from one of said channels, said quantity of said time slots including a first time slot and one or more remaining time slots;

generating a random number;

assigning a first of said positions within said frame of a first of said quantity of time slots based upon the value of said random number; and

assigning one or more additional positions for said one or more remaining time slots required by said determining step.

4,891,806

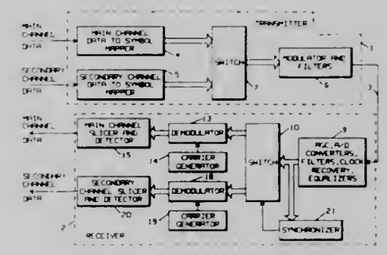
CONSTELLATION MULTIPLEXED INBAND SECONDARY CHANNEL FOR VOICEBAND MODEM

Luis V. Farias, Sunrise; Vadavalli G. Krishnan, Miami Lakes, and Chin-Pan Wong, Davie, all of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Sep. 18, 1987, Ser. No. 98,547

Int. Cl.[4] H04J *3/12, 3/06;* **H04L** *5/12, 23/02*

U.S. Cl. 370—110.1 **69 Claims**



1. A method for providing a main channel and a secondary channel in a data modem, the method comprising the steps of:

receiving data to be transmitted over a main channel;

receiving data to be transmitted over a secondary channel;

generating main channel symbols from a first constellation corresponding to said main channel data;

generating secondary channel symbols from a second constellation corresponding to said secondary channel data; and

alternating transmission of said main channel symbols during a first predetermined time period with transmission of said secondary channel symbols during a second predetermined time period so that said main channel symbols from said first constellation and said secondary channel symbols from said second constellation are interleaved in time.

4,891,807

MULTIPLEXER WITH LEAKAGE CURRENT COMPENSATION

Frederick S. Hutch, c/o Honeywell Inc., Legal Dept., 1100 Virginia Dr., Fort Washington, Pa. 19034

Filed Mar. 6, 1989, Ser. No. 319,213

Int. Cl.[4] H04J *3/00*

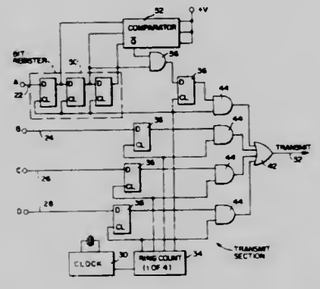
U.S. Cl. 370—112 **6 Claims**



1. A signal multiplexer comprising

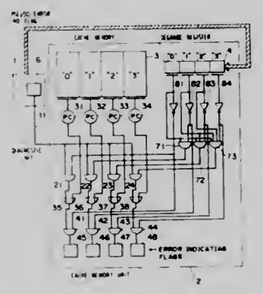
a plurality of solid-state input switches arranged to be connected to respective input signal sources,
circuit means for group said switches in a plurality of groups with each group having a plurality of said switches,
a plurality of selectable leakage current shunting circuits,
a plurality of leakage control switches with each of said control switches being arranged to connect a respective one of said groups to a respective one of said shunting circuits,
multiplexer output means for receiving signals from a selected one of the sources in said groups and
switch control means for concurrently operating said input switches to select one of the input signal sources and to select said control switches to connect all of the non-selected groups of said input switches to respective ones of said current shunting circuits.

4,891,808
SELF-SYNCHRONIZING MULTIPLEXER
Arthur B. Williams, Smithtown, N.Y., assignor to Coherent Communication Systems Corp., Hauppauge, N.Y.
Filed Dec. 24, 1987, Ser. No. 138,663
Int. Cl.[4] H04J *3/04*
U.S. Cl. 370—112 **17 Claims**



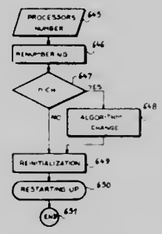
1. A multiplexer for transmitting time-varying signals from a plurality of parallel inputs over a serial path to a plurality of corresponding outputs, comprising:
means operable repetitively to sample a signal on each of the inputs in turn, at a sampling rate higher than an expected rate of change of the signals on the inputs, thereby defining sample bits, and to place levels corresponding to the sample bits for respective individual ones of the inputs onto the serial path in turn;
a marker operable to sense successive sample bits for at least a certain one of the plurality of inputs and to detect in the successive sample bits a predetermined pattern occurring therein during normal operation, the certain one of the inputs corresponding to a certain one of the outputs, the marker being operable to impose a variation in the levels for the certain one of the inputs, which variation identifies levels intended for said certain one of the outputs;
a receiver operable to receive the successive levels on the serial path and to set each of the outputs, in turn, equal to the sample bit for each of the inputs, in turn; and,
a sequencing means associated with the receiver, the sequencing means detecting the variation marking said certain one of the inputs and routing the corresponding output to said certain one of the outputs;
whereby the multiplexer synchronizes the certain one of the inputs to the certain one of the outputs every time the predetermined pattern appears on the certain one of the inputs.

4,891,809
CACHE MEMORY HAVING SELF-ERROR CHECKING AND SEQUENTIAL VERIFICATION CIRCUITS
Osamu Hazawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 16, 1988, Ser. No. 155,680
Claims priority, application Japan, Feb. 16, 1987, 62-31615
Int. Cl.[4] G01R *11/22*
U.S. Cl. 371—3 **1 Claim**



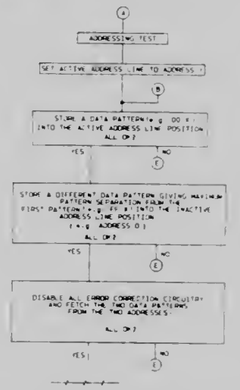
1. A cache memory system comprising:
a cache memory having a plurality of levels;
a first flag for storing a first logic state when said system is in a normal error checking mode and a second logic state when said system is in a pseudo-error verification mode;
a register having a plurality of stages corresponding in number to said levels of said cache memory for storing level-invalidating data;
a plurality of first logic gate means associated respectively with said levels of said cache memory, said first logic gate means being arranged to be disabled in response to said first logic state and enabled in response to aid second logic state for generating a pseudo-error in one of the levels of said cache memory specified by contents of said register;
a plurality of second logic gate means associated respectively with the register stages for sequentially activating each of said first logic gate means one at a time in accordance with logic states of the register stages when said first logic gate means are enabled;
a plurality of second flags associated respectively with said first logic gate means to give an error indication in response to the activated first logic gate means; and
a plurality of parity check circuits connected respectively to said levels of said cache memory,
wherein said first logic gate means comprise:
an array of first AND gates associated respectively with said levels of said cache memory, said first AND gates being arranged to be disabled in response to said first logic state and enabled in response to said second logic state;
an array of OR gates;
an array of second AND gates associated respectively with said parity check circuits and outputs of said first AND gates by way of said OR gates, said second flags being connected respectively to outputs of said second AND gates,
wherein said second logic gate means comprise:
a first logic circuit for activating respectively said first AND gates in accordance with the logic states of said register stages when said first AND gates are enabled; and
a second logic circuit for enabling said second AND gates respectively in accordance with the logic states of said register stages.

4,891,810
RECONFIGURABLE COMPUTING DEVICE
Patrick de Corlieu, Sevres; Michel Prevost, le Plessis Robinson, and Arnaud du Chêné, Paris, all of France, assignors to Thomson-CSF, Paris, France
Filed Oct. 27, 1987, Ser. No. 114,109
Claims priority, application France, Oct. 31, 1986, 86 15241
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—9.1 **12 Claims**



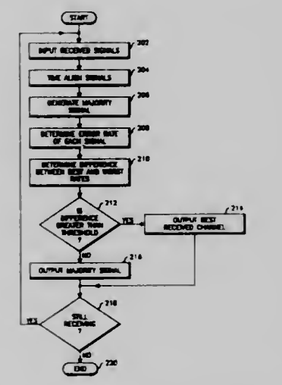
1. A single instruction multiple data stream computer comprising plural computing processors, redundant processor for, in the event of failure of any one of computing processors, replacing one of said computing processors, and a sequencer for giving instructions to be carried out, simultaneously to all said computing processors, wherein at the initialization of the computations, each processor is assigned a number, and wherein, in the event of the failure of a processor, the processors that are working are renumbered according to their physical position in the computer.

4,891,811
EFFICIENT ADDRESS TEST FOR LARGE MEMORIES
Kevin J. Ash; Jack H. Dereaburger, and Raymond L. Parsons, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 13, 1987, Ser. No. 14,749
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—21.2 **4 Claims**



1. A method for testing address line failures in a large storage array, comprising the steps of:
first writing a first bit pattern into a first memory word at an address formed with a bit under test on;
second writing a second bit pattern into a second memory word at an address formed with a bit under test off;
first reading data from both of said addresses;
first checking for a predetermined number of bit errors which constitute a permanent error;
repeating the above steps for each bit in said address until all address lines have been tested;
third writing said first data pattern to said second memory word at said address formed with said bit under test off;
fourth writing said second data pattern to said first memory word at said address formed with said bit under test on;
second reading data from both of said addresses;
second checking for a predetermined number of bit errors which constitute a permanent error; and
repeating the steps of third and fourth writing and second reading and checking for each bit in said address until all address lines have been tested.

4,891,812
METHOD AND APPARATUS FOR SELECTING A DIGITAL SIGNAL FROM A PLURALITY OF DIGITAL SIGNALS
Paul M. Bocci, Roselle; Kevin M. Cutts, and Carl M. Pietrzak, Jr., both of Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 9, 1985, Ser. No. 806,989
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—5.5 **10 Claims**

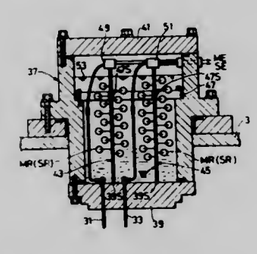


1. A method for selecting an optimum signal from at least three received digital signals, comprising the steps of:
(a) generating a majority signal from the at least three received digital signals by:
(i) comparing, bit-by-bit, all of the at least three received digital signals;
(ii) generating a majority signal bit having the same logical state as the majority of said compared bits of all of the at least three received digital signals, unless all of the at least three received signals comprises an even number of signals having a even distribution of alternate logical states, in which case a random selection of sai alternate logical states comprises said majority signal bit;
(b) determining the error rate of each of the at least three received digital signals by individual bit-by-bit comparison with said majority signal; and
(c) selecting a particular one of the at least three received digital signals if a predetermined condition is staisfied, else alternately selecting said majority signal.

4,891,813
PASSIVE BUS COMMUNICATION USING ALTERNATE CRC
Rafael E. Salcedo, Miami Springs, and Norman J. Donaghue, Jr., Plantation, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.
Filed Jan. 29, 1988, Ser. No. 150,129
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.1 **26 Claims**

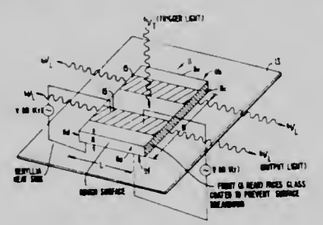
7. A method for providing communication over a passive bus in an ISDN without use of services of a central office, said ISDN using a predefined error checking operation at said central office, the method comprising the steps of:
receiving a D-echo channel frame which is transmitted from a device connected to said passive bus and echoed by a network termination device; and
performing an error checking operation on said D-echo channel frame, said error checking operation being different from said predefined error checking operation used at said central office such that frames generated using said error checking operation would appear to contain an error if checked by said central office.

4,891,814
GAS LASER GENERATOR
Masao Kimura, Odawara, Japan, assignor to Amada Company, Limited, Japan
Division of Ser. No. 19,136, Feb. 25, 1987, Pat. No. 4,791,637. This application Sep. 26, 1988, Ser. No. 249,176
Claims priority, application Japan, Feb. 25, 1986, 61-025050; Feb. 25, 1986, 61-038334
Int. Cl.[4] H01S *3/04*
U.S. Cl. 372—35 **2 Claims**



1. A gas laser generator comprising;
a laser gas as an active laser medium;
an electric discharge device means having a plurality of electrodes for exciting the laser gas to cause a laser light to be radiated therefrom; and
a resonant cavity means for amplifying the laser light, wherein the dishcharge device means includes:
a cooling receptacle for accommodating a coolant,
a plurality of printed boards detachably supported in the cooling receptacle, said printed boards extending vertically through slots formed in a pair of maintaining members opposedly mounted inside the cooling receptacle, said printed boards engaging with grooves formed in the upper surface of a bottom plate of said cooling receptacle,
a plurality of ballast resistances arranged on the printed boards, said ballast resistances respectively connected to the electrodes of the discharge device means.

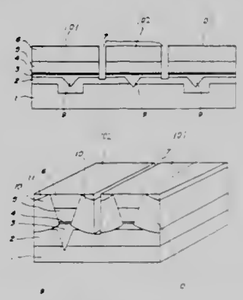
4,891,815
BULK AVALANCHE SEMICONDUCTOR LASER
Larry O. Ragle, Palo Alto, and Stephen J. Davis, San Francisco, both of Calif., assignors to Power Spectra, Inc., Fremont, Calif.
Filed Oct. 13, 1987, Ser. No. 108,191
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **25 Claims**



1. A bulk semiconductor laser comprising:
a block of semiconductor material;
first and second electrodes attached to said block at separated locations on said block a predetermined distance apart;
power supply means coupled to said electrodes for applying a high voltage, lower than a voltage required for spontaneous avalanche breakdown and high enough to result in avalanche multiplication after triggering, across said block;
means for irradiating said block with a first amount of triggering electromagnetic radiation sufficient to produce charge carriers in said block which recombine to generate a second amount of electromagnetic radiation to produce lasing between said electrodes, said first amount of triggering electromagnetic radiation having a predetermined wavelength, said predetermined wavelength having a value which results in the majority of said first radiation penetrating through said block between said electrodes a penetration distance which is less than said predetermined distance; and
first and second means for reflecting back into said block said second amount of electromagnetic radiation propagating toward first and second opposed sides of said block, respectively.

4,891,816
INTEGRATED SEMICONDUCTOR LASER DEVICE
Toshihiko Yoshida, Tenri; Taiji Morimoto; Shinji Kaneiwa, both of Nara, and Masahiro Yamaguchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 10, 1988, Ser. No. 205,446
Claims priority, application Japan, Jun. 30, 1987, 62-164766
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **2 Claims**

1. An integrated semiconductor laser device comprising a single substrate and a plurality of semiconductor laser device elements that are disposed on said substrate, said plurality of semiconductor laser device elements being composed of high output power semiconductor laser device elements and low output power semiconductor laser device elements, wherein at least one of said plurality of semiconductor laser device elements includes means for preventing injection of current in the vicinity of one facet or both facets so as to form said high



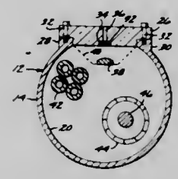
output power semiconductor laser device elements, said means for preventing the injection of current being composed of a current blocking layer that is made thicker in the vicinity of the facet than the current blocking layer of the inside of the facet, and said high output power semiconductor laser device elements and said low output power semiconductor laser device elements are disposed so that the facets of the former device elements agree with those of the latter device elements.

4,891,817
PULSED DYE LASER APPARATUS FOR HIGH PRF OPERATION
Francisco J. Duarte, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 13, 1988, Ser. No. 205,763
Int. Cl.[4] H01S *3/20*
U.S. Cl. 372—54 **4 Claims**



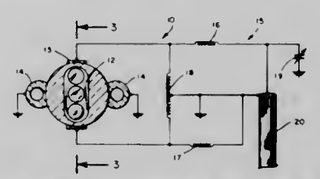
1. Laser apparatus for producing a laser beam, said apparatus comprising:
a first resonator cell, said cell having first and second walls extending generally in a direction transverse to an axis of propagation of said laser beam, said cell further including a narrow passageway located between said walls and along said axis for receiving a dye solution, and said passageway having a dimension in a direction transverse to said axis of between about 0.3 mm and about 0.75 mm;
a second resonator cell, said second resonator cell having cell walls extending generally in a direction transverse to said axis and a second narrow passageway therein between said cell walls, said second passageway being located to receive a laser beam along said axis from said first resonator cell, and said second passageway having a dimension in a direction transverse to said axis of between about 0.5 mm and about 1.00 mm;
means for circulating a dye solution through said passageways at a flow rate of between about 5 ms^{-1} and about 15 ms^{-1}; and
pump laser means for delivering a pump laser beam to said cells in a direction transverse to said axis, said pump laser delivering said pump laser beam at a pulse repetition frequency greater than 5,000 pulses per second.

4,891,818
RARE GAS-HALOGEN EXCIMER LASER
Jeffrey I. Levatter, Rancho Santa Fe, Calif., assignor to Accuiase, Inc., San Diego, Calif.
Continuation-in-part of Ser. No. 233,957, Aug. 18, 1988, abandoned, which is a continuation of Ser. No. 91,383, Aug. 31, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 322,567
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—57 **15 Claims**



1. In an excimer laser of the type in which a halogen gas is contained in a pressure vessel containing first and second electrodes for creating a laser discharge between the electrodes and generating a laser beam between first and second optical components at opposite end of the pressure vessel, a fan for circulating the gases, and a heat exchanger for cooling the gases, an improvement wherein the portions of the pressure vessel, first and second electrodes, fan and heat exchanger that are in contact with the halogen gas are fabricated entirely of a material that reacts with the halogen gas to form stable reaction products having a vapor pressure of less than about 10^{-6} torr, at normal operating temperatures, such that contamination of the gas by said pressure vessel, first and second electrodes, fan and heat exchanger is minimized and the lifetime of the excimer laser is increased.

4,891,819
RF EXCITED LASER WITH INTERNALLY FOLDED RESONATOR
Leroy V. Sutter, Jr., 44 Rocky Knoll Dr.; Harold A. Cameron, 2382 Morse Ave., both of Irvine, Calif. 92714, and Michael R. Davison, 22935 Briarcroft, El Toro, Calif. 92630
Filed Jan. 17, 1989, Ser. No. 298,109
Int. Cl.[4] H01S *3/097, 3/00*
U.S. Cl. 372—82 **2 Claims**



1. A transversely RF excited gas laser with an internally folded resonator, said transversely RF excited gas laser comprising:
a. an elongated chamber of cross-sectional dimensions suitable for confining a laser gas discharge;
b. a plurality of reflectors which form a stable folded laser

resonator cavity of a compact geometry in order to efficiently extract laser power from said laser resonator cavity wherein there are at least two of said plurality of reflectors and at least one of said plurality of reflectors is concave;

c. a laser gas which is disposed in said folded resonator cavity which reflect and guide light energy from the laser gas discharge within said elongated chamber;

d. a pair of electrodes are transversely disposed on said elongated chamber and excite said laser gas;

e. a pair of cooling electrodes are transversely disposed on said elongated chamber and electrically coupled to ground; and

f. impedance-matching means for applying RF power to said pair of electrodes, said impedance matching means including three inductors with a center-tapped coil being adjusted so that the voltage potential at the center of said laser discharge between said pair of cooling electrodes is a virtual ground thereby preventing RF current from passing through said pair of grounded cooling electrodes in order to efficiently extract laser power from said laser resonator cavity.

4,891,820

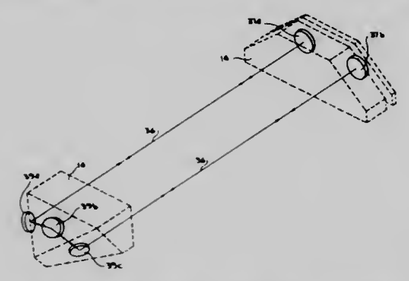
FAST AXIAL FLOW LASER CIRCULATING SYSTEM

Joseph F. Rando, Los Altos Hills, and Dale E. Koop, Sunnyvale, both of Calif., assignors to Rofin-Sinar, Inc., San Jose, Calif.

Division of Ser. No. 811,593, Dec. 19, 1985. This application Jul. 6, 1987, Ser. No. 70,014

Int. Cl.[4] H01S *3/081*

U.S. Cl. 372—93 **11 Claims**



1. A fast axial flow folded resonator cavity, comprising:

a resonator mirror mounting member;

a high reflector resonator mirror mounted to said resonator mirror mounting member;

a resonator output mirror mounted to said resonator mirror mounting member positioned substantially parallel with respect to said high reflector resonator mirror;

a retroreflector mounting member positioned opposite to said resonator mirror mounting member, said retroreflector mounting member including first, second and third planar mounting surfaces;

at least two substantially parallel discharge-confining bore tubes extending from said resonator mirror mounting member to said retroreflector mounting member, said parallel discharge-confining bore tubes providing parallel beam paths; and

first, second and third fold mirrors mounted to said first, second and third planar surfaces of said retroreflector mounting member and adapted to fold said beam paths substantially 180 degrees with respect to each other while providing angular stability for rotations of said retroreflector mounting member in any direction has been changed to "a first plane defined by said parallel beam paths, and angular stability in second and third planes which are substantially orthogonal to said first plane."

4,891,821

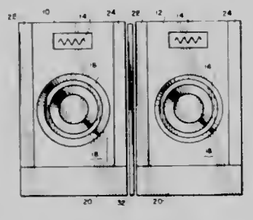
MAGNETIC CORRECTING FENCE FOR ADJACENT E-GUNS

Charles W. Hanks, 3661 Willowick Dr., Ventura, Calif. 93003

Filed Mar. 27, 1989, Ser. No. 329,396

Int. Cl.[4] H01J *37/305*

U.S. Cl. 373—16 **7 Claims**



1. In combination with a plurality of spaced substantially identical electron gun assemblies in parallel, each assembly having top and bottom surfaces, a centrally disposed crucible formed in a coolable housing, an electron emitter spaced from said crucible, and first and second sidewalls formed by first and second oppositely polarized magnets positioned in each of said assemblies and on each side of a line between said emitter and said crucible for producing a magnetic field across said top surface for directing and focusing an electron beam from said emitter into said crucible, a magnetic correction fence interposed between adjacent ones of said spaced parallel assemblies said fence comprising:

a thin magnetic wafer magnetized with opposite magnetic polarity on the side surfaces, said wafer positioned between the sidewalls of two spaced parallel assemblies and having a magnetic polarity on its surface identical to the magnetic polarity of the magnetic bar forming the adjacent sidewall of an electron gun assembly.

4,891,822

INDUCTOR APPARATUS FOR METAL TREATMENT

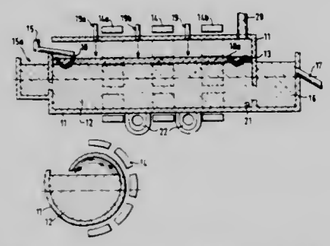
Paul Metz, 18 rue J.P. Brasseur, 1258 Luxembourg, Luxembourg

Division of Ser. No. 59,727, Jun. 9, 1987, Pat. No. 4,808,219. This application Jan. 30, 1989, Ser. No. 283,248

Claims priority, application Luxembourg, Jun. 12, 1986, 86469; Aug. 5, 1986, 86541

Int. Cl.[4] H05B *5/00*; F27D *3/00*

U.S. Cl. 373—146 **20 Claims**



1. An apparatus for treating metal melt by the addition of chemically active substances or alloying elements comprising:

a substantially cylindrical vessel having an apex and having a longitudinal axis which is substantially horizontal or inclined from the horizontal;

inductor means arranged about the exterior wall of said vessel, said inductor means exerting both rotational and axial forces on the metal melt to rotate the melt less than 360 degrees about said longitudinal axis of said vessel and to thereby raise said melt to the apex of said vessel; and

means for causing said melt to fall back from the apex in the direction of said longitudinal axis of said vessel onto the surface of said melt while the melt is contemporaneously being raised to the apex of said vessel.

4,891,823

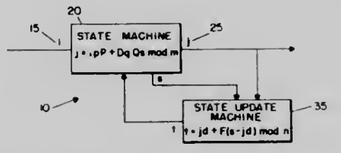
CHANNEL ENCODER FOR GENERATING ROTATIONALLY INVARIANT TRELLIS CODES

Paul D. Cole, Fairfield, Conn., assignor to General DataComm Inc., Middlebury, Conn.

Filed Oct. 26, 1988, Ser. No. 262,714

Int. Cl.[4] H04B *14/04*

U.S. Cl. 375—25 **4 Claims**



1. An encoder for coding data intended for transmission over a channel, comprising:

state means for receiving inputs i of said data, where i=0, . . . , q−1, and where q is an integer greater than one, and for generating outputs j, where j=0, . . . , m−1 and m=pq where p is an integer greater than one and has no common factors with q, said outputs generated according to said inputs i and states s of said state means according to j=i mod q and jd=s mod p, where s=0, . . . , n−1 and n=md where d is an integer greater than one and has no common factors with p; and

state update means for updating said state means to a new state t chosen from said 0, . . . , n−1 based on said ouput j and previous state s according to t=jd+F(s−jd) mod n, where F is the permutation of 0, . . . , n−1 and is a function given by F(am+b)=bd+a for a=0, . . . , d−1, and for b=0, . . . , m−1.

4,891,824

MUTING CONTROL CIRCUIT

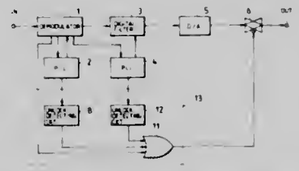
Yoshinobu Takamura, Tokyo; Norimichi Katsumura, Yamanashi; Nobuhiko Osawa, Yamanashi, and Kazuo Watanabe, Yamanashi, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo and Pioneer Video Corporation, Yamanashi, both of, Japan

Filed Jan. 5, 1989, Ser. No. 293,852

Claims priority, application Japan, Jun. 16, 1988, 63-148916

Int. Cl.[4] H04B *1/26*

U.S. Cl. 375—104 **7 Claims**



1. A muting control circuit for a digital audio data processing circuit comprising a first phase locked loop circuit for generating a data processing clock, a second phase locked loop circuit for generating a demodulation clock, a demodulation means for demodulating said digital audio data by using said demodulation clock, and a data processing means for processing output data of said demodulation means by using said data processing clock, a muting circuit responsive to a muting control signal for muting an output of said digital audio data processing circuit, and a muting control circuit for generating said muting control signal, said muting control circuit comprising:

first unlock detecting means for generating a first unlock detection signal when said first phase locked loop circuit is in an unlocked state; and

a muting control signal generating means for producing said muting control signal in response to said first unlock detection signal.

4,891,825

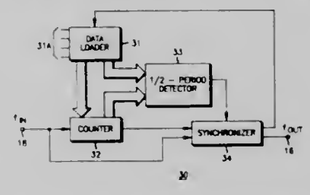
FULLY SYNCHRONIZED PROGRAMMABLE COUNTER WITH A NEAR 50% DUTY CYCLE OUTPUT SIGNAL

Kenneth A. Hansen, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 9, 1988, Ser. No. 154,160

Int. Cl.[4] H03K *5/04, 23/66*

U.S. Cl. 377—52 **16 Claims**



1. Apparatus for a fully synchronized, programmable frequency divider exhibiting a near 50% duty cycle output signal which is independent of the divisor therein, whether even or odd, the apparatus comprising:

(a) counting means for counting to a selected integer so that division of an applied input signal frequency is accomplished by a divisor equalling the selected integer;

(b) data loading means, responsive to a command signal, for storing and then automatically loading a new or same integer into said counting means to provide the selected integer as a present divisor for said counting means;

(c) half-period detecting means, coupled to the counting means and the data loading means, for detecting an integer-approximated half-period of the input signal by compairing when the count within the counting means equals the state INTEGER (N/2) and outputting an indicating thereof; and

(d) synchronizing means, coupled to the counting means and the data loading means, and responsive to the indication outputted from the half-period detecting means, for synchronizing the data loading of said counting means, and for synchronizing the output signal with respect to the input signal, thereby providing a near 50% duty cycle output signal which is independent of the present divisor therein.

4,891,826

METHOD OF OPERATING A CHARGE-COUPLED DEVICE TO REDUCE SPILLBACK

Kei-Wean C. Yang, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 14, 1988, Ser. No. 270,912

Int. Cl.[4] G11C *19/28*; H01L *29/78*

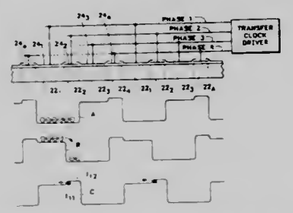
U.S. Cl. 377—58 **18 Claims**

1. A charge-coupled device comprising:

a body of semiconductor material having a channel along

which charge can be transferred in a predetermined direction by charge carriers of a first polarity,

a plurality of gates over the channel, the gates being in n sets, where n is an integer greater than two, such that a gate of the first set is preceded by a gate of the nth set in said predetermined direction and is succeeded by a gate of the second set, a gate of the ith set (where i is an integer greater than 1 and less than n) is preceded by a gate of the (i−1)th set and is succeeded by a gate of the (i+1)th set, and a gate of the nth set is preceded by a gate of the (n−1)th set and is succeeded by a gate of the first set, the



gates of at least one set being longer in the predetermined direction than the respective preceding gates, and

means for driving the sets of gates each between first and second potential levels of which the first potential level is of said first polarity relative to said second potential level, the first potential level to which the gates of said one set are driven being different from the first potential level to which said preceding gates are driven and the second potential level to which the gates of said one set are driven being substantially the same as the second potential level to which said preceding gates are driven.

4,891,827

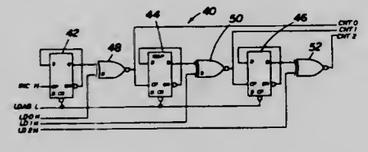
LOADABLE RIPPLE COUNTER

Andrew E. Slater, Maynard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 7, 1988, Ser. No. 164,584

Int. Cl.⁴ H03K *21/02*

U.S. Cl. 377—111 **9 Claims**



1. A loadable N-bit ripple counter comprising

N bit subcircuits, each said bit subcircuit providing a single bit output of the N-bit counter output, a less significant bit subcircuit clocking the next more significant bit subcircuit, said counter output being a function of a predetermined N-bit loaded binary word, each bit subcircuit comprising

a flip-flop configured to alternate its flip-flop output every time that it receives a clock pulse, said least significant bit flip-flop receiving a clock external of said ripple counter, said flip-flop having means to control said flip-flop output to a known state when a flip-flop control signal is asserted, said known state remaining until said control signal is deasserted, and

a bit loading element connected to receive said flip-flop output and a bit input of said predetermined N-bit word being loaded and to provide a bit output of said counter, said bit output being controlled by the states of said flip-flop output and said bit input, said bit output of said bit loading element, except for the most significant bit, being also connected to serve as a clock for the next more significant bit subcircuit.

4,891,828

VOLTAGE TO PULSE-WIDTH CONVERSION CIRCUIT

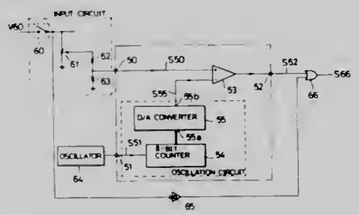
Akio Kawazoe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,716

Claims priority, application Japan, Mar. 9, 1987, 62-53386

Int. Cl.⁴ H03K *21/08, 5/26*

U.S. Cl. 377—114 **11 Claims**



1. A brightness control circuit for an electronic indicator, comprising:

an oscillation circuit which generates a reference frequency signal;

a counter receiving said reference frequency signal and producing a digital output signal having a multi-bit digital value corresponding to a count of cycles of said reference frequency signal;

a digital/analog converter receiving said digital output signal and producing an analog output signal having an analog value which corresponds to said multi-bit digital value, said digital/analog converter comprising a decoder for producing a decoded signal from an eight-bit input signal, a plurality of analog switches which are individually selectable according to said decoded signal, and a plurality of voltage-dividing resistors connected to a voltage supply, said voltage-dividing resistors being correspondingly connected to ones of said plurality of analog switches;

means for supplying a selected reference voltage; and

a voltage comparator receiving as inputs and comparing said reference voltage and said analog output signal, and producing a pulse width modulation signal corresponding to the difference between said inputs, said pulse width modulation signal determining a duty cycle ratio for controlling the brightness of the electronic indicator; whereby said voltage supply is divided by said voltage-dividing resistors to produce said output voltage signal corresponding to said analog value via the selected one of said plurality of analog switches.

4,891,829

METHOD AND APPARATUS FOR UTILIZING AN ELECTRO-OPTIC DETECTOR IN A MICROTOMOGRAPHY SYSTEM

Harry W. Deckman, and Brian P. Flannery, both of Clinton, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 19, 1986, Ser. No. 932,273

Int. Cl.⁴ G01N *23/00, 23/08*

U.S. Cl. 378—4 **38 Claims**

1. An apparatus for producing tomographic images of an object mounted with respect to a rotation axis, said object irradiated by a beam of plane parallel collimated x-ray radiation transmitted in a plurality of rays through a set of coplanar sections of said object as viewed from a plurality of angles about said rotation axis comprising:

(a) an imaging two-dimensional electro-optic detector to simultaneously record the transmitted radiation from multiple stacked planes through said object irradiated by a beam of plane parallel collimated x-ray radiation wherein the electro-optic detector includes an energy converter, an electro-optic readout and a means for format alteration, said format alteration means being focused;

(b) means to determine projection data from transmitted radiation with respect to one or more reference calibration exposures, wherein a projected image of said rotation axis is aligned on said readout, wherein said object is aligned with respect to said rotation axis, and wherein said electro-optic detector has a spatially uniform response and low signal dependent background;

(c) means to determine a three-dimensional reconstructed image of attenuation coefficients of said object from said projection data.

4,891,830

X-RAY REFLECTIVE MASK AND SYSTEM FOR IMAGE FORMATION WITH USE OF THE SAME

Kenji Iwahashi, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

PCT No. PCT/JP87/00177, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/06028, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 24, 1987, Ser. No. 137,857

Claims priority, application Japan, Mar. 28, 1986, 61-71970; Mar. 31, 1986, 61-74695

Int. Cl.⁴ G03F *1/00, 7/20*

U.S. Cl. 378—35 **2 Claims**



1. An X-ray reflective mask element, comprising:

an X-ray reflective substrate; and

an X-ray absorbing mask film coated on said substrate,

wherein the substrate has a plane face and is formed from a crystalline body which has an outwardly curved X-ray diffractive structure, and wherein the substrate face is cut out to have an inclination against diffractive lattice surfaces such that an X-ray reflected according to Bragg's rule, at the center of the substrate face, will travel to agree with a normal line also from the center of the substrate.

4,891,831

X-RAY TUBE AND METHOD FOR GENERATING X-RAYS IN THE X-RAY TUBE

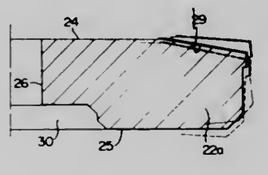
Akira Tanaka, Katsuta; Satoshi Shimada, Hitachi; Kazuji Yamada, Hitachi; Yusaku Nakagawa, Hitachi; Motohisa Nishihara, Katsuta; Tadahiko Miyoshi, Hitachi; Noboru Baba, Hitachiota; Hiromi Kagohara, Hitachi, and Ichiro Izumura, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,615

Claims priority, application Japan, Jul. 24, 1987, 62-185267

Int. Cl.⁴ H01J *35/10*

U.S. Cl. 378—125 **31 Claims**



1. A method for generating X-rays in an X-ray tube, comprising the steps of:

rotating an X-ray target of a rotating anode, said X-ray target having a metal coated layer thereon;

applying electron beams emitted from a cathode onto said metal coated layer of the X-ray target; and

offsetting thermal deformation of the X-ray target due to the application of said electron beams by deformation of the X-ray target due to centrifugal force, so as to maintain a position of said X-ray target in a direction of the a of the electron beams, at a predetermined temperature of said X-ray target, thus generating the X-rays.

4,891,832

ROTATING ANODE X-RAY TUBE

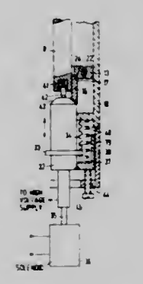
Hans Ebersberger, Kotzenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,385

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 8710059[U]

Int. Cl.⁴ H01J *35/10*

U.S. Cl. 378—132 **13 Claims**



1. An x-ray tube for use with a high voltage supply, said x-ray tube comprising:

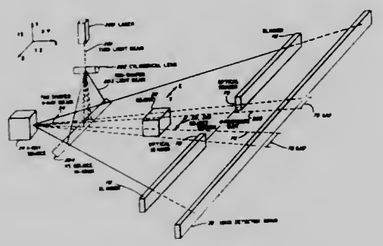
an evacuated housing;

a cathode disposed in said housing;

a rotatable anode having a drive shaft disposed in said housing, said drive shaft having a lower end in said housing;

a plurality of mechanical bearings disposed in said housing adjacent said drive shaft for supporting said drive shaft;
means for connecting said anode to said high voltage supply including a displaceable contact actuator having at least a portion thereof disposed in said evacuated housing, said contact actuator connected to said high voltage supply;
means for receiving said contact actuator in said evacuated housing air-tight;
means for displacing said contact actuator toward and away from said lower end of said drive shaft to make and break electrical contact therewith; and
guide means attached to said contact actuator and disposed outside said evacuated housing for guiding movement of said contact actuator during displacement thereof.

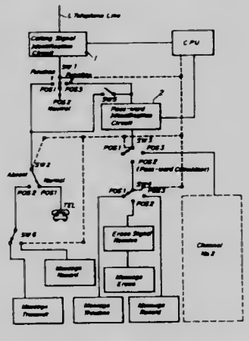
4,891,833
BLINDER FOR CAT SCANNER
Richard T. Bernardi, Lincolnshire, Ill., assignor to Bio-Imaging Research, Inc., Lincolnshire, Ill.
Continuation-in-part of Ser. No. 122,905, Nov. 19, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 296,412
Int. Cl.[4] G21K *1/04*
U.S. Cl. 378—145 **17 Claims**



1. A dynamic X-ray scanner comprising a source of X-rays, a detector means at a location for detecting said X-rays, said detector means comprising a plurality of detector units, said detector units being made of a material which deteriorates on exposure to said X-rays, means for moving an object under study between said source and said detector means so that a shadow of said object falls on at least some of said detector units, blinder means having a gap through which said X-rays must pass in order to fall on said detector means, and means for moving said blinder means in synchronism with the movement of said object under study so that said gap is over each of said detector unit substantially only when an X-ray shadow of said object falls on said detector units.

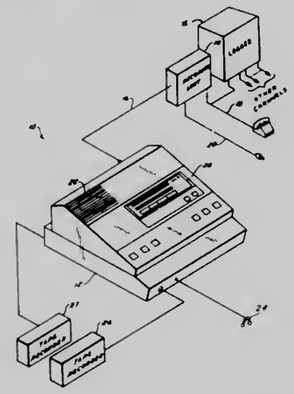
4,891,834
RECORDING TELEPHONE SYSTEM EQUIPPED WITH A REMOTE CONTROL CHANGE-OVER SWITCH
Mutsuo Sezaki, Ikoma, and Kinji Nishimura, Ise, both of Japan, assignors to C. Itoh Fuel Co., Ltd. and Nishitomo Co., Ltd., both of, Japan
Filed Oct. 18, 1988, Ser. No. 259,127
Claims priority, application Japan, Oct. 28, 1987, 62-270284
Int. Cl.[4] H04M *1/64, 1/66*
U.S. Cl. 379—67 **9 Claims**

1. A telephone message device having remote control switching capabilities comprising:
calling signal identification circuit means for identifying the number of calling signals transmitted to said device that are generated from another telephone;
MF signal password identification circuit means for identifying various passwords;
means for recording and reproducing a message from a calling party;
message function means for access by a calling party; and
at least one micro-computer having a plurality of switching circuits under the control of said micro-computer, said switching circuits interconnecting said calling signal circuit means, said MF signal password circuit means, said means for recording and reproducing and said message function means in a predetermined way so that after a calling party disconnects a calling signal connection after counting a predetermined number n_1 of calling signals,



said device is switching into a recording function stand-by mode, and upon receiving an additional calling signal within a predetermined time interval t_1, said means for recording and reproducing and said message function means are actuable by a calling party after said device identifies a password signal, provided by a calling party, by means of said MF signal password identification circuit means.

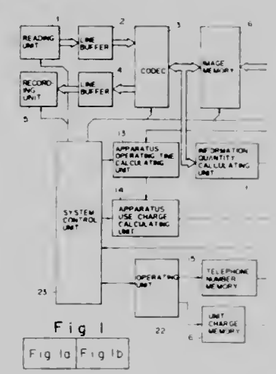
4,891,835
METHOD AND DEVICE FOR RECORDING AND REPLAYING AUDIO COMMUNICATIONS
Keith K. W. Leung; Kathleen Quinn, both of Norwalk, Conn.; John D. Goldson, Mt. Vernon, N.Y., and Wayne C. Hoffman, Norwalk, Conn., assignors to Dictaphone Corporation, Stratford, Conn.
Filed Apr. 30, 1986, Ser. No. 857,844
Int. Cl.[4] H04M *1/64*
U.S. Cl. 379—88 **45 Claims**

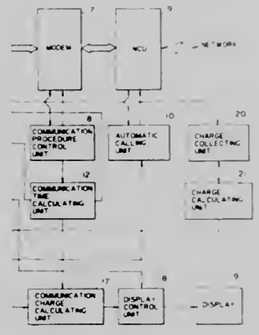


10. A method for recording and replaying audio messages which are concurrently being recorded on an analog logger, comprising the steps of:

selecting a particular one of the channels of said logger on which audio signals are provided;
converting the audio signals on the particular channel into corresponding digital signals;
storing the digital signals corresponding to a portion of the messages recorded on the logger in memory means in wraparound form;
selectively recalling digital signals from the memory means; and
converting the digital signals recalled from the memory means into analog audio signals.

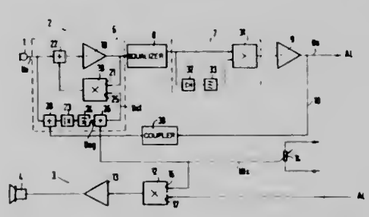
4,891,836
COMMUNICATION TERMINAL HAVING A CHARGE DISPLAYING FUNCTION
Shuichi Takahashi, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 8, 1988, Ser. No. 179,648
Claims priority, application Japan, Apr. 10, 1987, 62-87019
Int. Cl.[4] H04M *17/00, 15/02, 11/00*
U.S. Cl. 379—100 **21 Claims**





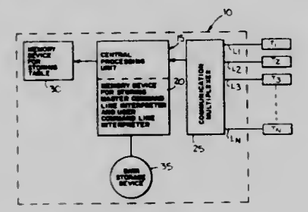
1. A communication terminal having a service charge displaying function, comprising:
storing means for storing data temporarily;
transmitting means for transmitting said data stored in said storing means to another communication terminal at a remote place through a transmission line;
calculating means for calculating a charge for transmitting said data stored in said storing means to said another communication terminal;
displaying means for displaying said calculated charge so that a user may recognize how much it costs to transmit said data;
charge collecting means for collecting a charge paid by the user;
controlling means for controlling said transmitting means such that said transmitting means initiates transmission of said data stored in said storing means to said another communication terminal only when at least a part of said calculated charge has been paid by said user at said charge collecting means; and
unit charge determining means for determining a unit charge per unit time depending on a distance to said another communication terminal, wherein said calculating means calculates said charge based on the product of said unit charge determined by said unit charge determining means and a calculated time period for transmitting said stored data to said another communication terminal.

4,891,837
VOICE CONTROL CIRCUIT FOR A COMMUNICATION TERMINAL
Michael Walker, Baltmannsweiler, and Günter Köhler, Kirchheim, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands
Filed May 16, 1988, Ser. No. 194,307
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716246; Jul. 23, 1987, 3724346; Feb. 20, 1988, 3805357
Int. Cl.[4] H04M *1/60*
U.S. Cl. 379—390 **19 Claims**



1. A circuit arrangement for controlling the dynamic range of voice signals in a communication terminal, comprising
a transmission channel,
a user microphone coupled to the transmission channel for supplying signal voltages in response to a voice input, the connection between the user microphone and the transmission channel defining a send path,
a compandor in said send path between said user microphone and said transmission channel which attenuates the signal voltages above a predetermined value and amplifies the signal voltages below the predetermined value with the gain of the compander being equal to a maximum gain when said signal voltages are just below said predetermined value,
a loudspeaker coupled to the transmission channel, the connection between the loudspeaker and the transmission channel defining a receive path,
volume control means for varying the loudness of the loudspeaker and
means responsive to said volume control means for lowering said predetermined value when the loudness of the loudspeaker is increased.

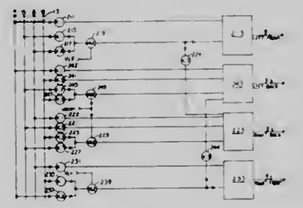
4,891,838
COMPUTER ACCESSING SYSTEM
Lawrence M. Faber, Sunnyvale, Calif., assignor to Dental Data Service, Inc., Mountain View, Calif.
Filed Nov. 4, 1985, Ser. No. 794,741
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—25 **3 Claims**



1. A system for accessing a computer system comprising:
(a) a computer system storing data, a first memory device for said computer system storing a master command line interpreter, a second memory device for said computer system storing a table of passwords and terminal lines;
(b) a plurality of computer terminals, each of said computer terminals having an assigned password transmittable therefrom; and
(c) a plurality of terminal lines establishing respective communication links between said computer system and said computer terminals, said computer terminals being arranged to transmit over said terminal lines, respectively, assigned passwords,
(d) said master command line interpreter comparing a password with the terminal line over which the password is transmitted and the table of passwords with terminal lines stored in said second memory device for instructing said computer system to enable or refuse access to data stored in said computer system by the computer terminal assigned the compared password over the terminal line which the compared password was transmitted,
(e) said computer system further comprising a data storage device and a user command line interpreter, said master command line interpreter instructing said computer system to sequence said user command line interpreter upon instructing said computer system to access the computer terminal assigned the compared password over the terminal line which the compared password was transmitted, said user command line interpreter in response to being sequenced by said computer system limits the computer terminal having access thereto over the terminal line transmitting the compared password to data stored in said data storage device designated for said sequenced user command line interpreter.

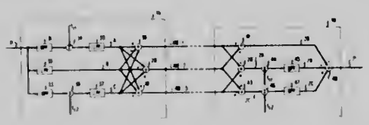
4,891,839
SIGNAL RE-DISTRIBUTION, DECODING AND PROCESSING IN ACCORDANCE WITH AMPLITUDE, PHASE AND OTHER CHARACTERISTICS
Peter Scheiber, 152 Bayview Ave., Northport, N.Y. 11768
Division of Ser. No. 687,860, Dec. 31, 1984, Pat. No. 4,704,728.
This application Jan. 22, 1988, Ser. No. 100,888
Int. Cl.[4] H04S 3/00
U.S. Cl. 381—22 **17 Claims**

1. A decoder for directing spatially encoded stereo A and B signals designated center left, center right, left, and right for which the A:B amplitude division ratios are respectively F:E, D:C, 1:0. and 0:1 to speakers designated left front, right front, left back, and right back respectively and where adjacent pairs are defined as left front-right front, right front-right back, left back-right, and left back-left front comprising
four combining elements for combining spatially encoded signals each element having an amplitude combination ratio and a phase relative angle associated therewith, said combination ratio differing as to elements of adjacent pairs of elements in at least one mode of operation of said decoder,
the amplitude combination ratios of said elements respec-



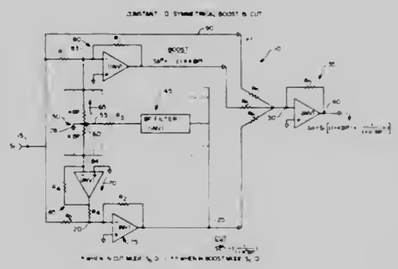
tively being approximately 1:0, 0:1, C:D, an E:F when the amplitude division ratios for corresponding spatially encoded stereo signals are F:E, D:C, 1:0, and 0:1, and
wherein the phase relative angle for each element is separated 180° approximately from that of the non-adjacent element's corresponding spatially encoded stereo signals.

4,891,840
MULTI-CHANNEL SIGNAL TRANSMISSION
Douglas O. Reudink, Sea Girt, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 10, 1986, Ser. No. 837,798
Int. Cl.[4] H04B 1/66
U.S. Cl. 381—29 **7 Claims**



7. A communications system, having a transmitter and a receiver, for transmitting a wide band signal over a plurality of narrow band transmission channels, with said transmitter comprising:
first means responsive to said wide band signal for separating said wide band signals into N narrow band signals, where N is a positive integer, second means for developing a baseband signal corresponding to each of said N narrow band signals thereby developing N baseband signals, and third means for developing N combination signals, where each of said combination signals is a unique algebraic combination of said N baseband signals; and
said receiver comprising:
N processing units, each responsive to said N baseband signals and each algebraically combining said N baseband signals to develop a combination signal having a frequency band, thereby forming N combination signals, N−1 modulation means, each connected to a preselected one of said combination signals leaving a chosen one of said combination signals unconnected to any of said modulation means, for shifting the frequency band of its applied combination signal to develop narrow band signals, and means for combining said narrow band signals with said chosen one of said combination signals to develop a wide band signal.

4,891,841
RECIPROCAL, SUBTRACTIVE, AUDIO SPECTRUM EQUALIZER
Dennis A. Bohn, Bothell, Wash., assignor to Rane Corporation, Everett, Wash.
Filed Feb. 22, 1988, Ser. No. 158,697
Int. Cl.[4] H03G 5/00
U.S. Cl. 351—98 **4 Claims**

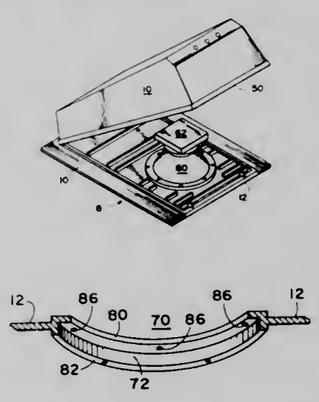


1. A constant-Q multiple bandpass frequency equalizer circuit comprising:
first signal channel means, boost signal channel means, and cut signal channel means arranged in parallel between an input and output;
said first signal channel means providing a passthrough signal having a relative gain of unity for all frequency components of an input signal and having a predetermined first polarity;
said boost signal channel means having gain adjustable bandpass filter means connected so as to produce a composite boost signal of a second polarity opposite that of said passthrough signal and being characterized by the relative value of 1+KBP, wherein K is an adjustable scale factor and BP is a bandpass filter response;
said cut channel means having gain adjustable bandpass filter means connected to produce a composite cut signal also of said second polarity and being characterized by a relative value of

$$\frac{1}{(1 \pm K'BP)},$$

wherein K′ is another adjustable scale factor and BP is a bandpass filter response;
signal combining circuit means for combining said composite boost and cut signals with said passthrough signal so that the resulting signal appearing at said output has a relative gain of greater than unity for frequency components that are boosted by said boost signal channel and ha a gain of less than unity for frequency components that are cut by said cut channel means; and wherein
said cut and boost channel means comprise a first amplifier means connected between said input and said signal combining circuit means, and a second amplifier means connected between said input and said signal combining circuit means, said adjustable bandpass filter means for said cut channel means connected in feedback around said first amplifier means to form said cut channel means and said adjustable bandpass filter means for said boost channel means connected in a feedforward path between an output of said first amplifier means and an input of said second amplifier means to form said boost channel means.

4,891,842
SOUND OUTPUT UNIT FOR INSTALLATION IN A CEILING STRUCTURE
Daniel N. Green, Portland, Oreg., assignor to Posh Diversified, Inc., Lake Oswego, Oreg.
Filed Mar. 24, 1988, Ser. No. 173,246
Int. Cl.[4] H04R 1/02
U.S. Cl. 381—188 **9 Claims**



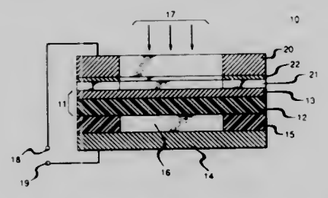
4. A sound output unit adapted for installation in a ceiling structure having parallel stud boards and a layer of sheet material, said unit comprising:
a polyhedral acoustic chamber including a bottom plate having an inner edge defining an opening, a top plate and two pairs of side plates forming three pairs of opposite sides for said chamber which are slanted in orientation with respect to another for reducing resonant vibrations;
a loudspeaker mounted in said bottom plate of said chamber for radiating sound outward from said output unit through said opening;
a plurality of baffle ribs mounted along the interior of said chamber for suppressing sound reflections;
a pair of flat sections extending out from said bottom plate of said chamber for mounting said chamber to said stud boards of said ceiling structure, and
means for mounting said loudspeaker in said bottom plate, said mounting means including a ring extending down from said inner edge of said bottom plate around said opening for forming an abutment to said sheet material of said ceiling, a recessed shoulder extending inward from the inner edge of said plate around said opening for mounting said loudspeaker in said opening, and a cover plate including a screen, said plate adapted for being removably mounted onto said ring from below said opening in said bottom plate.

4,891,843
ELECTRET MICROPHONE
Frank S. Paulus, Jr., Chesterfield Twp., Burlington Cty., N.J., and Isaac Tsah-Polu, Falls Twp., Lower Bucks Cty., Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Feb. 24, 1983, Ser. No. 469,489
Int. Cl.[4] H04R 19/00, 19/01
U.S. Cl. 381—191 **1 Claim**

1. An electret transducer comprising:
an electret diaphragm having a thin metal layer deposited on one of its major surfaces;
a ring-shaped metal washer made of nickel-plated brass material; and
a layer of lightly filled metal-filled adhesive for bonding the

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electet diaphragm to the metal washer so that the electret diaphragm is uniformly radially tensioned thereby



wherein the lightly filled adhesive comprises approximately 4% nickel.

4,891,844

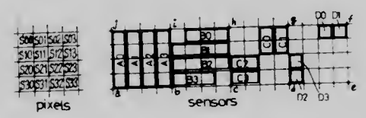
RADIATION IMAGE DETECTING SYSTEM

Motosada Kiri, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 25, 1988, Ser. No. 173,268
Claims priority, application Japan, Mar. 25, 1987, 62-71097
Int. Cl.[4] G06K 9/28
U.S. Cl. 382—6 **1 Claim**

1. A radiation image detecting system in which a radiation image projection plane divided into pixel domains for the purpose of detecting a radiation image with the same divided into pixels by placing at said radiation image projection plane a radiation image detecting plate on which a numerous number of radiation sensors are arrayed, said radiation image detecting system comprising:

a radiation image detecting plate divided into rows and columns of the same-sized sensor domains, each of which consists of the same-sized sensor subdomains, all of which are to correspond to one predetermined partial area supposed on said radiation image projection plane, each of said same-sized sensor subdomains including at least some number of radiation sensors different in number, size and distribution depending on each of said same-sized sensor subdomains;



a sensor displacing means for displacing said radiation image detecting plate stepwise so that each of said same-sized sensor subdomains may be successively brought to said one predetermined partial area supposed on said radiation image projection plane;

a memory for storing the output signals from said radiation sensors each time said radiation image detecting plate is displaced; and

a computing means for solving the simultaneous equations given the output signals from said radiation sensors.

DESIGN PATENTS

GRANTED JAN. 2, 1990

ERRATA

For CLASS	See PATENT NO.
D20-011	305,335

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305,275
COUNTERLESS SHOE HEEL PROTECTOR
Jill L. Kemna, Savage, Minn., assignor to Summerfield Industries, Inc., Roseville, Minn.
Filed May 15, 1987, Ser. No. 50,072
Term of patent 14 years
U.S. Cl. D2—277



305,276
COMBINED BOW AND SHOE HEEL AND COUNTER PROTECTOR
Jill L. Kemna, Bloomington, and Thomas R. Freeman, St. Paul, both of Minn., assignors to Summerfield Industries, Inc., Roseville, Minn.
Filed Jul. 20, 1987, Ser. No. 75,324
Term of patent 14 years
U.S. Cl. D2—277



305,277
COMBINED SHOE HEEL AND COUNTER PROTECTOR AND ANKLE BAND
Jill L. Kemna, Bloomington, and Thomas R. Freeman, St. Paul, both of Minn., assignors to Summerfield Industries, Inc., Rosefille, Minn.
Filed Nov. 9, 1987, Ser. No. 118,513
Term of patent 14 years
U.S. Cl. D2—277







253-571 O.G.-90-36

305,278
SHOE SOLE
Junichi Kiyonawa, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 11, 1987, Ser. No. 13,624
Claims priority, application Japan, Aug. 12, 1986, 61-31766
Term of patent 14 years
U.S. Cl. D2—320

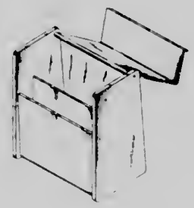


305,279
SHOE SOLE
Yoshiaki Hase, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Apr. 9, 1987, Ser. No. 36,421
Claims priority, application Japan, Oct. 13, 1986, 61-40636
Term of patent 14 years
U.S. Cl. D2—320

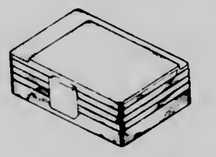


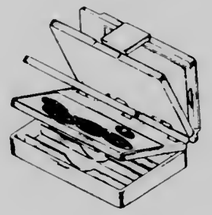


305,280
DISC FILE
Stephen H. Wolff, New York, N.Y., and Michael J. Heningan, Chatham, N.J., assignors to The Wolff Marketing Group Inc., New York, N.Y.
Filed Jul. 11, 1986, Ser. No. 884,410
Term of patent 14 years
U.S. Cl. D3—35

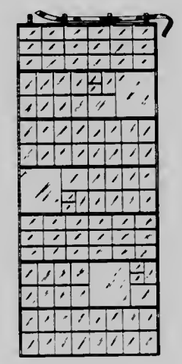


305,281
COSMETIC CASE
James S. K. Chen, 3F., No. 189, Sec. 4, Hsin-1 Rd., Taipei, Taiwan
Filed Oct. 9, 1987, Ser. No. 106,320
Term of patent 14 years
U.S. Cl. D3—39



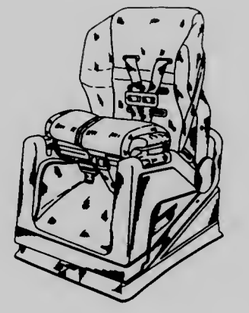


305,282
FOLDABLE DISPLAY UNIT FOR PHOTOGRAPHS OR THE LIKE
Zondra L. Schmidt, #25 Blue Anchor Cay Rd., Coronado, Calif. 92118
Filed Aug. 14, 1986, Ser. No. 896,466
Term of patent 14 years
U.S. Cl. D6—302





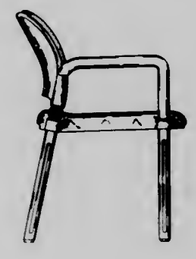
305,283
CAR SEAT
James M. Kain, Tripp City, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Oct. 10, 1986, Ser. No. 919,332
Term of patent 14 years
U.S. Cl. D6—333



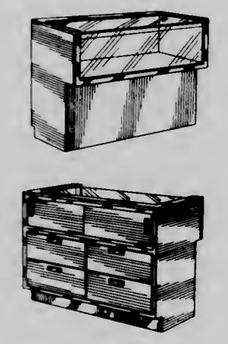
305,284
CHAIR
Giancarlo Piretti, Piazza Trento e Trieste 2/2, Bologna, Italy
Filed Dec. 2, 1986, Ser. No. 937,187
Claims priority, application Italy, Jun. 12, 1986, 53524/86[U]
Term of patent 14 years
U.S. Cl. D6—366



305,285
CHAIR
Giancarlo Piretti, Piazza Trento e Trieste 2/2, Bologna, Italy
Filed Dec. 2, 1986, Ser. No. 937,188
Claims priority, application Italy, Jun. 12, 1986, 53524/86[U]
Term of patent 14 years
U.S. Cl. D6—380



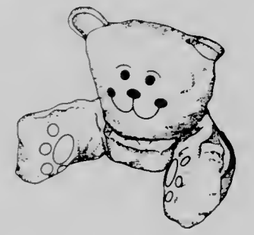
305,286
SHOW CASE
Martin Otema, 51 Pine Ridge Dr., Scarborough, Ontario, Canada (M1M 2X6)
Filed May 11, 1989, Ser. No. 350,262
Term of patent 14 years
U.S. Cl. D6—470



305,287
CONFECTION DISPLAY AND VENDING CASE
W. Neil Thompson, Kensington, Md., assignor to Unique Caseworks, Inc., Kensington, Md.
Filed Mar. 3, 1987, Ser. No. 21,017
Term of patent 14 years
U.S. Cl. D6—472



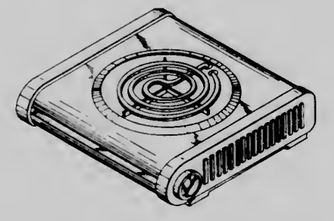
305,288
CHILD'S POCKETED BED REST CUSHION
Carol Eldridge, 17 Maverick St., Marblehead, Mass. 01945
Filed Apr. 13, 1988, Ser. No. 181,254
Term of patent 14 years
U.S. Cl. D6—598



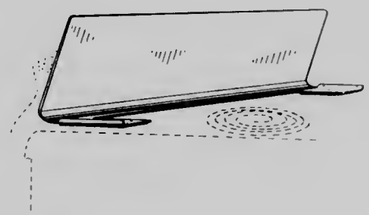
305,289
HANDLE FOR AN ARTICLE OF FLATWARE
William W. Robinson, Rowayton, Conn., and Clark L. Lofgren, Taunton, Mass., assignors to Scientific Silver Service Corporation, Hamden, Conn.
Filed Aug. 10, 1987, Ser. No. 83,303
Term of patent 14 years
U.S. Cl. D7—150



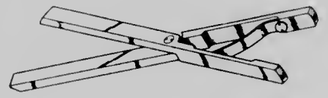
305,290
SINGLE BURNER TABLE RANGE
Alan Springer, Portchester, N.Y., assignor to Morton Springer & Co., Inc., Paterson, N.J.
Filed Mar. 12, 1986, Ser. No. 842,873
Term of patent 14 years
U.S. Cl. D7—367



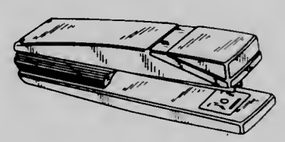
305,291
STOVE TOP BURN GUARD
Kurtis L. Kiev, 2949 W. 5750 South, Roy, Utah 84067
Filed Jul. 25, 1986, Ser. No. 889,263
Term of patent 14 years
U.S. Cl. D7—402



305,292
SCISSORS
Kazuo Kawasaki, Fukui, Japan, assignor to EX-Design Corporation, Fukui, Japan
Filed Sep. 23, 1987, Ser. No. 99,983
Term of patent 14 years
U.S. Cl. D8—5



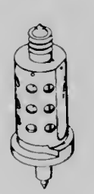
305,293
STAPLING MACHINE
Timothy P. Trotman, Bridgend, and Bryn Thomas, Pencoed, both of Wales, assignors to American Standard Inc., New York, N.Y.
Filed Mar. 5, 1986, Ser. No. 841,731
Claims priority, application United Kingdom, Sep. 6, 1985, 1029072; Sep. 6, 1985, 1029073
Term of patent 14 years
U.S. Cl. D8—50



305,294
KITCHEN SHEARS
Milton L. Cohen, Hewlett Bay Park, and Jeff Siegel, Great Neck, both of N.Y., assignors to Lifetime Cutlery Corporation, Brooklyn, N.N.
Filed May 1, 1987, Ser. No. 44,977
Term of patent 14 years
U.S. Cl. D8—57



305,295
CUTTING TOOL
Michael F. Momany, Seattle, Wash., assignor to Techsoarts Corporation, Seattle, Wash.
Filed Jul. 11, 1986, Ser. No. 884,407
Term of patent 14 years
U.S. Cl. D8—70

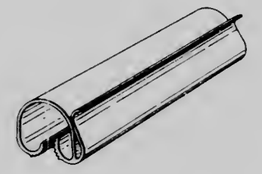


305,296
HANDSAW FRAME
Norman P. Nelson, 3804 Maple Rd., Lynnwood, Wash. 98037
Filed May 13, 1987, Ser. No. 50,342
Term of patent 14 years
U.S. Cl. D8—97



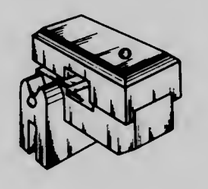


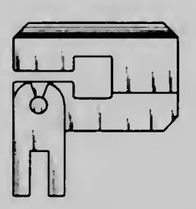
305,297
COMBINED BAG HANDLE, CLAMP, AND EDGE PROTECTOR
Hugh O'Neill, 353 Nahani Way, Mississauga, Ontario, Canada L4Z 3B1
Filed Aug. 11, 1987, Ser. No. 84,001
Claims priority, application Canada, Jun. 18, 1987, 18-06-87-7
Term of patent 14 years
U.S. Cl. D8—300



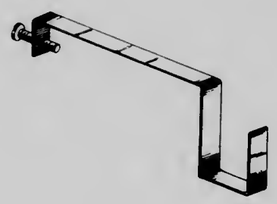


305,298
VISOR HINGE
Alan J. De Langie, 696 Glen Cairon Dr., Santa Maria, Calif. 93455
Filed Jul. 1, 1987, Ser. No. 68,321
Term of patent 14 years
U.S. Cl. D8—323

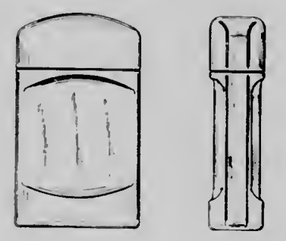




305,299
WREATH HANGER FOR A GRAVE STONE OR SIMILAR ARTICLE
George V. Freeman, 115 Linden St., Hamilton, Mass. 01982
Filed Nov. 2, 1987, Ser. No. 116,268
Term of patent 14 years
U.S. Cl. D8—373



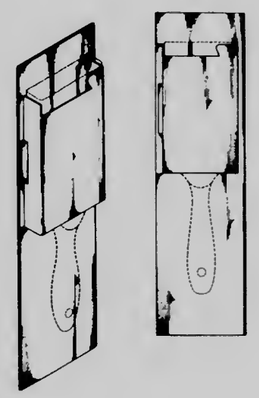
305,300
CONTAINER
Karl-Heinz Kraft, Hamburg, Fed. Rep. of Germany, assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed May 29, 1986, Ser. No. 868,414
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, URA1534/85
Term of patent 14 years
U.S. Cl. D9—377



305,301
DISPENSING CONTAINER
Ronald R. Gutkowski, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 9, 1987, Ser. No. 36,818
Term of patent 14 years
U.S. Cl. D9—373



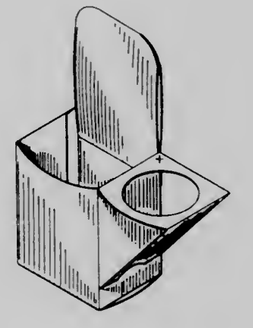
305,302
PAINT BRUSH CONTAINER
Paul D. Beatrice, Holbrook; James Mayne, Southwick, and Gary S. Furst, West Newton, all of Mass., assignors to American Brush Company, Claremont, N.H.
Filed May 14, 1986, Ser. No. 863,404
Term of patent 14 years
U.S. Cl. D9—415



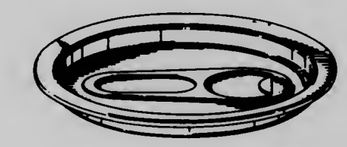
305,303
BABY FOOD CAN
William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corporation, Weirton, W. Va.
Filed Apr. 14, 1986, Ser. No. 851,686
Term of patent 14 years
U.S. Cl. D9—416



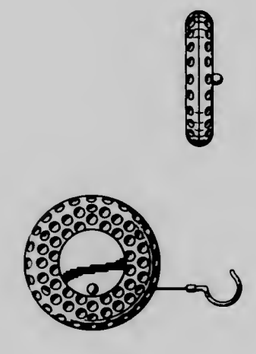
305,304
FOOD SERVING CARTON
Philip McCaleb, Chicago, Ill., assignor to P. Freetly's, Inc., Chicago, Ill.
Filed Oct. 26, 1987, Ser. No. 112,425
Term of patent 14 years
U.S. Cl. D9—418



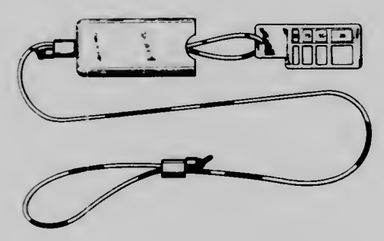
305,305
CAN CLOSURE
Andrew P. Pavely, Blunsdon, and Joseph S. Taylor, Marcham, both of England, assignors to MG Group plc, Reading, England
Filed Dec. 23, 1986, Ser. No. 945,468
Claims priority, application United Kingdom, Jun. 26, 1986, 1035009
Term of patent 14 years
U.S. Cl. D9—438



305,306
DISTANCE MEASURING DEVICE
Nicholas Castello, 1612 Ogden Ave., Lisle, Ill. 60532
Filed May 8, 1986, Ser. No. 862,397
Term of patent 14 years
U.S. Cl. D10—70



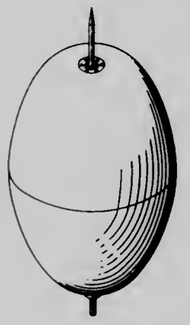
305,307
RANGEFINDER
Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736
Filed Feb. 17, 1987, Ser. No. 15,609
Term of patent 14 years
U.S. Cl. D10—70



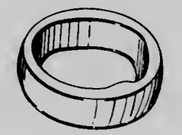
305,308
ELECTRONIC ARTICLE SURVEILLANCE SENSING SCREEN FOR A THEFT DETECTION SYSTEM
William H. Adams, Philadelphia, Pa.; Ronald Keaney, Sewell, N.J., and Lee T. Lamond, North Wales, Pa., assignors to Checkpoint Systems, Inc., Thorofare, N.J.
Filed Nov. 28, 1986, Ser. No. 936,035
Term of patent 14 years
U.S. Cl. D10—104



305,309
LIGHTNING ARRESTER
Kenneth P. Heary, Springville, N.Y., assignor to Heary Bros. Lightning Protection Co., Inc., Springville, N.Y.
Filed Apr. 1, 1987, Ser. No. 32,702
Term of patent 14 years
U.S. Cl. D10—105



305,310
FINGER-CONTOURED RINGS
Ralph W. Flinchbaugh, 8309 Winder St., Vienna, Va. 22180
Division of Ser. No. 850,389, Apr. 7, 1986, Pat. No. Des. 300,731. This application Feb. 1, 1989, Ser. No. 304,835
Term of patent 14 years
U.S. Cl. D11—26





305,311
GUITAR PICK EARRING
Velma Roberts, 131 S. Main St., Bellefontaine, Ohio 43311
Filed Jan. 13, 1988, Ser. No. 144,021
Term of patent 14 years
U.S. Cl. D11—48

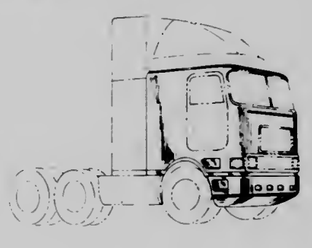




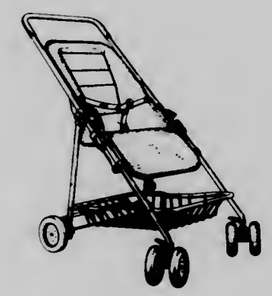
305,312
SLED
John R. Wright, 9240 E. Redfield Rd., #140, Scottsdale, Ariz. 85260
Filed Dec. 8, 1987, Ser. No. 129,976
Term of patent 14 years
U.S. Cl. D12—9



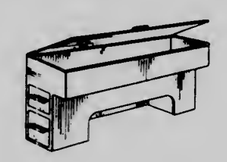
305,313
EXTERIOR SHELL OF A HIGHWAY TRACTOR
Ronald N. Brunger, and Larry N. Reynard, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.
Filed Oct. 19, 1987, Ser. No. 110,382
Term of patent 14 years
U.S. Cl. D12—96



305,314
BABY STROLLER
Francois Julien, Biarritz, France, assignor to Baby Relax, Anglet, France
Filed Oct. 13, 1987, Ser. No. 106,688
Term of patent 14 years
U.S. Cl. D12—129



305,315
TRUCK TOOL BOX
Nevin R. Fletcher, 11286 Roxabel St., Santa Fe Spring, Calif. 90670
Filed Jun. 24, 1987, Ser. No. 65,724
Term of patent 14 years
U.S. Cl. D12—157



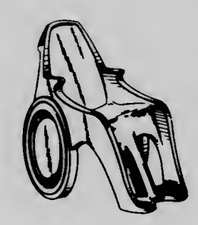
305,316
BABY CARRIAGE
Chin-Chung Lin, 265, Fu Hsing Rd., Shuh Lin Chen, Taipei Hsien, Taiwan
Filed Nov. 12, 1987, Ser. No. 121,757
Term of patent 14 years
U.S. Cl. D12—129



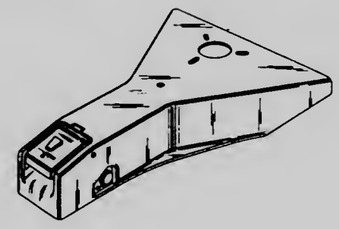
305,317
BABY CARRIAGE
Kenzou Kasai, Osaka, Japan, assignor to Aprica Kasai Kabushikikaisha, Osaka, Japan
Filed Dec. 31, 1987, Ser. No. 139,939
Claims priority, application Japan, Jul. 23, 1987, 62-29918
Term of patent 14 years
U.S. Cl. D12—129



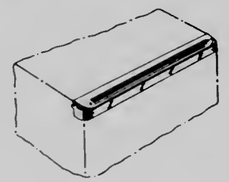
305,318
WHEELCHAIR
Benno Danecker, Grafing 11, D-8201 Haifing, Fed. Rep. of Germany
Filed Jul. 13, 1987, Ser. No. 72,576
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, MR III 1966
Term of patent 14 years
U.S. Cl. D12—131



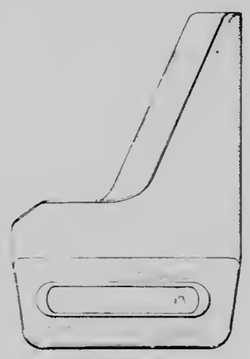
305,319
TRAILER COUPLER
Bernhardt P. Goettker, Escondido, Calif., assignor to Unique Functional Products, San Marcos, Calif.
Filed Aug. 6, 1987, Ser. No. 82,189
Term of patent 14 years
U.S. Cl. D12—162



305,320
FRONT CAP FOR A VAN-TYPE VEHICLE
Elton E. Mountz, R.D. #2, Box 199, Morgantown, Pa. 19543
Filed Jul. 22, 1987, Ser. No. 76,557
Term of patent 14 years
U.S. Cl. D12—181



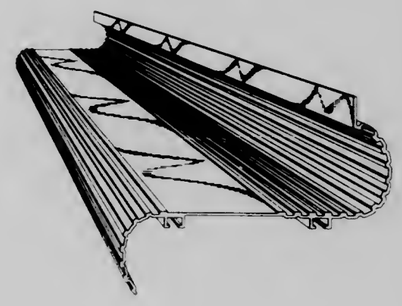
305,321
COMBINED AUTOMOBILE SPLASH GUARD AND DISPLAY DEVICE
Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.
Filed Dec. 23, 1987, Ser. No. 137,849
Term of patent 14 years
U.S. Cl. D12—185



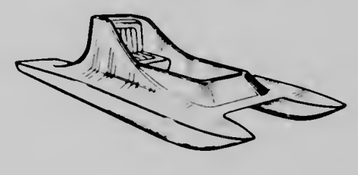
305,322
VEHICLE SPARE TIRE COVER
Richard E. Campbell, 622 S. 33rd St., South Bend, Ind.
Filed Mar. 19, 1987, Ser. No. 27,018
Term of patent 14 years
U.S. Cl. D12—202



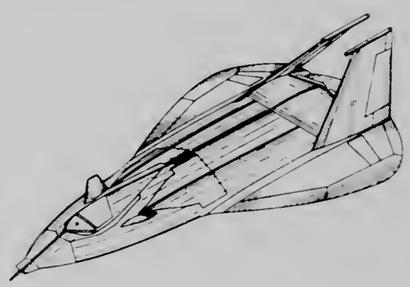
305,323
EXTENDED WIDE STEP RUNNING BOARD FOR VAN OR TRUCK
James E. Anderson, and Samuel R. Carlin, both of Sturgis, Mich., assignors to Oweas Products, Inc., Sturgis, Mich.
Filed Jun. 23, 1987, Ser. No. 65,522
Term of patent 14 years
U.S. Cl. D12—203



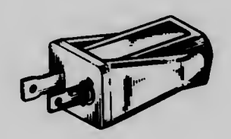
305,324
WATER CRAFT
Joe Mula, 711 Zanzibar Ct., San Diego, Calif. 92109
Filed Jul. 23, 1987, Ser. No. 76,660
Term of patent 14 years
U.S. Cl. D12—310



305,325
AIRPLANE
John J. Andrews, San Diego, Calif., assignor to The Testor Corporation, Rockford, Ill.
Filed Oct. 23, 1986, Ser. No. 922,565
Term of patent 14 years
U.S. Cl. D12—331



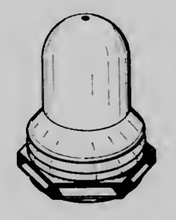
305,326
TWO-PRONG FUSED LINE CORD PLUG
Harold K. Clayton, Jr., Glen Ellyn, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Aug. 17, 1987, Ser. No. 86,111
Term of patent 14 years
U.S. Cl. D13—28



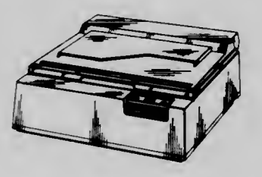
305,327
ENCLOSURE FOR CIRCUIT PROTECTION RELATED DEVICES
Larry J. Newmark, Avon, and David A. Hibbert, Tolland, both of Conn., assignors to General Electric Company, New York, N.Y.
Filed Sep. 10, 1986, Ser. No. 905,917
Term of patent 14 years
U.S. Cl. D13—35



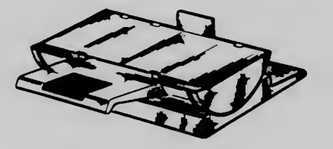
305,328
ARMORED SEAL FOR TOGGLE TYPE SWITCHES
Milton Morse, Fort Lee, N.J., assignor to Nesa Morse, Upper Saddle River, N.J.
Filed Sep. 22, 1986, Ser. No. 910,011
Term of patent 14 years
U.S. Cl. D13—37



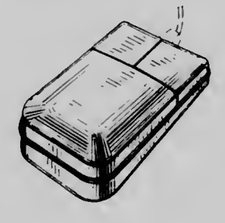
305,329
IMAGE SCANNER
Shin-ichi Hiroki, Tokyo, and Kunio Hara, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 28, 1988, Ser. No. 149,198
Claims priority, application Japan, Jul. 29, 1987, 62-30500
Term of patent 14 years
U.S. Cl. D14—107



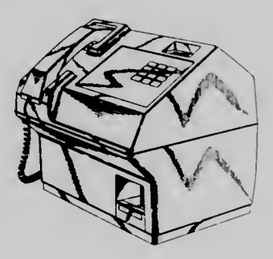
305,330
PERSONAL COMPUTER STAND
Charles F. Walters, II, and Stephen M. Myers, both of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Dec. 19, 1986, Ser. No. 944,597
Term of patent 14 years
U.S. Cl. D14—114

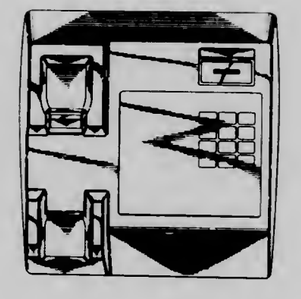


305,331
MOUSE FOR A COMPUTER
Hartmut Esslinger, Los Gatos, Calif., assignor to NeXT, Inc., Palo Alto, Calif.
Filed Jun. 30, 1988, Ser. No. 214,154
Term of patent 14 years
U.S. Cl. D14—114

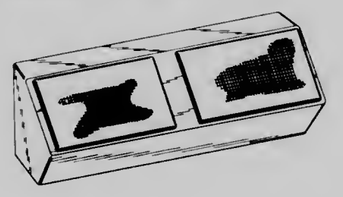


305,332
COIN TELEPHONE
Paul Schremmer, Balmain, and Andrew A. H. Crick, Chiswick, both of Australia, assignors to Standard Telephones and Cables Pty. Ltd., Alexandria, Australia
Filed Jan. 25, 1988, Ser. No. 147,739
Claims priority, application Australia, Jul. 29, 1987, 2669/87
Term of patent 14 years
U.S. Cl. D14—146





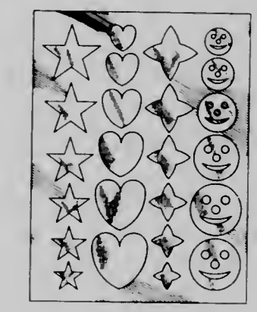
305,333
SPEAKER
Steven M. Irby, 1412 Eastern, Stillwater, Okla. 74074
Filed May 26, 1987, Ser. No. 54,170
Term of patent 14 years
U.S. Cl. D14—214



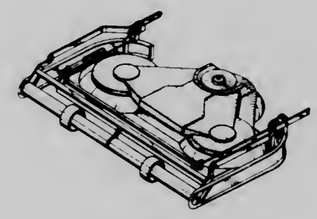
305,334
ANTENNA SHIELD
James M. Marr, 2304 Brown Deer Trail, Plano, Tex. 75023
Filed Mar. 20, 1986, Ser. No. 845,367
Term of patent 14 years
U.S. Cl. D14—230



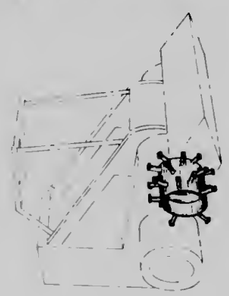
305,335
DECALCOMANIA SHEET
Scott E. Wood, and Elizabeth M. Wood, both of 7091 Ruth Way, Denver, Colo. 80221
Filed Jul. 6, 1988, Ser. No. 215,933
Term of patent 14 years
U.S. Cl. D20—11



305,336
LAWN MOWER HOUSING
Ake Berg; Sören Palmér, and Sören Johansson, all of Tranas, Sweden, assignors to Stiga AB, Tranas, Sweden
Filed Dec. 1, 1986, Ser. No. 936,555
Claims priority, application Sweden, May 30, 1986, 86-1322
Term of patent 14 years
U.S. Cl. D15—14



305,337
SOIL COMPACTOR WHEEL
Richard T. Plummer, Atlanta, Ga., assignor to Thunder Point Company, Atlanta, Ga.
Filed Aug. 13, 1986, Ser. No. 896,058
Term of patent 14 years
U.S. Cl. D15—28



305,338
STEERING WHEEL CONTROLLER
Ralph R. Baillie, Gibson City, Ill., assignor to Tri-R Innovations, Inc., Gibson City, Ill.
Filed Jun. 7, 1988, Ser. No. 203,758
Term of patent 14 years
U.S. Cl. D15—199



305,339
EYEGLASSES
Garry A. Reichert, 5626 Preston Oaks, #5B; Jay E. Teaney, 5565 Preston Oaks, #240, both of Dallas, Tex. 75240, and James F. Duggan, 3541 Pebble Beach, Dallas, Tex. 75234
Filed May 8, 1987, Ser. No. 47,925
Term of patent 14 years
U.S. Cl. D16—102



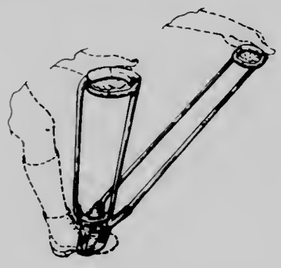
305,340
HOLDER FOR EYEGLASSES
Sylvia A. Stein, New York, N.Y., assignor to E & B Giftware, Inc., Mount Vernon, N.Y.
Filed Jan. 25, 1988, Ser. No. 147,764
Term of patent 14 years
U.S. Cl. D16—129



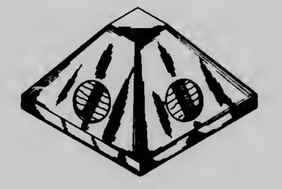
305,341
BALL POINT PEN
Robert W. Dolan, Sr., 1400 Lorain Rd., San Marino, Calif. 91108
Continuation-in-part of Ser. No. 425,006, Sep. 28, 1982, abandoned. This application Jul. 23, 1985, Ser. No. 757,531
Term of patent 14 years
U.S. Cl. D19—41



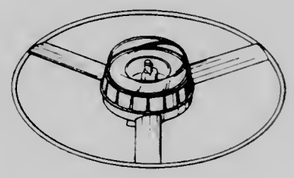
305,342
ELASTIC SLING MISSILE LAUNCHER TOY
Eric E. Magnusson, 803 E. Union St., Rockton, Ill. 61072
Filed Apr. 6, 1987, Ser. No. 36,691
Term of patent 14 years
U.S. Cl. D21—2



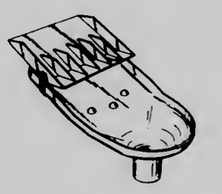
305,343
GAME BOARD
William A. Epperson, Rte. 1, Box 76-K, Keedysville, Md. 21756; Raymond P. Brodie, 916 - 9th Ave., New Brighton, Pa. 15066, and Deborah G. Epperson, Rte. 1, Box 76-K, Keedysville, Md. 21756
Filed Oct. 27, 1986, Ser. No. 923,257
Term of patent 14 years
U.S. Cl. D21—23



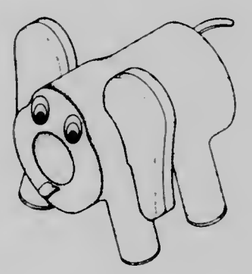
305,344
ROTARY FLYING TOY OR THE LIKE
Victor Stanzel, P.O. Box 28, Schulenburg, Tex. 78956
Filed Jul. 30, 1987, Ser. No. 79,508
Term of patent 14 years
U.S. Cl. D21—86



305,345
STARTING GATE MARBLE RACE TOY
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Jul. 1, 1988, Ser. No. 214,268
Term of patent 14 years
U.S. Cl. D21—143



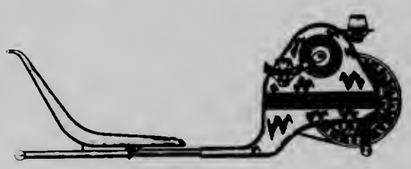
305,346
COMBINED ELEPHANT TOY FIGURE AND BOTTLE HOLDER
John R. Roberts, 2129 Ski Lodge, Montgomery, Ala. 36117
Filed Dec. 8, 1986, Ser. No. 939,016
Term of patent 14 years
U.S. Cl. D21—162



305,347
PHYSICAL EXERCISER
Steve Wittenbrock, Portland, Oreg., and Robert M. Greening, Jr., 655 SE. St. Andrews Dr., Portland, Oreg. 97202, assignors to Robert M. Greening, Jr., Portland, Oreg.
Filed Sep. 28, 1987, Ser. No. 101,558
Term of patent 14 years
U.S. Cl. D21—194



305,348
PEDAL EXERCISER
Margaret D. Schuring, Canton; Robert R. Schnabel, Jr., Navarre; Craig M. Saunders, Rocky River, and George R. Adamczyk, Chagrin Falls, all of Ohio, assignors to Consumer Direct, Inc., Canton, Ohio
Filed Jul. 6, 1988, Ser. No. 215,909
Term of patent 14 years
U.S. Cl. D21—194



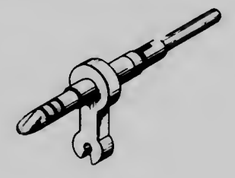
305,349
BODYSURFING BOARD
Dennis A. Shanelec, 1515 State St., Suite 1, Santa Barbara, Calif. 93101
Filed Sep. 21, 1987, Ser. No. 99,055
Term of patent 14 years
U.S. Cl. D21—228



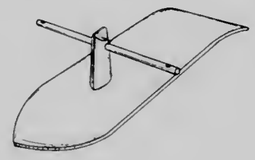
305,350
BOWIE KNIFE
Lynn C. Thompson, 987 Sand Piper Ct., Ventura, Calif. 93001
Filed Sep. 14, 1987, Ser. No. 95,994
Term of patent 14 years
U.S. Cl. D22—118



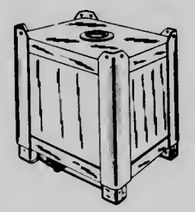
305,351
COMBINED LAMP, BATTERY, AND MOUNTING CLIP ASSEMBLY FOR ATTACHMENT ON A FISHING POLE TIP
Kenneth L. Mills, 825 Carroll Rd., Charleston, W. Va. 25315
Filed Jul. 11, 1986, Ser. No. 884,740
Term of patent 14 years
U.S. Cl. D22—134



305,352
DOWNRIGGER CONTROL BOARD
Gene L. Skille, Rte. 2, Box 2057, Hayward, Wis. 54843, assignor to Gene L. Skille, Hayward, Wis.
Filed Dec. 7, 1987, Ser. No. 129,094
Term of patent 14 years
U.S. Cl. D22—134



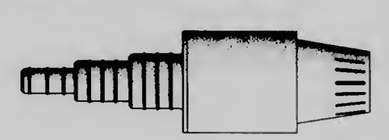
305,353
TANK
Larry D. Thomas, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.
Filed Jun. 24, 1988, Ser. No. 210,780
Term of patent 14 years
U.S. Cl. D23—202



305,354
NOZZLE EXTENSION
Ernesto I. Tejamo, 428 W. 8th St., Stockton, Calif. 95206
Filed Feb. 29, 1988, Ser. No. 161,614
Term of patent 14 years
U.S. Cl. D23—222



305,355
COMBINED FOOT VALVE AND STRAINER
James C. Bricker, Waynesville, Ohio, assignor to Hydro Systems Company, Cincinnati, Ohio
Filed Aug. 14, 1986, Ser. No. 896,240
Term of patent 14 years
U.S. Cl. D23—247



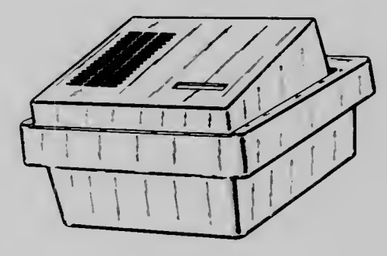
305,356
FAUCET HANDLE
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Aug. 7, 1987, Ser. No. 82,570
Claims priority, application Int'l Pat. Institute, Mar. 16, 1987, DM/008332
Term of patent 14 years
U.S. Cl. D23—250



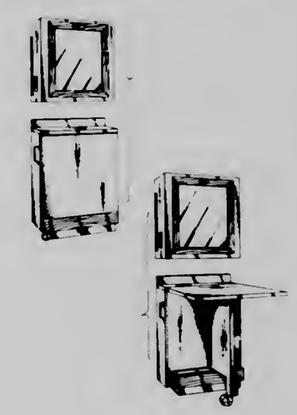
305,357
COMBINATION ADULT AND CHILD TOILET SEAT AND COVER
Thomas A. Ritzer, 172 N. Okoboji Grove Rd., Arnolds Park, Iowa 51331
Filed Aug. 21, 1987, Ser. No. 87,909
Term of patent 14 years
U.S. Cl. D23—311



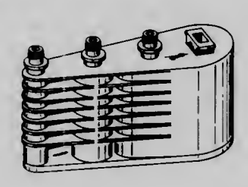
305,358
HUMIDIFIER
Robert Martinez, Stow, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Filed Oct. 22, 1987, Ser. No. 111,528
Term of patent 14 years
U.S. Cl. D23—356



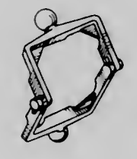
305,359
COMBINED EXAMINATION AND CONSULTATION STATION
Roderick G. McLean, Cazenovia, and Andrew K. Palmer, Fayetteville, both of N.Y., assignors to Ergo Designs, Inc., Cazenovia, N.Y.
Filed Apr. 27, 1987, Ser. No. 42,940
Term of patent 14 years
U.S. Cl. D24—3



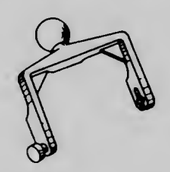
305,360
FLUID CARTRIDGE FOR AN AUTOMATED CLINICAL CHEMICAL ANALYZER
Harold F. Fechtner, Claremont, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jul. 11, 1986, Ser. No. 884,575
Term of patent 14 years
U.S. Cl. D24—8



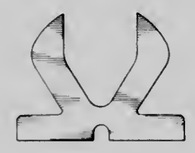
305,361
HINGED DENTAL ARTICULATOR WITH A BALL MOUNTING
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Jan. 28, 1987, Ser. No. 7,820
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—10



305,362
HINGED DENTAL ARTICULATOR ARM WITH A BALL MOUNTING
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Jan. 28, 1987, Ser. No. 7,821
Term of patent 14 years
U.S. Cl. D24—16



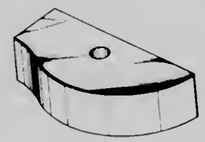
305,363
I. V. HOLDER
John S. Gentelia, Madison, and Alan B. Fink, Utica, both of N.Y., assignors to CoaMed Corporation, Utica, N.Y.
Filed Dec. 30, 1986, Ser. No. 962
Term of patent 14 years
U.S. Cl. D24—52



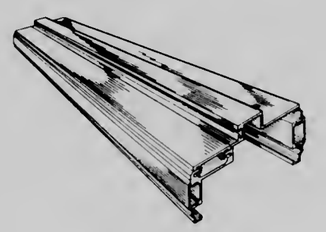
305,364
DECORATIVE GLASS PANEL
B. Jeremiah Shaffer, Worthington, Ohio, assignor to Pease Industries, Inc., Fairfield, Ohio
Filed Jul. 7, 1986, Ser. No. 882,819
Term of patent 14 years
U.S. Cl. D25—103



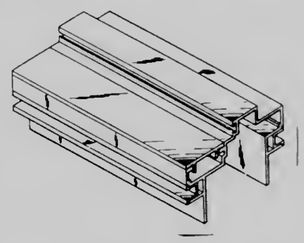
305,365
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 21, 1987, Ser. No. 42,575
Claims priority, application Japan, Oct. 21, 1986, 61-41454
Term of patent 14 years
U.S. Cl. D25—114



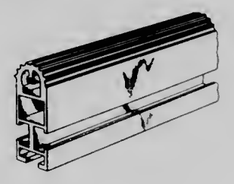
305,366
DOOR FRAME
Pat L. Ripley, Cedar Hill, Tex., assignor to Passport Technologies, Inc., Prosper, Tex.
Filed Apr. 27, 1987, Ser. No. 42,939
Term of patent 14 years
U.S. Cl. D25—119



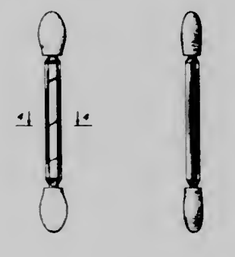
305,367
DOOR FRAME
Pat L. Ripley, Cedar Hill, Tex., assignor to Passport Technologies, Inc., Prosper, Tex.
Filed Nov. 2, 1987, Ser. No. 115,096
Term of patent 14 years
U.S. Cl. D25—119



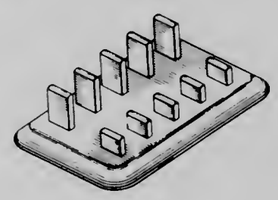
305,368
DECORATIVE EXTRUSION FOR DISPLAY PANELS OR SIMILAR ARTICLES
James E. Clark, Newark, N.J., assignor to Outwater Plastic/Industries, Inc., Wood-Ridge, N.J.
Filed Mar. 6, 1989, Ser. No. 319,641
Term of patent 14 years
U.S. Cl. D25—124



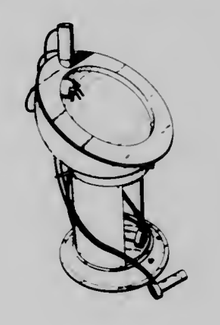
305,369
EYE SHADOW APPLICATOR
Ellen Gevin, Atlantic Highlands, N.J., assignor to L'Oreal, S.A., Paris, France
Filed Apr. 1, 1987, Ser. No. 33,484
Term of patent 14 years
U.S. Cl. D28—7



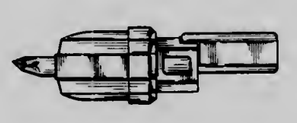
305,370
NAIL STAND
Terri A. Williams, 580 26th, Upland, Calif. 91786
Filed Feb. 17, 1987, Ser. No. 15,961
Term of patent 14 years
U.S. Cl. D28—61



305,371
SPRAY GUN CLEANING DEVICE
Leif E. Stern, Fattershus, S-225 90 Lund, Sweden
Filed Jul. 21, 1986, Ser. No. 887,433
Claims priority, application Sweden, Jan. 20, 1986, 1986-0115
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—1



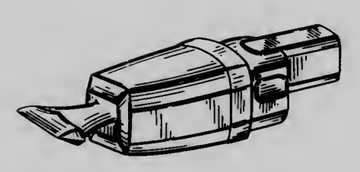
305,372
VACUUM CLEANER
William T. Y. Pang, Kowloon Bay, Hong Kong, assignor to Saple International Limited, Kowloon, Hong Kong
Filed Jun. 18, 1987, Ser. No. 63,518
Claims priority, application United Kingdom, Jan. 21, 1987, 1039424
Term of patent 14 years
U.S. Cl. D32—21



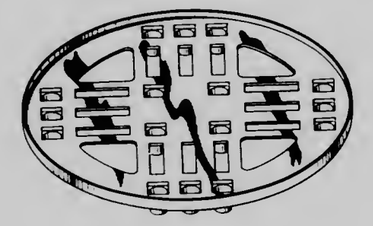
305,373
VACUUM CLEANER
Sachio Yamamoto, and Chikashi Kuriya, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 20, 1987, Ser. No. 40,236
Claims priority, application Japan, Oct. 20, 1986, 61-41611
Term of patent 14 years
U.S. Cl. D32—22







305,374
PALLET
Victor A. Sahm, Jr., 14910 Lake Forest Dr., Dallas, Tex. 75240
Filed Oct. 30, 1987, Ser. No. 114,376
Term of patent 14 years
U.S. Cl. D34—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF JANUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Smart, Allen A.; ; ; and , 4,890,439, Cl. 53-410.000.
Smart, Allen A.; ; ; and , 4,890,439, Cl. 53-410.000.
Smart, Allen A.; ; ; and , 4,890,439, Cl. 53-410.000.

A-Lok Products, Inc.: *See*—
Westhoff, James; and Kelly, James A., 4,890,863, Cl. 285-39.000.

A. O. Smith Corporation: *See*—
Pfeffer, John D., 4,890,762, Cl. 220-444.000.

A/S Hellesens: *See*—
Kummel, Karen; and Eiriksson, Bjorn, 4,891,048, Cl. 29-623.100.

Aalto, Erkki; Pellinen, Teuvo; and Eloranta, Jouko, to Halton Oy. Air distribution system. 4,890,544, Cl. 98-36.000.

AB Volvo Penta: *See*—
Brandt, Lennart, 4,891,025, Cl. 440-66.000.

Abbott Laboratories: *See*—
Anawis, Mark A.; and Lindberg, Roger E., 4,891,311, Cl. 435-7.000.
Schultz, Steven G., 4,891,125, Cl. 204-435.000.
Vcelka, John L., 4,891,134, Cl. 210-359.000.

Abdukarimov, Erkin T.: *See*—
Rasulev, Vadim A.; Khainov, Vladimir I.; and Abdukarimov, Erkin T., 4,891,486, Cl. 219-69.160.

Abe, Kunihiro: *See*—
Furuyama, Masaaki; and Abe Kunihiro, 4,890,592, Cl. 123-417.000.

Abe, Masaru; Kawai, Yoichi; Hoshino, Minoru; and Sekiguchi, Katsumi, to Mitsui Toatsu Chemicals, Incorporated. Production process of polyolefin resin composition containing inorganic filler. 4,891,392, Cl. 523-200.000.

Abe, Michiharu: *See*—
Oba, Hideaki; Sato, Tsutomu; Umehara, Masaakira; Ueda, Yutaka; Yamamuro, Tetsu; and Abe, Michiharu, 4,891,305, Cl. 430-495.000.

Abe, Yoshikazu: *See*—
Taguchi, Tatsuhisa; Abe, Yoshikazu; and Aburaya, Kiyoji, 4,890,986, Cl. 417-295.000.

Aburaya, Kiyoji: *See*—
Taguchi, Tatsuhisa; Abe, Yoshikazu; and Aburaya, Kiyoji, 4,890,986, Cl. 417-295.000.

Acculase, Inc.: *See*—
Levatter, Jeffrey I., 4,891,818, Cl. 372-57.000.

ACF Industries, Incorporated: *See*—
Dumser, Paul J., 4,890,646, Cl. 137-590.000.

Ackilli, Joseph A.; Saleeb, Fouad Z.; Morreale, Philip; and McKay, Rasdal P., to General Foods Corporation. Preparation of tricalcium phosphate. 4,891,198, Cl. 423-308.000.

Acumeter Laboratories, Inc.: *See*—
McIntyre, Frederic S., 4,891,249, Cl. 427-421.000.

Adams, Andrew D., to Eastman Kodak Company. Flexible formatting interface for pictorial data transfer. 4,891,709, Cl. 358-256.000.

Adler, David: *See*—
Ovshinsky, Stanford R.; and Adler, David, 4,891,074, Cl. 136-249.000.

Advanced Micro Devices, Inc.: *See*—
Chua, Hua-Thye, 4,891,683, Cl. 357-38.000.

Advantage Production Technology Inc.: *See*—
McNeilly, Michael A., 4,891,335, Cl. 437-247.000.

AeroChem Research Laboratories, Inc.: *See*—
Calcote, Hartwell F.; and Felder, William, 4,891,339, Cl. 501-87.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Labrot, Maxime; Pineau, Didier; and Feuillerat, Jean, 4,891,490, Cl. 219-121.520.

AFA Products Inc.: *See*—
Martin, Douglas S.; and Maas, Joseph W. J., 4,890,792, Cl. 239-343.000.

Afflerbaugh, Martin G.; and Knox, George J., to Minnesota Mining and Manufacturing Company. Solderless electrical connector. 4,891,018, Cl. 439-402.000.

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Sakamoto, Michiru; Kitahara, Akira; Ueno, Hidetoshi; and Nagata, Sumio, 4,891,182, Cl. 419-2.000.
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Ahad, Elie, to Canada, Her Majesty the Queen in right of, as repesented by the Minister of National Defence of Her Majesty's Canadian Government. Direct conversion of epichlorohydrin to glycidyl azide polymer. 4,891,438, Cl. 552-11.000.

Ahlgren, Frederic F.; Davenport, John M.; Hanaler, Richard L.; and Karikas, John J., to General Electric Company. Metal vapor discharge lamps. 4,891,555, Cl. 313-634.000.

Ahnsorge, Harald: *See*—
Gross, Wolfgang; Mueller, Manfred; Ahnsorge, Harald; and Zott, Andrea, 4,891,150, Cl. 252-142.000.

Ahresty Corporation: *See*—
Doi, Hachiro, 4,890,448, Cl. 56-255.000.

Air Products and Chemicals, Inc.: *See*—
Ambegaonkar, Anil S.; and Howells, Roger A., 4,891,223, Cl. 424-408.000.

Air-Shields, Inc.: *See*—
Ganguly, Dipankar; and Sanders, Gary B., 4,890,624, Cl. 128-661.070.

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Kano, Takenori; Kobayashi, Koji; Sumiya, Koji; Kubo, Seitoku; and Watanabe, Kazuaki, 4,890,512, Cl. 74-740.000.

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Veith, Peter E., 4,891,610, Cl. 331-96.000.

Akimoto, Osamu: *See*—
Daimon, Takashi; Sakamoto, Hideshi; and Akimoto, Osamu, 4,891,264, Cl. 428-246.000.

Akimoto, Toshio: *See*—
Shibaoka, Kazuo; Miwa, Takao; Akimoto, Toshio; and Eto, Noriaki, 4,891,055, Cl. 65-106.000.

Akita, Shigeyuki: *See*—
Matsumoto, Muneaki; Numata, Koji; Akita, Shigeyuki; Nishida, Minoru; and Masegi, Mitsuhiko, 4,891,559, Cl. 315-82.000.

Akkawi, Jean-Sony, to Comite Economique Agricole De La Production Du Chanvre, a part interest. Process for biochemical retting of phloem-fiber plants. 4,891,096, Cl. 162-1.000.

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Sleigh, Thomas; Savage, David S.; and Taylor, Robert, 4,891,366, Cl. 514-176.000.

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Renjilian, Armen; and Davenport, Francis L., 4,891,098, Cl. 162-198.000.

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Maini, Brij B., 4,890,482, Cl. 73-55.000.

Albery, Wyndham J.; Coombs, Anthony J. M.; Drummond, Humphrey J. J.; and Hahn, Clive, to National Research Development Corporation. Method of determining carbon dioxide in the presence of oxygen. 4,891,102, Cl. 204-1.00T.

Albrecht, Richard W., Jr.: *See*—
Cornmeier, Robert J.; Schlechtweg, Ronald E.; Albrecht, Richard W., Jr.; and Dry, Dennis P., 4,890,981, Cl. 416-220.00R.

Albright, Donald W.; and Miller, Raymond J., to MDT Corporation. Unplumbed sterilizer. 4,891,188, Cl. 422-114.000.

Alcatel N.V.: *See*—
Walker, Michael; and Kohler, Gunter, 4,891,837, Cl. 379-390.000.

Alcazar, David G.: *See*—
Birring, Anmol S.; Alcazar, David G.; Hendrix, Gary J.; and Hanley, John J., 4,890,496, Cl. 73-597.000.

Alcide Corporation: *See*—
Kross, Robert D.; and Zamojcin, Carol A., 4,891,216, Cl. 424-78.000.

Alcott, Charles: *See*—
Camloh, William J.; and Alcott, Charles, 4,890,371, Cl. 29-33.00P.

Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, to BASF Aktiengesellschaft. Photopolymerizable recording materials, photoresist layers and lithographic printing plates based theron, and novel 4-quinazolone compounds. 4,891,301, Cl. 430-281.000.

Alderson, Richard K.; Siester, Ronald D.; and Talley, James R. Infusion pump system and conduit therefor. 4,890,984, Cl. 417-234.000.

Aldrich, Allyn M.: *See*—
Ames, John E.; Krandel, Bruce A.; and Aldrich, Allyn M., 4,890,979, Cl. 416-46.000.

Alexandru, Lupu: *See*—
Sacripante, Guerino; and Alexandru, Lupu, 4,891,293, Cl. 430-109.000.

Alfieri, Mario: *See*—
Re, Alberto; and Alfieri, Mario, 4,891,417, Cl. 528-112.000.

Alfred Teves GmbH: *See*—
Drott, Peter, 4,890,859, Cl. 280-714.000.

Allegheny Ludlum Corporation: *See*—
Bollinger, Lawrence A.; and Tarhay, Mark A., 4,891,489, Cl. 219-121.480.

Allen, Matthew D.: *See*—
Rzasa, Peter W.; Allen, Matthew D.; Neuschaefer, Carl H.; Kowles, Joseph E.; Williams, Thomas D.; and Glazer, Frank, 4,891,767, Cl. 364-513.000.

Allen, Thomas E.; Scalf, Matt C.; and Lampe, John G., to Armstrong World Industries, Inc. Wooden drawer guide. 4,890,938, Cl. 384-21.000.

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Kane, John P., 4,890,717, Cl. 198-403.000.

Allied Gear & Machine Company: *See*—
Arter, James B.; Parsons, Daniel A.; Serra, Thomas M.; and Thomas, Bruce L., 4,890,945, Cl. 403-2.000.

Allied-Signal Inc.: *See*—
Jordan, David D., 4,890,456, Cl. 60-585.000.
Kotliar, Abraham M.; Boyle, William J., Jr.; Tang, Reginald T.; Mares, Frank; Patel, Kundanbhai M.; and Chiu, Tin-Ho, 4,891,263, Cl. 428-225.000.

Allison, Blaine M., to Lumelite Corporation. Child-resistant moisture-proof container. 4,890,742, Cl. 206-540.000.

Alppi, Hannu: *See*—
Kokkonen, Kari; Lethimaki, Martti; Tuominiemi, Seppo; and Alppi, Hannu, 4,891,170, Cl. 261-116.000.

Alps Electric Co., Ltd.: *See*—
Nakajima, Mikio; and Makino, Akihiro, 4,891,079, Cl. 148-307.000.
Okita, Masao; Sugawara, Tadami; and Yoshida, Hiroshi, 4,891,513, Cl. 250-239.000.

Aluminum Company of America: *See*—
Scanga, Theodore P.; Kiley, Matthew P.; Metz, Robert J.; and Schultz, Fred R., 4,890,759, Cl. 220-273.000.
Zaidi, Mohammad A.; and Vivola, Leo A., 4,891,261, Cl. 428-220.000.

AM International, Inc.: *See*—
Gibson, George A., 4,891,286, Cl. 430-38.000.

Amada Company, Limited: *See*—
Kimura, Masao, 4,891,814, Cl. 372-35.000.
Takahashi, Hideaki; Wakahara, Takashi; and Harashima, Yasuhiro, 4,890,476, Cl. 72-456.000.

Amano, Nobutaka: *See*—
Ooe, Kimio; Amano, Nobutaka; Kubo, Takashige; and Moriwaki, Kaoru, 4,891,773, Cl. 364-578.000.

Amano, Shintetsu; and Mizuhata, Yoshinori, to Metalaser Pty. Limited. Neon tube lighting device. 4,891,561, Cl. 315-223.000.

Ambegaonkar, Anil S.; and Howells, Roger A., to Air Products and Chemicals, Inc. Controlled release delivery coating formulation for bioactive substances. 4,891,223, Cl. 424-408.000.

Amerace Corporation: *See*—
Luzzi, Glenn J.; and Cole, James E., 4,891,016, Cl. 439-183.000.

American Combustion, Inc.: *See*—
Gitman, Gregory M., 4,890,562, Cl. 110-236.000.

American Cyanamid: *See*—
Schaefer, Frederic C., 4,891,441, Cl. 560-339.000.

American Cyanamid Company: *See*—
Watson, Roger J.; Wen, John H.; and Enquist, Lynn W., 4,891,315, Cl. 435-69.300.

American Telephone and Telegraph Company: *See*—
Huang, Alan; Knauer, Scott C.; O'Neill, Jay H.; Rutledge, Charles W.; Lin, Sheng L.; Ransom, Maurice N.; and Spanke, Ronald A., 4,891,803, Cl. 370-60.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Bowman, Wayne C.; Nitz, William A.; and Ziese, Norman G., 4,891,746, Cl. 363-131.000.
Holden, Clarence A., Jr.; and Law, Henry H., 4,891,480, Cl. 200-262.000.
Readisk, Douglas O., 4,891,840, Cl. 381-29.000.
Valdmanis, Janis A., 4,891,580, Cl. 324-96.000.

Amca, John E.; Krandel, Bruce A.; and Aldrich, Allyn M., to Sundstrand Corporation. No-back apparatus for propeller pitch control. 4,890,979, Cl. 416-46.000.

Amith, Avraham; Naselli, Charles; and Nevin, C. Scott, to ITT Corporation. Transmission method to determine and control the temperature of wafers or thin layers with special application to semiconductors. 4,890,933, Cl. 374-121.000.

Amoco Corporation: *See*—
Clendinning, Robert A.; Harris, James E.; Kelsey, Donald R.; Matzner, Markus; Robeson, Lloyd M.; Winslow, Paul A.; and Maresca, Louis M., 4,891,167, Cl. 560-52.000.
McMahon, Patrick E., 4,891,462, Cl. 585-411.000.
Newman-Evans, Richard H., 4,891,408, Cl. 525-113.000.
Sikkenga, David L., 4,891,467, Cl. 585-467.000.
Voyt, Walter F., 4,891,136, Cl. 210-605.000.

AMP Incorporated: *See*—
Chandler, Curtis S.; and Marsh, Edward K., 4,891,022, Cl. 439-610.000.
Hayes, Earl J.; and VanDerStuyf, Allen F., 4,891,021, Cl. 439-599.000.
Kuhn, Brent A.; and Yurko, Garold M., 4,891,017, Cl. 439-380.000.
Olson, Billy E., 4,891,019, Cl. 439-404.000.
Shaffer, Howard R., 4,890,384, Cl. 29-863.000.

Ampex Corporation: *See*—
Sayers, Richard C., 4,890,747, Cl. 211-106.000.

AMSTED Industries Inc.: *See*—
Kaplan, Vladimir; and Harrison, Richard H., Jr., 4,891,169, Cl. 261-30.000.

Analog Devices, Incorporated: *See*—
Holloway, Peter R., 4,891,533, Cl. 307-303.000.
Lewis, Stephen R.; and Lefton, Scott A., 4,891,645, Cl. 341-154.000.

Anami, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Discharge circuit for a semiconductor memory including address transition detectors. 4,891,793, Cl. 365-204.000.

Anawis, Mark A.; and Lindberg, Roger E., to Abbott Laboratories. Stabilized enzyme conjugate composition. 4,891,311, Cl. 435-7.000.

Andersen, Robert D., to Datatape Incorporated. Autocalibration of a data signal channel through simultaneous control signals. 4,891,716, Cl. 360-31.000.

Andersen, Robert D., to Datatape Incorporated. Fast closure method for a data signal channel. 4,891,719, Cl. 360-65.000.

Andersen, Roger K., to Baroid Technology, Inc. Rotary shear seal hydraulic valve. 4,890,645, Cl. 137-625.660.

Anderson, Charles B.; and Kenrick, C. Robert, to C-System Incorporated. Insulated duct end system. 4,890,864, Cl. 285-121.000.

Anderson, Daniel F.: *See*—
Pinkham, Raymond; and Anderson, Daniel F., 4,891,795, Cl. 365-230.030.

Anderson, Leslie A.; Selby, Eric J.; Wagner, David L.; and Walter, Alfred E., Jr., to Boeing Company, The. Apparatus for use in assembling electrical connectors. 4,890,382, Cl. 29-833.000.

Anderson, Robert S. Disposal receptacle for used, sharp, medical instruments or other biohazards. 4,890,733, Cl. 206-365.000.

Ando, Hitoshi: *See*—
Kashiwazaki, Takashi; and Ando, Hitoshi, 4,891,760, Cl. 364-443.000.

Andrae, Franz. Device to shield against an electromagnetic field. 4,891,468, Cl. 174-35.0MS.

Andre, Michel: *See*—
Calmettes, Lionel; and Andre, Michel, 4,890,360, Cl. 24-20.00R.

Andreas Stihl: *See*—
Fischer, Hartmut, 4,890,595, Cl. 123-556.000.

Andrejasich, Raymond J.; Slocum, Laurence S.; and Muasmann, Sara M., to Emhart Industries, Inc. Differential pressure level sensor with temperature sensing elements. 4,890,492, Cl. 73-292.000.

Angelastro, Michael R.; and Blohm, Thomas R., to Merrell Dow Pharmaceuticals Inc. 17β-(cyclopropyloxy)androst-5-en-3β-ol and related compounds useful as $C_{17\text{-}20}$ lyase inhibitors. 4,891,367, Cl. 514-178.000.

Angelucci, Francesco; Gigli, Mauro; and Penco, Sergio, to Farmitalia Carlo Erba S.r.l. 6-amino anthracyclines, process for their preparation and use thereof. 4,891,360, Cl. 514-34.000.

Anglovaal Ltd.: *See*—
Overbeek, Gerhardus; Williams, John K.; and Heanley, Charles P., 4,891,060, Cl. 75-10.190.

Annen, Klaus: *See*—
Wiechert, Rudolf; Beier, Sybille; Elger, Walter; Annen, Klaus; Nickisch, Klaus; and Laurent, Henry, 4,891,365, Cl. 514-173.000.

Aoki, Katsuyuki: *See*—
Matsuda, Kenji; Okada, Tetsuji; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,890,545, Cl. 98-39.100.

Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Color separation optical system which utilizes glass frit for bonding. 4,890,899, Cl. 350-173.000.

Aoshima, Shinichiro; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Voltage detector. 4,891,579, Cl. 324-96.000.

Aphton Corporation: *See*—
Karr, Stephen L., Jr.; Benjamini, Elizer; Scibienski, Robert J.; and Grimes, Stephen, 4,891,219, Cl. 424-85.800.

Arai, Akira: *See*—
Iwai, Kazumi; Arai, Akira; Koizumi, Hiromi; and Wada, Katsuo, 4,890,453, Cl. 60-39.465.

Arai, Masatoshi: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,891,434, Cl. 549-215.000.

Araki, Kazuhiro, to Minolta Camera Kabushiki Kaisha. Temperature control device for heat-roll fusing apparatus. 4,891,495, Cl. 219-216.000.

ARCO Chemical Technology, Inc.: *See*—
Gastinger, Robert G.; and Hayes, John E., 4,891,395, Cl. 523-456.000.
McCready, Russell J., 4,891,405, Cl. 525-64.000.
Sullivan, Carl J., 4,891,101, Cl. 203-36.000.

Arenda, Albert: *See*—
Brown, Gaylord W.; and Arenda, Albert, 4,890,524, Cl. 83-615.000.

Aritaka, Akitoshi; and Komaki, Norio, to Matsushita Electric Industrial Co., Ltd. Data terminal device. 4,891,783, Cl. 364-900.000.

Ariyoshi, Hisashi: *See*—
Fukuda, Susumu; Ariyoshi, Hisashi; and Kasanami, Toru, 4,890,370, Cl. 29-25.350.

Armstrong, Richard R. Beverage dispenser lock. 4,890,769, Cl. 222-153.000.

Armstrong World Industries, Inc.: *See*—
Allen, Thomas E.; Scalf, Matt C.; and Lampe, John G., 4,890,938, Cl. 384-21.000.

Arndt, Friedrich: *See*—
Nordhoff, Erhard; Franke, Wilfried; and Arndt, Friedrich, 4,891,428, Cl. 546-278.000.

Arp, Robert A., to Mentor Corporation. Tubing connector. 4,890,866, Cl. 285-243.000.

Arretz, Emmanuel, to Societe Nationale Elf Aquitaine (Production). Synthesis of tertiary mercaptans from isobutylene homopolymers. 4,891,445, Cl. 568-72.000.

Arrowsmith, John E.; and Cross, Peter E., to Pfizer Inc. Antiarrhythmic agents, compositions and method of use therefor. 4,891,372, Cl. 514-213.000.

Arter, James B.; Parsons, Daniel A.; Serra, Thomas M.; and Thomas, Bruce L., to Allied Gear & Machine Company. Rotary die cylinder bearer attachment. 4,890,945, Cl. 403-2.000.

Asada, Masaaki: *See*—
Kitano, Seiichi; and Asada, Masaaki, 4,890,708, Cl. 192-70.300.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nakamae, Kenji; and Shima, Tsukasa, 4,891,262, Cl. 428-224.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ito, Takayuki, 4,890,904, Cl. 350-427.000.

Asakawa, Kenichi: *See*—
Higuchi, Seijun; Asakawa, Kenichi; Ohmori, Takayuki; Umeno, Koji; Okada, Nobuyoshi; Fujinaga, Minoru; Yamamoto, Fumio; and Yabe, Katsuhiko, 4,891,274, Cl. 428-653.000.

Asanuma, Masato, to Sharp Kabushiki Kaisha. Developer density detection device. 4,891,675, Cl. 355-246.000.

ASARCO Incorporated: *See*—
Clement, Thomas P., II; Wettlaufer, John R.; and Scott, Jack A., 4,891,061, Cl. 75-24.000.

Asari, Masatoshi; Konishi, Ikuo; Fujita, Hiroyuki; Hirakimoto, Akira; and Nakanishi, Hiroaki, to Shimadzu Corporation. Radio frequency multipole linear accelerator. 4,891,601, Cl. 328-233.000.

Asars, Juris A., to Westinghouse Electric Corp. Synchronous detection and location of insulation defects. 4,891,597, Cl. 324-557.000.

Asbeck, Adolf: *See*—
Tetmann, Holger; Hempel, Hans U.; Mueller, Heinz; Gruenert, Margarete; and Asbeck, Adolf, 4,891,154, Cl. 252-321.000.

Ash, Kevin J.; Derenburger, Jack H.; and Parsons, Raymond L., to International Business Machines Corporation. Efficient address test for large memories. 4,891,811, Cl. 371-21.200.

Ashbrook-Simon-Hartley Corporation: *See*—
Hering, C. J., Jr., 4,891,142, Cl. 210-792.000.

Ashe, Bunnie M.: *See*—
Zimmerman, Morris; Ashe, Bunnie M.; and Doherty, James B., 4,891,370, Cl. 514-201.000.

Asher, Amram. System for detecting removal of items from a hotel minibar and for the automatic charging of the bill of the gas for item removed from the minibar. 4,891,755, Cl. 364-406.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,891,416, Cl. 528-85.000.

Ashtiani-Zarandi, Mansour; Tishbi, Youssef; and Welch, Jeffrey A., to General Motors Corporation. Energy absorption system for vehicle door and method of making. 4,890,877, Cl. 296-146.000.

ASM Fico Tooling B.V.: *See*—
Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,890,725, Cl. 198-774.000.

Asrar, Jawed, to Monsanto Company. Cyclopentane diester vinylene polymers. 4,891,413, Cl. 526-269.000.

Asrar, Jawed, to Monsanto Company. Cyclopentane diol vinylene polymers. 4,891,414, Cl. 526-269.000.

AT&T Bell Laboratories: *See*—
Huang, Alan; Knauer, Scott C.; O'Neill, Jay H.; Rutledge, Charles W.; Lin, Sheng L.; Ransom, Maurice N.; and Spanke, Ronald A., 4,891,803, Cl. 370-60.000.

AT&T Technologies, Inc.: *See*—
Paulus, Frank S., Jr.; and Tuah-Poku, Isaac, 4,891,843, Cl. 381-191.000.

Atherton, Russel P.: *See*—
Jones, David; Atherton, Russel P.; and McDowall, Mark A., 4,891,515, Cl. 250-288.000.

Athletic Training Equipment Company: *See*—
Ponza, Lorenzo J., 4,890,834, Cl. 273-26.00R.

Atlantic Richfield Company: *See*—
Gard, Michael F.; and Kyle, Donald G., 4,891,641, Cl. 340-857.000.

Ausimont S.r.l.: *See*—
Ciaccia, Vittorio, 4,891,272, Cl. 428-489.000.
Re, Alberto; and Alfieri, Mario, 4,891,417, Cl. 528-112.000.

Ausnit, Steven; and Tilman, Paul, to Minigrip, Inc. Leak resistant zipper. 4,890,935, Cl. 383-59.000.

Aust, Steven D.; Bumpus, John A.; and Tien, Ming, to Utah State University Foundation. Methods for the degradation of environmentally persistent organic compounds using white rot fungi. 4,891,320, Cl. 435-262.000.

Austin, Buddy J.: *See*—
Johnson, Chris; Keefover, Larry; and Austin, Buddy J., 4,890,813, Cl. 248-680.000.

Austin, Thomas H.; and Primeaux, Dudley J., II, to Texaco Inc. Strand coating method. 4,891,086, Cl. 156-296.000.

Austoft Industries Limited: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Yates, Graham G., 4,890,399, Cl. 37-86.000.

Auto-Fab, Inc.: *See*—
Drysdale, James P.; and Landrith, L. David, 4,891,176, Cl. 264-250.000.

Automatic Liquid Packaging, Inc.: *See*—
Weiler, Gerhard H.; and Komendowski, Henry, 4,891,171, Cl. 261-124.000.

Automatic Spring Coiling Co.: *See*—
Heyser, William M., 4,891,033, Cl. 464-68.000.

Automobiles Citroen: *See*—
Grand, Jean-Pierre, 4,890,819, Cl. 266-78.000.
Pajot, Jean-Claude, 4,891,012, Cl. 439-34.000.

Automobiles Peugeot: *See*—
Grand, Jean-Pierre, 4,890,819, Cl. 266-78.000.
Pajot, Jean-Claude, 4,891,012, Cl. 439-34.000.

Autos, John P.: *See*—
Osboad, Paul C.; Whatmore, Roger W.; and Autos, John P., 4,890,494, Cl. 73-338.000.

Auvray, Gerard, to Thomson-CSF. Method and a device for reducing the power of jamming signals received by the secondary lobes of a random frequency radar antenna. 4,891,647, Cl. 342-16.000.

Avante Sport: *See*—
Farris, Mark S.; and Harrison, Michael A., 4,890,507, Cl. 74-594.600.

Avar, Lajos; and Bohnke, Helmut, to Sandoz Ltd. New benztriazolyl compounds. 4,891,396, Cl. 524-91.000.

Avard, Louis H.; and Mason, Harry L., to Duralmetallic Corporation. Bellows seal with vibration damper. 4,890,851, Cl. 277-89.000.

Ayers, Thomas G.: *See*—
Wagner, Todd M.; James, Hardin T., Jr.; Ayers, Thomas G.; Breese, Dennis B.; and Durand, Gordon A., 4,890,547, Cl. 98-42.130.

Ayotte, Erik. Adjustable frame for puzzles. 4,890,839, Cl. 273-157.00R.

Azimi, Hossein. Grinding machine. 4,890,420, Cl. 51-122.000.

B. F. Goodrich Company, The: *See*—
Janda, Dennis J., 4,891,387, Cl. 521-54.000.
Megginson, George W.; Redenbarger, Philip D.; and First, David H., 4,890,699, Cl. 188-18.00A.

Baba, Hiroyuki; and Matsuzaki, Takashi, to Kabushiki Kaisha Toshiba. Semiconductor device and manufacturing method thereof. 4,891,333, Cl. 437-173.000.

Baba, Mitsuhiro, to Kabushiki Kaisha Toshiba. Voltage superposing circuit for an electronic tuner. 4,891,708, Cl. 358-195.100.

Baba, Noboru: *See*—
Tanaka, Akira; Shimada, Satoshi; Yamada, Kazuji; Nakagawa, Yusaku; Nishihara, Motohisa; Miyoshi, Tadahiko; Baba, Noboru; Kagohara, Hiromi; and Inamura, Ichiro, 4,891,831, Cl. 378-125.000.

Baba, Tatsuro, to Kabushiki Kaisha Toshiba. Still image color sequential photographic apparatus. 4,891,691, Cl. 358-75.000.

Babcock & Wilcox Company, The: *See*—
Belin, Felix; and Walker, David J., 4,891,052, Cl. 55-429.000.
Reed, Stuart E., 4,891,511, Cl. 250-227.000.

Bachmann, William V. Wing apparatus for skiers. 4,890,861, Cl. 280-810.000.

Bagley, David A., to Texas Instruments Incorporated. Lightly-doped drain transistor structure in contactless DRAM cell with buried source/drain. 4,891,747, Cl. 357-23.600.

Baier & Koppel GmbH & Co.: *See*—
Skarupa, Gunter, 4,890,696, Cl. 184-7.400.

Baig, Khalig F.: *See*—
Chechile, Robert A.; Cherbettchian, Agop H.; Spry, Sampson, III; and Baig, Khalig F., 4,890,812, Cl. 248-674.000.

Baker, David. Anechoic ear piece. 4,890,688, Cl. 181-136.000.

Baker, Malcolm J.: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Yates, Graham G., 4,890,399, Cl. 37-86.000.

Baker, Richard; and Nguyen, Tuan, to Sundstrand Corporation. Brake or clutch assembly. 4,890,702, Cl. 188-264.00D.

Ballard, Gary W.; and Dempsey, Daniel J., to Carrier Corporation. Control of energy use in a furnace. 4,891,004, Cl. 431-6.000.

Balsells, Joan C.: *See*—
Balsells, Peter J., 4,890,937, Cl. 384-16.000.

Balsells, Peter J., to Balsells, Peter J.; and Balsells, Joan C. Spring-loaded bearing. 4,890,937, Cl. 384-16.000.

Balter, Valentin, to Huntington Mechanical Laboratories, Inc. Device for axially and angularly positioning a beam or the like in a sealed chamber. 4,891,516, Cl. 250-310.000.

Baltschun, Horst, to Maschinenfabrik Lauffer GmbH & Co. KG. Prestressed hydraulic press. 4,890,475, Cl. 72-455.000.

Bamberg, William L; and Cordero, Keith P., to Wolfram, Inc. Lead metallizing process to avoid seal oxidation. 4,891,553, Cl. 313-623.000.

Bampton, Clifford C., to Rockwell International Corporation. Method for diffusion bonding aluminum. 4,890,784, Cl. 228-194.000.

Banis, David S.: *See*—
Downing, Ross O.; and Banis, David S., 4,890,727, Cl. 204-224.00R.

Bank, Harvey L.: *See*—
McNally, Robert T.; Heacox, Albert; Brockbank, Kelvin G. M.; and Bank, Harvey L., 4,890,457, Cl. 62-65.000.

Barcelo, Gerard; Castro, Bertrand; Jaouadi, Mahmoud; Martinez, Jean; Senet, Jean-Pierre; and Senayey, Gerard, to Societe Internationale Des Poudres et Explosifs. Process for synthesizing active esters of carboxylic acids, new alpha-halogenated carbonates which are useful for this synthesis and the method of producing them. 4,891,430, Cl. 548-259.000.

Barlow, William J. Arrow rest. 4,890,596, Cl. 124-41.00A.

Barmag, AG: *See*—
Leak, Erich; and Stitz, Albert, 4,890,800, Cl. 242-47.010.

Barnes, Peter H., to Shell Oil Company. Process for solids-fluid separation employing swirl flow. 4,891,129, Cl. 208-161.000.

Barnett, Robert B.: *See*—
Kelly, Eugene M.; and Barnett, Robert B., 4,890,565, Cl. 114-72.000.

Barnette, Luverne H.: *See*—
Bowden, William L.; DeMuth, David L.; and Barnette, Luverne H., 4,891,283, Cl. 429-194.000.

Barney, Kevin S.: *See*—
Moore, Wayne R., Jr.; and Barney, Kevin S., 4,890,421, Cl. 51-165.00R.

Baroid Technology, Inc.: *See*—
Andersen, Roger K., 4,890,645, Cl. 137-625.660.
Barot, Harry A.: *See*—
Carter, Larry A.; and Barot, Harry A., 4,890,847, Cl. 273-406.000.
Barry, Ronald E., Jr.: *See*—
Fresnola, Alfred A.; and Barry, Ronald E., Jr., 4,890,415, Cl. 43-61.000.
Bartlett, Robert R.: *See*—
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,891,374, Cl. 514-222.800.
Bartlo, Allen M.: *See*—
Duryee, George; and Bartlo, Allen M., 4,890,753, Cl. 215-231.000.
Bartman, Gerrit E.; Hatta, Nicodemus; Lindhout, Willem J.; and Trommelen, Sebastiaan F. M., to U.S. Philips Corp. Method of manufacturing biconvex lens elements and element formed thereby. 4,891,053, Cl. 65-64.000.
Baseghi, Behshad; and Lowenschuss, Oscar, to Raytheon Company. Discrete coherent chirp generator. 4,891,778, Cl. 364-721.000.
BASF Aktiengesellschaft: *See*—
Alday, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, 4,891,301, Cl. 430-281.000.
Broastert, Klaus; Wagner, Daniel; and Schuch, Horst, 4,891,410, Cl. 525-314.000.
Halbritter, Klaus; and Eggersdorfer, Manfred, 4,891,435, Cl. 549-313.000.
Hitzfeld, Michael; Grau, Werner; and Hack, Joachim, 4,891,114, Cl. 204-192.150.
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,891,451, Cl. 568-691.000.
Martin, Wolfgang K.; Ryffel, James R.; Schuster, Hans H.; and Wen, Chih-Peng, 4,891,420, Cl. 528-315.000.
BASF K&F Corporation: *See*—
Eilerman, Robert; Christenson, Philip; Yurecko, John, Jr.; and Zebovitz, Thomas, 4,891,447, Cl. 568-496.000.
Battelle Development Corporation: *See*—
Diamond, Sidney; and Patel, Aspi N., 4,891,059, Cl. 75-0.50R.
Battelle Memorial Institute: *See*—
Lessor, Delbert L.; and Robertus, Robert J., 4,890,667, Cl. 165-1.000.
Bauer, Klaus: *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Burstell, Helmut; Bauer, Klaus; and Bieringer, Hermann, 4,891,057, Cl. 71-72.000.
Baujat, Vincent, to Etat Francais. Process and device for narrow-gap welding. 4,891,494, Cl. 219-137.800.
Baum, Joachim: *See*—
Czech, Gunther; and Baum, Joachim, 4,890,356, Cl. 16-228.000.
Bavelloni, Franco, to Z. Bavelloni S.P.A. Supporting head particularly for machining plates of glass, marble or the like of any size. 4,890,423, Cl. 51-235.000.
Baxter, Bill V. Polished rod liner puller assembly. 4,890,671, Cl. 166-250.000.
Bayer Aktiengesellschaft: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; and Brunner, Helmut, 4,891,425, Cl. 536-22.000.
Schossler, Willi, 4,891,156, Cl. 252-364.000.
Schwabe, Peter; Voigt, Reiner; and Schlak, Ottfried, 4,891,400, Cl. 524-745.000.
Bays, F. Barry: *See*—
Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, 4,890,615, Cl. 606-146.000.
BBC Brown Boveri AG: *See*—
Fuglistaller, Cornel; Keller, Jakob; and Sattelmayer, Thomas, 4,890,793, Cl. 239-427.000.
Beach, John R.; Hasan, Syed R.; Noren, Donald W.; Hindman, Craig A.; and Senti, Ernest S., to Illinois Tool Works Inc. Stackable roofing washer. 4,890,968, Cl. 411-531.000.
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Byvik, Charles E.; and Buonchristiani, A. Martin, to United States of America, National Aeronautics and Space Administration. Method and apparatus for determining optical absorption and emission characteristics of a crystal or non-crystalline fiber. 4,890,915, Cl. 356-73.000.
C. Itoh Fuel Co., Ltd.: *See—*
Sezaki, Mutsuo; and Nishimura, Kinji, 4,891,834, Cl. 379-67.000.
C. R. Bard, Inc.: *See—*
Cook, William; Herman, Jack; Rowe, Donald; and Sylvanowicz, John, 4,890,623, Cl. 128-642.000.
C. R. & I., Inc.: *See—*
Hathaway, Richard C., 4,890,703, Cl. 188-300.000.
C & S Distributing Co.: *See—*
Burlison, Barry, 4,890,767, Cl. 222-78.000.
C-System Incorporated: *See—*
Anderson, Charles B.; and Kenrick, C. Robert, 4,890,864, Cl. 285-121.000.
Cad/Cam Tooling, Inc.: *See—*
Powel, Stephen S.; and Darby, Robert J., 4,890,743, Cl. 206-595.000.
Caduff, Edward A. Robotic ultrasonic cleaning and spraying device for ships' hulls. 4,890,567, Cl. 114-222.000.
Cahill, John M., to Dwyer Instruments, Inc. Differential pressure gauge transmitter. 4,890,497, Cl. 73-708.000.
Calafell, Dag O., II; and Kakabaker, Kenneth G., to Durametallic Corporation. Bearing protector with slinger ring. 4,890,941, Cl. 384-480.000.
Calcote, Hartwell F.; and Felder, William, to AeroChem Research Laboratories, Inc. Process and apparatus for the flame preparation of ceramic powders. 4,891,339, Cl. 501-87.000.
Caledonian Mining Co. Ltd.: *See—*
Mason, Benjamin, 4,890,676, Cl. 166-380.000.
Calhoon, William R. Bowling ball. 4,890,835, Cl. 273-63.00E.
Call, Duane B.; Mudrow, Alfred; Johnson, Randall C.; and Bennion, Robert F., to Floating Point Systems, Inc. Massively parallel vector processing computer. 4,891,751, Cl. 364-200.000.
Calmar, Inc.: *See—*
Corsette, Douglas F., 4,890,773, Cl. 222-380.000.
Calmettes, Lionel; and Andre, Michel, to Etablissements Caillau. Band clamp with tightening elements formed separately. 4,890,360, Cl. 24-20.00R.
CALP Corporation: *See—*
Ohkawa, Hideo; Chikushi, Masakuni; Nakamura, Hironori; Funayama, Shinji; Hashimoto, Takashi; and Hirai, Takahiro, 4,891,399, Cl. 523-200.000.
Cameron, Harold A.: *See—*
Sutter, Leroy V., Jr.; Cameron, Harold A.; and Davison, Michael R., 4,891,819, Cl. 372-82.000.
Camloh Industries, Inc.: *See—*
Camloh, William J.; and Alcott, Charles, 4,890,371, Cl. 29-33.00P.
Camloh, William J.; and Alcott, Charles, to Camloh Industries, Inc. Pallet changer for machining center. 4,890,371, Cl. 29-33.00P.

Campbell, John W., to Hewlett-Packard Company. Precision infrared position detector apparatus for touch screen system. 4,891,508, Cl. 250-221.000.
Canada, Her Majesty the Queen in right of, as repesented by the Minister of National Defence of Her Majesty's Canadian Government: *See—*
Ahad, Elie, 4,891,438, Cl. 552-11.000.
Canadian Patents and Development Limited/Societe Canadienne Des Brevets Et D'Exploitation Limitee: *See—*
Elias, Lorne; and Lawrence, Andre H., 4,890,502, Cl. 73-864.850.
Canino, Serafino S. Drywall utility knife. 4,890,387, Cl. 7-118.000.
Cannon, Fleming V., Jr.: *See—*
Nekola, Randy A.; and Cannon, Fleming V., Jr., 4,890,972, Cl. 414-563.000.
Canon Kabushiki Kaisha: *See—*
Hasegawa, Shizuo; and Matsuoka, Nobuo, 4,891,690, Cl. 358-75.000.
Hirose, Ryusho, 4,891,663, Cl. 355-53.000.
Ina, Kenzoh; Ishizawa, Yasuhisa; and Kuo, Hideo, 4,891,634, Cl. 340-723.000.
Mizutani, Morikazu, 4,891,665, Cl. 355-75.000.
Nakamura, Yasuo, 4,891,639, Cl. 340-825.500.
Nakayama, Tadayoshi; and Sato, Chikara, 4,891,702, Cl. 358-140.000.
Outa, Kenichi, 4,891,692, Cl. 358-75.000.
Sato, Tadashi; and Taniishi, Shinnosuke, 4,891,652, Cl. 346-76.0PH.
Suzuki, Koji, 4,891,572, Cl. 323-284.000.
Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takashi; Kameyama, Makoto; and Niizuma, Kiyozumi, 4,890,378, Cl. 29-603.000.
Takagi, Masafumi, 4,891,672, Cl. 355-245.000.
Tasaki, Shigemitsu, 4,891,769, Cl. 364-519.000.
Cantoni, Angelo, to Ital Idee s.r.l., An Italian Limited Liability Company. Absorption-type refrigeration system with thermal energy recovery, particularly for vehicles provided with an internal combustion engine. 4,890,463, Cl. 62-238.300.
Capek, Raymond G.; Dougherty, Lawrence W.; and Kraner, James L., to Zenith Electronics Corporation. Front assembly for a tension mask color cathode ray tube having a pre-sized mask support structure. 4,891,544, Cl. 313-402.000.
Capek, Raymond G.; and Danielson, David B., to Zenith Electronics Corporation. Faceplate front assembly with improved tension mask support structure. 4,891,545, Cl. 313-407.000.
Carboloy Inc.: *See—*
Keritsis, George, 4,890,963, Cl. 408-59.000.
Carl Edelmann Verpackungstechnik: *See—*
Heuberger, Erich; Knorrich, Wolf-Dieter; and Dziallas, Joachim W., 4,890,772, Cl. 222-156.000.
Carl, Hans-Georg; and Beuchler, Roland, to Montanwerke Walter GmbH. Lathe tool equipped with reversible plates for cutting grooves or threads. 4,890,961, Cl. 407-105.000.
Carlson, Karl, to Garrison & Stratton. Foot activated musical drum pedal device. 4,890,532, Cl. 84-422.100.
Carlson, Norman A.; and Evers, Glenn R., to Du Pont de Nemours, E. I., and Company. Chlorosulfonic acid composition. 4,891,196, Cl. 423-269.000.
Carmillet, Roger; and Lassiaz, Philippe, to Valeo. Clutch control system for an automobile vehicle, and a clutch release bearing therefor. 4,890,711, Cl. 192-98.000.
Carnes Company, Inc.: *See—*
Wagner, Todd M.; James, Hardin T., Jr.; Ayers, Thomas G.; Breese, Dennis B.; and Durand, Gordon A., 4,890,547, Cl. 98-42.130.
Carpenter Technology Corporation: *See—*
Del Corso, Gregory J.; Martin, James W.; and Strobel, David L., 4,891,080, Cl. 148-326.000.
Carr, Robin A. E.; and Powell, Lyn, to Imperial Chemical Industries PLC. Process for intermediates for insecticidal compounds. 4,891,450, Cl. 568-649.000.
Carrier Corporation: *See—*
Ballard, Gary W.; and Dempsey, Daniel J., 4,891,004, Cl. 431-6.000.
Clark, William E., 4,890,666, Cl. 165-16.000.
Zohler, Steven R., 4,890,669, Cl. 165-133.000.
Carrigan, Erwin R.; Johnson, Harold R., III; and Phillips, Allyn E., to Emerson Electric Co. Hetical gearsets. 4,890,504, Cl. 74-458.000.
Carroll, Philip C. Photograph holding greeting card. 4,890,402, Cl. 40-159.000.
Cartee, Larry A.; and Barot, Harry A., to Detroit Armor Corporation. Target retrieval system. 4,890,847, Cl. 273-406.000.
Carter, Don E.; and Hsu, Yung C., to Monsanto Company. Incrustation resistive crystallizer employing multifrequency vibrations. 4,891,190, Cl. 422-251.000.
Carter, Don E.; Hsu, Yung C.; and Tang, Jason J., to Monsanto Company. High efficiency column crystallizer. 4,891,191, Cl. 422-254.000.
Carter-Hoffman Corporation: *See—*
Fortmann, Robert C.; and Pinnow, Curtis C., 4,891,498, Cl. 219-401.000.
Carter, Ralph E. Portable igniter for fireplace logs. 4,891,005, Cl. 431-343.000.
Carver, Robert G., to Coburn, Iec. Collapsible display carrier and method of making. 4,890,738, Cl. 206-434.000.
Cascade Microtech, Inc.: *See—*
Gleason, K. Reed; Jones, Keith E.; and Strid, Eric W., 4,891,612, Cl. 333-33.000.
Case, Steven K.; Keil, Robert E.; and Jalkio, Jeffrey A., to CyberOptica Corporation. Point and line range sensors. 4,891,772, Cl. 364-562.000.
Casey, Everett R. Readily attachable auxiliary wide angle outside rearview mirror. 4,890,908, Cl. 350-606.000.
Casio Computer Co., Ltd.: *See—*
Kuroki, Yasuo; and Suga, Fusao, 4,891,776, Cl. 364-705.070.
Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, to Concept, Inc. Arthroscopic suturing instrument. 4,890,615, Cl. 606-146.000.
Castec, Inc.: *See—*
Cooper, David, 4,890,354, Cl. 16-87.00R.
Castro, Bertrand: *See—*
Barcelo, Gerard; Castro, Bertrand; Jaouadi, Mahmoud; Martinez, Jean; Senet, Jean-Pierre; and Sennyey, Gerard, 4,891,430, Cl. 548-259.000.
Catalysts & Chemicals Industries, Co., Ltd.: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamanchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.
Caterpillar Inc.: *See—*
Debuisson, Michael; Jose, Joseph A.; and Rigo, Marcel, 4,890,723, Cl. 198-716.000.
Haslett, Glenn M., 4,890,892, Cl. 305-25.000.
Morris, Leslie C.; and Riediger, Craig W., 4,890,695, Cl. 184-6.300.
Cattell, John P.: *See—*
Kite, Joseph S., III; Conaghan, Thomas B., III; Cattell, John P.; and Develin, Richard B., 4,891,256, Cl. 428-36.100.
Cemcom Corporation: *See—*
Bright, Randall P.; Wise, Sean; and MacKenzie, Mark L., 4,891,071, Cl. 106-90.000.
Centre National de la Recherche Scientifique, Elf France: *See—*
Fajula, Francois; Figueras, Francois; Moudafi, Latifa; Vera Pacheco, Mercedes; Nicolas, Serge; Dufresne, Pierre; and Gueguen, Claude, 4,891,200, Cl. 423-328.000.
Century Wrecker Corporation: *See—*
Nekola, Randy A.; and Cannon, Fleming V., Jr., 4,890,972, Cl. 414-563.000.
Ceramatec, Inc.: *See—*
Cutler, Raymond A.; and Virkar, Anil, 4,891,341, Cl. 501-89.000.
Cerex Corporation: *See—*
Colvin, Arthur E., Jr., 4,891,133, Cl. 210-198.200.
Cernansky, Joseph: *See—*
Rudell, Elliot; Foster, George; and Cernansky, Joseph, 4,890,838, Cl. 273-138.00R.
Ceskoslovenska akademie ved: *See—*
Sulc, Jiri; and Krcova, Zuzana, 4,890,911, Cl. 351-160.00H.
Cestind - Centro Studi Industriali - S.R.L.: *See—*
Romagnoli, Andrea, 4,890,440, Cl. 53-456.000.
Chambers, Laura J.: *See—*
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., 4,891,231, Cl. 426-52.000.
Chandler, Curtis S.; and Marsh, Edward K., to AMP Incorporated. Shielded data connector. 4,891,022, Cl. 439-610.000.
Chang, David, to King Phoenix Co., Ltd. Computer graphic drawing apparatus with coarse and fine controls. 4,891,632, Cl. 340-710.000.
Changle, Joseph F.: *See—*
Beatty, William E., Jr.; Kapples, Lawrence J.; Gula, Lance; and Changle, Joseph F., 4,891,617, Cl. 335-46.000.
Chapman, Gerald C. Tow mechanism for vehicles. 4,890,852, Cl. 280-402.000.
Charmilles Technologies SA: *See—*
Schnellmann, Danielle, 4,891,162, Cl. 252-570.000.
Charmilles Technologies S.A.: *See—*
Briffod, Jean-Paul, 4,891,485, Cl. 219-69.150.
Chase, Daniel F.: *See—*
Frison, Emmett C.; and Chase, Daniel F., 4,890,973, Cl. 414-607.000.
Chassaigne, Georges; and Saffores, Jean R., to Societe Nationale Industrielle Aerospatiale. Simulator for an installation for locating and guiding an aerial body in motion and installation of this type provided with such a simulator. 4,891,010, Cl. 434-2.000.
Chauve, Lionel. Board game having master course and regional games. 4,890,843, Cl. 273-246.000.
Chechile, Robert A.; Cherbettchian, Agop H.; Spry, Sampson, III; and Baig, Khalig F., to Litton Systems, Inc. Temperature compensated mount for supporting a ring laser gyro. 4,890,812, Cl. 248-674.000.
Chen, Loren: *See—*
Gray, Robert L.; Peterson, David; Chen, Loren; and van Buskirk, Gregory, 4,891,147, Cl. 252-104.000.
Cheng, Bruce C. H. Insulating tubeless transformer. 4,891,620, Cl. 336-198.000.
Cherbettchian, Agop H.: *See—*
Chechile, Robert A.; Cherbettchian, Agop H.; Spry, Sampson, III; and Baig, Khalig F., 4,890,812, Cl. 248-674.000.
Cherne Medical, Inc.: *See—*
Kroll, Mark W.; Olson, Kenneth M.; and Flynn, Patrick S., 4,890,630, Cl. 128-901.000.
Chernyai, Alexandr I.: *See—*
Shishkin, Viktor V.; Samuliev, Jury D.; Shapovalov, Jury P.; Sushkov, Yaroslav P.; Panchenko, Valery P.; Lukin, Evgeny G.; Chernyai, Alexandr I.; and Kryazhevskikh, Nikolai F., 4,891,115, Cl. 204-212.000.
Chevron Research Company: *See—*
Stemke, Jeffrey E., 4,891,146, Cl. 252-55.000.
Chikushi, Masakuni: *See—*
Ohkawa, Hideo; Chikushi, Masakuni; Nakamura, Hironori; Funayama, Shinji; Hashimoto, Takashi; and Hirai, Takahiro, 4,891,399, Cl. 523-200.000.

Chin, Albert K.: *See—*
Monfort, Michelle Y.; Chin, Albert K.; and Mollenauer, Kenneth H., 4,890,611, Cl. 606-159.000.
Ching-ho, Chen. Muffler. 4,890,691, Cl. 181-264.000.
Chisso Corporation: *See—*
Daimon, Takashi; Sakamoto, Hideshi; and Akimoto, Osamu, 4,891,264, Cl. 428-246.000.
Chiste', Rolando: *See—*
Makovec, Francesco; Chiste', Rolando; Peris, Walter; and Rovati, Luigi, 4,891,381, Cl. 514-119.000.
Makovec, Francesco; Chiste, Rolando; Peris, Walter; and Rovati, Luigi, 4,891,383, Cl. 514-443.000.
Chiu, Tin-Ho: *See—*
Kotliar, Abraham M.; Boyle, William J., Jr.; Tang, Reginald T.; Mares, Frank; Patel, Kundanbhai M.; and Chiu, Tin-Ho, 4,891,263, Cl. 428-225.000.
Cho, Michio: *See—*
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.
Cho, Thomas B., to Du Pont de Nemours, E. I., and Company. Photographic film antistatic backing layer with auxiliary layer having improved properties. 4,891,308, Cl. 430-527.000.
Choh, Nobuo: *See—*
Morimoto, Akira; Noguchi, Noriyoshi; and Choh, Nobuo, 4,891,427, Cl. 540-216.000.
Chonan, Kanroku; Koyama, Kazuyuki; and Hagiwara, Masahiro, to Ebara Corporation. Method of separating and transferring ion-exchange resin. 4,891,138, Cl. 210-675.000.
Chopin, Thierry; Garreau, Francois; Knipper, Magali; Nortier, Patrice; and Schuppiser, Jean-Luc, to Rhone-Poulenc Chimie. Catalyst supports and process for their preparation. 4,891,350, Cl. 502-439.000.
Chotiros, Nicholas P. Method and apparatus for tracking, mapping and recognition of spatial patterns. 4,891,762, Cl. 364-456.000.
Chouard, Claude-Henri: *See—*
Weber, Jean-Luc M.; Bloch, Serge; Noack, Jean-Claude; Chouard, Claude-Henri; and MacLeod, Patrick, 4,890,618, Cl. 128-420.600.
Christensen, Ronald J.; and Steimel, Lyle H., to DuBois Chemicals, Inc. Oxygen scavenger for boiler water and method of use. 4,891,141, Cl. 210-750.000.
Christenson, Philip: *See—*
Eilerman, Robert; Christenson, Philip; Yurecko, John, Jr.; and Zebovitz, Thomas, 4,891,447, Cl. 568-496.000.
Christian, Stephen R.: *See—*
Wiersing, Jeffrey K.; and Christian, Stephen R., 4,891,475, Cl. 200-5.00R.
Chrysler Motors Corporation: *See—*
Corwin, John M., 4,891,183, Cl. 420-435.000.
Mikolajczak, Christopher, 4,891,735, Cl. 361-419.000.
Chu, Cynthia T-W., to Mobil Oil Corporation. Aromatization of aliphatics over a zeolite containing framework gallium. 4,891,463, Cl. 585-415.000.
Chu, Wei-Kan: *See—*
Reisman, Arnold; and Chu, Wei-Kan, 4,891,329, Cl. 437-61.000.
Chua, Hua-Thye, to Advanced Micro Devices, Inc. Integrated SCR current sourcing sinking device. 4,891,683, Cl. 357-38.000.
Chugai Seiyaku Kabushiki Kaisha: *See—*
Kubodera, Noboru; Miyamoto, Katsuhito; Ochi, Kiyoshige; Matsunaga, Isao; and Murayama, Eigoro, 4,891,364, Cl. 514-167.000.
Chun, Jung-Hoon: *See—*
Sanchez-Caldera, Luis E.; Lee, Arthur K.; Suh, Nam P.; and Chun, Jung-Hoon, 4,890,662, Cl. 164-46.000.
Chung, Kenneth: *See—*
Gordon, Harry W.; and Chung, Kenneth, 4,891,213, Cl. 424-61.000.
Church & Dwight Co., Inc.: *See—*
Winston, Anthony E., 4,891,211, Cl. 424-52.000.
Chwaliez, Krzysztof; Beier, Sybille; Esch, Angelika; and Elger, Walter, to Schering Aktiengesellschaft. Use of antigestagens for softening the nonpregnant cervix. 4,891,368, Cl. 514-179.000.
Ciaccia, Vittorio, to Ausimont S.r.l. Waterproofing membranes based on bitumen. 4,891,272, Cl. 428-489.000.
Ciarlo, Dino R., to United States of America, Energy. (110) Oriented silicon wafer latch accelerometer and process for forming the same. 4,891,255, Cl. 428-131.000.
CIBA-GEIGY Corporation: *See—*
Guglielmetti, Leonardo; Meyer, Hans R.; Reinehr, Dieter; and Weber, Kurt, 4,891,153, Cl. 252-301.220.
Kaschig, Jurgen, 4,891,412, Cl. 526-265.000.
Kristinsson, Odd, 4,891,362, Cl. 514-90.000.
Seltzer, Raymond; and Winter, Roland A. E., 4,891,424, Cl. 534-649.000.
Szczepanski, Henry, 4,891,443, Cl. 564-103.000.
Cima, Richard M., to Lockheed Missiles & Space Company, Inc. Wick assembly for self-regulated fluid management in a pumped two-phase heat transfer system. 4,890,668, Cl. 165-104.250.
Cincinnati Milacron, Inc.: *See—*
Wiesmann, Siegfried R., 4,890,726, Cl. 198-803.120.
Cislo, Daniel M. Lockbox and carrying case for pistols. 4,890,466, Cl. 70-63.000.
Claassen, Wilhelmus A. P.: *See—*
Bloem, Jan; and Claassen, Wilhelmus A. P., 4,891,332, Cl. 437-165.000.
Claiborne, C. Clair; Kurz, Robert A.; Pearce, Henry A., Jr.; and Sheppard, Harry R., to Westinghouse Electric Corp. Gas-in-oil monitoring apparatus and method. 4,890,478, Cl. 73-19.000.
Clark, Jack E., II; Lee, Jeffrey C.; and Doyle, Brent R., to Harris Corporation. Photocurrent compensation using active devices. 4,891,606, Cl. 330-288.000.
Clark, William C. Splash suppressor. 4,890,339, Cl. 4-300.300.
Clark, William E., to Carrier Corporation. Method for controlling an air distribution system using ΔT. 4,890,666, Cl. 165-16.000.
Clausing, Gerhard: *See—*
Meerkatz, Joachim; and Clausing, Gerhard, 4,890,441, Cl. 53-456.000.
Cleary, Thomas P.: *See—*
Gosciniak, Donald J.; Cleary, Thomas P.; and Phalangas, Charlambos J., 4,891,212, Cl. 424-59.000.
Clement, Thomas P., II; Wettlaufer, John R.; and Scott, Jack A., to ASARCO Incorporated. Process for treating speiss. 4,891,061, Cl. 75-24.000.
Clendinning, Robert A.; Harris, James E.; Kelsey, Donald R.; Matzner, Markus; Robeson, Lloyd M.; Winslow, Paul A.; and Maresca, Louis M., to Amoco Corporation. Block polymers containing a poly(aryl ether ketone) and methods for their production. 4,891,167, Cl. 560-52.000.
Clifford, Arthur L.: *See—*
Dong, Dennis F.; and Clifford, Arthur L., 4,891,107, Cl. 204-296.000.
Clorox Company, The: *See—*
Gray, Robert L.; Peterson, David; Chen, Loren; and van Buskirk, Gregory, 4,891,147, Cl. 252-104.000.
Cloud, Eugene H.: *See—*
Hush, Glen E.; Mailloux, Jeffrey S.; and Cloud, Eugene H., 4,891,794, Cl. 365-189.040.
Coats Viyella Medical Limited: *See—*
Mitchell, David, 4,891,044, Cl. 604-27.000.
Coburn, Inc.: *See—*
Carver, Robert G., 4,890,738, Cl. 206-434.000.
Coca Cola Company: *See—*
Heuberger, Erich; Knorrich, Wolf-Dieter; and Dziallas, Joachim W., 4,890,772, Cl. 222-156.000.
Poore, John W., 4,890,774, Cl. 222-640.000.
Smazik, Kenneth G.; and Schroeder, Alfred A., 4,890,642, Cl. 137-614.030.
Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., 4,890,651, Cl. 141-1.000.
Cogsdill Tool Products, Inc.: *See—*
Westerman, William J.; Depperman, Warren B.; and Smith, Philip G., Jr., 4,890,473, Cl. 72-402.000.
Cohen, Murray S.; and Dunkel, Morris, to Epolin, Inc. Process for preparing bis-methylene spiroorthocarbonate. 4,891,436, Cl. 549-335.000.
Coherent Communication Systems Corp.: *See—*
Williams, Arthur B., 4,891,808, Cl. 370-112.000.
Colamussi, Arturo, to Vortex Systems S.r.l. High-capacity physical and/or chemical treatment apparatus in an automatic product production plant. 4,890,718, Cl. 198-465.300.
Cole, James E.: *See—*
Luzzi, Glenn J.; and Cole, James E., 4,891,016, Cl. 439-183.000.
Cole, Paul C.: *See—*
Tsao, Thomas K.; and Cole, Paul C., 4,890,412, Cl. 43-42.240.
Cole, Paul D., to General DataComm Inc. Channel encoder for generating rotationally invariant trellis codes. 4,891,823, Cl. 375-25.000.
Colgan, John R.: *See—*
Staehlin, John H.; and Colgan, John R., 4,891,651, Cl. 343-853.000.
Colgate-Palmolive Company: *See—*
Ouhadi, Trazollah; Dehan, Louis; and Fellen, Lucie, 4,891,148, Cl. 252-99.000.
Collier, Doris B. Reciprocating knife apparatus 4,890,386, Cl. 30-136.000.
Collins, John M.: *See—*
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,890,561, Cl. 108-137.000.
Colmon, Daniel: *See—*
Bravet, Jean L.; Colmon, Daniel; Daude, Gerard; and Moncheaux, Michel J., 4,891,271, Cl. 428-423.100.
Colonias, Karen W., to Simpson Strong-Tie Company, Inc. Multiple wood truss connection. 4,890,436, Cl. 52-643.000.
Colorocs Corporation: *See—*
Davis, David R.; and Slayton, Danny L., 4,891,676, Cl. 355-271.000.
Columbia Gas Service System Corporation: *See—*
Hemsath, Klaus H., 4,891,008, Cl. 432-148.000.
Colvin, Arthur E., Jr., to Cerex Corporation. Chromatography apparatus. 4,891,133, Cl. 210-198.200.
Combustion Engineering, Inc.: *See—*
Niziolek, James M.; and Sutton, James P., III, 4,890,920, Cl. 356-336.000.
Rzasa, Peter W.; Allen, Matthew D.; Neuschaefer, Carl H.; Kowles, Joseph E.; Williams, Thomas D.; and Glazer, Frank, 4,891,767, Cl. 364-513.000.
Comerford, John, to Eaton Corporation. Switch contact blade. 4,891,481, Cl. 200-409.000.
Comite Economique Agricole De La Production Du Chanvre: *See—*
Akkawi, Jean-Sony, 4,891,096, Cl. 162-1.000.

Compagnie de Signaux et d'Equipements Electroniques: *See—*
Pradat, Philippe J., 4,891,742, Cl. 363-39.000.
Compagnie Francaise De Mokta: *See—*
Beutier, Didier; and Le Quesne, Yves, 4,891,193, Cl. 423-54.000.
Compagnie Francaise d'Electrothemie Industrielle (CFEI): *See—*
Lafore, Dominique; Redoutey, Joel; and Servet, Yves, 4,891,745, Cl. 363-98.000.
Compaq Computer Corporation: *See—*
Brown, Alan E., 4,891,740, Cl. 363-21.000.
Computerized Security Systems, Inc.: *See—*
Miron, William L., 4,890,870, Cl. 292-333.000.
Conaghan, Thomas B., III: *See—*
Kite, Joseph S., III; Conaghan, Thomas B., III; Cattell, John P.; and Develin, Richard B., 4,891,256, Cl. 428-36.100.
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Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, 4,890,615, Cl. 606-146.000.
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Gailus, Walter J., 4,890,758, Cl. 220-270.000.
Cook, Graham D. System for assisting the learning of a subject. 4,891,011, Cl. 434-157.000.
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Cook, William; Herman, Jack; Rowe, Donald; and Sylvanowicz, John, to C. R. Bard, Inc. Biopotential sensing device and method for making. 4,890,623, Cl. 128-642.000.
Coombs, Anthony J. M.: *See—*
Albery, Wyndham J.; Coombs, Anthony J. M.; Drummond, Humphrey J. J.; and Hahn, Clive, 4,891,102, Cl. 204-1.00T.
Coon, Darryl D.; and Elliott, John P., to Microtronics Associates, Inc. Modular multi-element high energy particle detector. 4,891,522, Cl. 250-370.100.
Cooper, Christopher, to Guardine Disposable Limited. Waste bag. 4,890,936, Cl. 383-109.000.
Cooper, David, to Castec, Inc. Window shade lock device. 4,890,354, Cl. 16-87.00R.
Cooper, Glenn D.; Detinko, Felix M.; Singh, Gurdev; and Levino, Andre J., to Westinghouse Electric Corp. Generator core support system. 4,891,540, Cl. 310-254.000.
Cooper, John, to Imperial Chemical Industries PLC. Multi-component grouting system. 4,891,072, Cl. 106-90.000.
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Oosterhuis, Nicolaas M. G.; and Koerts, Kees, 4,891,318, Cl. 435-104.000.
CooperVision, Inc.: *See—*
Wittmann, Joseph W.; and Evans, John M., 4,891,046, Cl. 8-507.000.
Corbeels, Roger J.: *See—*
dePaz, Enrique F.; Corbeels, Roger J.; and Sengenberger, Charles G., 4,891,157, Cl. 252-373.000.
Corbett, James J.: *See—*
Futch, John E.; and Corbett, James J., 4,890,417, Cl. 47-58.000.
Cordero, Keith P.: *See—*
Bamberg, William I.; and Cordero, Keith P., 4,891,553, Cl. 313-623.000.
Corning Incorporated: *See—*
Prassas, Michel, 4,891,336, Cl. 501-13.000.
Corsette, Douglas F., to Calmar, Inc. Viscous product dispenser. 4,890,773, Cl. 222-380.000.
Corsmeier, Robert J.; Schlechtweg, Ronald E.; Albrecht, Richard W., Jr.; and Dry, Dennis P., to General Electric Company. Boltless rotor blade retainer. 4,890,981, Cl. 416-220.00R.
Corwin, John M., to Chrysler Motors Corporation. Method of preparing alloy compositions. 4,891,183, Cl. 420-435.000.
Cosenza, Frank J.: *See—*
Lindley, Adrian Q.; and Cosenza, Frank J., 4,890,964, Cl. 411-270.000.
Cotreau, Gerald M., to Harris Corporation. High speed low input current voltage follower stage. 4,891,604, Cl. 330-252.000.
Cottenceau, Remi; and Zurcher, Erwin, to Meadan S.p.A. Method for loosening and unravelling a textile yarn. 4,890,451, Cl. 57-22.000.
Cousins, Michael A.; and Lee, June, to Bristol-Myers Company. Container and delivery system for stick compositions. 4,890,944, Cl. 401-98.000.
Cox, James E. Dipole accelerating means and method. 4,891,600, Cl. 328-233.000.
Craig, Richard D. Barbell exercising device. 4,890,831, Cl. 272-123.000.
Crandall, Robert P.: *See—*
Fiske, John M.; and Crandall, Robert P., 4,891,681, Cl. 355-322.000.
Crane, Jack W., to Ford New Holland, Inc. Disc cutter construction. 4,890,445, Cl. 56-13.600.
Crawford, James P. Crematory loader. 4,890,367, Cl. 27-27.000.
Creative Automation, Inc.: *See—*
Duryee, George; and Bartlo, Allen M., 4,890,753, Cl. 215-231.000.
Criss, Russell C., to PPG Industries, Inc. Method of making architectural coating with interference colors. 4,891,113, Cl. 204-192.150.
Crookham, Carter C.; and Shonka, Bernard W., to Crookham, Carter C. Telephone cord straightener. 4,890,361, Cl. 24-129.00R.
Crosfield Ebway, Inc.: *See—*
Kuecker, Charles A.; and Klawinski, Gary M., 4,891,528, Cl. 250-548.000.
Cross, Eugene W., Jr., to Hughes Aircraft Company. Color corrector for embedded prisms. 4,890,901, Cl. 330-168.000.
Cross, Jerry R. Safety whip checks for hoses. 4,890,363, Cl. 24-298.000.
Cross, Peter E.: *See—*
Arrowsmith, John E.; and Cross, Peter E., 4,891,372, Cl. 514-213.000.
Crouzet (Societe Anonyme francaise): *See—*
Verdier, Robert, 4,891,592, Cl. 324-301.000.
Crowley, Gregory T. B., to U.S. Philips Corporation. Dynamic focus circuit. 4,891,564, Cl. 315-382.000.
Crowson, Arnold E. Ventilated welding shield. 4,890,335, Cl. 2-8.000.
CryoLife, Inc.: *See—*
McNally, Robert T.; Heacox, Albert; Brockbank, Kelvin G. M.; and Bank, Harvey L., 4,890,457, Cl. 62-65.000.
Crysler Motors Corporation: *See—*
Bien, Alfred A., 4,890,521, Cl. 81-448.000.
Csepel Autogyar: *See—*
Simonyi, Sandor; Torocsik, Laszlo ; and Valoczi, Gyorgy, 4,891,758, Cl. 364-424.100.
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Burgess, R. Anthony; Cunliffe, Geoffrey; and Tadros, Atef, 4,890,802, Cl. 244-115.000.
Cunningham, Roy T.: *See—*
McGovern, Terrence P.; and Cunningham, Roy T., 4,891,217, Cl. 424-84.000.
Curiel, Yoram, to TSL, Incorporated. Tamper resistant package and method of making same. 4,890,763, Cl. 220-455.000.
Curry Sales, Inc.: *See—*
Curry, Stephen A., 4,890,442, Cl. 53-474.000.
Curry, Stephen A., to Curry Sales, Inc. Collapsible easel and a method for packing collapsible easel. 4,890,442, Cl. 53-474.000.
Cushing, R. Rand. Swimming pool protector and converter. 4,890,342, Cl. 4-494.000.
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Hoeptner III, Herbert W.; and Hoekstra, Casey M., 4,890,644, Cl. 137-625.410.
Cutler, Raymond A.; and Virkar, Anil, to Ceramatec, Inc. Fine-grained ceramics and method for making the same. 4,891,341, Cl. 501-89.000.
Cutts, Kevin M.: *See—*
Bocci, Paul M.; Cutts, Kevin M.; and Pietrzak, Carl M., Jr., 4,891,812, Cl. 371-5.500.
CyberOptics Corporation: *See—*
Case, Steven K.; Keil, Robert E.; and Jalkio, Jeffrey A., 4,891,772, Cl. 364-562.000.
Cylink Corporation: *See—*
Omura, Jimmy K., 4,891,781, Cl. 364-768.000.
Czech, Gunther; and Baum, Joachim, to Eyemetrics-Systems AG. Hinge for the connection of the shaft of a temple with a hinge piece of spectacle frames as well as a process for the production of such a hinge. 4,890,356, Cl. 16-228.000.
Czenkusch, Edward L., to Phillips Petroleum Company. Oil shale wet oxidation process. 4,891,132, Cl. 208-428.000.
D-K Gleason, Inc.: *See—*
Pedersen, Harry, 4,890,511, Cl. 74-715.000.
Daane-Pluim, Gerdina J. R.: *See—*
Fernley, George W.; Daane-Pluim, Gerdina J. R.; and Verkouw, Hendrik T., 4,891,155, Cl. 252-354.000.
Dahl, Derek W. Beverage infusion device. 4,891,232, Cl. 426-78.000.
Dahl, Hans; and Schneid, Josef, to Sulzer-Escher Wyss GmbH. Apparatus for guiding the rolls of an essentially vertical calender. 4,890,551, Cl. 100-163.00A.
Dahl, Trygve: *See—*
Heald, Charles C.; and Dahl, Trygve, 4,890,980, Cl. 416-181.000.
Dahlberg, John R.: *See—*
Bricker, Jack A.; May, Earl L.; Michelotti, Donald P.; Dahlberg, John R.; Oravitz, James J., Jr.; and Siskos, William R., 4,891,054, Cl. 65-105.000.
Daikin Industries, Ltd.: *See—*
Kobayashi, Masahiro; Kobayashi, Noboru; Torikoshi, Kunikazu; and Uemura, Shigehiro, 4,890,932, Cl. 374-109.000.
Daimler-Benz Aktiengesellschaft: *See—*
Leiber, Heinz, 4,890,891, Cl. 303-115.000.
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Dainippon Ink & Chemicals, Inc.: *See—*
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,891,241, Cl. 427-44.000.
Nishimura, Katsuhide; Kunugiza, Motoyasu; Shirota, Hiroharu; and Ishizu, Hideyuki, 4,891,421, Cl. 528-370.000.
Daishowa Chemicals Inc.: *See—*
Lin, Stephen Y.; and Bushar, Lori L., 4,891,415, Cl. 527-400.000.
Daiwa Shinku Corp.: *See—*
Hata, Kazuo, 4,891,635, Cl. 340-783.000.
Dakubu, Salifu, to Golight, Inc. Photovoltaic cell including wavelength shifter comprising lanthanide chelate fluorophores based on dihydropyridine condensation products. 4,891,075, Cl. 136-257.000.
Dalo, Jean; and Dalo, Pierre. Framework forming support for a tent canvas of a light shelter. 4,890,634, Cl. 135-99.000.
Dalo, Pierre: *See—*
Dalo, Jean; and Dalo, Pierre, 4,890,634, Cl. 135-99.000.
Dana Corporation: *See—*
Booth, Dwight E.; and Lippincott, Gerry N., 4,891,619, Cl. 335-296.000.
Roll, Thomas P.; and Booth, Dwight E., 4,891,077, Cl. 148-9.00R.
Dancer, Jerry N. Railroad cable/pipe plow and method therefor. 4,890,958, Cl. 405-180.000.

Dane, Bernard: *See*—
Le Monnier de Gouville, Jean-Bernard; and Dane, Bernard, 4,891,006, Cl. 431-349.000.
D'Angelo, Charles: *See*—
Savin, Vinod K.; D'Angelo, Charles; and Rebenne, Helen E., 4,890,574, Cl. 118-719.000.
Danielson, David B.: *See*—
Capek, Raymond G.; and Danielson, David B., 4,891,545, Cl. 313-407.000.
Danno, Yoshiaki; and Dogahara, Takashi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Air fuel ratio detecting device. 4,891,122, Cl. 204-406.000.
Danno, Yoshiaki: *See*—
Hirako, Osamu; Danno, Yoshiaki; and Shimada, Makoto, 4,891,121, Cl. 204-406.000.
Danos, Michael. Photon counting structure and system. 4,891,521, Cl. 250-370.090.
Darby, Robert J.: *See*—
Powel, Stephen S.; and Darby, Robert J., 4,890,743, Cl. 206-595.000.
Da Re' , Mario, to Fiat Auto S.p.A. Method for the production of wood flour based fillers for plastic materials. 4,890,795, Cl. 241-3.000.
Datatape Incorporated: *See*—
Andersen, Robert D., 4,891,716, Cl. 360-31.000.
Andersen, Robert D., 4,891,719, Cl. 360-65.000.
Grant, Frederic F.; and Grant, John P., 4,891,720, Cl. 360-92.000.
Daub, Werner: *See*—
Vetter, Egon; Pfeifer, Thomas; Burghoff, Heinz-Georg; and Daub, Werner, 4,890,491, Cl. 73-290.00R.
Daude, Gerard: *See*—
Bravet, Jean L.; Colmon, Daniel; Daude, Gerard; and Moncheaux, Michel J., 4,891,271, Cl. 428-423.100.
Davenport, Francis L.: *See*—
Renjilian, Armen; and Davenport, Francis L., 4,891,098, Cl. 162-198.000.
Davenport, John M.: *See*—
Ahlgren, Frederic F.; Davenport, John M.; Hansler, Richard L.; and Karikas, John J., 4,891,555, Cl. 313-634.000.
Davenport, Ronald D. Cover for backflow prevention device. 4,890,638, Cl. 137-382.000.
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David, Samuel: *See*—
Thies, Peter W.; David, Samuel; Hell, Insa; and Wolf, Klau U., 4,891,384, Cl. 514-456.000.
Davidson Textron Inc.: *See*—
Gray, John D., 4,890,995, Cl. 425-144.000.
Davis, Allen V. C., to Kathryn L. Acuff Trust No. 2, The; and Heather Ruth Davis 1982 Trust, The. Control actuator and switch. 4,891,479, Cl. 200-81.00R.
Davis, Cecil. Liner for a pickup truck bed. 4,890,874, Cl. 296-39.200.
Davis, Cecil J.; Spencer, John E.; Bonifield, Thomas D.; Jucha, Rhett B.; Stiltz, William J.; Johnson, Randall E.; Whetsel, Joseph E.; and Jones, John L, to Texas Instruments Incorporated. Isolation substrate ring for plasma reactor. 4,891,087, Cl. 156-345.000.
Davis, Cecil J.; and Jucha, Rhett B., to Texas Instruments Incorporated. Processing apparatus and method. 4,891,488, Cl. 219-121.400.
Davis, David C. Flexible toy wand. 4,891,032, Cl. 446-484.000.
Davis, David R.; and Slayton, Danny L., to Colorocs Corporation. Transfer medium cleaning station for use in an electrophotographic print engine. 4,891,676, Cl. 355-271.000.
Davis, Kent A.: *See*—
Mize, James, Jr.; Davis, Kent A.; and Stockley, Henry W., 4,890,739, Cl. 206-459.000.
Davis, Stephen J.: *See*—
Ragle, Larry O.; and Davis, Stephen J., 4,891,815, Cl. 372-44.000.
Davis, Steven D.: *See*—
Lane, William A., Jr.; and Davis, Steven D., 4,890,744, Cl. 206-632.000.
Davis, Walter L., to Motorola, Inc. Nationwide display pager with location readout. 4,891,638, Cl. 340-825.440.
Davison, Michael R.: *See*—
Sutter, Leroy V., Jr.; Cameron, Harold A.; and Davison, Michael R., 4,891,819, Cl. 372-82.000.
Day, Stephen, to Foxboro Company, The. Apparatus for detecting a plurality of gases. 4,891,518, Cl. 250-339.000.
De La Rue Systems Limited: *See*—
Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., 4,890,766, Cl. 221-198.000.
DeBleyker, James R., to General Electric Company. Incandescent lamp having an improved arbor. 4,891,543, Cl. 313-315.000.
Debuisson, Michael; Jose, Joseph A.; and Rigo, Marcel, to Caterpillar Inc. Plate type clip conveyor. 4,890,723, Cl. 198-716.000.
De Carle, John T. Zoned multi-focal contact lens. 4,890,913, Cl. 351-161.000.
Deckman, Harry W.; and Flannery, Brian P., to Exxon Research and Engineering Company. Method and apparatus for utilizing an electro-optic detector in a microtomography system. 4,891,829, Cl. 378-4.000.
de Corlieu, Patrick; Prevost, Michel; and du Chene, Arnaud, to Thomson-CSF. Reconfigurable computing device. 4,891,810, Cl. 371-9.100.
de Cortanze, Andre, to Elf France. Steerable wheels of land vehicles. 4,890,857, Cl. 280-663.000.
Decuir, Joseph: *See*—
Gjerdrum, David; and Decuir, Joseph, 4,891,514, Cl. 250-255.000.
Deguchi, Hiroyuki: *See*—
Kobayashi, Hisao; Kawai, Katsunori; Tanikawa, Masayuki; and Deguchi, Hiroyuki, 4,890,458, Cl. 62-204.000.
Dehan, Louis: *See*—
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Del Laboratories, Inc.: *See*—
Gordon, Harry W.; and Chung, Kenneth, 4,891,213, Cl. 424-61.000.
DeLaCroix, Fern: *See*—
Berger, Johann; DeLaCroix, Fern; Buck, Harvey; and Schrenk, Juergen, 4,891,313, Cl. 436-7.000.
Del Corso, Gregory J.; Martin, James W.; and Strobel, David L., to Carpenter Technology Corporation. Workable boron-containing stainless steel alloy article, a mechanically worked article and process for making thereof. 4,891,080, Cl. 148-326.000.
Del Monte, Ernest J. Molding machine. 4,890,999, Cl. 425-439.000.
Delphax Systems: *See*—
Kubelik, Igor, 4,891,656, Cl. 346-155.000.
Dempsey, Daniel J.: *See*—
Ballard, Gary W.; and Dempsey, Daniel J., 4,891,004, Cl. 431-6.000.
DeMuth, David L.: *See*—
Bowden, William L.; DeMuth, David L.; and Barnette, Luverne H., 4,891,283, Cl. 429-194.000.
Denoel, Jean D., to Societe Anonyme:Societe Europeenne de Propulsion. Method for producing a laminated composite structure including tubular braided reinforcement. 4,891,083, Cl. 156-148.000.
Dental Data Service, Inc.: *See*—
Faber, Lawrence M., 4,891,838, Cl. 380-25.000.
dePaz, Enrique F.; Corbeels, Roger J.; and Bengenberger, Charles G., to Texaco Inc. Partial oxidation process. 4,891,157, Cl. 252-373.000.
Depperman, Warren B.: *See*—
Westerman, William J.; Depperman, Warren B.; and Smith, Philip G., Jr., 4,890,473, Cl. 72-402.000.
Derenburger, Jack H.: *See*—
Ash, Kevin J.; Derenburger, Jack H.; and Parsons, Raymond L., 4,891,811, Cl. 371-21.200.
De Ronde, Frans C., to National Research Development Corporation. Matching asymmetrical discontinuties in transmission lines. 4,891,614, Cl. 333-122.000.
Derouane, Eric G.; and von Ballmoos, Roland, to Mobil Oil Corporation. Silicophosphoaluminates and related crystalline oxides. 4,891,197, Cl. 423-279.000.
Derr, Andrew G.; and McLaughlin, Charles A., to International Business Machines Corporation. Editor for expert system. 4,891,766, Cl. 364-513.000.
Desjardins, Warren. Liquid tool caddy. 4,890,807, Cl. 248-146.000.
Desmond, Michael J.: *See*—
Gaffney, Thomas R.; Henry, JoAnn; and Desmond, Michael J., 4,891,164, Cl. 252-629.000.
Desmurs, Jean R.: *See*—
Nonn, Alain; and Desmurs, Jean R., 4,891,452, Cl. 568-730.000.
Detinko, Felix M.: *See*—
Cooper, Glenn D.; Detinko, Felix M.; Singh, Gurdev; and Levino, Andre J., 4,891,540, Cl. 310-254.000.
Detroit Armor Corporation: *See*—
Cartee, Larry A.; and Barot, Harry A., 4,890,847, Cl. 273-406.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen GmbH: *See*—
Stritzke, Detlef, 4,891,116, Cl. 204-241.000.
Deutsche Thomson-Brandt GmbH: *See*—
Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, 4,891,707, Cl. 358-190.000.
Deutsche Voest-Alpine Industrieanlagenbau GmbH: *See*—
Vuletic, Bogdan, 4,891,062, Cl. 75-28.000.
Develin, Richard B.: *See*—
Kite, Joseph S., III; Conaghan, Thomas B., III; Cattell, John P.; and Develin, Richard B., 4,891,256, Cl. 428-36.100.
De Vries, Alko F. E.: *See*—
Ten Pierick, Hendrik; Ponte, Edward M.; and De Vries, Alko F. E., 4,891,565, Cl. 315-408.000.
Dew, Edward G. Horizontal drilling through casing window. 4,890,675, Cl. 166-376.000.
De Zotell, Gary L.: *See*—
Braun, Paul A.; Ormsby, Michael W.; and De Zotell, Gary L., 4,891,529, Cl. 250-560.000.
Dhyanchand, John J.: *See*—
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Schumacher, John C., 4,891,201, Cl. 423-348.000.
Diamond, Israel, to Merchandising Display Corporation. Rotatable smokeless ashtray. 4,890,632, Cl. 131-237.000.
Diamond, Sidney; and Patel, Aspi N., to Battelle Development Corporation. Phase redistribution processing. 4,891,059, Cl. 75-0.50R.
Dictaphone Corporation: *See*—
Leung, Keith K. W.; Quinn, Kathleen; Goldson, John D.; and Hoffman, Wayne C., 4,891,835, Cl. 379-88.000.
Diehl GmbH & Co.: *See*—
Ottmann, Roland; and von Entress-Furstenecк, Wolfgang, 4,890,556, Cl. 102-499.000.
Diehm, Martin R. Plastic sheet feed attachment for round baler. 4,890,443, Cl. 53-118.000.
Dielectric Labs, Inc.: *See*—
Kent, Gordon D., 4,891,573, Cl. 324-58.00R.
Diesel Kiki Co., Ltd.: *See*—
Sugiura, Hiroyuki, 4,890,985, Cl. 417-295.000.

Takasi, Osawa; and Iida, Katsumi, 4,890,460, Cl. 62-180.000.
Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, to Deutsche Thomson-Brandt GmbH. Television receiver with a controlled, line-separating, switched external-power supply. 4,891,707, Cl. 358-190.000.
Dietlein, Robert W. Fastener with relieved thread section ends. 4,890,965, Cl. 411-280.000.
Digicomp Research Corp.: *See*—
Gupta, Om P., 4,891,504, Cl. 235-462.000.
Digital Equipment Corporation: *See*—
Slater, Andrew E., 4,891,827, Cl. 377-111.000.
Dilling, Peter; and Dimitri, Mitchell S., to Westvaco Corporation. Lignin amine salt as binder for aqueous printing ink composition. 4,891,070, Cl. 106-26.000.
Dillon, Diane M.; and Iwamoto, Ross Y., to Union Oil Company of California. Hydrocarbon fuel composition containing carbonate additive. 4,891,049, Cl. 44-53.000.
DiMaio, John; Wernic, Dominik M.; and Jaramillo, Jorge, to Bio-Mega Inc. ANE derivatives with novel bridging. 4,891,358, Cl. 514-13.000.
Dimitri, Mitchell S.: *See*—
Dilling, Peter; and Dimitri, Mitchell S., 4,891,070, Cl. 106-26.000.
Dinaco, Inc.: *See*—
Dinan, James M., 4,890,403, Cl. 40-604.000.
Dinan, James M., to Dinaco, Inc. Pole sign construction. 4,890,403, Cl. 40-604.000.
Directed Energy, Inc.: *See*—
Krausse, George J., III, 4,891,686, Cl. 357-68.000.
Dischler, Helmut. Bending machine for bending bars, channels, sections and the like. 4,890,469, Cl. 72-218.000.
Dispenziere, Nicholas C., Jr.: *See*—
Murrel, Lawrence L.; and Dispenziere, Nicholas C., Jr., 4,891,127, Cl. 208-111.000.
Doane, J. William; Wenninger, Eugene P.; West, John; and Wu, Bao-Gang, to Kent State University. Liquid crystal light modulating materials with selectable viewing angles. 4,890,902, Cl. 350-347.00V.
Dobler, Klaus; and Wendel, Jurgen, to Robert Bosch GmbH. Pressure sensor. 4,890,498, Cl. 73-727.000.
Dr. Ing. H.c.F. Porsche AG: *See*—
Grossmann, Kay, 4,890,885, Cl. 297-284.000.
Doemens, Guenter, to Siemens Aktiengesellschaft. Device for the electrical function testing of wiring matrices, particularly of printed circuit boards. 4,891,578, Cl. 324-73.00R.
Dogahara, Takashi: *See*—
Danno, Yoshiaki; and Dogahara, Takashi, 4,891,122, Cl. 204-406.000.
Doherty, James B.: *See*—
Zimmerman, Morris; Ashe, Bunnie M.; and Doherty, James B., 4,891,370, Cl. 514-201.000.
Doi, Hachiro, to Ahresty Corporation. Mowing blade unit. 4,890,448, Cl. 56-255.000.
Doi, Isao: *See*—
Masaki, Kenji; Osawa, Izumi; Doi, Isao; and Fujiwara, Masanori, 4,891,292, Cl. 430-66.000.
Doki, Masahiko: *See*—
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Dolengowski, George A., to Exxon Production Research Company. Steerable tail buoy. 4,890,568, Cl. 114-246.000.
Domnikov, Larissa, to Hughes Aircraft Company. Method of forming nonmagnetic silver electrodes on quartz glass. 4,891,106, Cl. 204-30.000.
Donaghue, Norman J., Jr.: *See*—
Salcedo, Rafael E.; and Donaghue, Norman J., Jr., 4,891,813, Cl. 371-37.100.
Dong, Dennis F.; and Clifford, Arthur L., to H-D Tech Inc. Porous diaphragm for electrochemical cell. 4,891,107, Cl. 204-296.000.
Donlan, John P.: *See*—
McLaurin, Leroy D.; Williams, Roland E.; Donlan, John P.; and Hultgren, Kent G., 4,890,978, Cl. 415-209.400.
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Fajula, Francois; Figueras, Francois; Moudafi, Latife; Vera Pacheco, Mercedes; Nicolas, Serge; Dufresne, Pierre; and Gueguen, Claude, 4,891,200, Cl. 423-328.000.
Filler, William S. Extracorporeal shock wave lithotripsy employing non-focused, spherical-sector shock waves. 4,890,603, Cl. 128-24.00A.
First, David H.: *See*—
Megginson, George W.; Redenbarger, Philip D.; and First, David H., 4,890,699, Cl. 188-18.00A.
Fischbeck, Kenneth H.: *See*—
Hoisington, Paul A.; Schaffer, Robert R.; and Fischbeck, Kenneth H., 4,891,654, Cl. 346-140.00R.
Fischer, Hartmut, to Andreas Stihl. Motor-driven chain saw having an arrangement for preheating fresh intake air. 4,890,595, Cl. 123-556.000.
Fischer, Hartmut; Grassmuck, Jurgen; Wissmann, Michael; and Dreher, Albert, to Stihl, Andreas. Exhaust gas muffler for a two-stroke engine. 4,890,690, Cl. 181-240.000.
Fischer, Werner; Schauer, Friedrich; and Kramer, Kurt, to Kabelmetal Electro GmbH. Sensing apparatus for monitoring a structure subject to wear. 4,890,697, Cl. 188-1.110.
Fisher, Edwin P.: *See*—
Quettrini, Victor L.; and Fisher, Edwin P., 4,891,789, Cl. 365-63.000.
Fiske, John M.; and Crandall, Robert P., to Eastman Kodak Company. Hard copy apparatus for producing center fastened sheet sets. 4,891,681, Cl. 355-322.000.
Flannery, Brian P.: *See*—
Deckman, Harry W.; and Flannery, Brian P., 4,891,829, Cl. 378-4.000.
Flavorcoffee Co. Inc.: *See*—
Lamparter, Adolf, 4,890,637, Cl. 137-246.000.
Fletcher, Maria L. Floral centerpiece construction. 4,891,251, Cl. 428-7.000.
Floating Point Systems, Inc.: *See*—
Call, Duane B.; Mudrow, Alfred; Johnson, Randall C.; and Bennion, Robert F., 4,891,751, Cl. 364-200.300.
Floyd, Brian A., to United States of America, Air Force. Floating fitting cable attachment. 4,890,536, Cl. 89-1.800.
Floyd, Ted J. Hammer. 4,890,518, Cl. 81-20.000.
Flynn, Gordon L.: *See*—
Shipman, Charles, Jr.; Nassiri, Mohammad R.; and Flynn, Gordon L., 4,891,377, Cl. 514-282.000.
Flynn, Patrick S.: *See*—
Kroll, Mark W.; Olson, Kenneth M.; and Flynn, Patrick S., 4,890,630, Cl. 128-901.000.
Fogarty, Thomas J.: *See*—
Monfort, Michelle Y.; Chin, Albert K.; and Mollenauer, Kenneth H., 4,890,611, Cl. 606-159.000.
Fohl, Timothy: *See*—
Mellor, Charles; and Fohl, Timothy, 4,891,542, Cl. 313-112.000.
Forbes, Joycelyn. Invalid's bathtub. 4,890,341, Cl. 4-555.000.
Ford, Alan A. Multiple rod center support. 4,890,808, Cl. 248-263.000.
Ford Motor Company: *See*—
Kostin, Richard M., 4,890,888, Cl. 297-443.000.
Kovacs, Bela V., 4,891,076, Cl. 148-3.000.

Ford New Holland, Inc.: *See*—
Crane, Jack W., 4,890,445, Cl. 56-13.600.
Forssen, Eric A., to Vestar, Inc. Multiple step entrapment/loading procedure for preparing lipophilic drug-containing liposomes. 4,891,224, Cl. 424-422.000.
Fortmann, Robert C.; and Pinnow, Curtis C., to Carter-Hoffman Corporation. Food treatment cabinet with flash steamer. 4,891,498, Cl. 219-401.000.
Foster, Clark B.: *See*—
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 4,890,627, Cl. 128-765.000.
Haber, Terry M.; and Foster, Clark B., 4,890,765, Cl. 221-25.000.
Foster, Donald L.: *See*—
Kuo, Han C.; and Foster, Donald L., 4,891,281, Cl. 429-105.000.
Foster, George: *See*—
Rudell, Elliot; Foster, George; and Cernansky, Joseph, 4,890,838, Cl. 273-138.00R.
Fourez, Michel; Lonca, Michel; and Pichant, Patrick, to Metal Coatings International Inc. Coated metal substrates with anticorrosion coating composition. 4,891,268, Cl. 428-421.000.
Fox, Anthony, to TFC Corporation. Band saw attachment for multipurpose power tool. 4,890,634, Cl. 144-1.00D.
Fox, Ernest I., to Raytheon Company. Solid state switch. 4,891,536, Cl. 307-521.000.
Fox, Robert L.: *See*—
Johnston, David F.; and Fox, Robert L., 4,891,591, Cl. 324-234.000.
Foxboro Company, The: *See*—
Day, Stephen, 4,891,518, Cl. 250-339.000.
Francis, Arthur W., Jr.: *See*—
Roberge, Raymond P.; Francis, Arthur W., Jr.; and Wolfe, Thomas G., 4,891,186, Cl. 422-83.000.
Frank L. Wells Company: *See*—
Hoff, Jeffrey H.; Kozak, Michael L.; and Wentzek, Horst F., 4,890,975, Cl. 414-788.900.
Franke, Wilfried: *See*—
Nordhoff, Erhard; Franke, Wilfried; and Arndt, Friedrich, 4,891,428, Cl. 546-278.000.
Franklin Computer Corporation: *See*—
McWherter, David, 4,891,775, Cl. 364-705.060.
Frantz, Virgil L., to Roanoke College. System for decontaminating compressed gas. 4,891,051, Cl. 55-162.000.
Frantztech Ltd.: *See*—
Riess, Ilan, 4,891,123, Cl. 204-427.000.
Fredlund, John R.; and Wess, Raymond E., to Eastman Kodak Company. Graphics display system. 4,891,631, Cl. 340-709.000.
Fredrickson, Eric M.: *See*—
Krause, Barry; and Fredrickson, Eric M., 4,890,467, Cl. 70-369.000.
French, Kendrick L., to K. W. Thompson Tool Co., Inc. Ramrod. 4,890,406, Cl. 42-90.000.
Frerking, Marvin E., to Rockwell International Corporation. Vibration compensated crystal oscillator. 4,891,611, Cl. 331-158.000.
Fressola, Alfred A.; and Barry, Ronald E., Jr. Timing device for live animal traps. 4,890,415, Cl. 43-61.000.
Friedman, Mark B.; and Kiliany, Gary J. Computer vision system with improved object orientation technique. 4,891,630, Cl. 340-706.000.
Frisa, Larry E.; King, Monroe L.; and Sampayan, Stephen E., to Eaton Corporation. SKM ion source. 4,891,525, Cl. 250-423.00R.
Frisch, Helmuth; Hartinger, Johann; and Weber, Alois, to S & S Electronike Geratebau Cmbit. Method for measuring and correcting the plunger adjustment in high-speed stroke presses. 4,890,468, Cl. 72-21.000.
Frison, Emmett C.; and Chase, Daniel F., to Brudi Equipment, Inc. Universal fork-supported push-pull slip sheet handling attachment for forklift trucks. 4,890,973, Cl. 414-607.000.
Frohlke, Manfred: *See*—
Koschinat, B. Hubert; and Frohlke, Manfred, 4,890,823, Cl. 267-64.270.
Froissant, Jacques: *See*—
George, Pascal; Giron, Claudie; and Froissant, Jacques, 4,891,371, Cl. 514-212.000.
Frymaster Corporation, The: *See*—
Grob, James T.; and Kinch, John M., 4,890,548, Cl. 99-408.000.
Fu Sheng Industry Co., Ltd.: *See*—
Lee, Hou-Teng, 4,890,992, Cl. 418-201.000.
Fuel Tech, Inc.: *See*—
Bowers, Wayne E.; and Sprague, Barry N., 4,891,050, Cl. 44-67.000.
Fuglistaller, Cornel; Keller, Jakob; and Sattelmayer, Thomas, to BBC Brown Boveri AG. Atomizer nozzle. 4,890,793, Cl. 239-427.000.
Fuji Electric Co., Ltd.: *See*—
Narita, Mitsuru, 4,891,290, Cl. 430-58.000.
Ooiwa, Kiyoshi; and Doki, Masahiko, 4,891,118, Cl. 204-298.000.
Fuji Electrochemical Co., Ltd.: *See*—
Nakano, Takayuki, 4,891,799, Cl. 369-45.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Furuyama, Masaaki; and Abe, Kunihiro, 4,890,592, Cl. 123-417.000.
Ohno, Katsuhiko; Ishii, Keisuke; and Etoh, Motoaki, 4,890,583, Cl. 123-41.700.
Suzuki, Hosei, 4,890,707, Cl. 192-3.300.
Fuji Kiko Company, Limited: *See*—
Kinoshita, Satoshi; Kachi, Shyogo; and Shimizu, Yoshiyuki, 4,890,505, Cl. 74-493.000.
Fuji Photo Film Co., Ltd.: *See*—
Kakimi, Fujio, 4,891,295, Cl. 430-138.000.
Mukunoki, Yasuo; Maekawa, Yukio; and Suga, Shuzo, 4,891,307, Cl. 430-527.000.
Nakamura, Koki, 4,891,304, Cl. 430-448.000.
Nakamura, Takashi, 4,891,277, Cl. 428-691.000.
Ogawa, Masashi, 4,891,119, Cl. 204-299.00R.
Shiozawa, Etsuo; Kato, Keishi; and Yoshimi, Yoshiki, 4,891,677, Cl. 355-280.000.
Takahashi, Koichi; Okutsu, Kazuo; Ide, Yoshihiro; Takei, Hiroshi; Ishida, Yukio; and Harada, Kazumasa, 4,891,089, Cl. 156-522.000.
Takashima, Masanobu; Iwakura, Ken; Satomura, Masato; and Ichikawa, Kimio, 4,891,297, Cl. 430-177.000.
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.
Yamada, Makoto, 4,891,299, Cl. 430-202.000.
Yokoyama, Shigeki; and Mackawa, Yukio, 4,891,306, Cl. 430-527.000.
Fujie, Nobuo: *See*—
Satoh, Masaki; Kamiya, Shigemitsu; Fujie, Nobuo; and Tabuchi, Shuji, 4,891,334, Cl. 437-228.000.
Fujii, Takaaki; Miura, Seishi; and Tsukui, Takaaki, to Honda Giken Kogyo Kabushiki Kaisha. Intake device for an internal combustion engine. 4,890,586, Cl. 123-52.00M.
Fujii, Yoshihalu; Fujita, Yukitoshi; and Moriyama, Hiroshi, to Sharp Kabushiki Kaisha. Automatic paper feeder for document shredder. 4,890,797, Cl. 241-34.000.
Fujima, Masatoshi: *See*—
Haga, Tomoyuki; Ozaki, Naotake; Koinuma, Kazushi; Fujima, Masatoshi; and Suzuki, Seishi, 4,890,770, Cl. 222-109.000.
Fujimaki, Yoshihide; Suzuki, Yasuo; and Takimoto, Masataka, to Konischiroku Photo Industry Co., Ltd. Photoreceptor for positive electrostatic charge. 4,891,288, Cl. 430-58.000.
Fujimori, Haruo: *See*—
Kitamori, Takehiko; Yasuda, Kazuo; Nomura, Yasushi; Suzuki, Kazumichi; and Fujimori, Haruo, 4,890,925, Cl. 356-432.000.
Fujinaga, Minoru: *See*—
Higuchi, Seijun; Asakawa, Kenichi; Ohmori, Takayuki; Umeno, Koji; Okada, Nobuyoshi; Fujinaga, Minoru; Yamamoto, Fumio; and Yabe, Katsuhiko, 4,891,274, Cl. 428-653.000.
Fujioka, Souichiro; and Okamoto, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Device for detecting rotation speed having feedback circuitry and improved frequency-response. 4,891,588, Cl. 324-166.000.
Fujioka, Yuji: *See*—
Tanikawa, Keiichi; Fujioka, Yuji; Higaki, Yuzo; and Goto, Hiroyuki, 4,891,161, Cl. 252-56.00S.
Fujishiro, Masahiko: *See*—
Otomo, Shigekazu; Nakatani, Ryoichi; Kumasaka, Noriyuki; Saito, Noritoshi; Kobayashi, Toshio; and Fujishiro, Masahiko, 4,891,278, Cl. 428-681.000.
Fujita, Hiroyuki: *See*—
Asari, Masatoshi; Konishi, Ikuo; Fujita, Hiroyuki; Hirakimoto, Akira; and Nakanishi, Hiroaki, 4,891,601, Cl. 328-233.000.
Fujita, Yukitoshi: *See*—
Fujii, Yoshihalu; Fujita, Yukitoshi; and Moriyama, Hiroshi, 4,890,797, Cl. 241-34.000.
Fujitani, Sakae; Suzuki, Yuzuru; Okuda, Masanao; Takahashi, Hitoshi; and Fukazawa, Junichiro, to Minebea Co., Ltd. Brushless DC motor having an outer rotor. 4,891,567, Cl. 318-254.000.
Fujitsu Limited: *See*—
Iwamasa, Akiyoshi, 4,891,671, Cl. 355-245.000.
Satoh, Masaki; Kamiya, Shigemitsu; Fujie, Nobuo; and Tabuchi, Shuji, 4,891,334, Cl. 437-228.000.
Sugiyama, Eiji; Natsume, Mitsuaki; and Saito, Toshiharu, 4,891,729, Cl. 361-91.000.
Wakasugi, Yasumasa; and Sugimoto, Masahiro, 4,891,344, Cl. 501-128.000.
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased, 4,891,524, Cl. 250-398.000.
Fujiwara, Masanori: *See*—
Masaki, Kenji; Osawa, Izumi; Fujiwara, Masanori; and Takedomi, Yumiko, 4,891,291, Cl. 430-66.000.
Masaki, Kenji; Osawa, Izumi; Doi, Isao; and Fujiwara, Masanori, 4,891,292, Cl. 430-66.000.
Fukazawa, Junichiro: *See*—
Fujitani, Sakae; Suzuki, Yuzuru; Okuda, Masanao; Takahashi, Hitoshi; and Fukazawa, Junichiro, 4,891,567, Cl. 318-254.000.
Fukuda, Morio: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.
Fukuda, Susumu; Ariyoshi, Hisashi; and Kasanami, Toru, to Murata Manufacturing Co., Ltd. Manufacturing method for integrated resonator. 4,890,370, Cl. 29-25.350.
Fukuda, Tokuya: *See*—
Senda, Tetsuya; Fukuda, Tokuya; and Matsumoto, Hiroaki, 4,891,689, Cl. 358-30.000.
Fukumoto, Masumi, to Nifco Inc. Apparatus for accommodating box-like articles. 4,890,735, Cl. 206-387.000.
Fukuzono, Shinichi: *See*—
Shimizu, Norio; Fukuzono, Shinichi; Nishimura, Nobuko; Odawara, Yoji; and Sumitani, Tomoaki, 4,891,310, Cl. 435-3.000.
Fuller, Claudia A. Interchangeable detachable decorative applique. 4,890,347, Cl. 5-508.000.
Funaki, Motokatsu. Tile mounting plate and tiled wall structure. 4,890,433, Cl. 52-386.000.

Funayama, Shinji: *See*—
Ohkawa, Hideo; Chikushi, Masakuni; Nakamura, Hironori; Funayama, Shinji; Hashimoto, Takashi; and Hirai, Takahiro, 4,891,399, Cl. 523-200.000.
Furuse, Tokuo: *See*—
Hayashi, Sei-ichi; Hohjoh, Tadashi; Furuse, Tokuo; Kuriyama, Hiroki; Watanabe, Tsuyoshi; and Takatsuto, Suguru, 4,891,168, Cl. 260-397.200.
Furuyama, Masaaki; and Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Ignition timing control system for engines. 4,890,592, Cl. 123-417.000.
Futatsumori, Koji: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,891,434, Cl. 549-215.000.
Futch, John E.; and Corbett, James J. Bank planter. 4,890,417, Cl. 47-58.000.
Gabler, Wilfried: *See*—
Brox, Werner; and Gabler, Wilfried, 4,891,229, Cl. 424-456.000.
Gach, Jerald. Disposable holder for hypodermic needles and sheaths. 4,890,734, Cl. 206-366.000.
Gaffney, Thomas R.; Henry, JoAnn; and Desmond, Michael J., to Standard Oil Company, The. Method for separating and immobilizing radioactive materials. 4,891,164, Cl. 252-629.000.
Gailus, Walter J., to Continental Can Company, Inc. Closure with improved pull tab. 4,890,758, Cl. 220-270.000.
Gaines, Van G. Portable roadster cover. 4,890,876, Cl. 296-136.000.
Gajjar, Jagdish T.; Underkoffler, Edwin C.; Wroblewski, Craig A.; and Roman, Michael F., to General Electric Company. Binary gas analyzer instrument and analysis method. 4,891,629, Cl. 340-632.000.
Ganguly, Dipankar; and Sanders, Gary B., to Air-Shields, Inc. Fetal heart rate counting system using digital signal processing. 4,890,624, Cl. 128-661.070.
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., to U.S. Philips Corporation. Circuit arrangement for adjusting the operating voltage of high-pressure gas discharge lamps. 4,891,563, Cl. 315-309.000.
Garces, Juan; Maj, Joseph J.; Lee, G. John; and Rocke, Stephen C., to Dow Chemical Company, The. Alkylation of polycyclic aromatic compounds to alkylates enriched in the para-substituted isomers. 4,891,448, Cl. 568-628.000.
Garcia, Roberto A.: *See*—
Owen, Charles W.; and Garcia, Roberto A., 4,890,580, Cl. 119-156.000.
Gard, Michael F.; and Kyle, Donald G., to Atlantic Richfield Company. Method for transmitting data over logging cable. 4,891,641, Cl. 340-857.000.
Gardner Sr., Gary L., to Dow Chemical Company, The. Method and apparatus for installing gasket members between flat plate structures. 4,891,117, Cl. 204-253.000.
Garreau, Francois: *See*—
Chopin, Thierry; Garreau, Francois; Knipper, Magali; Nortier, Patrice; and Schuppiser, Jean-Luc, 4,891,350, Cl. 502-439.000.
Garrison & Stratton: *See*—
Carlson, Karl, 4,890,532, Cl. 84-422.100.
Garver, Robert V.: *See*—
Saddow, Stephen E.; Garver, Robert V.; and Kaul, Roger, 4,891,730, Cl. 361-111.000.
Garza, Cesar M.; Douglas, Monte A.; and Johnson, Roland, to Texas Instruments Incorporated. Trilayer microlithographic process using a silicon-based resist as the middle layer. 4,891,303, Cl. 430-312.000.
Gas Logs (Brailsford) Ltd.: *See*—
Potter, Barry C., 4,890,601, Cl. 126-512.000.
Gascard, Inc.: *See*—
Jewell, Thomas L., 4,891,503, Cl. 235-380.000.
Gaskill, John S. Deer scarecrow. 4,890,571, Cl. 116-22.00A.
Gasparotti, Franca A., to Molteni & C. Dei F.lli Alitti S.p.A. Lidocaine derivative and therapeutic compositions which contain it as principal active ingredient. 4,891,386, Cl. 514-555.000.
Gastinger, Robert G.; and Hayes, John E., to ARCO Chemical Technology, Inc. High styrene content, stable polymer using epoxy resin-modified polyols as dispersants. 4,891,395, Cl. 523-456.000.
Gatewood, Sidney. Game apparatus with rotating elements. 4,890,845, Cl. 273-271.000.
Gatzka, Bruno G.; and Olsen, Christopher J., to Starch Industries, Pty. Ltd. Building truss. 4,890,429, Cl. 52-640.000.
Gaves, James W., to Rolf C. Hagen Inc. Resealable pouch/box combination. 4,890,761, Cl. 220-404.000.
Gavrila, Gelu N., to Teledyne Inc., Teledyne Farris Eng. Div. Frictional damper suitable for pressure relief valves. 4,890,641, Cl. 137-514.000.
Gazeley, Albert E., to Polaroid Corporation. Optical accessory for spectacles. 4,890,910, Cl. 351-47.000.
Gebert, Ulrich: *See*—
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,891,374, Cl. 514-222.800.
GEC Plessey Telecommunications, Limited: *See*—
Lake, David J., 4,891,804, Cl. 370-61.000.
Gellert, Jobst U. Sprue gated stack injection molding system. 4,891,001, Cl. 425-549.000.
General DataComm Inc.: *See*—
Boreland, Charles P., 4,891,754, Cl. 364-200.000.
Cole, Paul D., 4,891,823, Cl. 375-25.000.
General Electric Company: *See*—
Ahlgren, Frederic F.; Davenport, John M.; Hansler, Richard L.; and Karikas, John J., 4,891,555, Cl. 313-634.000.
Corsmeier, Robert J.; Schlechtweg, Ronald E.; Albrecht, Richard W., Jr.; and Dry, Dennis P., 4,890,981, Cl. 416-220.00R.
DeBleyker, James R., 4,891,543, Cl. 313-315.000.
Gajjar, Jagdish T.; Underkoffler, Edwin C.; Wroblewski, Craig A.; and Roman, Michael F., 4,891,629, Cl. 340-632.000.
Hathorn, William, 4,890,585, Cl. 123-48.00A.
Jastrzebski, Lubomir L., 4,891,092, Cl. 156-610.000.
Levand, Victor A., Jr.; and Duffy, Mark E., 4,891,554, Cl. 313-634.000.
Liu, Nan-I, 4,891,397, Cl. 524-141.000.
Rabatin, Jacob G., 4,891,527, Cl. 250-483.100.
Wengrovius, Jeffrey H.; VanValkenburgh, Virginia M.; and Valenty, Steven J., 4,891,402, Cl. 524-863.000.
Wills, Harry D.; and Betthauser, Joseph L., 4,890,906, Cl. 350-486.000.
General Foods Corporation: *See*—
Ackilli, Joseph A.; Saleeb, Fouad Z.; Morreale, Philip; and McKay, Randal P., 4,891,198, Cl. 423-308.000.
General Instrument Corporation: *See*—
Einthoven, Willem G.; and Mitchell, Muni M., 4,891,685, Cl. 357-56.000.
General Motors Corporation: *See*—
Ashtiani-Zarandi, Mansour; Tishbi, Youssef; and Welch, Jeffrey A., 4,890,877, Cl. 296-146.000.
General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Nagazumi, Yasuo, 4,891,633, Cl. 340-717.000.
Genesis Technology: *See*—
Meyers, Wayne E., 4,890,600, Cl. 126-512.000.
Geoghegan, Edward J.; Mulligan, Seamus; and Panoz, Donald E., to Elan Corporation plc. Diltiazem formulation. 4,891,230, Cl. 424-461.000.
George, Pascal; Giron, Claudie; and Froissant, Jacques, to Synthelabo. 3-(Acylaminomethyl)imidazo[1,2-a]pyridine derivatives, their preparation and their application in therapy. 4,891,371, Cl. 514-212.000.
Georgia Tech Research Corporation: *See*—
Knight, James A.; and Gorton, Charles W., 4,891,459, Cl. 585-240.000.
Logan, Kathryn V., 4,891,337, Cl. 501-80.000.
Gerretz, Josef; and Henn, Ewald, to Mannesmann Aktiengesellschaft. Loop transport system for a plurality of baskets containing material to be drawn through a drawing machine. 4,890,470, Cl. 72-289.000.
Gertzfeld, Sheldon G., to Superior Toy & Manufacturing Company, Inc. Toy with lighted playpieces. 4,891,030, Cl. 446-118.000.
Gesing, Adam J.; Luce, Edward S.; Raghavan, Narashima S.; and White, Danny R., to Lanxide Technology Company, LP. Production of metal carbide articles. 4,891,338, Cl. 501-87.000.
Ghandehari, Mohammad H., to Union Oil Company of California. Rare earth-containing magnets. 4,891,078, Cl. 148-301.000.
Giannuzzi, Louis N. Automatic setting tool for masonry anchors. 4,890,779, Cl. 227-139.000.
Gibbs, Christopher G.: *See*—
Wilson, Gordon, 4,890,351, Cl. 15-236.010.
Gibson, George A., to AM International, Inc. Methods of using liquid tower dispersions having enhanced colored particle mobility. 4,891,286, Cl. 430-38.000.
Gifford, David K., to Massachusetts Institute of Technology. Parallel processing system with processor array having SIMD/MIMD instruction processing. 4,891,787, Cl. 364-900.000.
Gigli, Mauro: *See*—
Angelucci, Francesco; Gigli, Mauro; and Penco, Sergio, 4,891,360, Cl. 514-34.000.
Giles, Alan F., to Thomas J. Lipton, Inc. Measuring apparatus. 4,890,500, Cl. 73-861.410.
Giordano, Vincenza. Distribution and shut-off device for hydraulic systems, particularly for domestic water systems. 4,890,648, Cl. 137-594.000.
Giron, Claudie: *See*—
George, Pascal; Giron, Claudie; and Froissant, Jacques, 4,891,371, Cl. 514-212.000.
Gitman, Gregory M., to American Combustion, Inc. Method and apparatus for treating solid particles. 4,890,562, Cl. 110-236.000.
Givens Buoy Liferaft Co., Inc.: *See*—
Givens, James A., 4,890,569, Cl. 114-349.000.
Givens, James A., to Givens Buoy Liferaft Co., Inc. Life raft. 4,890,569, Cl. 114-349.000.
Gjerdrum, David; and Decuir, Joseph, to Gjerdrum, David M. Device for monitoring radon exposure. 4,891,514, Cl. 250-255.000.
Gjerdrum, David M.: *See*—
Gjerdrum, David; and Decuir, Joseph, 4,891,514, Cl. 250-255.000.
Gl.Bl.Effe. S.R.L.: *See*—
Lo Duca, Carmelo, 4,890,789, Cl. 229-102.000.
Glazer, Frank: *See*—
Rzasa, Peter W.; Allen, Matthew D.; Neuschaefer, Carl H.; Kowles, Joseph E.; Williams, Thomas D.; and Glazer, Frank, 4,891,767, Cl. 364-513.000.
Gleason, K. Reed; Jones, Keith E.; and Strid, Eric W., to Cascade Microtech, Inc. Overlap interfaces between coplanar transmission lines which are tolerant to transverse and longitudinal misalignment. 4,891,612, Cl. 333-33.000.
Glover, Robert L.; and Bland, Verle V., to Electrict Power Research Institute, Inc. System and method for monitoring wet bulb temperature in a flue gas stream. 4,890,479, Cl. 73-29.000.
GNB Incorporated: *See*—
Jergl, Joseph J.; and Kump, William H., 4,891,270, Cl. 429-53.000.
Goddard, William H., to Eastman Kodak Company. Open frame sight viewfinder. 4,891,658, Cl. 354-219.000.

Goebel, Eickhart, to Hofmann Werkstatt-Technik GmbH. Tire demounting tool. 4,890,661, Cl. 157-1.300.
Goel, Anil B., to Ashland Oil, Inc. Novel thioether amide diols and polyurethane polymers therefrom. 4,891,416, Cl. 528-85.000.
Goetz, Norbert: *See*—
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,891,451, Cl. 568-691.000.
Gold, Peter N.; Vagnone, Louis M.; and Raheb, Richard. Anti-theft system. 4,891,478, Cl. 200-61.660.
Golden, Donald M.; and McVay, William P., to Ethicon, Inc. Two piece internal organ fastener. 4,890,613, Cl. 606-220.000.
Goldfarb, William C.: *See*—
Kamieniecki, Emil; Goldfarb, William C.; and Wollowitz, Mike, 4,891,584, Cl. 324-158.00R.
Goldie, Steve D. Bowling ball insert. 4,890,836, Cl. 273-63.00A.
Goldin, Stanley M. High resolution monitoring device. 4,891,185, Cl. 422-69.000.
Goldson, John D.: *See*—
Leung, Keith K. W.; Quinn, Kathleen; Goldson, John D.; and Hoffman, Wayne C., 4,891,835, Cl. 379-88.000.
Goldwasser, Eric P. Stroke typing system. 4,891,786, Cl. 364-900.000.
Golight, Inc.: *See*—
Dakubu, Salifu, 4,891,075, Cl. 136-257.000.
Good, Bruce R. Stackable circular skid. 4,890,560, Cl. 108-53.100.
Good, David M., to Voxcom, Inc. Folded hang tab. 4,890,809, Cl. 248-317.000.
Goodwin, Frank E., to International Lead Zinc Research Organization, Inc. Lead-aluminum material. 4,891,284, Cl. 429-226.000.
Goodyear Tire & Rubber Company, The: *See*—
Broyles, Henry D.; and Portalupi, Steven J., 4,891,082, Cl. 156-123.000.
Lamock, Andre , 4,890,660, Cl. 152-545.000.
Gordon, Douglas C.; and Rapkins, David W. Method of preparing a contoured plate. 4,891,302, Cl. 430-300.000.
Gordon, Douglas C., to Quebecor Publitech Inc. Copy indicator for a document. 4,891,666, Cl. 355-133.000.
Gordon, Harry W.; and Chung, Kenneth, to Del Laboratories, Inc. Nail enamel containing microcrystalline cellulose. 4,891,213, Cl. 424-61.000.
Goricon Metallurgical Services Limited: *See*—
Browning, Richard J., 4,890,375, Cl. 29-402.160.
Goronszy, Mervyn C., to Transfield, Inc. Solids excluding surface skimmer. 4,891,128, Cl. 210-121.000.
Gorton, Charles W.: *See*—
Knight, James A.; and Gorton, Charles W., 4,891,459, Cl. 585-240.000.
Gosciniak, Donald J.; Cleary, Thomas P.; and Phalangas, Charlambos J., to ICI Americas Inc. Ultraviolet radiation absorbing cyclobeaenylidene cyanoacetate ester and amide compositions. 4,891,212, Cl. 424-59.000.
Goto, Hiroyuki: *See*—
Tanikawa, Keiichi; Fujioka, Yuji; Higaki, Yuzo; and Goto, Hiroyuki, 4,891,161, Cl. 252-56.00S.
Gouda, Adam. Signal helmet. 4,891,736, Cl. 362-105.000.
Gough, David A., to University of California, The Regents of the. Two-dimensional diffusion glucose substrate sensing electrode. 4,890,620, Cl. 128-635.000.
Gough, George T., to REFAC International, Limited. Method and apparatus for conveying materials. 4,890,722, Cl. 198-706.000.
Goulet, Carl R., to Teledyne Industries, Inc. Fuel injection control system for an internal combustion engine. 4,890,593, Cl. 123-489.000.
Grabener, Theodor: *See*—
Grabener, Thomas; and Grabener, Theodor, 4,890,998, Cl. 425-193.000.
Grabener, Thomas; and Grabener, Theodor, to Theodor C..abener Pressensysteme GmbH & Co. KG. Press for manufacture of dimensionally stable articles from powdered material. 4,890,998, Cl. 425-193.000.
Graillat, Gerard, to Salomon S.A. Releasable ski stop. 4,890,855, Cl. 280-615.000.
Grainger, Frederick: *See*—
Parrotta, Michael A.; Grainger, Frederick; and Schoenleber, Donald W., 4,890,872, Cl. 283-56.000.
Graiver, Daniel; and Kalinowski, Robert E., to Dow Corning Corporation. Solid gel dispensers for achieving controlled release of volatile liquid materials and method for preparing same. 4,891,388, Cl. 521-64.000.
Graiver, Daniel; and Kalinowski, Robert E., to Dow Corning Corporation. Solid gel dispensers for achieving controlled release of volatile liquid materials and method for preparing same. 4,891,389, Cl. 521-64.000.
Grand, Jean-Pierre, to Automobiles Peugeot; and Automobiles Citroen. Machine for heat treating camshafts. 4,890,819, Cl. 266-78.000.
Grandinetti, Dennis L. Corn detasseler machine. 4,890,447, Cl. 56-63.000.
Granot, Joseph, to Elscint Ltd. Restricted volume imaging. 4,891,595, Cl. 324-309.000.
Grant, Bruce M. Luminescently outlined string instrument. 4,890,529, Cl. 84-291.000.
Grant, Frederic F.; and Grant, John P., to Datatape Incorporated. Belt drive system for a magnetic tape cassette transport/accessor. 4,891,720, Cl. 360-92.000.
Grant, John P.: *See*—
Grant, Frederic F.; and Grant, John P., 4,891,720, Cl. 360-92.000.
Gras, Jeffrey D.: *See*—
Boerema, Thomas L.; Kindig, Alan L.; and Gras, Jeffrey D., 4,890,883, Cl. 297-227.000.
Grassmuck, Jurgen: *See*—
Fischer, Hartmut; Grassmuck, Jurgen; Wissmann, Michael; and Dreher, Albert, 4,890,690, Cl. 181-240.000.
Grau, Werner: *See*—
Hitzfeld, Michael; Grau, Werner; and Hack, Joachim, 4,891,114, Cl. 204-192.150.
Gray, Charles H., Jr. Fire control valve. 4,890,635, Cl. 137-75.000.
Gray, Donald R.; Spadafora, Anthony J.; and Green, Lawrence R., III, to Mets, Inc. Method for accurately updating positional information provided on a digital map. 4,891,761, Cl. 364-452.000.
Gray, John D., to Davidson Textron Inc. Mold apparatus for forming shaped plastic shells. 4,890,995, Cl. 425-144.000.
Gray, Kimberly J.: *See*—
Renken, Gerald W.; Gray, Kimberly J.; and Greenwood, Michael W., 4,891,616, Cl. 333-236.000.
Gray, Robert L.; Peterson, David; Chen, Loren; and van Buskirk, Gregory, to Clorox Company, The. Stable liquid detergent containing insoluble oxidant. 4,891,147, Cl. 252-104.000.
Great Lakes Carbon Corporation: *See*—
Joo, Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., 4,891,279, Cl. 429-40.000.
Great Lakes Chemical Corporation: *See*—
Borden, Dennis M.; Favstritsky, Nicolai A.; and Termine, Enrico J., 4,891,449, Cl. 568-645.000.
Grecksch, Hans, to W. Schlafhorst & Co. Apparatus for removing a tube from a tube magazine and for transferring the tube to the creel of a winding station. 4,890,799, Cl. 242-35.50A.
Green, Daniel N., to Posh Diversified, Inc. Sound output unit for installation in a ceiling structure. 4,891,842, Cl. 381-188.000.
Green, Lawrence R., III: *See*—
Gray, Donald R.; Spadafora, Anthony J.; and Green, Lawrence R., III, 4,891,761, Cl. 364-452.000.
Green, William G.; and Hillis, James E., to Dow Chemical Company, The. Process for producing high purity magnesium. 4,891,065, Cl. 75-63.000.
Greenberg, Bert, to Greenberg, Bert; and Greenberg, Jodee K. Pants-like garment incorporating a stretchable construction. 4,890,337, Cl. 2-236.000.
Greenberg, Jodee K.: *See*—
Greenberg, Bert, 4,890,337, Cl. 2-236.000.
Greenwood, Michael W.: *See*—
Renken, Gerald W.; Gray, Kimberly J.; and Greenwood, Michael W., 4,891,616, Cl. 333-236.000.
Gretz, Michael R.: *See*—
Brown, R. Malcolm, Jr.; Brown, Debra S.; and Gretz, Michael R., 4,891,317, Cl. 435-101.000.
Grimes, Stephen: *See*—
Karr, Stephen L., Jr.; Benjamini, Elizer; Scibienski, Robert J.; and Grimes, Stephen, 4,891,219, Cl. 424-85.800.
Grimsley, John. Travel kit assembly. 4,890,728, Cl. 206-0.810.
Gris, Yvon, to Societe Pour l'Etude et la Fabrication de Circuits Integres Speciauxefcis. Method of manufacturing field effect transistors and lateral bipolar transistors on the same substrate. 4,891,328, Cl. 437-59.000.
Grob, James T.; and Kinch, John M., to Frymaster Corporation, The. Deep fat frying apparatus having an improved cooking fluid filtration system. 4,890,548, Cl. 99-408.000.
Grosfillex S.A.R.L.: *See*—
Ollat, Marc; and Kleinklaus, Norbert, 4,890,881, Cl. 297-26.000.
Gross, Robert A.; and Hogle, James E., to Xerox Corporation. Transfer apparatus. 4,891,680, Cl. 355-309.000.
Gross, Wolfgang; Mueller, Manfred; Ahnsorge, Harald; and Zott, Andrea, to Joh. A. Benckiser GmbH. Liquid sanitary cleansing and descaling agents and process for their production. 4,891,150, Cl. 252-142.000.
Grossmann, Kay, to Dr. Ing. h.c.F. Porsche AG. Seat for a vehicle, aircraft or the like. 4,890,885, Cl. 297-284.000.
Groth, Hugh F.: *See*—
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,890,561, Cl. 108-137.000.
Gruenert, Margarete: *See*—
Tesmann, Holger; Hempel, Hans U.; Mueller, Heinz; Gruenert, Margarete; and Asbeck, Adolf, 4,891,154, Cl. 252-321.000.
Grynecki, Michael: *See*—
Pratscher, Andrew J.; and Grynecki, Michael, 4,890,410, Cl. 43-15.000.
GTE Laboratories Incorporated: *See*—
Sarin, Vinod K.; D'Angelo, Charles; and Rebenne, Helen E., 4,890,574, Cl. 118-719.000.
Shastry, Shambhu K., 4,891,091, Cl. 156-606.000.
GTE Products Corporation: *See*—
Mellor, Charles; and Fohl, Timothy, 4,891,542, Cl. 313-112.000.
Guardine Disposable Limited: *See*—
Cooper, Christopher, 4,890,936, Cl. 383-109.000.
Gueguen, Claude: *See*—
Fajula, Francois; Figueras, Francois; Moudafi, Latifa; Vera Pacheco, Mercedes; Nicolas, Serge; Dufresne, Pierre; and Gueguen, Claude, 4,891,200, Cl. 423-328.000.
Guglielmetti, Leonardo; Meyer, Hans R.; Reinehr, Dieter; and Weber, Kurt, to CIBA-GEIGY Corporation. Mixtures of fluorescent whitening agents. 4,891,153, Cl. 252-301.220.
Guha, Subhendu; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method of fabricating n-type and p-type microcrystalline semiconductor alloy material including band gap widening elements. 4,891,330, Cl. 437-81.000.
Guichard, Jean, to Messier-Hispano-Bugatti. Carbon disk brake rotor fitted with reinforcing riders. 4,890,700, Cl. 188-73.200.
Gula, Lance: *See*—
Beatty, William E., Jr.; Kapples, Lawrence J.; Gula, Lance; and Changle, Joseph F., 4,891,617, Cl. 335-46.000.
Gunji, Katsuhiko: *See*—
Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; Sakurai, Yoshimitu; Horii, Hiroyuki; and Mashimo, Akira, 4,891,615, Cl. 333-206.000.
Gupta, D. V. Satyanarayana: *See*—
Shortt, Alexandra B.; and Gupta, D. V. Satyanarayana, 4,891,073, Cl. 134-20.000.
Gupta, Om P., to Digicomp Research Corp. Security level identification method for computer based information. 4,891,504, Cl. 235-462.000.
Gwinner, Lutz: *See*—
Beins, Wolfgang; Rohrig, Helmut; Salz, Ulrich; Gwinner, Lutz; and Oppawsky, Steffen, 4,890,997, Cl. 425-174.000.
H. B. Fuller Company: *See*—
Markevka, Virginia C.; Mackey, Sandra J.; and Bunnelle, William L., 4,891,269, Cl. 428-423.000.
Vander Giessen, Michael J.; Hume, Robert M., III; and Jannusch, Leonard C., 4,890,444, Cl. 55-498.000.
H-D Tech Inc.: *See*—
Dong, Dennis F.; and Clifford, Arthur L., 4,891,107, Cl. 204-296.000.
H. Stoll GmbH & Co.: *See*—
Essig, Horst, 4,890,462, Cl. 66-196.000.
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., to Habley Medical Technology Corporation. Manually evacuated suction tube. 4,890,627, Cl. 128-765.000.
Haber, Terry M.; and Foster, Clark B., to Habley Medical Technology Corp. Storage container for blood collection devices. 4,890,765, Cl. 221-25.000.
Habley Medical Technology Corporation: *See*—
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 4,890,627, Cl. 128-765.000.
Haber, Terry M.; and Foster, Clark B., 4,890,765, Cl. 221-25.000.
Hack, Joachim: *See*—
Hitzfeld, Michael; Grau, Werner; and Hack, Joachim, 4,891,114, Cl. 204-192.150.
Hadfield, Donald A.: *See*—
Briggs, Kerry D.; and Hadfield, Donald A., 4,890,867, Cl. 285-256.000.
Haga, Tomoyuki; Ozaki, Naotake; Koinuma, Kazushi; Fujima, Masatoshi; and Suzuki, Seishi, to Shiseido Company Limited; and Toppan Printing Company Limited. Dispensing and closing package for liquid products. 4,890,770, Cl. 222-109.000.
Hagiwara, Masahiro: *See*—
Chonan, Kanroku; Koyama, Kazuyuki; and Hagiwara, Masahiro, 4,891,138, Cl. 210-675.000.
Hahn, Clive: *See*—
Albery, Wyndham J.; Coombs, Anthony J. M.; Drummond, Humphrey J. J.; and Hahn, Clive, 4,891,102, Cl. 204-1.00T.
Hahn, Torbjorn. Rock chamber structure for storing gas or liquid. 4,890,956, Cl. 405-55.000.
Haines, Robert C., to Dunlop Limited. Games racket. 4,891,175, Cl. 264-154.000.
Hake, Lawrence W. Endoscope construction with means for controlling rigidity and curvature of flexible endoscope tube. 4,890,602, Cl. 128-4.000.
Hakko Metal Industries Limited: *See*—
Yoshimura, Hiroshi, 4,891,497, Cl. 219-241.000.
Hakky, Said I., to Northstar Research Institute, Ltd. Continuous glucose monitoring and a system utilized therefor. 4,890,621, Cl. 128-635.000.
Halbritter, Klaus; and Eggersdorfer, Manfred, to BASF Aktiengesellschaft. Preparation of 4,4-dimethyltetrahydrofuran-2,3-dione. 4,891,435, Cl. 549-313.000.
Hall, Lars, to RAGN-SELLSFORETAGEN AB. Method of controlling the flow of landfill gas from sanitary landfills and apparatus for performing the method. 4,890,672, Cl. 166-250.000.
Halliburton Logging Services, Inc.: *See*—
Ip, Matthew, 4,891,640, Cl. 340-853.000.
Halton Oy: *See*—
Aalto, Erkki; Pellinen, Teuvo; and Eloranta, Jouko, 4,890,544, Cl. 98-36.000.
Halttula, Kyosti, to Oy Tampella AB. Press roll for a paper machine. 4,890,372, Cl. 29-123.000.
Hamada, Akiyoshi; and Yagoto, Mitsutoshi, to Minolta Camera Kabushiki Kaisha. Image recorder with microstep driven motor transport. 4,891,653, Cl. 346-108.000.
Hamada, Masanori; Inoue, Takeahi; Isobe, Mitsuo; Ninomiya, Yuichi; Obtsuka, Yoshimichi; and Izumi, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Receiving system for band-compression image signal. 4,891,699, Cl. 358-136.000.
Hamada, Tetsurou; Masuda, Katsuhiko; Shibuya, Kazunori; Shimada, Kazuhiko; and Tokushima, Shoiji, to Honda Giken Kogyo Kabushiki Kaisha. Drive mode selecting system for four-wheel-drive motor vehicle. 4,890,686, Cl. 180-233.000.
Hamamatsu Photonics Kabushiki Kaisha: *See*—
Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,891,579, Cl. 324-96.000.
Takiguchi, Yoshihiro, 4,891,581, Cl. 324-96.000.
Hamamoto, Masato: *See*—
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Haman, David F.; and Noble, Mark C., to Outboard Marine Corporation. Marine propeller including fish line trap. 4,891,026, Cl. 440-73.000.
Hammel, William S.; Lawson, Donald B.; and Van Patten, Keith W., to Unico, Inc. Linear resolver utilizing plural nulled coil sets. 4,891,590, Cl. 324-207.000.
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., to Rubbermaid Commercial Products Inc. Extendable keyboard support assembly. 4,890,561, Cl. 108-137.000.
Hamrick, Richard L., Jr.: *See*—
Heiges, Charles W.; and Hamrick, Richard L., Jr., 4,890,408, Cl. 43-3.000.
Hanada, Masayuki: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.
Hanamura, Shoji; Kubotera, Masaaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Static type semiconductor memory with multi-stage sense amplifier. 4,891,792, Cl. 365-189.050.
Handte, Reinhard: *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Burstell, Helmut; Bauer, Klaus; and Bieringer, Hermann, 4,891,057, Cl. 71-72.000.
Hanke, David E.: *See*—
Perdelwitz, Lee E., Jr.; and Hanke, David E., 4,891,454, Cl. 428-137.000.
Hanks, Charles W. Magnetic correcting fence for adjacent e-guns. 4,891,821, Cl. 373-16.000.
Hanley, John J.: *See*—
Birring, Anmol S.; Alcazar, David G.; Hendrix, Gary J.; and Hanley, John J., 4,890,496, Cl. 73-597.000.
Hans, Waldemar: *See*—
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Hansen, Kenneth A., to Motorola, Inc. Fully synchronized programmable counter with a near 50% duty cycle output signal. 4,891,825, Cl. 377-52.000.
Hansler, Richard L.: *See*—
Ahlgren, Frederic F.; Davenport, John M.; Hansler, Richard L.; and Karikas, John J., 4,891,555, Cl. 313-634.000.
Hara, Akio: *See*—
Nakai, Tetsuo; Hara, Akio; and Yazu, Shuji, 4,890,782, Cl. 228-112.000.
Hara, Hajime; Toya, Tomohiro; Iida, Shigeki; and Satoh, Tetsuo, to Nippon Oil Company, Ltd. Cholesteric liquid crystal polyester. 4,891,418, Cl. 528-195.000.
Hara, Tomoyuki, to Nissan Motor Company, Ltd. Transfer unit for four wheel drive automotive vehicle drive train. 4,890,509, Cl. 74-710.500.
Harada, Katsuhito: *See*—
Tsukada, Masamichi; Oishi, Konosuke; Harada, Katsuhito; and Okumoto, Toyoharu, 4,890,919, Cl. 356-312.000.
Harada, Kazumasa: *See*—
Takahashi, Koichi; Okutsu, Kazuo; Ide, Yoshihiro; Takei, Hiroshi; Ishida, Yukio; and Harada, Kazumasa, 4,891,089, Cl. 156-522.000.
Harada, Kazuya: *See*—
Nagatsu, Yoshirou; Nagamoto, Akiyoshi; Harada, Kazuya; and Mukouyama, Hideaki, 4,891,440, Cl. 560-222.000.
Harada, Masasuke; Kumagawa, Hiroshi; and Izumi, Junji, to Nippon Rubber Co., Ltd. Shoe for sports involving running. 4,890,397, Cl. 36-30.00R.
Harakas, Nicholaos K.: *See*—
Schaumann, Jon P.; Olander, Jitka V.; Harakas, Nicholaos K.; and Feder, Joseph, 4,891,312, Cl. 435-7.000.
Harakawa, Yoshio: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Oguchi, Masahiro; and Harakawa, Yoshio, 4,891,068, Cl. 75-251.000.
Harakon, Katsuyuki; and Yamada, Shigeki, to Bridgestone Corporation. Reinforcing laminate for tire and heavy duty pneumatic radial tire using the same. 4,890,659, Cl. 152-531.000.
Harary, Cathy: *See*—
Harary, Eli D.; Harary, Cathy; Madnick, Peter A.; and Sherwood, Russell W., 4,890,878, Cl. 296-153.000.
Harary, Eli D.; Harary, Cathy; Madnick, Peter A.; and Sherwood, Russell W. Vehicular armrest. 4,890,878, Cl. 296-153.000.
Harashima, Yasuhiro: *See*—
Takahashi, Hideaki; Wakahara, Takashi; and Harashima, Yasuhiro, 4,890,476, Cl. 72-456.000.
Hardy, Jean-Marie, to Societe De Realisations Electro-Mecaniques Sorem. External fixation device intended for orthopedic use. 4,890,631, Cl. 606-59.000.
Harnischfeger Corporation: *See*—
Stera, Joseph E., 4,890,750, Cl. 212-153.000.
Harrar, Jackson E.: *See*—
Rigdon, Lester P.; Harrar, Jackson E.; Bullock, Jack C., Sr.; and McGuire, Raymond R., 4,891,124, Cl. 204-435.000.
Harrington, Christopher T. Collapsible beach chair. 4,890,882, Cl. 297-45.000.
Harris Corporation: *See*—
Clark, Jack E., II; Lee, Jeffrey C.; and Doyle, Brent R., 4,891,606, Cl. 330-288.000.
Cotreau, Gerald M., 4,891,604, Cl. 330-252.000.

Harris, James E.: *See—*
Clendenning, Robert A.; Harris, James E.; Kelsey, Donald R.; Matzner, Markus; Robeson, Lloyd M.; Winslow, Paul A.; and Maruca, Louis M., 4,891,167, Cl. 560-52.000.
Harris, Robert L. Folding ironing board. 4,890,704, Cl. 190-11.000.
Harrison, Michael A.: *See—*
Farris, Mark S.; and Harrison, Michael A., 4,890,507, Cl. 74-594.800.
Harrison, Richard H., Jr.: *See—*
Kaplan, Vladimir; and Harrison, Richard H., Jr., 4,891,169, Cl. 261-30.000.
Hartinger, Johann: *See—*
Frisch, Helmuth; Hartinger, Johann; and Weber, Alois, 4,890,468, Cl. 72-21.000.
Hartland, Frederick G.: *See—*
Bucciili, Theodore A.; and Hartland, Frederick G., 4,890,411, Cl. 43-42.060.
Hartmann, Uwe: *See—*
Dieterle, Franz, Hartmann, Uwe; and Mai, Udo, 4,891,707, Cl. 358-190.000.
Harwood, Van N., Jr., to Figgie International, Inc. High flow chemical oxygen generator assembly. 4,891,189, Cl. 422-165.000.
Hasaa, Syed R.: *See—*
Beach, John R.; Hasaa, Syed R.; Noren, Donald W.; Hindman, Craig A.; and Santi, Ernest S., 4,890,968, Cl. 411-531.000.
Hascher-Reichl, Asta; and Kubach, Hans, to Robert Bosch GmbH. Valve with membrane spring. 4,890,815, Cl. 251-129.150.
Hasebe, Atsushi, to Sony Corporation. Apparatus for arithmetic processing. 4,891,779, Cl. 364-754.000.
Hasegawa, Jun: *See—*
Saito, Katsuyuki; Kanno, Masahide; Uehara, Masao; Sasaki, Masahito; Sasagawa, Katsuyoshi; Yamashita, Shinji; Uchikubo, Akinobu; and Hasegawa, Jun, 4,891,697, Cl. 358-98.000.
Uchikubo, Akinobu; Uehara, Masao; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahito; Saito, Katsuyuki; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,891,695, Cl. 358-98.000.
Hasegawa, Kenji: *See—*
Tanaka, Akira; and Hasegawa, Kenji, 4,890,364, Cl. 24-673.000.
Hasegawa, Shizuo; and Matsuoka, Nobuo, to Canon Kabushiki Kaisha. Color image reading apparatus with plural linear sensors which can read different lines of the image. 4,891,690, Cl. 358-75.000.
Hashidate, Yuji: *See—*
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 4,890,899, Cl. 350-173.000.
Hashimoto, Takashi: *See—*
Ohkawa, Hideo; Chikushi, Masakuni; Nakamura, Hironori; Funayama, Shinji; Hashimoto, Takashi; and Hirai, Takahiro, 4,891,399, Cl. 523-200.000.
Hashimoto, Yutaka; Yamoto, Masanobu; Umeba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, to Dainippon Ink & Chemicals, Inc.; and Yamamura Glass Co., Ltd. Method of increasing the dynamical strength of glass container. 4,891,241, Cl. 427-44.000.
Haslett, Glenn M., to Caterpillar Inc. Track roller assembly. 4,890,892, Cl. 305-25.000.
Hata, Kazuo, to Daiwa Shinku Corp. Electrostatic display element. 4,891,635, Cl. 340-783.000.
Hata, Takuoki, to Matsushita Electric Industrial Co., Ltd. Oxide semiconductor for thermistor and manufacturing method thereof. 4,891,158, Cl. 252-518.000.
Hatae, Shinkichi, to Sansho Seiyaku Co., Ltd. Method of minimizing erythema and elastosis. 4,891,361, Cl. 514-58.000.
Hathaway, Richard C., to C. R. & I., Inc. Retention device for application to control cylinders. 4,890,703, Cl. 188-300.000.
Hathorn, William, to General Electric Company. Internal combustion engine with valve. 4,890,585, Cl. 123-48.00A.
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Turner, Michael R., 4,890,553, Cl. 101-389.100.
Heather Ruth Davis 1982 Trust, The: *See—*
Davis, Allen V. C., 4,891,479, Cl. 200-81.00R.
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Heckenkamp, Daniel P.; and Briggs, Roger J., to Eaton Corporation. Ambient compensator for thermal overload relay. 4,891,621, Cl. 337-49.000.
Heger, Winfried, to Hubtex Maschinenbau GmbH. Warp-beam lifting and transport carriage. 4,890,971, Cl. 414-546.000.
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Hemseth, Klaus H., to Columbia Gas Service System Corporation. High temperature convection furnace. 4,891,008, Cl. 432-148.000.
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Hering, Walton C. Attachment for round hay baler. 4,890,449, Cl. 56-341.000.
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Cook, William; Herman, Jack; Rowe, Donald; and Sylvanowicz, John, 4,890,623, Cl. 128-642.080.
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Campbell, John W., 4,891,508, Cl. 250-221.000.
Felps, Jimmie D., 4,891,607, Cl. 330-296.000.
Kato, Jeff J.; Ruska, David W.; and Van Maren, David J., 4,891,784, Cl. 364-900.000.
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Bentley, Joseph R.; and Kovalcheck, Steven W., 4,890,898, Cl. 350-96.230.
Hickman, John B.; and Ferg, Nelson M., to W. P. Hickman Company. Fascia assembly and method of making same. 4,890,426, Cl. 52-58.000.
Higaki, Yuzo: *See—*
Tanikawa, Keiichi; Fujioka, Yuji; Higaki, Yuzo; and Goto, Hiroyuki, 4,891,161, Cl. 252-56.00S.
Higuchi, Seijun; Asakawa, Kenichi; Ohmori, Takayuki; Umeno, Koji; Okada, Nobuyoshi; Fujinaga, Minoru; Yamamoto, Fumio; and Yabe, Katsuhiko, to Nippon Steel Corporation. Hot-dip aluminum coated steel sheet having excellent corrosion resistance and heat resistance. 4,891,274, Cl. 428-653.000.
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Hildebrand, Otto, to Sulzer-Escher Wyss GmbH. Apparatus for retaining a partition foil. 4,891,100, Cl. 162-343.000.
Hillis, James E.: *See—*
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Hirai, Kazuo; and Matsushita, Takao, to Toray Silicone Company, Ltd. Thermosetting organopolysiloxane composition. 4,891,393, Cl. 523-212.000.
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Hirai, Takahiro: *See—*
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Hirano, Yoshihiko: *See—*
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Hiroki, Masashi, to Kabushiki Kaisha Toshiba. Scanning apparatus. 4,891,669, Cl. 355-235.000.
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Hirschberger, Michael: *See—*
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Hatori, Kouichi; and Shimomura, Raiji, 4,891,765, Cl. 364-513.000.
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Ishibashi, Hiroyuki; Shimizu, Kazushi; Susa, Kenzo; and Kubota, Shinzou, 4,891,520, Cl. 250-367.000.
Iwai, Kazumi; Arai, Akira; Koizumi, Hiromi; and Wada, Katsuo, 4,890,453, Cl. 60-39.465.
Kitamori, Takehiko; Yasuda, Kazuo; Nomura, Yasushi; Suzuki, Kazumichi; and Fujimori, Haruo, 4,890,925, Cl. 356-432.000.
Kobayashi, Tohru; Hamamoto, Masato; and Yamada, Toshio, 4,891,531, Cl. 307-278.000.
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Mimata, Tsutomu; Uematsu, Toshihide; and Tabata, Katsuhiro, 4,890,780, Cl. 228-4.500.
Nakamura, Tomoharu; Irokawa, Hiroyuki; Mashiko, Syoichi; Shimamura, Hidehiko; and Tsutsumi, Hirofumi, 4,891,570, Cl. 323-210.000.
Nishioka, Yasushiro; Shinriki, Hiroshi; Sakuma, Noriyuki; and Mukai, Kiichiro, 4,891,684, Cl. 357-51.000.
Ooe, Kimio; Amano, Nobutaka; Kubo, Takashige; and Moriwaki, Kaoru, 4,891,773, Cl. 364-578.000.
Otomo, Shigekazu; Nakatani, Ryoichi; Kumasaka, Noriyuki; Saito, Noritoshi; Kobayashi, Toshio; and Fujishiro, Masahiko, 4,891,278, Cl. 428-681.000.
Shimizu, Norio; Fukuzono, Shinichi; Nishimura, Nobuko; Odawara, Yoji; and Sumitani, Tomoaki, 4,891,310, Cl. 435-3.000.
Tanaka, Akira; Shimada, Satoshi; Yamada, Kazuji; Nakagawa, Yusaku; Nishihara, Motohisa; Miyoshi, Tadahiko; Baba, Noboru; Kagohara, Hiromi; and Inamura, Ichiro, 4,891,831, Cl. 378-125.000.
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Hauba, Michael; Herold, Friedrich; Krieg, Claus-Peter; Skaletz, Detlef; and Wildhardt Juergen, 4,891,135, Cl. 210-500.380.
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Burstell, Helmut; Bauer, Klaus; and Bieringer, Hermann, 4,891,057, Cl. 71-72.000.
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Wingen, Rainer; Dubal, Hans-Rolf; Escher, Claus; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,891,151, Cl. 252-299.610.
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Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, to BASF Aktiengesellschaft. Preparation of vinyl ethers. 4,891,451, Cl. 568-691.000.
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Hoerner, L. Jeanne. Trash bag support sleeve. 4,890,652, Cl. 141-10.000.
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Hoffman, Craig O. Device for eliminating malodorous smells. 4,890,791, Cl. 239-44.000.
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Hoffman, Wayne C.: *See—*
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Hoffmann-La Roche Inc.: *See—*
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Hofmeister, Rodney V. Wind propelled sailing craft. 4,890,570, Cl. 114-39.100.
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Hohmann, Engen; Behringer, Wolfgang; and Preuss, Manfred, to Siemens Aktiengesellschaft. Device for separating solids from liquids in a dental apparatus. 4,891,041, Cl. 494-62.000.

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Holden, W. Bruce. Display holder for eyeglasses. 4,890,745, Cl. 211-13.000.
Holder, Garry N.: *See*—
Oloff, Clarence M.; Moss, William G.; Holder, Garry N.; and Hermsmeyer, Linda M., 4,890,579, Cl. 119-103.000.
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Holtermann, Theodore J., to Outboardmarine Corporation. Fuel residual handling system. 4,890,587, Cl. 123-73.00A.
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujii, Takaaki; Miura, Seishi; and Tsukui, Takaaki, 4,890,586, Cl. 123-52.00M.
Hamada, Tetsurou; Masuda, Katsuhiko; Shibuya, Kazunori; Shimada, Kazuhiko; and Tokushima, Shoiji, 4,890,686, Cl. 180-233.000.
Hattori, Torao; and Kanehara, Shigeru, 4,891,039, Cl. 474-242.000.
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Hoover Group, Inc.: *See*—
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Waltke, David L., 4,890,756, Cl. 220-66.000.
Hoover, Steven J. Hitch pin. 4,890,854, Cl. 280-504.000.
Hoover University, Inc.: *See*—
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Tsurukiri, Shigeru; Sugita, Hiroshi; Yamamoto, Toshio; Kawasaki, Masaru; and Horie, Eiji, 4,891,296, Cl. 430-142.000.
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Horna, Udo; Srebny, Hans-Gunther; and Yahlensieck, Hans-Joachim, to Huels Troisdorf AG. Alcohol-free orthoesters of zirconium and hafnium and method for the preparation thereof. 4,891,439, Cl. 556-54.000.
Horvath, Edward; and Spector, George. Door latch. 4,890,868, Cl. 292-67.000.
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Hosono, Masayuki; Hiramoto, Jun; and Tozaki, Takashi, to SMC Corporation. Tube joint for use with multi-walled tube assembly. 4,890,865, Cl. 285-133.100.
Hou, Jack. Ornamental display assembly. 4,890,828, Cl. 272-31.00R.
Houdek, Merle E.: *See*—
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Howard, Willis: *See*—
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Howells, Roger A.: *See*—
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Hsei, Paul K.: *See*—
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Hsu, Charles J. Mechanism which reacts to the presence of oil and/or water. 4,890,485, Cl. 73-61.10R.
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Huang, Alan; Knauer, Scott C.; O'Neill, Jay H.; Rutledge, Charles W.; Lin, Sheng L.; Ransom, Maurice N.; and Spanke, Ronald A., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Packet switching network. 4,891,803, Cl. 370-60.000.
Huang, Tien T. Measurement indicating gauge. 4,890,572, Cl. 116-298.000.
Hubbell Incorporated: *See*—
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Huber, Joel E.: *See*—
VanRheenen, Verlan H.; and Huber, Joel E., 4,891,426, Cl. 540-4.000.
Hubscher, Thomas T. Apparatus for performing determinations of immune reactants in biological fluids. 4,891,321, Cl. 435-293.000.
Hubtex Maschinenbau GmbH: *See*—
Heger, Winfried, 4,890,971, Cl. 414-546.000.
Hucul, Dennis A., to Dow Chemical Company, The. Redispersal of Ru, Os, Rh and Pd catalysts and processes therewith. 4,891,346, Cl. 502-35.000.
Hudson, Alice P.: *See*—
Woodward, Fred E.; and Hudson, Alice P., 4,891,143, Cl. 252-8.750.
Huels Aktiengesellschaft: *See*—
Bittacheidt, Josef; Horlbeck, Gernot; and Mumcu, Salih, 4,891,406, Cl. 525-64.000.
Huels Troisdorf AG: *See*—
Horns, Udo; Srebny, Hans-Gunther; and Yahlensieck, Hans-Joachim, 4,891,439, Cl. 556-54.000.
Hughes Aircraft Company: *See*—
Cross, Eugene W., Jr., 4,890,901, Cl. 350-168.000.
Domnikov, Larissa, 4,891,106, Cl. 204-30.000.
Longerich, Ernest P., 4,891,688, Cl. 357-82.000.
Miller, Leroy J.; van Ast, Camille; and Yamagishi, Frederick G., 4,891,152, Cl. 252-299.010.
Reeds, John W., 4,891,526, Cl. 250-442.100.
Huijsing, Johan H., to Bronkhorst High-Tech B.V. Direction-sensitive flow-rate indicator. 4,890,489, Cl. 73-204.240.
Hultgren, Kent G.: *See*—
McLaurin, Leroy D.; Williams, Roland E.; Donlan, John P.; and Hultgren, Kent G., 4,890,978, Cl. 415-209.400.
Hume, Robert M., III: *See*—
Vander Giessen, Michael J.; Hume, Robert M., III; and Jannusch, Leonard C., 4,890,444, Cl. 55-498.000.
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Bremecker, Klaus-Dieter; Hungerer, Klaus-Dieter; and Ronneberger, Hansjorg, 4,891,226, Cl. 424-434.000.
Hunt, William G. Pipe repair apparatus and method. 4,890,373, Cl. 29-402.090.
Hunter Automated Machinery Corporation: *See*—
Hunter, William A., 4,890,664, Cl. 164-182.000.
Hunter, William A., to Hunter Automated Machinery Corporation. Automatic matchplate molding system. 4,890,664, Cl. 164-182.000.
Huntington Mechanical Laboratories, Inc.: *See*—
Balter, Valentin, 4,891,516, Cl. 250-310.000.
Hupfer, Leopold: *See*—
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,891,451, Cl. 568-691.000.
Hurlock, Arthur C. Camper shell. 4,890,879, Cl. 296-180.200.
Hush, Glen E.; Mailloux, Jeffrey S.; and Cloud, Eugene H., to Micron Technology, Inc. Three port random access memory. 4,891,794, Cl. 365-189.040.
Hutch, Frederick S. Multiplexer with leakage current compensation. 4,891,807, Cl. 370-112.000.
Hutchinson, Frank D.: *See*—
Schmidt, William P.; Hutchinson, Frank D.; and Malcomson, Kirk, 4,890,909, Cl. 350-616.000.
Hutchinson, Jack M. Remote control ligher-than-air toy. 4,891,029, Cl. 446-58.000.
Huybrechts, Jozef T.; Louis van den Boach, Guido R.; and Landriette Verhaegen, Rudolf F., to Du Pont de Nemours, E. I., and Company. Pigment dispersant resin with P-containing acid. 4,891,401, Cl. 524-807.000.
Hydro-Quebec: *See*—
Naranacic, Vojislav; and Fecteau, Gilles, 4,890,380, Cl. 29-623.000.
Hyoty, Paavo; Uppstu, Erik; and Saiha, Erik, to Oy Tampella AB. Method for regulating, the feeding-in or combustion conditions of concentrated spent liquors. 4,891,097, Cl. 162-31.000.
Iams, John F.; and Splane, Robson L., Jr., to Superspine. User controlled device for decompressing the spine. 4,890,606, Cl. 128-75.000.
Ichikawa, Kimio: *See*—
Takashima, Masanobu; Iwakura, Ken; Satomura, Masato; and Ichikawa, Kimio, 4,891,297, Cl. 430-177.000.
Ichimaru, Kazuhiro: *See*—
Takahashi, Shuji; Suzuki, Yasuo; Ogawa, Hiroyasu; and Ichimaru, Kazuhiro, 4,891,267, Cl. 428-367.000.

Ichimura, Kunihiro; Itoh, Hiroshi; Nakazato, Shuuichi; and Takazawa, Hideaki. Saponified polyvinyl acetate derivatives which are photosensitive resin compositions. 4,891,300, Cl. 430-283.000.
ICI Americas Inc.: *See*—
Gosciniak, Donald J.; Cleary, Thomas P.; and Phalangas, Charlambos J., 4,891,212, Cl. 424-59.000.
Wee, Siok H. H., 4,891,058, Cl. 71-118.000.
Ide, Yoshihiro: *See*—
Takahashi, Koichi; Okutsu, Kazuo; Ide, Yoshihiro; Takei, Hiroshi; Ishida, Yukio; and Harada, Kazumasa, 4,891,089, Cl. 156-522.000.
Igarashi, Yoshiaki: *See*—
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Ihara, Keita: *See*—
Yohda, Hiroshi; Takahashi, Ken; Sawai, Eisuke; Muraoka, Syunsaku; and Ihara, Keita, 4,890,379, Cl. 29-603.000.
Iida, Katsumi: *See*—
Takasi, Osawa; and Iida, Katsumi, 4,890,460, Cl. 62-180.000.
Iida, Shigeki: *See*—
Hara, Hajime; Toya, Tomohiro; Iida, Shigeki; and Satoh, Tetsuo, 4,891,418, Cl. 528-195.000.
Iijima, Yasno, to Kabushiki Kaisha Toshiba. Data writing system for EEPROM. 4,891,791, Cl. 365-189.010.
Iizuka, Yoshio: *See*—
Nakamura, Norio; Ookawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, 4,891,363, Cl. 514-94.000.
Ikeda Bussan Co., Ltd.: *See*—
Sakamoto, Manabu, 4,890,880, Cl. 296-214.000.
Ikeda, Miyuki, to Hitachi, Ltd. #6 Control circuit for horizontal oscillator. 4,891,608, Cl. 331-20.000.
Ikeya, Taichi: *See*—
Ohsumi, Hisayoshi; and Ikeya, Taichi, 4,890,656, Cl. 144-350.000.
Illinois Tool Works Inc.: *See*—
Beach, John R.; Hasan, Syed R.; Noren, Donald W.; Hindman, Craig A.; and Santi, Ernest S., 4,890,968, Cl. 411-531.000.
Nation, Melvin S.; and Krawczyk, Robert W., 4,891,476, Cl. 200-11.00R.
Imada, Takehiko: *See*—
Sato, Shozo; Shimoyama, Toshikazu; Shono, Susumu; Matsumoto, Osa; Kamei, Hiromasa; and Imada, Takehiko, 4,891,493, Cl. 219-137.00R.
Imafuku, Ichiei; and Hans, Waldemar, to Robert Bosch GmbH. Perforated body for a fuel injection valve. 4,890,794, Cl. 239-533.120.
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, to Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Jukogyo Kabushiki Kaisha; Sakai Chemical Industry Co., Ltd.; Catalysts & Chemicals Industries, Co., Ltd.; and Mitsubishi Petrochemical Engineering Co., Ltd. Catalyst for removing nitrogen oxides in exhaust gases. 4,891,348, Cl. 502-309.000.
Imatsu, Tsuneo: *See*—
Nohira, Tadashi; Imatsu, Tsuneo; and Kagami, Ikuzo, 4,891,519, Cl. 250-349.000.
Imazeki, Kazuyoshi; and Nagazumi, Yasuo, to General Research of Electronics, Inc. Digital image exchange system. 4,891,633, Cl. 340-717.000.
Imel, Michael T.: *See*—
Budde, David; Riches, Robert; Imel, Michael T.; Myers, Glen; and Lai, Konrad, 4,891,753, Cl. 364-200.000.
ImmuDyne, Inc.: *See*—
Donzis, Byron A., 4,891,220, Cl. 424-88.000.
Imperial Chemical Industries PLC: *See*—
Carr, Robin A. E.; and Powell, Lyn, 4,891,450, Cl. 568-649.000.
Cooper, John, 4,891,072, Cl. 106-90.000.
Page, Darrin J.; and Rennison, Stuart C., 4,891,285, Cl. 430-14.000.
IMS Ionen Mikrofabrikations Systeme Gesellschaft GmbH: *See*—
Stengl, Gerhard; and Loschner, Hans, 4,891,547, Cl. 313-407.000.
Ina, Kenzoh; Ishizawa, Yasuhisa; and Kuo, Hideo, to Canon Kabushiki Kaisha. Image processing system with designatable output location and output resolution control. 4,891,634, Cl. 340-723.000.
Ina, Teruo: *See*—
Ito, Hiroki; and Ina, Teruo, 4,890,575, Cl. 118-723.000.
Inaba, Yoshiharu; and Tokunaga, Shigeo, to Fanuc Ltd. Product ejector for injection molding machine. 4,891,002, Cl. 425-556.000.
Inamura, Ichiro: *See*—
Tanaka, Akira; Shimada, Satoshi; Yamada, Kazuji; Nakagawa, Yusaku; Nishihara, Motohisa; Miyoshi, Tadahiko; Baba, Noboru; Kagohara, Hiromi; and Inamura, Ichiro, 4,891,831, Cl. 378-125.000.
Indal Technologies Inc.: *See*—
Burgess, R. Anthony; Cunliffe, Geoffrey; and Tadros, Atef, 4,890,802, Cl. 244-115.000.
Ingersoll-Rand Company: *See*—
Heald, Charles C.; and Dahl, Trygve, 4,890,980, Cl. 416-181.000.
Miller, Bernard F.; Sawyer, John A.; and Webber, Wayne F., 4,890,542, Cl. 92-194.000.
Innes, Robert A.; Zones, Stacey I.; and Nacamuli, Gerald J. Liquid phase alkylation or transalkylation process using zeolite beta. 4,891,458, Cl. 585-323.000.
Innotag Inc.: *See*—
Mercier, Francois, 4,890,955, Cl. 405-37.000.
Inoue, Akihisa: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Oguchi, Masahiro; and Harakawa, Yoshio, 4,891,068, Cl. 75-251.000.
Inoue, Koichi: *See*—
Takagawa, Ryozo; Tanabe, Hisaki; Inoue, Koichi; and Umemoto, Hirotoshi, 4,891,419, Cl. 528-274.000.
Inoue MTP Kabushiki Kaisha: *See*—
Katayama, Kenji, 4,890,431, Cl. 52-208.000.
Inoue, Takeshi: *See*—
Hamada, Masanori; Inoue, Takeshi; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,891,699, Cl. 358-136.000.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See*—
Daverio, Jean-Claude; and Rocchi, Dominique, 4,890,503, Cl. 73-866.500.
Institut Francais du Petrole: *See*—
Duret, Pierre, 4,890,594, Cl. 123-531.000.
Fajula, Francois; Figueras, Francois; Moudafi, Latifa; Vera Pacheco, Mercedes; Nicolas, Serge; Dufresne, Pierre; and Gueguen, Claude, 4,891,200, Cl. 423-328.000.
Intel Corporation: *See*—
Budde, David; Riches, Robert; Imel, Michael T.; Myers, Glen; and Lai, Konrad, 4,891,753, Cl. 364-200.000.
Mallik, Debendra; and Bhattacharyya, Bidyut K., 4,891,687, Cl. 357-70.000.
Interatom GmbH: *See*—
Yarahmadi, Mohamed, 4,890,663, Cl. 164-98.000.
International Business Machines Corporation: *See*—
Ash, Kevin J.; Derenburger, Jack H.; and Parsons, Raymond L., 4,891,811, Cl. 371-21.200.
Derr, Andrew G.; and McLaughlin, Charles A., 4,891,766, Cl. 364-513.000.
Edel, Thomas R.; and Pascoe, Robert A., 4,891,771, Cl. 364-523.000.
Hoffman, Roy L.; Houdek, Merle E.; and Soltis, Frank G., 4,891,749, Cl. 364-200.000.
Mitchell, Joan L.; and Pennebaker, William B., 4,891,643, Cl. 341-107.000.
International Lead Zinc Research Organization, Inc.: *See*—
Goodwin, Frank E., 4,891,284, Cl. 429-226.000.
International Wholesale, Inc.: *See*—
Swoboda, James J., 4,890,701, Cl. 188-218.0XL.
Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha. Center differential for four-wheel drive vehicle. 4,890,510, Cl. 74-711.000.
Ip, Matthew, to Halliburton Logging Services, Inc. High temperature and pressure fiber optic feedthrough for borehole usage. 4,891,640, Cl. 340-853.000.
Ireson, Robert C. J.: *See*—
Waggott, Ralph; and Ireson, Robert C. J., 4,891,484, Cl. 219-10.61R.
Irokawa, Hiroyuki: *See*—
Nakamura, Tomoharu; Irokawa, Hiroyuki; Mashiko, Syoichi; Shimamura, Hidehiko; and Tsutsumi, Hirofumi, 4,891,570, Cl. 323-210.000.
Isasi Capelo, Elida S.; and Isasi Capelo, Maria E. Human centrifugation machine. 4,890,629, Cl. 128-897.000.
Isasi Capelo, Maria E.: *See*—
Isasi Capelo, Elida S.; and Isasi Capelo, Maria E., 4,890,629, Cl. 128-897.000.
Iscar Ltd.: *See*—
Satran, Amir, 4,890,523, Cl. 82-158.000.
Ishibashi, Hiroyuki; Shimizu, Kazushi; Susa, Kenzo; and Kubota, Shinzou, to Hitachi, Ltd. Radiation detector. 4,891,520, Cl. 250-367.000.
Ishibashi, Masayasu: *See*—
Tanaka, Michio; Kurano, Yoshito; Taniguchi, Katsuo; and Ishibashi, Masayasu, 4,891,453, Cl. 568-805.000.
Taniguchi, Katsuo; Tanaka, Michio; Takahata, Kazunori; Sakamoto, Naoya; Takai, Toshihiro; Kurano, Yoshito; and Ishibashi, Masayasu, 4,891,465, Cl. 585-463.000.
Ishida, Tomoaki; and Nishioka, Kyusaku, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for plasma treatment. 4,891,095, Cl. 156-643.000.
Ishida, Yukio: *See*—
Takahashi, Koichi; Okutsu, Kazuo; Ide, Yoshihiro; Takei, Hiroshi; Ishida, Yukio; and Harada, Kazumasa, 4,891,089, Cl. 156-522.000.
Ishigami, Takashi: *See*—
Shimotori, Kazumi; Ochi, Yoshiharu; Ishihara, Hideo; Umeki, Takenori; and Ishigami, Takashi, 4,891,066, Cl. 75-84.000.
Ishiguro, Katsusuke, to Paloma Kogyo Kabushiki Kaisha. Pulse combustion device. 4,891,003, Cl. 431-1.000.
Ishihara, Hideo: *See*—
Shimotori, Kazumi; Ochi, Yoshiharu; Ishihara, Hideo; Umeki, Takenori; and Ishigami, Takashi, 4,891,066, Cl. 75-84.000.
Ishii, Hiroichi: *See*—
Ota, Akiho; Sugiura, Hiroaki; and Ishii, Hiroichi, 4,890,752, Cl. 215-1.00C.
Ishii, Kazuhiro: *See*—
Gb-Kita, Motomu; Ishii, Kazuhiro; Kato, Masaaki; and Kobayashi, Masao, 4,891,347, Cl. 502-206.000.
Ishii, Keisuke: *See*—
Ohno, Katsuhiko; Ishii, Keisuke; and Etoh, Motoaki, 4,890,583, Cl. 123-41.700.
Ishii, Tatsushi, to Nissan Motor Co., Ltd. Apparatus for blow moulding hollow article. 4,891,000, Cl. 425-522.000.
Ishii, Yasutaka, to Sun-Petrochemicals Co., Ltd. Process for producing alkylidenenorbornenes. 4,891,460, Cl. 585-360.000.
Ishikawa, Kiyomitsu; Tanabe, Tohru; Kimura, Shigeru; and Yamada, Kazuhiko, to Stanley Electric Co., Ltd. Rearward vehicle obstruc-

tion detector using modulated light from the brake light elements. 4,891,624, Cl. 340-436.000.

Ishikawa, Osamu, to Matsushita Electric Industrial Co., Ltd. Apparatus for measuring noise characteristics. 4,891,577, Cl. 324-73.00R.

Ishioka, Hidenori: *See—*
Matsuda, Kenji; Okada, Tetsuji; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,890,545, Cl. 98-39.100.

Ishizawa, Yasuhisa: *See—*
Ina, Kenzoh; Ishizawa, Yasuhisa; and Kuo, Hideo, 4,891,634, Cl. 340-723.000.

Ishizu, Hideyuki: *See—*
Nishimura, Katsuhide; Kunugiza, Motoyasu; Shirota, Hiroharu; and Ishizu, Hideyuki, 4,891,421, Cl. 528-370.000.

Ishizu, Hisao; Shibano, Tomobumi; Sagawa, Yasuhiro; and Komai, Hiroshi, to Ricoh Company, Ltd. Electrostatic recording apparatus having a cooled and insulated waste toner container. 4,891,678, Cl. 355-285.000.

Isobe, Mitsuo: *See—*
Hamada, Masanori; Inoue, Takeshi; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,891,699, Cl. 358-136.000.

Isomura, Shigenori: *See—*
Iwamoto, Shinichi; Isomura, Shigenori; Takao, Mitsunori; and Kamai, Kenichiro, 4,890,590, Cl. 123-198.00D.

Israel, Bert L. Mulching attachment for lawn mowers. 4,890,446, Cl. 56-17.500.

Itaba, Yasushi: *See—*
Saitoh, Keichiro; Itaba, Yasushi; Izawa, Minoru; and Yoshino, Tadao, 4,891,173, Cl. 264-22.000.

Ital Idee s.r.l., An Italian Limited Liability Company: *See—*
Cantoni, Angelo, 4,890,463, Cl. 62-238.300.

Ito, Hideya, to Mitsubishi Denki Kabushiki Kaisha. Punch press forming CRT shadow masks. 4,890,471, Cl. 72-348.000.

Ito, Hiroki; and Ina, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Thin film forming device. 4,890,575, Cl. 118-723.000.

Ito, Kanehiro: *See—*
Nishikawa, Hirotaka; Ukai, Sadao; and Ito, Kanehiro, 4,890,452, Cl. 57-276.000.

Ito, Noriki; Nagano, Yoshinobu; Tanaka, Akihiro; Numasaki, Yoso; and Takahashi, Koichiro, to Yamanouchi Pharmaceutical Co., Ltd. Phenoxy imidazole compound. 4,891,432, Cl. 548-341.000.

Ito, Sadanobu: *See—*
Teramoto, Tomihiko; Ono, Hidehiko; Ito, Sadanobu; and Nishino, Kiyoshi, 4,890,804, Cl. 246-453.000.

Ito, Takatoshi; Yoshida, Akihiro; Shimazaki, Kazunori; and Hattori, Shuzo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Hattori, Shuzo. Substrate of a hybrid ic, method of forming a circuit pattern and apparatus of forming the same. 4,891,242, Cl. 427-53.100.

Ito, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens system capable of wide-angle viewing for high zoom ratio. 4,890,904, Cl. 350-427.000.

Itoh, Hiroshi: *See—*
Ichimura, Kunihiro; Itoh, Hiroshi; Nakazato, Shuuichi; and Takazawa, Hideaki, 4,891,300, Cl. 430-283.000.

ITT Corporation: *See—*
Amith, Avraham; Naselli, Charles; and Nevin, C. Scott, 4,890,933, Cl. 374-121.000.

Iwahashi, Kenji, to Shimadzu Corporation. X-ray reflective mask and system for image formation with use of the same. 4,891,830, Cl. 378-35.000.

Iwai, Kazumi; Arai, Akira; Koizumi, Hiromi; and Wada, Katsuo, to Hitachi, Ltd. Method and apparatus for burning gaseous fuel, wherein fuel composition varies. 4,890,453, Cl. 60-39.465.

Iwakura, Ken: *See—*
Takashima, Masanobu; Iwakura, Ken; Satomura, Masato; and Ichikawa, Kimio, 4,891,297, Cl. 430-177.000.

Iwamasa, Akiyoshi, to Fujitsu Limited. Magnetic brush developing device. 4,891,671, Cl. 355-245.000.

Iwamoto, Mitoshi, to NEC Corporation. Coupled-cavity delay line for traveling-wave tube. 4,891,556, Cl. 315-3.500.

Iwamoto, Ross Y.: *See—*
Dillon, Diane M.; and Iwamoto, Ross Y., 4,891,049, Cl. 44-53.000.

Iwamoto, Shinichi; Isomura, Shigenori; Takao, Mitsunori; and Kamai, Kenichiro, to Nippondenso Co., Ltd. Fail-safe method and apparatus for internal combustion engines. 4,890,590, Cl. 123-198.00D.

Iwatsuki, Kunihiro: *See—*
Taniguchi, Hiroji; and Iwatsuki, Kunihiro, 4,890,515, Cl. 74-866.000.

Izawa, Minoru: *See—*
Saitoh, Keichiro; Itaba, Yasushi; Izawa, Minoru; and Yoshino, Tadao, 4,891,173, Cl. 264-22.000.

Izumi Automotive Industry Co., Ltd.: *See—*
Kudou, Masaaki; and Ogiwara, Tosio, 4,890,543, Cl. 92-228.000.

Izumi, Junji: *See—*
Harada, Masasuke; Kumagawa, Hiroshi; and Izumi, Junji, 4,890,397, Cl. 36-30.00R.

Izumi, Yoshinori: *See—*
Hamada, Masanori; Inoue, Takeshi; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,891,699, Cl. 358-136.000.

J. L. Wickham Co., Inc., The: *See—*
Wickham, John L., 4,890,514, Cl. 74-822.000.

Jabarin, Saleh A.: *See—*
Ajmera, Prakash R.; and Jabarin, Saleh A., 4,891,178, Cl. 264-521.000.

Jackson, Elizabeth M., to Kimberly-Clark Corporation. Surgical drape with means for channeling and collecting fluids. 4,890,628, Cl. 128-849.000.

Jacobs, Malin L.; and Milano, Umberto, to United States of America, Interior. Ground-based transmission line conductor motion sensor. 4,891,576, Cl. 324-72.000.

Jacobs, Robert C. Garden hoes for hoeing, sickleing, chipping, and cutting. 4,890,679, Cl. 172-371.000.

Jacobs Suchard GmbH: *See—*
Meerkatz, Joachim; and Clausing, Gerhard, 4,890,441, Cl. 53-456.000.

Jaeger, Kirk A.; Peleg, Yigal; and Popp, David R., to Stouffer Corporation, The. Disposable microwave heating receptacle and method of using same. 4,891,482, Cl. 219-10.55E.

Jalkio, Jeffrey A.: *See—*
Case, Steven K.; Keil, Robert E.; and Jalkio, Jeffrey A., 4,891,772, Cl. 364-562.000.

Jalon, Michel, to Petrel. Security markings, material provided with security marks, and apparatus to detect the security mark. 4,891,505, Cl. 235-491.000.

James, David F., to Paw Products, Inc. Transformable container. 4,890,576, Cl. 119-1.000.

James, Hardin T., Jr.: *See—*
Wagner, Todd M.; James, Hardin T., Jr.; Ayers, Thomas G.; Breese, Dennis B.; and Durand, Gordon A., 4,890,547, Cl. 98-42.130.

James River Corporation: *See—*
Smart, Allen A.; ; ; and , 4,890,439, Cl. 53-410.000.

James Walker & Company Limited: *See—*
Eason, Raymond J. H., 4,890,849, Cl. 277-27.000.

Janda, Dennis J., to B. F. Goodrich Company, The. Bulk polymerized cycloolefin monomers containing microencapsulated blowing agents. 4,891,387, Cl. 521-54.000.

Jang, Long-Kuan: *See—*
Sadeghi, Mohammad-Ali; Sadeghi, Kazem; Kuo, Jih-Fen; Jang, Long-Kuan; and Yen, Teh Fu, 4,891,131, Cl. 208-390.000.

Janko, Bozidar; and Smith, Kenneth R., to Tektronix, Inc. Multiple lead probe for integrated circuits in wafer form. 4,891,585, Cl. 324-158.00P.

Jannusch, Leonard C.: *See—*
Vander Giessen, Michael J.; Hume, Robert M., III; and Jannusch, Leonard C., 4,890,444, Cl. 55-498.000.

Janoff, Andrew S.; Popescu, Mircea C.; Weiner, Alan L.; Bolscak, Lois E.; Tremblay, Paul A.; and Swenson, Christine E., to Liposome Company, Inc., The. Steroidal liposomes. 4,891,208, Cl. 424-1.100.

Jansson, Peter. Wind turbine. 4,890,976, Cl. 415-4.400.

Jaouadi, Mahmoud: *See—*
Barcelo, Gerard; Castro, Bertrand; Jaouadi, Mahmoud; Martinez, Jean; Senet, Jean-Pierre; and Sennyey, Gerard, 4,891,430, Cl. 548-259.000.

Japan LSI Co., Ltd.: *See—*
Zimmerman, Dennis M.; and Mitch, Charles H., 4,891,379, Cl. 514-315.000.

Japan Steel Works, Ltd., The: *See—*
Shimizu, Nobuaki, 4,890,996, Cl. 425-145.000.

Jaramillo, Jorge: *See—*
DiMaio, John; Wernic, Dominik M.; and Jaramillo, Jorge, 4,891,358, Cl. 514-13.000.

Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., to U.S. Philips Corporation. Method of and circuit arrangement for controlling a switching network in a switching system. 4,891,802, Cl. 370-60.000.

Jastrzebski, Lubomir L., to General Electric Company. Method for making a silicon-on-insulator substrate. 4,891,092, Cl. 156-610.000.

Jehle, Franz; and Drescher, Roland, to Licentia Patent-Verwaltungs-GmbH. Aircraft radar arrangement. 4,891,648, Cl. 342-20.000.

Jergl, Joseph J.; and Kump, William H., to GNB Incorporated. Pressure release system for electric storage batteries. 4,891,270, Cl. 429-53.000.

Jewell, Thomas L., to Gascard, Inc. Distributed authorization system. 4,891,503, Cl. 235-380.000.

JLG Industries, Inc.: *See—*
Oakman, Willard R., 4,890,692, Cl. 182-141.000.

Joh. A. Benckiser GmbH: *See—*
Gross, Wolfgang; Mueller, Manfred; Ahnsorge, Harald; and Zott, Andrea, 4,891,150, Cl. 252-142.000.

Johannes, Lourence C. Bags. 4,890,736, Cl. 206-390.000.

John Brown Inc.: *See—*
Brown, Gaylord W.; and Arends, Albert, 4,890,524, Cl. 83-615.000.

Johnson, Chris; Keefover, Larry; and Austin, Buddy J., to White Consolidated Industries, Inc. Anti-tip bracket for ranges. 4,890,813, Cl. 248-680.000.

Johnson, Harold R., III: *See—*
Carrigan, Erwin R.; Johnson, Harold R., III; and Phillips, Allyn E., 4,890,504, Cl. 74-458.000.

Johnson, John L., to United States of America, Army. Parallel neural network for a full binary adder. 4,891,782, Cl. 364-786.000.

Johnson & Johnson Patient Care, Inc.: *See—*
Saferstein, Lowell; and Wolf, Stephen J., 4,891,359, Cl. 514-21.000.

Johnson, Paul B.; Mininger, Robert F.; Lane, Steven R.; and Lamb, Edwin, to Texas Instruments Incorporated. Automated flow solder machine. 4,890,781, Cl. 228-7.000.

Johnson, Randall C.: *See—*
Call, Duane B.; Mudrow, Alfred; Johnson, Randall C.; and Bennion, Robert F., 4,891,751, Cl. 364-200.000.

Johnson, Randall E.: *See—*
Davis, Cecil J.; Spencer, John E.; Bonifield, Thomas D.; Jucha, Rhett B.; Stiltz, William J.; Johnson, Randall E.; Whetsel, Joseph E.; and Jones, John I., 4,891,087, Cl. 156-345.000.

Johnson, Robert M.; and Spector, George. Automatic tank reading gauge. 4,890,493, Cl. 73-321.000.

Johnson, Roland: *See—*
Garza, Cesar M.; Douglas, Monte A.; and Johnson, Roland, 4,891,303, Cl. 430-312.000.

Johnston, David F.; and Fox, Robert L., to United States of America, National Aeronautics and Space Administration. Nonintrusive method and apparatus for monitoring the cure of polymeric materials. 4,891,591, Cl. 324-234.000.

Jones, Christopher C., to British Aerospace PLC. Anti-lighting strike fasteners for composite material aircraft structures. 4,891,732, Cl. 361-218.000.

Jones, David; Atherton, Russel P.; and McDowall, Mark A., to VG Instruments Group Limited. Sohition analyzing mass spectrometer. 4,891,515, Cl. 250-288.000.

Jones, Gordon R.; Moruzzi, James L.; and Prasad, Akkanapragada N., to University of Liverpool, The. Device and method for determining displacement. 4,891,509, Cl. 250-226.000.

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Jones, John I.: *See—*
Davis, Cecil J.; Spencer, John E.; Bonifield, Thomas D.; Jucha, Rhett B.; Stiltz, William J.; Johnson, Randall E.; Whetsel, Joseph E.; and Jones, John I., 4,891,087, Cl. 156-345.000.

Jones, Keith E.: *See—*
Gleason, K. Reed; Jones, Keith E.; and Strid, Eric W., 4,891,612, Cl. 333-33.000.

Jones, Richard G. Sawbuck construction and bracket. 4,890,952, Cl. 403-172.000.

Jonsson, Ann-Sofi: *See—*
Eriksson, Sture; Jonsson, Ann-Sofi; and Jonsson, Bengt, 4,890,550, Cl. 100-37.000.

Jonsson, Bengt: *See—*
Eriksson, Sture; Jonsson, Ann-Sofi; and Jonsson, Bengt, 4,890,550, Cl. 100-37.000.

Joo, Louis A.; Tucker, Kenneth W.; and Shaner, Jay R., to Great Lakes Carbon Corporation. Fuel cell plate separator. 4,891,279, Cl. 429-40.000.

Jordan, David D., to Allied-Signal Inc. Master cylinder and reservoir connection. 4,890,456, Cl. 60-585.000.

Jose, Joseph A.: *See—*
Debuisson, Michael; Jose, Joseph A.; and Rigo, Marcel, 4,890,723, Cl. 198-716.000.

Jour, Jean-Paul: *See—*
Salvaire, Andre; Jour, Jean-Paul; and Orban, Jacques, 4,890,927, Cl. 366-1.000.

Journe, Paul: *See—*
Pincent, Bernard; Journe, Paul; and Brugnot, Gerard, 4,890,488, Cl. 73-189.000.

Jucha, Rhett B.: *See—*
Davis, Cecil J.; Spencer, John E.; Bonifield, Thomas D.; Jucha, Rhett B.; Stiltz, William J.; Johnson, Randall E.; Whetsel, Joseph E.; and Jones, John I., 4,891,087, Cl. 156-345.000.
Davis, Cecil J.; and Jucha, Rhett B., 4,891,488, Cl. 219-121.400.

Jungfer, Hans; and Brauer, Olaf, to Linde Aktiengesellschaft. Plural absorption stages for hydrogen purification. 4,891,187, Cl. 423-248.000.

Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, to L'Oreal. 2,4-Diamino-1,3,5-trimethoxybenzene, process for its preparation and its use as a coupler in oxidation dyes for keratinous fibres. 4,891,045, Cl. 8-411.000.

K. W. Thompson Tool Co., Inc.: *See—*
French, Kendrick L., 4,890,406, Cl. 42-90.000.

Kabe, Kazuyuki; Koishi, Masataka; and Takahashi, Ken, to Yokohama Rubber Co., Ltd., The. Pneumatic radial tire. 4,890,658, Cl. 152-209.00D.

Kabelmetal Electro GmbH: *See—*
Fischer, Werner; Schauer, Friedrich; and Kramer, Kurt, 4,890,697, Cl. 188-1.110.

Kabushiki Kaisha Chubu Bearing Seisakusho: *See—*
Tanaka, Koichi, 4,890,943, Cl. 384-572.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Miura, Hideki; and Ookubo, Mamoru, 4,890,706, Cl. 192-3.280.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Kitano, Seiichi; and Asada, Masaaki, 4,890,708, Cl. 192-70.300.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Katsuta, Masanori; Yamaguchi, Tsutomu; Tamai, Yutaka; and Kamimura, Norizo, 4,890,533, Cl. 84-439.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Yoshimura, Shoji, 4,890,991, Cl. 418-201.00B.

Kabushiki Kaisha Kobe Seikosho: *See—*
Zimmerman, Dennis M.; and Mitch, Charles H., 4,891,379, Cl. 514-315.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Kamijima, Tadashi, 4,890,528, Cl. 84-95.200.

Kabushiki Kaisha Toshiba: *See—*
Baba, Hiroyuki; and Matsuzaki, Takashi, 4,891,333, Cl. 437-173.000.
Baba, Mitsuhiro, 4,891,708, Cl. 358-195.100.
Baba, Tatsuro, 4,891,691, Cl. 358-75.000.
Hiroki, Masashi, 4,891,669, Cl. 355-235.000.
Iijima, Yasuo, 4,891,791, Cl. 365-189.010.
Kasai, Toshihiro, 4,891,657, Cl. 346-160.100.
Mitomi, Michio, 4,891,596, Cl. 324-318.000.
Miyoshi, Akio, 4,891,780, Cl. 364-766.000.
Noudan, Yoshimasa, 4,891,703, Cl. 358-142.000.
Ohashi, Hiroshi; and Kusunoki, Masahiro, 4,891,721, Cl. 360-103.000.
Okumura, Katsuya; and Tezaki, Atsumu, 4,891,560, Cl. 315-111.410.
Shimotori, Kazumi; Ochi, Yoshiharu; Ishihara, Hideo; Umeki, Takenori; and Ishigami, Takashi, 4,891,066, Cl. 75-84.000.
Yoshimatsu, Kenzo, 4,891,506, Cl. 235-492.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Ito, Takatoshi; Yoshida, Akihiro; Shimazaki, Kazunori; and Hattori, Shuzo, 4,891,242, Cl. 427-53.100.
Kobayashi, Hisao; Kawai, Katsunori; Tanikawa, Masayuki; and Deguchi, Hiroyuki, 4,890,458, Cl. 62-204.000.
Mitsuya, Kinpei, 4,890,650, Cl. 139-116.00A.

Kabushiki Kaishia Tekune Yohkoh: *See—*
Nagaya, Kazuhiko; Sakurai, Hiroshi; and Michell, Andrew K., 4,891,574, Cl. 324-61.00P.

Kachi, Shyogo: *See—*
Kinoshita, Satoshi; Kachi, Shyogo; and Shimizu, Yoshiyuki, 4,890,505, Cl. 74-493.000.

Kadleck, Richard G.; and Nowak, William W., to Shelby Paper Box Co., The. Cardboard display container with contents retaining means. 4,890,737, Cl. 206-427.000.

Kafer, Kenneth G.: *See—*
May, Ronald F.; Kafer, Kenneth G.; Schuelke, Gregory W.; and Verstegen, Michael T., 4,891,743, Cl. 363-87.000.

Kagami, Ikuzo: *See—*
Nohira, Tadashi; Imatsu, Tsuneo; and Kagami, Ikuzo, 4,891,519, Cl. 250-349.000.

Kagi, Beat; and Oswald, Peter, to Rieter Maschinenfabrik AG. Apparatus for monitoring lap formation on a roll for guiding a textile sliver. 4,890,359, Cl. 19-265.000.

Kagohara, Hiromi: *See—*
Tanaka, Akira; Shimada, Satoshi; Yamada, Kazuji; Nakagawa, Yusaku; Nishihara, Motohisa; Miyoshi, Tadahiko; Baba, Noboru; Kagohara, Hiromi; and Inamura, Ichiro, 4,891,831, Cl. 378-125.000.

Kaiser, Elmar, Jr. Thermometer hood ornament. 4,891,252, Cl. 428-31.000.

Kajima Corporation: *See—*
Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, 4,890,430, Cl. 52-167.0CB.

Kakabaker, Kenneth G.: *See—*
Calafell, Dag O., II; and Kakabaker, Kenneth G., 4,890,941, Cl. 384-480.000.

Kakimi, Fujio, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent and polymerizable compound. 4,891,295, Cl. 430-138.000.

Kakodkar, Sunil: *See—*
Stobaugh, John F.; and Kakodkar, Sunil, 4,891,323, Cl. 436-86.000.

Kali-Chemie Pharma GmbH: *See—*
Thies, Peter W.; David, Samuel; Hell, Insa; and Wolf, Klau U., 4,891,384, Cl. 514-456.000.

Kalinowski, Robert E.: *See—*
Graiver, Daniel; and Kalinowski, Robert E., 4,891,388, Cl. 521-64.000.
Graiver, Daniel; and Kalinowski, Robert E., 4,891,389, Cl. 521-64.000.

Kalra, Satya P., to University of Florida. Methods and compositions for stimulation of appetite. 4,891,357, Cl. 514-12.000.

Kamada, Yutaka: *See—*
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,891,241, Cl. 427-44.000.

Kamagata, Shuichi: *See—*
Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, 4,890,430, Cl. 52-167.0CB.

Kamai, Kenichiro: *See—*
Iwamoto, Shinichi; Isomura, Shigenori; Takao, Mitsunori; and Kamai, Kenichiro, 4,890,590, Cl. 123-198.00D.

Kamei, Hiromasa: *See—*
Sato, Shozo; Shimoyama, Toshikazu; Shono, Susumu; Matsumoto, Osa; Kamei, Hiromasa; and Imada, Takehiko, 4,891,493, Cl. 219-137.00R.

Kamenskikh, Vasily A.: *See—*
Losev, German P.; Kamenskikh, Vasily A.; Vaisberg, Pavel M.; and Kharin, Boris N., 4,890,477, Cl. 73-9.000.

Kameyama, Makoto: *See—*
Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takashi; Kameyama, Makoto; and Niizuma, Kiyozumi, 4,890,378, Cl. 29-603.000.

Kamieniecki, Emil; Goldfarb, William C.; and Wollowitz, Mike, to Semitest, Inc. Apparatus for making surface photovoltage measurements of a semiconductor. 4,891,584, Cl. 324-158.00R.

Kamijima, Tadashi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box having a generator. 4,890,528, Cl. 84-95.200.

Kamimura, Norizo: *See—*
Katsuta, Masanori; Yamaguchi, Tsutomu; Tamai, Yutaka; and Kamimura, Norizo, 4,890,533, Cl. 84-439.000.

Kamiwaki, Tadayoshi; and Hoshika, Takumi, to Sumimoto Heavy Industries, Ltd. Belt clamp type unloader. 4,890,721, Cl. 198-626.000.

Kamiya, Shigemitsu: *See—*
Satoh, Masaki; Kamiya, Shigemitsu; Fujie, Nobuo; and Tabuchi, Shuji, 4,891,334, Cl. 437-228.000.
Kamo, Masayoshi: *See—*
Sato, Tadashi; Nishikasa, Keiichi; and Kamo, Masayoshi, 4,891,727, Cl. 360-137.000.
Kamyr Aktiebolag: *See—*
Eriksson, Sture; Jonsson, Ann-Sofi; and Jonsson, Bengt, 4,890,550, Cl. 100-37.000.
Kanai, Nobuo, to Minolta Camera Kabushiki Kaisha. Illumination device for copying apparatus and the like. 4,891,664, Cl. 355-67.000.
Kanari, Yukiharu: *See—*
Tagawa, Itsuo; Kanari, Yukiharu; Kanno, Samon; and Kozaki, Takaharu, 4,890,798, Cl. 241-266.000.
Kanbayashi, Hideyuki, to Minolta Camera Kabushiki Kaisha. Copying machine in which copying magnification can be easily set. 4,891,670, Cl. 355-243.000.
Kane, John P., to Allied Automation Systems, Inc. Wheel turnover device. 4,890,717, Cl. 198-403.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Okada, Wataru; Yasui, Hideo; and Miki, Yasuhiro, 4,890,929, Cl. 366-160.000.
Kanehara, Shigeru: *See—*
Hattori, Torao; and Kanehara, Shigeru, 4,891,039, Cl. 474-242.000.
Kaneiwa, Shinji: *See—*
Yoshida, Toshihiko; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,891,816, Cl. 372-50.000.
Kanno, Masahide: *See—*
Saito, Katsuyuki; Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Sasagawa, Katsuyoshi; Yamashita, Shinji; Uchikubo, Akinobu; and Hasegawa, Jun, 4,891,697, Cl. 358-98.000.
Uchikubo, Akinobu; Uehara, Masao; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Saito, Katsuyuki; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,891,695, Cl. 358-98.000.
Kanno, Samon: *See—*
Tagawa, Itsuo; Kanari, Yukiharu; Kanno, Samon; and Kozaki, Takaharu, 4,890,798, Cl. 241-266.000.
Kano, Takenori; Kobayashi, Koji; Sumiya, Koji; Kubo, Seitoku; and Watanabe, Kazuaki, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Hydraulic servo for friction coupling element of automatic transmission. 4,890,512, Cl. 74-740.000.
Kanoh, Toshiyuki, to NEC Corporation. Circuit for comparing magnitudes of binary signals. 4,891,334, Cl. 307-355.000.
Kansai Chemical Engineering Co., Ltd.: *See—*
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,891,236, Cl. 426-330.400.
Kanto Bunkiki Kabushiki Kaisha: *See—*
Teramoto, Tomihiko; Ono, Hidehiko; Ito, Sadanobu; and Nishino, Kiyoshi, 4,890,804, Cl. 246-453.000.
Kao, Jamee; and Hsu, Joseph C. S. Apparatus for making deep flute shade. 4,890,775, Cl. 223-32.000.
Kaplan, Vladimir; and Harrison, Richard H., Jr., to AMSTED Industries Inc. Transition duct for centrifugal fan. 4,891,169, Cl. 261-30.000.
Kapples, Lawrence J.: *See—*
Beatty, William E., Jr.; Kapples, Lawrence J.; Gula, Lance; and Changle, Joseph F., 4,891,617, Cl. 335-46.000.
Karikas, John J.: *See—*
Ahlgren, Frederic F.; Davenport, John M.; Hansler, Richard L.; and Karikas, John J., 4,891,555, Cl. 313-634.000.
Karl, Rupert; and Becker, Rudolf, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Spinning machine with a device to service spinning and winding stations. 4,890,450, Cl. 57-1.00R.
Karr, Stephen L., Jr.; Benjamini, Elizer; Scibienski, Robert J.; and Grimes, Stephen, to Ashton Corporation. Method for immunization against and treatment of infection by ectoparasites and endoparasites. 4,891,219, Cl. 424-85.800.
Kass-Technoplan GmbH: *See—*
Nickel, Klaus-Dietrich, 4,891,038, Cl. 474-166.000.
Kasai, Toshihiro, to Kabushiki Kaisha Toshiba. Apparatus for forming an image. 4,891,657, Cl. 346-160.100.
Kasanami, Toru: *See—*
Fukuda, Susumu; Ariyoshi, Hisashi; and Kasanami, Toru, 4,890,370, Cl. 29-25.350.
Kaschig, Jurgen, to Ciba-Geigy Corporation. Optically active styrene derivatives, polymers obtained from these, compleaes with iridium(I) and their use. 4,891,412, Cl. 526-265.000.
Kashiwa, Masaharu: *See—*
Tanaka, Cyuzaburo; Yazama, Teruyoshi; Miyajima, Yoshiki; Kashiwa, Masaharu; and Sugai, Hiroshi, 4,891,163, Cl. 252-627.000.
Kashiwazaki, Takashi; and Ando, Hitoshi, to Pioneer Electronic Corporation. On-board navigation system for motor vehicles. 4,891,760, Cl. 364-443.000.
Katao, Masaaki: *See—*
Sasaki, Toshio; Katao, Masaaki; Kawai, Kiyoshi; and Shiga, Akinobu, 4,891,411, Cl. 526-119.000.
Katayama, Kenji, to Inoue MTP Kabushiki Kaisha. Window molding. 4,890,431, Cl. 52-208.000.
Kathrya L. Acuff Trust No. 2, The: *See—*
Davis, Allen V. C., 4,891,479, Cl. 200-81.00R.
Kato, Hajime: *See—*
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,891,236, Cl. 426-330.400.
Kato, Hrioshi; and Komatsu, Keiichi. Process for dyeing fibers with a dye liquor containing granules of silica gel. 4,891,047, Cl. 8-632.000.
Kato, Jeff J.; Ruska, David W.; and Van Maren, David J., to Hewlett-Packard Company. High capacity tape drive transparently writes and reads large packets of blocked data between interblock gaps. 4,891,784, Cl. 364-900.000.
Kato, Keishi: *See—*
Shiozawa, Etsuo; Kato, Keishi; and Yoshimi, Yoshiki, 4,891,677, Cl. 355-280.000.
Kato, Masaaki: *See—*
Oh-Kita, Motomu; Ishii, Kazuhiro; Kato, Masaaki; and Kobayashi, Masao, 4,891,347, Cl. 502-206.000.
Kato, Taro, to Kitakamiseishi Kabushiki Kaisha. Deodorizing material. 4,891,215, Cl. 424-76.500.
Kato, Yuji, to Nissan Motor Co., Ltd. Control system for automotive automatic transmission including downshift select shock suppression arrangement. 4,891,759, Cl. 364-424.100.
Katsumura, Norimichi: *See—*
Takamura, Yoshinobu; Katsumura, Norimichi; Osawa, Nobuhiko; and Watanabe, Kazuo, 4,891,824, Cl. 375-104.000.
Katsuta, Masanori; Yamaguchi, Tsutomu; Tamai, Yutaka; and Kamimura, Norizo, to Kabushiki Kaisha Kawai Gakki Seisakusho. Key device for electronic keyboard musical instrument. 4,890,533, Cl. 84-439.000.
Kaul, Roger: *See—*
Saddow, Stephen E.; Garver, Robert V.; and Kaul, Roger, 4,891,730, Cl. 361-111.000.
Kaun, Thomas D.; and Mrazek, Franklin C., to United States of America, Energy. Cathode for molten carbonate fuel cell. 4,891,280, Cl. 429-41.000.
Kautz, Allan D.; and Steiner, Johann, to Zenith Electronics Corporation. Shielding means and process for use in the manufacture of tension mask color cathode ray tubes. 4,891,028, Cl. 445-30.000.
Kawada, Tsutomu; and Nakamura, Yasuo, to Nakamura, Yasuo. Suture needle and its manufacturing process. 4,890,614, Cl. 600-339.000.
Kawaguchi, Sigeo: *See—*
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,891,241, Cl. 427-44.000.
Kawai, Katsunori: *See—*
Kobayashi, Hisao; Kawai, Katsunori; Tanikawa, Masayuki; and Deguchi, Hiroyuki, 4,890,458, Cl. 62-204.000.
Kawai, Kiyoshi: *See—*
Sasaki, Toshio; Katao, Masaaki; Kawai, Kiyoshi; and Shiga, Akinobu, 4,891,411, Cl. 526-119.000.
Kawai, Yoichi: *See—*
Abe, Masaru; Kawai, Yoichi; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,891,392, Cl. 523-200.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Sakaguchi, Akira; and Koie, Hideaki, 4,890,785, Cl. 228-232.000.
Tamba, Shinichi; Yamane, Yoshiro; and Yamakawa, Tetsuhiro, 4,890,584, Cl. 123-41.700.
Kawasaki, Masaru: *See—*
Tsurukiri, Shigeru; Sugita, Hiroshi; Yamamoto, Toshio; Kawasaki, Masaru; and Horie, Eiji, 4,891,296, Cl. 430-142.000.
Kawata, Kazuhide: *See—*
Suzuki, Hiroyuki; and Kawata, Kazuhide, 4,891,705, Cl. 358-148.000.
Kawata, Koichi: *See—*
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 4,890,899, Cl. 350-173.000.
Kawazoe, Akio, to Oki Electric Industry Co., Ltd. Voltage to pulse-width conversion circuit. 4,891,828, Cl. 377-114.000.
Keating, Kenneth P.: *See—*
Marquis, Edward T.; Keating, Kenneth P.; Knifton, John F.; Smith, William A.; Sanderson, John R.; and Lustri, Jonathan, 4,891,437, Cl. 549-529.000.
Keba, James M.: *See—*
Siwiak, Kazimierz; Keba, James M.; and Steel, Francis R., 4,891,637, Cl. 340-825.440.
Keefover, Larry: *See—*
Johnson, Chris; Keefover, Larry; and Austin, Buddy J., 4,890,813, Cl. 248-680.000.
Keeler, Harry A. Golf putter. 4,890,837, Cl. 273-81.400.
Kehl, Georg; and Siegel, Heinz, to Robert Bosch GmbH. Brake cylinder. 4,890,538, Cl. 91-376.00R.
Keil, Robert E.: *See—*
Case, Steven K.; Keil, Robert E.; and Jalkio, Jeffrey A., 4,891,772, Cl. 364-562.000.
Keith, Barry. Sculpting material and method of manufacture and use. 4,891,266, Cl. 428-331.000.
Keller, Jakob: *See—*
Fuglistaller, Cornel; Keller, Jakob; and Sattelmayer, Thomas, 4,890,793, Cl. 239-427.000.
Kellum, Wilbur J., III: *See—*
McCormick, Walter A. (Sunny); Langton, Douglas W.; Kellum, Wilbur J., III; Saunders, Thomas C.; and Phillips, Gregory, 4,890,825, Cl. 271-188.000.
Kelly, Eugene M.; and Barnett, Robert B., to Sea-Land Service, Inc. Apparatus for securing on-deck containers. 4,890,565, Cl. 114-72.000.
Kelly, James A.: *See—*
Westhoff, James; and Kelly, James A., 4,890,863, Cl. 285-39.000.
Kelly, William, to Science Accessories Corp. Sparking stylus for acoustic digitizer. 4,891,474, Cl. 178-18.000.

Kelsey, Donald R.: *See—*
Clendinning, Robert A.; Harris, James E.; Kelsey, Donald R.; Matzner, Markus; Robeson, Lloyd M.; Winslow, Paul A.; and Maresca, Louis M., 4,891,167, Cl. 560-52.000.
Kennecott Utah Copper Corporation: *See—*
Rappas, Alkis S.; and Waterman, Brett T., 4,891,067, Cl. 75-101.00R.
Kennedy, Larry Z.: *See—*
Webster, Lee O.; Kennedy, Larry Z.; and Duthie, Joseph G., 4,891,790, Cl. 365-127.000.
Kenrick, C. Robert: *See—*
Anderson, Charles B.; and Kenrick, C. Robert, 4,890,864, Cl. 285-121.000.
Kensey, Kenneth, to Kensey Nash Corporation. Device for sealing percutaneous puncture in a vessel. 4,890,612, Cl. 606-213.000.
Kensey Nash Corporation: *See—*
Kensey, Kenneth, 4,890,612, Cl. 606-213.000.
Kent, Gordon D., to Dielectric Labs, Inc. Evanescent mode tester for ceramic dielectric substrates. 4,891,573, Cl. 324-58.00R.
Kent State University: *See—*
Doane, J. William; Wenninger, Eugene P.; West, John; and Wu, Bao-Gang, 4,890,902, Cl. 350-347.00V.
Keritsis, George, to Carboloy Inc. Cutting fluid transporting device and cutting tools employing the same. 4,890,963, Cl. 408-59.000.
Kern, Bernhard. Body fitness training apparatus to exercise muscles. 4,890,830, Cl. 272-117.000.
Kershaw Manufacturing Company, Inc.: *See—*
Whitaker, John B., Jr., 4,890,557, Cl. 104-7.300.
Kewpie Kabushiki Kaisha: *See—*
Kurokawa, Toru; Watanabe, Hiroyuki; Tanaka, Shoichi; and Mitsui, Fumito, 4,891,238, Cl. 426-559.000.
Khainov, Vladimir I.: *See—*
Rasulev, Vadim A.; Khainov, Vladimir I.; and Abdukarimov, Erkin T., 4,891,486, Cl. 219-69.160.
Kharin, Boris N.: *See—*
Losev, German P.; Kamenskikh, Vasily A.; Vaisberg, Pavel M.; and Kharin, Boris N., 4,890,477, Cl. 73-9.000.
Khoobehi, Bahram: *See—*
Zeimer, Ran C.; Khoobehi, Bahram; and Peyman, Gholam A., 4,891,043, Cl. 604-20.000.
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co. Ltd. Heating apparatus for hyperthermia. 4,891,483, Cl. 219-10.55A.
Kiley, Matthew P.: *See—*
Scanga, Theodore P.; Kiley, Matthew P.; Metz, Robert J.; and Schultz, Fred R., 4,890,759, Cl. 220-273.000.
Kiliany, Gary J.: *See—*
Friedman, Mark B.; and Kiliany, Gary J., 4,891,630, Cl. 340-706.000.
Killat, Ulrich R. P.: *See—*
Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., 4,891,802, Cl. 370-60.000.
Kilpatrick, Steven C.; and Watson, Billy J., to Dow Chemical Company, The. Process for preparing tetrahalopyridines. 4,891,108, Cl. 204-157.710.
Kimberly-Clark Corporation: *See—*
Fahrenkrug, Anne M., 4,891,258, Cl. 428-138.000.
Jackson, Elizabeth M., 4,890,628, Cl. 128-849.000.
Kimura, Masao, to Amada Company, Limited. Gas laser generator. 4,891,814, Cl. 372-35.000.
Kimura, Shigeru: *See—*
Ishikawa, Kiyomitsu; Tanabe, Tohru; Kimura, Shigeru; and Yamada, Kazuhiko, 4,891,624, Cl. 340-436.000.
Kinch, John M.: *See—*
Grob, James T.; and Kinch, John M., 4,890,548, Cl. 99-408.000.
Kindig, Alan L.: *See—*
Boerema, Thomas L.; Kindig, Alan L.; and Gras, Jeffrey D., 4,890,883, Cl. 297-227.000.
King, Gary A.: *See—*
Medlin, William L.; and King, Gary A., 4,890,687, Cl. 181-106.000.
King, Lloyd H., Sr. Drainage valve. 4,890,640, Cl. 137-512.400.
King, Monroe L.: *See—*
Frisa, Larry E.; King, Monroe L.; and Sampayan, Stephen E., 4,891,525, Cl. 250-423.00R.
King Phoenix Co., Ltd.: *See—*
Chang, David, 4,891,632, Cl. 340-710.000.
King, Timothy P. Adjustable clothes dryer vent connection. 4,890,396, Cl. 34-235.000.
Kinoshita, Satoshi; Kachi, Shyogo; and Shimizu, Yoshiyuki, to Fuji Kiko Company, Limited. Structure of telescopic steering apparatus for a vehicle. 4,890,505, Cl. 74-493.000.
Kinsman, Grant: *See—*
Duley, Walter W.; and Kinsman, Grant, 4,891,491, Cl. 219-121.640.
Kinsworthy, Donald D., to Nu-Tech Industries, Inc. High efficiency blower. 4,890,598, Cl. 126-110.00D.
Kirakossian, Hrair: *See—*
Pease, John; Weng, Litai; Kirakossian, Hrair; and Ullman, Edwin F., 4,891,324, Cl. 436-519.000.
Kiri, Motosada, to Shimadzu Corporation. Radiation image detecting system. 4,891,844, Cl. 382-6.000.
Kirkham, Stanley W.: *See—*
Peacock, Donald G.; and Kirkham, Stanley W., 4,891,179, Cl. 264-565.000.
Kirwan, Lawrence T., Jr.: *See—*
Kirwan, Lawrence T., Sr.; and Kirwan, Lawrence T., Jr., 4,890,610, Cl. 606-51.000.
Kirwan, Lawrence T., Sr.; and Kirwan, Lawrence T., Jr. Bipolar forceps. 4,890,610, Cl. 606-51.000.
Kistner, David. Easy connection of dipper stick to tool of an earth working machine. 4,890,974, Cl. 414-723.000.
Kitagawa Industries Co., Ltd.: *See—*
Morita, Katsuyuki, 4,890,805, Cl. 248-74.200.
Kitahara, Akira: *See—*
Sakamoto, Michiru; Kitahara, Akira; Ueno, Hidetoshi; and Nagata, Sumio, 4,891,182, Cl. 419-2.000.
Kitakamiseishi Kabushiki Kaisha: *See—*
Kato, Taro, 4,891,215, Cl. 424-76.500.
Kitamori, Takehiko; Yasuda, Kazuo; Nomura, Yasushi; Suzuki, Kazumichi; and Fujimori, Haruo, to Hitachi, Ltd. Method and apparatus for detecting particular particulate substance. 4,890,925, Cl. 356-432.000.
Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Machine tool. 4,890,716, Cl. 198-346.100.
Kitamura Machinery Co., Ltd.: *See—*
Kitamura, Koichiro, 4,890,716, Cl. 198-346.100.
Kitano, Seiichi; and Asada, Masaaki, to Kabushiki Kaisha Daikin Seisakusho. Clutch having an adjustable lever mating with a diaphragm spring. 4,890,708, Cl. 192-70.300.
Kite, Joseph S., III; Conaghan, Thomas B., III; Cattell, John P.; and Develin, Richard B., to Bentley-Harris Manufacturing Co., The. Wraparound closure device and a method of making same. 4,891,256, Cl. 428-36.100.
Kiyama, Mitsushige: *See—*
yagi, Yoshitaka; Matsugi, Toramasa; and Kiyama, Mitsushige, 4,890,719, Cl. 198-507.000.
Klawinski, Gary M.: *See—*
Kuecker, Charles A.; and Klawinski, Gary M., 4,891,528, Cl. 250-548.000.
Klees, Kevin J., to Eastman Kodak Company. Apparatus for non-linear error diffusion thresholding of multilevel video images. 4,891,714, Cl. 358-456.000.
Kleinklaus, Norbert: *See—*
Ollat, Marc; and Kleinklaus, Norbert, 4,890,881, Cl. 297-26.000.
Kleinschnitz, Donald J.: *See—*
Ward, Leonard G.; Reidenauer, Ronald R.; and Kleinschnitz, Donald J., 4,891,240, Cl. 427-11.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Herchenbach, Horst; Wolter, Albrecht; and Rodenhauser, Fritz, 4,891,007, Cl. 432-14.000.
Klok, Robert: *See—*
Verrips, Cornelis T.; Ledeboer, Adrianus M.; Edens, Luppo; Klok, Robert; and Maat, Jan, 4,891,316, Cl. 435-69.100.
Knabenhans, Balz, to Dragerwerk Aktiengesellschaft. Supportive fastening means for a protective helmet. 4,890,338, Cl. 2-421.000.
Knauer, Scott C.: *See—*
Huang, Alan; Knauer, Scott C.; O'Neill, Jay H.; Rutledge, Charles W.; Lin, Sheng L.; Ransom, Maurice N.; and Spanke, Ronald A., 4,891,803, Cl. 370-60.000.
Knoesser, Karl; Kornaker, Walter; Lau, Bernhard; and Schanz, Werner, to Nokia Graetz. Electron gun system. 4,891,549, Cl. 313-414.000.
Knifton, John F.: *See—*
Lin, Jiang-Jen; and Knifton, John F., 4,891,442, Cl. 562-450.000.
Marquis, Edward T.; Keating, Kenneth P.; Knifton, John F.; Smith, William A.; Sanderson, John R.; and Lustri, Jonathan, 4,891,437, Cl. 549-529.000.
Knight, James A.; and Gorton, Charles W., to Georgia Tech Research Corporation. Oil production by entrained pyrolysis of biomass and processing of oil and char. 4,891,459, Cl. 585-240.000.
Knipper, Magali: *See—*
Chopin, Thierry; Garreau, Francois; Knipper, Magali; Nortier, Patrice; and Schuppiser, Jean-Luc, 4,891,350, Cl. 502-439.000.
Knoll, Richard, to Norsk Hydro a.s. Aluminum shapes coated with brazing material and process of coating. 4,891,275, Cl. 428-650.000.
Knorrich, Wolf-Dieter: *See—*
Heuberger, Erich; Knorrich, Wolf-Dieter; and Dziallas, Joachim W., 4,890,772, Cl. 222-156.000.
Knox, George J.: *See—*
Afflerbaugh, Martin G.; and Knox, George J., 4,891,018, Cl. 439-402.000.
Kobayashi, Akira: *See—*
Uesawa, Yutaka; Kobayashi, Akira; and Morimoto, Isamu, 4,891,309, Cl. 430-627.000.
Kobayashi, Hisao; Kawai, Katsunori; Tanikawa, Masayuki; and Deguchi, Hiroyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Refrigerating circuit for car air conditioning. 4,890,458, Cl. 62-204.000.
Kobayashi, Koji: *See—*
Kano, Takenori; Kobayashi, Koji; Sumiya, Koji; Kubo, Seitoku; and Watanabe, Kazuaki, 4,890,512, Cl. 74-740.000.
Kobayashi, Masahiro; Kobayashi, Noboru; Torikoshi, Kunikazu; and Uemura, Shigehiro, to Daikin Industries, Ltd. Thermal environment sensor with means to simulate emissivity of human body. 4,890,932, Cl. 374-109.000.
Kobayashi, Masao: *See—*
Oh-Kita, Motomu; Ishii, Kazuhiro; Kato, Masaaki; and Kobayashi, Masao, 4,891,347, Cl. 502-206.000.
Kobayashi, Masashi, to Maruman Golf Co., Ltd. Wood-type golf club head for number one golf club. 4,890,840, Cl. 273-167.00H.
Kobayashi, Noboru: *See—*
Kobayashi, Masahiro; Kobayashi, Noboru; Torikoshi, Kunikazu; and Uemura, Shigehiro, 4,890,932, Cl. 374-109.000.

Kobayashi, Tohru; Hamamoto, Masato; and Yamada, Toshio, to Hitachi, Ltd. ECL flip-flop with improved α-ray resistant properties. 4,891,531, Cl. 307-278.000.

Kobayashi, Toshio: *See*—
Otomo, Shigekazu; Nakatani, Ryoichi; Kumasaka, Noriyuki; Saito, Noritoshi; Kobayashi, Toshio; and Fujishiro, Masahiko, 4,891,278, Cl. 428-681.000.

Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, to Kajima Corporation. Device and method for protecting a building against earthquake tremors. 4,890,430, Cl. 52-167.0CB.

Kocal, Joseph A., to UOP. HF alkylation process. 4,891,466, Cl. 585-464.000.

Kodama, Teruo: *See*—
Seki, Yachibo; Kose, Saburo; and Kodama, Teruo, 4,891,174, Cl. 264-44.000.

Koenig, Peter: *See*—
Natter, Arthur, 4,890,581, Cl. 122-1.00A.

Koerts, Kees: *See*—
Oosterhuis, Nicolaas M. G.; and Koerts, Kees, 4,891,318, Cl. 435-104.000.

Kogo, Katsuyuki; and Miyasaka, Shinji, to Sumitomo Electric Industries, Ltd. Particle detector using inlet and outlet pipes as electrodes. 4,891,575, Cl. 324-71.400.

Koh-I-Noor Rapidograph, Inc.: *See*—
Micale, Fortunato J., 4,891,245, Cl. 427-213.300.

Kohjin Co., Ltd.: *See*—
Nagatsu, Yoshirou; Nagamoto, Akiyoshi; Harada, Kazuya; and Mukouyama, Hideaki, 4,891,440, Cl. 560-222.000.

Kohler, Gunter: *See*—
Walker, Michael; and Kohler, Gunter, 4,891,837, Cl. 379-390.000.

Koie, Hideaki: *See*—
Sakaguchi, Akira; and Koie, Hideaki, 4,890,785, Cl. 228-232.000.

Koike, Hiroyuki: *See*—
Nakamura, Norio; Ookawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, 4,891,363, Cl. 514-94.000.

Koinuma, Kazushi: *See*—
Haga, Tomoyuki; Ozaki, Naotake; Koinuma, Kazushi; Fujima, Masatoshi; and Suzuki, Seishi, 4,890,770, Cl. 222-109.000.

Koishi, Masataka: *See*—
Kabe, Kazuyuki; Koishi, Masataka; and Takahashi, Ken, 4,890,658, Cl. 152-209.00D.

Koizumi, Hiromi: *See*—
Iwai, Kazumi; Arai, Akira; Koizumi, Hiromi; and Wada, Katsuo, 4,890,453, Cl. 60-39.465.

Koizumi, Katsuyuki: *See*—
Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, 4,891,726, Cl. 360-130.230.

Kokkonen, Kari; Lethimaki, Martti; Tuominiemi, Seppo; and Alppi, Hannu, to Oy Tampella Ab. Nozzle Assembly. 4,891,170, Cl. 261-116.000.

Koloc, Paul M. Method and apparatus for generating and utilizing a compound plasma configuration. 4,891,180, Cl. 376-144.000.

Komai, Hiroshi: *See*—
Ishizu, Hisao; Shibano, Tomobumi; Sagawa, Yasuhiro; and Komai, Hiroshi, 4,891,678, Cl. 355-285.000.

Komaki, Norio: *See*—
Aritaka, Akitoshi; and Komaki, Norio, 4,891,783, Cl. 364-900.000.

Komaki, Shigeki, to Sharp Kabushiki Kaisha. Compact electronic apparatus with removable processing units. 4,890,832, Cl. 273-1.00E.

Komaki, Shigeki, to Sharp Kabushiki Kaisha. Connector for a thin electronic appliance. 4,891,013, Cl. 439-66.000.

Komatsu, Keiichi: *See*—
Kato, Hiroshi; and Komatsu, Keiichi, 4,891,047, Cl. 8-632.000.

Komatsugawa Chemical Engineering Co., Ltd.: *See*—
Nohira, Tadashi; Imatsu, Tsuneo; and Kagami, Ikuzo, 4,891,519, Cl. 250-349.000.

Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; Sakurai, Yoshimitu; Horii, Hiroyuki; and Mashimo, Akira, to Oki Electric Industry Co., Ltd. Dielectric filter with attenuation pole. 4,891,615, Cl. 333-206.000.

Komendowski, Henry: *See*—
Weiler, Gerhard H.; and Komendowski, Henry, 4,891,171, Cl. 261-124.000.

Komura, Manabu; Hirai, Kunio; Nakai, Tatsuaki; Okumura, Kazuyoshi; and Yamamoto, Nobuyuki, to Kyoto Measuring Instruments Corp. Digital tape measure. 4,890,392, Cl. 33-762.000.

Konica Corporation: *See*—
Uenawa, Yutaka; Kobayashi, Akira; and Morimoto, Isamu, 4,891,309, Cl. 430-627.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujimaki, Yoshihide; Suzuki, Yasuo; and Takimoto, Masataka, 4,891,288, Cl. 430-58.000.

Konishi, Ikuo: *See*—
Asari, Masatoshi; Konishi, Ikuo; Fujita, Hiroyuki; Hirakimoto, Akira; and Nakanishi, Hiroaki, 4,891,601, Cl. 328-233.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Tsurukiri, Shigeru; Sugita, Hiroshi; Yamamoto, Toshio; Kawasaki, Masaru; and Horie, Eiji, 4,891,296, Cl. 430-142.000.

Koop, Dale E.: *See*—
Rando, Joseph F.; and Koop, Dale E., 4,891,820, Cl. 372-93.000.

Kopin Corporation: *See*—
Zavracky, Paul M.; Zavracky, Matthew M.; Fan, John C. C.; and Salerno, Jack P., 4,890,895, Cl. 350-96.200.

Kornaker, Walter: *See*—
Kniesser, Karl; Kornaker, Walter; Lau, Bernhard; and Schanz, Werner, 4,891,549, Cl. 313-414.000.

Kosa, Bruce G.: *See*—
Simpson, Scott S.; and Kosa, Bruce G., 4,891,014, Cl. 439-67.000.

Koschinat, B. Hubert; and Frohlke, Manfred, to Otto Sauer Achsenfabrik Keilberg. Plunger piston system with separate plastic plunger piston and supporting member. 4,890,823, Cl. 267-64.270.

Koschinat, B. Hubert, to Otto Sauer Achsenfabrik Keilberg. Device for mounting the cam shaft for actuating the brake shoes of a drum brake for vehicles and the like. 4,890,939, Cl. 384-322.000.

Kose, Saburo: *See*—
Seki, Yachibo; Kose, Saburo; and Kodama, Teruo, 4,891,174, Cl. 264-44.000.

Koshida, Yoshinori: *See*—
Motoi, Nobuhiro; Koshida, Yoshinori; Miyake, Isao; and Okazaki, Yasuo, 4,891,502, Cl. 235-379.000.

Koshikawa, Takeo: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.

Kostin, Richard M., to Ford Motor Company. Seat back attachment. 4,890,888, Cl. 297-443.000.

Kotani, Matahira: *See*—
Tanaka, Hironori; Kotani, Matahira; and Matsumoto, Masafumi, 4,891,661, Cl. 355-27.000.

Kotliar, Abraham M.; Boyle, William J., Jr.; Tang, Reginald T.; Mares, Frank; Patel, Kundanbhai M.; and Chiu, Tin-Ho, to Allied-Signal Inc. Polycarbonate random copolymer-based fiber compositions and method of melt-spinning same and device. 4,891,263, Cl. 428-225.000.

Koutsky, L. John; and Shovar, J. Scott, to Sears Manufacturing Company. Suspension seat for vehicles with restricted operator environment. 4,890,887, Cl. 297-320.000.

Kovac, John. Elastic band bolder. 4,890,730, Cl. 206-303.000.

Kovacs, Bela V., to Ford Motor Company. Gray cast iron having both increased wear resistance and toughness. 4,891,076, Cl. 148-3.000.

Kovalcheck, Steven W.: *See*—
Bentley, Joseph R.; and Kovalcheck, Steven W., 4,890,898, Cl. 350-96.230.

Kowles, Joseph E.: *See*—
Rzasa, Peter W.; Allen, Matthew D.; Neuschaefer, Carl H.; Kowles, Joseph E.; Williams, Thomas D.; and Glazer, Frank, 4,891,767, Cl. 364-513.000.

Koyama, Kazuyuki: *See*—
Chonan, Kanroku; Koyama, Kazuyuki; and Hagiwara, Masahiro, 4,891,138, Cl. 210-675.000.

Koyanagi, Mitsumasa, to Hitachi, Ltd. Semiconductor device and a process for manufacturing the same. 4,891,326, Cl. 437-29.000.

Koyo Seiko Co., Ltd.: *See*—
Matsuda, Akinobu; and Sakai, Masamitsu, 4,890,683, Cl. 180-79.100.

Kozak, Michael L.: *See*—
Hoff, Jeffrey H.; Kozak, Michael L.; and Wentzek, Horst F., 4,890,975, Cl. 414-788.900.

Kozaki, Takaharu: *See*—
Tagawa, Itsuo; Kanari, Yukiharu; Kanno, Samon; and Kozaki, Takaharu, 4,890,798, Cl. 241-266.000.

Krakenberg, Manfred: *See*—
Schaefer, Dietmar; and Krakenberg, Manfred, 4,891,166, Cl. 260-404.500.

Kramer, Kurt: *See*—
Fischer, Werner; Schauer, Friedrich; and Kramer, Kurt, 4,890,697, Cl. 188-1.110.

Kramer, Roland; and Neumaier, Robert, to Heyko Reinecker. Canned motor pump. 4,890,988, Cl. 417-372.000.

Krandel, Bruce A.: *See*—
Ames, John E.; Krandel, Bruce A.; and Aldrich, Allyn M., 4,890,979, Cl. 416-46.000.

Kraner, James L.: *See*—
Capek, Raymond G.; Dougherty, Lawrence W.; and Kraner, James L., 4,891,544, Cl. 313-402.000.

Kraus, Wayne A., to Hercules Incorporated. Catalyst-containing coating to promote rapid curing of polyurethane lacquers. 4,891,248, Cl. 427-340.000.

Krause, Barry; and Fredrickson, Eric M. Switch lock. 4,890,467, Cl. 70-369.000.

Krausse, George J., III, to Directed Energy, Inc. Semiconductor packaging with ground plane conductor arrangement. 4,891,686, Cl. 357-68.000.

Krawczyk, Robert W.: *See*—
Nation, Melvin S.; and Krawczyk, Robert W., 4,891,476, Cl. 200-11.00R.

Krcova, Zuzana: *See*—
Sulc, Jiri; and Krcova, Zuzana, 4,890,911, Cl. 351-160.00H.

Kreifels, Gerard A. FIFO with almost full/almost empty flag. 4,891,788, Cl. 365-49.000.

Krieg, Claus-Peter: *See*—
Hauba, Michael; Herold, Friedrich; Krieg, Claus-Peter; Skaletz, Detlef; and Wildhardt Juergen, 4,891,135, Cl. 210-500.380.

Krishnan, Vadavalli G.: *See*—
Farias, Luis V.; Krishnan, Vadavalli G.; and Wong, Chin-Pan, 4,891,806, Cl. 370-110.100.

Kristiansen, Odd, to Ciba-Geigy Corporation. Substituted amidophosphonates and amidophosphates. 4,891,362, Cl. 514-90.000.

Kroll, Mark W.; Olson, Kenneth M.; and Flynn, Patrick S., to Cherne Medical, Inc. Bio-electric noise cancellation system. 4,890,630, Cl. 128-901.000.

Kronos Titan, GmbH: *See*—
Kulling, Achim M.; and Steinhausen, Helmut, 4,891,206, Cl. 423-531.000.

Kross, Robert D.; and Zamojcin, Carol A., to Alcide Corporation. Disinfecting compositions and methods therefor. 4,891,216, Cl. 424-78.000.

Krouse, Edwin E. Stock flexure isolating gun barrel mount. 4,890,405, Cl. 42-75.030.

Kruger, Johann E. W.: *See*—
Jasmer, Wolfgang E.; Kruger, Johann E. W.; and Killat, Ulrich R. P., 4,891,802, Cl. 370-60.000.

Kryazhevskikh, Nikolai F.: *See*—
Shishkin, Viktor V.; Samuliev, Jury D.; Shapovalov, Jury P.; Sushkov, Yaroslav P.; Panchenko, Valery P.; Lukin, Evgeny G.; Chernyai, Alexandr I.; and Kryazhevskikh, Nikolai F., 4,891,115, Cl. 204-212.000.

Kuan, Tiong H.; Srail, Raymood C.; and Szczepanski, Thomas R., to R.J.F. International. Single phase shape-transformable elastomeric compounds. 4,891,409, Cl. 525-237.000.

Kubach, Hans: *See*—
Hascher-Reichl, Asta; and Kubach, Hans, 4,890,815, Cl. 251-129.150.

Kubelik, Igor, to Delphax Systems. Print cartridge with non-divergent electrostatic field. 4,891,656, Cl. 346-155.000.

Kubisa, Ryszard; and Voos, Helmut, to L. & C. Steinmuller GmbH. Method for scrubbing flue gases from a firing unit. 4,891,194, Cl. 423-240.000.

Kubo, Haruo; and Onodera, Kosaku, to Toyo Boseki Kabushiki Kaisha. Continuous plate making method for photosensitive resin plate and device thereof. 4,891,659, Cl. 354-317.000.

Kubo, Seitoku: *See*—
Kano, Takenori; Kobayashi, Koji; Sumiya, Koji; Kubo, Seitoku; and Watanabe, Kazuaki, 4,890,512, Cl. 74-740.000.

Kubo, Takashige: *See*—
Ooe, Kimio; Amano, Nobutaka; Kubo, Takashige; and Moriwaki, Kaoru, 4,891,773, Cl. 364-578.000.

Kubodera, Noboru; Miyamoto, Katsuhito; Ochi, Kiyoshige; Matsunaga, Isao; and Murayama, Eigoro, to Chugai Seiyaku Kabushiki Kaisha. Vitamin D derivatives, process for producing the same and their use in the differentiation of tumor cells. 4,891,364, Cl. 514-167.000.

Kubota, Shinzou: *See*—
Ishibashi, Hiroyuki; Shimizu, Kazushi; Susa, Kenzo; and Kubota, Shinzou, 4,891,520, Cl. 250-367.000.

Kubotera, Masaaki: *See*—
Hanamura, Shoji; Kubotera, Masaaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, 4,891,792, Cl. 365-189.050.

Kudou, Masaaki; and Ogiwara, Tosio, to Izumi Automotive Industry Co., Ltd. Light metal piston for internal combustion engines and method of making the same. 4,890,543, Cl. 92-228.000.

Kuecker, Charles A.; and Klawinski, Gary M., to Crosfield Ebway, Inc. Microprocessor-controlled apparatus for detecting and guiding a web wherein right and left eyespots are formed to determine right and left edges. 4,891,528, Cl. 250-548.000.

Kuhlmann, Werner: *See*—
Ott, Heidrun; and Kuhlmann, Werner, 4,891,390, Cl. 523-109.000.

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Oberle, Edmond; and Wattron, Bernard, 4,890,678, Cl. 172-54.500.

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Otomo, Shigekazu; Nakatani, Ryoichi; Kumasaka, Noriyuki; Saito, Noritoshi; Kobayashi, Toshio; and Fujishiro, Masahiko, 4,891,278, Cl. 428-681.000.

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Jergl, Joseph J.; and Kump, William H., 4,891,270, Cl. 429-53.000.

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Suzuki, Hideo; and Kurakake, Yasushi, 4,890,527, Cl. 84-697.000.

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Tanaka, Michio; Kurano, Yoshito; Taniguchi, Katsuo; and Ishibashi, Masayasu, 4,891,453, Cl. 568-805.000.
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Sasaki, Akira; Esaki, Seiji; Kurita, Shigeo; and Shimizu, Masahiro, 4,891,035, Cl. 464-111.000.

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Hayashi, Sei-ichi; Hobjoh, Tadashi; Furuse, Tokuo; Kuriyama, Hiroki; Watanabe, Tsuyoshi; and Takatsuto, Suguru, 4,891,168, Cl. 260-397.200.

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Claiborne, C. Clair; Kurz, Robert A.; Pearce, Henry A., Jr.; and Sheppard, Harry R., 4,890,478, Cl. 73-19.000.

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Ohashi, Hiroshi; and Kusunoki, Masahiro, 4,891,721, Cl. 360-103.000.

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Gard, Michael F.; and Kyle, Donald G., 4,891,641, Cl. 340-857.000.

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Yokoyama, Kiyoshi, 4,891,342, Cl. 501-97.000.

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Komura, Manabu; Hirai, Kunio; Nakai, Tatsuaki; Okumura, Kazuyoshi; and Yamamoto, Nobuyuki, 4,890,392, Cl. 33-762.000.

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Budde, David; Riches, Robert; Imel, Michael T.; Myers, Glen; and Lai, Konrad, 4,891,753, Cl. 364-200.000.

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Weisang, Francois, 4,891,063, Cl. 75-51.100.

Laitram Corporation, The: *See*—
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Johnson, Paul B.; Mininger, Robert F.; Lane, Steven R.; and Lamb, Edwin, 4,890,781, Cl. 228-7.000.

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Huybrechts, Jozef T.; Louis van den Bosch, Guido R.; and Landriette Verhaegen, Rudolf F., 4,891,401, Cl. 524-807.000.

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Drysdale, James P.; and Landrith, L. David, 4,891,176, Cl. 264-250.000.

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Lane, William A., Jr.; and Davis, Steven D., to W. A. Lane, Inc. Easy open product pouch. 4,890,744, Cl. 206-632.000.

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Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, 4,891,045, Cl. 8-411.000.

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Langkamp, Richard B., Jr., to Southco, Inc. Over-center draw latch. 4,890,869, Cl. 292-113.000.

Langton, Douglas W.: *See—*
McCormick, Walter A. (Sunny); Langton, Douglas W.; Kellum, Wilbur J., III; Saunders, Thomas C.; and Phillips, Gregory, 4,890,825, Cl. 271-188.000.

Lantz, Kenneth F.; Herschler, Scott C.; Bleich, Charles R.; Smolucha, Walter E.; and Wepner, Gregory W., to Williams Electronics, Inc. Apparatus for generating enhanced interactive video game playfield environments. 4,890,833, Cl. 273-1.00E.

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Gesing, Adam J.; Luce, Edward S.; Raghavan, Narashima S.; and White, Danny R., 4,891,338, Cl. 501-87.000.
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Fairman, Bruce A.; Larsen, Allen J.; Swinton, William G.; and Taylor, Robert G., Jr., 4,891,752, Cl. 364-200.000.

Lassiaz, Philippe: *See—*
Carmillet, Roger; and Lessiaz, Philippe, 4,890,711, Cl. 192-98.000.

Latassa, Frank M.: *See—*
Will, Jerald D.; and Latassa, Frank M., 4,891,551, Cl. 313-492.000.

Latourrette, Bertrand; and Magnier, Claude, to Rhone-Poulenc Specialites Chimiques. Preparation of zeolites of type ZSM-5. 4,891,199, Cl. 423-328.000.

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Lauper, Alfred; and Steffen, Andreas, to Siemens-Albis, AG. Expander system for pulse signals. 4,891,599, Cl. 328-109.000.

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Uchida, Shinya; Hirata, Akira; and Yoshikawa, Eiichi, 4,890,824, Cl. 271-3.100.

Laurent, Henry: *See—*
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Shroy, Robert E., Jr.; Lauro, Karen L.; and Sones, Richard A., 4,891,757, Cl. 364-413.130.

Law, Henry H.: *See—*
Holden, Clarence A., Jr.; and Law, Henry H., 4,891,480, Cl. 200-262.000.

Lawrence, Andre H.: *See—*
Elias, Lorne; and Lawrence, Andre H., 4,890,502, Cl. 73-864.850.

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Hammel, William S.; Lawson, Donald B.; and Van Patten, Keith W., 4,891,590, Cl. 324-207.000.

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Leber, David C.; Tuff, William B.; and Verstrate, Paul L., to Tektronix, Inc. IC grabber probe. 4,891,586, Cl. 324-158.00P.

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Verrips, Cornelis T.; Ledeboer, Adrianus M.; Edens, Luppo; Klok, Robert; and Maat, Jan, 4,891,316, Cl. 435-69.100.

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Le Duc, Don. Adjustable pliers. 4,890,519, Cl. 81-328.000.

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Clark, Jack E., II; Lee, Jeffrey C.; and Doyle, Brent R., 4,891,606, Cl. 330-288.000.

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Cousins, Michael A.; and Lee, June, 4,890,944, Cl. 401-98.000.

Lefton, Scott A.: *See—*
Lewis, Stephen R.; and Lefton, Scott A., 4,891,645, Cl. 341-154.000.

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Beutier, Didier; and Le Quesne, Yves, 4,891,193, Cl. 423-54.000.

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Levand, Victor A., Jr.; and Duffy, Mark E., to General Electric Company. Arc discharge lamp having improved performance. 4,891,554, Cl. 313-634.000.

Levatter, Jeffrey I., to Acculase, Inc. Rare gas-halogen excimer laser. 4,891,818, Cl. 372-57.000.

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Levy, David F., to Sony Corporation. Digital video signal processing with cut editing feature. 4,891,715, Cl. 360-14.100.

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Langer, Rudolf, 4,890,365, Cl. 26-73.000.
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Anawis, Mark A.; and Lindberg, Roger E., 4,891,311, Cl. 435-7.000.

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Jungfer, Hans; and Brauer, Olaf, 4,891,187, Cl. 423-248.000.

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Janoff, Andrew S.; Popescu, Mircea C., Weiner, Alan L.; Bolscak, Lois E.; Tremblay, Paul A.; and Swenson, Christine E., 4,891,208, Cl. 424-1.100.

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Buschelberger, Hans J., 4,890,923, Cl. 356-350.000.

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Chechile, Robert A.; Cherbettchian, Agop H.; Spry, Sampson, III; and Baig, Khalig F., 4,890,812, Cl. 248-674.000.
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Cima, Richard M., 4,890,668, Cl. 165-104.250.

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Williams, Ralph D., 4,890,694, Cl. 182-187.000.

Loliger, Willi; and Schmied, Rudolf, to Nestec S. A. Pressure regulating valve. 4,890,639, Cl. 137-510.000.

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Longerich, Ernest P., to Hughes Aircraft Company. Very high-acceleration tolerant circuit card packaging structure. 4,891,688, Cl. 357-82.000.

Lopata, John E., to Molex Incorporated. Circuit card edge connector and terminal therefor. 4,891,023, Cl. 439-637.000.

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Junino, Alex; Vandenbossche, Jean J.; Borowiak, Herve; and Lang, Gerard, 4,891,045, Cl. 8-411.000.

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Maucher, Paul; and Honemann, Rudolf, 4,890,712, Cl. 192-106.200.
Reik, Wolfgang; and Elison, Hans-Dieter, 4,890,709, Cl. 192-70.170.
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M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Schiessl, Gerhard, 4,890,670, Cl. 165-76.000.

Maas, Joseph W. J.: *See—*
Martin, Douglas S.; and Maas, Joseph W. J., 4,890,792, Cl. 239-343.000.

Maat, Jan: *See—*
Verrips, Cornelis T.; Ledeboer, Adrianus M.; Edens, Luppo; Klok, Robert; and Maat, Jan, 4,891,316, Cl. 435-69.100.

Mabe, Atsushi: *See—*
Sato, Tadashi; and Mabe, Atsushi, 4,890,987, Cl. 417-310.000.

MacAlpine, Derek K.: *See—*
Lyons, David; and MacAlpine, Derek K., 4,891,461, Cl. 585-376.000.

Macchi, Odile M. M.: *See—*
Marcos, Sylvie L.; Macchi, Odile M. M.; and Pintaux, Jean-Bernard L. P., 4,891,801, Cl. 370-32.100.

MacKenzie, Mark L.: *See—*
Bright, Randall P.; Wise, Sean; and MacKenzie, Mark L., 4,891,071, Cl. 106-90.000.

Mackerer, Carl R.: *See—*
Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., 4,891,322, Cl. 436-64.000.

Mackey, Sandra J.: *See—*
Markevka, Virginia C.; Mackey, Sandra J.; and Bunnelle, William L., 4,891,269, Cl. 428-423.000.

MacLeod, Patrick: *See—*
Weber, Jean-Luc M.; Bloch, Serge; Noack, Jean-Claude; Chouard, Claude-Henri; and MacLeod, Patrick, 4,890,618, Cl. 128-420.600.

Madnick, Peter A.: *See—*
Harary, Eli D.; Harary, Cathy; Madnick, Peter A.; and Sherwood, Russell W., 4,890,878, Cl. 296-153.000.

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Mukunoki, Yasuo; Maekawa, Yukio; and Suga, Shuzo, 4,891,307, Cl. 430-527.000.
Yokoyama, Shigeki; and Maekawa, Yukio, 4,891,306, Cl. 430-527.000.

Magee, Robert J.; and Marchi, Jian P., to United States of America, Navy. Small angle generating apparatus. 4,890,917, Cl. 356-138.000.

Magnetic Peripherals Inc.: *See—*
Minuhin, Vadim B., 4,891,717, Cl. 360-41.000.
Mowry, Greg S., 4,891,725, Cl. 360-113.000.
Zak, Brian S., 4,891,723, Cl. 360-106.000.

Magnier, Claude: *See—*
Latourrette, Bertrand; and Magnier, Claude, 4,891,199, Cl. 423-328.000.

Mahlo GmbH & Co. KG.: *See—*
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Mai, Udo: *See—*
Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, 4,891,707, Cl. 358-190.000.

Maibach, Bruce A., to W. G. Dairy Supply, Inc. Animal feed distribution device. 4,890,577, Cl. 119-52.100.

Mailloux, Jeffrey S.: *See—*
Hush, Glen E.; Mailloux, Jeffrey S.; and Cloud, Eugene H., 4,891,794, Cl. 365-189.040.

Maini, Brij B., to Alberta Oil Sands Technology and Research Authority. Method and apparatus for measuring fluid viscosity. 4,890,482, Cl. 73-55.000.

Maj, Joseph J.: *See—*
Garces, Juan; Maj, Joseph J.; Lee, G. John; and Rocke, Stephen C., 4,891,448, Cl. 568-628.000.

Makino, Akihiro: *See—*
Nakajima, Mikio; and Makino, Akihiro, 4,891,079, Cl. 148-307.000.

Makovec, Francesco; Chiste', Rolando; Peris, Walter; and Rovati, Luigi, to Rotta Research Laboratorium. Derivatives of 5-pentylamino-5-oxopentanoil and 4-pentlamino-4-ozobutanoic acids with antagonistic activity towards cholecystokinin. 4,891,381, Cl. 514-119.000.

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Malatesta, Natale D. Wood beam joint and method of forming. 4,890,953, Cl. 403-178.000.

Malcomson, Kirk: *See—*
Schmidt, William P.; Hutchinson, Frank D.; and Malcomson, Kirk, 4,890,909, Cl. 350-616.000.

Mallard, John R.: *See—*
Lurie, John; Bussell, David M.; and Mallard, John R., 4,891,593, Cl. 324-307.000.

Mallik, Debendra; and Bhattacharyya, Bidyut K., to Intel Corporation. Multi-layer molded plastic IC package. 4,891,687, Cl. 357-70.000.

Mamunose, Robert J., to United States of America, Army. Thin film all polymer capacitor and method of making. 4,891,733, Cl. 361-323.000.

Mannle, Ned, to Terrashield, Incorporated. Airtight sump crock cover. 4,890,425, Cl. 52-19.000.

Mann, Ralph V. System and method for teaching physical skills. 4,891,748, Cl. 364-410.000.

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Gerretz, Josef; and Henn, Ewald, 4,890,470, Cl. 72-289.000.

Mannhart, Peter: *See—*
Streit, Roland; Mannhart, Peter; and Schmid, Samuel, 4,890,537, Cl. 89-37.110.

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Maples, Paul D. Continuous chain lubricating device. 4,891,037, Cl. 474-91.000.

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Magee, Robert J.; and Marchi, Jian P., 4,890,917, Cl. 356-138.000.

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Mares, Frank: *See—*
Kotliar, Abraham M.; Boyle, William J., Jr.; Tang, Reginald T.; Mares, Frank; Patel, Kundanbhai M.; and Chiu, Tin-Ho, 4,891,263, Cl. 428-225.000.

Mareuca, Louis M.: *See—*
Clendinning, Robert A.; Harris, James E.; Kelsey, Donald R.; Matzner, Markus; Robeson, Lloyd M.; Winslow, Paul A.; and Mareuca, Louis M., 4,891,167, Cl. 560-52.000.

Markevka, Virginia C.; Mackey, Sandra J.; and Bunnelle, William L., to H. B. Fuller Company. Bonding method employing thermally stable hot melt moisture-cure polyurethane adhesive composition. 4,891,269, Cl. 428-423.000.

Markowitz, H. Toby; Prest-Berg, Kevin; and Thompson, David L., to Medtronic, Inc. Dual chamber activity responsive pacer. 4,890,617, Cl. 128-419.0PG.

Marquis, Edward T.; Keating, Kenneth P.; Knifton, John F.; Smith, William A.; Sanderson, John R.; and Lustri, Jonathan, to Texaco Inc. Olefin epoxidation of olefins in a polar medium. 4,891,437, Cl. 549-529.000.

Marsh, Edward K.: *See—*
Chandler, Curtis S.; and Marsh, Edward K., 4,891,022, Cl. 439-610.000.

Marsh, John L.: *See—*
More, Henry S.; and Marsh, John L., 4,891,734, Cl. 361-417.000.

Martin, Douglas S.; and Mass, Joseph W. J., to AFA Products Inc. Nozzle assembly. 4,890,792, Cl. 239-343.000.

Martin, Gail E. Steering wheel table. 4,890,559, Cl. 108-44.000.

Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., to De La Rue Systems Limited. Sheet store. 4,890,766, Cl. 221-198.000.

Martin, James W.: *See—*
Del Corso, Gregory J.; Martin, James W.; and Strobel, David L., 4,891,080, Cl. 148-326.000.

Martin, Wolfgang K.; Ryffel, James R.; Schuster, Hans H.; and Wen, Chih-Peng, to BASF Aktiengesellschaft. Continuous process for the hydrolytic production of polycaprolactam by tempering unextracted granular polymer material with moist inert gas. 4,891,420, Cl. 528-315.000.

Martinez, Jean: *See—*
Barcelo, Gerard; Castro, Bertrand; Jaouadi, Mahmoud; Martinez, Jean; Senet, Jean-Pierre; and Sennyey, Gerard, 4,891,430, Cl. 548-259.000.

Maruman Golf Co., Ltd.: *See—*
Kobayashi, Masashi, 4,890,840, Cl. 273-167.00H.

Maruyama, Yuji: *See—*
Nakazato, Katsuo; Kurosawa, Toshiharu; Maruyama, Yuji; Takahashi, Kiyoshi; and Tsuchiya, Hiroyoshi, 4,891,710, Cl. 358-443.000.

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Masaki, Kenji; Osawa, Izumi; Fujiwara, Masanori; and Takedomi, Yumiko, to Minolta Camera Kabushiki Kaisha. Photosensitive member having an amorphous carbon overcoat layer. 4,891,291, Cl. 430-66.000.

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Maschinenfabrik Heid Aktiengesellschaft: *See—*
Nader, Hans; and Steiner, Karl, 4,890,522, Cl. 82-142.000.

Maschinenfabrik Lauffer GmbH & Co. KG: *See—*
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Masegi, Mitsuhiko: *See—*
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Mashiko, Syoichi: *See—*
Nakamura, Tomoharu; Irokawa, Hiroyuki; Mashiko, Syoichi; Shimamura, Hidehiko; and Tsutsumi, Hirofumi, 4,891,570, Cl. 323-210.000.

Mashimo, Akira: *See—*
Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; Sakurai, Yoshimitu; Horii, Hiroyuki; and Mashimo, Akira, 4,891,615, Cl. 333-206.000.

Masler, William R., III: *See—*
Nagarajan, Madukkarai K.; and Masler, William R., III, 4,891,149, Cl. 252-110.000.

Mason, Benjamin, to Caledonian Mining Co. Ltd. Apparatus and method for lining bore holes with pre-formed lining shells. 4,890,676, Cl. 166-380.000.

Mason, Harry L.: *See—*
Avard, Louis H.; and Mason, Harry L., 4,890,851, Cl. 277-89.000.

Massachusetts Institute of Technology: *See—*
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Langer, Robert S.; and Rosen, Howard, 4,891,225, Cl. 424-428.000.

Masuda, Katsuhiko: *See—*
Hamada, Tetsurou; Masuda, Katsuhiko; Shibuya, Kazunori; Shimada, Kazuhiko; and Tokushima, Shoiji, 4,890,686, Cl. 180-233.000.

Masumoto, Tsuyoshi; Inoue, Akihisa; Oguchi, Masahiro; and Harakawa, Yoshio, to Teikoku Piston Ring Co., Ltd.; and Masumoto, Tsuyoshi. Additive powders for coating materials or plastics. 4,891,068, Cl. 75-251.000.

Matsubara, Susumu: *See—*
Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, 4,891,726, Cl. 360-130.230.

Matsubara, Tsutomu: *See—*
Hashimoto, Yutaka; Yumoto, Masanobu; Umaba, Toshihiko; Kamada, Yutaka; Matsubara, Tsutomu; and Kawaguchi, Sigeo, 4,891,241, Cl. 427-44.000.

Matsuda, Akinobu; and Sakai, Masamitsu, to Koyo Seiko Co., Ltd. Power steering apparatus. 4,890,683, Cl. 180-79.100.

Matsuda, Hari: *See—*
Steiner, Gregory; and Matsuda, Hari, 4,890,549, Cl. 99-450.000.

Matsuda, Kenji; Okada, Tetsuji; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner. 4,890,545, Cl. 98-39.100.

Matsugi, Toramasa: *See—*
yagi, Yoshitaka; Matsugi, Toramasa; and Kiyama, Mitsushige, 4,890,719, Cl. 198-507.000.

Matsumoto, Hiroaki: *See—*
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Matsumoto, Masafumi: *See—*
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Matsumoto, Muneaki; Numata, Koji; Akita, Shigeyuki; Nishida, Minoru; and Masegi, Mitsuhiko, to Nippondenso Soken, Inc.; and Nippondenso Co., Ltd. Apparatus for controlling a headlight of a vehicle. 4,891,559, Cl. 315-82.000.

Matsumoto, Osa: *See—*
Sato, Shozo; Shimoyama, Toshikazu; Shono, Susumu; Matsumoto, Osa; Kamei, Hiromasa; and Imada, Takehiko, 4,891,493, Cl. 219-137.00R.

Matsumoto, Tomohide: *See—*
Nobue, Tomotaka; Matsumoto, Tomohide; and Hikino, Tadashi, 4,891,557, Cl. 315-39.510.

Matsunaga, Fujihisa: *See—*
Yamamoto, Sanehiro; Yasuhara, Mitsuki; Matsunaga, Fujihisa; Okano, Masato; and Nakamura, Mitsunori, 4,891,431, Cl. 548-335.000.

Matsunaga, Isao: *See—*
Kubodera, Noboru; Miyamoto, Katsuhito; Ochi, Kiyoshige; Matsunaga, Isao; and Murayama, Eigoro, 4,891,364, Cl. 514-167.000.

Matsuno, Mitsuo: *See—*
Yuasa, Hitoshi; Matsuno, Mitsuo; and Satoh, Tetsuo, 4,891,456, Cl. 585-275.000.

Matsuoka, Nobuo: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 4,890,899, Cl. 350-173.000.
Aritaka, Akitoshi; and Komaki, Norio, 4,891,783, Cl. 364-900.000.
Fujioka, Souichiro; and Okamoto, Hiroshi, 4,891,588, Cl. 324-166.000.
Hamada, Masanori; Inoue, Takeshi; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,891,699, Cl. 358-136.000.
Hata, Takuoki, 4,891,158, Cl. 252-518.000.
Ishikawa, Osamu, 4,891,577, Cl. 324-73.00R.
Moriyama, Yuichi; and Sekihara, Toshinobu, 4,891,552, Cl. 313-495.000.
Nakazato, Katsuo; Kurosawa, Toshiharu; Maruyama, Yuji; Takahashi, Kiyoshi; and Tsuchiya, Hiroyoshi, 4,891,710, Cl. 358-443.000.
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Taguchi, Tatsuhisa; Abe, Yoshikazu; and Aburaya, Kiyoji, 4,890,986, Cl. 417-295.000.
Yohda, Hiroshi; Takahashi, Ken; Sawai, Eisuke; Muraoka, Syunsaku; and Ihara, Keita, 4,890,379, Cl. 29-603.000.

Matsushita, Takao: *See—*
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Matsushita, Toshihiko; and Morishita, Sadao, to Mitsubishi Paper Mills, Ltd. Process for producing double-capsules. 4,891,172, Cl. 264-4.330.

Matsuzaki, Takashi: *See—*
Baba, Hiroyuki; and Matsuzaki, Takashi, 4,891,333, Cl. 437-173.000.

Matsuzawa, Isamu. Key switch. 4,891,477, Cl. 200-61.640.

Mattausch, Hans J.; Matthiesen, Fred; and Schoebinger, Matthias, to Siemens Aktiengesellschaft. Arrangement for DPCM-coding of video signals. 4,891,698, Cl. 358-135.000.

Matthiesen, Fred: *See—*
Mattausch, Hans J.; Matthiesen, Fred; and Schoebinger, Matthias, 4,891,698, Cl. 358-135.000.

Matzner, Markus: *See—*
Clendinning, Robert A.; Harris, James E.; Kelsey, Donald R.; Matzner, Markus; Robeson, Lloyd M.; Winslow, Paul A.; and Mareuca, Louis M., 4,891,167, Cl. 560-52.000.

Maucher, Paul; and Honemann, Rudolf, to Luk Lamellen und Kupplungsbau GmbH. Torsional vibration damping device for clutch plates. 4,890,712, Cl. 192-106.200.

Maxichem, Inc.: *See—*
Waldmann, John J., 4,891,422, Cl. 528-422.000.

May & Christe GmbH Transformatorenwerke: *See—*
Tschuk, Robert, 4,891,558, Cl. 315-62.000.

May, Earl L.: *See—*
Bricker, Jack A.; May, Earl L.; Michelotti, Donald P.; Dahlberg, John R.; Oravitz, James J., Jr.; and Siskos, William R., 4,891,054, Cl. 65-105.000.

May, Ronald F.; Kafer, Kenneth G.; Schuelke, Gregory W.; and Verstegen, Michael T., to Enercon Industries Corporation. Power supply controller. 4,891,743, Cl. 363-87.000.

McCollum, Gregory J.; Zwack, Robert R.; and Scriven, Roger L., to PPG Industries, Inc. Cationic electrocoating compositions. 4,891,111, Cl. 204-181.700.

McCormick, Walter A. (Sunny); Langton, Douglas W.; Kellum, Wilbur J., III; Saunders, Thomas C.; and Phillips, Gregory, to EMF Corporation. Paper sheet stacking and jogging apparatus. 4,890,825, Cl. 271-188.000.

McCready, Russell J., to ARCO Chemical Technology, Inc. Moldable styrene-maleic anhydride/polybutylene terephthalate composition. 4,891,405, Cl. 525-64.000.

McDonald, John L. Metering device for soft ice cream freezers. 4,890,928, Cl. 366-101.000.

McDonald, Richard E.: *See—*
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., 4,891,231, Cl. 426-52.000.

McDowall, Mark A.: *See—*
Jones, David; Atherton, Russel P.; and McDowall, Mark A., 4,891,515, Cl. 250-288.000.

McEntee, Thomas C., to Morton Thiokol, Inc. Compositions containing antimicrobial agents in combination with stabilizers. 4,891,391, Cl. 523-122.000.

McEwen, Craig S.; and Scrivner, Noel C., to Du Pont de Nemours, E. I., and Company. Controlled atmosphere firing process. 4,891,246, Cl. 427-229.000.

McGovern, Terrence P.; and Cunningham, Roy T., to United States of America, Agriculture. Persistant attractants for the mediterranean fruit fly, the method of preparation and method of use. 4,891,217, Cl. 424-84.000.

McGuire, Raymond R.: *See—*
Rigdon, Lester P.; Harrar, Jackson E.; Bullock, Jack C., Sr.; and McGuire, Raymond R., 4,891,124, Cl. 204-435.000.

McIntosh, James L., to Tensor Development Inc. Program controlled force measurement and control system. 4,891,764, Cl. 364-508.000.

McIntyre, Frederic S., to Acumeter Laboratories, Inc. Method of and apparatus for somewhat-to-highly viscous fluid spraying for fiber or filament generation, controlled droplet generation, and combinations of fiber and droplet generation, intermittent and continuous, and for air-controlling spray deposition. 4,891,249, Cl. 427-421.000.

McKay, Randal P.: *See—*
Ackilli, Joseph A.; Saleeb, Fouad Z.; Morreale, Philip; and McKay, Randal P., 4,891,198, Cl. 423-308.000.

McKee, Davy (Poole) Limited: *See—*
Waggott, Ralph; and Ireson, Robert C. J., 4,891,484, Cl. 219-10.61R.

McLaughlin, Charles A.: *See—*
Derr, Andrew G.; and McLaughlin, Charles A., 4,891,766, Cl. 364-513.000.

McLaurin, Leroy D.; Williams, Roland E.; Donlan, John P.; and Hultgren, Kent G., to Westinghouse Electric Corp. Method and apparatus for vane segment support and alignment in combustion turbines. 4,890,978, Cl. 415-209.400.

McMahon, Patrick E., to Amoco Corporation. Cyclization-dehydrogentation of 1-ethyl-naphthalene over copper aluminum borate. 4,891,462, Cl. 585-411.000.

McNally, Robert T.; Heacox, Albert; Brockbank, Kelvin G. M.; and Bank, Harvey L., to CryoLife, Inc. Method for cryopreserving heart valves. 4,890,457, Cl. 62-65.000.

McNeilly, Michael A., to Advantage Production Technology Inc. Semiconductor substrate heater and reactor process and apparatus. 4,891,335, Cl. 437-247.000.

McVay, William P.: *See—*
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McWherter, David, to Franklin Computer Corporation. Electronic word game machine. 4,891,775, Cl. 364-705.060.

MDT Corporation: *See—*
Albright, Donald W.; and Miller, Raymond J., 4,891,188, Cl. 422-114.000.

Medlin, William L.; and King, Gary A., to Mobil Oil Corporation. Borehole acoustic transmitter. 4,890,687, Cl. 181-106.000.

Medtronic, Inc.: *See—*
Markowitz, H. Toby; Prest-Berg, Kevin; and Thompson, David L., 4,890,617, Cl. 128-419.0PG.
Pinckaers, B. Hubert, 4,890,616, Cl. 128-419.00R.

Meerkatz, Joachim; and Clausing, Gerhard, to Jacobs Suchard GmbH. Method and apparatus for packaging fluent solid material, in particular coffee. 4,890,441, Cl. 53-456.000.

Meggimson, George W.; Redenbarger, Philip D.; and First, David H., to B. F. Goodrich Company, The. Wet disc friction brake with casing rods extending through stator bores. 4,890,699, Cl. 188-18.00A.

Meis, Michael A., to Minnesota Mining and Manufacturing Company. Connecting device for optical fibers. 4,890,896, Cl. 350-96.210.

Mellor, Charles; and Fohl, Timothy, to GTE Products Corporation. Dichroic coated lamp with gettered outer jacket. 4,891,542, Cl. 313-112.000.

Melvin, Wayne D.; and Rejai, Jamshid, to Playtex Family Products, Inc. Portable tampon applicator. 4,891,042, Cl. 604-18.000.

Mentor Corporation: *See—*
Arp, Robert A., 4,890,866, Cl. 285-243.000.

Merchandising Display Corporation: *See—*
Diamond, Israel, 4,890,632, Cl. 131-237.000.

Mercier, Francois, to Innotag Inc. Control device for underground drainage network. 4,890,955, Cl. 405-37.000.

Merck & Co., Inc.: *See—*
Zimmerman, Morris; Ashe, Bunnie M.; and Doherty, James B., 4,891,370, Cl. 514-201.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Angelastro, Michael R.; and Blohm, Thomas R., 4,891,367, Cl. 514-178.000.

Meadan S.p.A.: *See—*
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Messerschmitt-Boelkow-Blohm GmbH: *See—*
Schmidt, Guenther; and Schmid, Peter, 4,890,454, Cl. 60-266.000.

Mesnick, Jerry C., Jr. Method for utilizing merchandise display shelves. 4,890,374, Cl. 29-402.090.

Messier-Hispano-Bugatti: *See—*
Guichard, Jean, 4,890,700, Cl. 188-73.200.

Metacon AG: *See—*
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Metal Coatings International Inc.: *See—*
Fourez, Michel; Lonca, Michel; and Pichaut, Patrick, 4,891,268, Cl. 428-421.000.

Metalaser Pty. Limited: *See—*
Amano, Shintetsu; and Mizuhata, Yoshinori, 4,891,561, Cl. 315-223.000.

Mets, Inc.: *See—*
Gray, Donald R.; Spadafora, Anthony J.; and Green, Lawrence R., III, 4,891,761, Cl. 364-452.000.

Metz, Paul. Inductor apparatus for metal treatment. 4,891,822, Cl. 373-146.000.

Metz, Robert J.: *See—*
Scanga, Theodore P.; Kiley, Matthew P.; Metz, Robert J.; and Schultz, Fred R., 4,890,759, Cl. 220-273.000.

Meunier, Thierry. System for inserting a test signal in a video image scanning line. 4,891,700, Cl. 358-139.000.

Meyer, Hans R.: *See—*
Guglielmetti, Leonardo; Meyer, Hans R.; Reinehr, Dieter; and Weber, Kurt, 4,891,153, Cl. 252-301.220.

Meyers, Wayne E., to Genesis Technology. Fireplace burning simulator unit. 4,890,600, Cl. 126-512.000.

Micale, Fortunato J., to Koh-I-Noor Rapidograph, Inc. Electrophoretic display particles and a process for their preparation. 4,891,245, Cl. 427-213.300.

Michell, Andrew K.: *See—*
Nagaya, Kazuhiko; Sakurai, Hiroshi; and Michell, Andrew K., 4,891,574, Cl. 324-61.00P.

Michelotti, Donald P.: *See—*
Bricker, Jack A.; May, Earl L.; Michelotti, Donald P.; Dahlberg, John R.; Oravitz, James J., Jr.; and Siskos, William R., 4,891,054, Cl. 65-105.000.

Microelectronics Center of North Carolina: *See—*
Reisman, Arnold; and Chu, Wei-Kan, 4,891,329, Cl. 437-61.000.

Micron Technology, Inc.: *See—*
Hush, Glen E.; Mailloux, Jeffrey S.; and Cloud, Eugene H., 4,891,794, Cl. 365-189.040.

Microtronics Associates, Inc.: *See—*
Coon, Darryl D.; and Elliott, John P., 4,891,522, Cl. 250-370.100.

Midwest Water Resource, Inc.: *See—*
Payne, Frederick C., 4,890,673, Cl. 166-266.000.

Mielke, Josef: *See—*
Humpolik, Bohumil; and Mielke, Josef, 4,891,257, Cl. 428-592.000.

Mignacca, Robert A.: *See—*
Belanger, Robert J.; and Mignacca, Robert A., 4,891,233, Cl. 426-94.000.

Miki, Yasuhiro: *See*—
Okada, Wataru; Yasui, Hideo; and Miki, Yasuhiro, 4,890,929, Cl. 366-160.000.
Mikkola, Donald E. Low density heat resistant intermetallic alloys of the Al_3Ti type. 4,891,184, Cl. 420-553.000.
Mikolajczak, Christopher, to Chrysler Motors Corporation. Heat sink for electrical components. 4,891,735, Cl. 361-419.000.
Milano, Umberto: *See*—
Jacobs, Malin L.; and Milano, Umberto, 4,891,576, Cl. 324-72.000.
Mildenberger, Hilmar: *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Burstell, Helmut; Bauer, Klaus; and Bieringer, Hermann, 4,891,057, Cl. 71-72.000.
Miles Inc.: *See*—
Dosmann, Andrew; Howard, Willis; and Zembrod, Alfred, 4,890,926, Cl. 356-369.000.
Miller, Bernard F.; Sawyer, John A.; and Webber, Wayne F., to Ingersoll-Rand Company. High-pressure-fluid machine, a seal. 4,890,542, Cl. 92-194.000.
Miller, Donald E.: *See*—
Oberhofer, Lanny A.; and Miller, Donald E., 4,890,786, Cl. 229-5.700.
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Miller, Raymond J.: *See*—
Albright, Donald W.; and Miller, Raymond J., 4,891,188, Cl. 422-114.000.
Mimata, Tsutomu; Uematsu, Toshihide; and Tabata, Katsuhiro, to Hitachi, Ltd. Manufacturing apparatus. 4,890,780, Cl. 228-4.500.
Minebea Co., Ltd.: *See*—
Fujitani, Sakae; Suzuki, Yuzuru; Okuda, Masanao; Takahashi, Hitoshi; and Fukazawa, Junichiro, 4,891,567, Cl. 318-254.000.
Minigrip, Inc.: *See*—
Ausnit, Steven; and Tilman, Paul, 4,890,935, Cl. 383-59.000.
Mininger, Robert F.: *See*—
Johnson, Paul B.; Mininger, Robert F.; Lane, Steven R.; and Lamb, Edwin, 4,890,781, Cl. 228-7.000.
Minnesota Mining and Manufacturing Company: *See*—
Afflerbaugh, Martin G.; and Knox, George J., 4,891,018, Cl. 439-402.000.
Meis, Michael A., 4,890,896, Cl. 350-96.210.
Minnesota Mining and Manufacturing Company (3M): *See*—
Cook, John S., 4,890,897, Cl. 350-96.210.
Minolta Camera Kabushiki Kaisha: *See*—
Araki, Kazuhiro, 4,891,495, Cl. 219-216.000.
Hamada, Akiyoshi; and Yagoto, Mitsutoshi, 4,891,653, Cl. 346-108.000.
Kanai, Nobuo, 4,891,664, Cl. 355-67.000.
Kanbayashi, Hideyuki, 4,891,670, Cl. 355-243.000.
Masaki, Kenji; Osawa, Izumi; Fujiwara, Masanori; and Takedomi, Yumiko, 4,891,291, Cl. 430-66.000.
Masaki, Kenji; Osawa, Izumi; Doi, Isao; and Fujiwara, Masanori, 4,891,292, Cl. 430-66.000.
Noda, Takashi, 4,891,662, Cl. 355-29.000.
Saijo, Hiromitsu, 4,891,679, Cl. 355-298.000.
Toyoshi, Naoki; Okamoto, Hiroshi; Tabuchi, Kenji; Takebe, Kaoru; and Yokoyama, Tomoaki, 4,891,287, Cl. 430-54.000.
Ueda, Hideaki, 4,891,289, Cl. 430-59.000.
Minuhin, Vadim B., to Magnetic Peripherals Inc. Methods and apparatus for performing high density isotropic/perpendicular digital magnetic recording. 4,891,717, Cl. 360-41.000.
Miranol Inc.: *See*—
Nadolsky, Richard J., 4,891,159, Cl. 252-545.000.
Miron, William L., to Computerized Security Systems, Inc. Mortise lock assembly with automatic dead bolt and incremental stop. 4,890,870, Cl. 292-333.000.
Misubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Danno, Yoshiaki; and Dogahara, Takashi, 4,891,122, Cl. 204-406.000.
Misumi, Akira: *See*—
Ezawa, Masayoshi; Wakana, Shigeru; Misumi, Akira; Tomita, Yoshifumi; and Hiratsuka, Yntaka, 4,890,481, Cl. 73-53.000.
Mitch, Charles H.: *See*—
Zimmerman, Dennis M.; and Mitch, Charles H., 4,891,379, Cl. 514-315.000.
Mitchell, David, to Coats Viyella Medical Limited. Ophthalmic aspirating/irrigating device. 4,891,044, Cl. 604-27.000.
Mitchell Instruments Ltd.: *See*—
Nagaya, Kazuhiko; Sakurai, Hiroshi; and Michell, Andrew K., 4,891,574, Cl. 324-61.00P.
Mitchell, Joan L.; and Pennebaker, William B., to International Business Machines Corporation. Arithmetic coding data compression/decompression by selectively employed, diverse arithmetic coding encoders and decoders. 4,891,643, Cl. 341-107.000.
Mitchell, Muni M.: *See*—
Einthoven, Willem G.; and Mitchell, Muni M., 4,891,685, Cl. 357-56.000.
Mitchell, Tyrone D., to Tetratec Corporation. Interpenetrating polymeric networks comprising polytetrafluoroethylene and polysiloxane. 4,891,407, Cl. 525-104.000.
Mitomi, Michio, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging apparatus. 4,891,596, Cl. 324-318.000.
Mitsubishi Chemical Industries Limited: *See*—
Nohso, Hidenori, 4,890,930, Cl. 366-208.000.
Mitsubishi Denki K.K.: *See*—
Okamoto, Kyoichi; Morikane, Hiroyuki; and Shiroyama, Shigeru, 4,891,539, Cl. 310-239.000.
Sato, Tadashi; Nishikasa, Keiichi; and Kamo, Masayoshi, 4,891,727, Cl. 360-137.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Anami, Kenji, 4,891,793, Cl. 365-204.000.
Ishida, Tomoaki; and Nishioka, Kyusaku, 4,891,095, Cl. 156-643.000.
Ito, Hideya, 4,890,471, Cl. 72-348.000.
Ito, Hiroki; and Ina, Teruo, 4,890,575, Cl. 118-723.000.
Matsuda, Kenji; Okada, Tetsuji; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,890,545, Cl. 98-39.100.
Nakata, Masahiro, 4,891,487, Cl. 219-69.170.
Oda, Minoru, 4,891,603, Cl. 330-110.000.
Okumura, Yoshinori, 4,891,327, Cl. 437-41.000.
Mitsubishi Denki Kaubshiki Kaisha: *See*—
Yamamoto, Yushin; and Miyashita, Takeshi, 4,891,744, Cl. 363-89.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Mochida, Isao; Sakai, Yukio; and Otsuka, Hiroyuki, 4,891,126, Cl. 208-39.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hirako, Osamu; Danno, Yoshiaki; and Shimada, Makoto, 4,891,121, Cl. 204-406.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.
Sato, Shozo; Shimoyama, Toshikazu; Shono, Susumu; Matsumoto, Osa; Kamei, Hiromasa; and Imada, Takehiko, 4,891,493, Cl. 219-137.00R.
Mitsubishi Paper Mills, Ltd.: *See*—
Matsushita, Toshihiko; and Morishita, Sadao, 4,891,172, Cl. 264-4.330.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.
Mitsubishi Petrochemical Engineering Co., Ltd.: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Oh-Kita, Motomu; Ishii, Kazuhiro; Kato, Masaaki; and Kobayashi, Masao, 4,891,347, Cl. 502-206.000.
Mitsuboshi Belting Ltd.: *See*—
Nagai, Takaji; Okawa, Hiroyuki; Mizuno, Takahide; and Nakagawa, Fumihito, 4,891,040, Cl. 474-267.000.
Mitsui, Fumito: *See*—
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Mitsui Petrochemical Industries, Ltd.: *See*—
Tanaka, Michio; Kurano, Yoshito; Taniguchi, Katsuo; and Ishibashi, Masayasu, 4,891,453, Cl. 568-805.000.
Taniguchi, Katsuo; Tanaka, Michio; Takahata, Kazunori; Sakamoto, Naoya; Takai, Toshihiro; Kurano, Yoshito; and Ishibashi, Masayasu, 4,891,465, Cl. 585-463.000.
Yamamoto, Sanehiro; Yasuhara, Mitsuki; Matsunaga, Fujihisa; Okano, Masato; and Nakamura, Mitsunori, 4,891,431, Cl. 548-335.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Abe, Masaru; Kawai, Yoichi; Hoshino, Minoru; and Sekiguchi, Katsumi, 4,891,392, Cl. 523-200.000.
Mitsuya, Kinpei, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Detecting and removing faulty weft in a jet loom. 4,890,650, Cl. 139-116.00A.
Miura, Hideki; and Ookubo, Mamoru, to Kabushiki Kaisha Daikin Seisakusho. Unbalance correction mechansm in a lock-up damper. 4,890,706, Cl. 192-3.280.
Miura, Seishi: *See*—
Fujii, Takaaki; Miura, Seishi; and Tsukui, Takaaki, 4,890,586, Cl. 123-52.00M.
Miwa, Takao: *See*—
Shibaoka, Kazuo; Miwa, Takao; Akimoto, Toshio; and Eto, Noriaki, 4,891,055, Cl. 65-106.000.
Miyajima, Yoshiki: *See*—
Tanaka, Cyuzaburo; Yazama, Teruyoshi; Miyajima, Yoshiki; Kashiwa, Masaharu; and Sugai, Hiroshi, 4,891,163, Cl. 252-627.000.
Miyake, Isao: *See*—
Motoi, Nobuhiro; Koshida, Yoshinori; Miyake, Isao; and Okazaki, Yasuo, 4,891,502, Cl. 235-379.000.
Miyamoto, Katsuhito: *See*—
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Miyao, Osami: *See*—
Shiraki, Manabu; and Miyao, Osami, 4,891,537, Cl. 310-68.00B.
Miyasaka, Shinji: *See*—
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Miyashita, Takeshi: *See*—
Yamamoto, Yushin; and Miyashita, Takeshi, 4,891,744, Cl. 363-89.000.
Miyate, Hiroo, to Nissan Shatai Company, Limited. Variable capacity type reciprocating piston device. 4,890,589, Cl. 123-197.00R.

Miyazaki, Akihiko, to Olympus Optical Co., Ltd. Electronic endoscope apparatus provided with image forming position detecting means. 4,891,696, Cl. 358-98.000.
Miyazaki, Hideki: *See*—
Nakamura, Norio; Ookawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, 4,891,363, Cl. 514-94.000.
Miyazaki, Kenji: *See*—
Hayashi, Noriki; Takano, Satoshi; Miyazaki, Kenji; and Yoshida, Noriyuki, 4,891,355, Cl. 505-1.000.
Miyoshi, Akio, to Kabushiki Kaisha Toshiba. Divisional operation system for obtaining a quotient by repeated subtraction and shift operations. 4,891,780, Cl. 364-766.000.
Miyoshi, Tadahiko: *See*—
Tanaka, Akira; Shimada, Satoshi; Yamada, Kazuji; Nakagawa, Yusaku; Nishihara, Motohisa; Miyoshi, Tadahiko; Baba, Noboru; Kagohara, Hiromi; and Inamura, Ichiro, 4,891,831, Cl 378-125.000.
Mize, James, Jr.; Davis, Kent A.; and Stockley, Henry W. Sealed internal package label. 4,890,739, Cl. 206-459.000.
Mizuguchi, Takeshi; and Shibuya, Kiyoshi, to House Food Industrial Company Limited. Method for expansion treatment of foods. 4,891,235, Cl. 426-281.000.
Mizuhata, Yoshinori: *See*—
Amano, Shintetsu; and Mizuhata, Yoshinori, 4,891,561, Cl. 315-223.000.
Mizukoshi, Seiichi; and Satoh, Tomonori, to Eastman Kodak Company. Method of sampling picture signals and apparatus therefor. 4,891,713, Cl. 358-445.000.
Mizuno, Takahide: *See*—
Nagai, Takaji; Okawa, Hiroyuki; Mizuno, Takahide; and Nakagawa, Fumihito, 4,891,040, Cl. 474-267.000.
Mizusaki, Takashi: *See*—
Yusa, Atsushi; Yamada, Hidetoshi; Mizusaki, Takashi; Nishizawa, Jun-ichi; and Tamamushi, Takashige, 4,891,682, Cl. 357-30.000.
Mizutani, Morikazu, to Canon Kabushiki Kaisha. Forward and reverse rotation mechanism. 4,891,665, Cl. 355-75.000.
Mobay Corporation: *See*—
Synek, Joseph, 4,891,385, Cl. 514-490.000.
Mobil Oil Corporation: *See*—
Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., 4,891,322, Cl. 436-64.000.
Chu, Cynthia T-W., 4,891,463, Cl. 585-415.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,891,197, Cl. 423-279.000.
Medlin, William L.; and King, Gary A., 4,890,687, Cl. 181-106.000.
Mochida, Isao; Sakai, Yukio; and Otsuka, Hiroyuki, to Mitsubishi Gas Chemical Company, Inc. Mesophase pitch for use in the making of carbon materials and process for producing the same. 4,891,126, Cl. 208-39.000.
Model Screw Products, Inc.: *See*—
Feller, Murray F., 4,890,499, Cl. 73-861.050.
Mogas Industries, Inc.: *See*—
Oliver, John P., 4,890,643, Cl. 137-614.110.
Molex Incorporated: *See*—
Lopata, John E., 4,891,023, Cl. 439-637.000.
Mollenauer, Kenneth H.: *See*—
Monfort, Michelle Y.; Chin, Albert K.; and Mollenauer, Kenneth H., 4,890,611, Cl. 606-159.000.
Molteni & C. Dei F.lli Alitti S.p.A.: *See*—
Gasparotti, Franca A., 4,891,386, Cl. 514-555.000.
Moncheaux, Michel J.: *See*—
Bravet, Jean L.; Colmon, Daniel; Daude, Gerard; and Moncheaux, Michel J., 4,891,271, Cl. 428-423.100.
Monford, Leo G., to United States of America, National Aeronautics and Space Administration. Docking aligament system. 4,890,918, Cl. 356-150.000.
Monfort, Michelle Y.; Chin, Albert K.; and Mollenauer, Kenneth H., to Fogarty, Thomas J. Endarterectomy apparatus and method. 4,890,611, Cl. 606-159.000.
Monoflo International, Inc.: *See*—
Rader, Helmut, 4,890,578, Cl. 119-72.500.
Monroe Auto Equipment Company: *See*—
Blankenship, David R., 4,890,858, Cl. 280-707.000.
Monsanto Company: *See*—
Asrar, Jawed, 4,891,413, Cl. 526-269.000.
Asrar, Jawed, 4,891,414, Cl. 526-269.000.
Carter, Don E.; and Hsu, Yung C., 4,891,190, Cl. 422-251.000.
Carter, Don E.; Hsu, Yung C.; and Tang, Jason J., 4,891,191, Cl. 422-254.000.
Schaumann, Jon P.; Olander, Jitka V.; Harakas, Nicholaos K.; and Feder, Joseph, 4,891,312, Cl. 435-7.000.
Montanwerke Walter GmbH: *See*—
Carl, Hans-Georg; and Beuchler, Roland, 4,890,961, Cl. 407-105.000.
Moore Business Forms, Inc.: *See*—
Pennock, Thomas G., 4,890,788, Cl. 229-71.000.
Moore Push-Pin Company: *See*—
Lorincz, Eugene M.; and Steele, Ronald J., 4,891,090, Cl. 156-577.000.
Moore Special Tool Co., Inc.: *See*—
Moore, Wayne R., Jr.; and Barney, Kevin S., 4,890,421, Cl. 51-165.00R.
Moore, Wayne R., Jr.; and Barney, Kevin S., to Moore Special Tool Co., Inc. Automatic measurement system. 4,890,421, Cl. 51-165.00R.
Moran, Peter L. Multilayer systems and their method of production. 4,891,259, Cl. 428-209.000.
More, Henry S.; and Marsh, John L., to Quantum Solutions, Inc. Vibration mount for electronic assemblies. 4,891,734, Cl. 361-417.000.
Morel, Didier: *See*—
Morel, Jacques; and Morel, Didier, 4,890,771, Cl. 222-137.000.
Morel, Jacques; and Morel, Didier, to Etablissements Morel - Ateliers Electromecaniques De Favieres. Cartridge for injecting a mixture of two liquid constituents. 4,890,771, Cl. 222-137.000.
Morgan, Lloyd A.; and Spector, George. Electrical cod jigger. 4,890,409, Cl. 43-15.000.
Mori, Akitoshi: *See*—
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 4,890,899, Cl. 350-173.000.
Mori, Kei. Stand for a solar ray collecting device. 4,890,806, Cl. 248-125.000.
Mori, Shinsaku: *See*—
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Morikane, Hiroyuki: *See*—
Okamoto, Kyoichi; Morikane, Hiroyuki; and Shiroyama, Shigeru, 4,891,539, Cl. 310-239.000.
Morimoto, Akira; Noguchi, Noriyoshi; and Choh, Nobuo, to Takeda Chemical Industries, Ltd. Tricyclic cepham compounds. 4,891,427, Cl. 540-216.000.
Morimoto, Isamu: *See*—
Uesawa, Yutaka; Kobayashi, Akira; and Morimoto, Isamu, 4,891,309, Cl. 430-627.000.
Morimoto, Taiji: *See*—
Yoshida, Toshihiko; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,891,816, Cl. 372-50.000.
Morinaga, Masaru; and Sasaki, Kazuhiko, to Nippon Seiko Kabushiki Kaisha. Webbing supporting device. 4,890,951, Cl. 403-96.000.
Morishita, Sadao: *See*—
Matsushita, Toshihiko; and Morishita, Sadao, 4,891,172, Cl. 264-4.330.
Morita, Katsuyuki, to Kitagawa Industries Co., Ltd. Electrical cord clamp. 4,890,805, Cl. 248-74.200.
Morita, Yasuyuki: *See*—
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 4,890,899, Cl. 350-173.000.
Morito Co., Ltd.: *See*—
Odajima, Kotoku; and Sasaki, Kazuhiro, 4,890,3o2, Cl. 24-713.700.
Moritoh, Naoya *See*—
Masaki, Mitsuo; Takeda, Hiromitsu; Moritoh, Naoya; and Takahashi, Toshihiro, 4,891,433, Cl. 549-12.000.
Moriwaki, Kaoru: *See*—
Ooe, Kimio; Amano, Nobutaka; Kubo, Takashige; and Moriwaki, Kaoru, 4,l91,773, Cl. 364-578.000.
Moriyama, Hiroshi: *See*—
Fujii, Yoshihalu; Fujita, Yukitoshi; and Moriyama, Hiroshi, 4,890,797, Cl. 241-34.000.
Moriyama, Yuichi; and Sekihara, Toshinobu, to Matsushita Electric Industrial Co., Ltd. Image display apparatus with means for correcting image distortion. 4,891,552, Cl. 313-495.000.
Morpheus Lights, Inc.: *See*—
Richardson, Brian E.; and Richardson, John R., 4,891,738, Cl. 362-282.000.
Morreale, Philip: *See*—
Ackilli, Joseph A.; Saleeb, Fouad Z.; Morreale, Philip; and McKay, Randal P., 4,891,198, Cl. 423-308.000.
Morris, John L. Retractable cleat. 4,890,566, Cl. 114-218.000.
Morris, Leslie C.; and Riediger, Craig W., to Caterpillar Inc. Engine lubrication system. 4,890,695, Cl. 184-6.300.
Morton Thiokol, Inc.: *See*—
McEntee, Thomas C., 4,891,391, Cl. 523-122.000.
Schneiter, Fred E., 4,890,860, Cl. 280-741.000.
Morud, Gregory L., to Rockwell International Corporation. Analog and digital video display system. 4,891,706, Cl. 358-184.000.
Moruzzi, James L.: *See*—
Jones, Gordon R.; Moruzzi, James L.; and Prasad, Akkanapragada N., 4,891,509, Cl. 250-226.000.
Jones, Gordon R.; Moruzzi, James L.; and Prasad, Akkanapragada N., 4,891,510, Cl. 250-226.000.
Moskowitz, Ronald: *See*—
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Moslehi, Mehrdad M., to Texas Instruments Incorporated. Method and apparatus for real-time wafer temperature uniformity control and slip-free heating in lamp heated single-wafer rapid thermal processing systems. 4,891,499, Cl. 219-502.000.
Moss, William G.: *See*—
Oloff, Clarence M.; Moss, William G.; Holder, Garry N.; and Hermann, Linda M., 4,890,579, Cl. 119-103.000.
Motoi, Nobuhiro; Koshida, Yoshinori; Miyake, Isao; and Okazaki, Yasuo, to Oki Electric Industry Co., Ltd. Cash dispenser of the type transporting a slip and bills together. 4,891,502, Cl. 235-379.000.
Motorola, Inc.: *See*—
Bocci, Paul M.; Cutts, Kevin M.; and Pietrzak, Carl M., Jr., 4,891,812, Cl. 371-5.500.
Davis, Walter L., 4,891,638, Cl. 340-825.440.
Hansen, Kenneth A., 4,891,825, Cl. 377-52.000.
Siwiak, Kazimierz; Keba, James M.; and Steel, Francis R., 4,891,637, Cl. 340-825.440.

Waldo, Whitson G., III, 4,891,094, Cl. 156-626.000.

Motter Printing Press Co.: *See*—
Bryer, Jack; Lindstrom, Jan; and Stone, Rex D., 4,890,555, Cl. 101-415.100.

Moudafi, Latifa: *See*—
Fajula, Francois; Figueras, Francois; Moudafi, Latifa; Vera Pacheco, Mercedes; Nicolas, Serge; Dufresne, Pierre; and Gueguen, Claude, 4,891,200, Cl. 423-328.000.

Mowry, Greg S., to Magnetic Peripherals Inc. Magnetoresistive sensor having antiferromagnetic exchange-biased ends. 4,891,725, Cl. 360-113.000.

Mrazek, Franklin C.: *See*—
Kaun, Thomas D.; and Mrazek, Franklin C., 4,891,280, Cl. 429-41.000.

Mroz, Edward J. Personal sports equipment carrier. 4,890,731, Cl. 206-315.900.

Mudrow, Alfred: *See*—
Call, Duane B.; Mudrow, Alfred; Johnson, Randall C.; and Bennion, Robert F., 4,891,751, Cl. 364-200.000.

Mueller, Heinz: *See*—
Teamann, Holger; Hempel, Hans U.; Mueller, Heinz; Gruenert, Margarete; and Asbeck, Adolf, 4,891,154, Cl. 252-321.000.

Mueller, Manfred: *See*—
Gross, Wolfgang; Mueller, Manfred; Ahnsorge, Harald; and Zott, Andrea, 4,891,150, Cl. 252-142.000.

Mueller, Walter B., to W. R. Grace & Co.-Conn. Moisture barrier medical film. 4,891,253, Cl. 428-35.200.

Mukai, Kiichiro: *See*—
Nishioka, Yasushiro; Shinriki, Hiroshi; Sakuma, Noriyuki; and Mukai, Kiichiro, 4,891,684, Cl. 357-51.000.

Mukouyama, Hideaki: *See*—
Nagatsu, Yoshirou; Nagamoto, Akiyoshi; Harada, Kazuya; and Mukouyama, Hideaki, 4,891,440, Cl. 560-222.000.

Mukunoki, Yasuo; Maekawa, Yukio; and Suga, Shuzo, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,891,307, Cl. 430-527.000.

Mulder, Lawrence: *See*—
Tosa, Thomas F.; and Mulder, Lawrence, 4,890,438, Cl. 52-790.000.
Wilkening, Steven R.; and Mulder, Lawrence, 4,890,435, Cl. 52-456.000.

Muller, Fritz. Locking hand lever for operating a valve or the like. 4,890,506, Cl. 74-523.000.

Muller, Hans R., to Sundstrand Data Control, Inc. Wind shear detection system. 4,891,642, Cl. 340-968.000.

Muller, Ingrid: *See*—
Wingen, Rainer; Dubal, Hans-Rolf; Escher, Claus; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,891,151, Cl. 252-299.610.

Mulligan, David C., to Roto Plastics, Inc. Method of making an automobile roof cap. 4,891,085, Cl. 156-216.000.

Mulligan, Seamus: *See*—
Geoghegan, Edward J.; Mulligan, Seamus; and Panoz, Donald E., 4,891,230, Cl. 424-461.000.

Mullin, John G., Jr.; Nakamura, Keiji; Tilley, Jefferson W.; and Watanabe, Hiroshi, to Hoffmann-La Roche Inc. Antiarrhythmic agents. 4,891,429, Cl. 546-329.000.

Mullins, Tommy D., to Nuturn Corporation. Breather holes and plug member for a service/emergency brake actuator. 4,890,540, Cl. 92-63.000.

Mumcu, Salih: *See*—
Bittscheidt, Josef; Horlbeck, Gernot; and Mumcu, Salih, 4,891,406, Cl. 525-64.000.

Mumper, Melanie A.: *See*—
Spitzer, Rich A.; Mumper, Melanie A.; and Stanley, Karen A., 4,891,712, Cl. 358-335.000.

Murao, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Device for detecting object. 4,891,627, Cl. 340-562.000.

Muraoka, Syunsaku: *See*—
Yohda, Hiroshi; Takahashi, Ken; Sawai, Eisuke; Muraoka, Syunsaku; and Ihara, Keita, 4,890,379, Cl. 29-603.000.

Murata Manufacturing Co., Ltd.: *See*—
Fukuda, Susumu; Ariyoshi, Hisashi; and Kasanami, Toru, 4,890,370, Cl. 29-25.350.

Murayama, Eigoro: *See*—
Kubodera, Noboru; Miyamoto, Katsuhito; Ochi, Kiyoshige; Matsunaga, Isao; and Murayama, Eigoro, 4,891,364, Cl. 514-167.000.

Murrel, Lawrence L.; and Dispenziere, Nicholas C., Jr., to Exxon Research and Engineering Company. Preparation and use of catalysts comprising a mixture of tungsten oxide and silica supported on a boehmite-like surface. 4,891,127, Cl. 208-111.000.

Murach, Michael; and Schwaiger, Karl-Heinz, to SMM Sportive Management and Marketing GmbH. Golf cart. 4,890,856, Cl. 280-646.000.

Muschter, Sigo: *See*—
Kunkel, Ernst; Bubolz, Petra; Rutz, Wolfhard; and Muschter, Sigo, 4,891,260, Cl. 428-220.000.

Mussmann, Sara M.: *See*—
Andrejasich, Raymond J.; Slocum, Laurence S.; and Mussmann, Sara M., 4,890,492, Cl. 73-292.000.

Myers, Glen: *See*—
Budde, David; Riches, Robert; Imel, Michael T.; Myers, Glen; and Lai, Konrad, 4,891,753, Cl. 364-200.000.

Nacamuli, Gerald J.: *See*—
Innes, Robert A.; Zones, Stacey I.; and Nacamuli, Gerald J., 4,891,458, Cl. 585-323.000.

Nachtsheim, Ralf: *See*—
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Naden, James M., to STC PLC. Thermo-optic differential expansion fiber sensor. 4,891,512, Cl. 250-227.000.

Nader, Hans; and Steiner, Karl, to Maschinenfabrik Heid Aktiengesellschaft. Clamping head for the releasable attachment of a workpiece carrier to a machine tool spindle. 4,890,522, Cl. 82-142.000.

Nadkarni, S. K.; and Raghavan, Narasimha S., to Lanxide Technology Company, LP. Method for producing composite ceramic structures using dross. 4,891,345, Cl. 501-155.000.

Nadolsky, Richard J., to Miranol Inc. Low-foam alkali-stable amphoteric surface active agents. 4,891,159, Cl. 252-545.000.

Nagai, Takaji; Okawa, Hiroyuki; Mizuno, Takahide; and Nakagawa, Fumihito, to Mitsuboshi Belting Ltd. Woven fabric belt. 4,891,040, Cl. 474-267.000.

Nagamoto, Akiyoshi: *See*—
Nagatsu, Yoshirou; Nagamoto, Akiyoshi; Harada, Kazuya; and Mukouyama, Hideaki, 4,891,440, Cl. 560-222.000.

Nagano, Kiyoshi: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,891,348, Cl. 502-309.000.

Nagano, Yoshinobu: *See*—
Ito, Noriki; Nagano, Yoshinobu; Tanaka, Akihiro; Numasaki, Yoso; and Takahashi, Koichiro, 4,891,432, Cl. 548-341.000.

Nagarajan, Madukkarai K.; and Masler, William R., III, to BFGoodrich Company, The. Compositions containing lime soap dispersing polymers and their use. 4,891,149, Cl. 252-110.000.

Nagashima, Hiroshi: *See*—
Nakanishi, Sadao; Nagashima, Hiroshi; and Tomiyasu, Kazuhiro. 4,891,492, Cl. 219-125.100.

Nagata, Sumio: *See*—
Sakamoto, Michiru; Kitahara, Akira; Ueno, Hidetoshi; and Nagata, Sumio, 4,891,182, Cl. 419-2.000.

Nagatsu, Yoshirou; Nagamoto, Akiyoshi; Harada, Kazuya; and Mukouyama, Hideaki, to Kohjin Co., Ltd. Process for producing unsaturated quaternary ammonium slats. 4,891,440, Cl. 560-222.000.

Nagaura, Toru; and Oishi, Shigeru, to Sony-Eveready Inc. Organic electrolyte cell. 4,891,282, Cl. 429-194.000.

Nagaya, Kazuhiko; Sakurai, Hiroshi; and Michell, Andrew K., to Mitchell Instruments Ltd.; and Kabushiki Kaishia Tekune Yohkoh. Hygrometer with plural measuring bones and redundancy system circuit. 4,891,574, Cl. 324-61.00P.

Nagazumi, Yasuo: *See*—
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Naito, Genpei, to Nissan Motor Co., Ltd. Device for controlling driving force distribution in four-wheel drive vehicle. 4,890,685, Cl. 180-233.000.

Nakada, Kimiaki: *See*—
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.

Nakagawa, Fumihito: *See*—
Nagai, Takaji; Okawa, Hiroyuki; Mizuno, Takahide; and Nakagawa, Fumihito, 4,891,040, Cl. 474-267.000.

Nakagawa, Yusaku: *See*—
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Nakai, Akira: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; and Ohno, Tomoyasu, 4,891,369, Cl. 514-192.000.

Nakai, Tatsuaki: *See*—
Komura, Manabu; Hirai, Kunio; Nakai, Tatsuaki; Okumura, Kazuyoshi; and Yamamoto, Nobuyuki, 4,890,392, Cl. 33-762.000.

Nakai, Tetsuo; Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Process for the production of a composite tool. 4,890,782, Cl. 228-112.000.

Nakajima, Mikio; and Makino, Akihiro, to Alps Electric Co., Ltd. High saturated magnetic flux density alloy. 4,891,079, Cl. 148-307.000.

Nakamae, Kenji; and Shima, Tsukasa, to Asahi Kasei Kogyo Kabushiki Kaisha. High strength wet-laid nonwoven fabric and process for producing same. 4,891,262, Cl. 428-224.000.

Nakamura, Hironori: *See*—
Ohkawa, Hideo; Chikushi, Masakuni; Nakamura, Hironori; Funayama, Shinji; Hashimoto, Takashi; and Hirai, Takahiro, 4,891,399, Cl. 523-200.000.

Nakamura, Hiroshi: *See*—
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 4,890,899, Cl. 350-173.000.

Nakamura, Keiji: *See*—
Mullin, John G., Jr.; Nakamura, Keiji; Tilley, Jefferson W.; and Watanabe, Hiroshi, 4,891,429, Cl. 546-329.000.

Nakamura, Koki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,891,304, Cl. 430-448.000.

Nakamura, Mitsunori: *See*—
Yamamoto, Sanehiro; Yasuhara, Mitsuki; Matsunaga, Fujihisa; Okano, Masato; and Nakamura, Mitsunori, 4,891,431, Cl. 548-335.000.

Nakamura, Norio; Onkawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, to Sankyo Company Limited. Cyclic ether derivatives and their use. 4,891,363, Cl. 514-94.000.

Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Phosphor, and radiation image storage panel. 4,891,277, Cl. 428-691.000.

Nakamura, Tomoharu; Irokawa, Hiroyuki; Mashiko, Syoichi; Shimamura, Hidehiko; and Tsutsumi, Hirofumi, to Hitachi, Ltd. Static var compensator with thyristor control. 4,891,570, Cl. 323-210.000.

Nakamura, Yasuo, to Canon Kabushiki Kaisha. Monitoring system of network. 4,891,639, Cl. 340-825.500.

Nakamura, Yasuo: *See*—
Kawada, Tsutomu; and Nakamura, Yasuo, 4,890,614, Cl. 600-339.000.

Nakanishi, Hiroaki: *See*—
Asari, Masatoshi; Konishi, Ikuo; Fujita, Hiroyuki; Hirakimoto, Akira; and Nakanishi, Hiroaki, 4,891,601, Cl. 328-233.000.

Nakanishi, Sadao; Nagashima, Hiroshi; and Tomiyasu, Kazuhiro, to Shinko Electric Co., Ltd. Mechanism for a robot tool support. 4,891,492, Cl. 219-125.100.

Nakano, Takayuki, to Fuji Electrochemical Co., Ltd. Optical head apparatus for writing and reading data on an optical disk having a lens with an inclined optical axis. 4,891,799, Cl. 369-45.000.

Nakata, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Electrode return control for electric spark machine. 4,891,487, Cl. 219-69.170.

Nakatani, Ryoichi: *See*—
Otomo, Shigekazu; Nakatani, Ryoichi; Kumasaka, Noriyuki; Saito, Noritoshi; Kobayashi, Toshio; and Fujishiro, Masahiko, 4,891,278, Cl. 428-681.000.

Nakayama, Tadayoshi; and Sato, Chikara, to Canon Kabushiki Kaisha. Image expansion apparatus. 4,891,702, Cl. 358-140.000.

Nakazato, Katsuo; Kurosawa, Toshiharu; Maruyama, Yuji; Takahashi, Kiyoshi; and Tsuchiya, Hiroyoshi, to Matsushita Electric Industrial Co., Ltd. Bi-level image display signal processing apparatus. 4,891,710, Cl. 358-443.000.

Nakazato, Shuuichi: *See*—
Ichimura, Kunihiro; Itoh, Hiroshi; Nakazato, Shuuichi; and Takazawa, Hideaki, 4,891,300, Cl. 430-283.000.

Nalco Chemical Company: *See*—
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Namioka, Kenta: *See*—
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.

Narancic, Vojislav; and Fecteau, Gilles, to Hydro-Quebec. Method of manufacturing a fuse with an envelope of non-porous rigid ceramic. 4,890,380, Cl. 29-623.000.

Narayan, Ramani; Tsao, George T.; and Biermann, Christopher J., to Purdue Research Foundation. Biodegradable graft copolymers. 4,891,404, Cl. 525-54.200.

Narita, Mitsuru, to Fuji Electric Co., Ltd. Photosensitive material for electrophotography. 4,891,290, Cl. 430-58.000.

Naselli, Charles: *See*—
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Nassiri, Mohammad R.: *See*—
Shipman, Charles, Jr.; Nassiri, Mohammad R.; and Flynn, Gordon L., 4,891,377, Cl. 514-282.000.

Nation, Melvin S.; and Krawczyk, Robert W., to Illinois Tool Works, Inc. Index rotary switch. 4,891,476, Cl. 200-11.00R.

National Research Development Corporation: *See*—
Albery, Wyndham J.; Coombs, Anthony J. M.; Drummond, Humphrey J. J.; and Hahn, Clive, 4,891,102, Cl. 204-1.00T.
De Ronde, Frans C., 4,891,614, Cl. 333-122.000.
Lurie, John; Bussell, David M.; and Mallard, John R., 4,891,593, Cl. 324-307.000.
Squire, Patrick T., 4,891,587, Cl. 324-244.000.

National Rolling Mills, Inc.: *See*—
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Natsume, Mitsuaki: *See*—
Sugiyama, Eiji; Natsume, Mitsuaki; and Saito, Toshiharu, 4,891,729, Cl. 361-91.000.

Natter, Arthur, to Koenig, Peter. Method and plant for purifying the exhaust air from a tenterframe or a singer. 4,890,581, Cl. 122-1.00A.

NCR Corporation: *See*—
Rieker, David A., 4,891,636, Cl. 340-825.310.

NEC Corporation: *See*—
Hazawa, Osamu, 4,891,809, Cl. 371-3.000.
Iwamoto, Mitoshi, 4,891,556, Cl. 315-3.500.
Kanoh, Toshiyuki, 4,891,534, Cl. 307-355.000.
Shikina, Chokei; Onosato, Masashi; Tsuji, Masakazu; Tsutsui, Takeo; Yorozu, Masatoshi; and Tanaka, Yutaka, 4,891,701, Cl. 358-140.000.
Suzuki, Hiroyuki; and Kawata, Kazuhide, 4,891,705, Cl. 358-148.000.
Yoshida, Shousei; and Otani, Susumu, 4,891,598, Cl. 328-61.000.

Nekola, Randy A.; and Cannon, Fleming V., Jr., to Century Wrecker Corporation. Quick connect/disconnect wheel cradle arrangement for wheel lift towing systems. 4,890,972, Cl. 414-563.000.

Nelson, Daniel E.; and Nelson, Mickey C. Floating fish container with adjustable length means and biased opening means. 4,890,413, Cl. 43-55.000.

Nelson, Dorand N. Traction assembly. 4,890,604, Cl. 128-74.000.

Nelson, Mickey C.: *See*—
Nelson, Daniel E.; and Nelson, Mickey C., 4,890,413, Cl. 43-55.000.

Nelson, Victor. Transfer device for combining, dividing, and switching microwave signals. 4,891,613, Cl. 333-108.000.

Nestec S. A.: *See*—
Loliger, Willi; and Schmied, Rudolf, 4,890,639, Cl. 137-510.000.

Nestec S.A.: *See*—
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., 4,891,231, Cl. 426-52.000.

Neumaier, Robert: *See*—
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Neuman, Charles E., to Neuman Industries, Inc. Refrigerator door ajar detection system. 4,891,626, Cl. 340-547.000.

Neuman Industries, Inc.: *See*—
Neuman, Charles E., 4,891,626, Cl. 340-547.000.

Neumann, Peter: *See*—
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Neuschaefer, Carl H.: *See*—
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Neutralysis Industries Pty. Ltd.: *See*—
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Nevin, C. Scott: *See*—
Amith, Avraham; Naselli, Charles; and Nevin, C. Scott, 4,890,933, Cl. 374-121.000.

Newland, Allan B.: *See*—
Tremaine, Eric; and Newland, Allan B., 4,890,977, Cl. 415-164.000.

Newman-Evans, Richard H., to Amoco Corporation. Epoxy resins based on tetraglycidyl diamines. 4,891,408, Cl. 525-113.000.

NFO Research, Inc.: *See*—
Spitzer, Rich A.; Mumper, Melanie A.; and Stanley, Karen A., 4,891,712, Cl. 358-335.000.

Nguyen, Tuan: *See*—
Baker, Richard; and Nguyen, Tuan, 4,890,702, Cl. 188-264.00D.

NHK Spring Co., Ltd.: *See*—
Ezure, Nobuya; Takadera, Ichiro; and Taguchi, Kohei, 4,890,822, Cl. 267-64.240.

Nichols, Joseph W. Dovetail gun sight mount. 4,890,407, Cl. 42-100.000.

Nicholson, Terence P., to Specialist Sealing Limited. Valve seats. 4,890,816, Cl. 251-174.000.

Nickel, Klaus-Dietrich, to Kasa-Technoplan GmbH. Drive and bearing arrangement for two oppositely rotating, adjacently located rotor systems. 4,891,038, Cl. 474-166.000.

Nickisch, Klaus: *See*—
Wiechert, Rudolf; Beier, Sybille; Elger, Walter; Annen, Klaus; Nickisch, Klaus; and Laurent, Henry, 4,891,365, Cl. 514-173.000.

Nicolas, Serge: *See*—
Fajula, Francois; Figueras, Francois; Moudafi, Latifa; Vera Pacheco, Mercedes; Nicolas, Serge; Dufresne, Pierre; and Gueguen, Claude, 4,891,200, Cl. 423-328.000.

Nicoll, Douglas, Sr.; and Nicoll, Tammy. Trash receptacle with vacuum breaking means. 4,890,760, Cl. 220-404.000.

Nicoll, Tammy: *See*—
Nicoll, Douglas, Sr.; and Nicoll, Tammy, 4,890,760, Cl. 220-404.000.

Niese, Michael W., to Robbins, Inc. Hardwood floor system. 4,890,434, Cl. 52-393.000.

Nifco Inc.: *See*—
Fukumoto, Masumi, 4,890,735, Cl. 206-387.000.
Umezawa, Takashi, 4,890,966, Cl. 411-340.000.

Nigol, Olaf. High voltage insulators constructed to have plural dry bands in use. 4,891,473, Cl. 174-150.000.

Niizuma, Kiyozumi: *See*—
Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takeshi; Kameyama, Makoto; and Niizuma, Kiyozumi, 4,890,378, Cl. 29-603.000.

Nikawa, Yoshio: *See*—
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Niles Parts Co., Ltd.: *See*—
Sekine, Takao, 4,891,796, Cl. 367-96.000.

Ninomiya, Yuichi: *See*—
Hamada, Masanori; Inoue, Takeshi; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,891,699, Cl. 358-136.000.

Nippon Chemiphar Co., Ltd.: *See*—
Masaki, Mitsuo; Takeda, Hiromitsu; Moritoh, Naoya; and Takahashi, Toshihiro, 4,891,433, Cl. 549-12.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Hayashi, Sei-ichi; Hobjoh, Tadashi; Furuse, Tokuo; Kuriyama, Hiroki; Watanabe, Tsuyoshi; and Takatsuto, Suguru, 4,891,168, Cl. 260-397.200.

Nippon Oil Company, Ltd.: *See*—
Hara, Hajime; Toya, Tomohiro; Iida, Shigeki; and Satoh, Tetsuo, 4,891,418, Cl. 528-195.000.
Yuasa, Hitoshi; Matsuno, Mitsuo; and Satoh, Tetsuo, 4,891,456, Cl. 585-275.000.

Nippon Paint Company, Ltd.: *See*—
Takagawa, Ryozo; Tanabe, Hisaki; Inoue, Koichi; and Umemoto, Hirotoshi, 4,891,419, Cl. 528-274.000.
Yasui, Fumio, 4,890,633, Cl. 134-76.000.

Nippon Rubber Co., Ltd.: *See*—
Harada, Masasuke; Kumagawa, Hiroshi; and Izumi, Junji, 4,890,397, Cl. 36-30.00R.
Nippon Seiko Kabushiki Kaisha: *See*—
Morinaga, Masaru; and Sasaki, Kazuhiko, 4,890,951, Cl. 403-96.000.
Nippon Sharyo Seizo Kabushiki Kaisha: *See*—
Teramoto, Tomihiko; Ono, Hidehiko; Ito, Sadanobu; and Nishino, Kiyoshi, 4,890,804, Cl. 246-453.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Shibaoka, Kazuo; Miwa, Takao; Akimoto, Toshio; and Eto, Noriaki, 4,891,055, Cl. 65-106.000.
Nippon Steel Corporation: *See*—
Higuchi, Seijun; Asakawa, Kenichi; Ohmori, Takayuki; Umeno, Koji; Okada, Nobuyoshi; Fujinaga, Minoru; Yamamoto, Fumio; and Yabe, Katsuhiko, 4,891,274, Cl. 428-653.000.
Odashima, Hisao; Hirano, Yoshihiko; and Hiraoka, Teruyoshi, 4,891,273, Cl. 428-623.000.
Tanikawa, Keiichi; Fujioka, Yuji; Higaki, Yuzo; and Goto, Hiroyuki, 4,891,161, Cl. 252-56.00S.
Umezawa, Kazushige; Kuwabara, Tatsuro; Oh-hara, Tetsuya; Nuibe, Tsuzuru; and Ozawa, Kousaku, 4,891,064, Cl. 75-51.200.
Nippon Zeon Co., Ltd.: *See*—
Satoh, Masaki; Kamiya, Shigemitsu; Fujie, Nobuo; and Tabuchi, Shuji, 4,891,334, Cl. 437-228.000.
Nippondenso Co., Ltd.: *See*—
Iwamoto, Shinichi; Isomura, Shigenori; Takao, Mitsunori; and Kamai, Kenichiro, 4,890,590, Cl. 123-198.00D.
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Nippondenso Soken, Inc.: *See*—
Matsumoto, Muneaki; Numata, Koji; Akita, Shigeyuki; Nishida, Minoru; and Masegi, Mitsuhiko, 4,891,559, Cl. 315-82.000.
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Nishihara, Motohisa: *See*—
Tanaka, Akira; Shimada, Satoshi; Yamada, Kazuji; Nakagawa, Yusaku; Nishihara, Motohisa; Miyoshi, Tadahiko; Baba, Noboru; Kagohara, Hiromi; and Inamura, Ichiro, 4,891,831, Cl. 378-125.000.
Nishikasa, Keiichi: *See*—
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Nishikawa, Hirotaka; Ukai, Sadao; and Ito, Kanehiro, to Howa Machinery, Ltd. Apparatus for controlling operation of spinning frame in roving bobbin exchange system. 4,890,452, Cl. 57-276.000.
Nishimura, Katsuhide; Kunugiza, Motoyasu; Shirota, Hiroharu; and Ishizu, Hideyuki, to Dainippon Ink and Chemicals, Inc. Processes for producing polycarbonate polyols. 4,891,421, Cl. 528-370.000.
Nishimura, Kinji: *See*—
Sezaki, Mutsuo; and Nishimura, Kinji, 4,891,834, Cl. 379-67.000.
Nishimura, Nobuko: *See*—
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Nishino, Haruo: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,891,236, Cl. 426-330.400.
Nishino, Kiyoshi: *See*—
Teramoto, Tomihiko; Ono, Hidehiko; Ito, Sadanobu; and Nishino, Kiyoshi, 4,890,804, Cl. 246-453.000.
Nishioka, Kyusaku: *See*—
Ishida, Tomoaki; and Nishioka, Kyusaku, 4,891,095, Cl. 156-643.000.
Nishioka, Yasushiro; Shinriki, Hiroshi; Sakuma, Noriyuki; and Mukai, Kiichiro, to Hitachi, Ltd. Semiconductor device. 4,891,684, Cl. 357-51.000.
Nishitomo Co., Ltd.: *See*—
Sezaki, Mutsuo; and Nishimura, Kinji, 4,891,834, Cl. 379-67.000.
Nishizawa, Jun-ichi: *See*—
Yusa, Atsushi; Yamada, Hidetoshi; Mizusaki, Takashi; Nishizawa, Jun-ichi; and Tamamushi, Takashige, 4,891,682, Cl. 357-30.800.
Nissan Motor Company, Ltd.: *See*—
Hara, Tomoyuki, 4,890,509, Cl. 74-710.500.
Ishii, Tatsushi, 4,891,000, Cl. 425-522.000.
Kato, Yuji, 4,891,759, Cl. 364-424.100.
Naito, Genpei, 4,890,685, Cl. 180-233.000.
Suzuki, Yutaka, 4,890,516, Cl. 74-866.000.
Takahashi, Takao, 4,890,649, Cl. 139-116.00A.
Ueki, Akihiro; and Sugano, Kazuhiko, 4,890,517, Cl. 74-868.000.
Nissan Shatai Company, Limited: *See*—
Miyate, Hiroo, 4,890,589, Cl. 123-197.00R.
Nisshin Oil Mills, Ltd.: *See*—
Tanikawa, Keiichi; Fujioka, Yuji; Higaki, Yuzo; and Goto, Hiroyuki, 4,891,161, Cl. 252-56.00S.
Nitz, William A.: *See*—
Bowman, Wayne C.; Nitz, William A.; and Ziesse, Norman G., 4,891,746, Cl. 363-131.000.
Nitzsche, Klaus. Tooth care atricle such as a toothbrush with replaceable insert. 4,890,349, Cl. 15-167.100.
Nixon, Ivor G. Metallurgical processes. 4,890,821, Cl. 266-267.000.
Niziolek, James M.; and Sutton, James P., III, to Combustion Engineering, Inc. In situ particle size measuring device. 4,890,920, Cl. 356-336.000.
Noack, Jean-Claude: *See*—
Weber, Jean-Luc M.; Bloch, Serge; Noack, Jean-Claude; Chouard, Claude-Henri; and MacLeod, Patrick, 4,890,618, Cl. 128-420.600.
Noble, Mark C.: *See*—
Haman, David F.; and Noble, Mark C., 4,891,026, Cl. 440-73.000.
Nobue, Tomotaka; Matsumoto, Tomohide; and Hikino, Tadashi, to Matsushita Electric Industrial Co., Ltd. Magnetron device. 4,891,557, Cl. 315-39.510.
Noda, Hideo: *See*—
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,891,236, Cl. 426-330.400.
Noda, Takashi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,891,662, Cl. 355-29.000.
Noguchi, Koji, to Hitachi Metals, Ltd. Electrostatic development toner. 4,891,294, Cl. 430-110.000.
Noguchi, Noriyoshi: *See*—
Morimoto, Akira; Noguchi, Noriyoshi; and Choh, Nobuo, 4,891,427, Cl. 540-216.000.
Nohira, Tadashi; Imatsu, Tsuneo; and Kagami, Ikuzo, to Komatsugawa Chemical Engineering Co., Ltd. Photometering apparatus. 4,891,519, Cl. 250-349.000.
Nohl, Andre; and Perkins, Ronald V., to Spectra-Physics, Inc. Method and apparatus for membrane extraction of hydrolysis contaminates. 4,891,137, Cl. 210-644.000.
Nohso, Hidenori, to Mitsubishi Chemical Industries Limited. Automatic sampling apparatus. 4,890,930, Cl. 366-208.000.
Nokia Graetz: *See*—
Kniesser, Karl; Kornaker, Walter; Lau, Bernhard; and Schanz, Werner, 4,891,549, Cl. 313-414.000.
Nomura, Yasushi: *See*—
Kitamori, Takehiko; Yasuda, Kazuo; Nomura, Yasushi; Suzuki, Kazumichi; and Fujimori, Haruo, 4,890,925, Cl. 356-432.000.
Nonn, Alain; and Desmurs, Jean R., to Rhone-Poulenc Chimie. Process for the preparation of hydroxybiphenyls. 4,891,452, Cl. 568-730.000.
Nordhoff, Erhard; Franke, Wilfried; and Arndt, Friedrich, to Schering Aktiengesellschaft. Imidazolinyl derivatives, having herbicidal activity. 4,891,428, Cl. 546-278.000.
Noren, Donald W.: *See*—
Beach, John R.; Hasan, Syed R.; Noren, Donald W.; Hindman, Craig A.; and Santi, Ernest S., 4,890,968, Cl. 411-531.000.
Noro, Masao, to Yamaha Corporation. Device for determining pick-up head tracking error in a digital tape player. 4,891,644, Cl. 341-128.000.
Norris, Alan H. Use of bacteriophages in dental hygiene. 4,891,210, Cl. 424-50.000.
Norsk Hydro a.s.: *See*—
Knoll, Richard, 4,891,275, Cl. 428-650.000.
North American Philips Corporation: *See*—
Will, Jerald D.; and Latassa, Frank M., 4,891,551, Cl. 313-492.000.
Northern Telecom Limited: *See*—
Kwa, Peter T. H., 4,890,894, Cl. 350-96.200.
Northrop, Donald; Schiazzano, Gerald; and Pirovic, Arpad, to Duro-Test Corporation. Phosphor blend for broad spectrum fluorescent lamp. 4,891,550, Cl. 313-487.000.
Northstar Research Institute, Ltd.: *See*—
Hakky, Said I., 4,890,621, Cl. 128-635.000.
Nortier, Patrice: *See*—
Chopin, Thierry; Garreau, Francois; Knipper, Magali; Nortier, Patrice; and Schuppiser, Jean-Luc, 4,891,350, Cl. 502-439.000.
Noudan, Yoshimasa, to Kabushiki Kaisha Toshiba. Method and system for determining video program system signals. 4,891,703, Cl. 358-142.000.
Nowak, William W.: *See*—
Kadleck, Richard G.; and Nowak, William W., 4,890,737, Cl. 206-427.000.
Nu-Tech Industries, Inc.: *See*—
Kinsworthy, Donald D., 4,890,598, Cl. 126-110.00D.
Nuckolls, Joe A.; and Buckley, Paul J., II, to Hubbell Incorporated. Hybrid regulator-ballast circuit for high intensity discharge lamps. 4,891,562, Cl. 315-277.000.
Nuibe, Tsuzuru: *See*—
Umezawa, Kazushige; Kuwabara, Tatsuro; Oh-hara, Tetsuya; Nuibe, Tsuzuru; and Ozawa, Kousaku, 4,891,064, Cl. 75-51.200.
Nukem GmbH: *See*—
Hezel, Rudolf; Hoffmann, Winfried; and Schum, Berthold, 4,891,325, Cl. 437-2.000.
Numasaki, Yoso: *See*—
Ito, Noriki; Nagano, Yoshinobu; Tanaka, Akihiro; Numasaki, Yoso; and Takahashi, Koichiro, 4,891,432, Cl. 548-341.000.
Numata, Koji: *See*—
Matsumoto, Muneaki; Numata, Koji; Akita, Shigeyuki; Nishida, Minoru; and Masegi, Mitsuhiko, 4,891,559, Cl. 315-82.000.
Nuturn Corporation: *See*—
Mullins, Tommy D., 4,890,540, Cl. 92-63.000.
Nydegger, Daniel L., to Boeing Company, The. Portable positive feed drill. 4,890,962, Cl. 408-14.000.
Oakland Corporation, The: *See*—
Wallace, Richard B., 4,891,244, Cl. 427-195.000.
Oakman, Willard R., to JLG Industries, Inc. Platform elevating apparatus. 4,890,692, Cl. 182-141.000.
Oba, Hideaki; Sato, Tsutomu; Umehara, Masaakira; Ueda, Yutaka; Yamamuro, Tetsu; and Abe, Michiharu, to Ricoh Co., Ltd. Optical information recording element. 4,891,305, Cl. 430-495.000.
Obara, Kazufumi, to Stanley Electric Co., Ltd. Electric regulator unit. 4,891,623, Cl. 338-163.000.

Oberhofer, Lanny A.; and Miller, Donald E., to Sonoco Products Company. Fibre drum with reinforcement collar. 4,890,786, Cl. 229-5.700.
Oberle, Edmond; and Wattron, Bernard, to Kuhn S.A. Soil-working farm machine. 4,890,678, Cl. 172-54.500.
O'Brien, Charles E. Knock-down support stand and kit for assembly thereof. 4,890,693, Cl. 182-151.000.
Oce-Nederland B.V.: *See*—
Willems, Theodorus H. M.; and Tunnissen, Franciscus H. J., 4,891,768, Cl. 364-518.000.
Zweedijk, Johan J., 4,891,668, Cl. 355-233.000.
Ochi, Kiyoshige: *See*—
Kubodera, Noboru; Miyamoto, Katsuhito; Ochi, Kiyoshige; Matsunaga, Isao; and Murayama, Eigoro, 4,891,364, Cl. 514-167.000.
Ochi, Yoshiharu: *See*—
Shimotori, Kazumi; Ochi, Yoshiharu; Ishihara, Hideo; Umeki, Takenori; and Ishigami, Takashi, 4,891,066, Cl. 75-84.000.
Oda, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Logarithmic amplifier. 4,891,603, Cl. 330-110.000.
Odajima, Kotoku; and Sasaki, Kazuhiro, to Morito Co., Ltd. Eyelet and method of attaching the same. 4,890,362, Cl. 24-713.700.
Odashima, Hisao; Hirano, Yoshihiko; and Hiraoka, Teruyoshi, to Nippon Steel Corporation. Multiple coated composite steel strip. 4,891,273, Cl. 428-623.000.
Odawara, Yoji: *See*—
Shimizu, Norio; Fukuzono, Shinichi; Nishimura, Nobuko; Odawara, Yoji; and Sumitani, Tomoaki, 4,891,310, Cl. 435-3.000.
ODL, Incorporated: *See*—
Tosa, Thomas F.; and Mulder, Lawrence, 4,890,438, Cl. 52-790.000.
Wilkening, Steven R.; and Mulder, Lawrence, 4,890,435, Cl. 52-456.000.
Ogawa, Hiroyasu: *See*—
Takahashi, Shuji; Suzuki, Yasuo; Ogawa, Hiroyasu; and Ichimaru, Kazuhiro, 4,891,267, Cl. 428-367.000.
Ogawa, Masashi, to Fuji Photo Film Co., Ltd. Medium for electrophoresis having improved physical properties. 4,891,119, Cl. 204-299.00R.
Ogiwara, Tosio: *See*—
Kudou, Masaaki; and Ogiwara, Tosio, 4,890,543, Cl. 92-228.000.
Oguchi, Masahiro: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Oguchi, Masahiro; and Harakawa, Yoshio, 4,891,068, Cl. 75-251.000.
Oh-hara, Tetsuya: *See*—
Umezawa, Kazushige; Kuwabara, Tatsuro; Oh-hara, Tetsuya; Nuibe, Tsuzuru; and Ozawa, Kousaku, 4,891,064, Cl. 75-51.200.
Oh-Kita, Motomu; Ishii, Kazuhiro; Kato, Masaaki; and Kobayashi, Masao, to Mitsubishi Rayon Co., Ltd. Process for the preparation of catalyst used in the production of unsaturated carboxylic acids. 4,891,347, Cl. 502-206.000.
Ohashi, Hiroshi; and Kusunoki, Masahiro, to Kabushiki Kaisha Toshiba. Magnetic head device. 4,891,721, Cl. 360-103.000.
Ohashi, Hiroshi: *See*—
Tanaka, Masaki; and Ohashi, Hiroshi, 4,891,398, Cl. 524-188.000.
Ohbayashi, Hisashi: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; and Ohno, Tomoyasu, 4,891,369, Cl. 514-192.000.
Ohkawa, Hideo; Chikushi, Masakuni; Nakamura, Hironori; Funayama, Shinji; Hashimoto, Takashi; and Hirai, Takahiro, to CALP Corporation. Thermoplastic resin-based molding composition. 4,891,399, Cl. 523-200.000.
Ohlendorf, Dieter: *See*—
Wingen, Rainer; Dubal, Hans-Rolf; Escher, Claus; Hemmerling, Wolfgang; Muller, Ingrid; and Ohlendorf, Dieter, 4,891,151, Cl. 252-299.610.
Ohmori, Takayuki: *See*—
Higuchi, Seijun; Asakawa, Kenichi; Ohmori, Takayuki; Umeno, Koji; Okada, Nobuyoshi; Fujinaga, Minoru; Yamamoto, Fumio; and Yabe, Katsuhiko, 4,891,274, Cl. 428-653.000.
Ohmura, Hiroshi: *See*—
Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.
Ohno, Katsuhiko; Ishii, Keisuke; and Etoh, Motoaki, to Fuji Jukogyo Kabushiki Kaisha. Crankcase of an engine. 4,890,583, Cl. 123-41.700.
Ohno, Tomoyasu: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; and Ohno, Tomoyasu, 4,891,369, Cl. 514-192.000.
Ohsumi, Hisayoshi; and Ikeya, Taichi, to Yamaha Corporation. Method for producing wooden decorative articles. 4,890,636, Cl. 144-350.000.
Ohta, Masanori, to TDK Corporation. Inspection mechanism for chip type circuit element. 4,891,583, Cl. 324-158.00P.
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, to Suntory Limited; and Kansai Chemical Engineering Co., Ltd. Method for tartar separation. 4,891,236, Cl. 426-330.400.
Ohtsuka, Yoshimichi: *See*—
Hamada, Masanori; Inoue, Takeshi; Isobe, Mitsuo; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,891,699, Cl. 358-136.000.
OI-NEG TV Products, Inc.: *See*—
Rapp, James E., 4,891,331, Cl. 437-164.000.
Oishi, Konosuke: *See*—
Tsukada, Masamichi; Oishi, Konosuke; Harada, Katsuhito; and Okumoto, Toyoharu, 4,890,919, Cl. 356-312.000.
Oishi, Shigeru: *See*—
Nagaura, Toru; and Oishi, Shigeru, 4,891,282, Cl. 429-194.000.
Okada, Nobuyoshi: *See*—
Higuchi, Seijun; Asakawa, Kenichi; Ohmori, Takayuki; Umeno, Koji; Okada, Nobuyoshi; Fujinaga, Minoru; Yamamoto, Fumio; and Yabe, Katsuhiko, 4,891,274, Cl. 428-653.000.
Okada, Tetsuji: *See*—
Matsuda, Kenji; Okada, Tetsuji; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,890,545, Cl. 98-39.100.
Okada, Wataru; Yasui, Hideo; and Miki, Yasuhiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for manufacturing coagulated grains from polymer latex. 4,890,929, Cl. 366-160.000.
Okamoto, Hiroshi: *See*—
Fujioka, Souichiro; and Okamoto, Hiroshi, 4,891,588, Cl. 324-166.000.
Toyoshi, Naoki; Okamoto, Hiroshi; Tabuchi, Kenji; Takebe, Kaoru; and Yokoyama, Tomoaki, 4,891,287, Cl. 430-54.000.
Okamoto, Kyoichi; Morikane, Hiroyuki; and Shiroyama, Shigeru, to Mitsubishi Denki K.K. Brush device. 4,891,539, Cl. 310-239.000.
Okamura Corporation: *See*—
Higuchi, Shunichiro, 4,890,636, Cl. 137-115.000.
Okano, Masato: *See*—
Yamamoto, Sanehiro; Yasuhara, Mitsuki; Matsunaga, Fujihisa; Okano, Masato; and Nakamura, Mitsunori, 4,891,431, Cl. 548-335.000.
Okawa, Hiroyuki: *See*—
Nagai, Takaji; Okawa, Hiroyuki; Mizuno, Takahide; and Nakagawa, Fumihito, 4,891,040, Cl. 474-267.000.
Okazaki, Toshio: *See*—
Ono, Mamoru; Yoneyama, Norihiro; and Okazaki, Toshio, 4,891,471, Cl. 174-68.300.
Okazaki, Yasuo: *See*—
Motoi, Nobuhiro; Koshida, Yoshinori; Miyake, Isao; and Okazaki, Yasuo, 4,891,502, Cl. 235-379.000.
O'Keefe, William F., Sr. Emergency paint brush. 4,890,350, Cl. 15-176.600.
Oki Electric Industry Co., Ltd.: *See*—
Kawazoe, Akio, 4,891,828, Cl. 377-114.000.
Komazaki, Tomokazu; Gunji, Katsuhiko; Onishi, Norio; Sakurai, Yoshimitu; Horii, Hiroyuki; and Mashimo, Akira, 4,891,615, Cl. 333-206.000.
Motoi, Nobuhiro; Koshida, Yoshinori; Miyake, Isao; and Okazaki, Yasuo, 4,891,502, Cl. 235-379.000.
Okita, Masao; Sugawara, Tadami; and Yoshida, Hiroshi, to Alps Electric Co., Ltd. Photosensor block having an adjustable mounting structure to permit fine positioning of the photosensor block included in the photosensor block. 4,891,513, Cl. 250-239.000.
Okoma Oberkochener Machinen GmbH: *See*—
Zweig, Siegfried, 4,890,655, Cl. 144-82.000.
Okuda, Masanao: *See*—
Fujitani, Sakae; Suzuki, Yuzuru; Okuda, Masanao; Takahashi, Hitoshi; and Fukazawa, Junichiro, 4,891,567, Cl. 318-254.000.
Okumoto, Toyoharu: *See*—
Tsukada, Masamichi; Oishi, Konosuke; Harada, Katsuhito; and Okumoto, Toyoharu, 4,890,919, Cl. 356-312.000.
Okumura, Katsuya; and Tezaki, Atsumu, to Kabushiki Kaisha Toshiba. Magnetron plasma apparatus with concentric magnetic means. 4,891,560, Cl. 315-111.410.
Okumura, Kazuyoshi: *See*—
Komura, Manabu; Hirai, Kunio; Nakai, Tatsuaki; Okumura, Kazuyoshi; and Yamamoto, Nobuyuki, 4,890,392, Cl. 33-762.000.
Okumura, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacturing field effect transistor. 4,891,327, Cl. 437-41.000.
Okutsu, Kazuo: *See*—
Takahashi, Koichi; Okutsu, Kazuo; Ide, Yoshihiro; Takei, Hiroshi; Ishida, Yukio; and Harada, Kazumasa, 4,891,089, Cl. 156-522.000.
Olander, Jitka V.: *See*—
Schaumann, Jon P.; Olander, Jitka V.; Harakas, Nicholaos K.; and Feder, Joseph, 4,891,312, Cl. 435-7.000.
Oldfield, William W., to Wiltron Company. Universal connector with interchangeable male and female sleeves for use in network analyzers and microwave devices. 4,891,015, Cl. 439-172.000.
Oliver, John P., to Mogas Industries, Inc. Bi-directional sealing valve. 4,890,643, Cl. 137-614.110.
Ollat, Marc; and Kleinklaus, Norbert, to Grosfillex S.A.R.L. Multiposition, foldable armchair with adjustable backrest inclination and seat height. 4,890,881, Cl. 297-26.000.
Oloff, Clarence M.; Moss, William G.; Holder, Garry N.; and Hermann, Linda M., to United States of America, Air Force. Timed primate roto-positioner. 4,890,579, Cl. 119-103.000.
Olsen, Christopher J.: *See*—
Gatzka, Bruno G.; and Olsen, Christopher J., 4,890,429, Cl. 52-640.000.
Olson, Kenneth M.: *See*—
Kroll, Mark W.; Olson, Kenneth M.; and Flynn, Patrick S., 4,890,630, Cl. 128-901.000.
Olson, Luanne. Wheelchair walker. 4,890,853, Cl. 280-87.021.
Olson, Ronald D. Cantilever supports. 4,890,884, Cl. 297-232.000.
Olsson, Billy E., to AMP Incorporated. Electrical connector for interconnecting a printed circuit board to a ribbon cable. 4,891,019, Cl. 439-404.000.

Olympus Optical Co., Ltd.: *See*—
Miyazaki, Akihito, 4,891,696, Cl. 358-98.000.
Saito, Katsuyuki; Kanno, Masahide; Uehara, Masao; Sasaki, Masahiko; Sasagawa, Katsuyoshi; Yamashita, Shinji; Uchikubo, Akinobu; and Hasegawa, Jun, 4,891,697, Cl. 358-98.000.
Uchikubo, Akinobu; Uehara, Masao; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Saito, Katsuyuki; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,891,695, Cl. 358-98.000.
Yusa, Atsushi; Yamada, Hidetoshi; Mizusaki, Takashi; Nishizawa, Jun-ichi; and Tamamushi, Takashige, 4,891,682, Cl. 357-30.000.
Omura, Jimmy K., to Cylink Corporation. Modulo arithmetic processor chip. 4,891,781, Cl. 364-768.000.
O'Neill, Jay H.: *See*—
Huang, Alan; Knauer, Scott C.; O'Neill, Jay H.; Rutledge, Charles W.; Lin, Sheng L.; Ransom, Maurice N.; and Spanke, Ronald A., 4,891,803, Cl. 370-60.000.
Ong, Marlin: *See*—
VanRiper, Bradley C.; and Ong, Marlin, 4,891,625, Cl. 340-479.000.
Onishi, Norio: *See*—
Komazaki, Tomokazu; Gunji, Katsuhiko; Oniahi, Norio; Sakurai, Yoshimitu; Horii, Hiroyuki; and Mashimo, Akira, 4,891,615, Cl. 333-206.000.
Ono, Hidehiko: *See*—
Teramoto, Tomihiko; Ono, Hidehiko; Ito, Sadanobu; and Nishino, Kiyoshi, 4,890,804, Cl. 246-453.000.
Ono, Mamoru; Yoneyama, Norihiro; and Okazaki, Tochio, to Yazaki Corporation. Wiring harness protector. 4,891,471, Cl. 174-68.300.
Onodera, Kosaku: *See*—
Kubo, Haruo; and Onodera, Kosaku, 4,891,659, Cl. 354-317.000.
Onosato, Masashi: *See*—
Shikina, Chokei; Onosato, Masashi; Tsuji, Masakazu; Tautsui, Takeo; Yorozu, Masatoshi; and Tanaka, Yutaka, 4,891,701, Cl. 358-140.000.
Ooe, Kimio; Amano, Nobutaka; Kubo, Takashige; and Moriwaki, Kaoru, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Logic simulation. 4,891,773, Cl. 364-578.000.
Ooiwa, Kiyoshi; and Doki, Masahiko, to Fuji Electric Co., Ltd. Plasma processing apparatus. 4,891,118, Cl. 204-298.000.
Ookawa, Nobuyuki: *See*—
Nakamura, Norio; Ookawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, 4,891,363, Cl. 514-94.000.
Ookubo, Mamoru: *See*—
Miura, Hideki; and Ookubo, Mamoru, 4,890,706, Cl. 192-3.280.
Oono, Takao: *See*—
Hanamura, Shoji; Kubotera, Masaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, 4,891,792, Cl. 365-189.050.
Oosterhuis, Nicolaas M. G.; and Koerts, Kees, to Cooperatieve Vereniging Suiker Unie U.S. Method for the fermentative preparation of polysaccharides, in particular xanthane. 4,891,318, Cl. 435-104.000.
Opdahl, Everett W., to Westinghouse Electric Corp. Deployment/retrieval system. 4,890,751, Cl. 212-271.000.
Oppawsky, Steffen: *See*—
Beins, Wolfgang; Rohrig, Helmut; Salz, Ulrich; Gwinner, Lutz; and Oppawsky, Steffen, 4,890,997, Cl. 425-174.000.
Opsvik, Peter, to Peter Opsvik A/S. Tilting mechanism, preferably for a chair seat or similar article. 4,890,886, Cl. 297-313.000.
Oravitz, James J., Jr.: *See*—
Bricker, Jack A.; May, Earl L.; Michelotti, Donald P.; Dahlberg, John R.; Oravitz, James J., Jr.; and Siskos, William R., 4,891,054, Cl. 65-105.000.
Orban, Jacques: *See*—
Salvaire, Andre; Jour, Jean-Paul; and Orban, Jacques, 4,890,927, Cl. 366-1.000.
Oread Laborstories, Inc.: *See*—
Stobaugh, John F.; and Kakodkar, Sunil, 4,891,323, Cl. 436-86.000.
Orient, David T.: *See*—
Singer, Leonard S.; and Orient, David T., 4,891,203, Cl. 423-449.000.
Orikasa, Tsuyoshi: *See*—
Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takeshi; Kameyama, Makoto; and Niizuma, Kiyozumi, 4,890,378, Cl. 29-603.000.
Ormsby, Michael W.: *See*—
Brusa, Paul A.; Ormsby, Michael W.; and De Zotell, Gary L., 4,891,529, Cl. 250-560.000.
Osawa, Izumi: *See*—
Masaki, Kenji; Osawa, Izumi; Fujiwara, Masanori; and Takedomi, Yumiko, 4,891,291, Cl. 430-66.000.
Masaki, Kenji; Osawa, Izumi; Doi, Isao; and Fujiwara, Masanori, 4,891,292, Cl. 430-66.000.
Osawa, Nobuhiko: *See*—
Takasawa, Yoshinobu; Katsumura, Norimichi; Osawa, Nobuhiko; and Watanabe, Kazuo, 4,891,824, Cl. 375-104.000.
Osband, Paul C.; Whatmore, Roger W.; and Auton, John P., to Plessey Overseas Limited. Atmospheric sensor. 4,890,494, Cl. 73-338.000.
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Rabotski, John, 4,891,237, Cl. 426-513.000.
Oshmia, Takeshi: *See*—
Nakamura, Norio; Ookawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, 4,891,363, Cl. 514-94.000.
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Downing, Ross O.; and Banis, David S., 4,890,727, Cl. 204-224.00R.
Oswald, Peter: *See*—
Kagi, Beat; and Oswald, Peter, 4,890,359, Cl. 19-265.000.
Ota, Akiho; Sugiura, Hiroaki; and Ishii, Hiroichi, to Yoshino Kogyosho Co. Ltd. Biaxial-orientation blow-molded bottle-shaped container with laterally extending grip ribs. 4,890,752, Cl. 215-1.00C.
Otani, Susumu: *See*—
Yoshida, Shousei; and Otani, Susumu, 4,891,598, Cl. 328-61.000.
Otis Engineering Corporation: *See*—
Le, Nam V., 4,890,674, Cl. 166-319.000.
Otomo, Shigekazu; Nakatani, Ryoichi; Kumasaka, Noriyuki; Saito, Noritoshi; Kobayashi, Toshio; and Fujishiro, Masahiko, to Hitachi, Ltd. Ferrromagnetic thin film and magnetic head using it. 4,891,278, Cl. 428-681.000.
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Mochida, Isao; Sakai, Yukio; and Otsuka, Hiroyuki, 4,891,126, Cl. 208-39.000.
Ott, Heidrun; and Kuhlmann, Werner, to Blendax GmbH. Dental impression material. 4,891,390, Cl. 523-109.000.
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Otto Sauer Achsenfabrik Keilberg: *See*—
Koschinat, B. Hubert; and Frohlke, Manfred, 4,890,823, Cl. 267-64.270.
Koschinat, B. Hubert, 4,890,939, Cl. 384-322.000.
Oudet, Claude, to Portescap. Synchronous motor with sinusodial torque variation in each phase. 4,891,538, Cl. 310-162.000.
Ouhadi, Trazollah; Dehan, Louis; and Fellen, Lucie, to Colgate-Palmolive Company. Low phosphate or phosphate free nonaqueous liquid nonionic laundry detergent comopsition and method of use. 4,891,148, Cl. 252-99.000.
Outa, Kenichi, to Canon Kabushiki Kaisha. Color image reading apparatus having variable exposure control. 4,891,692, Cl. 358-75.000.
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Haman, David F.; and Noble, Mark C., 4,891,026, Cl. 440-73.000.
Outboardmarine Corporation: *See*—
Holtermann, Theodore J., 4,890,587, Cl. 123-73.00A.
Overbeek, Gerhardus; Williams, John K.; and Heanley, Charles P., to Tetronics Research and Development Company Ltd.; and Anglovaal Ltd. Process for the recovery of gold using plasma. 4,891,060, Cl. 75-10.190.
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Guha, Subhendu; and Ovshinsky, Stanford R., 4,891,330, Cl. 437-81.000.
Owen, Charles W.; and Garcia, Roberto A., to Elexis Corporation. Electronic flea-repelling device including an integrated circuit. 4,890,580, Cl. 119-156.000.
Owen, Hartley; and Wright, Bernard S. Multistage process for converting olefins to heavier hydrocarbons. 4,891,457, Cl. 585-312.000.
Owens-Illinois Plastic Products Inc.: *See*—
Ajmera, Prakash R.; and Jabarin, Saleh A., 4,891,178, Cl. 264-521.000.
Robinson, Gerald R., 4,890,768, Cl. 222-109.000.
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Halttula, Kyosti, 4,890,372, Cl. 29-123.000.
Hyoty, Paavo; Uppstu, Erik; and Saiha, Erik, 4,891,097, Cl. 162-31.000.
Kokkonen, Kari; Lethimaki, Martti; Tuominiemi, Seppo; and Alppi, Hannu, 4,891,170, Cl. 261-116.000.
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Solomon, Stuart G.; and Whitman, David C., 4,890,983, Cl. 417-41.000.
Pagano, Raymond V. Pan and tilt motor for surveillance camera. 4,890,713, Cl. 192-142.00R.
Page, Darrin J.; and Rennison, Stuart C., to Imperial Chemical Industries PLC. Imaged copy film. 4,891,285, Cl. 430-14.000.
Pajot, Jean-Claude, to Automobiles Peugeot; and Automobiles Citroen. Bunch of electric conductors for motor vehicles. 4,891,012, Cl. 439-34.000.
Palac, Kazimir, to Zenith Electronics Corporation. Tension mask color cathode ray tube component with external registration-affording means. 4,891,548, Cl. 313-408.000.
Paloma Kogyo Kabushiki Kaisha: *See*—
Ishiguro, Katsusuke, 4,891,003, Cl. 431-1.000.
Panchenko, Valery P.: *See*—
Shishkin, Viktor V.; Samuliev, Jury D.; Shapovalov, Jury P.; Sushkov, Yaroslav P.; Panchenko, Valery P.; Lukin, Evgeny G.; Chernyai, Alexandr I.; and Kryazhevskikh, Nikolai F., 4,891,115, Cl. 204-212.000.
Panoz, Donald E.: *See*—
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Paoli, Jack R.: *See*—
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Paraskevas, Stavros: *See*—
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Parrotta, Michael A.; Grainger, Frederick; and Schoenleber, Donald W., to Webcraft Technologies, Inc. Flat paper sheet item for distributing a thin layer of material. 4,890,872, Cl. 283-56.000.

Parsons, Daniel A.: *See*—
Arter, James B.; Parsons, Daniel A.; Serra, Thomas M.; and Thomas, Bruce L., 4,890,945, Cl. 403-2.000.
Parsons, Raymond L.: *See*—
Ash, Kevin J.; Dereaburger, Jack H.; and Parsons, Raymond L., 4,891,811, Cl. 371-21.200.
Pas, Ireneus J. T. M.: *See*—
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Pascoe, Robert A.: *See*—
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Pastor, Jose; and Zemelman, Evelina I., to Pitney Bowes Inc. Optical character recognition by forming and detecting matrices of geo features. 4,891,750, Cl. 382-21.000.
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Diamond, Sidney; and Patel, Aspi N., 4,891,059, Cl. 75-0.50R.
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Kotliar, Abraham M.; Boyle, William J., Jr.; Tang, Reginald T.; Mares, Frank; Patel, Kundanbhai M.; and Chiu, Tin-Ho, 4,891,263, Cl. 428-225.000.
Paton, Charles R., to Westinghouse Electric Corp. Laminated copper assembly. 4,891,618, Cl. 335-195.000.
Paulus, Frank S., Jr.; and Tuah-Poku, Isaac, to AT&T Technologies, Inc. Electret microphone. 4,891,843, Cl. 381-191.000.
Pauly, Hans E.; and Schwarz, Herbert, to Behringwerke Aktiengesellschaft. Agent for the determination of peroxidase activity, with stabilizer, a process for its preparation and its use. 4,891,314, Cl. 435-28.000.
Paw Products, Inc.: *See*—
James, David F., 4,890,576, Cl. 119-1.000.
Payne, Frederick C., to Midwest Water Resource, Inc. Method of removing volatile contaminants from contaminated earth strata. 4,890,673, Cl. 166-266.000.
Peacock, Donald G.; and Kirkham, Stanley W., to Textilver S.A. Method of consolidating composite articles. 4,891,179, Cl. 264-565.000.
Pearce, Henry A., Jr.: *See*—
Claiborne, C. Clair; Kurz, Robert A.; Pearce, Henry A., Jr.; and Sheppard, Harry R., 4,890,478, Cl. 73-19.000.
Pease, John; Weng, Litai; Kirakossian, Hrair; and Ullman, Edwin F., to Syntex (U.S.A.) Inc. Particle with luminescer for assays. 4,891,324, Cl. 436-519.000.
Pedersen, Harry, to D-K Gleason, Inc. Friction reduction in a differential assembly. 4,890,511, Cl. 74-715.000.
Peleg, Yigal: *See*—
Jaeger, Kirk A.; Peleg, Yigal; and Popp, David R., 4,891,482, Cl. 219-10.55E.
Pelikan Aktiengesellschaft: *See*—
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Pellinen, Teuvo: *See*—
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Pem All Fire Extinguisher Corporation: *See*—
Scofield, William A., 4,890,677, Cl. 169-75.000.
Penco, Sergio: *See*—
Angelucci, Francesco; Gigli, Mauro; and Penco, Sergio, 4,891,360, Cl. 514-34.000.
Pennebaker, William B.: *See*—
Mitchell, Joan L.; and Pennebaker, William B., 4,891,643, Cl. 341-107.000.
Pennock, Thomas G., to Moore Business Forms, Inc. Mailing system. 4,890,788, Cl. 229-71.000.
Peanwalt Corporation: *See*—
Toukan, Sameeh; S., 4,891,144, Cl. 252-47.000.
Pennzoil Products Company: *See*—
Shortt, Alexandra B.; and Gupta, D. V. Satyanarayana, 4,891,073, Cl. 134-20.000.
Perdelwitz, Lee E., Jr.; and Hanke, David E., to Weyerhaeuser Company. Infant car seat liner. 4,891,454, Cl. 428-137.000.
Perflmutter, Robert J.: *See*—
Wilfley, Brian P.; and Perflmutter, Robert J., 4,891,594, Cl. 324-309.000.
Peris, Walter: *See*—
Makovec, Francesco; Chiste', Rolando; Peris, Walter; and Rovati, Luigi, 4,891,381, Cl. 514-119.000.
Makovec, Francesco; Chiste, Rolando; Peris, Walter; and Rovati, Luigi, 4,891,383, Cl. 514-443.000.
Perkins, Ronald V.: *See*—
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Peter Opsvik A/S: *See*—
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Peterscheck, Hermann W.: *See*—
Zeigler, Joseph E.; and Peterscheck, Hermann W., 4,891,139, Cl. 210-747.000.
Peterson, David: *See*—
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Petraia, Teresa M.: *See*—
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Thaman, Lauren A.; SaNogueira, James P.; and Petraia, Teresa M., 4,891,228, Cl. 424-443.000.
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Peyman, Gholam A.: *See*—
Zeimer, Ran C.; Khoobehi, Bahram; and Peyman, Gholam A., 4,891,043, Cl. 604-20.000.
Pfeffer, John D., to A. O. Smith Corporation. Water heater with dam draped over flange. 4,890,762, Cl. 220-444.000.
Pfeifer, Thomas: *See*—
Vetter, Egon; Pfeifer, Thomas; Burghoff, Heinz-Georg; and Daub, Werner, 4,890,491, Cl. 73-290.00R.
Pfizer Inc.: *See*—
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Lowe, John A., III, 4,891,375, Cl. 514-252.000.
Stoss, Peter; Lesitold, Matyas; and Yeates, Rodney, 4,891,373, Cl. 514-228.200.
Pfuhl, Berthold; Leutner, Volkmar; and Schuttenberg, Eckard, to Robert Bosch GmbH. Hydraulic control valve. 4,890,647, Cl. 137-625.660.
Phalangas, Charlambos J.: *See*—
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Phillips, Allyn E.: *See*—
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Phillips, Gregory: *See*—
McCormick, Walter A. (Sunny); Langton, Douglas W.; Kellum, Wilbur J., III; Saunders, Thomas C.; and Phillips, Gregory, 4,890,825, Cl. 271-188.000.
Phillips Petroleum Company: *See*—
Czenkusch, Edward L., 4,891,132, Cl. 208-428.000.
Roberts, John S.; and Shioyama, Tod K., 4,891,444, Cl. 568-44.000.
Pichant, Patrick: *See*—
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Picker International, Inc.: *See*—
Shroy, Robert E., Jr.; Lauro, Karen L.; and Sones, Richard A., 4,891,757, Cl 364-413.130.
Pietrzak, Carl M., Jr.: *See*—
Bocci, Paul M.; Cutts, Kevin M.; and Pietrzak, Carl M., Jr., 4,891,812, Cl. 371-5.500.
Pilling, Roger: *See*—
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Pincent, Bernard; Journe, Paul; and Brugnot, Gerard, to Simecsol. Ultrasonic anemometer. 4,890,488, Cl. 73-189.000.
Pincksers, B. Hubert, to Medtronic, Inc. Energy saving techsique for battery powered inductor. 4,890,616, Cl. 128-419.00R.
Pineau, Didier: *See*—
Labrot, Maxime; Pineau, Didier; and Feuillerat, Jean, 4,891,490, Cl. 219-121.520.
Pineda, Jose J. Portable file with retracting handle. 4,890,705, Cl. 190-18.00A.
Pinkham, Raymond; and Anderson, Daniel F., to Texas Instruments Incorporated. Dual-port memory having pipelined serial output. 4,891,795, Cl. 365-230.030.
Pinnow, Curtis C.: *See*—
Fortmann, Robert C.; and Pinnow, Curtis C., 4,891,498, Cl. 219-401.000.
Pintaux, Jean-Bernard L. P.: *See*—
Marcos, Sylvie L.; Macchi, Odile M. M.; and Pintaux, Jean-Bernard L. P., 4,891,801, Cl. 370-32.100.
Pinto, Akiva; Lucassen, Guenter; and Bocht, Bernhard, to Hergeth Hollingsworth GmbH. Apparatus for cleaning textile fiber material. 4,890,357, Cl. 19-64.500.
Pioneer Electronic Corporation: *See*—
Kashiwazaki, Takashi; and Ando, Hitoshi, 4,891,760, Cl. 364-443.000.
Takamura, Yoshinobu; Katsumura, Norimichi; Osawa, Nobuhiko; and Watanabe, Kazuo, 4,891,824, Cl. 375-104.000.
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Pirovic, Arpad: *See*—
Northrop, Donald; Schiazzano, Gerald; and Pirovic, Arpad, 4,891,550, Cl. 313-487.000.
Pitney Bowes Inc.: *See*—
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Pitts, Frank, to Engelhard Corporation. Process for removing metals from aluminosilicate materials. 4,891,130, Cl. 208-305.000.
Pivit, Werner; and Nachtsheim, Ralf, to Leybold Aktiengesellschaft. Apparatus for holding workpieces. 4,891,009, Cl. 432-223.000.
Plange, Wim C. Board game apparatus. 4,890,842, Cl. 273-246.000.
Plasson Maagan Michael Industries, Ltd.: *See*—
Uri, Ehud, 4,890,817, Cl. 251-312.000.
Platt, William J., to National Rolling Mills, Inc. Partition clip. 4,890,428, Cl. 52-238.100.
Playtex Family Products, Inc.: *See*—
Melvin, Wayne D.; and Rejai, Jamshid, 4,891,042, Cl. 604-18.000.
Plessey Overseas Limited: *See*—
Osband, Paul C.; Whatmore, Roger W.; and Auton, John P., 4,890,494, Cl. 73-338.000.
Plunkett, Michael D. Water ski binding. 4,891,027, Cl. 441-70.000.
Polaroid Corporation: *See*—
Gazeley, Albert E., 4,890,910, Cl. 351-47.000.
Waller, David P., 4,891,298, Cl. 430-221.000.

Pond, Charles R.; Teixeira, Patrick D.; and Rudeen, Robert W., to Boeing Company, The. Scanning interferometer. 4,890,921, Cl. 356-349.000.
Ponte, Edward M.: *See*—
Ten Pierick, Hendrik; Ponte, Edward M.; and De Vries, Alko F. E., 4,891,565, Cl. 315-408.000.
Ponza, Lorenzo J., to Athletic Training Equipment Company. Batting practice apparatus. 4,890,834, Cl. 273-26.00R.
Poore, John W., to Coca-Cola Company, The. Beverage dispensing system. 4,890,774, Cl. 222-640.000.
Popescu, Mircea C.: *See*—
Janoff, Andrew S.; Popescu, Mircea C.; Weiner, Alan L.; Bolscak, Lois E.; Tremblay, Paul A.; and Swenson, Christine E., 4,891,208, Cl. 424-1.100.
Popp, David R.: *See*—
Jaeger, Kirk A.; Peleg, Yigal; and Popp, David R., 4,891,482, Cl. 219-10.55E.
Porsfeld, Friedhelm. Machine for working rock, especially a block drilling machine. 4,890,680, Cl. 173-42.000.
Portalupi, Steven J.: *See*—
Broyles, Henry D.; and Portalupi, Steven J., 4,891,082, Cl. 156-123.000.
Porter, Gary A.: *See*—
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Portescap: *See*—
Oudet, Claude, 4,891,538, Cl. 310-162.000.
Posh Diversified, Inc.: *See*—
Green, Daniel N., 4,891,842, Cl. 381-188.000.
Potter, Barry C., to Gas Logs (Brailsford) Ltd. Gas burner. 4,890,601, Cl. 126-512.000.
Powel, Stephen S.; and Darby, Robert J., to Cad/Cam Tooling, Inc. System and pallet for packaging yarn spools. 4,890,743, Cl. 206-595.000.
Powell, Lyn: *See*—
Carr, Robin A. E.; and Powell, Lyn, 4,891,450, Cl. 568-649.000.
Power Spectra, Inc.: *See*—
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PPG Industries, Inc.: *See*—
Bricker, Jack A.; May, Earl L.; Michelotti, Donald P.; Dahlberg, John R.; Oravitz, James J., Jr.; and Siskos, William R., 4,891,054, Cl. 65-105.000.
Criss, Russell C., 4,891,113, Cl. 204-192.150.
McCollum, Gregory J.; Zwack, Robert R.; and Scriven, Roger L., 4,891,111, Cl. 204-181.700.
Prada, Camilo; and Paoli, Jack R. Hand-held carrier for a roll of blueprints and cut blank therefor. 4,890,873, Cl. 294-152.000.
Pradat, Philippe J., to Compagnie de Signaux et d'Equipements Electroniques. Procedure and device for eliminating interference generated by power switches. 4,891,742, Cl. 363-39.000.
Prasad, Akkanapragada N.: *See*—
Jones, Gordon R.; Moruzzi, James L.; and Prasad, Akkanapragada N., 4,891,509, Cl. 250-226.000.
Jones, Gordon R.; Moruzzi, James L.; and Prasad, Akkanapragada N., 4,891,510, Cl. 250-226.000.
Prassas, Michel, to Corning Incorporated. High index photochromic glasses. 4,891,336, Cl. 501-13.000.
Pratscher, Andrew J.; and Grynecki, Michael, to Speedhook Specialists, Inc. Automatic fishing hook setting device. 4,890,410, Cl. 43-15.000.
Pratt & Whitney Canada, Inc.: *See*—
Tremaine, Eric; and Newland, Allan B., 4,890,977, Cl. 415-164.000.
Prazak, Charles J.: *See*—
Dougherty, Lawrence W.; Fendley, James R.; Prazak, Charles J.; and Strauss, Paul, 4,891,546, Cl. 313-407.000.
Prazak, Charles J., III: *See*—
Libman, Philomena C.; and Prazak, Charles J., III, 4,891,110, Cl. 204-181.100.
Precision Fukuhara Works, Ltd.: *See*—
Tsuchiya, Koji; and Igarashi, Yoshiaki, 4,890,464, Cl. 66-132.00T.
Preis, Josef; Schwarz, Ulf; and Stolz, Gerhard, to Siemens Aktiengesellschaft. Circuit arrangement for limiting the switch-on current and for providing an over voltage protection in switch mode power supply devices. 4,891,728, Cl. 361-18.000.
Prest-Berg, Kevin: *See*—
Markowitz, H. Toby; Prest-Berg, Kevin; and Thompson, David L., 4,890,617, Cl. 128-419.0PG.
Preuss, Manfred: *See*—
Hohmann, Eugen; Behringer, Wolfgang; and Preuss, Manfred, 4,891,041, Cl. 494-62.000.
Prevost, Michel: *See*—
de Corliss, Patrick; Prevost, Michel; and du Chene, Arnaud, 4,891,810, Cl. 371-9.100.
Primeaux, Dudley J., II: *See*—
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Prince Corporation: *See*—
Boeresma, Thomas L.; Kindig, Alan L.; and Gras, Jeffrey D., 4,890,883, Cl. 297-227.000.
Prioli, Lorenzo: *See*—
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Belanger, Robert J.; and Mignacca, Robert A., 4,891,233, Cl. 426-94.000.
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Proctor & Gamble Company, The: *See*—
Vander Meer, James M., 4,891,160, Cl. 252-545.000.
Productech Reflow Solder Equipment Inc.: *See*—
Zimmer, Gero, 4,891,496, Cl. 219-233.000.
Progressive Fastening, Inc.: *See*—
Richards, Peter S., 4,890,954, Cl. 403-260.000.
Protoned, B.V.: *See*—
Walter, Herbert, 4,890,749, Cl. 211-189.000.
Purdue Research Foundation: *See*—
Narayan, Ramani; Tsao, George T.; and Biermann, Christopher J., 4,891,404, Cl. 525-54.200.
PVI, Inc.: *See*—
Biondo, John V., Jr., 4,891,660, Cl. 354-412.000.
Quadair, Taria, to W. R. Grace & Co.-Conn. Stabilized zirconia. 4,891,343, Cl. 501-103.000.
Quadrant Bioresources Limited: *See*—
Roser, Bruce J., 4,891,319, Cl. 435-188.000.
Quaile, Allan T. Segmented arch structure. 4,890,437, Cl. 52-690.000.
Quantex Corporation: *See*—
Lindmayer, Joseph; and Wrigley, Charles Y., 4,891,507, Cl. 250-213.0VT.
Quantum Solutions, Inc.: *See*—
More, Henry S.; and Marsh, John L., 4,891,734, Cl. 361-417.000.
Quattrini, Victor L.; and Fisher, Edwin P., to Bull HN Information Systems, Inc. Surface mounted multilayer memory printed circuit board. 4,891,789, Cl. 365-63.000.
Quebecor Publitech Inc.: *See*—
Gordon, Douglas C., 4,891,666, Cl. 355-133.000.
Quella, Daniel C.; and Beach, Michael E., to Racine Railroad Products, Inc. Anchor spreader. 4,890,558, Cl. 104-9.000.
Quinn, Kathleen: *See*—
Leung, Keith K. W.; Quinn, Kathleen; Goldson, John D.; and Hoffman, Wayne C., 4,891,835, Cl. 379-88.000.
R.J.F. International: *See*—
Kuan, Tiong H.; Srail, Raymond C.; and Szczepanski, Thomas R., 4,891,409, Cl. 525-237.000.
Raasch, Hans, to W. Schlafhorst & Co. Support disk assembly for the rotor shaft of an open end spinning machine. 4,890,942, Cl. 384-549.000.
Rabatin, Jacob G., to General Electric Company. Spherical phosphor aggregates, their preparation and use in X-ray screens. 4,891,527, Cl. 250-483.100.
Rabotski, John, to Oscar Mayer Foods Corporation. Expansion and compression compensation mechanism and loaf molding incorporating same. 4,891,237, Cl. 426-513.000.
Racal Data Communications Inc.: *See*—
Fallin, David B., 4,891,805, Cl. 370-95.100.
Farias, Luis V.; Krishnan, Vadavalli G.; and Wong, Chin-Pan, 4,891,806, Cl. 370-110.100.
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Ashlin, Joseph A.; Saleeb, Fouad Z.; Morreale, Philip; and McKay, Randal P., 4,891,198, Cl. 423-308.000.
Salerno, Jack P.: *See*—
Zavracky, Paul M.; Zavracky, Matthew M.; Pan, John C. C.; and Salerno, Jack P., 4,890,895, Cl. 350-96.200.
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Graillat, Gerard, 4,890,855, Cl. 280-615.000.
Salvaire, Andre; Jour, Jean-Paul; and Orbea, Jacques. Cement mixing apparatus. 4,890,927, Cl. 366-1.000.
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Samagalsky, William N., to XLNOW Trading Corporation. Packaged sheet for cleaning facsimile machines. 4,891,265, Cl. 428-280.000.
Sampayan, Stephen E.: *See*—
Prias, Larry E.; King, Moaroe L.; and Sampayan, Stephen E., 4,891,525, Cl. 250-423.00R.
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Shishkin, Viktor V.; Samuliev, Jury D.; Shapovalov, Jury P.; Sushkov, Yaroslav P.; Panchenko, Valery P.; Lukin, Evgeny G.; Cherayai, Alexandr I.; and Kryazhevskikh, Nikolai F., 4,891,115, Cl. 204-212.000.
San-Petrochemicals Co., Ltd.: *See*—
Ishii, Yasutaka, 4,891,460, Cl. 585-360.000.
Sanchez-Caldera, Luis E.; Lee, Arthur K.; Suh, Nam P.; and Chun, Jung-Hoon, to Sutek Corporation. Mixing and cooling techniques. 4,890,662, Cl. 164-46.000.
Sanden Corporation: *See*—
Sato, Tadashi; and Mabe, Atsushi, 4,890,987, Cl. 417-310.000.
Sanders, Gary B.: *See*—
Ganguly, Dipankar; and Sanders, Gary B., 4,890,624, Cl. 128-661.070.
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Marquis, Edward T.; Keating, Kenneth P.; Knifton, John F.; Smith, William A.; Sanderson, John R.; and Lustri, Jonathan, 4,891,437, Cl. 549-529.000.
Sandoz Ltd.: *See*—
Avar, Lajos; and Bohnke, Helmut, 4,891,396, Cl. 524-91.000.
Sangojuuki Co., Ltd.: *See*—
Tagawa, Itsuo; Kanari, Yukiharu; Kanno, Samon; and Kozaki, Takaharu, 4,890,798, Cl. 241-266.000.
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Nakamura, Norio; Ookawa, Nobuyuki; Koike, Hiroyuki; Sada, Toshio; Oshmia, Takeshi; Iizuka, Yoshio; and Miyazaki, Hideki, 4,891,363, Cl. 514-94.000.
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Thaman, Lauren A.; SaNogueira, James P.; and Petraia, Teresa M., 4,891,227, Cl. 424-443.000.
Thaman, Lauren A.; SaNogueira, James P.; and Petraia, Teresa M., 4,891,228, Cl. 424-443.000.
Sansho Seiyaku Co., Ltd.: *See*—
Hatae, Shinkichi, 4,891,361, Cl. 514-58.000.
Santi, Ernest S.: *See*—
Beach, John R.; Hasan, Syed R.; Noren, Donald W.; Hindman, Craig A.; and Santi, Ernest S., 4,890,968, Cl. 411-531.000.
Sanyo Electric Company, Ltd.: *See*—
Sugaya, Syoji, 4,891,800, Cl. 369-275.000.
Sarda, Alain; and Segaud, Jean-Pierre, to Uranium Pechiney. Process for the purification of traces of radioactive elements generated during the storage of uranium resulting from the reprocessing of irradiated nuclear fuels. 4,891,192, Cl. 423-6.000.
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Sasaki, Akira; Esaki, Seiji; Kurita, Shigeo; and Shimizu, Masahiro, to Honda Gikea Kogyo Kabushiki Kaisha. Slide type universal joint having longitudinal grooves in which rollers travel without tilting. 4,891,035, Cl. 464-111.000.
Sasaki, Katsuro: *See*—
Hanamura, Shoji; Kubotera, Masaaki; Sasaki, Katsuro; Oono, Takao; and Ueda, Kiyotsugu, 4,891,792, Cl. 365-189.050.
Sasaki, Kazuhito: *See*—
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Sasaki, Kazuhiro: *See*—
Odajima, Kotoku; and Sasaki, Kazuhiro, 4,890,362, Cl. 24-713.700.
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Sasaki, Toshio; Katao, Masaaki; Kawai, Kiyoshi; and Shiga, Akinobu, to Sumitomo Chemical Company, Limited. Process for producing olefin polymers and catalyst used therein. 4,891,411, Cl. 526-119.000.
Sato, Chikara: *See*—
Nakayama, Tadayoshi; and Sato, Chikara, 4,891,702, Cl. 358-140.000.
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Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, 4,891,726, Cl. 360-130.230.
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Sato, Tadashi; and Mabe, Atsushi, to Sanden Corporation. Scroll type compressor with seal supporting anti-wear plate portions. 4,890,987, Cl. 417-310.000.
Sato, Tadashi; and Taniishi, Shimonosuke, to Canon Kabushiki Kaisha. Image recording apparatus using plural types of energy and reversible transfer recording medium conveyance. 4,891,652, Cl. 346-76.0PH.
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Ushiro, Seimei; Namioka, Kenta; Ohmura, Hiroshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; Watanabe, Takeshi; Cho, Michio; Nakada, Kimiaki; Sato, Tokuji; and Watanabe, Takeshi, 4,891,517, Cl. 250-318.000.
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Oba, Hideaki; Sato, Tsutomu; Umehara, Masaakira; Ueda, Yutaka; Yamamuro, Tetsu; and Abe, Michiharu, 4,891,305, Cl. 430-495.000.
Satoh, Masaki; Kamiya, Shigemitsu; Fnjie, Nobuo; and Tabuchi, Shuji, to Nippon Zeon Co., Ltd.; and Fujitsu Limited. Process for production of electronic devices utilizing novolak resin as protective material. 4,891,334, Cl. 437-228.000.
Satoh, Tetsuo: *See*—
Hara, Hajime; Toya, Tomohiro; Iida, Shigeki; and Satoh, Tetsuo, 4,891,418, Cl. 528-195.000.
Yuasa, Hitoshi; Matsumo, Mitsuo; and Satoh, Tetsuo, 4,891,456, Cl. 585-275.000.
Satoh, Tomonori: *See*—
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Satran, Amir, to Iscar Ltd. Tool cutter head. 4,890,523, Cl. 82-158.000.
Sattelmayer, Thomas: *See*—
Fuglstaller, Cornel; Keller, Jakob; and Sattelmayer, Thomas, 4,890,793, Cl. 239-427.000.
Saunders, Thomas C.: *See*—
McCormick, Walter A. (Sunny); Langton, Douglas W.; Kellum, Wilbur J., III; Saunders, Thomas C.; and Phillips, Gregory, 4,890,825, Cl. 271-188.000.
Savage, David S.: *See*—
Sleigh, Thomas; Savage, David S.; and Taylor, Robert, 4,891,366, Cl. 514-176.000.
Savin, Ronald R. Coating composition containing metallic pigments exhibiting excellent resistance to environmental attack. 4,891,394, Cl. 523-442.000.
Sawada, Takeshi: *See*—
Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takeshi; Kameyama, Makoto; and Niizuma, Kiyozumi, 4,890,378, Cl. 29-603.000.
Sawai, Eisuke: *See*—
Yohda, Hiroshi; Takahashi, Ken; Sawai, Eisuke; Muraoka, Syunsaku; and Ihara, Keita, 4,890,379, Cl. 29-603.000.
Sawyer, John A.: *See*—
Miller, Bernard F.; Sawyer, John A.; and Webber, Wayne F., 4,890,542, Cl. 92-194.000.
Sayers, Richard C., to Ampex Corporation. Magnetic tape storage system. 4,890,747, Cl. 211-106.000.
Scalf, Matt C.: *See*—
Allen, Thomas E.; Scalf, Matt C.; and Lampe, John G., 4,890,938, Cl. 384-21.000.
Scanga, Theodore P.; Kiley, Matthew P.; Metz, Robert J.; and Schultz, Fred R., to Aluminum Company of America. Retortable container with easily-openable lid. 4,890,759, Cl. 220-273.000.
Schaapveld, Kenneth L. Cultured marble casket and method of producing same. 4,890,366, Cl. 27-7.000.

Schaefer, Dietmar; and Krakenberg, Manfred, to Th. Goldschmidt AG. Diquaternary polysiloxanes, their synthesis and use in cosmetic preparations. 4,891,166, Cl. 260-404.500.
Schaefer, Frederic C., to American Cyanamid. Process for the preparation of polymeric tertiary aralkyl isocyanates from 1,3- or 1,4-bis(1-chloro-1-methylethyl)benzene. 4,891,441, Cl. 560-339.000.
Schafer, Ralf: *See*—
Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 4,891,563, Cl. 315-309.000.
Schaffer, Robert R.: *See*—
Hoisington, Paul A.; Schaffer, Robert R.; and Fischbeck, Kenneth H., 4,891,654, Cl. 346-140.00R.
Schanz, Werner: *See*—
Kniesser, Karl; Kornaker, Walter; Lau, Bernhard; and Schanz, Werner, 4,891,549, Cl. 313-414.000.
Scharmann GmbH & Co.: *See*—
Esser, Karl-Josef, 4,890,969, Cl. 414-277.000.
Schatz, Oskar; and Steidele, Thomas. Method for postcharging an IC engine of the piston type and an apparatus for performing the method. 4,890,582, Cl. 123-26.000.
Schauer, Friedrich: *See*—
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Schaumann, Jon P.; Olander, Jitka V.; Harakas, Nicholaos K.; and Feder, Joseph, to Monsanto Company. Monoclonal antibody specific for human colon fibroblast-derived t-PA. 4,891,312, Cl. 435-7.000.
Scheiber, Peter. Signal re-distribution, decoding and processing in accordance with amplitude, phase and other characteristics. 4,891,839, Cl. 381-22.000.
Schering Aktiengesellschaft: *See*—
Chwaliaz, Krzysztof; Beier, Sybille; Esch, Angelika; and Elger, Walter, 4,891,368, Cl. 514-179.000.
Nordhoff, Erhard; Franke, Wilfried; and Arndt, Friedrich, 4,891,428, Cl. 546-278.000.
Wiechert, Rudolf; Beier, Sybille; Elger, Walter; Annen, Klaus; Nickisch, Klaus; and Laurent, Henry, 4,891,365, Cl. 514-173.000.
Schewe, Richard A., to Reed-Chatwood, Inc. Warper with tension isolator and tension controller. 4,890,368, Cl. 28-185.000.
Schiazzano, Gerald: *See*—
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Schiessl, Gerhard, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Cross-flow heat exchanger. 4,890,670, Cl. 165-76.000.
Schlags, Michael L. Portable decontamination tank. 4,890,343, Cl. 4-585.000.
Schlak, Ottfried: *See*—
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Schlechtweg, Ronald E.: *See*—
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Schleimann-Jensen, Lars J. System for guiding a flying object towards a target. 4,890,554, Cl. 102-384.000.
Schleyerbach, Rudolf: *See*—
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Schlumberger Technology Corporation: *See*—
Dussan V., Elizabeth B.; and Sharma, Yogeshwar, 4,890,487, Cl. 73-152.000.
Herron, Michael M., 4,890,486, Cl. 73-152.000.
Schmid, Peter: *See*—
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Schmid, Samuel: *See*—
Streit, Roland; Mannhart, Peter; and Schmid, Samuel, 4,890,537, Cl. 89-37.110.
Schmidt, Anton; Walter, Wilhelm; and Bruns, Focko, to Fag Kugelfischer Georg Schafer (KGaA). Magnetic liquid sealing ring installed in an antifriction bearing. 4,890,940, Cl. 384-446.000.
Schmidt, Guenther; and Schmid, Peter, to Messerschmitt-Boelkow-Blohm GmbH. Wall surface structure having an improved radiant heat discharge capability. 4,890,454, Cl. 60-266.000.
Schmidt, William P.; Hutchinson, Frank D.; and Malcomson, Kirk. Dual mounting assembly for mirrors. 4,890,909, Cl. 350-616.000.
Schmied, Rudolf: *See*—
Loliger, Willi; and Schmied, Rudolf, 4,890,639, Cl. 137-510.000.
Schmitt, Reinhold, to Siemens Aktiengesellschaft. Circuit for image displacement in a particle beam apparatus independently of magnification. 4,891,523, Cl. 250-396.00R.
Schneid, Josef: *See*—
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Schneider, Claus: *See*—
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Schneiter, Fred E., to Morton Thiokol, Inc. Wafer grain gas generator. 4,890,860, Cl. 280-741.000.
Schnellmann, Danielle, to Charmilles Technologies SA. Machining fluid for electrical discharge machining apparatus. 4,891,162, Cl. 252-570.000.
Schoebinger, Matthias: *See*—
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Schoenleber, Donald W.: *See*—
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Schossler, Willi, to Bayer Aktiengesellschaft. N-alkyl-benzenesulphonamide compositions. 4,891,156, Cl. 252-364.000.
Schreiner, Ceinwen A.: *See*—
Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., 4,891,322, Cl. 436-64.000.
Schrenk, Juergen: *See*—
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Schroeder, Alfred A.: *See*—
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Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See*—
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Schuch, Horst: *See*—
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May, Ronald F.; Kafer, Kenneth G.; Schuelke, Gregory W.; and Verstegen, Michael T., 4,891,743, Cl. 363-87.000.
Schulten, Elizabeth W. Releasably mountable hand grip for handles. 4,890,355, Cl. 16-111.00R.
Schultz, Fred R.: *See*—
Scanga, Theodore P.; Kiley, Matthew P.; Metz, Robert J.; and Schultz, Fred R., 4,890,759, Cl. 220-273.000.
Schultz, Steven G., to Abbott Laboratories. Reference electrode and method of making it. 4,891,125, Cl. 204-435.000.
Schum, Berthold: *See*—
Hezel, Rudolf; Hoffmann, Winfried; and Schum, Berthold, 4,891,325, Cl. 437-2.000.
Schumacher, John C., to Diamond Cubic Liquidation Trust. Ultra-pure epitaxial silicon. 4,891,201, Cl. 423-348.000.
Schumacher, Larry L. Torque transducer for electric motors. 4,890,501, Cl. 73-862.330.
Schuppiser, Jean-Luc: *See*—
Chopin, Thierry; Garreau, Francois; Knipper, Magali; Nortier, Patrice; and Schuppiser, Jean-Luc, 4,891,350, Cl. 502-439.000.
Schuster, Hans H.: *See*—
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Schuttenberg, Eckard: *See*—
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Schwabe, Peter; Voigt, Reiner; and Schlak, Ottfried, to Bayer Aktiengesellschaft. Silicone molding compounds. 4,891,400, Cl. 524-745.000.
Schwaiger, Karl-Heinz: *See*—
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Schwarz, Herbert: *See*—
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Science Accessories Corp.: *See*—
Kelly, William, 4,891,474, Cl. 178-18.000.
SCM Chemical Limited: *See*—
Robinson, Michael, 4,891,204, Cl. 423-495.000.
Scofield, William A., to Pem All Fire Extinguisher Corporation. Check valve system for fire extinguisher. 4,890,677, Cl. 169-75.000.
Scott, Jack A.: *See*—
Clement, Thomas P., II; Wettlaufer, John R.; and Scott, Jack A., 4,891,061, Cl. 75-24.000.
Scriven, Roger L.: *See*—
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Scrivner, Noel C.: *See*—
McEwen, Craig S.; and Scrivner, Noel C., 4,891,246, Cl. 427-229.000.
Sea-Land Service, Inc.: *See*—
Kelly, Eugene M.; and Barnett, Robert B., 4,890,565, Cl. 114-72.000.
Sears Manufacturing Company: *See*—
Koutsky, L. John; and Shovar, J. Scott, 4,890,887, Cl. 297-320.000.
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Seitz, Friedrich: *See*—
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; and Seitz, Friedrich, 4,891,301, Cl. 430-281.000.
Seki, Yachibo; Kose, Saburo; and Kodama, Teruo, to Agency of Industrial Science and Technology. Process for preparation of micro-cellular porous ceramic body. 4,891,174, Cl. 264-44.000.
Sekiguchi, Katsumi: *See*—
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Sekihara, Toshinobu: *See*—
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Sekine, Takao, to Niles Parts Co., Ltd. Icing preventive device for ultrasonic wave transmitting and receiving unit for vehicle. 4,891,796, Cl. 367-96.000.
Selby, Eric J.: *See*—
Anderson, Leslie A.; Selby, Eric J.; Wagner, David L.; and Walter, Alfred E., Jr., 4,890,382, Cl. 29-833.000.

Seltzer, Raymond; and Winter, Roland A. E., to Ciba-Geigy Corporation. 4-aralkyl-2-nitro-2'-hydroxy-3',5'-dialkyl (or cumyl)-azobenzenes. 4,891,424, Cl. 534-649.000.
Semen, John; and Rogers, John J., to Ethyl Corporation. Preceramic compositions and ceramic products. 4,891,340, Cl. 501-88.000.
Semitest, Inc.: *See*—
Kamieniecki, Emil; Goldfarb, William C.; and Wollowitz, Mike, 4,891,584, Cl. 324-158.00R.
Senda, Tetsuya; Fukuda, Tokuya; and Matsumoto, Hiroaki, to Sony Corporation. Color signal matrix circuits. 4,891,689, Cl. 358-30.000.
Senet, Jean-Pierre: *See*—
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Sengenberger, Charles G.: *See*—
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Senior, John M., to Raychem Limited. Method of making a curved composite article. 4,891,084, Cl. 156-196.000.
Sennyey, Gerard: *See*—
Barcelo, Gerard; Castro, Bertrand; Jaouadi, Mahmoud; Martinez, Jean; Senet, Jean-Pierre; and Sennyey, Gerard, 4,891,430, Cl. 548-259.000.
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Servet, Yves: *See*—
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Sessa, Angelo J. Bed sheet stuffing device. 4,890,345, Cl. 5-508.000.
Sethi, Rajinder S.; Brettle, Jack; and Lowe, Christopher. Chromatographic separation device. 4,891,120, Cl. 204-299.00R.
Seyfried, Joseph A., to Xerox Corporation. Retractable development apparatus. 4,891,674, Cl. 355-245.000.
Sezaki, Mutsuo; and Nishimura, Kinji, to C. Itoh Fuel Co., Ltd.; and Nishitomo Co., Ltd. Recording telephone system equipped with a remote control change-over switch. 4,891,834, Cl. 379-67.000.
Shackelford, Renee M. F. Apparatus for brushing teeth with hygienic disposable bristles. 4,890,732, Cl. 206-362.100.
Shaffer, Howard R., to AMP Incorporated. Method of crimping an electrical connection. 4,890,384, Cl. 29-863.000.
Shamsbojan, Peter C., to Watkins-Johnson Company. Process for borosilicate glass films for multilevel metallization structures in semiconductor devices. 4,891,247, Cl. 427-255.300.
Shanborm, Edward. Whole blood antiviral process and composition. 4,891,221, Cl. 424-101.000.
Shaner, Jay R.: *See*—
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Shannon, Gilbert A.; and Hines, Betty L. Paint brush and paint roller holder. 4,890,353, Cl. 15-257.00R.
Shapler, Thomas A.; Buehler, Thomas R.; and Hirschberger, Michael, to Hoover University, Inc. Apparatus for forming a parison with a view stripe. 4,890,994, Cl. 425-131.100.
Shapovalov, Jury P.: *See*—
Shishkin, Viktor V.; Samuliev, Jury D.; Shapovalov, Jury P.; Sushkov, Yaroslav P.; Panchenko, Valery P.; Lukin, Evgeny G.; Chernyai, Alexandr I.; and Kryazhevskikh, Nikolai F., 4,891,115, Cl. 204-212.000.
Sharma, Yogeshwar: *See*—
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Slattery, Daniel T.; and Watson, Jeremy D., 4,891,741, Cl. 363-35.000.
Stadler, Peter: *See—*
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; and Brunner, Helmut, 4,891,425, Cl. 536-22.000.
Staehlin, John H.; and Colgan, John R., to Westinghouse Electric Corp. Light plane communication system for use in a phased array antenna. 4,891,651, Cl. 343-853.000.
Stagga, Darrell W., to UOP. Control method for oxygen addition to oxidative reheat zone of hydrocarbon conversion process. 4,891,464, Cl. 585-440.000.
Stammetti, John J. Modified derailleur. 4,891,036, Cl. 474-82.000.
Standard Oil Company, The: *See—*
Gaffney, Thomas R.; Henry, JoAnn; and Desmond, Michael J., 4,891,164, Cl. 252-629.000.
Stanley Electric Co., Ltd.: *See—*
Ishikawa, Kiyomitsu; Tanabe, Tohru; Kimura, Shigeru; and Yamada, Kazuhiko, 4,891,624, Cl. 340-436.000.
Obara, Kazufumi, 4,891,623, Cl. 338-163.000.
Stanley, Karen A.: *See—*
Spitzer, Rich A.; Mumper, Melanie A.; and Stanley, Karen A., 4,891,712, Cl. 358-335.000.
Starch Industries, Pty. Ltd.: *See—*
Gatzka, Bruno G.; and Olsen, Christopher J., 4,890,429, Cl. 52-640.000.
Stauffer, John E. Rotary internal combustion engine and method of starting the engine. 4,890,591, Cl. 123-213.000.
STC PLC: *See—*
Naden, James M., 4,891,512, Cl. 250-227.000.
Steel, Francis R.: *See—*
Siwiak, Kazimierz; Keba, James M.; and Steel, Francis R., 4,891,637, Cl. 340-825.440.
Steele, Ronald J.: *See—*
Lorincz, Eugene M.; and Steele, Ronald J., 4,891,090, Cl. 156-577.000.
Steer, Peter L., to E. R. Squibb and Sons, Inc. Attachment assembly for use on the human skin. 4,890,608, Cl. 128-156.000.
Steffen, Andreas: *See—*
Lauper, Alfred; and Steffen, Andreas, 4,891,599, Cl. 328-109.000.
Steidele, Thomas: *See—*
Schatz, Oskar; and Steidele, Thomas, 4,890,582, Cl. 123-26.000.
Steimel, Lyle H.: *See—*
Christensen, Ronald J.; and Steimel, Lyle H., 4,891,141, Cl. 210-750.000.
Steiner, Gregory; and Matsuda, Hari. Food handling device. 4,890,549, Cl. 99-450.000.
Steiner, Johann: *See—*
Kautz, Allan D.; and Steiner, Johann, 4,891,028, Cl. 445-30.000.
Steiner, Karl: *See—*
Nader, Hans; and Steiner, Karl, 4,890,522, Cl. 82-142.000.
Steinhausen, Helmut: *See—*
Kulling, Achim M.; and Steinhausen, Helmut, 4,891,206, Cl. 423-531.000.
Stembridge, W. Frank: *See—*
Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., 4,890,651, Cl. 141-1.000.
Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., to Coca-Cola Company, The. Ultrasonic automatic cup filling method operating adjacent valves on different A.C. half cycles. 4,890,651, Cl. 141-1.000.
Stemke, Jeffrey E., to Chevron Research Company. Hydroperoxidized ethylene copolymers and terpolymers as dispersants and V. I. improvers. 4,891,146, Cl. 252-55.000.
Stengl, Gerhard; and Loschner, Hans, to IMS Ionen Mikrofabrikations Systeme Gesellschaft GmbH. Particle or radiation beam mask and process for making same. 4,891,547, Cl. 313-407.000.
Stern, Joseph E., to Harnischfeger Corporation. Portal crane. 4,890,750, Cl. 212-153.000.
Stevens, Frank H.; and Vetter, Sheila E., to Sherex Chemical Company, Inc. Particulate emulsifiable hair conditioning composition. 4,891,214, Cl. 424-70.000.
Sticht, Walter. Method of and a device for coding workpiece carriers in a production plant. 4,890,715, Cl. 198-340.000.
Stiff, Rodney A.; Baker, Malcolm J.; and Yates, Graham G., to Austoft Industries Limited. Rider type trenching machine. 4,890,399, Cl. 37-86.000.

Stihl, Andreas: *See—*
Fischer, Hartmut; Grassmuck, Jurgen; Wissmann, Michael; and Dreher, Albert, 4,890,690, Cl. 181-240.000.

Stiltz, William J.: *See—*
Davis, Cecil J.; Spencer, John E.; Bonifield, Thomas D.; Jucha, Rhett B.; Stiltz, William J.; Johnson, Randall E.; Whetsel, Joseph E.; and Jones, John I., 4,891,087, Cl. 156-345.000.

Stitz, Albert: *See—*
Lenk, Erich; and Stitz, Albert, 4,890,800, Cl. 242-47.010.

Stobaugh, John F.; and Kakodkar, Sunil, to Oread Laboratories, Inc. Method for assaying primary amines, secondary amines and peptides using fluorogenic derivatization reagents. 4,891,323, Cl. 436-86.000.

Stockel, Richard F. Polymeric biguanides. 4,891,423, Cl. 528-422.000.

Stockley, Henry W.: *See—*
Mize, James, Jr.; Davis, Kent A.; and Stockley, Henry W., 4,890,739, Cl. 206-459.000.

Stolz, Gerhard: *See—*
Preis, Josef; Schwarz, Ulf; and Stolz, Gerhard, 4,891,728, Cl. 361-18.000.

Stone, Rex D.: *See—*
Bryer, Jack; Lindstrom, Jan; and Stone, Rex D., 4,890,555, Cl. 101-415.100.

Storage Technology Corporation: *See—*
Ward, Leonard G.; Reidenauer, Ronald R.; and Kleinschnitz, Donald J., 4,891,240, Cl. 427-11.000.
Yeakley, Lester M.; and Taqhdir, Hesaan, 4,891,724, Cl. 360-106.080.

Stormberg, Hans P.: *See—*
Gasser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., 4,891,563, Cl. 315-309.000.

Stone, Peter; Leitold, Matyas; and Yeates, Rodney, to Pfizer Inc. Aminopropanol derivatives of 1,4:3,6-dianhydrohexitol nitrates, processes for their preparation and their use as medicaments. 4,891,373, Cl. 514-228.200.

Stouffer Corporation, The: *See—*
Jaeger, Kirk A.; Peleg, Yigal; and Popp, David R., 4,891,482, Cl. 219-10.55E.

Stowers, George E.; and Spector, George. Backwasher. 4,890,352, Cl. 15-244.100.

Stratton, Charles A., to Stratton, Mary Rose. Water-flood surfactant. 4,891,177, Cl. 252-8.515.

Stratton, Mary Rose: *See—*
Stratton, Charles A., 4,891,177, Cl. 252-8.515.

Strauss, Paul: *See—*
Dougherty, Lawrence W.; Feudley, James R.; Prazak, Charles J.; and Strauss, Paul, 4,891,546, Cl. 313-407.000.

Strehler, Bernard. Visual/voice input recognition sensor. 4,891,602, Cl. 381-45.000.

Streit, Roland; Maanhart, Peter; and Schmid, Samuel, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Elevatable firing weapon with a device for setting the elevation of the weapon barrel. 4,890,537, Cl. 89-37.110.

Strid, Eric W.: *See—*
Gleason, K. Reed; Jones, Keith E.; and Strid, Eric W., 4,891,612, Cl. 333-33.000.

Stritzke, Detlef, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen GmbH. Method and apparatus for electrochemically decomposing inorganic materials contained in an aqueous radioactive waste solution. 4,891,116, Cl. 204-241.000.

Strobel, David L.: *See—*
Del Corso, Gregory J.; Martin, James W.; and Strobel, David L., 4,891,080, Cl. 148-326.000.

Studenski, Udo, to U. I. Lapp KG. Screw-type cable fitting. 4,891,470, Cl. 174-65.0SS.

Stulemeijer, Ivo P. J. M.: *See—*
Worrall, Robert N.; and Stulemeijer, Ivo P. J. M., 4,890,682, Cl. 175-61.000.

Sturrock, James C.: *See—*
Stembridge, William F.; Stembridge, W. Frank; and Sturrock, James C., 4,890,651, Cl. 141-1.000.

Sturwald, Wilhelm; and Wieczorek, Stefan, to SKF Textilmaschinen-Komponenten GmbH. Method for speed regulation and switch arrangement for performing the method. 4,891,566, Cl. 318-78.000.

Saeddeutsche & Kuehlerfabrik Julius Fr. Behr GmbH: *See—*
Humpolik, Bohumil; and Mielke, Josef, 4,891,257, Cl. 428-592.000.

Suga, Fuso: *See—*
Kuroki, Yasuo; and Suga, Fuso, 4,891,776, Cl. 364-705.070.

Suga, Shuzo: *See—*
Matsunoki, Yasuo; Maekawa, Yukio; and Suga, Shuzo, 4,891,307, Cl. 430-527.000.

Sugai, Hiroshi: *See—*
Tanaka, Cyuzaburo; Yazama, Teruyoshi; Miyajima, Yoshiki; Kashiwa, Masaharu; and Sugai, Hiroshi, 4,891,163, Cl. 252-627.000.

Sugano, Kazuhiko: *See—*
Ueki, Akihiro; and Sugano, Kazuhiko, 4,890,517, Cl. 74-868.000.

Sugawara, Tadami: *See—*
Okita, Masao; Sugawara, Tadami; and Yoshida, Hiroshi, 4,891,513, Cl. 250-239.000.

Sugaya, Syoji, to Sanyo Electric Company, Ltd. Optical recording disc. 4,891,800, Cl. 369-275.000.

Sugimoto, Masahiro: *See—*
Wakasugi, Yasumasa; and Sugimoto, Masahiro, 4,891,344, Cl. 501-128.000.

Sugita, Hiroshi: *See—*
Tsurukiri, Shigeru; Sugita, Hiroshi; Yamamoto, Toshio; Kawasaki, Masaru; and Horie, Eiji, 4,891,296, Cl. 430-142.000.

Sugiura, Hiroaki: *See—*
Ota, Akiho; Sugiura, Hiroaki; and Ishii, Hiroichi, 4,890,752, Cl. 215-1.00C.

Sugiura, Hiroyuki, to Diesel Kiki Co., Ltd. Air conditioning system with variable capacity compressor. 4,890,985, Cl. 417-295.000.

Sugiyama, Eiji; Natsume, Mitsuaki; and Saito, Toshiharu, to Fujitsu Limited. Semiconductor integrated-circuit apparatus. 4,891,729, Cl. 361-91.000.

Suh, Nam P.: *See—*
Sanchez-Caldera, Luis E.; Lee, Arthur K.; Suh, Nam P.; and Chun, Jung-Hoon, 4,890,662, Cl. 164-46.000.

Sulc, Jiri; and Krcova, Zuzana, to Ceskoslovenska akademie ved. Contact lens and the method of manufacturing thereof. 4,890,911, Cl. 351-160.00H.

Sullivan, Carl J., to Arco Chemical Technology, Inc. Purification of tertiary hydroperoxides containing primary and secondary hydroperoxide contaminants. 4,891,101, Cl. 203-36.000.

Sulzer-Escher Wyss GmbH: *See—*
Dahl, Hans; and Schaeid, Josef, 4,890,551, Cl. 100-163.00A.
Hildebrand, Otto, 4,891,100, Cl. 162-343.000.

Sumimoto Heavy Industries, Ltd.: *See—*
Kamiwaki, Tadayoshi; and Hoshika, Takumi, 4,890,721, Cl. 198-626.000.

Sumitani, Tomoaki: *See—*
Shimizu, Norio; Fukuzono, Shinichi; Nishimura, Nobuko; Odawara, Yoji; and Sumitani, Tomoaki, 4,891,310, Cl. 435-3.000.

Sumitomo Electric Industries, Ltd.: *See—*
Hayashi, Noriki; Takano, Satoshi; Miyazaki, Kenji; and Yoshida, Noriyuki, 4,891,355, Cl. 505-1.000.
Kogo, Katsuyuki; and Miyaoka, Shinji, 4,891,575, Cl. 324-71.400.
Nakai, Tetsuo; Hara, Akio; and Yazu, Shuji, 4,890,782, Cl. 228-112.000.

Sumitomo Heavy Industries, Ltd.: *See—*
yagi, Yoshitaka; Matsugi, Tomomasa; and Kiyama, Mitsushige, 4,890,719, Cl. 198-507.000.

Sumitomo Metal Mining Company Limited: *See—*
Tanaka, Cyuzaburo; Yazama, Teruyoshi; Miyajima, Yoshiki; Kashiwa, Masaharu; and Sugai, Hiroshi, 4,891,163, Cl. 252-627.000.

Sumiya, Koji: *See—*
Kano, Takenori; Kobayashi, Koji; Sumiya, Koji; Kubo, Seitoku; and Watanabe, Kazuaki, 4,890,512, Cl. 74-740.000.

Sumtiomo Chemical Company, Limited: *See—*
Sasaki, Toshio; Katao, Masaaki; Kawai, Kiyoshi; and Shiga, Akinobu, 4,891,411, Cl. 526-119.000.

Sunds Defibrator AB: *See—*
Reinhall, Rolf B., 4,890,796, Cl. 241-30.000.

Sundstrand Corporation: *See—*
Ames, John E.; Krandel, Bruce A.; and Aldrich, Allyn M., 4,890,979, Cl. 416-46.000.
Baker, Richard; and Nguyen, Tuan, 4,890,702, Cl. 188-264.00D.
Shekhawat, Sampat S.; and Dhyanchand, John J., 4,891,532, Cl. 307-300.000.

Sundstrand Data Control, Inc.: *See—*
Muller, Hans R., 4,891,642, Cl. 340-968.000.

Suntory Limited: *See—*
Ohta, Naotake; Yotsumoto, Masahiro; Nishino, Haruo; Tanahashi, Hiroshi; Kato, Hajime; Tazawa, Toshiaki; Noda, Hideo; and Wakabayashi, Yuzuru, 4,891,236, Cl. 426-330.400.

Superior Toy & Manufacturing Company, Inc.: *See—*
Gertzfeld, Sheldon G., 4,891,030, Cl. 446-118.000.

Superspine: *See—*
Iams, John F.; and Splane, Robson L., Jr., 4,890,606, Cl. 128-75.000.

Susa, Kenzo: *See—*
Ishibashi, Hiroyuki; Shimizu, Kazushi; Susa, Kenzo; and Kubota, Shinzou, 4,891,520, Cl. 250-367.000.

Sushkov, Yaroslav P.: *See—*
Shishkin, Viktor V.; Samuliev, Jury D.; Shapovalov, Jury P.; Sushkov, Yaroslav P.; Pancheako, Valery P.; Lukin, Evgeny G.; Chernyai, Alexandr I.; and Kryazhevskikh, Nikolai F., 4,891,115, Cl. 204-212.000.

Sutek Corporation: *See—*
Sanchez-Caldera, Luis E.; Lee, Arthur K.; Suh, Nam P.; and Chun, Jung-Hoon, 4,890,662, Cl. 164-46.000.

Suthanthiran, Krishnan, to Best Industries, Inc. Device and method for encapsulating radioactive materials. 4,891,165, Cl. 252-633.000.

Sutter, Leroy V., Jr.; Cameron, Harold A.; and Davison, Michael R. RF excited laser with internally folded resonator. 4,891,819, Cl. 372-82.000.

Sutton, James P., III: *See—*
Niziolek, James M.; and Sutton, James P., III, 4,890,920, Cl. 356-336.000.

Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, to Sony Corporation. Rotary magnetic head and guide drum assembly with reduce mounting height. 4,891,726, Cl. 360-130.230.

Suzuki, Hideo; and Kurakake, Yasushi, to Yamaha Corporation. Mixing type tone signal generation device employing two channels generating tones based upon different parameter. 4,890,527, Cl. 84-697.000.

Suzuki, Hiroyuki; and Kawata, Kazuhide, to NEC Corporation. Apparatus for generating a picture signal at precise horizontal position. 4,891,705, Cl. 358-148.000.

Suzuki, Hiroyuki: *See—*
Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takeshi; Kameyama, Makoto; and Niizuma, Kiyozumi, 4,890,378, Cl. 29-603.000.

Suzuki, Hosei, to Fuji Jukogyo Kabushiki Kaisha. Control system for a lockup clutch for an automatic transmission. 4,890,707, Cl. 192-3.300.

Suzuki, Kazumichi: *See—*
Kitamori, Takehiko; Yasuda, Kazuo; Nomura, Yasushi; Suzuki, Kazumichi; and Fujimori, Haruo, 4,890,925, Cl. 356-432.000.

Suzuki, Koji, to Canon Kabushiki Kaisha. Power source apparatus. 4,891,572, Cl. 323-284.000.

Suzuki, Masahiko, deceased: *See—*
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased, 4,891,524, Cl. 250-398.000.

Suzuki, Seishi: *See—*
Haga, Tomoyuki; Ozaki, Naotake; Koinuma, Kazushi; Fujima, Masatoshi; and Suzuki, Seishi, 4,890,770, Cl. 222-109.000.

Suzuki, Takashi; Yamanaka, Toshio; Suzuki, Hiroyuki; Orikasa, Tsuyoshi; Sawada, Takeshi; Kameyama, Makoto; and Niizuma, Kiyozumi, to Canon Kabushiki Kaisha. Method for manufacturing a magnetic head core having a magnetic film. 4,890,378, Cl. 29-603.000.

Suzuki, Yasuo: *See—*
Fujimaki, Yoshihide; Suzuki, Yasuo; and Takimoto, Masataka, 4,891,288, Cl. 430-58.000.
Takahashi, Shuji; Suzuki, Yasuo; Ogawa, Hiroyasu; and Ichimaru, Kazuhiro, 4,891,267, Cl. 428-367.000.

Suzuki, Yoshikazu, Fumie Suzuki, heirs: *See—*
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased, 4,891,524, Cl. 250-398.000.

Suzuki, Yutaka, to Nissan Motor Co., Ltd. Ratio control system for continuously variable transmission. 4,890,516, Cl. 74-866.000.

Suzuki, Yuzuru: *See—*
Fujitani, Sakae; Suzuki, Yuzuru; Okuda, Masanao; Takahashi, Hitoshi; and Fukazawa, Junichiro, 4,891,567, Cl. 318-254.000.

Svyatsky, Eduard, to Bell & Howell Company. Document forwarding system. 4,891,088, Cl. 156-350.000.

Swenson, Christine E.: *See—*
Janoff, Andrew S.; Popescu, Mircea C.; Weiner, Alan L.; Bolscak, Lois E.; Tremblay, Paul A.; and Swenson, Christine E., 4,891,208, Cl. 424-1.100.

Swinton, William G.: *See—*
Fairman, Bruce A.; Larsen, Allen J.; Swinton, William G.; and Taylor, Robert G., Jr., 4,891,752, Cl. 364-200.000.

Swivel Machine Works, Inc.: *See—*
Ekstrom, Glen, 4,890,597, Cl. 124-74.000.

Swoboda, James J., to International Wholesale, Inc. Five-rib disk brake rotor. 4,890,701, Cl. 188-218.0XL.

Sylvanowicz, John: *See—*
Cook, William; Herman, Jack; Rowe, Donald; and Sylvanowicz, John, 4,890,623, Cl. 128-642.000.

Synek, Joseph, to Mobay Corporation. Insecticidal compositions. 4,891,385, Cl. 514-490.000.

Syntex (U.S.A.) Inc.: *See—*
Pease, John; Weng, Litai; Kirakossian, Hrair; and Ullman, Edwin F., 4,891,324, Cl. 436-519.000.

Synthelabo: *See—*
George, Pascal; Giron, Claudie; and Froissant, Jacques, 4,891,371, Cl. 514-212.000.
Manoury, Philippe; and Saarmets, Alfred, 4,891,376, Cl. 514-272.000.

Szabo, Sandor, to Brigham & Women's Hospital. Proteinase inhibitors for treatment of gastrointestinal ulcer disease. 4,891,356, Cl. 514-2.000.

Szczepanski, Henry, to Ciba-Geigy Corporation. N,N'-Dicyanocyclopropanecarbamidines and a process for their preparation. 4,891,443. Cl. 564-103.000.

Szczepanski, Thomas R.: *See—*
Kuan, Tiong H.; Srail, Raymond C.; and Szczepanski, Thomas R., 4,891,409, Cl. 525-237.000.

Szekacs, Gyorey, to Egyesult Izzolampa es Villamossagi RT. Headlight system for motor cars. 4,891,541, Cl. 313-25.000.

Szymanek, Donald D., to Thin-Lite Corporation. Quick fit diffuser lens apparatus. 4,891,737, Cl. 362-223.000.

Tabata, Katsuhiro: *See—*
Mimata, Tsutomu; Uematsu, Toshihide; and Tabata, Katsuhiro, 4,890,780, Cl. 228-4.500.

Tabler, Charles P., to Buckhorn, Inc. Snap together picking container. 4,890,740, Cl. 206-509.000.

Tabuchi, Kenji: *See—*
Toyoshi, Naoki; Okamoto, Hiroshi; Tabuchi, Kenji; Takebe, Kaoru; and Yokoyama, Tomoaki, 4,891,287, Cl. 430-54.000.

Tabuchi, Shuji: *See—*
Satoh, Masaki; Kamiya, Shigemitsu; Fujie, Nobuo; and Tabuchi, Shuji, 4,891,334, Cl. 437-228.000.

Tachi-S Co., Ltd.: *See—*
Sakamoto, Takao, 4,890,810, Cl. 248-588.000.

Tack, Robert D.: *See—*
Brod, Ramah J.; Tack, Robert D.; Lewtas, Kenneth; and Elliott, Robert L., 4,891,145, Cl. 252-52.00A.

Tadros, Atef: *See—*
Burgess, R. Anthony; Cunliffe, Geoffrey; and Tadros, Atef, 4,890,802, Cl. 244-115.000.

Tagawa, Itsuo; Kanari, Yukiharu; Kanno, Samon; and Kozaki, Takaharu, to Sangojuuki Co., Ltd. Structure crushing equipment. 4,890,798, Cl. 241-266.000.

Taguchi, Kohei: *See—*
Fzure, Nobuya; Takadera, Ichiro; and Taguchi, Kohei, 4,890,822, Cl. 267-64.240.

Taguchi, Tatsuhisa; Abe, Yoshikazu; and Aburaya, Kiyoji, to Matsushita Electric Industrial Co., Ltd. Variable capacity compressor. 4,890,986, Cl. 417-295.000.

Taiho Pharmaceutical Company, Limited: *See—*
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; and Ohno, Tomoyasu, 4,891,369, Cl. 514-192.000.

Takadera, Ichiro: *See—*
Ezure, Nobuya; Takadera, Ichiro; and Taguchi, Kohei, 4,890,822, Cl. 267-64.240.

Takagawa, Ryozo; Tanabe, Hisaki; Inoue, Koichi; and Umemoto, Hirotoshi, to Nippon Paint Company, Ltd. Modified polyester resin composition containing isononaoic acid and a cyclic ester. 4,891,419, Cl. 528-274.000.

Takagi, Masafumi, to Canon Kabushiki Kaisha. Image forming apparatus with developing device accommodating apparatus. 4,891,672, Cl. 355-245.000.

Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, to Shin-Etsu Chemical Co., Ltd. Novel organosilicon compound. 4,891,434, Cl. 549-215.000.

Takahashi, Hideaki; Wakahara, Takashi; and Harashima, Yasuhiro, to Amada Company, Limited. Precision plate bending machine having a play removing device. 4,890,476, Cl. 72-456.000.

Takahashi, Hitoshi: *See—*
Fujitani, Sakae; Suzuki, Yuzuru; Okuda, Masanao; Takahashi, Hitoshi; and Fukazawa, Junichiro, 4,891,567, Cl. 318-254.000.

Takahashi, Ken: *See—*
Kabe, Kazuyuki; Koishi, Masataka; and Takahashi, Ken, 4,890,658, Cl. 152-209.00D.
Yohda, Hiroshi; Takahashi, Ken; Sawai, Eisuke; Muraoka, Syunsaku; and Ihara, Keita, 4,890,379, Cl. 29-603.000.

Takahashi, Kiyoshi: *See—*
Nakazato, Katsuo; Kurosawa, Toshiharu; Maruyama, Yuji; Takahashi, Kiyoshi; and Tsuchiya, Hiroyoshi, 4,891,710, Cl. 358-443.000.

Takahashi, Koichi; Okutsu, Kazuo; Ide, Yoshihiro; Takei, Hiroshi; Ishida, Yukio; and Harada, Kazumasa, to Fuji Photo Film Co., Ltd. Apparatus for adhering ribbons to cartridge shell plate. 4,891,089, Cl. 156-522.000.

Takahashi, Koichiro: *See—*
Ito, Noriki; Nagano, Yoshinobu; Tanaka, Akihiro; Numasaki, Yoso; and Takahashi, Koichiro, 4,891,432, Cl. 548-341.000.

Takahashi, Shuichi; and Nishida, Kiyomi, to Tokai Chemical Industries, Ltd. Method for producing a foamed resin molding. 4,891,081, Cl. 156-78.000.

Takahashi, Shuichi, to Ricoh Company, Ltd. Communication terminal having a charge displaying function. 4,891,836, Cl. 379-100.000.

Takahashi, Shuji; Suzuki, Yasuo; Ogawa, Hiroyasu; and Ichimaru, Kazuhiro, to Toho Rayon Co., Ltd.; and Yokohama Rubber Co., Ltd., The. Carbon fiber cord for rubber reinforcement and process for producing the same. 4,891,267, Cl. 428-367.000.

Takahashi, Takao, to Nissan Motor Company, Limited. Faulty pick removal for a multiple-phase loom. 4,890,649, Cl. 139-116.00A.

Takahashi, Taneyuki. Sun visor for automobile. 4,890,875, Cl. 296-97.200.

Takahashi, Toshihiro: *See—*
Masaki, Mitsuo; Takeda, Hiromitsu; Moritoh, Naoya; and Takahashi, Toshihiro, 4,891,433, Cl. 549-12.000.

Takahata, Kazunori: *See—*
Taniguchi, Katsuo; Tanaka, Michio; Takahata, Kazunori; Sakamoto, Naoya; Takai, Toshihiro; Kurano, Yoshito; and Ishibashi, Masayasu, 4,891,465, Cl. 585-463.000.

Takai, Toshihiro: *See—*
Taniguchi, Katsuo; Tanaka, Michio; Takahata, Kazunori; Sakamoto, Naoya; Takai, Toshihiro; Kurano, Yoshito; and Ishibashi, Masayasu, 4,891,465, Cl. 585-463.000.

Takamura, Yoshinobu; Katsumura, Norimichi; Osawa, Nobuhiko; and Watanabe, Kazuo, to Pioneer Electronic Corporation; and Pioneer Video Corporation. Muting control circuit. 4,891,824, Cl. 375-104.000.

Takano, Satoshi: *See—*
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Yasuda, Hiroshi; and Suzuki, Masahiko, deceased (by Suzuki, Yoshikazu, Fumie Suzuki, heirs), to Fujitsu Limited. Charged particle beam exposure system and method of compensating for eddy current effect on charged particle beam. 4,891,524, Cl. 250-398.000.
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Zeimer, Ran C.; Khoobehi, Bahram; and Peyman, Gholam A., to University of Illinois, Board of Trustees of the. System for selective release of liposome encapsulated material via laser radiation. 4,891,043, Cl. 604-20.000.

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Zettner, Michael L. Rotary internal combustion engine with mutually interengaging rotatable elements. 4,890,990, Cl. 418-173.000.

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Zimmer, Gero, to Productech Reflow Solder Equipment Inc. Heated tool with multiple heating surfaces. 4,891,496, Cl. 219-233.000.

Zimmerman, Dennis M.; and Mitch, Charles H., to Kabushiki Kaisha Kobe Seikosho; and Japan LSI Co., Ltd. Piperidine opioid antagonists. 4,891,379, Cl. 514-315.000.

Zimmerman, Morris; Ashe, Bunnie M.; and Doherty, James B., to Merck & Co., Inc. Cephalosporin derivatives as anti-inflammatory agents. 4,891,370, Cl. 514-201.000.

Zimmern, Bernard. Hermetic or semi-hermetic refrigeration motor-compressor unit. 4,890,461, Cl. 62-197.000.

Zimmern, Bernard. Positive displacement machine with a plastic gate pinton. 4,890,989, Cl. 418-153.000.

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Zwambag, Henry: *See*—
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Zweedijk, Johan J., to Oce-Nederland B.V. Optical imaging system for a copying machine. 4,891,668, Cl. 355-233.000.

Zweig, Siegfried, to Okoma Oberkochener Machinen GmbH. Butt-end wood holding system. 4,890,655, Cl. 144-82.000.

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LIST OF REISSUE PATENTEES

TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ashby, Robert E., to Moore Business Forms. Packing form. Re. 33,139, Cl. 282-11.50A.

Booth, Dwight E., to Dana Corporation. Methods and apparatus for controlling the engagement of gap-type electromagnetic couplings. Re. 33,140, Cl. 361-154.000.

Dana Corporation: *See*—
Booth, Dwight E., Re. 33,140, Cl. 361-154.000.

Dow Corning Corporation: *See*—
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Gornowicz, Gerald A.; and Lee, Chi-Long, to Dow Corning Corporation. Moisture resistant polyurethanes derived from non-aromatic diisocyanates and polydiorganosiloxanes and a method for preparing same. Re. 33,141, Cl. 528-28.000.

Lee, Chi-Long: *See*—
Gornowicz, Gerald A.; and Lee, Chi-Long, Re. 33,141, Cl 528-28.000.

Moore Business Forms: *See*—
Ashby, Robert E., Re. 33,139, Cl. 282-11.50A.

Sailas, Vaino, to Valmet Oy. Roll manufacturing method and roll, particularly for paper machines. Re. 33,138, Cl. 29-127.000.

Valmet Oy: *See*—
Sailas, Vaino, Re. 33,138, Cl. 29-127.000.

LIST OF REEXAMINATION PATENTEES

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Martin, William E. Apparatus and method of making cartons. B1 4,545,780, 1-2-90, Cl. 493-11.000.

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Schuring, Margaret D.; Schnabel, Robert R., Jr.; Saunders, Craig M.; and Adamczyk, George R., 305,348, Cl. D21-194.000.

Adams, William H.; Kenney, Ronald; and Lamond, Lee T., to Checkpoint Systems, Inc. Electronic article surveillance sensing screen for a theft detection system. 305,308, 1-2-90, Cl. D10-104.000.

American Brush Company: *See*—
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American Standard Inc.: *See*—
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Anderson, James E.; and Carlin, Samuel R., to Owens Products, Inc. Extended wide step running board for van or truck. 305,323, 1-2-90, Cl. D12-203.000.

Andrews, John J., to Testor Corporation, The. Airplane. 305,325, 1-2-90, Cl. D12-331.000.

Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 305,317, Cl. D12-129.000.

Asics Corporation: *See*—
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Kiyosawa, Junichi, 305,278, Cl. D2-320.000.

Baby Relax: *See*—
Julien, Francois, 305,314, Cl. D12-129.000.

Baillie, Ralph R., to Tri-R Innovations, Inc. Steering wheel controller. 305,338, 1-2-90, Cl. D15-199.000.

Beatrice, Paul D.; Mayne, James; and Furst, Gary S., to American Brush Company. Paint brush container. 305,302, 1-2-90, Cl. D9-415.000.

Beckman Instruments, Inc.: *See*—
Fechtner, Harold F., 305,360, Cl. D24-8.000.

Berg, Ake; Palmer, Soren; and Johansson, Soren, to Stiga AB. Lawn mower housing. 305,336, 1-2-90, Cl. D15-14.000.

Bricker, James C., to Hydro Systems Company. Combined foot valve and strainer. 305,355, 1-2-90, Cl. D23-247.000.

Brodie, Raymond P.: *See*—
Epperson, William A.; Brodie, Raymond P.; and Epperson, Deborah G., 305,343, Cl. D21-23.000.

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Campbell, Richard E. Vehicle spare tire cover. 305,322, 1-2-90, Cl. D12-202.000.

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Casiello, Nicholas. Distance measuring device. 305,306, 1-2-90, Cl. D10-70.000.

Checkpoint Systems, Inc.: *See*—
Adams, William H.; Kenney, Ronald; and Lamond, Lee T., 305,308, Cl. D10-104.000.

Chen, James S. K. Cosmetic case. 305,281, 1-2-90, Cl. D3-39.000.

Clark, James E., to Outwater Plastic/Industries, Inc. Decorative extrusion for display panels or similar articles. 305,368, 1-2-90, Cl. D25-124.000.

Clayton, Harold K., Jr., to Cooper Industries, Inc. Two-prong fused line cord plug. 305,326, 1-2-90, Cl. D13-28.000.

Cohen, Milton L.; and Siegel, Jeff, to Lifetime Cutlery Corporation. Kitchen shears. 305,294, 1-2-90, Cl. D8-57.000.

Colgate-Palmolive Company: *See*—
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Compaq Computer Corporation: *See*—
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ConMed Corporation: *See*—
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185 4,890,368

CLASS 29
25.35 4,890,369
4,890,370
33 P 4,890,371
123 4,890,372
127 Re.33,138
402.09 4,890,373
4,890,374
402.16 4,890,375
434 4,890,376
597 4,890,377
603 4,890,378
4,890,379
623 4,890,380
623.1 4,891,048
832 4,890,381
833 4,890,382
841 4,890,383
863 4,890,384

CLASS 30
101 4,890,385
136 4,890,386
260 4,890,388
276 4,890,389
346 4,890,390

CLASS 33
613 4,890,391
762 4,890,392
768 4,890,393

CLASS 34
1 4,890,394
96 4,890,395
235 4,890,396

CLASS 36
30 R 4,890,397
114 4,890,398

CLASS 37
86 4,890,399
117.5 4,890,400

CLASS 38
43 4,890,401

CLASS 40
159 4,890,402
604 4,890,403

CLASS 42
57 4,890,404
75.03 4,890,405
90 4,890,406
100 4,890,407

CLASS 43
3 4,890,408
15 4,890,409
4,890,410
42.06 4,890,411
42.24 4,890,412
54.1 4,890,414
55 4,890,413
61 4,890,415
131 4,890,416

CLASS 44
53 4,891,049
67 4,891,050

CLASS 47
58 4,890,417

CLASS 49
463 4,890,418

CLASS 51
95 LH 4,890,419
122 4,890,420
165 R 4,890,421
168 4,890,422
235 4,890,423
289 R 4,890,424

CLASS 52
19 4,890,425
58 4,890,426
90 4,890,427
167 CB 4,890,430
208 4,890,431
238.1 4,890,428
314 4,890,432
386 4,890,433
393 4,890,434
456 4,890,435
640 4,890,429
643 4,890,436
690 4,890,437
790 4,890,438

CLASS 53
118 4,890,443
410 4,890,439
456 4,890,440
4,890,441
474 4,890,442

CLASS 55
162 4,891,051
429 4,891,052
498 4,890,444

CLASS 56
13.6 4,890,445
17.5 4,890,446
63 4,890,447
255 4,890,448
341 4,890,449

CLASS 57
1 R 4,890,450
22 4,890,451
276 4,890,452

CLASS 60
39.465 4,890,453
266 4,890,454
275 4,890,455
585 4,890,456

CLASS 62
65 4,890,457
126 4,890,459
180 4,890,460
197 4,890,461
204 4,890,458
238.3 4,890,463

CLASS 65
64 4,891,053
105 4,891,054
106 4,891,055
348 4,891,056

CLASS 66
132 T 4,890,464
196 4,890,462

CLASS 68
23.7 4,890,465

CLASS 70
63 4,890,466
369 4,890,467

CLASS 71
72 4,891,057
118 4,891,058

CLASS 72
21 4,890,468
218 4,890,469
289 4,890,470
348 4,890,471
393 4,890,472
402 4,890,473
416 4,890,474
455 4,890,475
456 4,890,476

CLASS 73
9 4,890,477
19 4,890,478
29 4,890,479
32 A 4,890,480
40.5 R 4,890,483
53 4,890,481
55 4,890,482
61 R 4,890,484
61.1 R 4,890,485
152 4,890,486
4,890,487
189 4,890,488
204.24 4,890,489
290 R 4,890,491
290 V 4,890,490
292 4,890,492
321 4,890,493
338 4,890,494
379 4,890,495
597 4,890,496
708 4,890,497
727 4,890,498
861.05 4,890,499
861.41 4,890,500
862.33 4,890,501
864.85 4,890,502
866.5 4,890,503

CLASS 74
458 4,890,504
493 4,890,505
523 4,890,506
594.6 4,890,507
687 4,890,508
710.5 4,890,509
711 4,890,510
715 4,890,511
740 4,890,512
781 R 4,890,513
822 4,890,514
866 4,890,515
4,890,516
868 4,890,517

CLASS 75
0.5 R 4,891,059
10.19 4,891,060
24 4,891,061
28 4,891,062
51.1 4,891,063
51.2 4,891,064
63 4,891,065
84 4,891,066
101 R 4,891,067
251 4,891,068

CLASS 81
20 4,890,518
328 4,890,519
365 4,890,520
448 4,890,521

CLASS 82
142 4,890,522
158 4,890,523

CLASS 83
615 4,890,524
762 4,890,525
886 4,890,526

CLASS 84
95.2 4,890,528
291 4,890,529
4,890,530
329 4,890,531
422.1 4,890,532
439 4,890,533
697 4,890,527

CLASS 86
19 4,890,534
31 4,890,535

CLASS 89
1.8 4,890,536
37.11 4,890,537

CLASS 91
376 R 4,890,538
485 4,890,539

CLASS 92
63 4,890,540
84 4,890,541
194 4,890,542
228 4,890,543

CLASS 98
36 4,890,544
39.1 4,890,545
42.06 4,890,546
42.13 4,890,547

CLASS 99
408 4,890,548
450 4,890,549

CLASS 100
37 4,890,550
163 A 4,890,551
233 4,890,552

CLASS 101
389.1 4,890,553
415.1 4,890,555

CLASS 102
384 4,890,554
499 4,890,556

CLASS 104
7.3 4,890,557
9 4,890,558

CLASS 106
1.15 4,891,069
26 4,891,070
90 4,891,071
4,891,072

CLASS 108
44 4,890,559
53.1 4,890,560
137 4,890,561

CLASS 110
236 4,890,562
246 4,890,563

CLASS 114
39.1 4,890,570
67 A 4,890,564
72 4,890,565
218 4,890,566
222 4,890,567
246 4,890,568
349 4,890,569

CLASS 116
22 A 4,890,571
298 4,890,572

CLASS 118
667 4,890,573
719 4,890,574
723 4,890,575

CLASS 119
1 4,890,576
52.1 4,890,577
72.5 4,890,578
103 4,890,579
156 4,890,580

CLASS 122
1 A 4,890,581

CLASS 123
26 4,890,582
41.7 4,890,583
4,890,584
48 A 4,890,585
52 M 4,890,586
73 A 4,890,587
78 E 4,890,588
197 R 4,890,589
198 D 4,890,590
213 4,890,591
417 4,890,592
489 4,890,593
531 4,890,594
556 4,890,595

CLASS 126
110 D 4,890,598
424 4,890,599
512 4,890,600
4,890,601

CLASS 128
4 4,890,602
24 A 4,890,603
74 4,890,604
75 4,890,605
4,890,606
80 C 4,890,607
156 4,890,608
206.29 4,890,609
419 PG 4,890,617
419 R 4,890,616
420.6 4,890,618
633 4,890,619
635 4,890,620
4,890,621
640 4,890,622
642 4,890,623
661.07 4,890,624
680 4,890,625
752 4,890,626
765 4,890,627
849 4,890,628
897 4,890,629
901 4,890,630

CLASS 131
237 4,890,632

CLASS 134
20 4,891,073
76 4,890,633

CLASS 135
99 4,890,634

CLASS 136
249 4,891,074
257 4,891,075

CLASS 137
75 4,890,635
115 4,890,636
246 4,890,637
382 4,890,638
510 4,890,639
512.4 4,890,640
514 4,890,641
590 4,890,646
594 4,890,648
614.03 4,890,642
614.11 4,890,643
625.41 4,890,644
625.66 4,890,645
4,890,647

CLASS 139
116 A 4,890,649
4,890,650

CLASS 141
1 4,890,651
10 4,890,652
82 4,890,653

CLASS 144
1 D 4,890,654
82 4,890,655
350 4,890,656
363 4,890,657

CLASS 148
3 4,891,076
9 R 4,891,077
301 4,891,078
307 4,891,079
326 4,891,080

CLASS 152
209 D 4,890,658
531 4,890,659
545 4,890,660

CLASS 156
78 4,891,081
123 4,891,082
148 4,891,083
196 4,891,084
216 4,891,085
296 4,891,086
345 4,891,087
350 4,891,088
522 4,891,089
577 4,891,090
606 4,891,091
610 4,891,092
613 4,891,093
626 4,891,094
643 4,891,095

CLASS 157
1.3 4,890,661

CLASS 162
1 4,891,096
31 4,891,097
198 4,891,098
261 4,891,099
343 4,891,100

CLASS 164
46 4,890,662
98 4,890,663
182 4,890,664
453 4,890,665

CLASS 165
1 4,890,667
16 4,890,666
76 4,890,670
104.25 4,890,668
133 4,890,669

CLASS 166
250 4,890,671
4,890,672
266 4,890,673
319 4,890,674
376 4,890,675
380 4,890,676

CLASS 169
75 4,890,677

CLASS 172
54.5 4,890,678
371 4,890,679

CLASS 173

42 4,890,680
163 4,890,681

CLASS 174

35 M S 4,891,468
52.3 4,891,469
65 SS 4,891,470
68.3 4,891,471
68.5 4,891,472
150 4,891,473

CLASS 175

61 4,890,682

CLASS 178

18 4,891,474

CLASS 180

79.1 4,890,683
135 4,890,684
233 4,890,685
4,890,686

CLASS 181

106 4,890,687
136 4,890,688
144 4,890,689
240 4,890,690
264 4,890,691

CLASS 182

141 4,890,692
151 4,890,693
187 4,890,694

CLASS 184

6.3 4,890,695
7.4 4,890,696

CLASS 188

1.11 4,890,697
4,890,698
18 A 4,890,699
73.2 4,890,700
218 XL 4,890,701
264 D 4,890,702
300 4,890,703

CLASS 190

11 4,890,704
18 A 4,890,705

CLASS 192

3.28 4,890,706
3.3 4,890,707
70.17 4,890,709
4,890,710
70.3 4,890,708
98 4,890,711
106.2 4,890,712
142 R 4,890,713

CLASS 193

35 R 4,890,714

CLASS 198

340 4,890,715
346.1 4,890,716
403 4,890,717
465.3 4,890,718
507 4,890,719
592 4,890,720
626 4,890,721
706 4,890,722
716 4,890,723
732 4,890,724
774 4,890,725
803.12 4,890,726

CLASS 200

5 R 4,891,475
11 R 4,891,476
61.64 4,891,477
61.66 4,891,478
81 R 4,891,479
262 4,891,480
409 4,891,481

CLASS 203

36 4,891,101

CLASS 204

1 T 4,891,102
4,891,103
4,891,104
28 4,891,105
30 4,891,106
157.71 4,891,108
181.1 4,891,110
181.7 4,891,111
192.15 4,891,113
4,891,114
192.3 4,891,112
212 4,891,115
224 R 4,890,727
241 4,891,116
253 4,891,117
296 4,891,107
298 4,891,118
299 R 4,891,119
4,891,120
406 4,891,121
4,891,122
427 4,891,123
435 4,891,124
4,891,125

CLASS 206

0.81 4,890,728
5.1 4,890,729
303 4,890,730
315.9 4,890,731
362.1 4,890,732
365 4,890,733
366 4,890,734
387 4,890,735
390 4,890,736
427 4,890,737
434 4,890,738
459 4,890,739
509 4,890,740
534 4,890,741
540 4,890,742
595 4,890,743
632 4,890,744

CLASS 208

39 4,891,126
111 4,891,127
161 4,891,129
305 4,891,130
390 4,891,131
428 4,891,132

CLASS 210

121 4,891,128
198.2 4,891,133
359 4,891,134
500.38 4,891,135
605 4,891,136
644 4,891,137
675 4,891,138
747 4,891,139
748 4,891,140
750 4,891,141
792 4,891,142

CLASS 211

13 4,890,745
59.2 4,890,746
106 4,890,747
133 4,890,748
189 4,890,749

CLASS 212

153 4,890,750
271 4,890,751

CLASS 213

1 C 4,890,752
231 4,890,753
252 4,890,754

CLASS 219

10.55 A 4,891,483
10.55 E 4,891,482
10.61 R 4,891,484
69.15 4,891,485
69.16 4,891,486
69.17 4,891,487
121.4 4,891,488
121.48 4,891,489
121.52 4,891,490
121.64 4,891,491
125.1 4,891,492
137 R 4,891,493
137.8 4,891,494
216 4,891,495
233 4,891,496
241 4,891,497
401 4,891,498
502 4,891,499
505 4,891,500
527 4,891,501

CLASS 220

5 A 4,890,755
66 4,890,756
72 4,890,757
270 4,890,758
273 4,890,759
404 4,890,760
4,890,761
444 4,890,762
455 4,890,763
460 4,890,764

CLASS 221

25 4,890,765
198 4,890,766

CLASS 222

78 4,890,767
109 4,890,768
4,890,770
137 4,890,771
153 4,890,769
156 4,890,772
380 4,890,773
640 4,890,774

CLASS 223

32 4,890,775
99 4,890,776

CLASS 224

326 4,890,777

CLASS 227

10 4,890,778
139 4,890,779

CLASS 228

4.5 4,890,780
7 4,890,781
112 4,890,782
122 4,890,783
194 4,890,784
232 4,890,785

CLASS 229

5.7 4,890,786
23 BT 4,890,787
71 4,890,788
102 4,890,789

CLASS 235

379 4,891,502
380 4,891,503
462 4,891,504
491 4,891,505
492 4,891,506

CLASS 236

34.5 4,890,790

CLASS 239

44 4,890,791
343 4,290,792
427 4,890,793
533.12 4,890,794

CLASS 241

3 4,890,795
30 4,890,796
34 4,890,797
266 4,890,798

CLASS 242

35.5 A 4,890,799
47.01 4,890,800
56 B 4,890,801

CLASS 244

115 4,890,802
219 4,890,803

CLASS 246

453 4,890,804

CLASS 248

74.2 4,890,805
125 4,890,806
146 4,890,807
263 4,890,808
317 4,890,809
588 4,890,810
642 4,890,811
674 4,890,812
680 4,890,813

CLASS 250

213 VT 4,891,507
221 4,891,508
226 4,891,509
4,891,510
227 4,891,511
4,891,512
239 4,891,513
255 4,891,514
288 4,891,515
310 4,891,516
318 4,891,517
339 4,891,518
349 4,891,519
367 4,891,520
370.09 4,891,521
370.10 4,891,522
396 R 4,891,523
398 4,891,524
423 R 4,891,525
442.1 4,891,526
483.1 4,891,527
548 4,891,528
560 4,891,529
572 4,891,530

CLASS 251

95 4,890,814
129.15 4,890,815
174 4,890,816
312 4,890,817

CLASS 252

8.515 4,891,177
8.75 4,891,143
47 4,891,144
52 A 4,891,145
55 4,891,146
56 S 4,891,161
99 4,891,148
104 4,891,147
110 4,891,149
142 4,891,150
299.01 4,891,152
299.61 4,891,151
301.22 4,891,153
321 4,891,154
354 4,891,155
364 4,891,156
373 4,891,157
518 4,891,158
545 4,891,159
4,891,160
570 4,891,162
627 4,891,163
629 4,891,164
633 4,891,165

CLASS 254

93 R 4,890,818

CLASS 260

397.2 4,891,168
404.5 4,891,166

CLASS 261

30 4,891,169
116 4,891,170
124 4,891,171

CLASS 264

4.33 4,891,172
22 4,891,173
44 4,891,174
154 4,891,175
250 4,891,176
521 4,891,178
565 4,891,179

CLASS 266

78 4,890,819
107 4,890,820
267 4,890,821

CLASS 267

64.24 4,890,822
64.27 4,890,823

CLASS 271

3.1 4,890,824
188 4,890,825
296 4,890,826

CLASS 272

4 4,890,827
31 R 4,890,828
75 4,890,829
117 4,890,830
123 4,890,831

CLASS 273

1 E 4,890,832
4,890,833
26 R 4,890,834
63 A 4,890,836
63 E 4,890,835
73 J 4,890,848
81.4 4,890,837
138 R 4,890,838
157 R 4,890,839
167 H 4,890,840
188 R 4,890,841
246 4,890,842
4,890,843
249 4,890,844
271 4,890,845
324 4,890,846
406 4,890,847

CLASS 277

27 4,890,849
80 4,890,850
89 4,890,851

CLASS 280

87.021 4,890,853
402 4,890,852
504 4,890,854
615 4,890,855
646 4,890,856
663 4,890,857
707 4,890,858
714 4,890,859
741 4,890,860
810 4,890,861

CLASS 282

11.5 A Re.33,139

CLASS 283

56 4,890,872
62 4,890,862

CLASS 285

39 4,890,863
121 4,890,864
133.1 4,890,865
243 4,890,866
256 4,890,867

CLASS 292

67 4,890,868
113 4,890,869
333 4,890,870
337 4,890,871

CLASS 294

152 4,890,673

CLASS 296

39.2 4,890,874
97.2 4,890,875
136 4,890,876
146 4,890,877
153 4,890,878
180.2 4,890,879
214 4,890,880

CLASS 297

26 4,890,881
45 4,890,882
227 4,890,883
232 4,890,884
284 4,890,885
313 4,890,886
320 4,890,887
443 4,890,888

CLASS 301

132 4,890,889

CLASS 303

9.63 4,890,890
115 4,890,891

CLASS 305

25 4,890,892

CLASS 307

278 4,891,531
300 4,891,532
303 4,891,533
355 4,891,534
475 4,891,535
521 4,891,536

CLASS 310

68 B 4,891,537
162 4,891,538
239 4,891,539
254 4,891,540

CLASS 313

25 4,891,541
112 4,891,542
315 4,891,543
402 4,891,544
407 4,891,545
4,891,546
4,891,547
408 4,891,548
414 4,891,549
487 4,891,550
492 4,891,551
495 4,891,552
623 4,891,553
634 4,891,554
4,891,555

CLASS 315

3.5 4,891,556
39.51 4,891,557
62 4,891,558
82 4,891,559
111.41 4,891,560
223 4,891,561
277 4,891,562
309 4,891,563
382 4,891,564
408 4,891,565

CLASS 318

78 4,891,566
254 4,891,567
560 4,891,568

CLASS 323

210 4,891,569
4,891,570
284 4,891,572
322 4,891,571

CLASS 324

58 R 4,891,573
61 P 4,891,574
71.4 4,891,575
72 4,891,576
73 R 4,891,577
4,891,578
96 4,891,579
4,891,580
158 P 4,891,581
4,891,583
4,891,585
158 R 4,891,586
4,891,582
4,891,584
166 4,891,588
207 4,891,589
4,891,590
234 4,891,591
244 4,891,587
301 4,891,592
307 4,891,593
309 4,891,594
4,891,595
318 4,891,596
557 4,891,597

CLASS 328

61 4,891,598
109 4,891,599
233 4,891,600
4,891,601

CLASS 330

110 4,891,603
252 4,891,604
279 4,891,605
288 4,891,606
296 4,891,607

CLASS 331

20 4,891,608
57 4,891,609
96 4,891,610
158 4,891,611

CLASS 333

33 4,891,612
108 4,891,613
122 4,891,614
206 4,891,615
236 4,891,616

CLASS 335

46 4,891,617
195 4,891,618
296 4,891,619

CLASS 336

198 4,891,620

CLASS 337

49 4,891,621

CLASS 338

22 R 4,891,622
163 4,891,623

CLASS 340

436 4,891,624
479 4,891,625
547 4,891,626
562 4,891,627
582 4,891,628
632 4,891,629
706 4,891,630
709 4,891,631
710 4,891,632
717 4,891,633
723 4,891,634
783 4,891,635
825.310 4,891,636
825.44 4,891,637
825.440 4,891,638
825.500 4,891,639
853 4,891,640
857 4,891,641
968 4,891,642

CLASS 341

107 4,891,643
128 4,891,644
154 4,891,645

CLASS 342

15 4,891,646
16 4,891,647
20 4,891,648
203 4,891,649
457 4,891,650

CLASS 343

853 4,891,651

CLASS 346

76 PH 4,891,652
108 4,891,653
140 R 4,891,654
151 4,891,655
155 4,891,656
160.1 4,891,657

CLASS 350

96.15 4,890,893
96.20 4,890,894
4,890,895
96.21 4,890,896
4,890,897
96.23 4,890,898
168 4,890,901
173 4,890,899
263 4,890,900
347 V 4,890,902
419 4,890,903
427 4,890,904
482 4,890,905
486 4,890,906
605 4,890,907
606 4,890,908
616 4,890,909

CLASS 351

47 4,890,910
98 4,891,841
160 H 4,890,911
161 4,890,912
4,890,913

CLASS 364

219 4,891,658
317 4,891,659
412 4,891,660

CLASS 365

27 4,891,661
29 4,891,662
53 4,891,663
67 4,891,664
75 4,891,665
133 4,891,666
230 4,891,667
233 4,891,668
235 4,891,669
243 4,891,670
245 4,891,671
4,891,672
4,891,673
4,891,674
246 4,891,675
271 4,891,676
280 4,891,677
285 4,891,678
298 4,891,679
309 4,891,680
322 4,891,681

CLASS 366

35.5 4,890,914
73 4,890,915
135 4,890,916
138 4,890,917
150 4,890,918
312 4,890,919
336 4,890,920
349 4,890,921
350 4,890,922
4,890,923
369 4,890,926
429 4,890,924
432 4,890,925

CLASS 367

23.6 4,891,747
30 4,891,682
38 4,891,683
51 4,891,684
56 4,891,685
68 4,891,686
70 4,891,687
82 4,891,688

CLASS 368

30 4,891,689
75 4,891,690
4,891,691
4,891,692
4,891,693
86 4,891,694
98 4,891,695
4,891,696
4,891,697
135 4,891,698
136 4,891,699
139 4,891,700
140 4,891,701
4,891,702
142 4,891,703
143 4,891,704
148 4,891,705
184 4,891,706
190 4,891,707
195.1 4,891,708
256 4,891,709
335 4,891,712
443 4,891,710
445 4,891,713
448 4,891,711
456 4,891,714
4,891,799
275 4,891,800

CLASS 370

32.1 4,891,801
60 4,891,802
4,891,803
61 4,891,804
95.1 4,891,805
110.1 4,891,806
112 4,891,807
4,891,808

CLASS 371

3 4,891,809
5.5 4,891,812
9.1 4,891,810
21.2 4,891,811
37.1 4,891,813

CLASS 372

35 4,891,814
44 4,891,815
50 4,891,816
54 4,891,817
57 4,891,818
82 4,891,819
93 4,891,820

CLASS 373

16 4,891,821
146 4,891,822

CLASS 374

109 4,890,932
121 4,890,933

CLASS 375

25 4,891,823
104 4,891,824

CLASS 376

144 4,891,180
300 4,891,181

CLASS 377

52 4,891,825
58 4,891,826
111 4,891,827
114 4,891,828

CLASS 378

4 4,891,829
35 4,891,830
125 4,891,831
132 4,891,832
145 4,891,833

CLASS 379

67 4,891,834
88 4,891,835
100 4,891,836
390 4,891,837

CLASS 380

25 4,891,838

CLASS 381

22 4,891,839
29 4,891,840
45 4,891,602
188 4,891,842
191 4,891,843

CLASS 382

6 4,891,844
21 4,891,750

CLASS 383

10 4,890,934
59 4,890,935
109 4,890,936

CLASS 384

16 4,890,937
21 4,890,938
322 4,890,939
446 4,890,940
480 4,890,941
549 4,890,942
572 4,890,943

CLASS 401

98 4,890,944

CLASS 403

2 4,890,945
13 4,890,946
16 4,890,947
23 4,890,948
77 4,890,949
96 4,890,950
4,890,951
172 4,890,952
178 4,890,953
260 4,890,954

CLASS 406

37 4,890,955
55 4,890,956
174 4,890,957
180 4,890,958
204 4,890,959
4,890,960

CLASS 407

105 4,890,961

CLASS 408

14 4,890,962
59 4,890,963

CLASS 411

270 4,890,964
280 4,890,965
340 4,890,966
372 4,890,967
531 4,890,968

CLASS 414

277 4,890,969
462 4,890,970
546 4,890,971
563 4,890,972
607 4,890,973
723 4,890,974
788.9 4,890,975

CLASS 415

4.4 4,890,976
164 4,890,977
209.4 4,890,978

CLASS 416

46 4,890,979
181 4,890,980
220 R 4,890,981
241 A 4,890,982

CLASS 417

41 4,890,983
234 4,890,984
295 4,890,985
4,890,986
310 4,890,987
372 4,890,988

CLASS 418

153 4,890,989
173 4,890,990
201 4,890,992
201 B 4,890,991

CLASS 419

2 4,891,182

CLASS 420

435 4,891,183
553 4,891,184

CLASS 422

69 4,891,185
83 4,891,186
114 4,891,188
165 4,891,189
251 4,891,190
254 4,891,191

CLASS 423

6 4,891,192
54 4,891,193
240 4,891,194
243 4,891,195
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269 4,891,196
279 4,891,197
308 4,891,198
328 4,891,199
4,891,200
348 4,891,201
352 4,891,202
449 4,891,203
495 4,891,204
531 4,891,206
576.6 4,891,205
617 4,891,207

CLASS 424

1.1 4,891,208
48 4,891,209
50 4,891,210
52 4,891,211
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61 4,891,213
70 4,891,214
76.5 4,891,215
78 4,891,216
84 4,891,217
4,891,218
85.8 4,891,219
88 4,891,220
101 4,891,221
196.1 4,891,222
408 4,891,223
422 4,891,224
428 4,891,225
434 4,891,226
443 4,891,227
4,891,228
456 4,891,229
461 4,891,230

CLASS 425

63 4,890,993
131.1 4,890,994
144 4,890,995
145 4,890,996
174 4,890,997
193 4,890,998
439 4,890,999
522 4,891,000
549 4,891,001
556 4,891,002

CLASS 426

52 4,891,231
78 4,891,232
94 4,891,233
115 4,891,234
281 4,891,235
330.4 4,891,236
513 4,891,237
559 4,891,238

CLASS 427

4 4,891,239
11 4,891,240
44 4,891,241
53.1 4,891,242
117 4,891,243
195 4,891,244
213.3 4,891,245
229 4,891,246
255.3 4,891,247
340 4,891,248
421 4,891,249

CLASS 428

1 4,891,250
7 4,891,251
31 4,891,252
35.2 4,891,253
36.1 4,891,256
78 4,891,254
131 4,891,255
137 4,891,454
138 4,891,258
209 4,891,259
220 4,891,260
4,891,261
224 4,891,262
225 4,891,263
246 4,891,264
280 4,891,265
331 4,891,266
367 4,891,267
421 4,891,268
423 4,891,269
423.1 4,891,271
489 4,891,272
592 4,891,257
623 4,891,273
650 4,891,275
653 4,891,274
670 4,891,276
681 4,891,278
691 4,891,277

CLASS 429

40 4,891,279
41 4,891,280
53 4,891,270
105 4,891,281
194 4,891,282
4,891,283
226 4,891,284

CLASS 430

14 4,891,285
38 4,891,286
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66 4,891,291
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109 4,891,293
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142 4,891,296
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495 4,891,305
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4,891,308
627 4,891,309

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599 4,891,021
610 4,891,022
637 4,891,023

CLASS 440

28 4,891,024
66 4,891,025
75 4,891,026

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70 4,891,027

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484 4,891,032

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206		4,891,347	212		4,891,371	141		4,891,397	315		4,891,420
309		4,891,348	213		4,891,372	188		4,891,398	370		4,891,421
329		4,891,349	222.8		4,891,374	745		4,891,400	422		4,891,422
439		4,891,350	228.2		4,891,373	807		4,891,401			4,891,423
	CLASS 503		252		4,891,375	863		4,891,402		CLASS 534	
227		4,891,351	272		4,891,376		CLASS 525		649		4,891,424
		4,891,352	282		4,891,377	26		4,891,403		CLASS 536	
		4,891,353	304		4,891,378	54.2		4,891,404	22		4,891,425
		4,891,354	315		4,891,379	64		4,891,405		CLASS 540	
	CLASS 505		353		4,891,380			4,891,406	4		4,891,426
1		4,891,355	429		4,891,382	104		4,891,407	216		4,891,427
	CLASS 514		443		4,891,383	113		4,891,408		CLASS 546	
2		4,891,356	456		4,891,384	237		4,891,409	278		4,891,428
12		4,891,357	490		4,891,385	314		4,891,410	329		4,891,429
13		4,891,358	555		4,891,386		CLASS 526			CLASS 548	
21		4,891,359		CLASS 521		119		4,891,411	259		4,891,430
34		4,891,360	54		4,891,387	265		4,891,412	335		4,891,431
58		4,891,361	64		4,891,388	269		4,891,413	341		4,891,432
90		4,891,362			4,891,389			4,891,414		CLASS 549	
94		4,891,363		CLASS 523			CLASS 527		12		4,891,433
119		4,891,381	109		4,891,390	400		4,891,415	215		4,891,434
167		4,891,364	122		4,891,391		CLASS 528		313		4,891,435
173		4,891,363	200		4,891,392	28		Re.33,141	335		4,891,436
176		4,891,366			4,891,399	85		4,891,416			
178		4,891,367	212		4,891,393						
			442		4,891,394						

529		4,891,437		CLASS 570							
	CLASS 552		206		4,891,455						
11		4,891,438		CLASS 585							
	CLASS 556		240		4,891,459						
54		4,891,439	275		4,891,456						
	CLASS 560		312		4,891,457						
52		4,891,167	323		4,891,458						
222		4,891,440	360		4,891,460						
339		4,891,441	376		4,891,461						
	CLASS 562		411		4,891,462						
450		4,891,442	415		4,891,463						
	CLASS 564		440		4,891,464						
103		4,891,443	463		4,891,465						
	CLASS 568		464		4,891,466						
44		4,891,444	467		4,891,467						
72		4,891,445		CLASS 600							
485		4,891,446	339		4,890,614						
496		4,891,447		CLASS 604							
628		4,891,448	18		4,891,042						
645		4,891,449	20		4,891,043						
649		4,891,450	27		4,891,044						
691		4,891,451		CLASS 606							
730		4,891,452	51		4,890,610						
805		4,891,453	59		4,890,631						
			146		4,890,615						
			159		4,890,611						
			213		4,890,612						
			220		4,890,613						

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		305,276		50	305,293	D11—	26	305,310		35	305,327		86	305,344
		305,277		57	305,294		48	305,311		37	305,328		143	305,345
	320	305,278		70	305,295	D12—	9	305,312	D14—	107	305,329		162	305,346
		305,279		97	305,296		96	305,313		114	305,330		194	305,347
D3—	35	305,280		300	305,297		129	305,314			305,331			305,348
	39	305,281		323	305,298			305,316		146	305,332		228	305,349
D6—	302	305,282		373	305,299			305,317		214	305,333	D22—	118	305,350
	333	305,283	D9—		305,301		131	305,318		230	305,334		134	305,351
	366	305,284		377	305,300		157	305,315	D15—	14	305,336			305,352
	380	305,285		415	305,302		162	305,319		28	305,337	D23—	202	305,353
	470	305,286		416	305,303		181	305,320		199	305,338		222	305,354
	472	305,287		418	305,304		185	305,321	D16—	102	305,339		247	305,355
	598	305,288		438	305,305		202	305,322		129	305,340		250	305,356
D7—	150	305,289	D10—	70	305,306		203	305,323	D19—	41	305,341		311	305,357
	367	305,290			305,307		310	305,324	D20—	11	305,335		356	305,358
	402	305,291		104	305,308		331	305,325	D21—	2	305,342			

D24--	3	305,359						
	8	305,360						
	10	305,361						
	16	305,362						
	52	305,363						
D25—	103	305,364						
	114	305,365						
	119	305,366						
		305,367						
	124	305,368						
D28—	7	305,369						
	61	305,370						
D32—	1	305,371						
	21	305,372						
	22	305,373						
D34—	38	305,374						

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PATENTS

01 :	4,890,557	4,890,745	4,891,660	4,891,254	4,890,651	4,891,466
	4,890,593	4,890,765	4,891,683	4,891,375	4,890,713	4,891,467
	4,890,699	4,890,767	4,891,688	4,891,474	4,890,732	4,891,476
	4,890,729	4,890,773	4,891,716	4,891,518	4,890,809	4,891,481
	4,890,747	4,890,774	4,891,719	4,891,684	4,891,210	4,891,498
	4,890,757	4,890,784	4,891,720	4,891,750	4,891,337	4,891,528
	4,890,852	4,890,812	4,891,722	4,891,754	4,891,459	4,891,532
	4,890,928	4,890,834	4,891,734	4,891,823	4,891,676	4,891,544
	4,890,946	4,890,836	4,891,736	4,891,835	15 : 4,890,769	4,891,545
	4,891,782	4,890,838	4,891,737	10 4,890,520	16 : 4,890,559	4,891,546
	4,891,790	4,890,878	4,891,738	4,891,042	4,891,794	4,891,548
02 :	4,890,532	4,890,901	4,891,752	4,891,196	17 : 4,890,348	4,891,812
	4,890,570	4,890,922	4,891,774	4,891,246	4,890,377	4,891,833
04 :	4,890,346	4,890,937	4,891,778	4,891,248	4,890,368	18 : 4,890,410
	4,890,361	4,890,960	4,891,781	11 : 4,891,521	4,890,377	4,890,414
	4,890,879	4,890,967	4,891,788	12 : 4,890,337	4,890,549	4,890,456
	4,890,984	4,890,983	4,891,815	4,890,350	4,890,571	4,890,492
	4,891,094	4,891,015	4,891,818	4,890,353	4,890,600	4,890,497
	4,891,687	4,891,027	4,891,819	4,890,367	4,890,612	4,890,599
	4,891,811	4,891,036	4,891,820	4,890,411	4,890,622	4,890,778
05 :	4,890,876	4,891,037	4,891,821	4,890,493	4,890,664	4,890,926
06 :	4,890,340	4,891,049	4,891,838	4,890,499	4,890,695	4,891,004
	4,890,343	4,891,058	08 4,890,363	4,890,524	4,890,733	4,891,243
	4,890,345	4,891,078	4,890,763	4,890,525	4,890,758	4,891,313
	4,890,354	4,891,104	4,890,900	4,890,564	4,890,775	4,891,379
	4,890,383	4,891,106	4,890,970	4,890,580	4,890,786	4,891,397
	4,890,385	4,891,124	4,891,139	4,890,585	4,890,833	4,891,404
	4,890,388	4,891,131	4,891,508	4,890,621	4,890,847	4,891,449
	4,890,391	4,891,137	4,891,576	4,890,728	4,890,853	4,891,761
	4,890,417	4,891,146	4,891,607	4,890,835	4,890,862	19 : 4,890,447
	4,890,418	4,891,152	4,891,686	4,890,842	4,890,887	4,891,611
	4,890,436	4,891,201	4,891,724	4,890,873	4,890,892	4,891,706
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	
—If paid on or after Jan. 1, 1990	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 6, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,633,526 through 4,635,299
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 4, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,366,579 through 4,367,560
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 22, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,295,403	06/220,080	10/20/81
4,296,138	06/217,810	10/20/81
4,547,905	06/593,543	10/22/85
4,547,906	06/508,385	10/22/85
4,547,910	06/460,997	10/22/85
4,547,919	06/467,546	10/22/85
4,547,922	06/572,116	10/22/85
4,547,924	06/510,667	10/22/85
4,547,925	06/380,740	10/22/85
4,547,926	06/558,374	10/22/85
4,547,928	06/543,096	10/22/85
4,547,929	06/575,587	10/22/85
4,547,935	06/646,934	10/22/85
4,547,940	06/506,621	10/22/85
4,547,946	06/579,650	10/22/85
4,547,947	06/588,801	10/22/85
4,547,949	06/582,754	10/22/85
4,547,963	06/504,421	10/22/85
4,547,966	06/639,461	10/22/85
4,547,973	06/655,909	10/22/85
4,547,974	06/652,258	10/22/85
4,547,975	06/577,798	10/22/85
4,547,984	06/593,913	10/22/85
4,547,988	06/514,815	10/22/85
4,547,989	06/624,681	10/22/85
4,547,990	06/548,991	10/22/85
4,547,991	06/593,523	10/22/85
4,548,001	06/264,393	10/22/85
4,548,003	06/473,330	10/22/85
4,548,013	06/608,561	10/22/85
4,548,019	06/557,731	10/22/85
4,548,026	06/602,679	10/22/85
4,548,028	06/477,797	10/22/85
4,548,031	06/508,262	10/22/85
4,548,035	06/441,105	10/22/85
4,548,036	06/443,112	10/22/85
4,548,040	06/609,902	10/22/85
4,548,046	06/601,605	10/22/85
4,548,054	06/587,019	10/22/85
4,548,059	06/536,910	10/22/85
4,548,060	06/554,996	10/22/85
4,548,064	06/524,833	10/22/85
4,548,073	06/599,554	10/22/85
4,548,081	06/632,924	10/22/85
4,548,113	06/614,562	10/22/85
4,548,115	06/487,231	10/22/85
4,548,122	06/525,242	10/22/85
4,548,125	06/394,058	10/22/85
4,548,130	06/584,748	10/22/85
4,548,142	06/528,367	10/22/85
4,548,147	06/575,542	10/22/85
4,548,148	06/460,894	10/22/85
4,548,151	06/390,861	10/22/85
4,548,152	06/576,954	10/22/85
4,548,157	06/579,220	10/22/85
4,548,160	06/436,782	10/22/85
4,548,184	06/413,303	10/22/85
4,548,185	06/649,119	10/22/85
4,548,189	06/420,850	10/22/85
4,548,192	06/628,493	10/22/85
4,548,193	06/648,524	10/22/85
4,548,217	06/461,688	10/22/85
4,548,218	06/567,238	10/22/85
4,548,224	06/661,955	10/22/85
4,548,245	06/472,104	10/22/85
4,548,247	06/556,948	10/22/85
4,548,250	06/530,957	10/22/85
4,548,256	06/546,387	10/22/85
4,548,268	06/566,119	10/22/85
4,548,283	06/224,445	10/22/85
4,548,290	06/619,260	10/22/85
4,548,298	06/480,597	10/22/85
4,548,303	06/470,036	10/22/85
4,548,305	06/456,181	10/22/85
4,548,308	06/441,212	10/22/85
4,548,312	06/590,566	10/22/85
4,548,314	06/488,032	10/22/85
4,548,315	06/501,835	10/22/85
4,548,323	06/313,742	10/22/85
4,548,324	06/571,883	10/22/85
4,548,330	06/553,834	10/22/85
4,548,331	06/673,012	10/22/85
4,548,342	06/483,656	10/22/85
4,548,344	06/505,713	10/22/85
4,548,346	06/474,544	10/22/85
4,548,352	06/572,444	10/22/85
4,548,358	06/546,029	10/22/85
4,548,362	06/566,536	10/22/85

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Patent Number	Serial Number	Issue Date
4,548,364	06/538,368	10/22/85
4,548,371	06/387,487	10/22/85
4,548,374	06/290,837	10/22/85
4,548,381	06/647,432	10/22/85
4,548,387	06/604,843	10/22/85
4,548,391	06/501,053	10/22/85
4,548,397	06/559,901	10/22/85
4,548,399	06/531,594	10/22/85
4,548,409	06/459,811	10/22/85
4,548,411	06/613,584	10/22/85
4,548,412	06/547,078	10/22/85
4,548,413	06/577,157	10/22/85
4,548,420	06/558,290	10/22/85
4,548,423	06/573,223	10/22/85
4,548,434	06/416,881	10/22/85
4,548,436	06/641,068	10/22/85
4,548,465	06/540,759	10/22/85
4,548,466	06/536,997	10/22/85
4,548,468	06/611,316	10/22/85
4,548,484	06/486,951	10/22/85
4,548,487	06/495,602	10/22/85
4,548,493	06/598,815	10/22/85
4,548,494	06/338,980	10/22/85
4,548,495	06/351,603	10/22/85
4,548,496	06/499,593	10/22/85
4,548,504	06/401,418	10/22/85
4,548,517	06/571,525	10/22/85
4,548,519	06/504,721	10/22/85
4,548,523	06/587,184	10/22/85
4,548,527	06/622,844	10/22/85
4,548,533	06/602,356	10/22/85
4,548,538	06/445,043	10/22/85
4,548,540	06/652,280	10/22/85
4,548,541	06/517,290	10/22/85
4,548,545	06/481,806	10/22/85
4,548,551	06/607,157	10/22/85
4,548,552	06/581,500	10/22/85
4,548,604	06/437,039	10/22/85
4,548,609	06/570,208	10/22/85
4,548,639	06/425,801	10/22/85
4,548,640	06/544,321	10/22/85
4,548,658	06/696,438	10/22/85
4,548,663	06/587,472	10/22/85
4,548,665	06/587,895	10/22/85
4,548,680	06/351,488	10/22/85
4,548,693	06/617,860	10/22/85
4,548,694	06/657,915	10/22/85
4,548,696	06/671,780	10/22/85
4,548,698	06/575,873	10/22/85
4,548,709	06/628,117	10/22/85
4,548,718	06/535,569	10/22/85
4,548,730	06/510,612	10/22/85
4,548,753	06/572,242	10/22/85
4,548,754	06/525,844	10/22/85
4,548,763	06/557,782	10/22/85
4,548,770	06/552,939	10/22/85
4,548,793	06/458,148	10/22/85
4,548,794	06/516,236	10/22/85
4,548,796	06/512,447	10/22/85
4,548,802	06/638,255	10/22/85
4,548,803	06/638,283	10/22/85
4,548,805	06/566,032	10/22/85
4,548,808	06/621,378	10/22/85
4,548,809	06/594,486	10/22/85
4,548,812	06/603,059	10/22/85
4,548,815	06/538,767	10/22/85
4,548,818	06/323,955	10/22/85
4,548,821	06/702,361	10/22/85
4,548,832	06/476,483	10/22/85
4,548,849	06/505,906	10/22/85
4,548,850	06/694,925	10/22/85
4,548,854	06/709,934	10/22/85
4,548,860	06/379,297	10/22/85
4,548,863	06/676,096	10/22/85
4,548,867	06/521,833	10/22/85
4,548,882	06/582,954	10/22/85
4,548,902	06/499,991	10/22/85
4,548,907	06/531,957	10/22/85
4,548,913	06/560,356	10/22/85
4,548,914	06/709,821	10/22/85
4,548,931	06/538,856	10/22/85
4,548,934	06/518,901	10/22/85
4,548,936	06/375,106	10/22/85
4,548,960	06/554,778	10/22/85
4,548,961	06/698,054	10/22/85
4,548,967	06/621,299	10/22/85
4,548,984	06/687,217	10/22/85
4,548,988	06/528,168	10/22/85
4,548,989	06/403,626	10/22/85
4,549,007	06/672,211	10/22/85
4,549,012	06/639,901	10/22/85
4,549,014	06/647,787	10/22/85
4,549,018	06/522,472	10/22/85
4,549,020	06/508,437	10/22/85
4,549,027	06/479,060	10/22/85
4,549,031	06/669,496	10/22/85
4,549,036	06/633,487	10/22/85
4,549,050	06/622,540	10/22/85
4,549,069	06/610,197	10/22/85
4,549,082	06/486,526	10/22/85
4,549,086	06/410,111	10/22/85
4,549,089	06/581,916	10/22/85
4,549,090	06/604,222	10/22/85
4,549,093	06/536,530	10/22/85
4,549,096	06/533,615	10/22/85
4,549,114	06/575,007	10/22/85
4,549,115	06/480,354	10/22/85
4,549,116	06/277,598	10/22/85
4,549,117	06/578,208	10/22/85
4,549,121	06/645,223	10/22/85
4,549,133	06/500,400	10/22/85
4,549,138	06/536,452	10/22/85
4,549,149	06/483,408	10/22/85
4,549,159	06/607,802	10/22/85
4,549,160	06/517,725	10/22/85
4,549,162	06/567,347	10/22/85
4,549,168	06/539,485	10/22/85
4,549,170	06/493,380	10/22/85
4,549,179	06/472,389	10/22/85
4,549,181	06/428,225	10/22/85
4,549,193	06/304,998	10/22/85
4,549,207	06/597,863	10/22/85
4,549,241	06/579,626	10/22/85
4,549,261	06/460,996	10/22/85
4,549,262	06/505,754	10/22/85
4,549,268	06/520,700	10/22/85
4,549,288	06/450,837	10/22/85
4,549,294	06/588,486	10/22/85
4,549,313	06/463,657	10/22/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,787,919, Re. S. N. 442,572, Filed Nov. 29, 1989, Cl. 55/16, MEMBRANE SEPARATION SYSTEM AND PROCESS, Michael J. Campbell, et al., Owner of Record: *Union Carbide, Danbury, Conn.*, Attorney or Agent: Lawrence G. Kastriner, et al., Ex. Gp.:135

401,925, Re. S. N. 4,777,984, Filed Sept. 1, 1989, Cl. 138/98, METHOD FOR LINING A PIPE OR MAIN, Brian W. Strorah, Owner of Record: *British Gas Plc., London, England*, Attorney or Agent: None, Ex. Gp.: 242

4,692,600, Re. S. N. 404,906, Filed Sept. 8, 1989, Cl. 235/379, SYSTEM AND METHOD FOR AUTOMATIC TRANSACTION, Kenichi Takahashi, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Thomas E. Beall, et al., Ex. Gp.: 235

4,642,682, Re. S. N. 442,145, Filed Nov. 28, 1989, Cl. 358/80, PHASE RESPONSIVE COMPOSITE VIDEO SIGNAL CONTROL SYSTEM, Michael L. Orsburn, et al., Owner of Record: *Utah Scientific Advanced Development Center, Salt Lake City, Utah*, Attorney or Agent: Anthony B. Askew, et al., Ex. Gp.: 262

4,846,122, Re. S. N. 442,729, Filed Nov. 29, 1989, Cl. 123/179F PNEUMATIC STARTER FOR INTERNAL COMBUSTION ENGINE, John J. Kristof, et al., Owner of Record: *Sycon Corp., Marion, Ohio*, Attorney or Agent: Robert J. Fay, et al., Ex. Gp.: 342

4,836,020, Re. S. N. 441,159, Filed Nov. 22, 1989, Cl. 73/187, MARINE INSTRUMENT, Stephen G. Boucher, Owner of Record: *Airmar Technology Corp., Milford, N. H.*, Attorney or Agent: David E. Brook, et al., Ex. Gp.: 268

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,389,074, Reexam. No. 90/001,900, Requested Dec. 6, 1989, Cl. 299/079, MINE TOOLS UTILIZING COPPER MAGANESE NICKEL BRAZING ALLOY, Mark S. Greenfield, Owner of Record: *GTE Products Corp., Danvers, Mass.*, Attorney or Agent: Unknown, Ex. Gp.: 320, Requester: Kennametal. Inc., Latrobe, Pa.

4,518,654, Reexam. No. 90/001,898, Requested Nov. 27, 1989, Cl. 428/331, ONE-SIDED CLING STRETCH WRAP, George N. Eichbauer, et al., Owner of Record: *Mobil Corp., Fairfax, Va.*, Attorney or Agent: James P. O'Sullivan, Ex. Gp.: 150, Requester: Owner

4,677,345, Reexam. No. 90/001,899, Requested Dec. 4, 1989, Cl. 315/209, INVERTER CIRCUITS, Ole K. Nilssen, Owner of Record: *Inventor, Barrington, Ill.*, Attorney or Agent: None, Ex. Gp.: 315/209, Requester: Motorola Lighting Inc., Buffalo Grove, Ill.

4,768,783, Reexam. No. 90/001,896, Requested Nov. 17, 1989, Cl. 272/122, APPARATUS FOR THE REHABILITATION OF DAMAGED LIMBS, John Engalitcheff, Jr., Owner of Record: *Baltimore Therapeutic Equipment Co., Hanover, Md.*, Attorney or Agent: James J. Brown, Ex. Gp.: 330, Requester: Owner

4,828,787, Reexam. No. 90/001,897, Requested Nov. 20, 1989, Cl. 376/245, APPARATUS FOR SIMULATION OF THE OPERATION OF A PRESSURIZED WATER NUCLEAR REACTOR, Klaus Distler, et al., Owner of Record: *Rheinisch-Westfalisches Elektrizitatswerk Essen, Fed. Rep. of Germany*, Attorney or Agent: Karl F. Ross, Ex. Gp.: 220, Requester: The Babcock & Wilcox Co., New Orleans, La.

Patents Available for Licence or Sale

4,367,652, Bernard L. Kleinke, 101 West Broadway, Suite 1580 San Diego, Calif. 92101

4,413,419, Bernard L. Kleinke, Laff, Whitesel, Conte & Saret, 101 West Broadway, Suite 1580, San Diego, Calif. 92101

4,482,939, Directionally Variable Lighting Assembly, Andrew Tishman, 170 East Street, New York, N. Y. 10128 #8B

4,702,704, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, 301 N. Washington, Falls Church, Va. 22046

4,852,930, Lois Agee, 2922 Gulf of Mexico Drive, Longboat Key, Fla. 34228

December 15, 1989

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to Director, Office of Enrollment and Discipline on or before February 9, 1990:

Boucher, Oliver V. A., 4840 Rue Jeanne Mance, Montreal, Que., H2V 4J7, Canada
Bryant, Kyle S., 5441 Fenmore Rd., Indianapolis, Ind. 46208
Downard, Rita E., 1937 McKelvey Hill Dr., St. Louis, Mo. 64043
Hayes, Lorenzo B., 4729 Queens Chapel Terrace, N. E., Washington, D. C. 20017
Hennon, Paul J., 130 Pleasant St., Vienna, Va. 22180
Huff, Richard L., 19304 Olney Mill Rd., Olney, Md. 20832
Hughes, Neil H., 6267 Atherly Crescent, Mississauga, Ont., L5N 2J1, Canada
Kellogg, Arthur D., 12419 Kembridge Dr., Bowie, Md. 20715
Knight, Anthony, 5718 Gladden Court, Franconia, Va. 22303
Mills, Catherine L., 8904 Clewiston Pl., Gaithersburg, Md. 20879
Pieprz, William, 1435 Crestridge Dr., Silver Spring, Md. 20910
Salindong, Theodore C., 8380 Greensboro Dr., #416, McLean, Va. 22102
Tarcza, John E., 2008 Lanadowne Way, Silver Spring, Md. 20910
Testardi, David A., 7230 Pimmit Court, Falls Court, Va. 22043
White, Robert F., 303 Princeton Blvd., Alexandria, Va. 22314
Williamson, Mark A., 1323 S. Pollard St., Arlington, Va. 22202

December 12, 1989

CAMERON WEIFFENBACH
Director of Enrollment and Discipline

REMOVAL FROM REGISTER

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on November 7, 1989, to Mr. Edmund F. Bard III, at 6565 West Loop South, Suite 710, Houston, Tex. 77401, the last post office address furnished by him to the Office of Enrollment and Discipline. The letter was returned marked: "Forwarding Time Expired".

Accordingly, his name is being removed from the Register of Attorneys and Agents.

December 12, 1989

CAMERON WEIFFENBACH
Director
Office of Enrollment and Discipline

NOTICE OF PURLIC REPRIMAND

Gerald P. Dundas of Grosse Pointe Shores, Michigan, whose registration number is 22,161, has been reprimanded for professional misconduct. This action is taken under provisions of 35 U.S.C. 32, and 37 CFR 10.130 and 10.133(g).

October 24, 1989

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline
December 12, 1989

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NOTICE OF PUBLIC REPRIMAND

David F. Gould of Bangor, Maine, whose registration number is 21,029, has been publically reprimanded. This action is taken under the provisions of 35 U.S.C. 32, and 37 CFR 10.130 and 10.133(g).

October 24, 1989 DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline
December 12, 1989

APPEALS TO THE FEDERAL CIRCUIT

Patent applicants should designate as appellants all named inventors in any notice of appeal to the U. S. Court of Appeals for the Federal Circuit when appealing a decision of the Board of Patent Appeals and Interferences.

In a recent unpublished opinion in *In re Deckert*, Appeal No. 89-1386 (Fed. Cir. Nov. 29, 1989), the Federal Circuit notes:

Deckert's co-inventors Couble and Bonnetti are not parties to this appeal because they were not specifically named in the notice of appeal. Fed. R. App. P. 15(a). *See Torres* v. *Oakland Scavenger Co.*, 108 S. Ct. 2405, 2409 (1988) (construing similiar requirement of Fed. R. App. P. 3(c)).

December 14, 1989 FRED E. McKELVEY
Solicitor

Number of Demands for International Preliminary Examination filed by U. S. Applicants with the European Patent Office as an International Preliminary Examining Authority (IPEA/EP) as of November 30, 1989

Pursuant to the Memorandum of Understanding between the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO) concerning monitoring the number of Demands submitted to the IEPA/EP by U. S. applicants published in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987, the number of Demands filed in the IPEA/EP by U. S. applicants who filed their international applications with the USPTO in its capacity as a Receiving Office as of November 30, 1989 was 330.

The Memorandum of Understanding between the EPO and the USPTO limits the number of Demands filed by U. S. applicants to 500 for the period of July 1, 1989 to June 30, 1990. The 500 limit is expected to be reached by the end of February 1990. Any Demands filed with the IPEA/EP after the limit of 500 has been reached will be forwarded to the USPTO for processing. Accordingly, applicants should file their Demands directly with the USPTO after the 500 limit has been reached.

The agreement calls for 500 Demands for International Preliminary Examination to be accepted by the IPEA/EP where the International Search Report has been prepared by the EPO between July 1, 1989 and June 30, 1990. The current agreement ends on June 30, 1990.

December 7, 1989 JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Questions and Answers

I. New Trademark Application Filing Requirements

The Trademark Law Revision Act of 1988, which was implemented on Nov. 16, 1989, contains the most significant amendments to the Lanham Act since its enactment in 1947. The Patent and Trademark Office has significantly revised the Trademark Rules of Practice to reflect the changes in the law. Additionally, the PTO has issued a supplement to Revision 7 of the *Trademark Manual of Examining Procedure* that reflects the changes in the law, rules, and Office policy and is available from the Government Printing Office.

The PTO's Office of the Assistant Commissioner for Trademarks has prepared a series of "Questions and Answers" about Office practice under the new law and rules. This first in the series concerns the requirements for the initial filing of an application. Subsequent "Questions and Answers" will address various examination issues, the statement of use, requests for extension of time to file the statement of use, the amendment to allege use and notice of allowance.

Q. What is an intent-to-use application?

A. The Trademark Law Revision Act of 1988 became effective on Nov. 16, 1989. It amended the Trademark Act to add a new basis for filing an application for Federal trademark registration on the Principal Register. A party with a bona fide intention to use a specific mark in commerce in relation to specific goods or services may now file an application. However, before the mark will be registered, the applicant must use the mark in commerce in connection with the specified goods or services and submit specimens evidencing use and a verified allegation concerning that use.

First, an intent-to-use application will be examined in relation to all substantive and procedural requirements, except use-related issues, and, if acceptable, published for opposition. If there is no opposition, or any opposition is resolved in the applicant's favor, the applicant will receive a notice of allowance.

The applicant must submit a statement of use within six months of that date, or request a six-month extension of time. The applicant may then request up to four additional six-month extensions of time in which to file the statement of use. The grant of such extensions is predicated, in part, upon the applicant's showing of "good cause" as to why the mark has not yet been used. Thus, an applicant may have up to 36 months from the mailing of the notice of allowance within which to file a statement of use. (See Trademark Rules 2.88 and 2.89 concerning the requirements for a statement of use and extension requests.) Upon filing, the statement of use will be examined and, if accepted, the mark will register.

Q. How does an intent-to-use application differ from an application based upon use in commerce?

A. The primary difference between the two types of applications is the basis for filing. Because of that difference, the filing requirements and processing of the two types of applications differ.

A party may not file an application based upon use of a mark in commerce until after that use has occured. Instead of asserting a bona fide intent to use the mark in commerce, the use-based application must include allegations concerning dates of use and specimens evidencing use as a filing requirement. The use-based application will be examined and, if acceptable, published for opposition. If the mark is not opposed, or any opposition is resolved in the applicant's favor, the mark will register. This procedure differs from the application procedure for an intent-to-use application, as noted above.

However, in all other respects the legal reasons for refusing registration (such as descriptiveness, likelihood of confusion, etc.) and the procedural requirements (such as specificity of identifications of goods, signature by applicant, etc.) are exactly the same for the two types of applications. Additionally, upon registration, the filing date of any application on the Principal Register is a constructive date of first use of the mark.

Q. What are the requirements for filing an intent-to-use application?

A. A complete intent-to-use application consists of a written application, a drawing of the mark, and the required filing fee for each class of goods. The requirements for a written intent-to-use application are set forth in Trademark Rule 2.33. The application must be made to the Commissioner of Patents and Trademarks, must include a request for registration, and must be signed and verified (sworn to) by the applicant.

The application must specify: the name and address of the applicant; information about the applicant's legal entity; a claim that the applicant has a bona fide intention to use the mark in commerce; the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark; the class of goods or services according to the official classification, if known to the applicant; and the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

The applicant must sign a verfication of the application which includes, in part, averments that the applicant is believed to be entitled to use the mark sought to be registered; that to the best of the declarant's knowledge and belief no other entity has the right to use the mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; and that the facts set forth in the application are true.

Please note that Rule 2.33 differs form section 1(b) of the Act because the rule requires the above verification to include a statement that "the applicant is the owner of the mark" rather than that "the applicant believes it is entitled to use the mark." This specific requirement of the rule should be disregarded to the extent that it differs from the statute. The rule will be amended in due course.

Q. What are the minimum requirements for receipt of a filing date for an intent-to-use application?

A. Trademark Rule 2.21 sets forth the minimum requirements for receipt of a filing date for intent-to-use applications, as well as other types of applications. These minimum formal requirements do not include all of the requirements which may ultimately be necessary to obtain registration, but merely those which must be satisified to receive a filing date.

An intent-to-use application must include the following elements in order to receive a filing date: the name of the applicant, the name and address to which communications can be directed, a drawing of the mark substantially meeting all of the requirements of Trademark Rule 2.52, an identification of goods or services, *a claim of a bona fide intention to use the mark in commerce*, a verification or declaration under Trademark Rule 2.33(b) *signed by the applicant*, and the required filing fee for at least one class of goods or services. If an application lacks any one of these elements, it will be denied a filing date and all papers will be returned to the applicant as informal.

Q. Is there any change in the requirements for applications based upon either use in commerce or Section 44 of the Trademark Act?

A. Yes. Effective Nov. 16, 1989, an application *must* be signed in order to receive a filing date. Trademark Rule 2.21 has been amended to require that an application include a verification or declaration in accordance with Trademark Rule 2.33(b), signed by the applicant, to receive a filing date. This requirement applies to *all* applications filed after Nov. 16, 1989, regardless of the basis for filing. Unsigned applications will be returned to the applicant as informal. A verified assertion, signed by the applicant, of the basis for filing, is believed to be essential because of the importance of the filing date as a constructive date of first use of the mark for registration of the Principal Register.

All other filing requirements for use-based applications remain unchanged.

Concerning Section 44 which permits, under certain circumstances, the filing of an application in the United States based upon an application or registration in another country, there are two additional changes. Effective Nov. 16, 1989, an application filed under Section 44(d) or Section 44(e) of the Trademark Act must include an allegation that the applicant has a bona fide intention to use the mark in commerce. However, Section 44 applicants will still be exempt from any use requirement as a condition to registration. In other words, Section 44 applicants are not required to file specimens evidencing use of the mark or an allegation of use in order to obtain registration.

As a requirement for obtaining a filing date, an application filed pursuant to Section 44(d) must include in the heading of the drawing the date of the foreign filing which forms the basis of its priority claim.

Q. Who can sign an application?

A. There are two issues that may arise with respect to the signature on an application: (1) whether the signature is sufficient for receipt of a filing date, and (2) whether the signature is that of the applicant.

The following persons can properly sign an application for an applicant: an individual applicant, a general partner of a partnership, or an officer of a corporation or association.

If an application is signed by an improper party, but the improper party had "color of authority" to act for applican., the Office will require re-execution of the application, but will not invalidate the filing date. (See Trademark Rule 2.71(c) concerning "color of authority.") The Examining Attorney will determine whether the signatory had color of authority to sign the application for the applicant. A person has such color of authority if he or she has firsthand knowledge of the relevant facts *and* implied or actual authority to act on behalf of the applicant. A general manager may qualify under this standard. *The applicant's attorney will not ordinarily be regarded as possessing color of authority to sign on behalf of a client.* Attorneys, who are not employees of a corporate applicant, do not usually have firsthand knowledge of a client's business or the authority to act on behalf of a client, other than as legal representative.

If the signature is acceptable for the purpose of receiving a filing date (i.e., if the signatory had color of authority), but is not the signature of the applicant, a substitute verification by the applicant of the facts in the application will be required. If the person who signed did not have even color of authority, the Examining Attorney will refuse registration because the applicant did not meet the minimum requirements of Rule 2.21 for receipt of a filing date. An application signed by a party without color of authority is *void ab initio* and cannot be corrected by submission of a substitute declaration.

Q. Are "fax" copies of signatures acceptable?

A. The Trademark Operation does not have the equipment to accept documents transmitted by "fax" for purposes of receiving a filing date. However, the signature on a properly filed application may be a photocopy or "fax" copy of the original signature. The subsequent submission of the original document will be required by the Examining Attorney.

Q. What is the significance of the filing date?

A. Section 7 of the Trademark Act has been amended to provide that the filing date of an application of the Principal Register is a constructive date of first use of the mark in commerce, provided the application matures into a registration. Thus, filing affords the applicant nationwide priority over others, with the exception of parties who had used the mark before the applicant's filing date, parties who had filed before the applicant, or parties who are entitled to an earlier priority filing date based upon the filing of a foreign application under Section 44(d) of the Trademark Act.

Q. Can an application be based upon both use and intent-to-use?

A. No. Section 1(a) of the Trademark provides for the filing of applications based upon actual use in commerce, while Section 1(b) provides for the filing of applications based upon intent-to-use. Trademark Rule 2.33(d) states that an applicant may not file under both Sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under Section 1(a) of the Act amend to seek registration under Section 1(b). Any application filed under both Sections 1(a) and 1(b) of the Trademark Act will be denied a filing date and returned to the applicant.

Q. Can an applicant assert both a Section 44 claim and an intent-to-use or use claim in the same application?

A. Yes. Section 44(d) provides for applications based upon an application for registration filed in an applicant's country of

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origin, and section 44(e) provides for applications based upon a registration in applicant's country of origin. An application may be based upon both a foreign application or registration under Section 44 and *either* use in commerce under Section 1(a) *or* intent-to-use under Section 1(b).

Q. Since a Section 44 application contains a statement of a bona fide intent to use the mark in commerce, isn't this also an intent-to-use application?

A. No. The statement of a bona fide intent to use a mark is one of the statutory requirements for a Section 44 filing and the PTO will not consider the mere inclusion of such a statement to constitute the assertion of a basis for filing under Section 1(b) of the Act. In other words, once the requirements for Section 44 are met and the application successfully completes the opposition period, the mark will register (rather than a notice of allowance issuing in the application).

A Section 44 applicant may *also* assert an intent-to-use basis by explicitly stating, after its statement of a bona fide intent to use the mark in commerce, that it is also asserting a Section 1(b) basis for filing.

Q. Can an intent-to-use application be filed on the Supplemental Register?

A. No. An intent-to-use application initially filed on the Supplemental Register will be denied a filing date and returned to the applicant. No amendment of an intent-to-use application to the Supplemental Register will be accepted until after use has commenced and after the filing and acceptance of an amendment to allege use or a statement of use. In such a case, the effective filing date of the application will be changed to the date on which the applicant filed the amendment to allege use under Section 1(c) of the Trademark Act or the statement of use under Section 1(d) of the Act.

Q. Must an intent-to-use applicant begin using the mark before a registration will issue?

A. Yes. An intent-to-use application may not mature into a registration until use of the mark has begun. After use begins, the applicant must verify such use in either (1) an amendment to allege use or (2) a statement of use. In addition, applicant must submit specimens evidencing use and a fee of $100 per class of goods or services in the application.

Q. What is the difference between an amendment to allege use and a statement of use?

A. The primary difference between the amendment to allege use and the statement of use is the time of filing. The amendment to allege use may be filed during initial examination of the application, i.e., after the filing date of the application and before the date on which the Examining Attorney approves the mark for publication. If the amendment to allege use is accepted, the application will then be processed for publication and issuance in the same manner as a use-based application.

If no amendment to allege use is filed before the Examining Attorney approves the mark for publication, the mark will be published for opposition. After the successful completion of the opposition period, the PTO will issue a notice of allowance. The applicant will then have six months from the date of the notice of allowance in which it must file a statement of use, or file a written request for an extension of time in which to file the statement of use. Successive extensions of time, aggregating no more than 36 months from the notice of allowance, may be obtained pursuant to Trademark Rule 2.89.

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Nov. 27, 1989

PATENT NOTICES

Certificates of Correction For Week of January 9, 1990

Re. 32,897	4,800,289	4,816,499	4,825,875
4,373,195	4,800,669	4,816,920	4,825,901
4,536,026	4,800,811	4,816,953	4,826,034
4,540,432	4,802,171	4,817,760	4,826,119
4,571,925	4,802,973	4,817,787	4,826,405
4,651,428	4,803,215	4,817,788	4,826,474
4,674,841	4,803,503	4,818,052	4,826,486
4,694,593	4,804,655	4,818,103	4,826,616
4,695,351	4,804,675	4,818,144	4,826,640
4,695,673	4,804,789	4,819,490	4,826,649
4,698,920	4,804,895	4,819,566	4,826,705
4,707,754	4,805,085	4,819,617	4,826,762
4,708,494	4,805,162	4,819,952	4,826,955
4,708,794	4,805,940	4,820,077	4,827,021
4,715,565	4,806,528	4,820,235	4,827,031
4,740,487	4,806,661	4,820,283	4,827,280
4,745,895	4,807,303	4,821,736	4,827,779
4,757,935	4,807,470	4,821,845	4,827,854
4,761,939	4,808,420	4,822,208	4,828,712
4,769,341	4,808,441	4,822,237	4,828,771
4,769,673	4,809,137	4,822,257	4,828,888
4,773,078	4,809,623	4,822,511	4,830,835
4,778,796	4,809,667	4,822,527	4,830,996
4,780,871	4,809,762	4,822,647	4,831,189
4,784,087	4,810,364	4,823,198	4,831,340
4,785,806	4,811,293	4,823,660	4,831,459
4,786,719	4,812,407	4,824,025	4,831,550
4,787,567	4,812,527	4,824,228	4,831,677
4,788,596	4,813,225	4,824,422	4,831,921
4,789,545	4,814,833	4,824,453	4,831,966
4,790,531	4,814,902	4,824,783	4,831,997
4,791,290	4,815,255	4,824,811	4,832,344
4,794,073	4,815,734	4,824,839	4,833,090
4,795,747	4,815,854	4,824,985	4,833,225
4,795,830	4,816,131	4,825,482	4,835,673
4,796,488	4,816,162	4,825,526	4,836,947
4,798,443	4,816,174	4,825,567	4,841,871
4,798,539	4,816,256	4,825,628	4,848,726
4,799,565	4,816,438	4,825,748	

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Box Pat. Ext.	Applications for patent term extension.
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PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

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	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
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North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2870
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF November 18, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	11-16-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	6-7-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	9-21-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during November 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,702,012 to 3,704,468 inclusive
Plant Patents ..... None

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REEXAMINATIONS

JANUARY 9, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,598,675 (1181st)
METHOD FOR SECURING STRIP MEMBERS TO CONTAINER BODIES
Karl Bofinger, Cincinnati, Ohio, and Walter T. Hake, Wyckoff, N.J., assignors to American National Can Company
Reexamination Request No. 90/001,543, Jun. 22, 1988.
Reexamination Certificate for Patent No. 3,598,675, issued Aug. 10, 1971, Ser. No. 595,809, Nov. 21, 1966.
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—172

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3**, **12** and **13** is confirmed.

Claims **1**, **2** and **4–11** are cancelled.

[**1**. The method of securing a strip member to a tubular body member, one of the members having an adhesive thereon so as to adhere to the other member upon contact therewith, comprising the steps of:

moving the body member along a first fixed path of revolution;

simultaneously rotating said member about its own axis as said member moves along said first path;

simultaneously moving the strip member along a second fixed path of revolution, tangential to said first path; and

contacting only a leading portion of the strip member to the rotating body member when said leading portion and the rotating body member are substantially tangential so that said leading portion adheres to the body member, said body member movement along said first path and rotation about its own axis subsequent to said contacting between said members causing the strip member to leave said second path and the remaining portion of the strip member to adhere around the tubular body member.]

3. The method of securing a strip member to a tubular body member according to claim **1** wherein the sum of the speed of revolution of the body member and the speed of rotation of said member about its own axis is substantially equal to the speed of revolution of the strip member.

B1 3,931,011 (1182nd)
FLUID SEPARATION APPARATUS
Mark S. Richards, and Shannon B. Copeland, both of Modesto, Calif., assignors to Parker-Hannifin Corporation
Reexamination Request No. 90/001,632, Nov. 4, 1988.
Reexamination Certificate for Patent No. 3,931,011, issued Jan. 6, 1976, Ser. No. 417,225, Nov. 19, 1973.
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—136

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. Apparatus for separating low density fluid from high density fluid and particles comprising:

a. a fluid impervious hollow elongated chamber closed at one end by cup means;

b. a fluid inlet passage extending into said chamber intermediate the ends thereof and having a tubular portion with a free end extending toward said cup means along the axis of elongation of said chamber;

c. a fluid impervious funnel member surrounding said tubular portion of said inlet passage in close spaced relation to the outer surface thereof, the apex of said funnel member extending toward said cup member and the outer periphery of said funnel member forming a fluid-tight annular joint with the inner wall of said chamber;

d. a deflector turbine means mounted at the free end of said tubular portion of said inlet passage to receive fluid from said inlet passage and urge said fluid to move in generally annular paths about the axis of elongation of said chamber, said deflector turbine means including a frusto-conical fluid impervious surface spaced from the free end of said tubular portion of said inlet passage having helical flutes therein and extending across said chamber with the apex thereof adjacent said free end of said tubular portion of said inlet passage and the periphery of the base thereof in close spaced relation to the inner surface of said chamber, said periphery of the base of said frusto-conical fluid impervious surface having a plurality of protuberances spaced from each other thereabout with each of said protuberances being located between a different pair of flutes on said frusto-conical surface and extending into contact with the inner surface of said chamber, and a frusto-conical member having an aperture at its apex communicating with said free end of said tubular portion of said inlet passage and having an inner frusto-conical surface mating with said fluted frusto-conical fluid impervious surface in close spaced relation thereto and an outer frusto-conical surface substantially parallel to said inner frusto-conical surface;

e. an outlet passage extending out of said chamber intermediate its ends and having a tubular portion extending away from said cup means along the axis of elongation of said chamber;

f. a tubular filter element more pervious to said low density fluid than said high density fluid surrounding said tubular portion of said outlet passage in spaced relation thereto, the outer surface of said tubular filter element being spaced from the inner surface of said chamber;

g. fluid impervious wall means extending outwardly from the outer surface of said tubular portion of said outlet passage and across the inner end of said tubular filter element, said wall means forming fluid-tight joints with said outer surface of said tubular portion of said outlet passage and with the inner end of said tubular filter element and having its outer periphery in close spaced relation to the inner surface of said chamber; and

h. fluid impervious cap means closing the other end of said chamber.

B1 4,120,845 (1183rd)
SULFIDE CONTAINING STABILIZERS
Thomas G. Kugele, Cincinnati, Ohio, assignor to Morton Thiokol Inc.
Reexamination Request No. 90/001,535, Jun. 21, 1988.
Reexamination Certificate for Patent No. 4,120,845, issued Oct. 17, 1978, Ser. No. 826,917, Aug. 22, 1977.
Divisio n of Ser. No. 492,969, Jul. 26, 1974, Pat. No. 4,062,881.
Int. Cl.[4] C08K *5/58*
U.S. Cl. 524—181

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 57 is confirmed.

1. A halogen containing vinyl of vinylidene polymer composition containing a monoorganotin or diorganotin mercaptoalkyl ester of a carboxylic acid or mercapto hydroxyalkyl ester of a carboxylic acid mono or polysulfide useful as a stabilizer for improving the resistance to deterioration of vinyl chloride polymers when heated at 350° F. containing at least one tin atom having one to two hydrocarbyl groups having from 1 to 20 carbon atoms and selected from the group consisting of alkyl, aryl, cycloalkyl, aralkyl and alkenyl and linked to the tin through carbon, at least one mercaptoalkyl ester of a carboxylic acid group linked to tin through the sulfur of the mercaptoalkyl group and at least one mono or polysulfide sulfur group bonded exclusively to tin, the organotin compound having an amount of tin within the range from 10 to 42% by weight and an amount of sulfur within the range from 8 to 42% by weight.

B1 4,391,705 (1184th)
BALLASTING DIGESTOR COVERS
Lynn W. Cook, Fruit Heights, and David P. Brown, Salt Lake City, both of Utah, assignors to Envirotech Corporation
Reexamination Request No. 90/001,650, Nov. 26, 1988.
Reexamination Certificate for Patent No. 4,391,705, issued Jul. 5, 1983, Ser. No. 268,214, May 29, 1981.
Int. Cl.[4] C02F *11/04*
U.S. Cl. 210—218

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-3 is confirmed.

1. An apparatus for digesting sludge comprising: a cylindrical tank, a cover adapted to move upwardly and downwardly within the tank, with the cover having an upright cylindrical sidewall the lower end thereof adapted to project into the sludge to form a gas-tight seal therewith and with gas being stored under the cover above the surface level of the sludge, a gas outlet at the upper end of the cover, valve means communicating with said outlet for regulating flow of gas from under the cover, a plurality of separate ballast members mounted to the interior of said sidewall near the lower end thereof, at least some of the ballast members each having a cavity formed in the upper end thereof that extends downwardly into the ballast member so that the cavity will fill with sludge upon flow of sludge into the tank and that is adapted to hold a predetermined substantial quantity of sludge therein, whereby when the volume of gas accumulated under the cover is sufficient to lift said ballast members partially from the sludge the predetermined total quantity of sludge within the ballast members effectively increases the total ballasting weight of the ballast members by a substantial predetermined amount over the ballasting weight of the members when they are not filled with sludge.

B1 4,438,217 (1185th)
CATALYST FOR OXIDATION OF PROPYLENE
Mashiro Takata; Ryuji Aoki, and Takahisa Sato, all of Himeji, Japan, assignors to Nippon Shokubai Kagak Kogyo Co., Ltd., Osaka, Japan
Reexamination Request No. 90/001,677, Dec. 22, 1988.
Reexamination Certificate for Patent No. 4,438,217, issued Mar. 20, 1984, Ser. No. 454,611, Dec. 30, 1982.
Claims priority, application Japan, Jan. 6, 1982, 57-406
Int. Cl.[4] B01J *21/08, 23/78, 23/84, 23/88*
U.S. Cl. 502—205

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-3 is confirmed.

New claims 4-7 are added and determined to be patentable.

1. A catalyst for the oxidation of propylene, said catalyst having the composition represented by the following formula

$$Mo_aW_bBi_cFe_dA_eB_fC_gD_hO_x$$

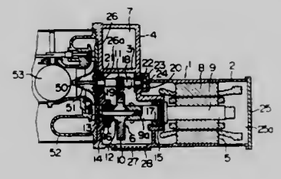
wherein
A represents at least one element selected from the group consisting of nickel and cobalt,
B represents at least one element selected from the group consisting of alkali metals, alkaline earth metals and thallium,
C represents at least one element selected from the group consisting of phosphorus, arsenic, boron and niobium,
D represents at least one element selected from the group consisting of silicon, aluminum and titanium,
a, b, c, d, e, f, g, h, and x respectively represent the atomic ratios of Mo, W, Bi, Fe, A, B, C, D, and O,
a is from 2 to 12
b is from 0 to 10,
the sum of a and b is 12,
c is from 0.1 to 10.0,
d is from 0.1 to 10.0,
e is from 2 to 20,
f is from 0.005 to 3.0,
g is from 0 to 4,
h is from 0.5 to 15 and
X is a number determined by the atomic valences of the individual elements,
and being molded in the shape of a hollow cylinder having an outside diameter of 3.0 to 10.0 mm, an inside diameter 0.1 to 0.7 times the outside diameter and a length 0.5 to 2.0 times the outside diameter.

REISSUES

JANUARY 9, 1990

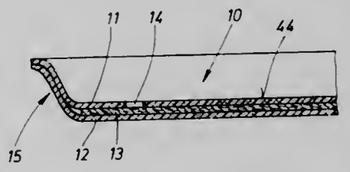
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,142
CENTRIFUGAL COMPRESSOR
Kazuo Sato, Kitaibaraki; Michiaki Ida; Masatosi Terasaki, both of Shimoinayoshi; Masaki Kurimoto, Kashiwa, and Shigeo Sugimoto, Ushikumachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Original No. 4,743,174, dated May 10, 1988, Ser. No. 907,132, Sep. 12, 1986. Continuation of Ser. No. 789,019, Oct. 18, 1985, abandoned. Application for reissue Mar. 31, 1989, Ser. No. 331,294
Claims priority, application Japan, Oct. 19, 1984, 59-218316
Int. Cl.[4] F04B *17/00, 35/00*
U.S. Cl. 417—365 **2 Claims**



1. A centrifugal compressor comprising:
a drive motor accommodated in a motor casing frame section and comprising a stator and a rotor;
a multiplying gear mechanism accommodated in a gear casing frame section and comprising a multiplying gear and a pinion meshing with said multiplying gear, said multiplying gear mechanism being connected at an input side thereof with said drive motor;
an impeller connected with said multiplying gear mechanism;
a rotor shaft for mounting said rotor in said motor casing frame section rotatably supported by a single bearing mounted on said gear casing frame section and extended into said gear casing frame section;
a gear shaft for mounting said multiplying gear rotatably supported at one end thereof by another single bearing mounted on said gear casing frame section opposite to said first mentioned bearing, said gear shaft and said rotor shaft being directly coupled with each other between said multiplying gear and said first-mentioned bearing to constitute a first shaft;
a second shaft for mounting said pinion rotatably supported at both ends thereof by bearings mounted on said gear casing frame section;
a side opening for said drive motor provided at said motor casing frame section;
a side plate for sealingly closing said opening;
a further side opening for said pinion provided on said gear casing frame section;
a further side plate for sealingly closing said further opening;
an access opening for said multiplying gear provided on said gear casing frame section; and
a closure plate for sealingly closing said access opening; and
wherein said motor casing frame section is integrally formed with said gear casing frame section.

Re. 33,143
TRAY FOR RECEIVING FOODSTUFFS AND A PROCESS AND APPARATUS FOR PRODUCING IT
Horst-Ditmar Gröne, Schwanewede, Fed. Rep. of Germany, assignor to Lin Tec Verpackungstechnik GmbH, Fed. Rep. of Germany
Original No. 4,702,377, dated Oct. 27, 1987, Ser. No. 799,707, Nov. 19, 1985. Application for reissue Mar. 31, 1989, Ser. No. 332,226
Int. Cl.[4] B65D *1/34, 6/04*
U.S. Cl. 206—557 **5 Claims**

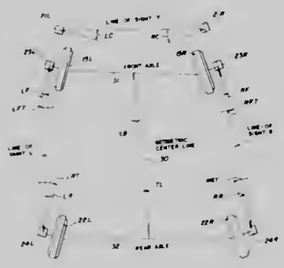


1. Tray for receiving liquid-secreting foodstuffs and delicacies, for example meat, fish or poultry, and having a basic tray body having a length and a width and consisting of liquid-tight plastic and an absorbent insert, characterised in that the basic body consists of two layers (11, 12) of liquid-tight plastic between which is [embedded] *disposed*, centrally relative to a longitudinal plane between the layers, a liquid-absorbent insert (13), in that the upper layer (11) pointing towards the foodstuff has orifices (14), in that the insert (13) is strip-shaped with a smaller width than said two layers and extends over only a limited region of the tray, so that outside the region of the insert (13) the two layers (11, 12) are in direct contact with one another, in that said basic body has a bottom wall (44), in that the insert extends over the entire length of the two layers (11, 12), and in that the width of the insert (13) corresponds approximately to the width dimension of the bottom wall (44).

Re. 33,144
VEHICLE WHEEL ALIGNMENT APPARATUS
Lee Hunter, Creve Coeur, and Daniel B. January, Bel-Ridge, both of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.
Original No. 43,021,047, dated Nov. 24, 1981, Ser. No. 81,102, Oct. 2, 1979. Application for reissue Nov. 22, 1982, Ser. No. 443,381
Int. Cl.[4] G01B *11/26, 5/24*
U.S. Cl. 356—152 **6 Claims**

1. In apparatus for determining the alignment positions of vehicle wheels in relation to a reference axis of the vehicle and to the thrust line of the non-steerable wheels, the improvement which comprises:
(a) first alignment determining instruments carried by each of a set of steerable wheels so as to be in a substantially vertical plane containing the axis of rotation of said steerable wheels;
(b) second alignment determining instruments carried by each of a set of non-steerable wheels so as to be in a substantially vertical plane containing the axis of rotation of said non-steerable wheels;
(c) third alignment determining instruments supported from said steerable wheels in position to be in line-of-sight with each other transversely of the vehicle;
(d) radiant energy beam projectors and beam sensors in each

of said first, second and third alignment determining instruments in positions such that the radiant energy beams from first instruments are in the line-of-sight to be sensed by said beam sensors in second instruments, radiant energy beams from second instruments are in the line-of-sight to be sensed by said beam sensors in first instruments, said first and second instruments are arranged in cooperating pairs along opposite longitudinal sides of the vehicle so as to be spaced in the longitudinal direction between said steerable and non-steerable wheels; and



(e) radiant energy beam projectors and beam sensors in said third alignment determining instruments in positions of cooperation transversely of the vehicle adjacent the steerable wheels, whereby said first and third instruments cooperate to generate signals determinative of the alignment positions of the steerable wheels relative to the vehicle reference axis and said second instruments cooperate with said first instruments to generate signals determinative of the thrust line effect of the non-steerable wheel on said steerable wheels.

Re. 33,145

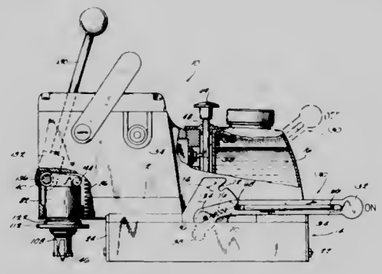
MAGNETIC BASE FOR PORTABLE TOOLS

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Original No. 4,639,170, dated Jan. 27, 1987, Ser. No. 720,899, Apr. 8, 1985. Application for reissue Oct. 19, 1988, Ser. No. 260,178

Int. Cl.[4] B23B *45/14*

U.S. Cl. 408—76 **8 Claims**



1. An electric power tool having a base,

permanent magnet means in said base for holding said base to a ferromagnetic material,

means operative to substantially shunt the magnetic field of said permanent magnet means to permit removal of the tool from the material,

a handle including lever means movable between "on" and "off" positions and connected to said shunt means to cause said shunt means to become operative when the lever means is moved to said "off" position,

a probe mounted in said base for reciprocation between a retracted position and a second position in which it projects from said base,

a spring biasing said probe to its said second position,

[and means interconnecting said probe and said shunt means to prevent movement of said probe from said second position when said shunt means as in said "off" position]

an electric motor mounted on said base,

a switch operable to "on" and "off" to control operation of said motor,

a switch actuator connected to said probe and to said switch,

means carried by said shunt means to prevent actuation of said actuator to operate said switch to "on" unless said probe is in its retracted position and said shunt means is in its "on" position.

PLANT PATENTS

GRANTED JANUARY 9, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,096

ROSE PLANT JACBRO

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 14, 1988, Ser. No. 284,296

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by the large apricot and yellow blend flower color, with good fragrance, good bloom production and a large vigorous plant growth.

7,097

IMPATIENS PLANT NAMED NEBULOUS

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 9, 1989, Ser. No. 308,818

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Nebulous, as illustrated and described.

7,098

IMPATIENS PLANT NAMED RADIANCE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Feb. 9, 1989, Ser. No. 303,817

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Radiance, as illustrated and described.

7,099

AFRICAN VIOLET PLANT NAMED LITTLE AQUAMARINE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,756

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Little Aquamarine, as described and illustrated, and particularly characterized by its miniature growth habit; single violet-shaped, white flowers with blue center; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,100

LILY PLANT NAMED AVIGNON

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J.A. Den Haan, Netherlands

Filed Oct. 24, 1988, Ser. No. 261,251

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of lily plant named Avignon, substantially as shown and described.

7,101

LILY PLANT NAMED GENEVE

Floris Vletter, Rijnsburg, Netherlands, assignor to Gebr. Vletter & J.A. den Haan, Netherlands

Filed Oct. 24, 1988, Ser. No. 261,253

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of lily plant named Geneve, substantially as shown and described.

7,102

AFRICAN VIOLET PLANT NAMED LITTLE TOURMALINE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,376

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Little Tourmaline, as described and illustrated, and particularly characterized by its miniature growth habit; semi-double, dark pink flowers with elongated petals; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, heart-to spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,103

AFRICAN VIOLET PLANT NAMED LITTLE VIOLET SAPPHIRE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,526

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Little Violet Sapphire, as described and illustrated, and particularly characterized by its miniature growth habit; large, purplish blue, star-shaped flowers with long petals; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; bright green, spear-shaped leaves; Flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,104

AFRICAN VIOLET PLANT NAMED IRENE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,630

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Irene, as described and illustrated, and particularly characterized by its wavy, semi-double, variegated blue and white flowers with frilled edges; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green, round, slightly serrated leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,105

MUSHROOM PLANT, *PLEUROTUS OSTREATUS* KUMMERI

David A. Kummer, 7967 Candlewood Dr., Boise, Id. 83709

Filed Sep. 26, 1988, Ser. No. 249,553

Int. Cl.[4] A01H *15/00*

U.S. Cl. Plt.—89 **1 Claim**

1. A novel mushroom, *Pleurotus ostreatus* kummeri, substantially as shown and described.

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PATENTS

GRANTED JAN. 9, 1990

ERRATA

For CLASS	See PATENT NO.
091-399	4,891,864
606-082	4,892,093
606-001	4,892,096
606-018	4,892,098
606-194	4,892,099
439-818	4,892,542
562-021	4,892,679
552-253	4,892,686
426-549	4,892,762
264-065	4,892,848
514-247	4,892,947
514-245	4,892,952
549-229	4,892,954
549-325	4,892,955
388-817	4,893,067
371-022	4,893,072
049-199	4,893,343

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PATENTS

GRANTED JANUARY 9, 1990

GENERAL AND MECHANICAL

4,891,845
BASEBALL GLOVES
Rufus Hayes, 18640 Griggs, Detroit, Mich. 48221
Filed Feb. 22, 1988, Ser. No. 158,647
Int. Cl.[4] A63B *71/14;* A41D *13/10*
U.S. Cl. 2—19 **9 Claims**



1. An apparatus for imparting hand, wrist and arm control to a baseball glove having a front or palm wall and a back wall connected thereto to define a thumb portion, a fingers portion, and a lower hand-insertion opening defined in part by a lowermost free edge of the front wall of the glove, comprising:

a substantially bendable support piece adapted to be integrally attached to the back wall of said baseball glove so as to extend a distance, above and below the lowermost free edge of the front wall of said baseball glove, which is sufficient to cover and support at least back portions of a user's hand, wrist and forearm;

a securing strap member extending from a lower portion of said support piece and adapted to encircle a portion of the user's forearm substantially below the user's wrist so as to secure said support piece in position adjacent at least back portions of the user's hand, wrist and forearm; and

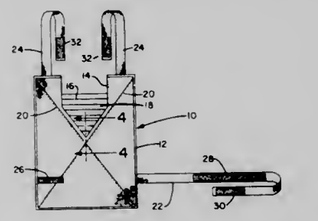
said support piece and said securing strap member operatively cooperating with each other and with said baseball glove to permit flexing of a user's hand and wrist beneath said support piece while said support piece is disposed sufficiently close to the back of the user's hand, wrist and forearm to support same and impart controlling movements from the user's hand, wrist and forearm to said baseball glove.

4,891,846
MEDICAL ABSORPTION GARMENT
Annette M. Sager, 17424 Fulton Rd., Marshallville, Ohio 44645, and Suzette M. Szittai, 185 Marion St., Doylestown, Ohio 44230
Filed Dec. 16, 1988, Ser. No. 285,764
Int. Cl.[4] A41D *1/04;* A41B *13/10*
U.S. Cl. 2—49 R **5 Claims**

1. A medical absorption garment comprising:

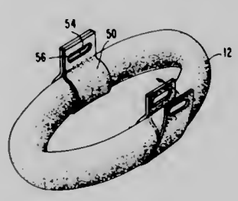
a bib member having upper and lower ends; a torso strap, and upper strapping, wherein said bib member is a laminate comprising at least one absorbent, fibrous inner layer disposed between two outer layers of fabric, said bib member being provided on its upper end with a neck yoke cut from the upper end of said bib member and extending downwardly therefrom, said neck yoke having an attenuated yoke panel adjacent the lower edge of said neck yoke, and said yoke panel comprising at least one absorbent fibrous inner layer disposed between two outer layers of fabric, and means for compressing the thickness of at least a portion of said yoke panel, and

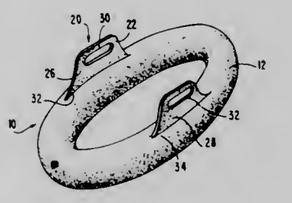
wherein said torso strap extends from one side of said bib, being adapted to encircle the torso of a wearer, and to be temporarily attached to the other side of said bib member, wherein further, said upper strapping extends from the



upper end of said bib member, one from each side of said neck yoke, being adapted to be temporarily attached to said torso strap at the rear of the wearer by a strap fastening means.

4,891,847
METHOD AND APPARATUS FOR REDUCING INCONTINENCE OR PAIN
Glenn R. Baker, and Janet B. G. French, both of 70 Glen Dr., Worthington, Ohio 43085
Continuation of Ser. No. 858,818, May 2, 1986, abandoned. This application Oct. 9, 1987, Ser. No. 106,895
Int. Cl.[4] A61F *5/34, 13/00;* A61G *9/00*
U.S. Cl. 4—239 **12 Claims**



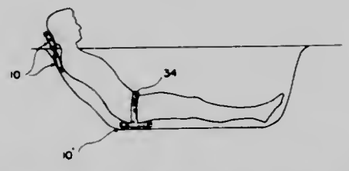


1. A method of using a generally annular cushion for reducing incontinence or pain while moving from a first standing position to a second seated position, said cushion being structurally adapted to be accommodated to the posterior portion of a human, defining an opening therein, and having handles positioned on opposite sides of the opening for removably securing said cushion to the posterior of said human during movement between said first position and said second position, comprising the steps of:

grasping said handles on said cushion by the hands of the human;

moving said cushion into contact with the posterior of said human while continuing to grasp said handles; and
moving between said first position and said second position while continuing to grasp said handles and maintain said cushion in contact with the posterior of said human;
thereby reducing a risk of incontinence and pain during such movement.

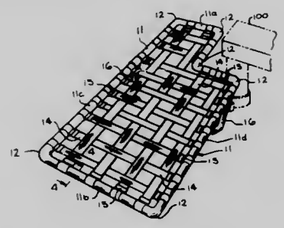
4,891,848
WATERPROOF PILLOW
Tommy L. Carter, 230 E. Alvin Dr. #116, Salinas, Calif. 93906
Filed Jan. 10, 1988, Ser. No. 204,851
Int. Cl.[4] A47K *3/12*
U.S. Cl. 4—571 **3 Claims**



1. A pillow assembly comprising an head-shoulder support member and a body support member separate and independent from said head-shoulder support member each comprising:
a first layer constructed of air entrained material;
a second layer constructed of a firm, pliable rubberized material;
said first and second layers being superimposed so that said first layer abuts said second layer defining a boundary substantially centered between said layers, said first and second layers having a plurality of air pockets disposed throughout;
said air pockets substantially equally deployed within said first and second layers;
a waterproof cover enclosing said first and second layers whereby said first and second layers define a floatable unit;
said head-shoulder support member having an uppermost portion sized and shaped to support a user's head and a lowermost portion of sufficient width and length to support a user's shoulders and back;
said uppermost and lowermost portions connected normally to each other to form an inverted T-shaped unit with the uppermost portion connected intermediate of the ends of the lowermost portion;
said independent head-shoulder and body support members each having means for adhering to an adjacent surface, whereby a user may recline thereon; and
hook and loop fastener means attached to said body support member whereby said body support member may be affixed to the body of a user.

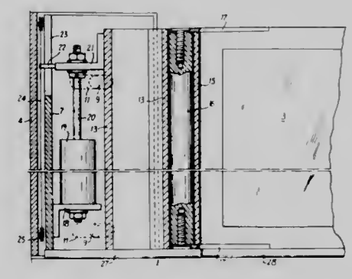
4,891,849
HYDROTHERAPY PATIENT SUPPORT APPARATUS
Harry W. Robinson, 8153 West Beard Rd., Perry, Mich. 48872
Continuation of Ser. No. 920,726, Oct. 20, 1986, abandoned, which is a division of Ser. No. 784,780, Oct. 7, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 91,298
Int. Cl.[4] A47K *3/022*
U.S. Cl. 4—575 **8 Claims**

1. A support apparatus for supporting a patient while immersed in a water filled bathtub for treatment of lower back pain which comprises:
(a) frame means with opposed top and bottom rails and opposed side rails positionable at an inclined angle in the bathtub wherein the rails define a single plane and wherein the frame means extends peripherally about the head, back and buttocks of the patient while leaving the legs of the patient unsupported and wherein a portion of the frame means adjacent the head is formed with a recess to allow positioning of a pump in the bathtub with nozzles directed at the back;
(b) flexible webbing stretched across and attached to said frame means for supporting the head, back and buttocks of the patient wherein the webbing is open so as to provide exposure of substantial portions of the back; and



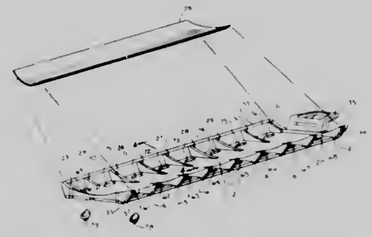
(c) a pair of leg supports mounted on the side rails of said frame means having a curved shape to fit a rounded bottom of the bathtub, wherein the leg supports hold the frame means at the inclined angle adjacent a bottom portion of the bathtub and wherein the bottom rail extends across the rounded bottom of the bathtub enabling circulation of water through the webbing onto the back of the patient and under the bottom rail of the frame means for recirculation.

4,891,850
ARTICULATED SHOWER-BATH SCREEN SHUTTERS FOR A BATH-TUB, A SHOWER RECEIVER AND LIKE TUB
Georges Borstcher, Résidence "Le Trianon", 52 rue des Eveuses, 78120 Rambouillet, France
Continuation of Ser. No. 910,525, Sep. 22, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 143,221
Claims priority, application France, Sep. 25, 1985, 85 14197
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—609 **7 Claims**



1. A pivotally mounted shower shield for a bath tub, shower receiver and like tub, comprising at least on shutter; articulating means for articulating said at least one shutter between two positions at right angle of said bath tub, shower receiver and like tub; guiding means provided on said articulated means for vertically guiding said at least one shutter between an up position and a down position; and shutter weight compensating means for counterbalancing said at least one shutter during movement and in any position between said up position and said down position, and wherein the guiding means comprises a guiding profile and a sliding profile with said guiding profile being disposed inside a support profile, and wherein a finger is fixed to said sliding profile and extends through a slot of the guiding profile, said finger being connected to at least one pull cord adapted to be fixed to studs provided on the support profile.

4,891,851
FLEXIBLE PATIENT TRANSFER CRADLE
Thomas J. Sierocuk, New Berlin, and Robert J. Dobberstein, West Allis, both of Wis., assignors to General Electric Company, Milwaukee, Wis.
Filed Dec. 12, 1983, Ser. No. 560,301
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R **6 Claims**

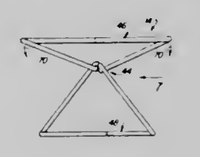


1. A flexible patient transfer cradle comprising:
an elongate, flexible mounting plate having a plurality of wheels mounted to the underside thereof, said mounting plate being sufficiently flexible to allow said wheels to maintain contact with a rolling surface having irregularities therein to reduce the transmission of undesired vibrations to the patient;
a plurality of support ribs disposed in two rows secured to the upper surface of said mounting plate, said support ribs in each row being positioned transversely and on either side of the longitudinal center line of said mounting plate along substantially the entire length thereof so as to substantially preserve the flexibility of said mounting plate; and
a pair of parallel elongate members substantially coextensive with and disposed laterally on either side of said mounting plate, said elongated members slidably engaging said support ribs to enable longitudinal movement thereof relative to said elongate members, thereby allowing in use said cradle to bend without resistance from the elongate members.

4,891,852
BASSINET ROCKER
Clisthenes F. Lopez, Jr., 22503 Meyler St., #27, Torrance, Calif. 90502
Filed Feb. 21, 1989, Ser. No. 312,453
Int. Cl.[4] A47D *9/04*
U.S. Cl. 5—105 **12 Claims**

1. An apparatus for holding and rocking a bassinet having a bed including a horizontally disposed bottom surface and legs supporting the bassinet bed, comprising:
a. four spaced apart vertical posts joined together by cross beams to form a vertically disposed structure;
b. four horizontal cross beams each joining a respective two vertical posts adjacent the tops of the posts to thereby form a horizontally disposed planar surface comprised of the four horizontal cross beams supported by the four vertical posts;
c. a pair of spaced apart generally parallel rocker members, each rocker member having an arcuate lower surface, and one rocker member attached adjacent the lowermost portion of two vertical posts and the other rocker member attached adjacent the lowermost portion of the remaining two vertical posts in a manner such that the lowermost arcuate portion of each rocker member lies in the same horizontal plane; and
d. the vertical distance from the lowermost point of the arcuate lower surface of a rocker member to the horizontal plane formed by the four horizontal cross beams is greater than the vertical height of the legs of the bassinet when the bassinet is placed upon the apparatus;
e. whereby the bassinet is placed upon said apparatus such that its horizontally disposed bottom surface rests on and is supported by the four horizontal cross beams such that the legs of the bassinet are raised above the ground to permit the rocker members to rock back and forth when a horizontal rocking force is imparted to the bassinet.

4,891,853
BOX SPRING ASSEMBLY
Upton R. Dabney, Georgetown, Ky., assignor to Hoover Group, Inc., Alpharetta, Ga.
Filed Oct. 28, 1988, Ser. No. 264,024
Int. Cl.[4] A47C *23/02*
U.S. Cl. 5—247 **6 Claims**

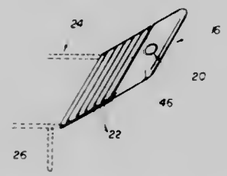




1. A spring for supporting a wire mattress support deck on a frame of a bedding unit;
said spring being formed of a single spring wire member which has a lower portion connectible to the said frame, an upper portion connectible to said wire deck and an intermediate portion connecting said lower portion to said upper portion, said intermediate portion being comprised of a pair of vertically collapsible column sections to support said upper portion resiliently on said lower portion;
said upper portion comprising a generally horizontal plat-

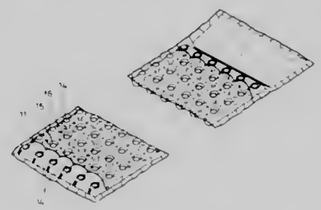
form member having upper transverse torsion bars at its ends;
said lower portion comprising a pair of substantially horizontally disposed mounting feet having lower transverse torsion bars located at the ends of said lower portion;
said column sections each including a middle transverse torsion bar spaced both vertically and horizontally from said upper and lower torsion bars in said upper and lower portions, and connecting bars extending from opposite ends of each of said column section middle torsion bars and being formed integral with said transverse torsion bars in said upper and lower portions;
said middle torsion bars in said column sections being substantially horizontally aligned and spaced apart in the unloaded position of said spring and being movable toward each other in response to vertically collapsible movement of said column sections; and
said column section middle torsion bars being movable into an engaged position during collapse of said column sections so as to thereby limit deflection of said platform toward said lower portion to a position in which said platform is spaced a predetermined distance above said engaged middle torsion bars.

4,891,854
FACE AND HEAD SUPPORT ASSEMBLY FOR USE WITH A LOUNGE CHAIR OR LIKE STRUCTURE
Neal B. Finkelstein, 8565 S.W. 137 Ave., Miami, Fla. 33183
Filed Apr. 10, 1989, Ser. No. 335,754
Int. Cl.[4] A47C *20/02, 17/66*
U.S. Cl. 5—435 **2 Claims**



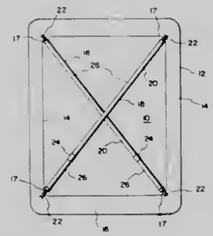
1. A support assembly designed to support a person's head in a reclining, face-down position and mounted on a lounge chair, said assembly comprising:
(a) a base comprising a front portion and a rear portion disposed in spaced relation to one another and defining a hollow interior, said front and rear portions connected by a closed end of said base and including an open end oppositely disposed to said closed end, said open end and hollow interior being dimensioned to slidingly surround an upper free end of a backrest portion of the lounge chair,
(b) an opening formed in said base and extending therethrough between opposite sides thereof and dimensioned and configured to allow passage of a major portion of the user's face therethrough,
(c) said opening including a peripheral portion disposed substantially continuously along the majority of the length of the peripheral edge thereof and extending outwardly from a surface of said base,
(d) said peripheral portion formed of a cushioning material and disposed in supporting, confronting engagement with the surface of the face and dimensioned to surround the mouth, nose and eyes thereof.

4,891,855
INFLATABLE SUNTANNER WITH SPEEDY AND HOMOGENEOUS SUNTAN EFFECT
Wang Cheng-Chang, Taipei, Taiwan, assignor to Team Worldwide Corporation, Taipei, Taiwan
Filed Nov. 14, 1988, Ser. No. 270,786
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—449 **5 Claims**



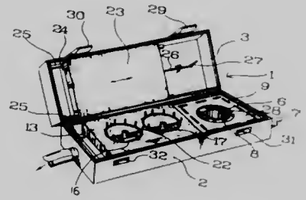
1. An inflatable suntanner comprising an upper transparent layer, a middle reflective layer and a bottom layer each of which is made of a flexible, gas impervious material, said middle layer being bonded to said upper layer at a plurality of upper joints to form an upper gas chamber between said upper layer and said middle layer, and bonded to said bottom layer at a plurality of lower joints to form a lower gas chamber between said middle layer and said bottom layer, characterized in that:
the size of each of said upper joints is different from that of each of said lower joints so as to corrugate those portions of said middle reflective layer interconnecting said upper and lower joints, whereby sunlight passing through said upper transparent layer and incident on said corrugated reflective layer can be irregularly reflected upon the side of the user not exposed to the sun rays so as to expedite a homogeneous suntan.

4,891,856
GRASPING SYSTEM FOR USE WITH A CONTOURED SHEET
Maria T. Thornhill, 15 Prospect Dr., Coral Gables, Fla. 33133
Filed Dec. 27, 1988, Ser. No. 290,609
Int. Cl.[4] A47G *9/04*
U.S. Cl. 5—496 **4 Claims**



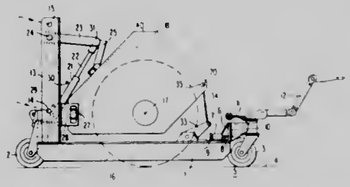
1. In combination a grasping system comprising a contoured sheet, a mattress and a grasping device for firmly holding said contoured sheet to said mattress, said mattress having a top and bottom portion, sides, end portions and opposed corner portions, said contoured sheet having a bottom portion that underlies the mattress bottom portion, said bottom portion including opposed corner adjacent said mattress corner positions, said grasping device firmly holding said contoured sheet against said top, sides and corner portions of said mattress, said grasping device comprising independent, crisscrossing, adjustable first and second straps in contact with said mattress bottom and having clips at each end thereof, and wherein clips of said first strap are secured to one pair of opposed contoured sheet corner portions and wherein clips of said second strap are secured to another pair of opposed contoured sheet corner portions whereby the contoured sheet is held tightly against the top and sides of said mattress.

4,891,857
DENTURE CLEANING DEVICE
Otto Pinsonneault, P.O. Box 1959, Vernon, Canada V1T 8Z7
Filed Jul. 8, 1988, Ser. No. 216,375
Claims priority, application Canada, Oct. 2, 1985, 492041
Int. Cl.[4] A46B *13/06*
U.S. Cl. 15—21 R **8 Claims**



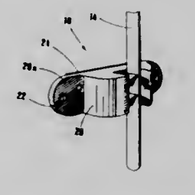
1. A denture cleaning apparatus comprising a housing having a water inlet and a water outlet, a turbine wheel adapted to be driven by water flowing through the housing, a pair of opposed brush members slidably mounted in the housing, means for receiving dentures between the brush members, and means driven by the turbine wheel for reciprocating the brush members so as to clean dentures located therebetween.

4,891,858
ROADWORKING APPARATUS
Johann Wachter, Mannsworth, Austria, assignor to Famag Fahrzeug- und Maschinenhandelsgesellschaft m.b.H. Nfg.KG., Vienna, Austria
Filed Mar. 22, 1988, Ser. No. 166,411
Claims priority, application Austria, Mar. 23, 1987, 686/87; Mar. 26, 1987, 744/87-1
Int. Cl.[4] F01H *5/09, 1/02*
U.S. Cl. 15—82 **50 Claims**



1. Apparatus for treating the surface of traffic areas with the aid of a motor-driven roll (16) rotatable about a substantially horizontally extending axis, the roll carrying working elements on its circumference, these elements acting on the surface to be treated, wherein the roll (16) is mounted in a support (18) having an end supported on the frame (1) of the apparatus, this frame being supported on the traffic area by wheels, said support being pivotable about an axis (20) parallel to the axis of rotation (17) of the roll (16), and the other end of said support coupled with at least one servo member (21) resting on the frame (1) of the apparatus, characterized in that the roll (16) is held in the desired vertical position, as regards the traffic area (5) to be treated, with respect to the frame (1) of the apparatus by means of said at least one servo member (21) which is a pressure medium motor that can be acted upon by a pressure medium at a preselectable, constant pressure; that the pressure medium motor serving as the servo member (21) can be supplied with the pressure medium by way of an accumulator for the pressure medium at a preselectable, constant pressure; that the end of the support (18) where the servo member (21) engages is guided to be displaceable upwardly and downwardly along the frame (1) of the apparatus; and that the roll (16) can be tilted about an axis (17) perpendicular to its axis and disposed essentially horizontally.

4,891,859
ENGINE OIL DIP STICK INDICATOR WIPER
Napoléon Tremblay, 7620 Marie-Victorin Blvd., Brossard, Canada J4W 1B2
Filed Dec. 14, 1988, Ser. No. 284,295
Int. Cl.[4] G01F *15/12*
U.S. Cl. 15—210 B **7 Claims**

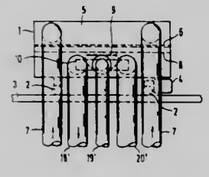


1. A wiper member for use in removing a liquid film deposited on a dip stick, comprising: a small, rigid, relatively thick frame adapted to be anchored by a support surface, a cavity being made thicknesswisely of said frame along a vertical axis to define a vertical channel, said cavity being bounded by two side walls and by an inner wall of the wiper member frame wherein said dip stick can be moved through said channel in a direction generally parallel to said inner wall, at least one pair of semi-flexible flaps, edgewisely mounted at their inner ends to said opposite side walls respectively, said flaps being freely maintained in a position orthogonal to said side walls and to said inner wall, pivot means about said inner ends of the flaps to enable said flaps to pivot about horizontal axes thereabout when a transverse biasing force is applied thereto, there being no free horizontal interface between said flaps in their freely maintained position; the free end sections of said flaps being adapted to wipe the surface of said dip stick during dip stick movement through said channel, in order to remove a liquid film deposited thereon.

4,891,860
DEVICE FOR DISTRIBUTING THE AIR BLAST IN A CLEANING DEVICE FOR TEXTILE MACHINES
Ulrich Steinike, Augsburg, Fed. Rep. of Germany, assignor to Ernst Jacobi & Co. KG., Augsburg, Fed. Rep. of Germany
Filed Nov. 8, 1988, Ser. No. 268,490
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738582
Int. Cl.[4] A47L *5/14*
U.S. Cl. 15—312 A **9 Claims**

1. A device, having a housing for distributing the air blast, in a cleaning device for textile machines having blow hoses fulfilling at least two different cleaning tasks, the blast air of a ventilator being conducted alternately into said blow hoses, said, ventilator having an impeller, a spiral ventilator housing surrounding the impeller, and at least one tuyere opening which opens into at least one air duct of the device housing; the

device housing having an air duct for each blow hose, the ventilator housing being pivoted about the impeller axis to



have its tuyere opening into each one of the air ducts alternately.

4,891,861
HAND VACUUM CLEANER

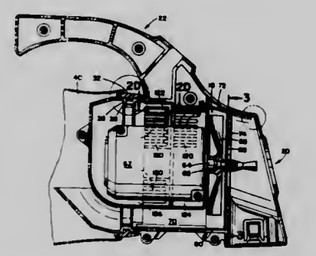
John F. Sovis, Coldwater, Mich.; Robert M. Smith, Copley, Ohio, and George H. Bramhall, Boulder, Colo., assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

Continuation of Ser. No. 877,881, Jun. 24, 1986, Pat. No. 4,730,362, which is a division of Ser. No. 670,553, Nov. 9, 1984, Pat. No. 4,633,543. This application Feb. 9, 1988, Ser. No. 153,971

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] **A47L** *5/24*

U.S. Cl. 15—344 **2 Claims**



1. A hand-held vacuum cleaner including a housing comprising mating first and second half housing elements, said housing having a handle and a nozzle, a motor having means for drawing cooling air through the motor, a selectively-separable bag assembly, a working air channel for communicating working air from said nozzle to said bag assembly, and a motor mount portion receiving said motor and spaced from said working air channel by a motor mount portion peripheral wall;

said motor mount portion including a peripheral motor cooling air intake chamber, a peripheral motor cooling air exhaust chamber and a peripheral baffle wall extending from a housing outer wall to contiguous engagement to said motor, said housing outer wall including a plurality of air inlet vents at said cooling air intake chamber for cooling air inflow to said motor from said intake chamber, and air outlet vents at said cooling air exhaust chamber, for cooling air exhaust from said motor through said exhaust chamber, said inlet and outlet vents being oppositely spaced about said baffle wall, said means for drawing cooling air through the motor causing the cooling air to enter said inlet vents and chamber and exit the outlet chamber and vents;

said sealing peripheral wall adjacent said working air channel sealing said intake and exhaust chambers from said channel to preclude cooling air in said cooling air intake and exhaust chambers from mixing with working air in said working air channel.

4,891,862
HINGE

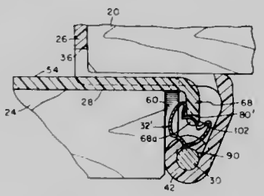
Leif A. Holan, P.O. Box 3527, Clear Lake Highlands, Calif. 95422

Continuation-in-part of Ser. No. 138,142, Dec. 28, 1987, Pat. No. 4,819,299. This application Jan. 30, 1989, Ser. No. 302,914

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] **F05F** *1/12*

U.S. Cl. 16—278 **19 Claims**



1. A hinge assembly comprising:

a first leaf and a second leaf having sleeves in coaxial alignment with one another;

a hinge pin coaxially journaled within said sleeves for pivotally interconnecting said first leaf and said second leaf for angular movement relative to one another;

said first leaf having a head portion projecting substantially radially with respect to said hinge pin and with respect to said sleeve of said second leaf;

said sleeve of said second leaf being formed with a pocket that is aligned and in registration with said head portion of said first leaf when said first leaf is in a closed position relative to said second leaf, said pocket having an edge;

a follower means mounted between and in contact with both said head portion of said first leaf and said sleeve of said second leaf in a manner to be co-moveable with said first leaf relative to said second leaf; and

a spring means operatively connected to said leaves for biasing said head portion in a direction substantially radially disposed to said hinge pin along an axis that is distally offset relative to the axis of said hinge pin;

contacting parts of said head portion, said follower and said sleeve of said second leaf having shape characteristics such that when said leaves are in a relatively open condition said follower is restrained by said sleeve of said second leaf against rocking movement relative to said head portion and such that when said head portion and said follower are rotated past said edge of said pocket said follower undergoes rocking movement relative to said head portion and relative to said edge of said pocket.

4,891,863
DEVICE FOR OPENING FIBER BALES

Bernd Bahlmann, Steingriff, and Johann Walk, Eichstaett, both of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,225

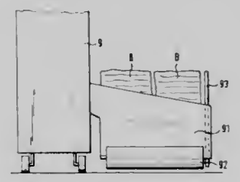
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734556

Int. Cl.[4] **D01G** *7/00*

U.S. Cl. 19—80 R **5 Claims**

1. In an opening machine for removing fiber from one or more stationary rows of bales supported on the floor, having an opening device which is supported on traveling rails for travel alongside said rows of bales, bale guide means comprising:

(a) A guide wall, spaced a predetermined distance from said travelling rails; and



(b) movable supporting means for supporting said guide wall, adapted to shift said guide wall transversely of said rows of bales for aligning each of said rows at a predetermined distance from said traveling rail.

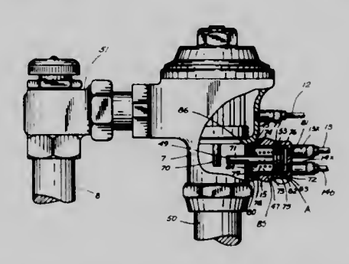
4,891,864
DISABLER AND ACTIVATION SYSTEM FOR PLUMBING FIXTURE

Martin J. Laverty, Jr., Earlysville, Va., assignor to Coyne & Delany Co., Charlottesville, Va.

Division of Ser. No. 18,495, Feb. 25, 1987, Pat. No. 4,802,246, which is a continuation of Ser. No. 781,944, Sep. 30, 1985, Pat. No. 4,709,427. This application Nov. 8, 1988, Ser. No. 268,483

Int. Cl.[4] **F16K** *31/122, 31/143;* **E03D** *3/04*

U.S. Cl. 91—399 **20 Claims**



1. In a hydraulic flush valve operating arrangement for use with a fixture having an actuating assembly including:

a housing having two fluid inlets;

a sleeve assembly in said housing;

a piston having a solid face slidable within said sleeve; and

fluid by-pass means in said sleeve assembly for diverting hydraulic fluid from one side of said piston to the other;

said piston being slidable within said sleeve assembly in response to fluid supply line pressure being supplied to said solid face with substantially equal fluid pressure in each said tubes for actuating said flush valve; and

said by-pass means cooperating with said piston and an outlet of said flush valve to a fixture to permit drainage of fluid from said housing into the fixture through said outlet of said flush valve, thereby providing uniform pressure over the face of said piston.

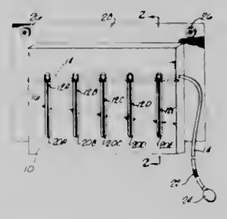
4,891,865
APPARATUS FOR SECURING AN ARTICLE IN A POCKET

Elmer E. Biloff, 18289 Thomas La., Shafter, Calif. 93263

Continuation-in-part of Ser. No. 150,513, Feb. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 2,506, Jan. 12, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 341,496

Int. Cl.[4] **A44B** *21/00*

U.S. Cl. 24—3 H **10 Claims**



1. An anti-pickpocket device to be worn in a pocket comprising:

a base member;

prong support means carried by said base member;

a plurality of prongs pivotally mounted on said support means;

biasing means carried by said base member for urging said prongs to a first position;

inflatable means carried by said base member for pivoting said prongs about said support means from said first position to a second position; and

means for inflating said inflatable means, said means for inflating being disposed exteriorly of said base member and being capable of being operated at a location remote from said base member.

4,891,866
BUCKLE OF SYNTHETIC RESIN

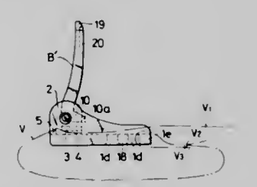
Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,436

Claims priority, application Japan, Aug. 11, 1987, 62-122883[U]

Int. Cl.[4] **A44B** *11/12*

U.S. Cl. 24—170 **5 Claims**



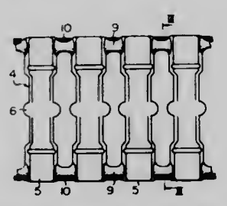
1. A buckle of polymeric organic synthetic resin comprising:

a base plate including a substantially flat base having an engaging tooth at one end thereof and a pair of spaced support members disposed on said base at respective sides thereof, said support members having respective bearing holes defined therein, and respective ridges disposed on respective inner confronting surfaces thereof at a level between said substantially flat base and said bearing holes; and

a one piece locking hook including a substantially flat base

having an integral leg projecting substantially perpendicularly therefrom at one end thereof and extending fully across said one end, said leg having opposite sides engageable with said ridges, respectively, when said locking hook is turned down against said base plate, said leg having a succession of teeth on a distal edge thereof each of said teeth extending transversely across said distal edge, and a pair of support shafts projecting from opposite sides of said base of said locking hook and loosely received respectively in said bearing holes, said base plate and said locking hook being a single integral molded assembly with said support shaft fitted respectively in said bearing holes, the distance between inner confronting surfaces of said ridges being substantially the same as the length of said leg across said one end.

4,891,867
SLIDE FASTENER
Kiyoshi Takeshima, and Ryukichi Murai, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Filed Oct. 22, 1982, Ser. No. 435,927
Claims priority, application Japan, Oct. 28, 1981, 56-172608
Int. Cl.[4] A44B *19/30*
U.S. Cl. 24—408 **8 Claims**



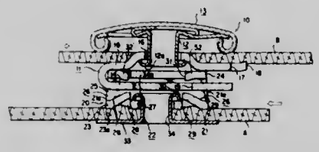
1. A slide fastener comprising a fastener tape and a continuous synthetic resin fastener element row produced by extruding means having a series of cavities and secured to one side edge of said fastener tape by means of element securing threads, said fastener element row including an engaging head and upper and lower legs extending from said engaging head, said individual fastener elements being connected in series at regular spaces by upper and lower synthetic resin spacer means integrally formed with the fastener elements adjacent to the free ends of the legs, said spacer means having a minimum cross sectioual area in the central portion thereof and gradually increasing in diameter from said central portion towards and being connected to the opposing walls of adjacent fastener elements, further comprising connecting threads passing through said upper and lower legs of the plurality of connected fastener elements adjacent and parallel to said spacer means and anchored to said legs closer to said free ends of said legs than said spacer means.

4,891,868
EYE FOR A HOOK-AND-EYE FASTENER
Hirokazu Watanabe, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Apr. 11, 1989, Ser. No. 336,118
Claims priority, application Japan, Apr. 13, 1988, 63-48835
Int. Cl.[4] A44B *13/00*
U.S. Cl. 24—691 **4 Claims**

1. In a female component of a hook-and-eye fastener including: a male component provided with a hook body fixedly mounted on a garment fabric; and a female component provided with an eye body which is fixedly mounted on another garment fabric by means of an eyelet, a part of said hook body of said male component being inserted into said eye body of said female component so as to be engaged with said female component in fastening operation of said fastener, the improvement wherein:

said eye body of said female component is formed into a hollow member having its opposite end portions open to form a pair of hook-insertion openings, said hollow member comprising: a base substantially planar mounting plate section having an eyelet-insertion aperture in its central portion, into which eyelet-insertion aperture is inserted an eyelet for fixing said eye body of said female component to said garment fabric; a top engaging plate section which is spaced apart from said base mounting plate section while disposed parallel to the latter; and opposite end plate sections through which opposite end portions of said base mounting plate section are connected with those of said top engaging plate section; and wherein:

said base mounting plate section of said eye body of said female component is provided with embossed rising portions formed inside said eye body at opposite sides of said



eyelet insertion aperture and are positioned adjacent to said hook-insertion openings, respectively, whereby:

a pair of garment-fabric receiving cavity portions are formed in its outer surface abutting against said garment fabric, between which garment-fabric receiving cavity portions is interposed said eyelet-insertion aperture;

a pair of upward-and-inward sloping portions are formed in its inner surface extending inside said eye body beyond said substantially planar base mounting plate section defining partially said hook-insertion openings, between which upward-and-inward sloping portions is interposed said eyelet-insertion aperture; and

a recessed portion is formed in its inner surface, said recessed portion being interposed between said upward-and-inward sloping portions while positioned above said eyelet-insertion aperture.

4,891,869
CARDBOARD COFFIN AND METHOD FOR FORMING THE SAME
Donald W. Nutting, 1295 Ithaca Dr., Boulder, Colo. 80303
Filed Jul. 18, 1988, Ser. No. 220,529
Int. Cl.[4] A63G *17/00*
U.S. Cl. 27—4 **20 Claims**

1. A cardboard coffin formed from a plurality of separate cardboard blanks comprising:

first and second cardboard blanks for forming a pair of wall portions;

each of said wall portions comprising a top wall portion, a side wall portion and a bottom wall portion;

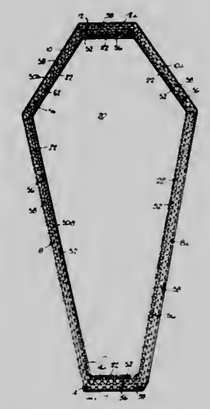
said top and bottom wall portions of said wall portions being in overlapping and contacting relationship;

securing means for securing said top and bottom wall portions in said overlapping relationship so that said wall portions have a transverse cross-sectional configuration wherein said top and bottom wall portions are in parallel relationship and said side wall portions comprise a pair of spaced apart relatively short inclined wall portions and a pair of spaced apart relatively long inclined wall portions;

a third cardboard blank for forming a bottom portions comprising a flat cardboard sheet having a central body portion having a perimeter defined by a plurality of score lines comprising a pair of spaced apart parallel score lines, a pair of spaced apart relatively short inclined score lines and a pair of spaced apart relatively long inclined score lines;

a plurality of integral rectangularly shaped portions extending upwardly from said perimeter of said central body portion with each of said integral rectangularly shaped portions having an angular relationship with said central body portion of about 90 degrees;

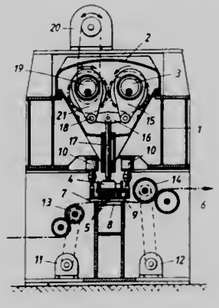
said central body portion having a length greater than its width and a lengthwise extending longitudinal axis;



said plurality of integral rectangularly shaped portions of said bottom portion being in juxtaposed relationship with portions of said wall portions; and

securing means for securing said plurality of integral rectangularly shaped portions to adjacent portions of said wall portions.

4,891,870
NEEDLING APPARATUS FOR MAKING A PATTERNED FELT WEB
Karl Müller, Wels, Austria, assignor to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Leonding, Austria
Filed Sep. 27, 1988, Ser. No. 249,783
Claims priority, application Austria, Oct. 1, 1987, 2500/87
Int. Cl.[4] B32B *5/06*; **D04H** *1/46, 5/02*
U.S. Cl. 028—107 **1 Claim**



1. A needling apparatus for making a patterned felt web, comprising the combination of

(a) a felt web support,

(b) a stripper defining a multiplicity of spaced apart passages,

(1) the stripper being disposed over the felt web support and constituting a felt web guide therewith,

(c) feed drive means for continuously feeding a felt web on the felt web support through the felt web guide at a controllable feeding speed,

(d) needle board means disposed on a side of the stripper which is opposite to the felt web support, the needle board means comprising

(1) a multiplicity of needles projecting toward the felt web guide and registering with respective ones of the passages,

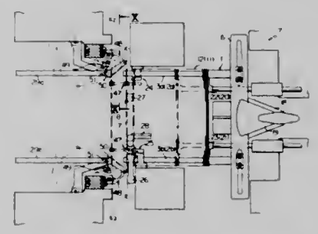
(e) drive means for the needle board means for reciprocating the needle board means to move the needles through the passages into and out of the felt web guide,

(f) stroke setting means for setting a stroke position of the needle board means relative to the felt web guide between an idle stroke position wherein there is no penetration of the needles into the felt web and a working stroke position wherein there is a maximum depth of penetration of the needles into the felt web continuously fed along the felt web support,

(1) the patterns of the felt web being determined by variations in the depth of penetration of the needles into the felt web, and

(g) control means for controlling the feeding speed imparted by the feed drive means to the felt web in dependence on the stroke position of the needle board means relative to the felt web guide in accordance with a programmed coordination of the stroke position of the needle board means and the feeding speed of the felt web.

4,891,871
HEDDLE TRANSFERRING APPARATUS
Juro Tachibana, Matsuyama, and Yoshihide Nishimura, Iyo, both of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan
Filed Jul. 8, 1988, Ser. No. 216,491
Claims priority, application Japan, Jul. 10, 1987, 62-172350
Int. Cl.[4] D03J *1/14*
U.S. Cl. 28—205 **2 Claims**



1. A heddle transferring apparatus comprising:

a heddle magazine having upper and lower magazine bars which have a plurality of heddles supported thereon;

a heddle bar supporting rack disposed in spaced and opposed relationship to said heddle magazine and having supported thereon a plurality of upper heddle bars in opposed relationship to said upper magazine bar and a plurality of lower heddle bars in opposed relationship to said lower magazine bar;

means for separating one heddle from among said plurality of heddles and maintaining said separated heddle in a first predetermined position wherein a warp thread is passed through the heddle;

a pair of upper and lower heddle transferring chucks for transferring to a second predetermined position said heddle maintained in said first predetermined position;

a pair of upper and lower heddle receiving hooks for receiving said heddle transferred to said second predetermined position from said pair of heddle transferring chucks, each of said heddle receiving hooks being movable in a direction parallel to a warp-threading direction wherein a warp

thread is passed through the heddle so as to be selectively stopped on an extension line of predetermined upper and lower heddle bars of said upper and lower heddle bars;

a pair of upper and lower heddle retaining bars for retaining said heddle of said second predetermined position in cooperation with said heddle receiving hooks, each of said heddle retaining bars being disposed parallel to said warp-threading direction and in opposed relationship to the corresponding heddle receiving hook and being movable along a vertical plane perpendicular to said warp-threading direction; and

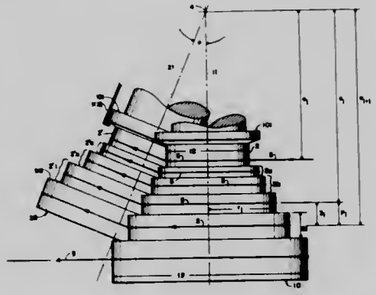
a pair of upper and lower heddle pushing bars each disposed parallel to said warp-threading direction and in opposed relationship to the corresponding heddle receiving hook and each movable along said vertical plane perpendicular to said warp-threading direction so that the heddle received on said heddle receiving hooks is inserted on said predetermined upper and lower heddle bars.

4,891,872

APPARATUS FOR INCREMENTALLY DRAWING FIBERS

Martin V. Sussman, 1361 Massachusetts Ave., Lexington, Mass. 02173

Filed May 9, 1988, Ser. No. 191,620
Int. Cl.[4] D02J *1/22*
U.S. Cl. 28—244 **16 Claims**



1. In apparatus for drawing fibers in small increments by passing said fiber with plural helical turns between a plurality of spaced-apart spindles, each of said spindles being elongated about an axis that extends transversely to the helical turns of said fiber thereon and is canted relative to said axis of the other spindle, and each of said spindles having a rotating fiber-bearing outer surface the radius of which changes along said axis thereof, said fiber-bearing surface being formed of a plurality of discrete circumferential microterraces of different radii which are substantially parallel to said axis of rotation of the corresponding one of said spindles, said fiber-bearing surface being designed and disposed for engaging each helical turn of said fiber frictionally and for supporting each said turn without imposing any substantial axially-directed restraint on said fiber, the improvement wherein:

each said microterrace on at least a first of said spindles has an axial length dimension dependent on the draw increment imposed on the portion of said fiber contacting said microterrace and dependent upon the pitch (p_i) of said helical turn of said fiber helix defined by a first equation:

$$p_i=[(DI_i+\cos\phi)r_i-a_i\sin\phi]\sin\phi$$

where:

ϕ is the angle of cant of said axes as measured in the projection along the perpendicular common to said spindles;

a_1 is the axial distance between the point of intersection of said spindle axes in said projection and the first intersection of said fiber with said axis of said first spindle;

a_i is the axial distance between the point of intersection of said spindle axes and the "i"th intersection of said wrap of said fiber with said first spindle axis in said projection; and a_i is other than a_1 and is substantially related to a_1 by a second equation:

$$a_i = a_1 + \sum_{x=1}^{i-1} p_x$$

p_i is said pitch, or distance as measured on said spindle axis between consecutive intersections of said wrap of said fiber with said first spindle axis;

r_1 is the radius of said surface of first contact on said first spindle;

DI_i is the draw ratio increment imposed on said fiber as it moves from said first spindle to said other spindle, at position a_i; and is equal to the ratio of the radius r'_i to r_i, which is the ratio of the other spindle fiber receiving radius to the first spindle fiber sending radius; and

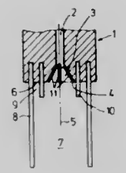
r_i is the radius of said first microterraced spindle at axial distance a_i, r_i being substantially equal to r_1 times the product of all draw increments preceding microterrace r_i.

4,891,873

DEVICE FOR CRIMPING LARGE FILAMENT GROUPS

Peter Landen, Grevenbroich; Dieter Paulini, and Wolfram Wagner, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 184,111
Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714610
Int. Cl.[4] D02G *1/16*
U.S. Cl. 28—255 **6 Claims**



1. A device for crimping large filament groups comprising a channel for moving filaments in a surrounding gas stream, a face wall through which the channel opens, and a compression chamber secured to the face wall comprising a first cage and at least a second cage, each cage including a plurality of spaced apart rods extending from the face wall and concentrically arranged around the channel opening therein, the second cage having shorter rods than the first cage and being located between the first cage and the channel opening in the face wall.

4,891,874

SELF LOADING CONTROLLED DEFLECTION

Arnold J. Roerig, Beloit, Wis., and Richard R. Hergert, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 87,555, Aug. 20, 1987, Pat. No. 4,837,907. This application Dec. 6, 1988, Ser. No. 280,629
Int. Cl.[4] B21B *27/00*
U.S. Cl. 29—115 **1 Claim**

1. A self-loading controlled deflection roll for use in engaging a mating roll along a nip line of contact therebetween, said roll comprising:

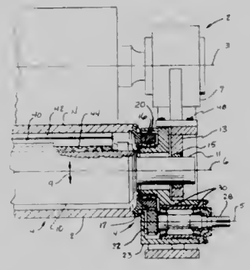
a stationary support beam;

a rotatable roll shell disposed about the beam and defining a space therebetween;

end support means supporting the ends of the support beam;

roll end assembly means secured on each end of the roll shell, including a ring gear at one end of the roll shell, said ring gear being rigidly secured relative to the end of the roll shell;

bearing housings disposed about the ends of the roll shell over the roll end assembly means independent of the end support means, the bearing housings are pivotally attached to the end support means in a plane disposed at about 90° from a plane extending between the shell roll axis of rotation and the intended nip line of contact on the roll shell with a mating roll;



pressure cylinders operatively linked with the bearing housings for urging the ends of the roll shell laterally relative to the support beam;

a non-self-aligned bearing mounted in each bearing housing intermediate the bearing housing and the roll end assembly means, and which rotatably support the roll shell and maintain rigid alignment between the roll shell and bearing housings;

roll shell support element means mounted in the beam for providing laterally-movable and rotatable support of the roll shell relative to the beam; and

means movably linking the bearing housings to the end of the support means whereby the bearing housing can move relative to the end support means.

4,891,875

METHOD FOR MANUFACTURING A PISTON FOR AN INTERNAL COMBUSTION ENGINE

Hara Soichi, and Hiroshi Kageyama, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

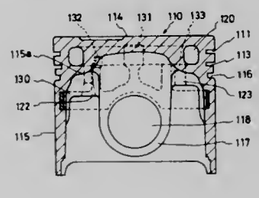
Filed Sep. 19, 1988, Ser. No. 245,899
Claims priority, application Japan, Sep. 17, 1987, 62-233151; Feb. 12, 1988, 63-017952
Int. Cl.[4] B23P *15/10*
U.S. Cl. 29—156.5 R **10 Claims**

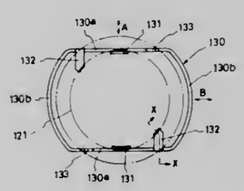
1. A method for manufacturing a piston of an internal combustion engine comprising;

holding a soluble core to a plurality of first projection portions and a plurality of second projection portions formed in a strut member, said first projections having a bent portion bent outwardly and extending along a face of said soluble core and said second projection portions having a cutting portion,

casting said strut member holding said soluble core in said piston subsequent to setting said strut member at an inside of an aggregate of an inorganic fiber positioned in a lower mold,

reinforcing a circumference of a top-ring groove of the piston by reinforcing said aggregate of inorganic fiber,





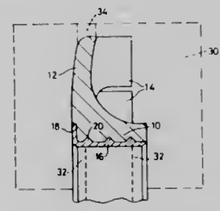
forming an oil-cooling gallery and melting away said soluble core by pouring water into said mold.

4,891,876

METHOD OF MAKING PUMP IMPELLER BY LOST-FOAM MOLDING

Richard R. Freeman, Ardens Grafton, England, assignor to Concentric Pumps Limited, United Kingdom

Filed Feb. 16, 1989, Ser. No. 310,907
Claims priority, application United Kingdom, Mar. 1, 1988, 8804794
Int. Cl.[4] B21K *3/04*
U.S. Cl. 29—156.8 R **5 Claims**



1. A method of making a water pump impeller having a tubular hub portion provided with a central axial aperture, a disc portion integral with said hub portion, and impeller vanes integral with said disc portion, said method comprising:

(a) forming a female die complementary to the shape of the impeller to be made;

(b) positioning a former in said die to be located in said central axial aperture of the tubular hub portion of the impeller to be made;

(c) filling said die with curable foam-like material thereby forming an impeller pattern which is mounted upon said former;

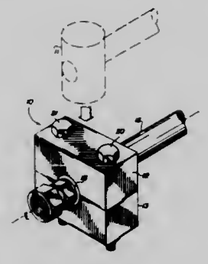
(d) curing said foam-like material of said pattern and removing said pattern from said die;

(e) using said pattern to form an impeller casting mold; and

(f) casting said impeller in said mold during which the cured foam-like material of said pattern is destroyed without destroying said former and maintaining the former in said

central axial aperture of the tubular hub portion of said impeller.

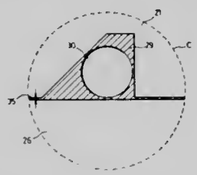
4,891,877
PORTABLE TOOL FOR COMPRESSING A FITTING ON A HOSE
Dino Talavera, P.O. Box 871690, Wasilla, Ak. 99687
Filed Mar. 20, 1989, Ser. No. 325,861
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—237 **3 Claims**



1. A portable tool for compressing a fitting on an associated hose comprising:
- a pair of machined parts held together by a pair of bolts extending through spaced parallel openings extending through said parts,
- said parts having mating surfaces machined to each form a die for receiving therein a hose fitting positioned to extend between and perpendicular to the longitudinal axis of said bolts,
- at least one of said parts defining a surface on the outside of said tool parallel with and spaced from said mating surfaces,
- said one of said surfaces being provided for receiving a blow from a hammer for causing said machine parts to move toward each other to cause the dies to crimp the fitting placed therein around the end of an associated hose, and
- shim means one mounted in each die in said mating surfaces for rendering said tool usable for fittings and hoses of various diameters,
- said shim means comprising a pair of plates one fitted to each die of each of said mating surfaces for varying the size of each die, whereby said tool may be usable with fittings and hoses of various sizes,
- each of said plates comprising a pin for extending into one of the mating surfaces of said parts,
- said bolts and associated openings extending through said parts in a direction substantially parallel with the direction of force applied to said one of said surfaces,
- whereby said bolts may be periodically tightened to maintain alignment of said parts during application of said force.

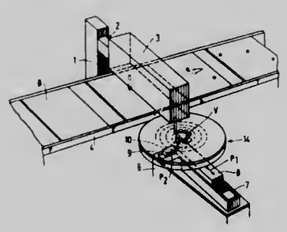
4,891,878
METHOD OF MAKING A MAGNETIC HEAD
Yoshihiko Kawai, Kyoto; Kazuaki Koyama, and Yasuda, Isao, both of Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Division of Ser. No. 97,316, Sep. 14, 1987, Pat. No. 4,807,075. This application Jan. 31, 1989, Ser. No. 304,286
Claims priority, application Japan, Mar. 16, 1984, 59-51323; Mar. 19, 1984, 59-52722
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **4 Claims**

1. A method for manufacturing a magnetic head having a main core formed by bonding opposing surfaces of a pair of core halves made of alloy material to each other for forming a gap using glass material, and a pair of reinforcing core halves made of nonmagnetic material for reinforcing the main core so that the main core is sandwiched between the pair of reinforcing cores, comprising the steps of:
- forming grooves on at least a surface of one of a pair of wafers made of alloy material;
- forming transition metal layers both on the surface of said one wafer with said grooves and on the surface of the other wafer contacting with said surface having said grooves of said one wafer;
- pressing and holding said pair of wafers so that the surfaces with said transition metal layers contact each other;
- inserting glass sticks into said grooves formed on said one wafer, said one pair of wafers being pressed and held, and heating and melting said inserted glass stick to thereby permeate melted glass between contacting surfaces of said pair of wafers so that the pair of wafers are bonded to each other;



slicing and grinding the pair of bonded wafers to thereby form main cores each main core having a gap and two major opposed surfaces perpendicular to said gap;
- forming transition metal layers on both said major surfaces of said main core;
- pressing reinforcing cores made of non-magnetic material to both said major surfaces of said main core with said transition metal layers and holding said reinforcing cores to both said major surfaces of said main core; and thereafter
- heating glass material from at least one side of said main core and said reinforcing cores to melt said glass material to thereby permeate said melting glass between said reinforcing cores and said transition metal layers so that said reinforcing cores are bonded to both said major surfaces of said main core.

4,891,879
APPARATUS FOR PICKING UP AND PLACING COMPONENTS
Anthonie A. De Lange, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 100,392, Sep. 24, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 266,317
Claims priority, application Netherlands, Oct. 13, 1986, 8602563
Int. Cl.[4] H05K *13/02*; B65G *1/06*
U.S. Cl. 29—822 **8 Claims**



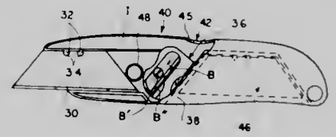
1. An apparatus for picking up a given component from a supply and for transferring that component to a placement position and placing it there, said apparatus being provided with a frame and with a transfer mechanism that can be moved in a reciprocating manner between a fixed pick-up point and a fixed placement point, said apparatus having at least one disc shaped carrier on one side of which the supply of components is arranged, a driving mechanism for rotatably and slidably driving said carrier with respect to the frame, said carrier being provided on the side remote from the supply of components side with uniformly extending guide track, and a guide member supported on the frame which cooperate with said guide track, said disc-shaped carrier comprising two separate elements including a supporting disc and a supply disc.

4,891,880
DRY-SHAVING APPARATUS COMPRISING AT LEAST ONE SLIDABLE SHUTTER
Ernst Poganitsch, and Arno Wolfger, Klagenfurt, both of Austria, assignors to U. S. Philips Corp., New York, N.Y.
Filed Apr. 21, 1988, Ser. No. 184,314
Claims priority, application Austria, Apr. 24, 1987, 1027/87
Int. Cl.[4] D26B *19/04*
U.S. Cl. 30—34.05 **6 Claims**



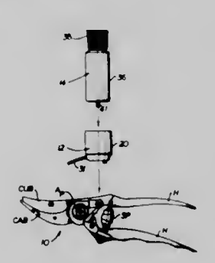
1. A dry-shaving apparatus comprising at least one slidable shutter for optionally covering or exposing a shear foil of the dry-shaving apparatus, a shaving-head frame which carries the shear foil and which is detachably secured to a basic apparatus by means of at least one resilient latch wherein the shutter is slidable from a position on the basic apparatus in which it exposes the shaving-head frame and the shear foil to a position in which it covers the shaving-head frame and the shear foil, and wherein the shutter prevents the latch from being moved for detachment of the shaving-head frame from the basic apparatus when said shutter is slid at least partly out of its position in which the shaving-head frame and shear foil are exposed.

4,891,881
COMBINED CUTTING TOOL AND SHARPENER
Norman T. Mills, 61 Harrison Ave., Glens Falls, N.Y. 12801
Continuation-in-part of Ser. No. 180,821, Apr. 12, 1988. This application May 16, 1989, Ser. No. 352,401
Int. Cl.[4] D25F *3/00*
U.S. Cl. 30—123 **5 Claims**



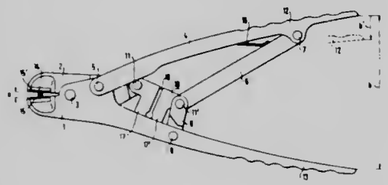
1. A combined tool comprising
- an elongated handle having opposite leading and trailing end portions,
- said handle comprising two shell halves having mating peripheral rims and defining a hollow interior,
- releasable fastener means retaining said shell halves together with said rims in fixed abutment,
- a cutting blade having a portion projecting from said handle leading end portion,
- lug means within said handle adjacent said leading end portion engaging and retaining said blade in a disposition ready for cutting,
- a compartment within said handle hollow interior adapted to contain spare cutting blades,
- a stationary pencil sharpener assembly disposed fully within said handle hollow interior angularly offset relative the longitudinal axis of said elongated handle,
- said pencil sharpener assembly including a blade fixedly mounted within said handle hollow interior,
- said handle provided with an aperture adjacent said pencil sharpener assembly and defined by two complementary juxtaposed indentations in said shell half rims intermediate said handle end portions,
- said aperture adapted to receive a pencil to engage said pencil sharpener fully disposed within said handle hollow interior, and a discharge slot formed in one said shell half permitting the dispensing of shavings as a pencil is sharpened by use of said sharpener within said handle interior.

4,891,882
FLUID DISPENSING SYSTEM
Walter L. Bloom, Atlanta, and Harry L. Vaughan, Lawrenceville, both of Ga., assignors to Bloomland Special Products, Inc., Atlanta, Ga.
Continuation-in-part of Ser. No. 832,635, Feb. 25, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 93,353
Int. Cl.[4] A01G *3/00*
U.S. Cl. 30—123.3 **20 Claims**



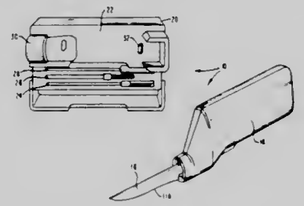
1. A treatment fluid dispenser for distributing the treatment fluid onto the cutting blade of a cutting implement for plants comprising:
- a container for holding the treatment fluid; said container defining a fluid chamber therein and a discharge passage therefrom;
- a distributor mounted on the cutting implement, said container mounted on said distributor, said distributor defining a support surface therein adapted to seat against a portion of the cutting implement adjacent the cutting blades to rotationally fix said distributor on the cutting implement and further including a connector attachable to the cutting implement to keep said distributor in place, and said distributor defining a fluid flow passage therethrough communicating with said discharge passage from said container so that the flow of treatment fluid is applied to the cutting blades to cause the treatment fluid to be applied to the cut in the plant made by the cutting blade; and
- flow control means for regulating the flow of fluid from said container out through said flow passage.

4,891,883
PLIERS
Erwin Mäntele, Tuttlingen, Fed. Rep. of Germany, assignor to Delma elektro- und medizinische Apparatebau GmbH, Tuttlingen, Fed. Rep. of Germany
Filed Dec. 20, 1988, Ser. No. 287,185
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743605
Int. Cl.[4] B26B *17/00*
U.S. Cl. 30—190 **11 Claims**



1. Pliers usable for surgical purposes for cutting through wires, screws and the like, comprising:
a cutter gripping lever having a first cutting edge at its front end, a handle at its rear end;
a cutting lever having a second cutting edge disposed opposite to the first cutting edge;
a cutting lever hinge pivotally connecting said second cutting edge to said cutter gripping lever;
a gripping lever pivotally connected to the cutter gripping lever behind the cutting lever hinge by a gripping lever hinge;
a transmission means between the gripping lever and the cutting lever hinge, said transmission means including a toggle lever drive and having an input drive member and an output drive member;
the input drive member including a transmission lever pivotally connected at its first end to said gripping lever;
said transmission lever and said gripping lever forming a first toggle lever;
the other end of the transmission lever loading a toggle lever hinge of a second toggle lever, said second toggle lever including a support lever pivotally connected to said cutter gripping lever and an intermediate lever, said intermediate lever extending from said toggle lever hinge to said cutting lever, said intermediate lever pivotally connected at an intermediate hinge;
wherein said input drive member of the transmission means is loaded by said gripping lever and said output drive member of the transmission means acts on said cutting lever at the side remove from the cutting edge of the cutter lever hinge which supports the cutting lever on the cutter gripper lever; and
wherein like relative pivotal movements of said gripping lever relative to said cutter gripping lever bringing about progressively smaller pivotal movements of said cutting lever relative to said cutter gripping lever as the distance between said cutting lever and said cutter gripper lever becomes smaller, so that the mechanical advantage increases automatically as the distance becomes smaller .

4,891,884
HAND HOLDABLE AUTOMATIC BLADED APPLIANCE FOR SLICING, PEELING AND THE LIKE
Philip Torbet, 26 Centre View Dr., Upper Brookville, N.Y. 11771, assignor to Philip Torbet, Upper Brookville and William R. Hebel, Sands Point, both of, N.Y.
Filed Jul. 21, 1987, Ser. No. 76,080
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—277.4 **22 Claims**

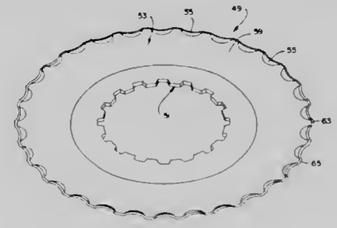


1. An automatic appliance for peeling, comprising:
a light weight handle assembly for conveniently holding the appliance,
a power system within said handle assembly including a power supply comprising a cylinder mounted within said handle assembly for rotation about the longitudinal axis of said cylinder and including a cam extending from and about said cylinder and which is aligned at an angle to said longitudinal axis,
a gear reduction means connecting said cylinder to a motor for rotation of said cylinder at a speed which is substantially less than the speed of said motor, a reciprocating mechanism including means for engaging said angular cam to effect rapid reciprocal movement of said mechanism as said cylinder is rotated by said motor and which is operatively connected to and reciprocated by said power supply to provide a fast acting, rapid and powerful reciprocation to said mechanism, and
a single thin blade-like peeler including a cutting guide and a blade spaced from the cutting guide, said blade defining a pair of cutting edges extending longitudinally along opposite sides of said blade adapted to be releasably connected to said mechanism for peeling.

4,891,885
METHOD OF MAKING A KNIFE HAVING A SCALLOPED CUTTING EDGE
Robert R. Fischer, Michigan City, and W. James Fischer, Valparaiso, both of Ind., assignors to Urschel Laboratories Incorporated, Valparaiso, Ind.
Filed Oct. 19, 1987, Ser. No. 109,518
Int. Cl.[4] B26B *9/02*
U.S. Cl. 30—355 **7 Claims**

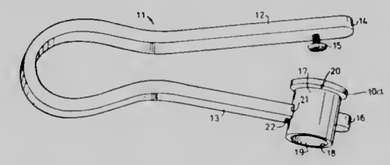
1. A method of forming a scalloped cutting edge on a knife blade comprising the steps of:
(a) providing a punch and die assembly including a first face and a corresponding second face, the second face having a plurality of scallop-shaped depressions formed therein;
(b) positioning a knife blank including an edge portion defined by a pair of opposed planar surfaces terminating at an end wall between the first and second faces; and
(c) compressing the first face towards the second face to deform the edge portion of the blank into the depressions

of the second face and outwardly of a planar surface thereof to impart a corresponding scalloped configuration



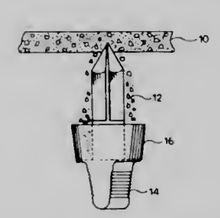
to the edge portion, wherein each scallop includes an outwardly extending convex side and a concave side.

4,891,886
INSTRUMENT FOR PRESSING ITEMS OUT OF STORAGE SPACES
Marcus Diamant, Kungsgatan 1, S-302 45 Halmstad, Sweden; Bertil Diamant, and Peder M. Diamant, both of Ellevadsveg 6, DK-2920 Charlottenlund, Denmark
Filed Jul. 20, 1987, Ser. No. 75,613
Claims priority, application Sweden, Jul. 24, 1986, 8603201; Dec. 1, 1986, 8605130
Int. Cl.[4] B26F *1/00*
U.S. Cl. 30—363 **2 Claims**



1. An instrument for pressing an object out of a receptacle defined in a support, wherein the support includes at least one recess, the recess has an open top and the open top is closed by a covering layer of burstable material;
the instrument comprising;
a pair of arms supported to each other, which can be moved together, the first arm supporting a collet which projects from the first arm toward the second arm, and the second arm supporting a counter member facing toward the collet on the first arm, the counter member being shaped and positioned for cooperating with the collet on the first arm when the arms are moved together,
whereby when the collet is placed against the side of the support at a closed side of the recess, the counter member is placed at the covering layer over the open side of the recess such that moving the arms together presses the collet against the closed side of the recess to force the article to burst through the covering layer toward the counter member;
the counter member is substantially annular with an open region at the center positioned to receive the collet when the first and second arms are moved together; the counter member further including a receptacle adjoining the annular portion thereof for receiving an item pressed from the recess;
the second arm extending through the counter member and defining a bottom for the receptacle in the counter member.

4,891,887
HAND HELD DRILL DRIVE
Karl Witte, 110 S. Hale, Bartlett, Ill. 60103
Filed Jun. 30, 1988, Ser. No. 213,825
Int. Cl.[4] B23F *1/16*
U.S. Cl. 30—366 **1 Claim**



1. A hand held hole scraping device for penetrating a hole through scrapable material comprising:
a shaft having a working extremity;
a cup spaced from said working extremity of said shaft and integral with said shaft for collecting debris;
a plurality of radially disposed blades formed integrally with said shaft, said blades exhibiting edges operative to cause scraping action when the shaft is rotated, and said blades defining longitudinal grooves along said shaft between said blades;
a handle formed integrally with said shaft at its end opposite said working extremity, wherein said handle presents a transversely disposed roughened planar surface for operatively grasping said handle between the thumb and finger; and wherein said shaft member, blades, cup member and handie are formed as a one piece plastic molded object.

4,891,888
AUXILIARY TOOL FOR CAREFULLY LEVELLING FINISHING FLOORS
Cornelius H. Maria De Bree, NK Driebergen, and Marinus Reincke, MD Langbroek, both of Netherlands, assignors to 501 Redexim B.V., Netherlands
Filed May 11, 1988, Ser. No. 192,490
Claims priority, application Netherlands, May 12, 1987, 8701124
Int. Cl.[4] G01C *15/02*
U.S. Cl. 33—293 **7 Claims**



1. An auxiliary tool for levelling a finishing floor made of flowable mortar or similar material, comprising an outer tube adapted to be arranged vertically with respect to the floor and

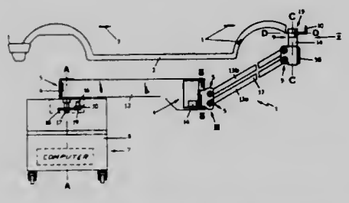
means for supporting said outer tube with its ower end spaced above said floor, a laser receiver adjustably mounted on said outer tube for receiving a laser beam located at a first predetermined height above said floor, a rod located in said outer tube and slidable axially relative thereto, a measuring pin extending laterally from said outer tube for conjoint movement therewith for alignment with a second predetermined height from said floor, means for relatively moving said outer tube and inner rod so that the lower end of said rod extends from the lower end of said outer tube in contact with said floor and said outer tube is moved to align said laser receiver with said laser beam and said measuring pin with the second predetermined height from said floor, and means for cutting the section of said rod extending below the lower end of said tube whereby said cut rod section determines the desired height of said finishing floor.

4,891,889

APPARATUS FOR MEASURE AND/OR CHECK THE POSITION AND ORIENTATION OF CHARACTERISTIC SPOTS OR AREAS IN STRUCTURES, PARTICULARLY IN MOTOR-VEHICLE BODIES

Raffaele Tomelleri, Verona, Italy, assignor to Garda Impianti S.R.L., Verona, Italy

Filed May 2, 1988, Ser. No. 189,227
Claims priority, application Italy, May 5, 1987, 84930 A/87
Int. Cl.[4] G01B *3/14, 5/24*
U.S. Cl. 33—503 **9 Claims**



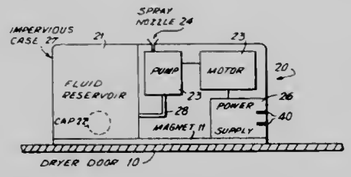
1. An apparatus for measuring or checking a spatial position and an angular orientation of characteristic spots or areas in structures, comprising an articulated arm with a number of pivot areas and having one end secured to a supporting member and a second free end from which extends a tracer element to be individually positioned adjacent each of said characteristic spots or areas in said structure to be measured or checked, a displacement transducer located adjacent at least one of said pivot areas, said transducer generating an electrical signal in dependence upon a variation in configuration of said pivot areas of the arm as compared to a reference configuration, supply means responsive to said electrical signal for supplying spatial coordinates of said spatial position and angular orientation of each of said characteristic spots or areas which are contacted by the tracer element, said articulated arm including a first element rotatably pivoted to said supporting member at a first fixed end thereof and being rotatable about a first axis, a second element having an end pivotably connected to an end of said first element that is opposite the first fixed end, said second element capable of rotating about a second axis substantially parallel to said first axis, said second element being in the form of a linkage parallelogram and comprising a pair of parallel rods capable of carrying out oscillations in a plane substantially parallel to said second axis, a supporting element adapted to retain said tracer element at an end of said second element opposite that connecting the second element to the first element, and a swinging head carrying the tracer element on said support element and being capable of performing rotations about a third axis substantially parallel to the first and second axes and about a fourth axis substantially perpendicular to the first axis.

4,891,890

METHOD AND APPARATUS FOR TREATMENT OF FABRICS IN LAUNDRY DRYERS

John A. Church, Princeton Junction, N.J., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Nov. 9, 1987, Ser. No. 118,680
Int. Cl.[4] F26B *7/00*
U.S. Cl. 34—12 **3 Claims**



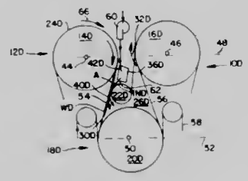
1. A universal self-contained spray apparatus powered by a battery for use in a clothes dryer comprising:
(a) a housing including attachment means for removable attachment of the spray apparatus to the dryer;
(b) a fluid reservoir within the housing, said reservoir having an opening for the introduction of a fluid fabric treating agent;
(c) a spary nozzle for injecting a spray of the agent into the dryer onto items being dried during operation of the dryer;
(d) a pump for drawing the agent from the reservoir and forcing it through the nozzle;
(e) a motor for driving the pump;
(f) a power supply housing for the battery; and
(g) timing circuit means for controlling the motor including means for setting the time when the motor is turned on and off.

4,891,891

DRYER SECTION APPARATUS AND METHOD

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 11, 1988, Ser. No. 256,347
Int. Cl.[4] F26B *3/04*
U.S. Cl. 34—23 **11 Claims**



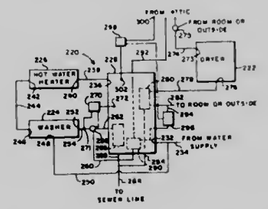
1. A dryer section apparatus for drying a web, said apparatus comprising:
a first tier of rotatable dryers;
said first tier including:
a first dryer, the web extending around said first dryer;
a second dryer disposed downstream relative to said first dryer;
a second tier of rotatable dryers;
said second tier including:
a third dryer disposed downstream relative to said first dryer and upstream relative to said second dryer such that the web moves from said first dryer towards and around said third dryer and subsequently to and around said second dryer;
a transfer roll disposed between said first, second and third dryers such that the distance between said transfer roll and said first dryer is less than the distance between said transfer roll and said second dryer;
a dryer felt extending contiguously with the web around said first dryer, said felt then extending around said transfer roll and thereafter around said second dryer such that a pocket is defined between the web extending between said dryers, said third dryer and said felt; and
a blow box disposed between said roll and said first and second dryers, said box being disposed outside said pocket for blowing a first current of air into said pocket through said felt extending between said first dryer and said roll, said first current of air augmenting a first flow of air flowing into said pocket through said felt extending between said first dryer and said roll to balance a second flow of air flowing out of said pocket through said felt extending between said roll and said second dryer.

4,891,892

CLOTHES DRYER AND LAUNDRY SYSTEM

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

Division of Ser. No. 561,882, Dec. 15, 1983, Pat. No. 4,689,896.
This application Aug. 24, 1987, Ser. No. 88,883
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—86 **20 Claims**



1. A laundry system comprising a dryer having an exhaust vent for air heated in and circulated through said dryer, a water storage tank, and heat exchanger means for transferring heat from the air exiting said dryer through said exhaust vent to water contained in said storage tank, said system further comprising a washer having a drain outlet for heated waste water, and second heat exchanger means for transferring heat from the heated waste water exiting through said drain outlet to water contained in said storage tank, valve means interposed between said drain outlet and said second heat exchanger means for selectively routing the heated waste water to said heat exchanger means, said valve means being responsive to sensed temperature diferential between said waste water and the water in said storage tank.

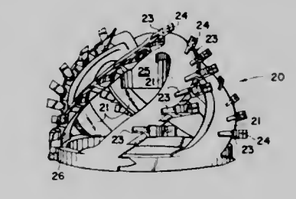
4,891,893

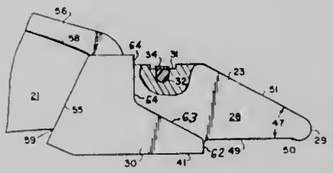
DREDGE CUTTERHEAD TOOTH ASSEMBLY

Stephen M. Bowes, Jr., Jacksonville, Fla., assignor to LVI Group, Inc., New York, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,951
Int. Cl.[4] E02F *3/92*
U.S. Cl. 37—67 **43 Claims**

1. In a rotatable dredge cutterhead having helical blades and teeth attached to these blades, a replaceable tooth assembly comprising a male adapter edge designed to be welded to the leading edge of said blades of said cutterhead, a female tooth designed to interfit with said adapter, a key to lock said tooth to said adapter and key retainer means to hold said key in place; said adapter edge being an elongated member with a longitudinal axis extending from a rearward base through a wedge-shaped forward protrusion to a lateral semicylindrical nose, a pair of arms extending laterally outward from opposite sides of said base and shaped to lie along said leading edge of any one of said blades, a half keyway slot passageway extending laterally through said adapter edge and a recess with an open end positioned medially in said keyway slot and a closed end internally of said adapter edge and adapted to receive said key retainer means; said tooth being an elongated member with a longitudinal axis coinciding with said longitudinal axis of said adapter edge, a forward cutting edge positioned laterally with respect to said axis, an internal recess adapted to mate with the said protrusion of said adapter, and a lateral half keyway slot passageway extending through said tooth and aligned with said half keyway slot passageway of said adapter edge such that





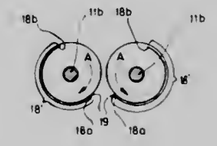
both said half slots, when aligned, produce a full slot to seat said key; said key being an elongated pin having a longitudinal axis and being of such shape in lateral cross section as to snugly fit into said full slot, and having on one elongated side parallel to said axis a recess with smoothly tapering edges connecting the bottom of said recess with said one side which engages said slot; and said key retainer means including a compressible member shaped to fit into said recess with an upper surface protruding slightly into said keyway slot and being shaped with a smoothly tapering protrusion to interfit with said recess in the surface of said key.

4,891,894

COVER SHEET ATTACHMENT FOR A TUNNEL FINISHER PNEUMATIC ROLL

Reinhardt Veit, Fuchstal-Seestall, Fed. Rep. of Germany, assignor to Veit GmbH and Co., Fed. Rep. of Germany

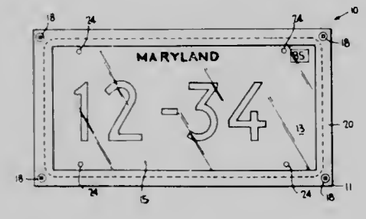
Filed May 24, 1988, Ser. No. 198,075
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 3721422
Int. Cl.[4] D06F *61/06*; D06B *23/16, 23/02*
U.S Cl. 38—66 **6 Claims**

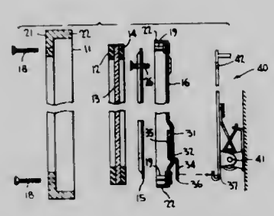


1. A tunnel finisher comprising pneumatic rollers for defining an entrance or an exit, respectively, of a clothing treatment space, each pneumatic roller comprising a shaft having ends

supported by a bearing secured to a housing, bottom-and-top-side discs connected to said shaft, and an envelope secured to said discs, said envelope enveloping a hollow cylindrical interior room extending between said discs, said envelope being adapted to be supplied with compressed air, said envelope being formed of a sheet in the form of a cylinder so as to form an overlap portion between exterior and interior positioned free longitudinal edges of said sheet said exterior positioned free longitudinal edge being positioned exteriorly of said envelope and said interior positioned free longitudinal edge having positioned within said interior room.

4,891,895
LICENSE PLATE HOLDER
Pascal DeLaquil, Jr., 111 Williamsburg Dr., Export, Pa. 15632
Filed May 24, 1985, Ser. No. 737,429
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—209 **18 Claims**





1. A license plate holder for providing a weather-proof and tamper-proof enclosure for a standard size vehicle license plate and adapted for connection to a license plate mounting support secured to a vehicle, the mounting support having at least two screw-receiving holes spaced by a standardized distance to permit the license plate to be secured to the mounting support by means of respective mounting screws extending through respective apertures in the license plate into and secured in the holes, said license plate holder comprising:

a backing plate having a front surface, a rear surface, and at least one dimension larger than a corresponding dimension of said license plate, there being two mounting apertures defined in the backing plate and spaced by said standardized distance for alignment with said license plate apertures, said two mounting apertures being located to expose first and second end portions of said forward surface when said license plate is placed against said forward surface with said license plate apertures aligned with said mounting apertures;

means securing said license plate and said backing plate to said mounting support with the license plate disposed adjacent said forward surface and said mounting support disposed adjacent said rear surface, said securing means comprising respective mounting screws extending through said license plate apertures and said mounting apertures into said holes in said mounting support;

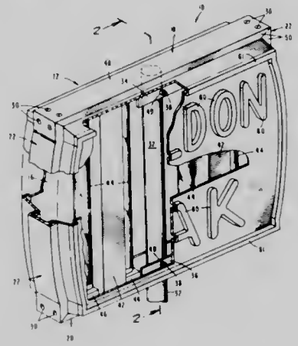
a frame member having four sides defining an open area therebetween, said frame member having a front surface and a back surface;

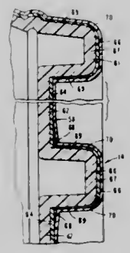
a transparent pane member having a surface area slightly larger than said open area but smaller in said at least one dimension than said frame member and said backing plate, said pane member being disposed between the back surface of said frame member and said license plate;

wherein said frame member is larger in said at least one dimension than said license plate such that first and second end segments of said frame member are spaced from and aligned with said first and second end portions, respectively, of said backing plate without any portions of said pane member and said license plate interposed therebetween; and

removable means for selectively securing said frame member to said backing plate, said removable means including first engagement means joining said first end segment of said frame member to said first end portion of said backing plate, and second engagement means for securing said second end segment of said frame member to said second end portion of said backing plate.

4,891,896
SIMULATED NEON SIGN
Vernie A. Boren, Lakewood, Calif., assignor to Gulf Development Corporation, Torrance, Calif.
Filed Aug. 15, 1988, Ser. No. 232,238
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—541 **14 Claims**





1. A simulated neon sign comprising:

(a) a frame;

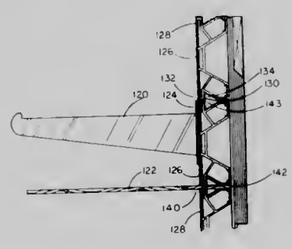
(b) non-neon internal lighting means within the frame;

(c) a front plastic panel formed of a light transmitting plastic held by the frame and having an outer face, the outer face comprising outwardly projecting indicia and a non-projecting region, the non-projecting region being substantially opaque to light from the internal lighting means;

(d) a first pigmented translucent coating on the indicia so that light from the lighting means can pass through the indicia; and

(e) additional pigmented coating on the non-projecting region of the panel adjacent to the indicia, the additional coating being of substantially the same color as the first pigmented coating so that it appears that light from the lighting means passing through the indicia is reflected off the opaque non-projecting region to achieve the halo effect of neon lights; wherein the thickness of the first coating is greater at the center than at the sides of the indicia so that the intensity of light through the sides of the indicia is substantially the same as at the center.

4,891,897
DISPLAY PANEL
Detlef J. Gieske, and David B. Kawchak, both of 13800 Ella Blvd., F207, Houston, Tex. 77014
Continuation-in-part of Ser. No. 808,421, Dec. 12, 1985, Pat. No. 4,722,147. This application Feb. 1, 1988, Ser. No. 151,228
Int. Cl.[4] G09F *7/02*; A47F *5/08*
U.S. Cl. 40—618 **15 Claims**



1. A display panel comprising:

a structural layer of rigid material;

a plurality of slat means fastened to said structural layer, said slat means having a first surface fastened to said structural layer, said slat means having a substantially planar second surface opposite said first surface, said slat means defining a horizontal slot between adjacent slat means, said slat means further comprising a receiving slot having a surface extending transverse to said horizontal slot and a surface angled relative to said horizontal slot;

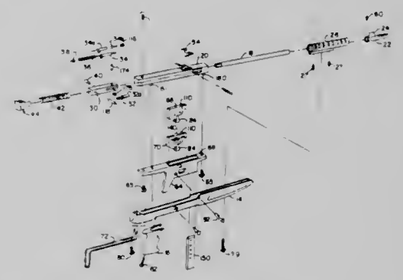
fastening means attached to said structural layer, said fastening means for connecting said structural layer to an adjacent surface;

and

a strip of hook-and-loop material fastened to said structural layer at the area of the said horizontal slot, said hook-and-loop material for fixing the horizontal movement of an object placed into said horizontal slot.

4,891,898
PROJECTILE FIRING WEAPON WITH A REPLACEABLE FIRING MECHANISM ACTUATOR CASSETTE
Walter R. Houseman, 5689 Country Glen, League City, Tex. 77573
Continuation of Ser. No. 229,735, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 70,248, Jul. 6, 1987, abandoned, which is a division of Ser. No. 619,926, Jun. 12, 1984, Pat. No. 4,679,487. This application Apr. 10, 1989, Ser. No. 336,591
Int. Cl.[4] F41D *11/02*
U.S. Cl. 42—69.02 **7 Claims**





1. A projectile firing weapon comprising:

a grip means defining an upwardly opening cavity having bottom, side and end walls;

a removable firing mechanism actuator cassette including at least bottom, side, end and top walls and configured to slide into said cavity;

a firing mechanism secured to said grip means so as to overlie said cavity and arranged to engage the cassette top wall and to retain said cassette bottom wall against the cavity bottom wall and the cassette top wall against the firing mechanism thereby restraining the cassette from vertical movement within the cavity;

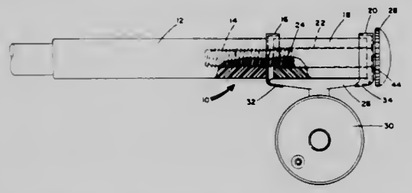
said cassette side walls being so configured in relation to said cavity side walls that the cassette side walls are contiguous with the cavity side walls along at least a portion of their surfaces and are retained between the cavity side walls;

said cassette end walls being so configured in relation to said cavity end walls that said cassette end walls are contiguous with the cavity end walls along at least a portion of their surfaces and are retained between the cavity end walls, thereby restraining the cassette from lateral movement within the cavity;

said firing mechanism including a bolt and firing pin for detonating a projectile;

fastening means for securing said firing mechanism to said grip means; release of said fastening means causing uncovering of said cavity and release of said cassette for movement relative to said grip means and for movement relative to said firing mechanism;
said cassette including at least a trigger and sear means for actuating said firing mechanism;
said firing mechanism and sear means arranged to engage and cooperate with each other and said trigger for controlling detonation of a projectile; and
a barrel means secured to the firing mechanism for guiding a projectile in cooperation with said firing mechanism.

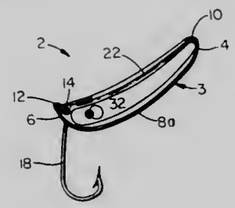
4,891,899
REEL SEAT
Lee Wulff, Beaverhill Rd., Lew Beach, N.Y. 12753
Filed Jun. 17, 1988, Ser. No. 208,746
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 **18 Claims**



1. An apparatus to secure a fishing reel to a rod comprising:
(a) a handle associated with said rod provided at one end with an axial bore hole;
(b) a shaft dimensioned and configured at one end to engagingly fit within said bore hole;
(c) a first bracket, shaped and dimensioned to abut said handle proximate said bore, said first bracket defining a first central opening to allow said shaft to pass through said bracket into said bore hole and said first bracket defining a first catching surface to engage a first mounting foot associated with said fishing reel;
(d) a second bracket, shaped and dimensioned to define a second central opening to allow said shaft to pass through and to define a second catching surface to engage a second mounting foot associated with said fishing reel;
(e) a member associated with the end of said shaft opposite said one end of said shaft dimensioned larger than said second central opening of said second bracket; and
(f) a tube configured and dimensioned to be positioned wholly between said first and second brackets allowing said shaft to pass through its interior.

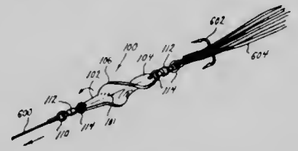
4,891,900
JIGGING SPOON
Gary L. Snyder, Dodge Center, Minn., assignor to UMM Holdings, Inc., Dodge Center, Minn.
Filed Dec. 27, 1988, Ser. No. 289,729
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.5 **10 Claims**

1. A fishing lure comprising a body having a fore and an aft end and peripheral edges extending therebetween and including means for securing a book to said body and further including first and second planar body portions convergent at a substantially uniform angular displacement over the length of the lure to form a lengthwise extending apex coincident with a longitudinal axis, such that when viewed end-on said body exhibits a V-shaped concavity and when viewed side-on said apex arcuately extends back upon itself at a first radius less than a second radius exhibited by the peripheral edges, whereby upon use of said lure during a downward free floating descent,



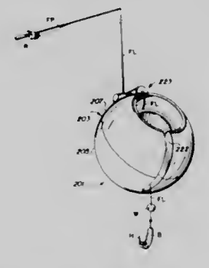
said lure orients so that said concavity will be lower than said apex as viewed end-on.

4,891,901
FISHING LURE
James E. Baker, Jr., Greenwood, Mo., assignor to Ronald Goldberg, Leawood, Kans.
Filed Mar. 13, 1987, Ser. No. 25,521
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.11 **48 Claims**



1. An artificial lure for presenting a fish-attracting action upon fishing line retrieval by the fisherman comprising:
a spinner blade having an upstream end and a downstream end;
a body section intermediate said blade ends, said body being twisted in a generally symmetrical convolution about an imaginary longitudinal axis passing through said ends;
an upstream swivel disposed adjacent said upstream end and having said axis passing therethrough;
means for connecting said upstream swivel to said upstream end;
a downstream swivel disposed adjacent said downstream end and having said axis passing therethrough;
means for connecting said downstream swivel to said downstream end;
means for connecting said downstream swivel to a fishing hook;
means for connecting said upstream swivel to said fishing line, said fishing lure retrieval causing water to flow over the opposed surfaces of said upstream end through said body section and over the opposed surfaces of said downstream end to rotate said spinner blade about said common axis passing through said swivels and said blade, said swivels cooperating with said ends to maintain said axis passage therethrough and said spinner blade in a generally straight-line rotatable action about said axis following the direction of retrieval of said fishing line,
said spiral progressively increases from said upstream end to the middle portion of said body and progressively decreases from said middle portion to said downstream end whereupon said water flow is collected at said middle portion of said blade and is directed by said spiral towards said downstream end.

4,891,902
FISHING BOBBER AND DEPTH FINDER
Ralph L. Whitney, Jr., 11R Summer St., Westborough, Mass. 01581
Continuation-in-part of Ser. No. 18,015, Feb. 24, 1987, abandoned. This application Nov. 5, 1987, Ser. No. 116,812
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.11 **19 Claims**



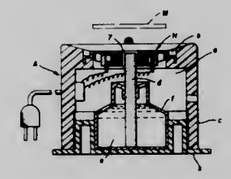
1. A combination fishing bobber and water depth finder device comprising:
a buoyant body means defining guide means for guiding passage of a fishing line during movement toward and away from an attached fishing pole; and
a line control means supported by said body means and sequentially actuatable into either first or second depth finding conditions, a fishing condition or a retrieval condition; said control means adapted in said first depth finding condition to allow movement of the line through said guide means in a direction away from the pole and in said second depth finding condition to prevent movement of the line through the guide means in a direction toward the pole; said control means further adapted in said fishing condition to engage and thereby prevent movement of the line through the guide means and to shift automatically into said retrieval condition which allows complete unrestricted movement of the line through said guide means in directions either away from or toward the pole.

4,891,903
COMBINATION SLIDING OR FIXED FISHING SINKER
Roger S. Wymore, 4612 F Ave. NE., Cedar Rapids, Iowa 52402
Filed Aug. 23, 1988, Ser. No. 235,049
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.89 **4 Claims**

1. A combination sliding and fixed fishing sinker comprising:
a lead body;
a circumferential slot dividing said body into first and second sides; and
a loop member on each of opposite ends of said body located proximate said circumferential slot;
whereby the combination sliding and fixed fishing sinker is mounted on a fishing line by either: first, wrapping the line around said body, within said circumferential slot, thus achieving the fixed fishing sinker mode; or second, threading the line straight through one side of said slot and under said loop members on either end of said body, thus allowing for the sinker's slipping along the line and achieving the slip sinker mode.



4,891,904
HEATING DEVICE FOR ELECTRIC MOSQUITO KILLING APPARATUS
Yoshikatsu Tabita, Wakayama, Japan, assignor to King Chemical Kabushikigaisha, Arida, Japan
Filed Apr. 27, 1989, Ser. No. 343,632
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 **3 Claims**



1. A heating device for electric mosquito killing apparatus comprising:
a heat receiving plate 1 with a plane 11 for loading thereon a mosquito killing mat (M) impregnated with mosquitocide to be evaporated by electric heating, and
a heating assembly fixed on the under face of said heat receiving plate (1) and consisted of upper and lower insulating members (2, 6) and a heating element (4) arranged to be fed with electric current and sandwiched between said upper and lower insulating members(2, 6),
each of the heat receiving plate (1) and the heating assembly being provided at central portion thereof with a wick insertion hole (7) of a size allowing formation of a gap between its inner face and the sucking wick(d).

4,891,905
PLANT RECEPTACLE
Thomas O. Stolz, 845 W. Centerville Rd., Dayton, Ohio 45459
Filed Apr. 5, 1988, Ser. No. 177,925
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 **5 Claims**

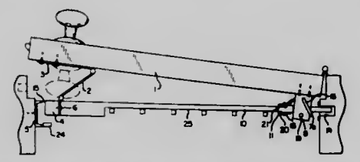
1. In combination with a plant having roots confined within

a ball of earth, a receptacle for supporting the plant, comprising an inverted generally cup-shaped body of plastics material and having a generally uniform wall thickness, said body including a central portion defining an upwardly concaved cavity, said ball of earth disposed within said cavity, stabilizing means including a series of spaced barbs projecting upwardly from said central portion engaging said ball of earth to stabilize



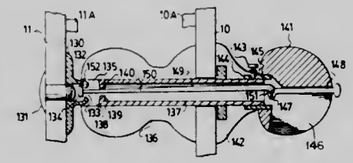
the plant, said body also including a peripheral skirt portion outwardly of said central portion and said ball of earth and projecting downwardly to engage a supporting surface, and said skirt portion having a top surface disposed above and laterally outwardly of said cavity for collecting and retaining rain or sprinkled water in said cavity for absorption by said ball of earth and said central portion being disposed to engage the supporting surface.

4,891,906
INTERLOCKING DOOR GUARD
Walter R. Knapp, 7020 SE. 87th, Portland, Oreg. 97266
Filed Jan. 6, 1989, Ser. No. 294,106
Int. Cl.[4] E05C *21/02*
U.S. Cl. 49—65 **9 Claims**



1. A door guard for use with a main door of the type having hinged connection at one of its edges on one side of the door frame and closure means on its other edge adjacent a closure edge of the door frame, said door guard comprising:
- a body member having opposite side edges arranged to be disposed adjacent respective side edges of a main door,
- one of said side edges including a locking edge and being disposed adjacent the closure edge of the door frame,
- socket means arranged to be provided on the closure edge of the door frame,
- and shift lever means arranged to support said body member on the main door for lateral movement relative to the door between engagement of said locking edge in said socket means of the door frame and clearance of said locking edge from said socket means, said shift lever means being arranged to move said body member laterally when the door is opened to clear said socket means but arranged to move said body member in the opposite direction to engage said locking edge with said socket means when the door is closed.

4,891,907
SECURITY LOCK AND SEAL FOR DOUBLE DOOR OR WINDOW INSTALLATIONS
Mychail Rapaway, Box 37, Group 607, S.S. #6, Winnipeg, Manitoba, Canada R2C 2Z3
Continuation-in-part of Ser. No. 108,897, Oct. 14, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 241,492
Claims priority, application Canada, Oct. 23, 1986, 521265
Int. Cl.[4] E05B *65/04*
U.S. Cl. 49—67 **13 Claims**

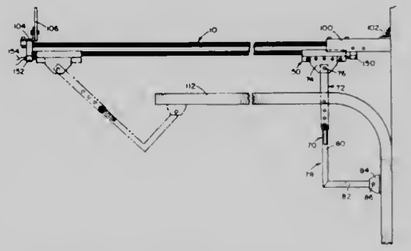


1. A security assembly for double panel installations which include an inner panel and an outer panel situated in spaced and parallel relationship within a panel frame, when in the closed position and opening in opposite directions when in the open position; said assembly comprising in combination a cooperating element in the outer panel, an element in the inner panel in engaging alignment with said cooperating element of said outer panel when said panels are in the closed position, and means on an inside end of the element in said inner panel for selectively and lockably engaging said element of said inner panel with said cooperating element of said outer panel thereby securing said panels together in a unitary relationship one with the other, said cooperating element on said outer panel including retainer means on the inner side thereof, said element on said inner panel including tube means mounted on said inner panel substantially perpendicular thereto, a knob being mounted on said tube means for partial rotation of the knob, a lever assembly operatively connected to said knob and extending through said tube means, and means on an outer end of said lever assembly selectively engageable and disengageable with said retainer means, said lever assembly including a link freely extending through said tube, and an actuating means operatively engaged with the knob and an inner end of the link to transmit rotary motion of the knob to the link as the knob is rotated between a retainer means engaging and a retainer means disengaging position, the actuating means being operatively engaged with the link to shift the link end-wise in the tube in response to movement of the actuating means relative to the knob.

4,891,908
PNEUMATIC DOOR OPENER
Anthony G. Aquilina, R.R. 5, Milton, Ontario, Canada L9T 2X9
Continuation-in-part of Ser. No. 29,733, Mar. 24, 1987, and a continuation-in-part of Ser. No. 216,879, Jul. 8, 1988. This application Nov. 15, 1988, Ser. No. 271,621
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—199 **21 Claims**

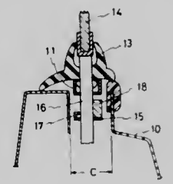
1. A sliding door operator system comprising:
- a rodless fluid cylinder comprising a cylinder body, a rodless piston adapted for reciprocation in said cylinder body, and a carriage adapted for reciprocation externally along the length of said cylinder body, said carriage being secured to said piston;
- a link means for connecting said cylinder carriage to an associated sliding door;
- a control means for controlling the operation of said fluid cylinder, and hence the position of the associated sliding door, wherein said control means comprises:
  - a source of pressurized fluid,

- a directional valve communicating with said fluid cylinder for directing a pressurized fluid from said source of pressurized fluid to a respective end of said fluid cylinder,



- an exhaust line communicating with said fluid cylinder for venting an exhaust fluid from said fluid cylinder, and
- a back pressure relief valve in fluid communication with said exhaust line for regulating a flow of said exhaust fluid through said exhaust line.

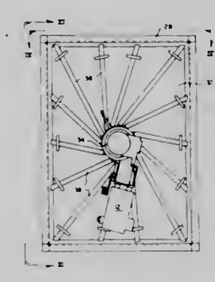
4,891,909
CLOSURE FOR TRIANGULAR WINDOW IN A VEHICLE BODY
Hirotake Nakao, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Mar. 31, 1989, Ser. No. 331,170
Claims priority, application Japan, Mar. 31, 1988, 63-044508[U]
Int. Cl.[4] B60J *1/14*
U.S. Cl. 49—391 **7 Claims**



1. In a vehicle body having a triangular window formed thereon, a window closure mechanism comprising:
- a shaft rotatably supported in said vehicle body;
- a glass fixed to said shaft so as to be rotated therewith for opening and closing said triangular window;
- a rotational stopper fixedly connected to said shaft so as to be integrally rotated therewith and provided with a cam portion which projects from said rotational stopper in the axial direction of said shaft; and
- a fixed stopper fixedly connected to said vehicle body and having one end portion located on the rotational locus of said cam portion, whereby contact between said rotational and fixed stoppers determines the full opening state of said triangular window.

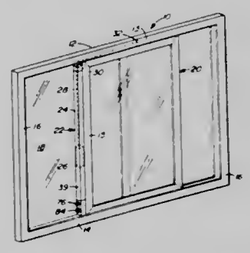
4,891,910
APPARATUS FOR SEALING A DOOR
Thomas G. Cook, Fairview, and Conrad J. Geibel, Jr., Erie, both of Pa., assignors to American Sterilizer Company, Erie, Pa.
Filed Dec. 30, 1988, Ser. No. 292,280
Int. Cl.[4] E05C *9/00*
U.S. Cl. 49—395 **6 Claims**

1. Apparatus for sealing the door of a chamber, the chamber being of the type wherein the door is urged into engagement with the chamber upon rotation of a locking wheel, the chamber further having a seal positioned between the door and the chamber such that upon movement of the door toward the chamber the seal is compressed, said apparatus comprising:
- motor means for providing torque to the locking wheel for urging the door toward the chamber;
- means for supplying current to said motor means; and



- means for monitoring the current supplied to said motor means to determine if a desired degree of pressure between the chamber and the seal has been achieved based on the amount of current drawn by said motor means,
- said means for supplying current being responsive to said means for monitoring so as to end the supply of current to said motor means when said desired degree of pressure between the chamber and the seal is achieved.

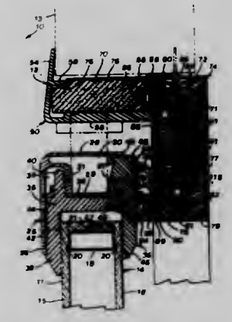
4,891,911
SLIDING DOOR CLOSING DEVICE
Victor J. L. Yung, 834 September Dr., Cupertino, Calif. 95014
Filed Mar. 17, 1989, Ser. No. 325,196
Int. Cl.[4] E05D *15/06*; E05F *1/00*
U.S. Cl. 49—404 **9 Claims**



1. An automatic closing device for a sliding door having upper and lower horizontal frame members interconnected by vertical frame members and supported between upper and lower track members, said closing device comprising:
- an elongated tubular member;
- a counterweight movable within said tubular member and forming a variable air chamber below the counterweight as it moves within the tubular member;
- sealing means on said counterweight for preventing any bypassing of air as said counterweight moves within said tubular member said sealing means comprising a pair of spaced apart gasket members fixed to at least one end of said counterweight;
- a flexible cable attached at one end of said counterweight and having an opposite end adapted to be anchored to said upper track member at a preselected location;
- an upper end element in said tubular member including a pulley wheel for supporting said cable between its ends;

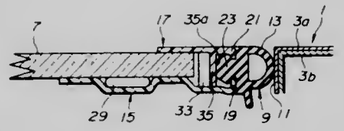
a lower end element in said tubular member forming an air tight seal therewith;
check valve means on said lower end element for allowing outside air to flow into said chamber within said tubular member while preventing air flow out of said chamber;
bleed valve means on said lower element for allowing air to flow out of said chamber at a restricted rate so as to control the downward travel of said counterweight within said tubular member when said door is closed.

4,891,912
REFRIGERATOR DOOR ASSEMBLY WITH MULTIPLE GASKET SEALING ARRANGEMENT
Gerald J. Bockwinkel, Mundelein, Ill., assignor to Ardco, Inc., Chicago, Ill.
Division of Ser. No. 70,362, Jul. 7, 1987. This application Jan. 17, 1989, Ser. No. 297,340
Int. Cl.[4] E06B 7/16
U.S. Cl. 49—484 **4 Claims**



1. A refrigerator door assembly mountable in an opening in the wall of a refrigerator cabinet comprising
a door mounting frame,
at least one insulated door mounted on said frame for pivotable movement between open and closed positions relative to said mounting frame, said door including an insulated glass unit having a plurality of glass panes mounted in spaced apart relation to each other with an air insulating space therebetween,
means on said door and mounting frame for defining a pair of parallel, spaced-apart gasket seals between said door and mounting frame when said door is in a closed position, said gasket seals defining means including first and second gaskets mounted on one of said door and mounting frame and means defining respective sealing surfaces on the other of said door and mounting frame for engagement by said first and second gaskets when said door is in a closed position, and
said first gasket being a magnetic gasket and said second gasket being a compression gasket, said compression gasket being disposed in outwardly spaced relation to said magnetic gasket when said door is in a closed position for blocking communication of ambient air to said magnetic gasket when said door is in a closed position.

4,891,913
WEATHER STRIP STRUCTURE FOR USE WITH SUN ROOF
Ryoji Shimura, and Jun Takahashi, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan
Filed Jul. 14, 1988, Ser. No. 218,862
Claims priority, application Japan, Jul. 17, 1987, 62-109116[U]
Int. Cl.[4] E06B 7/16
U.S. Cl. 49—493 **6 Claims**

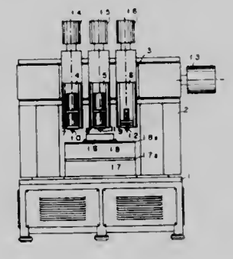


1. In a sun roof construction including a sun roof opening bounded by a peripheral edge of a roof panel, and a lid movable relative to said roof panel and slidable into its closed position wherein said lid is received in said sun roof opening having a peripheral edge portion thereof mated with said peripheral edge of said roof panel.
a weather strip structure comprising:
a holding structure including one part which is secured to the peripheral edge portion of the lid and the other part which has first and second engaging portions which are directed toward each other, said first and second engaging portions constituting first and second supporting edges respectively; and
a weather strip including a solid base portion and an outwardly protruded lip portion, said solid portion having at its upper and lower portions first and second engaged portions, said first and second engaged portions constituting first and second slits respectively such that said first and second supporting edges are tightly received in said first and second slits respectively,
wherein said holding structure holds said weather strip having said first and second engaging portions latchingly mated with said first and second engaged portions,
said holding structure comprising:
a first supporting member bonded to a lower peripheral surface of said lid, said first supporting member having a part by which said first supporting edge is defined;
a second supporting member placed on an upper peripheral surface of said lid, said second supporting member having a part by which said second supporting edge is defined; and
means for integrally connecting said first and second supporting members.

4,891,914
COMPUTER CONTROLLED UNIVERSAL GRINDER AND METHOD FOR GRINDING TROCHOIDAL AND CIRCULAR BEARING RACES
Michel A. Pierrat, 277 Forrest La., Boulder, Colo. 80302
Continuation of Ser. No. 176,846, Apr. 4, 1988, abandoned. This application Jun. 19, 1989, Ser. No. 368,912
Int. Cl.[4] B25B 5/00
U.S. Cl. 51—105 R **8 Claims**

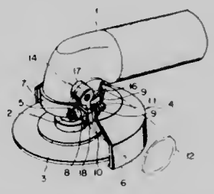
5. A machine for grinding a machine blank into a finished part having a plurality of machined surfaces, said part including a hypotrochoidal bearing race for use in a speed change device in which a rotor having an epitrochoidal outer circumference is mounted on an eccentric mounted for orbital rotation within said hypotrochoidal race and is separated therefrom by a plurality of spaced rollers in engagement both with said hypotrochoidal bearing race and said epitrochoidal surface, including

a first rotary table,
first drive means for rotating said first table,
a second rotary table,
means supporting said second table on a surface of said first table,
second drive means for rotating said second table relative to said first table,
said second drive means including means for rotating said second table in a direction opposite from the direction of rotation of said first table,



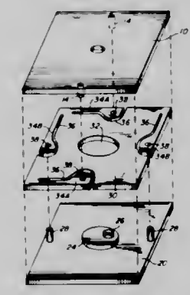
a grinding spindle,
means for adjusting the relative positions of said spindle and said first and second tables in two directions third drive means for rotating said spindle,
a grinding wheel,
said grinding wheel having a diameter approximately equal to the diameter of one of said rollers,
means for securing said grinding wheel to said spindle, and
means for securing said blank to said second table in a position to be finished by said grinding wheel.

4,891,915
DISK GRINDER
Shigeru Yasuda, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Nov. 8, 1988, Ser. No. 268,841
Claims priority, application Japan, Nov. 11, 1987, 62-172168[U]
Int. Cl.[4] B24B 23/02
U.S. Cl. 51—170 T **2 Claims**



1. A disk grinder wherein a grinding wheel and a wheel guard for surrounding a part of the grinding wheel are provided for a tip end portion of a handle, said disk grinder comprising:
fixing means for fixing said wheel guard to the tip end portion of said handle,
a subhandle-fitting tool which can be fixed to the tip end portion of said handle together with said wheel guard, by said fixing means; and
a subhandle which is attachable/detachable from said subhandle-fitting tool,
said subhandle-fitting tool including a leg portion attachable to said fixing means;
said fixing means including a ring-shaped band which has at least one split section and is fitted around the tip end portion of said handle, and a pair of projections adjustably extending from the split section outwardly in a radial direction, and bolt means for fastening said pair of projections together, and
said leg portion of said subhandle-fitting tool being engaged with inner side surfaces of said pair of projections and held by them, when said subhandle-fitting tool is fixed by said fixing means.

4,891,916
OSCILLATORY OR TRANSLATIONAL TABLE FOR MACHINE TOOLS
Lawrence J. Rhoades, Pittsburg, and William D. Jenkins, North Huntingdon, both of Pa., assignors to Extrude Hone Corporation, Irwin, Pa.
Continuation-in-part of Ser. No. 107,306, Oct. 13, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 265,935
Int. Cl.[4] B24B 47/02
U.S. Cl. 51—230 **6 Claims**



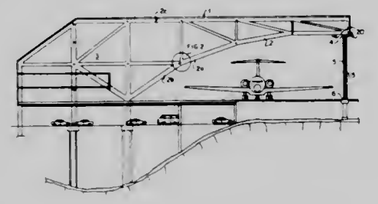
1. An orbital table assembly having a top plate which can be made to translate about an axis without rotating, comprising a fixed base member, a top plate over said fixed base member, a linkage member interposed between said base member and said top plate, a rotatable cam member rotatably secured to said top plate such that rotation of said cam member will cause said top plate to orbit in a translational path offset from the axis of translation, means for rotating said cam member, a first set of parallel deflecting arms, one end of which are connected to said linkage member and the other end connected to said base member at a point opposed on either side of the axis of translation, a second set of parallel deflecting arms perpendicular to said first pair of deflecting arms with one end thereof connected to said linkage member and the other end connected to said top plate at a point opposed on either side of the axis of translation, each pair of said deflecting arms oriented in a plane perpendicular to the axis of translation and aligned transversely to said axis, said deflecting arms thus preventing rotation of said top plate but eflecting to permit the translational motion thereof.

4,891,917
DEVICE IN A BUILDING STRUCTURE
Arne M. Lerstol, Vaekeroveien 185 B, N-0751 Oslo 7, Norway
PCT No. PCT/NO88/00014, § 371 Date Oct. 17, 1988, § 102(e) Date Oct. 17, 1988, PCT Pub. No. WO88/06663, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 18, 1988, Ser. No. 264,274
Claims priority, application Norway, Feb. 24, 1987, 870763
Int. Cl.[4] E04B 1/34, 1/32
U.S. Cl. 52—1 **19 Claims**

1. Device for use in a building structure having a supporting structure of connected supporting members subject to defor-

mation from an initial position due to its own weight and/or varying external forces comprising:

at least one force applying means operatively mounted on





said supporting structure for displacing at least one of said supporting members with respect to at least one adjacent supporting member after deformation to restore the supporting structure to the initial position.

4,891,918

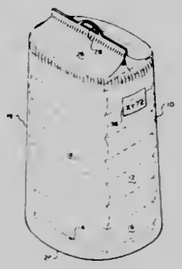
COTTON BALE STORAGE

Jack A. Wiley, Lubbock, Tex., assignor to Lov-Cot Industries, Incorporated, Lovington, N. Mex.

Filed Nov. 16, 1987, Ser. No. 121,234

Int. Cl.[4] B65D *71/00*

U.S. Cl. 52—3 **12 Claims**



1. A storage yard comprising:

a. a plurality of rows of cotton bales upon the ground,

b. each bale having four sides, a top, and a bottom,

c. each bale standing erect and spaced apart from the bales on either side thereof.

d. each bale having a stiff, tough, flexible, fireproof, water repellant cover over said bale, and

e. an indicia on the cover identifying the bale.

4,891,919

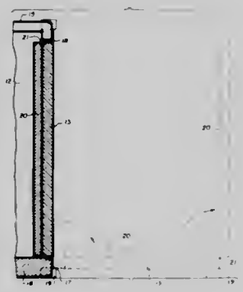
CONTAINERIZED TRANSPORTABLE HOUSE

James W. Palibroda, 221-5th Street, Prince Rupert, British Columbia, Canada V8J 3T2

Continuation-in-part of Ser. No. 940,529, Dec. 10, 1986. This application Apr. 15, 1988, Ser. No. 181,990

Int. Cl.[4] E04H *1/00, 14/00*

U.S. Cl. 52—79.5 **7 Claims**



1. A containerized house comprising, in combination:

a transportable container having the size and shape of a standard cargo shipping container, said container providing the support structure of said house and having a rectangular box-like frame;

first and second longitudinal side walls mounted by hinges along first and second bottom longitudinal side edges, respectively of said frame;

first and second end walls fixedly mounted to said frame;

top and bottom sections fixedly mounted to said frame, said top section forming part of a second floor plan of said house and said bottom section forming with said first and second longitudinal side walls, when opened, a first floor plan of said house;

first and second inner longitudinal side panels mounted by hinges along first and second top longitudinal side edges of said first and second side walls, respectively, said panels forming, when opened and erected, front and rear walls of said house; and

a plurality of composite panels stored in said container to form end wall sections, second floor sections, internal walls and roof sections of said house to create a fully enclosed living space.

4,891,920

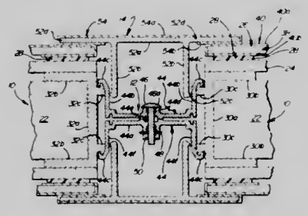
ACOUSTICAL WALL PANEL

Robert D. Pingston, Brighton, Mich., assignor to N.A.I. Acoustical Interiors, Inc., Warren, Mich.

Filed May 4, 1988, Ser. No. 190,142

Int. Cl.[4] E04B *1/84, 1/343*

U.S. Cl. 52—145 **16 Claims**



1. An acoustical wall panel assembly comprising:

(A) a plurality of vertical acoustical wall panels with each panel including

(1) a rigid rectangular hollow frame having spaced parallel left and right vertical members and spaced parallel upper and lower horizontal members,

(2) an acoustical core panel fixedly secured within said frame, and

(3) a decorative panel having the same nominal dimensions as said frame and positioned adjacent said frame;

(B) means mounting said vertical wall panels in side-by-side relation with a vertically extending later space between the left vertical frame member of one panel and the right vertical frame member of the adjacent panel; and

(C) a plurality of cover panels sized to cover said vertically extending lateral spaces and each having means extending into a respective vertically extending lateral space to secure said cover panel in vertical relation between a respective pair of wall panels and having flange portions along the respective vertical edges thereof arranged in overlying relation to the adjacent vertical edge portions of the decorative panels of the respective pair of wall panels to maintain said decorative panels positioned against the vertical frame members of the respective pair of wall panels.

4,891,921

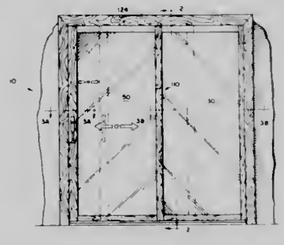
SLIDING DOOR ASSEMBLY WITH WEATHER SEAL STRUCTURE

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Mar. 30, 1987, Ser. No. 31,536

Int. Cl.[4] E04B *65/08;* **E05C** *9/12*

U.S. Cl. 52—207 **23 Claims**



1. A sliding door assembly comprising:

a frame having two vertical jambs, a head jamb, and a sill;

at least one fixed glass door panel mounted in said frame;

at least one slidable glass door panel mounted movably in said frame, said door panel having a closure edge;

means for weather sealing the sliding glass door panel around a substantial portion of the perimeter thereof; and

locking means for said sliding glass door panel for locking same at three points, in a completely closed position as well as one point in a partially open position, said locking means including a primary dual lock having spaced apart, opposed locking pins protruding through the closure edge of the door panel and movable toward and away from one another in associated locking pin receiving openings in the associated vertical jamb of the door frame to lock and unlock the door, and at least one guide pin protruding from the closure edge of the door panel adjacent at least one of the locking pins and in alignment with a guide opening in the associated vertical jamb of the door frame to align and guide the locking pin into proper operative relationship with the locking pin receiving openings.

4,891,922

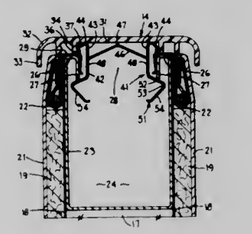
TOP CAP FOR PANEL

James S. Hozer, Muskegon, and Robert L. Gonder, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Dec. 23, 1988, Ser. No. 290,241

Int. Cl.[4] A47G *5/00;* **E04F** *19/06*

U.S. Cl. 52—239 **8 Claims**



1. In an upright space-dividing wall assembly including an upright panel having an upwardly-opening top channel extending longitudinally along an upper edge thereof, a horizontally elongated top cap releasably mounted on the upper edge of said panel for closing off said top channel, and a resilient retainer coacting between said top cap and said panel for releasably securing said top cap to said panel, the improvement comprising:

said top channel having top flanges which extend longitudinally therealong and which project inwardly toward one another from opposite sides thereof;

said top cap having a pair of sidewardly-spaced support ribs projecting downwardly therefrom and extending longitudinally therealong, each said support rib defining therein a retaining channel which opens sidewardly toward the other support rib; and

said retainer including (1) a sidewardly-spaced pair of upwardly cantilevered spring legs which at their upper free ends terminate in sidewardly-directed retaining flanges which engage within the respective retaining channels, (2) an upwardly-arched spring part joined between said upwardly cantilevered spring legs adjacent the lower ends thereof, said arched spring part having a middle part which is spaced upwardly from the lower ends of said upwardly cantilevered spring legs and which is normally positioned close to but spaced downwardly a small distance from an undersurface of said top cap, and (3) a sidewardly-spaced pair of downwardly cantilevered spring legs which project downwardly from said spring part and terminate in sidewardly outwardly projecting camming flanges which resiliently project under the top flanges of said top channel.

4,891,923

BUILDING STRUCTURE

Karl-Gustav Ericsson, Råbbmogatan 40, S-865 00 Alno, and Bertil Ericsson, Västergatan 13, S-852 49 Sundsvall, both of Sweden

PCT No. PCT/SE86/00457, § 371 Date Jun. 7, 1988, § 102(e) Date Jun. 7, 1988, PCT Pub. No. WO88/02801, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 8, 1986, Ser. No. 205,329

Claims priority, application Sweden, Apr. 10, 1985, 8501745; Jul. 17, 1985, 8503500

Int. Cl.[4] E04B *1/343, 5/48;* **E04C** *2/46*

U.S. Cl. 52—280 **5 Claims**

1. A building structure comprising:

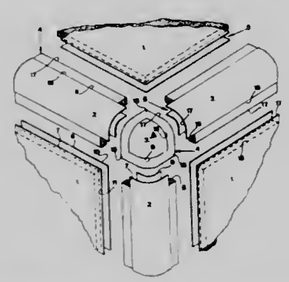
interconnectable structural building elements (1, 2, 3) formed by two rigid surface layers (6, 7) and a continuous insulating layer (8) located therebetween,

said continuous layer (8) in one of said structural building

elements (1, 2, 3) being directly adjacent to the continuous insulating layer (8) in an adjacent structural building element (1, 2, 3), so that a substantially continuous insulating layer (8) is formed in the building structure,

said structural elements (1, 2, 3) comprising for the interconnection, female and male edge portions (4, 5) for engagement with the adjacent structural building elements (1, 2, 3), said male edge portions (4) being formed by the continuous insulating layer (8) and the two rigid surface layers (6, 7), whereas the female edge portions (5) are formed by the two rigid surface layers (6, 7),

the two rigid surface layers (6, 7) including a step (9) arranged on their external surfaces (10, 11) extending away from the insulating layer (8) adjacent the male edge portions (4), said steps (9) being so arranged and adapted that the rigid surface layers (6, 7) of the female edge portions (5) lie closely adjacent to the rigid surface layers (6, 7) of the male edge portions and to the step (9) and form a substantially flat surface, at least on external surfces of the building structure facing away from the insulating layer,



in the transitions between the adjacent structural building elements (1, 2, 3),

the structural building elements (1, 2, 3) being of three different shape types, namely a first type of flat structural building elements (1), a second type of structural building elements (2) forming a portion of an envelope surface of a tube, and a third type of structural building elements (3) forming a portion of a hollow sphere, and

said third building element (3) comprising three corner regions (15), between which it engages with the second building elements (2) by means of said male and female edge portions (4, 5), said third building element (3) also engaging in the corner regions (15) thereof with the first building elements (1) by means of said male and female edge portions (4, 5);

the third building element (3) having male edge portions (4) extending entirely around its circumference and these male edge portions being received between female edge portions of the first building elements (1) in the corner regions (15) of the third building element (3).

4,891,924

CLADDING ASSEMBLY

Derrick B. Rose, Waterloo Cottage, Pen-y-Pound, Abergavenny, Gwent, NP7 7RN, United Kingdom

Filed Sep. 14, 1988, Ser. No. 244,418
Int. Cl.[4] E04D *3/362, 3/30*
U.S. Cl. 52—520 **6 Claims**



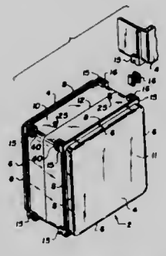
1. A cladding assembly comprising a plurality of cladding elements and a plurality of supports therefor; wherein each cladding element has a first hook formation at a first edge region, and a second hook formation at a second, opposite edge region, the first and second hook formations being oppositely directed; and each support is adapted to be mounted to a batten of quadrilateral section, each support having three flanges in a stepped array comprising (a) a first flange for overlying an outer surface of the batten, (b) a second flange extending inwardly from the first flange, and (c) a third flange extending from the inner end of the second flange, said first and second flanges being arranged to engage said batten and provide an attachment portion whereby the support is attachable to the batten of a structure to be clad; said support further including a tongue extending from adjacent the junction of the first and second flanges towards the third flange at an angle to the second flange, said tongue providing engagement means for engaging a mutually adjacent pair of first and second hook formations provided by an adjacent pair of cladding elements which extend away from the support in opposite senses, the engagement means acting to restrain their disengagement; the outer surfaces of said first and third flanges of the support providing support means for supporting the adjacent edge regions of the pair of cladding elements; and wherein each support extends in use for at least a substantial part of the width of a cladding element and provides support for both of the adjacent pair of cladding elements over at least a substantial part of the width of each.

4,891,925

INTERCONNECTED CONSTRUCTION BLOCKS

Marlon Carlson, 13544 16th Avenue, Surrey, British Columbia, Canada V4A 1P5, and Julian Carlson, 13176 - 22A Avenue, White Rock, British Columbia, Canada

Filed Oct. 11, 1988, Ser. No. 255,211
Int. Cl.[4] E04C *1/30*
U.S. Cl. 52—585 **7 Claims**



1. A construction block comprising a generally rectangular hollow body having a pair of faces joined by side edges;

spacing flanges extending about said side edges adjacent and essentially parallel to said faces to ensure correct spacing of said blocks when arranged in a wall construction;

cavities for connecting adjacent blocks together at each corner of said block having a T-shaped cross-section; and

connecting means comprising a spanning member having correspondingly shaped T-ends adapted for engagement in said cavities of adjacent blocks in order to connect said blocks into a unified wall structure;

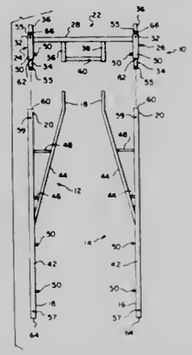
4,891,926

WALK-THROUGH SCAFFOLDING CONSTRUCTION

Dwight Allenbaugh, 7520 Monroe St., Paramount, Calif. 90723

Filed Jan. 12, 1989, Ser. No. 295,983
Int. Cl.[4] E04G *1/14*
U.S. Cl. 52—637 **15 Claims**

8. An improved modular walk-through scaffold section assembly comprising a pair of upright support members laterally spaced from each other and each terminating at its lower extremity in a single vertically disposed tubular leg and at its upper extremity in a pair of laterally spaced, upright inner and outer tubular connecting posts, and a removable crosspiece having a transverse bar member extending between all of said connecting posts, downwardly depending tubular coupling



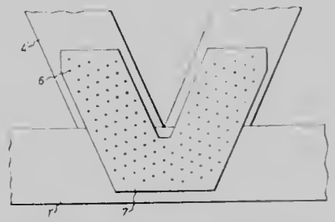
members rigidly joined to said transverse bar member and telescopically engageable with said connecting posts of said upright support members, and upwardly extending tubular coupling members adapted for telescopic engagement with a leg of another modular, walk-through scaffold section assembly located vertically thereabove.

4,891,927

JOINT FOR CONNECTING WOODEN BEAMS TO EACH OTHER, AND THE USE OF THE JOINT IN ROOF TRUSS STRUCTURES

Matti O. Kairi, Hormajärvi, and Markku S. Lehtonen, Routio, both of Finland, assignors to Metsaliiton Teollisuus OY, Espoo, Finland

Continuation of Ser. No. 85,318, Aug. 12, 1987, abandoned, which is a continuation of Ser. No. 657,145, Oct. 3, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 275,678
Claims priority, application Finland, Oct. 7, 1983, 833655
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—642 **3 Claims**



1. In a truss which includes a plurality of layers of beams juxtaposed facewise against one another in a transverse direction of the truss, said plurality of layers including a first layer of wooden beams and a second layer of wooden beams juxtaposed facewise against one another so that each of said first and second layers has an inner surface with faces towards and is juxtaposed with a respective other of said second and first layers, and each of said first and second layers has an outer surface which faces away from a respective other of said second and first layers, said inner surfaces extending in respective planes which are longitudinal to said longitudinal direction of said truss, and said beams having edge surfaces which bound and extend between said outer and inner surfaces, said edges therefore extending in said transverse direction of said truss,

a joint assembly, comprising:

at least two beams in said first layer meeting at a first intersection;

at least two beams in said second layer meeting at a second intersection corresponding to said first intersection;

recess means formed in said inner surface of said at least two beams in at least one of said first and second layer so as to traverse at least one of said first and second intersections, said recess means terminating short of all of said edges except ones hidden by intersection with others of said edge surfaces in said first and second intersections, and said outer surfaces of said beams in said first and second layers being imperforate throughout where they are disposed in registry with said recess means, in the longitudinal direction of said truss, so that said recess is substantially hidden from view externally of said truss;

a substantially imperforate unitary joint having two opposite faces bounded by and edge;

a plurality of nails having inner ends secured on said plate on opposite sides thereof, so that the nails project outwards from the two opposite faces in the transverse direction of the truss, the nails having free outer ends;

said unitary joint plate being located substantially entirely within said recess means, said inner surfaces of said first and second layers of beams engaging one another facewise substantially completely about the outer periphery of said unitary joint plate, and said nails piercing into corresponding beams of said first and second layers and thereby holding said first and second layers together at said joint, said outer ends of said nails being disposed within corresponding ones of said beams and therefore terminating short of said outer surfaces of corresponding ones of said beams;

said nails being distributed with generally uniform spacing about substantially all of the opposite sides of said unitary joint plate; and

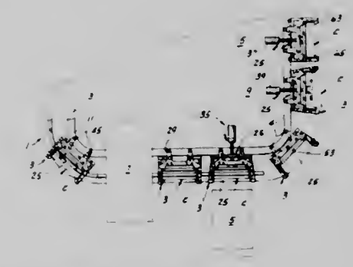
said unitary joint plate and nails providing substantially a sole mechanical means fastening said first and second layers of beams together, and respective intersecting beams in each of said first and second intersections of said first and second layers.

4,891,928

CARTON LOADING MACHINE

Robert C. James; Lloyd Kovacs, and Matthew R. Lind, all of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Sep. 14, 1988, Ser. No. 244,717
Int. Cl.[4] B65B *43/52*
U.S. Cl. 53—250 **14 Claims**



1. Carton loading apparatus comprising

an endless carton conveyor,

a series of holders carried by the conveyor each adapted to hold an erected carton in upright position,

the conveyor being movable to move each holder from a

carton receiving station for entry of an erected carton in the holder from the outside of the conveyor to a loading station for loading the carton and thence to a discharge station for discharge of the loaded carton,

each holder being open at the outside thereof for entry of an erected carton in the holder at the carton receiving station from the outside of the conveyor, and having carton-retaining means at the sides thereof movable relative to the holder between an open position for entry of an erected carton in the holder at the carton-receiving station and discharge of a loaded carton at the discharge station and a closed position for retaining the carton in the holder,

means for effecting opening of the carton-retaining means of each holder for entry of a carton in the holder at the carton receiving station and discharge of a loaded carton at the discharge station and closing of the carton-retaining means to retain a carton in the holder as it progresses from the carton receiving station to the carton loading station and thence to the discharge station,

each holder having a back and sides extending outwardly from the conveyor, one of said sides being fixed relative to the back, and

said carton-retaining means comprising a first latch member associated with said fixed side movable relative to said fixed side between a retracted open position with respect to said fixed side for entry of a carton in and discharge of a carton from the holder and a closed position with respect to said fixed side for retaining a carton in the holder, and a second latch member associated with the other side.

4,891,929

METHOD FOR THE PRODUCTION OF PRISMATIC CONTAINERS WITH PLANE GABLE SURFACES WITHOUT ANY LATERAL EARS

Franca Branchi, Parma, Italy, assignor to Italpack S.p.A., Mercogliano, Italy

Continuation of Ser. No. 44,025, Jun. 4, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 282,904
Claims priority, application Italy, Aug. 13, 1985, 4840 A/85
Int. Cl.[4] B65B *9/12;* **B65D** *75/48*
U.S. Cl. 53—451 **2 Claims**



1. A method for the production of prismatic containers having closure surfaces in the form of adjoining gable surfaces terminating in transverse sealing strips comprising the steps of:

filling completely a tube of continuous material with a liquid to provide a certain hydrostatic pressure within said tube;

continuously feeding the filled tube of continuous material;

pressing opposing lateral regions of the filled tube, which are to be connected by a transverse sealing strip, inwardly toward one another;

subsequently actuating transverse flattening members which press the gable surfaces together; and

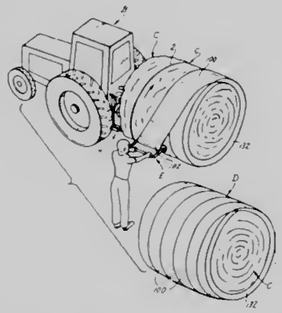
sealing the gable surfaces together to form said transverse sealing strip and complete production of one of said prismatic containers, while simultaneously maintaining said certain hydrostatic pressure in said tube, so as to prevent an air cushion from forming inside said filled tube as said transverse flattening members are actuated, said one prismatic container being free of any lateral projections therefrom in the region of said sealing strip.

4,891,930

APPARATUS AND PROCESS FOR APPLYING A COVER, TO A ROUND HAY BALE

Alan W. Schaefer, Box A, Bloomsdale, Mo. 63627

Filed Apr. 4, 1988, Ser. No. 177,169
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—587 **3 Claims**



1. An apparatus for use in connection with a transport vehicle for applying a cover to a round bale of hay, said apparatus comprising: a frame configured to be attached to the transport vehicle; a spear shaft carried by and projecting from the frame far enough to project axially a substantial distance into the bale; turning means carried by the frame for imparting rotation to the bale when the bale is on the spear shaft; a track supported on the frame generally parallel to the spear shaft; a carriage movable along the track; a dispenser attached to the carriage such that it can translate to and fro relative to the carriage in a direction parallel to the track, the length of the dispenser being substantially less than the axial dimension of the bale on the spear shaft, the length of the track and the translation of the dispenser relative the carriage that is on the track being of a magnitude great enough to enable the dispenser to project beyond each end of the bale on the spear shaft; and a roll of flexible strip material held by the dispenser such that the roll can rotate to enable the strip material to pay off of it and wrap around the bale as the turning means rotates the bale, the flexible strip material having a width substantially less than the axial dimension of the bale.

4,891,931

WEED CUTTER WHEEL KIT

Paul W. Holland, Rte. 4, 18 Centark Cir., Alexander, Ark. 72002

Filed Oct. 7, 1988, Ser. No. 254,859
Int. Cl.[4] A01D *34/67*
U.S. Cl. 56—16.7 **3 Claims**

1. An apparatus for attachment to a line trimmer having a shaft portion and a head portion comprising:

wheel means including an axle;

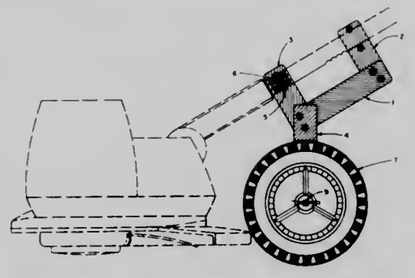
a first U-shaped bracket having a base and legs with apertures, said first bracket inverted for insertion of said axle to elevate said bracket above a surface;

a second U-shaped bracket having a base and legs attached to said first U-shaped bracket with the bases of each bracket in abutting relation;

a first support member having ends, attached at one end to one leg of said second U-shaped bracket and at the other end of said line trimmer shaft portion by fastening means, said first support member angularly positioned on said second U-shaped bracket leg to orient said line trimmer head portion predetermined direction;

a second support member having ends, attached at one end of said line trimmer shaft portion by fastening means and at the other end to one end of strut means in perpendicular relation;

said strut means being angularly attached at an other end to



the other leg of said second U-shaped bracket and said strut means, parallel to said line trimmer shaft portion;

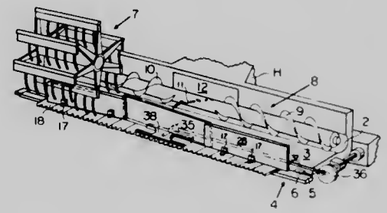
said wheel means, brackets, support members, and strut means elevating said line trimmer head portion to a height sufficient to carry out trimming.

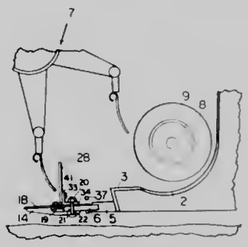
4,891,932

GRAIN-SAVER DAM FOR COMBINE CUTTER BAR

William A. Johnson, 12406 Taylorsville Rd., Jeffersontown, Ky. 40299

Filed Jun. 19, 1989, Ser. No. 368,259
Int. Cl.[4] A01D *55/02, 55/26*
U.S. Cl. 56—158 **7 Claims**





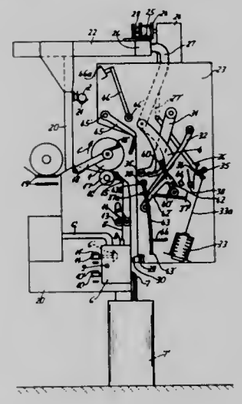
1. For use with a combine harvesting machine, having a cutter bar, including a reciprocating sickle bar, a dam, having an upstanding body portion, extending vertically to a height in the range of 2 to 4 inches and mounted on said cutter bar, behind said reciprocating sickle bar and extending across the long axis of said cutter bar.

4,891,933

METHOD AND APPARATUS FOR THE RAPID REESTABLISHMENT OF OPERATION OF A TEXTILE SPINNING MACHINE

Hans Raasch, Monchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,955
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801965
Int. Cl.[4] D01H *9/10, 9/18, 15/02;* **B65H** *54/02*
U.S. Cl. 57—269 **6 Claims**



1. A method for reestablishing the spinning operation of an open-end spinning machine following completion of spinning of a full package, wherein the spinning machine has a plurality of spinning stations at which yarn is spun using spinning elements and has a traveling service unit that includes devices for automatically forming a yarn reserve on a projecting end of the package, removing the package, placing an empty tube in position for winding yarn thereon and restarting spinning of yarn from the spinning element onto the empty tube, said method comprising:

forming a yarn reserve on a projecting end of a full package;

removing the full package with the yarn reserve thereon;

placing an empty tube in position for winding; and

during said reserve forming, package removing and tube placing

preparing and end of auxiliary yarn for restart feeding to the spinning element;

feeding the end of auxiliary yarn to the spinning element to restart spinning and withdrawing restarted yarn from the spinning element; and

engaging the restarted yarn on the empty tube to reestablish the spinning operation.

4,891,934

OIL SYSTEM FOR GAS TURBINE ENGINE

David S. Huelster, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1988, Ser. No. 264,575
Int. Cl.[4] F02C *7/06*
U.S. Cl. 60—39.08 **4 Claims**

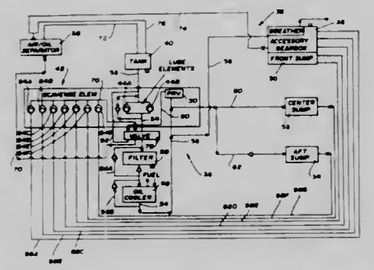
1. A gas turbine engine oil system comprising:

a supply circuit including a reservoir and an engine driven main pump having an inlet connected to said reservoir and a discharge connected to a nozzle in a sump of said gas turbine engine,

said supply circuit having a volume of residence oil between said main pump discharge and said nozzle when said main pump is operating,

a scavenge circuit including an engine driven scavenge pump having an inlet connected to said sump and a discharge connected to said reservoir, and

a distributor valve disposed in said supply circuit and in said scavenge circuit operative in response to oil pressure between said main pump discharge and said nozzle below



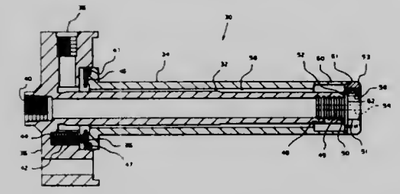
a predetermined threshold magnitude to disconnect said main pump discharge from said supply circuit and to connect said scavenge pump discharge to said supply circuit whereby said residence volume of oil in said supply circuit is recirculated from said sump to said nozzle by said scavenge pump.

4,891,935

FUEL NOZZLE ASSEMBLY FOR A GAS TURBINE ENGINE

Leroy D. McLaurin, Winter Springs, Fla., and David Y. K. Toy, East Brunswick, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 111,890, Oct. 23, 1987, abandoned. This application May 26, 1989, Ser. No. 357,698
Int. Cl.[4] F02C *7/22*
U.S. Cl. 60—39.37 **16 Claims**



1. A fuel nozzle assembly for a gas turbine engine comprising:

a fuel delivery tub having a delivery end and fuel inlet means at an opposite end;

a support flange attached to said fuel delivery tube generally adjacent said fuel inlet means;

an air delivery tube having an end, said air delivery tube substantially enclosing said fuel delivery tube, said air delivery tube extending axially from said support flange in spaced relation to said fuel delivery tube to define an annular air chamber between said tubes for delivery of air to said end of said air delivery tube;

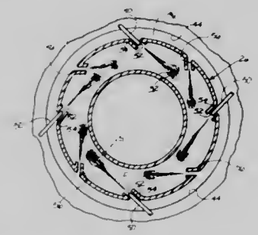
engaging means comprising an integral fuel nozzle/end cap having a fuel nozzle portion and an end cap portion, said fuel nozzle portion attached to said delivery end of said fuel delivery tube and said end cap portion engaging the end of said air delivery tube, said end cap portion extending axially past said air delivery tube end and having a lip which engages said end, said lip and said end forming a seal positioned axially between said air delivery tube and said end cap portion.

4,891,936

TURBINE COMBUSTOR WITH TANGENTIAL FUEL INJECTION AND BENDER JETS

Jack R. Shekleton, and Richard T. LeCren, both of San Diego, Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 28, 1987, Ser. No. 138,343
Int. Cl.[4] F23R *3/12, 3/54*
U.S. Cl. 60—39.36 **9 Claims**



1. A gas turbine comprising:

a rotor including compressor blades and turbine blades;

an inlet adjacent one side of said compressor blades;

a diffuser adjacent the other side of said compressor blades;

a nozzle adjacent said turbine blades for directing hot gasses at said turbine blades to cause rotation of said rotor; and

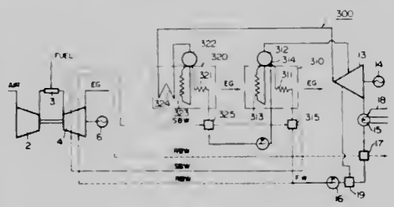
an annular combustor about said rotor and having an outlet connected to said nozzle and a primary combustion annulus remote from said outlet, a plurality of fuel injectors to said primary combustion annulus and being substantially equally angular spaced therearound and configured to inject fuel into said primary combustion annulus in a nominally tangential direction and at least an equal number of combustion supporting gas jets located about said primary combustion annulus in alternating relation with said fuel injectors, said jets being configured to introduce a combustion supporting gas into said primary combustion annulus in a nominally tangential direction, combustion supporting gas from said jets uniformly distributing burning fuel about said annulus to thereby enable the use of fewer fuel injectors while avoiding the presence of hot spots.

4,891,937

HEAT RECOVERY SYSTEM

Yoshiki Noguchi, and Youlchi Hattori, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,246
Claims priority, application Japan, Oct. 13, 1982, 57-178357
Int. Cl.[4] F02G *1/00*
U.S. Cl. 60—39.182 **13 Claims**



12. A heat recovery system associated with a gas turbine in

which stator blades thereof are cooled by a cooling medium, said system comprising:

high pressure boiler means for generating high pressure steam by exhaust heat energy from said gas turbine;

low pressure boiler means for generating low pressure steam by exhaust heat energy from said gas turbine;

a steam turbine driven by the steam from both of said boiler means;

means for condensing exhaust steam from said steam turbine into condensation;

means for supplying both of said boiler means with said condensation as feed water;

heat exchanger means provided upstream, respectively, of said high pressure boiler means and said low pressure boiler means with respect to a direction of flow of said condensation; and

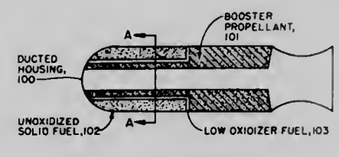
means for circulating the cooling medium from said gas turbine first through the heat exchanger means associated with said high pressure boiler means, then through the heat exchanger means associated with said low pressure boiler means, and finally through said stator blades.

4,891,938

SOLID FUEL BURN ENHANCER

Joseph G. Nagy, St. Louis County, and Daniel L. Jaspering, St. Charles, both of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 17, 1986, Ser. No. 840,619
Int. Cl.[4] F02K *9/12, 9/28*
U.S. Cl. 60—245 **3 Claims**



1. A solid fuel ramjet engine comprising:

a ducted housing having an air intake manifold at one end, and an exhaust nozzle at the other end;

a core of booster propellant housed in said ducted housing said core of booster propellant being an oxidized solid fuel core with a central passageway along the axis of the ducted housing which allows combustion to propel the ramjet engine to operational velocities;

a plurality of cores of unoxidized solid fuel which are fixed in said ducted housing and circumscribe said core of booster propellant, said plurality of cores of unoxidized fuel burning at a low burn rate to propel said ramjet engine once it has attained operational velocities; and

a plurality of inlays, each of which are embedded in said ducted housing between each of said cores of unoxidized solid fuel and said core of booster propellant, each of said inlays being composed of a low-oxidizer solid fuel which has a faster burn rate than that of the unoxidized solid fuel, said plurality of inlays thereby providing said ramjet engine with higher efficiency by having lower initial burn area requirements when said ramjet is operating at operational velocities, said ramjet engine subsequently burning with a lower burn rate when said inlays are consumed and said unoxidized solid fuel is being used.

4,891,939

SYSTEM FOR THE CRYOGENIC PROCESSING AND STORAGE OF COMBUSTION PRODUCTS OF HEAT ENGINES

Attilio Brighenti, Venice, Italy, assignor to Tecnomare S.p.A., Venice, Italy

Filed Nov. 28, 1988, Ser. No. 276,906
Claims priority, application Italy, Dec. 4, 1987, 22885 A/87
Int. Cl.[4] F02M *25/06*
U.S. Cl. 60—278 **4 Claims**



1. A system for processing and storing the combustion products of an engine comprising:

(a) first heat exchange means for cooling the combustion products of the engine;

(b) condensate separating means for receiving said cooled combustion products from the first heat exchange means and for separating condensed combustion products from non-condensed combustion products;

(c) mixing vessel means for receiving gaseous oxygen and a first portion of said non-condensed combustion products from said condensate separating means;

(d) dehydration means for receiving a second portion of said non-condensed combustion products from said condensate separating means and for removing liquids therefrom to thereby produce an anhydrous gas containing carbon dioxide;

(e) compressor means for compressing said anhydrous gas from said dehydration means;

(f) second heat exchange means for cooling said compressed anhydrous gas and providing a first and a second stream;

(g) cryogenic oxygen supply means for storing and maintaining oxygen in a liquid state at a substantially constant pressure;

(h) first liquefying/superheating means for receiving and cooling said first stream of said anhydrous gas to thereby condense at least a portion of said carbon dioxide from said second heat exchange means and for receiving liquid oxygen from said cryogenic oxygen supply means and heating the oxygen;

(i) first cryogenic carbon dioxide condensation/collection means for storing said anhydrous gas and condensed carbon dioxide at a substantially constant temperature and pressure;

(j) liquid oxygen circulation means through which said liquid oxygen circulates in a closed loop from said cryogenic oxygen supply means and back thereto comprising at least one liquid oxygen evaporation coil means located within said first cryogenic carbon dioxide condensation/-collection means;

(k) make-up oxygen control valve for receiving the gaseous oxygen from said first liquefying/superheating means and feeding said gaseous oxygen to said mixing vessel;

(l) cryogenic fuel supply means for storing and maintaining fuel in a liquid state at a substantially constant pressure;

(m) second liquefying/superheating means for receiving and cooling said second stream of said anhydrous gas to thereby condense at least a portion of said carbon dioxide from said second heat exchange means and for receiving liquid fuel from said cryogenic fuel supply means and heating the fuel;

(n) second cryogenic carbon dioxide condensation/collection means for storing liquid carbon dioxide obtained from

the second liquefying/superheating means at a substantially constant temperature and pressure; and

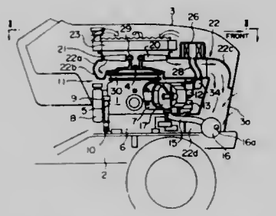
(o) liquid fuel circulation means through which said liquid fuel circulates in a closed loop from said cryogenic fuel supply means and back thereto comprising at least one liquefield fuel gas evaporator coil means located within said second cryogenic carbon dioxide condensation/collection means.

4,891,940

MUFFLER COOLING STRUCTURE FOR LIQUID-COOLED ENGINE SYSTEM

Shinichi Tamba, Kakogawa, and Hitomi Miyake, Miki, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 17, 1987, Ser. No. 122,013
Claims priority, application Japan, Nov. 20, 1986, 61-277932
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—320 **19 Claims**



1. A liquid-cooled engine system comprising:

a liquid-cooled engine arranged within an engine housing;

a radiator arranged within the engine housing, cooling liquid for said engine flowing through said radiator;

means for generating air flow passing through said radiator to cause the air flow to cool the cooling liquid flowing through said radiator;

duct means arranged within the engine housing, for guiding the air flow having passed through said radiator to the outside of the engine housing without exposure of the air flow to said engine; and

an exhaust muffler located in the vicinity of the bottom of said engine and connected to said engine, at least a part of said exhaust muffler being disposed within said duct means so that said exhaust muffler is cooled by at least a part of the air flow guided by said duct means.

4,891,941

FREE PISTON ENGINE-PUMP PROPULSION SYSTEM

Richard P. Heintz, 1841 Oakland Dr., Kalamazoo, Mich. 49008

Filed Aug. 1, 1988, Ser. No. 226,622
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—416 **2 Claims**

1. A stored energy vehicle propulsion system, comprising:

a prime mover comprising a double-acting free piston engine-pump having an output to which is supplied a pressurized hydraulic fluid;

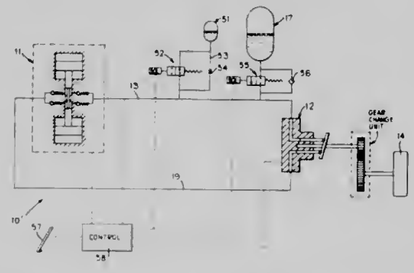
hydraulic motor means driven by said hydraulic fluid for effecting rotational driving of vehicle wheels;

passage means communicating between said engine-pump and said motor means for transmitting pressurized hydraulic fluid from said engine-pump to said motor means;

first pressure-type accumulator means connectable in fluid communication with said passage means for storing said hydraulic fluid therein at a relatively high pressure which approximately corresponds to the maximum operating pressure of said hydraulic motor means, said first accumulator means having a first capacity for said hydraulic fluid;

first valve means for controlling flow of hydraulic fluid between said first accumulator means and said passage means, said first valve means being normally maintained in a closed position preventing flow of pressurized hydraulic fluid from said first accumulator means into said passage means except when the pressure in said passage means is at a relatively high steady-state pressure and said motor means demands a sudden increase in pressure;

second accumulator means connectable to said passage means for storing a quantity of said hydraulic pressure fluid therein at a pressure level which normally approximately corresponds to the pressure level in said passage means, said second accumulator means having a capacity which is normally at least no more than one-tenth the capacity of said first accumulator means; and



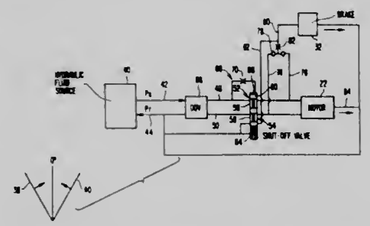
second valve means for controlling flow of hydraulic fluid between said second accumulator means and said passage means, said second valve means being normally maintained opened so as to cushion normal pressure variations of the hydraulic fluid within said passage means, said second valve means being closed in response to the pressure level demanded by the motor means exceeding the system pressure by a predetermined differential so as to isolate said second accumulator means from said passage means to permit rapid increase of pressure within said passage means.

4,891,942

HYDRAULICALLY POWERED ACTUATOR FOR MAINTAINING A MEMBER UNDER PRELOAD

Robert A. Schwarz, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 27, 1988, Ser. No. 211,974
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—436 **35 Claims**



1. A hydraulically powered drive unit for moving member into and away from a position at which the a member is under a preload comprising:

(a) a hydraulically powered motor coupled to the movable member, for moving the movable member to and from the position at which the member is preloaded;

(b) a source of pressurized hydraulic fluid coupled to the hydraulic motor for supplying power to the motor for moving the member;

(c) a brake, coupled to the movable member, for holding the movable member in the position at which the member is preloaded; and

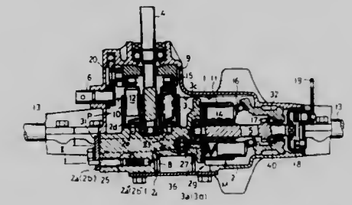
(d) hydraulic control means, coupled to the motor, the brake, and the source of pressurized hydraulic fluid which is responsive to pressure variations originating within the drive unit, to actuate the brake after the motor has moved the member to the position at which the member is preloaded and deactivates the motor while maintaining the member under preload.

4,891,943

AXLE DRIVING APPARATUS

Hideaki Okada, Takarazuka, Japan, assignor to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Feb. 1, 1989, Ser. No. 304,590
Claims priority, application Japan, Feb. 3, 1988, 63-24194
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—464 **7 Claims**



1. An axle driving apparatus which journals axles between an upper half casing and a lower half casing vertically divided and disposes a hydraulic pump connected in association with an engine and a hydraulic motor driven by oil pressure from said hydraulic pump and driving said axles within a casing formed by joining said upper half casing and lower half casing, characterized in that the pump mounting surface for said hydraulic pump is formed horizontally on the inner surface at the bottom of said lower half casing, the motor mounting surface for said hydraulic motor is formed on the side surface of a rising erected adjacently and perpendicularly to said pump mounting surface, and a pump shaft of said hyraulic pump is disposed vertically to said axles and a motor shaft of said hydraulic motor is disposed in parallel to said axles.

4,891,944

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Akihito Okuda; Yoshihiro Katagiri; Eiichiro Kawahara, and Kenichi Ikejiri, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,481
Claims priority, application Japan, Dec. 12, 1986, 61-296241
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—489 **12 Claims**

1. A hydraulically operated continuously variable transmission comprising:

a transmission case;

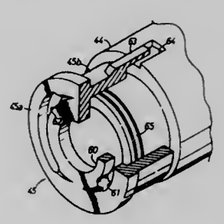
a fixed shaft mounted in said transmission case;

an output shaft rotatably supported in said transmission case;

a hydraulic motor coupled to said output shaft and having a motor cylinder and an annular array of slidable motor plungers disposed around an axis of rotation thereof and slidably disposed in respective cylinder holes defined in said motor cylinder, said hydraulic motor also having a distribution ring supported on said fixed shaft and rotatable relatively to and slidable against an end face of said motor cylinder for introducing high-pressure oil successively into said cylinder holes and discharging oil successively from said cylinder holes in response to rotation of said motor cylinder;

an input shaft rotatably supported in said transmission case;

a hydraulic pump coupled to said input shaft, at least one of said hydraulic pump and said hydraulic motor being of the variable-displacement type;



a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor; and

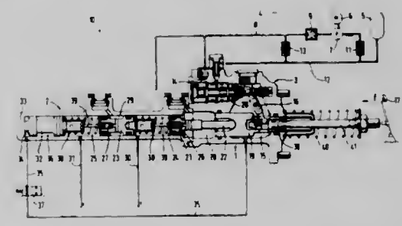
stop means holding said distribution ring in engagement with said fixed shaft for preventing said distribution ring from rotating with respect to said fixed shaft.

4,891,945

BOOST-FAILURE RESPONSIVE FLUID TAPPING VALVE IN TANDEM MASTER CYLINDER WITH BOOSTER PISTON AT PEDAL-REMOTE END OF MASTER CYLINDER

Horst-Peter Becker, Floersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 5, 1987, Ser. No. 81,872
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1986, 3627147
Int. Cl.[4] B60T *13/14*
U.S. Cl. 60—547.1 **7 Claims**



1. A brake pressure generator for a hydraulic brake system of automotive vehicles, said system comprising a master brake cylinder having a master cylinder piston and a working chamber for connection to a brake circuit, pedal actuating means adapted to act on the master cylinder piston and located at one end of the master cylinder, a hydraulic brake force booster having a booster chamber and a slideably disposed booster piston disposed in the opposite end of the master cylinder relative to the pedal actuating means with one operating surface of the booster piston being adjacent and directly confining the working chamber of the master cylinder, connecting means for connecting the booster chamber at the opposite end of said master cylinder to a hydraulic auxiliary pressure source, control valve means for controlling auxiliary pressure in the booster chamber, said pedal actuating means acting directly on the master cylinder piston upon the failure of auxiliary pressure and separately from the auxiliary pressure, and means to maintain pressure in the booster chamber to prevent displacement of said booster piston upon failure of auxiliary pressure,

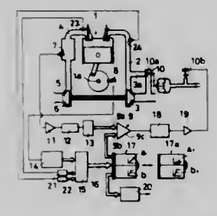
wherein said means to maintain pressure in the booster chamber includes a valve located between the connecting means and the booster chamber, said valve being normally open and being closeable upon failure of auxiliary pressure, said valve being controlled into its closing position upon decreasing of auxiliary pressure below the brake pressure in the master brake cylinder.

4,891,946

APPARATUS FOR CONTROL OF OPERATIONAL CHARACTERISTICS OF SUPERCHARGER IN INTERNAL COMBUSTION ENGINE

Kazuo Inoue, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 567,614, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 276,086, Jun. 22, 1981, abandoned. This application Jun. 25, 1985, Ser. No. 748,695
Claims priority, application Japan, Jun. 24, 1980, 55-84577
Int. Cl.⁴ F02B *37/12*
U.S. Cl. 60—602 **8 Claims**



1. An apparatus for controlling the operational characteristics of a supercharger in an internal combustion engine, the supercharger including a compressor, said apparatus comprising:

a pressure sensor positioned in an intake passage downstream of the compressor for detecting the pressure of the compressor;

a revolution sensor operatively coupled to the engine for detecting the revolution speed of the engine;

a processing means having inputs thereof coupled to the pressure sensor and revolution sensor, said processing means including,

(a) an arithmetic circuit means operatively connected to said revolution sensor for receiving the output thereof which corresponds to the speed of the engine,

(b) an address decoder means having a plurality of inputs and being operatively connected at one end of said inputs to said arithmetic circuit means for receiving the output thereof,

(c) an analog-to-digital converter, operatively connected to said pressure sensor to receive the output thereof,

(d) changeable memory means operatively connected to said address decoder for storing predetermined reference pressure values corresponding to specific revolution speeds of the engine and, in response to input from said address decoder, provide an output pressure signal corresponding to the engine revolution speed signal as a predetermined control characteristic, and

(e) a comparator receiving inputs from said analog-to-digital converter and said memory means, wherein said comparator compares the sensed pressure from the analog-to-digital converter to the output pressure signal from said memory means, and provides an output of the processing means in accordance with the comparison;

control means coupled to the output of the processing means, for controlling the pressure of the compressor in accordance with the output signal of the processing means;

structural means for accepting said memory means such that said memory means may be changed, thereby changing the predetermined control characteristic; and

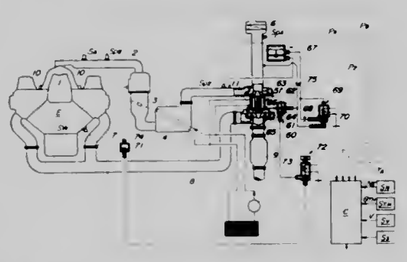
wherein a boost pressure sensor is provided in said intake passage downstream of said pressure sensor, said boost pressure sensor being connected to a boost pressure compensating circuit which in turn provides an input to said address decoder means.

4,891,947

METHOD OF CONTROLLING SUPERCHARGING PRESSURE IN INTERNAL COMBUSTION ENGINES

Noriyuki Kishi; Masao Kubodera, and Eitetsu Akiyama, all of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,303
Claims priority, application Japan, Dec. 29, 1987, 62-334198; Apr. 19, 1988, 63-97598
Int. Cl.⁴ F02B *37/12*
U.S. Cl. 60—602 **6 Claims**



1. A method of controlling supercharging pressure in an internal combustion engine having supercharging pressure control means, wherein the supercharging pressure is controlled by controlling a control amount by which said supercharging pressure control meals is operated, said control amount being corrected by a correction value depending upon at least one operating parameter of said engine

the method comprising the steps of:

(1) controlling said control amount in feedback control mode responsive to a difference between an actual value of the supercharging pressure and a desired value thereof when the supercharging pressure is in a steady state;

(2) obtaining a learned value of said correction value by calculating values of same applied during the control in feedback control mode;

(3) controlling said control amount in open loop control mode based upon said learned value of said correction value when the supercharging pressure is in a transient state; and

(4) inhibiting the execution of said step (2) when a predetermined condition is satisfied when the supercharging pressure is in said steady state.

4,891,948

STEAM TURBINE-GENERATOR THERMAL PERFORMANCE MONITOR

Jens Kure-Jensen, Schenectady, and Harris S. Shafer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 563,258, Dec. 19, 1983, abandoned. This applicatioo Dec. 23, 1985, Ser. No. 814,279
Int. Cl.⁴ F01K *13/02*
U.S. Cl. 60—645 **5 Claims**

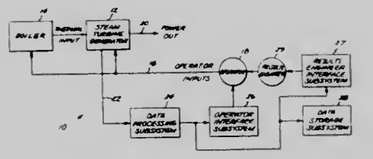
1. In a power plant including a steam generator, a steam turbine and an electric generator, a monitoring and display system providing a different data output to one of an operator display and an engineer display, the monitoring system comprising:

(i) means for sensing power plant current operating conditions such as steam temperatures, steam pressures, inlet valve positions, and electric generator outputs;

(ii) an operator thermal performance monitor connected to the operator display comprising:

(a) a deviation from design calculator for determining differences between the current measured operating conditions of temperature and pressure and the design operating conditions of temperature and pressure, said deviation from design calculator output connected to the operator display,

(b) an economic loss calculator for determining the money loss per unit time based upon inprts related to heat rate in the steam turbine, the steam turbine exhaust, a system design heat rate and electrical output, said economic loss calculator output connected to the operator display; whereby, the operator display includes: valve position; money loss per unit time; measured generator output or load; measured pressure and temperature;



and, deviations of measured temperature and pressure from design temperatures and pressures;

(iii) an engineer thermal performance monitor connected to the engineer display comprising:

(a) a turbine efficiency calculator for determining actual turbine efficiency based upon enthalpy;

(b) a design efficiency calculator for determining an ideal turbine efficiency based upon measured operating conditions;

(c) a deviation from heat rate calculator for comparing actual turbine efficiency with the ideal turbine efficiency;

(d) means for calculating main steam temperature power loss; means for calculating main steam pressure power loss; means for calculating turbine efficiency power loss and means for calculating exhaust pressure power loss all connected into the engineer display along with inputs related to actual and design temperature and generator load; whereby, the engineer display includes: valve position, design efficiency; actual efficiency; deviation from heat rate calculation; power loss calculations, measured load and temperature/pressure readouts.

4,891,949

DEVICE FOR STORING AND DISPENSING OF CREAMERS

James F. Caldarola, 30 Garford St., Springfield, Mass. 01118

Filed Nov. 15, 1988, Ser. No. 271,321
Int. Cl.⁴ F25B *21/02*
U.S. Cl. 62—3.2 **15 Claims**

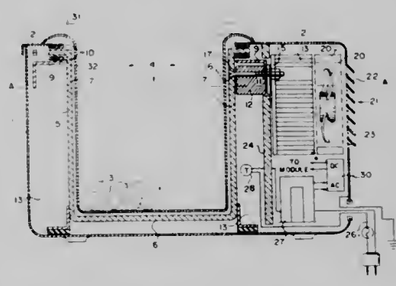
1. A cooling and storage device for the dispensing of creamers equipped with side wall means,said side wall means operatively connected thermally to the cooling side of at least one thermoelectric module,

said side wall means positioned substantially in a vertical orientation and of sufficient thickness and thermal conductivity to maintain less than about a 10 degree F differential in temperature between the coolest and the warmest portion of said side wall means,

said side wall means when viewed from the vertical being substantially of closed cross-section,

a bottom wall means connected to the bottom of said side wall means to form a vessel the inside of said vessel which defines a refrigerated space,

an open vessel end which is positioned substantially opposite said bottom,



a removable container means having an open end in which said creamers are placed,

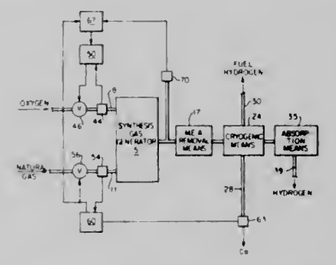
said removable container means placed substantially within said refrigerated space in said vessel.

4,891,950

CONTROL SYSTEM AND METHOD FOR A SYNTHESIS GAS PROCESS

Frederick B. Seufert, Bedford Hills, N.Y., and Pierre J. Osterrieth, Ridgefield, Conn., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,948
Int. Cl.⁴ F25J *3/00*
U.S. Cl. 62—37 **12 Claims**



1. A control system for controlling a synthesis gas process comprising:

generator means receiving oxygen and natural gas through separate pipes for providing synthesis gas,

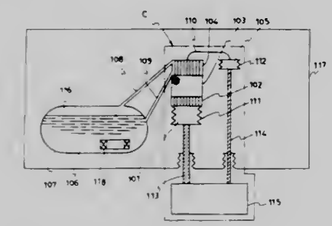
methane sensing means connected to the generator means for sensing the methane content of the synthesis gas and providing a methane signal corresponding thereto,

removal means connected to the generator means for removing carbon monoxide and fuel hydrogen from the synthesis gas and providing the carbon monoxide and the fuel hydrogen to separate pipes,

pressure sensing means connected to the pipe containing the carbon monoxide for sensing the pressure of the carbon monoxide in the pipe and providing a pressure signal corresponding thereto, and

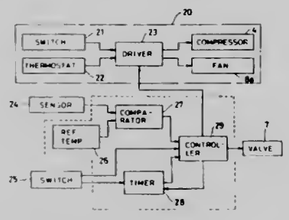
control means connected to the pipes carrying the oxygen and natural gas, to the methane sensing means and to the pressure sensing means for controlling the oxygen and natural gas entering the generator means in accordance with the methane signal and the pressure signal.

4,891,951
REFRIGERATION SYSTEM
Kiyoshi Ishibashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan
Filed Dec. 27, 1988, Ser. No. 290,428
Claims priority, application Japan, Dec. 26, 1987, 62-331476
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—51.3 **6 Claims**



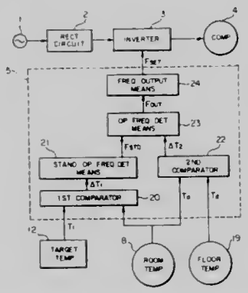
1. A refrigeration system comprising:
a compression portion having a volume to be varied;
a heat-accumulator fluidically connected to said compression portion;
a condenser fluidically connected to said heat-accumulator and having an upper side and a lower side;
an expansion portion fluidically connected to said condenser and having a volume to be varied, at which a very low-temperature is generated;
a vessel containing an amount of liquid helium and having a vapor phase of helium above said liquid helium, said condenser being external to said vessel;
a first conduit for connecting said vapor phase of helium in said vessel and said upper side of said condenser;
a second conduit for connecting said liquid helium in said vessel and said lower side of said condenser, whereby said vapor phase is condensed in said condenser and returned to said vessel.

4,891,952
FREEZER-REFRIGERATOR
Masaharu Yoshikawa, Kashihara; Kazuo Sagimoto, Osaka; Masuo Kamitaka, Nara; Shinya Takagi, Nara, and Hiroyuki Yoshida, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 29, 1988, Ser. No. 188,535
Claims priority, application Japan, Jul. 22, 1987, 62-184132; Oct. 20, 1987, 62-160682[U]; Nov. 17, 1987, 62-289900; Nov. 30, 1987, 62-304151; Dec. 8, 1987, 62-187049[U]; Dec. 15, 1987, 62-317755
Int. Cl.[4] F25B *5/00;* **F25D** *17/00*
U.S. Cl. 62—199 **30 Claims**



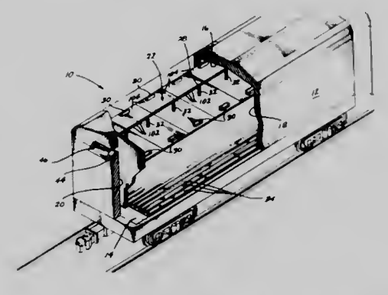
1. A refrigeration device comprising:
a compartment,
a refrigeration cycle comprising a compressor, a condenser, a first capillary tube and a first cooler connected with a refrigerant channel into a loop for circulating a refrigerant therethrough,
a quick freezing refrigerant circuit connected in parallel with the first cooler and comprising a second capillary tube and a second cooler connected in series therewith, the circuit having a junction for connection to the refrigerant channel from the first capillary tube to the first cooler,
a change-over valve provided in the refrigerant channel between the junction and the first cooler inclusive of the junction for changing a flow of the refrigerant toward the first cooler to a flow of the refrigerant toward the second cooler,
means for supplying air cooled by the first cooler to the compartment, and control means for driving the compressor, the means for supplying air and the change-over valve,
control means for driving the compressor, the fan and the change-over valve,
the second cooler being disposed within the compartment, the refrigerant being supplied to the first cooler for usual refrigeration to cool the compartment, the refrigerant being supplied to the second cooler for quick freezing to freeze an article to be frozen in contact with the second cooler,
said control means including,
a temperature sensor for detecting the temperature of the article,
a comparator for comparing the temperature of the article with a set value,
a timer, and
a controller for controlling the change-over valve based on the result of comparison by the comparator and the time measured by the timer, said controller controls the change-over valve so as to supply the refrigerant to the first cooler when the temperature of the article is not lower than a first set value, to supply the refrigerant to the second cooler when the temperature is between the first set value and a second set value which is lower than the first value, or to supply the refrigerant to the first cooler when the temperature is not higher than the second set value.

4,891,953
CONTROL DEVICE FOR AN AIR CONDITIONER WITH FLOOR TEMPERATURE SENSOR
Kazuaki Isono, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 1, 1989, Ser. No. 304,560
Claims priority, application Japan, Feb. 1, 1988, 63-21515
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—209 **9 Claims**



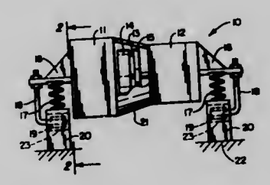
1. A control device for an air conditioner, comprising:
first temperature sensor means for detecting a temperature of a room conditioned by the air conditioner, at a level substantially higher than a floor level of the room;
second temperature sensor means for detecting a temperature of the room conditioned by the air conditioner, substantially at the floor level of the room;
target temperature setting means for setting a target temperature of the room conditioned by the air conditioner;
first comparator means, coupled to outputs of said target temperature setting means and said first temperature sensor means, for computing a difference between said target temperature and the room temperature detected by said first temperature sensor means;
second comparator means, coupled to outputs of said first and second temperature sensor means, for computing a difference between temperatures detected by said first and second temperature sensor means;
standard output power determining means, coupled to an output of said first comparator means, for determining a standard output power level of the air conditioner in accordance with said difference between the target temperature and the temperature detected by the first temperature sensor means; and
adjustment means, coupled to outputs of said standard output power determining means and said second comparator means, for determining an output power level to which the air conditioner is to be controlled, by making an adjustment to said standard output power level of the air conditioner, determined by said standard output power determining means, in accordance with said difference between temperatures detected by said first and second temperature sensor means.

4,891,954
REFRIGERATED CONTAINER
Van E. Thomsen, Enumclaw, Wash., assignor to Sheffield Shipping & Management Ltd., Barbados
Filed Jan. 19, 1989, Ser. No. 300,444
Int. Cl.[4] B60H *3/04*
U.S. Cl. 62—239 **9 Claims**



1. A refrigeration system utilizing a cryogenic refrigerant material, the refrigeration system comprising:
an insulated container having a floor, a ceiling, sidewalls, and end walls, said sidewalls defining the length and said end walls defining the width of said insulated container;
dividing means for partitioning said insulated container into an upper bunker and a lower storage area, said dividing means capable of supporting a supply of snow formed of a cryogenic material;
manifold means located in the upper regions of said bunker substantially along the longitudinal centerline of said bunker for forming cryogenic snow and distributing the formed cryogenic snow throughout said bunker;
a plurality of apertures extending through said dividing means adjacent said sidewalls and said end walls for permitting the flow of sublimated cryogenic gas from said bunker to said storage area, said apertures having a first peripheral housing extending substantially above said dividing means into said bunker;
at least one vent extending through said dividing means located substantially along the longitudinal centerline of said dividing means, said at least one vent having a second peripheral housing extending substantially above said dividing means into said bunker;
a plurality of channels extending substantially the entire length of said insulated container along said floor for collecting sublimated cryogenic gas; and
emission means communicating between said channels and the exterior of said insulated container for discharging the collected sublimated cryogenic gas to the atmosphere exterior to said insulated container.

4,891,955
ENGINE SUSPENSION SYSTEM
Thomas A. Klausing, Columbus, and Larry Schluer, Sugar Grove, both of Ohio, assignors to Gas Research Institute, Chicago, Ill.
Filed Mar. 14, 1989, Ser. No. 322,898
Int. Cl.[4] F25D *19/00*
U.S. Cl. 62—295 **6 Claims**



1. A heat pump system comprising:
(a) an internal combustion engine motive power source;
(b) a refrigeration compressor coupled to said internal combustion engine;
(c) rigid means interconnecting said internal combustion engine and coupled refrigeration compressor as a unit; and
(d) a plurality of compression spring means supporting said internal combustion engine and connected refrigeration compressor,
each said compression spring having a spring rate and a natural frequency under load which is substantially less than the lowest operating frequency of said internal combustion engine and connected refrigeration compressor.

4,891,956
INDICIA DEVICE
Sumner B. MacDonald, 39 Sea Breeze La., Bristol, R.I. 02809
Filed Dec. 19, 1988, Ser. No. 286,308
Int. Cl.[4] A44C *25/00*
U.S. Cl. 63—3 **8 Claims**

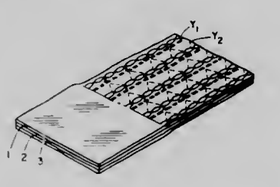
1. A jewelry charm comprising
an outer portion,
said outer portion including a rolled-over lip,
a spring member,
said spring member resiliently mating with said rolled-over lip, and
an insert,
said insert being configured to fit within said outer portion,
said insert including an integral protuberance,
said spring member including ends, said ends defining a gap,
said protuberance extending between said ends into said

gap, said ends thereby acting as circumferential stops for said insert.



wherein said insert is placed within said outer portion and said spring member is mated with said roller-over lip to removably retain said insert in said outer portion.

4,891,957
STITCHBONDED MATERIAL INCLUDING ELASTOMERIC NONWOVEN FIBROUS WEB
David C. Strack, Canton; Samuel C. Baer, Roswell; Diana M. Cates, Roswell, and Raju Venkatapathy, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Continuation of Ser. No. 64,583, Jun. 22, 1987. This application Mar. 2, 1989, Ser. No. 319,520
Int. Cl.[4] D04B *23/08*
U.S. Cl. 66—192 **24 Claims**



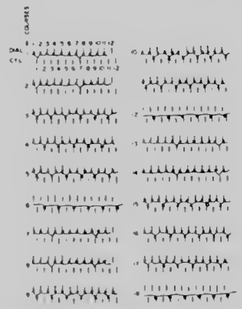
1. A stitchbonded elastomeric nonwoven fibrous web capable of being stretched to a length that is at least about 125% of its relaxed length and having an air permeability of 5–150 cm^3/cm^2 S when measured in accordance with ASTM D 737.

4,891,958
DOUBLE KNIT FABRIC WITH HOLES THERETHROUGH AND KNITTED COLOR BANDS
Andre Cournoyer, Ste Rosalie; Serge Berard, and Denis Cote, both of St-Hyacinthe, all of Canada, assignors to Sport Maska Inc., St.-Hyacinthe, Canada
Continuation of Ser. No. 937,077, Dec. 2, 1986, Pat. No. 4,838,045. This application Apr. 18, 1989, Ser. No. 339,984
Claims priority, application Canada, Nov. 27, 1986, 523976
Int. Cl.[4] D04B *7/04*
U.S. Cl. 66—196 **14 Claims**

1. A fabric of double knit construction for use in a sports garment to allow control of body heat with respect to perspiration of the player wearing same, said fabric comprising:

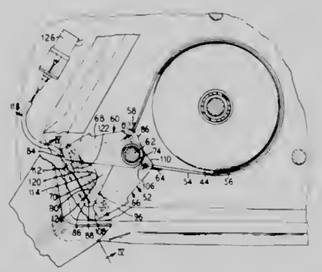
a repeating pattern of at least four courses and two cylinder wales,

a first cylinder wale of said two cylinder wales including two consecutive courses having tuck stitches to form a hole, said pattern being repeated to form the fabric with a plurality of holes, a minimum spacing between adjacent holes formed by the consecutive tuck stitches including five cylinder wales in a horizontal direction within the same two consecutive courses as said tuck stitches, sixteen courses in a vertical direction within said first cylinder wale and one cylinder wale and four courses diagonally, and



a second cylinder wale of said two cylinder wales including three welt stitches and one knit stitch in the same at least four courses as said two consecutive courses with tuck stitches.

4,891,959
BI-DIRECTIONAL PIVOT BAND BRAKE FOR AUTOMATIC WASHER
Douglas E. Wood, Hagar Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Jul. 1, 1988, Ser. No. 214,592
Int. Cl.[4] D06F *37/40*
U.S. Cl. 68—23.7 **14 Claims**



1. An automatic washer having a vertical axis agitator, a concentrically mounted wash basket, a motor drivingly connected to said agitator and wash basket to selectively oscillate and rotate said agitator and basket about said vertical axis, and a brake mechanism to selectively prevent rotary movement of said tub, comprising:

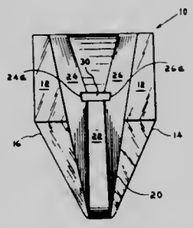
a brake band frictionally engageable with a portion of said basket, said band having a first end and second end,

means for mounting said first and second ends to each be pivotally movable about a fixed common pivotable axis, and

means for moving said first and second ends about said pivotable axis relative to each other so as to tighten or loosen the engagement of said belt with said basket,

wherein said brake band will be equally effective in either direction of rotation of said basket.

4,891,960
YARN FINISH APPLICATOR
Chandrakant S. Shah, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 148,584, Jan. 26, 1988, abandoned. This application Apr. 12, 1989, Ser. No. 337,132
Int. Cl.[4] D06B *1/08*
U.S. Cl. 68—200 **2 Claims**



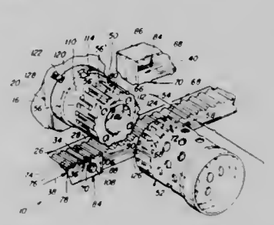
1. In a yarn finish applicator that includes a body member having top, opposed side and front and back surfaces and a slot in the front surface running from top to bottom, said slot having bottom and side walls, and a passage connecting the back surface of the body member to the slot for supplying finish to said slot, the improvement comprising: said passage connecting said back surface of the body member to said slot by extending through the bottom wall of the slot and through a portion of each side wall adjacent said bottom wall, providing extensions to said passage, said extensions having a cross sectional area of at least 15 percent of the cross sectional area of the passage where it extends through said bottom wall.

4,891,961
KEY RING
Anton Tsamas, 408 Kaplan Ave., Hackensack, N.J. 07601
Filed Sep. 9, 1988, Ser. No. 242,941
Int. Cl.[4] A44B *15/00*
U.S. Cl. 70—456 R **11 Claims**



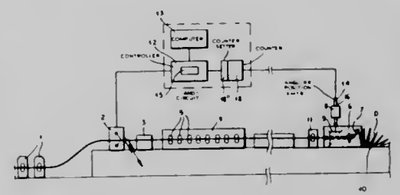
1. A key ring comprising: a base, a slot formed in the base to define a plate and a first resilient shoulder integrally formed with said base, a second resilient shoulder integrally formed with said base, said shoulders being torsionally displaceable with respect to the base, a first arm extending from said first resilient shoulder and a second arm extending from said second resilient shoulder, said first arm and said second arm overlapping to form a loop, said first and second arms each having a free end, each said free end having an outer periphery that define the periphery of the loop when the loop is in a closed position, so that a positive pressure can be applied to said resilient shoulders to cause said second arm to be displaced apart from said first arm at the overlapping portion to permit a key to be removed from the loop.

4,891,962
ROLL FORMING NOTCHES IN A THIN-WALL POWER TRANSMISSION MEMBER
Carl Anderson, Mt. Clemens, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.
Division of Ser. No. 263,396, Oct. 27, 1988, which is a division of Ser. No. 88,696, Aug. 21, 1987, Pat. No. 4,819,468. This application Jan. 27, 1989, Ser. No. 302,374
Int. Cl.[4] B21H *5/00*
U.S. Cl. 72—88 **5 Claims**



1. A mandrel (**50**) for forming a power transmission member (**52**) from a blank having a thin walled annular sleeve portion (**58**), said mandrel comprising: a central axis (**54**); mounting means (**20**) for maintaining said mandrel (**50**) on an apparatus (**10**) for rotation about said central axis (**54**) between the work surfaces (**34**) of a pair of die members (**26,30**); a body portion (**110**) for receiving and supporting the sleeve portion (**58**) of the blank thereover; and a work surface (**56**) generated around said central axis (**54**) for cooperating with the work surfaces (**34**) of the pair of die members (**26,30**) to form a transmission member (**52**) from the blank during a forming operation, said work surface including at least one recess (**80**) therein for cooperating with at least one notch forming projection (**70**) on the die members (**86**) to form a notch (**72**) in the bank during the forming operation, said work surface including a plurality of spline forming teeth (**56**) for cooperating with the spline forming teeth (**36**) on the die members (**26,30**) to form splines (**68**) in the blank, and at least one tooth (**56'**) including said recess (**80**) along at least a portion of the length thereof and with said recess (**80**) further spaced between adjacent spline forming teeth (**56**).

4,891,963
WIRE ROD ROLLING MILL
Manfred Reumann, Neuss-Wulmstorf, Fed. Rep. of Germany, assignor to Hamburger Stahlwerke GmbH, Hamburg, Fed. Rep. of Germany
Filed Aug. 31, 1988, Ser. No. 239,213
Claims priority, applicatioo Fed. Rep. of Germany, Sep. 12, 1987, 3730745
Int. Cl.[4] B21B *1/00*
U.S. Cl. 72—203 **7 Claims**



1. A wire rolling mill for making wire comprising a plurality of roughing stands, a cropping shears, a finishing block, a coiler with a coiler pipe and a coiler drive comprising a coiler

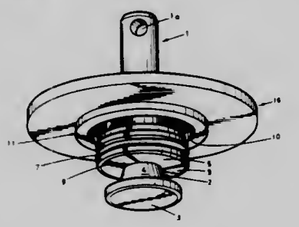
motor and a coiler gear unit, a delivery conveyor for said wire which has been completely rolled into coils, said roughing stands, said cropping shears, said finishing block, said coiler and said delivery conveyor being arranged in succession in the wire running direction, and also comprising a controller with a computer, in which said computer controls said shearing unit defined in a predetermined rolling program by a computer shear command and said shearing unit cuts away a cropped length defined in said computer shear command from the leading end of a rolled wire rod workpiece prior to feeding said rolled wire rod workpiece to said finishing block, and thereby produces a wire head of said wire deposited in a coil, said cropped length being correlated with the coiler pipe, position, said wire coiler having a rotation angle position transmitter operating with a plurality of digital pulses, which is connected with said controller and whose angular position corresponds to said coiler pipe position, said controller combining said computer shear command and said digital pulse of a presettable coiler pipe position sector by an electronic AND-circuit into a shear positioning command and said cropping shears responds to said shear positioning command.

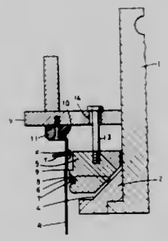
4,891,964

TOOL FOR THE FINAL FORMING OF CONNECTOR PIPES

Carl O. Hallström, Nälden, Sweden, assignor to C. Hallstroms Verkstader AB, Sweden

Filed Jan. 4, 1988, Ser. No. 140,773
Int. Cl.[4] B21D *39/00, 41/04*
U.S. Cl. 72—308 **5 Claims**





1. Apparatus for working a connector pipe to clamp a seal ring into a recess in said connector pipe and to form an end portion of said connector pipe, comprising:

a rod extending along a longitudinal axis from a first end to an opposite second end, said rod being reciprocable along said longitudinal axis relative to a calibration ring;

a calibration ring extending about said longitudinal axis and about said rod and having an inner forming surface facing said longitudinal axis;

a cone-shaped surface at said opposite second end of said rod for reciprocable movement with said rod along said longitudinal axis relative to said calibration ring, said cone-shaped surface facing away from said longitudinal axis and increasing in diameter towards said opposite second end, said cone-shaped surface including a flange extending in a radial direction away from said longitudinal axis at said opposite second end,

a plurality of form chucks extending radially about said rod and said longitudinal axis, each form chuck being in the shape of a circular segment, each form chuck of said plurality of form chucks having (a) an inner inclined surface facing said longitudinal axis for engagement with and sliding movement relative to said cone-shaped surface, and (b) an outer surface projecting radially away from said longitudinal axis, each form chuck including a lower surface for engagement with and sliding movement relative to said flange,

resilient means engaging said plurality of form chucks for retaining each form chuck in position relative to said rod;

said plurality of form chucks being moveable radially and in the direction of said longitudinal axis towards said calibration ring to so work said connector pipe therebetween when each inner inclined surface is caused to engage and slide relative to said cone-shaped surface as said rod and said cone-shaped surface are moved vertically along said longitudinal axis in a direction towards said calibration ring,

a plate having an aperture therethrough, said calibration ring being affixed to a first side of said plate, and said rod extending through said aperture from said first side such that said cone-shaped surface, and said plurality of form chucks, are on the same side of said plate as said calibration ring, and

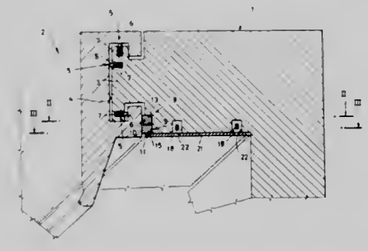
a respective screw extending from an opposite second side of said plate through a respective enlarged aperture in said plate, said respective screw being threaded into a respective form chuck to support said respective form chuck in the vicinity of said first side of said plate, each respective screw being of a length for longitudinal axial movement thereof with each respective form chuck and said rod, and relative to said calibration ring, during said working of said connector pipe.

4,891,965

SYSTEM FOR CONNECTING A BENDING BLADE TO ITS CORRESPONDING SUPPORT IN A SHEET METAL PANEL BENDING MACHINE

Dario Piacentini, Lonigo, Italy, assignor to Salvagnini Transferica S.p.A., Sarego, Italy

Filed Jun. 23, 1988, Ser. No. 210,505
Claims priority, application Italy, Jun. 25, 1987, 21045 A/87
Int. Cl.[4] B21D *37/14*
U.S. Cl. 72—481 **2 Claims**



1. System for connecting a bending blade to its corresponding support in a bending machine for sheet metal panels, comprising:

slack connecting means between the blade and the support,

elastic means for taking up slack between said blade and support in a direction of application of operating forces, and

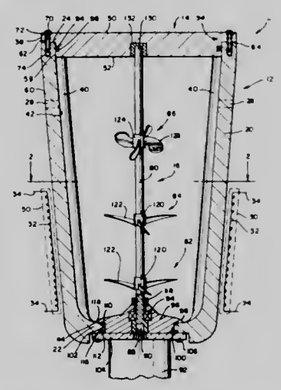
means for defining a face of the support with a variable length which reacts rigidly against a component of bending force in a direction parallel to a plane of a sheet metal panel and perpendicular to a bending line, said means include a pair of superimposed rods sliding in reciprocally inverse directions in the direction of the bending line in corresponding seats with a differentiated section obtained in said support, each seat being formed by at least two consecutive segments of different depths which determine different degrees of reaction of the corresponding rod to the bending force applied to the corresponding parts of the blade, shallower segments of the two seats being symmetrically opposite with respect to a median vertical axis of said support and being superimposed one over the other in a central part of the support, and there being also means for reciprocal movement of said rods in order to to vary in a corresponding manner an extension of their parts coinciding with the shallower segments of their seats and consequently an extension of the central part of the support which reacts rigidly to said component of the bending force.

4,891,966

PROCESS AND APPARATUS FOR MEASUREMENT OF VOLATILE RESIDUALS

Anatoly I. Kramer, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 291,710, Dec. 29, 1988, abandoned.
This application Jun. 5, 1989, Ser. No. 363,361
Int. Cl.[4] G01N *7/14*
U.S. Cl. 73—19 **23 Claims**



1. A process for measuring volatile residuals in a solid material, said process comprising:

providing particles of said solid material having a volatile residual material retained within said particles,

repeatedly reducing the size of said particles in a hermetically sealed chamber and liberating said volatile residual material as a gas within said chamber; and

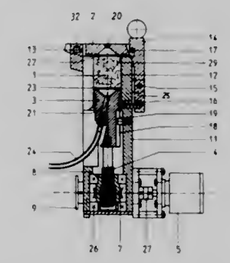
removing a sample of said gas from said hermetically sealed chamber and analyzing said sample and providing a measure of said gas residual.

4,891,967

METHOD AND APPARATUS FOR DETERMINING THE AVERAGE FINENESS OF LOOSE FIBRES

Horst-Dieter Vogt, Hochstrasse 36, 8044 Zurich, Switzerland

Filed Oct. 4, 1988, Ser. No. 253,536
Claims priority, application Switzerland, Oct. 6, 1987, 3895/87
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **11 Claims**



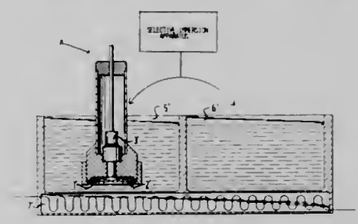
1. A method for determining the mean fineness of loose fibres, wherein a measuring chamber (1) is filled with a fibre sample (29) and then an air stream is conducted through the measuring chamber, and the effect of the fibres on the air stream is measured and from this measurement, the fineness of the fibres is calculated as a function of the volume of the measuring chamber, characterised in that, before the air stream is conducted through, the fibre sample (29) in the measuring chamber (1) is compressed by displacing at least one chamber wall with a constant force, and in that the chamber volume in the compressed state is measured separately for each fibre sample.

4,891,968

PROCESS FOR THE DETERMINATION OF THE CONCENTRATION OF SUBSTANCES DISSOLVED IN A SOLVENT BY MEANS OF OSMOTIC CELLS

Ernst Steudle, Eckersdorf; Gerd Böling, Inden-Pier, and Josef Zillikens, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,360
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706361
Int. Cl.[4] G01N *13/04*
U.S. Cl. 73—64.3 **22 Claims**



1. A process for testing a test solution, said test solution comprising a solvent, and at least one of a first substance dissolved in said solvent and a second substance dissolved in said solvent, said test solution having an approximate expected concentration of said first substance and an approximate expected concentration of said second substance, said process comprising the steps of:

(a) providing a first osmotic membrane, said first osmotic membrane having differing and distinct permeabilities with respect to said solvent, said first substance and said second substance, said first osmotic membrane being significantly more permeable with respect to said solvent than with respect to said first substance, and said first osmotic membrane being significantly more permeable with respect to said first substance than with respect to said second substance;

(b) exposing a first side of said first osmotic membrane to an osmometer solution, said osmometer solution having concentrations of said first and second substances which differ from said approximate expected concentrations of said first and second substances of said test solution, respectively, by not more than a first predetermined difference;

(c) exposing the second side of said first osmotic membrane to a reference solution, said reference solution having a concentration of said second substance which differs from said concentration of said second substance of said osmometer solution by not more than a second predetermined difference;

(d) determining a working pressure, P_O, existing on said first side of said first osmotic membrane exposed to said selected osmometer solution while said second side of said first osmotic membrane is exposed to said reference solution;

(e) replacing said reference solution with said test solution

(f) thereafter, determining at least one pressure change characteristic of said osmometer solution; and

(g) using said at least one determined pressure change characteristic of said osmometer solution to determine at least one of said concentrations of said first and second substances in said test solution.

4,891,969

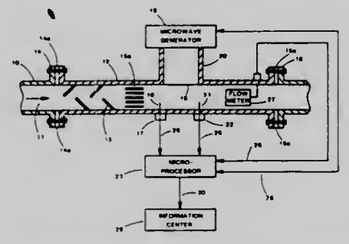
OIL/WATER RATIO MEASUREMENT

J. Robert Wayland, 580 Oakwood Pl., N. E., Albuquerque, N. Mex. 07123, and Caroline H. Persson-Reeves, 1013 Lynch Ct. N. W., Albuquerque, N. Mex. 87104

Filed Jul. 7, 1988, Ser. No. 216,073

Int. Cl.[4] G01N *25/58*; G01F *5/00*

U.S. Cl. 73—61.1 R **25 Claims**



1. A method for measuring the ratio of components with different properties in a fluid mixture of those components flowing through a conduit comprising the steps of:

(a) measuring the temperature of a fluid mixture in the conduit;

(b) measuring the flow rate of the mixture in the conduit;

(c) heating the fluid mixture by applying a microwave field to the mixture within the conduit;

(d) measuring the temperature of the mixture in the conduit after it has been heated;

(e) measuring the power input of the microwave field; and

(f) determining the ratio of components present in the mixture.

4,891,970

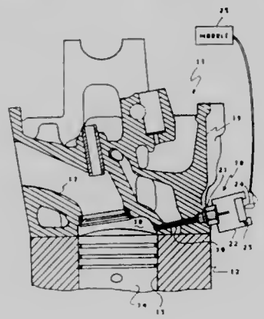
LUMINOSITY DETECTOR FOR INTERNAL COMBUSTION ENGINE, METHOD OF OPERATING ENGINE AND METHOD OF SENSING TEMPERATURE

Donald J. Remboski, Jr., Northborough, Mass., assignor to Barrack Technology Limited, Marlborough, Mass.

Filed Dec. 6, 1988, Ser. No. 280,595

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—116 **7 Claims**



1. In a luminosity detector for an internal combustion engine having a combustion chamber, light probe means in said combustion chamber for transmitting light from said combustion chamber through a body of said engine defining at least in part said combustion chamber, a photodiode fixed relative to said body and in light receiving relationship to said light probe to receive light therefrom and generate an electrical signal for transmission to an electrical module for providing engine operating data, the improvement comprising said photodiode being manufactured and biased to operate within the range of zero temperature coefficient for the wavelength being measured by said detector.

4,891,971

ENGINE MONITORING APPARATUS

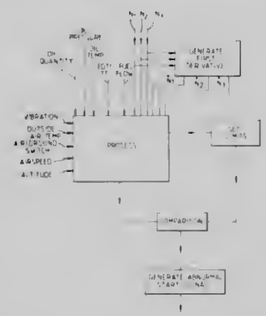
John W. D. Jones, Nympsfield, and Peter F. O'Sullivan, Cheltenham, both of England, assignors to Smiths PLC, London, England

Filed Dec. 21, 1988, Ser. No. 287,238

Claims priority, application United Kingdom, Dec. 23, 1987, 8729962

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 **11 Claims**



1. Engine monitoring apparatus for detecting abnormal start conditions of a gas-turbine engine comprising: means for deriving a first signal indicative of spool speed; means for deriving a second signal indicative of engine temperature ; processing means arranged to receive the first and second signals, said processing means monitoring the dynamic relationship between the first and second signals such as to determine when the said relationship is indicative of an abnormal start condition ; and visual display means which signals in real time a visual indication of such an abnormal start condition.

4,891,972

ULTRASONIC JOINT INSPECTION DEVICE AND METHOD

Takashi Kawaguchi, Ageo; Yoshiaki Fujita, Omiya, and Satoshi Kawai, Tochigi, all of Japan, assignors to Nippon Piston-Ring Co., Ltd., Tokyo, Japan

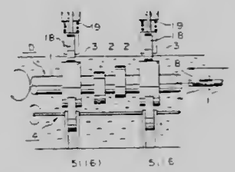
Continuation of Ser. No. 113,354, Oct. 28, 1987, Pat. No. 4,817,420, which is a continuation of Ser. No. 873,948, Aug. 20, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 254,168

Claims priority, application Japan, Jun. 14, 1985, 60-127979

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 R **4 Claims**



1. An ultrasonic joint inspection device for inspecting a joint between a hollow shaft and a piece joined to an outside surface of the hollow shaft of a composite camshaft, said device comprising:

a probe having means for generating ultrasonic waves and means for detecting ultrasonic waves;

a mirror positioned in front of said probe in a pathway of said ultrasonic waves generated from said probe for deflecting said ultrasonic waves;

a sub-probe positioned outside said composite camshaft so as to correspond in position to said mirror in an axial direction of said hollow shaft and operatively coupled to said probe so as to move together with said probe and said mirror;

support means for supporting and aligning said probe and said mirror;

guide means for supporting, positioning and aligning an assembled structure of said support means, said probe and said mirror within and out of engagement with an inner peripheral surface of the hollow shaft whereby a precise, fixed distance is maintained between said mirror and the joint being examined during the rotation of the hollow shaft about the inspection device; and

camshaft support means for supporting and rotating the camshaft being inspected, said camshaft support means comprising:

a first roller and a second roller rotatably mounted to a support;

a third roller positioned above said first roller and said second rollers;

biasing means for biasing said third roller against an outer peripheral surface of the hollow shaft during rotation of the hollow shaft about said probe;

drive means for driving said rollers for rotating the hollow shaft; and

means for moving said probe along a longitudinal axis of the hollow shaft for providing scanning of the entire joint.

4. An ultrasonic joint inspection device for inspecting a joint between a hollow shaft and a piece joined to an outside surface of the hollow shaft of a composite camshaft, said device comprising:

a tank filled with a coupling liquid;

an ultrasonic probe having means for generating and detecting ultrasonic waves from within the hollow shaft for inspecting the joint;

an ultrasonic sub-probe having means for generating and detecting ultrasonic waves from outside the hollow shaft for determining a position of said probe, said sub-probe being operatively coupled to said probe so as to move together with said probe in an axial direction of the hollow shaft; and

camshaft support means for supporting and rotating the camshaft being inspected within said coupling liquid, said camshaft support means comprising:

a first roller and a second roller rotatably supported within said tank;

a third roller positioned above said first roller and said second roller;

biasing means for biasing said third roller against an outer peripheral surface of the hollow shaft during rotation of the hollow shaft about said probe; and

drive means for driving said rollers for rotating the hollow shaft.

4,891,973

CIRCUIT ARRANGEMENT FOR TRANSMITTING MEASUREMENT VALUES ON VEHICLE WHEELS

Lothar Bollweber, Steinmauern; Walter Jansche, Durmersheim; Robert Hugel, Karlsruhe; Claus-Dietrich Pilch, Remchingen; Manfred Rothley, Kraichtal, and Erich Zabler, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

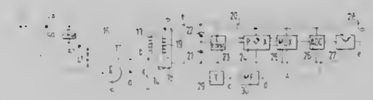
PCT No. PCT/DE86/00523, § 371 Date Jun. 9, 1988, § 102(e) Date Jun. 9, 1988, PCT Pub. No. WO87/04123, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 24, 1986, Ser. No. 221,464

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600260

Int. Cl.[4] B60C *23/04*; H03K *6/02*; H05F *3/00*; G08C *15/12*

U.S. Cl. 73—146.5 **10 Claims**



1. Circuit arrangement for transmitting variable measurement values, such as pressure and temperature, at vehicle wheels, comprising a repeater coil which is arranged at the vehicle in the vicinity of the wheel so as to be stationary and which is connected, on the one hand, to a square-wave generator (**15**) for supplying energy to a sensor circuit arrangement which revolves with the vehicle wheel and, on the other hand, to an evaluating circuit for transmitting measurement values in the voltage pauses of the square-wave generator (**15**), and comprising a revolving repeater coil which is fastened at the vehicle wheel, cooperates with the stationary repeater coil and is connected with the sensor circuit arrangement at the vehicle wheel for supplying energy on the one hand and for transmitting the measurement values on the other hand; the sensor circuit arrangement comprises a measurement value converter which transmits the measurement values produced by at least one sensor to the repeater coil in the form of H-F signals in the voltage pauses of the square-wave generator and whose frequency is a multiple of the frequency of the square-wave generator, characterized in that the sensor circuit arrangement (**20**) also contains a timing element (**29**) which responds to a voltage peak (Ui) in the revolving repeater coil (**19**) produced

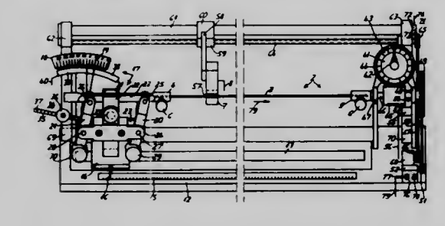
by means of the end of a voltage pulse (Ua) at the square-wave generator (15) and which triggers a timing circuit (30) with a corresponding delay time (T1) for transmitting the measurement values, which timing circuit (30) is connected with it on the output side, wherein the delay time (T1) of the timing element (29), together with the duty cycle (T2) of the timing circuit (30), is shorter than the pause time (t2) of the square-wave voltage at the square-wave generator (15).

4,891,974

METHOD AND APPARATUS FOR DETERMINING CHARACTERISTICS OF STAPLE FIBER YARNS

Heinz-Georg Wassenhoven, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 249,349
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732513
Int. Cl.[4] G01L *5/04*
U.S. Cl. 73—160 **26 Claims**



1. Method for measuring and testing of staple fiber yarn, comprising:
- measuring the diameter of a staple fiber yarn segment having a predetermined twist;
- manipulating said segment to change the twist thereof; re-measuring the diameter of said segment after said manipulating; and
- comparing the measured diameters to determine characteristics of said segment.

4,891,975

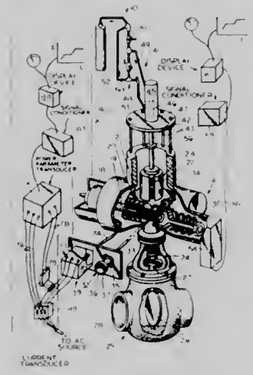
METHOD AND APPARATUS FOR REMOTE MONITORING OF VALVES AND VALVE OPERATORS

Arthur G. Charbonneau, Marietta; Stanley N. Hale, Rome, and Edmond A. Sayed, Marietta, all of Ga., assignors to Movats Incorporated, Marietta, Ga.

Continuation of Ser. No. 848,451, Apr. 4, 1986, Pat. No. 4,831,873. This application Dec. 1, 1988, Ser. No. 278,977
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—168 **5 Claims**

1. Method for monitoring the condition of a valve and valve operator to signal a need for maintenance of the valve or valve operator, said method comprising the steps of:
- imposing a thrust load in the valve operator during a calibration period;
- measuring the thrust load imposed in the valve operator;
- measuring a power parameter of the valve operator during imposition of the thrust load;
- calibrating thrust load to the power parameter;
- ending the imposing of thrust load in the valve operator during the calibration period;
- placing the valve and valve operator in use;
- measuring the power parameter of the valve operator during valve-in-use generation of thrust load in the valve operator; and

correlating the power parameter measured during imposition of the load with the power parameter measured dur-



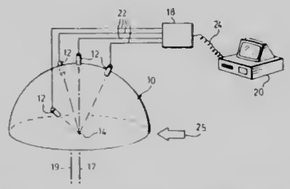
ing valve-in-use to provide an indication of thrust load developing in the valve operator during valve-in-use.

4,891,976

DEVICE EMPLOYING RESONANT CHAMBERS TO DETERMINE WIND CHARACTERISTICS

John D. Chato, 1412-1450 Chestnut St., Vancouver, B.C., Canada V6J-3K3

Filed Apr. 7, 1988, Ser. No. 178,914
Int. Cl.[4] G01W *1/04*
U.S. Cl. 73—189 **9 Claims**



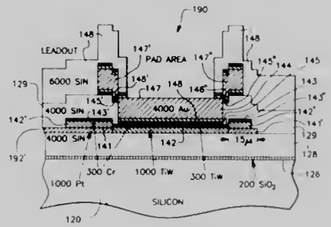
1. Apparatus for determining wind characteristics, comprising:
- frame means
- means defining a plurality of resonant chambers, each with a mouth opening such that wind blowing across the opening at an appropriate speed and direction causes air within the respective chamber to resonate and create a sound, the chambers and mouth openings being at different angles and orientations so as to correspond to hemispherical radii distributed at intervals no greater than about 10°,
- a sound detecting unit associated with each resonant chamber and producing a signal when its respective chamber is resonating,
- and interpretative means for continuously sampling the output from all said sound detecting units, and for calculating from said sampled outputs the compass direction, the inclination to the horizontal and the speed range of the wind.

4,891,977

MICROBRIDGE SENSOR BONDING PAD DESIGN FOR IMPROVED ADHESION

Robert G. Johnson; James O. Holmen, both of Minnetonka, and Jeffrey A. Ridley, Burnsville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 16, 1988, Ser. No. 285,272
Int. Cl.[4] G01F *1/68;* **H01C** *17/28, 1/102*
U.S. Cl. 73—204.26 **14 Claims**



8. A high adhesion bonding pad fabricated on the silicon nitride surface of a semiconductor microbridge sensor in which the sensing metal per se, does not make a strong adhesion bond to the silicon nitride comprising:
- a thin film of silicon nitride on the surface of a semiconductor substrate, said Si_3N_4 having a smooth surface;
- a bonding pad area on said silicon nitride;
- a sensor metal deposited to said Si_3N_4 surface away from said bonding pad area, said sensor metal having a termination in the edge of said bonding pad area, said sensor metal having been annealed to stabilize the sensor;
- a bonding site within said bonding pad area spaced laterally from said sensor metal;
- a thin film layer of an adhesion promoting metal selected from the group consisting of Cr and Ti:W deposited on the Si_3N_4 at the bonding site and also onto said sensor metal termination;
- a thin film layer of dielectric material deposited over said sensor metal, said adhesion promoting metal and said bonding pad area;
- a via extending through said dielectric film at said bonding site exposing the underlying adhesion promoting metal at the site;
- another thin film layer of the adhesion promoting metal deposited into said via on said site; and
- a thin film layer of gold deposited into said via on said adhesion promoting metal.

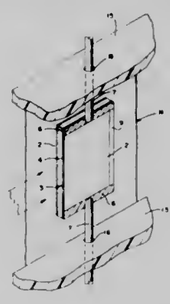
4,891,978

APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM AND METHOD FOR PRODUCING AN APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

Jaihind S. Sumal, Vaihingen-Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 585,093, Mar. 1, 1984, Pat. No. 4,826,328. This application Feb. 8, 1989, Ser. No. 307,724
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315704
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.26 **4 Claims**

1. A device for measuring the mass of a flow medium of an intake tube of an internal combustion engine, which comprises a substrate with parallel faces having a leading edge and a trailing edge, a resistor layer covering a major portion of at least one face of said substrate with said resistor layer extending from said leading edge toward said trailing edge, with a portion of said substrate extending along said trailing edge thereof free of said resistor layer, means for supporting said



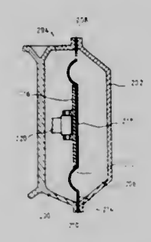
substrate in said intake tube with said trailing edge positioned down-stream in said flow medium.

4,891,979

GAS METER HAVING A SYNTHETIC DIAPHRAGM AND MOLDED HOUSING

André De Régo, Antony, France, assignor to Schlumberger Industries, S.A., Montrouge, France

Continuation of Ser. No. 828,414, Feb. 11, 1986, Pat. No. 4,779,459. This application Oct. 20, 1988, Ser. No. 260,344
Claims priority, application France, Feb. 12, 1985, 85-01931
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[4] G01F *11/08, 15/16*
U.S. Cl. 73—269 **9 Claims**



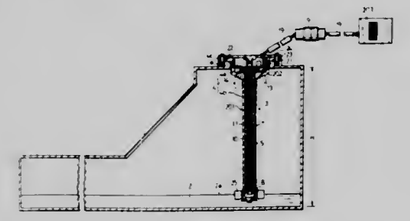
1. gas flow meter having a deformable membrane responsive to gas flow, the improvement comprising:
- a housing made of thermoplastic material having an inside wall and defining two measuring chambers; and
- said deformable membrane disposed in said housing between said chambers;
- said membrane being made of a complex comprising a film of non-vulcanizable thermoplastic elastomer material disposed opposite to one face of a synthetic fiber structure of substantially constant thickness, said elastomer material adhering to said film structure and covering said face of the film structure;
- said membrane further including a periphery which is fixed to said inside wall by hot-welding to form a gas-tight seal between the periphery of said membrane and said inside wall.

4,891,980

LIQUID LEVEL GAUGE

Makoto Kawai; Chikahisa Hayashi; Yoshikazu Hirose, and Tatsuya Terayama, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 26, 1988, Ser. No. 199,154
Claims priority, application Japan, May 26, 1987, 62-129531
Int. Cl.[4] G01F *23/76*; G01R *33/00*
U.S. Cl. 73—290 R **11 Claims**



1. A liquid level gauge, comprising:
a core extending in the vertical direction and disposed inside a liquid container having a cross sectional configuration varying in the vertical direction, said core being isolated from the liquid,
a coil wound in the direction of the length of said core, said coil comprising a densely wound portion formed at one end of said core, and a thinly wound portion formed on the remaining portion of said core,
a conductor ring disposed around the outer circumference of said coil and movable in the direction of the length of said coil according to the liquid level inside said container,
detecting means for detecting the change in the inductance of said coil according to the displacement of said conductor ring,
transforming means for transforming said change in the inductance of said coil into a change in an electric signal, and
display means for displaying the quantity of the liquid inside said container, corresponding to said electric signal,
said thinly wound portion having a winding density varying in steps along the direction of the length of said core,
said display means being made to display a display value proportional to the change in the quantity of the liquid inside said container,
said core being a cylindrical body formed by spirally rolling a sheet of silicon steel that is coated on both sides with an inorganic insulating film.

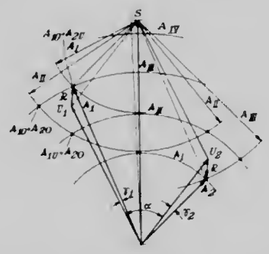
4,891,981

METHOD FOR DETERMINING THE POSITION AND MAGNITUDE OF UNBALANCE CORRECTION

Harald Schonfeld, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,562
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715499
Int. Cl.[4] G01M *1/16, 1/22*
U.S. Cl. 73—460 **4 Claims**

1. In a method for determining the position and magnitude of a correction in correction planes for the purpose or reducing a determined unbalance in a body whereby incremental correction is provided with respect to magnitude and continuous correction is provided with respect to position, the improvement comprising the steps of defining unbalance of a body in correction planes according to magnitude and position, determining the influence of several corrections for each correction plane upon static and dynamic residual unbalance through two correction weight increments which are closest to the defined unbalances per correction plane, forming combinations of the two correction weight increments per correction plane, the resultant of which corresponds to the resulting unbalance, defining a difference between each combination and the unbalance in one of the two correction planes, determining the one combination that shows the smallest difference, and when the difference is not larger than the residual unbalance permissible



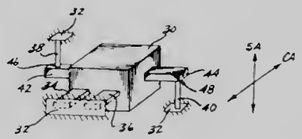
for each correction plane, utilizing the one combination as correction in the one correction plane, and selecting those corrections in each correction plane which represent the minimal possible static residual unbalance and the residual unbalance of which, per correction plane, lies within predetermined limits.

4,891,982

TEMPERATURE COMPENSATION OF A STEADY-STATE ACCELEROMETER

Brian L. Norling, Mill Creek, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 879,262, Jun. 27, 1986, Pat. No. 4,750,363. This application Jun. 10, 1988, Ser. No. 205,194
The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—497 **12 Claims**



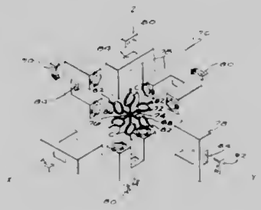
1. An accelerometer for measuring acceleration along a sensitive axis, the accelerometer comprising a housing, a proof mass, support means for mounting the proof with respect to the housing, and first and second force transducers each of which has a DC frequency response, each force transducer being connected between the proof mass and the housing such that an acceleration along the sensitive axis results in a compression force on one force transducer and a tension force on the other force transducer and such that differential thermal expansion or contraction between the force transducers and the other accelerometer components results in rotation of the proof mass about a compensation axis normal to the sensitive axis.

4,891,983

INDUCTIVELY COUPLED FORCE BALANCE INSTRUMENT

Robert E. Stewart, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 4, 1988, Ser. No. 228,360
Int. Cl.[4] G01P *15/11, 15/13*
U.S. Cl. 73—517 B **13 Claims**



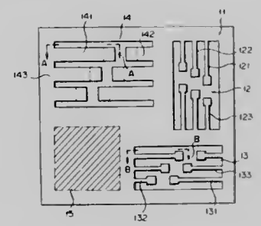
1. An inductively coupled force balance instrument comprising:
an instrument body;
a sensitive element having a shorted coil of conductive material associated with said body for relative movement in response to acceleration of the body;
means for generating a primary magnetic flux intersecting the shorted coil; and
means for inducing within the shorted coil a current which interacts with said primary magnetic flux to generate a force opposing said movement.

4,891,984

ACCELERATION DETECTING APPARATUS FORMED BY SEMICONDUCTOR

Tetsuo Fujii, Toyohashi, and Osamu Itoh, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 8, 1986, Ser. No. 917,103
Claims priority, application Japan, Oct. 8, 1985, 60-224066
Int. Cl.[4] G01P *15/12*
U.S. Cl. 73—517 R **5 Claims**



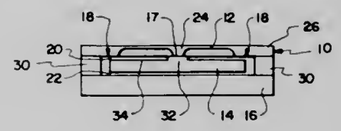
1. An acceleration detecting apparatus formed by a semiconductor comprising:
a semiconductor substrate having a front and a back surface;
acceleration detecting means including first, second and third movable members located in first, second and third frames respectively, said frames being formed by cutting said substrate from the front and the back surface, each of said movable members being formed of a plurality of beams which are made by cutting said substrate from the front and back surface, each of said beams being a cantilever extending parallel to the front and back surfaces of said substrate and having a movable portion, the beams formed in said first frame being capable of vibrating an X-axis direction parallel to the front and back surfaces of said substrate, the beams formed in said second frame being capable of vibrating in Y-axis direction also parallel to the surfaces of said substrate, and the beams formed in said third frame being capable of vibrating in Z-axis direction perpendicular to the front and back surface of said substrate; and
first, second and third piezo resistance means formed at the movable portions of said beams, respectively, and each having a resistance which varies in response to a bending degree of the beam, thereby generating an electrical signal corresponding to the resistance thereof.

4,891,985

FORCE SENSOR WITH ATTACHED MASS

Max C. Glenn, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 757,714, Jul. 22, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 920,899
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R **3 Claims**



1. A sensor comprising:
a die having a central region, a peripheral support, and a flexible annular sensing portion, the annular sensing portion being less thick than the central region and the peripheral support, the annular sensing portion being located between the central region and the peripheral support;
a housing having an interior surface and including a spacing means, wherein the spacing means is attached to the peripheral support of the die and to the interior surface to thereby rigidly space the interior surface away from the peripheral support of the die; and
mass means for enhancing the sensitivity of the die and for limiting the movement of the annular sensing portion of the die, the mass means being rigidly attached to the central region of the die, the mass means having a thickness and configuration permitting it to move between rigid limits formed by the peripheral support of the die and the interior surface of the housing.

4,891,986

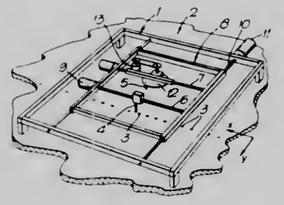
APPARATUS FOR INSPECTING ARTICLES

Paul Teagle, Surrey, England, assignor to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 222,285, Jul. 21, 1988, abandoned, which is a continuation of Ser. No. 65,758, Jun. 24, 1987, abandoned. This application May 16, 1989, Ser. No. 352,626
Claims priority, application United Kingdom, Jun. 24, 1986, 8615433; Aug. 15, 1986, 8619911
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—634 **22 Claims**

1. Apparatus for locating the geometrical center of a symmetrically shaped bore in a material comprising:
detector means, distinguishably responsive to a property of said material for providing a signal output indicative of said property;
bore traversing means, on which said detector means is mounted, for moving said detector means adjacent said material along a raster scan path; and
first means, operatively connected to said detector means and to said bore traversing means, and responsive to changes in said signal output of said detector means as said bore traversing means is scanned across a bore in two

mutually orthogonal directions, for determining a position of said bore by detecting edges of said material and determining coordinates of two mutually perpendicular



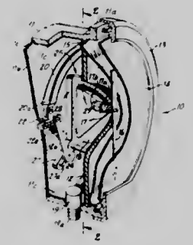
scanned chords across said bore and calculating coordinates of the center of said bore from said coordinates of said chords.

4,891,987

MAGNETIC LINKAGE FOR BOURDON TUBE GAUGES

William E. Stockton, 16721 SW. 299th St., Homestead, Fla. 33030, and Harold E. Stockton, 24 Veenstra Rd., Houston, Tex. 77022

Filed Nov. 25, 1988, Ser. No. 275,943
Int. Cl.[4] G01L *7/04*
U.S. Cl. 73—732 **16 Claims**



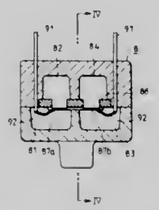
12. A Bourdon tube pressure gauge comprising a tubular casing having a transverse wall dividing the casing into front and rear compartments, a Bourdon tube mounted at one end on said casing in said rear compartment and having an opposite free end adapted to move radially outwardly and inwardly a relatively short distance in response to pressure changes within said Bourdon tube, a movement amplifying mechanism located in said rear compartment for converting the relatively short radial movement of said Bourdon tube free end to the rotary motion of a shaft on which a pointer is mounted for indicating pressure values on a circular dial, said movement amplifying mechanism comprising a rack segment pivotally mounted for acute angular movement and a pinion mounted on said shaft, a linkage connecting said Bourdon tube free end to said rack segment for pivoting the latter in response to said Bourdon tube free end movement, said rack segment having an arcuate band carrying magnetic means, said pinion having complementary magnetic means located for operative magnetic engagement with said rack segment magnetic means whereby pivotal rotation of said rack segment by said Bourdon tube free end movement rotates said pinion and shaft for predetermined pressure indication on said dial by said pointer, a rear closure plate for said rear compartment mounted on said casing, said casing, Bourdon tube, rear closure plate, rack segment, linkage and shaft being made of a non-magnetic material, and said rear compartment having a lining of magnetic flux barrier material to isolate said arcuate band magnetic means and pinion complementary magnetic means from external magnetic interference.

4,891,988

VORTEX FLOWMETER

Yasuo Tada, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,488
Claims priority, application Japan, Mar. 1, 1988, 63-27667[U]
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 **2 Claims**



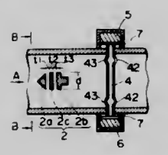
1. A vortex flowmeter, comprising: a first pressure conduit for transmitting the variation of pressure due to a Karman vortex in a conduit, through which fluid to be detected flows, to a first and a fourth pressure chambers, a second pressure conduit for transmitting a variation of vortex pressure to a second and a third pressure chambers, a first and a second diaphragms provided in a partition wall portion between said first and said second pressure chambers and a partition wall portion between said third and said fourth pressure chambers, respectively, a first and a second bridge circuits formed on said first and said second diaphragms, respectively, and a differential amplifier circuit for amplifying a difference of output between said first and said second bridge circuits.

4,891,989

VORTEX FLOW METER

Masao Misumi, and Koji Atsumi, both of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 24,294, Mar. 10, 1987, Pat. No. 4,838,092. This application Dec. 13, 1988, Ser. No. 283,656
Claims priority, application Japan, Mar. 15, 1986, 61-037995; Mar. 15, 1986, 61-037996; Mar. 16, 1986, 61-037828; Mar. 16, 1986, 61-057766; Mar. 17, 1986, 61-058975; Nov. 19, 1986, 61-178079
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 **6 Claims**



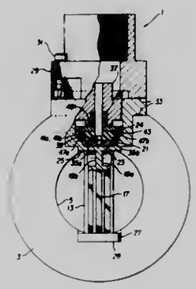
1. A vortex generator for measuring fluid flow in an elongated conduit having a central axis, comprising an upstream vortex generator and a generally T-shaped downstream vortex generator disposed transversely in said conduit, said upstream vortex generator having an upstream side and a downstream base side, said downstream vortex generator having a downstream side and an upstream base side, said upstream and downstream base sides being substantially flat and parallel surfaces which are spaced from one another, and plate means disposed in said space between said base sides, said plate means having one plate side spaced from said upstream base side and another plate side spaced from said downstream side.

4,891,990

VORTEX FLOWMETER TRANSDUCER

Mohamed Khalifa, Peachtree City, Ga., and John Manwell, Liverpool, United Kingdom, assignors to Schlumberger Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 129,123, Dec. 4, 1987, Pat. No. 4,864,868. This application Nov. 15, 1988, Ser. No. 271,490
Int. Cl.[4] G01F *1/38*
U.S. Cl. 73—861.24 **15 Claims**



1. A vortex flowmeter comprising:
a conduit for confining a fluid flowing therein;
a vortex shedding body having a portion placed within the conduit for generating vortices from fluid flowing past the body;
the body including a recessed portion having a surface which is subject to impact from the vortices generated by fluid flowing past the body;
the body further including a cavity portion located at one end thereof and outside the conduit, the cavity having a wall subject to alternate flexing caused by forces transmitted from the surface of the recessed portion of the body to the cavity portion of the body due to the impact of the vortices on the surface of the recessed portion of the body; and
means for sensing the flexing of the wall of the cavity including;
(a) at least one light source;
(b) light detection means;
(c) reflective means disposed on the wall portion of the cavity and;
(d) optical fiber means for transmitting light from the light source to the reflective means and to the light detection means;
the flexing of the wall of the cavity causing an output from the sensing means which represents the difference between the amplitude of the alternate flexing of the wall caused by impact of the vortices generated by the body.

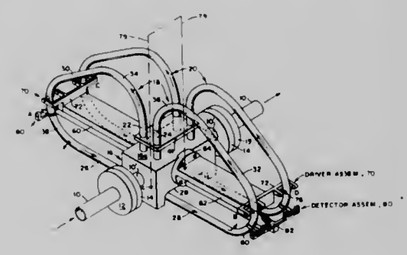
4,891,991

CORIOLIS-TYPE MASS FLOWMETER

Wade M. Mattar, Wrentham; Duane T. Thompson, Franklin; Joseph P. DeCarlo, Wrentham, all of Mass.; Yousif Hussain, Walton on Thames, United Kingdom, and Gordon W. Chitty, Norfolk, Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Oct. 28, 1986, Ser. No. 923,847
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **38 Claims**

1. A dual drive Coriolis-type mass flowmeter, comprising
a support,
a continuous loop of conduit solidly mounted at its inlet and outlet ends to the support,
a pair of drive means acting on said loop at different respective points along the loop for oscillating said loop about an oscillation axis, the portion of said loop between said pair of drive means being a substantially straight section,



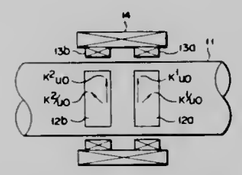
a coaxial inlet and outlet, said straight section being perpendicular to the inlet/outlet axis, and
means for measuring the magnitude of Coriolis forces, arising as a result of mass flow in the portion of said conduit undergoing oscillatory motion.

4,891,992

TORQUE DETECTING APPARATUS

Tadahiko Kobayashi; Masashi Sahashi, and Yoichi Tokai, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1989, Ser. No. 301,121
Claims priority, application Japan, Jan. 26, 1988, 63-15256
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.36 **16 Claims**



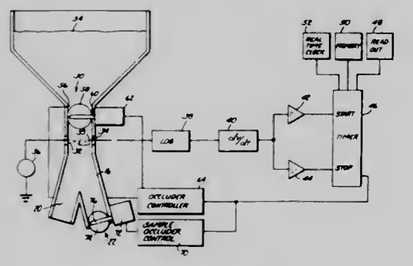
1. A torque detecting apparatus comprising:
a magnetic metal thin strip fixed on the circumferential surface of a torque transmitting shaft as an object of torque detection;
an induced magnetic anisotropy given in advance to said magnetic metal thin strip, said induced magnetic anisotropy appearing in a direction of a principal stress produced in said magnetic metal thin strip when a torque is imposed on said torque transmitting shaft;
a shape magnetic anisotropy of said magnetic metal thin strip caused by a shape of said magnetic metal thin strip, said shape magnetic anisotropy appearing in a direction forming an angle of 45° with the direction of the principal stress; and
detection means for detecting a change in magnetic anisotropy produced in the magnetic metal thin strip by a torque imposed on the torque transmitting shaft.

4,891,993

APPARATUS AND METHOD FOR MEASUREMENT OF URINE VOID VOLUMES

Kent R. Barker, Eagan, Minn., assignor to Prevention Sciences Incorporated, Eagan, Minn.

Filed Sep. 30, 1988, Ser. No. 252,456
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—863.52 **11 Claims**



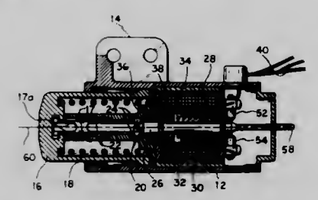
7. An apparatus for measuring urine volume comprising:
a pair of electrically isolated electrodes;
means for collecting urine and conveying streams of urine past the isolated electrodes at a substantially constant rate of flow; and
means for generating opposite polarity timing pulses associated, respectively, with increases and decreases in resistance between the electrodes associated with the beginning and the cessation of urine flow, including a source of alternating electrical potential connected to one of the isolated electrical terminals, a logarithmic signal generator coupled to a second one of the isolated electrical terminals, and a differentiating circuit coupled to receive signals from the logarithmic signal generator for generating the opposite polarity timing pulses indicating onset and cessation of urine flow through the outflow conduit; and
a clock responsive to the timing pulses for determining the volume of the urine flow by timing their duration.

4,891,994

LINEAR ELECTROMECHANICAL ACTUATOR

Valentin G. Barba, Princeton Junction, N.J., assignor to Plessey Incorporated, White Plains, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,109
Int. Cl.[4] G05G *17/00*
U.S. Cl. 74—2 **18 Claims**



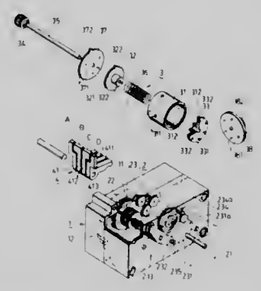
1. A linear elctromechanical actuator comprising:
a housing a first longitudinal axis;
a solenoid coil disposed in said housing and having a second longitudinal axis;
an armature electromagnetically coupled to said solenoid coil and mounted for longitudinal motion in a first direction along said second longitudinal axis in response to energization of said solenoid coil;
first means for resiliently urging said armature to move in a second direction along said second longitudinal axis, said second direction being opposite to said first direction, said solenoid coil being strong enough when energized to overcome the effect of said first means on said armature and cause said armature to move in said first direction;
an actuator member mounted for longitudinal reciprocation along said first longitudinal axis;
second means for resiliently urging said actuator member to move from a first position to a second position along said first longitudinal axis;
means for releasably retaining said actuator member at said first position;
means for operatively connecting said armature to said means for releasably retaining so that after a predetermined amount of motion of said armature in said first direction, said armature causes said means for releasably retaining to release said actuator member, thereby allowing said second means for resiliently urging to move said actuator member from said first position to said second position; and
means responsive to said means for releasably retaining said actuator member at said first position for producing an output indication if and only if said means for releasably retaining is fully operational to retain said actuator member at said first position.

4,891,995

TRIGGER CONTROL MEANS FOR MOVEABLE TOYS

Weng-Pin Lin, No. 30, Chien-Yung St., Taichung City, Taiwan

Filed Apr. 14, 1988, Ser. No. 181,491
Claims priority, application Japan, Aug. 20, 1987, 62-207339
Int. Cl.[4] G05G *17/00*; A63H *11/10*
U.S. Cl. 74—3.52 **8 Claims**



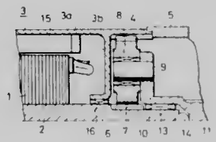
1. A toy comprising:
acting means for generating an acting force, said acting means having a member for triggering the acting force;
rotating means adapted to be driven by a rotating force for carrying out a primary action;
at least one rocking arm having a first end and a second end;
a rotatable can drum with an exterior cam surface;
tongues disposed on said cam surface, so that as said cam drum is rotated causing a tongue to urge against said second end of said rocking arm, said first end is caused to rock and thereby actuate said acting means; and
a gear train for reducing and transmitting the rotating force to said rotating means.

4,891,996

ENGINE STARTER HAVING PLANET REDUCTION GEAR MECHANISM

Shuzoo Isozumi, and Tetsuo Yagi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,710
Claims priority, application Japan, Dec. 25, 1986, 61-201596[U]; Dec. 25, 1986, 61-201597[U]; Jan. 7, 1987, 62-1321[U]
Int. Cl.[4] F02N *11/00*
U.S. Cl. 74—6 **4 Claims**



1. An engine starter for an internal combustion engine, comprising: a planet reduction gear mechanism including a solar gear (6), a plurality of planet gears (7), and an internal gear member (4), and a d.c. motor including a cylindrical yoke (3) having an axial extension formed integrally and in one piece therewith, said extension defining a housing surrounding the planet reduction gear mechanism and having a toothed inner circumferential surface defining the internal gear member, an armature (1) fixedly secured to a rotary shaft (2) of said motor defining said solar gear at one end thereof, and magnet means (15) disposed between said armature and said yoke, said axial yoke extension being non-rotatably fitted to a mounting bracket (5), said internal gear member meshing with said planet gears, which in turn mesh with said solar gear, said planet gears being supported by a flange portion (10) of an output shaft (11), and flange means (3b; 22) disposed between said yoke and said axial extension and extending radially inwardly therefrom for providing a partition therebetween, said flange means being formed with a center hole for supporting a bearing (16), and said rotary shaft of said motor being rotatably supported by said bearing, wherein said flange means is formed integrally and in one piece with an inner surface of said cylindrical yoke, wherein a root diameter circle of the toothed inner circumferential surface of the axial extension is substantially co-cylindrical with an inner circumferential surface of said yoke.

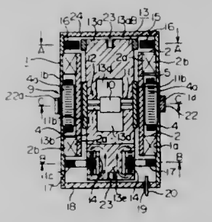
4,891,997

DYNAMICALLY TUNED GYRO

Sokichi Hayashi, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,900
Claims priority, application Japan, Oct. 8, 1987, 62-252498; Oct. 8, 1987, 62-153327; Oct. 14, 1987, 62-156136
Int. Cl.[4] G01C *19/08, 19/28, 19/30*
U.S. Cl. 74—5.46 **6 Claims**

1. A dynamically tuned gyro comprising in combination a cylindrical hysteresis ring mounted for rotation about its longitudinal axis within a cylindrical casing having a radially inner wall, said ring being joined to said casing wall by a pair of axially spaced apart bearings concentric with said ring, a stator for cooperating with said hysteresis ring to provide a spin motor, said stator being mounted within said casing axially between said bearings and radially between said hysteresis ring and said casing operatively spaced from said ring, a cylindrical gyro rotor having first and second ends and mounted through a hinge unit within said hysteresis ring with a predetermined radial gap therebetween, said gap being selected to determine the permitted range of tilting of said gyro rotor, a sensor ring mounted on said gyro rotor adjacent said first end of said rotor, a pair of axially spaced apart ring magnets mounted on said gyro rotor adjacent said second end of said rotor, a sensor coil mounted on said wall of said casing confronting in operative



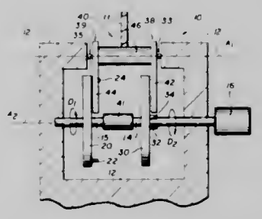
relation said sensor ring, and a torquer coil mounted on said wall of said casing confronting in operative fashion said ring magnets.

4,891,998

MOTION CONVERSION APPARATUS

Thomas W. Tourville, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 20, 1988, Ser. No. 209,246
Int. Cl.[4] F16H *21/40*; G02B *26/10*
U.S. Cl. 74—48 **2 Claims**



1. A motion conversion apparatus for converting input rotational motion into output oscillatory motion comprising:
link means disposed to pivot about a pivot point and coupled to a first member for inducing oscillation of said first member about a first axis thereby providing said output oscillatory motion, said link means including first and second slotted coupling arms attached to opposite ends of a first shaft;
flywheel means adapted to rotate about a second axis for causing said link means to pivot about said pivot point said flywheel means including:
first and second flywheels rotating in opposite directions about said second axis;
drive roller means mounted on said first and second flywheels for engaging said link means;
means for coupling said first and second flywheels; and
shaft means adapted to rotate about said second axis and operatively coupled to said flywheel means for providing said input rotational motion.

4,891,999

SHIFT CONTROL SYSTEM FOR A HYDROMECHANICAL TRACTOR TRANSMISSION

Leonard A. Scott, Bellwood, Ill., assignor to J. I. Case Company, Racine, Wis.

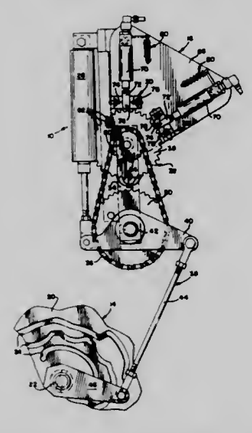
Filed Sep. 19, 1988, Ser. No. 246,426
Int. Cl.[4] F16H *5/06*
U.S. Cl. 74—337.5 **5 Claims**

1. A shift control system for a hydromechanical tractor

transmission which is shiftable between a plurality of different gear ratios, said shift control system comprising:

a cam mounted on said transmission for rotation about a pivot and between a series of distinct angular positions, said cam defining a cam profile which controls in which gear ratio said transmission is operated as a function of the angular disposition of said cam; and

an electronically controlled cam shifter assembly which is responsive to electric shift signals derived from a control unit, said cam shifter assembly comprising actuating



means responsive to said electric shift signals and including a driver and connecting means between the driver and said cam for rotatably shifting the cam and imparting angular movement thereto, a profiled member driven in timed relation to said cam and having a series of spaced radial projections thereon, the spacing between said projections being equal to a distance the cam must be rotated to effect a change in gear ratios, and stop means operated in response to said electric shift signals and in timed concert with said actuating means for limiting angular movement of said cam in incremental steps.

4,892,000

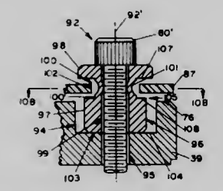
LUBRICANT RESTRICTING DEVICE

Richard J. Reak; George E. Boller, and Richard M. Ebert, all of Winona, Minn., assignors to Carol A. MacKay and Helen L. Kurtz, both of Winona, Minn.

Continuation-in-part of Ser. No. 794,769, Nov. 4, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 85,241

Int. Cl.[4] F16J *15/36*

U.S. Cl. 74—467 **4 Claims**



1. A device for use with a rotatable shaft having a gear on an end of said shaft wherein said shaft projects axially outwardly of a bearing mounting assembly having a mounting plate with a shaft bore therein through which said shaft projects, and wherein said gear on said shaft is spaced axially from said bearing mounting assembly comprising,

a base for nesting against said mounting plate between said gear and said mounting plate,

said base having an opening therein through which said shaft may project and having at least one mounting hole therein,

means carried by said base for reducing lubricant flow between said gear and said bearing mounting assembly, and

securing means for attaching said base to said mounting plate,

said securing means extending through said mounting hole including integrally connected top shoulder and bottom shoulders spaced apart from one another on opposite sides of said hole and defining a recessed groove with a connecting bottom wall therebetween extending through said mounting hole of said base, said recessed groove defined between said shoulders being of a width greater than the thickness of said base adjacent said securing means with said bottom shoulder projecting slightly above said mounting plate to space said base above said mounting plate to allow said base to move without substantial binding against said shoulders and against said mounting plate so as to accommodate differences in thermal expansion and contraction between said base and said mounting plate.

4,892,001

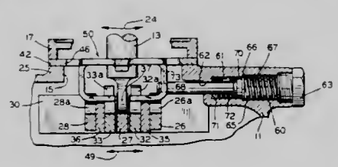
INTERLOCK ASSEMBLY FOR A VEHICLE TRANSMISSION

Richard S. Meyers, Jonesboro, Ark., and Charles R. Jones, Ottawa Lake, Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 6, 1988, Ser. No. 240,858

Int. Cl.[4] G05G *5/10, 9/14*

U.S. Cl. 74—477 **24 Claims**



1. In a vehicle transmission including a housing and a shift lever extending into the housing, a means for urging the shift lever toward a predetermined position within the housing comprising:

an aperture formed through the housing, said aperture including a first diameter portion and a second diameter portion, a shoulder being defined between said first and second diameter portions;

a washer disposed in said first diameter portion of said aperture;

first spring means for urging said washer against said shoulder;

pin means having a first end thereof disposed in said second diameter portion of said aperture and a second end thereof being connected with the shift lever for movement therewith; and

second spring means for urging said first end of said pin means against said washer, the shift lever being positioned in the predetermined position when said washer engages said shoulder and said first end of said pin means engages said washer.

4,892,002

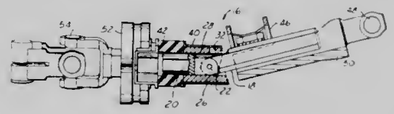
ARTICULATED STEERING DRIVESHAFT

John L. Groat, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1988, Ser. No. 228,206

Int. Cl.[4] B62D *1/16*

U.S. Cl. 74—492 **13 Claims**



1. An articulated steering driveshaft for an automotive vehicle, comprising:

first and second shaft segments coupled by means of a selectively foldable joint, with said joint comprising:

a hinge for joining said shaft segments for rotation about an axis perpendicular to the axes of said shafts; and

a sleeve slidably mounted upon said shaft segments and said hinge, with said sleeve being movable from a first position in which said sleeve extends axially over substantially the entirety of said hinge to a second position in which said sleeve extends over a lesser portion of said hinge, with said positions being further characterized such that while occupying said first position said sleeve is adapted to transmit steering torque from one of said shaft segments to the other of said segments while maintaining said segments in coaxial alignment, whereas while occupying said second position said sleeve allows said shaft segments to fold with respect to each other about the axis of said hinge.

4,892,003

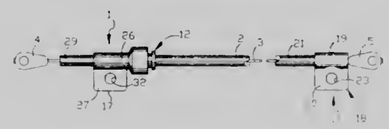
ASSEMBLY FOR THE SELF-ADJUSTMENT OF A CABLE CASING

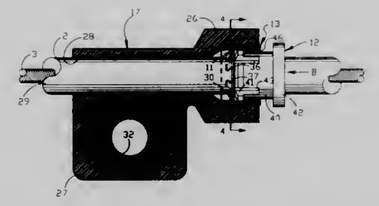
James T. Quinlan, Massillon, Ohio, assignor to Flex Technologies, Inc., Midvale, Ohio

Filed Apr. 27, 1988, Ser. No. 186,570

Int. Cl.[4] F16C *1/14*

U.S. Cl. 74—501.5 R **16 Claims**





1. An assembly for the self-adjustment of a casing of the type having a cable slideably mounted therein, wherein said cable extends between a manually operated lever of a vehicle temperature control module and a door movably mounted on a forward bulkhead of said vehicle, said assembly including:

(a) first and second mounting means for attaching the casing at spaced locations generally adjacent the control module lever and door, respectively;

(b) tang means mounted in the first mounting means for encircling and gripping the casing, said tang means being a generally flat ring having a plurality of circumferentially spaced, generally radially inwardly extending tangs permitting passage of said casing therethrough in a single direction;

(c) release means mounted in the first mounting means and engageable with the tang means for manually releasing said tang means from the casing; and

(d) retainer means mounted in the first mounting means for retaining the tang means and release means in said first mounting means adjacent a movable end of the casing, so that upon manual adjustment of the lever in a first direction said movable casing end moves through the tang means in the single direction to remove slack from the casing and to retain the casing is an adjusted position by the tang means.

4,892,004

AUTOMATIC LENGTH ADJUSTER FOR CONTROL CABLES

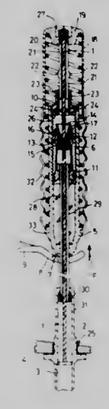
Antonio T. Segura, and Victorino S. Sallant, both of Barcelona, Spain, assignors to Pujol Y Tarrago S.A., Barcelona, Spain

Filed Jun. 22, 1988, Ser. No. 209,858

Claims priority, application Spain, Jul. 2, 1987, 8701942

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501.5 R **10 Claims**



6. A length adjuster for automatically adjusting an effective length of a control cable for controlling a member in accordance with a change in a position of the member, said length adjuster comprising:

a hollow cylindrical body;

a tubular body telescopically mounted with respect to said hollow cylindrical body, said tubular body being radially outside said hollow cylindrical body;

means for anchoring the control cable to said tubular body, the control cable extending axially through said hollow cylindrical body and said tubular body;

a compensation spring interposed between said hollow cylindrical body and said tubular body; and

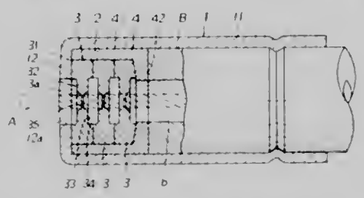
means displaceable within said hollow cylindrical body for connecting the control cable to said hollow cylindrical body at different relative longitudinal positions in accordance with different positions of the member to transmit a control force from the cable to the member in a respective position of the member.

4,892,005

END CAP FOR AN OUTER CABLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Iodustrial Company Limited, Osaka, Japan

Filed Apr. 29, 1988, Ser. No. 187,927
Claims priority, application Japan, May 2, 1987, 62-67325[U]
Int. Cl.[4] F16C *1/10*; F16N *7/16*
U.S. Cl. 74—502.4 **4 Claims**



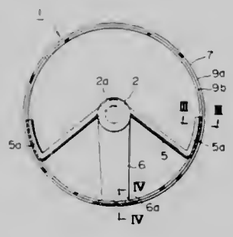
1. An end cap adapted to be used on an outer cable guiding a control wire of a bicycle, said end cap comprising:
a tubular cap body provided with a bottom portion having an insertion bore adapted to receive the control wire so as to enable the outer cable to be inserted into said cap body;
a holding means adapted to hold an end face of the outer cable at a given position when the outer cable is fitted into said cap body to form a chamber having an open space between the end face of the outer cable and an inner surface of said bottom portion; and
a plurality of sealing members disposed in said chamber and having a sealing portion adapted to surround and seal an outer periphery of the control wire, wherein each of said sealing members is provided with an annular portion and a lip portion extending radially inwardly from an inner periphery of said annular portion and having a center portion adapted to have the control wire inserted therethrough.

4,892,006

STEERING WHEEL RIM CORE AND ELONGATED BLANK THEREFOR

Tetsuji Endo, Fujinomiya, and Kazuyoshi Nishijima, Shizuoka, both of Japan, assignors to Nihon Plast Co., Ltd., Fuji, Japan

Filed Dec. 8, 1987, Ser. No. 130,720
Claims priority, application Japan, Dec. 12, 1986, 61-296127; Dec. 12, 1986, 61-296128
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 **3 Claims**



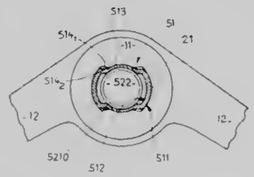
1. An annular rim core for a steering wheel having at least one spoke through which said annular rim core is connected to a central hub, said annular rim core comprising:
an annular rim structure having a pair of axially spaced side walls and a radially outer wall having a radially outwardly directed outer surface and interconnecting said side walls, such that said rim structure is open in the radially inward direction, wherein said side walls and said radially outer wall are shaped such that a first annular recess having first thickness dimension is formed between said side walls for receiving therein a spoke core of said first thickness dimension and a second annular recess is formed in one of a bottom of said first annular recess and said radially outwardly directed outer surface, said second annular recesses having an axially measured second thickness dimension smaller than said first thickness dimension.

4,892,007

DEVICE FOR COUPLING A WHEEL TO ITS SHAFT AND THE APPLICATION OF THE DEVICE IN THE KEYING OF AN AUTOMOBILE STEERING WHEEL

Bernard Haldric, and Sylvie Baudoo nee Chardon, both of Vendome, France, assignors to NACAM, Vendome, France

Filed May 13, 1988, Ser. No. 193,684
Claims priority, application France, May 19, 1987, 87 06971
Int. Cl.[4] B62D *1/18*; F16D *1/00*
U.S. Cl. 74—552 **11 Claims**



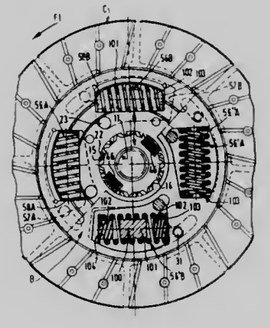
1. Coupling structure securing a wheel to a shaft and which structure allows the wheel to be axially and angularly positioned relative to the shaft prior to the securement thereof, said structure comprising:
a hub connected to said wheel and disposed on said shaft at an end portion of said shaft,
said hub and said end portion of said shaft having complementary arcuate peripheral bearing surfaces engaging one another with substantially no clearance therebetween and terminating at end portions thereof,
the bearing surface of one of said hub and said end portion of said shaft being an outer peripheral surface of said one of said hub and said end portion of said shaft, and said one of said hub and said end portion of said shaft having a respective projection extending radially from the outer peripheral bearing surface thereof and defined between end portions of the outer peripheral bearing surface,
the bearing surface of the other of said hub and said end portion of said shaft being an internal peripheral surface of said other of said hub and said end portion of said shaft, and the other of said hub and said end portion of said shaft having a respective cavity defined therein between each pair of end portions of and contiguous to said internal peripheral bearing surface, each respective said cavity receiving a respective said projection therein,
each said cavity and the projection received therein being defined at least in part by radially extending abutment surfaces of said hub and said end portion of said shaft, each said radially extending abutment surface of said end portion of said shaft confronting and spaced from a said radially extending abutment surface of said hub wherein said abutment surfaces limit the extent to which the wheel can be angularly positioned relative to the shaft; and
radial expansion means located within the end portion of said shaft and exerting a radially outward force that acts on said bearing surfaces to frictionally bind said bearing surfaces and secure the wheel to said shaft.

4,892,008

TORSION DAMPING DEVICE

Jacky Naudin, Ermont, and Jacques Alas, Eaubonne, both of France, assignors to Valeo, Paris, France

Filed Apr. 13, 1988, Ser. No. 181,039
Claims priority, application France, Apr. 14, 1987, 87 05294
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—574 **4 Claims**



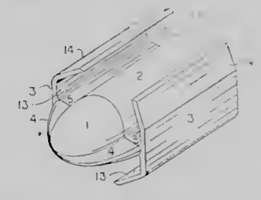
1. A torsion damping device, especially for automobiles, of the kind comprising at least two coaxial parts mounted to rotate relative to one another within defined limits of angular displacement against elastic units extending in the circumferential direction, each elastic unit having an interior, each elastic unit being disposed partly, on the one hand, in an opening of one of said parts and, on the other hand, in an opening of the other of said parts, wherein inside at least one elastic unit a stiffer elastic means is housed, comprising, in the central zone of said unit, a block of relatively rigid plastic material disposed with a predetermined clearance relative to two elastic pads which said elastic unit presents at each of its circumferential ends and wherein the elastic pads are supported by small spring seats in the shape of small plates interposed between each circumferential end of said elastic unit and a housing of one of the said parts.

4,892,009

BULLET BICYCLE PEDAL

Peter O. Gibson, 1445 Casino Cir., Silver Spring, Md. 20906

Filed Jun. 20, 1988, Ser. No. 209,006
Int. Cl.[4] G05G *1/14*; A43B *5/00*
U.S. Cl. 74—594.6 **3 Claims**



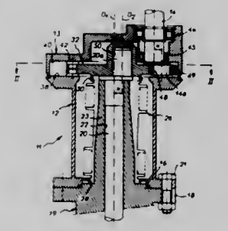
1. A bicycle pedal enabling lateral engagement of a cleat;
said pedal comprising a spindle with a longitudinal axis, a body, two lateral plates, two side flanges and a lead;
said pedal having two opposed substantially identical bilaterally symmetric tracks substantially parallel said longitudinal axis,
said body having two exterior convex surfaces, a free end, a fixed end and two sides,
each said lateral plate extended along said body in opposition to each other and having two opposed substantially parallel surfaces,
each said flange disposed substantially perpendicular either said lateral plate in aposition to each other and further extended symmetrically over a portion of both said opposed surfaces of one said lateral plate,
each said track bounded by a bilaterally symmetric set of longitudinally contiguous surfaces comprising one said body central convex surface with two substantially coplanar laterally adjacent surfaces and two laterally distal side surfaces in aposition defining the width of said track,
each said laterally distal side surface further projecting inwardly in juxtaposition to said central convex surface,
said lead attached said body free end and possessing two opposed bilaterally symmetric exterior surfaces,
each said lead exterior surface being flush said central convex surface and both substantially co-planar laterally adjacent surfaces of one said track,
said lead further tapering away from said pedal tracks to an apex coincident said longitudinal axis.

4,892,010

SEALED TRANSMISSION DEVICE USING METAL BELLOWS, SUITABLE FOR QUARTERTURN VALVES

Daniel Pottier; Rémy Leclaire, and Paul Vulliez, all of Pont-Audemer, France, assignors to 501 Normetex, Pont-Audemer, France

Filed Jul. 1, 1988, Ser. No. 214,610
Claims priority, application France, Jul. 2, 1987, 87 09402
Int. Cl.[4] F16C *3/04*; F16J *15/50*
U.S. Cl. 74—595 **10 Claims**



1. A sealed rotary transmission device comprising a control shaft, a receiver shaft parallel to and, spaced apart from said control shaft, a bellows having an upper end and a lower end surrounding said receiver shaft, a casing having an upper end and a lower end surrounding said bellows, the lower end of said bellows being fixed in a sealed way to the lower end of said casing, a transfer member having a radially outer most part is disposed in the upper end of said casing and constrained to move in said casing in a direction parallel to a plane which is perpendicular to said receiver shaft, the upper end of said bellows is fixed in a sealed way to said transfer member, a crank is attached to said control shaft and a crank is attached to said receiver shaft, the crank of the control shaft and the crank of the receiver shaft are eccentric to the axis of their respective control shaft and receiver shaft by the same distance, the crank of the control shaft and the crank of the receiver shaft are each coupled to said transfer member and are spaced apart by a distance which is equal to the distance between the control shaft and the receiver shaft, to enable circular translation of said transfer member, and the upper portion of said casing comprises two annular guide surfaces between which the radially outermost part of said transfer member is inserted and guided in its movement.

4,892,011

PLANETARY GEAR MECHANISM ON AN AUTOMATIC TRANSMISSION

Masaaki Nishida, Anjo, and Yonichi Hayakawa, Toyoake, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

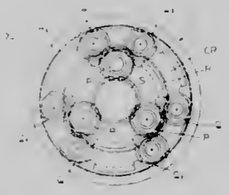
PCT No. PCT/JP87/00483, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00301, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 8, 1987, Ser. No. 181,148

Claims priority, application Japan, Jul. 8, 1986, 61-161263

Int. Cl.⁴ F16H *57/10, 1/28*

U.S. Cl. 74—761 **13 Claims**



1. A planetary gear set comprising:

a dual planetary gear unit including a sun gear, a ring gear, a first planetary pinion means operatively disposed between said sun gear and said ring gear and comprising at least one first pinion for transmitting torque between said sun gear and said ring gear, a second planetary pinion means operatively disposed between said sun gear and said ring gear and comprising a respective pair of circumferentially spaced second pinions associated with each said first pinion for also transmitting torque between said sun gear and said ring gear, and a carrier to which said second pinions are rotatably mounted,

said carrier rotatably supported in said gear set relative to said sun gear,

each said first pinion meshing with only the respective pair of second pinions associated therewith and one of said sun gear and said ring gear in said dual planetary gear unit, and

each said respective pair of second pinions meshing with only the first pinion associated therewith and the other of said sun gear and said ring gear in said dual planetary gear unit.

4,892,012

AUTOMATIC TRANSMISSIONS OF VEHICLE

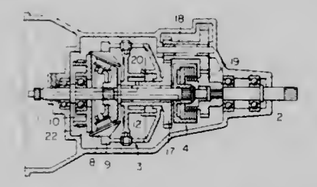
Tadashi Kashihara, Kyoto, Japan, assignor to Shimpo Kogyo Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 96,751, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 697,632, Feb. 4, 1985, abandoned. This application Jan. 30, 1989, Ser. No. 303,081

Claims priority, application Japan, Feb. 2, 1984, 59-17480; Oct. 24, 1984, 59-223779

Int. Cl.⁴ F16H *15/50, 57/10*

U.S. Cl. 74—772 **3 Claims**



1. Automatic transmission of vehicle including a stepless speed change gear equipped with a plurality of planet-rollers having a conical surface frictionally engaging with a axially movable ring member, a surface of concave cross-section frictionally engaging with a sun-member on an input shaft of the transmission and a flat surface frictionally engaging with a disc-member normally constrained against rotation, the rotation of the axially movable ring-member being first transmitted to an output member of the stepless speed change gear, characterized in that:

a. speed increasing gear means provided between the output member of the stepless speed change gear and in the output shaft of the transmission, an upper limit of the speed ratio between the input shaft and the output shaft of the transmission being increased to 1:1 by the provision of this speed increasing gear means, and in that;

b. first means for finding a state wherein the above speed ratio increased to 1:1, and second means for finding a state wherein the above speed ratio should be decreased from 1:1 are provided, and in that;

c. clutch-means provided between the input shaft of the transmission and the output member of the stepless speed change gear, this clutch means being operated to take an engaged state by a signal from the above first means and being operated to take a disengaged state by a signal from the above second means; and in that:

d. releasing means which operates simultaneously with said clutch-means to release the stepless speed change gear; and

e. means for determining the position of said ring-member corresponding to a torque acting on said output shaft, which is composed of a cam device on a member provided between said ring-member and said output shaft and means for applying a force in a speed increasing direction to said ring-member.

4,892,013

VARIABLE SPEED GEARING IN ROTARY ELECTRIC TOOL

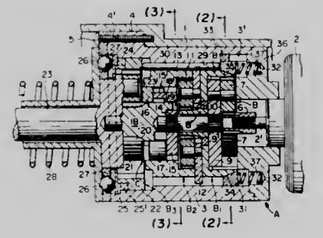
Atsushi Satoh, Saitama, Japan, assignor to Olympic Co. Ltd., Iruma, Japan

Filed Jun. 29, 1988, Ser. No. 213,156

Claims priority, application Japan, Jul. 30, 1987, 62-190587

Int. Cl.⁴ F16H *3/74*

U.S. Cl. 74—785 **20 Claims**



11. A variable speed gearing arrangement comprising:

(a) a gear case having a longitudinal axis;

(b) an axially movable brake disk;

(c) a first planetary gear mechanism to be operably connected to a driving shaft, said first planetary gear mechanism including an internal gear having a surface which is engageable with said axially movable brake disk to maintain said internal gear against rotation during such engagement;

(d) means for biasing said brake disk against said internal gear of said first planetary gear mechanism for engagement therewith;

(e) a final planetary gear mechanism to be operably connected to an output shaft, said final planetary gear mechanism including an axially movable internal gear having an outer periphery, said movable internal gear having projections located on said outer periphery;

(f) a torque-setting cam for engagement with said internal gear of said final planetary gear mechanism by means of said projections of said internal gear of said final planetary gear mechanism to maintain said movable internal gear against axial movement; and

(g) means for moving said brake disk in opposition to said means for biasing said brake disk, in response to movement of said movable internal gear of said final planetary gear mechanism, to separate said brake disk from said surface of said internal gear of said first planetary gear mechanism.

4,892,014

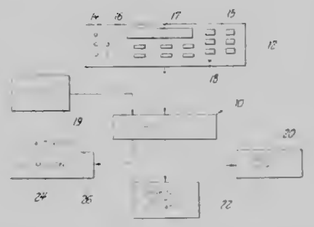
ELECTRONIC CONTROLLER FOR AUTOMATIC TRANSMISSIONS

Thomas H. Morell, Grand Haven, Mich., and Frederick A. Schonfeld, Albuquerque, N. Mex., assignors to Sparton Corporation, Jackson, Mich.

Filed Feb. 1, 1988, Ser. No. 150,985

Int. Cl.⁴ B60K *41/06*

U.S. Cl. 74—866 **2 Claims**



1. In an automotive vehicle, an electronic transmission controller for an automatic transmission having neutral, reverse, forward and park ranges and subject to range selection by electrical signals from the controller, the controller comprising;

speed sensors for sensing vehicle speed and engine speed,

ignition sensors for sensing whether the ignition is on and whether the key is in the ignition switch,

means for controlling the transmission park range in response to preset values of sensed vehicle conditions including programmable electronic means coupled to the sensors for producing electrical signals for range selection, the electronic means being programmed to limit the transmission to park range on the basis of prescribed sensor conditions,

said vehicle being equipped with a power operated parking brake and wherein the electronic means produced a brake signal, and

actuator means responsive to the brake signal for applying the parking brake when the transmission is shifted to its park range.

4,892,015

PLIERS FOR STRIPPING THE ENDS OF CONDUCTORS

Horst Beetz, Stadtallendorf, and Kurt Battenfeld, Ebsdorfergrund, both of Fed. Rep. of Germany, assignors to Wezag GmbH, Stadtallendorf, Fed. Rep. of Germany

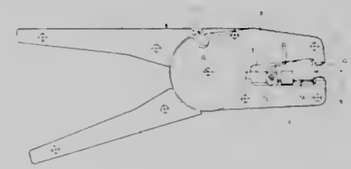
Filed Sep. 30, 1988, Ser. No. 252,376

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733358

Int. Cl.⁴ H02G *1/12*

U.S. Cl. 81—9.41 **10 Claims**

1. Pliers for stripping the ends of conductors, with a pair of handles and with a pair of gripping jaws that demarcate a mouth and can be forced against the insulation on the conductor, whereby one of the gripping jaws is integrated into one of the handles and constitutes a main pliers component, on which the other handle and the other gripping jaw pivot, with a control lever that has a roller mounted on it and pivots on the moving handle against the force of a restoring spring, with a stop positioned on the moving gripping jaw and establishing the starting position, with a control surface and a limiting stop associated with the roller on the control lever, and with two stripping jaws that are accommodated inside the gripping jaws, that are subject to the force of an expansion spring, that pivot



together at the ends remote from the mouth, and that can be jointly displaced longitudinally in the insulation-stripping direction by a tensioning component that comes into action once the moving handle has traveled a prescribed distance, characterized in that the moving handle (**5**) and the moving gripping jaw (**6**) pivot around the same axis (**4**) on the main component (**1**) of the pliers, in that the stripping jaws (**8** and **9**) are articulated to the control lever (**23**) by way of the tensioning component (**11**), and in that the stop (**29**), the control surface (**30**), and the limiting stop (**31**) are accommodated in the moving gripping jaw and associated strictly with the stripping motion.

4,892,016

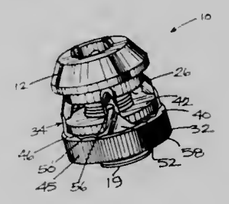
ADJUSTABLE SOCKET

J. E. C. Anderson, Moreland Hills, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Continuation of Ser. No. 162,980, Mar. 2, 1988, abandoned. This application Apr. 20, 1989, Ser. No. 344,549

Int. Cl.⁴ B25B *13/18*

U.S. Cl. 81—128 **11 Claims**



1. An adjustable socket comprising:

a driver rotatable a longitudinal axis, said driver having a plurality of inclined slideways extending with both radial and axial components with respect to the longitudinal axis;

a plurality of jaws respectively supported within the slideways of the driver for inward and outward movement along with concomitant axial movement with respect to the longitudinal axis;

each of said jaws having an internal driver aperture having an aperture axis transverse to said longitudinal axis;

an adjuster including a jaw operating member, a plurality of jaw clips and a connection that secures the jaws, jaw operating member and jaw clips to maintain the assembled condition of the socket and limit movement of the jaws;

said jaw operating member including a flange surface projecting outwardly with respect to the longitudinal axis, and groove structure spaced from said flange for support-

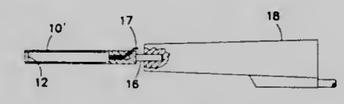
ing said jaw clips during operating engagement with walls of the driving apertures in each of said jaws;
mating helical surfaces supporting the adjuster on the driver for axial adjusting motion upon relative rotation that moves the jaws axially and concomitantly inwardly or outwardly along the slideways for size adjustment between open and closed positions;
said jaws each having a surface complemental to and in engagement with said flange surface during movement from said open to said closed positions and when the socket is in use; and,
each of said jaw clips being in engagement with a wall of said groove and an associated driving aperture wall when the socket is moved from its closed to its open position.

4,892,017
AUTOMOTIVE FUEL SYSTEM ADJUSTMENT TOOL
T. W. Kennedy, 13145 Woodmont Pl., Poway, Calif. 92064, and James C. McMillen, 1498 Country Club Dr., Escondido, Calif. 92025
Filed Apr. 7, 1989, Ser. No. 334,478
Int. Cl.[4] B25B *7/02*
U.S. Cl. 81—492 **13 Claims**



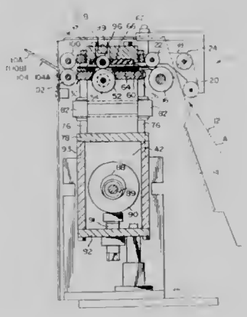
1. A fuel system adjustment tool, comprising:
an elongated hollow shaft;
transmittal means for transmitting a rotational motion from one end of the hollow shaft to the other end, the transmittal means being disposed within, and rotatable within, the hollow shaft;
a drive head attached to the transmittal means at one end of the hollow shaft and extending beyond that end of the hollow shaft;
a rotatable control knob attached to the transmittal means at the other end of the hollow shaft; and
sensing means for creating in the control knob a tactile sensation of releasable engagement at preselected degrees of rotation of the drive head.

4,892,018
DEFLASHING METHOD AND APPARATUS
Beryl A. Boggs, Richmond, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 3, 1985, Ser. No. 771,963
Int. Cl.[4] A47L *11/12*
U.S. Cl. 83—15 **9 Claims**



1. Apparatus for deflashing a fiber reinforced plastic article comprising a cutting edge, means for heating the cutting edge to a temperature of at least 800° F. (427° C.), and means for vibrating said cutting edge.

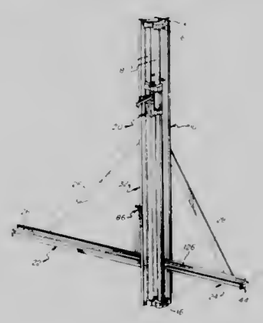
4,892,019
SHEET PUNCHING CUTTER
Mikio Kogane; Mizuho Nishimura, both of Kanagawa, and Tsutomu Kimura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 14, 1987, Ser. No. 85,600
Claims priority, application Japan, Aug. 28, 1986, 61-202551; Aug. 28, 1986, 61-202552; Aug. 29, 1986, 61-203476; Aug. 29, 1986, 61-203477
Int. Cl.[4] B26D *7/18, 9/00*
U.S. Cl. 83—105 **19 Claims**

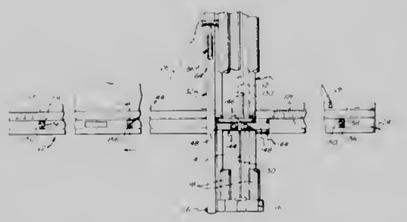


1. A sheet punching cutter for punching a sheet of material comprising:
a fixed block;
a moving punching blade having an aperture defined therein and being moveable towards and away from said fixed block, said sheet being disposed between said fixed block and said punching blade such that movement thereof toward said fixed block causes a portion of said sheet to be punched therefrom, the unpunched portion being a punched-remainder portion;
a transporting roller disposed inside said moving punching blade for transporting a punched-out portion of said sheet punched by said moving punching blade, said transporting roller being driven so as to convey said punched-out portion at a first speed; and
transporting means for moving said sheet to the punching position at which said sheet is punched and moving said sheet away from said punching position, said transporting means conveying said sheet at a second speed, wherein said second speed is different from said first speed to facilitate the separation of said punched out portion from said sheet.

4,892,020
WORKPIECE SUPPORT SYSTEM FOR CUTTING MACHINE
Vincent T. Kozyrski, Plainville, and Alan R. Peters, Milford, both of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.
Filed Jul. 8, 1988, Ser. No. 216,899
Int. Cl.[4] B26D *7/02*
U.S. Cl. 83—463 **20 Claims**

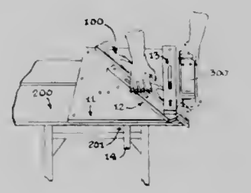
1. A wall-mounted support system for a sheet-cutting machine, comprising:
a frame having backing structure providing contact surfaces disposed in a generally vertical plane with said system in its normal, wall-mounted orientation;
an elongated clamping unit disposed on said frame forwardly of said generally vertical plane with its longitudinal axis vertically oriented, said clamping unit comprising:
(a) an elongated, rectilinear housing member of generally U-shaped cross-section, as taken in planes transverse to its longitudinal axis, comprised of a top wall and two spaced, parallel, coextensive sidewalls extending along the length thereof;
(b) an elongated, rectilinear clamp member assembled with said housing member and having a portion, extending along its entire length, that is of generally U-shaped cross-section, as taken in said transverse planes, said portion being comprised of a bottom wall and two spaced, parallel, coextensive sidewalls extending along the length thereof, the spacing of said clamp member sidewalls being less than that of said housing member sidewalls, and said clamp member sidewalls being received between said housing member sidewalls in edgewise confronting relationship, said clamp member having a clamping contact surface outwardly disposed on said bottom wall;
(c) a plurality of rigid pivot arms disposed in the space between said sidewalls of said clamp member at spaced locations along the length of said unit, each of said arms being pivotably attached to said housing member and said clamp member to permit parallel movement of said





clamp member between a retracted position, substantially within said housing member, and positions extended therefrom;
(d) a like plurality of guide pins extending transversely between said sidewalls of said clamp member and inserted through said pivot arms for pivotable attachment thereof, each of said pins having a shaft element and a head element on at least one end thereof, said head elements having low-friction outer surfaces thereon, and at least one of said head elements being interposed between the adjacent sidewalls of said clamp and housing members on each side of said unit;
(e) a handle member pivotably mounted on said housing member and having an inner end portion therewithin and an outer end portion accessible for manual operation; and
(f) a rigid link member effectively interconnecting said handle member to said clamp member, so as to enable said handle member to effect movement of said clamp member between said retracted and extended positions thereof; and
an elongated rack unit mounted on said frame forwardly of said vertical plane with its longitudinal axis horizontally oriented and parallel to said plane, said rack unit comprising:
(g) an elongated channel member attached to said frame and comprised of spaced, upstanding forward and rearward walls defining an upwardly opening channel therebetween, said rearward wall having at least one circular opening therein and said forward wall having an upper edge and a window therethrough below said upper edge and in general alignment with said opening of said rearward wall;
(h) an elongated leveling bar pivotably attached at one end, operatively to said frame, and contained within said channel of said channel member, said bar having a flat upper surface at a level below said upper edge of said forward wall and an upper marginal edge defining said forward wall window, and having at least one aperture therethrough spaced from said one end of said bar and in general alignment with said window and opening of said forward and rearward walls, respectively; and
(i) an eccentric mounting fixture, including a first part rotatably seated in said circular opening of said rearward wall for rotation about an axis through the center of said opening, and a second part having opposite ends and a shaft therebetween extending through said aperture of said leveling bar on an axis parallel to said axis of rotation, said second part being engaged at one end with an inner end portion of said first part at a point offset from the axis of rotation thereof, and having means at its other end for cooperating with said first part to clamp said bar against said rearward wall; whereby rotation of said first part will raise and lower said shaft of said second part to pivot said bar, and whereby said bar can be clamped in selected positions against said rearward wall by coaction of said first and second parts.

4,892,021
VARIABLE ANGLE SAW GUIDE APPARATUS
Jeffrey A. Sanderson, 5245 Bluestem Dr., Colorado Springs, Colo. 80917
Filed Jan. 12, 1989, Ser. No. 296,266
Int. Cl.[4] G27B *27/06*
U.S. Cl. 83—468 **1 Claim**



1. A variable angle saw guide apparatus to assist an individual in cutting a piece of lumber at a precise angle using a saw wherein the apparatus consists of:
an angle plate unit comprising a generally rectangular relatively thin flat plate member having a plurality of mounting apertures disposed around the periphery of the plate member, and a plurality of angle defining apertures, including a plurality of aligned angle defining apertures and at least one additional angle defining aperture offset from said plurality of aligned angle defining apertures,
an angle guide unit comprising a first elongated generally rectangular arm member having: a pair of mounting apertures disposed proximate the ends of the arm member; and, an elongated slot formed intermediate the ends of the

arm member; wherein, the angle guide member is disposed in contact with the angle plate unit and a piece of lumber;

a hold down clamp unit operatively attached to said angle guide unit and said angle plate unit; wherein the hold down clamp unit comprises a second elongated generally rectangular arm member having mounting apertures formed proximate the ends of the second arm member, which is adapted to overlie at least a portion of both said first elongated generally rectangular arm member and said piece of lumber for captively engaging said piece of lumber against the plate member;

a plurality of securing members adapted to engage the angle guide unit and the hold down clamp unit to the angle plate unit wherein one of the plurality of securing members extends through at least one of the mounting apertures in the hold down clamp unit, the angle guide unit and the angle plate unit; and another of the plurality of securing members extends through the elongated slot in the first arm member and a selected one of the plurality of angle defining apertures; and,

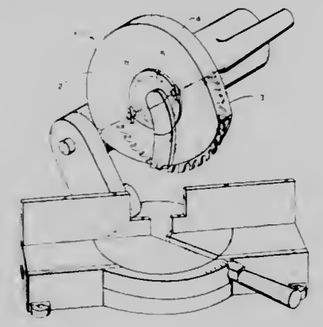
an auxiliary table saw guide unit including an elongated generally thin slat member which is adapted to be secured beneath said angle plate unit.

4,892,022

SAFETY GUARD FOR SAWING POWER TOOL PARTICULARLY MITRE SAW

Lawrence M. Cotton, and John C. Derler, both of New Bern, N.C., assignors to Robert Bosch Power Tool Corporation, New Bern, N.C.

Filed Sep. 20, 1988, Ser. No. 246,614
Int. Cl.[4] B27B *5/18*; B23D *45/04*
U.S. Cl. 83—478 **14 Claims**



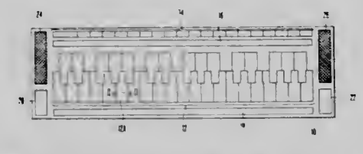
1. A saw blade guard for a sawing power tool, particularly a mitre saw, comprising a protective element having two side walls each formed as a part of a circle, and a peripheral wall connecting said side walls with one another, said side walls having a center and an edge spaced from said center, said protective element being formed as an integral element and provided with means in the region of said edge for turning said protective element as a whole, one of said side walls of said protective element being provided with a central opening for allowing access to a saw blade shaft of the sawing power tool; a cover associated with said central opening and movable between a first position in which it is spaced from said central opening to allow access to the saw blade shaft and a second position in which it covers said central opening.

4,892,023

ELECTRONIC KEYBOARD PERCUSSION INSTRUMENT

Akihiko Takeuchi, and Masaaki Mizuguchi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 110,617, Oct. 19, 1987, abandoned, which is a continuation of Ser. No. 850,212, Apr. 10, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 302,113
Claims priority, application Japan, Apr. 16, 1985, 60-80913
Int. Cl.[4] G10H *1/053, 1/34, 5/02*
U.S. Cl. 84—687 **16 Claims**



1. An electronic keyboard percussion instrument of a type to be struck with a striking member by a player comprising:

a plurality of pressure sensitive plates respectively corresponding to note names of musical tones to be produced and aligned parallel to each other;

a plurality of striking detecting means, each of which detects when a corresponding pressure sensitive plate is struck with said striking member by the player and generates a first striking detection signal representing a note name of the struck pressure sensitive plate and further generates a second striking detection signal representing a musical tone element modifier characteristic of a manner in which the player has struck the struck pressure sensitive plate;

a tone assignor for assigning said first and second striking detection signals to one of a plurality of tone channels; and

musical tone generating means coupled to said plurality of tone channels for generating a musical tone corresponding to said note name and said musical tone element modifier.

4,892,024

STRUCTURE OF KEYBOARD USED IN ELECTRONIC KEYBOARD INSTRUMENT

Keisuke Watanabe, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Aug. 4, 1988, Ser. No. 228,230
Claims priority, application Japan, Aug. 7, 1987, 62-197791
Int. Cl.[4] G10H *1/00*; G10C *3/12*
U.S. Cl. 84—719 **20 Claims**



1. A keyboard structure incorporated in an electronic keyboard instrument, comprising:

(a) a plurality of key members each having a front end portion and a rear end portion, said front end portion being depressed by a player of said electronic keyboard instrument;

(b) a plurality of flexible connecting members each coupled to the rear end portion of each key member;

(c) a retainer member for retaining a circuit board and being coupled to each of said flexible connecting members which connects the retainer member and said key member; and

(d) a plurality of key switches disposed on said circuit board, said retainer member retaining said circuit board so that each of said key switches opposes associated one of said key members, wherein said key members, said flexible

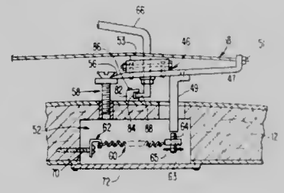
connecting members and the retainer member are formed into a singular piece.

4,892,025

TREMOLO DEVICE HAVING AN ADJUSTABLE COUNTERSPRING AND LOCK

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Jul. 22, 1988, Ser. No. 223,095
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **9 Claims**



1. A tremolo device for a stringed instrument having a body and a plurality of strings comprising:

tailpiece means for anchoring and moving one end of the strings;

pivot means for pivotally mounting said tailpiece means on the body;

counterspring means for providing a force on the tailpiece means which opposes tension of the strings on the tailpiece means, the counterspring means having a first end and a second end and extending in a first direction between the first end and the second end;

means for attaching the first end of the counterspring means to the body; and

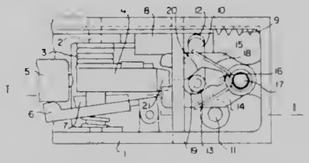
means for attaching the first end of the counterspring means to the tailpiece means and for varying the distance from the tailpiece means to the second end of the counterspring means by moving the second end of the counterspring means relative to the tailpiece means in a direction generally perpendicular to the first direction to vary the moment applied to the tailpiece means by the force of the counterspring means.

4,892,026

HAND-HELD AUTOMATIC FIREARM

Friedrich Aigner, St. Valentin, Austria, assignor to Steyr-Daimler-Puch AG, Postrach, Austria

Filed Sep. 8, 1988, Ser. No. 241,854
Claims priority, application Austria, Sep. 22, 1987, 2393/87
Int. Cl.[4] F41C *5/00*
U.S. Cl. 89—140 **6 Claims**



1. In a hand-held automatic firearm comprising

a receiver,

a breechblock, which is reciprocably mounted in said receiver for forward and recoil movements, and

a trigger mechanism mounted in said receiver and comprising

a hammer spring,

a hammer, which is pivoted to said receiver and arranged to be cocked against the force of said hammer spring by said breechblock during its recoil movement,

a sustained-fire lever, which is controlled by the breechblock and arranged to lock the hammer when said hammer is cocked under control of the breechblock during its forward movement,

a hammer extension, which is carried by said hammer and is movable by said hammer along a predetermined path,

a trigger slider, which is slidably mounted in said receiver for a movement from an initial position through a single-shot position and further to a sustained-fire position,

a trigger, which is pivoted to said receiver and operatively coupled to said trigger slider and is adapted to be pulled from an initial position to move said trigger slider from its initial position to said single-shot position and further to said sustained-fire position,

a trigger spring urging said trigger slider and said trigger to their respective initial positions, and

a pair of levers, which respectively comprise a release lever and a disconnector lever and are movable each into said predetermined path to a catching position in response to the movement of said trigger slider to either of said single-shot and sustained-fire positions,

the improvement residing in that

said release lever and said disconnector lever are pivoted on to said receiver on a common upright vertical axis and have confronting camming side edges, which define between them a cam slot,

a camming member is movably mounted in said receiver and is coupled to said trigger slider and is arranged to perform in response to pulling of said trigger a movement relative to said camming edges in engagement therewith and by said movement to impart to said pair of levers in dependence on one of the aforementioned positions assumed by said trigger slider, a movement of said pairs of levers from an initial position to a single-shot position when said trigger slider is in its single-shot position and to a sustained-fire position when said trigger slider is in its sustained-fire position,

a restoring spring is operatively connected to said pair of levers and urges them to their initial position,

said release lever is arranged to engage said hammer extension when said pair of levers are in their initial position and said hammer is cocked and to release said hammer extension when said pair of levers are in their single-shot position,

said disconnector lever is arranged to extend into said predetermined path when said pair of levers are in their sustained-fire position.

4,892,027

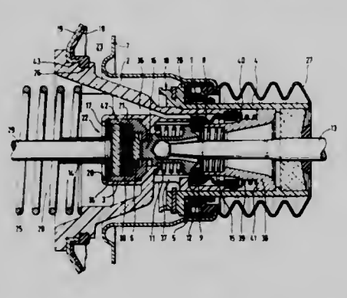
VACUUM BRAKE POWER BOOSTER FOR AUTOMOTIVE VEHICLES AND METHOD FOR ITS MANUFACTURE

Wilfried Wagner, Huettenberg-Weidenhausen, and Lothar Schiel, Hofheim-Lorsbach, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,327
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709172
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369.2 **8 Claims**

1. A vacuum brake power booster for automotive vehicles comprising a vacuum Casing which is sealingly subdivided by an axially movable wall into a vacuum chamber and a working chamber a mechanically actuatable control valve connecting the working chamber to the vacuum chamber and to atmosphere, the axially movable control valve having a casing being made of thermoplastics and accommodating in an axial bore therein an elastomeric reaction plate, said reaction plate abuts on a head flange of a push rod adapted to transmit a brake force onto an actuating piston of a master cylinder mountable

onto the vacuum casing, the movable wall being coupled to the control valve casing, a guide sleeve on said control valve casing adapted to axially guide the push rod therein said guide sleeve includes a radial flange wherein the radial flange of the



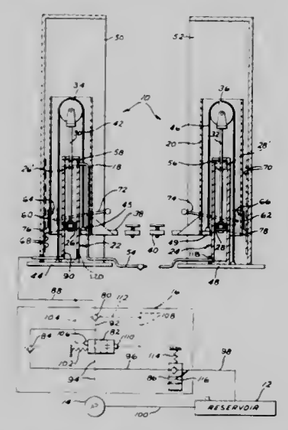
guide sleeve is axially supported inside the bore of the control valve casing accommodating the reaction plate and said guide sleeve axially embraced by a retaining member in positive engagement with said guide sleeve, said retaining member being connected to the control valve casing.

4,892,028

FLUID OPERATED CIRCUIT FOR CONTROLLING A DUAL POST HYDRAULIC LIFT ASSEMBLY

Bernard R. Stivers, Louisville, Ky., assignor to VBM Corporation, Louisville, Ky.

Filed Sep. 10, 1984, Ser. No. 648,503
Int. Cl.[4] B66F *3/46, 7/04, 7/20*
U.S. Cl. 91—517 **11 Claims**



11. For use with a dual post article lift assembly of the type which includes a hydraulically operated drive cylinder containing a movable piston connected to a piston rod, a hydraulically operated idler cylinder containing a movable piston connected to a piston rod, said cylinders being hydraulically connected in series such that upward and downward movements of said idler cylinder piston are dependent upon corresponding movements of said drive cylinder piston, and article supporting means nonfixedly connected to each of said rods such that upward movements of said pistons produce upward movements of said article supporting mean and such that downward movements of said pistons occur independently of movements of said supporting means, a fluid operated circuit for controlling the descent of said pistons comprising

a pilot operated check valve connectable for fluid flow therethrough to a lower end of said drive cylinder and responsively connectable to the lower ends of both of said cylinders for opening and remaining open for fluid flow therethrough when and so long as the ratio of the pressure of a fluid in a lower end of said idler cylinder to the pressure of a fluid in the lower end of said drive cylinder is at least as great as a predetermined minimum value indicative that the article supporting structure associated with said idler cylinder is unrestrained and free to descend as said pistons descend, said first valve being adapted to close to prevent the drainage of a fluid from said drive cylinder when said ratio is less than said value,

a first two-position control valve having an open and a closed position connected for fluid flow therethrough to said pilot operated check valve,

spring biasing means connected to said first valve and adapted to provide a preselected minimum bias pressure on said first valve which tends to maintain said first valve in an open position,

fluid biasing means responsively connectable to the lower end of said drive cylinder and operatively associated with said first valve tending to maintain said first valve in an open position,

fluid counterbiasing means responsively connectable to the lower end of said idler cylinder and operatively associated with said first valve in opposing relation to said spring and fluid biasing means for shifting said first valve to a closed position when the pressure of a fluid in the lower end of said idler cylinder exceeds the sum of the pressures of a fluid in the lower end of said drive cylinder and said spring biasing means indicative that the article supporting means associated with said drive cylinder is restrained from descending while said pistons are descending, and

a second check valve connected in shunting relation across said first valve and being adapted to close when said first valve is in an open position and being adapted to open to permit hydraulic fluid to be pumped around said first valve, to and through said pilot operated valve and into said drive cylinder when said first valve is closed so that the fluid pressure in said drive cylinder will be raised to shift said first valve from a closed to an open position.

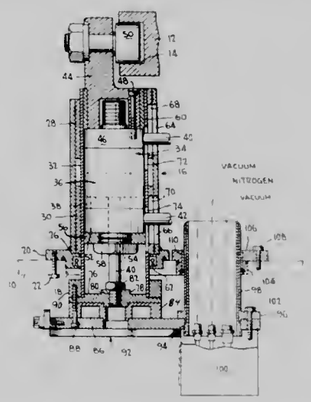
4,892,029

POSITIONING DEVICE

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Jun. 16, 1988, Ser. No. 207,506
Int. Cl.[4] F01B *3/00, 15/00*
U.S. Cl. 92—51 **14 Claims**

1. A positioning device particularly adapted for positioning and applying a member such as a sealing head, said positioning device comprising a mounting plate having an opening therethrough, a guide sleeve mounted on said plate in centered relation to said opening, an extensible fluid motor mounted within said guide sleeve for movement axially of said guide sleeve, a cam, said cam having a cam surface varying in distance from said said mounting plate, a cam follower carried by said fluid motor and engaged with said cam surface to vary the position of said fluid motor relative to said mounting plate, said fluid motor including a movable shaft, fluid means connected to said fluid motor for selectively extending and retracting said movable shaft independently of the position of said fluid motor



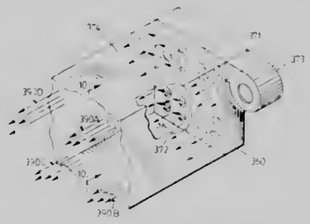
relative to said guide sleeve, and mounting means carried by said movable shaft.

4,892,030

AIRFLOW DISTRIBUTION SYSTEM FOR DISCHARGING AIR FROM A THIN PLENUM, AND OVEN EMPLOYING SAME

Douglas V. Grieve, Lake Forest, Ill., assignor to The Grieve Corporation, Round Lake, Ill.

Division of Ser. No. 217,392, Jul. 11, 1988, Pat. No. 4,869,155. This application Jul. 10, 1989, Ser. No. 377,143
Int. Cl.[4] A21B *1/26*
U.S. Cl. 98—1 **10 Claims**



1. An airflow distribution system comprising: an inlet plenum chamber, a discharge duct extending along a longitudinal axis intersecting said plenum chamber, and a fluid distribution plate forming a common wall therebetween;

said plenum chamber having inlet and outlet means for directing a flow of fluid through the plenum chamber into the duct;

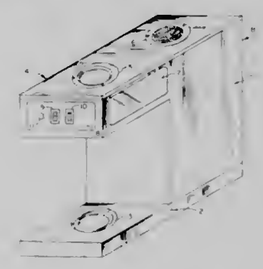
said outlet means comprising a plurality of discharge openings in said distribution plate arranged in a predetermined array around said longitudinal axis, said plate having diagonal louvers secured to the edges of said openings, said louvers having substantially the same orientation relative to said longitudinal axis to thereby direct individual streams of fluid outwardly from the distribution plate into and along the discharge duct where the individual streams merge and combine into a resultant fluid stream flowing along said axis through a predetermined portion of the cross sectional area of the discharge duct.

4,892,031

MODULARIZED CUSTOM BEVERAGE BREWER

Joseph P. Webster, and William L. Gustafson, both of St. Charles, Mo., assignors to Newco Research Corporation, St. Charles, Mo.

Continuation of Ser. No. 41,878, Apr. 23, 1987, Pat. No. 4,829,888. This application May 1, 1989, Ser. No. 345,365
Int. Cl.[4] A47J *31/00*
U.S. Cl. 99—284 **20 Claims**



1. In a modular fabricated custom formed beverage brewer of the type incorporating a component formed housing containing a hot water heating tank regulated by controls for heating water delivered to the tank by one of an automatic cold water inlet supply or a pour-in type for heating and delivery of water to a spray head for discharge onto a basket of beverage grounds for dripping of a brewed beverage to a decanter for consumption, the improvement which comprises, said housing being convertible for multiple usage through replacement and relocation of select of its components during assembly of the brewer housing, said beverage brewer incorporating a base member, an upright column means for use in containing the water heating tank, and an upper cantilevered portion mounted upon and extending forwardly of the column means, said combined base member, upright column means, and upper cantilevered portion disposing a front, left, and right sides for the constructed brewer, and said brewer being adaptable for providing one of a front, left or right side delivery of the decanter to and from the brewer during its application, control switch means provided upon the upper cantilevered portion, said control switch means being connectable upon one of the front, left or right sides of the said cantilevered portion, said control switch means being interchangeable between said front, left or right sides of the said cantilevered portion, and wherein said base member being interchangeable between one of a forwardly extending base member, a vertically extending height increasing base member, or a laterally mounting base member for the beverage brewer.

4,892,032

COOKING SPITS

Henry Jerome, 1689 Sherway Drive, Mississauga, Ontario L4X 1C8, Canada

Filed Nov. 28, 1988, Ser. No. 276,933
Int. Cl.[4] A47J *37/04*
U.S. Cl. 99—421 HV **6 Claims**

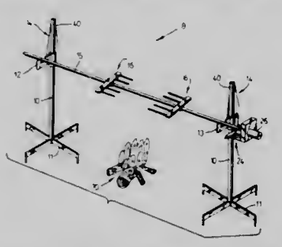
1. A portable cooking apparatus comprising:

(a) a pair of longitudinally elongated stanchions which are free of attachment to one another so as to be independently positioned in a generally upright manner in use,

(b) a spit rod support member mounted on each stanchion, each spit support member being formed to provide a seat for supporting a spit for rotation thereon about a first longitudinal axis which extends transversly between the seats in use,

(c) a motor support bracket for supporting a drive motor with its power output shaft aligned with said first longitudinal axis,

(d) mounting means connecting said first spit rod support member and said motor support bracket and providing simultaneous freedom of movement of the motor support bracket with respect to the spit rod support member about



a generally vertical and generally horizontal axis which serve to permit the motor support bracket to move simultaneously about the vertical and horizontal axes with respect to its associated stanchion to be aligned with the power output shaft of the motor and the spit rod in use.

4,892,033

METHOD AND APPARATUS FOR CONTINUOUS PROCESSING OF SUBSTANCES CONTAINING COCOA BUTTER OR SIMILAR FATS

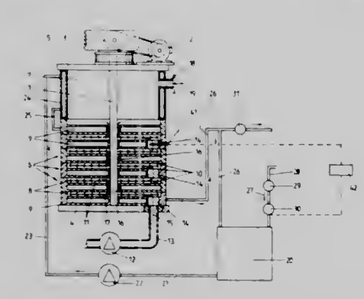
Helmut Sollich, Rabenkirchen, Fed. Rep. of Germany, assignor to Sollich GmbH & Co. KG, Bad Salzuflen, Fed. Rep. of Germany

Division of Ser. No. 188,462, Apr. 29, 1988, Pat. No. 4,859,483. This application Jan. 11, 1989, Ser. No. 295,518

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714663

Int. Cl.[4] A23C *3/04;* **A23G** *1/18*

U.S. Cl. 99—455 **15 Claims**



1. Tempering machine for substances containing cocoa butter and similar fats, particularly chocolate masses, comprising: at least one mass chamber with mixing and stirring elements and a cooling stage having heat-exchange surfaces; a cooling circuit with a cooling medium therethrough connected to said cooling stage, said masses being cooled through heat exchange at said heat-exchange surfaces; a heating stage with heat-exchange surfaces; a tempering circuit with a tempering medium connected to said heating stage, said masses being reheated after being cooled through heat exchange at said heat-exchange surfaces of said heating stage; said heat exchange surfaces of said heating stage being at least 40% of the sum of said heat-exchange surfaces of said cooling stage and said heating stage for maintaining a constantly regulated temperature of the heat-exchange surfaces of said heating stage.

4,892,034

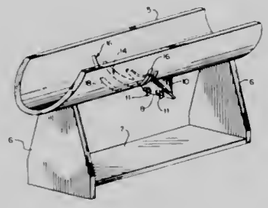
CORN CUTTER AND CREAMER

Charles B. Miles, 4551 Woodland Brook Dr., Atlanta, Ga. 30339

Filed Oct. 31, 1988, Ser. No. 264,982

Int. Cl.[4] A47J *17/00*

U.S. Cl. 99—567 **3 Claims**



1. Apparatus for cutting kernels of corn from a cob and optionally extracting cream from said cob, said apparatus comprising:

(a) an elongated trough extending along a linear axis and having an essentially uniform, U-shaped cross section perpendicular to said axis providing laterally spaced side walls on opposite sides of a bottom wall having a concave inner surface;

(b) support structure including a pair of parallel, upright members each fixedly attached to said trough adjacent opposite ends thereof to hold said trough with said axis substantially horizontal and said side walls extending upwardly, and a horizontally disposed member extending between and fixedly attached to each of said upright members adjacent the lower ends thereof, said substantially disposed member having an upwardly disposed surface adapted to support an open container below said trough;

(c) at least one lower opening extending through said bottom wall and having upper edges in said side walls of said trough;

(d) a first blade having a relatively sharp, concave, cutting edge;

(e) a support block fixedly attached to said trough on the outer surface of said bottom wall adjacent said lower opening;

(f) means securing said first blade to said support block with said blade extending through said lower opening and said cutting edge disposed laterally across said trough above said concave inner surface, said securing means permitting selective positioning of said cutting edge between minimum and maximum distances above the plane of said inner surface;

(g) a second blade having a relatively dull, concave, scraping edge;

(h) a pair of laterally aligned side openings extending through said side walls, said second blade and said side openings being respectively dimensioned for freely sliding movement of said second blade through said side openings to removably support said second blade upon said trough above said lower opening with said scraping edge extending laterally across said trough and spaced above the plane of said inner surface by a distance greater than said maximum distance, whereby a cob with the kernels removed may be drawn over said scraping blade when the latter is positioned in said side openings to remove the cream from said cob without contacting said first blade cutting edge.

4,892,035

CONTINUOUS DAMPING MEANS FOR OFF-SET PRINTING MACHINES

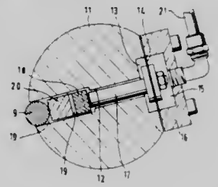
Giancarlo Terzuolo, Turin, Italy, assignor to Grapho Engineering s.r.l., Bologna, Italy

Filed Aug. 11, 1988, Ser. No. 231,185

Claims priority, application Italy, Aug. 17, 1987, 67719

Int. Cl.[4] B41L *25/02*

U.S. Cl. 101—148 **12 Claims**



1. An apparatus for the continuous damping of off-set printing machines comprising:

a reservoir (3) for damping liquid;

a feed roller (4) mounted for rotation and being at least partially inserted in said reservoir (3) for taking up said damping liquid by rotating therewithin;

an adjustable speed motor (5) for driving said feed roller;

means for the controlled application of said damping liquid to the surface of said feed roller; said application means extending transversely to the direction of rotation of said feed roller substantially over the entire length thereof and comprising a rigid support bar (11) having an axial peripheral groove (10) therein, said bar (11) being located at a distance from the periphery of said feed roller (4) emerging from said damping liquid; a linear elongated elastic wiper element (9) movably housed within said groove and having one side facing said feed roller and being in contact with the surface of said feed roller;

means (13–20) for pressing said wiper element against said surface of said feed roller;

means (21) in operative communication with said pressing means for regulating the pressure with which said wiper element is pressed against said surface of said feed roller; and

means for controlling said adjustable speed motor (5) and said regulating means (21).

4,892,036

COMBINATION COLLECTION AND FOLDING CYLINDER SYSTEM

Klaus-Ulrich Lange, Gersthofen, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,538

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810439

Int. Cl.[4] B41F *13/64*

U.S. Cl. 101—240 **9 Claims**

1. Combination collection or assembling and folding cylinder (9) for sheet products having

folding blades (12) controllably projectable from the cylinder;

a first control means including

a fixed blade control cam (23);

a movable blade control cam cover disk (62) having a blade camming surface,

said fixed blade control cam and blade cover disk conjointly defining a blade control curve;

a first pivoted cam follower (15) in controlled engagement with said blade control curve and coupled to said folding blades for controlling projection thereof;

puncture needles (10) controllably projectable from the cylinder (9);

a second control means including

a fixed needle control cam (25);

a movable needle control cam cover disk (61) having a needle camming surface,

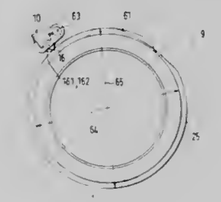
said fixed needle control cam and needle cover disk conjointly defining a needle control curve;

a second pivoted cam follower (16) in controlled engagement with said needle control curve and coupled to said needles for controlling projection thereof; and

means for relatively changing the angular position of said cover disks with respect to the associated cams independently of machine operation to permit change-over between operation of the cylinder, selectively, in sheet product collecting or assembling mode, or non-collecting mode,

said changing means comprising

a coupling gear (29) secured to a hollow shaft;



bearing means (19) journalling a cylinder shaft (17) projecting from the cylinder;

a gear (20) coupled to the cylinder shaft and driven by a main machine drive;

means (20) for driving said coupling gear (29) from the main machine drive;

adjustable means (28, 36, 37, 58, 60) for drivingly coupling disks (61, 62) to said coupling gear (29) including

a worm (28) defining worm flanks, and a worm shaft (26) extending from said worm, positioned within said hollow shaft and

roller bolts (36, 37) in engagement with the worm flanks and coupled to the coupling gear (29); and

means (57, 56, 50) for relatively axially shifting the coupling gear (29) and hence the roller bolts on the worm to superimpose an additional rotation on said coupling gear (29) on the rotation derived from the main machine drive to thereby shift the relative angular position of the cover disks with respect to said cams.

4,892,037

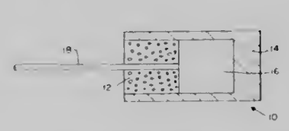
SELF CONSUMABLE INITIATOR

Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1989, Ser. No. 293,157

Int. Cl.[4] F42C *19/08*

U.S. Cl. 102—201 **5 Claims**



1. A self consumable initiator including a consumable material in combination with a fiber optic material which functions

to conduct laser energy from a laser source to said consumable material to thereby stimulate said consumable material to its ignition point and thereafter said consumable material self consumes, said self consumable initiator comprising:

(i) A consumable composition selected from the group of easily - ignitable compositions specified under pyrotechnic groups A-C as follows:

Pyrotechnic group A: metal fuel-oxidizer, composition 1: magnesium 60% by weight and polytetrafluorethylene 40% by weight, composition 2: boron 23.7%±2% by weight, potassium nitrate 70.7%±2% by weight, and binder 5.6% by weight; composition 3: zirconium 10 microns particle size 45% by weight and potassium perchlorate 6 to 17 microns particle size 55% by weight; and composition 4: aluminum flake 17 to 44 microns particle size 45% by weight and potassium perchlorate 6 to 17 microns particle size 55% by weight;

Pyrotechnic group B: primary explosive, composition 1: lead acids; and composition 2: lead styphnate; Pyrotechnic group C; propellants, composition 1: double-base propellants; composition 2: single base propellants, composition 3: composite propellants; and composition 4: black powders; and,

(ii) One or more lengths of a fiber optic material in contact with said consumable composition, said one or more lengths of a fiber optic material adapted for receiving laser energy of a uniform energy density from a laser source whereby said consumable composition is stimulated to its ignition point and thereafter self consumes.

4,892,038

CARTRIDGED AMMUNITION

Willi Lubbers, Trittau, Fed. Rep. of Germany, assignor to Nico-Pyrotechnik Hanns-Jürgen Diederichs GmbH & Co. KG, Trittau, Fed. Rep. of Germany

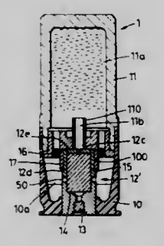
Continuation of Ser. No. 157,481, Feb. 22, 1988, Pat. No. 4,815,387, which is a division of Ser. No. 948,359, Nov. 5, 1986, Pat. No. 4,762,068. This application Dec. 6, 1988, Ser. No. 287,261

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507643

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—439 **20 Claims**



1. Cartridged ammunition for a grenade pistol, comprising:

a cartridge casing having a base and an opening;

a projectile disposed in the casing opening, the projectile including a base with a connecting thread, a payload, and at least one charge;

primer and propelling charges; and

a cup at the base of the casing, the primer and propelling charges being disposed in the cup, the cup including a sleeve and means for providing a firing channel oriented toward the at least one charge included in the projectile, wherein the sleeve has a free end section with an external thread followed by an annular, circumferential predetermined break location, and wherein the sleeve is fastened to the base of the projectile by way of the connecting thread.

4,892,039

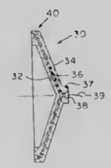
RING DETONATOR FOR SHAPED-CHARGE WARHEADS

John D. Emerson, Arab, and Scott D. Hill, Toney, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1989, Ser. No. 321,688

Int. Cl.[4] F42B *11/22*

U.S. Cl. 102—476 **2 Claims**



1. A ring detonator for a warhead comprising:

(i) an outer conically shaped member having the shape of a modified frustum of a circular cone, said outer conically shaped member having a slant height extending at a predetermined angle and for a predetermined distance to a larger base of said conically shaped member to form the outer ring of said ring detonator that has a diameter of about two thirds the diameter of the warhead with which the ring detonator is employed;

(ii) a cylindrical member extending from the smaller base of said outer conically shaped member which completes the shape to said modified frustum of a circular cone, said cylindrical member having a cavity therein for containing a point detonator charge, said cylindrical member having an opening extending from said cavity through the center line of said smaller base of said outer conically shaped member to an opening provided by mating said outer conically shaped member with an inner conically shaped member;

(iii) an inner conically shaped member mated with said outer modified frustum of a circular cone shaped member in a spaced apart relationship to define a space therebetween for containing an explosive composition, said inner conically shaped member extending at said predetermined angle and for said predetermined distance as defined for said outer conically shaped member to form the inner portion of said ring of said diameter defined hereinabove; and,

(iv) a common cylindrically shaped member extending from the larger bases of said outer and inner conically shaped members, said common cylindrically shaped member having an opening extending therethrough to said defined space for containing said explosive composition, said opening permitting the discharge from said formed ring of said ring detonator the detonation shock wave and detonation products from said explosive composition after ignition to thereby effect the transfer of a point detonator charge to said formed ring whereby said ring detonator creates a flatter wave front in a shorter distance to achieve initiation of a warhead by said ring detonator.

4,892,040

BALLAST TAMPING MACHINE

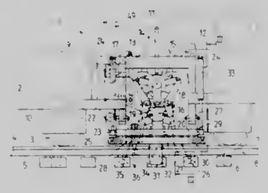
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie GmbH, Vienna, Austria

Filed May 20, 1988, Ser. No. 196,672

Claims priority, application Austria, Mar. 8, 1988, 613/88

Int. Cl.[4] E01B *29/10*

U.S. Cl. 104—6 **14 Claims**



1. In a mobile machine for tamping ballast under ties of a railroad track, each of the ties having opposite longitudinal sides extending transversely to the track, which comprises a machine frame, spaced undercarriages supporting the machine frame for mobility on the railroad track in an operating direction, and a ballast tamping assembly mounted on the machine frame and comprising a vertically adjustable tamping tool carrier, a drive for vertically adjusting the tamping tool carrier, pairs of vibratory and reciprocatory tamping tools immersible in the ballast upon vertical adjustment of the tamping tool carrier and defining a transversely extending plane of symmetry therebetween, and drives for vibrating and reciprocating the tamping tools; the combination of

(a) a first device associated with the ballast tamping assembly for gripping and transversely positioning a respective one of the ties, the first device including

(1) a drive for vertically adjusting the device and

(2) pivotally adjustable tongs for gripping the longitudinal tie sides, and

(b) a second device operable independently of the first device for transversely displacing a respective one of the ties, the second device including

(1) drive means for vertically and transversely adjusting the second device,

(c) the first and second devices being arranged in the plane of symmetry adjacent a respective one of the tamping tool carriers.

4,892,041

GOLF CART SYSTEM

Tomiichi Fukuda, 3-23-18, Denenchofu, Ohta-ku, Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,254

Claims priority, application Japan, Nov. 5, 1986, 61-262932

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] B61B *13/10*

U.S. Cl. 104—140 **1 Claim**

1. A golf cart system comprising:

a track adapted to be embedded in the ground,

a cart adapted to run on said track,

said track including

a bottom wall,

a pair of opposed side walls extending generally vertically from said bottom wall, and

top walls extending toward a center of said track from upper ends of said side walls to define a groove therebetween,

said cart including

a base frame,

supporting posts extending vertically and downwardly from said base frame through said groove into said track,

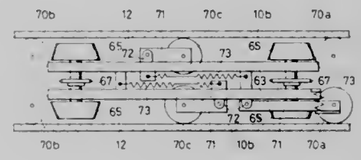
a wheel supporting frame mounted on said supporting posts and being movable within said track,

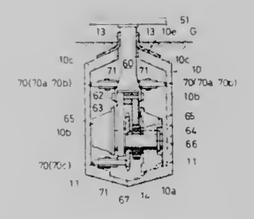
driving wheels mounted on said wheel supporting frame and driven by a power source to run on the inner surface of the bottom wall of the track,

front, rear and central anti-overturn rollers for preventing lateral overturn of said cart and engaging inner surfaces of said side walls, said front and rear rollers engaging said side walls at upper positions thereof and said central rollers being located between said front and rear rollers and engaging the inner surfaces of said side walls at lower positions thereof,

compression spring means for biasing said front rollers and said rear rollers against said side walls, and

tension spring means for biasing said central rollers against said side walls.





4,892,042

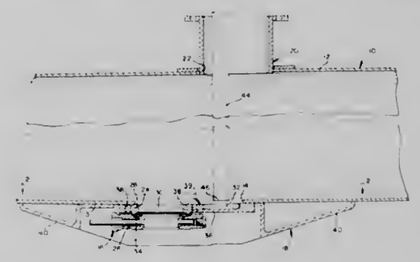
COMBINATION BOTTOM OUTLET SADDLE AND SUMP

Thomas H. Dalrymple, Crown Point, Ind.; Philip J. Daum, Chicago, Ill., and Walter T. Croson, Hammond, Ind., assignors to Union Tank Car Company, East Chicago, Ill.

Filed Dec. 15, 1988, Ser. No. 285,107

Int. Cl.[4] B61D *5/00*

U.S. Cl. 105—362 **8 Claims**



1. In a tank car bottom outlet valve assembly, a combination bottom outlet valve saddle and sump arrangement for attachment to the underside of a tank car in fluid communication with an outlet opening therein, comprising: an integral saddle member having an upper surface shaped to conform to the underside of said tank car for attachment thereto in surrounding relationship with said outlet opening, said saddle member

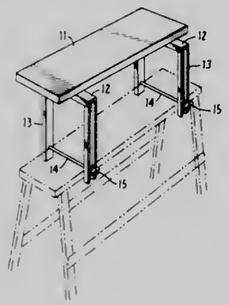
having an opening formed therein in fluid communication with said outlet opening, a sump integrally formed and recessed into the upper surface of said saddle member longitudinally spaced a short distance from said opening in said saddle member in fluid communication with said outlet opening for receipt of residual lading thereinto, and mounting means formed on a lower surface of said saddle member for mounting a bottom outlet valve thereto in fluid communication with said opening.

4,892,043

SUBSIDIARY BENCH TOP

Richard H. Schulz, 845 N. L St., Livermore, Calif. 94550

Filed Jul. 6, 1987, Ser. No. 72,645
Int. Cl.[4] A47B *7/00*
U.S. Cl. 108—90 **1 Claim**



1. A bench top extension for attachment to a work bench, said bench top extension comprising:

a standing section having longitudinal and lateral dimensions and having longitudinal and lateral ends;

a pair of brackets connected to said standing section near the longitudinal ends of the standing section, said brackets extending partially laterally away from said standing section;

two pairs of downwardly extending support members, each support member having a distal end, one pair of support members connected to each bracket with one support member at each end of each bracket; and

a pair of nut and bolt assemblies interconnecting the distal ends of each pair of support members, each pair of support members and nut and bolt assemblies defining means to secure the bench top extension to a work bench, the bolts to rest on top of a work bench and the nut and bolt assemblies to laterally compress the distal ends of the support members against the sides of a work bench, said standing section being partially laterally offset with respect to a work bench to provide a stepping means from a work bench that is laterally accessible to increase the effective elevation of a work bench.

4,892,044

CORNER STRUCTURE FOR A MODULAR SHELF AND METHOD OF MAKING SAME

John H. Welsch, Moscow, Pa., assignor to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Feb. 24, 1988, Ser. No. 159,918
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—154 **15 Claims**

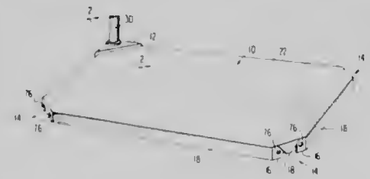
1. A corner structure comprising:

A. a corner connector having:

(1) insert means made of a rigid material and formed to be fastened to a shelf member, said insert means comprising a generally U-shaped brace having an arcuate portion connected to first and second side wall portions, reentrant means in the form of a plurality of tabs disposed on said side wall portions and a plurality of holes formed in said side wall portions, and ear means formed with said side wall portions; and

(2) housing means made of a non-corroding resinous material and encapsulating a major portion of said insert means, said housing means being formed about said insert means to be integrated therewith with said resinous material received within and filling said plurality of holes and received about said plurality of tabs forming said reentrant means, said housing means and said insert means together defining means for receiving a support member; and

B. means cooperating with said ear means of said brace for securing said corner connector to a shelf member.

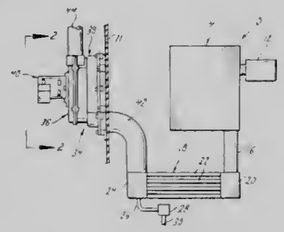


4,892,045

CONDENSATE DRAIN SYSTEM

David B. Schumacher, St. Louis, Mo., assignor to Snyder General Corporation, Red Bud, Ill.

Filed Sep. 22, 1988, Ser. No. 247,633
Int. Cl.[4] F23J *15/00*
U.S. Cl. 110—203 **19 Claims**



12. A system for collecting and draining condensate from a heating apparatus comprising;

a blower means;

a condenser means; and

a passage means between the condenser means and the blower means, the passage means being adapted to convey combustion products and condensate from the condenser means to the blower means, and also being adapted to collect, substantially all of the condensate conveyed and drain the condensate from the heating system.

4,892,046

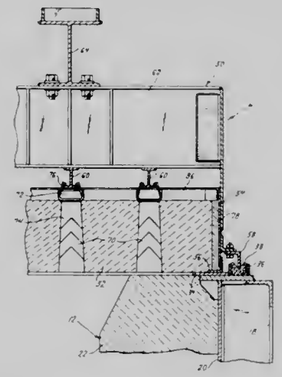
FURNACE ROOF AND METHOD OF CONSTRUCTING THE SAME

John R. Gillespie, Ballwin, Mo., assignor to Gillespie & Powers, Inc., St. Louis, Mo.

Filed Oct. 30, 1987, Ser. No. 115,167
Int. Cl.[4] F23M *5/06*
U.S. Cl. 110—332 **21 Claims**

1. A furnace for melting metal, said furnace comprising: a containment vessel having a side wall and a floor for containing a pool of molten metal, and a roof normally closing the top of the containment vessel, but being separable from the containment vessel so that it can be removed as a unit from the containment vessel, the roof including a framework that extends across the top of the containment vessel and has a metal band along its periphery, anchors attached to the framework, and a refractory cast about and interlocked with the anchors within the confines of the band so that the anchors hold the refractory to the framework, the refractory being carried on the framework such that the refractory is presented downwardly and exposed to the interior of the containment vessel.

20. A process for constructing the roof of a furnace for melting metal, said process comprising constructing a framework having cross members; placing the framework over a horizontal surface with the cross members spaced from the surface; placing a metal band around the space between the cross members and the surface at the periphery of the framework; attaching anchors to the framework such that the anchors are in the space between the framework and the horizontal surface and within the confines of the metal band; pouring a moldable refractory mix onto the horizontal surface within the confines of the metal band and around the anchors; vibrating the horizontal surface to cause the moldable mix to flow over the surface and around the anchors; and allowing the refractory mix to set up into a solid refractory that is interlocked with the anchors.

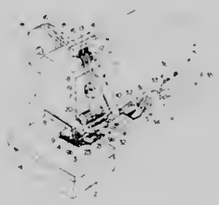


4,892,047

SEWING MACHINE FOR FEEDING AND CUTTING RIBBON LIKE PIECES OF DIFFERENT WIDTHS

Giorgio Fieschi, Buccinasco - Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Olcella, Italy

Filed Jul. 13, 1988, Ser. No. 218,716
Claims priority, application Italy, Oct. 9, 1987, 22209 A/87
Int. Cl.[4] D05B *35/10, 37/04*
U.S. Cl. 112—122 **2 Claims**



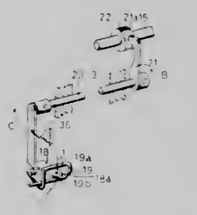
1. A sewing machine for feeding and cutting ribbon-like pieces of different widths comprising a presser foot having an engagement seat in a front portion of the presser foot for guiding said ribbon-like pieces under said presser foot through a slit extending downwardly from said engagement seat, feed means for feeding said ribbon-like pieces to said engagement seat, and cutting means for cutting pieces of trimmings between said feed means and said engagement seat, said presser foot having an adjusting element slidably carried in a region of said engagement seat, said adjusting element being provided with a boundary tab extending inside of said engagement seat for defining the width of the engagement seat depending upon the ribbon-like trimming width; said cutting means having a cutting unit slidably mounted on a guide means carried by said sewing machine, and positioning means for moving said cutting unit from a rest position spaced apart sideways from said engagement seat to a cutting position disposed in front of said engagement seat wherein when said cutting unit is positioned by said positioning means in the cutting position, an operating cylinder of said cutting unit is actuated and it further moves forward a shear means for carryng out a cutting operation on ribbon-like trimming and, vice-versa, when said cutting operation has been completed by said cylinder, said positioning means returning said cutting unit to said rest position away from said engagement seat.

4,892,048

AUTOMATIC THREAD TIGHTENING DEVICE FOR A SEWING MACHINE

Noboru Karuga, Hachinji; Kazumasa Hara, Hino; Mikio Koike, Qume, and Mitsuru Nishijima, Tachikawa, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 109,929, Oct. 19, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,899
Claims priority, application Japan, Oct. 24, 1986, 61-251589
Int. Cl.[4] D05B *47/04*
U.S. Cl. 112—254 **1 Claim**



1. A sewing machine having a vertically reciprocating needle for holding an upper thread, means of carrying a lower thread and catching the upper thread to form stitches in cooperation with the needle, an upper thread supply, a main thread take-up lever, and an automatic thread tension device, said device comprising an upper thread tension member arranged in a thread running path between said upper thread supply and said main thread take-up lever; an auxiliary thread take-up lever arranged in the thread running path between said main thread take-up lever and said needle and having a thread engaging part for guiding said upper thread; a thread presser arranged laterally of the thread running path between said main and auxiliary thread take-up levers to guide said upper thread from said tension member to said main thread take-up lever, said thread presser being controlled in response to a rotation phase of an upper shaft of the sewing machine to normally clamp said upper thread and to release the same only during a predetermined phase of supplying the upper thread from said supply; a thread guide fixedly arranged adjacent to said auxiliary thread take-up lever; and said auxiliary thread take-up lever being controlled for movement relative to said thread guide into a position in which said thread engaging part cooperates with said thread guide such as to absorb a slackening of the upper thread in said thread running path between the

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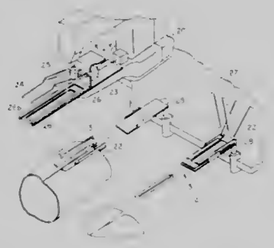
main thread take-up lever and the needle during said supplying phase.

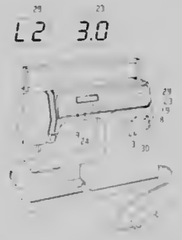
4,892,049

AUTOMATIC SEWING MACHINE EXCLUSIVELY USED FOR SEWING ZIPPER ON WORKPIECE

Tohru Hiramatsu; Kazuya Tami, and Torao Ohchi, all of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 882,884, Jun. 24, 1986, Pat. No. 4,854,251. This application May 2, 1989, Ser. No. 346,067
Int. Cl.[4] D05B *95/00, 1/00*
U.S. Cl. 112—265.2 **3 Claims**





1. A process for sewing a zipper on a flapped workpiece comprising the steps of:
- preparing a zipper having a length longer than a required length by the look of the slider positioned at the leading end of said zipper;
- gripping said zipper and flapped workpiece with said slide projecting outwardly beyond the end edge of said workpiece;
- operating a sewing machine and moving said zipper and flapped workpiece relative to each other describing an L-shape in a plane vertical to the movement direction of the needle of said sewing machine while holding the zipper and flapped workpiece for sewing a longitudinal straight seam along the inner side edge of the flap and a transverse straight seam;
- turning over said flap and moving said zipper and flapped workpiece substantially linearly relative to said sewing machine needle while holding the zipper and flapped workpiece for sewing a longitudinal straight seam on the lower side of said flap;
- stopping said sewing machine and effecting thread cutting;
- removing said flapped workpiece having said flap sewn thereon from said sewing machine;
- retracting said slider halfway in the longitudinal direction of said zipper and then cutting off the portion of the fastener tapes of said zipper projecting outwardly beyond said end edge of the workpiece; and
- securing a fastener to said zipper in a predetermined position of the zipper.

4,892,050

SEWING MACHINE HAVING APPARATUS FOR INDICATING ELONGATED PATTERN MAGNIFICATION

Takumi Ando; Toshitaka Toyomi, and Yasuhiro Osanai, all of Tokyo, Japan, assignors to Janome Sewing Machine Company Limited, Japan

Filed Apr. 29, 1988, Ser. No. 192,418
Claims priority, application Japan, Apr. 30, 1987, 62-107045
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—458 **1 Claim**

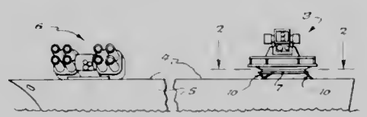
1. A sewing machine having pattern selecting means selectively operated to select a pattern to be stitched from a plurality of different patterns stored in a pattern memory, feed pitch setting means operated to set a desired feed pitch value of a selected pattern and simultaneously read out a data corresponding to the set feed pitch value of the selected pattern from a plurality of feed pitch display data stored in a feed pitch data memory which is to be digitally displayed in a first display, stitch amplitude setting means optionally operated to set a desired stitch amplitude value of the selected pattern and simultaneously to read out a data corresponding to the set stitch amplitude value of the selected pattern from a plurality of stitch amplitude display data which is to be digitally displayed in a second display, said sewing machine comprising means for setting an elongating magnification value of the selected pattern; memory means storing a plurality of pattern elongating magnification display data, said memory means being operated in response to operation of said pattern elongating magnification value setting means to produce a pattern elongating magnification display data corresponding to the set elongating magnification value of the selected pattern; means operated in response to operation of said pattern selecting means to discriminate if the selected pattern is elongatable, said discriminating means giving a signal upon confirmation that the selected pattern is elongatable; and switching means operated in response to the signal from said discriminating means and to operation of said pattern elongating magnification value setting means to electrically transmit the data of said pattern elongating magnification display data memory to said second display so as to make the latter digitally display said set elongating magnification value of the selected patterns while electrically disconnecting said stitch amplitude display data memory from said second display.

4,892,051

SHOCK ISOLATION METHOD AND APPARATUS FOR SHIP-MOUNTED DEVICE

Douglas P. Taylor, North Tonawanda, N.Y., and David A. Lee, Santa Monica, Calif., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed May 23, 1984, Ser. No. 613,587
Int. Cl.[4] B63G *13/00*
U.S. Cl. 114—1 **11 Claims**



6. A mounting system comprising a first member, a second member, a plurality of link means which are both rigid and resilient extending between said first and second members for mounting said second member on said first member in a predetermined fixed position when said link means are rigid but which permit movement of said first member in a plurality of directions when said link means are resilient, each of said link means including a link having a spring unit operable in both

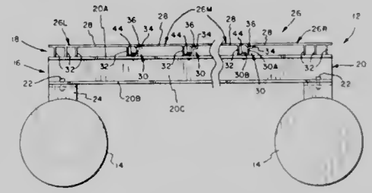
tension and compression, first and second ends on each of said links, first joint means connecting said first ends of said links to one of said members for permitting universal movement therebetween, second joint means connecting said second ends of said links to the other of said members for permitting universal movement therebetween, said links being oriented in a truss configuration comprising a plurality of pairs of said links with the links of each pair being spaced further apart at said second ends than at said first ends and thus diverging between said first and second ends, and said pairs of links being spaced circumferentially about portions of said first and second members, and each of said pairs of links converging toward each other.

4,892,052

BOAT DECKING SYSTEM AND METHOD OF ASSEMBLING SAME

Eldon A. Zook, Churubusco, and Leonard M. Niccum, Angola, both of Ind., assignors to Harris-Kayot, Inc., Lagrange, Ind.

Filed May 4, 1988, Ser. No. 189,995
Int. Cl.[4] B63C *13/00*
U.S. Cl. 114—85 **23 Claims**



21. A method of assembling a boat comprising the steps of:
- constructing a deck substructure mounted to a pair of pontoons;
- placing a plurality of deck planks on the deck substructure in side-by-side relation to one another to provide a deck platform upon the deck substructure, said planks including respective flanges extending laterally;
- the deck planks being placed on the deck substructure one at a time progressing from one side of the deck substructure to the other side thereof alternately with attachment of each plank to the deck substructure from above the substructure before the next plank is placed thereon, the planks being attached to the deck substructure by fastening the flanges to the substructure from above.

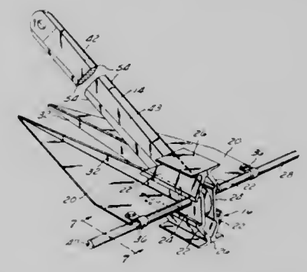
4,892,053

TWIN-FLUKE MARINE ANCHOR HAVING LOOSELY COUPLED FLUKES

Don Hallerberg, 20 Bay Colony La., Ft. Lauderdale, Fla. 33308

Filed Jul. 8, 1988, Ser. No. 216,784
Int. Cl.[4] B63B *21/24*
U.S. Cl. 114—303 **10 Claims**

1. A twin-fluke anchor having a minimal volume within the anchor crown so as to minimize (a) the amount and weight of debris that may accumulate within the anchor crown, (b) restrictions upon angular movement of the anchor shank relative to the anchor crown that may be caused by debris lodged within the anchor crown, and (c) the burying resistance, resulting in higher holding power, said anchor comprising:
- a monolithic crown structure;
- a pair of flukes attached to said monolithic crown structure; and
- a shank rotatably mounted to said monolithic crown structure,
- said crown structure having (a) a pair of oppositely disposed crown plates, (b) a pair of oppositely disposed side walls integrally merging into said crown plates along the width of and near the center portion of said crown plates whereby the center portion of said crown plates is thicker than the outer portion of said crown plates, and (c) a pair of oppositely disposed fluke retaining means comprising a slot along the outer width of said side wall opening onto an inset flange receiving member whereby interior volume of said monolithic crown structure is reduced.

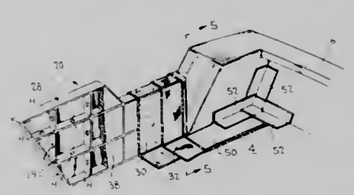


4,892,054

COMPOSITE TRANSOM STRUCTURE

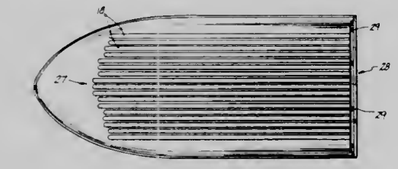
Samuel L. Davidson, Monroe, La., assignor to Mastercrafters Corporation, Winnsboro, La.

Continuation-in-part of Ser. No. 939,687, Dec. 9, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 266,858
Int. Cl.[4] B63B *5/24*
U.S. Cl. 114—357 **20 Claims**



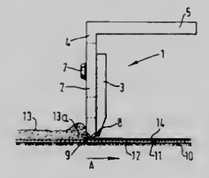
1. In a boat having a hull section and a wall portion on which a drive unit is to be attached, the improvement wherein the wall portion is in the form of a composite structure comprising:
- (a) a stiff grid structure having a series of laterally and longitudinally extending ribs defining a series of open sections therebetween;
- (b) a hardened filler material filling the open sections between the ribs;
- (c) said filler material being bondable to fiberglass layers; and
- (d) fiberglass layers on opposite sides of the grid bonded together by the filler material trapping the grid therebetween and further wherein the boat includes at least one layer of material extending at least partly over said wall portion, across a joint between the wall portion and the hull section, and at least partly over the hull section, said layer being chemically bonded to the wall portion and the hull section so as to secure the wall portion and hull section together.

4,892,055
REINFORCED HULL FOR A WATER CRAFT
Robert D. Schad, 110 Bloor Street West, Suite 2104, Toronto, Ontario, Canada
Filed Aug. 5, 1988, Ser. No. 228,496
Int. Cl.[4] B63B *5/24*
U.S. Cl. 114—357 **10 Claims**



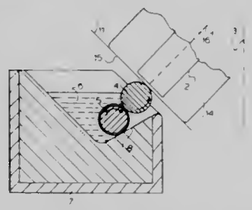
6. A hull structure for an amphibious craft having inboard and outboard sides, a bow and a stern comprising:
a primary hull skin,
a secondary hull skin, and,
means for keying said hull skins together in releasable fashion whereby said primary and secondary hull skins are movable relative to one another,
means for retaining said secondary hull skin against motion in a predetermined direction,
said retention means defining a transverse batten fixed to the stern of the hull overlapping an end portion of said secondary hull skin.

4,892,056
DOCTOR BLADE FOR DOCTORING A FINISH LAYER OF PVC ON A STRIP OF CARPET
Gilbert E. Hawkes, and Susan Fisher, both of southampton, England, assignors to Wilton Royal Carpets Limited, Hampshire, England
Filed Nov. 2, 1987, Ser. No. 115,969
Claims priority, application United Kingdom, Nov. 3, 1986, 8626241
Int. Cl.[4] B05C *11/04*
U.S. Cl. 118—126 **5 Claims**



1. A doctor blade for doctoring a finish layer of PVC on a strip of carpet, comprising:
said doctor blade having an upright orientation, and a comb-like form including a straight edge member and a toothed member having teeth, means for securing said members together such that said straight edge member extends across said toothed member covering a portion of said teeth, said straight edge member being chamfered to provide an underface that is narrow in the direction of movement of the strip of carpet, and each of said teeth having a rounded leading lower edge and a width not exceeding 25% of a pitch of said teeth.

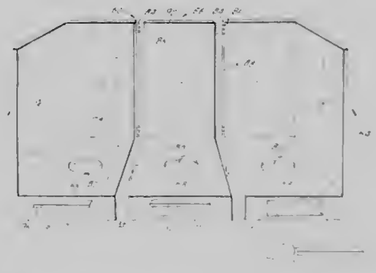
4,892,057
DEVICE FOR THE APPLICATION OF SMALL AND MINIMAL AMOUNTS OF FLOWABLE SUBSTANCES
Johannes Zimmer, Ebentaler Strasse 133, A-9020 Klagenfurt, Austria
PCT No. PCT/AT87/00032, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/06504, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 29, 1987, Ser. No. 154,251
Claims priority, application Austria, Apr. 30, 1986, 1178/86
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—248 **6 Claims**



1. A device for applying a small amount of a flowable substance to a web of material, comprising:
an application roller juxtaposed with said web;
means for applying a magnetic force to said roller including a beam so that said roller is magnetically pressed against said web said means for applying said magnetic force being a magnetic device generating force at an angle to the vertical and said applicator roller being arranged at said angle to the vertical said beam having a sliding surface where said application roller is slidable thereon; and
a device for feeding the substance to be applied including a dosing roller positioned to dip into the substance in a trough to supply said substance to the applicator roller, the magnetic device being lodged inside of a hollow roller and the applicator roller resting against a shell surface of said hollow roller in a circumferential position opposite the magnetic device, and also resting against said dosing roller, the applicator roller is located between and rests against the hollow roller and the dosing roller, said trough being provided with a surface which is inclined with respect to the hollow roller, the dosing roller or the applicator roller resting thereupon.

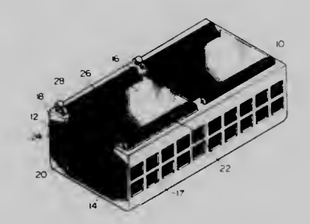
4,892,058
PORTABLE PET POTTY AND WETTING WALL
Nanette Clark, 2977 Milton Pl., Bronx, N.Y. 10465
Filed Mar. 10, 1988, Ser. No. 166,231
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **11 Claims**

1. A variably sized wetting wall facility for pets, comprising:
a first corner piece and a second corner piece, each of the corner pieces having a respective platform and a back wall, the corner pieces being positioned side by side such that their back walls lie in a common plane, at least one of the corner pieces including a waste receiving opening in its platform; and



means for joining the respective back walls of the corner pieces to provide a contiguous back wall that serves as a wetting wall and to provide a contiguous platform.

4,892,059
APPARATUS FOR EXCHANGING A NET OF FISH CAGE FOR FARMING FISH
Seiichi Yoneyama, Tokyo, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 178,547
Claims priority, application Japan, Apr. 8, 1987, 62-52075
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **12 Claims**

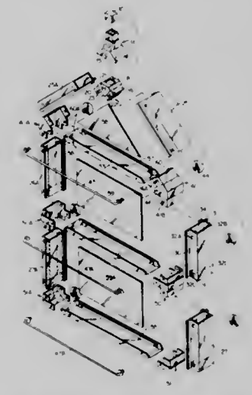


1. A fish breeding apparatus with an exchangeable net comprising:
a hull shaped fish cage having side platings, a bottom plating, screen bulkheads and a deck, said side platings and said bottom plating having openings provided therein;
a net;
pay out means for paying out the net into the cage;
guide means for guiding an end of the net through a predetermined path adjacent said platings; and
coil up means for coiling up the net.

4,892,060
BIRD FEEDER
Timothy Lundquist, Box 386A, Tivoli, N.Y. 12583
Filed Apr. 25, 1988, Ser. No. 185,955
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—52.2 **10 Claims**

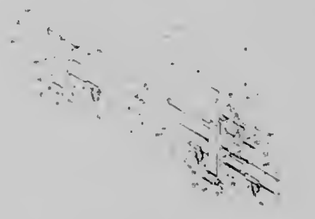
1. A bird feeder having a plurality of gravity-fed seed access stations and adaptable for distribution and storage of a plurality of seed varieties comprising
(a) a detachable loading tube having open entry and exit ends,
(b) a deflector in the tube for directing seed out of the exit end along a path of fall offset from the tube centerline,

(c) a manifold having an upper inlet and dividing into two lower outlets to each side of the manifold centerline, and
(d) distribution and storage chutes descending from the respective manifold outlets to the respective seed access stations,



(e) the tube in an operating orientation being adapted to be vertically disposed with its entry end upwardly and aligned over the manifold inlet in a selected rotational position permitting the deflector to direct seed into one or the other or both of the manifold outlets and thence to selected chutes and seed access stations.

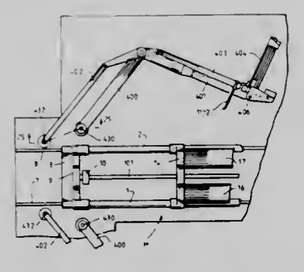
4,892,061
DRINKING SYSTEM FOR POULTRY, SMALL ANIMALS AND THE LIKE
Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.
Filed Mar. 1, 1988, Ser. No. 162,540
Int. Cl.[4] A01K *39/02*
U.S. Cl. 119—75 **39 Claims**



1. A drinking mechanism comprising a trough, said trough having a generally upwardly opening mouth when said trough is in an in-use position, means for suspending said trough from a support structure in said in-use position, said trough being movable to a non-use position at which said mouth is in a generally downardly opening position, first locking means for releasably locking said trough in said non-use position, and drinker means for delivering water in a generally downward direction when said trough is in said non-use position.

4,892,062
SHEEP HANDLING AND MANIPULATION FOR AUTOMATED SHEARING

David Elford, Mount Hawthron, Australia, assignor to The University of Western Australia, Nedlands, Australia
Filed Sep. 9, 1988, Ser. No. 242,757
Claims priority, application Australia, Sep. 9, 1987, PI4317; Jul. 15, 1988, PI9319
Int. Cl.[4] A61D *3/00*
U.S. Cl. 119—98 **10 Claims**



1. A system for handling animals such as sheep and goats in the automated treatment of such animals, comprising a multiplicity of animal supporting devices carrying means for supporting the animal and for restraining the front legs, rear legs and head of the animal, each said supporting device being capable of being transported from an animal loading station to a treatment or manipulation station, means at said manipulation station for engaging and manipulating said supporting and restraining means to facilitate treatment of the animal, whereupon the supporting device may be transported with the animal restrained thereon to an unloading station.

4,892,063
LEASH FOR TWO OR MORE ANIMALS

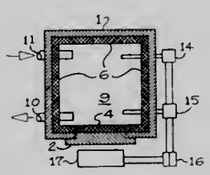
Catherine M. Garrigan, 6111 Greeley Blvd., Springfield, Va. 22152
Continuation of Ser. No. 556,125, Nov. 29, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,643
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—109 **8 Claims**



1. A leash for a pair of animals comprising:
an elongated leash member having a first end and an opposite second end,
a first releasable animal fastening means secured to said first end for fastening said first end to a first animal,
a second releasable animal fastening means secured to said second end for fastening said second end to a second animal at the same time as said first end is fastened to the first animal, and
a slidable compressible handle positioned between and slidable on said leash member toward and away from said first and second releasable animal fastening means, and having an opening passing therethrough through which said leash member passes,
said slidable compressible handle being compressible between a first generally natural state where, when the user grasps said handle loosely, said handle slides freely between generally said first and second ends as the first and second animals when secured, respectively, to said first and second releasably fastening means generally move relative to said handle or to each other, and a second compressed state wherein, when the user grasps said handle firmly, said handle grasps said leash member and said handle is thereby held on said leash member in a position generally fixed relative to said first and second ends.

4,892,064
HEAT TRANSFER AND FLUID HEATING DEVICE

Joseph M. Zappia, 235 NW. 26 Ave., Miami, Fla. 33125
Division of Ser. No. 923,295, Oct. 27, 1986, Pat. No. 4,854,378. This application May 26, 1989, Ser. No. 357,164
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—366 **5 Claims**

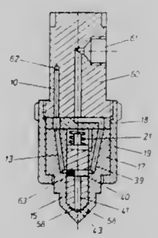


1. Tank means for heating a liquid comprising:
(A) a container comprising walls of low heat conductivity,
(B) an opening through said walls at the bottom of said container,
(C) a high-heat-conductivity plate sealing said opening,
(D) fibrous blanket means covering said plate within said container,
(E) fibrous wick means within said container extending upwardly from said bottom substantially to the top thereof,
(F) first pipe means introducing cold liquid into said container,
(G) second pipe means removing relatively hot liquid from said container, and
(H) means heating said plate.

4,892,065
METHOD CONCERNING THE DELIVERY OF FUEL INTO THE COMBUSTION CHAMBER OF A DIESEL ENGINE AND A DEVICE FOR REALIZING THE METHOD

Hans List, Heinrichstrasse 126, A-8010 Graz, Austria, assignor to AVL Gesellschaft Für Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof. Dr.Dr.H.C. Hans List, Graz, Austria
Division of Ser. No. 96,782, Sep. 14, 1987, Pat. No. 4,846,114, which is a continuation of Ser. No. 778,069, Sep. 20, 1985, abandoned. This application May 25, 1989, Ser. No. 357,895
Int. Cl.[4] F02B *13/02*
U.S. Cl. 123—26 **3 Claims**

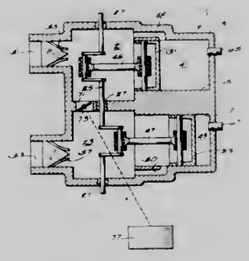
1. An apparatus for sequentially injecting charges of fuel and compressed air into a combustion chamber of a diesel engine, said apparatus comprising
a nozzle body which has a first end and a second end and which can be connected to a cylinder head of a diesel engine such that its second end communicates with a combustion chamber in said cylinder head, said nozzle body including a central bore which extends from said first end towards said second end, a plurality of nozzle bores at its second end which extend between said central bore therein and an outer surface thereof, and first and second separate feeder bores which communicate with said central bore, said first feeder bore carrying compressed air and said second feeder bore carrying fuel,
a fuel needle positioned in said central bore, said fuel needle including a cross bore which communicates with both said first and second feeder bores in said nozzle body and an



axial bore which extends from said cross bore to an end thereof adjacent said nozzle bores, and
control means in said cross bore of said fuel needle for controlling whether the central axial bore in said fuel needle is in communication with said first feeder bore or said second feeder bore based on the relative pressures of compressed air in said first feeder bore and fuel in said second feeder bore, passage of a charge of compressed air through said axial bore in said fuel needle and then through said nozzle bores causing fuel remaining therein to be conveyed into said combustion chamber.

4,892,066
MULTI-CYLINDER TWO-STROKE ENGINE WITH REDUCED COST AND COMPLEXITY

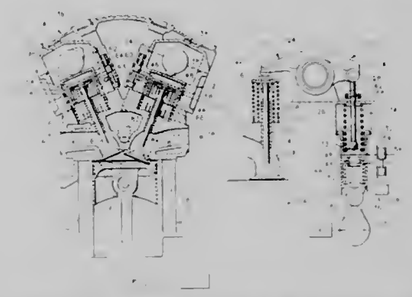
Peter W. Brown, Hartland, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Nov. 19, 1987, Ser. No. 123,357
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 V **14 Claims**



1. An internal combustion engine comprising first and second cylinders, first and second crankcases extending respectively from said first and second cylinders, a crankshaft extending through said first and second crankcases, first and second pistons connected to said crankshaft to afford opposite action of said pistons and respectively reciprocally movable in said first and second cylinders to define first and second combustion chambers respectively communicable, subject to piston movement, with said first and second crankcases, first and second means respectively including first and second reed valves for respectively supplying air to said first and second combustion chambers, a duct extending between said first and second crankcases, and a valve located in said duct and movable between open and closed positions to respectively permit and prevent fluid flow in both directions between said first and second crankcases.

4,892,067
VALVE CONTROL SYSTEM FOR ENGINES

Marius A. Paul; Ana Paul, and Cristiana J. Rotkoski, all of 1100 E. Orangethorpe Ave., Ste. 140, Anaheim, Calif. 92801
Filed Jul. 25, 1988, Ser. No. 223,436
Int. Cl.[4] F01L *9/02, 1/34*
U.S. Cl. 123—90.12 **16 Claims**



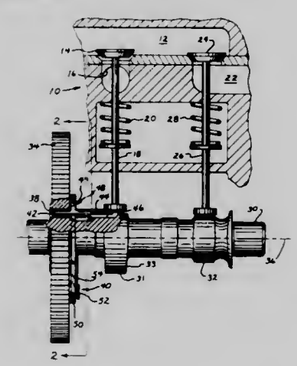
1. In an internal combustion engine having at least one cylinder with a piston reciprocal therein, and a cylinder head with first and second intake passages and first and second exhaust passages, each intake passage having an intake valve and each exhaust passage having an exhaust valve forming a four-valve per cylinder valve assembly, and, a cam shaft with cams dedicated to operate each intake valve and each exhaust valve in the valve assembly, an improved means for regulating the air charge and combustion gas emission to and from the engine cylinder comprising:
an electro-hydraulic valve lifter assembly for each valve, each lifter assembly including a first contact member mechanically contacting a cam on the cam shaft; a second contact member mechanically contacting a valve, wherein the first and second contact members are separated by a hydraulic chamber filled with hydraulic fluid and are displaceable with respect to one another in accord with the volume of fluid in the hydraulic chamber; valve means to regulate the flow of hydraulic fluid to and from the hydraulic chamber; and, electronic control means for operating each valve lifter assembly independently and controlling the regulation of hydraulic fluid to and from the hydraulic chamber according to engine conditions and operator demand wherein each valve in connection with an electro-hydraulic valve lifter assembly has a period and displacement controlled by the electronic control means wherein the first intake passage has a flow control means for restricting backflow and the second intake passage has fuel injection means for injecting fuel into the intake passage under time control of the electronic control means and wherein the electronic control means has a valve sequence timing regime under which the engine is operated in which the first intake valve in the first passage with at least one exhaust valve being open in part, such that exhaust gases are scavenged with air from the first intake passage without fuel loss.

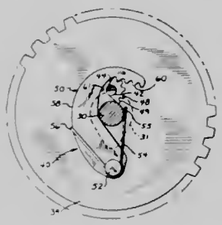
4,892,068

GEARED AUTOMATIC COMPRESSION RELEASE FOR AN INTERNAL COMBUSTION ENGINE

Jeffrey P. Coughlin, Kaukauna, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 9, 1989, Ser. No. 364,745
Int. Cl.[4] F01L *13/08*
U.S. Cl. 123—182 **9 Claims**





1. In an internal combustion engine having a valve, a valve lifter, a cam shaft with a cam surface which engages the valve lifter to open the valve at a first angular position of the cam shaft, and a mechanism for opening the valve at a second angular position of the cam shaft, the improvement in the mechanism comprising:

a cam pin located adjacent to the cam surface in a manner in which said cam pin can rotate on its longitudinal axis, and having a portion eccentric to the longitudinal axis which portion extends above the cam surface to engage the valve lifter and open the valve in a first rotational position and which portion in a second rotational position does not engage the valve lifter in a manner which opens the valve;

a drive member attached to said cam pin and having teeth in one surface thereof; and;

a flyweight which rotates with the cam shaft and having teeth meshed with the teeth of said drive member.

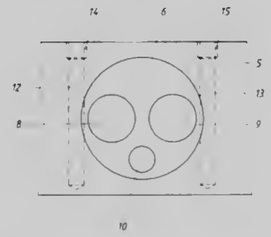
4,892,069

THERMALLY STRESSED COMPONENT

Fritz Rösch, Schwabach, and Bernd Otte, Zirndorf, both of Fed. Rep. of Germany, assignors to Alcan International Ltd., Montreal, Canada

Filed Jul. 28, 1988, Ser. No. 225,455
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3726027
Int. Cl.[4] F02F *3/02*
U.S. Cl. 123—193 CH **15 Claims**

1. Component for engines, machines or other devices subject to zonally differential thermal stress comprising at least one hollow chamber defined by the component outside and adjacent to zones of thermal stress which chamber is completely



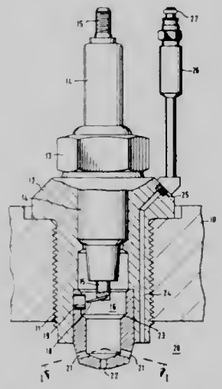
filled with a substance which has a higher coefficient of thermal expansion than material of the component surrounding the hollow chamber.

4,892,070

TECHNIQUE AND SPARK PLUG TO IGNITE VERY LEAN FUEL AIR MIXTURES, PARTICULARY FOR GAS ENGINES

Dieter Kuhnert, Friedrich-Metz-Str. 18, 6920 Sinsheim, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,123
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3709976
Int. Cl.[4] F02B *19/08, 23/00*
U.S. Cl. 123—274 **6 Claims**



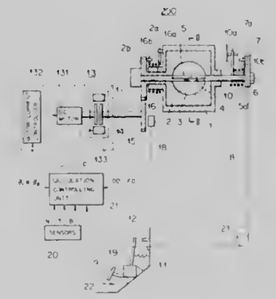
1. A spark plug construction for use in an opening of a combustion cylinder defining a main combustion chamber comprising: a connecting electrode; an insulating body surrounding said connecting electrode; a housing connected to said insulating body and surrounding said insulating body; an ignition chamber housing connected to said housing defining an ignition chamber, said connecting electrode having an end extending into said ignition chamber, said ignition chamber housing defining transfer channels providing fluid communication between the main combustion chamber and said ignition chamber; an ignition electrode connected to said connecting electrode, said ignition electrode being positioned in said ignition chamber; a counter electrode connected to said ignition chamber housing, said counter electrode cooperating with said ignition electrode to form a spark gap between said ignition electrode and said counter electrode; admixture line means defined by said housing for providing an admixture from outside the cylinder to one of a space in said main combustion chamber adjacent one of said transfer channels and directly to one of said transfer channels intermediate said ignition chamber and the main combustion chamber, said admixture line means having at least one valve, said valve includes control means for opening and closing said valve in response to the pressure of the admixture in said admixture line means and in response to the pressure in said main combustion chamber, said valve is positioned at an outlet of said admixture line means adjacent said combustion chamber.

4,892,071

THROTTLE VALVE CONTROLLING APPARATUS EMPLOYING ELECTRICALLY CONTROLLED ACTUATOR

Yoshiaki Asayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,972
Claims priority, applicatioo Japan, Jul. 22, 1987, 62-184169; Sep. 11, 1987, 62-229214
Int. Cl.[4] F02D *9/08*
U.S. Cl. 123—336 **9 Claims**



1. A throttle valve controlling apparatus for an automobile comprising:

throttle valve means including a first throttle valve and a second throttle valve relatively rotatable to said first throttle valve, for controlling a flow of an air/fuel mixture to an engine;

rotating means mechanically coupled to an accelerator pedal, for relatively rotating said first throttle valve with respect to said second throttle valve;

first return spring means for biasing said first throttle valve so as to set the same to a first closed position of said throttle valve means when said accelerator pedal is released;

relative rotation angle sensor means for detecting an actual relative rotation angle between said first and second throttle valves to output an actual relative rotation angle signal;

calculation controlling means for producing a rotation command signal representative of a target relative rotation angle for said first and second throttle valves, determined by operation of said accelerator pedal;

electrically controlled actuator means for relatively rotating said second throttle valve with respect to said first throttle valve in response to said rotation command signal derived from said calculation controlling means in such a manner that deviation between said target relative rotation angle and actual relative rotation angle becomes zero;

rotation angle sensor means coupled to said second throttle valve, for detecting a rotation angle of said second throttle valve to output a rotation angle signal to said calculation controlling means; and,

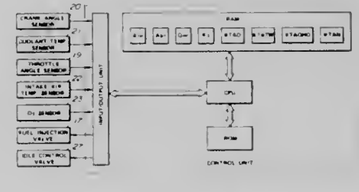
second return spring means for biasing said second throttle valve so as to set the same to a second closed position of said throttle valve means, whereby when said electrically controlled actuator means is brought into malfunction by checking said rotation angle signal from said rotation angle means, said second throttle valve is set to said second closed position at which engine speed is rapidly reduced, and said first throttle valve is independently rotatable by said accelerator pedal.

4,892,072

SYSTEM FOR MEASURING AMOUNT OF AIR INTRODUCED INTO COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE WITH AVOIDING INFLUENCE OF TEMPERATURE DEPENDENT AIR DENSITY VARIATION AND PULSATILE AIR FLOW

Hiromichi Miwa; Hatsuo Nagaishi; Ichiro Kishiki, all of Kanagawa, and Hirokimi Koyama, Shizuoka, all of Japan. assignors to Nisaan Motor Company, Limited, Yokohama, Japan

Filed May 19, 1988, Ser. No. 195,975
Claims priority, application Japan, May 19, 1987, 62-121496
Int. Cl.[4] F02D *41/14;* F02M *3/00*
U.S. Cl. 123—340 **29 Claims**



1. A system for detecting intake air flow amount in an internal combustion engine, comprising:

a first means for monitoring an engine revolution speed to produce an engine speed indicative first signal;

a second means for driving a basic engine load indicative data on the basis of a path area of an air induction passage of said internal combustion engine and said first signal value, said second means producing a second signal indicative of said basic engine load;

a third means for deriving a delay factor for introducing intake air into anengime cylinder on the basis of said first and secondsignal values, and

a time dependent firs correction value for correcting said basic engine load indicative data on the basis of said delay factor; and

a fourth means for modifying said second signal value on the basis of said first correction value and outputting a modified second signal as said intake air amount indicative signal indicative of the intake air amount.

4,892,073

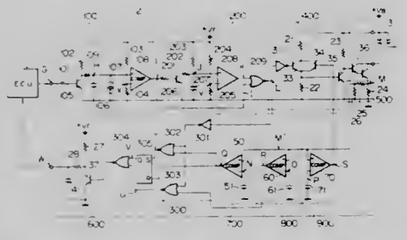
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noboru Yamamoto, Kariya; Masakuni Tsujimura, Anjo; Kiyotaka Sasaki, Nagoya; Kouichi Kato, Kuwana; Hideji Tani, Anjo; Yasuo Ito, Nagoya; Takeshi Matsui, Toyohashi, and Kenji Hashimoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 7, 1988, Ser. No. 241,216
Claims priority, application Japan, Sep. 10, 1987, 62-226990
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—417 **14 Claims**

1. An ignition system for internal combustion engines comprising an electronic control unit for computing an ignition timing electronically in accordance with parameters of an internal combustion engine, computing an energization time of an ignition coil and producing a pulse-shaped ignition signal in accordance with a result of the computation, and ignition

circuit means for interrupting a primary current of the ignition coil on the basis of the ignition signal supplied from said electronic control unit and producing an ignition monitor signal, wherein said ignition circuit means includes set means for setting the ignition monitor signal at a timing of starting energization of the ignition coil, first reset means for resetting the ignition monitor signal when the primary current of the ignition coil has exceeded a first reference level and has reached a



second reference level higher than the first reference level, second reset means for resetting the ignition monitor signal when the primary current of the ignition coil is interrupted before the primary current reaches the second reference level after the primary current has exceeded the first reference level, and maintenance means for maintaining a preceding state without resetting the ignition monitor signal when the primary current does not reach the first reference level.

4,892,074

SPARK IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

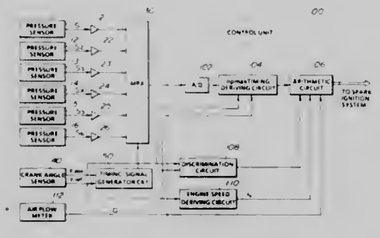
Masahiro Iriyama, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 28, 1988, Ser. No. 212,489

Claims priority, application Japan, Jun. 29, 1987, 62-100743[U]

Int. Cl.[4] F02P *5/12*

U.S. Cl. 123—425 **11 Claims**



1. A spark ignition timing control system for an internal combustion engine having a plurality of engine cylinders, comprising:

a first sensor for monitoring an engine revolution speed to produce an engine speed indicative first sensor signal;

a second sensor for monitoring load condition on the engine to produce an engine load indicative second sensor signal;

a third sensor, disposed in a first engine cylinder, for detecting first maximum pressure timing at which the internal pressure in a first combustion chamber thereof is obtained, said third sensor producing a third sensor signal indicative of said first maximum pressure timing;

a fourth sensor, disposed in a second engine cylinder, for detecting a second maximum pressure timing at which the internal pressure in a second combustion chamber thereof is obtained, said fourth sensor producing a fourth sensor signal indicative of said second maximum pressure timing;

fifth means for deriving a basic spark advance on the basis of said first and second sensor signal values;

sixth means for deriving a first error data representative of a difference between said first maximum pressure timing and a predetermined reference timing and a second error data representative of a difference between said second maximum pressure timing and said reference timing;

seventh means for deriving a correction value for said basic spark advance of said first engine cylinder, said correction value being constituted of a first component derived on the basis of said first error value and a second component derived on the basis of said second error value, and said seventh means correcting said basic spark advance of said first engine cylinder with said correction value.

4,892,075

CRANK ANGLE DETECTING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masahiro Iriyama, and Hiroshi Satoh, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Nov. 1, 1988, Ser. No. 265,819

Claims priority, application Japan, Nov. 2, 1987, 62-166794[U]; Nov. 2, 1987, 62-166795[U]

Int. Cl.[4] F02P *5/15;* **G01M** *15/00*

U.S. Cl. 123—425 **27 Claims**



1. A system for detecting a maximum pressure crank angle at which the pressure within a firing cylinder of an internal combustion engine is maximum and whereby detecting offset of said maximum pressure crank angle from a predetermined target angle, comprising:

first means for monitoring engine crank angle to produce first signals indicative of first, second and third crank angles within a range defined in the vicinity of said target angle;

second means for monitoring engine crank angle to produce a second signal indicative of a fourth crank angle outside of said range;

third means for monitoring pressure in said firing cylinder, said third means being responsive to said first and second signals, for producing a pressure value indicative of pressure within said firing cylinder at said first, second, third, and fourth crank angles;

fourth means, for comparing said pressure values at said first, second, and third crank angles, for projecting said maximum pressure crank angle when said maximum pressure crank angle is included within said range; and

fifth means for deriving direction and magnitude of offset of said maximum pressure crank angle to said target angle based on said pressure values at said first, second, third, and forth angles when said maximum pressure crank angle is not included within said range.

4,892,076

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

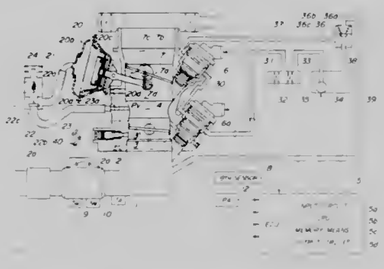
Kazushige Toshimits; Kelichi Osawa; Tadashi Umeda, and Kunio Noguchi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,330

Claims priority, application Japan, Sep. 8, 1987, 62-224807

Int. Cl.[4] F02D *41/00*

U.S. Cl. 123—442 **19 Claims**



1. A fuel supply control system for an internal combustion engine having a plurality of cylinders, an intake manifold formed by a diversified portion connected to each of said cylinders and a united portion to which said diversified portion is joined, a throttle body arranged within said united portion of said intake manifold, and a throttle valve provided within said throttle body said fuel supply control system comprising: a fuel injection valve arranged in said united portion of said intake manifold at a location upstream of said throttle body and having a nozzle for supplying fuel to said cylinders; an air throttle valve arranged in said united portion of said intake manifold at a location upstream of said throttle body, said air throttle valve having a valve body having a notched opening formed therein and disposed to be opposite said nozzle of said fuel injection valve to increase the flow speed of intake air in the vicinity of said nozzle when said air throttle valve is fully closed; first valve control means for controlling said fuel injection valve in response to operating conditions of said engine; second valve control mean for causing said air throttle valve to be fully closed when a predetermined low rotational-speed operating condition of said engine, in which at least the rotational speed of said engine is lower than a predetermined value, is satisfied; and means for setting said predetermined value of the rotational speed of said engine such that the lower the atmospheric pressure the smaller said predetermined value.

4,892,077

FUEL INJECTION CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Masahiko Yakuwa, Wako; Kikuo Tomozawa, and Kazuya Kishi, both of Minato, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,419

Claims priority, application Japan, May 12, 1987, 62-115539

Int. Cl.[4] F02D *41/20*

U.S. Cl. 123—487 **7 Claims**

1. A fuel injection control method for an internal combustion engine having a plurality of cylinders, and a plurality of fuel injection valves associated, respectively, with said cylinders, wherein fuel injection is started through each of said fuel injection valves while a period of time elapsed from the start of fuel injection is counted by time counting means, and the fuel injection through each of said fuel injection valves is terminated in response to completion of counting of said time counting means, the method comprising the steps of:

(1) starting fuel injection through a first one of said fuel injection valves, and at the same time causing said time counting means to count a period of time elapsed from the start of fuel injection through said first one fuel injection valve;

(2) starting fuel injection through a second one of said fuel injection valves when a predetermined period of time elapses after the start of fuel injection through said first one fuel injection valve;

(3) terminating the fuel injection through said first one fuel injection valve in response to completion of counting of



said time counting means started in said step (1), and at the same time setting a difference between a desired fuel injection period of time for said first one fuel injection valve and a desired fuel injection period of time for said second one fuel injection valve and restarting said time counting means to count said difference; and

(4) terminating the fuel injection through said second one fuel injection valve in response to completion of counting of said time counting means restarted in said step (3).

4,892,078

FUEL SUPPLY QUANTITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINE

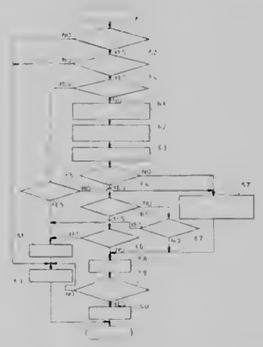
Yoji Fukutomi; Takeshi Fukuzawa, both of Utsunomiya, and Keisuke Kudo, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,002

Claims priority, application Japan, Sep. 8, 1987, 62-224967

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 **3 Claims**



1. In a method of controlling a fuel supply quantity with use

of a fuel supply device in an internal combustion engine having an exhaust gas component concentration sensor for generating an exhaust gas component signal, the improvement comprising the steps of

(a) setting the fuel supply quantity according to engine operation parameters including said exhaust gas component signal so far as a preset fuel supply quantity is not grater than a reference quantity;

(b) setting the fuel supply quantity irrespective of said exhaust gas component signal when said preset fuel supply quantity continues to be greater than said reference quantity for at least a reference time; and

(c) changing said reference time according to engine temperature.

4,892,079

MAGNETOGENERATOR

Kazuhisa Umezu, and Masayuki Ozawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,988

Claims priority, application Japan, Jun. 17, 1987, 62-151656; Jun. 17, 1987, 62-93610[U]; Jun. 18, 1987, 62-151728; Jun. 18, 1987, 62-93635[U]

Int. Cl.⁴ F02P *3/06;* **H02K** *21/22*

U.S. Cl. 123—602 **6 Claims**



1. A magnetogenerator comprising a bowl shaped fly-wheel adapted to be rotated in synchronism with a rotation of an engine having an associated ignition circuit, a plurality of permanent magnets arranged orderly on an inner periphery of said fly-wheel with magnetic poles thereof being alternative, a plurality of power generating coils including an ignition power generating coil and arranged within said fly-wheel in opposing relation to said plurality of permanent magnets and a trigger pole of an angle position detector provided on a member rotatable in synchronism with the engine rotation for producing a reference signal for an ignition timing control at a predetermined crank position of the engine, said plurality of permanent magnets including a plurality of adjacently disposed first magnets (32) each having a first peripheral length l, a pair of adjacently disposed second magnets (33) disposed adjacent said first magnets peripherally of said fly-wheel and having a second peripheral length longer than said first length by l_1 and a pair of third magnets (34) disposed adjacent said second magnets, respectively peripherally, and having a third length shorter than said first length by l_1, a position and a peripheral length of said trigger pole being determined such that opposite ends of said trigger pole pass over an electromagnetic pick-up of said angle position detector when a polarity of an output voltage of said ignition power generating coil produced by crossing magnetic flux of second magnets is changed.

4,892,080

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

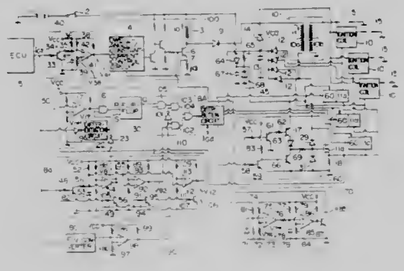
Seiji Morino, Okazaki; Satoru Kawamoto, Anjo; Yoshihiro Yoshitani, Nagoya; Toshio Sugimoto, Okazaki, and Toshio Nariki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 1, 1988, Ser. No. 214,443

Claims priority, application Japan, Jul. 3, 1987, 62-167419; Nov. 30, 1987, 62-302968

Int. Cl.⁴ F02P *3/06*

U.S. Cl. 123—604 **25 Claims**



1. An ignition system for an internal combustion engine, comprising:

a first series closed-loop circuit including a series connection of a DC power supply, an energy storage coil coupled to the DC power supply, and a first switching device coupled to the energy storage coil;

a second series closed-loop circuit coupled to the energy storage coil, including a series connection of a first diode, the primary winding of an ignition coil coupled to the diode, and a second switching device coupled to the primary winding;

a capacitor, connected to the energy storage coil through the diode; and

switching device control means for:

(1) first turning on a selected one of the first and second switching devices to store energy in the energy storage coil,

(2) subsequently turning off the selected one switching device to charge the capacitor using the energy stored in the energy storage coil,

(3) turning on the first switching device, after the charging the capacitor step, to store energy in the energy coil from the DC power supply,

(4) subsequently turning on the second switching device at substantially at the same time as a time of turning off of the first switching device and at an ignition timing, thereby to supply the primary winding of the ignition coil with both the energy stored in the energy storage coil and the energy charged in the capacitor.

4,892,081

COMPRESSIBLE BALL LAUNCHER

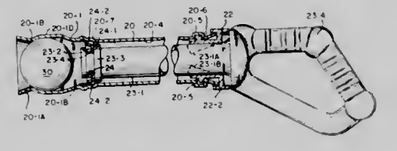
Randall H. Moormann, Georgetown, Mass., assignor to Tonka Corporation, Minnetonka, Minn.

Filed Nov. 9, 1988, Ser. No. 269,255

Int. Cl.⁴ F41B *11/00*

U.S. Cl. 124—65 **2 Claims**

1. A method of launching a compressible closed cell foam ball which will spring back to substantially its original shape after compression comprising forcing said compressible closed cell foam ball which will spring back to substantially its original shape after compression past a rigid constriction of a barrel into a ball retaining cavity thereof large enough to hold only a single ball, moving a plunger positioned in the barrel to pull the ball a predetermined distance in the same direction as the motion of the plunger to cause air to rush into the barrel between the ball and the plunger and thereafter moving the



plunger in the opposite direction to force air in the barrel between said compressible ball and the plunger forming a seal between the ball and the constriction and thereafter causing the ball to compress and squeeze by the rigid barrel constriction thus launching said ball therefrom.

4,892,082

DRESSING ROLL AND METHOD FOR PRODUCING THE SAME

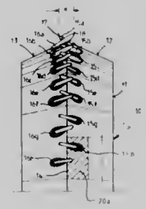
Horst J. Wedeniwski, Remsbalden-Grunbach, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 288,016

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743813; Apr. 8, 1988, 3811783

Int. Cl.⁴ B24B *53/00*

U.S. Cl. 125—11 R **6 Claims**



1. A dressing roll for dressing grinding wheels comprising a rotational roll body having a circumferential surface and an axis of rotation, said roll body defining a radial plane, extending perpendicularly to said axis, said dressing roll further comprising a plurality of diamond crystals being shaped as needles with a longitudinal axis, said needles being embedded into said surface over part of said longitudinal axis such that free ends of said needles protrude from said surface, said needles being, further, inclined with respect to said radial plane with a first number of needles being inclined in one direction and a second number of needles being inclined in a second direction opposite to said first direction, said first and second number of needles being arraned on said circumferential surface such that said free ends of said first number of needles overlap said free ends of said second number of needles when viewed in a circumferential direction.

4,892,083

BAKING OVEN

Helmut König, Rotmoosweg 15, A-8045 Graz, Austria

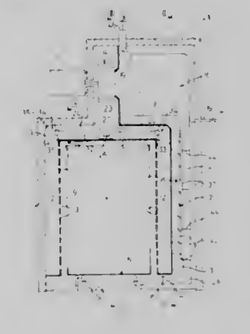
PCT No. PCT/AT87/00027, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO87/06100, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 15, 1987, Ser. No. 286,957

Claims priority, application Austria, Apr. 18, 1986, 1037/86

Int. Cl.⁴ F24C *15/32*

U.S. Cl. 126—21 R **14 Claims**



1. A baking oven comprising a housing having a baking chamber, first and second side air channels, and a hot air channel therein, a cover wall having an upper and lower sides, a lower side of said cover wall defining and substantially closing the upper extremity of said baking chamber, first and second side partitions in said housing defining opposite sides of said baking chamber, said first and second side partitions substantially separating said first and second side air channels, respectively, from said baking chamber and each having a plurality of air openings therein, said side partitions extending upwardly to said cover wall, carriage means removably received in said baking chamber for supporting goods to be baked therein, blower means disposed at least partially above said baking chamber and directly connected to said hot air channel, said blower means being operative for withdrawing air from said baking chamber and blowing it directly into said blower hot air channel, heater means disposed at least partially above said baking chamber and operative for heating the air withdrawn from said baking chamber before it enters said blower means, means for humidifying the air withdrawn from said baking chamber, said hot air channel extending across the upper side of said cover wall and communicating with said side air channels, switch means disposed in a central portion of said hot air channel above the upper said of the central portion of said cover wall for directing air from said blower means so that it alternatively passes into said baking chamber through said first side air channel or through said second side air channel.

4,892,084

SPACE HEATING APPLIANCE

John E. Fletcher, Clifton-on-Teme, England, assignor to Ambi-Rad Limited, Great Britain

Filed Nov. 8, 1988, Ser. No. 268,582

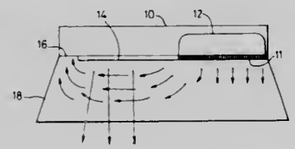
Claims priority, application United Kingdom, Nov. 10, 1987, 8726277

Int. Cl.⁴ F24C *3/04*

U.S. Cl. 126—92 AC **10 Claims**

1. A radiant plaque heater comprising a casing, fluid fuel feeding means in said casing, combustion panel means in said casing and in communication with said fuel feeding means, said combustion panel means being adapted to receive fluid fuel therethrough for combustion at the face thereof and emission of radiant heat therefrom, combustion gas flue means in said

casing and arranged to receive combustion products from said face of said combustion panel means and exhaust said products from said heater, and secondary emitter panel means in said casing between said combustion panel means and said flue



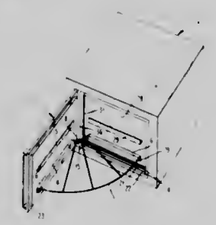
means and presenting an exposed face which is in the path of flow of said products, whereby said exposed face is heated by said products resulting in radiant heat being emitted from said secondary panel means to supplement the radiant heat emitted from said combustion panel means.

4,892,085

OVEN CLOSURES

Francisco J. Salvi, Zuviría 2040, Buenos Aires, Argentina

Filed Oct. 27, 1987, Ser. No. 113,124
Claims priority, application Argentina, Oct. 27, 1987, 305.701
Int. Cl.[4] F24C *15/16*
U.S. Cl. 126—340 **10 Claims**



1. An oven, comprising:

a plurality of upright walls defining an inner chamber, a first of the walls defining a front wall provided with an opening through which access may be had to the inner chamber, the opening including a first vertical axle extending along one side thereof, a second of the walls extending rearwardly from the first wall;

a door pivotally supported along said first vertical axle to be movable between a first door position extending across the opening for closing the inner chamber and a second door position opening the inner chamber, the door having an inner door surface facing rearwardly and exposed to the inner chamber when the door is in the first door position; an inner plate pivotally supported along a second vertical axle parallel to the first vertical axle and located within the inner chamber,

the inner plate being movable between a first inner plate position adjacent the second wall of the oven and a second inner plate position adjacent the opening, the inner plate including a front surface facing the inner chamber when the inner plate is in the first inner plate position;

at least one rack adapted for supporting materials to be heated in the oven; and means for supporting the rack between the front surface of the inner plate and the inner door surface, so that the door and the inner plate move together with the rack when the door is moved forwardly from the first door position to the second door position and so that when the door is in the second door position the rack is located outside the inner chamber and the chamber is closed by the inner plate;

the second wall including a concavely curved surface disposed adjacent a junction between the first and second walls, the curved surface forming a recess for receiving the second vertical axis.

4,892,086

INTERNAL COMBUSTION TYPE IRON

Masaharu Ichikawa, 44-11, Matsubara 1-chome, Setagayaku, Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,751
Claims priority, application Japan, Jan. 11, 1988, 63-1824[U]
Int. Cl.[4] A45D *1/02*
U.S. Cl. 126—409 **4 Claims**



1. An internal-combustion type iron comprising:

a grip portion;

a liquified-gas tank attached to said grip portion;

a nozzle located in the grip portion in selective communication with said liquified-gas tank for jetting a gas supplied from the liquified-gas tank;

a hollow barrel having a base portion attached to said grip portion, the barrel interior communicating with this outflow of said nozzle;

an air hole provided in the base portion of the barrel allowing the inflow of outside air for forming a gaseous mixture of said air and said gas;

an exhaust port provided at a tip portion of the barrel;

a gas flow control body disposed within the hollow portion of said hollow barrel, comprising a stagnant vortex flow generator portion which is centered within said hollow portion, and perpendicular to the flow of the gaseous mixture for generating a stagnant vortex flow along a surface of the downstream side of said stagnant vortex flow generator portion wherein a flame commences at the stagnant vortex flow generator such that the gaseous mixture lies close to the barrel and thereby heats the barrel efficiently along the entire length thereof;

a mixing chamber located in the hollow portion of the barrel between said air hole and said gas flow control body, the mixing chamber having a length permitting the required mixing of said gas with said air and for stablization of flow velocity; and,

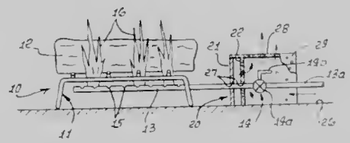
a heating chamber provided in the hollow portion of the barrel between said gas flow control body and said exhaust port, the heating chamber having a length sufficient for heating of the barrel by a combustion gas.

4,892,087

HEAT SHIELDING OF HOT FIREPLACES

Jon Bridgwater, Diamond Bar, Calif., assignor to R. H. Peterson Co., City of Industry, Calif.

Filed May 4, 1989, Ser. No. 346,878
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—512 **17 Claims**



1. For combination with a hot fireplace that includes an elongated main gas burner associated with a grate for supporting logs, there being a control operatively connected with the burner to control flow of combustible gas to the burner, the control located near the fireplace,

(a) heat shield means located proximate the control to intercept infra-red radiation toward said control,

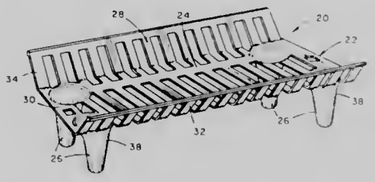
(b) said shield means having perforations sized for intercepting such radiation, and for passing convection air therethrough.

4,892,088

FIREPLACE GRATE

David M. Vestal, Sr., Sweetwater, Tenn., assignor to Vestal Manufacturing Company, Sweetwater, Tenn.

Filed Jun. 13, 1989, Ser. No. 365,370
Int. Cl.[4] F23H *13/00*
U.S. Cl. 126—540 **9 Claims**



1. A fireplace grate comprising:

means defining a support surface upon which fireplace fuels are placed for burning; and

a plurality of legs for supporting said support surface-defining means above a floor of a fireplace, each of said legs having a body which is attached to said support surface-defining means;

said support surface defining an upwardly-opening recess extending downwardly into the body of each leg for nestingly receiving the leg of a grate of like construction placed in overlying relationship with said grate so that a plurality of grates of like construction can be stacked in a superposed relationship with the legs of each grate nestingly accepted by the recesses of an underlying grate;

said support surface including a section encircling the opening of each recess; and

each recess having sidewalls which extend downwardly into the body of a corresponding leg and which are joined to a corresponding opening-encircling section of said support surface along a smooth arcuate surface.

4,892,089

METHOD FOR COMMINUTING KIDNEY STONES

Franklin H. Cocks, and Scott R. Akers, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Feb. 23, 1989, Ser. No. 315,412
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A **12 Claims**

1. A method for comminuting kidney stones with a lithotripter comprising:

exposing a stone to be comminuted to a renal matrix-attacking substance, said substance being a substance other than acid; and

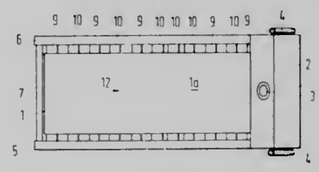
applying acoustic impulses to said stone; whereby the renal matrix-attacking substance lowers the fracture strength of the stone to be comminuted so that the stone is more easily pulverized by the acoustic impulses.

4,892,090

GUIDED RUNNING BELT OVER MASSAGE ROLLERS HAVING VARYING PROJECTIONS

Ernst Kaeser, Hauptstrasse 8, CH-4654 Lostorf, Switzerland

Filed Jul. 20, 1988, Ser. No. 221,799
Claims priority, application European Pat. Off., Jan. 27, 1988, 88101127.4
Int. Cl.[4] A61H *11/00, 15/00*
U.S. Cl. 128—58 **12 Claims**



1. A massage appliance for foot reflex-zone massage, comprising:

a frame assembly having a running direction;

a plurality of elongated massage rollers arranged transversely of said running direction and mounted so as to be freely rotatable in said frame; each of said rollers having a cylindrical outer surface;

each of said massage rollers having a plurality of rounded ring shaped roller elevations extending radially therefrom;

said roller elevations being disposed about at least a part of the circumference of the cylinder outer surface of said massage rollers,

said elevations varying in radial height and in axial width;

said roller elevations of one massage roller being offset transversely relative to the roller elevations of adjacent massage rollers,

an endless running belt guided around the massage rollers to form a running surface; and

means for driving the running belt in the running direction transverse to the axes of rotation of the massage rollers.

4,892,091

SCRATCHING DEVICE

Don R. Sullenger, 15721 Blaine #B, Bellflower, Calif. 90706

Filed Sep. 26, 1988, Ser. No. 249,328
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—62 R **2 Claims**

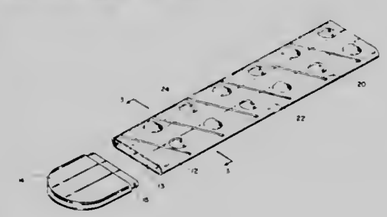
1. A scratching device, comprising:

an elongated body having two opposed generally flat rectangular faces, said body formed from a flexible material and having a hollow internal portion;

an open end at one end of said body communicating with said hollow interior portion;

a removable cap on said open end of said body;

a plurality of linear grooves spaced along the length of at least one of said faces of said body, said grooves each extending at an oblique angle with respect to a longitudinal axis of said body; and



a plurality of hollow hemispherical projections on at least one of said faces, said hemispherical projections each having an arcuate scraping edge and each communicating with said hollow interior portion.

4,892,092

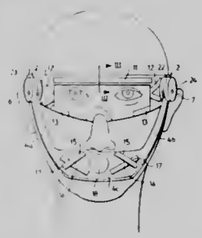
FACIAL MASK FOR USE IN EFFECTING ISOMETRIC TONING OF FACIAL MUSCLES

Sidi Klein, Hadganiot Street 6, Rehovot, Israel

Continuation-in-part of Ser. No. 826,796, Feb. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 566,033, Dec. 27, 1983, abandoned. This application Jul. 28, 1987, Ser. No. 78,633

Int. Cl.[4] A61F *5/08*

U.S. Cl. 128—76 B **18 Claims**



1. A facial mask for use in effecting isometric toning of facial muscles, comprising:

a plurality of shaped pressure applicators located to overlie the termination points of selected facial muscles of the user when applied to the user's head;

said facial mask including an upper band section having a plurality of said pressure applicators and configured to enclose the upper part of the uesr's head to overlie the user's eyes; and a depending lower section including a pair of arms joined at their outer ends to said upper band section at points outwardly of the eye portions and joined together at their inner ends forming an intermediate portion also having a plurality of pressure applicators to overlie the user's mouth;

a rear expansible chamber carried by the facial mask to overlie the back of the user's head such that when the chamber is expanded, it causes said pressure applicators to apply pressure to the termination points of the selected facial muscles;

and a hand-operated fluid pump for manually pumping fluid into said expansible chamber to expand it and thereby to cause said pressure applicators to apply pressure to the termination points of the selected facial muscles.

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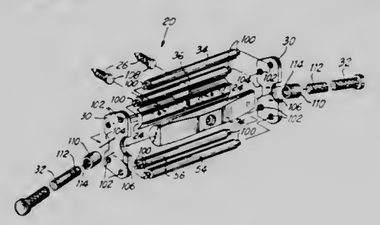
FEMORAL CUTTING GUIDE

Alfred J. Zarnowski, North Plainfield, N.J., and Christopher G. Sidebotham, Scotchtown, N.Y., assignors to Osteonics Corp., Allendale, N.J.

Filed Oct. 28, 1988, Ser. No. 263,687

Int. Cl.[4] A61F *5/04*

U.S. Cl. 606—82 **16 Claims**



1. A cutting guide for guiding a saw blade during the preparation of a femur for the implant of a femoral knee prosthesis, said cutting guide enabling guiding of said saw blade for cutting an axially directed anterior femoral cut, an axially directed posterior femoral cut, an anterior chamfer and a posterior chamfer, while said cutting guide remains located and secured to the femur in a single position on a transverse surface located along the distal femur, said cutting guide comprising:

a base member;

locating and securing means on said base member for locating and securing said base member on the femur at said transverse surface;

opposite side members extending from said base member in an axial direction distally relative to said transverse surface;

a first set of guide members extending laterally between said side members and located to delineate transversely opposite boundaries of an axially directed anterior cutting path intercepting the anterior femur, said first set of guide members including opposite guide surfaces spaced apart axially along said anterior cutting path for guiding said saw blade along said anterior cutting path during the anterior femoral cut;

a second set of guide members spaced transversely from said first set of guide members, said second set of guide members extending laterally between said side members and located to delineate transversely opposite boundaries of an axially directed posterior cutting path intercepting the posterior femur, said second set of guide members including opposite guide surfaces spaced apart axially along said posterior cutting path for guiding said saw blade along said posterior cutting path during the posterior femoral cut; and

a further set of guide members located transversely between said first and second sets of guide members, said further guide members extending laterally between said side members and located for delineating transversely opposite boundaries of an oblique anterior chamfer cutting path and delineating transversely opposite boundaries of an oblique posterior chamfer cutting path, said further guide members including first opposite guide surfaces spaced apart along said oblique anterior chamfer cutting path for guiding said saw blade along said oblique anterior chamfer cutting path during the anterior chamfer cut and second apposite guide surfaces spaced apart along said oblique posterior chamfer cutting path for guiding said saw blade during the posterior chamfer cut;

said side members being spaced apart laterally a distance sufficient to provide each of said delineated anterior cutting path, posterior cutting path, anterior chamfer cutting path and posterior chamfer cutting path with a continuous, uninterrupted lateral extent corresponding to the full lateral extent of the respective anterior femoral cut, posterior femoral cut, anterior chamfer and posterior chamfer, whereby the full anterior femoral cut, the full posterior femoral cut, the full anterior chamfer and the full posterior chamfer are accomplished while said cutting guide is located and secured on the femur in the single position on said transverse surface of the distal femur.

4,892,094

PRESSURE RESPONSIVE DIAPHRAGM VALVE

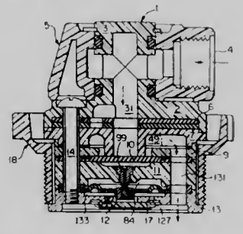
Nobuo Shigematsu, Urawa, Japan, assignor to Shigematsu Works Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,350

Claims priority, application Japan, Mar. 24, 1988, 63-38378[U]

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—201.28 **6 Claims**



1. A pressure responsive diaphragm valve comprising a valve assembly body and a pilot nozzle that is opened or closed by action of a pressure detecting diaphragm where said detecting diaphragm is operated in accordance with a pressure variation so as to move a diaphragm valve plate to an open or closed position, and wherein said valve assembly body excluding a mounting ring of said body consists of mutually laminated layer members.

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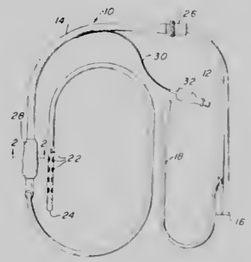
ENDOTRACHEAL TUBE

Karim B. Nakhgevany, 302 Fairview Rd., Narberth, Pa. 19072

Filed Mar. 17, 1987, Ser. No. 27,287

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.14 **4 Claims**



1. A method for endotracheal intubation comprising the steps of:

(a) providing a flexible guide tube having a length sufficiently long to extend between a patient's face and stomach and having a closed blunt end with at least one opening adjacent said closed end, said guide tube being adapted for passing a gas therethrough to said opening;

(b) inserting said guide tube through a facial passageway of the patient;

(c) blowing gas into said guide tube;

(d) auscultating over said patient's stomach;

(e) determining the location of said guide tube by listening for a gurgle-like sound, if said gurgle-like sound is made then said guide tube is removed and reinserted, if said gurgle like sound is not heard then said guide tube is properly located within said patient's trachea;

(f) sliding an endotracheal tube over said guide tube while a portion of said guide tube is positioned in said patient's trachea; and

(g) removing said guide tube from said patient.

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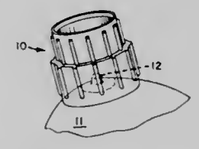
BREAST MARKING DEVICE

Krishna Narayanan, and Marc D. Liang, both of Pittsburgh, Pa., assignors to Montefiore Hospital Association of Western Pennsylvania, Pittsburgh, Pa.

Continuation of Ser. No. 57,117, Jun. 3, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 270,420

Int. Cl.[4] A61B *17/00*

U.S. Cl. 606—1 **6 Claims**



1. A device for creating a circular skin-discoloration mark on the surface of a human breast having an areola, said device comprising an optically transparent tubular member open at each end and having a generally circular cross section, one of the open ends of said tubular member having a greater diameter than the other open end; each of the two open ends comprising a circular marking edge; a wall member between the open ends extending across said tubular member substantially normal to the longitudinal central axis of said tubular member and being optically transparent; sighting means on said wall member comprising a pair of cross-markings intersecting at the central longitudinal axis of the said tubular member.

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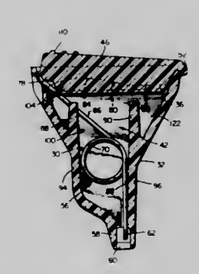
RETRACTABLE FINGER LANCET

Joseph V. Ranalletta, and Rowland W. Kanner, both of Guntersville, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Feb. 9, 1988, Ser. No. 153,968

Int. Cl.[4] A61B *17/32*

U.S. Cl. 606—182 **9 Claims**



1. A single-use, discardable lancet assembly including a lancet having a skin-puncturing probe and a housing in which

said lancet is mounted and confined, said housing having front and rear walls and side walls connected thereto and extending therebetween, said housing being formed with a through aperture in an end thereof for movement of a probe therethrough for piercing the skin, said skin-producing probe of said lancet being mounted within and reciprocably movable in said housing, said probe having a sharpened point for puncturing the skin upon being forcibly urged thereagainst, a releasably-restrained, pretensioned torsion spring means integral with said probe and operable upon release of restraint for driving said sharpened point of said probe through a travel sequence initiated from a stand-by, retracted, restrained, and inoperative position of said probe and continuing through a functional disposition of said probe in which said point of said probe forcibly pulses downwardly to project through said aperture and outwardly of said housing and then immediately returns to a final, retracted and sequestered state in which said point resides irretrievably interiorly of said housing, spring securement means in said housing for restrictingly securing, confining, and restraining said spring means in a tensioned, biased configuration and for establishing said retracted, stand-by position of said reciprocably movable probe of said lancet in said housing, and spring guide means in said housing for delineating a path of movement of said spring means upon release thereof, non-resettably trigger means for releasing said spring from said spring securement means for initiating said spring means travel sequence, and means securing said trigger means to said housing for access exteriorly thereof and wherein said spring means comprises an elongated wire disposed to extend longitudinally in said housing, said wire having opposed upwardly and downwardly directed lineal end portions joined to an integrally formed intermediately-positioned looped section, said sharpened point being formed on an end of said downwardly directed end portion, wherein movement of said spring means within said housing and transition of said spring means between initial and final states is effective temporarily to vary an overall operational length dimension of said spring and reciprocally to extend and to retract relative to said housing end aperture, said downwardly directed end portion of said spring means including said sharpened point of said probe.

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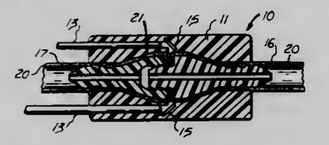
TUBULAR TISSUE WELDING DEVICE WITHOUT MOVING PARTS

Jude S. Sauer, 62½ Lattimore Rd., Rochester, N.Y. 14620

Continuation-in-part of Ser. No. 919,954, Oct. 17, 1986, abandoned, which is a division of Ser. No. 748,972, Jun. 26, 1985, Pat. No. 4,633,870. This application Feb. 25, 1988, Ser. No. 160,158

Int. Cl.⁴ A61B *17/04, 17/36;* **B23K** *9/00*

U.S. Cl. 606—18 **4 Claims**



1. An exoscope for joining tubular like objects comprising:

a hand-manipulable housing having first and second sections selectively movable relative to each other to form an unitary housing with a central opening lengthwise through said housing,

means for releasably supporting a pair of generally cylindrically shaped sections in said central opening formed in said housing, and with confronting ends of sections abutting each other along a seam located within said central opening,

a plurality of flexible, light transmissive elements extending at one into fixed sites in both sections of said housing and disposed to be connected at their opposite end to a source of laser energy operable to direct a beam of laser energy through said transmissive element into said housing,

means in said housing for directing said laser beam emitted from said light transmissive element to said central opening and onto said seam, said beam directing means simultaneously directing said beam circumferentially around said central opening to all portions of said seam thereby welding together said abutting ends along said seam, said housing sections being movable away from each other at the conclusion of a welding operation, to thereby permit withdrawal of the housing from the welded cylindrical sections to disengage the later said two housing sections being all of the housing sections required for joining tubular like objects.

4,892,099

CATHETER

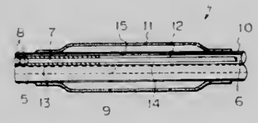
Shin-ichi Ohkawa; Koichi Tsuno; Jun-ichi Hiramoto, and Norifumi Matsumiya, all of Konohana, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 41,630, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 755,468, Jul. 16, 1985, abandoned. This application Dec. 12, 1988, Ser. No. 284,763

Claims priority, application Japan, Jul. 18, 1984, 59-107512[U]; Oct. 4, 1984, 59-208779

Int. Cl.⁴ A61B *1/06;* **A61M** *29/02*

U.S. Cl. 606—194 **7 Claims**



1. A catheter for insertion into a blood vessel, comprising:

a flexible tube-like sheath having a fluid passage therein;

a radially expansive and contractive balloon disposed about the peripheral surface of the distal end portion of said sheath and communicating with said fluid passage;

a light guide for transmitting illumination light to the distal end of said catheter;

an image guide for transmitting an image from the distal end of said catheter; and

a transparent liquid guide having a flush opening at the distal end of said catheter;

wherein said light guide, said image guide, and said transparent liquid guide are disposed substantially parallel with each other within said flexible tube-like sheath; and

wherein said light guide comprises a single transparent member formed by extrusion which substantially fills the inside of said flexible tube-like sheath along the entire length of said flexible tube-like sheath such that said image guide and said fluid passage and said transparent liquid guide are also formed with said light guide by extrusion of said single transparent member and disposed within said transparent member.

4,892,100

DEMAND PACEMAKER WITH PHYSIOLOGICAL CONTROL

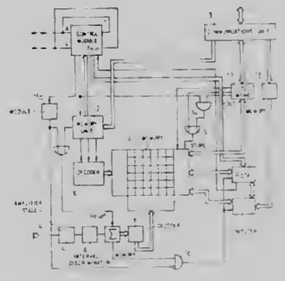
Max Schaldach, Erlangen, Fed. Rep. of Germany, assignor to BIOTRONIK Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 832,003, Feb. 24, 1986, abandoned. This application Aug. 3, 1988, Ser. No. 228,826

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506789

Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—419 PG **14 Claims**



1. A cardiac pacemaker for electrically stimulating the heart of a patient, comprising:

electrode means for applying stimulation pulses to the heart of the patient;

first monitoring means for detecting a physiological parameter which is characteristic of the patient and producing a first output signal representative of said first physiological parameter, said physiological parameter influencing spontaneous heart action in that the times between heart pulses spontaneously produced in the patient varies with variations in the value of said physiological parameter;

second monitoring means for monitoring the times between heart pulses spontaneously produced in the patient and producing a second output signal representative thereof;

memory means connected to said first and second monitoring means for storing representations based on said second output signal of the length of time between heart stimulation pulses spontaneously produced in the patient together with the concurrently occurring value of said physiological parameter;

circuitry means for producing a first address signal to address said memory means as a function of said first output signal and for producing a third output signal corresponding to said length of time representation; and

stimulation pulse producing means connected between said circuitry means and said electrode means for supplying to said electrode means, at least during the absence of spontaneous heart action, heart stimulation pulses at time intervals corresponding to said length of time representation produced by said circuitry means for the presently existing value of said physiological parameter.

4,892,101

METHOD AND APPARATUS FOR OFFSETTING BASELINE PORTION OF OXIMETER SIGNAL

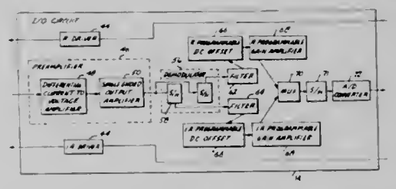
Peter W. Cheung, Mercer Island; Karl F. Gauglitz, Kirkland; Lee R. Mason, Issaquah; Stephen J. Prosser, Lynnwood; Robert E. Smith, Edmonds; Darrell O. Wagner, Monroe, and Scott W. Hunsaker, Seattle, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Continuation of Ser. No. 897,664, Aug. 18, 1986, Pat. No. 4,819,646. This application Feb. 24, 1989, Ser. No. 315,330

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.⁴ A61B *5/00, 6/00*

U.S. Cl. 128—633 **9 Claims**



1. An apparatus for receiving and processing signals, produced by a sensor, that contain information about the oxygen saturation of arterial blood flowing in tissue, said apparatus comprising:

offset subtraction means for subtracting from said sensor signal a controlled portion of said signal, said offset subtraction means having an output that is substantially equal to the portion of said sensor signal remaining after said controlled portion is subtracted therefrom;

control means for receiving said output of said offset subtraction means and providing a subtraction control signal, which is dependent on said output, to said subtraction means to control the magnitude of said portion of said sensor signal; and

analyzing means for receiving said output of said subtraction means and said controlled portion of said signal and producing an indication of the oxygen saturation of said arterial blood flowing in said tissue.

4,892,102

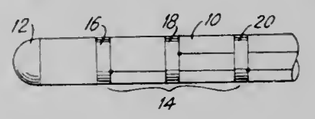
CARDIAC PACING AND/OR SENSING LEAD AND METHOD OF USE

Eliezer A. Astrinsky, 2600-1-n Netherlands Ave., Riverdale, N.Y. 10463

Continuation of Ser. No. 858,567, Apr. 24, 1986, abandoned, which is a continuation of Ser. No. 647,975, Sep. 6, 1984, abandoned, which is a continuatioo-in-part of Ser. No. 600,511, Apr. 16, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 912,236

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—642 **14 Claims**



13. A method for sensing electrical signals associated with muscular depolarization in a chamber of a heart without sensing electrical signals (a) associated with muscular depolarization in other chambers of the heart or (b) otherwise extraneous to the electrical signal being sensed, said method comprising the steps of:

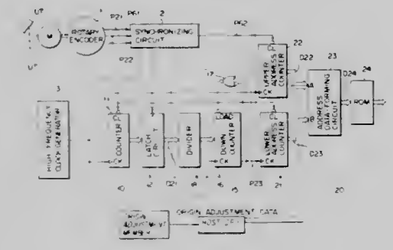
providing sensing circuitry;
placing a sensor assembly, mounted on an endocardial lead and including three spaced apart ring electrodes connected to the sensing circuitry, into a heart chamber;
sensing, with the middle one of the three ring electrodes relative to the outer two electrodes placed in the one heart chamber, electrical signals associated with muscular depolarization in the one heart chamber,
connecting the two outer electrodes together and to the sensing circuitry connecting the middle ring electrode to the sensing circuitry;
rejecting with the equi-potential state of the two outer ring electrodes in the heart in the area of the middle ring electrode, electrical signals (a) associated with muscular depolarization in other chambers of the heart or (b) otherwise extraneous to the electrical signals being sensed, thereby to prevent such other electrical signals from being sensed by the middle ring electrode.

4,892,103

ULTRASONIC SCANNING PULSE-GENERATING APPARATUS

Tatsuo Ogasawara, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 188,146, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 925,922, Nov. 3, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,697
Claims priority, application Japan, Nov. 7, 1985, 60-250042
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.01 **7 Claims**



1. An apparatus for providing energizing pulses to an ultrasonic pulse transducer, comprising:
position-detecting means coupled to a rotating motor for swingably moving an ultrasonic transducer, for generating a predetermined number of rotation angle pulses every time the motor rotates 360 degrees;
pulse cycle-measuring means for measuring a one-cycle period (T) of the rotation angle pulses output from the position-detecting means;
pulse-generating means, including means for dividing the one-cycle period (T) by a predetermined integer (m), for generating a plurality of divided pulses corresponding to a value obtained by said dividing means;
counting means for counting the divided pulses output from the pulse-generating means, to output count data; and
scanning pulse-generating means for generating scanning pulses corresponding to the count data.

4,892,104

APPARATUS FOR INSPECTING AN ELECTRICALLY STIMULATED HEART

Meiichi Ito, Sendai; Kazuya Kuriyagawa, Miyagimachi; Hitoshi Adachi, Tokyo, and Kohei Ohno, Higashiyamato, all of Japan, assignors to Nihon Kohden Corp., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 251,196
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—697 **5 Claims**



1. Apparatus for inspecting the electrical stimulation of a patient's heart, said apparatus including a stimulation means wherein an electrical stimulating wave is generated by an electrical stimulation wave generating means so to effect pacing of said heart in accordance with an externally set stimulating pattern impressed upon said wave and applied to said heart through a catheter, wherein intracardiac recorded on a recorder which is annexed to said stimulation means, said apparatus comprising:
(a) a final stimulation signal generating means for generating a final stimulation signal at a timing corresponding to a final electrical stimulation wave;
(b) a stimulation pattern generating means for generating a stimulation pattern representative of said stimulation pattern;
(c) a recording start signal generating means for generating a recording start signal for starting said recorder in advance of said generation of said final electrical stimulating wave;
(d) detecting said intracardiac electrocardiogram signal generated for the first time after said generation of said final electrical stimulation wave, and for generating a recording stop signal after the detection of said intracardiac electrocardiogram signal;
(e) a recording signal generating means for generating recording signals in accordance with which, the waveforms of said final stimulation signal and said intracardiac electrocardiogram signal are recorded, and the characters corresponding to said stimulation pattern are printed by said recorder; and
(f) a recording control means for starting the recording operation of said recorder in response to said recording start signal and stopping the recording operation in response to a said recording stop signal.

4,892,105

ELECTRICAL STIMULUS PROBE

Richard L. Prass, Lakewood, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Continuation of Ser. No. 845,848, Mar. 28, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,642
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—741 **14 Claims**

1. A hand held instrument for electrically stimulating exposed, subcutaneous tissue of a living body comprising:
an elongated, relatively flexible, electrically conductive wire element including a handle end and a tissue engaging end having a planar surface generally transverse to the axis of said wire element, said wire having sufficient rigidity to generally resist bending when in operable contact with said exposed subcutaneous tissue;
a tube encasing said wire element and orienting said wire element along a predetermined path, wherein a predetermined portion of said wire element is external of said tube and is adjustable relative thereto;



handle means disposed on the handle end of said wire element for manipulating said instrument;
means for connecting said wire element to a source of electrical stimulation energy; and
a sheath electrically insulating the peripheral surface along the length of said wire element wherein only said planar surface at the tissue engaging end thereof transmits electrical stimulus to said tissue when said wire element is positioned thereagainst.

4,892,106

MULTIPLE AFFERENT SENSORY STIMULATION DEVICE

William J. Gleeson, III, 2319 W. Rapallo Way, Tucson, Ariz. 85741

Filed Oct. 19, 1987, Ser. No. 109,403
Int. Cl.[4] A61B *13/00*; A61N *1/00*; H05G *00/00*
U.S. Cl. 128—745 **11 Claims**



1. A multiple afferent sensory stimulation device providing audio and visual sensory stimulation to a patient comprising:
a playback device adapted to receive a pre-recorded program and to emit audio stimulation signals and a plurality of visual stimulation control signals;
means operably connected to said playback device to separate the visual stimulation control signals from the audio stimulation control signals, said means including a high pass filter to block the audio stimulation signals while passing the visual stimulation control signals;
means operably connected to said playback device to provide audio stimulation to at least one of the patient's ears;
a pair of tone decoders operably connected to said means separating the visual stimulation control signals from the audio stimulation signals, one of said tone decoders adapted to emit a signal output upon receipt of a visual stimulation control signal of a first frequency, and a second of said tone decoders adapted to emit a signal output upon receipt of a visual stimulation control signal of a second frequency;
a logic circuit connected to said pair of tone decoders adapted to receive signal outputs from said first and second tone decoders, said logic circuit adapted to ignore false signals from either said first or second tone decoders; and
means operably connected to said tone decoders to receive the decoded visual stimulation control signals for displaying visual stimulation to at least one of the patient's eyes whereby audio and visual stimulation is provided a patient in accordance with the pre-recorded program to induce sensory reactions into the patient.

4,892,107

SINGLE USE, SAFETY BLOOD COLLECTION DEVICE

Terry M. Haber, El Toro, Calif., assignor to Habley Medical Technology Corp., Laguna Hills, Calif.

Filed Jan. 5, 1988, Ser. No. 141,019
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—763 **32 Claims**



1. A blood collection device comprising:
an outer sleeve and an inner needle carrier for receiving a double-pointed needle;
said inner needle carrier being mounted within said outer sleeve for axial movement between a first location at which said needle is adapted to project from said outer sleeve in an exposed position for drawing blood and a second location at which said needle is adapted to be fully disposed within said outer sleeve in a retracted position after use;
detent means cooperatively defined by the carrier and the outer sleeve for releasably holding said inner needle carrier in said first location for use of the needle;
locking means cooperatively defined by the carrier and the outer sleeve for non-releasably locking said inner needle carrier in said location after the use of said needle;
said outer sleeve including a slot and wherein said inner needle carrier includes an actuator extending through said slot for manually sliding said inner needle carrier from said first location to said second location; and
said inner carrier including means for resiliently biasing said actuator radially outwardly through said slot.

4,892,108

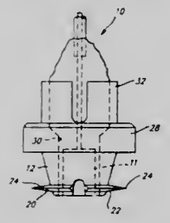
MULTI-CHANNEL EXTRACOCHLEAR IMPLANT

Josef M. Miller; Bryan E. Pfingst, both of Ann Arbor, Mich.; Anders Tjellstrom, Gothenburg, and Tomas Albrektsson, Molndal, both of Sweden, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jul. 23, 1987, Ser. No. 76,882
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—784 **21 Claims**

1. An anchor device for anchoring at least one electrode in or adjacent to a human cochlea so that the at least one electrode can afford electrical stimulation of nerve fibers to produce the sensation of sound, said device comprising:
shaft means forming a shaft and adapted to be disposed in an aperture in the lateral wall of the inner ear;

barb means forming at least one barb about said shaft means for preventing removal of said shaft means from the aperture; and



aperture means forming at least one aperture communicating axially through said shaft means to allow the at least one electrode to be disposed within said shaft means;

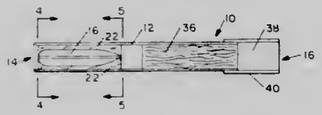
wherein said barb means comprises an annular barb disposed about said shaft means near one end thereof.

4,892,109

SIMULATED SMOKING ARTICLE

David G. Strubel, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 8, 1989, Ser. No. 320,428
Int. Cl.[4] A24F *1/00*; A24B *15/00*
U.S. Cl. 131—194 **7 Claims**



1. A simulated smoking article comprising:

a cylindrical sleeve open at its opposite ends and fabricated of a non-combustible material;

a capsule concentrically located within the sleeve extending from proximately one open end of the sleeve longitudinally of the sleeve a distance less than the length of the sleeve, the capsule having an outer circumference less than the inside circumference of the sleeve, and the capsule being fabricated of a heat conducting material;

a heat destructible seal located in the capsule dividing the interior of the capsule into a first chamber and a second chamber;

a fluid permeable membrane located in the capsule adjacent to and coextensive with the seal;

a first chemical reactant in the first chamber;

a second chemical reactant in the second chamber;

the first and second chemical reactants are selected from the group which reacts only exothermically, will not evolve a gas, and which are non-toxic individually and creates a non-toxic reaction product;

an annular air flow passage defined between the inside circumference of the sleeve and the outside circumference of the capsule;

a porous substrate located in the sleeve downstream of the capsule and air flow passage relative to the flow of air through the annular passage;

an aerosol generating substance in the substrate; and,

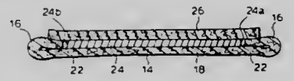
a filter located adjacent the porous substrate at the other open end of the sleeve opposite the capsule.

4,892,110

HAIR WRAP DEVICE

Philis A. Harvie, 227 Rhodes Avenue, Toronto, Ontario, Canada M41 3A2

Filed Jul. 18, 1988, Ser. No. 220,861
Claims priority, application Canada, Dec. 22, 1987, 555166
Int. Cl.[4] A45D *8/36*
U.S. Cl. 132—273 **9 Claims**



1. A hair wrap device for coiling about a bundle of hair to retain the hair in said bundle, comprising:

a thin, substantially rectangular sheet-like backing member having folded portions along at least two parallel sides thereof folded over onto a top surface of said backing member, a gap being formed on said top surface between edges of said folded over portions;

a rectangular, substantially flat, manually coilable, ductile metallic member, located in the gap, said ductile metallic member and said folded-over portions being of substantially equal thickness so that said folded-over portions and said ductile metallic member together form a substantially flat surface to which a thin, flexible, substantially rectangular decorative cover member is attached;

said cover member overlying at least a portion of each of said folded-over portions so as to bridge the gap along the length thereof and thereby sandwiching the metallic member between said top surface of said backing member and said cover member; and

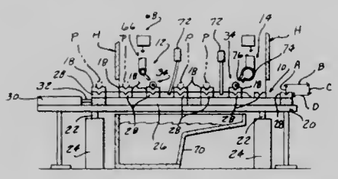
said ductile metallic member possessing sufficient resistance to bending so that said hair wrap device when manually coiled about a bundle of human hair retains the hair in said bundle.

4,892,111

PRODUCTION LINE PART CLEANING APPARATUS

Harold W. Parslow, Jr., and Timothy M. Parslow, both of Mt. Clemens, Mich., assignors to GraPar Corporation, Warren, Mich.

Filed Jun. 22, 1987, Ser. No. 65,280
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—66 **4 Claims**



1. An apparatus for production line spraying of like parts, each part having an established axis of rotation, said apparatus comprising:

conveying means operable to advance shaft-like parts in succession in intermittent step-by-step movement along a fixed path by cyclically lifting a part above stationary cradle blocks, carrying said part downstream along said fixed path of movement, lowering said conveying means below said stationary cradle blocks, and returning said conveying means upstream along said fixed path of movement;

first and second stationary platforms fixedly mounted in transverse alignment with each other at opposite sides of the conveying means and elevated above the stationary cradle blocks along the elevated downstream path of movement for said parts;

first and second carrier plates slidably mounted on the first and second stationary platforms respectively for horizontal movement toward and away from said parts;

first and second spindles rotatively supported by said first and second carrier plates respectively for rotation about a co-axial horizontal axis normal to the path of movement of the parts;

means for reciprocating the first and second carrier plates from a retracted position, wherein the first and second spindles are axially spaced from each other by a distance greater than an axial length of said parts, to an extended position, wherein the first and second spindles are co-axially engaging opposite ends of a part supported clear of the stationary cradle blocks at a downstream elevated first position;

part rotating means connected to one of the spindles for rapidly rotating said part by driving the spindle and engaged part in rotation about said co-axial horizontal axis when said first and second spindles are in the extended position coaxially aligned with the established axis of rotation for the part while the other of the spindles rotates freely; and

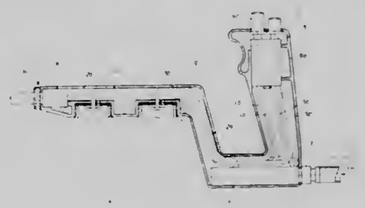
spray means adjacent said first location actuable to discharge pressurized cleaning fluid against said part while said part is being driven in rotation by said part rotating means.

4,892,112

HAND TOOL FOR CLEANING DISINFECTING AND/OR LUBRICATING

Wilfried Knetsch, Vienna, Austria, assignor to Ogussa Osterreichische Gold-und Siber Scheideanstalt Scheid und Roessler Gessellschaft M.b.H. & Co. KG, Vienna, Austria

Filed Aug. 5, 1988, Ser. No. 229,056
Claims priority, application Austria, Aug. 7, 1987, A2000/87
Int. Cl.[4] B08B *3/02, 9/00*
U.S. Cl. 134—102 **6 Claims**



1. A hand tool for cleaning, disinfecting, and/or lubricating dental tool holders, angle pieces, turbine pieces. or the like, said tool comprising:

(a) an inlet opening,

(b) a source of pressurized gas connected to said hand tool inlet opening,

(c) means for initiating and terminating the flow of said source of pressurized gas into said hand tool inlet opening,

(d) an outlet opening comprising means for mounting a dental tool holder, an angle piece, a turbine piece or the like thereon,

(e) a pressure control valve comprising an upstream portion and a downstream portion, wherein said pressure control valve upstream portion is in open communication with said hand tool inlet opening, said pressure control valve being located downstream of said hand tool inlet opening,

(f) a pressurized gas line which is in open communication, at one end, with said pressure control valve downstream portion, and said pressurized gas line being in open communication at the other end with said hand tool outlet opening,

(g) a container defining a cavity for receiving an agent for cleaning, disinfecting and/or lubricating the dental holder, angle piece, turbine piece, or the like mounted on said hand tool outlet opening, and

(h) at least one pump means for conveying said agent from said container to said hand tool outlet opening, wherein the upstream end of said pump means comprises a first conduit which is in open communication with the cavity of said container and wherein the downstream end of said pump means comprises a second conduit which is in open communication with said pressurized gas line.

4,892,113

MOISTURE MONITOR AND CONTROL SYSTEM

Farrokh Fattahi, Boulder, Colo., assignor to Spectrum 2000, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 825,254, Feb. 3, 1986, abandoned. This application Jan. 20, 1987, Ser. No. 5,149
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—78.3 **18 Claims**



1. A system for monitoring moisture level in soil and controlling application of water to said soil, said system comprising:

(a) a plurality of sensing units disposed in said soil, each said sensing unit being adapted to monitor moisture content in said soil; wherein each said sensing unit is powered by low voltage, low current, alternating current having a frequency in the range of about 1.8 to 10 KHz and utilizes a square wave with fifty percent duty cycle; and

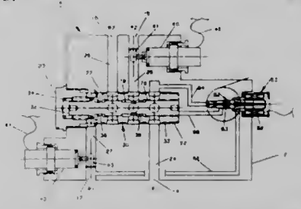
(b) control means which is electrically connected to each said sensing unit, wherein said control means is adapted to (i) compare said moisture content in said soil to a preset moisture requirement, and (ii) control the application of water to said soil; wherein said sensing units are periodically simultaneously activated to detect moisture content in said soil.

4,892,114

FLOW-SENSING SHUTOFF VALVE

G. Earl Maroney, Clarkston; Mark W. Dallas, Ortonville; Christopher West, Clawson; John A. Diemer, Auburn Hills, and Mark B. Chamberlin, Royal Oak, all of Mich., assignors to M. C. Aerospace Corporation, Lake Orion, Mich.

Filed Apr. 13, 1989, Ser. No. 337,334
Int. Cl.[4] G05D *7/00*
U.S. Cl. 137—87 **15 Claims**



1. A flow-sensing shutoff valve adapted to be installed in fluid pressure and return lines between upstream and down-

stream portions of a hydraulic system for isolating the downstream portion in response to a leakage condition therein, said valve comprising:

a valve body having fluid pressure entrance and fluid return exit ports connectable to the upstream fluid pressure and return lines, fluid pressure exit and fluid return entrance ports connectable to the downstream fluid pressure and return lines;

valve means within said valve body, and pressure and return passage means in said valve body for connecting said ports to said valve means, said valve means being movable between a normally open position in which said fluid pressure and fluid return entrance and exit ports are respectively connected by said pressure and return passage means and a closed position in which at least the connection between said fluid pressure entrance and exit ports is blocked;

pressure and return flowmeter means mounted in said valve body for sensing the fluid flow in said pressure and return passage means, said pressure and return flowmeter means being adapted to produce flow rate signals respectively proportioned to the pressure fluid flow and to the return fluid flow, and conditions in said pressure and return passage means upstream of said pressure and return flowmeter means;

control means connected to said pressure and return flow meter means for producing an output signal in response to a differential condition between said flow rate signals; and

actuator means for moving said valve means to said closed position in response to said output signal.

4,892,115

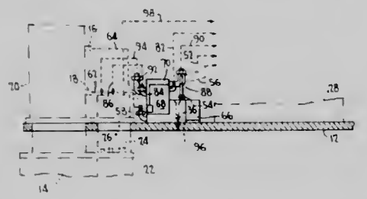
CONTROL VALVE ASSEMBLY

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Jun. 16, 1988, Ser. No. 207,509

Int. Cl.[4] G16K *11/00*

U.S. Cl. 137—269 **18 Claims**



1. A compact valve assembly for a multiple station machine, said valve assembly comprising a manifold including a base and an upstanding part integral with said base wherein said manifold is L-shaped in end elevation, said base having a front wall, a top wall, and a bottom wall, said upstanding part having a front wall, a rear wall and a top wall, said manifold having fluid passages extending through said base and said upstanding part, a first control valve mounted on said upstanding part rear wall and coupled to said fluid passages for controlling flow through said manifold, and said manifold forming a mounting support for at least one other control valve.

4,892,116

PLUMBING SEALING SYSTEM

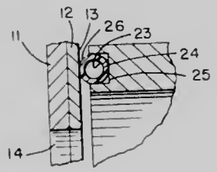
John J. Grasseschi, 1299 Grafton St., Worcester, Mass. 01609

Continuation of Ser. No. 91,506, Aug. 31, 1987, Pat. No. 4,756,332, which is a continuation of Ser. No. 943,312, Dec. 17, 1986, Pat. No. 4,706,702. This application Apr. 26, 1988, Ser. No. 186,450

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] F16L *5/00*

U.S. Cl. 137—360 **6 Claims**



1. Plumbing sealing system, comprising:

(a) a fixture including a flange adapted to lie with an edge in spaced relationship to a vertical wall surface adjacent an aperture in the wall, and

(b) a sealing element in the shape of an annulus of circular cross-section lying along and firmly attached to the said edge, while extending into the space between the plane of the edge and the wall surface, the sealing element being formed of an elastomer that is resilient and impervious to water, wherein the said edge of the flange defines a closed circular path confined to a single plane circumscribing the aperture in the wall, and wherein the sealing element has a porous, very resilient inner body completely surrounded by a non-porous, moderately-resilient skin, wherein the edge of the flange has a groove with a depth at least equal to the radius of the sealing element, and wherein the sealing element fits snugly in the groove.

4,892,117

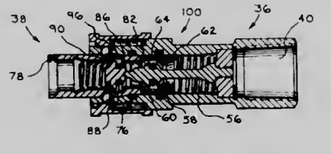
REFRIGERATION COUPLING

Robert D. Spalink, Jackson; Steven M. Knowles, Leslie, and John T. Kusztowny, Ann Arbor, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 10, 1988, Ser. No. 269,729

Int. Cl.[4] F16L *29/00*

U.S. Cl. 137—614.03 **1 Claim**



1. A coupling used in the charging and recharging of refrigeration circuits, comprising, in combination, a female part having an axial passage having an inner connection end and an open outer end, a male part having an axial passage having an inner connection end and an outer end adapted to be received within said female part outer end, connection means defined on said parts for selectively coupling said parts' open ends in coaxial communication, a first self-sealing valve within said passage of said male part axially moveable between open and closed positions having a maximum diameter, a first annular sealing ring mounted on said valve adjacent said maximum

diameter, said passage of said male part having a cylindrical sealing surface receiving and engaging said first sealing ring in said closed position, an annular recess defined in said male part passage adjacent said cylindrical surface, said first valve maximum diameter being radially aligned with said recess when said first valve is in said open position, a self-sealing valve sleeve within said passage of said female part axially moveable between open and closed positions and having an outer end, an inner cylindrical surface, and an annular recess between said valve outer end and said cylindrical surface, a coaxial probe fixed within said female part passage having a free end extending toward said female part open end and having a maximum diameter, a second annular sealing ring mounted on said probe adjacent said probe maximum diameter, said valve sleeve circumscribing said probe, said probe mounted sealing ring being received within and engaging said valve sleeve cylindrical surface when said valve sleeve is in said closed position, said valve sleeve recess being radially aligned with said probe maximum diameter when said valve sleeve is in said open position, said male and female parts each having releasable connection means for connecting said parts open outer ends to produce an open passage between said parts when fully coupled, a compression coil spring in each said parts biasing each said valve towards its closed position, said male part engaging said valve sleeve outer end and said probe engaging said first valve upon connection of said parts to displace said valve and valve sleeve to their open positions.

4,892,118

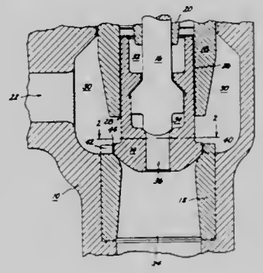
SILENT VALVE

Donald H. Davis, Scotia; Jens Kure-Jensen, and Solomon Jenkins, III, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 395,603, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 192,481, Sep. 30, 1980, abandoned. This application Mar. 21, 1985, Ser. No. 714,348

Int. Cl.[4] F16K *47/02*

U.S. Cl. 137—625.3 **14 Claims**



1. A valve for quietly controlling flow of steam comprising:

a pressurizable valve body including an inlet port and an outlet port;

a valve seat disposed within said body between said inlet port and said outlet port;

a cylindrical valve plug movable against said valve seat in an axial direction for continuously controlling the flow of steam between said inlet port and said outlet port, whereby a contact region between said valve seat and said valve plug is defined; and,

a cylindrical slotted member affixed to said valve seat and extending a predetermined distance upstream with respect to said valve seat, said slotted member for dividing said flow of steam into a plurality of fluid streams at low valve lift such that the frequency spectrum of noise energy from the flow of steam through said slotted member is shifted toward supra-audible frequency so that audible noise is reduced, said slotted member disposed immediately adjacent said contact region, the predetermined distance of said slotted member limited with respect to valve lift such that at high valve lift substantially all flow of steam from said inlet port to said outlet port bypasses said slotted member, said slotted member open at the predetermined distance from said seat to permit smooth transition from partially restricted flow of steam at low valve lift to substantially unrestricted flow of steam at high valve lift, wherein continuous control of flow of steam from said inlet port to said outlet port is obtained by said valve plug.

4,892,119

CHANGING CLOTH BEAMS IN A WEAVING MILL

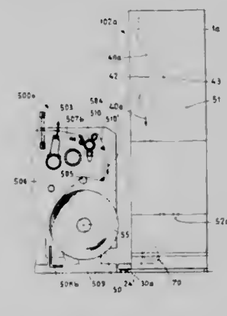
Schilling Hugo, Winterthur, Switzerland; Günter Veith, Münsingen-Dottingen, Fed. Rep. of Germany, and Zünd Marcel, Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 13, 1988, Ser. No. 206,185

Claims priority, application Switzerland, Jun. 16, 1987, 02268/87

Int. Cl.[4] D03D *49/00*

U.S. Cl. 129—1 R **14 Claims**



1. A method of changing cloth beams in a weaving mill comprising the steps of

transferring a full cloth beam from a weaving machine into a predetermined position in a transporter;

moving a wind-on beam into the path of fabric between the weaving machine and full cloth beam to form a loop of fabric;

moving the wind-on beam with the loop of fabric about a fresh cloth beam in the transporter;

cutting the fabric between the fresh cloth beam and full cloth beam;

positioning a free cut end of the fabric against the fresh cloth beam;

rotating the fresh cloth beam to wind the fabric thereon over the free cut end of the fabric; and

transferring the fresh cloth beam with the fabric windings thereon to the weaving machine.

4,892,120

APPARATUS FOR REGULATING THE JAW OF THE CUTTING RAILS IN FACE-TO-FACE WEAVING LOOMS

Roger Bostyn, Kortrijk/Marke, Belgium, assignor to N.V. Michael Van de Welle, Kortrijk/Marke, Belgium

Filed Oct. 7, 1988, Ser. No. 254,820

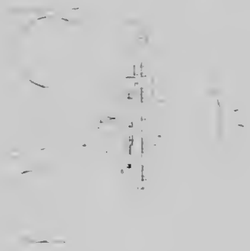
Claims priority, application Belgium, Oct. 10, 1987, 01167

Int. Cl.[4] D03D *39/18*

U.S. Cl. 139—21 **12 Claims**

1. Cutting device to split a face-to-face woven fabric, consisting of a fixed cutting bank (8) over which a knife carriage (7) provided with a knife blade (6) moves to-and-fro, and of a top cutting rail (4) and a bottom cutting rail (5), both of which

are arranged for vertical adjustment in relation to the knife blade (8), and which respectively form top and bottom guides for the unsplit face-to-face fabric (3), characterized in that the
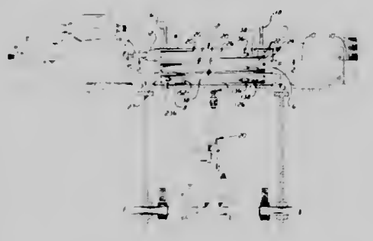


cutting device is provided with at least one electronic displacement transducer which produces a signal proportional to the position of the top and bottom cutting rails (4, 5) respectively in relation to the knife blade.

4,892,121

BLADDER TYPE SHUTTLE BRAKING APPARATUS FOR LOOMS

Charles M. Brown, Starkville, Miss., assignor to Niagara Lockport Industries Inc., Quincy, Fla.

Filed Jul. 14, 1988, Ser. No. 219,090
Int. Cl.[4] D03D *49/54*
U.S. Cl. 139—185 **9 Claims**



1. A shuttle braking apparatus for use in a shuttle box cell on a weaving loom having a selectively controllable source of pressurized fluid and in which a shuttle is picked along a shuttle raceway between two opposing shuttle box cells and in which the shuttle cells have a plurality of walls extending generally parallel to the shuttle raceway with the shuttle cell being aligned with the raceway for receiving a shuttle moving along the raceway, said braking apparatus having at least a portion thereof extending inwardly of at least one cell wall and comprising

a support member joined to said cell wall;

a shuttle engaging member having at least one surface for engaging a shuttle entering said cell;

at least one selectively inflatable and deflatable bladder interposed between said support member and said shuttle engaging member for urging said shuttle engaging member inwardly of said cell upon inflation of said bladder by selective introduction of pressurized fluid thereinto, such that inflation of said bladder will urge said shuttle engaging member toward a position interfering with movement of a shuttle within said cell, whereby inflation of the bladder will serve to brake movement of a shuttle within the cell; and

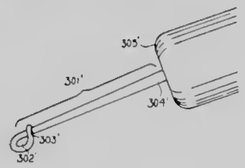
means for urging said bladder to a deflated condition upon selective release of said pressurized fluid therefrom to move said shuttle engaging member away from engagement with a shuttle within said cell when said bladder is deflated.

4,892,122

PROBE PIN ALIGNMENT TOOL

John M. Ickes, Emmett, Id., assignor to Micron Technology Inc., Boise, Id.

Filed Dec. 19, 1988, Ser. No. 286,855
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—123 **2 Claims**



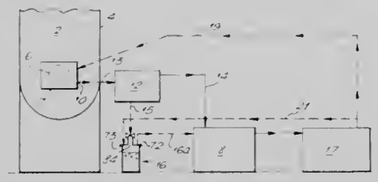
1. Apparatus for bending a probe pin, comprising a member attached to a handle, having a substantially closed aperture with a general diameter larger than a diameter of the probe pin, so that said aperture can be easily positioned around the probe pin, said member being made of wire at least as stiff as the probe pin and having a substantially straight shaft, a first end of said shaft being formed into at least one loop, so making said aperture, and a second end of said shaft connected to said handle, said first end being wrapped at least partially around said shaft, to prevent said aperture from flexing open, and said first end's cross-sectional area being less than said second end's cross-sectional area.

4,892,123

PNEUMATIC CONVEYING SYSTEM

Patrick G. Sheehan, Mid Glamorgan, United Kingdom, assignor to Technivac Limited, Mid Glamorgan, United Kingdom

Filed Aug. 25, 1988, Ser. No. 236,465
Claims priority, application United Kingdom, Aug. 25, 1987, 8719993; Aug. 25, 1987, 8719994
Int. Cl.[4] B65B *1/16*
U.S. Cl. 141—7 **11 Claims**



1. A method of discharging particulate material from a reactor, which comprises:

(a) providing a drain zone in said reactor and a gas/solids separator for operation on particulate material from said reactor and pneumatically conveying said particulate material from said drain zone of said reactor via a first vacuum line, to said gas/solids separator;

(b) providing a receiving vessel, having a top portion, for receiving said particulate material from said gas/solids separator and arranging a cover member having a gas inlet, a gas outlet and an inlet port in sealing engagement on the top portion of the receiving vessel, feeding said particulate material from said gas/solids separator to said

receiving vessel via a substantially gas-tight line from said gas solids separator to said inlet port;

(c) recycling the majority of the gas from said gas/solids separator to said drain zone via a main vacuum return line;

(d) drawing substantially the remainder of the gas from said gas/solids separator to said receiving vessel via a further vacuum line and the gas inlet provided on said cover member; and

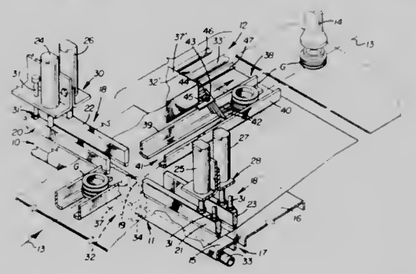
(e) passing gas from said receiving vessel, via the outlet port provided on said cover member and an auxiliary vacuum return line, to said main vacuum return line, said cover member being mounted for movement towards and away from said receiving vessel such that successive ones of a series of receiving vessels can be selectively covered by said cover member and filled with said particulate material.

4,892,124

CROSS-CUTTING APPARATUS AND CONVEYOR FOR BAG FILLING MACHINES

Peter N. Thomsen, 138 Baumont Ave., San Francisco, Calif. 94118

Filed Dec. 6, 1988, Ser. No. 280,710
Int. Cl.[4] B65B *43/42, 3/16*
U.S. Cl. 141—114 **12 Claims**



1. A machine for moving at least one pair of bags along a path disposed in a horizontal plane and for then cutting said bags from each other, said bags being connected together at a severable parting line extending transversely relative to said path, said machine comprising

a frame,

conveyor means mounted on said frame for intermittently moving said pair of bags along said path,

first and second platens mounted on said frame and spaced apart in the direction of said path to define an opening between said platens, extending transversely relative to said path,

clamping means movably mounted above said platens for engaging and clamping a leading end of a trailing bag and a trailing end of a leading bag of said pair of bags to said first and second platens, respectively, to position the severable parting line, connecting said pair of bags together, over said opening, said

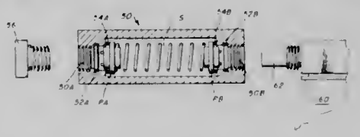
cutting means, including a cutting blade, mounted on said frame for severing the parting line connecting said pair of bags together by moving said cutting blade in said horizontal plane and transversely through said opening.

4,892,125

SYSTEM FOR SERVING A PRE-MIX BEVERAGE OR MAKING AND SERVING A POST-MIX BEVERAGE IN THE ZERO GRAVITY CONDITIONS OF OUTER SPACE

Arthur G. Rudick, Marietta; Richard H. Heenan, Atlanta, and William S. Credle, Jr., Stone Mountain, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 769,464, Aug. 26, 1985, Pat. No. 4,785,974. This application Jun. 23, 1988, Ser. No. 211,271
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—353 **5 Claims**



1. A system for making and serving a carbonated post-mix beverage in the zero gravity conditions of outer space comprising:

(a) a flavor concentrate module including a tubular housing with threaded inlet and outlet ports and spring biased poppets in each of said ports for normally closing said ports;

(b) a pre-measured amount of flavor concentrate disposed within said module;

(c) a source of carbonated water coupled to the inlet port of said module and having means for opening the poppet in the threaded inlet port and engaging the threaded inlet port for introducing carbonated water into said module for mixing with flavor concentrate to form the carbonated post-mix beverage; and

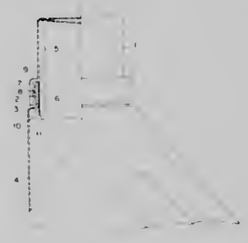
(d) a drinking container having tube means attached thereto, said tube means having a threaded fitting for engaging the threaded outlet port extending into the outlet port of said module to open the spring biased poppet therein and permit the carbonated post-mix beverage to flow into said drinking container.

4,892,126

THREADED DOSING CAP

Herbert Bucheler, Erkrath, and Paul O. Weltgen, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 537,415, Sep. 6, 1983, abandoned. This application Nov. 30, 1988, Ser. No. 277,855
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207223
Int. Cl.[4] B65D *51/24*
U.S. Cl. 141—381 **2 Claims**



1. In combination with a container having an externally threaded, reduced neck area, said neck area having an inner surface of predetermined length and an upper circular extrem-

ity, said neck area opening into a wider container volume, a dosing cap comprising:

a beaker type dosing cylinder having a drain ring which extends into and through said predetermined length of said reduced neck area, said drain ring wipingly bearing against said inner surface of said reduced neck area over its entire predetermined length to create a seal therebetween and having a lower-most portion which narrows from the inner surface of said reduced neck area and terminates with a sharp edge oriented obliquely inward; and

a skirt extending outwardly from said dosing cylinder and concentrically arranged thereabout, said skirt extending over said upper circular extremity of said reduced neck area and having internal threads, said skirt forms a seal when its internal threads are fully engaged with said external threads of said reduced neck area.

4,892,127

SNOW CHAIN HAVING A NETWORK OF DIAMOND SHAPED OPENINGS

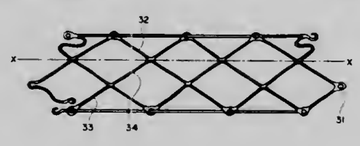
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 701,345, Feb. 13, 1985. This application Dec. 16, 1987, Ser. No. 133,744

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] B60C *27/10*

U.S. Cl. 152—221 **18 Claims**



1. A continuous snow chain for automobile tires comprising in combination:

(a) a network of flexible elongated elements including at least two rows of diamond-shaped openings disposed adjacent and parallel to one another;

(b) a first retainer flexible elongated member connected to one edge of said network at each zig-zag point on said one edge; wherein said first retainer flexible elongated member includes means for removably connecting two extremities thereof to one another;

(c) a second retainer flexible elongated member connected to the other edge of said network opposite to said one edge at each zig-zag point on said the other edge wherein said second retainer flexible elongated member includes means for removably connecting two extremities thereof to one another;

(d) a first and second flexible elongated members extending from one end-most junction of the first row of said diamond-shaped openings, wherein the first flexible elongated member is connected to said second retainer flexible elongated member and the second flexible elongated member includes a first half of a coupling means disposed at a mid portion thereof and a first half of a connecting means disposed at the extremity thereof;

(e) a third flexible elongated member extending from one end-most junction of the second row of said diamond-shaped openings adjacent to said one end-most junction of the first row of said diamond-shaped openings and connected to said first retainer flexible elongated member, said third flexible elongated member including a second half of said connecting means disposed at the extremity thereof;

(f) a fourth flexible elongated member extending from the other end-most junction of the first row of said diamond-shaped openings opposite to said one end-most junction and connected to said second retainer flexible elongated member; and

(g) a second half of said coupling means disposed at the other end-most junction of the second row of said diamond-shaped opening opposite to said one end-most junction of the second row and wherein the first or second half of said coupling means comprises at least an open-link member or an angle-link member.

4,892,128

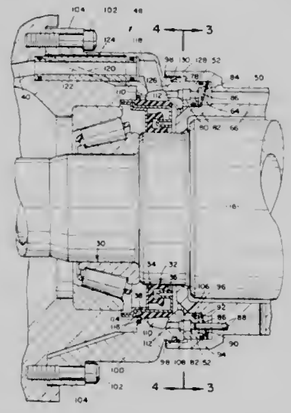
VEHICLE WHEEL SEAL ASSEMBLY

Josef A. Bartos, Diamond Bar, Calif., assignor to Tire Inflation Systems Corp., Willoughby, Ohio

Continuation-in-part of Ser. No. 91,057, Aug. 28, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,041

Int. Cl.[4] B60C *23/00*

U.S. Cl. 152—417 **46 Claims**



1. A wheel seal assembly for a vehicle having an onboard system for controlling the pressure of air in a tire of the vehicle, said system including a source of air under pressure, said vehicle having wheel means carrying said tire, wheel support means having an axis, and means supporting said wheel means on said wheel support means for rotation about said axis, said seal assembly comprising first annular seal means surrounding said wheel support means and coaxial therewith, means supporting said first annular seal means on said wheel support means for reciprocating movement axially thereof and against rotation relative to said axis, said first annular seal means having first annular sealing surface means in a plane transverse to said axis, second annular seal means coaxial with said axis, means supporting said second annular seal means for rotation with said wheel means, said second annular seal means having second annular sealing surface means in a plane transverse to said axis and facially engaging said first annular sealing surface means, means biasing said first annular seal means toward said second annular seal means to maintain said facial engagement, said first and second annular seal means respectively having first and second air flow passageway means opening axially through the corresponding sealing surface means to provide for flow across said facially engaging first and second annular sealing surface means, means for connecting said first air flow passageway means to said source of air under pressure, and means for connecting said second air flow passageway means with said tire.

4,892,129

TIRE UNIT AND PROCESS FOR MANUFACTURING SAME

Klaus Debus, Am Schwarzen Moor 13, 2070 Ahrensburg, Fed. Rep. of Germany

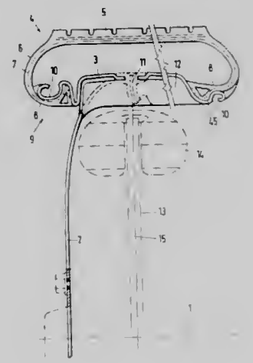
PCT No. PCT/EP87/00011, § 371 Date Sep. 16, 1987, § 102(e) Date Sep. 16, 1987, PCT Pub. No. WO87/04395, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 12, 1987, Ser. No. 116,568

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601316

Int. Cl.[4] B60C *15/036;* **B29D** *30/20*

U.S. Cl. 152—516 **19 Claims**



1. A tire unit comprising:

a wheel having a circumferential rim (**3**) for rotation about a wheel axis (**1**), the rim having axially outer edges (**10**) on either side of a radial plane (**15**) which is perpendicular to the wheel axis, each rim edge having an axially outer tire support surface (**26**) and an adjacent tire interface surface including an axially inner undercut (**28**) as the rim is viewing in a direction parallel to the wheel axis (**1**);

a coreless air tire (**4**) unreleasably secured to the rim and including two annular edges located on either side of said radial plane and confronting the tire interface surface of the rim edge, a tread spaced from the rim and extending substantially parallel to the wheel axis (**1**), and tire side walls extending between the tire edges and the tread;

a main bonding connection (**23**), for transmitting operating forces from the tire to the rim, in which at least a portion of a tire edge is bonded to a respective tire interface surface on the rim, wherein all points (**24**) included by the bonding connection have a tangent forming an angle (**25**) to the wheel axis (**1**) that is no smaller than the angle of the tangent to the interface surface at any point which lies closer to the support surface, or is smaller than the angle (**20**) between the tire wall (**6**) and the wheel axis (**1**) at the innermost point (**17**) at which the tire side wall (**6**) is spaced from the rim edge (**10**), under all normal loading conditions, so that only positive normal forces in the bonding connection are transmitted from the tire edge to the rim edge; and

annular reinforcement means (**29**) carried by the tire edge and interacting with the undercut (**28**), for reinforcing the bonding connection, said annular reinforcement means including a portion filling the undercut (**28**), said portion consisting of nonmetallic deformable material.

4,892,130

METHOD FOR MAKING A REINFORCED ARTICLE FOR AN INTERNAL COMBUSTION ENGINE

Keisuke Ban, Fujimi, and Akimasa Daimaru, Omiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

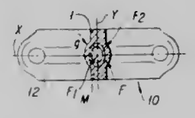
Division of Ser. No. 418,502, Sep. 15, 1982, Pat. No. 4,534,400. This application Jan. 28, 1985, Ser. No. 695,595

Claims priority, application Japan, Sep. 16, 1981, 56-145990

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[4] B22D *19/14*

U.S. Cl. 164—97 **5 Claims**



1. Method of making a reinforced cast article, said article having end portions and a center portion, comprising the steps of

forming a bundle of inorganic reinforcing uni-directional fibers, with said fibers uni-directional in said bundle, said bundle including a proportion of metallic fibers,

placing said bundle, with said fibers uni-directional, in a heat-resistant shaping container,

heating said contained bundle to partially fuse said metallic fibers to each other uni-directional in said bundle,

positioning said partially fused uni-directional bundle of said fiber into a mold having cavities for producing said article leaving a fixed minimum gap surrounding said bundle in a section of said cavities for producing said center portion, and

squeeze casting a molten light metal alloy into said mold and forming a matrix of said alloy and said uni-directional bundle of said fiber.

4,892,131

INJECTION APPARATUS OF DIE CAST MACHINES

Toyoaki Ueno, Yoshiki, Japan, assignor to Ube Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 741,239, Jun. 4, 1985, abandoned, which is a continuation of Ser. No. 459,840, Jan. 21, 1983, abandoned. This application Apr. 27, 1989, Ser. No. 346,368

Claims priority, application Japan, Jan. 26, 1982, 57-8202

Int. Cl.[4] B22D *17/10*

U.S. Cl. 164—312 **5 Claims**



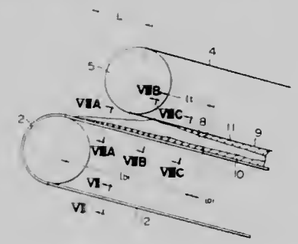
1. An injection apparatus mounted for operation with substantially horizontal stroke and comprising a support for an injection sleeve, injection cylinder and an injection plunger structured to support the injection plunger in concentric, non-deviating alignment with the injection sleeve and the injection cylinder, said support comprising a rigid end plate, a rigid flange bounding the end plate and perpendicular thereto, a rigid frame of lesser diameter than said flange concentric with the flange and flared to extend to join said flange, said frame embodying an end wall spaced from and parallel to the end

plate, said end plate and said end wall containing concentric aligned openings, said injection sleeve fixed in the opening in the end plate, said injection cylinder fixed in the opening in said end wall and containing a piston and a piston rod extending therefrom through said opening in the end wall, said piston rod being connected at its distal end to the plunger in the injection sleeve, said flange being of substantially greater axial length than the axial thickness of the end plate such as to impart rigidity to the end plate to provide for minimum thickness of the end plate and minimal length of the injection sleeve while maintaining alignment between the injection sleeve and the injection plunger and wherein said end plate, flange, frame, and end wall constitute a unit formed as an integral one-piece structure and wherein said frame effectively reduces the bending span of said end to thereby reduce bending deflection due to injection pressure on the face of said end plate.

4,892,132
CASTING METHOD AND APPARATUS USING TWIN BELT CASTER

Takashi Asari, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,312
Claims priority, application Japan, Oct. 29, 1987, 62-271675
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—431 **4 Claims**



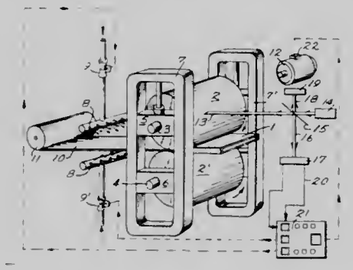
1. A casting method making use of a twin belt caster having an upper belt, a lower belt and dam members disposed between both opposing longitudinal edges of said upper and lower belts, said upper belt, lower belt and dam members in cooperation providing a continuous casting mold which is inclined at a predetermined angle from the horizontal plane and into which a melt of steel is poured, said method characterized in that said lower belt has a smaller heat conductivity than said upper belt so that solidification of said melt in the region adjacent to said lower belt is retarded as compared with the region adjacent to said upper belt.

4,892,133
PROCESS FOR MONITORING AND REGULATING THE LUBRICATION OF THE WORKING FACE OF THE ROTARY ROLLS OF A CONTINUOUS STRIP CASTING MACHINE

Philippe Solignac, Saint Egreve, France, assignor to Cegedure Societe de Transformation de l'Aluminum Pechiney, Paris, France

Filed Sep. 16, 1988, Ser. No. 245,636
Claims priority, application France, Oct. 14, 1987, 87 14491
Int. Cl.[4] B22D *11/07*
U.S. Cl. 164—452 **12 Claims**

1. A process for monitoring and regulating lubrication of a working face for rotary rolls of continuous strip casting machine, said process comprising the steps of:
directing at least one beam of coherent light on to at least one of the following (a) a lubricated working face of each of the rolls, (b) each lubricated face of a strip, and (c) a lubricated face of a roll and a lubricated face of a strip opposite to said roll;
measuring values representing mean strength and mean frequency of variations of said at least one beam being reflected by said lubricated faces;

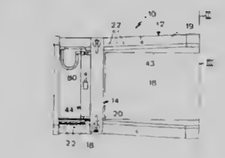


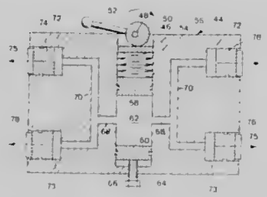
comparing said measured values to values determined during reference intervals; and
adjusting at least one of the following, based on the step of comparing said measured values to said values determined during the reference intervals, (a) the speed of rotation of said rolls, and (b) the lubricated flow rate.

4,892,134
ELECTROMAGNETIC MOLD FOR CONTINUOUS CASTINGS

Laurent Zuber, Chalais, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,962
Claims priority, application Switzerland, Feb. 22, 1984, 848/84
The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—503 **4 Claims**





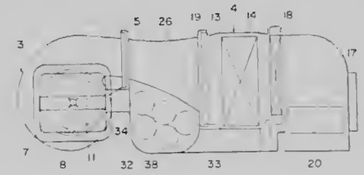
1. A mold for use in the electromagnetic casting of molten metal comprising a pair of side walls and a pair of end walls, each of said side walls and said end walls being provided with an inductor portion and a screen portion, means provided on one of said side walls and said end walls for selectively positioning and securing said one of said side walls and said end walls at different positions on the other of said side walls and said end walls for adjusting the size of the mold cavity and

means for providing electrical contact between the inductor portions of said side walls and said end walls and the screen portions of said side walls and said end walls so as to form an inductor characterized by a closed loop and a screen characterized by a closed loop, said means for providing electrical contact comprises a fluid link having a compression cylinder in fluid communication with a plurality of motor cylinders, said plurality of motor cylinders each being provided with a motor piston having one end in biasing contact with one of said inductor and said screen and the other end in contact with the fluid in said fluid link and a compression piston means reciprocally mounted in said compression cylinder for compressing said fluid so as to bias said motor pistons against one of said inductor and said screen.

4,892,135
AIR CONDITIONER FOR AUTOMOBILES WITH HOT/REFRIGERATION COMPARTMENT FOR STORED ARTICLES

Muneo Sakurada; Isamu Kurosawa, and Shinji Wakabayashi, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 111,799, Oct. 22, 1987, Pat. No. 4,834,170.
This application Dec. 27, 1988, Ser. No. 290,122
Claims priority, application Japan, Nov. 21, 1986, 61-179191; Mar. 12, 1987, 62-36517; Mar. 23, 1987, 62-68700
Int. Cl.[4] F25B *29/00;* F25D *17/08*
U.S. Cl. 165—42 **5 Claims**

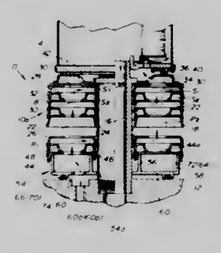


1. An automobile air conditioner comprising:
a casing comprising sides;
a blower unit including blower means for blowing air through the air conditioner in a flow direction, and a duct connected between said blower unit and said casing and in which an air flow passage is defined through which air blown by said blower means flows in said flow direction into said casing;
a first heat exchanger means disposed in said casing for cooling air passing therethrough;
a second heat exchanger means disposed in said casing downstream from with respect to said flow direction and adjacent to said first heat exchanger means for heating air passing therethrough,
said second heat exchanger means extending from one of said sides of said casing in a direction generally perpendicular to said flow direction to a location spaced from the other of said sides of said casing, a bypass passage defined between said second heat exchanger means and said other side of said casing;
an air distribution chamber defined in said casing open to said second heat exchanger means and disposed immediately downstream thereof with respect to said flow direction,
said air distribution chamber having an upper portion in which a defrost air outlet and an upper air outlet are defined, and a lower portion in which a lower air outlet is defined;
bypass control means disposed in said bypass passage for regulating the amount of air flowing through said bypass passage; and
a hot/refrigeration compartment means juxtaposed with said duct for heating or cooling articles stored therein,
said hot/refrigeration compartment means including a first connecting passage in communication with said casing in a manner in which at least one of air having passed through said first heat exchanger means and air having passed through said second heat exchanger means is able to pass through said first connecting passage to said hot/refrigeration compartment means, and a second connecting passage in communication with said blower unit in a manner in which air within said hot/refrigeration compartment means is able to pass through said second connecting passage to said blower unit.

4,892,136
HEAT EXCHANGER

Takayuki Ichihara, Tokyo; Takeji Yogo; Masuhito Iinuma, both of Sakado; Eriya Arita, Kawagoe, and Haruo Yokoo, Iruma, all of Japan, assignors to Kabushiki Kaisha Tsuchiya Seisakusho, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,842
Claims priority, application Japan, Dec. 31, 1986, 61-199103[U]; Dec. 31, 1986, 61-199104[U]; Dec. 31, 1986, 61-199106[U]; Jun. 30, 1987, 62-100884[U]; Jun. 30, 1987, 62-100880[U]
Int. Cl.[4] F28F *13/12, 19/00*
U.S. Cl. 165—51 **16 Claims**



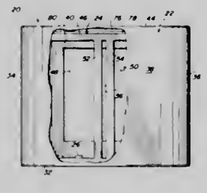
1. A heat exchanger for first and second fluids, comprising:
a heat exchange element including a plurality of heat transmission plates disposed one upon another, means for securely connecting said heat transmission plates to define a first fluid flowing space and a second fluid flowing space on opposite sides of each heat transmission plate, the first fluid flowing through said first fluid flowing space, the second fluid flowing through said second fluid flowing space, and means defining a first fluid passage communicating with said first fluid flowing space, and second and third fluid passages communicating with said second fluid flowing space;
a generally cup-shaped one-piece cover fixedly secured to said heat exchange element and said cover defining a first chamber communicating with said first fluid passage in said heat exchange element, and second and third chambers communicating respectively with said second and third fluid passages in said heat exchange element, each of said first, second and third chambers communicating with outside of said cover; and
means for securely fixing said heat exchange element to a mount member on which said heat exchanger is mounted, in a manner that said cover is interposed between said heat exchange element and the mount member, said fixing means including means for pressing said cover into said mount member.

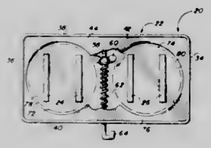
4,892,137

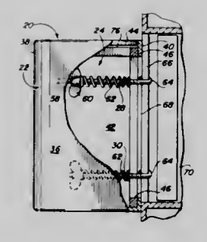
BEVERAGE TEMPERATURE CONTROLLER FOR A VEHICLE

Frank F. Bibik, Jr., 7010 Sepulveda Blvd., #212, Van Nuys, Calif. 91405

Filed Dec. 20, 1988, Ser. No. 286,823
Int. Cl.[4] B60H *1/32, 1/12*
U.S. Cl. 165—80.1 9 Claims







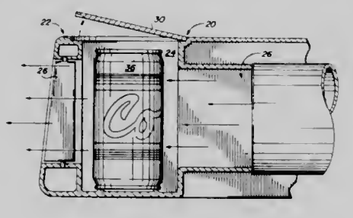
1. An improved beverage temperature controller for a vehicle, said controller comprising, in combination:
(a) a hollow housing having a closed generally horizontal bottom and interconnected closed upraised sides, front and rear, defining collectively a central beverage storage space and an open top with access to said space, said housing rear having an opening providing access to said storage space;
(b) a beverage container holder in said housing storage space having a vertical beverage container opening therein spaced from said sides, front and rear to provide a circulation pathway around a beverage container when in said holder;
(c) bottom spacers disposed on the upper surface of said housing bottom to separate a beverage container, when in said holder, from said bottom for improved air circulation around said beverage container; and,
(d) housing connector means secured to said housing rear and adapted to releasably interconnect said rear to a vehicle air temperature conditioning unit, with said rear opening over a vent of said air temperature conditioning unit,
(e) wherein said holder comprises a ring disposed between and secured by struts to said housing sides and/or rear and front.

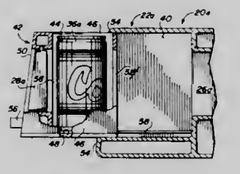
4,892,138

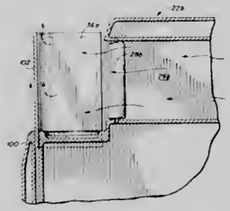
BEVERAGE TEMPERATURE CONTROLLING ASSEMBLY FOR A VEHICLE

Frank F. Bibik, Jr., 7010 Sepulveda Blvd., #212, Van Nuys, Calif. 91405

Filed Jan. 30, 1989, Ser. No. 303,323
Int. Cl.[4] F28F *7/00;* B60H *1/08, 1/32*
U.S. Cl. 165—80.1 8 Claims







1. An improved beverage temperature controlling assembly for a vehicle, said assembly comprising, in combination:
(a) a dashboard containing an air duct below the top of said dashboard, said duct leading from a vehicle air temperature conditioning unit to an exhaust vent in said dashboard; and,
(b) means integrally connected to said dashboard for releasably positioning a beverage container within said air duct to provide a circulation path around said container to cool or heat said container.

4. An improved beverage temperature controlling assembly for a vehicle, said assembly comprising, in combination:
(a) a dashboard containing an air duct below the top of said dashboard, said duct leading from a vehicle air temperature conditioning unit to an exhaust vent in said dashboard; and,
(b) means integrally connected to said dashboard for releasably positioning a beverage container within said air duct to provide a circulation path around said container to cool or heat said container,
(c) wherein said dashboard carries a drawer aligned with the front of said duct and slidable between a rear position within said dashboard and a forward position out of said dashboard, said drawer having a front end bearing said vent and a rear open end whereby air can freely pass forward from said duct through said drawer and out of said vent, said drawer having a closed bottom and open top and being adapted to releasably support at least one of said beverage containers therein.

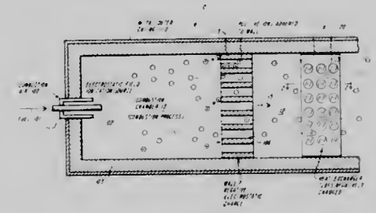
6. An improved beverage temperature controlling assembly for a vehicle, said assembly comprising, in combination:
(a) a dashboard containing an air duct below the top of said dashboard, said duct leading from a vehicle air temperature conditioning unit to an exhaust vent in said dashboard; and,
(b) means integrally connected to said dashboard for releasably positioning a beverage container within said air duct to provide a circulation path around said container to cool or heat said container,
(c) wherein said positioning means includes a ledge connected to said dashboard and extending directly below and in front of said vent, said ledge being adapted to support a beverage container in front of said vent to control the temperature thereof.

4,892,139

MEANS AND METHOD FOR PREVENTING UNWANTED ACCUMULATION IN HEAT EXCHANGERS

Paul G. LaHaye, Cape Elizabeth, Me., and Eric R. Norster, Holliston, Mass., assignors to H.P.S. Merrimack Corp., South Portland, Me.

Filed Jul. 11, 1988, Ser. No. 217,454
Int. Cl.[4] F28G *1/00*
U.S. Cl. 165—95 18 Claims



1. A method of preventing restrictive accumulation of particulate matter on a heat exchanger element while passing a gas stream laden with particles over said element,
said method comprising maintaining an electrical charge of a first polarity on said particles,
maintaining an electrical charge of the same polarity as said first charge on said heat exchange element.

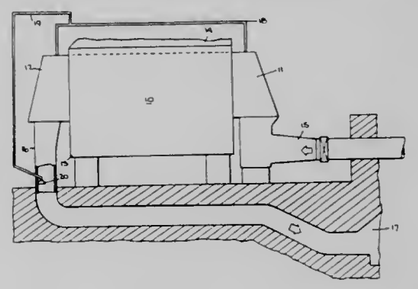
4,892,140

CONDENSER VENT SIPHON LINE

Tito D. Honovich, 149-24 21st Ave., Whitestone, N.Y. 11357

Filed Nov. 21, 1988, Ser. No. 273,844
Int. Cl.[4] F28B *1/02, 9/10*
U.S. Cl. 165—110 21 Claims

1. In combination with a condenser having an inlet water box and an outlet water box, an arrangement for using the flow of coolant water being discharged from the condenser to create a partial vacuum in a conduit means leading form conduit openings in a top portion of the inlet and outlet water boxes of the condenser to a lower opening of the conduit means within the discharging flow path of said coolant water from said condenser, to withdraw air and non-condensible gases from



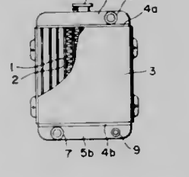
the water boxes through said conduit means to discharge into said discharging coolant water flow.

4,892,141

FIN OF HEAT EXCHANGER AND METHOD OF MAKING IT

Shoji Shiga; Akira Matsuda; Hideo Suda, and Nobuyuki Shibata, all of Nikko, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 873,641, Dec. 27, 1988, abandoned.
This application Jun. 27, 1989, Ser. No. 372,158
Int. Cl.[4] F28F *19/02*
U.S. Cl. 165—133 12 Claims



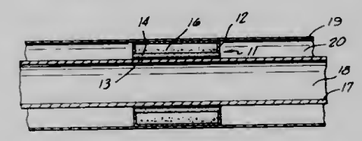
1. A fin for a heat exchanger comprising a Cu-Zn diffused layer having a Zn content of not less than 1 wt % formed on at least a portion of the surface of a Cu-based fin substrate, wherein the concentration of Zn decreases continuously from the outside surface of the Cu-Zn diffused layer to the interface between that layer and the Cu-based fin substrate.

4,892,142

DEVICE AND METHOD FOR REMOVING GASEOUS IMPURITIES FROM A SEALED VACUUM

Isaac J. Labaton, Jerusalem, Israel, assignor to Luz Industries Israel, Ltd., Jerusalem, Israel

Filed May 5, 1989, Ser. No. 348,060
Int. Cl.[4] F28F *13/00*
U.S. Cl. 165—134.1 14 Claims



1. A device for removing hydrogen from a vacuum insula-

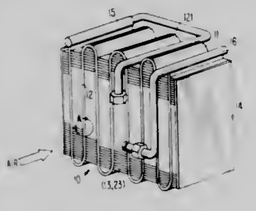
tion jacket for a vessel or pipe which holds or through which flows a hydrogen-containing medium at temperatures such that hydrogen permeates into the vacuum insulation jacket, comprising a container which contains oxygen or an oxygen generating material, and a palladium or palladium alloy membrane closing the container such that a first side of said palladium membrane facing the interior of the container is exposed to a region of relatively high oxygen pressure and relatively low hydrogen partial pressure, and a second side of said palladium or palladium alloy membrane is exposed to the vacuum having a relatively low oxygen partial pressure and a relatively higher hydrogen partial pressure, whereby the palladium membrane acts as a catalyst for the combination of hydrogen and oxygen to form water when hydrogen flows from the vacuum jacket into the container which contains oxygen following the hydrogen pressure gradient.

4,892,143

HEAT EXCHANGER

Yutaka Ishii, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jan. 23, 1989, Ser. No. 299,983
Claims priority, application Japan, Jan. 21, 1988, 63-5283[U]
Int. Cl.[4] F28D *1/047*; F28F *1/24*
U.S. Cl. 165—152 **2 Claims**



1. In an evaporator for use in a refrigeration circuit, said evaporator including a serpentined tube comprising a plurality of spaced, essentially parallel planar portions and a plurality of curved portions interconnecting said parallel portions, refrigerant fluid flowing through said serpentined tube, at least one corrugated fin unit fixedly disposed between opposed parallel planar portions, said fin unit including a plurality of spaced essentially parallel surfaces and a plurality of louvers formed through said surfaces of said corrugated fin unit and terminating a predetermined distance from the surfaces of said parallel portions of said serpentined tube, the improvement comprising:

said predetermined distance being selected from the range of from over 0.5 mm to under 1.0 mm.

4,892,144

INFLATABLE TOOLS

Malcolm G. Coone, Katy, Tex., assignor to Davis-Lynch, Inc., Pearland, Tex.

Filed Jan. 26, 1989, Ser. No. 301,862
Int. Cl.[4] E21B *33/127, 33/129*
U.S. Cl. 166—122 **27 Claims**

1. An inflatable tool, comprising

a mandrel adapted to be arranged concentrically with respect to a cylindrical wall and including a tubular section having upper and lower heads thereabout which are longitudinally movable relatively toward and away from one another, and

an inflatable element adapted to be moved into engagement with the wall, said inflatable element including

a sleeve of elastomeric material arranged concentrically of the tubular section of the mandrel and anchored at each longitudinal end to the heads,

substantially flat, relatively rigid but flexible strips arranged concentrically of the side of the sleeve opposite the tubular section and with their sides in overlapping relation,

means anchoring the longitudinal ends of the strips to the heads while leaving their intermediate portions free to move radially toward the wall in response to inflation of the sleeve, said anchoring means comprising

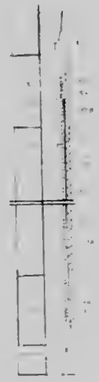
means in each head having radially inner and outer walls confining the radially inner and outer side edges of the strips and a shoulder about one wall which faces away from the shoulder about one wall of the other head,

a portion which extends from each end of each strip to dispose its longitudinally inner end edge over the shoulder, said portion being inclined at an acute angle with respect to the longitudinal and extending in a direction from one side edge toward its other side edge, and

spacers between the portions of adjacent strips.

16. A packer, comprising

a mandrel adapted to be arranged concentrically with respect to a cylindrical wall and including a tubular section having upper and lower heads thereabout which are longitudinally movable relatively toward and away from one another, and



an inflatable element adapted to be moved into engagement with the wall of the well bore, said inflatable element including

a sleeve of elastomeric material arranged concentrically of the tubular section and anchored at each longitudinal end to the heads,

substantially flat, relatively rigid but flexible strips arranged concentrically of the side of the sleeve opposite the tubular section and with their sides in overlapping relation, and

means anchoring the longitudinal ends of the strips to the heads while leaving their longitudinally intermediate portions free to move radially toward the wall in response to inflation of the sleeve, and

another sleeve of elastomeric material arranged concentrically of the sides of at least a portion of the strips opposite the first mentioned sleeve and longitudinally intermediate the heads for sealably engaging the cylindrical wall when forced radially thereagainst,

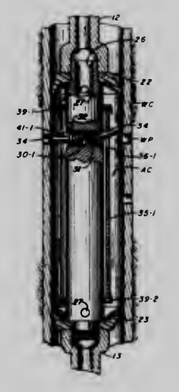
portions of at least certain of the strips which are not covered by the other sleeve having tabs struck therefrom for biting engagement with the cylindrical wall so as to anchor the packer with respect thereto.

4,892,145

WELL CASING CLEANING ASSEMBLY

Lawrence R. Stafford, 3905 Starwood La., Bakersfield, Calif. 93309

Filed May 8, 1989, Ser. No. 348,905
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—171 **5 Claims**



1. A well casing cleaning assembly, comprising:

a cylindrical mandrel including a plurality of diametric drillings extending thereacross said drillings being aligned at incremental azimuth displacements relative each other to form a spiral alignment;

a corresponding plurality of knife blade assemblies received in said drillings each said knife blade assembly including a coiled spring and a first and second knife blade extending from a base cap at one end thereof, said base caps abutting the ends of said coiled spring;

a plurality of arcuate plate segments engageable to the exterior of said mandrel said arcuate plate segments including slots formed therein in alignment over said drillings for receiving corresponding ones of said knife blades therethrough;

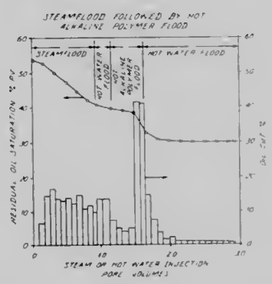
an upper and a lower packing attached to the ends of said mandrel and conformed for receipt in said well casing.

4,892,146

ALKALINE POLYMER HOT WATER OIL RECOVERY PROCESS

Chin W. Shen, Houston, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,092
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—270 **17 Claims**



1. A method of recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by an injection well and a producing well comprising

(a) introducing into the formation via the injection well a predetermined quantity of steam having quality of from 0.0 to 99.0 weight percent, said stream entering and sweeping petroleum from a portion of the formation and displacing petroleum toward the producing well;

(b) recovering petroleum together with the injected fluids from the formation via the producing well; and thereafter

(c) injecting a liquid phase displacing fluid into the same portion of the formation as was swept by steam, said liquid containing a viscosifying amount of a hydrophillic polymer, from 0.005 to 2.0 percent by weight of an alkalinity agent and from 0.01 to 5.0 percent by weight of an alkalinity-stabilizing agent selected from the group consisting of sodium carbonate, sodium bicarbonate and mixtures thereof, said liquid phase displacing fluid displacing petroleum through the formation to the production well; and

(d) recovering petroleum via the producing well.

4,892,147

HYDRAULIC FRACTURING UTILIZING A REFRACTORY PROPPANT

Alfred R. Jennings, Jr., and Lawrence R. Stowe, both of Plano, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,174
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[4] E21B *43/267, 43/24*
U.S. Cl. 166—280 **13 Claims**

1. A method for hydraulically fracturing a formation where a fused refractory proppant is used comprising:

(a) placing into a fracturing fluid a fused refractory proppant consisting essentially of silicon carbide or silicon nitride having a Mohs hardness of about 9 and in an amount sufficient to prop a created fracture where said proppant is substantially crush and acid resistant;

(b) injecting into the formation said fracturing fluid with said proppant therein under a pressure sufficient to fracture said formation; and

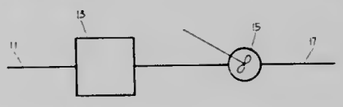
(c) fracturing said formation and thereafter causing said pressure to be released thereby propping at least one fracture which proppant provides for increased heat transfer into said formation.

4,892,148

USE OF CHLOROUS ACID IN OIL RECOVERY

James A. Mason, P.O. Box 605, Theodore, Ala. 36582

Filed Jun. 14, 1938, Ser. No. 206,604
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—305.1 **18 Claims**



1. In a process of oil recovery including the steps of injecting flooding waters into oil bearing subterranean formations by means of water injection wells in order to displace portions of the remaining oil therein, the improvement comprising flooding waters having therein an aqueous solution containing an effective antibacterial amount of a mixture of a salt of lactic acid and chlorous acid, wherein said aqueous solution is obtained by reacting lactic acid and sodium chlorite, wherein said reacting of said lactic acid and said sodium chlorite occurs off-site from said well prior to injection into said well, wherein thereafter said aqueous solution is delivered on-site to said well for injection, and wherein said aqueous solution is injected into said well.

4,892,149

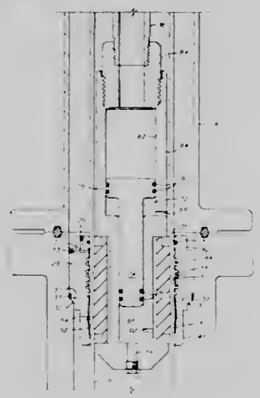
METHOD OF SECURING A TUBULAR MEMBER WITHIN AN ANNULAR WELL MEMBER, THE COMBINED WELL STRUCTURE AND THE TOOL

Larry M. Hoes, Spring; Thomas G. Cassity, Katy, and Steven D. Gullion, Houston, all of Tex., assignors to Cameron Iron Works USA, Inc., Houston, Tex.

Continuation of Ser. No. 44,409, Apr. 30, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,376

Int. Cl.[4] E21B *33/04*

U.S. Cl. 166—379 **9 Claims**



1. A method of securing a first annular member to a second annular member in a well including the steps of

positioning said members in the wall with one of said members being in surrounding relationship to the other of said members,

lowering a forming tool to a position within the inner of said members at a level at which such members are to be joined,

delivering fluid pressure to the forming tool at its position within the members and at a pressure sufficiently high to cause a portion of the inner member to be deformed by the forming tool radially outward into tight sealing and gripping engagement with the outer member,

relieving pressure delivered to the forming tool following completion of the deformation of the inner member,

delivering testing pressure to the outer of said members,

providing a seal between the two members at a position above the deformed portion of the inner member,

conducting testing pressure through the outer member to a position between said members above the deformed portion of the inner member and below the seal between the two members, and

detecting loss of test pressure delivered to said outer member.

4,892,150

POLYMER HORSESHOE PROVIDING ENHANCED SUPPORT

Owen E. Thoman, 20218 Viewcrest Dr., San Jose, Calif. 95120

Filed May 2, 1988, Ser. No. 189,315

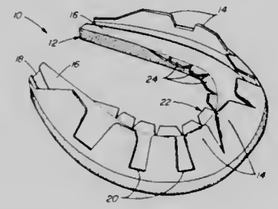
Int. Cl.[4] A01L *3/00, 5/00*

U.S. Cl. 168—4 **11 Claims**

1. A horseshoe comprising,

a flexible plastic shoe body having a hoof-engaging top surface and a bottom surface generally parallel to said top surface, said top surface having an arcuate force-bearing depression shaped and disposed to receive a keratinous portion of an animal hoof, said force-bearing depression extending along at least a majority of said shoe body, said force-bearing depression having a generally rectangular shape having sharp corners,

a plurality of securing tabs projecting upwardly from said shoe body for contact with an outer side wall of said horse hoof, said securing tabs forming an outer wall of said force-bearing depression,



a first bonding means for adhesively fixing said securing tabs to said outer side wall, and

a second bonding means for adhesively fixing said shoe body to said hoof.

4,892,151

BALLAST CLEANING MACHINE

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie GmbH, Vienna, Austria

Filed Oct. 1, 1984, Ser. No. 655,766

Claims priority, application Austria, Dec. 22, 1983, 4495/83

Int. Cl.[4] E01B *27/00*

U.S. Cl. 171—16 **10 Claims**



1. A track working machine adapted to receive, clean and convey bulk material, which comprises

(a) a chain mounted for excavating the bulk material and for conveying the excavated bulk material to a discharge end,

(b) a screening installation arranged to receive the excavated bulk material from the discharge end of the excavating and conveying chain, and to clean the received bulk material by separating waste from the bulk material, the screening installation comprising

(1) a supporting frame and

(2) two sets of a plurality of superposed vibratory screens extending obliquely with respect to the track in the direction of elongation of the machine, the sets of screens being arranged sequentially in, and symmetrically with respect to a vertical plane extending transversely to, said direction and having a common inlet area receiving the bulk material from the chain at a respective upper end of each set of screens, the two sets of screens having facing sides adjacent each other and the obliquely extending screens descending from the respective upper end whereby the screen; of the two sets enclose an angle, the bulk material flowing on the screens in said direction, and

(c) a conveyor band arrangement extending in said direction at least partially below the screening installation, the conveyor band arrangement comprising

(1) at least one conveyor band for receiving cleaned bulk material from the screening installation and

(2) at least one further conveyor band for receiving the waste from the screen installation.

4,892,152

CUTTING UNIT FOR CUTTING ONE OR MORE SODS

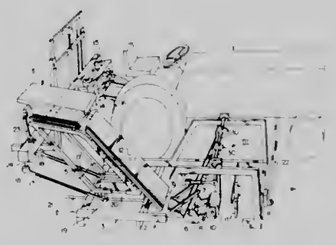
Johannes van Vuuren, Harmelerwaard 21, 3481 LC Harmelen, Netherlands

Filed Aug. 15, 1988, Ser. No. 232,165

Claims priority, application Netherlands, Aug. 14, 1987, 8701921

Int. Cl.[4] A01B *45/04*

U.S. Cl. 172—20 **9 Claims**



8. Apparatus for cutting sods comprising in combination, a powered vehicle movable over a ground surface in a forward direction, a first sub-frame supported by said vehicle, a cutting head supported by said first sub-frame, a second sub-frame supported by said vehicle, a conveyor supported by said second sub-frame for upwardly conveying sods, said first and second sub-frames being connected by bearing means disposed rearwardly of said cutting head and below said conveyor for supporting said first sub-frame for pivotal movement with respect to said second sub-frame about a pivot axis which extends substantially horizontal and parallel to the forward direction of movement of said vehicle so as to follow uneven terrain and/or slopes of a ground surface over which said vehicle travels.

4,892,153

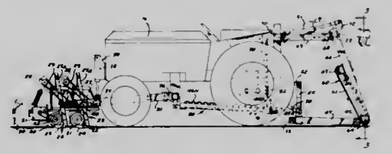
SOD HARVESTER

Eugene D. Cooling, and Timothy M. Cooling, both of Rockford, Ill., assignors to Joe Cooling & Sons Inc., Rockford, Ill.

Filed Apr. 8, 1988, Ser. No. 179,476

Int. Cl.[4] A01B *45/04*

U.S. Cl. 172—20 **8 Claims**



8. A sod harvester for cutting strips of sod from the ground, said harvester comprising a cutterhead adapted for attachment to a vehicle having a forward direction of travel, said cutterhead comprising a blade unit having a pair of transversely spaced side blades and having a bottom blade extending transversely between said side blades, means for moving the blade unit of said cutterhead back and forth to cause the blades thereof to cut the sod into a strip and to slice the strip from the ground during forward travel of the vehicle, and inclined pivot means supporting said cutterhead for pivoting relative to said vehicle about an axis which slants downwardly upon progressing forwardly and which is inclined relative to the ground at an angle of between 20 and 40 degrees.

4,892,154

GROUND-WORKING APPARATUS WITH ROTARY TILLER

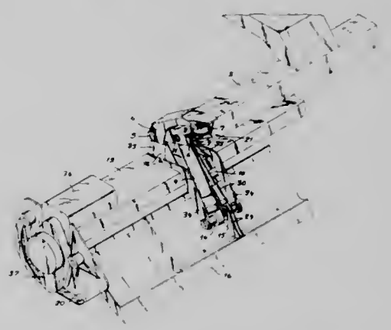
Dietrich Ranner, Salzburg, Austria, assignor to Bombardier-Rotax-Wien Produktions- und Vertriebsgesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 827,272, Feb. 6, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 165,410

Claims priority, application Austria, Feb. 8, 1985, 374/85

Int. Cl.[4] A01B *33/02, 33/16*

U.S. Cl. 172—72 **6 Claims**



1. A ground-working implement which comprises:

a holder comprising a beam provided with means enabling attachment of said beam to a vehicle;

a rotary ground-loosening unit articulated to said beam and having a substantially horizontal axis extending transversely of a direction of travel of said implement; and

a smoothing board mounted on said beam behind said unit for leveling the ground loosened by said unit, said board being generally centrally subdivided into respective sections interconnected by a joint allowing pivotal movement of the smoothing board sections relative to one another, means being provided at a central location along said ground-loosening unit between sections of said ground-loosening unit to permit independent pivoting of said sections of said ground-loosening unit with respect to one another and to said beam.

4,892,155

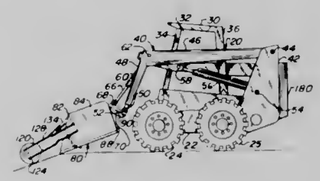
LEVELING ATTACHMENT FOR A SKID-STEER VEHICLE

Richard B. Wanamaker, Rte. 1, Box 1 Parkview, Fort Stockton, Tex. 79735

Continuation of Ser. No. 967,057, Dec. 6, 1978, abandoned. This application Aug. 7, 1980, Ser. No. 175,830

Int. Cl.[4] A01B *35/18, 59/048*

U.S. Cl. 172—199 **7 Claims**



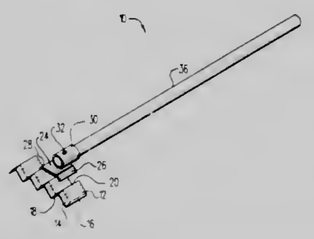
1. Earth working apparatus comprising:

a nominally horizontally-oriented rigid support frame;

a generally vertically-oriented elongated scraper blade, mounted laterally across a forward end of said support

frame in a position for primarily working the earth, having a correspondingly laterally elongated cutting edge rigidly disposed below said support frame and with said blade and cutting edge oriented in a direction to cut and collect the earth when said frame is moved rearwardly;
a roller;
a bracket assembly for mounting said roller rigidly from and forwardly of said support frame with said roller disposed permanently during use in a fixed position axially parallel to said blade;
a steerable motive vehicle having powered front and rear wheels;
holding means disposed immediately at the rear of said support frame and pivotally coupled to said vehicle for enabling vertical swinging of said support frame about the axis of said roller;
means mounted on said vehicle and coupled in juxtaposition to said holding means for swinging said support frame about said axis;
ram means, disposed vertically above said holding means, pivotally coupled at one end to said support frame and at the other end to said vehicle, for effecting an additional vertical swinging of said support frame relative to said vehicle;
and said support frame including means defining a region, to the rear of said blade and continuing to said vehicle, which is free of structure positionable in the path of said blade during rearward movement of said frame.

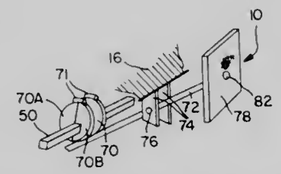
4,892,156
GARDEN TOOL
Walter C. Willis, Rte. 2 Box 255, Louisburg, N.C. 27549
Filed Jan. 31, 1989, Ser. No. 304,419
Int. Cl.[4] A01B *1/06*
U.S. Cl. 172—381 **14 Claims**



1. A garden tool, comprising:
an elongated handle;
means fixedly securing a cultivating blade adjacent one end of said handle;
said blade having a plurality of sequential adjacent connected teeth;
each of said teeth formed by a pair of generally perpendicular facets intersecting at a ridge line;
each of said pairs of facets forming each of said teeth being mirror symmetrical halves of a trapezoid;
each of said ridge lines extending generally parallel with said elongated handle;
and
a sharpened leading edge provided on each of said facets.

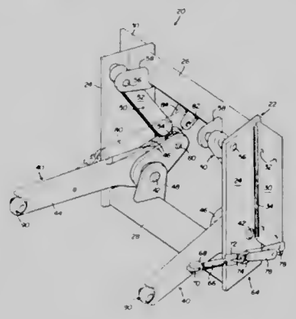
4,892,157
SEED METERING SHAFT ROTATION INDICATOR
LeRoy H. Gemar, 131 Riverview "B", Great Falls, Mont. 59404
Filed Sep. 9, 1988, Ser. No. 242,705
Int. Cl.[4] A01C *7/00*
U.S. Cl. 172—430 **3 Claims**

1. A seed metering shaft rotation indicator for use with a grain drill wherein the grain drill has a frame, multiple seed hoppers, and a rotatable seed metering shaft having an axis of rotation and extending through and between adjacent seed hoppers, the rotation indicator comprising:
a cylinder, having a longitudinal center line, the cylinder being frictionally mounted eccentrically on the seed metering shaft to rotate with the seed metering shaft, the longitudinal center line of the cylinder being positioned to be offset from, and parallel to, the axis of rotation of the seed metering shaft;
an indicator arm, having a first and second end, the arm



being hingedly mounted to the grain drill frame about an axis parallel to the axis of rotation of the seed metering shaft, with said first end positioned to abut and ride on the outside, longitudinal surface of the cylinder and the second end free to move in correspondence with movement of the first end;
a display means, mounted to the second end of the indicator arm, for providing a visual indication of arm movement;
whereby movement of the arm corresponds to movement of the seed metering shaft which movement is continuously indicated by the display means.

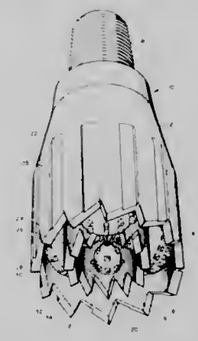
4,892,158
THREE POINT COUPLING ARRANGEMENT FOR A TRACTOR
Thomas R. Brown, Plainfield, Ill., and Daniel D. Morrow, Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.
Filed Feb. 18, 1987, Ser. No. 16,150
Int. Cl.[4] A01B *59/043*
U.S. Cl. 172—443 **1 Claim**



1. A three point coupling arrangement for a tractor comprising a frame assembly, said frame assembly includes opposed side members, an upper cross member and a lower cross member, each of said cross members connected to said side members to form a generally rectangular frame, and side flange members connected to said side members, draft arms each pivotally supported to rotate about a first axis in spaced relation on said lower cross member intermediate the ends of said draft arms, fluid lift cylinders each having a cylinder portion pivotally supported on a pivot axis to rotate relative to said upper cross member above a respective one of said draft arms and having a rod portion pivotally connected to a respective one of said draft arms at a location spaced forwardly of said first axis, a third connector pivotally supported on said upper cross member intermediate said lift cylinders, free rearward ends of said draft arms and said third connector providing a three point coupling, and a control means for operating said lift cylinders, said control means including fluid connector means providing fluid communication between the rod end of one of said lift cylinders and the head end of a second one of said lift cylinders interconnecting said cylinders in series to permit operation of said lift cylinders in unison, the area of said rod end of said one cylinder being substantially equal to the area of said head end of said second cylinder, said control means operating said cylinders in unison to lift said rearward draft arm ends as said lift cylinders are extended and lower said rearward draft arm ends as said lift cylinders are retracted;
wherein said draft arms are angularly related, each of said arms extending rearwardly from said lower cross member radially outwardly from the longitudinal axis of said frame assembly, said first axes being transverse pivot axes supporting said draft arms on said lower cross member and said pivot axes of said lift cylinder portions being spaced above and parallel to said draft arm pivot axes and perpendicular to said draft arms;
wherein said opposed side members are angularly related, each said side member extending generally parallel to the adjacent one of said draft arms, said draft arms and said lift cylinders pivotally supported to said side members; and
wherein said control means further includes a lift valve means in fluid communication with the head end of said one lift cylinder and the rod end of said second cylinder, and a tilt valve means in fluid communication with the rod and head ends of a selected one of said lift cylinders, whereby said selected lift cylinder may be operated by said tilt valve means to adjust the relative positions of said lift cylinders with respect to each other and said lift cylinders may be operated in unison by said lift valve means, and a valve restrictor connected to said tilt valve means for limiting the flow of fluid to said tilt valve means when said lift cylinders are operated in unison and said valve restrictor limiting the speed of extension or retraction of said selected lift cylinder when said tilt valve means is operated.

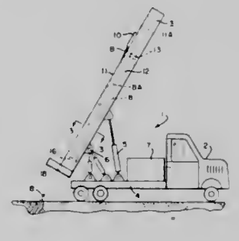
4,892,159
KERF-CUTTING APPARATUS AND METHOD FOR IMPROVED DRILLING RATES
Jesse L. Holster, Spring, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Nov. 29, 1988, Ser. No. 277,166
Int. Cl.[4] E21B *7/18*
U.S. Cl. 175—336 **35 Claims**

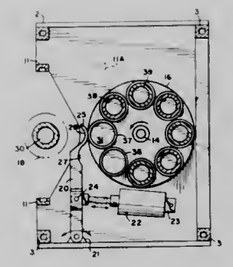
1. A drill bit comprising:
(a) a bit body having an upper end and a lower end, said lower end forming an annular cutter for cutting an outer annular kerf on rotation of the drill bit;
(b) an inner drill member positioned concentrically within said bit body having an upper end connected to said bit body and a lower end forming an annular cutter for cutting an inner annular kerf positioned concentrically within the outer annular kerf on rotation of the drill bit;
(c) a first plurality of rotary drilling members attachedly arranged between said bit body and inner drill member for rotation relative to said bit body and inner drill member, having lowermost cutting edges positioned above lowermost cutting edges of the annular cutter of said bit body and inner drill member to remove material between the outer and inner annular kerfs;
(d) a second plurality of rotary drilling members attachedly arranged within said inner drill member for rotation relative to said inner drill member, having lowermost cutting edges positioned above lowermost cutting edges of the annular cutter of said inner drill member to remove material surrounded by the inner annular kerf;
(e) a drilling fluid conduit disposed within said drill bit for delivering drilling fluid to said annular cutters and said



first and second plurality of rotary drilling members, said conduit separately discharging fluid to said first and second plurality of rotary drilling members; and
(f) means for connecting the upper ends of said bit body and drilling fluid conduit to a string of drill pipe.

4,892,160
DRILL PIPE TRANSFER ARM FOR ANGLE DRILLING
George P. Schivley, Jr., Richardson, and Calvin J. Moore, Jr., Dallas, both of Tex., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Continuation of Ser. No. 199,718, May 27, 1988, abandoned.
This application Jun. 13, 1989, Ser. No. 366,298
Int. Cl.[4] E21B *19/00*
U.S. Cl. 175—85 **7 Claims**





1. A transfer arm for controlling and positioning the lower end of a drill pipe upon removal from a stored position in a

circular carousel to an aligned position with a drill string comprising:

a lever arm interspaced between said carousel and a drill string centerline having pipe support means at one end and a pivot means at its other end;

means for rotating said lever arm about said pivot means to traverse said pipe support means from a position where said drill pipe is stored in said carousel to a position in alignment with said drill string centerline;

said pipe support means having a cylindrical pipe segment in an orientation such that it is substantially open toward said drill string and substantially closed toward said carousel; and

said lever arm including a recessed means spaced apart from and radially inward and opposite opening to said support means to accommodate close quarter drill storage in loading and unloading said carousel.

4,892,161

ROTARY ROCK DRILLING MACHINE
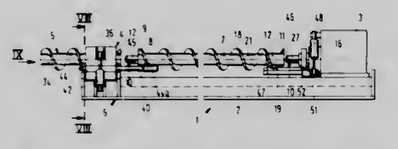
Wolfgang Ebeling, Hanover, Fed. Rep. of Germany, assignor to Turmag Turbo-Maschinen-AG Nüssel & Gräfer, Sprockhövel, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,385

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743706

Int. Cl.[4] E21B *17/046, 19/16;* **E21C** *1/00, 11/00*

U.S. Cl. 175—195 **28 Claims**



1. A rotary rock drilling machine, comprising a carriage having two ends; a rotary drilling drive arranged longitudinally displaceable on said carriage; a guiding head arranged on one end of said carriage, said guiding head and said rotary drilling drive defining a longitudinal axis of the machine; a drilling rod composed of a plurality of drilling rod parts which are releasably connected with one another, said drilling rod parts having a plurality of screw convolutions, said drilling rod parts having one end having a coupling pin with a snap pin and another end having a coupling bush with an engaging opening for said snap pin; a positioning device in said guiding head arranged to arrest a rotary position of said drilling rod; and an unlocking device for said snap pin, said positioning device including a locking bar which extends substantially parallel to said longitudinal axis and displaceable radially to said drilling rod, and which is insertable in at least one radial slot provided in said screw convolution of said drilling rod.

4,892,162

MAILING MACHINE

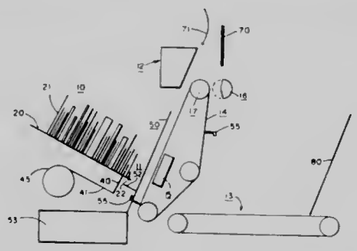
Donald T. Dolan, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 134,136, Dec. 17, 1987. This application Mar. 9, 1989, Ser. No. 321,043

Int. Cl.[4] G01G *23/22, 19/00*

U.S. Cl. 177—25.15 **15 Claims**

1. In a mailing machine including a mail processing device, and a package or envelope feeder for feeding packages to said mail processing device, the improvement wherein said envelope feeder comprises a support for holding a stack of substantially vertically oriented packages or envelopes, and further comprising means for separately sequentially feeding envelopes from said support to said mail processing device, said mailing machine further comprising means for sequentially feeding said envelopes upwardly from said processing device, said processing device comprising easel means for receiving



said envelopes, and weighing means for weighing envelopes on said easel.

4,892,163

WEIGHING DEVICE FOR STRAIN GAUGES

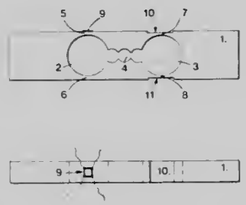
Jean-Pierre Aumard, Annemasse, France, assignor to Scaime, Annemasse, France

Filed Apr. 6, 1989, Ser. No. 334,702

Claims priority, application Switzerland, Apr. 12, 1988, 1341

Int. Cl.[4] G01G *3/14;* **G01L** *25/00, 1/22*

U.S. Cl. 177—211 **3 Claims**



I. A weighing device with strain gauges comprising a metal rod (1) designed to be constrained at one end and to receive a load supporting tray at the other end, provided with through holes (2, 3) at certain locations along its length defining in said rod weakened portions (5, 6, 7, 8) to provide hinges, said holes being connected together by a hollow portion (4), characterized in that it comprises a multiple strain gauge (9) fixed on the rod (1) at one of said weakened portions (5, 6, 7, 8) and in that the rod (1) has notches (10, 11) at a right angle with certain other weakened areas (7, 8), thereby displacing their neutral axis, said notches being calibrated to correct the inaccuracy observed when the load is offset, due to the gauges being formed as a single compact assembly at one location on the rod (1).

4,892,164

FRAME AND BODY CONSTRUCTION FOR SMALL SNOWMOBILE

Toshihiro Yasui; Masanori Sugita, and Tsuneo Isobe, all of Iwata, Japan, assignors to Yamaha Hatsuodoki Kabushiki Kaisha, Iwata, Japan

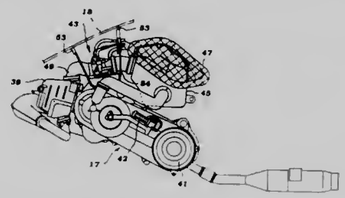
Filed Mar. 2, 1988, Ser. No. 163,389

Claims priority, application Japan, Mar. 4, 1987, 62-49058

Int. Cl.[4] B60K *13/02*

U.S. Cl. 180—68.3 **5 Claims**

1. A small snowmobile or the like comprising a generally open welded, tubular frame assembly, an engine supported in said frame assembly and having an induction system including a charge forming device, a body having a generally inverted cup shape affixed to said frame assembly and overlying said engine, said body having a substantially open lower area facing said frame assembly and said engine for facilitating assembly onto said frame assembly and whereby the underside of said



engine is substantially exposed to the elements when said body is affixed to said frame assembly, and a charge forming device enclosure fixed to said engine and cooperating with said body for enclosing said charge forming device for insulation of said charge forming device from the elements.

4,892,165

FRAME CONSTRUCTION FOR SMALL SNOWMOBILE

Toshihiro Yasui, and Masanori Sugita, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 1, 1988, Ser. No. 162,733

Int. Cl.[4] B62M *27/00*

U.S. Cl. 180—190 **7 Claims**

1. A snowmobile construction comprised of a frame assembly, said frame assembly comprising a plurality of interconnected tubular members defining a generally open, light weight construction, said frame defining a generally open engine area adapted to contain and support a driving engine, said frame further having a rearwardly extending portion adapted to accommodate and suspend a driving track driven by the engine, said frame assembly further providing mounting means for mounting a body and a body carried said mounting means in overlying relationship to only the forward portion of said frame assembly and closing only the upper part of said open engine area, and a seat for a rider mounted directly on said frame assembly and behind and independently of said body.

4,892,166

MOTORIZED WHEELCHAIR ASSEMBLY HAVING COUPLING DEVICE

Edward J. Gaffney, N26 W27293 Hwy. SS, Pewaukee, Wis. 53072

Filed May 3, 1988, Ser. No. 189,534

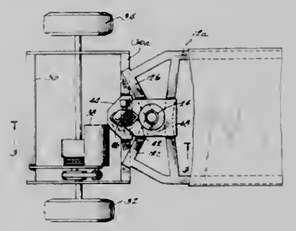
Int. Cl.[4] B62D *61/00*

U.S. Cl. 180—208 **8 Claims**

1. A device for coupling a front wheel unit of a wheelchair including a wheel and means for steering the wheel, with a rear wheel unit of the wheelchair including a frame and a wheel rotatably connected to said frame, said coupling device comprising:

a connector portion at a front end of said frame, which connector portion is generally vertically oriented but inclined forward slightly,

said front wheel unit having ata rear end thereof a connector portion which is generally vertically oriented but inclined forward approximately the same as the rear wheel unit



connector portion, said front wheel unit connector portion being sized and positioned so as to telescopically interfit with said connector portion of said rear wheel unit,

said connector portions having four sides of substantially equal size such that said portions are substantially square in cross-section,

a diagonal of said square cross-section of said connector portions being oriented generally parallel to the front-to-rear direction of the wheelchair.

4,892,167

AUTOMATIC ELECTRONIC AND MECHANICAL SYSTEM TO AVOID VEHICLE THEFT

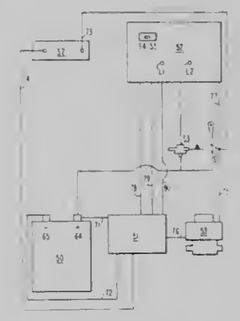
Jose O. V. Tejeda, Juan de la Barrera 33, Circ. Heroes, Cd. Satelite, C.P. 53100, Edo. de Mexico, Mexico

Filed Apr. 28, 1988, Ser. No. 187,476

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] B60R *25/00;* **B62H** *5/00*

U.S. Cl. 180—287 **1 Claim**



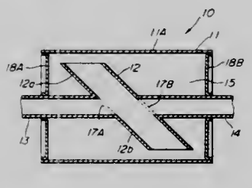
1. An automatic vehicle anti-theft system having an antitheft mode and an anti-hijack mode, for a vehicle having both an ignition switch S1 and an open door switch S 3 for a door, comprising in combination:

(a) an electrically controlled fuel supply system 53 supplied with switched electrical current by said ignition switch S 1;

(b) a momentary switch S2 supplied with switched electrical current by said ignition switch S1;

(c) an electronic valve between said electrically controlled fuel supply system S3 and the ground;
(d) said electronic valve normally closed and opened by a voltage applied to its gate and remaining open thereafter;
(e) said momentary switch S2 supplying a voltage to the gate of said electronic valve to open said electronic valve whenever said ignition switch is on;
(f) said electronic valve operating a delay module which turns off the fuel pump after a preset interval;
(g) said open door switch S3 open when the door is closed and closed when the door is open;
(h) said open door switch S3 controlling said electronic valve to close said electronic valve when said open door switch S3 is closed;
(i) an open door override switch S4 to selectively disable said anti-hijack mode; and
(j) a valet parking override switch S5 to selectively disable the anti-theft mode while the vehicle is in the valet mode;
Whereby said automatic vehicle anti-theft system permits the owner of said vehicle to disable either of two protection modes.

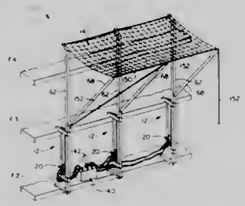
4,892,168
NOISE ATTENUATING DEVICE
Akira Sasaki, and Yuichi Sakuma, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 20, 1988, Ser. No. 286,750
Claims priority, application Japan, Dec. 22, 1987, 62-194282; Apr. 26, 1988, 63-103566
Int. Cl.[4] F01N *1/02*
U.S. Cl. 181—250 **11 Claims**



1. A noise attenuating device comprising:
a main body defining therein a resonance chamber;
a gas inlet tube extending to the inside of said main body so that gas is introduced through said inlet tube into the inside of said main body;
a gas outlet tube extending to the inside of said main body so that gas inside said main body is discharged through said outlet tube to the outside of said main body; and
a tuning tube to which said inlet and outlet tubes are connected, said tuning tube being located between said inlet and outlet tubes so that gas from said inlet tube flows through said tuning tube into said outlet tube, said tuning tube being opened to the resonance chamber so as to establish gas communication between the inside of said tuning tube and the resonance chamber, the cross-sectional area defined by the inner periphery of said tuning tube being larger than that of said inlet tube and that of said outlet tube.

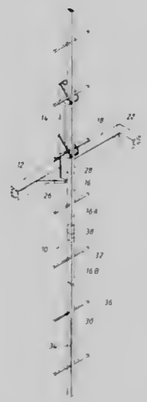
4,892,169
PERIMETER DEBRIS NET LIFTING SYSTEM
Charles W. Duncan, Costa Mesa, Calif., assignor to Sinco, Inc., East Hampton, Conn.
Filed Feb. 21, 1989, Ser. No. 313,089
Int. Cl.[4] E04G *21/30, 21/32*
U.S. Cl. 182—138 **32 Claims**

29. A debris net lifting system for climbing a series of vertically spaced platforms comprising:
a plurality of laterally spaced lifting units anchorable to said platforms;
a debris net suspended from said lifting units so as to extend generally laterally and outwardly from said platforms at a first pre-selected vertical height;
each said lifting unit comprising:
first frame means comprising inner upper and inner lower attachment means for independent mounting to respective spaced platforms;
second frame means slidably coupled to said first frame



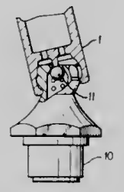
means comprising outer upper and outer lower attachment means for independent mounting to respective spaced platforms, said second frame means comprising suspension means for suspending said debris net;
so that one said frame means may be vertically displaced from said first height to a second vertical height while the other said frame means is mounted in fixed relationship to selected platforms with the debris net being suspended from said unit and supported on said selected platforms during the vertical displacement of said one frame means.

4,892,170
PORTABLE LADDER ASSEMBLY
William P. O'Donnell, Nassau Bay, Tex., assignor to Avanti International, Webster, Tex.
Filed Apr. 27, 1989, Ser. No. 344,060
Int. Cl.[4] B65D *90/10;* **E06C** *1/36*
U.S. Cl. 182—100 **20 Claims**



1. A portable ladder assembly for providing access to a manhole having a central axis and extending downward from a support surface, the ladder assembly comprising:
a base member including first and second arms positionable on radially opposite sides of the central axis of the opened manhole, each of the first and second arms having a portion adapted for engagement with the support surface to prevent the ladder assembly from tipping;
a ladder including a single elongate rail having a central rail axis and a plurality of rungs fixed to and extending in opposite directions outwardly from the rail, each rung extending outwardly from the rail along a rung axis substantially perpendicular to the central axis of the rail; and
a supporting bracket secured to the base member and having a rail receiving slot and a plurality of vertically spaced and downwardly directed rung receiving slots on opposing sides of the rail receiving slot, such that the ladder may be supported at a selected depth within the manhole by fitting the rail within the rail receiving slot and fitting a selected pair of rungs within their respective rung receiving slots.

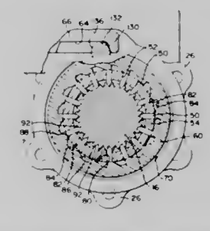
4,892,171
ADAPTER FOR USE WITH A LUBRICATION FITTING
Christian T. Scheindel, Star Route Ridge Rd., Randolph Center, Vt. 05061
Filed Sep. 12, 1988, Ser. No. 242,641
Int. Cl.[4] F01M *11/04*
U.S. Cl. 184—105.3 **12 Claims**



1. An adapter for use with a lubrication fitting of the type which includes a flow restrictor normally biased to a closed position to restrict the flow of fluid, the adapter comprising a generally tubular body having a top end and a bottom end, said top end of said tubular body being shaped and dimensioned to removably receive the output port of said lubrication fitting and a pin centrally positioned in said tubular body proximate said top end thereof, said pin being adapted to enter an opening of said lubrication fitting to move said flow restrictor from its normally closed position to an open position in which fluid can flow characterized in that the diameter of said pin (3) is smaller than the diameter of the opening of said lubrication fitting (10), and in that said pin is fixed to a separating disc (2) which is secured in a fixed position to said tubular body (1) and is provided with a plurality of openings (4) for allowing said fluid to flow into said lubrication fitting.

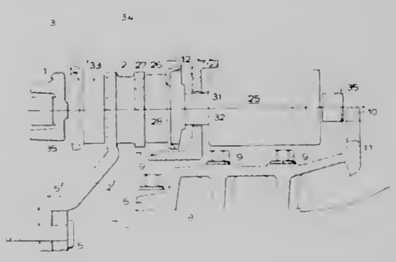
4,892,172
SHAFT LOCK ASSEMBLY
James C. Hobson, Traverse City, Mich., assignor to Cadillac Gage Textron Inc., Warren, Mich.
Filed Nov. 23, 1988, Ser. No. 275,517
Int. Cl.[4] F16D *65/32*
U.S. Cl. 188—69 **11 Claims**

1. A rotary lock assembly for securing a driven shaft while under a drive force and for releasing the driven shaft without interfering with its acceleration the combination of:
a lock assembly stator;
means for fixedly securing said stator against rotation;
a driven shaft having an end extension thereon located within said stator;
means defining a plurality of guide slots in said stator at circumferentially spaced points therearound;
a lock vane in each of said guide slots having an inboard end and an outboard end;
coacting means on said shaft extension engageable with said vanes to hold said driven shaft against rotation; and
lift means for lifting each of said vanes from engagement with said shaft extension without impeding acceleration of said shaft and said lift means mechanically holding each of said vanes in a released position to prevent engagement of said tapered surfaces with the accelerated shaft;



said lift means including a cam ring and a pair of laterally spaced scroll cams;
each of said scroll cams having means thereon engageable with said vanes and operative to move said vanes into a released position with respect to said shaft extension.

4,892,173
DISC BRAKES IN VEHICLES
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries Public Limited Co., Birmingham, United Kingdom
Continuation of Ser. No. 27,785, Mar. 19, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 268,663
Claims priority, application United Kingdom, Mar. 27, 1986, 8607760
Int. Cl.[4] F16D *55/224, 65/20*
U.S. Cl. 188—73.44 **17 Claims**



1. A disc brake for a vehicle comprising a disc having an inboard side and outboard side and being rotatable with an axle shaft which is rotatably mounted in an axle casing and which has a wheel-mounting flange by means of which a wheel is mounted on said axle shaft, the wheel-mounting flange having an inboard side, an outboard side, and an outer peripheral edge; a wheel mounted on said wheel-mounting flange on said axle shaft; inboard and outboard friction pad assemblies for engagement with opposite faces of said disc; a caliper assembly; an actuator incorporated in said caliper assembly for applying said friction pad assemblies to said disc; a bracket for mounting said caliper assembly on said axle casing; means detachable mounting said bracket on said axle casing on said inboard side of said disc, said bracket having a radial flange projecting radially outwards to locate said caliper assembly and having a peripheral edge, and said radial flange of said bracket incorporating a rigid diaphragm which extends between said actuator of said caliper assembly and the inboard friction pad assembly,

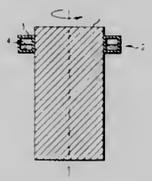
said diaphragm being provided with at least on opening through which a brake-applying force from said caliper assembly can be transmitted to said inboard pad assembly, said radial flange of said bracket also having relatively thin axially extending flanges which are disposed between said inboard pad assembly and said axle shaft and which extend circumferentially around the periphery of one end of said actuator substantially to surround that end of said actuator so as to form a housing in which said actuator is received, and wherein said caliper assembly and said bracket lie substantially outside said outer peripheral edge of said wheel-mounting flange, and wherein said disc has a first, radially inner, part which is outboard of said wheel-mounting flange, and a second, radially outer, part which is inboard of said wheel mounting flange, no portion of said second part being within the plan projection of said outer peripheral edge of said wheel-mounting flange as viewed along said central axis of said axle shaft so that after removing the wheel from said wheel-mounting flange and detaching said bracket from said axle casing, said disc and said caliper assembly can be withdrawn from said axle shaft in a single direction parallel to said central axis.

4,892,174

NUTATION DAMPER FOR A HIGH-SPEED SPINNING BODY

Shigeru Takekado, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 26,195, Mar. 16, 1987, abandoned. This application Jul. 21, 1988, Ser. No. 222,288
Claims priority, application Japan, Mar. 20, 1986, 61-63216
Int. Cl.[4] F16F *15/16*
U.S. Cl. 188—378 **9 Claims**



1. A nutation damper for a high-speed spinning body comprising:

a hollow ring-shaped container installed concentrically to the axis of spin of a high-speed spinning body and rotating therewith, and

a viscous liquid fluid sealed inside, and partially filling, the container so as to leave a gap, said viscous fluid having a volume which is determined as less than or equal to ½ of the volume enclosed by the outer wall of said container, said container containing only said viscous liquid fluid, except for said gap.

wherein said viscous fluid has a viscosity of more than or equal to 1.0 cSt with little fluctuation of viscosity with temperature and is one from the group consisting of a silicone oil and a fluorinated oil,

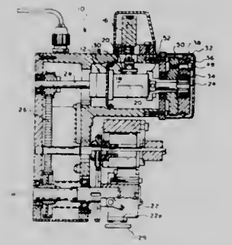
whereby a circumferential wave is formed in said viscous fluid during rotation of said spinning body and nutation energy is damped by said centrifugal wave when the centrifugal wave frequency matches the nutation frequency.

4,892,175

WRAP SPRING CLUTCH/BRAKE APPARATUS WITH HELPER CLUTCH MECHANISM

Donald Van Erden, Wildwood, and Donald Noren, Glenview, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 2, 1988, Ser. No. 265,957
Int. Cl.[4] F16D *67/02*
U.S. Cl. 192—12 BA **14 Claims**



1. In a wrap spring clutch/brake apparatus of the type having a constantly rotating hub input, a clutch shaft output, a stationary brake hub, a clutch spring and a brake spring, said clutch spring being wrapped down for positively engaging the hub input and the shaft output, said brake spring being wrapped down for engaging the shaft output and the brake hub, a load being drivingly coupled to the shaft output, wherein the improvement comprises a clutch mechanism for supplying increased frictional torque at lower rotational speeds to the load, comprising:

said clutch mechanism being operatively coupled to said hub input and including an inner cylindrical-shaped member attached to the shaft output, an outer annular member disposed concentrically around said inner cylindrical-shaped member, and a garter spring disposed concentrically around said outer annular member;

said outer annular member being formed of a plurality of identical-shaped sigmented fly-weights, each segmented fly-weight having an inner arcuate section and an outer arcuate section disposed in a spaced apart relationship from said inner arcuate section by an intermediate section; and

said inner arcuate section of said segmented fly-weights being disposed to be frictionally engaged with the circumference of said inner cylindrical-shaped member at lower rotational speeds to add increased frictional torque to said shaft output and being adapted for radial movement away from the frictional engagement with the inner member at relatively high rotational speeds.

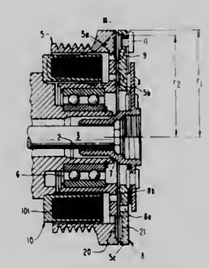
4,892,176

ELECTROMAGNETIC CLUTCH HAVING HIGH TORQUE TRANSFER

Matsushita Takashi, Isesaki, and Uehara Fumiaki, Takasaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Sep. 8, 1987, Ser. No. 93,697
Claims priority, application Japan, Sep. 5, 1986, 61-135595[U]; Sep. 5, 1986, 61-135596[U]
Int. Cl.[4] F16D *27/10*
U.S. Cl. 192—84 C **2 Claims**

1. In an electromagnetic clutch including a first rotatable member rotatably supported on a first bearing, said first rotatable member having an axial magnetic end plate with at least one arcuate slit, a second rotatable member rotatably supported on a second bearing, an annular magnetic member supported on said second rotatable member in a manner which permits limited axial movement of said annular magnetic member, said annular magnetic member facing said axial magnetic end plate of said first rotatable member with an axial gap therebetween, and electromagnetic means associated with said first rotatable member for attracting said annular magnetic member supported on said second rotatable member, the improvement comprising:



a first annular groove formed in said axial magnetic end plate, an outer edge of said first annular groove adjacent an outer surface of said first rotatable member and an inner edge of said first annular groove adjacent said at least one arcuate slit; and

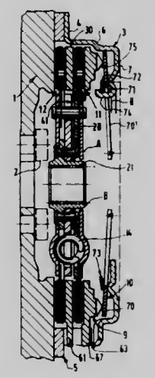
a second annular groove formed in said annular magnetic member opposite said first annular groove.

4,892,177

FRICTION CLUTCH WITH TWO FRICTION DISCS, AND A CLUTCH ASSEMBLY INCLUDING SUCH A CLUTCH

Ernesto Lanzarini, Moncalieri, and Bruno Boero, Dusino S.Michele, both of Italy, assignors to Valeo, Paris, France

Filed Mar. 6, 1989, Ser. No. 320,234
Claims priority, application France, Mar. 9, 1988, 88 03023
Int. Cl.[4] F16D *13/00, 3/14, 13/68, 47/02*
U.S. Cl. 192—106.2 **6 Claims**



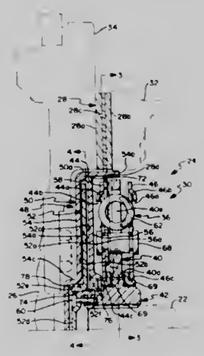
1. A friction clutch, particularly for a sports car, comprising a first part and a second part, means mounting said first and second parts for their rotation relative to each other, said means including circumferentially acting resilient means, said first part comprising a first carrier plate, a second carrier plate, and spacer means coupling the said carrier plates together at a fixed axial spacing, said second part comprising a damper plate disposed axially between the carrier plates, said first part further comprising a first friction disc and a second friction disc, said first friction disc comprising a support plate having through openings, the spacer means extending through said openings whereby the said support plate is axially movable with respect to said first carrier plate, the friction clutch further including coupling means coupling the support plate to said first carrier plate, and being characterised in that the support plate of said first friction disc is disposed axially between said first and second carrier plates.

4,892,178

VISCOUS DAMPER MODULE FOR TORSIONAL VIBRATION DAMPING MECHANISM

Gerald D. Damon, Farmington, and Robert S. Mueller, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1987, Ser. No. 87,586
Int. Cl.[4] F16D *3/66, 47/06*
U.S. Cl. 192—106.2 **15 Claims**



1. A torsional vibration damping mechanism in a free standing clutch plate assembly adapted to be rotationally interposed in a driveline between an output drive of a prime mover and an input drive of a transmission; the mechanism comprising:

first and second assemblies disposed for relative rotation about a common axis, the first assembly including first and second radially extending, axially spaced apart wall members secured together and adapted for driving connection to the prime mover drive, the second assembly including annular hub means adapted for connection to the transmission input drive, and bearing means for journaling a radially inner extent of at least one of the wall members on the hub means;

an intermediate means including a radially extending member disposed between the first and second wall members, the member of the intermediate means drivingly connected to and extending radially outward of the hub means;

a spring set disposed between radially inner and outer extends of the wall members, the spring set comprising a plurality of helical compression springs of relatively high spring rate circumferentially spaced apart and resiliently interconnecting the wall members with the intermediate means member, the springs being flexibly operative to attenuate torsionals when the driveline is connected to a load;

a friction assembly including first and second axially facing friction surfaces respectively defined on opposite sides of a radially extending flange, the friction surfaces disposed radially outward of the radially outer extent of the wall members, a radially inner portion of the flange fixed to the first assembly, and the friction surfaces adapted to be frictionally clamped between pressure plates of an engagement mechanism defining said input drive; the improvement comprising:

a viscous shear damper module disposed axially adjacent the first assembly, said damper module including annular

housing and clutch assemblies mounted for relative rotation, the housing assembly having first and second axially spaced apart sidewalls defining a chamber containing a viscous shear liquid with at least one of said sidewalls having an interior surface defining a first clutching surface, said clutch assembly being drivingly connected to one of said means and having a radially extending portion thereof disposed in said chamber, said portion defining a second clutching surface closely spaced from said first clutching surface and in viscous clutching coaction therewith via said viscous shear liquid; and

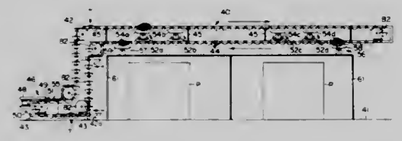
axially extending means fixing a radially outer portion of the annular housing assembly for rotation with the first assembly at positions radially outward of the spring set and radially inward of the axially facing friction surfaces.

4,892,179

BUCKET DISTRIBUTION SYSTEM

Jimmie F. Lassiter, Jr., and David R. Slager, both of San Antonio, Tex., assignors to Meyer Machine Company, San Antonio, Tex.

Filed Aug. 11, 1988, Ser. No. 231,720
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 **7 Claims**



1. Apparatus for distributing products from an infeed station to a plurality of distribution stations, comprising:

means for transporting a plurality of buckets in a continuous travel path, each of said buckets being adapted to receive a first predetermined portion of said products comprising a first amount of said products and a second predetermined portion comprising a second amount of said products in addition to said first amount;

primary bucket trip means for pivoting selected ones of said buckets at each of said distribution stations to thereby discharge products within said buckets; and

secondary bucket trip means for pivoting each of said buckets at an outlet station, said secondary bucket trip means being adapted to pivot said buckets so as to discharge products only from said buckets having said first and second portions of products therein, said secondary bucket trip means being further adapted to discharge only an amount of said products approximately equivalent to said second amount of said products.

4,892,180

METHOD AND APPARATUS FOR EXTRACTING INDIVIDUAL PARTS FROM A CONVEYOR

Walter Sticht, Karl-Heinrich-Waggerl-Strasse 8, A-4800 Attnang-Puchheim, Austria

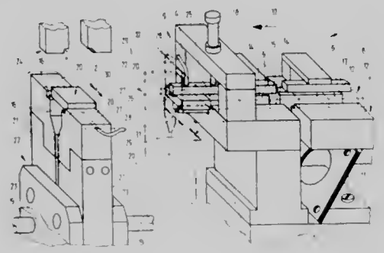
Continuation-in-part of Ser. No. 804,291, Dec. 3, 1985, abandoned. This application May 26, 1987, Ser. No. 54,290
Claims priority, application Austria, Dec. 6, 1984, 3869/84
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—375 **23 Claims**

1. A method of feeding assembly parts to an extraction station and extracting successive ones of said assembly parts at said station, which comprises the steps of

(a) laterally and vertically guiding a succession of substantially identically dimensioned, rigid assembly parts at portions thereof in a guiding track for aligning the assembly parts and subjecting the aligned assembly parts in the guiding track to a conveying force to convey the aligned assembly parts in a conveying direction along the guiding track to a singling station defining an end of the guiding track,

(b) retaining a respective one of the aligned assembly parts immediately trailing a leading assembly part at a singling station,

(c) mechanically clamping the leading assembly part at the portions thereof which are laterally and vertically guided by the end of the guiding track, and



(d) moving the clamped, vertically and laterally guided assembly part in the conveying direction away from the retained assembly part to the extraction station whereby the leading assembly part is separated from the succession of assembly parts and is singled at the singling station while being vertically and laterally guided.

4,892,181

METHOD AND ARRANGEMENT FOR ORIENTING CANDIES

Wilhelm Hogenkamp, Hanover, Fed. Rep. of Germany, assignor to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,150
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3708881
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—434 **13 Claims**



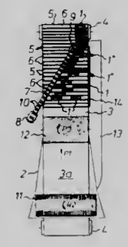
1. A method for aligning elongated articles such as bars of chocolate or pastries on a conveyor, comprising the steps: transporting said articles with varying misalignments on a conveyor having a conveyor speed in a conveying direction, said articles being transported on said conveyor in spaced rows; measuring misalignment of each article upstream of said conveying direction; lowering an aligning retainer rod from a raised position to a position between two adjacent rows of said articles; transporting said retainer rod with said moving conveyor at a speed that is less than the speed of the conveyor, so that said articles abut said rod and are decelerated for a predetermined time interval only dependent on said measuring step; holding said retainer rod in abutment with an article for said time interval until misalignment of said article is zero, said time interval being sufficient for aligning the articles in a row and preventing thereafter disorientation of longitudinal axes of said articles.

4,892,182

DEVICE FOR THE ORDERLY REMOVAL OF OBJECTS FROM A CONTAINER

Bror Gustafsson, Gislaved, Sweden, assignor to Aktiebolaget Tetra Pak, Lund, Sweden

PCT No. PCT/SE86/00101, § 371 Date Sep. 7, 1988, § 102(e) Date Sep. 7, 1988, PCT Pub. No. WO87/05275, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 10, 1986, Ser. No. 252,369
Claims priority, application Sweden, Sep. 10, 1984, 8404517
Int. Cl.[4] B65G *47/12*
U.S. Cl. 198—454 **7 Claims**



1. Device for the orderly removal of elongated objects (1), such as plastic spoons, from a container (2) holding a disarray of such objects, said device having an endless conveyor belt (3) which is provided on its outer side with transverse ribs (5) extending throughout the entire width of the conveyor belt (3) and defining between -hem transverse grooves (6) having a width slightly exceeding the width of the objects (1), and which has an upper run (3*a*) inclined upwardly in the direction of travel (P1) and extending through the container (2) in order, in its transverse grooves (6), to receive and transport objects (1) resting on the bottom (6*a*) of the grooves formed on the conveyor belt (3), from the disarray of objects in the container (2), characterized by an endless shifting belt (7) having a lower run the plane of which is parallel to the plane of the upper run (3*a*) of the conveyor belt (3), and extending obliquely across the conveyor belt throughout a portion of its width and having projecting pins (10) adapted to engage in the transverse grooves (6) in the upper run (3*a*) of the conveyor belt (3) in order, during advance of the conveyor belt (3), to drive the shifting belt (7) and shift objects (1) received in the transverse grooves (6) in the upper run of the conveyor belt, laterally transversely of the direction of travel (P1) of the conveyor belt so as to place the objects straight behind one another at one end of the transverse grooves (6).

4,892,183

TAKE-OUT MECHANISM FOR A GLASS CONTAINER FORMING MACHINE

Frank A. Fenton, Granby, Conn., assignor to Emhart Industries, Inc., Hartford, Conn.

Filed Aug. 25, 1988, Ser. No. 236,494
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—468.3 **2 Claims**

1. A take-out mechanism for removing finished containers from a selected pick-up location at a molding station of a container forming machine and carrying the removed containers to and depositing the removed containers on a conveyor comprising:

first container gripping means including

a first gripper head, and

means for vertically displacing said first gripper head between selected elevated and lowered positions;

second container gripping means including

a second gripper head, and

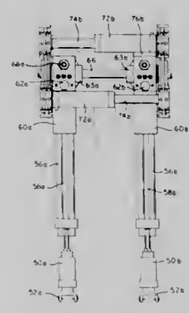
means for vertically displacing said second gripper head between selected elevated and lowered positions,

means for supporting said first and second container gripping means including

first and second spaced parallel rails for supporting said first and second container gripping means for horizontal displacement between advanced and retracted positions,

means for displacing said first and second container gripping means along said first and second rails between said advanced and retracted positions,

a third rail for supporting said first container gripping means for horizontal displacement in a direction transverse to said first and second rails from a retracted



position spaced from and on one side of the pick-up location to the pick-up location,

means for displacing said first container gripping means along said third rail between said retracted position and the pick-up location,

a fourth rail parallel to said third rail for supporting said second container gripping means for horizontal displacement from a retracted position spaced from and on the other side of the pick-up location to the pick-up location, and

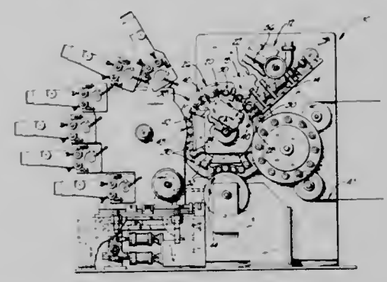
means for displacing said second container gripping means along said fourth rail between said retracted position and the pick-up location.

4,892,184

INFEED SYSTEM FOR CONTAINER DECORATING APPARATUS

Pieter S. vander Griendt, Bernardsville, N.J.; Robert W. Tielrooy, Amstelveen, Netherlands, and Edward J. Russell, Gladwin, Mich., assignors to Van Dam Machine Corporation, West Paterson, N.J.

Filed May 15, 1981, Ser. No. 263,809
Int. Cl.[4] B65G *47/84*
U.S. Cl. 198—476.1 **7 Claims**



1. An infeed transfer system for a continuously operated container decorating apparatus comprising:

A. a mandrel wheel assembly comprising:

a rotatable mandrel wheel,
a plurality of regularly spaced mandrel assemblies pivotally mounted on said mandrel wheel, and
a box cam guide means communicating with said mandrel assemblies at one end thereof, for guiding the path of movement of said mandrel assemblies during the rotation of said mandrel wheel; and

B. a pocket wheel defining a plurality of cradles for the reception and support of said containers, eccentrically mounted adjacent said mandrel wheel, wherein said pocket wheel has a diameter smaller than that of said mandrel wheel, and said cradles are fewer in number than said mandrel assemblies;

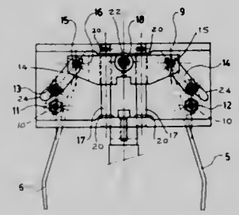
C. said box cam guide means defines a path causing each of said mandrel assemblies to follow the circumferential periphery of said pocket wheel in alignment therewith through an arc of rotation to facilitate the transfer of containers carried by said pocket wheel, to said mandrel assemblies;

D. wherein said smaller diameter pocket wheel simplifies the inspection and maintenance of said mandrel wheel assembly, by offering greater accessibility to said mandrel wheel and said mandrel assemblies, to effect repairs thereof and to remove misfed containers therefrom.

4,892,185
AUTOMATIC DISCHARGING TROUGH FOR USE IN A WEIGHING MACHINE

Agustín D. Guardiola, Barcelona, Spain, assignor to Talleres Daumar S.A., Barcelona, Spain

Filed Feb. 16, 1988, Ser. No. 156,286
Claims priority, application Spain, Feb. 27, 1987, 8700939
Int. Cl.[4] B65G *47/34*
U.S. Cl. 198—477.1 **14 Claims**

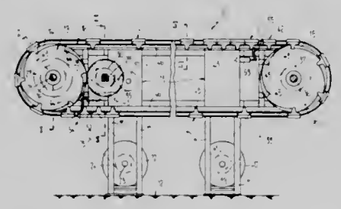


1. An automatic discharging trough for a weighing machine comprising:
a support piece including a C-shaped vertical section having upper and lower horizontal branches,
at least one substantially vertical rod fixed between the upper and lower horizontal branches of the C-shaped section,
a substantially vertical displaceable piece slidable along said at least one substantially vertical rod, said rod serving as a guide for said piece,
a first tilting side wall,
a first link hinged at one end thereof to said vertically displaceable piece, and attached at the other end thereof to said first tilting side wall,
a second tilting side wall, and
a second link hinged at one end thereof to said vertically displaceable piece, and attached at the other end thereof to said second tilting side wall,
end walls having fixed positions relative to said support piece, said side walls and said end walls in combination comprising at least a portion of the storage volume of said trough when said trough is closed,
substantially vertical movement of said substantially vertically displaceable piece in one direction along said at least one substantially vertical rod causes said side walls to move for closing said trough, and
substantially vertical movement of said substantially vertically displaceable piece in the opposite direction along said at least one substantially vertical rod causes said sidewalls to move apart for opening said trough, side displaceable piece being subject to movement by application of an external force.

4,892,186
CLOCK CONVEYOR PROVIDED WITH A PLURALITY OF ENTRAINMENT MEMBERS

Hans Frei, Oetwil am See, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jan. 22, 1988, Ser. No. 147,274
Claims priority, application Canada, Jan. 26, 1987, 258/87
Int. Cl.[4] B65G *29/00*
U.S. Cl. 198—803.01 **20 Claims**

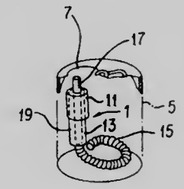


1. A clock conveyor comprising:
a plurality of entrainment members;
an endless revolvingly driven traction element at which there can be coupled said plurality of entrainment members wherein said endless revolvingly driven traction element comprises a belt member;
a release mechanism for individually summoning the entrainment members for coupling thereof with said endless revolvingly driven traction element;
at least one shuttle wheel for individually placing said entrainment members in succession and at a substantially uniform spacing from one another into a position such that said entrainment members can be coupled with the endless revolvingly driven traction element;
means for coupling each of said entrainment members with said endless revolvingly driven traction element;
said coupling means comprising magnetic means for force-lockingly coupling the entrainment members with the endless revolvingly driven traction element in order to thereby entrain and hold the entrainment members by said endless revolvingly driven traction element;
each of said entrainment members being operatively associated with said belt member when coupled therewith;
each of said entrainment members having a side confronting said belt member;
said side confronting said belt member of each entrainment member comprising at least one permanent magnet;
said belt member being provided with ferromagnetic elements; and
said at least one permanent magnet of each entrainment member and said ferromagnetic elements of said belt member constituting said magnetic means for force-lockingly entraining and holding said entrainment members at said endless revolving driven traction element.

4,892,187
DRINKING APPARATUS

Peter Stein, 1221 N. Courthouse Rd. 311, Arlington, Va. 22201

Continuation of Ser. No. 190,116, May 4, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 313,030
Int. Cl.[4] B65D *83/00*
U.S. Cl. 206—217 **3 Claims**

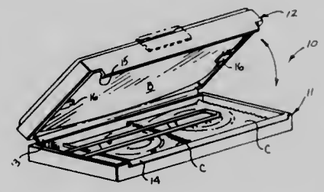


1. Drinking apparatus comprising a pop-up straw submerged in a beverage can, said straw including an upper end face, said can containing or including a strut, said can containing a beverage and connection means for connecting the straw to the strut and elevation means for emerging the upper portion of the straw upwardly and outward from the can when the can is opened, the beverage can having a fracture-and-press-in sealing tab on an upper end wall of the can for opening the can, the tab being moveable inwardly within the can, said upper end face of the straw being installed inside the can directly beneath the opening and beneath the tab.

4,892,188
SANITARY CONDOM CASE

Margaret A. Meadows, 1089 Highland Dr., St. Albans, W. Va. 25177

Filed Dec. 5, 1988, Ser. No. 279,509
Int. Cl.[4] B65D *85/14*
U.S. Cl. 206—223 **6 Claims**

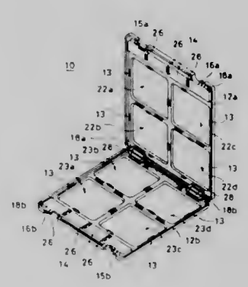


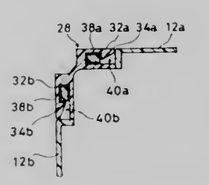
1. A condom case comprising, in combination,
a container defining a first cavity, and
a lid defining a second cavity in overlying relationship to said first cavity and pivotally secured to and overlying said container, and
fastening means for selectively securing said lid to said container, and
first clip means integrally secured within said first cavity of said container for securing at least one condom therein, and
second clip means integrally secured within said second cavity for securing a disposable bag therein, and
further including a dispensing compartment integrally secured to a top portion of said lid wherein said dispensing compartment includes an access opening means for providing access to a plurality of moistened cleansing towels therein, and
wherein said first clip means comprises a resilient elongate clip of a length less than a length defined by said container wherein said first clip is integrally secured to a side wall of said container and spaced from an opposing side wall of said container, and
wherein said second clip means comprises a plurality of rigid clip members, each clip member is secured to an opposing side wall of said lid and spaced from an interior surface formed by the top of said lid.

4,892,189
CASE FOR MULTIPLE COMPACT DISKS

Noriaki Kunimune, Higashiosaka, and Yukio Wada, Kyoto, both of Japan, assignors to Kunimune Kogyosho Co., Ltd., Osaka, Japan

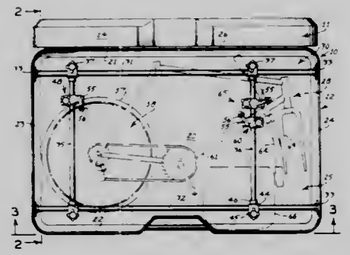
Continuation of Ser. No. 147,203, Jan. 22, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,517
Claims priority, application Japan, Sep. 24, 1987, 62-145670[U]; Nov. 6, 1987, 62-170576[U]
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—232 **5 Claims**





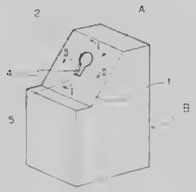
1. A compact disk carrying case comprising:
two separate and distinct case members for forming a plurality of storage compartments in cooperation with each other in a closed state, each of said case members including a plurality of concave portions for the purpose of storing said compact disks, each concave portion in one case member being complimentary to a corresponding concave portion in the other of said case members each of said case members being provided along corresponding edges with engaging means,
detachable connecting members provided on said corresponding edges of said two case members for connecting with said engaging means for hinging said two case members in a manner capable of opening and closing said case, and
latching means provided at corresponding edges of each case member opposite said hinged edges of said two case members for holding said two case members in a closed state, thereby forming said plurality of storage compartments for containing a multiplicity of compact disks.

4,892,190
BICYCLE CASE
Charles B. Delgado, 416 21st Ave., South, Nasbville, Tenn. 37203
Filed Jun. 19, 1989, Ser. No. 367,800
Int. Cl.[4] B65D *85/68*
U.S. Cl. 206—335 **9 Claims**



1. A case for receiving a disassembled bicycle, comprising:
(a) an elongated bottom container section having a bottom wall, opposed elongated side walls, and opposed end walls defining a bottom chamber large enough to receive a bicycle frame and an assembled rear wheel, and having an upper opening,
(b) an elongated top container section having a top wall, opposed elongated side walls, and opposed end walls defining an upper chamber of substantially the same length and width as said bottom chamber and having a depth great enough to receive flat against said top wall the disassembled front wheel of the bicycle frame received in said bottom chamber, and having a lower opening,
(c) said top and bottom container sections having a closed position in which said corresponding side and end walls engage each other and said upper and lower openings oppose each other to enclose the contents of said container sections, and an open position in which said container sections are separated,
(d) a bicycle support system comprising first and second longitudinal support bars in said bottom chamber having opposite ends secured to said opposed end walls of said bottom section, said longitudinal support bars being spaced from said bottom wall and parallel to each other,
(e) said bicycle support system further comprising a pair of transverse support bars having lengths less than the width of said bottom section and having first and second end portions,
(f) first clamp means connected to said first end portions and second clamp means connected to said second end portions, said first clamp means slidably engaging said first longitudinal support bar and said second clamp means slidably engaging said second longitudinal support bar,
(g) means for actuating said clamp means to selectively secure said clamp means on said corresponding longitudinal support bar, and
(h) at least one tie device, each said tie device comprising a clamp member adapted to adjustably secure said tie device upon a transverse support bar, and a tie member adapted to be secured around a component of a bicycle frame assembly received on said support system.

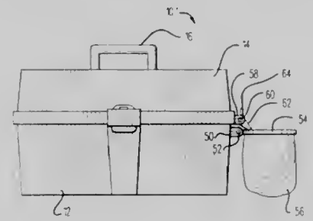
4,892,191
CONTAINER HAVING INJECTION NEEDLE-DETACHING MEANS
Motohiko Nakamura, Kamakura, Japan, assignor to Nissho Corporation, Osaka, Japan
Continuation of Ser. No. 225,985, Jul. 29, 1988, abandoned. This application Jun. 20, 1989, Ser. No. 368,888
Claims priority, application Japan, Jul. 31, 1987, 117564
Int. Cl.[4] B65D *25/00*; B65F *1/02, 7/00*
U.S. Cl. 206—366 **4 Claims**



1. A container having an injection needle detaching means for containing used injection needles comprising:
a closed container for containing injection needles, and
a needle-detaching means for detaching a slip type injection needle from a syringe,
said needle-detaching means comprising a first opening provided in a wall of said container for inserting said needle attached to said syringe, a second opening extending laterally from said first opening, and a sliding portion provided on each of both sides of said second opening,
said first opening having a size larger than the largest part of said needle,
said second opening having a width larger than the diameter of the nozzle of said syringe and smaller than the diameter of the hub of said needle,
each of said sliding portion having a side wall defining said second opening,
each of said side walls having, at the entrance of the second opening from said first opening, a thickness smaller than a distance between the root of the nozzle of said syringe and the bottom end of the hub of said needle when the needle is being attached to said syringe, each of said side walls being made gradually thicker toward the closed end of said second opening, the maximum thickness of each side wall being larger than said distance, the surface of said sliding portion on the rear side of said wall of said container, on which the bottom surface of the hub slides, forms a surface inclined both in the direction of the first opening and in the direction of the second opening.

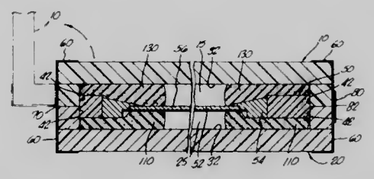
4,892,192
COUPON ORGANIZER
Timothy J. Hague, Sr., and Linda E. Hauge, both of 18 Rose Ave., Gibbstown, N.J. 08027
Filed Feb. 6, 1989, Ser. No. 306,635
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—425 **3 Claims**

1. A coupon organizer for organizing and transporting coupons and shopping accessory items, comprising:
a box-shaped rectangular housing having a hinged cover;
fastening means for securing said cover in a closed position;
a carrying handle mounted on an upper exterior surface of said cover;
a plurality of spaced hook and loop fastening members secured on an interior surface of said cover for removably securing various accessory items;
said housing divided into left and right compartments, with each of said left and right compartments housing a plurality of reduced sized hanging file folder for alphabetically organizing coupons; and



a retractable waste receptacle pivotally mounted on an exterior side wall of said housing.

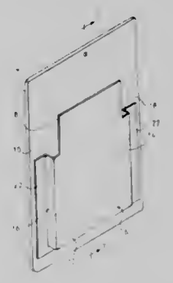
4,892,193
EXPANDED PLASTIC PACKAGING SYSTEM FOR SUBSTANTIALLY PLANAR OBJECTS
Gregg Thomas, 7927 Hesperia Ave., Reseda, Calif. 91335
Continuation of Ser. No. 85,527, Aug. 14, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,191
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—453 **34 Claims**



1. In combination, a substantially rigid bottom of expanded plastic and a complementary substantially planar and rigid lid of expanded plastic, the bottom and the lid each having exterior edges and corners and the bottom internally defining an open-faced cavity having sides and a polygonal inside surface, the open-faced cavity being adapted to receive through the open face and contain a substantially planar object, the lid being so dimensioned that it may be placed over the open face of the cavity in the bottom to cover the same and at least one strip of adhesive plastic tape may be placed over and along an outside juncture of the bottom and the lid in order to detachably secure the lid to the bottom and seal the cavity, the bottom and the lid each having a protective plastic coating on the edges and corners to resist chipping and cracking and an impact absorption means adapted to be placed within the cavity and between the object and at least one side of the cavity in order to absorb impact forces transmitted from the side of the cavity to the object.

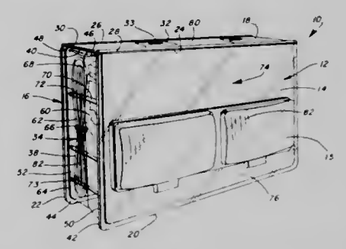
4,892,194
DISPLAY PACKAGE FOR A COSMETIC ARTICLE
Frank Garcia, Brooklyn, N.Y., assignor to Arthur Matney Company, Inc., Brooklyn, N.Y.
Filed Feb. 13, 1989, Ser. No. 310,365
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—470 **19 Claims**

1. A display package for a cosmetic article, which comprises:
a support backing having a display surface;
a pre-formed blister mounted on the display surface of the support backing, the pre-formed blister having a main blister portion including a top wall which is raised from the display surface, an edge flange joined to the main blister portion and secured to the display surface, and side walls connecting said top wall with said edge flange, the main blister portion having an open side and defining a pocket for receiving a cosmetic article therein and for securing the article to the support backing; and



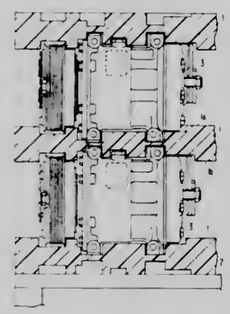
a flexible tongue joined to and extending from said top wall of said main blister portion and extending over said open side of said main blister portion, said flexible tongue being of sufficient length to be contacted with said display surface.

4,892,195
RECLOSABLE BOOK-LIKE PACKAGE
Daniel J. Slavin, Crystal Lake, and John R. Kreider, Carol Stream, both of Ill., assignors to Dordan Manufacturing Co., Chicago, Ill.
Filed Jun. 3, 1988, Ser. No. 202,700
Int. Cl.[4] B65D *1/24*
U.S. Cl. 206—473 **42 Claims**



1. A package adapted to be opened and closed like a book, comprising:
a transparent inner portion including a first leaf, a second leaf and a spine, said leaves each having an inner edge margin hinged to a corresponding edge of said spine, said inner portion having at least one formation for retaining articles therein;
a transparent outer portion, including a first leaf, a second leaf and a spine, said leaves each having an inner edge margin hinged to a corresponding edge of said spine; and
means for sealing said inner portion to said outer portion so that said first leaves, said second leaves and said spines of said inner and outer portions are in register with each other and the articles may be enclosed within said at least one formation and between said inner and outer portions, and may be visually inspected by opening and closing said leaves of said package without breaking the seal.

4,892,196
PARTITION WALL FOR PACKING COMPRESSORS
Yoshiaki Okajima, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Apr. 27, 1988, Ser. No. 186,960
Claims priority, application Japan, Apr. 27, 1987, 62-62735[U]
Int. Cl.⁴ B65D *81/06*
U.S. Cl. 206—523 **20 Claims**

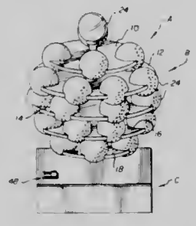


1. A package for a plurality of compressors comprising:
a plurality of partition walls for securely laying compressors thereon, each partition wall consisting of foamed plastic material, both the upper and lower surfaces of each partition wall being formed with cavities which are formed in substantially imperforate portions of said upper and lower surfaces of said partition walls and which are adapted to conform closely to the shape of the compressors so that each said partition wall is disposable on top of a first layer of compressors and a second layer of compressors is disposable on top of each partition wall, thereby permitting the compressors to fit closely within the compressor-shaped cavities in said upper and lower surfaces of said partition walls;
means for supporting said partition walls and plurality of compressors comprising a pallet; and
means for wrapping the partition walls and the pallet comprising stretch film.

7. A partition wall for use in packaging a plurality of compressors, said partition wall consisting of foamed plastic material, wherein both the upper and lower surfaces of said partition wall are provided with cavities formed in substantially imperforate portions of said upper and lower surfaces of said partition wall, each cavity closely conforming to a portion of the contour of a compressor, so that said partition wall is disposable on top of a first layer of compressors and a second layer of compressors is disposable on top of said partition wall thereby permitting the compressors to fit closely within the compressor-shaped cavities in said upper and lower surfaces of said partition wall.

19. A method of packaging a plurality of compressors comprising the steps of:
supporting a first partition wall consisting of foamed plastic material and having substantially imperforate portions in both the upper and lower surfaces thereof formed with depressions closely conforming to the shape of the compressors;
laying compressors in the depressions formed in the upper surface to form a first layer of compressors; and
placing a second partition wall similar to said first partition wall on top of said first layer of compressors so that the compressors securely fit in the depressions formed in the lower surface thereof.

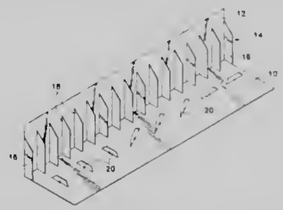
4,892,197
GOLF BALL DISPLAY STAND
Carroll A. Slattery, 882 Harness Trail, and Carlos Z. Rodriguez, 10144 Colebrook Ave., both of Potomac, Md. 20854
Filed Mar. 16, 1989, Ser. No. 324,089
Int. Cl.⁴ A47G *19/28*
U.S. Cl. 211—14 **15 Claims**



1. A display device for displaying golf balls or the like, comprising:
(a) an upper section including a plurality of supporting means arranged in a stacked fashion;
(b) a base section supporting said upper section and including an upper surface;
(c) a plurality of spacer means interposed between said supporting means and including top and bottom spacer means, said top spacer means including means for displaying a golf ball and said bottom spacer means being disposed above said upper surface of said base section;
(d) each said supporting means being generally flat and circular and including a peripheral edge;
(e) a series of similar C-shaped cut-out recesses cut into said peripheral edge so that the open portion of said C-shape faces outwardly of said peripheral edge and for receiving and supporting a spherical article of a diameter greater than the diameter of said C-shaped cut-out recesses such that said spherical article when supported in said C-shaped recess has a substantial portion extending beyond said peripheral edge;
(f) said spacer means being of a length slightly less than the diameter of the spherical articles to be supported on the display device;
(g) said C-shaped cut-out recesses being of similar dimension and spaced equidistant around said peripheral edge;
(h) said C-shaped cut-out recesses being generally circular in configuration; and
(i) said upper section being generally spherical in shape so that when displayed with the spherical articles the display device with the spherical articles thereon will have the appearance of a spheroid with dimples thereon.

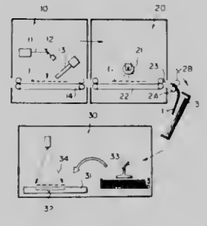
4,892,198
ARTICLE DISPLAY APPARATUS
Barry T. Johnson, Meadow Cottage, Normanton on Soar, Loughborough, Leicestershire, England
Filed Oct. 20, 1988, Ser. No. 260,924
Claims priority, application United Kingdom, Oct. 21, 1987, 8724686
Int. Cl.⁴ A47G *19/08*
U.S. Cl. 211—41 **4 Claims**

1. Apparatus for retaining articles for display, the apparatus comprising a base, an upstanding wall on one side of the base provided with a plurality of parallel, inwardly extending fixed ribs so spaced as to allow edgewise location of an article between adjacent ones of the ribs, and a plurality of abutment members which are spaced from the ribs towards the other side of the base, the abutment members being mounted on the base for movement between one position, wherein the abutment members are aligned with respective alternate ones of the ribs to enable an edgewise display of the articles, and a position at right angles to the ribs to enable a full faced display of the



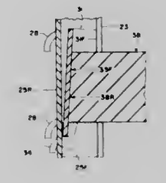
articles, through an intermediate position enabling an angled face display of the articles.

4,892,199
STIMULABLE PHOSPHOR SHEET STACKING TRAY
Isao Utsumi; Yasuhiro Kawai; Kaoru Tamura, all of Kanagawa; Yasunori Maehara, Tochigi; Sigeme Fujiwara, Tochigi, and Katsuhide Koyama, Tochigi, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Kabushiki Kaisha Toshiba, Kanagawa, Japan
Continuation of Ser. No. 808,174, Dec. 12, 1985, abandoned.
This application Jun. 15, 1988, Ser. No. 206,980
Claims priority, application Japan, Dec. 13, 1984, 59-263500; Dec. 13, 1984, 59-263501; Dec. 13, 1984, 59-263502
Int. Cl.⁴ A47F *7/00*
U.S. Cl. 211—51 **9 Claims**



1. A stacking tray for stacking stimulable phosphor sheets fed thereto by a feed mechanism, comprising:
a tray member having a guide means for laterally aligning stimulable phosphor sheets in a direction generally perpendicular to the direction of travel of the sheets during entry thereof into said tray member, said guide means including a tapered section for laterally aligning said stimulable phosphor sheets and an upright section extending parallel to an inner side wall of said tray member for positioning said phosphor sheets in a predetermined position, said guide means being disposed at said inner side wall of said tray member to guide a lower end portion of said stimulable phosphor sheet during entry thereof into said tray member to an end wall of said tray member for aligning and maintaining the positioning of said phosphor sheets in said predetermined position as said phosphor sheets fall under their own weight.

4,892,200
RETAILING DISPLAY ASSEMBLY
Joel H. Alperson, 3306 S. 157th St., Omaha, Nebr. 68130
Filed May 30, 1989, Ser. No. 358,148
Int. Cl.⁴ A47F *5/00*
U.S. Cl. 211—193 **3 Claims**



1. Retailing display assembly comprising:
(A) an upright channel member that is symmetrical with respect to a directionally laterally extending imaginary vertical-plane and that comprises five upright walls including:
(Ai) a directionally laterally extending left-wall located leftwardly of said vertical-plane,
(Aii) a directionally laterally extending right-wall located rightwardly of said vertical-plane,
(Aiii) a directionally transversely extending left-front-wall connected to a forward portion of said left-wall and located wholly leftwardly of said vertical-plane,
(Aiv) a directionally transversely extending right-front-wall connected to a forward portion of said right-wall and located wholly rightwardly of said vertical-plane, and
(Av) a directionally transversely extending rear-wall perpendicularly intersecting said vertical-plane and being connected to rearward portions of said left-wall and said right-wall, said rear-wall at two columnar positions therealong being rearwardly struck to provide two columns of spaced openings and wherein each opening is canopied by the rear-wall structural material; and
(B) a vertically slidable bracket in self-locking combination with said channel member interior, said bracket comprising:
(Bi) an upright web member having transversely extending front-surface and rear-surface, said rear-surface confronting the column rear-wall,
(Bii) attached to transversely separated locations of said web member and flanking said vertical-plane, a pair of upright wings extending directionally laterally forwardly of said web member, each said wing being laterally thickest at the wing upper portion and thereat including an abutment-face confronting a column front-wall,
(Biii) attached to transversely separated locations of said web member, a pair of downwardly and rearwardly extending tabs respectively extending into transversely separated and co-elevational column openings, and
(Biv) an elongate hanger bar attached to a central portion of said web member and extending substantially horizontally forwardly therefrom.

4,892,201

JIB SYSTEM FOR CRANES, ESPECIALLY MOBILE CRANES

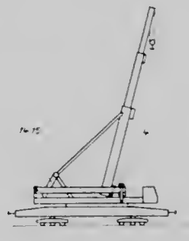
Harry Hellwig, and Klaus-Dietrich Sturm, both of Leipzig, German Democratic Rep., assignors to VEB Schwermaschinenbaukombinat Takraf, Leipzig, German Democratic Rep.

Filed May 11, 1988, Ser. No. 192,812

Claims priority, application German Democratic Rep., Jul. 8, 1987, 304749

Int. Cl.[4] B66C *23/26*

U.S. Cl. 212—186 **6 Claims**



1. In a jib system for a crane mounted to swivel about a pivot on an upper section of the crane, the jib system including a telescopic jib mounted to be shifted by a jib forwarding mechanism, the improvement wherein the pivot of the telescopic jib is movably mounted in a jib trough, the jib trough is mounted to be luffed by a working cylinder, and further comprising retracting means for retracting said telescopic jib, said retracting means comprising a cable pulley, retracting support means for holding said cable pulley on said crane, a pulling element connecting said cable pulley to said telescopic jib, and lifting means for raising and lowering said support means, whereby said jib is pivoted about said pivot.

4,892,202

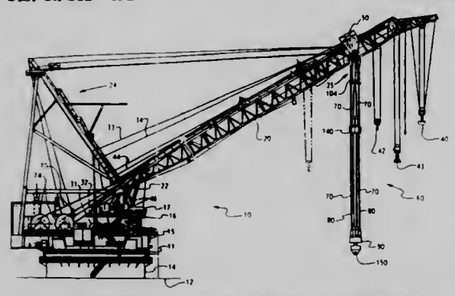
DEEPWATER EXTENDED HOOK TRAVEL ATTACHMENT

John E. Hey, Eagan; Pierre C. Delago, Afton, and James A. Carlson, St. Paul, all of Minn., assignors to Amca International Corporation, St. Paul, Minn.

Filed Apr. 28, 1988, Ser. No. 187,615

Int. Cl.[4] B66C *23/52*

U.S. Cl. 212—192 **20 Claims**



1. An apparatus to increase available hook raising and lowering distance for attachment to a crane or other lifting structure having a boom and at least one lifting hook tackle utilizing at least one lifting line connected to a prime mover comprising:

support means attached to the boom substantially at the connection point of said at least one tackle for supporting a pendant platform;

a lower gripper platform suspended from said support means by pendant lines and being movable with said boom, said lower platform having at least one cable gripper mounted thereon;

an upper gripper platform operatively connected to the at least one lifting line associated with said at least one tackle above said lower gripper platform, said upper platform having at least one cable gripper mounted thereon and adapted to reciprocate between said lower gripper platform and said support means in response to the prime mover drawing in or paying out said at least one lifting line via said at least one tackle;

at least one extended load line passing through the at least one cable gripper on each of said lower and upper gripper platforms;

means for taking up and letting out the at least one extended load line; and

control means connected to said at least one cable gripper mounted on each of said lower and upper gripper platforms for causing said cable grippers individually and selectively to release or to grip said at least one extended load line.

4,892,203

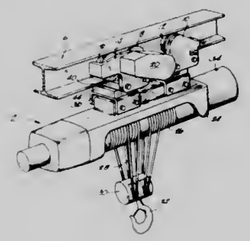
HOIST SWIVEL SUPPORT HAVING SWIVELABLE SURFACE AND BEARING INSERTS

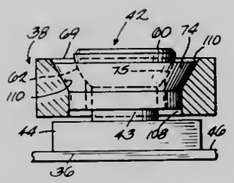
Ronnie A. Arav, Netania, Israel, assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Oct. 5, 1988, Ser. No. 253,522

Int. Cl.[4] B66C *17/06*

U.S. Cl. 212—221 **6 Claims**





1. In a hoist suspended from and travelable along a track means for raising, transporting and lowering material, the hoist including a frame, a rotatable drum mounted on the frame, a cable connected to and windable on to and off of the drum, a load hook attached to the cable for holding the material as the cable is wound on to or off of the drum when the drum rotates in one of said directions whereby the material is raised or lowered, the combination comprising:

trolley means supported on and movable along the track means for carrying the hoist in a suspended manner and including a swivel yoke having an opening therethrough, the opening having a support surface;

a swivel body affixed to the hoist frame and having an upper member projecting through the opening in the swivel yoke, the upper member including a swivel head having a swivelable surface;

a plurality of swivel bearing inserts each movable from a position exteriorly of said opening to a position within said opening between the swivelable surface of the swivel head and the support surface of the swivel yoke; and

the swivelable surface of the swivel body is in supporting engagement with the swivel bearing inserts whereby the hoist frame is supported by the trolley means and the hoist frame and drum are free to rotate relative to the trolley means.

4,892,204

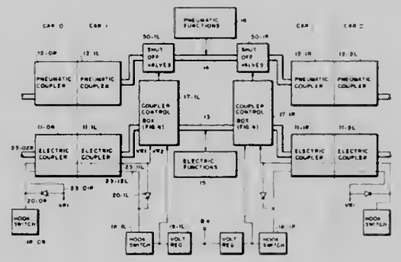
AUTOMATIC COUPLER CONTROL SYSTEM

Anthony Lumbis, Watertown, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 2, 1988, Ser. No. 202,085

Int. Cl.[4] B61G *5/06*

U.S. Cl. 213—1.6 **4 Claims**



1. In an electric coupling system for at least two railway vehicles in which each vehicle has a first electric line adapted for coupling to a battery and a second electric line adapted for connection to electric circuits, and an electric coupling element that interconnects the lines of the two vehicles when they are coupled; the improvement comprising:

electric isolation means for each vehicle for isolating the battery of each vehicle from its corresponding second line and electric circuits when the two vehicles are uncoupled while providing electric continuity therebetween when the two vehicles are coupled, such isolation means comprising a diode connected between the corresponding first and second lines with a polarity to isolate the battery from its corresponding second line; and

the electric coupling elements of the two vehicles mating in the coupled condition to provide a connection of the first and second lines of a first of the vehicles with the second and first lines, respectively, of the second of the vehicles, whereby upon coupling the battery of the first vehicle is coupled in a first circuit with its corresponding second line via the two electric coupling elements and the second line and diode of the second vehicle.

4,892,205

CONCENTRIC RIBBED PREFORM AND BOTTLE MADE FROM SAME

Thomas F. Powers, Ypsilanti, and William G. Kinslow, Saline, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jul. 15, 1988, Ser. No. 219,731

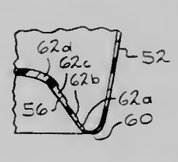
Int. Cl.[4] B65D *1/02, 23/00*

U.S. Cl. 215—1 C **13 Claims**

3. A plastic container comprising an upright hollow body having an upright longitudinal axis, said body having a tubular side wall merging at its lower end with a base structure, said base structure comprising:

a bottom wall having an upwardly facing inner surface;

a plurality of substantially continuous annular reinforcing ribs on said inner surface, said ribs being generally concentric about said axis and being of increased thickness relative to said tubular side wall, the wall thickness of each rib



being greater than the wall thickness of the preceding rib as the ribs progress toward the axis and said ribs being adjacent one another in a radial direction resulting in an increasing wall thickness of said bottom wall in a direction radially inwardly toward said axis.

4,892,206

REFILL BOTTLE

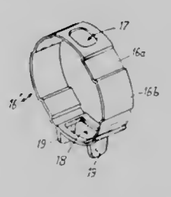
Alain Perrin, Rueil Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Jan. 13, 1988, Ser. No. 143,484

Claims priority, application France, Jan. 16, 1987, 87 00468

Int. Cl.[4] B65D *8/04, 8/08/23/08;* A45D *34/00*

U.S. Cl. 215—12.1 **4 Claims**



1. Container for a refill bottle comprising two half-shells connectable along a substantially medial plane, the first one of said half-shells comprising a stand at its lower portion, the second one of said half-shells including releasable means for joining said second one of said half-shells with the lower portion of said first one of said half-shells, while allowing said second half-shell to be released to permit insertion of a refill bottle within said container and to close said second one of said half-shells against said first one of said half-shells, said shells including a neck receiving portion and having adjacent said neck receiving portions a releasable locking means for securely joining said two half-shells together, said container including compensation means comprising a slightly deformable bracelet of plastic material which is located at the periphery of the refill bottle between said half-shells and said refill bottle for compensating the clearance of variable extent that may exist between the half-shells and the refill bottle.

4,892,207

BOTTLED WATER CONTAINER

Michael D. Cullis, Middletown, N.J., assignor to The Perrier Group of America, Inc., Greenwich, Conn.

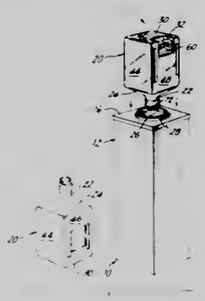
Filed Mar. 28, 1988, Ser. No. 173,925

Int. Cl.[4] B65D *21/02, 23/10, 23/14*

U.S. Cl. 215—100 A **24 Claims**

1. A container for liquids comprising a body portion and a feed neck opening at one end whereby liquid enters or exits from the container substantially in the direction of its longitudinal axis, a recess formed adjacent an end portion of the

container body opposite said feed neck opening and having its major axis oriented generally transverse to but not intersecting the longitudinal axis of the container, and a handle straddling



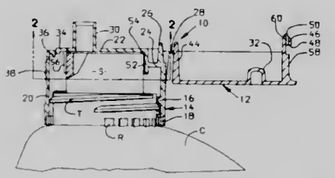
said recess in a direction substantially parallel to the major axis of said recess whereby said handle may be gripped by a hand entering said recess to extend around the handle for up-ending the container from an upright orientation to a feed orientation.

4,892,208

CHILD-RESISTANT CLOSURE ASSEMBLY

Larry C. Sledge, Midlothian, Va., assignor to Specialty Packaging Licensing Company, Wilmington, Del.

Filed Sep. 19, 1988, Ser. No. 245,639
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—216 **5 Claims**



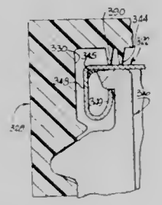
1. In combination, a container having a generally cylindrical upward dispensing spout and a concentric cylindrical enlargement at the base of the spout, the enlargement having threads about its side wall, and a cap having a top wall and a cylindrical side wall depending thereabout and having threads about the inside of the lower end thereof, the threads adapted to mate with the threads on the enlargement, the cap also having downward from the top wall an alignment sleeve concentric with the side wall and spaced thereinside, annular sealing means on the underside of the top wall inside the sleeve, the top wall of the cap being formed with a discharge orifice, the cap being provided with a hinged lid having a depending latch hook opposite the hinge, the top wall having a latch opening opposite the hinge adapted to lachingly receive the latch hook, a latch operator tab being formed on the side wall of the cap aligned with the latch when the lid is in the closed position, the sleeve being interrupted proximate the latch opening to avoid interference with the unlatching movement of the latch toward the hinge and the spout of the container forming a backstop for the latch hook, the sleeve adapted to fit closely over the outside of the spout on the container prior to the engagement of the mating threads, and thereby to prevent the cocking of the cap on the container and the assure proper square engagement of the spout with the sealing means.

4,892,209

LIQUOR BOTTLE CAPPING ASSEMBLY

Jan L. Dorfman, Littleton; Harold Cook, Jr., Evergreen, and Bruce A. Moen, Golden, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Continuation of Ser. No. 203,684, Jun. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 86,567, Aug. 18, 1987, Pat. No. 4,767,016. This application May 19, 1989, Ser. No. 355,790
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—277 **7 Claims**



1. A liquor bottle capping assembly for a liquor bottle having a threaded opening comprising:

perforated member means fixedly attachable to the liquor bottle in covering relationship with said threaded opening in the liquor bottle for preventing flame propagation into the liquor bottle;

gasket means positionable between said threaded opening and said perforated member means for providing a peripheral seal therebetween;

capping means threadably attachable and detachable on said threaded opening for providing a removable and reattachable closure for said liquor bottle opening;

wherein said perforated member means comprises a relatively thin member having a plurality of holes in a central portion thereof;

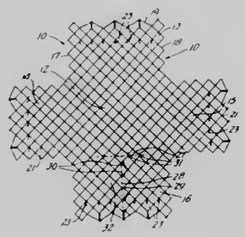
wherein said holes in said perforated member means each having a hole area of between 0.0028 square inches and 0.0044 square inches.

4,892,210

CONTAINER CARGO NET

Julius B. Kupersmit, 299 West 12th St., New York, N.Y. 10014

Filed Oct. 17, 1988, Ser. No. 258,625
Int. Cl.[4] B65D *88/16*
U.S. Cl. 220—1.5 **4 Claims**



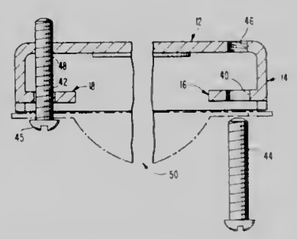
1. In an improved cargo net for use in enclosing an individual, generally rectangular cargo container to permit anchoring of the container with respect to a vehicle hold in which the container is positioned, said net being of generally cruciform shape, including a centrally disposed portion, and four leg portions, said leg portions having end edges and means for engaging corresponding lower edges of a container, the improvement comprising: one of said leg portions having a T-shaped opening therein with abutting vertical edges extending to a corresponding end edge; and plural hook means for selectively closing said T-shaped opening, whereby to permit selective access to said container without the necessity of folding said leg portion over the roof of said container.

4,892,211

CEILING BOXES FOR CEILING FAN SUPPORT

Robert W. Jorgensen, Niles, Mich., assignor to Hubbell Incorporated, Orange, Conn.

Filed Apr. 18, 1988, Ser. No. 182,413
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.2 **15 Claims**



1. A ceiling box **10** adapted to mount and support a ceiling fan thereto via a pair of mounting screws and comprising:

a top portion **12**;

a side portion **14**, said side portion extending substantially normal and rigidly coupled to said top portion to form a box open at one end; and

a pair of flanges **16,18** projecting substantially normal and rigidly coupled to said side portion, each of said flanges including a hole **40,42** extending normal therethrough;

said top portion having a pair of threaded mounting holes extending normal therethrough, each of said mounting holes **46,48** being axially aligned with one of said flange holes, wherein each of said mounting holes and the respective aligned flange hole are adapted to receive a mounting screw for mounting and supporting the ceiling fan thereto, said mounting holes adapted to threadedly receive the mounting screws therein.

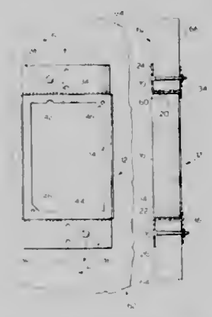
4,892,212

WALL BRACKET FOR MOUNTING AN ELECTRICAL CONNECTOR

Norman J. Andreyko, 34 Norgrove Crescent, Etobicoke, Ontario, Canada M9P 3C6

Filed Oct. 25, 1988, Ser. No. 261,864
Int. Cl.[4] H02B *1/02*
U.S. Cl. 220—3.3 **6 Claims**

1. A wall bracket for mounting an electrical connector for data or communications in an aperture in a wall panel, said bracket comprising a box-like body of sheet metal having a base with opposed end walls extending forwardly therefrom, each end wall having a front mounting flange extending substantially perpendicularly from a front end thereof in an outward direction, and the base having an opening and a pair of mounting tabs extending in opposite directions in the opening from opposite ends of the opening, each mounting tab having a length sufficient to enable the tab to be bent rearwardly through substantially 180°, after the bracket has been positioned in a wall panel aperture to position the front mounting flanges against a front face of the panel, to cause the tabs to engage a rear face of the panel as rear mounting flanges and enable securing devices to be passed through the front mounting flanges, the wall panel and the rear mounting flanges, and an auxiliary plate separate from the box-like body and insertable into the body from the front thereof, after the tabs have



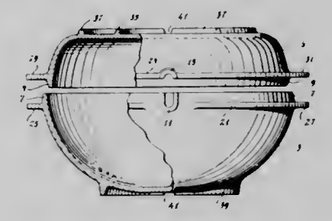
been rearwardly bent, to engage the base for securement thereto.

4,892,213

MICROWAVE COOKING AND SERVING DISH

Stanley I. Mason, Jr., 61 River Rd., Weston, Conn. 06883

Filed Jan. 6, 1986, Ser. No. 816,351
Int. Cl.[4] B65D *6/02, 21/02, 43/08;* **H05B** *6/80*
U.S. Cl. 220—4 B **2 Claims**



1. A reversible, two-section microwave cooking vessel capable of being used with either section on the base and the other section as the top, with the two sections interfitting, said vessel including

a first bowl and a second bowl made of material which is transparent to microwaves, said first bowl having a larger volumetric capacity than said second bowl, said bowls being of generally similar shape,

each of said bowls having a vertical upstanding rim along the inner edge of the periphery thereof, said rims being complementary and interfitting, with said rim of said first bowl fitting outside the said rim of said second bowl,

horizontal peripheral lips on each said bowl, said lips being proximate to, but spaced from, said rims on their respective said bowls, and the outer of said rims of one said bowl resting on the lip of the other said bowl when said bowls are assembled and thereby spacing said lips from one another,

said lips defining pairs of handle extensions at opposite ends of said bowls and being so spaced from one another when said bowls are interfitted as to permit grasping said pairs between thumb and forefinger of one's hands and far enough apart to permit a finger to come between them to separate said bowls, and

a probe hole in said rims, said probe hole being aligned in said rims of said bowls and being midway between said pairs of handle extensions at said opposite ends of said bowls,

whereby said lips together define spaced handle extensions when said bowls are assembled.

4,892,214

METAL CONTAINER AND METHOD OF MANUFACTURING THE SAME

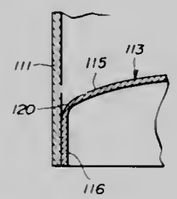
Masami Hamaguchi, Takatsuki; Hiromu Yanagihara, Osaka; Osamu Hiraoka, Takatsuki, and Osamu Takahashi, Nagaokakyo, all of Japan, assignors to Shiseido Company Limited, Tokyo and Asia Can Company Limited, Osaka, both of, Japan

Filed Sep. 8, 1987, Ser. No. 93,718

Claims priority, application Japan, Aug. 9, 1986, 61-212502; Mar. 23, 1987, 62-68467; Mar. 23, 1987, 62-68466; Apr. 3, 1987, 62-31242[U]; May 11, 1987, 62-114286

Int. Cl.[4] B65D *7/42*

U.S. Cl. 220—67 **17 Claims**



1. A metal container comprising:

a metal body means having an integral top cover and formed by drawing and ironing;

a metal bottom plate means having a central curved surface portion projecting toward the interior of the container, a peripheral cylindrical portion extending parallel to said body means, and a bending portion formed at the boundary between the curved surface portion and the cylindrical portion and having a reduced thickness to that of the curved surface portion and cylindrical portion;

an adhesive means for attaching said cylindrical portion of the bottom plate means to said body means;

a tight curl means formed by curling tight a lower portion of the body means inwardly to fasten it to the cylindrical portion of said bottom plate means; and

a take out means applied to the top cover for taking out the content from the container,

said bottom plate means being fitted in the bottom of said body means and attached together by said adhesive means, said tight curl means fastening said bottom plate means to said body means so as not to expose said tight curl means outside of the container, and said bending portion expanding in diameter when the internal pressure is applied on the central curved surface portion of the bottom plate means so as to increase contact pressure between said cylindrical portion of the bottom plate means and said body means.

4,892,215

BOTTOM CLOSURE FOR A BEVERAGE CONTAINER SLEEVE

Robert W. Carlson, Belton, and Douglas J. Ham, Austin, both of Tex., assignors to Custom Printing, Inc., Austin, Tex.

Filed Feb. 17, 1989, Ser. No. 311,870

Int. Cl.[4] B65D *25/24*

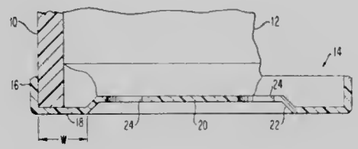
U.S. Cl. 220—69 **2 Claims**

1. A bottom closure for a beverage container sleeve, the sleeve being of the type comprising a tubular length of thermally insulating material dimensioned to receive a beverage container therein, the closure comprising

a unitarily formed body of soft, flexible polyvinyl chloride having

a short cylindrical having an inner surface dimensioned to receive therein an end portion of a beverage container sleeve;

an annular, generally planar bottom ring having a radial width significantly greater than the radial thickness of said beverage container sleeve, the outer periphery of said bottom ring being substantially continuously connected to an end of said cylindrical side wall;



a central bottom disk for receiving and supporting a beverage container inserted into said sleeve, said disk having a downwardly and outwardly sloping wall joining the outer periphery of said central disk to the inner periphery of said ring; and

means defining a plurality of openings through said central disk.

4,892,216

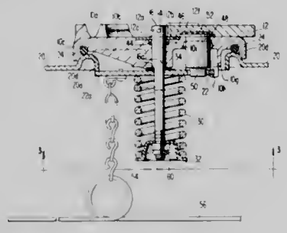
FUEL FILLER CAP WITH OVERPRESSURE RELIEF

Richard E. Scott, Naples, Fla., assignor to Shaw Aero Development Inc., Naples, Fla.

Filed Jan. 13, 1989, Ser. No. 296,570

Int. Cl.[4] B65D *51/16*

U.S. Cl. 220—206 **21 Claims**



1. A filler cap for mating with an adapter comprised by a fuel tank, said adapter comprising a circular wall defining a circular filler opening into said tank, an annular sealing member of generally uniform cross-sectional shape upstanding from an exterior wall of said tank, and a plurality of ears spaced circumferentially around and extending radially inwardly from the circular wall, said cap comprising:

a cap body member having formed therein an annular surface for receiving said annular sealing member;

first seal means disposed on said sealing member or within said groove for engaging the other of said sealing member and groove to form a gas-tight seal therewith;

an anchor disk comprising a central portion and a plurality of fingers equal in number to said plurality of ears spaced circumferentially around said central portion;

an actuator rod extending through a central hole formed in said cap body member and a central hole in said central portion of said anchor disk, so that said anchor disk is enabled to slide along said actuator rod;

an actuator lever pivoted to a first end of said actuator rod at an axis external to said cap body member, said actuator lever comprising a cam surface contacting a mating surface on an outer surface of said cap body member, the pivot point being located with respect to said lever surface such that pivoting of said actuator lever from a first free to a second locked position moves said actuator rod axially outwardly with respect to said cap body member; and

a first pressure limiting spring disposed between a second end of said actuator rod and said anchor disk, urging said anchor disk into engagement with a shoulder formed on said actuator rod;

whereby if gas pressure on the inner surface of said cap body member exceeds the force exerted on said anchor disc by said first spring when said actuator lever is in its locked position, said cap body member is moved axially outwardly, off said annular sealing member, releasing said pressure.

4,892,217

TAMPER EVIDENT DISPENSING CLOSURE

Eugene D. Shastal, 1149 S.E. Coral Reef St., Port St. Lucie, Fla. 34983

Filed Jul. 11, 1988, Ser. No. 217,477

Int. Cl.[4] B65D *51/22*

U.S. Cl. 220—258 **12 Claims**



1. A tamper-evident closure for selectively closing an opening of a container, said closure comprising:

a base element having a central opening larger than the container opening and means for affixation of the base element to the container so that the container opening is disposed entirely within said central opening;

a control element integral with said base element and disposed inwardly of said base element central opening and having a stopper portion including a sleeve having an outer diameter substantially identical to an inner diameter of the container opening and adapted to be received in the container opening, and manipulating means for withdrawing the stopper portion from the container opening; and

a puncturable film secured to said closure base element and extending across the base element central opening and held between said sleeve and the container opening for obstructing the container opening when said base element is affixed to the container.

4,892,218

LID CONTROL DEVICE FOR REFUSE CONTAINERS

Raymond J. Reiling, 620 Elm St., Coon Rapids, Iowa 50058

Filed Oct. 3, 1988, Ser. No. 252,543

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—263 **8 Claims**

1. In combination with a rectangular refuse container having a generally rectangular body with a bottom, front and rear walls, opposite end walls, an open top, defined by a rim portion comprising the upper ends of said front, rear and end walls, at least one closable lid extending across said open top and hinged adjacent the upper end of said rear wall, and lifting brackets secured to said upper ends of said end walls between the front and rear walls and located substantially on said rim portion to facilitate grasping of said container by the lifting mechanism of a refuse truck located forwardly of said container, the improvement comprising,

a linkage means secured to said container to permit the selective pivotal raising of said lid for purposes of depositing refuse in said container,

said linkage means comprising a generally horizontal foot pedal arm pivotally secured adjacent its center portion to the bottom portion of one of said end walls,

said foot pedal arm having a forward end terminating in a foot pedal means,

a vertically disposed lifting arm having upper and lower ends and pivotally secured by its lower end to the other end of said foot pedal arm,



a keeper bracket means secured to said rim portion rearwardly of one of said lifting brackets and slidably receiving the upper end of said lifting arm, the position of said keeper bracket freeing said lifting arm from engagement with said lifting mechanism of said refuse truck when said container is grasped thereby,

the upper end of said lifting arm normally positioned at the approximate level of said rim and engaging said lid whereby when said foot pedal is depressed downwardly, said lifting arm will rise and pivot said lid upwardly to permit refuse to be deposited in said container.

4,892,219

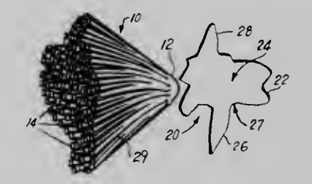
PLUGGING DEVICE

Russell W. Smith, 39 Proctor St., Manchester, Mass. 01944

Continuation of Ser. No. 582,048, Feb. 21, 1984, abandoned. This application Jan. 30, 1989, Ser. No. 303,018

Int. Cl.[4] B65D *51/00*

U.S. Cl. 220—287 **11 Claims**



1. A plugging device utilizable for plugging an aperture in a panel for the stoppage of leaks therethrough, said plugging device comprising:

a sheet of flexible material, said sheet having a central body member and an outer peripheral edge;

a plurality of tapered fingers disposed in said sheet, arranged in a radially directed array outwardly from said central body member of said sheet, said fingers being defined by a plurality of first cleavages arranged at a particular radius from said central body member, said cleavages arranged radially therefrom, said first fingers having a minimum cross-section at their point of attachment to said central body member, out to a maximum cross-section at their

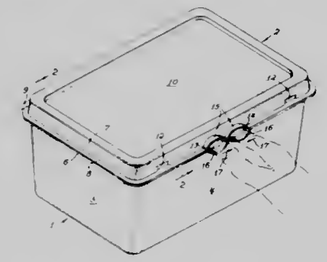
distal ends which comprises the peripheral edge of said sheet, to facilitate a wedging of said plugging device into a cone-like shape when the central body member of said plugging device is first pressed into an aperture.

4,892,220

CONTAINER/DISPENSER FOR WET WIPES AND THE LIKE

Douglas E. Foos, Barrington, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jun. 30, 1989, Ser. No. 373,511
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—339 **4 Claims**



1. In a thermoformed plastic container/dispenser for wet wipes and the like comprising a rectangular body having an open top, a cover hingedly connected to said body along the top portion of one side of said body and shaped and dimensioned to cover and close the top of said body, horizontal flanges extending outwardly from and along the forward edge portions of at least the fronts of said cover and of said body and engaging each other when said container is closed, and means for releasably holding said cover in position upon said body when said container is closed, the improvement which comprises means operable with one hand for opening said container/dispenser, said means comprising a pair of adjoining arcuate formations opening downwardly in said flange extending from said cover and a second pair of adjoining arcuate formations opening outwardly in said flange extending from said body, said pairs of formations being mutually opposite each other to define adjoining recesses adapted respectively to receive the thumb and finger of a hand whereby to exert upwardly directed force upon said flange extending from said cover to lift and disengage the same from said body in opening said container/dispenser.

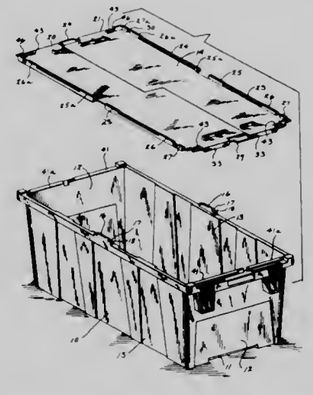
4,892,221

DETACHABLE LID CONTAINER

Paul R. Gora, Hartland, and Edward M. Kaucic, Watertown, both of Wis., assignors to Menasha Corporation, Neenah, Wis.

Filed Dec. 6, 1988, Ser. No. 280,777
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—343 **12 Claims**

1. A detachable two-part lid for a container wherein the parts of the lid are held together as a unit when removed from the container yet are hinged separately when attached to the container comprising:
- a container having hinge posts extending from an upper portion thereof with an opening in said hinge posts;
- a two component lid;
- a combined hinge and retention member having opposing ends slidably connected to said lid for positioning said ends in said openings in said hinge posts;
- means operatively positioned in connection with said lid to hold said combined hinge and retention member in a first position so that said two components of said lid are held together as a unit; and
- means constructed and arranged with respect to said combined hinge and retention member and said lid to retain said cover on said container when said combined hinge and retention member is moved from said first position to a second position where said ends engage said opening in said hinge posts and said lid components are hinged to said container.

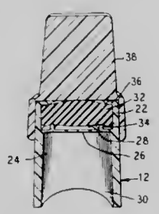


4,892,222

PORT ASSEMBLY FOR A CONTAINER

Josef Schmidt, Libertyville; James Ducay, Grayslake, both of Ill., and Hugh Forman, Waukesha, Wis., assignors to Baxter International Inc., Deerfield, Ill.

Filed Nov. 25, 1988, Ser. No. 276,274
Int. Cl.[4] A61J *1/00*
U.S. Cl. 220—356 **14 Claims**



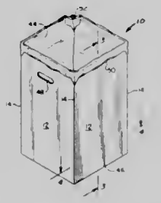
1. A port for a container comprising:
- an elongated tube extending from a base, the tube defining a tubular bore for receiving means for accessing the container, the tubular bore including a membrane for separating the tubular bore into a first portion and a second portion, the first portion being closer to the container than the second portion, the membrane including a ring extending from the membrane into the second portion of the tubular bore; and
- a resealing injection site, the elongated tube including a flange that circumscribes a portion of the resealable injection site to lock the resealable injection site against the ring in the second portion of the tubular bore.

4,892,223

PROCESS OF MAKING A LINED CONTAINER AND THE PRODUCT

David L. DeMent, Millersport, Ohio, assignor to Unipac, Inc., Hebron, Ohio

Filed Nov. 9, 1988, Ser. No. 269,159
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—404 **18 Claims**



1. A container comprising,
- a vertically extending side configured to form a vertically extending fiberboard tube having multiple corners which is open at the top,
- a liner bag located in said tube, the liner being closed at the bottom and open at the top,
- means for mechanically locking the liner to the upper end of the tube, said locking means comprising at least two horizontal slits through the vertical side,
- and spanning at least two of said corners, a score line extending vertically from each end of each slit to the top of the tube, said score lines serving as hinges for the flexing of the strip of sidewall between the slit and the top of the container, the straight line distance between the ends of each slit being less than the length of the slit along the vertical side,
- said slits being spaced from said top a distance greataer than about one-half inch when the container is formed of double wall fiberboard and greater than about one and one-half inches when the container is formed of single wall fiberboarad,
- the open top of the liner bag extending from inside the tube, over the top of the tube, and down the outside of the tube,
- portions of the liner extending from outside the tube, through each of said slits and into the inside of the tube, the portions of the liner extending through said slits being frictionally engaged by the edges of the slits to minimize relative movement between the slit edges and the contacting portion of the liner.

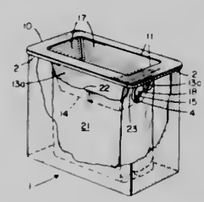
4,892,224

SUPPORT DEVICE FOR A DISPOSABLE TRASH BAG

Donald J. Graham, 63 Driving Park Ave., Lynbrook, L.I., N.Y. 11563

Filed May 6, 1988, Ser. No. 190,998
Int. Cl.[4] B65D *90/04*
U.S. Cl. 220—404 **1 Claim**

1. A trash entry chute device to be placed over the open mouth of a standard rigid top-opening trash container to facilitate the use of standard handled grocery bags, such as limp plastic bags, as disposable liners for the container, comprising a smooth surfaced chute having a collar around the mouth at one end which serves to support the device on the mouth of the container and divert trash into the chute, the chute arranged to extend downwardly and inwardly from the collar for a distance so as to extend into the mouth of a standard grocery bag, the bottom of which rests on the bottom of the container, whereby the grocery bag is held open and facilitates the smooth entry of trash to be disposed into the grocery bag, at least two bag supporting means attached to and in opposed positions on the outside surface of the chute below the flange and shaped to hold the bag by its handles whereby the limp plastic bag is supported inside the container while serving as a disposable liner.

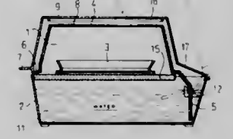


4,892,225

COOLING CONTAINER FOR BUTTER OR THE LIKE

Andreas von Zelewski, Oranieoburger Str. 24, and Zenon Kapela, Fürstenberger Str. 41, both of 4000 Düsseldorf 13, Fed. Rep. of Germany

PCT No. PCT/EP87/00113, § 371 Date Nov. 2, 1987, § 102(e) Date Nov. 2, 1987
PCT Filed Feb. 26, 1987, Ser. No. 143,131
Claims priority, applicatioo Fed. Rep. of Germany, Mar. 7, 1986, 3607533
Int. Cl.[4] B65D *00/00*
U.S. Cl. 220—408 **4 Claims**



1. A cooling container for a food stuff, comprising:
- an upwardly open receptacle forming a base for said container and adapted to hold a body of water;
- a plate disposed above said body of water and mounted in an upper portion of said receptable for receiving a holder for said foodstuff on said plate, said plate having a side thereof covered with an absorbent material and an extension covered with said absorbent material extending downwardly from said plate into said body of water whereby water evaporating from said absorbent cools said foodstuffs on said plate; and
- a cover swingably mounted on said receptacle and concave in the direction of said receptacle to enclose said foodstuffs on said plate in a closed position of said cover,

said cover comprising:
- an inner wall externally lined with absorbent material and having an extension covered with absorbent material projecting into said receptacle and the body of water therein,
- an outer lid spaced from said inner wall and juxtaposed therewith,
- a channel interconnecting said outer lid and said inner wall around a portion of the periphery of said cover and adapted to direct flow of water introduced between said outer lid and said inner wall into said receptacle whereby water evaporating from the absorbent material

on said inner wall cools said foodstuff in said closed position of said cover,

perforations formed in said outer lid and communicating with the space between said outer lid and said inner wall for enabling evaporation from the absorbent material lining said inner wall and pouring of water through said perforations into said space for passage into said receptacle, and

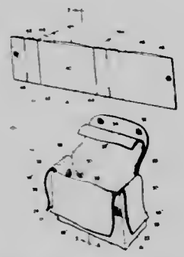
a peripherally extending drip edge around an upper part of said outer lid projecting downwardly in a closed position of said cover, and a cover cap extending outwardly from said outer lid at a rear portion of said container, said extension of said inner wall articulating said cover on said receptacle, said channel being formed at a front of the container with a handle.

4,892,226

PORTABLE APPARATUS FOR REFRIGERATED STORAGE AND TRANSPORTATION OF COSMETICS AND THE LIKE

Nooral S. Abtahi, 1400 Barton Rd., #109, Redlands, Calif. 92373

Filed Aug. 17, 1988, Ser. No. 233,066
Int. Cl.[4] B65D *85/72*
U.S. Cl. 220—412 **13 Claims**



1. A portable apparatus for refrigerated temporary storage and transportation of heat-sensitive cosmetics and the like, comprising:

a. A closable case having wall means defining an interior receiving area for cosmetics and like items;

b. a refrigerant pack conformable to said wall means of said case for selective insertion and removal therefrom; and

c. means for generally enclosing said refrigerant pack when conformed to and inserted in said case, said enclosing means having an absorbent surface for absorption of condensation from said refrigerant pack comprising a first web of an absorbent sheet material affixed to said wall means within said interior receiving area and a second web of said absorbent sheet material movable with respect to said first web to be foldable into and out of covering relation to said refrigerant pack when said refrigerant pack is inserted into said receiving area.

4,892,227

HIGH BARRIER PLASTIC CONTAINER AND METHOD OF MAKING SAME

Donald N. MacLaughlin, Midland, Mich., assignor to Packaging Resources Incorporated, New Vienna, Ohio

Filed Apr. 21, 1988, Ser. No. 184,278
Int. Cl.[4] B65D *25/14*
U.S. Cl. 220—450 **18 Claims**

1. A high barrier container comprising:

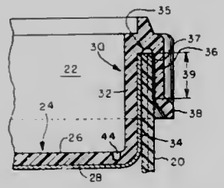
a barrel shaped gas-impermeable plastic container body having an open end and a closed end;

a container closure member comprising a top plastic layer including a circular central closure panel covering the opening in said container body and a peripheral annular plastic flange formed as an integral component thereof; and

a gas-impermeable barrier layer bonded to the bottom of said plastic central closure panel;

wherein said closure member is spin-welded to said open end of said container body such that a spin-weld interface is formed directly between said container body and said peripheral flange.

15. A method of forming a high barrier container comprising the steps of:



forming a plastic closure member having a central circular closure panel and an integral peripheral annular flange;

bonding a gas-impermeable barrier shield to said central closure panel;

forming a barrel shaped gas-impermeable plastic container body having an open end and a closed end; and

spin-welding said closure member to said container body such that a spin-weld interface is formed directly between said container body and said flange.

4,892,228

TOY WATER GUN

Hiroshi Yano, Moriguchi, Japan, assignor to Sekiden Co., Ltd., Osaka, Japan

Continuation of Ser. No. 636,243, Jul. 31, 1984, Pat. No. 4,784,293. This application Jul. 29, 1988, Ser. No. 226,082
Claims priority, application Japan, Aug. 3, 1983, 58-142010
Int. Cl.[4] F41B *9/00*
U.S. Cl. 222—79 **2 Claims**



1. In a toy gun for projecting a fluent material and having a front gun body and a hollow rear gun body of rigid material, one having a cylinder means as a part thereof and the other having a piston means as a part thereof, said piston means being slidable in said cylinder means for permitting movement of the gun bodies toward and away from each other, spaced apart grip means on the respective gun bodies projecting laterally thereof for gripping said bodies for relatively moving them for moving said piston means back and forth in said cylinder means, guide means on one of said gun bodies slidable along the other of said gun bodies for guiding said gun bodies in the direction of the longitudinal axes of said piston and cylinder means, stop means on the other of said gun bodies along the path of movement of the one body and the guide means and being engageable with the stop means when the gun bodies are substantially at the end of the movement of the gun bodies away from each other for preventing the gun bodies from coming apart, and nozzle means on the one of said piston means and cylinder means which is forwardmost, an improved valve means comprising:

a first one way valve means connected to said nozzle means on the forwardmost of said piston means and cylinder means and having a first hollow main body of soft elastic material with a nozzle integrally formed on the front end thereof and having a smooth conical shape converging forwardly of said main body, with a valve stop within said first hollow main body around said nozzle, with a first valve seat integrally formed on the rear end thereof having a first flow passage therethrough having a wall with a rearwardly converging smooth conical shape, and with a first valve body within said first hollow main body movable against said conical shape wall during movement of said piston means and said cylinder means away from each other and movable away from said first valve seat and against said valve stop during movement of said piston means and cylinder means toward each other; and

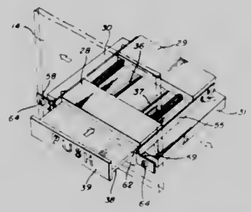
a second one way valve means on the one of said piston means and cylinder means which is rearmost and having a second hollow main body of soft elastic material with a second flow passage at the forward end thereof, with a furter valve stop within said second hollow main body around said second flow passage, with a second valve seat integrally formed on the rear end thereof having a further flow passage therethrough, and with a second valve body within said second hollow main body and movable against said second valve seat during movement of said piston means and said cylinder means toward each other and movable away from said second valve seat and against said further valve stop during movement of said piston means and said cylinder means away from each other.

4,892,229

SYSTEM FOR DISPENSING LIQUID FROM A PAPERBOARD CARTON

Arthur G. Rudick, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 24, 1988, Ser. No. 236,183
Int. Cl.[4] B65D *35/56*
U.S. Cl. 222—105 **15 Claims**



1. Apparatus for dispensing a liquid from a carton-type liquid container having a flexible reclosable opening located at one corner thereof, comprising:

means for holding the container so that the opening at the corner is located at the bottom during normal use whereby liquid can be dispensed by gravity downwardly through the opening; and

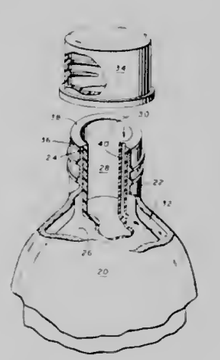
means located on said bolding means for controlling the opening and closing of the opening and thus the dispensing of liquid from the container, said controlling means comprising a pinch mechanism including mutually perpendicular adjacent pairs of pressure plates having mutually opposing parallel side wall surfaces for engaging and compressing respective pairs of opposite walls of the container at the opening, and means for interconnecting said pairs of plates to move in unison and mutual opposition and thereby alternately open and close the opening at the corner during a dispensing operation.

4,892,230

CARBONATED BEVERAGE BOTTLE

Arthur E. Lynn, Jr., Rte. 7, Box 218-A, Andalusia, Ala. 36420

Continuation-in-part of Ser. No. 152,987, Feb. 8, 1988, abandoned. This application Sep. 14, 1988, Ser. No. 244,111
Int. Cl.[4] B65D *35/56*
U.S. Cl. 222—105 **2 Claims**



1. An improved container for storing and dispensing a carbonated liquid, said container comprising:

a. a substantially rigid outer container in the form of a bottle having a neck extending upwardly to a bottle mouth defined by an annular upper rim, said bottle being otherwise imperforate;

b. an inner collapsible pouch disposed within said bottle for containing said liquid, said pouch being formed from a substantially non-elastomeric material which is impervious to liquids and to carbon dioxide gas, said pouch having a neck extending upwardly through said neck of said bottle and being otherwise imperforate to thereby define with said bottle an air space between said pouch and said bottle, said neck of said pouch terminating in an upper open mouth whereby said liquid may be poured from said pouch;

c. cap means for closing said open mouth; and

d. valve means for admitting air from the ambient atmosphere outside said improved container into said air space when said cap means is removed from said pouch and for isolating said air space both from the interior of said inner pouch and from said ambient atmosphere when said cap means is installed, whereby said air inside said air space is compressed by carbon dioxide escaping from said liquid while said cap means is installed.

4,892,231

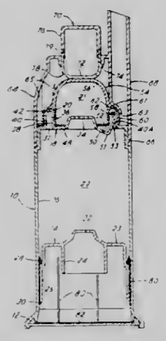
PUMP CHAMBER DISPENSER

Martin F. Ball, Wantage, England, assignor to Metal Box p.l.c., Reading, England

Continuation of Ser. No. 73,747, Jul. 15, 1987, Pat. No. 4,830,229. This application Oct. 31, 1988, Ser. No. 265,031
Claims priority, application United Kingdom, Jul. 16, 1986, 8617350
Int. Cl.[4] B67D *5/42;* **G01F** *11/00*
U.S. Cl. 222—207 **22 Claims**

1. A pump chamber dispenser for viscous or pasty product, comprising a body including a tubular side wall and an end wall panel integral with the side wall, a closed reservoir chamber within the body for receiving viscous or pasty product to be dispensed, the chamber being defined partly by said end wall panel, a piston within the chamber to move the viscous or pasty product toward said end wall panel, a unitary pumping member of elastomeric material mounted on the end wall panel outside of the reservoir chamber and confining with the end

wall panel a variable volume pump chamber, the pumping member including integral inlet and exit valve elements, an inlet port for conducting product to the pumping chamber from the reservoir chamber and an exit port for conducting product from the pumping chamber to a discharge nozzle, the inlet and exit ports being controlled by the inlet and exit valve elements, respectively, said end wall panel having a substantially annular projection directed away from the reservoir chamber and extending around an axis substantially parallel to the longitudinal axis of the body, the projection having inner and outer substantially cylindrical surfaces and a portion of said end wall panel surrounds said projection with the portion of said end wall panel being substantially planar, and said pumping member being rotationally symmetrical about an axis substantially parallel to the longitudinal axis of the body and having a domed portion and inner and outer coaxial skirts extending from the edge of the domed portion and forming



said inlet and exit valve elements, respectively, said skirts lying against said radially inner and outer surfaces of said projection with said outer skirt extending from the domed portion toward but terminating before the substantially planar portion of said end wall panel, said inlet port extending through the end wall panel from said groove to said radially inner surface of the projection, and said inlet port being closable by the inner skirt, a recess provided in said end wall panel and extending across the projection to define said exit port, the exit port communicating with the pumping chamber and opening at the said radially outer surface of the projection at a position to be closable by the outer skirt, and a cover member fixed to the body by a snap connection and including said discharge nozzle, the cover member having a movable part for acting on the domed portion of the pumping member to reduce the volume of the pumping chamber, and being arranged to enclose the pumping member during operation of the pump dispenser.

4,892,232

UNIT DOSE DISPENSER

James H. Martin, 8322 County Line Rd., Burr Ridge, Ill. 60521

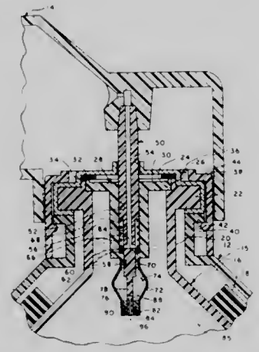
Filed Jul. 25, 1988, Ser. No. 225,081
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 **4 Claims**

1. Dispensing apparatus for dispensing a predetermined quantity of fluid, comprising in combination

first elastomeric reservoir means for containing a supply of said fluid under pressure,

second elastomeric reservoir means disposed within said first reservoir means,

manually operable fluid dispensing means for communicating said first reservoir to said second reservoir when in a first position to permit fluid from said first reservoir to flow into said second reservoir; and when in a second position for sealing said reservoirs from one another and communicating said second reservoir to a location which is exterior of both said reservoirs to permit fluid in said second reservoir to escape therefrom at said pressure, and said manually operable fluid dispensing means includes



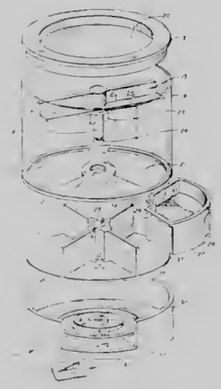
means responsive to the movement of said dispensing means from said first position to said second position for applying a mechanical force to compress said second reservoir.

4,892,233

DISPENSING APPARATUS

Barry M. Zelickson, 1309 Westwood Hills Rd., St. Louis Park, Minn. 55426

Filed Jun. 21, 1988, Ser. No. 209,487
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—226 **18 Claims**



1. A measuring and dispensing device for dispensing granular material wherein the device comprises

a canister for storing and dispensing material therefrom, said canister further having top and bottom ends wherein the bottom end includes at least one dispensing opening, said dispensing opening being in flow communication with at least one removable drawer, said drawer being positioned in a rotatable drawer holder, said drawer holder and drawer being substantially enclosed and rotatable within a dispenser housing, and

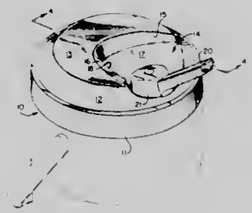
a mixing lever in said canister and said mixing lever being in rotational engagement with said drawer holder so that when said drawer holder is rotated, said mixing lever rotates.

4,892,234

COMBINED CLOSURE AND POURING SPOUT

Mark H. Bennett, Winfield, Kans., assignor to Gott Corporation, Winfield, Tex.

Filed Jul. 21, 1988, Ser. No. 222,621
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—484 **6 Claims**



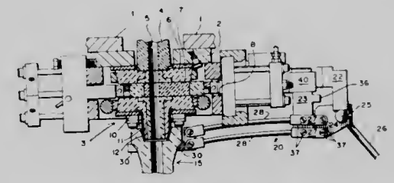
1. In a dispenser closure for a container, said closure comprising a normally vertical axis, a downturned peripheral flange, an upper top wall connected to said downturned peripheral flange by an arcuate wall thereby defining an upwardly open off-center recess in the top of the closure, a hollow mounting base within said recess having its axis inclined inwardly toward said closure axis, a pouring spout member adapted to be mounted in said recess on said mounting base for lateral rotation from a closed position wholly within said recess to an upwardly inclined open position projecting outwardly beyond the closure, an opening in said mounting base, an inner channel within said pouring spout which registers with said opening when said spout member is in said open position, a vent aperture in said spout member, and a vent tube depending from said mounting base which communicates with said vent aperture when said spout member is in said open position, thereby facilitating pouring through said spout member when the closure is tilted from its normally vertical axis and inhibiting drippage when returning the closure to its upright position.

4,892,235

JOINT AND SHROUD SUPPORT FOR POUR TUBE AND COLLECTOR NOZZLE

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Jun. 23, 1988, Ser. No. 210,577
Int. Cl.[4] B22D *37/00*
U.S. Cl. 222—607 **3 Claims**



1. A combination shroud to slide gate collector nozzle joint for use in a sliding gate valve construction for teeming metal, such combination including bullet-shaped metal encased collector nozzle at the lower portion of said valve,

a shroud formed of a refractory,

said shroud having a body portion which is essentially tubular,

said tubular body portion having a shroud orifice extending downwardly,

an open end portion at the upper portion of said shroud,

said open end portion having a refractory faced sealing cup with frustoconical sidewalls,

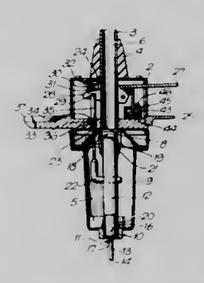
said shroud having means at its upper end for receiving a support ring for urging said shroud in contact with a bullet-shaped nose of the collector nozzle.

4,892,236

DISPENSING MEASURES

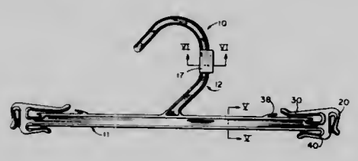
Ronald S. Griffiths, Rochester, and John E. Searles, Aylesford, both of England, assignors to R. and A. Bailey & Company Limited, United Kingdom

Continuation of Ser. No. 60,001, Jun. 9, 1987, abandoned. This application Jan. 18, 1990, Ser. No. 298,305
Claims priority, application United Kingdom, Jun. 10, 1986, 8614046; Jan. 28, 1987, 8701912
Int. Cl.[4] G01C *1/12;* **G01F** *11/28*
U.S. Cl. 222—640 **11 Claims**



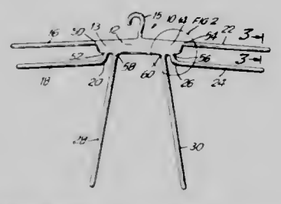
1. A dispensing measure for dispensing fluids having a head assembly with means for engagement with the neck of a bottle, a measuring chamber having an entry port and an exit port, an internal operating standard, an outlet portion at the exit port having a cylindrical internal wall, the internal operating standard having a bottom portion consisting essentially of a cylindrical portion and a nose portion smaller in diameter than said cylindrical portion, and additionally a means to move the internal operating standard alternately between a dispensing position in which it seals the entry port and a resting position in which it seals the exit port, the cylindrical portion having a cylindrical external surface which fits slidably and sealingly within the cylindrical internal wall of the outlet portion for wiping clean the entire internal wall of the outlet portion as the internal operating standard returns to its resting position after dispensing, the nose portion having an external surface for guiding fluid flow, only the nose portion extending beyond the outlet portion externally of the measuring chamber, and the external surface of the nose portion being entirely external to the measuring chamber when in said rest position, whereby fluid being dispensed from the measuring chamber flows through the exit port, and on the external surface of the nose portion and then directly into a receptacle held beneath the dispensing measure.

4,892,237
INTIMATE APPAREL HANGER WITH GARMENT CLAMPING ARMS
Everett L. Duester; Russell O. Blanchard, and Robert A. Bredeweg, all of Zeeland, Mich., assignors to Batts, Inc., Zeeland, Mich.
Continuation-in-part of Ser. No. 181,388, Apr. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 108,227, Oct. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 49,276, May 13, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 270,271
Int. Cl.[4] A47G *25/48*
U.S. Cl. 223—85 32 Claims



1. A garment hanger having an elongated body and supporting hook means midway between the ends of said body, the opposite ends of said body being identical and each comprising: a first arm at the body's outer end spaced from and overlying the top of and integral with said body, said arm forming a garment receiving first slot between the arm and the body; an upwardly and outwardly inclined finger having an outer end spaced from the inner end of said arm for defining an upwardly opening entrance to said slot; a downwardly extending second arm at the end of the body integral with the body at its upper end, said second arm forming a downwardly opening second garment receiving slot; a third arm extending toward the center of said body adjacent the lower edge of said body, said third arm being integral with the end of said body and forming a third garment receiving slot extending along the body's lower edge; the entrances to said slots formed by said first, second and third slots each being narrower than the inner portions of said slots to cause clamping of garments seated in said slots.

4,892,238
CLOTHES PRESS HANGER
Dorothy Pinczowski, 2090 Main St., Highland Falls, N.Y. 10928
Filed Jun. 7, 1989, Ser. No. 362,875
Int. Cl.[4] A47G *25/14;* A47B *61/02*
U.S. Cl. 223—92 20 Claims



1. A clothes press hanger comprising:
a body member having shoulder portions on opposite sides thereof;
a hook member extending upwardly from a center of a top portion of said body member between said shoulder portions;
a first pair of arms extending outwardly from one side of said body member, said arms being spaced apart;
a second pair of arms extending outwardly from an opposite side of said body member, said arms of said second pair being spaced apart; and
means for permitting said first pair of arms to be bent and spread apart from each other, and for also permitting said second pair of arms to be bent and spread apart from each other, in order to press a garment hanging on said hanger into shape to avoid any creasing and wrinkling thereof.

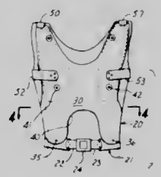
4,892,239
DEVICE FOR MAKING IT EASIER TO PUT ON ARTICLES OF CLOTHING
Walter Tomasi, Weilheimer Str. 21, D-7890 Waldshut/Tiengen, Fed. Rep. of Germany
PCT No. PCT/DE88/00317, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09637, PCT Pub. Date Dec. 15, 1988
PCT Filed May 28, 1988, Ser. No. 305,987
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1987, 3718330
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—111 15 Claims



1. A device for making it easier to put on articles of clothing, such as coats, jackets or the like, with a holding device for the articles of clothing which is mounted so as to be of adjustable height on a vertical guide (1) by means of a connecting element (2), wherein the holding device has two half-hangers (3, 4) articulated on the connecting element (2) by means of hinges (5, 6) the axial directions (I, II) of the hinges (5, 6) intersecting at an angle above the holding device, and the half-hangers (3, 4) being tiltable about the said axial direction (I, II) approximately horizontal, oppositely aligned first end position forwards away from the vertical guide (1) into a second end position, and wherein a drive (7–10) actuable by the person putting on the particular article of clothing is provided for varying the height (h) of the holding device on the vertical guide (1).

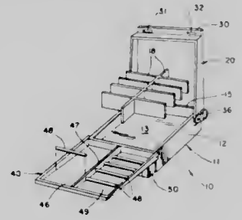
4,892,240
EXOSKETETAL CARRIAGE FOR ARTICLES TO BE CARRIED BY A PERSON
Michael S. Bell, 354 Daytona, Goleta, Calif. 93117
Filed May 8, 1987, Ser. No. 47,807
Int. Cl.[4] A45F *3/04*
U.S. Cl. 224—211 17 Claims

1. An exoskeletal carriage to be worn on the human body to support and to carry objects attached thereto, said carriage comprising:
a belt at least partially to encircle the waist of a wearer, said belt being flexible and conformable to said waist, and adapted to be tight enough as not to slip downwardly appreciably under the vertical loads intended to be applied to it;
a front blade-like columnar member and a rear blade-like columnar member adapted to be placed to the front and to the rear of the wearer, above the waist;
attachment means attaching said columnar members to said belt so that they are supported by said belt;
each said columnar member comprising a blade like structure having a substantial area with a substantial vertical and horizontal dimension, and with a dimension of thickness and physical properties which render the member at least stiffly flexible, both of said columnar members; when on the body having a channel shape along at least a portion of their vertical dimension; and both of said columnar members covering substantial areas of the front and rear portions of the upper torso extending to each side of the torso of the wearer; whereby when attached to the belt



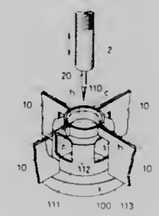
and weighted downwardly by objects supported by it, the members behave as a columnar support with no more than minimal columnar bending; and
connector means joining said front and back columnar members at a location above said belt to resist their separation, whereby articles may be mounted to said columnar members for carriage by the wearer and be principally supported by said belt.

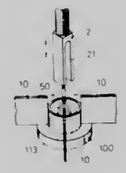
4,892,241
TACKLE BOX
Gus H. Mavrakis, 135 Burlington Ave., Billings, Mont. 59101
Filed Aug. 10, 1988, Ser. No. 230,609
Int. Cl.[4] A45F *3/04;* B65D *25/10;* A01K *97/06*
U.S. Cl. 224—216 5 Claims



1. A tackle box, comprising:
a cover and support member having a front wall, opposite side walls and a back wall;
means on the support member for securing the support member on the body of a user near the front of the user's waist;
a first receptacle having front, back, side and bottom walls and pivotally mounted at the back wall to a bottom edge of the support member for movement between an upwardly pivoted closed position disposed against the support member and an open position pivoted downwardly to a generally horizontal orientation in front of the support member;
a supplemental cover and shelf member having a first wall, opposite side walls and a back wall defining a shallow tray and wherein at least said opposite side walls have flat inner surfaces, said member pivotally mounted at a back edge thereof to the front wall of the receptacle and movable between a first position disposed in closed, overlying relationship to the receptacle and a second position disposed in open, generally horizontal position extending outwardly from the front wall of the receptacle;
a second receptacle secured on the front wall of the first receptacle in a position to be accessible to the user when the first receptacle is in its closed position relative to the cover and support member; and
a plurality of removable elongate rods frictionally held in the tray in spaced relationship to one another for releasably holding flies, hooks and other articles in the tray, said rods having opposite flat ends wedged between the flat inner surfaces of the opposite side walls of said tray thereby being held in position solely by tight frictional engagement between said ends of the rods and said opposite sides of the tray.

4,892,242
METHOD AND DEVICE FOR SEPARATING TRIMMING LOSSES OF PRODUCTS FORMED FROM SHEET
Osamu Tanida, Nara; Yoshiharu Okuno, Kyoto; Katsuhiko Yoshida, Nara; Nobuyasu Sakamoto, Nara; Hsao Ishikawa, Nara, and Eiichi Kobayashi, Nara, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan
Filed Jan. 13, 1988, Ser. No. 143,478
Int. Cl.[4] B26F *3/02*
U.S. Cl. 225—2 14 Claims





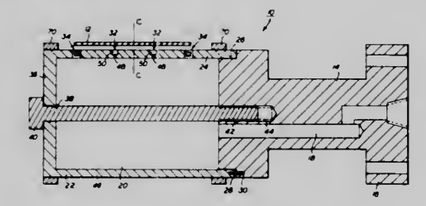
10. A device for separating trimming losses from a sheet having a plurality of products formed thereon with star-shaped scraps therebetween, said device comprising: a sheet supporting plate; a plurality of pushing rods, each pushing rod having a free end for contacting and pushing a corresponding said star-shaped scrap, said pushing rods and said sheet supporting plate being disposed on opposite sides of said sheet; a plurality of bush means fixed to said sheet supporting plate, each bush means corresponding to one of said pushing rods, wherein each bush means has a cylinder portion and a cutter means positioned in said cylinder portion, and wherein each pushing rod has a groove having a thickness greater than a thickness of said cutter means, and wherein each of said pushing rods pushes a corresponding star-shaped scrap onto said cutter means and through said cylinder portion; and collection chamber means positioned on the side of said sheet supporting plate opposite to said sheet, wherein said star-shaped scraps are collected in said collection chamber after being pushed through said pushing cylinder means by said pushing rods.

4,892,243

AIR-BEARING CENTER-GUIDING APPARATUS AND METHOD

Michael Long; Thomas W. Palone, both of Rochester, and Paul Kemp, Churchville, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,224
Int. Cl.[4] B65H *23/24, 23/32*
U.S. Cl. 226—97 22 Claims



1. A method for supporting and laterally center-guiding a thin web along a longitudinally extending web center line wherein the web has longitudinally extending side edges defining a predetermined web width, comprising the steps of:

providing a web-support member having an outer web-facing surface;

providing a pair of parallel, longitudinally extending rows of elongated guide apertures extending through said web-facing surface, said guide apertures being arranged in longitudinally spaced-apart relation in each row, said rows being laterally spaced apart a distance substantially equal to the predetermined width of the web being guided, each guide aperture further extending through said web-facing surface in a direction substantially perpendicular to the web and defining in cross-section an elongated aperture having a straight side and a curved side with one of said sides substantially in register with a side edge of said web and the other of said sides extended beyond said side edge, whereby each said elongated guide aperture is positioned substantially beyond said width of said web;

providing web-support means separate from and interposed between said rows of guide apertures; and

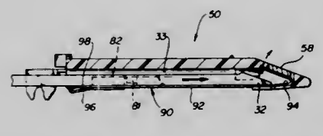
directing a source of pressurized air (1) to said web-support means for forming an air cushion below the web for supporting the web on the air cushion and (2) to said elongated guide apertures for directing jets of air against the web edges for forming localized web-guiding deformations on the web edges for laterally center-guiding the web along the web center line.

4,892,244

SURGICAL STAPLER CARTRIDGE LOCKOUT DEVICE

William D. Fox, New Richmond; Rudolph H. Nobis, Cincinnati; Richard P. Nuchols, Beavercreek, and Mark S. Zeiner, Cincinnati, all of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 7, 1988, Ser. No. 267,907
Int. Cl.[4] A61B *17/10*
U.S. Cl. 227—8 12 Claims



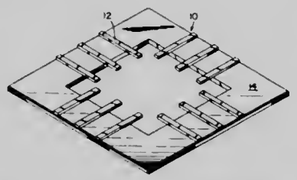
1. In a surgical stapler having firing means for firing staples and in which a removable cartridge containing staples may be loaded and replaced by another removable cartridge, a lockout mechanism on said stapler actuable by said firing means upon the firing of said staples by said stapler such that said lockout mechanism blocks said firing means and prevents the refiring of said stapler when loaded with said spent cartridge.

4,892,245

CONTROLLED COMPRESSION FURNACE BONDING

Thomas J. Dunaway, St. Louis Park; Richard K. Speilberger, Maple Grove; Jerald M. Loy, Anoka; Lori A. Dicks, New Hope, and Luverne O. Balgaard, Burnsville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 21, 1988, Ser. No. 274,431
Int. Cl.[4] B23K *31/02, 37/04*
U.S. Cl. 228—180.2 19 Claims



1. A system for controlled compression furnace bonding of a semiconductor chip to conductive elements of a leadframe, comprising:

(a) holding means comprising a holding member having a chip support surface for supporting a semiconductor chip;

(b) positioning means for precisely positioning conductive elements of a leadframe with corresponding bonding locations on the semiconductor chip, the positioning means comprising:

(i) standoff means for maintaining vertical distance between the leadframe conductive elements and the semiconductor chip bonding locations;

(ii) planar gravity means comprising an insert placed on top of the leadframe for providing controlled compression force against leadframe conductive elements so that all leadframe conductive elements are in conductive connection with corresponding semiconductor chip bonding locations; and

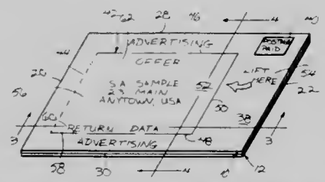
(c) furnace heating means comprising a furnace for heating and conductively bonding the conductive elements with the chip bonding locations.

4,892,246

POSTCARD WITH TEAR OUT RETURN POSTCARD

John A. Norman, Downers Grove, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Jan. 6, 1989, Ser. No. 293,977
Int. Cl.[4] B42D *15/04*
U.S. Cl. 229—92.8 10 Claims



1. A business form including a postcard mailing piece comprising:

first and second superimposed plies, each of card stock like that employed in postcards and having generally identical sizes and shapes;

means joining the peripheries only of said plies to hold the same in substantial abutment with each other;

a first franking designation or stamp receiving area on the side of one of said plies remote from the other of said plies;

a closed line of weakening in said one ply defining the periphery of a return postcard and located to be spaced from and within said joining means and not encompassing said first franking designation or stamp receiving area; and

a second franking designation or stamp receiving area on said one ply on the side thereof facing said other ply within said closed line of weakening to be on said return post card.

4,892,247

PAPERBOARD CARTON WITH LATCHING PLASTIC LID

Robert S. Dirksing, and Theodore P. Merz, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 19, 1988, Ser. No. 234,233
Int. Cl.[4] B65D *43/16*
U.S. Cl. 229—125.26 14 Claims



1. A package comprising:

(a) a paperboard carton having an open end and including a multiplicity of interconnected sidewalls, each of said sidewalls having an innermost and an outermost surface, at least one of said sidewalls including a folded over flap at said open end of said carton, said flap including at least one aperture therein;

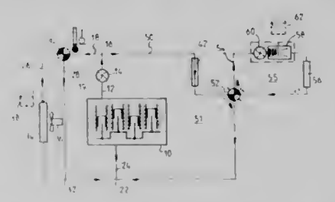
(b) a plastic lid having a periphery exhibiting a shape generally corresponding to the open end of said paperboard carton, said lid including a "U" shaped channel having an innermost and an outermost surface at its periphery in an area corresponding with said at least one sidewall including said apertured folded over flap, said innermost surface of said "U" shaped channel including a projection which is complementary to said aperture in said flap, said projection being located on the surface of said "U" shaped channel which faces said flap when said lid is in the closed position, said projection being so positioned that it enters into the aperture in said flap when said lid is in its closed position, said lid further including means for hingedly connecting it to one of said sidewalls of said paperboard carton other than the sidewall joined to said flap which includes said aperture, whereby said projection on said "U" shaped flange flange and said hole in said flap form a detenting latch to hold said lid in its closed position once said projection has entered said aperture.

4,892,248

HEATING INSTALLATION COMPRISING A HEAT GENERATOR, INTENDED FOR AN AUTOMOBILE

Roger Robin, Elancourt; Jean-Francois Somme, Chaville, and Jean-Francois Bouvot, Dampierre, all of France, assignors to Valeo, Paris, France

Filed May 20, 1988, Ser. No. 196,466
Claims priority, application France, May 21, 1987, 87 07158
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 B 13 Claims



1. A heating system for use in a vehicle comprising a coolant fluid circulation system including primary and secondary heating circuits, said primary circuit including a primary heat exchanger and the engine as a primary heat generator, said secondary heat circuit including a secondary heat exchanger positioned to heat the air to the passenger area of the vehicle, said secondary heat circuit further including a secondary heat generator responsive to the operation of said engine to raise the temperature of the coolant contained in said secondary heat exchanger, said primary and said secondary heating circuits being selectively connectable to and isolated from each other at engine start to accelerate the increase in the temperature of the coolant fluid in said secondary heat exchanger.

4,892,249

RAILROAD GRADE CROSSING WITH IMPROVED TRANSVERSE SPLINE AND ANCHORING ASSEMBLY

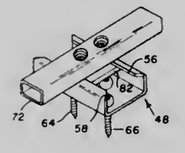
S. Hudson Owen, Marshfield, Wis., assignor to Koppers Industries, Inc., Pittsburgh, Pa.

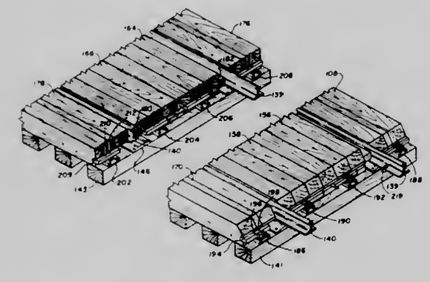
Continuation-in-part of Ser. No. 863,416, May 15, 1986, Pat. No. 4,732,320. This application Mar. 21, 1988, Ser. No. 170,527
Int. Cl.[4] E01B *21/04*
U.S. Cl. 238—8 14 Claims

1. A railroad crossing comprising rails supported by ties on a ballast and a deck of gage and outer field panels supported by said ties adjacent to said rails, said panels being substantially level with the top of said rails so as to allow motor vehicle traffic to cross over said rails, the improvement which comprises joining panels by means of transverse splines fitted into indentations on end surfaces of said gage and outer field panels whereby pairs of panels are joined together with one of said splines fitting partly into each end of adjoining panels; and lateral anchor means comprising a floor section fixed to one of said ties and vertical wall sections projecting upwardly from said floor section in transverse relation to on of said splines such that said spline rests on the upper terminal ends of said wall sections and said wall sections having opposed inwardly projecting horizontal lips and a spline retaining plate positioned beneath said lips and fastening means connecting said

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spline and said spline retaining plate so as to thereby fix the gage panels adjacent to said rails, and outer field panels





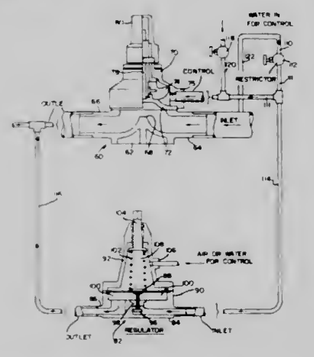
whereby the need is obviated for affixing the panels to the ties by means of surface spikes.

4,892,250

DYNAMIC FOUNTAIN DISPLAYS AND METHODS FOR CREATING THE SAME

Mark W. Fuller, Studio City, and Alan S. Robinson, El Monte, both of Calif., assignors to Wet Enterprises, Inc., Universal City, Calif.

Continuation-in-part of Ser. No. 106,533, Oct. 6, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 334,781
Int. Cl.[4] F21P *7/00*
U.S. Cl. 239—18 **17 Claims**



11. A patio fountain comprising:

a base extending over an area, the said base including drain means for collecting water from above for recirculation;

a patio deck supported above said base, said patio deck having a plurality of deck members supported adjacent to each other in slightly spaced apart relationship for allowing water to pass therebetween to said vase;

at least one nozzle disposed to direct water upward through at least one opening in said patio deck; and,

pump means coupled between said drain means and said at least one nozzle for recirculating water collected by said base;

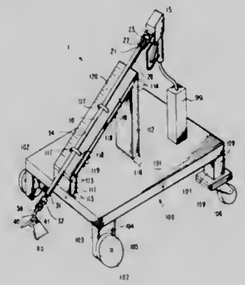
whereby a water fountain display is formed utilizing open joint paving and without using one or more fountain pools.

4,892,251

LINE MARKING DEVICE

Harrison Bresnen, 571 Elbridge Rd., Morrisville, Pa. 19067

Filed Nov. 14, 1988, Ser. No. 270,662
Int. Cl.[4] E01C *23/16*; B05B *15/06*
U.S. Cl. 239—150 **3 Claims**



3. A surface marking device adapted to mark a guide line or stripe upon the surface of a road or pavement for installation of parking lines and traffic markings, comprising in combination, airless paint spray power system, airless paint spray mechanism, and wheel-mounted paint spray mechanism support carrier; said airless paint spray mechanism including airless paint spray gun, hollow extension pole, nozzle angle head assembly, and paint spray nozzle, wherein said airless paint spray gun is attachable to said airless paint spray power system by suitable first connection means and to one end of said extension pole by suitable second connection means; wherein said nozzle angle head assembly is attachable to the opposite end of said extension pole by suitable third connection means and to said paint spray nozzle by suitable fourth connection means; said paint spray mechanism being supported above the surface of said road or pavement by said support carrier in a manner having said airless paint spray gun upwardly disposed to the rear of said support carrier and said paint spray nozzle downwardly disposed to the front of said support carrier toward the surface of the road or pavement to be marked, wherein said paint spray mechanism support carrier generally comprises a substantially flat support carrier lower table, and a support carrier upper table downwardly inclined from rear to front; said lower table being supported at its front edge by offset wheels, each wheel being rotatably attached to wheel support frame by means of wheel bolt, said wheel support frames extending vertically on each side of said lower table from the bottom wall surface of said lower table in vertical alignment with the side walls of said lower table, being attached thereto by weld means; said lower table being supported at its rear edge by casters, each caster being rotatably attached to a caster housing, said caster housing being attached to a caster frame in a manner to permit swivel rotation of the caster, said caster frames extending vertically on each side of the lower table from the bottom wall surface of said lower table, being attached thereto by weld means; said upper table being supported along the longitudinal axis of said carrier lower table by means of a front upper table support frame and a rear upper table support frame, said front upper table support frame being

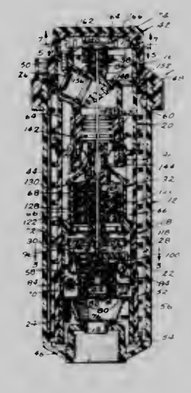
formed at a suitably shorter length than said rear upper table support frame to achieve the desired downward inclination of the carrier upper table from rear to front, said carrier upper table extending from the front edge of said front upper table support frame to the rear edge of said rear upper table support frame, said front upper support frame and said rear upper table support frame being attached to the carrier upper table by weld means at the bottom surface of said upper table, and being attached to carrier lower table by weld means at the top surface of said carrier lower table said upper table having bolt holes formed therein to one side of the area disposed for receipt of said paint spray mechanism, said paint spray mechanism being held in place by means of "J" bolts having threaded ends and which extend through said upper table bolt holes, said "J" bolts being secured by means of wing nuts, said wing nuts being threaded complimentarily with the threads of said "J" bolts for threadedly engagement and cooperation therewith; said support carrier including a suitably graduated scale on the top surface of said carrier upper table to facilitate adjustment of said paint spray mechanism to mark guide lines or stripes of varying widths.

4,892,252

ADJUSTABLE PART CIRCLE SPRINKLER ASSEMBLY

Kenneth J. Bruninga, Mapleton, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Nov. 3, 1988, Ser. No. 266,532
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—205 **34 Claims**



1. An adjustable part circle sprinkler assembly comprising

a sprinkler body structure having inlet means for communication with a source of water under pressure,

a sprinkler head structure mounted on said sprinkler body structure for rotational movement about an upright axis either in one direction or an opposite direction,

means defining a sealed flow path for water under pressure communicated with said inlet means including outlet means in said sprinkler head structure for discharging the water in an upwardly and outwardly extending stream formation so as to be dispersed in an instantaneous generally segmental ground pattern within a circular ground pattern,

said flow path defining means including means defining an annular chamber and reversible flow directing means mounted in said sprinkler body structure for movement between (1) a first position for directing water in said flow path into said chamber in one annular direction and (2) a second position for directing water in said flow path into said chamber in an opposite annular direction,

an impeller mounted in said chamber for rotation by the flow of water in said chamber in a direction corresponding to the annular direction of movement of the water into said chamber,

a meshing gear speed reduction assembly drivingly connected with said impeller and including a rotary output member rotatable in a direction commensurate with the direction of rotation of said impeller and at a speed commensurately less than the speed of rotation of said impeller, the operation being such that said output member cannot be rotationally moved when said impeller is stationarily inoperable,

slip clutch means operatively connecting said rotary output member with said sprinkler had structure for (1) normally operable rotational movement commensurate with the rotational movement of said rotary output member and (2) manual rotational movement in either direction without a commensurate movement of said rotary output member,

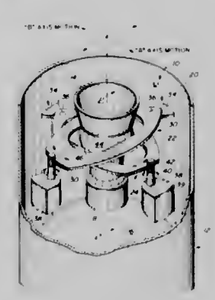
part circle pattern control means operatively connected with said reversible flow directing means and said sprinkler head structure including first means for adjustably predetermining the limits of the part of the circular ground pattern within which the instantaneous generally segmental ground pattern of the water is moved in opposite directions by corresponding opposite movements of the sprinkler head structure through positions within such limits and second means operable when said sprinkler head structure is manually moved as permitted by said slip clutch means into a position beyond the predetermined limits for enabling the sprinkler head structure to be moved in response to the rotational movement of said impeller back within said limits for continued normal movements in opposite directions within said limits.

4,892,253

YOKE NOZZLE ACTUATION SYSTEM

John M. Speicher, and Allan A. Voigt, both of Geyserville, Calif., assignors to Versatron Corporation, Healdsburg, Calif.

Filed Aug. 15, 1988, Ser. No. 232,022
Int. Cl.[4] F02K *9/84*
U.S. Cl. 239—265.35 **23 Claims**



1. A nozzle actuator for controlling the thrust angle of a rocket nozzle used to propel a vehicle comprising:

a vehicle frame support member;

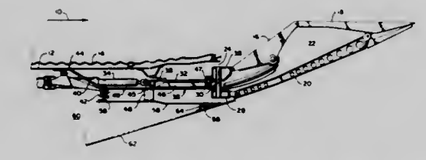
a steerable nozzle mounted to propel the vehicle;

a yoke plate having a bearing surface for contacting the nozzle along one side to transmit force thereto;

means for pivotably mounting the yoke plate to said support member; and

means for pivoting the yoke plate about said mounting means so as to direct force through the bearing surface to change the thrust angle of the nozzle.

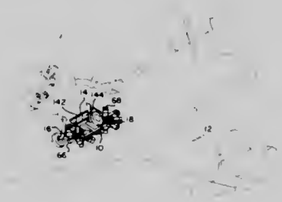
4,892,254
AIRCRAFT ENGINE INTERFACE FAIRING SUPPORT
Raymond P. Schneider, Lake Park; Ronald C. DuPont, Stuart, both of Fla., and Michael J. Dickman, Hanover, N.H., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 9, 1988, Ser. No. 165,954
Int. Cl.[4] B64C 15/06
U.S. Cl. 239—265.41 4 Claims



1. In a gas turbine engine within an aircraft engine compartment an apparatus comprising:
an augmentor duct conveying hot exhaust gas;
a plurality of convergent nozzle flaps forming an adjustable convergent nozzle receiving gas from said augmentor duct;
a plurality of external flaps surrounding said convergent nozzles in spaced relationship forming a flap chamber therebetween;
a sync ring pivotally connected to said convergent nozzle and said external nozzle for adjusting the position of said nozzles;
a static support structure circumferentially surrounding said augmentor duct, the upstream end of said support structure supported from said augmentor duct, a cylindrical stiffner at the upstream end of said support structure;
an actuator supported at least in part from said stiffner and connected to said sync ring for providing an axial travel of said sync ring;,
a cylindrical impervious lightweight fairing surrounding said support structure from said stiffner location to the location of the connection of said sync ring to said nozzle flaps;
a plurality of finger seals located on said stiffner and sealingly biased against said fairing, whereby fumes from said engine compartment may not enter the space inside said fairing; and
said fairing supported from said support structure at a support location on said support structure;
said support location being upstream of the travel of said sync ring and downstream of said stiffner.

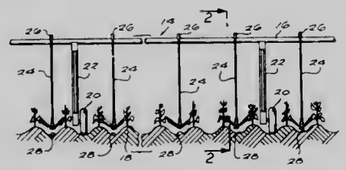
4,892,255
CENTRIFUGAL APPLICATING DEVICE
John E. Waldrum, 349 Fairview Ave., Ambler, Pa. 19002
Filed Oct. 14, 1988, Ser. No. 258,186
Int. Cl.[4] A01C 19/00; B64D 1/18
U.S. Cl. 239—682 15 Claims

1. An applicating device for spreading granular materials from a storage hopper mounted in an aircraft comprising
an upper plate secured to the aircraft below the storage hopper, the upper plate being provided with a pair of spaced material inlet openings to receive the granular materials from the storage hopper therethrough,
a pair of star wheel applicators rotatively secured to the upper plate, each star wheel applicator being positioned respectively below a material inlet opening, the star wheel applicators receiving portions of the granular materials from the storage hopper through the material inlet openings,
the star wheel applicators each comprising a central opening and a plurality circumferentially spaced hollow nozzles leading outwardly from the central opening,
a plurality of planar, enlarged paddles, each paddle being respectively affixed to a side of a nozzle to receive wind forces generated by forward movement of the aircraft to cause rotation movement of the star wheel applicators, each paddle being integral with and directly connected to its associated nozzle;



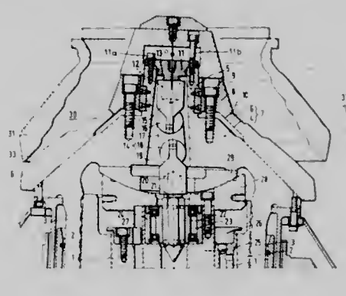
whereby the granular materials will be spread in a circular pattern by centrifugal force through the nozzles of each star wheel applicator.

4,892,256
UP-SPRAY DEFLECTOR CUP FOR SPRAYING THE UNDERSIDE OF PLANT FOLIAGE
Richard D. Brown, Glendora; Doyle R. Metz, Ontario, and Roger W. Perkins, Glendora, all of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Sep. 1, 1988, Ser. No. 239,796
Int. Cl.[4] B05B 1/26; A01G 25/09
U.S. Cl. 239—734 8 Claims



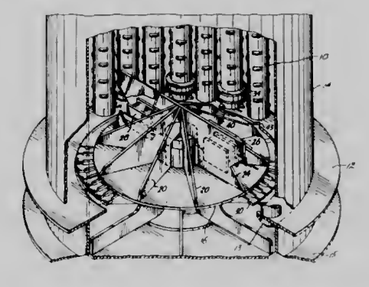
5. An up-spray deflector cup for deflecting water from a downwardly directed nozzle upwardly and radially outwardly as a pair of oppositely directed fan shaped sprays, said deflector comprising:
a circular bottom having a generally horizontal upper face;
a peripheral side wall integrally formed with said bottom and projecting upwardly and radially outwardly therefrom; and
first and second diametrically opposed pairs of vertical walls projecting radially inwardly from said side wall and terminating inwardly and vertical apices lying in a vertical plane diametrically through said bottom, the arcuately facing walls of each pair of vertical sides cooperating with the adjacent side wall portion extending therebetween to define deflecting surfaces for forming symmetrical fan shaped spray patterns on each side of said plane.

4,892,257
CONE CRUSHER COMPRISING ECCENTRICALLY DRIVEN CRUSHING CONE AND A MEANS FOR PREVENTING THE ENTRAINMENT OF THE CRUSHING CONE DURING NO-LOAD OPERATION
Helmut Stoeckmann, Wesseling; Klaus Schuette, and Franz-Rudolf Schmitz, both of Cologne, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 15, 1988, Ser. No. 284,919
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742460
Int. Cl.[4] B02C 2/04
U.S. Cl. 241—32 10 Claims



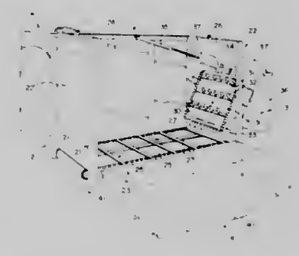
1. A cone crusher comprising in combination:
an eccentrically driven crushing cone;
a stationary main shaft;
and a means for preventing the entrainment of the crushing cone given no-load operation in the form of a one way clutch that is functionally connected between the crushing cone and the stationary main shaft of the crusher via a torsionally stiff articulated shaft arranged between the crushing cone and the one way clutch and having multiple individual parts including an upper connecting part and a lower connecting part and a common middle part and a first universal joint between the upper and middle and a second universal joint between the middle and lower part.

4,892,258
COMMINUTER FOR SOLID MATERIAL
John H. Hughes, 439 Monte Elma Rd., Montesano, Wash. 98563
Continuation of Ser. No. 861,424, May 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 635,213, Jul. 27, 1984, abandoned. This application Apr. 11, 1988, Ser. No. 183,270
Int. Cl.[4] B02C 23/10
U.S. Cl. 241—79.3 15 Claims



1. In an apparatus for comminuting solid materials to form particles, including a housing defining a comminuting chamber, said comminuting chamber formed by a series of comminuting rolls arranged within said housing, said housing further defining an adjacent discharge chamber, screening means located at an interface between said comminuting chamber and said discharge chamber, said screening means including a disk horizontally mounted within said housing for free rotation in a horizontal plane, said disk having a peripheral edge spaced from said comminuting rolls to define therebetween a size restriction passage for particles moving from said comminuting chamber to said discharge chamber, a series of screening members mounted on said disk independently of one another, a first portion of each of said screening members extending past said peripheral edge of said disk into said size restriction passage, and means for positioning each screening member relative to each other screening member past said peripheral edge of said disk so as to allow independent selective variation of the size of said first portion of each said screening members extending past said peripheral edge of said disk.

4,892,259
APPARATUS FOR RECEIVING, TRANSPORTING, CHOPPING, AND DISPENSING BLOCKS OF FODDER
Hans von der Heide, Ibbenbürener Str. 17, 4530 Ibbenbüren 2 - Laggenbeck, Fed. Rep. of Germany
Filed Dec. 2, 1988, Ser. No. 278,974
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740761; Mar. 9, 1988, 3807738
Int. Cl.[4] B02C 21/02
U.S. Cl. 241—101.7 7 Claims



1. Apparatus for picking up, transporting, comminuting and dispensing fodder blocks, especially silage, brewers' grains and/or corn cob mix, comprising:
a body having an open end;
loading means for loading a fodder block into said body;
conveyor means disposed on a floor of said body and running transversely of a longitudinal axis of the apparatus; and
means for the comminution and lateral discharge of the fodder block, said loading means comprising a platform which can be turned about a horizontal shaft close to said floor of said body and adjacent said open end from a flat, approximately horizontal position for driving under a block and picking it up and dumping it into said body, to a substantially vertical position closing said end of said body, as well as in the reverse direction, and said means for the comminution and discharge comprising at least one cutter chain system disposed laterally on said body and sloping upwardly and outwardly.

4,892,260

KNIFE ROLLER FOR AN APPLIANCE FOR THE PRECOMMINUTION OF FROZEN MATERIAL

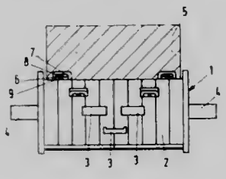
Juergen Hager, Hueckeswagen, and Walter Vieth, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Magurit Gefrierschneider GmbH, Remscheid-Lennep, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 301,536

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 8800928[U]

Int. Cl.[4] B02C *18/18*

U.S. Cl. 241—282.2 23 Claims



1. A knife roller used in an appliance for the precomminution of a frozen block of material, comprising:

an annular roller member having an outer surface which is rotatable about an axis;

at least one cutting member fastened to said roller member;

said cutting member having a U-shaped bow knife for cutting strips of material from said frozen block, said bow knife formed by a shearing knife spaced a radial distance from the surface of said roller member and two radially extending precutters, each of said precutters attached at their radially outermost end to respective ends of said shearing knife, and at their radially innermost end to said roller member, said shearing knife and said precutters defining a chip passageway;

said cutting member further having at least one substantially radially extending transverse knife secured between said precutters within said chip passageway for cutting said strips of material removed by said bow knife into smaller chips of material.

4,892,261

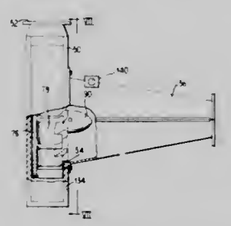
MATERIAL COMMUNITOR

Thomas E. Rolie; David J. Nebel; John L. Shulan, and William P. Liljestrom, all of Dubuque, Iowa, assignors to The T.D.J. Co., Inc., Dubuque, Iowa

Continuation of Ser. No. 112,408, Dec. 7, 1987, which is a continuation of Ser. No. 841,795, Mar. 20, 1986, Pat. No. 4,718,609. This application Apr. 21, 1989, Ser. No. 341,793

Int. Cl.[4] B02C *19/18*

U.S. Cl. 241—301 2 Claims



1. A device for the comminution of solid material comprising:

(a) a turbine comprising a plurality of blades mounted on a shaft for rotation about an axis, said shaft mounted in cantilevered manner in a set of bearings;

(b) a motor;

(c) a drive connection between said motor and said turbine for rotatably driving said turbine;

(d) a housing enclosing said turbine having an axial inlet and a tangential outlet for the passage of an air stream caused by said rotating turbine;

(e) means for varying the comminution effect of said device upon said material comprising an expansion chamber connected at one end to the axial inlet of said housing and connected at another end to a varied size velocity chamber; and

(f) feed tube means for feeding material to be comminuted into said air stream upstream of said velocity chamber;

whereby, material carried in said air stream is subjected to a rapid decrease in pressure in said expansion chamber as said material is drawn through said expansion chamber, said decrease in pressure being adjustable by interchanging various sized velocity chambers to vary the size of resultant comminuted material, and said material is comminuted and is exhausted with said air stream through said housing outlet.

4,892,262

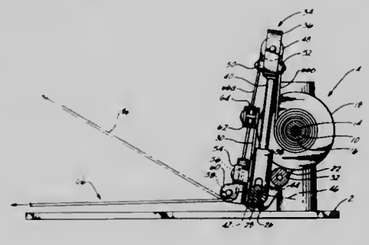
LEVEL WINDER FOR WINCH

George H. Hurst, Redlands, Calif., assignor to George Hurst Level Winders, Inc., Los Angeles, Calif.

Continuation of Ser. No. 9,098, Jan. 21, 1987, abandoned, which is a continuation of Ser. No. 780,614, Sep. 26, 1985, abandoned. This application May 3, 1988, Ser. No. 191,793

Int. Cl.[4] B65H *57/28*

U.S. Cl. 242—157.1 5 Claims



1. A level winder in combination with a winch having a drum on which a cable is wound from a fleet point in a contiguous helical configuration, the drum having an axis of rotation and edges, the level winder comprising:

a cable control arm mounted on support means at one end and pivotable about a first axis lying in a plane extending perpendicular to the plane including the drum axis of rotation and a second axis intersecting the first axis and extending parallel to the drum axis of rotation, the arm having oppositely disposed cable approach and drum approach sides, the cable approach side facing towards the fleet point and the drum approach side facing towards the drum;

a support member attached to said support means on the cable approach side of the control arm;

a first pulley mounted on the support member and rotatable about an axis extending transversely of the cable approach direction to the control arm;

a second rotatable pulley rotatably mounted on the distal end area of said control arm for rotation about an axis extending parallel to the plane including the drum axis, said second pulley arranged to guide the cable and reverse its direction between the cable and drum approach sides of the control arm;

a first pair of opposed guide rollers mounted on the support member between the first and second pulleys, said first pair of guide rollers arranged to guide the cable between the first and second pulleys and to rotate about parallel axes extending perpendicular to the first pulley axis;

the distance between the first pair of guide rollers and said second pulley defining a first cable length and the distance between the second pulley and the drum defining a second cable length when a cable is fitted between the first pulley, the second pulley and the drum;

the geometric relationship between the drum axis, the control arm, first and second axes, and the first and second cable lengths being such that, when said control arm pivots about either or both its first and second axes, the total sum of said cable lengths remains constant while each of said lengths varies inversely relative to the other, whereby a cable approaching the control arm, extending over the pulleys and wrapping around the drum from the drum approach side of the control arm is wound in contiguous helical turns by the force of the approaching cable turns reacting against the control arm and causing its pivotal motion about is first axis, and whereby the reaction force of the cable approaching the drum and progressively encountering a larger diameter surface as the cable is wound on the drum causes the control arm to pivot about its second axis.

4,892,263

UNWINDING APPARATUS FOR A PAPER OR BOARD WEB

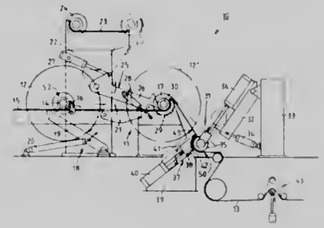
Rudolf Beisswanger, Steinheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,522

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723600

Int. Cl.[4] B65H *19/14*

U.S. Cl. 242—58.3 10 Claims



1. An apparatus for unwinding a paper web wound as a parent roll on a roll axle for subsequent handling by a succeeding rewind station, said apparatus comprising:

an unwinding unit including guideway means for receiving the ends of the roll axle of the parent roll, the parent roll being movable between a waiting position and an unwinding position on said guideway means;

splicing means for splicing the web-end of an unwound web to the web-beginning of a parent roll located in the unwinding position, said splicing means including a cross member substantially parallel to the roll axle of the parent roll, the cross member being movable against the unwound web substantially perpendicularly to the direction of web travel from a position in which the cross member is out of contact with the web to a position in which the cross member is partially wrapped by the web-end of the unwound web, the cross member wrapped by the web-end being movable against the parent roll, the parent roll being provided at the periphery thereof with adhesive on the web-beginning, the parent roll during splicing being fixed in the unwinding position with the adhesive in the path of motion of the web-end wrapped on the cross member;

separating means for separating the web expiring from the parent roll substantially perpendicularly to the direction of web travel, said separating means being movable between a working position in which the web, when stationary, is clamped to the cross member of said splicing means by said separating means and a neutral position out of contact with the web to which said separating means is returned after separation of the web;

lifting means for lifting out of the unwinding position the roll axle of an expired parent roll whose expiring web has been separated by said separating means; and

a dancer roller arranged after said splicing means in the direction of web travel, said dancer roller dipping into the unwound web expiring from the parent roll and emerging therefrom during splicing of the web.

4,892,264

LOWERING MECHANISM FOR THE FOIL IN A DEVICE FOR WINDING-UP A FOIL WEB, PARTICULARLY A SYNTHETIC-MATERIAL FOIL WEB

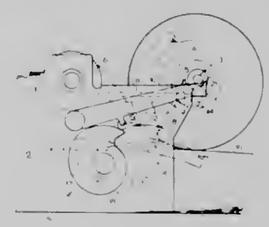
Norbert Achterwinter, Hilden, and Wolfgang Hax, St. Augustin, both of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,017

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3721966

Int. Cl.[4] B65H *19/26*

U.S. Cl. 242—58.6 5 Claims



1. A lowering mechanism for a foil roll in a device for winding up a foil web comprising:

a frame;

a contact roller mounted on said frame for guiding said foil web;

a roll core receiving said foil web guided from said contact roller, said foil web being wound around said roll core to form said foil roll;

a pair of loweing arms each for receiving an end of said roll core, said lowering arms each attached to one side of said frame;

a pair of lowering arm plates mounted each on a side of said frame having an outer leading edge basically in the shape of a numeral 6;

a guide means attached to each of said lowering arms to guide said arms through contact with said cam plates;

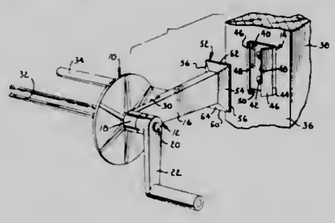
a drive shaft connecting said pair of lowering cam plates; and

a drive means for rotating said drive shaft whereby as said cam plates are rotated by said drive means said lowering arms are moved between vertical positions for removing said foil roll.

4,892,265
WRAP WINDER WITH REVERSIBLE MOUNTING BRACKET

Lloyd D. Cox, Rte. 2, Box 81A, Pratt, Kans. 67124

Filed Aug. 26, 1988, Ser. No. 237,055
Int. Cl.[4] B65H *17/46*; A47B *96/06*
U.S. Cl. 242—67.1 R **1 Claim**



1. Apparatus for rolling elongated, flexible leg wraps to facilitate the application of wraps to horses, said apparatus comprising:

an elongated, rigid frame rotatably mounting a winding spindle projecting from one side of the frame and a handle for turning the spindle projecting from the opposite side of the frame;

a mounting bracket adapted to be secured to a support for mounting the frame in outwardly projecting relationship from said member, said bracket comprising a substantially rigid element having a back section with a substantially flat major surface and a back surface, said element being adapted to be secured to said member, said bracket having a pair of forwardly extending planar side sections integral with the back section and projecting forwardly therefrom, said side sections being inclined inwardly toward one another and terminating in parallel, vertically extending edges with the edge of each side section spaced from the edge of the other side section whereby said side sections and the back section conjointly define a generally T-shaped, vertically extending slot open at the top and front of the bracket, the latter including a restriction adjacent the bottom of the slot, the sides of said slot being defined by said inclined planar side sections of the bracket and the back of the slot being defined by said flat major surface; and

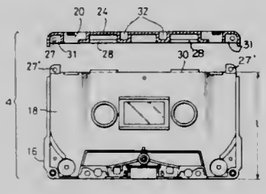
an elongated, rigid component rigidly carried by the frame at one end of the latter for complemental insertion of the component longitudinally in the slot from the open upper end thereof for releasably securing the component and frame together to mount the frame to the member when the component is in said slot, said component having a flat face engageable with the bracket major surface and a pair of forwardly and inwardly beveled side shoulders engageable with the slot defining edges of said bracket side sections when the component is in said slot, the component being longitudinally symmetrical to permit insertion of the component into the slot from either end of the component so that the frame may be mounted on the member in disposition with the handle and spindle projecting in either of two selected directions from the frame,

said bracket restriction comprising a flange on each bracket side section respectively, each respective flange projecting inwardly toward said bracket flat major surface and terminating in an edge at the bottom of said slot extending in spaced apart relationship from said flat major surface, and wherein said component has forwardly and inwardly beveled end shoulders on the respective ends of the component, a corresponding one of said end shoulders being adapted to engage the edges of said flanges when the component is installed in said slot.

4,892,266
MAGNETIC TAPE CASSETTE

Kimio Tanaka; Takateru Sato, both of Saku, and Haruo Shiba, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,227
Int. Cl.[4] G11B *23/04*
U.S. Cl. 242—199 **6 Claims**



1. A magnetic tape cassette having a front and rear portion comprising:

(a) upper and lower half members defining a housing having a front end and a rear end, wherein the front end of said housing is also the front portion of said tape cassette,

(b) a pair of rotary hubs having a magnetic tape wound therearound, wherein said hubs are rotatably housed in said housing,

(c) guide rollers and tape guides provided on said upper and lower half members for guiding said magnetic tape from one of said hubs to the other of said hubs by way of the front end of said housing,

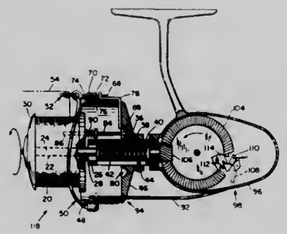
(d) a rear member having a front end and a rear end, wherein the rear end of said rear member is also the rear portion of said tape cassette, and wherein the rear end of said rear member comprises a means for preventing erasure by mistake and a means for detecting the kind of magnetic tape wound around said hubs, and

(e) coupling means for coupling the front end of said rear member to the rear end of said housing.

4,892,267
COMBINATION FISHING REEL

Charles A. Webb, 21 Amherst St., Nashua, N.H. 03060

Continuation-in-part of Ser. No. 99,497, Sep. 27, 1987, abandoned. This application Jan. 28, 1988, Ser. No. 149,493
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—228 **16 Claims**



1. Fishing reel comprising:

a support member;

a spool rotatably mounted on the support member, said spool positioned on the support member to allow line wound upon the spool to be discharged in a direction approximately parallel to the axis of the spool;

recovery means for rotating the spool about its axis for retrieving line, the recovery means comprising:

a worm gear coaxially coupled to the spool, the worm gear having a continuous groove which traverses the gear; and

a gearing mechanism for rotating the worm gear about its axis;

a guide mechanism for distributing line onto the spool when the recovery means rotates the spool;

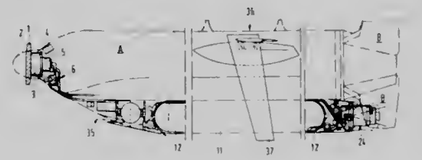
a follower secured to the guide mechanism and fitted within the groove of the worm gear for tracing the path of the groove when the worm gear is rotated thereby causing the guide mechanism to traverse the axis of the spool; and

means for pivoting the guide mechanism from a loaded line disengaged position to a line engaged retrieval position when the spool is rotated.

4,892,268
PROPULSION, MONITORING AND CONTROL UNIT PARTICULARLY FOR BALLISTIC OBJECTS

Claudio Peretti, and Guglielmo Rebuffatti, both of Lombardore Turin, Italy, assignors to A.R.I.S.S.p.A., Lombardore Turin, Italy

Filed Aug. 5, 1988, Ser. No. 228,973
Int. Cl.[4] F42B *15/033*
U.S. Cl. 244—3.1 **6 Claims**



1. A command, control and propulsion unit applicable to ballistic objects, to give them the capability of autonomous flight for a pre-established period, following launching from a carrier aircraft, the munitions having a body, and the unit comprising:

substantially bivalve air carrying equipment consisting of a winged saddle mounted to straddle the body of the munition, and a cradle mounted in radial opposite position to the saddle and with respect to the body which is locked between the saddle and the cradle;

removable means for mutual coupling of the saddle, cradle, and the body;

an alternator;

a pump;

a wind-drive propeller for operating said alternator and said pump;

a warhead integral with said wind-drive propeller;

an electric plant contained in the cradle fed by electric power generated by the alternator;

a first tank disposed in the cradle having a pressurizable vacuum space for carrying liquid oxygen;

second tanks for carrying liquid fuel;

a rocket motor for controlling flight of the munition; and

a plurality of devices for control and command of the motor.

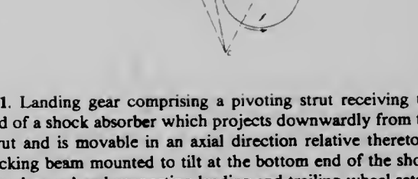
4,892,269
SPINNER DUCTED EXHAUST FOR PUSHER TURBOPROP ENGINES

Robert J. Greco, Tempe, and Jack D. Betterton, Mesa, both of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Apr. 28, 1988, Ser. No. 187,619
Int. Cl.[4] B64D *33/00, 29/00*
U.S. Cl. 244—53 R **18 Claims**

8. A method of cooling the interior of a nacelle surrounding an aircraft turboprop engine, of the type having a rotatable propeller and spinner assembly mounted to a gearbox immediately downstream of the turbine engine, comprising the steps of:

providing structure defining an annular ducted fan circumscribing a portion of said spinner assembly, said portion including the propeller blades, and configuring said ducted fan to contain a plurality of hollow, aerodynamic fan blade members surrounding the root of each propeller blade;



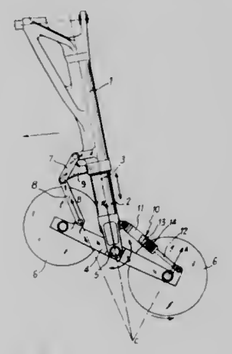
aligning said ducted fan with the open aft end of said nacelle; and

rotating said ducted fan structure in unison with said propeller to assist the flow of cooling air through said engine nacelle.

4,892,270
ROCKING BEAM LANDING GEAR

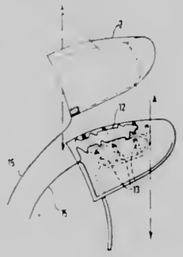
Michel Derrien, Versailles; Jacques Veaux, Chatillon, and Jean-Pierre Hainaut, La Queue en Brie, all of France, assignors to Messier-Haspano-Bugatti, Montrouge, France

Filed Jun. 8, 1988, Ser. No. 203,994
Claims priority, application France, Jun. 9, 1987, 87 07996
Int. Cl.[4] B64C *25/36*
U.S. Cl. 244—104 R **7 Claims**



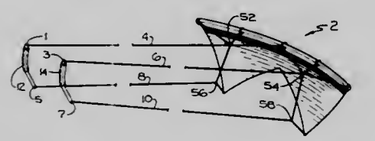
1. Landing gear comprising a pivoting strut receiving the rod of a shock absorber which projects downwardly from the strut and is movable in an axial direction relative thereto, a rocking beam mounted to tilt at the bottom end of the shock absorber rod and supporting leading and trailing wheel sets, a torque linkage comprising a top branch and a bottom branch which are hinged to each other, the top branch being hinged to the strut and the bottom branch being hinged to the rocking beam, and locking means for limiting a downwards pivot movement of the top branch of the torque linkage while the shock absorber rod is in both a fully extended and nonfully extended position.

4,892,271
CORONA DISCHARGE SURFACE TREATMENT AND AIRCRAFT COCKPIT CANOPIES SO TREATED
Andrew M. Elford, Eastleigh, United Kingdom, assignor to British Aerospace PLC, London, United Kingdom
Filed Oct. 11, 1988, Ser. No. 255,398
Claims priority, application United Kingdom, Oct. 14, 1987, 8724078
Int. Cl.[4] B64C *1/14*
U.S. Cl. 244—121 7 Claims



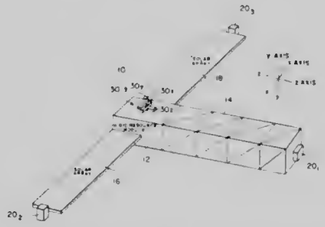
1. Apparatus for electrically pre-treating selected areas of a shaped article by corona discharge, comprising an electrically nonconductive jig shaped to conform with the internal shape of, and to mount, the article, electrode means mounted on said jig and connectable to a source of high voltage, the improvement consisting in that at least one rebate is formed in an external surface of said jig of a shape, size and position corresponding to said selected areas said electrode means being located in said at least one rebate at a predetermined depth and in that said electrode means and said article are in use connected to terminals of opposite polarity of said source whereby on application of a potential difference between the article and the electrode means a corona discharge occurs at said selected areas only.

4,892,272
KITE-LIKE FLYING DEVICE WITH DUAL HANDLES AND FOUR POINT CONTROL
Joseph R. Hadzicki, 4489 Caminito Cuarzo, San Diego, Calif. 92117
Filed Oct. 14, 1988, Ser. No. 257,859
Int. Cl.[4] B64C *31/06*
U.S. Cl. 244—153 R 9 Claims



1. A kite, comprising:
a substantially double V shaped sail having a left wing and a right wing each connected to a supporting frame, said frame having a leading edge support member associated with a left wing strut member and with a right wing strut member;
bridle means associated with said frame, said bridle means having a horizontal line member connected to said leading edge support member, a left wing vertical line member connected to said left wing strut member, and a right wing vertical line member connected to said right wing strut member; and
a set of control lines connected to said bridle, said set of control lines including an upper left line and a lower left line connected to upper left and lower left control line contact points, for controlling inclination of said left wing, respectively, and an upper right line and lower right line connected to upper right and lower right control line contact points, respectively, for separately controlling inclination of said right wing.

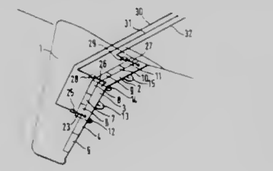
4,892,273
ACTIVE DAMPING OF SPACECRAFT STRUCTURAL APPENDAGE VIBRATIONS
Joseph V. Fedor, West Hyattsville, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Dec. 30, 1988, Ser. No. 292,143
Int. Cl.[4] B64G *1/28*
U.S. Cl. 244—158 R 10 Claims

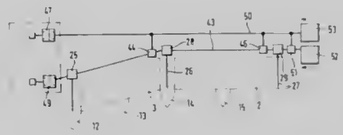


1. Apparatus located on a space platform for actively damping structural appendage vibrations along three mutually perpendicular axes of a generally flexible body member attached to a generally rigid body member wherein the apparatus for each axis comprises:
means for sensing the inertial acceleration substantially at the end of said flexible body member and generating a first acceleration signal indicative thereof;
means for sensing the inertial acceleration of said rigid body member and generating a second acceleration signal indicative thereof;
means for determining the difference between said first and second acceleration signals and integrating the difference therebetween to generate a signal proportional to the relative motional velocity at the end of said flexible body member;
electrical circuit means responsive to said signal proportional to relative velocity for generating a motor drive signal;
an electric motor responsive to said motor drive signal for operating an inertia wheel; and
an inertia wheel connected to said motor for developing a torque for damping a predetermined vibrational mode along one of said axes.

4,892,274
SEGMENTIZED FLAP SYSTEM
Ulrich Pohl, Bremen, and Juergen Renken, Freyersen, both of Fed. Rep. of Germany, assignors to MBB GMBH, Bremen, Fed. Rep. of Germany
Filed Aug. 26, 1986, Ser. No. 900,508
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530865
Int. Cl.[4] B64C *9/06, 9/16*
U.S. Cl. 244—213 5 Claims

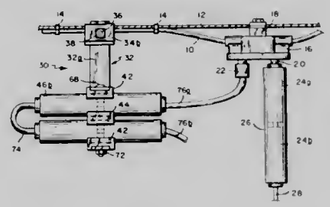
1. A flap system for transonic aircraft wings which system includes flap segments arranged in span direction, a driving system for protraction and retraction of the flap segments, comprising:
a plurality of spindle drives connected to said flap segments such that each flap segment is connected to at least two spindle drives; and
control means for controlling said spindle drives in such a manner that at least some of the drives are independently





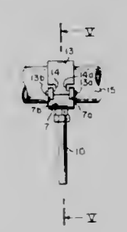
controlled from each other, such that those of the spindle drives that are connected to the same flap segment, are controlled independently from each other to obtain pivoting of that same flap segment on a vertical axis.

4,892,275
TRAP BRACKET ASSEMBLY
Andrew Szegda, Canastota, N.Y., assignor to John Mezzalingua Assoc. Inc., Manlius, N.Y.
Filed Oct. 31, 1988, Ser. No. 265,028
Int. Cl.[4] E21F *17/02*
U.S. Cl. 248—61 8 Claims



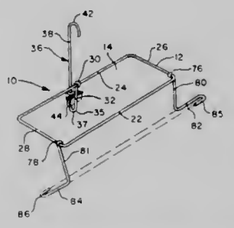
1. For use in a cable television system having a coaxial cable extending coextensively with and supported by a support cable, with the coaxial cable being adapted to carry a plurality of television signals which are scrambled by scrambling signals injected therein, the continuity of the coaxial cable being interrupted by at least one tap from which the scrambled television signals may be directed via a drop line to subscriber's receiver, with filter traps contained in protective shields and connected in series in the drop line between the tap and the subscriber's receiver to filter out the scrambling signals, the improvement comprising: a trap bracket assembly for supporting said shields and the traps contained therein at a location proximate to said trap, said bracket assembly including:
(a) a hanger bracket having a vertical segment, a lower segment extending horizontally from said vertical segment to define an L-shaped configuration, and an upper segment extending horizontally from said vertical segment to overlie said lower segment;
(b) first connector means associated with said upper segment for detachably securing said hanger bracket to the support cable;
(c) a plurality of vertically stacked clamp blocks underlying said lower segment, said clamp blocks having complimentary confronting sides configured to grip said shields therebetween and to maintain said shields in a mutually spaced parallel arrangement; and
(d) second connector means for separably interconnecting said clamp blocks to each other and to said lower segment.

4,892,276
COLLAR FOR FASTENING PIPES, CABLES, RODS AND THE LIKE
Walter Alessio, 24 Via E.Fermi, Paderno Dugnano MI, Italy
Filed Oct. 17, 1988, Ser. No. 258,792
Int. Cl.[4] F16L *3/10*
U.S. Cl. 248—74.1 1 Claim



1. A pipe-fastening collar of the type having a first upper and a second lower arcuate half-clamps arranged opposite each other, the lower half-clamp being centrally integral with a stud anchored onto a support surface, wherein:
said first upper half-clamp is provided at a first end with a flat flange having a bore for a bolt therein and at a second end opposite said first end with hooking means consisting of two end pins, axially opposite each other, defined by two slots provided on both sides of said half-clamp end; and
said second lower half-clamp is provided at a first end with a flat flange having a bore corresponding to the bore of said first upper half-clamp and at a second end opposite said first end with open hinge hooking means consisting of two flanges arcuate upwards and towards the outside of the half-clamp, so as to rotatably house said end pins of said first upper half-clamp.

4,892,277
WIRE SUPPORT RACK FOR DISPOSABLE PLASTIC TRASH BAGS
Mark A. Tobis, 1195 Sanders Rd., Northbrook, Ill. 60062
Filed Oct. 24, 1988, Ser. No. 261,105
Int. Cl.[4] B65B *67/12*
U.S. Cl. 248—101 1 Claim



1. A mounting for a conventional plastic bag having a body portion and an upper foldable portion from a mower handle having a hand held cross-bar and a pair of side members extending downwardly and forwardly to the mower comprising;,

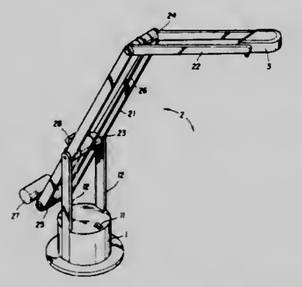
a peripheral frame comprising an endless quadrilateral wire a hoop adapted to receive the body of the bag therethrough with an upper portion folded thereover;
a hanger with a U-shaped lower portion comprising laterally spaced inner and outer vertical legs;
means securing the upper end of the inner leg to the hoop;
a hook at the upper end of the other leg adapted to hook over the cross-bar; and
a releasable securement mounted between said legs for holding the folded portion of the bag entered therein and a pair of tensioning hoots extending laterally from said side members for hooking thereabout.

4,892,278

REVOLVING SHAFT CONTROLLED MOVABLE LAMP STAND

Soddy Huang, 2F, No. 31, Lane 57, Tung Shun St., Shulin, Taipei Hsien, Taiwan

Filed Feb. 7, 1989, Ser. No. 307,878
Int. Cl.[4] F21V *21/14*
U.S. Cl. 248—124 **3 Claims**



1. A revolving shaft controlled movable lamp stand including a stand, a driving mechanism, and an illuminator lamp socket comprising: said driving mechanism comprises an actuating rod having a bottom and an upper end and driven rod, both said actuating rod and said driven rod being pivotally connected by means of an upper revolving shaft; said stand comprising two supporting arms bilaterally disposed to pivotally connect with said actuating rod by means of a located rod; a lower revolving shaft being pivotally connected with said actuating rod at the bottom end thereof; a holder and a handle being made on said lower revolving shaft and said locating rod respectively; said lower revolving shaft and said upper revolving shaft each comprising a circular groove and a hole, each said hole comprising an end a and an end b; a rope being provided to wind round said upper and lower revolving shafts through said holes and circular grooves of said upper and lower revolving shafts, to further let one end of said rope, which comprises a screw rod, be screwed up with the other end of said rope, which comprises a fastening matching means, so as to form a closed circulation; by means of said arrangement, said actuating rod being adjusted to change position by means of the operation through said hole and said handle so as to change the projecting position of the attached illuminator; said driven rod being adjusted by means of the up-and-down displacement of said holder, to drive said lower revolving shaft to provide an angular displacement so as to further let said rope drive said upper revolving shaft to make a synchronous movement and to further let said upper revolving shaft drive said driven rod to displace up-and-down and to change the position of the attached illuminator.

4,892,279

FULLY PORTABLE MEDICAL I.V. EQUIPMENT STAND/POLE

William G. Lafferty, and Robert E. Howard, both of Deephaven, Minn., assignors to Polymedical Technologies, Inc., Deephaven, Minn.

Filed May 4, 1987, Ser. No. 45,329
The portion of the term of this patent subsequent to Nov. 9, 2005, has been disclaimed.
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—125 **4 Claims**



1. A collapsible and fully portable medical I.V. equipment stand/pole of a character described above which comprises:
a. a many sectioned mast assembly made from hollow tubes, with each being of a slightly larger diameter and the smallest being the uppermost tube and the largest being the lowermost, and each being able to slide smoothly within one another in a telescoping fashion;
b. an internal pneumatic safety device built within the lower section of said tube mast assembly which acts to compress air as the upper sections of said mast assembly are lowered accidentally or on purpose thereby limiting the downward force and speed of said upper sections, but allowing movement of upper sections in both directions;
c. a slidable control handle assembly which is mounted on the lower section of said mast assembly to which the lower leg supports a plurality of legs which support said mast assembly are connected via vertical rods and which allow for opening or closing of square tubular leg supports in one continuous motion;
d. a hanger rod assembly which is permanently attached to the top of the uppermost said tubular section of said mast allowing independent inward and outward movement of each hanger rod and which rotates freely in either direction 360 degrees around the circumference of said uppermost tubular section and both movements of said hanger rod asembly which are free or able to be locked into position with the loosening or tightening of a vertically positioned control knob.

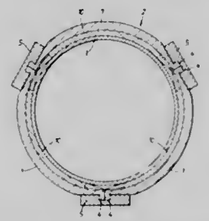
4,892,280

CLAMPING DEVICES FOR USE WITH ELONGATE MEMBERS

John D. McGugan; William A. Turner, and Robert A. M. Hunt, all of Aberdeen, Scotland, assignors to Hunting Oilfield Services Limited, Aberdeen, Scotland

Filed Sep. 29, 1988, Ser. No. 250,714
Claims priority, application United Kingdom, Oct. 5, 1987, 8723352
Int. Cl.[4] A47B *96/00*
U.S. Cl. 248—230 **19 Claims**

1. A clamping device for clamping onto an elongate member comprising an annular shell for surrounding the elongate member and formed by a plurality of generally part annular segments, each segment having generally axially extending edges, each edge being provided with an outwardly projecting rib extending axially therealong, the ribs of adjacent segments being in use juxtaposed, engagement members for engaging each pair of juxtaposed ribs for holding the segments together around the elongate member, the engagement members being slidable longitudinally of the ribs into full engagement with the respective pairs of juxtaposed ribs, wherein part at least of the inner surface of the shell is frustoconical and wedge means are



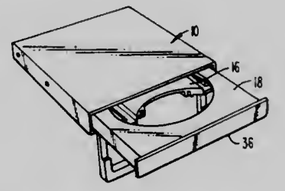
provided for positioning between the shell and the elongate member to stress said part of the shell to clamp the shell around the elongate member, the wedge means comprising a plurality of axially extending, circumferentially spaced wedge members, each having an inner surface shaped to engage the surface of the elongate member and a part frustoconical outer surface corresponding to the frustoconical inner surface of said shell, said wedge members being axially movable relative to the shell for adjusting the force applied by the shell to the elongate member.

4,892,281

GENERIC BEVERAGE CONTAINER HOLDER

Michael DiFilippo, Royal Oak, and David N. Grabowski, Rochester Hills, both of Mich., assignors to Chivas Products Limited, Sterling Heights, Mich.

Continuation-in-part of Ser. No. 4,994, Jan. 20, 1987, Pat. No. 4,738,423. This application Dec. 29, 1987, Ser. No. 138,988
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—311.2 **17 Claims**



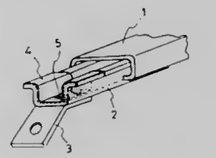
1. A generic container holder, usable with containers over a range of lateral sizes, for mounting to a surface comprising:
a housing mountable to said surface;
a frame mounted to said housing for movement between a retracted position, wherein said frame is within said housing, and an operational position, wherein said frame extends from said housing, said frame having a portion defining a central open area for receiving said containers;
said frame including first and second telescoping members for moving between an extended condition and a collapsed condition as said frame moves between said retracted and operational positions, each of said first and second telescoping members having a peripheral edge;
said central opening being formed by the peripheral edges of said first and second telescoping members.

4,892,282

SEAT SLIDING APPARATUS FOR VEHICLES

Saburo Suzuki, Tokoname; Takami Terada, Toyota, and Masayuki Yamazaki, Himi, all of Japan, assignors to Aisin Seiki,Co. Ltd., Japan

Filed Sep. 28, 1988, Ser. No. 250,465
Claims priority, application Japan, Sep. 29, 1987, 62-148999[U]
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—430 **4 Claims**



1. A slide assembly for a seat, comprising:
a longitudinally extending elongated lower rail having a generally U-shaped cross sectional configuration with a central base portion and spaced legs each with an outwardly extending flange portion adjacent an outer end, each flange portion having an edge surface;
a bracket affixed to the lower rail for fastening the rail to a surface with the legs extending in a substantially upward direction;
an upper rail, for attachment to the seat, slidably mounted to the lower rail for longitudinal movement relative the lower rail;
a reinforcing member having a length substantially shorter than the lower rail and having a generally U-shaped cross-sectional configuration with outwardly extending flange portions substantially corresponding to the lower rail cross-section, said member being disposed in mating relationship adjacent at least one end of the lower rail extending longitudinally for a portion of the length thereof providing lateral rigidity to the lower rail; and
means for fixing said reinforcing member to said lower rail.

4,892,283

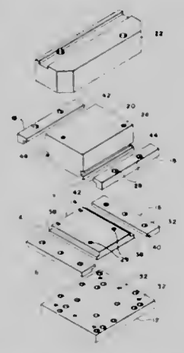
STABLE MIRROR MOUNT

Ronald W. Cutburth, Bulls Gap, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 68,766, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 783,069, Oct. 3, 1985, abandoned, which is a continuation of Ser. No. 548,811, Nov. 4, 1984, abandoned. This application Jun. 16, 1988, Ser. No. 207,894
Int. Cl.[4] A47B *23/00*
U.S. Cl. 248—466 **8 Claims**

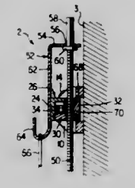
1. A mirror mount for supporting a mirror where said mirror is oriented in an X-ray plane, said mirror mount comprising
post assembly means for supporting the mirror,
first keyway means for orienting said post assembly means such that said post assembly means are slidable only in a first direction parallel to a Y-axis orientation, and including first screw holes,
nut plate means for supporting said first keyway means and including second screw holes,
second keyway means for supporting said nut plate means such that said nut plate means are slidable only in a second direction normal to said first direction and parallel to an X-axis orientation such that said post assembly means and said nut plate means are each slidable in a plane parallel to said X-Y plane, and
locking means normal to said X-Y plane including a single screw type locking member movable in a third direction

orthogonal to said first and second directions between a first position through said first and second screw holes for simultaneously locking in a single step in clamping engagement said first and second keyway means, said post



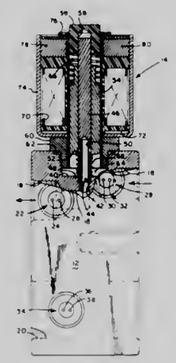
assembly means and said nut plate means in place in both said X-axis and said Y-axis orientation, and a second position for allowing said post assembly means and said nut plate means to slide freely in said X-axis and Y-axis orientations, respectively.

4,892,284
ADJUSTABLE HANGER
Joseph Kelrick, 4230 Casper Ct., Hollywood, Fla. 33021
Filed Dec. 23, 1988, Ser. No. 290,267
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—476 **15 Claims**



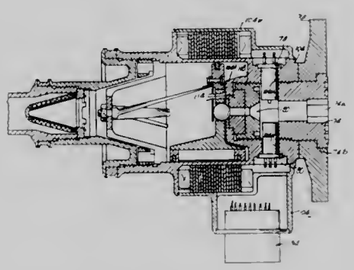
1. An adjustable device for hanging an object on a wall comprises:
- means for attaching the device to the wall;
- adjustable means for continuously moving the object in a first direction engaged with the means for attaching the device to the wall;
- carrier means for engaging the adjustable means for continuously moving the object in the first direction;
- adjustable means engaged with the carrier means for continuously moving the object in a second direction perpendicular to the first direction; and
- means for attaching an object to the device engaged with the adjustable means for continuously moving the object in the second direction;
- whereby an object hanging on a wall may be moved by adjusting one or both of the adjustable means without removing the object from the wall.

4,892,285
MODULATED ELECTRICALLY OPERATED REFRIGERANT EXPANSION VALVE
Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Apr. 29, 1988, Ser. No. 188,017
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.05 **25 Claims**



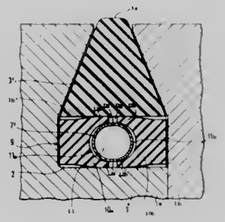
1. An electromagnetically operated valve assembly for use in controlling flow of compressed refrigerant in a refrigeration system, said assembly comprising:
(a) valve body means defining an inlet and outlet port;
(b) armature housing means formed of non-magnetic material attached to said body means and defining a valving chamber, said chamber communicating with said inlet port;
(c) an armature guide formed of non-magnetic material extending from said housing means, said guide defining a cavity therein, said cavity communicating with said outlet port and having at least one port therein communicating said cavity with said valving chamber;
(d) a hollow tubular armature formed of magnetic material and open at both ends received over said guide in closely fitting slidably movable arrangement with said guide extending therethrough, said armature movable between a first position covering said at least one port and any one of a plurality of second positions each at least partially uncovering at least one port, said armature in said closed position operative to provide a desired minimal residual refrigerant flow for compressor lubrication;
(e) means resiliently biasing said armature to said first position and limit means operable to resiliently oppose in the closed position movement of said armature in the direction of said bias;
(f) coil means disposed about said armature housing and operable upon electrical energization to provide sufficient magnetomotive force to move said armature from said first to any one of said second positions; and,
(g) pole frame means operable for completing a magnetic flux loop about said coil and through said armature and including a permanent magnet disposed about the exterior periphery of said armature housing means axially spaced from said armature, said magnet disposed exclusively about a periphery greater than the outer periphery of said armature.

4,892,286
FLUID CONTROL DEVICE
Robert H. Reinicke, Mission Viejo, and Jefferson Y. S. Yang, Orange, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio
Filed Jan. 25, 1988, Ser. No. 147,829
Int. Cl.[4] F16K *31/04*
U.S. Cl. 251—129.11 **26 Claims**



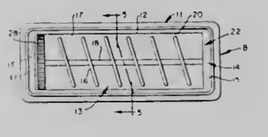
1. A fluid control device comprising:
a housing having an inlet passage, an interior chamber communicating with said inlet passage, an outlet passage leading from said interior chamber, and a valve seat disposed in said outlet passage;
a brushless DC motor in said housing having a rotor supported in said interior chamber, bearing means providing for free rotary movement of said rotor and for free axial sliding movement independent of said rotary movement thereof of said rotor in said chamber, openings in said rotor permitting fluid passage therethrough, said rotor carrying a poppet closing off said outlet passage from said interior chamber in a de-energized condition of said motor; and
means effecting axial translation of said rotor in response to rotation thereof for moving said poppet away from said valve seat.

4,892,287
VALVE BODY WITH A HOUSING HAVING A CYLINDRICAL FLOW PASSAGE
Henri H. Weevers, Gouda, Netherlands, assignor to Mokveld Valves B.V., Gouda, Netherlands
Filed Sep. 16, 1988, Ser. No. 245,800
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731349
Int. Cl.[4] G16K *25/00*
U.S. Cl. 251—172 **8 Claims**



1. A valve having a longitudinal axis, comprising a housing having a cylindrical flow passage and a valve seat surface surrounding said flow passage between a high pressure side and a low pressure side, a valve piston axially movable in said housing and having a circumferential groove, sealing ring means arranged in said circumferential groove, said sealing ring means having a radially inner axially extending surface in said circumferential groove and a radially outer axially extending surface for cooperation with said valve seat surface, and spring ring means arranged in said circumferential groove for radially biasing said sealing ring means to press said radially outer surface of said sealing ring means radially outwardly against said valve seat surface, and channel means between said sealing ring means and a wall of said groove in said valve piston for exposing surfaces at least of said sealing ring means facing said high pressure side, to high pressure, said sealing ring means and said spring ring means having a mirror-symmetrical construction relative to a radial plane extending centrally through said valve perpendicularly to said longitudinal axis, said sealing ring means and said spring ring means retaining said mirror-symmetrical construction in a valve open condition and substantially in a valve closed condition to reduce wear and tear.

4,892,288
AIR FLOW LOUVER SYSTEM
Raymond L. Norbury, Jr., Dallas; John W. Baker, De Soto, and Vernon L. Poynter, Bedford, all of Tex., assignors to Cary Products Co., Inc., Dallas, Tex.
Filed Nov. 14, 1988, Ser. No. 270,833
Int. Cl.[4] F16K *1/226*; F24F *13/14*
U.S. Cl. 251—306 **4 Claims**



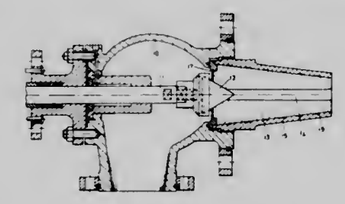
1. In a fluid flow control louver unit, having a holding frame defining an opening therein, with a fluid inlet at its back side and a fluid outlet at its front side, the improvement comprising a flexible unitary material rotor rotatably mounted within said frame for controlling the volume and direction of the fluid passing through said opening, and means for sealing all sides of said opening, and a rigid material wheel for turning said rotor attached to said rotor in said opening.

4,892,289
LETDOWN VALVES
Barney Van Dyk Burckard, Orkney, and Hermanus Pieterse, Vaal Reefs, both of South Africa, assignors to Crucible Societe Anonyme, Luxembourg, Luxembourg
Filed Dec. 22, 1982, Ser. No. 452,055
Claims priority, application South Africa, Dec. 23, 1981, 81/8895
Int. Cl.[4] F16K *31/00*; F16L *7/00*
U.S. Cl. 251—368 **4 Claims**

1. A letdown valve comprising a plug of hard ceramic material adapted to seat on a frustoconical seat in an axially bored throttle body also composed of a hard ceramic, the throttle body being received in a metallic sleeve, with the improvement that the throttle body is tapering and the metallic sleeve

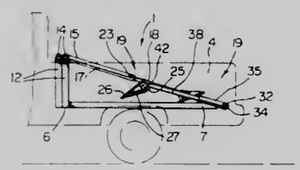
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is complementally tapered and in that a lubricant sealer is present between the body and the sleeve and a series of internal



grooves is formed in the sleeve to accomodate excess lubricant sealer.

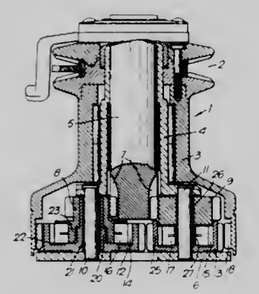
4,892,290
COMBINATION HOIST AND STAND
John A. Hart, Box 578, Claresholm, Alberta, Canada T0L 0T0
Filed May 16, 1988, Ser. No. 194,341
Int. Cl.[4] B66F *7/26*
U.S. Cl. 254—49 **5 Claims**



1. A portable lift and stand device comprising an L-shaped extendible frame means for mounting on a vehicle in a collapsed condition and an extension slidable in said frame or movement between a storage position and an extended use position, leg means extendible between storage and ground engageable positions and pivotally connected to each end of said frame means for rotation between storage and inclined, ground engaging positions, whereby when said leg means are rotated from the stored to the ground engaging positions and the vehicle is moved in a first direction, said frame means is pushed to an erect, stand position, and subsequent movement of the vehicle in a second, opposite position leaves the device in an erect, standing position, said frame means being substantially L-shaped for engaging horizontal and vertical portions of a vehicle whereby during movement of the vehicle in said first direction, the vertical portion of the vehicle engages the vertical arm of the frame means to cause rotation of the frame means about the leg means to the erect position, and said frame means being extendible.

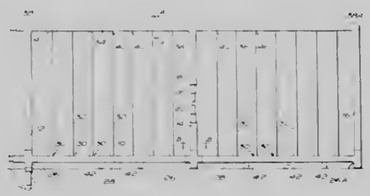
4,892,291
TWO-SPEED WINCH
Brian Shuker, Portsmouth, and Richard D. J. Huggett, Horndean, both of England, assignors to Lewmar Marine Limited, Havant, England
Continuation of Ser. No. 921,438, Oct. 22, 1986, abandoned, which is a division of Ser. No. 539,407, Oct. 6, 1983. This application Jul. 22, 1988, Ser. No. 224,218
Claims priority, application United Kingdom, Oct. 8, 1982, 8228815; Dec. 30, 1982, 8237000
Int. Cl.[4] B66D *1/14*
U.S. Cl. 254—342 **10 Claims**

1. A winch having a central drive shaft and a drum, there being only two geared drive trains between the central drive shaft and the drum, each drive train including undirectional drive means, the said undirectional drive means being arranged so that drive is transmitted from the drive shaft to the drum by a different one of the drive trains according to the direction of rotation of the drive shaft, an inner wall of the drum having a gear ring defined thereon, said drive shaft having a single array of pinion teeth formed thereon, a first of the drive trains consisting of a first double gear and the second of the drive trains consisting of a second double gear, a first part of the double gears each having a gear track, the gear tracks ofthe first parts of the double gears meshing with each other and the gear track of the first part of the first double gear meshing with said gear



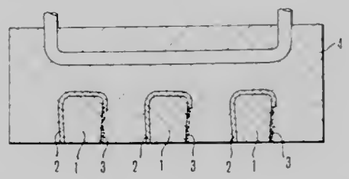
ring, a second part of each of the double gears each having a gear track, the gear tracks of the second parts of the double gears meshing in common with said single array of pinion teeth on the shaft, the said first part of the first double gear having a sleeve-like hub rotatably borne by an axle fixedly secured in the housing and said second part of the first double gear being rotatably supported on said sleeve-like hub of the first part over substantially the whole axial length thereof, said undirectional drive acting between the first and second parts of the first double gear.

4,892,292
NON-CORROSIVE SECURITY RAILING
Thomas R. Russell, Miami, Fla., assignor to Saftron Inc., Miami, Fla.
Filed May 12, 1986, Ser. No. 862,252
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—66 **14 Claims**



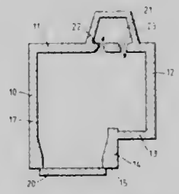
1. A security railing comprising:
a plurality of railing sections, each of said sections formed from an outer, plastics pipe having an outside dimension and an inner dimension and a second pipe, said second pipe having an inside dimension and an outside dimension essentially equal to the inside dimension of said first pipe, said second pipe inserted into said first pipe so that a portion of the second pipe projects beyond one end of the first pipe; a plurality of posts having upper and lower ends, each formed from one of said railing sections; a plurality of horizontal top rails, each formed from one of said railing sections;
T-shaped connector bodies between and connecting adjacent ones of said top rails and posts said connector bodies each having an inner bore essentially equal to the outside dimension of the second pipe and receiving said projecting portions of the second pipes of said connecting adjacent ones of said top rails and posts and an outside dimension essentially equal to the outside dimension of the outer pipe whereby the connector body forms smooth continuations of the outer pipes of said top rails and posts.

4,892,293
BRICK CASTING METHOD OF MAKING A STAVE COOLER
Yoichiro Kato; Hiroyuki Takao; Yasuhide Koga, and Tsuguro Takashima, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Mar. 15, 1989, Ser. No. 323,784
Claims priority, application Japan, May 25, 1988, 63-125842
Int. Cl.[4] C21B *7/10*
U.S. Cl. 266—193 **5 Claims**



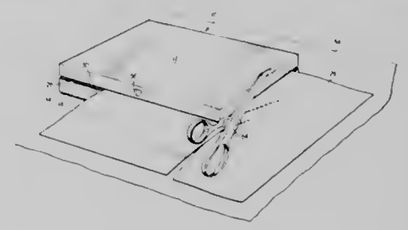
1. A method for producing a stave cooler having a cooling pipe for cooling a furnace wall and bricks embedded in a cast-iron stave body, said bricks being arranged in a horizontal row on a working side of stave cooler exposed to the furnace atmosphere, comprising covering said bricks on one of their upper and lower surfaces to be brought into contact with molten iron with metal wool and on the other surface with a heat-insulating buffer material and then pouring the molten iron around the brick row.

4,892,294
DEVICE FOR LIQUID PUMPING
Per-Olof Kagstrom, Finspang, Sweden, assignor to Granges Aluminium Aktiebolag, Stockholm, Sweden
PCT No. PCT/SE88/00111, § 371 Date Jan. 9, 1989, § 102(e) Date Jan. 9, 1989, PCT Pub. No. WO88/07165, PCT Pub. Date Sep. 22, 1988
PCT Filed May 8, 1988, Ser. No. 299,330
Claims priority, application Sweden, Mar. 9, 1987, 8700966-8; Apr. 10, 1987, 8701514-5
Int. Cl.[4] F27D *23/04*
U.S. Cl. 266—233 **12 Claims**



1. A device for liquid pumping, comprising
a main chamber and a pump chamber for receiving a subportion of the liquid to be pumped from said main chamber and which is provided with means for cyclic variation of the pressure in said pump chamber between a pressure greater than the pressure in said main chamber and a pressure less than the pressure in said main chamber, said pump chamber being connected to said main chamber by at least one input opening and at least one output opening, wherein
said input opening has a substantially lower flow resistance in the direction into said pump chamber than in the opposite direction and said output opening has a substantially lower flow resistance in the direction out of the pump chamber than in the opposite direction, so that when said pump chamber is at a pressure lower than the pressure in said main chamber a larger liquid quantity is sucked into the pump chamber through the input opening and when said pump chamber is at a pressure lower than the pressure in said main chamber a larger liquid quantity is forced out through the output opening than through the input opening, so that a net liquid quantity is sucked in through said input opening and forced out through said output opening.

4,892,295
PAPER CUTTING ASSIST
Jeanne N. Keller, 504 Gawain Ct., Virginia Beach, Va. 23464
Filed Dec. 7, 1988, Ser. No. 280,913
Int. Cl.[4] B25B *1/04*
U.S. Cl. 269—8 **10 Claims**



1. A paper cutting assist for holding paper sheets when they are being cut, said paper cutting assist comprising:
a relatively flat substantially rectangularly shaped lid block defining a flat lid-jaw paper gripping surface on one side thereof;
a relatively flat substantially rectangularly shaped base block defining a flat base support surface on a first side thereof for supporting said base jaw block from a floor surface and a flat base-jaw paper-gripping surface on an opposite side thereof both said lid block and said base block having substantially solid interiors, each having approximately the same length and width dimensions as the other, with the width dimensions being at least 40% of the length dimension so that outer edges of the lid and base blocks are relatively even to each other;
a hinge means for hingedly attaching said lid-jaw block to said base-jaw block at hinge edges of said lid- and base-jaw blocks for allowing said lid- and base-jaw blocks to freely pivot relative to one another such that said flat lid- and bottom-jaw paper gripping surfaces can be closed on one another to be approximately in parallel contact one-to-the-other, and so that they can be pivoted away from one another;
a separate jaw non-slip layer of non-slip material mounted on one of said lid- and base-jaw paper-gripping surfaces for contacting a paper sheet placed between said lid- and base-jaw paper-gripping surfaces when they are closed on one another to inhibit relative sliding between said paper sheet and said lid- and base-jaw paper-gripping surfaces; and,
a base support non-slip layer of non-slip material mounted on said flat base support surface for contacting said floor surface to inhibit relative sliding between said floor surface and said flat base support surface;

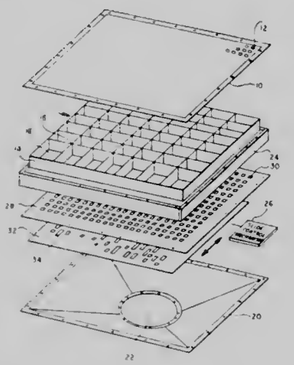
wherein said lid- and base-blocks are constructed of a sufficiently heavy material such that when said base support surface with said base support non-slip layer is resting on said floor surface and said flat lid-jaw paper-gripping surface is closed on said base jaw paper-gripping surface, with a sheet of paper therebetween, the weight of said lid- and base-jaw members maintains said paper holder stationary on said floor surface and maintains said sheet stationary in said paper holder to allow a user to cut the paper sheet with scissors.

4,892,296

SUCTION TABLE ASSEMBLY

Vaclav Jelinek, River Edge, N.J., assignor to SSMC Inc., Fairfield, N.J.

Filed Feb. 27, 1989, Ser. No. 316,044
Int. Cl.[4] B25B *11/00*
U.S. Cl. 269—21 **6 Claims**



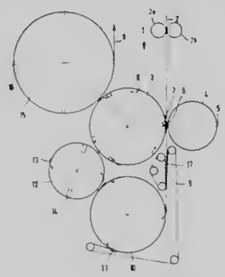
1. A suction table assembly comprising:
a member having a hollow interior with open top and bottom horizontal ends;
a partition arrangement disposed in the interior of the member to partition the member interior into a plurality of cubicles having hollow interiors, each cubicle having open top and bottom horizontal ends respectively flush with the top and bottom ends of the member;
a first flat perforated horizontal plate overlying the member and connected to the top ends of all of the cubicles, the perforations in the plate communicating with the interiors of the underlying cubicles, the perforations having like areas and being regularly spaced;
suction producing means for producing suction forces, said suction producing means being disposed below the bottom ends of the member; and
shutter means disposed between and connected to the bottom ends of the cubicles and the suction producing means, the shutter means applying the suction forces to the interiors of the cubicles, the shutter means having a plurality of different suction distributing positions, the amount of suction applied to each cubicle interior varying in accordance with each different suction distributing position, the shutter means including a second horizontal plate with regularly spaced openings of like area disposed below the bottom ends of the member, each opening having a substantially larger area than each perforation in the first plate.

4,892,297

COMBINATION SHEET FOLDING AND SELECTIVELY OPERABLE STAPLING APPARATUS

Ingo Kobler, Anhausen, Fed. Rep. of Germany, assignor to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,464
Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716451
Int. Cl.[4] B41L *43/10*
U.S. Cl. 270—38 **6 Claims**



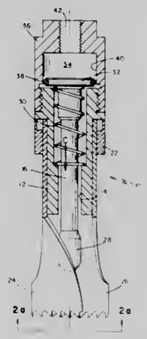
1. Combination sheet handling apparatus for severing a web into sheets, for stapling the sheets and for folding the sheets, comprising the combination of
a combination, multifunction cylinder (3) having at least one cutting groove (6), at least one folding blade (8) and at least one group of grippers (7) thereon;
a cutting blade cylinder (4) having cutting knife blades (5) thereon;
the cutting blade cylinder (4) being operatively associated with the combination cylinder (3);
means (*2a, 2b*) for guiding a substrate web, or a plurality of superposed substrate webs (2) between said operatively associated combination cylinder (3) and said cutting blade cylinder (4) to provide for cutting said web or webs and to furnish a sequence of cut substrate elements (17);
transport means (9) receiving the cut substrate elements from the combination cylinder (3);
a collection cylinder (10) having grippers (11) located thereon and receiving the cut sheets from said transport means (9);
a transfer and stapling cylinder (12),
said transfer and stapling cylinder (12) having grippers (13) and stapling heads (14) thereon, said transfer and stapling cylinder receiving the cut substrate elements from the collection cylinder (10) gripping the cut substrate elements (17) with the grippers thereon and inserting staples therein;
a folding jaw cylinder (15) having folding jaws (16), operatively associated with the combination cylinder (3),
wherein said transfer and stapling cylinder (12) is further operatively associated with the combination cylinder (3) for transfer of the cut substrate elements (17) on the grippers (13) on the transfer and stapling cylinder (12)
back to the combination cylinder (3), and on the grippers (7) thereon, and
wherein the cutting grooves (6) on the combination cylinder, in cooperation with the operatively associated cutting blade cylinder (4) provides for cutting of the substrate web (2) into individual cut substrate elements (17) and for subsequent transfer to said transport means (9), and the folding blades (8) on the combination cylinder (3) provide for folding of the cut elements (17) transferred back thereto by the transfer and stapling cylinder (12) and for engagement into the folding jaws (16) of the folding jaw cylinder and consequent placement of the then folded cut elements (17) on the folding jaw cylinder (15).

4,892,298

DEVICE AND METHOD FOR PICKUP OF SHEET-FORM FLEXIBLE FABRIC OR THE LIKE

Richard R. Walton, Ten W. Hill Pl., Boston, Mass. 02114, and George E. Munchbach, Roslindale, Mass., assignors to Richard R. Walton, Boston, Mass.

Continuation-in-part of Ser. No. 500,621, Jun. 2, 1983, Pat. No. 4,641,827, and a continuation-in-part of Ser. No. 614,478, May 30, 1984, Pat. No. 4,645,193. This application Sep. 22, 1986, Ser. No. 909,996
Int. Cl.[4] B65H *3/22*
U.S. Cl. 271—18.3 **11 Claims**



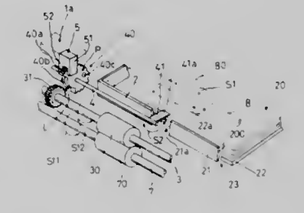
1. A pickup device for a piece of sheet-form flexible fabric or the like comprising:
first and second fabric gripping elements adapted to come together in a gripping position at the face of said fabric piece to grip a localized portion of the fabric,
said gripping elements defining gripping lines that come together in said gripping position,
support means for resiliently biasing said fabric gripping elements together in said gripping position,
support means for resiliently biasing said fabric gripping elements together in said gripping position,
said support means comprises a pair of elongated spring arms that are biased together,
actuatable separating means for applying force to said support means for overcoming said biasing,
said separating means comprises a carrying means slidable between opposed inner surfaces of said spring arms to progressively move said gripping elements and thus said gripping lines apart,
said gripping lines lying at an angle to a direction of movement of said spring arms,
upon deactuation of said separating means, said support means resiliently carries said gripping elements generally toward each other and laterally thereto in order to grip the fabric while applying tension to the fabric,
whereby, when the gripping elements reach a final gripping position, the fabric has previously been tensioned by motion of said gripping elements.

4,892,299

DOCUMENT FEEDER

Hiroyoshi Hayama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1988, Ser. No. 225,873
Claims priority, application Japan, Jul. 31, 1987, 62-193374
Int. Cl.[4] B65H *3/06*
U.S. Cl. 271—110 **8 Claims**



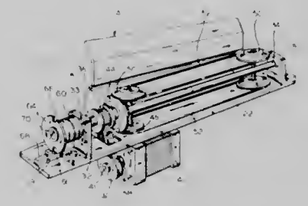
1. A document feeder, comprising:
a housing;
a document storing member disposed in said housing for storing a plurality of documents to be copied;
a document feed mechanism including a feed roller for feeding out the documents stored in the document storing member, and a forward rotation pickup roller and a backward rotation pickup roller arranged downstream of the feed roller, said forward rotation pickup roller and said backward rotation pickup roller being in contact with each other to deliver only one document at a time;
a drive shaft supported by said housing and carrying the backward rotation pickup roller and a drive gear coaxially with each other;
a rotary shaft carrying a driven gear, said driven gear including, peripherally thereof, a driven gear portion for meshing with said drive gear and a cutout portion out of mesh with said drive gear, said rotary shaft further carrying a document detector mounted coaxially with said driven gear for contacting the documents on said document storing member and detecting the presence and absence of the documents; and
a sensor for detecting angular movement of said driven gear.

4,892,300

DIFFERENTIAL DOCUMENT DRIVE

Eduard Svyatsky, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 25, 1988, Ser. No. 198,472
Int. Cl.[4] B65H *5/02*
U.S. Cl. 271—225 **30 Claims**



1. A differential motion translating and document drive delivery system wherein said system includes power means, first means for delivery of documents sequentially along a first path, means for establishing orientation relative to a planar reference means, and means related to said first delivery means

for translating the direction of movement of said documents angularly relative to said first path along a second path said paths being generally perpendicular and hence said second path is substantially parallel relative to said reference said translating means including means having a substantially line contact with said document for controlling movement of said document, said translating means further including means for converting rotary motion along said first path to linear motion along said second path, and in addition said related means has a planetary mechanism consisting of a sun gear and at least one planetary gear, said sun gear being mounted on a hollow cylindrical member coaxially supported by bearing means on a central shaft means.

4,892,301

SHEET FEEDER AND ACCELERATOR

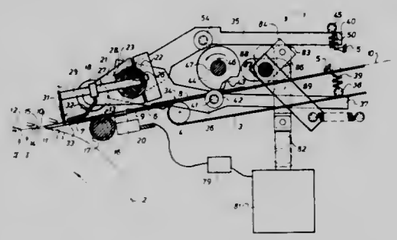
Claus D. Barrois, Markthiedenfeld, and Philipp A. Dieterich, Randersacker, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,729

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731216

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—227 **5 Claims**



1. A sheet feeding and accelerating assembly for feeding sheets aligned by front register lays to a sheet-treating machine and for selectively controlling an initial tension applied to the sheets, said sheet feeding and accelerating assembly comprising:

means to forward said sheets to the sheet-treating machine;

a driven accelerating roller and at least one cooperating pressure roller for periodically contacting said sheets on said means to forward said sheets; and

means for adjustably controlling the time of contact of said at least one pressure roller with said accelerating roller, including a drivable control drum on which a control roller for said at least one pressure roller runs, said control drum having an axially extending control recess whose opening angle varies axially and wherein said control roller and said control drum are shiftable axially with respect to each other.

4,892,302

JUMPING SKILL TRAINING GAME

Dennis L. Daigle, 1004 - 155th St., West, Burnsville, Minn. 55337

Filed Dec. 9, 1988, Ser. No. 281,794

Int. Cl.[4] A63B *5/22, 67/00;* **A63K** *3/04*

U.S. Cl. 272—74 **6 Claims**

1. A skill training game, comprising

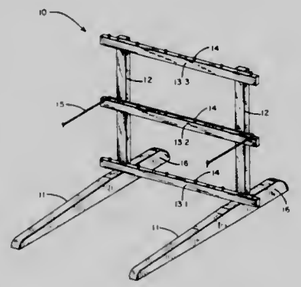
(a) a pair of substantially identical frames adapted for spaced-apart, independently supported positioning, each frame comprising

(i) a pair of spaced apart foot members;

(ii) an upwardly projecting post affixed to each foot member;

(iii) a plurality of spaced-apart crossing members bridging between said posts, each crossing member having a plurality of regularly spaced retainers;

(b) an elongate elastic cord adapted for connection about one or more retainers and for extending between said



frames whereby said retainers align said cord in parallel segments and said parallel segments provide obstacles for jumping, and wherein the lateral spacing between the parallel segments and the distance of said segments from a support surface may be changed.

4,892,303

SPORT FENCING DEVICE

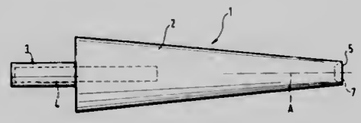
Günther Lohre, Reinsburgstrasse 111, D-7000, Stuttgart 1, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,670

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1987, 3728187

Int. Cl.[4] A63B *69/02*

U.S. Cl. 272—98 **14 Claims**



1. A sport fencing device, comprising

an oblong striking element including a longitudinal axis made from a foam material, said striking element being conic in shape and including a narrow end and a wide end, said narrow end including an end face,

a handle attached to said striking element adjacent said wide end,

a stabilizing element interconnecting said striking element with said handle, said stabilizing element extending approximately one-third of the way into said striking element, and

electronic hit detection means integrated into said end face for detecting when said end face makes a hit with a surface along said longitudinal axis.

4,892,304

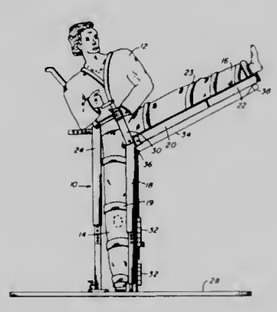
LEG STRENGTHENING AND STRETCHING APPARATUS

Vincent L. DeNiro, 490 W. Midmorning Blvd., Youngstown, Ohio 44511

Continuation-in-part of Ser. No. 37,693, Apr. 13, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 234,403

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—126 **23 Claims**



1. Leg strengthening and stretching apparatus for aiding in the development of leg muscles of a user utilized in a kicking motion, including:

a body support for supporting the user in an upstanding position, said body support being comprised of a support leg retainer for retaining one leg of the user in an upright support position and a torso support for supporting the torso of the user in a desired position;

a first exercise leg support extending from said support leg retainer at a desired angle for supporting an upper leg of the user thereupon; and

a second exercise leg support rotatably attached at an end portion of said first exercise leg support for supporting a lower leg portion of the user thereupon.

4,892,305

EXERCISING DEVICE

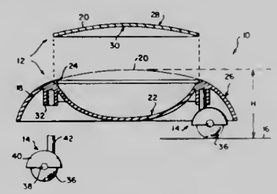
Peter G. Lynch, 166 Woodway, Glencairn, Cape Town, Cape Province, South Africa

Filed Dec. 21, 1987, Ser. No. 136,142

Claims priority, application South Africa, Dec. 22, 1986, 86/9629

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—127 **7 Claims**



1. An exercising device which comprises a platform and three or more caster wheels underneath the platform, the for supporting a limb of a user on or against a supporting surface while permitting movement of the limb in any direction along the supporting surface:

the platform comprising a lower body part and a removable upper part;

the body part comprising a central portion having a concave uppper surface, and a skirt portion which extends peripherally of the central portion;

the central portion and the skirt portion defining between them, on the underside of the body part, a downwardly open annular recess;

the caster wheels being mounted underneath the body part so as to be partly accommodated in, and protrude downwardly from, said annular recess; and

said upper part being such that, when supported in position on the body part, it extends across said concave upper surface.

4,892,306

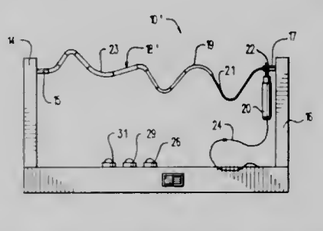
ELECTRICAL HAND STEADINESS TESTING GAME

Ibrahim M. Kawar, 2411 Glenallen Ave. H90 204, Silver Spring, Md. 20906

Filed May 23, 1989, Ser. No. 355,429

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—1 GA **10 Claims**



1. An electrical steadiness testing game, comprising:

a base;

a pair of spaced upstanding supports on said base;

a plurality of sequentially stepped diameter cylindrical segments interconnected to form an electrically conductive track member between said supports;

means rotatably connecting at least some adjacent segments of said track member to allow changing of a path defined by said track member;

an electrically conductive ring member received around said track member;

an insulated manually manipulable handle secured to said ring member;

power supply means; and

indicating means operably connected with said power supply means, said track member and said ring member for actuation upon contact of said ring member with said track member.

4,892,307

BALANCING STICK TOY

Arthur N. Lehberger, 256 Winfield Ter., Union, N.J. 07083

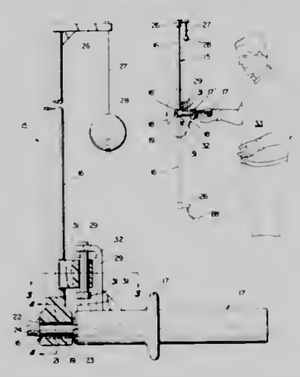
Filed Mar. 13, 1989, Ser. No. 322,344

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—1 GF **5 Claims**

1. In a balancing stick toy, a handle member having a forwardly-extending pivot shaft, a weighted balancing stick member having its lower end pivotally connected to the pivot shaft to normally turn freely thereabout and releasable means carried on one of the members and engagable with the other member so that upon turning the handle about its longitudinal

axis by the hand of the user the balance stick may be brought from a depending position to an upright position and is auto-



matically releasable to carry out the balancing exercise of the stick about the handle member.

4,892,308

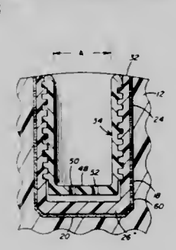
BOWLING BALL AND FINGER INSERT THEREOF

Ray P. Gaunt, P.O. Box 181, New Brighton, Pa. 15066

Filed Oct. 17, 1988, Ser. No. 258,636

Int. Cl.[4] A63B *37/00*

U.S. Cl. 273—63 B **6 Claims**



1. A bowling ball having a variable internal diameter finger hole comprising,

a bowling ball having an oversized cylindrical finger hole therein having the shape of a cylinder throughout its length,

a rigid liner insert having the shape of a cylinder throughout its length and having a cylindrical outer surface and an inner cylindrical bore, said inner cylindrical bore having an internal threaded portion, means for adhesively securing said liner insert in said oversized finger hole,

a cylindrical finger receiving insert having an internal bore of a preselected diameter and an external cylindrical surface with external threads formed thereon,

said finger receiving insert threadedly secured in said liner insert, and

means to threadably remove said finger receiving insert from said liner insert and threadably securing a second finger receiving insert having a different internal diameter in said liner insert.

4,892,309

TWO AND FOUR POSITION TARGET ASSEMBLY

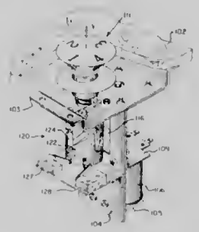
Mark S. Kim, Chicago, and Gary L. Berge, Crystal Lake, both of Ill., assignors to Williams Electronics Games, Inc., Chicago, Ill.

Division of Ser. No. 18,480, Feb. 25, 1987, Pat. No. 4,822,046.

This application Dec. 14, 1988, Ser. No. 284,255

Int. Cl.[4] A63F *7/00*

U.S. Cl. 273—127 R **5 Claims**



1. In a flipper-type pinball game machine of the type having an inclined playfield having an opening therein and which supports a rolling ball and one or more play features, the improved play feature comprising:

(a) ball target means extending through said opening to be contacted by a ball rolling on said playfield;

(b) means for rotating said ball target to a plurality of predetermined positions, said positioning means include: i linear actuating means and ii cam means engaging said linear actuating means to control movement of said ball target means to said predetermined positions.

4,892,310

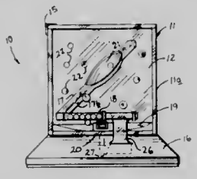
RANDOM NUMBER SELECTION APPARATUS

Leonard H. Patterson, 740 Birmingham St., Bridgeport, Conn. 06606

Filed Dec. 5, 1988, Ser. No. 279,511

Int. Cl.[4] A63F *5/00*

U.S. Cl. 273—144 A **8 Claims**



1. A random ball selector apparatus for random selection of a pre-selected number of digits from a plurality of spheres, said apparatus comprising,

a stationary transparent enclosure formed with an opaque base portion, spaced transparent side panels, and spaced transparent end panels;

a plurality of spheres;

a pressurizing means formed in said base to project and direct airborne a plurality of spheres within said enclosure wherein each sphere includes at least one numerical digital display thereon, and

a first chute diagonally oriented from an upper level of said enclosure to a lower level of said enclosure, and

a catch means positioned within said first chute for catching the airborne spheres within said enclosure and directing said spheres downwardly within said first chute, and

a second chute angularly disposed and and associated with said first chute to accept spheres within said second chute and to randomly secure a preselected number of said spheres within said second chute for random selection of digits imprinted on said spheres, and

wherein each of said spheres has formed thereon a plurality of numerical digits equally spaced about a surface of each sphere, and

wherein each of said digits is of a first magnetic polarity and wherein a pre-selected number of magnetic members of a reverse second magnetic polarity is formed in a top surface of said second chute for alignment of selective ones of said digits within said chute.

4,892,311

GAME PLAYING MACHINE EQUIPPED WITH A VIBRATING FEEDER

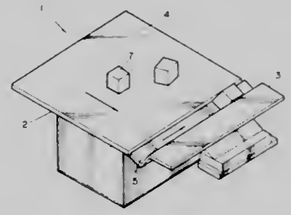
Kouji Zaitsu, Yokohama, Japan, assignor to Bonanza Enterprises, Ltd., Yokohama, Japan

Filed Sep. 6, 1988, Ser. No. 240,722

Claims priority, application Japan, Dec. 18, 1987, 62-192332[U]; Apr. 29, 1988, 63-58104[U]

Int. Cl.[4] A63F *9/04*

U.S. Cl. 273—145 D **6 Claims**



1. A die throwing machine comprising:

a vibrating feeder on which a die is to be thrown, said feeder having at least two divisional sections integrally connected with each other, a first divisional section and a second divisional section, said first divisional section receiving a thrown die and having a vibratory transporting surface large enough to receive the die and allow it to rotate in all directions while transporting it toward said second divisional section, said second divisional section having spot counting means for counting the number of spots of a selected side of said die and a vibratory transporting channel along which the die is linearly transported to a counting place at which the spot counting means is provided.

4,892,312

OPERATING DEVICE FOR TV GAME MACHINE

Hideki Minemoto, and Hisayuki Yamaguchi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Taito, Tokyo, Japan

PCT No. PCT/JP86/00487, § 371 Date Mar. 3, 1988, § 102(e) Date Mar. 3, 1988, PCT Pub. No. WO88/00489, PCT Pub. Date Jan. 28, 1988

PCT Filed Sep. 19, 1986, Ser. No. 188,409

Claims priority, application Japan, Jul. 18, 1986, 61-111133

Int. Cl.[4] A63B *17/04;* **G01D** *5/34;* **H03M** *1/26;* **F16H** *13/00*

U.S. Cl. 273—148 B **11 Claims**

1. An operating device for a TV game machine for inputting coordinate positions of a controlled object that move across a screen of said TV game machine, comprising:

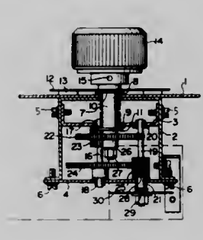
a base assembly mounted on a control box of a game machine body;

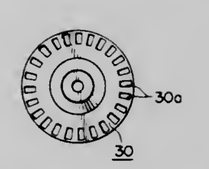
a main shaft rotatably mounted on said base assembly;

an operating knob mounted on an end of said main shaft for rotating said main shaft;

a rotational number increasing mechanism housed within said base assembly, said rotational number increasing mechanism increasing the rotational number of said main shaft;

a disk fixed to an output shaft of said rotational number





increasing mechanism and having a plurality of holes or notches in its periphery; and

a sensor section for detecting said holes or said notches of said disk.

4,892,313

LOTTERY TICKET REVIEWING DEVICE

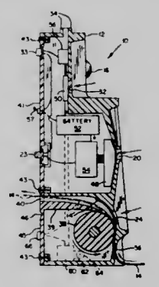
Jimmie J. James, and Susanna M. James, both of 1 Woodland Ct., Novato, Calif. 94947

Continuation-in-part of Ser. No. 98,809, Sep. 21, 1987, Pat. No. 4,772,025. This application Sep. 19, 1988, Ser. No. 246,286

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] A63F *3/06*

U.S. Cl. 273—148 R **9 Claims**



1. A device for comparing lottery tickets to winning lottery numbers, in a lottery game wherein a series of numbers are selected by customers, which if successfully selected will match a series of winning numbers drawn in the lottery, comprising:

a housing generally in the configuration of and having the appearance of a slot machine, but smaller in size,

a series of manually settable number displays mounted for viewing at the front of the housing, each number display having a range of all possible numbers which can poten-

tially be selected in the lottery for each number position, the number of number displays being at least equal to the number of numbers to be selected in the lottery drawing for which the device is used, with means enabling the user/lottery customer to set the number displays to match the winning numbers selected in a lottery drawing, with the series of winning numbers appearing in a horizontal series at the front of the device,

a lottery ticket infeed slot in the front of the housing,

rotatable ticket feed means in the housing and adjacent to the infeed slot, including means for enabling the user/lottery customer to cause the rotatable feed means to rotate and to advance a lottery ticket into and through the housing when the lottery ticket is placed in the infeed slot,

ticket viewing window means in the front of the housing, in a generally linear horizontal arrangement and positioned so that numbers on a lottery ticket are viewable through the window means, with a ticket number directly adjacent to and generally aligned vertically with each of the manually set lottery winning numbers visible at the front of the device,

and an outfeed slot in the device, through which the lottery ticket exits the device,

whereby the user can first determine the published winning numbers in a lottery and set the plurality of number displays accordingly to expose the series of winning lottery numbers on the number displays at the front of the machine, arranged in a horizontal line in a prescribed sequence as published, then feed into the device a lottery ticket having customer-selected series of numbers, advance the lottery ticket into the device to a point where the first row of numbers on the ticket is directly behind the window means and thus adjacent to the manually input numbers on the number displays, number by number, and make a comparison of the numbers; and if multiple series of customer-selected lottery numbers are on the lottery ticket, the user can review each series of numbers sequentially, comparing them with the adjacent series of winning numbers and advancing the lottery ticket forward through the device to position the next series of numbers on the ticket behind the viewing windows, make another comparison, and so on.

4,892,314

GOLF PUTTER WITH DETACHABLE DIVOT MENDER STORED IN GRIP

Joseph F. Rango, 39770 St. Michel Pl., Palm Desert, Calif. 92260

Continuation-in-part of Ser. No. 111,864, Oct. 23, 1987, Pat. No. 4,799,684. This application Jan. 17, 1989, Ser. No. 298,125
Int. Cl.[4] A63B *53/00*
U.S. Cl. 273—162 D **2 Claims**

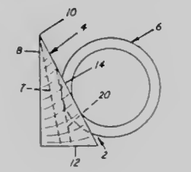
1. A golf putter including a shaft with a hollow end and having a hand grip which surrounds the upper end of the shaft, and a divot mending device positioned within such hollow end said shaft and hand grip also having a cap portion overlying the end thereof and an opening formed in said cap portion having a diameter smaller than the diameter of said shaft at the end thereof, said divot mending device having a sleeve or body portion including a tined strip depending therefrom, said body portion having a diameter corresponding substantially to that of the said opening in said cap portion but sufficient to be frictionally engaged thereby, said body portion with said tined strip being thereby positioned within the inner wall of said shaft when inserted therein, and a cap member affixed to or integral with said body portion which overlies the end of said shaft and said cap portion in which said opening has been made to form an end cap for said shaft.

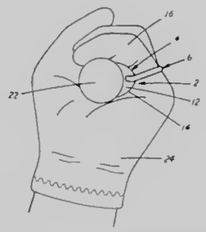
4,892,315

GOLF HAND PAD DEVICE

Alfred Iorlano, 3106 Grove Rd., Palm Beach Gardens, Fla. 33410

Filed Aug. 4, 1988, Ser. No. 228,162
Int. Cl.[4] A63B *53/14*; **A41D** *19/00*
U.S. Cl. 273—166 **11 Claims**





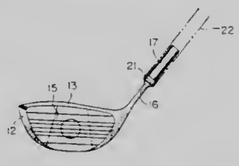
1. A golf hand pad device comprising a tapered hand pad for positioning on a golfer's upper hand adjacent the base of the little finger, said tapered hand pad having an elongated groove tapered along its length for receiving the grip portion on a golf club shaft, means for positioning and maintaining said tapered hand pad on a golfer's upper hand.

4,892,316

GOLF CLUB HEAD

H. E. Langert, Del Mar, and Horst Kraft, Sylmar, both of Calif., assignors to Langert Golf Co., Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 101,739, Sep. 28, 1987, Pat. No. 4,809,983. This application Feb. 22, 1989, Ser. No. 313,742
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[4] A63B *53/04, 53/02*
U.S. Cl. 273—167 E **15 Claims**



1. A golf club head having a body formed with a top, a generally flat sole plate, a toe end and a heel end, and a generally flat ball striking face extending between the top and the sole plate at an angle with respect to the vertical, said golf club head comprising:

a shank having a longitudinal axis extending generally upwardly from said heel end of said body; and

hosel means extending axially upward from said shank, said hosel means providing means for connecting said golf club head to an elongated shaft, said hosel means being formed generally as a cylinder;

said shank having a cross section which is relatively thin in one plane and relatively wide in another plane generally perpendicular to said one plane, thereby forming a foil configuration which is symmetrical about said longitudinal axis with a long axis through said wide plane extending between a leading edge of said foil through a trailing edge;

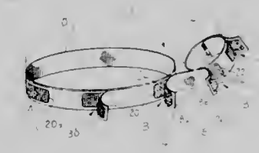
whereby the shape of said shank results in reduced drag as the golf club head passes through the air, and an improved ratio of body mass to shank mass, both as compared with a golf club head having a round shank, thereby resulting in more mass at greater speed for the same energy applied to swinging the club.

4,892,317

GOLF CLUB SWING TRAINING DEVICE

William O. Corder, Jr., 1003 Windwood Dr., Anderson, S.C. 29621

Filed Jul. 13, 1988, Ser. No. 218,279
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **11 Claims**



1. A golf swing training device comprising:

a chest strap for encircling the chest of a golfer;

an arm strap for encircling an upper arm of the golfer;

a first piece carried on an exterior of said chest strap near an armpit of said golfer;

a second piece carried by the exterior of said arm strap generally near said armpit and facing said first piece;

a connector strap for interconnecting said chest and arm straps;

a third piece carried by a first end of said arm strap mating with said first piece to form a first connection;

a fourth piece carried by a second end of said connector strap mating with said second piece carried by said arm strap to form a second connection;

at least one of said first and second connections being a releasable connection which releases when the swing of said golfer's arm exceeds a desired movement to prevent injury to said golfer; and

said pieces of said releasable connection include hook and loop pieces which tear from each other when said swing exceeds said desired movement to provide a discernible audible signal for memory training of the muscles to train for a correct golf swing.

4,892,318

GOLF BALL STORAGE, DISPENSING AND TEEING APPARATUS

Kenneth L. Jennings, Rte. 2, Box 83-4, Strafford, Mo. 65757

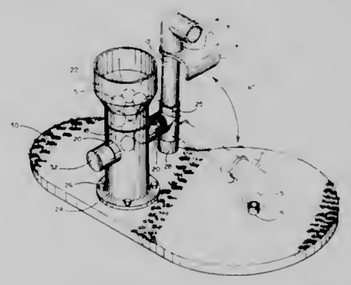
Filed Jul. 25, 1988, Ser. No. 223,433
Int. Cl.[4] A63B *57/00*
U.S. Cl. 273—201 **7 Claims**

1. A gravity activated golf ball teeing apparatus comprising:

a cylinder for storing a plurality of golf balls, said cylinder having a pair of opposed coaxial apertures defining an axis which is substantially perpendicular to the axis of said cylinder;

a fixed tube extending through said apertures, said fixed tube having a cutout portion within said cylinder;

a swing tube lying substantially coaxially within said fixed tube and also having a cutout portion, the interior diameter of said swing tube being properly dimensioned for receiving a plurality of serially arrayed golf balls, the outer diameter of said swing tube being smaller than the inner diameter of said fixed tube to permit rotation of said swing tube within said fixed tube and to permit the axes of said fixed tube and swing tube respectively to define a non-zero angle to promote the gravitational flow of said serially arrayed golf balls toward one end of said swing tube;



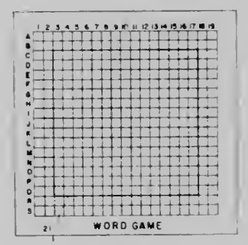
an articulated tubular arm affixed perpendicularly to said one end of said swing tube exterior of said cylinder, said tubular arm providing a path for said serially arrayed golf balls within said swing tube and an exit aperture at one end thereof spaced from said one end of said swing tube and through which exit aperture said golf balls may be selectively delivered onto a tee, said arm also having a weight positioned at the end thereof opposite said exit aperture end, said swing tube being affixed to said tubular arm intermediate of said exit aperture end and said weight end of said tubular arm whereby said tubular arm is normally in a substantially vertical position and releases a golf ball through said exit aperture onto said tee when said exit aperture end of said tubular arm is rotated into a position below horizontal.

4,892,319

WORD GAME

Theodore D. Johnson, II, 3900 Pebble Creek Rd., Midlothian, Va. 23112

Filed Jul. 20, 1988, Ser. No. 221,555
Int. Cl.[4] A63F *3/00, 9/04*
U.S. Cl. 273—272 **8 Claims**

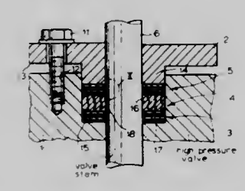


1. 1 A word game comprising:

a playing area;

a matrix of letter spaces in said playing area;
a plurality of playing tiles for playing in said letter spaces, said tiles have thereon varying letters of the alphabet and bonus letters indicia;
a random number selector for the chance selection of a single number from up to at least 30 or more;
a code for converting said randomly selected numbers to a single constant letter of the alphabet or bonus letter with said chance selection of numbers approximating the frequency of letter usage in word games;
said playing tiles selected by said chance selection of numbers and said code conversion of the numbers being initially arranged and played by a player of the game to form a word as that player's territory in said playing spaces at a corner of said matrix of said playing area with subsequent playing tiles added at the player's turn to the player's territory in cross-word fashion when additional words can be created.

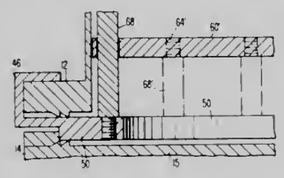
4,892,320
STUFFING BOX ASSEMBLY
Hans-Joachim Tückmantel, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to Kempchen & Co. GmbH, Oberhausen, Fed. Rep. of Germany
Filed Jul. 5, 1988, Ser. No. 215,019
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3721967
Int. Cl.[4] F16J *15/28, 15/30;* F16K *41/02*
U.S. Cl. 277—125 **20 Claims**



1. A stuffing box seal assembly, comprising:
a seal housing formed with a seal chamber opening at a surface of said housing and surrounding a spindle movable relative to said housing;
a packing gland surrounding said spindle and tightenable against said housing; and
a seal in said chamber under compression from said gland, said seal comprising:
a coiled graphite pressed ring in said chamber and including a spirally coiled strip of expanded graphite having turns interleaved with a metal strip extending around said spindle and under axial compression, and
at least one laminate ring on an axial side of said coiled graphite pressed ring, said laminate ring comprising a plurality of stacked annular disk layers of expanded graphite extending generally transversely to an axis 7 of said spindle and axially pressed toward each other and limiting adhesion of material from said coiled graphite pressed ring to said spindle upon movement thereof relative to said housing.

4,892,321
ULTRA-HIGH VACUUM DEVICE GASKET WITH MEANS OF INSERTION AND REMOVAL
Samuel O. Colgate, 4132 NW. 38 St., Gainesville, Fla. 32606, and Grant M. Schrag, 8114 SW. 53rd Pl., Gainesville, Fla. 32608
Filed Jun. 16, 1988, Ser. No. 207,533
Int. Cl.[4] F16L *19/00*
U.S. Cl. 277—167.5 **24 Claims**

13. A bakeable gasket for insertion between flanges of an ultra-high vacuum device, the flanges each having at least one sealing surface, comprising:
(a) a generally annular gasket portion substantially traversing the shape of an O-ring; and
(b) integral handling means attached to said annular portion for inserting said gasket in and for removing said gasket from the flange sealing surfaces,



whereby said handling means are adapted to be disposed outside the flange sealing surfaces and said ultra-high vacuum device after insertion and further adapted to avoid impairment of the sealing properties of the ultra-high vacuum device.

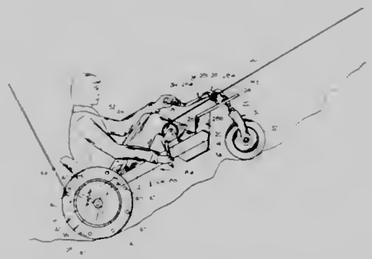
4,892,322
LOUVER GASKET
Coleman L. Koza, 321 Laclie Street, Orillia, Ontario, Canada L3V4P2 , and Lawrence J. Koza, 42 Cairns Boulevard, Barrie, Ontario, Canada L4M4S7
Filed Apr. 12, 1988, Ser. No. 180,752
Claims priority, application Canada, Mar. 23, 1988, 562227
Int. Cl.[4] F16J *15/00*
U.S. Cl. 277—207 R **7 Claims**

1. A gasket for use with a ventilation louver of the kind having a base and a sidewall, said gasket having a body arranged in a closed polygonal loop with an open interior for receiving said louver, said body having a generally concave circumferential radially inwardly facing surface adapted to encircle and press against said sidewall of said louver, a generally concave circumferential rearwardly facing surface adapted to press against a construction material covering the base of said louver, and a circumferential front surface, said front surface being at least partly concave, said circumferential front surface and said circumferential radially inwardly facing surface meeting in a thin radially inwardly extending circumferential lip, said lip being adapted to press sealingly against said sidewall, said circumferential radially inwardly facing surface and said circumferential rearwardly facing surface meeting at an acute angle.

4,892,323
ALL-TERRAIN WHEELCHAIR
Stuart G. Oxford, 7817 Crown Point Ave., Omaha, Nebr. 68134
Filed Oct. 27, 1988, Ser. No. 263,417
Int. Cl.[4] B62M *1/14, 1/16*
U.S. Cl. 280—250.1 **6 Claims**

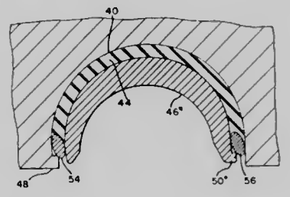
1. An all-terrain wheelchair comprising:
an elongated frame means having rearward and forward ends;
a pair of laterally extending axle members positioned adjacent to the rearward end of said frame menas;
a pair of wheels rotatably mounted on said axle members and positioned laterally of the rearward end of said frame means;
a seat means on said frame means positioned between said wheels;
a ground engaging steerable wheel mounted at the forward end of said frame means;
a steering means connected to said steerable wheel for steering said steerable wheel;
each of said wheels of said pair of wheels having a plurality of radially spaced apart tubular members secured thereto which extend horizontally outwardly therefrom and which are disposed parallel to the axis of rotation of said wheels;





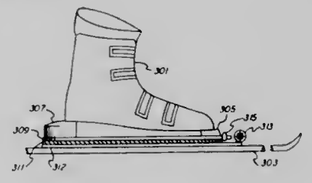
and a pair of elongated arms selectively removably secured at one end thereof to said axle members for selective engagement with said tubular members to permit the user of the wheelchair to apply additional propelling force to the wheels through the use of said arms.

4,892,324
FIFTH WHEEL MOUNTING PAD
Charles P. Spencer, Staunton, Ill.; Terry L. Pitchford, St. Louis, Mo., and Robert P. Radwill, Burr Ridge, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.
Filed Aug. 22, 1988, Ser. No. 234,517
Int. Cl.[4] B62D *53/08*
U.S. Cl. 280—440 **12 Claims**



1. An improved fifth wheel mounting wherein mounting brackets attached to a tractor frame have arcuate bearing surfaces that are received within pockets on the underside of the fifth wheel toward arcuate pocket surfaces therein with an arcuate shoe placed between said surfaces, said improvement comprising:
an inwardly directed ledge at each end of one of said arcuate pocket surface and said arcuate shoe, said ledge reducing but not closing an open space between said arcuate pocket surface and said shoe;
a resilient elastomer pad interposed between said arcuate pocket surface and said shoe said pad having an end proximate each said inwardly directly ledge;
and a non-extrudable end member located at each end of said pad and between said arcuate bearing surface and said arcuate shoe and inwardly of each ledge, said end member extending substantially the width of said elastomer pad whereby to completely block extrusion of said pad from the inside between said arcuate pocket surface and shoe when a load is placed on said fifth wheel causing said pad to be compressed while still allowing for relative movement between said arcuate pocket surface and said shoe to provide a cushioning effect.

4,892,325
MOTION DETECTOR
Nicholas F. D'Antonio, 7695 Admiral Dr., Liverpool, N.Y. 13088
Filed Jan. 8, 1982, Ser. No. 338,092
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—612 **21 Claims**



1. An electronic motion detector for detecting at least one direction of relative lateral movement of two bodies and the magnitude of that movement, said detector comprising:
source means for activating said detector;
sensing means having a plurality of electrical values changeable in response to the lateral movement of said source means with respect to said sensing means;
measuring means connected to said sensing means for interpreting changes in said electrical values and generating output signals indicating the direction and magnitude of said lateral movement; and,
electronic adjusting means connected to said measuring means for adjusting one of said output signals according to a predetermined criterion to produce an adjusted output signal, said electronic adjusting means comprising an electronic balancing means which generates a balancing signal of variable magnitude and adds said balancing signal to one of said output signals, when said source means has not moved with respect to said sensing means, to produce a summed output signal having a near-zero magnitude, said electronic balancing means comprising:
counting means for producing a counting signal changing stepwise in magnitude in one direction with time;
reference signal means for producing a balance reference signal having magnitude near zero relative to the stepwise changes of said counting signal;
switch means, connected to said counting means, for enabling said counting means and for resetting said counting signal to zero upon receipt of a balancing command;
adding means, receiving said output and counting signals, for adding said counting signal and said output signal to

produce said summed output signal having an absolute magnitude approaching that of said balancing reference signal; and

first comparison means receiving said summed output and balance reference signals, for comparing said summed output signal to said balance reference signal and connected to said counting means, for disabling said counting means when the absolute magnitude of said summed output signal falls below the absolute magnitude of said balance reference signal.

4,892,326

NON-SOLE DEPENDENT SKI BINDING

Josef Svoboda, Schwechat, and Radko Pavlovec, Wien, both of Austria, assignors to TMC Corporation, Switzerland

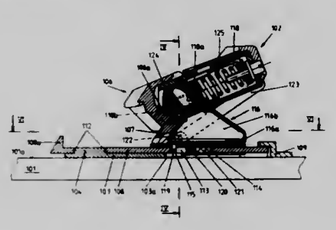
PCT No. PCT/EP87/00081, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/04940, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 14, 1987, Ser. No. 116,729

Claims priority, application Austria, Feb. 17, 1986, 408/86

Int. Cl.⁴ A63C 9/082

U.S. Cl. 280—618 **13 Claims**



1. A safety ski binding for releasably securing a ski boot to a ski having a tip end and a rear end, the binding comprising:

an elongated base plate having a first surface disposed to be mounted on a ski, a second surface opposite said first surface, and a cam surface disposed on an edge of said base plate:

a pivot axle extending from said second surface of said base plate;

an elongated support plate pivotably mounted on said base plate about said pivot axle, said support plate having an oblong cam axle opening and an oblong lug opening, said openings extending in the longitudinal direction of the support plate;

a heel support having a bearing block portion and a sole holding portion pivotably mounted on said bearing block portion for pivotal movement between a sole locking and a sole releasing position, said bearing block portion mounted on said elongated support plate for longitudinal movement along said support plate, said heel support including a cam axle extending through said cam axle opening and a lug extending through said lug opening;

a cam roller disposed on said cam axle for rolling engagement with said cam surface of said base plate, said cam roller and said cam surface cooperating to move said heel support in the direction of the rear end of said ski when said sole plate is pivoted about said pivot axle; and

spring means disposed between an edge of said lug opening and said lug for biasing said cam roller against said cam surface.

4,892,327

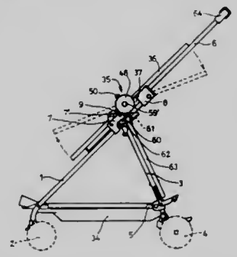
FOLDABLE FRAMES FOR CHILDREN'S PUSHCHAIRS

Ramón J. Cabagnero, Barcelona, Spain, assignor to Jané, S.A., Barcelona, Spain

Filed Apr. 5, 1988, Ser. No. 177,633

Int. Cl.⁴ B62B 7/08

U.S. Cl. 280—650 **15 Claims**



1. A carriage comprising a base frame having a front end and an opposite base frame rear end, a front leg having a lower front leg end pivotally connected to said base frame adjacent said base frame front end, said front leg having an opposite front leg end extending obliquely upwardly in an unfolded position, a rear leg having a rear leg end pivotally connected to said base frame adjacent said base frame rear end and an opposite rear leg outer end, a front leg guiding sleeve pivotally connected to said rear leg adjacent said outer end and being slidable on said front leg, a handle bar having an inner end fixed on said front leg guiding sleeve, a handle bar guiding sleeve slidable on said handle bar and fixed to said opposite front leg end, detent means permitting movement of said front leg guiding sleeve in a direction toward said front leg but locking said front leg guiding sleeve in an adjusted position, and releasable latching means defined between said handle bar and said front leg preventing movement of said handle bar and said rear leg to said front leg.

4,892,328

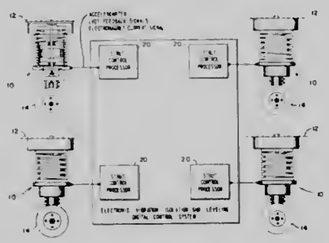
ELECTROMAGNETIC STRUT ASSEMBLY

Zvi Kurtzman, Los Angeles; Keith O. Stuart, Cypress, and Blake W. Bartosh, Manhattan Beach, all of Calif., assignors to Aura Systems, Inc., Los Angeles, Calif.

Filed May 27, 1988, Ser. No. 200,025

Int. Cl.⁴ B20G 17/00

U.S. Cl. 280—707 **23 Claims**



1. An assembly for use in an active suspension system to couple a wheel to a chassis of a motor vehicle and for controlling the orientation of the chassis at a preselected orientation, said assembly comprising:

an electromagnetic device including the coil and a magnetically-conductive member movable within said coil along an axis of relative movement between said chassis and said wheel, wherein said coil is adapted to move along said axis with movement of one of said chassis and wheel, and said magnetically-conductive members adapted to move along said axis with movement of the other of said chassis and wheel, said coil being adapted to generate a magnetic force on said magnetically-conductive member along said axis in response to a corrective current as a function of each of (a) any acceleration and deceleration forces applied along said axis, and (b) any difference between (i) the position of said chassis relative to said wheel and (ii) a predetermined value of the relative position between said chassis and wheel; and

control means for generating said corrective current as a function of acceleration and decelerstion forces applied along said axis and the position of said chassis relative to said wheel along said axis.

4,892,329

STABILIZER CONTROL APPARATUS FOR USE IN MOTOR VEHICLES

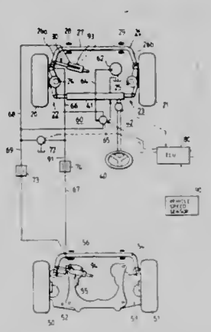
Tetsuji Kozaki; Mamoru Shimamoto, both of Nagoya, and Toshio Oonuma, Susono, all of Japan, assignors to Nippondenso Co., Ltd. and Kariya and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan

Filed Nov. 21, 1988, Ser. No. 273,533

Claims priority, application Japan, Nov. 19, 1987, 62-292568

Int. Cl.⁴ B62D 9/02

U.S. Cl. 280—772 **5 Claims**



1. A control apparatus for use in a motor vehicle having at least a left-side wheel and a right-side wheel, comprising:

elastically twistable stabilizer means provided between said left-side and right-side wheels of said motor vehicle;

hydraulic pressure cylinder unit means coupled between one end portion of said elastically twistable stabilizer means and one of said left-side and right-side wheels, said hydraulic pressure cylinder unit means having at least one cylinder body and one piston dividing the space within said cylinder body into two chambers and slidably movable in said cylinder body so as to be expandable and contractable in accordance with slidable movements of said piston;

hydraulic pressure generator means for generating a hydraulic pressure;

hydraulic pressure actuator means including change-over valve means and coupled between said hydraulic pressure generator means and said hydraulic pressure cylinder unit means to control hydraulic pressures in said two chambers of said cylinder body using the hydraulic pressure generated by said hydraulic pressure generator means so as to allow adjusting a position of said piston, the position of said piston in said cylinder body determining the twisting amount of said stabilizer means;

steering angle sensor means for sensing a steering angle of said motor vehicle in response to a rotational movement of a steering wheel of said motor vehicle and generating a signal indicative of the sensed steering angle;

position sensor means adapted for sensing the position of said piston in said cylinder body and generating a signal indicative of the sensed piston position;

first control means responsive to said steering angle signal and said position signal from said steering angle sensor means and said position sensor means to determine a predetermined stable condition of said motor vehicle on the basis of said steering angle signal and to obtain a neutral position of said piston taken under the condition that said motor vehicle is in said predetermined stable condition, said neutral position thereof being sensed by said position sensor means; and

second control means responsive to said steering angle signal to determine a turning state of said motor vehicle on the basis of said steering angle signal and to determine a target piston position with respect to the obtained neutral position of said piston in accordance with the degree of the vehicle turning state, determined by said steering angle signal, in response to the determination of the vehicle turning state, said second control means outputting a control signal to said hydraulic pressure actuator means so that said piston is controlled to assume the determined target piston position.

4,892,330

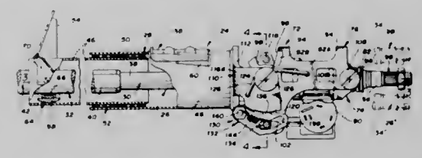
ADJUSTABLE STEERING COLUMN

Howard D. Beauch, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1988, Ser. No. 285,693

Int. Cl.⁴ B62D 1/18

U.S. Cl. 280—775 **5 Claims**



1. An adjustable steering column comprising:

a tubular mast jacket having a lower end and an upper end each adapted for attachment to a vehicle body,

a steering shaft disposed in said mast jacket with an upper end projecting beyond said mast jacket upper end,

a lower mount supporting said steering shaft on said mast jacket near said lower end thereof for rotation and for tilting in a vertical center plane of said mast jacket about a point near said lower end thereof between an upper limit position and a lower limit position,

an upper mount supporting said steering shaft on said mast jacket near said upper end thereof for rotation and for said tilting movement in the vertical center plane of said mast jacket, and

a tilt lock between said upper mount and said mast jacket operative to releasably lock said steering shaft in a plurality of positions between said upper limit position and said lower limit position.

4,892,331

MOTORIZED HEIGHT ADJUSTER FOR ADJUSTING THE HEIGHT OF THE PILLAR LOOP IN VEHICLE SAFETY BELTS

Erik Wollner, deceased, late of Alingsas, Sweden (by Barbro Wollner, representative); Barbro Wollner, and Leif Enerdal, both of Alingsas, Sweden, assignors to Allied Engineering Company S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 71,518, Jul. 9, 1987, abandoned. This application Feb. 1, 1988, Ser. No. 151,114
Claims priority, application Sweden, Jul. 10, 1986, 8603077
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 **10 Claims**



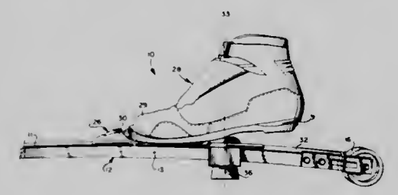
1. Motorized height adjuster for adjusting the height of the pillar loop in vehicle safety belts, comprising;
an elongate bar having a substantially U-shaped cross-section;
a threaded spindle rotatably mounted in the bar;
a motor positioned adjacent a first end of said bar and connected to a first end of said spindle for driving the spindle;
a carrier for the pillar loop adapted to be moved along the bar by the rotation of the spindle, and
first screw means for attaching said first end of said bar to said vehicle body and second screw for attaching a second end of said bar to the vehicle body, wherein
the first screw means has a main portion configured for engagement with the bar between said motor and a second end of said spindle, and configured for positioning between the sidewalls of said bar, said main portion provided with a recess for unobstructed accommodation of said spindle.

4,892,332

BRAKING SYSTEM FOR ROLLER SKIS

Ryan Jennings, 1 Apple La., Glen Falls, N.Y. 12801

Filed Nov. 4, 1988, Ser. No. 267,448
Int. Cl.[4] A63C *17/04*
U.S. Cl. 280—842 **14 Claims**



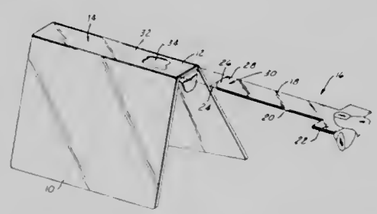
1. A roller ski assembly comprising:
(a) a ski having an elongated body having substantially flat top and bottom surfaces, an inside side edge, and an outside side edge, and front and rear ends;
(b) means for mounting a piece of footwear on the top surface of said ski body at a location thereon closer to said rear end than said front end;
(c) roller means disposed at said rear end and said front end of said ski body for mounting said ski body for rolling movement along a traversable surface;
(d) at least one friction producing braking element for effecting braking of the rolling movement of said ski body when said element is brought into engagement with a traversable surface, said element being generally circular in cross-section; and
(e) means for mounting said braking element to said ski body so that the operative portion of said braking element is disposed beneath said ski body, and the center of said generally circular cross section braking element is substantially disposed in a vertical plane containing said inside edge of said ski so that a substantial portion of said element extends horizontally away from said ski past said plane containing said inside edge of said ski body, but is unconnected to any other structure, and so that said braking element is out of contact with a traversable surface when said top surface of said ski body is substantially horizontal; and wherein the center of said braking element is substantially disposed in a vertical plane that extends approximately through the center of the footwear in a dimension perpendicular to the direction of elongation of said ski body.

4,892,333

WINDOW POCKET INSERTION DEVICE AND METHOD OF USE THEREFOR

Ronald F. Krulich, 8945 Mystic La., Warren, Mich. 48093

Filed Jun. 4, 1987, Ser. No. 58,262
Int. Cl.[4] B42D *3/00;* **B42F** *13/00;* **B25B** *9/00;* **A41H** *43/00*
U.S. Cl. 281—15.1 **2 Claims**



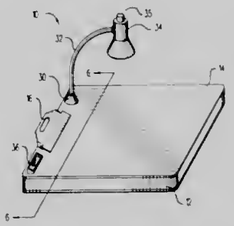
1. A device for inserting and removing sheet material with respect to a pocket, said pocket being defined by an outer overlay surface and an inner surface, said device comprising:
pair of prongs, each prong of said pair of prongs having a mutually similar length, width and thickness, each said prong being oriented in mutual parallel relationship, each said prong having a thin thickness as compared with said width, said length and said width of each said prong forming a substantially rectangular shape which defines a first face and an opposite second face, each first face of said pair of prongs being in mutual adjacency, each of said prongs further being flexibly joined at one end so as to permit the sheet material to be placed between each said first face of said pair of prongs, each said prong of said pair of prongs being dimensioned so that said pair of prongs and the sheet material may be both inserted into the pocket and removed from the pocket with only an extreme end portion of the sheet material contacting the pocket, said pair of prongs being structured to guide the sheet material into a seating position in the pocket when said pair of prongs is moved inward relative to the pocket, said pair of prongs being structured to frictionally interact with the sheet material so as to remove the sheet material from said seating position in the pocket when said pair of prongs is moved outward relative to the pocket except when the outer overlay surface of the pocket is pressed against said extreme end portion of the sheet material thereby trapping the sheet material between the outer overlay surface of the pocket and the inner surface of the pocket.

4,892,334

PORTABLE CLIPBOARD AND STORAGE BOX

Gary A. Sinclair, 22617 120th Ave. SE., Kent, Wash. 98031

Filed Mar. 9, 1989, Ser. No. 321,002
Int. Cl.[4] B42D *3/00*
U.S. Cl. 281—45 **1 Claim**



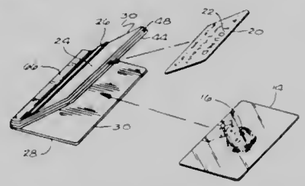
1. A portable clipboard and storage box, comprising:
a shallow generally rectangular box;
a cover mounted by a hinge on said box;
a spring retainer clip adjacent an upper edge of said cover;
cooperating magnetic fastening means adjacent an interior bottom edge of said cover and on a bottom edge of said box;
said magnetic fastening means comprises a rectangular magnet sandwiched between a pair of steel side plates and disposed within a bottom sidewall of said box, each of said steel side plates having an inwardly extending peg received through a transverse aperture formed through a midportion of said magnet;
a pair of spaced notches in said bottom edge of said box for opening said cover;
a light mounted by a flexible stem on said cover and operatively connected to a battery power source within said box; and
a digital clock on said cover.

4,892,335

CARD CONSTRUCTION

Milton C. Taft, Whittier, Calif., assignor to Rand McNally & Company, Skokie, Ill.

Filed Nov. 14, 1986, Ser. No. 931,364
Int. Cl.[4] B42D *15/00;* **G09F** *19/00, 3/00;* **B41L** *37/08*
U.S. Cl. 283—75 **16 Claims**



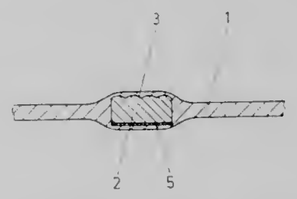
1. A card construction for carrying information, comprising:
first and second protective coverings, each capable of transmitting information through said covering;
structure between said protective coverings defining first and second openings positioned to communicate with one another in the direction of the thickness of the card construction, said first opening disposed toward said first protective covering and said second opening disposed toward said second protective covering, said openings having boundaries, along a boundary of the card construction, which are out of registration with one another; and
a first information-carrying medium in said first opening having a front face and a back face, said front face of said first information-carrying medium carrying information and facing said first protective covering, and a second information-carrying medium in said second opening having a front face and a back face, said front face of said second information-carrying medium carrying information and facing said second protective covering, said mediums being positioned in said openings to abut each other along said back faces.

4,892,336

ANTIFALSIFICATION DOCUMENT HAVING A SECURITY THREAD EMBEDDED THEREIN AND A METHOD FOR PRODUCING THE SAME

Wittich Kaule, Emmering; Jurgen Moll, Grunwald; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fuer Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,552
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609090
Int. Cl.[4] B42D *15/00;* **G09F** *3/00;* **G02B** *5/18, 1/10*
U.S. Cl. 283—91 **22 Claims**



1. An antifalsification document comprising a security thread embedded within the document, wherein said security thread is made of a transparent material;
a first side of said security thread exhibits a printed pattern;
a second side of said security thread spaced away from said printed pattern, defining an outer surface area of said security thread, exhibits an optically effective structure wherein when said printed pattern is viewed through said optically effective structure different areas of said printed pattern are recognizable at different viewing angles, and
wherein said printed pattern is configured so that an optical appearance of said security thread changes when viewing angle changes.

4,892,337

FATIGUE-RESISTANT THREADED CONNECTOR

Richard H. Gunderson, Houston, Tex.; Jerome Q. Burns, San Diego, Calif., and Stewart A. Fox, Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jun. 16, 1988, Ser. No. 207,687
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—333 **18 Claims**

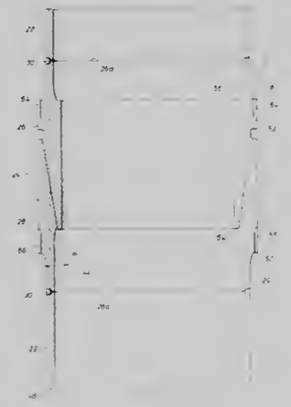
1. A threaded connector for use in connecting adjacent sections of tubing in a tubing string, said tubing having an inside diameter, an outside diameter, and a wall thickness, said

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tubing string having a longitudinal axis, said threaded connector comprising:

(a) a generally tubular pin member having first and second ends, said first end of said pin member adapted to be welded to a first section of said tubing, at least a portion of said pin member having a generally frustoconical outer surface which tapers radially inwardly toward said second end of said pin member, said frustoconical outer surface having a thread formed thereon;

(b) a generally tubular box member having first and second ends, said first end of said box member adapted to be welded to a second section of said tubing, at least a portion of said box member having a generally frustoconical inner surface which tapers radially outwardly toward said second end of said box member, said frustoconical inner



surface having a thread formed thereon which corresponds to and is threadedly engagable with said thread formed on said pin member;

(c) said thread formed on said pin member and said thread formed on said box member being modified buttress threads having a load flank substantially perpendicular to said longitudinal axis of said tubing string;

(d) said threaded connector adapted to be radially preloaded upon assembly and having a tapered thread engagement oriented so that the midpoint of said tapered thread engagement is located at approximately the same radial distance from said longitudinal axis of said tubing string as the midpoint of said wall thickness of said tubing, whereby there is a substantially straight load path with substantially no eccentricity through said threaded connector.

4,892,338

PLURAL POINT DOOR LOCK AND FLUSH-MOUNTABLE OPERATING MECHANISM WITH DETENT

Lee S. Weinerman, Medina; Joseph P. Spinelli, Jr., Seville, and Michael J. Rachocki, Columbia Station, all of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Oct. 13, 1988, Ser. No. 257,837

Int. Cl.[4] E05C *1/12*

U.S. Cl. 292—35 **20 Claims**

1. A plural-point latch for mounting on a closure for releasably retaining the closure in a closed position, comprising:

(a) a plurality of latch bolt assembly means for attachment to a closure at a plurality of spaced locations about the periphery of the closure for releasably engaging suitably configured strike formations that are provided adjacent the spaced locations, with each of the latch bolt assembly means including casing means for attachment to the closure, and an associated latch bolt means that is connected to the casing means for movement relative to the casing means into and out of engagement with an associated one of the strike formations;

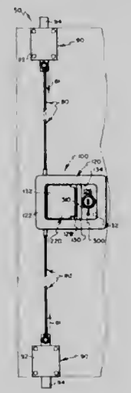
(b) flush-mountable operating means for flush-mounting on the closure at an operating means location that is remote from each of the plurality of spaced locations;

(c) elongate linkage means for connecting the operating means with the latch bolt assembly means for moving the latch bolt means out of engagement with their associated strike formations in response to operation of the operating means so as to release the latch bolt assembly means from engagement with the strike formations;

(d) wherein the operating means includes:

(i) pan-shaped housing means formed as a metal stamping and having side and back walls that define a forwardly-facing recess that is surrounded by a perimetrically extending mounting flange, with the back wall having a front surface that faces forwardly into the recess, and having a back surface on the opposite side thereof, and with the back wall having an opening that is formed through the back wall;

(ii) mounting plate means formed as a metal stamping for attachment to the back surface of the back wall in the vicinity of the opening that is formed through the back



wall, with the mounting plate means having opposed side formation means and opposed end formation means that form a continuous band of material that extends about a central opening that is formed through the mounting plate means, with the opposed side formation means having at least portions thereof that are configured to extend along portions of the back wall that are located on opposite sides of the opening that is formed through the back wall, and with the mounting plate means having track formation means that extend from the opposed side formation means toward the central opening to define a pair of opposed rail means that face toward each other and extend along opposite sides of the central opening, with the opposed rail means extending substantially parallel to each other and being spaced apart by a first distance for defining a slide track that extends along the back wall in the vicinity of the opening that is formed through the back wall, and with the track intersecting with the opening that is formed through the back wall;

(iii) elongate slide means having a pair of opposed, longitudinally extending side portions that face away from each other and are spaced apart by a second distance that is greater than the first distance, with groove means being provided to extend longitudinally along the side portions to define a pair of grooves that are configured to receive the opposed rail means to mount the slide means for movement along the track;

(iv) handle means pivotally mounted on the housing means and being movable with respect to the housing means between a nested position wherein the handle means is nested within the recess, and an extended position wherein at least a portion of the handle means projects forwardly from the recess, with the handle means having a rearwardly extending projection that extends through the opening that is formed through the back wall and that extends into the slide means moves along the track;

(v) receiving formation means provided on the slide means for closely receiving the rearwardly extending projection of the handled means to provide an essentially play-free driving connection between the handle means and the slide means that is operable to cause the handle means and the slide means to move in unison, with the slide means being movable along the track between a first position that is assumed by the slide means when the handle means is in its nested position, and a second position that is assumed by the slide means when the handle means is in its extended position;

(vi) operating arm means for connecting the elongate linkage means to the slide means to effect movement of the elongate linkage means in response to movement of the slide means such that, when the slide means is in its first position, the elongate linkage means permits the latch bolt means to extend into engagement with the strike formations, and when the slide means is in its second position, the elongate linkage means retracts the latch bolt means from engagement with the strike formations, with the operating means including a pair of operating arms each of which is connected to the housing means for pivotal movement relative to the housing means about a separate axis of rotation, and each of which is connected to the slide means so as to be rotated about its associated axis of rotation in response to movement of the slide means between its first and second positions; and,

(vii) detent means interposed between the slide means and the housing means, for releasably retaining the slide means in its first and second positions with respect to the housing means, with the detent means including a hole formed in the slide means and opening forwardly toward the back wall of the housing means, a detent element positioned in the hole, biasing means positioned in the hole for biasing the detent element forwardly with respect to the hole so as to project outwardly from the hole and into engagement with the back wall portion of the housing means, and with first and second dimple-like depression means being provided in the back wall portion of the housing means for receiving the detent element when the slide means is in its first and second positions.

4,892,339

POWER-CLOSING MOTOR-VEHICLE DOOR LATCH

Frank Kleefeldt, Heiligenhaus, and Hans T. Menke, Velbert, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,238

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725075

Int. Cl.[4] E05C *3/26*; E05B *47/00*

U.S. Cl. 292—201 **5 Claims**

1. A vehicle door latch in combination with a door belt, the latch comprising:

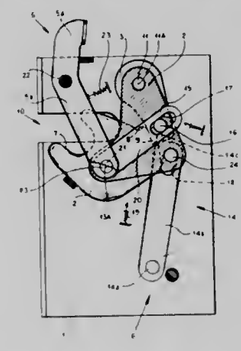
a door belt;

a housing formed with a horizontally open recess in which the bolt is receivable;

a latch fork formed with a fork seat and with at least one detent;

a fork pivot on the housing supporting the fork for pivoting between a locked and a semilocked position with the seat directly vertically away from the fork pivot and the bolt engaged in the seat and an unlocked position permitting the bolt to enter and exit seat and recess;

an operating plate pivotal on the housing about an operating plate axis substantially parallel to the fork pivot;



a latch pawl pivotal on the operating plate into and out of a position engaging the detentand thereby retaining the fork in the semilocked position;

means including a motor connected to the operating plate for pivoting same means about its axis and, when the pawl is engaged with the detent, pivoting the fork into the locked position; and

a door handle and a link connected between the handle and the pawl for pivoting same out of engagement with the detent in any position of the fork.

4,892,340

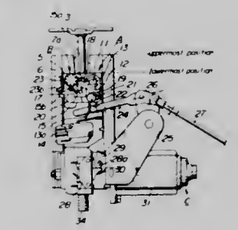
ELECTRIC LOCKING DEVICE FOR LID

Masaharu Matumoto, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Oct. 13, 1987, Ser. No. 106,680

Int. Cl.[4] E05B *65/19*

U.S. Cl. 292—201 **17 Claims**



1. An electric locking device for locking a lid to a receptacle member, comprising:

a striker mounted to said lid;

a lock proper mounted to said receptacle member and locking said striker when the striker is brought into full engagement therewith, said lock proper being movable relative to said receptacle member along a guide path;

a locked condition sensing means mounted to said receptacle member, said sensing means issuing a striker locked condition representing signal when said striker is locked by said

lock proper and issuing a striker released condition representing signal when said striker is released from said lock proper;

an electric mover mounted to said receptacle member for moving, when electrically energized, said lock proper along said given way;

a control circuit for controlling operation of said electric mover in such a manner that when said sensing means issues said striker locked condition representing signal, the mover moves said lock proper in one direction along said guide path to a first position for achieving full closing of said lid and when said sensing means issues said striker released condition representing signal, the mover moves said lock proper in a second direction along said guide path to a second position for catching said striker; and

a hollow slider to which said lock proper is installed, and a guide frame to which said slider is slidably connected, said guide frame being secured to said receptacle member;

wherein said lock proper comprises:

a latch plate rotatably held in said slider;

a pawl plate rotatably held in said slider, said pawl locking said latch plate when the latter latches said striker;

an open lever rotatable together with said pawl plate;

a lock cancelling lever pivotally connected at one end to said slider;

a connecting lever connecting said lock cancell. ıg lever to said open lever in a lost motion manner, so that pivoting said lock cancelling lever in a given direction can induce a pivoting of said open lever in a first direction causing said pawl plate to release the latch plate; and

actuating means for pivoting said lock cancelling lever in said given direction when said lock proper is moved in said second direction.

4,892,341

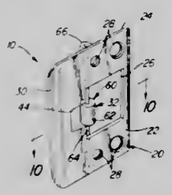
SELF-ADJUSTING DOOR STRIKE

Hagen Dietrich, Delta, Canada, assignor to Masco Building Products, Corp., Taylor, Mich.

Division of Ser. No. 9,434, Feb. 2, 1987, Pat. No. 4,813,724. This application Aug. 19, 1988, Ser. No. 234,431

Int. Cl.⁴ E05B *15/02*

U.S. Cl. 292—341.12 **4 Claims**



1. A door strike adapted to receive a latch bolt of a door lock mechanism, the latch bolt extending longitudinally from the door lock mechanism through said door strike into a door frame to which said door strike is mounted, said door strike comprising:

a plate member having rear and front faces and a plurality of apertures for mounting said plate member to the door frame in alignment with the door lock mechanism, said plate member including a central opening having a configuration substantially similar to the configuration of the latch bolt longitudinally extendable through said central opening; and

a resilient biasing member attached to said plate member, said resilient biasing member including at least one roller axially mounted to a flexible spring-wire having its outer ends secured to the rear face of said plate member, said at least one roller extending across at least a portion of said central opening to laterally engage and bias against the latch bolt upon extension of the belt through said central opening wherein said plate member includes a guide notch communicating with said central opening, said notch guiding the biasing movement of said roller upon extension of the latch bolt through said central opening of said plate member.

4,892,342

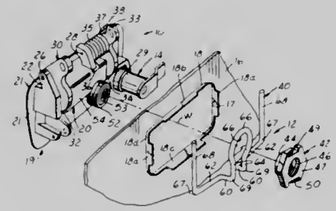
VEHICLE DOOR HANDLE MOUNTING ARRANGEMENT

Howard G. Newman, Troy; David G. Monette, Warren; Michael D. Koczara, St. Clair Shores; Duane J. Ribant, Fraser; Ronald D. Papke, Rochester; Alfred A. Bien, West Bloomfield, and Richard A. Hawkins, Livonia, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 13, 1989, Ser. No. 296,636

Int. Cl.⁴ E05C *21/00*

U.S. Cl. 292—347 **8 Claims**



1. In a housing mounted on a vehicle body panel, said housing comprising a main portion extending inboard through a rectangular-shaped panel opening and having a terminal lip flange portion extending around the periphery of said housing main portion in flush engagement with the outboard surface of said panel, the panel opening symmetrical axis extending transversely through the geometric center thereof, said panel opening formed with inboard extending border side and bottom flange means, an improved arrangement for securing said housing in said panel opening comprising:

said housing main portion formed with an inboard extending cylindrical-shaped externally threaded hub having its principal axis substantially aligned on said opening symmetrical axis;

a piloted nut comprising a driving head portion and an internally threaded pilot collar portion extending from one undersurface of said head portion, said collar portion extending axially from said undersurface with its internal threads engaging said hub external thread;

a bent spring rod retainer interposed between the inboard surface of said panel and said nut driving head undersurface, said spring rod retainer in its free state comprising an inboard upstanding central open eye formation defining a semi-circular eyelet and a pair of outboard upstanding arm portions;

said bent spring rod retainer having a pair of angled rod-length portions lying in a horizontally disposed base plane, a pair of upstanding transition portions, each said transition portion joining an associated one end of said open eye formation with a respective inboard end of an associated angled rod-length base portion, and each said upstanding arm portion joined to the outboard end of an associated angled rod-length base portion;

each said spring retainer arm portion juxtaposed on the outwardly facing surface of an associated one of said border side flange means and each said angled rod-length base portion juxtaposed on the downwardly facing surface of said border bottom flange means, such that the center of said retainer eyelet is self-aligned on said panel rectangular opening symmetrical axis;

said eye formation semi-circular eyelet having a predetermined diameter slightly greater than said piloted nut collar for passage of said collar within said eyelet with no play upon said collar internal thread being threaded-on said hub external thread; and

whereby upon said nut being turned in a threading-on direction pressure is brought to bear on said open eye formation and said arm portions causing said spring retainer to be axially flexed wherein said retainer provides a constant spring biasing preload acting on said nut driving head undersurface and said panel inboard surface locking said nut against loosening while said arrangement secures said housing in said panel opening.

4,892,343

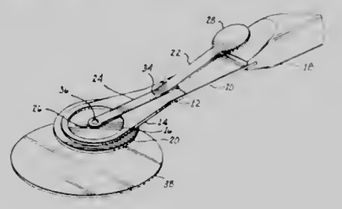
VACUUM PENCIL

Brian E. Hall, 3046 E. Dover St., Mesa, Ariz. 85213

Filed Oct. 5, 1988, Ser. No. 253,689

Int. Cl.⁴ B66C *1/02*; **B25J** *15/06*

U.S. Cl. 294—64.1 **24 Claims**



1. A vacuum pencil for transporting semiconductor members, comprising:

a. a relatively flat, planar frame member having an enlarged end with a substantially circular hole formed therein;

b. a handle coupled to an end of the frame member opposite the enlarged end thereof;

c. a relatively flat, deformable elastic member having a first upper side for engaging the enlarged end of the frame member and an opposing lower side for engaging a semiconductor member, the upper side of the deformable elastic member being disposed adjacent and connected to the enlarged end of the flat frame member and concentric with the hole formed therein, the deformable elastic member having a central portion;

d. a lever member having a relatively flat first end lying closely adjacent to the flat frame member, the flat first end being connected to the central portion of the deformable elastic member, the lever member including an opposing second end adapted to be depressed by the user, thereby causing the flat first end to raise the central portion of the deformable elastic member to create a temporary vacuum attachment when the deformable elastic member is in contact with a semiconductor member, thereby permitting the semiconductor member to be safely lifted and transported.

4,892,344

PARALLEL GRIPPER

Susumu Takada, and Kouichirou Ishibashi, both of Soka, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,422

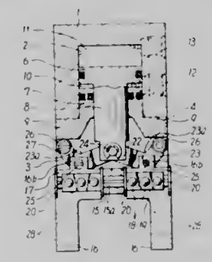
Claims priority, application Japan, May 25, 1987, 62-078398

Int. Cl.⁴ B25J *15/08*

U.S. Cl. 294—88 **8 Claims**

1. A parallel gripper which opens and closes a pair of fingers while keeping parallelism between said fingers by transmitting driving force of a fluid pressure actuator to the fingers by means of a power transmission mechanism, which comprises:

the fluid pressure actuator is constructed by arranging a pair of pistons in a single cylinder bore provided in a body, the pair of pistons having the same diameter and being mutually slidable in the cylinder bore, one of the pistons which is an outer piston having a center hole and guide sections on both sides of the center hole, the other piston which is an inner piston being provided with a rod which passes slidably and hermetically through the center hole,



wherein a pressure chamber is defined between the pistons,

the pair of fingers are supported slidably in a direction perpendicular to the axial direction of the cylinder bore by means of guide members provided on the body,

the power transmission mechanism consists of a pair of levers, in which one end of each lever is pivotally connected on the rod of the inner piston such that said one end of each lever moves with said inner piston, the other end of each lever being in contact with each guide section of the outer piston, and a bent portion at the middle of each lever is mounted pivotally on each finger such that the two fingers move relatively in parallel, so that the opening and closing operation for gripping with the fingers is realized by driving of both pistons and

a port for supplying and discharging a pressurized fluid into the pressure chamber between the pair of pistons to open and close the fingers for gripping a work.

4,892,345

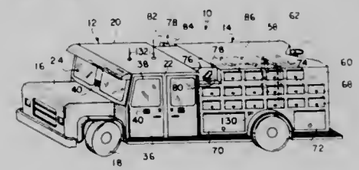
ARMORED VEHICLE

Stephen Rachael, III, 6329 Briergate, Bartlett, Tenn. 38134

Filed Sep. 23, 1988, Ser. No. 248,195

Int. Cl.⁴ B60P *3/03*

U.S. Cl. 296—24.1 **5 Claims**



1. An armored vehicle comprising;

a body including a forward cab section and an rearward vault section,

said vault section provided with left and right side walls having a plurality of cargo compartments therebetween each having a separate door juxtaposed a respective one said side wall,

actuating means for unlocking and permitting opening of said compartment doors whereby access may be had to said cargo compartments,

said cab section includes opposite sides each provided with at least one door permitting passage of crew members,

said vault section side walls disposed in planes inwardly offset from the plane of said cab section sides,

control means operable from within said cab section to

activate said actuating means,
video cameras on said body having a field of view encompassing said compartment doors,
at least two said video cameras respectively disposed on said vault section adjacent the juncture between said cab and vault sections and disposed in defined spaces recessed from said vault section side walls, and
video monitor means within said cab section displaying the images captured by said video cameras.

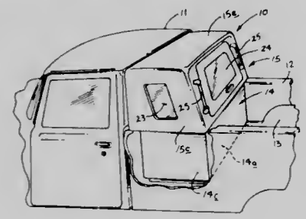
4,892,346

DROP-IN UTILITY ENCLOSURE APPARATUS

Joseph P. Berlin, 198 Plank Rd, Clifton Park, N.Y. 12065

Filed Feb. 16, 1989, Ser. No. 310,913
Int. Cl.[4] B60R *11/00*
U.S. Cl. 296—37.6 **12 Claims**

1. A drop-in utility enclosure apparatus removably mountable into the forwardmost portion of a flat truck body including vertical walls extending upwardly from the truck body wherein said apparatus comprises,
a lower unit defined by a lower rear face, a lower forward face, a lower first side, a lower second side, and a lower bottom face, and
an upper unit integrally formed to and extending upwardly of said lower unit defined by an upper rear face, an upper top face, an upper first side, an upper second side, and an upper forward face aligned with said lower forward face and wherein said upper first and second sides extend outwardly of said lower first and second sides to define first and second surfaces to overlie the walls of the truck body, and
wherein said lower rear and forward faces are of a length substantially equal to that of the interior width of the



truck bed and of a height substantially equal to that of the walls of the truck bed, and the length of the forward and rear faces of the upper unit are defined by the lengths greater than that of the lower forward and rear faces to overlie the walls of the truck bed, and
wherein said upper rear face includes a pivotally mounted door enabling access interiorly of the upper and lower units, and
wherein first and second lids are pivotally mounted overlying the first and second surfaces interiorly thereof in the upper unit to completely overlie the lower unit interiorly thereof when the first and second lids are in a lowered position.

4,892,347

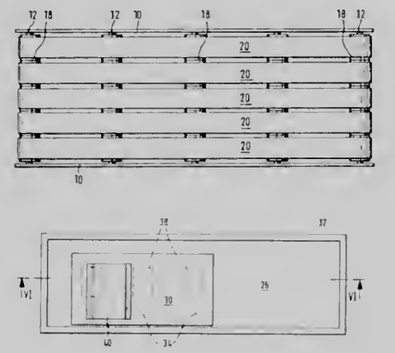
APPARATUS FOR SAVING AND PROTECTING THE SHOES OF THE DRIVER OF A MOTOR VEHICLE

Helmut Steinhilber, Sonnenbergstr. 40, CH-6052 Hergiswil Schweiz, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 202,189
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 3718581
Int. Cl.[4] B60N *3/06*
U.S. Cl. 296—75 **21 Claims**

1. An apparatus for saving and protecting the shoes of a driver of a motor vehicle, comprising: a support device for resting the foot of a driver, said support device being disposed in front of the gas pedal and the braking pedal of a motor vehicle and being movable with the foot at least in a cross direction, and said support device comprising at least one belt (20).

9. An apparatus for saying and protecting the shoes of a driver of a motor vehicle having a floor, comprising; a support device for resting the foot of the driver, said support device being disposed in front of the gas pedal and braking pedal of a motor vehicle and being movable with the driver's foot at least in a cross direction, and said support device comprising a plate (30) slidably supported on a base plate (26), said base plate position on said floor (16); whereby no friction occurs between



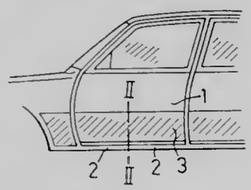
the plate and the driver's shoe during sideways movement of the driver's foot.

4,892,348

CONSTRUCTION OF LOWER PART OF DOOR IN MOTOR VEHICLE

Masahiro Nozaki, Ama, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 1, 1989, Ser. No. 304,658
Claims priority, application Japan, Mar. 24, 1988, 63-38600; Mar. 31, 1988, 63-43868; Sep. 26, 1988, 63-125818
Int. Cl.[4] B62D *27/00*
U.S. Cl. 296—146 **6 Claims**



1. A construction of a lower part of a door of a motor vehicle, comprising:
a broad moulding-shaped cover plate attached to an outer surface of a lower portion of a door outer panel so as to cover the lower portion thereof; and
a seal member attached along a lower edge of said cover plate for sealing a space between a lower edge of said cover plate and a rocker panel; said seal member being formed of an elastic material, and provided with a base portion retained by said lower edge of said cover plate in pressure contact with the outer surface of the door outer panel, which is opposed to said lower edge of said cover plate, and a sealing portion which extends downward

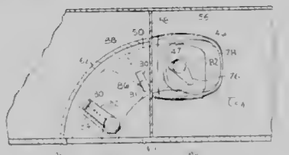
from said base portion like a lip and of which a lower end is brought into contact with said rocker panel when the door is closed.

4,892,349

TOILET SYSTEM WITH REMOVABLE HOLDING TANK FOR RECREATIONAL VEHICLES

Charles L. Sargent, Ann Arbor, Mich., assignor to Thetford Corporation, Ann Arbor, Mich.

Filed May 13, 1988, Ser. No. 193,905
Int. Cl.[4] B60R *15/04*
U.S. Cl. 296—156 **13 Claims**



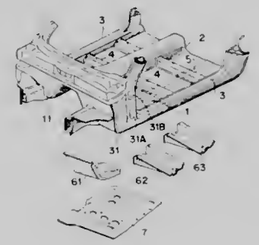
8. A waste holding tank for use with a water use sanitary toilet in a recreational vehicle, said tank separably connected to said toilet to form a fluid connection therebetween to allow waste from said toilet to pass into said tank, said tank comprising
a generally horizontal bottom wall;
a generally horizontal top wall vertically spaced above said bottom wall;
first and second upright end walls disposed between said top and bottom wall; and
first and second curved upright sidewalls disposed between said bottom and top walls joining said top and bottom walls along longitudinal edges of said top and bottom walls, said sidewalls being curved in arcuate paths about a common center point.

4,892,350

AUTOMOBILE UNDERBODY STRUCTURE

Mitsutoshi Kijima, Iwakuni, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 2, 1988, Ser. No. 227,249
Claims priority, application Japan, Aug. 4, 1987, 62-119372[U]
Int. Cl.[4] B62D *27/02*
U.S. Cl. 296—204 **6 Claims**



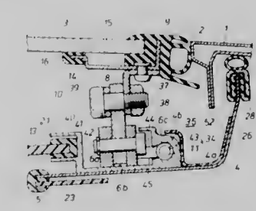
1. An automobile underbody structure comprising:
a floor panel having a pair of longitudinal side edges, each said side edge extending in a direction to be longitudinally of an automobile body structure;
a pair of side sills, each said side sill being rigidly secured to a respective said side edge so as to extend in a direction generally parallel to the longitudinal dimension of the automobile body structure;
a pair of side frames positioned between said side sills and secured from below to an undersurface of said floor panel so as to extend generally parallel to said side sills;
two sets of a plurality of generally elongated torque boxes, one said set for each side of said floor panel, said torque boxes of each said set being secured to said undersurface of said floor panel so as to define generally closed hollow spaces in cooperation with said floor panel, said torque boxes of each said set being spaced apart from each other in a direction longitudinally of the automobile body structure; and
a reinforcement plate member secured to said torque boxes of each said set and spaced from said floor panel.

4,892,351

WATER DRAIN TROUGH FOR AUTOMOTIVE SUNROOF

Jun Ooo; Yuichiro Iso, and Hiroshi Ise, all of Saitama, Japan, assignors to Honda Giken Kogyo K.K., Japan

Filed Feb. 23, 1988, Ser. No. 159,082
Claims priority, application Japan, Mar. 13, 1987, 62-058081; Jun. 9, 1987, 62-143638
Int. Cl.[4] B60J *7/195;* **B60R** *13/07*
U.S. Cl. 296—213 **10 Claims**



1. In combination, a sunroof structure having an opening provided in a roof panel of an automobile, a sunroof panel which can move between a first position for closing the opening and a second position for exposing the opening, a sunroof base panel supporting a pair of guide rails extending longitudinally of said automobile roof panel along a side periphery of said opening and for achieving the motion of the sunroof panel, and a water drain trough defined along a peripheral region of the opening, wherein the water drain trough comprises a trough liner having a substantially U-shaped cross section extending along a peripheral region of the opening and resting upon an inner surface of a substantially upright outer wall of the sunroof base panel and an outer surface of said guide rails for the sunroof panel.

4,892,352

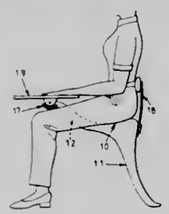
SEAT

Michael Haywood, Hillside, Bushcombe Lane, Woodmancote, Cheltenham GL 52 4QL, England

Filed Nov. 1, 1988, Ser. No. 265,542
Claims priority, application United Kingdom, Nov. 4, 1987, 8725782
Int. Cl.[4] A47B *39/00*
U.S. Cl. 297—195 **7 Claims**

1. A seat comprising a seating member, ground engageable support means depending from the seating member, the support means alone being incapable of maintaining the seating member in a stable seating position, and stabilizing means projecting forwards of the seating member and including, at a

position removed from the seating member, thigh abutment means for making contact with the front of a seated user's



thigh, the seat being stackable with like seats for ease of storage.

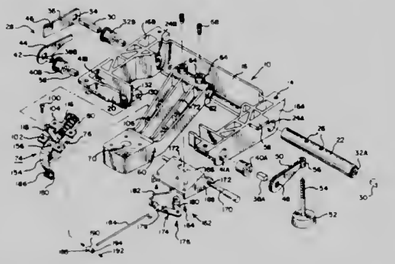
4,892,353
COVER FOR LOUNGE CHAIR
Dan J. Goddard, 5407 W. Roanoke Ave., Phoenix, Ariz. 85035
Filed Mar. 6, 1989, Ser. No. 319,329
Int. Cl.[4] A47C *31/00*
U.S. Cl. 297—224 **7 Claims**



1. A fitted cover for a leg-supported lounge chair of the type having a body-supporting section with a head end, foot end and opposite side edges, said cover comprising:
(a) a cover panel having a top edge, a body edge, and opposite side edges, said cover generally conforming to the shape of the lounge chair body-supporting surface;
(b) a fitting pocket extending transversely of said cover panel at the top and bottom edges thereof and engageable with at least a part of the foot and head end of the chair to maintain the cover in position on said body-supporting section;
(c) an elasticized panel extending transversely of said cover panel at an intermediate location between said fitting pockets to apply tension to said cover panel to maintain the same snugly on said chair, said elasticized panel terminating inwardly of said panel side edges; and
(d) elastic bands extending on said cover panel adjacent said elasticized panel at the side edges of said cover panel.

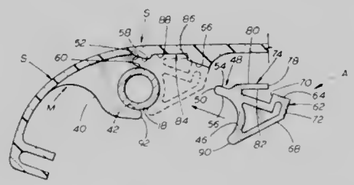
4,892,354
CHAIR SEAT TILT CONTROL
Michael H. Estkowski; Don E. Minor, Coloma, both of Mich., and Leonard V. Lastuck, Granger, Ind., assignors to Shepherd Products U.S., Inc., St. Joseph, Mich.
Filed Jun. 30, 1989, Ser. No. 374,269
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—301 **6 Claims**

1. A support mechanism for a tiltable chair including a seat support assembly having a front and a rear adapted to be mounted to the underside of a chair seat, said support assembly including a pair of side plates; a tube having a central axis supported between and toward the front ends of said side plates such that said support assembly and said tube are relatively rotatable; a rear tilt torque mechanism associated with said seat support assembly operative to resist rear tilt of said seat support assembly about said tube; a rear tilt torque adjustment means connected to said rear tilt torque mechanism to selectively vary the resistance to rear tilt; a base member having a rear end which is adapted to be supported by a chair post and a front end which is rigidly securable to said tube; a detent mechanism connected between said base member and said



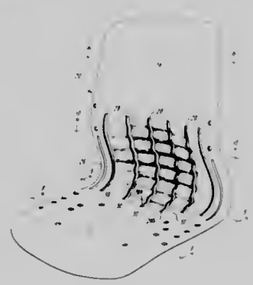
support assembly to bias said support assembly to a horizontal position and to provide added resistance to rear tilt, said detent mechanism adapted to assume a first position such that rear tilt of said support assembly about said tube is permitted, but front tilt of said support assembly about said tube is prohibited, said detent mechanism further adapted to assume a second position to allow forward tilt of said support assembly about said tube; and a release mechanism associated with said detent mechanism operative to lock said detent mechanism in said first position and to selectively release said detent mechanism to assume said second position.

4,892,355
CHAIR CONSTRUCTION
Fritz M. Fend, Regensburg, Fed. Rep. of Germany, assignor to Samsonite Furniture Company, Murfreesboro, Tenn.
Filed Nov. 18, 1986, Ser. No. 932,448
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609591
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—440 **31 Claims**



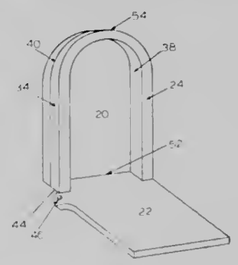
1. A chair comprising:
a frame having a forward and a rear transverse supporting member;
a seat mounted to said forward and rear transverse supporting members, said seat further comprising:
rigid rear seat attachment means,for unflexingly engaging said rear transverse supporting member to selectively secure the rear of said seat to said frame;
a front attachment member extending from said seat and adapted to engage said forward transverse supporting member when said rear attachment means engages said rear transverse supporting member;
a clip, said clip having a rigid body, a first projection and a second, bearing surface projection, said clip adapted to engage said forward transverse supporting member whereupon said clip is retained to said forward transverse supporting member by virtue of said projections: said first projection positioned between said forward transverse supporting member and said seat and said bearing surface projection laterally spaced from said first projection and engaged with said seat at a bearing surface to provide a moment about said first projection with a force applied to said bearing surface thereby transferring load placed on said seat to said forward transverse supporting member, said clip securing said engagement between said front attachment member and said forward transverse supporting member.

4,892,356
CHAIR SHELL
Ernest A. Pittman, Courtland; Edward R. Dandridge, Senatobia, both of Miss., and Robert L. Wilson, Memphis, Tenn., assignors to Chromcraft Furniture Corp., Senatobia, Miss.
Filed Jul. 27, 1988, Ser. No. 224,936
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—457 **18 Claims**



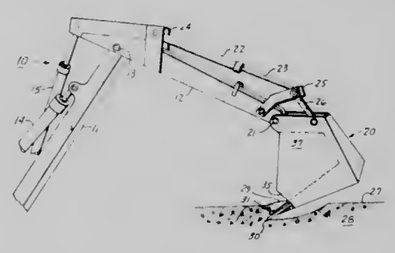
1. A chair which provides resilient flexing of the backrest and seat to accommodate occupants of different size and shape as well as movement of the occupant comprising
a one piece structurally resilient chair shell having seat and back sections joined by a generally curved transition section, said back section having a contoured portion for supporting the back,
a plurality of generally parallel slots in the shell extending rearwardly from the rear portion of the seat section across the transition section and vertically approximately half way up the back section so as to define a plurality of generally parallel ribs extending from the rear of the seat section into the back section.
a plurality of transverse corrugations formed in the ribs extending substantially throughout their length and superimposed on the contoured portion of the back section and the curved transition section,
cushioning covering the front and back of the shell and spanning the slots in the shell,
an upholstery cover enclosing the shell and cushioning and hiding the slots and corrugations,
and a base secured to and supporting the shell.

4,892,357
CHILD'S PORTABLE AUXILIARY SEAT CUSHION WITH UPPER BODY SUPPORT RIDGE
Adriana Nieto-Busby, and Guadalupe Nieto, both of 838 Vinemead Dr., Whittier, Calif. 90601
Filed Apr. 21, 1988, Ser. No. 184,299
Int. Cl.[4] A47C *20/00, 7/02, 31/00*
U.S. Cl. 297—464 **4 Claims**



1. A child's portable auxiliary seat cushion with upper body support ridge comprising an oblong mat of a predetermined size comprising a front layer and a back layer; interposed between said front layer and said back layer are a fiberfilled layer and an interfacing layer, both the same shape as said front layer, a continuous securing means extends around the perimeters of, and peripherally interconnects said front, fiber-filled, interfacing and back layers, stitching at the hinge defines a seat portion and backrest, said seat portion comprises: two slits, one on each side adjacent to hinge, as means for inserting a seat belt and making said seat portion pliable enough to accommodate a safety booster seat, said backrest portion comprises a ridge, upper body support means, peripherally connected to the upper outer perimeters of said backrest portion and projecting forwardly thereof, said ridge comprising an innermost, uppermost, outermost and bottom section, creating a tubular form as means for retaining a ridge filler which is made of a firm, yet resilient material such as, but not exclusive to, foam rubber.

4,892,358
BUCKET SYSTEM WITH PERCUSSIVE PENETRATION MEMBER
Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037
Filed Jun. 10, 1988, Ser. No. 205,266
Int. Cl.[4] F02F *3/32;* F21C *3/04*
U.S. Cl. 299—37 **10 Claims**



1. A bucket system for release and collection of material on and from a working face, said system comprising:
a bucket having a bottom with a dimension of width, a digging edge, and two sides, said digging edge extending

between said sides whereby to form a material receiving structure;

an impact hammer mounted to the bucket beneath said bottom, and including a striker driven percussively and repetitively along an axis which extends generally toward said digging edge;

a penetration member mounted to the bucket beneath said bottom, aligned with said striker to receive blows from it and transmit said blows to said working face, said penetration member having a continuous free edge, extending beyond said digging edge so as to contact said working face before said digging edge makes such contact, and having a dimension of length at least equal to the distance between said two sides at the digging edge,

whereby with said impact hammer exerting percussive blow against said penetration member, and with said free edge of said penetration member pressed against said working face, the penetration member fragments said working face over a width at least equal to the distance between the said two sides, and the digging edge follows it so as to collect loosened material in said bucket.

4,892,359

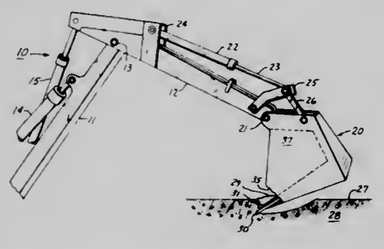
BUCKET SYSTEM WITH PERCUSSIVE PENETRATION MEMBER

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 205,266, Jun. 10, 1988. This application May 31, 1989, Ser. No. 359,484

Int. Cl.[4] E02F *3/32*; E21C *3/04*

U.S. Cl. 299—37 **11 Claims**



1. A bucket system for release and collection of material on and from a working face, said system comprising:

a bucket having a bottom with a dimension of width, a digging edge, and two sides, said digging edge extending between said sides whereby to form a material receiving structure;

an impact hammer mounted to the bucket beneath said bottom, and including a striker driven percussively and repetitively along an axis which extends generally toward said digging edge;

a penetration member mounted to the bucket beneath said bottom, aligned with said striker to receive blows from it and transmit said blows to said working face, said penetration member having a continuous free edge, extending beyond said digging edge so as to contact said working face before said digging edge makes such contact, and having a dimension of length at least equal to the distance between said two sides at the digging edge,

whereby with said impact hammer exerting percussive blows against said penetration member, and with said free edged of said penetration member pressed against said working face, the penetration member fragments said working face over a width at least equal to the distance between the said two sides, and the digging edge follows it so as to collect loosened material in said bucket;

said penetration member including a pair of deflector wings which rise to a level above the bottom of the bucket, and which are spaced farther apart than the sides of the bucket, said wings having a free edge continuous with the free edge in front of the bottom of the bucket.

4,892,360

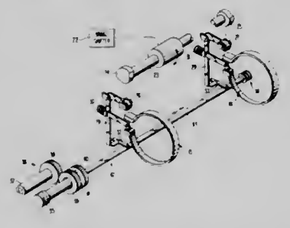
BRAKE ACTIVATION APPARATUS AND POWER DRIVE UNIT THEREFOR

John D. Tysver, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 14, 1988, Ser. No. 218,869

Int. Cl.[4] B60T *13/00*

U.S. Cl. 303—9.61 **12 Claims**



1. An activation apparatus comprising first and second brake devices capable of being selectively applied, shifting means for selectively applying either said first or second brake device and not the other, and means for overriding said shifting means for applying both of said first and second brake devices, wherein said means for overriding comprises linkages for applying the first and second brake devices, a common bar connected to said linkages and means for moving the bar for applying and releasing application of both the first and second brake devices, and wherein said means for moving the bar includes a spring for biasing said bar in a direction for applying both said first and second barking devices and a hydraulic piston-cylinder for opposing the biasing of said spring to release application of both braking devices when hydraulic pressure is applied to said piston-cylinder.

4,892,361

HYDRAULIC BRAKE BOOSTER

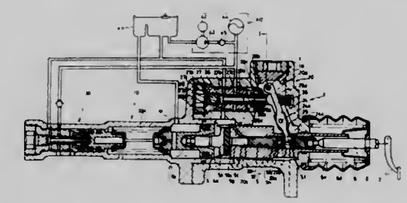
Michiharu Nishii, Toyota, and Yoshihiko Tada, Hazu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 12, 1988, Ser. No. 231,439

Claims priority, application Japan, Aug. 13, 1987, 62-202255

Int. Cl.[4] B60T *13/12*

U.S. Cl. 303—114 **3 Claims**



1. A hydraulic brake booster for actuating a master cylinder by a hydraulic power pressure supplied from a power source in response to an input rod connected to a brake pedal comprising:

a housing connected to said master cylinder,

a power piston slidably disposed in a boost chamber which is defined in said housing and transmitting a boost force which is generated in response to said input rod,

a hydraulic pressure control valve having a valve body moved between a power position communicated with said power source and an initial position communicated with a reservoir in said boost chamber on an exist extending substantially in parallel with a sliding axis of said power piston,

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4,892,362

ANTILOCKING APPARATUS FOR VEHICLE BRAKES

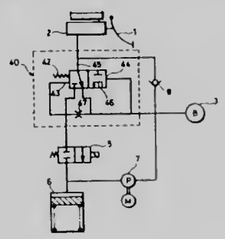
Koji Takata, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 9, 1988, Ser. No. 230,617

Claims priority, application Japan, Aug. 13, 1987, 62-202114

Int. Cl.[4] 303 *68, 84.2, 113, 114, 115, 116, 117, 119*; 188 *131 A*

U.S. Cl. 303—115 **3 Claims**



1. An antilocking apparatus for performing an antilocking operation for a wheel brake of a vehicle, said antilocking apparatus comprising a master cylinder; an inlet valve provided in a fluid path connecting said master cylinder with said wheel brake for selectively allowing and cutting off communication between said master cylinder and said wheel brake through said fluid path; an electrically switch-controlled outlet valve capable of discharging a working fluid from a fluid path portion connecting said inlet valve with said wheel brake; a damping reservoir for temporarily storing said working fluid discharged through said outlet valve; a pump for drawing said working fluid stored in said damping reservoir and delivering said working fluid into said fluid path portion connecting said inlet valve with said wheel brake, said inlet valve comprising differential pressure responsive valve means actuated by a differential pressure between fluid pressure in said fluid path portion connecting said inlet valve with said wheel brake and fluid pressure in a fluid path portion connecting said inlet valve with said outlet valve, said differential pressure responsive valve means comprising a casing, a spool slidable along an inner surface of said casing, said spool having a first end facing a fluid path portion communicating with said wheel brake and a second end facing a fluid path portion communicating with said outlet valve, and a spring for normally urging said spool toward said first end, said spool having an orifice connecting said fluid path portion communicating with said wheel brake and said fluid path portion communicating with said outlet valve, said casing having a plurality of ports and a casing configuration for cooperation with said spool, said spool having fluid passages and a spool configuration located for cooperation with respective ones of said ports and configuration in said casing depending on a first, a second, and a third relative position between said casing and said spool for implementing three respective operational states, including a first operational state allowing communication between said master cylinder and said wheel brake through a large passage of said passages in said spool, communication between said master cylinder and said outlet valve through said orifice, and communication between said wheel brake and said outlet valve through said orifice; a second operational state cutting off communication between said master cylinder and said wheel brake and between said master cylinder and said outlet valve, and allowing communication between said wheel brake and said outlet valve through a large passage of said passages in said spool; and a third operational state cutting off communication between said master cylinder and said wheel brake and between said master cylinder and said outlet valve, and allowing communication between said wheel brake and said outlet valve through said orifice.

4,892,363

ANTI-LOCKING BRAKE SYSTEM

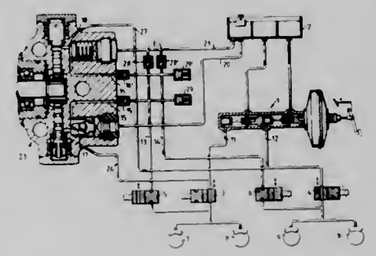
Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 317,153

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807552

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—116 **7 Claims**



1. In an anti-locking brake system in which the pressure acting on the wheel brakes is reduceable by bleeding hydraulic fluid through a return line (**13, 14**), with a hydraulic pump whose suction chamber (**17, 18**) includes a check valve incorporated therein and is connected through a suction line (**20, 21**) to a hydraulic fluid reservoir, the improvement comprising connecting said return line (**13, 14**) to said suction chamber and having the chamber terminate in said suction line, positioning a first valve (**28, 28'**) in said return line (**13, 14**) upstream of a junction point (E) between said return line and said suction line, and wherein a suction valve (**15', 16'**) is inserted in said return line (**13, 14**) near the point of connection to said hydraulic pump, said suction valve being disposed nearer to said hydraulic pump than to said first valve (**28, 28'**).

4,892,364

SYSTEM FOR THE OPERATION OF AN AUXILIARY PUMP

Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,276

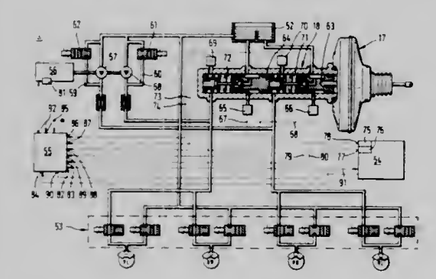
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813172

Int. Cl.[4] B60T *8/48*

U.S. Cl. 303—116 **15 Claims**

1. A system of operating an auxiliary pump of an electro-hydraulic control system for hydraulic brake systems and particularly of automotive vehicles brake pressure control means, in particular, an anti-locking brake control system (ALC-system), including a master cylinder exhibiting at least one working piston and one working chamber, preferably at least one pressure modulator having at least one passage valve and blocking valve, for the modulation of the hydraulic pressure in the individual wheel cylinders during the control mode, at least one electronic pump controller adapted to accept signals from at least one wheel sensor means, said controller adapted to form regulated signals for operation of said at least one passage and blocking valves of said at least one pressure

modulator, motion sensor means being provided so that the motions of said working piston are sensed and manifested in the form of electric way sensor signals, at least one algorithm means connected with said at least one electronic controller whereby the volume requirements of said master cylinder are determined by said at least one electronic controller in accordance with said algorithm means installed therein which defines volume patterns that are made available at the output of said electronic controller in the form of volume requirement-indicating electric signals, in that said way sensor signals and said volume requirement-signals in said electronic pump controller are processed to form a predetermined regulated quantity and said regulated quantity is employed for controlling the rate of delivery of said auxiliary pump.

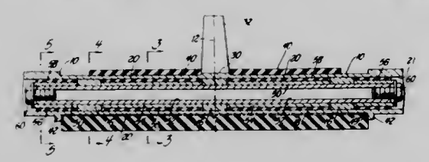


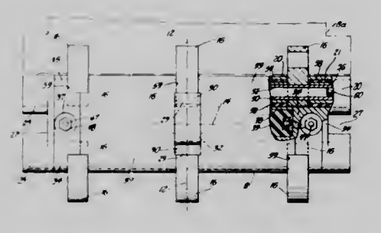
4,892,365

TRACK UNIT FOR USE IN A VEHICLE TRACK ASSEMBLY

Geza C. Szakacs, 2168 Belle Vernon Dr., Rochester Hills, Oakland, Mich. 48309

Filed May 4, 1988, Ser. No. 197,010
Int. Cl.[4] B62D *55/21, 55/18*
U.S. Cl. 305—58 R **14 Claims**





1. A double pin track unit comprising a track body having a transverse centerline; two cylindrical bores extending continuously through the track body parallel to the transverse centerline; a track pin located entirely within each bore; each track pin comprising a single rod extending substantially the full width of the track body; a plurality of links extending radially out of the bore, the links keyed within the bore to the rod, the links having a curved end surface congruently and adjacently facing an inner peripheral surface of the bore; sleeves keyed to the rod, the sleeves being alternated and abutted with the links along the entire length of the rod such that each link is between two sleeves; means for holding sleeves at the ends of the rod in fixed axial relation to the rod, whereby the rod, all the sleeves and the links are axially fixed relative to one another; and an annular elastomeric bushing surrounding each sleeve within the associated transverse bore.

4,892,366

SNEEZE GUARD SYSTEM

Donald Yerman, Euclid, Ohio, assignor to Crescent Metal Products, Inc., Cleveland, Ohio

Continuation of Ser. No. 658,810, Oct. 9, 1984, abandoned. This application May 12, 1989, Ser. No. 352,648
Int. Cl.[4] A47B *96/18*
U.S. Cl. 312—140.4 **14 Claims**



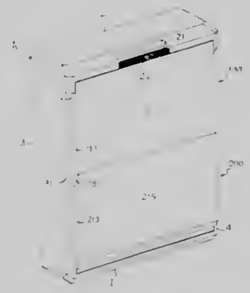
1. A sneeze guard system comprising a sneeze guard panel, support means for supporting said sneeze guard panel in a first position, and means for mounting said sneeze guard panel to said support means in such first position while permitting removal of said sneeze guard panel upon pivoting to a second position, said sneeze guard panel having an upwardly turned top edge portion opwerative in such first position of said sneeze guard panel to interfere with said means for mounting to hold said sneeze guard panel on said support means and in such second position to clear said means for mounting to permit removal of said sneeze guard panel.

4,892,367

STORAGE CABINET WITH PIVOTING STORAGE COMPARTMENTS

Eric Jantzen, Ville d'Avray, France, assignor to Gefitec S.A., Lausanne, Switzerland

Filed Sep. 27, 1988, Ser. No. 249,843
Claims priority, application France, Sep. 30, 1987, 87 13538
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—328 **8 Claims**



1. A storage cabinet with pivoting storage compartments, comprising
a frame,

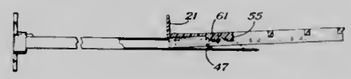
at least two superimposed rows of like storage modules pivotally mounted on the frame upon respective parallel, horizontal pivot axes spaced a distance y apart, so that corresponding points on vertically adjacent modules also lie a distance y apart,
at least one connecting rod interconnecting said rows of modules so as to cause them to pivot in unison between open and closed positions,
each storage module being delimited by front and rear planar walls having respective upper and lower edges, and by two lateral end walls and a bottom, the front walls of the storage modules being substantially coplanar in the closed position, the upper edge of the rear wall and the lower edge of the front wall of each module lying in paprallel planes a distance x apart, where x is less than the distance y, the upper edge of the rear wall of one module being lower that the lower edge of a front wall of its upper adjacent module, and the lower edge of a lateral wall of a module having a shape which is the complement of the upper edge of the corresponding lateral wall of the lower adjacent module so that all the superimposed storage modules, except for the upper part of the upper storage module, are entirely closed by themselves, independently of the frame, in the closed position,
wherein an angle of rotation B between the open and closed positions of the storage modules is determined according to the equation $\sin\beta = x/y$, the difference z between the levels of said lower edge and of said upper edge being calculated according to the equation $z = y(1-\cos\beta)$,
and wherein, in the open position, the upper edge of the rear wall of the lower module abuts flat against the lower edge of the front wall of the upper module, thus precisely terminating the rotational movement of the modules and ensuring the continuity of the rear wall of each lower storage module with the front wall of its upper adjacent storage module in such a way that the two walls are substantially coplanar in the open position, whereby the entire useful storage volume of each storage module is visible and accessible.

4,892,368

DRAWER SLIDE

Takashi Goto, Euless, Tex., and George E. Malcom, Elkhart, Ind., assignors to Malgo Corporation, Grand Prairie, Tex.

Filed Oct. 3, 1988, Ser. No. 252,119
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—348 **4 Claims**



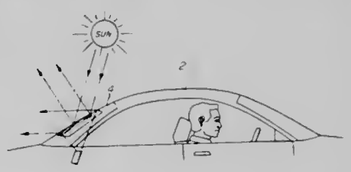
1. A combination drawer slide and track comprising:
a body member;
a pair of spaced guides depending downward from said body member a predetermined depth for engaging a mating track, each of said guides having a vertical wall portion and a perpendicular lip, the vertical wall portion and lip together defining a L-shaped cross section;
a mating track having opposed channel regions which provide a sliding fit above and below said guides for substantially the entire length of said guides;
a stop member extending upwardly between said channel regions near an outer extent of said track;
a primary strut interconnecting said spaced guides in transverse fashion, said primary strut having a rigid, vertically extending front wall which extends for a preselected depth, less than the depth of said guides, to engage said stop provided in said mating track and having a beveled rear face for sliding over said stop as the drawer is being mounted;
wherein the depth of said rigid, vertically extending front wall is selected to allow said primary strut to ride over said stop when said guides are canted at an angle in said mating track to thereby release said drawer slide;
a plurality of spaced nubs extending upwardly along said perpendicular lip on the exterior of said spaced guides to limit the vertical travel of said guides in said mating tracks, whereby it is necessary to cant said guides at an angle in said mating track to release said drawer slide; and
wherein the necessary cant angle can only be achieved once a predetermined number of spaced nubs have cleared the mating tracks in withdrawing said drawer slide from said tracks.

4,892,369

HOLOGRAPHIC REAR WINDOW STOPLIGHT

Gaylord E. Moss, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 6, 1987, Ser. No. 793
Int. Cl.[4] G02B *5/32;* **G03H** *1/28;* **F21Q** *1/00;* **B60Q** *1/44*
U.S. Cl. 350—3.7 **27 Claims**



18. An improved rear stoplight assembly capable of being mounted within the field of view of the rearview window of a vehicle without obscuring the vision of the driver, comprising:
means for providing a stoplight within the rearview window including a substantially transparent and colorless stoplight member mounted adjacent the rear window and within the rearview vision of the driver;
means for activating the stoplight member to produce a light directed to the rear of the vehicle of a characteristic wavelength band for a stoplight that is substantially visible only to an observer behind the vehicle and not to the driver, the driver's field of view extending through the stoplight member regardless of its activation; and
a holographic image of said substantially transparent and colorless stoplight member and a reflection holographic image on said means for providing a stoplight member both having a series of parallel fringes, the respective orientation of the fringes of the image of said stoplight member directing the light from the means for activating the stoplight member to produce a light to said reflection holographic image and then rearward at a position approximately parallel to said rearview window of the vehicle whereby exterior incident light will not be reflected forward through said stoplight member into the line of sight of the driver as he looks through his rearview mirror.

4,892,370

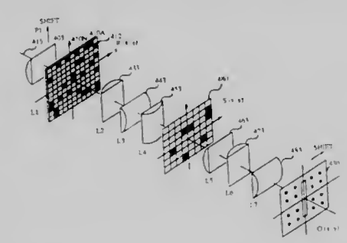
MEANS AND METHOD FOR IMPLEMENTING A TWO-DIMENSIONAL TRUTH-TABLE LOOK-UP HOLGRAPHIC PROCESSOR

Yun-Parn T. Lee, 3991A Miramar St., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 23,676, Mar. 9, 1987, abandoned. This application Feb. 17, 1988, Ser. No. 157,276
Int. Cl.[4] G02B *5/32;* **G06G** *9/00, 7/16*
U.S. Cl. 350—3.74 **39 Claims**

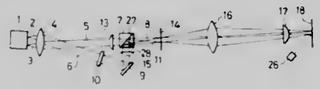
1. An optical processor for generating a looked-up digital light signal from input and output data of a truth-table, which comprises:

means for detecting and coding an input light signal emitted by a light source, said light signal representing a plurality of digital input vectors for said binary truth-table;
input means for receiving said input light signal and for transforming said plurality of digital input vectors into a boolean basis vector, in conformance with a predetermined transform;
means for multiplying said boolean basis vector by the truth-table output data corresponding to said input light signal;
optical means impinged by said boolean basis vector for storing a product of said means for multiplying;



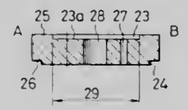
means for presenting said product as a spectral expansion vector having coefficients which can be positive, negative or zero, of said output data;
means for performing an inner product of said spectral expansion vector with said boolean basis vector and for generating an output light signal corresponding to said output data; and
output means for receiving said output light signal exiting from said means for generating.

4,892,371
SEMICONDUCTOR LASER ARRAY LIGHT SOURCE AND SCANNER
Kunio Yamada, and Shigeru Tsukada, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Dec. 2, 1987, Ser. No. 127,470
Claims priority, application Japan, Dec. 4, 1986, 61-289652
Int. Cl.[4] G02B *26/10, 27/14*
U.S. Cl. 350—6.8 **17 Claims**



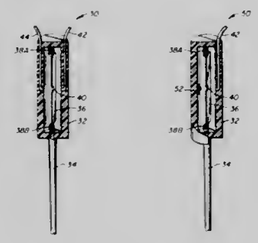
1. A semiconductor laser array light source comprising:
semiconductor laser array means having a plurality of luminous points;
lens means for condensing a plurality of beams emanating from said semiconductor laser array means and for directing the plurality of beams along a plurality of optical paths;
optical means having first and second incident surfaces having first and second angles of incidence, respectively, different from each other, said first incident surface transmitting one of said plurality of beams incident thereon; and
optical-path changing means for directing a second of said plurality of beams to said second incident surface of said optical means and for adjusting a relative arrangement of optical axis of said plurality of beams emanating from said optical means.

4,892,372
ROTATING POLYGON MIRROR
Hideo Chonan, Toride; Michio Motohashi, Tokyo; Hirotaka Noguchi, Yawahara; Kazuo Ogawa, Ibaraki, and Kimio Takahashi, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 20, 1985, Ser. No. 767,734
Claims priority, application Japan, Aug. 31, 1984, 59-180497
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **11 Claims**



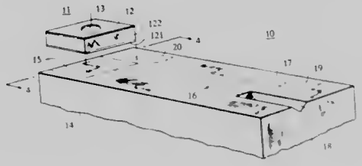
1. A rotating polygon mirror including a polygon cylinder having upper and lower surfaces and a side, said mirror comprising:
at least one reflection mirror surface formed on the side of the polygon cylinder;
a first mount portion formed in the upper surface for engaging with a first mount member of a scan device;
a second mount portion formed in the lower surface for engaging with a second mount member of the scan device; and
a surface formed in at least one of said first and second mount portions to be used as a mount reference surface when said rotating polygon mirror is mounted on the scan device;
one of said first and second mount portions having a recess and the other of said first and second mount portions having a projection such that, when two identical rotating polygon mirrors are stacked with said first and second mount portions abutting each other, said mount reference surface formed in at least one of said first and second mount portions of one rotating polygon mirror does not contact the other of the first and second mount portions of the other rotating polygon mirror.

4,892,373
SIGN BIT OPTICAL GEOPHONE
Swan A. Sie, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Dec. 9, 1983, Ser. No. 560,016
Int. Cl.[4] G02B *6/00, 6/14*
U.S. Cl. 350—96.10 **17 Claims**



1. An optical geophone comprising:
optical fiber means for transmitting an optical signal to a geophone case;
light chopping means located within said case, said light chopping means
positioned so that either the movement up or down along its vertical axis of movement passes or blocks light while a movement in the opposite direction along the vertical axis blocks or passes light, said light chopping means configured to be at least equal to or longer than about one-half of the expected total amplitude of the up and down movement along the vertical axis;
oscillating means connected to said chopping means, said oscillating means capable of oscillating said chopping means along said chopping means vertical axis in response to geological movement thereby creating a
binary signal of either light or no-light; and
signal return directing means for returning the chopped light signal to the seismic vehicle.

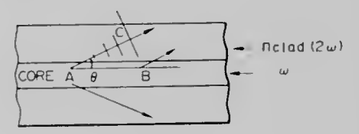
4,892,374
ARTICLE COMPRISING AN OPTO-ELECTRONIC DEVICE AND AN OPTICAL WAVEGUIDE COUPLED THERETO, AND METHOD OF MAKING THE ARTICLE
David A. Ackerman, Hopewell, and Louis A. Koszi, Scotch Plains, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Mar. 3, 1988, Ser. No. 163,689
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **7 Claims**



7. An article comprising a substrate, with an optoelectronic device and an optical waveguide on the substrate, the device comprising a semiconductor body and at least one metallization layer at least partly covering a major surface of the semiconductor body,
characterized in that
(a) the device is mounted on the substrate in a position adapted for coupling radiation from the device into the waveguide and/or from the waveguide into the device; and
(b) the metallization layer comprises a window such that pump radiation can be transmitted into the semiconductor body, whereby the device can be caused to emit radiation by photoluminescence, with at least some of the radiation coupled into the waveguide.

4,892,375
FIBER-TYPE LIGHT CONVERSION DEVICE
Kiyofumi Chikuma, and Sota Okamoto, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 4, 1989, Ser. No. 347,058
Claims priority, application Japan, May 20, 1988, 63-123414
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **1 Claim**

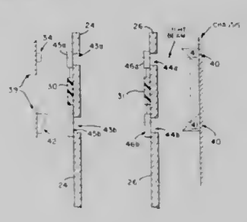
1. A fibre-type light conversion device comprising a fibre-type conversion element for changing the wavelength of an incident light, and a converging lens for converging said incident light whose wavelength is changed by said conversion element, wherein said converging lens is a single lens having an aspherical surface configured such that a distance Zi from a plane perpendicular to an optical axis of said lens and passing an extremity of said lens to a point on said aspherical surface having a height Y from the optical axis is expressed by the following equation



$$Zi = \frac{CiY^2}{1 + \sqrt{1 - KiCi}} + A_1(i)Y + A_4(i)\,Y^4 + A_6(i)\,Y^6 + A_8(i)\,Y^8 + A_{10}(i)\,Y^{10}$$

where Ci is an inverse number of the radius of curvature of an "i"th surface at an intersecting point between the "i"th surface and the optical axis, Ki, $A_1(i) \sim A_{10}(i)$ are constants, and Y is the height from the optical axis to the refracting surface of said lens.

4,892,376
OPTICAL BACKPLANE FOR CIRCUIT BOARDS
William A. Whitehouse, Poulsbo, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Jan. 26, 1989, Ser. No. 301,852
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **9 Claims**



1. An apparatus comprising:
a chassis;
a first circuit card mounted on the chassis and having a first hole;
a first circuitry mounted on the first circuit card;
a second circuit card mounted on the chassis and having a second hole aligned with the first hole;
second circuitry mounted on the second circuit card; and
a means for optically transmitting information from the first circuitry to the second circuitry comprising:
a light source that generates a light beam through the first hole of the first circuit card and the aligned second hole of the second circuit card;
an optical modulator mounted at the first hole of the first circuit card for modulating information onto the light beam; and
an optical demodulator mounted at the second hole of the second circuit card for receiving the light beam from the optical modulator and reading information from the light beam.

4,892,377

ALIGNMENT OF FIBRE ARRAYS

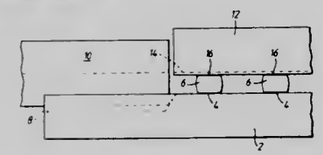
Frederick A. Randle, Northants, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 19, 1988, Ser. No. 233,757

Claims priority, application United Kingdom, Aug. 19, 1987, 8719557

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.2 **9 Claims**



1. A method for aligning an array of optical fibres with a corresponding array of optical components included as part of a block, the method comprising:

providing a substrate having a first major plane surface that is solder repellent and bears upon said first major plane surface a first array of solder wettable pads, each of said pads of said first array are a predetermined area, and in said substrate an array of grooves is defined, each of said grooves is aligned with, and is located in an accurate lateral relationship to, said array of solder wettable pads;

providing said corresponding optical component on said block, said block having a solder-repellent second major plane surface and has a second array of solder wettable pads, each of said pads of said second array are a predetermined area, and are located relative to each other at positions in one-to-one correspondence with corresponding positions of said solder wettable pads of said first array;

depositing on at least one of said solder pads of said first and said second arrays controlled amounts of solder;

mounting said block above said substrate with said first and second major plane faces facing;

reflowing said solder to form solder drops of predetermined dimensions, said solder drops securing said block at a predetermined height above said first major plane surface, and positioning said block both laterally and longitudinally in relation to said substrate; and

locating each one of said optical fibres in a respective one of said grooves defined in said substrate to align said array of optical fibres and said array of optical components.

4,892,378

PROCESS FOR MOUNTING AN OPTICAL FIBER IN AN OPTICAL-FIBER CONNECTOR ELEMENT, AND A CONNECTOR ELEMENT FOR CARRYING OUT THE PROCESS

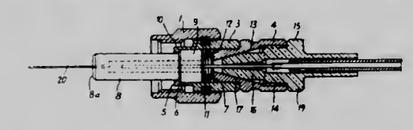
Elie Zajac, and Gilbert Manoff, both of Gagny, France, assignors to Radiall, Rosny Sous Bois, France

Filed May 19, 1988, Ser. No. 196,045

Claims priority, application France, May 21, 1987, 87 07138

Int. Cl.[4] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **8 Claims**



1. Process of mounting an optical fiber in a connector element comprising a peripheral assembly nut; a body whose frontal end surface defines a reference plane, provided at its rear end with means for retaining an optical fiber introduced from the rear of said body; a ferrule in which the stripped end of the optical fiber may be positioned, which is accommodated in said body and projects axially therefrom toward the front, the frontal end face of said ferrule being located at a predetermined axial distance from said plane of reference; characterized by the fact that after the end of an optical fiber (**20**) has been stripped, it is mounted from the rear in the connector element so that it projects axially from the frontal end (*8a*) of the ferrule (**8**); the non-stripped part of the optical fiber is immobilized at the rear of the connector body; the axial position of the stripped part of the fiber relative to the frontal face of the ferrule is modified by a mechanical force applied to one of the fiber and the ferrule; by means of a scribing tool (**27**) positioned precisely with respect to the plane of reference, a scratch is made in predetermined relation to the plane of the frontal face of the ferrule; the fiber is broken at the position of the scratch; and one of the fiber and the ferrule is allowed to return elastically.

4,892,379

FIBER OPTIC CONNECTOR

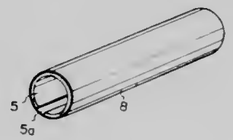
Mitsuru Takeda, and Koji Mizunuma, both of Tochigi, Japan, assignors to Amphenol Corporation, Wallingford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,445

Claims priority, application Japan, Jul. 4, 1983, 58-102736[U]

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **21 Claims**



1. In a fiber optic connector assembly in which two fiber optic connectors are connected to each other by means of an adaptor, each of the connectors including at least one ferrule, said ferrules retaining an optical fiber, and said ferrules being inserted in said adaptor such that the optical fiber of each connector is arranged in a light transmitting position with respect to the optical fiber of the other connector, the adaptor including at least one split sleeve for receiving at its opposite ends a ferrule from each of said connectors, said split sleeve having a longitudinal slit, the improvement comprising:

a tubularly shaped elastic body installed around the outer periphery of said split sleeve, said body applying a spring force to the periphery of said split sleeve.

4,892,380

OPTICAL CONNECTOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

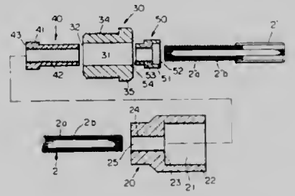
Filed Dec. 16, 1988, Ser. No. 286,402

Claims priority, application Japan, Apr. 20, 1988, 63-98767

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.21 **1 Claim**

1. An optical connector for connecting each other two optic cable members, each of which includes an optic cable end having a smoothly finished surface and firmly secured in a protective tube with an externally-threaded end to be connected, comprising a first cap-nut-shaped connecting member having an internally threaded socket with a flat bottom to threadably engage with the threaded protective tube end of the first optic cable, a second bolt-shaped connecting member having a bore there-through and threadably engaged with said first cap-nut-shaped connecting member, a third connecting member and a fourth connecting member loosely inserted in the through-bore of the second bolt-shaped connecting member and having a flange at its opposite sides for threadably engaging with the threaded tube end of the second optic cable member, characterized in that the end-surfaces of the fiber optic cable member and the second optic cable member are



arranged opposite to each other, the third member's flange being caught between the second connecting member's bottom surface and the first connecting member's socket bottom surface and the fourth connecting member being screwed onto the protected tube-end of the second optic cable member to form a light-guiding passage.

4,892,381

HIGH TEMPERATURE FIBER OPTIC CONNECTOR

Wiliam M. Glasheen, Derry, N.H., assignor to Ametek, Inc., New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,063

Int. Cl.[4] G02B *7/26*

U.S. Cl. 350—96.22 **13 Claims**

1. A high temperature optic fiber connector comprising:

(a) a connector body having an interior chamber;

(b) axial passage means through said body communicating with said chamber;

(c) at least one metal coated fiber positioned in said axial passage means and passing through said chamber;

(d) means for bonding said metal coated optic fiber to the walls of said chamber including a sintered metallic compact adhering both to said optic fiber and said wall, said compact containing the same metal as the metal coating of said fiber.

4,892,382

DIELECTRIC OPTICAL DROP CABLE

Christopher A. Story, Hickory, and Susan M. Cooper, Newton, both of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Sep. 26, 1988, Ser. No. 249,112

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **2 Claims**

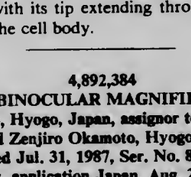
1. An optical fiber cable comprising:

(a) a first tube which is made of a flame retardant material;

(b) at least one optical fiber and a hydrophobic filling compound disposed in the first tube;

(c) a first layer of densely packed loose glass yarn material circumscribing the first tube;

(d) a second layer of glass fiber members impregnated with resinous material circumscribing the first layer; and



(e) a second tube which is made of a flame retardant material circumscribing the second layer.

4,892,383

RESERVOIR FIBER OPTIC CHEMICAL SENSORS

Stanley M. Klainer, San Ramon; Kisholoy Goswami, Walnut Creek, both of Calif.; Nelson R. Herron, Lachini, Mich.; Stephen J. Simon, and Lawrence A. Eccles, both of Las Vegas, Nev., assignors to FiberChem Inc., Las Vegas, Nev.

Filed Feb. 17, 1989, Ser. No. 312,645

Int. Cl.[4] G02B *6/02;* H01J *5/16;* A61B *5/00;* G01N *21/00*

U.S. Cl. 350—96.29 **20 Claims**



1. A reservoir cell assembly for a fiber optic chemical sensor, comprising:

a modular cell body having a predetermined length and enclosing a predetermined volume and having two open ends;

a semipermeable membrane positioned at one open end of the cell body;

quick attach membrane retainer means which fit securely to one open end of the cell body to hold the membrane in place so that a predetermined chemical species may selectively diffuse through the membrane into the cell;

quick attach fiber optic connector means which fit securely to the other end of the cell body to hold the fiber optic positioned with its tip extending through the connector means into the cell body.

4,892,384

BINOCULAR MAGNIFIER

Zenjiro Okamoto, Hyogo, Japan, assignor to Kabushiki Kaisha AG, Osaka and Zenjiro Okamoto, Hyogo, both of, Japan

Filed Jul. 31, 1987, Ser. No. 80,340

Claims priority, application Japan, Aug. 27, 1986, 61-130520

Int. Cl.[4] G02B *25/00;* G02C *7/02*

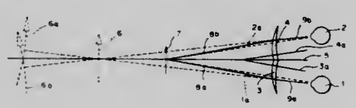
U.S. Cl. 350—145 **4 Claims**

1. A binocular magnifier for weak-sighted persons comprising:

a meniscus convex lens for the right eye retained in front of the right eye, said lens for the right eye having a satisfactorily large diameter to ensure a wide field of view, said lens for the right eye being disposed eccentrically in such a manner that the optical axis of said lens is parallel to the visual axis of the right eye in the short-distance working

region and located on the side of said visual axis which is closer to the left eye;

a meniscus convex lens for the left eye retained in front of the left eye, said lens for the left eye having a satisfactorily large diameter to ensure a wide field of view, said lens for the left eye being disposed eccentrically in such a manner



that the optical axis of said lens is parallel to the visual axis of the left eye in the short-distance working region and located on the side of the visual axis of said left eye which is closer to the right eye; and

said two meniscus convex lenses being spliced together in one unit at the median position between the right and left eyes.

4,892,385

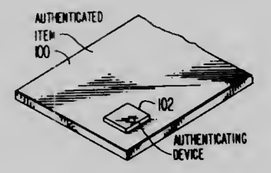
SHEET-MATERIAL AUTHENTICATED ITEM WITH REFLECTIVE-DIFFRACTIVE AUTHENTICATING DEVICE

William M. Webster, Jr., Princeton, and John P. Russell, Pennington, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,970

Int. Cl.⁴ G02B *5/18;* **B44F** *1/12*

U.S. Cl. 350—162.23 **2 Claims**



1. An article comprising an authenticated item of sheet material which is subject to counterfeiting and an authenticating device bonded to said item, wherein said device includes:

a substrate bonded to said sheet material, said substrate having a predetermined reflective diffraction grating structure formed as a relief pattern that is situated on at least one region of a viewable surface of said substrate,

a transparent material filling and covering said reflective diffraction grating structure, said transparent material exhibiting a given index-of-refraction greater than unity,

wherein said relief pattern forming said structure has a rectangular grating profile, physical amplitude and line frequency parameters such that said structure is operative to separate polychromatic illuminating light incident thereon into at least one pair of adjacent, separate and distinct, reflected beams of contrasting colors, wherein the size of the narrowest angular dimension of the beam-width of each of said beams at a distance of thirty centimeters is at least two milliradians, said physical amplitude and line frequency parameters being such that, in cooperation with said given index-of refraction, said structure diffracts through at least a certain angle, determined by said line frequency, a portion of said polychromatic illuminating light to discriminatingly transfer, as a predetermined function of wavelength of the wavelength spectrum of said polychromatic light, some certain fraction of each spectral component of said polychromatic illuminating light into orders higher than the zero diffraction order and transfer substantially the entire remainder of said polychromatic illuminating light into the zero diffraction order, said certain angle being sufficient to obtain zero and higher diffraction order reflected beams that are separate and distinct from one another, whereby the color of said zero diffraction order reflected beam is the complement of the color of the aggregate of all the diffraction order beams higher than said zero diffraction order, and

wherein said transparent material is bonded to said viewable surface of said substrate in a manner sufficiently secure to prevent said transparent material from being removed from said structure without effectively destroying said structure.

4,892,386

ON-VEHICLE HEAD UP DISPLAY DEVICE WITH DOUBLE IMAGES ANGULARLY SEPARATED LESS THAN A MONOCULAR RESOLVING POWER

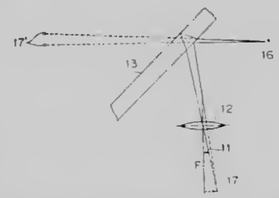
Yoshiyuki Suzuki; Tatsumi Ohtsuka; Tadashi Iino, all of Susono; Akihisa Kasahara, and Noriyasu Tomiyama, both of Tokorozawa, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 907,148, Sep. 12, 1986, Pat. No. 4,787,711. This application Jun. 2, 1988, Ser. No. 201,411

Claims priority, application Japan, Jan. 23, 1986, 61-011123; Mar. 28, 1986, 61-068467

Int. Cl.⁴ G02B *27/10, 17/08*

U.S. Cl. 350—174 **5 Claims**



1. An on-vehicle head-up display apparatus wherein a windshield glass having inner and outer surfaces of a vehicle is utilized as a catoptric system to reflect an image of various information in the vehicle from said inner and outer surfaces of said windshield glass, comprising:

display means for indicating said information; and

an optical system positioned between said windshield glass and said display means for forming an indication image of said indicated information having an object point therein, light beams from said object point impinging upon said inner and outer surfaces of the windshield glass to be reflected to form a virtual image in a doubled state at a finite distance outside the windshield glass, and said optical system forming said indication image beyond said display means to form an angle defined by said reflected light beams reflecting from said inner and outer surfaces thereof, which is smaller than a monocular resolving power.

4,892,387

LIGHT CONTROLLING SHEET

Noboru Takeuchi, Aichi; Masakazu Goto, Konan; Hiroaki Takahashi, Gifu, and Takeshi Kojima, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

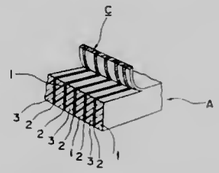
Continuation of Ser. No. 918,903, Oct. 15, 1986, Pat. No. 4,722,097. This application Jul. 20, 1988, Ser. No. 221,874

Claims priority, application Japan, Sep. 20, 1986, 61-222466; Sep. 25, 1986, 61-227535

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 350—319 **6 Claims**



1. A light controlling sheet for use for optical indicators comprising:

louver element means including an arbitrary pattern of walls having openings therebetween, inner surfaces of said walls defining said openings and extending in a direction of thickness of said louver element means, said walls being constructed of an opaque material for absorbing incident light;

transparent layers for permitting incident light to pass therethrough; and

light reflection layers for reflecting incident light;

said transparent layers and the light reflection layers being mutually arranged in a side-by-side arrangement adjacent to each other with a wall of said louver element means being interposed therebetween.

4,892,388

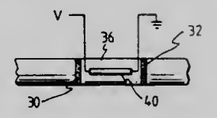
METHOD FOR PRODUCING REFLECTIVE TAPS IN OPTICAL FIBERS AND APPLICATIONS THEREOF

Henry F. Taylor, College Station, Tex., assignor to Texas A & M University System, College Station, Tex.

Division of Ser. No. 108,270, Oct. 13, 1987, Pat. No. 4,848,999. This application Dec. 19, 1988, Ser. No. 286,055

Int. Cl.⁴ G02B *6/00;* **C22B** *4/00;* **C03B** *23/20*

U.S. Cl. 350—320 **10 Claims**



1. A method of forming variably reflective optical taps, comprising:

forming two optical mirrors along a continuous length of optical fiber such that the mirrors are separated by a length of optical fiber, the combination forming a Fabry-Perot cavity;

depositing an electrically resistive medium on the fiber between the two mirrors, such that the reflectivity of the cavity will vary upon the passage of electrical current through said medium.

4,892,389

METHOD OF DRIVING A DISPLAY DEVICE AND A DISPLAY DEVICE SUITABLE FOR SUCH A METHOD

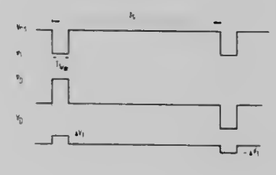
Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1987, Ser. No. 106,084

Claims priority, application Netherlands, Oct. 28, 1986, 8602698

Int. Cl.⁴ G02F *1/133;* **G09G** *3/36*

U.S. Cl. 350—333 **18 Claims**



1. A method of driving a display device, said display device including an electro-optical display medium between two supporting plates, a matrix of picture elements arranged in rows and columns, each of said picture elements being formed by picture electrodes provided on opposing facing surfaces of said two supporting plates, and a system of row and column electrodes adjacent to said picture electrodes of said facing surfaces, said method comprising the steps of

(a) presenting a selection signal to one of said rows of picture elements through one of said row electrodes by using non-linear switching elements arranged in series between said row electrodes and said picture electrodes at one side of said facing surfaces, said selection signal being presented during a time period for selecting said one of said rows of picture elements,

(b) presenting at least a part of a data signal to one of said column electrodes at an opposite facing surface during a portion of said time period, said data signal being presented substantially simultaneously with said selection signal presented to said one of said row electrodes,

(c) presenting a non-selection signal to said one of said row electrodes during the remaining portion of said time period, and

(d) presenting a reference voltage to said column electrodes in the absence of said data signal.

4,892,390

MULTI-LAYERED LIQUID CRYSTAL PANEL WITH TWISTED NEMATIC LIQUID CRYSTAL MATERIAL HAVING POLARIZERS DISPLACED FOR SHARP-RISING CHARACTERISTIC

Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 244,820, Mar. 17, 1981, abandoned. This application Feb. 7, 1989, Ser. No. 309,027

Claims priority, application Japan, Mar. 17, 1980, 55-34539

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—335 **8 Claims**

1. A multilayer liquid crystal display comprising:

two liquid crystal cells disposed adjacent to each other so as to include a common middle substrate plate disposed therebetween and upper and bottom substrate plates disposed on either side thereof, wherein each cell contains twisted nematic liquid crystal material with molecules that are oriented

(i) in the direction r_2^2 at the underside of said upper substrate plate,
(ii) in a direction r_2^1 at an angle of 90° against r_2^2 at the topside of said middle substrate plate,
(iii) in a direction r_1^2 which is opposite to r_2^1 at the underside of said middle substrate plate, and





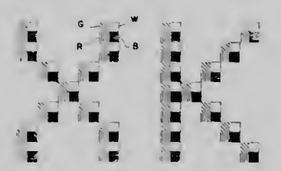
(iv) in a direction r_1^1 which is opposite to r_2^2 at the topside of said bottom substrate plate; an analyzer above the liquid crystal cells; and
a polarizer underneath the liquid crystal cells, wherein the analyzer is twisted by an angle of $\Delta\theta_1$ against r_2^2, the polarizer is twisted by an angle $\Delta\theta_2$ against r_1^1 in the same direction as the analyzer, and $\Delta\theta_1$ and $\Delta\theta_2$ are essentially the same and are between 3° and 15°.

4,892,391

METHOD OF ARRANGING THE CELLS WITHIN THE PIXELS OF A COLOR ALPHA-NUMERIC DISPLAY DEVICE

Wilber C. Stewart, Highstown; Albert P. Pica, East Windsor, and William R. Roach, Rocky Hill, all of N.J., assignors to General Electric Company, Princeton, N.J.

Continuation of Ser. No. 156,061, Feb. 16, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 303,997
Int. Cl.[4] G02F *1/133*; G09G *1/28*; H04N *3/12*
U.S. Cl. 350—339 F **4 Claims**



3. A ethod for producing straight vertical and horizontal alpha-numeric lines and for producing upwardly and downwardly sloping alpha-numeric lines having the same overall appearance in a display device having an array of multi-cell liquid crystal pixels arranged along horizoontal and vertical axes, wherein each of said pixels includes a white cell, a green cell, a red cell and a blue cell comprising the steps of:
arranging said white cell and said green cell substantially parallel to one of said axes; and
aligning said green cell and said blue cell diagonally with respect to the other of said axes.

4,892,392

PICTURE DISPLAY CELL AND METHOD OF FORMING AN ORIENTATION LAYER ON A SUBSTRATE OF THE PICTURE DISPLAY CELL

Dirk J. Broer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 92,253, Sep. 1, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,694
Claims priority, application Netherlands, Sep. 4, 1986, 8602235
Int. Cl.[4] G02F *1/13*; B05D *3/06*; C09K *19/00*
U.S. Cl. 350—339 R **12 Claims**



1. A picture display cell comprising as a substrate two oppositely located plates which are transparent to light and which on the facing sides comprise an electrode of a material which is transparent to light having thereon an orientation layer and a sealing ring between the ends of the plate, a liquid crystalline material being provided in the space between the plates and the ring, characterized in that the orientation layer is formed from a monomer or a low molecular weight compound which is first oriented at a given angle essentially only in an electric or magnetic field and is then polymerized.

6. A method of forming an orientation layer on a substrate for a picture display cell comprising an electrode, characterized in that a film of a liquid crystalline monomer is provided in the substrate, the monomer is oriented essentially in a magnetic or electric field at a given angle, and is then polymerized.

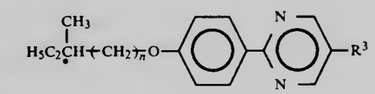
4,892,393

FERROELECTRIC LIQUID CRYSTAL COMPOSITION

Kanetsugu Terashima; Mitsuyoshi Ichihashi, both of Ichihara-shi; Makoto Kikuchi, Kisarazushi; Fusayuki Takeshita, Ichiharashi, and Kenji Furukawa, Yokosukashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

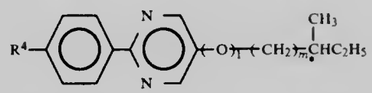
Filed Oct. 12, 1988, Ser. No. 256,413
Claims priority, application Japan, Nov. 6, 1987, 62-280625
Int. Cl.[4] G02F *1/13*; C09K *19/34*
U.S. Cl. 350—350 S **3 Claims**

1. A ferroelectric liquid crystal composition comprising at least one member selected from the group consisting of chiral compounds expressed by the following formulas (A-I) to (A-VI) and at least one member selected from the group consisting of compounds expressed by the following formulas (VII) to (XV) and having a spontaneous polarization value of 40 nC/cm² or more,
the concentration of said at least one member of chiral compounds of the formulas (A-I) to (A-VI) used being 20 to 80% by weight and the concentration of said at least one member of compounds of the formulas (VII) to (XV) used being 5 to 50% by weight:



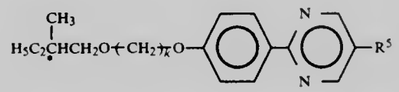
(A-I)

wherein R^3 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; n represents an integer of 2 to 5; and * indicates an asymmetric carbon:



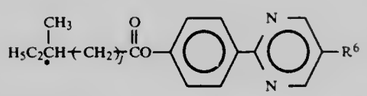
(A-II)

wherein R^4 represents a linear or branched chain alkyl or alkoxy group.each of 1 to 18 carbon atoms; m represents an integer of 2 to 5; l represents 0 or 1; and * indicates an asymmetric carbon atom;



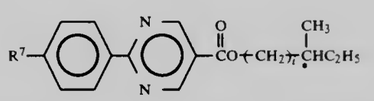
(A-III)

wherein R^5 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; k represents an integer of 2 to 5 carbon atoms; and * indicates an asymmetric carbon atom;



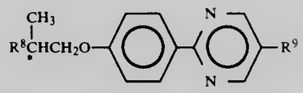
(A-IV)

wherein R^6 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; j represents an integer of 0 to 5; and * indicates an asymmetric carbon atom;



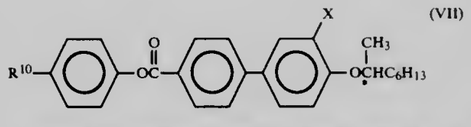
(A-V)

wherein R^7 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; i represents an integer of 0 to 5 carbon atoms; and * indicates an asymmetric carbon atom; and



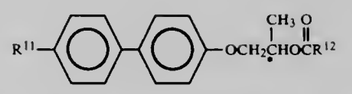
(A-VI)

wherein R^8 represents a linear or branched chain alkyl or alkoxy group each of 2 to 8 carbon atoms; R^9 represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom.



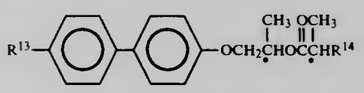
(VII)

wherein R^{10} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; X represents —H, —F or —CN; and * represents an asymmetric carbon atom;



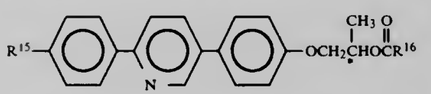
(VIII)

wherein R^{11} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{12} represents an alkyl group of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom;



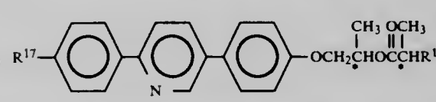
(IX)

wherein R^{13} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{14} represents a linear or branched alkyl group of 2 to 18 carbon atoms or a linear or branched alkoxy group of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom;



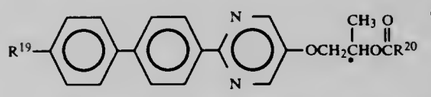
(X)

wherein R^{15} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{16} represents a linear chain alkyl group of 2 to 10 carbon atoms or a linear chain alkoxy group of 1 to 18 carbon atoms; and * represents an asymmetric carbon atom;



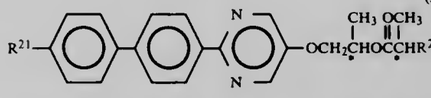
(XI)

wherein R^{17} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{18} represents a linear chain alkyl group of 2 to 18 carbon atoms or a linear or branched alkoxy group of 1 to 10 carbon atoms; and * indicates an asymmetric carbon atom;



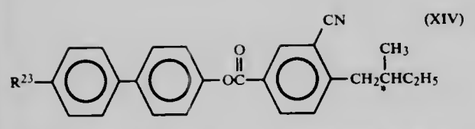
(XII)

wherein R^{19} represents a linear chain alkyl or alkoxy group each of 1 to 18 carbon atoms; R^{20} represents a linear chain alkyl group of 1 to 18 carbon atoms of a linear chain alkoxy group of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom;

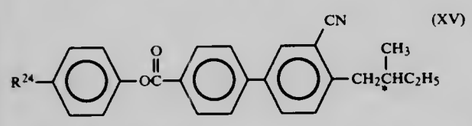


(XIII)

wherein R^{21} represents a linear or branched chain alkyl or alkoxy group of 1 to 18 carbon atoms; R^{22} represents a linear or branched chain alkyl group of 2 to 18 carbon atoms or a linear or branched chain alkoxy group of 1 to 18 carbon atoms; and * represents an asymmetric carbon atom;

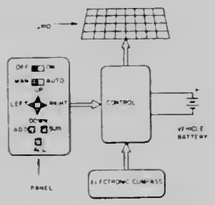


wherein R^{23} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom; and



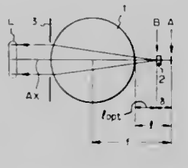
wherein R^{24} represents a linear or branched chain alkyl or alkoxy group each of 1 to 18 carbon atoms; and * indicates an asymmetric carbon atom.

4,892,394
ELECTRONIC SUN SHIELD
Farid M. Bidabad, P.O. Box 41262, San Jose, Calif. 95160
Filed May 3, 1988, Ser. No. 189,947
Int. Cl.[4] G02F *1/17, 1/23*
U.S. Cl. 350—357 **10 Claims**



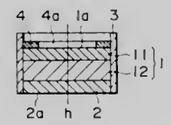
9. The invention of claim 8, wherein said window comprises a vehicle windshield mounted in a vehicle.

4,892,395
COLLIMATING OPTICAL SYSTEM USING A SPHERICAL LENS
Masayuki Suzuki, Atsugi, and Noritaka Mochizuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 27, 1988, Ser. No. 149,019
Claims priority, application Japan, Jan. 30, 1987, 62-19916
Int. Cl.[4] G02B *3/00*
U.S. Cl. 350—416 **27 Claims**



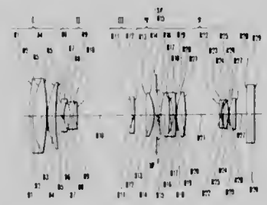
1. A collimating optical system for collimating a diverging light beam, comprising:
a lens element having a light input surface and a light output surface of essentially common center of curvature, and having a predetermined focal distance;
an origin point of divergence of the diverging light beam being displaced from a focal point of said lens element determined by the focal distance, by a predetermined distance along an optical axis of the system;
said lens element receiving the diverging light beam on the light input surface emitting a collimated light beam from the light output surface.

4,892,396
VARIABLE-FOCUS OPTICAL DEVICE
Nobuo Kushibiki, Ebina, and Yoko Yoshinaga, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 26, 1987, Ser. No. 53,676
Claims priority, application Japan, May 26, 1986, 61-119182
Int. Cl.[4] G02B *15/00, 3/14*
U.S. Cl. 350—423 **7 Claims**



1. A variable-focus optical device comprising:
an elastomeric member and an aperture member having an aperture adapted for causing projection or sinking of the elastomeric member therethrough or thereat to deform the surface of the elastomeric member;
wherein said elastomeric member is formed of plural elastic layers laminated along an optical axis and comprises an elastomeric material having a storage elastic modulus and a loss elastic modulus respectively in a range of 5×10^2 to 1×10^8 dyne/cm^2, and a dynamic loss factor of not larger than 1, respectively, in a frequency range of 0.1 rad/sec to 1×10^3 rad/sec.

4,892,397
PHOTOGRAPHIC LENS HAVING GHOST IMAGE PREVENTED FROM APPEARING
Akihisa Horiuchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 26, 1989, Ser. No. 301,951
Claims priority, application Japan, Jan. 29, 1988, 63-018957
Int. Cl.[4] G02B *15/14, 9/64*
U.S. Cl. 350—425 **7 Claims**



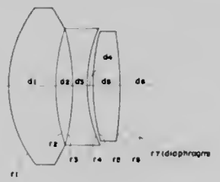
1. A zoom lens comprising:
from front to rear,
a first lens unit having a positive refractive power;
a second lens unit for variation of the image magnification having a negative refractive power;
a third lens unit for compensating for the shift of an image

plane resulting from the variation of the image magnification;
a fourth lens unit;
a fifth lens unit having a positive refractive power and hving an image forming function,
wherein the following condition is satisfied:

$$1.05<f_4/L<1.3$$

where L is the absolute value of a distance from a point of convergence of an on-axial light beam which has passed said first lens unit through said third lens unit to a front principal point of said fourth lens unit, and f_4 is a focal length of said fourth lens unit.

4,892,398
TRIPLET TYPE OBJECTIVE WITH A DIAPHRAGM ARRANGED BEHIND THE LENS SYSTEM
Yoshinobu Kudo; Akira Fukushima; Kazuo Kimura, and Mitsuko Date, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 17, 1988, Ser. No. 272,759
Claims priority, application Japan, Nov. 18, 1987, 62-291479
Int. Cl.[4] G02B *9/14*
U.S. Cl. 350—475 **3 Claims**



1. A triplet type objective comprising,
(a) a lens system which includes from the object side;
a first positive meniscus lens element having an object side surface convex to the object side,
a second biconcave lens element,
a third biconvex lens element,
wherein, the first and the second lens elements are formed of plastic and the third lens element is formed of glass, and
(b) a diaphragm arranged behind the lens system,
(c) wherein the lens system fulfills the following conditions:

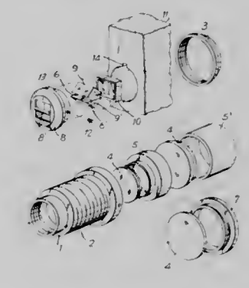
$$0.15<N_3-N_1<0.45$$

$$0.75<N_2/N_3<0.90$$

wherein:
N_1 represents the refractive index of the first lens element;
N_2 represents the refractive index of the second lens element;
N_3 represents the refractive power of the third lens element.

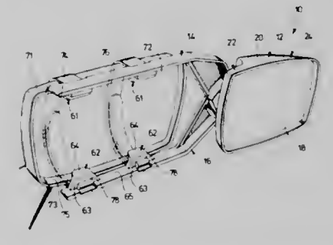
4,892,399
DOOR VIEWER
Chul H. Ahn, #101 Goongjeon Yeonlip, 494-9, Sinwol 2-dong, Kangshu-ku, Seoul, Rep. of Korea
Filed Oct. 7, 1988, Ser. No. 255,069
Claims priority, application Rep. of Korea, Aug. 5, 1988, 1988-10027[U]
Int. Cl.[4] G02B *25/04, 23/02*
U.S. Cl. 350—569 **6 Claims**

1. A door viewer comprising:
two prisms whose hypotenuse surfaces abut to invert the image of an outside caller ;
a front convex lens inverting again said image inverted by said prisms and having a front concave surface and a rear convex surface ;
an intermediate convex lens widening the angle of said image from said front convex lens ; and



a rear convex eyepiece lens positioned at a predetermined distance from said intermediate convex lens corresponding to the focal lengths of said intermediate convex lens and said rear convex eyepiece lens.

4,892,400
TOWING MIRROR
Geoffrey S. Brookes, Kidderminster, and George J. Wyers, Coseley, both of England, assignors to Blazer International Corporation, Franklin Park, Ill.
Filed Oct. 17, 1988, Ser. No. 258,559
Int. Cl.[4] G02B *5/08*
U.S. Cl. 350—626 **16 Claims**



1. An auxiliary external rearview mirror apparatus which is adapted to be mounted to an existing external mirror member of a vehicle, said existing mirror member including a mirror side having an existing mirror, and a back side, said apparatus comprising:
an auxiliary mirror member;
first and second support arms extending from said auxiliary mirror member for mounting said auxiliary mirror member to an existing extenal mirror member on a vehicle, said first and second support arms being adapted to engage the mirror side of said existing mirror on opposite sides of said existing mirror; and
securing means for securing the auxiliary mirror apparatus to the existing mirror member, said first and second support arms including a first side which faces the mirror side of the existing mirror member when the first and second support arms are mounted to the existing mirror member, and first and second projections extending from the first and second support arms, respectively, the first and second projections each including a depending portion which extends from a second side of its respective support arm in a direction generally towards the other support arm and which includes a surface which is substantially aligned

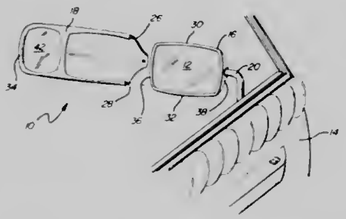
with said first side of its respective support arm to define with the first side of its respective support arm a first seating surface to seat the mirror side of the existing mirror member, and an extending portion which extends outwardly from the depending portion beyond the first side of the support arm to define a second seating surface to seat the mirror side of the existing mirror member, the first and second seating surface of each support arm defining first and second generally L-shaped seats for seating the mirror side of the existing mirror member on opposite sides of the existing mirror.

4,892,401

AUXILIARY SIDE VIEW MIRROR MODULE

John H. Kittridge, and Suzanne Nellett, both of 1063 Genella St., Pontiac, Mich. 48054

Filed Mar. 10, 1989, Ser. No. 321,873
Int. Cl.[4] G02B *5/10*
U.S. Cl. 350—626 **9 Claims**



1. An auxiliary mirror module for extending the viewing area of an automotive side view mirror of the type mounted in a housing, said housing being mounted on a support bracket configured to be attached to the exterior of a vehicle, said module comprising:
an elongated planar casing;
a pair of opposed channel sections supported on the casing, said channel sections being separated by a distance substantially equal to a dimension between opposed edges of the side view mirror housing so that the casing may be supported on said housing by sliding the channel sections over said opposed edges of the housing so that one of the ends of the casing extends laterally outward from the vehicle;
an auxiliary mirror supported on the casing at said laterally extending end so as to be supported alongside and substantially co-planar with the side view mirror housing; and
a threaded fastener supported on the casing at a location removed from said channels and adapted to engage said side view mirror support bracket to retain the casing relative to the side view mirror housing.

4,892,402

METHOD FOR MAKING CONTACT LENS HYDROPHILIC

Takeyuki Sawamoto, Tokyo; Koichi Ishida; Niro Tarumi, both of Akishima, and Tetsuro Izumitani, Hino, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,472
Claims priority, application Japan, Apr. 30, 1987, 62-107563
Int. Cl.[4] B05D *3/06*
U.S. Cl. 351—160 H **6 Claims**

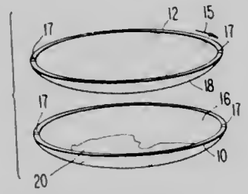
1. A method for making contact lens hydrophilic, which comprises contacting a contact lens with a treating solution containing a hydrophilic monomer, at least one photosensitizer selected from aromatic ketones or quinones, and a solvent, and thereafter irradiating said contact lens with ultraviolet light.

4,892,403

COMPOSITE PLASTIC LENS AND METHOD OF MAKING THE SAME

Joseph Merle, Miami, Fla., assignor to Opticast International Corporation, London, England

Filed Aug. 19, 1988, Ser. No. 234,090
Int. Cl.[4] G02C *7/02, 7/06*
U.S. Cl. 351—168 **18 Claims**



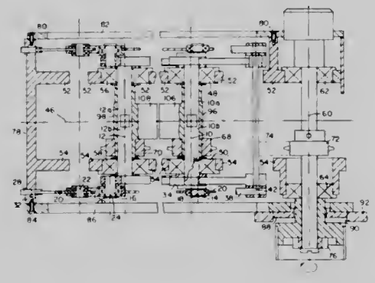
1. A lens for an eyeglass comprising:
an anterior plastic lens having a first corrective feature;
a posterior plastic lens having a second corrective feature;
said anterior and posterior lenses joined together by an adhesive that bonds opposing, etched surfaces of said anterior and posterior lenses; and
wherein said lenses, when joined, form a prescription lens incorporating said first and second corrective features.

4,892,404

FILM TRANSPORT MECHANISM FOR A MOTION PICTURE CAMERA

Otto Blaschek, Aschheim, Fed. Rep. of Germany, assignor to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG, Munich, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,119
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643594
Int. Cl.[4] G03B *1/22*
U.S. Cl. 352—192 **11 Claims**



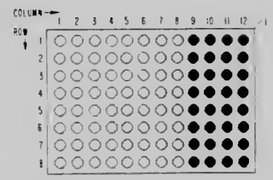
1. A film feed mechanism for a motion picture camera to advance film in a travelling plane, the film having first and second rows of perforations, comprising:
first and second feeding claws respectively having tips for engaging the perforations on the film, said first feeding claw being disposed on one side of a center plane for engagement with the first row of perforations of the film which is to be fed in steps past a picture window of the camera, and said second feeding claw being disposed on the other side of the center plane for engagement in the second row of perforations of the film;
first and second transporting drives for respectively driving said first and second feeding claws so that said tips traverse an elongate, closed curve which has an end which enters into the travelling plane of the film and has another end which leaves the travelling plane of the film,
first and second drive shafts which are respectively in driving connection with said first and second transporting drives;
first and second bearings for mounting said first drive shaft, and third and fourth bearings for mounting said second drive shaft, said first and second bearings being mounted on each end of said first shaft, said third and fourth bearings being mounted on each end of said second drive shaft, said bearings for each of said first and second shafts being disposed closer to the center plane of the film feed mechanism than said first and second transporting drives.

4,892,405

METHOD AND APPARATUS FOR PROVIDING QUALITY ASSURANCE AND CALIBRATION ASSURANCE IN A SPECTROPHOTOMETER

Keld Sorensen; James N. Macri; Timothy J. Douros, all of Oyster Bay; Paul Sajda, Commack, and Emiddio V. Ippolito, Smithtown, all of N.Y., assignors to NTD Laboratories, Inc., Carle Place, N.Y.

Filed Oct. 12, 1988, Ser. No. 256,568
Int. Cl.[4] G12B *13/00;* **G01N** *21/59*
U.S. Cl. 356—243 **11 Claims**



1. A quality monitoring apparatus for a photometer used to sample a plurality of samples, the photometer having at least one light source and at least one detector for generating signals corresponding to light from the samples, comprising:
a QC plate having an array of sample wells, at least some of said sample wells having different optical densities of a known value and first color between the source and detector, the array serving to position a sample well of the QC plate at each location at which the photometer samples one of the plurality of samples;
means for processing the signals generated when each density of the first color is sampled; and
means for indicating from the processed signals whether the photometer is operational.

4,892,406

METHOD OF AND ARRANGEMENT FOR MEASURING VIBRATIONS

James P. Waters, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 11, 1988, Ser. No. 142,889
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **18 Claims**

1. A method of measuring the movement of a predetermined zone of a surface of a vibrating object, comprising the steps of:
generating a laser beam having a predetermined coherence length;
separating the laser beam into a probe beam and a reference beam;
delaying the reference beam relative to the probe beam by a predetermined time interval sufficient for the probe beam to travel through a predetermined distance at least corresponding to the coherence length;
combining the thus delayed reference beam with the probe beam to form a combination beam;
subdividing the combination beam into a plurality of substantially equal component beams;
conducting each of the component beams along a separate path to a separate associated location spaced from the predetermined zone substantially by one-half of the distance traveled by light in said predetermined time interval between the respective associated location and the predetermined zone;
reflecting a predetermined portion of each of the component beams at the respective associated location back into the respective path;
directing the remainder of each of the component beams from the respective associated location to the predetermined zone for return from the predetermined zone at least predominantly back toward the respective associated location, in the form of a speckle pattern including dark speckles which may be situated at least at one but not at all of said associated locations, and into the respective path with attendant coherent interference of the probe beam part of the thus returned remainder of the respective component beam with the reference beam part of the predetermined portion of the respective component beam resulting in a return light beam modulated in dependence on the movement of the predetermined zone relative to the respective associated location except when one of the dark speckles coincides with said associated location; and
concurrently demodulating all of the return light beams to obtain from those of them that are unaffected by the dark speckles an indication of the movement of the predetermined zone.



4,892,407

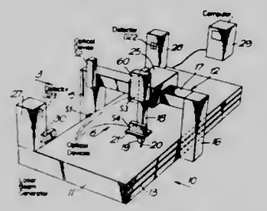
OPTICAL MEASURING APPARATUS FOR USE ON MACHINES

David R. McMurtry, Wotton-under-Edge, and Raymond J. Chaney, Berkeley, both of United Kingdom, assignors to Renishaw plc, United Kingdom

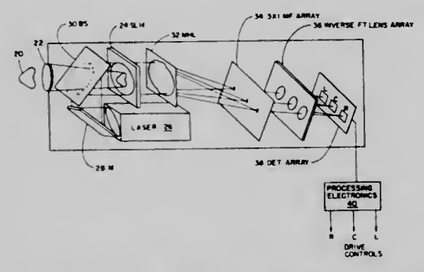
PCT No. PCT/GB87/00470, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00327, PCT Pub. Date Jan. 14, 1988
PCT Filed Jul. 3, 1987, Ser. No. 159,592
Claims priority, application United Kingdom, Jul. 5, 1986, 8616431
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—375 **18 Claims**

1. Optical measuring apparatus for use on a machine having a first part movable along a first axis and supported on a second part movable along a second axis orthogonal to the first axis, the apparatus comprising in combination:
means for directing a collimated light beam towards the second machine part in a direction substantially parallel to the second axis,
a square deflector mountable on the second machine part in the path of the collimated light beam and for deflecting at least a portion of said light beam to produce a deflected beam directed substantially parallel to the first axis
measuring beam generating means mountable on the first machine part, for receiving the deflected light beam from

the square deflector and for producing therefrom at least one measuring beam, and,
detector means including at least one first detector positionable in the path of a said measuring beam in an orientation such as to produce a signal indicative of transverse displacement of the measuring beam caused by rolling movement of the first machine part about the first axis.

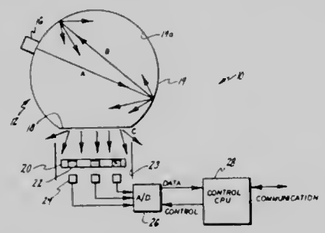


4,892,408
REFERENCE INPUT PATTERNS FOR EVALUATION AND ALIGNMENT OF AN OPTICAL MATCHED FILTER CORRELATOR
Benjamin J. Pernick, Forest Hills, and Michael A. Nowak, East Northport, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,530
Int. Cl.[4] G01B *11/27*
U.S. Cl. 356—400 **5 Claims**



1. A reference input pattern providing for evaluation and alignment of an optical instrument which optically compares an input image with optical information stored in an array of a plurality of matched filters to provide identification and aspect information about the input image, wherein an input image to be analyzed is spatially modulated onto a reference beam of radiation, and is directed onto a plurality of lenses to obtain a plurality of Fourier transforms of the spatially modulated radiation beam, and an optical memory element having an array of a plurality matched filters recorded thereon, and having the plurality of Fourier transforms incident thereon, with each matched filter comprising a Fourier transform hologram of an aspect view of an object of interest and passing an optical correlation signal in dependence upon the degree of correlation of the Fourier transform of the spatially modulated radiation beam with the Fourier transform hologram recorded by the matched filter, an inverse Fourier transform lens means receiving the optical correlation outputs of the matched filters, for performing an inverse Fourier transformation on each optical correlation output, and a detector means for detecting the inverse Fourier transforms of the optical correlation outputs, and for producing detector output signals representative of the optical correlation outputs; said reference input pattern supplying said input image to the optical instrument and providing for evaluation and alignment of said optical instrument, and comprising a two dimensional array of substantially transparent reference targets provided on a uniform dark background which provides an identifiable power spectral density distribution and autocorrelation function, for evaluation and alignment of the optical instrument.

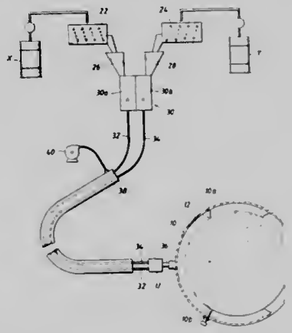
4,892,409
PHOTOMETRIC APPARATUS FOR MULTIWELL PLATES HAVING A POSITIONABLE LENS ASSEMBLY
Harry F. Smith, 7 Fern Lake, Newtown, Conn. 06470
Filed Jul. 14, 1988, Ser. No. 218,874
Int. Cl.[4] G01N *21/31, 21/84*
U.S. Cl. 356—414 **24 Claims**



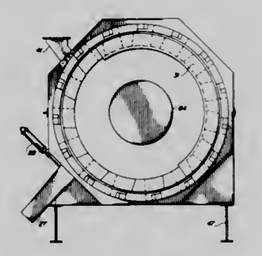
1. A photometric apparatus for determining a characteristic of individual ones of a plurality of samples contained within a plurality of sample chambers, comprising:
an enclosure;
means for providing a substantially uniform source of radiation to said enclosure such that a plurality of sample chambers, disposed within said enclosure, are simultaneously illuminated by said uniform source means;
optical lens means, interposed between said uniform source providing means and the plurality of sample chambers, for directing radiation emanating from said substantially uniform source of radiation simultaneously into each of the sample chambers;
means, coupled to said optical lens means, for controllably positioning said optical lens means relative to the sample chambers; and
means for detecting an amount of radiation, if any, that is transmitted through individual ones of the sample chambers, said detecting means having an output signal having a magnitude which is a function of the amount of radiation, if any, which is transmitted through an individual one of the sample chambers.

4,892,410
METHOD AND APPARATUS FOR PROTECTIVE ENCAPSULATION OF STRUCTURAL MEMBERS
Richard K. Snow, Gallatin, and Milton W. Ellisor, Jr., Houston, both of Tex., assignors to Sandoz Ltd., Basel, Switzerland
Division of Ser. No. 874,500, Jun. 16, 1986. This application Sep. 22, 1988, Ser. No. 247,950
Int. Cl.[4] E04G *21/04*; B01F *5/04*; E02D *5/60*
U.S. Cl. 366—2 **4 Claims**

1. A method of preparing and delivering a two component polymer material system separately to a discharge manifold for combining the components to initiate curing the polymer material system into a useful hardened state adjacent the desired location for use of the hardened polymer material, comprising the steps of:
preparing a first liquid component of a two component polymer material system by mixing to blend in an granular inert filler material at a location remote from the location of use;
preparing a second liquid component of the two component polymer material system by mixing to blend in an inert granular filler material at a location remote from the location of use;
pumping the first component under pressure through a first conduit to a discharge manifold located adjacent desired location for hardening of the polymer material;
pumping the second component under pressure through a second conduit to the discharge manifold located adjacent the desired location for hardening of the polymer material; .
combining the first component with the second component in the discharge manifold with a static mixer to initiate the solidification reaction immediately prior to discharging the combined polymer material from the discharge manifold into the desired location for hardening use in response to the pressure provided by the steps of pumping.

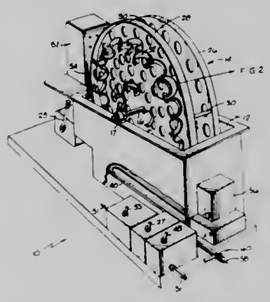


4,892,411
ASPHALT MIXER APPARATUS AND METHOD
E. J. Elliott, Altamonte Springs, Fla.; Fred W. Prill, North Aurora, and Douglas R. Fisher, East Dundee, both of Ill.
Filed Feb. 8, 1988, Ser. No. 153,459
Int. Cl.[4] B28C *5/46*
U.S. Cl. 366—25 **10 Claims**



1. Drum heating and mixing apparatus comprising:
a first cylindrical rotatable drum having a first material input in one end portion thereof and a material output at the other end thereof;
a second concentric drum mounted adjacent the material output end of the first cylindrical drum and attached thereto and having the material input from the material output of the first cylindrical drum and a material output therefrom at the other end thereof so that materials passing through the first cylindrical drum will pass into the second cylindrical drum;
a burner mounted on one end of said second cylindrical drum and extending therethrough for directing a flame into the first cylindrical drum;
a cowling mounted around a portion of the outside of said first cylindrical rotatable drum forming a passageway for air intake therearound and said cowling being connected to the burner air intake whereby h.. ted air is fed to said burner;
means for introducing reclaimed asphaltic pavement materials into the mixing area of the second cylindrical drum; and
means for introducing liquid asphalt into the mixing area of the second cylindrical drum, whereby aggregate enters from the output end of the first cylindrical drum into the second cylindrical drum for the mixing of the liquid asphalt and reclaimed asphaltic materials;
a scavenger blower coupled between said second concentric drum and said burner for capturing smoke and particles from said second concentric drum and feeding said smoke and particles into said burner for incineration; and
means for switching the dried heated virgin aggregates between an elevator, and said second cylindrical mixing drum.

4,892,412
HEATABLE MIXER APPARATUS
David A. Thomas, Golden; Robert F. Karr, Wheatridge, and Patricia K. Davies, Golden, all of Colo., assignors to Adolph Motors COmpany, Golden, Colo.
Filed May 9, 1989, Ser. No. 349,232
Int. Cl.[4] B01F *15/06, 9/02*
U.S. Cl. 366—145 **9 Claims**



1. A heatable mixer apparatus comprising:
(a) an open-top tank wherein a liquid can be housed;
(b) a wheel means for supporting a plurality of retainer means mounted thereon for releasably holding closed vessels into which materials to be mixed can be placed, said wheel means rotatably mounted essentially perpendicularly above the tank with a portion thereof disposed within the tank;
(c) heater means for heating and regulating the temperature of liquid within the tank; and
(d) rotation means for rotating the wheel means.

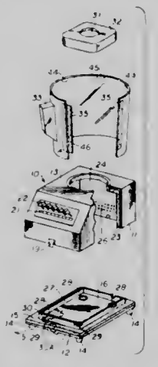
4,892,413
SOUND AND VIBRATION REDUCING APPARATUS
Raj K. Vats, 11610 Perry Rd., Houston, Tex. 77064
Filed Jul. 1, 1987, Ser. No. 68,547
Int. Cl.[4] B01F *15/00*; G10K *11/00*
U.S. Cl. 366—349 **19 Claims**

1. A sound reducing enclosure for electric blenders and other appliances of the type having a motor within a housing, a liquid containing canister removably received on the motor housing, a canister lid, and motor control buttons extending through the appliance housing for manual operation of the appliance, said sound reducing enclosure comprising;
a generally flat rigid base member having a bottom surface

with legs depending therefrom for supporting it on a flat surface and a top surface covered by a layer of sound insulating material having a centrally disposed waterproof portion peripherally surrounded by a raised rim to prevent liquid from leaking from the waterproof portion,

positioning means within the raised rim of said base member corresponding with the legs of the appliance for removably receiving and positioning the appliance on said base member,

a rigid upper body member removably hinged to said base member and having a top wall and side walls configured to substantially surround and enclose the appliance motor housing when positioned on said base member and an opening in the top wall for allowing the appliance canister to be removably received on the appliance motor housing,



a layer of sound insulating material lining the interior surfaces of said upper body member, and

one or more manipulating devices extending movably through one of said upper body side walls in alignment with the motor control buttons on the appliance housing for operatively engaging the buttons for manual operation of the appliance when it is positioned on said base member and substantially enclosure by said upper body member,

the sound insulating material of said base member and said upper body member substantially surrounding the appliance motor housing when enclosed thereby to absorb the sound and vibration emanating from the appliance and the waterproof portion and raised rim of said base member preventing leakage of liquid from the enclosure.

4,892,414

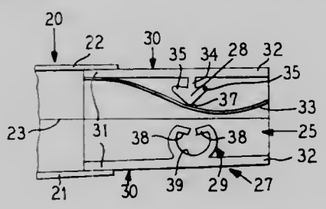
BAGS WITH RECLOSABLE PLASTIC FASTENER HAVING AUTOMATIC SEALING GASKET MEANS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 214,941, Jul. 5, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 308,932

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—63 **46 Claims**



1. A bag or package having an openable mouth carrying an elongate reclosable extruded plastic zipper extending across the inside of said mouth.

said zipper having complementary profiles separably interlockable in a closed condition of the zipper; and

gasket flange means extending along substantially the full length of the profiles for separably sealingly gripping interengagement by and between said profiles in said closed condition of the zipper.

4,892,415

MINIATURE LINEAR GUIDE APPARATUS

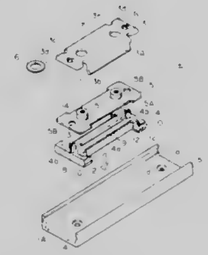
Masayuki Katahira, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,725

Claims priority, application Japan, Feb. 10, 1988, 63-16979

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 **3 Claims**



1. A miniature linear guide apparatus comprising a guide rail having a U-shaped cross section with a bottom plate and side walls extending outwardly therefrom, axially extending ball rolling grooves formed in the inner surfaces of said side walls, and a slider formed by integrally assembling a race member having an inverted U-shaped cross section with an upper plate and side walls extending outwardly therefrom, axially extending ball rolling grooves formed in both outer side surfaces opposing respectively said ball rolling grooves of said guide rail, a circulator fitted within a recess of said race member having ball circulating paths formed as grooves in the inside thereof, and a cap for covering said ball circulating paths, said slider loosely fitted within said U-shaped cross section of said guide rail and supported therein through many roller balls interposed between said rolling grooves of said guide rail and said race member, an improvement comprising:

a column member, having a thread hold for attaching a member to be driven, extending outwardly from a surface of said cap facing said race member, and

a through hole, formed in said race member, through which said column member passes, formed at a position corresponding to said column member.

4,892,416

PRECISION CARRIAGE AND HOUSING FOR RELATIVE POSITION SENSING DEVICE

William L. Hassler, Jr., El Toro, and Falin Shieh, Irvine, both of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Jul. 8, 1988, Ser. No. 216,747

Int. Cl.[4] F16C *29/04, 29/08;* **G01B** *11/04*

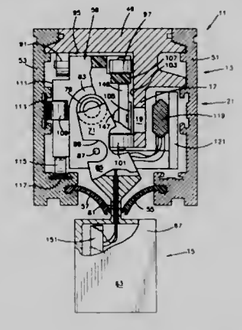
U.S. Cl. 384—58 **15 Claims**

1. An improved carriage and housing for a position sensing device of the type having a carriage carrying a reader for reading the position of the carriage with respect to the housing along a position line of the device, the improvement comprising:

the housing including a rider support having first and second planar reference surfaces and first and second spring supports; said first planar reference surface extending parallel to said position line with said first spring support extending parallel thereto and spaced therefrom, and said second planar reference surface extending parallel to the position line and approximately perpendicular to the first planar reference surface with said second spring support extending parallel thereto and spaced therefrom;

the carriage including a rider frame for riding adjacent said rider support and carrying said reader;

exactly five bearings mounted on said rider frame for supporting the rider frame with respect to the first and second planar reference surfaces of said rider support, said five bearings being disposed so that a first and second of said bearings are disposed parallel to said position line and support said rider frame with respect to said first planar



reference surface, said third and fourth bearings are disposed parallel to said position line and support said rider frame with respect to said second planar reference surface, and said fifth bearing is disposed to support said rider frame with respect to said second planar reference surface and disposed other than in alignment with said third and fourth bearings; and

first and second springs mounted on said rider frame, said first spring being disposed on said rider frame opposite said first and second bearings and bearing against said first spring support to urge said frame toward said first planar reference surface and said second spring being disposed on said rider frame opposite said third, fourth and fifth bearings and bearing against said second spring support to urge said frame toward said second planar reference surface.

4,892,417

ELASTOMERIC MOUNT FOR THRUST BEARING SHOE

John D. Spargo, and Joseph W. White, both of Annapolis, Md., assignors to The United States of America as represented by the United States Department of the Navy, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,132

Int. Cl.[4] F16C *39/04*

U.S. Cl. 384—99 **4 Claims**

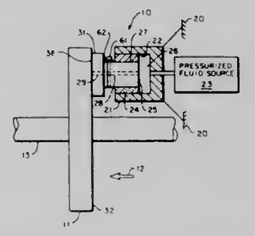
1. A bearing for applying axial thrust to a collared shaft rotating within a stationary platform, comprising:

a source of pressurized fluid;

a cell ring affixedly attached to said stationary platform, said cell ring having an internal cavity in internal communication with said source of pressurized fluid, said cavity having an internal diameter;

a piston in fluid communication with said source of pressurized fluid, said piston having an external diameter disposed radially inward from said internal diameter of said cavity within said cell ring, said piston having a portion of the length of said piston disposed concentric with said internal diameter of said cell ring;

an elongated elastomeric bearing-seal adhesively bonded between said internal diameter of said cavity of said cell ring and said concentric portion of said piston; and,



a thrust bearing shoe lockedly engaged with said piston, said thrust bearing shoe axially thrusting said collar under influence of pressure from said pressurized fluid.

4,892,418

HYDRODYNAMIC BEARING DEVICE

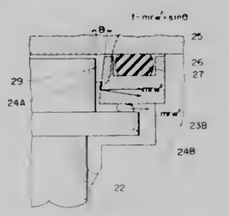
Takafumi Asada, Osaka; Jiro Katsoka, Hyogo, and Kouji Nakagawa, Osaka, all of Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Filed Oct. 31, 1988, Ser. No. 264,883

Claims priority, application Japan, Nov. 2, 1987, 62-277613

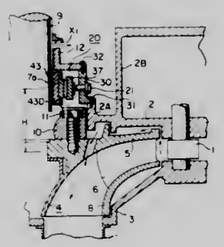
Int. Cl.[4] F16C *33/72*

U.S. Cl. 384—124 **9 Claims**



1. A hydrodynamic bearing device which comprises a shaft, a ring-shaped member having an inner peripheral face confronting an outer peripheral face of said shaft in the vicinity of its forward end and a thrust bearing member disposed in a position confronting a forward end face of said shaft, with a lubricating material being held in a gap defined by an end face of said thrust bearing member, the inner peripheral face of said ring-shaped member and the outer face in the vicinity of the forward end of said shaft, either one or both of the inner peripheral face of said ring-shaped member and the outer peripheral face in the vicinity of the forward end of said shaft being formed with a conical face having a taper to increase its diameter in a direction as it approaches said thrust bearing member.

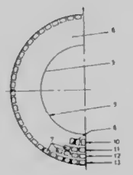
4,892,419
LUBRICATED BEARING APPARATUS FOR HYDRAULIC MACHINERY
Hisao Inoue, Hitachi; Ichiro Hitomi, Katsuta; Osamu Sugimoto, Saita, and Teiji Horita, Hikone, all of Japan, assignors to Hitachi, Ltd., Tokyo and The Kansai Electric Co., Inc., Osaka, both of, Japan
Filed Jun. 13, 1988, Ser. No. 206,048
Claims priority, application Japan, Jun. 15, 1987, 62-147108
Int. Cl.[4] F16C *33/10, 17/02*
U.S. Cl. 384—322 **9 Claims**



1. A lubricated bearing apparatus for hydraulic machinery, comprising:
a runner mounted on the tip of the main shaft, an upper cover covering said runner, a bearing supporting plate that extends upwardly from said upper cover having threaded holes, adjusting screws inserted through said threaded holes, reinforcing support plates disposed in contact with said adjusting screws, bearing ceramic sliding plates mounted on said reinforcing support plates, at least one rotary-side sliding plate disposed in contact with said bearing ceramic sliding plates, and a main shaft sleeve member that is mounted on the main shaft and to which said rotary-side sliding plate is fixed, said adjusting screw being rotatable to bring said bearing ceramic sliding plates into press contact with said rotary-side sliding plate;
said rotary-side sliding plate being a rotary-side ceramic sliding plate formed of a ceramic material;
engagement portions in one side surface of said rotary-side ceramic sliding plate, at least one receiving groove in an outer peripheral surface of said main shaft sleeve member for receiving said rotary-side ceramic sliding plate, and said main shaft sleeve member having preventing portions partially extending across said receiving groove for engaging said engagement portions.

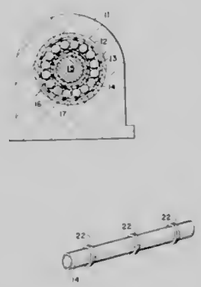
4,892,420
FRICTION BEARING FOR DEEP WELL DRILLING TOOLS
Volker Kruger, Sassengarten 8, D-3110 Celle, Fed. Rep. of Germany
Filed Mar. 24, 1988, Ser. No. 172,591
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709836
Int. Cl.[4] F16C *33/12;* **E21B** *4/02*
U.S. Cl. 384—420 **9 Claims**

1. Friction bearing for well drilling tools, with a trace ring and a bearing ring where the bearing ring has bearing segments supported on the sliding face of said trace ring and the trace ring has a bearing body with a bearing material that is hard and wear resistant, characterized by the fact that the sliding face of the trace ring is formed by a number of molded bodies countersunk so flush with the surface of the bearing body and they are arranged side by side in a mosaic pattern, with their surfaces



together defining a ring path that has an essentially closed surface.

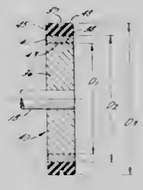
4,892,421
BEARING WITH COMPOSITE LOAD BEARING SURFACES
Hofgren Jon M., 3805 NW. 16th Blvd., Gainesville, Fla. 32605
Filed Jan. 11, 1988, Ser. No. 141,954
Int. Cl.[4] F16C *27/04*
U.S. Cl. 384—492 **8 Claims**



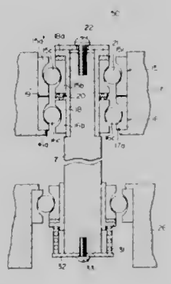
1. In a bearing for a rotating shaft wherein the bearing includes a plurality of rolling members retained in free rolling relationship by an inner race mounted on said shaft and an outer race mounted on a housing supporting said shaft, the improvement which comprises incorporating between said races, and said rolling member a thin layer of fiber reinforced elastomeric material being capable of rapid and complete recovery from deflections.

4,892,422
SUPPORT ASSEMBLY FOR THE ROTOR OF AN OPEN END YARN SPINNING APPARATUS
Peter H. Stahlecker, Charlotte, N.C., assignor to American Suessen Corporation, Charlotte, N.C.
Filed Aug. 1, 1988, Ser. No. 226,673
Int. Cl.[4] D01H *1/24;* **F16C** *13/00*
U.S. Cl. 384—549 **18 Claims**

1. A support assembly adapted to be mounted in adjacent pairs to form a wedge shaped cusp for rotatably supporting a shaft of a spinning rotor of an open end yarn spinning apparatus, and comprising
a metallic support shaft defining a central axis,
a bearing mounted on said support shaft for rotatably mounting said shaft to the frame of the yarn spinning apparatus,
a pair of discs mounted to said support shaft on respective opposite sides of said bearing, with each of said discs comprising:
(a) an annular metal body member having a central bore coaxially receiving said shaft so as to be fixedly mounted thereto, and with said body member having an annular outer surface which is cylindrical and concentric to said central bore and to said central axis of said shaft,
(b) an annular metal ring mounted coaxially upon said outer surface of said body member, with said metal ring having an outer peripheral surface and an inner surface, with said inner surface of said metal ring being cylindrical and contacting and engaging said outer surface of said body member so as to form a self holding and releasable press fit interconnection between said metal ring and said body member, and
(c) an annular plastic ring fixedly mounted upon said outer peripheral surface of said metal ring,
whereby said metal ring and said plastic ring of each disc may be removed as a unit from the associated body member to facilitate the replacement of said plastic ring.

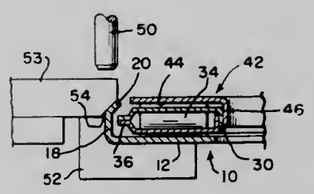


4,892,423
ROTARY ACTUATOR AND FABRICATION PROCESS THEREFOR
Tsuyoshi Takahashi; Katsumi Kawamura; Jun Naruse, and Jyousei Shimizu, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 19, 1986, Ser. No. 943,750
Claims priority, application Japan, Dec. 23, 1985, 60-287703
Int. Cl.[4] F16C *19/10*
U.S. Cl. 384—611 **3 Claims**



1. A rotary actuator, comprising:
a rotational shaft;
a plurality of bearing sets arranged in spaced relationship along the axis of said rotational shaft to support opposite ends of said rotational shaft, each of said plurality of bearing sets including a plurality of axially arranged ball bearings having an outer ring and an inner ring which are concentric with said rotational shaft, and a plurality of balls interposed between said outer and inner rings; and
an elastic member interposed between said plurality of ball bearings and having applied thereto a force in the axial direction of said rotational shaft;
wherein said plurality of ball bearings are situated interiorly of a housing of said bearing set in the axial direction of said rotational shaft, such that under the application of an axial force, they share substantially equally component forces generated by said elastic member, wherein said elastic member intervenes in one of sets of the outer rings and of the inner rings, and the other set opposing said one set is coaxial therewith, the axial height of said other set being prolonged as compared to that of said one set so that the rings of said other set may make close contact with each other when the axial force acting to make the rings of said one set head toward said elastic member in opposition to a repulsive force generated by said elastic member intervening in said one set reaches a predetermined value.

4,892,424
THRUST BEARING
Carl R. Christenson, Bethlehem, and Richard L. Alling, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.
Filed Sep. 29, 1988, Ser. No. 250,657
Int. Cl.[4] F16C *33/64*
U.S. Cl. 384—620 **8 Claims**



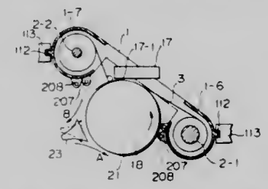
1. A thrust bearing race comprising: a radially extending annular raceway having an outer periphery and an inner periphery; a totally solid annular lip integral with and extending axially from at least one of said peripheries, said lip having an inside surface and an outside surface, and at least one stake which has been bent after being heated and having an inside surface and an outside surface, one of said stake surfaces protruding from one of said lip surfaces, the other of said stake surfaces indented from the other of said lip surfaces, each stake surface being at an acute angle with respect to the associated lip surface.

4,892,425
THERMAL TRANSFER RECORDING APPARATUS AND INK SHEET CASSETTE THEREFOR
Hiroshi Shimizu; Naohiro Ozawa, both of Yokohama; Toshihiko Gotoh, Tokyo; Kentaro Hamma, and Takeshi Nomura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 30, 1987, Ser. No. 139,826
Claims priority, application Japan, Jan. 9, 1987, 62-1610; Feb. 13, 1987, 62-29612; Apr. 13, 1987, 62-88810
Int. Cl.[4] B41J *33/14, 32/00, 3/20*
U.S. Cl. 400—120 **14 Claims**

1. A combination of a thermal transfer recording apparatus and an ink sheet cassette therefor,
said ink sheet cassette comprising a cassette case having, in a united form, a supply shaft housing section, a take-up shaft housing section and means for connecting-said sup-

ply shaft housing section and said take-up shaft housing section to each other, a supply shaft rotatably mounted within said supply shaft housing section, a take-up shaft rotatably mounted within said take-up shaft housing section, and an ink sheet having applied thereto thermal transfer ink, the ink sheet before use or new ink sheet being wound in the form of a continuous roll about said supply shaft, the ink sheet extending between said supply shaft and said take-up shaft, the ink sheet after use or used ink sheet being taken up about said take-up shaft, said supply shaft housing section having an inner diameter substantially equal to an outer diameter of the roll of the new ink sheet wound about said supply shaft, said take-up shaft housing section having an inner diameter substantially equal to said inner diameter of said supply shaft housing section; and

said thermal transfer recording apparatus comprising a chassis assembly defining a cassette loading section on which said ink sheet cassette is to be loaded, said chassis assembly having an inner chassis, drive means mounted on said inner chassis for driving one end of the respective supply and take-up shafts, and a print section having a drum and a thermal head, said thermal head cooperating with said drum to pinch therebetween a sheet to be printed and the



new ink sheet in superposed relation to effect printing on the sheet to be printed,

wherein the new ink sheet, wound about said supply shaft to a location close to an inner wall surface of said supply shaft housing section of said cassette case, is changed to the used ink sheet, the used ink sheet being wrinkled due to heating by said thermal head, the used ink sheet having an increased thickness due to the wrinkles, and wherein said take-up shaft has an outer diameter sufficiently smaller than that of said supply shaft such that, when the used ink sheet is taken up in the form of a roll about said take-up shaft, the roll of the used ink sheet entirely wound about said take-up shaft has such an outer diameter as to be out of contact with an inner wall surface of said take-up shaft housing section, to thereby prevent contact of said take-up shaft with an inner wall surface of said cassette case due to an increase in the diameter of the roll of the used ink sheet wound about said take-up shaft, whereby the distance between the outer diameter of the take-up shaft and inner diameter of the take-up shaft housing section is increased, as compared to the distance between the outer diameter of the supply shaft and inner diameter of the supply shaft housing section, without increasing the inner diameter of the take-up shaft housing section.

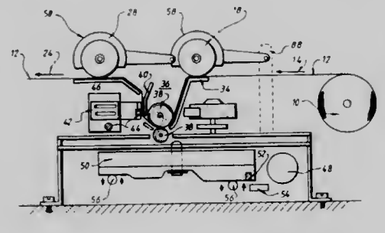
4,892,426

PAPER MOVEMENT MONITOR

David Steele, Edinburgh, Scotland, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 30, 1988, Ser. No. 213,857
Int. Cl.[4] B41J *11/64*
U.S. Cl. 400—708 **27 Claims**

1. An apparatus for monitoring movement of paper in a printer, said apparatus comprising a first movement sensor operative to engage paper in a printer at a first point and operative to detect the distance moved by the paper at said first point between successive lines of printing, said apparatus providing indication of a paper feed error if said distance of movement



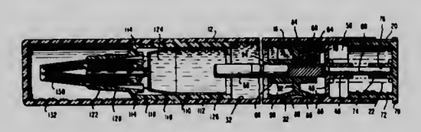
detected by said first sensor does not lie within first and second predetermined limits.

4,892,427

SEAL FOR A DOSAGE DISPENSER TUBE

John Ford, Cordova, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 75,385, Jul. 20, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 210,896
Int. Cl.[4] A46B *11/02*; A45D *40/26*
U.S. Cl. 401—182 **38 Claims**



1. A dispenser for dispensing metered portions of a viscous material, said dispenser comprising:

a cylindrical tube having an actuating axial end and a discharge end through which the viscous material may be expelled from said tube and an interior surface facing into said tube;

a rod disposed in said cylindrical tube and having a plurality of transversely extending ridges spaced along a longitudinal direction of said rod;

push button means operatively coupled to said rod for reciprocating said rod axially within said tube from a first position to a second position closer to said discharge end than said first position;

biasing means for urging said push button means and rod toward said first position;

a plunger extending around said rod and movable therealong from said actuating end of said tube toward said discharge end, said plunger extending radially from said rod to said interior surface of said tube and being effective to provide a first seal between said interior surface and said plunger and a second seal between said rod and said plunger, said plunger having a general H-shaped cross-section, for cross-sections taken along radial-longitudinal planes in said tube through said plunger, said plunger comprising an outer tubular section which sealingly contacts and is movable along said interior surface of the tube, forming said first seal, an inner tubular section which sealingly surrounds said rod and forms said second seal and a ring-shaped rib extending radially in said tube and connecting said outer and inner tubular sections to one another; and

catch means connected to said plunger and engageable with said ridges on said rod for moving said plunger, in ratchet-like manner, on said ridges of said rod in a direction toward said discharge end.

4,892,428

TIP REMOVAL DEVICE

Gerald Grötsch, Fürth, Fed. Rep. of Germany, assignor to J. S. Staedtler GmbH & Co., Fed. Rep. of Germany

Filed Oct. 27, 1987, Ser. No. 112,997
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640517
Int. Cl.[4] B43K *13/00, 9/00*
U.S. Cl. 401—258 **12 Claims**



1. An axially removable cylindrical holding shaft or cap for placement over and for unscrewing and removing a tip of a writing or drawing instrument, said holding shaft having a receiving bore for that instrument tip and being comprised of at least one approximately axially extending lever in a wall of said receiving bore, said lever being tiltable about an axis extending approximately tangentially to said wall, wherein said lever has an arm on each side of said axis, one of said arms forming a part of said wall and having a detent at its end, said detent projecting into said receiving bore for engaging one of a groove and an undercut of said tip when said tip is inserted in said receiving bore, fixing said tip in said receiving bore in axial direction, said detent being disengaged from said tip by means of radial pressure exerted on the other of said arms.

4,892,429

ROOF ANCHOR AND STRESS PLATE ASSEMBLY

Louis N. Giannuzzi, 59 Dingletown Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 81,016, Aug. 3, 1987. This application Jul. 5, 1988, Ser. No. 215,307
Iot. Cl.[4] F16B *25/06*
U.S. Cl. 411—383 **13 Claims**



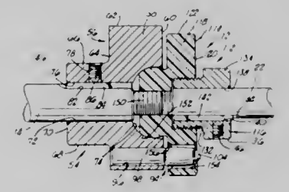
1. An anchor for use in either relatively soft or hard material, said anchor comprising a head and a shank having a section of predetermined length constituted by a screw terminating in a tip at the end of the shank, said screw being defined by a root which tapers toward the tip along substantially the full length of the section and a threading formed by a series of convolutions whose crests are of essentially the same diameter along substantially the full length of the section except for the convolutions thereof adjacent the tip including a final convolution in the series.

4,892,430

QUICK CONNECT-DISCONNECT DRIVE SHAFT COUPLING

Miroslav Liska, Northridge, and Anthony Tomsicek, Woodland Hills, both of Calif., assignors to Durotech Co., Moorpark, Calif.

Filed Nov. 14, 1988, Ser. No. 270,047
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—24 **18 Claims**



1. A quick connect-disconnect coupling adapted to unite on a common axis a first drive shaft of a prime mover with a second drive shaft of a piece of equipment for common rotation of said shafts comprising:

a first mating member mounted on one of said shafts, said first mating member including a socket portion and a first interlockable drive means which includes at least one side biasing, axially nonfastenable driver pin fixedly secured thereto and a part thereof projecting generally parallel to said common axis; and

a second mating member mounted on the other of said shafts, said second mating member including a ball portion removable matable with said socket portion for aligning said shafts and a second interlockable drive means matable with said first interlocking drive means in which said second interlocking drive means includes a driver bore to releasably receive said side biasing, axially non-fastening driver pin whereby movement of one of said shafts will impart movement through said first and second interlockable drive means when said mating members are biasingly engaged one with the other and movement of one of said shafts will impart movement through said interlocking drive means to said other drive shaft.

4,892,431

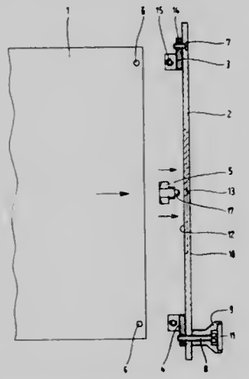
MOUNTING DEVICE FOR CONDUCTOR PLATES

Peter Bachmann, Karlsruhe, and Hans U. Guenther, Straubenhardt, both of Fed. Rep. of Germany, assignors to Schroff GmbH, Straubenhardt, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,328
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 8701710
Int. Cl.[4] F16B *9/00*; H05K *7/00, 5/00*
U.S. Cl. 403—187 **12 Claims**

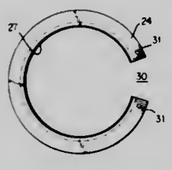
1. A connecting plug for providing lateral support for a circuit board in a plug-in unit intended to receive electrical and electronic components in industrial electronic devices, the plug-in unit including a front panel having a rear face. and a circuit board fastened to the rear face of the front panel and perpendicularly thereto by means of at least two holding blocks, said connecting plug comprising: a body provided on one side with at least one insertion groove for receiving a circuit board; and a plug-in pin projecting from said body at a

side opposite said one side, said plug-in being shaped to provide a press seat with a blind recess provided in a rear face of



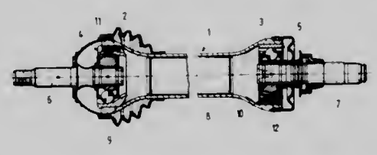
the front panel of the plug-in unit to prevent said connecting plug from dropping off the front panel.

4,892,432
CLIP FOR SECURING ROTATING PARTS
David G. Cooper, Urmston, England, assignor to Eaton Corporation, Cleveland, Ohio
Filed Jan. 11, 1988, Ser. No. 142,600
Claims priority, application United Kingdom, Jan. 24, 1987, 8724966; Jan. 31, 1987, 8702198
Int. Cl.[4] F16B *2/20*
U.S. Cl. 403—297 **2 Claims**



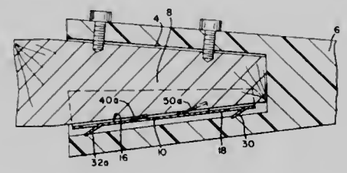
1. A clip (22) comprising a generally circular body having two ends defining a gap (30,42) in the general circle, and resilience to allow firstly a preparatory contraction in the radial cross-section, with reduction of said gap, for the introduction of the clip to a receiving position, and secondly an expansion in cross-section with increase of said gap, for the installation of the clip to a clipping position, wherein the body comprises:
- a tubular web portion (27,41) and two axially spaced radially projecting flanges (23, 24: 43, 44) therefrom to enable said installation in two internal annular grooves (28):
- a formation (31) towards the two ends of at least one of the flanges to enable gripping and transport by a contracting tool to the receiving position; and
- one or more holes (47) in the web portion to facilitate resilient contraction thereof.

4,892,433
PROCESS FOR PRODUCING A JOINT BETWEEN A METALLIC INNER SLEEVE AND A TUBE OF FIBER-REINFORCED PLASTIC MATERIAL AND THE RESULTING JOINT PRODUCED THEREBY
Wolfgang Schreiber, Sontra, Fed. Rep. of Germany, assignor to Volkwagen AG, Wolfsburg, Fed. Rep. of Germany
Filed Jul. 12, 1988, Ser. No. 217,640
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728978
Int. Cl.[4] B25G *3/10*
U.S. Cl. 403—359 **3 Claims**



2. A joint between an inner member and a tubular region of a fiber-reinforced plastic member comprising an inner cylindrical member made of rigid material and having a knurled outer surface and a fiber-reinforced plastic member having an elastically deformable tubular cylindrical member-retaining region in mating contact with the knurled surface, the retaining region having reinforcing fibers which extend substantially entirely in the circumferential direction about the axis of the tubular retaining region and being press-fitted on the knurled outer surface of the cylindrical member so as to apply force in the radial direction to the tubular retaining region, thereby causing elastic enlargement of the tubular retaining region.

4,892,434
HANDLE BRACKET RETAINER
Drexel R. Miller, McHenry, Ill., assignor to Cotter & Company, Chicago, Ill.
Filed Oct. 31, 1988, Ser. No. 264,835
Int. Cl.[4] B25G *3/02;* **F16D** *1/00*
U.S. Cl. 403—361 **12 Claims**



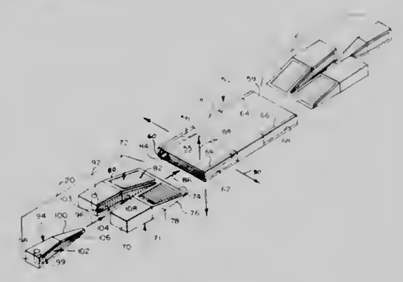
1. A handle bracket retaining for retaining the end of a handle in the socket of a hand tool comprising
- a one-piece body forming a curved open shell having a longitudinal axis extending from a first open end in which the handle end is inserted to a smaller second open end, said shell further having a tapered configuration from said first end to said second end to form an internal surface generally matching the exterior shape of the handle end and an outer surface generally matching the internal shape of the socket of the tool,

said body having tab means respectively being formed angularly inward from said inner surface and angularly outward from said outer surface, said tab means including a plurality of outer tabs bent extending outward from said outer surface near said first open end along respective lines connecting said plurality of tabs to said body and forming free end portions for engaging the socket, said connecting lines of said plurality of outer tabs being disposed in a common plane arranged laterally to said longitudinal axis of said body, said body being capable of being at least partially positioned in said socket prior to insertion of the end of handle with said outer plurality of tabs being arranged exteriorly of said socket,
- a third tab extending outward from said outer surface near said second open end along another connecting line disposed in a second plane generally parallel to said common plane, said third tab forming a free end for engaging the socket, said tab means further including at least one inner tab extending inward from said inner surface from a connecting line and forming a free end portion for engaging the end of the handle, said at least one inner tab extending inward from said inner surface in a direction relative to said longitudinal axis opposite to said direction said plurality of outer tabs extend outward from said outer surface,

said inner surface being arranged to be positioned in confronting relationship to the the end of the handle when the end of handle is inserted into said body positioned in the tool socket with said plurality of outer tabs being arranged exteriorly of the socket, and said plurality of outer tabs being snapped into contact with the internal surface of the socket upon said handle end being fully inserted into said body, and

said plurality of tabs respectively acting frictionally to engage the end of the handle and the internal surface of the socket for preventing relative movement therebetween when the end of the handle is fully inserted into the socket of a tool.

4,892,435
INTERLOCKING STRUCTURAL MEMBERS EMPLOYING TRANSVERSE LOCKING DOUBLE INTERFITTING WEDGE
Robert E. Anderson, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Feb. 6, 1989, Ser. No. 306,196
Int. Cl.[4] F16B *2/14*
U.S. Cl. 403—374 **8 Claims**

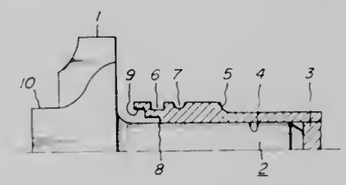


5. An expansion fastener comprising:
a hollow receptacle having
- (a) a first section including a wall, and
- (b) at least one additional section integrally extending coaxially from the first section and having slits formed in the wall thereof; and

a double interlocking wedge received within the slitted section for expanding the slitted wall thereof, the double wedge including a first wedge member having
- (a) tapered surfaces for contacting mating tapered surfaces within the wall of the slitted section,
- (b) at least one tapered surface being ridged for engaging a mating ridged surface within the wall of the slitted section;
- (c) an inwardly tapering recess formed therein; and

a second wedge member adapted to be driven into the recess, the second wedge member having inwardly tapering rippled sidewalls adapted to securely engage mating rippled surfaces formed in the recess;
- the driving insertion of the first wedge member resulting in independent expansion of the receptacle in a first direction, and further wherein the driving insertion of the second wedge member into the first wedge member results in expansion of the first wedge member and coupled translated expansion of the receptacle in a second direction orthogonal to the first direction;
- a receptacle further including still another slitted section similar to the first and integrally extending coaxially from the first section in a direction opposite that of the first additional slitted section for receiving another double wedge;
- and still further wherein two opposite vertically tapered surfaces of the wedge are ridged for engaging mating ridged surfaces in the wall of the slitted section.

4,892,436
SHAFT COMPOSITE STRUCTURE BETWEEN CERAMIC TURBINE ROTOR AND METAL MEMBER
Takeyuki Mizuno, Toyohashi, and Seiichi Asami, Okazaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Mar. 24, 1988, Ser. No. 172,378
Claims priority, application Japan, Mar. 30, 1987, 62-45875[U]
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—404 **10 Claims**

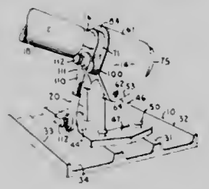


1. A shaft composite structure wherein a ceramic shaft integrally formed on a ceramic turbine rotor is coaxially fixed to a metal sleeve integrally formed on a metal rotary shaft of a compressor impeller, comprising a connection edge formed on said metal sleeve in contact with said ceramic shaft, said edge being located at a position in substantial alignment with a recess arranged on an outer surface of said metal sleeve, such that said edge and said recess are arranged substantially in a radial plane which outwardly extends perpendicularly from the axis of said ceramic shaft and said metal sleeve, and a tip portion of said metal sleeve axially spaced from said connection edge and radially spaced from said ceramic shaft, wherein said tip portion has a thickness within a range of about 0.5 mm to 1.5 mm and a portion of said metal sleeve which includes said connection edge has a thickness of greater than about 1.5 mm.

4,892,437
CONCRETE FINISHING FLOAT WITH REAR FITTING BAR
Simon Kraft, 7501 W. 99th Ter., Overland Park, Kans. 66212
Filed May 23, 1988, Ser. No. 197,279
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—97 **8 Claims**

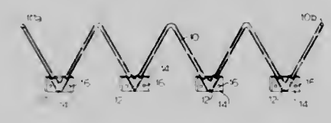
1. A tilting mechanism for an elongated concrete finishing float having a forward edge and a rear edge, comprising:
- (a) support means adapted for mounting on said float; said support means having an upper portion and a lower portion, a hinge connecting said support means upper portion to said support means lower portion for tilting motion

therebetween along an axis running generally parallel to the longitudinal axis of said float;
(b) an elongated shaft, rotatable connecting means for connecting said shaft to said support means upper portion whereby said shaft extends generally transversely and rearwardly of said float; and
(c) a link having a first end and a second end, said link first end being adapted for pivotal connection to said shaft at a position spaced rearwardly from said rotatable connecting means; said link second end being adapted for pivotal connection below and rearwardly of said hinge for movement with said support means lower portion;



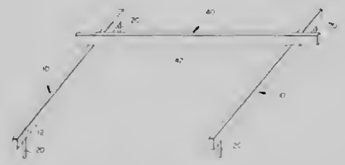
(d) stop means which are associated with said hinge means; said stop means comprising inclined stops abutting each outer side of said support means lower portion; said inclined stops having upper stop surfaces; said support means upper portion having lower stops surfaces for stopping engagement with said upper stop surfaces; and
(e) whereby rotational movement of said shaft produces tilting between said support means upper and lower portions which translates into tilting motion of said float with respect to said shaft.

4,892,438
SCREED CONSTRUCTION AND METHOD
Donald R. Morrison, 9827 Mt. Holly Rd., Rte. 6, Box 634, Charlotte, N.C. 28208
Filed Dec. 30, 1988, Ser. No. 292,269
Int. Cl.[4] B28B *1/08*; E01C *19/40*
U.S. Cl. 404—119 **4 Claims**



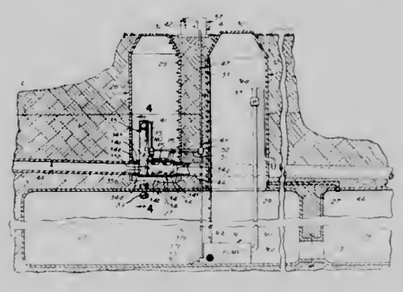
1. A frame side construction for a portable vibrating concrete screed having a pair of screed blades on an open frame of triangular cross section comprising:
(a) a rod-tube assembly, comprising:
(i) a single continuous metal frame rod bent back and forth in a zig-zag configuration so as to define plural lower and upper bent portions connected by straight portions of the rod and terminating with upper rod ends; and
(ii) a plurality of loosely fitted tubular metal sleeves mounted on and correspondingly bent on each lower bent portion of the screed frame, said bent frame rod extending for a selected portion of the length of the screed;
(b) a metal ridge member forming the apex of the portion of the screed frame corresponding to the effective length of said rod-tube assembly, each of said upper bent portions and the upper terminal ends of said rod being welded to said ridge member;
(c) a screed blade corresponding in length to the length of said rod-tube assembly and comprising one of a pair of screed blades for the screed in which said frame side construction is to be employed;
(d) a plurality of metal plate welded to each of said tubular metal sleeves on said lower bent portions and positioned for being secured to said screed blade; and
(e) means joining each of said metal plates to said screed blade to form a frame side for a portable vibrating concrete screed intended to use said frame side.
4. The method of fabricating a side frame member for a portable vibrated concrete screed comprising the steps of:
(a) locating a plurality of spaced apart tubular metal sleeves on a single length of continuous metal rod intended for service as a side member of a screed frame;
(b) bending said continuous metal rod in a back and forth, zig-zag configuration with selected bends in the rod coinciding with the locations of the said tubular metal sleeves such that each sleeve and the portion of the rod within each said sleeve are bent together; and
(c) securing the tubular metal sleeves tubes and terminal ends of the rod to other metallic members forming part of the frame in which the frame member is installed.

4,892,439
SCREED RAIL SYSTEM
Edward D. Kiefer, Fort Collins, Colo., assignor to Gerald M. Kiefer, Fort Collins, Colo., a part interest
Filed Mar. 9, 1989, Ser. No. 321,634
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—119 **11 Claims**



1. A screed rail system for leveling concrete to provide a planar top surface, said system comprising:
(a) a first pair of upright spaced-apart grade pins having upper ends supported in a manner such that said upper ends define a grade above a support surface which is to be covered with concrete;
(b) a second pair of upright spaced-apart grade pins having upper ends supported in a manner such that said upper ends define a grade above said support surface;
(c) first and second elongated screed rails each comprising an elongated tubular member having a rectangular cross-section and including upper and lower edges and first and second end portions; wherein said upper edge defines a straight edge along the length of said screed rail; and wherein said lower edge includes an elongated slotted opening in each of said end portions;
(d) an elongated leveling rod having a lower portion which defines a straight edge;
wherein said first screed rail is supported on said first pair of spaced-apart grade pins, said grade pins extending into said slotted openings in said lower edge of said first screed rail; wherein said second screed rail is supported on said second pair of spaced-apart grade pins, said grade pins extending into said slotted openings in said lower edge of said second screed rail; wherein said leveling rod is supported on said first and second screed rails in a manner such that said lower portion of said leveling rod defines a planar surface as said leveling rod is drawn along the length of said screed rails.

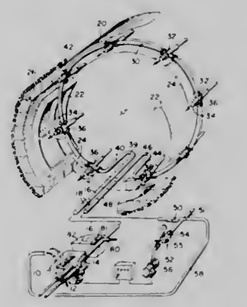
4,892,440
WATER BACKUP PREVENTING SYSTEM AND MONITORING SYSTEM THEREFOR
Patrick Regan, Chicago, Ill., assignor to Eveready Flood Control, Elmwood Park, Ill.
Filed Jul. 5, 1988, Ser. No. 215,545
Int. Cl.[4] E03F *1/00*
U.S. Cl. 405—36 **28 Claims**



1. A water backup preventing system for a given area having a ground buried sewer line for receiving rain and other water, the sewer line being incapable of carrying without backup thereof a given flow rate of water, the sewer line being provided at a given point therealong with at least one overflow opening into which opening water which cannot be handled by the sewer line will rise and overflow, water storage tank means below said sewer line and into which the overflow water from said opening will drain and be temporarily stored, said storage tank means having a volume to store water which cannot otherwise flow in said sewer line, pump means in the bottom portion of the storage tank for pumping water into a downstream portion of said sewer line, and pump control means for the pump means for preventing the operation of said pump means when a water backup condition exists in said sewer line and for automatically rendering said pump means operative when such condition disappears from said sewer line, so that the storage tank means can be substantially emptied and accommodate overflow conditions caused by a subsequent rainstorm.

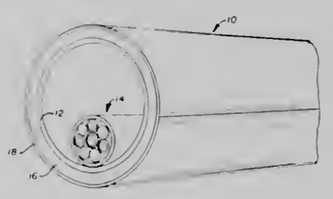
4,892,441
APPARATUS AND A METHOD FOR DISTRIBUTING CONCRETE AND SIMILAR MATERIALS TO SELECTED POINTS OF USE
Rudolf Riker, Memmingen, Fed. Rep. of Germany, assignor to Messrs. Stetter GmbH, Dr. Karl-Lenz-Str., Memmingen, Fed. Rep. of Germany
Filed Mar. 24, 1989, Ser. No. 328,248
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811585
Int. Cl.[4] E21D *11/00*
U.S. Cl. 405—146 **21 Claims**

1. A concrete distributing apparatus for tunnel lining comprising a supply conduit extending in longitudinal direction within the tunnel, one end thereof connected with a concrete pump and the other end connected with at least one intermediate conduit extending at least partly along a perimeter of the terminal and substantially in a radial plane of the tunnel, a plurality of branch pipes branching off said intermediate conduit at a plurality of branch points and leading into mould portions respectively, the plurality of branch points arranged in series in series one behind another in spaced relationship along the intermediate conduit, a plurality of valves, each one provided in one of the plurality of branch pipes, close to the intermediate conduit, each one of the plurality of branch pipes consisting of a short tube, each one of the plurality of valves comprising a plug having a length at least as that of the short tube, and a diameter as an inner diameter of the tube, the plug arranged for displacement from a closed position within the tube into an open position. in which it is received in a rearward



extension of the short tube to connect the tube with at least an incoming part of the intermediate conduit whereas in the closed position of the plug the tube being completely filled by the plug and blocked against the intermediate conduit.

4,892,442
PRELUBRICATED INNERDUCT
John Shoffner, Middlesboro, Ky., assignor to Dura-Line, Middlesboro, Ky.
Filed Mar. 3, 1987, Ser. No. 21,237
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—154 **10 Claims**

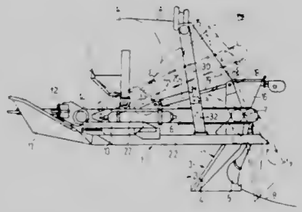


1. A relatively flexible coextruded plastic tube for slidably receiving and providing a protective housing for a cable, said tube consisting essentially of a pair of telescopically related inner and outer cylindrical portions, said inner portion being formed from a highly lubricous polymeric material to provide a permanently lubricated inner surface for the tube which has a low coefficient of friction to enable substantially low friction placement of the cable therewithin and said outer portion being formed from a high tensile strength polymeric material for maintaining the structural integrity so that a protective housing is defined for the cable by the tube.

4,892,443
CABLE PLOW
Dieter Kunze, Neuried, and Peter Lancier, Wolbeck, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 1, 1988, Ser. No. 214,535
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 8709260[U]
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—164 **6 Claims**

1. In a cable plow composed of a chassis which moves over a surface which is to be plowed and provided with a cable, a swivel arm pivotably connected to the chassis at one end by a

first pivot connection, a plow element being pivotably connected by a second pivot connector to the other end of the swivel arm for pivoting around a second pivot point in a plane that lies parallel to the plowing direction and at right angles to a horizontal plane, said plow element being composed of a combination of plowshares and including a laying housing, and said plow element together with the swivel arm being adjust-



able out of a rated plowing position into a raised position, the improvements comprising said chassis having a sled frame having two sliding, parallel extending skids and a bow connecting said skids together, and said plow includes means for applying an opposing torque to force the plow element back to the rated position when pivoted around the second pivot point by striking an obstruction during plowing.

4,892,444

RESILIENT UNIT

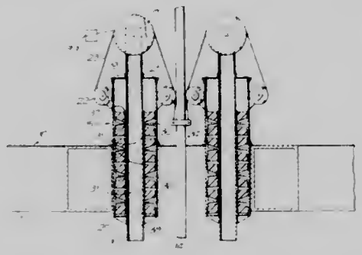
Alan F. Moore, Burbage, England, assignor to Dunlop Limited a British Company, United Kingdom

Filed Feb. 17, 1988, Ser. No. 156,577

Claims priority, application United Kingdom, Feb. 24, 1987, 8704216; Mar. 7, 1987, 8705378

Int. Cl.[4] E02D *21/00*

U.S. Cl. 405—195 **18 Claims**



1. A resilient unit comprising an inner rigid member, an outer rigid member, and an elastomeric bearing assembly interposed between said rigid members whereby said rigid members are able to move axially relative to one another in a restrained manner, said elastomeric bearing assembly comprising an axially extending arrangement of a series of annular elastomeric elements which each alternate with and are bonded to respective support means of a series of rigid support means with a plurality of elastomeric bearing units arranged to be loaded in series and to deform in shear thereby to provide said restrained relative axial movement of the rigid members in response to applied axial load said series of rigid support means comprising a series of outer rings alternating with inner rings, the outer being bonded to radially outward portions of the elastomeric elements and the inner rings being bonded to inner portions of said elements.

4,892,445

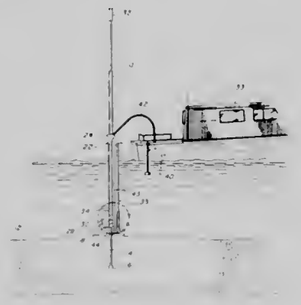
MAN PORTABLE SHALLOW WATER STRUCTURE

Marshall A. Paige, Pass Christian, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1987, Ser. No. 54,354

Int. Cl.[4] E02D *5/74*

U.S. Cl. 405—224 **7 Claims**



1. A man portable surface piercing tide measurement system support structure that is highly stable and can easily be installed in shallow coastal waters from a small boat without diver intervention, the combination comprising:

a foundation to be installed in the ocean bottom;

a separable mast coupled to said foundation;

each of said mast and said foundation being man-portable;

said mast being hollow and hacing a latch and release mechanism internal thereto located at the junction of said mast and said foundation;

a keyed messenger being configured to slide inside said hollow mast and to exert an inward and horizontal force upon said latch and release mechanism,

said latch and release mechanism being responsive to the inward horizontal force of said keyed messenger to be activated when said keyed messcnger is lowered down said hollow mast from the surface of the ocean to engage said latch and release mechanism.

4,892,446

GROUP CONTROL MEANS FOR HYDRAULIC MINE-ROOF SUPPORTS

Andreas Rachel, Wuppertal, Fed. Rep. of Germany, assignor to Herman Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 299,003

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801593

Int. Cl.[4] E21D *15/44*

U.S. Cl. 405—302 **4 Claims**

1. A group control means for a hydraulic self-advancing support in a high-output longwall comprising face support units which are electro-hydraulically controlled in groups in accordance with the position of the mining machine and which operate automatically in the sequence of prop drawing, advancing and setting, characterised in that a sequence zone, the extent of which is adapted to be influenced by the cutting speed of the mining machine, is formed behind the mining

machine, and individual support units therein carry out the sequence simultaneously and continuously and in dependence



on one another, the roof being supported by at least each second support unit.

4,892,447

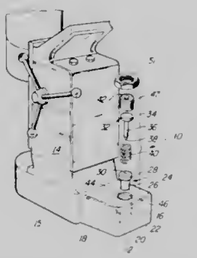
TORQUE RESTRAINING DEVICE FOR DRILL WITH SELF-ATTACHING BASE

John Schmidt, Palm Harbor, Fla., assignor to Everett D. Hougen, Flint, Mich.

Filed Feb. 8, 1988, Ser. No. 153,686

Int. Cl.[4] B23B *47/00*

U.S. Cl. 408—76 **30 Claims**



25. A magnetic base drill having a torque restraining device, said magnetic base drill including an electromagnetic base having a generally flat bottom surface, a drill mounted on said magnetic base, energizing means for energizing said electromagnetic base electromagnetically adhering said bottom surface to a ferromagnetic work surface, and a torque restraining device operatively mounted on said base spaced from said drill to resist torque generated by said drill, said torque restraining device comprising:

a penetrating member operable fixed to said base having a free end extending below said bottom surface, said penetrating member free end having a relatively sharp piercing surface for penetrating said work surface when said electormagnetic base is energized;

a protective sleeve telescopically mounted on said penetrating member having a free end telescopically extensible below said penetrating member free end; and

means moving said protective sleeve toward said work surface to raise an adjacent portion of said magnetic base and said penetrating member free end from said work surface enclosing and protection said penetrating member free end and for permitting retraction of said protective sleeve upon contact with said work surface and the energizing of said electromagnetic bas to expose said penetrating member free end for penetration into said work surface said energizing means energizing said electromagnetic base drawing said base bottom surface into magnetic contact with said work surface, retracting said sleeve free end against said work surface and telescopically retracting said sleeve and driving said penetrating member free end into said work surface.

4,892,448

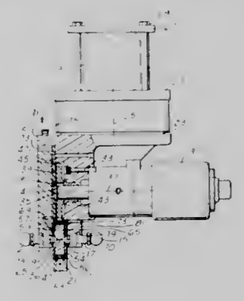
CUTTER AND DRIVE GEAR ASSEMBLY FOR DRESSING WELDING ELECTRODE TIPS

Norman J. Hoch, 1748 Wiltshire, Berkley, Mich. 48072, and Arno Rabin, 629 Snowmass, Rochester Hills, Mich. 48309

Filed Aug. 23, 1988, Ser. No. 235,217

Int. Cl.[4] B23C *3/12;* **B23K** *11/30*

U.S. Cl. 409—181 **12 Claims**



1. A cutter and gear assembly for simultaneously dressing a pair of spaced aligned welding electrode tips comprising:

a housing;

a power-rotated hollow gear journaled upon said housing for rotation upon a first axis;

said gear having an axial bore arranged upon said axis, said bore at one end terminating in an annular seating flange, and at its other end extending outwardly of said gear, and adjacent its other end having an annular groove;

there being a plurality of angularly spaced peripheral drive grooves and ridges within said gear extending from said flange along said bore;

a unit dressing tool cutter assembly axially nested within said gear bearing against said seating flange and having a plurality of axially elongated arcuate drive tangs nested within said drive grooves and ridges;

a snap ring anchored within said annular groove and retainingly engaging said cutter assembly for rotation with said gear upon said axis;

said cutter assembly including a pair of symmetrical outwardly opening cutting elements on its opposite sides, each cutting element including a plurality of angularly related inclined cutting edges having a profile corresponding to the contour of a pair of aligned electrode tips axially projected into and against said cutting elements upon said first axis.

4,892,449

RELEASABLE FASTENER WITH GAUGE, AND METHOD

Malcolm A. Croxton, Lomita, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 1, 1988, Ser. No. 162,726

Int. Cl.[4] F16B *13/06;* **G01B** *5/00*

U.S. Cl. 411—54 **10 Claims**

1. A releasable fastener with thickness gauge for use in positioning the aligned holes of overlaid workpieces for temporarily fastening them together while simultaneously gauging and reading out the combined thickness of such workpieces at

the aligned holes from the front side to the back side thereof, comprising:

an elongate body having first and second ends and a bore opening therein from said first end to said second end,

means surrounding the bore opening at the first end for forming a work contact surface for reproducibly contacting the workpieces on the front side,

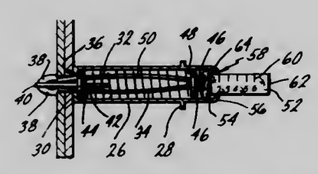
a pair of laterally expandable elongate pins disposed in and captured in the bore for sliding movement between extended and retracted positions,

each pin having a working engaging radially outwardly facing shoulder,

spring means for biasing said pins toward each other,

spreader means interposed in a fixed position between the pins and having a limited length so that when the pins are extended beyond the spreader means, they are biased by the spring means into a smaller lateral extent than when retracted over the spreader means,

plunger and gauge means mounted in said bore for movement in the bore in contact with the end of said pins remote from the work engaging shoulder for moving said pins from a normally retracted position into a projected position extending outwardly through said first end and work contact surface,



said plunger and gauge means extending in coaxial alignment outwardly from the second end of the body an amount proportional to the position of the pins,

said plunger and gauge means including means forming a scale thereon,

means located in the second end of the body for reading said scale,

said scale being referenced to said reading means to show depth of pin position relative to the work contact surface at the first end of the body and thus the thickness of interposed workpieces,

means on the body adapted to be gripped to allow movement of the plunger and gauge means and pins between a retracted position and an extended position for being inserted through the aligned holes in the workpieces, which, when then retracted, causes the pins to move over the spreader with their shoulders engaging the back side of the workpieces, with the work contact surface of the fastener body contacting the front side of the workpieces, and

compression spring means disposed in said bore and about said pins and abutting interiorly at the first end of the body and at the internal end of the pins for urging the pins into retracted position.

4,892,450

FASTENING ELEMENT CONSISTING OF A TIE BOLT AND A CLAMPING WEDGE

Anton Gerhard, Nuernberg, Fed. Rep. of Germany, assignor to "Toge-Dubel" A. Gerhard Gmbh, Nuernberg, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,928

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709361

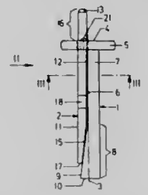
Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—78 **11 Claims**

1. A fastening element comprising a tie bolt (1) having a front end (10) and a rear end (4), and a clamping wedge (2) having a front end (17) and a rear end (13),

said tie bolt (1) having an annular flange provided in said rear end (4), said annular flange (5) having an open passage (19) for receiving therein said clamping wedge (2), said tie bolt (1) having a frontal area (8) provided with a wedge face (9) which is inclined from said front end (10) to said rear end (4) in the direction of a central longitudinal axis (3) of said tie bolt (1), said tie bolt (1) having an adjoining face (6) extending generally parallel to the central longitudinal axis (3) and reaching as far as said rear end (4),

said clamping wedge (2) having a contact face (12) and an outer face (11), said clamping wedge (2) —in its non-extended state —complementing said tie bolt (1) to form an approximately cylindrical shape with said contact face (12) on said adjoining face (6) and with said clamping wedge (2) having an expansion face (15) on said wedge



face (9), and where said front end (17) of said clamping wedge (2) does not extend to the front end (10) of said tie bolt(1) and the rear end (13) of the clamping (2) extends beyond said annular flange (5),

said outer face (11) having a radius smaller than the radius of said open passage (19) so as to provide a gap between said open passage (19) and said outer face (11), and frictional retaining means for holding said clamping wedge (2) in its non-extended state in said open passage (19) of said flange (5), said frictional retaining means comprising protrusions (21) extending from said outer face (11) and abutting against said open passage (19) of said flange (5) when said clamping wedge (2) is in its non-extended state, the smaller radius of said outer face (11) relative to the radius of said open passage (19) providing free play after said clamping wedge (2) is pushed in the direction of said front end (10) of said tie bolt (1) to the extent that said protrusions (21) no longer abut said open passage (19).

4,892,451

APPARATUS FOR THE QUASI-CONTINUOUS TREATMENT OF SUBSTRATES

Peter Mahler, Hainburg, Fed. Rep. of Germany, assignor to Leybold-Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,087

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702775

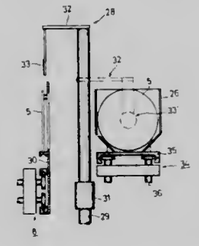
Int. Cl.[4] B65G *49/06*; F27D *3/12*

U.S. Cl. 414—217 **14 Claims**

1. Apparatus for quasi-continuous treatment, especially for the coating, of tabular substrates supplied in vertical planes in cassettes, having a system of treatment chambers and transport means for the transport of at least one substrate holder through the chambers in a transport direction and with a loading station for loading the substrate holder with one substrate at a time from the cassette and unloading one substrate at a time from the substrate holder into the cassette, characterized in that

(a) the substrate holder is equipped with projections for holding one tabular substrate at a time, by gravity alone, in a receiving plane which is at an acute attitude angle to the vertical, said receiving plane being simultaneously parallel to the treatment chambers, and

(b) the loading station has a shifting means for shifting at least one cassette and a manipulator means disposed to extract a substrate out of the cassette and insert it into the cassette by movement parallel to the receiving plane, and



by which the substrate can be brought by a ninety degree rotation to a slanting position corresponding substantially to the receiving plane of the substrate holder, in which slanting position the substrate can be lowered onto and lifted away from the projections by said manipulator means.

4,892,452

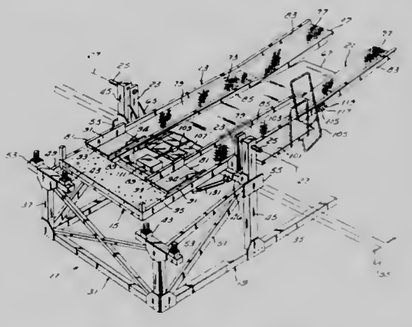
PARKING APPARATUS

John J. Moynihan, Newport Beach, Calif., assignor to GMX Parking Systems, Santa Ana, Calif.

Filed Nov. 24, 1987, Ser. No. 124,828

Int. Cl.[4] E04H *6/06*

U.S. Cl. 414—229 **28 Claims**



1. A vehicle parking apparatus, comprising:

a platform having a base and a pair of arms, said base being sized and shaped to permit a vehicle to be driven onto said base and be supported thereby, said base having a first end and a second end and said arms secured to and extending upward from said base between said ends;

a mounting device suspending said platform by said arms in a manner which permits said platform to selectively rotate about an axis in response to the force of gravity on the platform and any additional items supported thereby; and

a weight shifter supported by said platform for selectively shifting the center of gravity of the weight borne by said platform from one side of a line intersecting said axis in the direction of the force of gravity to the opposite side of said line without changing the position of said vehicle relative to said platform to permit the direction in which said platform has a tendency to rotate to be controlled.

4,892,453

APPARATUS FOR MANIPULATING EMPTY AND FILLED TRAYS FOR CIGARETTES AND LIKE ROD-SHAPED ARTICLES BETWEEN MAKING AND PROCESSING MACHINES

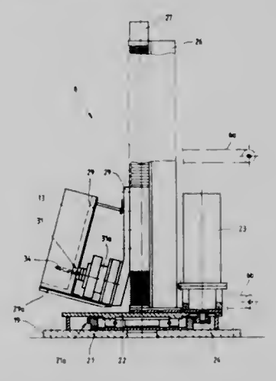
Jürgen Bantien, Hamwarde; Dietrich Bardenhagen, Hamburg, and Erich Staudte, Büchen, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 71,189

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624133

Int. Cl.[4] A24C *5/352*

U.S. Cl. 414—403 **25 Claims**



1. Apparatus for manipulating receptacles for rod-shaped articles of the tobacco processing industry, particularly for manipulating chargers for cigarettes, comprising at least one first unit for filling the receptacles; at least one second unit for evacuating articles from filled receptacles, each of said units respectively having first and second facilities for temporary storage of empty and filled receptacles; at least one magazine for temporary storage of at least one receptacle; and means for transferring receptacles between said units as well as between said magazine and at least one of said units, including a support, a carriage mounted on said support for movement between a plurality of different levels and for angular movement between a plurality of different positions with reference to a substantially vertical axis, means for moving said carriage, a holder for receptacles on said carriage, and means located on said carriage for advancing receptacles between said holder on the one hand and said facilities and said magazine on the other hand.

4,892,454

REFUSE COLLECTING VEHICLE

Hans-Jurgen Behling, Hanover, and Friedrichwilhelm Schmadeke, Neustadt, both of Fed. Rep. of Germany, assignors to Schorling GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,939

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811716

Int. Cl.[4] B65F *3/20*

U.S. Cl. 414—406 **7 Claims**

1. A refuse-collecting vehicle comprising: an undercarriage;

a driver's cabin mounted on a forward portion of the undercarriage;

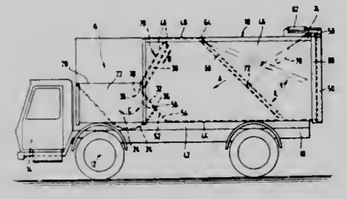
a refuse-collecting bin mounted on the undercarriage rearwardly of the driver's cabin, said refuse-collecting bin having sidewalls and a top portion;

a refuse-charging system for conveying refuse into said refuse collection bin;

a means associated with said vehicle for picking up refuse

receptacles and for emptying said refuse into said refuse-charging system;

a refuse-compacting means forming part of said refuse-charging system mounted forwardly of said refuse-collecting bin for moving refuse rearwardly into said refuse-collecting bin;



at least one counterpressure plate pivotally mounted on said top portion of said refuse-collecting bin a predetermined distance rearwardly of said refuse-compacting means; and

a means for pivoting said at least one counterpressure plate forwardly so that the pressure applied to said refuse by the rearward movement of said compacting means is increased by the forward positioning of said counterpressure plate to provide a uniform compaction of said refuse.

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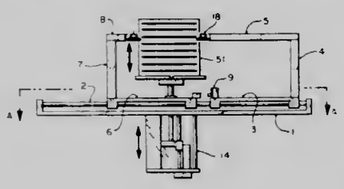
WAFER ALIGNMENT AND TRANSPORT MECHANISM

Derek L. Hine, 5 Hawk View, Portola Valley, Calif. 94025

Continuation of Ser. No. 52,496, May 21, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,207

Int. Cl.[4] B65G *1/06*

U.S. Cl. 414—417 **9 Claims**



3. Apparatus which is suitable for transporting an individual silicon wafer which is in the form of a generally circular disk having a plane, a periphery, and a center, and which apparatus comprises

(1) a mounting frame;

(2) at least two wafer carriers which

(a) are movably mounted on the frame

(b) comprise a plurality of wafer supports, and

(c) can be moved relative to each other between (i) a closed position in which a wafer to be transported can be supported solely by contact between the periphery of the wafer and the wafer supports and (ii) an open position in which a wafer to be aligned can be passed freely between the wafer carriers;

(3) closing means which continuously and resiliently urges the wafer carriers toward the closed position, and

(4) motion-controlling means which (i) when the wafer carriers are in the open position, can overcome the force exerted by the closing means, and (ii) can be operated to permit the wafer carriers to move in a controlled manner into the closed position.

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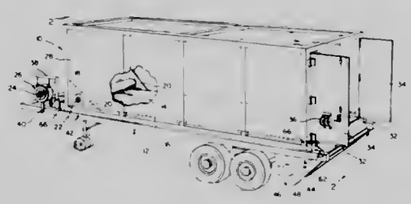
UNLOADING SYSTEM FOR FREIGHT CONTAINERS

Graham L. Hodgetts, Mars, Pa., assignor to Rolflor Industries, Inc., Warrendale, Pa.

Filed Feb. 4, 1988, Ser. No. 152,105

Int. Cl.[4] B65G *67/02*

U.S. Cl. 414—527 **3 Claims**



1. A combination of a freight container and a trailer for transporting the container over land, the combination including means for releasably securing the container on the trailer and an unloading system for removing a load from the container when secured on the trailer, through one end, namely a back end, of the container, said unloading system including a wind-up roll within the container at a forward end thereof, a load transporting belt having a forward end secured to said roll, the belt having a length at least two times the length of the container for extending along a floor of the container to the back end of the container, a drive drum on the trailer, means for releasably attaching a back end of the belt to the drive drum, means for rotating the drum to wind up the belt on the drum and thereby unload the container, and drive means on the trailer for attachable/detachable engagement with the wind-up roll for rewinding the belt thereon when the container has been unloaded, wherein the means for releasably attaching comprises strap means extending from the back end of the belt and engagable/disengagable coupling elements of the strap means and drive drum, wherein the container includes rear door means with sealing means for the strap means to extend through when the container is loaded and reel means on the exterior of the door means for storing the strap means when detached from the drive drum.

4,892,457

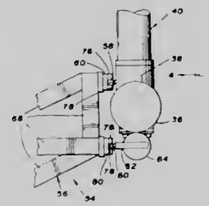
APPARATUS FOR MASTERING A ROBOT

Donald S. Bartlett, Troy; David I. Freed, Lake Orion, and William H. Poynter, Jr., Spitzley, all of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Filed Jul. 11, 1988, Ser. No. 217,304

Int. Cl.[4] B25J *9/06*

U.S. Cl. 414—735 **16 Claims**



1. Apparatus for mastering a robot including a base and an arm assembly supported for movement on the base, the robot, including the arm assembly, being movable to occupy a predetermined reference position and orientation, the apparatus comprising:

a fixture including at least one set of first, second and third mutually converging locating surfaces wherein the first surface is orthogonal to the second and third surfaces and the second surface is orthogonal to the third surface;

mounting means for mounting the fixture on the base in a fixed spatial position; and

at least one member adapted to be mounted for movement with the arm assembly, the at least one member having a generally spherical surface configured to simultaneously contact each of the surfaces of at least one set of locating surfaces only when the robot is in the predetermined reference position and orientation.

4,892,458

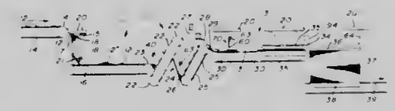
BOARD STACKING MACHINE

Denis Proulx, Beloeil, Canada, assignor to Les Emballages P. Proulx Ltée/P. Proulx Packaging Ltd., Quebec, Canada

Filed Sep. 19, 1988, Ser. No. 245,814

Int. Cl.[4] B65G *57/18*

U.S. Cl. 414—791.6 **20 Claims**



1. A board stacking machine comprising feed conveying means for feeding a plurality of boards precut to a predetermined size, feed control means for feeding a constant supply of said boards to a board orienting station; said feed control means having an accumulator displaceably secured at a discharge end of said feed conveying means for storing and releasing accumulated boards maintained in substantially horizontal alignment by stacking them onto an input end of a control feed conveyor, said feed control means having first sensing means to detect if said accumulator is accumulating boards, and second sensing means for detecting a predetermined condition of said boards at said input end of said control feed conveyor, a discharge conveyor for feeding boards from an end section of said control feed conveyor to a feed supply position of a single board feed conveyor; said board orienting station having a delivery conveyor for supporting and transporting said boards, means to orient said boards in horizontal alignment and means to position said boards in side-by-side abutting relationship on said delivery conveyor; discharging means for feeding boards to a board holding means, board arresting means actuable to prevent the discharge of boards to said board holding means; said board holding means having a pair of opposed end support members each having a board support flange, an end wall, a stop wall; a displaceable frame for moving each end support member in a horizontal and vertical direction, and a pusher member for applying downward pressure on a top surface portion of a board layer supported between said end support members, stacking means for stacking said boards in a squared bundle, said stacking means including said board holding means for supporting a predetermined number of said boards oriented side by side in a board layer thereon and for positioning said predetermined number of boards on a vertically displaceable support with said boards maintained in alignment, and control means for positioning a predetermined number of board layers one on top of the other to form said squared bundle and displacing said support each time a layer is placed on said stack.

4,892,459

AXIAL THRUST EQUALIZER FOR A LIQUID PUMP

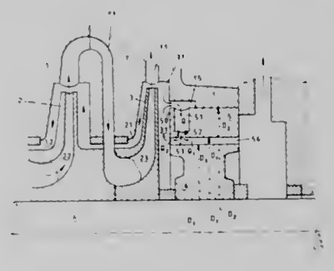
Johann Guelich, Burgstrasse 62b CH8408, Winterthur, Switzerland

Continuation of Ser. No. 922,069, Oct. 20, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,612

Claims priority, application Switzerland, Nov. 27, 1985, 5066/85-7

Int. Cl.[4] F01D *3/04*

U.S. Cl. 415—104 **18 Claims**



1. An axial thrust equalizer for a liquid pump comprising a dummy piston for securement to a pump rotor shaft; and a stationary sleeve spaced from said dummy piston to define an annular gap of uniform radial width therebetween, said sleeve having a plurality of ducts extending inwardly from an outer periphery to said gap to guide a flow of working liquid from a pump chamber contiguous with said sleeve and said piston into said gap, said ducts communicating with said gap to permit a delivered flow of working liquid to divide into two sub-flows with one sub-flow returning into the pump chamber to prevent rotating liquid in the pump chamber from entering into said gap wherein the ratio of the outer diameter of said sleeve to the inner diameter of said sleeve is at least 1.24:1 and the sum of the cross-sectional areas of said ducts is at least three times the cross-sectional area of said gap.

4,892,460

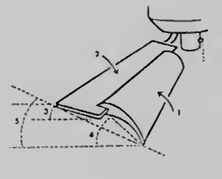
PROPELLER BREEZE ENHANCING BLADES FOR CONVENTIONAL CEILING FANS

Steve J. Volk, 7900 Tatum Waterway Dr., Miami Beach, Fla. 33141-1936

Filed Jan. 30, 1989, Ser. No. 303,938

Int. Cl.[4] F04D *29/38*

U.S. Cl. 416—62 **10 Claims**



1. Propeller breeze enhancing blade attachments for conventional ceiling fans wherein said auxiliary blades wedge firmly onto the trailing edges of primary fan blades to increase the angle of incidence and thus create a greatly increased dual air flow outward and downward in relation to the fan's central core; said blade attachments comprised of top and bottom surfaces, leading and trailing side edges, and inner and outer ends; configuration of said top and bottom surfaces being convex and concave respectively, with said leading edge being

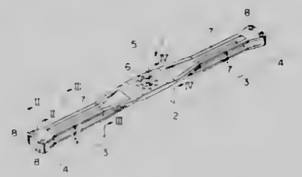
of greater depth than said trailing edge, and said outer end being of greater width and lesser depth than said inner end, with said leading edge housing the means of securing said auxiliary blades to the primary fan blades via a flexible tapered groove along said auxiliary blades' leading edge extending from their inner end to their outer end.

4,892,461

FLEXBEAM FOR ROTOR BLADES OF HELICOPTER AND METHOD FOR FABRICATION THEREOF

Tadahiro Matsumoto, and Kiyoshi Nishikawa, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 294,259
Claims priority, application Japan, Jan. 8, 1988, 63-1831
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—134 A **10 Claims**



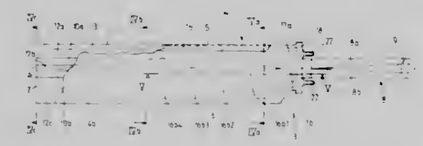
1. A flexbeam for rotor blades of a helicopter comprising:
a mast mounting and flapping part;
a feathering and lead-lag motion part integrally joined to said mast mounting and flapping part, said feathering and lead-lag motion part comprising a plate like central member made of a composite fiber material, and a pair of frame members disposed along longitudinal sides of and parallel to said central member, said frame members being made of loops of unidirectional composite fiber material and each having a Y-shaped cross section, said central member and said frame members being joined integrally along both longitudinal side portions of the central member; and
a rotor blade mounting part joined to that end of said feathering and lead-lag motion part, opposite to said mast mounting and flapping part, and adapted to be coupled to a rotor blade.

4,892,462

BLADE OF COMPOSITE MATERIALS AND ITS MANUFACTURING PROCESS

Bruno J. M. Barbier, Val d'Oise, and Jean A. Michaud-Soret, Paris, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jun. 7, 1989, Ser. No. 203,373
Claims priority, application France, Jun. 9, 1987, 87 07981
Int. Cl.[4] B64C *11/00, 27/00*
U.S. Cl. 416—226 **26 Claims**



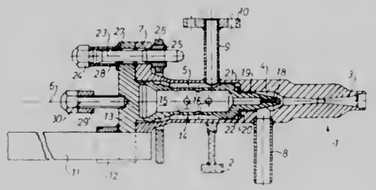
1. Blade essentially of composite materials, particularly for a multi-blade propeller of variable pitch and with individually removable blades, used in particular as the tail rotor, preferably streamlined, of a rotorcraft such as a helicopter, comprising:
a shell (**4**) with an aerodynamic profile, having a suction face covering (**4***b*) and a pressure face covering (**4***a*) that extend from the leading edge (**5**) to the trailing edge (**6**) of the blade and along which trailing edge they are connected to one another, the shell (**4**) comprising at least one layer of fabric of fibres with high mechanical strength agglomerated by a polymerised synthetic impregnation resin, and having an internal end formed into a blade footing (**3**),
a spar (**8**, **10***a*, **10***b*) with a longitudinal axis substantially parallel to that of the blade, and comprising at least one elongated bundle (**10***a*, **10***b*) of rovings of fibres with high mechanical strength agglomerated by a polymerised synthetic resin, the largest portion of which is housed in the shell (**4**) and fixed by adherence of its suction face surface directly against the internal face of the opposite portion of the suction face covering (**4***b*) of the shell, and an inner end portion of which, emerging from the shell (**4**) and passing through the blade footing (**3**), forms a root portion (**8**) flexible in torsion and flexion, arranged in a loop that surrounds, by its internal end, a single attaching socket (**9**), by which the blade is designed to be individually attached to a hub,
a filling (**12***a*, **12***b*, **12***c*) placed in the shell (**4**), between the latter and the spar (**8**, **10***a*, **10***b*), and
a member (**24**) for controlling the pitch of the blade, which is integral with the blade footing (**3**) and designed to be mounted in rotation upon the hub about the longitudinal axis of the blade and to apply to the shell (**4**) a twisting moment substantially centered on the longitudinal axis of the spar, characterised in that the spar is centered on the longitudinal axis (AA) of the blade and each bundle (**10***a*, **10***b*) of the spar is of a single piece, with a substantially rectangular cross-section, and also fixed, in its portion housed in the shell (**4**), by adherence of its pressure face surface directly to the inner face of the opposite portion of the pressure face covering (**4***a*) of the shell (**4**), and in that the filling includes at least two filling bodies (**12***a*, **12***c*), one of which (**12***a*) is arranged between the spar (**10***a*, **10***b*) and the leading edge (**5**) and the other (**12***c*) between the spar (**10***a*, **10***b*) and the trailing edge (**6**).

4,892,463

RAIL MOUNTED EJECTOR

Hans Meyer, Waldbronn, and Manfred Steegmanns, Frankfurt, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,220
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730438
Int. Cl.[4] F04F *5/00*
U.S. Cl. 417—151 **5 Claims**



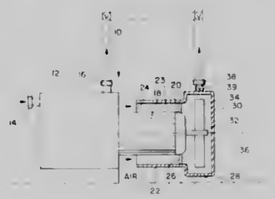
1. An ejector comprising:
a pump casing having on one axial end thereof a diffuser bore and at another axial end, opposite said one axial end, an opening, said pump casing also having radial working fluid and suction connections arranged offset with respect to each other in the axial direction of said casing and a flange arranged at said another axial end of said casing;
a working fluid nozzle cooperating with said pump casing for insertion into said opening, said working fluid nozzle including at least one radial through bore in fluid communication with the working fluid connection, a cover plate and an extractor which extends towards said another axial end of said casing from said cover plate, said working fluid nozzle being inserted into said opening in said axial direction and firmly joined to said casing so as to project out of the opening, whereby said cover plate interacts with said flange of said casing such that said flange and cover plate may be screwed together by clamping bolts and whereby said extractor may be grasped by a manipulator for extracting the working fluid nozzle from the casing;
longitudinal guide means, parallel to said axial direction, for guiding said working fluid nozzle in said axial direction into said opening of said casing, said guide means including a rail arranged at said another axial end of said casing, remote from said diffuser bore, and a slide, whereby the cover plate of working fluid nozzle is held and guided along said rail to said opening by means of said slide; and further wherein the manipulator may introduce clearing means into the casing, instead of the working fluid nozzle for clearing means including a slide member adapted for engagement with the longitudinal guide means and displaceable along the same.

4,892,464

PUMP MEANS FOR SWIMMING POOLS AND SIMILAR FACILITIES

Martin T. Schydlo, Am Obersthof 25, D-4030 Ratingen 6, Fed. Rep. of Germany

Continuation of Ser. No. 907,672, Sep. 15, 1986, abandoned. This application May 6, 1988, Ser. No. 190,775
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3537039
Int. Cl.[4] F04B *23/04*
U.S. Cl. 417—201 **18 Claims**



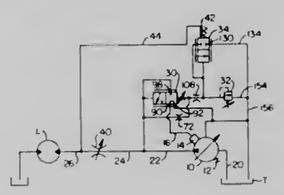
1. A pump apparatus for supplying water and air via suitable respective feeding means to a swimming pool or similar facility, comprising a water pump, an electric motor having a casing for driving the water pump, and collecting means connected to the electric motor for pulling air over the casing of the electric motor for according contact of this air with the inner workings of the motor and the oil and grease associated therewith and for heating the air and for cooling the motor and for collecting the heated air in a chamber, the output of said collecting means being adapted to be connected to conduit means for delivering air to said water feeding means or said swimming pool,
the collecting means including a channel section means for surrounding, at least partially, the electric motor and the electric motor casing, and for forming an annular gap therebetween through which air is pulled to heat the air and to cool the motor.

4,892,465

AUTOMATIC CONTROL FOR VARIABLE DISPLACEMENT PUMP

Ellis H. Born, Upper Arlington; David L. Thurston, Ashley, and Lee A. DeBoer, Worthington, all of Ohio, assignors to Hagglunds Denison Corporation, Columbus, Ohio

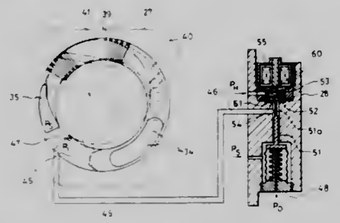
Filed Sep. 14, 1988, Ser. No. 244,038
Int. Cl.[4] F04B *49/08*
U.S. Cl. 417—218 **5 Claims**



1. An automatic control for a variable displacement pump having a displacement setting device movable between a maximum displacement position and a minimum displacement position, said device having a stroking piston, a first spring which acts to bias the displacement setting device to the maximum displacement position, a first fluid conduit connected to said stroking piston and adapted to receive or discharge control pressure fluid from said control to move said stroking piston and thereby vary the displacement of said pump, said automatic control comprising;
a pilot operated stroke control having a sleeve, a first port in said sleeve connected to said first fluid conduit, a spool movable in said sleeve, a control land formed on said spool which cooperates with said first port of said sleeve, a source of working pressure fluid, second fluid conduit means for connecting said working pressure fluid to one side of said control land, a case adapted to receive low pressure fluid, third fluid conduit means for connecting said pressure fluid to the other side of said land, said spool movable between a first control position in which said control land blocks said case pressure fluid from said first port and connects said control pressure fluid source to said said first port to overcome the force of said first spring and bias said stroking piston to a position of reduced pump displacement and a second control position in which said control land blocks said control pressure fluid source from said first port and connects said case pressure fluid to said first port to drain fluid from said first fluid conduit to allow said first spring to bias said stroking piston to a position of increased pump displacement with a third control position in which said control land blocks both said control pressure fluid source and said case pressure fluid from said port to substantially maintain the set pump displacement, second spring means for biasing said control spool to said second ,control, position, a first control orifice formed in said spool piston, a source of pilot fluid and fourth fluid conduit means for connecting said pilot fluid to the upstream side of said first control orifice wherein said stroke control spool will shift to said first control position when the flow of pilot fluid causes a pressure drop which overcomes the force of said second spring means;
a pilot relief valve which provides the maximum pressure setting for said pump; and
wherein said second spring means comprises a light spring having a relative low spring rate to offset the stroke control spool to said second control position and a second spring acting in series with said first spring having a relatively high spring rate, wherein said stroke control spool first overcomes said first spring force and said second spring functions to provide a high rate of change of force on the stroke control spool when the spool is moving

between said second control position and said first control position.

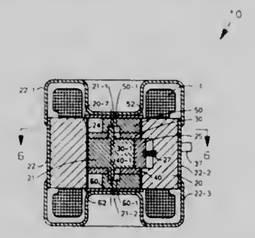
4,892,466
VARIABLE CAPACITY COMPRESSOR
Tatsuhisa Taguchi, Katano, and Yoshikazu Abe, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed May 20, 1988, Ser. No. 196,592
Claims priority, application Japan, May 20, 1987, 62-122913
Int. Cl.[4] F04B *49/02*
U.S. Cl. 417—295 **1 Claim**



1. A variable capacity compressor comprising:
an enclosure having cylindrical internal space, a cylindrical-shaped rotor which is rotatably held in said enclosure and driven by an external force and has vanes, plural return ports formed on a wall of volume-decrease-step space in said internal space wherein volume of sectioned space by movements of said rotor and said vanes is changed cyclically, an exit formed on said wall of volume-increase-step space in said internal space wherein volume of sectioned space by movements of said rotor and said vanes is changed cyclically, and a C-shaped guide passage formed in said wall for connecting said plural return ports and said exit;
an arc-shaped slider which is provided slidably in said guide passage for opening and closing said plural return ports with a pressure control compartment remained in said guide passage;
a bias spring for urging said slider in a direction to close said return ports; and
control pressure supply means which supplies control pressure to said pressure control compartment and comprises a pressure detecting part which compares suction pressure with atmospheric pressure, thereby to generate a displacement thereof, a valve urged to close by a spring, a rod driven by said pressure detecting part for opening said valve, and an electromagnetic coil for applying electromagnetic force to said valve, thereby to urge said valve in a direction to open.

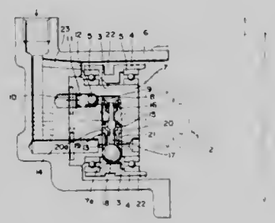
4,892,467
BALANCED ROLLING ROTOR MOTOR COMPRESSOR
James F. Crofoot, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 12, 1988, Ser. No. 282,528
Int. Cl.[4] F04C *23/02*
U.S. Cl. 417—353 **7 Claims**

1. A rolling rotor motor means comprising:
housing means;
stator means within said housing means and having a plurality of windings and a cylindrical opening therein;
cylindrical rotor means located within said cylindrical opening and defining therewith a chamber;
said rotor means having a pair of axially extending shafts;
a pair of counterweight means in said cylindrical opening each coacting with one of said pair of shafts whereby said pair of counterweight means and said rotor means move as



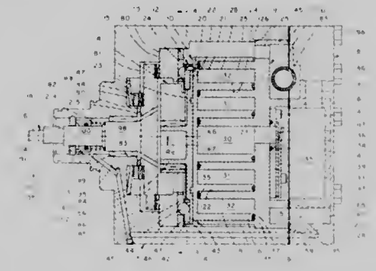
a unit responsive to the sequential actuation of said plurality of windings.

4,892,468
HYDRAULIC PUMP
Toshifumi Maehara, Hanazono, Japan, assignor to Akebono Brake Industry Co., Ltd. and Akebono Research, Development Centre Ltd., both of Tokyo, Japan
Filed Aug. 8, 1988, Ser. No. 229,457
Claims priority, application Japan, Aug. 24, 1987, 62-209955
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—415 **8 Claims**



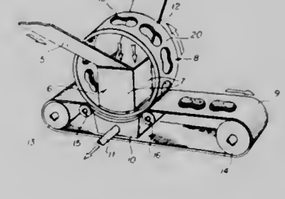
1. A hydraulic pump, which comprises:
a motor;
a cylinder body having a cylinder member;
a suction portion through which an external fluid is introduced into said cylinder chamber and an ejection port through which said fluid in said cylinder chamber is ejected outward;
a cam member rotatable about an axis of rotation of said motor;
a movable member reciprocably mounted in said cylinder body and engageable with said cam member, wherein said fluid in said cylinder chamber is ejected through said ejection portion when said movable member is moved into said cylinder chamber by said cam member;
a cylindrical piston slidably fitted in said cylinder chamber of said cylinder body wherein said movable member is engageable with said cylindrical piston when said movable member is moved into said cylinder chamber to shut off communication between said cylinder chamber and said suction port, thereby sealing said cylinder chamber; and
a valve provided in said ejection passage for communication with said ejection port wherein said valve is open due to pressure in said cylinder chamber occurring when said movable member is further moved into said cylinder chamber for ejecting said fluid in said hydraulic chamber wherein said cylindrical piston comprises an inner piston and an outer piston and wherein said inner piston is engageable with said movable member.

4,892,469
COMPACT SCROLL-TYPE FLUID COMPRESSOR WITH SWING-LINK DRIVING MEANS
John E. McCullough, Carlisle; John T. Dieckmann, Belmont, and Thomas P. Hosmer, Concord, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.
Filed Apr. 3, 1981, Ser. No. 250,730
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 **8 Claims**



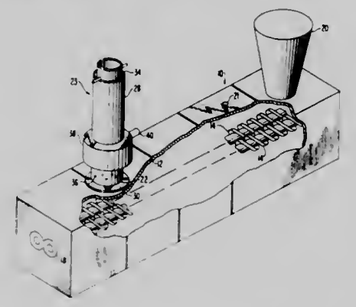
1. In a positive fluid displacement compressor into which fluid is introduced at low-pressure through a peripheral inlet for circulation and subsequently withdrawn at high pressure through a central discharge port, the compressor comprising a housing, stationary and orbiting scroll members each having an end plate and an involute wrap of multiple turns interengaged and cooperating with each other within the housing; drive shaft means extending through the housing and rotatable about a drive shaft axis for driving said orbiting scroll member in a circular orbit with respect to said stationary scroll member about an orbital axis, the orbit having an orbit radius define as the distance between the centerline of the stationary scroll member and the centerline of the orbiting scroll member, whereby said involute wraps make moving line contacts to seal off and define moving pockets of variable volumes of different fluid pressures on both sides of said moving line contact; coupling means to maintain said scroll members in fixed angular relationship; the improvement comprising:
(a) crankplate means affixed to said drive shaft means and rotatable about the drive shaft axis;
(b) swing-link means pivotally connected to said crankplate means in torque transmitting relationship and pivotally movable relative to said crankplate means about a pivot point offset from said drive shaft axis; said pivot point following a circular orbital path about said drive shaft axis; said swing-link means extending from said pivot point and being pivotally connected to said orbiting scroll member in driving relationship to pull the orbiting scroll member in its orbital path in the same direction as the crankplate means; said pivot point of said swing-link means being located towards one side of a tangent line extending from the orbit radius of the orbiting scroll member where the centerline of the orbiting scroll member is located, and generally towards the pivot point, said one side being away from the direction of motion of said orbiting scroll member; counterweight means forming a component of said swing-link means connected to said orbiting scroll member and having a mass that generates a centripetal force with respect to the orbital axis that exactly balances the centrifugal force exerted by the orbiting scroll member and its associated structure when said orbiting member is driven about its orbital axis so that driving motion of said crankplate means through said swing-link means effects orbital movement of the orbiting scroll member and the sole radial sealing force between the wraps of the orbiting scroll member and the stationary scroll member, said sealing force being proportional to driving torque applied to the orbiting scroll member by said crankplate means;
(c) a fixed thrust plate means disposed between said crankplate means and said orbiting scroll member, said thrust plate means having a surface facing towards said crankplate means;
(d) a bearing means arranged to react and carry moment loads generated by the driving force applied by the crankplate means to the orbiting scroll member, said bearing means comprising a first thrust bearing between said crankplate means and said thrust plate surface and a second thrust bearing means on the opposite side of said crankplate means; and
(e) means for exerting an axial force against the second thrust bearing means in a direction to urge the crankplate means against the first thrust bearing means.

4,892,470
APPARATUS FOR LAYERED FLANGED FIBROUS PAD FORMATION
Allan P. Farrington, Englishtown, and Gerald M. Marshall, Somerville, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Feb. 16, 1989, Ser. No. 311,544
Int. Cl.[4] B29J *5/00*
U.S. Cl. 425—80.1 **10 Claims**



1. In an apparatus for forming a complexly shaped product, the apparatus having at least one fiber supply means to supply opened fibers to an air stream which air stream entrains and transports said fibers to a condensing surface, the improvement comprising:
(a) a moving foraminous surface forming said condensing surface positioned to pass through said air stream substantially transversely thereto;
(b) a continuous molding loop defining at least one mold, for receiving entrained fibers from said air stream which are condensed on said foraminous surface within said mold to form a product having a shape defined in part by said mold and said foraminous surface, said mold comprising:
(i) a first mold portion adjacent said foraminous surface defining an opening of predetermined shape and dimensions; and
(ii) a second mold portion separated from said foraminous surface by at least said first mold portion and defining an opening of predetermined shape and dimensions which blocks a part of the opening defined by said first mold portion; and
(c) means for moving said molding loop along a path which passes in part adjacent to and in the same direction of movement as said foraminous surface and in part away from said foraminous surface leaving products formed in said mold deposited on said foraminous surface.

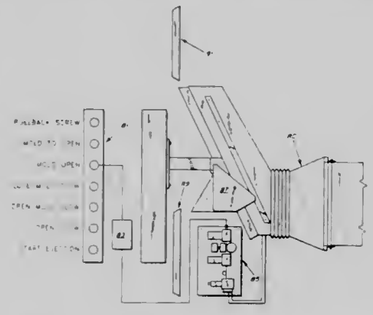
4,892,471
STEAM VENTING EXTRUDER FEEDER
John E. Baker, Farmers Branch, and Ramon Cantu, Dallas, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.
Filed Sep. 23, 1988, Ser. No. 249,344
Int. Cl.[4] B29C *31/10, 47/00*
U.S. Cl. 425—132 **5 Claims**



1. An extruder feeder apparatus for feeding moisture-containing solid materials into a downstream port of a food extruder for preparing an extrudate in which the extrudate at the downstream port has a temperature such that steam is generated in the extrudate and such steam hinders solid material feeding, the feeder apparatus comprising:
(a) a feed tube for feeding solid materials into the extruder through an extruder wall opening;
(b) means defining a steam exit passage through the extruder wall opening and surrounding the feed tube, said means including vent openings allowing ambient, untreated air to enter the steam exit passage; and
(c) means for pressure assisting the venting of the steam from the extruder and the feed of solid materials within the feed tube, said means for pressure assisting comprising a compressed air chamber which surrounds the outer tube and comprises
(i) an inlet for the introduction of compressed air into a housing of the compressed air chamber, and
(ii) an air directing ring disposed within the housing and comprising a restricted passageway for directing the compressed air into the steam exit passage,
whereby compressed air injected into the steam exit passage induces (1) ambient, untreated air to enter the steam exit passage through the vent boles, (2) ambient, untreated air to enter the feed tube and assist in the downward flow of the solid materials and (3) steam generated in the extruder to be vented out of the apparatus through the steam exit passage.

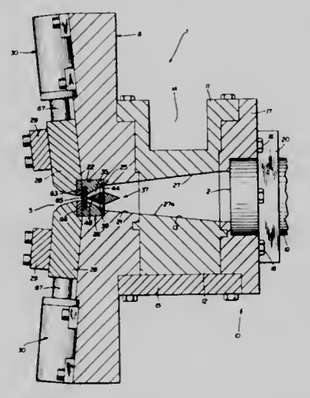
4,892,472
AUTOMATIC PART-RUNNER SEPARATOR CHUTE
James Harrison, 13182 Marshall La., Tustin, Calif. 92680
Continuation-in-part of Ser. No. 797,692, Nov. 13, 1985, Pat. No. 4,710,124. This application Mar. 3, 1987, Ser. No. 21,132
Int. Cl.[4] B29C *39/44, 41/52, 41/42, 45/76*
U.S. Cl. 425—139 **10 Claims**

1. Apparatus for separating runners and molded products ejected from an injection mold assembly, comprising:
a control circuitry disposed externally of the mold assembly for generating mold control signals to regulate the operation of the mold assembly; and
a chute mechanism disposed proximate the mold assembly and connected with said control circuitry, the chute and mechanism being operative to separate products and runners by directing products and runners entering the chute



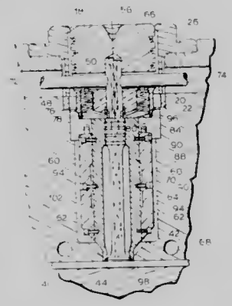
to different collection areas in response to the mold control signals from the control circuitry.

4,892,473
HEAD FOR EXTRUSION OF ELASTOMERIC CONTOUR INNERLINER
Gerardo P. Elia, Akron, Ohio; Gaetan Arbour, Joliette, Canada, and Ivan Z. Podobnik, Stow, Ohio, assignors to Bridgestone/-Firestone, Inc., Akron, Ohio
Filed Dec. 22, 1988, Ser. No. 288,594
Int. Cl.[4] B29C *47/68*
U.S. Cl. 425—197 **9 Claims**



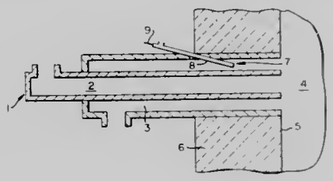
1. An extrusion head for extruding a laminated sheet of an elastomeric material including:
(a) a chamber having an entrance for receiving an incoming supply of the elastomeric material and a discharge end, said chamber being defined by spaced walls dimensional to diverge the width and converge the thickness of the incoming elastomeric material as it moves toward the discharge end;
(b) insert means mounted in the discharge end of the chamber for splitting the elastomeric material into at least a pair of separate streams of said elastomeric material;
(c) breaker means mounted in the discharge end downstream of the insert means for removing any foreign particles present in the separate streams of elastomeric material; and
(d) die means located downstream of the breaker means for converging the separate streams of elastomeric material toward an orifice and for maintaining said streams separate until entering the orifice where they are joined to form the laminated sheet of etastomeric material.

4,892,474
PROFILED PLATE HEATERS FOR INJECTION MOLDING NOZZLES
Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1
Filed Feb. 21, 1989, Ser. No. 312,467
Int. Cl.[4] B29C *45/20, 45/72*
U.S. Cl. 425—549 **6 Claims**



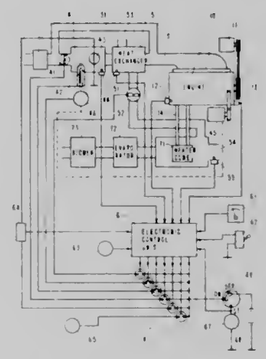
1. In an elongated injection molding heated nozzle having a central portion extending between a rear portion adjacent a rear end and a forward portion adjacent a forward end, and a melt bore extending therethrough from the rear end to the forward end, the improvement wherein:
the central portion of the nozzle has at least one outer face which receives an electric plate heater securely mounted thereagainst, the plate heater having an inner face which abuts against said at least one outer face of the central portion of the nozzle, the inner face of the plate heater and said at least one outer face of the central portion of the nozzle being shaped to define at least one insulative air space therebetween having a configuration to provide heat flow from the plate heater to the nozzle according to a predetermined profile.

4,892,475
IGNITION SYSTEM AND METHOD FOR POST-MIXED BURNER
Dennis R. Farrenkopf, Bethel, Conn., and William J. Snyder, Ossining, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Dec. 8, 1988, Ser. No. 281,459
Int. Cl.[4] F23C *5/00;* **F23Q** *7/06*
U.S. Cl. 431—8 **18 Claims**



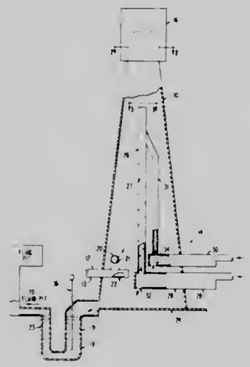
1. A method for igniting a combustible mixture comprising:
(A) passing main oxidant into a combustion zone from the discharge end of a main oxidant passage;
(B) passing fuel into the combustion zone, separately from the main oxidant, from the discharge end of a fuel passage to form a combustible mixture in the combustion zone;
(C) passing igniter oxidant having an oxygen concentration greater than that of air through a tube containing an electrode into the fuel passage at an angle not exceeding 45 degrees to the direction in which the fuel is flowing toward the discharge end, at a point recessed from the discharge end of the fuel passage;
(D) creating a spark from the electrode to cause combustion of fuel and igniter oxidant within the fuel passage;
(E) passing combusting fuel and igniter oxidant from the fuel passage into the combustion zone to ignite the combustible mixture; and
(F) terminating the flow of igniter oxidant while maintaining the flow of main oxidant into the combustion zone.

4,892,476
APPARATUS FOR CONTROLLING COMBUSTION IN HEATER
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,056
Claims priority, application Japan, Oct. 29, 1986, 61-257474
Int. Cl.[4] F23N *1/00*
U.S. Cl. 431—36 **5 Claims**



1. An apparatus for controlling combustion in a heater including a burner having an atomizing device for atomizing supplied fuel and an igniting device for igniting fuel atomized by the atomizing device, the apparatus comprising:
detector means for detecting the temperature in said burner and outputting a temperature signal;
means for selecting a re-ignition mode based on the temperature signal from said detector means;
said re-ignition mode selecting means including means for selecting a first mode in which the atomizing device is operated at a basic atomizing temperature when the temperature in said burner as detected by said detector means is higher than a predetermined temperature, and for selecting a second mode in which the atomizing device is operated at a temperature higher than said basic atomizing temperature when the temperature in said burner is lower than said predetermined temperature; and
control means for controlling said atomizing device in the re-ignition mode when selected by said re-ignition mode selecting means.

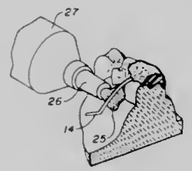
4,892,477
APPARATUS FOR FLARING GAS
Larry Zimmiond, Highway 23, P.O. Box 7, Keene, N. Dak. 58847
Filed Sep. 30, 1987, Ser. No. 102,605
Int. Cl.[4] F23D *13/20*
U.S. Cl. 431—202 **3 Claims**



1. An apparatus for flaring gas, comprising:
flare stack means, having a base, for flaring gas;
fluid pit means for storing fluid;
gooseneck pipe means, coupled to the base of said flare stack means and to said fluid pit means, said gooseneck pipe means being configured to maintain a reservoir of fluid therein at a predetermined level;
high pressure inlet means for introducing a first combination of waste gas and liquid of a first predetermined pressure or greater, into said flare stack means, said high pressure inlet means including first separating means for separating the liquid in said first combination of waste gas and liquid from the waste gas in said first combination of waste gas and liquid;
said first separating means including an inlet pipe having a first drainage aperture and a t-shaped pipe coupled to said inlet pipe, said t-shaped pipe being open at both ends of the t allowing venting of gases into the flare stack, and said drainage aperture draining said liquids into said gooseneck pipe via said routing means;
low pressure inlet means for introducing a second combination of waste gas and liquid, of a second predetermined pressure less than that of said first predetermined pressure, into said flare stack means, said low pressure inlet means including second separating means for separating the liquid in said second combination of waste gas and liquid from the waste gas in said second combination of waste gas and liquid; and
means for routing the liquid separated from said first and second combination of waste gas and liquid into said gooseneck pipe.

4,892,478
METHOD OF PREPARING DENTAL APPLIANCES
Louis H. Tateosian, York, Pa., and Louis C. Souder, Ocean City, N.J., assignors to Dentsply Research & Development Corp., Milford, Del.
Filed Mar. 21, 1988, Ser. No. 171,493
Int. Cl.[4] A61C *13/00, 13/01*
U.S. Cl. 433—6 **4 Claims**

1. A method of preparing a dental appliance comprising the steps of
(a) preparing a dental cast of a patients 'mouth,
(b) adapting a dental appliance substructure to said dental cast,
(c) placing said substructure on said dental cast,
(d) extruding at least one stream of self-merging hardenable dental gel around said substructure and on said dental cast in adjacent extruded portions and permitting said adjacent extruded portions to merge together whereby there are no



interface lines between said adjacent extruded portions, said gel comprising a colloidal system of a hardenable dispersing medium, a colloid, and a catalyst, and having a viscosity of 8000 to 50,000 cps at 20 RPM's and a slump of 10 mm to 27 mm, and
(e) curing said gel in one step to produce a dental appliance without interface lines having a form adapted specifically for said patients'mouth.

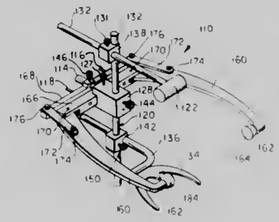
4,892,479
ORTHODONTIC ARCH WIRE
John C. McKenna, 39 Stoner Dr., West Hartford, Conn. 06107
Filed Oct. 11, 1988, Ser. No. 255,495
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—20 **10 Claims**

1. In an orthodontic arch wire used with anterior brackets comprising a wire of uniform cross-section along its length having a generally U-shaped configuration and defining both a principal plane of the arch wire and center line for the arch within the plane, the improvement wherein the wire is provided with a mid-point marker in the form of a displaced wire portion offset from the principal place of the arch wire at the center line, said displaced offset including a pair of integral inclined portions connecting the offset to the remainder of the wire, the ends of said inclined portions connected to the remainder of the wire defining a gap therebetween within the plane of the wire, said offset being spaced from the wire by up to about 0.012 inch and being insufficient to substantially alter the continuous radial curvature of the arch wire at the center line or to apply force components to the wire.

4,892,480
FACE BOW
Ronald R. Levandoski, 1103 Powell Ave., Erie, Pa. 16505
Filed Sep. 14, 1988, Ser. No. 244,098
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—73 **10 Claims**

1. In combination a face bowl and an articulator,
said face bow comprising a vertically extending rod, a first bracket, a second bracket, and a third bracket,

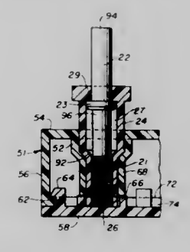
said first bracket, said second bracket and said third bracket each being vertically adjustably and slidably received on said vertically extending rod,
a teeth engaging fork means having a first support rod attached thereto and slidably received in first bracket,
a naison indicating member having a second support rod attached thereto,
said second support rod being slidably horizontally an adjustably supported on said third bracket,
said calipers removably supported on said second bracket,
said calipers having auditory meatus engaging means thereon whereby said calipers can be supported on the auditory meatus of a patient, thereby supporting said face bow on said patient,
said articulator having an upper frame and a lower frame, a first denture support on said upper frame, a second denture support on said lower frame aNd condyle means,



said condyle means swingably supporting said second denture support relative to said first denture support,
said calipers being adapted to be removed from said second bracket and said face bow transferred to said articulator,
a face bow recess means on said lower frame of said articulator for receiving a part of said vertical support,
said vertical support rod having a part adapted to be received in said recess means whereby said face bow is supported on said articulator,
said first denture support having means thereon to adjust said first denture support relative to said naison indicator,
said second denture support being adapted to be adjusted to conform to said teeth engaging fork means on said articulator to position said denture supports relative to one another to be articulated on said articulator.

4,892,481
DENTAL COMPOSITE CARRIER AND COMPOSITE PACKAGE
Thomas V. Kopunek, Lewes, Del., and Douglas D. Bennett, Cambridge, Md., assignors to Dentsply Research & Development Corp., Milford, Del.
Division of Ser. No. 35,574, Apr. 7, 1987, Pat. No. 4,767,325.
This application Jul. 6, 1988, Ser. No. 215,657
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—90 **5 Claims**

1. A package for a composite comprising: a plurality of composite ampules, each said ampule comprising a composite reservoir and a piston, said reservoir being open at one end and having a piston received in a distal end; a tray for storing said ampules having a top part having an upper surface and a lower surface said top part having mounting stations therein, each said mounting station being adapted to receive a composite ampule in said upper surface of said tray and having composite ampules received therein for storage, said mounting stations



being adapted to permit easy removal of said ampules therefrom when said ampules are used.

4,892,482
DENTAL RETRACTION CORD
Michael P. Lococo, 4999 Victoria Avenue, Niagara Falls, Ontario, Canada L2E 4C9
Filed Aug. 30, 1988, Ser. No. 238,191
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—136 **11 Claims**



1. Dental retracting cord comprising a plurality of flexible braided strands made of a liquid permeable material, and at least one stiffener strand generally integral with the cord and continuously extending throughout the entire length thereof, said stiffener strand being made of a generally non-resiliently deformable material having a form retaining capability greater than that of said braided strands, to render the entire length of the cord generally non-resiliently bendable in order to facilitate the application thereof.

4,892,483
ORAL DRUG RETAINING DEVICE
Jesse B. Douglas, Jr., Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.
Filed Aug. 15, 1988, Ser. No. 231,959
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—229 **3 Claims**

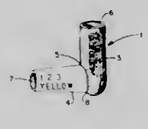
1. An apparatus for retaining a matrix impregnated with a pharmacologic agent in the mouth of a patient, comprising:
receptacle means including a basket and a frame for receiving and protecting said impregnated matrix from physical damage due to mastication and tooth brushing;
means for opening and closing said basket and said frame including latch means and hinge means on opposing sides

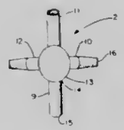
of said basket and said frame that allow replacement of said impregnated matrix; and



means for mounting said receptacle means to a tooth of the patient.

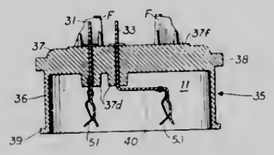
4,892,484
INTERCONNECTING TOY
Dorothy M. Brown, and John S. Brown, both of 2570 Wells Rd., Ashland, Ohio 44805
Filed Mar. 6, 1989, Ser. No. 319,303
Int. Cl.[4] G09B *1/36;* **A63H** *33/08*
U.S. Cl. 434—259 **8 Claims**





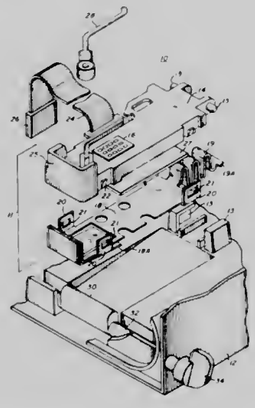
1. An educational toy, comprising:
a first game piece, having a plurality of first tubular members extending therefrom, said first game piece establishing a base;
a plurality of second game pieces, each having a plurality of second tubular members extending therefrom, said first and second tubular members being adapted for mating interconnection with each other; and
wherein certain of said tubular members are of a uniform cross section along a length thereof, and others of said tubular members are tapered, having a gradually changing cross section along a length thereof, said tapered tubular members extending from a smaller unattached end to a larger end attached to the respective game piece, and being of various cross sectional geometric configurations, tubular members of one game piece being adapted for mating interconnection with tubular members of like cross sectional configurations of another game piece, said tubular members including indicia thereon for indicating the mateability of each tubular member with other tubular members.

4,892,485
ADAPTER PLATE FOR CONVERTING A THREE PHASE METER SOCKET FOR USE WITH A SINGLE PHASE WATT HOUR METER
Victor L. Patton, Grass Valley, Calif.
Filed Jun. 16, 1988, Ser. No. 207,543
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—167 **27 Claims**



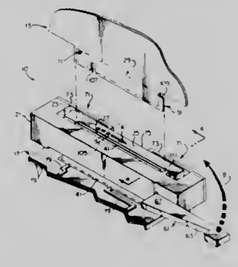
1. An adapter plate interposed between a single phase meter and three phase meter socket comprising, in combination:
a sleeve for uniting the single phase meter to the socket having a barrier contained within said sleeve to preclude direct contact between the socket and the meter,
a coupling to connect 120 volt clips of the socket to the meter including means for offsetting two of the socket clips to align with the meter,
wherein said offsetting means include first and second bus bars for offsetting two of said socket clips with respect to their connection with the three phase meter socket, said bus bars communicating with the socket by means of blades extending from an exterior wall of said barrier,
wherein said sleeve has at extremities thereof peripherally extending flanges to serve as abutment stops limiting the amount of orientation required to place said adapter sleeve in the socket, and to limit the placement of the single phase meter within said sleeve.

4,892,486
PORTABLE COMMUNICATIONS DEVICE ADAPTOR
Andrzej T. Guzik, Pompano Beach; Rudy Yorio, Boca Raton; Joseph A. Budano, II, Plantation, and Mark Tellam, Parkland, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 2, 1988, Ser. No. 279,002
Int. Cl.[4] H01R *13/629*
U.S. Cl. 439—248 **16 Claims**



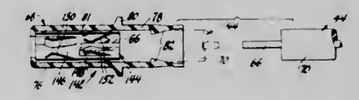
1. A adaptor for receiving therein a portable communications device having a first set of accessible electrical contacts, said adaptor comprised of:
a mounting base adapted to receive said portable device therein;
a connector assembly having a second set of electrical contacts disposed to mate with said first set of accessible electrical contacts;
means which mounts said connector assembly to said mounting base so that said second contact set can be moved with respect to said communications device in at least two orthogonal dimensions to permit alignment with said first contact set when said communications device is received in said adaptor; and
actuator means for moving said connector assembly with respect to said mounting base so as to cause said first and second contact sets to mate.

4,892,487
CONNECTOR ASSEMBLY WITH MOVABLE CARRIAGE
David W. Dranchak, Endwell; David E. Engle, Vestal, and Alan D. Knight, Newark Valley, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.
Filed Jun. 15, 1989, Ser. No. 366,848
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—260 **17 Claims**



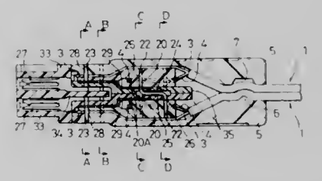
1. An electrical connector assembly for providing electrical connection between at least one contact element on a circuit board and a corresponding conductor located on a circuit device, said connector assembly comprising:
a housing for being positioned adjacent said circuit device and including an opening therein;
a flexible circuit member located substantially within said housing and including a first terminal thereon for engaging said contact element on said circuit board and a second terminal thereon electrically coupled to said first terminal and adapted for engaging said corresponding conductor on said circuit device;
a carriage movably positioned within said opening within said housing and including a slot therein for having said circuit board located therein, said carriage and said circuit board occupying a first position within said housing wherein said contact element on said board and said first terminal of said flexible circuit member are not engaged, said carriage and said circuit board adapted for moving to a second position wherein said contact element and said first terminal are engaged to provide electrical contact therebetween;
actuation means operatively connected to said carriage to cause said carriage and said circuit board to move from said first position to said second position; and
biasing means secured to or forming part of said housing for biasing said carriage within said housing in a direction toward said flexible circuit member when said carriage occupies both said first and second positions within said housing and during said movement between said first and second positions.

4,892,488
IGNITION CABLE TERMINATION ASSEMBLY AND METHOD OF MAKING SAME
Charles R. Nestor, Niles, and John A. Yurtin, Southington, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 5, 1987, Ser. No. 117,050
Int. Cl.[4] H01R *4/24. 11/20*
U.S. Cl. 439—438 **10 Claims**



1. A cable termination assembly for terminating a cable comprising:
a cable which has an insulation jacket and a conductive core which has a stripped end portion which projects axially of the insulation jacket,
an insulator housing which has a plug portion at one end for receiving a terminal and an attachment portion at the other end which secures the insulator housing to the insulation jacket of the cable, and
a terminal which is disposed in the insulator housing and which has a socket portion at one end which is disposed in the plug portion of the insulator housing and a ferrule portion at the other end which surrounds and biasingly engages the stripped end portion of the conductive core of the cable.

4,892,489
FLAT-CABLE CONNECTOR
Yuji Hirai, Tokyo, Japan, assignor to Honda Tsushin Kogyo Co., Ltd., Tokyo, Japan
Filed Feb. 1, 1989, Ser. No. 304,528
Claims priority, application Japan, Jul. 28, 1988, 63-186755
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—497 **6 Claims**



1. A flat-cable connector for use in connecting to a flatcable having a plurality of signal conductors arranged at regular intervals each accompanying a grounding conductor comprising:
a cable cover having a plurality of first ridges arranged at intervals in the form of comb-teeth and integrally connected to the inner surface of the cable cover, each ridge having a longitudinal groove made at its top for accommodating a selected grounding conductor and a lateral groove made at its top for accommodating a selected grounding terminal; and a plurality of second ridges arranged at intervals in the form of the comb-teeth and integrally connected to the inner surface of the cable cover, each ridge having a longitudinal groove made at its top for accommodating a selected signal conductor and a lateral groove made at its top for accommodating a selected contact terminal, said first ridges confronting the inter-ridge spaces of said second ridges and vice versa;
a cable housing having staggered ribs arranged at intervals

in the form of comb-teeth and integrally connected to the under surface of the cable housing, said staggered ribs being adapted to fit in the staggered inter-ridge spaces of said cable cover;

a grounding contact member comprising a common grounding plate and a plurality of upright grounding terminals integrally connected to the common grounding plate, each terminal having a pinch slit made at its top; and

a plurality of press contact terminals;

said cable cover having said grounding contact assembly assembled thereto with each upright grounding terminal inserted in each lateral groove of each of said first ridges, and each of said press contact terminals being inserted in each lateral groove of each of said second ridges.

4,892,490

ELECTRICAL CONNECTOR ENABLING PREVENTION OF INCOMPLETE COUPLING

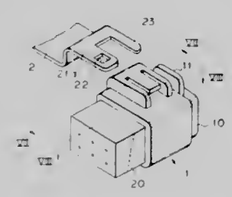
Yoshikazu Tsuchiya; Hideki Kano; Yasuyuki Aihara; Noboru Miyazaki; Izumi Suzuki, and Kiyofumi Ichida, all of Tochigi, Japan, assignors to Honda Gikeu Kogyo K.K., Tokyo and Sumitomo Wiring System, Ltd., Mie, both of, Japan

Filed Dec. 14, 1988, Ser. No. 284,114

Claims priority, application Japan, Dec. 15, 1987, 62-190398[U]; Dec. 15, 1987, 62-190399[U]

Int. Cl.⁴ H01R *13/60*

U.S. Cl. 439—533 **2 Claims**



1. An electrical connector and mounting means therefor, comprising:

a male connector having a male connector body;

a female connector having a female connector body joinable with said male connector body along an axis for forming the connector; and

a support bracket for supporting said connector on another structure, said support bracket having a support finger and a detection finger projecting substantially parallel to each other and transversely to said axis;

one of said connector bodies having a path therethrough corresponding to the shape and dimensions of said support finger and into which said support finger is insertable for supporting said connector on said bracket, and the other of said connector bodies having a rib thereon, said rib being positioned, when said connector bodies are improperly coupled, for being abutted by said detection finger for preventing entry of said support finger into said path, and said rib being positioned, when said connector bodies are properly coupled, for being engaged by said detection finger for blocking movement of said other connector body relative to said one connector body transverse to said axis.

4,892,491

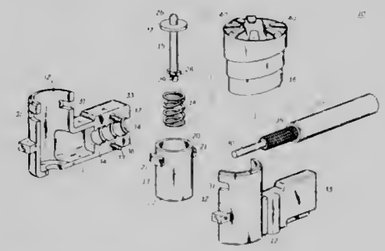
COAXIAL CONNECTOR

Joseph A. Budano, II, Plantation; Andrzei T. Guzik, Pompano Beach; Rudy Yorio, Boca Raton, and Harold M. Cook, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1988, Ser. No. 286,185

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 439—582 **13 Claims**



1. A coaxial connector comprising:

a housing

an insulator carried in the housing;

a center contact carried by the insulator;

a resilient means biasing the center contact; and

a volute spring located about the housing, electrically engaging the housing and providing an outer contact.

4,892,492

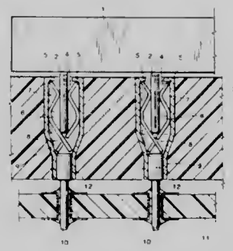
DEVICE WITH OPENINGS FOR RECEIVING PINS OF ELECTRICAL COMPONENTS

Harry B. Mueller, Hollywood Hills, Fla., assignor to Modular Computer Systems, Inc., Fort Lauderdale, Fla.

Filed Jun. 17, 1988, Ser. No. 207,879

Int. Cl.⁴ H01R *4/48*

U.S. Cl. 439—828 **5 Claims**



1. A device for receiving pins of electrical components in electrical connection, comprising:

a substrate having an opening therein which extends axially into said substrate and which is bounded by an electrically conductive sidewall, said opening having a mouth, a central axis, an upper portion and a lower portion; said sidewall having a lower concave portion and a lip projecting generally radially inwardly adjacent said mouth of said opening;

a pair of spring elements disposed within said opening which are in facing relationship to each other, each of said spring elements having an upper end portion, a center portion, and a terminal portion;

said terminal portion of each said spring being disposed in said lower portion of said opening in engagement with said concave portion of said sidewall so as to retain said terminal portion of said spring in a fixed axial position, each said spring extending generally axially from a first side of said opening across said central axis to the opposite side of said opening, both of said spring elements crossing said central axis at substantially common location; and

each said spring having a substantially sheet-like body, said terminal portion of each said spring contacting said sidewall in the vicinity of said lower portion of said opening, said upper end portion of each said spring engaging said lip of said sidewall in the vicinity of said upper portion of said opening so as to retain said spring within said opening, and said center portion of each said spring having a first portion which extends generally radially toward said central axis and a second portion which extends generally radially from said first portion toward said sidewall.

4,892,493

SUPPLEMENTAL SAILBOAT PROPULSION DEVICE

Yoram Gil, 1441 S. Beverly Glen Rd., Los Angeles, Calif. 90024

Filed Sep. 29, 1988, Ser. No. 250,742

Int. Cl.⁴ B63H *16/08*

U.S. Cl. 440—17 **2 Claims**



1. A supplemental propulsion device for a sailboat or sailboard type water craft having a pivotal centerboard extending downwardly from the hull of the craft through an elongated hull slot, said propulsion device comprising: a pair of propulsion wings vertically hinged to one-another by a wing hinge, said wing hinge being mounted to the lower portion of the leading edge of the centerboard of said craft whereby upon the application to the centerboard of a reciprocating pumping action each propulsion wing moves inwardly to a retracted position adjacent the centerboard during forward movement of the lower portion of the centerboard and moves outwardly to an extended position removed from the centerboard during rearward movement of the lower portion of the centerboard; cable means connecting the free edge of said propulsion wings to the trailing edge of the centerboard and of a length to stop the outwardly movement of said wings at a point no more than 90 degrees from the centerboard during rearward movement of the lower portion of the centerboard whereby said wings provide enlarged and effective thrust surfaces to the surrounding water to forcefully propel said craft through the water; handle means at the upper portion of said centerboard for use by a sailor to pump said centerboard and thereby reciprocate said propulsion wings; and means at the free edges of the propulsion wings to lock said wings in their retracted position adjacent the centerboard when the water craft is under sailing propulsion and the supplemental propulsion device is not to be used.

4,892,494

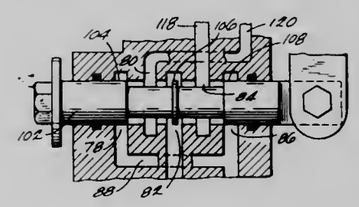
POWER STEERING MECHANISM FOR MARINE INSTALLATIONS

Arthur R. Ferguson, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 28,958, Mar. 23, 1987, Pat. No. 4,744,777. This application Apr. 4, 1988, Ser. No. 177,530

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—61 **42 Claims**



1. A marine propulsion device comprising mounting means adapted to be mounted on a boat and including a tilt tube extending along a generally horizontal tilt axis, a propulsion unit mounted on said mounting means for pivotal movement relative thereto about said tilt axis and about a generally vertical steering axis, said propulsion unit including a propeller shaft adapted to rotatably support a propeller, an elongated member slideably housed within said tilt tube for axial movement relative thereto, an extendible and contractible hydraulic assembly having a first end adapted to be connected to the boat, and a second end connected to said propulsion unit for causing pivotal movement of said propulsion unit about said steering axis, valve means including a first member fixedly connected to said second end of said hydraulic assembly, and a second member reciprocally movable relative to said first member, and a link member having a first portion pivotally connected to said elongated member, a second portion pivotally connected to said second member, and a third portion pivotally connected to said first member.

4,892,495

SUBSURFACE BUOY MOORING AND TRANSFER SYSTEM FOR OFFSHORE OIL AND GAS PRODUCTION

Niels-Alf Svensen, Leanglia 16, N-1370 Asker, Norway

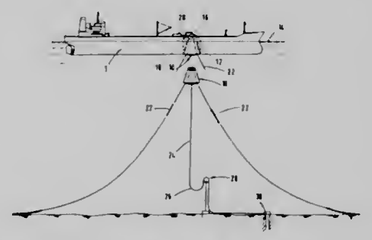
PCT No. PCT/NO87/00025, § 371 Date May 6, 1988, § 102(e) Date May 6, 1988, PCT Pub. No. WO87/05876, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 24, 1987, Ser. No. 188,551

Claims priority, application Norway, Mar. 24, 1986, 861171

Int. Cl.⁴ B63B *22/02*

U.S. Cl. 441—5 **10 Claims**



1. A subsurface vessel mooring and loading system for offshore petroleum production, comprising:

submersible buoy to be anchored to a sea bed by a plurality of mooring lines to extend from the sea bed to said buoy;

at least one riser pipe to extend from at least one production well in the sea bed and having a top end connected to said buoy;

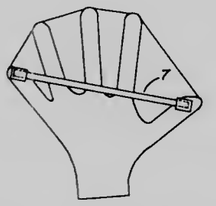
a loading vessel having a hull, and open tunnel shaft opening into said hull, and receiving loading facilities;

a rotatable turret seat mounted in said tunnel shaft to extend above the high draft water line in said tunnel shaft, said turret seat having a generally annular ring shape, said buoy being adapted to be firmly seated in said turret seat such that a top side of said buoy is above the high draft water line in said tunnel shaft, and product receiving means in said turret seat;

first product transfer means extending laterally from said top end of said at least one riser pipe to said product receiving means of said turret seat; and

second product transfer means extending between said turret seat and said receiving loading facilities of said vessel.

4,892,496
WEB GLOVE
Charles Vondruska, Box 1662, Newport Beach, Calif. 92663
Filed Aug. 22, 1988, Ser. No. 234,545
Int. Cl.[4] A63B *31/02*
U.S. Cl. 441—57 **1 Claim**



1. A swimming glove for placement over the hand of a swimmer, comprising hollow elongate finger and thumb portions, said portions being joined to one another by integral flexible web portions, and an elongated removable brace for maintaining said swimming glove in an outstretched configuration, said elongated removable brace extending from an outer end of an elongated finger portion intended to accommodate the little finger of a swimmer, to an outer end of the elongated thumb portion.

4,892,497
METHOD FOR ASSEMBLY OF LASER MIRRORS
Edwin G. Chaffee, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah
Division of Ser. No. 117,668, Nov. 5, 1987, Pat. No. 4,803,697.
This application Nov. 14, 1988, Ser. No. 270,674
Int. Cl.[4] H01S *30/03*
U.S. Cl. 445—28 **5 Claims**

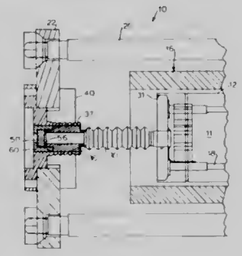
1. The method of processing a gas laser tube comprising:

(a) assembling a gas laser tube with both cathode and anode ends left open;

(b) installing the open ended tube in a heated vacuum oven;

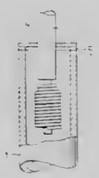
(c) heating the open tube while in the vacuum oven to cause contaminating substances within the tube to be driven out; and

(d) installing mirrors on the ends of the tube utilizing pressure sensitive adhering means between the tube ends and the mirror surfaces adhered thereto by placing said pressure sensitive adhering means between said mirrors and open ends and forcing said mirrors against said pressure



sensitive adhering means by threaded mirror retainers screwed on said open ends.

4,892,498
PROCESS FOR VACUUM-TIGHT SEALING OF A CERAMIC TUBE
Reinhold Gradl, Rückersdorf, and Klaus Popp, Nuremberg, both of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany
Filed Feb. 6, 1989, Ser. No. 306,357
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803227
Int. Cl.[4] H01J *9/26*
U.S. Cl. 445—44 **18 Claims**



1. A process for vacuum-tight sealing of a cylindrical tube of translucent alumina ceramic, using a metallic current bushing, which comprises

(1) applying to the ends of the tube a metallizing paste which contains

(a) at least one finely dispersed metal powder, selected from the group comprising tungsten, molybdenum, niobium and tantalum,

(b) a liquid organic binder and

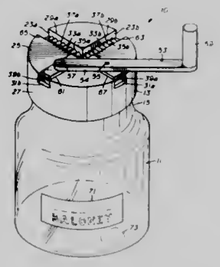
(c) a pulverulent calcium-magnesium silicate having a melting point in the range 1200–1500° C.,

(2) producing a thin metal layer on the alumina ceramic by burning the paste in,

(3) after burning-in of the metallizing paste, depositing a further layer of nickel or copper on the remaining metal layer,

(4) inserting metallic current bushings into the tube in the region of the tube ends and sealing the ends vacuum-tight in the metallized areas by means of a brazing solder having a melting point between 950° and 1200° C., if necessary with the use of disk-shaped gasket elements.

4,892,499
NOVELTY GRINDER
Luay Ayyoubi, P.O. Box 8636, The Woodlands, Tex. 77387-8636, and Theresa R. Beck, 27220 Blueberry Hill Dr., Conroe, Tex. 77385
Filed Nov. 4, 1988, Ser. No. 267,227
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—81 **4 Claims**



1. A novelty grinder comprising:

a grinder base having an upper surface;

a container having an open upper end, said grinder base being mounted on and closing said open upper end of said container;

a pair of guide channels formed in the upper surface of said grinder base, said guide channels being substantially perpendicular to one another and intersecting substantially at the center of said upper surface of said grinder base;

a pair of shuttle members slidably disposed in said guide channels, each shuttle member being disposed in a separate one of said guide channels and being adapted for reciprocating translational movement in its respective guide channel;

retaining means disposed on said shuttle members and said guide channels for preventing the removal of said shuttle members from said guide channels in a direction transverse to the direction of their reciprocating translational movements;

crank means pivotally connected to each of said shuttle members for causing said reciprocating translational movement of said shuttle members in said guide channels when said crank means is rotated about said grinder base;

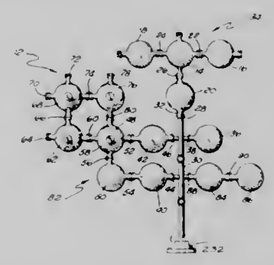
said guide channels having a dovetailed configuration in cross-section and said shuttle members having a cross-section that is wider at its widest point than the opening of said dovetailed guide channels, and further including a serrated surface in the bottom of each of said guide channels and a rib projecting from the bottom of each of said shuttle members, said ribs engaging each of the serrations of said serrated surfaces in succession when said shuttle members reciprocate in said guide channels.

4,892,500
VERSATILE NETWORK OF MULTIPLE SPOUT BALLOONS
Po Chun Lau, 8224 Wilkinson Ave., North Hollywood, Calif. 91605
Filed Mar. 1, 1988, Ser. No. 162,663
Int. Cl.[4] A63H *3/06;* **F16L** *41/00;* **G09B** *23/26*
U.S. Cl. 446—221 **21 Claims**

1. A versatile network of multiple spout inflatable toy balloons comprising:

a plurality of inflatable balloons being formed of material which is resilient and expandable, each of said balloons having a body and at least two integral spouts, formed of the same material as the remainder of said balloon with said spouts being necked down and extending from the body of the balloon, each said balloon constituting a single air chamber and being continuously inflatable to any desired size up to a certain maximum size beyond which it may explode, each said balloon comprising film walls which are expandable and stretchable to many times their non-inflated configuration;

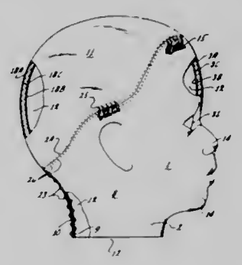
at least one plug, each of said plug having at least two ends with at least one end including means for making an airtight joint with a balloon spout, said spout making resilient airtight engagement with a corresponding end of said plug; and



each said balloon being capable of interconnecting to at least another one of said balloons using one of said plugs at each interconnection, with one end of said plug making resilient airtight engagement with a spout of one of said balloons, and another of said ends of said plug making resilient airtight engagement with a spout of another one of said balloons;

whereby said balloons may be interconnected in a deflated state to form an airtight, versatile, three dimensional network of balloons, which may be readily transported and inflated to form a network at a chosen location.

4,892,501
DOLL'S HEAD AND METHOD OF FABRICATION
Leonard Girelli, Stanley, Hong Kong, assignor to Mattel, Inc., Hawthorne, Calif.
Continuation of Ser. No. 808,516, Dec. 13, 1985, abandoned.
This application Feb. 25, 1988, Ser. No. 160,376
Int. Cl.[4] A63H *3/02*
U.S. Cl. 446—372 **26 Claims**



1. A method of forming a doll's head, in which face and neck portions (1 and 2) have molded textile fabric surfaces;

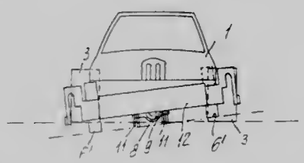
Comprising the steps of

adhesively attaching a first sheet (3A) of textile fabric to one side of a first sheet (3C) of foamed plastic to form a first laminate (3);

pressing the first laminate (3) between male and female dies (6 and 7) of a first pressure mold with the first textile fabric sheet (3A) adjacent to the female die (7) and heating at

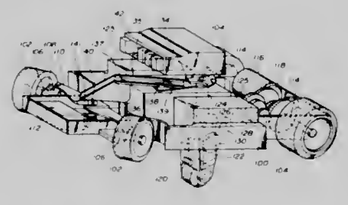
least one of the dies (6 and 7) to form said face portion (1) of a doll's head and an integral neck extension (8) having two ends (9 and 10);
forming a crown portion (11) for the doll's head from pliable sheet material;
attaching the crown portion (11) to the face portion (1) and to the integral neck extension (8) to form part of an outer casing;
connecting the two ends (9 and 10) of the neck extension (8) to form said neck portion (2) and complete said outer casing; and
filling the outer casing with stuffing (12).

4,892,502
TOY VEHICLE WITH OWN MOTOR DRIVE
Kurt Hesse, Waldstrasse 36, D-8510 Fürth, Fed. Rep. of Germany
PCT No. PCT/DE86/00447, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04362, PCT Pub. Date Jul. 30, 1987
PCT Filed Nov. 25, 1986, Ser. No. 116,564
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1986, 3602349
Int. Cl.⁴ A63H *17/26*
U.S. Cl. 446—454 **3 Claims**



1. An improved toy vehicle driven by a motor thereon particularly a toy car for toy race track systems, having a front undercarriage part with front wheels and, separated therefrom, a rear undercarriage part with back wheels, and having a vehicle assembly placed above both undercarriage parts and tightly gripping the rear undercarriage part, the front undercarriage part being arranged separately from the vehicle assembly, the improved toy vehicle is also provided with a swivel axle positioned in parallel with respect to the longitudinal vehicle axis in the area between the front and back wheels, the axle serving to pivotably interconnect the front and back undercarriage parts relative to each other, wherein the improvement comprises:
the swivel axle having one end fixed on the rear undercarriage part and an opposite end extending into and rotatably supported by a clamping ring positioned on the front undercarriage part, said opposite end of the axle which is rotatable with respect to the front undercarriage part has a collar permanently fixedly attached to said opposite end, which collar acts as an abutment to prevent axial movement of the freely rotatable front undercarriage part between the fixed rear undercarriage part and collar in the axial direction;
a bridge fixedly mounted on each of the front and rear undercarriage parts, each of said bridges having a pair of free ends; and,
holding elements having lateral guide edges supporting the toy vehicle on the race track mounted on each free end of said bridges.

4,892,503
ACTION TOY VEHICLE WITH CONTROLLABLE AUXILIARY WHEEL
Kiyoshi Kumazawa, Tokyo, Japan, assignor to Apollo Corporation, Tokyo, Japan
Filed Dec. 31, 1987, Ser. No. 140,167
Claims priority, application Japan, Aug. 5, 1987, 62-195747; Aug. 11, 1987, 62-200362; Oct. 29, 1987, 62-274214
Int. Cl.⁴ A63H *17/39*
U.S. Cl. 446—456 **28 Claims**

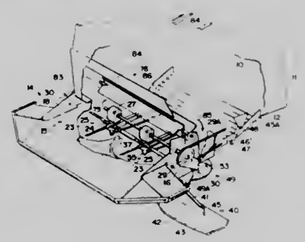


28. An action toy vehicle comprising:
a vehicular chassis;
a plurality of road wheels rotatably suspended from said vehicular chassis;
a steerable auxiliary wheel;
a first structure for supporting said auxiliary wheel, said structure being so constructed and arranged so as to be selectively shifting said auxiliary wheel between a first position in which said plurality of road wheels are in contact with a road surface and a second position in which said auxiliary road wheel is lowered for lifting a portion of the vehicular chassis for releasing at least one road wheel from a road surface;
a second structure for operating said auxiliary wheel for steering while said auxiliary wheel is placed in said second position;
means for selectively providing a control signal; and
means for selectively activating said first and second structure in response to said control signal for shifting said auxiliary wheel from said first position to said second position while said vehicle is in motion on the road surface and causing steering action in said auxiliary wheel for selectively performing desired wheely action and lifting of one side of said vehicle.

4,892,504
STRAW CHOPPER AND SPREADER ASSEMBLY
William A. Scott, and Bernard Penner, both of Winnipeg, Canada, assignors to Gehl Company, West Bend, Wis.
Continuation of Ser. No. 747,447, Jun. 21, 1985, Pat. No. 4,735,216, which is a continuation of Ser. No. 404,611, Aug. 2, 1982, Pat. No. 4,526,180. This application Mar. 29, 1988, Ser. No. 174,786
Int. Cl.⁴ A01F *29/02*
U.S. Cl. 460—112 **1 Claim**

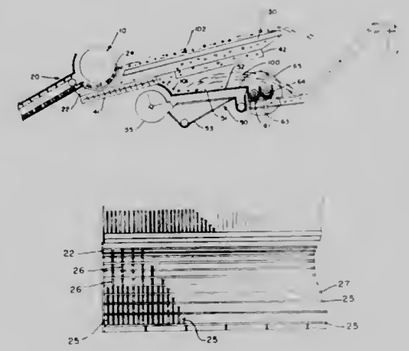
1. An assembly for spreading straw discharged from a rear discharge area of a combine harvester of the type that moves forwardly across the field to be harvested, the apparatus comprising a casing having a base plate, means for mounting the casing adjacent to the rear discharge area such that the base plate lies in a substantially horizontal plane, a pair of rotatable blade means, means mounting each of said blade means on said casing for rotation about a respective one of two vertical axes spaced transversely of the plate such that the blade means overlap between said axes and are rotated in opposed direction so as to sweep straw material deposited on said plate in a direction rearwardly across a line joining the axes and outwardly from said plate, said casing including a substantially vertical wall arranged such that it extends across said plate transversely to the direction of movement of the combine at a

location rearwardly of said blade means and cooperates with said plate and said blade means to discharge the material outwardly to the sides of the combine, said blade means each having a plurality of separate blade members each consisting of a single flat blade extending outwardly from the respective vertical axis with all the blade members of the associated one of the blade means lying in a common place, said mounting means being arranged such that the single flat blades of one blade means overlap and pass vertically above the single flat blades of the other blade means in an area between the axes and such that the blades pass said line joining the axes from the forward



side thereof to a rearward side thereof in phase, a shearing action in the area of the blades being provided solely by the coaction between the blades without any intervening stationary shearing surfaces, said casing mounting means being arranged such that straw from said discharge area enters the area between said blade means forwardly of said line and is discharged from said area rearwardly of said line, guide means for directing the discharge of chopped straw from said blade means rearwardly and to each side of said assemby, and means for generating a spreading force on said straw consisting solely of said blade means and said vertical wall.

4,892,505
METHOD AND APPARATUS FOR AUTOMATIC CORN COB REDUCTION
Larry Shrawder, R.D. #2, Kempton, Pa. 19529
Filed Feb. 21, 1989, Ser. No. 313,225
Int. Cl.⁴ A01F *11/06*
U.S. Cl. 460—149 **7 Claims**

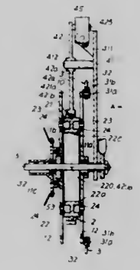


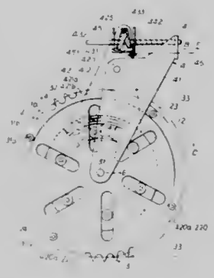
1. A method of reducing cleaned corn cobs into reduced segments and separating the segments from chaff in a combine which has been modified comprising the steps of:
(a) feeding a corn ear having a husk, a stalk, kernels of shelled corn and a cob into the combine having a concave having arcs, a multiplicity of longitudinal bars disposed perpendicular to the arcs and evenly spaced vertical rods parallel to the arcs to form a screen, the combine further having a cylinder, an arc to cylinder adjustment means, a perforated straw separating means and a cleaning means consisting essentially of a cleaning shoe with a defined travel line and having a sieve with a multiplicity of orienting fins above the sieve parallel to the travel line and a pan below the sieve, wherein the combine modification comprises:
(1) changing the concave's configuration from elliptical to circular;
(2) adjusting the space between the cylinder and concave to a clearance sufficient to reduce the corn cobs into segments;
(3) removing alternate vertical rods from the concave beginning with at least the fifth horizontal bar from the front of the concave;
(4) modifying the straw separating means by enlarging the perforations thereof;
(5) installing, adjacent to the cleaning shoe at its discharge end, a cob segment separating and cleaning means;
(b) threshing the ear into shelled corn and chaff consisting of husk, stalk, cob and debris;
(c) reducing the cob between the cylinder and concave into segments which expose pith and are of a defined length;
(d) separating at the concave, the cob segments and chaff into a first and second portion, the first portion consisting essentially of shelled corn and cob segments and the second portion consisting essentially of cob segments, husk, stalk and debris;
(e) conveying from the concave the first portion to the cleaning shoe;
(f) separating at the cleaning shoe the first portion into cob sections and shelled corn;
(g) collecting the shelled corn on the cleaning pan;
(h) conveying from the concave the second portion onto the straw separating means;
(i) separating in the straw separating means cob segments from the second portion husk, stalk and debris;
(j) disposing of the second portion husk and most of the second portion stalk and debris;
(k) conveying the second portion cob segments and remaining stalk and debris to the cleaning shoe;
(l) orienting the stalk on the cleaning shoe sieve by the fin means such that it travels longitudinally;
(m) transporting the cob segments to the cob separating means;
(n) separating the stalk and debris from the cob segments by cob cleaning means;
(o) disposing of the stalk and debris; and
(p) collecting the cob segments.

4,892,506
SYNERGETIC SPEED-VARIATING MEANS AS ECCENTRICALLY OPERATED
Maz Wen, P. O. Box 89-42, Taipei, Taiwan
Continuation-in-part of Ser. No. 135,331, Dec. 21, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 337,325
Int. Cl.⁴ F16H *55/30;* **B62M** *9/08*
U.S. Cl. 474—49 **8 Claims**

1. A speed variating means for bicycle or like comprising:
an outer driving disk having a central portion rotatably mounted on axle of a rear bike wheel, a plurality of radial slots formed in the disk each slightly inclined from a corresponding radius of the slot to form an approximate spiral shape of all the slots, and having an outer flange secured with a chain wheel driven by a bike chain;
an inner driving disk corresponding to said outer driving disk having a central annular extension rotatably engageable with a hub of the rear bike wheel, a plurality of radial slots formed in the inner driving disk each slightly inclined from a corresponding radius of each slot to form an approximate spiral shape;

a central sliding-roller carrier means sandwiched between said outer driving disk and said inner driving disk having a plurality of sliding block rotatably engageable in a first annular groove formed in a right side portion of said sliding-roller carrier means each sliding block having a roller protruding outwardly to be slidably engaged with each radial slot formed in said outer driving disk, and having a plurality of sliding blocks rotatably engageable in a second annular groove formed in a left side portion of said inner disk each sliding block having a roller protruding outwardly to engage each radial slot formed in said inner driving disk, each said sliding block having means for operatively coupling said block with said annular groove of said sliding-roller carrier means when forwardly driving said chain wheel and said outer driving disk; and





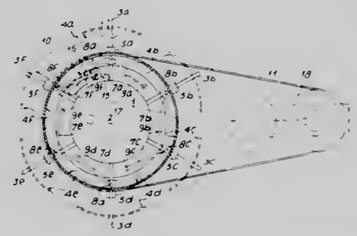
a variable speed-adjusting means having a fixing plate secured to an axle of the rear bike wheel, and an eccentric plate having a circular disk rotatably mounting said sliding-roller carrier means therein, said eccentric plate being operatively biased to eccentrically move said sliding-roller means with respect to said two driving disks, thereby obtaining a synergetic overall speed variation by multiplying a first speed variation exerting between said outer driving disk and said central sliding-roller carrier means, and a second speed variation exerting between said inner driving disk and said central sliding-roller carrier means.

4,892,507

SINGLE OR DOUBLE VARIABLE DIAMETER PULLEY AND SPEED VARIATORS INCLUDING SUCH A DOUBLE PULLEY

Pierre Patin, and Pierre-Armand Patin, both of Paris, France, assignors to Electricite de France Service National, Paris, France

Filed May 31, 1989, Ser. No. 359,625
Claims priority, application France, May 31, 1988, 88 07230
Int. Cl.[4] F16H *55/54*
U.S. Cl. 474—50 **18 Claims**



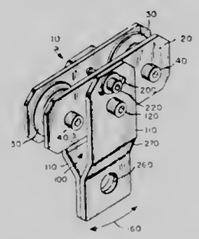
1. Variable diameter pulley rotating about a shaft (2) and provided with displaceable elements (4) for moving towards or away from the shaft under the action of a common regulating mechanism (10,7) all the elements being at a common distance from the shaft, as well as a guidance structure (3) for the displaceable elements, characterized in that the common regulating system is a disk (10) parallel to the pulley, which rotates relative to the pulley and which is provided with rods (4), whereof each is articulated at one end to a displaceable element, carries at its other end a counterweight and pivots (9) at an intermediate point on a pivot located on the disk, the pivots being located on a circle centred on the shaft.

4,892,508

SAFETY GUIDE SUPPORT FOR PIVOTING PULLEY

Robert Ryan, R.R. #1, Box 55, Richardson Rd., Ashby, Mass. 01431; Steven Webster, 21 Essex St., Newburyport, Mass. 01950; Richard Prouty, 20 Langsford St., Gloucester, Mass. 01930, and Peter Rosa, 84 Wildcat La., Norwell, Mass. 02061

Filed Jun. 13, 1989, Ser. No. 365,380
Int. Cl.[4] F16H *7/04*; B61B *12/00*
U.S. Cl. 474—101 **30 Claims**



1. An improved safety control mechanism for a pulley apparatus of the type comprising main support bars having at least two wheels mounted at their centers a spaced distance apart between the bars and a swing arm assembly pivotally connected to the bars at a point between the centers of the wheels, the swing arm assembly comprising a pair of arms straddling opposing surfaces of the bars and pivotally connected to the bars by a main pivot bolt mechanism extending through complementary aligned apertures in the arms and the bars, wherein the improvement comprises:

a second bolt mechanism extending through a second complementary aperture disposed in either the bars or the arms and a slot disposed in the other of the bars or the arms;

the second aperture or the slot provided in the bars being disposed in the spaced distance between the center mountings of the wheels;

the second aperture or the slot provided in the arms being aligned with the other of the second aperture or the slot provided in the bars with the arms and the bars connected by the main pivot bolt;

the slot having an arcuate engagement surface which follows the pivot of the arms and engages the second bolt mechanism against detachment of the arms upon failure of the main pivot bolt;

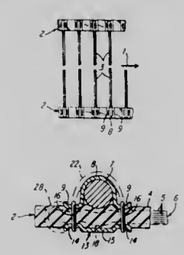
the second aperture and the slot being disposed around the complementary aligned apertures through which the main pivot bolt extends.

4,892,509

BELT WITH RODS FOR A ROD BELT CONVEYOR

Andreas Jäger, Burgdorf, and Friederich Röhrs, Celle, both of Fed. Rep. of Germany, assignors to Arnold Jäger, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,365
Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815115; Feb. 6, 1989, 3903475
Int. Cl.[4] F16G *1/00*; B65G *15/30*
U.S. Cl. 474—237 **27 Claims**



1. In a belt with rods for a rod belt conveyor, especially of an agricultural machine, in particular a harvesting machine, with said belt having two or more circumferential, flexible, inextensible bands that are interconnected by rods of steel or the like that are spaced from one another and extend transverse to the circumferential direction of said bands, and with said rods having ends that are secured to said bands by securing means that extend through said bands, the improvement comprising:

bands that are in a non-prepared state, not having any special holes or the like provided therein for securing means;

holder means, with a respective holder means extending about each of said rod ends; and

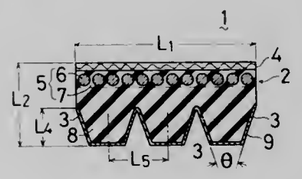
securing means in the form of clamps, with each of said holder means being held in place about its associated rod end via said clamps, which are adapted to be forced into said non-prepared bands.

4,892,510

V-RIBBED BELT AND THE METHOD OF MANUFACTURING THE SAME

Hiroshi Matsuoka, and Masaki Ochiai, both of Osaka, Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Division of Ser. No. 855,978, Apr. 25, 1986, Pat. No. 4,747,812. This application Nov. 24, 1987, Ser. No. 124,524
Int. Cl.[4] F16G *1/10*
U.S. Cl. 474—252 **6 Claims**



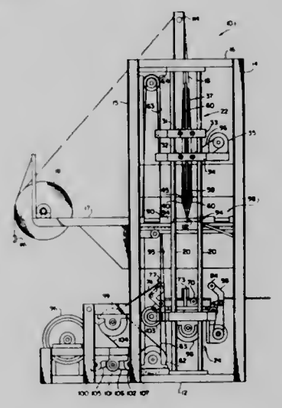
1. A V-ribbed belt having a plurality of ribs on a belt base along the lengthwise direction of said belt, each of said ribs being formed solely of rubber and having at the outer surface thereof a surface layer molded thereon and vulcanized thereto of a non-woven fabric having a thickness from about 0.01 to about 0.3 mm.

4,892,511

METHOD AND APPARATUS FOR THE AUTOMATIC MANUFACTURE OF FLAT BOTTOM BAGS

Robert A. Luciano; Lawrence W. Luciano, both of Lebanon; Don H. Rowe, Westfield, all of N.J., and Violet M. Hanson, 14 Fairway Dr., Old Bethpage, N.Y. 11804, assignors to Violet M. Hanson, Old Bethpage, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,859
Int. Cl.[4] B31B *33/28*
U.S. Cl. 493—194 **22 Claims**



1. In a machine for making and folding open top flat bottom bags from a heat sealable material comprising,

bag forming means on said machine for forming in the material, opposed faces and opposed sides and a flat bottom for a bag including said opposed faces and sides,

means on said machine supplying a continuous length of heat sealable material to said bag forming means,

closure sealing means on said machine for forming a closure seal on said material,

material severing means on said machine for severing a

length of said material to form the open top of the flat bottom bag,

folding means on said machine having bag bottom sealing means for sealing opposed portions of the opposite sides to the flat bottom, and said folding means and forming means being adjacent for engaging therebetween the opposed sides and bottom of the bag while said bottom sealing means seals portions of the opposed sides to the flat bottom of the bag, and said folding means having means for removing the severed length of material from said bag forming means while folding the flat bottom of the bag alongside an extent of the severed length of the material.

4,892,512

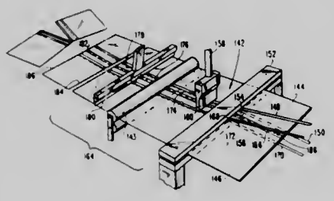
METHOD OF MAKING RECLOSABLE FLEXIBLE CONTAINERS HAVING FASTENER PROFILES AFFIXED TO EXTERIOR OF BAG WALLS

Mark Branson, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Division of Ser. No. 796,632, Nov. 8, 1985, abandoned. This application Aug. 11, 1987, Ser. No. 84,310

Int. Cl.[4] B31B *23/90, 23/72*

U.S. Cl. 493—194 **4 Claims**



1. A method of manufacturing flexible reclosable containers comprising:

advancing a double web of plastic material having a first layer and a second layer, said first layer having a top which faces away from said second layer, said second layer having a bottom which faces away from said first layer;

advancing a first fastener profile into proximity with the top of said first layer of plastic film and outboard of said layers;

advancing a second fastener profile into proximity with the bottom of said second layer of plastic film and outboard of said layers;

said first and second fastener profiles adapted to be selectively interlocked and having portions which are selectively interlockable;

aligning said first and second fastener profiles with said first and second layers of plastic material;

guiding said first fastener profile into contact with the top of said first layer of said plastic film and outboard of said layers;

guiding said second fastener profile into contact with the bottom of said second layer of said plastic film outboard of said layers with the selectively interlockable portions of said second profile facing the selectively interlockable portions of said first profile;

intermittently sealing said fastener profiles to said first and second layers of said plastic film; and

intermittently sealing sections of said first and second layers of plastic film into bag-shaped containers.

4. A method of making multiple plastic bags with reclosable fasteners thereon comprising:

continuously feeding a continuous strip of thermoplastic film having a rear wall portion and a front wall portion;

continuously feeding one or more rear fastener strips onto the exterior of said rear wall portion;

continuously feeding one or more front fastener strips onto the exterior of said front wall portion, each of said front fastener strips being aligned in parallel to a rear fastener strip; and

simultaneously sealing said front and rear fastener strips to said exterior of said front wall and rear wall portions respectively, and

applying a roller against said front fastener strips so as to cause said front fastener strips to press against and interlock with said rear fastener strips, said front and back walls of said thermoplastic film being interposed therebetween.

4,892,513

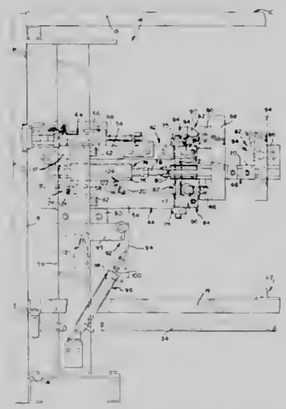
CARTON ERECTOR APPARATUS

Adam Kwiek, Chicago, Ill., assignor to Durable Packaging Corporation, Chicago, Ill.

Filed Jan. 30, 1989, Ser. No. 304,328

Int. Cl.[4] B31B *1/00, 5/74*

U.S. Cl. 493—316 **8 Claims**



1. A carton erecting apparatus for setting up cartons that are supplied to the apparatus as knocked-down carton blanks having side and end panels and top and bottom flaps formed integral therewith; said apparatus comprising: a carton blank storage section having a magazine means for storing and urging knocked-down carton blanks in a substantially vertical orientation with their bottom flaps lowermost towards a carton setup section located adjacent to said carton blank storage section; said carton setup section including a carton opening assembly for receiving a carton blank from said magazine means in a substantially vertical orientation and setting up said carton in a tubular form, said carton opening assembly having a folding arm and a pivot arm, said folding arm being secured to a first substantially vertical shaft and movable between a first position generally parallel to the side panel of said knocked-down carton blank in said magazine means and a second position generally perpendicular to the side panel of said knocked-down carton blank, said pivot arm being secured to a second substantially vertical shaft pivotally secured to said folding arm and movable between a first position substantially parallel to said folding arm and a second position substantially perpendicular to said folding arm, said carton assembly having a first means for moving said folding arm between its first and second positions and a second means for moving said pivot arm between its first and second positions; a first grasping means associated with said pivot arm for grasping a side panel of said carton blank from said magazine means when said pivot arm and said folding arm are in their respective first positions such that upon subsequent movement of said pivot arm and said folding arm into their respective second positions an end panel of said carton blank contacts said folding arm urging said carton blank into a setup tubular form; a second grasping means mounted to said folding arm and movable therewith for grasping said end panel of said carton when said folding arm is in its second position and a third grasping means mounted to said folding arm and movable therewith for grasping the other side panel of said carton when said folding arm is in its second position, said second and third grasping means cooperating with said first grasping means to cradle said carton and maintain it in its setup tubular form; and bottom flap folding means for infolding the bottom flaps of the setup carton.

4,892,514

BAG AND TUBE FOLDING METHOD AND APPARATUS

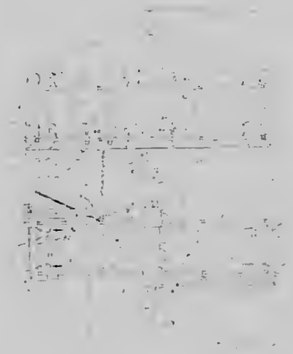
William C. Johnson, Omaha, Nebr., assignor to Rand Farm Systems Inc., Adrian, Mo. and Poly Farm, Inc., Grapevine, Tex., a part interest

Continuation of Ser. No. 697,210, Jan. 31, 1985, Pat. No. 4,775,359. This application Oct. 3, 1988, Ser. No. 253,195

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] B65H *45/107;* **B31B** *39/52*

U.S. Cl. 493—413 **1 Claim**



1. An apparatus for folding flexible tubular material, comprising:

a frame having an upper end and a lower end;

a plurality of fold-supporting surfaces mounted circumferentially about the frame adjacent the lower end thereof for supporting successive folds of flexible tubular material;

an array of first clamping fingers each extending radially outwardly from the frame below the fold-supporting surfaces at spaced apart locations for movement from a retractive position into an extended position to grip the flexible tubular material against the fold-supporting surfaces;

an array of second clamping fingers each extending radially from the frame above the fold-supporting surfaces at spaced apart location for movement from a retracted position into an extended position to fold the flexible tubular material downwardly about the extended first clamping fingers and to grip the fold against the fold-supporting surfaces;

upper actuating means for selectively pivoting the second clamping fingers between their extended and retracted positions;

lower actuating means for selectively pivoting the first clamping fingers between their extended and retracted positions;

the array of second clamping fingers and the array of first clamping fingers engaging the fold-supporting surfaces at alternate intervals;

means for supporting a quantity of flexible tubular material above the second clamping fingers; and

a guide assembly for guiding material from the material-supporting means to the fold supporting surfaces about the upper end of the frame.

4,892,515

ARTIFICIAL RIBBONED FLOWER MAKING METHODS AND APPARATUS

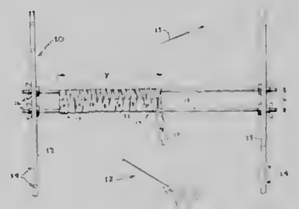
Pamela S. Stiegeler, 800 Johnson St., Box 1290, Coos Bay, Oreg. 97420

Filed Jul. 14, 1988, Ser. No. 219,034

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] D04D *7/00*

U.S. Cl. 493—956 **7 Claims**



1. A method of fabricating a variety of artificial flowers from ribbon material wherein said variety of artificial flowers includes: closed rosebuds; crysanthemums; closed cap mums; pom pon mums; dahlias, daisies, open roses; gladiolas; violets; poinsettias; bachelor buttons; carnations; azaleas; and hyacinth; wherein the materials required to practice the basic method comprise: ribbon material having diverse lengths, finishes, and widths; needle and thread; and, choosing a selected one among a plurality of open generally flat elongated framework members; wherein, each of the plurality of framework members consists of a side element and a pair of parallel arm elements of variable spacing "X" that project outwardly from the one side element; wherein the basic method steps comprise:

(a) choosing a selected one of said variety of artificial flowers;

(b) choosing a ribbon material having a selected length, finish, and width corresponding to choice (a);

(c) selecting an open framework member from among said plurality of framework members having the outboard edges of the arm elements disposed a predetermined distance "x" apart in accordance with choice (a);

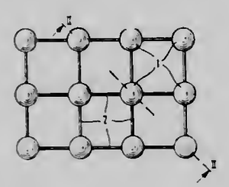
(d) wrapping the length of ribbon around the arm elements a number of times "y", and in accordance with a selected one of the following wrapping patterns: (1) straight wrap; (2) overlapping wrap; and (3) twisted wrap; wherein the beginning and end of each completed wrap are temporarily secured together;

(e) selecting among a needle and thread, and staples and thread to form a selected pattern across the ribbon wrap; while the ribbon is still wrapped around the arm elements; wherein the patterns comprise stitched and non-stitched versions including: (1) a straight stitch; (2) a single gather stitch; (3) a double gather stitch; (4) a plurality of tacking stitches; and, (5) a plurality of staples;

(f) removing the ribbon wrap from the open framework member.

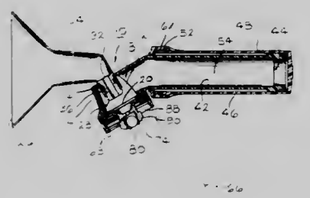
VOL 1110 ISS 2 JA 9 990 UMI

4,892,516
SURGICAL AID
Anton Härle, Münster-Roxel, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany
PCT No. PCT/EP83/00092, § 371 Date Jan. 9, 1984, § 102(e) Date Jan. 9, 1984, PCT Pub. No. WO83/03967, PCT Pub. Date Nov. 24, 1983
PCT Filed May 29, 1983, Ser. No. 598,546
Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217109
Int. Cl.[4] A61B *17/18*
U.S. Cl. 604—57 **10 Claims**



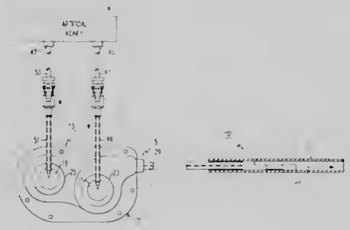
1. A surgical aid, capable of being incorporated into soft tissue wounds, the surgical aid comprising a pharmaceutically active compound retained in a support structure, the surgical aid permitting protracted release of the active compound, the support structure being configured as a flat article provided with individual free spaces, each individual free space having an area of at least 0.1 cm^2, the total area of the free spaces comprising at least 60 percent of the area of the flat article.

4,892,517
BREAST PUMP
Arthur H. Yuan, Hudson, Ohio, and Michael S. Joss, Chicago, Ill., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Apr. 11, 1988, Ser. No. 179,822
Int. Cl.[4] A61M *1/06*
U.S. Cl. 604—74 **6 Claims**



1. A breast pump for extracting milk from a mother's breast comprising:
- a central manifold having a cavity and a plurality of openings;
- a horn for coupling a mother's breast to be milked with the cavity of the manifold, the horn being symmetric about a first axis over the majority of its extent, the horn also having a projection rotatably positioned within one of the openings, the projection being symmetric about a second axis at an angle with respect to the first axis for varying the angular position of the horn with respect to the manifold for the convenience of the mother;
- a first fixed cylinder formed integrally with a second opening of the manifold;
- a second cylinder reciprocatingly received on the first cylinder for effecting a pumping action therebetween to create reduced pressure in the space within the horn, manifold and cylinders;
- a third opening within the manifold for coupling of the baby bottle therewith; and
- a ball valve located within the third opening whereby when the second cylinder is reciprocated with respect to the first cylinder and a vacuum created in the space within the horn, manifold and cylinders, the ball valve will seal the third opening and bottle from the space of reduced pressure and suck milk from a mother's breast in association with the horn.

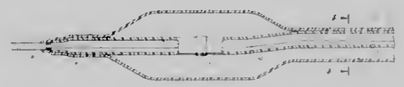
4,892,518
HEMODIALYSIS
James R. Cupp, Indiana; Robert D. Norman, Clymer; David L. Purdy, Marion Center, all of Pa., and Orlando Maytin, Lauderdale Lakes, Fla., assignors to Biocontrol Technology, Inc., Indiana, Pa.
Filed Dec. 4, 1987, Ser. No. 128,890
Int. Cl.[4] A61M *11/00*
U.S. Cl. 604—93 **17 Claims**



1. A hemodialysis port assembly including a port structured for complete subcutaneous implantation in a patient, septum means in said port, an inlet hypodermic needle and an outlet hypodermic needle to penetrate said septum means, said port assembly also including a catheter assembly connected to said septum means, said catheter assembly to be implanted in said patient with its distal end injected into a blood vessel of said patient, said catheter assembly including a first channel, to to connected to said inlet needle to pass detoxified blood from said inlet needle to said blood vessel, and a second channel conducting fluid separately from said first channel, to be connected to said outlet needle, to pass toxified blood from said blood vessel to said outlet needle, said first channel and said second channel being structured in said catheter so as to permit both said channels to be injected into a common blood vessel in transmission communication with the blood in said blood vessel, and valve means connected to each said channel for gating the flow of detoxified blood into said blood vessel and toxified blood out of said blood vessel.

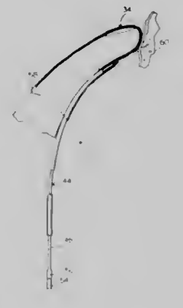
4,892,519
STEERABLE PERFUSION DILATATION CATHETER
Ronald W. Songer, and Peter R. McInnes, both of Sunnyvale, Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.
Filed Dec. 3, 1987, Ser. No. 128,154
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—96 **5 Claims**

1. A steerable dilatation catheter for use in coronary angioplasty, comprising:
(a) an outer tubular member having proximal and distal portions and having an inflatable balloon toward the distal end thereof;
(b) an inner tubular member disposed within the outer tubular member having an inner lumen and proximal and distal portions and generally defining an annular passageway with the outer tubular member for inflation and deflation of the balloon, the distal portion of the inner tubular member extending through and beyond the interior of the balloon;
(c) means sealing the sidewalls of the distal ends of the inner and outer tubular members together adjacent the distal end of the balloon to close the distal end thereof with at least one perfusion passageway passing through the sealed distal ends and being in fluid communication with the inner lumen of the inner tubular member;
(d) means sealing the sidewalls of the inner and outer tubular members together at an eccentric location along one side thereof adjacent the proximal end of the balloon without substantial obstruction of the inflation/deflation passageway
with at least one perfusion passageway extending through the sealed sidewalls of the inner and outer tubular members. said passageways being in fluid communication with the inner lumen of the inner tubular member for carrying blood therethrough to the perfusion passageways passing through the sealed sidewalls of the distal ends of the inner and outer tubular members; and
(e) a guidewire extending through and fixed within the innez lumen in the inner tubular member with a distal portion of the guidewire extending beyond the distal end of the tubular members.

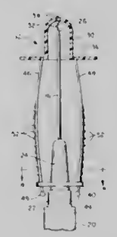


4,892,520
FINGER MOUNTED SURGICAL NEEDLE GUIDE/NEEDLE PROTECTOR
James H. Gilbaugh, 2902 SW. Canterbury La., Portland, Oreg. 97201
Continuation-in-part of Ser. No. 218,229, Jul. 13, 1988. This application Aug. 1, 1988, Ser. No. 226,796
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—117 **8 Claims**

1. A finger-mount guide for a surgical needle comprising
an elongate, finger-mountable, body having proximal and distal ends with an open lumen extending between said ends for receiving, freely and slidably, such a needle, and
an elongate, flexible, touch-sensitive, glance-protective attaching ribbon joined to said body adjacent, and extendible from, the latter's said distal end adjacent one side of the distal end of said lumen, adapted for folding longitudinally smoothly around the end of the user's finger with the guide in place on the finger, thus to promote, for the user, touch sensitivity, and finger/needle protectivity, during a guided surgical procedure.



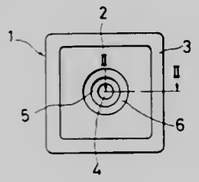
4,892,521
PROTECTIVE COVER FOR HYPODERMIC NEEDLE
Joseph P. Laico, New City, and Joseph L. Molino, Valley Cottage, both of N.Y., assignors to Lincoln Mills, Inc., New City, N.Y.
Filed Aug. 3, 1988, Ser. No. 227,756
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **12 Claims**



1. A protective hypodermic needle cover assembly comprising:
hypodermic needle means comprising a mounting base and a needle connecting said base and terminating in a sharpened point axially spaced from said base, said base comprising a transversely projecting guide means defining a pair of apertures;
protective shield means mounted to said base for protectively shielding said needle point in an extended protective position, said shield means comprising a cap-like member defining a needle opening, said needle extending through said opening to expose said needle point in a retracted position; and
a pair of guide rods extending from said protective shield means and received in said apertures so that the rods move through said apertures when the protective shield means is displaced from the retracted to protective positions, said rods connecting said protective shield means to said hypodermic means in the protective position.

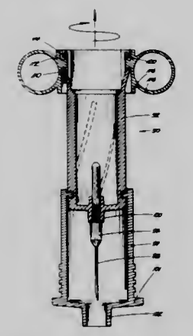
VOL 1110 ISS 2 JA 9 990 UMI

4,892,522
DEVICE FOR PREVENTING INJURY WHEN CAPPING INJECTOR NEEDLE AFTER USE
Tsuyoshi Suzuki, Tokyo, and Shoji Kudoh, Noda, both of Japan, assignors to Seirin Kasei Co., Ltd., Shimizu, Japan
Filed Jun. 14, 1988, Ser. No. 206,365
Claims priority, application Japan, Jun. 17, 1987, 62-93108[U]; Jan. 13, 1988, 63-1986[U]; Jan. 13, 1988, 63-1987[U]
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **10 Claims**



1. A device for use with a tubular cap for an injection needle, comprising a plate shaped member made of a synthetic resin material and having a plane when assembled on the cap that extends substantially transverse to the axis of the tubular cap, said plate member comprising an outer peripheral wall portion having an axial thickness that provides the plate shaped member with the required strength and an inner wall portion integral with the outer portion and having a thickness smaller than the thickness of the outer peripheral portion, said inner wall portion having an inner edge defining an opening having an inner diameter which is smaller than the outer diameter of the cap near the end where the needle is to be inserted, a first thin-walled portion and a second thin-walled portion having a thickness larger than that of the first thin-walled portion, the inner wall portion of the plate shaped member elastically flexing as the cap is inserted through the opening in the plate-shaped member with the inner edge of the opening gripping the outer surface of the cap to hold the plate in place.

4,892,523
SHIELDED SAFETY SYRINGE
Terry Haber, Lake Forest; Clark B. Foster, El Toro, and William H. Smedley, Lake Elsinore, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.
Division of Ser. No. 43,042, Apr. 27, 1987, Pat. No. 4,758,231.
This application Jul. 11, 1988, Ser. No. 217,369
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **4 Claims**



1. A shielded syringe assembly comprising an inner syringe cylinder having an open proximal end and a substantially closed distal end, a hypodermic needle supported at and extending outwardly from said distal end, and an outer protective sleeve having an open proximal end and an opening in a substantially closed distal end, said outer sleeve coaxially aligned with and axially advanceable relative to said inner cylinder from a retracted position, where said needle projects outwardly through the opening in said sleeve, to an extended position, where said needle is located within and completely surrounded by said sleeve;
said inner cylinder having at least one groove extending between the proximal and distal ends thereof; and
said outer sleeve having at least one bump extending therefrom for receipt within the groove of said inner cylinder;
said bump riding through said groove from the proximal to the distal ends of said inner cylinder when said outer sleeve is advanced axially from the retracted to the extended position relative to said inner cylinder to thereby releaseably retain said outer sleeve in the extended position with said needle shielded by said sleeve.

4,892,524
INTRAVENOUS ADMINISTRATION SYSTEM
Gordon Smith, 1320 Pinehill Dr., Jefferson, Tex. 75657
Filed Oct. 30, 1987, Ser. No. 115,424
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—246 **16 Claims**



1. An apparatus for administering a liquid to a patient comprising:
(a) at least one container for holding liquid suspended elevated above the patient;
(b) a passive metering device located a sufficient distance from the container to effect a substantial hydrostatic head pressure, the passive metering device containing at least one restricted orifice through which fluid may flow, the metering device located below the container;
(c) a regulator having a fluid chamber and an air-tight exit valve comprising means to obstruct air flow therethrough, the regulator located a pre-selected distance below the container;
(d) first flexible tubing connecting the container to the regulator with the metering device located therebetween so that constant volumetric flow from the container to the regulator is assured by the combination of constant hydrostatic pressure drop from the container to the regulator and the restricted flow through the metering device; and
(e) second flexible tubing connecting the output of the regulator to the patient so that instantaneous fluid flow to the patient is determined by the head pressure from the regulator to the patient.

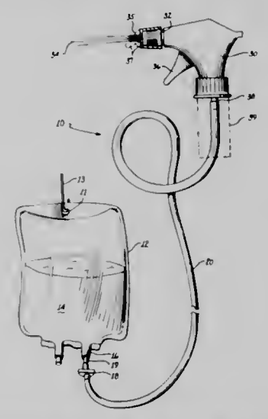
4,892,525
HYPODERMIC NEEDLE PROTECTIVE BARREL AND CAP PACKAGING
William J. Hermann, Jr., Sealy, and John R. Zanek, Missouri City, both of Tex., assignors to Synertex, Missouri City, Tex.
Filed Jan. 18, 1984, Ser. No. 571,779
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—263 **14 Claims**



1. In a protective barrel and cap packaging for enclosing a hypodermic needle, which is attached to hub at a proximate and extends axially to a distal end, wherein said packaging consists essentially of the combination of an axially extending protective barrel and a protective cap, wherein said barrel has an open end and a closed end, said open end being adapted to accept entry of a needle tip and frictionally engage about an outer surface of a needle hub, and said barrel closed end being adapted to surround a needle tip inserted therein, wherein further said protective cap has an open end and a closed end, said cap open end being adapted to engage with said barrel open end thereby to define an enclosure for any needle therewithin, the improvement comprising:
a needle entrance guide means attached to said barrel open end and extending laterally and axially therefrom to define a laterally enlarged barrel opening with a transition ramp surface into the barrel open end, and towards the barrel closed end to guide a laterally misaligned needle tip axially into said protective barrel open end, said ramp surface making an included angle with the axial centerline of said barrel which is greater than 45 degrees and defining an obverse ramp outer surface between said enlarged barrel opening and said barrel outer surface which has a lateral projected width greater than 0.5 cm. and wherein a laterally enlarged cap open end is defined to engage with said laterally enlarged barrel opening, thereby to define said enclosure, whereby the obverse surface to said ramp surface encourages a user's fingers to locate behind the ramp and around a barrel outer surface which is proximate the barrel open end.

4,892,526
SURGICAL IRRIGATION APPARATUS
H. William Reese, 3214 S. River Rd., Tempe, Ariz. 85282
Filed Aug. 18, 1988, Ser. No. 234,029
Int. Cl.[4] A61M *7/00*
U.S. Cl. 604—290 **1 Claim**

1. A method, for providing sufficient quantities of irrigation fluid onto exposed tissue during surgical procedures, comprising the following:
providing a plastic intravenous bag having a suitable fluid located within an inner evacuable chamber, a puncturable and sealable outlet opening, and a means attached to said bag for holding the bag in any desired elevated position;
drawing the fluid from the intravenous bag through a fluid conduit made of flexible tubing, said conduit having a hollow lance coupling device for insertion into said outlet opening of said intravenous bag;
drawing the fluid from said intravenous bag into said conduit to pump spray means which emits a spray of the fluid; and



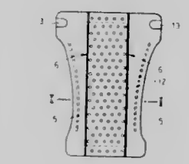
providng a multi-directional adapter at the outlet of said pump spray means to selectively direct the spray of the fluid in various directions while maintaining the pump spray means in one position.

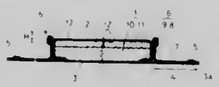
4,892,527
SPORTMAN'S REUSABLE, ANTI-COLLAPSING URINE COLLECTION DEVICE
Zbig Z. Zivny, 104 Wintergreen Hill, Painesville, Ohio 44077
Filed Sep. 10, 1987, Ser. No. 95,174
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—353 **13 Claims**



1. A reusable urine containment device comprising:
a holster,
a reservoir tube contained within the holster,
means for preventing the collapse of the reservoir tube in response to outside pressure having a magnitude that a leg of a wading fisherman would experience, said anticollapse structure maintaining said magnitude even if wet, said means comprising an anti-collapse structure contained within the reservoir tube, and
means for securing the containment device in operating position.

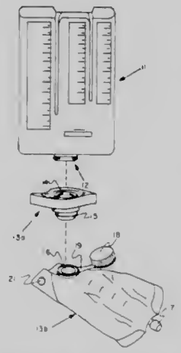
4,892,528
DISPOSABLE DIAPER
Migaku Suzuki, Kawanoe; Mitsuzo Ochi, Ehime, and Takeshi Kudo, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan
Continuation of Ser. No. 69,181, Jul. 1, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,298
Claims priority, application Japan, Jul. 4, 1986, 61-158609; Aug. 20, 1986, 61-194500
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.2 **9 Claims**





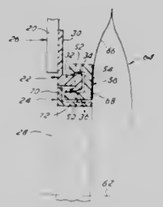
1. A disposable diaper comprising in combination
(a) a thick absorbent core (1) having a top surface, a bottom surface and two side surfaces,
(b) a top sheet (2) extending over both the top surface and the two side surfaces of said absorbent core (1), the portion of said top sheet (2) that extends over the top surface of said adsorbent core (1) being water-permeable,
(c) a water-impermeable backsheet (3) extending over the major portion of the bottom surface of said absorbent core (1) and having two lateral portions that extend laterally outwardly from the sides of said absorbent core (1),
(d) two sheets (7) resistant to the passage of water disposed adjacent to and at least partially outwardly from the two side surfaces of said absorbent core,
(i) the outer portion of each of said sheets (7) being joined to the portions of said water-impermeable backsheet (3) that extend laterally from the sides of said absorbent core (1) so that together they form side flaps (4),
(ii) the inner portion of each of said sheets (7) being formed into the general shape of an inverted "U" (8) that has the two ends of the "U" facing toward said backsheet (3) with one section of said inner portion being disposed in a parallel relationship to and in close proximity to the portion of said top sheet (2) that extends along the sides of said absorbent core (1), said inverted "U" portion (8) extending above said backsheet (3) to a point which is above the top surface of said absorbent core (1) so as to form a leakage-protecting baffle (6) that extends above the top surface of said absorbent core (1),
(e) a length of elastic material (9) disposed within the inverted "U" inner portion (8) of each of said sheets (7), and
(f) an elongated elastic band (5) joined to each side flap (4).

4,892,529
METHOD OF AUTOLOGOUS TRANSFUSION
Michael A. Valerio, Wallingford, Conn., assignor to Sherwood Medical Company, St. Louis, Mo.
Continuation of Ser. No. 923,058, Oct. 24, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 268,666
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—317 **6 Claims**



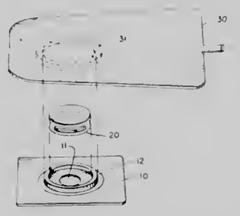
1. A method of autologously transfusing a patient which comprises:
(a) collecting blood from the chest cavity of the patient in the collection bottle of an underwater drainage device for the chest cavity;
(b) detaching the collection bottle from the underwater drainge device;
(c) placing in fluid-tight communication with the blood collected in the collection bottle, a transfer blood bag having first and second ends and a means at the second end thereof to be placed in fluid-tight communication with an infusion set for the patient;
(d) transferring the collected blood from the collection bottle to the transfer bag through the first end of said transfer bag; and
(e) allowing the blood collected in the transfer bag to be infused into the patient through the infusion set.

4,892,530
OSTOMY COUPLING
Peter L. Steer, Surrey, England, assignor to Edward Weck Incorporated, Princeton, N.J.
Continuation of Ser. No. 936,056, Nov. 28, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 142,351
Claims priority, application United Kingdom, Dec. 10, 1985, 8530369
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—338 **1 Claim**



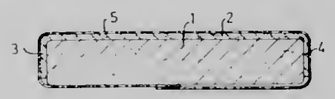
1. An ostomy appliance intended for attachment to a peristomal area of a wearer including a pad of medical -grade skin-attachable adhesive material, a first coupling element secured thereto, the element having an extending flange attached to a surface of the pad and an upstanding rib of closed loop form constructed to couple with a counterpart second coupling element on a bag or pouch having a stomal orifice, said second coupling element comprising inner and outer parallel spaced apart upstanding walls which form a channel surrounding the stomal orifice to accept the upstanding rib of the first coupling element and a separate inner chute member located radially within and adjacent to the first coupling element, the chute member having a substantially cylindrical wall covering the whole of the radially inner surface of the first coupling element and, at one of its ends, a radially outwardly extending flange positioned to be engaged under the end of the inner wall of said second coupling element said chute member is trapped when the two coupling elements are coupled together.

4,892,531
ANTI-SEAL DEVICE FOR USE WITH OSTOMY APPLIANCES
Jack L. Metz, deceased, late of Des Plaines, Ill., and by Florence Metz, executrix, 469 Oak St., Des Plaines, Ill. 60016, assignors to Florence Metz, Des Plaines, Ill.
Filed Sep. 11, 1987, Ser. No. 95,212
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—340 **3 Claims**



1. An improved ostomy appliance for collecting waste material emitted from a human body through a stoma, said appliance comprising:
a diaphragm having an aperture adapted to permit the stoma to enter and project slightly therethrough;
first means for attaching said diaphragm to the body;
a pouch having an inner wall and an outer wall, said walls being joined along peripheral edge margins thereof for storing body waste materials emitted from the stoma, said inner wall having an opening to allow the entrance of the waste material into said pouch, said pouch opening being in register with said diaphragm aperture;
second means for attaching said pouch to said diaphragm so as to define a passageway adapted to allow the passage of the waste material from the stoma into said pouch;
a cup-like anti-seal device located within said pouch between said outer wall and said diaphragm and having a completely closed end which faces said pouch outer wall, a cylindrical side wall peripherally secured at one end thereof to said closed end, said side wall having at least one opening therein and a thickness sufficient to maintain said outer pouch wall away from the stoma, said side wall defining an open end of said device opposite said closed end, said open end positioned within said pouch to contact said diaphragm, to be inserted into said opening and to circumscribe the stoma so as to maintain said outer wall away from the stoma, such that externally applied pressure to said closed end is conveyed around the entire periphery of the stoma and the stoma is protected from direct impact.

4,892,532
DISPOSABLE LIQUID-ABSORBING ARTICLE
Lars Boman, Mölndal, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden
PCT No. PCT/SE87/00250, § 371 Date Dec. 29, 1987, § 102(e) Date Dec. 29, 1987, PCT Pub. No. WO87/07117, PCT Pub. Date Dec. 3, 1987
PCT Filed May 20, 1987, Ser. No. 150,406
Claims priority, application Sweden, May 27, 1986, 8602413
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—366 **6 Claims**



1. A disposable liquid-absorbing article such as a diaper, a sanitary napkin or the like comprising an absorption body (1), a casing (5) surrounding said body (1) and having a portion adapted to face the user of the article, said casing (5) being liquid permeable at least in its portion adapted to face the user of the article, characterized in that the liquid-permeable portion of the casing (5) consists of a thin, spun-bonded fibrous fabric layer composed of a hydrophobic material, and in that a similarly constructed hydrophobic fibrous layer of melt-bonded fiber fabric is applied between said casing portion and the absorption body, the latter said layer (2) having a weight per unit area which is greater than that of said casing portion.

4,892,533
ULTRAHIGH WATER-ABSORBING FIBER-FORMING COMPOSITION
Bi Le-Khac, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.
Division of Ser. No. 834,075, Feb. 26, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,634
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—368 **20 Claims**

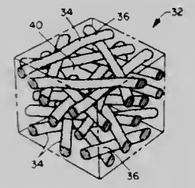
1. A stable, heat curable, aqueous composition comprising in weight percent:
(a) from about 80 to about 99.5 of a copolymer containing from about 25 to about 75 mole percent of about 20 to about 80 percent neutralized carboxylic acid substituted ethylenic units and from about 75 to about 25 mole percent recurring units of at least one copolymerizable comonomer; and
(b) at least one heterocyclic carbonate compound wherein the resulting aqueous composition is uncured and stable at room temperature.

4,892,534
NONWOVEN WEB USEFUL AS A BODYSIDE LINER FOR AN ABSORPTION ARTICLE
Paul J. Datta, and Gary C. Anderson, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 30, 1988, Ser. No. 292,600
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—370 **22 Claims**

10. A fluid permeable, nonwoven web useful as a bodyside liner for a feminine pad comprising 3 to 8 layers of thermoplas-

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tic filaments bonded together, said filaments having a denier of between about 4 to 10, web having a basis weight of between



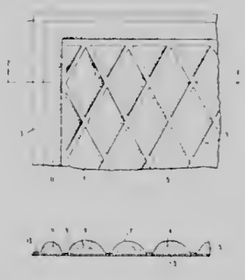
about 0.7 to 1.0 ounces per square yard and a density of between about 150 to 350 meters per cubic centimeter.

4,892,535

ABSORBENT PAD AND METHOD AND APPARATUS FOR MAKING THE SAME

Sten Björnberg, Spanga, and Ove Ahlstrand, ålvsjö, both of Sweden, assignors to Landstingens Inköpscentral, Lic, Ekonomisk Förening, Solna, Sweden

Filed Aug. 7, 1987, Ser. No. 82,725
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—380 **5 Claims**



1. An absorbent pad comprising a liquid-impervious back sheet, a plurality of bodies of liquid-absorbent material disposed on one surface of the back sheet, and a liquid-pervious cover sheet covering said bodies of absorbent material and directly secured to the back sheet along lines which separate said bodies of absorbent material, these lines being substantially free from said absorbent material.

4,892,536

ABSORBENT ARTICLE HAVING ELASTIC STRANDS

Thomas A. DesMarais; Mary E. Freeland, both of Norwood, and William J. Moore, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 2, 1988, Ser. No. 240,149
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.2 **14 Claims**

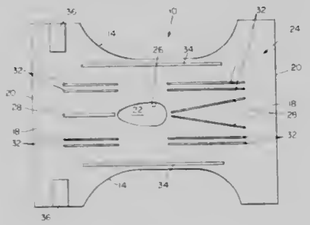
1. A disposable absorbent article having a longitudinal axis, said article comprising:

a urine impervious backsheet;

a urine pervious liner having a front portion, a rear portion and at least one passageway adapted to permit waste materials to pass through said liner, said liner being at least partially peripherally affixed to said backsheet;

an absorbent core intermediate said liner and said backsheet;

a means for contracting said liner in the longitudinal direction, said contracting means being disposed substantially longitudinally nonadjacent said passageway and in the front portion of said liner; and



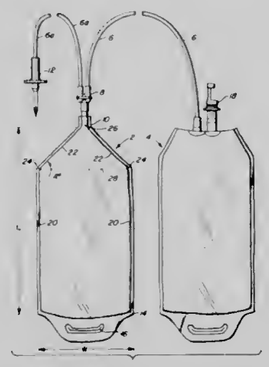
a means for contracting said liner in the longitudinal direction, said contracting means being disposed substantially longitudinally nonadjacent said passageway and in the rear portion of said liner.

4,892,537

BAG FOR SEPARATION AND ISOLATION OF BLOOD COMPONENTS

Raleigh A. Carmen, Concord; Barry S. Leng, Pleasant Hill; Willie J. Lewis, Oakland, and Edward J. Nelson, San Rafael, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 11, 1985, Ser. No. 700,793
Int. Cl.[4] A61B *5/00*; B65D *33/00*
U.S. Cl. 604—408 **7 Claims**



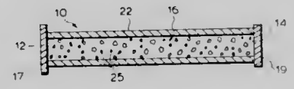
1. A blood bag for separation and isolation of neocyte red blood cells from a mixture of neocyte and gerocyte red blood cells, the bag comprising a generally flat, elongated, edge-sealed polymeric bag having a length to width ratio of at least 2 to 1 and comprising substantially parallel major sides and an upper end portion having two opposite top minor sides extending directly from the major sides and which minor sides are in direct and tapering communication with a connected polymeric tubing such that, when the bag is expanded by the mixture which is then separated into neocytes and gerocytes according to a predetermined density gradient, the upper end portion forms a funnel-like guide adapted for directing the neocyte red blood cells from the bag and through the tubing in a substantially unobstructed manner.

4,892,538

IN VIVO DELIVERY OF NEUROTRANSMITTERS BY IMPLANTED, ENCAPSULATED CELLS

Patrick Aebischer; Shelley R. Winn, and Pierre M. Galletti, all of Providence, R.I., assignors to Brown University Research Foundation, Providence, R.I.

Filed Nov. 17, 1987, Ser. No. 121,626
Int. Cl.[4] A61K *9/22*
U.S. Cl. 604—891.1 **24 Claims**



I. A method of delivering a neurotransmitter to a subject afflicted with a neurotransmitter deficiency comprising the steps of:

encapsulating at least one neurotransmitter-secreting cell within a semipermeable membrane, said membrane allowing the diffusion of the neurotransmitter therethrough while excluding viruses, antibodies and other detrimental agents present in the external environmental; and

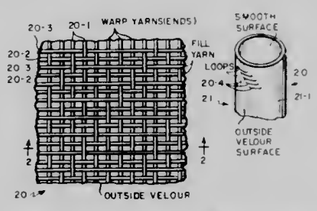
implanting said encapsulated cell into a target region within a subject's brain, such that the encapsulated cell secretes the neurotransmitter and thereby provide constitutive delivery of the neurotransmitter to the target region to treat the deficiency.

4,892,539

VASCULAR GRAFT

Durmus Koch, Demarest, N.J., assignor to D-R Medical Systems, Inc., Northvale, N.J.

Filed Feb. 8, 1988, Ser. No. 152,978
Int. Cl.[4] A61F *2/06, 2/04*; D03D *3/02*
U.S. Cl. 623—1 **16 Claims**



1. A vascular graft comprising a seamless tube of crimped woven texturized yarn fabric, said tube having a complete outer velour surface and a smooth inner surface, said outer velour surface having loops open to receive tissue ingrowth formed of fill yarn, each of said loop extending outside of a plurality of warp yarns.

4,892,540

TWO-LEAFLET PROSTHETIC HEART VALVE

Franco Vallana, Turin, Italy, assignor to Sorin Biomedica S.p.A., Saluggia, Italy

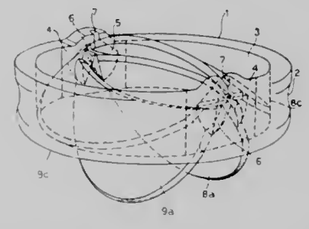
Filed Apr. 20, 1988, Ser. No. 183,774
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **8 Claims**

1. A prosthetic heart valve for reducing the formation of thrombi comprising:

(a) a base ring adapted to house a suture ring in its exterior for suturing to the heart tissue, wherein said base ring includes an inner surface with walls forming two diametrically opposed recesses which communicate with the exterior, and wherein said recesses include:

(i) an upper portion having a substantially flat surface with an opening therebetween;

(ii) a lower portion separated into two spherical bottom surfaces by a separator body wherein said separator body extends from said lower portion of said recess and said separator body comprises a wedge shape to provide an opposing recess portion on each side of said separator body; and



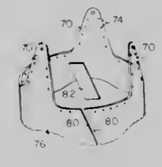
(b) two leaflets having an open position and a closed position for regulating the flow of blood in one direction wherein each of said leaflets has a pair of tongues with one tongue on each side of each leaflet positioned in a recess portion of each of said opposing recesses, and wherein said tongues of said leaflets have continuously changing point contact with the walls of said opposing recesses when said leaflets move between said open position and said closed position for preventing the formation of thrombi as the blood flows from and through said recesses.

4,892,541

HEART VALVE PROSTHESIS

Manuel T. Alonso, Newport Beach, Calif., assignor to Tascon Medical Technology Corporation, Minneapolis, Minn.

Division of Ser. No. 664,150, Oct. 24, 1984, Pat. No. 4,680,031, which is a continuation-in-part of Ser. No. 445,259, Nov. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 303,345, Oct. 7, 1982, abandoned. This application Jan. 29, 1987, Ser. No. 8,207
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **6 Claims**



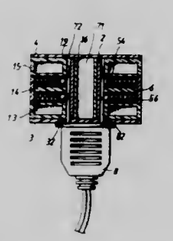
1. A method of fabrication of a stent for an artificial heart valve comprising:

cutting a plate of metal having a thickness of 0.010 inches or less to produce an elongated stent member having a first end, a second end, a lower edge, and an upper edge, said upper edge provided with three commissural posts extending therefrom;

bending said stent member to place said first end adjacent said second end of said stent member; and

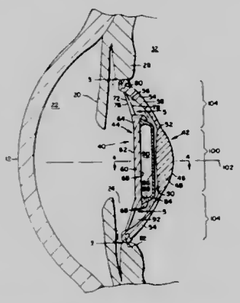
mechanically coupling said first end to said second end of said stent member.

4,892,542
SOCKET
Tian T. Wang, No. 26, Lane 293, Hua Cheng Rd., Hsin Chuang City, Taipei Hsien, Taiwan
Filed Apr. 6, 1989, Ser. No. 333,968
Int. Cl.[4] H01R *13/10*
U.S. Cl. 439—818 **6 Claims**



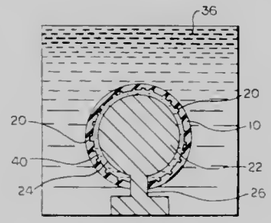
1. A socket comprising:
a casing having a number of insulating partition plates to form a major configuration of said socket which has two symmetrical lateral sides separated by a plurality of compartments, said compartments being separated by a plurality of vertical insulation partition plates corresponding to prongs of a plug, at least one lateral cylindrical chamber being formed on each lateral side of said casing;
a conducting plate being disposed in two of said compartments which are formed each between a lateral side of said socket and a vertical insulating partition plate, and bearing against said vertical insulating partition in order to form a receptacle between said conducting plate and said lateral side of said socket;
a ball and a spring being disposed in series in each lateral cylindrical chamber;
a partition wall disposed on each outer end of said lateral cylindrical chamber for retaining and forcing said spring and said ball into position.

4,892,543
INTRAOCULAR LENS PROVIDING ACCOMODATION
Dana F. Turley, 4651 Prices Creek Rd., Huntington, W. Va. 25701
Filed Feb. 2, 1989, Ser. No. 305,603
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 **14 Claims**



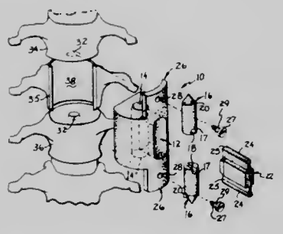
1. An intraocular lens for mounting within the ciliary body of a host eye and capable of emulating the natural process of accommodation comprising first optical means having a first refractive power, second optical means having a variable refractive power, said first and second optical means being connected together for relative movement along the principal axis of lens, said first optical means including a surface of predetermined configuration engageable by said second optical means upon relative movement of said first and second optical means towards each other in response to contraction of the ciliary body to increase the refractive power of the lens.

4,892,544
METHODS FOR FORMING HOLLOW, POROUS-SURFACED ELASTOMERIC BODIES
Eldon E. Frisch, Midland, Mich., assignor to Dow Corning Wright Corporation, Arlington, Tenn.
Filed Mar. 7, 1988, Ser. No. 164,700
Int. Cl.[4] A61F *2/06*; C08J *9/26*; B29C *41/02*
U.S. Cl. 623—11 **20 Claims**



1. A method of making a hollow elastomeric body having a porous surface layer comprising
(a) coating at least a portion of a surface of a mandrel with a coating liquid selected from the group consisting of water, water-and-wetting agent solutions, and water-an-sugar solutions
(b) adhering a layer of water-elutable particles onto the coated mandrel surface,
(c) applying a layer of fluid elastomer composition to the particle-coated mandrel surface, said elastomeric composition capable of forming a water-insoluble elastomer,
(d) causing said elastomeric composition to form a cohesive mass while in contact with said particle-coated mandrel surface,
(e) dissolving said elutable particles from said cohesive mass with a water-based solvent, and
(f) removing said cohesive mass from said mandrel.

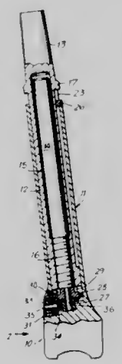
4,892,545
VERTEBRAL LOCK
James L. Day, and Richard B. Budde, both of Cincinnati, Ohio, assignors to Ohio Medical Instrument Company, Inc., Cincinnati, Ohio
Filed Jul. 14, 1988, Ser. No. 219,087
Int. Cl.[4] A61F *2/44*
U.S. Cl. 623—17 **9 Claims**



1. A vertebral lock comprising:

(a) a body seatable within a cavity formed by removal of a portion of a vertebra from a spinal column,
(b) a central slot presented by said body,
(c) a pair of guide holes in said body, said guide holes extending substantially perpendicularly from said slot in opposite directions through respective ends of said body,
(d) a retaining pin axially slidably received in and axially guided by each said guide hole, each pin having a pointed tip at an outer end thereof, said tip in use projecting outwardly of said body for engaging a vertebra, each pin having an inner end which extends into said slot; and
(e) locking member insertable into said slot perpendicularly to said pins after said pins have been projected outwardly of said body to positively abut and stop the inner ends of said pins and thereby lock the pins in said guide holes with their tips projecting outwardly of said body.

4,892,546
ADJUSTABLE PROSTHESIS FOR A JOINT BONE
Rainer T. Kotz, Vienna, Austria, and Hans E. Harder, Probsteierhagen, Fed. Rep. of Germany, assignors to Howmedica GmbH, Schoenkirchem, Fed. Rep. of Germany
Filed May 3, 1988, Ser. No. 189,570
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 8706999
Int. Cl.[4] A61F *1/00*
U.S. Cl. 623—18 **9 Claims**



1. An adjustable prosthesis for a bone joint, comprising a joint component, an elongated rod having a distal end and a proximal end, a drive trunnion connected to said rod through an angular gear, an elongated inner sleeve, an outer sleeve and means for preventing rotation of said inner sleeve within said outer sleeve, said elongated rod including a threaded spindle and said inner sleeve including a threaded spindle nut which cooperates with said threaded spindle to provide longitudinal adjustment of the inner sleeve relative to the rod, said inner sleeve being telescopically slidable within said outer sleeve but being prevented by said means from rotating within said outer sleeve, said outer sleeve being secured to said joint component, said elongated rod being supported at its proximal end in said joint component for rotation relative to the joint component by said drive trunnion and angular gear, said drive trunnion being rotatably supported in said joint component, and said elongated rod having means for being releasably fixed against said rotation.

4,892,547
PARTIALLY STABILIZED KNEE PROSTHESIS
David R. Brown, Warsaw, Ind., assignor to Biomet, Inc., Warsaw, Ind.
Filed Feb. 3, 1988, Ser. No. 151,659
Int. Cl.[4] A61F *2/38*
U.S. Cl. 623—20 **15 Claims**

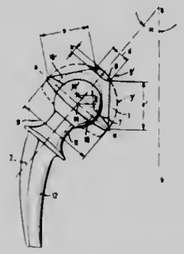


1. A knee joint prosthesis, comprising:
a femoral component, adapted for implantation on the condylar end of the femur, having a pair of spaced-apart condylar bearing portions, an anterior intercondylar portion, a posterior intercondylar portion, and an intercondylar opening between said anterior and posterior intercondylar portions, said femoral component having an interior contour which closely matches an exterior contour of the end of the femur after the femur has been prepared to receive the femoral component, said interior contour being at least partially defined by generally horizontal superior surfaces of the condylar bearing portions and by the intercondylar opening, said intercondylar opening lying in a common plane with, or inferiorly to, said horizontal superior surfaces of the condylar bearing portions; and
a tibial component, adapted for implantation on the tibial plateau, having a pair of spaced-apart bearing surfaces for supporting the condylar bearing portions of the femoral component, and having an intercondylar eminence between the bearing surfaces, said eminence having a posterior side and a peak which defines the highest portion of the tibial component, as measured relative to the tibial plateau;
wherein, the peak of the intercondylar eminence on the tibial component extends into, but not through, and interacts with the intercondylar opening to define a partially stabilized prosthesis, such that resection of the femur to provide clearance for the intercondylar opening and the intercondylar eminence is unnecessary.

4,892,548
JOINT SOCKET
Gino Niederer, Zollikofen, and Otto Frey, Winterthur, both of Switzerland, assignors to Gebruder Sulzer, Winterthur and Protek AG, Bern, both of, Switzerland
Filed Jan. 3, 1983, Ser. No. 454,993
Claims priority, application Switzerland, Jan. 12, 1982, 147/82
Int. Cl.[4] A61F *2/34*
U.S. Cl. 623—22 **6 Claims**

1. A joint socket for receiving a spherical joint head of a hip joint prosthesis, said socket having a non-metallic body with an external surface at least partly of a surface of revolution about a longitudinal axis and an internal hemispherical cavity;
a metallic contrast ring in said surface of said body concentric to said axis; and
a metal measuring ring fixed in said surface in an area opposite and spaced from said cavity and concentric to said axis, said measuring ring being longitudinally spaced from

and parallel to said contrast ring wherein the spacing of said measuring ring from said contrast ring is so great that



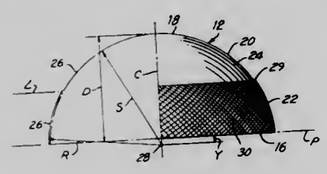
said measuring ring does not lie in the shadow region of a spherical joint head in an X-ray photograph.

4,892,549

DUAL-RADIUS ACETABULAR CUP COMPONENT

Harry E. Figgie, III, Pepper Pike, Ohio; Alfred J. Zarnowski, North Plainfield, and Matthew V. Lyons, Hoboken, both of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Jan. 31, 1989, Ser. No. 304,752
Int. Cl.[4] A61F 2/34
U.S. Cl. 623—22 **14 Claims**



1. A shell component for use in an acetabular cup assembly of a prosthetic joint, the shell component having a dual-radius outer surface contour configured for implant into an acetabulum and securement therein by an interference fit, the shell component comprising:

a lower rim;

an apical region spaced upwardly in an axial direction a given distance from the lower rim;

an intermediate location spaced approximately one-half the distance between the lower rim and the apical region; and

an outer surface having a first generally spherical surface portion extending upwardly from the lower rim to the intermediate location, and a second generally spherical surface portion extending upwardly from the intermediate location to the apical region, the first generally spherical surface portion having a radius slightly greater than the radius of the second generally spherical surface portion.

4,892,550

ENDOPROSTHESIS DEVICE AND METHOD

Donald L. Huebsch, 3716 Prestwick Dr., Los Angeles, Calif. 90027

Filed Dec. 30, 1985, Ser. No. 814,690
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—22 **37 Claims**

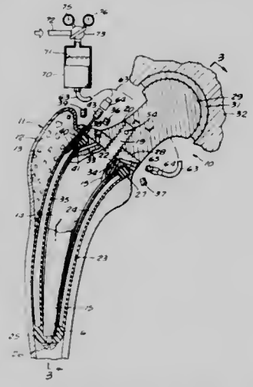
1. A pressurizable elastic endoprosthesis anchoring apparatus freely insertable into a medullary canal and thereafter immovably anchorable thereto comprising:

an elongated load bearing stem;

an elastic member mounted around and extending lengthwise of said stem; and

means for compressing said elastic member radially outward into pressurized contact with the juxtaposed surface of the medullary canal after insertion therein;

the elastic member being fluid impervious and having an internal cavity, and said means for compressing said elastic member including means for introducing a fluent medium under pressure into said cavity to expand said elastic member into pressurized contact with said surface of the medullary canal and to continuously maintain the elastic



member compressed in resilient pressure contact with the medullary canal surface, said elastic member being effective to distribute elastic pressure substantially uniformly to the surface area of the medullary canal in contact therewith and to conform to irregularities present in the juxtaposed surface portion of the medullary canal, said uniformly distributed elastic pressure applied continuously by the elastic member to the medullary canal being effective to anchor said endoprosthesis immovably therein.

4,892,551

IMPACT DISSIPATING AND LOAD DIVERTING TOTAL HIP ARTHROPLASTY PROSTHESIS

Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Jul. 3, 1986, Ser. No. 881,638
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—23 **15 Claims**

1. An impact dissipating hip arthroplasty prosthesis for interconnecting first and second bones of a patient, said prosthesis having a head portion attached at a first of the patient's bones, and a body portion attached at the second of the bones and having an inwardly extending surface that forms a fulcrum, said prosthesis including a one piece impact dissipating member extending from said head portion to be received within said body portion and supported at said fulcrum, said impact dissipating member being rotatable in a first direction within said body portion and around said fulcrum in response

to an intraskeletal load applied in a second, transverse direction through the patient's first bone so as to redirect and decelerate



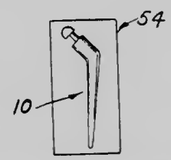
the load and reduce the shock effect of such load on the patient's second bone.

4,892,552

ORTHOPEDIC DEVICE

Robert D. Ainsworth, 118 Castle Hill Ranch Rd., Walnut Creek, Calif. 94595; Thirumalai N. C. Devanathan, 1801 Duncan, Tracy, Calif. 95576, and Steven T. C. Lin, 7100 San Ramon Rd., Dublin, Calif. 94566

Continuation of Ser. No. 595,215, Mar. 30, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,592
Int. Cl.[4] A61F 2/32, 2/30
U.S. Cl. 623—23 **11 Claims**



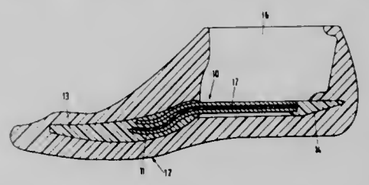
1. In a femoral stem suitable for permanent human implantation into the natural femur, the femoral stem including an elongate shaft extending in an axial direction and having a size and shape for implantation within the medullary canal of the natural femur, and a neck suitable for replacement of the natural femoral neck, the neck being unitary with the shaft and extending from the shaft in a direction angled with respect to the axial direction of the shaft such that the axial direction and the angled direction define a plane to be aligned with the medial-lateral direction upon implant of the femoral stem, the improvement wherein the shaft and the neck are comprised of a number of first uniplanar layers of continuous unidirectional filament carbon fibers and a number of second uniplanar layers of continuous unidirectional filament carbon fibers, with the carbon fibers of each layer extending parallel to one another along a respective axis of orientation and being embedded in a respective matrix of non-biodegradable, bio-compatible thermoplastic polymer, the layers being in a stacked arrangement generally parallel to one another and essentially parallel to said plane, the axis of orientation of the fibers of the first layers being aligned essentially with the axial direction, the axis of orientation of the fibers of the second layers being offset from the axial direction up to $\pm 90°$ relative to the axial direction, at least some first layers alternating with at least some second layers within the stacked arrangement, and wherein the number of first layers in the stacked arrangement of layers is greater than the number of second layers.

4,892,553

ARTIFICIAL FOOT FOR A LEG PROSTHESIS

Gregor M. Prahl, Rullstorf, Fed. Rep. of Germany, assignor to IPOS GmbH & Co, KG, Lüneburg, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,462
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 8804228[U]
Int. Cl.[4] A61F 2/66
U.S. Cl. 623—55 **13 Claims**



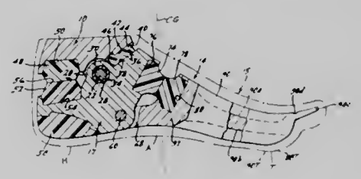
1. An artificial foot for a leg prosthesis comprising a foamed plastic molded foot portion having a ball and plantar area with a plate-shaped, metallic reinforcing member embedded therein which has a section curved so as to extend correspondingly to the ball of the foot so as to support a rolling function of the foot, and an elastic, yielding cushioning forefoot core and a function core consisting of a tab disposed within a heel area, the function core and the reinforcing member being rigidly interconnected, the reinforcing member including at least two superimposed leaf springs of approximately equal length configured to correspond with the rolling profile of the foot, the leaf springs consisting of one of titanium and a high-tensile titanium-aluminum alloy, the at least two leaf springs including a bottom leaf spring and a top leaf spring, the bottom leaf spring being provided so as to overlap the top leaf spring by at least 5 mm in the direction of the point of the foot; wherein said artificial foot further comprises an elastic spacer disposed between the leaf springs, the elastic spacer being fabricated from a material possessing a high gliding ability and being essentially T-shaped with a salient portion directed toward the point of the foot which becomes under so as to assume a lingulate configuration so that the leaf springs overlap the spacer on all sides.

4,892,554

PROSTHETIC FOOT

David L. Robinson, 37 Ferrin Pl., Mt. Clemens, Mich. 48043

Filed Dec. 21, 1987, Ser. No. 135,588
Int. Cl.[4] A61F 2/66
U.S. Cl. 623—55 **9 Claims**



1. A prosthetic foot comprising an ankle member, a heel member underlying said ankle member, first pivot means coupling said heel member to said ankle member for resiliently resisted pivotal movement about a first transverse axis, an

elongate metatarsal-toe member having a rear portion underlying a forward portion of said heel member and projecting forwardly from said heel member, second pivot means coupling said toe member to said heel member for pivotal movement about a second transverse axis, positive stop means engageable between said heel and toe members define an end limit to downward pivotal movement of the forward end of said toe member relative to said heel member, compression means engaged between said heel and toe members for resiliently resisting upward pivotal movement of the forward end of said toe member relative to said heel member, said toe member having an elongate slot therethrough extending longitudinally rearwardly from the forward end of said toe member bifurcating the forward portion of said toe member, the underside of said heel and toe members being conformed to cooperatively define a longitudinally extending concave arch, first means on said heel member defining a weight supporting support point on the underside of said heel member at the rearward end of said arch, second means on said toe member defining first and second weight supporting support points on the underside of said toe member at the forward end of said arch respectively located at opposite sides of said slot, said support points defining a stable three-point support for said foot when in a foot-flat position, and said first and second axes being spaced rearwardly from the center of said arch.

4,892,555

METHOD FOR CONDITIONING FABRICS

Arthur G. Leigh, Wirral, and John Oakes, Cheshire, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 82,023, Aug. 5, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 243,165

Claims priority, application United Kingdom, Aug. 6, 1986, 8619152

Int. Cl.[4] **D06L** *3/00*

U.S. Cl. 8—101 **7 Claims**

1. A method of conditioning and bleaching fabrics which comprises tumbling damp fabrics in a laundry dryer with a composition comprising a fabric conditioner which is a cationic material and a compound containing a transition metal ion, selected from groups 4b–7b, 8 and 1b of the Periodic Table, said composition added to the dryer separate from said fabrics, and subsequently washing said fabrics with a bleach containing composition.

4,892,556

PROCESS FOR TRANSFER PRINTING ON LEATHER SUBSTRATES IMPREGNATED WITH AMINOPLAST PRE-CONDENSATE

Herbert W. A. Schulzen, deceased, late of Bad Schwalbach; Elisabeth A. Schulzen, heir; Holger Schulzen, heir, both of Wilhelmstrasse 33, 6208 Bad Schwalbach-Hettenhain, and Petra S. Schulzen, heir, An der Ringkirche 5, 6200 Wiesbaden, all of Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 940,926

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544239

Int. Cl.[4] **D06P** *3/32, 1/56;* **B41M** *1/38;* **D06M** *15/39*

U.S. Cl. 8—436 **10 Claims**

1. A process for printing on leather substrates using the transfer printing process by surface treatment of the substrate, applying an auxiliary carrier which is printed with sublimable dyes and transferring the dyes onto the substrate by dry heat treatment characterized in that the substrate surface is impregnated with an aqueous solution of a pre-condensate of a urea formaldehyde resin or melamine formaldehyde resin, the solvent is removed at a temperature of up to a maximum of 120° C. which does not cause condensation of the pre-condensate and the dyes are transferred at a temperature of between 140° and 250° C. for a sufficiently long period of time for the pre-condensate to condense out at the same time.

4,892,557

PROCESS FOR FORMING CREPE FABRICS AND FOR TEMPORARILY STABILIZING HIGH TWIST FILAMENT YARN IN THE MANUFACTURE OF SUCH FABRICS

Delano M. Conklin, Burlington, and Joe F. London, Jr., Greensboro, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 27, 1986, Ser. No. 923,279

Int. Cl.[4] **D03D** *15/04;* **D06C** *23/04*

U.S. Cl. 8—497 **5 Claims**

1. A crepe fabric comprising highly twisted continuous filament yarn woven on a shuttleless loom after having been treated with a hot-melt size, half the yarn having Z-twist and half the yarn having S-twist, said fabric characterized by the appearance, hand and drape of silk and having a selvage consisting of severed weft yarns.

5. A crepe fabric produced by the steps of:

(a) highly twisting a continuous filament yarn followed immediately by;

(b) temporarily reducing the liveliness of the yarn by applying a hot melt size at a temperature of about 290°–300° F. with an add-on of between about 10.5 and 13.5%;

(c) weaving a fabric from said yarn on a shuttleless loom;

(d) restoring the liveliness of the yarn by desizing the woven fabric; and

(e) gradually raising the temperature of the fabric to about 240° F. to develop the crepe of the fabric;

(f) dyeing the fabric; and

(g) framing the fabric.

4,892,558

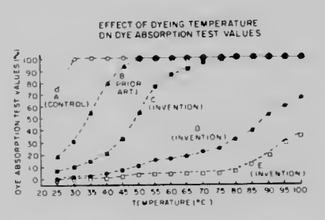
PROCESS FOR DYEING STAIN RESISTANT NYLON CARPETS

Randolph C. Blyth, Gulf Breeze, and Pompelio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 296,301, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 84,777, Aug. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 59,714, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 914,507, Oct. 2, 1986, Pat. No. 4,680,212, which is a continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. This application Jun. 21, 1989, Ser. No. 370,099

Int. Cl.[4] **D06P** *1/00*

U.S. Cl. 8—560 **3 Claims**



1. In a process for dyeing carpet containing nylon pile fibers coated with stain blocker, wherein said stain blocker is a polymeric condensation product containing $-SO_3X$ groups where X is hydrogen or a cation and wherein the carpet is treated with an aqueous solution of an acid dye under conditions of time and temperature sufficient to provide dyed carpet of a selected shade, the improvement comprising adding a sufficient amount of said stain blocker to said aqueous solution to provide carpet having a dye absorption value at 25° C. of substantially zero.

4,892,559

ELECTRODE ARTICLE

George B. Park, Nr. Swindon; John A. Cook, Faringdon, and Robert H. McLoughlin, Swindon, all of England, assignors to Scimat Limited, United Kingdom

Division of Ser. No. 667,034, Nov. 1, 1984, abandoned, and a continuation-in-part of Ser. No. 618,111, Jun. 7, 1984, abandoned. This application Aug. 25, 1986, Ser. No. 900,026

Claims priority, application United Kingdom, Nov. 2, 1983, 8329211; Dec. 15, 1983, 8333387

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] **H01M** *6/00*

U.S. Cl. 29—623.3 **17 Claims**

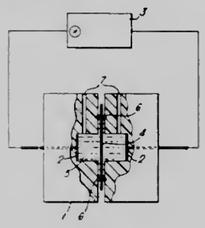
1. A method of making an electrochemical device, comprising:

(a) providing a body of sensitive electrode material;

(b) assembling together said electrode material and a layer of flexible protective material, at least part of which protective material is swellable by electrolyte liquid with which it will come into contact in said device, permitting the electrolyte to permeate through it, which protective material in its non-swollen state protects said electrode material, and which protective material is ready to function as

an electrode separator when said electrode material is used as an electrode in an electrochemical device;

(c) deforming said electrode material so as to decrease its thickness, thereby substantially increasing its surface area, while said electrode material is in contact with said protective material; and



(d) inserting the assembly of said electrode material and said protective material into liquid electrolyte in an electrochemical device to cause the protective material to swell so that its permeability is increased sufficiently to enable it to function as a separator in the device.

4,892,560

FUELS

Nasir M. Sial, c/o Fanar Overseas Limited, Malcolm House, 12 Orange Street, London, England

PCT No. PCT/GB85/00254, § 371 Date Feb. 10, 1987, § 102(e) Date Feb. 10, 1987, PCT Pub. No. WO86/07375, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 10, 1985, Ser. No. 13,829

Int. Cl.[4] C10L *1/00, 1/32*

U.S. Cl. 44—50 **17 Claims**

17. A method of improving the burning properties of molasses which comprises homogenizing a liquid fuel oil with the molasses to form a homogenized mixture consisting essentially of a liquid fuel oil in an amount of between about 15 and 50 percent by weight and molasses present in an amount of between about 85 and 50 percent by weight, wherein the homogenized mixture shows no visual signs of separation for at least one month and has a caloric value of between about 6,470 and 11,025 BTU's per pound.

4,892,561

METHYL ETHER FUELS FOR INTERNAL COMBUSTION ENGINES

Irving E. Levine, 1 Paper Mill Creek Ct., Novato, Calif. 94947

Continuation-in-part of Ser. No. 407,119, Aug. 11, 1982, abandoned. This application Feb. 21, 1986, Ser. No. 832,263

Int. Cl.[4] C10L *1/32, 1/10*

U.S. Cl. 44—51 **7 Claims**

7. The method of operating a Diesel Engine which comprises continuously injecting into the combustion chamber of the engine a fuel consisting essentially of 95 to 99.9% by weight of dimethyl ether and from 0.1 to 5 percent of a cetane number improving additive selected from the group consisting of hydrogen peroxide, ethyl t-butyl peroxide, di-t-butyl peroxide, amyl nitrate and nitromethane.

4,892,562

DIESEL FUEL ADDITIVES AND DIESEL FUELS CONTAINING SOLUBLE PLATINUM GROUP METAL COMPOUNDS AND USE IN DIESEL ENGINES

Wayne E. Bowers, Clearwater, Fla., and Barry N. Sprague, West Haven, Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 796,428, Nov. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,954, Dec. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 790,738, Oct. 24, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 897,864

Int. Cl.[4] C10L *1/30*

U.S. Cl. 44—67 **18 Claims**

1. A method of reducing emissions from or increasing the utilizable energy of diesel fuel for powering internal combustion engines, comprising admixing with diesel fuel a fuel soluble organo-metallic fuel additive composition in an amount effective to supply from 0.01 to 1.0 parts per million of platinum per part of fuel, said composition comprising a compound having the general formula

$$XPtR_1R_2$$

wherein X is a ligand containing at least one unsaturated carbon-to-carbon bond with an olefinic, acetylenic or aromatic pi bond configuration and R_1 and R2 are, independently, benzyl, phenyl, nitrobenzyl or alkyl having from 1-10 carbons.

4,892,563

PHENOLIC-CONTAINING MANNICH BASE REACTION PRODUCTS AND FUEL COMPOSITIONS CONTAINING SAME

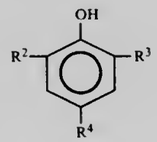
Sheldon Chibnik, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 136,077, Dec. 21, 1987, Pat. No. 4,806,130, which is a division of Ser. No. 813,813, Dec. 27, 1985, Pat. No. 4,717,492. This application Jan. 23, 1989, Ser. No. 299,286

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—73 **8 Claims**

1. A composition comprising a major amount of a liquid hydrocarbyl fuel normally susceptible to oxidation and a minor antioxidant amount of an additive product prepared by (a) reacting a preformed Mannich base derived from a phenol, a C_1–C_8 alkyl aldehyde and a low boiling amine, and (b) a reactive compound having at least one reactive hydrogen selected from reactive hydrocarbyl amines, said phenol having the following generalized structural formula:



where R^2 and R^3 are the same or different and are hydrogen or C_1 to C_{18} alkyl or tertiary alkyl and R^4 is hydrogen or C_1 to about C_{30} hydrocarbyl, said reaction being carried out with an equivalent amount of Mannich base to amine at temperatures varying from about 25° to about 250° C., said reactive compound having a higher boiling point than said low boiling amine.

4,892,564

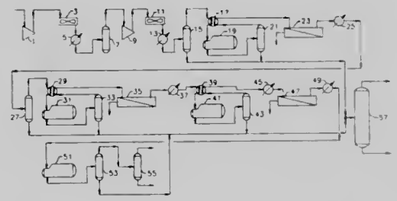
MEMBRANE PROCESS FOR HYDROCARBON LIQUID RECOVERY

Thomas E. Cooley, 5215 Spanish Oak, Houston, Tex. 77066

Filed Mar. 24, 1988, Ser. No. 172,670

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **4 Claims**



1. Method of separating components of a feedstock into one or more gas streams comprising mostly hydrogen or methane, and one or more liquid streams comprising mostly C-3 and higher hydrocarbons, comprising:

(a) subjecting the said feedstock to one or more gas-liquid separations producing a gas effluent and a liquid effluent wherein the gas effluent is a feed to a next separation;

(b) subjecting the gas effluent from (a) to one or more gas-gas membrane separations producing a gas residue from the membrane wherein the gas residue from the membrane is cooled producing a gas and liquid mixture and is a feed to a succeeding gas-liquid separation producing a gas effluent and a liquid effluent;

(c) combining a major amount of liquid effluents from the above (a) and (b); and

(d) subjecting the effluents combined in Step (c) to a stripping operation to provide a final liquid product.

4,892,565

ADSORPTIVE SEPARATION UTILIZING MULTIPLE ADSORPTION BEDS

William P. Schmidt; Ravi Kumar, and Alan D. Abel, all of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 138,983, Dec. 29, 1987, Pat. No. 4,813,977. This application Dec. 16, 1988, Ser. No. 285,468

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] B01D *53/04*

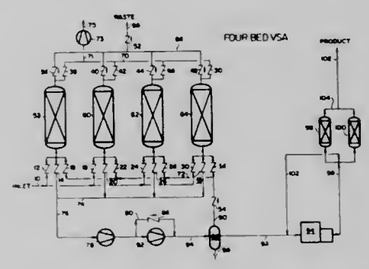
U.S. Cl. 55—26 **28 Claims**

1. A process for the production of high purity more selectively adsorbed key component from a gas mixture containing the key component and one or more less selectively adsorbed secondary components using a plurality of parallel adsorption beds which comprises:

(a) drawing said gas mixture through the feed end of a first bed of adsorbent by connecting the effluent end of said bed to the effluent end of a parallel bed, which is presently evacuated, so as to selectively adsorb said key component on said first bed of adsorbent and allow said one or more secondary components to pass through said first bed;

(b) cocurrently rinsing said first bed with high purity key component to remove any co-adsorbed secondary component and void space secondary component from said bed;

(c) countercurrently desorbing said first bed by pressure reduction in one or more stages to a subatmospheric pressure to recover a rinse gas for another of said plurality of beds presently undergoing step (b) and a high purity key component product;



(d) countercurrently repressurizing said first bed by connecting the effluent end of said first bed at its subatmospheric pressure at the end of step (c) with the effluent end of another of said plurality of beds presently undergoing the adsorption of step (a), and

(e) continuing this series of steps with the plurality of beds to form a continuous process for production of high purity key component.

4,892,566

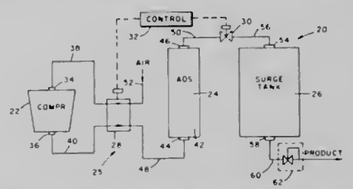
PRESSURE SWING ADSORPTION PROCESS AND SYSTEM

Ravinder K. Bansal, East Amherst, and Edward E. Vrana, West Seneca, both of N.Y., assignors to AirSep Corporation, Buffalo, N.Y.

Filed Mar. 22, 1989, Ser. No. 326,905

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **20 Claims**



1. A pressure swing adsorption process utilizing an adsorber having an inlet and an outlet and a bed of adsorbent material adapted to fractionate at least one constituent from a feed stream of a gaseous mixture routed through the adsorber between the adsorber inlet and the adsorber outlet and reservoir means for receiving product gas exiting the adsorber outlet, said process comprising the steps of;

(a) directing the feed stream into the inlet of the adsorber so that product gas exits the adsorber outlet and accumulates in the reservoir means and so that the internal pressures of the adsorber and the reservoir means are raised to elevated levels;

(b) shutting off the feed stream flow to the adsorber inlet and the product gas flow between the adsorber outlet and reservoir means and venting the adsorber inlet so that the internal pressure of the adsorber falls below that of the reservoir means;

(c) conducting a flow of product gas from the reservoir

means into the adsorber outlet while the feed stream flow to the adsorber inlet remains shut off; and

(d) directing the feed stream into the adsorber inlet to resume feed stream flow thereto and so that the internal pressure of the adsorber equalizes with that of the reservoir means.

13. A pressure swing adsorption system comprising an adsorber having an inlet and an outlet and a bed of adsorbent material adapted to fractionate at least one constituent from a gaseous mixture routed through the adsorber between the adsorber inlet and the adsorber outlet;

reservoir means for receiving product gas exiting the adsorber outlet;

means for directing a feed stream of a gaseous mixture into the adsorber inlet;

first valve means associated with the directing means for selectively conducting the flow of the gaseous mixture into the adsorber inlet or shutting off the flow of the gaseous mixture into the adsorber inlet and for venting the adsorber inlet when the flow of the gaseous mixture into the adsorber inlet is shut off;

second valve means interposed between the adsorber outlet and the reservoir means for selectively conducting or shutting off the flow of product gas between the adsorber outlet and the reservoir means;

control means associated with the first and second valve means so that the system cycles through the sequential stages of;

(a) directing the feed stream into the inlet o the adsorber so that product gas exits the adsorber outlet and accumulates in the reservoir means and so that the internal pressures of the adsorber and the reservoir means are raised to elevated levels;

(b) shutting off the feed stream flow to the adsorber inlet and the product gas flow between the adsorber outlet and reservoir means and venting the adsorber inlet so that the internal pressure of the adsorber falls below that of the reservoir means;

(c) conducting a flow of product gas from the reservoir means into the adsorber outlet while the feed stream flow to the adsorber inlet remains shut off; and

(d) directing the feed stream into the adsorber inlet to resume feed stream flow thereto and so that the internal pressure of the adsorber equalizes with that of the reservoir means.

4,892,567

SIMULTANEOUS REMOVAL OF MERCURY AND WATER FROM FLUIDS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,194
Int. Cl.[4] B01D *52/04*
U.S. Cl. 55—33 **62 Claims**

1. A method for simultaneously removing mercury and water from a fluid comprising contacting the fluid with an effective amount of a molecular sieve comprising zeolite A containing on its surface 0.001–15% weight of elemental silver or gold and regenerating the molecular sieve for simultaneous water and mercury removal at elevated temperatures.

26. A regenerable molecular sieve capable of simultaneously removing mercury and water from a fluid, comprising zeolite A containing on its surface about 0.001–15% by weight of elemental silver or gold.

4,892,568

PROCESS FOR REMOVING N-TYPE IMPURITIES FROM LIQUID OR GASEOUS SUBSTANCES PRODUCED IN THE GAS-PHASE DEPOSITION OF SILICON

Helene Prigge, Unterschleissheim; Robert Rurländer, Halsbach; Michael Schwab, Neuötting; Hans P. Bortner, and Andreas Englmüller, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jan. 3, 1989, Ser. No. 293,750
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805282
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—73 **10 Claims**

1. A process for removing n-type doping impurities from liquid or gaseous substances produced in the gas-phase deposition of silicon comprising the steps of:

passing the liquid or gaseous substances through a purification station where the liquid or gaseous substances are brought into contact with halides of at least one element selected from the group consisting of silicon, titanium, tin and a combination thereof, whereby adducts are formed containing the impurities;

transferring said halides from said purification station to a regeneration station prior to or at the point when said halides are saturated with said adducts;

regenerating at least part of said halides in said regeneration station by treating said halides at predetermined temperatures to at least partially dissociate said adducts to liberate the impurities; and

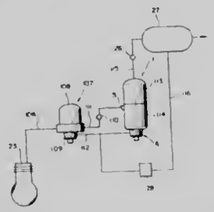
transferring said at least part of said halides regenerated to said purification station.

4,892,569

COMPRESSED AIR PRESSURE SUPPLY SYSTEM

Katsumi Kojima, Yokosuka, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Feb. 22, 1988, Ser. No. 157,726
Claims priority, application Japan, Feb. 23, 1987, 62-024282; Nov. 26, 1987, 62-180287
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—163 **18 Claims**



1. An air compressor system for supplying compressed air, said system comprising:

air compressor means for compressing air;

an air dryer means operatively connected to and disposed downstream of said air compressor means in the system so as to receive compressed air from said air compressor means,

said air dryer means including desiccant for removing moisture from the received compressed air;

an air reservoir operatively connected to and disposed downstream of said air dryer means in the system so as to receive dried compressed air from said air dryer means and for storing the same;

a regenerating valve connected to said air dryer means and communicable therewith and with the atmosphere exterior of the system, said regenerating valve movable between a first position at which the interior of said air dryer means is open to the atmosphere through said valve and said desiccant is regenerable and a second position at which said regenerating valve closes the interior of said air dryer means to the atmosphere;

an oil separator means connected to and between said air compressor means and said air dryer means, said oil separator means comprising residue removing means for removing residue in compressed air passing from said air compressor means to said air dryer means,

a drain valve connected to said oil separator means and communicable therewith and with the atmosphere, said drain valve movable between a first position at which the interior of said oil separator means is open to the atmosphere and residue removed from compressed air by said oil separator means is dischargeable through said drain valve to the atmosphere and a second position at which said drain valve closes the interior of said oil separator means to the atmosphere;

a non-return valve operatively connected between said oil separator means and said air dryer means for preventing compressed air received by said air dryer means from flowing back to said oil separator means; and

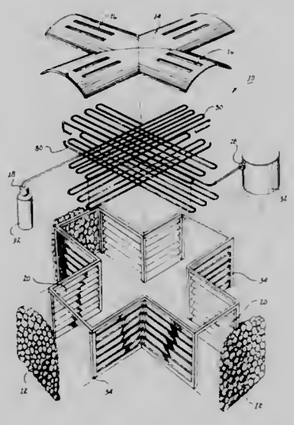
a governor device operatively connected to said regenerating valve and to said drain valve for issuing a command to said regenerating valve when air pressure within said air reservoir reaches a predetermined maximum which causes said regenerating valve to move to the first position thereof thereby opening the interior of said air dryer means to the atmosphere, said governor device ceasing the issuance of said command to said regenerating valve when air pressure within said air reservoir reaches a predetermined minimum, and for issuing a command to said drain valve which causes said drain valve to move to the first position thereof.

4,892,570

WATER PRECIPITATOR APPARATUS

Melvin M. Littrell, 2130 W. Indian School Rd., Apt. 105, Phoenix, Ariz. 85015

Filed Sep. 19, 1988, Ser. No. 245,811
Int. Cl.[4] B01D *53/26*
U.S. Cl. 55—269 **1 Claim**



1. An improved water precipitator apparatus comprising, in combination:

refrigeration means comprised of coils of metal piping connected at one end to a tank filled with Butane and connected at the other end to an empty tank for condensing hot air into water;

structural member means for capturing the hot air irrespective of wind direction and which relies on convection to move the hot air past said refrigeration means; and

air intake means comprised of a series of air intake flaps that are activated, to the open or closed position, solely by the dynamic pressure of the incoming air for permitting said hot air to enter into said structural member means.

4,892,571

EQUIPMENT AND METHOD TO REMOVE PARTICULATE AND DISSOLVED PARTICLES FROM STEAM

Robert H. Elliott, 6027 Cannon Hill Rd., Fort Washington, Pa. 19034

Filed Aug. 18, 1988, Ser. No. 233,360
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—458 **7 Claims**



1. Equipment to remove soluble and insoluble particles from the output steam of a steam boiler:

an elongated, cylindrically-shaped central member having a straight axis, a steam entrance end, and a steam exit end; an elongated, cylindrically-shaped steam inlet member; means securing said steam inlet member to the steam entrance end of said central member

an elongated, cylindrically-shaped steam outlet member; means securing said steam outlet member to the outlet end of said central member;

a flat, solid baffle member disposed within said central member and having a pair of opposite connector edges, an upper edge and a lower edge respectively extending between the connector edges, the connector edges being connected to the interior wall of the central member and the upper and lower edges being spaced from the interior wall of the central member to respectively form an upper space and a lower space and the baffle member being oriented at an angle to the axis of the central member with said upper edge being disposed closer to said steam exit end than it is to the steam entrance end; and

receiver means connected to said central member adjacent to and below said lower space to receive insoluable particles and water droplets with dissolved particles and convey the same outwardly of the equipment.

4,892,572

OPTICAL FIBER DRAWING APPARATUS

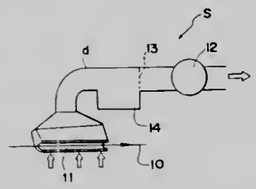
Katsuyuki Tsuneishi; Shigeru Ito, and Takashi Yamazaki, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 22, 1988, Ser. No. 274,855

Claims priority, application Japan, Nov. 24, 1987, 62-177609[U]

Int. Cl.⁴ C03B *37/25*

U.S. Cl. 65—10.1 **1 Claim**



1. An optical fiber drawing apparatus which comprises a heating furnace which fuses a forward end of an optical fiber preform for drawing an optical fiber therefrom, and a screening portion including means for applying tension to the optical fiber through in-line for guaranteeing strength of the fiber, said screening portion further comprising a suction device disposed along a passage of the optical fiber running therethrough for sucking in said optical fiber at a time of breakage of said optical fiber, said suction device comprising a suction port provided along the passage, a suction blower connected to said suction port through a pipe, and a mesh element provided in the pipe between said suction port and said suction blower with a pocket formed in said pipe in a position prior to the mesh element.

4,892,573

PROCESS AND DEVICE FOR MELTING GLASS

Robert Delage, Ribecourt; Marcel Cadier, Velizy-Villacoublay, and Jacques Boillet, Compiegne, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Oct. 13, 1987, Ser. No. 106,863

Claims priority, application France, Oct. 13, 1986, 86 14172

Int. Cl.⁴ C03B *5/187*

U.S. Cl. 65—179 **13 Claims**



1. A device for melting glass before pouring onto a float bath, comprising a melting furnace for the tank having means defining zones which are a melting zone, a refining zone, and a homogenization zone separated from the refining zone by an intermediate zone, and means for agitation of the molten glass in the tank, wherein the means for agitation are located in the intermediate zone and are comprised of (1) at least one horizontally extending agitator formed of a series of essentially vertically downward extending loops and horizontally extending means horizontally connecting said loops, with said loops extending over essentially the entire width of the tank, and are further comprised of (2) means imparting to each point of the agitator an elliptical motion in a horizontal plane the imparting means being capable of varying the axes of the ellipse traversed by said each point of the agitator.

4,892,574

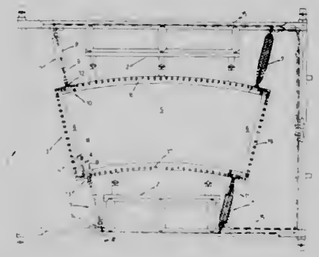
APPARATUS FOR THE HORIZONTAL BENDING AND TEMPERING OF GLASS SHEETS

Sergio V. Cortes, Sector Monterrey, Mexico, assignor to Vitro Flex, S.A., Mexico

Filed Jul. 11, 1988, Ser. No. 217,667

Int. Cl.⁴ C03B *23/025*

U.S. Cl. 65—273 **6 Claims**



1. In an apparatus for bending glass sheets comprising a lehr, a horizontal conveyor for transporting glass sheets through said lehr, a ceramic holder mold to pick up the glass sheets from said conveyor by means of a vacuum which forces the glass sheet to adhere to said holder, a ring mold mounted on a shuttle to move directly below the holder, means for cutting said vacuum and release the glass sheet onto said ring mold for gravity forming of said sheet, and means for moving said shuttle to transport the glass sheet from the lehr to a quench and tempering zone, the improvement which comprises a plurality of press forming dies arranged by pairs at the side edges of the ring mold, with each die of each pair located on the end of a zone wherein a sharp curvature is desired, each of said press forming dies comprising a non-rotatable radius piece having a radius of curvature corresponding to the radius of curvature desired for said zone of the glass sheet and having a length sufficient to press over a large proportion of the width of said zone so as to produce a uniform sharp bending of the glass sheet, and means to move said dies sidewardly of the ring mold from a fully retracted position outwardly of the side edges of said ring mold to a fully extended or press forming position inwardly of the side edges of said ring mold and over the side edges of the glass sheet, whereby to more sharply bend said glass sheet in the desired zones by pressure non-rotatable contact of said dies on the periphery of said glass sheet against said ring mold.

4,892,575

HERBICIDAL SULFONAMIDES

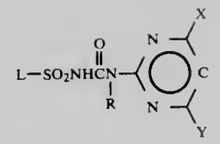
Martha M. Bolinski, Northeast, Md., and Donald J. Dumas, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 60,567, Jun. 11, 1987, Pat. No. 4,744,816, which is a continuation of Ser. No. 731,261, May 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 618,412, Jun. 7, 1984, abandoned. This application Feb. 19, 1988, Ser. No. 160,296

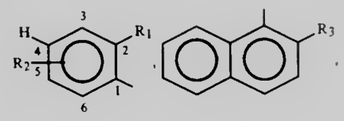
Int. Cl.⁴ A01N *43/54*; C07D *251/52, 401/12, 409/12*

U.S. Cl. 71—90 **15 Claims**

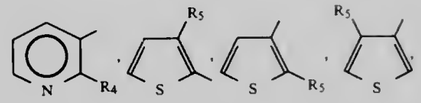
1. A compound of the formula:



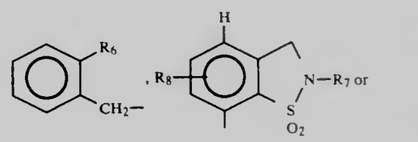
wherein
R is H or CH_3;
L is



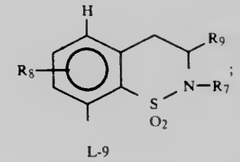
L-1 L-2



L-3 L-4 L-5 L-6

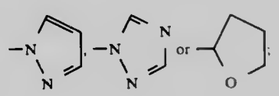


L-7 L-8



L-9

R_1 is C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, Br, NO_2, CO_2R_{10}, $SO_2NR_{11}R_{12}$, $SO_2N(OCH_3)CH_3$, $S(O)_nR_{13}$, CH_2OCH_3, $CH_2OC_2H_5$, C_6H_5 or Q:
Q is



Q-1 Q-2 Q-3

R_2 is H, F, Cl, Br, CF_3, CH_3, C_2H_5, OCH_3, OC_2H_5, SCH_3 or SC_2H_5;
R_3 is H, CH_3, OCH_3, F, Cl, Br, $SO_2N(CH_3)_2$, OSO_2CH_3 or $S(O)_nCH_3$;
R_4 is CH_3, C_2H_5, OCH_3, OC_2H_5, F, Cl, Br, $SO_2NR_{11}R_{12}$, $SO_2N(OCH_3)CH_2$ or $S(O)_nR_{13}$;
R_5 is C_1–C_3 alkyl, F, Cl, Br, NO_2, CO_2R_{10}, $SO_2NR_{11}R_{12}$, $SO_2N(OCH_3)CH_3$ or $S(O)_nR_{13}$;
R_6 is CO_2CH_3, $CO_2C_2H_5$, $SO_2N(CH_3)_2$, OSO_2CH_3, SO_2CH_3 or $SO_2CH_2CH_3$;
R_7 is H, C_1–C_5 alkyl, CH_2CH_2F, $CH_2CH_2CH_2F$, C_3–C_4 alkenyl, C_3–C_4 alkynyl, $CH_3OCH_2CH_2$ or $C_2H_5OCH_2CH_2$;
R_8 is H, Cl, CH_3 or OCH_3;
R_9 is H or CH_3;
R_{10} is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl, $CH_2CH{=}CH_2$ or $CH_2C{\equiv}CH$;
R_{11} is H or C_1–C_2 alkyl;
R_{12} is C_1–C_2 alkyl;
R_{13} is C_1–C_3 alkyl;
n is 0, 1 or 2;
X is $NR_{14}R_{15}$;
R_{14} is H or C_1–C_2 alkyl;
R_{15} is C_1–C_2 alkyl, OCH_3, OC_2H_5 or CH_2CN;
Y is OCH_2CH_2F, OCH_2CHF_2 or OCH_2CF_3; and
Z is CH;
and their agriculturally suitable salts.

11. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,892,576

6,7-DIHYDRO-PYRAZOLO (1,5-A)(1,3,5)TRIAZINE-2-SULPHONAMIDES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Martin Krüger; Jürgen Westermann; Friedrich Arndt; Richard Rees, all of Berlin, Fed. Rep. of Germany, and Russel G. Hunt, Harston, England, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

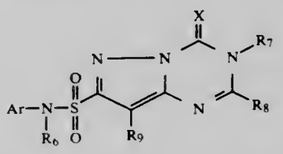
Filed Jun. 30, 1988, Ser. No. 213,905

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3722072

Int. Cl.⁴ A01N *43/14, 43/66, 43/68*; C07D *251/00*

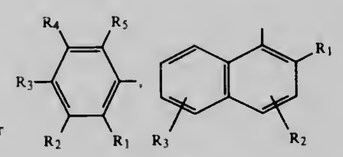
U.S. Cl. 71—93 **16 Claims**

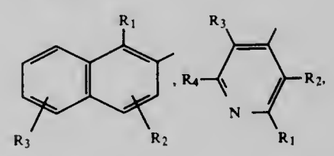
1. 6,7-Dihydropyrazole[1,5-a][1,3,5]triazine-2-sulphonamides of formula I



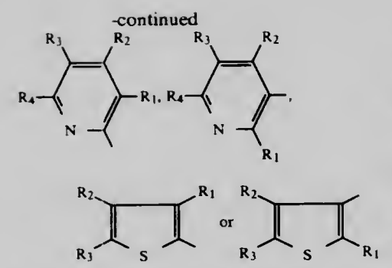
(I)

in which
Ar is phenyl, naphthyl, pyridyl or thienyl group of general formula





-continued



R_1, R_2, R_3, R_4 and R_5 are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy, halo-C_1–C_4-alkyl, C_1–C_4-alkoxy, halo-C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, halogen, C_1–C_4-alkoxy, a group R_{10}—O—CO, a carbamoyl group $R_{11}R_{12}N$—CO—, an amino group $R_{11}R_{12}N$—, cyano, nitro, a sulphur containing group R_{10}—$S(O)_n$—, an acyl group R_{10}—CO, a group R_{10}—O—CO—$(CH_2)_n$, or phenyl or phenoxy, both of which are optionally substituted by one of more of C_1–C_4-alkyl, halo or nitro,

R_6 is hydrogen, an acyl group R_{10}—CO, a group R_{10}—O—CO—, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, phenyl-C_1–C_4-alkyl, a carbamoyl group $R_{11}R_{12}N$—CO—, an alkali metal, an alkaline earth metal or ammonium group, optionally substituted by C_1–C_6-alkyl,

R_7 and R_8 are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by halo or C_1–C_4-alkoxy, a phenyl-C_1–C_6-alkyl, phenyl-C_2–C_6-alkenyl or phenyl-C_2–C_6-alkynyl group, each of which is optionally substituted by halo, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl or halo-C_1–C_4-alkyl, phenyl, substituted by R_1, R_2, R_3, R_4 and R_5, an acyl group R_{10}—CO, a group R_{10}—O—CO, a group R_{10}—O—CO—$(CH_2)_n$, a carbamoyl group $R_{11}R_{12}N$—CO—, or a sulphonyl group R_{10}—SO_2,

R_9 is hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by halo or C_1–C_4-alkoxy, a phenyl-C_1–C_6-alkyl, phenyl-C_2–C_6-alkenyl or phenyl-C_2–C_6-alkynyl group, each of which is optionally substituted by halo, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl or halo-C_1–C_4-alkyl, phenyl, substituted by R_1, R_2, R_3, R_4 and R_5, an acyl group R_{10}—CO, a group R_{10}—O—CO, a group R_{10}—O—CO—$(CH_2)_n$, a carbamoyl group $R_{11}R_{12}N$—CO—, a sulphonyl group R_{10}—SO_2 or R_{10}—O—SO_2, cyano or nitro

R_{10} is hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or phenyl-C_1–C_4-alkyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy or C_1–C_4-alkoxy, or phenyl, optionally substituted by halo, nitro or C_1–C_4-alkyl,

R_{11} and R_{12} are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy or C_1–C_4-alkoxy, or

R_{11} and R_{12} together with the adjacent nitrogen form a pyrrolidinyl, piperidino or morpholino ring,

X is oxygen or sulphur, and

n is 0, 1 or 2.

3. A herbicidal and plant-growth regulant composition with comprises an effective herbicidal and plant growth regulant amount of a compound according to claim 1, in admixture with carriers and diluents.

4,892,577

SOLUTION OF 3-ALKYLTHIO-4-AMINO-6-TERT.-BUTYL-1,2,4-TRIAZIN-5-ONES IN NORMALLY LIQUID N-ARYL-N-ALKOXYALKYL-HALOACETAMIDES

Joseph Synek, Overland Park, Kans., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1985, Ser. No. 801,885

Int. Cl.[4] A71N 43/4

U.S. Cl. 71—93 **17 Claims**

1. A solution of a 3-alkylthio-4-amino-6-tert.-butyl-1,2,4-triazin-5-one in at least twice its weight of a normally liquid N-aryl-N-alkoxyalkyl-haloacetamide.

4,892,578

PHENYLMETHYL-4,4-DIMETHYL-3-ISOXAZOLIDINONE PLANT REGULATORS

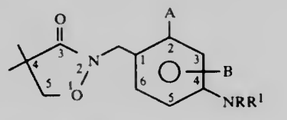
Jun H. Chang, Princeton Junction, and Jonathan S. Baum, Pennington, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 6, 1987, Ser. No. 118,390

Int. Cl.[4] A01N 43/80, 43/42; C07D 261/04, 413/12

U.S. Cl. 71—94 **3 Claims**

1. A plant regulating 2-[(4-substituted phenyl)-methyl]-4,4-dimethyl-3-isoxazolidinone of the formula



or an agriculturally acceptable salt thereof in which

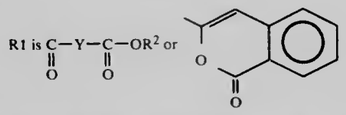
(A)

A is hydrogen or halogen,

B is hydrogen or halogen,

or A and B together form —C_4H_4— bridging adjacent carbon atoms;

R is hydrogen or lower alkyl;



R^2 is hydrogen, methyl diphenylmethyl or an agriculturally acceptable cation, and Y is

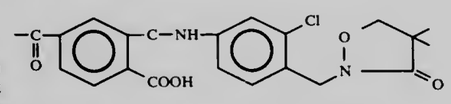
(a) lower alkylene or lower alkenylene which may be substituted with halogen or phenyl,

(b) ortho-cyclohexylene or ortho-cyclohexenylene which may be substituted with methyl,

(c) ortho-bicycloalkylene of 7 or 8 carbon atoms,

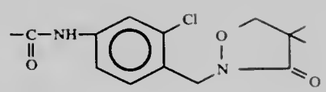
(d) ortho-oxabicycloalkenylene of 6 or 7 carbon atoms,

(e) ortho-phenylene which may be substituted with lower alkyl, halogen, nitro, a group of formula I



I

or with carboxyl and a group of formula II

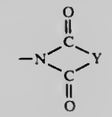


II

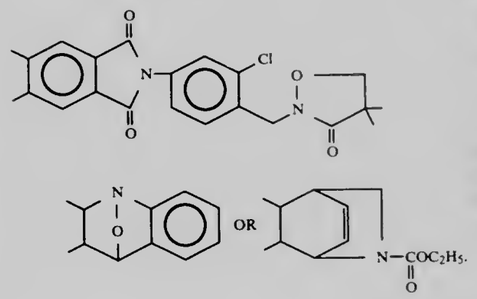
(f) ortho-naphthalene,

(g) ortho-phenylmethylene,

(B) A and B are as defined above and NRR[1] is (2-hydroxyphenyl)methylimino, (4-halo-2-hydroxyphenyl)-methylimino, (thien-2-yl)methylimino, phthalidylidenylamino, or a group of the formula



in which Y is as defined above



4,892,579

PROCESS FOR PREPARING AN AMORPHOUS ALLOY BODY FROM MIXED CRYSTALLINE ELEMENTAL METAL POWDERS

Lowell E. Hazelton, Sunol, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 184,533, Apr. 21, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,677

Int. Cl.[4] B22F 9/00

U.S. Cl. 75—0.5 B **30 Claims**

1. A process for preparing mixed elemental metal powders comprising the steps of:

(1) entraining vapors of at least a first metal and a second metal, the two metals being selected such that they have a negative heat of mixing when combined, in separate heated inert gas streams;

(2) cooling each inert gas stream adiabatically by passing it through a nozzle, to produce an elemental metal powder aerosol;

(3) mixing the inert gas streams to produce mixed elemental metal powder aerosols;

(4) collecting the mixed elemental metal powder aerosols to form mixed elemental metal powders.

4,892,580

LEAD-CONTAINING ADDITIVE FOR STEEL MELTS

Bernd Neuer, Schnaitsee, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellscnaft, Trostberg, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,535

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739154

Int. Cl.[4] C21C 7/02

U.S. Cl. 75—53 **16 Claims**

1. A lead containing additive (for steel melts,) which comprises a cored wire consisting of a metallic sheath and finely-divided filling material, the finely-divided filling material consisting of

(a) metallic lead or a lead alloy, and

(b) a lime-containing material which splits off carbon dioxide at the temperature of the steel melt.

4,892,581

DISPERSION STRENGTHENED COPPER

Haskell Sheinberg, Los Alamos, N. Mex.; Thomas T. Meek, Knoxville, Tenn., and Rodger D. Blake, Santa Fe, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 281,158, Dec. 5, 1988, Pat. No. 4,857,266. This application Apr. 4, 1989, Ser. No. 333,073

Int. Cl.[4] C22C 29/12

U.S. Cl. 75—232 **3 Claims**

1. A composition of matter in the form of a consolidated shape consisting essentially of copper and particles which are dispersed throughout the copper where the particles are comprised of copper oxide or copper having a coating of copper oxide.

4,892,582

DENTAL FILLING-MATERIAL AND METHOD FOR ITS PREPARATION

Walter Diehl, Hanau, and Hans-Martin Ringelstein, Frankfurt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 301,048

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1988, 3804022

Int. Cl.[4] C22C 3/00, 5/02

U.S. Cl. 75—251 **5 Claims**

1. A dental-filling material comprising a gold-alloy powder for filling dental cavities by gold condensation, said gold-alloy powder being formed of gold and at least one metal capable of alloying with gold to produce a hard gold alloy and which metal is soluble in nitric acid, the surface layer of said gold-alloy powder being rough and consisting of pure gold.

4,892,583

1-METHYL-3,5,7-TRIAZA-1-AZONIATRICYCLODECANE TRIIODIDE, A METHOD OF PREPARATION, AND ITS USE IN THE CONTROL OF MICROORGANISMS IN AQUEOUS SYSTEMS

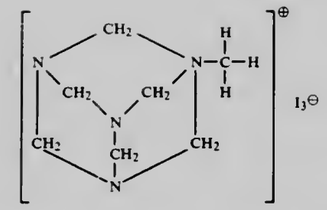
S. Rao Rayudu, Germantown, Tenn., assignor to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Nov. 4, 1988, Ser. No. 268,205

Int. Cl.[4] C09D 5/16; C07D 487/12

U.S. Cl. 106—18.32 **3 Claims**

1. A method of preserving an aqueous system which is susceptible to microbiological degradation, comprising the step of adding to said system a compound having the formula



wherein said compound is added in an amount sufficient to inhibit the growth and proliferation of at least one microorganism in said aqueous system.

4,892,584

WATER SOLUBLE INFRARED ABSORBING DYES AND INK-JET INKS CONTAINING THEM

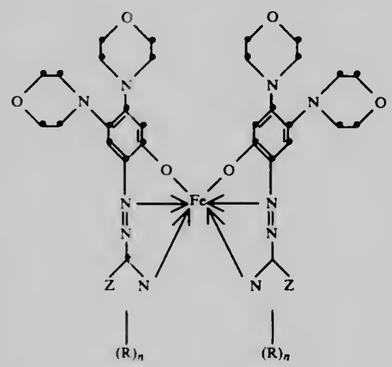
Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,752

Int. Cl.[4] C09D *11/02*; C09B *45/32*

U.S. Cl. 106—22 **10 Claims**

1. A water-soluble, ferrous-chelate, infrared absorptive dye having the structure:



wherein

n is 1 to 3;

Z represents the atoms to complete a nitrogen containing, aromatic heterocyclic group, and

R represents at least one water solubilizing group.

4,892,585

PROCESS FOR PRODUCING ARTICLES MADE FROM POLYURETHANE FOAM AND ADDITIVE FOR PERFORMING THIS PROCESS

Wolfgang Fischer, Morlenbach; Thomas Hattich; William Krug, both of Heidelberg, and Gerhard Schuster, Nuremberg, all of Fed. Rep. of Germany, assignors to Grace Service Chemicals GmbH, Heidelberg, Fed. Rep. of Germany

Division of Ser. No. 927,896, Nov. 6, 1986, Pat. No. 4,783,296. This application Oct. 17, 1988, Ser. No. 248,698

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541513

Int. Cl.[4] B28B *7/36*

U.S. Cl. 106—38.22 **14 Claims**

1. A release agent composition comprising an aqueous carrier fluid, a mould release agent, an alkali metal or ammonium salt of a C_{18}-C_{30}-fatty acid and a C_4-C_{26}-alcohol.

4,892,586

CONCRETE COMPOSITION FOR ROLLER COMPACTED PLACING METHOD

Yoshiharu Watanabe; Hisayuki Shimizu, and Mineo Ito, all of Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 22,588, Mar. 3, 1987, which is a continuation of Ser. No. 809,991, Dec. 17, 1985, abandoned. This application Jun. 3, 1988, Ser. No. 205,027

Claims priority, application Japan, Dec. 26, 1984, 59-276698

Int. Cl.[4] C04B *24/00, 24/10*

U.S. Cl. 106—92 **16 Claims**

1. A concrete composition for a roller compacted placing method, comprising 100 parts by weight of a cement, an aggregate, from 0.05 to not more than 0.5 parts by weight of an organic acid and/or a salt thereof, from 0.05 to not more than 2 parts by weight of a set accelerating inorganic salt and from 2 to not more than 15 parts by weight of a calcium sulfate when calculated in terms of $CaSO_4$, said cement being selected from the group consisting of Portland cements, mixed cements and mixtures thereof, said mixed cements being selected from the group consisting of silica cement, fly ash cement and blast furnace cement, said organic acid and/or a salt thereof being selected from the group consisting of hydroxypolycarboxylic acids, hydroxymonocarboxylic acids, saturated and unsaturated carboxylic acids, polymers of carboxylic acids, salts of said acids and mixtures thereof, said set accelerating inorganic salt being selected from the group consisting of carbonates, silicates, aluminates and hydroxides of alkali metals and mixtures thereof, wherein said concrete composition has a slump of not more than 3 cm.

4,892,587

LIGNOSULFONATE ADDITIVE-CONTAINING CARBON BLACK COMPOSITIONS

Peter Dilling, Isle of Palms; Gerald Prazak, Charleston, and Catherine C. Cashman, Hanahan, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,156

Int. Cl.[4] C08L *97/02*

U.S. Cl. 106—123.1 **4 Claims**

1. A carbon black composition comprising carbon black and a sulfonated lignin dispersant prepared by methylolating a lignin material by reaction less than about 2 moles formaldehyde per 1,000 grams of the lignin and sulfonating the methylolated lignin by reaction with from about 2.3 to about 3.5 moles of a sulfite or bisulfite compound per 1,000 grams of the lignin at an initial reaction pH of below about 6.6 and at a temperature of about 170° C., allowing the reaction pH to rise to a final pH greater than 7.5 to sequentially sulfonate both the methylolated aromatic nucleus and a side chain of the lignin.

4,892,588

PRODUCTION OF LIGNOSULFONATE ADDITIVES

Peter Dilling, Isle of Palms; Vaughn R. Loeffler, Summerville; Gerald Prazak, Charleston, and Karin U. Thomas, Alvin, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,155

Int. Cl.[4] C08L *97/02*

U.S. Cl. 106—123.1 **5 Claims**

1. A method of producing a lignin dispersant composition comprising the steps of methylolating a lignin compound by reaction with less than about 2 moles formaldehyde per 1,000 grams of the lignin, and sulfonating the methylolated lignin by reaction with from about 2.5 to 3.5 moles of a sulfite or bisulfite compound per 1,000 grams of lignin at an initial reaction pH of below about 6.6 and at a temperature of at least about 170° C., while allowing the pH of the reaction mixture to rise to a final pH of greater than 7.5 to sequentially sulfonate both the methylolated aromatic nucleus and the side chain of the lignin.

4,892,589

COMPOSITION COMPRISING WATER-SOLUBLE, NONIONIC HYDROPHOBICALLY MODIFIED HYDROXYETHYL CELLULOSE AND WATER-SOLUBLE, NONIONIC HYDROXYETHYL CELLULOSE

William J. Kirkland, Newark, Del.; Carl A. Lukach, Katy, Tex., and William C. McLachlan, West Chester, Pa., assignors to Aqualon Company, Wilmington, Del.

Division of Ser. No. 115,214, Oct. 30, 1987, Pat. No. 4,784,693. This application Aug. 16, 1988, Ser. No. 232,820

Int. Cl.[4] C04B *24/10*

U.S. Cl. 106—197.1 **20 Claims**

1. A composition of matter comprising, (a) from about 1 to about 99% water-soluble, monionic hydroxyethyl cellulose and (b) from about 99 to about 1% water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose, based on the total dry weight of (a) the water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose and (b) the water-soluble, nonionic hydroxyethyl cellulose, wherein the hydrophobic modifier of the water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose is a long chain alkyl group attached to the cellulose in an amount of from about 0.2 to about 4%, by weight of the fully substituted water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose.

4,892,590

PRECIPITATED CALCIUM CARBONATE-CATIONIC STARCH BINDER AS RETENTION AID SYSTEM FOR PAPERMAKING

Robert A. Gill, Bethlehem, Pa., and Nigel D. Sanders, Somerville, N.J., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,175

Int. Cl.[4] C08L *91/00*; D21D *3/00*

U.S. Cl. 106—214 **4 Claims**

1. A binder system for use in a papermaking process, said system comprising a highly dispersible, high surface area precipitated calcium carbonate and a cationic starch. Wherein the precipitated calcium carbonate has a surface area of from 10 m^2/g-200 m^2/g and the ratio of precipitated calcium carbonate: cationic starch is 2:1 to 1:20 by weight.

4,892,591

FILLER FOR INK JET RECORDING PAPER

Masahide Ogawa; Teiji Sato, both of Shibata; Masao Takahashi, Shiunji, and Kazumitsu Enomoto, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,804

Claims priority, application Japan, Jun. 6, 1987, 140767

Int. Cl.[4] C04B *14/04*

U.S. Cl. 106—482 **10 Claims**

1. A filler for ink jet recording paper, said filler being composed of amorphous silica particles having a median diameter, measured by the coulter counter method, of 2 to 15 μm, an oil absorption of at least 180 ml/100 g, a refractive index, measured by the solvent method, of 1.460 to 1.500, and a moisture absorption, measured when it is caused to absorb moisture for 200 hours at a relative humidity of 90% and a temperature of 25° C., of at least 35%, and a coating of a compound of a metal of Group II of the periodic table on the surface of the silica particles in an amount of 0.5 to 20% by weight, wherein the coated silica particles has an acid amount, in an acid strength function H_o of more than +1.5 and up to +3.3, of not more than 0.020 millimole/g.

4,892,592

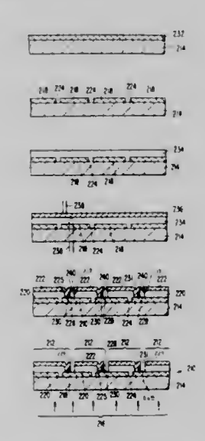
THIN FILM SEMICONDUCTOR SOLAR CELL ARRAY AND METHOD OF MAKING

Charles R. Dickson, Trenton; Barry J. Johnson, Cream Ridge, both of N.J., and David B. Gerhardt, Solebury, Pa., assignors to Solarex Corporation, Rockville, Md.

Continuation of Ser. No. 31,919, Mar. 26, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,443

Int. Cl.[4] H01L *27/14. 31/18*

U.S. Cl. 136—244 **10 Claims**



10. A multi-cell thin-film semiconductor device fabricated by a process comprising the steps of:

a. fabricating a plurality of spaced-apart front electrodes on a substrate;

b. fabricating a thin film of semiconductor material on said front electrodes;

c. fabricating a thin film of metal on said semiconductor film;

d. scribing said metal film along a pattern of first lines with a laser operated at a first power density sufficient to melt said metal through said underlying semiconductor film and form electrical connections between said metal film and said front electrodes along said first lines; and

e. scribing said semiconductor film along a pattern of second lines with a laser operated at a second power density sufficient to ablate said semiconductor material along said second lines, said second lines being substantially parallel to and adjacent said first lines, the ablation of said semiconductor material producing gases that structurally weaken and burst through said metal film overlying said semiconductor material along said second lines to form gaps separating said metal film into a plurality of back electrodes.

4,892,593

SOLAR TRAP

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 659,227, Oct. 9, 1984, Pat. No. 4,723,535. This application Jan. 7, 1988, Ser. No. 141,910

Int. Cl.[4] H02N *6/00*; F24J *2/18*

U.S. Cl. 136—246 **10 Claims**

1. A solar energy collecting apparatus comprising in combination:

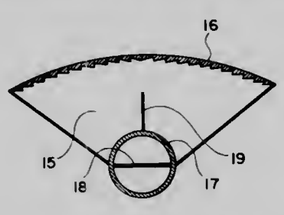
(a) a light funneling trough including two flat light reflecting surfaces disposed in a face-to-face arrangement having an oblique angle therebetween;

(b) a two dimensional Fresnel lens covering the opening of the light funneling trough at the diverging extremity thereof;

(c) a photovoltaic panel facing the two dimensional Fresnel

lens disposed adjacent to the converging extremity of the light funneling trough; and

(d) at least one dual-sided light reflecting planar member disposed radially intermediate the two light reflecting surfaces, said dual-sided light reflecting planar member extending from the converging extremity of the light funneling trough towards the diverging extremity thereof



and terminated at a substantial distance away from the plane including the opening of the light funneling trough; wherein the sunlight entering the light funneling trough through the two-dimensional Fresnel lens is refracted by the two dimensional Fresnel lens and funneled by the light funneling trough towards the converging extremity of the light funneling trough and irradiates the photovoltaic panel.

4,892,594

PHOTOVOLTAIC ELEMENT

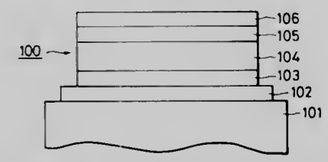
Ryoji Fujiwara, Kamakura; Misori Yamaguchi, Akashi, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Kanegafuchi Chemical Industry Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 106,924, Oct. 7, 1987, abandoned, which is a continuation of Ser. No. 871,167, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 703,486, Feb. 20, 1985, abandoned. This application Oct. 5, 1988, Ser. No. 253,890

Claims priority, application Japan, Feb. 23, 1984, 59-33003

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—258 **7 Claims**



1. A photovoltaic element having a p-i-n laminated structure on a substrate, comprising in sequence:

a first electroconductive layer;

a transparent iridium oxide layer having a thickness of 20 to 5000 Å and p-type conductivity;

a hydrogenated amorphous silicon active layer having a thickness of 1000–20,000 Å and i-type conductivity;

a hydrogenated amorphous silicon layer having a thickness of 50 to 2000 Å and n-type conductivity; and

a second electrocondouctive layer.

4,892,595

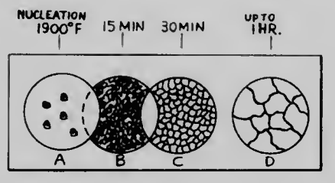
METHOD OF FORMING HIGH QUALITY MOLD PIN INSERT

Orie E. Holmes, 18997 Barroso St., Rowland Heights, Calif. 91748

Filed Apr. 30, 1986, Ser. No. 858,213

Int. Cl.[4] C21D *8/00*

U.S. Cl. 148—12 R **13 Claims**



7. In the method of forming a mold pin for a high quality mold, the steps comprising:

selecting a steel rod formed by a rolling process which drives any impurities in the rod toward its center, whereby the rod has a longitudinally extending central region having a relatively high concentration of such impurities and an annular region surrounding said central region having a relatively low concentration of said impurities,

longitudinally coring a cylindrical slug from said annular region,

heating said slug in a corrosion inhibiting atmosphere to a point of dendritic crystal formation in the steel of the slug between nucleation and the onset of dendritic crystal growth and thereafter quenching and thermally drawing the slug to the desired hardness, and

machining and polishing the slug to the desired outside diameter.

4,892,596

METHOD OF MAKING FULLY DENSE ANISOTROPIC HIGH ENERGY MAGNETS

Dilip K. Chatterjee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1988, Ser. No. 159,635

Int. Cl.[4] H01F *1/02*

U.S. Cl. 148—104 **6 Claims**



1. A method of making anisotropic permanent magnets which comprises extruding a rare earth, transition metal, magnetic alloy together with an oxygen-getter material at a temperature of from about 600° C. to about 1000° C. at an extrusion ratio of from about 10:1 to about 26:1 said rare earth, transition metal, magnetic alloy and said oxygen-getter material being disposed within an extrusion zone in separate and discrete locations.

4,892,597

DISSOLVED TRINITROTOLUENE IN SENSITIZED NITROMETHANE

John D. Sullivan, Jr., Edgewood, Md., assignor to The United States of America as represeuted by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1989, Ser. No. 401,194

Int. Cl.[4] C06B *25/38*

U.S. Cl. 149—91 **10 Claims**

1. An explosive composition comprising an effective explosive amount of the combination of (a) nitromethane, (b) trinitrotoluene, and (c) pyridine.

4,892,598

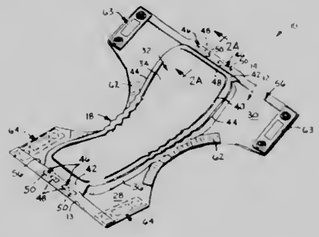
METHOD OF INTEGRATING AN ABSORBENT INSERT INTO AN ELASTOMERIC OUTER COVER OF A DIAPER GARMENT

Robert A. Stevens, Appleton; Leona G. Boland, Neenah, and John L. Chiatalas, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 30, 1987, Ser. No. 140,264

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—91 **28 Claims**



1. A method of integrating a fluid-absorbing component into a holding component of an anatomically form-fitting and generally self-adjusting diaper garment, said method comprising the steps of:

a. providing a flexible, resiliently stretchable positioning means for holding and positioning the absorbing component during use, delimiting a shape having front and rear waist sections, an intermediate crotch section, a pair of leg openings along opposed marginal edges of said crotch section and front and rear panels separated from one another by said crotch section;

b. providing a relatively inelastic insert means containing said fluid-absorbing component for absorbing and containing bodily fluids and other wastes, delimiting a shape, superposable on an inner, body-facing surface of said positioning means, with opposed longitudinal ends and a pair of sides extending between and interconnecting said ends;

c. providing cooperable retaining means on said insert means and said positioning means, respectively, for retaining said insert means, including fastening means and slot-forming means adapted for receiving said fastening means therethrough while allowing substantially unrestricted functional elongation and retraction of said positioning means relative to said insert means;

d. providing a flexible shape-retaining means disposed with said inelastic insert means for maintaining said inelastic insert means in a generally body-conforming orientation;

e. superposing said insert means on said inner surface of said positioning means; and

f. fastening said fastening means together through said slot-forming means, integrating said insert means with said outer cover means and forming said diaper garment.

4,892,599

JOINING METAL COMPONENTS

William F. Marwick, Daventry, England, assignor to Alcan International Limited, Montreal, Canada

Filed Sep. 29, 1988, Ser. No. 250,909

Claims priority, application United Kingdom, Oct. 7, 1987, 8723565

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—94 **6 Claims**

1. A method of joining components of a metal structure, which method comprises applying a heat-curable adhesive between faying surfaces of the components, applying an infrared absorbing coating to an exterior surface of the structure in the vicinity of the adhesive, and curing the adhesive by applying infra-red radiation to the coated surface.

4,892,600

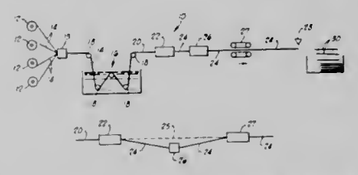
METHOD AND APPARATUS FOR PULTRUDING NON-LINEAR THERMOPLASTIC COMPOSITE ARTICLES

William H. Beever, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1988, Ser. No. 284,673

Int. Cl.[4] B32B *27/02, 31/12;* **B31F** *1/00*

U.S. Cl. 156—166 **13 Claims**



1. A method of continuously pultruding non-linear reinforced thermoplastic composite articles comprising:

pulling a reinforcing material impregnated with a thermoplastic material through a heated composite forming die, the temperature of said die being such that said thermoplastic material is initially melted and upon exiting said die the resulting formed thermoplastic composite is still deformable;

moving said deformable composite transversely to the direction in which said composite passes through said heated die while cooling said composite to produce one or more angular bends therein,

wherein said deformable composite is pulled through a cooling guide after exiting said heated die, and said cooling guide is moved transversely to the direction in which said composite passes through said heated die to thereby transversely move said composite, said moving occurring while the composite is advancing through said cooling guide; and dividing said cooled composite into separate nonlinear articles.

4,892,601

POLE REPAIR SYSTEM

Leslie S. Norwood, Northants, England, assignor to Scott Bader Company Limited, Northamptonshire, United Kingdom

Filed Aug. 8, 1988, Ser. No. 229,505

Claims priority, application United Kingdom, Aug. 13, 1987, 8719143

Int. Cl.[4] B32B *35/00*

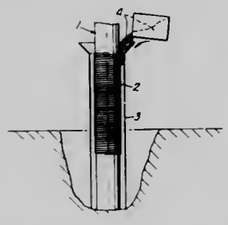
U.S. Cl. 156—94 **16 Claims**

1. A method selected from repairing, protecting and strengthening a utility pole (1) projecting from the ground, which method comprises

fitting a compressible elastomeric interlayer around the pole so that the interlayer is at least mechanically bonded to the pole,

fitting a sleeve around the pole so as to provide a clearance between the sleeve and the interlayer surrounding the pole,

introducing into the clearance between the sleeve and the interlayer a flowable hardenable composition, which said composition is essentially free from shrink on said hardening, and



allowing the composition to harden so as to form a core, which core is at least mechanically bonded both to the interlayer and to the sleeve, and thereby

forming an assembly in which each of the pole, the interlayer, the core and the sleeve provides a respective structural component of the assembly.

4,892,602

HEAT-SENSITIVE TRANSFER MEDIUM

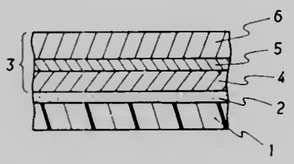
Hitoshi Oike, and Motoshige Yanagimachi, both of Kyoto, Japan, assignors to Oike Industrial Co., Ltd., Kyoto, Japan

Filed Aug. 14, 1987, Ser. No. 85,190

Claims priority, application Japan, Aug. 19, 1986, 61-195013; Sep. 4, 1986, 61-208722; Feb. 16, 1987, 62-32984

Int. Cl.[4] B41M *5/26*

U.S. Cl. 156—233 **13 Claims**



1. A method for producing print images having a metallic luster by use of a heat-sensitive transfer medium, which comprises the steps of:

(a) preparing a heat-sensitive transfer medium comprising a support and a transfer layer on one side of said support wherein said transfer layer comprises a protective resin layer having a heat deformation temperature of at least 120° C., a metal deposition layer on said resin layer, and an adhesive layer over said metal deposition layer;

(b) bringing said adhesive layer of said transfer layer into contact with a receiving medium; and

(c) heating localized areas of said transfer layer by means of a thermal head which is brought into contact with the support of the transfer medium, thereby selectively transferring the heated areas of the transfer layer onto the receiving medium to form print images having a metallic luster on said receiving medium.

4,892,603

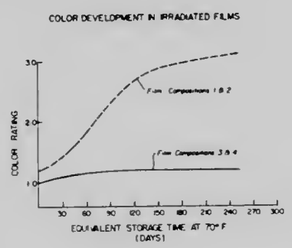
IRRADIATED MULTILAYER FILM FOR PRIMAL MEAT PACKAGING

Stanley Lustig, Park Forest; Jeffrey M. Schuetz, Woodridge, and Stephen J. Vicik, Darien, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Continuation of Ser. No. 134,657, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 744,680, Jun. 14, 1985, Pat. No. 4,714,638. This application Sep. 9, 1988, Ser. No. 243,133

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—244.11 **26 Claims**



1. A process for producing a multilayer film suitable for packaging primal and sub-primal meat cuts and processed meats comprising:

(a) co-extruding a first outer film layer, a core film layer comprising a vinylidene chloride-methyl acrylate copolymer, and a second outer film layer;

(b) biaxially stretching said multilayer film; and

(c) irradiating said multilayer film to a dosage level of between about 1 megarad and about 5 megarads.

4,892,604

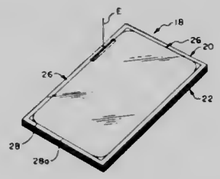
METHOD OF MAKING A STERILIZABLE MULTI-LAYER CONTAINER

Paul E. Measells, Palatine; William D. Johnston, Buffalo Grove; Peter C. Kwong, McHenry; Dean G. Laurin, Lake Zurich, and Leonard F. Czuba, Lombard, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 59,132, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 827,847, Feb. 7, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,295

Int. Cl.[4] B32B *31/26, 31/28*

U.S. Cl. 156—244.24 **9 Claims**



1. A method of fabricating a heat sterilizable stress-free container comprising the steps of:

forming first and second film members, each having at least two integral layers, the first of the layers formed of a material which is cross-linkable and free or essentially free of leachable plasticizers and which has a heat distortion temperature at or below 110° C., the first layer material being selectively cross-linkable to obtain the desired resistance to distortion at heat sterilization temperatures, the second of the layers formed of a material which, when compared to the first layer material, is not cross-linkable and which has a heat distortion temperature above 110° C.;

positioning the first and second film members in overlapping relationship with corresponding first layers of each adjacent one another so as to form inner surfaces of the container;

melting a peripheral region of the overlapping, adjacent first layers of the container using heat sealing elements without pre-stressing said film members to form a peripheral seal between the inner first layers of the container;

irradiating the container so as to cross-link the first layers to obtain the desired resistance to melting; and

sterilizing the container by exposure to heat at or above 110° C. without pre-stressing the material, to form a non-stressed, non-heat shrinkable container.

4,892,605

PROCESS FOR PRODUCING A FURNITURE LAMINATE SHEET OR WEB

Manfred Schneider, Munich; Heinrich Heitz, Germering; Dieter Schlenz, Neufahrn, and Egon Ewald, Munich, all of Fed. Rep. of Germany, assignors to Alkor GmbH Kunststoffe, Munich, Fed. Rep. of Germany

Division of Ser. No. 899,037, Aug. 22, 1986, Pat. No. 4,767,667. This application Jun. 13, 1988, Ser. No. 184,956

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530290

Int. Cl.[4] B32B *31/12, 31/28*

U.S. Cl. 156—272.6 **13 Claims**



1. A process for producing a laminate comprising the steps of:

(a) providing a multi-layer web comprising a polyolefin web comprising an admixture of from 70 to 97.5 parts by weight of a first polymer material selected from the group consisting of propylene homopolymers and propylene copolymers, and from 5 to 30 parts by weight of a second polymer material selected from the group consisting of low pressure polyethylene, polyvinylalcohol, ethylene-vinylalcohol copolymers, ethylene-acrylic acid copolymers, ethylene-acrylate ester-acrylic acid copolymers and terpolymers, polycaprolactone, and mixtures and blends of low pressure polyethylene with at least one of the foregoing materials, and per 100 parts by weight of said first and second polymer material admixture, from 50 to 150 parts by weight of at least one finely divided mineral filler material, of which more than 60% includes a reactive material containing at least one polar group and at least one nonpolar group, said reactive material being present in an amount from 0.5 to 10 weight percent based on the weight of the filler, and a surface layer having a thickness from 3 to 30 microns applied over a front side of said polyolefin web;

(b) subjecting at least the back side of said polyolefin web of said multi-layer web to a radiation treatment, and

(c) adhesively bonding said back side of said polyolefin web of said radiation-treated multi-layer web to a wood material substrate.

4,892,606

OPTICAL RECORDING MEDIUM HAVING SPACE THEREIN AND METHOD OF MANUFACTURING THE SAME

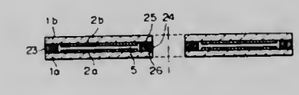
Takeshi Miyazaki; Tetsuro Fukui, both of Kawasaki, and Tsuyoshi Santoh, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,272

Claims priority, application Japan, Aug. 28, 1986, 61-199935; Sep. 10, 1986, 61-211473; Sep. 16, 1986, 61-215862; Sep. 16, 1986, 61-215863; Sep. 24, 1986, 61-223837; Oct. 8, 1986, 61-239850

Int. Cl.[4] B32B *31/12; G11B 7/26*

U.S. Cl. 156—275.5 **9 Claims**



1. A method comprising the steps of:

forming an optical recording layer on at least one of a pair of substrates;

applying an adhesive mixture from a storage tank to part of at least one of the pair of substrates, said adhesive mixture being a dispersion of granular or filler-type spacing members in said adhesive, said spacing members having a specific gravity from 0.9 to 1.3 times that of the adhesive in said tank, the spacing members and the adhesive being mixed to prepare a mixture, said mixture being supplied in a small amount from said tank in each applic cycle;

adhering the pair of substrates while an optical recording layer faces inside; and

curing the adhesive.

4,892,607

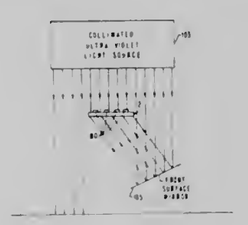
CHIP MOUNTING TECHNIQUES FOR DISPLAY APPARATUS

Frank J. DiSanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Continuation of Ser. No. 938,147, Dec. 4, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 208,854

Int. Cl.[4] B32B *31/28*

U.S. Cl. 156—275.7 **5 Claims**



1. A method of bonding integrated circuits in a monolithic flat panel display comprising the steps of:

placing a spot of optical cement which is curable upon exposure to ultraviolet radiation on a surface of an integrated circuit to be bonded;

positioning said integrated circuit to be bonded on a first surface of a transparent display panel at a location adjacent to inputs and outputs of said display panel to be connected to said integrated circuit, said first surface and said surface forming an interface therebetween and said first surface of said display panel being disposed to support said integrated circuit; and

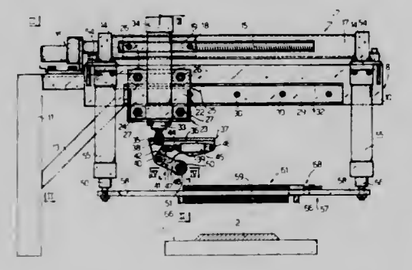
exposing said interface to collimated ultraviolet radiation through a second surface of said transparent display panel, which second surface is disposed on the opposite side of said display panel from said first surface, until said spot of optical cement becomes sufficiently tacky so as to hold said integrated circuit if said display panel were inverted, wherein said step of exposing includes placement of said first surface beneath a source of collimated ultraviolet radiation and includes employing a front surface mirror to direct collimated ultraviolet radiation from the source at an angle other than 90° through said second surface to said interface.

4,892,608

AUTOMATIC TRANSVERSE SPLICING DEVICE FOR UNCURED ELASTOMERIC SHEET MATERIAL

Roberto Lippa, Castel Romano, Italy, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Filed Jan. 23, 1989, Ser. No. 299,589
Claims priority, application Italy, Jan. 22, 1988, 67039 A/88
Int. Cl.[4] B29D *30/06*; B65H *69/06*
U.S. Cl. 156—421 **7 Claims**



1. An automatic device for splicing uncured elastomeric sheet material along a predetermined transverse splicing line, said device being designed to cooperate with a surface supporting said material, said device comprising a number of blades arranged substantially perpendicular to, and facing said supporting surface and said splicing line, said blades being grouped together, in an axially-sliding manner to and from said supporting surface, into a displaceable pack extending along said splicing line and having a first lateral surface facing said supporting surface; approach means for enabling relative displacement of said pack and said supporting surface to and from an operative position wherein the material for splicing is retained between said pack and said supporting surface; and pressure means cooperating, in use, with a second surface of said pack, opposite said first surface, for axially thrusting said blades towards said supporting surface by successively applying a predetermined axial pressure on said blades.

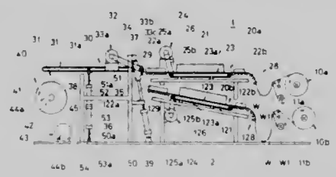
4,892,609

AUTOMATIC MATERIAL FEEDER IN TIRE FORMING MACHINE

Heikichi Nakanome, and Takeshi Yonezawa, both of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 810,146, Dec. 18, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 133,180
Claims priority, application Japan, Dec. 23, 1984, 59-271032
Int. Cl.[4] B29D *30/30*
U.S. Cl. 156—406.4 **3 Claims**

1. An automatic feeder for feeding tire building material in a tire building machine, comprising a plurality of first feeders disposed in a multistage vertical arrangement on a material supplying side, each of said first feeders being provided with cloth inspection means, with automatic cutting apparatus, with centering apparatus and with a discharge portion; a single second feeder disposed at the discharge end of said discharge portion feeders of said first feeder for receiving tire building material from the discharge portion of a selected one of said first feeders and for guiding the tire building material to a tire forming drum, said second feeder having an inlet portion and a discharge portion; first moving means connected in said inlet portion of said second feeder and second moving means connected to said second feeder intermediate said inlet portion and said discharge portion of said second feeder, means for operating said first and second moving means for moving said inlet portion of said second feeder to the discharge portion of said selected one of said first feeders and to the one of said first feeders selected thereafter, respectively, for receiving tire



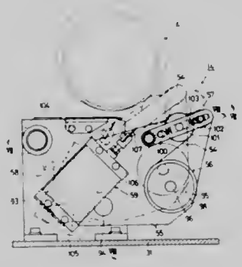
building material from said selected one of said first feeders; and third moving means aligned with said second moving means for moving said discharge portion of said second feeder with said receiving tire building material thereon into alignment with said tire forming drum for feeding said receiving tire building material from said discharge portion of said second feeder to said tire forming drum and for moving said discharge portion of said second feeder away from said tire forming drum after said tire building material is transferred to said tire forming drum, said each first feeder being further provided with a group of separating rollers at said discharge portion of said first feeders and driving means for driving said rollers independent of said first and second feeders and separating tire building material on said second feeder from tire building material on said selected first feeder.

4,892,610

AUTO REEL LOADER

Shozo Sano, Hyogo, Japan, assignor to Kabushiki Kaisha Kaneda Kikai Seisakusho, Osaka, Japan

Filed Jan. 30, 1989, Ser. No. 303,210
Claims priority, application Japan, Sep. 6, 1988, 63-223100
Int. Cl.[4] B66F *9/14*
U.S. Cl. 156—446 **5 Claims**



1. An auto reel loader having a plate on which a truck may be loaded and a used up paper roll holder for receiving a used up paper roll from the paper roll reel of a rotary press and transferring the used-up paper roll to the truck, said auto reel

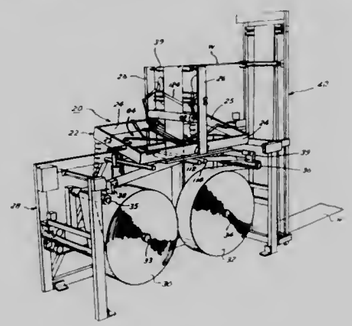
loader being characterized in that it is provided with a fastening means which may be moved into proximity of said paper roll reel, said fastening means including means for applying an adhesive tape to the outer circumferential surface of a used-up paper roll on the paper roll reel to thereby secure a remaining strip of paper on the used-up paper roll.

4,892,611

KNIFE WHEEL ASSEMBLY SUITABLE FOR FORMING A BUTT SPLICE

Roger R. Wheeler, Roscoe, and John R. Martin, Rockford, both of Ill., assignors to Martin Automatic, Inc., Rockford, Ill.

Continuation of Ser. No. 153,578, Jan. 29, 1988, Pat. No. 4,801,342, which is a continuation of Ser. No. 907,117, Sep. 12, 1986, abandoned. This application Jul. 18, 1988, Ser. No. 221,023
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
Int. Cl.[4] B31F *5/06*; B65H *69/06*
U.S. Cl. 156—504 **14 Claims**



1. In an apparatus for forming a butt splice to join together, by a piece of adhesive tape, a web from a new roll of material to a web which is from an expiring roll of material and which is being run, downstream from the expiring roll, under tension along a pre-determined path of travel that includes running web storage means, with the apparatus including: an anvil means disposed adjacent to the path of travel and having first and second sides and a cutting edge at the downstream ends of the sides; means for supporting the expiring roll and the new roll so that each web on each roll may run off of the roll and past the anvil means; means for selectively holding a portion of the web from the new roll against the first side of the anvil means; means for selectively trimming off the web from the ne roll along the cutting edge of the anvil means so that the trimmed edge of the leading end of the web from the new roll is aligned with and conforms to the cutting edge of the anvil means and so that a piece of adhesive tape can be applied to one side of the leading end, with the adhesive on the adhesive tape facing the path of travel and with an exposed portion of the adhesive tape projecting downstream beyond the cutting edge of the anvil means and the trimmed edge of the web from the new roll; means for momentarily stopping the running of the portion of the web from the expiring roll adjacent to the anvil means while permitting the further downstream portions of the web from the expiring roll, remote from the anvil means, to continue to run under tension; means for selectively holding the stopped, anvil adjacent portion of the web from the expiring roll against the second side of the anvil means; and means for permitting a joined leading end of the web from the new roll and trailing end of the web of the expiring roll to run again, along the path of travel, with the further downstream portions of the web of the expiring roll; the improvement comprising:

a knife wheel assembly including a roller that is disposed, in relation to the anvil means, downstream from the cutting edge of the anvil means and a knife edge that is aligned with the cutting edge of the anvil means, with both the roller and the knife edge being adjacent with the second side of the anvil means and to one side edge of the web from the expiring roll; and

means for moving the knife wheel assembly across the web from the expiring roll, from its one side edge to its other side edge, after the web from the expiring roll has been momentarily stopped adjacent to the anvil means, with this movement of the knife wheel assembly causing: (A) the knife edge to cut the stopped, anvil adjacent portion of the web from the expiring roll a part at a time, across the web and beginning at the one side edge thereof, so that the point of cutting moves across the stopped, anvil adjacent portion of the web from the expiring roll from the one side edge to the other side edge, so that the uncut part of the web from the expiring roll remains under tension ahead of the point of cutting, and so that the trimmed edge of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll is aligned with and conforms to the cutting edge of the anvil means and; (B) the roller to apply the cut part of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll, behind the point of cutting, to the downstream extending, exposed portion of the adhesive tape substantially simultaneously as the point of cutting moves across the stopped, anvil adjacent portion of the web from the expiring roll so that the trimmed edge of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll abuts and is disposed closely adjacent to the trimmed edge of the leading end of the web from the new roll, and so that the adhesive tape secures together the leading end of the web from the new roll and the trailing end of the web from the expiring roll.

4,892,612

POLISHING METHOD

John E. Huff, 4102 W. Wagon Wheel Dr., Phoenix, Ariz. 85051

Filed Oct. 11, 1988, Ser. No. 255,801
Int. Cl.[4] H01L *2/306*; B44C *1/22*
U.S. Cl. 156—636 **7 Claims**

1. In the method of polishing the surfaces of silicon wafers sliced from single crystal ingots with a silica sol-amine combination, the improvement comprising selecting the amine from the group of water-soluble alkanolamines, providing sufficient amine so that at least 2.0 pbw are present for each 10 pbw of SiO_2 and adding no alkali metal hydroxide or ammonium hydroxide to said silica sol-alkanolamine combination upon dilution or during polishing.

4,892,613

PROCESS FOR ETCHING LIGHT-SHIELDING THIN FILM

Noboru Motai, Tochigi; Sakae Tanaka; Yoshiaki Watanabe, both of Tokyo; Katsuo Shirai; Yaeko Suzuki, both of Tochigi; Yoshihisa Ogiwara, Tochigi; Kazunori Saito, Tochigi, and Keiko Shibuki, Tochigi, all of Japan, assignors to Nippon Precision Circuits Ltd. and Seikosha Co., Ltd., both of Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,076
Claims priority, application Japan, Dec. 29, 1987, 62-336682; Dec. 2, 1988, 63-305763
Int. Cl.[4] C23F *1/02*; H01L *21/306*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—643 **4 Claims**

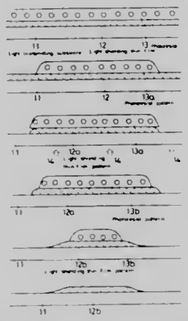
1. A process for etching a light-shielding thin film which comprises the steps of:

applying a photoresist to a light-shielding thin film formed on a light-transmitting substrate;

exposing the photoresist and then developing the exposed photoresist, thereby forming a photoresist pattern of desired shape;

etching the light-shielding thin film by using the photoresist

pattern as a mask, thereby forming a light-shielding thin film pattern matching the photoresist pattern;
exposing the photoresist pattern through the reverse side of the light-transmitting substrate by using the light-shielding



thin film pattern as a mask and then developing the exposed photoresist pattern, thereby reducing the size of the photoresist pattern; and
etching the light-shielding thin film pattern by using the reduced size photoresist pattern as a mask.
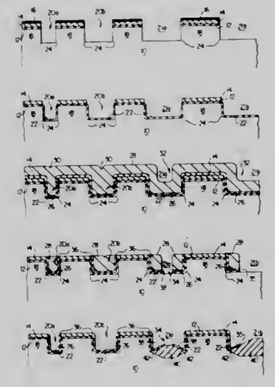
4,892,614

INTEGRATED CIRCUIT ISOLATION PROCESS

Richard A. Chapman, Dallas, and Clarence W. Teng, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 882,732, Jul. 7, 1986, Pat. No. 4,842,675. This application Mar. 10, 1989, Ser. No. 321,699
Int. Cl.[4] B44C *1/22;* **H01L** *21/306;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **14 Claims**

1. A method of fabricating an isolation region at a surface of a semiconductor body, comprising:
etching a recess having sides and a bottom into said surface of said semiconductor body, a portion of said surface not within said recess defined as an active region;
forming an oxidation mask over said active region and along the sides and bottom of said recess;
forming a masking layer over said oxidation mask, said masking layer having a portion near the center of said recess which is thinner than the portion of said masking layer near the sides of the recess;
etching said masking layer so that the thinner portion of the masking layer is removed and so that portions of said masking layer remain within said recess near the sides of said recess;
removing a portion of said oxidation mask at the bottom of said recess at the location not covered by the remaining portions of said masking layer near the sides of said recess;
oxidizing a portion of said bottom of said recess at the location from which the portion of said oxidation mask was removed, to form a first oxide layer thereat;



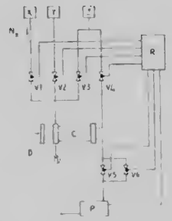
depositing a second oxide layer over said active region and into said recess after said oxidizing step; and
etching said second oxide layer over said active region.

4,892,615

METHOD FOR DECONTAMINATION OF A CHAMBER USED IN VACUUM PROCESSES FOR DEPOSITION, ETCHING AND/OR GROWTH OF HIGH PURITY FILMS

Antonino Motta, Milan, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Dec. 2, 1987, Ser. No. 127,952
Claims priority, application Italy, Dec. 2, 1986, 22532 A/86
Int. Cl.[4] B44C *1/22;* **B05D** *3/06;* **C23C** *14/00*
U.S. Cl. 156—643 **5 Claims**



1. A method for decontamination of a chamber used in vacuum processes for deposition, etching and/or growth of high purity films which comprises:

introducing into a chamber products to be processed as high purity films,
creating a vacuum in said chamber containing said products by pumping so that the pressure in said chamber is reduced to a first minimum pressure value of at least about 25 mTorr,
purging said chamber by introducing therein a non-contaminating gas until a second pressure is reached higher than said first minimum value pressure,
and repeating the above purging and pumping steps, such that the flow of said non-contaminating gas is intermittent and decontamination is realized by said series of purgings and pumping steps.

4,892,616

PROCESS FOR STRIPPING COLOR FILTER ARRAYS FROM SUBSTRATES

Bertalan J. Vegh, Fairport, and Laurel J. Pace, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1988, Ser. No. 263,940
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **B29B** *37/00*
U.S. Cl. 156—655 **6 Claims**

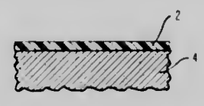
1. A process for stripping a color filter array coating from a substrate of a solid-state color image sensing device to recover the substrate which subsequently can be used to produce another solid-state color image sensing device, said process comprising contacting said color filter array coating with a stripping solution comprising chromic acid and sulfuric acid for a time effective to remove said coating from said substrate.

4,892,617

PROCESSES INVOLVING LITHOGRAPHIC MATERIALS

Frank S. Bates, Summit; Mark A. Hartney, Westfield, and Anthony E. Novembre, Union City, all of N.J., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 643,156, Aug. 22, 1984, abandoned. This application Oct. 19, 1987, Ser. No. 110,630
Int. Cl.[4] B44C *1/22;* **G03C** *5/00*
U.S. Cl. 156—659.1 **6 Claims**



1. A process for fabricating a structure comprising the steps of forming a region of radiation delineable material on a substrate, delineating said material by exposing the material to a pattern of radiation and developing the pattern and employing said delineated material as a dry etch mask to transfer said pattern to said substrate in continuing said fabrication.
CHARACTERIZED IN THAT
said material comprises a polymer including at least a first and second segment, said first and second segments each imparting a distinct chemical property to said polymer wherein each segment includes at least 10 monomer units, wherein said first and second segments are compositionally different, and wherein the distinct chemical property of the first segment is chosen to improve the step of delineating said material and the distinct chemical property of the second segment is chosen to improve the said dry etch transfer.

4,892,618

METHOD FOR THE MANUFACTURE OF PRODUCTS CONTAINING WOOD CHIPS BY INSOLUBILIZING THE LIGNIN

Rune Simonson, Sotenäsvägen 64, S-433 64 Partille, and Brita Ohlsson, N. Stommen 318, S-438 00 Landvetter, both of Sweden

Continuation of Ser. No. 848,207, Apr. 4, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,049
Claims priority, application Sweden, Apr. 4, 1985, 8501688
Int. Cl.[4] B27N *3/04, 1/02;* **D21J** *1/04*
U.S. Cl. 162—16 **8 Claims**

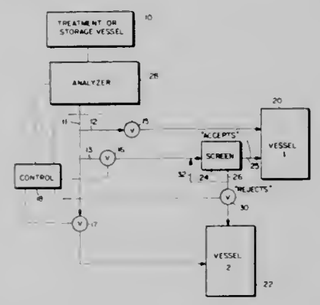
1. A method for the manufacture of moisture resistant products from wood chips by compression and adhesive bonding comprising the steps of
(a) transforming lignin into water-soluble form by dissolving lignin and water-soluble derivatives thereof in an aqueous solution of pH 12.5 or less;
(b) impregnating the wood chips and the cells of the wood chips with said aqueous lignin solution
(c) treating the chips impregnated with said water-soluble lignin so it will not leach from said wood chips, by insolubilizing the lignin within the wood chips by impregnating the chips with a weakly acid aqueous solution of a metal salt in a further impregnating step;
(d) drying said chips containing insolubilized lignin;
(e) coating the outer surfaces of the wood chips impregnated with the insolubilized lignin with glue;
(f) and then compressing the coated chips to form said product.

4,892,619

METHOD OF PRODUCTION OF FIBER CONTAINING PULP WITH DIFFERENT RAW MATERIALS

Goran Tistad, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Apr. 1, 1988, Ser. No. 177,472
Claims priority, application Sweden, Apr. 6, 1987, 87014239
Int. Cl.[4] D21F *7/06*
U.S. Cl. 162—49 **14 Claims**



1. A method of continuously producing cellulosic fibrous material pulp during changeover of a pulp production process from a first raw material for continuously producing a first pulp having a first property, to a second raw material for continuously producing a second pulp having a second property different from the first property, so as to minimize waste of the pulp while maintaining the integrity of the final pulp produced, comprising the steps of continuously:
(a) feeding the continuously produced first pulp to a first location for storage or treatment thereof;
(b) after changeover to the second raw material, feeding the pulp mixture produced during changeover from the first to the second raw material, which pulp mixture has pulp

with both said first and second properties, to a screening station;

(c) at the screening station separating the pulp mixture into separate pulp fractions according to the different first and second properties of the pulps making up the pulp mixture;

(d) feeding the separated pulp fractions, one fraction comprising substantially all first pulp and the other fraction substantially all second pulp, to different locations for storage or treatment of the first and second pulps; and

(e) once the pulp mixture contains substantially all second pulp, terminating steps (b) and (c) and feeding the second pulp to a second location for storage or treatment thereof.

4,892,620

DIURETHANE LATEX AND PROCESSES

Catherine Beuzelin, Paris, and Claude Senez, Gouvieux, both of France, assignors to Atochem, Paris La Defense, France

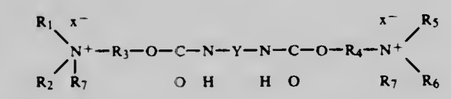
Division of Ser. No. 3,790, Jan. 16, 1987, Pat. No. 4,786,330. This application Aug. 8, 1988, Ser. No. 230,934

Claims priority, application France, Jan. 24, 1986, 86 00997

Int. Cl.[4] D21H *3/12*

U.S. Cl. 162—158 **8 Claims**

1. A process of sizing a paper comprising adding to the paper the sizing agent in an amount sufficient to size the paper and then drying the paper, said sizing agent utilizable in a neutral medium consisting essentially of a latex consisting essentially of at least one diurethane dispersed in an aqueous medium, said diurethane being of the formula:



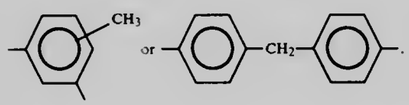
in which:

(a) R_1, R_2, R_5 and R_6 are each alkyl radicals and at least one of them possesses a medium of 7 carbon atoms;

(b) R_7 and x represent, respectively, the cationic and anionic portions of the quarternizing agent R_7x;

(c) R_3 and R_4 are selected from C_2–C_4 alkylene radicals or polyalkoxylated radicals of a degree of polycondensation of between 1 and 4; and

(d) Y is



4,892,621

METHOD AND DEVICE FOR MEASURING PERMEABILITY/PENETRABILITY OF FABRIC IN A PAPER MACHINE

Pekka Eskelinen, Karhula, Finland, assignor to Valmet Paper Machinery, Inc., Finland

Filed Sep. 23, 1988, Ser. No. 249,358

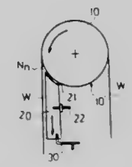
Claims priority, application Finland, Sep. 23, 1987, 874161

Int. Cl.[4] D21F *7/00*; G01N *15/08*

U.S. Cl. 162—198 **20 Claims**

1. Method for measuring air penetrability or permeability of fabric in a paper machine, in which the fabric passes over at least one roll with a positive pressure formed in an inlet nip between a face of the roll and the moving fabric at an inlet side of the roll and a negative pressure formed in an outlet nip between the moving fabric and the roll face at an outlet side of the roll, the positive and negative pressures depending upon the permeability or penetrability of the fabric, comprising the steps of

mounting at least one device adjacent the fabric and roll and which is sealed with respect to the moving roll face so that an at least partially closed pressure space is formed between said device, the roll face and the fabric,



measuring pressure out of said pressure space while the fabric moves, to thereby obtain a measured pressure value, and

calculating the permeability or penetrability of the fabric from the measured pressure value.

4,892,622

METHOD FOR RESISTING FORMATION OF UNDULATIONS IN A FIBER/WATER MIXTURE DURING FORMING OF A PAPER WEB IN A PAPER-MAKING MACHINE

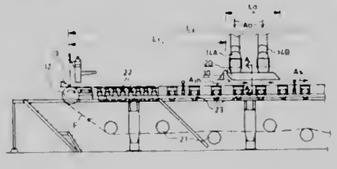
Raimo Malkki; Paavo Jaatinen, both of Lappeenranta; Timo Haverinen; Pekka Eskelinen, both of Turku; Juhani Jokinen, Masku; Vesa Vuorinen; Raimo Virta, both of Turku, and Martti Salmivaara, Littoinen, all of Finland, assignors to Valmet Oy and Kymmene Oy, both of, Finland

Filed Aug. 20, 1987, Ser. No. 87,400

Claims priority, application Finland, Aug. 22, 1986, 863411

Int. Cl.[4] D21F *1/00*

U.S. Cl. 162—208 **9 Claims**



1. A method of resisting formation of undulations in a fiber/water mixture supported by a forming wire during forming of a paper web in a high-speed, paper-making process, comprising the steps of:

jointly advancing the fiber/water mixture and the forming wire during the forming of the paper web along an advancement path at a web velocity; and

moving a mass of air directly above and extending over a direction transverse to said advancement path, in the same direction as said advancing of the fiber/water mixture and only partly along said advancement path during forming of the paper web, and at an air velocity generally equal in magnitude to said web velocity;

wherein said moving step is commenced at a point downstream of commencement of said joint advancing step;

wherein the advancing and moving steps are performed at web and air velocities on the order of 1000 m/min and higher;

directing the mass of air substantially over the entire width of the web;

wherein the advancing step is performed in a paper-making machine of the type having a forming station at which the fiber/water mixture is supplied from a lip slice of a headbox onto the forming wire;

wherein the moving step is performed at an air-moving station within the forming station;

wherein the moving step includes the steps of commencing a flow of air mass at a predetermined location downstream of the lip slice, and

continuing the air mass flow over a predetermined distance along the advancement path;

wherein the commencing step is performed at said predetermined location which is greater than two meters from the lip slice; and

wherein the moving step includes feeding air into and through the air-moving station, and forming a moving air curtain which blankets the fiber/water mixture within and exiting the air-moving station, and

the moving air curtain is formed by feeding air through a plurality of nozzles successively arranged along the advancement path, each nozzle extending along the transverse direction to emit air across the width of the fiber/water mixture.

4,892,623

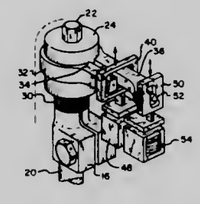
TWO-SPEED STEPPER ACTUATOR

Gordon K. Reed, Bexley, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Feb. 17, 1989, Ser. No. 311,915

Int. Cl.[4] D21F *1/02*

U.S. Cl. 162—344 **13 Claims**



1. A stepper acuator for rotationally driving a member about an axis of rotation, said actuator comprising in combination:

a clamp in engagement with said member to be rotationally driven;

said clamp including opposed clamping legs in spaced, substantially parallel relation:

said legs extending transversely to said axis of rotation;

means for moving said legs toward each other to clamp said member to be rotationally driven; and

cam means engaging one of said legs to provide measured rotational movement of said clamp and said member to be rotationally driven, upon movement of said cam means when said member is clamped said cam means being structured and arranged to provide for the member to be driven at at least two different speeds.

2. The actuator of claim 1 in which the member to be rotationally driven is in combination with said actuator and is a power nut attached to a spindle clamp to linearly drive a spindle.

4,892,624

WORKUP OF DISTILLATION RESIDUES FROM THE PURIFICATION OF CAPROLACTAM

Hugo Fuchs, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,215

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729853

Int. Cl.[4] B01D *3/34*; C07D *201/16*

U.S. Cl. 203—37 **5 Claims**

1. A process for the recovery of caprolactam from a distillation residue containing caprolactam, oligomers of caprolactam, polymers of caprolactam and unidentified decomposition and reaction products, which process comprises

(a) adding to said distillation residue sodium or potassium hydroxide and per part by weight of distillation residue from 0.1 to 10 parts by weight of high boiling hydrocarbons having a boiling point above 250° C. up to 450° C.,

(b) heating the mixture of said distillation residue, sodium hydroxide or potassium hydroxide, and high boiling hydrocarbons to a temperature of from 250° to 450° C., and

(c) removing continuously vaporized caprolactam from said heated mixture.

4,892,625

METHOD FOR PRODUCING HIGH PURITY CHEMICALS

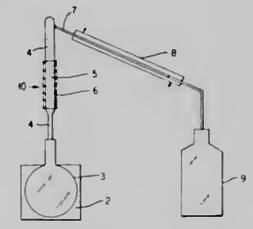
Shumpei Shimizu, Moses Lake, Wash.; Mamoru Yoshizako, Machida, Japan, and Toshitsura Cho, Kawasaki, both of Japan, assignors to Tama Chemicals Co., Ltd., Japan and Moses Lake Industries, Inc., Japan

Filed Jan. 23, 1987, Ser. No. 65,481

Claims priority, application Japan, Jan. 27, 1987, 62-015219

Int. Cl.[4] B01D *3/00*

U.S. Cl. 203—86 **4 Claims**



1. A method for the distillation in a distillation device of an inorganic acid having non-volatile matter impurities therein, said distillation device comprising a heating section, a contacting section and a condensing section, to obtain the inorganic acid essentially free of non-volatile matter impurities, said method consisting essentially of:

(a) boiling the inorganic acid in the heating section to form vapors of the inorganic acid;

(b) contacting the vapors of the inorganic acid from the heating section with a contact member inert to said vapors in the contacting section, said vapors being passed through the contacting section at a flow rate of 0.01 to 10 sec^{-1} per unit volume of the contacting section;

(c) heating the contacting section at a temperature of 1 to 100° C. higher than the boiling point of the inorganic acid being distilled and maintaining the inorganic acid completely vaporized in the contacting section; and

(d) condensing the vapors from the contacting section in the condensing section.

4,892,626

METHOD FOR PLATING ONE SIDE OF A WOVEN FABRIC SHEET

James H. Covey, Snohomish, Wash., assignor to Boeing Company, Seattle, Wash.

Filed Jan. 21, 1988, Ser. No. 146,418

Int. Cl.[4] C25D *5/02*

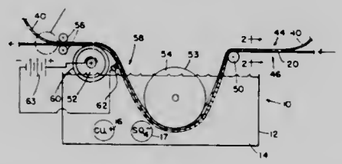
U.S. Cl. 204—15 **12 Claims**

1. A method for plating one side of individual fibers in a fabric sheet with a conductive material, comprising the steps of:

removably attaching a flexible backing sheet to an upper side of a fabric sheet having individual fibers woven so as to form interstices therebetween;

immersing the fabric and backing sheets into an electrolytic solution containing a desired metallic ion for deposition on the fabric sheet, wherein the fabric and backing sheets are oriented and introduced into the solution so that air pockets are formed at the interstices, whereby only the backing sheet and a lower surface of each fiber are wetted;

positioning a first electrode against the fabric sheet;



positioning a second electrode against the lower peripheral surfaces of the fibers;

applying an electric potential between the electrodes to generate an electric field through the fabric sheet to bond the metallic ions to the lower surfaces of the fibers; and removing the backing sheet.

4,892,627

METHOD OF NICKEL-TUNGSTEN-SILICON CARBIDE COMPOSITE PLATING

Koji Takada, Nagoya, Japan, assignor to Takada Laboratories, Inc., Japan

Filed Apr. 27, 1989, Ser. No. 344,226
Claims priority, application Japan, Feb. 18, 1989, Hei 1-37330
Int. Cl.[4] C25D *15/00*
U.S. Cl. 204—16 **1 Claim**

1. A method of nickel-tungsten-silicon carbide composite plating comprising the steps of:

preparing a plating bath having the following composition;

nickel sulfate	0.12–0.16 mol/L
sodium tungstate	0.17–0.23 mol/L
ammonium citrate	0.30–0.50 mol/L
pH	6.0–8.0
bath temperature	60–80

dispersing fine powder of silicon carbide having a grit size of 0.8–1.5 μm in said plating bath with a concentration of 20–60 g/L; and

causing electrolysis in said plating bath while mechanically agitating said plating bath, with a cathode current density of 10–30 A/dm^2 by use of a stainless steel plate as an anode.

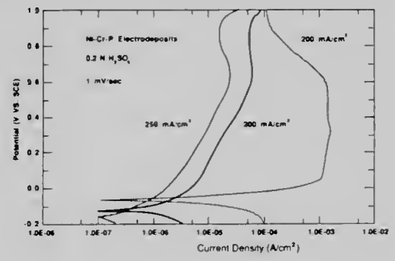
4,892,628

ELECTRODEPOSITION OF AMORPHOUS TERNARY NICKEL-CHROMIUM-PHOSPHORUS ALLOY

Terry R. Gullinger, Albuquerque, N. Mex., assignor to The United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1989, Ser. No. 338,013
Int. Cl.[4] C25D *3/56*
U.S. Cl. 204—44.7 **10 Claims**

1. A method of forming amorphous ternary nickel-phosphorus-chromium alloy deposits by electrodeposition on an electrically conductive substrate, comprising subjecting said substrate to an applied current density between about 20 and 40 A/dm^2 at a temperature from the range of about 20 ° to 30° C. in a bath comprising: a chromium salt and a nickel salt in a weight ratio of about 3:1, a phosphorus source at about 0.3M P



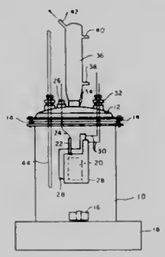
concentration; about 0.3M of a complexing agent; about 0.1M of a supporting salt; and about 1.0M of buffer.

4,892,629

ELECTROCHEMICAL PREPARATION OF SILVER OXIDE ELECTRODES HAVING HIGH THERMAL STABILITY

Daniel R. Glen, Baltimore, Md.; Azzam N. Mansour, Fairfax Station, Va.; Kathleen M. O'Neill, Silver Spring, Md.; Steven Dallek, Beltsville, Md., and Benjamin F. Larrick, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1989, Ser. No. 389,219
Int. Cl.[4] C25D *11/02*
U.S. Cl. 204—56.1 **7 Claims**



1. In the process for preparing AgO cathodes by anodizing silver plaques in basic electrolytes, the improvement comprising:

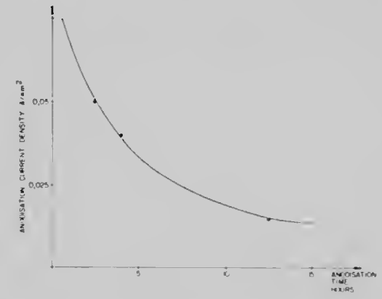
performing the anodizing process at a temperature in the range of from about 70° C. to just under the reflux temperature of the electrolyte.

4,892,630

PROCESS FOR THE PASSIVATING ANODIZATION OF COPPER IN A MEDIUM OF MOLTEN FLUORIDES, AND USE FOR THE PROTECTION OF COPPER PARTS OF FLUORINE ELECTROLYSERS

Patrick Germanaz, Aix en Provence; Sylvie Lamirault, Voiron, and Gerard Picard, Fontenay Sous Bois, all of France, assignors to Comurhex Societe Pour la Conversion de l'Ranium en Metal et Hexafluorure, Courbevoie, France

PCT No. PCT/FR88/00334, § 371 Date Feb. 23, 1989, § 102(e) Date Feb. 23, 1989, PCT Pub. No. WO88/10328, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 23, 1988, Ser. No. 343,145
Claims priority, application France, Jun. 26, 1987, 87 09574
Int. Cl.[4] C25D *11/02*
U.S. Cl. 204—59.5 **13 Claims**



1. A process for the passivating anodisation of copper parts in a liquid KF-xHF medium, where x is about 2, which makes it possible to produce a mechanically and electrically strong, adherent protective layer, with a high rate of covering of the copper substrate, comprising immersing said parts in the liquid KF-xHF bath they and subjecting said immersed parts to an anodic current of a surface-related density, calculated with respect to the immersed surface of copper to be treated, of lower than 0.1 A/dm^2.

4,892,631

RECOVERY OF PRECIOUS METALS FROM COMPLEX ORES

Merwin G. White, P.O. Box 404, Moapa, Nev. 89025

Filed Jun. 20, 1988, Ser. No. 208,758
Int. Cl.[4] C25C *1/20*; C22B *4/00*
U.S. Cl. 204—109 **4 Claims**

1. A method of recovery of precious metals from complex ores comprising

(a) heating a complex ore having a precious metal inquart added thereto before heating and a base metal in an electric arc furnace to smelt precious metal values contained in the ore into the base metal;

(b) transferring the base metal having precious metal values smelted therein in an acid-proof bag to an electrolytic cell;

(c) positioning the base metal to be an anode of the cell;

(d) subjecting the cell to a direct positive current whereby the base metal and unresolved complex values are plated out on a cathode of the cell and the resolved precious metal remain in the bag in the form of an anode mud; and

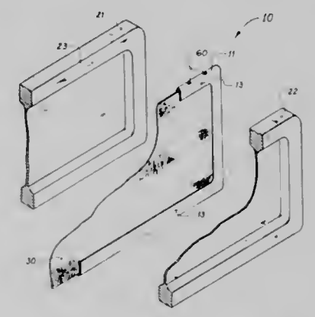
(e) smelting and electrolyzing the anode mud to recover a rich anode mud.

4,892,632

COMBINATION SEAL MEMBER AND MEMBRANE HOLDER FOR AN ELECTROLYTIC CELL

Gregory J. E. Morris, Milan, Italy, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,070
Int. Cl.[4] C25B *1/26, 9/00, 13/00*; B65D *53/00*
U.S. Cl. 204—128 **8 Claims**



8. A method of operating an electrolytic cell comprising:

(a) providing a seal member comprising a solid body structure in a picture frame type configuration having a groove therein forming a U-shaped member when viewed in cross-section, the bottom of the "U" of the U-shaped member forming the outside perimeter surface of the frame configuration and the "arms" of the U-shaped member forming the groove disposed toward the inside perimeter surface of the frame configuration, the groove adapted for holding the edge of a sheet-like member therein such that a space between the edge of the sheet-like member and the inside of the groove is formed, said structure having at least one orifice interconnecting the groove and the outside perimeter surface of the structure, said orifice adapted for venting any gases or liquid present in the space formed between the edge of the sheet-like member and the groove;

(b) inserting a sheet-like separator in the groove of the U-shaped seal member;

(c) interposing the seal member with separator between at least a first frame member and a second frame member, the separator spacing apart an anode and a cathode compartments defined by the first and second frame members and the separator;

(d) compressing the seal member with separator and the first and second frame members together;

(e) feeding an aqueous alkali metal halide solution to the electrolytic cell; and

(f) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

4,892,633

MAGNETRON SPUTTERING CATHODE

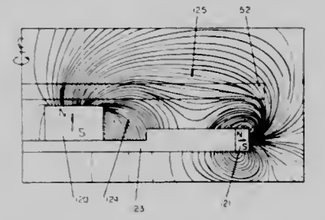
Richard P. Welty, Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 271,100, Nov. 14, 1988. This application Apr. 11, 1989, Ser. No. 336,243
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.12 **27 Claims**

18. A method of increasing the target utilization in a magnetron sputtering process wherein a glow discharge plasma is magnetically confined to a region adjacent to and above the target, said target having a front surface, a body and back surface, comprising:

utilizing magnet means that generate magnetic flux lines which form a closed-loop magnetic tunnel adjacent to said

front surface of said target and within said target body; the curvature of said magnetic flux lines in the center of said tunnel changing progressively from concave, to flat, to convex with increasing distance from said magnet means; in the region where said magnetic flux lines are flat, the flat area is at least 20% of the width of said magnet means,



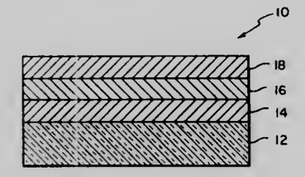
in which at least a portion of said magnetic tunnel has said flat region oriented at an angle to said front surface of said target, and is located substantially at said front surface of said target; and in the region where said magnetic flux lines are concave, said concave area is located substantially within said target body.

4,892,634

METHOD OF PREPARING THERMO-MAGNETO-OPTIC RECORDING ELEMENTS

David A. Glocker, W. Henrietta, N.Y., and Geoffrey C. Lesh, Sunnyvale, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,322
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.15 **10 Claims**



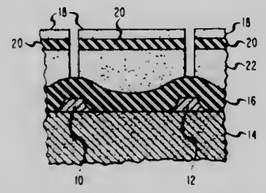
1. In a method of making a thermo-magneto-optic recording element by applying a first ceramic barrier layer contiguous to a polymeric substrate, applying a thermo-magneto-optic layer on the surface of the barrier layer opposite to that in contact with the substrate and applying a second barrier layer to the surface of the thermo-magneto-optic layer opposite to the surface in contact with the first barrier layer, the improvement which comprises subjecting the substrate, prior to the application thereto of the first barrier layer, to an RF oxygen plasma glow discharge or etch treatment at a power of from about 30 to about 200 watts for a period of time of from about 5 to about 180 seconds, the multiple of power and time not to exceed 2500 watt-seconds.

4,892,635

PATTERN TRANSFER PROCESS UTILIZING MULTILEVEL RESIST STRUCTURE FOR FABRICATING INTEGRATED-CIRCUIT DEVICES

Avinoam Kornblit, Highland Park, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 878,606, Jun. 26, 1986, abandoned.
This application Feb. 8, 1988, Ser. No. 153,579
Int. Cl.[4] H01L *21/312*
U.S. Cl. 204—192.36 **7 Claims**



1. A method for fabricating an integrated-circuit device comprising the steps of forming a multilevel structure that includes a relatively thin patterned masking layer comprising a material selected from the group consisting of resist material and silicon dioxide overlying a relatively thick planarizing layer comprising a hardened polymer on a substrate, forming a pattern including at least one structure having a dimension of 1 micron or less in said thin patterned masking layer, transferring said pattern by

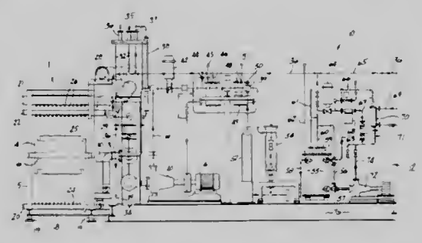
anisotropically etching said planarizing layer in a reaction chamber in a plasma derived from carbon dioxide to transfer the pattern of said relatively thin masking layer into said relatively thick planarizing layer, wherein the resolution of said pattern during said transfer is not substantially degraded, and wherein the time taken to effect said transfer is not substantially longer compared to the time required to transfer said pattern with the same resolution utilizing an oxygen plasma.

4,892,636

MODULAR ELECTROLYTIC CELL AND PROCESSING APPARATUS

Roger E. Bolick, II, Chattanooga; David W. Cawlfield, and Kenneth E. Woodard, Jr., both of Cleveland, all of Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 17, 1988, Ser. No. 207,798
Int. Cl.[4] C25B *9/00, 15/08*
U.S. Cl. 204—237 **31 Claims**



1. A modular electrolytic cell apparatus and processing apparatus for the electrolytic production of a chemical product, the modular cell and processing apparatus being easily assembled and disassembled for transport separately to a remote operating site, comprising in combination:

(a) generally horizontally positioned electrolytic cell support means defining the base of an electrolytic cell apparatus module;
(b) cell support structure means having generally vertically extending means connected to the generally horizontally positioned electrolytic cell support means;
(c) an electrolytic cell mounted to the cell support structure means;
(d) anolyte circulation means connected to the cell for supplying anolyte feed fluid to the electrolytic cell and for carrying anolyte fluid away therefrom;
(e) catholyte circulation means connected to the cell for supplying catholyte feed fluid to the electrolytic cell and for carrying catholyte fluid away therefrom, the electrolytic cell and the anolyte and catholyte circulation means being transportable as a separate assembled unit comprising the electrlytic cell apparatus module;
(f) generally horizontally positioned processing apparatus support means defining the base of the electrolytic cell processing apparatus module;
(g) an anolyte disengager mounted to the generally horizontally positioned processing apparatus support means and connectable to the anolyte circulation means;
(h) a catholyte disengager mounted to the generally horizontally positioned processing apparatus and connectable to the catholyte circulation means;
(i) anolyte processing circulation means connected in fluid flow communication with the anolyte disengager for transporting anolyte through the processing apparatus and mounted to the processing apparatus support means;
(j) catholyte processing circulation means connected in fluid flow communication with the catholyte disengager for transporting catholyte through the processing apparatus and mounted to the processing apparatus support means;
(k) anolyte pump means mounted to the processing apparatus support means and connected to the anolyte processing circulation means for continuously circulating the anolyte therethrough between the electrolytic cell and the processing apparatus;
(l) catholyte pump means mounted to the processing apparatus support means and connected to the catholyte processing circulation means for continuously circulating the catholyte therethrough between the electrolytic cell and the processing apparatus; and
(m) control means for controlling the flow of anolyte fluid and catholyte fluid through the processing apparatus, the processing apparatus mounted to the processing apparatus support means being transportable as a separate assembled unit comprising the processing apparatus module.

4,892,637

PLASTIC-BOUND GAS DIFFUSION ELECTRODE CONTAINING A MANGANESE OXIDE CATALYST AND PROCESS FOR PREPARING SAME

Hans Sauer, Idstein, and August Winsel, Kelkheim, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,591
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722019
Int. Cl.[4] C25B *11/04, 11/06*
U.S. Cl. 204—291 **18 Claims**

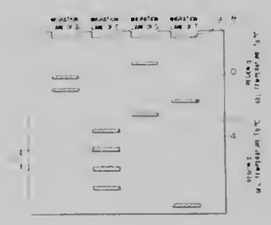
14. A biporous gas diffusion electrode of improved cathodic load potential which is gas and liquid permeable and which consists essentially of from about 15 to about 65 percent of catalytic manganese oxide as, $Mn_2O_3 \times Mn_5O_8$ with Mn_2O_3 being predominate, and from about 15 to 35 percent of polytetrafluoroethylene (PTFE) and a carbon-containing conductive agent.

4,892,638

INSTRUMENT FOR DETERMINATION OF THE BASE SEQUENCE OF DNA

Kenichi Watanabe, Kudamatsu; Tamotu Simada, Akishima; Keiichi Nagai, Higashiyamato; Jirou Tokita; Ryusei Nakano, both of Kokubunji, and Tomoaki Sumitani, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,220
Claims priority, application Japan, Nov. 4, 1986, 61-260740
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—299 R **4 Claims**



1. An instrument for determination of the base sequence of deoxyribonucleic acid (DNA) which is designed to detect DNA fragments in course of gel electrophoresis in real time to determine the base sequence of DNA, and comprises:

an electrophoretic gel (**8**), supported between a first and a second plate (**7** and **6**) and having a well (**9**) at an upper end thereof to which DNA fragments are to be supplied;
a first buffer solution tank (**1**) attached to the upper side of said gel which contains a first buffer solution (**2**) being in contact with the upper end of said gel;
a second buffer solution tank (**3**) attached to the lower side of said gel which contains a second buffer solution (**4**) being in contact with an lower end of said gel;
an electric power source (**5**) connected between said first and second buffer solution tank so that a direct current high voltage is supplied to said gel and the upper end of said gel becomes a negative electrode;
a detector (**14**) attached to said first plate (**7**) at a determined position which detects DNA fragments migrating through said gel when the DNA fragments pass in front thereof;
a first thermostat panel (**31**) attached to said second plate (**6**) at a first region (a) near said well (**9**) to which water is supplied at a controlled low temperature; and
a second thermostat panel (**32**) attached to said second plate (**6**) at a second region (b) near the place where detector (**14**) is attached to which water is supplied at a controlled temperature higher than said low temperature.

4,892,639

ELECTROPHORESIS PLATE AND METHOD OF MAKING SAME

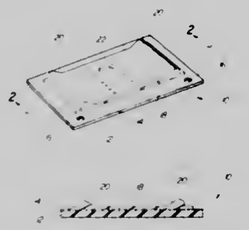
Robert J. Sarrine, Beaumont; Philip A. Guadagno, Vidor, and Henry A. Garsee, Kountze, all of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Jul. 17, 1987, Ser. No. 74,584
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—299 R **19 Claims**

1. In an electrophoresis plate of the type including a substrate which is chemically and electrically inert, relative to electrophoretic separation, and a layer of electrophoretic medium thereon, the electrophoretic medium including at least some buffer material, the electrophoretic medium including upper and lower surfaces, the lower surface of the electrophoretic medium being in contact with said substrate, the improvement comprising:

alignment means associated with the electrophoresis plate; and
buffer blocks formed integrally with the electrophoretic

medium and spatially oriented in a predetermined position relative to the alignment means, said buffer including material for functioning as a self-contained reservoir;



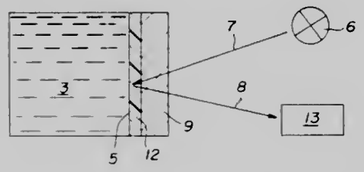
said buffer blocks extending from said upper surface of the electrophoretic medium in a direction away from said substrate.

4,892,640

SENSOR FOR THE DETERMINATION OF ELECTROLYTE CONCENTRATIONS

Otto S. Wolfbeis, Graz, Austria, and Petra Braun geb. Hochmuth, Munzbach, Luxembourg, assignors to AVL AG, Switzerland

Filed Jul. 12, 1988, Ser. No. 218,445
Claims priority, application Austria, Apr. 16, 1985, 1148/85
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—418 **14 Claims**



1. A sensor for determining the concentration of an electrolyte in an aqueous sample solution, said sensor comprising an ion-selective membrane which contains valinomycin as an ion-carrier material and which has a first side that can be brought into contact with an electrolyte-containing aqueous sample solution, and a potential-sensitive fluorescent indicator immobilized at said first side of said ion-selective membrane, said fluorescent indicator, when excited, emitting fluorescence having an intensity which is dependent on a potential difference which arises at the boundary surface between said ion-selective membrane and said electrolyte-containing aqueous sample solution due to ion transport from said sample solution into said ion-selective membrane at said boundary surface by means of said ion-carrier material, said fluorescence intensity corresponding to the concentration of electrolyte in the electrolyte-containing aqueous sample solution.

4,892,641

PROCESS FOR THE PRODUCTION OF MESOPHASE PITCH

Ta-Wei Fu, Ponca City, Okla., and Manfred Katz, Wilmington, Del., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 99,033, Sep. 21, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,600
Int. Cl.[4] C10G *27/00*; C10C *3/04, 3/02*
U.S. Cl. 208—39 **17 Claims**

1. A process for producing a pitch product having a mesophase content of from 50 to 100% by volume and a melting point below 360° C. and suitable for carbon fiber manufacture which comprises heating a molten carbonaceous feedstock substantially free of mesophase pitch in the presence of an oxidatively reactive sparging gas at a temperature of from about 200° C. to about 350° C. and for a time period sufficient to increase the oxygen content and/or molecular weight of the carbonaceous feedstock, said carbonaceous feedstock remaining substantially free of mesophase pitch after such treatment, and thereafter heating the oxidatively treated carbonaceous feedstock to a melt phase at a higher mesophase-forming temperature while passing a non-oxidative sparging gas therethrough for a time period sufficient to produce a pitch product having said mesophase content and a melting point of below 360° C.

4,892,642

PROCESS FOR THE PRODUCTION OF MESOPHASE

Hugh E. Romine, and Ta-Wei Fu, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 125,968, Nov. 27, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,536
Int. Cl.[4] C10G *27/00*; C10C *3/04, 3/02*
U.S. Cl. 208—39 **17 Claims**

1. A process for producing a pitch product having a mesophase content of from 50 percent to 100 percent by volume and suitable for carbon fiber manufacture which comprises heating a carbonaceous feedstock substantially free of mesophase pitch to a melt phase at an elevated temperature while passing through the molten feedstock, a sparging gas containing an oxidatively reactive gaseous component for a sufficient period of time to produce a substantially isotropic pitch product containing mesophase precursors and thereafter solvent fractionating said pitch product to produce a solid pitch product which on fusion has said mesophase content.

4,892,643

UPGRADING NAPHTHA IN A SINGLE RISER FLUIDIZED CATALYTIC CRACKING OPERATION EMPLOYING A CATALYST MIXTURE

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 191,716, May 2, 1988, abandoned, which is a continuation of Ser. No. 903,343, Sep. 3, 1986, abandoned. This application Apr. 11, 1989, Ser. No. 336,571
Int. Cl.[4] C10G *63/04*
U.S. Cl. 208—70 **8 Claims**

1. A fluidized catalytic cracking process undertaken in a single riser which comprises introducing a heavy feed comprising 343 C+ (650 F.) hydrocarbons and passing it up through the riser in the presence of a cracking catalyst having a settling rate in the riser, to provide lighter products including naphtha product; and deactivated cracking catalyst which is stripped in a catalyst stripper, and regenerated in a regenerator and recycled to the riser to contact more heavy feed characterized by

(a) use of an additive component which contains a shape selective crystalline silicate zeolite catalyst which has a higher settling rate than the settling rate of the cracking catalyst so as to reside in the riser for a longer period of time than the cracking catalyst component and introducing naphtha to the riser downstream of the heavy charge in the presence of the additive component to produce a gasoline product; and

(b) separating the additive from the cracking catalyst upstream of the regenerator and recycling directly to the riser the additive component without passing the additive component through the regenerator to reduce the residence time of the additive in the regenerator relative to the cracking catalyst and increase the residence time of the additive component in the riser reactor relative to the cracking catalyst.

4,892,644

UPGRADING SOLVENT EXTRACTS BY DOUBLE DECANTATION AND USE OF PSEUDO EXTRACT AS HYDROGEN DONOR

Byung Choi, Cherry Hill; Grant G. Karsner, Voorhees Township, Camden County; Chang-Kuei Lee, Sewell; Madhava Malladi, West Deptford, all of N.J., and Donald Milstein, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 13,733, Feb. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 793,938, Nov. 1, 1985, abandoned. This application Oct. 7, 1988, Ser. No. 256,095
Int. Cl.[4] C10G *47/32*
U.S. Cl. 208—107 **25 Claims**

1. A process for visbreaking a heavy petroleum residual oil which comprises subjecting the residual oil to an elevated temperature for a period of time corresponding to an equivalent reaction time of about 250 to about 1500 ERT seconds at 427° C., to produce a fuel oil product having a viscosity lower than that of the starting residual oil, the residual oil being subjected to the elevated temperature in the presence of from about 0.1 to about 50 weight percent, based on the residual oil, of a hydroaromatic solvent having a content of H_{alpha} hydrogen of at least about 20 percent of the total hydrogen content, said hydroaromatic solvent being provided as a pseudo extract from a solvent extraction process in which a liquid hydrocarbon feed containing aromatic and non-aromatic hydrocarbon components is extracted with an extraction solvent to provide a raffinate phase containing a major portion of the non-aromatic components and an extract phase containing the major portion of the aromatic hydrocarbon components of the feed, cooling the extract phase to separate it into a pseudo raffinate containing most of the non-aromatics of the extract phase and a pseudo extract containing most of the aromatic content of the extract phase, and separating the pseudo raffinate from the pseudo extract.

4,892,645

DEWAXING CATALYST BASED ON TIN CONTAINING MATERIALS

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,205
Int. Cl.[4] C10B *47/02, 11/02*
U.S. Cl. 208—111 **29 Claims**

1. A catalytic dewaxing process comprising

contacting a waxy feed, containing C_{15}° paraffins, under dewaxing conditions, with a non-acidic catalyst comprising a dehydrogenation metal and a non-acidic crystalline microporous modifier containing material wherein the modifier is selected from the group consisting of tin, thallium, and lead;

converting said C_{15}+ paraffins to distillate range boiling products; and

producing a product having a pour point which is less than that of the feed.

4,892,646

METHOD FOR TREATING DEWAXING CATALYSTS

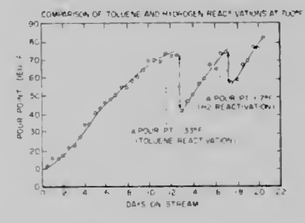
Chaya Venkat, Princeton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 87,196, Aug. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 937,951, Dec. 4, 1986, abandoned. This application May 2, 1988, Ser. No. 189,454
Int. Cl.[4] C10G *11/05, 47/20, 47/18*; B01J *29/38*
U.S. Cl. 208—111 **4 Claims**

1. A process for dewaxing a wax-containing lube stock which comprises:

dewaxing said lube stock with a fresh zeolite dewaxing catalyst, having a constraint index between 1 and 12, in an original catalyst dewaxing cycle, wherein prior to said original dewaxing cycle the fresh catalyst is pretreated in the presence of hydrogen gas with one or more low molecular weight aromatic hydrocarbon compounds selected from the group consisting of benzene, toluene, xylene, naphthalene and mixtures thereof at temperatures greater than 800° F. and under conditions which deposit on the catalyst between 2 and 30% of coke, by weight of the catalyst;

continuing said first catalytic dewaxing cycle to an end of cycle dewaxing reaction temperature of between 650° to



680° F. at which point said dewaxing catalyst is substantially deactivated; and

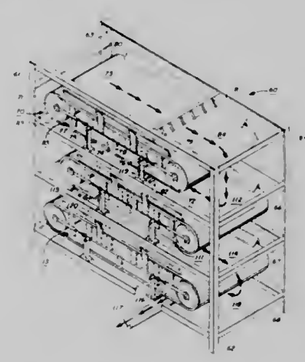
regenerating said pretreated dewaxing catalyst by contacting the substantially deactivated catalyst with hydrogen and one or more low molecular weight aromatic hydrocarbon compounds selected from the group consisting of benzene, toluene, xylene, naphthalene or mixtures thereof at a temperature from 600° to 1200° F. to reactivate the catalyst.

4,892,647

SYSTEM FOR SEGREGATING TRASH

Franklin D. Liddle, 4144 W. Gail, Chandler, Ariz. 85226, and Ottavio A. Tassielli, 1101 W. Lynwood, Phoenix, Ariz. 85007

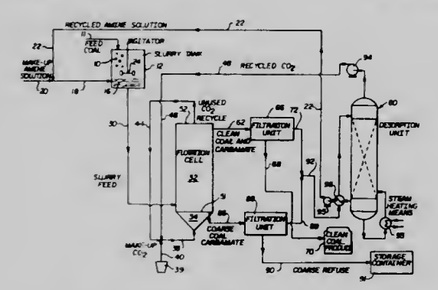
Filed Jul. 5, 1988, Ser. No. 215,779
Int. Cl.[4] B07B *13/00*
U.S. Cl. 209—11 **7 Claims**



1. A system for segregating trash containing thermoplastic material and non-thermoplastic material into collectable fractions comprising a plastic segregator assemblage having a vertical frame member, a plurality of horizontal frame members mounted to said vertical frame member in spaced generally parallel relationship to each other, and a plurality of heated conveyor units, one of said heated conveyor units being mounted between and to each pair of adjacent ones of said horizontal frame members in staggered relationship to each other, each of said conveyor units having a driving roller, a driven roller disposed in rigid spaced operative relationship to said driving roller, and an endless conveyor belt reeved around

said driven roller and said driving roller said belt being operable in response to said driven roller to transport trash placed thereupon to the end of thereof to provide a continuous flow of trash therealong with gradual heating until substantially all of said thermoplastic contained therein adheres to one of said belts while non thermoplastic material pass therefrom; said heated conveyor unit having a heater unit operatively disposed between said rollers and between the upper and lower run of each said endless conveyor belt, said heater unit having a main frame an upper grid support superposed to said main frame and having a surface facing said conveyor belt and a plurality of leg members depending therefrom into supportive engagement with said main frame, a lower grid support subposed to said main frame and having a surface facing said conveyor belt and a plurality of leg members extending upwardly therefrom into supportive engagement with said main frame, a first and second heat plate, said first plate being secured to said facing surface of said upper grid support and said second plate being secured to said facing surface of said lower grid support, and means for removing said adherent thermoplastic material from each said belt.

4,892,648
PROCESS FOR BENEFICIATION OF COAL AND ASSOCIATED APPARATUS
Amol A. Kulkarni, Pittsburgh, Pa., assignor to Viking Systems International, Inc., Pittsburgh, Pa.
Filed Apr. 20, 1989, Ser. No. 340,913
Int. Cl.[4] B03D *1/02, 1/10, 1/12*
U.S. Cl. 209—164 **15 Claims**

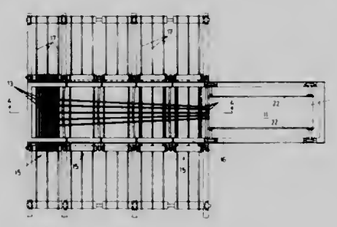


1. A process for separating coal particles from mineral matter in a raw coal feed material containing said coal particles and said mineral matter comprising the steps of
mixing said raw coal feed material with an aqueous amine solution to create an aqueous slurry,
introducing said aqueous slurry into a lower portion of a flotation cell,
charging said lower portion of said cell with gas containing carbon dioxide so as to create bubbles,
creating turbulence in said aqueous slurry by said charging of said gas, so that said coal particles attach to said bubbles,
reducing the size of said bubbles by about 50% to 90% as said bubbles rise from said lower portion of said cell to said upper portion of said cell by operating the cell under conditions such that the carbon dioxide chemically reacts with said amine solution,
transporting said coal particles by means of said rising bubbles to an upper portion of said cell, and
removing said coal particles from said upper portion of said cell.

4,892,649
CALCIUM CARBONATE BENEFICIATION
Joseph L. Mehaffey, Lockport, and Thomas C. Newman, Hinsdale, both of Ill., assignors to Akzo America Inc., New York, N.Y.
Filed Jun. 13, 1988, Ser. No. 206,247
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 **2 Claims**

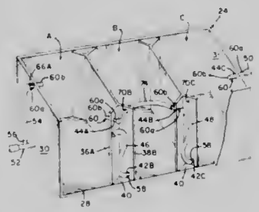
1. A process for purifying calcium carbonate ore containing silicate impurities comprising grinding and forming an aqueous slurry of said ore, adding an effective amount of a collector selective for said silicate impurities to said slurry comprising dimethyl (2-ethylhexyl) cocoammonium chloride, and subjecting said slurry containing said silicate impurity collector to froth flotation thereby floating the silicate impurities away from a resultant slurry containing purified calcium carbonate.

4,892,650
FRUIT GRADING MACHINE
Phillip J. Wotton, Carey Gully, Australia, assignor to Belt-Ton Grading Pty., Ltd., So. Australia, Australia
Filed Oct. 11, 1988, Ser. No. 255,662
Claims priority, application Australia, Oct. 13, 1987, PI4850
Int. Cl.[4] B07C *5/06*
U.S. Cl. 209—621 **10 Claims**



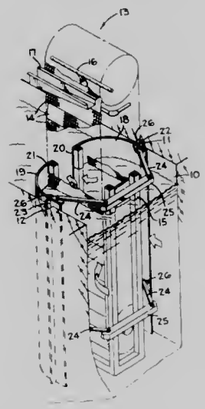
1. A fruit grader comprising a loading station, a plurality of belts of soft resilient elastomer which are driven and which diverge in a longitudinal direction away from the loading station, and a plurality of banks of closely spaced belts also of soft resilient elastomer beneath the diverging belts and which extend transversely thereof, and respective drive means for the diverging belts and the transversely extending belts.

4,892,651
FILTERING SYSTEM FOR FISH PONDS
Theodore L. Hill, 1506 Crestmont Dr., Harrisburg, Pa. 17112
Filed Mar. 25, 1988, Ser. No. 173,456
Int. Cl.[4] E04H *3/16*
U.S. Cl. 210—151 **9 Claims**



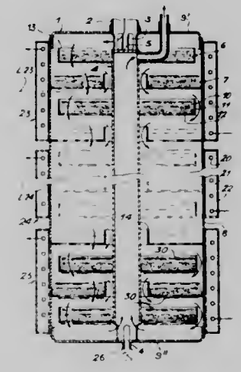
1. A filtering system for filtering the water in a man-made pond of the type containing fish, said system comprising:
means for defining a plurality of chambers with at least one of said chambers having micro-organisms for scavenging organic waste matter from the water entering said chambers from the pond, said means being a single structure having end walls, side walls, a floor and including intermediate walls between and defining adjacent chambers, said intermediate walls including hollow enclosures devoid of water;
inlet means attached to and extending between said single structure and the pond for directing water from the pond to said single structure;
outlet means for directing water from said single structure to the pond;
first conduit means fluidly connecting each of said plurality of chambers, said first conduit means being disposed in each of said hollow enclosures; and
second conduit means for being selectively integrated into said first conduit means whereby the flow of water through the system may bypass at least one chamber.

4,892,652
CURVED DIVERTER PLATE ASSEMBLY FOR INTERCHANGEABILITY OF VARIOUS MODELS OF TRAVELING WATER SCREENS
Douglas W. Rudy, Naperville, Ill.; Michael P. Hunnemann, Ottsville, and Stephen B. Thomas, Silverdale, both of Pa., assignors to FMC Corporation, Chicago, Ill.
Filed Jul. 22, 1988, Ser. No. 223,208
Int. Cl.[4] B01D *33/02*
U.S. Cl. 210—160 **3 Claims**



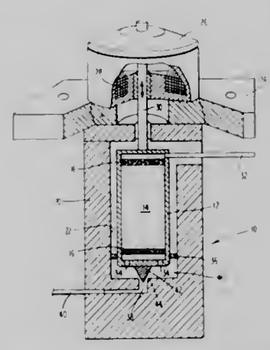
1. Mounting means for mounting a dual flow traveling water screen, said screen including a screen frame, in a channel having a pair of vertical walls having vertical cavities, said mounting means comprising a first curved diverter plate having an upstream edge portion, located adjacent one of the vertical walls, said first curved diverter plate attached to and extending radially outward from said screen frame of said dual flow traveling water screen to one vertical wall of said pair of vertical walls of said channel;
a second curved diverter plate having an upstream edge portion locted adjacent the other vertical wall, said second curved diverter plate attached to and extending radially outward from the screen frame to the other of said pair of channel walls;
said first and second diverter plates each having a projecting flange on the obverse sides of said curved diverter plates, said projecting flanges projecting into said vertical cavities of said walls when said traveling water screen is in said channel;
compression struts extending from said upstream edge portions of said curved diverter plates to said screen frame.

4,892,653
COLD TRAP FOR THE PURIFICATION OF LIQUID METALS CONTAINING DISSOLVED IMPURITIES
Christian Latge, Aix En Provence, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed Sep. 9, 1987, Ser. No. 94,670
Claims priority, application France, Sep. 10, 1986, 86 12657
Int. Cl.[4] B01D *8/00;* **G21C** *19/00*
U.S. Cl. 210—184 **8 Claims**



1. A liquid metal purification cold trap comprising a reservoir pipe for supplying the liquid metal to be purified and linked with the intake of the reservoir, a pipe for discharging the purified metal linked with the outlet of the reservoir, a plurality of independently operating cooling means around said reservoir, and in series along the reservoir and, in the reservoir, a plurality of filter assemblies having perforated bases lined with metal wool, the filter assemblies being arranged perpendicular to the overall direction of the outflow of the liquid metal to be purified, being spaced from one another and each defining an opening, the openings being staggered so so as to permit a staggered outflow of the liquid metal in the reservoir.

4,892,654
TRAPPING ASSEMBLY
Mark A. Nickerson, 19 Glenlock Dr., Landenberg, Pa. 19350
Filed Mar. 15, 1989, Ser. No. 324,353
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **4 Claims**



1. In a fluid trapping assembly for use with fluid systems

having a column for removing and collecting a solute component of said fluid, the combination comprising:

a fluid entrance located near the base of said column and a fluid outlet located near the top of said column,

a valve chamber surrounding the base of said column having a fluid inlet orifice for admitting fluid into said chamber,

a column seal surrounding said column and forming the upper part of said chamber, said seal being in sealing engagement with said column,

orifice engagement means attached to the base of said column adapted to engage said fluid inlet orifice and restrict the flow of fluid into said chamber and through said column,

axial movement means adapted to engage said column and move said orifice engagement means into and out of engagement with said orifice.

4,892,655

ARRANGEMENT FOR WATER TREATMENT

Leopold Makovec, Kalchgruben 39, A-6094 Axams, Austria

PCT No. PCT/EP87/00083, § 371 Date Oct. 16, 1987, § 102(e) Date Oct. 16, 1987, PCT Pub. No. WO87/05003, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 15, 1987, Ser. No. 116,570

Claims priority, application Austria, Feb. 21, 1986, 462/86

Int. Cl.⁴ C02F *1/48*

U.S. Cl. 210—222 **10 Claims**



1. Arrangement for treatment of water by a magnetic field the arrangement comprising in combination an electromagnet and a pipe carrying water, the pipe having an external surface with a surface curvature and a longitudinal direction, the electromagnet having at least one exciter coil and being applied to the external surface of the pipe carrying water, the electromagnet having a U- or E-shaped iron core (3) with freely projecting legs (5, 6, 7), the legs being pressed against the pipe (2) consecutively in longitudinal direction of the pipe, the legs (5, 6, 7) having free ends with end surfaces facing the pipe, each end surface having a shape and means for matching said shape to the surface curvature of the pipe (2) comprising the iron core (3) being constituted by layered sheet metal plates (8) which are displaceable relative to each other in direction of the legs (5, 6, 7).

4,892,656

VACUUM FILTER WITH RELEASABLY CLAMPED SEALING STRIP

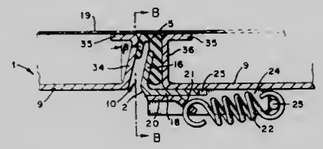
Kurt E. Pietzsch, Wiesbaden-Sonnenberg, Fed. Rep. of Germany, assignor to Dorr-Oliver Incorporated, Milford, Conn.

Filed Feb. 23, 1989, Ser. No. 314,613

Int. Cl.⁴ B01D *33/26, 33/32*

U.S. Cl. 210—232 **9 Claims**

1. A vacuum filter for separating solids from liquids comprising a circulating, endless array of troughs guided over a stationary vacuum drain and having lateral edges or weirs which constitute a common horizontal filter surface on which an endless filter cloth is laid, said troughs having leading and rear edges of rimless configuration which extend along the trough bottom transversely to the direction of trough movement, each said trough having an elastic sealing strip on a leading or rear edge thereof, the sealing strip being releasably clamped fast



against the leading and/or rear edge of the trough by means of a spring-loaded, movable clamp angle member or bracket.

4,892,657

SPACER FOR GUIDING FLOWING MEDIUM

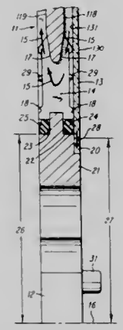
Jürgen Mohn, Reinbek, and Wilhelm Heine, Hamburg, both of Fed. Rep. of Germany, assignors to DT Membranfilter Vertriebs GmbH, Hamburg, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,280

Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715183

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—232 **18 Claims**



1. In a spacer for guiding flowing medium, constructed and arranged for use in an apparatus for filtering and separating such flowing medium via reverse osmosis and ultrafiltration, said spacer constructed and arranged for use with a respective filter element being disposed as a membrane pad having flowing medium that flows on both sides thereof in a location sandwiched between each two adjacent spacers, each said spacer having a substantially disk-like configuration with a central hole, and said spacers being constructed and arranged such that said flowing medium flows about said spacers, the improvement therewith comprising:

means that form a plurality of spaced-apart openings in said spacer constructed and arranged such that said flowing medium passes through said openings in a location disposed projecting about said central hole of said spacer and through which the flowing medium as a permeate drainage occurs via said membrane pad to said central hole for discharge passage thereof.

4,892,658

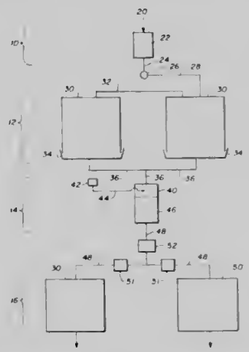
WASTEWATER TREATMENT SYSTEM

Joseph P. Martin, 252 Sagamore Rd., Havertown, Pa. 19083, and Kenneth J. Zitomer, 6340 N. 7th St., Philadelphia, Pa. 19126

Filed Mar. 17, 1988, Ser. No. 169,863

Int. Cl.⁴ C02F *9/00*

U.S. Cl. 210—617 **16 Claims**



13. A process for the environmentally-safe, unified treatment of a wastewater effluent, said process comprising:

primary treatment including sedimentation of a wastewater effluent to substantially remove suspended solids, providing a clarified effluent;

secondary treatment including filtration of the clarified effluent through a filtration field to oxidize organic materials and provide a nitrified effluent;

capture and conveyance of the nitrified effluent to a batch type advanced treatment zone wherein the nitrified effluent is accumulated and dosed with a controlled carbon source and held in an anoxic condition to provide a de-nitrified effluent; and

filtration of the de-nitrified effluent through an infiltration field to provide a treated effluent and discharge of the treated effluent.

4,892,659

SEPARATION AGENT COMPRISING ALIPHATIC ESTER OF POLYSACCHARIDE

Tohru Shibata; Hajime Namikoshi, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 18,814, Feb. 18, 1987, Pat. No. 4,786,415, which is a continuation of Ser. No. 716,790, Mar. 27, 1985, abandoned. This application Jul. 27, 1988, Ser. No. 225,066

Claims priority, application Japan, Apr. 2, 1984, 59-65323

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—635 **9 Claims**

6. A method for chromatographically separating an optical isomer from a racemic mixture thereof which comprises contacting said mixture, under liquid chromatographic separation conditions, with a chromatographic separation material consisting essentially of inorganic carrier particles having a particle size of from 1 μm to 10 mm and coated with from 1 to 100% by weight of resolving agent, based on the weight of said carrier particles, said resolving agent consisting essentially of amylose triacetate.

4,892,660

PRESSURE INDUCED SURFACTANT RECOVERY DURING ULTRAFILTRATION OF WATER-OIL EMULSIONS

James R. Sweet, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 17, 1988, Ser. No. 258,344

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—637 **4 Claims**

1. A method for recovering surfactant from an oil/water/-surfactant emulsion, the method consisting of contacting the emulsion with an ultrafiltration membrane having a molecular weight cut-off in the range 30,000 to 500,000 at a pressure in the range 50 to 150 psi thereby selectively permeating the surfactant through the membrane.

4,892,661

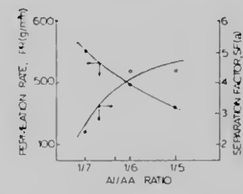
NOVEL MEMBRANE METHOD

Robert Y. M. Huang, Waterloo, Canada, assignor to University of Waterloo, Waterloo, Canada

Filed May 5, 1988, Ser. No. 190,682

Int. Cl.⁴ B01L *13/00*

U.S. Cl. 210—640 **11 Claims**



1. A novel dense non-porous pervaporation membrane material, prepared by a method which comprises:

solution blending a mixture consisting of polyvinyl alcohol in aqueous solution, polyacrylic acid in aqueous solution and a nylon in formic acid to form a homogeneous blend having a single glass transition temperature,

casting said blend into a membrane, and

ionically cross-linking the membrane to provide a dense non-porous membrane material suitable for effecting pervaporation.

10. In a pervaporation process, wherein miscible organic solvent-water solutions are selectively separated into their component parts by pervaporation using a dense non-porous membrane, the improvement which comprises using a membrane as defined in claim 1 as said membrane.

4,892,662

MEMBRANE PROCESSING METHOD

James W. Walsh, 3832 Beech Ave., Baltimore, Md. 21211

Division of Ser. No. 942,054, Dec. 15, 1986, which is a continuation-in-part of Ser. No. 694,773, Jan. 25, 1985, abandoned. This application Nov. 3, 1988, Ser. No. 266,831

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—649 **11 Claims**

6. An improved method of eluting molecules and molecule fragments in a gel matrix onto a membrance and treating the membrane with a fluid, comprising the steps of:

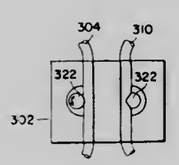
engaging a membrane onto which molecules or molecule fragments are to be eluted on at least one side with a porous membrane support material that defines a plurality of pathways across the engaged surface of the membrane;

applying the membrane and membrane support to a gel matrix from which molecules and molecule fragments are to be eluted, the membrane support positioned intermediate the gel matrix and the membrane;

establishing a capillary transfer through the gel matrix, the

membrane support, and the membrane to elute molecules and molecule fragments from the gel matrix, through the membrane support to the membrane; and

containing the membrane and the membrane support within a flexible walled container having fluid distribution channels on at least two edges of the membrane and a fluid port in communication with each of the fluid distribution channels;



introducing a fluid into one of the fluid ports for distribution into the associated fluid distribution channel; and

establishing a pressure differential between the interior and the exterior of the container to cause the flexible walls of the container to press against the membrane support to maintain engagement of the membrane support with the membrane thereby allowing the introduced fluid to flow across the surface of the membrane through the plurality of pathways to the other port.

4,892,663

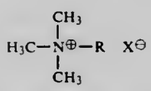
COAL FILTRATION PROCESS AND DEWATERING AIDS THEREFOR

Robert O. Keys, Columbus, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

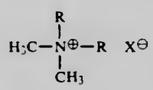
Filed Dec. 2, 1988, Ser. No. 279,423
Int. Cl.[4] B01D *37/02*
U.S. Cl. 210—729 **3 Claims**

1. In a method for dewatering an aqueous slurry of solid coal particulates wherein the aqueous slurry contains between about 10 and 60 percent of solid coal particulates and a dewatering aid is added to said slurry followed by vacuum filtration thereof to produce a filter cake of said coal particulates, the improvement for lowering the water content of said filter cake which comprises adding to said slurry prior to filtration an effective amount of a dewatering aid selected from the group consisting of:

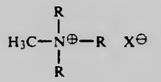
(a) a monoalkyl trimethyl quaternary ammonium compound of the structure:



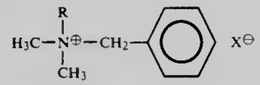
(b) a dialkyl dimethyl quaternary ammonium compound of the structure:



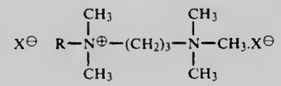
(c) a monomethyl trialkyl quaternary ammonium compound of the structure:



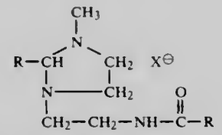
(d) a dimethyl alkyl benzyl quaternary ammonium compound of the structure:



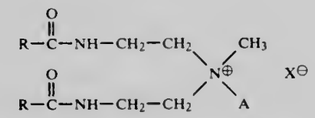
(e) a diquaternary ammonium compound of the structure:



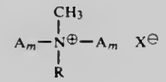
(f) an imidazolinium quaternary ammonium compound of the structure:



(g) a diamido monohydroxyalkyl quaternary ammonium compound of the structure:



(h) a monomethyl di(hydroxyalkyl) quaternary ammonium compound of the structure:



where:

each R independently is a C_8–C_{22} alkyl group,

A is a 2-hydroxyethyl or 2-hydroxypropyl group;

$X^{\ominus}$ is the anionic residue of an alkylating agent, and m is 1–50,

and mixtures thereof.

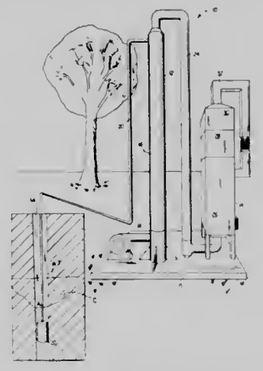
4,892,664

DECONTAMINATION OF SITES WHERE ORGANIC COMPOUND CONTAMINANTS ENDANGER THE WATER SUPPLY

Paul C. Miller, Pitman, N.J., assignor to Groundwater Technology, Inc., Norwood, Mass.

Filed Jul. 28, 1987, Ser. No. 78,779
Int. Cl.[4] C02F *1/20*
U.S. Cl. 210—747 **10 Claims**

1. A decontamination system installed at an outdoor contaminated site at which organic contaminants have entered the ground and contaminate the ground water, said system comprising air stripper means constructed to receive water from said outdoor site containing said organic contaminants and constructed to produce therefrom an air stream carrying organic contaminants and an effluent water stream substantially free of said organic contaminants, and decontamination apparatus having an inlet to receive said air stream carrying site-derived organic contaminants, preheating means, comprising (a) a heat exchanger and (b) a heater arranged to preheat said air stream, an oxidizing catalytic converter having a predetermined minimum operating temperature for efficient operation and arranged to receive the preheated air stream from said preheater means and constructed to oxidize said site-derived organic contaminants carried by said air stream to produce an effluent air stream substantially free of said organic contaminants, and ducting directing the effluent air stream from said catalytic converter through said heat exchanger, and thence to



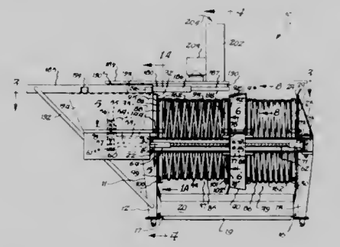
the atmosphere, said heat exchanger effective to cause the air stream, flowing from said catalytic converter, to transfer its heat to the incoming air stream that carries site-derived contaminants, said heater of said preheating means constructed and arranged to cooperate with said heat exchanger to elevate the temperature of said preheated air stream reaching said catalytic converter to said minimum operating temperature, whereby a gaseous effluent substantially free of said site-derived organic contaminants is released to the atmosphere at said outdoor site while an effluent stream of water decontaminated of said site-derived organic contaminants is produced.

4,892,665

METHOD AND PRESS FOR PRESSING LIQUID FROM THIN LAYERS OF LIQUID CONTAINING MASSES

Dale E. Wettlaufer, 7930 Clinton St., Elma, N.Y. 14059

Filed Dec. 5, 1983, Ser. No. 558,181
Int. Cl.[4] B01D *25/12, 29/12*
U.S. Cl. 210—770 **28 Claims**



1. A press for pressing liquid from a liquid-containing mass comprising a press frame, spaced horizontal frame members on said press frame, first and second vertical stationary platens spacedly mounted on said horizontal frame members, a horizontally movable vertical platen mounted on said horizontal frame members and having a first side facing said first stationary platen and a second side facing said second stationary platen, a plurality of first horizontally spaced vertical racks, first mounting means mounting said first vertical racks between said first fixed platen and said first side of said movable platen, a plurality of second horizontally spaced vertical racks, second mounting means mounting said second racks between said second fixed platen and said second side of said movable platen, a plurality of first porous bags having first openings at their upper ends, third mounting means mounting said first porous bags between said first racks, a plurality of second porous bags having second openings at their upper ends, fourth mounting means mounting said second porous bags between said second racks, and linkage means for moving said movable platen toward and away from said first and second fixed platens whereby liquid-containing masses in said first or second bags may be pressed while the solids remaining after pressing in the other of said first or second bags may be removed and additional liquid-containing masses may be placed into said other of said first or second bags.

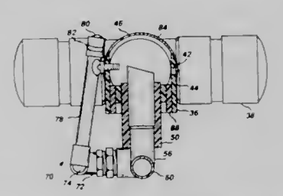
6. A method of pressing liquid from liquid-containing masses comprising the steps of mounting a plurality of relatively thin porous bags in interspersed relationship with racks on a frame, said bags having openings at their tops facing upwardly, filling liquid-containing masses into said plurality of relatively thin porous bags through said openings, applying a pressing force to each of said plurality of relatively thin bags through said racks to press liquid from said liquid-containing masses therein, relieving said pressing force from said bags, and inverting as a unit said frame and said racks and said bags to discharge from the openings of said bags the residue of said liquid-containing masses.

4,892,666

SKIMMING APPARATUS AND METHOD

Douglas A. Paulson, 10931 Rainier Ave. S., Seattle, Wash. 98178

Filed Oct. 7, 1988, Ser. No. 255,066
Int. Cl.[4] C02F *1/40*
U.S. Cl. 210—776 **29 Claims**



28. An improved method for removing a fluid from an immiscible fluid composition including a floating liquid and a carrying liquid, said method comprising the steps of:

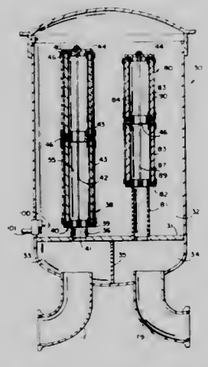
(a) disposing, in a fluid composition of immiscible liquids, a body having an internal cavity and allowing a fluid composition comprised substantially of said floating liquid to enter said internal cavity;

(b) supporting said body with flotation means in said fluid composition;

(c) skimming said floating liquid from the fluid within said internal cavity with a slidable pickup conduit disposed coaxially with a receiving conduit coextensive with the bottom of said cavity; and

(d) removing said skimmed floating liquid from said internal cavity with means which permit rotation of said body about a horizontal plane while permitting free movement in a vertical plane.

4,892,667
METHOD AND MEANS FOR DEWATERING LUBRICATING OILS
Matt Parker, III; Michael D. Blom, and Roger K. Miller, all of LaGrange, Ga., assignors to Kaydon Corporation, Muskegon, Mich.
Filed Sep. 16, 1988, Ser. No. 245,045
Int. Cl.[4] B01D *17/02, 29/26*
U.S. Cl. 210—799 **12 Claims**



1. In the process of removing water by coalescence from lubricating oil having a viscosity at 65° F. of approximately 350 ssu which water has formed an emulsion with the oil and maintaining a flow rate of at least 100 gallons per hour per square foot of coalescer surface when the oil has a viscosity of 150 ssu or less, the steps which include passing the oil through a particulate filter element in a preconditioning unit, passing the oil containing free water and the oil/water emulsion into the internal central chamber of a coalescer; in the coalescer passing the oil through a first member of pleated filter medium surrounding said chamber to initiate breaking of the emulsion, supporting the member externally against outwardly acting pressure exerted by the oil and surrounding the pleats with spaced rings and anchoring the rings to the apices of said pleats to support the rings and members against outwardly acting radial thrust, passing the liquid discharged from the first member through plural layers of compressed glass fiber in mat form to further coalesce the separated water, passing the coalesced water droplets through a non-wettable screen into a non-compressed layer of glass fibers and then through a closely woven jacket of non-wettable fabric to form droplets of water of sufficient size that they will separate from the jacket and descend through the surrounding body of oil to collect at the bottom of the vessel in which the coalescer is housed.

4,892,668
BLOOD COLLECTION BAG SUPPORT
Daniel C. Harmony, Tucson, Ariz., and Bradley T. Noble, Redondo Beach, Calif., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.
Filed Oct. 5, 1988, Ser. No. 253,687
Int. Cl.[4] B01D *21/26;* **B04B** *15/00*
U.S. Cl. 210—782 **16 Claims**

13. A method for preventing isolation of a quantity of blood within one or more folds of a blood collection bag during centrifugaiton after placement of the blood collection bag within a centrifuge cup, said method comprising the steps of:
(a) generating a source of fluid under pressure during the centrifugation process; and
(b) imposing a force upon a side of the blood collection bag in response to said step of generating to pressurize the interior of the blood collection bag and urge unfolding of any folds of the blood collection bag to permit drainage



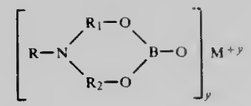
therefrom of any contained blood in response to the centrifugal forces imposed.

4,892,669
COMPOSITION BASED ON POLYTETRAFLUOROETHYLENE SUITED FOR OBTAINING A SELF-LUBRICATING LAYER ON POROUS BRONZE BEARINGS
Giovanni Marcora, Magnago, and Federico Cataldo, Cagliate, both of Italy, assignors to Ausimont S.p.A., Italy
Filed Nov. 16, 1987, Ser. No. 120,663
Claims priority, application Italy, Nov. 21, 1986, 22419 A/86
Int. Cl.[4] C10M *107/38, 125/00*
U.S. Cl. 252—30 **5 Claims**

1. A PTFE-based composition suited for forming a covering layer with self-lubricating properties, to be applied on a porous bronze substrate, formed following a thermal sintering treatment, characterized in that it consists of the following ingredients, indicated in parts-by-weight per 100 parts of mixture:
(a) PTFE in the form of a dry powder, with a granulometric distribution of between 1μ and 8μ, a molecular weight from 300,000 to 500,000 and a melt-flow index of 0.1–0.3, measured at 350° C. according to ASTM D-1238, in a quantity between 30 to 60 parts by weight (p.b.w.);
(b) inorganic component selected from: MoS_2, PbO, powdery metal Pb-graphite and aluminum silicates with a granulometry of from 4 to 5 microns, in a quantity of between 10–25 parts by weight;
(c) an adhesive resin, selected from epoxy-, silicon-, and polyamidic resins, in a quantity between 2 and 8 p.b.w.;
(d) a chlorinated hydrocarbon solvent with a good wetting power for PTFE and the inorganic component having a boiling point between 50° and 150° C., in a quantity between 10 and 20 p.b.w.;
(e) alliphatic paraffinic hydrocarbon having a viscosity between 10 and 20 centistokes at 40° C. in a quantity between 10 and 50 p.b.w.;

4,892,670
LUBRICATING COMPOSITIONS
Leah T. Mendelson, Santa Ana, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Jan. 29, 1985, Ser. No. 695,958
Int. Cl.[4] C10M *141/02*
U.S. Cl. 252—37 **53 Claims**

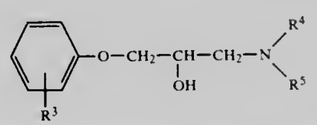
1. A lubrication composition comprising a lubricating oil containing an antiwear enhancing amount of a dissolved copper carboxylate and a boron-containing compound of the formula



wherein:
y is an integer;
M is a inorganic or organic radical;
R is a C_1 to C_{50} organic radical; and
R_1 and R_2 are the same or different C_1 to C_{50} organic radical.

4,892,671
2-PROPANOL DERIVATIVES AS CORROSION INHIBITORS
Robert M. O'Neil, Flixton, and John D. Payne, Withington, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 63,884, Jun. 19, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,769
Claims priority, application United Kingdom, Jun. 28, 1986, 8615866; Dec. 13, 1986, 8629834
Int. Cl.[4] C10M *133/14;* **C07C** *93/06*
U.S. Cl. 252—51.5 R **11 Claims**

1. A composition consisting essentially of a lubricant in contact with ferrous metal and a corrosion inhibiting amount of at least one compound of formula (I).

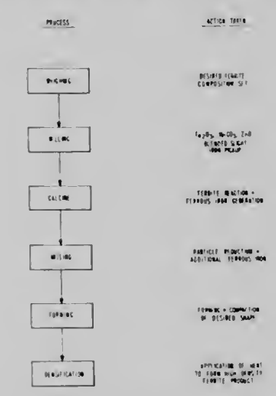


(I)

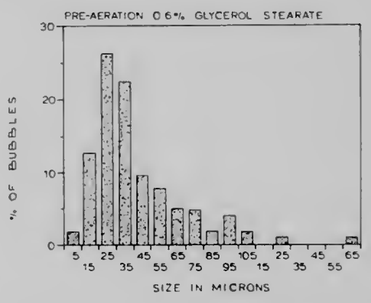
or a derivative thereof in which R^3 is hydrogen, a C_3–C_{15} straight or branched chain alkyl residue, a C_5–C_{12} cycloalkyl residue, a C_6–C_{15} aryl residue or C_7–C_{12} aralkyl residue, and R^4 and R^5 are, independently, hydrogen, 2-hydroxyethyl or 2-hydroxypropyl with the provisos that
(a) R^4 and R^5 are not simultaneously hydrogen;
(b) when R^4 and R^5 are each $—CH_2—CH_2—OH$, R^3 is not a pentyl residue;
(c) that polyalkylene phenol or polycarboxylic ester co-additives are absent; and
(d) when R^3 is C_3–C_{15} alkyl, R^4 and R^5 are not hydrogen; as well as salts thereof.

4,892,672
PROCESS FOR CONTROLLING FERROUS IRON CONTENT IN MANGANESE ZINC FERRITE
Ralph W. Scheidecker, and Robert R. Suchomel, both of Byron, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 566,872, Dec. 29, 1983, abandoned. This application Aug. 1, 1985, Ser. No. 761,534
Int. Cl.[4] C04B *35/26*
U.S. Cl. 252—62.51 **10 Claims**

1. Process of preparing a ferrite composition with a final ferrous iron content of about 1.5% from ferrite material in a mixture with ranges of 52–55 mole percent Fe_2O_3, 26–32 mole percent MnO and 15–20 (22) mole percent ZnO, the process comprising the steps of:
a. weighing powders for setting a desired final ferrite powder composition;
b. first milling said ferrite powder composition in a stainless steel mill with stainless steel media for intimate mixing of said ferrite powder composition and controlled iron pick-up;
c. calcining said ferrite powder composition for a first time interval under a flowing inert atmosphere providing for formation of ferrite spinal structures in a ferrite reaction of ferric iron to ferrous iron reduction; and,
d. second ball milling said calcined ferrite powder composition in a stainless steel mill with stainless steel media for a second time interval providing particle reduction and additional ferrous iron pick-up yielding an optimum final ferrous iron content of about 1.5% in said final ferrite powder composition.



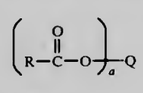
4,892,673
NON-AQUEOUS, NONIONIC HEAVY DUTY LAUNDRY DETERGENT WITH IMPROVED STABILITY
Nagaraj S. Dixit, Kendall Park; Robert J. Rhinesmith, Somerset; James J. Sullivan, New Brunswick; Cynthia A. Barone, Colts Neck; Richard P. Adams, Kendall Park, and Koo-Yann Lai, Plainsboro, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed May 2, 1988, Ser. No. 188,947
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—114 **61 Claims**



1. A non-aqueous liquid fabric treating composition comprising:
a continuous non-aqueous liquid phase comprising a detersively effective amount of at least one non-ionic surfactant;
a suspended particle phase comprising:
a detergent building effective amount of at least one particulate detergent builder salt suspended in said nonaqueous liquid phase, and
gas bubbles, having an average size of from about 10 to

about 100 microns, suspended in said non-aqueous liquid phase in an amount effective to substantially inhibit settling of said suspended particles; and

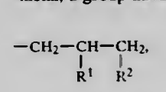
an air bubble stabilizing effective amount of a stabilizer having the formula



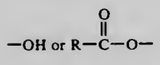
wherein

R is a hydrocarbon group of about 5 to 21 carbon atoms,

Q is a hydrogen atom, a Group IA metal, a Group IIA metal, a group having the formula



or a mixture thereof, wherein R^1 and R^2 are, independently, —OH or



(R being as defined above), and

a is 1 or 2, with the proviso that a=2 only when Q is a Group IIA metal.

4,892,674

ADDITION OF SEVERELY-HINDERED AMINE SALTS AND/OR AMINOACIDS TO NON-HINDERED AMINE SOLUTIONS FOR THE ABSORPTION OF H_2S

W. S. Winston Ho, and Guido Sartori, both of Annandale, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 13, 1987, Ser. No. 106,805

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—189 **13 Claims**

1. An absorbent composition comprising:

(1) MDEA and, optionally, at least one other non-hindered amino compound, and

(2) an additive of

(a) a severely hindered aminoacid having a cumulative $-E_s$ value greater than 1.75, said aminoacid and non-hindered amino compound being present in said absorbent composition in a mole ratio of said aminoacid to said non-hindered hindered amino compound of about 0.01:1 to 4:1,

(b) an amine salt, said amine salt being the reaction product of an amine selected from the group consisting of severely hindered amino compounds having a cumulative $-E_s$ value greater than 1.75, and a component selected from the group consisting of an acid having at least one pKa of not more than about 7, a decomposable salt of an acid having at least one pKa of not more than about 7, a compound capable of forming an acid having a pKa of not more than about 7 and mixtures thereof, said amine salt and said non-hindered amino compound being present in said absorbent composition in a mole ratio of said amine salt to said non-hindered amino compound of about 0.2:1 to 4:1.

4,892,675

OPTICALLY ACTIVE POLYMER AND LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Hiroyuki Nohira, Urawa; Kazutaka Arai, Yotsukaidou, and Kazuo Yoshinaga, Machida, all of Japan, assignors to Canon Kabushiki Kaisha and Nissan Chemical Industries, Ltd., both of Tokyo, Japan

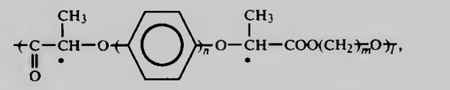
Filed Jun. 7, 1988, Ser. No. 203,132

Claims priority, application Japan, Jun. 10, 1987, 62-143177; May 17, 1988, 63-118330

Int. Cl.[4] C09K *19/52, 19/12;* **C08G** *63/02*

U.S. Cl. 252—299.01 **12 Claims**

1. An optically active polymer comprising recurring units of the following formula (I):



wherein l is an integer of 5-1000, n is an integer of 1-3, m is an integer of 2-20, and * denotes the location of an asymmetric center.

4,892,676

PHENYL PYRIMIDINE COMPOUND AND LIQUID CRYSTALLINE COMPOSITION

Takao Sakurai; Tadahiko Yokota; Eri Komatsu; Naoko Mikami; Ryoichi Higuchi, and Koji Takeuchi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 94,290

Claims priority, application Japan, Sep. 9, 1986, 61-211894; Jan. 9, 1987, 62-3048

Int. Cl.[4] G02F *1/13;* **C09K** *19/34;* **C07D** *239/02*

U.S. Cl. 252—299.61 **11 Claims**

1. A smectic C liquid crystal compound represented by the following formula (I)

$$R_1—Ph—Py—R_2 \quad (I)$$

wherein Ph represents 1,4-phenylene group and Py represents 2,5-pyrimidyl group, R_1 and R_2 represent independently a linear acyloxy group or alkoxy group, either R_1 or R_2 represents a linear acyloxy group or linear alkoxy group having more than the seven carbon atoms.

4,892,677

DEFROST INDICATOR

Anthony F. Preziosi, Ledgewood; Thaddeus Prusik, Roosevelt, and Ray H. Baughman, Morris Plains, all of N.J., assignors to LifeLines technology, Inc., Morris Plains, N.J.

Division of Ser. No. 373,955, May 3, 1982. This application Dec. 19, 1984, Ser. No. 683,443

Int. Cl.[4] G01N *31/00;* **G01D** *21/00*

U.S. Cl. 252—408.1 **8 Claims**

1. Article of manufacture comprising an intimate mixture of a phase of crystalline diacetylenic monomer admixed with a solid solvent phase, said monomer being soluble in said solvent above the melting point of said solid solvent phase.

4,892,678

THIOPHENE DERIVATIVE POLYMER AND A POLYMER COMPOSITION THEREOF

Susumu Tanaka; Masaaki Sato, both of Tsukuba; Kyoji Kaeriyama, Tsuchiura; Yoshio Suda, Hachioji, and Takao Hiraide, Tochigi, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

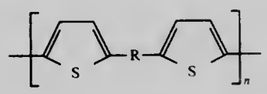
Division of Ser. No. 155,274, Feb. 12, 1988. This application Feb. 6, 1989, Ser. No. 306,581

Claims priority, applicatioo Japan, Feb. 19, 1987, 62-36816

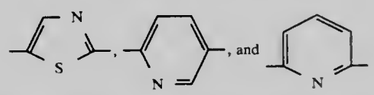
Int. Cl.[4] H01B *1/00, 1/06*

U.S. Cl. 252—500 **4 Claims**

1. A thiophene derivative polymer composition, comprising: a polymer having repeating units of the formula:



wherein n denotes a number within the range of about 10 to 500 and R represents a member selected from the group consisting of



doped with at least one anion selected from the group consisting of the tetrafluoroborate ion, perchlorate ion, hexafluorophosphate ion, hexafluoroarsenate ion, iodide, bromide, chloride, fluoride, sulfate, hydrogen sulfate, trifluoroacetate and p-toluenesulfonate in an amount within the range of 10 to 50% by weight.

4,892,679

OXA-ALKANE POLYPHOSPHONIC ACIDS, THEIR USE AS THRESHOLDERS, AND COMPLEXING COMPOSITIONS CONTAINING THESE COMPOUNDS

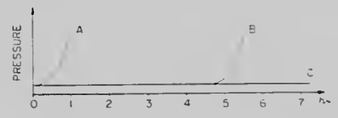
Helmut Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgeselsschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 314,531

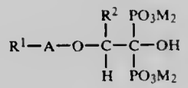
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805663

Int. Cl.[4] C07F *9/38;* **A61K** *7/16, 31/08;* **C02F** *1/00*

U.S. Cl. 562—21 **7 Claims**



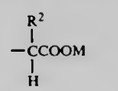
1. An axo-alkane polyphosphonic acid or basic addition salt thereof of the formula:



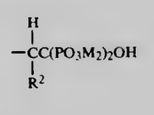
(I)

in which

R^1 is a straight or branched chain C_1-C_{10} alkyl group, an unsubstituted or substituted C_6-C_{10} aryl group, a phenylalkyl or napthylalkyl group, a group having the formula

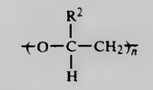


or a group having the formula



R^2 is H or methyl,

A is the structural unit



where n is an integer of from 1 to 20, and

M is H or the monovalent cation of a base.

4,892,680

SYNTHETIC LUBRICATING OILS AND SPECIFIED NAPHTHALENE DERIVATIVES FOR USE THEREIN

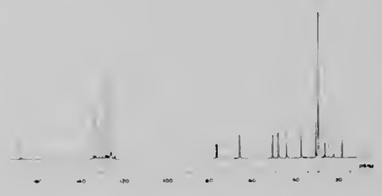
Noboru Ishida, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1989, Ser. No. 294,374

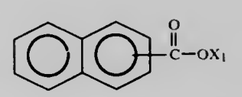
Claims priority, application Japan, Jan. 11, 1988, 63-2545; Feb. 8, 1988, 63-25742

Int. Cl.[4] C10M *105/34*

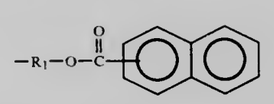
U.S. Cl. 252—565 **9 Claims**



1. A synthetic lubricating oil comprising as the main component a naphthoic acid ester represented by the general formula

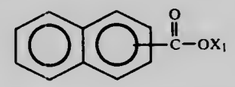


wherein X_1 is an alkyl group having 1-20 carbon atoms, or a group having the general formula

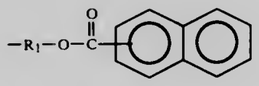


in which R_1 is an alkylene group having 2-20 carbon atoms.

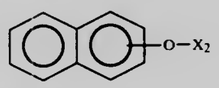
6. A synthetic lubricating oil comprising as the main components (1) a naphthoic acid ester of formula



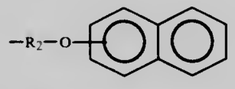
wherein X_1 is alkyl having 1-20 carbon atoms, or a group having the formula



in which R_1 is alkylene having 2-20 carbon atoms and (2) a naphthyl ether of formula



wherein X_2 is alkyl having 1-20 carbon atoms, phenyl, monoalkylphenyl having 7-26 carbon atoms or a group of formula



in which R_2 is alkylene of 2-20 carbon atoms.

4,892,681

NON-LINEAR OPTICAL ARTICLE

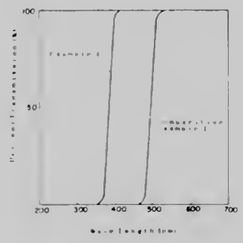
Seizo Miyata, Hoya; Toshiyuki Watanabe, Kurume; Yoshitaka Goto, and Masaharu Nakayama, both of Ibaraki, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,193

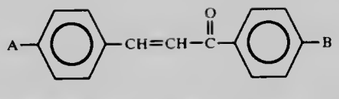
Claims priority, application Japan, Sep. 30, 1986, 61-229612

Int. Cl.[4] G02B *5/00, 6/14*

U.S. Cl. 252—582 **2 Claims**



1. In a non-linear optical device in which an organic compound is disposed in a light beam, the improvement in which the organic compound is a derivative of benzalacetophenone selected from the group represented by the following general formula



wherein A is CH_3O— in case of B being —NH_2, —Br or —H; A is $(CH_3)_2N$—, Br— or C_2H_5O— in case of B being —OCH_3; and A is Br— in case of B being —H.

4,892,682

AZOMETHINE COMPOSITIONS HAVING NONLINEAR OPTICAL PROPERTIES

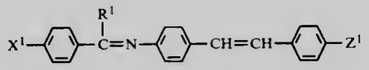
Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence, and James B. Stamatoff, Westfield, all of N.J., assignors to Hoechst Celanese Corporation, Sommerville, N.J.

Division of Ser. No. 927,990, Nov. 7, 1986. This application Mar. 20, 1989, Ser. No. 326,115

Int. Cl.[4] G02B *5/22*

U.S. Cl. 252—589 **4 Claims**

1. A nonlinear optical medium in the form of a transparent solid which is a blend of constituents comprising (1) a host thermoplastic polymer; and (2) a guest organic compound corresponding to the formula:



where X^1 is $-NR^2R^2$, $-OR^2$ or $-SR^2$; R^1 is hydrogen or methyl; R^2 is hydrogen or a C_1-C_{20} alkyl group; and Z^1 is $-NO_2$, —CN or $-CF_3$.

4,892,683

FLAME RETARDANT LOW SMOKE POLY(VINYL CHLORIDE) THERMOPLASTIC COMPOSITIONS

Homaira Naseem, Leominster, Mass., assignor to Gary Chemical Corporation, Leominster, Mass.

Filed May 20, 1988, Ser. No. 196,326

Int. Cl.[4] C09K *21/00;* **H01B** *7/00;* **C08K** *9/00;* **C08L** *27/00*

U.S. Cl. 252—609 **15 Claims**

1. A flame retardant smoke-suppressed thermoplastic composition comprising the below-listed materials, amounts being expressed as parts per hundred of the sum of poly(vinyl chloride) and chlorinated polyethylene resins in the composition:

poly(vinyl chloride), in an amount from about 60 to about 90 parts per hundred of resin;

chlorinated polyethylene, in an amount from about 40 to about 10 parts per hundred of resin;

tribasic lead sulfate, in an amount from about 6 to about 12 parts per hundred of resin;

a zinc molybdate, in an amount from about 10 to about 30 parts per hundred of resin;

alumina trihydrate, in an amount from about 10 to about 30 parts per hundred of resin;

a brominated aromatic ester plasticizer, in an amount from about 10 to about 30 parts per hundred of resin;

at least one additional plasticizer besides said brominated aromatic ester, said at least one additional plasticizer being efficacious in PVC-based plastic materials; and

at least one lubricant efficacious in PVC-based plastic materials.

4,892,684

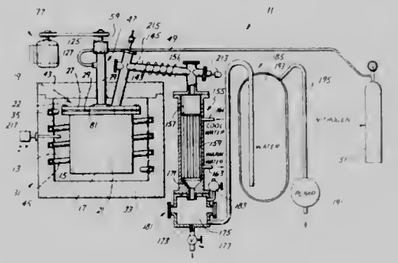
METHOD AND APPARATUS FOR SEPARATING RADIONUCLIDES FROM NON-RADIONUCLIDES

Richard J. Harp, 18746 Viking Way, Cerritos, Calif. 90701

Filed Nov. 12, 1986, Ser. No. 929,717

Int. Cl.[4] G21F *9/00*

U.S. Cl. 252—626 **29 Claims**



1. Apparatus for separating radionuclides from non-radionuclides comprising:

a reactor vessel including wall members defining a reactor chamber adapted to receive a mixture of the radionuclides and non-radionuclides in a solid or liquid phase;

the radionuclides having temperatures of vaporization higher than a first temperature;

the non-radionuclides having temperatures of vaporization lower than a second temperature;

means for heating the mixture in the chamber to a temperature greater than the second temperature but less than the first temperature to drive the non-radionuclides to a vapor phase while retaining the radionuclides in a solid or liquid phase;

means for removing the vapors of the non-radionuclides from the chamber; whereby

substantially all of the non-radionuclides exit the chamber in a vapor phase while the radionuclides remain within the chamber in a solid or liquid phase.

6. A method for disposing of radionuclides present in a mixture of non-radionuclides and radionuclides, comprising the steps of:

providing a reactor apparatus including a reactor vessel having wall members defining a reactor chamber;

depositing the mixture of radionuclides and non-radionuclides in the chamber of the reactor vessel, both the radionuclides and the non-radionuclides being in the liquid or solid phase;

transforming the non-radionuclides to a vapor phase while retaining the radionuclides in a solid or liquid phase, within the chamber;

removing the non-radionuclides in the vapor phase from the chamber of the vessel while retaining the radionuclides in the solid or liquid phase within the chamber of the vessel;

separating the reactor vessel from at least a portion of the remainder of the reactor apparatus; and

burying the reactor vessel with the radionuclides disposed within the chamber of the reactor vessel.

4,892,685

PROCESS FOR THE IMMOBILIZATION OF ION EXCHANGE RESINS ORIGINATING FROM RADIOACTIVE PRODUCT REPROCESSING PLANTS

Guy Magnin; Marie-Francoise Champeaud, both of Plaisir; Véronique Aubert, Les Clayes-sous-Bois, and Claude Jaouen, Guyancourt, all of France, assignors to Societe Generale Pour Les Techniques Nouvelles S.G.N., France

Filed Feb. 16, 1988, Ser. No. 157,038

Claims priority, application France, Dec. 16, 1987, 87 17595

Int. Cl.[4] G21F *9/16*

U.S. Cl. 252—628 **5 Claims**

1. A process for the immobilization of ion exchange resins originating from radioactive product reprocessing plants, wherein said resins are immobilized in a cement and wherein, before immobilization in the said cement, said resins are treated with an aqueous solution containing NO_3^- and Na^+ ions, the quantity of NO_3^- ions in the said aqueous solution being calculated so as to ensure that all the sites in the resins are saturated, and that the quantity of Na^+ ions used in the said aqueous solution ensures that the medium has a basic pH and that all the sites in the cationic resins are saturated.

4,892,686

PROCESS FOR THE PREPARATION OF 1-NITROANTHRAQUINONE

Walter Fischer, Reinach, and Tibor Somlo, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 22, 1988, Ser. No. 275,238

Claims priority, application Switzerland, Dec. 3, 1987, 4722/87

Int. Cl.[4] C07C *50/18*

U.S. Cl. 552—253 **27 Claims**

1. A process for the preparation of 1-nitroanthraquinone by (1) reacting 5-nitro-1,4-naphthoquinone with butadiene, (2) oxidising the 1-nitro-5,8,11,12-tetrahydroanthraquinone so obtained to 1-nitroanthraquinone, and (3) isolating the 1-nitroanthraquinone, which process comprises reacting in step (2) 1-nitro-5,8,11,12-tetrahydroanthraquinone (a) with oxygen, as inorganic peroxide compound or a metal oxide as oxidising agent and isolating 1-nitro-5,8-dihydroanthraquinone, and then (b) oxidising this intermediate to 1-nitroanthraquinone with one of the above oxidising agents.

4,892,687

PROCESS FOR SYNTHESIS OF AMIDOACIDS USING A COBALT CATALYST AND A BIDENTAL PHOSPHINE LIGAND

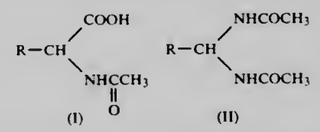
Jiang-Jen Lin, Round Rock, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 8, 1986, Ser. No. 916,770

Int. Cl.[4] C07C *102/00, 102/06, 103/44, 103/48, 103/50*

U.S. Cl. 260—404 **12 Claims**

1. A process for producing novel N-acetyl-amino acid derivatives represented by the formula (I) and (II) [, for example,]



which comprises reacting a feedstock from the group consisting of alpha olefins with 2 to 20 carbons and internal olefins with 4 to 20 carbons, acetamide and synthesis gas with a catalyst comprising a cobalt-containing compound promoted by a bidental-phosphine ligand in a solvent at a pressure of at least 500 psi and a temperature of at least 50° C., wherein R can be any alkyl and wherein the bidental phosphine ligand is of the formula

$Ph_2P(CH_2)_nPPh_2$

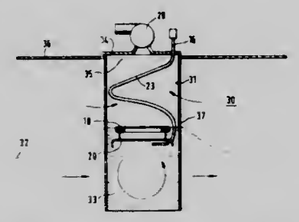
wherein n=2, 3, or 6 and Ph represents phenyl.

4,892,688

ARRANGEMENT FOR EXPELLING LIGHT VOLATILE CONTAMINANTS FROM LIQUIDS

Bruno Bernhardt, Reutlingen-Betzingen, Fed. Rep. of Germany, assignor to IEG Industrie-Engineering GmbH, Reutlingen, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,942
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—24 **2 Claims**



1. An arrangement for expelling volatile contaminants from a liquid, comprising a receptacle for receiving the liquid to be decontaminated, said receptacle having a top cover formed with an opening; a suction blower arranged in said opening to generate underpressure in a free space between a top surface of said liquid and said cover by exhausting air therefrom; a gas receiving container having an open bottom and a perforated top wall arranged below the top surface of the liquid in said receptacle and extending substantially parallel thereto; suction conduit means connecting said gas receiving container with the outer atmosphere whereby, upon creation of an underpressure in the free space outer air is sucked through said suction conduit means and is discharged in the form of bubbles through the perforations of said top wall to ascend through the liquid into said free space, said receptacle being a borehole drilled vertically in the ground and reinforced at least partially by one of a perforated casing and sieve rings.

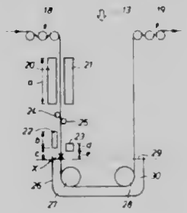
4,892,689

PROCESS FOR MAKING CURLED PHOTOGRAPHIC FILM

Jan B. Van Cappellen, Schilde; Luc M. De Groot, Aarschot; Gery Vancoppenolle, Weerde; Daniël G. Vandenbrande, Mortsel, and Jan K. De Keyzer, Schilde, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jul. 14, 1988, Ser. No. 218,919
Claims priority, application Hague, Jul. 14, 1987, EP8720/348.7
Int. Cl.[4] B29C *35/10*
U.S. Cl. 264—25 **10 Claims**

1. In a process for making biaxially oriented photographic polyethylene terephthalate film by the steps comprising extruding molten polyethylene terephthalate polymer through a flat die slot onto a cooling drum to cool down the same, subjecting the film to molecular orientation by stretching the cooled down film longitudinally and transversely, and heat-setting the film, wherein the film is longitudinally stretched by applying longitudinal stretching forces to the film while heating the film, said heating comprising first pre-heating the film to increase the film temperature but not sufficiently for plastic elongation to occur, and then stretching the film while it is heated to a temperature above the Tg (glass transition temperature) in a zone where the film is unsupported, whereby rapid plastic elongation occurs under the stretching forces, and then rapidly cooling to a temperature below the Tg to arrest the stretching; the improvement of imparting longitudinal curvature of a given degree by the steps of controlling the heating of the film during longitudinal stretching so that a temperature



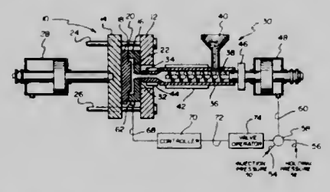
gradient Delta T exits across the film thickness from one surface of the film to the other which is larger than 10° C., and regulating the longitudinal tension applied to the film during such stretching to less than 10 N/sq. mm.

4,892,690

METHOD OF DATA ACQUISITION AND APPLICATION FOR AN INJECTION MOLDING PROCESS

Frederick J. Buja, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1988, Ser. No. 208,918
Int. Cl.[4] B29C *45/57*
U.S. Cl. 264—40.1 **5 Claims**



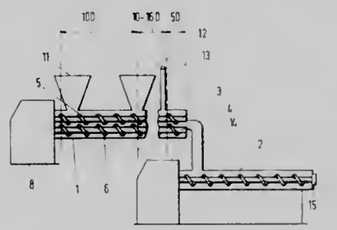
1. In an injection molding method utilizing an injection molding machine having a pair of separable mold elements forming a mold cavity therebetween and arranged for separation for the removal of a molded product, means for opening and closing the mold elements, and injection means for injecting a moldable material into said mold cavity at a first pressure and for exerting a second pressure on said moldable material as it cures in said cavity, the method of data acquisition and application in the operation of said injection machine comprising the steps of closing said mold elements, injecting the moldable material into said mold cavity at said first pressure, measuring the separation of the mold elements during the injection of the moldable material, changing the injection pressure from said first pressure to said second pressure upon detecting a predetermined separation known to produce an acceptable product, maintaining said second pressure until the thermoplastic material has cured, opening said mold and ejecting the cured product, detecting the maximum separation of said mold elements, accumulating said maximum separation measurements from a plurality of mold cycles while producing the acceptable products, then selecting a value for said predetermined separation of said mold elements at 30–70% of the greatest maximum separation measurement accumulated, and substituting said selected value of said separation for said predetermined separation for use during subsequent cycles to improve product quality.

4,892,691

EXTRUSION METHOD AND APPARATUS FOR PRODUCING A FOAMABLE MIXTURE OF PLASTICS MATERIAL

Klaus-Dieter Kolossow, Hambühren, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,319
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722050
Int. Cl.[4] B29C *47/50, 67/22*
U.S. Cl. 264—54 **11 Claims**



1. A method of producing a foamable mixture of plastics materials from two plastics materials having differing properties in a tandem extruder system comprising first and second screw extrusion devices, said first extrusion device having a variable throughput and having associated therewith sequential, longitudinally spaced first, second and third feed apertures, the method comprising the steps of:

(a) feeding a high-molecular weight, high-temperature-resistant plastics material into said first extrusion device through said first feed aperture, and fusing said material therein,

(b) feeding a second low-molecular weight, low-temperature-resistant plastics material, together with a blowing agent, through said second feed aperture into said fused, homogenised high-molecular weight plastics material and fusing and homogenizing said second plastics materials and blowing agent therewith,

(c) introducing a propellant into said fused and homogenised mixture of said plastics materials and blowing agent through said third feed aperture in said first extrusion device,

(d) homogenizing said mixture of plastics materials, blowing agent and propellant in the first extruder,

(e) transferring said homogenised and fused mixture into said second extruder,

(f) cooling said mixture in said second extruder, and

(g) extruding said mixture in the form of a foamed tubular film or profile.

4,892,692

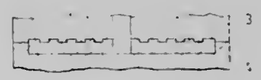
PROCESS FOR PRODUCING SUBSTRATE FOR OPTICAL DISK BY ANNEALING SUBSTRATE WITH GRADIENT DOUBLE REFRACTION DISTRIBUTION

Kunio Takada, Kawasaki, and Teruaki Okuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,687
Claims priority, application Japan, Jan. 30, 1987, 62-18476
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—106 **12 Claims**

1. A process for producing a substrate for optical disks, comprising steps of:

forming a disk-shaped substrate with polycarbonate with such gradient distribution of double refraction that the value of double refraction is in a range from −10 to −30 nm in the vicinity of the external periphery of said sub-



strate and is in a range from +10 to +30 nm in the vicinity of the center thereof; and

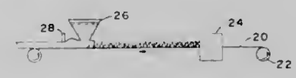
annealing thus formed substrate.

4,892,693

METHOD OF MAKING FILAMENT GROWTH COMPOSITE

Anthony J. Perrotta, Monroeville; Donald K. Grubbs, Rector; William H. Quayle, Murrysville, and Thomas B. Gurganus, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 24, 1987, Ser. No. 77,451
Int. Cl.[4] B22D *19/14*; B32B *5/02*
U.S. Cl. 264—108 **21 Claims**



1. A process for forming a novel composite comprising providing a substrate bearing crystalline filaments as growths on the substrate and forming a solid matrix encompassing the filaments, wherein the filaments are substantially uni-directional in a direction other than perpendicular to the substrate.

4,892,694

DEACTIVATION OF SPENT SILICON POWDER

Alan Ritzer, Sand Lake; George P. Moloney, Jr., Halfmoon, and Jack C. Leunig, Albany, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 41,184, Apr. 22, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,243
Int. Cl.[4] B27N *3/00*; C01B *33/08*
U.S. Cl. 264—109 **10 Claims**

1. A process for stabilizing finely divided residual silicon powder contaminated with chlorine, hydrogen and oxygen comprising:

(a) pelletizing the silicon powder and

(b) impregnating the pellets with an organic binder whereby the impregnated pellets of residual silicon are made stable for safe transportation and disposal.

4,892,695

PROCESS FOR MAKING A MOLDABLE FIBROUS MAT

David W. Bainbridge, Lakewood, and Mario P. Tocci, Littleton, both of Colo., assignors to Manville Corporation, Denver, Colo.

Division of Ser. No. 204,843, Jun. 10, 1988, Pat. No. 4,826,724. This application Feb. 9, 1989, Ser. No. 308,294
Int. Cl.[4] B29C *35/02, 69/00*; B32B *17/04, 25/02*
U.S. Cl. 264—119 **5 Claims**

1. A process for the production of a fibrous mat consisting essentially of the steps of:

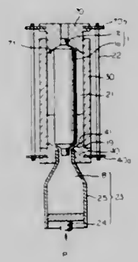
(a) combining about (i) 20–60 wt % glass fibers; (ii) 10–60 wt % polyolefin fibers; (iii) 1–50 wt % fibers selected from the group consisting of polyamide fibers; polyester fibers; and mixtures thereof; and (iv) 20–50 wt % latex which will cross-link at a temperature in the range of about 75°–300° F.;

(b) consolidating the fibers and binder into a loosely packed mat;
(c) curing the consolidated mat of fibers and binder at a temperature in the range of about 250°–400° F.; and
(d) thereafter molding the cured mat of fibers into an insulation shape at ambient temperature conditions.

4,892,696
METHOD FOR PRODUCING A RUBBER OR PLASTIC-COATED ROLLER

Takatoshi Murakami; Toshio Kida, both of Yokohama; Shiji Kon, Sagamihara; Toshinobu Asai, Yokohama, and Yoshiyuki Nunome, Kawasaki, all of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kanagawa, Japan

Division of Ser. No. 891,660, Aug. 1, 1986, Pat. No. 4,766,843. This application Jan. 8, 1988, Ser. No. 203,896
Claims priority, application Japan, Aug. 2, 1985, 60-171640; Aug. 26, 1985, 60-129819
Int. Cl.[4] B29C *33/40*
U.S. Cl. 264—219 **5 Claims**

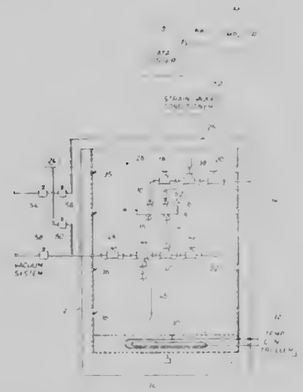


1. A method for coating a core shaft with a rubber or plastic layer to form a rubber or plastic coated roller, comprising the steps of:
(a) guiding a core shaft having tapered surfaces formed at the opposite ends thereof into a cylindrical mold having an upright molding cavity, an open upper part and an open lower part, said lower part being closed by a lower plug inserted in said lower part, wherein said lower plug has an externally tapered surface and a material injection hole at the center thereof, said tapered surface of said lower plug corresponding to said tapered surface at one of said core shaft for guiding said core shaft into a predetermined position in said lower part of said cylindrical mold;
(b) inserting a slidable upper plug into said open upper part of said cylindrical mold, said upper plug having an externally tapered surface and a vent hole at the center thereof, said tapered surface of said upper plug corresponding to said tapered surface at the other end of said core shaft for guiding said core shaft into a predetermined position in said upper part of said cylindrical mold;
(c) forcing said slidable upper plug downwards within said cylindrical mold with an elastic means thereby holding said tapered surface at one end of said core shaft against said tapered surface of said lower plug;
(d) injecting liquid rubber or plastic material into said molding cavity under pressure through said material injection hole in said lower plug, thereby causing said tapered surface of said core shaft to pushed upwards away from said tapered surface of said lower plug to form a gap therebetween, the air in said molding cavity to be vented through said air vent hole, and said molding cavity to be filled through said gap with said liquid rubber or plastic material until said liquid rubber or plastic material overflows through said air vent holes, filling of said molding cavity resulting in equilibration of upward pressure on said core shaft and inner mold cavity pressure so that said elastic means forces said core shaft downward to close said gap and maintain pressure within said molding cavity; and
(e) removing said rubber or plastic coated roller from said cylindrical mold after said liquid rubber or plastic material has set.

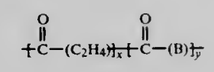
4,892,697
PROCESS FOR PREPARING MELT PROCESSED POLYKETONE-BASED BARRIER POLYMER MATERIALS

Leonard E. Gerlowski, and John R. Kastelic, both of Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 128,968
Int. Cl.[4] B29C *71/02*
U.S. Cl. 264—234 **7 Claims**



1. A process for preparing a melt processed polymer material having improved oxygen, water or carbon dioxide barrier properties comprising the steps of:
(a) melt processing a quantity of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon to form a film wherein said polymer is of the formula



wherein B is the moiety of an ethylenically unsaturated α-olefin of at least 3 carbon atoms polymerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0.5;
(b) heating said melt processed film to a temperature ranging from about 2° C. to about 40° C. above the melting point of the polymer; and
(c) cooling said heated melt processed film at a moderate rate between about 6° C. and about 10° C. per minute to form a melt processed polymer material.

4,892,698
METHOD FOR MANUFACTURING PRODUCTS WITH BRISTLES

Georg Weibrauch, Waldmichelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Waldmichelbach, Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,342
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511528
Int. Cl.[4] B29D *31/00*
U.S. Cl. 264—243 **12 Claims**

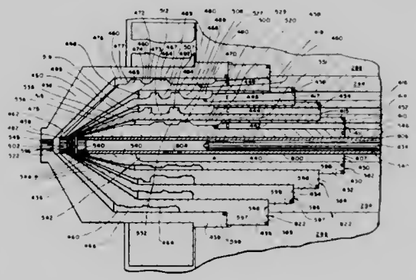


1. Method for manufacturing products with bristles, the product including a bristle holder of a castable or foamable material and plastic bristles anchored therein, the method comprising the steps of inserting the bristles, either individually or as strands of bristles through channels into a mold for the bristle holder, melting the bristles by heat at an end in the mold to form a thickening, filling the mold with bristle holder material, and bringing the thickening on the bristles into sealing contact with an opening of the channel guiding the bristles by tensile forces applied to the bristles before the bristle holder material enters the mold thereby positively sealing the opening of the channel by the thickening at the end of the bristles.

4,892,699
METHODS FOR INJECTION MOLDING AND INJECTION BLOW MOLDING MULTI-LAYER ARTICLES

Frederick G. Kudert, Niles; Maurice G. Latreille, Batavia; Robert J. McHenry, St. Charles; George F. Nahill, Crystal Lake, all of Ill.; Henry Pfutzenreuter, III, Loma, Calif.; William A. Tennant, Schaumburg, Ill.; Thomas T. Tung, Hoffman Estates, Ill., and John Vella, Jr., Aurora, Ill., assignors to American National Can Company, Chicago, Ill.

Division of Ser. No. 484,707, Apr. 13, 1983, Pat. No. 4,712,990. This application Sep. 19, 1986, Ser. No. 909,288
Int. Cl.[4] B29C *45/16*
U.S. Cl. 264—328.8 **101 Claims**



1. A method for forming multi-layer plastics articles wherein said method involves use of a multi-cavity injection molding machine, characterized in that a combined material stream is injected from each of a plurality of co-injection nozzle means of said machine into an associated injection cavity to form each article, said method being further characterized by:
providing streams of polymeric materials to form the corresponding layers of the articles, and moving each material stream separately to each of the nozzle means,
forming the combined stream in the plural nozzle means from the separate material streams, and
injecting the combined streams to form the multi-layer plastics articles.

4,892,700
PROCESS FOR MAKING MULTILAYERED, FORMABLE LAMINATES

Carlos Guerra, Fairfield; John Lee, Norwalk, and Mark Johnson, Bridgeport, all of Conn., assignors to Polycast Technology Corporation, Stamford, Conn.

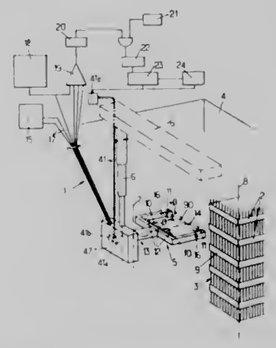
Filed Oct. 7, 1987, Ser. No. 106,191
Int. Cl.[4] B29C *47/06, 51/02, 51/10, 51/14*
U.S. Cl. 264—510 **31 Claims**

1. A process for producing a laminate which comprises:
preparing an acrylic composition comprising an acrylic monomer and at least one free radical reaction initiating catalyst;
casting said acrylic composition upon at least a portion of one surface of at least one thermoplastic material; and
curing said cast acrylic composition in multiple stages at a sufficient temperature and for a sufficient time in each stage such that a major portion of said acrylic monomer is polymerized in a first stage and the remaining unpolymerized acrylic monomer is cured in a final stage so as to permit partial penetration of said acrylic monomer into said thermoplastic material to form a multilayer, formable laminate having a controllable gradient of polymerized acrylic monomer therethrough and increased resistance to debonding during subsequent handling, forming, or other manufacturing operations.

4,892,701
DEVICE FOR MEASURING NUCLEAR REACTOR FUEL ASSEMBLY GRIDS

Christian Mauvieux, Lyons; Bernard Gebelin, Tassin, and Philippe Herbaut, Lyons, all of France, assignors to Framatome, Courbevoie and Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, both of, France

Filed Nov. 20, 1987, Ser. No. 123,461
Claims priority, application France, Nov. 20, 1986, 86 16135
Int. Cl.[4] G21C *17/06*
U.S. Cl. 376—258 **6 Claims**



5. A measuring device for remotely measuring dimensions of an external lateral face of a nuclear fuel assembly grid, comprising

(a) supporting means carrying a set of two ultrasonic transducers aligned along a common direction substantially parallel to said lateral face, facing each other, and mutually spaced by a distance larger than the length of said lateral face, each transducer for measuring the distance thereof with a side of said lateral face; and

(b) displacement means connected to said supporting means through connecting means and arranged for rectilinearly moving said supporting means towards said lateral face along a direction orthogonal thereto, until abutment means carried by the supporting means are in abutting contact with said lateral face, said abutment means being arranged for maintaining said common direction parallel to said lateral face when forced into contact with said lateral face;

(c) said connecting means having:

(i) first rotation means allowing the supporting means to rotate about an axis parallel to a longitudinal axis of the grid parallel to the sides of said lateral face responsive to abutting contact of said abutment means with said lateral face; and

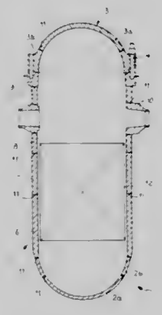
(ii) second rotation means for forcibly rotating said supporting means about a further axis perpendicular to said lateral face and to the longitudinal axis of the grid throughout a predetermined limited angular range symmetrical with respect to a reference position, where said common direction is substantially perpendicular to the longitudinal axis of the grid, responsive to further movement of said displacement means after said abutment means have initially come into contact with said lateral face.

4,892,702

LIGHT-WATER NUCLEAR REACTOR VESSEL AND PROCESS FOR ITS MANUFACTURE

Alain Vignes, Paris, France, assignor to Framatome, Courbevoie, France

Filed Oct. 17, 1988, Ser. No. 258,358
Claims priority, application France, Oct. 16, 1987, 87 14323
Int. Cl.[4] G21C *13/08, 21/00*
U.S. Cl. 376—294 **6 Claims**



1. Process for the manufacture of a light-water nuclear reactor vessel comprising a shell having a thickness, greater than 100 mm, symmetrical in revolution, consisting in shaping at least two unit components of overall symmetrical shape in revolution and in assembling said unit components by welding over their entire thickness to produce the nuclear reactor vessel, wherein the unit components (*2a*, *2b*, **6**, **7**, **8**, **9**, **10**, *3a*, *3b*) are made of a steel containing 2 to 2.50% of chromium, 0.9 to 1.1% of molybdenum and less than 0.15% of carbon, and the assembly of the unit components is carried out by welding by means of an electron beam, in a single pass, without filler metal, over the entire thickness of the unit components.

4,892,703

SURFACE STRUCTURE OF AlN SUBSTRATE AND A PROCESS FOR PRODUCING THE SAME

Satoshi Ito, and Akiyasu Okuno, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Division of Ser. No. 30,253, Mar. 9, 1987, Pat. No. 9,840,853. This application Mar. 24, 1989, Ser. No. 328,289
Claims priority, application Japan, Mar. 8, 1986, 61-51213
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—13 **3 Claims**

1. A process for producing a surface structure on an AlN substrate comprising:

coating a surface of the AlN substrate with metallizing layer components,

heat treating the resultant coated substrate at a temperature of 200°–500° C. under an oxidizing atmosphere, and

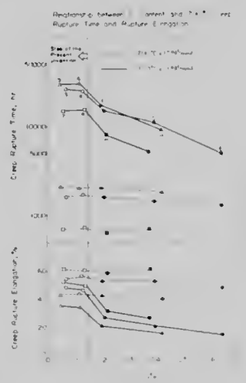
further heating the heat treated coated substrate at a temperature of 1200°–1400° C. under a nonoxidizing atmosphere having a dew point of −35° to 5° C..

4,892,704

LOW SI HIGH-TEMPERATURE STRENGTH STEEL TUBE WITH IMPROVED DUCTILITY AND TOUGHNESS

Yoshiatsu Sawaragi, Nishinomiya, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 8, 1988, Ser. No. 232,636
Claims priority, application Japan, Apr. 28, 1988, 63-106794
Int. Cl.[4] C22C *38/48*
U.S. Cl. 420—59 **8 Claims**



1. A low Si high-temperature strength steel tube with improved ductility and toughness which consists essentially of:

not more than 0.10 wt% of carbon (C), not more than 0.15 wt% of silicon (Si), not more than 5 wt% of manganese (Mn), 22 to 27 wt% of chromium (Cr), 15 to 25 wt% of nickel (Ni), 0.2 to 0.35 wt% of nitrogen (N), 0.10 to 1.0 wt% of niobium (Nb) and not more than 0.005 wt% of oxygen (O_2); and

at least one of 0.020 to 0.1 wt% of aluminum (Al) and 0.003 to 0.02 wt% of magnesium (Mg) in an amount defined by the following formula:

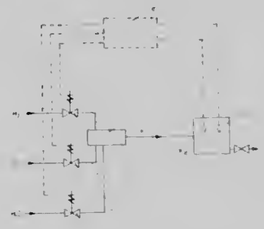
$0.006(\%) \leqq (1/5Al + Mg) \leqq 0.020(\%)$ the balance being Fe and inevitable impurities.

4,892,705

METHOD OF PRODUCING VAPOR FOR USE IN A VAPOR STERILIZING PROCESS

Hans J. Sternfeld, Jagsthausen; Karlheinz Wolfmüller, Eppingen-Adelshofen; Rodhardt Froese, Schömberg, and Manfred Paulus, Pforzheim, all of Fed. Rep. of Germany, assignors to Fr. Kammerer GmbH, Huchenfeld and Deutsche Forschungs- und Versuchsaustalt fur luft-und Raumfahrt e.V., Bono, both of, Fed. Rep. of Germany

Continuation of Ser. No. 836,969, Mar. 6, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 178,882
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508043
Int. Cl.[4] A61L *2/06*
U.S. Cl. 422—26 **5 Claims**



1. A method of sterilizing objects comprising the steps of:

supplying hydrogen and oxygen at preselected supply rates in a stoichometric ratio into a combustion chamber;

burning the hydrogen with the said oxygen to generate hot combustion gases;

simultaneously introducing liquid water at a certain supply rate into said combustion gases whereby the water is evaporated to generate sterilizing steam;

introducing said sterilizing steam into a vessel housing said objects;

sensing vapor pressure and vapor temperature of said sterilizing steam; and

controlling the sterilization conditions by controlling the proportional supply rates of hydrogen and oxygen and independently thereof controlling the supply rate of the liquid water responsive to the sensed vapor pressure and vapor temperature thereby controlling the vapor supply rate, the vapor pressure and the vapor temperature independently and separately from each other.

4,892,706

AUTOMATED LIQUID STERILIZATION SYSTEM

Raymond C. Kralovic, Springfield, Pa., and Edward T. Schneider, Mentor, Ohio, assignors to Steris Corporation, Painesville, Ohio

Continuation-in-part of Ser. No. 826,730, Feb. 6, 1986, Pat. No. 4,731,222. This application Jan. 4, 1988, Ser. No. 140,388
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] A61L *2/18, 2/24;* **C23F** *13/00*
U.S. Cl. 422—28 **17 Claims**

1. A method of sterilizing medical instruments, the method comprising:

disposing a medical instrument to be sterilized in a storage module;

closing the module to penetration by microbial contamination;

removably attaching the storage module with tubing which interconnects the attached module with a source of liquid rinse solution;

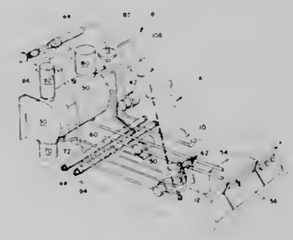
completely filling the interconnecting tubing from the module to the rinse solution source and the module with a liquid sterilant which includes peracetic acid;

retaining the liquid sterilant in the module and the interconnecting tubing for a pre-selected duration, which pre-selected duration is sufficiently long to sterilize the module, the medical instrument, and the interconnecting tubing;

passing a sterilized liquid rinse solution from the rinse solution source only through the sterilized interconnecting tubing into the sterilized module to rinse the liquid sterilant from the interconnecting tubing, the module, and the medical instrument, whereby the liquid rinse solution passes only in contact with sterilized surfaces to prevent contamination of the liquid rinse solution;

detaching the module from the interconnecting tubing while maintaining the module closed to microbial contamination; and,

storing the module and the medical instrument as a unit.

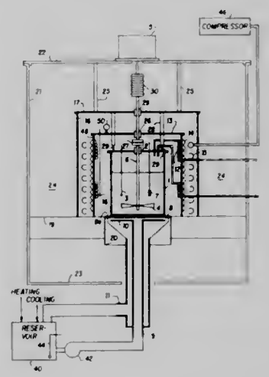


4,892,707

APPARATUS FOR THE CALORIMETRY OF CHEMICAL PROCESSES

Gerald W. Stockton, Morrisville; Dale H. Chidester, Levittown, both of Pa., and Susan J. Ehrlich, Hamilton Township, Mercer County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 25, 1983, Ser. No. 517,189
Int. Cl.[4] G01N *25/20*
U.S. Cl. 422—51 **17 Claims**



9. A calorimeter for use in examining chemical processes comprising:

(a) a flat bottomed reaction vessel;

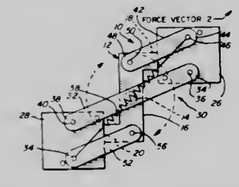
(b) a gas-tight cover for said reaction vessel having at least two chemical inlet ports;

(c) an agitator mechanism disposed within said reaction vessel;

(d) a first temperature sensor disposed within said reaction vessel;

(e) a calibration heater disposed within said reaction vessel;
(f) a pressure relief mechanism for relieving overpressure in said reaction vessel;
(g) a heat exchanger in intimate thermal contact with the base of said reaction vessel for regulating heat flow to the vessel and a reaction mass disposed therein, including means to supply coolant at a determined temperature and flow rate and an electric heater;
(h) an adiabatic shield surrounding said reaction vessel, to prevent uncontrolled heat leakage from said vessel, said adiabatic shield comprising a closed barrier vessel having a cover;
(i) an electrical heater for heating said adiabatic shield;
(j) means for cooling said adiabatic shield with a coolant supplied at constant flow and temperature;
(k) a second temperature sensor disposed in the space between said adiabatic shield and said reaction vessel;
(l) means for supplying chemical feed streams to said chemical inlet ports;
(m) means to equilibrate the temperature of said chemical feed streams;
(n) means for driving said agitator mechanism; and
(o) temperature regulation means receiving inputs from said first and second temperature sensors and providing outputs to said calibration heater, said heat exchanger electrical heater, and adiabatic heat shield electric heater and to said means to supply coolant, such as to maintain said defined fluid temperature in said coolant.

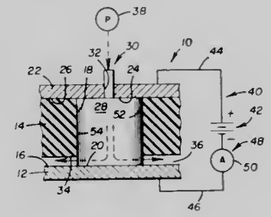
4,892,708
FLUID SEPARATION AND PROCESSING DEVICE
Frank W. Wogoman, South Bend, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Jul. 1, 1987, Ser. No. 68,451
Int. Cl.[4] G01N *21/07*
U.S. Cl. 422—72 **16 Claims**



1. An assembly for separating, metering, diluting and delivering a fluid, comprising:
a central rotating member rotatable about a fixed spin axis;
a processing chamber holding member; and centrifugally actuated means for connecting said processing chamber holding member to said central rotating member and for translating said processing chamber holding member in response to a change in centrifugal force acting on said centrifugally actuated means from a first position relative to said spin axis to a second position relative to said spin axis thereby changing the direction of centrifugal force acting on said processing chamber holding member, wherein said second position is at greater distnce from said axis than said first position.

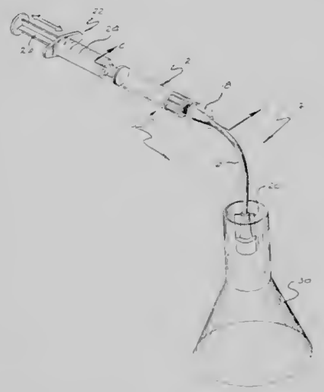
4,892,709
MICRODEVICE FOR GAS AND VAPOR SENSING
Karl W. Frese, Jr., Cupertino, Calif., assignor to SRI International, Menlo Park, Calif.
Filed Oct. 2, 1987, Ser. No. 104,338
Int. Cl.[4] H01L *7/00;* **H01C** *13/00*
U.S. Cl. 422—98 **23 Claims**

19. A microdevice for gas and vapor sensing, comprising:
an electrically conductive substrate having a substrate surface;
an electrically conducting member having a member surface generally parallel to said substrate surface;
an electrical insulator sandwiched between and abutting said substrate surface and said member surface, said insulator having an opening therethrough exposing facing portions of said substrate and member surfaces, said insulator and said facing portions of said substrate and member surfaces defining an ionization chamber;



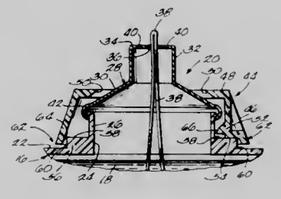
means for flowing gas through said chamber;
means for applying a sufficient voltage difference between said substrate and said member to provide a voltage gradient therebetween of at least about 10^4 V/cm and to cause a current to flow between said substrate and said member; and
means for measuring the current flowing between said substrate and said member.

4,892,710
CARTRIDGE ASSEMBLY WITH MULTI-PURPOSE CLOSURE TUBING
Raphael C. Wong, and That T. Ngo, both of Irvine, Calif., assignors to Bioprobe International, Inc., Tustin, Calif.
Filed Jul. 7, 1987, Ser. No. 70,764
Int. Cl.[4] B01L *3/00*
U.S. Cl. 422—102 **9 Claims**



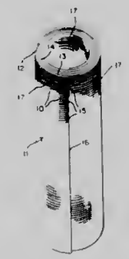
1. A cartridge assembly which comprises:
at least one cartridge means for sampling, testing or purifying materials having a male end and a female end; and
a closure tubing having a female end adapted to close the male end of said cartridge means and a male end adapted to close the female end of said cartridge means.

4,892,711
FRAGRANCE DISPENSING DEVICE
Donald W. Tendick, Sr., Wauwatosa, Wis., assignor to Lamplight Farms, Inc., Wauwatosa, Wis.
Filed Dec. 31, 1987, Ser. No. 139,909
Int. Cl.[4] A61L *9/02*
U.S. Cl. 422—125 **11 Claims**



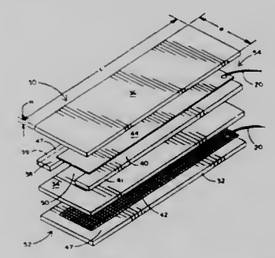
1. A fluid burning lamp comprising
a canister containing a combustible fluid and having a top wall including an opening and an upstanding collar surrounding said opening;
a burner assembly mounted on said canister over said opening and including a wick having a lower portion which extends into the combustible fluid and an exposed upper portion which can be lit to provide a flame and further including a metal cap member which fits over said collar and has a central raised portion which holds the upper portion of said wick; and;
a ring-like fragrance dispensing element made from a solid, synthetic, polymeric, plastic material containing about 5 to about 20 weight % of a vaporizable fragrance material uniformly dispersed throughout and mounted on said canister and surrounding said burner assembly such that, when said wick is lit, heat from said burner vaporizes and drive said fragrance material from said plastic material, said element being arranged to cooperate with said canister to prevent contact of any part of said element with said cap member.

4,892,712
FLUID PURIFICATION
Michael K. Robertson, and Robert B. Henderson, both of London, Canada, assignors to Nutech Energy Systems Inc., London, Canada
Filed Sep. 4, 1987, Ser. No. 94,000
Int. Cl.[4] B01J *1/10, 19/08;* **G01N** *21/01, 21/51*
U.S. Cl. 422—186 **28 Claims**



1. A matrix for use in a method of removing, reducing or detoxifying organic pollutants from a fluid, characterized by a porous substrate having a photoreactive metal semiconductor material bonded with, to or into surfaces of said substrate, said substrate comprising a filamentous, fibrous or stranded base material through which the fluid can flow in intimate contact with the photoreactive material.

4,892,713
OZONE GENERATOR
James J. Newman, 4703 Portland Rd. #34, Salem, Oreg. 97305
Filed Jun. 1, 1988, Ser. No. 200,826
Int. Cl.[4] B01J *19/08, 19/12*
U.S. Cl. 422—186.07 **20 Claims**



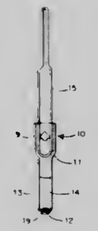
19. A generator for forming ozone from air, said generator requiring a low amount of energy and no coolant and being adapted to be connected to a 120 volt electrical power source, said generator comprising:
a unitary grid assembly having:
a first porcelain dielectric plate;
a second porcelain dielectric plate spaced apart from said first dielectric plate, wherein said first and said second dielectric plates are of the same size and shape;
a stainless steel wire mesh anode located between said first and said second dielectric plates, said anode being sized smaller than said dielectric plates and spaced away from the perimeter of said dielectric plates, the perimeters of said dielectric plates being bonded directly together thereby forming a sealed anode assembly wherein said anode is sealed in and between the central portion of said first and said second dielectric plates;
a stainless steel cathode plate sized smaller than said dielectric plates and spaced away from said second dielectric plate; and
a pair of porcelain dielectric spacers located between said second dielectric plate and said cathode plate, the width of each of said pair of dielectric spacers being less than the width of said anode assembly, the outside perimeter of said second dielectric plate being bonded to the outside perimeter of said pair of dielectric spacers, said cathode plate being spaced away from the outside perimeter of said pair of dielectric spacers,
wherein said second dielectric plate, said pair of spacers and said cathode plate define a space for the passage of air and the formation of ozone formed from the air;
means, located spaced from but adjacent said grid assembly, for moving air through said space;
a transformer;
means for connecting said transformer to said anode and said cathode plate;
means for connecting said transformer to a power source; and
means for emitting ozone formed is said generator from said generator.

4,892,714

RECRYSTALLIZATION APPARATUS

Robert L. Stevens, South Harpswell, Me., assignor to Microscale Organic Laboratory Corporation, Newcastle, N.H.

Filed Oct. 13, 1988, Ser. No. 257,209
Int. Cl.[4] B01D *35/00*
U.S. Cl. 422—245 **4 Claims**



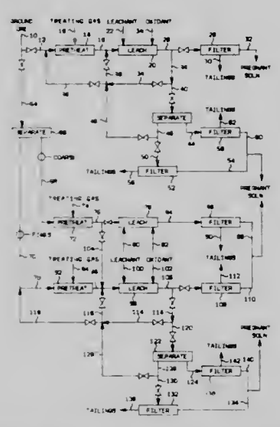
1. Recrystallization apparatus comprising:
a. A tube having an upper portion joined by a constriction to a closed bottom portion of said tube;
b. a plug of plastic material fitting inside said upper portion and having a nose end too large to pass said constriction;
wherein one of said nose end and said constriction is circular in cross-section while the other is noncircular so as to provide an open area between said nose end and said constriction which is of the size that allows passage of liquid while blocking passage of crystals therethrough.

4,892,715

RECOVERING MINERAL VALUES FROM ORES

Robert L. Horton, Chagrin Falls, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1982, Ser. No. 451,699
Int. Cl.[4] C22B *60/02*
U.S. Cl. 423—20 **13 Claims**



1. A method for recovering uranium from ground uranium-containing ore, comprising:
(a) pretreating said ground ore with a gas selected from the group consisting of (1) a halogen gas and (2) a nitrogen oxide gas, in at least one pretreating step for a time sufficient to essentially saturate said ore with said gas;
(b) leaching said ground ore with an aqueous leach solution, comprising; less than about 180 pounds per ton of ore of sulfuric acid and less than about 10 pounds per ton of sodium chlorate, at a temperature between atmospheric temperature and about 80° C., in at least one leaching step;
(c) separating a first part of the effluent from said leaching step into a pregnant leach solution containing said uranium values and residual solids; and
(d) separating a second part of the effluent from the leaching step into a coarse fraction and a fines fraction and at least part of the total fines fraction, containing fluids from the leaching step, is recycled to at least one of (1) the pretreating step and (2) the leaching step.

4,892,716

MOLDED CATALYST AND METHOD OF CATALYTIC GAS REACTIONS USING THE SAME

Kazunobu Abe, and Toshikatsu Umaba, both of Sakai, Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Division of Ser. No. 947,415, Dec. 24, 1986, Pat. No. 4,755,500.
This application Apr. 19, 1988, Ser. No. 183,155
Claims priority, application Japan, Dec. 27, 1985, 60-296957
Int. Cl.[4] B01D *53/36*
U.S. Cl. 423—213.7 **1 Claim**

1. A method of performing catalytic gas reactions in which a molded catalyst having openings therethrough is fitted in a reactor vessel having an inlet and an outlet for a reactant gas so that the openings extend in the direction of the flow of the reactant gas, and the catalyst is an integral molded unit which comprises a wear-resistant front portion facing the inlet and a continuation of the front surface extending therefrom, both the wear-resistant portion and continuation thereof constituting the front portion of the catalyst, and the remaining part made so wear-susceptible as to have either:
(a) a wearability of 2–10% in a shaking abrasion test wherein grinding particles having an average particle size of 1000 μm and a Mohs scale of 9 are placed in the openings of the catalyst in an amount of 50% by volume based on the total volume of the openings, and the catalyst is shaken for three hours with an amplitude of 77 mm and a frequency of 320 per minute; or
(b) a wearability of 7.5–35% in an air abrasion test wherein an air which contains silica particles having an average particle size of 40 μm in amounts of 70 g/m^3 is passed through in a reactor vessel including a rectangular parallelepipedic catalyst of 45 mm wide, 45 mm thick and 100 mm long so fitted thereinto, so that the catalyst extends longitudinally in the direction of the flow of the air for 30 min. at a superficial velocity of 40 m/sec. at the front fact of the catalyst,
said catalyst being wear-resistant over a length which is 1 to 20 times the equivalent diameter of the openings of the catalyst,
the method comprising: allowing grinding particles to exist continuously or intermittently in the reactant gas fed into the reactor vessel, thereby to wear the surface layer of the same remaining part of the catalyst with the grinding particles.

4,892,717

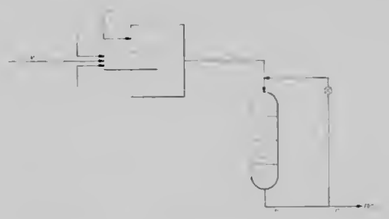
GAS TREATING PROCESS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 31, 1985, Ser. No. 761,065
Int. Cl.[4] C01B *33/00, 17/16, 3/12, 3/16*
U.S. Cl. 423—217 **77 Claims**

1. A process for preventing oxygen from deactivating a catalyst susceptible to deactivation by oxygen comprising (1) scavenging oxygen contained in a feed gas stream comprising carbon monoxide and water vapor as reactant gases in the presence of an oxidation catalyst under conditions which remove essentially all of said oxygen by reaction with hydrogen sulfide and (2) contacting the resultant gas stream, containing said reactants but essentially free of oxygen, with a catalyst

susceptible to deactivation by oxygen but active for the water gas shift reaction, said contacting in step (2) being under conditions resulting in the conversion of at least some of said carbon monoxide and water vapor to hydrogen and carbon dioxide.



4,892,718

DECONTAMINATION OF GASES BY SCRUBBING

Siegfried Peter, Lindenweg 3, D-8525 Uttenreuth, and Georg Haertel, Westtorgraben 9, D-8500 Nuernberg, both of Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 885,918
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525241
Int. Cl.[4] C01B *21/02*
U.S. Cl. 423—235 **15 Claims**

1. A method for removing of at least one of the following contaminants, COS, CS2, mercaptans, SOX and/or NOX from host gases, including the step of scrubbing the contaminant containing host gases at a normal or elevated pressure, at a temperature between about room temperature and 200 degrees Celsius, the improvement comprising, using in the step of scrubbing a solution of salts of at least one element of the following, scandium, yttrium, lanthanide or actinide groups, or mixtures thereof of such salts, the solution being in water and/or an organic solvent, to remore sulfur and/or nitrogen.

4,892,719

REMOVAL OF ALDEHYDES AND ACIDIC GASES FROM INDOOR AIR

Hyman D. Gesser, 218 Girton Blvd., Winnipeg, MB, Canada R3P 0A7

Filed Aug. 24, 1988, Ser. No. 235,493
Int. Cl.[4] B01J *8/00;* **C10H** *23/00*
U.S. Cl. 423—245.1 **12 Claims**

1. A method of reducing the indoor air concentration of aldehydes by coating a porous support filter with water soluble polymeric amine to which a water soluble low-volatile liquid plasticizer is added to render the coating soft and flexible and passing the indoor air through said support filter.

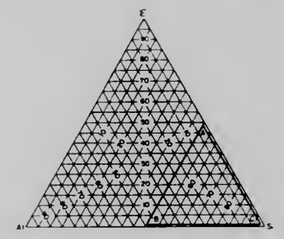
4,892,720

SUBSTITUTED ALUMINOSILICATE COMPOSITIONS AND PROCESS FOR PREPARING SAME

Gary W. Skeels, Brewster, and Richard Ramos, Bronx, both of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Apr. 26, 1984, Ser. No. 604,179
Int. Cl.[4] C01B *33/28;* **C01G** *23/04, 49/02*
U.S. Cl. 423—328 **14 Claims**

1. The process for preparing molecular sieves containing at least one of titanium and/or iron from a starting crystalline aluminosilicate which comprises contacting said crystalline aluminosilicate having pore diameters of at least about 3 Angstroms and having a molar SiO_2/Al_2O_3 ratio of at least 3, with a fluoro salt of titanium and/or iron, said fluoro salt being in the form of a solution or slurry, whereby framework aluminum atoms of the starting crystalline aluminosilicate are removed and replaced by at least one of titanium and iron.

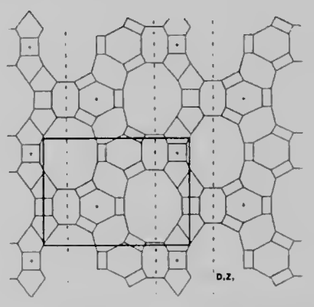


4,892,721

CRYSTALLINE ZEOLITE MATERIALS CONSTITUTING MAZ-MORITE INTERMEDIATES

Michael E. Leonowicz, Neshanic Station; David E. W. Vaughan, Flemington, and Karl G. Strohmaier, Port Murray, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 713,050, Mar. 18, 1985, Pat. No. 4,657,748. This application Apr. 2, 1987, Ser. No. 33,244
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **23 Claims**



1. A crystalline porous tectosilicate composition characterized as combining mordenite sheets with mazzite or 'omega' sheets, having orthorhombic unit cell parameters of 7.3Å (±0.2), 18.1Å(±0.3) and sum combinations of 10.6Å (±0.2) and 15.6Å(±0.3).

7. The composition of claim 1 having the configuration D_1Z_1.

4,892,722

METHOD FOR PRODUCING HIGH STRENGTH, HIGH MODULUS MESOPHASE-PITCH-BASED CARBON FIBERS

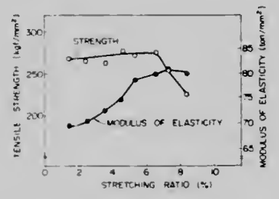
Yoshinori Suto; Toshiyuki Ito; Hideyuki Nakajima; Yoshiyuki Suzuki; Shin-ichi Nayuki, all of Ibarakiken; Hiroyasu Ogawa, and Harumitsu Enomoto, both of Shizuokaken, all of Japan, assignors to Petoca Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,990

Claims priority, application Japan, Jun. 5, 1987, 62-139980

Int. Cl.[4] C01B *31/04*

U.S. Cl. 423—448 **1 Claim**



1. A method for producing high strength, high modulus mesophase-pitch-based carbon fibers having a modulus of elasticity of 75 tonf/mm^2 or more and a tensile strength of 250 kgf/mm^2 or more which comprises heat treating mesophase-pitch-based carbon fibers at a temperature of 2600° C. to 2900° C. while stretching said fibers with a stretching ratio S which satisfies the relation of equation (1) in the case of a modulus of elasticity of 2 tonf/mm^2 or more and 10 tonf/mm^2 or less and the relationship of equation (2) in the case of a modulus of elasticity of 10 tonf/mm^2 or more and 70 tonf/mm^2 or less.

$$0.337M+0.79 \leqq S \leqq 0.371M+5.06 \quad (1)$$

$$-0.102M+7.38 \leqq S \leqq -0.121M+9.98 \quad (2)$$

wherein M is a modulus of elasticity (tonf/mm^2) and S is stretching ratio (%)

4,892,723

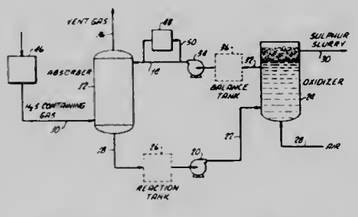
METHOD FOR IMPROVING THE LONG-TERM STABILITY OF H_2S ABSORPTION-OXIDATION PROCESS SOLUTIONS

Dennis D. Delaney, Yorba Linda, and Hugh W. Gowdy, Irvine, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Sep. 12, 1988, Ser. No. 243,460

Int. Cl.[4] C01B *17/02*

U.S. Cl. 423—573.1 **67 Claims**



1. A hydogen sulfide removal process wherein an organically contaminated hydrogen sulfide-containing gas stream is contacted with a circulating, regenerable aqueous washing solution in which said washing solution first absorbs said hydrogen sulfide and then oxidizes it into sulfur particles, with said sulfur particles being removed and recovered, the process further comprising contacting at least a portion of said gas stream with charcoal to reduce the concentration of said organic contamination in said gas stream.

4,892,724

TARTAR INHIBITING ORAL COMPOSITIONS AND METHOD

Zahid Amjad, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 9, 1988, Ser. No. 191,668

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[4] A61K *7/16, 7/18, 9/68*

U.S. Cl. 424—49 **19 Claims**

1. An oral composition comprising:

(a) an effective amount of a fluoride source,

(b) effective amount of a dental abrasive; and

(c) 0.01 to 10% by weight of an anticalculus agent selected from at least one phosphorus-containing compound and at least one polymer in the weight ratio of 1:10 to 10:1; said compound is selected from the group consisting essentially of amino phosphonic acids, diphosphonic acids, phosphonoalkane carboxylic acids, hydroxy phosphonocarboxylic acids, polyphosphoric acids, polyol phosphate esters, amino phosphonates, salts thereof, and mixtures thereof and whereas said polymer is selected from the group consisting essentially of homopolymers of a carboxylic monomer selected from the group consisting essentially of monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms, salts and anhydrides of such acids, and mixtures of such carboxylic monomers, and from copolymers containing at least 30% by weight of such carboxylic monomer and at least 5% by weight of a principal comonomer.

4,892,725

TARTAR INHIBITION ON TEETH

Zahid Amjad, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 9, 1988, Ser. No. 191,667

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[4] A61K *7/16, 7/18, 9/68*

U.S. Cl. 424—49 **19 Claims**

1. Oral composition comprising:

(a) effective amount of a fluoride source,

(b) effective amount of a dental abrasive; and

(c) 0.01 to 10% by weight of an anticalculus agent of at least one polymer selected from homopolymers of carboxyl monomers selected from monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms, salts and anhydrides thereof, and at least one copolymer containing at least 30% by weight of said carboxyl monomer, which anticalculus agent yields synergistic results compared to the use of said homopolymer alone or said copolymer alone.

4,892,726

MAKEUP OR COSMETIC COMPOSITIONS

Kazuya Yonekura, and Shoji Daikuzono, both of Tokyo, Japan, assignors to Toshiba Silicon Co., Ltd., Japan

Filed May 20, 1988, Ser. No. 196,917

Claims priority, application Japan, May 29, 1987, 62-131349

Int. Cl.[4] A61K *7/21, 7/35, 7/2*

U.S. Cl. 424—63 **3 Claims**

1. A makeup or cosmetic composition comprising polymethylsilsesquioxane powders which has a mean particle diameter of 0.05 to 100 μm and where 80% or more of the polymethylsilsesquioxane particles are within the range of ±30% of the mean particle diameter.

4,892,727

COSMETIC OR DERMOPHARMACEUTICAL COMPOSITIONS CONTAINING A POWDER OF SWEET LUPINE SEEDS ESSENTIALLY FREE OF ALKALOIDS

Jean-Francois Grollier, Paris, France, assignor to Societe Anonyme dite: L'OREAL, Paris, France

Filed Jul. 24, 1986, Ser. No. 889,001

Claims priority, application Luxembourg, Jul. 24, 1985, 86021

Int. Cl.[4] A61K *7/02, 7/027, 7/035, 7/06*

U.S. Cl. 424—69 **10 Claims**

1. A topical composition for to the hair, skin and scalp, said composition being in the form of an emulsion, a cream, a lotion, a gel or a powder and comprising in a cosmetically acceptable vehicle, an effective amount of a powder of sweet lupine seeds essentially free of alkaloids.

4,892,728

PUMPABLE CATIONIC FATTY ALCOHOL DESPERSION

Rolf Kawa, Monheim; Holger Tesmann, Duesseldorf; Josef Wilhelm; Karl-Heinz Rose, both of Huenfeld, and Eugen Konrad, Darmstadt, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,844

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708425

Int. Cl.[4] A61K *7/075, 7/08, 7/021; B01F 17/18*

U.S. Cl. 424—70 **20 Claims**

1. A cationic fatty alcohol dispersion having a high fatty alcohol content and a viscosity of about 0.5 to about 50 Pa.s at 20° C. comprising a mixture of:

(A) from more than 10 to about 25.0% by weight of a linear or branched, primary, saturated C_{14}–C_{22} fatty alcohol or mixtures of such alcohols;

(B) from about 0.01 to about 1.0% by weight of a cationic surface-active compound containing a quaternary ammonium, pyridinium or imidazolinium group and a linear C_8–C_{22} alkyl or 2-hydroxyalkyl group; and

(C) water in a quantity sufficient to adjust to 100% by weight.

4,892,729

SOAP-FREE, BRUSHLESS NON-LATHERING SHAVING CREAM

Paolo Cavazza, Rome, Italy, assignor to Avantgarde S.p.A., Pomezia, Italy

Filed Mar. 10, 1988, Ser. No. 166,317

Claims priority, application Italy, Mar. 18, 1987, 47739 A/87

Int. Cl.[4] A01K *7/15*

U.S. Cl. 424—73 **10 Claims**

1. A brushless non-lathering shaving cream characterized in that it comprises the following components:

(a) from 4 to 15% by weight of a long-chain alcohol selected from stearyl alcohol, lauryl alcohol, cetyl alcohol, myristyl alcohol and mixtures thereof;

(b) from 1 to 10% by weight of an anionic, nonionic, amphoteric or quaternary surfactant and emulsifying agent, provided that if the quaternary surfactant is present the anionic surfactant is absent, or

(c) from 1 to 10% by weight of an anionic, nonionic, amphoteric or quaternary surfactant or emulsifying agent, provided that if the quaternary surfactant is present the anionic surfactant is absent;

(d) from 1 to 10% by weight of a wetting agent selected from glycerol, propylene glycol, sorbitol and polyethylene glycol; and

(e) from 4 to 20% by weight of an emollient selected from mineral oils and VASELINE (petrolatum).

4,892,730

PROCESSES FOR PREPARATION OF SOLID, RAPIDLY RELEASED MEDICAMENT PREPARATIONS CONTAINING DIHYDROPYRIDINES

Ahmed Hegasy, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 864,677, May 19, 1986, which is a continuation of Ser. No. 728,123, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 433,570, Oct. 8, 1982, abandoned. This application Sep. 20, 1988, Ser. No. 247,009

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142853; Feb. 16, 1982, 3205399

Int. Cl.[4] A61K *31/78, 31/44*

U.S. Cl. 424—80 **12 Claims**

1. A process for the production of a solid medicament preparation, which process comprises dissolving 1 part by weight of dihydropyridine as active compound and 2.0 to 6.0 parts by weight of PVP having a mean molecular weight of 15,000 to 50,000, in 2 to 20 parts by weight of an amount of an organic solvent which is sufficient to dissolve the dihydropyridine and PVP, then granulating this resultant solution with 4 to 23 parts by weight of absorptive excipients comprising a mixture of 3.5 to 15 parts by weight cellulose, 0.25 to 4 parts by weight starch and 0.25 to 4 parts by weight crosslinked insoluble PVPP, then further processing the resulting granules to give the solid medicament preparation.

4,892,731

BIOLOGICAL INTESTINAL ANTISEPTICS

Tadashi Arai, Tokyo; Mamoru Tanaka, Nagano, and Akio Maeda, Chiba, all of Japan, assignors to Tadashi Arai, Tokyo, Japan

PCT No. PCT/JP87/00970, § 371 Date Aug. 9, 1988, § 102(e) Date Aug. 9, 1988

PCT Filed Dec. 11, 1987, Ser. No. 243,038

Claims priority, application Japan, Dec. 11, 1986, 61-293349

Int. Cl.[4] A61K *39/08*

U.S. Cl. 424—93 **1 Claim**

1. A biological intestinal antiseptic comprising, as the active component, cells or endospores of a butyric-acid bacterium *Clostridium butyricum* M11588-Sens 1 strain having the sensitivity that this strain is infected and lysed by bacteriophage KM1, or cells or endospores of a spontaneous mutant M11588-Res 1 strain which has been screened from the cultured colonies of the M11588-Sens 1 strain and exhibits resistance to bacteriophage KM1.

4,892,732

METHOD AND COMPOSITION FOR ENHANCING THE INSECTICIDAL ACTIVITY OF CERTAIN ORGANOPHOSPHORUS COMPOUNDS

Doris L. Parconagian, Pleasant Hill; Donald H. DeVries; Mark J. Costales, both of Concord, and Walter Reifschneider, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 125,909, Nov. 27, 1987, abandoned, which is a continuation of Ser. No. 489,422, Apr. 28, 1983, abandoned. This application Jan. 12, 1989, Ser. No. 296,545

Int. Cl.[4] A01N *25/08*

U.S. Cl. 424—409 **13 Claims**

1. An insecticidal composition which comprises an inert carrier and an insecticidally effective amount of an active mixture of toxicants which mixture comprises about 1 part by weight of O,O-diethyl O-(3,5-6-trichloro-2-pyridinyl)phosphorothioate in admixture with from ¼ part to about 4 parts by weight of a pyrimidinyl phosphoramidothioate selected from the group consisting of

O-(2-cyclopropyl-5-pyrimidinyl) O-ethyl N-(1-methylethyl)phosphoramidothioate,

O-(2-cyclopropyl-5-pyrimidinyl) O-ethyl N-n-propyl phosphoramidothioate and

N-cyclopropyl O-(2-cyclo-propyl-5-pyrimidinyl) O-ethyl phosphoramidothioate.

4,892,733

BIODEGRADABLE SYNTHESIS POLYPEPTIDE AND ITS THERAPEUTIC USE

Daniel Bichon, Gaillard, France; Bernard Lamy, Carouge, and William Borloz, Nyon, both of Switzerland, assignors to Imperial Chemical Industries PLC, London, England

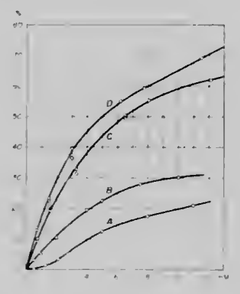
PCT No. PCT/CH86/00177, § 371 Date Aug. 18, 1987, § 102(e) Date Aug. 18, 1987, PCT Pub. No. WO87/03891, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 15, 1986, Ser. No. 101,298

Claims priority, application Switzerland, Dec. 19, 1985, 5436/85

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—422 **20 Claims**

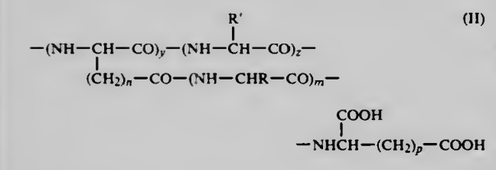


1. Hydrosoluble, biodegradable, carboxylated polypeptide derived from polyaspartic and/or polyglutamic acids, of formula



(I)

or its copolymers with other aminoacids, of formula



(II)

in which:

R and R′ are side chains of aminoacids, and R′ is the same or different than R;

m is an integer from 0 to 5;

p is 0, 1 or 2;

n is 1 or 2;

x is selected so that the molecular weight of the polypeptide is at least 5000 Dalton; and

x=y+z with the ratio of y/z being in the range of about 1 to about 30.03.

4,892,734

DISPENSING PASTE FOR FORMING MEDICINAL PELLETS

Robert J. Leonard, Lynnfield, Mass., assignor to Endocon, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 35,379, Apr. 6, 1987, Pat. No. 4,748,024. This application Mar. 31, 1988, Ser. No. 175,540

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—422 **19 Claims**

1. A process for dispensing an active ingredient and a carrier for forming pellets containing said active ingredient and said carrier comprising,

forming a paste from said active ingredient, said carrier and a liquid,

dispensing said paste,

causing said liquid to be evaporated out of said paste, leaving a dry mixture, and

forming a pellet from said dry mixture.

4,892,735

PLATINUM CHEMOTHERAPEUTIC PRODUCT

Kenneth R. Harrap, Peaslake, Nr. Guildford, England, assignor to Johnson Matthey Public Limited Company, London, England

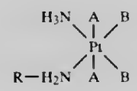
Filed Mar. 16, 1989, Ser. No. 324,054

Claims priority, application United Kingdom, Mar. 16, 1988, 8806224

Int. Cl.[4] A61E *9/02*

U.S. Cl. 424—435 **10 Claims**

1. A chemotherapeutic product comprising a platinum coordination compound of the general formula I,



(I)

wherein R is hydrogen, methyl, ethyl or a straight chain or branched chain or cyclic alkyl group having from 3 to 9 carbon atoms, A is a chlorine atom or hydroxyl group and is present when the platinum atom is in the Pt (IV) state, and each B is a chlorine atom or together form a malonate or substituted malonate, providing B is not chlorine when R is hydrogen, and loperamide, as a combined preparation for simultaneous, separate or sequential use in the treatment of cancer.

4,892,736

INTRA-POCKET DRUG DELIVERY DEVICES FOR TREATMENT OF PERIODONTAL DISEASES

J. Max Goodson, Cambridge, Mass., assignor to The Forsyth Dental Infirmary For Children d/b/a Forsyth Dental Center, Boston, Mass.

Continuation of Ser. No. 15,521, Feb. 13, 1987, Pat. No. 4,764,377, which is a continuation-in-part of Ser. No. 539,823, Oct. 7, 1983, abandoned. This application Jun. 3, 1988, Ser. No. 202,699

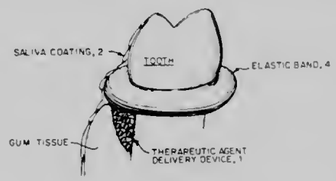
Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—435 **9 Claims**

1. A therapeutic agent delivery and maintenance system suitable for continuously delivering a pharmacologically-effective level of therapeutic agent to the site of a periodontal infection within a periodontal pocket and maintaining it there, comprising:

(a) therapeutic material selected from the group of therapeutic agents consisting of antibacterials, antibiotics, antiinflammatory agents, immune-suppressive agents, immune-stimulatory agents, dentinal desensitizers, odor masking agents, immune reagents, anesthetics, nutritional agents, antioxidants, lipopolysaccharide complexing agents, and peroxides;

(b) biocompatible polymeric material selected from the group of polymers consisting of collagen, cellulosic polymers, glycolic acid polymers, methacrylate polymers, ethylene vinyl acetate copolymers, ethylene vinyl alcohol copolymers, and polycaprolactone; said polymeric material containing said therapeutic material impregnated therein and being permeable to said therapeutic material; said polymeric material being in the form of a fiber having



a diameter of 0.1 to 1 mm and being sufficiently formable and flexible to conform to the site to be treated; and

(c) means, separate from the therapeutic agent-containing polymeric material, for maintaining said therapeutic agent-containing polymeric material within said periodontal pocket in contact with the site to be treated, said maintaining means also serving to limit diffusion of said therapeutic agent from said pocket.

4,892,737

COMPOSITION AND METHOD FOR ENHANCING PERMEABILITY OF TOPICAL DRUGS

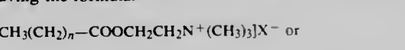
Nicholas S. Bodor, Gainesville, Fla., and Thorsteinn Loftsson, Reykjavik, Iceland, assignors to University of Florida, Gainesville, Fla.

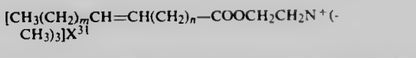
Filed Sep. 22, 1988, Ser. No. 247,532

Int. Cl.[4] A61K *9/06, 9/22*

U.S. Cl. 424—449 **24 Claims**

1. In a composition adapted for application to the skin of a human or non-human animal and containing a bio-active agent for permeation through said skin, the improvement wherein said composition contains an amount, sufficient to enhance the permeability of said bio-active agent through said skin, of a member selected from the group consisting of (1) a choline ester having the formula:





wherein m and n are integers in the range of from 0 to 30 and X− is a pharmaceutically acceptable anion and (2) a mixture of the choline ester and acid having the formula:



or a pharmaceutically acceptable salt thereof.

4,892,738

SUSTAINED-RELEASE GRANULAR PHARMACEUTICAL PREPARATIONS

Yasushi Takagishi, Hyogo; Toshihiro Ogura, Osaka; Kenji Sasaki, Nara, and Shunji Nagata, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation of Ser. No. 442,916, Nov. 19, 1982, abandoned, which is a continuation of Ser. No. 265,595, May 20, 1982, abandoned. This application Apr. 18, 1988, Ser. No. 185,354

Claims priority, application Japan, May 21, 1980, 55-68271

Int. Cl.[4] A61K *9/22, 9/26*

U.S. Cl. 424—468 **8 Claims**

1. A pindolol sustained-release granular preparation comprising an enteric coated sustained-release component prepared by an extrusion of a moistened mass of a mixture which comprises 1–10 wt. % of pindolol, 10–50 wt. % of at least one metal salt of a C_{16}–C_{18} saturated fatty acid selected from the group consisting of magnesium stearate, calckium stearate, magnesium palmitate, calcium palmitate, aluminum stearate and aluminum palmitate, 40–55 wt. % of microcrystalline cellulose and 2–20 wt. % of at least one water soluble cellulose derivative wherein said enteric coating material is a member selected from the group consisting of cellulose acetate phthalate, hydroxypropylmethyl cellulose phthalate, a copolymer of 2-methyl-5-vinylpyridine, methyl methacrylate and methacrylic acid, and a copolymer of methyl methacrylate and methacrylic acid.

4,892,739

OSMOTIC CONTINUOUS DISPENSING ORAL DELIVERY SYSTEM CONTAINING A PHARMACEUTICALLY ACCEPTABLE ACTIVE AGENT HAVING A IMPROVED CORE MEMBRANE ADHESION PROPERTIES

Shailesh B. Shah, Union, and Arun D. Koparkar, Westfield, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,564

Int. Cl.[4] A11L *9/24*

U.S. Cl. 424—473 **11 Claims**

1. An osmotic dispensing oral delivery system containing a moderately water-soluble pharmaceutically active agent a B -blocker wherein upon activation in the gastrointestinal tract of the host, from about 60 up to about 90 percent of said active agent is delivered at a substantially continuous rate of about 5 to about 12 percent by weight of the total weight of said active agent, per hour, comprising:

(a) a semipermeable shaped wall membrane substantially impermeable to said pharmaceutically active agent and permeable to gastrointestinal fluid;

(b) a discrete layer within said wall membrane of a water-soluble or water dispersible but water permeable substantially non-osmotically active solid polymeric binder in an amount of from 0.3 to 10% by weight based on a core;

(c) said core within and defined by said discrete binder layer, said core being in the form of a solid osmotically active composition comprising about 5 to about 20 percent by weight of a tableting binder; 0 up to about 10 percent by weight of a tableting lubricant; 0 up to 80% by weight of an osmotically active driving agent; and the remainder said pharmaceutically active agent all based upon the total core composition weight; and

(d) at least one passageway in said wall in communication with said core and the external environment for dispensing said active agent into said gastrointestinal tract.

4,892,740

ORALLY ADMINISTRABLE PHARMACEUTICAL PREPARATION OF IMPROVED FLAVORING CHARACTERISTICS

Yasuji Takasima, Ageo; Ikuo Koyama, Hasuda; Kimihide Shimano, Ageo, and Kaoru Maezuru, Hoya, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Jan. 25, 1988, Ser. No. 147,860

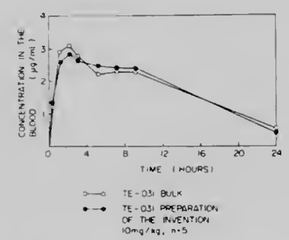
Claims priority, application Japan, Jan. 3, 1987, 62-19828

Int. Cl.[4] A61K *9/28*

U.S. Cl. 424—474 **8 Claims**

1. An orally administrable pharmaceutical preparation of improved flavoring characteristics composed of a core mate-

rial containing a drug and a coating layer applied to its surface, said coating layer being composed of a particulate polymeric



substance having an average particle diameter of not more than 60 microns and being soluble in gastric juice.

4,892,741

PRESS COATED DHP TABLETS

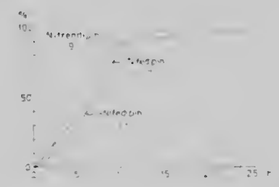
Andreas Ohm, Neuss; Helmut Luchtenberg, Niederkassel; Shinji Maegata, Oharanaka, and Wolfgang Opitz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1988, Ser. No. 204,056

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720751

Int. Cl.[4] A61K *9/36*

U.S. Cl. 424—479 **12 Claims**



1. A solid medicament preparation having a long-lasting action in the form of a press coated tablet which contains a sparingLy soluble dihydropyridine, the press coated tablet comprising

(a) a core which contains a dihydropyridine in rapid-release form, and

(b) a coat around the core, the coat containing a dihydropyridine in slow-release form.

4,892,742

CONTROLLED RELEASE COMPOSITIONS WITH ZERO ORDER RELEASE

Navnit H. Shah, Clifton, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 18, 1985, Ser. No. 799,229

Int. Cl.[4] A61K *9/36*

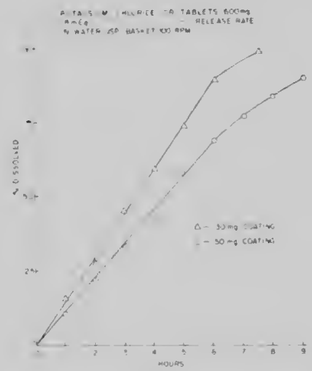
U.S. Cl. 424—480 **10 Claims**

1. A controlled release composition in table form comprising

(1) a core element comprising a 90–95% by weight of the tablet, said core comprising

(a) 65–95% by weight of a water soluble active ingredient

(b) 5–35% by weight of a water insoluble polymeric matrix; and



(2) a membrane coating comprising 5–10% by weight of the tablet said membrane comprising a rate controlling polymer.

4,892,743

NOVEL HYBRID INTERFERON SPECIES

Paul J. Leibowitz, Hackensack, and Michael J. Ryan, Milford, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 21, 1983, Ser. No. 564,066

Int. Cl.[4] A61K *45/02;* **C07K** *13/00, 15/26;* **C12P** *21/00*

U.S. Cl. 424—85.7 **9 Claims**

1. A protein having an amino acid sequence of 161 or 162 amino acids depending on the optional addition of methionine attached to a first amino acid in said sequence, said sequence including different portions of two different naturally occurring alpha interferons as joined discrete sub-sequences thereof defined as a delta-4 alpha-2 (Bgl II-1) sub-segment and an (Bgl II) alpha-1 segment, wherein said protein is a chain of amino acids that is not naturally occurring as an alpha interferon.

4,892,744

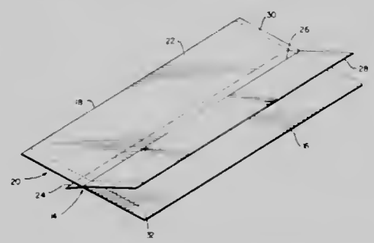
SINGLE-PLEATED MICROWAVE POPCORN PACKAGE

Jon A. Ylvisaker, Marietta, N.Y., assignor to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 13,354, Feb. 11, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,178

Int. Cl.[4] B65D *30/00, 75/12, 81/34*

U.S. Cl. 426—111 **8 Claims**



1. A backage formed from a length of microwave energy transparent sheet material, said sheet material forming said package having longitudinally extending opposed marginal edges, said package comprising two substantially planar opposed faces of said sheet material defining a product-containing chamber and a heat-expandable food product therein; two opposed longitudinally extending fold lines in said sheet material joining the longitudinal periphery of said opposed faces; a longitudinally-extending seam intermediate said fold lines, integral with and projecting away from said one of said face, outside the plans of said one face, said seam comprising a seal between said opposed marginal edges such that said edges are sealed to each other in face to face congruent fashion; and a longitudinally-extending pleat intermediate said fold lines, integral with and projecting away from said face opposite said one of said faces, outside the plane of said opposite face, said pleat comprising an additional fold line in said sheet material and additional opposed faces and foldable to lie against said opposite face,

said package further comprising two opposed transverse seals extending substantially along only the transverse edges of said package to seal the product contained therein, said transverse seals sealing said opposed faces to each other along said transverse edge and sealing said additional opposed faces to each other that constitute said pleat, said sheet material being otherwise unsealed between said opposed faces and said additional opposed faces and the orientation and configuration of said pleat and said transverse seals being such that when said package is placed in a microwave oven with said pleat folded against said opposite face adjacent the oven floor and microwave energy applied to the package, the expandable product will cause the expansion of said pleat creating a three-surface, generally tubular structure with sealed transverse edges each surface having one common edge with each of the other surfaces and each surface convexly curved around between the sealed transverse edges and between its common edges such that only one of said surfaces of the package contacts said oven floor and makes minimal contact between the package and the microwave oven floor thereby reducing heat transfer from said package to said floor,

at least one of said sealed transverse edges being peelable after microwave heating so that said package is openable by grasping said pleat and said seam and pulling in opposite directions so that the package opens along said peelable transverse seal.

4,892,745

TEXTURE EQUILIBRATION IN COOKIES

Dennis R. Gage, and Martin A. Mishkin, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed May 3, 1984, Ser. No. 606,727

Int. Cl.[4] A21D *13/00, 8/06*

U.S. Cl. 426—549 **3 Claims**

1. A process for accelerating texture equilibration in crumb-continuous cookies having distributed therein a discrete outer region of storage-stable crisp texture comprising sugar and starch and at least one discrete substantially enrobed inner region of storage-stable chewy texture comprising increasing the rate of sugar crystallization in the outer region of the cookie by exposing the baked cookie to an exogenous source of moisture to rehydrate the cookie surface, said sugar in said discrete outer region comprising at least about 85% sucrose by weight and said outer region having a sucrose to flour ratio of at least about 1.1:1.

4,892,746

POWDERED SOYBEAM EXTRACT

Carlos O. Donida, Rua Engenheiro Ildelfonso Simoes Lopes #40; Isolde H. Degrandi, Rua Panamericana; Raul De Moraes, Rua Joao Abbott #577/8; Nelson Magdalena, Rua Hilario Ribeiro #15/201, and Samuel Kreimer, Rua Bage #232/901, all of, Porto Alegre, Brazil

Continuation of Ser. No. 1,024, Jan. 7, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,080

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—598 **30 Claims**

10. A process for producing a solid water-soluble soybean extract, comprising:

hydrating soybeans in a first water bath to obtain hydrated soybeans;

replacing said first water bath with a second water bath;

crushing the hydrated soybeans in the presence of an additional third water bath at a temperature between about 80° C. to 90° C. to form a slurry;

thermally treating the slurry;

separating a liquid portion containing a soluble soybean extract and relatively insoluble solid portion from the slurry; and

removing the liquid from said separated liquid portion to form the solid water-soluble soybean extract.

4,892,747

LOW-CALORIE CEREAL AND PROCESS FOR PREPARING THE SAME

Atsutane Ohta, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Shibuya, Japan

Continuation-in-part of Ser. No. 65,378, Jun. 23, 1987, abandoned. This application Jul. 12, 1988, Ser. No. 219,055

Claims priority, application Japan, Jun. 30, 1986, 61-151609

Int. Cl.[4] A23L *1/10*

U.S. Cl. 426—618 **2 Claims**

1. A stabilized retort food obtained by sealing in a pack for retort a rice gruel containing granular rice with saccharide reduced more than 20% which is obtained by adding 2–10 parts by weight of water or a dilute aqueous acid heated at 60° C. or higher to 1 part by weight of boiled granular rice, warming the resulting mixture at 60° C. or higher for a period from 1 to 30 minutes while maintaining the viscosity of said water or dilute aqueous acid at 200 cP or below, removing the liquid part of the mixture from the granular rice and adding 0.5–5 parts by weight of water containing 0.1–10 parts by weight of water-soluble dietary fiber to the remaining granular rice, and sterilizing by retort.

4,892,748

LOW CALORIE PET TREAT

David A. Andersen, Long Beach, and Richard L. Harpe, Huntington Beach, both of Calif., assignors to David Piatt & Associates, Woodland Hills and Wescotek, Inc., Long Beach, both of Calif.

Filed Jun. 20, 1988, Ser. No. 208,653

Int. Cl.[4] A23K *1/00*

U.S. Cl. 426—635 **4 Claims**

1. A method of making a low-calorie treat for pets, including the steps of:

providing a base having the following ingredients in the following percentages by weight:

Ingredient	Percentage Range by Weight
Water	36.0–58.0
[Protein or Carbohydrate] By-product Selected from the Group Consisting of Proteins and Carbohydrates	4.9–40.0
Methylcellulose Gum	1.0–5.0
Color	0.6–3.0
Salt	0.2–0.6

-continued

Ingredient	Percentage Range by Weight
Food grade Cellulose	20.0–32.0
Vitamins-mineral Supplement	0–0.3
Grits	0–5

heating approximately one third (⅓) of the water to about 200° F. and distributing the methylcellulose gum in the hot water;
agitating the remaining two thirds (⅔) of the water and adding this water to the distributed methylcellulose gum during such agitation at a temperature of about 70° F.;
dry blending the other ingredients; and
adding the water solution of the methylcellulose gum slowly to the dry blend under constant mixing at a temperature of about 70° F.

4,892,749

METHOD OF MANUFACTURING A REDUCED CALORIE SAUSAGE CONTAINING COOKED RICE

Gerald R. Johnson; Edward C. Jones, Jr., and Milo C. Jones, all of Fort Atkinson, Wis., assignors to Jones Dairy Farm, Fort Atkinson, Wis.

Division of Ser. No. 755,865, Jul. 17, 1985, Pat. No. 4,735,819. This application Aug. 10, 1987, Ser. No. 87,943
Int. Cl.⁴ A23L *1/317*
U.S. Cl. 426—646 **4 Claims**

1. A method of forming a food product said method including the steps of
forming a particulate mixture of lean meat, fat and rice by mixing said components to form a base mixture,
grinding said meat, fat, and said rice together to form a mixture,
maintaining meat particles and rice particles of said mixture at a size generally similar to one another,
making sure said rice particles maintain their structural integrity,
blending said mixture with spices, and without adding additional fat to said mixture,
forming said mixture into a final product selected from the group including tub®s, links, both caseless and cased, patties and bulk sausage,
the particles size of the components being sufficiently small to enable the available supply of myosin to tend to form a matrix,
the fat content being no more than about 35% nor less than 4%,
the rice content being no more than about 35% nor less than 2%,
balance lean meat in an amount no more than about 90% nor less than 40%,
all in weight percent of the base mixture,
whereby a generally coarse mixture of breakfast sausage is formed in which said rice particles are generally indistinguishable from fat globules, which is suitable for forming into patties and links, and which has the texture, consistency, appearance, and taste of a high-fat breakfast sausage.

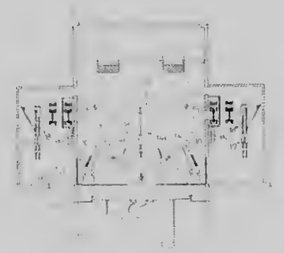
4,892,750

ELECTROSTATIC SPRAY COATING METHOD

Fujio Soshi, and Tatsuro Hamu, both of Tokyo, Japan, assignors to Taikisha Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,355
Claims priority, application Japan, Sep. 12, 1987, 62-229361
Int. Cl.⁴ B05D *1/04*
U.S. Cl. 427—27 **3 Claims**

1. An electrostatic spray coating method where an electrical field is generated in a spraying system between a spray gun and an object to be sprayed, said method comprising the steps of:
(a) grounding said spraying system;
(b) electrically insulating said object by suspending said object from a hanger rod with an insulator of a hanger conveyor type installed in a spray booth;
(c) connecting a clamping device disposed on a floor face of the spray booth to said object; and



(d) impressing a high voltage on said object by a high-voltage generator via said clamping device which transmits the voltage while clamping said object for electrostatically attracting the paint to the object for coating said object.

4,892,751

METHOD OF AND APPARATUS FOR FORMING A THIN FILM

Kiyoshi Miyake, Tsukui; Akira Shintani, Koube; Keizo Suzuki, Kodaira, and Takao Miyazaki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,358
Claims priority, application Japan, Jan. 19, 1987, 62-8027
Int. Cl.⁴ B05D *1/08*
U.S. Cl. 427—34 **22 Claims**

1. A method of forming a thin film comprising the steps of:
introducing a gas near a substrate, the gas containing an element used to constitute a predetermined thin film as part of its constituent elements;
irradiating said gas with a high output power laser beam to locally produce a plasma by dissociating said gas; and
forming a thin film on said substrate by the action of reactive particles produced in said plasma.

4,892,752

METHOD OF ION IMPLANTATION

Hisashi Fukuda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,255
Claims priority, application Japan, Aug. 12, 1987, 62-200001; Aug. 12, 1987, 62-200002; Aug. 19, 1987, 62-204254; Aug. 31, 1987, 62-215453
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **4 Claims**



1. A method of ion implantation for implanting at least one of boron ions and arsenic ions in a substrate surface, said method comprising:

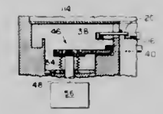
providing a four-element alloy of platinum, silicon, arsenic, and boron, a reservoir, and an emitter having a tip;
holding said four-element alloy in said reservoir in a molten state;
supplying said four-element alloy from said reservoir to said emitter;
applying a strong electric field to said tip of said emitter to extract ions from said tip of said emitter; and
implanting the extracted ions in the substrate surface.

4,892,753

PROCESS FOR PECVD OF SILICON OXIDE USING TEOS DECOMPOSITION

David N. Wang, Cupertino; John M. White, Hayward; Kam S. Law; Cissy Leung, both of Union City; Salvador P. Umotoy, Pittsburgh; Kenneth S. Collins, San Jose; John A. Adamik, San Ramon; Ilya Perlov, Mountain View, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 944,492, Dec. 19, 1986. This application Oct. 26, 1988, Ser. No. 262,993
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **12 Claims**



1. In a process for depositing silicon dioxide onto a substrate by exposing the substrate to plasma formed from a gas mixture which includes tetraethylorthosilicate, the steps of: positioning the substrate on a support within a vacuum chamber and adjacent a gas manifold which is an RF electrode and includes a multiplicity of closely-spaced gas outlet holes closely adjacent the substrate; and communicating the gas mixture into the manifold while applying RF energy between the manifold and the substrate support and maintaining the total pressure in the chamber within the range of about 1 to 50 torr and the temperature of the substrate in the range of about 200° C. to 500° C.

4,892,754

PROCESS FOR PREPARATION OF WATER ABSORPTIVE COMPOSITE MATERIAL

Kiichi Itoh, and Takeshi Shibano, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and Uni-Charm Corporation, Kawanoe, both of, Japan

Filed Apr. 15, 1988, Ser. No. 182,194
Claims priority, application Japan, Apr. 17, 1987, 62-94465
Int. Cl.⁴ B05D *3/06, 3/02;* B32B *27/00*
U.S. Cl. 427—54.1 **12 Claims**

1. A process for preparing a water absorptive composite material, which comprises the combination of the following steps of:
(A) applying an aqueous solution of polymerizable monomers comprising as a main component acrylic acid, of which 20% or more of the carboxyl groups have been neutralized to its alkali metal salt or ammonium salt, to a prefabricated fibrous substrate;
(B) polymerizing the polymerizable monomers applied to said fibrous substrate to form a composite of a polymer derived from said polymerizable monomer and said fibrous substrate; and
(C) irradiating ultraviolet rays onto said composite with its water content being 0.01 to 40 parts by weight per 1 part by weight of said polymer to obtain a water absorptive composite having a lower content of unpolymerized monomers than said composite.

4,892,755

REFRACTORY COMPOSITE ARTICLES AND METHOD OF MAKING SUCH ARTICLES

David A. Eitman, Huntington Beach, Calif., assignor to Science Applications International Corporation, San Diego, Calif.

Division of Ser. No. 793,706, Oct. 31, 1985, Pat. No. 4,735,850. This application Dec. 7, 1987, Ser. No. 129,224
Int. Cl.⁴ B05D *1/36*
U.S. Cl. 427—203 **21 Claims**



1. A method of forming a refractory composite material, including the steps of:
providing a plurality of fibers in a porous relationship to form a substrate, the fibers having a particular thickness,
disposing particles of a pyrolyzed material on the substrate, and
mechanically locking in the pores of the fibers particles of a mixture formed from a first material having properties of oxidizing and having a low oxide melting temperature, a second material having properties of oxidizing and having a higher oxide melting temperature than the oxide of the first material and a refractory material having properties of oxidizing and having considerably higher oxide melting temperature than the oxides of the first and second materials, the particles of the mixture having a size in the same order of magnitude as the particular thickness, the oxide of the first material being non-viscous, the oxide of the second material being more viscous than the first material and the oxide of the third material being considerably more viscous than the first and second materials.

4,892,756

FLOCK ADHESIVE COMPOSITION

Patrick A. Warren, Erie; Robert A. Auerbach, Williamsport, and Eugene L. Polaski, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Division of Ser. No. 203,795, Jun. 6, 1988, Pat. No. 4,835,226. This application Mar. 20, 1989, Ser. No. 326,215
Int. Cl.⁴ C08G *18/58*
U.S. Cl. 427—206 **5 Claims**

1. In the preparation of flocked rubber articles wherein flocks of staple fibers are fixed to the surface of a rubber substrate through an adhesive layer, the improvement comprising employing as the adhesive layer the adhesive composition comprising:
A. about 1 to 20% by weight of an aromatic nitroso compound;
B. about 1 to 20% by weight of an epoxy resin having an epoxy equivalent of at least one; and
C. about 60 to 98% by weight of a blocked isocyanate-functional urethane prepolymer, the isocyanate group or

groups of said prepolymer being blocked with a blocking agent comprising a substituted or unsubstituted phenol.

4,892,757

METHOD FOR A PRODUCING MANGANESE ACTIVATED ZINC SILICATE PHOSPHOR

Anthony F. Kasenga, Towanda, Pa.; Leslie F. Gray, Waverly, N.Y.; Thomas L. Henson, and MacInnis, Martin B., both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,659
Int. Cl.⁴ C09K *11/59*
U.S. Cl. 427—215 **8 Claims**

1. A method for reproducibly producing manganese activated zinc silicate phosphor particles, said method comprising:
(a) dry blending a mixture of components consisting essentially of zinc oxide, silicic acid, a source of manganese, ammonium chloride, ammonium fluoride, and silica, and having a Zn+Mn /Si mole ratio of from about 1.95 to about 2.02 wherein said silica is colloidal and has a surface area of from about 50 to about 410 m^2 per gram and wherein said colloidal silica makes up from about 0.01% to about 1.0% by weight of said mixture; and
(b) firing the resultig dry blend of components in a nitrogen atmosphere at a temperature of from about 1200° C. to about 1300° C. for a sufficient time to produce said phosphor particles wherein said phosphor particles exhibit reproducible brightness.

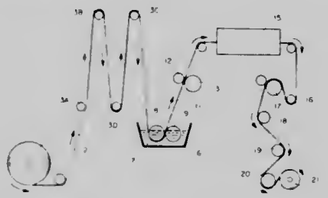
6. A method according to claim 1 comprising the additional step of coating said phosphor particles with a continuous coating of aluminum oxide to form manganese activated zinc silicate phosphor particles having a continuous coating of aluminum oxide thereon said coated phosphor particles having improved maintenance over said phosphor particles produced absent said coating.

4,892,758

CLEANING PRODUCT

Paul J. Serbiak, Green Bay, Wis.; Edwin G. Greenman, Woodstock, Ga., and Gary L. Shanklin, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 236,952, Aug. 26, 1988, abandoned, which is a division of Ser. No. 920,494, Oct. 17, 1980, Pat. No. 4,793,941. This application Apr. 7, 1989, Ser. No. 334,826
Int. Cl.⁴ B05D *1/16, 3/12*
U.S. Cl. 427—242 **3 Claims**



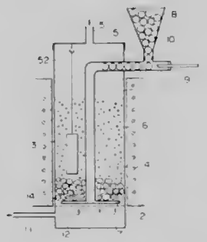
1. A method for making a cleaning product comprising:
(a) continuously passing a meltblown web through a container containing liquid detergent, wherein the web is submersed in the liquid detergent and saturated therewith;
(b) passing the saturated web through a nip to squeeze out excess liquid detergent;
(c) drying the web to remove substantially all of the available moisture; and
(d) converting the web into individual sheets.

4,892,759

METHOD FOR SURFACE TREATMENT

Tohru Arai, 9-3, Yashiro, Misaki-cho, Toyoake-shi, Aichi-ken; Hiromasa Takeda, Narumi-Shataku 422, 84-1, Aza Otokoyama, Narumi-cho, Midori-ku, Nagoya-shi, Aichi-ken, and Hiroyuki Kawaura, Nagakute-ryo 314, 41-3, Aza Yokomichi, Oaza Nagakute, Nagakute-cho, Aichi-gun, Aichi-ken, all of Japan

Filed Aug. 5, 1988, Ser. No. 228,423
Claims priority, application Japan, Aug. 12, 1987, 62-201330
Int. Cl.⁴ C23C *16/44;* **B05D** *1/22*
U.S. Cl. 427—249 **18 Claims**



1. A method for forming, on a material to be treated, a surface layer of a carbide, nitride or carbonitride, or a mixture thereof, or a solid solution thereof, which method comprises:
disposing in a fluidized bed furnace a mass of particles of a layer-forming agent, containing at least one element for forming the surface layer, below and/or at the side of the material to be treated in a manner not to contact said material to be treated;
disposing in said fluidized bed furnace a powder of alumina or other refractory material as a fluidizing agent for forming a fluidized bed;
introducing a fluidizing gas into the fluidized bed furnace to fluidize said powder of alumina or other refractory material and to form a fluidized bed;
disposing said material to be treated in said fluidized bed; and
introducing from outside the fluidized bed furnace a halide as an activator for said layer-forming agent into said furnace below said layer-forming agent,
thereby forming under heating a layer of a carbide, nitride or carbonitride, or a mixture thereof, or a solid solution thereof on the surface of the material to be treated.

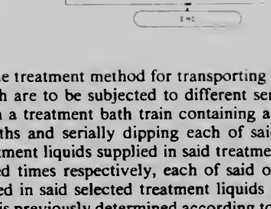
4,892,760

APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF SURFACE TYPE FASTENER TAPES OR LIKE STRIPS

Hissai Nishiyama, Toyama, Japan, assignor to Yoshida Koqyo K. K., Tokyo, Japan

Continuation of Ser. No. 195,025, May 17, 1988, abandoned, which is a division of Ser. No. 928,480, Nov. 10, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,109
Claims priority, application Japan, Nov. 11, 1985, 60-172334
Int. Cl.⁴ B05D *1/28;* **B05C** *1/08*
U.S. Cl. 427—428 **7 Claims**

1. A method for simultaneously applying a coating substance to a plurality of elongated tapes each of a known width which comprises:
moving said tapes in uniformly spaced relation along a predetermined path in parallel spaced relation;
applying a layer of coating subatance uniformly across the surface of a coating roller,
contacting said layer while on said roller with a doctor blade having scraping edges registering with the spacings between said tapes and recesses between said scraping edges equal to the widths of said tapes, and



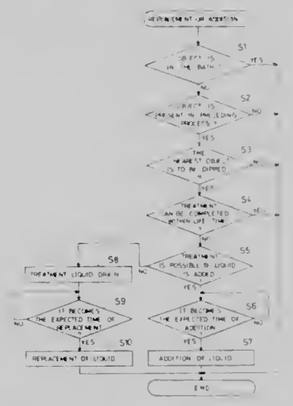
removing coating substance from said roller with said scraping edges while depositing coating substances on said moving tapes limited to the widths of said tapes.

4,892,761

SURFACE TREATMENT METHOD AND APPARATUS THEREFOR

Takuma Yamada, Moriyama, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 906,401, Sep. 9, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,863
Claims priority, application Japan, Oct. 1, 1985, 60-219868
Int. Cl.⁴ B05D *1/18*
U.S. Cl. 427—430.1 **4 Claims**



1. A surface treatment method for transporting a number of objects which are to be subjected to different series of treatment steps in a treatment bath train containing a plurality of treatment baths and serially dipping each of said objects in selected treatment liquids supplied in said treatment baths, for predetermined times respectively, each of said objects being serially dipped in said selected treatment liquids in a dipping order which is previously determined according to a treatment program for each of said objects individually, said surface treatment method comprising the steps of:
determining a reference clock time at which a particular one of said objects is actually brought into said treatment bath train;
calculating for a particular one of said treatment baths an expected clock time at which said particular object is expected to arrive at said particular treatment bath on the basis of said reference clock time and a predetermined length of time that elapses for said particular object to be treated in at least one preceding treatment bath in said dipping order before said particular object arrives at said particular treatment bath, said expected clock time being calculated before said particular object arrives at said one treatment bath; and
transporting said particular object along said treatment bath train and serially dipping said particular object in said treatment liquids in said treatment baths while controlling a characteristic of each of said treatment liquids on the basis of said expected clock time through the steps of
(a) calculating a lifetime terminating clock time after which a known lifetime of said treatment liquid currently available in said particular treatment bath is expected to be over,
(b) comparing said lifetime terminating clock time with said expected clock time,
(c) counting a number of dippings indicating how many of said objects have been dipped in said treatment liquid currently available in said particular treatment bath,
(d) comparing said number of dippings with a known allowed dipping number indicating how many more of said objects can be effectively treated by said treatment liquid currently available in said particular treatment bath without replacement of at least a portion thereof,
(e) determining on the basis of said steps (b) and (d) whether said lifetime terminating clock time will be over, and whether said number of dippings will exceed said allowed dipping number, if said particular object is dipped in said treatment liquid currently available in said particular treatment bath, and
(f) replacing at least a portion of said treatment liquid in said treatment bath in accordance with the determination made in said step (e).

4,892,762

REDUCED CALORIE HIGH FIBER BREAD CONTAINING A TREATED SOY POLYSACCHARIDE MATERIAL

Abdelrahman A. Abdelrahman, St. Louis, Mo., assignor to Continental Baking Company, Del.

Filed May 12, 1988, Ser. No. 192,971
Int. Cl.⁴ A21D *8/02, 13/04*
U.S. Cl. 426—549 **17 Claims**

1. A process for the treatment of a soy polysaccharide material to provide improved functionality as an ingredient for a baked product comprising:
(a) hydrating a soy polysaccharide material at a weight ratio of soy polysaccharide material to water of about 1:0.5 to 1:4;
(b) heating said hydrated material for a temperature and time sufficient to improve the specific volume (cc/gm) of the baked product in which the material is used as an ingredient and as compared to the use of an untreated soy polysaccharide material.

4,892,763

BOTTLE GRADE POLYESTER RESINS REINFORCED WITH GLASS FIBERS AND CONTAINERS MADE OF SUCH RESINS

Diego Duse, Via Osmano, n. 1, 24100 Bergamo, B.G., Italy

Filed Jan. 16, 1985, Ser. No. 692,355
Claims priority, application United Kingdom, May 1, 1984, 8411095
Int. Cl.⁴ B27N *5/02*
U.S. Cl. 428—34.1 **17 Claims**

9. A container as set forth in claim 1 or 2, wherein said container is molded by injection stretch-blow molding.

4,892,764

FIBER/RESIN COMPOSITES, AND METHOD OF MAKING THE SAME

Kieran F. Drain, Rochester Hills, Mich.; Larry A. Nativi, Rocky Hill, and Richard T. Thompson, Haddam, both of Conn., assignors to Loctite Corporation, Conn.

Continuation-in-part of Ser. No. 104,885, Aug. 19, 1987, which is a continuation-in-part of Ser. No. 882,670, Jul. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 801,984, Nov. 26, 1985. This application Oct. 16, 1987, Ser. No. 109,675

Int. Cl.[4] B29C *35/10, 71/04;* **B32B** *1/08, 1/10, 31/28;* **B65H** *81/00*

U.S. Cl. 428—34.5 **16 Claims**



1. A fiber/resin composite comprising a resin having fiber(s) associated therewith, said resin comprising a first resin component cured by actinic radiation and a second, ambient temperature curable resin component which is non-curable under actinic radiation conditions curingly effective for the first resin component, wherein the actinic radiation cured component is present in an immobilizingly effective amount for the composition prior to curing of the second resin component.

4,892,765

HEAT-SHRINKABLE LAMINATE FILM AND PROCESS TO PRODUCE THE SAME

Nobuyuki Hisazumi, Tsuchiura; Keisuke Kahara, and Yoshihiro Matsukura, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1987, Ser. No. 53,404

Claims priority, application Japan, May 23, 1986, 61-118724

Int. Cl.[4] A22C *13/00*

U.S. Cl. 428—34.8 **8 Claims**



1. A heat-shrinkable laminate film consisting of a core layer of a copolymer of vinylidene chloride, two surface layers of a polyamide and a modified copolymer obtained by grafting a copolymer of ethylene and a vinyl carboxylate or an acrylic ester with an ethylenically unsaturated carboxylic acid or an acid anhydride thereof, a polymeric material obtained by neutralizing said modified copolymer with a metallic compound and a thermoplastic polyurethane as an adhesive layer between each one of said two surface layers and said core layer, and showing the rate of shrinkage of not less than 10% both lengthwise and breadthwise after keeping said film 3 seconds in an atmosphere of 90° C, the rate of delayed recovery of not more than 2% in room temperature and the rate of creep of not more than 20% after immersing said film 10 seconds into a warm water of 80° C with a load of 1 kg/mm^2, produced by coextruding the copolymer of vinylidene chloride, the polyamide and the adhesive to form a coextruded laminate film and rapidly cooling the thus coextruded laminate film to a temperature of lower than the second order transition point of one of the polyamides, which is lower, but not lower than 30° C below the lower transition point, thereby making said copolymer of vinylidene chloride into an amorphous state and making said polyamide of said two surface layers absorb water so that the rate of absorption of water is from 1 to 5% by weight, biaxially stretching the thus rapidly cooled film at a temperature of from 60 to 100° C, and thereafter, subjecting the thus biaxially stretched film to heat-treatment for not shorter than 2 seconds at a temperature of from 70 to 100° C while making said polymide of the outer surface layer absorb water from 2 to 7% by weight, thereby making said biaxially stretched film shrink from 1 to 15% both lengthwise and breadthwise.

4,892,766

CAPSULES

Brian E. Jones, Basingstoke, England, assignor to Lilly Industries Limited, Basingstoke, England

Filed Sep. 8, 1988, Ser. No. 241,647

Claims priority, application United Kingdom, Sep. 11, 1987, 8721455

Int. Cl.[4] A61K *9/48*

U.S. Cl. 428—36.4 **12 Claims**

1. A two-piece hard capsule shell having improved embrittlement properties comprising an admixture of gelatin and a pharmaceutically or veterinary acceptable hydrophilic fibrous material, wherein the fibres in the fibrous material have lengths of up to about 1000 microns.

4,892,767

SCREENING ARRANGEMENT

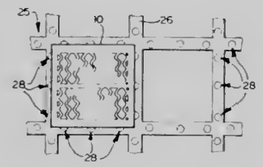
Manfred F. A. Freissle, Birkenweg, Fed. Rep. of Germany, assignor to Screenex Wire Weaving Manufacturers (Proprietary) Limited, Alberton, South Africa

Filed Dec. 15, 1988, Ser. No. 284,934

Claims priority, application South Africa, Sep. 29, 1988, 88/7318

Int. Cl.[4] B32B *3/12*

U.S. Cl. 428—52 **10 Claims**



1. A screening element for screening a load of material and which is predominately of a synthetic plastics material and which has a screening surface formed by a plurality of ribs extending across the element, the ribs each being of a zig-zag configuration and the ribs being spaced from each other to define between them screening apertures, portions of adjacent ribs being closely spaced from and opposed to each other but not abutting against each other and other portions of adjacent ribs being further spaced from and opposed to each other so that the screening apertures defined between the ribs have alternate wide and narrow regions, the ribs being resiliently deformable independently of each other under the load of material to be screened and the ribs tending to straighten during deformation under the load.

4,892,768

THERMOPLASTIC STRAP WITH MULTIPLE MATERIAL STRUCTURE AND WELD PRODUCED THEREWITH

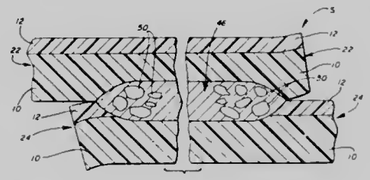
Nelson Cheung, Hoffman Estates; Russell J. Gould, Mt. Prospect, and Manuel C. Enriquez, Morton Grove, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 871,693, Jun. 6, 1986, Pat. No. 4,776,905. This application Apr. 19, 1988, Ser. No. 183,072

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] B32B *5/18*

U.S. Cl. 428—57 **8 Claims**



1. A welded joint between two overlapping portions of thermoplastic strap arranged in a face-to-face relationship at said welded joint wherein said strap includes a first material defining a layer and a second material carried by said first material with said second material including a non-atmospheric, non-aqueous, particulate foaming agent which foams as a result of application of heat, said welded joint comprising:

at least part of the thickness of each said strap portion forming a resolidified region from a fused state after application of heat to said strap portions in an initial solid state, said resolidified region containing a plurality of cavities at least adjacent each end of said resolidified region, said cavities being defined by the encapsulation of the foam resulting from said foaming agent during application of the heat of welding.

4,892,769

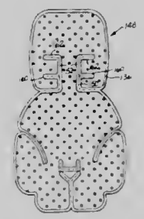
FIRE RESISTANT THERMOPLASTIC MATERIAL CONTAINING ABSORBENT ARTICLE

Lee E. Perdelwitz, Jr., Tacoma; Paul G. Gaddis, Renton; Ron H. Iff, Puyallup; Michael E. Cotie, Tacoma, and Amar N. Neogi, Seattle, all of, assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 29, 1988, Ser. No. 188,309

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—68 **32 Claims**



1. A fire resistant infant seat liner having a lower leg supporting section, a central seat supporting section and an upper body supporting section, the infant seat liner comprising a thermobonded mixture of thermoplastic and natural fibers, the thermobonded mixture including a fire resistant material in the amount sufficient to increase the fire resistance of the thermobonded mixture above the fire resistance of the thermobonded mixture without the fire resistant material, the infant seat liner having a flame propagation rate of no greater than 4.5 lineal inches per minute.

4,892,770

INTERIOR TRIM FOAM PRODUCT AND METHOD OF FABRICATION THEREOF

Craig B. Labrie, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 230,572, Aug. 10, 1988, Pat. No. 4,839,118. This application Mar. 20, 1989, Ser. No. 325,446

Int. Cl.[4] B32B *3/06, 5/28*

U.S. Cl. 428—71 **2 Claims**



1. A vehicle interior trim component comprising an outer shell of flexible material having a raw edge formed continuously around the periphery thereof; a mold insert located in spaced relationship to said flexible shell including an inboard located peripheral edge thereon located in spaced relationship to the continuously formed peripheral raw edge of said shell; said insert being located in spaced relationship to said shell to form a cavity therebetween; foam material filling said cavity and the space between said raw edge and inboard periphery of said insert; and a heat post formed outer flange on said insert located in overlying relationship to the outer surface of the shell to form a finished surface around the full periphery of both the shell and the insert whereby the insert is connected to the shell to form an exposed back on the shell for supporting both it and the foam material.

4,892,771

THERMAL INSULATION BLANKET FOR A HOT WATER HEATER

David F. Rowland, 1148 Meadowcroft La., Mt. Pleasant, S.C. 29464

Filed Apr. 1, 1988, Ser. No. 176,465

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—74 **3 Claims**



1. A thermal insulation blanket for a hot water heater, comprising a fiberglass insulative material sandwiched between a first and a second layer of woven polyethylene, with said first layer of woven polyethylene attached to said second layer of woven polyethylene along all edges thereof, by sewing said edges together so as to eliminate air pockets or other gaps between said first layer and said second layer and within said insulative material, and so as to prevent said insulative material from being compressed by said first and said second layer, wherein the height of the blanket is slightly higher than the height of a hot water heater to be covered and the length of

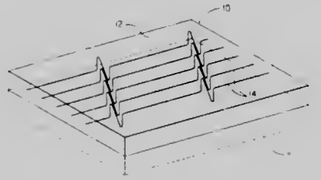
said blanket is approximately equal to the circumference of said water heater to be covered, wherein a means is provided for joining an edge of said blanket which meets an opposite edge of said blanket when the blanket is wrapped around said hot water heater along the length of said edge and said opposite edge, and wherein a line is provided through a top edge of said blanket to allow said edge to be pulled tightly against said water heater.

4,892,772

FIBER REINFORCED RESIN SHEETS

Kwai-Yung B. Su, Hockessin, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1988, Ser. No. 271,152
Int. Cl.[4] B51B *5/12*
U.S. Cl. 428—113 **12 Claims**



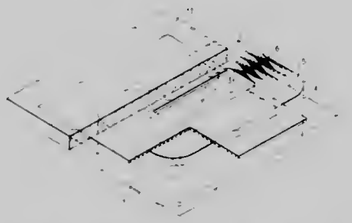
1. A composite structure for forming into a shaped article comprising a sheet of matrix resin reinforced with a unidirectional array of fiber lengths, each of said fiber lengths having alternating straight length and excess length sections.

4,892,773

PREPARATION OF AMORPHOUS METAL CORE FOR USE IN TRANSFORMER

Terrence E. Chenoweth, Watkinsville; Eugenius S. Hammack, Athens, both of Ga., and Wallace L. McDonald, Sandy Springs, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1987, Ser. No. 79,854
Int. Cl.[4] B32B *3/04*
U.S. Cl. 428—121 **14 Claims**



1. An amorphous metal core having an adhesive impregnated substrate of woven cloth or matted material selected from the group consisting of glass, polyesters, polyimides, polyamides and mixture thereof that is impregnated with a curable adhesive comprising a thixotrope bonded to at least a portion of each edge, where said substrate extends beyond said edge, is bent over said edge, and is bonded to said core.

4,892,774

INTERLEAFED FIBER-REINFORCED THERMOPLASTIC COMPOSITE

Michael A. Vallance, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 7, 1988, Ser. No. 141,708
Int. Cl.[4] B32B *27/08, 27/12, 31/12*
U.S. Cl. 428—174 **38 Claims**

1. An interleafed fiber-reinforced thermoplastic composite comprising:
(1) at least one fiber-reinforced layer comprising reinforcing filaments coated with at least one thermoplastic binder resin, and on at least one surface of said fiber-reinforced layer,
(2) at least one interleaf layer comprising a block copolymer resin comprising polymer segments of
(a) at least one thermoplastic resin co-crystallizable or co-vitrifiable with said binder resin, and
(b) at least one co-resin having a glass transition temperature substantially lower than said segment (a).

4,892,775

JET INK FOR VINYL SUBSTRATE MARKING

Il H. Song, Glen Ellyn, Ill., assignor to Videojet Systems International, Inc., Elk Grove Village, Ill.

Division of Ser. No. 113,792, Oct. 27, 1987, Pat. No. 4,834,797. This application Jan. 4, 1989, Ser. No. 293,369
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—195 **2 Claims**

1. A plasticized vinyl article comprising
(a) a vinyl layer which contains a vinyl polymer and at least one plasticizer for said polymer; and
(b) images printed on said layer by non-contact, ink jet application of an ink having a composition comprising an acrylic resin binder component having pendant amino groups, said binder being soluble in, and dissolved by, a mixture of a lower alkanol and a lower ketone; a carrier comprising a lower alkanol and a lower ketone in which the acrylic resin binder is soluble; and a dye which is soluble or dispersible in said carrier; the images being stable against degradation by the plasticizer contained in said vinyl coating.

4,892,776

CIRCUIT BOARD MATERIAL AND ELECTROPLATING BATH FOR THE PRODUCTION THEREOF

James H. Rice, Sylmar, Calif., assignor to Ohmega Electronics, Inc., Culver City, Calif.

Filed Sep. 2, 1987, Ser. No. 91,990
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—209 **19 Claims**

1. A circuit board material comprising:
a support layer;
at least one electrical resistance layer adhered to the support layer, the resistance layer having a nickel phosphorous composition; and
a conductive layer adhered to the resistance material layer, the conductive layer having an activating agent applied thereto before the resistance layer is eeposited onto the conductive layer, wherein the resistance layer of the circuit board material has an electrical resistance of at least 500 ohms per square.

4,892,777

FINE-GRAINED COATED LAMINATE IN CONTINUOUS WEB FORM

Hanns J. Wald, Waldmichelbach; Wilfried Getrost, Mölenbach, and Sigrid Lang, Birkenau, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 334,602
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3812948
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—212 **8 Claims**

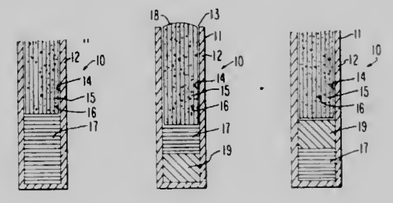
1. A coated laminate material in web form, with leather-like appearance and fine-grained surface and a thickness of 0.7 to 5.0 mm, consisting of an 0.03 to 0.4 mm thick, soft PVC, polyurethane, NBR, SBR or acrylate coating, an adhesive coating, and an 0.2 to 3.5 mm thick supporting layer having a specific weight of 30 to 500 g/m^2 of nonwoven fabric, or of a woven fabric impregnated with acrylate dispersion, wherein, between the supporting layer and the coating, a smooth-textured knitted fabric having a specific weight of 30 to 200 gm/m^2 or a smooth-textured woven fabric having a specific weight of 100 to 500 gm/m^2 is placed, consisting of polyester, polyamide, or cotton fibers or mixtures thereof, this intermediate layer being surrounded on both sides by a soft polymer layer joining the supporting layer to this intermediate layer, and the laminate material in the embedded state having an elongation at rupture of at least 8%.

4,892,778

JUXTAPOSED LAMINATED ARRANGEMENT

Felix Theeuwes, Los Altos; Patrick S. L. Wong, Hayward; Richard Cortese, and James B. Eckenhoff, both of Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 27, 1987, Ser. No. 54,714
Int. Cl.[4] A61K *9/22;* **B32B** *7/02*
U.S. Cl. 428—218 **6 Claims**



1. A juxtaposed laminated arrangement useful for manufacturing a dispenser, which laminate when disposed in the dispenser and the dispenser is in operation administers a beneficial agent to a biological fluid environment of use, wherein the laminated arrangement comprises: a first lamina means for changing from an initial physical state when inside the dispenser to a different physical state when outside the dispenser, which first lamina comprises the beneficial agent and transports the beneficial agent from the dispenser to the biological environment; and, a second lamina means for consuming space inside the dispenser, which second lamina comprises a hydrophilic composition that on contact with fluid from the environment that enters the dispenser absorbs the fluid and thereby exhibits a 2 to 50 fold volume increase for consuming space.

4,892,779

MULTILAYER ARTICLE OF MICROPOROUS AND SUBSTANTIALLY NONPOROUS MATERIALS

Dennis D. Leatherman, Pittsburgh, Pa., and Richard A. Schwarz, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 169,654, Mar. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 138,980, Dec. 29, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,584
Int. Cl.[4] B32B *3/26, 5/22*
U.S. Cl. 428—220 **31 Claims**

1. A multilayer article comprising material which is impervious to the passage of gas and bacteria fusion bonded in the absence of extrinsic intervening adhesive to microporous material comprising:
(a) a matrix consisting essentially of essentially linear ultrahigh molecular weight polyolefin which is essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least about 18 deciliters/gram, essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least about 6 deciliters/gram, or a mixture thereof.
(b) finely divided particulate substantially water-insoluble siliceous filler distributed throughout said matrix, said filler constituting from about 50 percent to about 90 percent by weight of said microporous material, and
(c) a network of interconnecting pores communicating throughout said microporous material, said pores before fusion bonding constituting at least about 35 percent by volume of said microporous material.

4,892,780

FIBER REINFORCEMENT FOR RESIN COMPOSITES

William H. Cochran, 1 Williams St., P.O. Box 32, Stonington, Conn. 06378, and Brian P. Doyle, 3 Clifton Rd., Natick, Mass. 01760

Filed Jul. 16, 1987, Ser. No. 74,170
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—234 **9 Claims**

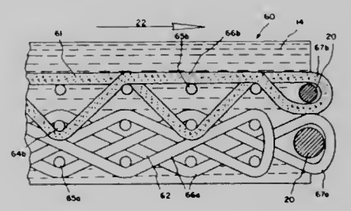
1. A resin-impregnated fiber composite comprising a laminate of fibrous substrates each having staple fiber applied to one or both sides by mechanical entanglement, the substrates being impregnated with resin and the laminate being cured whereby the composite is characterized by improved interlaminar shear strength through the interlocking effect of the staple fibers applied by mechanical entanglement.

4,892,781

BASE FABRIC STRUCTURES FOR SEAMED WET PRESS FELTS

Patrick H. Penven, Clinton, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Division of Ser. No. 108,491, Oct. 14, 1987, Pat. No. 4,824,525. This application Mar. 3, 1989, Ser. No. 318,727
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—234 **4 Claims**



1. A papermaker's wet press felt which is rendered endless

by intermeshing seaming loops, extending from respective ends of a base fabric of said felt, and inserting a pintle in the resulting channel formed by the loops, said felt comprising:

(a) the base fabric being a multi-ply fabric which was flat woven in a selected repeat pattern with crimped warp yarns oriented lengthwise in the loom and further oriented in the felt running direction during use on the papermaking machine;

(b) said crimped warp yarns being woven at least 60 to 100 yarns per inch;

(c) each of said seaming loops, at the respective ends of said felt, being a portion of a selected one of said crimped warp yarns of said base fabric which extends beyond the respective end of said woven base fabric and is retained in said base fabric by said selected repeat pattern, said seaming loops extending in the lengthwise or felt running direction when said loops are intermeshed at the seam; and

(d) at least one layer of batt material affixed to said base fabric.

4,892,782

FIBROUS MICROWAVE SUSCEPTOR PACKAGING MATERIAL

John R. Fisher, Hockessin, Del., and Hua-Feng Huang, Mendenhall, Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 13, 1987, Ser. No. 37,987
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—240 **15 Claims**

1. A composite material for wrapping around a food item to be cooked in a microwave oven comprising a drapable, liquid permeable, woven or non-woven, fibrous, dielectric substrate, which substrate, or fibers of which substrate, are coated and/or imbibed with one or more microwave susceptor materials, the amount of said susceptor materials being sufficient to generate adequate heat to rapidly brown or crispen the surface of food item adjacent thereto without substantially impeding the ability of the microwave energy to penetrate the susceptor material and cook the food item, said composite material being liquid permeable.

4,892,783

TRI-ELEMENT CARBON BASED HEAT SHIELD

James P. Brazel, Berwyn, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Nov. 10, 1988, Ser. No. 269,467
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—282 **18 Claims**



1. A heat shield comprising:

layer including a carbonaceous material, the outer layer having a first thermal diffusivity, an outer surface, an inner surface and a thickness disposed between the outer and inner surface, the outer surface for operating at a predetermined expected maximum temperature;

a middle layer including pyrolytic graphite, the middle layer deposited on the inner surface of the outer layer, the middle layer having a second thermal diffusivity, an inner surface and a thickness disposed between the inner surface of the outer layer and the inner surface of the middle layer; and

an inner layer including a compliant material having an outer surface for abutting the inner surface of the middle layer, the inner layer having a third thermal diffusivity, an inner surface and a thickness disposed between the outer and inner surface, wherein the operational temperature at the inner surface of the inner layer is less than a protective limit temperature when the outer surface of the outer layer is at the predetermined expected maximum temperature.

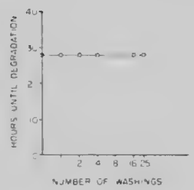
10. The heat shield as in claim 1, wherein the compliant material includes a carbon felt.

4,892,784

SURFACE TREATMENT FOR INHIBITING THERMAL OXIDATION OF POLYPROPYLENE FABRICS

William G. Reeves, Woodstock; Robert J. Roeder, Roswell, and Leonard E. Duello, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 27, 1988, Ser. No. 224,835
Int. Cl.[4] B05D *1/18, 3/02*; D04H *1/58*
U.S. Cl. 428—288 **20 Claims**



1. A process for inhibiting thermal oxidation of polypropylene fabrics comprising the steps of:

preparing an aqueous solution having a concentration of greater than about 5 ppm of dilaurylthiodipropionate;

heating the aqueous solution to at least 150 degrees F.;

saturating the polypropylene fabric with the heated aqueous solution; and allowing the fabric to dry to substantially remove the water therefrom.

5. The polypropylene fabric formed from the process of claim 1.

4,892,785

HEAT RESISTANT BINDERS

Ronald Pangrazi, Somerville, and James L. Walker, Whitehouse Station, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 912,747, Sep. 26, 1986, Pat. No. 4,859,508. This application Apr. 10, 1989, Ser. No. 335,360
Int. Cl.[4] B05D *1/38*; B32B *11/04, 27/08, 27/30*
U.S. Cl. 428—288 **10 Claims**

1. A roofing membrane comprising a polyester mat impregnated with an emulsion polymer having a glass transition temperature (Tg) of +10° to +50° C., the polymer comprising 100 parts by weight of acrylate or styrene/acrylate monomers, 3 to 6 parts of a blocked, N-methylol containing comonomer selected from the group consisting of N-(isobutoxymethyl)acrylamide, N-(iso-propoxymethyl)acrylamide and N-(propoxymethyl)acrylamide; 0 to 3 parts of a water soluble non-blocked N-methylol containing comonomer and 0 to 5 parts of a multifunctional comonomer; the impregnated mat being coated with asphalt.

4,892,786

CERAMIC ARTICLES WITH A POLYMER COMPONENT AND METHODS OF MAKING SAME

Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 908,054, Sep. 16, 1986, abandoned. This application Jun. 26, 1987, Ser. No. 67,522
Int. Cl.[4] B32B *3/06*; B05D *5/00*; B22F *7/04*
U.S. Cl. 428—307.3 **18 Claims**

10. A self-supporting ceramic body which comprises: a polycrystalline oxidation reaction product formed upon oxidation of a molten parent metal with an oxidant, and possessing interconnected porosity at least partially accessible from at least one surface of said ceramic body; and a polymer disposed in at least a portion of said porosity.

4,892,787

COATED PAPER FOR INK JET PRINTING

Jurgen M. Kruse, and Donald Kimball, both of Clinton, Conn., assignors to AM International, Inc., Chicago, Ill.

Filed Aug. 10, 1987, Ser. No. 83,276
Int. Cl.[4] D21H *1/38*; B32B *23/08*
U.S. Cl. 428—331 **23 Claims**

1. A coated substrate useful in ink jet printing, comprising:

(a) a cellulosic substrate defining at least one surface coated with

(b) a coating comprising an intimate mixture of

(1) particulate dye-sorptive pigment having a surface area of at least 100 m^2/g and an average particle size of less than about 8 μm in an amount sufficient to provide a desired rate of dye sorption; and,

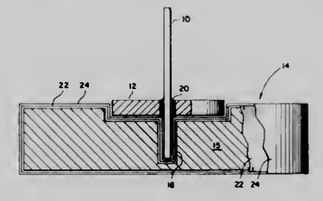
(2) a binder comprising a mixture of an acrylic resin and polyvinyl alcohol in respective amounts effective to minimize or eliminate chalking of said pigment and to sorb solvent from water- or glycol-based jet printing ink applied to said coating to form round dots from droplets of said ink provided to said coating by an ink jet printer.

4,892,788

GRAPHITE BRAZING FIXTURE COATED WITH COMPOSITE LAYERS OF TITANIUM CARBIDE AND TITANIUM NITRIDE

Michael B. Miller, DeSoto, Tex., and Robert D. Bertin, Foster City, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 28, 1988, Ser. No. 173,957
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—336 **7 Claims**



1. A fixture for holding components to be joined by brazing which comprises a graphite substrate having a first layer of titanium carbide on at least a portion of the surface of the substrate and a second layer of titanium nitride overlaying said layer of titanium carbide.

2. The fixture according to claim 1 wherein said layer of titanium carbide has a thickness of about 0.0001 to 0.0003 inches and said titanium nitride layer has a thickness of about 0.0003–0.0005 inches.

3. The fixtures according to claim 1 wherein said graphite substrate has the following properties;

Density: 1.8–2.0 grams/cm^3

Grain size: 0.0001–0.0010 inches

Compressive strength: >10,000 psi

Flexural strength: >6,400 psi

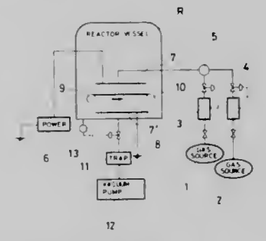
Coefficient of thermal expansion: $(4.8\text{–}5.1)\times10^{-6}$ cm/cm/°C.

4,892,789

MAGNETIC RECORDING MEDIUM

Masatoshi Nakayama; Yasufumi Takasugi, and Kunihiro Ueda, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,897
Claims priority, application Japan, Dec. 25, 1984, 59-279748
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—336 **4 Claims**



1. A magnetic recording medium consisting essentially of a substrate, a ferromagnetic metal thin film formed on the substrate, and a top coat formed on the thin film, characterized in that

the top coat comprises a plasma-polymerized film consisting essentially of carbon and hydrogen in an atomic ratio of carbon to hydrogen in the range of from 1:1 to 6:1 and having a thickness of from 10 to 30 Å and an organic material film vacuum deposited on the plasma-polymerized film and having a thickness of from 10 to 60 Å.

4,892,790

OXIDATION-INHIBITED CARBONOUS MATERIALS

Paul E. Gray, San Diego, Calif., assignor to General Atomics, San Diego, Calif.

Continuation of Ser. No. 798,994, Nov. 18, 1985, which is a continuation-in-part of Ser. No. 676,985, Nov. 30, 1984. This application Dec. 6, 1985, Ser. No. 805,887
Int. Cl.[4] B22F *7/01*
U.S. Cl. 428—548 **10 Claims**

1. An oxygen-resistant, high-temperature structure comprising

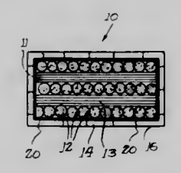
a carbonous structural matrix formed with interstices throughout,

boron, in elemental form and/or as moiety of a compound, said boron being dispersed throughout said matrix, silicon in elemental form and/or as a moiety of a compound, said silicon being dispersed throughout said matrix, plus an additional metal or metalloid, in elemental form and/or as

a moiety of a compound, said metal or metalloid being dispersed throughout said matrix,

said boron, said silicon and said additional metal or metalloid each oxidizing when exposed to a high-temperature, oxidizing environment to form borosilicate plus a metal oxide or a metalloid oxide within the interstices and at the surface of said matrix;

the boron plus silicon plus said additional metal or metalloid, calculated as if in their fully oxidized forms, comprising between about 10 about 1000 weight percent of the carbon



in said matrix, said silicon, calculated as a silicon oxide, being present in amounts of from about 3 to about 40 mole percent of silicon plus boron, calculated as silicon oxide plus boron oxide, said metal or metalloid, calculated as if fully oxidized, being present in an amount of from about 3 to about 50 mole percent of boron plus silicon, calculated as boron oxide plus silicon oxide;

at high temperatures, the metal oxide or metalloid oxide which forms stabilizing the viscosity of the molten phase of the borosilicate which forms.

4,892,791

BODY COATED WITH CUBIC BORON NITRIDE & METHOD FOR MANUFACTURING THE SAME

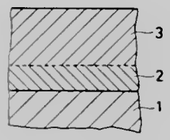
Kazuhiro Watanabe; Kazuya Saito; Yoshiyuki Yuchi, and Konosuke Inagawa, all of Ibaragi, Japan, assignors to Nihon Sinku Gijutsu Kabushiki Kaisha, Japan

Filed Mar. 25, 1988, Ser. No. 173,663

Claims priority, application Japan, Mar. 27, 1987, 62-071856

Int. Cl.[4] B32P *15/28;* **B32B** *27/14;* **C04B** *41/06*

U.S. Cl. 428—698 **7 Claims**



1. A body coated with cubic boron nitride comprising:

(A) a base material;

(B) a first interlayer formed on said base material; and/or a second interlayer formed on said first interlayer or said base material; and

(C) a cubic boron nitride film formed on said first interlayer or said second interlayer;

wherein said first interlayer comprises nitride or boride mixed with at least one element of the IVb group, IIIb group, Vb group, IVa group, Va group and VIa group of the periodic table, in accordance with the quality of the material of said base material, said at least one element having a composition ratio which decreases towards the surface between said first interlayer and said second interlayer or said first interlayer and said cubic boron nitride film; said second interlayer comprises nitride or boride mixed with at least one element of the IVb group, IIIb group, Vb group, IVa group, Va group and VIa group of the periodic table, in accordance with the quality of the material of said base material, at a total mixing amount of 0.01 atomic % to 10 atomic %, and shows an absorption peak at the wave number of 950 cm^{-1} to 1150 cm^{-1} according to the infrared absorption spectrum, and said cubic boron nitride film shows a maximum absorption peak at the wave

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4,892,792

AlN COATED SILICON NITRIDE BASED CUTTING TOOLS

Vinod K. Sarin, Lexington, and Charles D'Angelo, Southboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 103,333, Oct. 1, 1987, abandoned. This application Aug. 12, 1988, Ser. No. 233,876

Int. Cl.[4] C23C *11/08;* **B32B** *13/04*

U.S. Cl. 428—698 **8 Claims**



1. A wear resistant coated article comprising a densified monolithic or composite silicon nitride-based substrate body having an adherent refractory coating layer deposited thereon, the coating layer consisting essentially of aluminum nitride.

4,892,793

NICKEL-CADMIUM CELL APPARATUS

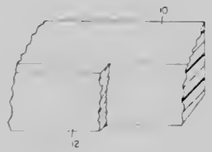
Klaus von Benda, Nürtingen; Gábor Benczúr-Ürmössy, Stuttgart; Gerhard Berger, Deizisau; Rainer Klink, Kernen, and Uwe Gierz, Plochingen, all of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellshaft mbH, Hanover, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,501

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720072

Int. Cl.[4] H01M *10/34*

U.S. Cl. 429—60 **7 Claims**



1. Sealed nickel-cadmium cell apparatus which works on the oxygen cycle principle and which has a charge and discharge reserve at the negative electrode and has a gas diffusion body at the side of the negative electrode facing away from the positive electrode, comprising a hermetically sealed cell including oxygen and gases which cannot be reacted in the cell having a partial pressure, the partial pressure of the gases which cannot be reacted in the cell being below 0.4 bar and the hermetically sealed cell having a substantially gas tight plastic housing and a layer which inhibits the diffusion of nitrogen disposed on at least 85% of a surface of the housing.

4,892,794

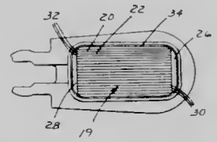
BATTERY

Matthew T. Scholz, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 18, 1988, Ser. No. 220,661

Int. Cl.[4] H01M *10/02*

U.S. Cl. 429—72 **16 Claims**



1. A battery adapted to withstand high temperatures, such as generated during heat or steam sterilization, comprising a casing defining at least one battery cell, aqueous fluid electrolyte in the cell, a generally hydrophilic electrode assembly in the cell including cooperating positive and negative electrodes immersed in the electrolyte, a vent in the casing for venting gases and pressure during recharging and heat-sterilizing, and porous material in the cell generally adjacent the electrode assembly for holding excess electrolyte, the porous material being hydrophoboc and having a hydrophobicity sufficiently large relative to the electrode assembly that electrolyte in the porous material tends to migrate into the electrode assembly to wet the electrodes while excess electrolyte is stored in the porous material.

4,892,795

NON-AQUEOUS CELL COMPRISING NIOBIUM TRISELENIDE

Wei-Chou Fang, Bridgewater, and Brijesh Vyas, Warren, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 14, 1988, Ser. No. 244,218

Int. Cl.[4] H01M *4/58, 6/00*

U.S. Cl. 429—194 **14 Claims**

1. A process of making a nonaqueous cell comprising a lithium negative electrode, a separator, a positive electrode comprising niobium chalcogenide active material, and electrolyte, the process characterized in that the positive electrode is made by a procedure that comprises the steps of

a. forming a layer of niobium powder on a substrate; and

b. reacting the niobium powder with selenium vapor or with sulfur vapor to form the niobium chalcogenide active material.

4,892,796

POSITIVE CURRENT COLLECTOR FOR LITHIUM SECONDARY SYSTEM

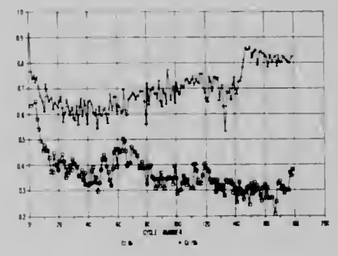
On-Kok Chang; John C. Hall, both of San Jose; Jeffrey Phillips, Saratoga, and Lenard F. Silvester, Scotts Valley, all of Calif., assignors to Altus Corporation, San Jose, Calif.

Filed Aug. 26, 1988, Ser. No. 237,190

Int. Cl.[4] H01M *6/14, 6/02*

U.S. Cl. 429—196 **7 Claims**

1. In a rechargeable non-aqueous electrochemical cell having a positive terminal, a negative terminal, a current collector and cathode attached to the positive terminal, an anode of alkali metal connected to the negative terminal and a non-aqueous electrolyte solution in contact with the cathode and anode,



the improvement comprising a current collector comprising a chrome foil plated upon a core of nickel.

4,892,797

BIPOLAR ELECTRODE AND PROCESS FOR MANUFACTURING SAME

Bhaskara M. L. Rao, Flemington; William Kobasz, Edison, and James C. Menke, Long Valley, all of N.J., assignors to Alupower, Inc., Warren, N.J.

Filed Mar. 10, 1989, Ser. No. 321,896

Int. Cl.[4] H01M *6/48*

U.S. Cl. 429—210 **11 Claims**



1. A bipolar electrode structure, which comprises;

an electrically conductive intermediate layer of a thickness of less than about 5 mils having pressure sensitive adhesive surfaces and a volume resistively of at least 0.5 ohm-cm but less than 100 ohm.cm;

an electronegative layer disposed on a surface of said intermediate layer; and

an electropositive layer disposed on an opposite surface of said intermediate layer.

4,892,798

ELECTROPHORETIC IMAGING METAL-TONER FLUID DISPERSION

William M. Lamanna; Robin E. Wright, and Hsin-Hsin Chou, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 13, 1988, Ser. No. 283,596

Int. Cl.[4] G03G *13/10*

U.S. Cl. 430—38 **23 Claims**

21. A method comprising the steps:

(a) providing a toner fluid dispersion comprising electrostatically charged, colloidal, elemental metal particles dispersed in an electrically nonconductive organic carrier liquid of dielectric constant less than 3.5 and having a volume resistivity greater than 10^{12} ohm.cm, and providing a dielectric or photoconductive substrate,

(b) electrophoretically and irreversibly depositing the charged, colloidal, elemental metal particles of the toner fluid in a continuous or imagewise fashion on at least one of the surfaces of said substrate using standard electro-

graphic techniques to provide a nonconductive, colloidal, elemental metal coating thereon, and

(c) optionally, in the case of a catalytically active colloidal, elemental metal, subjecting the resulting colloidal metal coated substrate to an electroless metal plating solution to induce selective metal plating on the elemental colloidal metal coated portions of the substrate surface, to provide a second elemental metallic coating on said portions of the substrate surface which is electrically conductive.

4,892,799

4-CHLOROOXAZOLE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION AND USE

Rainer Wingen, Hattersheim; Dieter Guenther, Kelkheim, and Juergen Lingnau, Mainz-Laubenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,596

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706880

Int. Cl.[4] G03G *5/06*

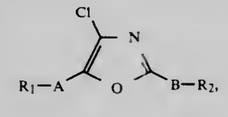
U.S. Cl. 430—77 **7 Claims**

1. A recording material comprising:

a support;

at least one photoconductive layer on the support comprising a 4-chlorooxazole compound of general formula I:

(I)



wherein:

A is a single bond or the —CH=CH— group,

B is a single bond, the —CH=CH— or —CH=CH—CH=CH— group and is a single bond, in the case of A representing the —CH=CH— group,

R_1 is phenyl, which is optionally substituted in one or more positions by (C_1–C_4)-alkoxy or di-(C_1–C_4)-alkylamino radicals, and

R_2 is phenyl, phenyloxazolyl, pyridyl, julolidin-9-yl, N-(C_1–C_4-alkyl) carbazol-3-yl, coumarin-6-yl or stilbene-4-yl, which are optionally substituted in one or more positions by (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, halogen-(C_1–C_4)-alkoxy, hydroxy, halogen, di-(C_1–C_4)-alkylamino or dibenzylamino radicals.

4,892,800

PHOTOSENSITIVE MEMBER HAVING A PHOTOCONDUCTIVE LAYER COMPRISING A CARBONIC FILM FOR USE IN ELECTROPHOTOGRAPHY

Masao Sugata, Yokohama; Tatsuo Takeuchi, Kawasaki; Hiroshi Satomura, Hatogaya; Yoshihiro Oguchi, Yokohama; Akio Maruyama, Tokyo; Keishi Saito, Nabari; Tohru Den, Atsugi; Susumu Ito; Keiji Hirabayashi, both of Tokyo; Keiko Ikoma, Yokohama; Noriko Kurihara, Kawasaki, and Kuniji Osabe, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,314

Claims priority, application Japan, Sep. 24, 1986, 61-225218; Sep. 26, 1986, 61-227304; Sep. 26, 1986, 61-227305; Sep. 26, 1986, 61-227306

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—85 **8 Claims**

1. A photosensitive member for use in electrophotography comprising a substrate and a photoconductive layer comprising a film containing carbon atoms in an amount of at least 65 atomic percent and at least one element selected from the group consisting of boron, aluminum, gallium, indium, thallium, nitrogen, phosphorus, arsenic, antimony and bismuth in an amount of 5 atomic ppm to 5 atomic percent; said film having a matrix of said carbon atoms and said film having a value of 0.16 to 1.9 for the ratio of I_D/I_G between the peak intensity (I_D) of 1333 cm^{-1} and the peak intensity (I_G) of 1580 cm^{-1} in Raman spectra.

4,892,801

MIXED ESTER O-QUINONE DIAZIDE PHOTOSENSITIZERS AND PROCESS OF PREPARATION

Robert E. Potvin, West Warwick; Jonas O. St. Alban, Westerly, and Chester J. Sobodacha, Coventry, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 858,631, May 2, 1986, Pat. No. 4,732,837. This application Mar. 21, 1988, Ser. No. 170,534

Int. Cl.[4] G03C *1/54;* **C07C** *113/00*

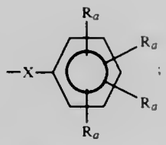
U.S. Cl. 430—193 **19 Claims**

1. A photosensitive compound represented by the general formulae (1):

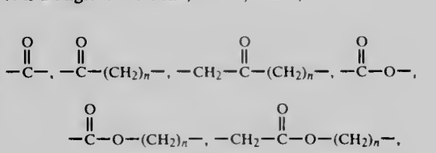
(1)



wherein R is



X is a single C—C bond, —O—, —S—,



n is 1 or 2, R_a is H, —OH, —OY, —OZ, halogen or lower alkyl, with at least one R_a radical being —OY and at least one thereof being —OX;

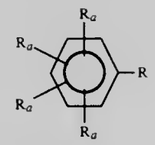
wherein Y is 1,2-naphthoquinonediazide-5-sulfonyl and Z is —W—R_3, where W is



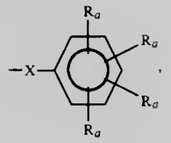
or —SO_2—, and R_3 is alkyl, aryl, substituted alkyl or substituted aryl; and the total amount of Diazo and organic acid halide reacted with the phenolic compound is that amount sufficient to produce a photosensitizer condensate capable of inhibiting the dissolution rate of an alkali soluble resin when mixed with said resin.

2. A photosensitizer comprising the condensation product of:

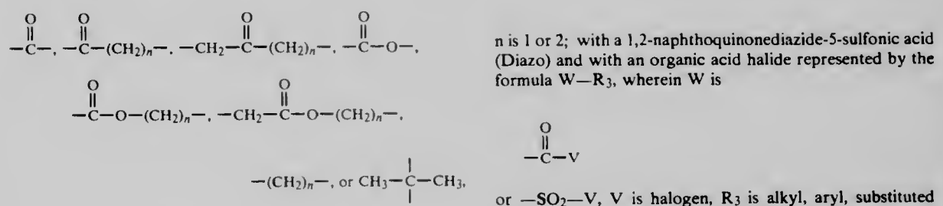
(I) a phenolic compound having the formula:



wherein R is



R_a is H, —OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being —OH, X is a single C—C bond, —O—, —S—, —SO_2—,



n is 1 or 2 and

(II) a 1,2-naphthoquinonediazide-5-sulfonic acid (Diazo); and

(III) an organic acid halide represented by the formula:

W—R_3

wherein W is



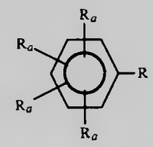
or —SO_2—V, V is halogen and R_3 is alkyl, aryl, substituted alkyl or substituted aryl;

wherein the molar ratio of the amount of Diazo reacted to the amount of organic acid reacted is in the range of from about 1:2 to about 19:1; and the total amount of Diazo and organic acid halide reacted with the phenolic compound is that amount sufficient to produce a photosensitizer condensate capable of inhibiting the dissolution rate of an alkali soluble resin when mixed with said resin.

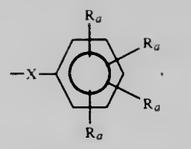
3. A method of preparing a photosensitizer condensate comprising:

condensing a phenolic compound represented by the general formulae (A):

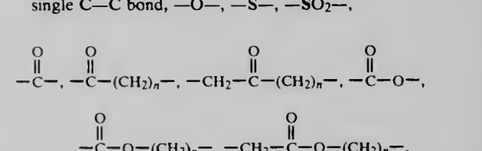
(A)



wherein R is



R_a is H, —OH, halogen lower or lower alkyl, with at least two and not greater than six R_a radicals being —OH, X is a single C—C bond, —O—, —S—, —SO_2—,



n is 1 or 2; with a 1,2-naphthoquinonediazide-5-sulfonic acid (Diazo) and with an organic acid halide represented by the formula W—R_3, wherein W is

or —SO_2—V, V is halogen, R_3 is alkyl, aryl, substituted alkyl or substituted aryl; wherein the molar ratio of the amount of Diazo to the amount of organic acid halide to be reacted is in the range of from about 1:2 to about 19:1; and the total amount of Diazo and organic acid halide reacted with the phenolic compound is that amount sufficient to produce a photosensitizer condensate capable of inhibiting the dissolution rate of an alkali soluble resin when mixed with said resin; wherein said condensing is conducted in a solvent medium in the presence of an acid scavenger; and then subsequently isolating said photosensitizer condensate.

4,892,802

POSITIVE WORKING TONABLE FILM HAVING A PHOTOHARDENABLE LAYER

Richard D. Bauer, Towanda, Pa.; Ursula A. Kraska, Pfungstadt, and Manfred A. Sondergeld, Mulheim/Main, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 129,149, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 857,313, Apr. 30, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,248

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—270 **7 Claims**

1. A positive working tonable film comprising a synthetic resin support layer and a photohardenable layer having a thickness from about 2 microns to about 1 mm consisting essentially of a mixture of:

(a) about 10 to about 80 weight % of at least one ethylenically unsaturated photopolymerizable compound based on the total weight of the dried film;

(b) about 20 to about 90 weight % of binder based on the total weight of the dried film wherein a binder is selected from the group consisting of single polymers with Tg≦70° C. and mixtures of polymers each with Tg≦80° C., the binder is at least one thermoplastic copolymer selected from the group consisting of esters of acrylic acid and esters of methacrylic acid and the copolymer pos-

sesses at least 2 weight percent acid salt forming groups selected from the group consisting of carboxyl, sulfonic acid, sulfonamide and hydroxyl groups;

(c) at least one crosslinking agent selected from the group consisting of compounds of multivalent metals of groups IIA-IVA, IIB-IVB and VIIB of the Periodic Chart, said agent being present in an effective amount to reduce temperature dependency during toning wherein fluctuations in achievable toned density due to temperature are less than fluctuations in achievable toned density in a positive working tonable film comprising a synthetic resin support layer and a photohardenable layer consisting essentially of (a), (b), and (d); and

(d) about 0.01 to about 15 weight percent of a photoinitiator or photoinitiating system activatable by actinic radiation based on the total weight of the dried film.

4,892,803

COLOR IMAGE-FORMING PROCESS COMPRESSING DEVELOPER CONTAINING NO BENZYL ALCOHOL

Kokichi Waki; Kazunori Hasebe, and Masahiro Asami, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP87/00046, § 371 Date Sep. 23, 1987, § 102(e) Date Sep. 23, 1987, PCT Pub. No. WO87/04533, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 23, 1987, Ser. No. 107,833

Claims priority, application Japan, Jan. 23, 1986, 61-13414

Int. Cl.⁴ G03C *7/30/7/26*

U.S. Cl. 430—380 **18 Claims**

1. A color image-forming process which comprises developing, after imagewise exposure, a color photographic light-sensitive material comprising a reflective support having provided thereon at least one silver halide emulsion layer containing a core/shell surface latent image type monodispersed silver halide emulsion (having a variation coefficient of up to 0.15) containing no silver iodide, having a silver chloride content of up to 80 mol%, and having a silver bromide content in the shell portion lower than that in the core portion with a color developer containing substantially no benzyl alcohol within 2 minutes and 30 seconds.

4,892,804

PHOTOGRAPHIC COLOR DEVELOPING COMPOSITIONS WHICH ARE ESPECIALLY USEFUL WITH HIGH CHLORIDE PHOTOGRAPHIC ELEMENTS

Sheridan E. Vincent, and Richard W. Berls, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 822,097, Jan. 24, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 233,882

Int. Cl.⁴ G03C *7/30, 7/00, 7/40*

U.S. Cl. 430—380 **25 Claims**

1. A photographic color developing composition which is especially useful in the development of high chloride silver halide photographic elements, said composition being substantially free of bromides and comprising:

(1) a primary aromatic amino color developing agent,

(2) N,N-diethylhydroxylamine,

(3) at least one sequestering agent which functions to sequester iron,

(4) at least one sequestering agent which functions to sequester calcium, and (5) from zero to 0.2 moles of sulfite per mole of said primary aromatic amino color developing agent.

4,892,805

PHOTOGRAPHIC ELEMENT AND PROCESS

Arlyce T. Bowne; Robert F. Romanet, both of Rochester, and Sharon E. Normandin, Macedon, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,197

Int. Cl.⁴ G03C *7/38*

U.S. Cl. 430—387 **8 Claims**

6. A process of forming a dye image in an exposed photographic element comprising a support bearing a photographic silver halide emulsion, said process comprising developing the photographic element with a silver halide color developing agent in the presence of a color coupler comprising a pyrazoloazole coupler comprising at least one polyether group (A) comprising at least three ether (—O—) groups and terminated by a hydroxy, carboxy or sulfonamide group.

4,892,806

NON-IONIC SURFACE ACTIVE COMPOUNDS AND PHOTOGRAPHIC MATERIALS CONTAINING THEM

Catherine B. A. Briggs, Middlesex, and Alan R. Pitt, Hertfordshire, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

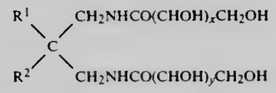
Filed Sep. 26, 1988, Ser. No. 249,741

Claims priority, application United Kingdom, Oct. 30, 1987, 8725486

Int. Cl.⁴ G03C *1/04, 1/38;* **G07C** *103/07, 103/10*

U.S. Cl. 430—449 **20 Claims**

16. A process for preparing a photographic coating composition which comprises dispersing an oil soluble photographic additive in an aqueous solution of a hydrophilic colloid in the presence of a dispersion aid, characterized in that the dispersion aid comprises a water soluble surface active compound having the formula



wherein

each of R^1 and R^2 independently is hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted cycloalkyl, or substituted or unsubstituted aryl, provided that not both R^1 and R^2 are hydrogen,

and each of x and y independently is an integer from 3 to 6.

4,892,807

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL EXCELLENT IN TREATMENT STABILITY

Shigeto Hirabayashi; Hirokazu Sato, and Eiichi Sakamoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

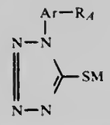
Filed Jul. 29, 1987, Ser. No. 79,214

Claims priority, application Japan, Aug. 1, 1986, 61-181528

Int. Cl.⁴ G03C *7/34, 1/34*

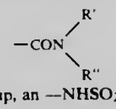
U.S. Cl. 430—505 **9 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon photographic component layers comprising a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein said red-sensitive silver halide emulsion layer contains silver halide grains comprising not less than 90 mol % of silver chloride, a compound represented by the following formula [S] and a cyan coupler represented by the following formula [I]:

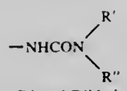


Formula [S]

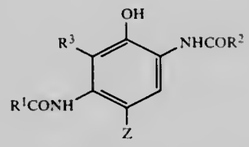
wherein Ar is an arylene group or a cycloalkylene group; R_A is an alkyl group, an alkoxy group, a carboxyl group or its salt, a sulfo group or its salt, a hydroxyl group, an amino group, an acylamino group, a



group, an $-NHSO_2R''$ group or an



group, R' and R'' being a hydrogen atom an alkyl group or an aryl group, respectively, and M is a hydrogen atom, an alkali metal atom or an ammonium group;



Formula [I]

wherein R^1 is an alkyl group or an aryl group; R^2 is an alkyl group, a cycloalkyl group, an aryl group or a heterocyclic group; R^3 is a hydrogen atom, a halogen atom, an alkyl group or a alkoxy group, R^3 and R^1 being allowed to form a ring by coupling with R^1; Z represent a hydrogen atom or a group capable of being splitted off upon reaction with the oxidized product of an aromatic primary amine color developing agent.

4,892,808

PHOTOGRAPHIC MATERIAL PROTECTED AGAINST HYDROGEN CYANIDE GAS

Kenneth G. Harbison, Rochester, and Wilbur S. Gaugh, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 208,911, Jun. 20, 1988, abandoned. This application May 12, 1989, Ser. No. 352,322

Int. Cl.⁴ G03C *1/06*

U.S. Cl. 430—517 **12 Claims**

1. A photographic assemblage comprising:

(a) a light-sensitive photographic element comprising a support bearing a sulphur and gold sensitized silver halide emulsion layer, and

(b) an associated non-light sensitive material comprising a support and carbon black,

the assemblage containing, as a scavenger for hydrogen cyanide gas in a location where it will intercept hydrogen cyanide gas evolving from the carbon black before the gas reaches the silver halide in the photosensitive element, a noble metal compound selected from the group consisting of palladium, gold and platinum, in an amount of about 1 to 250 parts metal per million parts carbon black by weight, or a noble metal compound selected from the group consisting of iridium, rhodium and osmium in an amount of about 10 to 1000 parts metal per million parts carbon black, by weight.

4,892,809

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Yasuhito Momoki, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

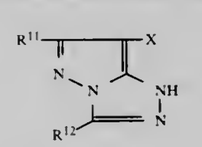
Continuation of Ser. No. 909,232, Sep. 19, 1986, abandoned. This application May 11, 1989, Ser. No. 351,273

Claims priority, application Japan, Sep. 20, 1985, 60-208313

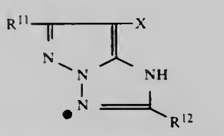
Int. Cl.⁴ G03C *7/38*

U.S. Cl. 430—550 **13 Claims**

1. A silver halide color photographic material comprising a support and at least one silver halide emulsion layer disposed on said support, wherein said emulsion layer contains at least one type of magenta coupler from a pyrazoloazole system represented by Formula (V) or (VI) below, and said silver halide emulsion is a silver chlorobromide emulsion or a silver chloroiodobromide emulsion which is chemically sensitized in the presence of at least one compound selected from the group consisting of deoxyribonucleic acid, ribonucleic acid, adenine, guanine, uracil, cytosine and thymine prior to the completion of chemical sensitization by sulfur compounds:



Formula(V):



Formula(VI):

wherein R^{11} and R^{12}, which may be the same or different from each other, independently represent a hydrogen atom, halogen atom, alkyl group, aryl group, heterocyclic group, cyano group, alkoxyl group, aryloxy group, heterocyclic oxy group, acyloxy group, carbamoyloxy group, silyloxy group, sulfonyloxy group, acylamino group, anilino group, ureido group, imido group, sulfamoylamino group, carbamoylamino group, alkylthio group, arylthio group, heterocyclic thio group, alkoxycarbonylamino group, aryloxycarbonylamino group, sulfonamido group, carbamoyl group, acyl group, sulfamoyl group, sulfonyl group, sulfinyl group, alkoxycarbonyl group, and aryloxycarbonyl group; and X represents a hydrogen atom, halogen atom, carboxyl group, or a coupling split-off group connected through an oxygen atom, nitrogen atom, or sulfur atom; or the magenta coupler may be a dimer or a polymer connected through R^{11}, R^{12} or X.

4,892,810

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING CYAN DYE FORMING COUPLER

Kozo Aoki; Michio Ono, and Naoki Saito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

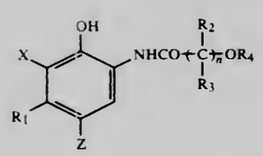
Continuation of Ser. No. 9,065, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 748,537, Jun. 25, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,518

Claims priority, application Japan, Jun. 25, 1984, 59-130745

Int. Cl.⁴ G03C *7/34*

U.S. Cl. 430—553 **11 Claims**

1. A silver halide color photographic light-sensitive material containing a cyan dye forming coupler represented by the following general formula (I):



(I)

wherein R_1 represents an alkyl group having 2 to 15 carbon atoms, R_2 and R_3 each represent a hydrogen atom or an alkyl group, R_4 represents a substituted aryl group which is substituted by a group other than an aryl group or an aralkyl group, wherein said group other than an aryl group or an aralkyl group can be at least one alkyl group, X represents a chlorine atom or a fluorine atom, Z represents a chlorine atom or a fluorine atom, n represents an integer of 1 to 4, and the total number of carbon atoms in the alkyl groups contained in R_1, R_2, R_3, and R_4 is 8 or more, and the total number of carbon atoms in the alkyl groups contained in R_1 and R_4, in the case that n is 1, is 11 or less.

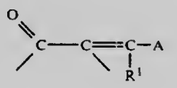
4,892,811

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morio Yagihara; Mitsunori Ono, and Akihiko Ikegawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 788,198, Oct. 16, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 121,242
Claims priority, application Japan, Oct. 16, 1984, 59-216928
Int. Cl.[4] G03C *5/54, 1/42, 7/26, 1/34*
U.S. Cl. 430—562 **14 Claims**

14. A silver halide photographic material which comprises a support having coated thereon a light-sensitive silver halide emulsion layer, wherein the photographic material contains a blocked photographic agent represented by the following general formula (I):



(I)

Z

wherein A represents a photographic agent moiety which is bonded to a blocking moiety through a hetero atom, or a precursor thereof; R^1 represents a hydrogen atom or a substituent group; and Z represents atoms necessary to form a carbocyclic ring or a heterocyclic ring, wherein A is a group represented by the following general formula (II):

$$X_mB \qquad \text{(II)}$$

wherein B represents a photographic agent moiety selected from the group consisting of azo dyes and azomethine dyes which is bonded to X through a hetero atom contained in B; X represents a divalent linkage group which is bonded to a blocking moiety through a hetero atom contained in X; and m is 0 or 1, wherein the photographic agent moiety represented by B is bonded to the divalent linkage group represented by X through a hetero atom contained therein.

4,892,812

SILVER HALIDE PHOTOSENSITIVE MATERIALS

Isao Kohmura, and Katsuaki Iwaosa, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 575,998, Feb. 1, 1984. This application Oct. 27, 1986, Ser. No. 924,169
Claims priority, application Japan, Feb. 4, 1983, 58-16094; Feb. 4, 1983, 58-16095; Feb. 25, 1983, 58-31413; Feb. 25, 1983, 58-31414; Feb. 25, 1983, 58-31415; Feb. 28, 1983, 58-33600; Mar. 29, 1983, 58-54535; Mar. 29, 1983, 58-54536
Int. Cl.[4] G03C *1/34, 1/36*
U.S. Cl. 430—567 **4 Claims**

1. A silver halide photographic photosensitive material which comprises a support and photographic layers including at least one silver halide emulsion layer which contains (1) a spectrally unsensitized negative silver halide having an average grain size of 0.1 to 0.3 μm and containing at least 80 mol % of silver chloride and (2) an organic desensitizer having an anodic polargraphic potential and a cathodic polargraphic potential which give a positive sum,

wherein said emulsion has undergone substantially no chemical ripening and

wherein said photosensitive material contains:

(c) (iv) 2-mercaptobenzoic acids.

4,892,813

METHOD FOR THE DETERMINATION OF THE ENZYMATIC ACTIVITY OF CONVERTASE

Paul Cohen, Paris; Alain Morel, Puteaux; Sophie Gomez, Issy les Moulineaux; Christine M. Clamagirand; Pablo Gluschankof, both of Paris; Pierre Nicolas, Argenteuil, and Hamadi Boussetta, Paris, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Continuation of Ser. No. 796,042, Nov. 7, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 117,896
Int. Cl.[4] C12Q *1/00, 1/34, 1/36, 1/38*
U.S. Cl. 435—4 **7 Claims**

1. A method for measuring the enzymatic activity of a convertase that enzymatically cleaves a neuropeptide precursor at an excision site comprising:

(a) contacting a biological sample containing the convertase with a labeled peptide substrate consisting of at least 10 amino acids and no more than 20 amino acids, reproducing or mimicking the sequence of the precursor at the excision site,

(b) incubating for a time to allow for conversion, and

(c) measuring the enzymatic activity of the sample by determining the precentage of labeled conversion fragments relative to one or more standards.

4,892,814

METHOD FOR DISTINGUISHING CREUTZFELDT-JAKOB DISEASE FROM OTHER DEMENTIAS

Michael G. Harrington; Carl R. Merril, both of Rockville; David M. Asher, Chevy Chase, and D. Carleton Gajdusek, Frederick, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 22, 1987, Ser. No. 67,420
Int. Cl.[4] C12Q *1/70*
U.S. Cl. 435—5 **3 Claims**

1. A method for distinguishing Creutzfeldt-Jakob disease from other causes of human dementia wherein it has been clinically determined that the patient does not suffer from herpes simplex encephalitis comprising analyzing the cerebrospinal fluid of a patient for proteins 130 and 131, the presence of proteins 130 and 131 in the cerebrospinal fluid indicating the presence of Creutzfeldt-Jakob disease.

4,892,815

PROCESS AND REAGENT FOR THE SPECIFIC DETERMINATION OF THE CHOLESTEROL OF THE HDL FRACTION

Lorenz Kerscher, Penzberg; Brigitte Pautz; Gisela Trunk, both of Herrsching, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 107,467
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636851
Int. Cl.[4] C12Q *1/60 A;* **G01N** *33/68, 33/92 B*
U.S. Cl. 435—7 **17 Claims**

1. Process for specific determination of HDL cholesterol in a serum lipoprotein containing sample which contains LDL comprising adding to said sample pancreatic cholesterol esterase to liberate cholesterol from cholesterol esters, cholesterol oxidase and oxygen to oxidize said liberated cholesterol with the formation of hydrogen peroxide and kinetically measuring one of hydrogen peroxide formation or oxygen consumption, within 2-15 minutes thereafter as a measurement of HDL cholesterol, said measuring and reaction taking place at a temperature of from 20° C to 40° C during a predetermined time interval during which measurement one maintains a pancreatic cholesterol esterase concentration of from 0.05 to 30 U/ml, a cholesterol oxidase concentration of from 0.1 to 50 U/ml, a tenside of a bile acid group at a concentration of from 1.0 to 20 mMole/liter, concentration of a non-ionic detergent of from 0.1 to 10g/liter and a pH of from 5 to 9.

4,892,816

METHOD FOR THE DETERMINATION OF CHOLESTEROL

Tetsunori Akiba, Kani, and Kuniyoshi Matsunaga, Ichinomiya, both of Japan, assignors to Amano Pharmaceutical Co., Ltd., Aichi, Japan

Continuation of Ser. No. 788,581, Oct. 17, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,522
Claims priority, application Japan, Oct. 31, 1984, 59-229290
Int. Cl.[4] C12Q *1/60, 1/44, 1/26, 1/32*
U.S. Cl. 435—11 **13 Claims**

1. An enzymatic method for measurement of cholesterol, which comprises:

(1) preparing a test sample;

(2) mixing the test sample with a reagent composition comprising:

(a) a cholesterol dehydrogenase,

(b) an oxidizing agent selected from the group consisting of nicotinamide-adenine dinucleotide (NAD) and nicotinamide-adenine dinucleotide phosphate (NADP), and,

(c) from about 10 to about 100 mg/ml in final working solution of non-ionic surfactant;

(3) incubating the mixture at a room temperature from about 20° C. to about 40° C. and a pH from about 6.0 to about 10.0; and

(4) measuring an absorbency increase per unit time of the resulting detectable oxidized and reduced products kinetically.

4,892,817

STABLE PHOSPHATASE SUBSTRATE COMPOSITION

Jan W. Pawlak, Oakland, Calif., assignor to Biogenex Laboratories, San Ramon, Calif.

Filed Sep. 21, 1987, Ser. No. 99,062
Int. Cl.[4] C12Q *1/42, 1/00*
U.S. Cl. 435—21 **18 Claims**

1. A stabilized phosphatase substrate composition, comprising:

(a) an indoxyl phosphate;

(b) a tetrazolium salt; and

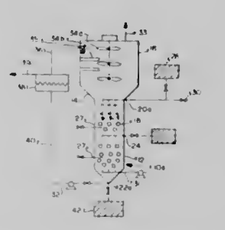
(c) a water-soluble ferricyanide/ferrocyanide salt, comprising a mixture of ferricyanide and ferrocyanide alkali metal salts having a molar ratio of Fe^{3+} to Fe^{2+} of 1:1 to 20:1.

4,892,818

BIOREACTOR

Floyd Ramp, 3948 Humphrey Rd., Richfield, Ohio 44286

Filed Feb. 5, 1987, Ser. No. 11,315
Int. Cl.[4] C12Q *1/24*
U.S. Cl. 435—30 **7 Claims**



1. A process for conducting microbiological reactions in a vertical hollow containing column packing particles classifiable by means of differential liquid settling rates, said column having a lower reaction section in which said microbiological reactions take place, and an upper disengagement section in which said packing particles can be dispersed and in which separation of biological fouling from said packing particles occurs, said upper disengagement section having a larger cross-sectional area than said lower reaction section, as well as a reactant inlet near one end, and a product outlet near the other end, comprising the following sequential steps:

(1) continuously introducing a liquid near the bottom end of the column and continuously removing said liquid near the top end of the column at a flow rate such that its upward linear velocity exceeds the settling rate of said column packing particles, and maintaining the flow rate until said column packing particles have been substantially dispersed within said disengagement section;

(2) thereafter, gradually reducing the flow rate so that sai particles slowly settle into the column's reaction section, thereby classifying said packing particles in an initial classified condition in which faster settling packing particles are located toward the lower end of said reaction section, while slower settling packing particles are located toward the upper end of said reaction section;

(3) exposing said packing particles to an inoculant containing selected bioreaction microorganisms;

(4) continuously introducing a liquid feed comprising microorganism nutrients into a reactant inlet near the bottom end of said column at a substantially constant flow rate such that its upward linear velocity is insufficient to suspend said packing particles, and continuously removing product and unreacted feed from a product outlet located near the top end of said column;

(5) wherein when packing particle fouling has progressed to a determined point, the column is cleaned by increasing the flow rate of a liquid through the column so as to provide an upward linear velocity sufficient to prevent the settling of said packing particles, until said packing particles have been substantially dispersed within said disengagement section;

(6) thereafter, maintaining said flow rate at the point at which its upward linear velocity is sufficient to prevent the settling of said packing particles, allowing them to remain substantially suspended in such dispersed state within the disengagement section until the desired amount of said fouling has been removed from the packing particles, and from the column;

(7) thereafter gradually reducing the flow rate below the linear settling rate of said packing particles, allowing them

to slowly settle into the column's reaction section substantially oriented in the initial classified condition in which said faster settling particles are located toward the lower end of said reaction section, while said slower settling particles are located toward the upper end of said reaction section; and

(8) reestablishing the biological reaction using the process of step (4).

4,892,819

RECOMBINANT DNA EXPRESSION VECTORS AND DNA COMPOUNDS THAT ENCODE ISOPENICILLIN N SYNTHETASE FROM PENICILLIUM CHRYSOGENUM

Lucinda G. Carr; Thomas D. Ingolia; Stephen W. Queener, all of Indianapolis, and Paul L. Skatrud, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 25, 1985, Ser. No. 801,523

Int. Cl.[4] C12P *21/00, 1/02;* C12N *15/00, 9/00*

U.S. Cl. 435—69.1 **65 Claims**

1. An isolated DNA compound that comprises a DNA sequence that encodes the isopenicillin N synthetase activity of *Penicillium chrysogenum.*

48. A method of producing isopenicillin N synthetase in a recombinant host cell that comprises:

(1) transforming said host cell with a recombinant vector that comprises:

(a) a transcription and translation activating sequence; and

(b) the DNA compound of claim **1** positioned for expression from said activating sequence; and

(2) culturing said host cell transformed in step (1) under conditions that allow for gene expression.

4,892,820

SOLVENT SYSTEM FOR ENZYMATIC COUPLING PROCESS

John B. Hill, Woodstock, and Steven O. Roczniak, Chicago, both of Ill., assignors to The Nutrasweet Company, Deerfield, Ill.

Filed Jun. 10, 1987, Ser. No. 60,286

Int. Cl.[4] C12P *21/02, 21/04*

U.S. Cl. 435—68.1 **20 Claims**

1. In an enzymatic coupling process for coupling amino acids and/or amino acid esters and derivatives, the improvement which comprises:

an alkylphosphate as a solvent or cosolvent.

4,892,821

METHOD FOR PREPARING VITAMIN D COMPOUNDS

Sadafumi Omura, Ageo; Joji Sasaki, Omiya; Akiko Mikami, and Kazutoshi Mizoue, both of Urawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Jul. 5, 1988, Ser. No. 215,316

Claims priority, application Japan, Jul. 8, 1987, 62-170669; Dec. 26, 1987, 62-331323

Int. Cl.[4] C12P *15/00;* A61K *31/59;* C12R *1/04, 1/465*

U.S. Cl. 435—127 **10 Claims**

1. A method for preparing a 1α- or 25-hydroxyvitamin D compound which comprises adding a vitamin D compound having a hydrogen atom at the 1α- or 25-position to a reaction mixture containing a mycelium of Actinomycetales being capable of hydroxylating the vitamin D compound or to a reaction mixture containing the enzyme produced from said mycelium and converting the hydrogen atom into a hydroxyl group.

4,892,822

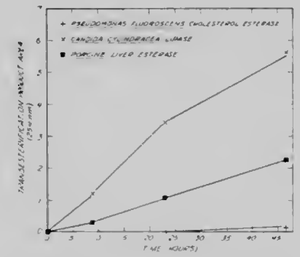
ENZYME-CATALYZED REACTIONS INVOLVING DIPHENYL CARBONATE

Daniel A. Abramowicz, Ballston Spa, and Charles R. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

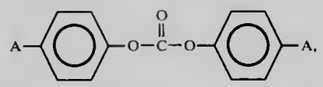
Filed Oct. 22, 1987, Ser. No. 111,248

Int. Cl.[4] C12P *7/00;* C08G *63/62*

U.S. Cl. 435—132 **19 Claims**



1. A method for performing an exchange reaction with a diphenyl carbonate compound of the formula



wherein each A is individually selected from the group consisting of hydrogen, lower alkyl groups, lower alkoxy groups, and halogens, comprising the reaction of the diphenyl carbonate compound with water or an alcohol in the presence of an enzymatic catalyst having an active site capable of binding the diphenyl carbonate while retaining a catalytic residue after binding.

17. A method for the preparation of polycarbonates, comprising the transesterification of a diphenyl carbonate compound with a dihydric phenol in the presence of an enzymatic catalyst selected from the group consisting of *Candida Cylindracea* lipase, Porcine liver esterase, Rhizopus lipase, and *Pseudomonas Fluorescens* cholesterol esterase.

4,892,823

METHOD FOR PRODUCING 2-KETO-L-GULONIC ACID

Ko Imai, Minoo; Takeshi Sakane, Suita, and Ikuo Nogami, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 4, 1987, Ser. No. 57,979

Claims priority, application Japan, Jun. 5, 1986, 61-131121

Int. Cl.[4] C12R *1/38;* C12P *7/60*

U.S. Cl. 435—138 **7 Claims**

1. A method for producing 2-keto-L-gulonic acid which comprises contacting L-sorbose with a microorganism of *Pseudomonas sorbosoxidans* which is able to oxidize L-sorbose to 2-keto-L-gulonic acid or a processed material thereof to produce and accumulate 2keto-L-gluonic acid and harvesting the same.

4,892,824

FAST TRACK METHOD FOR PRODUCING MONOCLONAL BI-SPECIFIC IMMUNOGLOBULINS

Eileen Skaletsky, San Diego, Calif., assignor to Synbiotics Corporation, San Diego, Calif.

Filed Mar. 15, 1988, Ser. No. 168,378

Int. Cl.[4] C12N *15/00, 5/00, 33/53;* C12R *1/91*

U.S. Cl. 435—172.2 **13 Claims**

1. A fast track method for producing one or more polyomas which express a desired bi-specific immunoglobulin having specificities for a first known hapten or antigen and a second known hapten or antigen, the first hapten or antigen being different from the second hapten or antigen, the method comprising the following steps:

Step A: obtaining a first sample of antibody expressing cells which express a first immunoglobulin having a specificity for the first hapten or antigen; Step B: obtaining a second sample of antibody expressing cells which express a second immunoglobulin having a specificity for the second hapten or antigen; Step C: obtaining a sample of myeloma cells which are selectable and which are fusible with the antibody expressing cells of the first and second samples; then Step D: combining the sample of myeloma cells with the first and second samples of antibody expressing cells so as to form a cell mixture; then Step E: forming cellular fusion products by the addition of a fusing agent to the cell mixture, the cellular fusion products including one or more polyomas created by substantially simultaneously fusing one myeloma cell, one antibody expressing cell from the first sample, and one antibody expressing cell from the second sample; and then Step F: selecting, from among the cellular fusion products, one or more polyomas which express the bispecific immunoglobulin.

4,892,825

IMMOBILIZATION OF BIOLOGICALLY ACTIVE MATERIAL WITH GLUTARALDEHYDE AND POLYAZETIDINE

Mogens Wumpelmann, Herlev, and Henrik Mollgaard, Lyngby, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 874,141, Jun. 13, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 213,773

Claims priority, application Denmark, Jun. 14, 1985, 2692/85

Int. Cl.[4] C12N *11/08, 11/02, 11/04*

U.S. Cl. 435—180 **18 Claims**

1. A process for forming polyazetidine cross-linked immobilized biologically active materials in particle form which consists essentially of:

partially cross-linking an aqueous dispersion or solution of a biologically active material with glutaraldehyde, to produce a two phase system of flocculated partially cross-linked solids containing said biologically active material and water, dewatering said two phase system and recovering the solids as a wet pasty mass,

sub-dividing said pasty mass into discrete particles each of which is essentially homogeneous adding a polyazetidine prepolymer before, or at the beginning of partially cross-linking or subsequent thereto but prior to subdividing said pasty mass into particles, and

thereafter curing said particles whereby said polyazetidine prepolymer undergoes cross-linking.

4,892,826

PROCESS FOR THE PREPARATION OF UROKINASE DERIVATIVES

Gene A. Homandberg, Evanston, and Thanda Wai, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 11, 1988, Ser. No. 255,681

Int. Cl.[4] C12N *9/00*

U.S. Cl. 435—183 **13 Claims**

1. A process for the preparation of urokinase derivatives, the process comprising:

(a) saturating a parent urokinase molecule with arginine;

(b) reacting the saturated parent urokinase molecule in arginine with an amount of reducing agent sufficient to reduce the parent urokinase molecule to a reduced urokinase molecule by reducing three disulfide bridges;

(c) removing the reducing agent; and

(d) reacting the reduced urokinase molecule with from at least about 15 to about 30 molar excess of a desired compound having a sulfhydryl containing group.

4,892,827

RECOMBINANT PSEUDOMONAS EXOTOXINS: CONSTRUCTION OF AN ACTIVE IMMUNOTOXIN WITH LOW SIDE EFFECTS

Ira H. Pastan, Potomac; Sankar Adhya, Gaithersburg, and David Fitzgerald, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 24, 1986, Ser. No. 911,227

Int. Cl.[4] C12P *21/00, 21/02;* C12N *9/10;* A61K *34/00*

U.S. Cl. 435—193 **10 Claims**

1. A modified Pseudomonas exotoxin which comprises ADP ribosylating activity and the ability to translocate across a cell membrane; wherein the exotoxin comprises a deletion in the receptor binding domain Ia of the native toxin sufficient to render the modified toxin less toxic to human or animal cells in vitro and less toxic to the liver when administered in vivo relative to an unmodified Pseudomonas exotoxin.

4,892,828

MONOCLONAL ANTIBODY FOR HUMAN HEMATOPOIETIC GLYCOPROTEINS AND METHOD

Bo Dupont, Harrison, N.Y.; Yasuo Morishima, Nagoya, Japan; Nancy Collins, Larchmont, N.Y.; Shun-ichiro Ogata, Kagoshima, Japan, and Kenneth O. Lloyd, Bronx, N.Y., assignors to Sloan-Kettering Institute For Cancer Research, New York, N.Y.

Continuation of Ser. No. 509,201, Jun. 29, 1983, Pat. No. 4,710,457. This application Nov. 16, 1987, Ser. No. 120,608

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C12N *15/00*

U.S. Cl. 435—240.27 **2 Claims**

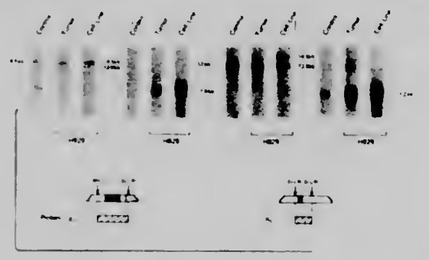
1. Hybridoma cell line ATCC No. HB 8311.

4,892,829

HUMAN PLASMA CELL LINE HAVING REARRANGED C-MYC PROTO-ONCOGENE

Adi F. Gazdar, Potomac, and Herbert K. Oie, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Apr. 22, 1986, Ser. No. 854,493
Int. Cl.[4] C12N *5/00, 15/00*; C12R *1/91*
U.S. Cl. 435—240.2 5 Claims



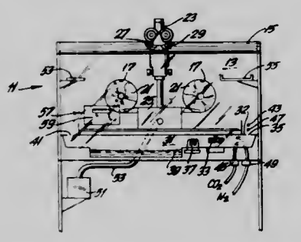
1. A cultured, human plasma cell myeloma line, having a rearranged c-myc gene and having the characteristics of ATCC CRL 9068.

4,892,830

ENVIRONMENTALLY CONTROLLED IN VITRO INCUBATOR

William Findley, and William E. Gibbons, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Apr. 2, 1987, Ser. No. 36,061
Int. Cl.[4] C12M *1/38*
U.S. Cl. 435—290 19 Claims



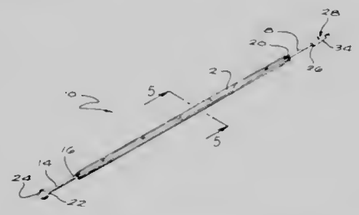
1. An environmentally controlled incubator, comprising:
(a) an environmentally closed chamber including an enclosure having a transparent portion, said transparent portion including means for strongly attenuating transmission of light below a predetermined wavelength for preventing damage to culture media and biological materials within said chamber;
(b) means for positioning a microscope stage having a microscope mounting thereon within said chamber;
(c) a first aperture for permitting a microscope mounted on said stage to extend through said aperture;
(d) second and third apertures within said enclosure positioned for allowing one using a microscope mounted on said microscope stage to manipulate things within said chamber, and sealing means for minimizing leakage between said chamber and the external ambient in the annuli between the edges of the said apertures and the microscope and forearms or hands of a user.

4,892,831

INOCULATING DEVICE

Johnson N. S. Wong, Rolling Hills, Calif., assignor to Evergreen Industries, Inc., Los Angeles, Calif.

Filed Dec. 19, 1988, Ser. No. 286,248
Int. Cl.[4] C12M *1/26*
U.S. Cl. 435—292 19 Claims



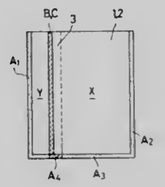
1. A streaking device for use upon bacteriological samples comprising a handle, a first end of said handle and a pyramidal shaped head disposed on said first end, said pyramidal shaped head having a base, at least three distinct streaking surfaces which are convexly shaped in a lateral direction parallel to said base for streaking bacteriological samples, and an apex for isolating and transferring selected bacterial colonies from one culture medium to another.

4,892,832

FILTER BAG FOR MICROBIOLOGICAL EXAMINATION

Kiyotaka Omote; Yuichi Matsushima; Masami Taki; Harutomo Oshio, and Kazuo Shiraishi, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Dec. 2, 1987, Ser. No. 127,651
Claims priority, application Japan, Dec. 5, 1986, 61-187582; Dec. 5, 1986, 61-187583
Int. Cl.[4] C12M *1/12*
U.S. Cl. 435—311 8 Claims



1. A filter bag for microbiological examination comprising, opposed sidewalls sealed along the side and bottom edges thereof to form an interior space, and unsealed along the top edges thereof to form an opening inlet, and a filter sheet extending from a top end located at said opening inlet to a bottom end located at the sealed bottom edges of said sidewalls, and attached along one edge thereof to one of said sidewalls and along an opposite edge thereof to another of said sidewalls so as to divide said interior space formed by said sidewalls into two sections, said filter sheet being permeable to a liquid but impermeable to a solid material.

7. A package of filter bags for microbiological examination comprising an outer bag, and a plurality of said filter bags within said outer bag, said package of filter bags having been sterilized, and wherein each of said filter bags comprises opposed sidewalls sealed along the side and bottom edges thereof to form an interior space, and unsealed along the top edges thereof to form an opening inlet, and a filter sheet extending from a top end located at said opening inlet to a bottom end located at the sealed bottom edges of said sidewalls, and attached along one edge thereof to one of said sidewalls and along an opposite edge thereof to another of said sidewalls so as to divide said interior space formed by said sidewalls into two sections, said filter sheet being permeable to a liquid but impermeable to a solid material.

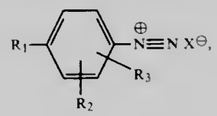
4,892,833

PROCESS AND A REAGENT KIT FOR THE DETERMINATION OF DIRECT AND TOTAL FILIRUBIN

Ludwig Weiss, Munich, and Georg-Erich Hoffman, Grafrath, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,221
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225331
Int. Cl.[4] C01N *33/72*
U.S. Cl. 436—97 13 Claims

1. A process for the determination of bilirubin in body fluids, comprising the steps of
adjusting the pH of a first test solution sample with a buffer to a pH range of 4.3 to 5.7 and thereafter coupling the bilirubin with a diazonium salt of the formula:



(I)

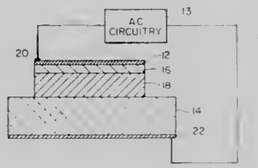
in which R_1 is a hydrogen or halogen atom or a lower alkyl, lower alkoxy or benzolyamino radical, R_2 is a hydrogen atom or a lower alkyl or lower alkoxy radical, R_3 is a hydrogen or halogen atom or a lower alkyl or lower alkoxy radical, whereby R_1 and R_3 do not simultaneously represent halogen atoms, and X is an anion forming a storage-stable salt with the diazonium cation, to determine direct bilirubin; and
adjusting the pH of a second test solution sample to a pH range from 6 to 7 and thereafter coupling the bilirubin with said diazonium salt in the absence of caffeine and sodium benzoate additives, to determine total bilirubin;
determining the difference between total and direct bilirubin as a measure of the amount of indirect bilirubin present.

4,892,834

CHEMICAL SENSOR

R. David Rauh, Newton, Mass., assignor to EIC Laboratories, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 894,285, Aug. 7, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 92,458
Int. Cl.[4] G01N *27/00*
U.S. Cl. 436—149 25 Claims



3. A sensor for detecting a chemical substance comprising an insertion element comprising a compound selected from the group consisting of IRO_2 and HfS_2 having a structure which enables insertion of said chemical substance with a resulting change in the bulk electrical characteristics of said insertion element; and
detecting means for measuring the change in said bulk electrical characteristics as an indication of the presence of said chemical substance.

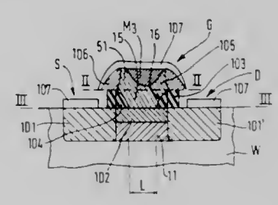
17. A method for detecting a chemical substance comprising the steps of
providing a sensor comprising an insertion element comprising a compound selected from the group consisting of IrO_2 and HfS_2;
contacting said sensor with said chemical substance under conditions sufficient to permit effective insertion, whereupon said chemical substance inserts into the bulk of said insertion element and causes the bulk electrical characteristics of said insertion element to change; and
detecting said change in said bulk electrical characteristics of said insertion element as an indication of the presence of said chemical substance.

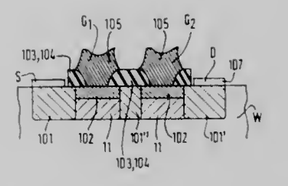
4,892,835

METHOD OF MANUFACTURING A FIELD EFFECT TRANSISTOR

Patrick D. Rabinzohn, Saint-Maurice; Christian Rocher, Sucy-en-Brie, and Serge Gourrier, Lognes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1988, Ser. No. 171,990
Claims priority, application France, Mar. 24, 1987, 87 04072
Int. Cl.[4] H01L *21/265, 21/283, 21/314, 29/80*
U.S. Cl. 437—22 22 Claims





1. A method of manufacturing a field effect transistor semiconductor device comprising the steps of
(a) forming a substrate of a monocrystalline semiconductor material, said substrate having a surface orientated parallel to a crystallographic plane of said semiconductor material,
(b) forming a first layer of a first dielectric material at said surface,
(c) forming at least one first mask on said first layer
(d) etching said first layer relative to said first mask by reactive ion etching to obtain at least one first dielectric area of said first layer having a shape of said first mask, said first mask being disposed on said first dielectric area,
(e) forming a second mask at a spacing around said first dielectric area to expose portions of said substrate through a first opening,
(f) implanting ions into said substrate through said first opening to form source and drain regions of a first conductivity

in said substrate, said source and drain regions having a first resistivity different from a resistivity of said substrate,
(g) removing said second mask,
(h) forming at least one second layer over each of said first layer, said source and drain regions, and said substrate, said second layer being a second dielectric material with a uniform thickness, said uniform thickness of said second layer being at least equal to a thickness of said first dielectric area,
(i) planarizing the semiconductor device to said thickness of said first dielectric area to expose said first dielectric area,
(j) reactive ion etching said first dielectric area down to said substrate to form at least one second opening through said second layer to said substrate,
(k) implanting ions into said substrate through said second opening to form at least one active layer of said first conductivity, said active layer having a second resistivity different from said source and drain regions,
(l) forming first spacers in said second opening at edges of said second layer, said first spacers being made of said second dielectric material, and said first spacers reducing dimensions of said second opening to a length L,
(m) depositing gate metal layer in said at least one second opening to a thickness exceeding said second dielectric material, said gate metal layer extending over said second dielectric material at a uniform thickness, and said gate metal layer having a depression at said second opening,
(n) depositing a further layer over said gate metal layer to a further uniform thickness, said further layer being selected from the group consisting of titanium (Ti) and said first dielectric material,
(o) planarizing said semiconductor device down to said gate metal layer, a portion of said further layer remaining in said depression,
(p) etching said gate metal layer around said portion of said further layer down to said second layer by one of selective reactive ion etching and a beam of ions of a neutral gas, said portion acting as a third mask to form at least one gate electrode having said length L,
(q) forming second spacers on exposed edges of said gate electrode to form a peripheral dielectric part around said gate electrode at right angles to said second layer, said peripheral dielectric part being of said first dielectric material, and
(r) etching said second layer down to said surface of said substrate to expose said source and drain regions and said substrate by selective reactive ion etching, said etching being prolonged to laterally etch under said peripheral dielectric part.

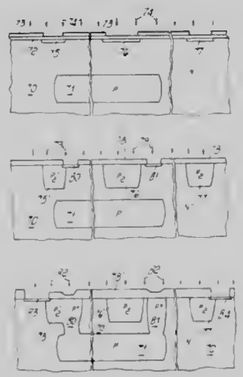
4,892,836

METHOD FOR MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUITS INCLUDING CMOS AND HIGH-VOLTAGE ELECTRONIC DEVICES

Antonio Andreini, Milan; Claudio Contiero, Buccinasco, and Paola Galbiati, Mouza, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Mar. 23, 1987, Ser. No. 28,842
Claims priority, application Italy, Mar. 27, 1986, 19906 A/86
Int. Cl.⁴ H01L *21/70, 21/76*
U.S. Cl. 437—29 **5 Claims**

1. In a method for manufacturing semiconductor integrated circuits comprising a CMOS device and a high voltage electronic device, the CMOS device including an N-channel transistor having a P-well region and said high voltage electronic device having a border region in which an extended border portion is diffused to withstand the high voltage, the only step of simultaneously implanting the P-well region and at least one part of said extended border portion at said border region, by implanting impurities having a P-type conductivity and a pre-



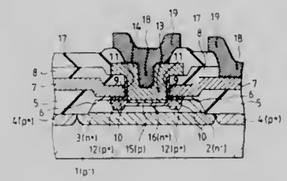
set concentration with a protective mask obtained through a single photolithographic step.

4,892,837

METHOD FOR MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Satoshi Kudo, Maebashi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,032
Claims priority, application Japan, Dec. 4, 1987, 62-308446; Jan. 18, 1988, 63-8134
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—31 **22 Claims**



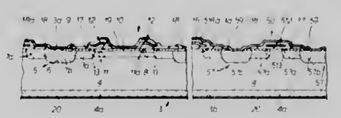
1. A method for manufacturing a semiconductor integrated circuit having a bipolar transistor in which an emitter electrode in led out from a region surrounded by a base electrode, comprising the steps of:
(a) successively forming a first insulating film, a base electrode forming layer including a silicon film as a principal constituent and a second insulating film on a principal surface of a silicon substrate;
(b) patterning said base electrode forming layer by an anisotropic etching process to form a base electrode;
(c) side-etching said first insulating film underneath the end portion of said base electrode on the side thereof which is closer to an emitter electrode forming region which is surrounded by said base electrode by an isotropic etching process to form an under cut portion;
(d) depositing a silicon film on the whole surface of said substrate in such a manner that said undercut portion is filled with said silicon film;
(e) forming said silicon film into a third insulating film except for that part of said silicon film which is buried in said undercut portion;
(f) removing said third insulating film from the emitter electrode forming region by etching to expose the surface of said silicon substrate, the removing of the third insulating film being performed by anisotropic etching; and
(g) forming an emitter electrode on the exposed surface of said silicon substrate.

4,892,838

METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT TRANSISTOR

Carole A. Fisher, Horley, and David H. Paxman, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1988, Ser. No. 197,542
Claims priority, application United Kingdom, Jun. 8, 1987, 8713383
Int. Cl.⁴ H01L *21/425, 29/78*
U.S. Cl. 437—41 **8 Claims**



1. A method of manufacturing a semiconductor device comprising a lateral insulation gate field effect transistor, which method comprises defining an insulated gate structure on a given surface of a semiconductor body having a first region of one conductivity type adjacent the given surface by providing an insulating layer on the given surface having a relatively thin region on a first area of the given surface adjoining a relatively thick region on a second area of the given surface and providing a conductive layer on the insulating layer to define an insulated gate over the first area of the given surface, with the conductive layer extending up onto the relatively thick region of the insulating layer, opening a window in the conductive layer on the relatively thick region of the insulating layer overlying the second area, etching the insulating layer isotropically through the window in the conductive layer to form a window in the relatively thick region of the insulating layer thereby leaving part of the conductive layer overhanging the edge of the window in the insulating layer, selectively etching the conductive layer with at least the area of the conductive layer spaced from the window masked so as to remove the part overhanging the edge of the window in the insulating layer, and introducing impurities into the semiconductor body using the insulated gate structure as a mask to form a source region of the one conductivity type aligned with the insulated gate and a drain region of the one conductivity type spaced from the source region and aligned with the window in the relatively thick region of the insulating layer.

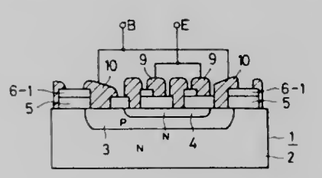
4,892,839

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH POLYSILICON RESISTORS AND FIELD PLATE

Shinichi Ito, and Hirokazu Kaneda, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,533
Claims priority, application Japan, Nov. 28, 1986, 61-283727
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—47 **2 Claims**

1. A method of manufacturing a semiconductor device with polysilicon resistors in which a base of a second conductivity type is provided in a semiconductor substrate of a first conductivity type, said semiconductor substrate of said first conductivity type being a collector, an emitter of said first conductivity type being provided in said base, pn junctions between said collector and said base being exposed on a surface of said semiconductor substrate, and said emitter being provided with low resistance stabilizing resistors, comprising the steps of:
providing a silicon oxide film on said surface of said substrate;
providing a polysilicon film on portions of said silicon oxide film above at least said emitter and said pn junctions between said collector and said base;
providing a resist film on said polysilicon film;
removing a portion of said resist film located above said emitter so that said resist film remains in place above said pn junctions between said collector and said base;



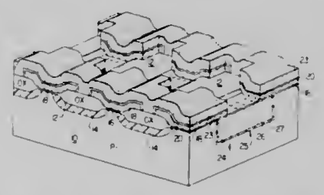
implanting ions having said first conductivity type into the portions of said polysilicon film above said emitter where said resist film has been removed;
heating said polysilicon film to diffuse said ions only into said portion of said polysilicon film above said emitter; and
photoetching said polysilicon film and said silicon oxide film so as to form said low resistance stabilizing resistors above said emitter and high resistance films above said pn junctions between said collector and said base.

4,892,840

EPROM WITH INCREASED FLOATING GATE/CONTROL GATE COUPLING

Agerico L. Esquivel, Dallas, Tex.; Robert Groover, III, Arlington, Va., and Howard L. Tigelaar, Allen, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 96,176, Sep. 11, 1987, which is a continuation-in-part of Ser. No. 844,915, Mar. 27, 1986, Pat. No. 4,698,900. This application Apr. 11, 1989, Ser. No. 336,265
Int. Cl.⁴ H01L *21/269*
U.S. Cl. 437—52 **16 Claims**



1. A method for fabricating a non-volatile memory array, comprising the steps of:
forming a plurality of bit line diffusions overlaid by bit line insulators near the surface of a semiconductor body to define channel regions in said semiconductor body located between said bit line diffusions;
etching away portions of said semiconductor body on opposing sides of said channel regions to define trenches having a depth at least half that of said bit line diffusion;
filling said trenches with a dielectric;
depositing over said semiconductor body and patterning a first insulated conductive layer to form conductive strips;
depositing over said first insulated conductive layer a second insulated conducting layer; and
etching said second conductive layer to form word lines which are not parallel to said bit line diffusions, while also etching away portions of said first conductive layer which

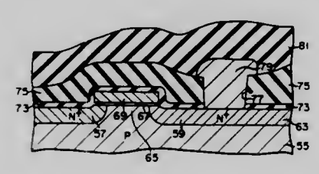
do not underlie portions of said second conductive layer, and etching said first and second layers in a pattern so that at least a portion of said layers overlie said dielectric-filled trenches.

4,892,841

METHOD OF MANUFACTURING A READ ONLY SEMICONDUCTOR MEMORY DEVICE

Taira Iwase, Kawasaki; Shoji Arizumi, Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 942,807, Dec. 22, 1986, abandoned, which is a division of Ser. No. 674,999, Nov. 27, 1984, abandoned. This application Oct. 11, 1988, Ser. No. 256,266
Claims priority, application Japan, Nov. 29, 1983, 58-224921
Int. Cl.⁴ H01L *21/70, 21/00*
U.S. Cl. 437—52 **10 Claims**



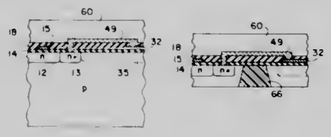
1. A method of manufacturing memory cells in a semiconductor memory device comprising the steps of:
preparing a semiconductor body;
forming MOS transistors, all of said transistors having a gate region, a source region, a drain region, and a gate electrode in said semiconductor body, a completed channel and a field oxide film defining an element region of said semiconductor body on said semiconductor body;
forming a first insulation layer to cover said MOS transistors;
forming a first contact hole for each of the transistors in said first insulation layer so as to extend to the drain region of each said MOS transistors;
forming a polycrystalline silicon layer for each of the transistors over said MOS transistors except over at least a portion of the gate region of said MOS transistors, said silicon layer extending over said field oxide film, but not over the adjacent transistors, and into the first contact hole, and directly contacting the drain region of said MOS transistors;
forming a second insulation layer on at least said polycrystalline silicon layer;
forming a second contact hole in said second insulation film, said second contact hole being formed on a portion of said polycrystalline silicon layer over said field oxide film;
forming a metal wire layer over said MOS transistors except over at least a part of said gate region of said MOS transistors and connected to said polycrystalline silicon layer via said second contact hole to transmit output signals of said MOS transistors; and
implanting ions into the gate region of said MOS transistors through said gate electrode to vary the threshold voltage after said metal wire layer is formed, thereby to write data in said MOS transistors.

4,892,842

METHOD OF TREATING AN INTEGRATED CIRCUIT

Brian L. Corrie, Gaston; Morley M. Blouke, Beaverton, and Denis L. Heidtmann, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 29, 1987, Ser. No. 114,884
Int. Cl.⁴ H01L *21/76, 21/82*
U.S. Cl. 437—67 **11 Claims**



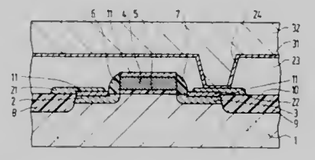
1. A method of treating an integrated circuit formed in a semiconductor die having a front face and a back face, the die having at least two distinct functional regions that are electrically connected together, comprising the steps of:
mounting the die by way of its front face on a support member, and
removing material of the die by way of the back face so as to separate the functional regions of the die from each other without disconnecting the functional regions from each other.

4,892,843

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Johannes E. J. Schmitz; Antonius J. M. Van Dijk, and Russell C. Ellwanger, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 28, 1988, Ser. No. 290,921
Claims priority, application Netherlands, Jan. 29, 1988, 8800221
Int. Cl.⁴ H01L *21/00, 21/02, 21/31, 21/60*
U.S. Cl. 437—192 **14 Claims**



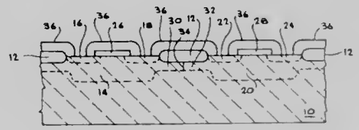
1. A method of manufacturing a semiconductor device comprising the steps of
first forming a first tungsten layer on a substrate by reducing tungsten hexafluoride with silane in the gaseous phase and in the absence of a separate supply of hydrogen gas, said silane having a mole fraction smaller in the supply to the gaseous phase than a mole fraction of said tungsten hexafluoride, and
thereafter forming a further tungsten layer over said first tungsten layer by reducing tungsten hexafluoride with only hydrogen gas.

4,892,844

MAKING A LOW RESISTANCE THREE LAYERED CONTACT FOR SILICON DEVICES

Robin W. Cheung, Cupertino; Bernard W. K. Ho, Fremont; Hsiang-Wen Chen, Cupertino, and Hugo W. K. Chan, Fremont, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 858,994, May 2, 1986, Pat. No. 4,796,081. This application Dec. 16, 1988, Ser. No. 285,188
Int. Cl.⁴ H01L *21/00, 21/02, 21/90, 21/306*
U.S. Cl. 437—194 **8 Claims**



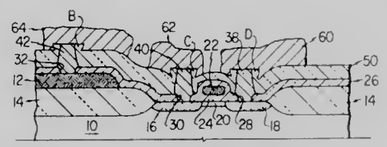
1. A process for forming an improved metal contact to conducting regions of a silicon-based semiconductor device formed on a surface of a silicon substrate, said contact formed through openings in a dielectric layer to said conducting regions underlying said dielectric layer, said process comprising:
(a) forming a composite metal contact comprising
(1) forming a first layer of a refractory metal silicide everywhere on said dielectric layer, including in said openings,
(2) forming a second layer of aluminum on said refractory metal silicide,
(3) forming a top layer of a refractory metal silicide on said layer of aluminum;
(b) patterning said composite contact; and
(c) sintering said composite contact.

4,892,845

METHOD FOR FORMING CONTACTS THROUGH A THICK OXIDE LAYER ON A SEMICONDUCTIVE DEVICE

Jeffrey M. Bridges, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,559
Int. Cl.⁴ H01L *21/316*
U.S. Cl. 437—195 **9 Claims**



1. A method for forming contacts with semiconductor substrates, comprising:
(a) providing a semiconductor substrate;
(b) forming a thin oxide layer on the surface of the substrate;
(c) patterning openings in said thin oxide layer to allow access to desired contact areas thereon;
(d) forming conducting contacts in the formed openings extending upward from the substrate;
(e) depositing a layer of thick oxide on the substrate to cover the thin oxide layer and formed contacts, the height above said substrate of the formed contacts being approximately equal to the thickness of the thick oxide layer; and then
(f) selectively etching the resulting layer to remove only the portion of the thick oxide covering the upper surface of the formed contacts.

4,892,846

REINFORCEABLE SINTERED GLASS-CERAMICS

Philip S. Rogers, Rickmansworth; Rees D. Rawlings, Kingston-upon-Thames, and Hyung S. Kim, London, all of England, assignors to National Research Development Corporation, London, England

Filed Nov. 17, 1988, Ser. No. 272,343
Int. Cl.⁴ C03C *10/04, 10/06*
U.S. Cl. 501—8 **11 Claims**

1. A method of making a ceramic material comprising a primary crystalline phase of diopside and about 5 to 30 weight % anorthite, said method comprising the steps of:
forming a homogeneous glass powder having a composition in parts by weight: $CaO+MgO+Al_2O_3+SiO_2$ totalling 100 in proportions
(0–30):(0–30):(5–35):(35–75) respectively, plus ½–3 Cr_2O_3 or a precursor of Cr_2O_3 to yield ½–3 Cr_2O_3, plus ½–10 Fe_2O_3 or a precursor of Fe_2O_3 to yield ½–10 Fe_2O_3, and of a particle size not exceeding 70 μm; and
heating the powder so as to sinter and crystallize it in the same heating.

4,892,847

LEAD-FREE GLASS FRIT COMPOSITIONS

Barry P. Reinherz, Lawrence, Pa., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1988, Ser. No. 206,250
Int. Cl.⁴ C03C *8/02, 3/064*
U.S. Cl. 501—14 **6 Claims**

1. A lead-free glass frit composition consisting essentially of the following components in the indicated weight percent amounts:
SiO_2: 25–35
Bi_2O_3: 25–43
B_2O_3: 12–25
alkali metal oxide: 4–19
ZrO_2: 0–3
TiO_2: 0–5
ZnO: 0–6
CaO: 0–4
SrO: 0–15
BaO: 0–19
Al_2O_3: 0–4
NO_2: 0–10
WO_3: 0–1
Ce_2O_3: 0–1.5
Cr_2O_3: 0–7
CoO: 0–15
MnO: 0–8
P_2O_5: 0–10
with the amount of ZrO_2+TiO_2 being 0.3–8.

4,892,848

SILICON NITRIDE SINTERED BODY AND PROCESS FOR PREPARATION THEREOF

Makoto Yoshida, and Kiyoshi Yokoyama, both of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jul. 29, 1986, Ser. No. 891,854
Claims priority, application Japan, Jul. 30, 1985, 60-169177
Int. Cl.⁴ C04B *35/58*
U.S. Cl. 264—65 **16 Claims**

16. A process for preparation of a silicon nitride sintered body, which process comprises (i) molding a composition comprising (a) silicon nitride and (b) 2 to 13% by weight of a sintering aid, said sintering aid comprising an oxide or nitride of an element of group IIIa of the Periodic Table and an inorganic oxide capable of forming a liquid phase component having a melting point lower than that of silicon nitride, the inorganic oxide being present in an amount of up to 7% by weight base on the composition, thereby forming a molded body; (ii) sintering the molded body in a non-oxidizing atmosphere at a first temperature within the range of 1650° and

1800° C. and sufficient to form a liquid phase comprising said liquid phase component, thereby forming a sintered body; and (iii) heat-treating the sintered body in a non-oxidizing atmosphere at a second temperature within the range of 1900° and 2000° C., whereby volatilization of the liquid phase component is promoted, said heat-treating being carried out (1) while forcibly substituting non-oxidizing gas in the atmosphere to maintain vapor pressure of the liquid phase component in the atmosphere at a low level to form a final product or (2) so that oxygen content of the surface layer of the final product is lower than 3% by weight.

4,892,849

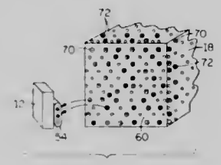
CERAMIC COMPOSITION HAVING LOW FRICTION COEFFICIENT AT HIGH OPERATING TEMPERATURES

James Lankford, Jr., San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 18,627, Feb. 25, 1987, Pat. No. 4,775,548. This application May 26, 1988, Ser. No. 198,936

Int. Cl.[4] C04B *35/48, 35/58*

U.S. Cl. 501—97 **4 Claims**



2. A stable ceramic material having a surface with a low coefficient of friction and a high wear resistance at high operating temperatures comprising:

a composite of a first metal ion selected from the group consisting of cobalt, nickel, titanium, niobium, silver, zinc, copper, zirconium and yttrium, a second metal ion selected from the group consisting of cobalt, nickel, titanium, niobium, silver, zinc, copper, zirconium and yttrium, said first metal ion being different than said second metal ion, and a ceramic composition selected from the group consisting of silicon nitride and zirconia, on a near surface region of said composition, said composite formed by ion mixing of said first metal ion having been ion implanted in said near surface region with said second metal ion having been ion implanted in said near surface region, said composite having been oxidized at high oxidizing temperatures to form an oxide gradient layer in said surface of said ceramic composition.

4,892,850

TOUGH CORUNDUM-RUTILE COMPOSITE SINTERED BODY

Saburo Hori, Tokyo, Japan, assignor to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,532

Claims priority, application Japan, Nov. 7, 1986, 61-265329

Int. Cl.[4] C04B *35/10, 35/46*

U.S. Cl. 501—127 **9 Claims**

1. A corondum-rutile composite sintered body of high toughness consisting essentially of alumina of corundum phase and titania of rutile phase, which contains alkali metal, existing in oxide form, in an amount of about 0.01 to 0.5 wt % and plate-shaped corundum particles whose cross sections having aspect ratios of about 2.5 or more are observed to be about 10 vol % or more by scanning electron microscopy, wherein the content of alumina is about 10 to 90 wt % and the remainder is substantially titania.

4,892,851

PROCESS AND CATALYST FOR PRODUCING SYNDIOTACTIC POLYOLEFINS

John A. Ewen, Houston, and Abbas Razavi, Seabrook, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Jul. 15, 1988, Ser. No. 220,007

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—104 **12 Claims**

1. A metallocene catalyst for use in preparing syndiotactic polyolefins, said catalyst described by the formula $R''(CpR_n)(CpR'_m)MeQ_k$ wherein each Cp is a cyclopentadienyl or substituted cyclopentadienyl ring; each R_n is the same or different and is a hydrocarbyl radical having 1-20 carbon atoms; each R'_m is the same or different and is a hydrocarbyl radical having 1-20 carbon atoms; R'' is a structural bridge between the Cp rings imparting stereorigidity to the catalyst; Me is a group 4b, 5b, or 6b metal from the Periodic Table of Elements; each Q is a hydrocarbyl radical having 1-20 carbon atoms or is a halogen; $0 \leqq k \leqq 3$; $0 \leqq n \leqq 4$; $1 \leqq m \leqq 4$; and wherein R'_m is selected such that (CpR'_m) is a sterically different ring than (CpR_n).

9. The catalyst of claim 1 further comprising an aluminum compound selected from the group consisting of alumoxanes, alkyl aluminums and mixtures thereof.

4,892,852

TRANSITION METAL COMPOSITION

Roy J. Sampson, Guisborough; John W. Kelland, and Frank T. Kiff, both of Middlesborough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 13, 1988, Ser. No. 180,930

Claims priority, application United Kingdom, Apr. 13, 1987, 8708810

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—107 **10 Claims**

1. A transition metal composition which is the reaction product of a compound of a transition metal of Group IVA, VA or VIA of the Periodic Table with a magnesium compound of the general formula

$$Mg_x(R(COO)_y)_z$$

wherein

R is unsubstituted cycloalkyl or cycloalkyl substituted with one or more halogen atoms, alkyl groups containing 1 to 6 carbon atoms, or alkoxy groups containing 1 to 6 carbon atoms; and

x, y and z are integers such that $yz=2x$.

4,892,853

ETHYLENE POLYMERIZATION CATALYST

Kevin J. Cann; Frederick J. Karol, both of Belle Mead, N.J.; Kiu H. Lee, South Charleston, and Arthur E. Marcinkowsky, Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 30, 1988, Ser. No. 251,360

Int. Cl.[4] C08F *4/68*

U.S. Cl. 502—112 **18 Claims**

1. A vanadium catalyst composition comprising:

(i) the reaction product of a vanadium compound and an electron donor, which is a liquid, organic Lewis base in which the vanadium compound is soluble;

(ii) a hydrocarbyl aluminum cocatalyst; and

(iii) a promoter having the following formula;

$$C_3(X)_a(F)_b(H)_c$$

where X is chlorine, bromine, or iodine, and each X can be alike or different

a=an integer from 6 to 8

b=an integer from 0 to 2

c=an integer from 0 to 2

$a+b+c=8$

and wherein the molar ratio of promoter to vanadium has an upper limit of about 4:1, said composition exhibiting enhanced catalytic activity in the polymerization of ethylene alone or together with one or more other alpha olefins.

4,892,854

DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM

Ronald L. Pastorino, Larkspur, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, New York, N.Y.

Filed Jan. 5, 1989, Ser. No. 293,890

Int. Cl.[4] C08J *9/08*

U.S. Cl. 502—160 **27 Claims**

1. An aqueous dispersion for use in foaming and curing polyester resins comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; dispersion stabilizing amounts of magnesium aluminum silicate and alkali metal carboxymethyl cellulose; glycerol; and sufficient water to form an aqueous dispersion.

4,892,855

CATALYST AND METHOD FOR PRODUCING METHANOL FROM HYDROGEN AND CARBON MONOXIDE

Koichi Mizuno, Tsukuba; Masahiro Saito, Kawaguchi; Tadao Takahashi, Kitasoma, and Reize Aizawa, Ushiku, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Aug. 30, 1988, Ser. No. 238,058

Claims priority, application Japan, Nov. 6, 1987, 62-281399

Int. Cl.[4] B01J *27/138*

U.S. Cl. 502—200 **4 Claims**

1. A catalyst comprising a carrier of Li-taeniolite having the formula:

$$LiMg_2LiSi_4O_{10}F_2$$

and a catalytic component including palladium and carried by said carrier.

4,892,856

CATALYST FOR OXIDATION OF ACROLEIN AND PROCESS FOR PREPARATION THEREOF

Tatsuya Kawajiri; Shinichi Uchida, both of Himeji, and Masahiro Wada, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 1, 1988, Ser. No. 201,026

Claims priority, application Japan, Jun. 5, 1987, 62-139663

Int. Cl.[4] B01J *23/22, 23/28*

U.S. Cl. 502—247 **6 Claims**

1. A catalyst for use in the production of acrylic acid by catalytic gas phase oxidation of acrolein, comprising active substances represented by general formula

wherein Mo represents molybdenum, V represents vanadium, A represents at least one element selected from the group consisting of tungsten and niobium, B represents at least one element selected from the group consisting of iron, copper, bismuth, chromium, antimony and thallium, C represents at least one element selected from the group consisting of alkali metals and alkaline earth metals, D represents at least one element selected from the group consisting of silicon, aluminum and titanium, and O represents oxygen; and further, a, b, c, d, e, f and x represents atomic ratios of Mo, V, A, B, C, D, and O respectively, and when a=12, then b=2 to 14, c=0 to 12, d? 0 to 6, e? 0 to 6 and f? 0 to 30 and x is a numerical value determined depending upon the oxidation states of the other elements, and said catalyst being prepared by charging an unfired catalyst material powder into a centrifugal flow coating apparatus to form particles, and firing the particles, wherein said particles are characterized by having a specific surface area of 0.50 to 15.0 m^2/g, a pore volume of 0.10 to 0.90 cc/g and a pore diameter distribution in which the pore diameters are distributed concentratedly in each of the ranges of from 0.1 to less than 1.0 μm, from 1.0 to less than 10.0 μm and from 10.0 to 100 μm.

4,892,857

ELECTRICALLY CONDUCTIVE CERAMIC SUBSTRATE

David L. Tennent, Lindley; Gerald D. Fong, Beaver Dams, and Christine L. Hoaglin, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed May 20, 1987, Ser. No. 52,253

Int. Cl.[4] B01J *35/04*

U.S. Cl. 502—439 **14 Claims**

I. An apparatus for use in a liquid-phase, gas-phase, or mixed-phase reaction consisting essentially of:

(a) a substrate selected from the group consisting of glass, glass-ceramic, ceramic, and a mixture thereof, said substrate further including a transition metal oxide, said substrate having thin walls with open porosity, wherein said thin walls define a plurality of cells extending substantially parallel through said substrate so as to be open at both ends for the flowable passage of liquids and gases;

(b) a first layer formed by diffusing at least a portion of said transition metal oxide to a position integral with the walls of said substrate; and

(c) a second metal-containing layer superposed on said first layer, wherein the combination of said first and second layers forms a substantially continuous conductive film having a resistivity of no greater than approximately 100 ohm-cm.

4,892,858

HEAT SENSITIVE TRANSFER MATERIALS

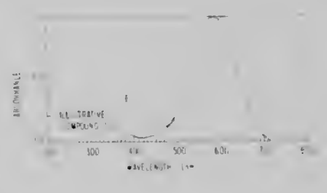
Takeshi Nakamine, and Kozo Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1988, Ser. No. 272,034

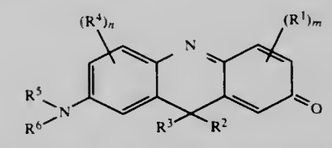
Claims priority, application Japan, Nov. 16, 1987, 62-288971

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **10 Claims**



1. A heat sensitive transfer material comprising a support having provided thereon a layer containing a binder and a dye represented by formula (I)



(I)

wherein R^1 represents an aliphatic group which has from 4 to 10 carbon atoms, an aromatic group which has from 4 to 10 carbon atoms, an acyl group, an acyloxy group, an alkoxycarbonyl group, an acylamino group, a carbamoyl group, a sulfon-

amido group, a sulfamoyl group, an imido group, a urethane group, a ureido group, a sulfonyl group, a hydroxyl group, a cyano group, a carboxyl group, a nitro group or a halogen atom; m represents an integer of from 0 to 3; when $m \geqq 2$ the R^1 groups may be the same of different and may be joined together to form a ring; R^2 and R^3 each independently represents an aliphatic group which has from 1 to 6 carbon atoms or an aromatic group which has from 4 to 10 carbon atoms, and R^2 and R^3 may be joined together to form a ring; R^4 represents a halogen atom, an alkoxy group, an aliphatic group which has from 1 to 6 carbon atoms or an aromatic group which has from 4 to 10 carbon atoms; n represents an integer of from 0 to 3; when $n \geqq 2$ the R^4 groups may be the same or different; and R^5 and R^6 each independently represents a hydrogen atom, an aliphatic group which has from 1 to 6 carbon atoms, or an aromatic group which has from 4 to 10 carbon atoms, R^5 and R^6 may have substituent groups which contain hetero atoms, R^5 and R^6 may be joined together to form a ring, and R^5 and/or R^6 may be joined to R^4 to form a ring.

4,892,859

THERMAL TRANSFER PRINTING

Peter Gregory, Bolton, and Roy Bradbury, Widnes, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 28, 1988, Ser. No. 225,213

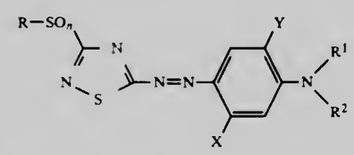
Claims priority, application United Kingdom, Jul. 30, 1987, 8718086; Oct. 2, 1987, 8723150

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] B41M *5/35, 5/26*

U.S. Cl. 503—227 **7 Claims**

1. A thermal transfer printing sheet comprising a substrate having a coating comprising a binder and a dye of the formula:



wherein:

R represents an optionally substituted alkyl, aryl or aralkyl radical;

n is one or 2;

X represents hydrogen, halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-4}-alkylthio, beta-cyanoethyl, C_{1-4}-alkylcarbonylamino or C_{1-4}-alkylsulphonylamino;

Y represents hydrogen or methoxy, and

each of R_1 and R_2 independently, represents allyl, C_{1-12}-alkyl or C_{1-4}-alkyl substituted by a group selected from cyano, C_{1-4}-alkoxycarbonyl, C_{1-4}-alkylcarbonyloxy, R^3CONH—, R^3NHCO— and R^3NHCOO— in which R^3 represents C_{1-4}-alkyl or optionally substituted aryl.

4,892,860

SLIPPING LAYER CONTAINING AMINO-MODIFIED SILOXANE AND ORGANIC LUBRICATING PARTICLES FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Noel R. Vanier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 173,345, Mar. 25, 1988, abandoned. This application Nov. 18, 1988, Ser. No. 273,380

Int. Cl.[4] B41M *5/35, 5/26*

U.S. Cl. 503—227 **20 Claims**

10. In a process of forming a dye transfer image comprising

(a) imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer and on the other side a slipping layer comprising a lubricating material in a polymeric binder, said lubricating material comprising a linear or branched aminoalkyl-terminated poly(dialkyl, diaryl or alkylaryl siloxane), and

(b) transferring a dye image to a dye-receiving element to form said dye transfer image,

the improvement wherein said slipping layer also comprises organic lubricating particles.

4,892,861

LIQUID PHASE SINTERED SUPERCONDUCTING CERMET

Siba P. Ray, Plum Boro, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 14, 1987, Ser. No. 85,959

Int. Cl.[4] C22C *29/12*; H01L *39/12*

U.S. Cl. 505—1 **10 Claims**

1. A method of making a super-conducting cermet having superconducting properties with improved bulk density, low porosity and in situ stabilization comprising the steps of:

(a) forming a structure of

(i) a superconducting ceramic material having the formula $RM_2Cu_3O_{(6.5+x)}$ wherein R is one or more rare earth elements capable of reacting to form a superconducting ceramic, M is one or more alkaline earth metal elements selected from barium and strontium capable of reacting to form a superconducting ceramic, x is greater than 0 and less than 0.5; and

(ii) a precious metal compound in solid form selected from the class consisting of oxides, sulfides and halides of silver; and

(b) liquid phase sintering the mixture at a temperature wherein the precious metal of the precious metal compound is molten and below the melting point of said ceramic material, the liquid phase sintering carried out for a time less than 36 hours but sufficient to improve the bulk density of the cermet.

4,892,862

PROCESS FOR PRODUCING SUPERCONDUCTING MATERIAL

Tetsuya Ogushi; Yoshinori Hakuraku, both of Kagoshima, and Hisanao Ogata, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,097

Claims priority, application Japan, Apr. 13, 1987, 62-88847; May 18, 1987, 62-118844; May 18, 1987, 62-118846; Aug. 21, 1987, 62-206359; Aug. 21, 1987, 62-206360

Int. Cl.[4] H01L *39/24*; C23C *14/34*

U.S. Cl. 505—1 **11 Claims**



1. A process for producing a film of oxide superconducting material represented by the formula:

$$(L_xA_{1-x})_iMO_y \quad (1) \text{ or}$$

$$(L_xA_{1-x})_iM_{i-z}Cu_zO_y \quad (2)$$

wherein L is at least one element selected from the group consisting of Sc, Y, lanthanide elements of atomic numbers 57 to 71, and Li, Na, K, Rb, Cs and Fr belonging to the group Ia of the periodic table; A is at least one element selected from alkaline earth metal elements; M is at least one element selected from the group consisting of V, Nb, Ta, Ti, Zr and Hf; x is $0<x<1$; i is 1, 3/2 or 2; y is $0<y \leqq 3$ in the case of $i=1$, or $0<y \leqq 4$ in the case of $i=3/2$ or 2; and z is $0<z<1$, which comprises

depositing, on a metal film of one element selected from the group consisting of the elements L, A, and M, an oxide of the rest of the elements other than that of the metal film, and

heat treating the metal film and the resulting deposited layer to carry out a diffusion reaction therebetween.

4,892,863

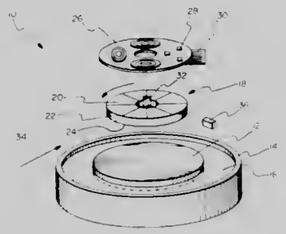
ELECTRIC MACHINERY EMPLOYING A SUPERCONDUCTOR ELEMENT

Ashok K. Agarwala, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,621

Int. Cl.[4] H02K *9/00*

U.S. Cl. 505—1 **29 Claims**



1. A machine comprising:

(a) a superconductor bearing;

(b) a magnetic rotor that can be positioned so that it can levitate and move with respect to the superconductor bearing and producing a first magnetic field; and

(c) a stator comprising an armature winding that is connectible to a source/sink of electrical power to produce a second magnetic field between the stator and the rotor, the first and second magnetic fields capable of interacting so as to create an electromagnetic torque, so that

when the machine is acting as a generator, the electromagnetic torque opposes rotation of the rotor, and

when the machine is acting as a motor, the electromagnetic torque acts in the direction of rotation.

4,892,864

PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING AS AN ACTIVE COMPONENT 10-ACETYL-1,8,9-TRIACETOXY ANTHRACENE

Braham Shroot, Antibes; Gérard Lang, Epinay-sur-Seine, and Jean Maignan, Tremblay les Gonesse, all of France, assignors to Centre International de Recherches Dermatologiques (C.I.R.D.), Valbonne, France

Continuation of Ser. No. 58,324, Jun. 4, 1987, abandoned, which is a continuation of Ser. No. 756,300, Jul. 18, 1985, abandoned. This application Feb. 8, 1988, Ser. No. 153,600

Claims priority, application France, Jul. 19, 1984, 84 11441

Int. Cl.[4] A61K *31/21, 7/06*

U.S. Cl. 514—510 **6 Claims**

1. A pharmaceutical composition for the treatment of eczema, rheumatism, dermatosis, seborrhea, pellicular poll evil, sunburn, psoriasis or warts comprising in a pharmaceutically acceptable carrier from 0.01 to 70 percent by weight, based on the total weight of said composition of 10-acetyl-1,8,9-triacetoxy anthracene as the active component, said composition being in the form of tablets, granules, gelules and capsules.

4,892,865

PYRROLO[2,3-D]PYRIMIDINE NUCLEOSIDES AS ANTIVIRAL AGENTS

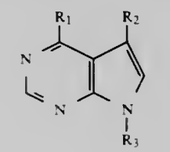
Leroy B. Townsend; John C. Drach, both of Ann Arbor, Mich., and Steven H. Krawczyk, Bellerose, N.Y., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Dec. 1, 1987, Ser. No. 127,487

Int. Cl.[4] A61K *31/52*; C07H *19/14*

U.S. Cl. 514—43 **17 Claims**

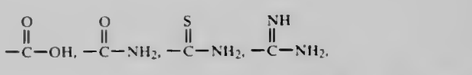
1. The method of treating human cells infected with a virus selected from the group consisting of herpes virus and cytomegalovirus, said method comprising the step of contacting said cells with a composition comprising a therapeutically effective amount of a compound selected from the group consisting of a compound of the following formula and pharmaceutically acceptable salts thereof:



where

R_1 is NH^2 or OH;

R_2 is H, CN,



and

R_3 is 2',3'-dideoxy-2',3'-didehydro-β-D-ribofuranose or 2',3'-dideoxyribofuranose.

4,892,866

STABILIZED PESTICIDAL COMPOSITION

Hansbelmut Itzel, Gau-Algesheim; Manfred Dewenter, Badenheim, and Siegfried Henke, Welgesheim, all of Fed. Rep. of Germany, assignors to Sbell International Research Maatshappij B. V., The Hague, Netherlands

Filed Jul. 22, 1988, Ser. No. 223,078

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726339

Int. Cl.[4] A01N *57/00*

U.S. Cl. 514—119 **4 Claims**

1. A pesticidal composition comprising, as active ingredient, a pesticidally effective amount of dimethoate together with at least one inert carrier therefor, characterized in that the composition contains a stabilizing effective amount of a stabilizer comprising a cyclopropene fatty acid, said stabilizer being selected from the group consisting of malvalic acid, sterculic acid, and oil from seeds of the kapok tree, from *Sterculia* species, from *Durio zibethinus*, from *Gretum gnemon* or from species of the *Malvaceae* family.

4,892,867

ANTIANDROGENIC 17-ALPHA-ALKYL STEROIDS

Rudolf Wiechert; Dieter Bittler; Annerose Schleusener, and Manfred Albring, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

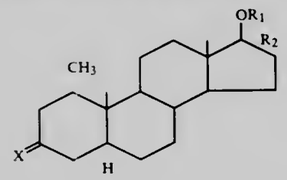
Continuation of Ser. No. 784,121, Oct. 4, 1985, abandoned, which is a division of Ser. No. 620,216, Jun. 13, 1984, Pat. No. 4,558,041, which is a division of Ser. No. 380,328, May 20, 1982, Pat. No. 4,456,600, which is a division of Ser. No. 198,383, Oct. 30, 1980, Pat. No. 4,344,941. This application Oct. 14, 1986, Ser. No. 918,231

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943776

Int. Cl.[4] A61K *31/56;* **C07J** *1/00*

U.S. Cl. 514—178 **22 Claims**

1. A 17α-substituted steroid of the formula



wherein

R_1 is hydrogen, an acyl group of a C_{1-17} hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, C_{1-5}-alkyl or C_{1-5}-alkenyl interrupted by an oxa atom, cyclopentyl or tetrahydropyranyl,

R_2 is C_{3-4}-alkyl, and

X is oxygen or $H(OR_3)$ wherein R_3 is hydrogen, an acyl group of a C_{1-17} hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, cyclopentyl or tetrahydropyranyl.

4,892,868

DERIVATIVES OF BILIARY ACIDS, PROCESS FOR THE PRODUCTION THEREOF AND CORRESPONDING PHARMACEUTICAL COMPOSITIONS

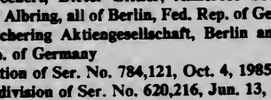
Virginio Castagnola, Milan; E. Giuliano Frigerio, Bresso; Roberto Pellicciari, Perugia, and Aldo Roda, Bologna, all of Italy, assignors to Gipharmex, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 641,741, Aug. 17, 1984, abandoned. This application Jul. 10, 1986, Ser. No. 884,003

Int. Cl.[4] A61K *31/575;* **C07J** *9/00*

U.S. Cl. 514—182 **15 Claims**

1. Compounds of formula I



(I)

wherein:

St represents a 17-ethiocholanyl group, having two or the hydroxy groups both in the α and β conformation, some of which may be replaced by keto groups;

m and n are zero or 1;

when n is 1, R_1 is hydrogen, whereas when n is zero, R_1 is methyl;

X represents hydroxy, OR_3 (where R_3 is a pharmaceutically acceptable cation), taurine or glycine groups of formula $—NH(CH_2)_2SO_3H$ and $—NH—CH_2—COOH$, which may be salified, and stereoisomers thereof.

12. A method for treating hepatobiliary functional disorders which comprises administering to a patient a therapeutically effective amount of the compound of claim 1.

15. A method for treating cholesterol gallstones which comprises administering to a patient a therapeutically effective amount of the compound of claim 1.

4,892,869

2-AZA SUBSTITUTED-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

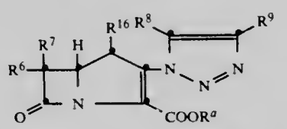
Burton G. Christensen, Cliffside Park; Ronald W. Ratcliffe, Matawan, and John C. Chabala, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 170,577, Mar. 10, 1988, abandoned, which is a continuation of Ser. No. 97,347, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 743,191, Jun. 10, 1985, abandoned. This application Jan. 19, 1989, Ser. No. 300,738

Int. Cl.[4] C07D *457/04;* **A61K** *21/40*

U.S. Cl. 514—210 **7 Claims**

1. A compound of the formula:



wherein R^a is hydrogen, or a pharmaceutically acceptable salt cation or ester group; wherein R^{16} is hydrogen or methyl; wherein R^7 and R^6 are selected from linear, branched or cyclic C_1–C_5 alkyl, which can be substituted with fluoro, hydroxy, protected hydroxy, sulfoxy, amino, protected amino, wherein R^6 and R^7 taken together can also be C_2–C_4 alkylidene, optionally substituted by the above substituents, with the proviso that both R^6 and R^7 are not unsubstituted alkyl, and R^8 and R^9 are independently chosen from H, or lower alkyl, which can be substituted with OH, alkoxy, NH_2, mono- or dialkylamino, $NR^{11}C(X)R^{11}$, N_3, or $R^{10}SO_2O$, phenyl, benzyl, pyridyl, pyridylmethyl, thienyl, or thienylmethyl, which can be substituted with from 1 to 2 of F, Cl, Br, CF_3, OR^{11}, NR_2^{11}, $OCOR^{11}$, or $NR^{11}C(X)R^{11}$, wherein R^8 and R^9 may also be joined to form a ring of 5 or 6 members containing 0 or 1 oxygen or nitrogen atoms.

4,892,870

OXAZA HETEROCYCLES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

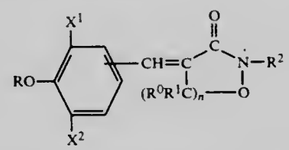
Sung J. Lee, Clarks Summit, Pa., assignor to Biofor, Ltd., Waverley, Pa.

Filed Aug. 1, 1988, Ser. No. 227,572

Int. Cl.[4] C07D *267/04;* **A61K** *31/55, 31/695;* **C07F** *7/08*

U.S. Cl. 514—211 **44 Claims**

1. A compound of the formula:



wherein:

R is a member selected from the group consisting of hydrogen, alkyl, alkanoyl, aroyl, alkoxyalkyl, alkoxycarbonyl, lower alkylaminocarbonyl and di-lower alkylaminocarbonyl;

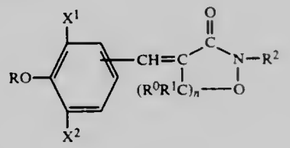
R^0, R^1 and R^2 are the same or different and represent a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower cycloalkyl:

X^1 and X^2 are the same or different and represent a member

selected from the group consisting of teriaryalkyl, trimethylsilyl and trifluoromethyl; and

n is an integer having a value of 1–3; and the nontoxic pharmacologically acceptable salts thereof.

32. A method for treating inflammation in a mammal which comprises administering a safe and effective amount of a compound having the formula:



wherein:

R is a member selected from the group consisting of hydrogen, alkyl, alkanoyl, aroyl, alkoxyalkyl, alkoxycarbonyl, lower alkylaminocarbonyl and di-lower alkylaminocarbonyl;

R^0, R^1 and R^2 are the same or different and represent a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower cycloalkyl;

X^1 and X^2 are the same or different and represent a member selected from the group consisting of tertiaryalkyl, trimethylsilyl and trifluoromethyl; and

n is an integer having a value of 1–3; or a non-toxic pharmacologically acceptable salt thereof.

4,892,871

AZIDO-SUBSTITUTED OCTOPAMINE AGONISTS AND THE USE THEREOF TO CONTROL INVERTEBRATE PESTS

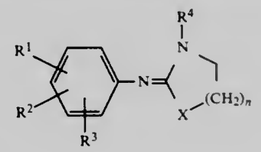
James A. Nathanson, Wellesley, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Apr. 12, 1988, Ser. No. 180,758

Int. Cl.[4] A01N *43/86, 43/50;* **C07D** *233/50*

U.S. Cl. 514—227.2 **14 Claims**

1. An azido-substituted octopamine agonist of the formula:



wherein

R^1 is azido,

R^2 and R^3 are the same or different and selected from the group consisting of hydrogen, azido, hydroxy, fluorine, bromine, chlorine, iodine, nitro, lower (C_1–C_6) alkyl, lower (C_1–C_6) alkoxy, lower haloalkyl, amino, mono-lower alkyl amino, di-lower alkyl amino, hydroxy substituted alkyl amino, lower acyl amino, and R^2 and R^3 may together form a fused ring;

R^4 is hydrogen, lower alkyl or lower alkyl substituted by hydroxy or lower alkoxy;

n=1 or 2;

X is NH, O, CH_2, or S; and

wherein the ratio $K_a^{oct}/K_a^{(Azido)}$ for said azido-substituted octopamine agonist, as determined in a broken cell preparation of the firefly light organ, is greater than 1;

with the proviso that wherein R^2 is fluorine, bromine, chlorine or iodine, then R^3 is selected from the group consisting of hydrogen, nitro, lower (C_1–C_6) alkyl, lower (C_1–C_6) alkoxy, lower haloalkyl, amino, mono-lower alkyl amino, di-lower alkyl amino, hydroxy substituted alkyl amino, and lower acyl amino.

13. A method of controlling an invertebrate pest comprising bringing into contact with said pest an invertebrate pest-controlling amount of the azido-substituted octopamine agonist of claim 1.

4,892,872

BENZOXAZINE COMPOUNDS AND PHARMACEUTICAL USE THEREOF

Tetsuya Tahara; Takeshi Kawakita, both of Oita; Mitsuyoshi Yasumoto, and Takemi Fukuda, both of Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

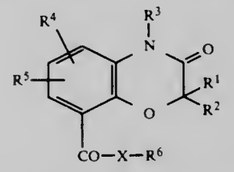
Filed Oct. 24, 1988, Ser. No. 261,067

Claims priority, application Japan, Oct. 22, 1987, 62-267953; Dec. 25, 1987, 62-331259; Jan. 13, 1988, 63-5415

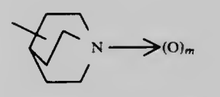
Int. Cl.[4] A61K *31/535;* **C07D** *265/36*

U.S. Cl. 514—230.5 **5 Claims**

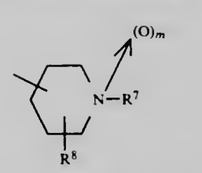
1. A benzoxazine compound of the formula:



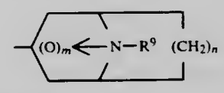
wherein R^1 and R^2 are the same or different, and each represents hydrogen or alkyl: R^3 represents hydrogen, alkyl, phenylalkyl or substituted phenylalkyl; R^4 and R^5 are the same or different, and each represents hydrogen, halogen, alkyl, alkoxy, amino, acylamino, alkylamino, hydroxy or nitro; X represents oxygen or NH; R^6 represents a group of the formula:



wherein m is 0 or 1, a group of the formula;



wherein R^7 represents alkyl, phenylalkyl, phenoxyalkyl, substituted phenylalkyl or substituted phenoxyalkyl, R^8 represents hydrogen or alkoxy and m is as defined above, or a group of the formula:



wherein R^9 represents alkyl, phenylalkyl or substituted phenylalkyl, n is 0 or 1, and m is as defined above, an optical isomer thereof or a pharmaceutically acceptable salt thereof.

4,892,873

N-SUBSTITUTED -N-(3-(1,2,4-TRIAZOLO-(4,3-B)PYRIDAZIN-6-YL)PHENYL)ALKANAMIDES, CARBAMATES AND UREAS

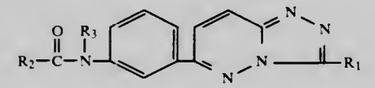
Jay D. Albright, Nanuet, N.Y.; Dennis W. Powell, Greenwich, Conn., and John P. Dusza, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 31,331, Mar. 27, 1987, Pat. No. 4,767,765, which is a division of Ser. No. 793,437, Oct. 21, 1985, Pat. No. 4,654,343. This application Apr. 19, 1988, Ser. No. 183,124

Int. Cl.[4] A61K *31/50*

U.S. Cl. 514—248 **10 Claims**

1. A method of inducing skeletal muscle relaxation in a mammal which comprises administering to said mammal a pharmacologically effective amount of a compound of the formula



wherein R_1 is a hydrogen, alkyl(C_1–C_3), amino, monoalkyl(C_1–C_3)amino, dialkyl(C_1–C_3)-amino, -NHCoalkyl(C_1–C_3) or N-alkyl(C_1–C_3)-CO-alkyl(C_1–C_3); R_2 is hydrogen, alkyl (C_1–C_6), cycloalkyl (C_3–C_6), -O-alkyl(C_1–C_6), -NH-alkyl (C_1–C_3), -N-dialkyl(C_1–C_3), -$(CH_2)_n$-O-alkyl(C_1–C_3), -$(CH_2)_n$-NH-alkyl (C_1–C_3) or -$(CH_2)_n$-N-dialkyl(C_1–C_3), where n is an integer from 1 to 3 inclusive; and R_3 is alkyl(C_1–C_6), —CH_2OCH_3 —$CH_2CH_2OCH_3$.

4,892,874

SYNERGISTIC ANTICANCER COMBINATION

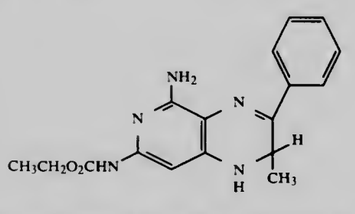
Carroll G. Temple, and Glynn P. Wheeler, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Nov. 4, 1986, Ser. No. 926,559

Int. Cl.[4] A61K *31/50, 31/495, 31/44*

U.S. Cl. 514—249 **9 Claims**

1. A method for the treatment of a mammal afflicted with a tumor comprising administering to said mammal a synergistic combination of an antineoplastically effective amount of a compound having the formula



(1)

or a pharmaceutically acceptable salt thereof and an antineoplastically effective amount of vincristine.

4,892,875

SUBSTITUTED HETEROCYCLYLALKYL ESTERS OF 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACIDS

Kanji Meguro, Nishinomiya, and Akinobu Nagaoka, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

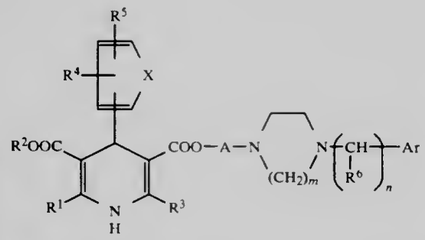
Continuation of Ser. No. 488,663, Apr. 26, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,196

Claims priority, application PCT Int'l Appl., May 10, 1982, PCT/JP/82/00159; Jan. 11, 1983, PCT/JP83/00008

Int. Cl.[4] A61K *31/495;* **C07D** *401/12*

U.S. Cl. 514—253 **15 Claims**

1. A dihydropyridine compound of the formula



(1)

wherein

R^1, R^2 and R^3 are the same or different and each is C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{3-6}-cycloalkyl-C_{1-6}-alkyl, or C_{3-7}-alkoxyalkyl;

R^4 and R^5 are the same or different and each is hydrogen, halogen, nitro, trifluoromethyl, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{2-4}-alkoxycarbonyl or C_{1-3}-alkylthio; R^6 is hydrogen, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, phenyl-C_{1-3}-alkyl optionally substituted on the phenyl ring by halogen, nitro trifluoromethyl, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{1-3}-alkylthio and C_{2-4}-alkoxycarbonyl groups, or phenyl, or naphthyl, wherein the phenyl or naphthyl groups can be optionally substituted by one or two halogen, nitro, trifluormethyl, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{1-3}-alkylthio and C_{2-4}-alkoxycarbonyl groups; A is C_{2-4}-alkylene;

Ar is 2-pyridyl, 3-pyridyl, 4-pyridyl or phenyl or naphthyl which phenyl or naphthyl can be optionally substituted by one or two nitro, trifluoromethyl, halogen, C_{1-6}-alkyl, C_{3-6}-cycloalkyl, C_{1-3}-alkoxy, cyano, C_{1-3}-alkylthio and C_{2-4}-alkoxycarbonyl groups;

m is an integer of 1 to 3 inclusive;

n is an integer of 1 or 2, and

wherein



represents phenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-furyl, 2-thienyl, 2,1,3-benzoxadiazol-4-yl, or 2,1,3-benzothiadiazol-4-yl; or a pharmaceutically acceptable salt thereof.

15. A pharmaceutical composition which comprises, as an active ingredient, an effective antihypertensive amount of a dihydropyridine compound or its salt as defined in claim 1, and a pharmaceutically acceptable carrier or diluent therefor.

4,892,876

METHOD FOR INHIBITING HIV AND AN PHARMACEUTICAL COMPOSITION THEREFOR

Hiroo Hoshino, Machida, and Nobuyoshi Shimada, Tokyo, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

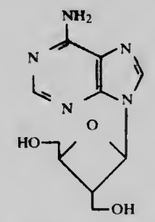
Filed Mar. 24, 1988, Ser. No. 172,637

Claims priority, application Japan, Apr. 21, 1987, 62-98429

Int. Cl.[4] A61K *31/52*

U.S. Cl. 514—265 **2 Claims**

1. A method for inhibiting HIV in human cell in vivo which comprises applying oxetanocin represented by the formula (1)



(1)

or a pharmaceutically acceptable salt thereof to the human cell in a therapeutically effective amount.

4,892,877

ANTITUSSIVE LIQUID COMPOSITIONS CONTAINING PHENOL

James V. Sorrentino, Wilton, Conn., assignor to Richardson-Vicks Inc., Shelton, Conn.

Filed Oct. 27, 1987, Ser. No. 112,922

Int. Cl.[4] A61K *31/485*

U.S. Cl. 514—289 **7 Claims**

1. A liquid pharmaceutical composition of matter for use in the treatment of coughs and associated sore throat, by direct swallowing, comprising, per 5–30 ml dose:

(a) an aqueous-based orally acceptable pharmaceutical carrier;

(b) an effective antitussive amount of dextromethorphan hydrobromide;

(c) from about 10 to about 150 milligrams of phenol; and

(d) from about 5 to about 25 volume/volume percent of co-solvent; said composition having a pH of about 5–9.

4,892,878

OLEIC ACID ESTERS AND PHARMACEUTICAL COMPOSITIONS

Klaus G. Jensen, Frederiksberg, and Peter Bregnedal, Allerod, both of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Nov. 24, 1987, Ser. No. 124,819

Claims priority, application United Kingdom, Dec. 3, 1986, 8628903

Int. Cl.[4] A61K *31/445;* **C07D** *211/52*

U.S. Cl. 514—327 **4 Claims**

1. The oleic acid ester of 4-(4-(4-chlorophenyl)-4-hydroxy-1-piperidinyl)-1-(4-fluorophenyl)-1-butanone, as well as pharmaceutically acceptable acid addition salts thereof.

3. Method for the alleviation of psychic abnormalities in a subject in need thereof comprising the step of parenterally administering to the said subject a neuroleptically-effective amount of a compound of claim 1.

4,892,879

1-SUBSTITUTED-4-(THIAZOLYL-2-)-PIPERAZINES, -PIPERIDINES AND TETRAHYDRO-PYRIDINES USEFUL AS ANXIOLYTIC, PSYCHOSOMATIC, ANTIDEPRESSANT AND ANTIDOPAMINERGIC AGENTS

Dieter Sorg, Bern, Switzerland, assignor to Sandoz Pharm. Corp., E. Hanover, N.J.

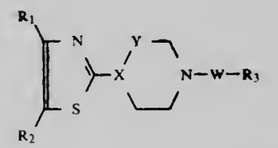
Division of Ser. No. 894,698, Aug. 28, 1986, Pat. No. 4,737,500. This application Feb. 2, 1988, Ser. No. 151,249

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3622354; Jun. 22, 1986, 3621363; Jun. 18, 1986, 3620304; Feb. 24, 1986, 3605860

Int. Cl.[4] A61K *31/433;* **C07D** *417/04*

U.S. Cl. 514—338 **5 Claims**

1. A compound of formula I:



I

wherein

R_1 and R_2 independently are hydrogen, (C_{1-6})alkyl, (C_{3-6})cycloalkyl, (C_{3-6})cycloalkyl(C_{1-3})alkyl, phenyl, phenyl(C_{1-3})alkyl or

R_1 and R_2 signify together trimethylene, tetramethylene or pentamethylene, optionally substituted at the same or different carbon atoms by 1 or 2 methyl groups, or

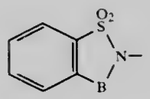
R_1 and R_2 signify together —$(CH_3)_2C$—O—$C(CH_3)_2$—,

R_1 may additionally signify trifluoromethyl;

W is alkylene of 2 to 6 carbon atoms, or alkenylene or alkynylene of 4 to 6 carbon atoms, whereby the unsaturation is not adjacent to the nitrogen atoms;

X—Y is C═CH or CH—CH_2; and

R_3 is a group of formula (f)



(f)

in which B is



where R_4 is hydrogen or (C_{1-4})alkyl, and R_5 is hydrogen, (C_{1-4})alkyl, phenyl or phenyl(C_{1-4})alkyl; or is C═O;

or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition useful in treating anxiety, geriatric disorders, depressions or schizophrenia comprising a pharmaceutically acceptable carrier or diluent and a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable acid addition salt thereof.

4,892,880

PESTICIDAL PYRIDYLTHIADIAZOLES

Odd Kristiansen, Möhlin, and Jozef Drabek, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

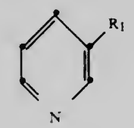
Continuation of Ser. No. 570,711, Jan. 13, 1984, abandoned. This application Jan. 7, 1987, Ser. No. 4,743

Claims priority, application Switzerland, Jan. 19, 1983, 300/83

Int. Cl.[4] C07D *417/04;* A01N *43/40*

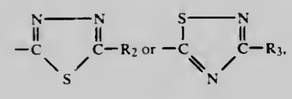
U.S. Cl. 514—342 **5 Claims**

1. A method of combating insects which attack plants, which method comprises applying to said plants or to the locus thereof an insecticidally effective amount of a compound of the formula I



(I)

wherein R_1 is



R_2 is hydrogen and R_3 is hydrogen or C_1–C_4alkyl.

4,892,881

DIHYDROPYRIDINE ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE AGENTS

David Alker, Margate; Simon F. Campbell, Kingsdown, and Peter E. Cross, Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

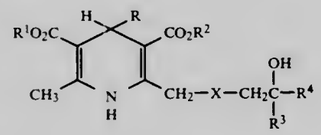
Division of Ser. No. 927,881, Nov. 5, 1986, Pat. No. 4,732,985. This application Nov. 2, 1987, Ser. No. 115,274

Claims priority, application United Kingdom, Nov. 9, 1985, 8527698

Int. Cl.[4] A61K *31/455;* C07D *211/90*

U.S. Cl. 514—356 **7 Claims**

1. A compound of the formula:



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein

R is selected from the group consisting of 2-chlorophenyl, 2,3-dichlorophenyl and 2-chloro-3-trifluoromethylphenyl;

R^1 and R^2 are each independently C_1–C_4 alkyl; X is O or S; R^3 is H or C_1–C_4 alkyl; and R^4 is selected from the group consisting of 1,2,4-triazol-1-ylmethyl, imidazol-1-ylmethyl, azidomethyl, 2,4,5-trimethylimidazol-1-ylmethyl, 3,4-dihydro-4-oxopyrimidin-2-ylthiomethyl, pyrimidin-2-ylthiomethyl; pyrimidin-2-ylaminomethyl, 3,4-dihydro-4-oxopyrimidin-2-ylaminomethyl, 2-aminopyrimidin-4-yloxymethyl, methoxymethyl, 2-furyl, 2-pyridylmethyl, imidazol-2-yl, hydroxymethyl, aminomethyl, 1,2,4-triazol-4-ylmethyl or 2-hydroxyethyl.

4,892,882

CARBAMOYLOXY-ISOXAZOLE DERIVATIVES, THEIR PREPARATION AND INSECTICIDAL COMPOSITIONS CONTAINING THEM

Kazuo Tomita; Tadashi Murakami, both of Hiromachi; Hideakira Tsuji, Shiga; Keigo Matsumoto, Shiga, and Katsuhiro Fujita, Shiga, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

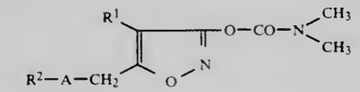
Division of Ser. No. 527,180, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 318,602, Nov. 5, 1981, abandoned. This application Jan. 18, 1985, Ser. No. 692,869

Claims priority, application Japan, Nov. 11, 1980, 55-158550

Int. Cl.[4] A01N *47/18;* C07D *261/12*

U.S. Cl. 514—380 **16 Claims**

1. An insecticidal composition comprising at least one insecticide and a carrier or diluent, wherein the insecticide is at least one compound of formula (I):



(I)

wherein:

R^1 represents a hydrogen atom or a bromine or chlorine atom;

R^2 represents a C_1–C_3, n-alkyl group; and

A represents a sulphur atom.

4,892,883

PHARMACEUTICAL COMPOSITIONS CONTAINING BILOBALIDE FOR THE TREATMENT OF NEUROPATHIES AI

Shyam S. Chatterjee; Benard L. Gabard, both of Karlsruhe, and Hermann E. W. Jaggy, Bad Schonborn, all of Fed. Rep. of Germany, assignors to Willman - Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

Continuation of Ser. No. 134,577, Dec. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 802,539, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 662,598, Oct. 19, 1984, Pat. No. 4,571,407. This application Oct. 11, 1988, Ser. No. 256,233

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1973, 3338995

Int. Cl.[4] A61K *31/36*

U.S. Cl. 514—464 **7 Claims**

1. A pharmaceutical composition useful for the treatment of neuropathic disorders which comprises a combination of flavone glycosides and bilobalide in a pharmaceutical carrier wherein the concentration of bilobalide and flavone glycosides are cooperatively sufficient to alleviate neuropathic disorders.

4,892,884

NOVEL HMG-COA REDUCTASE INHIBITORS

Kent W. Neuenschwander, Ambler, and Anthony C. Scotese, King of Prussia, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

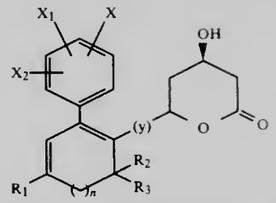
Continuation-in-part of Ser. No. 135,805, Dec. 21, 1987, Pat. No. 4,863,957. This application Dec. 5, 1988, Ser. No. 279,898

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[4] C07D *309/30*

U.S. Cl. 514—460 **19 Claims**

1. A compound of the formula



and pharmaceutically acceptable salts thereof wherein:

Y is: —CHR—,

—CHRCHR—,

—CHRCHRCHR—, or

—RC=CR—, wherein R is H or lower alkyl;

X, X_1 and X_2 are indepently: H, F, Cl, Br, OH, CF_3 alkyl, or alkoxy;

R_1, R_2 and R_3 are independently: H, alkyl, CF_3, aryl; haloaryl and n=0 or 1 .

4,892,885

ESTERS OF (TRIARYLPHOSPHORANYLIDENE)CARBAMIC ACID FOR EFFECTING DIURESIS

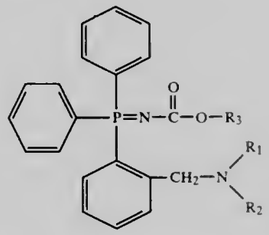
Andrew S. Tomcufcik, Old Tappan; William B. Wright, Jr., Woodcliff Lake, both of N.J., and Walter E. Meyer, Suffern, N.Y., assignors to American Cyanamid Company

Filed Apr. 19, 1988, Ser. No. 183,122

Int. Cl.[4] C07C *125/06;* A61K *31/27*

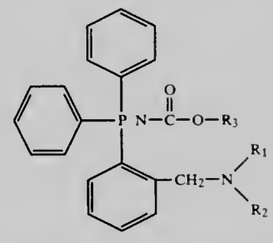
U.S. Cl. 514—478 **9 Claims**

1. A compound of the formula:



wherein R_1 and R_2 may be the same or different and are each individually hyrogen or lower alkyl having from one to four carbon atoms, where lower alkyl may include both straight chain and branched chain alkyl radicals; and R_3 is lower alkyl having from one to four carbon atoms.

8. A method for lowering plasma renin activity in a mammal which comprises administering to the mammal a plasma renin lowering amount of a compound of the formula:



wherein R_1 and R_2 may be the same or different and are each individually hyrogen or lower alkyl having from one to four carbon atoms, where lower alkyl may include both straight chain and branched chain alkyl radicals; and R_3 is lower alkyl having from one to four carbon atoms.

4,892,886

PHENOXYPROPANOLAMINES

Leo Alig, Kaiseraugst, and Marcel Müller, Frenkendorf, both of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 215,195, Jul. 5, 1988, abandoned. This application May 10, 1989, Ser. No. 350,056

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—567 **5 Claims**

1. [p-[2-[[(S)-2-Hydroxy-3-phenoxypropyl]amino]ethyl]-phenoxy]acetic acid or a physiologically compatible salt thereof.

4,892,887

N,N'-BIS(SULFONYL)HYDRAZINES HAVING ANTINEOPLASTIC ACTIVITY

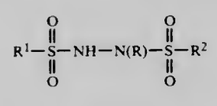
Alan C. Sartorelli, Woodbridge, and Krishnamurthy Shyam, Hamden, both of Conn., assignors to Yale University, New Haven, Conn.

Continuation of Ser. No. 52,493, May 20, 1987, abandoned, which is a division of Ser. No. 810,644, Dec. 18, 1985, Pat. No. 4,684,747, which is a continuation-in-part of Ser. No. 683,852, Dec. 20, 1984, abandoned. This application Aug. 9, 1988, Ser. No. 230,687

Int. Cl.[4] A61K *31/18*

U.S. Cl. 514—601 **14 Claims**

1. A method of inhibiting tumors in host organisms which comprises administering to a said host organism an antineoplastically effective amount of the compound of the formula



where R is selected from the group consisting of methyl and 2-chloroethyl, and $R^1$and R^2, which may be the same or different, are each a C_{1-10} alkyl, phenyl naphthyl moiety, or a ring substituted, phenyl or naphthyl in which the substituent is methyl, ethenyl, methoxy, halo, nitro, or acetylamino.

4,892,888

ANHYDROUS COMPOSITION, STABLE TO OXIDATION, OF ANTHRALIN OR ONE OF ITS DERIVATIVES IN A FATTY ACID ALKYL ESTER AND ITS USE IN THE TREATMENT OF SKIN DISEASES

Jean-Francois Grollier, Paris; Georges Rosenbaum, Asnieres; Josiane Allec, Pierrefitte, and Braham Shroot, Antibes, all of France, assignors to Société Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 435,984, Oct. 22, 1982, abandoned. This application Mar. 31, 1988, Ser. No. 175,602

Claims priority, application France, Oct. 23, 1981, 81 19952; Apr. 5, 1982, 82 05864

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/05*

U.S. Cl. 514—132 **3 Claims**

1. A thickened and stable to oxidation, anhydrous composition for the treatment of diseases of the skin and particularly for psoriasis containing 0.01 to 5% by weight of anthralin in the form of a solution or dispersion of anthralin in a carrier comprising a fatty acid alkyl ester, the fatty acid having from 5 to 18 carbon atoms and the alkyl radical having from 4 to 18 carbon atoms, said fatty acid alkyl ester stabilizing said anthralin, and of 0.1 to 20% by weight of a thickener, said thickener

being a silica having an average particle diameter of less than 30 mμ.

4,892,889
PROCESS FOR MAKING A SPRAY-DRIED, DIRECTLY-COMPRESSIBLE VITAMIN POWDER COMPRISING UNHYDROLYZED GELATIN
Paula S. Kirk, Dearborn Heights, and Dale R. Olson, Riverview, both of Mich., assignors to BASF Corporation, Parsippany, N.J.
Continuation-in-part of Ser. No. 932,164, Nov. 18, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 104,446
Int. Cl.[4] A61K *47/00, 31/07, 31/355, 31/59, 31/015*
U.S. Cl. 514—774 **11 Claims**

1. A process for making a spray-dried vitamin powder suitable for the preparation of direct-compression vitamin tablets, comprising:
(A) combining:
(1) a fat-soluble vitamin; and
(2) a gelatin having a bloom number between 30 and 300; and
(3) a water-soluble carbohydrate; and
(4) an effective amount of water to permit spray-drying; so that a mixture is formed;
(B) spray-drying the mixture in a conventional spray-dryer whereby a directly-compressible powder is formed, the relative amounts of vitamin, gelatin, and carbohydrate in the mixture being selected so that the resulting spray-dried powder comprises:
(1) 20 to 60 percent by weight of the fat-soluble vitamin; and
(2) 6 to 46 percent by weight of the gelatin; and
(3) an effective amount of the carbohydrate to prevent extrusion.

4,892,890
EXTERNAL ANALGESIC COMPOSITIONS
Nalinkant C. Damani, Cincinnati, Ohio, assignor to G. D. Searle and Company, Chicago, Ill.
Continuation-in-part of Ser. No. 667,036, Nov. 1, 1984, abandoned. This application May 5, 1986, Ser. No. 859,594
Int. Cl.[4] A61K *9/00, 9/06*
U.S. Cl. 514—784 **5 Claims**

1. An external analgesic solid stick composition comprising about 10 to 30% by weight of methyl salicylate and about 3 to 16% by weight of menthol incorporated within a non reactive hydrophobic wax matrix comprising
(a) about 5 to 25% by weight of stearic acid, about 5 to 25% by weight of stearyl alcohol, together being about 10 to 30% by weight;
(b) about 10 to 40% by weight of paraffins, esters of long-chain fatty acids having from 10 to 30 carbon atoms, or esters of long-chain fatty alcohols having from 10 to 30 carbon atoms;
(c) about 1 to 25% by weight of polyethylene glycol (PEG) esters;
(d) about 1 to 20% by weight of non-hydroxylic volatile silicones; and
(e) about 3 to 25% by weight of propylene glycol
wherein said composition excludes water and reactive lower alcohols.

4,892,891
NOVEL FOAM COMPOSITIONS
Donald S. Close, Stow, Ohio, assignor to Syn-Coat Enterprises, stow, Ohio
Filed Dec. 2, 1988, Ser. No. 279,408
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—69 **21 Claims**

1. A product obtained by the process comprising reacting polymerizable components which include a polyurethane prepolymer in the presence of a blowing agent, and at least one modifying agent, said modifying agent including portland cement, asphalt, epichlorohydrin, a silicone, or mixtures of at least two of the preceding.

4,892,892
FLAME RETARDANT POLYURETHANE FOAM COMPOSITIONS CONTAINING POLYNUCLEARBROMINATED ALKYLBENZENE
Nicolai A. Favstritsky, Lafayette; Richard S. Rose; Dennis M. Borden, both of West Lafayette, and David J. Honkomp, Lafayette, all of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.
Filed Oct. 9, 1987, Ser. No. 107,627
Int. Cl.[4] C08J *9/00*
U.S. Cl. 521—107 **9 Claims**

1. A flame retardant polyurethane foam composition comprising:
a polyurethane foam; and
as a flame retardant agent, an effective amount of a liquid polynuclearbrominated higher C_{6-18} alkylbenzene containing about 30–70 percent bromine by weight of the agent, with or without a polyaryl phosphate.

4,892,893
FLAME RETARDANT POLYURETHANE FOAMS RESISTANT TO CIGARETTE SMOLDERING IGNITION
Oscar M. Grace, Troy; Theodore M. Smiecinski, Woodhaven, and Steven E. Wujcik, Romulus, all of Mich., assignors to BASF Corporation, Parsippany, N.J.
Filed Feb. 17, 1989, Ser. No. 312,990
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—128 **20 Claims**

1. A flame retardant flexible polyurethane foam which retains its cigarette smoldering resistance after service, comprising the reaction product of (a) a polyoxyalkylene polyether polyol, (b) toluenediisocyanate, (c) a blowing agent, (d) a catalyst, (e) a surfactant, (f) substantially uncrushed melamine, and (g) optionally a flame retardant other than melamine, wherein the concentration of melamine is from about 5 weight percent to about 25 weight percent of the weight of the foam, wherein the density of the foam is from at least 1.2 lbs/ft^3 to about 4 lbs/ft^3, and wherein the melamine has a mean particle size of about 40 μm or more.

4,892,894
PHOTOCOPOLYMERIZABLE COMPOSITIONS BASED ON EPOXY AND HYDROXYL-CONTAINING ORGANIC MATERIALS
Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Chemical and Plastics Company Inc., Danbury, Conn.
Continuation of Ser. No. 794,980, Nov. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 369,835, Apr. 19, 1982, abandoned. This application May 5, 1988, Ser. No. 191,749
Int. Cl.[4] C08G *59/62*
U.S. Cl. 522—31 **1 Claim**

1. A photocopolymerizable composition comprising 3,4-epoxy-cyclohexylmethyl-3,4-epoxycyclohexane carboxylate, a triarylsulfonium salt photoinitiator and a propylene oxide glycerol polyol having a molecular weight of about 2,500 to 4,200, said polyol being present in said composition in an amount of about 10 to about 60 weight percent of the photopolymerizable constituents.

4,892,895
ULTRAVIOLET-CURABLE ORGANOPOLYSILOXANE COMPOSITION
Masatoshi Arai; Shinichi Satoh, and Kazutoshi Fujioka, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1988, Ser. No. 150,166
Claims priority, application Japan, Jan. 30, 1987, 62-19711
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] C08F *2/46*
U.S. Cl. 522—99 **14 Claims**

1. An ultraviolet-curable organopolysiloxane composition which comprises, in admixture:
(A) its first organopolysiloxane having, in a molecule, at least one organosilyl-substituted alkyl group represented by the general formula

$$-(-CH_2-)_a-Si(O-CMe=CH_2)_b(OR)_c(Me)_d,$$

in which Me is a methyl group, R is a monovalent hydrocarbon group free from aliphatic unsaturation, a is 2 or 3, b is 1, 2 or 3 and c and d are each 0, 1 or 2 with the proviso that b+c+d=3;
(B) a second organopolysiloxane having, in a molecule, at least two mercaptoalkyl groups bonded to the silicon atoms in an amount sufficient to provide from 0.1 to 20 moles of mercaptoalkyl groups per mole of the isopropenyloxy groups in the component (A);
(C) an organosilicon compound having at least one vinyl group bonded to the silicon atom in its molecule, in an amount sufficient to provide from 0.01 to 10 moles of vinyl groups per mole of the isopropenyloxy groups in the component (A); and
(D) a photosensitizer in an amount effective to promote the ultraviolet-induced reaction of the components (A), (B) and (C).

4,892,896
PROCESSING POLYIMIDE PRECURSOR COMPOSITIONS
William E. Wright, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Apr. 4, 1988, Ser. No. 179,398
Int. Cl.[4] C08J *3/28*
U.S. Cl. 523—300 **20 Claims**

1. A flowable liquid polyimide precursor composition having a solids content of at least 70% by weight and comprising (a) 25–40 wt % of a diester of an aromatic tetracarboxylic acid (b) 25–50 wt % of 2,2-bis[4-(4-aminophenoxy)-phenyl]hexafluoropropane or 2,2-bis[4-(3-aminophenoxy)phenyl]-hexafluoropropane, (c) 2–20 wt % of a polyamic acid having a weight average molecular weight of about 1500 to about 5000 produced from (a) and (b), and (d) 15–25 wt % of an inert solvent produced by the process comprising:
(1) forming a composition that is viscous liquid at 60° to 80° C. and a non-flowable semi-solid or viscous liquid when cooled by
(i) combining substantially equimolar quantities of component (a) and component (b) in component (d);
(ii) heating the combination of step i) to about 70° to 95° for a time sufficient to react some of component (a) with some of component (b) to form component (c);
(iii) cooling the composition from step (ii) thereby forming said non-flowable semi-solid or liquid polyimide precursor.
(2) Subjecting the polyimide precursor composition of step 1) to microwave radiation of intensity and for a time sufficient to form said flowable liquid polyimide precursor composition but not cause a significant change in the chemical composition of said non-flowable semi-solid or liquid precursor composition.

4,892,897
COATING COMPOSITIONS
Richard P. Redman, Reading, England, assignor to Imperial Chemical Industries PLC, London, England
Filed May 12, 1988, Ser. No. 193,096
Claims priority, application United Kingdom, May 28, 1987, 8712577
Int. Cl.[4] C08K *3/20;* **C08L** *63/00*
U.S. Cl. 523—404 **15 Claims**

1. A coating composition comprising:
(i) a non-gelled amine-expoxide reaction product having units derived from:
(a) at least one secondary amine of formula (1):

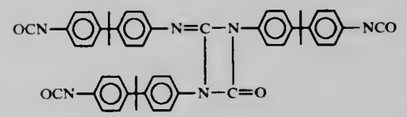
$$R^1R^2NH \quad (1)$$

where R^1 and R^2 are the same or different and are amino- or protected amino-C_{2-6}alkyl, optionally substituted C_{1-18}alkyl or C_{5-8}Cycloalkyl or R^1 and R^2 together with the nitrogen atom to which they are attached represent an optionally substituted five, six or seven membered heterocyclic group where, in each case, the optional substituent is one or more C_{1-4}alkyl groups, C_{1-4}alkoxy groups or hydroxy groups;
(b) optionally a primary amine of formula (2):

$$R^3NH_2 \quad (2)$$

where R^3 is C_{1-18}alkyl or C_{5-8}cycloalkyl optionally substituted with amino, di-C_{1-4}alkylamino, morpholino or piperazino;
(c) units derived from a polyepoxide;
(d) optionally capping units for the polyepoxide;
(e) optionally units derived from a polyoxyalkylene polyamine; and
(f) optionally capping units for the primary amine or for the polyoxyalkylene polyamine, said capping units being derived from a monoepoxide;
(ii) a crosslinker for the amine-epoxide reaction product, the crosslinker being a mixed reaction product derived from a diol and/or a triol; a mixture of 4,4'-diphenylmethane diisocyanate and 4,4'-diphenyl methane diisocyanate uretonimine derivative having the formula (3):

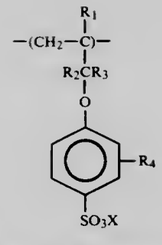
(3)



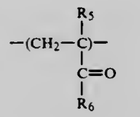
the compound of formula (3) being present in an amount such that the mixture of 4,4'-diphenylmethane diisocyanate and the uretonimine derivative is liquid at room temperature and a mono alcohol or caprolactam; and
(iii) an aqueous carrier for the composition.

4,892,898
WATER SOLUBLE POLYMERS CONTAINING ALLYLOXYBENZENESULFONATE MONOMERS
John C. Leighton, Flanders, and Michael J. Sanders, Flemington, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Continuation-in-part of Ser. No. 944,478, Dec. 19, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,125
Int. Cl.[4] C08K *3/18;* **C08F** *228/02*
U.S. Cl. 524—3 **7 Claims**

1. A water soluble polymer consisting essentially of 1 to 20 mole percent of a recurring monomer unit (A) represented by the chemical structure:



wherein R_1, R_2, R_3, and R_4 are independently hydrogen or C_1–C_6 alkyl; and X is hydrogen, an alkali or alkaline earth metal or ammonium, and 80 to 99 mole percent of a monomer unit (B) represented by the structure



wherein R_5 is hydrogen or C_1–C_6 alkyl;
R_6 is OX' or NR_7R_8;
R_7 and R_8 are independently hydrogen, C_1–C_6 alkyl, or an alkyloxyether or alcohol; and
X' is hydrogen, C_1–C_6 alkyl, hydroxyalkyl, an alkali or alkaline earth metal or ammonium.

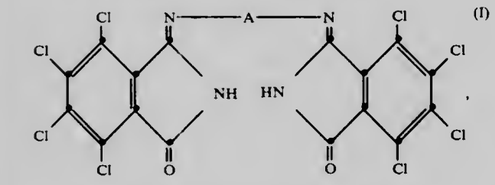
4,892,899

NOVEL COMPOSITIONS BASED ON TETRACHLOROISOINDOLINONE PIGMENTS

Edward E. Jaffe, Wilmington, Del.; Jost von der Crone, Arconciel, and Bernhard Medinger, Giffers, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

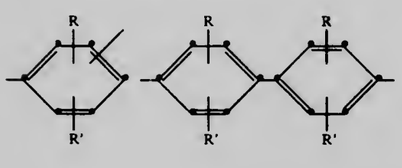
Filed Dec. 8, 1987, Ser. No. 130,245
Int. Cl.[4] C08K *5/34;* **C07D** *209/50*
U.S. Cl. 524—83 **29 Claims**

1. A composition containing
(a) an isoindolinone pigment of the formula I

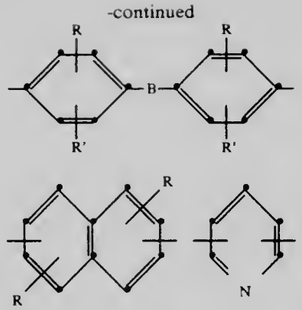


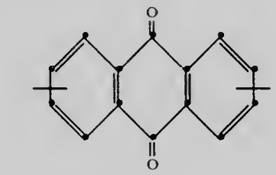
(I)

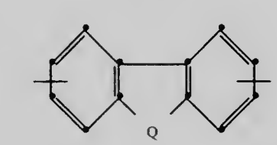
in which A is one of the groups of the formulae

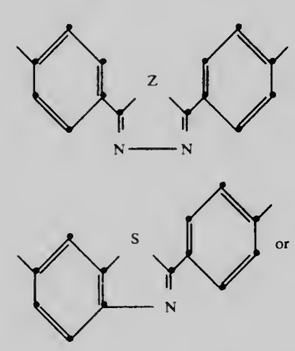


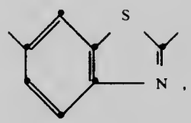
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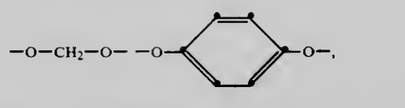






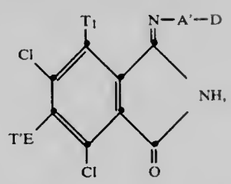


in which B is —O—, —S—, $—SO_2—$, —N=N—, $—CH_2—$, —CH=CH—,



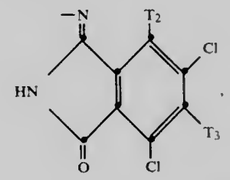
—CONH—, —NHCONH—, or —CONHNHCO—, Q is —O— or —NH— and Z is —O— or —S— and R and R' are independently of each other hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or phenoxy, and

(b) a compound of the formula II



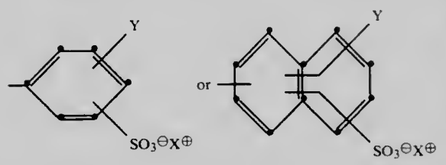
(II)

in which A' is as defined above for A, D is hydrogen, amino or a group of the formula III



(III)

E is —O— or —S—, T_1, T_2 and T_3 independently of one another are chlorine or a group —ET', T' is a group of the formulae



$X^{\oplus}$ is $H^{\oplus}$ or a group of the formulae $M^{n\oplus}/n$ or $N^{\oplus}(R_1)(R_2)(R_3)(R_4)$, $M^{n\oplus}$ is an n-valent metal cation, n is 1, 2 or 3, R_1, R_2, R_3 and R_4 are independently of one another hydrogen, C_1–C_{18}-alkyl, C_5–C_6-cycloalkyl, unsubstituted or C_1–C_{18}-alkyl-substituted phenyl or R_3 and R_4 together with the N atom form a pyrrolidine, imidazolidine, piperidine, piperazine or morpholine radical, or R_2, R_3 and R_4 together with the N atom form a pyrrole, pyridine, picoline, pyrazine, quinoline or isoquinoline radical and Y is hydrogen, halogen, methyl, methoxy or amino.

29. A cellulose ether, cellulose ester, natural resin or synthetic resin containing a composition according to claim 1.

4,892,900

POLYPHENYLENE ETHER RESIN COMPOSITION

Isao Sasaki; Naoki Yamamoto, both of Hiroshima, and Akira Yanagase, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,734
Int. Cl.[4] C08L *51/08;* **C08K** *7/14, 5/52, 3/22*
U.S. Cl. 524—141 **15 Claims**

1. A polyphenylene ether resin composition comprising a polyphenylene ether resin (A), a polystyrene resin (B), and a polyorganosiloxane-based graft copolymer (C) produced by graft polymerizing one or more vinyl monomers onto a polyorganosiloxane rubber which contains a graft-linking agent copolymerized and exhibits a degree of swelling of 3 to 15 measured in toluene.

4,892,901

POLYETHERIMIDE ESTER ELASTOMER

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 31, 1987, Ser. No. 139,912
Int. Cl.[4] C08L *63/06*
U.S. Cl. 524—303 **25 Claims**

1. A polyetherimide ester composition comprising:
(i) as least one polyetherimid ester resin; and
(ii) a modifier composition which is comprised of 0.1 to 2.0 weight percent of triglycidyl isocyanurate.

4,892,902

METHOD FOR PRODUCTION OF AQUEOUS DISPERSION OF INORGANIC PIGMENT

Shobu Shioji, Himeji; Masazumi Sasabe, Kakogawa; Yorimichi Dairokn, Himeji, and Teruaki Fujiwara, Nagaokakyo, all of Japan, assignors to Nippon Shokubai Kagaku, Co., Ltd., Osaka, Japan

Division of Ser. No. 118,311, Nov. 6, 1987, Pat. No. 4,818,783. This application Mar. 27, 1989, Ser. No. 328,687
Claims priority, application Japan, Nov. 7, 1986, 61-263843; Nov. 14, 1986, 61-269775; Nov. 17, 1986, 61-271964; Nov. 21, 1986, 61-276451; Nov. 21, 1986, 61-276452; Apr. 13, 1987, 62-88704
Int. Cl.[4] C08K *3/32;* **C08L** *29/04*
U.S. Cl. 524—417 **10 Claims**

1. A method for the production of an aqueous dispersion by the dispersion of an inorganic pigment in an aqueous medium, which method comprises incorporating in said inorganic pigment as a dispersant (I) 0.1 to 2 parts by weight of a water-soluble condensed phosphate and (II) 0.03 to 1 part by weight of a water-soluble anionic modified polyvinyl alcohol possessing a polymerization degree in the range of 30 to 700 , a saponification degree in the range of 30 to 100 mol%, and an anionic modification degree in the range of 0.5 to 20 mol%, respectively based on 100 parts by weight of said inorganic pigment.

4,892,903

ELASTOMERIC FIBERS, STRUCTURES FASHIONED THEREFROM AND ELASTOMERIC FILMS

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 882,986, Jul. 7, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 87,477
Int. Cl.[4] C08L *25/04, 25/16, 53/02, 91/08*
U.S. Cl. 524—488 **47 Claims**

1. An elastomeric fiber comprising at least one block copolymer comprising at least two polymeric blocks containing predominantly monoalkenyl aromatic hydrocarbon monomer units having a weight-average molecular weight within the range from about 4,000 to about 50,000 and at least one polymeric block containing predominantly conjugated diolefin monomer units which have been hydrogenated so as to saturate at least about 80% of the ethylenic unsaturation in the polymer block after its preparation and having a weight-average molecular weight within the range from about 10,000 to about 200,000, from about 5 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a polymer selected from the Group consisting of homopolymers of anionic polystyrene, homopolymers of α-methylstyrene, hydrogenated polystyrene, and copolymers of α-methylstyrene and styrene, said polymer selected from said group having a weight-average molecular weight within the range from about 1,000 to about 17,000 and from about 0 parts to about 50 parts, by weight, per 100 parts, by weight, of combined block copolymer of a parraffinic and/or microcrystalline wax.

15. A nonwoven structure prepared with an elastomeric fiber comprising at least one block copolymer comprising at least two polymeric blocks containing predominantly monoalkenyl aromatic hydrocarbon monomer units having a weight-average molecular weight within the range from about

4,000 to about 50,000 and at least one polymeric block containing predominantly conjugated diolefin monomer units which have been hydrogenated so as to saturate at least about 80% of the ethylenic unsaturation in the polymer block after its preparation and having a weight-average molecular weight within the range from about 10,000 to about 200,000, from about 5 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a polymer selected from the Group consisting of anionic polystyrene, homopolymers of α-methylstyrene, hydrogenated polystyrene, and copolymers of α-methylstyrene and styrene, said polymer selected from said group having a weight-average molecular weight within the range from about 1,000 to about 17,000 and from about 0 parts to about 50 parts, by weight, per 100 parts, by weight, of combined block copolymer of a paraffinic and/or microcrystalline wax.

29. An elastomeric film comprising at least one block copolymer comprising at least two polymeric blocks containing predominantly monoalkenyl aromatic hydrocarbon monomer units having a weight-average molecular weight within the range from about 4,000 to about 50,000 and at least one polymeric block containing predominantly conjugated diolefin monomer units which have been hydrogenated so as to saturate at least about 80% of the ethylenic unsaturation in the polymer block after its preparation and having a weight-average molecular weight within the range from about 10,000 to about 200,000, from about 5 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a polymer selected from the Group consisting of homopolymers of anionic styrene, homopolymers of α-methylstyrene, hydrogenated polystyrene, and copolymers of α-methylstyrene and styrene, said polymer selected from said group having a weight-average molecular weight within the range from about 1,000 to about 17,000 and from about 0 parts to about 50 parts, by weight, per 100 parts, by weight, of block copolymer of a paraffinic and/or microcrystalline wax.

4,892,904

GLASS-REINFORCED BLENDS OF POLYPHENYLENE ETHER RESIN AND POLYOLEFIN HAVING IMPROVED HEAT DISTORTION TEMPERATURE

Sai-Pei Ting, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 658,476, Oct. 9, 1984, abandoned. This application Jun. 27, 1988, Ser. No. 211,697

Int. Cl.⁴ C08K *3/40;* **C08L** *71/04*

U.S. Cl. 524—494 **25 Claims**

1. A thermoplastic composition comprising a homogeneous admixture of

(a) a polyphenylene ether resin;

(b) a homopolymeric alkenyl aromatic resin, with or without a rubber modifier;

(c) from at least 15 to about 95 parts by weight, based upon 100 parts by weight of (a), (b), (c) and (d) of a polyolefin resin;

(d) an alkenyl aromatic-based copolymer or terpolymer in an amount sufficient to improved the compatibility between components (a) and (c); and

(e) an amount of fibrous glass effective to increase the flexural modulus and the heat distortion temperature of the composition after molding.

4,892,905

ADHESIVE EMULSION

Andre Lepert, Allouville Bellefosse, France; Morris L. Evans, Baton Rouge, La., and Lutz E. Jacob, Wezembeek-Oppem, Belgium, assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 899,185, Aug. 18, 1986, Pat. No. 4,766,169, which is a division of Ser. No. 717,980, Mar. 28, 1985, Pat. No. 4,633,698. This application Feb. 26, 1988, Ser. No. 160,980

Claims priority, application United Kingdom, Mar. 28, 1984, 84-07984

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.⁴ C08J *3/04;* **C08L** *33/02, 57/00*

U.S. Cl. 524—499 **5 Claims**

1. An adhesive emulsion comprising a homogenous mixture of 100 parts by weight carboxylated styrene butadiene polymer and an aqueous emulsion containing about 20 to 150 parts by weight of a resin having a softening point from 10° C. to 80° C., said resin comprising a Friedel-Crafts catalyzed polymerization copolymer of a feed comprising predominantly petroleum cracked distillate C_5 olefins and diolefins and one or more monovinyl aromatic compounds, said resin containing from 10 to 30 wt. % of the monovinyl aromatic compounds.

4,892,906

URETHANE COATING COMPOSITION

Phuog N. Pham, Shorewood, and William E. Michael, Muskego, both of Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1988, Ser. No. 250,275

Int. Cl.⁴ C08L *75/04*

U.S. Cl. 524—730 **14 Claims**

1. A thermosetting coating composition comprising:

(a) an acrylic polyol;

(b) a polyester polyol;

(c) a blend of curing agents; and

(d) a liquid carrier.

4,892,907

FAST ROOM TEMPERATURE VULCANIZING SILICONE ELASTOMERS

Warren R. Lampe, Charlton, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 8, 1988, Ser. No. 282,228

Int. Cl.⁴ C08K *5/24*

U.S. Cl. 524—731 **14 Claims**

1. An organopolysiloxane composition of matter, comprising (i) a polyhydroxylated polysiloxane, (ii) a polyacyloxysilane cross-linking agent therefor, and (iii) a hardening accelerator which comprises a water-in-oil emulsion of water in a polysiloxane stabilized with an organosilicon surface active agent.

4,892,908

RUBBER COMPOSITION AND METHOD FOR MAKING THE SAME

Bojayan Durairaj; Alex P. Peterson, Jr., and Gideon Salee, all of Pittsburgh, Pa., assignors to Indspec Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,395

Int. Cl.⁴ C08L *61/00*

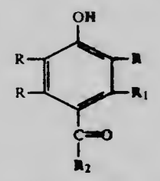
U.S. Cl. 525—160 **7 Claims**

1. A vulcanizable rubber composition comprising

(a) rubber component selected from at least one member of the group consisting of natural rubber, styrene butadiene copolymer rubber, polyisoprene rubber, polybutadiene rubber, acrylonitrile butadiene rubber and polychloroprene rubber,

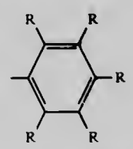
(b) a methylene donor compound which is capable of generating formaldehyde by heating, and

(c) a methylene acceptor selected from at least one compound of the general structural formula



Wherein R may be the same or different radicals selected from the group consisting of hydrogen, alkyl of 1 to about 20 carbon atoms, aryl of about 6 to about 12 carbon atoms, R_1 is —H, —OH, —O—CO—R_3 or —O—R_4 and R_3 and R_4 are each an alkyl or aryl group having 1 to about 12 carbon atoms.

Wherein R_2 is a hydrocarbon radical, saturated or unsaturated of 1 to about 20 carbon atoms, naphthyl or an aromatic radical of the formula



wherein R may be the same or different and is defined as above.

4,892,909

COMPATIBLE STYRENE-METHACRYLATE POLYMER BLENDS

Werner Siol, Darmstadt-Eberstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 233,754

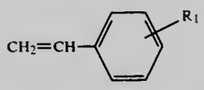
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730026

Int. Cl.⁴ C08L *25/04, 25/06, 33/10*

U.S. Cl. 525—216 **11 Claims**

1. A compatible polymer blend consisting of:

(I) 0.1–99.9% by weight of a polymerisate P1, which is formed from monomers of formula I:



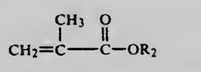
I

wherein R_1 is hydrogen or methyl, and

(II) 99.9–0.1% by weight of copolymerisate P2, which is formed from

(a) 5–40% by weight of cyclohexyl methacrylate

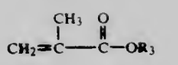
(b) 30–70% by weight of a methacrylic ester of formula II:



II

wherein R_2 is methyl or ethyl,

(c) 10–50% by weight of a methacrylic ester of formula III:



III

wherein R_3 is a hydrocarbon group having 4–18 carbon atoms, and

(d) 0–10 parts by weight of a monomer M which is copolymerizable with monomers of (a)–(c), yet different from these monomers.

4,892,910

POLYMER POWDERS OF LOW FINES CONTENT AND METHOD FOR MAKING THE SAME BY SPRAY DRYING

Wolfgang Klesse, Mainz; Hubert Rauch, Wetterstadt; Peter J. Arndt, Seeheim-Jugenheim, and Norbert Suetterlin, Muehltal-Nieder-Ebersbach, all of Fed. Rep. of Germany, assignors to Gmbh Rohm, Darmstadt, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,808

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723668

Int. Cl.⁴ B01D *1/18;* **C08L** *33/00*

U.S. Cl. 525—221 **7 Claims**

1. Powder grains consisting essentially of aggregated particles of two different polymers (A) and (B), wherein (1) 70 to 99.5 percent by weight of said powder grains comprise particles of polymer (A) having a dynamic glass transition temperature which is above 90° C., said particles of polymer (A) not being sintered together, and (2) 30 to 0.5 percent by weight of said powder grains comprise particles of polymer (B) having a dynamic glass transition temperature from 55° C. to 90° C. and which is at least 10 Centigrade degrees less than the dynamic glass transition temperature of polymer (A), said particles of polymer (B) being sintered to one another and to particles of polymer (A).

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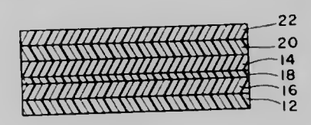
FILMS USING BLENDS OF POLYPROPYLENE AND POLYISOBUTYLENE

Roger P. Genske, Neenah, Wis., assignor to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 803,029, Nov. 29, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,652

Int. Cl.⁴ B29C *47/06;* **B32B** *27/08, 31/30;* **C08L** *23/02*

U.S. Cl. 525—240 **35 Claims**



1. A polymeric film comprising a blend of greater than 65% and up to 90% by weight polypropylene polymer, including polypropylene copolymer, and conversely 10% up to less than 35% by weight polyisobutylene, said polypropylene polymer comprising 70 to 98 sole percent propylene moieties and conversely 30 to 2 mole percent ethylene moieties, said film having been made by a process of:

(a) compounding a masterbatch composition by (i) melting polyisobutylene and a polypropylene polymer or copolymer, to form a melt mixture, and (ii) heating and mixing said melt mixture, to thereby form said masterbatch composition;

(b) making a blend of said masterbatch composition and propylene ethylene copolymer containing no more than 30% mol ethylene, whereby the overall composition of said blend is greater than 65% by weight and no more than 90% by weight polypropylene polymer, and con-

versely at least 10% by weight and less than 35% by weight polyisobutylene; and

(c) feeding said blend into an extruder, processing said blend as a melt in said extruder, and extruding said melted blend through a film forming die to form said film.

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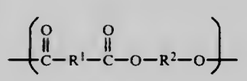
PROCESS FOR PRODUCING AROMATIC POLYESTER

Hideo Hayashi; Hideyn Murai, and Nobuyuki Inaba, all of Sodegaura, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,695
Int. Cl.[4] C08F *20/00*
U.S. Cl. 525—437 **5 Claims**

1. A process for producing aromatic polyester which comprises mixing

5 to 70 mol % (as calculated by converting the repeating unit mentioned below into one molecule) of polyester (A) with the repeating unit represented by general formula (I),



(I)

and 95 to 30 mol % of an acyloxyl aromatic carboxylic acid (B),

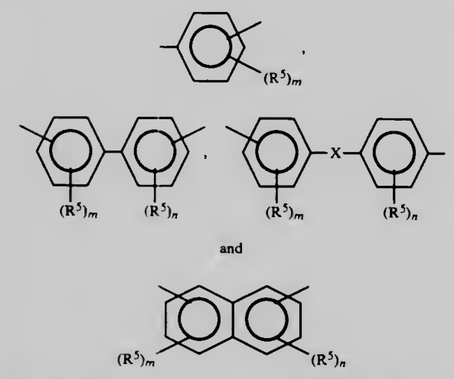
with 0.1 to 20 mol % based on the total amount of (A) and (B), of a diacyloxy aromatic compound (C) represented by general formula (II),



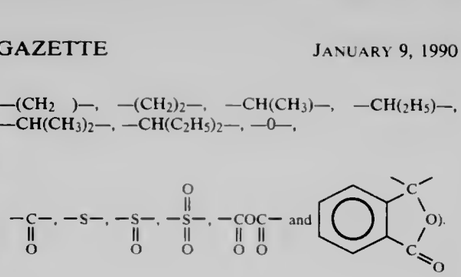
(II)

and reacting the resulting mixture;

wherein R^1 represents an aromatic bivalent radical with 6 to 20 carbon atoms, R^2 is selected from the group of an aliphatic bivalent radical with 2 to 20 carbon atoms, an alicyclic bivalent radical with 4 to 20 carbon atoms, an aromatic bivalent radical with 6 to 20 carbon atoms and poly(alkylene oxide) bivalent radical with a molecular weight of 200 to 8000, R^3 represents an alkyl radical with 1 to 8 carbon atoms, and R^4 is selected from the group of



(wherein R^5 is selected from the group of a hydrogen atom, a halogen atom, an alkyl radical with 1 to 4 carbon atoms and an alkoxy radical with 1 to 4 carbon atoms, m and n are independently an integer of 1 to 4, and X is selected from the group of



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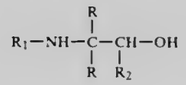
NOVEL CROSSLINKING COMPONENTS CONTAINING BIURET GROUPS FOR CATIONIC PAINT BINDERS

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Aug. 25, 1988, Ser. No. 236,201
Claims priority, application Austria, Aug. 25, 1987, 2116/87
Int. Cl.[4] C08G *18/80*
U.S. Cl. 525—452 **5 Claims**

1. Process for preparing crosslinking components containing biuret groups for use with cationic paint binders containing hydroxyl groups and/or primary or secondary amino groups, comprising reacting —

(A1) beta-hydroxyalkylamines having the formula —



(I)

wherein —

R is a hydrogen atom or an alkyl or hydroxymethyl group,

R_1 is an alkyl, hydroxyalkyl, hydroxypoly(alkoxy) group or a group of formula $—CH_2—CH(R_4)—CO—R_3$,

R_2 is a hydrogen atom, an alkyl group or the residue of a monoepoxide compound after the epoxide group has been reacted with a primary amino group,

R_3 is an alkoxy, hydroxyalkoxy, hydroxypoly(alkoxy) group or $-NH_2$, and

R_4 is a hydrogen atom or a methyl group; or

(A2) beta-hydroxyalkylamines having the formulae —

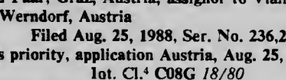
(II)

wherein —

R_5 is a hydrogen atom, an alkyl group, a hydroxy alkyl group, a hydroxy poly(alkoxy) group, a group of the formula $—CH_2—CH(R_4)—CO—R_3$, or the residue of monoepoxide compound after the epoxide group has been reacted with a primary amino group,

R_6 represents an alkylene or poly(alkoxy) group,

or —



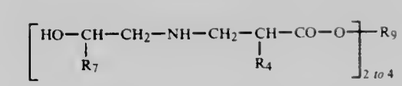
(III)

wherein —

R_7 represents an alkyl group, a hydroxyalkyl or tert-.aminoalkyl group,

R_8 represents an aliphatic and/or aromatic group of a diglycidylether,

or —



(IV)

wherein —

R_9 represents the residue of a polyol with 2 to 4 hydroxyl groups,

with,

(B) isocyanate compounds at 30 to 60° C in a ratio wherein at least one secondary amino group of a beta-hydroxyalkylamine is reacted with an isocyanate group, with the proviso that essentially polyisocyanate compounds are used for the beta-hydroxyalkylamines of group (A1), and essentially monoisocyanate compounds are used for the beta-hydroxyalkylamines of group (A2); and, thereafter, reacting

(C) the NH-groups and any other isocyanate-reactive groups of the reaction product which may be present with 50 to 100 mole- % of a semi-blocked diisocyanate at 20 to 100° C.

4,892,914

CATALYSTS PREPARED FROM TETRAKIS(DIALKYLAMIDE OR DIARYLAMIDE) DERIVATIVES OF TITANIUM AND POLYMERIZATION OF OLEFINS THEREWITH

John G. Hefner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 236,691, Aug. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 126,331, Nov. 30, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 295,855
Int. Cl.[4] C08F *4/64*
U.S. Cl. 526—114 **38 Claims**

1. A process for polymerizing one or more α-olefins or a mixture of one of more α-olefins and one or more polymerizable ethylenically unsaturated monomers which process comprises conducting the polymerization under solution conditions in the presence of

(I) a supported catalyst which comprises the product resulting from mixing in a suitable inert diluent

(A) at least one inorganic support;

(B) at least one metal-containing reducing agent; and

(C) as a transition metal component, at least one transition metal compound comprising a titanium tetrakis(dialkylamide) or titanium tetrakis(diarylamide) or a combination thereof;

wherein in the preparation of the catalyst, all of components (A) and (B) are added prior to the addition of component (C); and

(II) a cocatalyst or activator compound; wherein the components are employed in quantities which provide an atomic ratio of Ms:Tm of from about 2:1 to about 160:1; an atomic ratio of Mc:Tm of from about 1:1 to about 64:1; an atomic ratio of Mr:Tm of from about 1:1 to about 64:1; and wherein Ms represents the metal atoms in the support material, Mc represents the metal atoms in the cocatalyst or activator compound, Mr represents the metal atoms in the reducing agent and Tm represents the sum of the transition metal atoms in the transition metal component.

6. A process of claim 1, 2 or 3 wherein the transition metal component, (C), additionally contains at least one zirconium or hafnium compound selected from a zirconium tetrakis(dialkylamide), a zirconium tetrakis(diarylamide), a hafnium tetrakis(dialkylamide), a hafnium tetrakis(diarylamide), or any combination thereof; wherein the atomic ratio of (Zr+Hf) to (Ti+Zr+Hf) is from about >0:1 to about 0.9:1.

4,892,915

COPOLYMERS OF 2-(2-HYDROXY-5-ACRYLOYLOXYALKYL)PHENYL-2H-BENZOTRIAZOLES

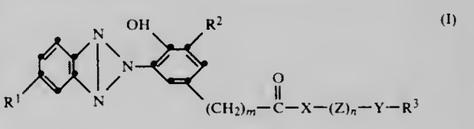
Mario Slongo, Tafers, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 886,934, Jul. 18, 1986, Pat. No. 4,785,063. This application Jul. 13, 1988, Ser. No. 218,188
Claims priority, application Switzerland, Jul. 26, 1983, 4087/83
Int. Cl.[4] C07D *249/16*
U.S. Cl. 526—259 **1 Claim**

1. A copolymer which comprises the copolymerization product of

(a) an ethylenically unsaturated compound, and

(b) a compound of formula I



(I)

wherein

X is —O— or $—N(R^4)—$,

Y is —O— or $—N(R^5)—$,

Z is C_2–C_6-alkylene, 2-hydroxypropylene or cyclohexylene,

m is 2,

n is 1,

R^1 is hydrogen or chlorine,

R^2 is tert-butyl,

R^3 is a $—C(O)—C(R^6)=C(H)R^7$ group, wherein R^6 and R^7 independently of one another are hydrogen or methyl, or

R^3, when Y is $—N(R^5)—$, forms together with R^5 a group $—C(O)—CH=CH—C(O)—$, and

R^4 and R^5 independently of one another are hydrogen or C_1–C_4-alkyl.

4,892,916

POLYMERIC THICKENERS AND THEIR PRODUCTION

Malcolm Hawe, and David Farrar, both of West Yorkshire, England, assignors to Allied Colloids Limited, England

Continuation of Ser. No. 894,343, Aug. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 766,697, Aug. 15, 1985, Pat. No. 4,702,844, and a continuation-in-part of Ser. No. 766,098, Aug. 15, 1985, abandoned. This application Sep. 22, 1987, Ser. No. 99,629
Claims priority, application United Kingdom, Aug. 15, 1984, 8420693; Aug. 15, 1984, 8420694; Aug. 15, 1984, 8420695; Jan. 30, 1985, 8502329; Aug. 12, 1985, 8520218; Feb. 14, 1986, 8603653; Feb. 14, 1986, 8603652; Feb. 14, 1986, 8603651
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] C08L *33/14*; C08F *265/04*
U.S. Cl. 526—304 **37 Claims**

1. A polymer that is substantially non swelling and insoluble in water but soluble or swellable in aqueous acid or alkali, and formed by oil in water emulsion polymerisation of a polymerisable mixture formed by mixing monomers consisting essentially of

(a) 5 to 90% by weight of monolthylenically unsaturated ionic monomer

(b) 5 to 90% by weight of monoethylenically unsaturated substantially non-ionic monomer

(c) 0.5 to 90% by weight of a monoethylenically unsaturated monomer that carries a pendant group $—B_nR$ where B is ethylenoxy, n is zero or a positive integer and R is a hydrophobic hydrocarbyl group of at least 8 carbon atoms

(d) 0 to 0.2% by weight of cross linking monomer, and in which monomer (c) is an allyl ether of the formula $CH_2=CR'CH_2O_nR$ where R' is hydrogen or methyl and in which B, n and R are as defined above and monomer (d)

consists essentially of polyethylenically unsaturated monomer.

4,892,917

ADHESIVE COMPOSITIONS FOR USE ON VINYL SUBSTRATES

Paul R. Mudge, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 9,450, Feb. 2, 1987, Pat. No. 4,753,846. This application Feb. 8, 1988, Ser. No. 153,310
Int. Cl.[4] C08F *20/10*
U.S. Cl. 526—318 **7 Claims**

1. Pressure sensitive adhesive compositions having a Tg of −45° to −25° C. suitable for application to plasticized polyvinyl chloride films consisting essentially of an emulsion polymer of 30–70% by weight of a vinyl ester of an alkanoic acid selected from the group consisting of vinyl formate, vinyl acetate, vinyl propionate, vinyl butyrate, vinyl isobutyrate, vinyl valerate, vinyl-2-ethyl-hexanoate, vinyl isooctanoate, vinylnonate, vinyl decanoate, vinyl pivalate, and vinyl versetate; 10–30% by weight ethylene: 20 to 40% by weight di-2-ethylhexylmaleate or the corresponding fumarate; 1 to 10% by weight of a mono-carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, monoethylmaleate, monobutyl maleate and monooctylmaleate; and 0 to 5% of a copolymerizable comonomer selected from the group consisting of acrylamide, allyl carbamate, N-vinylpyrrolidinone, diallyl adipate, trially/cyanurate, butanediol diacrylate, allyl methacrylic, hydroxyethyl acrylate, hydroxy propyl acrylate, and the corresponding methacrylates.

4,892,918

SECONDARY AMINE TERMINATED SILOXANES, METHODS FOR THEIR PREPARATION AND USE

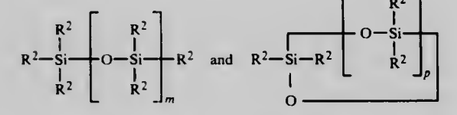
Hong-Son Ryang, Camarillo, Calif., assignor to BASF Corporation, Parsippany, N.J.

Filed May 29, 1987, Ser. No. 55,312
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 **16 Claims**

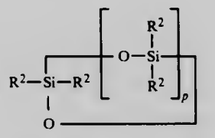
1. A process for the preparation of a secondary amine-functionalized organosilicone, comprising reacting

(a) an N substituted-N-alkenylmonoamine selected from the group consisting of N-aryl-N-alkenyl amines, N-alkyl-N-alkenylamines, N-cycloalkyl-N-alkenyl amines, and N-aralkyl-N-alkenyl amines, wherein the ethylenic unsaturation of said alkenyl amine is located at least two carbon atoms away from the amino nitrogen, with:

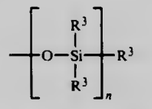
(b) an Si-H functional organosilicone selected from the group consisting of



and



where each R^2 is selected from the group consisting of hydrogen; alkyl; alkoxy; cyanoalkyl; halogenated alkyl; acetoxy; and substituted and unsubstituted cycloalkyl, aryl, and aralkyl; and



wherein m and n are natural numbers from 1 to about 10,000; wherein p is a natural number from 2 to about 20; wherein the sum m+n is less than about 10,000; wherein R^3 is selected from the group consisting of hydrogen; alkyl alkoxy; cyanoalkyl; halogenated alkyl; acetoxy; and substituted and unsubstituted cycloalkyl, aryl, and aralkyl; and wherein at least one of R^2 or R^3 is hydrogen; in the presence of,

(c) a hydrosilation reaction-promoting-catalyst present in an amount effective to catalyze the reaction between (a) and (b).

4,892,919

TEREPHTHALIC CONTAINING HYBRID CASTABLE RESINS

Robert H. Leitheiser, Port Washington, and Joan E. Karloske, Saukville, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Nov. 28, 1988, Ser. No. 276,802
Int. Cl.[4] C08G *18/62*
U.S. Cl. 528—48 **16 Claims**

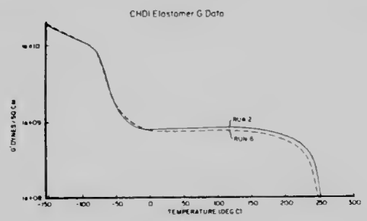
1. A hybrid resin system which comprises an unsaturated polyester polyol, an unsaturated diluent, a diisocyanate and catalysts for promoting the urethane reaction between the polyol and the diisocyanate and the crosslinking reaction between the unsaturated bonds of the urethane and the diluent, the improvement comprising employing a terephthlate containing entity in the preparation of said polyester polyol as the principal aromatic diacid or diester component of said polyol.

4,892,920

PROCESS FOR THE PREPARATION OF CYCLOHEXANEDIISOCYANATE CONTAINING POLYISOCYANATE PREPOLYMERS AND POLYURETHANES HAVING HIGH TEMPERATURE PERFORMANCE

Jeffrey R. Quay, Kutztown, and Jeremiah P. Casey, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 21, 1988, Ser. No. 274,539
Int. Cl.[4] C08G *18/10*
U.S. Cl. 528—61 **12 Claims**



1. In a process for producing a prepolymer suited for producing a polyurethane or polyurethane/urea elastomer wherein an aliphatic diisocyanate selected from the group consisting of cyclohexanediisocyanate or C_{1-4} alkyl-substituted cyclohexanediisocyanates is reacted with a long chain diol to produce a prepolymer and the prepolymer reacted with a diol or diamine chain extender to form a said polyurethane or polyurethane/urea elastomer, the improvement for producing such prepolymer and for enhancing physical properties in the resulting polyurethane or polyurethane/urea elastomer which comprises:

(a) reacting said aliphatic diisocyanate with said long chain diol at a temperature from about 40° to 100° C. and at a mole ratio of aliphatic diisocyanate to long chain diol from 6 to 20:1; and

(b) removing unreacted aliphatic diisocyanate from the reaction product to a level of less than about 0.15% by weight of the prepolymer.

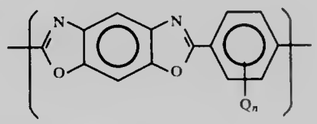
4,892,921

PENDANT BENZAZOLE RIGID-ROD AROMATIC BENZOXAZOLE

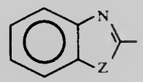
Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 85,094, Aug. 13, 1987, Pat. No. 4,835,246. This application Feb. 21, 1989, Ser. No. 313,766
Int. Cl.[4] C08G *69/00, 73/00, 75/32*
U.S. Cl. 528—183 **5 Claims**

1. An aromatic heterocyclic polymer having repeating units of the formula



wherein n is 1 or 2, and Q is



wherein Z is —O— or —S—.

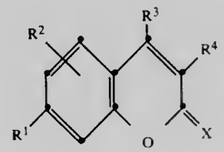
4,892,922

POLYESTER POLYMER CONTAINING THE RESIDUE OF A BENZOPYRAN COLORANT COMPOUND AND SHAPED ARTICLES PRODUCED THEREFROM

Max A. Weaver; Clarence A. Coates, Jr.; Wayne P. Pruett, all of Kingsport, and Samuel D. Hilbert, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 126,315, Nov. 30, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,814
Int. Cl.[4] C08G *63/20, 63/18, 63/16*
U.S. Cl. 528—190 **12 Claims**

1. A composition comprising molding or fiber grade polyester having copolymerized therein or reacted therewith the residue of a benzopyran compound having the formula



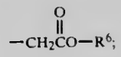
wherein

R^1 is amino or

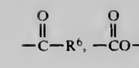


R^2 is hydrogen, alkyl, —O—R^5, or halogen;

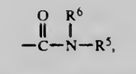
R^3 is hydrogen, an alkyl or aryl radical, or



R^4 is cyano,



carbamoyl,

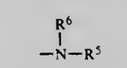


or a carbocyclic or heterocyclic aryl radical; and

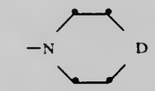
X is oxo or imino; wherein

R^5 is alkenyl or an alkyl, cycloalkyl or aryl radical;

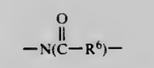
R^6 is hydrogen or an alkyl, cycloalkyl or aryl radical; and



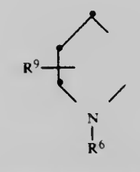
collectively are (1) a group having the structure



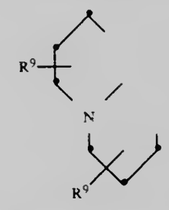
wherein D is $—CH_2—$, —O—, —S—, $—SO_2—$, $—N(R^5)—$,



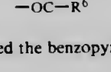
or $N(SO_2—R^6)—$; (2) a divalent group having the structure



which with the carbon atoms of the benzopyran nucleus forms a fused, six-membered ring; or (3) a trivalent group having the structure



which with the carbon atoms of the benzopyran nucleus forms two fused, six-membered rings; wherein R^9 is hydrogen, an alkyl radical, hydroxy, —OR^5,



or halogen; provided the benzopyran compound bears at

least one substituent that is reactive with one of the monomers from which the polyester is derived, said residues absorbing radiation in the range of about 400 to 450 nm and being non-extractable from said polyester and stable under the polyester processing conditions.

4,892,923

POLYESTER COMPOSITIONS CONTAINING THE RESIDUE OF A NAPHTHOPYRAN COMPOUND AND SHAPED ARTICLES PRODUCED THEREFROM

Max A. Weaver; Wayne P. Pruett, both of Kingsport; Samuel D. Hilbert, Jonesborough, and Clarence A. Coates, Jr., Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

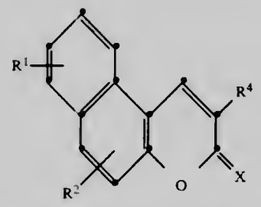
Continuation-in-part of Ser. No. 158,820, Feb. 22, 1988, abandoned. This application Dec. 21, 1988, Ser. No. 287,819

Int. Cl.[4] C08G *63/20, 63/18, 63/16*

U.S. Cl. 528—190 **8 Claims**

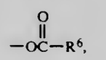
1. A composition comprising molding or fiber-grade polyester having reacted or copolymerized therein the residue of a naphthopyran compound having the formula

(I)

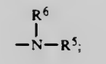


wherein

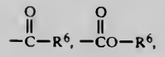
R^1 and R^2 are independently selected from hydrogen, $-R^5$, hydroxy, $-O-R^5$, halogen,



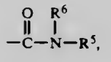
amino or



R^4 is cyano,



carbamoyl,

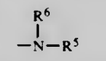


$-SO_2-R^6$, or an unsubstituted or substituted carbocyclic or heterocyclic or homocyclic aryl radical; and

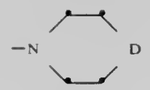
X is oxo or imino; wherein

R^5 is alkenyl or an unsubstituted or substituted alkyl, cycloalkyl or aryl radical;

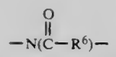
R^6 is hydrogen or an alkyl, cycloalkyl or aryl radical; and



collectively are a group having the structure



wherein D is $-CH_2-$, $-O-$, $-S-$, $-SO_2-$, $-N(R^5)-$,



or $-N(SO_2-R^6)-$; provided the naphthopyran compound bears at least one substituent that is reactive with one of the monomers from which the polyester polymer is derived, said naphthopyran residue absorbing radiation in the range of about 350 to 450 nm and being non-extractable from said polymer and stable under the polymer processing conditions.

4,892,924

POLYCARBONATE CONTAINING COMPOUND FROM BIS(3-PHENYL-4-HYDROXYPHENYL)

Kazuyoshi Shigematsu; Takashi Nakagawa, and Shuji Sakamoto, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 65,305, Jun. 18, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 287,036

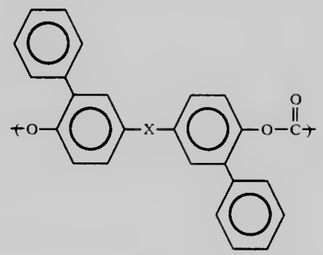
Claims priority, application Japan, Jun. 20, 1986, 61/142842; Jun. 20, 1986, 61/142843; Feb. 20, 1987, 62/37595

Int. Cl.[4] C08G *63/62*

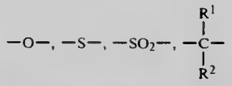
U.S. Cl. 528—196 **12 Claims**

1. A polycarbonate polymer exhibiting improved optical properties consisting essentially of repeating units represented by the following general formula:

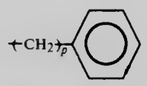
[I]



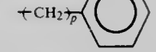
wherein: X is selected from



wherein: R^1 is selected from hydrogen atom; alkyl radicals of 1 to 6 carbon atoms; cycloalkyl radicals of 5 to 6 carbon atoms;



wherein p is an integer having a value of from 0 to 3; phenyl radicals substituted at para position by a substituent selected from alkoxy radicals of 1 to 5 carbon atoms, phenoxy radical, or halogen radicals; or p-biphenylyl radical, and R^2 is selected from hydrogen atom; cycloalkyl radicals of 5 to 6 carbon atoms;



wherein p is an integer having a value of from 0 to 3; phenyl radicals substituted at para position by a substituent selected from alkoxy radicals of 1 to 5 carbon atoms, phenoxy radical, or halogen radicals; or p-biphenylyl radical, $-(CH_2)_q$ wherein q is an integer having a value of from 2 to 10, or



wherein r is an integer having a value of from 4 to 8, and having a reduced viscosity [η sp/c] of at least 0.2 dl/g as measured in methylene chloride at a concentration of 0.5 g/dl at 20° C.

4,892,925

PROCESS FOR PREPARING PHENOLIC HYDROXYL-CONTAINING COMPOUNDS FROM 2,6-DIBROMO-3,5-DIALKYL-4-HYDROXYBENZYL ETHERS

Chun S. Wang, Lake Jackson, Tex.; Abel Mendoza, Midland, Mich., and David B. Fritz, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

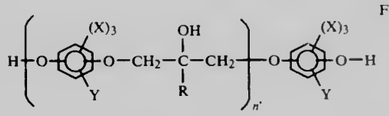
Filed Jan. 23, 1989, Ser. No. 300,460

Int. Cl.[4] C08G *65/38*

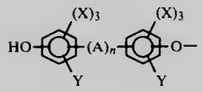
U.S. Cl. 528—219 **8 Claims**

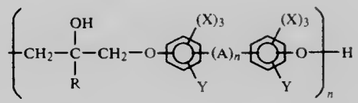
1. A process for preparing phenolic hydroxyl-containing compounds represented by the formulas VII, VIII, IX, X or XI

Formula VII

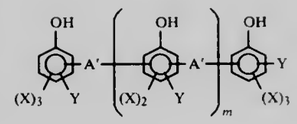


Formula VIII



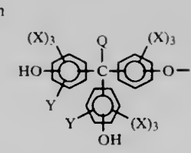


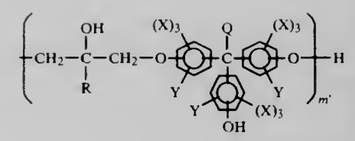
Formula IX



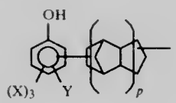
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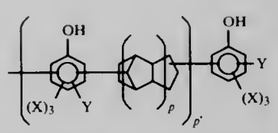
Formula X





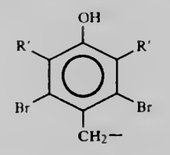
Formula XI





wherein each A is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms; each A' is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each Q is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; each X is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 12 carbon atoms or a halogen atom; each Y is independently hydrogen or a group represented by the following formula XII wherein R' is an alkyl group having from 1 to about 10 carbon atoms with the proviso that at least one Y group is a group represented by formula XII;

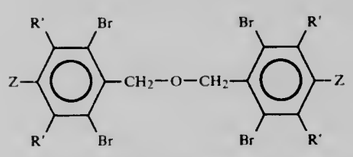
Formula XII



m has an average value from about 0.01 to about 8; m' has an average value from zero to about 10; n has a value of zero or 1; n' has an average value from about zero to about 3; each p has a value from zero to about 10; and each p' has an average value from zero to about 8; which process comprises reacting

(A) one or more 2,6-dibromo-3,5-dialkyl-4-hydroxybenzyl ethers represented by the following formula I

Formula I

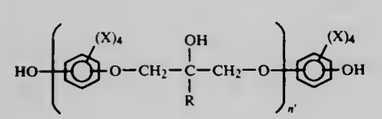


wherein each R' is independently an alkyl group having from 1 to about 10 carbon atoms and each Z is a hydroxyl group; with

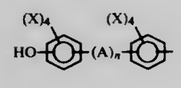
(B) one or more phenolic hydroxyl containing compounds

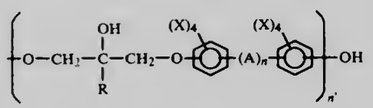
having an average of more than one phenolic hydroxyl group per molecule represented by the following formulas II, III, IV, V or VI

Formula II

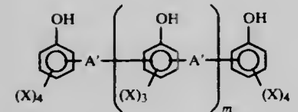


Formula III

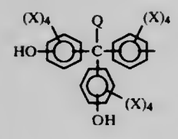


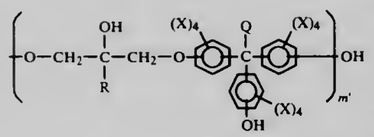


Formula IV

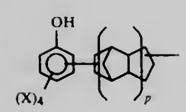


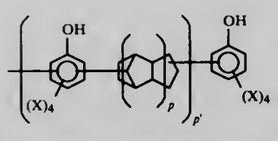
Formula V





Formula VI





wherein each A is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms; each A' is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each Q is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; and each X is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 12 carbon atoms or a halogen atom; and

wherein components (A) and (B) are employed in quantities which provide a ratio of phenolic hydroxyl groups from 2,6-dibromo-3,5-dialkyl-4-hydroxybenzyl ether to aromatic rings from the phenolic hydroxyl containing compound of from about 0.05:1 to about 0.5:1.

4,892,926

THERMOTROPIC LIQUID CRYSTAL POLYESTERS AND A METHOD FOR THEIR PRODUCTION

Jun-ichi Suenaga; Hisayuki Naito, and Singo Sasaki, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Mar. 31, 1988, Ser. No. 175,795

Claims priority, application Japan, Mar. 31, 1987, 62-80454; Apr. 22, 1987, 62-99451

Int. Cl.[4] C08G *63/18, 63/16*

U.S. Cl. 528—305 **4 Claims**

1. A thermotropic liquid crystal polyester consisting essentially of:

(i) an ethylene glycol residue,

(ii) a terephthalic acid residue, and

(iii) a parahydroxybenzoic acid residue wherein the mol ratio of the ethylene glycol residue to the terephthalic acid residue is substantially about 1:1 and the mol ratio of the terephthalic acid residue to the parahydroxybenzoic acid residue is in the range of 15.85 to 22.78, wherein said polyester has an intrinsic viscosity of at least 0.5 dl/g measured in a 50:50 by weight solvent mixture of phenol and 1,1,2,2 -tetrachlorethane at 20° C., and a light transmittance at 530 nm of at least 80% at a light path length of 10 mm measured using a 0.4 wt% solution of said polyester in said solvent mixture.

4,892,927

α-AMINO-ε-CAPROLACTAM-MODIFIED POLYAMIDE OF DICARBOXYLIC ACIDS/DIAMINES

Rolf-Volker Meyer; Rolf Dhein; Michael Dietrich; Heinz Bonten; Hans-Detlef Heinz, all of Krefeld, and Peter-Rolf Müller, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,335

Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714609; Mar. 2, 1988, 3806632

Int. Cl.[4] C08G *69/14*

U.S. Cl. 528—324 **11 Claims**

1. A process for the preparation of aliphatic (co)polyamide by the polycondensation of polyamide-forming, predominantly aliphatic diamine and dicarboxylic acid or salts thereof or polyamide forming amino acid, with or without ω-lactams, characterised in that from 0.02 to 1% by weight of α-amino -ε-caprolactam (ACL) is added to the polyamide forming mixture which is polymerised.

4,892,928

HYDROGENATION PROCESS

Ronald J. Hoxmeier, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1988, Ser. No. 256,537

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—338 **14 Claims**

1. A process for selectively hydrogenating the ethylenic unsaturation in a polymer comprising ethylenic unsaturation and cyano groups comprising the steps of:

(a) contacting a polymer comprising polymerized conjugated diene units having ethylenic unsaturation and cyano groups selected from polymerized nitrile units and grafted cyano compounds with hydrogen in a first suitable solvent, and in the presence of a catalyst prepared by combining one or more palladium carboxylates with one or more aluminum compounds, selected from aluminum hydrides and aluminum alkyls, in a second suitable solvent, which second suitable solvent may be the same or different from said first suitable solvent;

(b) maintaining the contact in step (a) for a sufficient period of time permit conversion of at least a portion of the ethylenic unsaturation contained in said polymer; and

(c) recovering an at least partially hydrogenated polymer.

4,892,929

MELT STABILIZATION OF POLY ARYLENE SULFIDE KETONE

Jon F. Geibel, Bartlesville, Okla.; Roger G. Gaughan, Piscataway, N.J., and Michael D. Cliffton, Kingsport, Tenn., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 16, 1988, Ser. No. 272,620

Int. Cl.[4] C08G *6/00, 75/16*

U.S. Cl. 528—480 **35 Claims**

1. A method to provide a melt stable polymeric resin while simultaneously increasing its molecular weight comprising:

heating a first particulate resin selected from the group consisting of poly(arylene sulfide ketone) and poly(arylene sulfide diketone), while in the presence of a gaseous oxidizing atmosphere, to a temperature at least about 150° C. (302° F.) but below the melting point of said first particulate resin, for time sufficient to produce a second particulate resin, wherein the melt stability of said second particulate resin is superior to that of said first particulate resin, and wherein the molecular weight of said second particulate resin is greater than that of said first particulate resin.

4,892,930

METHOD FOR LOWERING THE MELT CRYSTALLIZATION TEMPERATURE OF AN ARYLENE SULFIDE POLYMER WITH ORGANIC PHOSPHITE COMPOSITION

Yeon F. Liang, Kohler, Wis., assignor to Phillips Petroleum Company, Bartlesville, Okla.

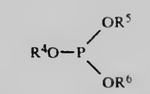
Filed Jul. 29, 1988, Ser. No. 226,029

Int. Cl.[4] C08G *75/16*

U.S. Cl. 528—487 **13 Claims**

1. A process for lowering the melt crystallization temperature (T_{mc}) in an arylene sulfide polymer composition which comprises incorporating in said polymer an effective amount of an organic phosphite selected from the group consisting of

(a) polyol- and glycol-substituted organic phosphites of the formula



where R^4, R^5 and R^6 are the same or different and are alkylene oxide groups having 2 to 6 carbon atoms;

(b) 100 percent polypropoxylated phosphoric acid;

(c) tetraphenyl dipropylene glycolphosphite;

(d) di(stearyl) pentaerythritol diphosphite; and

(e) polymeric tris(nonylphenyl) phosphite.

4,892,931

PURIFICATION OF POLYCARBONATE WITH EXTRACTANT/SWELLING AGENT AND ELEVATED PRESSURE AND TEMPERATURE

Manfred Knerr, Krefeld, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 937,382, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 748,865, Jun. 26, 1985, abandoned. This application May 31, 1988, Ser. No. 204,929

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425125

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—493 **6 Claims**

1. A process for the non-destructive removal of unwanted residual constituents from solid polycarbonate polymer by the application of heat and pressure, comprising the following steps:

(a) adding an extractant to the solid polycarbonate polymer which has no significant dissolving effect on the polymer and which is selected from the group consisting of acetone, methyl ethyl ketone, diethyl ketone, toluene, xylene, ethanol, and super critical carbon dioxide;

(b) changing the morphology of the polymer by swelling to widen the space between the polymeric chains comprising the solid polymer to accelerate the diffusion of unwanted residual constituents into the extractant at elevated pressure and at a temperature in the range from ambient temperature to the glass transition temperature of the polymer;

(c) separating the extractant enriched with residual constituents;

(d) evaporating of the residual extractant together with the residual constituents therein by the application of heat.

4,892,932

METHOD FOR SPRAY DRYING POLYMER EMULSIONS AND SOLUTIONS

Hubert Rauch, Weiterstadt, and Peter J. Arndt, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,381

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807543

Int. Cl.[4] C08J *3/12, 3/16*

U.S. Cl. 528—499 **10 Claims**

1. A method for making a spray dried polymer powder, which method comprises atomizing water and an aqueous dispersion or solution of a polymer in a warm air stream. the amount of water atomized per unit time being smaller than the amount of dispersion or solution, and separating the polymer powder from the warm air stream.

4,892,933

MONOCLONAL ANTIBODY FOR COLORECTAL CARCINOMA

Ronald R. Salem, Brookline; Peter Thomas, Pembroke; Norman Zamcheck, W. Newton, and Gleun Steele, Swampscott, all of Mass., assignors to New England Deaconess Hospital Corporation and Mallory Institute of Pathology Foundation, both of Boston, Mass.

Filed Apr. 20, 1988, Ser. No. 183,831

Int. Cl.[4] C07K *15/00;* **C12N** *5/00*

U.S. Cl. 530—387 **9 Claims**

4. A hybridoma which produces a monoclonal antibody that specifically binds the CC glycoprotein, said glycoprotein having a molecular weight of 160,000 daltons, being found on the surface of undifferentiated colorectal carcinomas cells, and not specifically binding with any of CEA, CA 19.9, alpha-1-acid glycoprotein, NCA, or with blood group substances A, B, and H.

4,892,934

PROCESS FOR PREPARING HYBRIDOMA CELLS WHICH PRODUCE TUMOR-SPECIFIC MONOCLONAL ANTIBODIES

Hajime Yoshida, and Nobuo Hanai, both of Kanagawa, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 709,967, Mar. 11, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 244,601

Claims priority, application Japan, Mar. 12, 1984, 59-46683

Int. Cl.[4] C07K *15/14;* **A61K** *39/395;* **C12N** *15/00*

U.S. Cl. 530—387 **7 Claims**

1. In the process for producing mouse monoclonal antibodies which bind to tumer-associated antigens of human carcinomas selected from the group consisting of lung and stomach carcinomas by immunizing neonatal mice to the antigens from said carcinomas, the improvement which comprises the step of tolerizing said neonatal mice to normal adult cell antigens by the immunization of said mice to normal human adult cell antigens prior to the conventional immunizing of said mice with said cancer antigens to form said mouse monoclonal antibodies.

4,892,935
ANTI-HUMAN PULMONARY CARCINOMA MONOCLONAL ANTIBODY

Hajime Yoshida, Sagamihara, Japan; Nobuo Hansi, Mercer Island, Wash., and Kenya Shitara, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1987, Ser. No. 70,052
Claims priority, application Japan, Jul. 11, 1986, 61-163415
Int. Cl.[4] A61K *39/395;* **C07K** *16/14*
U.S. Cl. 530—387 **3 Claims**

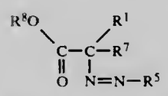
1. An anti-human pulmonary carcinoma antigen specific monoclonal antibody which has the same antigen specificity and binding characteristics as antibodies produced by hybridoma cell line ECACC 86070306, and which belongs to the class IgM, is capable of reacting with human squamous cell lung carcinoma, lung adenocarcinoma and large cell lung carcinoma; is non-reactive with human small cell lung carcinoma and normal human lung cell, and the binding activity of which is substantially unaffected with rabbit anti-β_2 microglobulin antibody, rabbit anti-CEA antibody and rabbit anti-AFP antibody.

4,892,936
PROCESS FOR THE PREPARATION OR α-AZO ESTERS

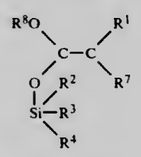
Masato Tanaka, and Toshiyasu Sakakura, both of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 883,808, Jul. 7, 1986, Pat. No. 4,772,714. This application Mar. 23, 1988, Ser. No. 171,976
Claims priority, application Japan, Jul. 8, 1985, 60-149727; Jul. 8, 1985, 60-149728; Jul. 8, 1985, 60-149729
Int. Cl.[4] C07C *107/02, 45/00*
U.S. Cl. 534—595 **7 Claims**

1. A process for the preparation of a α-azo ester of the formula



wherein R^1 and R^7 are each independently a member selected from the group consisting of C_{1-8} alkyl, C_{7-8} aralkyl, C_{6-10} aryl, C_{2-8} alkenyl, C_{3-5} heteroaryl and substituted derivatives thereof in which the substituent is selected from the group consisting of halogen, alkoxy, alkoxycarbonyl, dialkylamino, β-indolyl, dialkoxymethyl, thioalkoxy, nitro and cyano; R^2, R^3, R^4 and R^8 are each a member selected from the group consisting of C_{1-8} alkyl, C_{7-8} aralkyl, and C_{6-10} aryl; R^5 is a member selected from the group consisting of phenyl, chlorophenyl, bromophenyl, nitrophenyl, tolyl, anisyl, formylphenyl, ethoxycarboxylphenyl, dimethoxymethylphenyl, naphthyl, pyridyl, furyl, thienyl and 4,4'-biphenylenyl; and X is a member selected from the group consisting of Cl, HSO_4, NO_3, ClO_4, BF_4, $B(C_6H_5)_4$, PF_6, CH_3CO_2, $\frac{1}{2}ZnCl_4$, $\frac{1}{2}SnCl_6$, $\frac{1}{2}HgCl_4$, $\frac{1}{2}CdCl_4$, $1/3Fe(CN)_6$ and $FeCl_4$, which comprises reacting in a solvent a ketene silyl acetal of the formula



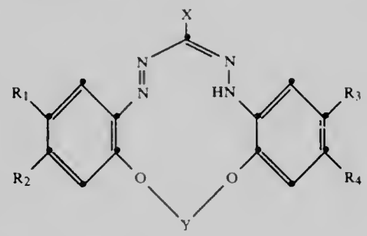
with a diazonium salt of the formula $R^5-N=N-X$.

4,892,937
TETRA-SUBSTITUTED ARYL CYCLIC FORMAZAN DYES

Mary H. Delton, Honeoye Falls, and Shari L. Eiff, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,341
Int. Cl.[4] D06P *50/04;* **G01N** *21/78, 33/20, 33/52*
U.S. Cl. 534—652 **3 Claims**

1. A dye having the structure



wherein

X represents CN or NO_2;

Y represents CH_2CH_2, $CH_2CH_2CH_2$, or $CH_2CH_2—O—CH_2CH_2$; and

R_1, R_2, R_3 and R_4 each independently represent butyl, halogen, alkoxy or NO_2.

4,892,938
METHOD FOR THE RECOVERY OF STEVIOSIDES FROM PLANT RAW MATERIAL

Roger H. Giovanetto, 2220 39 Avenue NE, T2E6P7 Calgary, Alberta, Canada

Filed Jul. 20, 1988, Ser. No. 221,811
Claims priority, application European Pat. Off., Jul. 21, 1987, 87110541.7
Int. Cl.[4] C07G *3/00;* **C07H** *1/06*
U.S. Cl. 536—18.5 **15 Claims**

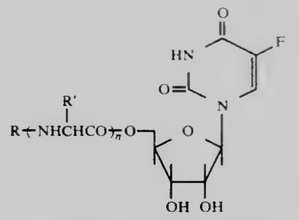
1. A method for recovering steviosides from dried plant material of *Stevia rebaudiana* Bertoni, comprising treating dried plant material of *Stevia rebaudiana* Bertoni by stirring in a solvent consisting of water at a temperature ranging from room temperature to about 65° C., filtering or centrifuging the treated plant material to obtain an aqueous extract, treating the aqueous extract with calcium hydroxide to form a precipitate, filtering and centrifuging the treated extract to separate the precipitate, sequentially treating the separated precipitate three times, first with a strongly acidic ion exchange resin and then with a weakly basic ion exchange resin, and thereafter filtering and drying the treated precipitate to obtain a product containing steviosides without employing any solvents other than water.

4,892,939
OLIGOPEPTIDYL-5-FLUOROURIDINE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Katsumi Sakai, Tokyo; Kiyoaki Chou, and Takeshi Endo, both of Nakaniikawa, all of Japan, assignors to Fuji Kagaku Kogyo Kabushiki Kaisha, Toyama, Japan

PCT No. PCT/JP86/00278, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO87/07276, PCT Pub. Date Dec. 3, 1987
PCT Filed May 30, 1986, Ser. No. 148,507
Int. Cl.[4] C07H *19/06*
U.S. Cl. 536—23 **24 Claims**

1. 5'-O-oligopeptidyl-5-fluorouridine compounds of the general formula:



(I)

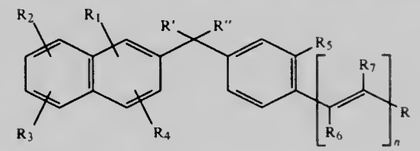
wherein n is an integer of 1 to 3, R' stands for a straight or branched chain alkyl group having 1 to 4 carbon atoms or a benzyl group, and R stands for an amino acid residue selected from the group consisting of alanyl, phenylalanyl, valyl, tyrosyl, 3,4-dihydroxyphenylalanyl and lysyl groups, or pharmacologically acceptable salts thereof.

4,892,940
AROMATIC NAPHTHYL COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN HUMAN AND VETERINARY MEDICINE AND IN COSMETIC COMPOSITIONS

Jean Maignan, Tremblay Les Gonesse; Gérard Lang, Saint Gratien; Gérard Malle, Villiers Sur Morin; Serge Restle, Aulnay-Sous-Boise, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

Filed May 22, 1987, Ser. No. 52,930
Claims priority, application France, May 23, 1986, 86 07405
Int. Cl.[4] C07C *69/80, 43/20;* **A61K** *7/48, 31/19*
U.S. Cl. 536—55.2 **28 Claims**

1. An aromatic naphthyl compound having the formula



(I)

wherein

n is 0 or 1,

R' represents hydrogen, OH, acyloxy, lower alkoxy or NH_2,

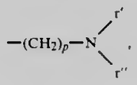
R'' represents hydrogen or lower alkoxy or R' and R'' taken together from an oxo radical, a methano radical or a hydroxyimino radical,

R represents $—CH_2OH$ or $—COR_8$,

R_8 represents hydrogen, $—OR_9$ or



R_9 represents hydrogen, linear or branched alkyl having 1–20 carbon atoms, mono or polyhydroxy alkyl, aryl, aryl substituted by halogen, hydroxy or nitro, aralkyl, the residue of a sugar or a radical having the formula



p is 1,2 or 3,

r' and r'' each independently represent hydrogen, lower alkyl, monohydroxyalkyl, monohydroxyalkyl interrupted by a heteroatom, polyhydroxyalkyl, aryl, aryl substituted by halogen, hydroxy or nitro, benzyl, the residue of an amino acid or the residue of an aminated sugar, or r' and r'' taken together form a heterocycle,

R_1, R_2, R_3 and R_4 each independently represent hydrogen, lower alkyl, alkoxy having 1–4 carbon atoms, lower fluoroalkoxy, CF_3, cycloalkyl. lower acyl, halogen, OH, amino, lower acylamino or lower alkoxy carbonyl,

the substituents R_1 to R_4 being able to be distributed on one of the two rings or on both at the same time,

R_5, R_6 and R_7 represent hydrogen or methyl or when n = 1, R_5 and R_7 taken together can form with the benzene ring a naphthalene ring, and

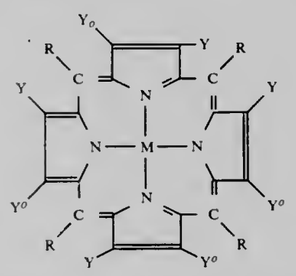
the salts of said compound of formula I or its geometric or optical isomers.

4,892,941
PORPHYRINS

David H. Dolphin, 4464 West 12th Avenue, Vancouver, British Columbia, Canada V6R 2R2 ; Taku Nakano, 950 Sata, Tamaki-cho, Watarai-gun, Mie-Ken 519-04, Japan (0596582524); Thomas K. Kirk, 7814 Oxtrail Way, Verona, Wis. 53593; Tilak P. Wijesekera, 2902 E. 54th Avenue, Vancouver, B.C., Canada V5S 1Y5 ; Roberta L. Farrell, 177 Hobart St., Danvers, Mass. 01923, and Theodore E. Maione, 153 Thoreau St., Apt. 2, Concord, Mass. 01742

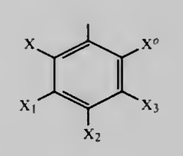
Continuation-in-part of Ser. No. 39,566, Apr. 17, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 181,859
Int. Cl.[4] C07D *487/22*
U.S. Cl. 540—145 **28 Claims**

1. A compound of the formula:



I

wherein M is a transition metal capable of sustaining oxidation, said M being optionally axially ligated to a ligand, each Y and Y^o independently H, fluoro or chloro, each R ring is



X and X^o are independently H or a non-water solubilizing electronegative group, and X_1, X_2 and X_3 are independently H or an electronegative group, subject to the provisos that:

(1) when none of X_1, X_2 and X_3 is in a water solubilizing group, then at least one of Y and Y^o on each porphyrin ring is other than H,

(2) when Y and Y^o are both H, at least one but not more than two of X_1, X_2 and X_3 is water solubilizing group and at least two of X, X^o, X_1, X_2 and X_3 is a non-water solubilizing electronegative group, or the water soluble salts thereof in which said water solubilizing groups are in corresponding water soluble salt form,

(3) no more than two of X_1, X_2 and X_3 is a water solubilizing group,

or a compound of the formula I in which the water solubilizing groups are in water soluble salt form.

4,892,943

1-CARBACEPHALOSPORIN ANTIBIOTICS

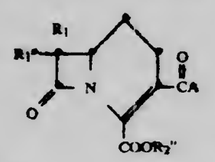
John E. Nouvee, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 66,900, Jun. 26, 1987, Pat. No. 4,793,196, which is a continuation-in-part of Ser. No. 894,943, Dec. 30, 1985, abandoned. This application Aug. 24, 1988, Ser. No. 236,090

Int. Cl.[4] C07D 205/08

U.S. Cl. 540—205 **7 Claims**

1. The compound of the formula

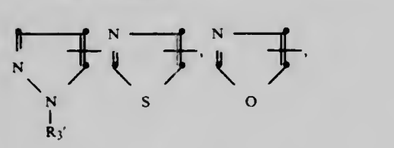


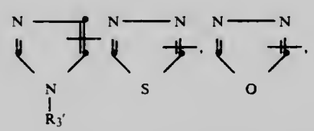
wherein

R_1' is amino or a protected amino group, R_1 is hydrogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, or formamido; R_2'' is hydrogen or a carboxy-protecting group; and

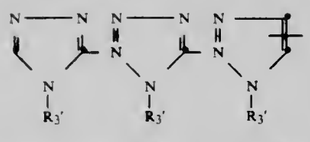
A is hydroxy, halo, azido, 2-(tri-C_1–C_4 alkylsilyl)ethoxy, C_1–C_6 alkoxy, C_2–C_6 alkenyloxy, C_2–C_6 alkinyloxy, C_1–C_4 alkoxycarbonyloxy, phenoxy, or phenoxy substituted by one or two of the same or different groups selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, halo, hydroxy, amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl-)amino, C_1–C_4 alkanoylamino, carboxy, carbamoyl, cyano, trifluoromethyl, or C_1–C_4 alkanoyl;

or A is C_1–C_6 alkoxy substituted by one or two of the same or different groups selected from among hydroxy, amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, C_1–C_4alkanoylamino, halo, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyano, carboxy, C_1–C_4 alkoxycarbonyl, carbamoyl, carbamoyloxy, N-(C_1–C_4 alkyl)carbamoyloxy, N,N-di-(C_1–C_4 alkyl)carbamoyloxy, C_1–C_4 alkoxycarbonyloxy, phenoxycarbonyloxy, C_1–C_4 alkoxycarbonylamino, phenoxycarbonylamino, N-(C_1–C_4 alkyl)carbamoylamino, N,N-di-(C_1–C_4 alkyl)carbamoylamino, N-phenylcarbamoylamino, anilino, substituted anilino, phenyl, substituted phenyl, where said substituted anilino and substituted phenyl groups are substituted on the phenyl ring by one or two of the same or different groups selected from among C_1–C_4 alkyl, C_1–C_4 alkoxy, methlenedioxy, halo, hydroxy, amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl-)amino, C_1–C_4 alkanoylamino carboxy, carbamoyl, cyano, trifluoromethyl, or C_1–C_4 alkanoyl; a hetrocyclic amino group R_3NH— wherein R_3 is thienyl, furyl or a 5-membered nitrogen containing heterocyclic ring represented by the formulae

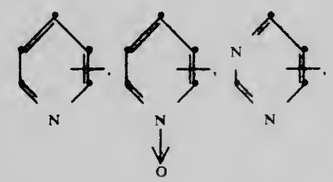


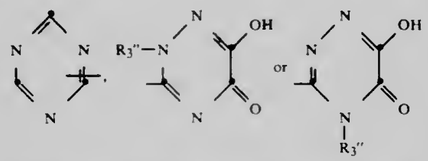


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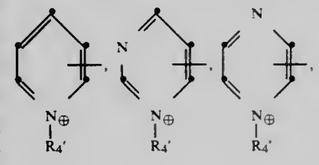


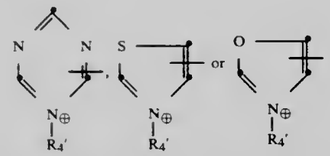
wherein R_3, is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkyl substituted by carboxy, sulfo, or di(C_1–C_4 alkyl)amino; or R_3 is a 6-membered nitrogen-containing ring represented by the formulae





wherein R_3'' is hydrogen or C_1–C_4 alkyl; or a thio group R_3'S— wherein R_3 is phenyl, substituted phenyl as defined above or R_3 as defined above; or a quaternary heterocyclic group R_4'⊕X⊖ wherein R_4'⊕ is a nitrogen containing hetrocyclic represented by the formulae



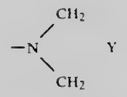


wherein R_4' is C_1–C_4 alkyl, benzyl, or —CH_2COCH_3, and X⊖ is a halide, sulfate, or nitrate anion; or R_4'⊕—S—X⊖ wherein R_4'⊕ and X⊖ are as defined above; or C_1–C_6 alkoxy substituted by a heterocyclic group R_3 as defined above;

or A is an amino group represented by the formula

—N(R')(R'')

wherein R' and R'' are independently hydrogen, phenyl, substituted phenyl as defined above, C_1–C_4 alkyl, C_1–C_4 alkyl substituted by one or two of the same or different groups selected from among halo, hydroxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkylsulfonyloxy, amino, or C_1–C_4 alkanoylamino; or R' and R'' can be taken together with the nitrogen atom to which they are bonded to form a 5–7 membered ring represented by the formula



wherein

Y is $(CH_2)_p$ or —CH_2—Y'—CH_2— wherein p is 2–4 and Y' is O, S, or NR''' wherein R''' is hydrogen or C_1–C_4 alkyl; or R' is hydrogen and R'' is C_1–C_4 alkyl substituted by a heterocyclic R3, or a heterocyclic amino group R_3NH—, or a thio group R_3'S—, or a quaternary heterocyclic group R_4'⊕X⊖, wherein R_3, R_3, R_4'⊕ and X⊖ have the same meanings as defined above;

or A is a heterocyclic amino group R3NHwherein R_3 is as defined above, phenyl, or substituted phenyl as defined above;

or A is C_1–C_4 alkyl, or C_1–C_4 alkyl monosubstituted by hydroxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, halogen, carboxy, cyano amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl)amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylsulfonylamino, C_1–C_4 alkylsulfonyloxy, phenyl, substituted phenyl as defined above, phenylthio, phenoxy, substituted phenoxy as defined above, anilino, substituted anilino as defined above, a heterocyclic group R_3, a heterocyclic amino group R_3NH, a thio group R_3'S—, or a quaternary heterocyclc group R_4'⊕KX⊖ or R_4'⊕—S—X⊕, wherein R_3, R_3', R_4'⊕, and X⊖ are as defined above;

or A is phenyl, thienyl, furyl, pyridyl, pyrimidyl, imidazoyl, pyrazolyl, tetrazolyl, oxazolyl, thiazol, thiadiazolyl or oxadiazolyl, and said phenyl or heterocycle substituted by one or two of the same or different substitutents selected from C_1–C_4 alkyl, C_1 –C_4 alkoxy, halogen, amino, or hydroxy;

or A is a group of the formula —COR_6 wherein R_6 is hydrogen, hydroxy, C_1–C_4 alkoxy, phenoxy, substituted phenoxy as defined above, tri-(C_1–C_4 alkyl)silyloxy, amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl)amino, phenyl, substituted phenyl as defined above, or C_1–C_4 alkyl;

or A is the group —CH_2—⊕R_4 wherein ⊕R_4 is pyridinium, or a substituted pyridinium group substituted by one or two of the same or different groups selected from among C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, hydroxy, halogen, trifluromethyl, cyano, carboxy, carbamoyl, amino, or C_1–C_4 alkoxycarbonyl; or the pyridinium ring is substituted on adjacent carbon atoms with adivalent alkylene group represented by the formula CH_{2p}, wherein p' is 3–5, or the divalent alkylene group is interrupted by an O, S, or one or two N atoms and in addition can contain one or two double bounds and can be substituted in either ring by one or two of the same or different substituents selected from the groups defined above when ⊕R_4 is a substituted pyridine; or ⊕R_4 is a thiazolium ring or a substituted thiazolium ring substituted by one or two of the same or different groups, amino, C_1–C_4 alkyl, C_1–C_4 alkylthio, C_1–C_4 alkoxy, C_1–C_4 alkyl substituted by hydroxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkylsulfonyloxy, halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, or amino, or the thiazolium ring is substituted on the adjacent carbon atoms with a divalent alkylene group represented by the formula CH_2p' wherein p' is 3–5; and when R_2 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

4,892,943

FUSED BICYCLIC IMIDES WITH PSYCHOTROPIC ACTIVITY

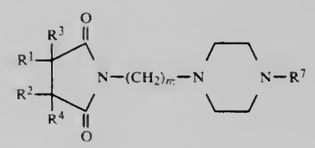
Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 909,049, Sep. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 892,160, Jul. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 787,887, Oct. 16, 1985, abandoned. This application Aug. 26, 1988, Ser. No. 237,106

Int. Cl.[4] A61K *31/495*; C07D *401/06, 401/14*

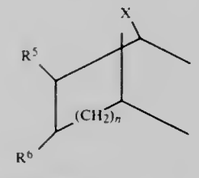
U.S. Cl. 540—575 **34 Claims**

1. A compound having the formula:



wherein

R^1 and R^2 represent the structure:



R^3 and R^4 are hydrogen;

R^5 and R^6 are hydrogen, or R^5 and R^6 taken together form a 3–6 membered carbocyclic ring or a cyclobutenyl ring; with the proviso that when R^3, R^4, R^5 and R^6 are hydrogen, n is other than zero;

m is 2–4;

n is 0–4;

X is lower alkylene, vinylene or O;

R^7 is unsubstituted or monosubstituted phenyl, 2-pyridinyl, 2-pyrimidinyl, 2-pyrazinyl or 3-pyridazinyl; where the substituents are selected from the group lower alkyl, lower alkoxy, halo, cyano, nitro and trifluoromethyl;

and the pharmaceutically acceptable salts thereof.

4,892,944

PROCESS FOR PRODUCING QUATERNARY SALTS

Shoichiro Mori; Kazuhiko Ida, and Makoto Ue, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,524

Claims priority, application Japan, May 13, 1987, 62-116463; May 14, 1987, 62-117380; May 22, 1987, 62-125427; May 22, 1987, 62-125428

Int. Cl.[4] C07C *85/24*

U.S. Cl. 544—107 **8 Claims**

1. A process for producing a quaternary salt comprising

(a) a first step of reacting (a1) one number selected from the group consisting of tertiary alkylamines, N,N,N',N'-tetramethylethylenediamine, N-alkylpyrrolidines, N-alkylpiperidines, N-alkylhexamethyleneimines, N-alkylmorpholines, N,N'-dialkylpiperazines, 1,5-diazabicyclo[4,3,0]-5-nonene, 1,8-diazabicyclo[5,4,0]-7-undecene, alkylpyridines, 4-dimethylaminopyridine, picoline, N-alkylimidazoles, N-methylbenzimidazole, quinoline, 4,4,-dipyridyl, trialkylphosphines, tricyclohexylphosphine, 1,2-bis(dimethylphosphine)ethane, triphenylphosphine, tribenzylphosphine, dialkylphenylphosphines, alkyl-

VOL 1110 ISS 2 JA 9 990 UMI

diphenylphosphine, 1-ethylphosphoran, 1-phenylphosphoran, 1-phenylphosphane, and 1-phenylphosphate, with (a2) a carbonic acid dialkylester at a temperature of 20° C. to 200° C. to produce a corresponding quaternary carbonate, and

(b) a second step of mixing the quaternary carbonate thus formed with an acid or an acidic phenol, while removing carbon dioxide generated from the system, to replace the carbonate anion with the corresponding acid or phenyl anion.

4,892,945

ISOINDOLINE PIGMENTS CONTAINING AT LEAST ONE TRIAZOLOPYRIMIDONE RADICAL

Max Jost, Oberwil; Kurt Burdeska, Basle, and Jost von der Crone, Arconciel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

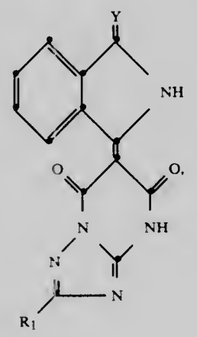
Filed Dec. 8, 1988, Ser. No. 281,417

Claims priority, application Switzerland, Dec. 21, 1987, 4986/87-3

Int. Cl.[4] **C09B** *57/04*

U.S. Cl. 544—263 **3 Claims**

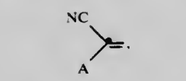
1. An isoindoline of formula I



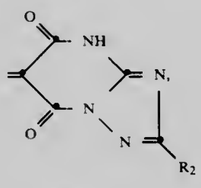
(I)

wherein

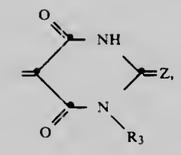
Y is a radical of formula II, III, IV, IVa, V or VI



(II)

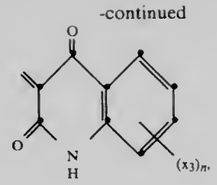


(III)

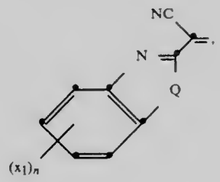


(IV)

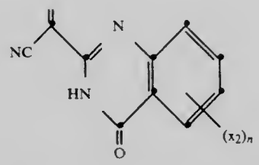
-continued



(IVa)

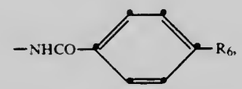


(V)



(VI)

wherein R_1 and R_2 are each independently of the other —H, —$CONH_2$, —COO—C_1-C_4alkyl, C_1-C_3alkyl, phenyl or phenyl which is substituted by one to three identical or different members selected from the group consisting of halogen, C_1-C_3alkyl and C_1-C_3alkoxy, R_3 is —H, C_1-C_4alkyl, phenyl or phenyl which is substituted by one or two identical or different members selected from the group consisting of halogen, C_1-C_3-alkyl and C_1-C_3alkoxy, Z and Q are O, S or NH, and A is a group of formula —CN, —COO—C_1-C_4alkyl or —$CONHR_4$, in which R_4 is —H, C_1-C_4alkyl, benzyl, phenyl or phenyl which is substituted by one or more identical or different members selected from the group consisting of halogen, C_1-C_4-alkyl, C_1-C_4alkoxy, a group —COR_5, —NH-CO—C_1-C_4alkyl and



wherein R_5 is C_1-C_4-alkoxy, —NH_2 or —NH—C_1-C_4alkyl, and R_6 is hydrogen, halogen or C_1-C_4alkyl, and R_4 is also naphthyl or naphthyl substituted by one or two halogen atoms or one or two methyl or methoxy groups, and x_1, x_2 and x_3 are each independently halogen, methyl, methoxy or —NH-$COCH_3$, and n is 0, 1 or 2.

4,892,946

AGRICULTURAL SULFONAMIDES

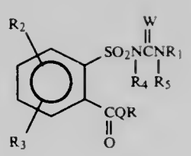
George Levitt, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 171,355, Jul. 23, 1980, Pat. No. 4,305,884, and a continuation-in-part of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506. This application Nov. 24, 1980, Ser. No. 209,307

Int. Cl.[4] **C07D** *239/28, 239, 30*

U.S. Cl. 544—321 **50 Claims**

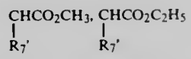
1. A compound selected from



wherein

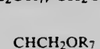
Q is O;

R is C_1-C_{12} alkyl, C_3-C_{10} alkenyl, C_3-C_{10} alkynyl, C_2-C_6 alkyl substituted with one to four substituents selected from 0–3 atoms of F, Cl or Br, 0–2 methoxy groups and 0–1 cyano groups, CH_2CN,

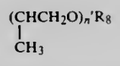


where R_7' is H or CH_3, C_3-C_6 alkenyl substituted with 1–3 atoms of F, Cl or Br, C_3-C_6 alkynyl substituted with one of F, Cl or Br, C_5-C_8 cycloalkyl, C_5-C_8 cycloalkenyl, C_5-C_6 cycloalkyl substituted with OCH_3, alkyl of C_2-C_4, F, Cl or Br or one to four methyl groups, C_4-C_{10} cycloalkylalkyl or C_4-C_8 cycloalkylalkyl with 1-2 CH_3;

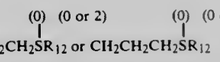
R is also H, M, $CH_2CH_2OR_7$, $CH_2CH_2CH_2OR_7$,



where R_7 is CH_2CH_3 or $CH(CH_3)_2$, CH_2OR_8' where R_8' is CH_3, CH_2CH_3, $CH(CH_3)_2$, $CH_2CH_2OCH_3$, or $CH_2CH_2OCH_2CH_3$, $(CH_2CH_2O)_{n'}R_8$,



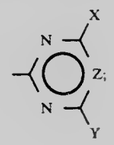
where R_8 is CH_3, CH_2CH_3 or $CH(CH_3)_2$ and n' is



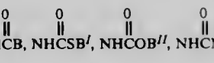
2, $CH_2CH_2SR_{12}$ or $CH_2CH_2CH_2SR_{12}$

where R_{12} is CH_3, CH_2CH_3 or $CH(CH_3)_2$ and provided that R has a total number of carbon atoms $\leqq 13$;

R_1 is



R_2 is NCO,



CF_3SO_2NH or CH_3SO_2NH;

B is C_1-C_4 alkyl optionally substituted with 1–3 atoms of F, Cl, Br or a single OCH_3 group or C_2-C_4 alkenyl;

B^I is C_1-C_4 alkyl or C_3-C_4 alkenyl;

B^{II} is C_1-C_4 alkyl optionally substituted with $CH_2CH_2OCH_3$, $CH_2CH_2OCH_2CH_3$ or 1–3 atoms of F, Cl or Br, or C_3-C_4 alkenyl;

B^{III} is C_1-C_4 alkyl optionally substituted with Cl or OCH_3 or C_3-C_4 alkenyl;

R_3 is H, Cl, Br, F or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3 or OCH_3;

M is an alkali metal;

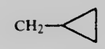
W is oxygen or sulfur;

X is H, Cl, CH_3, OCH_3, OCH_2CH_3, $OCH_2CH_2OCH_3$, CH_2OCH_3 or $CH_2OCH_2CH_3$;

Y is H, F, Cl, Br, C_1-C_4 alkyl,



where L is NH_2, OH, NCH_3, $NH(C_1$-C_4 alkyl), $N(C_1$-C_4 alkyl)$_2$ or C_1-C_6 alkoxy, OCH_3, C_1-C_4 alkyl substituted with OCH_3, OC_2H_5, CN or 1 to 3 atoms of F, Cl or Br, C_3-C_4 alkenyl, $CH_2C{\equiv}CR_{13}$ where R_{13} is H, CH_3 or CH_2Cl, —A—$(CH_2)_{n'}$—A_1—(C_1-C_3 alkyl) where A is 0 or S and A_1 is 0, S or SO_2 and n' is as previously defined, SCN, N_3, $NR_{16}R_{17}$ where R_{16} is H or CH_3 and R_{17} is H, OCH_3, C_1-C_6 alkyl, C_1-C_4 alkyl substituted with CN, C_3-C_4 alkenyl, C_3-C_6 cycloalkyl or C_2-C_3 alkyl substituted with OCH_3 or OC_2H_5, or R_{16} and R_{17} can be taken together to form —$CH_2CH_2CH_2CH_2$— or —$CH_2CH_2OCH_2CH_2$—, OR_{14} where R_{14} is C_1-C_4 alkyl substituted with cyano, C_3-C_4 alkenyl or $CH_2C\sigma$— CR_{13} where R_{13} is as previously defined,



or SR_{15} where R_{15} is C_1-C_4 alkyl; with the provision that when Y is $\geqq 4$ carbon atoms, R is $\leqq 4$ carbon atoms; when X is Cl, then Y is Cl; and when X and Y are both H, then R is $\leqq 4$ carbon atoms; and

Z is N or CH.

4,892,947

3(2H)PYRIDAZINONE, PROCESS FOR ITS PREPARATION AND ANTI-ALLERGIC AGENT CONTAINING IT

Motoo Mutsukado, Sakura; Keizo Tanikawa, Tokyo; Ken-ichi Shikada, Kuki, and Ryozo Sakoda, Kashiwa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

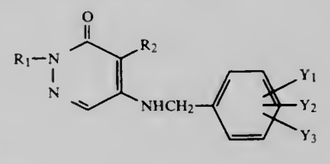
Filed Apr. 22, 1986, Ser. No. 854,521

Claims priority, application Japan, Apr. 27, 1985, 60-91612

Int. Cl.[4] **C07D** *237/22;* **A61K** *31/50*

U.S. Cl. 514—247 **29 Claims**

1. A 3(2H)pyridazinone of the formula:



wherein

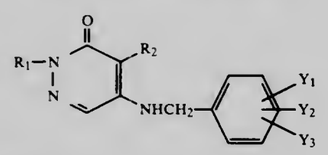
R_1 is hydrogen; methyl; C_3-C_6 alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; —$(CH_2)_mCO_2R_3$, wherein $R_3$is hydrogen or C_1-C_5 alkyl, and m is an integer of from 1 to 4; —$(CH_2)_nA$, wherein A is —OH or —$N(R_4)_2$, wherein R_4 is C_1-C_3 alkyl, and n is an integer of from 2 to 6; or —CH_2CF_3;

R_2 is chlorine or bromine;

each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1-C_5 alkyl; C_2-C_8 alkenyl; halogen; —OR_5, wherein R_5 is hydrogen, C_1-C_8 alkyl or —$(CH_2)_q$-phenyl,

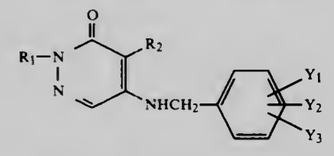
wherein q is an integer of from 1 to 4; $—CO_2R_6$, wherein R_6 is hydrogen or C_1–C_5 alkyl; $—N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or $—SR_8$, wherein R_8 is C_1–C_4 alkyl; and
Y_3 is halogen;
or a pharmaceutically acceptable salt thereof.

2. A 3(2H)pyridazinone of the formula:



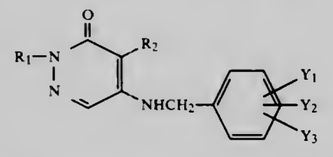
wherein
R_1 is hydrogen; methyl; C_3–C_6alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; $—(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; $—(CH_2)_nA$, wherein A is —OH or $—N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or $—CH_2CF_3$;
R_2 is chlorine or bromine;
each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; $—OR_5$, wherein R_5 is hydrogen, C_1–C_8 alkyl or $—(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; $—CO_2R_6$, wherein R_6 is hydrogen or C_1–C_5 alkyl; $—N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or $—SR_8$, wherein R_8 is C_1–C_4 alkyl; and
Y_3 is $—OR_5$, wherein R_5 is as defined above;
or a pharmaceutically acceptable salt thereof.

3. A 3(2H)pyridazinone of the formula:



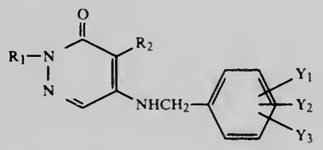
wherein
R_1 is hydrogen; methyl; C_3–C_6 alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; $—(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; $—(CH_2)_nA$, wherein A is —OH or $—N(RHD\ 4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or $—CH_2CF_3$;
R_2 is chlorine or bromine;
each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; $—OR_5$, wherein R_5 is hydrogen, C_1–C_8 alkyl or $—(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; $—CO_2R_6$, wherein R_6 is hydrogen or C_1–C_5 alkyl; $—N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or $—SR_8$, wherein R_8 is C_1–C_4 alkyl; and
Y_3 is $—CO_2R_6$, wherein R_6 is as defined above;
or a pharmaceutically acceptable salt thereof.

5. A 3(2H)pyridazinone of the formula:



wherein
R_1 is hydrogen; methyl; C_3–C_6 alkenyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; $—(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; $—(CH_2)_nA$, wherein A is —OH or $—N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or $—CH_2CF_3$;
R_2 is chlorine or bromine;
each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; $—OR_5$, wherein R_5 is hydrogen, C_1–C_8 alkyl or $—(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; $—CO_2R_6$, wherein R_6 is hydrogen or C_1–C_5 alkyl; $—N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or $—SR_8$, wherein R_8 is C_1–C_4 alkyl; and
Y_3 is halogen;
or a pharmaceutically acceptable salt thereof.

24. A method of reducing the incidence or severity of allergy induced in a subject by SRS-A, which comprises administering to said subject an amount effective to reduce the incidence or severity of the allergy of a 3(2H)pyridazinone of the formula:



wherein
R_1 is hydrogen; methyl; C_3–C_6 alkeyl; C_5 or C_6 cycloalkyl; benzyl; phenyl; $—(CH_2)_mCO_2R_3$, wherein R_3 is hydrogen or C_1–C_5 alkyl, and m is an integer of from 1 to 4; $—(CH_2)_nA$, wherein A is —OH or $—N(R_4)_2$, wherein R_4 is C_1–C_3 alkyl, and n is an integer of from 2 to 6; or $—CH_2CF_3$;
R_2 is chlorine or bromine;
each of Y_1 and Y_2 which may be the same or different, is hydrogen; C_1–C_5 alkyl; C_2–C_8 alkenyl; halogen; $—OR_5$, wherein R_5 is hydrogen, C_1–C_8 alkyl or $—(CH_2)_q$-phenyl, wherein q is an integer of from 1 to 4; $—CO_2R_6$, wherein R_6 is hydrogen or C_1–C_5 alkyl; $—N(R_7)_2$, wherein R_7 is C_1–C_4 alkyl; or $—SR_8$, wherein R_8 is C_1–C_4 alkyl; and
Y_3 is C_{1-5} alkyl, C_2–C_8 alkenyl; halogen; $—OR_5$, wherein R_5 is as defined above; $—CO_2R_6$, wherein R_6 is as defined above; $—N(R_7)_2$, wherein R_7 is as defined above; or $—SR_8$, wherein R_8 is as defined above;
or a pharmaceutically acceptable salt thereof, and
a pharmaceutically acceptable carrier.

4,892,948

2-METHYL-4-AMINO-5-AMINOMETHYLPYRIMIDINE CARBONATE, PROCESS FOR PREPARING THE SAME AND METHOD OF PURIFICATION OF 2-METHYL-4-AMINO-5-AMINOMETHYLPYRIMIDINE USING THE SAME

Keigo Nishihira, Ube; Masayoshi Yamashita, Tokyo, and Hiroshi Yoshida, Ube, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Apr. 26, 1988, Ser. No. 186,167
Claims priority, application Japan, May 15, 1987, 62-117062
Int. Cl.[4] C07D *239/02*
U.S. Cl. 544—326 **1 Claim**

1. A 2-methyl-4-amino-5-aminomethylpyrimidine carbonate.

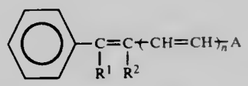
4,892,949

STILBENE DERIVATIVES

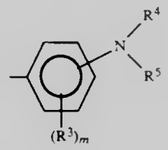
Masaomi Sasaki, Susono, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 875,510, Jun. 18, 1986, which is a continuation of Ser. No. 488,883, Apr. 26, 1983, abandoned. This application Aug. 9, 1988, Ser. No. 230,320
Claims priority, application Japan, Apr. 30, 1982, 57-73075; Apr. 30, 1982, 57-73076; May 14, 1982, 57-80115; May 14, 1982, 57-80116
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] C07D *211/08, 211/20, 209/82, 95/08*
U.S. Cl. 546—98 **13 Claims**

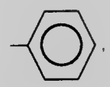
1. A compound having the formula



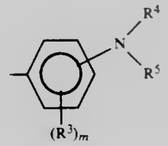
wherein n is 0 or 1, R^2 is hydrogen, alkyl or phenyl; the pair (R^1, A) is selected from the group consisting of
(a) R^1 is hydrogen, A is



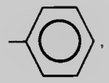
(b) R^1 is

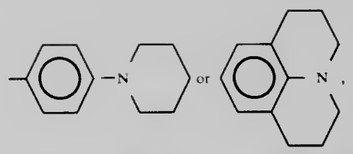


A is selected from the group consisting of



N-alkyl carbazolyl, and substituted N-alkyl carbazolyl, and
(c) R^1 is hydrogen or





wherein R^3 is hydrogen alkyl, alkoxy, or halogen, and R^4 and R^5 independently represent alkyl, aryl, substituted aryl, aralkyl and substituted aralkyl, and m is an integer of from 0 to 2, provided that when R^1 is hydrogen and n is 1, R^2 is not hydrogen.

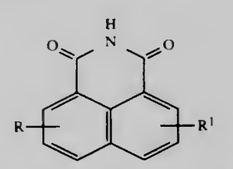
4,892,950

PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,8-DICARBOXIMIDES

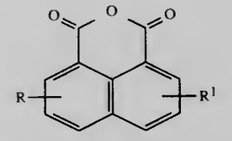
Detlef-Ingo Schütze, Cologne; Klaus Wunderlich, Leverkusen; Karl-Heinz Reinhardt, Leverkusen, and Martin Wienkenhöver, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,468
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719850
Int. Cl.[4] C07D *221/14*
U.S. Cl. 546—98 **6 Claims**

1. A process for the preparation of a napthalene-1,8-dicarboximide of the formula



in which R and R^1 denotes hydrogen, alkyl, alkoxy, halogen, N,N-dialkylamino and nitro comprising reacting a napthalene-1,8-dicarboxylic anhydride of the formula



with an amonium salt in an aqueous medium at a pH of about 6.5 to 7.5, acidifying the reaction mixture to a pH of 1 to 4 and subsequently adjusting again the pH to a value of about 6.5 to 7.5.

4,892,951

DERIVATIVES OF 3-NITROPYRIDINES USEFUL AS ADJUNCTS TO RADIATION THERAPY

Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

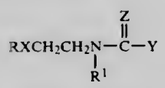
Continuation of Ser. No. 885,513, Jun. 10, 1986, abandoned, which is a continuation of Ser. No. 716,885, Mar. 27, 1985, abandoned. This applicatioo Nov. 17, 1988, Ser. No. 273,122
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] C07D *213/76*
U.S. Cl. 546—307 **5 Claims**

1. A method for enhancing the therapeutic effect of radiation

which comprises administering to a patient in need of such radiation treatment an effective amount of a 3-nitropyridine compound of the formula
wherein the $NHCH_2CHOHCH_2OH$ substitutent is attached at position 2, 4 or 6.

4,892,952
SUBSTITUTED HETEROARALKYL, HETEROARALKENYL OR HALOMETHYL FUNGICIDES
David M. Spatz, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Nov. 19, 1982, Ser. No. 443,009
Int. Cl.[4] C07D *253/06, 249/14;* **A01N** *43/707, 43/653*
U.S. Cl. 514—245 **17 Claims**

1. A compound of the formula:

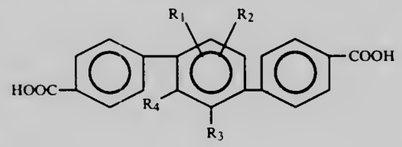


wherein R is phenyl or phenyl substituted with 1 to 4 substituents independently selected from fluoro, chloro, bromo, iodo, lower alkyl and trihalomethyl; R^1 is lower alkyl; Y is $—CH_2W$ where W is a 5- or 6-membered aromatic heterocyclic ring containing 2 or 3 nitrogen atoms and the remainder of the ring atoms carbon atoms; Z is oxygen or sulfur and X is oxygen or sulfur.

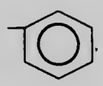
11. A method for controlling fungi comprising contacting said fungi or their growth environment with a fungicidally effective amount of a compound of the formula defined in claim **1**.

4,892,953
BENZTHIAZOLE SUBSTITUTED DIACID TERPHENYL MONOMERS
Fred E. Arnold, Centerville, and Jerry L. Burkett, Troy, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 29, 1988, Ser. No. 227,978
Int. Cl.[4] C07D *277/66*
U.S. Cl. 548—156 **6 Claims**

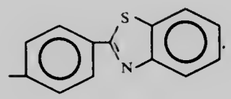
1. A phenylbenzthiazole-substituted p-terphenylene dicarboxylic acid of the formula



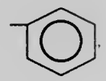
wherein R_1 is —H or



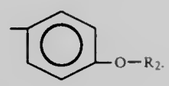
R_2 is



R_3 is



and R_4 is R_2 or



4,892,954
PROCESS FOR THE PREPARATION OF 2-OXO-1,3-DIOXOLANES
Gerhard Brindöpke, Frankfurt am Main, and Manfred Marten, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 894,334, Aug. 8, 1986, abandoned. This application Oct. 21, 1987, Ser. No. 111,979
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529263
Int. Cl.[4] C07D *317/12*
U.S. Cl. 549—229 **9 Claims**

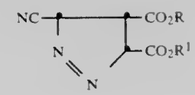
1. A process for the preparation of 2-oxo-1,3-dioxolanes by reaction of epoxides with carbon dioxide in the presence of a catalyst, wherein at least one epoxy compound is mixed with at least one catalyst of the group consisting of 4-dimethyl aminopyridine, 4-(1-pyrrolidinyl)-pyridine, amidines, imidazoles, and is reacted in the presence or absence of an inert solvent at temperatures from 40° to 180° C. while introducing carbon dioxide at normal pressure or slightly increased pressure up to 10 bar to form the corresponding organic carbonates.

4,892,955
METHOD FOR PRODUCING A LACTONE
Keisuke Wada, Yokohama; Yoshinori Hara, Machida, and Koushi Sasaki, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed Jul. 13, 1987, Ser. No. 72,744
Claims priority, application Japan, Aug. 19, 1986, 61-193691; Apr. 18, 1987, 62-95631
Int. Cl.[4] C07D *307/26*
U.S. Cl. 549—325 **4 Claims**

1. A method for producing a lactone by hydrogenating a dicarboxylic acid, a dicarboxylic acid anhydride and/or a dicarboxylic acid ester in the presence of a catalyst, wherein said catalyst is a ruthenium catalyst substantially free from halogen, comprising (1) ruthenium, (2) an organic phosphine and (3) a conjugate base of an acid having a pKa of less than 2 selected from the group consisting of tetra-fluoroborate anion and hexafluorophosphate anion.

4,892,956
5-CYANO-4,5-DIHYDRO-3,4-DICARBOXYPYRAZOLE DERIVATIVES
John R. Rizzo, and Eddie V. P. Tao, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Nov. 7, 1988, Ser. No. 267,905
Int. Cl.[4] C07D *231/06*
U.S. Cl. 548—356 **3 Claims**

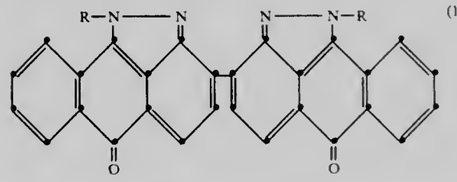
1. A 5-cyano-4,5-dihydro-3H-pyrzole-3,4-dicarboxylic acid dialkyl ester of the formula



wherein R and R^1 are independently C_1–C_{10} alkyl.

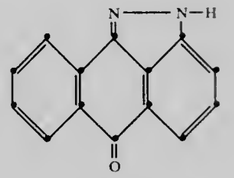
4,892,957
PROCESS FOR THE PREPARATION OF A N-ALKYLATED BIPYRAZOLEANTHRONE
Rainer Hildebrand, Lörach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Aug. 15, 1988, Ser. No. 232,043
Claims priority, application Switzerland, Aug. 24, 1987, 3230/87
Int. Cl.[4] C07D *231/54*
U.S. Cl. 548—357 **9 Claims**

1. A process for the preparation of a N-alkylated 2,2'-bipyrazoleanthrone of formula



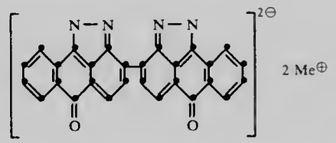
(1)

wherein R is C_1–C_8alkyl, which process comprises dimerising a 1,9-pyrazoleanthrone of formula



(2)

in the presence of an alkali metal hydroxide and an alkanol of 1 to 5 carbon atoms and at elevated temperature, and reacting the resultant intermediate of formula

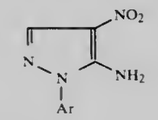


(3)

wherein Me is an alkali metal cation, with an alkyl halide which introduces the alkyl radical R, in the molar ratio 1:2, and in the presence of an alkylene glycol or a C_1–C_4alkyl ether thereof as catalyst.

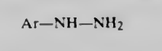
4,892,958
PREPARATION OF 5-AMINO-1-PHENYL-4-NITROPYRAZOLES
Ilauke Fürstenwerth, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Dec. 8, 1988, Ser. No. 282,225
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742819
Int. Cl.[4] C07D *231/16*
U.S. Cl. 548—362 **10 Claims**

1. A process for the preparation of a 5-amino-1-phenyl4-nitropyrazole of the formula



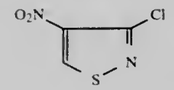
(I)

in which
Ar is optionally substituted phenyl, which comprises reacting an arylhydrazine of the formula



(II)

with 3-chloro-4-nitro-isothiazole of the formula



(III)

4,892,959
METHOD FOR THE PRODUCTION OF N-METHYLPYRROLIDINE
Donald H. Champion, Pflugerville; John F. Knifton, and Wei-Yang Su, both of Austin, all of Tex., assignors to Texaco Chemical Co., White Plains, N.Y.
Filed Apr. 22, 1988, Ser. No. 184,660
Int. Cl.[4] C07D *295/02*
U.S. Cl. 548—579 **7 Claims**

1. A method for the production of N-methylpyrrolidine which comprises the steps of reacting N-methylpyrrolidone with hydrogen, and wherein water is a by-product, over a catalyst consisting of copper chromite wherein the copper chromite catalyst comprises 40 to 65% copper oxide and 35 to 60% chromium oxide having a promoter from the group consisting oxides of barium, magnesium and manganese, at a temperature range of 150°–350° C. and a pressure of 1000 psig to 5000 psig, and thereafter isolating the N-methylpyrrolidine from its aqueous azeotrope by extracting said N-methylpyrrolidine with a hydrocarbon selected from the group consisting of pentane, isooctane, xylene, toluene, diethyl benzene and triisopropyl benzene.

4,892,960
CRYSTALLINE LYSOCELLIN COMPOSITIONS AND METHOD OF MAKING
Vernon V. Young, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Northbrook, Ill.
Continuation of Ser. No. 695,419, Jan. 28, 1985, abandoned, which is a continuation of Ser. No. 291,133, Aug. 7, 1981, abandoned. This application Dec. 20, 1985, Ser. No. 810,910
Int. Cl.[4] C07D *309/10*
U.S. Cl. 549—414 **5 Claims**

1. A crystalline lysocellin composition selected from the group consisting of the crystalline free acid of lysocellin, crys-

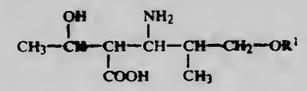
talline zinc lysocellin, crystalline manganese lysocellin and crystalline copper lysocellin.

4,892,961
AMINO ACID DERIVATIVES, AND THEIR PRODUCTION

Shiro Terashima, Tokyo; Yoshikazu Hamada; Yoshio Ito, both of Sagamihara; Kunihiro Sakai, Tokyo, and Tsuneharu Hiyama, Sagamihara, all of Japan, assignors to Sankyo Pharmaceuticals Company, Limited, Osaka, Japan

Filed Jul. 28, 1986, Ser. No. 890,889
Claims priority, application Japan, Jul. 31, 1985, 60-167808; Nov. 15, 1985, 60-257308
Int. Cl.[4] C07D 315/00; C07F 7/10
U.S. Cl. 549—429 7 Claims

1. An amino acid compound of the formula:



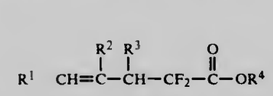
wherein R^1 is a protective group.

4,892,962
PROCESS FOR THE PREPARATION OF 2,2-DIFLUOROPENT-4-ENOIC ACIDS AND ACID DERIVATIVES

Robert W. Lang, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

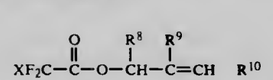
Filed Dec. 7, 1987, Ser. No. 129,198
Claims priority, application Switzerland, Dec. 18, 1986, 5058/86
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—416 6 Claims

1. A process for the preparation of a compound of formula I



(I)

in which signifies cis/trans isomers, R^1 is H, unsubstituted C_1–C_{24}-alkyl or C_6–C_{12}-aryl, C_7–C_{16}-aralkyl or C_8–C_{40}-alkaralkyl which are unsubstituted or substituted in the aryl group by C_1–C_6-alkoxy, C_1–C_6-alkylthio, F, Cl, Br or —CN, R^2 and R^3 independently of one another are H or C_1–C_{24}-alkyl, or R^1 and R^3 together are unsubstituted or C_1–C_6-alkyl-substituted C_1–C_5-alkylene or C_2–C_5-alkenylene, or R^2 and R^3 together or R^1 and R^2 together are unsubstituted or C_1–C_6-alkyl-substituted C_1–C_6-alkylene or C_3–C_6-alkenylene, and R^4 is $SiR^5R^6R^7$, in which R^5, R^6 and R^7 independently of one another are C_1–C_{12}-alkyl, phenyl or benzyl which comprises heating 1 mol of an allyl monobromo- or monochloro-difluoroacetate of the formula II



(II)

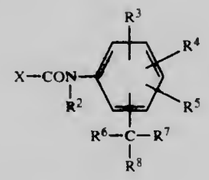
in which is as defined above, X is Cl or Br, R^8 is as defined for R^1, R^9 is as defined for R^2, R^{10} is as defined for R^3, R^8 and R^9 are as defined for R^1 and R^2, R^8 and R^{10} are as defined for R^1 and R^3, R^9 and R^{10} are as defined for R^2 and R^3, in the presence of at least 1 mol of zinc and of at least 1 mol of a monochlorosilane $R^5R^6R^7SiCl$, in which R^5, R^6 and R^7 are as defined above and isolating the compound of formula I.

4,892,963
N-PHENYL AMIDE COMPOUNDS

Peter T. Gallagher, Camberley; Terence A. Hicks, Fleet, and Graham W. Mullier, Aldershot, all of Great Britain, assignors to Lilly Industries Limited, Basingstoke, England

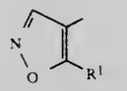
Filed Aug. 7, 1987, Ser. No. 83,538
Claims priority, application United Kingdom, Aug. 8, 1986, 8619432
Int. Cl.[4] A61K 31/165, 31/42, 31/275
U.S. Cl. 558—414 9 Claims

1. A compound of the formula



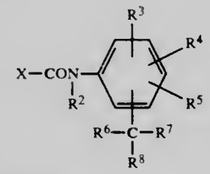
(I)

in which X is $R^1(HO)C{=}C(CN)$—, $R^1(CO)$—CH(CN)— or



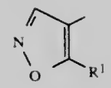
R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4 and R^5 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-suybstituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, phenoxy, phenoxy substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, R'R''N— where R' and R'' are each hydrogen or C_{1-4} alkyl or R'''CONH— where R''' is C_{1-4} alkyl, R^6, R^7 and R^8 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl, phenyl, or phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, or R^6 and R^7, together with the carbon atom to which they are attached, form a cycloalkyl group containing 3 to 7 carbon atoms, or R^6, R^7 and R^8 together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms; and salts thereof.

8. A pharmaceutical formulation comprising a compound of the formula



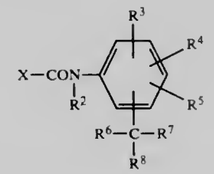
(I)

in which X is $R^1(HO)C{=}C(CN)$—, $R^1(CO)$—CH(CN)— or



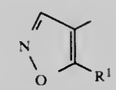
R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4 and R^5 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 groups selected from halogen nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, phenoxy, phenoxy substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, R'R''N— where R' and R'' are each hydrogen or C_{1-4} alkyl or R'''CONH— where R''' is C_{1-4} alkyl, R^6, R^7 and R^8 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl, phenyl, or phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, or R^6 and R^7, together with the carbon atom to which they are attached, form a cycloalkyl group containing 3 to 7 carbon atoms, or R^6, R^7 and R^8 together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms, or a pharmaceutically-acceptable salt thereof, in association with a pharmaceutically-acceptable carrier or diluent therefor.

9. A method of treating an animal, including a human, suffering from or susceptible to a disorder of the immune system or a disease in which leukotrienes are implicated, which comprises administering an effective amount of a compound of the formula



(I)

in which X is $R^1(HO)C{=}C(CN)$—, $R^1(CO)$—CH(CN)— or



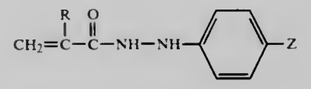
R^1 and R^2 are each hydrogen or C_{1-6} alkyl, R^3, R^4 and R^5 are each hydrogen, hydroxy, halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio, C_{2-5} alkoxycarbonyl, phenyl, phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, phenoxy, phenoxy substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, R'R''N— where R' and R'' are each hydrogen or C_{1-4} alkyl or R'''CONH— where R''' is C_{1-4} alkyl, R^6, R^7 and R^8 are each C_{1-6} alkyl, halo-substituted C_{1-6} alkyl, phenyl, or phenyl substituted with 1 to 3 groups selected from halogen, nitro, cyano, carboxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halo-substituted C_{1-4} alkyl, halo-substituted C_{1-4} alkoxy, halo-substituted C_{1-4} alkylthio and C_{2-5} alkoxycarbonyl, or R^6 and R^7, together with the carbon atom to which they are attached, form a cycloalkyl group containing 3 to 7 carbon atoms, or R^6, R^7 and R^8 together with the carbon atom to which they are attached, form a bicycloalkyl group containing 4 to 9 carbon atoms, or a pharmaceutically-acceptable salt thereof.

4,892,964
HYDRAZIDE-CONTAINING THERMOPLASTIC POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 93,680, Sep. 8, 1987, Pat. No. 4,818,802.
This application Jun. 22, 1988, Ser. No. 209,985
Int. Cl.[4] C07C 109/04
U.S. Cl. 558—414 5 Claims

1. A polymerizable compound corresponding to the formula:



where R is a substituent selected from hydrogen and C_1-C_4 alkyl groups, and Z is p-cyano or p-trifluoromethyl.

4,892,965
PRODUCING BIS (ALICYCLIC) THIOETHERS

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 917,773, Oct. 10, 1986, Pat. No. 4,798,900.
This application Juo. 6, 1988, Scr. No. 202,521
Int. Cl.[4] C07C 149/26
U.S. Cl. 560—118 2 Claims

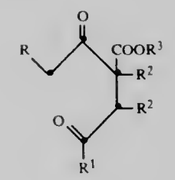
1. 4,4'-Thiobis(3,6-dihydrophthalic acid) and the dimethyl ester thereof.

4,892,966
ACETOACETIC ACID ESTER DERIVATIVES FOR THE MANUFACTURE OF α-HYDROXYCARBONYL COMPOUNDS

Hans J. Wild, Wolfhausen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

PCT No. PCT/CH86/00157, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/03287, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 13, 1986, Ser. No. 86,130
Claims priority, application Switzerland, Nov. 20, 1985, 4942/85; Sep. 23, 1986, 3805/86
Int. Cl.[4] C07C 69/716
U.S. Cl. 560—174 8 Claims

1.
A compound of the formula



II

wherein:

R represents C_{1-4}-alkoxy, chlorine, bromine or C_{1-4}-alkanoyloxy, R^1 signifies C_{1-5}-alkyl, the radicals R^2 each independently represent hydrogen or C_{1-5}-alkyl, and R^3 signifies C_{1-4}-alkyl.

4,892,967

CITRATE ESTERS

Ezekiel H. Hull, Greensboro, and Edward P. Frappier, Kernersville, both of N.C., assignors to Morflex Chemical Company, Inc., Greensboro, N.C.

Division of Ser. No. 117,080, Nov. 4, 1987, Pat. No. 4,789,700, which is a continuation of Ser. No. 865,874, May 21, 1986, Pat. No. 4,711,922, which is a continuation of Ser. No. 735,149, May 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 217,217

Int. Cl.[4] C07C *69/704*

U.S. Cl. 560—180 **18 Claims**

1. A citrate ester selected from the group consisting of acetyltri-n-hexyl citrate and n-butyryltri-n-hexyl citrate, said ester having an aconitate level of less than 0.20% when the esterification mixture from which said citrate is produced tests about 0.6% maximum acidity calculated as citric acid, said ester having heat stability characteristics, after heating at 150° C. for two hours, of a color not greater than 50–60 APHA and a mild odor at 25° C.

4,892,968

3,3'-DICHLORO-4,4-DIAMINODIPHENYL SULFONIC ACIDS

Colin D. Campbell, Beith, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

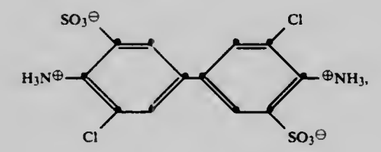
Filed Jul. 29, 1988, Ser. No. 226,008

Claims priority, application United Kingdom, Aug. 7, 1987, 8718798

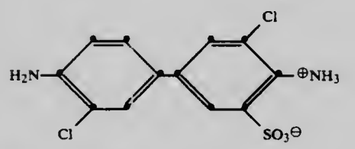
Int. Cl.[4] C07C *143/56*

U.S. Cl. 562—59 **1 Claim**

1. A compound having the formula I or II



(I)



(II)

or its salt or hydrate thereof.

4,892,969

PROCESS FOR THE PREPARATION OF 1-AMINO-2-NAPHTHOL-4-SULFONIC ACID

Bruno Förtsch, Ramlinsburg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 39,827, Apr. 15, 1987, abandoned, which is a continuation of Ser. No. 823,211, Jan. 28, 1986, abandoned. This application May 31, 1988, Ser. No. 203,553

Claims priority, application Switzerland, Feb. 15, 1985, 731/85

Int. Cl.[4] C07C *143/66*

U.S. Cl. 562—70 **5 Claims**

1. In a process for the preparation of 1-amino-2-naphthol-4-sulfonic acid by treating 1 mole of 1-hydroxyl-imino-2-tetralone-4-sulfonic acid with an alkali metal pyrosulfite in a mineral acid medium in the presence of catalytic amounts of a copper compound, the improvement which comprises gradually adding said 1-hydroxylimino-2-tetralone-4-sulfonic acid as an aqueous solution over about 2 hours to said acid medium containing 0.5 to 50 millimoles of said copper compound at temperatures in the range of 45° to 50° C., at normal atmospheric pressure, with the exclusion of atmospheric oxygen, and maintaining said temperature range for a reaction time of about one-half hour to two hours.

4,892,970

STAGED AROMATICS OXIDATION IN AQUEOUS SYSTEMS

Neal R. Nowicki, Naperville, and James D. Lowry, Jr., Bolingbrook, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 30, 1985, Ser. No. 814,510

Int. Cl.[4] C07C *51/265, 57/34*

U.S. Cl. 22—413 **22 Claims**

1. A continuous, staged process for the oxidation of benzenes disubstituted with oxidizable substituents selected from the class consisting of alkyl, hydroxyalkyl, aldehyde, carboalkyl groups and mixtures thereof, to their corresponding acid derivatives in an aqueous solvent system, comprising the steps of:

(a) affording a feed mixture comprising 100 weight parts of the aforesaid disubstituted benzenes, from about 5 to about 100 weight parts of water, from about 0.1 to about 5.0 weight parts of ionic catalytic metals, comprising manganese and at least one other catalytic metal selected from the class consisting of cobalt, nickel, zirconium and mixtures thereof, and bromine in an amount within the range from about 10 to about 300 atom percent, based on total catalytic metals;

(b) partially oxidizing said feed mixture in a first oxidation stage, in the presence of an oxygen-containing gas, at a temperature within the range from about 300° to about 410° F. and at a pressure sufficiently high to maintain the mixture substantially in the liquid phase;

(c) recovering from said first oxidation stage an effluent phase, wherein the degree of conversion to acid derivatives is within the range from about 60% to about 95%.

(d) adding to said effluent phase supplemental bromine to raise the concentration therein of total bromine to a concentration that is higher than the bromine concentration in the first oxidation stage and that is in the range of from about 50 to about 500 atom percent, based on total catalytic metals, and supplemental water in an amount to provide a workable slurry phase;

(e) substantially completely oxidizing the resulting slurry phase in a second oxidation stage, in the presence of an oxygen-containing gas, at a temperature within the range from about 400° to about 480° F. and at a pressure sufficiently high to maintain the slurry substantially in the liquid phase; and

(f) recovering from said second oxidation stage an acid derivative product.

4,892,971

PROCESS FOR THE PREPARATION OF N-ACETYLPHENYLALANINE

Heinz Erpenbach, Cologne; Klaus Gehrmann, and Peter Hörstermann, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,715

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 37368613

Int. Cl.[4] C07C *99/06*

U.S. Cl. 562—450 **3 Claims**

1. A process for the preparation of N-acetylphenylalanine from 2-methyl-4-benzylidene-1,3-oxazolin-5-one, which process comprises:

opening the ring of the 2-methyl-4-benzylidene-1,3-oxazolin-5-one with a ring-opening agent consisting essentially of water in a solvent medium which is a mixture consisting essentially of said water and an aliphatic C_3-ketone to C_{10}-ketone or a water-miscible ether, thereby obtaining 2-acetaminocinnamic acid in said solvent medium,

hydrogenating the resulting 2-acetaminocinnamic acid in said solvent medium at a temperature in the range of 10° to 50° C. and at a pressure of 1 to 15 bar in the presence of a supported palladium catalyst, thereby obtaining the N-acetylphenylalanine.

4,892,972

PURIFICATION OF CRUDE TEREPHTHALIC ACID

Hobe Schroeder, Warrenville, and David E. James, Batavia, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 905,766, Sep. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 785,322, Oct. 7, 1985, abandoned. This application Apr. 27, 1989, Ser. No. 344,657

Int. Cl.[4] C07C *51/42;* B01J *21/18*

U.S. Cl. 562—487 **30 Claims**

1. A method for the purification of crude terephthalic acid, comprising:

passing an aqueous solution of said crude terephthalic acid, at a temperature of from about 100° C. to about 350° C. and at a pressure sufficient to maintain the solution substantially in the liquid phase, through a particulate catalyst bed and in the presence of hydrogen; said particulate catalyst bed being a layered bed that includes a first catalyst layer supported on an active carbon carrier and containing a metal of Group VIII of the Periodic Table of Elements having a single electron in its outermost orbital when in the ground state, and a lower catalyst layer containing palladium supported on an active carbon carrier; said solution being first passed through said first layer and thereafter being passed through said second layer; and

thereafter cooling the hydrogenated aqueous solution to effect separation of the resulting purified terephthalic acid from said solution by crystallization.

11. A layered catalyst bed suitable for hydrogenation of a relatively impure aqueous solution of crude terephthalic acid containing 4-carboxybenzaldehyde which comprises:

a first catalyst layer constituted by a particulate active carbon carrier containing a metal of Group VIII of the Periodic Table of Elements having a single electron in its outermost orbital when in the ground state; and

a second catalyst layer constituted by a particulate active carbon carrier containing palladium.

4,892,973

PROCESS FOR PRODUCING 1,1-DIPHENYLALKENES

Kozo Mizuno, Uji; Hideaki Fujisaki, Kyoto; Yoshinori Uda, Kyoto; Tadashi Imai, Kyoto, and Katsuhiko Tsunemitsu, Kyoto, all of Japan, assignors to Yamada Chemical Co., Ltd., Kyoto, Japan

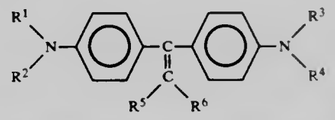
Continuation of Ser. No. 785,500, Oct. 8, 1985, abandoned. This application Aug. 31, 1988, Ser. No. 239,072

Claims priority, application Japan, Oct. 12, 1984, 59-214982

Int. Cl.[4] C07C *87/14;* C07D *209/00, 207/00*

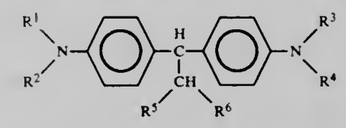
U.S. Cl. 564—315 **5 Claims**

1. A process for producing a 1,1-diphenylalkene represented by the formula:



which comprises dissolving a 1,1-diphenylalkane in an aqueous solvent by adding thereto 2 to 20 mol of an acid based on 1 mol of the 1,1-diphenylalkane and contacting lead peroxide with the 1,1-diphenylalkane in the thus obtained aqueous acidic solution at a temperature of −30° to 30° C., wherein the molar ratio of the lead peroxide to the 1,1-diphenylalkane is 1 to 3:

the 1,1-diphenylalkane being represented by the formula:



wherein R^1, R^2, R^3 and R^4 each independently represent an (C_1–C_6) alkyl group, a (C_3–C_{12}) cycloalkyl group, an aryl (C_1–C_6) alkyl group, or an alkylene group which forms a heterocyclic ring comprising the nitrogen atom to which it is bound and the carbon atom at the ortho-position of the benzene ring bound to the nitrogen atom, or R^1 and R^2 are bound to one another and form a heterocyclic ring comprising the nitrogen atom to which they are bound, or R^3 and R^4 are bound to one another and form a heterocyclic ring comprising the nitrogen atom to which they are bound; and

wherein R^5 and R^6 each independently represent a hydrogen atom, an (C_1–C_{10}) alkyl group, a (C_3–C_{12}) cycloalkyl-group, or an aryl or substituted aryl (C_1–C_6) alkyl group.

4,892,974

PROCESS FOR PRODUCING MONO-ORTHO-TERT-BUTYL-ANILINE USING SILICA-ALUMINA CATALYSTS

William F. Burgoyne, Jr., Emmaus, Pa., and Dale D. Dixon, Venice, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 10, 1988, Ser. No. 166,288

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[4] C07C *85/24*

U.S. Cl. 564—409 **4 Claims**

1. In a process for reacting aniline with isobutylene to form a ring alkylated aniline, said reaction being carried out in the presence of an acidic catalyst, the improvement for selectivity forming monotertiary butyl aniline where the tert butyl group is ortho to the amine at high conversion which comprises:

reacting aniline with isobutylene; and

effecting said reaction in the presence of a silica-alumina catalyst maintained in a fixed bed catalytic reactor;

maintaining a mole ratio of aniline to isobutylene of from 2 to 10, a temperature from 130° to 190° C; and

maintaining an LHSV of from 0.05 to 0.5 hr^{-1}.

4,892,975

DIETHYNYL MONOMERS AND POLYMERS THEREOF

Thomas X. Neenan, Arlington, and George M. Whitesides, Newton, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

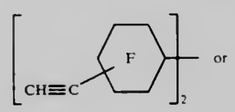
Filed Sep. 28, 1987, Ser. No. 101,632

Int. Cl.[4] C07C *149/34, 43/29, 25/28*

U.S. Cl. 568—56 **2 Claims**

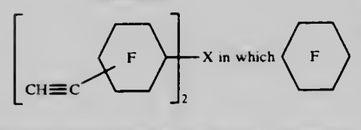
1. The compound 1,3-diethynyl tetrafluorobenzene.

2. A compound having the structure



or

-continued



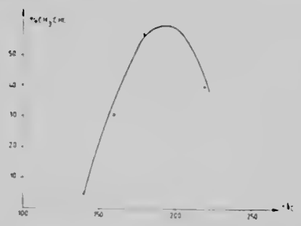
represents a perfluorinated benzene ring and X represents oxygen or sulfur.

4,892,976

PROCESS FOR THE PREPARATION OF ALDEHYDES

Jean Cordier, Saint Saulve; Bernard Dussart, Schiltigheim; Francis Petit; Yves Castanet, both of Villeneuve D'Aso; Serge Melloul, Lille, and André Mortreux, Hem, all of France, assignors to Solilac, Paris, France

Filed Jul. 15, 1988, Ser. No. 219,926
Claims priority, application France, Jul. 16, 1987, 87 10044
Int. Cl.[4] C07C *45/49*
U.S. Cl. 568—465 **12 Claims**



1. A process for the selective preparation of an aldehyde of the formula

R—CHO

in which R is a C_1-C_7 alkyl, the process comprising reacting an alkyl formate of the formula

H—COOR

in which R has the meaning given above, with CO in the absence of H_2, in the presence of:

(a) a catalyst based on a metal selected from Rh, Ru, Ir, mixtures of them and a mixture of RH and/or Ru and/or Ir with Co, Ni or Fe, said catalyst being used in a molar proportion of between 10^{-2} and 10^{-4} with respect to the alkyl formate;

(b) a promoter selected from the iodides of alkali and alkaline earth metals, quaternary ammonium iodides and phosphonium iodides, mixtures of covalent compounds of iodine and a phosphine of formula PR'$_3$, R' being selected from alkyl and aryl, and mixtures of covalent compounds of iodine and a tertiary amine of formula NR"$_3$, R" being alkyl, the iodide or the covalent compound of iodine being used in a molar proportion of $4 \cdot 10^{-2}$ to $0.25 \cdot 10^{-2}$ with respect to the alkyl formate; and,

(c) a solvent consisting of a cyclic N—(C_1-C_6 alkyl) amide, the cyclic amide being used in a molar proportion of at least 1 with respect to the alkyl formate whereby the cyclic N—(C_1-C_6 alkyl) amide aids in providing good selectivity of the R—CHO.

4,892,977

PREPARATION OF NONIONIC SURFACTANTS BY OXYALKYLATION WITH A MAGNESIUM CATALYST

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Jun. 13, 1988, Ser. No. 205,754
Int. Cl.[4] C07C *41/03*
U.S. Cl. 568—618 **12 Claims**

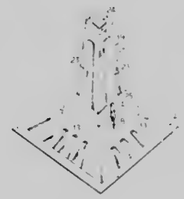
1. A method for the alkoxylation of a reactive hydrogen compound selected from the group comprising monohydric alcohols having between about 6 and about 30 carbon atoms, both branched and linear, with an alkylene oxide having 2 to 4 carbon atoms comprising reacting said monohydric alcohol with said alkylene oxide at a temperature at which the reaction proceeds in the presence of at least a catalytic amount of a catalyst that is produced by (a) mixing a high molecular weight alcohol with magnesium and a low molecular weight alcohol and subsequently removing the low molecular weight alcohol then (b) reacting the resulting magnesium-containing compound with phosphorus acids or esters.

4,892,978

SELF-SUPPORTING PEDESTAL

William Axworthy, P.O. Box 2628, Station "B", Richmond Hill, Ontario, Canada L4E 1A6

Filed Mar. 10, 1989, Ser. No. 321,711
Int. Cl.[4] H02G *9/02*
U.S. Cl. 174—38 **5 Claims**



1. A self-supporting pedestal comprising,

a hollow generally truncated pyramidal base unit having a square base and slanting side walls sloping upwardly to a square upper end,

a square collar extending upwardly from said upper end and having two pairs of mutually parallel upstanding side walls,

two channels formed in two opposite upstanding side walls of said square collar,

horizontal flanges extending outwardly from said square base of said base unit,

an inverted U-shaped bracket means having two lower leg members therein slidably and movably engageable with said channels in said upstanding side walls of said square collar,

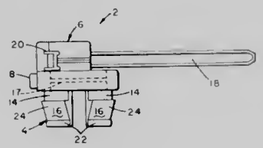
a top cover means operative to dispose over said base unit, said top cover means having a hollow truncated generally elongated pyramidal shape with slanting side walls sloping convergently upwardly to a closed square top panel and divergently downwardly to a square open bottom end.

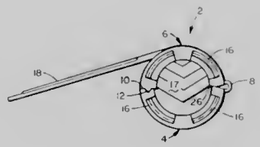
4,892,979

MULTI-PIECE INSULATING BUSHING AND METHOD OF SECURING AN ELECTRICAL CONDUCTOR THERETO

Leroy J. Rossow, 11050 50th St. North, Lake Elmo, Minn. 55042

Filed Jun. 7, 1988, Ser. No. 203,083
Int. Cl.[4] H01B *17/26*
U.S. Cl. 174—153 G **19 Claims**





1. A bushing comprising a tubular body member having a lengthwise coextensive bore for receiving elongated through members, a bulkhead fastener portion and a through member fastener portion, wherein said through member fastener portion is defined by an arcuate portion of said body member mountable exteriorly of a bulkhead and includes:

(a) a collar having a through aperture;

(b) an elongated wrap member positioned to circumscribe through members when positioned in said bore and to mount in said collar;

(c) means for restraining said wrap member when cinched about said through members; and

(d) a wedging member transversely extending from an interior wall of the bore of said body member.

19. A method for securing an electrical conductor to a multi-piece bushing comprising the steps of:

(a) mounting at least one electrical conductor in a longitudinal bore of a tubular bushing member comprised of a plurality of portions which portions align with one another to define said bore;

(b) passing a wrap member about said conductor and relative to a first latch means to secure said conductor to at least one of said portions; and

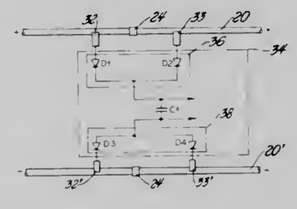
(c) passing a remaining end of said wrap member about an outer surface of said bushing member and relative to a second latch means to secure the portions of said bushing member to one another.

4,892,980

DUAL CONTACTS ON VOLTAGE RAIL

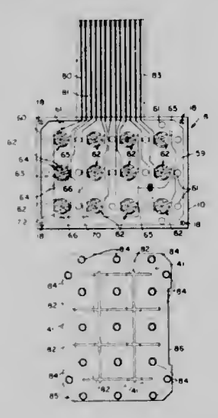
Ron Riley, Grand Blanc, Mich., assignor to J. N. Fauver Company, Madison Heights, Mich.

Filed Aug. 3, 1988, Ser. No. 227,704
Int. Cl.[4] B60L *5/04, 5/38*
U.S. Cl. 191—14 **36 Claims**



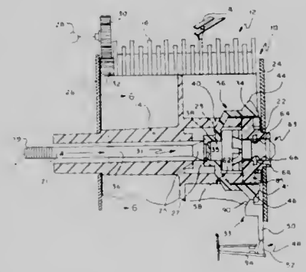
35. A conveyor assembly including a vehicle **(12)** for moving about a track **(18)**, said assembly comprising; vehicle **(12)** being mobile along the track **(18)**, conductive means **(20)** along the track **(18)** for supplying an electrical signal to said vehicle **(12)**, said conductive means **(20)** along the track **(18)** for supplying an electrical signal to said vehicle **(12)**, said conductive means **(20)** comprising isolated sections of rail each transmitting an electrical signal and having buffers **(24)** between each isolated section for preventing electrical conduction therebetween, and said vehicle **(12)** including at least two contacting pads **(32, 33)** placed a distance apart and in contact with said conductive means such that at least one contacting pad is in electrical connection with said rail and including receiver means **(34)** connected to said contacting pads **(32, 33)** for receiving the electrical signal from each contact pad **(32, 33)** and for preventing back feeding of received electrical signals to either contact pad **(32, 33)**, said receiver means **(34)** including diode logic for receiving said electrical signals on one of said contacting pads **(32, 33)** and for preventing backfeeding to the other of said contacting pads.

4,892,981
SNAP-IN MODULAR KEYPAD APPARATUS
Richard Soloway, 2 Richard Rd., Lido Beach, N.Y. 11566, and Richard Farrell, 84 Claire Ct., West Babylon, N.Y. 11704
Filed Sep. 26, 1988, Ser. No. 248,824
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—5 A **19 Claims**



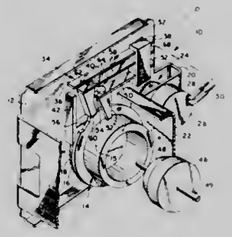
1. A keypad apparatus comprising:
a planar frame member having a front surface and a back surface, and including a plurality of button accommodating apertures located on said planar member extending from the front surface to the back surface, and a plurality of mounting post members extending outwardly from said back surface thereof;
a button assembly including a planar elastomeric member having a front surface and a back surface, and a plurality of elastomeric buttons dimensioned to be received by said button accommodating apertures and formed integrally with said elastomeric member extending outwardly from said front surface, said elastomeric member having a plurality of first apertures extending from the front surface to the back surface and being positioned thereon to receive said mounting post members such that each of said buttons extends through an associated button accommodating aperture of said frame, said button assembly being mounted to said frame such that said buttons are depressable, each button having a conductive bottom member located on the bottom thereof;
a switch assembly including a thin planar member fabricated from Mylar having a front surface and a back surface, and a plurality of contact areas located on the front surface of the thin planar member, one contact area corresponding to each button, said contact area having an outer partial circular contact disrupted by an opening and electrically connected to at least four equally-spaced, inwardly disposed triangular sections, and an inner T-shaped contact surrounded by said outer contact, said T-shaped contact having an upper branch and a lower branch, said upper branch being positioned between said triangular sections and said lower branch extending through said opening, said inner T-shaped contact being electrically insulated from said outer partial circular contact, said thin planar member having a plurality of second apertures extending from the front surface to the back surface and being positioned to receive said mounting post members such that said contact areas oppose said corresponding buttons, said switch assembly being mounted on said button assembly such that said corresponding conductive bottom member electrically connects said outer contact to said T-shaped inner contact upon depression of an associated button; and
a planar back plate member having a front surface and a back surface and including a plurality of third apertures positioned to receive said mounting post members, the front surface of said back plate being mounted on top of said switch assembly with said mounting post members extending through said third apertures, said mounting post members having their respective ends deformed to form a fixed, secured sandwich-like assembly, said back plate serving as a stop to enable an operator of a button to tactically feel said button operation.

4,892,982
TIMING MECHANISM WITH IMPROVED CLUTCH ASSEMBLY
William J. Hueber, Brownsburg; Robert L. Eder, Speedway, and R. Keith Cearlock, Frankfort, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.
Continuation-in-part of Ser. No. 106,999, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 5,015, Oct. 20, 1987, abandoned, and a continuation-in-part of Ser. No. 124,493, Nov. 23, 1987, abandoned. This application May 2, 1988, Ser. No. 189,326
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R **12 Claims**



1. A timing mechanism comprising:
a support;
a camstack, a shaft, first clutch teeth and second clutch teeth all mounted in said support for rotation about a common axis, said shaft movable along said axis between a first position and a second position;
first switch means for contacting said camstack to be actuated thereby; means for mechanically coupling said first clutch teeth to said camstack so that when one rotates the other also rotates;
said second clutch teeth integrally formed with said shaft;
said shaft, said first teeth, and said second teeth located so that when said shaft is in said first position, said first teeth are intermeshed with said second teeth and when said shaft is in said second position said first teeth and said second teeth are disengaged; and
intermesh assurance means for causing said first and second teeth to intermesh when said shaft is moved axially from said second position toward said first position no matter what relative rotational position about said axis said shaft is in.

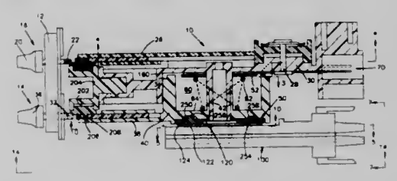
4,892,983
PROGRAMMER/TIMER WITH COMBINED LINE AND PROGRAM FUNCTION SWITCH
Richard C. Bogda, Elmhurst, and George D. Georgacakis, Skokie, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio
Filed Dec. 8, 1988, Ser. No. 281,572
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R **7 Claims**



1. A combination electrical programmer timer and line switch assembly for an appliance comprising:
(a) housing means;
(b) a program cam mounted for rotary movement on said housing means;
(c) timing motor means associated with said housing means and operable upon energization to effect said movement of said program cam;
(d) a first movable line switch contact blade mounted on said housing means for connection to one side of a power line;
(e) actuator means movably mounted on said housing means and including auxiliary cam means contacting a movable member operable upon user manual movement to move said movable member for moving said movable first contact blade between a first (low) and second (high) position;
(f) a stationary contact blade mounted on said housing means for series connection with certain appliance functions;
(g) an active program switch contact blade disposed on said housing means between said first movable line contact blade and said stationary blade, said program switch blade including a cam follower contacting said program cam, said program switch blade series connected with said motor means for series connection with all of said appliance functions, wherein said line contact blade in said high position prevents energization of said motor for any position of said cam follower on said programmer cam and in said first (low) position, maintains said motor energized for all positions of said cam follower on said program cam.

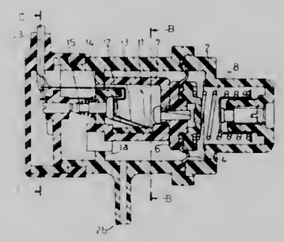
4,892,984
ROTARY VACUUM-ELECTRICAL CONTROL
James F. Clark, Marshall; David J. McFadyen, Paris, both of Ill., and Pradeep K. Mishra, Terre Haute, Ind., assignors to TRW Inc., Lyndhurst, Ohio
Filed Feb. 8, 1989, Ser. No. 308,242
Int. Cl.[4] H01H *9/06;* **F16K** *11/06*
U.S. Cl. 200—61.86 **24 Claims**

1. A rotary vacuum-electrical switch controller, comprising:
a valve body including a valve seat having a generally flat first circular surface and having a plurality of valve ports therein, a plurality of valve nipples extending from said body and adapted for connection to a vacuum source and vacuum control devices and means for connecting each of said ports with a respective one of said nipples;
a disk-shaped valve plate having an axis of rotation and having a second circular surface facing said first surface and being coaxial therewith and having a plurality of chambers defined therein by peripherally encompassing radially and circumferentially extending walls for selectively interconnecting various of said ports as said valve plate is rotated about said axis of rotation;
a rotor having first and second ends and being coaxially aligned with said valve plate, said first end having means for engaging said valve plate for rotating said valve plate about said axis of rotation;
an electrical switch body including a stator member having a generally flat surface having a plurality of electrical leads mounted thereon;



a disk-shaped electrically conductive switch plate interposed between the second end of said rotor and said switch body and being coaxially aligned with said rotor, the second end of said rotor having means for drivingly engaging said switch plate so as to drive said switch plate about said axis of rotation, said switch plate having means for selectively interconnecting various of said electrical leads as it is rotated about said axis of rotation.

4,892,985
VACUUM RESPONSIVE MULTICONTACT SWITCH
Yosuke Tateishi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan
Filed Jan. 27, 1989, Ser. No. 302,606
Claims priority, application Japan, Jan. 29, 1988, 63-020245
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—83 N **6 Claims**



1. A multicontact vacuum responsive switch comprising:
a housing;
diaphragm means for dividing the interior of said housing into first and second chambers;
means for connecting said first chamber to a vacuum source;
means for communicating said second chamber with atmospheric pressure, whereby said diaphragm means is movable within said housing in response to a pressure differential between said first and second chambers;
a plate in said housing and movable with said diaphragm means, said plate having an electrically conductive portion;
a plurality of electrical contacts mounted in said housing and slidably contacting said plate such that said contacts may selectively contact said electrically conductive portion of said plate in response to said movement of said diaphragm means; and
means for adjusting the position of at least one of said

contacts in the direction of movement of said diaphragm means,

wherein one of said contacts comprises a reference contact which always contacts said conductive portion and wherein said conductive portion is shaped with a pattern such that each of a remainder of said contacts slidably contact said conductive portion at a predetermined vacuum pressure difference between said first and second chambers.

4,892,986

VACUUM CIRCUIT BREAKER

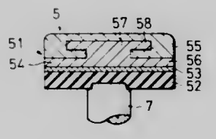
Ruyji Watanabe, Toukai; Seiki Shimizu, and Hisashi Ando, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 732,005, Apr. 29, 1985, abandoned. This application Jan. 12, 1988, Ser. No. 143,119

Claims priority, application Japan, Feb. 9, 1983, 58-160448

Int. Cl.[4] H01H *9/30, 33/00, 1/02, 1/06*

U.S. Cl. 200—144 B **7 Claims**



1. A vacuum circuit breaker comprising:

a vacuum container;

a pair of copper support electrodes axially arranged in and carried by said vacuum container, at least one of said support electrodes being axially movable;

a pair of auxiliary support electrodes, each made of a sintered conductive refractory cobalt body of a theoretical density ratio of more than 95% and having a disk-like base and a protrusion projecting therefrom, said protrusion having a larger diameter portion at an end thereof and a smaller diameter portion between said base and said larger diameter portion, said larger diameter portion being smaller than an outer diameter of said base;

a pair of porous conductive cobalt refractory bodies respectively sintered on said auxiliary support electrodes so as to embed said protrusion, the sintered porous conductive cobalt refractory bodies each having sufficient porosity for impregnation by a molten metal compound and impregnated with a melted metal compound of Ag_2Se which reaches interfaces between said auxiliary support electrodes and said sintered porous cobalt refractory bodies thereby providing a pair of electrical contacts, with each of said contacts providing at one side an auxiliary support electrode portion and at an opposite side of electrical contact portion; said porous refractory body sintered on said auxiliary support electrode having a diameter substantially equal to diameters of said base of said auxiliary support electrode and said support electrode and

solder layers of silver alloy each disposed between and joining one end of said support electrode and said auxiliary support electrode and spreading substantially all over an opposite face of said auxiliary support electrode to said end of said support electrode.

4,892,987

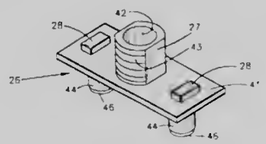
MOUNTING FOR ELECTRICAL CONTROL

Mousa Aframian, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 23, 1989, Ser. No. 299,142

Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—296 **17 Claims**



1. An infinite switch appliance control and adapter combination, said control without said adapter being mountable on a control panel of an appliance with threaded fasteners and with said adapter being mountable on a control panel of an appliance by a bushing mount, said control comprising a body assembly providing a metal mounting surface providing at least one screw receiving opening therein adapted to receive a threaded fastener for mounting said control, said control also providing an operator extending through said mounting surface, a one-piece bushing mount adapter having a tubular bushing portion encircling said operator adjacent to said mounting surface and providing external threads, said adapter also providing a projection extending through said screw opening with an interference fit to secure said adapter on said control against said mounting surface, said adapter being formed of a material which is softer and more ductile than the metal of said mounting surface, permitting said adapter to be mounted on said control by axially inserting said projection into said opening, said opening providing edges biting into the surface of said projection after said projection is inserted therein permanently securing said adapter on said body assembly, said adapter permitting mounting of said control on a control panel with said bushing portion and operator extending therethrough, and a nut received on said bushing portion for securing said control to said control panel.

4,892,988

MEMBRANE PANEL SWITCH

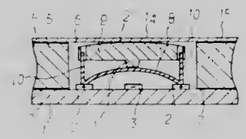
Toshihiro Ishii, Fukuyama, Japan, assignor to Ishii Hyoki Co., Ltd., Japan

Filed Feb. 8, 1988, Ser. No. 153,675

Claims priority, application Japan, Apr. 10, 1987, 62-89311

Int. Cl.[4] H01H *3/12*

U.S. Cl. 200—516 **2 Claims**



1. A membrane panel switch, comprising:

(a) a sheet of extrtuded foam-molded polypropylene having a thickness of greater than 2 mm;

(b) an aperture for a switch in said sheet;

(c) a printed circuit board coupled to said shset and having a pair of contact elements disposed within said aperture;

(d) a clicking plate in said aperture in contact with one of said contact elements and spaced from the other of said contact elements;

(e) said clicking plate having projections at ends thereof extending to an opening of said aperture from a bottom of said aperture;

(f) a press plate having a spherical upper surface and a lower surface in said aperture, said lower surface contacting said clicking plate;

(g) said press plate further having vertical through holes pierced therethrough said projections of said clicking plate being inserted and guided in said through holes.

4,892,989

DISCHARGE MACHINING APPARATUS HAVING MEANS FOR DISTINGUISHING ABNORMAL INTERELECTRODE GAP CONDITIONS

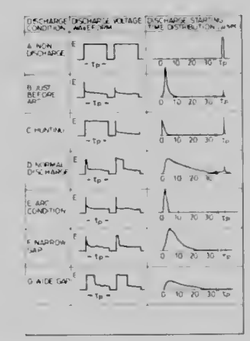
Tetsuroh Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,328

Claims priority, application Japan, May 2, 1983, 58-77731; May 4, 1983, 58-78523; May 4, 1983, 58-78524; May 4, 1983, 58-78525; May 4, 1983, 58-78526; May 4, 1983, 58-78718; May 4, 1983, 58-78719; May 4, 1983, 58-78720; May 4, 1983, 58-78721

Int. Cl.[4] B23H *1/02, 1/10*

U.S. Cl. 219—69.13 **20 Claims**



1. A discharge machining apparatus comprising: an electrode disposed in confronting relation to a workpiece with an insulative machining solution interposed therebetween for machining the workpiece by an electric discharge generated across an interelectrode gap between said electrode and said workpiece; detector means for detecting a distribution of times prior to generation of said discharge across said interelectrode gap after a voltage has been applied thereacross, wherein said voltage comprises a pulsed voltage having a predetermined time duration and applied periodically across said interelectrode gap, said detector means being arranged to divide said time duration of said voltage into a plurality of intervals and count occurrences of discharge started in each of said intervals for a predetermined period of time, such that said distribution of times is detected; and interelectrode condition discriminator means for comparing a distribution of times as detected by said detector means after the voltage has been applied across said interelectrode gap and before the discharge is generated thereacross to produce a signal indicative of a condition of said interelectrode gap.

4,892,990

AUTOMATIC WELDING APPARATUS FOR WELD BUILD-UP AND METHOD OF ACHIEVING WELD BUILD-UP

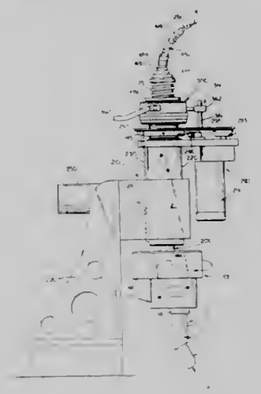
Rees Acheson, Hill Rd., Alstead, N.H. 03602

Continuation-in-part of Ser. No. 945,182, Dec. 23, 1986, Pat. No. 4,687,899, which is a continuation of Ser. No. 707,341, Mar. 1, 1985, abandoned, and a continuation-in-part of Ser. No. 815,682, Jan. 2, 1986, which is a continuation-in-part of Ser. No. 759,543, Jul. 23, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 120,393

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.14 **19 Claims**



1. Apparatus for weld build-up on a surf. e of revolution, comprising:

an elongated, rotatable assembly that supports, at one end, an electrical welding torch that terminates in a nozzle,

said rotatable assembly being adapted to introduce electrical welding current, inert gas, and welding wire to the torch, characterized in that

said assembly comprises an electricity conducting, hollow, metal drive spindle (**200**) consisting of an outer, elongated, hollow tubular body,

said apparatus further comprising,

means for direct application of driving motion (**240**) to said outer tubular body for rotation of said torch, and means for conducting electrical current (**300**) into said tubular body of said metal drive spindle for transmission along the electrically live outer body to the torch (**10**), and

the gas and welding wire pass within said electrical current-carrying, hollow spindle to the torch.

4,892,991

UTILIZATION OF A MATERIAL POSSESSING A MICRO-DUPLEX GRAIN STRUCTURE

Hansjorg Stadler, Ruckersdorf, and Peter Ruchel, Lauf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Division of Ser. No. 157,330, Feb. 17, 1988. This application Mar. 20, 1989, Ser. No. 325,692

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710334

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.74 **3 Claims**

1. A method of deflecting a laser beam comprising deflecting a laser beam off of a reflective surface formed from a brass material possessing a micro-duplex matrix, or grain structure,

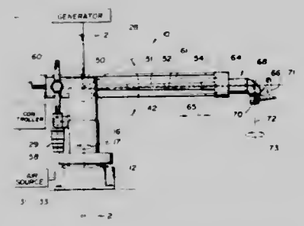
said brass having a theoretical copper content in the range of about 61-65%, the remainder being zinc.

4,892,992

INDUSTRIAL LASER ROBOT SYSTEM

Hadi A. Akeel; Stan H. McClosky, both of Rochester, and Lupcho Najdovski, Sterling Heights, all of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Filed Nov. 3, 1988, Ser. No. 266,679
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.78 **37 Claims**



1. An industrial laser robot system comprising:
a laser beam generator for generating a laser beam;
a pedestal having a first axis;
a hollow base supported on said pedestal for rotation about said first axis;
hollow arm support means laterally supported on said base for rotation relative to the base about a second axis, said first and second axes being obliquely angled to and intersecting one another;
a robot arm elongated along a third axis and laterally supported on said arm support means for pivotal rotation therewith relative to the base about said second axis;
a first mirror supported by and within said base to rotate therewith about the first axis so that the reflective surface of said first mirror contains a first point of intersection of said first and second axes and so inclined so that a laser beam traveling along said first axis is deflected by said first mirror to travel along said second axis;
a second mirror supported by said arm support means within said arm to rotate therewith about the second axis so that the reflective surface of said second mirror intersects said second axis at a second point of intersection and is so inclined to direct said laser beam along said third axis of said arm;
an optical focusing assembly mounted on said arm; and
a continuous unobstructed hollow passage that extends along and surrounds said first axis to said first point of intersection and along said second axis to said second point of intersection and along said third axis to and through said optical focusing assembly; said pedestal being so disposed so that the base receives the laser beam from the laser beam generator for transmission along said hollow passage to said optical focusing assembly.

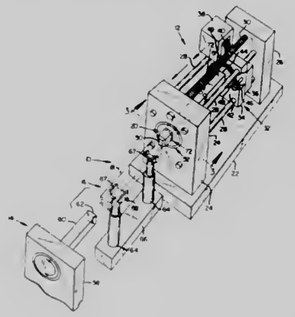
4,892,993

WELDING SYSTEM FOR HOLLOW THIN WALLED MEMBERS

Isreal Stol, Mt Lebanon, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 19, 1988, Ser. No. 196,373
Int. Cl.[4] B23K *9/32*
U.S. Cl. 219—125.1 **32 Claims**

1. A system for facilitating the welding of a thin walled attachment to outside surfaces of a thin walled hollow member at a plurality of welded joints, said member having an elongated cavity defined by a plurality of elongated internal wall surfaces and having at least one open end, comprising:
(a) a mandrel carrier for receiving and supporting an end of a mandrel, the carrier being supported for movement in a longitudinal direction;
(b) means for supporting the hollow member so that its elongated cavity extends in the longitudinal direction;



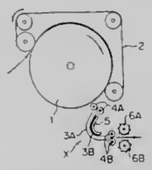
(c) an elongated expandable mandrel supported at one end by the carrier in substantially cantilever fashion and extending in the longitudinal direction and having a free end opposite from the supported end: and
(d) means for advancing the carrier with the mandrel in the longitudinal direction so that the free end of the mandrel passes through the at least one open end and enters the cavity of the thin walled hollow member.

4,892,994

CURLING PREVENTION DEVICE OF THERMAL DEVELOPING MACHINE

Masaru Tsuchiya; Junichi Kohno, and Ken Okauchi, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,780
Claims priority, application Japan, Mar. 17, 1987, 62-61785
Int. Cl.[4] H05B *3/00*
U.S. Cl. 219—216 **10 Claims**



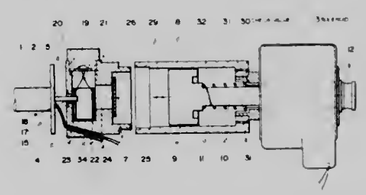
1. A device for the prevention of curling in a thermal-developing, light-sensitive material passed through a thermal developing machine having means for subjecting said material to a thermal developing operation which results in curling said material to bend in a certain arc, said device comprising:
a correcting guide passage adapted to be positioned at an outlet of a thermal developing means and to receive material as it exits therefrom, said correcting guide passage having at least a portion thereof bent in an arc opposite to an arc of said material, and
means for controlling the temperature of said material as it enters said correcting guide passage from the outlet of said thermal developing means to be at least 50° C. and lower than a thermal developing temperature of said material.

4,892,995

ELECTRIC PORTABLE DESOLDERING IRON

Bienvenido Del Pino Millan, Sector Foresta 24, Tres Cantos, Colmenar Viejo, Madrid, Spain

Continuation-in-part of Ser. No. 116,017, Oct. 30, 1987, abandoned. This application May 17, 1988, Ser. No. 195,137
Claims priority, application Spain, Nov. 4, 1986, 8602897; Oct. 19, 1987, 8702978
Int. Cl.[4] B23K *3/04*
U.S. Cl. 219—230 **20 Claims**



1. An automatic portable desolderer comprising: a tubular heating member, to melt soldering material defining a suction conduit, a housing defining a reservoir for collection of the soldering material, the housing having an opening communicating with said tubular heating member suction conduit; a cylinder connectable to said housing, defining a working space, a passage in said housing providing fluid communication between said reservoir and said cylinder working space relief valve means for blocking fluid flow in the direction from exterior of said cylinder to said cylinder and allowing fluid flow from said cylinder to the exterior of said cylinder; a piston positioned within said cylinder for reciprocal movement therein, said piston having a piston rod formed of a magnetically attractable material; a solenoid coil positioned adjacent said cylinder, said piston rod forming a solenoid core which is pulled to a central position when the coil is energized; a spring member positioned within said cylinder for urging said piston away from said solenoid coil; first one-way valve means positioned between said cylinder and said reservoir for blocking fluid flow in the direction from said cylinder to said reservoir and allowing fluid to flow in the direction from said reservoir to said cylinder; and, second one-way valve connected to said relief valve means preventing fluid from entering said cylinder and allowing fluid to exit said cylinder, when said coil is energized, said piston drawing air through said first one way valve which draws melted soldering material into said reservoir, when said solenoid coil is de-energized, said piston moving toward said reservoir and fluid within said working chamber escaping from said cylinder through said relief valve means, said housing including a reservoir opening and a locking plug sealing said reservoir from the exterior of said housing, said locking plug being removable to remove solder from said reservoir, a solder retaining member being positioned in said reservoir to retain solder as it moves from said suction conduit, said retaining member being removable from said reservoir through said reservoir opening.

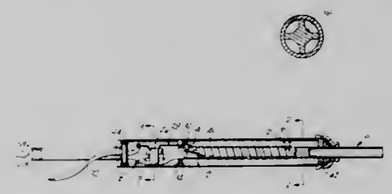
4,892,996

THERMOSTATICALLY CONTROLLED IN-LINE DIESEL FUEL HEATER USING A BIMETAL DISC THERMOSTAT

James L. Mertes, Altadena, Calif., assignor to TRW Technar Inc., Irwindale, Calif.

Continuation of Ser. No. 89,227, Aug. 25, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 220,409
Int. Cl.[4] H05B *1/02*; F24H *1/10*; F02M *31/00*; H01H *37/04*
U.S. Cl. 219—301 **6 Claims**

1. A fuel heater for diesel engine fuel line conducting a diesel fluid in which wax precipitates below a predetermined ambient temperature comprising:
a metal pipe section for transporting a fluid, a resistance heater strip in thermal contact with a first portion of the pipe section, a thermostatic switch connected in series with the resistance heater and being mounted on a second portion of the pipe in heat sensing relationship to the pipe, the second portion of the pipe being upstream of the first portion of the pipe in relation to the normal direction of fluid flow through the pipe, the second portion having a pipe wall that is flattened to less than half the normal diameter of the pipe to reduce the cross-sectional area of the pipe, the thermostatic switch having a heat sensitive bimetal disk that snaps over center to open the switch as



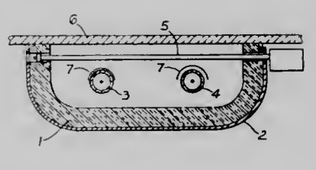
the disk is heated and to close the switch as the disk is cooled about a predetermined reference temperature, the disk being mounted to said flattened pipe wall, the thermostatic switch being held below said reference temperature by fluid flowing past the flattened pipe wall at an ambient fluid temperature below the level at which wax forms in the fluid but rising above said reference temperature when the fluid stops flowing and the heater is on because of conductive heat transfer in the pipe between the heater and the switch.

4,892,997

ELECTRIC HEATERS

Joseph A. McWilliams, Droitwich, United Kingdom, assignor to Micropore International Limited, Worcestershire, England

Continuation of Ser. No. 742,707, Jun. 7, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 86,227
Claims priority, application United Kingdom, Jun. 9, 1984, 8414764
Int. Cl.[4] H05B *3/74*
U.S. Cl. 219—461 **19 Claims**



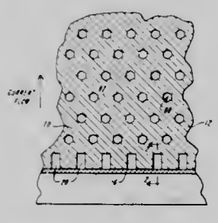
1. An electric cooker which comprises:
a smooth cooking surface; and
at least one electric heater mounted beneath said smooth cooking surface and comprising:
a dish;
a layer of thermal insulation material supported in said dish;
at least one source of infra-red radiation in the form of an infra-red lamp supported between said layer of thermal insulation material and said cooking surface;
a thermal cut-out device; and
at least one respective reflector positioned to intercept infra-red radiation emitted by each said source in a direction towards said smooth cooking surface, and to reflect said infra-red radiation in a direction towards said layer of thermal insulation material.

4,892,998

SEMI-CONDUCTIVE ELECTRICAL HEATING DEVICE WITH VOIDS

John A. Marstiller, Marston Mills; Paul H. Bodensiek, Waltham, and Frederick G. J. Grise, Osterville, all of Mass., assignors to Flexwatt Corporation, West Wareham, Mass.

Filed Dec. 29, 1987, Ser. No. 138,857
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—548 **26 Claims**



1. An electrical heating device including a layer of semi-conductive material carried on an insulating surface and defining a semi-conductive pattern, and a pair of spaced-apart conductors electrically connected to said semi-conductive pattern, said device being characterized in that

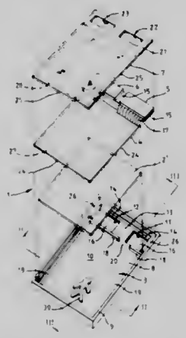
a first heating portion of said semi-conductive pattern intermediate said conductors includes a two-dimensional array of areas devoid of semi-conductive material ("voids") within a mesh of semi-conductive material, said voids being arranged such that the centers of the voids forming sets of three adjacent voids are positioned at the corners of equilateral triangles.

4,892,999

CALCULATOR

Ho Wai-Kwan, Kwai Chung, Hong Kong, assignor to Leona Electronics Co., Ltd., Hong Kong

Filed Jul. 15, 1988, Ser. No. 219,138
Int. Cl.[4] G06C *5/02*
U.S. Cl. 235—1 D **20 Claims**



1. A calculator or memory device, comprising:

a printed circuit board for performing memory functions;

a substantially transparent circuit board having a plurality of switches for inputting information to the printed circuit board;

a body external of the transparent circuit board and printed circuit board, the body including a substantially transparent keyboard-supporting member for supporting the transparent circuit board;

at least a portion of the keyboard-supporting member forming a hollow void between the transparent circuit board and the body; and

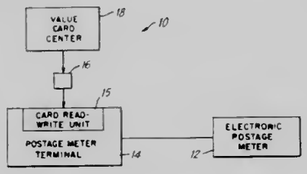
a liquid in the hollow void of the portion of the keyboard-supporting member for enhancing visual effects.

4,893,000

SYSTEM FOR SECURELY CONTROLLING POSTAGE FUNDS

Winslow E. Jackson, Monroe, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 8, 1988, Ser. No. 153,392
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **12 Claims**



1. A system for securely controlling postage meter funds comprising:

a value card center for receiving funds from a customer and issuing integrated circuit value card means, said card means having postage funds and a public-key encryption key encoded therein; and

postage meter terminal means for communicating an appropriate public-key decryption key to said card means, whereupon postage funds may be accessed from said card means to authorize printing of postage indicia.

4,893,001

IC CARD

Isao Ohkubo, Kawasake, and Shintaro Aiba, Kanagawa, both of Japan, assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 3,668, Jan. 15, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,295
Claims priority, application Japan, Jan. 20, 1986, 61-8090
Int. Cl.[4] H05K *1/14*
U.S. Cl. 235—490 **5 Claims**



1. An IC card comprising:

a flat, relatively thin housing having an elongated edge;

a slot formed lengthwise in said edge;

a printed circuit member in said housing generally aligned with said slot;

at least one active device mounted on said printed circuit member;

said printed circuit member having a border region extending into said slot;

said border region providing upper and lower planar surfaces within said slot adjacent to said edge;

a row of spaced terminals on one of said surfaces of said printed circuit member; and

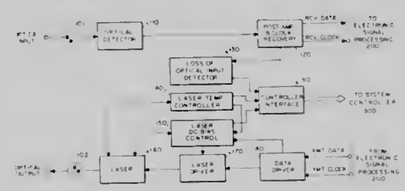
said housing embodying separation walls extending from the sides of said slot to said upper and lower surfaces of said border region of said printed circuit member to support said border region, said separation walls being located between said terminals.

4,893,002

LOSS OF OPTICAL INPUT CIRCUIT

Miklos J. Kollanyi, Albuquerque, N. Mex., assignor to AG Communications Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 944,042, Dec. 22, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 248,310
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 R **3 Claims**



1. A loss of optical signal detector used with a signal generating circuit to detect the loss of an optical input signal, said signal generating circuit arranged to develop a signal voltage when said optical input drops below a preset threshold, said loss of optical signal detector comprising:

signal coupling means including a first transistor having its base lead connected to said signal voltage from said signal generating circuit and its collector connected to a source of voltage and current and responsive to the application of said signal voltage from said signal generating circuit said first transistor turns on connecting said source of voltage and current to said first transistor emitter lead;

signal voltage means including first and second resistors connected to said first transistor emitter lead, said signal voltage means arranged to receive said voltage and current from said signal coupling means and produce an output signal representing the loss of the optical signal;

comparator means having a second transistor connected to said signal voltage means and a third transistor connected to said second transistor and to a reference voltage, said third transistor producing an alarm voltage in response to the application of said output signal from said signal voltage means to said second transistor when said signal voltage means output signal is greater than said reference voltage; and,

alarm signal generating means connected to said comparator means third transistor, said alarm signal generating means receiving said alarm voltage and producing and sending an alarm signal to a controller interface indicating the loss of said optical input signal.

4,893,003

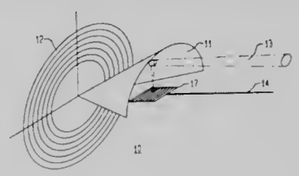
CIRCLE-TO-LINE INTERFEROMETER OPTICAL SYSTEM

Paul B. Hays, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Filed Sep. 19, 1988, Ser. No. 246,096
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **17 Claims**

1. An optical system for converting information in the form of a circular ring of electromagnetic radiation to a linear form, the optical system comprising:

reflector means having a reflective surface configured at least in part as an internal conical surface, for receiving and reflecting the electromagnetic radiation; and



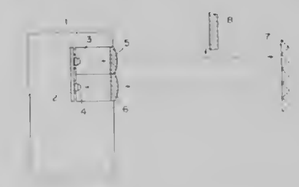
linear detector means arranged to receive the electromagnetic radiation reflected by said reflective surface of said reflector means.

4,893,004

REFLECTION TYPE PHOTOELECTRIC SWITCH FOR DETECTING THE PRESENCE OF AN OBJECT

Arata Nakamura, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 28, 1987, Ser. No. 138,052
Claims priority, application Japan, Dec. 26, 1986, 61-312456
Int. Cl.[4] G01V *9/04*; G06M *7/00*; H01J *40/14*
U.S. Cl. 250—221 **14 Claims**



1. A reflection type photoelectric switch which detects the presence of an object, comprising:

light emitting means for emitting a substantially single light beam having first and second different wavelengths into a space in which the object may be detected,

a reflector for reflecting said substantially single light beam at different reflection rates with respect to said first and second wavelengths,

light receiving means for sensing said first and second wavelengths of the reflected light beam and which generates outputs in response to said first and second wavelengths, and

means for analyzing said outputs generated by said light receiving member to generate an output representing the existence in the space of the object detected by the photoelectric switch.

4,893,005

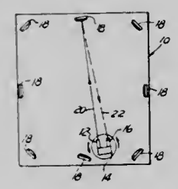
METHOD AND APPARATUS FOR AREA AND PERIMETER SECURITY WITH REFLECTION COUNTING

Ariel Stiebel, Bloomfield Hills, Mich., assignor to Development/Consulting Associates, Troy, Mich.

Continuation of Ser. No. 850,725, Apr. 11, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,113
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **10 Claims**

1. A method for detecting disturbance in a protected area or perimeter, said method comprising emitting a beam of radiation along a predetermined path, rotating said beam of radiation for a complete revolution along said predetermined path, positioning a plurality of individual reflectors along said prede-

termined path within said area or perimeter, counting a base number of beam reflections for said complete revolution of said beam after activation, storing said base number for establishing a beam reflection number corresponding to a normal state in



said area or perimeter, counting a number of beam reflections for each subsequent revolution of said beam, comparing said counted number with said stored base number, and triggering an alarm when said counted number is different from said stored base number.

4,893,006

OPTICAL TIME DOMAIN REFLECTOMETER WITH LEVEL ADJUSTING FUNCTION

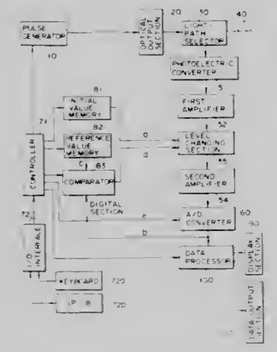
Toshiyuki Wakai, and Toshiyuki Kashiwabara, both of Atsugi, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,995

Claims priority, application Japan, Oct. 19, 1987, 62-261850; Sep. 30, 1988, 63-244226

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **12 Claims**



1. An optical time domain reflectometer comprising:
optical pulse supplying means for supplying an optical pulse to a target optical fiber;
reflection light detecting means for outputting an electric signal corresponding to reflection light from said target optical fiber;
level control means for receiving said electric signal from said reflection light detecting means and controlling said electric signal to have a level according to an initial value or a compensation value;
A/D converting means for converting an output of said level control means into a digital signal;
parameter input means for entering a parameter for determining a level indicating reflection light from said target optical fiber;
initial value storage means for storing said initial value to be set in said level control means in accordance with a parameter from said parameter input means;
compensation value computing means comparing said digital signal from said A/D converting means corresponding to said initial value with a reference value and computing said compensation value to be set in said level control means; and
processing means for processing said digital signal from said A/D converting means to output said digital signal.

4,893,007

ROTARY MACHINE WITH A MEASURING DEVICE FOR THE ANGLE OF ROTATION

Jorgen C. Stannow, Sonderborg; Bruno Wolff, Malov; Niels H. Gade, Sonderborg; Ib M. Espensen, and Knud Blohm, both of Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 29, 1988, Ser. No. 188,213

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716464

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **9 Claims**



1. A rotary machine having an angle of rotation measuring capability, comprising a machine housing having a housing bore, a machine rotor within the housing bore and rotor mounting means mounted within the machine housing for rotatably mounting the rotor, said rotor having circumferentially spaced markings thereon and within the machine housing and scanner means for sensing the markings for determining the angle of rotation, the scanner means including a sensor element mounted by the machine housing and extending into the housing bore into closely adjacent relationship to the markings.

4,893,008

SCANNING OPTICAL MICROSCOPE

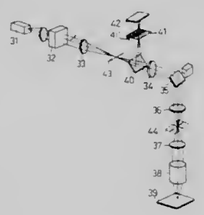
Yoshiaki Horikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,277

Claims priority, application Japan, Jun. 9, 1987, 62-142218

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—234 **11 Claims**



1. A scanning optical microscope comprising:
a light source;
an objective lens for focusing light emitted from said light source upon an object to form a minute light spot on said object;
a light deflecting optical system arranged between said light source and said objective lens and including at least one acousto-optic light deflector for varying the angle of incidence on said objective lens of the light emitted from said light source so as to scan said object with said light spot;
light splitting means provided in said light deflecting optical system and between said acousto-optic light deflector and said objective lens for taking out at least a part of the light coming from said object;
focusing means for focusing the light taken out by said light splitting means;
light shielding means arranged in the focusing position of said focusing means and having an elongated aperture, the longitudinal direction of said elongated aperture being coincident with the direction of movement of the light in said focusing position; and
photoelectric transducing means for receiving the light passing through said aperture of said light shielding means.

4,893,009

SCANNING ELECTRON MICROSCOPE AND THE LIKE APPARATUS

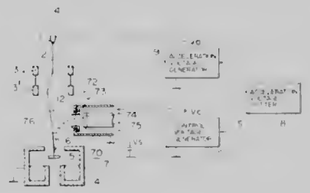
Katsuhiro Kuroda, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 310,920

Claims priority, application Japan, Feb. 26, 1988, 63-41986

Int. Cl.[4] H01J *37/28, 37/244*

U.S. Cl. 250—310 **4 Claims**



1. A scanning electron microscope comprising:
an electron beam source for producing a finely focused primary electron beam;
means for applying to said electron beam source an acceleration voltage for accelerating the primary electron beam;
a specimen bombarded with the accelerated primary electron beam;
a secondary electron detector for detecting secondary electrons released from said specimen;
means for applying to said secondary electron detector a voltage for attracting the secondary electrons to said secondary electron detector; and
electric field control means for changing intensity of an electric field created by the voltage applied to said secondary electron detector in the path of the accelerated primary electron beam, in compliance with the change of the acceleration voltage applied to said electron beam source.

4,893,010

IMAGE RECORDING APPARATUS

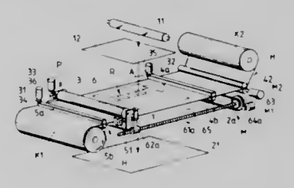
Yoshiya Tomatsu, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jul. 12, 1988, Ser. No. 217,632

Claims priority, application Japan, Jul. 15, 1987, 62-176849

Int. Cl.[4] G01U *15/00*

U.S. Cl. 250—318 **12 Claims**



1. An image recording apparatus which produces an image on a photosensitive recording medium through a light transmissive member which carries thereon a light shieldable mask image, comprising:
a mask image forming means provided at a mask image forming zone for forming said light shieldable mask image on said light transmissive member, said light shieldable mask image corresponding to color information derived from a colored original;
exposure means for exposing said photosensitive recording medium to light through said light transmissive member carrying said mask image in an exposure zone for forming a latent image on said photosensitive recording medium corresponding to said mask image, said mask image forming zone being identical with said exposure zone;
developing means disposed at a downstream side of said exposure means for developing said latent image into a visible image on said photosensitive recording medium; and,
a holding means for selectively holding portions of said light transmissive member extending outside of said exposure zone and maintaining a segment of said light transmissive member stationary in said exposure zone during the mask image formation and during the exposure in accordance with said color information.

4,893,011

METHOD OF PROCESSING X-RAY FILM CASSETTES WITH PHOSPORUS-COATED FILMS AND A READING STATION FOR EXECUTING THE PROCESS

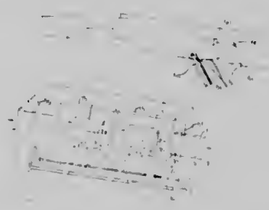
Walter Bauer; Jürgen Müller, both of Munich, and Volkmar Voigtländer, Eicbenau, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 238,034

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731203

Int. Cl.[4] G03G *5/16;* **H05B** *33/00;* **B65B** *21/02, 69/00*

U.S. Cl. 250—327.2 **10 Claims**



3. A reading station for processing an X-ray film cassette

formed of a bottom part and a lid pivotable one relative to another and containing an X-ray receiving film coated with a layer of stimulatable phosphorus which faces towards said bottom part, wherein said film is exposed to X-rays to produce thereon a latent image, the reading station comprising housing means having an inlet opening for insertion the cassette with the film therein into the reading station and an outlet opening aligned with said inlet opening and formed opposite thereto for discharging the cassette from the reading station; two cassette positioning means for positioning the cassette in said reading station, a first one of said positioning means being located next to said inlet opening and a second one of said positioning means being located next to and before said outlet opening and in alignment with said first positioning means; means for removing the film from the cassette, a laser beam scanner for bringing said latent image to luminescence so that emitted light converts said image into digital electric signals; a central memory for storing said digital image signals; means for erasing said film by exposing the same to visible light; a film platform receiving the film removed from the cassette, said first and second positioning means guiding said film platform with the film therein in a direction perpendicularly to a scanning direction of the laser beam scanner (**6a**, **6b**) which scans the film; a light-conductive element (**6c**) and a photomultiplier connected to the central memory, said erasing means including a lamp, said positioning means linearly moving said platform with the film by said light-conductive element and said lamp from an initial position to an end position, said positioning means including means transporting said cassette in the same direction as said platform with the film to a position corresponding to said end position; means inserting the film removed from the platform into said cassette at said corresponding position; and means closing the lid of said cassette, said cassette with the erased film therein being discharged from the reading station through said outlet opening.

4,893,012

RADIATION IMAGE READ-OUT AND REPRODUCING APPARATUS

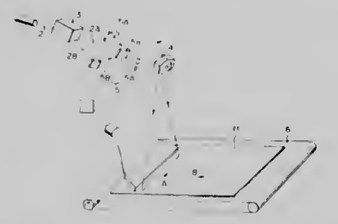
Toshitaka Agano; Ryousuke Furue; Hiroyuki Karasawa, and Ichirou Miyagawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 18, 1988, Ser. No. 195,333

Claims priority, application Japan, Jan. 13, 1987, 62-5266; Jul. 14, 1987, 62-175487; Jul. 14, 1987, 62-175488; Dec. 29, 1987, 62-335505

Int. Cl.[4] G03B *42/08*

U.S. Cl. 250—327.2 **9 Claims**



1. An image read-out and reproducing apparatus comprising:

(i) a light beam source for producing a light beam,

(ii) a acousto-optic modulator provided in an optical path of said light beam,

(iii) a change-over means for selectively guiding either one of a zero-order light component and a first-order light component, which are radiated by said acousto-optic modulator, to a predetermined optical path,

(iv) a light deflector positioned in said predetermined optical path for deflecting the incident light beam and scanning an image information sheet carrying an image recorded thereon or a recording sheet, on which said image is to be reproduced, by the deflected light beam in a main scanning direction,

(v) a sub-scanning means for moving said image information sheet or said recording sheet with respect to said light beam in a sub-scanning direction approximately normal to said main scanning direction, and

(vi) a light detection means for detecting light obtained from said image information sheet when said image information sheet is scanned by said light beam,

wherein in the course of movement of said image information sheet by said sub-scanning means, said change-over means guides said zero-order light component to said predetermined optical path so that said zero-order light component is deflected by said light deflector to scan said image information sheet in the main scanning direction and the light obtained from said image information sheet is detected by said light detection means, so as to carry out read-out of said image from said image information sheet, and

in the course of movement of said recording sheet by said sub-scanning means, said change-over means guides said first-order light component to said predetermined optical path and said first-order light component is modulated by said acousto-optic modulator in accordance with image signals, so that the modulated first-order light component is deflected by said light deflector to scan said recording sheet in the main scanning direction, so as to carry out reproduction of said image on said recording sheet.

4,893,013

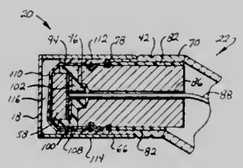
DETECTOR AND LOCALIZER FOR LOW ENERGY RADIATION EMISSIONS

Dennis J. Denen; Marlin O. Thurston, and Raymond C. Ramsey, all of Columbus, Ohio, assignors to Neoprobe Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 27,197, Mar. 17, 1987, Pat. No. 4,801,803. This application Sep. 23, 1988, Ser. No. 248,920

Int. Cl.[4] G01T *1/161*

U.S. Cl. 250—336.1 **5 Claims**



1. An instrument for detecting and locating sources of radiation emission having predetermined energy levels, comprising:

a housing having interior walls defining an interior cavity and first portion having sidewalls formed of select gamma radiation attenuating material and exhibiting an electrical shielding effect and extending to a forward opening positionable proximate said source, and a hand graspable second portion extending from said first portion;

window means for permitting transmission of gamma radiation of energy level at least as low as 27 kev through said forward opening while blocking the passage of light;

blocking means formed of material selected for attenuating gamma radiation of said predetermined energy levels, having an outer surface, supportable within said housing and having a portion extensible within said housing first portion to a base support surface;

elastomeric means intermediate said housing and said blocking means for retaining said blocking means spaced from said housing interior wall;

electrically insulative support means mounted upon said blocking means base support surface and having a mounting surface positioned outwardly from said base support surface;

a resiliently compressible shock cushion layer positioned in adjacency over said insulative support means and having an outwardly disposed surface;

a gamma radiation responsive crystal having a rearwardly disposed surface positioned in adjacency with said shock cushion layer and having a forwardly disposed surface;

grounding means for electrically grounding said crystal forwardly disposed surface;

biasing means for applying an electrical bias to said crystal rearwardly disposed surface;

elastomeric retainer means positioned over the assemblage of said support means, said shock cushion layer, and said crystal for effecting their compressed mutual association;

retaining means for positioning said housing first position over said assemblage and said blocking means portion such that said crystal forwardly disposed surface is spaced from said window means an amount establishing a dead air space therebetween.

4,893,015

DUAL MODE RADIOGRAPHIC MEASUREMENT METHOD AND DEVICE

Klaus Kubierschky, North Reading, and Herbert L. Aronson, Newton, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Apr. 1, 1987, Ser. No. 32,692

Int. Cl.[4] G01T *1/208*

U.S. Cl. 250—369 **14 Claims**



1. A radiation measuring device for measuring a wide range of X-ray intensities comprising:

a scintillator crystal for emitting light in response to irradiation by X-rays;

photodetector means optically coupled to said scintillator crystal for receiving the emitted light and converting said emitted light into electrical current, said photodetector means comprising first and second outputs;

first and second analyzing means respectively responsive simultaneously to said first and second outputs;

said first analyzing means coupled to said first output of said photodetector means for counting discrete electronic pulses generated by said photodetector means, said first analyzing means producing a first output signal;

said second analyzing means operated simultaneously with said first analyzing means coupled to said second output of said photodetector means, said second analyzing means including integrating means for integrating current generated by said photodetector means, said second analyzing means producing a second output signal;

receiving means responsive to said first and second output signals for measuring detected radiation.

4,893,014

MOVEMENT MONITOR HAVING AN INFRARED DETECTOR

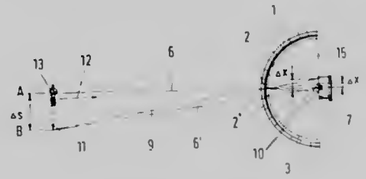
Berthold Geck, Altena, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,225

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742031

Int. Cl.[4] G01J *5/08*

U.S. Cl. 250—353 **20 Claims**



1. Movement monitor having an infrared detector, comprising collecting optics focusing thermal radiation picked up from a radiating object in a monitored zone, at least one sensor being sensitive in the infrared band, said at least one sensor receiving the focused thermal radiation from said collecting optics and transmitting a signal upon a predetermined change in infrared radiation received by said at least one sensor for tripping a switching function, said collecting optics being formed of a cylindrical section being axially divided into segments each effecting focusing with a principal ray directed onto said at least one sensor, and deflecting optics in the vicinity of said collecting optics deflecting a portion of each bundle of rays incident parallel to the principal ray of a segment and forming at least two radiation maxima striking said at least one sensor one after another upon the occurrence of a corresponding change in the position of the radiating object.

4,893,016

GAS-COOLED SEMICONDUCTOR RADIATION DETECTOR

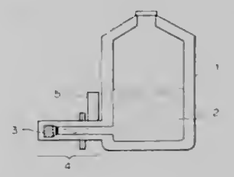
Masaki Katagiri, Ibaraki, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 10,468, Feb. 3, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 247,432

Claims priority, application Japan, Apr. 2, 1986, 61-22754

Int. Cl.[4] G01T *1/24*

U.S. Cl. 250—370.09 **1 Claim**



1. In a gas-cooled semiconductor detection system for detecting gamma rays while a semiconductor detection device is

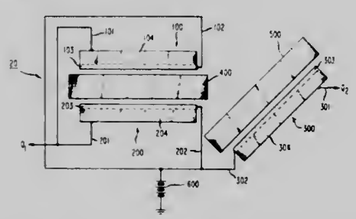
cooled to a temperature in the neighborhood of the temperature of liquid nitrogen with a refrigerator that is composed of an adiabatic expansion valve, a heat exchanger and a cooling section and which makes use of the adiabatic expansion of air or nitrogen gas, the improvement wherein a gas-permeable fibrous or screen-like material such as cotton wool, gauze or felt envelopes the periphery of the gas outlet of said adiabatic expansion valve located at the tip of the refrigerator in direct contact therewith such that air vibrations which occur in a space between said adiabatic expansion valve and said cooling section when a gas is released from the adiabatic expansion valve and mechanical vibrations which occur when the gas directly collides with the cooling section are sufficiently damped thereby to improve the energy resolution of the spectrometry of gamma rays that is attainable by the gamma rays detection system.

4,893,017

DOSE AND DOSE RATE SENSOR FOR THE POCKET RADIAC

Stanley Kronenberg, Skillman, N.J., assignor to The United State of America as represented by the Sectretay of the Army, Washington, D.C.

Filed Oct. 14, 1988, Ser. No. 260,425
Int. Cl.[4] G01T *3/08*
U.S. Cl. 250—370.07 **7 Claims**



1. A radiation detector for detecting gamma and neutron radiation at high dose rates comprising a first silicon photodiode, a second silicon photodiode, a third silicon photodiode, biasing means, a slab of silicon and a slab of polyethylene,

said first and second silicon photodiodes being reverse biased by said biasing means and positioned on either side of said slab of polyethylene such that the depleted layer of each of said first and second silicon photodiode is adjacent said slab of polyethylene,

said third silicon photodiode being reverse biased by said biasing means and positioned next to said slab of silicon such that the depleted layer of said third silicon photodiode is adjacent said slab of silicon,

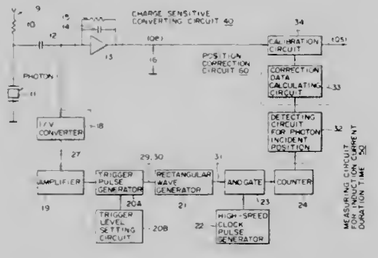
the outputs of said first and second silicon photodiodes being combined to yield a first analog signal proportional to the neutron dose and gamma ray dose absorbed by said first and second silicon photodiodes, and the output of said third silicon photodiode yielding a second analog signal proportional to the gamma ray dose absorbed by said third silicon photodiode.

4,893,018

RADIATION DETECTING CIRCUIT INCLUDING POSITIONAL ERROR CALIBRATOR

Satoshi Saitou, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 20, 1987, Ser. No. 51,644
Claims priority, application Japan, May 21, 1986, 61-116869; May 28, 1986, 61-122818
Int. Cl.[4] G01T *1/22*
U.S. Cl. 250—370.10 **16 Claims**



1. A radiation detecting circuit arrangement comprising:

a semiconductor radiation detector having two electrodes to sandwich the detector, to which a predetermined biasing voltage is being applied, for detecting radiation energy incident thereon to derive an electric signal;

a converting circuit for converting total electric charge induced in the detector into a corresponding voltage in response to the electric signal detected from the detector;

a circuit for measuring a duration time period of induction current caused by movement of electrons occurring in the detector in response to the detected electric signal;

a circuit for detecting a position of the radiation incident upon the detector on the basis of said duration time period of induction current to produce a positional signal of the incident radiation; and

a circuit for correcting the voltage output from the converting circuit based upon the positional signal of the incident radiation to thereby produce an energy value of the radiation independent of the incident position thereof.

4,893,019

ION CURRENT GENERATOR SYSTEM FOR THIN FILM FORMATION, ION IMPLANTATION, ETCHING AND SPUTTERING

Tatsno Oomori; Kouichi Ono, and Shigeto Fujita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,236
Claims priority, application Japan, May 27, 1987, 62-134289; Jui. 27, 1987, 62-186839; Aug. 19, 1987, 62-205763
Int. Cl.[4] H01J *37/08*
U.S. Cl. 250—423 R **77 Claims**

1. An ion current generator comprising:

material atoms supply means for supplying a particle current having material atoms to a predetermined region;

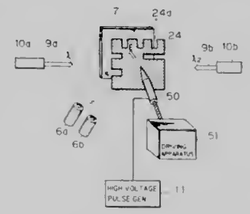
laser generating means for supplying laser radiation to said region to excite said material atoms to a Rydberg state; and

electric field application means for applying a predetermined electric field to said material atoms in said Rydberg state so that said material atoms are ionized to be led to a predetermined direction, wherein said electric field application means includes:

a substrate,

an electrode provided to face said substrate, and

a power source for supplying a predetermined electric potential to said electrode to generate an electric field between said substrate and said electrode wherein said electrode has a surface facing said substrate, said surface being irregularly shaped so as to have a first region spaced from said substrate by a first distance and a second region spaced from said substrate by a second



distance where said second distance is greater than said first distance;

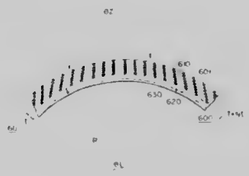
said first region faces a region on said substrate to which an ion current is to be supplied and said second region faces a region on said substrate to which said ion current is not to be supplied.

4,893,020

X-RAY FLUORESCENT IMAGE INTENSIFIER

Katsuhiro Ono, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 17, 1987, Ser. No. 134,157
Claims priority, application Japan, Dec. 18, 1986, 61-299984
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—483.1 **11 Claims**



and securable therearound when said outer lid is rotated relative to said opening, said inner lid remaining stationary relative to said cask opening when said outer lid is rotated and having no torque applied thereto by said outer lid when said outer lid is rotated, and

c. bolt means threadedly mounted through said outer lid for applying a compressive force between said inner and outer lids after said outer lid has been secured to said opening in order to depress the gasket means of said inner lid into sealing engagement with said ledge while avoiding the application of torsion between said gasket means and said ledge.

4,893,023

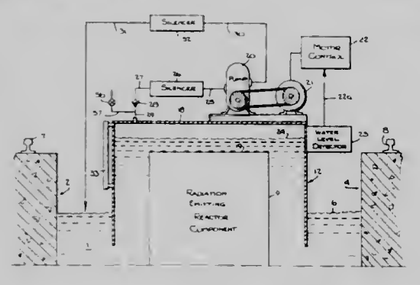
RADIATION SHIELDING APPARATUS

William A. Homyk, R.D. #1, Martin Rd., Hopewell Junction, N.Y. 12533

Division of Ser. No. 108,482, Oct. 14, 1987, Pat. No. 4,851,185. This application Sep. 29, 1988, Ser. No. 250,523

Int. Cl.[4] G21C *11/00*

U.S. Cl. 250—515.1 **7 Claims**



1. In apparatus for shielding a radiation emitting component which is immersed in a pool of liquid in a tank with an upper portion of the component extending above the upper surface of the liquid of said pool, said tank being at atmospheric pressure, said apparatus comprising:

a vessel having a top end wall, a side wall extending downwardly from said top wall and secured at its upper end in gas tight relation to said top end wall to provide a vessel which is gas tight except at its lower end which is open, said side wall having an inner circumferential size greater than the circumferential size of said upper portion of said component and a height at least equal to the height of said portion for receiving said portion within said vessel and said vessel being of a size receivable within said tank;

pumping means connected for fluid flow to the upper end of the interior of said vessel for removing fluid from the upper end of the latter and thereby creating a vacuum in at least a portion of said vessel and raising the level of the upper surface of said liquid to at least the upper end of said portion of said component;

reinforcing means secured to said top end wall and said side wall for preventing collapse of said top end wall and said side wall with evacuation of said vessel; and

suspending means connected to said vessel for suspending said vessel with the lower end of said side wall immersed in said pool of liquid and with said wall encircling said upper portion of said component.

4,893,024

APPARATUS FOR MEASURING THE THICKNESS OF A THIN FILM WITH ANGLE DETECTION MEANS

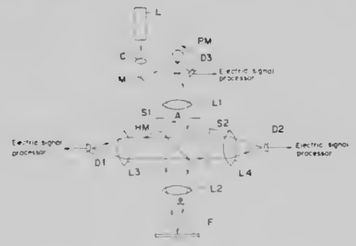
Katsue Koashi, Toyonaka, and Yosuke Eguchi, Takatsuki, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

Filed May 25, 1988, Ser. No. 198,494

Claims priority, application Japan, May 25, 1987, 62-128962; May 20, 1988, 63-124155

Int. Cl.[4] G01N *21/86;* **H01J** *3/14*

U.S. Cl. 250—560 **8 Claims**



1. An apparatus for measuring the thickness of a thin film, having top and bottom surfaces, utilizing an interferometric method, comprising:

a light emitting means for generating a monochromatic light beam;

a beam scanning means including a deflection means for deflecting the light beam continuously and repeatedly and a lens means, having an optical axis, for projecting the deflected light beam on a thin film arranged substantially perpendicular to said optical axis of said lens means, said deflection means deflecting the light beam so as to scan it symmetrically with respect to a normal of the thin film to be measured;

an angle detection means including a half mirror for splitting the light beam into an impinging beam for impinging onto the thin film and a reference beam and a light receiving means for detecting an incident angle of said impinging beam with respect to the thin film by receiving said reference beam after having been split by said half mirror, said half mirror being arranged on an optical path from said deflection means to said lens means and inclined at 45° with respect to said optical axis of said lens means;

an interference pattern detection means for detecting an interference pattern which is caused by interference between light beams reflected from the top and bottom surfaces of the thin film having passed through said lens means of said beam scanning means and deflected by a rear surface of said half mirror; and

a calculating means for calculating the thickness of the thin film based on said interference pattern detected by said interference pattern detection means and the incident angle of the impinging beam detected by said angle detection means.

4,893,025

DISTRIBUTED PROXIMITY SENSOR SYSTEM HAVING EMBEDDED LIGHT EMITTERS AND DETECTORS

Sukhan Lee, 4913 Revlon Dr., La Canada, Calif. 91011

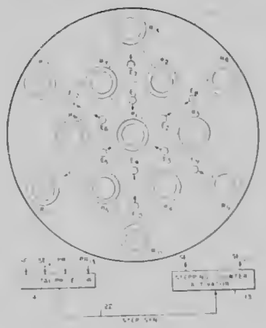
Filed Dec. 30, 1988, Ser. No. 292,047

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—561 **8 Claims**

1. A distributed sensor system for robotics comprised of multiple proximity sensors embedded on the surface of a robotic moving member, each proximity sensor comprising a defined pattern of interspersed light emitters and receivers, each receiver having an aperture with a lens focusing light

onto an array of photosensitive devices, and each light emitter comprising a light emitting diode and an optical guide to form a light beam with its axis tilted slightly toward the center of an



adjacent receiver that is either closer or further from the center of said defined pattern, and with a dispersion angle sufficient to span said aperture of one of said light receivers toward which it is tilted.

4,893,026

STATION FOR DETECTING AND LOCATING THROUGH LASER BEAMS AN OBJECT OR A SUBSTANCE LIKELY TO DIFFUSE BACK AT LEAST ONE PART OF THE INCIDENT LASER RAY AND SYSTEM FOR SENSING A SUBSTANCE SUCH AS SMOKE IN PARTICULAR OF A FIRE SUCH AS A FOREST FIRE

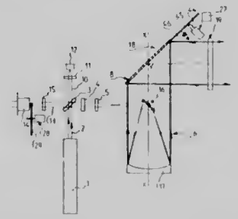
Francois Brown de Colstoun, 5755 E. River Rd., #2602, Tucson, Ariz. 85715; Jean-Paul Chambaret, 161 Avenue Paul Vaillant Couturier, 94250 Gentilly, France; Yves Chambaret, 77 Avenue Parmentier, 75011 Paris, France; Arnaud G. Le Saige de la Villesbrunne, 108 Boulevard de la Reine, 78000 Versailles, France, and Jean-Claude M. Moscovici, 66 Avenue Victor Hugo, 75116 Paris, France

Continuation-in-part of Ser. No. 947,892, Dec. 20, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 162,871

Claims priority, application France, Dec. 31, 1985, 85 19508

Int. Cl.[4] G01H *15/06*

U.S. Cl. 250—574 **17 Claims**



1. A station for detecting and locating through laser rays an obstacle such as an object or a substance likely to retrodiffuse at least one part of an incident laser ray, in particular fire smoke such as forest fire smoke, comprising

a laser source emitting recurrent pulses,

an optical device through which rays emitted and retrodiffused travel and provided with a device for separating emitted and retrodiffused rays and a device for enlarging and reducing the diameter of parallel beams as the beams are admitted or retrodiffused, wherein

the optical device comprises a revolving optical assembly rotatably arranged within the beam travel path portion of larger diameter and oriented such that the emitted laser beams perform a predetermined sweeping motion,

the revolving optical assembly being driven by a step-by-step motor, and

wherein a data processing device is provided which includes memory means in which data are stored for each angular position of the revolving optical device corresponding to one step thereof, which are representative of distance of a location of a zone to be controlled from a reference scan plane, and

a control device is provided for pivoting the optical assembly about a horizontal axis to enable the assembly to sweep said location in response to a control signal developed by said control device from the said stored data.

4,893,027

PROXIMITY SWITCH INSENSITIVE TO INTERFERENCE FIELDS

Heinz Kammerer, Ostfildern, and Reinhard Stumpe, Neuhausen; both of Fed. Rep. of Germany, assignors to Gebhard Balluff Fabrik Feinmechanischer Erzeugnisse GmbH & Co., Neuhausen, Fed. Rep. of Germany

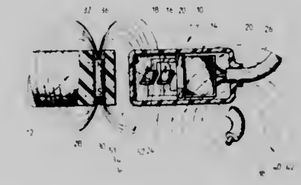
PCT No. PCT/DE87/00426, § 371 Date May 20, 1988, § 102(e) Date May 20, 1988, PCT Pub. No. WO88/02579, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 21, 1987, Ser. No. 219,065

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632624

Int. Cl.[4] H03K *17/95*

U.S. Cl. 307—116 **49 Claims**



1. A proximity switch for detecting the position of a machine element comprising:

at least one sensor providing a first signal having a total signal comprising a detection field signal component caused by a machine element in proximity with said at least one sensor and in interference field signal component caused by an interference field;

circuit means, responsive to said first signal for providing an output signal as a function of the detection field signal component, said circuit means including:

means for providing a sequence of scanning pulses in response to a time dependence of said interference field;

means for scanning said first signal with said scanning pulses; and

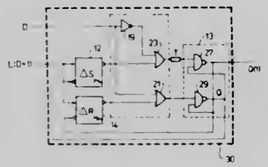
means for providing a threshold signal in response to the scanning pulses indicating that said machine element is in a position to be detected, wherein the value of the threshold signal is preselectable to a minimum value with which a minimum field strength required for response of said proximity switch is established.

4,893,028

ONE OR MORE INPUT ASYNCHRONOUS REGISTER

Angelo Beltramini, Novara, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Jul. 1, 1988, Ser. No. 214,381
Claims priority, application Italy, Jul. 7, 1987, 21201 A/87
Int. Cl.[4] H03K *3/037*
U.S. Cl. 307—291 **25 Claims**



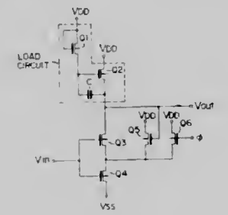
1. A register comprising:
an output flip-flop having set and reset inputs and at least one output signal line;
a first gating means for applying an input signal D and its complement $\overline{D}$ respectively to said reset and set inputs under control of a switching edge of an applied input load control signal L, said first gating means operating such that said input signal D and its complement $\overline{D}$ are applied to said reset and set inputs, upon occurrence of a predetermined switching edge of said load control signal only for a period of time sufficient to cause a switching of the state of the output state of said flip-flop by one of said D and $\overline{D}$ signals, said period ending when at least one feedback signal, responsive to said state switching, indicates by a predetermined switching edge that said state switching has occurred.

4,893,029

POWER SUPPLY NOISE PROTECTION CIRCUIT

Ryosuke Matsuo, Yokohama, and Masaru Koyanagi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1988, Ser. No. 167,687
Claims priority, application Japan, Mar. 25, 1987, 62-70766
Int. Cl.[4] H03K *17/16, 3/01, 19/017*
U.S. Cl. 307—296.4 **10 Claims**



1. A semiconductor integrated circuit having an input circuit, an internal circuit, and an output circuit formed together on a single chip, each of said circuits being connected to common power source lines, said input circuit comprising:
a load circuit coupled between a power source potential supply terminal and a signal output terminal;
first and second FETs, of the same conductivity type, serially connected between said signal output terminal and a common potential supply terminal and having a series connecting point therebetween, each of said first and second FETs having a gate connected to receive an input signal;
a third FET connected between said power source potential supply terminal and the series connecting point of said first and second FETs, said third FET having a gate connected to said signal output terminal;
a fourth FET, connected between a predetermined potential and the series connecting point of said first and second FETs, and
control means, responsive to operation of either of said internal circuit or said output circuit, for turning on said fourth FET for a predetermined period of time when the operation of said terminal circuit or said output circuit is likely to cause the potentials of the common power source lines to fluctuate.

4,893,030

BIASING CIRCUIT FOR GENERATING PRECISE CURRENTS IN AN INTEGRATED CIRCUIT

Gerald W. Shearer, Orange; Karl M. J. Lofgren, Long Beach, and Kenneth W. Ouyang, Huntington Beach, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation of Ser. No. 937,983, Dec. 4, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 233,847
Int. Cl.[4] G05F *1/56*
U.S. Cl. 307—296.8 **36 Claims**



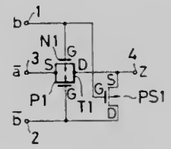
1. A biasing circuit for generating a reference bias level that can be applied to a first gate terminal of an active operating device, where the operating device is integrally formed in an integrated circuit and first gate terminal controls the magnitude of a first current passing through the operating device by way of first and second output terminals of the operating device, an operating device output voltage being developed between the first and second output terminals, the biasing circuit comprising:
an active exemplary device which is integrally formed in the same integrated circuit together with the operating device, wherein the exemplary device includes a second gate terminal and third and fourth output terminals, the second gate terminal controlling the magnitude of a second current passing through the exemplary device by way of the third and fourth output terminals and the magnitude of an exemplary device output voltage developed between the third and fourth output terminals, the exemplary device being formed in the integrated circuit such that the exemplary device operating characteristics, characterized by the relationship between the second current and the exemplary device output voltage, are substantially a copy of, or a replica scaled in accordance with a predetermined scaling of, the operating device operating characteristics, characterized by the relationship between the first and current and the operating device output voltage;
reference means, connected in series with the exemplary device, for forcing the magnitude of the second current to be equal to a predetermined reference value;
voltage establishing means for establishing a desired voltage;
control means, coupled to the voltage establishing means and the exemplary device, for sensing the exemplary device output voltage developed between the third and fourth output terminals, comparing the sensed exemplary device output voltage to the desired voltage, and supplying a bias level to the second gate terminal to drive the exemplary device output voltage toward the desired voltage; and
bias level duplicating means, connected to the operating device and the control means, for applying to the first gate terminal a duplicate of the bias level supplied to the second gate terminal, thereby creating a condition wherein the magnitude of the first current will be substantially a precision copy or a precisely scaled replica of the magnitude of the second current when an operating output voltage, substantially equal to the exemplary device output voltage, develops between the first and second output terminals of the operating device;
wherein the bias level duplicating means includes a switching means for applying the duplicate bias level to the operating device for a first time duration.

4,893,031

LOGICAL CIRCUITS FOR PERFORMING LOGICAL FUNCTIONS WITHOUT A POWER SUPPLY

Eiji Masuda, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 10, 1988, Ser. No. 269,320
Claims priority, application Japan, Dec. 23, 1987, 62-323792
Int. Cl.[4] H03K *19/20;* **G06F** *7/38*
U.S. Cl. 307—451 **14 Claims**



1. A logical circuit for performing logical operations without a power supply, comprising:
(a) a transfer gate section having a first type MOS transistor, the gate electrode of which is connected to a first input terminal to which a first input signal having one polarity is applied, and a second type MOS transistor, the gate electrode of which is connected to a second input terminal to which a second input signal having the opposite polarity is applied, the source electrodes of the first and second MOS transistors connected in parallel with each other being connected to a third input terminal to which a third input signal is applied, and the drain electrodes of the first and second MOS transistors connected in parallel being connected to an output terminal, and
(b) a second type MOS switching transistor, the gate electrode of which is connected to the first input terminal, the remaining electrodes of the MOS switching transistor being connected to the output terminal and the second input terminal,
whereby logical operation of the two input signals applied to the second and third input terminals is performed.

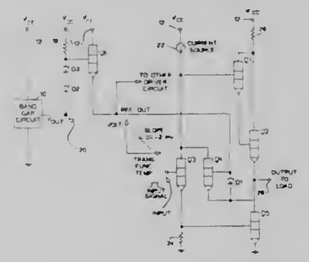
4,893,032

NON-SATURATING TEMPERATURE INDEPENDENT VOLTAGE OUTPUT DRIVER WITH ADJUSTABLE DOWN LEVEL

James J. Braden, Endicott, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 28,992, Mar. 23, 1987, abandoned. This application Jun. 20, 1989, Ser. No. 368,971
Int. Cl.[4] H03K *19/088, 19/013*
U.S. Cl. 307—456 **3 Claims**

1. A non-saturating output driver circuit comprising:
a supply voltage source;
a supply voltage return;
a resistor having one end coupled to the supply voltage return;
an input transistor having first and second primary terminals and a control terminal, the first primary terminal being coupled to the supply voltage source, the second primary terminal being coupled to the other end of the resistor and the control terminal receiving an input signal;
an output transistor having first and second primary terminals and a control terminal, the first primary terminal supplying an output signal to a load, the second primary terminal being coupled to the supply voltage return and the control terminal being coupled to the second primary terminal of the input transistor;
a temperature compensation voltage reference circuit having an output terminal for supplying a reference voltage which varies in a predetermined manner with temperature;



and a saturation control diode mechanism having first and second primary terminals, the first primary terminal being coupled to the output terminal of the temperature compensation voltage reference circuit and the second primary terminal being coupled to the first primary terminal of the output transistor;
whereby the saturation control diode mechanism functions to minimize saturation of the output transistor and the temperature compensation voltage reference circuit functions to minimize temperature produced variations in down-level voltage at the first primary terminal of the output transistor.

4,893,033

PROGRAMMABLE LOGIC ARRAY HAVING INPUT TRANSITION DETECTION FOR GENERATING PRECHARGE

Kiyoshi Itano, 477-102, Shimokodanaka, Nakahara-ku, Kawasaki-shi, Kanagawa, 211, and Kohji Shimbayashi, 979, Kamikodanaka, Nakahara-ku, Kawasaki-shi, Kanagawa, 211 both of Japan

Filed Oct. 5, 1988, Ser. No. 253,515
Claims priority, application Japan, Oct. 6, 1987, 62-251980
Int. Cl.[4] H03K *17/04, 19/017*
U.S. Cl. 307—465 **13 Claims**

1. A programmable logic array circuit comprising:
an AND array comprising a plurality of memory cells connected to input lines and product term lines, input signals being supplied to the AND array through the input lines;
an OR array comprising a plurality of memory cells connected to OR array input lines and OR array output lines, output signals being extracted through the OR array output lines;
pulse signal generating means for generating a pulse signal by detecting a change in levels of the input signals;
product term sensing buffer means for sensing levels of the product term lines, sensed levels being sent to the OR array through the OR array input lines,

the product term sensing buffer means comprising first precharging means for charging the product term lines up to a predetermined potential in response to the pulse signal derived from the pulse signal generating means, and discharging means for discharging the OR array input lines



in response to the pulse signal derived from the pulse signal generating means; and

second precharging means for charging the OR array input lines up to a predetermined potential in response to the pulse signal derived from the pulse signal generating means.

4,893,034

STOP/RESTART LATCH

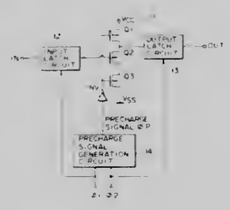
Kiichiro Tamaru, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 16, 1988, Ser. No. 155,822

Claims priority, application Japan, Feb. 19, 1987, 62-36730

Int. Cl.[4] H03K *17/16, 19/02, 3/284*

U.S. Cl. 307—480 **6 Claims**



1. A logic circuit for converting an input signal to a logic output signal, comprising:

a precharge signal generator driven by first and second clock signals to generate a precharge signal, said precharge signal being in a first level during a period ranging from an instant that the first clock signal changes from the first level to a second level until the second clock signal changes from a first level to a second level, said precharge signal being in the second level during the remaining periods;

first latch circuit means receiving the input signal and being driven by said first clock signal for latching the input signal when the first clock signal is changed from the second level to the first level;

a logic gate controlled by said precharge signal of said precharge signal generator, said logic gate being placed in a precharge mode when said precharge signal is in the second level and being placed in an operation mode when said precharge signal is in the first level, said logic gate producing a logic signal in response to a signal output from said first latch circuit; and

second latch circuit means driven by said second clock signal for latching the logic signal output from said logic gate when said second clock signal changes from the second level to the first level.

4,893,035

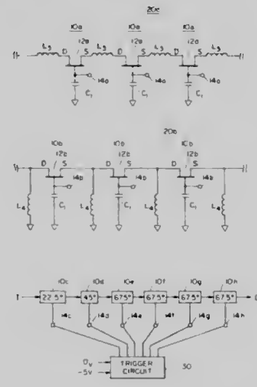
CASCADED LOW PASS/HIGH PASS FILTER PHASE SHIFTER SYSTEM

Leonard D. Reynolds, Jamaica Plain, and Yalcin Ayasli, Lexington, both of Mass., assignors to Hittite Microwave Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 220,737, Jul. 18, 1988. This application Sep. 26, 1988, Ser. No. 248,587

Int. Cl.[4] H03B *19/14;* **H03H** *7/10;* **H03J** *3/26;* **H03K** *17/687*

U.S. Cl. 307—520 **8 Claims**



1. A cascaded low pass/high pass filter phase shifter system comprising:

a series of semiconductor switches each having a control electrode and first and second load electrodes;

a capacitance connected in series between each said control electrode and ground;

an inductance connected in series between each second load electrode of one semiconductor switch and the first load electrode of the adjacent semiconductor switch in the series;

means for selectively applying a control signal to each said control electrode for switching the associated semiconductor switch between a first state in which it operates as a low pass filter and a second state in which it operates as a high pass filter to introduce a phase shift in a propagated signal.

4,893,036

DIFFERENTIAL SIGNAL DELAY CIRCUIT

Richard E. Hester, Eden Prairie, Minn., and Jerry R. Wahl, Woodland Park, Colo., assignors to VTC Incorporated, Bloomington, Minn.

Filed Aug. 15, 1988, Ser. No. 232,285

Int. Cl.[4] H03K *5/13*

U.S. Cl. 307—603 **11 Claims**

1. A phase transition delay circuit for a differential signal with a primary phase and a complementary phase, the delay circuit comprising:

primary phase and complementary phase input terminals for receiving the differential signal;

a primary node and a complementary node;

a first voltage controlled current source connected to the primary node;

a second voltage controlled current source connected to the complementary node;

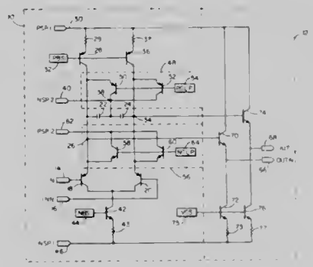
first capacitive means connected to the primary node;

second capacitive means of substantially the same capacitance of as the first capacitive means connected to the complementary node;

means coupled to the primary and complementary nodes for clamping the maximum voltage levels thereon at a predetermined level;

means coupled to the primary and complementary nodes for clamping the minimum voltage levels thereon at a predetermined level;

a voltage controlled current sink; and



comparator means connected to the input terminals for connecting the complementary node to the current sink when the primary phase is more positive than the complementary phase and for connecting the primary node to the current sink when the complementary phase is more positive than the primary phase;

wherein the first and second voltage controlled current sources provide current at substantially the same rate and wherein the current sink sinks a current having a magnitude substantially equal to the sum of the currents from the first and second voltage controlled current sources.

4,893,037

MOTOR-DRIVEN CABLE REEL ASSEMBLY

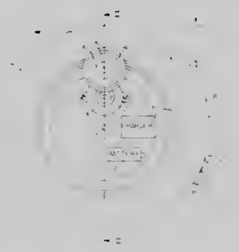
Östen Schwartz, Värmdö, Sweden, assignor to AB Electrolux, Stockholm, Sweden

Filed Apr. 18, 1988, Ser. No. 182,893

Claims priority, application Swedeo, Apr. 28, 1987, 8701749

Int. Cl.[4] A47L *9/25;* **H02G** *11/02;* **H01R** *13/60;* **H02K** *7/12*

U.S. Cl. 310—68 B **6 Claims**



1. In a motor-driven cable reel assembly comprising a rotatable drum for winding thereon an electric cable, an electric motor operatively connected to said drum for rotating said drum in a cable reel-in direction, a storage battery connected to said motor for supplying power thereto, a battery charger connected to said cable for recharging said battery when said cable is connected to a source of current, the improvement comprising:

said drum including a rotatable side wall;

motor control switch means, operatively connected to said motor and operable to actuate said motor to rotate said drum in said reel-in direction, during which said motor generates torque, for switching-off said motor in response to generation thereby of a predetermined said torque, said switch means being actuated by rotation of said side wall to switch on and off said motor in response to the direction of rotation of said side wall.

4,893,038

DEVICE FOR LIMITING DIRECTION OF ROTATION OF SYNCHRONOUS MOTOR

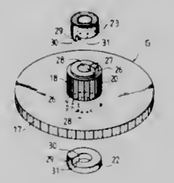
Yukimori Miyzawa, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusbo, Nagano, Japan

Filed Mar. 9, 1989, Ser. No. 321,126

Claims priority, application Japan, Mar. 10, 1988, 63-32016[U]

Int. Cl.[4] H02K *7/10, 19/00;* **F16D** *63/00;* **F16H** *57/10*

U.S. Cl. 319—83 **13 Claims**



1. A device for limiting the direction of rotation of a synchronous motor comprising:

(a) a gear drivingly rotated by a rotor of the motor for being rotated;

(b) a shaft supported to a casing for rotatable supporting said gear in such a manner that said gear is movable in an axial direction of said shaft;

(c) a pair of fixed members fixed to a casing and supporting said shaft, said gear being interposed between said pair of fixed members, one of said fixed members having a first engaging portion on a surface thereof facing said gear; and

(d) a first projection integrally formed on a surface of said gear facing said one fixed member, said projection being engageable with said engaging portion when said gear is rotated;

(e) said projection being engageable with said engaging portion to move said gear in the axial direction of said shaft to allow the rotation of said gear when the rotor is rotated in a normal direction, said projection being brought into abutting engagement with said engaging portion to prevent the rotation of said gear when said rotor is rotated in a reverse direction.

4,893,039

WINDSHIELD WIPER MOTOR

Yosinori Isii, Kanagawa, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 10, 1988, Ser. No. 204,806

Claims priority, application Japan, Jun. 12, 1987, 62-89606[U]

Int. Cl.[4] H02K *5/00*

U.S. Cl. 310—89 **2 Claims**

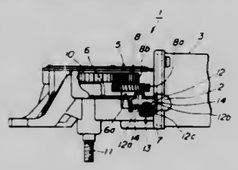
1. A windshield wiper motor assembly comprising a motor casing having motor means therein,

a gear casing connected to said motor casing and having reduction gear means therein operatively connected to said motor means,

a crooked air passage extending between said motor casing and said gear casing with an opening at each end thereof in communication with each casing and

breather means located in said passage to provide communication between said passage and the atmosphere outside of

said casings, wherein said breather means is provided with a hole offset from said openings at opposite ends of said passage in a position preventing straight line communication between said openings and said hole and includes a



substantially T-shaped member having a leg portion and a cap portion with said leg portion disposed in said hole and having at least one groove extending along the length thereof.

4,893,040

DYNAMO-ELECTRIC MACHINES

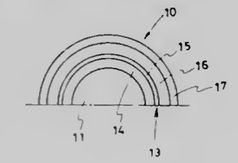
Alan B. Turner; Toshiyuki Kondo, and Katsuhiro Mori, all of East Sussex, United Kingdom, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

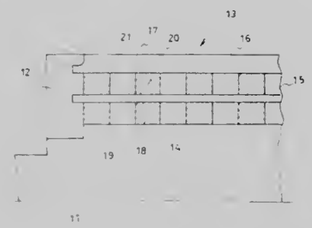
Filed May 5, 1988, Ser. No. 190,386

Claims priority, application United Kingdom, May 8, 1987, 8710991; May 8, 1987, 8710989; May 8, 1987, 8710990; May 14, 1987, 8711389

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 **18 Claims**





1. A rotating part for a dynamo-electric machine, comprising:

a core portion of magnetic material;

an annular permanent magnet surrounding said core portion, said annular permanent magnet includes a plurality of annular permanent magnet rings separated axially by nonmagnetic rings;

an annular retaining ring of magnetic material for securing the annular permanent magnet; and

a side wall made of a nonmagnetic material adjacent said annular permanent magnet.

4,893,041

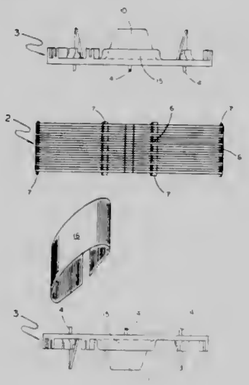
STATOR END CAP INSULATOR ASSEMBLY INCLUDING AN IMPROVED STATOR LINER, STATOR LINER RETAINER AND SHADING ELEMENT INSULATOR

S. Duke Snider; L. Ranney Dohogne, and Patrick K. Murphy, all of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 27, 1988, Ser. No. 263,615

Int. Cl.[4] H02K *3/34*

U.S. Cl. 310—215 **6 Claims**



1. An improved stator end wire insulation assembly for a stator core having a central axis with pole pieces having solid end face portions, circumferentially spaced about said central axis of said stator core separated by core openings extending through said core with magnet wires wound around each pole to extend through adjacent core openings on opposite side flanks of each pole to provide end turns adjacent said solid end face portions comprising:

separate and independent insulating liner means for each of said core openings formed into a shape corresponding to and only covering the surround wall defining each of said core openings; and

molded end cap insulator structure for attachment to opposite end faces of said core including a pair of plates having solid portions and formed into a shape corresponding to said solid end face portions of said core and including spaced openings aligned with said spaced openings in said core separated by said solid portions to overlie said solid end face portions of said pole pieces, said plates including liner restraining means cooperative with said insulating liner means of each opening to restrain both radial and axial movement of said liner means within its opening to maintain said liner means in flush relation with the surrounding wall defining said opening.

4,893,042

ROTOR FOR DC MOTOR

Toshinori Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

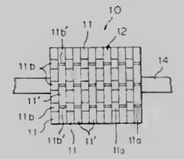
Filed Mar. 8, 1988, Ser. No. 165,593

Claims priority, application Japan, Mar. 12, 1987, 62-59144; Mar. 12, 1987, 62-37725[U]

Int. Cl.[4] H02K *1/00*

U.S. Cl. 310—216 **11 Claims**

1. A rotor for a DC motor comprising an axial lamination of core sheets each having a plurality of radially and inwardly extended slits, said slits having an open portion at the circumferential periphery of said core sheets, said core sheets aligned so that said slits in said core sheets, when the core sheets are axially laminated, define longitudinal grooves in said lamination at the circumferential periphery of said core sheets which form said lamination, and armature coils wound around said lamination through said grooves, characterized in that said core sheets are at least partially formed of electromagnetic steel plate, and a soft iron member is provided for partially closing the said open portion of said grooves defined by said



aligned slits in said lamination, said soft iron member being a cylindrical unit having a plurality of slots that extend longitudinally thereof, said cylindrical unit receiving said lamination therein, said plurality of superimposed over corresponding grooves in said lamination, and dimensioned to circumferentially and partially close the open portions of said grooves at the circumferential periphery of said core sheets which form said lamination.

4,893,043

BRUSH PROTECTION IN AN ELECTRIC MOTOR

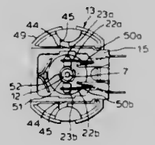
Roger F. Baines, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

Filed Feb. 16, 1988, Ser. No. 155,705

Claims priority, application United Kingdom, Feb. 16, 1987, 8703527

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **4 Claims**



1. A PMDC motor having a commutator and a pair of brushleaves each carrying a brush, each leaf biassing its respective brush against the commutator to make electrical contact therewith, wherein an abutment-type stop is provided for at least one of the brushleaves the stop being located to engage said one of the brushleaves so as to limit movement of said one of the brushleaves toward the commutator and prevent electrical shorting between the brushleaves wherein the motor includes an end cap, wherein the end cap comprises a bearing support portion and a holder slidably received in the bearing support portion, the brushleaves being mounted in the holder and wherein the stop is integrally formed on the holder.

4,893,044

ROTOR BALANCING

James W. Bush, and Gary J. Anderson, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Nov. 20, 1987, Ser. No. 123,333

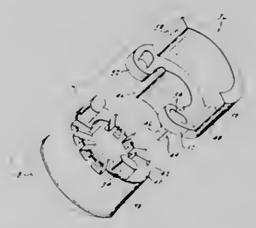
Int. Cl.[4] H02K *1/22*

U.S. Cl. 310—261 **6 Claims**

1. A counterweight for a rotor of a dynamoelectric motor comprising:

a main body portion of substantial mass, said main body portion being generally of a shape so as to extend generally circumferentially along an end face of a rotor through an arc of up to but not exceeding 180° f said end face; and

mounting means extending outwardly from opposite ends of said main body portion so as to extend generally circumferentially along said end face of said rotor,



said mounting means and said main body being of a length so as to extend in excess of 180° around said circumference of said rotor when assembled thereto;

said main body portion of said counterweight being stepped and including a C-shaped inner section sized to fit within a bore provided in said end surface of said rotor and a C-shaped outer section extending axially outwardly from said end surface of said rotor.

4,893,045

ULTRASONIC DRIVING DEVICE

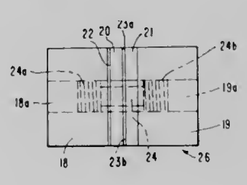
Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan

Filed Jul. 13, 1988, Ser. No. 218,656

Claims priority, application Japan, Jul. 14, 1987, 62-176911; Sep. 12, 1987, 62-228799

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **24 Claims**



1. An ultrasonic driving device comprising:

a stator having two metal blocks,

at least one piezoelectric vibrator,

two electrodes, one electrode being divided in two parts,

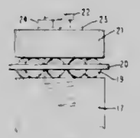
said electrodes and said at least one vibrator being positioned between said two metal blocks,

a bolt for fixing the metal blocks, the at least one piezoelectric vibrator and said two electrodes by means of threads on said bolt extending to both sides of the metal blocks,

a member to be driven on an end portion or side portion of the stator, and

a single AC voltage supply means for driving only one said part of said divided electrode, said AC voltage supply means supplying an AC voltage only to said one said part and to the other electrode.

4,893,046
ULTRASONIC DRIVING DEVICE
Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan
Filed Sep. 8, 1988, Ser. No. 241,602
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **9 Claims**



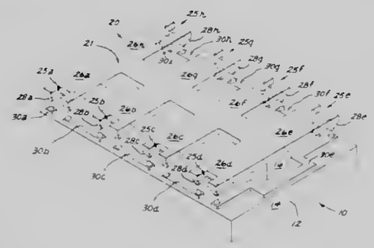
I. An ultrasonic driving device comprising
(a) disk-type rotary means for rotating a rotary machine element, said rotary means including means for rotatably holding a plurality of rolling means with the rolling means being exposed at opposite surfaces of the rotary means;
(b) a stator means for producing a progressive wave, said stator means being in contact with the rolling means extending from one surface of the rotary means;
(c) pressure means for pressing the rolling means of the rotary means to the stator means, said pressure means being in contact with the rolling means extending from the opposite surface of the rotary means; and
(d) fixing means for fixing the rolling means of the rotary means between the pressure means and the stator means;
whereby movement of the rolling means with the progressive wave on the stator means causes rotation of the rotary means.

4,893,047
ULTRASONIC DRIVING DEVICE
Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan
Filed Sep. 14, 1988, Ser. No. 244,917
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **8 Claims**



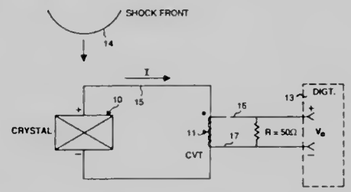
1. An ultrasonic driving device comprising:
a stator including a cylindrical piezoelectric vibrator;
inner divided electrodes secured to an inside portion of the cylindrical piezoelectric vibrator, with first gaps therebetween
outer divided electrodes secured to an outside portion of the cylindrical piezoelectric vibrator, with second gaps therebetween;
said first and second gaps being shifted from each other;
an alternating current (AC) power supply connected to respective ones of the divided electrodes on the inside and outside portions of the cylindrical piezoelectric vibrator; and
a rotary member combined with an end or side portion of the stator.

4,893,048
MULTI-GAP SWITCH
George A. Farrall, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Oct. 3, 1988, Ser. No. 252,623
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—331 **21 Claims**



1. A switch comprising:
a first and second main terminals;
more than two contact pairs connected in series between said first and second main terminals, each of said contact pairs including a movable contact and having an open position and a closed position, said first main terminal being connected to said second main terminal by said switch if only if all of said contact pairs in said series connection are in their closed position, said contact pairs comprising a contact material which develops a contact voltage X in the presence of an arc, said series connection of contact pairs including at least $V_P/2X$ contact pairs where V_P is the peak voltage said switch is rated to turn off; and
means for actuating said contact pairs between their respective open and closed positions.

4,893,049
LITHIUM NIOBATE EXPLOSION MONITOR
Charles H. Bundy, Clearwater, Fla.; Robert A. Graham, Los Lunas, N. Mex.; Stephen F. Kuehn, Albuquerque, N. Mex.; Richard R. Precit, Albuquerque, N. Mex., and Michael S. Rogers, Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 29, 1986, Ser. No. 868,375
The portion of the term of this patent subsequent to Dec. 9, 2004, has been disclaimed.
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—338 **9 Claims**



1. An explosive monitor including:
means for providing an electrical output indicative of the detonation of an explosive material, said means comprising:
a lithium niobate crystal wafer having spaced parallel faces cut substantially perpendicular to a unique polar axis "z"; and

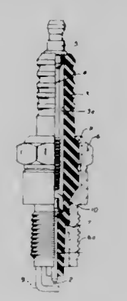
first means for detecting a piezoelectric current output of said crystal indicative of the detonation of an explosive material; and
checking means for nondestructively checking the responsiveness of said crystal prior to detonation of the explosive material, said checking means comprising:
second means for controllably heating said crystal; and
third means for detecting a pyroelectric charge output of said crystal responsive to the heating of said crystal by said second means.

4,893,050
LAMP WITH A CAPTURED REFLECTOR AND METHOD OF MANUFACTURE
Larry R. Fields, Richmond, Ky., assignor to GTE Products Corporation, Danvers, Mass.
Filed Aug. 22, 1988, Ser. No. 234,983
Int. Cl.[4] H01K *1/36, 3/12*
U.S. Cl. 313—113 **18 Claims**

1. A press sealed incandescent electric lamp with a captured reflector comprising:
(a) a radiant energy transmissive envelope having an inner surface defining an enclosed volume, and a press seal portion,
(b) an incandescent filament structure to generate radiant energy positioned in the enclosed volume, and having electrical leads passing through the press seal portion, and
(c) a reflector, having a reflective surface positioned in the enclosed volume, opposite the filament structure to reflect radiant energy generated by the filament, including a support projection captured in the inner surface of the press seal.

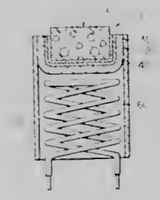
4,893,051
SPARK PLUG AND THE METHOD OF MANUFACTURING THE SAME
Ryoji Kondo, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Continuation of Ser. No. 372,148, Apr. 27, 1982, abandoned.
This application Mar. 18, 1985, Ser. No. 712,917
Claims priority, application Japan, May 7, 1981, 56-66725
Int. Cl.[4] H01T *13/20*
U.S. Cl. 313—141 **11 Claims**

1. A spark plug for internal combustion engines comprising:
a ground electrode made of an electrically conductive base metal;
a center electrode made of an electrically conductive base metal and provided with a noble metal tip only on a flat end of a tapered end portion thereof, said noble metal tip facing said ground electrode through an air gap said noble metal tip being completely resistance welded under mechanical pressure to said electrically conductive base metal to provide a strong bond therebetween; and
an insulator securely encasing said center electrode and electrically insulating said center electrode from said ground electrode, wherein said noble metal tip is made of a platinum alloy consisting essentially of 70–80 percent platinum, by weight, and 30–20 percent iridium, by weight, and wherein said center electrode is manufactured by the steps of:
preparing the base metal of said central electrode having a uniform diameter;



welding said noble metal tip to the top end surface of said center electrode; and
shaping said center electrode to provide said flat end of said tapered end portion to be smaller in diameter than said center electrode axially beyond said tapered end portion.

4,893,052
CATHODE STRUCTURE INCORPORATING AN IMPREGNATED SUBSTRATE
Hideo Tanabe, and Mamoru Tsuzurahara, botb of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 14, 1987, Ser. No. 3,325
Claims priority, application Japan, Mar. 14, 1986, 61-54784
Int. Cl.[4] H01J *1/14, 19/06*
U.S. Cl. 313—346 R **20 Claims**



12. A cathode structure comprising:
a substrate comprising a porous sinter made of high melting point metal impregnated with an electron emitting material;
a metal supporting sleeve for supporting said substrate;
a metal cup shaped to receive said substrate therein secured to said metal supporting sleeve;
a layer of solder provided between said substrate and said metal cup for bonding said substrate within said metal cup; and
a covering layer provided between said substrate and said layer of solder, said covering layer being made of a metal having a melting point higher than a melting point of said solder, wherein said covering layer is arranged so as to prevent said solder from permeating into said substrate.

4,893,053

COLOR DISPLAY TUBE WITH CHANNEL ELECTRON MULTIPLIER MEANS

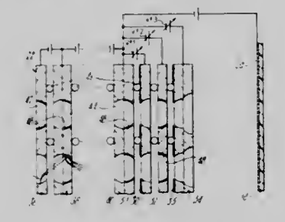
Alan G. Knapp, Crawley, and John R. Manseli, East Grinstead, both of United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 625,398, Jun. 28, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,790

Claims priority, application United Kingdom, Jul. 8, 1983, 8318493

Int. Cl.[4] H01J *29/80. 29/46*

U.S. Cl. 313—400 **8 Claims**



1. A color display tube comprising an envelope including a faceplate, said envelope containing:

(a) means for producing an electron beam;

(b) electron multiplier means including a multiplicity of channels having respective input ends and output ends and containing secondary emissive material along the lengths thereof, said output ends being disposed opposite the faceplate at a predetermined distance therefrom;

(c) scanning means for scanning the electron beam across the input ends of the channels;

(d) a screen comprising a pattern of dots and surrounding rings of luminescent materials disposed on the faceplate for impingement by electrons from respective ones of the channels; and

(e) output electrode means disposed between the electron multiplier means and the screen and having apertures aligned with corresponding ones of the output ends of said channels, said output electrode means in response to the application of predetermined voltages thereto controlling both the focusing of the electrons into beams and the distance from the center of each dot and ring to the source where the electrons focused into the corresponding electron beam last strike secondary emissive material, thereby controlling the shapes and widths of the electron beams where they impinge on the screen.

4,893,054

SHADOW MASK TYPE COLOR CATHODE RAY TUBE

Hiroo Kobayashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,702

Claims priority, application Japan, Mar. 3, 1987, 62-49411; Mar. 10, 1987, 62-55911

Int. Cl.[4] H01J *29/81*

U.S. Cl. 313—408 **4 Claims**

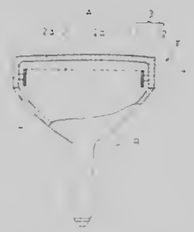
1. A color cathode ray tube, comprising:

a face panel including a faceplate having a flat outer surface and a curved inner surface, and a phosphor screen formed of a pattern of triads of phosphor dots on said curved inner surface;

a color selecting shadow mask carried by said face panel so as to confront, and be spaced a predetermined distance inwardly from the phosphor screen, said shadow mask being held flat under tension and having a pattern of apertures defined therein for the passage of electron beams therethrough towards the phosphor screen;

said curved inner surface of said faceplate further being curved to have first, second and third radii of curvature in diagonal, widthwise and heightwise directions, respectively, said first radius of curvature being of the greatest value, said third radius of curvature being of the smallest value, and said second radius of curvature being of a value generally intermediate the value of said first and third radii of curvature; and

the pitch between each neighboring aperture in the shadow mask decreasing progressively away from the center of



the faceplate towards a peripheral region of said faceplate while satisfying a condition wherein the pitch is chosen, in reference to the interval of the phosphor dots on the phosphor screen in the horizontal scanning direction on a plane perpendicular to the axis of the color cathode ray tube, to have a value equal to or greater than 80% of the pitch at a position corresponding to the center of the faceplate.

4,893,055

PROCESS FOR USING UNSATURATED POLYESTER RESIN COMPOSITION FOR TREATING CATHODE-RAY TUBES AND CATHODE TUBES OBTAINED THEREBY

Tadashi Fuzii, Hitachi; Hirobumi Izumi, Kitaibaraki; Etsuji Iwami, and Kazuyuki Tanaka, both of Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 817,668, Jan. 10, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 118,160

Claims priority, application Japan, Jan. 22, 1985, 60-10686; Jan. 24, 1985, 60-11278

Int. Cl.[4] H01J *29/88, 29/87*

U.S. Cl. 313—479 **12 Claims**

1. A cathode-ray tube obtained by casting a resin composition for treating cathode-ray tubes exhibiting excellent adhesive strength and freedom from cure distortion into a gap between a front glass and a face-plate portion of a cathode-ray tube and curing the resin composition, said resin composition comprising:

0.5 to 10 parts by weight of maleic anhydride admixed with 100 parts by weight of an unsaturated polyester resin composition comprising

(I) an unsaturated polyester obtained by reacting an acid component comprising as an essential constituent at least one member selected from the group consisting of an unsaturated dibasic acid and an acid anhydride thereof, with an alcohol component and having a molecular weight of 500 to 8,000 per unsaturated group,

(II) at least one member selected from the group consisting of a styrene monomer and a derivative thereof, and

(III) at least one polymerizable unsaturated compound selected from the group consisting of

(i) acrylonitrile, itaconic acid and citraconic anhydride,

(ii) a monoester and a diester of unsaturated diabasic acid, and

(iii) acrylic acid, methacrylic acid and a derivative thereof;

the component (I) being dissolved in the components (II) and (III) in the range of

$(b)/\{(a)+(c)\}=1/10$ to $10/1$,

wherein (a) is the number of unsaturated groups in the component (I); (b) is the number of unsaturated groups in the component (II); and (c) is the number of unsaturated groups in the component (III).

4,893,056

FLUORESCENT DISPLAY APPARATUS

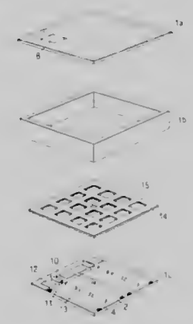
Zenichiro Hara, Nagasaki; Masaaki Kobayashi; Kazunori Tatsuda, both of Mie; Nobuo Terazaki, and Shuji Iwata, both of Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda and Ise Electronics Corporation, Ise, both of, Japan

Filed Oct. 12, 1988, Ser. No. 256,616

Claims priority, application Japan, Oct. 12, 1987, 62-256610

Int. Cl.[4] H01S *29/74*

U.S. Cl. 313—495 **6 Claims**



1. In a fluorescent display apparatus consisting of a vacuum chamber containing cathodes for emitting thermoelectrons, control electrodes for controlling the flow of the emitted thermoelectrons, and a display portion formed of a plurality of fluorescent display portions coated with fluorescent material and emitting light upon being bombarded by the thermoelectrons, said fluorescent display apparatus wherein

said display portion is formed of said fluorescent display portions arranged in a matrix of 2 m rows by n columns (m, n are natural numbers),

said cathodes are made up of cathodes in a linear form oriented in the direction of the row or column and disposed to oppose said display portion arranged in an array of m rows by n columns so that one each thereof corresponds to two of said fluorescent display portions, and

said control electrodes are made up of a first control electrode in a planar form disposed between said display portion and said cathodes and having openings made therein corresponding to said fluorescent display portions of said display portion, second control electrodes disposed on the side of said cathodes opposite to said display portion and arranged in an array of m rows by n columns so that each thereof are disposed corresponding to each said cathode, and third control electrodes disposed on both sides of said second control electrodes in the direction of the column arranged in an array of 2 m rows by n columns.

4,893,057

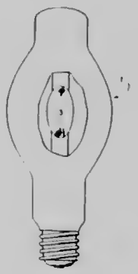
HIGH INTENSITY DISCHARGE LAMP AND ELECTODES FOR SUCH A LAMP

Nancy J. Tillman nee Caruso, Perry, and Philip J. Nalepa, Painted Post, both of N.Y., assignors to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 493,175, May 10, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 799,273

Int. Cl.[4] H01J *61/073*

U.S. Cl. 313—631 **4 Claims**



1. A high intensity discharge lamp comprising

an arc tube enclosing a space,

an ionizable material contained in said space,

at least two electrodes each extending to a tip, and arranged in said space for establishment of an arch between said tips, and

means for connecting said electrodes to a source of electric current,

characterized in that said electrodes each are all metallic and consist essentially of a length of wire having a straight tip end and a connection end, a first portion of said length adjoining said straight tip end and a second portion of said length adjoining said connection end, each portion being a straight portion, and said portions extending generally parallel to each other, arranged such that in normal operation the arc extends between said straight tip ends,

between said first portion and said second portion said length comprises a third portion formed as a helical coil having a plurality of closely spaced turns, said turns defining crevices arranged to permit easy lamp starting by initiation of an arc at one of the crevices, and subsequent transfer of the arc to the tip,

said wire has circular cross-section, and said coil has an inside diameter greater than the diameter of the wire,

the coil axis is skewed with respect to said straight tip and connection ends, and

said electrodes each further comprises a core slug comprising a metallic cylinder having a length approximately equal to the length of said coil, about which core slug said coil fits snugly.

4,893,058

ARRAY ELECTRON ACCELERATOR

Jean-Pierre Gueguen, Chevilly Larue; Annick N'Guyen, Bures sur Yvette, and Jacques Pottier, Orsay, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 20, 1988, Ser. No. 196,424

Claims priority, application France, May 26, 1987, 87 07379

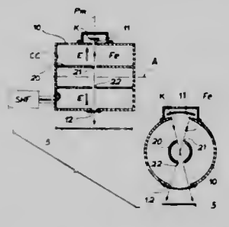
Int. Cl.[4] H01J *25/02*

U.S. Cl. 315—5 **3 Claims**

1. Array electron accelerator, incorporating a linear cathode (K) emitting an electron beam (Fe) in the form of an array, an accelerating structure where there is an electric field (E) directed into the plane of the array, characterized in that the accelerating structure is a coaxial cavity (CC) constituted by

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an external cylindrical conductor (10) and an internal cylindrical conductor (20) having the same axis (A), said cavity being excited by a high frequecy source (SHF) to the resonant frequency of the fundamental mode and in that the cathode (K) is contained in the median plane (Pm) of the cavity perpendicular



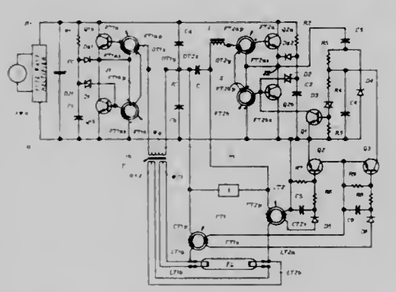
to the axis, the electron beam (Fe) emitted by the cathode (K) being injected into the cavity in said median plane, the external (10) and internal (20) cylinders having circular arc-like openings (11,12,21,22) centered on the axis of the cavity for the passage of the beam (Fe).

4,893,059

ELECTRONIC BALLAST WITH SAFETY FEATURE

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Feb. 19, 1986, Ser. No. 830,739
Int. Cl.[4] H05B *44/14*
U.S. Cl. 315—127 **16 Claims**



1. A ballast for a fluorescent lamp, comprising:

source means: (i) having control input means receptive of a control signal, (ii) being controllably operable to provide a current-limited output voltage between a pair of output terminals, (iii) being adapted to exist in either of two modes of operation: a first mode in which the output voltage consists of brief periods of relatively high-magnitude voltage interrupted with short periods of relatively low-magnitude voltage and a second mode in which the output voltage consists of a substantially constant-magnitude voltage, and (iv) being operative to exist in the second mode only if a control signal is supplied to the control input means;

lamp connect means operative to permit connection of a fluorescent lamp between the pair of output terminals; and

control means connected in circuit with the output terminals and the control input means, the control means being responsive to current flowing from the output terminals and operative to provide a control signal to the control input means as long as current is indeed flowing from both output terminals;

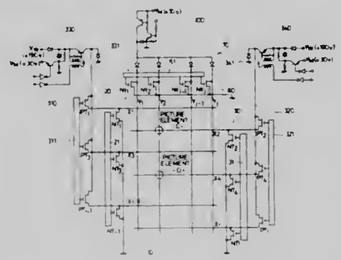
whereby, if current is prevented from flowing from at least one of the output terminals, no control signal is provided and the source means will then exist in its first mode of operation.

4,893,060

DRIVE CIRCUIT FOR A THIN-FILM ELECTROLUMINESCENT DISPLAY PANEL

Toshihiro Ohba; Yoshiharu Kanatani, both of Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 664,958, Oct. 26, 1984, abandoned.
This application Apr. 25, 1988, Ser. No. 186,743
Claims priority, application Japan, Oct. 31, 1983, 58-206514
Int. Cl.[4] H01J *19/14*
U.S. Cl. 315—169.3 **16 Claims**



1. A drive circuit for a thin-film electroluminescent (EL) matrix display panel comprising:

data side electrodes formed on one major surface of the thin-film electroluminescent (EL) matrix display panel in one direction;

scanning side electrodes formed on the opposing major surface of said thin-film electroluminescent (EL) matrix display panel in another direction substantially perpendicular to said data side electrodes, said scanning side electrodes being alternately divided into odd number scanning electrodes and even number scanning electrodes;

an odd side write driving circuit supplying a writing pulse to selected even number scanning electrodes in a first drive field and to selected odd number scanning electrodes in a second drive field;

an even side write driving circuit supplying said writing pulse to said selected odd number scanning electrodes in said first drive field and to said selected even number scanning electrodes in said second drive field;

an odd side N-channel high voltage MOS driver connected to said odd number scanning electrodes at one end thereof, the other end of said odd side N-channel high voltage MOS driver being connected to a grounded terminal;

an odd side P-channel MOS high voltage driver connected to said odd number scanning electrodes at one end thereof, the other end of said odd side P-channel MOS high voltage driver being connected to said odd side write driving circuit;

an even side N-channel high voltage MOS driver connected to said even number scanning electrodes at one end thereof, the other end of said even side N-channel high voltage MOS driver being connected to the grounded terminal; and

an even side P-channel high voltage MOS driver connected to said even number scanning electrodes at one end thereof, the other end of said even side P-channel high voltage MOS driver being connected to said even side write driving circuit;

said writing pulse supplied in said first drive field being of opposite polarity to said writing pulse supplied in said second drive field.

4,893,061

SWITCHING ARRANGEMENT

Henricus M. H. Linssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1988, Ser. No. 194,632
Claims priority, application Netherlands, Jun. 11, 1987, 8701358
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—227 R **4 Claims**

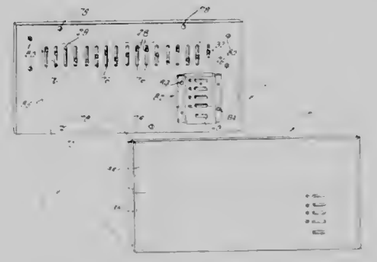
1. A switching arrangement for ignition and operation with a stable discharge of at least one high-pressure discharge lamp comprising: at least two lamp connection points interconnected by a branch circuit comprising a capacitor and a switching element, a ballast impedance, means for connecting said ballast impedance in series circuit with said two lamp connection points to a pair of voltage supply terminals for the switching arrangement, and means connecting the capacitor to a charge voltage source via a charge circuit that excludes said ballast impedance, characterized in that the switching element is a gas-filled breakdown element.

4,893,062

WALL BOX DIMMING SYSTEM AND FACE PLATE AND SWITCH ASSEMBLY THEREFOR

Michael J. D'Aleo, Ottsville, and Joel S. Spira, Coopersburg, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 21, 1987, Ser. No. 40,646
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—291 **41 Claims**



1. A dimming system assembly for controlling the intensity of m groups of lights, m being an integer, each group including one or more lights, said dimming system assembly comprising:

(A) an electronics module having dimmer electronics located therein for controlling the lighting level of said m groups of lights in accordance with a selected one of n preset scenes, n being an integer greater than 1, said dimmer electronics including:

(1) n groups of m slide potentiometers, each slide potentiometer of a given group controlling the intensity of a respective group of lights; and

(2) n switch means, each switch means being associated with a different said group of slide potentiometers for causing the intensity of said groups of lights to be determined by that group of slide potentiometers associated with the respective switch means; and

(B) a face plate assembly coupled to said electronics module, said face plate assembly comprising:

(1) a support plate having m×n slots formed therein, each of said slide potentiometers including slide arms extending into a respective said slot; said support plate including a coupling section having a cam surface and a locking surface which intersect at a ridge; said support plate also having at least one opening through which said switch means extend;

(2) a window pivotally coupled to said coupling section of said support plate by a pin and being pivotable about an axis of said pin between a closed position, wherein said window covers said slots and said slide arms of said potentiometers, and an open position, wherein said window exposes said slots and said slide arms of said potentiometers so that the position of said slide arms of said potentiometers may be adjusted by the operator of said dimming system assembly; an inner surface of said window sliding along said cam surface as said window moves from said closed position to said open position until it reaches said ridge and then contacting said locking surface after it moves past said ridge; and

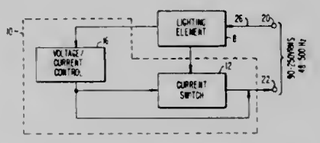
(3) said coupling section, said window and said pin cooperating to cause said inner surface to be biased radially inward toward said axis of said pin in such a manner that said inner surface is first biased into contact with said cam surface and then is biased into locking engagement with said locking surface as said window is moved from said closed to said open position.

4,893,063

APPARATUS FOR IMPROVING THE EFFICIENCY OF A LIGHTING ELEMENT

Joseph Pernyeszi, 844 Weston Rd., Scotts Valley, Calif. 95066

Filed Oct. 6, 1987, Ser. No. 106,736
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—307 **20 Claims**



1. Apparatus for regulating the illumination of a lighting element connected to an alternating current voltage supply comprising:

voltage detecting means for detecting the AC voltage across a lighting element; and

voltage maintaining means, responsive to the voltage detecting means, for maintaining a prescribed voltage across the lighting element independently of the current flowing through the lighting element, the voltage maintaining means including initial voltage increasing means for gradually increasing the voltage across the lighting element when the lighting element is initially turned on.

4,893,064

OPERATING SYSTEM FOR SKIN TREATMENT APPARATUS

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jul. 15, 1985, Ser. No. 754,982
Int. Cl.[4] H05B *41/00*
U.S. Cl. 315—317 **20 Claims**

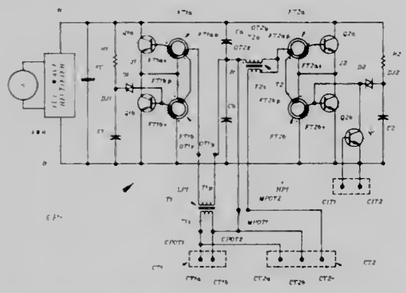
1. In an operating system for a skin treatment apparatus, said system being adapted to be powered from an ordinary electric

VOL 1110 ISS 2 JA 9 990 UMI

utility power line and having a plurality of fluorescent lamp means, each such lamp means: (i) having a pair of thermionic cathodes, each cathode having a pair of input terminals, (ii) being operative to provide radiation suitable for beneficially affecting human skin exposed to this radiation, and (iii) requiring for proper operation that a relatively low-magnitude cathode voltage be applied across the input terminals of each cathode and that a relatively high-magnitude current-limited main voltage be applied between the two cathodes; the improvement comprising:

rectifier and filter means connected with said power line and operable to provide across a pair of DC terminals a DC voltage of substantially constant magnitude;

inverter means connected with said DC terminals and, in response to said DC voltage, operable to provide a first AC voltage at a first AC output and a second AC voltage at a second AC output;



for each lamp means, a lamp ballasting means operable: (i) whenever receiving said first AC voltage at a first set of input terminals, to provide therefrom said relatively low-magnitude cathode voltage, and (ii) whenever receiving said second AC voltage at a second set of input terminals, to provide therefrom said relatively high-magnitude current-limited main voltage; said lamp ballasting means comprising protection means whereby, if the lamp means does not start operation within a brief period after having been provided with said relatively high-magnitude current-limited main voltage, an effective short circuit is placed between the cathodes of said lamp means; and

distribution means connected with said first and second AC outputs and operative to provide said first AC voltage at said first set of input terminals and said second AC voltage at said second set of input terminals.

4,893,065

GEOMETRIC ERROR COMPENSATION CIRCUIT OF COLOR TELEVISION CAMERA DEVICES

Junichi Yamanaka, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 580,163, Feb. 14, 1987, abandoned. This application Sep. 16, 1987, Ser. No. 96,788

Claims priority, application Japan, Feb. 17, 1983, 58-23722

Int. Cl.[4] H01J *29/56*

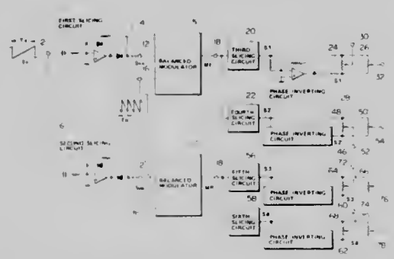
U.S. Cl. 315—371 **7 Claims**

1. A geometric error compensation circuit of a color television camera device having means for generating vertical and horizontal scanning sawtooth shaped signals during respective vertical and horizontal scanning periods, said compensation circuit comprising:

a first separating circuit for separating said vertical scanning signal into a first signal and a second signal corresponding to fore and rear portions respectively of the vertical scanning period;

first and second balanced modulator circuits for effecting balanced modulations of said horizontal scanning signal in accordance with the separated first and second signals, respectively, to provide an output signal for each said first and second modulator circuits, each said output signal having symetrical positive and negative portions;

second and third separating circuits for separating the output signals of said first and second balanced modulation circuits into third and fourth output signals, and fifth and



sixth output signals, respectively, in accordance with reference levels of its respective said modulating circuit output signals; and

compensation signal forming circuits for forming geometric error compensation signals corresponding to specific portions of said horizontal and vertical scanning periods in accordance with said separated third through sixth signals.

4,893,066

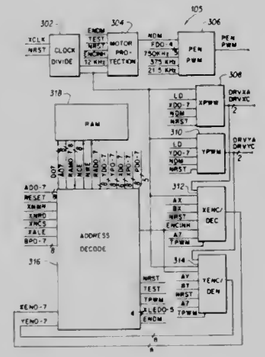
HYBRID SAMPLE RATE SERVO MOTOR CONTROLLER

Lowell J. Stewart, Poway, and Alfred H. Mebane IV, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 19, 1988, Ser. No. 246,240

Int. Cl.[4] G05B *19/29*

U.S. Cl. 318—600 **18 Claims**



1. In a digital rate compensation servo controller for controlling a plant apparatus and employing a displacement indicator having a predetermined resolution and providing displacement signals indicative of displacement of said plant and which are integral multiples of said resolution, and further employing a rate compensation feedback loop for providing rate compensation signals to be combined with reference control signals, the magnitude of said compensation signals varying as a function of estimates of the plant velocity, said velocity estimates being dependent on said displacement signals, and wherein updated velocity estimates are provided under high velocity conditions at a first relatively high fixed sample rate, the improvement comprising means for modifying the rate at which non-zero velocity estimates are provided under low velocity conditions so that updated non-zero velocity estimates are provided only after said displacement signal has incremented by said predetermined resolution, thereby substantially reducing rate quantization error due to said displacement indicator resolution.

4,893,067

DIRECT CURRENT MOTOR SPEED CONTROL

Pradeep Bhagwat, Baltimore, Md.; Duronie Harrell, Charlotte; Stephen Smith, Raleigh, both of N.C., and Samuel G. Woods, Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.

Filed May 6, 1987, Ser. No. 47,181

Int. Cl.[4] G05B *5/00*

U.S. Cl. 388—817 **14 Claims**



1. A DC motor speed control circuit comprising:

a DC motor inducing a back EMF;

a sample and hold means coupled to said motor for developing a signal having a $1-\chi$ relationship to the back EMF of said motor where is χ the back EMF;

a means for measuring and comparing said developed signal with a predetermined reference signal indicative of the desired motor speed;

a means for producing a gating signal indicative of the relationship of said developed signal to said reference signal;

a gated control means coupled to regulate electrical power to said motor; said control means being responsive to said gating signal to permit power flow to said motor when said developed signal is at one relationship to said reference signal and to restrict power flow to said motor when said developed signal is at a second relationship to said reference signal.

4,893,068

DIGITAL SERVO EMPLOYING SWITCH MODE LEAD/LAG INTEGRATOR

Daniel D. Evans, Jr., Oceanside, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 15, 1988, Ser. No. 271,477

Int. Cl.[4] G05B *5/01*

U.S. Cl. 318—615 **26 Claims**

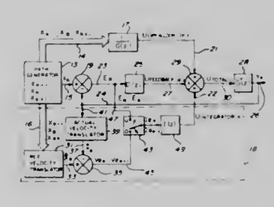
1. Servo positioning apparatus for use in moving and holding a mechanical element comprising:

means for outputting a desired position signal representative of a desired position of said element;

means for generating a velocity error signal representing departure of the velocity of said element during movement from a desired velocity;

a feedback loop including means for generating a position error signal related to the difference between the actual position of said element and the desired position of said element represented by said desired position signal, said feedback loop further including means for applying a transfer function to said error signal to generate a feedback control signal; and

means receiving said position error signal as an input for generating an integrator error signal, said integrator error signal being determined in accordance with said velocity error signal during movement of said element and said position error signal during holding of said element, and for integrating said integrator error signal to generate an integrator control signal for combination with said feedback control signal.



4,893,069

FERRORESONANT THREE-PHASE CONSTANT AC VOLTAGE TRANSFORMER ARRANGEMENT WITH COMPENSATION FOR UNBALANCED LOADS

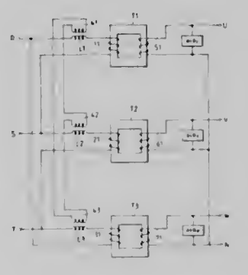
Kosuke Harada; Akihiko Katsuki, both of Fukuoka, and Fukutoshi Tominaga, Saga, all of Japan, assignors to Nishimu Electronics Industries Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 249,720, Sep. 7, 1988, abandoned. This application May 30, 1989, Ser. No. 358,476

Claims priority, application Japan, Jul. 29, 1988, 62-162142

Int. Cl.[4] G05F *1/13*

U.S. Cl. 323—215 **6 Claims**



1. A ferroresonant three-phase constant AC voltage transformer comprising:

three magnetically permeable transformer cores,

a primary side winding and a secondary side winding formed on each of said transformer cores,

three input terminals,

three input means each of which can be in an inductive coupling and each of which provides an inductive reactance effectively in series with a corresponding one of said primary side windings to thereby form three primary phase winding units each in a predetermined connection pattern to the three input terminals,

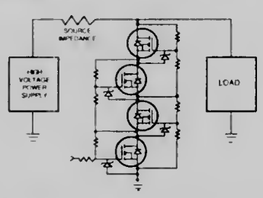
automatic voltage regulating means for controlling secondary side output voltages generated at the secondary side windings to a predetermined value,
three compensating windings each formed so as to be inductively coupled with a corresponding one of said input means, and
means for connecting said compensating windings to each other in series to form a series closed loop circuit.

4,893,070

DOMINO EFFECT SHUNT VOLTAGE REGULATOR

Walter E. Milberger, Severna Park; Charles S. Kerfoot, Pasadena, and Franklin B. Jones, Catonsville, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 28, 1989, Ser. No. 318,210
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—270 **4 Claims**



1. A shunt voltage regulator used with a high voltage power supply having a series source impedance feeding a load, wherein the shunt voltage regulator comprises an amplifier connected shunting the load;
wherein said amplifier comprises a plurality of stages in tandem from a first stage to an Nth stage, each stage being a three-terminal unit having an input terminal, an output terminal and a common terminal, input means coupled between the input and common terminals of the first stage, the input means being coupled to an external signal source to command operation of the first stage, the output terminal of the Nth stage being coupled to the load;
each stage after the first having its input terminal coupled to the common terminal of the preceding stage, and its common terminal coupled to the output terminal of the preceding stage;
each stage comprising an amplifying device having an inverting input, a non-inverting input and an output, a reference resistor connected between the input terminal of each stage and the non-inverting input of each amplifying device, a feedback resistor connected between the inverting input and the output of each amplifying device, the non-inverting input of each amplifying device being the common terminal of the stage, and the output of each amplifying device being the output terminal of each corresponding stage.

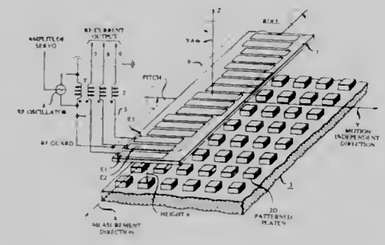
4,893,071

CAPACITIVE INCREMENTAL POSITION MEASUREMENT AND MOTION CONTROL

Gabriel L. Miller, Westfield, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 24, 1988, Ser. No. 197,800
Int. Cl.[4] G01B *7/30*; G08C *19/10*
U.S. Cl. 324—660 **29 Claims**

1. A capacitive position-sensing system of the type comprising
a plurality of conducting elements lying essentially in a configuration defining a smooth surface;
at least some of said elements being spaced apart in said smooth surface in a first direction in which motion is to be sensed;
means for providing capacitive effects with respect to said elements, including
means for forming a capacitive reference surface for said elements; and
means for sensing differences of capacitances between the reference surface and respective ones of said elements;
the means for providing capacitive effects with respect to said elements including



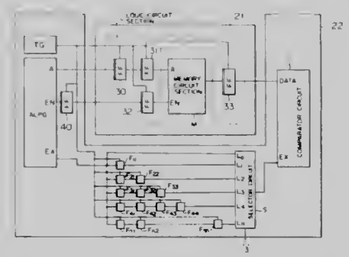
means for establishing a spatially modulated repetitive capacitive pattern between said reference surface and said conducting elements;
said system being characterized in that
the forming means forms a conductively monolithic capacitive reference surface;
the spaced apart elements are subdivided into at least three groups; and
the sensing means simultaneously senses at least two capacitive difference signals.

4,893,072

APPARATUS FOR TESTING AN INTEGRATED CIRCUIT DEVICE

Takashi Matsumoto, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 210,094
Claims priority, application Japan, Juo. 29, 1987, 62-162158
Int. Cl.[4] G01R *31/00*
U.S. Cl. 371—223 **13 Claims**



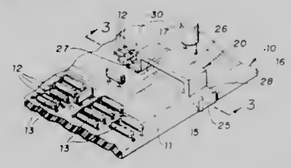
1. An apparatus for testing an integrated circuit device comprising:
means for generating a test signal to be supplied to said integrated circuit device under control of a clock signal so that said integrated circuit device produces an output signal in response to said test signal;
means for generating an expected signal to be hopefully delivered from said integrated circuit device in response to said test signal;
means connected with said expected signal generating means for transferring said expected signal under control of said clock signal with a time delay shift associated with the period of said clock signal; and
means for comparing said output signal of said integrated circuit device with said expected signal delivered through said expected signal transferring means to check performance characteristics of said integrated circuit device.

4,893,073

ELECTRIC CIRCUIT BOARD CURRENT SENSOR

Brian P. McDonald, Saginaw, and Steven J. Collier-Hallman, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1989, Ser. No. 303,702
Int. Cl.[4] G01R *33/00*; H05K *13/04*; F02P *3/00*
U.S. Cl. 324—117 H **3 Claims**



1. An electric circuit board current sensor comprising a circuit board of insulting material with a thin current trace of electrically conducting material on one side of the circuit board near an edge thereof, other electric components on the circuit board effective, when electric power is applied thereto, to produce an electric current through the current trace, a notch in the edge of the circuit board and an opening therethrough on opposite sides of the current trace, a magnetic sensor In the opening and a flux member mounted on the circuit board surrounding the current trace;
the flux member being made of a ductile magnetic material and having a first portion thereof adjacent the circuit board on the side thereof opposite the current trace with a free end comprising a latching portion inserted in the opening, a second portion on the same side of the circuit board as the current trace but spaced therefrom with a free end adjacent the opening, and an end portion engaging the notch and joining the first and second portions on the other side of the current trace from the free ends, the free ends being biased by an internal spring characteristic of the flux member to engage opposite sides of the magnetic sensor and thus complete a magnetic circuit therewith around the current trace, the flux member being positively retained on the circuit board in a predetermined alignment around the current trace by the notch and opening of the circuit board, whereby current through the current trace generates a magnetic flux in the flux member which is sensed by the magnetic sensor.

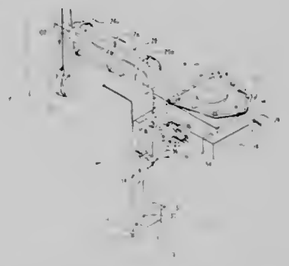
4,893,074

ELECTRONIC DEVICE TESTING SYSTEM

Alyn R. Holt, Cherry Hill, N.J., and Brian R. Moore, Postcombe, England, assignors to inTEST Corporation, Cherry Hill, N.J.

Filed May 13, 1988, Ser. No. 193,768
Int. Cl.[4] G01R *1/00, 1/04*
U.S. Cl. 324—158 F **19 Claims**

1. An electronic device testing system comprising:
a support structure;
a positioner movable along said support structure;
a test head assembly including:
(a) a cradle,
(b) means for attaching said cradle to said positioner for pivotal movement of said cradle about a horizontal axis,
(c) a test head, and
(d) means for attaching said test head to said cradle for pivotal movement of said test head about a second axis pivotable about said horizontal axis in a plane perpendicular to said horizontal axis;
a test cabinet;
a cable support;



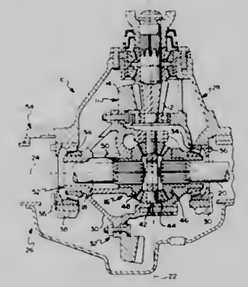
means for attaching a first end of said cable support to said test head assembly;
and a cable connected between said test head and said test cabinet and extending along said cable support away from said test head assembly.

4,893,075

DUAL SPEED SENSOR PICKUP ASSEMBLY WITH ANTI-CROSS TALK COILS

Joseph B. Dierker, Jr., Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 237,920, Aug. 29, 1988, abandoned. This application Oct. 21, 1988, Ser. No. 260,963
Int. Cl.[4] G01B *7/14*; G01P *3/48, 3/54*
U.S. Cl. 324—174 **11 Claims**



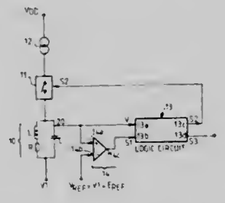
1. A dual speed sensor pickup assembly for sensing the rotational velocity of a first and a second exciter rotor, said exciter rotors closely axially spaced and independently rotatable about a common axis of rotation, said pickup assembly comprising mounting means for mounting said pickup assembly in predetermined position relative to said first and second exciter rotors, a first and a second closely spaced speed sensor assembly fixedly retained in said mounting means, each of said speed sensor assemblies comprising a ferromagnetic pole piece, a permanent magnet and a conductive coil surrounding the pole piece, said pole pieces each defining a longitudinally extending axis about which the coil is looped; said coils each having a composite signal induced therein composed of a true speed signal of the associated exciter rotor and a cross talk signal from the other speed sensor; said pickup assembly characterized by:
each speed sensor including anti-cross talk means associated therewith for producing an anti-cross talk signal added to the composite signal in the coil of the other speed sensor for canceling the cross talk signal therein.

4,893,076

PROXIMITY DETECTOR USING INDUCTIVE EFFECT ON OSCILLATING CIRCUIT THE CHARGE OF WHICH IS CONTROLLED BY A PULSE OF SHORT DURATION

Didier Leonard, Hiersac; Jean M. Periot, La Couronne, and Pierre Petit, Champniers, all of France, assignors to La Telemecanique Electrique, France

Filed Apr. 22, 1988, Ser. No. 184,853
Claims priority, application France, Apr. 23, 1987, 87 05961
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—207 **5 Claims**



1. An inductive proximity detector including:

i- an oscillating circuit comprising a coil which is influenced by an object to be detected and a capacitor, said oscillating circuit having a predetermined pseudo-oscillation period and a hot point terminal ;

ii- a power supply source and controllable switch means connecting the power supply source to the hot point terminal of the oscillating circuit, said switch means having a control input ;

iii- logic circuit means having an output connected to said control input and generating square wave signals during predetermined periodic time intervals, said pulses opening the switch means during said intervals, said logic circuit means having a further output on which a measurement signal is produced, and

iv- comparator means comparing the voltage at the hot point terminal of the oscillating circuit with a predetermined voltage threshold, said comparator means having an output ;

v- said logic circuit means having an input connected to the hot point of said oscillating circuit and a further input connected to the output of the compatator means ;

vi- said predetermined time intervals being substantially equal to half the said pseudo-oscillation period.

4,893,077

ABSOLUTE POSITION SENSOR HAVING MULTI-LAYER WINDINGS OF DIFFERENT PITCHES PROVIDING RESPECTIVE INDICATIONS OF PHASE PROPORTIONAL TO DISPLACEMENT

Richard C. Auchterlonie, 5701 N. Sheridan #29-q, Chicago, Ill. 60660

Continuation-in-part of Ser. No. 55,422, May 28, 1987. This application Mar. 31, 1988, Ser. No. 175,760
Int. Cl.[4] G01B *7/14;* **G05B** *1/06;* **G08C** *19/06, 19/12*
U.S. Cl. 324—208 **19 Claims**

1. An inductive position sensor comprising, in combination,

a first support,

a second support disposed in close proximity to said first support, said second support being relatively movable with respect to said first support along a direction,

a first set of electrically conductive windings mounted on said first support,

a second set of electrically conductive windings mounted on said first support,

a third set of electrically conductive windings mounted on said second support,

said second support being relatively moveable with respect to said first support along a predefined direction to align said third set of windings with locations within a predefined range of locations over said first support, said first set of windings being disposed in a first periodic spatial pattern extending along said direction over said range, said first periodic spatial pattern having a first pitch, said first periodic spatial pattern having multiple cycles over said range,

said second set of windings being disposed in a second periodic spatial pattern extending along said direction over said range, said second periodic spatial pattern having a second pitch, said second periodic spatial pattern having multiple cycles over said range, said second pitch being substantially different from said first pitch, said first and second sets of windings being disposed in close proximity to each other and being registered one over the other along said direction and over said range,

said first set of windings being inductively coupled to said third set of windings such that said first set of windings is connectable to one of a plural-phase source of alternating current and a phase discriminator, and said third set of windings is connectable to the other of said plural-phase source of alternating current and said phase discriminator, when said second set of windings is disconnected, to provide a first phase indication that is proportional to





displacement of said second support with respect to said first support along said direction and over said range, said first phase indication being a first periodic function of said displacement that varies continuously over at least two pi (2π) radians, values of said displacement differing by approximately said first pitch giving rise to the same values of said first phase indication, and

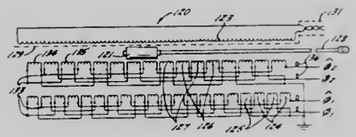
said second set of windings being inductively coupled to said third set of windings such that said second set of windings is connectable to said one of said plural-phase source of alternating current and said phase discriminator, and said third set of windings is connectable to said other of said plural-phase source of alternating current and said phase discriminator, when said first set of windings is disconnected, to provide a second phase indication that is proportional to displacement of said second support with respect to said first support along said direction and over said range, said second phase indication being a second periodic function of said displacement that varies continuously over at least two pi (2π) radians, values of said displacement differing by approximately said second pitch giving rise to the same values of said second phase indication, whereby said displacement is determinable from said first and second phase indications.

4,893,078

ABSOLUTE POSITION SENSING USING SETS OF WINDINGS OF DIFFERENT PITCHES PROVIDING RESPECTIVE INDICATIONS OF PHASE PROPORTIONAL TO DISPLACEMENT

Richard C. Auchterlonie, 5701 N. Sheridan #29-q, Chicago, Ill. 60660

Filed May 28, 1987, Ser. No. 55,422
Int. Cl.[4] G01B *7/14;* **G08C** *19/06;* **H01F** *21/02;* **H02K** *24/00*
U.S. Cl. 324—208 **17 Claims**



1. A method of sensing the position of a selected location over a certain range of locations along a predefined path, said method comprising the steps of:

(a) establishing an electromagnetic field along said path, said electromagnetic field alternating at a predetermined frequency but having a first phase that is a predetermined first periodic function of position within said range, said first periodic function having a predetermined first wavelength, said range extending over a distance of at least twice said first wavelength, such that said first phase varies continuously over two pi (2π) radians over a distance of said first wavelength in said range and said first phase is proportional to position in said range but said first phase has the same value at two different positions in said range which are spaced apart by a distance of said first wavelength,

(b) sensing the phase of said electromagnetic field at said selected location to obtain a first phase indication, said first phase indication thereby being related to said position of said location according to said first periodic function,

(c) changing said electromagnetic field along said path so that said electromagnetic field has a second phase that is a predetermined second periodic function of position within said range, said second periodic function having a predetermined second wavelength, said range extending over a distance of at least twice said second wavelength, such that said second phase varies continuously over two pi (2π) radians over a distance of said second wavelength in said range and said second phase is proportional to position in said range but said second phase has the same value at two different positions in said range which are spaced apart by a distance of said second wavelength, said first wavelength being different from said second wavelength so that every position within said range determines a unique combination of said first phase and said second phase but neither said first phase alone nor said second phase alone is sufficient to uniquely determine said position,

(d) sensing the phase of the changed electromagnetic field at said selected location to obtain a second phase indication, said second phase indication thereby being related to the position of said location according to said second periodic function, and

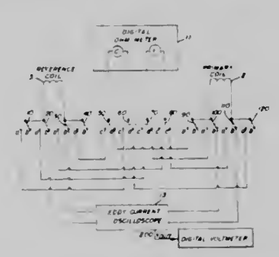
(e) computing said position of said location from said first and second phase indications.

4,893,079

METHOD AND APPARATUS FOR CORRECTING EDDY CURRENT SIGNAL VOLTAGE FOR TEMPERATURE EFFECTS

Thomas A. Kustra, N. Huntingdon, and Alfred J. Caffarel, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1988, Ser. No. 237,203
Int. Cl.[4] G01N *27/72;* **G01B** *7/10;* **G01R** *33/12*
U.S. Cl. 324—225 **3 Claims**



2. An apparatus for measuring physical characteristics of an electrically conductive material in a heated environment comprising:

eddy current probe means including a primary coil and a reference coil for producing an eddy current signal in response to said probe means coming in contact with said material;

resistance measuring means including a digital ohm meter for measuring the resistances of said primary coil and said reference coil;

output means for outputting said eddy current signal; and

switch means connected between said probe means, said resistance measuring means, and said output means, for connecting said probe means to said resistance measuring means to measure the resistances of said coils, and for connecting said probe means to said output means to obtain said eddy current signal, said switch means connecting said probe means directly to said resistance measuring means and said output means so that said eddy current signal and said measured resistances are performed at substantially the same time and under the same conditions in the heated environment, wherein the resistance differential of the coils is proportional to temperature differential changes which cause errors in said eddy current signal produced by said probe means, such that said error may be compensated for by correcting the measured value of said eddy current signal in accordance with the measured resistances of the coils.

4,893,080

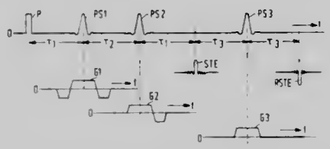
VOLUME-SELECTIVE SPECTROSCOPY USING REFOCUSED ECHOES

Peter R. Luyten; Jan A. Den Hollander; Johannes H. Den Boef, and Johannes J. Van Vaals, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 10, 1988, Ser. No. 230,630
Claims priority, application Netherlands, Aug. 12, 1987, 8701889
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **8 Claims**

1. A method of determining a nuclear magnetization distribution in at least a part of an object, such part of the object being excited by a sequence of rf pulses generating a refocussed

stimulated echo from such part which is sampled; characterized in that the sequence comprises at least four rf pulses, a first



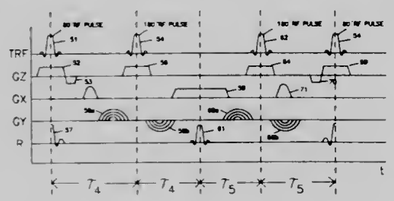
pulse of which is a frequency-selective 90° excitation pulse, and another pulse of which is a refocussing 180° pulse.

4,893,081

DRIVEN EQUILIBRIUM IN MAGNETIC RESONANCE IMAGING

Yuval Zur, Hertzlia, Israel, assignor to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 78,889, Jul. 29, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 330,971
Claims priority, application Israel, Aug. 15, 1986, 79732
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **19 Claims**



1. A method of applying a modified spin echo sequence having selecting (Gz), viewing (Gx) and phase encoding (Gy) gradient pulses for acquiring magnetic resonance imaging data wherein echo signals are driven to equilibrium, said method comprising the steps of:

applying a first 90° RF pulse for tipping spins normally aligned along the Z axis into a transverse plane where the spins dephase,

applying a first 180° Rf pulse at a time τ after the application of the first 90° RF pulse to rephase the dephased spins and form a first echo signal at a time 2τ after the application of the first 90° RF pulse,

applying another 180° RF pulse at a time $n\tau$ after receipt of the first echo signal to again rephase dephasing spins and form another echo signal, where n is any positive odd integer starting with 1,

applying a second 90° RF pulse during formation of said another echo signal at a time τ after the application of said another 180° Rf pulse to drive said another echo signal to equilibrium,

applying said gradient pulses to maximize said another echo signal driven to equilibrium, said step of applying said gradient pulses including the steps of:

applying a Gz gradient pulse during the application of each of the RF pulses,

applying a Gx gradient pulse during the receipt of said first echo signal,

applying a prior Gx gradient pulse prior to the receipt of said first echo signal,

applying a subsequent Gx gradient pulse after the receipt of said first echo signal and before the receipt of said another echo signal, and

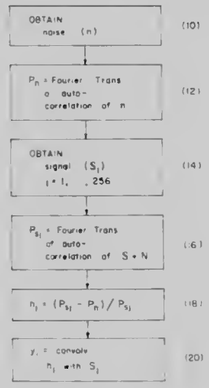
applying Gy gradient pulses of different amplitudes symmetrically distributed in time about both the first and said another 180° RF pulse, said distributed Gy gradient pulses being positive on one side of each of the 180° RF pulse and negative on the other side of each of said 180° RF pulses.

4,893,082

NOISE SUPPRESSION IN MAGNETIC RESONANCE IMAGING

John H. Letcher, III, 7421 S. Marion, Tulsa, Okla. 74136

Filed Feb. 13, 1989, Ser. No. 309,804
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 **12 Claims**



1. A method of removing the effects of noise from a received signal (s=n+g) containing the noise (n) and an actual signal (g), comprising:

(a) obtaining at least one sample of ambient noise (n);

(b) obtaining a power spectrum of the noise (P_n);

(c) obtaining a data set of the signal (s);

(d) obtaining a power spectrum of the signal (P_s);

(e) obtaining a transfer function $h=(P_s-P_n)/P_s$; and

(f) obtaining the convolution of h with s yielding signal (y), wherein $y \simeq g$.

4,893,083

MAGNETIC RESONANCE APPARATUS COMPRISING INTEGRATED GRADIENT R.F. COILS

Johannes A. Overweg, and Wilhelmus R. M. Mens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1988, Ser. No. 233,308
Claims priority, application Netherlands, Aug. 19, 1987, 8701949
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **21 Claims**



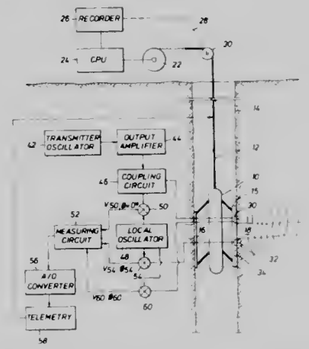
1. A magnetic resonance apparatus, comprising a magnet system for generating a steady magnetic field, a magnet system for generating mutually perpendicular field gradients, and an r.f. coil for generating a spatially uniform r.f. magnetic field, characterized in that the gradient coil system and the r.f. coil are combined so as to form a magnetically and structurally integrated gradient/r.f. coil system and in that current conductors of the gradient coil system and current conductors of the r.f. coil are situated in substantially the same cylinder generated surface.

4,893,084

FORMATION ELECTROMAGNETIC PARAMETERS MEASURING TOOL USING TRANSMITTER REFERENCE AND REFLECTED SIGNALS AND A RECEIVED SIGNAL

Rama N. Rau, League City, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed May 19, 1988, Ser. No. 196,164
Int. Cl.[4] G01V *3/30, 3/38*
U.S. Cl. 324—341 **17 Claims**



1. For use in a well borehole for dielectric measurements of earth's formations adjacent to the borehole, an apparatus which comprises:

(a) a sonde adapted to be lowered in a well borehole for engagement with the sidewall of the borehole;

(b) a transmitting antenna supported by said sonde in contact with the borehole wall for transmitting microwave electromagnetic signals of a specified wave length into the adjacent formation;

(c) a receiving antenna mounted at a distance from said transmitting antenna and supported by said sonde in contact with the borehole wall for receiving the transmitted microwave signals;

(d) measuring means connected to said transmitting antenna and receiving antenna for making measurements of microwave electromagnetic signals transmitted through formation between said antennas and wherein the measurements include a transmitter reference signal, a transmitter reflected signal and a received signal; and

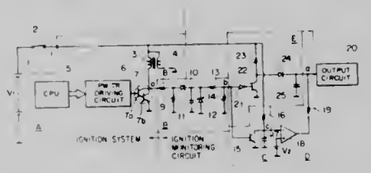
(e) means for determining formations resistivity and dielectric constant from measurements from said measuring means.

4,893,085

IGNITION MONITORING CIRCUIT FOR AN IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE INCLUDING AN ERRONEOUS PULSE ELIMINATING CIRCUIT MEANS

Masaaki Tarsya, and Kiyoshi Ookawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,484
Claims priority, application Japan, Mar. 18, 1988, 63-63423
Int. Cl.[4] F02P *17/00;* **G01P** *3/42*
U.S. Cl. 324—378 **6 Claims**



1. An ignition monitoring circuit for an ignition system of an internal combustion engine, comprising:

first pulse shaper circuit means, coupled to a terminal of a primary winding of an ignition coil of the ignition system, for shaping voltage impulses, occurring at the terminal of the primary winding of the ignition coil upon production of ignition voltages, into pulses of a predetermined height;

second pulse shaper circuit means, coupled to an output of said first pulse shaper circuit means, for converting said pulses outputted from said first pulse shaper means into pulses of a fixed predetermined width; and

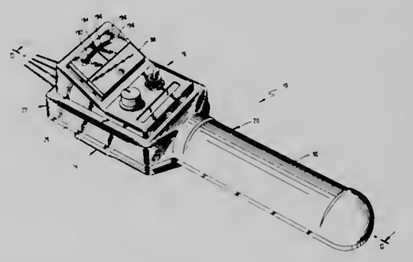
erroneous pulse eliminating circuit means, having an input coupled to the output of the first pulse shaper circuit means and supplied with a voltage from a battery, for eliminating an output pulse of said second pulse shaper means not corresponding to any output pulse of said first pulse shaper means, said erroneous pulse eliminating circuit means sustaining output pulses of said second pulse shaper circuit means corresponding to output pulses of said first pulse shaper means, by supplying the voltage from the battery to an output terminal of said second pulse shaper means in response to output pulses of said first pulse shaper circuit means.

4,893,086

BAR-TO-BAR ARMATURE TESTER

Junior R. Shrewsbury, 2628 Bland Rd., Bluefield, W. Va. 24701

Filed Jan. 24, 1989, Ser. No. 301,045
Int. Cl.[4] G01R *31/34*
U.S. Cl. 324—545 **11 Claims**



1. A tester for testing electric motor armature windings to

determine whether each of said windings is shorted, open, reversed, or properly installed and unbroken, comprising:

a hollow housing having a front end and a rear end;

first, second, third and fourth electrically conductive elongated probes connected to and extending forwardly from said front end of said housing and positioned respectively successively in side-by-side spaced relation;

source means, disposed within said hollow housing and electrically connected across said first and third probes, for providing a voltage across a selected coil winding of said armature;

indicator means disposed within said hollow housing and electrically connected across said second and fourth probes, for detecting and indicating whether said selected coil winding is shorted, whether said selected coil winding is open, whether said selected coil winding is reversed, or whether said selected coil winding is proper; and

probe marking means on said second probe for marking which of said probes is contacting an armature bar which is directly connected to said selected coil winding.

4,893,087

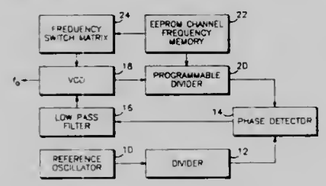
LOW VOLTAGE AND LOW POWER FREQUENCY SYNTHESIZER

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,380

Int. Cl.[4] H03B *19/00*; H03L *7/00*

U.S. Cl. 328—14 **4 Claims**



1. A low voltage and low power frequency synthesizer including a variable divider phase locked loop for controlling the output frequency of a voltage controlled oscillator (VCO) comprising:

memory means having information corresponding to a desired frequency and divisor information for the phase locked loop and the VCO; and

frequency capacitance switch means coupled between said memory and said VCO responsive to additional information to select a predetermined value of capacitance, said switch means including a plurality of capacitors from which the frequency capacitance switch means may select, said switch means further including means producing a course tuning frequency determining network of the VCO whereby a broad range of frequencies can be synthesized at lower voltages and maintained with lower power consumption with the phase locked loop operating to maintain the precision of the desired frequency.

4,893,088

TRANSIMPEDANCE FOCAL PLANE PROCESSOR

Brent A. Myers, Palm Bay, and William W. Wiles, Jr., West Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 16, 1988, Ser. No. 271,656

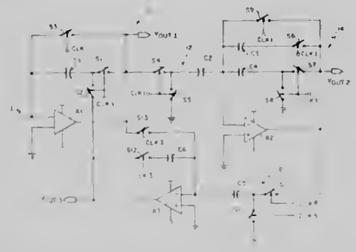
Int. Cl.[4] G11C *27/02*; H03F *1/08*

U.S. Cl. 328—127 **19 Claims**

1. A transimpedance processor for converting photocurrents into voltage comprising:

input integrator means for integrating input signals over a measurement cycle on a first capacitor of said input integration means;

S/H mans connected to an output of said input integrator means for sampling and holding the output of said integrating means; and



precharge means connected between an output of said S/H means and said first capacitor and including a precharge integrator means for integrating output of said S/H means and generating a voltage as a function of input background level and switching means for precharging said first capacitor with negative of the output of said precharge integrator means in a precharge cycle.

4,893,089

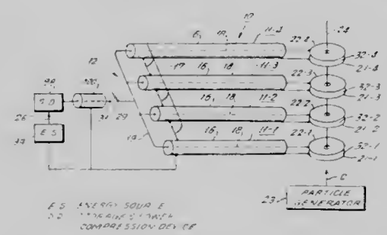
PULSE POWER LINAC

Francesco Villa, Alameda, Calif., assignor to Harris Blake Corporation, Great Neck, N.Y.

Filed Sep. 14, 1988, Ser. No. 244,121

Int. Cl.[4] H05H *5/00*

U.S. Cl. 328—233 **17 Claims**



1. A linear accelerator including:

first means for emitting charged particles that travel along a linear path extending through a particle accelerating region;

second means defining a first plurality of accelerating gaps disposed in series at said accelerating region;

each of said accelerating gaps being defined by a pair of spaced electrodes disposed transverse to said path, and each of said electrodes having an aperture through which said path extends;

third means for generating energy pulses to power said accelerator;

transmission line means connecting said electrodes to a power injection region where said pulses are applied to said transmission line means to propagate therealong to said accelerating gaps;

said transmission line means including a plurality of line sections that are connected in parallel at said power injection region, and an individual one of said line sections being connected to each pair of said spaced electrodes;

said line sections being constructed to delay arrival of each of said pulses at said accelerating gaps in a predetermined sequence so that at each of said gaps as charged particles pass thereacross they are subjected to an accelerating force generated by an electric field which is derived from one of said pulses;

each of said line sections comprising elongated plate-like first and second conductors with a space therebetween.

4,893,090

AMPLIFIER ARRANGEMENT

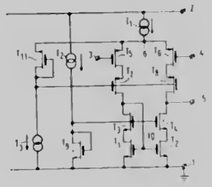
Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1988, Ser. No. 241,689

Claims priority, application Netherlands, Sep. 14, 1987, 8702177

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **13 Claims**



1. An amplifier arrangement comprising a differential amplifier having two input terminals for receiving an input voltage and a differential-to-single-ended converter having an output terminal for supplying an output current, said converter including a first and a second transistor of a first conductivity type whose source electrodes are coupled to a first supply terminal and whose gate electrodes are coupled together, and a third and a fourth transistor of the first conductivity type arranged in cascade with the first and the second transistors, respectively, and having their gate electrodes coupled together, the gate electrode of the first transistor being coupled to a drain electrode of the third transistor, said differential amplifier including a fifth and a sixth transistor of a second conductivity type opposite to the first conductivity type whose gate electrodes are coupled to the input terminals and whose source electrodes are coupled to a common terminal which is coupled by means of a first constant current source to a second supply terminal, and a seventh and an eighth transistor of the second conductivity type which are arranged in cascade with the fifth and the sixth transistors respectively, the arrangement also including a bias circuit for biasing the gate electrodes of the third and the fourth transistors at a voltage which is substantially equal to the sum of one threshold voltage and two saturation voltages, said bias circuit including a ninth transistor of the first conductivity type whose source electrode is coupled to the first supply terminal and whose gate electrode is coupled to the gate electrodes of the third of the fourth transistors and to its drain electrode, characterized in that the drain electrode of the ninth transistor is coupled to the second supply terminal by means of a second constant current source.

4,893,091

COMPLEMENTARY CURRENT MIRROR FOR CORRECTING INPUT OFFSET VOLTAGE OF DIAMOND FOLLOWER, ESPECIALLY AS INPUT STAGE FOR WIDE-BAND AMPLIFIER

William J. Lillis, and Anthony D. Wang, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

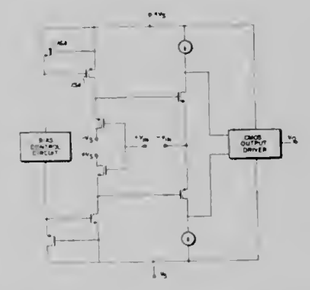
Filed Oct. 11, 1988, Ser. No. 255,774

Int. Cl.[4] H03F *3/45, 3/30*

U.S. Cl. 330—253 **17 Claims**

10. A method of producing a current which represents an inequality between a parameter of a first MOSFET of a first channel type and a second MOSFET of a second channel type, comprising the steps of:

(a) forcing a control current through a source electrode of the first MOSFET to generate a first gate-to-source voltage;



(b) applying the first gate-to-source voltage between gate electrode and a source electrode of the second MOSFET to cause a controlled current to flow in the second MOSFET, the controlled current including a first component which is proportional to the control current and a second component which is related to the inequality.

4,893,092

OPERATIONAL AMPLIFIER CIRCUIT

Toshiyuki Okamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 30, 1988, Ser. No. 252,396

Claims priority, application Japan, Oct. 2, 1987, 62-250520

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **10 Claims**



1. An operational amplifier circuit having two input nodes and an output node, said amplifier circuit comprising:

(a) a differential amplifier input stage coupled between first and second voltage sources and responsive to a difference voltage applied between said two input nodes for producing an amplified signal with respect to said difference voltage;

(b) an output stage coupled between said first and second voltage sources and responsive to said amplified signal for producing an output signal at said output mode with respect to said difference voltage;

(c) a phase compensating circuit coupled between said differential amplifier input stage and said output stage and operative to absorb a distortion appearing in said amplified signal to allow said output signal to similarly vary with respect to said difference voltage;

(d) a biasing circuit coupled between said first and second voltage sources and operative to produce a biasing voltage signal which allows constant currents corresponding

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to the biasing voltage signal to flow through said differential amplifier input stage and said output stage, respectively; and

(e) a phase compensation supporting circuit coupled at one end thereof to said differential amplifier input stage and at the other end thereof to said biasing circuit and operative to support said phase compensating circuit for absorption of a distortion in said amplified signal under a high frequency operation.

4,893,093

SWITCHED POWER SPLITTER

Edward A. Cronauer, Massapequa Park, and Eileen T. Sarc, Bohemia, both of N.Y., assignors to United Technologies Incorporated, Hartford, Conn.

Filed Feb. 2, 1989, Ser. No. 305,960

Int. Cl.[4] H03F *3/68*

U.S. Cl. 330—295 **8 Claims**



1. A switched power splitter comprising:

input means for providing high frequency input signals;

a plurality of amplifier means;

first transmission line means connected between said input means and each said amplifier means, each said first transmission line means exhibiting an impedance which may be altered to either a high or low level state;

resistance means coupled between each said first transmission line means, said resistance means being balanced and having no substantial current flow therethrough when all said first transmission line means are in their low level impedance state and being unbalanced and having a current flow therethrough when one or more of said first transmission line means is in its high impedance state and another of said

first transmission line means is in its low impedance state;

second transmission line means connected in shunt across said first transmission line means, the impedance of said second transmission line means being alterable to either a low or high level state;

a control means connected to said first and second transmission line means for selectively altering the impedance state of said first transmission line means and for simultaneously altering the impedance state of said second transmission line means in the opposite manner.

4,893,094

FREQUENCY SYNTHESIZER WITH CONTROL OF START-UP BATTERY SAVING OPERATIONS

Barry W. Herold, Boca Raton, and Omid Tanernia, Coconut Creek, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1989, Ser. No. 322,393

Int. Cl.[4] H03L *7/18*

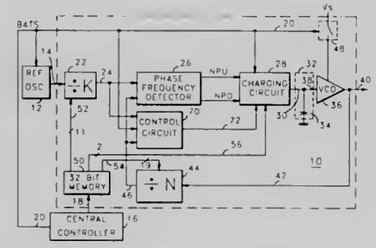
U.S. Cl. 331—1 A **8 Claims**

1. A frequency synthesizer governed by a battery saving signal having sleep and awake cycles, for generating a synthesized frequency signal, said frequency synthesizer comprising:

first means for generating a reference frequency signal;

second means controlled by a governing signal to generate a feedback frequency signal representative of said synthesized frequency signal, said first and second means being governed by said battery saving signal to enable and inhibit the generation of their respective reference and feedback frequency signals during the awake and sleep cycles, respectively, thereof;

storage means for maintaining said governing signal;



means governed by said battery saving signal to adjust the governing signal of said storage means in response to said reference and feedback frequency signals solely during the awake cycles of said battery saving signal; and

control means governed by said battery saving signal, said reference frequency signal and said feedback frequency signal to inhibit the adjustment of said governing signal by said adjusting means until both of said first and second generating means are determined to be effectively enabled in response to an awake cycle of said battery saving signal.

4,893,095

FREQUENCY STABILIZED OSCILLATOR

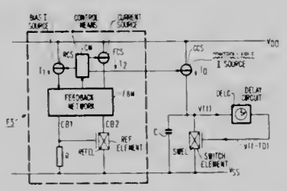
Werner F. Thommen, Staefa, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,338

Claims priority, application Netherlands, Aug. 4, 1987, 8701831

Int. Cl.[4] H03B *1/00*

U.S. Cl. 331—57 **8 Claims**



1. An oscillator comprising, connected between a first and a second power supply terminal, a series connection of a current source which is controllable by frequency stabilization means and which is connected to the second power supply terminal and a parallel connection of a capactive load and a current path of a switching element, which parallel connection is connected to the first power supply terminal, a junction point between the controllable current source and the parallel connection being fed back, via a delay circuit, to a control connection of the switching element, characterized in that the frequency stabilization means comprise:

a first current branch including a bias current source and a resistor which are connected to the second power supply terminal and the first power supply terminal, respectively,

a second current branch including a further current source and a current path of a reference element which is substantially identical to the switching element, which further current source and current path are connected to the second power supply terminal and the first power supply terminal, respectively, the controllable current source and the further current source supplying substantially equal currents and being coupled to the bias current source so as to be controllable in the same sense, a control connection of the reference element being coupled to the resistor, and

feedback means for feeding back a voltage across the reference element in the second current branch to the first current branch so that the bias current source can be adjusted such that the ratio of a control voltage for the reference element and the current in the second current branch is substantially constant.

4,893,096

OSCILLATOR CIRCUIT COMPRISING AN OSCILLATOR WITH A CMOS

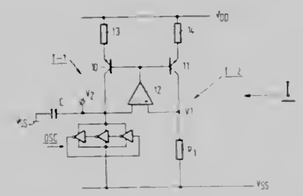
Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1988, Ser. No. 203,048

Claims priority, application Netherlands, Jun. 5, 1987, 8701316

Int. Cl.[4] H03L *1/00*

U.S. Cl. 331—175 **19 Claims**



1. An oscillator circuit, comprising an oscillator with a CMOS gate, characterized in that the oscillator comprises frequency stabilization means coupled to said oscillator so as to keep a ratio of a current consumed by the CMOS gate and a supply voltage present across the CMOS gate substantially constant.

4,893,097

METHOD FOR TEMPERATURE COMPENSATION OF A VOLTAGE-CONTROLLED CRYSTAL OSCILLATOR IN A PHASE CONTROL CIRCUIT

Eduard Zwack, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,708

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732627

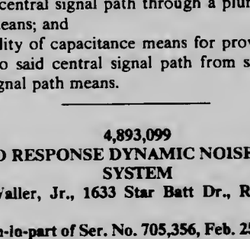
Int. Cl.[4] H03L *1/04*

U.S. Cl. 331—176 **7 Claims**

1. A method for temperature compensation of a voltage-controlled crystal oscillator which includes a crystal in a phase locked loop circuit, comprising the steps of:

controlling the temperature of the crystal oscillator by a heating-cooling device;

sensing the temperature of the crystal oscillator and feeding signals resulting therefrom to a processor;



controlling the heating-cooling device by said processor to a selected temperature of the crystal oscillator lying closest to a current ambient temperature.

4,893,098

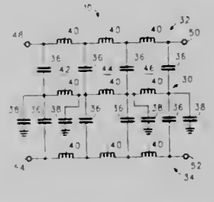
90 DEGREE BROADBAND MMIC HYBRID

Warren L. Seely, and Joseph Staudinger, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1988, Ser. No. 280,094

Int. Cl.[4] H01P *5/18*

U.S. Cl. 333—112 **4 Claims**



1. A four terminal broadband 0/90 degree hybrid comprising:

a plurality of signal path means for transforming the impedance and phasing of an input signal;

a first of said signal path means capacitively coupled to an electric ground to form a central signal path;

said central signal path means for providing an impedance to said ground;

a second and third of said signal path means having ends providing the terminals of the 0/90 degree hybrid coupled to said central signal path through a plurality of capacitance means; and

said plurality of capacitance means for providing an impedance to said central signal path from said second and third signal path means.

4,893,099

EXTENDED RESPONSE DYNAMIC NOISE REDUCTION SYSTEM

James K. Waller, Jr., 1633 Star Batt Dr., Rochester, Mich. 48309

Continuation-in-part of Ser. No. 705,356, Feb. 25, 1985, Pat. No. 4,647,876. This application Nov. 10, 1986, Ser. No. 928,543

Int. Cl.[4] H03H *7/01*

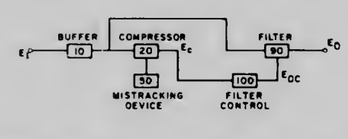
U.S. Cl. 333—17.1 **23 Claims**

1. A noise reduction system for an input signal comprising:

means for compressing said input signal, said compressing means having a first means for sensing said compressed signal and for providing a D.C. signal to said compressing means responsive to said compressed signal to control compression;

means for filtering said input signal over a variably extended range of frequencies; and

second means for sensing said compressed signal and for providing a D.C. signal to said filtering means responsive to levels and quantities of information in a preselected



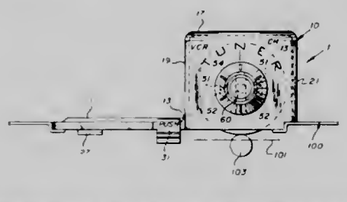
frequency band of said compressed signal to extend the bandwidth of said filtering means when said compressed signal contains more than a predetermined level or quantity of information and to reduce the bandwidth of said filtering means when said compressed signal contains less than a predetermined level or quantity of information.

4,893,100

EXTERNAL MANUAL ROTATABLE DRIVE USEABLE TO TUNE A VCR

Robert L. Spurgeon, 112 W. Douglas, Fairfield, Ill. 62837

Filed Nov. 24, 1987, Ser. No. 124,246
Int. Cl.[4] H03J *1/12*
U.S. Cl. 334—39 **9 Claims**



1. In a first device having a first housing with a first surface, said first surface having a first slot therein with a first rotary wheel protruding partially therethrough and second and third opposed elongated slots adjacent said first surface, an actuator detachably mountable on said first device and including:

(a) a second housing including a bottom surface and an upstanding wall with an opening therethrough;

(b) connection means on said bottom surface for releasably attaching said second housing to said first surface, said connection means comprising opposed tabs releasably engageable in said second and third slots, respectively;

(c) a friction wheel with an actuator shaft protruding through said opening;

(d) said first rotary wheel having a first peripheral surface which is frictionally engaged by a second peripheral surface on said friction wheel when said connector means attaches said second housing to said first surface, whereby rotation of said actuator shaft results in rotation of said friction wheel and first rotary wheel.

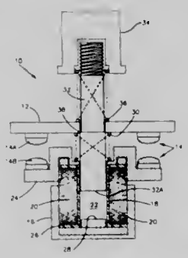
4,893,101

RESETTABLE GROUND FAULT CIRCUIT INTERRUPTER

James M. Robitaille, Cleveland, Ohio, assignor to Ericson Manufacturing Company, Willoughby, Ohio

Continuation of Ser. No. 260,877, Oct. 21, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 327,012
Int. Cl.[4] H01H *83/02, 50/58*; H02H *3/16*
U.S. Cl. 335—18 **10 Claims**

1. A manually resettable ground fault circuit interrupter comprising a pair of normally open contacts, a housing, solenoid means slideably retained by said housing, a contact carrier attached to said solenoid means and having one of said contacts fixed thereon opposite the other contact, said solenoid means being slideable between a first position and a second position, means biasing said solenoid means towards said first position, said contacts being electronically open when said solenoid means is in said first position and said contacts being closed when said solenoid means is in said second position, and a manually actuated plunger which extends at least partially through said solenoid means and is magnetized when said solenoid means conducts a predetermined current, said plunger



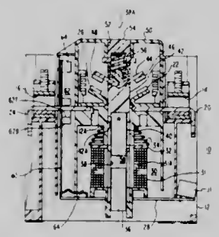
being slideable between a plunger first position and a plunger second position and being biased towards said plunger first position, such that when a predetermined current is conducted by said solenoid means and said plunger is manually actuated said plunger directly engages said solenoid means and upon release of said manual actuation moves said solenoid means to said second position, and when said solenoid means conducts an insufficient current said solenoid means is in said first position regardless of actuation of said plunger.

4,893,102

ELECTROMAGNETIC CONTACTOR WITH ENERGY BALANCED CLOSING SYSTEM

James A. Bauer, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 161,212, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 16,425, Feb. 19, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 230,710
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—132 **11 Claims**



1. An electrical contactor, comprising:

first contact means;

second contact means for being moved into a disposition of electrical continuity with said first contact means;

electromagnet means with armature means which is mechanically interconnected with said second contact means for moving from a first armature means position to a second armature means position to place said second contact means into said disposition of electrical continuity with said first contact means in response to the flow of electrical current through a winding of said electromagnet means;

abutment means against which said armature means abuts to define said second armature means position;

spring means disposed to resist the movement of said armature means, the minimum amount of kinetic energy which when applied to said armature means is sufficient to overcome said spring resistance to cause said first contact means and said second contact means to abut and to cause said armature means to just abut said abutment means without significant rebound at said second armature means position equaling K; and

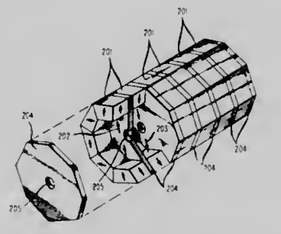
means for supplying electrical current to said winding of said electromagnet means, the total amount of said kinetic energy which is supplied to said armature means during movement thereof being substantially the result of said electrical current flowing in said winding and being substantially equal to K.

4,893,103

SUPERCONDUCTING PYX STRUCTURES

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 24, 1989, Ser. No. 316,710
Int. Cl.[4] H01F *7/22*
U.S. Cl. 335—216 **7 Claims**



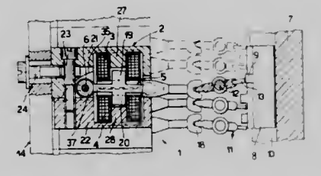
1. A permanent magnetic structure comprising at least one truncated hollow substantially cylindrical flux source for producing a uniform high-field in its central cavity, said high field being perpendicular to the axis of the truncated flux source, and a pair of superconducting plates covering the end faces of the truncated flux source.

4,893,104

ELECTROMAGNETIC ACTUATOR DEVICE, IN PARTICULAR FOR THE SELECTION OF THE NEEDLES ON A KNITTING MACHINE

Leone Donini, Brescia, Italy, assignor to Santoni S.r.l., Brescia, Italy

Filed Dec. 29, 1988, Ser. No. 290,406
Claims priority, application Italy, Jan. 11, 1988, 20415/88[U]
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—266 **12 Claims**



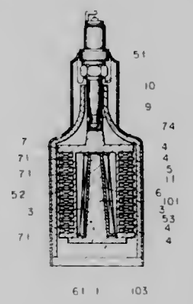
1. Electromagnetic actuator device, in particular for the selection of the needles in knitting machines, comprising at least two windings in a support structure made from a ferromagnetic material, an armature made from a ferromagnetic material hinged relative to said support structure, said armature being subject to the action of the magnetic field generated by said two windings in order to be moved between two angular positions, said armature having a first end for engaging a member to be actuated thereby, charaterized in that said two windings are positioned on opposite sides of the armature, said armature being hinged at a second of its ends opposite said first end, said armature having a hinge axis sustantially perpendicular to the axis of said windings, and said armature having transverse portions projecting from opposite sides thereof to positions between windings.

4,893,105

TRANSFORMER WITH TAPERED CORE

Tsutomu Maeda; Kiyoshi Matsui; Takayuki Kanno, and Kunihiro Sato, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,643
Claims priority, application Japan, Jun. 30, 1987, 62-100317[U]; Jun. 30, 1987, 62-100318[U]; Feb. 6, 1988, 63-14809[U]
Int. Cl.[4] H01F *15/04, 27/30*
U.S. Cl. 336—84 M **3 Claims**



1. A transformer, comprising:

a low-voltage input coil;

a first bobbin around which said low-voltage input coil is wound, said first bobbin having an inner diameter hole;

a high-voltage output coil;

a second bobbin around which said high-voltage output coil is wound, said second bobbin having an inner-diameter hole;

a core for magnetically connecting both of said coils together;

a connector for connecting to an ignition plug;

an insulating cover coaxially disposed of said second bobbin;

a shield case for entirely surrounding said transformer,

said core comprises a rod portion for insertion into said inner diameter hole of said first bobbin and a flange portion provided at one axial end of said core, said rod portion comprises a tapering cross-section such that said rod portion is gradually tapered from a low voltage side of said high-voltage output coil to a high-voltage side,

said inner diameter hole of said first bobbin is formed to fit with said core,

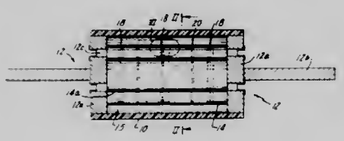
a coil winding section of said first bobbin is formed so as to define a sufficient insulating distance on said high voltage side,

said connector is mounted on an end surface of said second bobbin on an opposite side of said flange portion of said core so that a mounting direction of said connector substantially coincides with an axial direction of said bobbin,

said core is located in said inner diameter of said first bobbin, and

said first bobbin is located in said inner diameter of said second bobbin.

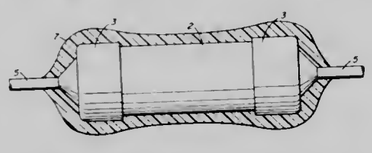
4,893,106
ELECTRICAL FUSES
Michel Goldstein, Randolph Township, N.J.; Kenneth D. Howton, Palatine, and Larry L. Jones, Bartlett, both of Ill., assignors to Brush Fuses Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 169,313, Mar. 17, 1988. This application Dec. 21, 1988, Ser. No. 287,111
Int. Cl.[4] H01H *85/04, 85/38*
U.S. Cl. 337—159 **23 Claims**





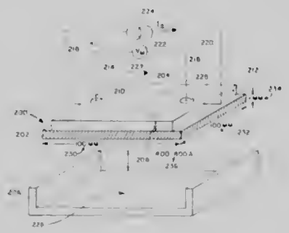
1. A electrical fuse having an enclosure comprising an insulating tube and electrical terminals closing the ends of the tube, a fuse link in said enclosure interconnecting said terminals, and inert granular arc-quenching material which, alone, is tightly packed in said enclosure leaving voids throughout, and a binder unifying said granular material, said voids containing boric acid.

4,893,107
AXIAL MINIATURE FUSE WITH PLASTIC MOLDED BODY
John M. Moser, Ballwin, Mo., assignor to Cooper Industries, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 31,489, Mar. 27, 1987, abandoned. This application Dec. 30, 1987, Ser. No. 139,359
Int. Cl.[4] H01H *85/02*
U.S. Cl. 337—186 **13 Claims**



1. A fuse comprising:
an oppositely open ended insulating housing in the form of a cylindrical sleeve;
a fusible element disposed within said housing;
a pair of end cap means closing the ends of said sleeve, securing the ends of said fusible element and making electrical contact thereto, each of said cap means being cup-shaped to provide a cylindrical recess to accommodate an end of said sleeve and having an external lead connected thereto and extending outwardly therefrom for making external electrical connection to said fusible element; each of said cap means containing a quantity of solder fused to make electrical contact between said end cap means and said ends of said fusible element, said fusible element extending diagonally across the length of said sleeve housing and having a portion of each of its ends exiting the open ends of said sleeve and folded back over a portion of the external surface of said sleeve to be located between the sleeve ends and the end cap means; and
an insulating high temperature, resilient coating layer disposed over said sleeve, end cap means and leads to cover, seal, and physically interconnect the exposed exterior surfaces of said sleeve, said pair of end cap means, and a portion of each of said leads adjacent to said pair of end cap means.

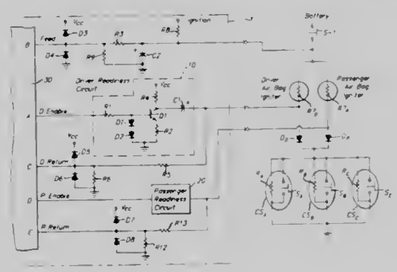
4,893,108
HALOGEN DETECTION WITH SOLID STATE SENSOR
Edward S. Kolesar, Jr., Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 24, 1988, Ser. No. 211,006
Int. Cl.[4] H01L *7/00*
U.S. Cl. 338—34 **18 Claims**



1. Apparatus for detecting the presence of gaseous first halogen components in an unknown mixture of gases comprising the combination of:
a detection substrate member comprised of a second halogen chemical compound of a first metal;
a thin film electrical resistance detector element received on said substrate member and comprised of a second metal in thin film metallic form;
means for moving a stream of said unknown gas mixture over said detection substrate and detector elements; and
means responsive to the combined detector element unknown gas exposure and the substrate member unknown gas exposure resistance changes in said detector element for indicating the presence of said first halogen components in said unknown mixture of gases.

4,893,109
AIRBAG ELECTRICAL IGNITER READINESS DETECTOR
Robert J. Vrabel, Sterling Heights; Dennis W. Rhee, Bloomfield Hills, and Michael R. Seeger, Saline, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 5, 1988, Ser. No. 253,480
Int. Cl.[4] B60Q *1/00;* **B60R** *21/32*
U.S. Cl. 340—438 **10 Claims**

1. In an automotive air bag deployment system containing an explosive igniter that is responsive to inflate an air bag when energized with an electrical current of a predetermined minimum value for a predetermined minimum time period, an apparatus for periodically checking the resistance of the igniter without causing said igniter to responsively inflate said air bag, comprising:
means for applying a predetermined low energy electrical pulse to said igniter, the duration and value of said pulse being selected to be less than said predetermined minimums and therefor insufficient to cause the igniter to reactively explode;
means for detecting the voltage drop across said igniter



when said pulse is applied, comparing said detected voltage drop with values within a predetermined acceptable range, and providing a warning when said voltage drop is outside said acceptable range.

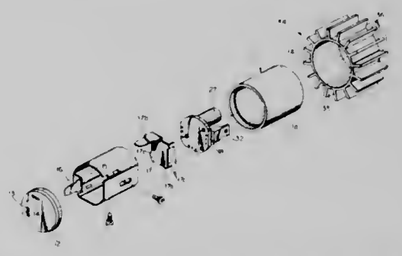
4,893,110
PROCESS FOR DETECTING ANOMALIES BY USE OF PRESSURE AND TEMPERATURE MEASUREMENTS IN A TIRE-MONITORING DEVICE
Jacques Hebert, Jouy-en-Josas, France, assignor to Compagnie Generale des Establissements Michelin-Michelin & Cie, Clermont-Ferrand, France
Filed Oct. 17, 1988, Ser. No. 258,519
Claims priority, application France, Nov. 9, 1987, 87 15611
Int. Cl.[4] B60C *23/00*
U.S. Cl. 340—442 **10 Claims**



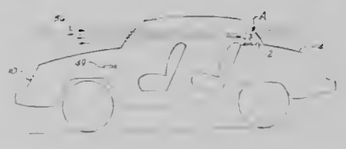
1. A process for monitoring parameters relative to wheels of a vehicle, comprising the steps of:
substantially simultaneously measuring pressure and temperature values in tires mounted on each of the wheels of the vehicle;
calculating a ratio of the measured pressure to the measured temperature for each of the tires;
comparing said ratio for one of the tires with said ratio for at least another one of the tires; and
outputting an alarm when a result N of said comparison deviates from a predetermined range of values.

4,893,111
HEAVY DUTY SOLID STATE FLASHER FOR TURN SIGNAL AND EMERGENCY WARNING LAMPS
Philip C. Roller, Ashville, N.Y., assignor to Truck-Lite Co., Inc., Falconer, N.Y.
Filed Jan. 25, 1989, Ser. No. 301,446
Int. Cl.[4] B60Q *1/46*
U.S. Cl. 340—471 **17 Claims**

1. A solid state flasher for connection into a circuit path of electrical conduction for plural turn signal and emergency working lamps for a vehicle, capable of flashing very heavy loads with small voltage drop without contact arcing and pitting, comprising a cylindrical cup-shaped housing can having a closed bottom and an opposite open end, a dielectric disc-shaped closure wafer closing and sealing the open end of the can and having a flat inner surface and a pair of prong-receiving slots extending therethrough, an input terminal/heat-sink member in the form of a cylindrical tubular metallic shell axially spanning the space between said wafer and said can bottom disposed in said can in thermally conductive engagement with confronting wall portions of said can and having a contact prong formation integrally extending from one end thereof through one of said slots of said wafer, an output terminal member in the form of a thin metal sheet having a generally rectangular main body positioned inwardly adjacent and parallel to said flat inner surface of said wafer and including a contact prong formation extending 20 integrally perpendicularly from a edge thereof through the other of said wafer slots, and a circuit board assembly having a solid state flasher circuit thereon comprising a planiform circuit board supported inwardly parallel to the main body of said output terminal member to be rigidly carried by the input terminal member which in turn is rigidly carried in selected spaced relation to and surrounded by the input terminal member within said can.



4,893,112
BRAKE LIGHT AND RADAR DETECTION DEVICE
Howard R. Hatcher, 204 Barry Dr., Greer, S.C. 29651
Filed Nov. 23, 1987, Ser. No. 123,772
Int. Cl.[4] B60Q *1/44*
U.S. Cl. 340—479 **14 Claims**



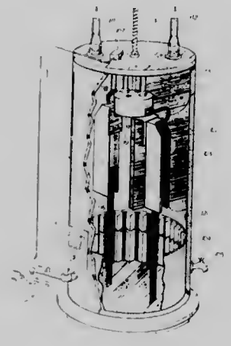
1. In a motor vehicle, a combination vehicle brake light and radar detection device for providing increased detection of radar waves emitted from a traffic speed radar unit and mounting to said motor vehicle in a generally theft-proof manner, said device comprising:
a housing for mounting to said vehicle having a brake light compartment facing a rear of said vehicle with a translucent brake light window:
means for mounting said housing to a surface of a vehicle;
a radar detector for detecting said radar waves; and
radar receiver means carried within said housing forward of said brake light compartment facing a front of said vehicle for receiving said radar waves coming from a direction forward of said vehicle, and delivering said radar waves to said radar detector.

4,893,113

GAS ALARM AND DETOXIFICATION HEATING SYSTEMS

Sea C. Park, and In P. Park, both of 3836 Birchwood, Skokie, Ill. 60076

Filed Jan. 29, 1988, Ser. No. 150,389
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—632 **9 Claims**



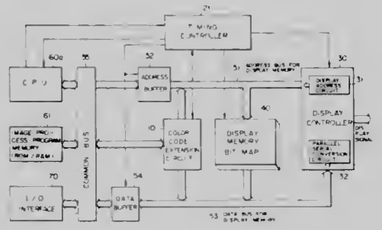
1. A gas monitoring and heating assembly which comprises an electrochemical reactor containing an anode and a cathode disposed therein for the electrolytic conversion of water into hydrogen and oxygen,
means for recovering the oxygen from the electrochemical reactor and introducing it into the atmosphere,
an oxygen room sensor operatively connected to the electrochemical reactor for controlling the generation of oxygen based upon the measurement of the oxygen content in the room,
a water heater containing a burner,
means for recoverng the hydrogen from the electrochemical reactor and introducing it as fuel to the burner,
cold water inlet means and hot water outlet means for introducing cold water to said water heater and recovering hot water from said water heater, said water being heated by indirect heat exchange with the heat generated from the burner, and
heating means comprising a heating chamber which communicates with the atmosphere, heat exchange conduit means disposed in said heating chamber and connected to said cold water inlet means and hot water outlet means and blower means for blowing air across said heat exchange conduit means, whereby at least a portion of the hot water recovered from the hot water outlet means can be selectively introduced into the heat exchange unit means for heating the air from the blower means, said water with the heat removed therefrom being returned to the cold water inlet means, and a gas alarm operatively associated with the oxygen room sensor, said gas alarm being activated when the oxygen room sensor senses a reduction in the oxygen content of the room below a predetermined level.

4,893,114

IMAGE DATA PROCESSING SYSTEM

Takatoshi Ishii, Tokyo, Japan, assignor to ASCII Corporation, Tokyo, Japan

Continuation of Ser. No. 871,542, Jun. 6, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 212,131
Claims priority, application Japan, Jun. 10, 1985, 60-125794; Sep. 30, 1985, 60-217310
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—703 **5 Claims**



1. An image data processing system comprising:
color code extension circuit means including: a foreground register for storing foreground color codes, a background register for storing background color codes, a pattern shift register for storing pattern data to be extended to color codes and for shifting the patern data, and a selector for selectively outputting the foreground or background color codes in accordance with the contents of high-order bits of the pattern shift register;
control processor means for setting the foreground color codes, background color codes, pattern data information and corresponding computed addresses into said color code extension circuit means and for outputting an execution signal;
display controller means for outputting a display address corresponding to a display position of the screen and for generating a display signal to be displayed on a screen of a CRT from received corresponding color code data;
display memory means for receiving the display address from said display controller means and for receiving the corresponding output color codes from said color code extension circuit means and for outputting the corresponding color code data to said display controller means; and
timing controller means for receiving the outputted execution signal from said control processor means and for controlling the timing in which said color code extension circuit means outputs the corresponding color codes to said display memory means.

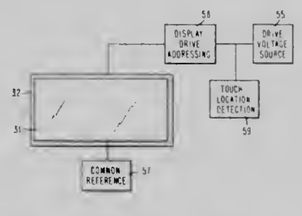
4,893,115

TOUCH SENSITIVE VISUAL DISPLAY SYSTEM

Randall D. Blanchard, Marysville, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation of Ser. No. 767,417, Nov. 12, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 129,873
Int. Cl.[4] G06F *3/033*
U.S. Cl. 340—712 **39 Claims**

1. A touch sensitive visual display system comprising:
control means for providing a display command signal;
display means connected to said control means and responsive to said display command signal to provide a visual display indication thereof;
touch sensitive means conductively connected to said display means through a low resistance DC path, said touch sensitive means being responsive to a touch thereto to establish selectively an electrical conductive shunt of at least a portion of said display command signal from said display means through said DC path thereby changing a value of an electrical parameter of said display command signal; and
signal means connected with said control means for measuring said electrical parameter of said display command signal for sensing said change in said electrical parameter value caused by said signal shunt from said display means and indicating a simultaneous provision of said display command signal and said touch.

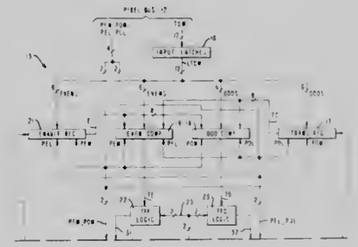


4,893,116

LOGICAL DRAWING AND TRANSPARENCY CIRCUITS FOR BIT MAPPED VIDEO DISPLAY CONTROLLERS

David L. Henderson, Marlboro, Mass.; Brian K. Herbert, Colorado Springs; Michael D. Lahey, Colorado Springs, and Jamey L. Robbins, Colorado Springs, all of Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 16, 1987, Ser. No. 120,902
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—747 **8 Claims**



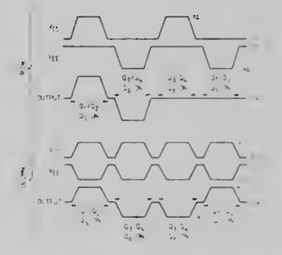
1. Apparatus for implementing a read-modify-write sequence in a pixel based video graphics controller using a frame buffer, comprising:
a source of binary data representing transparency color for a pixel;
a source of binary data representing foreground color for the pixel;
binary data representing background color for the pixel sourced from the frame buffer;
means for comparing by pixel foreground color data with transparency color data and generating a signal upon correspondence; and
means for transmitting either the foreground color binary data or the background color binary data to the frame buffer in response to said logically defined signal from the means for comparing.

4,893,117

LIQUID CRYSTAL DRIVING SYSTEMS

Peter F. Blomley, Bishop's Stortford; Peter J. Ayliffe, Stansted; Ewen R. M. Huffman, and Gregory W. M. Yuen, both of Bishop's Stortford, all of Great Britain, assignors to STC PLC, London, England

Filed Jul. 17, 1987, Ser. No. 74,945
Claims priority, application United Kingdom, Jul. 18, 1986, 8617593; Nov. 27, 1986, 8628366
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—784 **4 Claims**



1. A display device, including a matrix addressed smectic liquid crystal display, row drive and column drive circuits for operation of the display, control means for said row and column drive circuits, and a power supply, wherein said power supply is adapted to provide, from a single floating voltage source, a first waveform comprising positive going pulses and a second waveform comprising negative going pulses, said waveform being of equal pulse repetition rate, wherein each said drive circuit includes means for sampling said positive going and negative going waveforms for deriving therefrom, in response to signals from the control circuit, a series of single cycle alternating output waveforms and zero voltage signals whereby, in use, the pixels of the display may be driven to a scattered state, a cleared state, or an unchanged state, the display device being such that there is a period of zero voltage between successive half cycles of the output waveforms, wherein the relative timing of said positive going and negative going waveform is such that at no time are both a positive going and a negative going pulse simultaneously present thereby limiting the maximum voltage stress applied to a said drive circuit to one half of the peak voltage of its corresponding alternating output waveform, wherein each said row drive and column drive circuit has outputs one for each corresponding row or column of the display, and wherein each output comprises a pair of thyristors whereby, in use, the waveforms are sampled selectively to provide display drive signals.

4,893,118

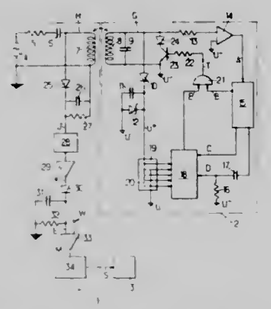
DEVICE FOR IDENTIFICATION BY PROXIMITY

Jacques Lewiner, Saint Cloud; Claude Hennion, and Didier Leonard, both of Paris, all of France, assignors to Societe Fontaine, Paris, France

Filed Nov. 25, 1987, Ser. No. 125,660
Claims priority, application France, Nov. 25, 1986, 86 16393
Int. Cl.[4] G06K *5/00*; H04Q *7/02*
U.S. Cl. 340—825.54 **4 Claims**

1. A device for enabling the identification of an object or objects at a short distance from the latter, without direct contact with the object, and comprising an interrogator-reader member for generating an alternating voltage at a high frequency F, of a value no greater than on the order of 150 kHz, in an inductance and for receiving and identifying binary response signals appearing in the form of coded sequences of electrical pulses modulating the frequency F and following one another at a formation frequency f less than F, which sequences are applied inductively to said inductance; and an elec-

tronic identification circuit mounted on each object to be identified, said circuit comprising a resonant circuit adapted to be inductively coupled to the said inductance, means for using the voltage collected at terminals of said resonant circuit to provide an electrical supply for the identification circuit, means for forming coded binary signals characteristic of the identification circuit, and an electronic switch, actuated by said binary signals, for short-circuiting the resonant circuit so as to form the said response signals, said identification circuit further



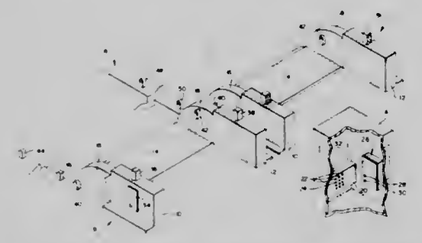
comprising means for modulating, using the coded binary signals, an alternating voltage of intermediate frequency f_i which lies between the frequencies f and F, said intermediate frequency f_i being of the order of 5 to 20 times greater than the frequency f and of the order of 5 to 20 times smaller than the frequency F, and for applying the modulated voltage to the electronic switch to control switching thereof, said interrogator-reader member further comprising means for demodulating from said frequency f_i the coded signals received, after demodulation thereof from the frequency F.

4,893,119

METHOD AND APPARATUS FOR OPERATING A VEHICLE BARRICADE

Kenneth F. Nasatka, Clinton, Md., assignor to Nasatka Barrier, Inc., Clinton, Md.

Filed Sep. 8, 1987, Ser. No. 93,556
Int. Cl.[4] E01F *13/00*
U.S. Cl. 340—928 **33 Claims**



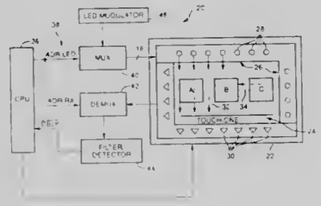
1. A method of operating a vehicle barricade, comprising the steps of:
(a) providing hydraulic means comprising electrically operated motor driven pump means and passive accumulator means, said hydraulic means for operable connection with a barrier for causing the barrier to be displaced between a first lowered position and a second raised position;
(b) providing a plurality of indicator lights, each light operably associated with one of the pump means and the accumulator means and causing the lights to be continuously illuminated when the associated pump means and accumulator means are in an operative condition and causing the associated light to be extinguished when one of the pump means and accumulator means is not in the operative condition;
(c) electrically operating an electromechanical valve means for causing the motor means to displace the barrier between the positions;
(d) electrically operating the valve means for causing the accumulator means to displace the barrier between the positions when the motor means is not operating;
(e) displacing the barrier to the second position upon the occurrence of a defined emergency condition;
(f) providing a first source of electric power for operating the valve means when the motor driven pump means is operating and a second source of electric power for operating the valve means when the motor driven pump means is not operating;
(g) operably interconnecting the sources and thereby maintaining uninterrupted power supply for operating the valve means;
(h) providing a battery power supply as the second source; and,
(i) indicating which of the power supplies is operating the valve means.

4,893,120

TOUCH PANEL USING MODULATED LIGHT

Roger W. Doering, Hayward, and Colin F. McManus, Danville, both of Calif., assignors to Digital Electronics Corporation, Hayward, Calif.

Continuation of Ser. No. 935,471, Nov. 26, 1986, abandoned.
This application Nov. 18, 1988, Ser. No. 274,708
Int. Cl.[4] G01V *9/04*
U.S. Cl. 341—31 **9 Claims**



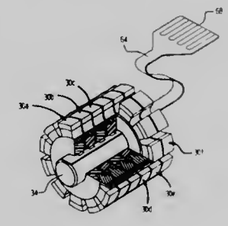
7. A method of locating the position of an object adjacent to a display surface having a defined perimeter, the steps of the method comprising:
providing a multiplicity of light emitting elements and light receiving elements; said elements located so that the light paths defined by selected pairs of light emitting and light receiving elements cross said display surface and define a grid of intersecting light paths thereon;
sequentially energizing selected pairs of said light emitting and light receiving elements;
generating a blocked path signal when the currently enabled light receiving means does not receive the light emitted from the currently enabled light emitting means; and
testing the operability of a selected one of said elements by performing the steps of:
enabling said selected element and a complementary element across said display surface from said selected element, and testing for the presence of a blocked path signal;
enabling the same complementary element and a second element of the same type as said selected element and which is located near said selected element, and testing for the presence of a blocked path signal; and
denoting the detection of a component failure if a blocked path signal is detected when said selected element is enabled, but no blocked path signal is detected when said second element is enabled.

4,893,121

PRINTWHEEL AND ENCODER ASSEMBLY

Donatas V. Gasiunas, Carmel, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 136,076
Int. Cl.[4] H03M *1/22*
U.S. Cl. 341—15 **4 Claims**



1. A printwheel assembly comprising:
a shaft of non-ferrous material having a slot arranged along the length thereof;
a magnet disposed in said slot;
a plurality of Hall-effect sensors mounted in spaced relation along and juxtaposed to said magnet, each Hall-effect device having leads therefrom;
a plurality of printwheels, each printwheel having a ring of ferrous material molded therein, said ring of ferrous material having a T-shaped cross section, said printwheels being mounted for rotation on said shaft and being located along said shaft in juxtaposition to respective Hall-effect devices on said shaft whereby an output signal on respective leads from each said Hall-effect device will vary in correspondence to the angular position of the respective printwheel; and
means mounted on said shaft and extending therefrom for conducting said signals on said leads outside of said assembly.

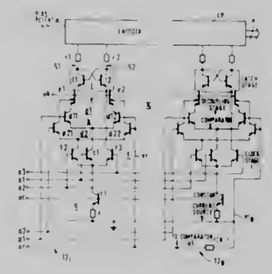
4,893,122

PARALLEL ANALOG TO DIGITAL CONVERTER EMPLOYING SAMPLE AND HOLD STAGES

Wolfgang Hoehn, Märgen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,258
Claims priority, application European Pat. Off., Dec. 15, 1987, 87118603.7
Int. Cl.[4] H03M *1/36*
U.S. Cl. 341—122 **12 Claims**

1. A parallel analog to digital converter for processing at least two analog inputs, said converter having at least one quantizing means for quantizing the analog inputs into at least one discrete output, and an encoder means for converting the output of said at least one discrete output into digital data, each of said at least one quantizing means comprising:
comparator means having a common reference voltage and at least two differential amplifier circuits, the input side of each of said at least two differential amplifier circuits being connected to a corresponding analog input, and the reference side of both being connected to the common reference voltage, wherein each of said at least two differential amplifier circuits compares . its associated analog input to the reference voltage and generates at least one discrete output therefrom;
latch means for storing the output of said comparator means, the outputs of each of said at least two differential amplifier circuits being connected in parallel to the input of said latch means; and
timing circuit means for selecting one differential amplifier circuit to compare its analog input to the reference voltage, output its results to the encoder means and store the results in said latch means, and for selecting the latch means to output its stored results to the encoder means;



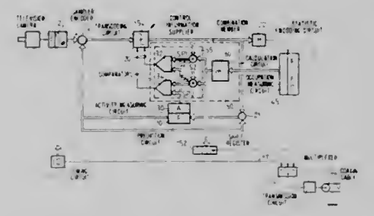
whereby said timing circuit means sequentially selects each of said at least two differential amplifier circuits, one at a time, first generating at least one discrete output to the encoder means, and then outputting the stored results of said latch means to the encoder means, thereby multiplexing and converting the at least two analog signals into a stream of continuous digital data.

4,893,123

TRANSMISSION SYSTEM HAVING A DIFFERENTIAL PULSE CODE MODULATION ENCODING APPARATUS AND AN ASSOCIATED DECODING APPARATUS

Jean-Yves Boisson, Clamart, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1987, Ser. No. 50,181
Claims priority, application France, May 23, 1986, 86 07392
Int. Cl.[4] H03M *3/04*
U.S. Cl. 341—143 **6 Claims**



1. A differential pulse code modulation encoding apparatus comprising:
an input for receiving an input signal to be encoded;
a difference circuit coupled to said input for forming a differential signal, having a number of binary elements, from the difference between said input signal and a prediction signal;
a transmission prediction circuit for forming said prediction signal, said transmission prediction circuit being coupled to an input of said difference circuit;
a transmission transcoding circuit coupled to an output of said difference circuit for reducing said number of binary elements in said differential signal as a function of a control information;
a statistic encoding circuit coupled to an output of said transmission transcoding circuit for variable word length

coding of an output signal of said transmission transcoding circuit;

a buffer memory circuit coupled to an output of said statistic encoding circuit for storing encoded output words from said statistic encoding circuit and for supplying said stored encoded output words to an output of said apparatus;

an activity measuring circuit coupled to said transmission prediction circuit and to said output of said transmission transcoding circuit for generating an activity information; and

an occupation measuring circuit coupled to said buffer memory circuit for generating an occupation information of said buffer memory circuit, characterized in that said encoding apparatus further comprises:

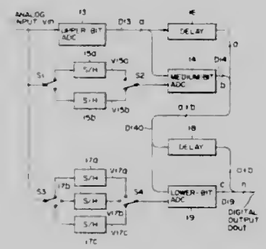
a combining circuit coupled to an output of said activity measuring circuit and an output of said occupation measuring circuit for supplying said control information to a control input of said transmission transcoding circuit in response to said activity information and said occupation information.

4,893,124

PIPELINED SERIAL-PARALLEL A/D CONVERTER

Kazuhiro Tsuji; Tetsuya Iida, and Naoki Sugawa, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 163,025
Claims priority, application Japan, Mar. 4, 1987, 62-47733
Int. Cl.[4] H03M *1/14*
U.S. Cl. 341—156 **20 Claims**



1. An A/D converter for converting an analog input signal into a digital output signal having an n-bit binary code, wherein n, a, and b are positive integers, and n=a+b, and comprising:

first A/D conversion means for A/D-converting the analog input signal into a first digital output corresponding to upper a-bit data of the n-bit digital output signal;

first sample-hold means for sampling a signal level of the analog input signal and outputting a first hold signal;

second sample-hold means for sampling a signal level of the analog input signal and outputting a second hold signal;

first switching means for, in synchronism with the A/D conversion operation of said first A/D conversion means, selecting the second hold signal from said second sample-hold means during a period in which said first sample-hold means samples the signal level of the analog input signal, and selecting the first hold signal from said first sample-hold means during a period in which said second sample-hold means samples the signal level of the analog input signal;

second A/D conversion means for A/D-converting one of the first and second hold signals selected by said first switching means, and outputting a second digital output corresponding to lower b-bit data of the n-bit digital output signal, said first and second digital outputs being combined to provide said n-bit digital output signal; and

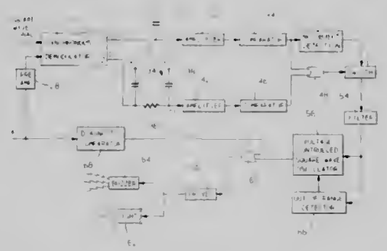
delay means connected to said first A/D conversion means for delaying the first digital output until A/D conversion is completed by said second A/D conversion means, thereby synchronizing the first digital output from said first A/D conversion means to the second digital output from said second A/D conversion means.

4,893,125

VEHICLE DIPLEX DOPPLER NEAR-OBSTACLE DETECTION SYSTEM

Phillip A. May, Lompoc, Calif., assignor to Delco Electronics Corporation, Goleta, Calif.

Filed Nov. 1, 1988, Ser. No. 265,624
Int. Cl.[4] G01S *13/38*
U.S. Cl. 342—129 **3 Claims**



1. A Doppler radar system for a vehicle for indicating a distance between the vehicle and an obstacle as the vehicle approaches the obstacle, the system comprising in combination:

means for transmitting a radar signal alternately at first and second frequencies;

means for receiving the transmitted radar signal reflected from the obstacle;

means for mixing the transmitted and received radar signals to generate first and second Doppler signals having a phase difference that is a measure of the distance to the obstacle and each having a frequency varying directly with the rate that the vehicle is approaching the obstacle;

means for generating a duty cycle signal comprised of repeated pulses having a frequency varying directly with the frequency of the Doppler signals and each having a duration equal to a first time equal to the phase difference between the Doppler signals and therefore being a measure of the distance to the obstacle minus a second time so that the duty cycle signal represents the distance to the obstacle minus an offset distance determined by the second time, the offset distance determined by the second time being directly related to the rate that the vehicle is approaching the obstacle; and

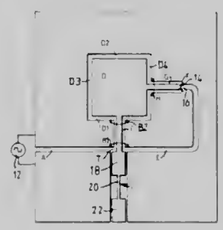
a filter for converting the duty cycle signal to an analog signal having a value representing the distance between the vehicle and the obstacle, the filter having a predetermined time constant resulting in the distance represented by the value of the analog signal being greater than the distance represented by the duty cycle signal by an amount directly related to the rate that the vehicle is approaching the obstacle, the second time being equal to a predetermined constant value so that the offset distance is substantially equal to the lag in the distance represented by the value of the analog signal, whereby the analog signal provides an indication of the distance to the obstacle.

4,893,126

INTEGRATED MILLIMETER-WAVE TRANSCEIVER

David H. Evans, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,138
Claims priority, application United Kingdom, Sep. 23, 1987, 8722412
Int. Cl.[4] G01S *7/42*
U.S. Cl. 342—175 **7 Claims**



1. A microwave CW transceiver comprising a monolithic integrated circuit including:

a. an annular slot antenna having first and second feed points, said first feed point being coupled to a portion of the antenna which is adapted to radiate energy in a first polarization, and said second feed point being coupled to a portion of the antenna which is adapted to receive energy of a second polarization orthogonal to the first polarization;

b. an RF source coupled to the first feed point for applying to the antenna RF energy to be transmitted in the first polarization; and

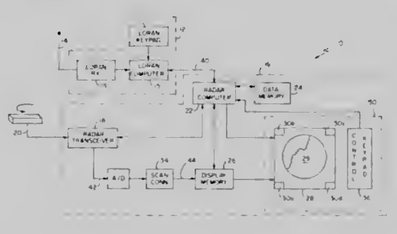
c. a balanced mixer coupled to the second feed point and to the RF source for mixing at least a portion of the received energy of the second polarization with coupled energy from the RF source.

4,893,127

RADAR NAVIGATION SYSTEM

Stanley L. Clark, Derry; Carsten H. Peters, and Jack R. Trommer, both of Bedford, all of N.H., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 12,095, Feb. 6, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,890
Int. Cl.[4] G01S *1/08*
U.S. Cl. 342—386 **4 Claims**



1. A method for displaying information used by a navigator in navigating a vessel, comprising the steps of:

obtaining from a Loran unit electronic representations of the vessel's present position, the present course of the vessel, and the position of a waypoint;

generating a radar image including navigation obstructions in the area surrounding the vessel, the radar image also including a point corresponding to the vessel's present position and a point substantially dead ahead of the vessel;

providing a display of the radar image together with a numeric representation of the present course, the numeric representation of the present course being displayed adjacent the point on the radar image dead ahead of the vessel;

overlaying a heading line on the display, the heading line having as endpoints the point corresponding to the vessel's present position and the point substantially dead ahead of the vessel;

overlaying a graphic indication of the waypoint's position on the display; and

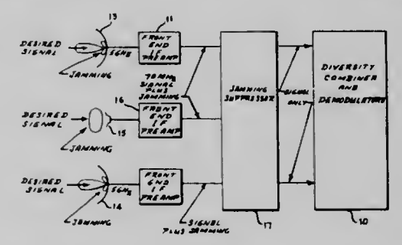
overlaying a waypoint bearing line on the display, the waypoint bearing line having as endpoints the point corresponding to the vessel's present position and a point adjacent the graphic indication of the waypoint's position wherein the navigator is provided with the heading line, the bearing line to the waypoint, and navigation obstructions all on the display so that when the navigator deviates from the waypoint bearing to steer around navigation obstructions, there is a clear visual indication of that deviation by comparing the heading line with the waypoint bearing line.

4,893,128

TROPOSCATTER DIVERSITY SIDELOBE JAMMING SUPPRESSOR

Steen A. Parl, Cambridge, and John N. Pierce, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 29, 1979, Ser. No. 97,589
Int. Cl.[4] G01S *3/16*; H04B *1/10*
U.S. Cl. 342—379 **3 Claims**



1. In a dual diversity troposcatter link receiver having first and second high gain main antennas and a dual diversity demodulator the improvement residing in a sidelobe jamming suppressor, said sidelobe jamming suppressor comprising

an auxiliary low gain antenna, and

a jamming signal suppressor circuit, said jamming signal suppressor circuit comprising

first, second and third variable attenuators,

first, second, third, fourth, fifth, sixth seventh, eighth, ninth, tenth, eleventh, twelvth, and thirteenth hybrids,

first, second and third clippers,

first, second, third and fourth DC amplifiers,

first, second, third and fourth low pass filters,

first, second, third and fourth multipliers,

first, second, third and fourth mixers,

first and second amplifiers, and

first and second limiting amplifiers,

said first hybrid receiving signals from said auxiliary antenna through said second variable attenuator and feeding said tenth and eleventh hybrids,

said first and third variable attenuators receiving signals from said first and second main antennas respectively and being connected to said dual diversity demodulator, said

first variable attenuator through said second and fourth hybrids and said third variable attenuator through said third and fifth hybrids,

a first feedback loop fed from said fourth hybrid comprising said first limiting amplifier feeding said eighth hybrid, said eighth hybrid feeding in parallel the series connected arrangement of said first mixer, said first low pass filter, said third DC amplifier, said third clipper and said first multiplier and the series connected arrangement of said third mixer, said second low pass filter, said second DC amplifier, said second clipper, and said SECPND multiplier,

a second feedback loop fed from said fifth hybrid comprising said second limiting amplifier feeding said ninth hybrid, said ninth hybrid feeding in parallel the series connected arrangement of said second mixer, said third low pass filter, said third DC amplifier, said third clipper and said third multiplier and the series connected arrangement of said fourth mixer, said fourth low pass filter, said fourth DC amplifier, said fourth clipper, and said fourth multiplier,

said tenth hybrid feeding said first and second mixers through said twelvth hybrid,

said eleventh hybrid feeding said third and fourth mixers through said thirteenth hybrid,

the output of said tenth hybrid being fed through said first multipler, said sixth hybrid, said first amplifier and said second hybrid and also through said third multiplier, said seventh hybrid, said second amplifier and said third hybrid, and

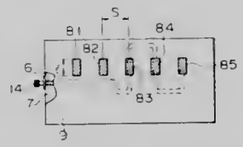
the outputs of said eleventh hybrid being fed through said fourth multiplier, said seventh hybrid, said second amplifier and said third hybrid, and also through said second multiplier, said sixth hybrid, said first amplifier and said second hybrid, said jamming signal suppressor circuit receiving signals from said first and second high gain main antennas and from said auxiliary low gain antenna, said suppressor circuit differencing the signals from each said high gain main antenna with the signal from said low gain auxiliary antenna and inputting the differenced signals to said dual diversity demodulator, the gain of said auxiliary low gain antenna being substantially equal to the sidelobe gain of said high gain main antennor.

4,893,129

PLANAR ARRAY ANTENNA

Masao Kodera, Okazaki, and Seishin Mikami, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 15, 1988, Ser. No. 284,730
Claims priority, application Japan, Dec. 26, 1987, 62-331034
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS **5 Claims**



1. A planar array antenna of a series-feed type comprising:

a planar grounding conductor;

a planar first dielectric substrate having said grounding conductor disposed on one of its surfaces;

an elongate feeder line disposed on another surface of said first dielectric substrate to extend from one end to another end of said first dielectric substrate, said feeder line having no branched portion;

a planar second dielectric substrate having one of its surfaces disposed adjacent to said feeder line and said other surface of said first dielectric substrate; and

a plurality of radiation elements for radiating radio frequency power supplied through said feeder line, said radiation elements being arrayed on another surface of said second dielectric substrate so as to be opposite to said feeder line across said second dielectric substrate, said radiation elements being supplied said radio frequency power starting from an end radiation element positioned nearest to a feeding end of said feeder line,

said feeder line having a first feeder part spaced apart by a predetermined distance from a marginal contour of one of said radiation elements in the planar direction of said second dielectric substrate and a second feeder part disposed within a width of a marginal contour of another one of said radiation elements and directly beneath said another radiation element, and said second feeder part being divided into two parts arranged along a longitudinal axis of said feeder line with respective ends thereof confronting each other,

a power coupling coefficient between said second feeder part and said another radiation element being selected to be larger than a power coupling coefficient between said first feeder part and said one of said radiation elements.

4,893,130

ADHESIVE MOUNT MOBILE TELEPHONE ANTENNA

Donald E. Metivier, Denton, Tex., assignor to Decibel Products, Inc., Dallas, Tex.

Filed Mar. 21, 1989, Ser. No. 326,276
Int. Cl.[4] H01A *1/32*
U.S. Cl. 343—715 **14 Claims**



1. An antenna mount for adhesive attachment to the surface of a non-conducting body, comprising:

a first electrically conductive member defining a first face and having a plastically deformable neck for coupling to said antenna wherein the orientation said antenna with respect to said surface can be set by plastically deforming said neck;

a first adhesive element for securing said first face to said surface;

a facia ring surrounding said first member and defining a ring face;

a second adhesive element for securing said ring face to said surface, and

a sealant between and bonded to said first member, said ring and said surface for protecting said first adhesive element from damage.

4,893,131

MOBILE OR GROUND MOUNTED ARCUATE ANTENNA

William J. Smith, and Jack M. Smith, both of 4772 Prescot Dr., Bethel Park, Pa. 15102

Filed Jun. 15, 1988, Ser. No. 206,806
Int. Cl.[4] H01Q *1/32, 9/30*
U.S. Cl. 343—713 **2 Claims**

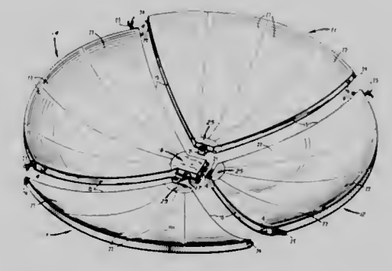
1. A transmitting and receiving radio frequency antenna having two spaced, parallel, vertical end portions of equal height and an integral intermediate portion bowed upwardly and being of semicircular shape, serving as a radio frequency radiator of wavelengths between about two meters to one hundred-sixty meters comprising a coaxial cable input connector having a grounded outer conductor and an inner conductor connected to a terminal of a high/low frequency switch and a first end of a variable capacitor, said switch arranged to selectively connect said variable capacitor in series with said inner conductor or to short out said variable capacitor so as to connect said first end of said variable capacitor and said inner conductor to a second end of said variable capacitor, said second end of said variable capacitor connected to a first terminal of a variable, tapped tuning and loading inductor and to a variable bandswitch, a second terminal of said inductor connected to one end of one of said vertical end portions at one end of said antenna, and a capacitance coupling connected to an end of a second one of said vertical end portions at the other end of said antenna and coupled to ground, whereby vertical and horizontal polarization is obtained from the shape of said antenna.

4,893,132

ASSEMBLY SYSTEM FOR MAINTAINING REFLECTOR SEGMENTS OF AN ANTENNA IN PRECISION ALIGNMENT

Farhad M. Habibi, Sterling, Va., assignor to Radiation Systems, Inc. Technical Products Division, Sterling, Va.

Filed Oct. 28, 1988, Ser. No. 263,944
Int. Cl.[4] H01Q *15/20*
U.S. Cl. 343—912 **10 Claims**



1. An antenna reflector mounting system for supporting reflector segments in precise alignment comprising:

a master hub member attached at one end thereof to a narrow end of one of said reflector segments, said hub member including a plurality of surfaces equal in number to a remaining number of said reflector segments, aligned along an axis of support of the remaining segments, each of said facing surfaces including:

a central cavity having a rectangular cross-section open to receive a tongue member connected to one of said remaining segments in alignment with an axis thereof, said cavity including adjacent said opening a supporting horizontal bar located adjacent a lower edge of said central cavity;

a tongue member connected in alignment with each of a remaining reflector segment, said tongue member extending downwardly from a connected reflector segment at an angle thereto, said tongue member having a distal end for insertion over said horizontal bar when said reflector segment is inclined downward from its normally aligned position, said tongue member pivoting about said horizontal bar when said reflector segment is raised pulling said antenna segment inward to said aligned position; and,

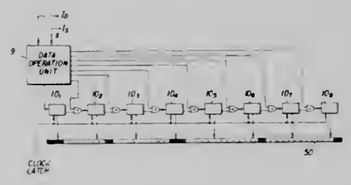
means on a wide end of each antenna segment for holding said segment into alignment with an adjacent segment.

4,893,133

THERMAL PRINTING APPARATUS FOR FORMING A CONTINUOUS TONE DYE IMAGE

Seishi Ohmori, and Wayne F. Niskala, both of Tokyo, Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 138,624, Dec. 28, 1987, abandoned.
This application May 25, 1989, Ser. No. 357,655
Claims priority, application Japan, Mar. 6, 1987, 62-51386
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **1 Claim**



1. Thermal printing apparatus for forming a continuous tone dye image composed of dye image pixels, each image pixel having A different possible dye density levels comprising:

a. a thermal print head for printing a line of image pixels, and including a number N of heating elements, each heating element being addressed during A consecutive heating cycles;

b. means for addressing at least one and no more than L consecutive heating elements during any given heating cycle and for addressing at least one different heating element during the next heating cycle, wherein N is at least equal to 2 times L and L and N are integers, said addressing means addressing each heating element A times; and

c. means for selectively energizing each addressed heating element until each heating element delivers sufficient energy to cause a desired amount of dye to be transferred, whereby group line effects are minimized.

4,893,134

THERMAL TRANSFER RECORDING APPARATUS

Junichi Yamamoto; Akihiko Onuma; Kouji Shibuya, and Yasukuni Omata, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

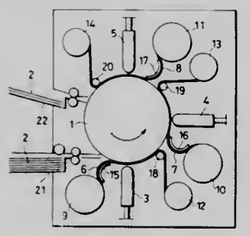
Filed Sep. 2, 1988, Ser. No. 239,760
Claims priority, application Japan, Sep. 4, 1987, 62-222756; Apr. 20, 1988, 63-98807; Jul. 8, 1988, 63-91080[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **16 Claims**

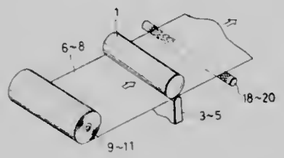
1. A thermal transfer recording apparatus comprising:

a thermal head including a plurality of heating elements arranged in a row;

a platen roller for transporting recording paper to a position opposed to said thermal head;

ink film transport means including a supply reel for supplying an ink film and a takeup reel for taking up the ink film, said ink film transport means transporting the ink film, synchronously with recording paper transportation, to a recording section where said thermal head and said platen roller are opposed to each other; and





an idle roller slightly spaced from a peripheral surface of said platen roller for contacting a back face of the ink film between said recording section and said takeup reel, said idle roller rotatable with movement of the ink film, and said idle roller including grooves in a grid form on a peripheral surface thereof.

4,893,135

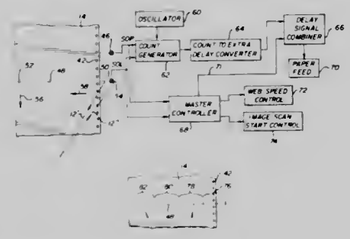
LASER PRINTER WITH POSITION REGISTRATION ENHANCEMENT

Fereidoon S. Jamzadeh, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,075

Int. Cl.[4] G01D *15/14, 9/00;* **H04N** *1/21*

U.S. Cl. 346—108 **15 Claims**



1. A scanning printer for making hard copy documents on a sheet material, said printer comprising:

a movable photosensitive surface;

means for detecting the position of the movable surface;

means for scanning a modulated light beam across said surface while the surface is moving;

means for detecting when the beam is substantially at the beginning of a scan line;

means for feeding a sheet of the document material into an area where a developed image on the surface, previously defined by successive scans of the light beam across the surface, is transferred to the sheet; and

means for delaying the feeding of the sheet from the sheet feeding means, with the delay time being dependent upon a difference in time between the position detection of the photosensitive surface and the detection of the beam, and with the dependency being a function of the position of the beam along a scan line when the movable surface position detecting means signals the start of scanning for defining the image.

4,893,136

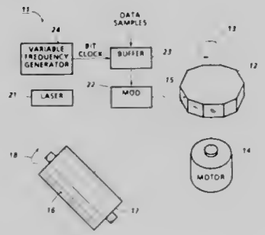
ARITHMETICALLY COMPUTED MOTOR HUNT COMPENSATION FOR FLYING SPOT SCANNERS

Douglas N. Curry, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,501

Int. Cl.[4] G01D *15/14;* **H04N** *1/04*

U.S. Cl. 346—108 **1 Claim**



1. In a flying spot scanner having a rotating polygon with a drive motor for cyclically scanning an intensity modulated light beam across a photosensitive recording medium in a line scanning direction while said recording medium is being advanced in an orthogonal process direction, a modulator for modulating said light beam in accordance with data samples representing an image, a buffer for storing said data samples, and an arithmetic frequency synthesizer having an accumulator for recursively accumulating a R-bit long word having a time varying value N at a predetermined reference frequency to generate a variable frequency bit clock for serially shifting said data samples from said buffer to said modulator at a rate controlled by the frequency of said bit clock, the improvement comprising

counter means for accumulating counts during each of said scan cycles at a frequency scaled to said reference frequency, whereby the count accumulated by said counter means during any given scan cycle is a measure of the rotational velocity of said polygon during said given scan cycle,

means for offsetting the accumulated counts by a predetermined bias selected to cause the offset counts to be the accumulator input word values that causes said arithmetic frequency synthesizer to vary the frequency of said bit clock when required for maintaining the bit clock frequency for any subsequent scan cycle multiplied by the rotational velocity of said polygon during at least one preceding scan cycle substantially constant, thereby compensating for any normal polygon motor hunt errors.

4,893,137

RECORDING APPARATUS AND INK CARTRIDGE

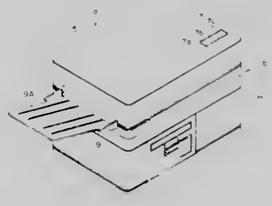
Ryuichi Ebinuma, Kawasaki; Nobutoshi Mizusawa, Yamato, and Yuji Chiba, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 131,083

Claims priority, application Japan, Dec. 10, 1986, 61-292599/1986; Dec. 10, 1986, 61-292600/1986; Dec. 10, 1986, 61-292601/1986; Dec. 25, 1986, 61-307937/1986; Dec. 25, 1986, 61-307938/1986; Dec. 25, 1986, 61-307939/1986; Dec. 25, 1986, 61-307940/1986

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—134 **59 Claims**



1. A recording apparatus including:

recording means for discharging ink for effecting recording on a recording medium in response to information;

electric circuit means;

an upper unit having said recording means and having at least a portion of said electric circuit means of said recording apparatus;

a lower unit having a platen for maintaining the recording medium in a recording station for effecting recording thereon by said recording means and a position connecting said upper unit and said lower unit being located at the recording station; and

conveying means for conveying the recording medium to the recording station and allowing the recording medium to be conveyed along the position connecting said upper unit and said lower unit at the recording station;

said upper unit and said lower unit being capable of being opened and spaced apart from each other at the position connecting said upper unit and said lower unit at the recording station.

4,893,138

INK JET RECOVERY DEVICE INCLUDING A COMMUNICATING VALVE AND A VENTILATING VALVE

Koji Terasawa, Mitaka; Hideki Yamaguchi, Yokohama; Akira Miyakawa, Tanashi; Shinya Matsui; Mikio Shiga, both of Yokohama, and Shigeru Tsuyukubo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,527

Claims priority, application Japan, Mar. 13, 1987, 62-58390; Mar. 8, 1988, 63-54279

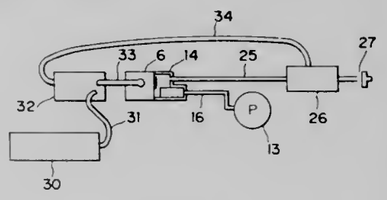
Int. Cl.[4] G01D *15/6;* **B41J** *3/04*

U.S. Cl. 346—140 R **49 Claims**

1. A recovery device for an ink jet recording apparatus having a cap for covering an ink discharge port of a recording head and suction means communicating with the cap for sucking ink from the ink discharge port, said device comprising:

a tube having an interior communicating with the cap and a subtank for supplying ink to the recording head;

a communicating valve for connecting and disconnecting communication of the cap with the subtank provided in an intermediate portion of said tube; and



a ventilating valve communicating the interior of said tube with the atmosphere provided separately from said communicating valve.

4,893,139

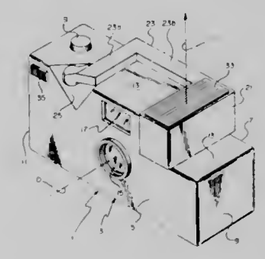
COMPACT CAMERA PROVIDING DIRECT AND INDIRECT FLASH

John H. Alligood, Penfield, and Joel S. Lawther, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,454

Int. Cl.[4] G03B *15/05*

U.S. Cl. 354—149.1 **3 Claims**



1. An improved photographic camera wherein a flash unit is movable relative to the camera body between an erect position unfolded from said camera body and a storage position folded against the camera body, and wherein the improvement comprises:

said flash unit including a flash light emission window arranged to face generally toward a subject to be photographed when the flash unit is in its erect position, to provide direct illumination of the subject, and arranged to face substantially upward with respect to the subject when the flash unit is in its storage position, to provide direct bounce illumination of the subject.

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4,893,140

SINGLE-LENS REFLEX CAMERA WITH BUILT-IN FLASH

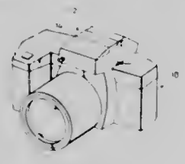
Masato Yamamoto; Susumu Koshino; Toshimasa Yamanaka; Koji Sato; Akihiro Arai, and Masahiro Kiozuma, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

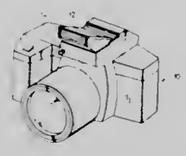
Filed Nov. 24, 1986, Ser. No. 934,055

Claims priority, application Japan, Nov. 22, 1985, 60-261238; Dec. 4, 1985, 60-271373; Dec. 25, 1985, 60-198374[U]; Jan. 31, 1986, 61-11595[U]; Feb. 5, 1986, 61-14482[U]

Int. Cl.⁴ G03B *15/03*

U.S. Cl. 354—149.11 **15 Claims**





1. A single-lens reflex camera comprising:

a single-lens camera body having a principal photographic axis;

a pentaprism included in said camera body over said principal photographic axis for operator viewing along said principal photographic axis;

a moveable light emitter built into said camera body, disposed at least partially above said pentaprism and being moveable from an operating position protruded from said camera body to a non-operating position housed in said camera body; and

a lifting mechanism disposed at least partially above said pentaprism for lifting said light emitter to said operating position protruded from said camera body from said non-operating position housed in said camera body, wherein said lifting mechanism includes levers rotatably supported near an upper front face of said pentaprism, said light emitter being rotatably supported at one end of each of said levers, guide grooves located over said pentaprism and extending in a front-to-rear direction of said camera, said light emitter being provided with sliding pins fitted in said grooves, biasing means for biasing at least one of said levers in such a direction as to protrude from said light emitter, and engaging means engaging a portion of said biased lever and releasing same when said light emitter is in the protruded position.

4,893,141

OPEN FRAME SIGHT VIEWFINDER

David C. Smart, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

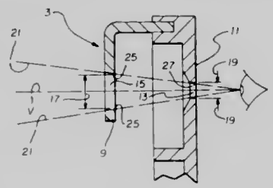
Filed Jan. 30, 1989, Ser. No. 303,613

Int. Cl.⁴ G03B *13/04*

U.S. Cl. 354—219 **2 Claims**

1. An improved open frame sight viewfinder for a photographic camera, wherein an aiming sight having a circular-shaped aiming aperture for aiming the camera at a subject to be photographed is positioned forward of a similarly shaped viewing aperture to view the subject simultaneously through the two apertures, and wherein the improvement comprises:

said aiming aperture being dimensioned sufficiently greater than said viewing aperture to approximately encircle the extreme rays of ambient light permitted to pass through the viewing aperture, to prevent said aiming sight substantially from being seen in the viewing aperture when the



camera is correctly aimed at a subject to be photographed, but causing the aiming sight to partially occlude the viewing aperture when the camera is incorrectly tilted relative to the subject.

4,893,142

DEVICE FOR ACTIVATING MOTOR-DRIVEN SHUTTER BLADES

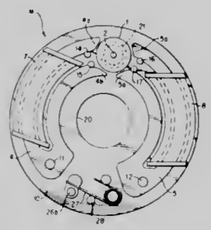
Hiroaki Ishida; Nobuo Shinozaki, and Yasuhiro Nishitani, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,800

Claims priority, application Japan, Nov. 16, 1987, 62-174884[U]; Dec. 26, 1987, 62-198636[U]; Dec. 26, 1987, 62-198637; Dec. 26, 1987, 62-198639[U]; Dec. 26, 1987, 62-198642[U]

Int. Cl.⁴ G03B *9/08*

U.S. Cl. 354—234.1 **34 Claims**



1. A device for activating shutter blades relative to a shutter opening and utilizing a control signal from an electronic circuit comprising:

an electric motor rotatable clockwise and counterclockwise according to a control signal from said electronic circuit;

a gear means driven by said motor, said gear means being located on one side of said shutter opening;

fixed axis means located on an opposite side of said shutter opening opposite to said one side; and

shutter operable means comprising shutter blades pivotable about said fixed axis means, said shutter operable means having gear teeth meshing with said gear means such that said gear means is operable to pivot said shutter blades clockwise and counterclockwise about said axis means to open and close said shutter opening.

4,893,143

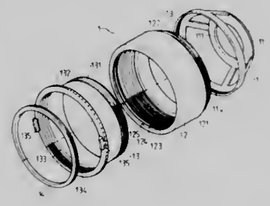
LENS BASE AND ITS ACCESSORIES FOR ANY COMPACT AUTOMATIC CAMERA

Wey Sheng-Huei, No. 26 Chiu-Lung Street, Kang-Shan Towu, Kaohsiung Hsien, Taiwan

Filed Sep. 16, 1988, Ser. No. 245,160

Int. Cl.⁴ G03B *17/00*

U.S. Cl. 354—286 **10 Claims**



1. A mounting arrangement for an automatic camera having a main lens, comprising:

(a) connector means mounted on the camera, and including a connecting member having a central connector hole aligned along a longitudinal axis with the main lens of the camera and a pair of mutually parallel, elongated guide channels at opposite lateral sides of the central connector hole;

(b) a guiding ring including an end wall having a central guide hole aligned along the longitudinal axis with the connector hole, and a pair of guide projections insertable into, and slidable lengthwise along, the guide channels, said guide projections frictionally contacting the guide channels and being frictionally retained in a selected position along the guide channels, said guiding ring having a threaded open end opposite said end wall;

(c) an outer cylindrical ring having a threaded end section for threadedly engaging the threaded open end of the guiding ring, an opposite rim end section, a threaded idling section between the end sections, and a threaded intermediate section adjacent the idling section;

(d) an inner cylindrical ring having a threaded end portion for threadedly engaging the threaded intermediate section of the outer ring, an opposite threaded portion, and a handle portion for turning the inner ring about the longitudinal axis, said inner ring also having projecting arms for holding a photographic element in front of the main lens of the camera; and

(e) a positioning ring threadedly engaging the opposite threaded portion of the inner ring, and retaining the photographic element in position on the inner ring.

4,893,144

CONTINUOUS WEB FORM INSTANT PHOTOGRAPHIC MATERIALS AND METHOD FOR PROCESSING THE SAME

Duncan C. Sorli, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 21, 1989, Ser. No. 313,162

Int. Cl.⁴ G03D *5/02*

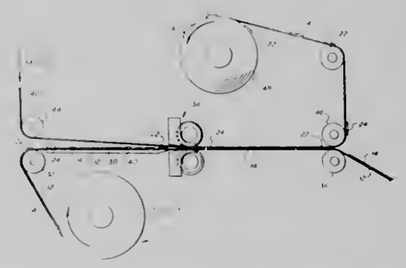
U.S. Cl. 354—304 **11 Claims**

1. The method for processing successive image receiving frames of rapid access instant photographic material on a continuous carrier web, said frames each having leading trailing and side edges and being spaced longitudinally on said carrier web, the width of each frame relative to the width of said carrier web providing marginal areas between opposite side edges of said frames and opposite side edges of said carrier web, said method comprising the steps of:

supplying a measured quantity of processing liquid to said leading edge of each of said frames;

releasably securing a residual processing liquid trap to said carrier web near the trailing edge of each of said frames;

passing said carrier web through a processing gap with an image-bearing web overlying said frames and said traps to spread the processing liquid over the area of each of said frames and onto the top surface of said trap;



transferring said traps to said image bearing web after passage thereof through said processing gap; and

delivering said processed frames on said carrier web to a user.

4,893,145

FOCUSING OPERATION CHANGEOVER APPARATUS FOR A CAMERA

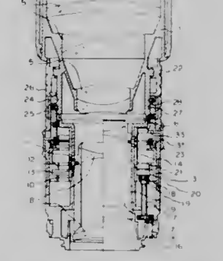
Atsushi Matsuda, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,700

Claims priority, application Japan, Feb. 5, 1987, 62-25673

Int. Cl.⁴ G03B *3/10, 7/02*

U.S. Cl. 354—400 **19 Claims**



1. A focusing operation changeover apparatus adapted for use in a camera, said camera being capable of use in both an automatic focus condition and a manual focus condition, said changeover apparatus comprising:

(a) a group of photographic lenses which are freely moveable in opposite directions along the optical axis of said camera;

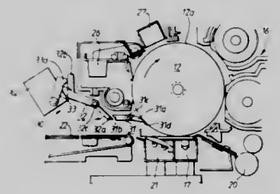
(b) automatic focusing means for moving said photographic lenses along said optical axis in accordance with a focusing signal in order to achieve automatic focusing;

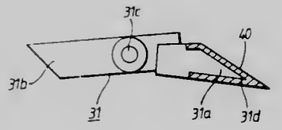
(c) a manual focus control ring for moving said group of photographic lenses along said optical axis, said manual control ring being rotatable about said optical axis and being prevented from moving along said optical axis;

(d) a rotatable changeover ring for selectively disconnecting the manual focus control ring from said group of photo-

graphic lenses, wherein said changeover ring and said manual focus control ring comprise separate rings;
(e) means for preventing said manual focus control ring and said changeover ring from rotating when said camera is in said automatic focus condition; and
(f) means for moving said changeover ring between an automatic focus position and a manual focus position irrespective of the position of the photographic lenses.

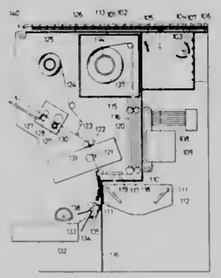
4,893,146
PAPER SEPARATING CLAW FOR IMAGE FORMING APPARATUS
Natsuki Tachibana, Yokohama; Kenshi Toshimitsu, Kawasaki, and Issey Ichihara, Funabashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 110,876, Oct. 21, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,158
Claims priority, application Japan, Oct. 31, 1986, 61-259714; Oct. 31, 1986, 61-259724
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—315 **11 Claims**





1. An image forming apparatus including a movable image carrier, means for forming an image on the image carrier, and means for transferring the image from the image carrier onto an image bearing sheet while the image bearing sheet is in contact with the surface of the image carrier, the apparatus comprising:
means for separating the image bearing sheet from the image carrier, including a separating claw, the separating claw formed of an elastic synthetic resin composition containing a polyurethane resin; and
means for moving the separating claw between a first position in which the tip of the separating claw is in contact with the surface of the image carrier and a second position in which the separating claw is separated from contact with the surface of the image carrier; wherein the synthetic resin tip of the claw contacts both the surface of the image carrier and the image bearing sheet to be separated therefrom.

4,893,147
COLOR PICTURE IMAGE RECORDING APPARATUS
Kazunori Tanabe; Makoto Suzuki; Kazumasa Makino; Eiji Shibata; Kazuhito Ishida; Takashi Nakata, all of Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Mizuho, and Yoichi Horaguchi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Feb. 18, 1988, Ser. No. 156,744
Claims priority, application Japan, Feb. 28, 1987, 62-46524; Sep. 25, 1987, 62-241075; Dec. 15, 1987, 62-317848
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **22 Claims**



1. An image recording apparatus for recording on a recording medium an image of an original, said recording medium comprising a first medium having a first surface carrying a first material and a second surface, and a second medium having a first surface carrying a second material and a second surface, said first medium being in the form of an elongated, web-like continuous sheet and said second medium being in the form of a cut sheet, said apparatus comprising:
means for exposing said first medium to an image bearing light to form a latent image thereon corresponding to said image of said original;
means for developing said latent image according to a reaction of said first material with said second material to form a visible image on said first surface of said second medium;
means for introducing said first and second mediums into said developing means, said first surface of said first medium and said first surface of said second medium being held in facial contact with each other when introduced thereinto;
means for separating said second medium from said first medium after being subjected to development by said developing means; and
means for conveying said second medium with said first surface of said second medium face-up.

4,893,148
METHOD FOR STORING DRY SILVER SALT ROLL FILM FOR ROTARY TYPE MICROPHOTOGRAPHY AND ROTARY TYPE MICROPHOTOGRAPHY CAMERA SYSTEM
Masahiko Sanada, Matsudo; Yoshio Hayashi, Fuji; Akira Ohnuma, Fuji, and Shuichiro Ogawa, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan
PCT No. PCT/JP87/00066, § 371 Date May 3, 1988, § 102(e) Date May 3, 1988, PCT Pub. No. WO88/01758, PCT Pub. Date Mar. 10, 1988
PCT Filed Jan. 31, 1987, Ser. No. 199,041
Claims priority, application Japan, Sep. 4, 1986, 61-206739
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **47 Claims**

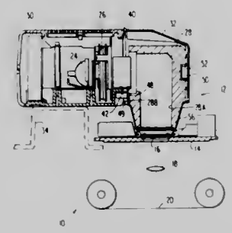
1. A rotary type microphotography camera system, comprising:

(a) a storage means for storing an unexposed roll film;
(b) an unwinding means for unwinding said unexposed roll film from said storage means;
(c) a light source for emitting light for illuminating an original to be exposed;
(d) an optical means for illuminating said original by the light emitted from said light source under a condition that the travel of said original is synchronized with the unwinding of said unexposed film and for imaging the output light from said original on the surface of said unexposed roll film at a reduced size;



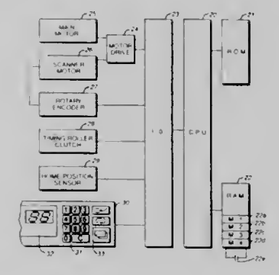
(e) a heating means for heating said roll film thus exposed by said optical means to thermally develop said roll film;
(f) a monitor means for measuring, immediately after the thermal development, the optical density of said roll film thermally developed by said heating means to monitor the storage conditions of said unexposed film substantially simultaneously with the exposure and the thermal development; and
(g) a discharging means for discharging said thermally developed roll film.

4,893,149
PHOTOGRAPHIC PRINTING APPARATUS
Hiroyuki Satou, and Junichi Tsuji, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 19, 1989, Ser. No. 299,096
Claims priority, application Japan, Jan. 20, 1988, 63-10382
Int. Cl.[4] G03B *27/54, 27/72*
U.S. Cl. 355—67 **18 Claims**



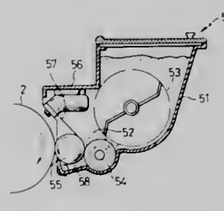
1. A photographic printing apparatus arranged to diffuse light emitted from a light source and irradiate a negative film with said light diffused, for printing an image from said negative film, comprising:
means for accommodating said light source;
means for diffusing light emitted from said light source, said diffusing means being swingable with respect to said accommodating means; and
mounting means for mounting detachably said diffusing means in said mounting means and for being swingable between an exposure-light guiding position and an out-of-optical-path position, said mounting means being swingably attached to said accommodating means.

4,893,150
COPIER
Yoshikado Yamada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 18, 1988, Ser. No. 273,808
Claims priority, application Japan, Nov. 20, 1987, 62-294378
Int. Cl.[4] G03B *27/00*
U.S. Cl. 355—243 **3 Claims**



1. A copier comprising
an optical scanner,
paper supplying means for supplying a copy paper sheet to have an image transferred thereonto,
input means for inputting displacement values measured during an adjustment mode of operation of said copier at two magnification values between the position of a target image with respect to a scanned original document and the position of a copied image of said target image with respect to a copy paper sheet,
calculating and storing means for calculating timing values for determining the timing for supplying a copy paper sheet with respect to the action of said optical scanner on the basis of measured values inputted by said input means and storing said calculated timing values, and
driving means for driving said paper supplying means according to a timing based on said timing values stored in said calculating and storing means.

4,893,151
IMAGE DEVELOPING APPARATUS
Mutsuki Yamazaki, Yokohama; Kaoru Oshima, Tokyo, and Toshimasa Takano, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 25, 1988, Ser. No. 276,416
Claims priority, application Japan, Nov. 26, 1987, 62-296022; Nov. 30, 1987, 62-302011; Nov. 30, 1987, 62-302015; Nov. 30, 1987, 62-302016
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—245 **20 Claims**



1. An image developing apparatus, comprising:
image bearer means for bearing a latent image;
toner conveyer means for conveying non-magnetic single component toner to the image bearer means in order to

develop the latent image, the toner conveyer means having its surface coated with a ceramic; and

lamination controller means for controlling a thickness of non-magnetic single component toner lamina to be formed on the toner conveyer means.

4,893,152

COPYING APPARATUS HAVING A SORTER WITH A SHEET BINDING FUNCTION

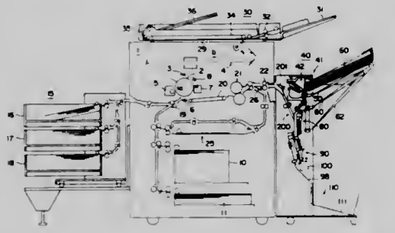
Kuniaki Ishiguro, and Takuma Ishikawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kasha, Osaka, Japan

Filed Sep. 13, 1988, Ser. No. 243,797

Claims priority, application Japan, Sep. 16, 1987, 62-231500; Sep. 16, 1987, 62-231501

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—323 **3 Claims**



1. A copying apparatus comprising:

image forming means for copying an original image onto a predetermined number of sheets;

sorting means for distributing the sheets ejected from said image forming means to a plurality of bins;

binding means for binding the sheets taken-out from each of the bins;

a first path for transporting sheets having an original image formed thereon by said image forming means from the image forming means to said sorting means;

a second path for transporting the sheets having an original image formed thereon by said image forming means from the image forming means to said binding means;

diverting means for diverting the sheets to either said first path or said second path;

inputting means for inputting the number of copy sets to be prepared from one original;

designation means for designating a sorting mode;

a first control means for controlling said diverting means to conduct sheets to said first path in accordance with the designation of the sorting mode; and

second control means for controlling said diverting means to conduct sheets to said second path regardless of said first control means when the input number of copy sets is 1.

4,893,153

COLLATION OF MULTI-PAGE DOCUMENTS

Milton S. Sales, and John R. Thompson, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,850

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—325 **8 Claims**

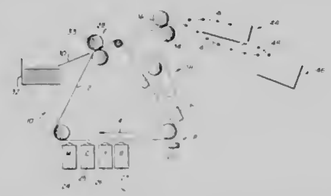
1. In an electrostatographic machine adapted to reproduce multi-original documents containing interleaved types of originals requiring skip frame cycles between types, the improvement comprising:

means for reproducing all originals of one type;

means for storing the reproductions of the originals of said one type;

means for reproducing all the originals of the other type; and

means, operative during the reproduction of the originals of said other type, for delivering the reproductions of said one type original seriatim from said storage means into the reproduction document in collated fashion at the position



corresponding to the position of the associated original in the multi-original document.

4,893,154

ELECTROLUMINESCENT DEVICE

Yutaka Hirai, Tokyo; Masafumi Sano, Kawasaki; Hisanori Tsuda, Atsugi, and Katsuji Takasu, Asaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 170,634, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 842,240, Mar. 21, 1986, abandoned. This application Feb. 8, 1989, Ser. No. 309,023

Claims priority, application Japan, Mar. 28, 1985, 60-62088

Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—4 **5 Claims**



1. An electroluminescent device, which emits light by recombination of the carriers injected or excited by light or energy of electrical field said electroluminescent device comprising:

an active layer at least a part of which is a non-monocrystalline semiconductor layer of a super-lattice structure having an effective band gap; and

electrodes for applying variable voltage to said non-monocrystalline semiconductor layer of said super-lattice to change the effective band gap of the semiconductor layer.

4,893,155

HETEROJUNCTION FIELD EFFECT TRANSISTOR DEVICE AND PROCESS OF FABRICATION THEREOF

Keiichi Ohata, Tokyo, Japan, assignor to General Electric Company, Schenectady, N.Y.

Filed May 16, 1988, Ser. No. 194,370

Claims priority, application Japan, May 14, 1987, 62-11590

Int. Cl.[4] H01L *29/80, 29/225*

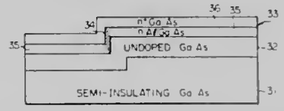
U.S. Cl. 357—22 **5 Claims**

1. A heterojunction field effect transistor fabricated on a semi-insulating substrate, comprising:

(a) a first layer overlying said semi-insulating substrate and formed of a first high-purity compound semiconductor material, said first layer having a lower portion, an upper portion and a first shoulder portion interconnecting the lower and upper portions;

(b) a second layer topographically overlying said first layer so that a step configuration of said first shoulder portion is

transferred to said second layer to form lower and upper portions formed of a second compound semiconductor material and a second shoulder portion interconnecting the lower and upper portions and formed of a fourth compound semiconductor material, said second compound semiconductor material being smaller in electron affinity than said first high-purity compound semiconductor material, said fourth compound semiconductor material being smaller in electron affinity than said first high-purity compound semiconductor material but larger in electron affinity than said second compound semiconductor material, an active channel layer taking place in said upper portion of said first layer along a heterojunction formed between said first layer and said second layer;



(c) a source contact region formed on the lower portion of said second layer so as to be in contact with said second shoulder portion, said source contact region being formed of a third compound semiconductor material;

(d) a drain region formed on the upper portion of said second layer so as to be electrically coupled to said active channel layer, said drain region being spaced from said source region; and

(e) a gate electrode formed on the upper portion of said second layer, said gate electrode being biased to control said active channel layer, wherein said fourth compound semiconductor material has a lower edge of a conduction band higher in energy level than that of said first high-purity compound semiconductor material but lower in energy level than that of said second compound semiconductor material.

4,893,156

MOS FET DEVICE

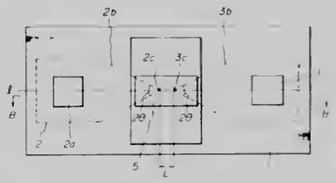
Shinji Karasawa, Matori, Japan, assignor to Miyage National College of Technology, Miyagi, Japan

Filed Mar. 7, 1988, Ser. No. 165,077

Claims priority, application Japan, May 28, 1987, 62-129872

Int. Cl.[4] H01L *29/78, 29/06*

U.S. Cl. 357—23.1 **11 Claims**



1. A MOS FET device comprising a semiconductor substrate of one conductivity type, a source layer of the other conductivity type formed in the substrate, a drain layer of the other conductivity type formed in the substrate with a gap from the source layer, a drain electrode applied on the drain layer, a channel region being defined in the substrate between said source layer and said drain layer, an insulating film overlying the channel zone, and a gate electrode applied on the insulating film so as to face the channel region via the insulating film, at least one of the source and drain layers having a tapered portion whose diminished edge extends into the channel zone so as to face the other one of the source and drain layers, wherein the diminished edge of said at least one of the source and drain layers is separated from the other one of the source and drain layers by such a gap L that a carrier moving speed in the channel zone is saturated when a sourcedrain voltage higher than a threshold value is applied across the source and drain electrodes.

4,893,157

SEMICONDUCTOR DEVICE

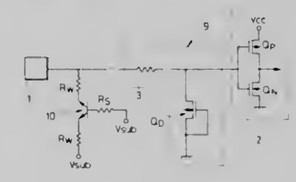
Kazuyuki Miyazawa, Kodaira; Yasunori Yamaguchi, Tachikawa, and Hiroshi Kawamoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

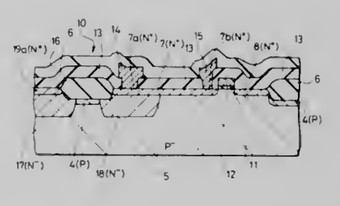
Continuation of Ser. No. 764,072, Aug. 9, 1985, abandoned. This application Dec. 23, 1987, Ser. No. 136,939

Claims priority, application Japan, Aug. 24, 1984, 59-174947

Int. Cl.[4] H01L *29/78, 27/02, 29/72*

U.S. Cl. 357—23.13 **33 Claims**





1. A semiconductor device comprising an internal circuit having a plurality of MISFETs and an input protective circuit which has a resistor and wherein destruction of at least one of said plurality of said MISFETs in said internal circuit is prevented, said semiconductor device comprising:

a semiconductor substrate having a first and a second portion, each having a first conductivity type, in order to form said input protection circuit and said internal circuit, respectively;

a first semiconductor region of a second conductivity type, formed inside said first portion, said first semiconductor region including said resistor, and wherein one end portion of said first semiconductor region is connected directly to an input terminal by an aluminum layer and another end portion of said first semiconductor region is connected to a gate electrode of one of said plurality of MISFETs of said internal circuit;

a second semiconductor region of a second conductivity type, formed inside said first portion, said second semiconductor region being deeper than said first semiconductor region and source and drain regions of said MISFETs in said internal circuit, and having a lower impurity concentration than the source and drain regions of said MISFETs in said internal circuit, said second semiconductor region being in contact with and disposed below said one end portion of said first semiconductor region; and

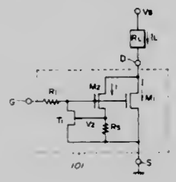
a third semiconductor region of the second conductivity type, formed inside said first portion, said third semiconductor region being disposed adjacent to said second

semiconductor region and separated from said second semiconductor region by a predetermined distance so that said second and third semiconductor regions at said first portion constitute a transistor for preventing the destruction of said at least one of said plurality of MISFETs.

4,893,158
MOSFET DEVICE

Teruyoshi Mihara, Yokosuka; Yukitsugu Hirota, Kamakura; Yukio Hiramoto, Tokyo, and Tsutomu Matsushita, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 20, 1988, Ser. No. 209,237
Claims priority, application Japan, Jun. 22, 1987, 62-153479; Sep. 8, 1987, 62-223018; Sep. 9, 1987, 62-224063; Sep. 9, 1987, 62-224064
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.13 **30 Claims**



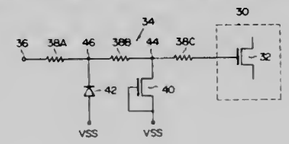
1. A MOSFET device comprising
a main MOSFET component having source, drain and gate electrodes,
a protective circuit having a monitor MOSFET component having a gate electrode, a source electrode and a drain electrode which is connected with said drain electrode of said main MOSFET component, a monitor resistor connected between said source electrodes of said main and monitor MOSFET components, a first branch connecting said gate electrodes of said main and monitor MOSFET components, and a protective transistor having a first electrode connected with said gate electrode of said main MOSFET component, a second electrode and a control electrode connected with a node between said monitor resistor and said source electrode of said monitor MOSFET component.

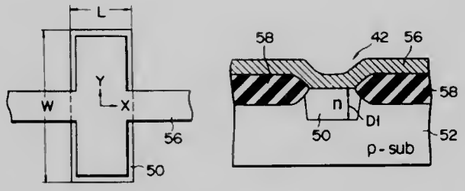
4,893,159
PROTECTED MOS TRANSISTOR CIRCUIT

Youichi Suzuki; Makoto Segawa, both of Yokohama; Shoji Arikuni, Tokyo; Takeo Kondo, Yokosuka, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 910,663, Sep. 23, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 219,805
Claims priority, application Japan, Sep. 25, 1985, 60-211419
Int. Cl.[4] H01L *29/78, 27/02, 29/04*
U.S. Cl. 357—23.13 **8 Claims**

1. A protected MOS transistor circuit comprising:
a semiconductor substrate with a top surface;
an input terminal supplied with an input voltage signal;
an input MOS transistor including an insulated gate and also including source and drain regions formed in the top surface of said semiconductor substrate;
an impurity-doped semiconductor layer insulatively formed over said top surface of said substrate and connected between said input terminal and said insulated gate of said input MOS transistor, said semiconductor layer acting as a transfer line for transferring said input voltage signal to the insulated gate of said input MOS transistor;
first diode means connected in a reverse-biased orientation between a power source terminal and a first portion of said semiconductor layer; and
second diode means also connected in the reverse-biased orientation between said power source terminal and a second portion of said semiconductor layer which is located closer to said input terminal than said first portion of said semiconductor layer, said second diode means having a diffusion region formed in the top surface of said semiconductor substrate and extending laterally in a transverse direction to said semiconductor layer such that said diffusion region is longer in a transversal direction of said semiconductor layer than in a longitudinal direction of said layer, said diffusion region, together with said semiconductor substrate, constituting a pn junction;
wherein said second portion of said semiconductor layer is elongated in the transversal direction of said semiconductor layer and contacts substantially the entire top surface of said diffusion region.

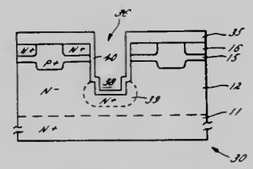




4,893,160
METHOD FOR INCREASING THE PERFORMANCE OF TRENCHED DEVICES AND THE RESULTING STRUCTURE

Richard A. Blanchard, Los Altos, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Filed Nov. 13, 1987, Ser. No. 120,395
Int. Cl.[4] H01L *29/78, 29/06*
U.S. Cl. 357—23.4 **8 Claims**

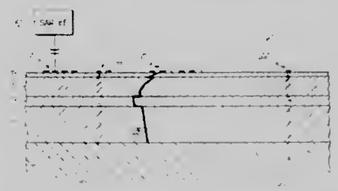


1. A semiconductor device comprising:
a first region of semiconductor material, doped to a first concentration with a dopant of a first conductivity type, and serving as a drain region;
a trench formed within said first region, said trench having sides and a bottom;
a second region of semiconductor material located within said first region and adjacent to said trench near said bottom of said trench, said second region being of said first conductivity type and having a higher dopant concentration than said first region;
a gate electrode within said trench; a layer of gate dielectric insulating said gate electrode from said first and second regions;
a source region formed on the surface of said first semiconductor region; and
a body region within said first region beneath said source region, said body region having a second conductivity type opposite said first conductivity type.

4,893,161
QUANTUM-WELL ACOUSTIC CHARGE TRANSPORT DEVICE

William J. Tanski; Sears W. Merritt, and Robert N. Sacks, all of Glastonbury, Conn., assignors to United Technologies, Hartford, Conn.

Filed Sep. 24, 1987, Ser. No. 100,795
Int. Cl.[4] H01L *29/78, 27/14, 29/205, 45/00*
U.S. Cl. 357—24 **3 Claims**

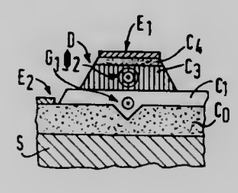


1. An integrated electronic acoustic charge transport device comprising:
a substrate defining a horizontal plane;
charge transport layer of piezoelectric semiconductive material, having a transport layer thickness and a transport layer conduction band potential, disposed above said semiconducting substrate and having a predetermined relationship thereto;
surface acoustic wave means disposed above an insulating support means and mechanically connected to said charge transport layer, for passing acoustic waves along a predetermined path in said charge transport layer;
electron confinement means for preventing the escape of electrons from said predetermined path;
electron supply means for supplying and maintaining a predetermined concentration of supply electrons in the conduction band of said charge transport layer, whereby at least some of said supply electrons are carried along said predetermined path in electron packets, having an average electron wavelength, by an electric potential traveling with said acoustic wave; and
control means for controlling the passage of selected electron packets along said path, characterized in that:
said charge transport layer has a first conduction band potential and is positioned vertically between lower and upper confinement semiconductor layers, each having a higher conduction band potential than said transport layer conduction band potential; and
said transport layer thickness is such that a potential well extends through said transport layer, whereby said electron packets are confined vertically in said charge transport layer by said potential well and said transport layer thickness is less than 50 nm.

4,893,162
INTEGRATED SEMICONDUCTOR ARRANGEMENT OF THE COUPLING TYPE BETWEEN A PHOTODETECTOR AND A LIGHT WAVEGUIDE

Jean-Louis Gentner, Saint-Maur, and Marko Erman, Paris, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 29, 1987, Ser. No. 81,212
Claims priority, application France, Jul. 9, 1986, 86 09984
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **11 Claims**

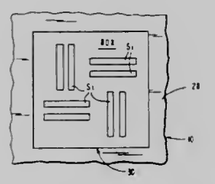


1. An integrated semiconductor device of the type for coupling between a photodetector D and a light waveguide G_1, operating within a band of given wavelengths, containing on the surface of a semiconductor substrate S of a III-V compound a confining layer C_0 of a III-V compound and a transparent layer C_1 of a III-V compound, transparent layer C_1 being transparent for the operating wavelengths and having an index superior to that of the confining layer, the light waveguide G_1 being disposed in layer C_1, and also containing an absorbing layer C_3 of a III-V compound, for the operating wavelengths, having an index superior to that of the waveguide, in which later C_3 the photodetector is formed, characterized in that the absorbing layer C_3 is deposited on top of the transparent layer C_1 such that the photodetector is formed on the surface of the light waveguide G_1 and coupled to said waveguide G_1 in parallel with the axis of G_1 over a given coupling length L_2 which is a function of the amount of light issued by the waveguide G_1 and received by the photodetector.

4,893,163
ALIGNMENT MARK SYSTEM FOR ELECTRON BEAM/OPTICAL MIXED LITHOGRAPHY

Paul J. Rudeck, Bronx, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1988, Ser. No. 173,832
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—40 **4 Claims**



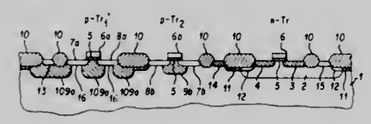
1. A semiconductor wafer comprising:
a series of semiconductor devices produced on said wafer, and a series of alignment marks etched into said wafer in alignment with and bordered by an isolation level oxide.

4,893,164

COMPLEMENTARY SEMICONDUCTOR DEVICE HAVING HIGH SWITCHING SPEED AND LATCHUP-FREE CAPABILITY

Takehide Shirato, Hiratsuka, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 178,788, Apr. 1, 1988, abandoned, which is a continuation of Ser. No. 786,939, Oct. 11, 1985, abandoned. This application May 5, 1989, Ser. No. 348,132
Claims priority, application Japan, Oct. 13, 1984, 59-214617
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 **5 Claims**



2. A complementary semiconductor device having a high speed operating capability and a high integration density, formed in a semiconductor substrate having a first conductivity type, on which an input/output circuit operatively connectable to an external circuit is formed in a peripheral area thereof, and an inner circuit operatively connected to said input/output circuit is formed in an inner area thereof, said complementary semiconductor device, comprising:

a field insulation layer formed over a surface of said semiconductor substrate for defining transistor regions in which MIS field effect transistors are formed and electrically separating said transistors from each other by surrounding each of said MIS field effect transistor regions;

a well region of a second conductivity type formed in said semiconductor substrate, said well region having a higher dopant concentration than that of said semiconductor substrate, and extending beneath said field insulation layer, wherein said first conductivity type is opposite to said second conductivity type;

a first impurity region of said first conductivity type formed in said semiconductor substrate, and extending beneath a part of said field insulation layer, said first impurity region having a higher dopant concentration than that of said substrate including a plurality of empty portions selectively formed in said first impurity region, wherein said first impurity region is absent from said plurality of empty portions;

a second impurity region of said first conductivity type formed in said substrate, said second impurity region having a higher dopant concentration than that of said semiconductor substrate;

a first conductivity type channel MIS field effect transistor formed in said well region of said second conductivity type and having a source region, a drain region, and a channel region, all of which are formed in said well region;

a second conductivity type channel MIS field effect translator of a first type formed in said semiconductor substrate, and having a source region, drain region and channel region which are formed in said first impurity region, wherein at least a portion of each of said drain region and said source region formed in at least one empty portion in said first impurity region to thereby have said portion of each of said drain region and said source region directly contact said semiconductor substrate for increasing switching speed of said second conductivity type channel MIS field effect transistor of a first type;

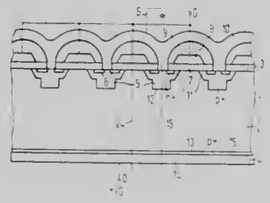
a second conductivity type channel MIS field effect transistor of a second type formed in said substrate and having a source region and drain region formed directly in said substrate and a channel region substantially located at said second impurity region to thereby increase switching speed of said second conductivity type channel MIS field effect transistor of a second type, wherein said second conductivity type channel MIS field effect transistor of said first type and said first conductivity type channel MIS field effect transistor are selectively disposed in said input-/output circuit, and said second conductivity type channel MIS field effect transistor of said second type and said first conductivity type channel MIS field effect transistor are disposed selectively in said inner circuit.

4,893,165

BIPOLAR TRANSISTOR CONTROLLABLE BY FIELD EFFECT

Gerhard Miller, Penzing; Helmut Strack, and Jenoe Tihanyi, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 313,045
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805799
Int. Cl.[4] H01L *29/78, 29/74*
U.S. Cl. 357—43 **11 Claims**



1. An improved field-effect controllable bipolar transistor having a field effect transistor structure with a source side and a drain side, the improvement, comprising:

a semiconductor body on which the field effect transistor structure is formed having an inner zone in which life time of minority charge carriers in at least 1 microsecond,

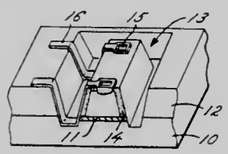
a zone at the drain side of said semiconductor body with higher doping than said inner zone and of an opposite conductivity type, said drain side zone being less than 1 micrometer thick and being doped with implanted ions of a dose between 1×10^{12} and 1×10^{15} cm^{-2}.

4,893,166

HIGH VALUE SEMICONDUCTOR RESISTOR

James Geekie, Santa Clara, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Division of Ser. No. 88,157, Aug. 21, 1987, Pat. No. 4,843,027. This application Feb. 21, 1989, Ser. No. 313,737
Int. Cl.[4] H01L *27/04*
U.S. Cl. 357—51 **10 Claims**



1. A semiconductor structure comprising:

a sublayer formed of semiconductor material of a first conductivity type;

a semiconductor layer of said first conductivity type formed on said sublayer;

a groove formed in said semiconductor layer substantially to said sublayer, thereby forming an island of said semiconductor layer;

a peripheral region of said island of said semiconductor layer, formed as the top and sides of said island, said peripheral region being doped to a second conductivity type opposite said first conductivity type; and

an isolation region formed in said sublayer beneath said island of semiconductor material, said isolation region being of said second conductivity type,

whereby a central portion of said island remains doped to said first conductivity type,

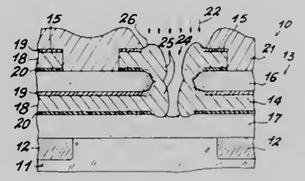
whereby said central portion of said island serves as a resistor and said peripheral portion of said island is junction isolated from said central portion.

4,893,167

METHOD FOR PROGRAMMABLE LASER CONNECTION OF TWO SUPERIMPOSED CONDUCTORS OF THE INTERCONNECT SYSTEM OF AN INTEGRATED CIRCUIT

Alain Boudou, Vert, and Marie F. Bonnal, Fortenay Le Fleury, both of France, assignors to Pull S.A., Paris, France

Continuation of Ser. No. 71,473, Jul. 9, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 319,911
Claims priority, application France, Jul. 11, 1986, 86-10205
Int. Cl.[4] H01L *27/02, 29/06, 23/48*
U.S. Cl. 357—51 **12 Claims**



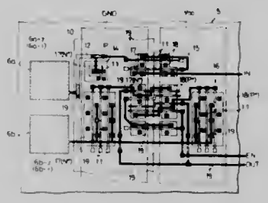
1. An integrated circuit device comprising an interconnect system including a first conductor of a multilayered structure comprising a strip of a metal having a predetermined melting point sandwiched between lower and upper films of a material having a substantially higher melting point than said predetermined melting point of said strip of metal, a dielectric layer disposed over said first conductor, a second conductor having a multilayered structure comprising a strip of a metal having a predetermined melting point sandwiched between lower and upper films of a material having a substantially higher melting point than said predetermined melting point of said strip of said metal, a passivation layer disposed over the second conductor, an opening formed by laser beam through the passivation layer, the second conductor, the dielectric layer and at least partially the first conductor, and a connection in said opening comprising a first and second bead and extending from and between the first and second conductors, wherein each of said first and second beads comprises said metal and said material having a substantially higher melting point than that of said metal.

4,893,168

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING BONDING PADS AND FABRICATING METHOD THEREOF

Yoshikazu Takahashi, Shiga; Tsuneo Itoh, Kokubunji, and Makoto Takechi, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcompnter Engineering, Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,680
Claims priority, application Japan, Jun. 22, 1981, 56-95357
Int. Cl.[4] H01L *27/02, 21/44*
U.S. Cl. 357—68 **24 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor substrate;

a plurality of I/$\overline{O}$ cells formed on said semiconductor substrate, each of said I/$\overline{O}$ cells including predetermined circuit elements capable of being interconnected to provide at least one of the circuit functions of an input circuit, an output circuit and an input/output circuit;

a plurality of bonding pads formed on said semiconductor substrate corresponding to respective I/$\overline{O}$ cells, with each I/$\overline{O}$ cell having at least two independent bonding pads in correspondence therewith, the number of bonding pads exceeding the number of I/$\overline{O}$ cells, said at least two bonding pads being adjacent to each other; and

a wiring pattern for providing each of said I/$\overline{O}$ cells with at least two selected circuits of said input, output and input-/output circuits, said wiring pattern including an interconnection for electrically connecting each of said I/$\overline{O}$ cells with at least two of said corresponding bonding pads to extract said two selected circuits from each I/$\overline{O}$ cell.

4,893,169

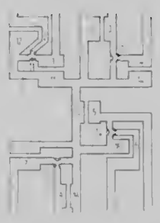
LEAD FRAME AND A PROCESS FOR THE PRODUCTION OF A LEAD WITH THIS LEAD FRAME

Helmut Rusch; Guenter Waitl; Hansjoerg Harrasser, all of Regensburg; Hans-Juergen Richter, Planegg, all of Fed. Rep. of Germany; Lee Francis, Melaka, Malaysia; Alois Seidl, Regensburg, Fed. Rep. of Germany; Hans Wissinger, Regensburg, Fed. Rep. of Germany, and Hans-Joachim Hampel, Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 895,626, Aug. 11, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 181,881
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534916
Int. Cl.[4] H01L *23/48, 33/00*
U.S. Cl. 357—70 **5 Claims**

1. A lead frame carrier for semiconductor chips for encapsulation into a package, the lead frame carrier comprising a patterned area for a plurality of semiconductor chips including a plurality of first electrical leads each one of the plurality of semiconductor chips having a first electrical lead extending outward from a region selected for encapsulation to provide a plurality of external leads, the patterned area including a common conductor having a plurality of semiconductor chip receiving areas within the region and extending outward from the region to provide at least one external connection, a plurality of connecting points located in the region, each connecting

point connected between at least one of said first electric leads and the common conductor for providing mechanical rigidity for the lead frame carrier through their connections and each



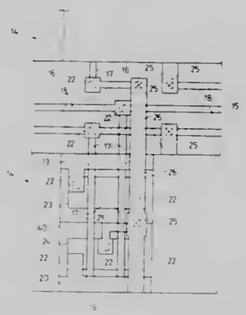
connecting point having a reduced cross sectional area coupling between the common conductor and each one of the selected electrical leads.

4,893,170

SEMICONDUCTOR DEVICE WITH MULTI-LEVEL WIRING IN A GATE ARRAY

Takeshi Tokuda, Osaka; Jirou Korematsu, Itami, and Osamu Tomisawa, Nishinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,064
Claims priority, applicatioo Japan, Jun. 24, 1983, 58-114602
Int. Cl.[4] H01L *27/10, 29/52*
U.S. Cl. 357—71 **17 Claims**



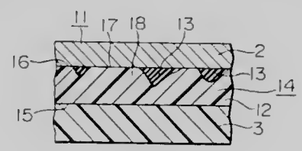
1. A semiconductor device of a multiple-layer wiring structure comprising:
a plurality of logic gate cells;
a wiring channel-containing wiring connections between said logic gate cells;
vertical wirings each of which is contained in a vertical wiring layer;
horizontal wirings each of which is contained in a horizontal wiring layer;
either of said vertical or horizontal wiring layers being provided in plurality;
wirings of one of said wiring layers that is provided in plurality being used as wirings for input terminals of logic gates of said logic gate cell and being connected to other wirings in said wiring channel;
another wiring layer of one of said wiring layers that is provided in plurality being used as wirings for output terminals of logic gates of said logic gate cell connected to other wires in said wiring channel where said wirings are disposed along a wiring grid in said wiring channel;
said wiring grid being established for each of said wiring layers that is provided in plurality so that the lines of different ones of said grids are alternately arranged.

4,893,171

SEMICONDUCTOR DEVICE WITH RESIN BONDING TO SUPPORT STRUCTURE

Masahiko Denda, Itami, Japan, assignor to Director General, Agenty of Industrial Science and Technology, Japan

Division of Ser. No. 175,182, Mar. 30, 1988, Pat. No. 4,871,405.
This application Nov. 29, 1988, Ser. No. 277,639
Int. Cl.[4] H01L *23/28*
U.S. Cl. 357—72 **4 Claims**



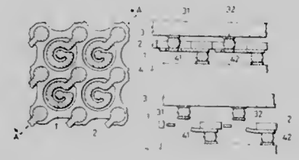
1. A semiconductor device comprising:
a semiconductor element;
a support structure for supporting said semiconductor element; and
a bonding layer, disposed between said semiconductor element and said support structure, bonding said semiconductor element to said support structure, said bonding layer having first and second bonding surfaces to which said semiconductor element and said support structure are respectively bonded,
said bonding layer comprising a first resin layer composed of a first bonding agent having a first hardness and a first viscosity, said first resin layer having an irregular free surface including projections and cavities therein and forming part of one of said bonding surfaces; and
a second resin layer having a hardness less than the first hardness and a viscosity less than the first viscosity disposed on said first resin layer in the cavities filling said cavities and forming with said projections one of said bonding surfaces.

4,893,172

CONNECTING STRUCTURE FOR ELECTRONIC PART AND METHOD OF MANUFACTURING THE SAME

Kunio Matsumoto; Muneo Oshima, both of Yokohama, and Suguru Sakaguchi, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,200
Claims priority, application Japan, Jan. 19, 1987, 62-8004
Int. Cl.[4] H01L *23/36, 23/48, 21/603*
U.S. Cl. 357—79 **20 Claims**



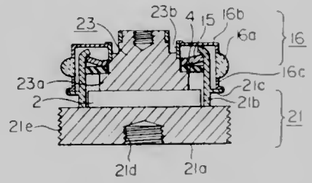
1. A connecting structure for an electronic part comprising:
said electronic part having at least an electrode;
a substrate to be electrically connected to said electrode of said electronic part; and
a lead member having a planar shape of a curved line, and a width greater than a thickness of said lead member, and said lead member being connected between said electrode and said substrate such that said electronic part and said substrate are mutually deformable relative to one another in any of a horizontal and vertical direction.

4,893,173

LOW-INDUCTANCE SEMICONDUCTOR APPARATUS

Mituo Ohdate, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 55,542, May 29, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,441
Claims priority, application Japan, Jun. 4, 1986, 61-129665; Jun. 4, 1986, 61-129666
Int. Cl.[4] H01L *21/603, 25/14, 23/04*
U.S. Cl. 357—79 **5 Claims**



1. A semiconductor apparatus comprising:
an electrically-conducting base which has a flat upper surface and which serves as a first electrode;
a cylindrical casing secured to the upper surface of said base in an airtight manner and protruding from said base;
a semiconductor element which is disposed inside said casing on the upper surface of said base in electrical contact therewith;
a second electrode, the height of which is substantially equal to its diameter, disposed on said semiconductor element opposite said base inside said casing in electrical contact with said semiconductor element, said second electrode containing a threaded hole and having a flat upper surface from which said threaded hole into which an electrical lead can be screwed is accessible, said second electrode having a ledge proximate said base;
pressing means for pressing said second electrode against said semiconductor element, said pressing means including a disc spring of a non-magnetic material disposed around said second electrode, within and engaging the inside of said casing, and an electrical insulator disposed between and in contact with said disc spring and said ledge within said casing; and
a cap having a top surface and an opposed lower portion including a hole in the center of said top surface, the inner periphery of the hole in said cap being secured to said second electrode in an airtight manner and the lower portion of said cap being secured to said cylindrical casing in an airtight manner.

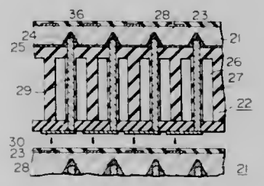
4,893,174

HIGH DENSITY INTEGRATION OF SEMICONDUCTOR CIRCUIT

Minoru Yamada, Iruma; Akira Masaki, Musashino; Kazuo Sato, and Yutaka Harada, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 883,529, Jul. 8, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 240,443
Claims priority, application Japan, Jul. 8, 1985, 60-148393; Jul. 10, 1985, 60-150100
Int. Cl.[4] H01L *25/04, 29/06, 23/16*
U.S. Cl. 357—82 **41 Claims**

1. An integrated circuit structure formed by stacking a plurality of semiconductor substrates, in a thickness direction, in such a manner that an insulating board is sandwiched between adjacent semiconductor substrates, wherein a semiconductor substrate and an insulating board have substantially the same size; wherein said insulating board includes a coolant path, in said insulating board, said coolant path including a groove in the insulating board for passing a coolant therethrough, the groove being provided by walls formed in the insulating board; and wherein both the semiconductor substrate and the insulating board include a plurality of electrical communication paths which respectively pierce said semiconductor substrate and the insulating board in the thickness direction, said electrical communication paths piercing the semiconductor substrate including a conductive member provided in an anisotropic etch pit which is formed in the semiconductor substrate, said



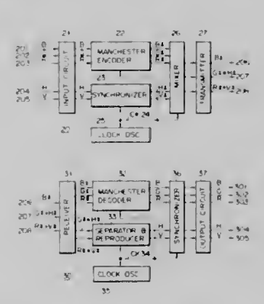
semiconductor substrate having first and second main surfaces, opposite to each other in said thickness direction, said conductive member provided in said anisotropic etch pit electrically connecting the first main surface of the semiconductor substrate, where a circuit element is formed, to the second main surface of the semiconductor substrate, said pit being made by a process including the step of boring a hole under a highly-doped layer which is part of said circuit element, from the second main surface of said semiconductor substrate to said highly-doped layer, by an anisotropic etching method, and the electrical communication paths piercing the insulating board including conductive portions extending on the walls, providing the groove, formed in the insulating board.

4,893,175

VIDEO SIGNAL TRANSMISSION SYSTEM WITH REDUCED NUMBER OF SIGNAL LINES

Akio Fukada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 3, 1987, Ser. No. 128,278
Claims priority, application Japan, Jan. 30, 1987, 62-18616
Int. Cl.[4] H04N *11/06*
U.S. Cl. 358—12 **62 Claims**



1. A signal transmission system for transmitting main signals and sub signals from a transmitter part to a receiver part through signal transmission lines, wherein said transmitter part comprises:
modulation means for modulating the main signals by a predetermined modulation method which allows separa-

tion of the main signals from the sub signals, and outputting modulated main signals;

mix means, coupled to said modulation means, for mixing the sub signals with the modulated main signals, and outputting three transmission signals each of said transmission signals having any one of three separate modulated main signals, two of said three transmission signals having a separate sub signal, which is a sync signal, mixed with the modulated main signal; and

transmission means, coupled to said mix means, for transmitting the transmission signals onto said signal transmission lines.

4,893,176

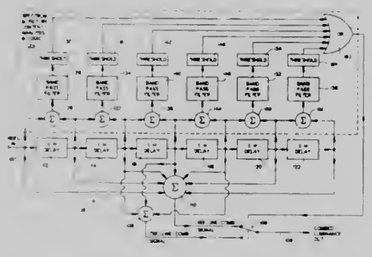
ADAPTIVE COMB FILTER FOR QUADRATURE MODULATED COLOR TELEVISION SYSTEMS

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Continuation of Ser. No. 87,614, Aug. 20, 1987, abandoned, which is a continuation of Ser. No. 785,880, Oct. 9, 1985, abandoned. This application May 11, 1988, Ser. No. 193,230

Int. Cl.[4] H04N *9/78, 11/14*

U.S. Cl. 358—31 **5 Claims**



1. A method for encode-decode processing of a quadrature modulated color television picture signal including a luminance component and a chrominance component which is amplitude modulated in phase quadrature upon a suppressed subcarrier, to reduce cross-color and cross-luminance artificacts in a resultant signal to be displayed, the method including in an encoding process the steps of:

comb filtering the quadrature modulated chrominance component in a comb filter structure including an adaptively selectable number of n delays, where n is equal to an integer lying in a range between 2 and 13 and the delay is a predetermined one of line scan period, frame scan period, and frame/line scan periods, the number n being adaptively selected in relation to chrominance/luminance spectral overlap in an incoming video signal in order to put out a comb filtered chroma component;

processing the luminance component by passing the luminance component through two complementary filters both symmetrically centered about a chrominance component subcarrier frequency, one filter comprising a band pass filter and the other filter comprising a band reject filter; comb filtering the luminance signal passing through the band pass filter in a comb filter structure including an adaptively selectable number of n delays, where n is equal to an integer and the delay is the same predetermined one of line scan period, frame scan period, and frame/line scan periods the number n being adaptively selected in relation to chrominance/luminance spectral overlap in an incoming video signal in order to produce a comb filtered high frequency luminance signal; and adding in phase the comb filtered high frequency luminance signal and the signal passing through the band reject filter in order to provide a comb filtered full bandwidth luminance signal; and,

combining in phase the comb filtered chroma component and the comb filtered full bandwidth luminance signal in order to provide a composite signal to a path;

the method including within a decoding process the steps of:

receiving the composite signal from the path;

comb filtering the composite signal received from the path in a comb filter structure including n delays, where n is equal to an integer and the delay period is the same predetermined one of said line scan period, frame scan period, and frame/line scan periods in order to separate a received chrominance component and a received luminance component; and,

decoding said comb filter separated chrominance component and said comb filter separated luminance component to recover said resultant signal to be displayed.

4,893,177

APPARATUS AND A METHOD FOR GENERATING MANUSCRIPTS TO REPRODUCE A COLOR PRINT

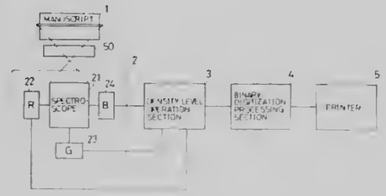
Kaoru Tada, and Masaaki Oyabu, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1986, Ser. No. 937,510

Claims priority, application Japan, Dec. 5, 1985, 60-273772

Int. Cl.[4] H04N *1/387*

U.S. Cl. 358—75 **27 Claims**



1. An apparatus for effecting an optical scanning of a full color manuscript, for separating an optical image thereof into three primary color images, for reading each image, and for outputting data for each image thus read to a thermal printer so as to generate a print associated with each primary color obtained by the color separation, comprising:

means for effecting an optical scanning of the full color manuscript;

means including a spectroscope for effecting a color separation of an optical image obtained by optically scanning the full color manuscript;

a plurality of photoelectric transducer means for conducting a photoelectric conversion for each color of light to generate an electric signal corresponding to a density level at each pixel of the image associated with each separated color;

means for processing each electric signal to generate binary data for the image to be outputted to a thermal printer, said means adapted to process the electric signals according to an area gradation method that includes reducing the density level of each color at each pixel location by an amount corresponding to a density level common to each separated color and multiplying said electric signals by a factor of decimal fraction corresponding to the number of color images used so that a total of dots in a pixel associated with each color is at most a total of matrix elements in the pixel and the dots of each color are arranged in the pixel so as not to cause an overlap therebetween in the pixel; and

control means for controlling the output of the binary data for each color to the thermal printer.

4,893,178

SIMULATOR FOR AUTOMATIC PHOTOGRAPHIC PRINTING APPARATUS INCLUDING INVERSION CIRCUITRY AND SPECTRAL CHARACTERISTIC COMPENSATION

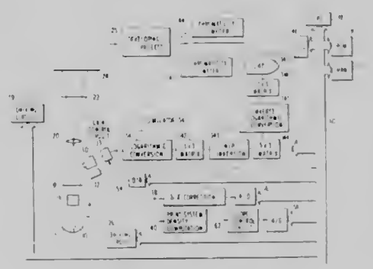
Toru Matama; Kenji Suzuki; Koji Takahashi, and Tsuneo Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 29, 1987, Ser. No. 78,956

Claims priority, application Japan, Jul. 29, 1986, 61-178293; Sep. 3, 1986, 61-207564; Sep. 26, 1986, 61-227377; Jun. 18, 1987, 62-152161

Int. Cl.[4] G03F *3/08*

U.S. Cl. 358—76 **18 Claims**



1. A simulator for use in an automatic photographic printing apparatus of the type in which a photographic paper is exposed to a negative image carried by a negative film by means of a light source system controlled by an automatic exposure control function of the automatic photographic printing apparatus, said simulator being adapted to display a positive image corresponding to said negative image in accordance with an output signal from an image pickup device which picks up said negative image when said negative film is illuminated by said light source system, said simulator comprising:

first conversion means receiving said output signal from said image pickup device;

inversion means coupled to an output from said first conversion means;

second conversion means coupled to an output from said inversion means; and

display means coupled to an output from said second conversion means;

said inversion means inverting said output from said first conversion means so as to produce a positive image corresponding to said negative image;

said display means displaying a compensated positive image in accordance with the output from said second conversion means; and

said first conversion means and said second conversion means together effecting compensation for any difference between an integrated density of said negative image relative to the spectral sensitivity of said image pickup device and an integrated density of said negative image relative to the spectral sensitivity of said photographic paper, and substantially equalizing first tristimulus values associated with spectral emission characteristics of a fluorescent substance on said display means with second tristimulus values associated with dye absorption characteristics of a print obtained from the photographic paper.

4,893,179

DIGITAL COLOR COPYING MACHINE

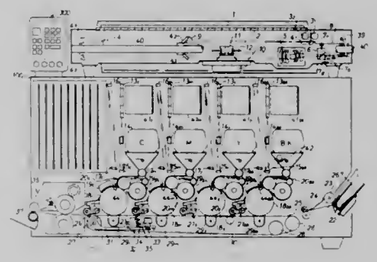
Takanori Ito, Kanagawa, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

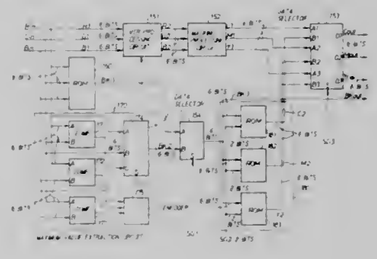
Filed Mar. 31, 1988, Ser. No. 176,298

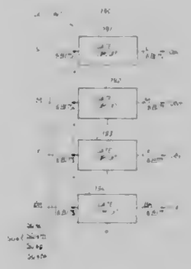
Claims priority, application Japan, Apr. 1, 1987, 62-80794

Int. Cl.[4] G03F *3/08;* **H04N** *1/46;* **G03G** *15/01*

U.S. Cl. 358—79 **3 Claims**







1. A digital color copying machine comprising:

a color-decomposing means for color-decomposing color image projected thereto into three fundamental colors and generating three digital color signals corresponding respectively to said three fundamental colors;

a color conversion means connected to said color-decomposing means for extracting a black component and one signal with the greatest density level from said three digital color signals and generating a plurality of fundamental color signals corresponding to said three digital color signals, a first signal corresponding to said black component and a second signal corresponding to said one signal;

an image recording means connected to said color conversion means for recording on a predetermined medium images in the color corresponding to at least one of said

fundamental color signals, said first signal and said second signal supplied thereto from said color conversion means respectively; and

a control means connected to said color conversion means for controlling signals delivered by said color conversion means such that said color conversion means delivers to said image recording means a plurality of said fundamental color signals and said first signal when said image recording means records said images in a plurality of colors corresponding to a plurality of said fundamental color signals and said first signal, delivers to said image recording means said second signal when said image recording means records said images in the color corresponding to said second signal, and delivers to said image recording means said first signal when said image recording means records said images in the color corresponding to said first signal.

4,893,180

COLOR IMAGE SIGNAL PROCESSING METHOD

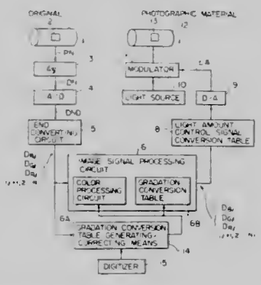
Takao Shigaki; Osamu Shimazaki, and Hitoshi Urabe, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 928,824, Nov. 10, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 334,758

Claims priority, application Japan, Nov. 9, 1985, 60-251573

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—80 **5 Claims**



1. A color image signal processing method for a color image input/output system which is adapted to read an original by an image input section, to correct in color and gradation thus obtained image signals, and to feed output density signals for each color to an image output device, which comprises the steps of;

calculating differences (ΔD_B, ΔD_G, ΔD_R) between desired finish densities and the output density signals (D_i') at specified points on said original which are obtained by converting input density signals at said specified points based upon reference gradation conversion curves;

preparing characteristic curves ($f(D_i')$) of said differences with respect to said output density signals utilizing a same function for the respective colors, said same function satisfying specified restraint conditions;

preparing corrected gradation conversion curves by adding said reference gradation conversion curves to said functions; and

determining said functions so that said corrected gradation conversion curves F_i are within a specified inclination range ($F_{imin} < F_i < F_{imax}$), wherein F_{imin} is a minimum inclination and F_{imax} is a maximum inclination;

thereby correcting a gradation conversion table as well as correcting a color correction table by limiting the values of color correction coefficients so as to remove color distortion of output images.

4,893,181

INTERACTIVE IMAGE MODIFICATION

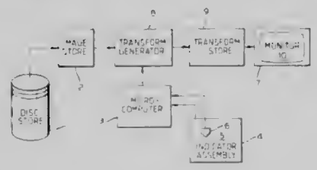
Andrew J. V. Yeomans, Hertfordshire, England, assignor to Crosfield Electronics Limited, London, England

Filed Oct. 3, 1988, Ser. No. 252,405

Claims priority, application United Kingdom, Oct. 2, 1987, 8723203

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—80 **6 Claims**



5. Apparatus for interactively modifying an image represented by digital data defining the colour component content of pixels of the image, the apparatus comprising an image store for storing the said digital data; a display; retouching means defining retouch curves for each colour component; and control means for applying said image in said image store to said retouching means and thereafter to said display to display the retouched image and for modifying said retouch curves, wherein said control means modifies said retouch curves so that a second selected image point is retouched to the colour of a first selected image point by modifying a colour component retouch curved for each colour component used to define the original image such that a pixel located at said second selected point will be retouched to have the colour content of a pixel at the first selected point.

4,893,182

VIDEO TRACKING AND DISPLAY SYSTEM

Michael G. Gautraud, Muskegon, Mich.; Thomas M. Buie, Richardson, and Mark F. Blessing, Dallas, both of Tex., assignors to Microoyx, Inc., Richardson, Tex. and Brunsick Bowling & Billiards Corporation, Muskegon, Mich.

Filed Mar. 18, 1988, Ser. No. 170,268

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—105 **26 Claims**



1. An image processing system for displaying a succession of selected separated images of a moving object moving in an otherwise substantially static scene, comprising:

an image sensor for generating video signals of the static scene and for generating video signals of the static scene including the object moving therethrough, said video signals being generated over a plurality of frames;

first memory means for storing video signals of at least one of said plurality of frames from the static scene;

second memory means for storing video signals of said plurality of frames from the static scene including the object moving therethrough;

means for comparing on a frame-by-frame basis said video signals stored in said first memory means with said video signals stored in said second memory means to thereby determine the presence of the object in each of said plurality of frames; and

means for displaying the location of the object in each of said plurality of frames.

4,893,183

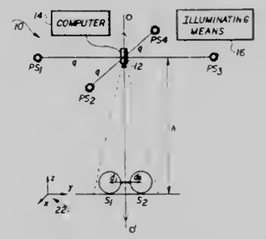
ROBOTIC VISION SYSTEM

Shree K. Nayar, Pittsburgh, Pa., assignor to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Aug. 11, 1988, Ser. No. 231,180

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—107 **7 Claims**



1. A robotic vision system for identifying the location of objects comprising:

means for recording images;

n elements where $n \geq 2$, and is an integer, each of said n elements disposed at a predetermined position such that each of the n elements is in view of the recording means and reflections of objects from each of the n elements is directly received by the recording means; and

means for determining the locations of objects from the image received by the recording means, said recording means connected to the determining means to provide the viewed image thereto.

4,893,184

ARRANGEMENT FOR DPCM-CODING WITH HIGH DATA RATE

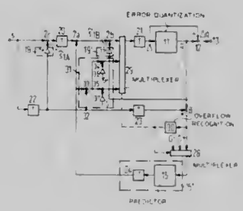
Hans-Juergen Mattausch, Brunnthal-Faistenhhar; Fred Matthiesen, and Matthias Schoebinger, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 346,084

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820234

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—135 **16 Claims**



1. An arrangement for DPCM coding with high data rate, whereby prediction values are subtracted from digitized picture element signals at an input (1) and difference signals thus obtained are utilized for signal transmission after a processing, the arrangement having a recursive signal path that has a first adder (8) for forming reconstructed picture element signals (s_R), a predictor (10) for the formation of estimated values, and a first means for subtraction (2a) for the formation of the difference signals, comprising, for processing the difference signals, the difference signals are supplied to a first input of a second adder (12) via a means for outputting a quantization error (11) pertaining to a difference signal of the difference signals; a second input of the second adder (12) receiving the difference signals, signals for signal transmission being taken at an output (13) of the second adder (12); an output of the means for outputting a quantization error (11) of a difference signal connected to a first input of the first adder (8), a second input of the first adder (8) receiving the digitized picture element signal; and an output of the first adder (8) connected to the first subtraction means (2a) via the predictor (10).

4,893,185

IMAGE SENSING APPARATUS

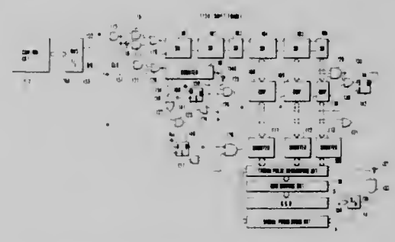
Nobuo Fukushima, and Makoto Kondo, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 100,594, Sep. 24, 1987, abandoned. This application May 13, 1989, Ser. No. 352,605

Claims priority, application Japan, Sep. 30, 1986, 61-232019

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.17 **10 Claims**



1. An image sensing apparatus comprising:

a memory arranged to store defect position data representing the corresponding positions to all defects existing in an image sensor;

a cyclic register arranged to temporarily store a plurality of defect position data stored by said memory;

a comparator arranged to compare one defect position data stored by said register with the scanning position of said image sensor; and

correcting means arranged to correct the output of said image sensor in accordance with the output of said comparator.

4,893,186

IMAGE PICKUP DEVICE WITH EXPOSURE CONTROL BASED ON PIXEL SAMPLES

Hendrik Mulder, Delft, Netherlands, assignor to B.V. Opische Industrie "De Oude Delft" , Delft, Netherlands

Filed Feb. 8, 1988, Ser. No. 153,249

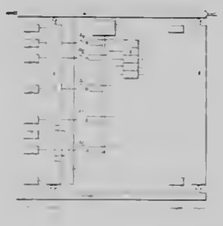
Claims priority, application Netherlands, Feb. 16, 1987, 8700372

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.19 **19 Claims**

1. Image pickup device comprising a matrix having horizontal rows and vertical columns of image pickup elements, means for supplying clock signals to said matrix of image pickup elements to shift image information in a column direction in time-delay-and-integration mode, and means for repeatedly reading said image information out of a column, which comprises means for determining amount of charge stored in prede-

termined image pickup elements in a column and means for removing said charge in only said predetermined image pickup



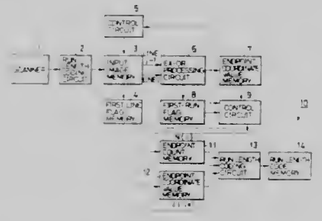
elements of said column when said detected amount exceeds a predetermined limit value.

4,893,187

IMAGE PROCESSING APPARATUS

Shuichi Tsujimoto, and Haruo Asada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 13, 1988, Ser. No. 205,774
Claims priority, application Japan, Sep. 30, 1987, 62-246138
Int. Cl.[4] H04N *1/419*
U.S. Cl. 358—261.1 **15 Claims**



9. An image processing method for carrying out a run length coding in a first direction on original image data to obtain input image data and carrying out an image process in a second direction on the obtained input image data, comprising the steps of:

(a) coding the original image data with run length codes in the first direction to obtain input image data;

(b) storing the input image data in memory means;

(c) sequentially reading, from the memory means, data of every two lines which are adjacent to each other in the second direction perpendicular to the first direction; and

(d) carrying out an exclusive OR operation on the read data of the every two lines, to detect second directional end-point positions of the original image data without decoding the input image data into the original image data.

4,893,188

DOCUMENT IMAGE ENTRY SYSTEM

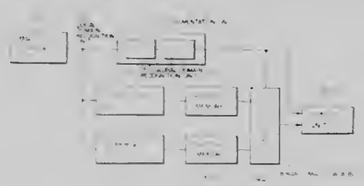
Tatsuya Murakami, Tachikawa; Hiromichi Fujisawa, Tokyo; Masaaki Fujinawa, Tokorozawa, and Toshihiro Hananoi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,116
Claims priority, application Japan, Jun. 19, 1987, 62-151108
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—456 **16 Claims**

1. An image input apparatus comprising:

an image scanning unit for effecting a scanning on a surface of a sheet of paper to convert an optical image on the sheet into halftone or multivalue digital image data;

a local recognition unit for effecting a scanning on an image attained by said image scanning unit by use of a window including M×N (M and N are integers) pixels such that a feature value is extracted depending on a state of a density distribution of pixels in the window and a recognition to determine whether each of said pixels belongs to a binary domain or a halftone domain is effected according to said feature value; and



a large scale recognition unit for subdividing the image in block each including P×Q (P and Q are integers and P>M, Q>N) pixels such that depending on a feature value represented by an output result from said local recognition unit with respect to each pixel of each block, whether said each block belongs to a binary domain or a halftone domain is recognized in a real-time processing;

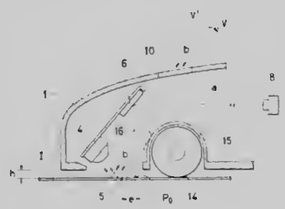
wherein recognition of whether each portion of said image belongs to a binary domain or halftone domain is effected only depending on partial data of said image.

4,893,189

PORTABLE IMAGE SCANNER

Mineo Kubota, Yamanashi, and Kenji Masuyama, Kofu, both of Japan, assignors to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed Jun. 30, 1988, Ser. No. 214,050
Claims priority, application Japan, Sep. 11, 1987, 62-139893[U]
Int. Cl.[4] H04N *1/024*
U.S. Cl. 358—471 **10 Claims**



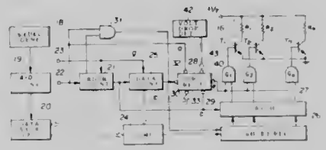
1. A portable image scanner comprising a light source for illuminating an reading portion to be read on an objective image plane, a reflecting member for refracting image light reflected in a substantially vertical direction from the reading portion, an image sensor which receives said image light sent through said reflecting member and is adapted to convert said image light to corresponding image data signals, a housing accommodating said light source, reflecting member and image sensor, and a sub-scanning drive member for allowing the scanner to move in a sub-scanning direction, said housing being provided at its lower surface with a reading aperture and at its upper surface with a peep hole displaced to the image sensor side with respect to a portion substantially right above said reading aperture so as to form a viewing path inclined against said image sensor side.

4,893,190

GRADATION CONTROL DEVICE FOR THERMAL INK-TRANSFER TYPE PRINTING APPARATUS

Itsuo Takanashi, Kamakura; Hideshi Tanaka; Terumi Ohara, both of Yokohama; Kenichi Miyazaki, Yokohama; Toshinori Takahashi, Kawasaki; Hiroki Kitamura, Tokyo; Tadao Shinya, and Yutaka Mizoguchi, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 15, 1987, Ser. No. 96,659
Claims priority, application Japan, Sep. 19, 1986, 61-221634
Int. Cl.[4] H04N *1/40, 1/21, 1/23*
U.S. Cl. 358—298 **7 Claims**



1. A gradation control device for a thermal ink-transfer type printing apparatus, said printing apparatus comprising a power source and a thermal printing head coupled to said power source through a transmission path and provided with n heating elements arranged in line, said n heating elements heating an ink film coated with a kind of ink which melts due to heat and transferring the melted ink onto a recording sheet which makes contact with the ink film to print images line by line, said gradation control device comprising:

memory means for storing at least n digital data of natural binary code which represent gradation levels with which a printing is to be carried out;

control data producing means including comparing means repeatedly supplied with the n digital data from said memory means in response to a clock pulse signal having a constant repetition frequency m times in a time period in which one line is printed and means for generating a reference printing density datum a value of which is changed every time the n digital data are supplied to said comparing means once, said comparing means being supplied with said reference printing density datum so as to compare the n digital data with said reference printing density datum, said control data producing means producing control data in a form of a serial n-bit data signal having a constant bit rate in accordance wth said constant repetition frequency every time the n digital data are supplied to said comparing means once, each control datum constituting the serial n-bit data signal having a logic value "1" or "0" depending on whether or not each value of the n digital data is greater than or equal to the value of said reference printing datum;

serial-to-parallel converting means for converting said n-bit data signal into a parallel n-bit data signal;

voltage drop detecting means for detecting a voltage drop caused in a supply voltage to said thermal printing head and for producing a voltage drop datum dependent on the detected voltage drop;

heating pulse generating means for generating m heating pulses for printing one line, said m heating pulses having pulse widths which are available as a function of the value of the reference printing density datum and said voltage drop datum; and

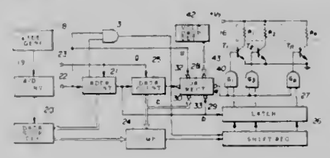
driving means supplied with said parallel n-bit data signal and said heating pulses for supplying to each of said n heating elements having a corresponding control datum with the logic value "1" a current having a predetermined magnitude for the widths of the heating pulses.

4,893,191

GRADATION CONTROL DEVICE FOR THERMAL INK-TRANSFER TYPE PRINTING APPARATUS

Hideshi Tanaka, and Kenichi Miyazaki, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Japan

Continuation-in-part of Ser. No. 96,659, Sep. 15, 1987. This application Mar. 28, 1988, Ser. No. 173,989
Claims priority, application Japan, Sep. 19, 1986, 61-22163; Mar. 31, 1987, 62-78979
Int. Cl.[4] H04N *1/40, 1/21, 1/23*
U.S. Cl. 358—298 **6 Claims**



1. A gradation control device for a thermal ink-transfer type printing apparatus, said printing apparatus comprising a power source and a thermal printing head coupled to said power source through a transmission path and provided with n heating elements arranged in line, said n heating elements heating an ink film coated with a kind of ink which melts due to heat and transferring the melted ink onto a recording sheet which makes contact with the ink film to print images line by line, said gradation control device comprising:

memory means for storing at least n digital data of natural binary code which represent gradation levels with which a printing is to be carried out;

control data producing means including comparing means repeatedly supplied with the n digital data from said memory means in response to a clock pulse signal having a constant repetition frequency m times in a time period in which one line is printed and means for generating a reference printing density datum a value of which is changed every time the n digital data are supplied to said comparing means once, said comparing means being supplied with said reference printing density datum so as to compare the n digital data with said reference printing density datum, said control data producing means producing control data in a form of a serial n-bit data signal having a constant bit rate in accordance with said constant repetition frequency every time the n digital data are supplied to said comparing means once, each control datum constituting the serial n-bit data signal having a logic value "1" or "0" depending on whether or not each value of the n digital data is greater than or equal to the value of said reference printing datum;

serial-to-parallel converting means for converting said n-bit data signal into a parallel n-bit data signal;

voltage drop detecting means for detecting a voltage drop caused in a supply voltage to said thermal printing head and for producing a voltage drop datum dependent on the detected voltage drop;

heating pulse generating means for generating m heating pulses for printing on line, said m heating pulses respectively having pulse widths which are variable as a function of the value of the reference printing density datum and said voltage drop datum; and

driving means supplied with said parallel n-bit data signal and said heating pulses for supplying to each of said n heating elements having a corresponding control datum with the logic value "1" a current having a predetermined amplitude for current applying durations corresponding to the widths of the heating pulses,

said voltage drop detecting means detecting the voltage drop in a vicinity of an end of each of said current applying durations.

4,893,192
VIDEO SIGNAL DROP-OUT CORRECTOR CIRCUIT RESPONSIVE TO LEVEL OF LUMINANCE COMPONENT OF THE SIGNAL

Shinichi Takemura, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

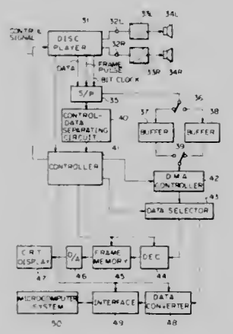
Filed Mar. 16, 1988, Ser. No. 169,254
Claims priority, application Japan, Mar. 17, 1987, 62-39443[U]
Int. Cl.[4] H04N 5/94
U.S. Cl. 358—336 3 Claims

1. A drop-out corrector circuit for video signals comprising: detecting means for detecting specific predetermined components of high-frequency signals including said video signals; comparator means for comparing the output level of said detector means with a reference level and producing a drop-out detection pulse in response to the results of the comparison; and means for varying said reference level according to the level of a luminance signal component of said video signals.

4,893,193
DISC RECORDING MEDIUM AND APPARATUS FOR PLAYBACK THEREOF

Shoichi Nakamura, and Tadao Suzuki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 163,132, Feb. 24, 1988, abandoned, which is a continuation of Ser. No. 763,132, Jul. 30, 1985, abandoned. This application Oct. 27, 1988, Ser. No. 266,207
Claims priority, application Japan, Nov. 30, 1983, 58-226598
Int. Cl.[4] H04N 5/92; G11B 20/12, 27/10
U.S. Cl. 358—341 12 Claims

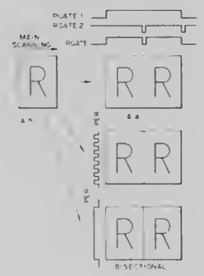


1. A disc having a first recording region for storing a first type of data signal, a second recording region succeeding said first recording region for storing a second type of data signal, a lead-in region preceding said first recording region for storing an identifying data signal for indicating the presence of said second recording region, and a lead-out region between said first recording region and said second recording region for storing an end data signal for indicating the end of said first recording region.

4,893,194
MULTI-COPY SYSTEM FOR A DIGITAL COPIER

Seiji Sakata, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,328
Claims priority, application Japan, May 9, 1987, 62-113073
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—443 4 Claims

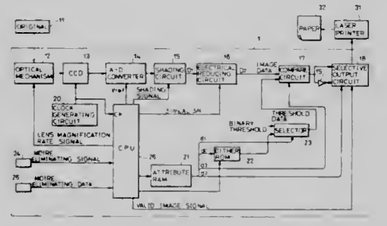


1. A multi-copy system for a digital copier, comprising:
store means for storing data which are provided by one main scanning;
data generating means for generating the data stored in said store means a plurality of times within a period of time of one scanning; and
discriminating means for discriminating a phantom line, a solid line and like borders between nearby data which are generated by said data generating means.

4,893,195
IMAGE PROCESSING APPARATUS CAPABLE OF ELIMINATING MOIRE PATTERN

Kaoru Tada, and Masamichi Kishi, both of Azuchi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 25, 1988, Ser. No. 236,554
Claims priority, application Japan, Aug. 27, 1987, 62-213694; Sep. 26, 1987, 62-241697
Int. Cl.[4] H04N 1/40, 1/46
U.S. Cl. 358—454 24 Claims



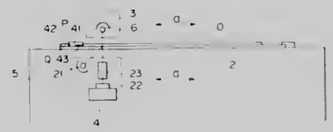
17. An image processing apparatus capable of eliminating a moire pattern, comprising:
an image sensor for converting an image of an original into electrical data;
optical projecting means for projecting the image of the original onto said image sensor and capable of changing a magnification rate of projection;
data reducing means for electrically reducing the electrical data converted by said image sensor at a reducing magnification rate corresponding to the magnification rate of projection of said optical projecting means;

area designating means for designating an area of a half tone image on the original;
moire pattern eliminating means for eliminating a moire pattern, generated when the image of the original is converted into electrical data by said image sensor, by controlling said optical projecting means such that it is operated at a prescribed magnification rate of projection;
data control means for invalidating the electrical data converted by said image sensor for areas other than the area designated by said area designating means;
magnification rate determining means for detecting the period of the generated moire pattern based on the electrical data not invalidated by said data control means and for determining said magnification rate of projection from said period of the moire pattern; and
moire pattern controlling means adapted to activate said moire pattern eliminating means using the magnification rate of projection determined by said magnification rate determining means to eliminate the moire pattern in said designated area.

4,893,196
IMAGE READING APPARATUS

Takashi Koshiyouji, and Tsuyoshi Ishida, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 7, 1988, Ser. No. 178,615
Claims priority, application Japan, Apr. 9, 1987, 62-87488; May 19, 1987, 62-119993; Jul. 22, 1987, 62-182726
Int. Cl.[4] H04N 1/04, 1/10
U.S. Cl. 358—474 24 Claims

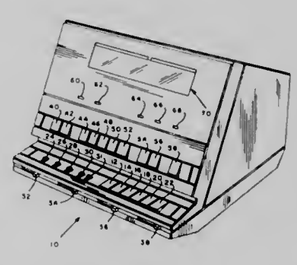


15. An image reading apparatus for reading image data from an original comprising:
a transparent original table for supporting the original;
a first light source, located on one side of said original table, for irradiating light to the original supported on said original table;
a second light source located on the opposite side of said original table, for irradiating light to the original supported on said original table;
photoelectric converting means for receiving the light irradiated by said first light source and passing through the original and the light irradiated by said second light source and reflected from the original, for converting the light into a plurality of electric signals, and for outputting the electric signals as image data;
first drive means for moving said first light source and said photoelectric converting means simultaneously along said original table;
second drive means for moving said second light source and said photoelectric converting means simultaneously along said original table;
original-specifying means for specifying whether the original is one of a light-passing type and a light-reflecting type; and
control means for turning on said first light source, for keeping the second light source turned off, and for causing said first drive means to move said first light source and said photoelectric converting means simultaneously along said original table when the original is of the light-passing type and for turning on said second light source, for keeping the first light-source turned off, and for causing said second drive means to move said second light source and said photoelectric converting means simultaneously along said original table when the original is of the light-reflecting type.

4,893,197
PAUSE COMPRESSION AND RECONSTITUTION FOR RECORDING/PLAYBACK APPARATUS

Joseph A. Howells, Brookfield, and Alan F. Sweet, Stratford, both of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Filed Dec. 29, 1988, Ser. No. 291,842
Int. Cl.[4] G11B 5/00, 5/02
U.S. Cl. 360—8 29 Claims



1. Sound recording apparatus comprising: an input including analog-to-digital converter (ADC) means for receiving analog audio signals, converting the received audio signals to digitized audio signals and producing digital samples of the received audio signals; pause detecting means coupled to said input for detecting respective pauses in the received audio signals; pause encoding means for encoding the length of each detected pause and for producing a digital pause encoded signal representing said length; replacement means for replacing respective pauses in the digitized audio signals with the digital pause encoded signal therefor; digital recording means for recording the pause-replaced digitized audio signals; and temporary store means having addressable locations for storing said digital samples, and address generating means for generating addresses to identify the respective locations in which said digital samples are stored, whereby audio signals are recorded without original pauses and are compressed.

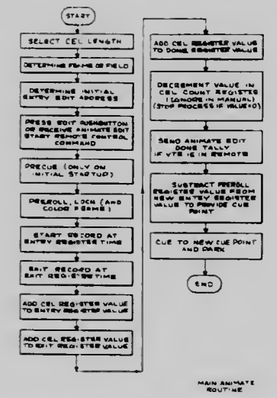
4,893,198
METHOD AND APPARATUS FOR PERFORMING HIGH SPEED VIDEO ANIMATION

Graeme M. Little, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 26, 1985, Ser. No. 727,455
Int. Cl.[4] G11B 27/02
U.S. Cl. 360—14.1 18 Claims

1. System for recording an animated program as a succession of cels formed of a plurality of still images, comprising:
means for supplying the plurality of still images;
means for selecting the cel size in terms of the number of times a single still image is repeated for each cel;
means for selecting a first edit entry point for a first selected cel;
means for continuously recording the entire first selected cell in response to the supplying means;
means for calculating the edit entry point of a succeeding cel by selectively adding the cel size to the first edit entry point;
means responsive to the calculating means for immediately recueing the recording means upon recording the first selected cel; and

wherein the recording means continuously records the succeeding cel at its respective edit entry point in response to



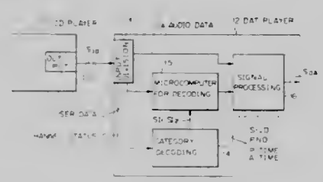
the supplying means providing a corresponding still image.

4,893,199

DIGITAL SIGNAL RECORDING APPARATUS WITH A DIGITAL SUBDATA CONVERTING CAPABILITY

Kentaro Okada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,505
Claims priority, application Japan, Sep. 16, 1987, 62-231785
Int. Cl.[4] G11B *5/09, 5/00*
U.S. Cl. 360—48 **3 Claims**



1. An apparatus for recording a transmitted digital signal formatted according to a predetermined digital interface format which includes main data, digital subcodes, such as a device category code, user data and channel status, wherein the recording apparatus is capable of recording digital main data and digital subcode data, including a category code specifying the recording apparatus' device type, according to a predetermined format, the recording apparatus comprising:

means supplied with the transmitted digital signal for detecting from the digital subcodes a category code indicating the type of device which transmitted the digital signal;

means supplied with the transmitted digital signal for converting the transmitted digital subcode data into corresponding subcode data formatted according to the format of the recording apparatus when the detected category code is different from its own category code;

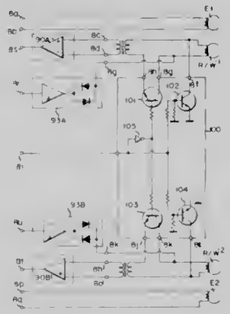
whereby the recording apparatus is enabled to record the received main digital data and the converted subcode data onto a recording medium.

4,893,200

COMPOSITE MAGNETIC HEAD

Yutaka Yunoki, Kunitachi; Manabu Inoue, Kokubunji, and Hiroyuki Wantanabe, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 270,386, Nov. 11, 1988. This application Apr. 25, 1989, Ser. No. 343,062
Claims priority, application Japan, Oct. 5, 1984, 59-209526; Oct. 24, 1984, 59-223617; Oct. 24, 1984, 59-223618; Oct. 24, 1984, 59-223619; Oct. 2, 1985, 60-219540
Int. Cl.[4] G11B *5/02*
U.S. Cl. 360—67 **3 Claims**



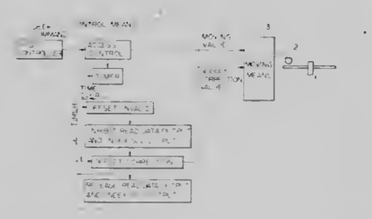
1. A composite magnetic head comprising a head chip mounted on a base, a read/write switch circuit for switching said head chip to a read or write system, a write amplifier for amplifying a write current and supplying the amplified current to said head ship when said head chip is connected to said write system by said read/write switch circuit, a step-up transformer, mounted on said base, for stepping up the level of a signal picked up by said head chip when said head chip is connected to said read system by said read/write switch circuit, and a differential input read amplifier for amplifying the signal stepped up by said step-up transformer, wherein said read/write switch circuit, said write amplifier, and said differential input amplifier are formed into a hybrid IC and mounted on said base.

4,893,201

TRACK ACCESS CONTROL SYSTEM FOR MAGNETIC DISK APPARATUS

Teruaki Emori; Hiroyuki Mase, both of Kawasaki, and Ikuo Kitamura, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 6, 1988, Ser. No. 202,673
Claims priority, application Japan, Jun. 6, 1987, 62-140752
Int. Cl.[4] G11B *5/02, 5/596, 21/08*
U.S. Cl. 360—77.04 **10 Claims**



10. A method of accessing disk tracks including information, said method comprising:

generating an offset correction value based on the information, said offset having a valid state and an invalid state;

measuring a predetermined time after which said offset correction value state is made invalid;

providing index and data signals responsive to the information during the predetermined time;

receiving a seek command;

determining if a seek command was received during the predetermined time;

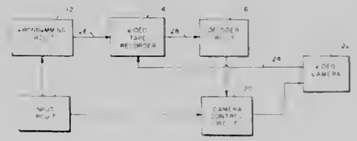
inhibiting said index and data signals, initiating said generation of an offset correction value and restarting the measurement of the predetermined time if a seek command has not been received during the predetermined time.

4,893,202

VIDEO TAPE RECORDER CONTROL SYSTEM

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Filed Mar. 16, 1988, Ser. No. 169,052
Int. Cl.[4] G11B *31/00*
U.S. Cl. 360—79 **18 Claims**



1. An automatic control system for a video camera, comprising:

an input circuit for generating control signals for operating at least one video camera;

a converter for converting said control signals to data signals suitable for recording on an audio track of a storage medium;

a recording and reproducing apparatus for recording and reproducing said data signals on said storage medium;

a decoder for decoding said reproduced data signals such that said recording/reproducing apparatus uses said data signals to directly control said at least one video camera;

wherein said recording and reproducing apparatus comprises a video tape recorder comprised of:

a recording and reproducing apparatus for recording said data signals and

for reproducing said data signals from said audio track while simultaneously recording a video signal from said at least one video camera on a video track of said video tape recorder.

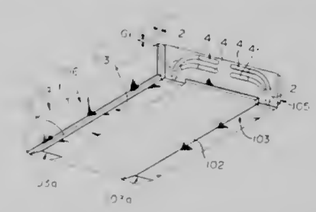
4,893,203

MAGNETIC HEAD

Joichiro Ezaki; Yoshiaki Itoh; Shunichi Katase, and Mikio Matsuzaki, all of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,426
Claims priority, application Japan, Aug. 14, 1987, 62-202892
Int. Cl.[4] G11B *5/60*
U.S. Cl. 360—103 **3 Claims**

1. A magnetic head which comprises a slider having a flying plane on its one surface opposed to a magnetic recording medium, a reading/writing element attached to the end surface at the air discharge side of said slider and a protective layer formed on said end surface so as to cover said reading/writing element, wherein an edge of said protective layer is inside an edge of said end surface at at least the upper surface which is opposite said flying plane, so that there is formed a space



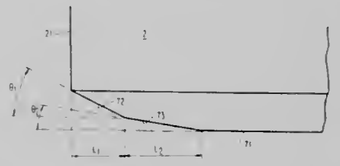
between the edge of said end surface and the edge of said protective layer.

4,893,204

AIR BEARING HEAD SLIDER HAVING FIRST AND SECOND LEADING EDGE TAPERED PORTIONS

Tadaharu Yamada; Makoto Watanabe, and Yoshihiro Terada, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,061
Claims priority, application Japan, Mar. 6, 1987, 62-52342
Int. Cl.[4] G11B *5/60*
U.S. Cl. 360—103 **13 Claims**



1. An air bearing head slider comprising: outside rails, each of said outside rails including a flat portion forming an air bearing surface which is to be opposed to a surface of a magnetic disk moving relative to said head slider; a first leading edge tapered portion formed on each of said outside rails at an air inflow edge on the upstream side of the relative movement of the magnetic disk to said head slider, said first leading edge tapered portion being inclined with respect to said flat portion by a first angle; and a second leading edge tapered portion formed on each of said outside rails between said flat portion and said first leading edge tapered portion, said second leading edge tapered portion being inclined with respect to said flat portion by a second angle which is smaller than said first angle; said first leading edge tapered portion of said outside rails being disposed in a first common plane and said second leading ledge tapered portions of said outside rails being disposed in a second common plane, the summed longitudinal length of said first and second leading edge tapered portions being between five and forty percent of the total longitudinal length of said head slider.

4,893,205

FLEXURE MOUNT FOR DISC DRIVES

Robert F. Hoppe, Santa Cruz; Terence H. West, Aptos, and Chun-Jer C. Cheng, Saratoga, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

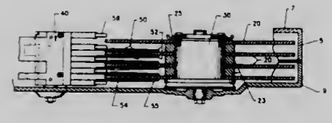
Filed Jul. 18, 1988, Ser. No. 220,553
Int. Cl.[4] G11B *21/16*
U.S. Cl. 360—104 **6 Claims**

1. A flexure mounting arrangement for a disc drive system having a head positioner assembly for positioning a plurality of

transducer heads relative to a recording media located within a disc housing, the head positioner assembly having a plurality of platforms each arranged to carry at lest one flexure, each said flexure supporting one of said transducer heads, the flexure mounting arrangement comprising a plurality of flexure mounts having a longitudinal axis, each flexure mount including:

a base having a proximal protruding portion sized to mate with a recess in the mount's associated platform, the base being substantially perpendicular to said longitudinal axis;

a pair of attachment arms extending laterally from opposite sides of the base distally of said proximal protruding portion of the base, each attachment arm having a longitudinally extending screwhole that extends substantially parallel to the longitudinal axis of the mount, and a contact surface for engaging the mount's associated platform apart from said recess;



a flexure support pad extending distally from the base, the flexure support pad being thinner than the base and including flat support surfaces adapted to engage a selected one of said flexures;

means for coupling said selected flexure to said support pad; and

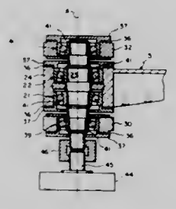
attachment means for coupling said flexure mount to said head positioner assembly through said screwholes.

4,893,206

PIVOTING RADIAL ACCESS MECHANISM WITH SPINNING SUPPORT SHAFT

Boris A. Shtipelman, Rochester, and David L. White, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,425
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—106 **3 Claims**



1. Apparatus for controlling the radial position of a transducer relative to a spinning disk, said apparatus comprising a radial access arm for supporting such transducer; and means for mounting said arm for pivotal movement in a plane parallel to the disk plane, such movement serving to move the transducer along an arcuate path over the disk surface, said mounting means comprising:

(a) bearing means mounted on said arm at a location spaced from the transducer;

(b) a support shaft journalled for rotation in said bearing means;

(c) means for rotatably supporting said support shaft;

(d) drive means for continuously rotatably driving said support shaft in said shaft-supporting means to minimize rotational static friction between said shaft and said bearing means; and

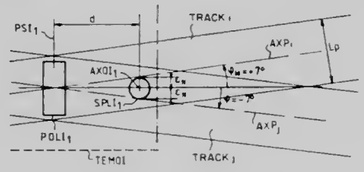
(e) means for controlling the pivotal position of said radial access arm about said continuously rotating support shaft independently of the rotation of said support shaft.

4,893,207

MAGNETIC WRITING AND OPTICAL READING HEAD FOR A DATA CARRIER

Christian Maury, Voiron le BX; Dan-Tam Pham, Bagneux, and Jean-Marie Richard, Houilles, all of France, assignors to Bull S.A., Paris, France

Filed Dec. 29, 1987, Ser. No. 138,863
Claims priority, application France, Dec. 30, 1986, 86 18321
Int. Cl.[4] G11B *5/127, 5/60*
U.S. Cl. 360—114 **12 Claims**



1. A magnetic writing and optical reading element adapted to fly above a magnetic data carrier, including at least two rails (PI_1, PI_2) and a groove disposed between them, and comprising at least

one optical device (SOI_1, SOI_2) disposed on one of the rails (PI_1, PI_2) for focusing a beam of light ($SPLI_1$) on the carrier adapted to be used for reading data written upon said carrier;

one magnetic writing transducer (TMI_1, TMI_2) disposed on the said one rail (PI_1, PI_2), the optical device and the magnetic transducer (TMI_1) having the same longitudinal axis, and

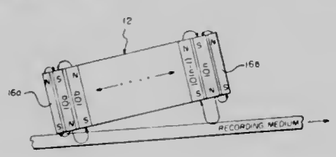
the optical device and the transducer are disposed in the immediate vicinity of one another, such that a distance d between an optical axis of the optical focusing device and a plane of symmetry (PSI_1) of a writing pole ($POLI_1$), perpendicular to the longitudinal axis, is less than a ratio of the difference between the width L_p of the tracks of said magnetic data carrier to be written upon by the transducer and the diameter D of the spot of light produced by the focusing optical element (SOI_1, SOI_2), said diameter D to be taken at a surface of said magnetic data carrier, to twice the sine of the maximum azimuth angle ψM.

4,893,208

MAGNETIC ERASE HEAD WITH TERMINATOR MAGNETS ON THE ENDS

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,950
Int. Cl.[4] G11B *5/325*
U.S. Cl. 360—118 **5 Claims**



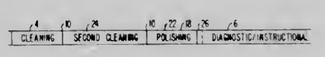
1. In a magnetic erase head of the type having an array of an odd number of alternatingly polarized permanent erasing magnets of substantially equal thickness so disposed in the array thereof that their respective exiting fields are aimed generally at a recording medium that is to be erased, the improvement wherein the first and last magnets of the array are provided with terminator means for suppressing some of the respective fields which exit said first and last permanent magnets, said terminator means also being permanent magnets sandwiching therebetween said array of erasing magnets, said terminator means permanent magnets being about half as thick as the thickness of said permanent erasing magnets, said half-thickness permanent magnets being similarly polarized with respect to each other, and each being polarized oppositely with respect to its adjacent erasing magnet.

4,893,209

MULTIFUNCTIONAL MAGNETIC HEAD CLEANING MEDIA

Mohammed Siddiq, San Jose, Calif., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Apr. 18, 1988, Ser. No. 182,825
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 **9 Claims**



1. A multifunctional cleaning medium comprising:

a magnetic head cleaning segment;

a diagnostic/instructional segment containing diagnostic/instructional information for the user; and

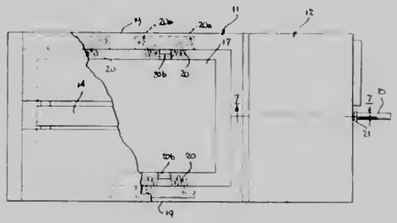
means for masking the transition between the cleaning segment and the diagnostic/instructional segment, the masking means including a gap portion of the diagnostic/instructional segment, the gap portion having electronic noise recorded thereon.

4,893,210

COMPUTER DISK DRIVE ASSEMBLY HAVING A RESILIENTLY SUPPORTED SEPARABLE DISK PACK UNIT

Richard P. Mintzlaff, Granada Hills, Calif., assignor to Danford Corporation, San Pedro, Calif.

Filed Jul. 11, 1988, Ser. No. 217,618
Int. Cl.[4] G11B *17/00, 33/08*; G06F *1/00*; F16M *1/00*
U.S. Cl. 360—137 **2 Claims**



1. A computer disk drive assembly comprising:

a disk pack unit,

a power supply-wiring harness unit for providing power and wiring interconnections for said disk pack unit,

said disk pack unit including a housing having opposing walls, a disk drive, mounting means comprising wire coil springs attached to the walls of said housing and the disk drive for resiliently suspending said disk drive from the walls of said housing, said mounting means being adapted to provide vibration and shock isolation for said disk drive, connector means having contact pins for providing electrical connections to said disk pack unit, and an elongated channel formed in the bottom of said housing,

said power supply-wiring harness unit including an elongated plate member extending from the bottom thereof, said plate member fitting into the channel in the bottom of the disk pack unit housing in mating engagement therewith, connector means having contact pins for providing electrical connection from said power supply-wiring harness unit to said disk pack unit, and fastener means for mechanically interconnecting said power supply-wiring harness and said disk pack units in latching engagement with each other.

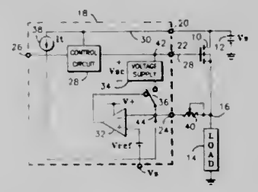
said fastener means operating on sequence first to mechanically join the units together with the connector means of said units joined together, then to bring the pins of the contact pins of said units into electrical contact with each other and finally to effect the connection of power from said power supply-wiring harness to unit to said disk pack unit.

4,893,211

METHOD AND CIRCUIT FOR PROVIDING ADJUSTABLE CONTROL OF SHORT CIRCUIT CURRENT THROUGH A SEMICONDUCTOR DEVICE

Byron G. Bynum, and Robert B. Jarrett, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1985, Ser. No. 718,416
Int. Cl.[4] H02H *9/02*
U.S. Cl. 361—18 **4 Claims**



1. A method used in limiting the power dissipation in a transistor having a pair of electrodes defining a current path between a power source and a load, and a control electrode, comprising the steps of:

sensing the potential drop accurring between the pair of electrodes of the transistor; and

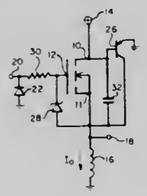
clamping the voltage potential between the control electrode and one of said pair of electrodes of the transistor to a predetermined value in response to said potential drop between said pair of electrodes exceeding a predetermined value to limit the current flow through the transistor to a reduced value wherein the step of clamping the voltage potential includes comparing the voltage level appearing at said one of said pair of electrodes of the transistor to a reference voltage level and establishing both a predetermined voltage potential and an adjustable voltage potential between said control electrode and said one of said pair of electrodes of the transistor whenever said voltage level appearing at said one of said pair of electrodes decreases below said reference voltage level.

4,893,212

PROTECTION OF POWER INTEGRATED CIRCUITS AGAINST LOAD VOLTAGE SURGES

Stephen L. Wong, Scarsdale, and Satyendranath Mukherjee, Yorktown Hts., both of N.Y., assignors to North American Philips Corp., New York, N.Y.

Filed Dec. 20, 1988, Ser. No. 288,062
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—91 **7 Claims**



1. A circuit arrangement comprising

a semiconductor switch having first and second switch terminals and a control terminal,

means for directly connecting said first switch terminal to one terminal of a power supply source whose other terminal is connected to a point of reference potential such as ground,

means for connecting said second switch terminal to one terminal of a two-terminal load device, the other terminal of said load device being connected to said point of reference potential,

active means connected in parallel with said load device for providing an alternate current path for said load device only in response to the occurrence of a voltage surge across said load device, including a bipolar transistor having base, emitter and collector terminals, said emitter terminal being connected to said point of reference potential, said collector terminal being connected to said one terminal of said load device, and said base terminal being connected to said first switch terminal which is connected to said power supply source.

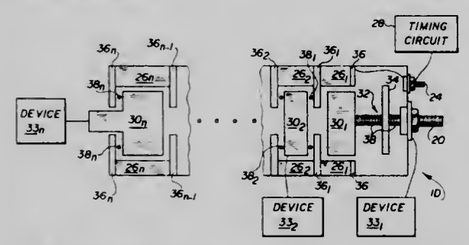
and means connected to said control terminal and to said second switch terminal for limiting the voltage that can appear between said control terminal and said second switch terminal when a load voltage surge occurs.

4,893,213

MULTI-STAGE SOLENOID WITH TIME DELAYED ACTUATION

John K. Apostolides, Pittsburgh, Pa., assignor to R.P.M. Industries, Washington, Pa.

Filed Jun. 17, 1988, Ser. No. 208,387
Int. Cl.[4] H01H 47/00
U.S. Cl. 361—191 **5 Claims**



1. A solenoid comprising:

the element closest to the second set of electrical contacts moves the flange of the plunger from its original position into contact with the second positive contact and second negative contact such that electricity flows therebetween via the flange; and

first biasing means in contact with the plunger such that when electricity stops being received by the coil winding closest to the second set of electrical contacts, the element closest to the second set of electrical contacts and the flange of the plunger in contact therewith are moved back to their original positions.

a housing having a first set of electrical contacts, and at least a second set of electrical contacts, said first set of electrical contacts having a first positive contact and a first negative contact extending from and penetrating into the housing, said second set of electrical contacts having a second positive contact and a second negative contact extending from and penetrating into the housing;

n coil windings disposed in the housing, where n is an integer and $n \geqq 2$, said n coil windings being electrically distinct from each other;

a timing circuit electrically connected through the first set of electrical contacts and separately to each of the n coil windings for individually controlling when each of the n coil windings receives electricity;

n magnetically responsive elements disposed in the housing at original positions and associated with the n coil windings such that each of the n coil windings is positioned with respect to its associated element so when electricity is received by the ith coil winding, the element the coil winding is positioned with respect to is caused to move, where i is an integer and $1 \leqq i \leqq n$;

a plunger having a flange made of electrically conducting material disposed in the housing and in contact with the element closest to the second set of electrical contacts such that when electricity is received by the coil winding associated with the element closest the second set of electrical contacts through the first set of electrical contacts from the timing circuit,

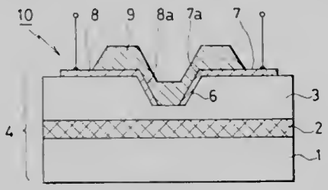
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4,893,214

CAPACITANCE TYPE SENSITIVE ELEMENT AND A MANUFACTURING METHOD THEREOF

Satoru Nishiwaki, Tokyo; Yukinobo Takahashi; Kouji Murakami, both of Yokohama, and Norisuke Fukuda, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1988, Ser. No. 242,201
Claims priority, application Japan, Sep. 29, 1987, 62-242586
Int. Cl.[4] H01G 7/00, 5/20
U.S. Cl. 361—286 **9 Claims**



1. A capacitance type sensitive element comprising:

a pair of electrodes formed on an insulating substrate and having opposite electrode faces perpendicular or slantingly formed with respect to a face of the insulating substrate; and

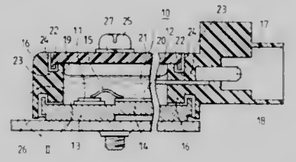
sensitive material disposed between the opposite electrode faces of the pair of electrodes and on both of the electrodes and having electrical characteristics changed on the basis of the physical or chemical interaction between the sensing means and a substance to be detected.

4,893,215

ELECTRONIC CIRCUIT APPARATUS OF AUTOMOBILE

Noriyoshi Urushiwara, Katsuta; Noboru Kobayashi, Mito, and Ryoichi Kobayashi, Naka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,507
Claims priority, application Japan, Sep. 30, 1987, 62-243819
Int. Cl.[4] H05K 7/14
U.S. Cl. 361—395 **7 Claims**



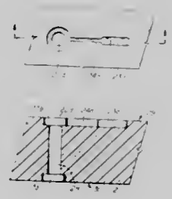
1. An electronic circuit apparatus of an automobile comprising a metal base which mounts electronic circuits; a mold resin case which is connected to a peripheral portion of the metal base, and forms a space together with the metal base enclosing the electronic circuits therein, said case including a molded connector which is used for inputting and outputting an electric signal from the electronic circuits; said molded resin case having a groove along all of the peripheral portion of a bottom surface thereof, said metal base forming a projection along all the peripheral portion of an edge thereof, and having a step portion next to the projection, and a bond material in the form of a silicon paste being filled in said groove of said bottom of said molded resin case and engaging said projection of said metal base, the bonding material covering a surface of said step portion of said metal base.

4,893,216

CIRCUIT BOARD AND METHOD OF SOLDERING

George R. Hagner, Cary, N.C., assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 9, 1988, Ser. No. 230,147
Int. Cl.[4] H05K 13/04, 3/34
U.S. Cl. 361—406 **9 Claims**



1. A pin grid array adapter (PGAA) comprising:

an electrically insulating substrate having first and second approximately parallel surfaces, at least said first surface provided with a plurality of grooves;

said grooves terminating at a first end in a pad area comprised of a widened groove, and terminating at a second end in a hole passing between said first and second surfaces;

electrically conductive pins in at least some of said holes, said pins protruding from said second surface;

an integrated circuit soldered to said first surface, with solder approximately filling said grooves, and solder sealing said holes having said pins.

9. A method of wave soldering a surface mounted component to a circuit board which has conductive grooves on a first surface and holes passing from said grooves to a second surface, said method comprising the steps of:

(a) positioning said surface mounted component on said first surface such that terminals of said component mate with respective grooves on said board;

(b) passing said circuit board through a wave of solder such that said wave of solder contacts said second surface of said circuit board and such that some solder from said wave engages at least some of said holes, moves through said holes and along at least some of said grooves to said terminals of said component; and

(c) removing said circuit board from said solder and allowing it to cool.

4,893,217

ALUMINUM ELECTROLYTE CAPACITOR

Wilhelm Schweikert, Heidenheim-Mergelst, and Wilhelm Lauer, Giengen-Huerben, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,367
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743629
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—506 **7 Claims**

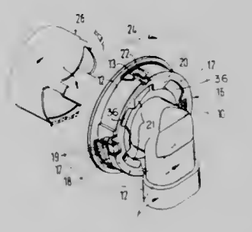
1. An aluminum electrolyte capacitor comprising two layers of aluminum foils would with one another, the anode foil thereof being provided with an oxide layer acting as dielectric, spacers that are saturated with a liquid operating electrolyte that contains combustible constituents are arranged between the foils, the aluminum electrolyte capacitor is integrated in a housing, and an absorbent mass that bonds electrolyte emerging from the winding is contained in the housing, the absorbent mass being pourable and only partially filling an empty volume of the housing.

4,893,218

HEADLIGHT FOR MOTOR VEHICLES, ESPECIALLY ROAD VEHICLES

Gerhard Dilk, Spiesen-Elversberg; Rolf Klaiber, Reutlingen; Kurt Kreschel, Bietigheim-Bissingen; Wolfgang Krieg, Reutlingen; Heinz Ruckwied, Kusterdingen-Wankheim, and Gerhard Ulrich, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,897
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719767
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—61 **19 Claims**



1. A headlight for motor vehicles, which comprises:

a reflector which has an outwardly protruding crown neck including an outer jacket;

a bulb base to which an incandescent bulb is secured and which is axially secured in said crown neck and centered radially thereon;

a ring that is detachably secured on said outer jacket of said

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crown neck, thereby securing the incandescent bulb base on the reflector;

at least one unilaterally acting friction catch which detachably fastens said ring (16) on the outer jacket of the crown neck, said friction catch includes a body disposed on said outer jacket of said crown neck (11), and said ring (16) includes at least one pawl which engages said at least one friction catch; and

said body disposed on said outer jacket of said crown neck (11) comprises a plurality of radially spaced tightening faces (12) that extend radially outward circumferentially, and that said at least one pawl comprises a plurality of radially spaced inwardly directed protrusions (18).

4,893,219

HEADLAMP ADJUSTING MECHANISM

Stephen P. Lisak, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Sep. 30, 1988, Ser. No. 251,652
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—66 **22 Claims**



1. An adjusting mechanism for a headlamp or the like comprising: a molded gear housing having a gear-journaling bore and an apertured cap portion having an interior surface closing one end of said bore; a drive gear rotatably journaled in said bore; a drive shaft extending through the aperture in said cap portion and having one end thereof operatively coupled with said gear within said bore; and a retainer member carrier entirely within said housing and engaging and securing said drive shaft within said bore and bearing against said cap portion in order to prevent retraction of said shaft end from said gear.

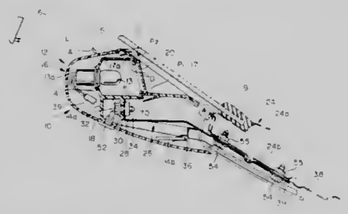
4,893,220

HIGH-MOUNTED STOPLIGHT FOR MOTOR VEHICLE

Susumu Kakidaira, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,171
Claims priority, application Japan, Dec. 28, 1987, 62-330005
Int. Cl.[4] B60Q *1/44*
U.S. Cl. 362—80.1 **2 Claims**

1. A high-mounted stoplight (10) for a motor vehicle, comprising: a lens (20) attached to an open front of a body (12) of said stoplight, a light source (13) provided in said body behind the lens; said lens and said open front of the body being located at the center of the width of said vehicle inside a rear window thereof and spaced from said window, and a shade (17) surrounding the lens, said shade having a top edge portion (17*a*) extending upwardly and inwardly in a direction substantially parallel to the rear window a sufficient distance to block light (L) emitted from said light source, transmitted from a foremost lower point (P_1; P_4) of said lens, past a foremost upper point (P_2; P_5) of the shade on a vertical central longitudinal section of said stoplight, and reflected by said window toward the



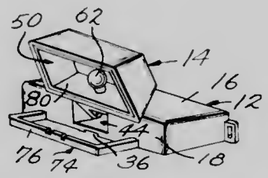
front of said vehicle, thus preventing such light from reaching a driver's eyes via a rearview mirror.

4,893,221

PORTABLE LIGHT

Arthur S. Friedman, Box 625, 2144 Seneca W., Merrick, N.Y. 11566

Filed Jul. 19, 1989, Ser. No. 381,985
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—108 **11 Claims**



1. A portable light comprising a battery case, a lamp housing, means mounting said lamp housing to said battery case for pivotal movement of the lamp housing between a closed position and an open position, means for forming an electrical circuit between said battery case and said lamp housing, said lamp housing defining a bulb compartment with an open face, said lamp housing projecting laterally from said battery case, a closure plate rigid with said battery case and projecting therefrom, said lamp housing, in the closed position, having the open face thereof engaged with and closed by said closure plate, and switch means for selectively opening and closing said circuit in response to pivotal movement of said lamp housing for closing said circuit in the open position of the lamp housing, and opening said circuit in the closed position of the lamp housing.

4,893,222

ILLUMINATION DEVICE FOR A HAND-HELD REMOTE CONTROL UNIT

Joseph H. Mintzer, 46 Ridge Rd., Hartsdale, N.Y. 10530

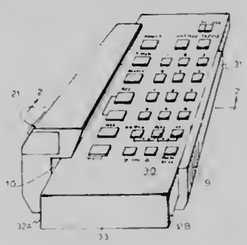
Filed Apr. 11, 1988, Ser. No. 179,744
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—109 **16 Claims**

1. An illumination device for use with a hand-held remote control unit having a length, width and height and a front control panel, said illumination device comprising:

a base and a projection extending from and projecting above said base and being exposed to a space formed by said base;

said projection containing illumination means directed toward said space, said illumination means being capable of producing light rays;

said space being configured to accommodate receipt of at least a portion of the length of said hand held remote control unit and the entire width and height thereof in said space so as to return the hand-held control unit in a position to subject a selected surface of said front control



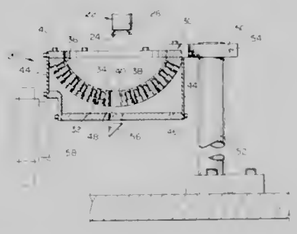
panel to said illumination means for facilitating illumination of said selected surface by reflecting light rays therefrom, while permitting actuation and operation of the hand-held remote control unit.

4,893,223

ILLUMINATION DEVICES FOR INSPECTION SYSTEMS

Aaron L. Arnold, Palm Beach Gardens, Fla., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 10, 1989, Ser. No. 295,277
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—252 **12 Claims**



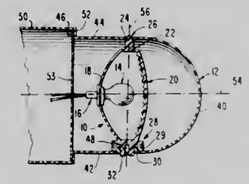
1. An illumination device for an inspection system comprising a mounting means for mounting a plurality of spaced apart light emitting diodes in mounting locations disposed in a part spherical array to cause light from the diodes to converge upon a particular restricted field of view, and a location means for locating an article to be illuminated in the restricted field of view.

4,893,224

EMERGENCY LIGHTING FIXTURE

Raymond K. Tinley, Mt. Prospect, Ili., assignor to Cooper Industries, Houston, Tex.

Filed Dec. 20, 1988, Ser. No. 286,821
Int. Cl.[4] F21V *21/28*
U.S. Cl. 362—287 **14 Claims**



1. An apparatus for adjusting the position of a light source comprising:

(a) a light source supporting structure;

(b) a housing; said support structure arranged for relative rotative movement within said housing;

(c) means for adjusting the position of said structure within said housing; said means including a rotatable member fixed to said structure and a fixed member fixed to said housing; said members being movable between a locked and unlocked position wherein in said locked position said members interengage to prohibit relative movement between said members and in said unlocked position said members can be rotated relative to each other; and

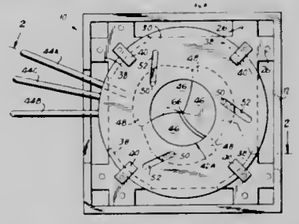
(d) said means for adjusting the position of said structure including a portion of said fixed member extending beyond said housing for operation by a user.

4,893,225

COLOR CHANGER

Dennis Solomon, Yormouth Port, Mass., assignor to Altman Stage Lighting Co., Inc., Yonkers, N.Y.

Continuation-in-part of Ser. No. 939,348, Dec. 8, 1986, Pat. No. 4,811,182. This application Mar. 3, 1988, Ser. No. 163,742
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—293 **15 Claims**



1. A color changer system mounted in a luminaire that contains at least one light source emitting a beam of white light and one lens, said beam having a cross-sectional axis and said luminaire having a beam emission and, comprising, in combination,

at least one support means mounted in said liminaire and having an aperture which passes said beam of white light,

iris means connected to said support means, said iris means being for coloring said beam of white light and being movable between an open position and a closed position including a plurality of intermediate positions between said open and closed positions, wherein in said open position the beam of white light passes said iris means uncolored by said iris means and in said closed position the beam is fully colored, and wherein in said plurality of intermediate positions said iris means during movement between said open and closed positions is successively positioned across portions of the beam extending from the periphery of the beam to positions spaced from the axis of the beam,

said iris means comprising at least one iris unit having a plurality of colored, translucent leaves centered about and disposes transverse to the beam axis, each of said leaves being positioned between said support means and said contol plate, and being rotatably mounted to said support means by a pivot member, each of said plurality of leaves being simultaneously rotatable about each said pivot member, such leaf of said plurality of leaves including an arced circumferential edge,

control means connected to said iris means and said at least one support means, said control means being for selectively positioning said iris means at any of selected open, closed, or intermediate positions,

said control means including a control plate supporting said at least one iris unit, said control plate forming another aperture aligned with said aperture of said support means, said control plate being rotatably connected to said support means, each of said plurality of leaves being slidably

connected to said plate for rotation of said leaves as said plate is rotated, and

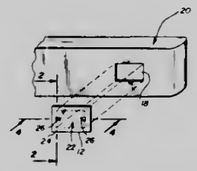
mounting means connected to said circumferential edge of each of said plurality of translucent leaves, said mounting means supporting each of said plurality of translucent leaves, and said mounting means includes a plurality of arced mounting portions connected to said plurality of translucent leaves, each mounting portion of said plurality of mounting portions being thicker than said translucent portions, with each said mounting portion having an inner arched rim and an arced slot opening at said inner arced rim, and said translucent leaf being positioned in said arched slot.

4,893,226

ADJUSTABLE LENS SHIELD ASSEMBLY FOR VEHICULAR LIGHTS

Roy M. Neece, 9436 Tranquil Acres Rd., Saginaw, Tex. 76179

Filed Jan. 23, 1989, Ser. No. 300,326
Int. Cl.[4] F21V *15/00*
U.S. Cl. 362—376 **25 Claims**



1. A lens shield assembly for protecting recessed automotive lights—such as the type mounted behind a cutout in a vehicle body—from impact with stones and other road debris which might be thrown into the air by a truck or the like, said assembly comprising:

(a) a protective plate having a peripheral region and an inner region, the plate being positionable against an outer vehicle surface to cover a cutout in the vehical surface behind which a light is recessed, and the inner region being esesntially transparent, the plate including at least a first opening which extends between a front and rear face of the plate and from the peripheral region toward the inner region.

(b) a first retaining member being manually positionable through the cutout in the vehicle surface to secure the plate to the vehicle surface;

(c) a clip attachable to the rear face of the plate near the peripheral region thereof for sliding engagement along an edge portion of the first plate opening, said clip including a surface for contacting a portion of the vehicle surface bordering the cutout to secure said assembly to the vehicle surface; and

(d) a fastener positionable through the first plate opening to couple the plate to said clip, and said sliding engagement of the clip and securement of the assembly being effected by coupling said clip with the fastener.

4,893,227

PUSH PULL RESONANT FLYBACK SWITCHMODE POWER SUPPLY CONVERTER

George C. Gallios, Setauket; Charles Lien, Huntington; Remo Stella, Dix Hills, all of N.Y., and Wendell Boucher, Los Osos, Calif., assignors to Venus Scientific, Inc., Farmingdale, N.Y.

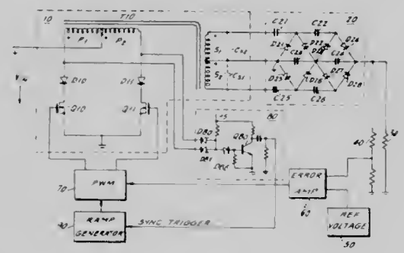
Filed Jul. 8, 1988, Ser. No. 216,548
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—26 **22 Claims**

1. A push pull resonant flyback switchmode power supply converter for supplying power to a load, comprising:

(a) a transformer having a primary and a secondary, said primary comprising first and second primary halves with an equal number of primary turns;

(b) first switch means for coupling an input voltage of an input power supply across said first primary half during a first series of time intervals to store energy from said input power supply in the form of current in the inductance of said primary without resonance and for disconnecting said first primary half from said input voltage during a second series of time intervals during which the current in the inductance of said primary is transferred to said secondary, said secondary having an inductance and a parallel stray capacitance, the energy stored in the form of voltage in said stray capacitance being transferred in the form of current to the inductance of said secondary by parallel resonance, the current in the inductance of said secondary being delivered to said load when the voltage across said stray capacitance resonates to a predetermined level which is greater than said input voltage;

(c) second switch means for coupling said input voltage of said input power supply across said second primary half during a third series of time intervals to store energy from



said input power supply in the form of current in the inductance of said primary without resonance and for disconnecting said second primary half from said input voltage during a fourth series of time intervals during which the current in the inductance of said primary is transferred to said secondary, the energy stored in the form of voltage in the stray capacitance of said secondary being transferred in the form of current to the inductance of said secondary by parallel resonance, the current in the inductance of said secondary being delivered to said load when the voltage across said stray capacitance resonates to said predetermined level which is greater than said input voltage;

(d) pulse width modulating means for controlling the switching of said first and second switch means to vary the length and frequency of said time intervals in response to variations in the load and in said input voltage; and

(e) means for synchronizing said pulse width modulating means to the frequency of said time intervals as required by the resonant frequency of the parallel stray capacitance and inductance of said secondary.

4,893,228

HIGH-EFFICIENCY PROGRAMMABLE POWER SUPPLY

Herbert P. Orrick, Rockaway, and Siu B. Wong, Randolph, both of N.J., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 91,630, Sep. 1, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,745
Int. Cl.[4] H02M *7/04*; G05F *1/56*
U.S. Cl. 363—89 **6 Claims**

1. A power supply comprising:

a source of unregulated direct current;

an asynchronous switching pre-regulator receiving said unregulated direct current and providing a pre-regulated direct current output;

a linear regulator receiving said pre-regulated direct current and including a series pass element therein, and selectively providing a regulated output according to an externally applied control signal, wherein



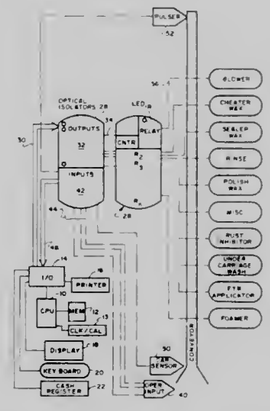
said switching pre-regulator includes means for measuring the voltage drop across the series pass element, and is responsive to the measured voltage drop across said series pass element, providing a selectable pre-regulated direct current potential which maintains a selected voltage drop across said series pass element independent of external periodic signals.

4,893,229

COMPUTERIZED CAR WASH CONTROLLER SYSTEM

Kevin Detrick, Stroudsburg, Pa., assignor to Innovative Control Systems, Inc., Allentown, Pa.

Filed Sep. 9, 1988, Ser. No. 242,725
Int. Cl.[4] G05B *19/00*; B08B *3/00*
U.S. Cl. 364—140 **20 Claims**



1. A computerized car wash having a plurality of washing and waxing devices for cars controllable by command signals, the computerized car wash comprising:

means for tracking positions of said cars as they move by said plurality of devices in said car wash;

an operator controlled input means for selecting select ones of said plurality of devices per car;

means for generating and applying said command signals to said plurality of devices based upon (1) said select ones identified by said input means, (2) a pre-established, baseline operational sequence for said plurality of devices and (3) said positions of said cars determined by said tracking means; and,

means for monitoring said tracking means and said input means and for determining the number of times and the duration when more than a single car has been tracked by said tracking means per selection by said input means.

4,893,230

PHYSICAL QUANTITY CONTROLLER

Tooru Shimomura, Muko; Kazutomo Naganawa, Suita; Toshiya Tanamura, Takatsuki, and Toshiaki Nagao, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 24, 1988, Ser. No. 172,438
Claims priority, application Japan, Sep. 30, 1987, 62-80341
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—146 **7 Claims**



1. A physical quantity controller, comprising:

a display means including a numeral display area for displaying a numeral thereon;

a numeral updating means for updating a numeral displayed on said numeral display area;

a mode changing means for changing display modes of said display means;

a storage means including (i) an input buffer for temporarily storing a numeral updated by said updating means, (ii) a counter for counting time elapsing after said numeral updating means has been actuated, and (iii) a storage area for storing a value relating to said physical quantity; and

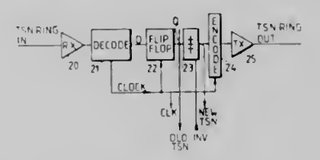
a writing means for writing said updated numeral stored in said input buffer into said storage area as a new value when said counter reaches a predetermined number after said numeral updating means has been actuated.

4,893,231

MULTI-NODE DATA PROCESSING SYSTEM

Donald Bell, Disley, United Kingdom, assignor to International Computers Limited, London, England

Filed Sep. 11, 1987, Ser. No. 95,113
Int. Cl.[4] C06F *15/00*
U.S. Cl. 364—200 **3 Claims**



1. Data processing apparatus comprising

(a) a plurality of data processing nodes,

(b) a plurality of data transmission links for carrying messages between the nodes, and

(c) allocation means common to all the nodes, for allocating a single global sequence of transmission sequence numbers to messages transmitted by the nodes, each message being allocated a transmission sequence number unique to that message,

(d) each node comprising means for reorganizing all of the

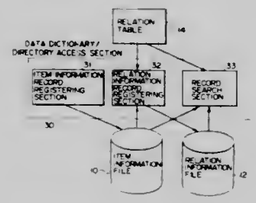
message received from all the transmission links into order of their transmission sequence numbers.

4,893,232

DATA MANAGEMENT SYSTEM FOR EFFICIENTLY SEARCHING DATA ELEMENTS AND HAVING A FLEXIBLE REGISTRATION ORDER OF DATA ELEMENTS

Kouichi Shimaoka, and Matoi Iizaka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 932,677, Nov. 20, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 235,617
Claims priority, application Japan, Nov. 30, 1985, 60-269633
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **24 Claims**



1. A data management system for efficiently searching item information for a data element, comprising:

item information file means for storing a plurality of item information records, each showing a state of a data element belonging to an item, said item information file means being accessed by an item index using a part of a stored item information record;

relation table storing means for storing a relation table in which information indicating a relation between items is registered;

relation information file means for storing a plurality of relation information records, each showing relation information between source and object data elements, said relation information file means being accessed by a relation index using a part of a stored relation information record; and

search means, connected to said item information file means, said relation table storing means, and said relation information file means, for obtaining item information for a data element to be searched, by accessing said item information file means using the item index in order to obtain the item information for source and object data elements to be searched, by accessing said relation table storing means in order to obtain the information indicating the relation, and by accessing said relation information file means using the relation index in order to obtain the relation information, in accordance with an input search instruction.

4,893,233

METHOD AND APPARATUS FOR DYNAMICALLY CONTROLLING EACH STAGE OF A MULTI-STAGE PIPELINED DATA UNIT

Denman Marvin A., Austin, Tex., and Yoav Talgam, Tel-Aviv, Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1988, Ser. No. 182,630
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 **4 Claims**

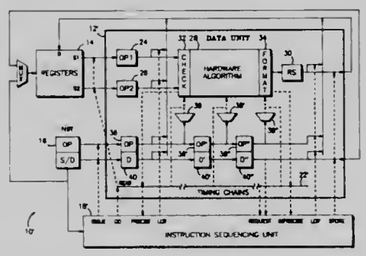
1. In a pipelined data unit for use in a data processor, a data unit comprising:

an input stage for selectively receiving input operands from said data processor;

a plurality of operation stages for performing selected operations on said input operands to produce an output result, at least a first one of said operation stages, coupled to said input stage, for performing its respective operation in one of a plurality of ways as selected by a value of a control signal;

an output stage, coupled to at least a last one of said operation stages, for selectively providing said output result to said data processor;

instruction buffer means, substantially coincident with said plurality of operation stages, for providing to each of said plurality of operation stages selected information related



to a respective one of a plurality of instructions executing in said plurality of operation stages; and

control means, coupled to said plurality of operation stages, for controlling execution of said instructions in each of said plurality of operation stages in accordance with the information relating thereto provided by said instruction buffer means;

the improvement comprising:

control signal buffer means, coupled to said instruction buffer means, for storing, for each of said instructions, a corresponding value of said control signal, and providing said corresponding value of said control signal to said first one of said operation stages substantially coincident with said instruction buffer means providing the corresponding instruction information.

4,893,234

MULTI-PROCESSOR INCLUDING DATA FLOW ACCELERATOR MODULE

George S. Davidson, and Paul E. Pierce, both of Albuquerque, N. Mex., assignors to United States Department of Energy, Washington, D.C.

Filed Jan. 15, 1987, Ser. No. 3,540
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **11 Claims**

1. A data flow computer for implementing a data flow graph, said computer including a plurality of processing means, each operable for executing a primitive computation of a node of the graph, and accelerator means for accelerating execution of said computation, said accelerator means comprising:

a plurality of memory cells for representing, respectively, each of the nodes of the graph, each memory cell including:

a plurality of slot means for storing all the data operands required for a primitive computation; and

indicating means for providing a first output upon conclusion of each memory cycle for indicating that all operands required by a primitive associated with the cell are available, said indicating means comprising tag bit generating means for generating respective tag bits for each slot of said cell, each said tag bit having a first logic value for a particular slot each time one of said plurality of processing means writes data in said slot and for generating a tag bit of a second logic value for said slot each time one of said processing means reads data from said slot; and

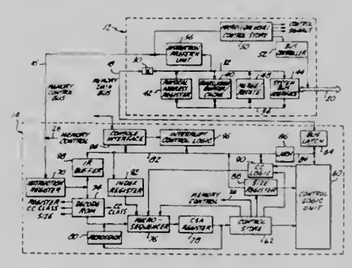
identifying means for storing the address of only each memory cell with an indicating means providing a first output, said address being used by any one of said processing means to identify a respective primitive operation for operating on the data operands contained within said cell.

4,893,235

CENTRAL PROCESSING UNIT FOR A DIGITAL COMPUTER

H. Bruce Batts, Jr., Seattle; David N. Cutler, Mercer Island; Peter C. Schnorr, Redmond, and Robert T. Short, Woodinville, all of Wash., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 782,092, Sep. 30, 1985, abandoned, Division of Ser. No. 538,373, Oct. 3, 1983, Pat. No. 4,586,130. This application Jun. 16, 1988, Ser. No. 208,844
Int. Cl.[4] G06F *9/34*
U.S. Cl. 364—200 **5 Claims**



1. A central processing unit for a computer for decoding and executing macroinstructions comprising an operation code and first and second operand specifiers, wherein each operand specifier includes a register field and a mode field for specifying literal operands or direct or indirect addressing modes, each macroinstruction being executed by executing a series of microinstructions corresponding to said macroinstruction op-code, and including a micro op-code and first and second micro-operand specifiers having register and mode fields, said central processing unit comprising:

a plurality of general registers for the temporary storage of data representing operands or location of operands, each general register having a unique address associated therewith;

at least two pointer registers for the temporary storage of data, including data specifying the address of a general register and data representing the literal value of an operand, each pointer register having assigned to it (i) a direct address specifying as an operand the contents of the general register addressed in the register field of one of said micro-operand specifiers and (ii) a unique indirect address specifying as an operand address the contents of the general register addressed in the register field of said micro-operand;

decoding means for decoding the macroinstruction and for loading the register fields thereof, without alteration, into respective pointer registers; and

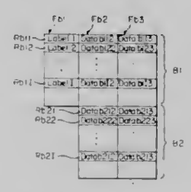
execution means for executing the macroinstruction by executing said corresponding series of microinstructions, the execution means including an ALU having first and second input ports, and register access means for providing data specified by a first pointer register to said first input port and for providing data specified by a second pointer register to said second input port.

4,893,236

ELECTRONIC CASH REGISTER

Souichi Ohnishi, Yao; Yasuhide Nakamura; Kensaku Komai, both of Yamatokoriyama, and Kazuyuki Goto, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 31, 1987, Ser. No. 80,568
Claims priority, application Japan, Jul. 31, 1986, 61-181705
Int. Cl.[4] G07G *1/12*
U.S. Cl. 364—405 **8 Claims**



7. An electronic cash register, comprising:

key input means having a plurality of operation keys;

file structured memory means divided into a plurality of file storage regions for storing a plurality of different types of accumulated data;

control means for controlling said key input means and said memory means;

wherein said control means controls said memory means so as to change the space allocation of a predetermined file storage region, generate a space allocation for a required file storage region or erase the space allocation for a selected file storage region in the memory means;

each of said file storage regions further including a file descriptor region and a file data region; and

wherein said file descriptor region for each file storage region stores start address, end address and data structure of said file data region for the respective file storage region.

4,893,237

INTERCONNECTED SALES DATA REGISTRATION AND PAYMENT SETTLEMENT SYSTEM

Shohei Unno, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 27,808, Mar. 19, 1987, abandoned. This application May 31, 1989, Ser. No. 361,832
Claims priority, application Japan, Mar. 27, 1986, 61-69242
Int. Cl.[4] G07G *1/12*
U.S. Cl. 364—405 **8 Claims**

1. A sales data registration and payment settlement apparatus, comprising:

a plurality of register terminals each having a keyboard with a plurality of operation keys including a total key, first memory means, and first control means including:

means for writing, in said first memory means, sales data and total sales amount data for each customer;

means for generating the sales data and the total sales amount data upon operation of said operation keys;

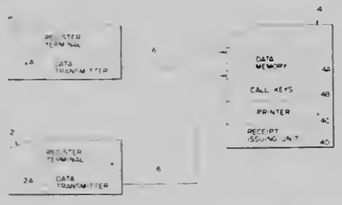
means for reading out the sales data and the total sales amount data from said first memory means; and

means for transmitting the read out sales data and total

sales amount data, upon operation of at least one operation key; and

an electronic cash register having input for receiving data output from said register terminals, a plurality of second memory means for storing sales data and total sales amount data received from said register terminals or each customer, a plurality of call keys each for designating a different one of said register terminals, printing means, and second control means including:

means responsive to operation of each of said call keys, for reading out, from a corresponding one of said plurality of second memory means, the sales data and the total sales amount data for one customer, received from one of said register terminals designated by one of said call keys; and



means for driving said printing means to print the read out data on a receipt;

wherein said first control means in each of said register terminals includes means for attaching a receipt number to said sales data and said total sales amount data for each customer, the receipt number being incremented each time said sales data and said total sales amount data are transmitted, and said reading out means of said second control means in said electronic cash register reads out from one of said second memory means the sales data and the total sales amount data for the customer having the earliest receipt number received from the register terminal designated by one of said call keys.

4,893,238

TEXT PROCESSING DEVICE FOR STENOGRAPHIC TYPING

Izaäk Venema, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,448

Claims priority, application Netherlands, Feb. 19, 1987, 8700410

Int. Cl.[4] B41J *3/02*

U.S. Cl. 364—419 **16 Claims**

13. A method of entering an alphabetic text into a computer using abbreviated word forms and translating the abbreviated word forms into their corresponding complete word forms comprising:

for a majority of words, entering into the computer a sequence of alphabetic characters comprising less than all of the characters in said words, said sequence comprising an abbreviated word form including the first letter of each syllable of the corresponding complete word,

comparing each said abbreviated word form with a stored dictionary of corresponding abbreviated word forms and when a match is established,

translating said abbreviated word form into its corresponding complete word form by inserting one or more missing letters between each two successive letters of the abbreviated word form, and

storing, at least temporarily, in said computer the complete words corresponding to matched abbreviated words.

4,893,239

DEVICE FOR DETECTING DRIVING CONDITION FOR AUTOMOBILE
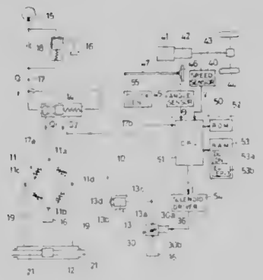
Kunihiko Eto, Toyota; Yutaka Mori, Okazaki; Shigeo Tanooka, and Kazumasa Kodama, both of Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 16, 1988, Ser. No. 156,012

Claims priority, application Japan, Feb. 16, 1987, 62-32927

Int. Cl.[4] B62D *5/06*

U.S. Cl. 364—424.05 **8 Claims**



1. An improved device for detecting driving conditions for an automobile including:

a speed sensor for detecting speed information which varies in response to the speed of said automobile;

index arithmetic means for effecting computation of a driving condition index corresponding to a driving condition encountered by an operator of said automobile wherein said driving condition index is calculated from changes in said speed information;

limit setting means for setting a limit value derived from said speed information, said limit value indicating a limit in the change rate of said driving condition index and varying depending upon the speed of said automobile;

compensating means for compensating said driving condition index by using said limit value so that the rate of change of said driving condition index over a predetermined time period is restricted to said limit value when said rate of change exceeds said limit value.

4,893,240

REMOTE CONTROL SYSTEM FOR OPERATING SELECTED FUNCTIONS OF A VEHICLE

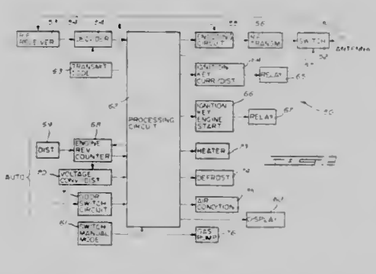
Imad Karkouti, 8112A Trans Canada Highway, St-Laurent, Quebec H4S 1M5, Canada

Continuation of Ser. No. 8,341, Jan. 29, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 320,793

Int. Cl.[4] F02N *11/08*

U.S. Cl. 364—424.05 **8 Claims**

1. A remote control system for operating selected functions in a vehicle operated by an engine, said system comprising a portable remote control unit, a vehicle operation unit associated with the electrical and mechanical systems of said vehicle, said remote control unit having a keyboard for programming a personal code therein and selecting a personal code and one or more function codes to be transmitted and executed by said vehicle operation unit, an encoder in said control unit to encode said personal code with one or more function codes prior to the transmission of an encoded signal by an RF transmitter contained in said control unit through a switching device, said operation unit having a receiver and a decoder for receiving and decoding said encoded signal and storing said personal code signal generated by said control unit and a code comparison program in a processing circuit for verifying said personal code and for performing command functions as determined by said one or more function codes, encoding circuit means for generating encoded signals corresponding to said received personal code and said selected one or more function codes to indicate that said operation unit is operational or not, a transmitter for transmitting said encoded signals, said decoder also verifying said personal code and said selected one or more function codes, said processing circuit is further provided in said vehicle operation unit for processing said selected one or more function codes and operating an interface circuit corresponding to said function code, said vehicle operation unit also having a coding and transmitting circuit for transmitting to said control unit a confirmation signal to confirm that said personal code has been matched and that it is ready to receive one or more function code signals by said control unit, said control unit being provided with a receiver circuit and a de-



coder for receiving said confirmation signal and an operational signal indicative of the operation of the selected one or more function codes and verifying if said operation unit has accepted said personal code and effected said one or more function codes, display means on said control unit to display the acceptance of said confirmation signal and selected one or more function codes by said operation unit, said remote control unit and said vehicle operation unit each being provided with an output switching circuit which is automatically placed in a transmit or receive mode by its respective unit, one of said selected function codes being an engine starting function code for starting said engine, said starting function code generating a starting function signal which operates two interface circuits, a first of said two interface circuits being operated to distribute current to selected electrical equipment to be operated in the vehicle, and a second interface circuit being operated for starting said engine, each said first and second interface circuits being associated with a relay coil for the operation thereof, a third interface circuit for detecting the operation of said engine of said vehicle, said third interface circuit sensing the frequency of a distributor associated with said engine, said third interface circuit being connected to said processing circuit of said vehicle operation unit and effecting the transmission of a function operation signal upon detection of said frequency to indicate to said control unit that said engine is properly operating, said processing circuit automatically monitors said engine by detection of the revolutions of said distributor provided by a revolution counter.

4,893,241

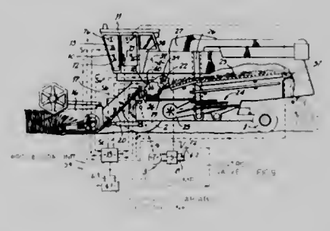
CROP PROCESSING APPARATUS

Joseph C. Girodat, West Milton; David W. Rumble, King City; Lawrence M. Sweetman, Mississauga, and William Swindall, Ayr, all of Ontario, Canada, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 10, 1987, Ser. No. 36,952

Int. Cl.[4] A01D *41/00*; G06F *15/20*

U.S. Cl. 364—424.07 **27 Claims**



1. Crop processing apparatus comprising crop processing means; drive means comprising an input drive shaft, an output driven shaft connected to drive the crop processing means, and transmission means through which power is transmitted from the input drive shaft to the output driven shaft and in which relative rotation between the input drive shaft and output driven shaft under constant load conditions causes a transmission loss; a first sensor for producing an output signal corresponding to the rate of rotation of the output driven shaft; setting means for selecting a reference signal corresponding to a selected level of transmission loss in the transmission means; signal processing means which processes the output signal from the first sensor to produce a transmission loss signal corresponding to said transmission loss in the transmission means and which compares said transmission loss signal with said reference signal to produce a crop load control signal; and actuator means that is controlled in accordance with said crop load control signal and is effective to vary the rate of feed of crop to the crop processing means to maintain a substantially uniform load of crop in the crop processing means.

4,893,242

VEHICLE BRAKE TEST SYSTEM

John N. Rogers; James M. Lady; Donald W. Bilsbarrow, and Rene S. Trujillo, all of Tucson, Ariz., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1987, Ser. No. 137,686

Int. Cl.[4] G01L *5/28*; G06F *15/20*

U.S. Cl. 364—426.01 **2 Claims**



1. The method of testing the braking force of an axle of a vehicle, comprising the steps of:

positioning the axle's left side and right side wheels on left and right brake test apparatus of the type having rollers driven at constant speed by a variable magnitude torque signal;

actuating the vehicle's braking system with increasingly increasing applied force over a real time test interval;

sampling in pairs, periodically over the test interval, the

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magnitude of the left (BK_1) and right (BK_1) torque signals applied in near coincidence to the left and right brake test apparatus, and storing the sampled pair of coincident torque signal magnitudes;

filtering the left and right side values of each sampled pair of coincident torque signal magnitudes (i), from i=1 to Q, using the following algorithm

$$BK_i ave = \frac{\sum_{n=i-K/2}^{n=i+K/2} BK_n}{K}$$

Where:

BK_i ave = The summation value of BK_n

K = The number of sampled pairs of coincident torque signal magnitudes per tire revolution

to produce filtered pairs of coincident torque signal magnitudes;

reporting, as a maximum brake force value for the axle, the maximum one of the left and right side sum values of said filtered pairs of coincident torque signal magnitudes; and

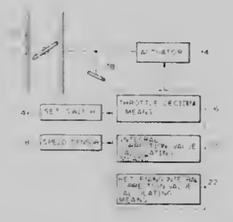
indicating, as the axle brake force imbalance, the maximum one of the left and right difference values of said filtered pairs of coincident torque signal magnitudes.

4,893,243

CONTROL DEVICE FOR MAINTAINING CONSTANT SPEED OF AN AUTOMOBILE

Tetsuya Tada, Anjyo; Hiroaki Tabuchi, Toyota, and Tatsuo Teratani, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 27, 1988, Ser. No. 149,074
Claims priority, application Japan, Jan. 28, 1987, 62-015925
Int. Cl.[4] B60K *31/00*
U.S. Cl. 364—426.04 **13 Claims**



1. A control device for maintaining a constant speed of an automobile, said automobile having an internal combustion engine with an intake air passage and a throttle valve arranged therein, said control device comprising:

an actuator connected to said throttle valve;

means for setting a desired set speed of the automobile;

means for detecting a speed of the automobile;

throttle deciding means for determining an initial degree of opening of said throttle valve, and controlling said actuator in correspondence with a desired degree of opening of said throttle valve, to bring the speed of the automobile to approach said set speed;

a first calculating means for determining a difference between the detected speed and the set speed and cyclically obtaining an integral at a predetermined first gain when said difference is a predetermined amount, and calculating an integral correction value and correcting said desired degree of opening of said throttle valve based on said integral correction value when said difference exists; and

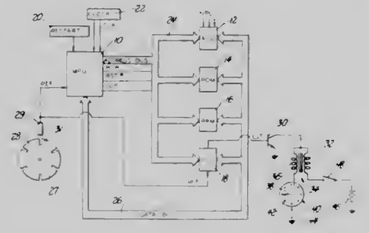
a second calculating means for adjusting said integral correction value toward its initial value at a predetermined second gain greater than said predetermined first gain when said integral correction value calculated by said first calculating means becomes greater than a second predetermined value and the difference between the detected speed and said set speed is no longer the predetermined amount.

4,893,244

PREDICTIVE SPARK TIMING METHOD

Dah-Lain Tang, Canton; Man-Feng Chang, and Myrna C. Sultan, both of Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1988, Ser. No. 237,021
Int. Cl.[4] F02P *5/15*
U.S. Cl. 364—431.03 **7 Claims**



1. A method of determining spark time in a spark timing system of an internal combustion engine having a plurality of cylinders and a spark period for each cylinder in which a spark occurs, comprising the steps of:

generating at least one crankshaft position reference pulse for each spark firing event, the reference pulse nearest the next spark being set to occur within a same cylinder event as the next spark;

measuring at least two reference periods between recent reference pulses;

calculating the spark timing synchronously with crankshaft position by performing the calculation upon receipt of the reference pulse nearest the next spark;

predicting the engine speed for the next spark period from at least two reference periods including the most recent reference period; and

based on the predicted speed, calculating a spark time measured from the said reference pulse nearest the next spark.

4,893,245

WINDSHEAR GUIDANCE FOR AIRCRAFT HAVING INERTIAL SENSOR

Terry L. Zweifel, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 11, 1988, Ser. No. 141,752
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—435 **10 Claims**

1. An aircraft flight path angle control system including an inertial reference system, comprising:

means responsive to said inertial reference system for sensing an inertial flight path angle for the aircraft and producing a signal representative thereof;

means for providing a signal representative of a predetermined flight angle,

means responsive to said signals representative of an inertial flight path angle and a predetermined flight path angle for producing an algebraic difference thereof,

means responsive to said difference for deriving an error signal,

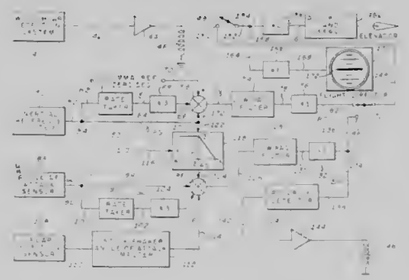
means for applying said error signal to said control system,

means for providing a signal representative of stick shaker angle of attack,

means for sensing the actual angle of attack of the aircraft and providing a signal representative thereof,

means responsive to said signals representative of stick shaker angle of attack and actual angle of attack for forming an algebraic difference thereof,

means for combining said error signal with said difference of



stick shaker angle of attack and actual angle of attack to form a further difference thereof corresponding to a maximum safe angle of attack, and

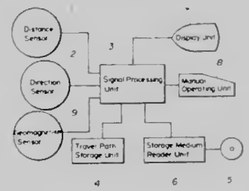
means for varying said error signal in accordance with a predetermined value of inertial angle of attack.

4,893,246

APPARATUS FOR DISPLAYING TRAVEL PATH

Akira Iihoshi; Yukinobu Nakamura, and Shinichiro Yasui, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,680
Claims priority, application Japan, Dec. 15, 1986, 61-298353
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **4 Claims**



2. An apparatus for displaying a travel path of a moving body during travel on two-dimensional coordinates is successively computed and the current location is displayed on a map and successively renewed according to data of the current location thus computed, comprising:

means for setting at least one target point on a desired running course on the map;

means for setting a running direction of the moving body at the target point; and

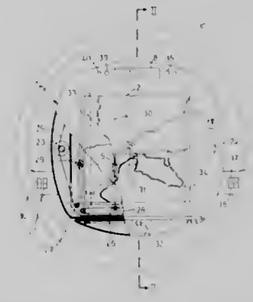
means for deciding that the moving body has passed the target point by a first determination that a closest distance of the current location of the moving body relative to the target point, the closest distance having been obtained by computation of data of position of the target point and data of the current location, is within a predetermined distance and by a second determination that a difference in angle between an actual running direction of the moving body after reaching a closest position relative to the target point and a running direction previously set at the target point is within a predetermined angle.

4,893,247

ORIENTATION AND LOCALIZATION TABLE ON MAP

Claude Waudolt, rue du Goddiarch 1, 6320 Villers-la-Ville, Belgium

Continuation-in-part of Ser. No. 34,346, Mar. 30, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,942
Claims priority, application Belgium, Mar. 28, 1986, 904513
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **4 Claims**



1. A map position orientation and location apparatus employing inexpensive and commercially available DC motors with a calculator, said apparatus indicating the position of a carrier such as a vehicle, on a map, comprising a map support adapted to be movably supported on a steering wheel, an electrical orientation DC motor for moving said map support with respect to said steering wheel, a localization device including a mobile reference mounted on said map support so that the mobile reference will move automatically above the map placed on the map support, said mobile reference being provided with a light source supported by the wires actuated by a pair of DC motors, roller means for supporting said map over said map support, a steering wheel position sensor connected to said calculator and providing a signal proportional to the steering mechanism of the vehicle, a vehicle displacement indicator including a displacement sensor connected to said calculator, a vehicle orientation indicator connected to said calculator, whereby said calculator monitors the mechanisms of the orientation of the map support and displacement of the mobile reference in response to electrical signals continuously provided by said vehicle displacement indicator, the vehicle orientation indicator, and the steering wheel position sensor.

4,893,248

MONITORING AND REPORTING SYSTEM FOR REMOTE TERMINALS

W. Hampton Pitts, and Ronald G. Thomas, both of Nashville, Tenn., assignors to Access Corporation, Nashville, Tenn.

Filed Feb. 6, 1987, Ser. No. 11,976
Int. Cl.[4] H04H *9/00;* **G06F** *15/20*
U.S. Cl. 364—464.01 **62 Claims**

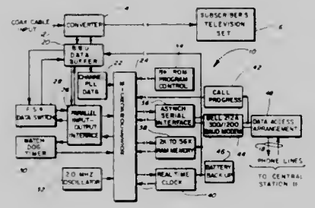
1. A remote terminal for use in a system for monitoring and accumulating data indicative of viewer authorized pay per view programs on a television set at each of a plurality of remote terminals, each of said remote terminals connected by non-dedicated telephone lines for transmitting said accumulated data over said telephone lines to a host computer at a central station, said host computer processing said transmitted data to provide bills to said viewers, each of said remote terminals comprising:

(a) means actuated by a viewer for authorizing the viewing of a pay per view program upon the television set;

(b) means connected to said authorizing means and responsive to the viewer actuation of said authorizing means for

monitoring the viewing of said pay per view program to provide program data indicative thereof;

(c) memory means connected to said monitoring means for storing said program data therefrom; and



(d) means connected to said authorizing means and said memory means, and responsive to said authorization for transmitting over said telephone lines to said host computer a report message including said program data.

4,893,249

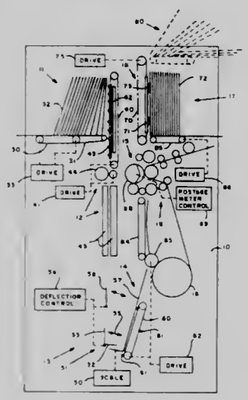
MAILING MACHINE

Morton Silverberg, Westport, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 17, 1987, Ser. No. 134,492

Int. Cl.[4] B65G *17/26*

U.S. Cl. 364—464.03 **25 Claims**



1. In a plural object processing system having a processing station, an input station, a first transporting means for sequentially feeding objects from said input station to said processing station, an output station, and a second transporting means for sequentially directing objects from said processing station to said output station; the improvement wherein said first and second transporting means are arranged to transport said objects respectively in first and second substantiallY opposite directions.

4,893,250

CENTRALIZED LOOM CONTROL METHOD WITH OPTIMIZATION OF OPERATING SPEED

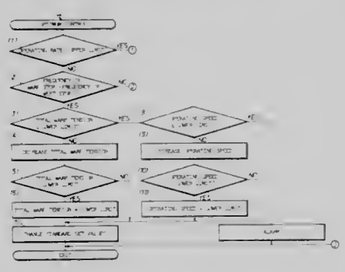
Tsutomu Sainen, Kanazawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Mar. 28, 1989, Ser. No. 329,638

Claims priority, application Japan, Mar. 28, 1988, 63-073639

Int. Cl.[4] G06F *15/46*; D03D *51/00*

U.S. Cl. 364—470 **3 Claims**



1. A centralized loom control method to be carried out by a centralized loom control system comprising a host computer, memory means connected to the host computer, and a plurality of loom control units which are controlled by control signals given thereto from the host computer; comprising steps of:

storing a data base including data accumulated by recording past actual weaving conditions in the memory means;

entering data representing the specifications of a fabric to be woven in the host computer;

deciding whether or not standard set values for a fabric of the same specifications as these of the fabric to be woven are stored in the memory means;

reading the standard set values from the memory means when the standard set values for the fabric to be woven is stored in the memory means or reading standard set values for fabrics of specifications approximately similar to those of the fabric to be woven from the memory means;

determining standard set values for the fabric to be woven by processing the standard set values for fabrics of specifications approximately similar to those of the fabric to be woven through predetermined calculation or interpolation;

comparing a standard operating speed among the standard set values with a target operating speed of a loom on which the fabric is to be woven and changing the standard set values according to the result of comparison for a new standard set values suitable for weaving operation at the target operating speed; and

giving a control signal to the loom control units to operate the looms controlled respectively by the loom control units at the new standard operating speed.

4,893,251

METHOD OF GENERATING CUTTING PATH OF COMPLEX CURVED SURFACE

Masaki Seki, and Koji Samukawa, both of Tokyo, Japan, assignors to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP87/00477, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/00367, PCT Pub. Date Jan. 4, 1988

PCT Filed Jul. 7, 1987, Ser. No. 171,870

Claims priority, application Japan, Jul. 9, 1986, 61-161518

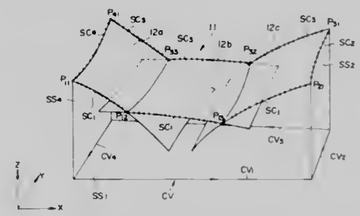
Int. Cl.[4] G05B *19/403*

U.S. Cl. 364—474.29 **5 Claims**

1. A method of generating a cutting path for a complex curved surface having at least two three-dimensional curved surfaces, said method comprising the steps of:

inputting data corresponding to each of the three-dimensional curved surfaces, and specifying one curve in a predetermined plane, said specified curve comprising two or more elements, each element comprising one of a line segment and a circular arc;

finding section curves of the complex curved surface by



dividing the complex curved surface into sections defined by planes, each of the planes corresponding to one of the elements of said specified curve in said predetermined plane that are i-th (i=1, 2, . . .) elements in a predetermined direction among the number of elements constituting said specified curve; and

generating as a cutting path, a path for moving a tool along said section curves corresponding to the elements in said predetermined order of the elements.

4,893,252

MONITORING SYSTEM FOR THE OUTPUT STAGE OF A BRIDGE

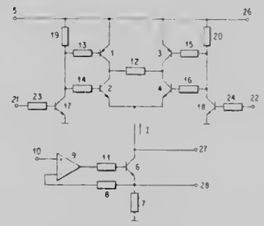
Thomas Blümel, Schmitten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,116

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643869

Int. Cl.[4] G01R *19/10*; G05F *1/56*

U.S. Cl. 364—483 **11 Claims**



1. A monitoring system for an electric power source capable of supplying current to a load, wherein the power source is to be energized by a source of operating voltage, the power source having a controllable source of current and a bridge output stage, which stage is connected in series with the controllable source of current between terminals of the source of operating voltage, the system comprising:

a subtraction circuit;

a computer with an analog-to-digital converter;

a current-measuring resistor connected in series with the bridge output stage; and wherein

a voltage drop across the bridge output stage and a voltage drop across the current-measuring resistor are applied to separate input terminals of the subtraction circuit, the subtraction circuit is connected via the analog-to-digital converter to an input of the computer, the computer being operated with a program for testing whether a voltage at the input of the computer lies within a predetermined range.

4,893,253

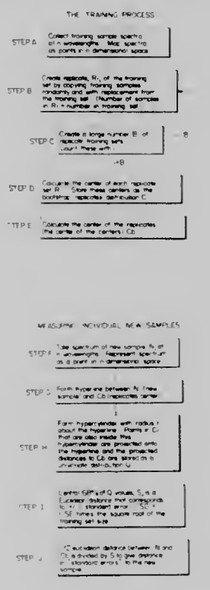
METHOD FOR ANALYZING INTACT CAPSULES AND TABLETS BY NEAR-INFRARED REFLECTANCE SPECTROMETRY

Robert A. Lodder, Bloomington, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Mar. 10, 1988, Ser. No. 166,233

Int. Cl.[4] G05F *15/20, 15/42*

U.S. Cl. 364—497 **3 Claims**



1. An analytical method for detecting adulterants in samples using a Near Infrared Reflectance Analysis (NIRS) instrument comprising the steps of:

(a) obtaining spectra at an appropriate number of wavelengths for a training set of an appropriate number of unadulterated samples;

(b) performing a transformation of each spectrum by representing such spectrum as a single point in hyperspace, and thus yielding a cluster of points in n-dimensional hyperspace, where n is the number of wavelengths utilized;

(c) creating a large set of training set sample replicates, each replicate being the same size as the training set, by randomly selecting samples from the training set, with replacement from the training set, and thus creating a bootstrap replicate distribution;

(d) calculating the center of the bootstrap replicate distribution;

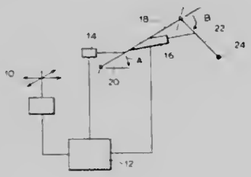
(e) obtaining a spectrum for an adulterated sample;

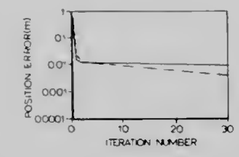
(f) transforming this spectrum into a point in hyperspace;

(g) forming a hyperline in hyperspace between the point in hyperspace yielded from the spectrum of the adulterated sample and the center point of the bootstrap replicate distribution;

(h) forming a hypercylinder around the hyperline containing points of the training set sample replicates;
(i) projecting the multivariate points of the training set sample replicates onto the hyperline to form a univariate distribution of points;
(j) using this univariate distribution of points to construct confidence limits;
(k) identifying as abnormal the adulterated sample, the point of which falls three central 68% quantiles outside of the cluster of points yielded by the replicate spectra obtained from the training set sample replicates of the training set.

4,893,254
MANIPULATOR ARM POSITION SENSING
STephen K. C. Chan, and Peter D. Lawrence, both of Vancouver, Canada, assignors to University of British Columbia, Vancouver, Canada
Filed Apr. 20, 1988, Ser. No. 184,107
Int. Cl.[4] G05B *19/18*
U.S. Cl. 364—513 **7 Claims**

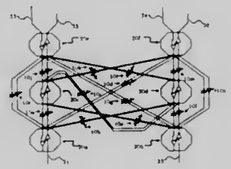




1. A method of controlling the movement of an articulated arm comprising applying command to a control computer to define a target position for an end point of said articulated arm, applying an iterative pseudoinverse Jacobian having a damping factor for defining the amount of change of each joint angle for each joint to be actuated of said arm, changing the magnitude of said damping factor for each iteration in accordance with the calculated workspace distance between the end point and the target position so that said damping factor increases with an increase in said distance, adjusting the angles of said joints of said arms in accordance with angles determined using a number of iterations in the range of 1 to 20.

4,893,255
SPIKE TRANSMISSION FOR NEURAL NETWORKS
Max S. Tomlinson, Jr., San Diego, Calif., assignor to Analog Intelligence Corp., Carlsbad, Calif.
Filed May 31, 1988, Ser. No. 200,604
Int. Cl.[4] G06F *15/18*; G06G *7/12*
U.S. Cl. 364—513 **21 Claims**

1. A neural network for receiving an input vector comprised of input vector elements, each representing an input vector element value, and, in response thereto and as a function thereof, for outputing a network output value; said network comprising:
a plurality of matrix elements, corresponding in number to the number of elements in the input vector, each comprising:
means for receiving a corresponding element of the input vector as an input data value;
duty cycle conversion means
for receiving said input data value, and
for producing an output data signal, said output data signal being a pulse train whose duty cycle is proportional to said input data value;
and



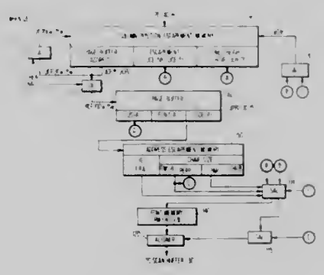
means for transmitting said output data signal; and
a combining element, comprising:
means for OR'ing said output data signals from said matrix elements to produce a raw squashed data output signal; and
means for transmitting said raw squashed data output signal as said network output value.

4,893,256
INTERACTIVE VIDEO COMPOSITION AND PRESENTATION SYSTEMS
Charles T. Rutherfoord, DeKalb, and Nancy S. Frank, Fulton, both of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 4, 1986, Ser. No. 848,171
Int. Cl.[4] G06F *13/10*
U.S. Cl. 364—518 **14 Claims**



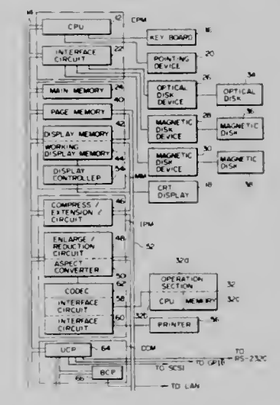
1. An interactive software multi-media presentation composing method for a computer system, said computer system comprising a display monitor and an operator input device, said computer system controlling a plurality of input and output multi-media devices, said software method assisting an operator of the computer system in developing an interactive multi-media presentation for use by a user, said interactive multi-media presentation comprising a plurality of events executed by the computer system and the input and output multi-media devices under the control of said computer system and in response to inputs by said user, said software method comprising the steps of:
providing to the operator on the display monitor for each event in a presentation list of events a set of event elements which may take place during the event and a set of time periods for the event elements, each event element in the list corresponding to an input or output multi-media device controlled by said computer;
said set of event elements and said set of time elements defining a matrix whereby each cell of the matrix represents the operation of one of said multi-media devices during one time period of a plurality of time periods of an event;
prompting the operator to select one or more event elements from the list and to specify a time period for each event element selected:
prompting the operator, for each event, to specify a next event, said next event including a branch event dependent on a user input during said interactive presentation; and
generating and storing a representation of each event and the sequence in which events are to be executed by the computer system and the devices under its control, all in response to signals from the operator input device.

4,893,257
MULTIDIRECTIONAL SCAN AND PRINT CAPABILITY
Ruben Dominguez, Jr.; David E. Finlay; Stephen D. Hanna, all of Boulder; Jesus C. Lopez; David C. Stevenson, both of Longmont, all of Colo., and Donald W. Zegafuse, Jr., deceased, Nicholasville, Ky. (by Mary A. Zegafuse Smith, executrix), assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 10, 1986, Ser. No. 929,030
Int. Cl.[4] G06F *3/09*
U.S. Cl. 364—519 **19 Claims**



1. An apparatus for generating symbols to be imaged on an output device in successive rows of symbols, scanned in a raster fashion along successive scan lines in which said scan lines can be parallel to said rows of symbols and directed left to right, successive scan lines progressing from top to bottom or vice versa, or said scan lines can be perpendicular to said rows of symbols and directed top to bottom, successive scan lines progressing left to right or vice versa, said apparatus including:
a page buffer containing a representation of said symbols in a predetermined order, each such representation including an address/escape pointer,
a column position escape memory specifying for each of said rows of symbols a page buffer pointer to a first symbol in said row and a height factor identifying a space allotted for presentation of said symbol row,
an address escape memory with a record for each different symbol containing a font pointer and a representation of space allotted for said symbol in orthogonal directions,
a font memory with a record for each symbol providing a graphic representation of said symbol,
first means responsive to a print command specifying a specific relation between symbol rows, scan direction and scan progression for accessing said column position escape memory to identify an initial symbol for a selected row of symbols by said page buffer pointer,
second means responsive to said first means for accessing a corresponding entry in said page buffer including said address/escape pointer,
third means responsive to said second means for accessing said address escape and font memories to select a predetermined portion of a corresponding graphic representation, and for deriving output information related to said portion of said graphic representation,
addressing means responsive to said print command and to said second and third means for deriving additional output information of additional symbols.

4,893,258
DATA PROCESSING APPARATUS HAVING ENLARGEMENT/REDUCTION FUNCTIONS CAPABLE OF SETTING DIFFERENT MAGNIFICATION IN DIFFERENT DIRECTIONS
Hiroshi Sakuragi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 27, 1988, Ser. No. 149,222
Claims priority, application Japan, Jan. 28, 1987, 62-15962
Int. Cl.[4] G06F *15/20*; H04N *1/04*
U.S. Cl. 364—521 **22 Claims**



1. A data processing apparatus comprising:
means for displaying data to be processed;
first designating means for designating an amount of either an enlarging or reducing magnification ratio in a vertical direction of said data displayed on said displaying means;
second designating means for designating an amount of either an enlarging or reducing magnification ratio in a horizontal direction of said data displayed on said display means; and
means for changing a displayed size of said data displayed on said displaying means in accordance with said amount of either the enlarging or reducing magnification ratio in a vertical direction designated by said first designating means and said amount of either the enlarging or reducing magnification ratio in the horizontal direction designated by said designating means;
wherein said first designating means includes;
means for generating first conversion ratio data representing either the enlarging or reducing ratio in the vertical direction of said data;
first conversion ratio memory means for storing the first conversion ratio data;
fixing means for calculating first physical positions of pixels of the data before either enlargement or reduction operation of the data is performed, calculating second vertical positions of the pixels of the data after either the enlargement or reduction operation of the data is performed in accordance with the first vertical positions of the pixels and the first conversion ratio, and calculating either an enlargement or reduction ratio of the data to obtain vertical position determination signals; and
computing means for computing vertical position data of object pixels after either the enlargement or reduction of the data is performed based on the vertical position determination signals and vertical reference pixels ex-

tracted from the pixels of the data before either the enlargement or reduction of the data is performed; and

wherein said second designating means includes:

means for generating second conversion ratio data representing either the enlarging or reducing ratio in the horizontal direction of said data;

second conversion ratio memory means for storing the second conversion ratio data;

fixing means for calculating first horizontal positions of pixels of the data before either enlargement or reduction operation of the data is performed, calculating second horizontal positions of the pixels of the data after either the enlargement or reduction operation of the data is performed in accordance with the first horizontal positions of the pixels and the second conversion ratio, and calculating either an enlargement or reduction ratio of the data to obtain horizontal position determination signals; and

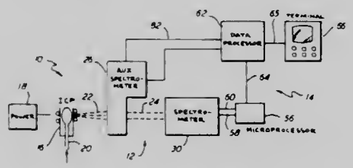
computing means for computing horizontal position data of object pixels after either the enlargement or reduction of the data is performed based on the horizontal position determination signals and horizontal reference pixels extracted from the pixels of the data before either the enlargement or reduction of the data is performed.

4,893,259

STANDARDIZATION OF SPECTRAL LINES

Zoe A. Grosser, Fairfield; John B. Collins, Westport, and Ewa M. Pruszkowski, Bethel, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 2, 1988, Ser. No. 201,510
Int. Cl.[4] G01J *3/36;* G01N *21/64*
U.S. Cl. 364—525 **8 Claims**



4. An optical spectrometer comprising:

radiation means for generating a spectral input beam characteristic of a plurality of atomic elements including a sample element, a reference element and a standard element;

separation means for separating the input beam into a sample spectral line characteristic of the sample element, a reference spectral line characteristic of the reference element, and a standard spectral line characteristic of the standard element;

first measuring means for measuring at a first time an intensity I_A of the sample line and a first intensity I_{R1} of the reference line;

second measuring means for measuring at a second time different than the first time an intensity I_S of the standard line and a second intensity I_{R2} of the reference line;

computing means responsive to the first and second measuring means for computing an intensity ratio IR defined by the formula

$$IR_0 = \left(\frac{I_A}{I_{R1}}\right) \div \left(\frac{I_S}{I_{R2}}\right)$$

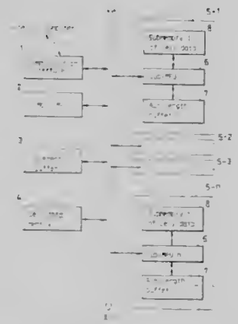
wherein the intensity ratio IR_O is representative of a standardized intensity of the sample line compensated for source fluctuations.

4,893,260

THREE-DIMENSIONAL GEOMETRY PROCESSING METHOD AND APPARATUS THEREFOR

Yoshiki Arakawa, Yawata, Japan, assignor to Matsushita Electric Industrial Company, Ltd., Kadoma, Japan

Filed Jan. 19, 1988, Ser. No. 145,084
Claims priority, application Japan, Jan. 19, 1987, 62-9333
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—564 **6 Claims**



1. A three dimensional geometry processing method comprising the steps of:

defining a three dimensional geometry by a predetermined three dimensional coordinate system,

dividing said three dimensional solid geometry into three dimensional solid geometry elements with respect to the predetermined three dimensional coordinate system,

storing data of said three dimensional solid geometry elements,

setting a reference plane divided into a predetermined grid size in said three dimensional coordinate system,

setting scanning lines having a predetermined thickness and being perpendicular to said reference plane on said grid,

obtaining a run-length representing an intersection of said scanning line and said three dimensional solid geometry elements,

storing data of said run-length,

creating one run-length by combining superimposing plural run-lengths,

storing cell data representing respective all volumes made by dividing an analysis domain which encloses said three dimensional solid geometry,

calculating a volume of said three dimensional solid geometry, which is represented by an integration of said run-length in said cell, and

calculating an occupation ratio of said volume of said cell and said volume of said solid geometry which is occupied in said cell.

4,893,261

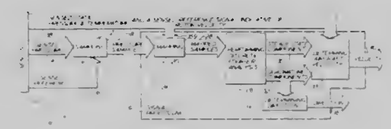
APPARATUS AND METHOD FOR DETERMINING AIRSPEED AND DIRECTION

William W. Flint, III, West Hartford, and Richard C. Filipkowski, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1987, Ser. No. 123,421
Int. Cl.[4] G01C *21/00*
U.S. Cl. 364—565 **16 Claims**

1. Apparatus for providing an airspeed signal indicative of an aircraft's velocity relative to an air mass surrounding the aircraft and for providing a direction signal indicative of the aircraft's direction in the air mass with respect to a frame of reference fixed in the aircraft, the aircraft having a plurality of signals available, including: (i) a sensed signal indicative of pressure at an end of a rotating member, (ii) a sensed periodic reference signal indicative of the rotating member periodically passing a reference position relative to the frame of reference, and (iii) a sensed signal indicative of static pressure of the air mass, the apparatus comprising:

sampling means for selectively sampling the magnitude of the sensed pressure signal according to the position of the rotating member for each of a plurality of subrevolution intervals determined with respect to the sensed periodic reference signal, said sampling means providing sampled signals having magnitudes indicative of said magnitude of



the sensed pressure signal during each of said plurality of subrevolution intervals;

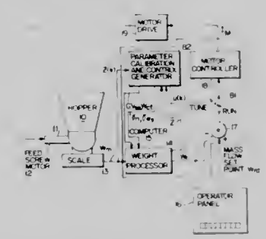
signal processing means, responsive to said sampled signals for providing Fourier component signals having magnitudes indicative of Fourier component representations of the pressure at the end of the rotating member, said signal processing means utilizing said component signals and the static pressure signal for determining aircraft velocity and direction, said signals processing means providing the airspeed and direction signals having magnitude indicative thereof.

4,893,262

WEIGH FEEDING SYSTEM WITH SELF-TUNING STOCHASTIC CONTROL

Paul R. Kalata, Cherry Hill, N.J., assignor to K-Tron International, Inc., Pitman, N.J.

Continuation of Ser. No. 174,976, Mar. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 879,430, Jun. 27, 1986, Pat. No. 4,775,949. This application Apr. 28, 1989, Ser. No. 344,458
Int. Cl.[4] G01G *13/00;* B67D *5/14*
U.S. Cl. 364—567 **8 Claims**



8. A weigh feeding system comprising:

a means for storing material;

means for discharging material from said means for storing;

means for sensing a weight of the stored material or a weight of the material being discharged;

means for deriving an estimated weight state of the material being weighed and an estimated mass flow state of the material being discharged, from said sensed weight using a Kalman filter means including a noise model of at least one noise process which causes said sensed weight to differ from an actual weight state of the material being weighed, and including a control model;

means for automatically calibrating said noise model and said control model;

means for calculating a set-point error proportional to a difference between said estimated mass flow state and a desired mass flow state;

means for calculating a weight control signal according to said set-point error and according to a magnitude of said set-point error relative to said desired mass flow state; and

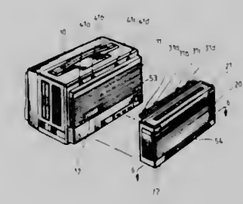
means for controlling said means for discharging according to said weight control signal to discharge material from said means for storing at said desired mass flow state.

4,893,263

SUPPORT APPARATUS FOR PORTABLE COMPUTER EXPANSION UNIT

Stephen M. Myers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 12, 1987, Ser. No. 13,649
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **7 Claims**



1. A support apparatus for a computer expansion unit said support apparatus comprising:

a computer frame having a first mating electrical connector and a first set of horizontal ribs on a first mating surface;

a computer expansion unit having a second mating electrical connector and a second set of horizontal ribs on a second mating surface, the second set of ribs being sized and positioned to engage the first set of ribs such that the first mating surface of the computer frame provides support by way of the engagement of the sets of ribs for the second mating surface of the computer expansion unit when the fist mating electrical connector is connected to the second mating electrical connector; and

the computer expansion unit having means for releasably locking the second mating surface of the computer expansion unit to the first mating surface of the computer frame.

4,893,264

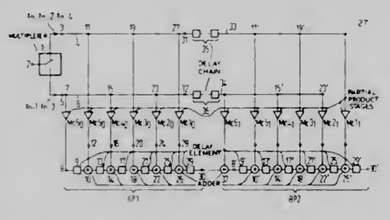
DIGITAL DECIMATION FILTER

Tobias Noll, Neufahrn, and Stefan Meier, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 224,018
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729172
Iot. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.1 **3 Claims**

1. A digital decimation filter comprising a multiplexer (1) which receives an input signal and which has two outputs (3, 5) respectively connected to first and second signal paths (4, 6), with said first signal path (4) receiving the even-numbered signal values of an input signal which is supplied to said multiplexer (1) at a prescribed sampling rate and said second signal path (6) receives the odd-numbered signal values, a plurality of multipliers which weight the signal values with a plurality of binary filter coefficients and alternately connected to said first and second paths, a first plurality of adders (10, 14, 18, 22, 26) connected in a first iterative circuit for adding the weighted signal values, each of said plurality of multipliers divided into a plurality of partial product stages ($Mc6_0$, $Mc6_1$, . . . $Mc1_0$,

$Mc1_1$) which correspond in number to the place number of the binary filter coefficients (c6 . . . c1), each of said partial product stages performing a weighting based on one filter coefficient bit; said partial product stages ($Mc6_0$ . . . $Mc1_0$) weighting in according to the filter coefficient bits which have the lowest significance ($c6_0$ . . . $c1_0$) are connected between the signal paths (4, 6) of said first signal path and first inputs of said first plurality of adders (10, 14, 18, 22, 26), a first plurality of time delay elements (13, 17, 21, 25) connected between individual ones of said first plurality of adders; and a first delay element (9) is switched between a first adder (10) and a first partial stage ($mc6_0$), third and fourth signal paths (33, 34) provided for each, further filter coefficient bit ($c6_1$ . . . c1) which has a higher significance, said third and fourth signal paths respectively, connected to said first and second signal paths (4, 6) through first and second delay chains (35, 36); an additional iterative circuit (8′ . . . 30′) including a further plurality of



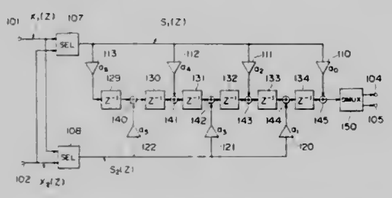
adders (10′, 14′, 18′, 22′, 26′) for each of the further filter coefficient bits ($c6_1$ . . . $c1_1$) and for each of said further filter coefficient bits ($c6_1$ . . . $c1_1$), additional plurality of partial product stages ($Mc6_1$ . . . $Mc1_1$) are provided which weigh according to the filter coefficient bits are connected between said third and fourth signal paths (33, 34) and said further plurality of adders (10, 14′, 18′, 22′, 26′) connected, respectively, to the outputs of said additional plurality of partial product stages, a further plurality of tune delay elements (13′, 17′, 21′, 25′) respectively connected to said further plurality of adders; and a second delay element (9′) is switched between a second adder (37) and a third adder (37) and said second adder (37) is connected to receive the output of a second partial product stage ($Mc6_1$) and the output of the proceeding chain circuit (8–30); and the output (30′) of said additional iterative circuit (8′ . . . 30′) corresponding to the filter coefficient bit which has the highest significance.

4,893,265

RATE CONVERSION DIGITAL FILTER

Botaro Hirosaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,147
Claims priority, application Japan, Nov. 8, 1984, 59-235409
Int. Cl.⁴ G06F *15/31*
U.S. Cl. 364—724.10 **4 Claims**



1. A finite impulse response digital filter responsive to first and second digital data streams each being sampled at intervals T, comprising:

a first multiplexer for alternately selecting samples of said first and second data streams at intervals t:

a second multiplexer for alternately selecting samples of said first and second data streams at intervals T in a manner complementary to said first multiplexer;

a plurality of storage means arranged in successive stages comprising at least first and last stages, and being simultaneously clocked at intervals T for introducing a unit delay time T in each of said storage means;

first multiplier means having a first plurality of ordered output terminals, comprising at least a first output terminal, for multiplying an output of said first multiplexer by first multiplying factors and generating at said first plurality of output terminals a plurality of first multiplied samples, said first ordered output terminal being connected to the first stage of said storage means;

second multiplier means having a second plurality of ordered output terminals, comprising at least a first output terminal, for multiplying an output of said second multiplexer by second multiplying factors and generating at said second plurality of output terminals a plurality of second multiplied samples; and

a plurality of summation means each having first and second input terminals and an output terminal, the first input terminals and the output terminals of all but one of said plural summation means being respectively connected between successive ones of said storage means, said one summation means being connected to an output terminal of said last storage stage and said output terminal of said one summation means being a filter output terminal, first alternate ones of said second input terminals of said summation means being connected to output terminals of said first multiplier means and second alternate ones of said second input terminals of said summation means being connected to output terminals of said second multiplier means for providing summation of said first multiplied samples respectively with outputs of alternate ones of said storage means, and providing summation of said second multiplied samples respectively with outputs of the other storage means, whereby a summation of multiplied samples of each of said first and second data streams alternately appears at intervals 2T at said filter output terminal.

4,893,266

ALIAS TAGGING TIME DOMAIN TO FREQUENCY DOMAIN SIGNAL CONVERTER

Jake O. Deem, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 56,617, Jun. 1, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 284,777
Int. Cl.⁴ G06F *15/353*
U.S. Cl. 364—726 **11 Claims**

1. A time domain to frequency domain signal converter comprising:

a terminal for receiving an input signal capable of exhibiting one of a plurality of frequencies;

means for performing a first fourier transform, said first fourier transform performing means having an input coupled to said terminal and having an output of providing a first signal corresponding to a particular one of the plurality of frequencies of said input signal;

means, having an input coupled to said terminal and having an output, for delaying the input signal;

means for performing a second fourier transform, said second fourier transform performing means having an input coupled to the output of said delaying means and having an output for providing a second signal corresponding to a particular one of the plurality of frequencies of said delayed input signal;

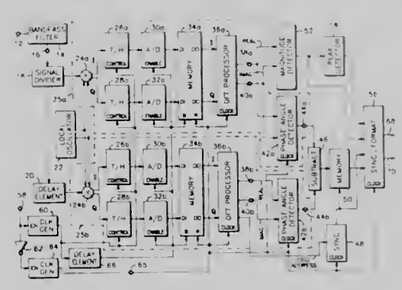
means, having an input coupled to the output of said first fourier transform performing means and having an output, for calculating signal phase of the first signal;

means, having an input coupled to the output of said second fourier transform performing means and having an output for calculating signal phase of the second signal;

means, coupled to the outputs of said means for calculating signal phase of the first and second signal, for calculating a phase difference between the first and second signals;

each of the plurality of frequencies of the input and the delayed input signals is not greater than a maximum one of the plurality of frequencies, the maximum one of the plurality of frequencies corresponds to a maximum frequency transformed by said first and second fourier transform performing means;

first means, having an input coupled to said terminal and having an output coupled to the input of said first fourier



transform performing means, for sampling the input signal at a predetermined sample rate so that fewer than two samples for each complete oscillation of the maximum transformed frequency occur;

second means, having a delay input coupled to the output of said delaying means and having an output coupled to the input of said second fourier transform performing means, for sampling the input signal at the predetermined sample rate; and

band pass filter means having an output coupled to said terminal, said band pass filter means being configured so that said band pass filter means transmits, with low level attenuation, frequencies of the input signal which correspond to frequencies transformed by said first and second fourier transform performing means that exhibit more than one complete oscillation for each two samples at the predetermined sample rate.

4,893,267

METHOD AND APPARATUS FOR A DATA PROCESSOR TO SUPPORT MULTI-MODE, MULTI-PRECISION INTEGER ARITHMETIC

Mitchell Alsup, Dripping Springs; Yoav Talgam, Tel Aviv, Israel, and Marvin A. Denman, Austin, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1988, Ser. No. 265,437
Int. Cl.⁴ G06F *7/38*
U.S. Cl. 364—745 **3 Claims**

1. In a data processor comprising:

an instruction register for sequentially receiving and storing each of a plurality of instructions for execution by the data processor;

an execution unit, including an arithmetic unit having addition/subtraction carry logic and overflow logic, for selectively executing each of said instructions stored in the instruction register; and

an instruction execution control unit for controlling the operation of the execution unit in the execution of each of said stored instructions;

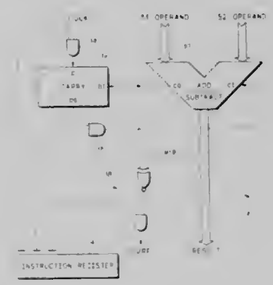
the improvements wherein a selected one of said instructions includes;

a carry-in enable field;

a carry-out enable field;

an overflow enable field;

and wherein, in response to the storage of said selected one of said instructions in the instruction register, the carry logic of



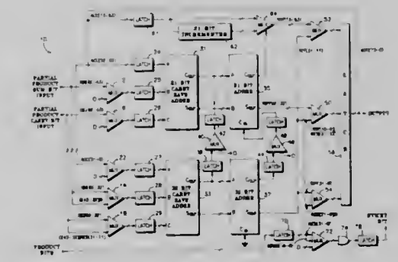
the arithmetic unit is enabled to accept a carry-in bit in response to a first predetermined value in said carry-in enable field and to selectively provide a carry-out bit in response to a second predetermined value in siad carry-out enable field, and the overflow logic of the arithmetic unit is enabled to selectively provide an overflow signal indicating an overflow of bits in the arithmetic unit in response to a third predetermined value in said overflow control field.

4,893,268

CIRCUIT AND METHOD FOR ACCUMULATING PARTIAL PRODUCTS OF A SINGLE, DOUBLE OR MIXED PRECISION MULTIPLICATION

Marvin A. Denman, Jr.; John M. Young, both of Austin, and Mitch K. Alsup, Dripping Springs, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 15, 1988, Ser. No. 181,865
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—759 **7 Claims**



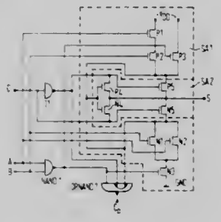
5. The method of claim 4 wherein the predetermined number of iterations is one when each input operand is a single precision data operand.

4,893,269

ADDER CELL FOR CARRY-SAVE ARITHMETIC

Karl Knauer, Grafing, and Winfried Kamp, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 324,807
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814639
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—784 **3 Claims**



1. An adder cell for carry-save arithmetic, comprising an inverter (I1), an NAND Gate (NAND1) and an ORNAND Gate (ORNAND1), means connecting a first and a second sum operand input (A, B) to the NAND Gate (NAND1), means for connecting a carry input (C_i) to the inverter (I1), means connecting an output of the NAND Gate (NAND1) to an AND input of the ORNAND Gate (ORNAND1), means for connecting an output of the inverter (I1) to a first OR input of the ORNAND Gate (ORNAND1), a first circuit arrangment (SA1), means for connecting the first and second operand inputs (A, B) and the output of the NAND Gate (NAND1) to said first circuit arrangement (SA1), a second circuit arrangement (SA2), means for connecting the carry input and the output of the inverter (I1) to said second circuit arrangement (SA2); means for connecting a first output of said first circuit arrangement (SA1) to a second OR input of said ORNAND Gate (ORNAND1), and means for connecting a second, third and fourth output of the first circuit arrangement (SA1) to the second circuit arrangement (SA2); whereby an output of the second circuit arrangement (SA2) forms a sum output (S) and an output of the ORNAND Gate (ORNAND1) forms a carry output (C_0).

4,893,270

MEDICAL INFORMATION SYSTEM

Roger P. Beck, Reynoldsburg; Daniel L. Castagno, Pickerington; Robert B. Craig, Jr., Westerville; Timothy S. Davidheiser, Reynoldsburg; Allen W. Haley, Jr., Columbus; Stanley M. Huff, Westerville, and Russell P. Radigan, Johnstown, all of Ohio, assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 12, 1986, Ser. No. 862,094
Int. Cl.[4] G06F *15/16, 15/42*
U.S. Cl. 364—900 **16 Claims**

2. A medical information system (1) having a plurality of interconnected computer terminals (1000) each defined by station requirements file data (10015):

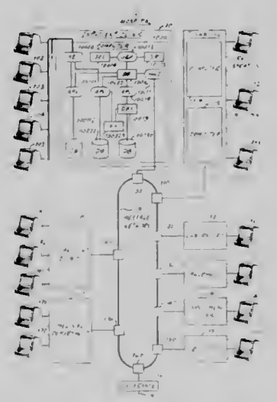
characterized in that

said medical information system comprises

means (10010, 10011, 10022) for entering record and medical data into one of the computer terminals and recording said record and medical data in forms files and medical data dictionary data bases (100112, 100222) of the computer terminal,

means (19, 10011, 10017, 10018, 10022) for accessing said recorded record and medical data at predetermined intervals of time and transmitting said accessed record and medical data to each of the interconnected computer terminals, and

means (10011, 10013, 10014, 10018, 10022) for modifying said transmitted record and medical data at each computer terminal in accordance with the computer terminal station requirements file data and recording said modified record and medical data in the computer terminal forms files and



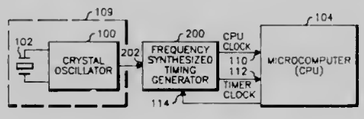
medical data dictionary data bases (100112, 100222) for use in entering patient data into a patient file data base (10030) of the computer terminal consistent with said station requirements file data and said modified record and medical data.

4,893,271

SYNTHESIZED CLOCK MICROCOMPUTER WITH POWER SAVING

Walter L. Davis, Plantation; Barry W. Herold, Lauderhill, both of Fla., and Wendell L. Little, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 842,056, Mar. 18, 1986, abandoned, which is a continuation of Ser. No. 549,954, Nov. 7, 1983, abandoned. This application Feb. 26, 1987, Ser. No. 18,761
Int. Cl.[4] G06F *1/04, 7/38*
U.S. Cl. 364—900 **23 Claims**



1. A microcomputer system capable of operating with minimum power comprising:

a central processing unit including means designating the predetermined clock pulse frequency requirements of the central processing unit for the immediate execution of programmable tasks;

stable frequency source producing timing pulses at a frequency less than the largest in magnitude of the predetermined clock pulse frequency requirements of the central processing unit; and

a frequency synthesizer coupled to and receiving timing pulses from said stable frequency source, said frequency synthesizer being coupled to said central processing unit for generating and supplying synthesized clock pulses to said central processing unit, said synthesizer including selecting means, responsive to said designating means, for selecting an output frequency of the synthesized clock

pulses equal to the predetermined clock pulse frequency requirements of said central processing unit;

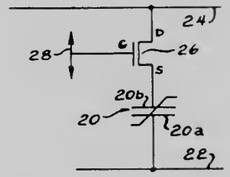
whereby the total power consumed by the elements of the microcomputer system is minimized by the operation of the stable frequency source at a frequency less than the largest in magnitude of the clock pulse frequency requirements of the central processing unit and the generation by the frequency synthesizer and supply of clock pulse frequencies to the central processing unit is no greater than that required for the immediate execution of programmable tasks.

4,893,272

FERROELECTRIC RETENTION METHOD

S. Sheffield Eaton, Jr.; Douglas Butler, and Michael Parris, all of Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Filed Apr. 22, 1988, Ser. No. 184,996
Int. Cl.[4] G11C *7/00, 11/22*
U.S. Cl. 365—145 **6 Claims**



1. A method of operating a ferroelectric capacitor having first and second electrodes with a ferroelectric dielectric therebetween to improve data retention therein comprising the steps of:

generating a write pulse;

coupling said write pulse to said first electrode of said capacitor via a switching device coupled to said first electrode; then disconnecting the write pulse from said first electrode by opening said switching device prior to terminating said write pulse, and then

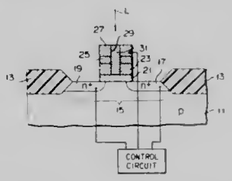
terminating said write pulse, whereby dipoles in said ferroelectric dielectric are maintained in an aligned position.

4,893,273

SEMICONDUCTOR MEMORY DEVICE FOR STORING IMAGE DATA

Toshiro Usami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1986, Ser. No. 842,193
Claims priority, application Japan, Mar. 28, 1985, 60-62102
Int. Cl.[4] G11C *11/40;* **H01L** *29/78*
U.S. Cl. 365—185 **9 Claims**



9. A memory device for storing image data including a memory cell comprising:

a semiconductor body;

a source region and a drain region formed in said semiconductor body;

a first gate insulating film formed on a channel region between said source and drain regions;

a floating gate electrode formed on said first gate insulating film;

a second gate insulating film formed on said floating gate electrode;

a control gate electrode formed on said second gate insulating film;

means for guiding light incident on said memory cell onto at least said channel region; and

means for applying a first predetermined voltage to said control gate electrode and applying a second predetermined voltage across said source and drain regions, thereby causing said floating gate electrode to accumulate therein electrons of electron-hole pairs generated in said channel region in accordance with an amount of light guided by said light guiding means, and causing said memory cell to store binary data therein based on a change in the threshold level of said memory cell corresponding to the amount of electrons accumulated in said floating gate electrode,

said first and second predetermined voltages being determined in accordance with a threshold level at which light conducted by said guiding means is determined to be present or absent, a high second predetermined voltage being applied across said source and drain regions to lower said threshold level and a low second predetermined voltage being applied across said source and drain regions to raise said threshold level,

wherein said light guiding means comprises means for guiding light onto said channel region through said first and second gate insulating films, said floating gate electrode, and said control gate electrode,

wherein said light guiding means comprises a light-transmitting material forming an optical path extending through said first and second gate insulating films, said floating gate electrode, and said control gate electrode, and

wherein said first gate insulating film comprises a light-transmitting material;

said floating gate electrode, said second gate insulating film, and said control gate electrode each has an opening therethrough in communication with each other; and

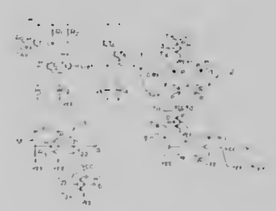
said light-transmitting material is disposed in said openings forming said optical path through said first gate insulating film.

4,893,274

SEMICONDUCTOR MEMORY DEVICE HAVING LEVEL CONVERTERS

Isao Fukushi, Yokohama, Japan, assignor to Fujutsu Limited, Kawasaki, Japan

Filed Oct. 24, 1988, Ser. No. 261,298
Claims priority, application Japan, Oct. 30, 1987, 62-273481
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189.04 **5 Claims**



1. A semiconductor memory device having a plurality of level converters, each of said plurality of level converters comprising:

a bridge circuit constituted by four MOS transistors having one type of conductivity, gates of one pair of said four transistors opposing each other receiving a first signal, gates of the other pair of said four transistors opposing each other receiving a signal complementary to said first signal;

a pair of complementary MOS inverter circuits to which a second signal and a signal complementary to said second signal are input, respectively, the outputs of said pair of inverter circuits being connected to a first pair of connecting points positioned alternately in said bridge circuit, respectively; and

a flip-flop circuit connected between a second pair of connecting points positioned alternately in said bridge circuit, to thereby output a third signal and a signal complementary to said third signal from said second pair of connecting points, respectively.

4,893,275

H1GH VOLTAGE SWITCHING CIRCUIT IN A NONVOLATILE MEMORY

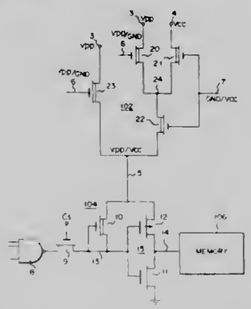
Sumio Tanaka; Shigeru Atsumi, both of Tokyo; Nobuaki Ohtsuka, and Keniti Imamiya, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,563

Claims priority, application Japan, Mar. 31, 1987, 62-78522

Int. Cl.[4] G11C *7/00;* **G05F** *3/16;* **H03K** *3/01*

U.S. Cl. 365—189.09 **3 Claims**



1. A nonvolatile semiconductor memory device with a power voltage select circuit, wherein said power voltage select circuit comprises:

first and second power source nodes;

third and fourth nodes;

an output node;

first and second depletion type MOS transistors having source-drain paths connected in series between said first power source node and said output node, the gates of said first and second depletion type MOS transistors being connected to said third node;

a third MOS transistor having a source-drain path connected between an interconnection point which is between the source-drain paths of said first and second depletion type MOS transistors and said second power source node, the gate of said third MOS transistor being directly connected to said fourth node; and

a fourth MOS transistor having a source-drain path connected between said second power source node and said output node, the gate of said fourth MOS transistor being directly connected to said fourth node.

4,893,276

OUTPUT CIRCUIT OF A STATIC RANDOM ACCESS MEMORY CIRCUIT

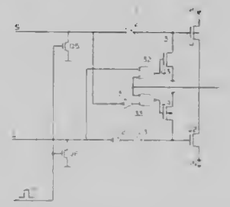
Hiroaki Okuyama, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Nov. 29, 1988, Ser. No. 277,195

Claims priority, application Japan, Dec. 3, 1987, 62-306345

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.08 **4 Claims**



1. An output circuit of a static random access memory comprising:

a memory cell block containing plural memory cells;

output control means for receiving internal data changed depending on the data in any one of said plural memory cells selected by an address signal;

data output means composed of P-channel and N-channel MOS FETs of which sources are connected to two supply potentials, in which an output signal of said output control means is applied to the gates of said P-channel and N-channel MOS FETs for on/off control, and an output potential at a connection point of the drains of said P-channel and N-channel MOS FETs is changed to a potential level corresponding to data in said selected memory cell; and

intermediate potential setting means for setting said output potential of said data output means to an intermediate potential between an immediately preceding output potential of said data output means and one of said supply potentials, after a transition of said address signal and before a change of said internal data, on the basis of said transition of said address signal and said output potential of said data output means, in which

said output control means changes said output potential of said data output means from said intermediate potential to a potential corresponding to data in said selected memory cell, after transition of said address signal and after change of said internal data.

4,893,277

SEMICONDUCTOR MEMORY

Kazuhiko Kajigaya, and Katsuyuki Sato, both of Gakuennishi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 878,072, Jun. 24, 1986, Pat. No. 4,780,852. This application Oct. 11, 1988, Ser. No. 255,314

Claims priority, application Japan, Jun. 26, 1985, 60-137733

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—203 **20 Claims**

1. A semiconductor memory comprising:

a plurality of memory arrays each including pairs of data lines, word lines intersecting said pairs of data lines, and memory cells respectively provided at the intersections between said pairs of data lines and said word lines, wherein each of said memory cells includes a MOSFET and a capacitor coupled to said MOSFET for storing data;

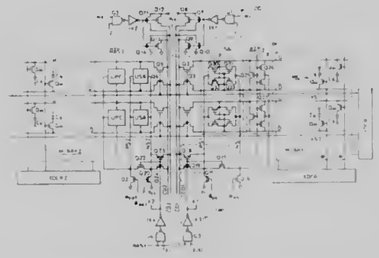
precharge means for precharging said pairs of data lines to a potential which is substantially medium between first and second potentials;

pairs of common data lines provided respectively corresponding to said memory arrays;

first switching means for connecting each of said pairs of common data lines to each of said pairs of data lines in the memory array which said switching circuit respectively corresponds to;

a plurality of word selecting means provided respectively corresponding to said memory arrays, wherein each of said word selecting means selects one of said word lines;

column selecting means provided in common with respect to said memory arrays, said column selecting means including means for connecting each of said pairs of common data lines respectively to one pair of data lines selected



from among said pairs of data lines in each of said memory arrays by means of said switching means on the basis of a common column selecting signal;

memory array selecting means for selecting one of said plurality of memory arrays so that a memory cell is selected by the respective operation of said column selecting means, said plurality of word selecting means, and said memory array selecting means; and

voltage supply means for supplying a potential having a substantially identical potential to said medium potential to a pair of common data lines corresponding to a memory array which is not selected by said memory array selecting means when said memory array selecting means selects one of said memory arrays.

4,893,278

SEMICONDUCTOR MEMORY DEVICE INCLUDING PRECHARGE/EQUALIZATION CIRCUITRY FOR THE COMPLEMENTARY DATA LINES

Akira Ito, Kunitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 60,334

Claims priority, application Japan, Jun. 13, 1986, 61-135909

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—203 **24 Claims**

1. A semiconductor memory device comprising:

a plurality of word lines and a plurality of complementary data line pairs;

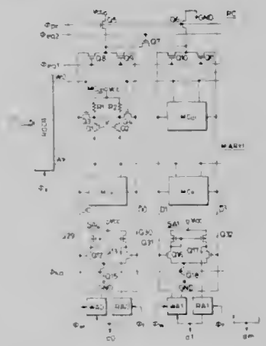
a plurality of memory cells coupled to said plurality of word lines and said plurality of complementary data line pairs forming a grid-like memory matrix arrangement wherein each memory cell is connected to a word line and to a complementary pair of data lines; and

a plurality of precharge circuit means for precharging a plurality of complementary data line pairs, each one of said precharge circuit means being coupled so as to precharge two adjacent pairs of said complementary data lines; and each precharge circuit means comprising:

means for supplying a first voltage to one pair of said two complementary data line pairs,

means for supplying a second voltage, different than said first voltage, to the other pair of said two complementary data line pairs, and

equalization means for effecting a short circuit between at least one data line of said one pair of said two complementary data line pairs and at least one data line of said other pair of said two complementary data line pairs wherein there is provided a substantially equal potential at each of the data lines of said two complementary data line pairs during a precharging mode of operation.



4,893,279

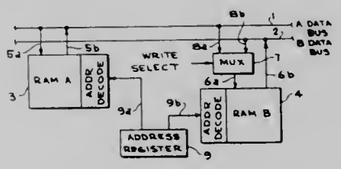
STORAGE ARRANGEMENT HAVING A PAIR OF RAM MEMORIES SELECTIVELY CONFIGURABLE FOR DUAL-ACCESS AND TWO SINGLE-ACCESS RAMS

Mahboob F. Rahman, Sunnyvale; Dakshesh D. Parikh, San Jose; Marita E. Daly, El Cerrito, and Bu-Chin Wang, Saratoga, all of Calif., assignors to Advanced Micro Devices Inc., Sunnyvale, Calif.

Continuation of Ser. No. 836,024, Mar. 4, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 309,976

Int. Cl.[4] G11C *7/00, 8/00;* **G06F** *12/00, 13/00*

U.S. Cl. 365—230.03 **7 Claims**



1. A memory arrangement having first and second storage modes for use with a digital signal processor comprising in combination,

(a) first and second data buses connected to said signal processor,

(b) first and second memories, each of which includes a plurality of addressable data storage locations,

(c) first transferring means connected between said first data bus and said first memory for transferring first data between said first memory and said first data bus during said first and second modes,

(d) second transferring means connected between said second second memory and said first and second data busses for

(1) transferring said first data from said first data bus to said second memory and from said second memory to said second data bus during said first mode, and

(2) transferring second data from said first data bus to said

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second memory and from said second memory to said second data bus during said second mode,

(e) addressing means connected to said memories for supplying addresses to said first and second memories, and

(f) control means, connected to said addressing means and said transferring means, operable in response to;

(1) a first mode signal to cause said first data on said first data bus to be simultaneously stored in corresponding locations of said first and second memories and subsequently during said first mode to be simultaneously transferred from said corresponding said locations to said first and second data busses, and

(2) a second mode signal to cause said first data and said second data from said first data bus to be stored in corresponding said locations of said first and second memories respectively during said second mode and subsequently transferred during said second mode to said first and second data busses, respectively.

7. A method for use with a digital signal processor to control the dual mode transfer of first and second operands between a memory storage system and a pair of data busses connected to said signal processor, said system including,

(A) first and second random access memories, each said memory having a,

(a) separate addressing means for addressing storage locations in said memory, and

(b) separate write and read cycles for transferring data between each said memory and said pair of data busses, and

(B) means connected to said separate addressing means for generating addresses for said separate addressing means, said method comprising the following combination of steps;

(1) storing one operand from one said data bus of said pair of data busses during one said mode in said first memory at a first said storage location and simultaneously the same said operand in said second memory at a said location corresponding to said first location by generating said write cycles simultaneously for said memories,

(2) simultaneously transferring during said one mode said one operand from said first memory and said same said operand from said second memory, to said pair of data busses by generaating said read cycles simultaneously for said memories,

(3) storing during a second said mode, first and second different operands from said one data bus, at said locations in said first and second memories by generating write cycles for said memories at different times corresponding to when said different operands are on said one data bus, and

(4) simultaneously transferring during said second said mode said first and second operands from said first and second memories respectively to said pair of data busses by generating said read cycles simultaneously for said first and second memories.

4,893,280

DUAL PORT RANDOM ACCESS MEMORY HAVING VARIABLY CUSTOMIZED ORGANIZATION OF MEMORY BIT UNITS

Tito Gelsomini, Rieti, and Pasqualino Fiorentino, Rome, both of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 26, 1988, Ser. No. 148,457
Claims priority, application Italy, Feb. 27, 1987, 47682 A/87
Int. Cl.[4] G11C *8/00, 7/00;* **G06F** *7/50, 11/00*
U.S. Cl. 365—230.05 **8 Claims**

1. A dual port random access memory having a variably customized organization of memory bit units, said random access memory comprising:

a memory array having a plurality of memory cells arranged in a matrix;

first and second data ports;

said first data port having a plurality of input/output terminal pins connected to input/output lines coupled to said memory array, said first data port also having a first plurality of address pins coupled to corresponding address lines;

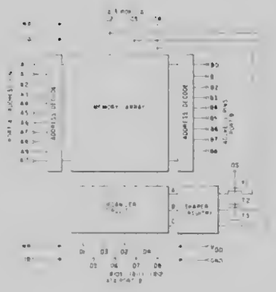
said second data port having a plurality of input/output terminal pins connected to input/output lines coupled to said memory array, said second data port also having a second plurality of address pins coupled to corresponding address lines;

at least one of said first and second data ports being organizable to provide for a variable number of operable input-/output terminal pins and input/output lines for accommodating sets of data bits of a variable number of bits in length and a variable number of address pins and address lines;

a first address decoder interposed between said first plurality of address lines and said memory array and respectively coupled thereto;

a second address decoder interposed between said second plurality of address lines and said memory array and respectively coupled thereto;

said organizable data port including said plurality of address



pins providing a set of address pins for application of address signals thereto and n data input/output pins connected to n input/output lines;

memory organizer means interposed between said memory array and said organizable data port, said memory organizer means being connected to said n data input/output pins of said organizable data port via said n input/output lines and to said memory array;

means driving said memory organizer means by a selected number of signals numbering from one up to m number of signals to enable respective sets of bits comprising a variable number of bits for access to said memory array through selected sets of input/output terminal pins of said organizable data port, wherein each set of input/output terminal pins is comprised of a number of terminal pins different from the number of terminal pins in another set; and

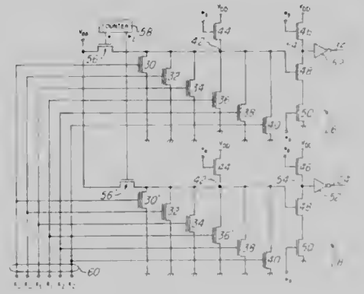
said n data input/output pins of said organizable data port being convertible up to a corresponding number m thereof to be organized into a corresponding number m of additional address pins with respect to said organizable data port in dependence upon the driving of said memory organizer means by a selected number of signals.

4,893,281

SEMICONDUCTOR MEMORY SYSTEM WITH PROGRAMMABLE ADDRESS DECODER

Masashi Hashimoto, Inashiki, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 25, 1986, Ser. No. 911,926
Claims priority, application Japan, Oct. 8, 1985, 60-225738
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—230.06 **12 Claims**



1. A memory system comprising:

a memory array addressed by a first portion of an address signal;

a first address decoder for generating an output address for said memory array in correspondence to said first portion of said address signal, the first address decoder being programmable and including switches having programmable threshold values, whereby said first address decoder produces a predetermined memory address in response to predetermined addresses represented by said first portion of said address signal;

means for selectively changing the threshold value of said switches to program said first address decoder;

a second address decoder for generating an output in correspondence to a second portion of the address signal; and

an address select detection circuit responsive to the outputs of said first and second address decoders for enabling and disabling an associated active device based on the outputs of said first and second address decoders.

4,893,282

SEMICONDUCTOR MEMORY DEVICE

Tomohisa Wada, and Hirofumi Shinohara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 809,173, Dec. 16, 1985, abandoned.
This application Dec. 7, 1987, Ser. No. 133,153
Claims priority, application Japan, Feb. 26, 1985, 60-39601
Int. Cl.[4] G11C *8/00, 11/40*
U.S. Cl. 365—233.5 **7 Claims**

1. A semiconductor static memory device having a plurality of memory cells comprising:

means for receiving an externally generated, chip selection signal;

first pulse signal generating circuits corresponding to a plurality of address signals designating the addresses of said memory cells for generating selectively a first pulse signal in response to a level change in a corresponding address signal, said chip selection signal being independent of said address signals;

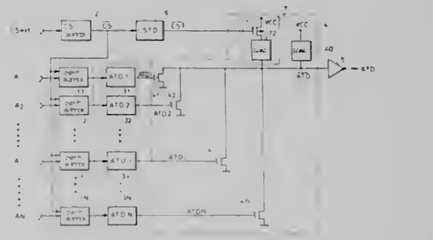
logic circuit means responsive to any of said first pulse signals generated by said first pulse signal generating circuits for generating an output signal to access an addressed one of said memory cells,

a second pulse signal generating circuit for generating a second pulse signal in response to a level change in the chip selection signal, and

a speed control circuit operative in response to said second pulse signal generated by said second pulse signal generating circuit to reduce a response time of said logic circuit means to access the addressed memory cell, wherein

said logic circuit means comprises

a plurality of MOS field-effect transistors respectively provided with gates connected to the outputs of said plurality of first pulse signal generating circuits, sources thereat



connected to a ground potential and drains thereat connected together,

a first load device connected between a power supply potential and said commonly connected drains of said plurality of MOS field-effect transistors, and

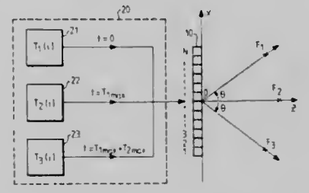
a second load device connected between said power supply potential and said commonly connected drains of said plurality of MOS field-effect transistors, said second load device being controlled by said second pulse signal from said second pulse signal generating circuit.

4,893,283

ECHO ULTRASOUND SYSTEM WITH AN IMPROVED IMAGE SEQUENCE RATE

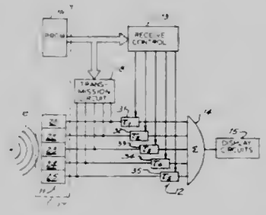
Patrick R. Pesque, Perigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,612
Claims priority, application France, Dec. 30, 1987, 8718387
Int. Cl.[4] G03B *42/06*
U.S. Cl. 367—7 **2 Claims**



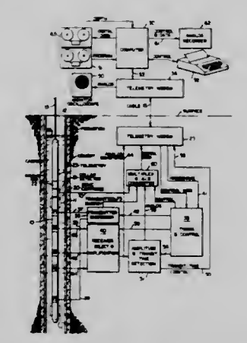
1. In an echo ultrasound imaging system of the type which comprises an array of transducer elements, emission means connected to the array for transmission of ultrasound, and receiving means connected to the array for simultaneous reception of a plurality, M, of focussed ultrasound echo beams from M different directions; the improvement wherein the emission means sequentially transmit M beams in said M different directions and the receiving means simultaneously receive echoes from said M beams.

4,893,284
CALIBRATION OF PHASED ARRAY ULTRASOUND PROBE
Mark G. Magrane, Redmond, Wash., assignor to General Electric Company, Milwaukee, Wis.
Filed May 27, 1988, Ser. No. 199,893
Int. Cl.[4] H04B *11/00*
U.S. Cl. 367—12 **9 Claims**



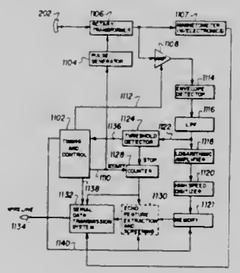
1. A transducer probe assembly comprising:
a plurality of ultrasonic transducers arranged in an array;
means for storing correction values corresponding to time delay . errors inherent in said transducers;
assembly means for carrying said transducers and said correction means; and
conductor means coupled to said transducers and said correction value storing means and carried by said assembly means for permitting said transducers and said correction value storing means to be electrically connected to an ultrasound system.

4,893,285
METHOD AND APPARATUS FOR CEMENT BOND TOOL
Jean P. H. R. M. Masson, Garches, France; Lee H. Gollwitzer, and Robert A. Lester, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Continuation of Ser. No. 119,443, Nov. 12, 1987, abandoned, which is a division of Ser. No. 394,395, Jul. 1, 1982, Pat. No. 4,757,479. This application May 12, 1988, Ser. No. 195,443
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—35 **25 Claims**



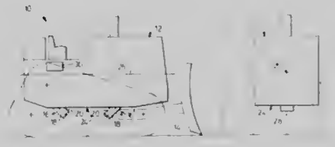
1. A method for obtaining a measure of the quality of a cement bond relative to a casing in a borehole comprising the steps of:
establishing a well tool having two longitudinally spaced acoustic transmitters and at least two longitudinally spaced acoustic receivers disposed between said acoustic transmitters with a transmitter-to-receiver spacing to normally provide for a measurable signal-noise-ratio, the arrival of a casing signal prior to the arrival of a formation signal and to tolerate eccentring of as much as 0.3 inches;
moving the tool through the cased borehole;
repetitively energizing said acoustic transmitters to apply acoustic energy into the casing surrounding said well tool;
detecting at said receivers energy from a first of said transmitters arriving at said receivers by way of said casing;
detecting at said receivers acoustic energy arriving by way of said casing from a second of said transmitters following the firing of said first transmitter;
for each of the foregoing generations and detections, measuring the peak amplitude of a portion of the acoustic casing signals detected at each of said receivers, said portion being selected based on the expected first energy arrival at the respective receiver;
obtaining a ratio of the peak amplitudes associated with the firing of said first transmitter;
obtaining a ratio of the peak amplitudes associated with the firing of said second transmitter;
combining said ratios to produce a function representative of the attenuation of acoustic energy travelling through the casing; and
recording said attenuation as a function of tool position in the borehole.

4,893,286
SYSTEM AND METHOD FOR PREPROCESSING AND TRANSMITTING ECHO WAVEFORM INFORMATION
Wesley N. Cobb, University Heights, Ohio, assignor to Standard Oil Company, Cleveland, Ohio
Filed Nov. 4, 1987, Ser. No. 116,309
Int. Cl.[4] G01S *15/02*
U.S. Cl. 367—87 **14 Claims**



1. A method for preprocessing and transmitting echo waveform information derived from an echo of an acoustic wave reflected from a target surface, comprising the steps of:
digitizing an echo waveform produced in response to a launching of an acoustic wave;
detecting amplitude of said echo waveform;
continuously storing said digitized echo waveform in a recirculating memory;
freezing information stored in said recirculating memory during a predetermined time period beginning after the detected amplitude of said echo waveform rises above a predetermined threshold;
measuring a time interval between said launching of the acoustic wave and the rise of said detected amplitude of said echo waveform above said predetermined threshold; and
multiplexing the time interval measured in said measured step and the waveform information frozen in said recalculating memory in said freezing step for transmission to a location remote from said acoustic wave.

4,893,287
VELOCITY REFERENCE SYSTEM
Kenneth L. Stratton, Chillicothe, and Ali A. Bitar, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Dec. 17, 1987, Ser. No. 134,418
Int. Cl.[4] G01S *9/66*
U.S. Cl. 367—91 **24 Claims**



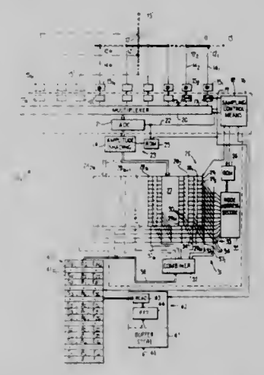
1. A velocity reference system for measuring the speed and distance travelled of a vehicle moving in a direction relative to a surface by means of ultrasonic wave Doppler shifts, said vehicle having a longitudinal axis extending in the direction of vehicle travel, said apparatus comprising:
a first sensing unit adapted to transmit and receive sonic wave energy having a first preselected frequency, said first sensing unit being responsive to received sonic wave energy having a first predetermined bandwidth about said first preselected frequency;
a second sensing unit adapted to transmit and receive sonic wave energy having a second preselected frequency, said second sensing unit being responsive to received sonic wave energy having a second predetermined bandwidth substantially non-overlapping said first bandwidth about said second preselected frequency;
said first sensing unit being adapted for mounting on the vehicle along said longitudinal axis and positioned to transmit sonic wave energy generally downwardly toward the surface, aligned along the longitudinal axis, and generally in the direction of vehicle travel, a portion of said transmitted wave energy being reflected by the surface and received by said first sensing unit;
said second sensing unit being adapted for mounting on the vehicle along the longitudinal axis spaced apart from said first sensing unit and positioned to transmit sonic wave energy generally downwardly toward the surface, aligned along the longitudinal axis, generally towards said first sensing unit and in a direction opposed to vehicle travel, a portion of said transmitted wave energy being reflected by the surface and received by said second sensing unit; and
digital processing means for determining the speed and distance travelled of said vehicle relative to the surface in response to a Doppler shift of said received sonic wave energy.

4,893,288
AUDIBLE ANTENNA ALIGNMENT APPARATUS
Gerhard Maier, Dauchingen, and Veit Armbruster, St. Georgen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany
PCT No. PCT/EP87/00740, § 371 Date Aug. 26, 1988, § 102(e) Date Aug. 26, 1988, PCT Pub. No. WO88/04478, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 28, 1987, Ser. No. 246,541
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641310
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 367—116 **2 Claims**

1. A system for aligning an antenna comprising: means for producing a voltage dependent on alignment; a voltage-to-frequency converter for converting said voltage into a converted signal having a frequency within the audible range and being inversely proportional to said voltage; a switching stage with a control input, said converted signal being applied in form of a switching signal to said control input; said switching stage having an input and an output; an oscillator having an output signal switched over to said input of said switching stage at a constant frequency within the audible range, groups of pulses in said output signal from said oscillator being obtainable at said output of said switching stage in synchronization with said converted signal from said voltage-to-frequency converter, said voltage having a relatively low value when said antenna is substantially misaligned, said converted signal from said converter having a relatively high frequency when said antenna is substantially misaligned and said voltage has a relatively low value; said voltage having a relatively high value when said antenna is in substantial alignment, said converted signal from said converter having a relatively low frequency when said antenna is in substantial alignment and said voltage has a relatively high value, said converted signal being audible to an operator and having a substantially zero frequency sensed easily by said operator when said antenna is in alignment.



4,893,289
PRODUCTION OF DIRECTIONALLY LIMITED ACOUSTIC POWER SPECTRA
Michael J. Greenwood, Dean Head Farm, Huddersfield Rd., Delph, Oldham, and David P. J. Coughtrie, 5 Darwin Grove, Bramhall, Cheshire, both of England
Filed Mar. 9, 1988, Ser. No. 165,801
Claims priority, application United Kingdom, Mar. 21, 1987, 8706781
Int. Cl.[4] H04D *1/06*
U.S. Cl. 367—136 **20 Claims**



1. Apparatus for providing a plurality of acoustic power spectra, all defined over a predetermined frequency band from acoustic signals received in a predetermined time interval, for individually identifiable directions, comprising
(i) an array of microphone elements fixedly disposed in relation to each other substantially in a measurement plane,
(ii) sampling means operable to define a succession of sampling periods throughout the predetermined time interval and for each sampling period to sample the acoustic signals received by the array elements,

(iii) array sample storage means having readable storage locations operable to store for each array element each signal sample and the samples of a plurality of immediately preceding sampling periods,

(iv) directed beam forming means operable to define for each beam direction relative delays between array element signals characteristic of the reception beam direction in terms of the sampling period and storage locations at which the samples have been stored with the appropriate delays and for at least some of the sampling periods read the stored samples at locations corresponding to the relative delays associated with the beam directions and combine the read samples to give directed beam samples associated with the individual sampling periods for each of the beam directions,

(v) directed beam sample storage means operable to store directed beam samples to form, for each beam direction, for sampling periods extending over at least a part of the predetermined interval a set of directed beam samples, and

(vi) analysis means operable at the end of the predetermined interval to determine from each set of directed beam samples the acoustic power spectrum of the signals received from the direction associated with the set.

4,893,290

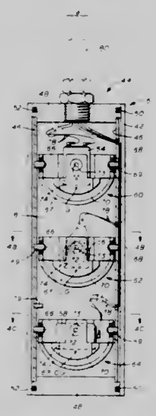
THREE-AXIS SENSOR

William O. McNeel; James A. Sackett; Joe N. Wood, all of Houston, and Julian Soliz, III, Pearland, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 924,679, Oct. 29, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 260,693

Int. Cl.[4] G01V *1/00*

U.S. Cl. 367—178 **20 Claims**



1. An apparatus for detecting seismic signals along orthogonal axes, consisting essentially of:

(a) a housing having a longitudinal axis;

(b) at least two gimbals located within the housing, the gimbals providing two degrees of rotational freedom perpendicular to the longitudinal axis of the housing, each gimbal having an outer table pivotally coupled to the housing perpendicular to the longitudinal axis thereof to define a first pivot axis, and an inner table pivotally coupled to the outer table at a right angle to the first pivot axis to define a second pivot axis, the first pivot axis of each gimbal is contained in a common plane passing through the housing and contains the longitudinal axis of the housing; and

(c) at least two seismic sensors disposed within the housing, each having an axis of sensitivity to the seismic signals and each suspended within the housing by one of said gimbal, the sensors oriented such that their axes of sensitivity are orthogonal to each other, and remain orthogonal with the longitudinal axis of the housing inclined from a horizontal.

4,893,291

DEVICES FOR AIDING RESYNCHRONIZATION OF BODY CLOCKS

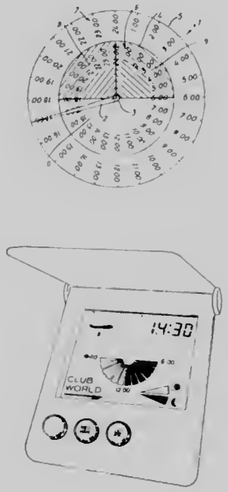
Peter A. Bick, Fife, and Christine J. Kinnell, Edinburgh, both of Scotland, assignors to Jet-R Limited, Edinburgh, Scotland

Filed Aug. 26, 1988, Ser. No. 236,970

Claims priority, application United Kingdom, Aug. 29, 1987, 8720477

Int. Cl.[4] G04B *47/00, 19/22*

U.S. Cl. 368—10 **15 Claims**



1. A device for aiding resynchronisation of a personal body clock of a traveller, said device comprising a first data series representing the personal body time of the traveller and a second data series representing local time at the destination of the traveller, both said data series having representations of twenty-four hours and being displaceable with respect to each other, the mutual displacement of the data series being carried out with reference to the time of the departure of the traveller and the duration of the journey of the traveller, a readable display for indicating a procedure to resynchronise the personal body clock of the traveller upon said mutual displacement, said procedure comprising controlling exposure of the body of the traveller to daylight.

4,893,292

ELECTRONIC WATCH MOVEMENT COMPRISING TIME DISPLAY MEANS HAVING INDICATOR HANDS

Willy Cleusix, Le Landeron, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

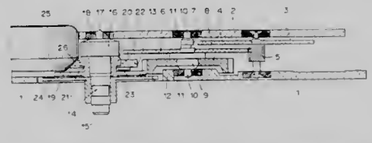
PCT No. PCT/CH87/00094, § 371 Date Apr. 6, 1988, § 102(e) Date Apr. 6, 1988, PCT Pub. No. WO88/01071, PCT Pub. Date Feb. 11, 1988

PCT Filed Aug. 3, 1987, Ser. No. 181,294

Claims priority, application Switzerland, Aug. 7, 1986, 03176/86

Int. Cl.[4] G04B *37/00, 19/02*

U.S. Cl. 368—88 **13 Claims**



1. An electronic watch movement comprising a bottom-plate having a central opening, a cell, time display means having indicator hands, a motor and a gear-train connecting the motor to the indicator hands, said gear-train including an intermediate gear, a center gear having a shaft and having a wheel and a pinion solid with said shaft, a minutes gear and an hours wheel, having a pipe, rotatably mounted on said shaft directly over the wheel of said center gear, the wheel of said center gear meshing with teeth on said intermediate gear and extending over said cell, and the central opening in said bottom-plate having a diameter larger than that of the pinion of said center gear.

4,893,293

METHOD FOR OPERATING MULTIDISK PLAYER

Fumio Endo; Toshiyuki Kimura, and Yoshio Aoyagi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 164,027, Mar. 4, 1988, abandoned. This application Dec. 21, 1988, Ser. No. 296,386

Claims priority, application Japan, Mar. 4, 1987, 62-47788; Mar. 4, 1987, 62-47789; Mar. 4, 1987, 62-47792

Int. Cl.[4] G11B *17/22*

U.S. Cl. 369—34 **2 Claims**



1. A method for detecting the presence or absence of a disk in at least one of plural trays in a magazine set into a disk player, comprising the steps of:

detecting when said magazine has been set in said disk player;

conveying said trays one at a time from said magazine to a playing position in response to detection of said magazine in said detection step;

detecting for each tray thus conveyed whether or not a disk is on said tray; and

ejecting said magazine when no disk is detected.

4,893,294

DISK PLAYER AND DISK-PLAYING METHOD IN WHICH TRACKING MISS TOLERANCE IS ADJUSTED

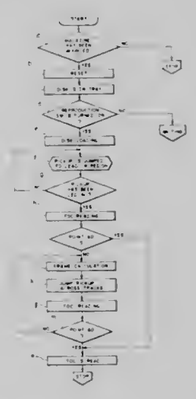
Toshiyuki Kimura; Yoshio Aoyagi, and Fumio Endo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 164,353, Mar. 4, 1988. This application Oct. 5, 1988, Ser. No. 253,473

Claims priority, application Japan, Mar. 4, 1987, 62-47790; Mar. 4, 1987, 62-47791; Mar. 4, 1987, 62-47793; Mar. 4, 1987, 62-47794

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **12 Claims**



1. A disk playing method for a disk player, comprising the steps of:

detecting a tracking miss that is not within a predetermined tolerance; and

varying said predetermined tolerance in an amount corresponding to a difference between an address actually read and an expected address used in said tracking miss detection according to a frequency of occurrence of said tracking miss.

4,893,295

FRONT LOADING DISK PLAYER

Ryo Matsuura; Nobuyuki Isobe, and Masao Kase, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 60,699, Jun. 11, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 284,836

Claims priority, application Japan, Jun. 11, 1986, 61-135241; Jun. 11, 1986, 61-135242

Int. Cl.[4] G11B *17/04, 25/04*

U.S. Cl. 369—75.2 **7 Claims**

1. A front loading disc player, comprising:

a housing;

play means including a turntable;

a carrier for carrying a disc to be played; and

projection/accommodation means for moving said carrier so as to project/accommodate said carrier out-of/into said housing, said projection/accommodation means including moving members movably provided within said housing, means for applying a driving force to said moving members, and carrier moving means for moving said carrier in a horizontal direction and a vertical direction in response to the movement of said moving members in a horizontal direction, said carrier moving means including a speed multiplier mechanism for moving said carrier at a higher rate of speed than that of said moving members as said

moving members move in a horizontal direction, said speed multiplier mechanism being connected with said



carrier in the middle of the movement of said moving members in the horizontal direction.

4,893,296

OPTICAL PICKUP DEVICE

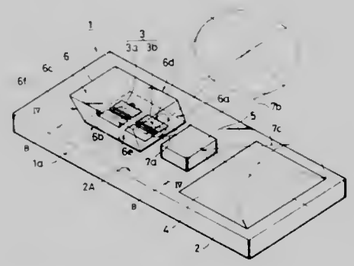
Yoshiyuki Matsumoto; Hidehiro Kume; Koji Mitsumori; You Yoshitoshi, all of Tokyo; Etsufumi Yamamoto, Kanagawa, and Hiroshi Oinoue, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,915

Claims priority, application Japan, Jul. 30, 1987, 62-190788

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—112 **14 Claims**



1. An optical pickup device comprising:

(a) a substrate;

(b) a semiconductor laser element mounted on said substrate;

(c) a photo detector for receiving a laser beam emitted from said semiconductor laser element formed on said substrate;

(d) an optical path branching optical element fixed to said substrate on said photo detector and of which the face opposing said semiconductor laser element is formed as an inclined face on which is deposited a semitransparent reflection film; and

(e) preventing means provided on said optical element for preventing, of laser beams incident on said optical element, reflected and/or scattered laser beams within said optical element from being introduced into said photo detector.

4,893,297

DISC-SHAPED MEMBER

David P. Gregg, Culver City, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 812,158, Jul. 1, 1977, Pat. No. 4,819,223, Continuation of Ser. No. 571,259, Apr. 24, 1975, abandoned, Continuation of Ser. No. 735,007, Jun. 6, 1968, abandoned. This application Mar. 8, 1989, Ser. No. 320,534

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—275 **17 Claims**



1. A disc-shaped member, comprising:

a major surface having a planar surface area and a plurality of spaced-apart, elongated, discrete surface indicia integral with said planar surface area and extending away from the plane of said planar surface area, wherein:

said discrete surface indicia are sequentially arranged in a plurality of substantially parallel information tracks;

adjacent surface indicia along each track are separated by interval portions of said planar surface area;

said parallel information tracks are separated by intertrack portions of said planar surface area;

said intertrack portions and said interval portions together define said planar surface area;

said discrete surface indicia have substantially uniform widths defining the width of said information tracks;

said intertrack portions between adjacent information tracks have substantially uniform widths; and

said discrete surface indicia have variable lengths to represent stored information.

4,893,298

RECORD-CARRIER BODY PROVIDED WITH A RELIEF STRUCTURE OF OPTICALLY DETECTABLE SERVO-TRACK PORTIONS AND SECTOR ADDRESSES AND APPARATUS FOR FORMING SAID STRUCTURE

Johannes H. T. Pasman, and Nicolaas C. J. A. Van Hijningen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1985, Ser. No. 735,005

Claims priority, application Netherlands, Jan. 22, 1985, 8500153

Int. Cl.[4] G11B *7/24, 7/26*

U.S. Cl. 369—275 **7 Claims**

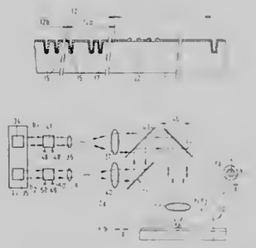
1. A record-carrier body for recording information thereon with a write beam of radiation, said record carrier body comprising:

a planar substrate provided with a plurality of elongated, generally parallel servo tracks which are separated from each other in a direction normal to the longitudinal direction thereof by lands extending there-between, said lands having a flat surface which is coplanar with the surface of said substrate;

a recording layer disposed on said surface of said lands, said recording layer being modifiable by the write beam incident thereon so as to enable information to be recorded on said lands;

said lands having sector addresses spaced along the length thereof so as to define segments therebetween, each sector address being associated with a respective adjacent segment and containing an address of that segment, each sector address being comprised of first areas which are detectable by a beam of radiation, which first areas are spaced from each other in the longitudinal track direction by intermediate areas and which first areas have a first phase depth; said servo tracks having a second phase depth which is different from said first phase depth and being adapted to be scanned by a beam of radiation so as to derive therefrom a signal for correcting the position of





the write beam during recording of information on said lands; and

said servo tracks having a maximum width transverse to the longitudinal track direction which is at least 60% of the track period, such maximum width also being at least twice the maximum width of said first areas transverse to the longitudinal track direction.

4,893,299

MAGNETO-OPTIC DATA STORAGE TECHNIQUE

Victor C. Humberstone, 22, Greenfield Close, Stapleford, Cambridgeshire, United Kingdom CB3 6RP; Robert M. Pettigrew, Pound Cottage, High Street, Foxton, Cambridgeshire, United Kingdom CB2 6RP, and Peter R. Helfet, 5 Meadow Drive, London, United Kingdom (NW4 1SD)

Filed Dec. 28, 1984, Ser. No. 688,915

Claims priority, application United Kingdom, Apr. 28, 1983, 8311691; Nov. 9, 1983, 8329859

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—275 **7 Claims**



1. An optical data storage medium for use in an optical read/write system using an optical read radiation of wavelength W, comprising:

a medium including a region which carries a surface texture including raised areas and depressed areas which are disposed in a regular array with a period (pitch) measured transversely to the mean surface level of not greater than W and a depth (peak-to-trough) in the range 10 to 1,000 nanometers, and wherein the medium comprises (a) a substrate, and (b) a regular array of zones of a magneto-optic material disposed at least over the peaks and troughs of said surface texture and conforming thereto; and

the texture of the surface being in the form of a series of alternate grooves and ridges which are substantially parallel and are in the form of concentric rings or concentric spirals.

4,893,300

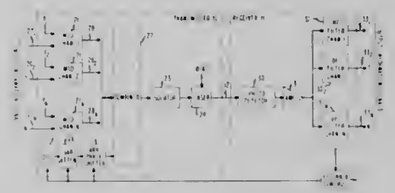
TECHNIQUE FOR REDUCING DISTORTION CHARACTERISTICS IN FIBER-OPTIC LINKS

James W. Carlin, Holmdel; Anthony C. Chipaloski, Howell, and Robert P. Schloss, East Brunswick, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 1, 1988, Ser. No. 226,697

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—3 **10 Claims**



1. A lightwave transmitter for suppressing intermodulation products in a lightwave frequency division multiplexed (FDM) transmitter output signal, the transmitter comprising:

means for receiving an electrical FDM information signal comprising a plurality of N channel information signals disposed in separate non-overlapping portions of a predetermined FDM channel frequency band,

means for providing an electrical intermodulation product suppression signal comprising a tone which is (1) at a predetermined power level above the power level of the channel information signals in the electrical FDM information signal, and (2) disposed outside of the predetermined FDM channel frequency band at a frequency that causes minimal intermodulation products to be formed within the predetermined FDM channel frequency band;

combining means for combining (1) the electrical FDM information signal from the receiving means, and (2) the electrical intermodulation suppression signal from the providing means to generate a combined resultant FDM output signal; and

means for generating a predetermined lightwave carrier, the generating means being responsive to the combined resultant FDM output signal from the combining means for intensity modulating the lightwave carrier to generate the lightwave FDM transmitter output signal.

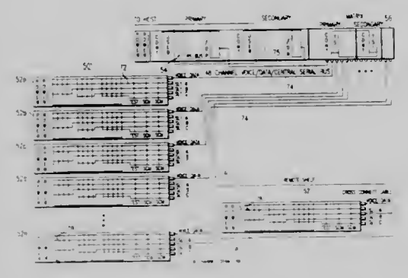
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4,893,301

AUTOMATIC CALL DISTRIBUTION (ACD) SWITCHING SYSTEM HAVING DISTRIBUTED PROCESSING CAPABILITY

Gerald W. Andrews, Colleyville; William E. Dunnigan, Garland; E. Fletcher Haselton, Irving, and William J. Redwood, Coppell, all of Tex., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 211,589, Jun. 27, 1988, Pat. No. 4,840,570. This application Jul. 29, 1988, Ser. No. 226,229
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58.2 **18 Claims**



1. An automatic call distribution (ACD) switching system having a switch control module for controlling a timeslot interchange switch to selectively connect one of a plurality of telephone trunks to one of a plurality of agent workstations, comprising:

a plurality of agent/trunk interface circuits for interfacing the telephone trunks to the agent workstations;

a backplane having a timeslot serial bus connected to the timeslot interchange switch, and a non-timeslot serial bus;

a first line interface module (LIM) supported on the backplane and having a shelf control module (SCM) and a plurality of carrier cards connected to the timeslot serial bus and the non-timeslot serial bus, the carrier cards having means for supporting one or more of the agent/trunk interface circuits;

control means supported on each carrier card an responsive to a call processing request for service at a first agent/-trunk interface circuit on the carrier card for generating a data packet and transmitting the data packet over the non-timeslot serial bus to the shelf control module, the call processing request for service requiring the first agent/-trunk interface circuit be connected to a second agent/-trunk interface circuit; and

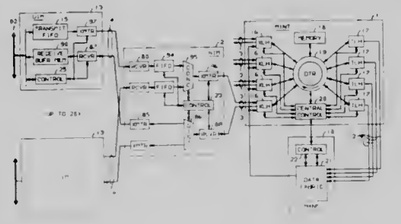
control means supported on the shelf control module for receiving the data packet from the carrier card and in response thereto transmitting control information to the switch control module to enable the switch control module to direct the timeslot interchange to establish a connection between the first agent/trunk interface circuit and the second agent/trunk interface circuit.

4,893,302

ARRANGEMENT FOR SWITCHING CONCENTRATED TELECOMMUNICATIONS PACKET TRAFFIC

Jayant G. Hemmady, Naperville; Michael J. Knudsen, Wheaton; William P. Lidinsky, Naperville; Robert K. Nichols, Glen Ellyn; Gaylord W. Richards, Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville; Ronald C. Weddige, Western Springs, and Bruce R. Zelle, Naperville, all of Ill., assignors to Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,698
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **7 Claims**



1. A data distribution means for switching data packets from a plurality of inputs to a plurality of outputs connectable to another switching network, comprising:

memory control means for concurrently loading data from each of said plurality of inputs to a memory and unloading data from said memory to each of said plurality of outputs; and

processing means;

wherein said memory control means loads said memory in parallel from said plurality of inputs and unloads said memory in parallel to said plurality of outputs;

wherein said processing means comprises means for controlling said memory control means for chaining groups of data packets addressed to a common output of said another switching network; and

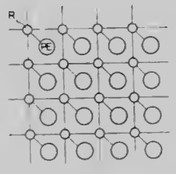
wherein said processing means comprises means for controlling said memory control means for unloading of each of said groups of chained data packets in one sequence from said memory to one of said plurality of outputs.

4,893,303

METHOD AND APPARATUS FOR PARALLEL COMPUTATION

Sadao Nakamura, Yamato, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 2, 1988, Ser. No. 266,152
Claims priority, application Japan, Nov. 11, 1987, 62-284747
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **8 Claims**



1. An apparatus for parallel computation which processes information represented in forms of message packets, a first of

which contains an address of an ultimate destination of a message while the remaining of which do not contain said address, said apparatus comprising a multiplicity of processing units interconnected together, each of said processing units comprising:

processing element means for processing information; and

router means for controlling transfer of said message packets in and out of said processing element means,

said router means including:

means for deciding a route in which a first outgoing message packet of said message is to be transferred from said router means to another router means in accordance with the ultimate destination of said message and the operational conditions of neighboring router means;

routing table means for recording said route decided by said deciding means; and

means for transferring all said message packets of said message in accordance with said route recorded in said routing table means.

4,893,304

BROADBAND PACKET SWITCH WITH COMBINED QUEUING

James N. Giacopelli, Flanders, N.J., and Morgan Littlewood, Middle Park, Australia, assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 2, 1988, Ser. No. 240,748
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **20 Claims**

1. A packet switch comprising:

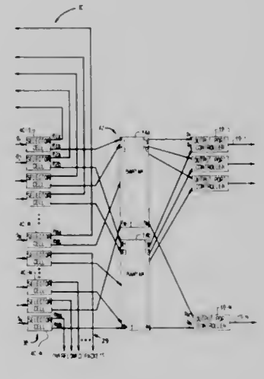
a plurality of inputs and a plurality of outputs,

a sorting network connected to said inputs for sorting data packets to be routed through said switch,

a trap network connected to said sorting network for identifying said data packets as exiting packets or recirculating packets,

a plurality of recirculation loops connected to at least some of said inputs,

a plurality of distinct routing networks for providing a plurality of routing paths to each of said plurality of outputs, and



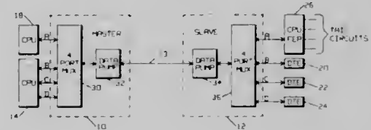
a selector network for applying said identified recirculating packets to said recirculation loops and said identified exiting packets to said routing networks.

4,893,305

INBAND DYNAMIC PORT ALLOCATION

Raul F. Fernandez, Miami, and Ignacio Urbieta, Jr., Miami Lakes, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Mar. 31, 1988, Ser. No. 175,871
Int. Cl.[4] H04J *3/22*; H04B *1/38*; H04L *5/16*
U.S. Cl. 370—84 **20 Claims**



1. In a multi-port modem, a method of allocating bandwidth from a donor port which is idle to a recipient port which is to have its bandwidth allocation increased without interrupting other ports in said modem, said multi-port modem being of the kind that transmits and receives data to and from a plurality of

ports including said donor and recipient ports over a transmission medium using time division multiplexing so that each port uses one or more time slots for data transmission, and wherein the data are transmitted over said transmission medium, the method comprising the steps of:

transmitting a code over said donor port time slot to signify that said donor port is idle;

coordinating a change in transmission rate of said recipient port by transmitting a handshaking protocol over the time slots of said idle donor port and said recipient port; and

reconfiguring said multi-port modem to allocate the bandwidth of said donor port to said recipient port without interruption of said other ports.

4,893,306

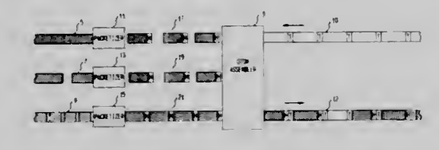
METHOD AND APPARATUS FOR MULTIPLEXING CIRCUIT AND PACKET TRAFFIC

Hung-Hsiang J. Chao, Madison; Sang H. Lee, Bridgewater, and Liang T. Wu, Gladstone, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 10, 1987, Ser. No. 118,977

Int. Cl.[4] H04J *3/16, 3/26*

U.S. Cl. 370—94.2 **7 Claims**



1. A method for simultaneously transmitting data from sources having different bit rates in a telecommunication network comprising the steps of:

generating a bit stream comprising a sequence of frames, each of said frames including a transmission overhead field containing frame timing information and an empty payload field, and

filling the empty payload fields in said frames with data in packetized format from a plurality of sources which have access to the bit stream including circuit or packet sources, such that data in packetized format from any of said sources is written into any available empty payload field of any of said frames for transmitting data from each of said sources at its own desired bit rate via said bit stream and for transmitting data from said plurality of sources simultaneously via said bit stream.

4,893,307

METHOD AND APPARATUS FOR LINKING SNA TERMINALS TO AN SNA HOST OVER A PACKET SWITCHED COMMUNICATIONS NETWORK

Douglas B. McKay, Potomac; Richard M. Morten, Gaithersburg, and Michael P. Marsili, Middletown, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,545

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—94.1 **25 Claims**

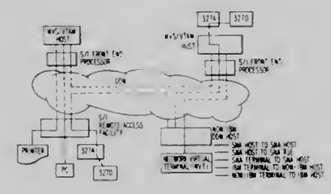
1. A data communications system for establishing a communications path from an SNA host computer over a packet switched network to an SNA terminal, comprising:

a front end processor having a first SNA interface means coupled to said SNA host and having a first packet switched interface coupled to said packet switched network, for transferring data and control messages between said host with an SNA protocol and said packet switched network with a packet switched protocol;

a remote access facility having a second SNA interface means coupled to said SNA terminal and a second packet switched interface coupled to said packet switched network; for transferring said data and control messages between said terminal with said SNA protocol and said packet switched network with said packet switched protocol;

said front end processor further comprising:

a plurality of SNA PU2 channel interfaces coupled to said SNA host;



means for dynamically allocating to one of said plurality of PU2 channel interfaces, a SNA logical unit from a pool of a plurality of available SNA logical units in response to said remote access facility requesting over said packet switched network, that a communications path be established with said SNA host.

4,893,308

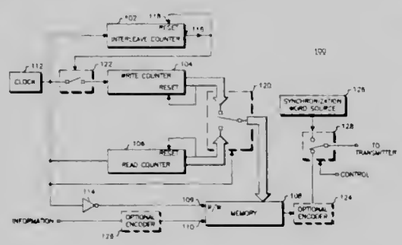
METHOD AND APPARATUS FOR TIME COMPANDING A DIGITAL VOICE SIGNAL

Alan L. Wilson, Hoffman Estates; Michael W. Bright, Arlington Heights; Michelle M. Bray; Eric F. Ziolko, both of Schaumburg, and David L. Weiss, Roselle, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1986, Ser. No. 903,315

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—109 **22 Claims**



1. A method of expanding a compressed digital information signal having at least every Nth information bit removed and any remaining information bits contiguously arranged to form said compressed digital signal, said method comprising the steps of:

(a) receiving the compressed information signal to provide a received signal;

(b) predicting at least every Nth information bit from said received signal to provide predicted information bits, and expanding said received signal such that said predicted information bits may be interleaved therewith to provide a recovered signal.

4,893,309

DIGITAL INTERFACE BETWEEN AT LEAST TWO SUBSCRIBER LINE INTERFACE CIRCUITS AND A PROCESSING UNIT

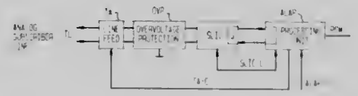
Robert Lechner, Sankt Poelten, Austria; Hans-Werner Rudolf, Munich, Fed. Rep. of Germany; Harald Stader, Munich, Fed. Rep. of Germany; Norbert Wingerath, Munich, Fed. Rep. of Germany; Christopher C. A. Priest, Maidenhead, United Kingdom; Nigel P. Dyer, London, United Kingdom; Robert K. P. Galpin, Knutsford, United Kingdom; Marcello Manca, Milan, Italy; Virgilio Mosca, Milan, Italy; Antonio Nicastro, Milan, Italy; Pierre Albouy; Robert Le Gougnec, both of Lannion, France, and Ramatchandirane Nadaradjane, Perros-Guirec, France, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,428

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704409

Int. Cl.[4] H04J *3/12*

U.S. Cl. 370—110.1 **3 Claims**



1. A digital interface circuit between at least two subscriber interface circuits over which analog subscriber lines are connected to a time multiplex switching center of a digital time-multiplexed telecommunications network, and a processing unit of the time multiplex switching center performing the coding and decoding and filtering of the telephone data transmitted over the subscriber lines under the control of its own processor, which also transmits instructions to set up the various operating conditions of the subscriber line interface circuits and instructions for determining the type of subscriber line status indications for which the subscriber lines must be interrogated, comprising:

it is designed as a parallel interface;

the processing unit has a plurality of connections to which connections are selectively allocated a level of an input-/output register in which the data being received from or to be sent to, the subscriber line interface circuits and thus the subscriber lines connected to the same, are temporarily stored pending the arrival of a read or write instruction, as well as a level of a control register;

means are provided for selectively activating the connections of the processing unit as signal inputs or signal outputs depending upon which of two possible switching states the respective level of the control register is placed in;

means are provided for bringing the connections of the processing unit into a first operating mode, in which these connections serve to link up with connections of subscriber lines that also have an input/output register whose levels are allocated to some of the connections of these subscriber line units; and

means for operating the connections of the processing unit in a second operating mode, in which they can be linked up with connections of subscriber line units that have no such input/output register.

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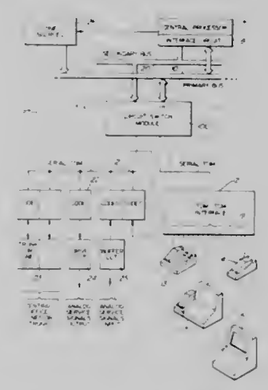
DIGITAL KEY TELEPHONE SYSTEM

David J. Robertson, Ottawa, Canada; Ronald J. Maginley, Ann Arbor, Mich.; Alan S. J. Chapman, Kanata, Canada; Terence N. Thomas, Nepean, Canada; Nadir Nizamuddin, Kanata, Canada; John W. J. Williams, Kanata, Canada; Alan M. Redmond, Kanata, Canada, and Robert S. Morley, Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 126,710, Nov. 30, 1987. This application Mar. 10, 1988, Ser. No. 166,345

Int. Cl.[4] H04J *3/12*; H04Q *11/04*

U.S. Cl. 370—110.1 **16 Claims**



1. A key telephone system for providing digital signal communication paths between a plurality of ports and for providing a signaling and supervision link between, any of said ports and a processing device in the key telephone system, comprising:

a communication path being operable to provide n pairs of time division multiplex transmit (TDMT) and time division multiplex receive (TDMR) channels, each channel including a plurality of bit positions, at least one of said n pairs of TDMT and TDMR channels being exclusively associated with each port of said plurality of ports and each said TDMT channel and said TDMR channel including a signaling and supervision (S and S) bit position in said plurality of bit positions;

a switching means being operable to couple communication signals between bit positions of selected ones of the TDMT channels and bit positions of selected ones of the TDMR channels, to the exclusion of said S and S bit positions, as directed by the processing device;

an interface means for transferring information from the S and S bit position of a selected TDMT channel to the processing device and for transferring information from the processing device to the S and S bit position of at least one of the TDMR channels.

4,893,311

CMOS IMPLEMENTATION OF A BUILT-IN SELF TEST INPUT GENERATOR (BISTIG)

Craig C. Hunter, Vancouver, Wash., and Thomas S. Spohrer, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1988, Ser. No. 185,610

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—22.5 **3 Claims**

1. In a built in self test input generator (BISTIG) for a programmable logic array (PLA), wherein the PLA comprises a first level array adapted to receive N input signals in N input lines and to provide M product terms on M product term lines, and a second level array adapted to receive the M product

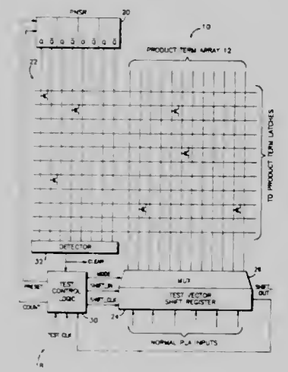
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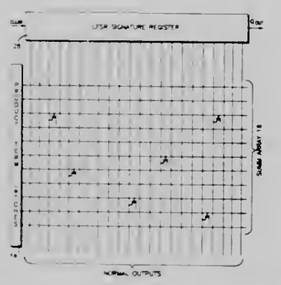
terms on the M product term lines and to provide P output signals on P output lines, wherein N, M, and P are integers greater than one, the BISTIG having a product term selector which sequentially enables each of the M product term lines of the second level array individually in response to a first control signal, an improved test vector generator comprising:

initialization means for selectively generating an initial N-bit vector comprising N-1 logical zeroes and a single logical one in response to a second control signal;

N-stage, recirculating shift register means, coupled to said initialization means, for selectively generating one of N test vectors by sequentially shifting each of said N-bits comprising said initial vector by one bit in response to a third control signal;

coupling means, coupled to said shift register means and to said N input lines of said PLA, for selectively coupling each of said N-bits comprising said one test vector to a





corresponding one of said N input lines in response to a fourth control signal, thereby allowing said single logical one to be shifted across a true and a complement of said N input lines; and

control means, coupled to said product term selector, to said initialization means, to said shift register means and to said coupling means, for receiving a test signal and each of a plurality of clock pulses, and selectively providing said first control signal each time said shift register means recirculates said logical one, thereby incrementing a product term address provided by said product term selector, and selectively providing said second control signal in response to first receiving said test signal, thereby initializing said product term selector to an initial value, and selectively providing said third control signal in response to receiving each clock pulse, thereby shifting said single logical one into one of said N-stages of said shift registers means, and providing said fourth control signal substantially continuously while receiving said test signal.

4,893,312

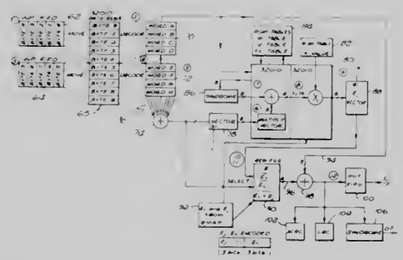
COMPACT, REAL TIME TAPE DRIVE SYSTEM

John R. Cogley, Jr., Covina, Calif., assignor to Qualstar Corporation, Chatsworth, Calif.

Filed Apr. 25, 1988, Ser. No. 185,793

Int. Cl.[4] G11B *20/18*

U.S. Cl. 371—37.8 **20 Claims**



1. An error detection and correction system for nine track tape recorders comprising:

means for receiving successive bytes of digital information each including eight bits;

means for calculating a parity correction bit for each said byte of data and adding it to said eight bits to form a series of nine bit bytes of binary information;

a microcomputer;

means for forming a cyclic redundancy code for a block of data bytes, in the form of an error correction check byte, by offsetting successive bytes in said block of data bytes by one bit, and adding the digital data, to obtain a product high and a product low, using the address indicated by the product high as a pointer to retrieve a Modifier from a stored table associated with the microcomputer, and adding the modifier to the product low to form an error correction check (ECC) byte;

means for recording the block of data bytes along with the ECC byte on a nine track tape;

means for retrieving the block of data and ECC byte from the tape;

means for calculating a parity check error vector by checking the parity of each byte in the block of data and the ECC byte;

means for calculating the error syndrome by repeating the steps for forming the ECC byte, but including the ECC byte;

means for identifying two of the nine columns or tracks Ei and Ej which most probably contain errors;

means for calculating the error correction vectors for each of columns Ei and Ej, using the error vector, the error syndrome, an identification of the two channels Ei and Ej, and Look-Up Tables stored in memory associated with said microcomputer; and

means for supplying the disrupted data to an error correction circuit concurrently with data representing the error correction vectors, to correct the disrupted data to its input format.

4,893,313

SEMICONDUCTOR LASER DEVICE WHICH HAS A DOUBLE-HETERO STRUCTURE HAVING AN OPTIMAL LAYER THICKNESS

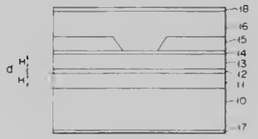
Genichi Hatakoshi, Yokohama; Kazuhiko Itaya, Tokyo; Shigeya Naritsuka, Yokohama; Masayuki Ishikawa, Nishimine; Hajime Okuda, Yokohama; Hideo Shiozawa, Yokohama; Yukio Watanabe, Yokohama; Yasuo Ohba, Yokohama; Yoshihiro Kokubun, Yokohama, and Yutaka Uematsu, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1989, Ser. No. 323,400

Claims priority, application Japan, Mar. 14, 1988, 63-59908; May 13, 1988, 63-114747; May 13, 1988, 63-114750; May 13, 1988, 63-114751

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **23 Claims**



1. A semiconductor laser device for emitting a laser beam having a wavelength λ, comprising:

a double-hetero structure including:

an active layer made of $In(Ga_{1-y}Alpgd\ y)P$ and having a thickness d and a refractive index n_a, and first and second surfaces;

a first cladding layer of a first conductivity type formed on the first surface of the active layer having a refractive index n_c, made of $In(Ga_{1-x}Al_x)P$, where x and y satisfy the inequality of $0 \leqq y < x \leqq 1$; and

a second cladding layer of a second conductivity type formed on the second surface of the active layer, having a refractive index nc_2, and made of $In(Ga_{1-z}Al_z)P$, where y and z satisfy the inequality of $0 \leqq y < z \leqq 1$, wherein said double-hetero structure satisfies the following ineguality:

$0.015\Delta^{-\frac{1}{2}} < d/\lambda < 0.028\Delta^{-\frac{1}{2}}$

where is specific refractive index difference defined as:

$$\Delta = (\Delta_1 + \Delta_2)/2$$

$$\Delta_1 = (na^2 - nc_2)/(2n_a 2)$$

and

$$\Delta_2 = (na^2 - nc2^2)/(2n_a 2)$$

4,893,314

PROTECTED INTERNAL LASER MIRROR ADJUSTING APPARATUS

William Shull, Aptos; Rudolf Nissen, Pescadero, and Kim M. Gunther, Watsonville, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

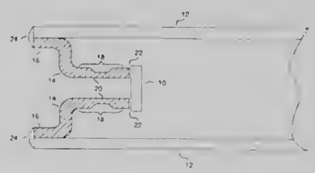
Filed Sep. 29, 1988, Ser. No. 251,120

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **4 Claims**

1. A protected internal laser mirror adjustment apparatus, insertable into a laser tube, including:

a hollow mirror seat completely insertable into the end of a laser tube, said mirror seat having a first portion of a first length and a first outside diameter closely matched with the inside diameter of said laser tube, and having a second portion of a second length and a second outside diameter smaller than said first outside diameter for attachment of a mirror,



means in said second length, for facilitating the deformation of at least the portion of said second length of said mirror seat to which said mirror is attached, thereby adjusting said mirror off of its normal axis.

4,893,315

CALORIMETRY SYSTEM

John C. Homer, Chardon; Shahriar Nowshirvani, Mayfield Hts.; Steven L. Ross, Cleveland, and Gilbert F. Lutz, Chesterland, all of Ohio, assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 153,741, Feb. 8, 1988, Pat. No. 4,846,081, which is a continuation of Ser. No. 36,048, Apr. 8, 1987, Pat. No. 4,809,190. This application May 8, 1989, Ser. No. 348,918

Int. Cl.[4] G01N *25/38*

U.S. Cl. 374—37 **8 Claims**

3. A calorimetry system for measuring the heating value of solid fuel, such as coal, which comprises a calorimeter having a combustor which converts the fuel into combustion gases and a mixer which mixes the combustion gases with another gas to provide flue gas, means for the continuous measurement of the feed rates of the fuel and gases which flow into said calorimeter and the temperature of the gases which flow into said calorimeter and the temperature of the flue gas, means for supplying fuel gas of known heating value to said calorimeter, means utilizing said measurement means for calibrating said calorimeter while said fuel gas of known heating value is being supplied, means for supplying said solid fuel to said calorimeter while measuring the mass feed rate thereof, means responsive to said continuous measurement of said mass feed rates of said solid fuel and gases into said calorimeter and the temperature of said gases and said flue gases to analyze the heating value of said solid fuel.

4,893,316

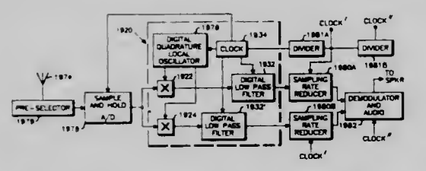
DIGITAL RADIO FREQUENCY RECEIVER

Robert V. Jasc, Palos Heights; Steven C. Jasper, Hoffman Estates; Lester A. Longley; Katherine L. Zebrose, both of Chicago; William J. Turney, and Ross J. Lillie, both of Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 771,736, Sep. 3, 1985, abandoned, Continuation-in-part of Ser. No. 720,311, Apr. 4, 1985, abandoned, Continuation-in-part of Ser. No. 612,107, Apr. 20, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 890,804

Int. Cl.[4] H04L *27/18*

U.S. Cl. 375—44 **162 Claims**



1. An apparatus for extending the threshold sensitivity of an analog to digital (A/D) converter that converts an analog alternating current (AC) input signal having a given frequency into digital data, comprising:

means for generating a noise signal which does not have any substantial energy at said given frequency;

means for summing said analog AC input signal and said noise signal to produce a resultant signal that is coupled to an input of the A/D converter;

clock means for generating periodic pulses at a first frequency coupled to said A/D converter causing the latter to make A/D conversions in response to said pulses; and

the resultant signal produced by said summing means containing the signal component corresponding to said analog AC input signal which is converted by the A/D converter into a digital data representation, said A/D converter having a given threshold sensitivity and the magnitude of said AC input signal being less than said threshold sensitivity, said signal component corresponding to the AC input signal being converted by the A/D into digital data, whereby AC input signals having a magnitude less than said given threshold sensitivity of the A/D converter can be converted into digital data thereby extending the threshold sensitivity of the A/D converter.

4,893,317

DIGITAL SIGNALS AND FREQUENCY CORRECTION IN A DIGITAL WIRELESS SYSTEM

David N. Critchlow; Graham M. Avis; Sandra J. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givatalim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to International Mobile Machines Corporation, Philadelphia, Pa.

Division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Oct. 12, 1988, Ser. No. 256,415

Int. Cl.[4] H04L *27/06*

U.S. Cl. 375—97 **1 Claim**

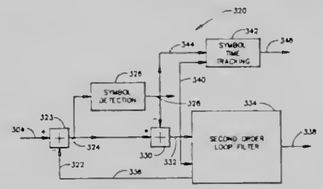
1. A symbol time tracking and Automatic Frequency Control (AFC) system comprising

an input for a detected phase signal;

means for subtracting a phase correction value from the detected phase signal to provide a corrected phase signal;

means for quantizing the phase of the corrected phase signal to a predetermined increment;

means for subtracting the quantized phase signal from the corrected phase signal to provide a phase error signal; and



means for obtaining said phase error signal and computing both said phase correction value and a frequency correction signal therefrom.

4,893,318

METHOD FOR REFERENCING MULTIPLE DATA PROCESSORS TO A COMMON TIME REFERENCE

Richard J. Potash, Dedham, Mass., and Steven K. Burns, Durham, N.H., assignors to Computer Sports Medicine, Inc., Waltham, Mass.

Filed Jan. 26, 1988, Ser. No. 148,565

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[4] H04L *7/00*

U.S. Cl. 375—109 **43 Claims**



1. A method for referencing at least one slave clock to a master clock, said master clock providing a master clock time signal, said slave clock providing a periodically incremented slave clock time signal, said method comprising the steps of:

(1) transmitting from said slave clock to said master clock a first time signal having a value ST_0 corresponding to the value of said slave clock time signal when said first time signal is transmitted;

(2) determining a value MT_0 of said master clock time signal when said first time signal is received by said master clock;

(3) subsequently transmitting from said master clock to said slave clock a second time signal having the value MT_0;

(4) subsequently transmitting from said master clock to said slave clock a third time signal having a value MT_1 corresponding to the value of said master clock time signal when said third time signal is transmitted;

(5) determining a value ST_1 of said slave clock time signal when said third time signal is received by said slave clock;

(6) upon receipt of said second and third time signals at said slave clock, determining a virtual clock reference time t_{ref} given by

$$t_{ref}=[(MT_0+MT_1)-(ST_0+ST_1)]/2; \text{ and}$$

(7) at said slave clock, calculating a virtual clock value T_{vc} given by

$$T_{vc}=t_{ref}+n_{pc}$$

where n_{pc} is the number of slave clock time signal increments.

4,893,319

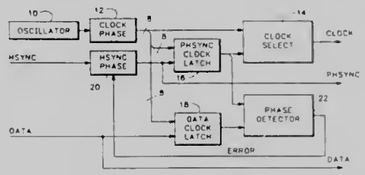
CLOCK REGENERATION CIRCUIT EMPLOYING DIGITAL PHASE LOCKED LOOP

Michael J. Zluchkovski, Portland, Oreg., assignor to Planar Systems, Inc., Beaverton, Oreg.

Filed Dec. 19, 1988, Ser. No. 286,288

Int. Cl.[4] H04L *7/04*

U.S. Cl. 375—111 **8 Claims**



6. A clock regeneration network for phase locking a data signal to both a synchronization signal and a clock signal comprising oscillator means for producing multiple phase regenerated clock signals, a synchronization latch circuit and a data latch circuit for selecting desired ones of said multiple phase clock signals, a phase regenerated comparator for comparing the respective outputs of said latch circuits and for producing an error signal to adjust the phase of said synchronization signal to bring it into coincidence with the data signal input and to select one of said clock signals as a clock pulse whereby said clock pulse is in phase with both said data signal and said synchronization signal.

4,893,320

APPARATUS FOR COUNTING PARTICLES ATTACHED TO SURFACES OF A SOLID

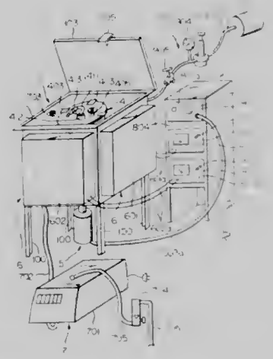
Motonori Yanagi; Masaharu Hama; Nobuyoshi Hattori, and Takaaki Fukumoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1988, Ser. No. 246,743

Claims priority, application Japan, Jun. 8, 1988, 63-139540

Int. Cl.[4] G01N *15/10, 29/02;* B08B *3/12*

U.S. Cl. 377—11 **19 Claims**



1. An apparatus for counting particles attached to surfaces of a solid comprising: an external tank; an internal tank disposed within said external tank, said internal tank being capable of hermetically accommodating a measuring liquid into which a sample having particles attached to the surfaces thereof is to be immersed, a driving means for rotating said internal tank with respect to said external tank, a sonic wave generating means for generating sonic waves having a plurality of different frequencies toward said internal tank, and a measuring means connectable to said internal tank in a hermetic fashion for counting the number of particles in the measuring liquid that have been removed from said sample by the sonic waves generated from said sonic wave generating means.

4,893,321

X-RADIATOR, PARTICULARLY FOR PRODUCING INTRA-ORAL DENTAL EXPOSURES

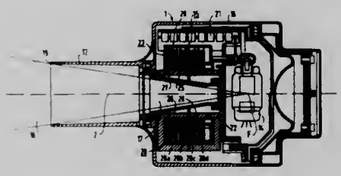
Dorothea Eitner, Erlangen; Hermann Kuehnke, Muenchaurach; Elisabeth Messingschlager, Wiesenttal, and Dorothea Wilke, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,180

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639773

Int. Cl.[4] H01J *35/16*

U.S. Cl. 378—121 **15 Claims**



1. An x-radiator, for producing intra-oral dental exposures, said x-radiator comprising a common housing having a barrel with a first axis at one end of the housing, an x-ray tube having a window for emitting x-ray beams on a beam path, a high-voltage generator having a high-voltage transformer, said high-voltage transformer comprising a tubular winding extending on a longitudinal axis of symmetry with an inside wall forming an axial opening extending on said longitudinal axis, said transformer being positioned in the housing adjacent the barrel with the axial opening being parallel to the first axis of the barrel, said x-ray tube being positioned at an end of the transformer opposite the barrel with the window arranged so that the x-ray path extends along the longitudinal axis and through the axial opening to the barrel of the housing.

4,893,322

FILM CHANGER

Mark Hellmick, Canoga Park; Leif A. Johansson, Agoura, and Otto Weber, Chatsworth, all of Calif., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Nov. 15, 1985, Ser. No. 798,310

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] G03B *42/02*

U.S. Cl. 378—173 **43 Claims**

5. A medical film exposure device for an x-ray apparatus, which comprises:

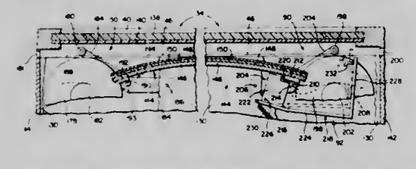
a backing plate;

a pressure plate mounted in opposed relationship to the backing plate such that a film to be exposed can be positioned between the backing plate and the pressure plate, the pressure plate having a natural substantially flat configuration;

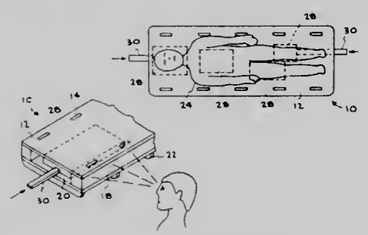
means for moving the pressure plate toward and away from the backing plate, to clamp and release the film, respectively; and

VOL 1110 ISS 2 JA 9 1990 UMI

means for flexing the pressure plate from its natural substantially flat configuration into a convex configuration as the pressure plate is moved away from the backing plate, with outer ends of the pressure plate returning to initial positions as the pressure plate is moved toward the backing plate and back to its natural substantially flat configuration, such that the pressure plate applies pressure to the unexposed sheet of film progressively outward from the center of the sheet of film to opposite ends thereof.



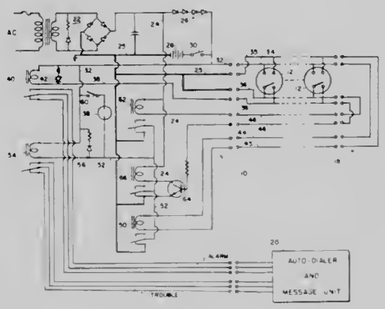
4,893,323
COMBINATION PORTABLE X-RAY TABLE AND STRETCHER
Charles F. Cook, III, 1437 Dunigan Pl., Manteca, Calif. 95336
Filed Jul. 19, 1988, Ser. No. 221,437
Int. Cl.[4] A61B 6/04
U.S. Cl. 378—208 **16 Claims**



10. A portable apparatus for immobilizing a patient during transportation and subsequent x-ray examination, comprising:
a substantially rectangular base;
a pair of transparent side supports mounted to the base and extending along two opposed sides thereof;
a flat, rigid, low x-ray attenuation top support made of a material with an aluminum equivalence of about 1 mm or less and mounted to the side supports in a spaced relation to the base, and defining with the base and side supports an open channel comprising means for the insertion of an x-ray cassette and extending between two open ends of the apparatus;
the base, side supports and top support forming a portable unit.

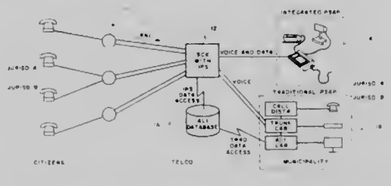
4,893,324
PORTABLE FIRE DETECTION SYSTEM
Kenneth M. Scown, 2603 Laramie Gate Cir., Pleasanton, Calif. 94566
Filed Feb. 16, 1989, Ser. No. 311,645
Int. Cl.[4] H04M 11/04; G08B 17/12
U.S. Cl. 379—40 **1 Claim**

1. A portable fire detection and alarm system including a power supply and monitor unit, said detection and alarm system comprising:
a plurality of ionization type smoke detectors having a pair of power input terminals, and a pair of alarm output terminals that are electrically interconnected by the detection of smoke, each pair of input and output terminals being connected to respective pair of conductors having first and second ends, each ends of said respective pair of conductors being coupled to the power supply and monitor unit;
the power supply and monitor unit including:
a power supply providing a first DC power source provided by rectified AC input power and a second DC power source derived from batteries rechargeable from said first power source, said first and second sources having a common ground;
first circuitry coupling said second DC. power source and said common ground to the first ends of said pair of smoke detector power input lead conductors;
second circuitry coupling the first end of a first one of said pair of smoke detector alarm output conductors to said common ground and the first end of a second one of said pair of smoke detector alarm output conductors to one end of the excitation coil of an alarm relay, the second end of the excitation coil of said alarm relay being coupled to said second DC source;
a telephone auto-dialer and message transmitter coupled to the relay contacts of said alarm relay and responsive to the energizing of said alarm relay for transmitting a prerecorded alarm message to a predetermined telephone number;



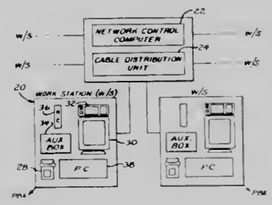
a first supervisory relay having a coil coupled to the second ends of said pair of said smoke detector power input conductors, the contacts of said relay normally connecting a supervisory conductor to common ground, the excitation of said first supervisory relay coil removing said supervisory conductor from said ground;
second and third supervisory relays each having a first coil end coupled to the second ends of said pair of smoke detector alarm output conductors and a second coil end coupled to said first DC power source, the contacts of said second and third supervisory relays normally connecting said supervisory conductor to common ground; and
a trouble signaling relay having its coil coupled between said second DC source and said supervisory conductor, said trouble signaling relay being energized by a loss of AC input power and absence of continuity through the smoke detector power input and output alarm circuit conductors, and said telephone auto-dialer and message transmitter coupled to the contacts of said trouble signaling relay and responsive to the energizing of said trouble signaling relay for transmitting a prerecorded trouble message to a predetermined telephone number.

4,893,325
INTEGRATED PUBLIC SAFETY ANSWERING POINT SYSTEM
Andrew W. Pankonen, Naperville; Donald J. Jester, Lisle; Robert J. Mulrow, Wheaton; Catherine P. Modica, West Chicago, and John M. Zdenek, Riverside, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Sep. 23, 1988, Ser. No. 248,855
Int. Cl.[4] H04M 3/54
U.S. Cl. 379—45 **8 Claims**



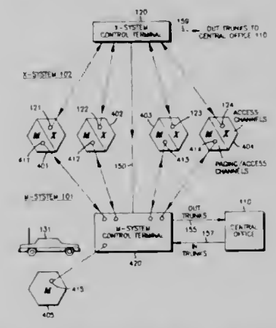
1. A telephone call distribution system for handling a special type call, said call containing at least automatic number identification (ANI) data, comprising:
at least one central switching location for receiving said call and having means for processing;
means for interfacing with an automatic location identification (ALI) data base having ALI data associated with said ANI data, said means for interfacing receiving said ANI data from said means for processing and returning said ALI data to said means for processing, and having means for storing said ALI data associated with said call; and
means for connecting said means for processing to at least one remotely located terminal means for receiving said call, said means for processing also sending said ALI data to said terminal means.

4,893,326
VIDEO-TELEPHONE COMMUNICATIONS SYSTEM
Joe W. Duran, Austin; Michael L. Kenoyer; Edward H. Cooper, Jr., both of San Antonio, and JoonYoul Maeng, Austin, all of Tex., assignors to Video Telecom Corp., Austin, Tex.
Filed May 4, 1987, Ser. No. 46,248
Int. Cl.[4] H04N 1/42
U.S. Cl. 379—53 **13 Claims**



1. A communication system for permitting simultaneous voice and video communication between two or more parties comprising:
(i) a work station for each party, said work station including:
(a) audio means for providing audio communications via an audio transmission path,
(b) video means for providing video communications via a video transmission path,
(c) computer means for initiating and supporting audio and video communications over said transmission paths,
(d) means for interfacing the video and audio means with said transmission paths responsive to said computer means;
(ii) network control means in said video transmission path for coordinating video communications among work stations including means for dynamically assigning transmit and receive frequencies for each participating work station and for dynamically reassigning receive frequencies during communication to achieve a video-follows-voice mode.

4,893,327
COLOCATED CELLULAR RADIOTELEPHONE SYSTEMS
Morton Stern, Skokie, and James Williams, Lombard, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 75,914, Jul. 20, 1987, Pat. No. 4,799,253.
This application Nov. 25, 1988, Ser. No. 276,495
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—59 **6 Claims**

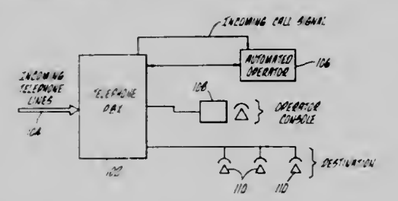


1. A method of controlling operation of a first cellular radiotelephone system pre-existing in a geographical area by a second cellular radiotelephone system wherein fixed site radio apparatus of said second cellular radiotelephone system is located in each cell including fixed site radio apparatus of said first cellular radiotelephone system, said method comprising the steps of:
operating all fixed site radio apparatus of said first cellular radiotelephone system in an access-only mode for processing radiotelephone calls directed thereto;
operating all fixed site radio apparatus of said second cellular radiotelephone system in a paging/access mode for processing all calls originated by radiotelephones in each cell of said first and second cellular radiotelephone systems; and
directing a predetermined percentage of telephone calls originated by radiotelephones from said second cellular radiotelephone system to said first cellular radiotelephone system.

4,893,328
AUTOMATED TELEPHONE OPERATOR OVERFLOW DEVICE
Gregory Peacock, Laguna Beach, Calif., assignor to Microvoice Systems Corporation, Irvine, Calif.
Filed Jul. 31, 1987, Ser. No. 80,679
Int. Cl.[4] H04M 3/50
U.S. Cl. 379—67 **9 Claims**

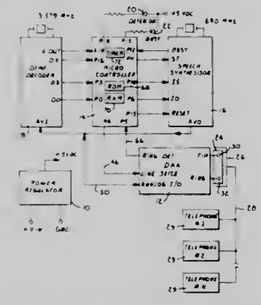
1. In a telephone answering system having a plurality of destinations and at least one routing point for arrival of incoming calls, an automated telephone answering device, comprising

measurement means for measuring the number of incoming calls for a recent period of time of predetermined length;
automated routing means for routing incoming calls to their destinations; and



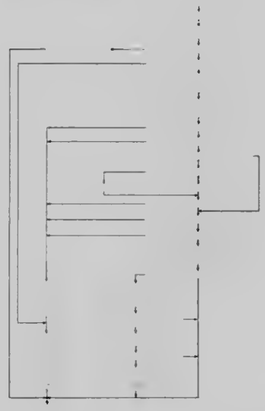
means, responsive to said measurement means, for engaging said automated routing means when said number of incoming calls for said recent period of time exceeds a predetermined value.

4,893,329
CALL DEFERRAL SYSTEM FOR TELEPHONES
Terry D. O'Brien, 6310 W. 50th St., Mission, Kans. 66202
Filed Sep. 20, 1988, Ser. No. 246,980
Int. Cl.[4] H04M *1/64, 1/66*
U.S. Cl. 379—88 **21 Claims**



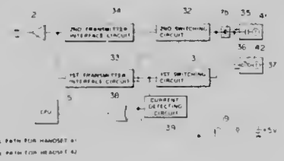
21. Telephone call deferral apparatus for deferring telephone calls on a subscriber telephone line having a telephone set that functions in a normal operating mode to receive incoming calls from calling parties and generate a ring signal when an incoming call is received, said apparatus comprising:
means for receiving signals entered at the telephone set commanding initiation of a user selected defer period during which incoming calls to the telephone set are to be interrupted and after which incoming calls are to be received;
means for intercepting incoming calls and suppressing the ring signal during the defer period;
means responsive to the interception of an incoming call for transmitting to the calling party a message indicating when the defer period will have expired; and
means for automatically effecting the normal operating mode upon expiration of the defer period.

4,893,330
METHOD AND APPARATUS FOR RESTRICTING CREDIT CARD COMMUNICATION CALLS
Victor A. Franco, Old Bridge, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, New York, N.Y.
Filed Jun. 1, 1989, Ser. No. 360,178
Int. Cl.[4] H04M *3/38, 11/00*
U.S. Cl. 379—91 **27 Claims**



1. In a data base system, a method of providing a calling charge validation service for determining whether a communication call connection should be complete by an associated communication switching syste ., the method characterized by the steps of
receiving from said switching system a call message including a call billing code and a dialing sequence identifying the destination of a call,
accessing a data base associated with said billing code to obtain stored dialing data which identifies potential destinations for said call, and
comparing the dialing sequence against said stored dialing data and, in response to said comparison, signaling said switching system to control a call connection to the destination determined by said dialing sequence.

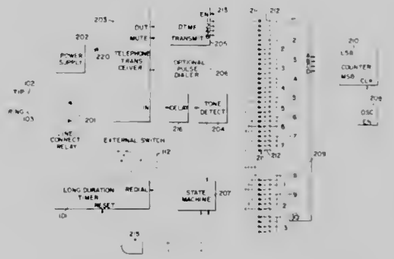
4,893,331
SYSTEM ALLOWING SELECTIVE CONNECTION OF VARIOUS TYPES OF EXTERNAL APPARATUSES TO TELEPHONE SET
Takeshi Horiuchi, Hino; Yasuji Sato, Hachioji, and Yasuo Funato, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 19, 1988, Ser. No. 157,808
Claims priority, application Japan, Feb. 24, 1987, 62-40595; Mar. 20, 1987, 62-66669
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—93 **12 Claims**



8. A system allowing selective connection of various types

of external apparatuses to a telephone set, the various types of external apparatuses including a first external apparatus having a manual operating switch, the manual operating switch being turned on at times when the first external apparatus is in use, and a second external apparatus having a hook switch, the hook switch being turned on at times when the second external apparatus is in use, the system comprising:
a connection terminal to which the first external apparatus and the second external apparatus are connected in parallel;
first interface means for receiving a signal from the first external apparatus, the first interface means having a first characteristic corresponding to the first external apparatus and including a current supply source for supplying current to the first external apparatus;
second interface means for receiving a signal from the second external apparatus, the second interface means having a second characteristic corresponding to the second external apparatus;
first switching means provided between the first interface means and the connection terminal for selectively connecting the first interface means to the connection terminal;
second switching means provided between the second interface means and the connection terminal for selectively connecting the second interface means to the connection terminal;
current detecting means for detecting an output current of the current supply source of the first interface means when the manual operating switch of the first external apparatus is operated;
first control means for turning off the first switching means when the hook switch is turned on; and
second control means for turning off the second switching means in response to an output of the current detecting means.

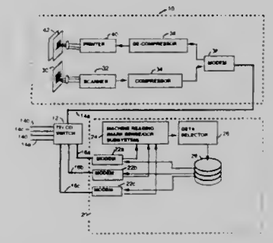
4,893,332
LOW-POWERED REMOTE SENSOR
Richard W. Brown, Mound, Minn., assignor to Aquatrol Corporation, Arden Hills, Minn.
Continuation of Ser. No. 862,124, May 12, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,496
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—97 **18 Claims**



4. A remote transmitting device for periodically reporting to a central station over a telephone line comprising:
telephone interfacing means electrically connected to the telephone line for transmitting information;
automatic dialing means connected to said telephone interfacing means for transmitting a telephone number corresponding to the central station;
timer means connected to said dialing means for periodically causing said automatic dialing means to transmit said telephone number corresponding to the central station; and
low-power source means capacitively connected to the telephone line for drawing inductively coupled AC power from a long wire line and for powering said timer means.

11. A remote utility sensing device for monitoring a utility meter and reporting utility usage to a portable peripheral device, comprising:
sensing means connected to the utility meter for generating digital pulses in response to the utility usage;
counter means connected to said sensing means for counting and storing said digital pulses;
interface means connected to said counter means for transmitting values stored in said counter means to the portable peripheral device; and
power source means capacitively coupled to a long wire for drawing inductively coupled AC line power, and further operable for rectifying and low-pass filtering said power for powering said remote utility sensing device.

4,893,333
INTERACTIVE FACSIMILE SYSTEM AND METHOD OF INFORMATION RETRIEVAL
Paul Baran, 83 James Ave., Atherton, Calif. 94025, and David F. Baran, 1324 Josephine St., Berkeley, Calif. 94703
Filed Mar. 14, 1989, Ser. No. 323,282
Int. Cl.[4] H04M *11/08;* **H04N** *1/42*
U.S. Cl. 379—100 **19 Claims**



1. A FAX server apparatus for interactively providing requested portions of stored information to an inquiring CCITT FAX transceiver by means of a machine readable information selector sheet marked by the requesting party and transmitted by the inquiring FAX transceiver to the FAX server via telephone lines, said FAX server comprising:
CCITT modem means for communicating with said CCITT FAX transceiver to electronically receive said transmitted selector sheet and to transmit the requested information;
machine readable means for interpreting the machine readable markings on the selector sheet received by said CCITT modem means;
memory means for storing the information from which the requestor can select; and
retrieval means under the control of said machine readable means for retrieving the information requested by the requesting party from said memory means and coupling the retrieved information to said CCITT modem means.

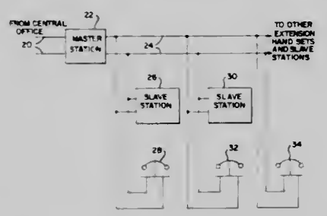
4,893,334
INTERCOMMUNICATION SYSTEM FOR TELEPHONES
Nicholas G. Parnello, Rockford, Ill., assignor to Power Play, Chicago, Ill.
Filed Aug. 28, 1987, Ser. No. 90,741
Int. Cl.[4] H04M *9/02;* **H04Q** *5/02*
U.S. Cl. 379—157 **15 Claims**

1. An apparatus for using a plurality of telephone handsets

on a single wire pair connected to a telephone exchange as an extension for an intercom system, the apparatus comprising:

means for disconnecting the single wire pair from the telephone exchange in response to a signal from a first handset;

a slave station connected to the single wire pair including a paging speaker;



means for enabling said paging speaker at said slave station thereby permitting paging from the first handset;

means for disabling the paging speaker when a second handset goes off-hook to enable voice communication between the first handset and the second handset; and

means for connecting the single wire pair to the telephone exchange when the first and second handset are go on-hook.

4,893,335

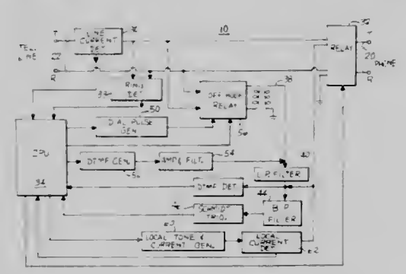
REMOTE ACCESS TELEPHONE CONTROL SYSTEM

Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Fuller Research and Development Company, Bellevue, Wash.

Continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 841,931

Int. Cl.[4] H04M *1/274, 1/53, 1/66;* **H04Q** *7/04*

U.S. Cl. 379—200 **56 Claims**



1. A telephone control system connected between a telephone line and a local telephone station, said system comprising:

a decoder for determining numbers being dialed by said local station and outputting information signals corresponding thereto;

a dialer selectively placing on said telephone line dialing signals corresponding to digit identifying signals;

processor means receiving the information signals from said decoder, said processor means examining information signals corresponding to numbers being dialed, determining if said information signals have a predetermined value, recording the information signals for numbers being dialed at least up until the time that said processor means determines if a call over said telephone line is being attempted and, in response to said processor means determining that a call over said telephone line is being attempted and within a period thereafter that is independent of the rate of subsequently dialing digits, outputting to said dialer digit identifying signals corresponding to the information signals recorded by said processor means at least up until the time that said processor means has determined that a call over said telephone line is being attempted thereby placing dialing signals corresponding to said information signals on said telephone line; and

a switch actuatable to a first position in which said telephone station is connected to said telephone line, said switch being actuated by said processor means to said first position responsive to said processor means determining that a call over said telephone line is being attempted and after said processor means has outputted to said dialer the digit identifying signals corresponding to all information signals recorded in said processor means prior thereto, whereby after said switch has been activated to said first position, said dialing signals are thereafter placed on said telephone line in real time as they are generated by said local telephone station.

16. A system for reporting to a central telephone station the telephone number associated with a telephone unit having an identifying number and being connected to a telephone line, comprising:

inhibit means for rendering said telephone unit inoperable until the telephone number associated with said telephone unit has been entered into said telephone unit;

storage means for storing the telephone number associated with said telephone unit; and

dialing means for automatically causing said telephone unit to dial the telephone number of said central telephone station and, after said central telephone station has gone off-hook, dialing the telephone number associated with said telephone unit and a number corresponding to said identifying number thereby informing said central telephone station the telephone number to which said telephone unit is connected.

18. A remotely accessible telephone control system for connection to a telephone line from a telephone exchange, the telephone exchange providing a user controlled call conferencing function, the system comprising:

detector means for detecting signals on said telephone line;

signal generating means responsive to control signals to produce predetermined signals and apply said signals to said telephone line;

memory means for controllably storing electronic signals; and

central processing means for monitoring signals on said telephone line as detected by said detector means, accessing said memory means and producing and applying predetermined control signals to said signal generating means, said central processing means including means for:

(a) identifying a call to said system from a remote user,

(b) identifying a control signal from said remote user indicating a desired call transfer to a predetermined number,

(c) receiving and storing said predetermined transfer number from said remote user,

(d) activating the call conferencing function of the telephone exchange to place the remote user on hold,

(e) producing control signals to cause the signal generating means to apply appropriate signals to said telephone line to complete a call to said predetermined transfer number,

(f) further activating said telephone exchange to connect said remote user to said predetermined transfer number,

(g) detecting the completion of the call between said remote user and said transfer number and, in response thereto,

(h) repeating items (b) through (f) to allow said remote user to call a further transfer number.

25. A remotely accessible telephone control system for connecting to a telephone line from a telephone exchange, the telephone exchange providing a user controlled call conferencing function, the system comprising:

detector means for detecting signals on said telephone line;

signal generating means responsive to control signals to produce predetermined signals and apply said signals to said telephone line;

memory means for controllably storing electronic signals; and

central processing means for monitoring signals on said telephone line as detected by said detector means, accessing said memory means and producing and applying predetermined control signals to said signal generating means, said central processing means including means for:

(a) identifying a call to said system from a remote user,

(b) activating the call conferencing function of the telephone exchange to place the remote user on hold,

(c) recalling from said memory means a predetermined transfer number,

(d) producing control signals to cause the signal generating means to apply appropriate signals to said telephone line to complete a call to said predetermined transfer number,

(e) further activating said telephone exchange to connect said remote user to said predetermined transfer number,

(f) identifying a call from a remote user indicating a desired change in said predetermined transfer number,

(g) receiving from said remote user the new transfer number, and

(h) loading into said memory said new predetermined number.

4,893,336

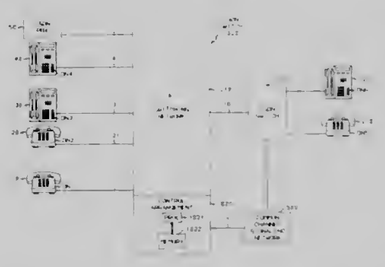
CALL FORWARDING ARRANGEMENT

Mark S. Wuthnow, Hazlet, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1987, Ser. No. 134,649

Int. Cl.[4] H04M *3/54*

U.S. Cl. 379—211 **5 Claims**



5. A method of processing a call to a communication station comprising

determining whether said call is a forwarded call;

in response to a determination that said call is a forwarded call, performing at least one of the following steps (A) and (B): (A) effecting generation of an altering signal distinctive from an alerting signal for a non-forwarded call, and (B) completing said call to said station; and

in response to a determination that said call is a non-forwarded call, performing one of the following steps (C) and (D): (C) denying said call, and (D) forwarding said call to another communication station

wherein said first-mentioned station is connected to a switch and wherein said method is performed by said first-mentioned station.

4,893,337

CIRCUIT ARRANGEMENT FOR A DIGITAL TELEPHONE STATION

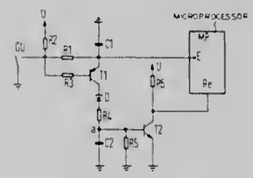
Dieter Blossfeldt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,226

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725329

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—424 **1 Claim**



1. A circuit arrangement for a digital telephone station in digital telephone systems whereby the telephone station is controlled by a microprocessor which includes a control input and a rest input, and whereby inquiry and control signals are constantly exchanged via the leads of the subscriber line, and whereby a feed voltage supply of the telephone station in the quiescent condition and in the voice condition occurs by way of the subscriber line or by way of a local voltage source, the improvement comprising:

cradle switch means for bringing said control input of said microprocessor to ground potential when said cradle switch means is in its actuated position;

a first resistor connected between said control input and said cradle switch means;

a first capacitor including first and second terminals, said first terminal of said first capacitor connected to said control input, said second terminal of said first capacitor connected to ground;

a second resistor including first and second terminals, said first terminal of said second resistor connected to a second terminal of said first resistor, said second terminal of said second resistor connected to said feed voltage;

a pnp first transistor having a collector, an emitter, and a base, said emitter of said pnp first transistor connected to said first terminal of said first capacitor;

a third resistor connected between said cradle switch means and said base of said pnp first transistor; and

a diode including an anode connected to said collector of said first pnp transistor, and a cathode;

a fourth resistor including a first terminal connected to said cathode of said diode, and a second terminal;

a second capacitor including a first terminal connected to said second terminal of said fourth resistor and a second terminal connected to ground;

a fifth resistor connected in parallel with said second capacitor;

an npn second transistor having a base, an emitter and a collector, said emitter of said npn second transistor connected to ground, said base of said npn second transistor connected to said first terminal of said second capacitor; and

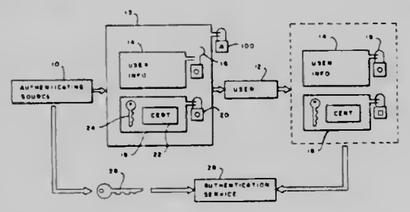
a sixth resistor including a first terminal connected to said collector of said second npn transistor and to said reset input of said microprocessor, and a second terminal connected to said feed voltage.

4,893,338

SYSTEM FOR CONVEYING INFORMATION FOR THE RELIABLE AUTHENTIFICATION OF A PLURALITY OF DOCUMENTS

Jose Pastor, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 31, 1987, Ser. No. 140,051
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—25 **11 Claims**



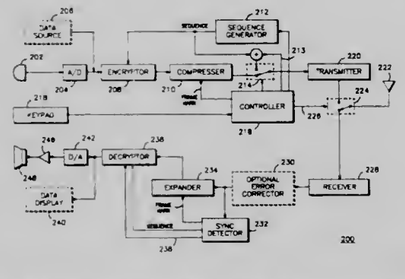
1. A system for authenticating a plurality of documents, said system comprises:
an authenticating source, said authenticating source including means for providing a first public key encryption key to a third party;
means, associated with said source, for providing an authentication message to said third party in the form of coefficient of a polynomial, said authentication message being encrypted by a second public key encryption key and including the decryption key for said first public key encryption key;
means, associated with said third party, for generating variables and values to said polynomial and applying different ones of said variables and value to each of said plurality of documents;
means, associated with an authenticating service, for recovering said authentication message from a plurality of different ones of said variables and values; and
means, associated with said source, for providing the decryption key corresponding to said second public key encryption key to said authenticating service such that said authentication message can be decrypted.

4,893,339

SECURE COMMUNICATION SYSTEM

Michael W. Bright, Arlington Heights; Eric F. Ziolko, Schaumburg; Alan L. Wilson, Hoffman Estates; Michelle M. Bray, Schaumburg; Harry A. Hennen, Woodstock, and David L. Weiss, Roselle, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1986, Ser. No. 903,360
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—28 **53 Claims**



45. In a secure communication system, a method for communicating a voice signal from a transmitter to at least one receiver, comprising the steps of:
at the transmitter:
(a) digitizing the voice signal to provide a digitized signal;
(b) encrypting said digitized signal to provide an encrypted signal;
(c) discarding every Nth bit of said encrypted signal;
(d) time compressing the remaining encrypted signal to provide a compressed signal;
(e) generating a pseudo-random synchronization signal;
(f) inserting at least a portion of said pseudo-random synchronization signal into said compressed signal to provide a combined signal;
(g) transmitting said combined signal to at least one receiver;
at the receivers:
(a) receiving the transmitted signal to provide a received signal;
(b) inverting said received signal to provide an inverted signal;
(c) loading, in parallel, at least a portion of said received signal into a first sequence generating means;
(d) generating a first local pseudo-random synchronization sequence;
(e) comparing said local pseudo-random synchronization sequence and said received signal to provide an error count;
(f) providing a first pseudo-random synchronization signal if said error count is below a predetermined threshold else repeating from step (c);
(g) loading, in parallel, at least a portion of said inverted signal into a second sequence generating means;
(h) generating a second local pseudo-random synchronization sequence;
(i) comparing said second local pseudo-random synchronization sequence and said inverted signal to provide an error count;
(j) providing a second pseudo-random synchronization signal if said error count is below a predetermined threshold else repeating from step (c);
(k) providing either said received signal or said inverted signal to a predictor in response to said first and second pseudo-random synchronization signals;
(l) predicting every Nth bit of said received signal in response to step (k);
(m) interleaving said predicted bits with their respective signals to provide an expanded signal;
(n) decrypting said expanded signal to provide a decrypted signal;
(o) converting said decrypted signal into an analog signal comprising the voice signal.

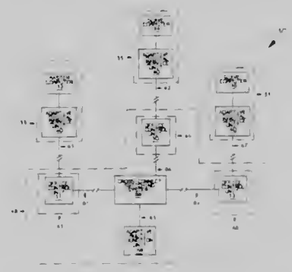
4,893,340

MULTIJUNCTION UNIT APPARATUS FOR USE IN A DIGITAL NETWORK

Daniel P. Lubarsky, San Jose; George A. Weigt, Livermore, and Mark E. Haisch, Freemont, all of Calif., assignors to Pacific Bell, San Francisco, Calif.

Filed Oct. 5, 1988, Ser. No. 254,275
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—50 **18 Claims**

1. A multijunction unit for transferring digital data between at least three channels of a time-domain multiplexed communication link of a multipoint communication network which includes a plurality of network units with at least one of said network units comprising said multijunction unit, said network units coupled to telephone system communication links, each said network unit comprising means for transmitting and receiving digital data in a frame mode in which said data is organized into frames on said communication links, each said frame including synchronization data, command data, error correcting data, and user data, each said network unit further comprising:
means for storing an address identifying said network unit;
means for receiving commands from other network units in said computer network, said commands being specified by command data in a said frame received by said network unit;
means for generating command data in response to a received command included in said command data;
means for transmitting commands to other network units in said computer network, said transmitting means comprising means for inserting command data generated by said command data generating means into a said frame transmitted by said network unit; and
means for executing a said received command specifying said stored address as the target thereof;
said multijunction unit further comprising:
first, second, and third input port means, each said input port means being coupled to a different incoming channel of a time-domain multiplexed communication link, each said input port means comprising means for receiving a primary channel word from the said incoming primary channel coupled thereto and first decrypting means for generating a data word corresponding to each said received primary channel word, each said generated data word comprising a portion of a said frame;
first, second, and third output port means, each said output port means being coupled to a different primary outgoing channel of said time-domain multiplexed communication link, each said output port means comprising means for receiving a said data word, first encrypting means for generating a said primary channel word from said received data word and means for transmitting said primary channel word on the said outgoing primary channel coupled thereto;
means for coupling a data word generated by said first input channel to the said receiving means in said second and third output port means; and
means for combining the said data words generated by said second and third input port means to form a combined data word and for coupling said combined data word to the said receiving means in said first output port means.



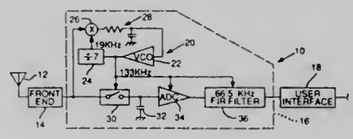
4,893,341

DIGITAL RECEIVER OPERATING AT SUB-NYQUIST SAMPLING RATE

Mark R. Gehring, Portland, Oreg., assignor to AT&E Corporation, San Francisco, Calif.

Filed Aug. 1, 1989, Ser. No. 388,186
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—7 **4 Claims**

1. A receiver for receiving an amplitude modulated subcarrier, said subcarrier being transmitted as part of an RF composite signal that includes a pilot signal, the receiver including:
a front end for converting the RF composite signal to a baseband composite signal;
a frequency source for producing a sampling clock signal;
means for phase locking said frequency source to the pilot signal in the baseband composite signal;
sampling means for sampling said composite signal at a rate determined by the sampling clock signal;
analog to digital conversion means for converting the samples produced by the sampling means into digital form;



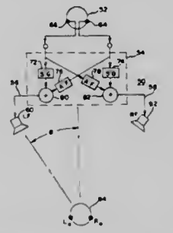
digital filter means for digitally filtering said digitized samples to attenuate the non-subcarrier components thereof;
wherein said sampling clock signal has a frequency less than twice the maximum frequency of the modulated subcarrier.

4,893,342

HEAD DIFFRACTION COMPENSATED STEREO SYSTEM

Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61821, and Jerald L. Banck, 1007 W. Clark #4, Urbana, Ill. 61801

Filed Oct. 15, 1987, Ser. No. 109,197
Int. Cl.[4] H04R *5/027*
U.S. Cl. 381—26 **20 Claims**



1. An audio processing system for generating compensated audio signals suitable for reproduction through a loudspeaker system, comprising:
source means for providing two channels of audio signals having head-related transfer functions imposed thereon;
compensation means for providing cross-talk cancellation of the audio signals and for providing naturalization compensation of the audio signals to correct for propagation path distortion including filtering means for substantially modifying frequency and phase response of the cross-talk cancellation and naturalization compensation at frequencies beginning at a frequency above 600 hertz and beginning at least at a frequency below ten kilohertz in such a way as to release the cross-talk cancellation at such high frequencies thereby generating compensated audio signals.

4,893,343

DUAL DIVERGING MANIFOLD LOUDSPEAKER SYSTEM

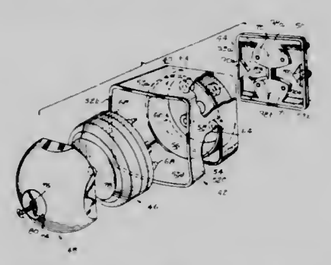
Joseph F. Bader, Crete, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Filed Jan. 13, 1989, Ser. No. 296,839
Int. Cl.[4] H04R *1/30, 1/34;* **G01K** *9/00, 9/12*
U.S. Cl. 381—156 **20 Claims**

15. A dual diverging manifold loudspeaker system comprising:
first diverter means for diverting a rearwardly-traveling

planar sound wavefront into two diverging sound wavefronts;

second diverter means for splitting said two diverging sound wavefronts into four separate planar wavefronts;



reflector means for deflecting forwardly said four separate planar wavefronts toward an open mouth of said loudspeaker system; and

manifold means for recombining said four separate planar wavefronts back into a single composite wavefront emanating from the open mouth ofsaid loudspeaker system.

4,893,344

HEADSET HAVING A POST AURICLE MOUNT AND ARRANGED TO BE WORN ON A PERSON'S OUTER EAR

Jan Trägardh, Copenhagen K; Bjarne Jönsson, Bronshoj, and Finn Jensen, Struer, all of Denmark, assignors to GN Netcom A/S, Copenhagen, Denmark

Filed Sep. 23, 1988, Ser. No. 248,490

Claims priority, application Denmark, Sep. 30, 1987, 5152/87

Int. Cl.[4] H04M *1/05*

U.S. Cl. 381—187 **4 Claims**



1. A headset with sound receiving microphone and sound reproducing transducer, arranged to be worn on a person's outer ear, comprising

a curved post auricle mount arranged to be positioned behind the ear and configured to be lengthwise adjustable, said mount including a stabilizer part having substantially the same curvature as the mount, and being extractable from said mount, said mount further being coupled to said sound reproducing transducer by a joining link means for providing rotation of said mount in two orthogonal axis.

4,893,345

METHOD FOR DETECTING/PROCESSING IMAGE INFORMATION

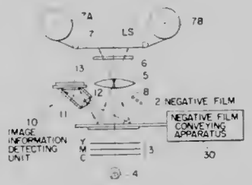
Fumio Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1987, Ser. No. 40,238

Claims priority, application Japan, Apr. 28, 1986, 61-99208; Apr. 30, 1986, 61-99875; Apr. 30, 1986, 61-99876

Int. Cl.[4] G06K *9/28*

U.S. Cl. 382—1 **12 Claims**



1. A method for detecting and processing image information comprising the steps of: moving an original film and a two-dimensional sensor relatively to each other; photometrically measuring images on said original film with said two-dimensional sensor; wherein outputs from picture element arrays, detected at a relatively smaller pitch than the pitch of said two-dimensional sensor, are processed to interpolate a picture element pitch; and, wherein data from plural said picture element arrays corresponding to a predetermined detection scope are synthesized to thereby achieve detection of image information at high speed and a high resolution.

4,893,346

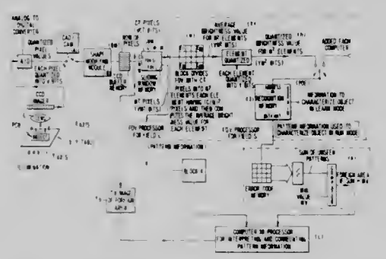
APPARATUS FOR AUTOMATICALLY INSPECTING OBJECTS AND IDENTIFYING OR RECOGNIZING KNOWN AND UNKNOWN PORTIONS THEREOF, INCLUDING DEFECTS AND THE LIKE, AND METHOD

Robert Bishop, Brookline, Mass., assignor to Beltronics, Inc., Brookline, Mass.

Continuation of Ser. No. 711,995, Mar. 14, 1985, abandoned. This application Sep. 2, 1987, Ser. No. 93,114

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—8 **29 Claims**



1. A method of inspection of circuit board conductive shapes wherein digital signal information is stored representing desired shapes to be monitored in future board inspections, the method comprising, originally storing digital signal information representing images of desired predetermined object shapes to be learned; predetermining at least one of acceptable size or dimension variations in such object shapes; modifying the stored digital signal information to create a set of fictitious images of said object shapes to be learned that incorporates the acceptable variations therein; storing the modified digital signal information representing said fictitious images; and, during circuit board inspections, ignoring said acceptable variations as possible defects by responding to recognition of the acceptable variations in the said fictitious stored images.

4,893,347

FM COMMUNICATION SYSTEM WITH IMPROVED RESPONSE TO RAYLEIGH-FADED COMPANDED SIGNALS

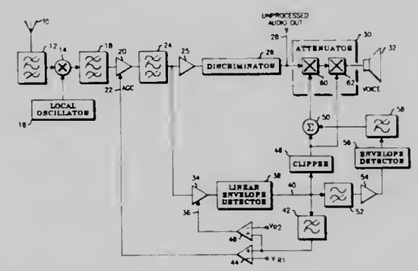
Bruce C. Eastmond, Downers Grove, and Donald L. Linder, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 926,064, Nov. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 847,962, Apr. 3, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 90,982

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[4] H04B *15/00, 1/10*

U.S. Cl. 455—52 **56 Claims**



1. An FM communication system in which speech signals are companded, that is, compressed prior to transmission and expanded after reception, comprising:

compressor means for compressing the amplitude of input speech signals;

transmitter means for transmitting the compressed speech signals via an FM signal;

receiver means for receiving the FM signal, said receiver means including discriminator means for converting the FM signal into a baseband signal containing both in-band speech signals and above-band noise;

noise reduction means for minimizing noise bursts in the in-band speech signals of said baseband signal in response to the magnitude of the above-band noise contained in said baseband signal thereby producing noise-minimized speech signals, said noise reduction means operating only when the carrier-to-noise ratio (C/N) of the received FM signal is less than a predetermined C/N; and

audio processing means including expandor means for expanding the noise-minimized speech signals to produce output speech signals which correspond to the input speech signals, said noise reduction means minimizing noise bursts without substantially adversely affecting the operation of said expandor means.

4,893,348

POWER SOURCE CONTROL DEVICE IN CAR TELEPHONE MOBILE STATION SYSTEM

Akira Andoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,460

Claims priority, application Japan, Sep. 9, 1987, 62-224012

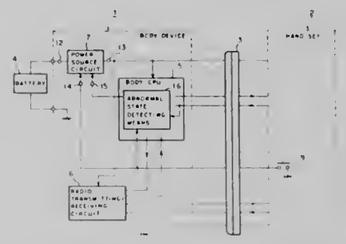
Int. Cl.[4] H04B *1/38*

U.S. Cl. 455—89 **3 Claims**

1. A car telephone mobile station system, comprising:

a body device including a body control unit, a radio transmitting/receiving circuit controlled by said body control unit, a battery for providing a source of power, and a power source circuit controlling the supply of power to said body control unit and said radio transmitting/receiving circuit from said battery in response to an ON/OFF signal;

a hand set connected to said body device and receiving power from said power source circuit including a hand set control unit communicating with said body control unit, a power source switch providing a first power source control signal for developing said ON/OFF signal to said



power source circuit, and a voice circuit for transmitting and receiving voice signals to and from said radio transmitting/receiving circuit;

a control terminal provided at said power source control circuit which receives a second power source control signal for turning said power source circuit off; and

abnormal state detecting means provided in said body control unit for detecting an abnormal state of a signal from said hand set control unit and developing said second power source control signal in response thereto.

4,893,349

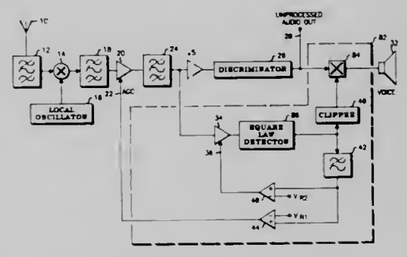
FM COMMUNICATION SYSTEM WITH IMPROVED RESPONSE TO RAYLEIGH-FADED RECEIVED SIGNALS

Bruce C. Eastmond, and Wai Elliott Lum, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 926,060, Nov. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 847,962, Apr. 3, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 91,160

Int. Cl.[4] H04B *1/10, 15/00*

U.S. Cl. 455—205 **100 Claims**



81. An FM receiver having an improved audio response for Rayleigh faded received signals comprising:

discriminator means for converting the received FM signals into audio signals; and

means for controllably attenuating said audio signals so that substantially constant attenuation is provided for received

signals greater than a certain signal level, said certain signal level consisting of a predetermined level below the average magnitude of the received signal, said attenuating means increasing attenuation of said audio signals when said received signals are less than said certain signal level, said attenuating means maintaining a substantially constant bandwidth to said audio signals.

4,893,350

INTERFERENCE CANCELLATION SYSTEM

Kenichi Minamisono; Masayuki Yasunaga; Fumio Watanbe, all of Tokyo, and Noboru Babe, Sayama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

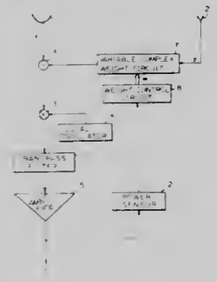
PCT No. PCT/JP87/00806, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/03340, PCT Pub. Date May 5, 1988

PCT Filed Oct. 21, 1987, Ser. No. 196,205

Claims priority, application Japan, Oct. 22, 1986, 61-249532; Jul. 13, 1987, 62-173013

Int. Cl.⁴ H04B *1/06*

U.S. Cl. 455—278 **3 Claims**



1. An interference cancellation system which receives a main signal, including a desired signal and an undesired signal in a direction of a sidelobe of a main antenna, and a reference signal, which has essentially only the undesired signal, said interference cancellation system suppressing an undesired signal component in the main signal to provide a main signal which has only a desired signal component, said interference cancellation system comprising:

a main antenna positioned in a direction of the desired signal;

an auxiliary antenna positioned in a direction of the undesired signal;

a subtractor coupled with an output of said main antenna;

an output terminal coupled with an output of said subtractor;

power measuring means, coupled with the output of said subtractor, for measuring a power of the output of said subtractor in a high frequency band;

a variable complex weight circuit, coupled with said auxiliary antenna and said subtractor, said variable complex weight circuit adjusting the undesired signal received by the auxiliary antenna; and

control means, coupled to said variable complex weight circuit and said power measuring means, for controlling said variable complex weight circuit according to said output power.

4,893,351

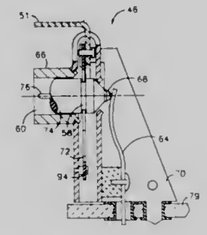
COMMUNICATION RECEIVER HAVING A REMOTE ALERT DEVICE

John M. McKee, Coral Springs, and Marilyn S. Burger, Pompano, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 2, 1987, Ser. No. 92,092

Int. Cl.⁴ H04B *1/08*

U.S. Cl. 455—347 **19 Claims**



1. An apparatus for generating a remote alert signal from a communication receiver, the communication receiver being enclosed in a casing and having alert circuitry for generating an electrical signal in response to a selective call message, said apparatus comprising:

a latching receptacle enclosed within said casing, said latching receptacle including a locking means and a socket, said socket being accessible from outside said casing, wherein said locking means includes a means for preventing said electrical connector from disengaging or accidentally separating from said socket and said socket includes a first socket contact and a second socket contact, said first and second socket contacts operatively coupled to the alert circuitry for transmitting the electrical signal;

a removable electrical connector for engaging said socket, said electrical connector including a first pair of electrical contacts, slidably engaging said first and second socket contacts to maintain electrical connection between said first pair of electrical contacts and said first and second socket contacts while permitting rotation of said electrical connector relative to said socket, and an insulation housing enclosing a portion of said first pair of electrical contacts, wherein one of said first pair of electrical contacts comprises an outer shaft enclosed by a portion of said insulation housing and insulated by said housing, and a second of said first pair of electrical contacts comprises an inner shaft concentric with and insulated from said outer shaft;

an alerting device for generating an alert signal in response to the electrical signal, said alerting device being remote from said communication receiver and including a second pair of electrical contacts for receiving said electrical signal; and

a connector cable terminating at a first end with said electrical connector and terminating at a second end with said alerting device, said connector cable including a pair of cable conductors to provide electrical communication between said electrical connector and said alerting device, wherein the electrical signal being transmitted from the alert circuitry to said alerting device generates said alert signal;

wherein said electrical connector further comprises a means for preventing said connector cable from twisting and kinking, and wherein said outer shaft includes a proximal end being electrically coupled to one of said pair of cable conductors, and said inner shaft includes a proximal end being electrically coupled to a second of said pair of cable conductors, said inner shaft and said outer shaft extending beyond said insulation housing at a distal end to expose a generally cone-like portion to form a mating plug, and wherein said first socket contact further comprising a leaf spring member urged into abutting relation with the distal end of said inner shaft during engagement between said electrical connector and said socket, and said second socket contact further comprising a sleeve having an inner surface urged into contact with the exposed distal end of said outer shaft during engagement between said electrical connector and said socket.

4,893,352

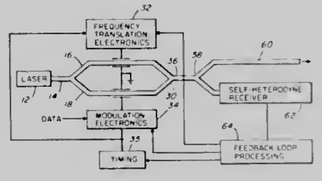
OPTICAL TRANSMITTER OF MODULATED SIGNALS

David Welford, Middleton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 30, 1987, Ser. No. 68,233

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 455—610 **27 Claims**



1. An optical waveguide modulator comprising:

an input waveguide for carrying an input optical signal;

an optical waveguide splitter for splitting the power of the input optical signal into plural signals in plural waveguides;

modulator means for modulating at least one of the plural signals such that at least one of the plural signals has negligible energy in frequency ranges of all other plural signals; and

an optical combiner for combining the signals into an output optical waveguide.

4,893,353

OPTICAL FREQUENCY SYNTHESIZER/SWEEPER

Hideto Iwaoka; Akira Ohte, and Koji Akiyama, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,448

Claims priority, application Japan, Dec. 20, 1985, 60-287162; Dec. 26, 1985, 60-294342; Jan. 24, 1986, 61-11894; Feb. 26, 1986, 61-40772; Feb. 26, 1986, 61-40773; Jun. 24, 1986, 61-96170; Jun. 26, 1986, 61-98194; Jun. 27, 1986, 61-97611; Jun. 27, 1986, 61-149777; Jul. 17, 1986, 61-168924; Aug. 26, 1986, 61-199364; Sep. 19, 1986, 61-221668

Int. Cl.⁴ H04B *9/00*

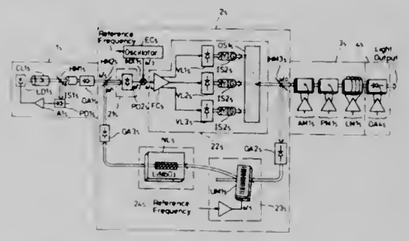
U.S. Cl. 455—612 **36 Claims**

2. An optical frequency synthesizer/sweeper comprising

a reference light source for generating an optical output signal having a wavelength; and

at least one optical frequency phase locked loop for controlling the wavelength of said optical output signal and for producing an output signal;

said at least one optical frequency phase locked loop comprising a variable wavelength light source for producing an output light and an optical heterodyne detector, said optical heterodyne detector receiving as inputs light associated with said output light from said variable wavelength light source and said optical output signal from said reference light source and outputting a signal to said variable wavelength light source so that the wavelength of said output signal from said at least one optical frequency phase locked loop is made variable on the basis of the wavelength of said optical output signal from said reference light source; wherein said at least one optical frequency phase locked loop comprises an optical frequency shifter for shifting the frequency of said output light from said variable wavelength light source and for producing an output light, and wherein said output light from said optical frequency shifter is emitted and applied as an input to said optical heterodyne detector.



4,893,354

SYSTEM AND METHOD FOR SELF-COMPENSATING FIBER-OPTIC DATA TRANSMISSION AT TEMPERATURES UP TO 200 DEGREES C.

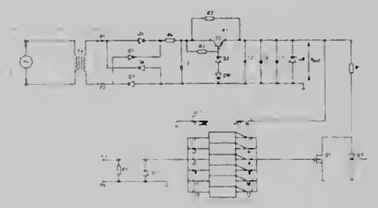
Erik Janzén, and Rune Tenghamn, both of Västerås, Sweden, assignors to AB ASEA-Atom, Sweden

Filed Nov. 6, 1987, Ser. No. 117,534

Claims priority, application Sweden, Nov. 7, 1986, 8604792

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 455—612 **9 Claims**



2. A self-compensating fiber-optic data transmission system for use at temperatures from ambient to 200° C. and at high pressure, comprising

a light source device adapted to emit light with a wavelength greater than 1100 A,

an armoured cable including an optical fiber having a head end and an upper end for the transmission of light, for example in connection with bore hole logging for communication between the head end in a bore hole and the upper end at a surface position, with contacts at the head end for connection to the light source device,

a drive unit for control of the light source device, and

a receiver for receiving the light signals from the light source device at the upper end of the cable,

wherein the light source device is adapted for continuous operation in such a way that at no temperature in the range 100°-200° C. does the output wavelength of the source device correspond to the highest peak of the wavelength/attenuation characteristic of the optical fiber.

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DESIGN PATENTS

GRANTED JAN. 9, 1990

ERRATA

For CLASS	See PATENT NO.
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DESIGNS

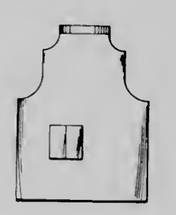
JANUARY 9, 1990

305,375
UNDERSHORTS
Daniel J. Beggs, P.O. Box 629, Crowley, La. 70527
Filed Nov. 8, 1988, Ser. No. 268,531
Term of patent 14 years
U.S. Cl. D2—10

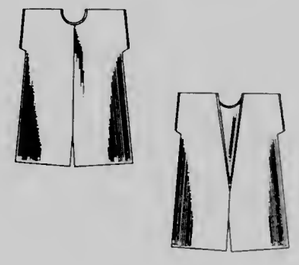




305,377
TRAVEL BIB
Rudy Labatto, and Cathy Labatto, both of 2532 S. Kittredge Way, Aurora, Colo. 80013
Filed Jun. 22, 1987, Ser. No. 64,795
Term of patent 14 years
U.S. Cl. D2—229



305,376
PATIENT GOWN
Susan Russell, Rte. 1, Box 75, Black Mountain, N.C. 28711
Filed Oct. 26, 1987, Ser. No. 112,428
Term of patent 14 years
U.S. Cl. D2—29

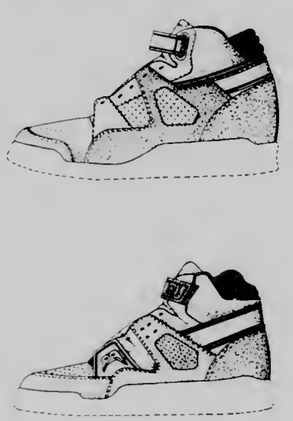


305,378
SHOE HEEL AND COUNTER PROTECTOR
Jill L. Kemna, Bloomington, and Thomas R. Freeman, St. Paul, both of Minn., assignors to Summerfield Industries, Inc., Roseville, Minn.
Filed Jan. 4, 1988, Ser. No. 140,435
Term of patent 14 years
U.S. Cl. D2—277

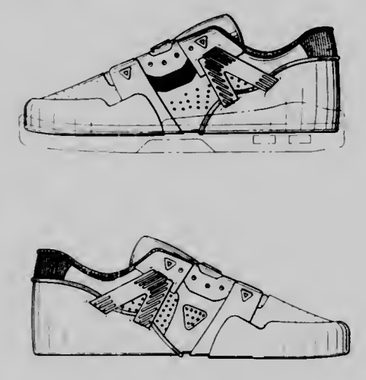


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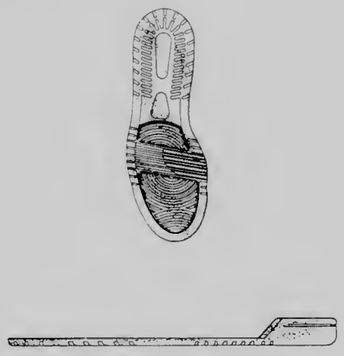
305,379
SHOE UPPER
Paul D. Brown, Hingham; Judith Ringel, Milton, and David E. Miller, Carver, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,570
Term of patent 14 years
U.S. Cl. D2—314



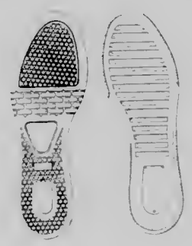
305,380
SHOE UPPER
Ric Claveria, Loma Linda, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Jun. 20, 1989, Ser. No. 369,100
Term of patent 14 years
U.S. Cl. D2—314



305,381
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 11, 1987, Ser. No. 13,622
Claims priority, application Japan, Aug. 12, 1986, 61-31765
Term of patent 14 years
U.S. Cl. D2—320



305,382
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 9, 1987, Ser. No. 12,635
Claims priority, application Japan, Aug. 9, 1986, 61-31240
Term of patent 14 years
U.S. Cl. D2—320



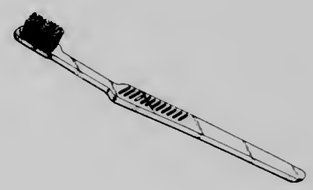
305,383
SHOE SOLE
Takashi Arai, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Feb. 6, 1987, Ser. No. 11,848
Claims priority, application Japan, Aug. 6, 1986, 61-30963
Term of patent 14 years
U.S. Cl. D2—320



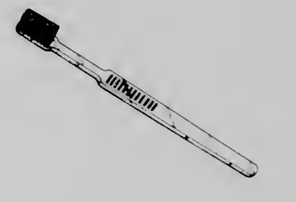
305,384
SOCK
Robert L. Hubbard, Henderson, N.C., assignor to Americal Corporation, Henderson, N.C.
Filed Jan. 12, 1987, Ser. No. 2,262
Term of patent 14 years
U.S. Cl. D2—331



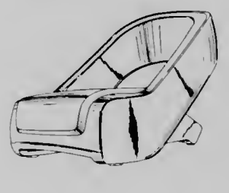
305,385
TOOTHBRUSH
Peter Schneider, Koenigstein, Fed. Rep. of Germany, assignor to Gillette of Canada Inc., Montreal, Canada
Filed Sep. 2, 1988, Ser. No. 240,188
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104



305,386
TOOTHBRUSH
Dieter Rams, Kronberg; Jürgen Greubel, Heidenrod, and Peter Schneider, Koenigstein, all of Fed. Rep. of Germany, assignors to Gillette Canada Inc., Montreal, Canada
Filed Jul. 13, 1987, Ser. No. 69,572
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104



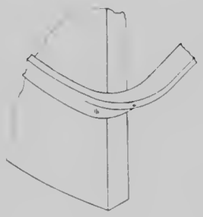
305,387
INFANT BOOSTER CHAIR
James F. Mariol, Cincinnati, Ohio, assignor to Rubbermaid Commercial Products, Winchester, Va.
Filed Jan. 8, 1987, Ser. No. 1,602
Term of patent 14 years
U.S. Cl. D6—333



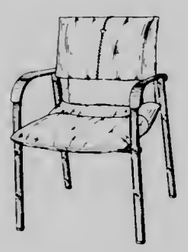
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305,388
CANTILEVERED CHAIR
Mark Mascheroni, 37 E. 67th St., New York, N.Y. 10021
Filed May 22, 1986, Ser. No. 866,690
Term of patent 14 years
U.S. Cl. D6—372

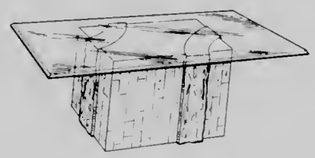


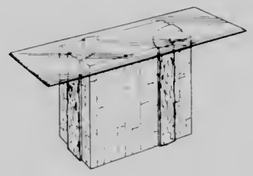


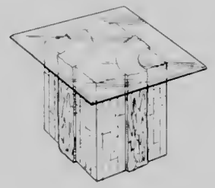
305,389
CHAIR
Mario Bellini, Milan, Italy, assignor to Fehlbaum & Co., Dornach, Switzerland
Filed Jun. 10, 1986, Ser. No. 872,769
Claims priority, application Italy, Jun. 5, 1986, DM/007 027
Term of patent 14 years
U.S. Cl. D6—379



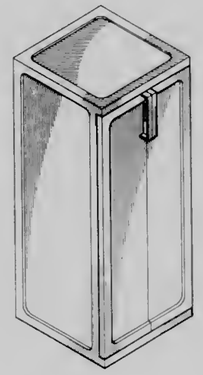
305,390
TABLE
Steven J. Pitchersky, 4509 Kenbridge Dr., Greensboro, N.C. 27410, and Edwin Goldstein, 160 Overlook Ave., Hackensack, N.J. 06041, assignors to Steven J. Pitchersky, Greensboro, N.C. and Edwin Goldstein, Hackensack, N.J.
Filed Apr. 14, 1989, Ser. No. 338,133
Term of patent 14 years
U.S. Cl. D6—451







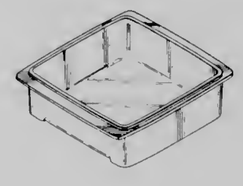
305,391
BATHROOM CABINET
Michael G. Whitney, 10610 Eastview Dr., Orlando, Fla. 32825
Filed Nov. 9, 1987, Ser. No. 118,639
Term of patent 14 years
U.S. Cl. D6—561



305,392
WINE GLASS OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 24, 1987, Ser. No. 42,003
Term of patent 14 years
U.S. Cl. D7—13



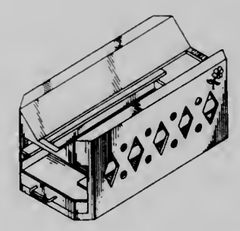
305,393
COMBINED COOKING AND STORAGE CONTAINER
James B. Stewart, Randolph, N.J., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Apr. 4, 1986, Ser. No. 847,896
Term of patent 14 years
U.S. Cl. D7—21



305,394
COMBINED FOOD CONTAINER COVER AND COASTER
Luis F. Puignero, Mallorca St 288, Barcelona, Spain
Filed Nov. 7, 1986, Ser. No. 928,141
Claims priority, application Spain, May 7, 1986, 110553
Term of patent 14 years
U.S. Cl. D7—40

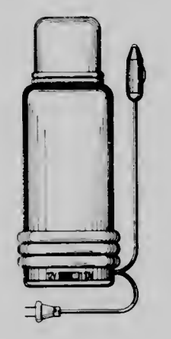


305,395
BOTTLE HOLDER
Charles Steelman, 803 E. 4th St., Denver City, Tex. 79323
Filed Apr. 28, 1986, Ser. No. 857,808
Term of patent 14 years
U.S. Cl. D7—70

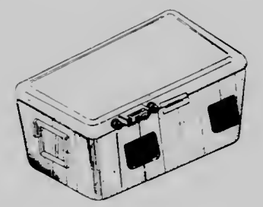


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305,396
COMBINED FOOD CONTAINER AND HEATING ELEMENT
Mark Weller, 1707 Pittston Ave., Scranton, Pa. 18505
Filed Dec. 3, 1987, Ser. No. 128,501
Term of patent 14 years
U.S. Cl. D7—77



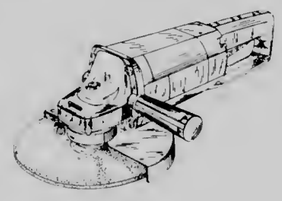
305,397
COMBINED COOLER CHEST AND RADIO
Mark A. Balius, 299 Forrest Ave., Biloxi, Miss. 39530
Filed Jul. 30, 1987, Ser. No. 79,784
Term of patent 14 years
U.S. Cl. D7—77



305,398
STAPLER
Paul Olesen, Bellmore, N.Y., assignor to Swingline Inc., Long Island City, N.Y.
Filed Jan. 31, 1986, Ser. No. 823,086
Term of patent 14 years
U.S. Cl. D8—49



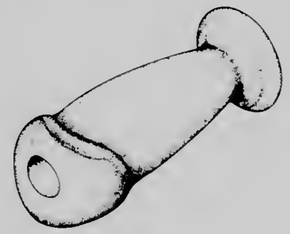
305,399
ELECTRIC DISC GRINDER
Fusao Fushiya, and Hirokazu Kimata, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Aug. 19, 1987, Ser. No. 86,838
Claims priority, application Japan, Feb. 24, 1987, 62-6861
Term of patent 14 years
U.S. Cl. D8—62



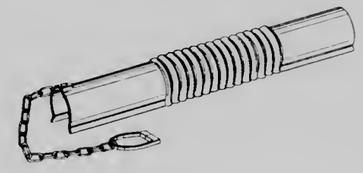
305,400
HAND HELD SANDER
Richard L. Petrovich, 6413 Fordwick Rd., Parma Hts., Ohio 44130
Continuation of Ser. No. 845,549, Mar. 28, 1986. This application Sep. 4, 1987, Ser. No. 93,395
Term of patent 14 years
U.S. Cl. D8—90



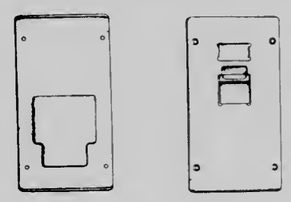
305,401
ANATOMICAL HANDGRIP
Steven A. Winston, Westlake Village, Calif., assignor to Guardian Products, Inc., Arleta, Calif.
Filed Jul. 31, 1987, Ser. No. 81,433
Term of patent 14 years
U.S. Cl. D8—303



305,402
CLAMP FOR HOLDING A TOWEL OR THE LIKE ON A BAR
David M. Novak, 1894 Commercenter, Ste. 201, P.O. Box 5865, San Bernardino, Calif. 92412
Filed Nov. 13, 1987, Ser. No. 119,989
Term of patent 14 years
U.S. Cl. D8—395



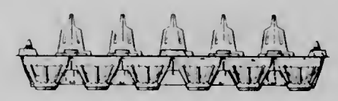
305,403
COMBINED RESCUE DOOR STOP AND STRIKER PLATE
Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.
Filed Feb. 3, 1987, Ser. No. 10,315
Term of patent 14 years
U.S. Cl. D8—402



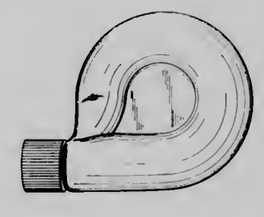
305,404
PERFUME CONTAINER
Alain-Dominique Perrin, Ruell-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Jul. 15, 1987, Ser. No. 73,429
Claims priority, application France, Jan. 16, 1987, 87 0191
Term of patent 14 years
U.S. Cl. D9—310



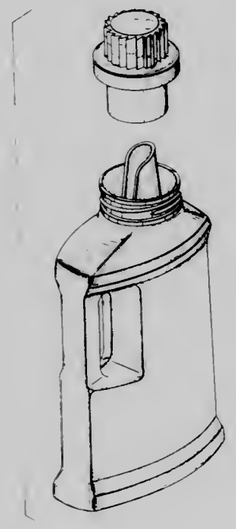
305,405
EGG CARTON
Ian G. Wilkinson, Ashwell, Nr. Baldock, Hertfordshire, England, assignor to Ovotherm Verpackungsproduktions, Wr. Neudorf, Austria
Filed Nov. 14, 1986, Ser. No. 930,555
Term of patent 14 years
U.S. Cl. D9—345



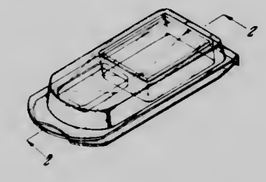
305,406
BOTTLE
Matteo Thune, Milan, Italy, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
Filed Aug. 27, 1986, Ser. No. 901,023
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 8 MR 928
Term of patent 14 years
U.S. Cl. D9—373



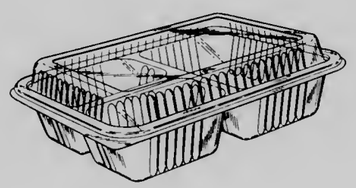
305,407
COMBINED DISPENSING BOTTLE AND CAP
Frank E. Gonda, Fairfield, Conn., assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 21, 1986, Ser. No. 821,172
Term of patent 14 years
U.S. Cl. D9—376



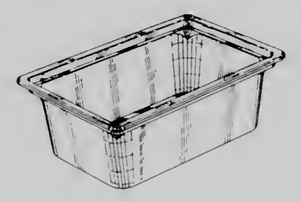
305,408
CLAM SHELL PACKAGE
Aldran H. LaJoie, El Toro, Calif., assignor to Cosmar Corporation, Huntington Beach, Calif.
Filed Mar. 31, 1986, Ser. No. 847,547
Term of patent 14 years
U.S. Cl. D9—415



305,409
TRAY WITH COVER
John T. Michaud, Moraga, and Harvey Hum, San Francisco, both of Calif., assignors to Packaging Corporation of America, Evanston, Ill.
Filed Aug. 26, 1986, Ser. No. 900,476
Term of patent 14 years
U.S. Cl. D9—425



305,410
PACKAGING CONTAINER
Frank S. Tyler, Sevenoaks, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Mar. 2, 1987, Ser. No. 20,824
Claims priority, application United Kingdom, Sep. 2, 1986, 1036466
Term of patent 14 years
U.S. Cl. D9—425



305,411
COMBINED WRISTWATCH AND GUARD THEREFOR
Takashi Atagi, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 29, 1986, Ser. No. 947,508
Term of patent 14 years
U.S. Cl. D10—31



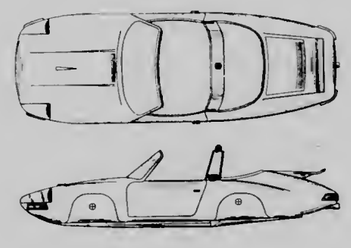
305,412
JEWELRY CLASP
Jack D. Zemer, 550 South Hill, Ste. 891, Los Angeles, Calif. 90013
Filed Jun. 13, 1986, Ser. No. 874,356
Term of patent 14 years
U.S. Cl. D11—87



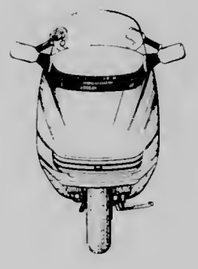
305,413
NECKTIE RESTRAINT
Joseph G. Martinus, 6020 N. Navarre St., Chicago, Ill. 60631
Filed Jan. 20, 1987, Ser. No. 5,573
Term of patent 14 years
U.S. Cl. D11—202



305,414
AMPHIBIOUS ROAD VEHICLE
Brian K. Costello, 7 Smith Rd., Colchester, Vt. 05446
Filed Jul. 20, 1987, Ser. No. 75,319
Term of patent 14 years
U.S. Cl. D12—3



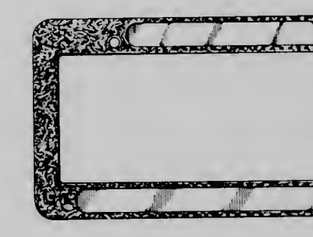
305,415
MOTORCYCLE
Takeo Miura; Kiyoshi Takagi, and Seiji Higashihara, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 13, 1987, Ser. No. 72,624
Claims priority, application Japan, Jan. 14, 1987, 62-956
Term of patent 14 years
U.S. Cl. D12—110



305,416
BABY WALKER'S SEAT COVER
Samuel E. Rohrer, Elverson, and Ronald R. Hoffman, Morgantown, both of Pa., assignors to Graco Children's Products, Elverson, Pa.
Filed Sep. 30, 1987, Ser. No. 103,577
Term of patent 14 years
U.S. Cl. D12—133



305,417
LICENSE PLATE FRAME
John L. Corey, 17700 S. Avalon Blvd. #55, Carson, Calif. 90746
Filed Apr. 4, 1988, Ser. No. 177,035
Term of patent 14 years
U.S. Cl. D12—193



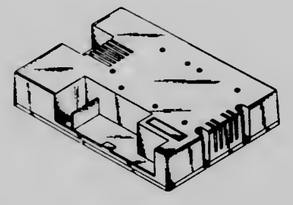
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305,418
GONDOLA FOR AN AIRSHIP
Bruce N. Blake, Kensington, Australia, assignor to Airship Developments Australia Pty. Ltd., Victoria, Australia
Filed Dec. 20, 1987, Ser. No. 139,879
Term of patent 14 years
U.S. Cl. D12—345

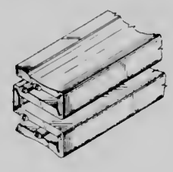


305,419
ROTATING WIND GENERATOR
Michael Korneski, 13075 Hilary Path, Hastings, Minn. 55033
Filed Sep. 29, 1987, Ser. No. 102,604
Term of patent 14 years
U.S. Cl. D13—3

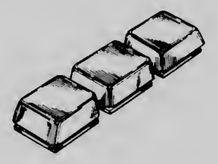
305,420
ELECTRONIC CONTROL MODULE COVER
Walter E. Bujak, Jr., Winsor Locks, Conn., and Robert W. Peitz, Jr., Fayetteville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 2, 1987, Ser. No. 128,539
Term of patent 14 years
U.S. Cl. D13—12



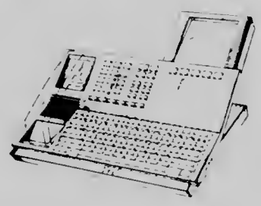
305,421
CONDUCTOR STRIP FOR ELECTRICAL AND TELECOMMUNICATION CONDUCTORS
Harald Widell, Kalendervägen 25; Jan Widell, Augustivägen 11, and Nils-Åke Bergman, Junivägen 24, all of S-352 47 Växjö, Sweden
Filed Jun. 18, 1986, Ser. No. 876,368
Claims priority, application Sweden, Dec. 23, 1985, 853143
Term of patent 14 years
U.S. Cl. D13—13



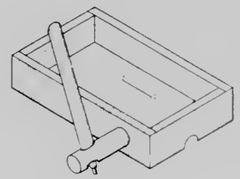
305,422
THREE KEYPAD PUSHBUTTON SET FOR TELECOMMUNICATIONS INSTRUMENTS
David J. Steer, Lincoln; Steven Hawker, Arnold, and Leonard Colebourne, Nottingham, all of England, assignors to Plessey Overseas Limited, Ilford, United Kingdom
Filed Oct. 22, 1986, Ser. No. 922,986
Claims priority, application United Kingdom, Apr. 22, 1986, 1033655
Term of patent 14 years
U.S. Cl. D14—247



305,423
COMMUNICATIONS WORKSTATION
Arthur H. Gilmore; Chris G. Johnson, both of New York, N.Y.; Norman W. Petty, Boulder, Colo.; Barbara A. Seelye, Arvada, Colo., and Thomas J. Tierney, Jr., Aurora, Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Apr. 8, 1987, Ser. No. 35,942
Term of patent 14 years
U.S. Cl. D14—101



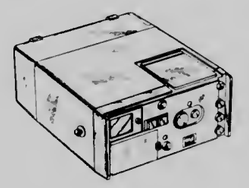
305,424
COMBINATION DRAWING PEN AND ENCLOSURE FOR A COMPUTER MOUSE FOR GENERATING FREE HAND COMPUTER GRAPHICS
Leonard E. Pressley, Sr., 6801-19 Space 269, Lubbock, Tex. 79407
Filed Sep. 14, 1987, Ser. No. 96,325
Term of patent 14 years
U.S. Cl. D14—114



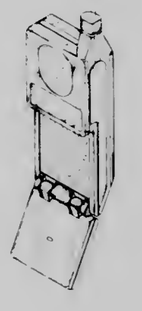
305,425
FACSIMILE
Kunio Hara, Chiba, and Shin-ichi Hiroki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 23, 1987, Ser. No. 137,002
Claims priority, application Japan, Jun. 25, 1987, 62-25628; Jun. 25, 1987, 62-25629
Term of patent 14 years
U.S. Cl. D14—118



305,426
PORTABLE STILL VIDEO TRANSMITTER
Susumu Doi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 20, 1987, Ser. No. 110,499
Claims priority, application Japan, Apr. 27, 1987, 62-16687
Term of patent 14 years
U.S. Cl. D14—124



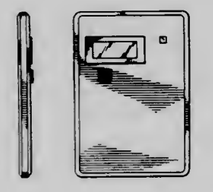
305,427
HOUSING FOR A PORTABLE HANDSET TELEPHONE OR SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 11, 1988, Ser. No. 255,696
Term of patent 14 years
U.S. Cl. D14—138





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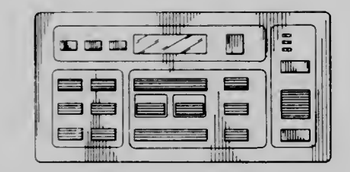
305,428
RADIO PAGER
Jan Berkheij, Driebergen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands
Filed Jun. 2, 1987, Ser. No. 56,681
Claims priority, application Int'l Pat. Institute, Dec. 3, 1986, DM/007869
Term of patent 14 years
U.S. Cl. D14—191



305,429
RADIO PAGER
Jan Berkheij, Driebergen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands
Filed Jun. 2, 1987, Ser. No. 56,683
Claims priority, application Int'l Pat. Institute, Dec. 3, 1986, DM/007869
Term of patent 14 years
U.S. Cl. D14—191



305,430
SURFACE FOR A FRONT PANEL FOR A VIDEO EDITING CONTROLLER
Robert A. Cohen, 29901 Weatherwood Ave., Laguna Niguel, Calif. 92677
Filed Nov. 14, 1986, Ser. No. 931,173
Term of patent 14 years
U.S. Cl. D14—257

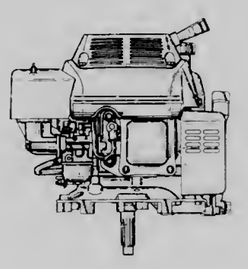


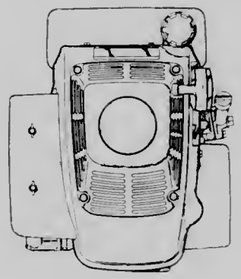
305,431
DOUBLE HOOK FOR A WALL
William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.
Filed May 26, 1987, Ser. No. 54,279
Term of patent 14 years
U.S. Cl. D8—367



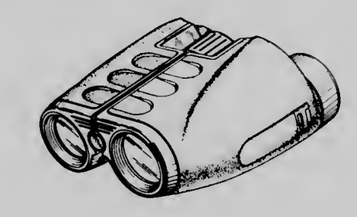


305,432
INTERNAL COMBUSTION ENGINE
Yasunori Hashigaki, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan
Filed Jun. 27, 1988, Ser. No. 214,575
Claims priority, application Japan, Jun. 30, 1987, 62-26889
Term of patent 14 years
U.S. Cl. D15—1





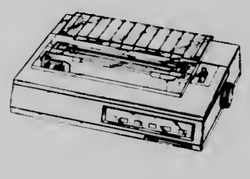
305,433
BINOCULARS
Hiroshi Kobayashi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Mar. 29, 1988, Ser. No. 174,680
Claims priority, application Japan, Oct. 27, 1987, 62-43849
Term of patent 14 years
U.S. Cl. D16—133



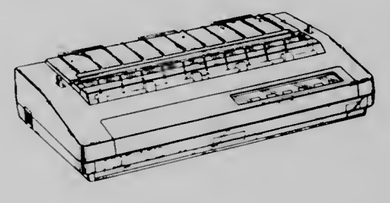
305,434
ELECTRONIC HARP
Ralph F. Garritano, P.O. Box 923, Crystal Beach, Fla. 34681
Filed Dec. 18, 1986, Ser. No. 943,160
Term of patent 14 years
U.S. Cl. D17—16



305,435
PRINTER
Seiichi Omino, Tokyo; Atsushi Noda, Kawasaki, and Soichi Hiramatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1986, Ser. No. 867,291
Claims priority, application Japan, Nov. 28, 1985, 60-49702
Term of patent 14 years
U.S. Cl. D18—13

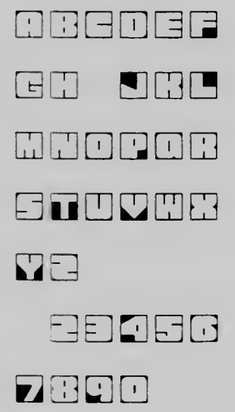


305,436
PRINTER
Eiichi Yoshioka, Abiko, and Koji Terasawa, Mitaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 26, 1986, Ser. No. 935,554
Claims priority, application Japan, May 30, 1986, 61-20803
Term of patent 14 years
U.S. Cl. D18—13



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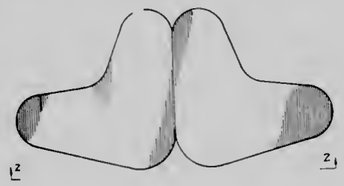
305,437
FONT OF TYPE
Leonard W. Wendling, #161 River Forest Village, Punta Gorda, Fla. 33950
Filed Mar. 6, 1989, Ser. No. 318,947
Term of patent 14 years
U.S. Cl. D18—24



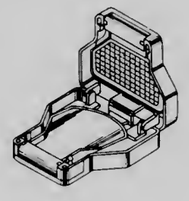
305,438
PORTABLE COPYING MACHINE
Isshin Miyamoto, Fukuoka, and Koji Imaizumi, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Plus Corporation, both of Osaka, Japan
Filed Sep. 11, 1986, Ser. No. 906,780
Claims priority, application Japan, Mar. 14, 1986, 61-9193
Term of patent 14 years
U.S. Cl. D18—36



305,439
CARD
Kevin F. Spendler, Ashwood, Australia, assignor to Designcorp Australia Pty. Limited, St. Kilda, Australia
Filed Sep. 29, 1986, Ser. No. 912,552
Claims priority, application Australia, Jan. 24, 1986, 3977/86
Term of patent 14 years
U.S. Cl. D19—1



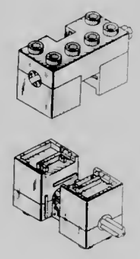
305,440
SIMULATIVE TOY TOOL
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,550
Term of patent 14 years
U.S. Cl. D21—59



305,441
COMBINED TOY BALLOON AND STUFFER
Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240
Filed Nov. 23, 1987, Ser. No. 124,462
Term of patent 14 years
U.S. Cl. D21—84



305,442
TOY BUILDING LIFT ELEMENT
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Switzerland
Filed May 26, 1987, Ser. No. 54,367
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, URA 1526/86
Term of patent 14 years
U.S. Cl. D21—108



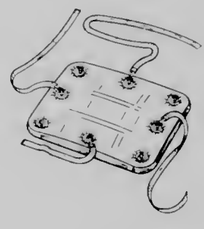
305,443
JUMP MARBLE RACE TOY
Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.
Filed Jul. 1, 1988, Ser. No. 214,697
Term of patent 14 years
U.S. Cl. D21—143



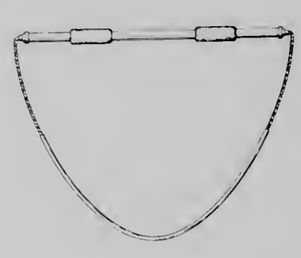
305,444
GRANDMA DOLL
Arvid Strohschein, 831 Birch St., Sauk Centre, Minn. 56378
Filed Sep. 3, 1985, Ser. No. 772,024
Term of patent 14 years
U.S. Cl. D21—175



305,445
PHYSICAL EXERCISER
Raymond Ramos, Jr., 820 Raywood, Montebello, Calif. 90640
Filed Jul. 6, 1987, Ser. No. 69,623
Term of patent 14 years
U.S. Cl. D21—191

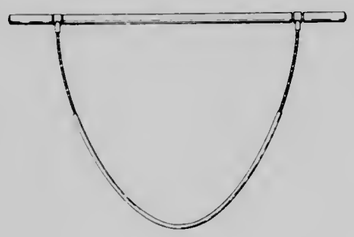


305,446
JUMPROPE
Thomas Valentine, Sherman Oaks, Calif., assignor to Apogee, Inc., Van Nuys, Calif.
Filed Dec. 21, 1987, Ser. No. 136,644
Term of patent 14 years
U.S. Cl. D21—198

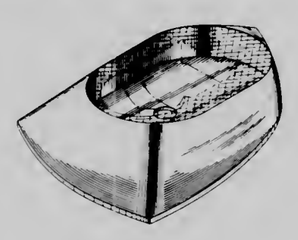


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305,447
JUMPROPE
Thomas Valentine, Sherman Oaks, Calif., assignor to Apogee, Inc., Van Nuys, Calif.
Filed Dec. 21, 1987, Ser. No. 136,181
Term of patent 14 years
U.S. Cl. D21—198



305,448
KICKING TEE BASE
H. Jay Spiegel, 2112 Whiteoaks Dr., Alexandria, Va. 22306
Filed Jan. 7, 1987, Ser. No. 1,110
Term of patent 14 years
U.S. Cl. D21—209



305,449
FLOAT
Peter A. Rundquist, Jr., Atlanta, Ga., assignor to Anton Discovery Group, Inc., Atlanta, Ga.
Filed Jun. 19, 1987, Ser. No. 64,296
Term of patent 14 years
U.S. Cl. D21—237



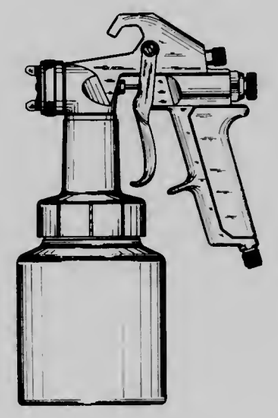
305,450
COMBINED FISHING POLE, NIGHT LIGHT AND BITE INDICATOR LIGHT
Jack B. Noble, and Barbara A. Noble, both of 202 Macdill Ct., Lackland AFB, San Antonio, Tex. 78236
Filed Oct. 2, 1986, Ser. No. 914,757
Term of patent 14 years
U.S. Cl. D22—142



305,451
COMBINED SPRAYER AND REFILL CONTAINER
Robert S. Rosenbaum, Los Angeles, Calif., assignor to Mission Kleensweep Products, Inc., Los Angeles, Calif.
Filed Jul. 31, 1987, Ser. No. 79,888
Term of patent 14 years
U.S. Cl. D23—225



305,452
SPRAY GUN UNIT
Fredrick M. Morgan, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Filed Oct. 30, 1987, Ser. No. 116,135
Term of patent 14 years
U.S. Cl. D23—225



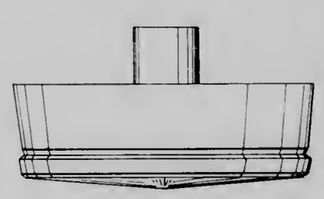
305,453
SPRAY GUN
Fredrick M. Morgan, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Filed Oct. 30, 1987, Ser. No. 116,120
Term of patent 14 years
U.S. Cl. D23—226



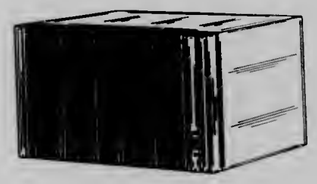
305,454
HOSE END TRIGGER NOZZLE
Craig E. Beal, Vistas, Calif., assignor to Rain Bird Consumer Products Mfg. Corp, Glendora, Calif.
Filed Nov. 27, 1987, Ser. No. 126,301
Term of patent 14 years
U.S. Cl. D23—226



305,455
COMBINED BATHTUB OVERFLOW DRAIN COVER AND DRAIN CONTROL HANDLE
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Apr. 6, 1987, Ser. No. 34,186
Term of patent 14 years
U.S. Cl. D23—254

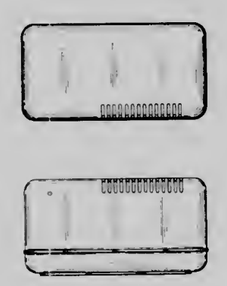


305,456
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,074
Claims priority, application Japan, May 29, 1987, 62-22489
Term of patent 14 years
U.S. Cl. D23—353

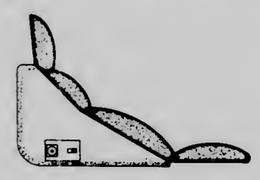


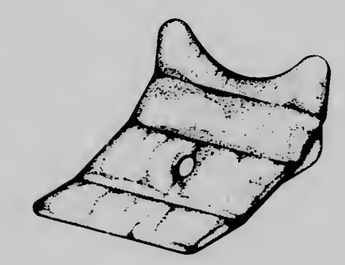
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305,457
DEODORIZER
Kaname Nakao, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 9, 1988, Ser. No. 192,309
Claims priority, application Japan, Nov. 10, 1987, 62-45840
Term of patent 14 years
U.S. Cl. D23—366

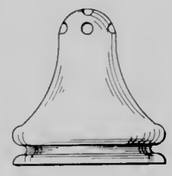


305,458
MASSAGE CUSHION OR SIMILAR ARTICLE
Austin Wang, 6F, No. 24, Ting-Mn E. Road, Taipei, Taiwan
Filed Jun. 1, 1987, Ser. No. 26,162
Term of patent 14 years
U.S. Cl. D24—40

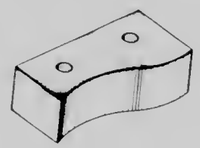




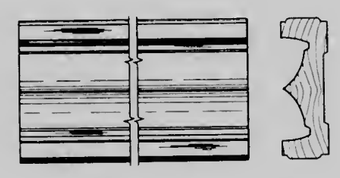
305,459
FEEDING NIPPLE
Lois G. Smith, 4046 E. Harley, Tucson, Ariz. 85712
Filed Jun. 12, 1987, Ser. No. 61,175
Term of patent 14 years
U.S. Cl. D24—46



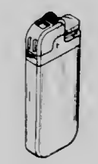
305,460
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,891
Claims priority, application Japan, Oct. 15, 1986, 61-40558
Term of patent 14 years
U.S. Cl. D25—114



305,461
MOLDING
Charles V. Pike, 309 Via Linda, Palm Beach, Fla. 33408
Filed Jun. 15, 1987, Ser. No. 62,051
Term of patent 14 years
U.S. Cl. D25—136



305,462
CIGARETTE LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Jun. 23, 1987, Ser. No. 65,523
Claims priority, application Japan, Dec. 24, 1986, 61-50781
Term of patent 14 years
U.S. Cl. D27—156



305,463
COSMETIC SAMPLER
Linda Zango, 1160 Fifth Ave., Ste. 610, New York, N.Y. 10029
Filed Jun. 15, 1987, Ser. No. 63,271
Term of patent 14 years
U.S. Cl. D28—7



305,464
BLOW DRYER
Lee Rickard, and Peggy Rickard, both of Rte. 15, Box 808-D, N. Ft. Myers, Fla. 33917
Filed Dec. 3, 1987, Ser. No. 128,502
Term of patent 14 years
U.S. Cl. D28—12





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305,465
SAFETY RAZOR OR THE LIKE
Oneta R. Hayes, 533 E. 5th, Claremore, Okla. 74107
Filed Aug. 11, 1986, Ser. No. 895,266
Term of patent 14 years
U.S. Cl. D28—46

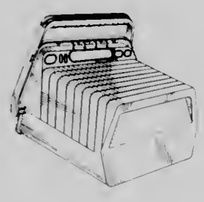


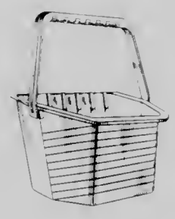


305,466
ELECTRIC MOUSTACHE AND BEARD TRIMMER OR SIMILAR ARTICLE
Teizoh Satoh, Osaka, Japan, assignor to Helen of Troy Corporation, El Paso, Tex.
Filed May 24, 1988, Ser. No. 202,574
Term of patent 14 years
U.S. Cl. D28—53

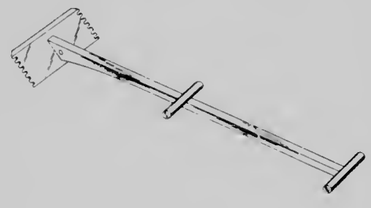


305,467
BUCKET
David L. Dagge, Luton, United Kingdom, assignor to Addis Limited, Hertfordshire, United Kingdom
Filed Dec. 10, 1987, Ser. No. 131,173
Claims priority, application United Kingdom, Jun. 16, 1987, 1042855
Term of patent 14 years
U.S. Cl. D32—53





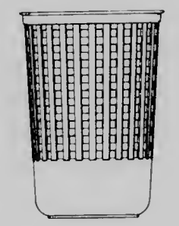
305,468
COMBINED SNOW AND ICE REMOVER AND SCRAPER
Edward H. Yonkers, 13 Cooney St., Somerville, Mass. 02143
Filed Dec. 27, 1985, Ser. No. 813,710
Term of patent 14 years
U.S. Cl. D32—49



305,469
COMBINED BASKET AND REMOVABLE LINER
Sarah M. Mautner, 703 S. Main St., Auburn, Ind. 46706
Filed Jul. 6, 1987, Ser. No. 70,231
Term of patent 14 years
U.S. Cl. D34—40



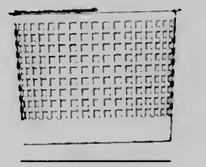
305,470
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Jun. 2, 1986, Ser. No. 869,941
Claims priority, application Japan, Dec. 17, 1985, 60-52716
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—40



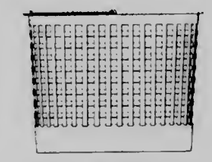
305,471
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Jun. 2, 1986, Ser. No. 869,940
Claims priority, application Japan, Dec. 17, 1985, 60-52717
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—40



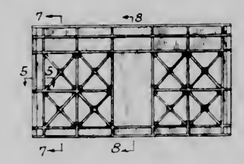
305,472
BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Sep. 23, 1986, Ser. No. 910,776
Claims priority, application Japan, May 8, 1986, 61-17255
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—42



305,473
BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Sep. 23, 1986, Ser. No. 910,742
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305,474
ORNAMENTAL CASE
Orlando O. Fresquez, 9549 Markwood Dr., Santee, Calif. 92071
Filed Dec. 1, 1987, Ser. No. 127,098
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Bollweber, Lothar; Jansche, Walter; Hugel, Robert; Pilch, Claus-Dietrich; Rothley, Manfred; and Zabler, Erich, 4,891,973, Cl. 73-146.500.
Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, 4,893,218, Cl. 362-61.000.
Sumal, Jaihind S., 4,891,978, Cl. 73-204.260.

Robert Bosch Power Tool Corporation: *See—*
Cotton, Lawrence M.; and Derler, John C., 4,892,022, Cl. 83-478.000.

Robertson, David J.; Maginley, Ronald J.; Chapman, Alan S. J.; Thomas, Terence N.; Nizamuddin, Nadir; Williams, John W. J.; Redmond, Alan M.; and Morley, Robert S., to Northern Telecom Limited. Digital key telephone system. 4,893,310, Cl. 370-110.100.

Robertson, Michael K.; and Henderson, Robert B., to Nutech Energy Systems Inc. Fluid purification. 4,892,712, Cl. 422-186.000.

Robin, Roger; Somme, Jean-Francois; and Bouvot, Jean-Francois, to Valeo. Heating installation comprising a heat generator, intended for an automobile. 4,892,248, Cl. 237-12.30B.

Robinson, Alan S.: *See—*
Fuller, Mark W.; and Robinson, Alan S., 4,892,250, Cl. 239-18.000.

Robinson, David L. Prosthetic foot. 4,892,554, Cl. 623-55.000.

Robinson, Harry W. Hydrotherapy patient support apparatus. 4,891,849, Cl. 4-575.000.

Robitaille, James M., to Ericson Manufacturing Company. Resettable ground fault circuit interrupter. 4,893,101, Cl. 335-18.000.

Rocher, Christian: *See—*
Rabinzohn, Patrick D.; Rocher, Christian; and Gourrier, Serge, 4,892,835, Cl. 437-22.000.

Rockwell International Corporation: *See—*
Pankonen, Andrew W.; Jester, Donald J.; Mulrow, Robert J.; Modica, Catherine P.; and Zdenek, John M., 4,893,325, Cl. 379-45.000.

Rockwell-Rimoldi, S.p.A.: *See—*
Fieschi, Giorgio, 4,892,047, Cl. 112-122.000.

Roczniak, Steven O.: *See—*
Hill, John B.; and Roczniak, Steven O., 4,892,820, Cl. 435-68.100.

Roda, Aldo: *See—*
Castagnola, Virginio; Frigerio, E. Giuliano; Pellicciari, Roberto; and Roda, Aldo, 4,892,868, Cl. 514-182.000.

Rodriguez, Carlos Z.: *See—*
Slattery, Carroll A.; and Rodriguez, Carlos Z., 4,892,197, Cl. 211-14.000.

Rody, Jean: *See—*
Slongo, Mario; and Rody, Jean, 4,892,915, Cl. 526-259.000.

Roeder, Robert J.: *See—*
Reeves, William G.; Roeder, Robert J.; and Duello, Leonard E., 4,892,784, Cl. 428-288.000.

Roediger, Gary A.: *See—*
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.

Roehm GmbH Chemische Fabrik: *See—*
Siol, Werner; and Terbrack, Ulrich, 4,892,909, Cl. 525-216.000.

Roerig, Arnold J.; and Hergert, Richard R., to Beloit Corporation. Self loading controlled deflection. 4,891,874, Cl. 29-115.000.

Rogers, John N.; Lady, James M.; Bilsbarrow, Donald W.; and Trujillo, Rene S., to United Technologies Corporation. Vehicle brake test system. 4,893,242, Cl. 364-426.010.

Rogers, Michael S.: *See—*
Bundy, Charles H.; Graham, Robert A.; Kuehn, Stephen F.; Precit, Richard R.; and Rogers, Michael S., 4,893,049, Cl. 310-338.000.

Rogers, Philip S.; Rawlings, Rees D.; and Kim, Hyung S., to National Research Development Corporation. Reinforceable sintered glass-ceramics. 4,892,846, Cl. 501-8.000.

Rohm, GmbH: *See—*
Klesse, Wolfgang; Rauch, Hubert; Arndt, Peter J.; and Suetterlin, Norbert, 4,892,910, Cl. 525-221.000.
Rauch, Hubert; and Arndt, Peter J., 4,892,932, Cl. 528-499.000.

Rohrs, Friederich: *See—*
Jager, Andreas; and Rohrs, Friederich, 4,892,509, Cl. 474-237.000.

Rolflor Industries, Inc.: *See—*
Hodgetts, Graham L., 4,892,456, Cl. 414-527.000.

Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., to T.D.J. Co., Inc., The. Material communitor. 4,892,261, Cl. 241-301.000.

Roller, Philip C., to Truck-Lite Co., Inc. Heavy duty solid state flasher for turn signal and emergency warning lamps. 4,893,111, Cl. 340-471.000.

Romanet, Robert F.: *See—*
Bowne, Arlyce T.; Romanet, Robert F.; and Normandin, Sharon E., 4,892,805, Cl. 430-387.000.

Romine, Hugh E.; and Fu, Ta-Wei, to Conoco Inc. Process for the production of mesophase. 4,892,642, Cl. 208-39.000.

Rorer Pharmaceutical Corporation: *See—*
Neuenschwander, Kent W.; and Scotese, Anthony C., 4,892,884, Cl. 514-460.000.

Rosa, Peter: *See—*
Ryan, Robert; Webster, Steven; Prouty, Richard; and Rosa, Peter, 4,892,508, Cl. 474-101.000.

Rosch, Fritz; and Otte, Bernd, to Alcan International Ltd. Thermally stressed component. 4,892,069, Cl. 123-193.0CH.

Rose, Derrick B. Cladding assembly. 4,891,924, Cl. 52-520.000.

Rose, Karl-Heinz: *See—*
Kawa, Rolf; Tesmann, Holger; Wilhelm, Josef; Rose, Karl-Heinz; and Konrad, Eugen, 4,892,728, Cl. 424-70.000.

Rose, Richard S.: *See—*
Favstritsky, Nicolai A.; Rose, Richard S.; Borden, Dennis M.; and Honkomp, David J., 4,892,892, Cl. 521-107.000.

Rosenbaum, Georges: *See—*
Grollier, Jean-Francois; Rosenbaum, Georges; Allec, Josiane; and Shroot, Braham, 4,892,888, Cl. 514-132.000.

Ross, Steven L.: *See—*
Homer, John C.; Nowshiravani, Shahriar; Ross, Steven L.; and Lutz, Gilbert F., 4,893,315, Cl. 374-37.000.

Rossow, Leroy J. Multi-piece insulating bushing and method of securing an electrical conductor thereto. 4,892,979, Cl. 174-153.00G.

Rothley, Manfred: *See—*
Bollweber, Lothar; Jansche, Walter; Hugel, Robert; Pilch, Claus-Dietrich; Rothley, Manfred; and Zabler, Erich, 4,891,973, Cl. 73-146.500.

Rotkoski, Cristiana J.: *See—*
Paul, Marius A.; Paul, Ana; and Rotkoski, Cristiana J., 4,892,067, Cl. 123-90.120.

Rowe, Don H.: *See—*
Luciano, Robert A.; Luciano, Lawrence W.; Rowe, Don H.; and Hanson, Violet M., 4,892,511, Cl. 493-194.000.

Rowland, David F. Thermal insulation blanket for a hot water heater. 4,892,771, Cl. 428-74.000.

Royal Appliance Mfg. Co.: *See—*
Sovis, John F.; Smith, Robert M.; and Bramhall, George H., 4,891,861, Cl. 15-344.000.

Ruchel, Peter: *See—*
Stadler, Hansjorg; and Ruchel, Peter, 4,892,991, Cl. 219-121.740.

Ruckwied, Heinz: *See—*
Dilk, Gerhard; Klaiber, Rolf; Kreschel, Kurt; Krieg, Wolfgang; Ruckwied, Heinz; and Ulrich, Gerhard, 4,893,218, Cl. 362-61.000.

Rudeck, Paul J., to International Business Machines Corporation. Alignment mark system for electron beam/optical mixed lithography. 4,893,163, Cl. 357-40.000.

Rudick, Arthur G.; Heenan, Richard H.; and Credle, William S., Jr., to Coca-Cola Company, The. System for serving a pre-mix beverage or making and serving a post-mix beverage in the zero gravity conditions of outer space. 4,892,125, Cl. 141-353.000.

Rudick, Arthur G., to Coca-Cola Company, The. System for dispensing liquid from a paperboard carton. 4,892,229, Cl. 222-105.000.

Rudolf, Hans-Werner: *See—*
Lechner, Robert; Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; Priest, Christopher C. A.; Dyer, Nigel P.; Galpin, Robert K. P.; Manca, Marcello; Mosca, Virgilio; Nicastro, Antonio; Albouy, Pierre; Le Gougnec, Robert; and Nadaradjane, Ramatchandirane, 4,893,309, Cl. 370-110.100.

Rudy, Douglas W.; Hunnemann, Michael P.; and Thomas, Stephen B., to FMC Corporation. Curved diverter plate assembly for interchangeability of various models of traveling water screens. 4,892,652, Cl. 210-160.000.

Rumble, David W.: *See—*
Girodat, Joseph C.; Rumble, David W.; Sweetman, Lawrence M.; and Swindall, William, 4,893,241, Cl. 364-424.070.

Rurlander, Robert: *See—*
Prigge, Helene; Rurlander, Robert; Schwab, Michael; Bortner, Hans P.; and Englmuller, Andreas, 4,892,568, Cl. 55-73.000.

Rusch, Helmut; Waitl, Guenter; Harrasser, Hansjoerg; Richter, Hans-Juergen; Francis, Lee; Seidl, Alois; Wissinger, Hans; and Hampel, Hans-Joachim, to Siemens Aktiengesellschaft. Lead frame and a process for the production of a lead with this lead frame. 4,893,169, Cl. 357-70.000.

Russell, Edward J.: *See—*
vander Griendt, Pieter S.; Tielrooy, Robert W.; and Russell, Edward J., 4,892,184, Cl. 198-476.100.

Russell, John P.: *See—*
Webster, William M., Jr.; and Russell, John P., 4,892,385, Cl. 350-162.230.

Russell, Thomas R., to Saftron Inc. Non-corrosive security railing. 4,892,292, Cl. 256-66.000.

Rutherfoord, Charles T.; and Frank, Nancy S., to International Business Machines Corporation. Interactive video composition and presentation systems. 4,893,256, Cl. 364-518.000.

Ryan, Michael J.: *See—*
Leibowitz, Paul J.; and Ryan, Michael J., 4,892,743, Cl. 424-85.700.

Ryan, Robert; Webster, Steven; Prouty, Richard; and Rosa, Peter. Safety guide support for pivoting pulley. 4,892,508, Cl. 474-101.000.

Ryang, Hong-Son, to BASF Corporation. Secondary amine terminated siloxanes, methods for their preparation and use. 4,892,918, Cl. 528-15.000.

Ryder International Corporation: *See—*
Lisak, Stephen P., 4,893,219, Cl. 362-66.000.
Ranalletta, Joseph V.; and Kanner, Rowland W., 4,892,097, Cl. 606-182.000.

Saari, Walfred S., to Merck & Co., Inc. Derivatives of 3-nitropyridines useful as adjuncts to radiation therapy. 4,892,951, Cl. 546-307.000.

Sackett, James A.: *See—*
McNeel, William O.; Sackett, James A.; Wood, Joe N.; and Soliz, Julian, III, 4,893,290, Cl. 367-178.000.

Sacks, Robert N.: *See—*
Tanski, William J.; Merritt, Sears W.; and Sacks, Robert N., 4,893,161, Cl. 357-24.000.

Saftron Inc.: *See—*
Russell, Thomas R., 4,892,292, Cl. 256-66.000.

Sager, Annette M.; and Szittai, Suzette M. Medical absorption garment. 4,891,846, Cl. 2-49.00R.

Sahashi, Masashi: *See—*
Kobayashi, Tadahiko; Sahashi, Masashi; and Tokai, Yoichi, 4,891,992, Cl. 73-862.360.

Sainen, Tsutomu, to Tsudakoma Corp. Centralized loom control method with optimization of operating speed. 4,893,250, Cl. 364-470.000.

St. Alban, Jonas O.: *See—*
Potvin, Robert E.; St. Alban, Jonas O.; and Sobodacha, Chester J., 4,892,801, Cl. 430-193.000.

Saint-Gobain Vitrage: *See—*
Delage, Robert; Cadier, Marcel; and Boillet, Jacques, 4,892,573, Cl. 65-179.000.

Saito, Kazunori: *See—*
Motai, Noboru; Tanaka, Sakae; Watanabe, Yoshiaki; Shirai, Katsuo; Suzuki, Yacko; Ogiwara, Yoshihisa; Saito, Kazunori; and Shibuki, Keiko, 4,892,613, Cl. 156-643.000.

Saito, Kazuya: *See—*
Watanabe, Kazuhiro; Saito, Kazuya; Yuchi, Yoshiyuki; and Inagawa, Konosuke, 4,892,791, Cl. 428-698.000.

Saito, Keishi: *See—*
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.

Saito, Masahiro: *See—*
Mizuno, Koichi; Saito, Masahiro; Takahashi, Tadao; and Aizawa, Reize, 4,892,855, Cl. 502-200.000.

Saito, Naoki: *See—*
Aoki, Kozo; Ono, Michio; and Saito, Naoki, 4,892,810, Cl. 430-553.000.

Saitou, Satoshi, to Kabushiki Kaisha Toshiba. Radiation detecting circuit including positional error calibrator. 4,893,018, Cl. 250-370.100.

Sajda, Paul: *See—*
Sorensen, Keld; Macri, James N.; Douros, Timothy J.; Sajda, Paul; and Ippolito, Emiddio V., 4,892,405, Cl. 356-243.000.

Sakaguchi, Suguru: *See—*
Matsumoto, Kunio; Oshima, Muneo; and Sakaguchi, Suguru, 4,893,172, Cl. 357-79.000.

Sakai Chemical Industry Co., Ltd.: *See—*
Abe, Kazunobu; and Umaba, Toshikatsu, 4,892,716, Cl. 423-213.700.

Sakai, Katsumi; Chou, Kiyoaki; and Endo, Takeshi, to Fuji Kagaku Kogyo Kabushiki Kaisha. Oligopeptidyl-5-fluorouridine compounds and process for preparing the same. 4,892,939, Cl. 536-23.000.

Sakai, Kunikazu: *See—*
Terashima, Shiro; Kimura, Yoshikazu; Ito, Yoshio; Sakai, Kunikazu; and Hiyama, Tamejiro, 4,892,961, Cl. 549-419.000.
Sakakura, Toshiyasu: *See—*
Tanaka, Masato; and Sakakura, Toshiyasu, 4,892,936, Cl. 534-595.000.
Sakamoto, Eiichi: *See—*
Hirabayashi, Shigeto; Sato, Hirokazu; and Sakamoto, Eiichi, 4,892,807, Cl. 430-505.000.
Sakamoto, Nobuyasu: *See—*
Tanida, Osamu; Okuno, Yoshiharu; Yoshida, Katsuhiko; Sakamoto, Nobuyasu; Ishikawa, Hsao; and Kobayashi, Eiichi, 4,892,242, Cl. 225-2.000.
Sakamoto, Shuji: *See—*
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 4,892,924, Cl. 528-196.000.
Sakane, Takeshi: *See—*
Imai, Ko; Sakane, Takeshi; and Nogami, Ikuo, 4,892,823, Cl. 435-138.000.
Sakata, Seiji, to Ricoh Company, Ltd. Multi-copy system for a digital copier. 4,893,194, Cl. 358-443.000.
Sakoda, Ryozo: *See—*
Mutsukado, Motoo; Tanikawa, Keizo; Shikada, Ken-ichi; and Sakoda, Ryozo, 4,892,947, Cl. 514-247.000.
Sakuma, Yuichi: *See—*
Sasaki, Akira; and Sakuma, Yuichi, 4,892,168, Cl. 181-250.000.
Sakurada, Muneo; Kurosawa, Isamu; and Wakabayashi, Shinji, to Diesel Kiki Co., Ltd. Air conditioner for automobiles with hot/refrigeration compartment for stored articles. 4,892,135, Cl. 165-42.000.
Sakuragi, Hiroshi, to Kabushiki Kaisha Toshiba. Data processing apparatus having enlargement/reduction functions capable of setting different magnification in different directions. 4,893,258, Cl. 364-521.000.
Sakurai, Takao; Yokota, Tadahiko; Komatsu, Eri; Mikami, Naoko; Higuchi, Ryoichi; and Takeuchi, Koji, to Ajinomoto Co., Inc. Phenyl pyrimidine compound and liquid crystalline composition. 4,892,676, Cl. 252-299.610.
Salee, Gideon: *See—*
Durairaj, Bojayan; Peterson, Alex P., Jr.; and Salee, Gideon, 4,892,908, Cl. 525-160.000.
Salem, Ronald R.; Thomas, Peter; Zamcheck, Norman; and Steele, Glenn, to New England Deaconess Hospital Corporation; and Mallory Institute of Pathology Foundation. Monoclonal antibody for colorectal carcinoma. 4,892,933, Cl. 530-387.000.
Sales, Milton S.; and Thompson, John R., to Eastman Kodak Company. Collation of multi-page documents. 4,893,153, Cl. 355-325.000.
Sallant, Victorino S.: *See—*
Segura, Antonio T.; and Sallant, Victorino S., 4,892,004, Cl. 74-501.50R.
Salmivaara, Martti: *See—*
Malkki, Raimo; Jaatinen, Paavo; Haverinen, Timo; Eskelinen, Pekka; Jokinen, Juhani; Vuorinen, Vesa; Virta, Raimo; and Salmivaara, Martti, 4,892,622, Cl. 162-208.000.
Salvagnini Transferica S.p.A.: *See—*
Piacentini, Dario, 4,891,965, Cl. 72-481.000.
Salvi, Francisco J. Oven closures. 4,892,085, Cl. 126-340.000.
Sampson, Roy J.; Kelland, John W.; and Kiff, Frank T., to Imperial Chemical Industries PLC. Transition metal composition. 4,892,852, Cl. 502-107.000.
Samsonite Furniture Company: *See—*
Fend, Fritz M., 4,892,355, Cl. 297-440.000.
Samukawa, Koji: *See—*
Seki, Masaki; and Samukawa, Koji, 4,893,251, Cl. 364-474.290.
Sanada, Masahiko; Hayashi, Yoshio; Ohnuma, Akira; and Ogawa, Shuichiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for storing dry silver salt roll film for rotary type microphotography and rotary type microphotography camera system. 4,893,148, Cl. 355-27.000.
Sanden Corporation: *See—*
Ishii, Yutaka, 4,892,143, Cl. 165-152.000.
Okajima, Yoshiaki, 4,892,196, Cl. 206-523.000.
Takashi, Matsushita; and Fumiaki, Uehara, 4,892,176, Cl. 192-84.00C.
Sanders, Michael J.: *See—*
Leighton, John C.; and Sanders, Michael J., 4,892,898, Cl. 524-3.000.
Sanders, Nigel D.: *See—*
Gill, Robert A.; and Sanders, Nigel D., 4,892,590, Cl. 106-214.000.
Sanderson, Jeffrey A. Variable angle saw guide apparatus. 4,892,021, Cl. 83-468.000.
Sandoz Ltd.: *See—*
Snow, Richard K.; and Ellisor, Milton W., Jr., 4,892,410, Cl. 366-2.000.
Sandoz Pharm. Corp.: *See—*
Sorg, Dieter, 4,892,879, Cl. 514-338.000.
Sankyo Company Limited: *See—*
Tomita, Kazuo; Murakami, Tadashi; Tsuji, Hideakira; Matsumoto, Keigo; and Fujita, Katsuhiro, 4,892,882, Cl. 514-380.000.
Sano, Masafumi: *See—*
Hirai, Yutaka; Sano, Masafumi; Tsuda, Hisanori; and Takasu, Katsuji, 4,893,154, Cl. 357-4.000.
Sano, Shozo, to Kabushiki Kaisha Kaneda Kikai Seisakusho. Auto reel loader. 4,892,610, Cl. 156-446.000.
Santa Barbara Research Center: *See—*
Tourville, Thomas W., 4,891,998, Cl. 74-48.000.
Santoh, Tsuyoshi: *See—*
Miyazaki, Takeshi; Fukui, Tetsuro; and Santoh, Tsuyoshi, 4,892,606, Cl. 156-275.500.
Santoni S.r.l.: *See—*
Donini, Leone, 4,893,104, Cl. 335-266.000.
Sanyo Electric Co., Ltd.: *See—*
Kawai, Yoshihiko; Koyama, Kazuaki; and Yasuda, Isao, 4,891,878, Cl. 29-603.000.
Sarc, Eileen T.: *See—*
Cronauer, Edward A.; and Sarc, Eileen T., 4,893,093, Cl. 330-295.000.
Sargent, Charles L., to Thetford Corporation. Toilet system with removable holding tank for recreational vehicles. 4,892,349, Cl. 296-156.000.
Sarin, Vinod K.; and D'Angelo, Charles, to GTE Laboratories Incorporated. AlN coated silicon nitride based cutting tools. 4,892,792, Cl. 428-698.000.
Sarrine, Robert J.; Guadagno, Philip A.; and Garsee, Henry A., to Helena Laboratories Corporation. Electrophoresis plate and method of making same. 4,892,639, Cl. 204-299.00R.
Sartorelli, Alan C.; and Shyam, Krishnamurthy, to Yale University. N,N'-bis(sulfonyl)hydrazines having antineoplastic activity. 4,892,887, Cl. 514-601.000.
Sartori, Guido: *See—*
Ho, W. S. Winston; and Sartori, Guido, 4,892,674, Cl. 252-189.000.
Sasabe, Masazumi: *See—*
Shioji, Shobu; Sasabe, Masazumi; Dairoku, Yorimichi; and Fujiwara, Teruaki, 4,892,902, Cl. 524-417.000.
Sasaki, Akira; and Sakuma, Yuichi, to Nissan Motor Co., Ltd. Noise attenuating device. 4,892,168, Cl. 181-250.000.
Sasaki, Isao; Yamamoto, Naoki; and Yanagase, Akira, to Mitsubishi Rayon Co., Ltd. Polyphenylene ether resin composition. 4,892,900, Cl. 524-141.000.
Sasaki, Joji: *See—*
Omura, Sadafumi; Sasaki, Joji; Mikami, Akiko; and Mizoue, Kazutoshi, 4,892,821, Cl. 435-127.000.
Sasaki, Kenji: *See—*
Takagishi, Yasushi; Ogura, Toshihiro; Sasaki, Kenji; and Nagata, Shunji, 4,892,738, Cl. 424-468.000.
Sasaki, Kiyotaka: *See—*
Yamamoto, Noboru; Tsujimura, Masakuni; Sasaki, Kiyotaka; Kato, Kouichi; Tani, Hideji; Ito, Yasuo; Matsui, Takeshi; and Hashimoto, Kenji, 4,892,073, Cl. 123-417.000.
Sasaki, Koushi: *See—*
Wada, Keisuke; Hara, Yoshinori; and Sasaki, Koushi, 4,892,955, Cl. 549-325.000.
Sasaki, Masaomi, to Ricoh Company, Ltd. Stilbene derivatives. 4,892,949, Cl. 546-98.000.
Sasaki, Singo: *See—*
Suenaga, Jun-ichi; Naito, Hisayuki; and Sasaki, Singo, 4,892,926, Cl. 528-305.000.
Sato, Hirokazu: *See—*
Hirabayashi, Shigeto; Sato, Hirokazu; and Sakamoto, Eiichi, 4,892,807, Cl. 430-505.000.
Sato, Katsuyuki: *See—*
Kajigaya, Kazuhiko; and Sato, Katsuyuki, 4,893,277, Cl. 365-203.000.
Sato, Kazuo: *See—*
Yamada, Minoru; Masaki, Akira; Sato, Kazuo; and Harada, Yutaka, 4,893,174, Cl. 357-82.000.
Sato, Koji: *See—*
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.
Sato, Kozo: *See—*
Nakamine, Takeshi; and Sato, Kozo, 4,892,858, Cl. 503-227.000.
Sato, Kunihiro: *See—*
Maeda, Tsutomu; Matsui, Kiyoshi; Kanno, Takayuki; and Sato, Kunihiro, 4,893,105, Cl. 336-84.00M.
Sato, Masaaki: *See—*
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,892,678, Cl. 252-500.000.
Sato, Takateru: *See—*
Tanaka, Kimio; Sato, Takateru; and Shiba, Haruo, 4,892,266, Cl. 242-199.000.
Sato, Teiji: *See—*
Ogawa, Masahide; Sato, Teiji; Takahashi, Masao; and Enomoto, Kazumitsu, 4,892,591, Cl. 106-482.000.
Sato, Yasuji: *See—*
Horiuchi, Takeshi; Sato, Yasuji; and Funato, Yasuo, 4,893,331, Cl. 379-93.000.
Satoh, Atsushi, to Olympic Co. Ltd. Variable speed gearing in rotary electric tool. 4,892,013, Cl. 74-785.000.
Satoh, Hiroshi: *See—*
Iriyama, Masahiro; and Satoh, Hiroshi, 4,892,075, Cl. 123-425.000.
Satoh, Shinichi: *See—*
Arai, Masatoshi; Satoh, Shinichi; and Fujioka, Kazutoshi, 4,892,895, Cl. 522-99.000.
Satomura, Hiroshi: *See—*
Sugata, Masao; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; Saito, Keishi; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; and Osabe, Kuniji, 4,892,800, Cl. 430-85.000.
Satou, Hiroyuki; and Tsuji, Junichi, to Fuji Photo Film Co., Ltd. Photographic printing apparatus. 4,893,149, Cl. 355-67.000.

Sauer, Hans; and Winsel, August, to Varta Batterie Aktiengesellschaft. Plastic-bound gas diffusion electrode containing a manganese oxide catalyst and process for preparing same. 4,892,637, Cl. 204-291.000.
Sauer, Jude S. Tubular tissue welding device without moving parts. 4,892,098, Cl. 606-18.000.
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Suenaga, Jun-ichi; Naito, Hisayuki; and Sasaki, Singo, to Unitika Ltd. Thermotropic liquid crystal polyesters and a method for their production. 4,892,926, Cl. 528-305.000.

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Tada, Kaoru; and Kishi, Masamichi, to Minolta Camera Kabushiki Kaisha. Image processing apparatus capable of eliminating moire pattern. 4,893,195, Cl. 358-454.000.

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Matsumoto, Yoshiyuki; Kume, Hidehiro; Mitsumori, Koji; Yoshitoshi, You; Yamamoto, Etsufumi; and Onoue, Hiroshi, 4,893,296, Cl. 369-112.000.
Yamamoto, Junichi; Onuma, Akihiko; Shibuya, Kouji; and Omata, Yasukuni, to Minolta Camera Kabushiki Kaisha. Thermal transfer recording apparatus. 4,893,134, Cl. 346-76.0PH.
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Single-lens reflex camera with built-in flash. 4,893,140, Cl. 354-149.110.
Yamamoto, Naoki: *See—*
Sasaki, Isao; Yamamoto, Naoki; and Yanagase, Akira, 4,892,900, Cl. 524-141.000.
Yamamoto, Noboru; Tsujimura, Masakuni; Sasaki, Kiyotaka; Kato, Kouichi; Tani, Hideji; Ito, Yasuo; Matsui, Takeshi; and Hashimoto, Kenji, to Nippondenso Co., Ltd. Ignition system for internal combustion engines. 4,892,073, Cl. 123-417.000.
Yamanaka, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Geometric error compensation circuit of color television camera devices. 4,893,065, Cl. 315-371.000.
Yamanaka, Toshimasa: *See—*
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Kionuma, Masahiro, 4,893,140, Cl. 354-149.110.
Yamashita, Masayoshi: *See—*
Nishihira, Keigo; Yamashita, Masayoshi; and Yoshida, Hiroshi, 4,892,948, Cl. 544-326.000.
Yamazaki, Masayuki: *See—*
Suzuki, Saburo; Terada, Takami; and Yamazaki, Masayuki, 4,892,282, Cl. 248-430.000.

Yamazaki, Mutsuki; Oshima, Kaoru; and Takano, Toshimasa, to Kabushiki Kaisha Toshiba. Image developing apparatus. 4,893,151, Cl. 355-245.000.
Yamazaki, Takashi: *See—*
Tsuneishi, Katsuyuki; Ito, Shigeru; and Yamazaki, Takashi, 4,892,572, Cl. 65-10.100.
Yan, Tsoung Y., to Mobil Oil Corporation. Simultaneous removal of mercury and water from fluids. 4,892,567, Cl. 55-33.000.
Yanagase, Akira: *See—*
Sasaki, Isao; Yamamoto, Naoki; and Yanagase, Akira, 4,892,900, Cl. 524-141.000.
Yanagi, Motonori; Hama, Masaharu; Hattori, Nobuyoshi; and Fukumoto, Takaaki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for counting particles attached to surfaces of a solid. 4,893,320, Cl. 377-11.000.
Yanagihara, Hiromu: *See—*
Hamaguchi, Masami; Yanagihara, Hiromu; Hiraoka, Osamu; and Takahashi, Osamu, 4,892,214, Cl. 220-67.000.
Yanagimachi, Motoshige: *See—*
Oike, Hitoshi; and Yanagimachi, Motoshige, 4,892,602, Cl. 156-233.000.
Yang, Jefferson Y. S.: *See—*
Reinicke, Robert H.; and Yang, Jefferson Y. S., 4,892,286, Cl. 251-129.110.
Yano, Hiroshi, to Sekiden Co., Ltd. Toy water gun. 4,892,228, Cl. 222-79.000.
Yasuda, Isao: *See—*
Kawai, Yoshihiko; Koyama, Kazuaki; and Yasuda, Isao, 4,891,878, Cl. 29-603.000.
Yasuda, Shigeru, to Nitto Kohki Co., Ltd. Disk grinder. 4,891,915, Cl. 51-170.00T.
Yasui, Shinichiro: *See—*
Iihoshi, Akira; Nakamura, Yukinobu; and Yasui, Shinichiro, 4,893,246, Cl. 364-449.000.
Yasui, Toshihiro; Sugita, Masanori; and Isobe, Tsuneo, to Yamaha Hatsuodoki Kabushiki Kaisha. Frame and body construction for small snowmobile. 4,892,164, Cl. 180-68.300.
Yasui, Toshihiro; and Sugita, Masanori, to Yamaha Hatsudoki Kabushiki Kaisha. Frame construction for small snowmobile. 4,892,165, Cl. 180-190.000.
Yasumoto, Mitsuyoshi: *See—*
Tahara, Tetsuya; Kawakita, Takeshi; Yasumoto, Mitsuyoshi; and Fukuda, Takemi, 4,892,872, Cl. 514-230.500.
Yasunaga, Masayuki: *See—*
Minamisono, Kenichi; Yasunaga, Masayuki; Watanbe, Fumio; and Baba, Noboru, 4,893,350, Cl. 455-278.000.
Yazaki Corporation: *See—*
Suzuki, Yoshiyuki; Ohtsuka, Tatsumi; Iino, Tadashi; Kasahara, Akihisa; and Tomiyama, Noriyasu, 4,892,386, Cl. 350-174.000.
Yehushua, Moshe: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 4,893,317, Cl. 375-97.000.
Yeomans, Andrew J. V., to Crosfield Electronics Limited. Interactive image modification. 4,893,181, Cl. 358-80.000.
Yerman, Donald, to Crescent Metal Products, Inc. Sneeze guard system. 4,892,366, Cl. 312-140.400.
Ylvisaker, Jon A., to Borden, Inc. Single-pleated microwave popcorn package. 4,892,744, Cl. 426-111.000.
Yogo, Takeji: *See—*
Ichihara, Takayuki; Yogo, Takeji; Iinuma, Masuhito; Arita, Eriya; and Yokoo, Haruo, 4,892,136, Cl. 165-51.000.
Yokogawa Electric Corporation: *See—*
Iwaoka, Hideto; Ohte, Akira; and Akiyama, Koji, 4,893,353, Cl. 455-612.000.
Yokohama Rubber Co., Ltd., The: *See—*
Nakanome, Heikichi; and Yonezawa, Takeshi, 4,892,609, Cl. 156-406.400.
Yokoo, Haruo: *See—*
Ichihara, Takayuki; Yogo, Takeji; Iinuma, Masuhito; Arita, Eriya; and Yokoo, Haruo, 4,892,136, Cl. 165-51.000.
Yokota, Tadahiko: *See—*
Sakurai, Takao; Yokota, Tadahiko; Komatsu, Eri; Mikami, Naoko; Higuchi, Ryoichi; and Takeuchi, Koji, 4,892,676, Cl. 252-299.610.
Yokoyama, Kiyoshi: *See—*
Yoshida, Makoto; and Yokoyama, Kiyoshi, 4,892,848, Cl. 264-65.000.
Yonekura, Kazuya; and Daikuzono, Shoji, to Toshiba Silicon Co., Ltd. Makeup or cosmetic compositions. 4,892,726, Cl. 424-63.000.
Yoneyama, Seiichi, to Nippon Kokan Kabushiki Kaisha. Apparatus for exchanging a net of fish cage for farming fish. 4,892,059, Cl. 119-3.000.
Yonezawa, Takeshi: *See—*
Nakanome, Heikichi; and Yonezawa, Takeshi, 4,892,609, Cl. 156-406.400.
Yoon, Hyun-Nam: *See—*
DeMartino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., 4,892,682, Cl. 252-589.000.
Yorio, Rudy: *See—*
Budano, Joseph A., II; Guzik, Andrzei T.; Yorio, Rudy; and Cook, Harold M., 4,892,491, Cl. 439-582.000.
Guzik, Andrzej T.; Yorio, Rudy; Budano, Joseph A., II; and Tellam, Mark, 4,892,486, Cl. 439-248.000.
Yoshida, Hajime; and Hanai, Nobuo, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for preparing hybridoma cells which produce tumor-specific monoclonal antibodies. 4,892,934, Cl. 530-387.000.
Yoshida, Hajime; Hanai, Nobuo; and Shitara, Kenya, to Kyowa Hakko Kogyo Co., Ltd. Anti-human pulmonary carcinoma monoclonal antibody. 4,892,935, Cl. 530-387.000.
Yoshida, Hiroshi: *See—*
Nishihira, Keigo; Yamashita, Masayoshi; and Yoshida, Hiroshi, 4,892,948, Cl. 544-326.000.
Yoshida, Hiroyuki: *See—*
Yoshikawa, Masaharu; Sugimoto, Kazuo; Kamitaka, Masuo; Takagi, Shinya; and Yoshida, Hiroyuki, 4,891,952, Cl. 62-199.000.
Yoshida, Katsuhiko: *See—*
Tanida, Osamu; Okuno, Yoshiharu; Yoshida, Katsuhiko; Sakamoto, Nobuyasu; Ishikawa, Hsao; and Kobayashi, Eiichi, 4,892,242, Cl. 225-2.000.
Yoshida Kogyo K. K.: *See—*
Kasai, Kazumi, 4,891,866, Cl. 24-170.000.
Takeshima, Kiyoshi; and Murai, Ryukichi, 4,891,867, Cl. 24-408.000.
Yoshida Kogyo K.K.: *See—*
Watanabe, Hirokazu, 4,891,868, Cl. 24-691.000
Yoshida Koqyo K. K.: *See—*
Nishiyama, Hissai, 4,892,760, Cl. 427-428.000.
Yoshida, Makoto; and Yokoyama, Kiyoshi, to Kyocera Corporation. Silicon nitride sintered body and process for preparation thereof. 4,892,848, Cl. 264-65.000.
Yoshikawa, Masaharu; Sugimoto, Kazuo; Kamitaka, Masuo; Takagi, Shinya; and Yoshida, Hiroyuki, to Sharp Kabushiki Kaisha. Freezer-refrigerator. 4,891,952, Cl. 62-199.000.
Yoshinaga, Kazuo: *See—*
Nohira, Hiroyuki; Arai, Kazutaka; and Yoshinaga, Kazuo, 4,892,675, Cl. 252-299.010.
Yoshinaga, Yoko: *See—*
Kushibiki, Nobuo; and Yoshinaga, Yoko, 4,892,396, Cl. 350-423.000.
Yoshitani, Yoshihiro: *See—*
Morino, Seiji; Kawamoto, Satoru; Yoshitani, Yoshihiro; Sugimoto, Toshio; and Nariki, Toshio, 4,892,080, Cl. 123-604.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Tahara, Tetsuya; Kawakita, Takeshi; Yasumoto, Mitsuyoshi; and Fukuda, Takemi, 4,892,872, Cl. 514-230.500.
Yoshitoshi, You: *See—*
Matsumoto, Yoshiyuki; Kume, Hidehiro; Mitsumori, Koji; Yoshitoshi, You; Yamamoto, Etsufumi; and Onoue, Hiroshi, 4,893,296, Cl. 369-112.000.
Yoshizako, Mamoru: *See—*
Shimizu, Shumpei; Yoshizako, Mamoru; and Cho, Toshitsura, 4,892,625, Cl. 203-86.000.
Young, John M.: *See—*
Denman, Marvin A., Jr.; Young, John M.; and Alsup, Mitch K., 4,893,268, Cl. 364-759.000.
Young, Vernon V., to International Minerals & Chemical Corp. Crystalline lysocellin compositions and method of making. 4,892,960, Cl. 549-414.000.
Yuan, Arthur H.; and Joss, Michael S., to Spalding & Evenflo Companies, Inc. Breast pump. 4,892,517, Cl. 604-74.000.
Yuchi, Yoshiyuki: *See—*
Watanabe, Kazuhiro; Saito, Kazuya; Yuchi, Yoshiyuki; and Inagawa, Konosuke, 4,892,791, Cl. 428-698.000.
Yuen, Gregory W. M.: *See—*
Blomley, Peter F.; Ayliffe, Peter J.; Huffman, Ewen R. M.; and Yuen, Gregory W. M., 4,893,117, Cl. 340-784.000.
Yung, Victor J. L. Sliding door closing device. 4,891,911, Cl. 49-404.000.
Yunoki, Yutaka; Inoue, Manabu; and Wantanabe, Hiroyuki, to Olympus Optical Co., Ltd. Composite magnetic head. 4,893,200, Cl. 360-67.000.
Yurtin, John A.: *See—*
Nestor, Charles R.; and Yurtin, John A., 4,892,488, Cl. 439-438.000.
Zabler, Erich: *See—*
Bollweber, Lothar; Jansche, Walter; Hugel, Robert; Pilch, Claus-Dietrich; Rothley, Manfred; and Zabler, Erich, 4,891,973, Cl. 73-146.500.
Zaitsu, Kouji, to Bonanza Enterprises, Ltd. Game playing machine equipped with a vibrating feeder. 4,892,311, Cl. 273-145.00D.
Zajac, Elie; and Manoff, Gilbert, to Radiall. Process for mounting an optical fiber in an optical-fiber connector element, and a connector element for carrying out the process. 4,892,378, Cl. 350-96.200.
Zamcheck, Norman: *See—*
Salem, Ronald R.; Thomas, Peter; Zamcheck, Norman; and Steele, Glenn, 4,892,933, Cl. 530-387.000.
Zanek, John R.: *See—*
Hermann, William J., Jr.; and Zanek, John R., 4,892,525, Cl. 604-263.000.
Zappia, Joseph M. Heat transfer and fluid heating device. 4,892,064, Cl 122-366.000.
Zarnowski, Alfred J.; and Sidebotham, Christopher G., to Osteonics Corp. Femoral cutting guide. 4,892,093, Cl. 606-82.000.
Zarnowski, Alfred J.: *See—*
Figgie, Harry E., III; Zarnowski, Alfred J.; and Lyons, Matthew V., 4,892,549, Cl. 623-22.000.

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Zdenek, John M.: *See*—
Pankonen, Andrew W.; Jester, Donald J.; Mulrow, Robert J.; Modica, Catherine P.; and Zdenek, John M., 4,893,325, Cl. 379-45.000.
Zebrose, Katherine L.: *See*—
Janc, Robert V.; Jasper, Steven C.; Longley, Lester A.; Zebrose, Katherine L.; Turney, William J.; and Lillie, Ross J., 4,893,316, Cl. 375-44.000.
Zegafuse, Donald W., Jr., deceased: *See*—
Dominguez, Ruben, Jr.; Finlay, David E.; Hanna, Stephen D.; Lopez, Jesus C.; Stevenson, David C.; and Zegafuse, Donald W., Jr., deceased, 4,893,257, Cl. 364-519.000.
Zeiner, Mark S.: *See*—
Fox, William D.; Nobis, Rudolph H.; Nuchols, Richard P.; and Zeiner, Mark S., 4,892,244, Cl. 227-8.000.
Zelickson, Barry M. Dispensing apparatus. 4,892,233, Cl. 222-226.000.
Zelle, Bruce R.: *See*—
Hemmady, Jayant G.; Knudsen, Michael J.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,893,302, Cl. 370-60.000.
Zenjiro Okamoto: *See*—
Okamoto, Zenjiro, 4,892,384, Cl. 350-145.000.
Ziegenhorn, Joachim: *See*—
Kerscher, Lorenz; Pautz, Brigitte; Trunk, Gisela; and Ziegenhorn, Joachim, 4,892,815, Cl. 435-7.000.
Zillikens, Josef: *See*—
Steudle, Ernst; Boling, Gerd; and Zillikens, Josef, 4,891,968, Cl. 73-64.300.
Zimmer, Johannes. Device for the application of small and minimal amounts of flowable substances. 4,892,057, Cl. 118-248.000.
Zimmiond, Larry. Apparatus for flaring gas. 4,892,477, Cl. 431-202.000.
Ziolko, Eric F.: *See*—
Bright, Michael W.; Ziolko, Eric F.; Wilson, Alan L.; Bray, Michelle M.; Hennen, Harry A.; and Weiss, David L., 4,893,339, Cl. 380-28.000.
Wilson, Alan L.; Bright, Michael W.; Bray, Michelle M.; Ziolko, Eric F.; and Weiss, David L., 4,893,308, Cl. 370-109.000.
Zitomer, Kenneth J.: *See*—
Martin, Joseph P.; and Zitomer, Kenneth J., 4,892,658, Cl. 210-617.000.
Ziuchkovski, Michael J., to Planar Systems, Inc. Clock regeneration circuit employing digital phase locked loop. 4,893,319, Cl. 375-111.000.
Zivny, Zbig Z. Sportman's reusable, anti-collapsing urine collection device. 4,892,527, Cl. 604-353.000.
Zook, Eldon A.; and Niccum, Leonard M., to Harris-Kayot, Inc. Boat decking system and method of assembling same. 4,892,052, Cl. 114-85.000.
Zuber, Laurent, to Swiss Aluminium Ltd. Electromagnetic mold for continuous castings. 4,892,134, Cl. 164-503.000.
Zur, Yuval, to Elscint Ltd. Driven equilibrium in magnetic resonance imaging. 4,893,081, Cl. 324-309.000.
Zwack, Eduard, to Siemens Aktiengesellschaft. Method for temperature compensation of a voltage-controlled crystal oscillator in a phase control circuit. 4,893,097, Cl. 331-176.000.
Zweifel, Terry L., to Honeywell Inc. Windshear guidance for aircraft having inertial sensor. 4,893,245, Cl. 364-435.000.
501 Normetex: *See*—
Pottier, Daniel; Leclaire, Remy; and Vulliez, Paul, 4,892,010, Cl. 74-595.000.
501 Redexim B.V.: *See*—
Maria De Bree, Cornelius H.; and Reincke, Marinus, 4,891,888, Cl. 33-293.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Grone, Horst-Ditmar, to Lin Tec Verpackungstechnik GmbH. Tray for receiving foodstuffs and a process and apparatus for producing it. Re. 33,143, Cl. 206-557.000.
Hitachi, Ltd.: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.
Hunter Engineering Company: *See*—
Hunter, Lee; and January, Daniel B., Re. 33,144, Cl. 356-152.000.
Hunter, Lee; and January, Daniel B., to Hunter Engineering Company. Vehicle wheel alignment apparatus. Re. 33,144, Cl. 356-152.000.
Ida, Michiaki: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl 417-365.000.
January, Daniel B.: *See*—
Hunter, Lee; and January, Daniel B., Re. 33,144, Cl. 356-152.000.
Kurimoto, Masaki: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000.
Lin Tec Verpackungstechnik GmbH: *See*—
Grone, Horst-Ditmar, Re. 33,143, Cl. 206-557.000.
Milwaukee Electric Tool Corporation: *See*—
Palm, Bernhard, Re. 33,145, Cl. 408-76.000.
Palm, Bernhard, to Milwaukee Electric Tool Corporation. Magnetic base for portable tools. Re. 33,145, Cl. 408-76.000.
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, to Hitachi, Ltd. Centrifugal compressor. Re. 33,142, Cl. 417-365.000.
Sugimoto, Shigeo: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl 417-365.000.
Terasaki, Masatosi: *See*—
Sato, Kazuo; Ida, Michiaki; Terasaki, Masatosi; Kurimoto, Masaki; and Sugimoto, Shigeo, Re. 33,142, Cl. 417-365.000

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

American National Can Company: *See*—
Bofinger, Karl; and Hake, Walter T., B1 3,598,675, Cl. 156-172.000.
Aoki, Ryuji: *See*—
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, B1 4,438,217, Cl. 502-205.000.
Bofinger, Karl; and Hake, Walter T., to American National Can Company. Method for securing strip members to container bodies. B1 3,598,675, 1-9-90, Cl. 156-172.000.
Brown, David P.: *See*—
Cook, Lynn W.; and Brown, David P., B1 4,391,705, Cl. 210-218.000.
Cook, Lynn W.; and Brown, David P., to Envirotech Corporation. Ballasting digestor covers. B1 4,391,705, 1-9-90, Cl. 210-218.000.
Copeland, Shannon B.: *See*—
Richards, Mark S.; and Copeland, Shannon B., B1 3,931,011, Cl. 210-136.000.
Envirotech Corporation: *See*—
Cook, Lynn W.; and Brown, David P., B1 4,391,705, Cl. 210-218.000.
Hake, Walter T.: *See*—
Bofinger, Karl; and Hake, Walter T., B1 3,598,675, Cl. 156-172.000.
Kugele, Thomas G., to Morton Thiokol Inc. Sulfide containing stabilizers. B1 4,120,845, 1-9-90, Cl. 524-181.000.
Morton Thiokol Inc.: *See*—
Kugele, Thomas G., B1 4,120,845, Cl. 524-181.000.
Nippon Shokubai Kagak Kogyo Co., Ltd.: *See*—
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, B1 4,438,217, Cl. 502-205.000.
Parker-Hannifin Corporation: *See*—
Richards, Mark S.; and Copeland, Shannon B., B1 3,931,011, Cl. 210-136.000.
Richards, Mark S.; and Copeland, Shannon B., to Parker-Hannifin Corporation. Fluid separation apparatus. B1 3,931,011, 1-9-90, Cl. 210-136.000.
Sato, Takahisa: *See*—
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, B1 4,438,217, Cl. 502-205.000.
Takata, Mashiro; Aoki, Ryuji; and Sato, Takahisa, to Nippon Shokubai Kagak Kogyo Co., Ltd. Catalyst for oxidation of propylene. B1 4,438,217, 1-9-90, Cl. 502-205.000.

LIST OF DESIGN PATENTEES

Adams Mfg.: *See*—
Adams, William E., 305,431, Cl. D8-367.000.
Adams, William E., to Adams Mfg. Double hook for a wall. 305,431, 1-9-90, Cl. D8-367.000.
Addis Limited: *See*—
Dagge, David L., 305,467, Cl. D32-53.000.
Airship Developments Australia Pty. Ltd.: *See*—
Blake, Bruce N., 305,418, Cl. D12-345.000.
Americal Corporation: *See*—
Hubbard, Robert L., 305,384, Cl. D2-331.000.
American Standard Inc.: *See*—
Stairs, Henry M., Jr., 305,455, Cl. D23-254.000.
American Telephone and Telegraph Company: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.
Anton Discovery Group, Inc.: *See*—
Rundquist, Peter A., Jr., 305,449, Cl. D21-237.000.
Apogee, Inc.: *See*—
Valentine, Thomas, 305,446, Cl. D21-198.000.
Valentine, Thomas, 305,447, Cl. D21-198.000.
Arai, Takashi, to Asics Corporation. Shoe sole. 305,383, 1-9-90, Cl. D2-320.000.
Asics Corporation: *See*—
Arai, Takashi, 305,383, Cl. D2-320.000.
Kiyosawa, Junichi, 305,382, Cl. D2-320.000.
Mitsui, Shigeyuki, 305,381, Cl. D2-320.000.
AT&T Information Systems Inc.: *See*—
Gilmore, Arthur H.; Johnson, Chris G.; Petty, Norman W.; Seelye, Barbara A.; and Tierney, Thomas J., Jr., 305,423, Cl. D14-101.000.
Atagi, Takashi, to Casio Computer Co., Ltd. Combined wristwatch and guard therefor. 305,411, 1-9-90, Cl. D10-31.000.
Balius, Mark A. Combined cooler chest and radio. 305,397, 1-9-90, Cl. D7-77.000.

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Beal, Craig E., to Rain Bird Consumer Products Mfg. Corp. Hose end trigger nozzle. 305,454, 1-9-90, Cl. D23-226.000.
Beggs, Daniel J. Undershorts. 305,375, 1-9-90, Cl. D2-10.000.
Bellini, Mario, to Fehlbaum & Co. Chair. 305,389, 1-9-90, Cl. D6-379.000.
Bergman, Nils-Åke: *See—*
Widell, Harald; Widell, Jan; and Bergman, Nils-Åke, 305,421, Cl. D13-13.000.
Berkheij, Jan, to Ericsson Paging Systems B.V. Radio pager. 305,428, 1-9-90, Cl. D14-191.000.
Berkheij, Jan, to Ericsson Paging Systems B.V. Radio pager. 305,429, 1-9-90, Cl. D14-191.000.
Blake, Bruce N., to Airship Developments Australia Pty. Ltd. Gondola for an airship. 305,418, 1-9-90, Cl. D12-345.000.
Brown, Paul D.; Ringel, Judith; and Miller, David E., to Reebok International Ltd. Shoe upper. 305,379, 1-9-90, Cl. D2-314.000.
Bujak, Walter E., Jr.; and Peitz, Robert W., Jr., to Carrier Corporation. Electronic control module cover. 305,420, 1-9-90, Cl. D13-12.000.
Canon Kabushiki Kaisha: *See—*
Doi, Susumu, 305,426, Cl. D14-124.000.
Omino, Seiichi; Noda, Atsushi; and Hiramatsu, Soichi, 305,435, Cl. D18-13.000.
Yoshioka, Eiichi; and Terasawa, Koji, 305,436, Cl. D18-13.000.
Carrier Corporation: *See—*
Bujak, Walter E., Jr.; and Peitz, Robert W., Jr., 305,420, Cl. D13-12.000.
Cartier International B.V.: *See—*
Perrin, Alain-Dominique, 305,404, Cl. D9-310.000.
Casio Computer Co., Ltd.: *See—*
Atagi, Takashi, 305,411, Cl. D10-31.000.
Claveria, Ric, to L.A. Gear, Inc. Shoe upper. 305,380, 1-9-90, Cl. D2-314.000.
Coben, Robert A. Surface for a front panel for a video editing controller. 305,430, 1-9-90, Cl. D14-257.000.
Colebourne, Leonard: *See—*
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209 4,891,953
239 4,891,954
295 4,891,955

CLASS 63
3 4,891,956

CLASS 65
10.1 4,892,572
179 4,892,573
273 4,892,574

CLASS 66
192 4,891,957
196 4,891,958

CLASS 68
23.7 4,891,959
200 4,891,960

CLASS 70
456 R 4,891,961

CLASS 71
90 4,892,575
93 4,892,576
4,892,577
94 4,892,578

CLASS 72
88 4,891,962
203 4,891,963
308 4,891,964
481 4,891,965

CLASS 73
19 4,891,966
38 4,891,967
61.1 R 4,891,969
64.3 4,891,968
116 4,891,970
117.3 4,891,971
119 R 4,891,972
146.5 4,891,973
160 4,891,974
168 4,891,975
189 4,891,976
204.26 4,891,977
4,891,978
269 4,891,979
290 R 4,891,980
460 4,891,981
497 4,891,982
517 B 4,891,983
517 R 4,891,984
4,891,985
634 4,891,986
732 4,891,987
861.22 4,891,988
4,891,989
861.24 4,891,990
861.38 4,891,991
862.36 4,891,992
863.52 4,891,993

CLASS 74
2 4,891,994
3.52 4,891,995
5.46 4,891,997
6 4,891,996
48 4,891,998
337.5 4,891,999
467 4,892,000
477 4,892,001
492 4,892,002
501.5 R 4,892,003
4,892,004
502.4 4,892,005
552 4,892,006
4,892,007
574 4,892,008
594.6 4,892,009
595 4,892,010
761 4,892,011
772 4,892,012
785 4,892,013
866 4,892,014

CLASS 75
0.5 B 4,892,579
53 4,892,580
232 4,892,581
251 4,892,582

CLASS 81
9.41 4,892,015
128 4,892,016
492 4,892,017

CLASS 83
15 4,892,018
105 4,892,019
463 4,892,020
468 4,892,021
478 4,892,022

CLASS 84
313 4,892,025
687 4,892,023
719 4,892,024

CLASS 89
140 4,892,026

CLASS 91
369.2 4,892,027
399 4,891,864
517 4,892,028

CLASS 92
51 4,892,029

CLASS 98
1 4,892,030

CLASS 99
284 4,892,031
421 HV 4,892,032
455 4,892,033
567 4,892,034

CLASS 028
107 4,891,870

CLASS 101
148 4,892,035
240 4,892,036

CLASS 102
201 4,892,037
439 4,892,038
476 4,892,039

CLASS 104
6 4,892,040
140 4,892,041

CLASS 105
362 4,892,042

CLASS 106
18.32 4,892,583
22 4,892,584
38.22 4,892,585
92 4,892,586
123.1 4,892,587
4,892,588
197.1 4,892,589
214 4,892,590
482 4,892,591

CLASS 108
90 4,892,043
154 4,892,044

CLASS 110
203 4,892,045
332 4,892,046

CLASS 112
122 4,892,047
254 4,892,048
265.2 4,892,049
458 4,892,050

CLASS 114
1 4,892,051
85 4,892,052
303 4,892,053
357 4,892,054
4,892,055

CLASS 118
126 4,892,056
248 4,892,057

CLASS 119
1 4,892,058
3 4,892,059
52.2 4,892,060
75 4,892,061
98 4,892,062
109 4,892,063

CLASS 122
366 4,892,064

CLASS 123
26 4,892,065
73 V 4,892,066
90.12 4,892,067
182 4,892,068
193 CH 4,892,069
274 4,892,070
336 4,892,071
340 4,892,072
417 4,892,073
425 4,892,074
4,892,075
442 4,892,076
487 4,892,077
489 4,892,078
602 4,892,079
604 4,892,080

CLASS 124
65 4,892,081

CLASS 125
11 R 4,892,082

CLASS 126
21 R 4,892,083
92 AC 4,892,084
340 4,892,085
409 4,892,086
512 4,892,087
540 4,892,088

CLASS 128
24 A 4,892,089
58 4,892,090
62 R 4,892,091
76 B 4,892,092
201.28 4,892,094
207.14 4,892,095
419 PG 4,892,100
633 4,892,101
642 4,892,102
660.01 4,892,103
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741 4,892,105
745 4,892,106
763 4,892,107
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CLASS 129
1 R 4,892,119

CLASS 131
194 4,892,109

CLASS 132
273 4,892,110

CLASS 134
66 4,892,111
102 4,892,112

CLASS 136
244 4,892,592
246 4,892,593
258 4,892,594

CLASS 137
78.3 4,892,113
87 4,892,114
269 4,892,115
360 4,892,116
614.03 4,892,117
625.3 4,892,118

CLASS 139
21 4,892,120
185 4,892,121

CLASS 140
123 4,892,122

CLASS 141
7 4,892,123
114 4,892,124
353 4,892,125
381 4,892,126

CLASS 148
12 R 4,892,595
104 4,892,596

CLASS 149
91 4,892,597

CLASS 152
221 4,892,127
417 4,892,128
516 4,892,129

CLASS 156
91 4,892,598
94 4,892,599
4,892,601
166 4,892,600
172 B1 3,598,675
233 4,892,602
244.11 4,892,603
244.24 4,892,604
272.6 4,892,605
275.5 4,892,606
275.7 4,892,607
406.4 4,892,609
421 4,892,608
446 4,892,610
504 4,892,611
636 4,892,612
643 4,892,613
4,892,614
4,892,615
655 4,892,616
659.1 4,892,617

CLASS 162
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49 4,892,619
158 4,892,620
198 4,892,621
208 4,892,622
344 4,892,623

CLASS 164
97 4,892,130
312 4,892,131
431 4,892,132
452 4,892,133
503 4,892,134

CLASS 165
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51 4,892,136
80.1 4,892,137
4,892,138
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133 4,892,141
134.1 4,892,142
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CLASS 166
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280 4,892,147
305.1 4,892,148
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CLASS 171
16 4,892,151

CLASS 172
20 4,892,152
4,892,153
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199 4,892,155
381 4,892,156
430 4,892,157
443 4,892,158

CLASS 174
38 4,892,978
153 G 4,892,979

CLASS 175
85 4,892,160
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138 4,892,169

CLASS 184

105.3 4,892,171

CLASS 188

69 4,892,172
73.44 4,892,173
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CLASS 191

14 4,892,980

CLASS 192

12 BA 4,892,175
84 C 4,892,176
106.2 4,892,177
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CLASS 198

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434 4,892,181
454 4,892,182
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803.01 4,892,186

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38 R 4,892,982
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61.86 4,892,984
83 N 4,892,985
144 B 4,892,986
296 4,892,987
516 4,892,988

CLASS 203

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86 4,892,625

CLASS 204

15 4,892,626
16 4,892,627
44.7 4,892,628
56.1 4,892,629
59.5 4,892,630
109 4,892,631
128 4,892,632
192.12 4,892,633
192.15 4,892,634
192.36 4,892,635
237 4,892,636
291 4,892,637
299 R 4,892,638
4,892,639
418 4,892,640

CLASS 206

217 4,892,187
223 4,892,188
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335 4,892,190
366 4,892,191
425 4,892,192
453 4,892,193
470 4,892,194
473 4,892,195
523 4,892,196
557 Re.33,143

CLASS 208

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70 4,892,643
107 4,892,644
111 4,892,645
4,892,646

CLASS 209

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164 4,892,648
166 4,892,649
621 4,892,650

CLASS 210

136 B1 3,931,011
151 4,892,651
160 4,892,652
184 4,892,653
198.2 4,892,654
218 B1 4,391,705
222 4,892,655
232 4,892,656
4,892,657
617 4,892,658
635 4,892,659
637 4,892,660
640 4,892,661
649 4,892,662
729 4,892,663
747 4,892,664
770 4,892,665
776 4,892,666
782 4,892,668
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CLASS 211

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193 4,892,200

CLASS 212

186 4,892,201
192 4,892,202
221 4,892,203

CLASS 213

1.6 4,892,204

CLASS 215

1 C 4,892,205
12.1 4,892,206
100 A 4,892,207
216 4,892,208
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CLASS 219

69.13 4,892,989
76.14 4,892,990
121.74 4,892,991
121.78 4,892,992
125.1 4,892,993
216 4,892,994
230 4,892,995
301 4,892,996
461 4,892,997
548 4,892,998

CLASS 220

1.5 4,892,210
3.2 4,892,211
3.3 4,892,212
4 B 4,892,213
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206 4,892,216
258 4,892,217
263 4,892,218
287 4,892,219
339 4,892,220
343 4,892,221
356 4,892,222
404 4,892,223
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412 4,892,226
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CLASS 222

79 4,892,228
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226 4,892,233
484 4,892,234
607 4,892,235
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CLASS 223

85 4,892,237
92 4,892,238
111 4,892,239

CLASS 224

211 4,892,240
216 4,892,241

CLASS 225

2 4,892,242

CLASS 226

97 4,892,243

CLASS 227

8 4,892,244

CLASS 228

180.2 4,892,245

CLASS 229

92.8 4,892,246
125.26 4,892,247

CLASS 235

1 D 4,892,999
380 4,893,000
490 4,893,001

CLASS 237

12.3 B 4,892,248

CLASS 238

8 4,892,249

CLASS 239

18 4,892,250
150 4,892,251
205 4,892,252
265.35 4,892,253
265.41 4,892,254
682 4,892,255
734 4,892,256

CLASS 241

32 4,892,257
79.3 4,892,258
101.7 4,892,259
282.2 4,892,260
301 4,892,261

CLASS 242

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58.6 4,892,264
67.1 R 4,892,265
157.1 4,892,262
199 4,892,266
228 4,892,267

CLASS 244

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53 R 4,892,269
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121 4,892,271
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158 R 4,892,273
213 4,892,274

CLASS 248

61 4,892,275
74.1 4,892,276
101 4,892,277
124 4,892,278
125 4,892,279
230 4,892,280
311.2 4,892,281
430 4,892,282
466 4,892,283
476 4,892,284

CLASS 250

214 R 4,893,002
216 4,893,003
221 4,893,004
4,893,005
227 4,893,006
231 SE 4,893,007
234 4,893,008
310 4,893,009
318 4,893,010
327.2 4,893,011
4,893,012
336.1 4,893,013
353 4,893,014
369 4,893,015
370.07 4,893,017
370.09 4,893,016
370.10 4,893,018
423 R 4,893,019
483.1 4,893,020
487.1 4,893,021
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515.1 4,893,023
560 4,893,024
561 4,893,025
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129.05 4,892,285
129.11 4,892,286
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CLASS 252

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37 4,892,670
51.5 R 4,892,671
62.51 4,892,672
114 4,892,673
189 4,892,674
299.01 4,892,675
299.61 4,892,676
408.1 4,892,677
500 4,892,678
565 4,892,680
582 4,892,681
589 4,892,682
609 4,892,683
626 4,892,684
628 4,892,685

CLASS 254

49 4,892,290
342 4,892,291

CLASS 256

66 4,892,292

CLASS 260

404 4,892,687

CLASS 261

24 4,892,688

CLASS 264

25 4,892,689
40.1 4,892,690
54 4,892,691
65 4,892,848
106 4,892,692
108 4,892,693
109 4,892,694
119 4,892,695
219 4,892,696
234 4,892,697
243 4,892,698
328.8 4,892,699
510 4,892,700

CLASS 266

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233 4,892,294

CLASS 269

8 4,892,295
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CLASS 270

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CLASS 271

18.3 4,892,298
110 4,892,299
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CLASS 272

74 4,892,302
98 4,892,303
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CLASS 273

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1 GF 4,892,307
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148 B 4,892,312
148 R 4,892,313
162 D 4,892,314
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183 B 4,892,317
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CLASS 277

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167.5 4,892,321
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CLASS 280

250.1 4,892,323
440 4,892,324
612 4,892,325
618 4,892,326
650 4,892,327
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775 4,892,330
808 4,892,331
842 4,892,332

CLASS 281

15.1 4,892,333
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CLASS 283

75 4,892,335
91 4,892,336

CLASS 285

333 4,892,337

CLASS 292

35 4,892,338
201 4,892,339
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341.12 4,892,341
347 4,892,342

CLASS 294

64.1 4,892,343
88 4,892,344

CLASS 296

24.1 4,892,345
37.6 4,892,346
75 4,892,347
146 4,892,348
156 4,892,349
204 4,892,350
213 4,892,351

CLASS 297

195 4,892,352
224 4,892,353
301 4,892,354
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457 4,892,356
464 4,892,357

CLASS 299

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CLASS 303

9.61 4,892,360
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115 4,892,362
116 4,892,363
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CLASS 305

58 R 4,892,365

CLASS 307

116 4,893,027
291 4,893,028
296.4 4,893,029
296.8 4,893,030
451 4,893,031
456 4,893,032
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480 4,893,034
520 4,893,035
603 4,893,036

CLASS 310

68 B 4,893,037
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89 4,893,039
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215 4,893,041
216 4,893,042
239 4,893,043
261 4,893,044
323 4,893,045
4,893,046
4,893,047
331 4,893,048
338 4,893,049

CLASS 312

140.4 4,892,366
328 4,892,367
348 4,892,368

CLASS 313

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141 4,893,051
346 R 4,893,052
400 4,893,053
408 4,893,054
479 4,893,055
495 4,893,056
631 4,893,057

CLASS 315

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127 4,893,059
169.3 4,893,060
227 R 4,893,061
291 4,893,062
307 4,893,063
317 4,893,064
371 4,893,065

CLASS 318

600 4,893,066
615 4,893,068

CLASS 323

215 4,893,069
270 4,893,070

CLASS 324

117 H 4,893,073
158 F 4,893,074
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207 4,893,076
208 4,893,077
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225 4,893,079
309 4,893,080
4,893,081
312 4,893,082
318 4,893,083
341 4,893,084
378 4,893,085
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660 4,893,071

CLASS 328

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127 4,893,088
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CLASS 330

253 4,893,090
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CLASS 331

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175 4,893,096
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CLASS 333

17.1 4,893,099
112 4,893,098

CLASS 334

39 4,893,100

CLASS 335

18 4,893,101
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CLASS 336

84 M 4,893,105

CLASS 337

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CLASS 338

34 4,893,108

CLASS 340

438 4,893,109
442 4,893,110
471 4,893,111
479 4,893,112
632 4,893,113
703 4,893,114
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825.54 4,893,118
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CLASS 341

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31 4,893,120
122 4,893,122
143 4,893,123
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CLASS 342

129 4,893,125
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CLASS 343

700 MS 4,893,129
713 4,893,131
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96.21 4,892,379
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96.23 4,892,382
96.29 4,892,383
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162.23 4,892,385
174 4,892,386
319 4,892,387
320 4,892,388
333 4,892,389
335 4,892,390
339 F 4,892,391
339 R 4,892,392
350 S 4,892,393
357 4,892,394
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425 4,892,397
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626 4,892,400
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CLASS 351

160 H 4,892,402
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CLASS 352

192 4,892,404

CLASS 354

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149.11 4,893,140
219 4,893,141
234.1 4,893,142
286 4,893,143
304 4,893,144
400 4,893,145

CLASS 355

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245 4,893,151
315 4,893,146
323 4,893,152
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152 Re.33,144
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CLASS 357

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23.13 4,893,157
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23.4 4,893,160
24 4,893,161
30 4,893,162
40 4,893,163
42 4,893,164
43 4,893,165
51 4,893,166
4,893,167
68 4,893,168
70 4,893,169
71 4,893,170
72 4,893,171
79 4,893,172
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CLASS 358

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75 4,893,177
76 4,893,178
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80 4,893,180
4,893,181
105 4,893,182
107 4,893,183
135 4,893,184
213.17 4,893,185
213.19 4,893,186
261.1 4,893,187
298 4,893,190
4,893,191
336 4,893,192
341 4,893,193
443 4,893,194
454 4,893,195
456 4,893,188
471 4,893,189
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CLASS 360

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14.1 4,893,198
48 4,893,199
67 4,893,200
77.04 4,893,201
79 4,893,202
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4,893,204
104 4,893,205
106 4,893,206
114 4,893,207
118 4,893,208
128 4,893,209
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CLASS 361

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395 4,893,215
406 4,893,216
506 4,893,217

CLASS 362

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80.1 4,893,220
108 4,893,221
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287 4,893,224
293 4,893,225
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CLASS 363

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CLASS 364

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146 4,893,230
200 4,893,231
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424.07 4,893,241
426.01 4,893,242
426.04 4,893,243
431.03 4,893,244
435 4,893,245
449 4,893,246
4,893,247
464.01 4,893,248
464.03 4,893,249
470 4,893,250
474.29 4,893,251
483 4,893,252
497 4,893,253
513 4,893,254
4,893,255
518 4,893,256
519 4,893,257
521 4,893,258
525 4,893,259
564 4,893,260
565 4,893,261
567 4,893,262
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724.10 4,893,265
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189.08 4,893,276
189.09 4,893,275
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230.03 4,893,279
230.05 4,893,280
230.06 4,893,281
233.5 4,893,282

CLASS 366

2 4,892,410
25 4,892,411
145 4,892,412
349 4,892,413

CLASS 367

7 4,893,283
12 4,893,284
35 4,893,285
87 4,893,286
91 4,893,287
116 4,893,288
136 4,893,289
178 4,893,290

CLASS 368

10 4,893,291
88 4,893,292

CLASS 369

34 4,893,293
44 4,893,294
75.2 4,893,295
112 4,893,296
275 4,893,297
4,893,298
4,893,299

CLASS 370

3 4,893,300
58.2 4,893,301
60 4,893,302
4,893,303
4,893,304
84 4,893,305
94.1 4,893,307
94.2 4,893,306
109 4,893,308
110.1 4,893,309
4,893,310

CLASS 371

22.5 4,893,311
37.8 4,893,312
223 4,893,072

CLASS 372

46 4,893,313
107 4,893,314

CLASS 374

37 4,893,315

CLASS 375

44 4,893,316
97 4,893,317
109 4,893,318
111 4,893,319

CLASS 376

258 4,892,701
294 4,892,702

CLASS 377

11 4,893,320

CLASS 378

121 4,893,321
173 4,893,322
208 4,893,323

CLASS 379

40 4,893,324
45 4,893,325
53 4,893,326
59 4,893,327
67 4,893,328
88 4,893,329
91 4,893,330
93 4,893,331
97 4,893,332
100 4,893,333
157 4,893,334
200 4,893,335
211 4,893,336
424 4,893,337

CLASS 380

25 4,893,338
28 4,893,339
50 4,893,340

CLASS 381

7 4,893,341
26 4,893,342
156 4,893,343
187 4,893,344
1 4,893,345
8 4,893,346

CLASS 382

63 4,892,414

CLASS 384

45 4,892,415
58 4,892,416
99 4,892,417
124 4,892,418
322 4,892,419
420 4,892,420
492 4,892,421
549 4,892,422
611 4,892,423
620 4,892,424

CLASS 388

817 4,893,067

CLASS 400

120 4,892,425
708 4,892,426

CLASS 401

182 4,892,427
258 4,892,428

CLASS 403

24 4,892,430
187 4,892,431
297 4,892,432
359 4,892,433
361 4,892,434
374 4,892,435
404 4,892,436

CLASS 404

97 4,892,437
119 4,892,438
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CLASS 405

36 4,892,440
146 4,892,441
154 4,892,442
164 4,892,443
195 4,892,444
224 4,892,445
302 4,892,446

CLASS 408

76 Re.33,145
4,892,447

CLASS 409

181 4,892,448

CLASS 411

54 4,892,449
78 4,892,450
383 4,892,429

CLASS 414

217 4,892,451
229 4,892,452
403 4,892,453
406 4,892,454
417 4,892,455
527 4,892,456
735 4,892,457
791.6 4,892,458

CLASS 415

104 4,892,459

CLASS 416

62 4,892,460
134 A 4,892,461
226 4,892,462

CLASS 417

151 4,892,463
201 4,892,464
218 4,892,465
295 4,892,466
353 4,892,467
365 Re.33,142
415 4,892,468

CLASS 418

55 4,892,469

CLASS 419

13 4,892,703

CLASS 420

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CLASS 422

26 4,892,705
28 4,892,706
51 4,892,707
72 4,892,708
98 4,892,709
102 4,892,710
125 4,892,711
186 4,892,712
186.07 4,892,713
245 4,892,714

CLASS 423

20 4,892,715
213.7 4,892,716
217 4,892,717
235 4,892,718
245.1 4,892,719
328 4,892,720
4,892,721
448 4,892,722
573.1 4,892,723

CLASS 424

49 4,892,724
4,892,725
63 4,892,726
69 4,892,727
70 4,892,728
73 4,892,729
80 4,892,730
85.7 4,892,743
93 4,892,731
409 4,892,732
422 4,892,733
4,892,734
435 4,892,735
4,892,736
449 4,892,737
468 4,892,738
473 4,892,739
474 4,892,740
479 4,892,741
480 4,892,742

CLASS 425

80.1 4,892,470
132 4,892,471
139 4,892,472
197 4,892,473
549 4,892,474

CLASS 426

111 4,892,744
549 4,892,745
4,892,762
598 4,892,746
618 4,892,747
635 4,892,748
646 4,892,749

CLASS 427

27 4,892,750
34 4,892,751
38 4,892,752
4,892,753
54.1 4,892,754
203 4,892,755
206 4,892,756
215 4,892,757
242 4,892,758
249 4,892,759
428 4,892,760
430.1 4,892,761

CLASS 428

34.1 4,892,763
34.5 4,892,764
34.8 4,892,765
36.4 4,892,766
52 4,892,767
57 4,892,768
68 4,892,769
71 4,892,770
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113 4,892,772
121 4,892,773
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331 4,892,787
336 4,892,788
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548 4,892,790
698 4,892,791
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CLASS 429

60 4,892,793
72 4,892,794
194 4,892,795
196 4,892,796
210 4,892,797

CLASS 430

38 4,892,798
77 4,892,799
85 4,892,800
193 4,892,801
270 4,892,802
380 4,892,803
4,892,804
387 4,892,805
449 4,892,806
505 4,892,807
517 4,892,808
550 4,892,809
553 4,892,810
562 4,892,811
567 4,892,812

CLASS 431

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36 4,892,476
202 4,892,477

CLASS 433

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20 4,892,479
73 4,892,480
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136 4,892,482
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CLASS 434

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CLASS 435

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11 4,892,816
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68.1 4,892,820
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172.2 4,892,824
180 4,892,825
183 4,892,826
193 4,892,827
240.2 4,892,829
240.27 4,892,828
290 4,892,830
292 4,892,831
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CLASS 436

97 4,892,833
149 4,892,834

CLASS 437

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31 4,892,837
41 4,892,838
47 4,892,839
52 4,892,840
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67 4,892,842
192 4,892,843
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CLASS 439

167 4,892,485
248 4,892,486
260 4,892,487
438 4,892,488
497 4,892,489
533 4,892,490
582 4,892,491
818 4,892,542
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CLASS 440

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CLASS 441

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CLASS 445

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CLASS 446

81 4,892,499
221 4,892,500
372 4,892,501
454 4,892,502
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CLASS 455

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278 4,893,350
347 4,893,351
610 4,893,352
612 4,893,353
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CLASS 460

112 4,892,504
149 4,892,505

CLASS 474

49 4,892,506
50 4,892,507
101 4,892,508
237 4,892,509
252 4,892,510

CLASS 493

194 4,892,511
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316 4,892,513
413 4,892,514
956 4,892,515

CLASS 501

8 4,892,846
14 4,892,847
97 4,892,849
127 4,892,850

CLASS 502

104 4,892,851
107 4,892,852
112 4,892,853
160 4,892,854
200 4,892,855
205 B1 4,438,217
247 4,892,856
439 4,892,857

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CLASS 505

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CLASSIFICATION OF PATENTS

	4,892,863	107	4,892,892	304	4,892,916	575	4,892,943		CLASS 560	340	4,892,531
	CLASS 514	128	4,892,893	318	4,892,917		CLASS 544	118	4,892,965	353	4,892,527
43	4,892,865		CLASS 522		CLASS 528	107	4,892,944	174	4,892,966	366	4,892,532
119	4,892,866	31	4,892,894	15	4,892,918	263	4,892,945	180	4,892,967	368	4,892,533
132	4,892,888	99	4,892,895	48	4,892,919	321	4,892,946		CLASS 562	370	4,892,534
178	4,892,867		CLASS 523	61	4,892,920	326	4,892,948	21	4,892,679	380	4,892,535
182	4,892,868	300	4,892,896	183	4,892,921		CLASS 546	59	4,892,968	385.2	4,892,528
210	4,892,869	404	4,892,897	190	4,892,922	98	4,892,949	70	4,892,969		4,892,536
211	4,892,870		CLASS 524	196	4,892,923		4,892,950	450	4,892,971	408	4,892,537
227.2	4,892,871	3	4,892,898	219	4,892,924	307	4,892,951	487	4,892,972	891.1	4,892,538
230.5	4,892,872	83	4,892,899	305	4,892,925		CLASS 548		CLASS 564		CLASS 606
245	4,892,952	141	4,892,900	324	4,892,926	156	4,892,953	315	4,892,973	1	4,892,096
247	4,892,947	181	B1 4,120,845	480	4,892,927	356	4,892,956	409	4,892,974	18	4,892,098
248	4,892,873	303	4,892,901	487	4,892,929	357	4,892,957		CLASS 568	82	4,892,093
249	4,892,874	417	4,892,902	493	4,892,930	362	4,892,958	56	4,892,975	182	4,892,097
253	4,892,875	488	4,892,903	499	4,892,931	579	4,892,959	465	4,892,976	194	4,892,099
265	4,892,876	494	4,892,904		4,892,932		CLASS 549	618	4,892,977		CLASS 623
289	4,892,877	499	4,892,905		CLASS 530	229	4,892,954		CLASS 604	1	4,892,539
327	4,892,878	730	4,892,906	387	4,892,933	325	4,892,955	57	4,892,516	2	4,892,540
338	4,892,879	731	4,892,907		4,892,934	414	4,892,960	74	4,892,517		4,892,541
342	4,892,880		CLASS 525		4,892,935	419	4,892,961	93	4,892,518	6	4,892,543
356	4,892,881	160	4,892,908		CLASS 534		CLASS 552	96	4,892,519	11	4,892,544
380	4,892,882	216	4,892,909	595	4,892,936	253	4,892,686	117	4,892,520	17	4,892,545
460	4,892,884	221	4,892,910	652	4,892,937		CLASS 556	192	4,892,521	18	4,892,546
464	4,892,883	240	4,892,911		CLASS 536	416	4,892,962		4,892,522	20	4,892,547
478	4,892,885	338	4,892,928	18.5	4,892,938		CLASS 558	198	4,892,523	22	4,892,548
510	4,892,864	437	4,892,912	23	4,892,939	414	4,892,963	246	4,892,524		4,892,549
567	4,892,886	452	4,892,913	55.2	4,892,940		4,892,964	263	4,892,525		4,892,550
601	4,892,887		CLASS 526		CLASS 540			290	4,892,526	23	4,892,551
774	4,892,889	114	4,892,914	145	4,892,941			317	4,892,529		4,892,552
784	4,892,890	259	4,892,915	205	4,892,942			338	4,892,530	55	4,892,553
	CLASS 521										4,892,554
69	4,892,891										

CLASSIFICATION OF DESIGNS

D2—	10	305,375	D7—	13	305,392		415	305,408		124	305,426		143	305,443		46	305,459
	29	305,376		21	305,393		425	305,409		138	305,427		175	305,444	D25—	114	305,460
	229	305,377		40	305,394			305,410		191	305,428		191	305,445		136	305,461
	277	305,378		70	305,395	D10—	31	305,411			305,429		198	305,446	D27—	156	305,462
	314	305,379		77	305,396	D11—	87	305,412		247	305,422			305,447	D28—	7	305,463
		305,380			305,397		202	305,413		257	305,430		209	305,448		12	305,464
	320	305,381	D8—	49	305,398	D12—	3	305,414	D15—	1	305,432		237	305,449		46	305,465
		305,382		62	305,399		110	305,415	D16—	133	305,433	D22—	142	305,450		53	305,466
		305,383		90	305,400		133	305,416	D17—	16	305,434	D23—	225	305,451	D32—	49	305,468
	331	305,384		303	305,401		193	305,417	D18—	13	305,435			305,452		53	305,467
D4—	104	305,385		367	305,431		345	305,418			305,436		226	305,453	D34—	40	305,469
		305,386		395	305,402	D13—	3	305,419		24	305,437			305,454			305,470
D6—	333	305,387		402	305,403		12	305,420		36	305,438		254	305,455			305,471
	372	305,388	D9—	310	305,404		13	305,421	D19—	1	305,439		353	305,456		42	305,472
	379	305,389		345	305,405	D14—	101	305,423	D21—	59	305,440		366	305,457			305,473
	451	305,390		373	305,406		114	305,424		84	305,441						
	561	305,391		376	305,407		118	305,425		108	305,442	D24—	40	305,458		45	305,474

CLASSIFICATION OF PLANTS

P.—	11	7,096		7,098		7,101		7,102	
	68	7,097		7,100	69	7,099		7,103	7,104
							89		7,105

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
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Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
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Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,892,037	4,892,253	4,892,824	4,892,183	4,892,558	4,892,604
	4,892,039	4,892,256	4,892,831	4,892,213	4,892,562	4,892,611
	4,892,097	4,892,262	4,892,844	4,892,310	4,892,737	4,892,649
	4,892,148	4,892,272	4,892,854	4,892,406	4,893,049	4,892,652
	4,892,230	4,892,286	4,892,918	4,892,409	4,893,087	4,892,699
	4,892,874	4,892,313	4,892,952	4,892,424	4,893,088	4,892,768
	4,893,219	4,892,314	4,892,996	4,892,429	4,893,094	4,892,775
02 :	4,891,877	4,892,316	4,893,025	4,892,475	4,893,223	4,892,820
04 :	4,892,106	4,892,328	4,893,030	4,892,479	4,893,271	4,892,826
	4,892,269	4,892,335	4,893,063	4,892,529	4,893,305	4,892,970
	4,892,343	4,892,357	4,893,066	4,892,700	4,893,351	4,892,972
	4,892,353	4,892,358	4,893,068	4,892,780	13 : 4,891,882	4,892,983
	4,892,526	4,892,359	4,893,089	4,892,787	4,891,921	4,892,984
	4,892,570	4,892,369	4,893,120	4,892,877	4,891,957	4,893,059
	4,892,612	4,892,370	4,893,125	4,892,887	4,891,975	4,893,064
	4,892,647	4,892,373	4,893,136	4,893,000	4,891,990	4,893,077
	4,892,668	4,892,383	4,893,160	4,893,161	4,892,034	4,893,078
	4,893,026	4,892,394	4,893,166	4,893,197	4,892,125	4,893,100
	4,893,091	4,892,416	4,893,176	4,893,249	4,892,229	4,893,113
	4,893,098	4,892,430	4,893,198	4,893,259	4,892,667	4,893,224
	4,893,211	4,892,449	4,893,205	4,893,261	4,892,773	4,893,287
	4,893,242	4,892,452	4,893,208	4,893,338	4,892,784	4,893,302
	4,893,245	4,892,455	4,893,209	10 : 4,891,960	4,893,256	4,893,308
	4,893,266	4,892,472	4,893,210	4,892,481	16 : 4,892,122	4,893,316
05 :	4,891,931	4,892,485	4,893,255	4,892,589	17 : 4,891,887	4,893,325
	4,892,001	4,892,493	4,893,279	4,892,772	4,891,912	4,893,327
06 :	4,891,848	4,892,496	4,893,297	4,892,782	4,891,942	4,893,334
	4,891,852	4,892,500	4,893,312	4,892,786	4,891,999	4,893,339
	4,891,862	4,892,519	4,893,314	4,892,899	4,892,029	4,893,342
	4,891,865	4,892,523	4,893,317	4,892,943	4,892,030	4,893,343
	4,891,896	4,892,537	4,893,322	4,892,946	4,892,115	4,893,347
	4,891,911	4,892,541	4,893,323	12 : 4,891,854	4,892,153	4,893,349
	4,891,926	4,892,550	4,893,324	4,891,856	4,892,158	18 : 4,891,885
	4,891,936	4,892,551	4,893,328	4,891,893	4,892,175	4,891,934
	4,891,983	4,892,552	4,893,333	4,891,935	4,892,195	4,892,042
	4,891,998	4,892,561	4,893,340	4,891,987	4,892,220	4,892,052
	4,892,017	4,892,579	3,931,011	4,892,053	4,892,222	4,892,512
	4,892,043	4,892,595	08 : 4,891,869	4,892,064	4,892,232	4,892,547
	4,892,067	4,892,670	4,891,914	4,892,216	4,892,235	4,892,708
	4,892,087	4,892,684	4,892,021	4,892,217	4,892,246	4,892,819
	4,892,091	4,892,709	4,892,113	4,892,254	4,892,252	4,892,892
	4,892,107	4,892,710	4,892,127	4,892,284	4,892,277	4,892,901
	4,892,124	4,892,717	4,892,155	4,892,292	4,892,285	4,892,942
	4,892,128	4,892,723	4,892,209	4,892,315	4,892,300	4,892,956
	4,892,137	4,892,732	4,892,412	4,892,321	4,892,309	4,892,960
	4,892,138	4,892,748	4,892,439	4,892,403	4,892,324	4,892,982
	4,892,145	4,892,753	4,892,593	4,892,411	4,892,360	4,893,253
	4,892,150	4,892,755	4,892,633	4,892,421	4,892,434	19 : 4,891,903
	4,892,169	4,892,776	4,892,695	4,892,447	4,892,440	4,892,218
	4,892,193	4,892,778	4,893,257	4,892,460	4,892,494	4,892,261
	4,892,226	4,892,790	4,893,272	4,892,486	4,892,513	20 : 4,892,234
	4,892,240	4,892,796	09 : 4,892,020	4,892,491	4,892,531	4,892,265
	[illegible]	4,892,817	4,892,162	4,892,492	4,892,603	4,892,437

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4,892,577
4,893,329
21 : 4,891,853
4,891,932
4,892,028
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22 : 4,892,054
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23 : 4,892,139
4,892,714
24 : 4,892,197
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 13, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,635,300 through 4,637,073
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 11, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,367,561 through 4,368,543
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED OCTOBER 29, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,297,508	06/218,973	10/27/81
4,549,318	06/696,190	10/29/85
4,549,321	06/712,717	10/29/85
4,549,322	06/449,868	10/29/85
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4,549,370	06/458,997	10/29/85
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4,549,684	06/469,776	10/29/85
4,549,689	06/522,744	10/29/85
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4,549,697	06/502,493	10/29/85
4,549,709	06/349,889	10/29/85
4,549,710	06/469,121	10/29/85
4,549,714	06/541,586	10/29/85
4,549,716	06/561,659	10/29/85
4,549,722	06/617,512	10/29/85
4,549,724	06/385,386	10/29/85
4,549,725	06/676,412	10/29/85
4,549,726	06/540,889	10/29/85
4,549,735	06/611,337	10/29/85
4,549,738	06/605,169	10/29/85
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4,549,762	06/620,727	10/29/85
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4,550,407	06/504,305	10/29/85
4,550,430	06/236,276	10/29/85
4,550,442	06/615,573	10/29/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,613,371, Re. S. N. 247,786, Filed Sept. 21, 1988, Cl. 75/255, METHOD FOR MAKING ULTRAFINE METAL POWDER, Richard F. Cheney, et al., Owner of Record: *GTE Products Corp., Stamford Conn.*, Attorney or Agent: Donald R. Castle, Ex. Gp.: 111

4,685,091, Re. S. N. 389,669, Filed Aug. 4, 1989, Cl. 367/31, METHOD AND APPARATUS FOR ACOUSTIC WELL LOGGING, Jing-Yau Chung, Owner of Record: *Exxon Production Research Company*, Attorney or Agent: Michael A. Nametz, et al., Ex. Gp.: 222

4,697,244, Re. S. N. 414,480, Filed Sept. 29, 1989, Cl. 364/520, COORDINATE INPUT DEVICE WITH DISPLAY AND PRINTER, Azuma Murakami, et al., Owner of Record: *Wacom Co. Ltd., Saitama, Japan*, Attorney or Agent: Allan M. Lowe, et al., Ex. Gp.: 231

4,697,281, Re. S. N. 414,468, Filed Sept. 29, 1989, Cl. 379/59, CELLULAR TELEPHONE DATA COMMUNICATION SYSTEM AND METHOD, Harry M. O'Sullivan, Owner of Record: *Spectrum Cellulur Communications Corp. Inc., Dallas, Tex.*, Attorney or Agent: Charles M. Leedom, Jr., et al., Ex. Gp.: 261

4,709,454, Re. S. N. 444,605, Filed Nov. 30, 1989, Cl. 24/590, AXIAL LOCKING DEVICE, Austen B. Barnes, Owner of Record: *Inventor*, Attorney or Agent: Remy J. Vanophem, Ex. Gp. 357

4,715,498, Re. S. N. 445,367, Filed Dec. 4, 1989, Cl. 206/366, SHARPS DISPOSAL SYSTEM, Paul H. Hanifi, Owner of Record: *Sage Products, Inc., Cary Ill.*, Attorney or Agent: Wm. Marshall Lee, et al., Ex. Gp.: 241

4,726,081, Re. S. N. 444,284, Filed Dec. 1, 1989, Cl. 4/564, BATH WITH A VERTICALLY MOVABLE SEAT, Ricard W. Duffin, et al., Owner of Record: *Inventor*, Attorney or Agent: Edmund M. Jaskiewicz, Ex. Gp.: 243

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,203,639, Reexam. No. 90/001,901, Requested Dec. 4, 1989, Cl. 339/22, PANEL WIRING SYSTEM, Harold L. Vanderhoek, et al., Owner of Record: *Steelcase Inc., Grand Rapids, Mich.*, Attorney or Agent: Price, Heneveld & Cooper, et al., Ex. Gp.: 320, Requester: Haworth Inc., Holland, Mich.

4,683,195, Reexam No. 90/001,902, Requested Dec. 6, 1989, Cl. 430/6, PROCESS FOR AMPLIFYING DETECTING AND/OR CLONING NUCLEIC ACID SEQUENCES, Kary B. Mullis, et al., Owner of Record: *Cetus Corp. Emeryville, Calif.*, Attorney or Agent: A. P. Halluin, Ex. Gp.: 120, Requester: Pennie & Edmonds, New York, N. Y.

4,683,202, Reexam No. 90/001,903, Requested Dec. 6, 1989 Cl. 435/91, PROCESS FOR AMPLIFYING NUCLEIC ACID SEQUENCES, Kary P. Mullis, Owner of Record: *Cetus Corp., Emeryville, Calif.*, Attorney or Agent: A. P. Halluin, Ex. Gp.: 120, Requester: Pennie & Edmonds, New York, N. Y.

PATENT TERMS EXTENDED UNDER 35 USC 156

Certificates extending the terms of the following patents were issued on December 11, 1989.

Patent No. 4,395,403, granted July 26, 1983 to Wilfried Bauer, et al., Owner of Record: Sandoz, Ltd., Title: NOVEL POLYPEPTIDES, PROCESSES FOR THEIR PRODUCTION, PHARMECUETICAL COMPOSITIONS COMPRISING SAID POLYPEPTIDES AND THEIR USE, Classificqation: 514-12, Product Trade Name: Sandostatin, Term Extended: 2 years.

Patent No. 3,965,143, granted June 22, 1976 to Paul W. Collins, et al., Owner of Record: G. D. Searle & Co., Title: 16-OXYGENATED PROSTANOIC ACID DERIVATIVES, Classification: 560-118, Product Trade Name: Cytotec, Term Extended: 2 years.

Patent No. 4,166,182, granted August 28, 1979 to Edmund C. Kornfeld, et al., Owner of Record: Eli Lilly and Company, Title: 6-N-PROPYL-8-METHOXYMETHYL OR METHYLMERCAPTO-METHYLERGOLINES AND RELATED COMPOUNDS, Classification: 546-67, Product Trade Name: Permax, Term Extended: 2 years.

Patent No. 4,396,598, granted August 2, 1983 to Youlin Lin, Owner of Record: Mallinckrodt, Inc., Title: TRIIODOISOPHTHALAMIDE X-RAY CONTRAST AGENT, Classification: 166-85, Product Trade Name: Optiray, Term Extended: 815 days.

Patent No. 4,219,559, granted August 26, 1980 to Frans Janssens, et al., Owner of Record: Janssen Pharmeceutical N. V., Title: N-HETEROCYCYL-4-PEPERIDINAMINES, Classification: 514-322, Product Trade Name: Hismanal, Term Extended: 2 years.

Patent No. 3,985,758, granted October 12, 1976 to Masuo Murkami, et al., Owner of Record: Yamanouchi Pharmaceutical Co. Ltd., Title: 1, 4-DIHYDROPYRIDINE DERIVATIVES, Classification: 546-321, Product Trade Name: Cardene, Term Extended: 2 years.

Patent No. 3,910,924, granted October 7, 1975 to Yasumitsu Tamura, et al., Owner of Record: Otsuka Pharmaceutical Co., Ltd., Title: 3, 4-DIHYDROCARBOSTYRIL DERIVATIVES AND A PROCESS FOR PREPARING THE SAME, Classification: 546-158, Product Trade Name: Cartrol, Term Extended: 2 years.

Patent No. 4,241,057, granted December 23, 1980 to Kenzo Ishizuka, et al., Owner of Record: Takeda Chemical Industries, Ltd., Title: ANTIBIOTIC COMPOSITIONS, Classification: 514-206, Product Trade Name: Ceradon, Term Extended: 2 years.

Patent No. 4,406,906, granted September 27, 1983 to Horst Meyer, et al., Owner of Record: Bayer Aktiengesellschaft, Title: CEREBRAL THERAPEUTIC AGENT AND ITS USE, Classification: 514-356, Product Trade Name: Nimotop, Term Extended: 2 years.

Patent No. 3,732,340, granted May 8, 1973 to Herbert Arnold, et al., Owner of Record: Asta Pharma AG, Title: N',O-PROPYLENE PHOSPHORIC ACID ESTER DIAMIDES, Classification: 558-81, Product Trade Name: Ifex, Term Extended: 2 years.

Patent No. 4,220,660, granted September 2, 1980 to Norbert Brock, Owner of Record: Asta Pharma AG, Title: PROCESS FOR THE TREATMENT OF HUMANS SUFFERING FROM UNDESIRED UROTOXIC SIDE EFFECTS CAUSED BY CYTOSTATICALLY ACTIVE AKLYLATING AGENTS, Classification: 514-78, Product Trade Name: Mesnex, Term Extended 821 days.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
[Docket No. 91283-9283]

Request for Information Regarding Process Patent Amendments Made by the Omnibus Trade and Competitiveness Act of 1988

Agency: Patent and Trademark Office, Commerce.
Action: Request for information from domestic industries regarding possible adverse effects of the process patent amendments made by the Omnibus Trade and Competitiveness Act of 1988 (Pub. L. 100-417).
Date: Comments must be received on or before February 9, 1990.
For Further Information Contact: Documents and questions should be submitted to H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D. C. 20231. Telephone at (703) 557-3065.
Supplementary Information: The Omnibus Trade and Competitiveness Act of 1988 (Pub. L. 100-417) was enacted on August 23, 1988. Among other things, the Act amended title 35, United States Code, to extend the protection of a process patented in the United States also to products made by that process. As a consequence, whoever without authority imports into the United States, or sells or uses in this country, a product made by a patented process shall be liable as an infringer, if the importation, sale or use, occurs during the term of the processs patent. (Sections 9002 and 9003 of Pub. L. 100-417). The effective date of that amendment is February 23, 1989.

Section 9007 of the Act requires the Secretary of Commerce to report to the Congress, at the end of each one-year period from the effective date of the above amendments, on the effect of these amendments on those domestic industries that submitted complaints during such period, alleging that their legitimate sources of supply have been adversely affected. Such reports must be submitted for five successive years.

The first report from the Secretary of Commerce to the Congress will be submitted on February 23, 1990, covering the preceding one-year period. Accordingly, it is requested that domestic industries wishing their complaints reflected in the Secretary's report ensure that any submission on this subject is received by the Department of Commerce not later than February 9, 1990.

December 19, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

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PATENT NOTICES

Certificates of Correction For Week of January 16, 1990

4,520,493	4,803,591	4,822,528	4,838,426
4,596,734	4,803,599	4,822,542	4,829,357
4,693,725	4,805,013	4,822,736	4,829,428
4,706,079	4,806,680	4,822,816	4,829,460
4,715,471	4,807,196	4,822,854	4,829,595
4,733,281	4,808,394	4,823,235	4,829,614
4,738,350	4,810,381	4,823,386	4,829,911
4,749,443	4,811,373	4,823,394	4,829,998
4,749,667	4,811,435	4,823,427	4,830,133
4,751,307	4,812,191	4,823,781	4,830,290
4,751,347	4,812,434	4,823,901	4,830,611
4,757,037	4,812,680	4,824,232	4,830,794
4,762,599	4,814,165	4,824,352	4,830,999
4,764,523	4,814,894	4,824,493	4,831,236
4,772,645	4,815,956	4,824,519	4,831,928
4,779,060	4,816,028	4,824,694	4,832,354
4,780,105	4,816,586	4,824,709	4,832,445
4,780,175	4,816,711	4,825,062	4,832,607
4,782,296	4,816,824	4,825,170	4,832,687
4,783,751	4,816,844	4,825,445	4,832,738
4,784,142	4,816,966	4,825,757	4,832,791
4,786,430	4,817,451	4,825,929	4,832,889
4,786,816	4,818,394	4,826,515	4,833,170
4,789,794	4,818,438	4,826,682	4,833,195
4,790,315	4,818,654	4,826,741	4,833,735
4,797,403	4,819,012	4,826,784	4,833,876
4,798,810	4,819,022	4,826,822	4,833,894
4,800,152	4,819,028	4,827,032	4,834,565
4,800,278	4,820,501	4,827,049	4,835,242
4,800,401	4,820,871	4,827,161	4,835,312
4,801,484	4,821,058	4,827,358	4,836,727
4,801,662	4,821,955	4,827,531	4,844,602
4,802,032	4,822,019	4,827,660	4,846,054
4,802,969	4,822,169	4,828,022	
4,803,203	4,822,449	4,828,063	

Disclaimer

4,621,144.—*Yoshiyuki Okada*, Suita; *Yasuo Sato*, Kyoto, both of Japan. 1-PHENYL-4-HYDROXYPYRAZOLE DERIVATIVES. Patent dated Nov. 4, 1986. Disclaimer filed July 6, 1989, by the assignee, Takeda Chemical Industries, Ltd.

Hereby enters this disclaimer to claims 1, 2 and 5 of said patent.

Disclaimer

4,631,215.—*Dennis G. Welygan*, Cottage Grove; *Ronald O Zemike*, White Bear Lake, Both of Minn. EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME. Patent dated Dec. 23, 1986. Disclaimer filed Aug. 28, 1989, by the assignee, Minnesota Mining and Manufacturing Company.

Hereby enters this disclaimer to claims 4 and 9 of said patent.

Disclaimer

4,806,248.—*Joseph S. Murken*, Springfield, Mo. HOSE CONSTRUCTION, COUPLING ARRANGEMENT THEREFOR AND METHOD OF MAKING THE SAME. Patent dated Feb. 21, 1989. Disclaimer filed Nov. 9, 1989, by the assignee, Dayco Products, Inc.

The term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Disclaimer

4,860,005.—*Joan S. DeLuca; Randi L. Dulaney*, both of Boca Raton, Fla. COMMUNICATION RECEIVER WITH AUTOMATIC TURN ON/OFF. Patent dated Aug. 22, 1989. Disclaimer filed Nov. 20, 1989, by the assignee, Motorola, Inc.

The term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Dedication

Des. 254,000.—*Michael A. Kolowski*, Tallmadge; *Daniel J. Lindner*, North Canton, both of Ohio; *Henry T. Kwee*, Stow; *Charles W. Roberts*, Akron, Ohio; *Harold D. Fetty*, Birmingham, Mich. TIRE. Patent dated Jan. 22, 1980. Dedication filed May 12, 1989, by the assignee, The Goodyear Tire & Rubber Company.

Hereby dedicates to the Public the entire term of said patent.

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PATENT APPLICATION	New patent application and associated papers and fees.
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These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775

Reference Collection of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 2, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	11-16-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-7-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	10-30-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

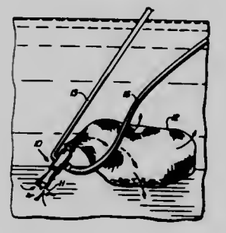
Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REEXAMINATIONS

JANUARY 16, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,240,173 (1186th)
POOL VACUUM
John C. Sherrill, Phoenix, Ariz., assignor to Innovative Products Corporation, Phoenix, Ariz.
Reexamination Request No. 90/001,644, Nov. 22, 1988.
Reexamination Certificate for Patent No. 4,240,173, issued Dec. 23, 1980, Ser. No. 57,211, Jul. 13, 1979.
Int. Cl.[4] E04H *3/20*
U.S. Cl. 15—1.7

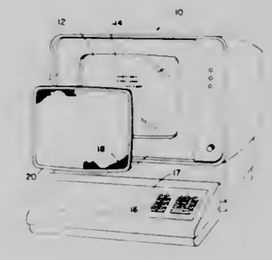


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1-9** are cancelled.

[**1**. A pool vacuum including in combination:
a first intake hollow pipe section with a debris pick-up end and a discharge end wherein at least a portion of the discharge end thereof is cylindrical in cross section of a predetermined external diameter;
fluid discharge means comprising a second pipe section surrounding said discharge end of said first pipe section and spaced therefrom by first and second spacing means located substantially near the respective ends of said second pipe section to form a hollow chamber between the external surface of the discharge end of said first pipe section and the internal surface of the second pipe section, the second spacer located near the discharge end of said first pipe section having a plurality of apertures therethrough extending substantially parallel to the axis of said first pipe section;
a third pipe section having an inlet end and an outlet end with said inlet end having an internal diameter greater than the external diameter of said first pipe section and communicating with the apertures through said second spacer, said third pipe section being bonded to one of said spacer and said second pipe section to provide a fluid-tight bond therewith; and
means for supplying fluid under pressure to the hollow chamber formed between said first pipe section and said second pipe section to cause the discharge of such fluid through the apertures in said second spacer into the inlet end of said third pipe section for discharge from the outlet end thereof.]

B1 4,253,737 (1187th)
ANTI-GLARE DEVICE FOR A COMPUTER TERMINAL DISPLAY
Erik J. Thomsen, San Rafael, and Patrick W. Brennan, Greenbrae, both of Calif., assignors to Sun-Flex Co., San Rafael, Calif.
Reexamination Request No. 90/001,648, Nov. 29, 1988.
Reexamination Certificate for Patent No. 4,253,737, issued Mar. 3, 1981, Ser. No. 11,112, Feb. 12, 1979.
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—276 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1, 2** and **3** is confirmed.

1. An anti-glare device for a curved video display screen comprising:
a thin, lightweight, portable frame of a flexible material;
a microweave mesh of black filaments stretched across the inner surface of said frame;
said frame being wide enough that it resists bending in all directions in the plane of the mesh but being flexible in all directions transverse thereto so that said frame and stretched mesh will conform to the curvature of a terminal display scope to which said frame is attached; and
means for attaching said frame to a terminal display scope so that said mesh conforms to and contacts said scope over the surface thereof.

B1 4,282,521 (1188th)
REGULATING CIRCUIT FOR GASEOUS IMPURITY DETECTOR
Leonard N. Lieberman, La Jolla, Calif., assignor to TIF Instruments, Inc., Miami, Fla.
Reexamination Request No. 90/001,733, Mar. 27, 1989.
Reexamination Certificate for Patent No. 4,282,521, issued Aug. 4, 1981, Ser. No. 93,543, Nov. 13, 1979.
Int. Cl.[4] G08B *17/10*; **G01M** *3/04*
U.S. Cl. 340—632

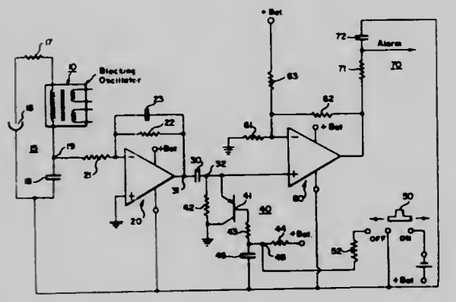
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1-16** is confirmed.

1. Apparatus for detecting gaseous impurities in an atmosphere comprising:
an asymmetrical electrode pair disposable in said atmosphere;

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means for forming a corona discharge across said electrode pair in the continuous corona region;
means for forming a first signal representative of the mean corona current of said discharge, said signal being representative of the concentration of the gaseous impurity;
means for forming a second signal which is a function of said first signal;
means for storing said second signal relatively rapidly, whereby there is recorded a representation of said mean corona current at the time said second signal is stored, and for updating relatively slowly the signal that is stored;



switching means having at least two operative states, said second signal being stored relatively rapidly when said switching means is in a first state and said stored signal being updated relatively slowly when said switching means is in a second state; and
means for sensing a change in the mean corona current relative to said stored signal and for producing an output signal when said change in the mean corona current is greater than a predetermined amount.

B1 4,436,233 (1189th)
BABY CARRIER
James B. Hill, and Sally F. Hill, both of Rte. 2, Galena, Mo. 65656
Reexamination Request No. 90/001,387, Nov. 27, 1987.
Reexamination Certificate for Patent No. 4,436,233, issued Mar. 13, 1984, Ser. No. 335,682, Dec. 30, 1981.
Int. Cl.⁴ A47D *13/02*
U.S. Cl. 224—159

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-8 are cancelled.

[1. Apparatus for carrying an infant on and by the body of an adult comprising:
a seat means adapted to be located in proximity to the waist, hip and stomach of an adult for conformable supporting engagement with the legs, buttocks and lower back of the infant;
a lower hip strap means attached to a lower portion of said seat means and adapted to be located about the hips of an adult for conformable supporting engagement with the body of the adult;
an upper shoulder strap means attached to an upper portion of said seat means and adapted to be located across the back and over the shoulder and across the chest of the adult for conformable supporting engagement with the body of the adult; and
said seat means and said hip strap means and said shoulder strap means being constructed and arranged to form said seat means into a J shape configuration providing a front



flap portion connected to and extending downwardly from said waist strap means and located between the infant and the adult and a bottom portion located in the crotch area of the infant and a back portion extending upwardly across the back of the infant and being connected to said shoulder strap means.]

B1 4,505,620 (1190th)
FLEXIBLE OFFSHORE PLATFORM
Bernard Andrier, Louveciennes, France, assignor to Entropose GTM pour les Petroliers Maritimes ETPM, Montreuil, France
Reexamination Request No. 90/001,435, Feb. 11, 1988.
Reexamination Certificate for Patent No. 4,505,620, issued Mar. 19, 1985, Ser. No. 545,153, Oct. 25, 1983.
Claims priority, application France, Sep. 22, 1983, 8315045
Int. Cl.⁴ E02D *21/00*
U.S. Cl. 405—224

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

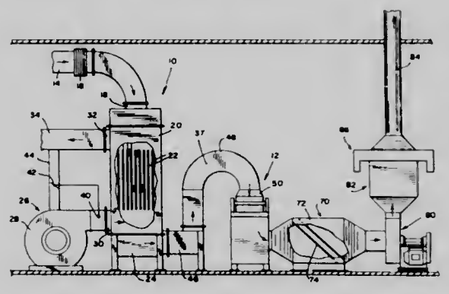
Claim 3 is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2 and 4-6, dependent on an amended claim, are determined to be patentable.

1. A flexible offshore platform comprising a foundation which fixes the platform on the sea-bed, a flexible column fixed to said foundation extending over more than half of the total height of the platform, a stabilizer fixed to the top of the flexible column, a deck and a second column connecting the stabilizer to the deck, the stabilizer being positioned to be immersed in the water and entraining a given mass of water, the mass formed by the mass of the stabilizer and the mass of water entrained by the stabilizer providing a stabilizing effect for the platform, *the stabilizer comprising at least one open shell which entrains a large quantity of water which contributes to the stabilizing effect,* and wherein the platform structure itself has a rigidity able to generate reaction stresses which resist actions due to waves, wind and current.

B1 4,662,899 (1191st)
AIR POLLUTION CONTROL SYSTEM METHOD AND APPARATUS
Jag S. Tandon, Northbrook, Ill., assignor to American Environmental International Inc.
Reexamination Request No. 90/001,796, Jan. 22, 1989.
Reexamination Certificate for Patent No. 4,662,899, issued May 5, 1987, Ser. No. 720,100, Apr. 5, 1985.
Int. Cl.⁴ B01D *51/10*
U.S. Cl. 55—80

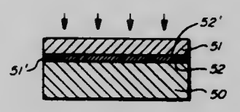


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 6 is confirmed.

1. Apparatus for filtering vaporized organic solvents and fine particulate matter from a hot exhaust stream comprising a condenser and a filter unit; said condenser including a housing having an upper inlet and a lower outlet for said exhaust stream, baffle means within said housing defining a plurality of individual vertical flow paths with said exhaust stream communicating with an upper end of alternating flow paths and flowing downward to said lower outlet, an atmospheric pressurized fluid source in communication with the lower ends of the remaining flow paths and flowing upward to a heated fluid exit adjacent the upper end of said housing for cooling said exhaust gases and condensing said vaporized organic solvents into at least an aerosol particle mist, said filtering unit including a substantially vertical housing having an upper inlet and a lower outlet, a movable filter support bed extending across said housing and a mist-coalescing filter supported on said bed, and conduit means extending from said lower outlet of said condenser to said upper inlet of said vertical housing so that said exhaust stream flows downward through said mist-coalescing filter; pressure sensitive means for sensing the pressure differential of said exhaust stream across said mist-coalescing filter and drive means connected to said filter support bed for moving a new filter section across said vertical housing when the pressure differential exceeds a certain level with a fan downstream of said filter unit for drawing said exhaust stream through said filter unit; and a movable charcoal filter extending across said exhaust stream downstream of said fan for removing odors from said exhaust stream.

B1 4,703,336 (1192nd)
PHOTODETECTION AND CURRENT CONTROL DEVICES
Stanford R. Ovshinsky, Bloomfield Hills, and Arun Madan, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc.
Reexamination Request No. 90/001,571, Aug. 2, 1988.
Reexamination Certificate for Patent No. 4,703,336, issued Oct. 27, 1987, Ser. No. 853,264, Apr. 17, 1986.
Continuation of Ser. No. 710,359, Apr. 18, 1985, which is a continuation-in-part of Ser. No. 540,153, Oct. 7, 1983, Pat. No. 4,529,380, which is a continuation of Ser. No. 427,688, Sep. 29, 1982, Pat. No. 4,409,605, which is a continuation of Ser. No. 222,489, Jan. 5, 1981, abandoned, which is a continuation of Ser. No. 104,284, Dec. 17, 1979, abandoned, which is a division of Ser. No. 887,353, Mar. 16, 1978, Pat. No. 4,226,898.
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 357—30



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 17-20 are cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2-16, dependent on an amended claim, are determined to be patentable.

New claims 21-52 are added and determined to be patentable.

1. A photodetection device comprising: means responsive to the intensity of incident radiation for providing a corresponding output signal, said responsive means including a thin semiconductor film comprising a solid [amorphous silicon or] amorphous germanium host matrix having electronic configurations with an energy gap; said host matrix of the amorphous [semiconductor] *germanium* material further including at least one compensating element for reducing the density of localized states in said energy gap.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,146

OCCUPANCY RESPONSIVE TEMPERATURE CONTROL SYSTEM

Edwin A. Carrell, Georgetown, and David H. Spivey, Austin, both of Tex., assignors to Flair International Corporation, Hauppauge, N.Y.

Original No. 4,485,864, dated Dec. 4, 1984, Ser. No. 225,101, Jan. 14, 1981. Application for reissue Dec. 2, 1986, Ser. No. 937,018

Int. Cl.[4] **G05D** *23/00*; **H01H** *3/16*

U.S. Cl. 165—11.1 **14 Claims**



6. A method of operating a system for modifying the temperature of an enclosed space having at least one access portal, the system including temperature means for changing the temperature of the air in the space and regulating means responsive to the temperature within the space for producing a command signal to said temperature means causing heat to be supplied to or withdrawn from the space when the temperature therein departs from a first control range, the method comprising the steps of:

detecting absence or presence of a body within the space;

detecting the opening or closing of the access portal;

initiating a predetermined interval of time in response to the opening or closing of the access portal;

deactivating the regulating means when no presence of a body is detected during said predetermined interval of time; and

maintaining active the regulating means, once the presence of a body is detected during said predetermined interval of time, even when no body presence detected outside said predetermined interval.

Re. 33,147

CEILING FAN MOUNTING ASSEMBLY

Kenneth H. Reiker, 22 Lakeshore Dr., Shalimar, Fla. 32579

Original No. 4,684,092, dated Aug. 4, 1987, Ser. No. 785,405, Oct. 8, 1985. Application for reissue Aug. 8, 1988, Ser. No. 229,438

Int. Cl.[4] **F24F** *7/06*

U.S. Cl. 248—200.1 **37 Claims**

17. A ceiling fan mounting assembly providing high load capability, and vibration and torque resistance for an electrical ceiling fan support housing connected with a joist structure adjacent an opening in the ceiling, the assembly comprising:

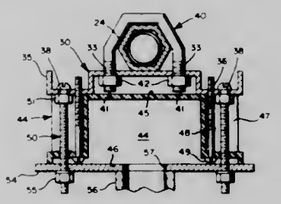
(a) means for engaging the joist structure adjacent the ceiling opening and for providing a firm, torque resistant support structure above the ceiling opening;

(b) an electrical junction box having a relatively flat upper surface and side wall structure with a lower peripheral surface, said junction box in firm engagement with said joist engaging means for providing vibration and torque resistance;

(c) two widely spaced support elements operably associated with said box and extending downwardly therefrom substantially parallel to said side wall structure and terminating substantially below said peripheral surface;

(d) a ceiling fan supporting housing having a structural member disposed below and in firm engagement with said junction box lower peripheral surface, said structural member having a pair of widely spaced openings therein;

(e) said support elements extending through said openings and



having an upper portion disposed above said upper surface; and,

(f) fastening means are mounted on the terminal end of each support element for maintaining said supporting housing structural member in firm engagement with said peripheral surface and for thereby providing vibration and torque resistance.

Re. 33,148

STRUT TYPE SUSPENSION FOR AUTOMOBILE

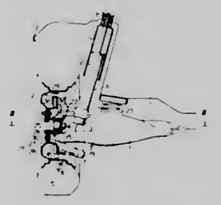
Mamoru Sakata, Ooizumigakuen, and Masaaki Minakawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 4,620,720, dated Nov. 4, 1986, Ser. No. 822,938, Jan. 27, 1986. Continuation of Ser. No. 576,307, Feb. 2, 1984, abandoned. Application for reissue Mar. 3, 1988, Ser. No. 163,918

Claims priority, application Japan, Feb. 2, 1983, 58-15923; Feb. 2, 1983, 58-15924

Int. Cl.[4] **B60G** *3/02*

U.S. Cl. 280—666 **10 Claims**



1. A strut type suspension for automobiles having a chassis, comprising a support member for rotably supporting a wheel, a lower control arm extending in the widthwise direction of the chassis and connected pivotably at its outer *end to said support member, a radius rod having one and other* ends and extending substantially in a longitudinal direction of said chassis with the one end thereof pivotably connected to the chassis, and a brake unit in said wheel, said brake unit being in a central portion of said wheel with a recess opened to an inner side of said chassis, said support member having an integral member extending inwardly and downwardly of said chassis and connected with the other end of said radius rod, the outer end of said lower control arm pivoted to the support member extending into said recess so that said pivot is located close to the center line contact of said wheel with the ground.

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Re. 33,149

FINELY PARTICULATED COLLOIDAL PLATINUM COMPOUND AND SOL FOR PRODUCING THE SAME AND METHOD OF PREPARATION OF FUEL CELL ELECTRODES AND THE LIKE EMPLOYING THE SAME

Henry G. Petrow, Watertown, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech Company, Newton Highlands, Mass.

Original No. 4,044,193, dated Aug. 23, 1977, Ser. No. 534,731, Dec. 20, 1974. Continuation-in-part of Ser. No. 153,824, Jun. 16, 1971, abandoned, which is a continuation of Ser. No. 430,190, Dec. 28, 1973, abandoned. Application for reissue Dec. 28, 1981, Ser. No. 335,201

Int. Cl.⁴ H01M *4/92*

U.S. Cl. 429—40 **38 Claims**

1. In a fuel cell [and the like], a catalytic electrode comprising an electrically conductive high surface area *carbon* substrate on which has been deposited platinum particles of the order of substantially 15 to 25 Angstroms in particle size and in which said particles are formed from [one of] an oxidative decomposition of a platinum *sulfite* complex comprising an oxidizable ligand [, and hydrolysis of a non-complex platinum salt solution].

35. A fuel cell comprising a catalytic electrode having an electrically conductive high surface area carbon substrate on which has been deposited platinum particles of the order of substantially 15 to 25 Angstroms in particle size, with the average particle size being in that range, and formed from a complex platinum sulfite having substantially the composition of $H_3Pt(SO_3)_2OH$.

PLANT PATENTS

GRANTED JANUARY 16, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,106

APPLE TREE

Kunio Hatakoshi, Matsumoto, Japan, assignor to Komachien Co., Ltd., Nagano, Japan

Filed Mar. 18, 1988, Ser. No. 170,966

Claims priority, application Japan, Jun. 22, 1987, 2356.

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as illustrated and described herein, characterized over known apple trees by (A) having a moderate vigor and a good spur-bearing habit, and (B) producing a medium size fruit having an oval shape (a) maturing early in the season and earlier than 'Tsugaru', and (b) having (1) a superior keeping quality for a cultivar maturing earlier than 'Tsugaru', (2) a conspicuous appearance caused by a relief of dense and large dots against a solid deep red coloured surface, which overlays a yellowish green ground colour skin, if not bagged, and (3) a yellowish white flesh which is moderately juicy, crisp and hard, has a moderate sweetness, a relatively strong acidity, and an aromatic flavor, and gives a good sweet-acid balance and an excellent dessert quality.

7,107

GERANIUM NAMED KLEDOL

Siegfried Klemm, Hanfacker 8, D-7000 Stuttgart 50, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,999

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive geranium plant substantially as herein shown and described, particularly distinguished by its clear red-purple flowers, of which the individual florets have a distinctive white eye.

7,108

AFRICAN VIOLET PLANT NAMED LITTLE BLUE TOPAZ

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,757

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Little Blue Topaz, as described and illustrated, and particularly characterized by its miniature growth habit; purplish blue, single violet-shaped flowers; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; medium green, spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,109

AFRICAN VIOLET PLANT NAMED IMPROVED TEXAS

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,759

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Texas, as described and illustrated, and particularly characterized by its single violet-shaped, blue flowers with frilled edges and somewhat darker center; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; relatively dark green, oval to heart-shaped leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,110

AFRICAN VIOLET PLANT NAMED SCORPIO

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,760

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Scorpio, as described and illustrated, and particularly characterized by its single, lilac flowers with darker center radiating into the 2 small petals; strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves; bright green, slightly serrated girl-type leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,111

CARNATION NAMED KLEFICARO

Siegfried Klemm, Hanfacker 8, D-7000 Stuttgart 50, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 252,593

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new carnation plant, substantially as herein shown and described, characterized by being a fast growing miniature variety having an average plant height of about 60 cm. producing medium sized flowers of a light orange color having red petal markings growing on strong stems having a moderate amount of medium broad, green-blue leaves.

7,112

CARNATION NAMED BIANCA

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda b.v., Aalsmeer, Netherlands

Filed Jan. 23, 1989, Ser. No. 299,757

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct spray carnation variety, substantially as herein shown and described, characterized by its medium sized flowers of substantially pure white color, its profuse production of blooms carried on a long flower stem, and its vigorous and upright growth habit with abundant foliage.

7,113

CARNATION NAMED HILSWISS

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda b.v., Aalsmeer, Netherlands

Filed Feb. 10, 1989, Ser. No. 308,757

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct spray carnation variety, substantially as herein shown and described, characterized by its relatively small flowers having basically white petals, red picotee along its marginal edges and red marginal stripes, its continuous and profuse blooming habit with the flowers carried on a long flower stem, and its vigorous and upright growth habit with abundant foliage.

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7,114

CARNATION NAMED HILSHOW

Jan J. Hilverda, 12 Stommeerweg, Aalsmeer, Netherlands

Filed Feb. 10, 1989, Ser. No. 308,647
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 1 Claim

1. A new and distinct spray carnation variety, substantially as herein shown and described, characterized by its very small, generally pink flowers borne in clusters on a strong stem from a plant of very short height and particularly adaptable to pot plant culture.

7,115

CARNATION NAMED HILBIRD

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda b.v., Aalsmeer, Netherlands

Filed Feb. 10, 1989, Ser. No. 308,752
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 1 Claim

1. The new and distinct spray carnation variety, substantially as herein shown and described, characterized by its relatively small flowers having an overall lavender-lilac coloration, its profuse production of blooms carried on a long flower stem, and its vigorous and upright growth habit with abundant foliage.

PATENTS

GRANTED JAN. 16, 1990

ERRATA

For CLASS	See PATENT NO.
528-208	4,893,443
606-054	4,893,618
606-087	4,893,619
606-127	4,893,621
227-180	4,893,622
544-331	4,894,460
346-076	4,894,712
360-006	4,894,728
174-035	4,894,740
371-022	4,894,800

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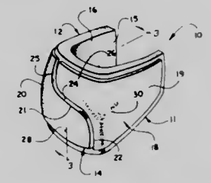
PATENTS

GRANTED JANUARY 16, 1990

GENERAL AND MECHANICAL

4,893,355
KNEE PROTECTOR
William H. Ritter, 3644 Southern Blvd., Birmingham, Ala. 35242

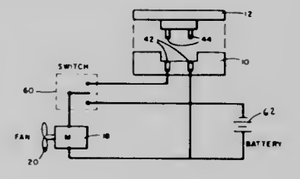
Filed Aug. 8, 1988, Ser. No. 229,273
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—24 5 Claims

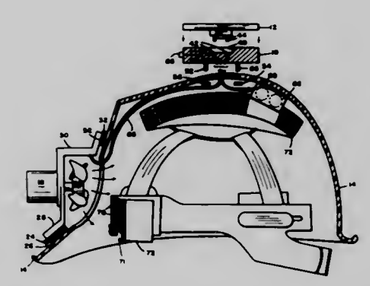


1. A knee protector for shielding a knee against blows, said knee having a kneecap on the front thereof, an inside surface on one side of said knee and an outside surface on the opposite side of said knee, said knee protector comprising padding means consisting of flexible padding material carrying protecting means of generally rigid material, said knee protector further including an inside portion for at least partially covering said inside surface and said knee, and an outside portion generally parallel to said inside portion and spaced therefrom for at least partially covering said outside surface of said knee, and a front portion connecting said inside portion and said outside portion and covering said kneecap, said protecting means defining a line of articulation for providing a first section of said protecting means and a second section of said protecting means, said line of articulation defining on said front portion on upper lobe of said protecting means and a lower lobe of said protecting means, and first section of said protecting means being generally coextensive with said inside portion of said knee protector and integral with one of said lobes of said protecting means, said second section of said protecting means being generally coextensive with said outside portion of said knee protector and integral with the other of said lobes of said protecting means.

4,893,356
AIR CONDITIONED HEADWEAR HAVING CONVERTIBLE POWER MODULE
William A. Waters, 3648 East 49th St., Tulsa, Okla. 74135-3102
Filed Sep. 22, 1987, Ser. No. 99,791
Int. Cl.[4] A42C *5/04*
U.S. Cl. 2—171.3 48 Claims

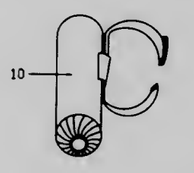
1. Headwear of the type covering at least a portion of a wearer's head and, having means to circulate air upon another portion of said wearer's head said means comprising
an opening through said covering of said headwear.
an electric motor driven air moving means positioned contiguously of said at least one opening,
a first self-contained power means attached to said headwear and connected to said electric motor,
a power module attached to said headwear, said module having means to removably receive an alternate self-contained power source,





switch means to selectively connect or disconnect said first power means or said alternate power source with said electric motor.

4,893,357
REVERSIBLE HAND WARMING MUFF
Keith O. Evans, 12296 W. Bay Sh. Dr., Traverse City, Mich. 49684
Filed Feb. 22, 1988, Ser. No. 158,553
Int. Cl.[4] A41D *13/08, 19/00*
U.S. Cl. 2—208 6 Claims



1. A combination reversible hand warming muff with a belt comprising:
(a) A cylindrical tube having two distal open ends and inner and outer surfaces or layers:
(b) A cylindrical cuffs sewn to each of said open ends of said tube:
(c) A rectangular longitudinal strip, each sewn intermediate to the said open ends, along the inner and outer surfaces, in a lengthwise direction on the said tube, to provide a double open ended belt channel having inner open edges, thru which a reversible muff belt can pass.

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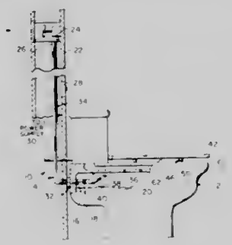
4,893,358
GARMENTS HAVING AN ADJUSTABLE WAIST
Lorin L. Bice, Jr., 3335 Harding St., Long Beach, Calif. 90805
Filed Nov. 14, 1988, Ser. No. 270,781
Int. Cl.[4] A41D *1/06, 1/14*
U.S. Cl. 2—221 2 Claims



1. In a garment having a waist portion, a waist adjustment comprising:
at least one foldable member formed from an excess portion of said waist portion folded back upon itself to form two layers secured each to the other, said excess portion being foldable onto the remainder of said waist portion in contiguous engagement therewith;
means on said foldable member and said remainder of said waist portion for selectively affixing one to the other at different relative positions, the relative positions of affixing determining the adjusted size of said garment waist portion, said affixing means comprising a pair of complementary hook and loop fastening elements, a first of said pair of fastening elements being secured to said foldable member and a second of said pair of said fastening elements being secured to said waist portion, said second element having a greater length dimension than said first element, whereby said relative positions of said first and second elements may be selectively affixed at any one of a plurality of non-discrete locations along said length dimension of said second element; and,
means for coupling said first fastening element to said foldable member, said coupling means securing said two layers of said foldable member each to the other while simultaneously securing said first fastening element thereto.

4,893,359
VENTED TOILET BOWL
Phuc N. Vu, 4451 Janssen Dr., Memphis, Tenn. 38128, and George Spector, 233 Broadway, Rm 3815, New York, N.Y. 10007
Filed Feb. 17, 1989, Ser. No. 311,742
Int. Cl.[4] E03D *9/05*
U.S. Cl. 4—216 7 Claims

1. An odor eliminator system for a toilet bowl which comprises:
an elongated conduit extending through an aperture in a rear portion of the toilet bowl above the bowl water and upwardly into a bathroom wall;
an exhaust fan built into the bathroom wall and connected to a distant end of said conduit;
a switch electrically connected between said exhaust fan and a power supply to that when said switch is closed said exhaust fan will be activated for drawing gaseous odors away from the toilet bowl and out into the ambient atmosphere;
wherein said elongated conduit includes:
a fitting disposed into the aperture in the rear portion of the toilet bowl;
a pipe extending from one side of said fitting to said exhaust fan;
an outlet port member extending from the opposite side of said fitting into said toilet bowl, said outlet port member curving upwardly at a free end thereof and having a drain hole therein; and



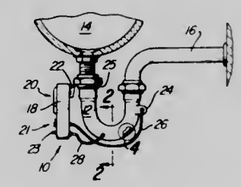
a normally closed one way check valve built into said outlet port member to generally prevent some of the agitated water within the toilet bowl from entering said pipe, whereby said check valve will only open when said exhaust fan is activated.

4,893,360
APPARATUS FOR POSITIONING A SEAT ON THE RIM OF A TOILET BOWL
Barry Wofford, 1102 Parkside Blvd., Toledo, Ohio 43607
Filed Jan. 30, 1989, Ser. No. 303,759
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—237 11 Claims



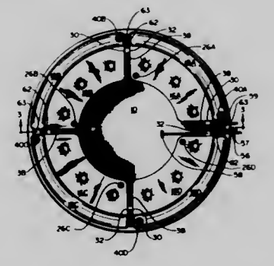
1. For use with a toilet having a bowl defining a rim having an upper surface, and a seat pivotably attached to the bowl, the seat having a lower surface and being movable to a lowered position wherein the lower surface of the seat rests upon the upper surface of the rim, an apparatus for positioning the seat relative to the rim comprising:
a first positioning member;
means for attaching said first positioning member to the upper surface of the rim;
a second positioning member; and
means for attaching said second positioning member to the lower surface of the seat, said first and second positioning members being aligned such that they are cooperable when the seat is in the lowered position so as to prevent lateral movement of the seat relative to the rim.

4,893,361
DRAIN TRAP ULTRASONIC VIBRATION CLEANING APPARATUS
Paul H. Burns, 394 W. Webster, Ferndale, Mich. 48220
Filed Dec. 22, 1987, Ser. No. 136,386
Int. Cl.[4] E03C *1/30*
U.S. Cl. 4—255 13 Claims



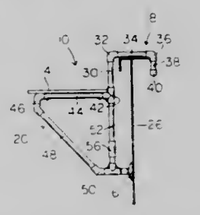
1. A drain trap cleaning apparatus comprising:
a drain trap body interconnectable with a plumbing system;
one or more transducers fitted within said drain trap body;
said transducers being configured and situated to minimally interfere with the flowthrough of material through said drain trap body;
a flow sensor fixed to said drain trap body;
an electrical signal generator including actuating means selectively operable when said system is in use and electrically interconnected with said transducers and said flow sensor so that said sensor is capable of signalling said electrical signal generator in response to a low fluid flow rate through said system when in use to send electrical signals to said transducers; and
said transducers being capable of producing vibrations.

4,893,362
PORTABLE SPA
Pierce M. Murphy, N 1189 Continental La., LaCross, Wis. 54601
Filed Apr. 1, 1988, Ser. No. 176,646
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—493 19 Claims



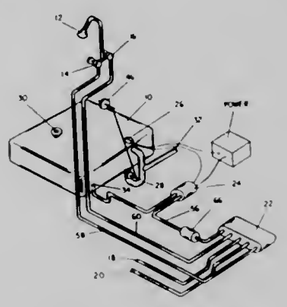
2. A fluid containing portable spa comprising
(a) a vertically, circumferentially rigid, upstanding side wall having an open cylindrical configuration;
(b) a flexible liner disposed over and within said side wall and including a plurality of inflatable seat chambers disposed on the bottom of said liner and a plurality of inflatable backrest chambers disposed peripherally around the upper interior thereof, each of said seat and backrest chambers having selectively operable access valve
means disposed on upper and lower portions, thereof and each of said seat chambers having interconnecting selectively operable valve means disposed adjacent the side portions thereof.

4,893,363
HANGING WALL TABLE FOR SWIMMING POOLS
Harold E. Huff, 7 Edwards La., Belleville, Ill. 62223
Filed Sep. 21, 1988, Ser. No. 247,174
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—496 4 Claims



1. A hanging table for support upon a side wall of an above the ground swimming pool which comprises a tubular frame consisting of at least two hanging J-shaped support members adapted to fit over a top of the pool side wall, at least two triangular support bases coplanar with and oriented below said hanging support members, a vertical leg member forming a vertical leg of said triangular base and extending therefrom to form a vertical leg portion of said J-shaped support member in each of said triangular bases and support members, a horizontally extending brace member being fixed to a bottom portion of each of said triangular bases to connect said bases together in rigid relationship, a table shelf which is secured upon top edges of said triangular support bases, and suction cups attached to said triangular bases to engage the side wall from which said frame is supported, and said frame being comprised of polyvinyl chloride tubing and fittings which may be easily assembled from a kit.

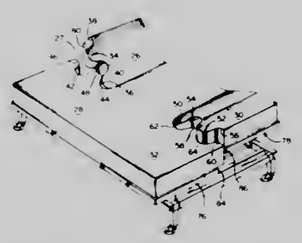
4,893,364
WATER-RECYCLING SHOWER
Francis R. Keeler, 505 Great Plain Ave., Needham, Mass. 02192
Filed May 23, 1988, Ser. No. 197,586
Int. Cl.[4] A47K *4/00*
U.S. Cl. 4—597 3 Claims



1. A shower of the type providing hot and cold water inlets receiving water from hot and cold fresh water sources to a shower head disposed within a shower area having a floor upon which the user stands, said floor having a water shower drain therein, comprising:
a water storage tank disposed to receive water from said water shower drain;

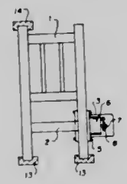
a tank drain defined in said water storage tank;
a recycle water outlet defined at the bottom of said water storage tank;
a recycle water pipe having a first and second end, said first end connected to said recycle water outlet;
means to sense when said water storage tank contains a predetermined amount of water therein;
a pump positioned in line on said recycle water pipe;
means to activate said pump, said means controlled by said means to sense a predetermined amount of water in said water storage tank; and
means to direct water flow to said hot and cold water inlets of said shower, said means including means to receive water from said water storage tank pumped through said second end of said recycle water pipe and to direct such water to said hot and cold water inlets of said shower head while at the same time ceasing flow of hot and cold water from said fresh water sources, said means to direct water flow controlled by water pressure from said recycle water pipe such that in a first mode when no water pressure is in said water recycle pipe, fresh water reaches said shower head and in a second mode when pressure is present in said water recycle pipe, said pressure causes said means to direct water flow to enter a second mode and cease the flow of fresh hot and cold water from its fresh water sources and to then direct the water from said water storage tank to said hot and cold water inlets of said shower head.

4,893,365
ADJUSTABLE KING-SIZED MATTRESS
Donald R. Justice, P.O. Box 458, Matlacha, Fla. 33909
Filed May 22, 1989, Ser. No. 354,769
Int. Cl.[4] A61G 7/00
U.S. Cl. 5—68 **7 Claims**



5. A bed comprising:
a bed frame,
a mattress located on said bed frame, said mattress including a head end, a foot end and a central portion located between said head end and said foot end, said head end including a centrally-located head end separation for dividing said head end into two head portions, said head end separation extending from said head end towards said foot end and terminating at said central portion, said separation extending in a serpentine pattern to form a series of complementary-shaped crests and valleys on said two head portions,
said foot end including a centrally-located foot end separation for dividing said foot end into two foot portions, said foot end separation extending from said foot end towards said head end and terminating at said central portion, said separation extending in a serpentine pattern to form a series of complementary-shaped crests and valleys on said two foot portions.

4,893,366
CRIB WITH VIBRATION ATTENUATING MEANS
Karl G. Rosén, Karantänsgatan 13, S 442 35 Kungälv, Sweden
Continuation-in-part of Ser. No. 889,933, Jul. 17, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 162,693
Claims priority, application Sweden, Dec. 10, 1984, 8406250
Int. Cl.[4] A47D 9/02
U.S. Cl. 5—109 **3 Claims**



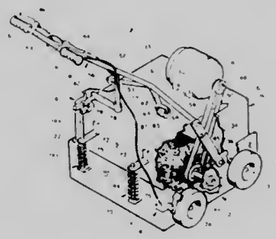
1. A crib comprising a plurality of generally vertical corner posts, a vibrating device attached to said crib comprising a housing and a motor having an eccentric weight mounted on a shaft driven by said motor so as to produce vibrations upon actuation of said motor, the frequency of said vibrations being within the range 800–2000 vibrations per minute, sound generating means attached to said crib, said sound generating means including volume and frequency control means, and vibration attenuating means located at the lower ends of said posts and at the upper ends of at least some of the posts, whereby the transmission of vibrations to the floor supporting the posts and the walls contacting the posts, will be attenuated.

4,893,367
SYSTEM OF SEPARATELY ADJUSTABLE PILLOWS
Bent Heimreid, Ovre Maihaugen 4B, N-3700 Skien, and Finn Risung, Borgekroken 31, 3900 Porsgrunn, both of Norway
Filed Jan. 17, 1989, Ser. No. 297,427
Claims priority, application Norway, Jan. 18, 1988, 880185
Int. Cl.[4] A47C 27/10
U.S. Cl. 5—431 **1 Claim**



1. A system of separately adjustable pillows, comprising:
a plurality of inflatable pillows, each of which is subject to being moved about in relation to a person's body substantially independently of all others of said pillows;
each pillow being subject to being inflated with a fluid to a desired extent, having, when less inflated, a smaller volume and a softer feel and having, when more inflated, a larger volume and a harder feel; and
a means for inflating each pillow, comprising:
a manifold for receiving a supply of pressurized fluid;
a valve for each pillow, said valves being operatively connected with the manifold for receiving pressurized fluid therefrom; and
an inflation tube connecting each valve with a respective pillow, for selectively supplying said pillows with pressurized fluid under control of said valves, at least some of the inflation tubes being of a sufficient length to permit the positioning of pillows in supporting relation to a person's head and feet.

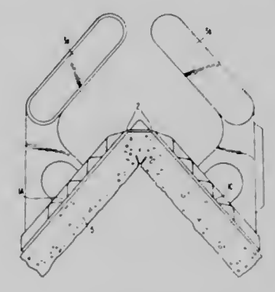
4,893,368
DRIVEWAY SCRUBBER
Justin Ward, 895 Alveda Ave., El Cajon, Calif. 92019
Filed Nov. 18, 1988, Ser. No. 272,917
Int. Cl.[4] E01H 1/05
U.S. Cl. 15—79 A **7 Claims**



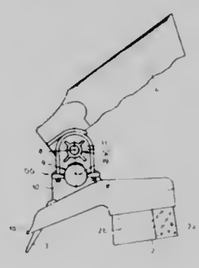
1. A power driven driveway scrubbing apparatus comprising:
an outer base housing having a rear wall with laterally spaced side structural members extending forwardly from its opposite ends, a front axle extending laterally through and extending outwardly from each of said respective side walls, front wheels mounted on opposite ends of said front axle, a pair of rear wheels each of which is mounted on its own separate axle that extends outwardly from said respective side structural members;
an inner base housing having a top wall, a front wall, a rear wall, and laterally spaced side walls, said inner base housing being physically located within said outer base housing, said front axle being journaled in apertures in the respective side walls of said inner base housing so that the inner base housing may be pivoted about said front axle;
a cylindrically shaped brush located within said inner base housing and being mounted on a first shaft member having its opposite ends secured to the respective lateral side walls of said inner base housing;
a motor and means for transmitting rotational motion therefrom to said brush means;
a push handle assembly having means pivotally attaching its lower end to said outer base housing;
means to bias the inner base housing vertically with respect to said outer base housing; and
means connected to said push handle assembly for rotating the rear end of said inner base housing downwardly about said front axle thereby causing said cylindrically shaped brush to be forced into scrubbing contact with the surface upon which said scrubbing apparatus is traveling over.

4,893,369
HAND-HELD UTENSIL FOR SURFACE CLEANING, MOPPING AND THE LIKE
Bryan Johnson, Beauvais, France, assignor to Spontex Incorporated, New Rochelle, N.Y.
Filed May 20, 1988, Ser. No. 196,266
Int. Cl.[4] A47L 13/12
U.S. Cl. 15—119 A **19 Claims**

1. A hand-held utensil for surface cleaning, mopping and the like, comprising a pad of surface-treatment material, and a holder for the pad, the holder comprising parts which are movable relative to one another from a first working position in which the pad is used in normal use of the utensil to a second position in which the parts squeeze the pad, the holder parts having respective handles adapted to be directly gripped by the user and to enable the user to move the parts from the first working position to the second position, and wherein the handles, in the first working position of the holder parts, cooperate to form a handle arrangement extending along the holder which serves as a grip to enable the user to hold the utensil.



4,893,370
HAND TOOL FOR CLEANING SMOOTH SURFACES, IN PARTICULAR PANES OF GLASS
Manfred Klotz, Friedrich-List-Str. 25, 4790 Paderborn, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 60,570, Oct. 3, 1987. This application Jan. 7, 1988, Ser. No. 203,191
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 8627272; Jul. 16, 1987, 8709764
Int. Cl.[4] A47L 13/14
U.S. Cl. 15—121 **26 Claims**



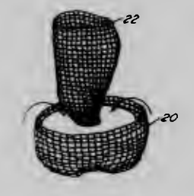
1. A hand tool for cleaning smooth surfaces, in particular panes of glass, comprising a flat-box-shaped holder; receiving a sponge block received in said holder; a squeegee spaced apart from said sponge block and parallel to it; a handle being disposed on said holder in a manner swivelable in terms of inclination and laterally about a vertical lateral swivel axis, and an inclination-adjusting axis extending parallel to said holder; two joints (SG, DG) disposed one above the other; and a common locking and unlocking element for locking both of said joints in a particular handle position including a slide provided to be displaceable parallel to the inclination-adjusting axis and swivelable with the lateral swivel axis is located between the two axes disposed spaced apart one above the other.

4,893,371
SCOURING PAD
Hans J. Hartmann, P.O. Box 2026, Woonsocket, R.I. 02895
Filed Jul. 25, 1988, Ser. No. 223,405
Int. Cl.[4] A47L 13/07
U.S. Cl. 15—209 B **3 Claims**

1. A scouring pad comprising a porous, resilient toroidal

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core having a central opening, a tubular knitted metallic ribbon mesh located in the central opening with its ends folded back



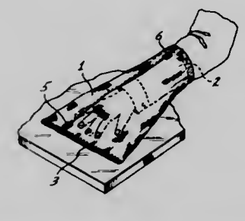
over the core to form two plies over the core and with the last folded and tucked into the opening at the opposite side of the core.

4,893,372

FREE-HAND TOWEL

Ronald E. Wenzel, Seattle, Wash., assignor to Myron H. Berg, Seattle, Wash., a part interest

Filed Sep. 16, 1988, Ser. No. 246,120
Int. Cl.[4] A47L *13/18*
U.S. Cl. 15—227 **2 Claims**



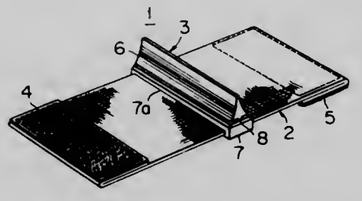
1. A free-hand tubular towel comprising a tubular body flaring from an upper constricted end portion toward a lower enlarged wiping end portion, an elastic band carried by the upper end portion of said tubular body for encircling and gripping the arm of a wearer above or slightly below the elbow with the lower enlarged wiping end portion of said tubular body dangling loosely over the hand, one component of a hook-and-pile fastener being carried by the upper end portion of said tubular body and a second component of a hook-and-pile fastener being carried by the lower end portion of said tubular body at locations adapted for fastening engagement of the two fastener components when the lower end portion of said tubular body is reverse-folded over the upper end portion of said tubular body.

4,893,373

MANUAL WIPER

Makoto Kato, Tokyo, Japan, assignor to Yugen Kaisha Ads. Planning, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,257
Int. Cl.[4] A47L *25/00*
U.S. Cl. 15—245 **3 Claims**



1. A manual wiper comprising:
an elastic base elongated adopted to be detachably wound around a finger; and
a wiper blade provided on said base in such a manner as to traverse the same and whose position is adjustable on said base.

4,893,374

WINDSHIELD WIPER SYSTEM

Herbert Bienert, Besigheim, and Bernd Walther, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,291
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523441
Int. Cl.[4] B60S *1/52*
U.S. Cl. 15—250.04 **16 Claims**

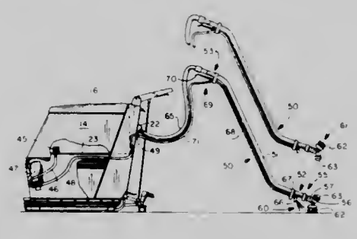
1. A windshield wiper system comprising:
a fastening member for attachment to a wiper arm member, said fastening member being fixed onto a wiper shaft;
a cap swivellably articulated onto said fastening member, said cap having an operating position wherein it covers the connection between said wiper shaft and said fastening member, said cap being pivotable from said operating position;
a washing liquid channel extending within said wiper shaft;
said cap having a bore through which said channel extends, said bore being larger than the outside diameter of said channel in the area of said bore to permit said cap to pass over said channel when said cap is articulated onto said fastening member; and
a nozzle in fluid communication with said liquid channel, said nozzle being disposed on a side of said cap which is opposite said fastening member when said cap is in said operating position.

4,893,375

DUAL MODE FLOOR SCRUBBING MACHINE

Richard L. Girman, Glen Ellyn; Gary E. Palmer, Roselle, and Gust G. Gotsis, Naperville, all of Ill., assignors to Hako Minuteman, Inc., Addison and Restaurant Technology, Inc., Oak Brook, both of, Ill.

Filed Mar. 17, 1989, Ser. No. 325,559
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—321 **5 Claims**



1. Floor scrubbing apparatus for use either as a walk-behind scrubber or as a manually-operated scrubber comprising: a chassis having support wheels; a rotary brush carried by said chassis in a position to scrub a floor; a first motor for driving said rotary brush; first dispensing means for dispensing cleaning solution on said floor to be worked by said rotary brush; vacuum recovery means including a recovery reservoir, vacuum motor means for generating a vacuum in said reservoir, and pick-up means behind said rotary brush for recovering spent solution worked by said rotary brush in cleaning said floor and for delivering said spent solution to said recovery reservoir; and a manually-operated scrub and recovery device adapted for selective connection to said apparatus and comprising a hand-held wand adapted for maneuvering by an operator and including an elongated rigid vacuum tube having one end connectable to said recovery reservoir thereby to draw in air and solution through the other end thereof, second dispensing means for dispensing cleaning solution under pressure on said floor under manual control of said operator at a location adjacent said other end of said rigid vacuum tube, and convertible means coupled to said other end of said rigid vacuum tube for movement between first and second use positions, said convertible means including a second brush and a second vacuum recovery means communicating with said rigid vacuum tube, whereby said operator may use said apparatus without said scrub and recovery device as a walk behind floor scrubbing machine or said operator may attach said scrub and recovery device to said apparatus, dispense cleaning solution under pressure on the floor adjacent said convertible means and use said second brush in said first use position to work said solution onto said floor and then move said second vacuum recovery means to recover the spent solution and store the same in said recovery reservoir.

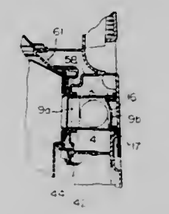
4,893,376

UPRIGHT-TYPE ELECTRIC VACUUM CLEANER

Masao Sunagawa; Kazuhiro Kubota; Yoshitaro Ishii, all of Hitachi, and Susumu Satoh, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 908,670, Sep. 17, 1986. This application Dec. 21, 1988, Ser. No. 287,274
Claims priority, application Japan, Sep. 20, 1985, 60-209731; Oct. 4, 1985, 60-220125; Nov. 19, 1985, 60-259347; Nov. 29, 1985, 60-267149; Dec. 13, 1985, 60-278984; Dec. 13, 1985, 60-278986; Jan. 8, 1986, 61-624; Mar. 7, 1986, 61-48345; Mar. 7, 1986, 61-48352; Mar. 7, 1986, 61-48353; Apr. 4, 1986, 61-76568
Int. Cl.[4] A47L *5/32*
U.S. Cl. 15—337 **2 Claims**

1. An upright-type electric vacuum cleaner comprising a main body case having an electrically operated blower chamber, a main body duct, a bag compartment, and a dust filter accommodated in said bag compartment; a suction port body accommodating an electrically driven rotary brush and tiltably supporting said main body case; a T-shaped tubular member for interconnecting an outlet of said main body duct and an inlet opening of said dust filter, said T-shaped tubular member means having an opening for receiving an optional hose arranged to be open in a direction of a rear surface of said main body case; and an operable cover means for closing said opening, said operable cover means having a curved inside surface configured so as to make dust jump therealong towards said dust filter.

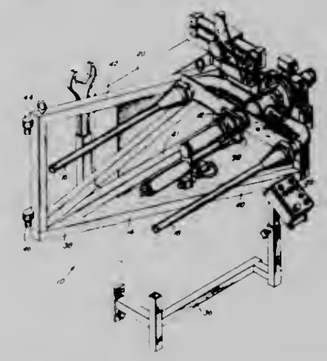


4,893,377

STUFFING HORN TURRET MACHINE

Alfred J. Evans; Raymond H. Misner, both of Raleigh; James A. Gallion, Cary, and Melvin L. Harrod, Raleigh, all of N.C., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Continuation of Ser. No. 144,589, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 947,628, Dec. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 821,691, Jan. 23, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 285,325
Int. Cl.[4] A22C *11/02*
U.S. Cl. 17—35 **7 Claims**



1. A turret machine for stuffing horns, the stuffing horns adapted to receive casings having ends, the machine comprising:
a frame structure;
a turret adapted to have mounted thereon at least two of the stuffing horns, the turret being rotatably mounted on the frame structure;
drive means for rotating the turret and thereby the stuffing horns through at least one active rotational position and at least one standby rotational position;
a limit means on the turret assembly for sensing movement

of the ends of a casing on a first of the stuffing horns while the first stuffing horn is in active rotational position;

control means on the machine for causing the drive means to rotate the first stuffing horn away from the active rotational position after the limit means senses movement of the end of the casing on the first stuffing horn and simultaneously causing the drive means to rotate the second stuffing horn to the active rotational position after the limit means senses movement of the end of the casing on the first stuffing horn; and

sensing means for sensing the proper presence or absence of a casing on the second stuffing horn while the second stuffing horn is in the standby rotational position, the control means further being means for causing the drive means to rotate the second stuffing horn to the active rotational position only if the sensing means senses that a casing is properly present on the second stuffing horn.

4,893,378

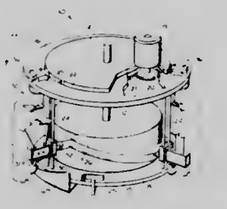
REVOVING POULTRY THIGH DEBONER

Jacobus E. Hazenbroek, and Bastiaan Verrijp, both of Numansdorp, Netherlands, assignors to Systemate Holland B.V., Netherlands

Filed Oct. 31, 1988, Ser. No. 264,890

Int. Cl.[4] A22C *25/16*

U.S. Cl. 17—46 **16 Claims**



1. A method of deboning poultry thighs or the like comprising the steps of:

grasping a thigh bone at a first knuckle,

engaging the thigh adjacent the first knuckle with meat stripper means,

moving the thigh bone and the meat stripper means with respect to each other along the length of the thigh bone until the meat stripper means passes over the other knuckle of the thigh bone and separates the meat from the bone, and

as the thigh bone moves with respect to the meat stripper means, rotating the thigh bone about its length with respect to the stripper means.

4,893,379

TOW STEAMING APPARATUS WITH ADJUSTABLE STEAM CHANNEL CROSS SECTION

Konrad Gilhaus, Bielefeld, Fed. Rep. of Germany, assignor to Spinnereimaschinenfabrik Seydel & Co. GmbH, Bielefeld, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,972

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716690

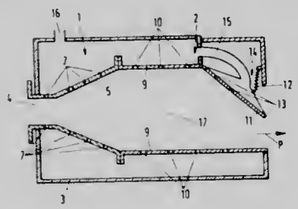
Int. Cl.[4] D01B *9/00*

U.S. Cl. 19—66 T **17 Claims**

1. An apparatus for continuously steaming filament tows or fiber slivers following a stretch-break converting machine, with said apparatus comprising:

a steam channel for receiving saturated steam for steaming filament tows or fiber slivers in said steam channel to release and eliminate shrinkage from said tows or slivers that encounter pressure of movement thereof through the steam channel; and

means for adjusting counterpressure against said filament tows or fiber slivers encountering pressure of movement in said steam channel, said steam channel having an inflow end where filament tows or fiber slivers enter said steam



channel, and an outflow end where said tows or slivers exit said steam channel, with said means for adjusting counterpressure being a flap that is pivotably connected near said outflow end of said steam channel, whereby said flap is adapted to vary the cross-sectional area of said steam channel.

4,893,380

CARD CLOTHING FOR FLATS OF A CARDING MACHINE

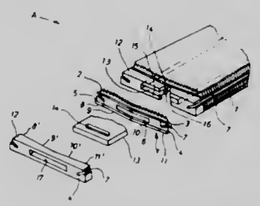
Ralph A. Graf, Freienbach, Switzerland, assignor to Gtsg & Cir. AG, Rapperswil, Switzerland

Filed Mar. 28, 1988, Ser. No. 174,099

Claims priority, application European Pat. Off., Dec. 27, 1987, 87119240.7

Int. Cl.[4] D01G *15/24*

U.S. Cl. 19—114 **4 Claims**



1. A card clothing for flats of a carding machine, said card clothing includes a plurality of mutually abutting saw tooth wire strips, each saw tooth wire strip comprising at least two angularly bent wire strip sections that extend inclined relative to the direction of fibre flow and at least one wire strip section that extends parallel relative to the direction of the fibre flow, and in which the saw tooth wire strips are clampingly supported on an elongated carrier member in a lateral mutually prestressed manner.

4,893,381

BUNDLING STRAP WITH TWO ADJUSTABLE CLOSURES

Erie H. Frankel, 509 N. Genoa Ave., Lubbock, Tex. 79416-3331

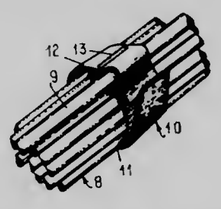
Filed Mar. 9, 1988, Ser. No. 165,974

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 R **3 Claims**

1. A bundling strap which comprises two elongated tape segments aligned generally parallel to each other and means including partially overlapping peel-resistant faces for releasably attaching the tape segments to each other, the two tape

segments being permanently fastened together along a transverse joint, each tape segment having one and only one side thereof covered with a single peel-resistant face, said single peel-resistant face occupying the entire side of the tape segment; the single peel-resistant face of the first tape segment being directed toward the single peel-resistant face of the second tape segment at the transverse joint; the transverse joint being disposed at a first end of the first tape segment and at points between the ends of the second tape segment, the second end of the first tape segment extending longitudinally past a transverse edge disposed at one end of the second tape segment when both tape segments are fully extended longitudinally;



a portion of the peel-resistant face of the first tape segment proximate the transverse joint and a portion of the peel-resistant face of the second tape segment situated between the transverse joint and said transverse edge being adapted to form a first closure; and

a portion of the peel-resistant face on the second end of the first tape segment and a portion of the peel-resistant face of the second tape segment situated between the transverse joint and the end of the second tape segment distal said transverse edge being adapted to form a second closure, so that two closures can be formed simultaneously between portions of the peel-resistant faces.

4,893,382

ARRANGEMENT FOR A FASTENER FOR A STRAINING DEVICE

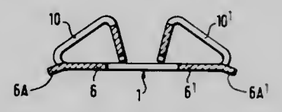
Lennart Lindblad, Hedasgatan 16, S-447 00 Vargarda, Sweden

Continuation of Ser. No. 88,130, Jul. 23, 1987, abandoned. This application May 4, 1989, Ser. No. 351,329

Claims priority, application Sweden, Nov. 27, 1985, 8505607

Int. Cl.[4] A44B *11/00*

U.S. Cl. 24—200 **4 Claims**



1. A releasable buckle for connecting a pair of straining devices together, comprising a flat metallic plate consisting of a pair of spaced side members interconnected by a pair of parallel clamping stop bars, each of said clamping stop bars having a pair of spaced uprights extending outwardly and joined together by a direction-changing bar, said uprights extending slightly beyond said direction-changing bar to define a pair of stop supports, said spaced side members and said clamping stop bars defining therebetween a space for passage of said pair of straining devices, each of said pair of uprights, said direction-changing bar and said clamping stop bar defining a cavity for passage of a respective straining device therethrough wherein a side of each clamping stop bar facing the cavity is provided with a tongue set outwardly out of said plate in a direction opposite to the adjacent respective pair of uprights, each pair of said uprights being bent outwardly of said plate and over its respective said clamping stop bar, said respective direction-changing bar being bent downwardly from its respective said pair of uprights toward said side members to position said respective stop supports on said side members.

4,893,383

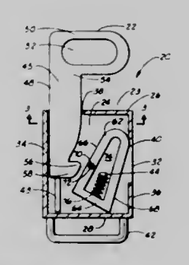
HALTER BUCKLE

Charles C. Quickel, Rte. 1, Box 106C, Sallisaw, Okla. 74955

Continuation-in-part of Ser. No. 181,548, Jul. 27, 1988. This application Feb. 3, 1989, Ser. No. 305,568

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—647 **11 Claims**



1. A buckle comprising:

a first coupler;

a second coupler, having a cavity therein sized for receiving the first coupler;

a latch for selectively retaining the first coupler within the second coupler, wherein the latch is piv cootally secured to the second

a latch for selectively retaining the first coupler within the second coupler, wherein the latch is pivotally secured to the second coupler for movement between a locking position and an unlocking position;

means for biasing the latch into the locking position;

and means for enclosing the means for biasing within the latch, wherein the means for enclosing the means for biasing is characterized by the latch having an opening therein, and wherein the means for biasing the latch is contained within the opening.

4,893,384

SHOE BUCKLE

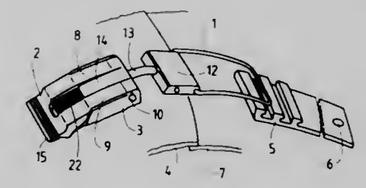
Vancenzo Bidoia, Castelfranco V, and Orelio Mogno, Paese, both of Italy, assignors to Lange International S.A., Switzerland

Filed Feb. 15, 1989, Ser. No. 311,464

Claims priority, application Switzerland, Mar. 31, 1988, 12358/85

Int. Cl.[4] A43C *11/00*

U.S. Cl. 24—68 SK **4 Claims**



1. A shoe buckle comprising a base (3) intended to be fixed onto a shoe part, a tensioning lever (2) with two arms hinged on this base by the ends of its arms, a first hooking member (1) intended to be hooked onto a second hooking member (5) fixed to another part of the shoe, connecting means with an adjust-

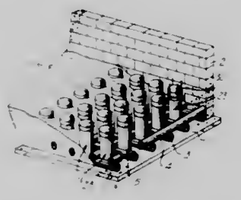
able length between the first hooking means (12) provided with a rod (13) having a threaded part by means of which the rod (13) is integral with a tensioning lever attachment element (14), wherein the attachment element (14) consists of a retaining piece hinged on the tensioning lever (2) by a pin (30) and having a cylindrical longitudinal hole (21) having a smooth inner surface which passes through the attachment element (14) from end to end and through which the said rod (13) passes and of a rotating adjustment button (22) provided with a tapped hole into which the said threaded part of the rod is screwed, this button bearing against the end of the attachment element opposite to the first hooking means, and wherein the assembly formed by the threaded rod (13) and the adjustment button (22) is axially locked inside the attachment element (14) by said pin (30) the surface of said pin creating means for engaging the rod (13) and locking the rod in place within the attachment element (14).

4,893,385

MEMORIAL VAULT APPARATUS

Truman F. Schrag, 2460B Hamlet La., Colorado Springs, Colo. 80918

Filed Jan. 23, 1989, Ser. No. 300,306
Int. Cl.[4] A61G *17/00*; E04H *13/00*
U.S. Cl. 27—35 **6 Claims**



1. A memorial vault apparatus for human cremated remains comprising:

burial vaults;

a concrete slab having a top level surface;

a first set of elongated parallel cylindrical pipes supported on said top level surface, each adjacent pair of pipes being equidistantly spaced from each other and each pipe of the first set having a top and a longitudinal axis;

a second set of elongated parallel cylindrical pipes, each adjacent pair of pipes in said second set being equidistantly spaced from each other, each of the pipes of the second set of pipes being perpendicular to each of the pipes of the first set of pipes and each of the pipes of the second set having a bottom and a longitudinal axis, means for connecting each of the pipes of the second set of pipes to each of the pipes of the first set of pipes, for forming a grid work among said first and second set of pipes for forming spaces to receive said burial vaults, each of said connecting means comprising a saddle means having a first semi-cylindrical surface thereon in abutment with the top of one of the first set of pipes, said first semi-cylindrical surface being formed about an axis parallel to the longitudinal axis of the pipe of said first set of pipes on which it abuts and a second semi-cylindrical surface thereon in abutment with the bottom of one of the second set of pipes, said second semi-cylindrical surface being formed about an axis parallel to the longitudinal axis of the pipe of said second set of pipes which it abuts the bottom thereof, each of said saddle means being adhesively cemented to the pipes which each saddle means abuts;

cylindrical vaults being disposed in said spaces formed in said grid work, a sealed bottom on each vault being in abutment with the top of said level surface, each of said vaults also having a tightly fitting cylindrical cap on the top thereof; and

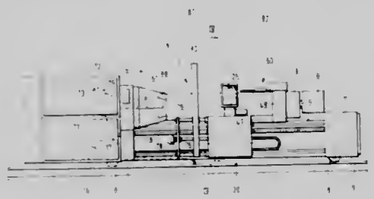
an aggregate material such as sand or gravel covering all of the concrete slab, grid work and vaults.

4,893,386

APPARATUS FOR THE PRODUCTION OF PATTERN WARPS ETC. ON A CONE WARPING MACHINE

Wilhelm Thier, Billerbeck; Josef Lenzen, Duelman; Erich Uckelmann, deceased, late of Ahaus-Wessum (by Renate Uckelmann, heiress), and Herbert Wisniewski, Coesfeld-Lette, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelman, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 252,295
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733692
Int. Cl.[4] D02H *3/00, 5/00, 7/00*
U.S. Cl. 28—191 **21 Claims**



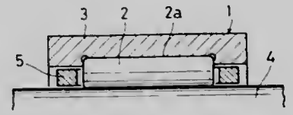
1. Apparatus for producing pattern warps on a cone warping machine of the type comprising a drum having a cone portion, a support means for receiving a heddle frame, a warping reed, lease rods disposed in slots of the cone portion of the drum, displacement means for displacing the lease rods along the drum axis, driving means for rotating the drum and for moving said support means along the drum axis, and a control means for controlling said drive means to provide for the intermittent rotation of the drum and for the displacement of the support means in a predetermined relation; characterized in that said displacement means for displacing said lease rods includes a tong-type gripper having a pair of tong legs for engaging said lease rod.

4,893,387

ROLLER ELEMENTS FOR ROLLER BEARING

Yoshinobu Akamatsu, Kuwana; Morikatu Kotani, Iwata; Toshihide Goto, Morimachi; Kenji Hibi, Gifu, and Toshihiko Matsushima, Iwata, all of Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Feb. 27, 1989, Ser. No. 315,876
Claims priority, application Japan, May 30, 1988, 63-133794; Sep. 20, 1988, 63-235732
Int. Cl.[4] B21B *31/07*
U.S. Cl. 29—121.1 **1 Claim**



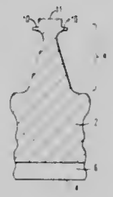
1. A roller element for use in a roller bearing, said roller element having a surface extending in longitudinal and circumferential directions and formed with a multiplicity of minute recesses arranged in random directions on said surface so that the ratio RMS(L)/RMS(C) is not more than 0.8 wherein RMS(L) is the surface roughness mean square value in the longitudinal direction of said surface and RMS(C) is the surface roughness mean square value in the circumferential direction of the surface and so that the SK value is not more than −2.0 in both the longitudinal and circumferential directions of said surface wherein the SK value represents skewness that indicates a distribution curve of surface roughness of said longitudinal and circumferential surface.

4,893,388

METHOD OF MODIFYING TURBINE ROTOR DISCS

Dennis R. Amos, Rock Hill, S.C.; Robert E. Clark, Orlando; Roger W. Heinig, Cocoa Beach, both of Fla., and Stephen R. Reid, Newark, Del., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1988, Ser. No. 281,136
Int. Cl.[4] B21K *3/04*
U.S. Cl. 29—156.8 R **10 Claims**



1. A method for modifying an original blade supporting disc which is integral with a turbine rotor, and which has an original outline, in order to create a modified disc which has an outline different from the original outline and which provides a blade-supporting region of increased size, the original disk having at least one portion which must be removed in order to create the modified disc, comprising:

machining away each said portion of the original disc;

building up the original disc with weld metal past the eventual outline of the modified disc at all locations where the outline of the original disc, after said machining step, is to be enclosed by the outline of said modified disc; and

machining away parts of the weld metal to the outline of the modified disc.

4,893,389

REINSTATEMENT OF LATERAL BRANCH CONNECTIONS IN RELINED SEWERS OR PIPES

Peter Allen, and Sydney Molyneux, both of P.O. Box 226, Brisbane Markets, QLD, 4106, Australia

PCT No. PCT/AU87/00081, § 371 Date Sep. 30, 1988, § 102(e) Date Sep. 30, 1988, PCT Pub. No. WO87/05984, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 25, 1987, Ser. No. 272,803
Claims priority, application Australia, Mar. 25, 1986, PH5195
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157 T **5 Claims**

1. A method for the reinstatement of lateral branch connections in relined sewers or pipes including the steps of:

sealing the connection of the lateral branch to the sewer or pipe before a liner has been grouted in the sewer or pipe;

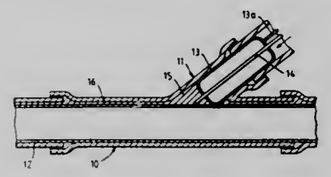
injecting grout into the area at the connection and inwardly of the seal, and into the area between the liner and the pipe;

removing the seal after the liner has been grouted in the sewer or pipe at the connection and the grout has at least initially set;

letting the grout fully set;

cutting out a pilot hole, aligned with the lateral branch, through the grout and the liner in the sewer or pipe with a first cutting tool fed down the lateral branch; and

cutting out the grout and the liner with a second cutting tool, fed towards the lateral branch from the sewer or



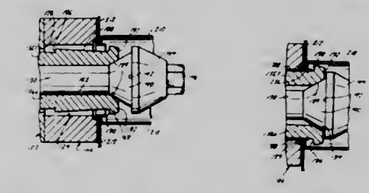
pipe, to open the pilot hole to substantially the diameter of the lateral branch to reinstate the connection.

4,893,390

METHOD AND EXPANDER FOR MANUFACTURING A FURNACE HEAT EXCHANGER AND PLATE ASSEMBLY

Russell W. Hoeffken, Belleville, Ill., assignor to Snyder General Corporation, Red Bud, Ill.

Filed Sep. 1, 1988, Ser. No. 239,348
Int. Cl.[4] B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157.3 R **19 Claims**



13. A method for securing a tubular heat exchanger unit of a furnace to a plate member, comprising the steps of:

providing said heat exchanger unit as a relatively thin walled sheet metal structure defining a chamber for the flow of fluid to be in heat exchange relationship with the walls of said heat exchanger unit, said heat exchanger unit having at least one opening into said chamber through a wall of said heat exchanger unit and defined by a peripheral rim;

providing a plate member including an opening corresponding to said opening in said heat exchanger unit and defined by a perimeter flange projecting from the plane of said plate member;

inserting said flange into said chamber through said opening in said heat exchanger unit; and

bending said flange radially outwardly and axially into engagement with an inner wall surface of said heat exchanger unit at the periphery of said opening and substantially without displacement of said rim to form a substantially rigid leakproof joint between said heat exchanger unit and said plate member;

the step of bending said flange being carried out using a tool including a plurality of at least eight radially expandable and contractable laminar jaw members, said method including the steps of inserting said tool through said opening in said plate member and into said chamber, actuating said jaw members to move radially outward into engagement with portions of said flange, moving said jaw members axially to bend said flange into engagement with said heat exchanger unit, contracting said jaw members radially inwardly, and removing said tool from said opening in said plate member, the number of flange engaging jaw segments being such that a single sequence of said flange engaging jaw segments radially outward with respect to an axis and axially with respect to said axis to bend said flange into engagement with said heat exchanger unit forms a substantially rigid leakproof joint.

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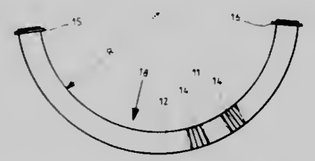
15. An expander comprising:
a body,
an opening through the body,
a mandrel movable axially through the opening,
a plurality of at least eight laminar jaw segments extending axially within the opening and positioned circumferentially about the mandrel,
the body having a crimping area on the body surrounding the opening, the jaw segments having complementary crimping areas,
means on the mandrel for moving the jaws "radially outwardly and thereafter" axially upon movement of the mandrel in an axial direction to move the complementary jaw crimping areas toward the body crimping area for crimping two metal components together in a fluid-tight connection about an opening,
the jaw segments being of sufficient number to minimize the space between adjacent jaw segments upon said radially outward movement of the jaw segments whereby a single operation of the expander produces a fluid-tight seal between the two metal components about the entire perimeter of the opening.

4,893,391

METHOD AND APPARATUS FOR PRODUCING ROUND-ROLLED PARTS FOR HEAT EXCHANGERS

Werner Zobel, Böblingen, and Wolfgang Ostertag, Walddorfhäslach, both of Fed. Rep. of Germany, assignors to Kühlerfabrik Längerer & Reich GMBH & Co. KG, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 207,374
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721257
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.3 R **27 Claims**



1. A method of making a round-rolled part for a heat exchanger comprising a network of spaced-apart tubes and, in between said spaced-apart tubes, a plurality of irradiating elements, said method comprising:
a. connecting said tubes and said irradiating elements to each other to form a rectilinear one of said networks of said spaced-apart tubes, said network having two ends;
b. clamping both of said ends of said rectilinear network to put said rectilinear network under tension; and
c. stretching and bending said clamped rectilinear network of said tubes and said irradiating elements so that said network assumes an arcuate shape.

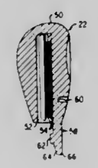
12. An apparatus for producing a round-rolled part for a heat exchanger comprising a network of spaced-apart tubes and, in between said spaced-apart tubes, a plurality of irradiating elements, and two side parts and at least one end plate for said tubes comprising:
a. a locally fixed round bending tool operated by rotation on which said network of said tubes is bent to form said round-rolled part;
b. a clamping means which maintains one end of said network of said tubes substantially tangentially while clamping said network fixed on said round bending tool;
c. a mating holder spaced from said round bending tool provided with a gripping means for the other end of said network of said tubes; and
d. an entraining means which engages between said end plate and said side parts at respective ends of said network of said tubes for both said gripping means and said clamping means.

4,893,392

METHOD OF MANUFACTURING AN IMPROVED KNOB BY INJECTION MOLDING

David K. Stricker, Juneau; John B. Kuhn, Rubicon; Virgil P. Huhmann, Beaver Dam, and William E. Chase, Colgate, all of Wis., assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 3,332, Jan. 13, 1987, Pat. No. 4,783,884.
This application Jul. 27, 1988, Ser. No. 224,628
Int. Cl.[4] B21D *53/38*
U.S. Cl. 29—161 **1 Claim**





1. A method of manufacturing an improved resilient knob by injection molding comprising the steps of:
forming a generally cylindrically shaped knob body having an elongated cavity having a plurality of knife edges formed therein, the cavity extending to and terminating at a terminal exterior surface of the body located approximately at mid-point from top of said body;
forming an elongated extension projecting from the terminal exterior surface of the body; and extending outwardly beyond the terminal exterior surface of the body;
forming a resilient projection on the extension spaced from said exterior surface, extending outwardly from the extension and having a tapered portion formed on a distal end of said extension remote from said cavity;
forming said knife edges for biasing tbe extension in the direction of the projection; and
forming said tapered portion integrally formed near the end of the extension.

4,893,393

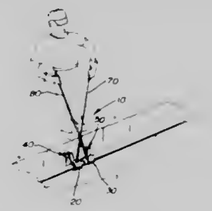
PIPE FITTING ASSEMBLY TOOL

Ben C. Marshall, 31 Walker Ave., Gaithersburg, Md. 20877

Filed Oct. 25, 1988, Ser. No. 261,960
Int. Cl.[4] F16L *35/00*
U.S. Cl. 29—237 **7 Claims**

1. A pipe fitting assembly tool for connecting and disconnecting pipes comprising:
a pair of lever clamping systems including a pair of clamps which encircle and lock the pipes, each of said clamps includes a pair of opposing arcuate half clamps, each of said half clamps pivotally connected by means of a separate straight lever arm secured thereto and extending upwardly and inwardly therefrom and pivotally attached to each other above said clamps in scissors structure which open and close said half clamps said lever arms adjustably joined at the top by a pivotally attached cam lever locking system, each of said clamping systems is pivotally attached to the bottom of long straight separate handle bars extending upwardly therefrom and which are pivotally attached to each other in a scissors structure,

whereby said clamping systems operate locking and unlocking of the pipes in the clamps and said handle bars operate



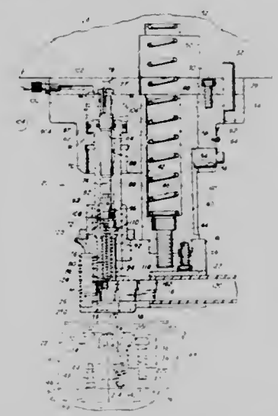
movement of the locked pipes along a single plane to and from each other.

4,893,394

INSTALLATION APPARATUS FOR ATTACHING A FEMALE ELEMENT TO A PANEL

Rodolf R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 111,966, Oct. 21, 1987, Pat. No. 4,831,698, which is a continuation-in-part of Ser. No. 69,804, Aug. 17, 1987, Pat. No. 4,810,143, which is a division of Ser. No. 869,507, Jun. 2, 1986, Pat. No. 4,700,470, which is a division of Ser. No. 657,570, Oct. 4, 1984, Pat. No. 4,610,072, which is a continuation-in-part of Ser. No. 563,833, Oct. 21, 1983, Pat. No. 4,555,838, which is a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, Pat. No. 4,543,701, and a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, said Ser. No. 504,074, is a continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned, said Ser. No. 485,099, is a division of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Nov. 14, 1988, Ser. No. 271,123
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—243.52 **3 Claims**



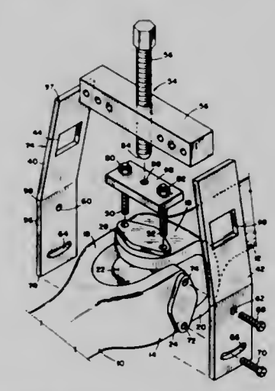
1. A die set for attaching a female element to a plastically deformable panel, said die set including a die assembly, a punch and a driving member, said female element including a body portion having a bore therethrough and an integral annular barrel portion generally concentric with said body portion bore having internal and external surfaces and an open free end, said die assembly including a die member having a concave bowl-shaped die cavity, a panel supporting surface on at least opposed sides of said die cavity and a bore through the center of said die cavity, a die post telescopically extending through said die member bore projecting into said die cavity having a free end and an axial bore extending through said free end, said die post having a radially outwardly extending concave arcuate die surface spaced from said free die post end and said die cavity having a generally concave mating surface, biasing means resiliently biasing said die post into said die cavity to extend said die post free end to near the plane of said die member panel supporting surface and stop means limiting movement of said die post into said die cavity against the force of said biasing means substantially aligning said die post radially outwardly concave arcuate die surface and said mating die cavity surface, said punch having a free end telescopically receivable through said bore and barrel portion of said female element to engage a panel supported on said die member panel supporting surface, said punch free end including an axially extending piercing end having a diameter substantially less than said internal barrel portion surface to pierce a slug from said panel forming a pierced panel opening followed by an enlarged convex arcuate drawing portion which is driven against said panel and through said panel opening, and an annular driving member telescopically received around said punch to engage said fastener element body portion to drive said barrel portion free end through said panel opening into said die cavity and against said mating die surfaces to radially outwardly deform said barrel portion free end into locking engagement with said panel.

4,893,395

U-JOINT PULLER

Glen R. Crowder, Rt. No. 1, Box 41, Wyandotte, Okla. 74370

Filed Sep. 22, 1988, Ser. No. 247,743
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—259 **1 Claim**



1. An apparatus for removing a bearing cup normally held by a pair of bolts from a universal joint of the type having a first yoke member and a second yoke member, and each said yoke having opposed arms, each said arm having a bearing cup mounted therein, comprising:
a Tee-puller having a pusher bolt and a cross bar;
first and second legs, each said leg having a hole toward one end through which said cross bar may extend, each said leg being an elongated flat member having a first upper section and a second bottom section in which said first section is bent inwardly with respect to the second section, and having a pair of first and second vertically spaced bolt holes on said second section, said bolt holes being spaced apart a distance equal to the centerline distance of said pair of bolts holding said bearing cup, at least one of said bolt holes being in the form of an arcuate slot, and means to attach said first and second legs, via said first and second bolt holes, to a pair of said bearing cups of said

first yoke for removal of a bearing cup that is transverse thereto in one of said arms of said second yoke.

4,893,396

METHOD OF SETTING UP APPARATUS FOR HANDLING ELECTRICAL OR ELECTRONIC COMPONENTS

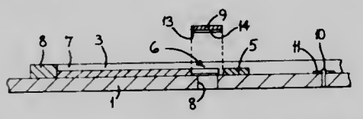
Steven J. H. Ainsworth, and Derek R. Dane, both of Colchester, England, assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Jan. 11, 1989, Ser. No. 295,964

Claims priority, application United Kingdom, Jan. 28, 1988, 8801897

Int. Cl.[4] B23Q *17/00*

U.S. Cl. 29—407 **2 Claims**



1. A method of setting up a component placement machine comprising a substrate supporting X-Y table, a head having a tool displaceable between an up position and a down component pick up/deposit position, the head movable, with the tool at the up position, to locate the tool at pick up, inspection and deposit locations, comprising

removably mounting a test component on the X-Y table at a precise X-Y location,

picking up the removably mounted test component with the tool,

displacing the tool to the up position and moving the head to locate the tool at the inspection station and

inspecting the test electronic component held by the tool at the inspection to determine its X-Y location, and

comparing the actual and theorretical X-Y locations and determining X, Y corrections for such tool as it is displaced between the inspection location and the deposit location.

4,893,397

FIRE-RESISTANT CONTAINER AND METHOD OF ASSEMBLING SAME

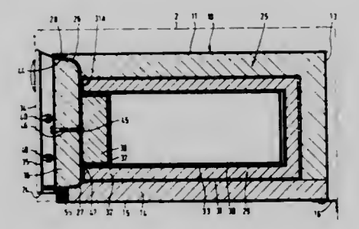
John T. Hughes, Cromwell Crescent, United Kingdom, assignor to Micropore International Limited, Worcestershire, United Kingdom

Filed Nov. 25, 1987, Ser. No. 125,453

Claims priority, application United Kingdom, Nov. 27, 1986, 8628424

Int. Cl.[4] B61O *39/03*

U.S. Cl. 29—428 **4 Claims**



1. A method of assembling a fire-resistant container for magnetic media into a filing cabinet incorporating a casing having a front open face and at least one recess dimensioned to receive a filing drawer of conventional dimensions, which method comprises the steps of:

fitting a base of thermal insulation material securely to the casing of the filing cabinet, the base extending between side walls of the casing and from the region of the open face of the casing towards the rear thereof;

positioning on the base and within the casing a body of thermal insulation material which incorporates a heat absorbing material and securing the body to the base, the body comprising side walls, a rear wall and a top, the side walls and the rear wall engaging with the base so as to define therewith a storage cavity which opens towards the front open face of the casing; and

inserting into the storage cavity a storage drawer having a facing to co-operate with the front open face of the casing, which storage drawer is provided with a body of thermal insulation material which body, in use, co-operates with the body defining the storage cavity so as to close and insulate the storage cavity.

4,893,398

DEVICE FOR AUTOMATIC JOINING AND MACHINING

Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka GmbH, Augsburg, Fed. Rep. of Germany

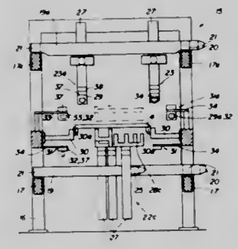
PCT No. PCT/EP86/00073, § 371 Date Oct. 22, 1986, § 102(e) Date Oct. 22, 1986, PCT Pub. No. WO86/04871, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 14, 1986, Ser. No. 925,000

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506314

Int. Cl.[4] B23Q *3/155*; B23K *11/00*; B62D *65/00*

U.S. Cl. 29—568 **22 Claims**



1. A machining station for joining and machining different assemblies, comprising: a single workpiece carrier for each assembly, said single workpiece carrier carrying several components which cooperate to form an assembly;

a machining station frame defining a machining station area;

positioning means for positioning said single workpiece carrier relative to the machining frame in the machining area;

a first tool carrier set positioned at one level, substantially parallel to said workpiece carrier, on one side of each of said workpiece carrier and said positioning means;

a second tool carrier set positioned at another level, substantially parallel to said workpiece carrier, on another side of each of said workpiece carrier and said positioning means, each of said tool carrier sets including at least one tool carrier, each of said tool carriers including tool carrier movement means for moving a tool carrier head end in three separate dimensions;

first tool carrier set mounting and movement means for movably mounting said first tool carrier set with respect to said machining station machine frame and for moving said first tool carrier set relative to said frame in said one level;

second tool carrier set mounting and movement means for movably mounting said second tool carrier set with respect to said machining station machine frame and for moving said first tool carrier set relative to said frame in said another level;

a tool magazine, connected to said machining station machine frame and accessible by said first and second tool carriers to exchange tools, said tool magazine holding a plurality of freely exchangeable tools adapted to be carried by said first and second tool carriers including a tool for gripping assembly components from said workpiece carrier and moving said components to a chucking position, and including a tool for chucking said components and a tool for welding said components.

4,893,399

APPARATUS FOR CHANGING TOOLS OF A NUMERICALLY CONTROLLED MACHINING CENTER

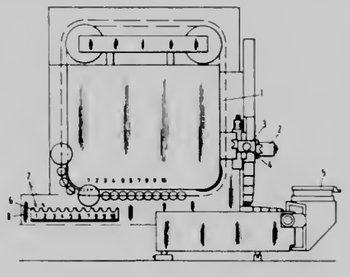
Helmut Hammer, Berlin, Fed. Rep. of Germany, assignor to Werner und Kolb Werkzeugmaschinen GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 186,051

Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714967; May 8, 1987, 3715874

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **26 Claims**



1. An apparatus for changing tools of a numerically controlled machining center having a tool chain magazine which has a straight chain strand, comprising first means having a plurality of tool receptacles which are arranged one behind the other, are immovable relative to one another and have the same spacings as the tool receptacles of the chain magazine, second means having means for accommodating said first means and for moving said first means between a normal position and a first position, third means for transferring one or more tools directly between said first means and said strand in said first position, said first means being loadable and unloadable with regard to the tools in said normal position,

the improvement comprising said first means being a first cassette (6) consisting of a single piece, being movable from said normal position to said first position and back as accommodated on said second means and being slideably separable from said second means, and fourth means slideably accommodating plural cassettes for exchanging said first cassette (6) for another cassette in said normal position.

4,893,400

METHOD OF MAKING A REPAIRABLE TRANSFORMER HAVING AMORPHOUS METAL CORE

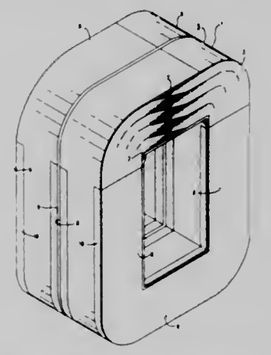
Terrence E. Chenoweth, Watkinsville, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1987, Ser. No. 87,929

Int. Cl.[4] H01F *41/02*

U.S. Cl. 29—606 **8 Claims**

1. In a method of making a transformer having a wound amorphous metal core with a core joint in a cut leg, an improvement that makes said transformer repairable, characterized by completely enclosing said core in materials that prevents the escape of particles of said amorphous metal, where some of said materials, are impregnated with a curable adhesive, and curing said adhesive to bond materials impregnated therewith to said core, while preventing said adhesive from bonding to the edges of said cut leg and to the edges of the radii that adjoin said cut leg.



4,893,401

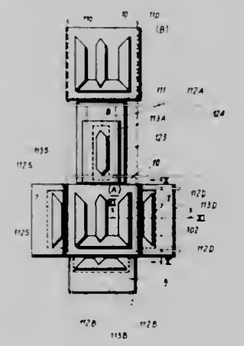
AUTOMATIC TRANSFORMER CORE ASSEMBLY SYSTEM

Ioseph Viani, Pomezia, Italy, assignor to Ansaldo Componenti S.p.A., Genoa, Italy

Filed Oct. 7, 1988, Ser. No. 255,158

Int. Cl.[4] H01F *41/02*

U.S. Cl. 29—738 **8 Claims**



1. A transformer core assembly system for assembly of transformer laminated cores having three parallel legs and two yokes, the system comprising, a movable support frame on which individual transformer laminated cores are formed by stacking of core laminations thereon, the support frame being cyclically movable from a core lamination loading station after completion of a transformer laminated core thereon movable to another station for removal of a completed transformer laminated core thereon and then after removal of the completed transformer laminated core restored to the core lamination loading station, four individual movable platforms each having a stack of respective transformer core laminations thereon cyclically positioned at four individual lamination feed positions circumferentially about the support frame when the

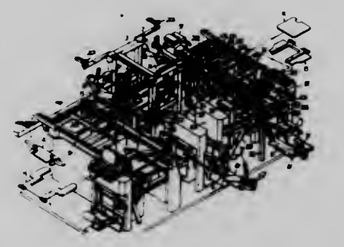
support frame is at said core lamination loading station and each movable independently cyclically from a respective lamination feed position in a selected sequence to an individual lamination loading position for loading of core laminations and when loaded with core laminations restored to the respective lamination feed position, four overhead travelling cranes cyclically operable independently in a selected sequence to said feed positions for feeding core laminations from a respective movable platform in a selected sequence on to the support frame for assemblying a transformer laminated core thereon and operable for loading laminations thereon when the respective platforms are at the respective lamination loading positions, and the four cranes having means for independently lifting and lowering the laminations individually for stacking thereof on the support frame and the corresponding platforms.

4,893,402

SYSTEM FOR ASSEMBLING BOTTOM PARTS FOR VEHICLES

Mitsuaki Hirasaka; Kunio Nokajima, and Nagatoshi Murata, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,082
Claims priority, application Japan, Oct. 8, 1987, 62-198343
Int. Cl.[4] B21B *39/14*
U.S. Cl. 29—771 **14 Claims**



1. A system for assembling bottom parts for vehicles, in which the bottom parts are transported to a position below a vehicle body positioned and fixed and are assembled to said vehicle body, said system comprising:

a pallet member for holding thereon bottom parts and a plurality of threaded parts for fastening said bottom parts to said vehicle body;

a transporter for circulating said pallet member so that said pallet member is stopped below said vehicle body;

a first feeder disposed in a vicinity of said transporter to feed said threaded parts to said pallet member;

a second feeder also disposed in a vicinity of said transporter to feed said bottom parts to said pallet member;

a lifter disposed below said vehicle body to raise and lower said pallet member relative to said vehicle body; and

a turning machine also disposed below said vehicle body for turning said threaded part to fasten said bottom part to said vehicle body when said pallet member is in a raised position.

4,893,403

CHIP ALIGNMENT METHOD

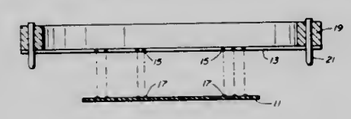
Bruce Heflinger, Los Altos, and Kevin Douglas, San Mateo, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 15, 1988, Ser. No. 181,875
Int. Cl.[4] H05K *3/34*
U.S. Cl. 29—840 **12 Claims**

1. A method of aligning integrated circuit chips on a substrate comprising,

making a chip transfer plate from a stencil mask having holes therein in locations matched to solder bumps on a solder bump substrate where integrated circuit chips of the types having contacts for connection to said solder bumps are to be mounted,

placing said integrated circuit chips in an alignment configuration which is the same as on said solder bump substrate,



picking up said integrated circuit chips using said transfer plate while preserving chip alignment, and

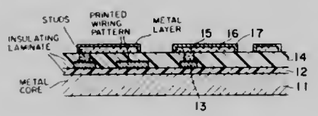
placing chip contacts onto solder bumps on the solder bump substrate and joining said contacts to said bumps.

4,893,404

METHOD FOR PRODUCING A MULTILAYER PRINTED WIRING BOARD

Isao Shirahata, Kanagawa; Shoji Shiga, Tochigi; Hisako Hori, Tokyo, and Takamasa Jinbo, Kanagawa, all of Japan, assignors to Furukawa Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 55,706, May 29, 1987, Pat. No. 4,791,239.
This application Sep. 13, 1988, Ser. No. 244,050
Claims priority, application Japan, May 30, 1986, 61-125118
Int. Cl.[4] H01K *3/10*
U.S. Cl. 29—852 **16 Claims**



1. A method for producing a multilayer printed wiring board comprising the following steps:

(a) forming a first layer of printed wiring pattern by a subtractive process on a metal foil layer of a metal foil-clad insulated metal core comprising a metal foil having at least one surface thereof roughened such that an average value of differences in height between peaks and valleys thereof is at least 1 μm and a metal core to which said metal foil is bonded through a first insulating laminate, with said roughened surface serving as a nonbonding surface;

(b) curing a resin-type conductive paste to form a plurality of through studs for current flow between said first layer of printed wiring pattern and a second layer of printed wiring pattern to be formed next and forming a second insulating laminate for providing insulation spaces of said first layer of printeed wiring pattern and between said first and second layers of printed wiring patterns; and

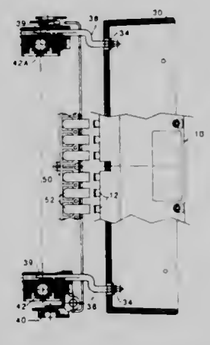
(c) forming said second layer of printed wiring pattern by screen printing a resin-type conductive paste in a desired pattern on the surface of said through studs and said second insulating laminate, curing said conductive paste and applying an electrodeless plating thereto.

4,893,405

METHOD OF CORRECTING CONNECTORS TO LEADS ON PCBS

Roy E. Pennington, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 44,084, Apr. 29, 1987, Pat. No. 4,804,335.
This application Nov. 9, 1988, Ser. No. 269,851
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—857 **1 Claim**



1. A method for interconnecting a bank of electrical connectors with electrical leads on printed circuit cards which are accessible at the opening of a mainframe card cage, wherein said method comprises the steps of:

(a) attaching a frame assembly to said opening of said mainframe card cage, wherein said frame assembly includes (i) a plurality of retractable support members, and (ii) arm means carried by the frame assembly and being adapted to move the support member outwardly from the frame and inwardly toward the frame assembly;

(b) securing a bank of electrical leads in a terminal block comprising (i) a housing having front and rear faces, (ii) a plurality of elongated electrical conductors secured to the electrical connectors and extending rearwardly through the rear face of the housing, and (iii) alignment means carried by the front face of the housing and being adapted to align said bank of electrical connectors with said electrical leads on said printed circuit card;

(c) retaining said terminal block in an interconnect module which is adapted to be attached to said retractable support members of said frame assembly;

(d) attaching said interconnect module to said retractable support members; and

(e) moving said arm means so as to move said support members toward said frame assembly in a manner such that said electrical connectors become coupled to said electrical leads on said printed circuit card.

4,893,406

EXTENSION APPARATUS FOR TOENAIL CLIPPERS

James D. Larson, P.O. Box 972, Vashon, Wash. 98070

Filed Oct. 12, 1988, Ser. No. 256,529
Int. Cl.[4] A45D *29/02*
U.S. Cl. 30—28 **2 Claims**

1. The combination of a conventional nail clipping device having a pair of jaw members mounted for relative reciprocation with respect to one another by virtue of the movement of an actuating lever, and an extension apparatus wherein the extension apparatus consists of:

an extension unit comprising an elongated extension member having the conventional nail clipping device operatively secured on the lower portion of the elongated extension member and disposed in a generally perpendicular fashion to the longitudinal axis of said elongated extension member;

a remote actuating unit comprising an elongated spring loaded cable element which is contained in a flexible sheath element wherein the spring loaded cable element is operatively secured on one end to the actuating lever of said conventional nail clipping device for the purpose of exerting a downwardly directed force thereon; wherein, the other end of said remote actuating unit is operatively connected to the upper portion of the elongated extension member;



a visual inspection member operatively associated with the extension unit wherein the visual inspection member comprises a magnifying glass element which is operatively secured to said elongated extension member above the location of said conventional nail clipping device; and,

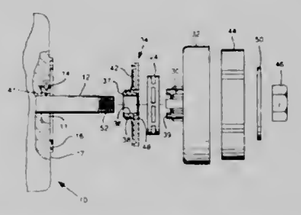
a support member operatively associated with the extension unit wherein the support member comprises a leg brace element which is disposed above the location of both the conventional nail clipping device and the visual inspection member; and, wherein both the leg brace element and the visual inspection member are movably disposed relative to the longitudinal axis of said extension member.

4,893,407

INTEGRAL DUST COVER AND PUMP DRIVE

Ronald D. Lane, Lake Oswego, Oreg., assignor to Blount, Inc., Portland, Oreg.

Filed May 30, 1989, Ser. No. 358,086
Int. Cl.[4] F16N *13/14*
U.S. Cl. 30—123.4 **4 Claims**



1. A chain saw having a housing and a drive shaft protruding from a cavity in the housing, a pump gear for generating a pumping action for a lubricating pump, said pump gear mounted in the cavity of the housing and adjacent the output shaft, and said housing having an annular groove surrounding the cavity;

a centrifugal clutch mounted on the outboard end of the output shaft, a clutch cup surrounding the centrifugal clutch and a hub adapter having a splined exterior pro-

truding from the clutch cup, said adapter surrounding the output shaft and extending inwardly along the drive shaft toward the housing and said adapter having limited axial movement along said output shaft, a sprocket mounted on the splined exterior of the hub adapter,

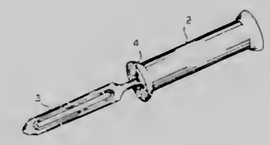
and the improvement which comprises; a combination member having a disc shaped seal portion integral with a hub shaped gear driver portion, said combination member having a center opening that surrounds the output shaft, and slidable interlock means slidably interlocking the member with the end of the adapter of the clutch cup, and the gear drive portion interengaged with the pump gear located in the cavity of the housing, said gear driver portion driving the pump gear in reaction to the clutch cup being driven by the centrifugal clutch, and an annular lip protruded from the disc-shaped seal portion and protruded into the groove of the housing surrounding the cavity.

4,893,408

ENCLOSED PEELING KNIFE AND PRONG HOLDER

Judith B. Mattingly, and Edward J. Mattingly, both of 1107 Memory La., 8B, Santa Ana, Calif. 92706

Filed Jan. 12, 1989, Ser. No. 297,870
Int. Cl.[4] B26B *11/00*
U.S. Cl. 30—123.5 **8 Claims**



4. An interlocking peeling knife and holding prong device comprising:

a first elongated handle having a first front face and further having a peeling knife extending axially outwardly from said first front face;

a second elongated handle having a second front face and further having a plurality of prongs extending axially outwardly from said second front face;

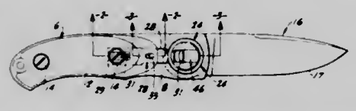
said first handle having a plurality of recesses in said first front face that are distant from said peeling knife for accommodating said plurality of prongs and said second handle having a recess on said second front face that is distant from said prongs for accommodating said peeling knife, whereby said prongs and said peeling knife may be interlocked and protectively recessed in said handles when not in use.

4,893,409

FOLDING PERSONAL KNIFE

Paul W. Poehlmann, 6480 Panoramic Hwy., Stinson Beach, Calif. 94970

Filed Oct. 6, 1987, Ser. No. 104,939
Int. Cl.[4] B26B *3/06*
U.S. Cl. 30—161 **2 Claims**



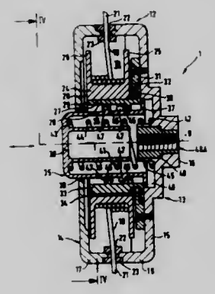
1. A folding personal knife comprising a frame having a compartment, a pivot pin having an axis, said pin engaging said frame and spanning said compartment, a knife blade receivable in said compartment and mounted to rotate about said pivot pin axis relative to said frame, means manually slidable relative to said frame and into engagement with said blade for holding said blade against rotation about said axis relative to said frame, said means including threads on said pivot pin, a nut threadedly engaging said threads on said pivot pin, and means for inhibiting relative rotation of said pivot pin and said nut relative to said frame.

4,893,410

CUTTERHEAD FOR A VEGETATION CUTTER

Joachim Hoffmann, Aichwald; Dieter Angstenberger, Leutenbach, and Gerhard Zerrer, Korb, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,925
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739269
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 **11 Claims**



1. A cutterhead for a motor-driven vegetation cutter defining a drive axis about which the cutterhead is rotatably driven, the cutterhead comprising:

a housing adapted to be rotated by the vegetation cutter about said drive axis;

said housing having a base and a side wall extending upwardly from said base to define an enclosed space;

a spool rotatably journalled in said enclosed space, said spool having a hub for accommodating a coil of cutting filament thereon and having first and second flanges connected to respective longitudinal ends of said hub for delimiting said coil;

indexing means for permitting an incremental rotation of said spool relative to said housing to pay out incremental lengths of the cutting filament;

said indexing means including a switching member for receiving said spool thereon so as to cause one of said flanges of said spool to be adjacent said base and for imparting said incremental rotation to said spool;

said indexing means further including: an indexing member for coacting with said switching member to provide said incremental rotation; said switching member and said indexing member being mounted in said housing so as to be displaceable relative to each other; first and second cam means formed on said switching member so as to be spaced from each other; and, first and second stop means mounted on said indexing member so as to be spaced from each other so as to cause one of said cam means to coact with one of said stop means with each displacement of said switching member and indexing member relative to each other thereby effecting said incremental rotation of said spool; and,

coupling means for coupling said spool to said switching member irrespective of which one of said flanges is adjacent said base when said spool is mounted on said switching member.

4,893,411

POWER SAWBLADES FOR ABRASIVE MATERIALS

Arvo Leini, Edsbyn, Sweden, assignor to Sandvik AB, Sandvikea, Sweden

Filed Nov. 17, 1988, Ser. No. 272,334
Claims priority, application Sweden, Nov. 23, 1987, 8704621
Int. Cl.[4] B27B *11/02, 33/02*
U.S. Cl. 30—369 **2 Claims**



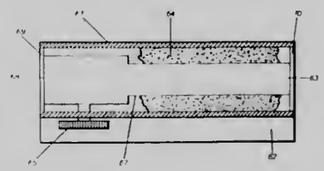
1. Sawblades for a power saw comprising a guidebar having a longitudinal groove in which the sawblades are reciprocally disposed, a first of the sawblades having forwardly facing first teeth and a second of the sawblades having rearwardly second facing teeth; each of said first and second teeth having a main cutting edge and a side cutting edge; the sawblades being mounted laterally adjacent one another within the groove for longitudinal reciprocation in opposite directions such that teeth on one sawblade become disposed laterally opposite teeth of the other sawblade so as to be disposed in cutting relationship therewith; a first distance from a selected first tooth to a preceding first tooth of said first sawblade being different than a second distance from said selected first tooth to a following first tooth on said first sawblade; a third distance from a selected second tooth to a preceding second tooth on said second sawblade being different than a fourth distance from said selected second tooth to a following second tooth on said second sawblade, said first, second, third and fourth distances being dimensioned such that no more than one tooth on either sawblade is in cutting relationship with a tooth of the other sawblade at any given instant.

4,893,412

WEAPON SIGHTING STRUCTURE

Robert E. Snodgrass, 33 Sleepy Hollow Rd., Andover, Sussex County, N.J. 07821

Continuation of Ser. No. 340, Jan. 5, 1987, abandoned, which is a continuation of Ser. No. 92,731, Aug. 24, 1987, abandoned.
This application Jan. 3, 1989, Ser. No. 293,156
Int. Cl.[4] G02B *27/32*
U.S. Cl. 33—247 **2 Claims**



1. A sighting structure for a rifle wherein said rifle has a barrel with defined barrel longitudinal axis, said structure comprisng:

telescope means for sighting, having a defined telescope longitudinal axis;

open-ended hollow cylindrical housing means for loosely enclosing said telescope means, and for holding said telescope means so that the longitudinal axes of said telescope and barrel means are completely aligned or are essentially parallel;

singular rubber sleeve means within said housing means along at least two-thirds of the full length of said telescope and surrounding said telescope means as a sleeve which is firmly attached to both the inside of the said housing means and to the outside of the telescope means;

first adjustment screw adapted in a first hole in said housing means so that said first screw engages said telescope means for displacing it in a first direction at will by tightening said first screw, or in the reverse said first direction by loosening said first screw, respectively, such displacement of the telescope by tightening causing compression of said rubber sleeve between the telescope and the inside surface of said housing;

second adjustment screw adapted in a second hole in said housing means so that said second screw engages said telescope means for displacing it in a second direction at will by respectively tightening said second screw, or in the reverse said second direction by loosening said second screw, respectively, such first and second direction being essentially orthogonal to one another, displacement of said telescope by said second screw tightening also causing compression of said rubber sleeve between the telescope and the inside surface of said housing; and

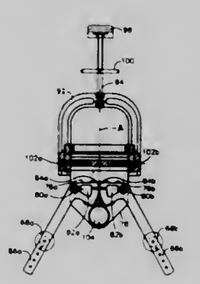
whereby the sighting direction of said telescope may be adjusted to an original setting by said first and second screws to suit an operator so that it sights essentially in the direction the rifle is pointing, wherein the combination alone of said rubber sleeve under compression and the barriers created by said first and second screws alone, as adjusted, provide for holding the telescope clamped in place in its said original setting position within said housing, and without any metal spring means for such setting; and whereby said original setting remains true even though the rifle undergoes one hundred shootings or otherwise experiences severe vibrations to the rifle elements including the telescope.

4,893,413

STEERING WHEEL CENTERING DEVICE

Marcellus S. Merrill, Denver, and Richard E. Kiefer, Boulder, both of Colo., assignors to Merrill Engineering Laboratories, Inc., Englewood, Colo.

Filed Feb. 24, 1988, Ser. No. 159,778
Int. Cl.[4] G01C *9/00*
U.S. Cl. 33—371 **6 Claims**



1. An apparatus for positioning a vehicle steering wheel to within a pre-selected tolerance of a centered position, comprising:

first means for sensing a deviation in the position of the steering wheel from a centered position;

second means mounted to the vehicle steering wheel for supporting said first means, said second means including

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holding means for use in engaging differently configured vehicle steering wheels; and

wherein said holding means comprises first and second cams and a pair of cam arms, each of said cams being connected to one of said cam arms.

4,893,414

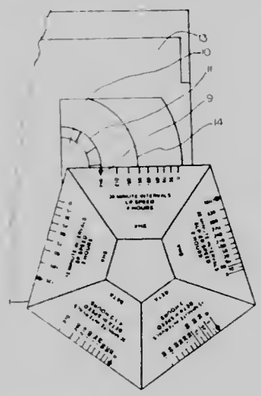
APPARATUS FOR MEASURING VIDEO CASSETTE TAPE USAGE

Michael E. Samosek, 2318 S. Overlook Rd., Cleveland Heights, Ohio 44106-3107

Filed Aug. 31, 1987, Ser. No. 90,940

Int. Cl.[4] G01B *3/00*

U.S. Cl. 33—501 **6 Claims**



1. A device for measuring the taping time remaining on a video cassette comprising:

a thin pentagonal card having five straight edges and five corners;

measuring scales printed adjacent each of the edges wherein two of the scales have graduated markings corresponding to the remaining taping time one each for the different taping speeds of a BETA format video cassette, and three of the scales have graduated markings corresponding to the remaining taping time one each for the different taping speed of a VHS format video cassette, wherein the scales are centrally located on each edge, and start and end laterally inward of the corners, and the graduated markings range from zero to a maximum;

a printed designation of the taping speed each scale is calibrated to measure; and

indexing means on the scales wherein: the indexing means for the VHS scales is located at the maximum graduated marking, and the indexing means for the BETA scales is located at the zero marking.

4,893,415

METHOD FOR THE DRYING OF WOOD AND WOOD-BASED PRODUCTS

Steen Ole Moldrup, Magstraede 4, 1204 Copenhagen K, Denmark

PCT No. PCT/DK87/00012, § 371 Date Feb. 6, 1988, § 102(e) Date Feb. 6, 1988, PCT Pub. No. WO87/04779, PCT Pub. Date Aug. 13, 1987

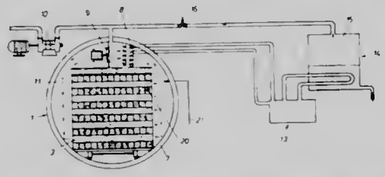
PCT Filed Feb. 6, 1987, Ser. No. 110,694

Claims priority, application Denmark, Feb. 6, 1986, 592/86

Int. Cl.[4] F28B *5/04*

U.S. Cl. 34—16.5 **12 Claims**

1. An improved method for the removal of moisture from solid wood and other wood-based products, whereby the wood is first stacked with suitable air space in a drying chamber which is arranged to be able to withstand a vacuum and temperatures of up to 100° C, after which the drying chamber is closed and evacuated during the introduction of heat for the boiling out of the moisture bound in the wood, the method being the type in which one replaces the evacuated air with water vapour, the improvement comprising regulating the wood dampness and thereby the drying process by superheating said water vapour and controlling the pressure and the temperature of said superheated water vapour, and maintaining the pressure and the temperature of the superheated vapour



as uniformly as possible in the drying chamber, wherein during the drying process the water vapours are evacuated from the drying chamber by condensing the vapours in a separate cooler condensation tank, in which there is maintained a temperature lower than the dewpoint temperature of the superheated vapours existing in the drying chamber, the wood dampness and the drying process are controlled by opening a pressure regulating valve provided between the drying chamber and the cooler condensation tank each time the pressure in the drying chamber exceeds the value p, where p depends on the following equation:

$$p = \frac{RH}{100} \times (10^{8.94}) \times (10^{-(2260/t+273)}),$$

where

p=the pressure in the drying chamber measured in mm Hg absolute pressure,

RH=a value between 0 and 100, which value can be determined by those familiar with the art on the basis of the actual dampness MC, the kind and the dimension of the wood, and

t=the actual temperature in the drying chamber measured in °C,

and by closing the pressure regulating valve each time the pressure in the drying chamber is lower than p.

4,893,416

APPARATUS FOR THE CONTACTLESS GUIDING OF WEBS OF MATERIAL

Hilmar Vits, Hüschelrath 16, D-5653 Leichlingen, Fed. Rep. of Germany

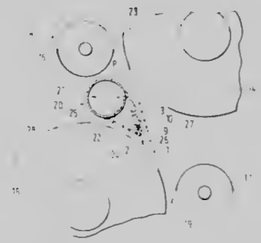
Filed Jul. 6, 1988, Ser. No. 215,574

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722354

Int. Cl.[4] F26B *13/00*

U.S. Cl. 34—156 **11 Claims**

1. An apparatus for the contactless guiding of webs of material comprising: at least two blow nozzles having blowjets and being arranged one behind the other in the running direction of and extending transversely to the web of material; a plurality of flow baffles being arranged in the running direction of the web of material and guiding the blowjets in the same direction and directing said blowjets obliquely against the web of material and on the side towards the web of material, said plurality of flow baffles comprising a convexly curved flow baffle and an at least one-step shock diffuser flow baffle, said convexly curved baffle adjoining a rear blow nozzle and being convexly curved towards the web of material and the shock diffuser



flow baffle lying between the convexly curved flow baffle and a front blow nozzle.

4,893,417

INNER SHOE FOR SHELL-TYPE SKI BOOT

Antonio Dalla Lana, Montebelluna, Italy, assignor to Lange International S.A., Switzerland

Filed Sep. 9, 1988, Ser. No. 242,783

Claims priority, application Switzerland, Sep. 15, 1987, 3552/87

Int. Cl.[4] A43B *19/00, 5/04*

U.S. Cl. 36—10 **4 Claims**



1. An inner shoe for a ski-boot comprising a shell in the form of a boot with an upper region and a lower region separated by an instep region, a deformable narrow zone of lesser resistance extending horizontally across the front of the mid upper region with the ends of the deformable zone extending downward along the outer sides of the instep toward the end of the lower region of the boot, defining a tongue-shaped region, the deformable zone creating a flexible zone in the instep region.

4,893,418

SHOE INSOLE AND METHOD OF MANUFACTURE

John M. Ogden, Cincinnati, Ohio, assignor to Ogden Inc., Cincinnati, Ohio

Filed Jan. 11, 1988, Ser. No. 142,474

Int. Cl.[4] A43B *13/38, 13/40*

U.S. Cl. 36—44 **10 Claims**

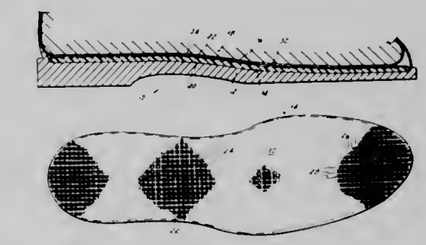
1. An insole for a shoe, comprising:

a bottom layer formed of a cushioning material, said bottom layer having an upper surface and a lower surface adapted to overlie the sole of a shoe;

a top layer formed with a plurality of apertures, said top layer having an upper surface and a lower surface;

said upper surface of said top layer being adapted to contact a foot and sock when the insole is inserted in a shoe, said upper surface of said top layer having frictional characteristics which control movement of the foot and sock with respect to said top layer within the shoe;

said top layer being at least partially embedded in said bottom layer so that said lower surface of said top layer extends beneath said upper surface of said bottom layer



and said cushioning material of said bottom layer extends at least partially into said apertures in said top layer.

4,893,419

REAR-FITTING SHELL-TYPE SKI BOOT

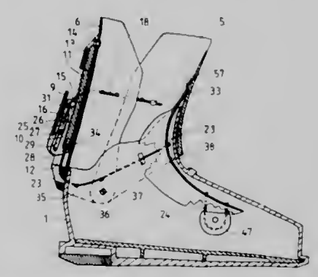
Simon Arieh, Geneva, and Guy Courvoisier, Celigny, both of Switzerland, assignors to Lange International S.A., Switzerland

Filed Jul. 13, 1988, Ser. No. 218,639

Claims priority, application Switzerland, Sep. 9, 1987, 3491/87

Int. Cl.[4] A43B *5/04; A43C 11/00*

U.S. Cl. 36—119 **4 Claims**



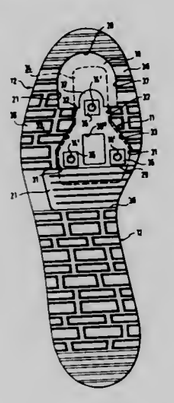
1. Rear-fitting shell-type ski boot comprising a rigid bottom shell (1) and a two-part upper consisting of a front part (5) and a rear part (6) hinged on the bottom shell and on which there is mounted a tensioning device (8) operating in a vertical plane and acting on at least one pulling cable (17, 18, 23, 24) of a closing and/or clamping means by means of a tensioning lever (9) hinged on a support piece (10), wherein the support piece (10) of the tensioning lever is slidably mounted on a rack with ratchet teeth (11) on which it is retained by a pawl (15) against the pulling action of the cable (17, 18) connected to the tensioning lever, the pawl being kept engaged with the rack by a spring and having an arm (16) by means of which it may be separated manually from the rack.

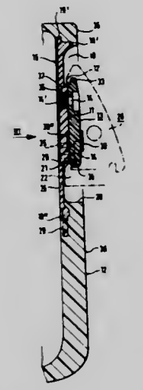
4,893,420

CYCLIST'S SHOE

Michel Bezin, Nevers; Yves Boisot, Varennes-Vauzelles, both of France, and Otto Harsányi, Loonberg, Fed. Rep. of Germany, assignors to Look S.A., Nevers Cedex, France

Filed Jun. 22, 1988, Ser. No. 209,712
Claims priority, application European Pat. Off., Jul. 6, 1987, 87109717.6
Int. Cl.[4] A43B 5/14
U.S. Cl. 36—131 34 Claims





1. Cyclist's shoe for use with a cycle safety pedal having a pressure surface, a front end, a rear end, an engagement projection at said front end with said engagement projection being spaced from said pressure surface, and a pedal latch at said rear end with said pedal latch being spaced from said pressure surface; said shoe comprising a sole having a base surface, a recess in said sole, an attachment region within said recess and extending substantially parallel to said base surface, and a pedal plate which in use confronts said pressure surface having a thickness and attached to said attachment region, with said attachment region being recessed relative to said base surface by an amount substantially equal to the thickness of said pedal plate; respective front and rear spaces in said recess at the front and rear of said pedal plate respectively; a counter-projection capable of cooperating with said engagement projection located at said front of said pedal plate; a counter-latch capable of cooperating with said pedal latch at said rear of said pedal plate; said front and rear spaces accommodating said engagement projection and said pedal latch respectively and permitting movement thereof into and out of engagement with said counter-projection and said counter-latch respectively, whereby, on latching of said pedal plate on said cycle safety pedal, a locked engagement of the pedal plate is effected with respect to vertical forces, with separation of the pedal plate from the safety pedal being effected by rotation of the pedal plate about a vertical axis.

34. Cyclist's shoe for releasable engagement with a cycle safety pedal having a pedal latch and an engagement projection, said shoe comprising a sole including a recess, a pedal plate disposed in the recess and having a thickness such that the pedal plate does not substantially project downwardly beyond the sole, the recess having a size and shape to form free spaces about portions of the pedal plate adapted to accommodate the pedal latch and the engagement projection where they are in operative engagement with the pedal plate.

4,893,421

HUNTING SHOE NOISE SUPPRESSOR

Ronald J. Folks, Box 17, Kaw City, Okla. 74641

Filed Jan. 9, 1989, Ser. No. 294,336
Int. Cl.[4] A43B 05/18, 05/00
U.S. Cl. 36—132 3 Claims





1. In a hunter's shoe or boot having a sole defining a generally flat bottom surface of toe and heel end portions and a substantially vertical perimeter edge surface, the improvement comprising:

continuous imperforate flexible wall means overlapping the perimeter edge surface in coextensive relation and depending therefrom normal to the bottom surface for forming a cavity between said shoe or boot and a supporting surface; and

means including cooperative self-adhering members for securing the wall means to the perimeter edge surface.

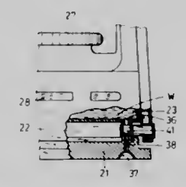
4,893,422

STEAM IRON WITH WATER SOFTENING FACILITY

Gotthard C. Mahlich, Kronberg, and Michael Borgmann, Solingen, both of Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 239,211
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729800
Int. Cl.[4] D06F 75/14
U.S. Cl. 38—77.3 35 Claims

1. In an electric appliance, such as a steam iron with a workpiece smoothing surface, the combination of a housing contained in said appliance; a vessel provided in said housing and arranged to store a body of water, such as magnesium- and/or calcium-containing tap water; means for receiving water from said vessel, said receiving means being provided in said housing and extending to said smoothing surface; means defining at least one path for the flow of water in said housing from said vessel to said receiving means; and a supply of water softening agent in said path.

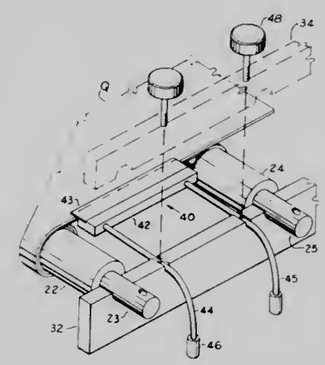


4,893,423

TENSIONING SYSTEM FOR QUILT FRAMES

John T. Heinrich, 5 Mt. Shasta Ct., San Rafael, Calif. 94903

Filed Sep. 6, 1988, Ser. No. 241,892
Int. Cl.[4] D06C 3/08
U.S. Cl. 38—102.1 3 Claims



1. A quilt frame having a support structure and at least two roller members for holding a length of quilting material, said roller members terminating in a shaft portion at each end, the improvement comprising:

a pair of tension block members located between said roller members and adjacent opposite sides of said quilting material to grip said material therebetween;

at least one tension cord member extendeing laterally from each of said tension block members;

a pair of rail members each including a rail block portion and a rail cap portion, each of said rail block and rail cap portions bearing complementary roller shaft grooves conditioned to capture said roller shafts, each of said rail members further including a tension cord groove conditioned to capture said tension cord member;

at least one clamping member adjustably connecting each of said rail block and rail cap portions; and

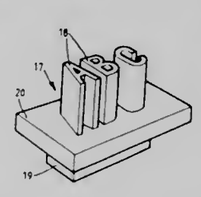
fastening means comprising adjustable screws for securing said tension cord members against said tension cord grooves, whereby the lateral tension on said quilted material can be varied by changing the position of said cord on said rail members.

4,893,424

METHOD AND APPARATUS FOR IDENTIFICATION OF HISTOLOGY SAMPLES

William McLean, 1 Hill Cottage, Bockelton, Tenbury Wells, England (WR15 8PP)

Continuation of Ser. No. 832,711, Feb. 14, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 119,310
Claims priority, application United Kingdom, Jun. 17, 1984, 8415648; Jun. 29, 1984, 8416688
Int. Cl.[4] G09F 23/00
U.S. Cl. 40—616 9 Claims



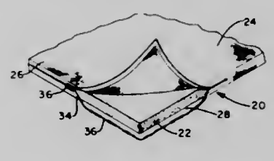
1. An identification marker for use in permanent identification of a histology sample comprising a plurality of columnar indicia moulded integrally with a base, the indicia extending from the base in a protruding manner, the marker consisting solely of a single mouldable jelly-like material capable of being sliced by microtome and dimensionally sized for embedding within an embedding medium along with a histology sample.

4,893,425

PORTABLE LIGHTWEIGHT DISPLAY BOARD ASSEMBLY

Priscilla M. Ellis, Silver Lake, Ohio, assignor to The McNellis Company, New Brighton, Pa.

Filed Sep. 6, 1988, Ser. No. 240,528
Int. Cl.[4] G09F 7/06
U.S. Cl. 40—622 10 Claims



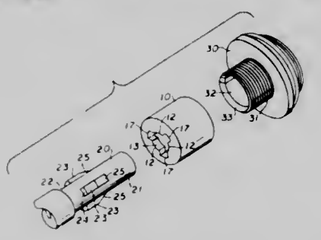
1. A portable display board assembly comprising:

(a) an essentially rigid rectangular board capable of receiving pins or the like, said board having a thickness substantially less than its width or height;

(b) a removable flexible cloth cover adapted to enclose said board and to fit closely thereover, said cover being of generally rectangular shape conforming to that of said board and including a pair of side panels and four edges corresponding, respectively, to the two sides and four edges of the board, said cover having an opening sufficiently large to permit removal of said board without bending, and fastener means for closing said opening.

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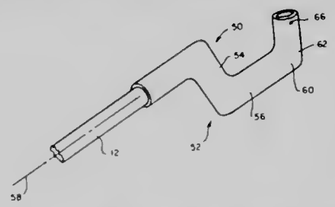
4,893,426
LUGGED COUPLING APPARATUS
Timothy D. Bixler, Katy, Tex., assignor to South Central Research Corp., Katy, Tex.
Filed Oct. 7, 1988, Ser. No. 255,597
Int. Cl.[4] F41C *21/18, 27/00*
U.S. Cl. 42—75.01 **10 Claims**



1. Coupling apparatus for securing a shaft to an externally threaded member comprising:
a cylindrical collar member having internal threads at one end to be threadedly received on the threaded member and at its other end a series of circumferentially spaced internal lugs extending radially inward to define a central opening and a series of circumferential apertures between the internal lugs,
each said collar internal lug having a long longitudinal raised side and a short longitudinal raised side which define inwardly facing recesses therebetween, and
a cylindrical shaft member having a plurality of circumferentially spaced external lugs at one end extending radially outward from the shaft,
said shaft member having a diameter sufficient to be slidably received through the central opening of said collar member and said external lugs configured to be slidably received through the apertures of said collar member and pass over the short side and engage the long side of said collar internal lugs upon relative rotation between said collar and said shaft members, whereby
when said collar member is threaded onto said threaded member in one direction said shaft external lugs will become seated in the recesses of said collar internal lugs and said shaft will be drawn into firm engagement on the threaded member to securely connect said shaft member to the threaded member, and
when said collar member is rotated in the opposite direction relative to the threaded member said shaft external lugs will become unseated from said recesses and pass over the short sides of said collar internal lugs allowing said shaft to be removed from said threaded member and said collar.

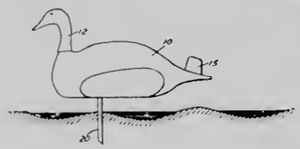
4,893,427
TELESCOPING UNIPAD
Arthur Davidson, 3746 F. Rd., Clifton, Colo. 81520
Filed Nov. 10, 1988, Ser. No. 269,444
Int. Cl.[4] F42C *27/00*
U.S. Cl. 42—94 **3 Claims**

1. A firearm support comprising:
(A) a plurality of telescopically engaged tubular members which include a bottom member adapted to rest on a support surface and a double-bent top member adapted to be attached to a firearm, said double-bent top member including a connecting section mounted on one of said tubular members, a first section oriented at an angle with respect to said connecting section and being in a common plane with said connecting section, a first bend connecting said connecting section to said first section, a second section oriented at an angle with respect to said first section and being in said common plane with said first section and said connecting section, a second bend connecting said first section to said second section, a third section oriented at an angle with respect to said second section and being in a second plane that is oriented at an angle with respect to said common plane, and a third bend connecting said third section to said second section, said third section having an outer surface and an end spaced from said third bend;
(B) an attaching means on said top member third section for attaching said top member to a firearm, said attaching means including
(1) a swivel pin mounted on said top member third section adjacent to the end of said top member third section and



extending outwardly of said third section outer surface to define attaching ears,
(2) a U-shaped stirrup attached to said swivel pin attaching ears and mounted thereon to pivot around the end of said top member third section,
(3) a second swivel pin affixed to said stirrup, and
(4) a circular clamp member attached to said second swivel pin to rotatable about said second swivel pin, said clamp member being adapted to encircle the firearm and having a thumbscrew for engaging the firearm to attach said clamp member to the firearm.

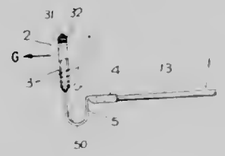
4,893,428
SELF-ALIGNING DECOY
Kenneth M. Gagnon, Sr., 4 Mill St., Cumberland, R.I. 02864
Filed Apr. 14, 1989, Ser. No. 338,191
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **4 Claims**





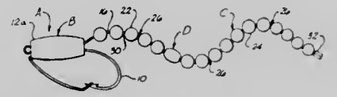
1. A self-aligning decoy comprising a body in the shape of a bird including a head portion and a body portion; said body portion having a tail portion, a fin mounted on the tail portion substantially along the central portion thereof, said fin extending generally perpendicular to the body, a socket having a spherical end mounted near the center of gravity of the body, said socket opening downwardly towards the bottom portion of the decoy, a stake having a generally cylindrical cross-section with a reduced end portion, said reduced end portion having a pointed end and being received in said socket.

4,893,429
TOP GUIDE FOR A FISHING ROD
Yoshiro Yamoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Nov. 9, 1988, Ser. No. 268,978
Claims priority, application Japan, Nov. 11, 1987, 62-172989[U]
Int. Cl.[4] A01K *87/04*
U.S. Cl. 43—24 **2 Claims**



1. A top guide adapted to be mountd to the tip of a fishing rod, said top guide comprising:
a mounting portion for mounting on the tip;
a line guide ring for guiding a fishing line adapted to extend along the fishing rod toward the tip; and
a connector interconnecting said mounting portion and said line guide ring, said connector being formed of a plate having a given width, having its widthwise dimension perpendicular to an axial direction of said line guide ring, coupled at one lengthwise end to said mounting portion and at its other lengthwise end to said line guide ring, and having an elastically deformable lengthwise intermediate portion curved in a circular arc shape which is adapted to be elastically displaced in said axial direction thereof but not in a direction perpendicular to said axial direction responsive to an impact applied to said line guide ring to thereby buffer said impact.

4,893,430
MULTI-JOINTED BEADED FISHING WORM LURE
Timmy R. Barfield, 1304 Collins Park St., Conway, S.C. 29526
Filed Dec. 5, 1988, Ser. No. 279,874
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.24 **20 Claims**



1. A multi-joined fishing lure comprising:
an artificial worm having a head end and a tail end;
a worm head carried at said head end;
a multi-jointed worm body substantially elongated relative to said worm head carried by said worm head; said elongated worm body including a continuous flexible strand, a plurality of generally spherical beads carried individually by said strand in series trailing said worm head, and said spherical beads being generally longitudinally shiftable along said strand facilitating undulating of said worm body during retrieval through the water;
a joint formed between each spherical bead so that said worm body may flex continuously along its length in all directions to simulate the natural motion of a live worm; and
at least one fish hook carried by said worm.

4,893,431
FISHING LURE
Harry M. Ehlers, 5330 E. Kemper Rd., Cincinnati, Ohio 45241
Filed Sep. 6, 1988, Ser. No. 240,530
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.47 **5 Claims**



1. A fish lure, comprising:
(a) a hollow body;
(b) a single piece frame member comprising
(i) a lip extending forwardly from said body, said lip configured to impart action to the lure, said lip having a leading edge; and
(ii) a reach extending rearwardly from said lip, said reach disposed at least partially in said hollow body;
(c) a rib formed in said lip;
(d) a link having an attachment end, a guard portion and a loop, said loop being spaced apart from said attachment end, formed between said attachment end and said guard portion, and configured to be connected to a fishing line, said attachment end being attached to said rib, said guard portion having an operative position in which said guard portion is disposed in front of said leading edge extending at least partially below said leading edge without passing through said lip, and extending generally rearwardly whereby weeds and other similar objects are kept from becoming entangled about said rib and said attachment end.

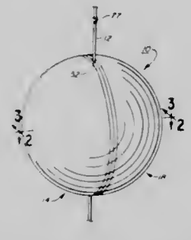
4,893,432
FISHING JIG
Walter H. Roseagrant, HC 68 Box 328A, Kingston, Okla. 73439
Filed Mar. 13, 1989, Ser. No. 322,400
Int. Cl.[4] A01K *91/04*
U.S. Cl. 43—42.74 **2 Claims**



1. A fishing jig, comprising:
a pair of elongated semirigid wires disposed in crossed relation medially their ends,
each wire of said pair of wires having its respective end portion arcuately curved to define a depending line receiving closed loop,
one wire of said pair of wires being doubled back upon itself at the crossed position to define a part circular upstanding loop and extend laterally a selected distance normal to its longitudinal axis,

the other wire of said pair of wires being arcuately curved to form a depending closed loop at the crossed position and similarly doubled back upon itself with its doubled back portion cooperatively received between the doubled back portions of said one wire;
a sleeve surrounding and bonded to the doubled back portions of said pair of wires; and,
a first plurality of fishing lures respectively secured to said depending loops.

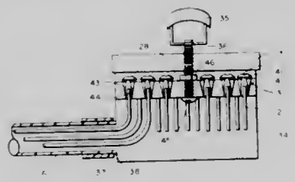
4,893,433
FISHING FLOAT
Clement J. Scheffler, and Marvin L. Scheffler, both of 12233 Ann St., Blue Island, Ill. 60406
Filed Feb. 21, 1989, Ser. No. 313,018
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—43.1 **2 Claims**



1. A slip bobber for a fishing line comprising:
a pair of separable parts that abut on each other at respective transverse mating surfaces thereof to form a buoyant body;
means forming a transverse groove in the mating surface of one of said parts for slidable reception of a fishing line therein;
said one part including an externally threaded post projecting outwardly from its mating surface;
means forming a longitudinal slot extending transversely through said post for the length of the post and adapted for receiving a fishing line in the slot, said slot registering with said groove for moving a fishing line through the slot and into the groove;
the remaining one of said parts including a resilient flexible transverse wall having a recessed outer surface comprising the mating surface of the part;
means forming an opening in said remaining part wall in register with said post and adapted for receiving the post in the opening in threaded engagement with said wall for bringing said parts into abutment, thereby to confine a fishing line in said groove; and
said remaining part wall being adapted for being stressed by engagement of said post therewith upon said bringing said parts into abutment, thereby to produce a force deforming said transverse wall wherein it becomes substantially planar and the force resiliently urges the abutted parts toward one another.

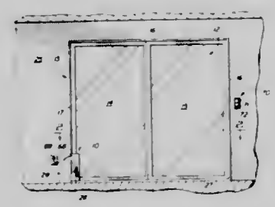
4,893,434
PEST EXTERMINATING SYSTEM
Richard C. Knipp, 985 Papaya Ln., Winter Springs, Fla. 32708; Richard R. Schmitt, 292 Wekiva Park Dr., Sanford, Fla. 32771, and Kenneth R. Chitwood, 115 Seminola Blvd., Casselberry, Fla. 32707
Filed May 15, 1989, Ser. No. 352,282
Int. Cl.[4] A01M *7/00*
U.S. Cl. 43—124 **11 Claims**

1. A gas or liquid distribution system in a building for the control of pests in the building comprising:
tube means disposed in the walls of a building and having a plurality of flexible tubes, each tube having a plurality of openings along the side thereof in one open portion thereof and each tube passing into a predetermined building zone;
a control distribution box attached to a building wall and having a panel therein having a plurality of openings passing therethrough and having the open end of each said flexible tube attached to said panel through one said opening therein; and



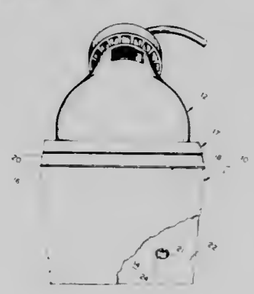
a plurality of tube end connectors for connecting each flexible tube end to said panel in said control distribution box, each said connector extending into one said panel opening and holding one said flexible tube open end thereto whereby injecting a pest control gas or liquid into an opening in said panel and tube open end will distribute gas or liquid to one zone of a building.

4,893,435
LOW PROFILE SLIDING DOOR OPENER
H. Stanley Shalit, Seminole, Fla., assignor to Remote-A-Matic, Inc., Bradenton, Fla.
Filed Apr. 7, 1989, Ser. No. 335,118
Int. Cl.[4] E05F *15/14*
U.S. Cl. 49—360 **20 Claims**



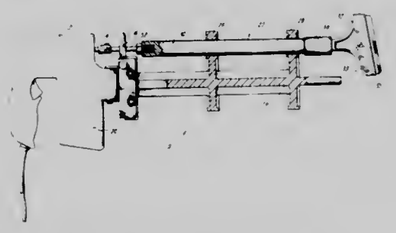
1. An opener for a closure panel movably mounted to slide along an elongated channel strip across a bottom of a wall opening between "panel closed" and "panel open" positions, said opener comprising:
a housing member in the form of a threshold plate dimensioned, configured and adapted to extend nonintrusively across said bottom of said opening adjacent said channel strip;
a belt;
means for mounting said belt within said housing member for movement along a run longitudinally aligned with said channel strip;
means for attaching said panel to said belt at said run for movement therewith;
a motor; and
means mounting said motor at an elevation above said threshold plate for driving said belt mounting means by said motor to move said belt along said run to move said attached panel between said positions.

4,893,436
FELTED FOAM BACK UP PAD
Larry D. Rich, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 946,367, Dec. 24, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 163,216
Int. Cl.[4] B24B *23/00*
U.S. Cl. 51—170 MT **6 Claims**



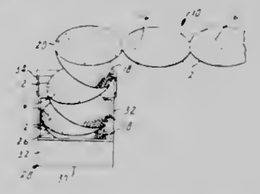
1. A back up pad for incorporation into the drive platen of a vibrating or orbital sander comprising a rectangular rigid back up plate having four spaced points of attachment adapted to be attached to a drive mechanism of the sander, and a rectangular layer of felted polyurethane foam having first and second generally parallel opposite surfaces with said first surface fixed to said back up plate, and said second surface adapted to have a coated abrasive sheet removably adhered thereto, said layer of felted polyurethane foam providing efficient driving force transmission between said first and second surfaces of the pad in a direction parallel to said surfaces to drive a coated abrasive sheet removably adhered to said second surface from driving forces applied at said first surface through said back up plate, and said layer of felted polyurethane foam having a Shore A compression reading measured in a direction normal to said surfaces in the range of about 2 to 20 to provide relatively low resistance to compression in a direction normal to said second surface so that a sander by which the back up pad is driven has little tendency to chatter and bounce on the surface of a workpiece being sanded.

4,893,437
POWER SANDING ADAPTER FOR JIGSAWS
John P. Doherty, 49 Soley St., Charlestown, Mass. 02129
Continuation-in-part of Ser. No. 158,571, Feb. 22, 1988, Pat. No. 4,790,045. This application Apr. 7, 1988, Ser. No. 178,555
Int. Cl.[4] B24B *23/00*
U.S. Cl. 51—170 TL **9 Claims**



1. A tool attachment for a jigsaw, comprising:
an extension having a foot;
means for clamping the foot to a jigsaw so that the extension is rigidly attached thereto without tilting off the axis of elongation thereof;
an elongated post having a tool attachment end and a remote end;
means for mounting the elongated post to the extension for reciprocating motion with respect to the extension; and
means for fastening the remote end of the elongated post to a chuck of a jigsaw so that the post is moved reciprocally with the reciprocating motion of the chuck of the jigsaw.

4,893,438
FAN FOLDED ABRASIVE DISCS
Richard L. Fry, White Bear Lake; Gerald L. Bergerud, Maplewood, both of Minn.; Russell J. Maland, Ames, Iowa, and James A. Weldon, Eagan, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Sep. 6, 1988, Ser. No. 245,462
Int. Cl.[4] B24D *11/00*
U.S. Cl. 51—394 **12 Claims**



1. A concatenation of circular abrasive discs each including a backing having first and second major surfaces, a layer of abrasive material on said first surface, and a multiplicity of loops projecting from said second surface by which said discs may be releasably attached to a drive member having hooks adapted to releasably engage the loops, said discs being cut from a single sheet of stock and each disc being attached to two adjacent discs at opposite edges by two narrow tabs along each edge spaced by at least about 0.32 centimeter (⅛ inch) along said edge and generally equally spaced on opposite sides of a center line extending between the centers of the attached discs, said discs being separated between said tabs and said tabs being folded to position said abrasive discs in a stack with each abrasive disc within the stack having its layer of abrasive material against the layer of abrasive material of one adjacent disc, and its loops against the loops of the other adjacent disc.

4,893,439
ABRASIVE ARTICLE CONTAINING HELICALLY CRIMPED FIBERS
Thomas R. McAvoy, Stillwater, and Fred H. Bland, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 38,062, Apr. 14, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 230,673
Int. Cl.[4] B24D *13/14*
U.S. Cl. 51—400 **13 Claims**



1. An article suitable for buffing floors consisting of an open,

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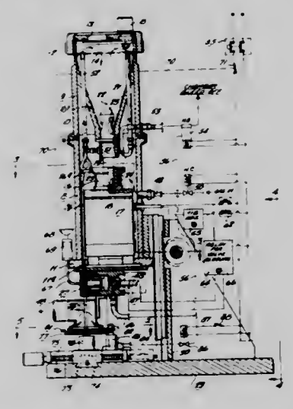
lofty nonwoven web comprising at least 30% by weight of helically crimped, synthetic, organic, staple fibers, said web containing a binder and abrasive particles ranging in grade from about 36 to about 1000.

4,893,440

ABRASIVE JET MACHINING

Ben J. Gallant, Corpus Christi, Tex., and Walter G. Kulischenko, East Brunswick, N.J., assignors to Airsonics License Partnership, Corpus Christi, Tex.

Continuation of Ser. No. 148,387, Jan. 25, 1988, abandoned, which is a division of Ser. No. 858,373, May 1, 1986, Pat. No. 4,733,503. This application May 19, 1989, Ser. No. 355,880
Int. Cl.[4] B24C *7/00*
U.S. Cl. 51—436 **5 Claims**



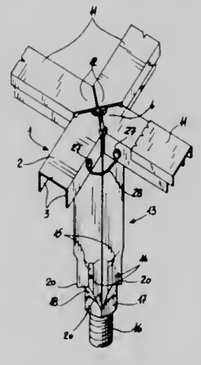
1. Apparatus for developing and handling an abrasive-laden gas stream, comprising a substantially vertical feed tube having an upwardly directed inlet opening at its upper end and having a downwardly directed delivery nozzle at its lower end with a downwardly directed delivery nozzle opening, said vertical tube and said nozzle having coaxial passages, a pneumatically pressurized receptacle in which said upwardly directed inlet opening is exposed, the receptacle having a lower closure through which the feed tube extends, a vibratory feed chamber in said pressurized receptacle, the feed chamber having a delivery duct adapted to feed a stream of particulate material into the upwardly directed inlet opening of said feed tube to provide for carrying the particulate material in a stream of gas downwardly through said tube to a region externally below said pressurized receptacle, the feed tube including vertically and axially aligned rigid tube elements with adjoining ends presented toward and spaced from each other in said region externally below said pressurized receptacle, and a flow shut-off valve in the region of the space between said vertically aligned tube elements, the shut-off device including a vertically extended tube formed of resilient material and having an inside diameter sufficient to engage and telescopically overlap the ends of the vertically aligned tube elements, rigid means surrounding the tube formed of resilient material and rigidly interconnecting the adjoining ends of said vertically aligned tube elements and a shut-off plunger positioned to horizontally pinch the resilient tube in said region below said pressurized receptacle.

4,893,441

LOAD-BEARING STRUCTURE FOR RAISED FLOORS

Cosimo Catalano, Padova, and Paolo Pasto', Piove Di Sacco, both of Italy, assignors to Iceco S.P.A., Piove Di Sacco PD, Italy

Filed Feb. 25, 1987, Ser. No. 19,083
Claims priority, application Italy, Jun. 5, 1985, 41562 A/85
Int. Cl.[4] E04F *15/02*
U.S. Cl. 52—126.6 **10 Claims**



1. A load-bearing structure for raised floors, comprising:
a plurality of rest feet arranged at a mutual distance, each of said rest feet including a tubing section and a ground rest plate, said tubing section having a first end connected to said rest plate, a second, open end opposite to said first end and height adjusting means, said rest plate extending substantially perpendicular to said tubing section,
a plurality of crosspieces, extending between pairs of rest feet and forming a rest grid, each of said crosspieces including a U-like bent sheet element including an upper longitudinal wall and two bent side walls, said upper longitudinal wall having two opposite ends extending each beyond said side walls and having a triangular shape defining two converging sides, each said crosspiece further including hooking means comprising two protruding walls extending from said converging sides substantially parallel thereto and perpedicular to said bent sheet element, said protruding walls extending at a distance from said side walls and defining therewith a pair of slots, said protruding walls being accomodated within said open end of one of said rest feet, with said tubing section partially extending into said slots.
connection means arranged within said tubing sections proximate to said second open end, said connection means having a first portion engaging with said protruding walls of said crosspieces and a second portion engaging with an inner portion of said tubing section for firmly securing said crosspieces to said rest feet, and
a covering structure, overlying said sheet elements.

4,893,442

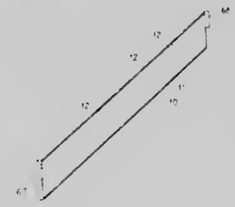
STAIRWAY APPARATUS AND METHOD OF MANUFACTURE

James M. Graham, Myrtle Beach, and Edward F. Schaack, Greenville, both of S.C., assignors to Duraflite, Inc., Newtown, Conn.

Continuation of Ser. No. 929,826, Nov. 13, 1985, Pat. No. 4,838,005. This application Dec. 28, 1988, Ser. No. 275,970
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—184 **10 Claims**

1. A stair assembly for a stairwell of a building, the combination comprising:

a pair of spaced stringer elements (**10, 11**) each having a support end bar (**66**) affixed at an upper end portion;
a plurality of tread pan riser elements each having portions forming a tread pan portion (**13**) and a frontal flange (**14**) and an inturned flange (**15**) and an angular riser (**16**) and having parallel end edges being welded to a respective one of said stringer elements;
a plurality of tread pad means each being secured to a respective tread pan portion to form a tread pad stair step;
a plurality of support bracket means (**56, 57, 58**), being securely affixed to a portion of the building stairwell;
a support beam (**96**) being supported at opposite end portions upon a respective one (**57, 58**) of said plurality of support bracket means;



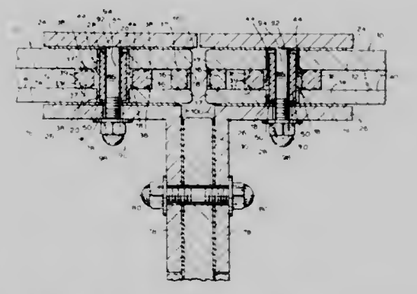
a prefabricated landing means (**50**) having four sections of angle irons (**80-83**) welded together to form an open bottom box means (**85**), a corrugated decking bottom member having lower protrusions (**88**) supported upon and secured to one or more horizontal reach portions (**90**) of said angle irons, and having one or more angle brackets (**94**) affixed to an interior portion of one or more vertical reach portions of said angle irons (**80-83**) at a predetermined step pad level, and having a concrete step pad member (**92**) precast within said box means (**85**) atop said corrugated decking bottom member, whereby said landing means being supported at a rear portion upon a respective support bracket means (**56**) and at a front portion upon said support beam (**96**) and whereby said support end bars (**66**) are supported on a portion of said support beam (**96**).

4,893,443

SEALED DOUBLE GLAZING UNIT

Ronald Haber, Chestnut Ridge, N.Y., assignor to W & W Glass Products Ltd., Spring Valley, N.Y.

Filed Jan. 18, 1989, Ser. No. 298,635
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—208 **23 Claims**



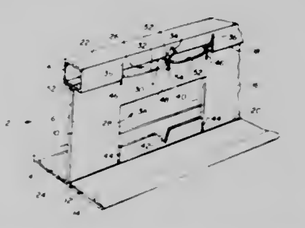
1. A sealed double glazing unit comprising:
(A) an outer pane and an inner pane, each defining in at least one corner thereof an aperture therethrough, said pane apertures being axially aligned;
(B) peripheral sealing means about the periphery of said panes, and
(C) means, disposed in said at least one corner of said panes, for enabling mounting of said unit to a supporting member, including
(i) a torus having opposed end surfaces and a sidewall connecting said end surfaces and defining a hole, said torus extending between said panes coaxially with said pane apertures and having the end surfaces of said torus secured to facing surfaces of said panes about said pane apertures,
(ii) a sleeve extending through said hole of said torus and having its end portion disposed at least partially within respective ones of said pane apertures, and
(iii) sealant securing the outer surface of said sleeve to the inner surface of said torus.

4,893,444

FIRE EXPANSION JOINT FOR CEILING RUNNER

James C. Ollinger, Lancaster, and Daniel C. Ziegler, Millersville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed May 2, 1988, Ser. No. 189,188
Int. Cl.[4] E04C *2/42*; E04B *5/50*
U.S. Cl. 52—232 **4 Claims**



1. An expansion runner for a ceiling system comprising:
(a) a vertical web member with upper and lower ends;
(b) said vertical web member having an enlarged bulb at its upper end and a horizontal flange extending from both sides of its lower end;
(c) said runner having an upper elongated opening adjacent the upper end of the web and, said runner having a lower elongated opening positioned in the vertical web intermediate the upper and lower ends of the vertical web;
(d) the upper and lower openings having a length taken along the length of the runner selected to accommodate anticiapted axial expansion of the runner upon exposure to a fire;
(e) the improvement comprising:
(1) said upper elongated opening extends from the upper end of the web into the enlarged bulb, the upper elongated opening having upper and lower edges, said upper edge having only one triangular notch therein with the notch positioned at the midpoint of the upper edge and extending to almost the top of the enlarged bulb, at each end of the upper edge a straight line cut with abutting edges extends from the upper opening toward and to almost the top of the enlarged bulb, and
(2) said lower elongated opening having upper and lower margins, said upper margin being spaced from the lower edge of the upper elongated opening, said lower margin having only one triangular notch therein with the notch positioned at the midpoint of the lower margin and extending to adjacent the horizontal flange, at each end of the lower margin a straight line cut with abutting edges extends from the lower opening toward and to almost the top of the horizontal flange.

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4,893,445

CONSTRUCTION SYSTEM

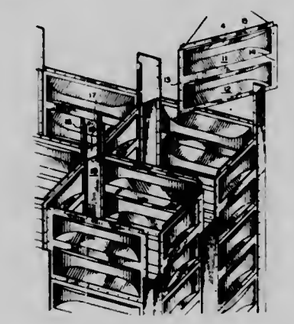
Hans G. Hefer, New South Wales, Australia, and Jurgen Schneider, Schaumanstein, Fed. Rep. of Germany, assignors to M.A.H. Construction & Engineering Pty-Ltd., Smithfield, Australia

Continuation of Ser. No. 894,291, Aug. 7, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 188,170

Claims priority, application Australia, Aug. 7, 1985, PH01829

Int. Cl.[4] E04H 7/30

U.S. Cl. 52—234 4 Claims



1. A silo comprising a plurality of support columns and walls,

each of said walls including at least one wall plate having profiled strengthening sections and flat flanges around its periphery, said flat flanges having first boreholes for receiving attaching means, wherein at least one said flange is offset on at least one peripheral edge of said wall plate,

each of said support columns being formed by at least one plate-shaped building element, said building element comprising a column plate having a flange at each opposite longitudinal edge thereof, said flanges being at approximately 45 degrees from said plate, the included angle between the flanges being approximately 90 degrees, said flanges having second boreholes for receiving attaching means,

wherein a flat flange of each of said wall plates is sandwiched between a flange of a

said building element and an additional flange of an additional said building element selected from the group consisting of a second said building element, a flat-surfaced building element having said additional flange at a longitudinal edge thereof, and a right-angled building element having said additional flange at a longitudinal edge thereof, said additional flange having third boreholes for receiving attaching means, such that said first, second and third boreholes align to receive attaching means, and

wherein said offset allows said wall plate to abut a second wall plate, said first boreholes of said wall plates aligning to receive attaching means.

4,893,446

RELOCATABLE VERTICAL OR HORIZONTAL WALL SYSTEM

Edgar Gudmundsson, Vesturberg 49, and Oli J. Asmundsson, 111 Reykjavik, both of Iceland, Iceland

Filed Nov. 13, 1987, Ser. No. 119,875

Int. Cl.[4] E04H 3/00

U.S. Cl. 52—238.1 6 Claims

1. A modular, selectively alterable wall system comprising;

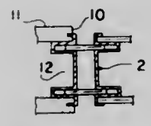
a plurality of adjacent wall sections,

each said wall section including a pair of spaced apart panel members each provided with inner and outer surfaces and having peripheral edges,

a profile element engageable with laterally adjacent ones of said peripheral edges of each said pair of panel members of each said wall section, each said profile element including a substantially planar central web having inner and outer faces bounded by lateral edges and extending transversely of said pair of panel members, said web defining the majority width of said profile element,

a U-shaped channel at each said web lateral edge normal to said web and projecting from said inner face, each said channel comprising inside and outside walls defining a first groove therebetween accessible from the direction of said web outer face,

an outermost flange joined to each said channel outside wall by a base element and defining a second groove therebetween accessible from the direction of said web inner face, said second grooves having a width substantially greater than that of said first grooves, said outermost flanges parallel to said channel outside walls,



said profile element second grooves engageable with said peripheral edges of said spaced apart pair of panel members of one said wall section with at least a portion of the thickness of each said panel member disposed between each said outermost flange and channel outside wall,

a pair of rigid planar splines each having first and second opposite edges with said spline first edges respectively slidably disposed within said first grooves of one said profile element as engaged with said pair of panel members of one said wall section,

said panel members in at least one of said plurality of wall sections comprising wallboards,

said panel members in at least another one of said plurality of wall sections comprising glass,

said second edges of said pair of splines slidably disposed within said first grooves of one said profile element of another, adjacent wall section, whereby,

the distance between adjacent ones of said wall sections is variable depending upon the disposition of and dimension of said splines within respective ones of said first grooves.

4,893,447

CYCLORAMA CONSTRUCTION

Ronald E. Opp, 12122 SW. Tualitan La., Beaverton, Oreg. 97005, and Frederick W. von Tagen, 1102 Schaeffer Rd., West Linn, Oreg. 97068

Filed Feb. 1, 1988, Ser. No. 150,839

Int. Cl.[4] E04B 1/32

U.S. Cl. 52—288 1 Claim



1. Coves for linear abutting installation between horizontal and vertical supports to provide curved surfaces therebetween, each of said coves comprising,

a curved sheet of concavo-convex shape having an upper edge and a lower edge parallel to one another and curved side edges, said sheet having a lower portion of increased thickness to support momentary loads applied thereto and to receive a cove anchoring device in a recessed and concealed manner, side flanges integral with the sheet along the curved side edges thereof, said side flanges adapted for abutment with and attachment to the side flanges of adjacent coves, said side flanges being truncated so as to terminate rearwardly from said lower edge of the sheet to permit said lower edge to rest on and be supported by the horizontal support,

at least one of the parallel edges having a flange therealong for securement to one of said supports, and

said curved sheet having concave recessed marginal areas contiguous with and extending the length of said curved side edges, said marginal areas of the sheet are for the reception of deposited cementious material so that the material will overlie abutting curved side edges of adjacent coves to conceal same.

4,893,448

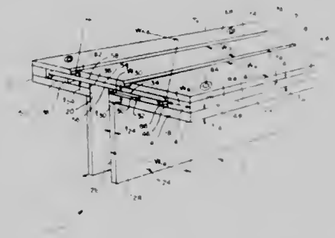
STEEL EXPANSION JOINT

Wilbert McCormick, 2039 Swanson Ave., Suite 2E, Lake Havasu City, Ariz. 86403

Filed Feb. 23, 1989, Ser. No. 313,856

Int. Cl.[4] E01C 11/12, 11/04

U.S. Cl. 52—396 10 Claims



1. An expansion joint structure for use in conjunction with a variable width expansion gap between two structural sections of a roadway, a bridge, a building or the like, which are subject to expansion and contraction due to temperature changes and the like, comprising:

(A) two monolithic steel L-shaped expansion joint structure portions, each being fixedly attached to an associated structural section of two structural sections which are spaced apart to define an expansion gap, each including

(1) a first leg having a bottom face in abutting contact with said associated structural section, a top face , a thickness dimension as defined between said first leg bottom face and said first leg top face, a first edge located adjacent to said expansion gap, a second edge located to be spaced from said expansion gap, and a width dimension as defined between said first leg first and second edges,

(2) a second leg having one edge attached to said first leg adjacent to said first leg first edge and extending into said expansion gap, said second leg including a rear surface in abutting contact with said associated structural section and a front surface facing into said expansion gap;

(B) two monolithic steel plate portions each including

(1) a first surface in abutting contact with an associated L-shaped portion first leg top surface, a top surface, a thickness dimension as measured between said plate portion top surface and said plate portion bottom surface, a first edge located adjacent to said L-shaped portion first leg first edge, a second edge located to be spaced from said plate first edge, and a width dimension as measured between said plate portion first edge and said plate portion second edge,

(2) fastening means fixedly attaching said each plate portion to said associated L-shaped portion first leg;

(C) two monolithic steel spacer plates each including

(1) a bottom surface in abutting contact with an associated one of said L-shaped plate portion first legs, a top surface, a thickness dimension as measured between said each spacer plate top surface and said each spacer plate bottom surface, a first edge located adjacent to said L-shaped portion first leg second edge, a second edge spaced from said each spacer plate first edge, a width dimension as measured between said each spacer plate first edge and said each spacer plate second edge,

(2) said each spacer plate second edge being spaced from a second edge of an adjacent plate portion to define a channel;

(D) a monolithic steel expansion gap spanner plate having a bottom surface slidably resting on said spacer plate top surfaces, a top surface and a thickness dimension as measured between said spanner plate top surface and said spanner plate bottom surface;

(E) said each spacer plate thickness being essentially equal to the combined thicknesses of said each plate portion and said expansion gap spanner plate whereby said expansion gap spanner plate top surface and said spacer plate top surfaces are essentially co-planar; and

(F) two monolithic steel cover plates, each including a bottom surface fixedly attached to a top surface of a spacer plate associated therewith and slidably resting on the top surface of said gap spanner plate adjacent to one edge of said expansion gap spanner plate, each of said cover plates extending over an associated channel of said channels to close both of said channels and engaging said expansion gap spanner plate to control movement of said expansion gap spanner plate.

4,893,449

REMOVABLE BRIDGE PROFILE FOR FLOOR JOINTS

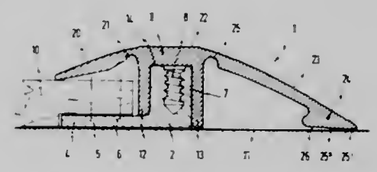
Hans A. Kemper, D-5883 Kierspe 1, Webestrasse 19, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,083

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743895

Int. Cl.[4] E04F 15/14

U.S. Cl. 52—464 9 Claims



1. Removable bridge profile for floor joints, in particular of parquet floors with different vertical position of the joint edges, consisting of an L-shaped base profile with a threaded drive channel projecting into the joint, at least one covering wing adjoining a center portion covering the joint and drive screws, wherein the improvement comprises a drive channel having a pair of vertical upstanding walls with planar outer vertical surfaces to form a vertical leg of said L-shaped base profile, and the lower side of the center portion comprises two parallel webs engaging over the planar outer vertical surfaces of the threaded drive channel.

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4,893,450

WATERTIGHT FASTENER

Barry G. Donaldson, Yorktown, N.Y., and Joseph H. Newman, West Orange, N.J., assignors to Tishman Research Corporation, New York, N.Y.

Filed Feb. 23, 1988, Ser. No. 159,108
Int. Cl.[4] E04B *2/72*; E04C *2/46*
U.S. Cl. 52—506 **15 Claims**



1. In combination:

(A) a prefabricated surround panel defining at the base thereof intermediate the front and back thereof a peripherally-opening groove; and

(B) a watertight fastener for mounting said surround panel on a wall comprising:

(i) a rigid support member having a mounting portion and a surround-receiving portion, said mounting portion being secured to the wall and said surround-receiving portion being within said peripheral groove of said surround panel; and

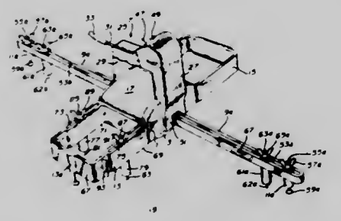
(ii) a unitary one-piece resilient seal member having an elongate body portion and a sealing portion, said body portion and said surround-receiving portion extending into said peripheral groove of said surround panel, said body portion having a first surface abutting a surface of said surround-receiving portion and a serrated second surface abutting a surface of said peripheral groove of said surround panel, and said sealing portion extending intermediate said surround panel and an adjacent surface to form a watertight seal therebetween.

4,893,451

APPARATUS FOR LAYING TILES

Pietro Valente, Windsor, Canada, assignor to Antonietta Investments Ltd., Windsor, Canada

Filed Sep. 17, 1987, Ser. No. 97,579
Claims priority, application Canada, Sep. 18, 1986, 518519
Int. Cl.[4] E01C *19/14*
U.S. Cl. 52—749 **8 Claims**



1. Apparatus for laying tiles on a surface in a predetermined arrangement, wherein each tile is laid individually at a given distance from neighboring, already laid tiles, which comprises an enclosure;

holding means mounted on said enclosure for holding a tile over a surface portion covered with an adhesive material, said surface portion being intended to receive said tile, said holding means further permitting said tile to contact said adhesive material;

a pair of extendable arms laterally extending from said enclosure on front and back sides thereof;

an adjustable leg at the end of each of said arms, wherein one of said adjustable legs is placed on a tile which has been laid while the other of said legs is directly placed on said surface portion;

joint spacers dependent from each of said arms and parallel with said legs for correctly spacing a tile relative to adjoining tiles so as to form a joint of predetermined width between adjoining tiles;

vibration means associated with said enclosures and operative when said tile is in contaCt with said surface portion covered with said adhesive material, said vibration means causing said tile to become embedded in said adhesive material and become fixed on said surface portion; and

releasing means enabling said holding means to release said tile after said tile has been fixed on said surface portion.

4,893,452

METHOD FOR MAKING A TAMPER-EVIDENT, DIFFERENTIAL PRESSURE-THERMOFORMED LIDDED PLASTIC CONTAINER

Robert Bruce, and Robert W. Whitney, both of Litchfield, Ill., assignors to CPC-Rexel, Inc., St. Louis, Mo.

Division of Ser. No. 81,695, Aug. 4, 1987, Pat. No. 4,836,407.
This application Nov. 15, 1988, Ser. No. 275,729
Int. Cl.[4] B65B *7/28*, *61/18*
U.S. Cl. 53—420 **23 Claims**



1. A method for making a tamper-evident lid for a container body having an upstanding peripheral sidewall providing a mouth defined at least in part by a rim having an outer portion which projects downwardly and terminates in a lower end, comprising:

providing a sheet of thermoplastic resin;

differential pressure-thermoforming a site on said sheet to provide a potential lid having a central disk-shaped portion perimetrically surrounded by an inverted U-shaped channel portion having a radially inner wall, a top wall and a radially outer wall;

providing a circumferentially extending radially inwardly convex bulge in said radially outer wall of said U-shaped channel portion at an axially intermediate level thereon;

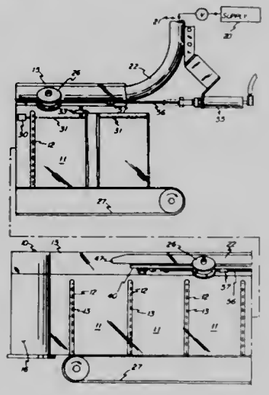
while supporting said U-shaped channel portiou against axial collapse, mechanically compressing said radially outer wall below said convex bulge axially towards said top wall and thereby telescoping and permanently deforming said convex bulge to provide a barb which projects inwardly towards said inner wall of said U-shaped channel portion sufficiently to catch under said lower end of said rim, when said channel portion is pushed onto said container body so as to enclose said rim from above, with sufficient interference as to normally prevent non-destructive removal of said channel portion from said container body.

4,893,453

PACKAGING SYSTEM AND METHOD

Roy J. Welkert, c/o Asepak Corporation, 1915 E. Simpson Ave., Suite #1, Fresno, Calif. 93703-1043

Filed Jan. 24, 1989, Ser. No. 301,197
Int. Cl.[4] B65B *3/04*, *7/06*, *43/52*
U.S. Cl. 53—469 **9 Claims**



9. The method of packaging fluent material in successive pouches of material which comprises the steps of:

(a) supplying a continuous web of pouches consisting of a closed tube having upper and lower edges and spaced seam lines extending upwardly to a level spaced from said tube upper edge to form a series of pouches which are interconnected at the tops thereof by an integral tubular portion of said web and which are individually open to said tubular portion but are sealed from each other by said seam lines extending along the adjacent sides thereof,

(b) inserting in said tubular portion an elongated filling pipe having a discharge end provided with two outlet ports in the underside thereof,

(c) drawing said web along said pipe with said pipe received in said tubular portion thereof,

(d) continuously supplying material to be packaged to said pipe for discharge therefrom through said outlet ports,

(e) alternately opening and closing said outlet ports in timed relation with said drawing movement of said web whereby each of said ports is open only when one of said pouches is passing thereunder and is closed when one of said seam lines is thereunder, and

(f) containing said material in each of the resulting filled said pouches by sealing said tube along a line intersecting said seam lines adjacent the upper ends thereof.

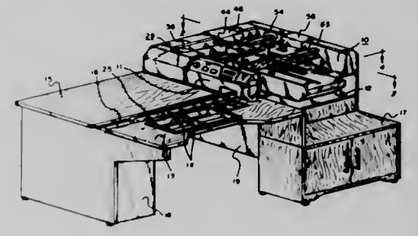
4,893,454

ENVELOPE OPENING MACHINE AND METHOD

Robert J. Russell, Marlton, N.J., assignor to Comtrex Systems Corporation, Moorestown, N.J.

Filed May 6, 1988, Ser. No. 191,952
Int. Cl.[4] B65B *43/30*
U.S. Cl. 53—492 **22 Claims**

1. The method of facilitating the extraction of the contents of envelopes which have been opened on three sides comprising: providing at least a partial crease in at least one envelope panel along a line generally between the opened edges of



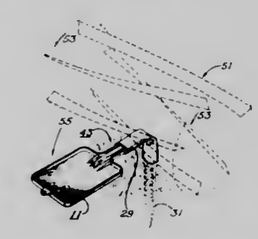
the envelope to deform the envelope panel to leave the contents of the envelope exposed for easy extraction.

4,893,455

BENDABLE MARKER AND METHOD OF MARKING

Robert K. Hughes, Fort Meyers, Fla., assignor to Hughes Enterprises, Ft. Worth, Tex.

Division of Ser. No. 190,482, May 5, 1988, Pat. No. 4,862,823.
This application Apr. 24, 1989, Ser. No. 342,168
Int. Cl.[4] A01D *45/00*
U.S. Cl. 56—1 **3 Claims**



1. A method of mowing grass with a grass mower in the vicinity of a post, comprising the steps of:

providing the post with a shaft with an upper end and a lower end;

providing the post with a stake with an upper end;

providing the post with a flexible elastomeric element with an upper and lower end;

coupling said lower end of said shaft to said upper end of said flexible element;

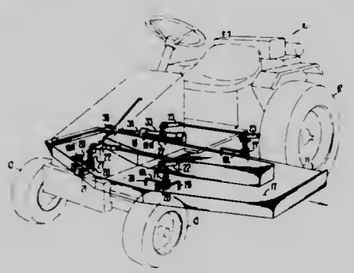
coupling said upper end of said stake to said lower end of said flexible element;

inserting said stake into said grass area at said selected location to a depth that positions the top of said stake substantially level with the surface of said grass area and positions a lower portion of said elastomeric element below the surface of said grass area; and

passing said grass mower over said stake, contacting said shaft with the grass mower and bending said shaft downward at said elastomeric element into a position substantially flat on the grass area.

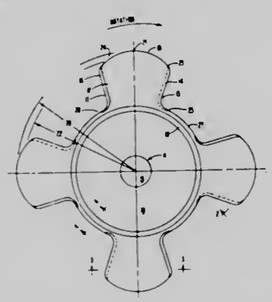
VOL 1110 ISS 3 JA 16 1990 UMI

4,893,456
TRACTOR WITH SHIFTABLE MOWING DECK
Robert H. Wallace, 136 Greenwood Dr., Cumming, Ga. 30130
Filed Apr. 21, 1988, Ser. No. 184,114
Int. Cl.[4] A01D *34/64*
U.S. Cl. 56—15.5 6 Claims



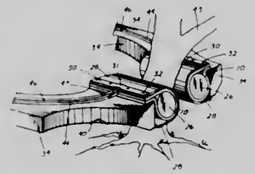
1. Mowing machine comprising:
a vehicle including front wheels and rear wheels for traversing a selected path;
mowing means supported by the vehicle at a longitudinal location between the front and rear wheels, and operative to mow a swath as the vehicle travels along the path;
motive means operatively associated with the mowing means to shift the mowing means laterally between a first lateral position and a second lateral position longitudinally located between the front and rear wheels, relative to the selected path,
the mowing means in the first lateral position being substantially centered relative to the vehicle wheels, and in the second lateral position extending laterally beyond the vehicle wheels alongside the vehicle to displace the mowing swath relative to the path traveled by the vehicle.

4,893,457
SAFETY BLADE FOR ROTARY GRASS TRIMMERS
Joseph S. Castain, 771 N. Market St., Opelousas, La. 70570
Filed Oct. 28, 1988, Ser. No. 264,075
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—295 6 Claims



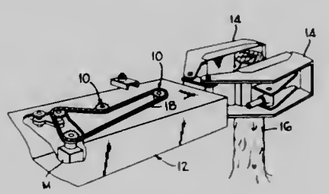
1. A safety blade for use with rotary grass trimmers for cutting grass and weeds around sidewalks, curbs, fence posts, other unyielding objects and loose debris, such as gravel, twigs and stones, comprising:
(a) a disc shaped body;
(b) a means for attaching said body at its center to the shaft of a rotary trimmer for rotation of said blade in a spinning manner;
(c) a plurality of vanes mounted to said body and extending radially from the center of said body, each vane being uniformly separated spacedly from the other and having a leading edge in the direction of rotation of said blade said leading edge having a proximal end and a distal end;
(d) a curved rounded outside radial edge for each vane adjacent to said leading edge having a varying radius along said radial edge from the center of said body, said varying radius being a minimum where said outside radial edge and said leading edge meet so as to allow said rounded outside radial edge to bump against said unyielding objects and loose debris as the blade rotates, nudging said blade away from the unyielding object and loose debris; and
(e) a cutting area along said leading edge of each vane for cutting grass and weeds coming between said vanes during rotation, said cutting area being upwardly beveled to eliminate lifting and throwing of loose debris by the spining blade;

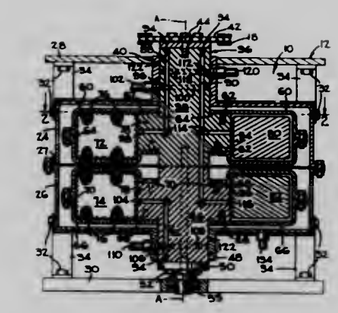
4,893,458
LIQUID COOLED SHAKER PAD RETAINING SLING
Ira Compton, 2434 Dayton Rd., Chico, Calif. 95928
Filed Jan. 27, 1988, Ser. No. 148,919
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.
Int. Cl.[4] A01D *46/26*
U.S. Cl. 56—340.1 9 Claims



1. A shaker sling for mounting a shaker pad on a shaker arm of a fruit tree shaking harvester machine, with said sling being liquid cooled to reduce the frequency of required greasing, comprising:
a substantially flat rectangular-shaped panel structured of at least two members of flexible but firm synthetic rubber material fastened one on top of the other;
said panel provided with at least one fluid circulating channel manufactured into at least one of said two members;
said panel provided with fluid inflow and outflow apertures in communication with said fluid circulating channel;
said fluid circulating channel sufficiently of a closed nature to be charged with and retain a liquid coolant;
a fluid inflow tube attached to said inflow aperture at one end, the opposite end of said fluid inflow tube attached to a liquid cooling means for cooling said liquid coolant;
a fluid outflow tube attached to said outflow aperture at one end, the opposite end of said fluid outflow tube attached to said liquid cooling means;
means for causing said liquid coolant to course directionally from said liquid cooling means through said fluid inflow tube, through said fluid circulating channel and return to said liquid cooling means through said fluid outflow tube;
means for attaching said panel to said shaker arm of said harvester machine with said panel wrapped around and retaining said shaker pad.

4,893,459
VARIABLE FORCE SHAKER
Franklin P. Orlando, Morgan Hill, Calif., assignor to FMC Corporation, Chicago, Ill.
Filed Jul. 11, 1988, Ser. No. 217,260
Int. Cl.[4] A01D *46/00*
U.S. Cl. 56—340.1 15 Claims





1. A variable force shaking head comprising:
means for rotating an eccentrically weighted member about a shaft having an axis;
means for supporting a movable weight on said eccentrically weighted member, and
means for movign said movable weight about said axis between a position in balance with said eccentrically weighted member for precluding shaking about said axis, and a plurality of selected unbalanced positions about said axis to impart a shaking action of different insensities to said shaft.

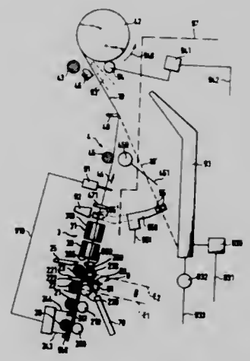
4,893,460
BELT TYPE SPINDLE DRIVE FOR TEXTILE MACHINES
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany
Filed Jan. 26, 1989, Ser. No. 302,449
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802200
Int. Cl.[4] D01H *1/241*; F16H *7/02*
U.S. Cl. 57—105 19 Claims

1. A belt type spindle drive apparatus for textile machines of the type having a plurality of simultaneously driven aligned spindles arranged in at least one row, comprising:
an endless belt extending along said spindles in driving engagement therewith;
a plurality of belt driving devices, each belt driving device including
a drive roller offset from said aligned spindles and around which said belt is trained for driving said belt,
a drive motor for drivingly rotating said drive roller,
an input guide roller intermediate the ends of said row of spindles for guiding said belt from driving alignment with a spindle in said row to said drive roller, and



an output guide roller intermediate the ends of said row of spindles for guiding said belt from said drive roller into driving engagement with a spindle in said row.

4,893,461
PROCESS AND DEVICE FOR PIECING WITH A SPINNING DEVICE OPERATING WITH A PNEUMATIC TWISTING UNIT
Peter Artzt; Harald Dallmann, both of Reutlingen; Kurt Ziegler, Kirchheim-Nabern, and Gerhard Egbers, Reutlingen, all of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany
PCT No. PCT/DE88/00106, § 371 Date Dec. 22, 1988, § 102(e) Date Dec. 22, 1988, PCT Pub. No. WO88/06650, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 2, 1988, Ser. No. 272,990
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706728
Int. Cl.[4] D01H *15/00, 15/02, 5/28*
U.S. Cl. 57—261 69 Claims



1. Process for piecing with a spinning device operating with a pneumatic twisting unit downstream from drawing equipment having at least one pair of output rollers on an output side thereof, so that a yarn end is back-fed from the output side of the twisting unit through the twisting unit to the drawing equipment and is then inserted laterally into the pair of drawing equipment output rollers, from where it is subsequently drawn off through the twisting unit in the form of a continuous

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yarn while a rove is incorporated into it, such process including conveying the yarn end through the twisting unit located after the pair of drawing equipment output rollers to the twisting unit input side, seizing the yarn end there at such unit input side and conveying the yarn end to a grasping device located at the side of the drawing equipment, which grasping device then pulls the yarn end past the drawing equipment for subsequent insertion into the pair of output rollers.

19. Device for piecing on a spinning apparatus equipped with a pneumatic twisting unit, situated downstream from a pair of output rollers of drawing equipment, comprising a back-feeding element to back-feed a free yarn end from the output side of the twisting unit to its input side, a grasping device to pull back the yarn end from the input side of the twisting unit past said pair of drawing equipment output rollers until it is at the side of the drawing equipment, and a yarn presenting device for seizing the yarn end emerging from the input side of the twisting unit during back-feeding and for conveying it to said grasping device.

4,893,462

OPEN-END SPINNING MACHINE AND PROCESS FOR THE START-UP OF SUCH A DEVICE

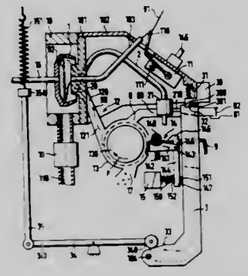
Erwin Braun, and Eberhard Grimm, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Aug. 3, 1988, Ser. No. 227,816

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726531

Int. Cl.[4] D01H *7/885, 15/02*

U.S. Cl. 57—302 **30 Claims**



1. An open-end spinning machine, having a plurality of open-end spinning devices, each of which has an open-end spinning rotor and means to clean the inner surface of said rotor with a compressed air current when said device stops for piecing a broken end, said cleaning means having a cleaning conduit for directing said current of compressed air onto the inner surface of said rotor, said conduit being connected to a pressurized source of air and to pressure control means for alternating the pressure of the air in said cleaning conduit, said pressurized source comprising:

(a) a main conduit connected to each of the cleaning conduits of said open-end spinning devices to convey compressed air from said source to said cleaning conduits; and

(b) stop valve means disposed in each of said cleaning conduits for selectively directing a current of said compressed air onto the inner surface of the rotor of selected open-end spinning devices to dislodge fibers from said inner surface and to clean said rotor.

4,893,463

PRICKLE CHAIN DEVICE AND METHOD OF PRODUCTION THEREOF

Lyell J. Woolford, P.O. Box 66, Kimba 5641. South Australia, Australia

Filed Sep. 22, 1988, Ser. No. 247,932

Int. Cl.[4] B21L *1/00*

U.S. Cl. 59—27 **6 Claims**



6. A method of producing a link of a chain, comprising engaging an intermediate portion of a rod with the primary links of two rod engaging means each of which comprises a primary link, an outer link, pivot means joining the primary and outer links, and a piston/cylinder assembly operatively coupled to one end of the outer link,

actuating both said piston/cylinder assemblies simultaneously to form the rod to a "U" shape,

inhibiting further movement of the primary links when the rod is of said "U" shape, but continuing actuation of the piston/cylinder assemblies to continue movement of the outer links and thereby deform the projecting portions of the "U" shape rod to cross one another and project outwardly from one another.

4,893,464

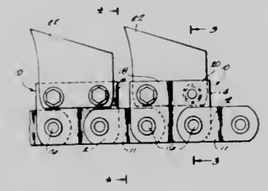
OFFSET ATTACHMENT SIDEBAR CHAIN

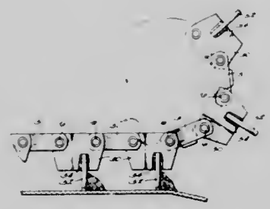
John H. Thuerman, West Allis, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.

Filed Dec. 2, 1988, Ser. No. 279,528

Int. Cl.[4] F16G *13/06*

U.S. Cl. 59—78 **21 Claims**





1. An offset sidebar chain comprising:

pairs of offset sidebars having heights perpendicular to the direction of chain travel when said chain is in use, at least one pair of offset sidebars of the chain having an extended height and each of the sidebars including a first portion having opposite ends, each of said pairs of sidebars having a forward end adapted to be connected by a chain pin to a preceding pair of sidebars and a rearward end adapted to be connected by another chain pin to a trailing pair of sidebars, and said pair of extended height sidebars each including an extended height portion having structure for supporting a tool,

each sidebar of said pair of extended height sidebars including a continuous offset bend extending through the first portion thereof and continuing through the extended height portion thereof, such that both the first portion and the extended height portion include a continuous offset bend,

a tool fastened to said extended height portion of said pair of extended height sidebars.

4,893,465

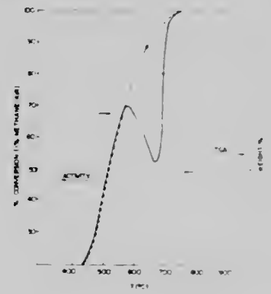
PROCESS CONDITIONS FOR OPERATION OF IGNITION CATALYST FOR NATURAL GAS COMBUSTION

Robert J. Farrauto, Westfield; Teresa Kennelly, Belle Mead, and Earl M. Waterman, Vallsburg, all of N.J., assignors to Engelhard Corporation, Edison, N.J.

Filed Aug. 22, 1988, Ser. No. 234,660

Int. Cl.[4] F23R *3/40*

U.S. Cl. 60—39.02 **19 Claims**



1. A process for starting a combustion system to catalytically combust carbonaceous fuels with air in a combustor in the presence of a palladium oxide containing catalyst, which comprises utilizing a flow of hot gases from a preburner to heat said catalyst to a first temperature in excess of the decomposition temperature of the catalyst, said decomposition temperature at atmospheric pressure being at least about 800° C., and thereafter reducing the flow of hot gases from the preburner while supplying air and fuel for combustion to the combustor downstream of said preheater, and thereafter restoring catalytic activity by lowering the temperature of the catalyst into a regenerating temperature range which at atmospheric pressure is from about 530° C. to about 650° C. and maintaining the temperature within that range until desired catalytic activity is achieved and thereafter maintaining the catalyst below about 800° C.

4,893,466

METHOD OF OPERATING A GAS TURBINE UNIT

Roland Egnell; Ben Kyrklund; Svante Stenfors, all of Finspang, Sweden, and Henrik Harboe, Copenhagen, Denmark, assignors to Asea Stal AB, Finspang, Sweden

Continuation of Ser. No. 43,967, Apr. 29, 1987, abandoned. This application May 15, 1989, Ser. No. 355,038

Claims priority, application Sweden, Apr. 29, 1986, 8602003

Int. Cl.[4] F02C *6/18*

U.S. Cl. 60—39.03 **1 Claim**



1. Method of operating a gas turbine unit for power generation on an electrical power grid for maximum efficiency minimizing polluting emissions and controlling accurately rotational speed within predetermined limits comprising a combustion chamber, a high pressure turbine, a high pressure compressor driven by said high pressure turbine, a low pressure turbine, said low and high pressure turbine being in fluid communication through adjustable flow control vanes and a low pressure compressor driven by said low pressure turbine, said high pressure and low pressure compressors being connected in series, the method comprising the steps of:

(a) supplying pressurized air from the compressors to the combustion chamber;

(b) adjusting the useful power of the gas turbine unit by controlling the gas condition upstream of the low pressure turbine;

(c) utilizing substantially all of the air delivered to the combustion chamber from the compressors for the combustion in the combustion chamber;

(d) cooling the gas generated in the combustion chamber by producing steam from water heated by the gas in a system separated from the gas to a temperature which corresponds to the maximum operating temperature of the high pressure turbine to limit formation of polluting emissions;

(e) utilizing the power of said steam in a steam turbine by said cooling of the generated gas;

(f) recovering the useful power of the gas turbine unit from the high pressure turbine;

(g) maintaining the temperature of the gas supplied to the high pressure turbine by controlling the heat supply to the gas generated in the combustion chamber independently of the useful power recovered from the gas turbine unit; and

(h) controlling the flow of gas between said high and low pressure turbines by adjustment of said flow control vanes to limit the rotational speed of the high pressure turbine to stall the rotor of the low pressure turbine.

4,893,467

CONTROL SYSTEM FOR USE WITH STEAM INJECTED GAS TURBINE

Carl W. Woodson, Ballston Lake, N.Y., assignor to Gas Research Institute, Chicago, Ill.

Filed Jul. 13, 1988, Ser. No. 218,680

Int. Cl.[4] F02C *3/30*

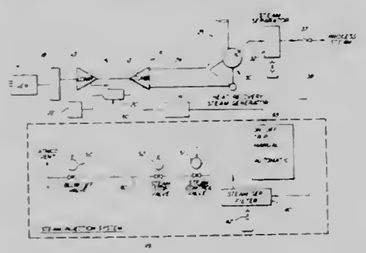
U.S. Cl. 60—39.3 **15 Claims**

1. In a gas turbine engine wherein a gas turbine is coupled to a compressor and the compressor provides air to the turbine

combustor, a steam injection system for delivering steam under pressure from a steam supply to the combustor that includes

an injection line for carrying steam from the steam supply to the combustor,

flow regulating means at the entrance to said injection line which opens at the beginning of a steam injection cycle to allow steam to flow to the combustor and closes at the end of said cycle to prevent additional steam from flowing to said combustor,



normally closed venting means connected into the injection line downstream from the flow regulating means which when opened vents the injection line to an area of lower pressure, and

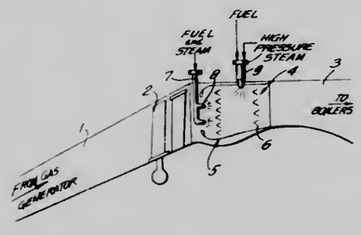
control means connected to said flow regulating means and said venting means for opening and closing the flow regulating means at the beginning and the end of a steam injection cycle and opening the venting means for predetermined period of time at both the beginning and the end of said steam injection cycle to purge said injection line.

4,893,468

EMISSIONS CONTROL FOR GAS TURBINE ENGINE

William R. Hines, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 30, 1987, Ser. No. 126,092
Int. Cl.[4] F02C *3/30*
U.S. Cl. 60—39.05 **31 Claims**



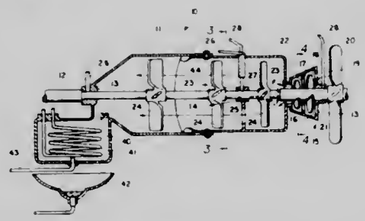
1. A method of controlling combustion emissions of a gas turbine engine including a main combustor operating at a first temperature to provide a gas stream, comprising the steps of locally burning portions of the gas stream at a temperature less than the first temperature in an emissions combustor to provide very hot locally heated portions of the gas stream, and thoroughly mixing the locally heated portions of the gas stream with those portions of the gas stream which are not locally burned and which are cooler portions of the gas stream, while propagating a resulting hot flame front over the gas stream flow to thereby reduce the carbon monoxide emissions.

4,893,469

STEAM AND COMBUSTION GAS ENGINE

Yasui Yamashita, 631 Park Ave., Hot Springs, Ark. 71901

Filed Jan. 7, 1988, Ser. No. 141,576
Int. Cl.[4] F01K *21/04*
U.S. Cl. 60—39.54 **7 Claims**



1. An internal combustion engine using a powdered biomass fuel to heat water into steam, including:

an expansion chamber containing a drive shaft, turbine blades affixed to said drive shaft;

a compression chamber disposed at a front end of said expansion chamber and having an air inlet, said compression chamber and said expansion chamber communicating through an aperture disposed between said expansion and compression chambers;

a combustion chamber laterally offset from said expansion chamber and communicating with said expansion chamber through one or more openings disposed between said expansion and combustion chambers;

supply and feed means delivering said powdered fuel into sid combustion chamber;

means to ignite said powdered biomass fuel within said combustion chamber;

means to spray water into said expansion chamber;

an exhaust chamber communicating with said expansion chamber and disposed at an end of said expansion chamber opposite said compression chamber; whereby
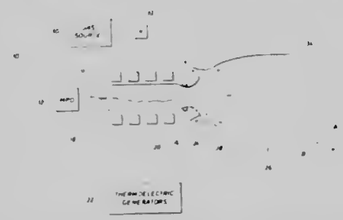
ignition of said powdered biomass fuel heats said water in said expansion chamber, converting said water into steam, which expands and turns said turbine blades and drive shaft, providing power.

4,893,470

METHOD OF HYBRID PLUME PLASMA PROPULSION

Franklin R. Chang, Webster, Tex., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 46,341, Apr. 13, 1987, Pat. No. 4,815,279, which is a continuation of Ser. No. 781,397, Sep. 27, 1985, abandoned. This application Sep. 23, 1988, Ser. No. 248,228
Int. Cl.[4] F03H *1/00*
U.S. Cl. 60—204 **9 Claims**



1. A method of adjusting the thrust of a propulsive vehicle in relation to the vehicle velocity to attain an optimal propulsive efficiency, comprising:

producing a hybrid plume having an axis, said hybrid plume being produced by generating a plasma,

enhancing the energy of the plasma,

radially containing and axially guiding the plasma by allowing the plasma to flow in only one axial direction,

producing a relatively lower energy neutral fluid flow,

introducing the relatively lower energy neutral fluid flow to the plasma so as to annularly surround the plasma and flow in the same axial direction, said hybrid plume also having a thrust, said thrust being characterized by a mean particle exit velocity,

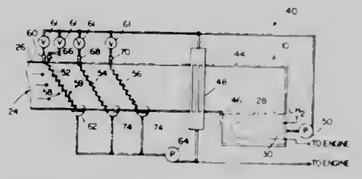
selectively varying the thrust of the hybrid plume and its mean particle exit velocity by controlling the mass rate of flow of the neutral fluid, thus selectively adjusting the mass flow rate of the hybrid plume, so that the magnitude of the mean particle exit velocity is near the magnitude of the vehicle velocity.

4,893,471

INLET AIR DEMOISTURIZING SYSTEM FOR A CRYOGENIC ENGINE AND METHOD FOR OPERATION THEREOF

Don W. Huling, King County, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 4, 1988, Ser. No. 176,848
Int. Cl.[4] F02K *9/42*
U.S. Cl. 60—204 **16 Claims**



11. A method for removing water from inlet air of a cryogenic engine of the type having an inlet for receiving gaseous air, an outlet for removing liquefied air, and a cross-flow heat exchanger therebetween for transferring heat energy from the gaseous air to a cryogenic fluid in the heat exchanger, comprising:

cooling the gaseous air below the freezing point of water prior to introduction of the gaseous air to the heat exchanger to precipitate water therefrom in the form of ice crystals;

trapping the ice crystals on a screen located between the inlet and the heat exchanger;

washing the screen with liquid air to remove the trapped ice crystals therefrom; and

collecting the liquid air and suspended ice crystals from the screen.

4,893,472

COLLAPSIBLE TUBULAR DIAPHRAGM FOR MASTER CYLINDER RESERVOIR

David C. Barker, Utica, and Keith V. Leigh-Monstevens, Troy, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Feb. 26, 1988, Ser. No. 161,010
Int. Cl.[4] B60T *11/26*
U.S. Cl. 60—562 **12 Claims**

10. A hydraulic apparatus comprising:

(A) a cylinder defining a pressure chamber and a reservoir port in communication with said pressure chamber;

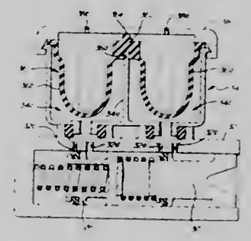
(B) a piston mounted for reciprocal movement in said pressure chamber;

(C) a reservoir mounted on said cylinder and including a closed end adjacent said reservoir port and an open end remote from said reservoir port; and

(D) a diaphragm of tubular configuration having an open end and a closed end;

(E) said diaphragm including an annular mounting portion adjacent its open end for mounting on the open end of said reservoir and a main body portion positioned within said reservoir and extending from said mounting portion to said closed end thereof so as to divide said reservoir into a liquid chamber outside of said diaphragm and in communication with said reservoir port and a gas chamber within said diaphragm;

(F) said reservoir including means venting the open end of said diaphragm to atmosphere so that said gas chamber is at atmospheric pressure;



(G) said main body portion including an annular lip portion for seating on the open end of said reservoir and a conical portion interposed between said lip portion and said main body portion and converging toward said closed end of said diaphragm;

(H) said main body portion maintaining a static system of balance between said liquid chamber and said gas chamber but including a series of axially extending circumferentially spaced flutes extending along said main body portion and a series of axially extending circumferentially spaced rounded ridges extending along said main body portion between said flutes and coacting with said flutes to form a series of radially extending arms arranged about the central axis of the diaphragm, said arms opening in said conical portion proximate the open end of said diaphragm and allowing said main body portion to move in response to wear and liquid leakage in the apparatus between expanded and collapsed conditions.

4,893,473

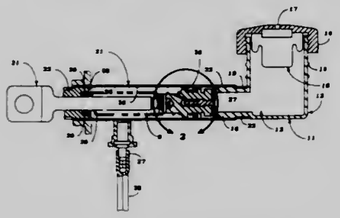
RESERVOIR-FORMED SHOULDER STOP FOR MAKEUP FLUID VALVE ACTUATION IN PULL-TYPE MASTER CYLINDER

Patrick H. Hool, St. Clair, and Glenn R. Gouldoni, Birmingham, both of Mich., assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jan. 21, 1988, Ser. No. 146,347
Int. Cl.[4] B60T *11/22, 11/28;* F15B *7/08*
U.S. Cl. 60—589 **11 Claims**

7. A fabricated master cylinder comprising a reservoir housing comprised of a first portion defining a cavity adapted to contain a fluid for makeup and a second projecting portion having an end surface, a second part having a generally cylindrical bore received upon and fixed to said projecting portion with said end surface extending into said cylinder bore and forming a shoulder therein, a piston slidably supported in said cylinder bore and dividing said bore into first and second chambers, means accessible externally of said cylinder bore for moving said piston to pressurize said first bore chamber, recuperation passage means extending through said piston between

said first and second second bore chambers, recuperation valve means supported within said piston for controlling the flow through said recuperation passage means, and means forming a



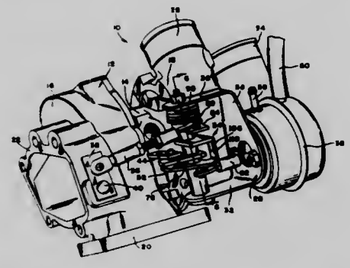
stop defined at least in part by said shoulder for holding said recuperation valve means in an opened position when said piston is at an at rest condition.

4,893,474

TURBOCHARGER WITH DUAL FUNCTION ACTUATOR

Charles D. Miller, Long Beach; Marian Janik, San Pedro, and Richard S. Tomoyasu, Terrance, all of Calif., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 25, 1988, Ser. No. 223,302
Int. Cl.[4] F02B *37/12*
U.S. Cl. 60—602 **18 Claims**



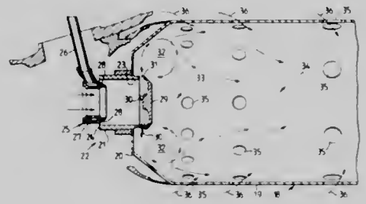
1. An exhaust gas driven turbocharger comprising a housing, a shaft rotatably mounted in said housing, a turbine wheel and a compressor wheel mounted in said housing on said shaft for rotation therewith, said housing defining a turbine inlet passage and a compressor inlet passage for communicating exhaust gas to said turbine wheel and ambient air to said compressor wheel respectively and further defining a turbine outlet passage and a compressor outlet passage for communicating exhaust gas and compressed air respectively from said housing a wastegate valve for venting said turbine inlet passage, a flow are control means for varying the flow area of said turbine inlet passage and actuable from a minimum flow area position to a maximum flow area position, a single pneumatic actuator responsive to the pressure level in said compressor outlet passage for sequentially operating both said flow area control means and said wastegate valve, said pneumatic actuator including an output member progressively actuated from a retracted to an extended position in response to successively increasing pressure levels in said compressor outlet passage, and linkage means connecting said output member to both said flow area control means and said wastegate valve, said linkage means including a bellcrank lever pivotally mounted on said housing for rotation about and axis and connected to said output member for rotation thereby as said output member is moved from said retracted to said extended positions, first lever means for operating said flow control means and second lever means for operating said wastegate valve, and control means interconnecting the bellcrank lever with each of said first and second lever means.

4,893,475

COMBUSTION APPARATUS FOR A GAS TURBINE

Jeffrey D. Willis, Coventry, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 108,912, Oct. 15, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 380,749
Claims priority, application United Kingdom, Dec. 10, 1986, 8629468
Int. Cl.[4] F23R *3/20*
U.S. Cl. 60—732 **9 Claims**



1. Combustion apparatus suitable for a gas turbine engine comprising a combustion chamber having a fuel burner at its upstream end, said fuel burner comprising a generally tubular member having an upstream end and a downstream end, said upstream end being positioned externally of said combustion chamber and said downstream end being positioned within said combustion chamber, fuel conduit means having a fuel outlet opening defined within said tubular member and in facing relation to the radially inner walls of said tubular member for directing fuel against said radially inner walls, compressed air inlet means for directing compressed air into said tubular member, said tubular member directing a mixture of said compressed air and fuel into said combustion chamber, the downstream end of said tubular member being provided with a deflection member which is so configured as to cooperate with said tubular member to define a generally annular radially directed outlet with respect to the axis of said tubular member for said mixture of fuel and air, said radially directed outlet being located immediately downstream of the upstream end of said combustion chamber so that said mixture of fuel and air is urged into a single substantially toroidal fuel rich vortex in a first combustion zone situated in the upstream region of said combustion chamber, said combustion chamber being provided with additional air inlets downstream of said burner to direct air into a second combustion zone in said combustion chamber downstream of said toroidal vortex so as to render said second combustion zone fuel weak.

4,893,476

THREE FUNCTION HEAT PUMP SYSTEM WITH ONE WAY RECEIVER

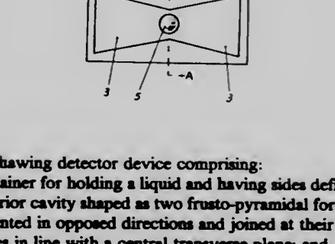
Willem Bos, Sacramento, and Martin Fasciullo, Rancho Cordova, both of Calif., assignors to Phenix Heat Pump Systems, Inc., Sacramento, Calif.

Filed Aug. 12, 1988, Ser. No. 231,454
Int. Cl.[4] F25B *7/00*
U.S. Cl. 62—79 **14 Claims**

10. A method of providing space heating, space cooling and domestic hot water in a reversible heat pump system with a one-way receiving having an inlet and an outlet, said system comprising the steps of:

directing compressed refrigerant serially through a domestic hot water heat exchanger to heat water in a domestic water tank;

selecting one of a space heating and space cooling mode; said space heating mode directing refrigerant serially from said domestic hot water heat exchanger through a thermal storage heat exchanger in a thermal storage tank to condense said refrigerant, said receiver inlet, said receiver outlet, and an external heat exchanger; said space cooling mode directing refrigerant serially from said domestic hot



water heat exchanger through said external heat exchanger to condense said refrigerant, said receiver inlet, said receiver outlet, and said thermal storage heat exchanger; and

preventing introduction of refrigerant into said receiver outlet from said thermal storage heat exchanger in said heating mode and from said external heat exchanger in said cooling mode. said receiver outlet, and said thermal storage heat exchanger; and

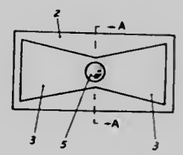
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4,893,477

FROZEN FOODSTUFFS THAWING DETECTOR DEVICE

Jose A. G. Vazquez, Pedroneras, 40, 28043 Madrid, Spain

Filed Dec. 7, 1987, Ser. No. 129,284
Claims priority, application Spain, Dec. 10, 1986, 8603349
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—125 **9 Claims**



2. A thawing detector device comprising:

a container for holding a liquid and having sides defining an interior cavity shaped as two frusto-pyramidal formations oriented in opposed directions and joined at their smaller bases in line with a central transverse plane; and

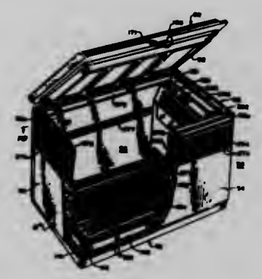
detection or marker means maintained on the central transverse plane by the freezing of the liquid contained in said container.

4,893,478

MODULAR REFRIGERATION APPLIANCE WHICH CAN BE ASSEMBLED AT A REMOTE LOCATION

Richard W. Kruck, Sodus Township, Berrien County; Ronald F. Iannelli, St. Joseph Township, Berrien County, and Kevin S. Lauadroche, Detroit, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 12, 1988, Ser. No. 217,963
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—126 **15 Claims**



1. A refrigeration appliance comprising

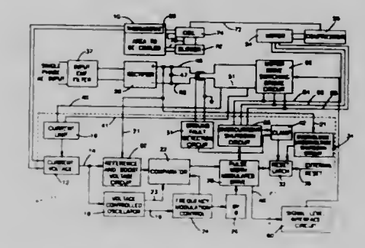
a plurality of side panels and a base panel each panel comprising a pair of spaced apart walls of plastic material which are sealed at the edges thereof to form a hollow panel, at least some of said side panels and said base panel each having a layer of insulation positioned between said spaced apart walls of the hollow panel, one of said side panels having a complete mechanical refrigeration unit positioned within the hollow panel formed by said spaced apart plastic walls thereof, each of said side panels and said base panel having cooperating means formed in the plastic walls of said hollow panel for interconnecting said side panels with said base panel and with each other, whereby said side panels may be readily assembled on said base panels without the use of tools by simple engagement of said interconnecting means to provide a refrigerated compartment.

4,893,479

COMPRESSOR DRIVE SYSTEM

Jimmie D. Gillett, Garland; Richard R. Garcia, Plano, and Charles B. Ingram, Coppell, all of Tex., assignors to Ranco Electronics Division, Irving, Tex.

Continuation of Ser. No. 28,309, Mar. 20, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 222,325
Int. Cl.[4] H02P *5/28*
U.S. Cl. 62—213 **16 Claims**

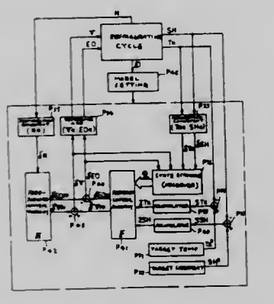


1. A compressor drive system comprising:

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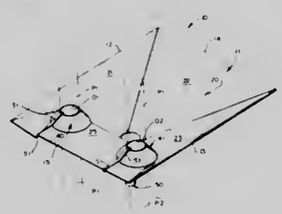
rectifier means for converting externally supplied single phase alternating current into direct current as an output;
temperature sensing means for producing a signal indicating ambient air temperature;
modulation control means for receiving the temperature signal and producing multiphase power and speed control signals;
motor drive switching bridge circuit means for modulating the rectifier output in accordance with the multiphase power and control output signals and producing multiphase power output at a voltage level and at a frequency in response thereto; and
a motor connected to receive the multiphase power output from the bridge circuit means and connected to drive an air conditioner compressor at a speed in accordance with the temperature signal.

4,893,480
REFRIGERATION CYCLE CONTROL APPARATUS
Katsumasa Matsui; Masahiro Ohba, both of Okazaki; Toru Kakehi, Nagoya, and Kazutoshi Nishizawa, Toyoake, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Mar. 11, 1988, Ser. No. 167,103
Claims priority, application Japan, Mar. 13, 1987, 62-59192; May 12, 1987, 62-115268; May 12, 1987, 62-115269
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—225 **22 Claims**



1. A control apparatus for a refrigeration arrangement including a heat exchanger and a compressor, the heat exchanger being disposed within an air duct having a downstream end opening into an interior of a vehicle, the compressor having a variable capacity, the control apparatus comprising:
(a) means for detecting a physical quantity related to a condition of heat exchange of the heat exchanger;
(b) means for setting a target value of the physical quantity;
(c) means for calculating a difference between the detected physical quantity and the target value;
(d) means for calculating a perturbation component of the detected physical quantity which is measured from a steady value of the physical quantity being predetermined relative to a dynamic model;
(e) means for calculating a perturbation component of the compressor capacity on the basis of the difference, the physical quantity perturbation component, and a feedback gain, formed as an optimal regulator based on dynamic models which represent a relationship among the compressor capacity and the physical quantity in terms of perturbation components measured from respective steady values occurring when the refrigeration cycle operates under the steady states;
(f) means for adding the compressor capacity perturbation component and a compressor capacity steady value being predetermined relative to the dynamic model;
(g) means for adjusting the compressor capacity to the output of the adding means; and
(h) means for changing the physical quantity steady value, the feedback gain and the compressor capacity steady value in accordance with a change in an operation condition of the refrigeration cycle, the physical quantity steady value, the feedback gain and the compressor capacity steady value being changeable among values predetermined for respective steady states.

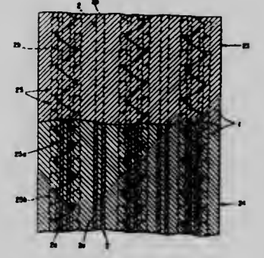
4,893,481
CONVECTOR TRAY
John T. Sullivan, 3910 Madison St., Hyattsville, Md. 20781
Filed Oct. 17, 1988, Ser. No. 258,920
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—291 **29 Claims**



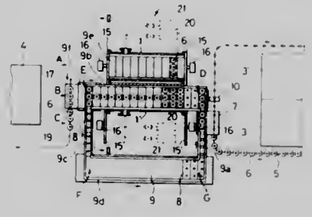
20. A convector tray comprising a one-piece generally homogeneous in situ molded polymeric/copolymeric material tray body defining an upwardly opening condensate chamber, said condensate chamber being defined by an upper surface and a lower surface, a spout projecting beyond said lower surface, a wall closing said spout at an end remote from said lower surface whereby upon the removal of said wall condensate deposited in said condensate chamber will be discharged therefrom through said spout, and means projecting above said upper surface and defining a removable access area through which a pipe conducting a heat exchange medium is adapted to pass.

4,893,482
WARP-KNITTING FABRIC WITH OBLIQUE AND DIAGONAL FILLING THREADS
Bertram Frenzel; Dietmar Grenzendorfer; Heinz Kemter; Wolfgang Wuensch, and Peter Zeisberg, all of Karl-Marx-Stadt, Fed. Rep. of Germany, assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.
Division of Ser. No. 61,254, Jun. 10, 1987, Pat. No. 4,841,747, which is a continuation-in-part of Ser. No. 14,152, Feb. 12, 1987, which is a continuation of Ser. No. 559,116, Dec. 7, 1983, abandoned. This application Mar. 14, 1989, Ser. No. 323,467
Claims priority, application German Democratic Rep., Feb. 28, 1983, 2483026
Int. Cl.[4] D04B *7/12*
U.S. Cl. 66—190 **9 Claims**

1. A warp-knit fabric, and especially a sewn-knitted fabric, comprising a plurality of filling-thread sections disposed in zigzag fashion with respect to each other, each filling-thread section being composed of a plurality of endless filling threads arranged parallel to each other within a filling-thread section, the endless filling threads of a filling-thread section being arranged obliquely and diagonally with respect to a boundary of said fabric, each filling-thread section being arranged obliquely and diagonally with respect to the boundary of said fabric at a different angle of slope than another filling-thread section, whereby adjacent filling-thread sections overlap one another, said filling-thread sections being secured to each other by stitch-forming warp threads.

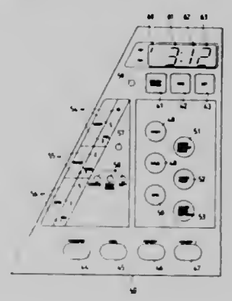


4,893,483
HEAT TREATMENT APPARATUS FOR BOBBINS OF YARN
Takuya Kawasaki, Takarazuka, and Osamu Kawakami, Amagasaki, both of Japan, assignors to Nikku Industry Co., Ltd., Itami, Japan
Filed Aug. 25, 1988, Ser. No. 236,224
Claims priority, application Japan, Sep. 18, 1987, 62-232391; Sep. 26, 1987, 62-239975
Int. Cl.[4] D06B *3/04*
U.S. Cl. 68—5 C **13 Claims**



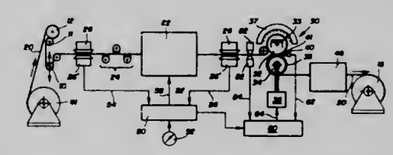
1. A heat treatment apparatus for bobbins of yarn, comprising
first and second heat treatment baths arranged parallel to each other and disposed between a spinning machine and a winding machine;
a conveyor line for supplying bobbins of yarn to be heat-treated from the spinning machine to said heat treatment baths, and another conveyor line for delivering heat-treated bobbins of yarn from said heat treatment bath, to the winding machine;
said heat treatment baths being movable in directions crossing the axial line of the spinning machine; and means provided for automatically alternating heat treatment of bobbins of yarn and replacement of bobbins in a manner such that while bobbins of yarn are heat-treated in either of said first and second heat treatment baths, replacement of heat-treated bobbins with bobbins to be heat-treated takes place in the other of said first and second heat treatment baths.

4,893,484
WASHING MACHINE
Toshihiro Takahashi; Hideyuki Tobita; Koichi Ito, and Shigeharu Nakano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 6, 1988, Ser. No. 254,230
Claims priority, application Japan, Oct. 12, 1987, 62-254538
Int. Cl.[4] D06F *33/02*
U.S. Cl. 68—12 R **6 Claims**



1. A washing machine comprising an instruction and control unit having a reservation function means for enabling performance of an at least one reserved washing operation in an order set in advance and at a time set in advance, a drive unit for energizing a load unit for an agitating means, a water supply valve, and a water discharge valve in accordance with an instruction from said instruction and control unit, and an automatic turning off power switch for connecting an alternating current power supply to said load unit and said drive unit, characterized in that
a contact of a relay is interposed between said load unit and said drive unit and said automatic turning off power switch, whereby said contact of said relay is kept open during a waiting period until said at least one reserved washing operation is to be started and said contact of said relay is closed in accordance with an instruction from said instruction and control unit at a start time of said at least one reserved washing operation, said contact of said relay automatically opening after said at least one reserved washing operation has been set in advance.

4,893,485
APPARATUS FOR THE CONTINUOUS APPLICATION OF TREATING LIQUOR ON AN ABSORPTIVE, COMPRESSIBLE MATERIAL WEB
Martin Schwemmer, Urdorf, and Albert Goetz, Linnaut, both of Switzerland, assignors to Triatex International AG, Switzerland
Division of Ser. No. 181,831, Apr. 15, 1988, Pat. No. 4,845,791. This application Feb. 7, 1989, Ser. No. 307,407
Claims priority, application European Pat. Off., Apr. 16, 1987, 87810240.9
Int. Cl.[4] D06B *23/00, 15/02*
U.S. Cl. 68—13 R **12 Claims**



1. An apparatus for the continuous and controlled treatment

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of an absorptive and compressible material web, said apparatus comprising:

means for advancing the web along a path;

an applicator device for applying liquor to the web while the web is advancing along said path;

two solid surfaces on said path and downstream from said applicator device, said solid surfaces forming a nip for equalizing the distribution of liquor applied to the web by redistributing liquor from regions of the web which contain relatively high amounts of liquor to regions of the web which contain relatively low amounts of liquor, without squeezing liquor out of the web; and

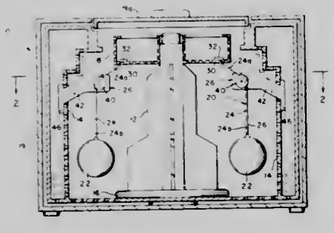
thickness adjusting means for adjusting and controlling the thickness of said nip by moving one of said solid surfaces with respect to the other.

4,893,486

FLOW-INTENSIFYING APPARATUS FOR CLOTHES WASHER

Guillermo Diaz, Dover, N.J., assignor to Agriworld Corp., Union, N.J.

Filed Jul. 19, 1989, Ser. No. 382,714
Int. Cl.[4] D06F *17/10*
U.S. Cl. 68—18 FA **26 Claims**



1. Flow-intensifying apparatus for use in an upright automatic clothes washing machine having a central vertically oriented agitator, a hollow cylindrical drum coaxially disposed about the agitator, and means for reciprocally rotating the agitator and the drum relative to each other about a vertical axis during the washing cycle, said flow-intensifying apparatus comprising:

(A) weighted means adapted to be disposed intermediate the agitator and the drum;

(B) non-extendible elongate means adapted to be operatively connected at one end to the agitator for movement therewith and at the other end to said weighted means for movement therewith;

(C) redirecting means adapted to be traversed by said elongate means and operatively connected to the drum for movement therewith so that the reciprocal relative rotation of the agitator and the drum causes a corresponding reciprocal vertical movement of said weighted means.

4,893,487

LOCKING DEVICE FOR BOAT MOTOR

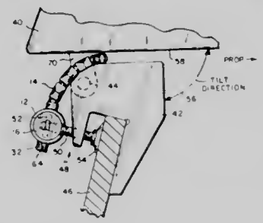
Todd W. Johnson, 3 Newtonville Ave., Newton, Mass. 02158

Filed Jun. 14, 1989, Ser. No. 366,674
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—58 **17 Claims**

1. A locking device for a motor mounted to a boat by at least one turnbolt, each turnbolt having a head and a shank, the motor having a prop and being moveable between an operative position with said prop in water and an inoperative position with the prop out of water, the locking device comprising:

a hollow tubular member which is sealed at one end and is normally open at the other end, a slot extended from the open end being formed in a side of said member, the length of said slot being greater than the spacing between the two most widely separated of said turnbolt shanks, the hollow portion of said member being large enough to permit the turnbolt heads to be fitted therein when said slot is fitted, open end first, over said shanks;

locking means for sealing the open end of said member when said member is positioned on said turnbolts; and



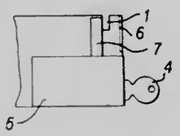
inhibit means cooperatively associated with said member and said locking means when said member is mounted on said turnbolts and sealed by the locking means for engaging the motor to prevent the motor from being moved from its inoperative to its operative positions.

4,893,488

MODULAR COMMUNICATIONS SOCKET LOCK

Edward Klein, 2 Professional Dr., Ste. 232, Gaithersburg, Md. 20879

Filed Mar. 2, 1989, Ser. No. 318,013
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—360 **7 Claims**



1. A device for locking and unlocking an unused modular communications socket, said device comprising a locking mechanism entirely inclosed in casing while in the unlocked position, said casing dimensioned to fit said communications socket and having opening in said casing positioned to allow sliding bolt mechanism to protrude from said opening in casing posterior to retention shoulder of said communications socket, preventing removal of said device in locked position, and allowing for unlocking of said device by repositioning bolt inside of casing allowing for the removal of said device from modular socket.

4,893,489

DRIVE SYSTEM FOR A BENDING MACHINE

Benjamin Mason, Newark, England, assignor to Caledonian Mining Company Limited, Great Britain

Continuation-in-part of Ser. No. 30,872, Mar. 26, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 170,138
Claims priority, application United Kingdom, Mar. 27, 1986, 8607806
Int. Cl.[4] B21D *5/14*
U.S. Cl. 72—8 **21 Claims**

1. A bending machine for bending a strip workpiece from a linear infeed configuration to a curved outfeed configuration, said machine comprising

at least three rollers oriented in a generally triangular pattern through which said strip workpiece is passed,

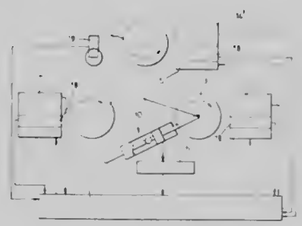
means for ascertaining the position of one of said rollers,

bi-directional means for adjusting that position, said bi-directional means permitting the roller position to be altered in two directions which are perpendicular one relative to the other,

means for measuring the speed of rotation of one of said rollers,

means for adjusting that speed,

means for measuring the torque applied to one of said rollers, and



a control system unit to which signals are fed from said position ascertaining means and from said speed measuring means, said control system unit being connected to said bi-directional means and to said speed adjusting means for adjusting the position and speed for the affected roller, a signal from said means for measuring the applied torque on the affected roller also being fed to said control system unit, said control system unit being connected to said means for adjusting the applied torque of that affected roller all so that commands may be given to vary these parameters in order to enhance the desired bending of a linear infeed workpiece into a curved outfeed workpiece.

4,893,490

DEVICE AND PROCESS FOR CONTROLLING THE EFFECTIVENESS OF PARTICLE HAMMERING OF THE INNER SURFACE OF A STEAM GENERATOR TUBE

Gerald Isnardon, Nanterre; Paul Jacquier, Tassin la Demi-Lune, and Lylvie Voisembert, Heyrieux, all of France, assignors to Framatome, Courbevoie, France

Filed Mar. 14, 1988, Ser. No. 168,059
Claims priority, application France, Mar. 13, 1987, 8703484
Int. Cl.[4] B23P *15/26*
U.S. Cl. 72—53 **8 Claims**

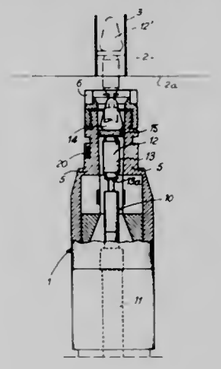
7. Process for controlling the effectiveness of particle hammering of the inner surface of a steam generator tube (3) set into a tube plate (2), the hammering being performed by means of a device comprising a tubular outer housing (5) having an end face (6) bearing on a face (2a) of the tube plate (2), around a flush end of the tube (3), and a tool comprising a nozzle (12) for projecting particles conveyed by a gas at high speed and fastened at the end of a flexible conduit which supplies said particles, said nozzle and conduit being (11) mounted for axial movement in the outer housing (5), said process comprising the steps of

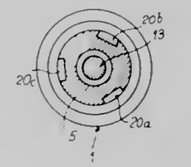
(a) moving the nozzle (12) for projecting the particles into a position inside the outer housing (5), after having performed the hammering in a tube (3);

(b) projecting at high speed a jet of particles suspended in the gas which is identical to the jet of particles which has performed the hammering of the tube (3) onto the inner surface of the outer housing (5);

(c) converting the ultrasonic waves due to the impact of the particles against the outer housing (5) into electrical signals;

(d) measuring the amplitude of the electrical signals produced by the impact of the particles; and





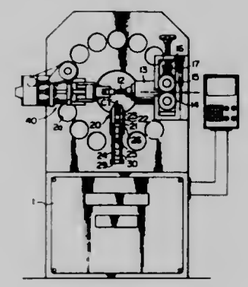
(e) using the measurement of the amplitude of the electrical signals to control the effectiveness of the hammering in the tube (3).

4,893,491

APPARATUS FOR FORMING COIL SPRINGS

Yozo Obdai, Kasugai; Norifumi Abiru, Owariasahi, and Eiji Ohbayashi, Kuwana, all of Japan, assignors to Asahi-Seiki Manufacturing Co., Ltd., Aichi, Japan

Filed Mar. 16, 1988, Ser. No. 169,048
Claims priority, application Japan, Mar. 30, 1987, 62-47491[U]
Int. Cl.[4] B21F *3/02, 35/02*
U.S. Cl. 72—137 **10 Claims**



1. An apparatus for forming a coil spring, comprising:

a quill having a longitudinal axis and a tip through which a wire to be formed into said coil spring is fed;

a tool assembly disposed opposite said quill and including a

tool operating support for slidable movement along the axis of said quill, an operating cylinder supported on said tool operating support for rotation about the axis of said quill, a tool holder supported on said operating cylinder for swinging movement about an axis perpendicular to the axis of said quill, a forming tool securely held at one end of said tool holder and having a forming surface, and an operating rod operatively connected to the other end of said tool holder and supported for forward and backward movements with respect to said operating cylinder along the axis of said quill;

first drive means for moving said operating support toward and away from said quill;

second drive means for rotating said operating cylinder about the axis of said quill with respect to said operating support;

third drive means for moving said operating rod to swing said tool holder between a first position at which said forming surface of said forming tool is located outside the axis of said quill and a second position at which said forming surface is located to confront said tip of said quill;

fourth drive means for feeding the wire through said tip of said quill; and

control means for controlling operation of said first, second, third and fourth drive means.

4,893,492

ROLL FORGING MACHINE AND METHOD

Mike B. Martincic, Mentor, Ohio, assignor to Ajax Manufacturing Co., Cleveland, Ohio

Filed Sep. 30, 1988, Ser. No. 251,517
Int. Cl.[4] B21B *39/24*
U.S. Cl. 72—188 49 Claims



1. In combination a roll forging machine comprising top and bottom roll forging dies forming side-by-side roll forging passes, a stock transfer comprising a grip head, means supporting said grip head on an X axis slide for movement aligned with the passes, means supporting said slide on a Y axis carriage for movement of the slide from pass-to-pass, motor means on said carriage driving a timing belt in the X direction, and means on said slide to grip said timing belt to cause said slide to move with said timing belt in the X direction.

4,893,493

MECHANICALLY POWERED CRIMPING TOOL

Serge Jacquet, 5142 Des Veterans, Lac Megantic, Quebec, Canada (G6B 2G5), and Roger Boulanger, 210 Rang des Grenier, Piopolis, Quebec, Canada (G0Y 1H0)

Filed Dec. 15, 1988, Ser. No. 284,571
Int. Cl.[4] B23P *11/00, 28/32*
U.S. Cl. 72—325 12 Claims

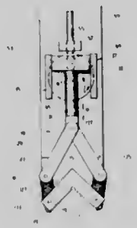
1. A mechanically powered tool comprising:

a crimping device capable of shearing tines out of an angle-bar used for protecting a corner formed by two wall panels and driving said tines into said panels for fixing said angle-bar thereto, said crimping device including a rectilinearly reciprocable actuating rod connected thereto and movable in a working stroke;

a movement-transforming device having an output section including a follower block displaceable in a rectilinearly reciprocable motion, said block being formed with an elongated open slot extending in a direction normal to said motion and being operatively connected to one end of said rectilinearly reciprocable actuating rod to displace said rod and said crimping device in said working stroke, said movement-transforming device further having a rotary input section;

a single-revolution clutch having a rotary shaft operatively connected to said rotary input section of said movement-transforming device, said clutch further having a rotary input section;

power means including a rotary member operatively connected to said rotary input section of said single-revolution clutch;



said output section of said movement-transforming device further comprises constraining means for constraining said follower block into said rectilinear reciprocable motion of said actuating rod; and

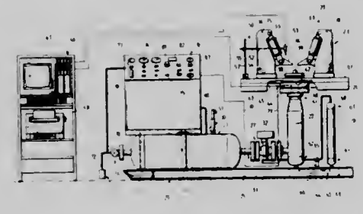
said rotary input section of said movement-transforming device comprises a disk fixed at the center thereof for rotation on an end of said rotary shaft of said clutch, and a roller mounted at the periphery of said disk, said roller being engaged in said open slot of said follower block, constructed so that, upon rotation of said disk, said roller moves back and forth in said slot and causes said follower block, said actuating rod and said crimping device to be displaced according to said stroke.

4,893,494

METHOD AND SYSTEM FOR TESTING SAFETY RELIEF VALVES

Waring F. Hart, Pearland, Tex., assignor to Management Services International, Inc., Houston, Tex.

Filed Mar. 31, 1988, Ser. No. 176,309
Int. Cl.[4] G01M *19/00;* G01L *27/00*
U.S. Cl. 73—4 R 12 Claims



1. A method for testing a safety relief valve comprising the steps of:

(a) disposing a first pressure vessel in fluid communication with a reservoir of high pressure fluid;

(b) disposing between the first pressure vessel and the reservoir, a first means for controlling the fluid flow between the first pressure vessel and the reservoir;

(c) maintaining the pressure of the high pressure fluid in the reservoir at a substantially greater pressure than the pressure in the first pressure vessel;

(d) disposing the safety relief valve in unrestricted fluid communication with a second pressure vessel; the second pressure vessel being disposed between the first pressure vessel and the safety relief valve, the first pressure vessel having a larger volume than the second pressure vessel;

(e) disposing between the first and second pressure vessels, a second means for controlling fluid flow between the first and second pressure vessels;

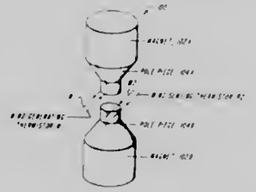
(f) metering high pressure fluid from the reservoir through the first and second pressure vessels and into the safety relief valve, by utilizing the fluid flow control means, to provide the necessary fluid pressure in the second pressure vessel to open the safety relief valve, and to provide a sufficient, variable volume of fluid through the safety relief valve to prevent the safety relief valve from simmering and damaging the safety relief valve upon closing.

4,893,495

OXYGEN SENSING METHOD AND APPARATUS

Emilio Meyer, Assago-Milan, Italy, assignor to Panametrics, Inc., Waltham, Mass.

Filed Oct. 3, 1988, Ser. No. 252,812
Int. Cl.[4] G01N *27/74*
U.S. Cl. 73—27 A 8 Claims



1. Apparatus for measuring the concentration of a paramagnetic gas in a gas mixture, comprising

magnetic field means for generating an inhomogeneous magnetic field,

magnetic wind generating thermistor means, including first and second electrically heated magnetic wind generating thermistors, said first and second magnetic wind generating thermistors having an electrical parameter proportional to temperature, said first and second magnetic wind generating thermistors being positioned inside said inhomogeneous magnetic field, for generating a magnetic wind in the presence of a paramagnetic gas, the magnetic wind having a magnitude proportional to concentration of the paramagnetic gas in the gas mixture,

magnetic wind sensing thermistor means, including first and second electrically heated magnetic wind sensing thermistors, said first and second magnetic wind sensing thermistors having an electrical parameter proportional to temperature, said first and second magnetic wind sensing thermistors positioned substantially outside said inhomogeneous magnetic field, for sensing the magnetic wind generated by said first and second magnetic wind generating thermistors in the presence of a paramagnetic gas, and

signal generating means, in electrical circuit with said magnetic wind generating thermistor means and said magnetic wind sensing thermistor means, for measuring said electrical parameter of said magnetic wind sensing thermistors and generating a measurement signal having an amplitude representative of the concentration of the paramagnetic gas in the gas mixture and proportional to the magnitude of the magnetic wind in the presence of the paramagnetic gas, said signal generating means including

a Wheatstone bridge having four branches, said four branches including said first and second magnetic wind generating thermistors and said first and second magnetic wind sensing thermistors, and

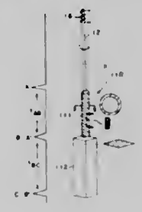
temperature control means for automatically maintaining said first and second magnetic wind generating thermistors and said first and second magnetic wind sensing thermistors at a substantially constant temperature.

4,893,496

TORSIONAL WAVE FLUID SENSOR AND SYSTEM

Haim H. Bau, Swarthmore; Jin O. Kim, Philadelphia, both of Pa.; Lawrence C. Lynnworth, Waltham, and Toan H. Nguyen, Needham, both of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Oct. 14, 1988, Ser. No. 257,714
Int. Cl.[4] G01N *9/24*
U.S. Cl. 73—32 A 46 Claims



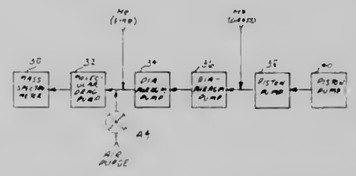
4. A sensor for sensing a physical property of a fluid, such sensor comprising a sensor body having at least a portion adapted for immersion in the fluid such that propagation of a torsional wave in said portion is modified by contact with the fluid, wherein a first part of said portion has a cross-sectional shape optimized to modify the propagation of said wave in functional dependence on a first property of said fluid, and a second part of said portion has a shape selected to modify the propagation of said wave in functional dependence on a second property of said fluid different from said first property.

4,893,497

LEAK DETECTION SYSTEM

Philip Danielson, 5620 Main St., Downers Grove, Ill. 60516

Filed Sep. 12, 1988, Ser. No. 193,810
Int. Cl.[4] G01M *3/20*
U.S. Cl. 73—40.7 19 Claims



1. In a leak-detection system for detecting leaks in vacuum vessels and containers, which system comprises helium-detection means for sensing the presence of helium, which helium is a probe gas injected into a vacuum vessel or container being tested for leaks, high-vacuum pump means connected to said helium-detection means for forming a high vacuum in said helium-detection means, means for directing helium probe gas from a leak to the outlet of said high-vacuum pump means, and support pump means connected to the outlet of said high-vacuum pump means for exhausting the system to the environmental surroundings, the improvement comprising:

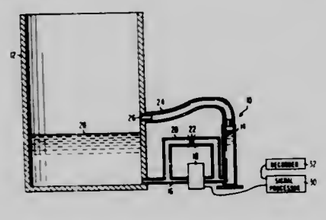
said high-vacuum pump means comprising a molecular drag pump having an inlet in fluid communication with the interior of said helium-detection means, and an outlet in fluid communication with said means for directing.

4,893,498

METHOD AND APPARATUS FOR DETECTING LIQUID LEAKS

Jay E. Jensen, Raritan, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 19, 1988, Ser. No. 183,121
Int. Cl.[4] G01M *3/32*
U.S. Cl. 73—49.2 **9 Claims**



1. A liquid leak detector for a storage tank, comprising:
(a) a vertically upright standpipe;
(b) means for connecting said standpipe to a storage tank at the bottom of the tank to fill the standpipe with the liquid in the tank to the same level as the liquid in the tank;
(c) a first pipe connected to said standpipe at its bottom and adapted to be connected to the tank at the bottom of the tank;
(d) a pressure transducer in said first pipe for measuring the pressure differential between the liquid in the tank and the liquid in the standpipe, said preasure transducer having an electrical output signal corresponding to the pressure differential; and
(e) a hose connected to the top of the standpipe and adapted to be connected to the tank above the level of the liquid in the tank;
wherein said means for connecting said standpipe to the tank is a second pipe connected to the standpipe and bypassing the transducer, said second pipe having a valve therein.

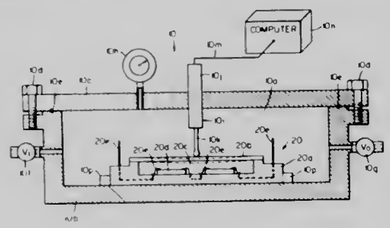
4,893,499

METHOD AND APPARATUS FOR DETECTING LEAKS IN IC PACKAGES BY SENSING PACKAGE DEFLECTIONS

Wilbur T. Layton, San Diego; Dale L. Robinson, Escondido, and Jerry L. Tustaniwskyj, Mission Viejo, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 5, 1988, Ser. No. 280,089
Int. Cl.[4] G01M *3/36*
U.S. Cl. 73—49.3 **7 Claims**

1. A method of detecting whether or not an enclosure of a package leaks above a certain minimum rate; said enclosure being filled with a first gas at a first pressure; and, said method including the steps of:
enveloping said package in a second gas at a second pressure;
measuring respective deflections, by a surface of said enclosure, at the start and end of a time interval during said enveloping step; and,
rejecting said package for having a leak if the difference between said respective deflections exceeds a certain limit; wherein,
said second gas is of a type which leaks into said enclosure faster than said first gas leaks out, said second preasure is larger than said first preasure, and said time interval is substantially shorter than one during which respective deflections occur that differ by said limit under the conditions where said package has said minimum leak rate and is enveloped by said first gas at said second pressure.

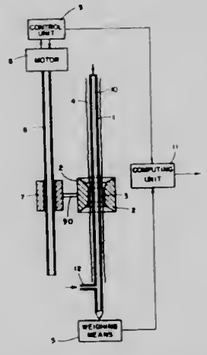


4,893,500

METHOD OF MEASURING THE FLOW PROPERTIES OF HIGH VISCOSITY FLUIDS AS WELL AS A DEVICE FOR CARRYING OUT THE INVENTIVE METHOD

Paul Fisk-Jensen, Copenhagen, Denmark, assignor to Reciprotor A/S, Farum, Denmark

Filed Sep. 19, 1988, Ser. No. 246,508
Int. Cl.[4] G01N *11/10*
U.S. Cl. 73—60 **12 Claims**



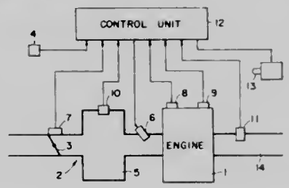
1. A device for measuring the flow properties of preferably high viscosity fluids, said device comprising a rod and a ring movably borne around said rod, a gap being provided between the rod and the ring for receiving the fluid whose viscosity is to be measured, said device further comprising a first measuring unit for measuring the shear force imparted to the fluid by the mutual displacement of the rod and the ring, and a second measuring unit for measuring the relative velocity of the ring and the rod, wherein moving means are provided for imparting a controlled movement to the ring with respect to the the rod.

4,893,501

THROTTLE VALVE OPENING DEGREE DETECTING SYSTEM FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Yoshiyuki Sogawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,691
Claims priority, application Japan, Nov. 24, 1987, 62-296996
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **2 Claims**



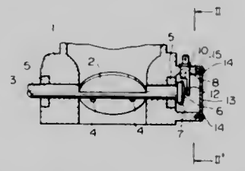
1. A throttle valve opening degree detecting system for controlling an internal combustion engine comprising:
a throttle sensor for detecting a throttle valve opening degree;
a plurality of switch means;
a plurality of resistors each coupled to a corresponding one of said plurality of switch means, said plurality of resistors being adapted to be connected in parallel with said throttle sensor; and
control means for supplying a control signal to turn on and off said plurality of switch means;
whereby said plurality of switch means are selectively turned on and off in response to said control signal from said control means to variably set the output voltage characteristic of said throttle sensor;
said cootrol means changes the on/off state of said control signal in accordance with the engine speed.

4,893,502

ANGLE SENSOR FOR THROTTLE VALVE OF INTERNAL COMBUSTION ENGINE

Masanori Kubota, Nakaminato; Sadayasu Ueno; Kanemasa Sato, both of Katsuta, and Kiyoshi Misra, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

Filed Aug. 3, 1988, Ser. No. 227,647
Claims priority, application Japan, Aug. 3, 1987, 62-192649; Mar. 30, 1988, 63-74338
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **20 Claims**



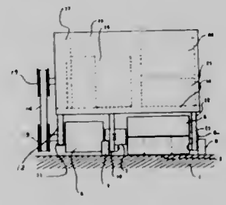
16. An angle sensor for a throttle valve of an internal combustion engine, comprising:
a permanent magnet for generating a magnetic field, said permanent magnet being disposed at one end of the shaft of the throttle valve so as to move in a plane substantially transverse to the axis of said throttle valve shaft with the rotation of said throttle valve shaft;
a throttle body accommodating said throttle valve;
a cavity formed as an integral part of said throttle body to freely rotatably accommodate said permanent magnet and communicating with a bore through which said throttle valve shaft extends;
a magneto-sensitive element disposed in said cavity with its detecting surface in a plane substantially transverse to the axis of said throttle valve shaft and in a relation substantially facing the maagnetic-flux appearing surface of said permanent magnet and being spaced apart from said magnetic-flux appearing surface of said permanent magnet by a varying gap so as to detect a change in the magnetic flux density as a result of the change in said gap with rotation of said permanent magnet; and
an electrical circuit receiving and amplifying the output of said magneto-sensitive element so as to convert the detected change in said magnetic flux density into a corresponding change in an electrical signal.

4,893,503

METHOD OF MEASURING ADHESIVE STRENGTH OF ADHESIVE SHEET AND APPARATUS FOR IMPLEMENTING THIS METHOD

Akira Kimura, Saita, and Osamu Tomita, Osaka, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Tokyo, Japan

PCT No. PCT/JP87/00274, § 371 Date May 17, 1988, § 102(e) Date May 17, 1988, PCT Pub. No. WO88/02484, PCT Pub. Date Apr. 7, 1988
PCT Filed Apr. 30, 1987, Ser. No. 208,417
Claims priority, application Japan, Sep. 27, 1986, 61-228040
Int. Cl.[4] G01N *19/04*
U.S. Cl. 73—150 A **5 Claims**



1. A method of measuring an adhesive strength comprising the steps of:
keeping the peripheral surface of a pickup roller at a level slightly heightened from the surface of a substrate adhered with an adhesive sheet such that the uppermost portion of the peripheral surface of said of pickup roller faces the top surface of said adhesive sheet on the substrate, by contacting an auxiliary roller projecting from a machine frame with the surface of a substrate;
securing the tip end of either the adhesive sheet or a lead-in tape leading said adhesive sheet to engaging means of said pickup roller;
setting a specific peeling angle for peeling said adhesive sheet from the surface of said substrate;
pulling said adhesive sheet by rotating said pickup roller at a constant speed while maintaining the set angle;
peeling off said adhesive sheet from said substrate, and subsequently winding it onto said pickup roller;
detecting the torque of said pickup roller by means of a torque detector; and
displaying and/or recording adhesive-strength of said adhesive sheet to said substrate based on signals output from said torque detector.

5. An adhesive-strength measuring apparatus comprising: a pickup roller which is provided with engaging means for engaging a free end of either an adhesive sheet with which the surface of a substrate is adhered, or a lead said adhesive sheet, said egaging means being substantially groove which makes up

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an acute angle against the tangent of the circumference of said pickup roller on the extended side from said adhesive sheet at the engaging point in order that either said adhesive sheet or lead-in tpae can securely be engaged by means of inserting a head chip secured to tip end of said adhesive sheet or lead-in tape into said groove;

a plurality of auxiliary rollers for contacting the surface of the substrate adhered with said adhesive sheet to keep the peripheral surface of said pickup roller at a level slightly heightened from the surface of said substrate such that the undermost portion of the peripheral surface of said pickup roller faces the top surface of said adhesive sheet on the substrate;

drive means for said pickup rotating roller at a constant speed;

torque detection means for generating output signals by detecting the torque of said pickup roller; and

display means for displaying adhesive strength of said adhesive sheet to said substrate based on the output

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4,893,504

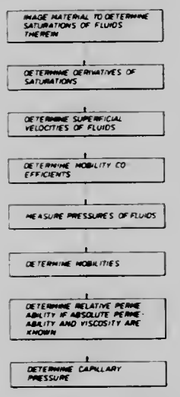
METHOD FOR DETERMINING CAPILLARY PRESSURE AND RELATIVE PERMEABILITY BY IMAGING

Daniel J. O'Meara, Jr., and Harold J. Vinegar, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 881,159, Jul. 2, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 222,878

Int. Cl.[4] E21B *49/02*

U.S. Cl. 73—153 9 Claims



1. A method for determining at least one preselected petrophysical property of a material having determinable porosity parameters and determinable absolute permeability parameters and/or of preselected fluids having determinable viscosity parameters contained therein, comprising:

imaging a preselected volume of such material to determine the saturations of such fluids in said preselected volume,

determining time and spatial derivatives of said determined saturations

determining superficial velocities of such fluids, and

determining said at least one petrophysical property.

4,893,505

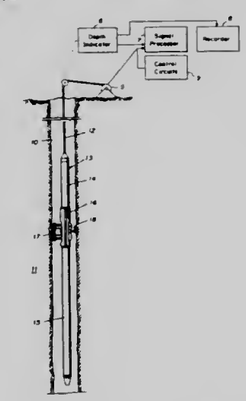
SUBSURFACE FORMATION TESTING APPARATUS

Michael J. Marsden, Houston, and Wade M. Johnson, Jr., Cypress, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Mar. 30, 1988, Ser. No. 146,489

Int. Cl.[4] E21B *47/06*

U.S. Cl. 73—155 29 Claims



1. Apparatus for obtaining temperature corrected pressure measurement characteristics of a connate fluid sample from subsurface earth formations traversed by a borehole, comprising:

a body member for positioning in a borehole;

a sample probe cooperatively arranged on and extensible from said body member into the earth formations;

pressure sensing means coupled to said sampling probe for measuring the pressure of a connate fluid sample from said earth formations, said pressure sensing means including a first strain gauge pressure transducer pressure sensor for generating a first pressure measurement and a second pressure sensor for generating a second pressure measurement;

temperature sensing means coupled to said sampling probe for simultaneously measuring the temperature of said connate fluid sample from said earth formations; and

means for correcting the first and second pressure measurements as a function of said temperature measurement.

4,893,506

METHOD FOR ESTIMATING RAINFALL AND A SENSING DEVICE THEREFOR

Jia Ming Shyu; Kuang Pu Wen, and Joseph Huang, all of Hsin Chu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan

Filed Jul. 14, 1988, Ser. No. 218,845

Int. Cl.[4] G01W *1/14*

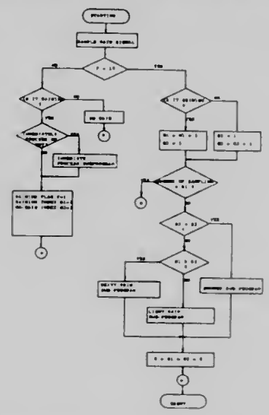
U.S. Cl. 73—171 8 Claims

7. An apparatus for estimating rainfall comprising:

means for sensing a presence or absence of a rain drop and generating a rain signal in response thereto, said rain signal having a rain-present state in the presence of said rain drop and a rain-absent state in the absence of a rain drop;

sampling means for sampling said rain signal to generate a sequence of samples of said rain signal; and

calculating means for determining a rain state based on said samples, said samples being compared to a predetermined minimum value, said sequence of samples comprising a raining signal time and a no-rain signal time, said raining signal time and no-rain signal time being compared with said predetermined value to determine said rain state.



4,893,507

DEVICE TO MEASURE THE LEVEL OF LIQUID METAL IN A CRYSTALLIZER OF A CONTINUOUS CASTING INGOT MOULD

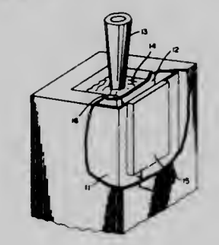
Lorenzo Ciani, Udine, Italy, assignor to CEDA SpA Costruzioni Elettromeccaniche e Dispositivi d'Automazione, Buttrio, Italy

Filed Oct. 12, 1988, Ser. No. 256,468

Claims priority, application Italy, Oct. 21, 1987, 83479 A/87

Int. Cl.[4] G01F *23/26*

U.S. Cl. 73—290 R 16 Claims



1. A device to measure the level of liquid metal in a crystallizer of a continuous casting ingot mold, said ingot mold having a cooling fluid conveyor surrounding at least a portion of the crystallizer, said device comprising:

a container disposed on the conveyor and spaced apart from the crystallizer; and

means for determining the level of liquid metal in the crystallizer, comprising an emitter coil, at least one receiver coil, and a first generator for supplying at least one high frequency to the emitter coil so as to create an electromagnetic field, said determining means being contained within aid container so that the generator, emitter coil and receiver coil are located within the body of the ingot mold, said determining means being coupled electromagnetically to a single wall of the crystallizer and to the volume within the crystallizer, without contacting the crystallizer.

4,893,508

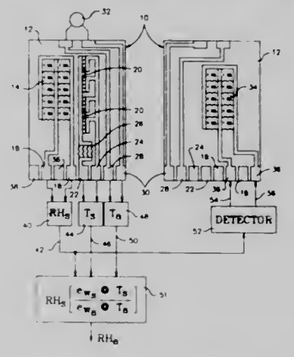
HUMIDITY SENSING APPARATUS AND METHOD THEREFOR

Maurice Friedman, Roslyn, Pa., assignor to VIZ Manufacturing Company, Philadelphia, Pa.

Filed Dec. 13, 1988, Ser. No. 283,798

Int. Cl.[4] G01W *1/02, 1/08*

U.S. Cl. 73—336.5 16 Claims



1. A humidity sensing system, comprising, in combination:

a support;

first means deposited on said support for continuously producing a first signal indicative of the relative humidity above the dew point temperature of a gas mixture contiguous thereto;

second means deposited on said support for producing a second signal indicative of the temperature of said support;

third means for producing a third signal indicative of the temperature of the gas mixture at a point spaced from said support; and

computer means responsive to said signals for determining the relative humidity of the mixture at the spaced point as a function of the first signal and the ratio of saturation vapor pressures of the mixture at the respective temperatures indicated by the second and third signals.

4,893,509

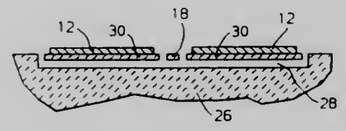
METHOD AND PRODUCT FOR FABRICATING A RESONANT-BRIDGE MICROACCELEROMETER

Bernard A. MacIver, Lathrup Village, and James C. Erskine, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1988, Ser. No. 291,250

Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 73—517 AV 14 Claims



1. A method for forming an accelerometer comprising the following steps:

providing a silicon substrate;

forming a buried layer in said silicon substrate;

forming a predetermined proof mass of appropriate lateral

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dimensions on said silicon substrate symmetrically disposed generally over said buried layer;

removing silicon from said silicon substrate, so as to delineate a pattern which generally corresponds to said lateral dimensions of said predetermined proof mass and so as to delineate a plurality of microbridges; and

removing said buried layer in said silicon substrate so as to form a cavity generally everywhere therebetween said proof mass and said microbridges, and said silicon substrate.

4,893,510

METHOD OF MEASURING DISTRIBUTION OF CRYSTAL GRAINS IN METAL SHEET AND APPARATUS THEREFOR

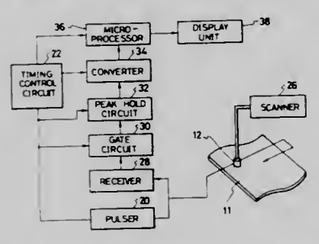
Fumihiko Ichikawa, Yotsukaido; Hajime Takada, and Kazuya Asano, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Nov. 14, 1988, Ser. No. 270,648

Claims priority, application Japan, Nov. 16, 1987, 62-289019; Sep. 20, 1988, 63-235294

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—620 **10 Claims**



1. A method of measuring a distribution of crystal grains in metal sheet, comprising:

determining an exciting frequency of ultrasonic wave such that a wavelength of ultrasonic wave propoagated in a direction of the sheet thickness of the grains each having an aimed orientation is set at a value of twice the thickness of the sheet multiplied by about integers or about half integers;

directing into the sheet thickness burst-like ultrasonic pulses having said frequency and including two or more waves by use of at least one ultrasonic probe moving relatively with the metal sheet;

causing multiple reflected waves generated from the bottom and top faces of the metal sheet upon the reflection from the sheet surface to interfere with each other;

detecting said multiple reflected waves, which have interfered with each other;

estimating orientations of the grains in the metal sheet from the magnitudes in amplitude of said interferent multiple reflected waves; and

two-dimensionally detecting the distribution of the grains in orientation in various portions, into which the ultrasonic wave is directed.

4,893,511

METHOD AND APPARATUS FOR DETERMINING CRACKS IN A SHAFT BY MEANS OF AN ULTRASOUND PULSE ECHO

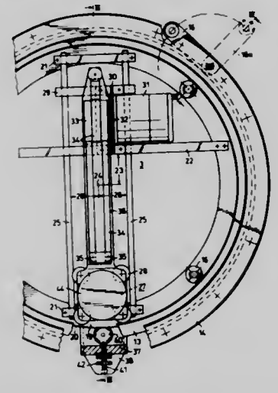
Wilhelm Voigt, and Ingo Hildmann, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,137

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3728369

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—622 **23 Claims**



1. An ultrasound pulse echo method for detecting cracks in a shaft using a test head coupled to an end face of the shaft, which emits a series of ultrasound pulses of a given frequency and receives a series of reflected sound echoes in a sound receiver contained in the test head and recorded by an evaluation device, the method comprising the steps of:

(a) placing the test head on the end face of the shaft at a radial distance from a central axis of the shaft via an adjustable mechanical device coupled to said shaft;

(b) delivering sound pulses having a high frequency in the range of 4 to 8 MHz from the test head for conducting measurements; and

(c) displacing the test head in the course of the measurements at least over part of the circumference of a circle defined by the radial distance of the test head from the central axis.

4,893,512

SWINGING-TYPE AUTOMATIC EXAMINATION APPARATUS FOR PIPING

Kenichi Tanimoto, Ibaraki, and Osamu Kakuma, Uozu, both of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan and Sugino Machine Limited, both of, Japan

Filed May 17, 1988, Ser. No. 196,172

Claims priority, application Japan, Jun. 12, 1987, 62-146437

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—622 **9 Claims**

1. An automatic pipe examination apparatus for scanning and examining at least one pipe, comprising:

a pair of bodies slidable connected to each other such that the total length of the pair of bodies along a longitudinal axis thereof is adjustable;

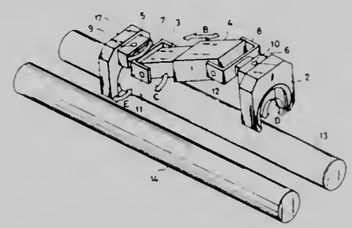
a first drive means for driving said pair of bodies along said longitudinal axial length;

a pair of couplings each connected to one of said bodies in a manner such that each of said pair of couplings is movable with respect to one of said bodies within a first plane parallel to said longitudinal axis;

a pair of second drive means for driving each of said pair of couplings within said first plane;

a pair of gear boxes each connected to each of said pair of couplings in a manner such that each of said pair of gear boxes is movable with respect to said each of said pair of couplings within a second plane perpendicular to said first plane;

a pair of third drive means for driving each of said pair of gear boxes within said second plane; and



a pair of clamping devices each connected to each of said pair of gear boxes and each extending in a third plane substantially perpendicular to said longitudinal axis and to said second plane, each clamping device being provided with a clamping means for reasonably clamping said at least one pipe; and

at least one scanning means movably positioned within at least one of said clamping device for examining the circumferential surfaces of said pipe.

4,893,513

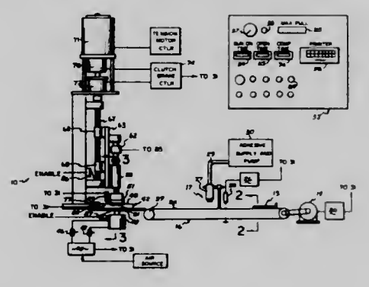
METHOD AND APPARATUS FOR BOND TESTING

Joseph G. Schroeder, Bay Village; Jan L. Shanaberger, Westlake; William R. Rehman, Vermilion; Harry J. Lader, Lakewood, and Jeffrey S. Noss, Bay Village, all of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Nov. 1, 1988, Ser. No. 265,719

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—827 **25 Claims**



1. An apparatus for measuring the strength of an adhesive bond between two substrates comprising:

a dispenser adapted to supply an adhesive to a first of said substrates;

compressor means adapted to apply compressive force between said first substrate and a second substrate for a preselected compression time to form an adhesive bond therebetween;

means for pulling one of said adhesively bonded substrates from the other of said substrates at a substantially constant rate of speed to break said adhesive bond; and

a load cell operatively associated with said pulling means adapted to measure the force applied to said adhesive bond.

4,893,514

DEVICE FOR MEASURING FORCES IN METAL SPINNING LATHES

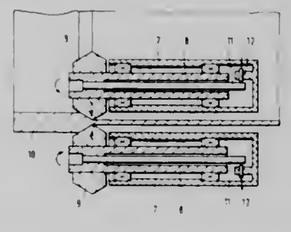
Heinz Grönert, Emmering; Jochen Vetter, Karlsfeld; Manfred Eckert, Dachau; Henning von Petersdorff, Puchheim, and Johann Münich, Munich, all of Fed. Rep. of Germany, assignors to MAN Technologies GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 220,003

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728313

Int. Cl.[4] G01L *5/00*

U.S. Cl. 73—862.55 **5 Claims**



1. A spinning lathe comprising

a support,

a plurality of spinning means on said support for applying radial forming forces to a workpiece, each spinning means comprising:

a housing secured to said support

a spindle rotatably supported in said housing, said spindle having opposite ends,

a spinning roll secured to said

spindle proximate one of the ends thereof,

said spindle having a coaxial bore therein with an open end,

a detector rod in said bore, said detector rod being secured to the spindle in a region at which the spinning roll is secured to the spindle,

said detector rod having an end projecting out of said open end of said bore and beyond said spindle, said end of said rod being free and unsupported and undergoing displacement in response to application of force to said spindle by said roll, and

sensor means fixed to said housing adjacent to the projecting end of said rod for measuring displacement of said end of the rod without physical contact therewith, said sensor means laterally facing said projecting end of said rod to measure said displacement by measuring the distance between said end of said rod and the sensor means.

4,893,515

SAMPLE-SUCKING CONDITION CHECKING METHOD AND SYSTEM

Makoto Uchida, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 94,878, Sep. 10, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,553

Claims priority, application Japan, Sep. 18, 1986, 61-218006

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—864.34 **8 Claims**

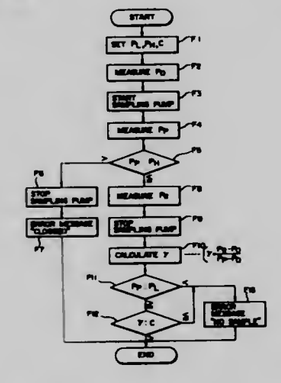
6. A sample-sucking condition checking system comprising:

sampling nozzle to be immersed into a sample;

sampling pump connected to the sampling nozzle through a tube for sucking the sample;

pressure sensing means for measuring a first suction pressure value P_o at the sampling nozzle before suction of the

sample starts, a second suction pressure value P_p at the sampling nozzle when the suction speed of the sampling pump reaches a maximum level during the suction of the sample, and a third suction pressure value P_e at the sampling nozzle when the suction speed of the sampling pump reaches a middle level before completion of suction of the sample; and



comparing means for comparing a first change between the first suction pressure value P_o and the second suction value P_p with a second change between the first suction pressure value P_e and the third suction pressure value P_o to determine whether or not sample-sucking condition is normal.

4,893,516

METAL CONTACT MEMBER FOR A MEASURING LANCE FOR TAKING MEASUREMENTS IN METAL MELTS

Johan M. J. Knevels, Bree, Belgium, assignor to Electro-Nite International NV, Antwerpen, Netherlands

Filed Jan. 31, 1989, Ser. No. 304,982

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 3804809

Int. Cl.[4] C21B *7/24*

U.S. Cl. 73—866.5 **8 Claims**



1. A metal contact member for disposal at an end of a measuring lance, said contact member having an end adapted to receive a consumable probe so as to electrically connect said probe to leads running through said contact member, said probe containing measuring means for taking measurements in metal melts, the contact member comprising two tubes, one tube having a tapered portion and the other tube having a widened opening portion, a sleeve-shaped insulating member interposed between said tapered portion of said one tube and said widened portion of said other tube, said insulating member having a flanged portion, the two tubes having outer wall portions abutting said flanged portion of the insulating member and having substantially the same outside diameter as the insulating member at said flanged portion, and a cup-shaped insulating member forming a part of the interior of said end of the contact member, the cup-shaped insulating member having a base and an interior, said interior of the cup-shaped member containing contacts which are insulated from one another and which are connected, through the base of the cup-shaped insulating member, to said leads, first means (21) for providing a water-tight seal between said sleeve-shaped insulating member (17) and the tapered portion (14) of said one tube (11) and between said sleeve-shaped insulating member and the widened portion (12) of said other tube (10), and second means (30) for providing a watertight seal between said cup-shaped insulating member (26) and said one tube.

8. A measuring lance for measuring oxygen or other activity of molten metal, said lance including a contact member for electrical connection to a consumable measuring probe, said contact member comprising first and second metal tubes and a sleeve-shaped insulating member telescopically interconnecting said tubes, said tubes and sleeve-shaped member being configured so as to define one gap between said sleeve-shaped member and one of said tubes and another gap between said sleeve-shaped member and the other of said tubes, and means disposed in each gap for providing a water-tight seal between said sleeve-shaped member and each of said tubes.

4,893,517

CONTINUOUSLY VARIABLE TRACTION ROLLER TRANSMISSION

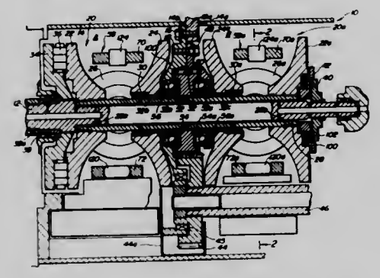
Masaki Nakano, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 24, 1989, Ser. No. 314,846

Claims priority, application Japan, Mar. 7, 1988, 63-52977

Int. Cl.[4] F16H *15/12*

U.S. Cl. 74—200 **12 Claims**



1. A continuously variable traction roller transmission of a double cavity type, comprising:

a casing;

a partition wall structure installed in said casing to define front and rear cavities in the same;

a first shaft extending through said front and rear cavities;

first and second motion transmitting traction mechanisms respectively installed in said front and rear cavities and disposed about said first shaft, each mechanism being operatively connected to the first shaft and including opposite paired input and output toroidal discs and paired traction rollers disposed between and in engagement with the paired input and output toroidal discs;

a second shaft extending through only said rear cavity;

first means for operatively connecting said second shaft to both of said first and second motion transmitting traction mechanisms;

second means for biasing one of the paired input and output discs of each motion transmitting traction mechanism toward the other in accordance with a magnitude of torque applied to said one disc;

third means for constantly biasing one of the paired input and output discs of each motion transmitting traction mechanism toward the other; and

fourth means for rotatably mounting adjacent two of the discs of the respective first and second motion transmitting traction mechanisms to said partion wall structure.

4,893,518

ELECTRIC STEERING APPARATUS

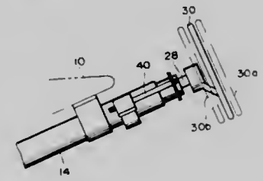
Sakae Matsumoto, Takasaki, and Mitsuo Ichikawa, Maebashi, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

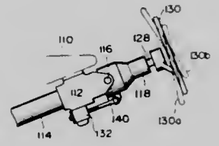
Filed Apr. 6, 1988, Ser. No. 178,229

Claims priority, application Japan, Apr. 17, 1987, 62-57545[U]

Int. Cl.[4] B62D *1/18*

U.S. Cl. 74—493 **10 Claims**





1. An electric steering apparatus comprising:

a lower column fixed to a vehicle body and having a housing provided thereon;

an upper column having a tilting pivot portion and a screw shaft pivot portion, said upper column being pivotally attached to said lower column at said tilting pivot portion so as to be tiltable with respect to said lower column;

a lower shaft rotatably received in said lower column and having a first end and a second end, said first end being connected to a steering gear;

an upper shaft rotatably received in said upper column for tilting with said upper column and having a first end connected to a steering wheel and a second end connected to said second end of said lower shaft through a universal joint such that an angle formed between respective axes of said upper and lower shafts may be changed by tilting of said upper shaft with said upper column;

a screw shaft having a non-threaded first end portion pivotally connected directly to said screw shaft pivot portion of said upper column, and a second end portion formed with a screw thread;

nut means rotatable by an electric motor and having a threaded portion engaged with said screw thread of said screw shaft;

ball bearing means mounted in said housing and comprising two inner races provided on a surface of said nut means, two outer races fitted in said housing, and two groups of balls provided between said inner races and said outer races, said ball bearing means being mounted in said housing in such a manner as to support said nut means for rotation relative to said screw thread and as to prevent said nut means from moving in an axial direction of said lower column and from moving in a direction perpendicular to said lower column, said screw shaft thus moving in the axial direction of said lower column upon rotation of said nut means by said motor while pivoting relative to said screw shaft pivot portion;

aligning means for aligning a rotational axis of said nut means with an axis of said screw shaft during said pivoting of said screw shaft; and

back-lash eliminating means for eliminating back-lash by pressing on said non-threaded portion of said screw shaft such that said screw thread presses against said threaded portion of said nut means.

5. An electric steering apparatus comprising:

a lower column fixed to a vehicle body and having a housing provided thereon;

an upper column telescopically connected to said lower column;

a lower shaft rotatably received in said lower column and having a first end and a second end, said first end being connected to a steering gear;

an upper shaft rotatably received in said upper column for movement with said upper column relative to said lower column and having a first end connected to a steering wheel and a second end connected to said second end of said lower shaft such that the connected second ends may move axially but not rotatably relative to each other;

a screw shaft having a non-threaded first end portion connected to said upper column and a second end portion formed with a screw thread;

nut means rotatable by an electric motor and having a threaded portion engaged with said screw thread of said screw shaft;

ball bearing means mounted in said housing and comprising two inner races provided on a surface of said nut means, two outer races fitted in said housing, and two groups of balls provided between said inner races and said outer races, said ball bearing means supporting said nut means in such a manner as to prevent said nut means form moving in an axial direction of said lower column but to permit said nut means to rotate relative to said screw shaft, said screw shaft thus moving in the axial direction of said lower column upon rotation of said nut means by said motor;

first back-lash eliminating means for eliminating back-lash by pressing said non-threaded portion of said screw shaft so that said screw thread of said screw shaft presses against said threaded portion of said nut means; and

second back-lash eliminating means for eliminating back-lash by pressing said ball bearing means so that each said inner race presses against a corresponding said outer race through an associated one of said groups of balls.

4,893,519

HANDLEBAR GRIP

Riccardo Corso; Roberto Macciosi, and Giuliano Passaglia, all of Viareggio, Italy, assignors to Sandro Mentasti & C. S.a.S., Varese, Italy

Filed Aug. 11, 1988, Ser. No. 230,905

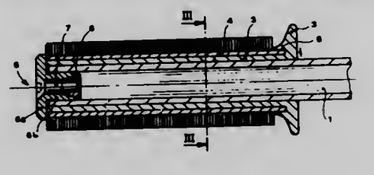
Int. Cl.[4] B62K *21/26*

U.S. Cl. 74—551.9 **7 Claims**

1. A handgrip for a handlebar comprising a tubular body covering an extremity of the handlebar, wherein said tubular

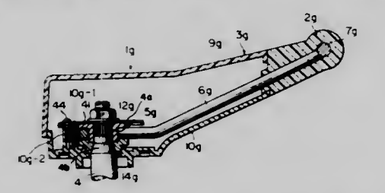
VOL 1110 ISS 3 JA 16 1990 UMI

handgrip body has a covering formed by a plurality of densely distributed flexible needles extending from an external cylindrical surface of said body, wherein said needles are made of a material belonging to the group composed of stainless steel,



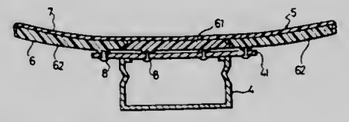
polyamides polyolefins and carbon fibers, and having a modulus of elasticity sufficiently high to produce flexible needles, said needles having a length comprised between 2 and 10 millimeters.

4,893,520
STEERING WHEEL
Tetsuji Endo, Fujinomiya, and Kazuyoshi Nishijima, Shizuoka, both of Japan, assignors to Nihon Plast Co., Ltd., Fuji, Japan
Continuation of Ser. No. 933,418, Nov. 21, 1986, Pat. No. 4,777,840. This application Jun. 22, 1988, Ser. No. 209,823
Claims priority, application Japan, Jan. 14, 1986, 61-5975; Mar. 20, 1986, 61-63382
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 **3 Claims**



1. A steering wheel for a vehicle comprising: a rim section including a rim core of metal, a hub section including a metallic hub for securing said steering wheel to a steering shaft of the vehicle, and at least one spoke core interconnecting said metallic hub and said rim core, said metallic hub comprising a first hub member of a metal defining therein a fire through-hole for said steering shaft and a second hub member of a metal defining therein a second through-hole for said steering shaft and disposed in axially aligned relationship to said first hub member, said first and second hub members having opposed surfaces, said spoke core having a portion disposed between and fixed to said opposed surfaces of said hub member for securing together said first and second hub members and said portion of said spoke core, said hub members have means for positioning said hub members one to the other, said positioning means comprising an engagement protrusion and recess formed on and in said hub members adjacent to said opposed surfaces and disposed substantially coaxially with said first and second through-holes, respectively, said engagement protrusion and recess, respectively, having end face and bottom face disposed in abutment engagement with each other to position said hub members in the axial direction thereof, said engagement protrusion and recess further having peripheral surfaces disposed in engagement with each other to position said hub members in the rotational direction, said portion of said spoke core being welded to said opposed surfaces of said hub members.

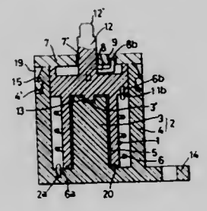
4,893,521
STEERING WHEEL
Syuichi Ishida, Ichinomiya; Shinichi Goto, Nagoya, and Kimio Muramatsu, Okazaki, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Nov. 14, 1988, Ser. No. 271,387
Claims priority, application Japan, Feb. 14, 1986, 61-031581; Feb. 14, 1986, 61-031582
Int. Cl.[4] B62D *1/06*
U.S. Cl. 74—552 **13 Claims**



1. A steering wheel comprising:
an operating portion;
a hub portion for connection with a steering shaft, said hub portion being located generally centrally of said operating portion;
a spoke portion connecting said operating portion to said hub position for transmitting steering motion applied to said operating portion, to the steering shaft via the spoke portion and the hub portion;
an impact energy absorbing member located on said hub portion for absorbing impact energy;
a pad covering said impact energy absorbing member and said spoke portion, said pad including a hard insert integrally covered by a soft cover member, said hard insert comprising a plurality of separate hard insert parts which are divided from one another by at least one bendable portion each of which provides a line of preferential bendability, whereby said pad can be bent when a force impacts said soft cover member, by causing bending movement of said parts along at least one said line of preferential bendability

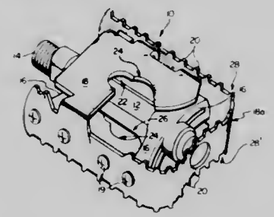
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4,893,522
ROTARY DAMPER
Masaru Arakawa, Chigasaki, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Jun. 30, 1988, Ser. No. 213,872
Claims priority, application Japan, Jul. 10, 1987, 62-171232
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—574 **12 Claims**



1. A rotary damper, which comprises:
a cylindrical rotor for receiving a torque input;
a bore defined within a first end of said cylindrical rotor;
a housing having a shaft disposed within said bore of said cylindrical rotor and a cylindrical wall surrounding said shaft;
a viscous fluid interposed between sidewall portions of said bore of said cylindrical rotor and said shaft of said housing;
a coil spring, interposed between said cylindrical wall of said housing and said cylindrical rotor and having one end secured to said housing and another end secured to said cylindrical rotor, so as to be wound up as a result of rotation of said cylindrical rotor caused by said torque input;
a cover secured to an open end of said cylindrical wall of said housing and having an inner surface facing a second end of said cylindrical rotor;
an excursion groove defined within said inner surface of said cover and having an end portion with a heart-shaped cam groove formed therein; and
an operating pin having one end thereof fixedly secured within said cylindrical rotor and another end thereof disposed within said excursion groove of said cover so as to be capable of excursion along said excursion groove.

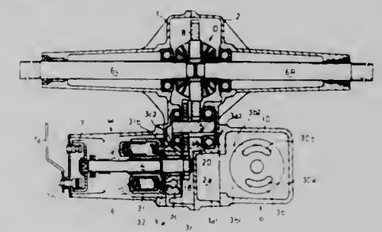
4,893,523
BICYCLE AND PEDAL SYSTEM
Dan C. Lennon, Box 1177, Hailey, Id. 83333
Filed Jan. 7, 1988, Ser. No. 142,049
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 **45 Claims**



1. A bicycle pedal system comprising:
a flanged stud mountable to a bicycle rider's shoe to depend from the rider's shoe, said flange forming an enlarged lowermost portion of the stud;
a pedal having a perimeter portion and comprising:
a shaft mountable to a bicycle; and platform means secured to said shaft for supporting a bicycle rider, said platform means including a slot for engaging the flange of said stud and for restraining said stud from movement with respect to said platform means while allowing said stud to rotate when restrained by said slot, said platform means further including a free zone defined by an opening between said slot and the perimeter of said pedal in which said stud may be disposed in a disengaged position in said free zone by movement of said stud from said slot during pedaling, said free zone extending from said slot through the perimeter of the platform means, whereby the pedal system can be utilized in an engaged or disengaged position by the bicycle rider.

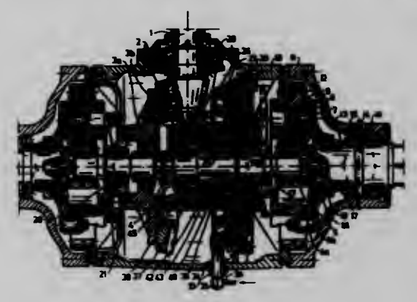
4,893,524
HST SYSTEM AXLE DRIVING APPARATUS
Ryota Ohashi, Kobe, and Masahisa Kawamura, Amagasaki, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan
Filed Nov. 15, 1988, Ser. No. 271,311
Claims priority, application Japan, Nov. 21, 1987, 62-177885[U]
Int. Cl.[4] F16H *47/04*
U.S. Cl. 74—687 **4 Claims**

1. A hydrostatic-transmission-type axle driving apparatus, comprising
a transmission casing including a first axle casing and a second axle casing;
a first axle disposed within said first axle casing; a second axle disposed within said second axle casing;
a motor casing attached to a side surface of said first axle casing;
a hydraulic motor disposed within said motor casing, said hydraulic motor including a motor cylinder block and a motor shaft disposed in parallel to said first and second axles;
a motor cylinder block oil passage formed in said motor cylinder block;
a pump casing attached to a side surface of said second axle casing;



a hydraulic pump disposed within said pump casing, said hydraulic pump including a pump cylinder block disposed at a bottom surface of said pump casing, and a pump shaft disposed perpendicular to said first and second axles;
a pump cylinder block oil passage formed in said pump cylinder block;
a pump casing oil passage formed in said pump casing in communication with said pump cylinder block oil passage; and
an axle casing oil passage formed in said first and second axle casings, said axle casing oil passage connecting said pump casing oil passage with said motor cylinder block oil passage.

4,893,525
CENTRALIZED WET-BRAKE AND OTHER IMPROVEMENTS FOR RUNNING GEARS WITH ADJUSTABLE WHEEL TRACK
Szalai Gábor, Győr, Hungary, assignor to Magyar Vagon es Gepgyar, Gyor, Hungary
Filed Mar. 11, 1988, Ser. No. 166,889
Claims priority, application Hungary, Mar. 26, 1987, 1317/87
Int. Cl.[4] F16H *1/44.5*
U.S. Cl. 74—710.5 **5 Claims**



1. A differential gear mechanism for vehicle wheels which comprises:

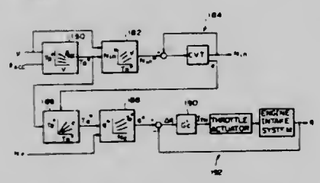
(a) a main housing including first and second spaced end walls,
(b) first and second tapered-roller bearings supported by said main housing end walls,
(c) an equalizer gear housing within said main housing and rotatably supported at each end by said bearings,
(d) said equalizer gear housing comprising first and second axially joined gear housing parts,
(e) said first gear housing part mounting an annular crown gear and being supported by said first bearing,
(f) said first and second gear housing parts defining, in the region of their joining, a first chamber for first and second differential output bevel gears connected by bevel idler gear means,
(g) said second gear housing part being rotatably supported by the outer race of said second bearing and further defining an open ended chamber adjacent to and opening toward said second main housing end wall,
(h) first and second output half-shafts rotatably supported in said main housing and mounting said first and second output bevel gears,
(i) said second half-shaft extending coaxially through said open ended chamber and defining therewith an annular space located between said first chamber and said second housing end wall,
(j) said second housing part being provided on its outer surface with a longitudinally extending external spline,
(k) an annular brake housing member secured to said second spaced end wall of said main housing and forming a wet brake chamber,
(l) said brake housing member having a longitudinally extending internal spline on an internal surface thereof, spaced from and facing said external spline,
(m) a plurality of annular braking discs received within said brake chamber,
(n) alternate ones of said discs being slideably but non-rotatably associated with said respective internal and external splines, and
(o) means within said wet-brake chamber for applying axial pressure to said braking discs tending to inhibit rotation of said gear housing within said main housing.

4,893,526

CONTINUOUS VARIABLE TRANSMISSION CONTROL SYSTEM

Setsuo Tokoro, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 17, 1987, Ser. No. 98,531
Claims priority, application Japan, Sep. 19, 1986, 61-219838; Sep. 19, 1986, 61-219839; Oct. 3, 1986, 61-234527; Oct. 4, 1986, 61-235484; Oct. 4, 1986, 61-235485
Int. Cl.[4] B60K *41/14*
U.S. Cl. 74—866 **27 Claims**



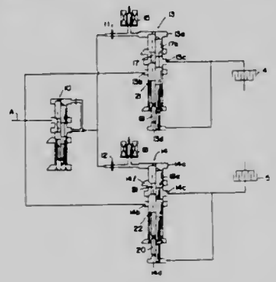
1. A system for driving a vehicle, comprising:
an internal combustion engine;
an accelerator member operable by a driver;
a torque control means provided in said internal combustion engine for controlling an output torque of the internal combustion engine;
an actuator means for operating the torque control means independently of an amount of depression of the accelerator member;
a transmission device having an input shaft connected to the engine, an output shaft connected to the vehicle and actuator means for obtaining a continuously varied speed ratio between the input shaft and the output shaft;
a first calculating means for calculating a target speed of the input shaft of the transmission device;
a first detecting means for detecting an actual speed of the input shaft of the transmission device;
a transmission control means for controlling the transmission device for varying the speed ratio so that an actual speed of the input shaft conforms to the target speed;
a second calculating means for calculating a target value of a torque of the engine;
a second detecting means for detecting an engine parameter related to an intake air amount characteristic of the internal combustion engine; and
a feedback means, responsive to the detected intake air amount characteristic, for providing a feedback signal to an operating signal generating means, responsive to the feedback signal, for providing an operating signal directed to the torque control means to obtain the target torque.

4,893,527

SPEED CHANGE CONTROL APPARATUS FOR AUTOMATIC TRANSMISSIONS

Choji Furusawa, Aichi; Masato Shimel, Nagoya; Toshiaki Ishiguro, Nagoya; Katsuhiko Hattori, Nagoya, and Hiroyuki Yamaguchi, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of, Japan

Filed Sep. 23, 1987, Ser. No. 100,364
Claims priority, application Japan, Sep. 24, 1986, 61-223841
Int. Cl.[4] B60K *41/18*
U.S. Cl. 74—866 **19 Claims**



1. Speed change control apparatus in an automatic transmission having a plurality of friction elements in which a gear stage is established by engaging one of the friction elements and disengaging one of the others, said speed change control apparatus comprising:
control valves connected to respective ones of said friction elements, each control valve having a control oil line for supplying it with control hydraulic pressure;
a duty solenoid valve connected to the control oil line of each control valve; and
control means for engaging one friction element by outputting an engagement duty signal to one duty solenoid valve to control its control hydraulic pressure, and for simultaneously disengaging one of the other friction elements by outputting a disengagement duty signal to one of the other duty solenoid valves to control its control hydraulic pressure.

4,893,528

ADJUSTABLE SPANNER

Chang Chung-Hsing, No. 5, Chang Ma Street, Ma Hsing Village, Shiow Showi Shi, Chang Hsuh, Taiwan

Filed Mar. 21, 1989, Ser. No. 326,342
Int. Cl.[4] B25B *13/28*
U.S. Cl. 81—100 **8 Claims**



1. An adjustable spanner comprising:
a handle having a mounting end which includes an upper nose portion having a pressure edge, and a lower thinned portion defining, at a bottom of said nose portion, a first wall and a second wall, said second wall being inclined with respect to said first wall;
a movable piece having an upper gripping portion have an inward multi-angular surface capable of cooperating with said pressure edge to grip therebetween a tubular article, and a lower engaging portion which is slidably and pivotably mounted on said thinned portion and includes a groove defining therein a plurality of indentations and a side wall means for flushly engaging with either one of said first and second walls; and
a pivot means extending through said groove for selectively engaging one of said indentations and for pivotally mounting said lower engaging portion to said thinned portion, wherein when said side wall means flushly engages with said second wall, said multi-angular surface and said pressure edge are ready to clamp therebetween said tubular article, when said movable piece is pivoted with respect to said handle, the size of a space formed between said pressure edge and said multi-angular surface is accordingly adjusted, and when said side wall flushly matches against said first wall, said engaging portion is slidable on said thinned portion to allow said pivoting medium to be positioned in any one of said indentations.

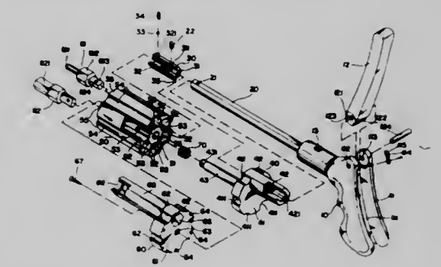
4,893,529

STORAGE TYPE HEXAGONAL SOCKET WRENCH

Schih-Chang Lin, No. 102, Lane 222 Hsin-Chung Rd., Ho-Mei Town, Chang-Hua, Taiwan

Filed Jan. 12, 1989, Ser. No. 296,131
Int. Cl.[4] B25G *1/08*; B25B *23/00*
U.S. Cl. 81—177.1 **3 Claims**

1. A storage type hexagonal socket wrench comprising a handle for manual operation of said wrench,
a driving shaft having a front portion, a rear portion and a hexagonal rod-like configuration,
control means located on said handle and selectively connecting said rear portion of said driving shaft for either clockwise or counterclockwise rotation of said driving shaft,
a socket having a front portion, a rear portion and a hexagonal outer configuration,
said socket having a hexagonal hole in the rear portion thereof which receives said front end of said driving shaft, said socket also having a pentagonal hole in said front portion,
an opening being positioned between said pentagonal hole and a first exterior side of said socket, said opening having a steel ball and an elastic element located therein,
a longitudinal groove is located on a second exterior side of said socket which is parallel to said first exterior side,
a back seat having a front face, a rear face and comprising a circular block,
a hexagonal tube extending from said rear face and slidably receiving said socket therein,
said hexagonal tube having a flange to form a reduced hexagonal hole for insertion of said driving shaft,
an axle being integral with said back seat and extending from a central portion of said front face,
a rotatable storage wheel having a center is rotably mounted on said axle,
a plurality of hexagonal holes having front and rear ends are located equidistantly around said center of said rotatable storage wheel,
a stop lug being located on said rotatable wheel at the rear end of each hexagonal hole,
a front seat having a front face, a rear face and comprising a circular block,
a hexagonal tube extending from said front face of said front seat,
said hexagonal tube having a flange protruding inward to form a reduced hexagonal hole,

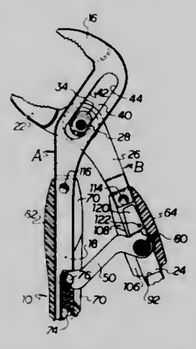


bolt means for connecting said front seat and said rear seat together,
a set of socket wrench elements being positioned in said plurality of hexagonal holes in said rotating storage wheel,
each of said wrench elements having a hexagonal central portion of a size suitable for sliding in said plurality of hexagonal holes and in the hexagonal tube of said front seat,
each of said wrench elements also having a rear portion for insertion in said socket,
said rear portion being a pentagonal post with a slot therein for receiving said steel ball to firmly fix the connection after said rear portion is inserted into said pentagonal hole of said socket,
whereby the following procedure may be followed in order to select a desired wrench element, the driving shaft is pulled backward to let said socket be separated from the pentagonal post of an engaged wrench element so that the driving shaft is positioned in the hexagonal tube of said back seat while the hexagonal central portion of the wrench element is stopped by a stop lug of said rotatable wheel and retained inside thereof, then said rotatable wheel is revolved so that the selected socket wrench element is aligned with the hexagonal tube of said back seat, then, said driving shaft is pushed forward to drive the pentagonal post of the selected socket wrench element, thereafter, said driving shaft is continuously pushed forward so that the desired socket wrench element is forced

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to protrude beyond the hexagonal hole of said front seat to form an operative hexagonal socket wrench.

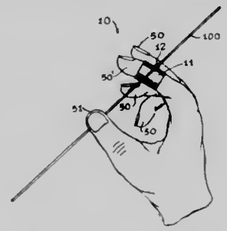
4,893,530
PLIER-TYPE TOOL
William A. Warheit, 121 Iroquois Dr., Butler, Pa. 16001
Filed Mar. 19, 1987, Ser. No. 27,799
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] B25B 7/04
U.S. Cl. 81—409.5 23 Claims



1. A plier-type tool for automatically gripping workpieces of different sizes, comprising:
first and second rigid elongated body members each having a jaw end, a handle end, and an intermediate neck portion;
slidable and pivotable fastening means connecting the body members between their neck portions and permitting the jaw ends to move toward each other in a sliding action in response to an initial manual force being applied to close the handle ends toward each other to grasp a workpiece between the jaw ends;
the fastening means including an elongated slot in the neck portion of a first of the body members and a pawl pivotably secured to the neck portion of the second body member and disposed to slide within the slot;
the fastening means being responsive to the jaw ends contacting the workpiece such that the sliding action is arrested by the pawl pivotally engaging a long edge of the slot and continued manual force on the body members causes a pivoting gripping action of the jaw ends against the workpiece; and
means operatively engaged to the pawl which acts to normally urge the pawl out of engage with the long edge of the slot.

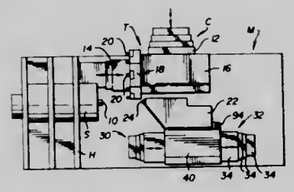
4,893,531
WELDING ACCESSORY APPARATUS
Harry P. Stolz, II, 768 E. Fifth Ave., Durango, Colo. 81301
Filed Oct. 21, 1988, Ser. No. 260,744
Int. Cl.[4] B25B 33/00
U.S. Cl. 81—487 3 Claims

1. A welding accessory apparatus for the manipulation, positioning and feeding of an elongated filler rod during the welding process wherein the apparatus comprises:
a finger encircling unit including a ring member adapted to engage one of a welders fingers; wherein, the ring member is provided with at least one raised attachment member which projects radially outwardly from the ring member and has a central aperture formed therein; wherein, the axis of the said central aperture is disposed generally perpendicular to the axis of said ring member; and,
a friction unit operatively associated with said finger encircling unit wherein the friction unit comprises: a resilient



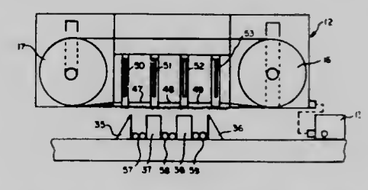
insert member adapted to be received in said raised attachment member.

4,893,532
BREAK AWAY TOOL ELEMENT AND METHOD OF MOUNTING
Harold E. Walbara, Elmira; Jayesh B. Patel, Horseheads, and Jeffery W. Thomasson, Odessa, all of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.
Filed May 26, 1988, Ser. No. 199,090
Int. Cl.[4] B23B 23/00, 19/00
U.S. Cl. 82—148 25 Claims



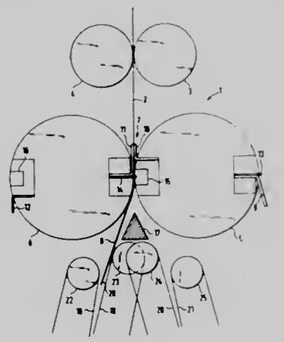
1. Break away machine tool assembly, comprising:
(a) a support;
(b) a bearing plate overlying and contiguous said support and movable relative thereto;
(c) a tool element overlying and contiguous said plate and movable therewith;
(d) means releasably secure said plate and said element in overlying relation to said support for permitting said plate and said element to move relative to said support within a defined range upon being subject to an impact;
(e) said releasable securing means includes a plurality of corresponding cooperating slots disposed in said support and said plate, a plurality of securement elements extend from said tool element through said plate and said support slots and said securement elements are movable relative to said support slots for permitting said plate and said tool element to move relative to said support, and there are at least two longitudinally extending slots in said support and each slot is angularly disposed relative to the other slot;
(f) three securement elements extend from said tool element and said securement elements are triangularly disposed; and,
(g) two of said securement elements extend through said slots and the remaining securement element defines a pivot axis for said plate and said tool element.

4,893,533
BAND SAW HAVING MORE THAN TWO BLADE GUIDES
Gerald R. Harris, P.O. Box 1148, Pryor, Okla. 74362
Filed May 16, 1988, Ser. No. 194,484
Int. Cl.[4] B23D 55/08
U.S. Cl. 83—13 23 Claims



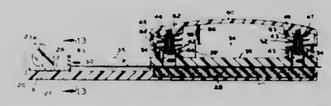
20. A method for cutting multiple workpieces simultaneously with a band saw apparatus having a continuous loop saw blade comprising:
aligning and clamping multiple workpieces in a vise assembly in side-by-side spaced apart relation;
rotating said continuous loop saw blade and guiding said saw blade in a cutting orientation along at least two side-by-side spaced apart cutting stretches by means of at least three aligned blade guide assemblies, each of said cutting stretches being between two adjacent blade guide assemblies; and
displacing said saw blade and said workpieces with respect to one another to contact each of said saw blade cutting stretches with said workpieces to effect cutting thereof while continuing said guiding step by each of said blade guide assemblies throughout cutting.

4,893,534
COMBINATION WEB CUTTING AND PATH SWITCHING SYSTEM
Ingo Köbler, Aubausen, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Fed. Rep. of Germany
Filed Jun. 15, 1988, Ser. No. 207,145
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721515
Int. Cl.[4] B26D 1/40; B65H 35/08
U.S. Cl. 83—107 16 Claims



1. Combination web cutting and path switching system for web substrates (2), such as printed paper webs, having
means (3, 4) for supplying the web (2) to the system, the system comprising
a cutter cylinder and counter cylinder pair (5, 6) having a plurality of cutter knives;
two removal paths (18, 19; 20, 21) located essentially symmetrically with respect to the nip of the cylinder pair,
and comprising, in accordance with the invention,
elastic deflection elements (9, 10; 11, 12) located on the cutter cylinder and counter cylinder pair (5, 6), said deflection elements being positioned relative to the direction of rotation, behind one of the plurality of cutter knives, for deflection of the leading edge of the web into one of the removal paths (18, 19; 20, 21) before the web is severed by one of the plurality of cutter knives of the cylinder and counter cylinder pair (5, 6).

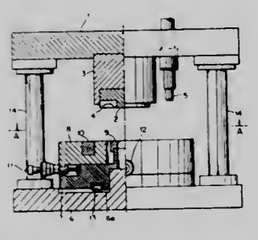
4,893,535
SLOT-PUNCHING DEVICE
Glenn D. Bentrim, 7013 NW. 40th St., and Michael A. T. McKnight, 7006 NW. 40th St., both of Coral Springs, Fla. 33065
Filed Sep. 12, 1988, Ser. No. 243,497
Int. Cl.[4] B26F 1/18
U.S. Cl. 83—133 8 Claims



1. A device for punching two narrow slots in a sheet with a straight edge to hold on the sheet a smaller card having a predetermined corner-to-corner diagonal dimension, said device comprising:
first and second members coupled to each other for movement toward and away from each other between an apart position permitting the insertion of the sheet between them and a together position holding said sheet between them;
a stop on one of said members having a flat surface for engagement by said straight edge of the sheet;
said second member having two punches with respective narrow, flat, substantially parallel punch blades theron which extend at a substantial acute angle to said flat surface of the stop and are offset from each other both parallel and perpendicular to said flat surface of said stop, said punch blades being spaced from each other slightly less than said corner-to-corner diagonal dimension of the card;
said first member having means for receiving said punch blades when said first and second members are in said together position;
each of said punches being slidably reciprocable in said second member between a first position away from said first member and a second position projecting from said second member into said first member;
said stop being slidably adjustable on said first member toward and away from said punch blades;
spring means on said second member biasing said punches to said first position;
and a reciprocable head on said second member for displacing said punches to said second position;
said spring means comprising:
a pair of coil springs engaged between said second member and said head to bias them apart;
and a pair of coil springs acting between said second member and said punches to hold said punches against said head.

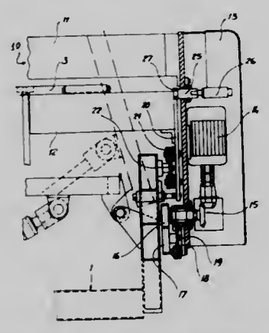
VOL 1110 ISS 3 JA 16 1990 UMI

4,893,536
CENTER PUNCHING APPARATUS
Kaoru Kinoshita, Kawagoe, Japan, assignor to Nikka Engineering Co., Ltd., Asaka, Japan
Filed Sep. 6, 1988, Ser. No. 240,811
Claims priority, application Japan, Oct. 7, 1987, 62-251693
Int. Cl.[4] B26F 1/14
U.S. Cl. 83—451 7 Claims



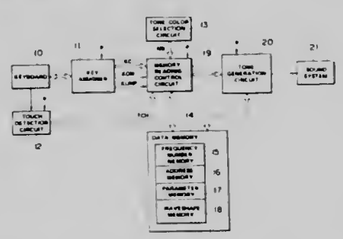
1. A center punching apparatus comprising, an upper die base, an upper die mounted on the upper die base facedown, a lower die base, a rotatable turntable mounted on the lower die base for rotation about an axis coaxial with the upper die, a movable table on the turntable for holding a workpiece of a material to be punched and movable in X and Y directions, a lower die disposed centrally on the turntable coaxial with the upper die, the movable table having an opening circumferentially about said lower die, micrometer means for selectively moving the movable table in X and Y directions independently to accurately position said workpiece relative to the upper die, guide means extending between the upper die base and the lower die base, the lower die base, the turntable, the movable table and the lower die being movable upwardly jointly and guided by said guide means for punching the workpiece with the upper die, and monitor means on the apparatus for monitoring the accuracy of the positioning of the workpiece relative to the upper die by monitoring position of a reference indicium on the workpiece.

4,893,537
APPARATUS FOR CUTTING SINGLE AND DOUBLE GLASS SHEETS
Giorgio Lorenzo, via Pasteur, 7--20017 Passirana di Rho, Milano, Italy
Filed Jul. 14, 1988, Ser. No. 219,347
Claims priority, application Italy, Jul. 17, 1987, 21335A/87
Int. Cl.[4] B26D 3/08, 1/18
U.S. Cl. 83—885 1 Claim



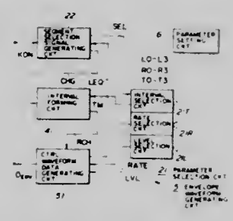
1. An apparatus for cutting either single or double glass sheets, comprising a bearing frame defining a movable-strip supporting table for supporting a glass sheet to be cut, said bearing frame supporting a framework consisting of a upper cross-member and a lower cross-member, adapted for mutual connection, there being moreover provided a upper glass sheet cutting head and a lower glass sheet cutting head movably supported on said cross-members, said supporting table consisting of a plurality of adjoining strips supported by a corresponding plurality of piston members for displacing said strips in a direction substantially perpendicular to said supporting table, said upper cross-member being supported by sidewalls supporting a motor for longitudinal displacement, said motor being coupled, through bevel gears, to a driving pinion meshing with a main rack supported by said bearing frame, said sidewalls supporting guiding carriages engaging with guiding rods coupled to said bearing frame, said lower cross-member being supported by side shoulders provided with small sliding carriages adapted for sliding on auxiliary sliding rods, wherein said apparatus further comprises removable coupling means for coupling said shoulders and sidewalls, consisting of a pawl supported by said sidewalls and driven by a coupling piston member for removably engaging it within a seat formed on said shoulders.

4,893,538
PARAMETER SUPPLY DEVICE IN AN ELECTRONIC MUSICAL INSTRUMENT
Kazuo Masaki, and Mitsumi Kato, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Feb. 26, 1987, Ser. No. 19,528
Claims priority, application Japan, Feb. 28, 1986, 61-43035
Int. Cl.[4] G10H 1/06, 1/46, 7/00
U.S. Cl. 84—605 11 Claims



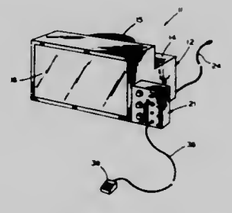
4. A parameter supply device in an electronic musical instrument comprising: parameter memory means for storing plural sets of parameters in correspondence to plural sets of combinations of parameter determining factors;
address memory means provided for each of said parameter determining factors for storing address data individually in correspondence to each parameter determining factor; and
operation means, capable of operating on address data read out from said address memory means individually in correspondence to each parameter determining factor, for forming an address signal corresponding to a combination of parameter determining factors and reading out a set of parameters from said parameter memory means in response to this address signal;
wherein address data stored in a portion of said address memory means corresponding to at least one parameter determining factor is read out in accordance with a combination of said at least one parameter determining factor and data corresponding to at least another parameter determining factor.

4,893,539
CONTROL WAVEFORM GENERATING APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT
Tetsuo Nishimoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Continuation of Ser. No. 48,225, May 11, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,636
Claims priority, application Japan, May 13, 1986, 61-109063
Int. Cl.[4] G10H 1/057
U.S. Cl. 84—663 11 Claims



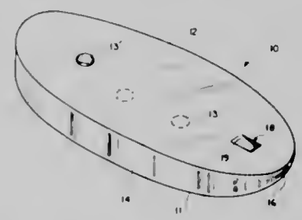
1. A control waveform generating apparatus for an electronic musical instrument, said control waveform generating apparatus generating a control waveform which comprises a plurality of segment waveforms divided along a time axis to constitute at least a rising portion and a falling portion therein and of which level varies with a lapse of time, said control waveform generating apparatus comprising:
(a) segment designating means for sequentially designating a segment waveform among said plurality of segment waveforms in response to a command signal for generating a control waveform;
(b) control waveform means for generating each designated segment waveform as a part of said control waveform thereby to form the entire control waveform in response to the command signal;
(c) interval forming means coupled with said control waveform forming means for forming, in at least one selectable segment waveform, an interval portion of a selectable length less than the length of the selected segment waveform in which the level of said control waveform is maintained at a selectable constant level.

4,893,540
DISPLAY APPARATUS FOR VISUALLY IMPAIRED PERSONS
Richard M. Friedman, P.O. Box 2824, Toledo, Ohio 43606
Continuation-in-part of Ser. No. 938,153, Dec. 4, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,933
Int. Cl.[4] G09B 15/08
U.S. Cl. 84—478 15 Claims



1. An apparatus for visually displaying stored information to persons having vision deficiencies comprising:
a housing adapted to be positioned on an upper surface of a piece of furniture and having a stepped upper surface with a rear portion lower than a front portion;
a rear projection viewing screen mounted on a surface of said housing and oriented to be viewed by a person located adjacent the piece of furniture;
means mounted to said rear portion of said housing for individually storing a plurality of images of information each said image photographically reduced in size from an associated original size image having a height and a width;
means for selecting a predetermined one of said stored images from said means for storing and projecting said selected image on said viewing screen as a projected image increased in size wherein the product of the height and width of said projected image is in a range of approximately eighty-seven to one hundred nineteen times the product of a height times a width of said associated original image as a whole;
means mounted to said housing for selectively varying the brightness of said selected image on said viewing screen; and
means mounted to said housing for selectively varying the length of time said selected image is projected on said viewing screen whereby a person having a vision deficiency is enabled to recognize said projected image.

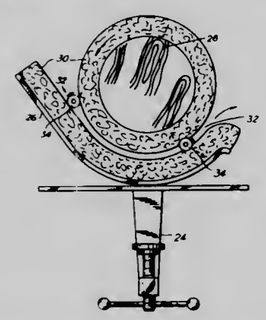
4,893,541
PENTATONIC OCARINA
Ilania H. Fowler, P.O. Box 8361, Atlanta, Ga. 30306-0061, and J. Charles Hind, 2301 West North Ave., Anderson, S.C. 29621
Filed May 5, 1988, Ser. No. 190,402
Int. Cl.[4] G10D 7/00
U.S. Cl. 84—380 C 7 Claims



1. A wind instrument for producing the tones of a specific pentatonic scale, comprising:
an enclosed instrument body having an upper surface, a lower surface, and a wall defining the joining of said upper and lower surfaces, said body enclosing one or more hollow interior chambers;
a mouthpiece located on said wall;
a vent slot in each of said one or more interior chambers disposed within said upper surface of said body and offset from said wall;
a wind passageway having an inlet opening in said mouthpiece and an outlet opening within each of said one or more interior chambers of said instrument body adjacent to said vent slots, said passageway shaped to direct air blown through said mouthpiece against a bottom edge of said vent slot, whereby air within said one or more hollow interior chambers is caused to vibrate; and
a plurality of at most three per chamber pitch control holes disposed within said upper or lower surfaces of said instrument body whereby, when any selected one or more said holes are opened and closed while air is blown through said mouthpiece and into said instrument body, only notes of said specific pentatonic scale may be produced.

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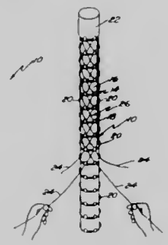
4,893,542
SHELL LUBRICATOR
Peter A. Alsotto, 1668 Hendrickson St., Brooklyn, N.Y. 11234
Filed Dec. 9, 1988, Ser. No. 282,484
Int. Cl.[4] F42B 31/02
U.S. Cl. 86—19 4 Claims



1. A shell lubricator, for lubricating the external surface of a shell casing with grease or oil, comprising:
a vertical support member having an upper end and a lower end, said upper end being provided with a bore;
a horizontal support member serving as a base for said shell lubricator, said lower end of said vertical support member being rigidly attached to said horizontal support member;
means for fixedly and removably attaching said horizontal support member to a work surface;
an arcuate, rigid plate having a convex side and a concave side attached to said horizontal support member at a point adjacent to said vertical support member so that said concave side of said arcuate, rigid plate faces away from said horizontal support plate;
a first resilient, absorbent covering capable of holding a lubricating material attached to said concave side of said arcuate, rigid plate;
a rigid, cylindrical roller having two ends, a cylindrical side surface, and an axle protruding from one of said two ends, said axle designed to be passed through said bore in said vertical support member so that the rotation of said axle will cause the rotation of said rigid, cylindrical roller, said rigid, cylindrical roller facing said concave side of said arcuate, rigid plate;
a second resilient, absorbent covering attached to said cylindrical side surface of said rigid, cylindrical roller and being capable of holding a lubricating material, said second resilient, absorbent covering being of a thickness on said cylindrical side surface of said rigid, cylindrical roller that will leave a gap between said second resilient, absorbent covering and said first resilient, absorbent covering on said arcuate, rigid plate so that said rigid, cylindrical roller can freely rotate; and
means for rotating said rigid, cylindrical roller.

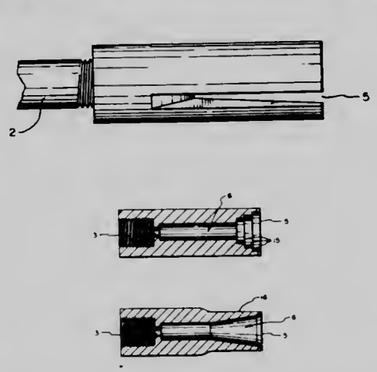
4,893,543
BRAIDING MANDREL FOR CABLE GRIP AND STRAIN RELIEF ASSEMBLIES
Raymond J. Phillips, 879 Raymond Hill Rd., Oakdale, Conn. 06370
Filed Jul. 5, 1989, Ser. No. 376,271
Int. Cl.[4] D04C 7/00
U.S. Cl. 87—34 2 Claims

1. A braiding mandrel comprising:
a wire retainer;
a rod connected to said wire retainer;
a plurality of hook-ring elements placed over said rod and coaxial with said rod; and



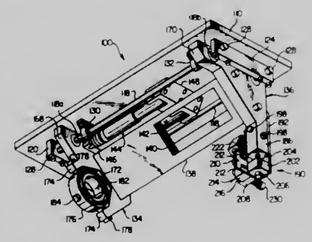
a plurality of spacer elements placed over said rod, coaxial with said rod and said plurality of hook-ring elements, and interspersed with said hook-ring elements.

4,893,544
FLASH SUPPRESSOR
Mark R. Hawley, Keansewick, Wash., and Gerald B. Lucas, Lakeside, Mont., assignors to D. C. Brennan Firearms, Inc., Cincinnati, Ohio
Continuation of Ser. No. 33,518, Apr. 1, 1987, abandoned, which is a continuation of Ser. No. 642,784, Aug. 21, 1984, Pat. No. 4,664,014. This application Sep. 19, 1988, Ser. No. 245,977
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[4] F41C 21/18
U.S. Cl. 89—14.2 9 Claims



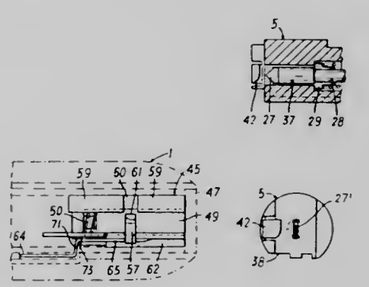
1. A device for suppressing flash from the muzzle of a firearm having a defined nozzle bore and said device having a first end, said first end having means to attach to the muzzle of a firearm said device comprising a shell, said shell comprising:
a first opening and an opposite exit plane opening wherein the ratio of the diameter of said exit plane opening to the diameter of said muzzle bore is from 4 to 14.7;
an inner bore extending from said first opening to said exit plane opening;
said inner bore including a first cylindrical section followed by a main cylindrical section and an outwardly expanding tapered section which extends to said exit plane opening;
said tapered section including from 3 to 6 continuous unrestricted axial slots through walls of said tapered section and which extend to said exit plane opening;
said first cylindrical section having a ratio of diameter to muzzle bore diameter of from greater than 1 to less than 2;
said main cylindrical section having a ratio of diameter to muzzle bore diameter of from 2 to 4;
said tapered section having a taper of from 2° to 10°.

4,893,545
AIRCRAFT ARMAMENT APPARATUS
Paul H. Sanderson, 2019 Cripple Creek, Lewisville, Tex. 75067, and Richard C. Serkland, 1010 Meadowlake Dr., McKinney, Tex. 75069
Filed Jan. 13, 1988, Ser. No. 144,873
Int. Cl.[4] F41D 11/26
U.S. Cl. 89—37.19 12 Claims



1. Recoil shock-absorbing apparatus for mounting a gun on an object, the gun extending generally along a firing axis, said apparatus comprising:
a base member;
attachment means for securing said base member directly to the object;
first and second elongated, essentially straight support members each having a length;
connecting means for securing said first and second elongated support members to said base member in a laterally opposed, mutually spaced and essentially parallel relationship;
a first carriage member carried by each of said first and second elongated support members for movement along their lengths;
a second carriage member carried by each of said first and second elongated support members for movement along their lengths, said second carriage member being spaced apart from said first carriage member among the lengths of said first and second elongated support members,
said first and second elongated support members precluding appreciable movement of said first and second carriage members relative to said base member other than in a direction parallel to the lengths of said first and second elongated support members;
mounting means for supportingly securing axially spaced portions of the gun to said first and second carriage members for movement therewith along the lengths of said first and second elongated support members, said mounting means being operable to selectively lock the gun in a predetermined selectively variable orientation relative to said first and second carriage members in a manner permitting selective adjustment of the firing axis of the gun relative to an axis parallel to the lengths of said first and second elongated support members; and
shock absorbing means, operably associated with one of said first and second carriage members, for absorbing and damping the firing recoil force of the gun, said shock absorbing means being directly interconnected between said base member and said one of said first and second carriage members and being positioned between said first and second carriage members.

4,893,546
AUTOMATIC PISTOL
Gaston Glock, Siebenbürger Strasse 16-12, A-1220 Vienna, Austria
Continuation of Ser. No. 733,352, Sep. 6, 1985, abandoned, Continuation of Ser. No. 456,056, Dec. 30, 1982, Pat. No. 4,539,889. This application Aug. 2, 1988, Ser. No. 227,511
Claims priority, application Austria, Apr. 30, 1981, 1944/81
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[4] F41C 19/14
U.S. Cl. 89—145 6 Claims



1. In a pistol, including

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a frame having a longitudinal axis and a barrel mounted in the frame;
a slide mounted on the frame so as to be slidable forwardly toward the barrel into a closed position in which the slide is in contact with the barrel, and rearwardly out of a closed position, a recoil spring for biasing the slide into the closed position;
the slide including a breech block, the breech block closing off a cartridge chamber in the closed position of the slide;
a firing pin being mounted longitudinally movable in the breech block and having a nose projecting toward the frame, a firing pin spring for biasing the firing pin, the tension of the firing pin spring being releasable in a direction toward the barrel;
the frame further including a trigger mechanism with a trigger means and an abutment, the abutment being movable by the trigger means from an initial position initially parallel to the firing pin so that the firing pin nose engages the abutment and is moved and the firing pin spring is tensioned, the abutment being further movable in release direction until the abutment and the nose are disengaged;
the slide defining control means which during firing cause the abutment to be moved from the released position into the path of movement of the nose;
the improvement comprising,
the frame including positive guide means serving for maintaining the abutment in the path of motion of the nose of the firing pin at least in a portion of the initial movement of the abutment parallel to the firing pin.

4,893,547

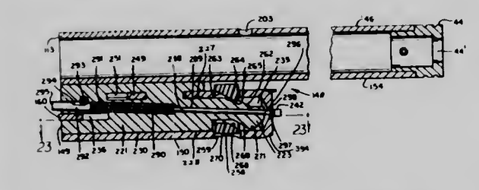
BOLT MECHANISM FOR FIRE ARM

Maxwell G. Atchisson, 6695 Ridgemoore Dr., Doraville, Ga. 30360

Division of Ser. No. 784,157, Oct. 4, 1985, Pat. No. 4,693,170, which is a division of Ser. No. 639,526, Aug. 8, 1984, Pat. No. 4,553,469, which is a continuation of Ser. No. 336,328, Dec. 31, 1981, abandoned. This application Sep. 14, 1987, Ser. No. 96,934

Int. Cl.[4] F41D *5/04*

U.S. Cl. 89—187.01 **7 Claims**



1. Bolt locking mechanism for a firearm including a breech, comprising:
a bolt carrier selectively movable on a predetermined path;
a bolt movable with the bolt carrier either to a forward position relative to the breech of the forearm, or to a rearward position, the bolt carrier being associated with the bolt to allow the bolt carrier a limited extent of forward travel beyond the forward position of the bolt;
cam means associated with the bolt carrier and extending longitudinally of the bolt carrier;
the bolt having a bollow portion within which the cam means moves as the bolt carrier travels relative to the bolt;
lock means movable with the bolt and operable hy said cam means, in response to the limited extent of forward travel by the bolt carrier, to move vertically relative to the bolt on a path normal to the path of bolt movement, so as to extend upwardly from the top of the bolt and engage the breech, locking the bolt in the forward position;
the lock means being disposed in the hollow portion of the bolt;
the lock means including surfaces defining a window extending within the hollow portion of the bolt along a path generally parallel to the path of bolt movement, and receiving the longitudinally-extending cam means in operative relation with the window-defining surfaces,
so that the cam means moves the lock means vertically to lock or unlock the bolt as the cam means moves longitudinally within the window in the hollow portion of the bolt.

4,893,548

HYDRAULICALLY OPERATED SWASH-TYPE APPARATUS

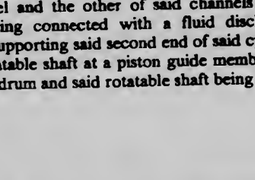
Eiichiro Kawahara; Mitsumasa Furumoto, both of Saitama, and Takashi Koyama, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,192

Claims priority, application Japan, Dec. 12, 1986, 61-296244

Int. Cl.[4] F04B *1/22*

U.S. Cl. 91—499 **7 Claims**



1. A hydraulically operated swash-plate apparatus comprising:
a case;
a cylinder block rotatably supported in said case and having a plurality of axial cylinders arranged in an annular pattern;
a plurality of plungers received respectively in said cylinders;
a swash plate supported in said case and slidably held against free ends of said plungers through a shoe therebetween, said plungers being movable into and out of said respective cylinders by a stroke determined by the angle of inclination of said swash plate; and
said shoe having a body and a sliding surface disposed thereon and slidably held against said swash plate and made of a material having a coefficient of thermal expansion different from that of said body of said shoe, the arrangement being such that said sliding surface becomes convex at a temperature of operation of the apparatus.

4,893,549

ADJUSTABLE AXIAL PISTON MACHINE HAVING A BENT AXIS DESIGN

Franz Forster, Karlstadt/Main-Muhlbach, Fed. Rep. of Germany, assignor to Linde Aktiengeselleschaft, Wiesbaden, Fed. Rep. of Germany

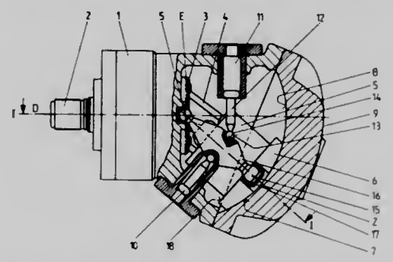
Filed Jul. 28, 1988, Ser. No. 225,284

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725525

Int. Cl.[4] F01B *3/00, 13/04*

U.S. Cl. 92—12.2 **10 Claims**

1. An adjustable axial piston machine having a bent axis design including a machine housing, a rotatable shaft, a swivel carriage having opposed-faces and a pair of channels formed therein and a cylindrical drum having a first end rotatably supported on said swivel carriage and a second end, one of said channels in said swivel carriage being connected with a fluid feed channel and the other of said channels in said swivel carriage being connected with a fluid discharge channel, means for supporting said second end of said cylindrical drum on said rotatable shaft at a piston guide member surface, said cylindrical drum and said rotatable shaft being rotatable in the same direction, said cylindrical drum having a plurality of cylindrical bores formed therein and a reciprocable piston located in each of said cylindrical bores in said cylindrical drum, a swivel carriage housing connected to said machine housing forming a concave swivel carriage guide surface, the face of said swivel carriage opposite said cylindrical drum being convex and positioned against said concave guide surface of said swivel carriage housing, the common axis of curvature of the convex face of said swivel carriage and the concave swivel carriage guide surface of said swivel carriage housing



intersects the axis of rotation of said cylindrical drum in said piston guide member surface, a plurality of pairs of counteracting servo piston means for adjusting the angle between the axis of rotation of said cylindrical drum and the piston guide surface to modify the length of the stroke of said pistons within said bores in said cylindrical drum, and at least one support piston having a piston rod pivotably connected to said machine housing and an end connected to said swivel carriage, whereby reciprocation of said serve piston means adjusts the location of said swivel carriage in said swivel carriage housing.

4,893,550

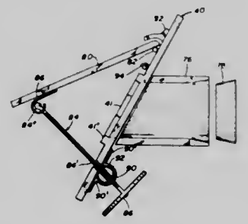
DYNAMIC VENT FOR AUTOMOBILES

Bin-Lah Cheng, 2332 Hampshire Way, Tallahassee, Fla. 32308

Filed Oct. 3, 1988, Ser. No. 252,599

Int. Cl.[4] B60H *1/26*

U.S. Cl. 98—2.02 **20 Claims**



1. A ventilator for a vehicle for mounting in a window of the vehicle, comprising, in combination:
at least one mounting panel for placement in the channel of a vehicular window frame, said at least one mounting panel having at least one opening formed through a portion thereof, said at least one mounting panel defining an interior surface and an exterior surface;
a d.c. powered fan comprising a housing for operative fluid communication with said at least one opening of said at least one mounting panel, said fan having a length taken in the direction from exteriorly to interiorly;
means securing said fan to said mounting panel for juxtaposition and alignment with said opening, said means for securing said fan to said panel so that at least part of said fan projects inwardly and away from said interior surface of said panel; and
means for electrically coupling said fan to a source of d.c. power, whereby said fan causes the exchange of air between the interior of a vehicle and the ambient air;
said at least one mounting panel having a thickness less than said length of said housing.

4,893,551

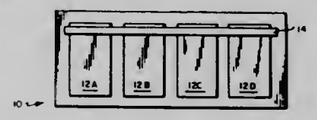
FUME HOOD SASH SENSING APPARATUS

Gordon P. Sharp, Newton, and Jerome J. Schonfeld, Framingham, both of Mass., assignors to Phoenix Controls Corporation, Newton, Mass.

Filed May 19, 1988, Ser. No. 196,029

Int. Cl.[4] B08B *15/02*

U.S. Cl. 98—115.3 **38 Claims**



1. In fume hood having an opening for access to the interior thereof and at least two sashes for covering the opening, apparatus for sensing the extent to which the sashes cover the opening comprising:
a source of radiation;
means for detecting said radiation; and
means for mounting said radiation source and said radiation detecting means such that there is relative movement between them as a sash is moved to cover or uncover an opening, the movement between the source and detector being such that the amount of said radiation detected by said detecting means from said source is proportional to the uncovered portion of said opening.

4,893,552

BEVERAGE-MAKING MACHINE

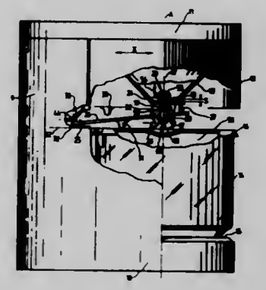
Dieter Wunder, Reichelsheim, and Hans-Jürgen Henning, Königstein, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,436

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743050

Int. Cl.[4] A47J *31/24*

U.S. Cl. 99—299 **19 Claims**



1. A beverage making machine comprising a housing having structure defining a storing receptacle receiving region and support structure above said storing receptacle receiving region,

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filter case structure for releasable engagement with said support structure,

said filter case structure having an outlet and an anti-drip valve disposed in said outlet, said anti-drip valve being movable between closed and opened positions,

a valve operating mechanism including biasing means for biasing said valve to its closed position closing said filter case outlet, and one piece lever structure connected between said biasing means and said valve for moving said valve to its open position,

said one piece lever structure being deflectable about a first axis of rotation to a ready position by a stop on the housing as said filter case structure is inserted into said beverage making machine without opening said anti-drip valve, and, only by insertion of said storing receptacle beneath the filter case structure, said lever is deflected by said storing receptacle to move about a second axis of rotation to open said anti-drip valve.

4,893,553

MACHINE FOR THE AUTOMATIC PRODUCTION OF MEAT AND/OR VEGETABLE KEBABS THREADED ONTO SKEWERS

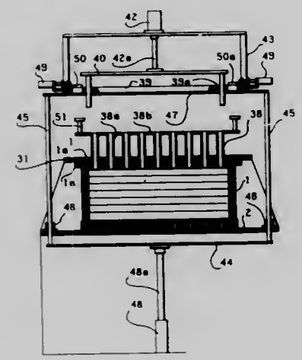
Michel Emsens, Fraisses, France, assignor to Emsens Antoine S.A.R.L., France

Filed Feb. 4, 1988, Ser. No. 152,402

Claims priority, application France, Feb. 4, 1987, 87 01658

Int. Cl.[4] A47J *43/18, 43/00*

U.S. Cl. 99—419 **6 Claims**



1. Machine for the automatic production of layers of meat and/or vegetables threaded onto skewers in which the skewering device is axially positioned, comprising a container (1) having plural,

stacked layers of meat, skewers (20) vertically positioned in vertical holes (1a1) on a top face of a cylinder which acts as a lid (1a) to allow said skewers (20) to rest against the plural layers of meat and/or vegetables; said machine having arrangements taking the skewers (20) that are made up of a plurality of tubes (38) which correspond with perforations in a lid of the container,

the said tubes being fixed at one end into holes made out in the thickness of a coupling plate, which makes up a guiding and positioning assembly for said skewers;

said tubes (38) being of a length that after they are positioned in perforations of the container lid and applied against the layers of meat and/or vegetables, the skewers (20), project a length (x) from the coupling plate; and wherein

said skewering device comprises a horizontal support plate (39) fixed to control means for vertically and simultaneously driving from above, both skewers and tubes

said plate taking a free sliding thrust means, adjustable in function of the length (x) of part projecting from the skewers and to be applied against the plate, said means being controlled by a compression means.

4,893,554

APPARATUS FOR DISTRIBUTING CHEESE COAGULUM IN A VAT

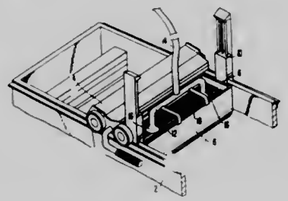
Knud Gasbjerg, Silkeborg, Denmark, assignor to Gadan Maskinfabrik A/S, Them, Denmark

Filed Sep. 21, 1988, Ser. No. 249,872

Claims priority, application Denmark, Sep. 21, 1987, 4930/87

Int. Cl.[4] A01J *19/00, 25/00*

U.S. Cl. 99—458 **4 Claims**



1. An apparatus for supplying cheese coagulum to an oblong prepressing vat or similar container, the apparatus comprising a distributor means arranged generally crosswise of a longitudinal direction of the container and being reciprocable along a length of the container, the distributor means including a distributor container having opposed part-cylindrical bottom wall portions, an upper receiving portion, an elongated outlet edge means, and a slot-shaped bottom outlet means, said distributor means being operable to receive a mixture of whey and cheese coagulum from at least one location along a length of the distributor means and to distribute said mixture through the distributor container over the length of the distributor means in such a manner that the mixture may flow off from the distributor container in a broad relatively even flow over a length of the distributor container, rotating wing rollers provided in the distributor for sluicing out said mixture from the at least one receiving location to and beyond the elongated outlet edge means of the distributor container, said wing rollers are mounted so as to engage with each other at an intermediate height level of the distributor container, and wherein said wing rollers are rotatable for sluicing down the mixture along the respective part-cylindrical bottom wall portions of the distributor container just above said slot-shaped bottom outlet means.

4,893,555

HOT FOIL PRINTING

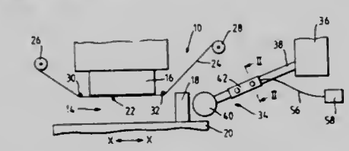
Alan J. Leyland, and Brian C. A. Scorgie, both of Merseyside, England, assignors to Delco Electronics Overseas Corp., Detroit, Mich.

Filed Dec. 16, 1988, Ser. No. 285,685

Claims priority, application United Kingdom, Jan. 12, 1988, 8800596

Int. Cl.[4] B41F *1/07*

U.S. Cl. 101—29 **11 Claims**



1. A hot foil printing apparatus for printing letters or other devices on a surface of a plastics substrate, the hot foil printing apparatus comprising a workstation comprising a heated die having an outer surface with a print pattern thereon, a printing tape positioned adjacent the outer surface of the heated die and having a printing material thereon on the opposite side of the printing tape to the outer surface of the heated die, and holding means for securing the plastics substrate and for presenting the surface of the plastics substrate to the heated die such that the printing tape can be compressed between the surface of the plastics substrate and the outer surface of the heated die; and transfer means for moving the plastics substrate from a stored position to a second position in which the plastics substrate can be secured by the holding means; characterised in that the transfer means includes heating apparatus in close antecedent proximity to the heated die for heating the surface of the plastics substrate immediately prior to presentation to the heated die, such that the temperature of the surface of the plastics substrate is above room temperature when presented to the heated die.

4,893,556

SCREEN PRINTER WITH DOUBLE DOCTOR/SQUEEGEE, PRINTING PRESSURE SENSOR AND ALIGNING MECHANISM

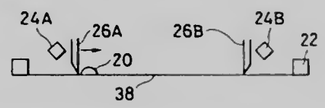
Tetsuo Takahashi; Akio Sasaki; Kunio Mogi; Hajime Shimazaki, and Masakazu Hasegawa, all of Akita, Japan, assignors to TDK Corporation, Japan

Filed Feb. 10, 1988, Ser. No. 155,152

Claims priority, application Japan, Feb. 23, 1987, 62-37899; Feb. 23, 1987, 62-37900; Feb. 25, 1987, 62-40149

Int. Cl.[4] B41F *15/42*

U.S. Cl. 101—123 **11 Claims**



1. A screen printing apparatus comprising:

a screen; and

a pair of printing heads each arranged above said screen so as to be laterally movable with respect to said screen and each including a doctor plate mounted on said printing head and a squeegee vertically movably mounted on said printing head;

said printing heads being alternately actuated for printing;

said doctor plates of said printing heads being arranged laterally opposite to each other on said screen;

said doctor plates each applying a paste onto said screen while transferring said paste;

said squeegees each being moved while pressing said screen against a printed object after application of said paste onto said screen by said doctor plate corresponding thereto.

4,893,557

COUPLING DEVICE FOR AN ADJUSTER WHEEL

Norbert Benthake, Schöppenstedt, and Hans-Jürgen Knoch, Neckargemünd, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

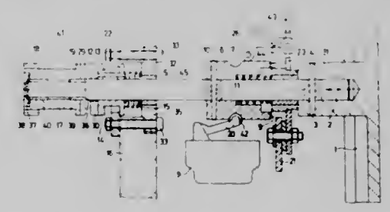
Continuation of Ser. No. 722,995, Apr. 15, 1985, abandoned, which is a continuation of Ser. No. 500,774, Jun. 3, 1983, abandoned. This application Mar. 19, 1986, Ser. No. 841,675

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220872

Int. Cl.[4] B41F *13/00*

U.S. Cl. 101—141 **2 Claims**

1. In a printing machine having a drive system including drive gearing, a coupling device for an adjuster wheel manually turnable for starting up printing machine functions, comprising an adjuster wheel shaft having an adjuster wheel at one end thereof and a gear wheel at the other end thereof, said adjuster wheel shaft being adjustably displaceable axially in two stages for bringing the adjuster wheel into and out of operative connection via the gear wheel with the drive gearing of the printing machine, shift means, in response to axial displacement of said adjuster wheel shaft, in one of the two stages, preventing switching on of the drive system for the printing machine, a clutch device, in response to a further axial displacement of said adjuster wheel shaft, in the other of the two stages operatively connecting the adjuster wheel with the drive gearing of the printing machine, first and second stop means engageable with said shift means and effective after each of said two adjustment stages, respectively, as stage limitation elements for limiting further axial displacement of said adjuster wheel shaft, and means actuable by turning the adjuster wheel for disengaging and overriding said first stop means.



4,893,558

IMAGE REPRODUCTION

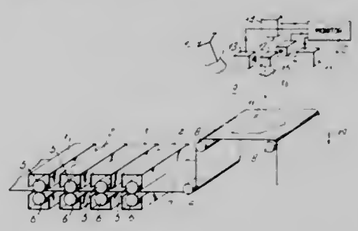
Martin P. Gooch, Hertfordshire, England, assignor to Crosfield Electronics (USA) Limited, London, England

Continuation of Ser. No. 44,263, Apr. 30, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 290,807

Claims priority, application United Kingdom, May 12, 1986, 8611555

Int. Cl.[4] B41F *5/06, 5/16*

U.S. Cl. 101—211 **4 Claims**



1. A method of detecting the positions of features in colour separations, comprising the steps of:

(a) successively printing a plurality of different colour separations on a substrate in superposed relationship, each including a detectable feature, with respective inks, each said ink containing both a visible pigment corresponding to the respective colour of each separation and a respective invisible dye which is detectable only when exposed to radiation outside the visible range, wherein the invisible dyes in each colour separation link individually emit radiation centered on different respective wavelengths;

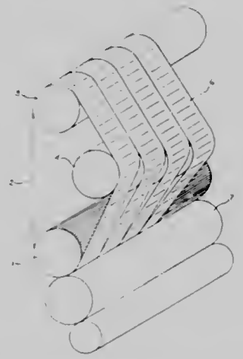
(b) exposing said printed colour separations to said radiation; and

(c) determining the positions of said features in said printed colour separations by individually detecting radiation from said dyes.

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4,893,559
METHOD AND APPARATUS FOR PRINTING QUASI RANDOM NUMBER TABLES IN A FLEXOGRAPHIC PRESS

Ian M. Sillars, 2704 The Strand, Manhattan Beach, Calif. 90266
Filed Dec. 16, 1987, Ser. No. 133,666
Int. Cl.[4] B41F *5/18, 5/24*
U.S. Cl. 101—216 6 Claims



1. A device for printing quasi random number tables comprising:

a printing plate cylinder, a plurality of continuous belts disposed about said printing plate cylinder, a common idle roller disposed within said belts, said idle roller spaced apart from said printing plate cylinder, a tension roller abutting said belts for providing tension to said belts;

each of said plurality of belts being of different length, each of said belts having gearing means disposed on one side thereof for engagement with said printing plate cylinder and maintaining registration between said belts and said printing plate cylinder, said belts having a plurality of flexographic printing plates disposed on another side thereof at a predetermined pitch;

each of said belts having a length which is a multiple of said predetermined pitch;

each of said printing plates having at least one number disposed thereon so that a plurality of numbers may be printed.

4,893,560
DOCUMENT AND CARD POSITIONING DEVICE FOR ROLLER IMPRINTER

A. Glenn Wright, Route 4, Box 355, Pittsboro, N.C. 27312, and James L. Ross, 1803 Fountain Ridge Road, Chapel Hill, N.C. 27514
Filed Sep. 27, 1988, Ser. No. 249,908
Int. Cl.[4] B41F *3/04*
U.S. Cl. 101—269 10 Claims

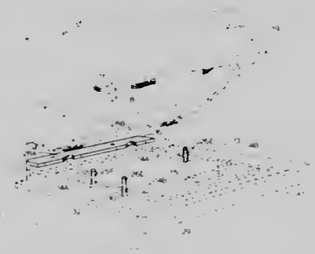
1. In a card and document positioning imprinter device including a roller mechanism movable between an inoperative upper position and lowered printing position over a platen supported by a lower frame piece, the improvement comprising:

(a) a base positioned beneath the platen;

(b) a plurality of pegs extending upward from the base;

(c) a depressible spring means for vertically positioning the base beneath the platen so that the pegs extend upward above the platen; and

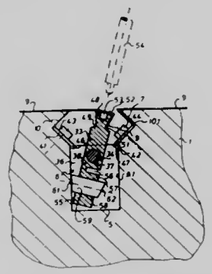
(d) a formed piece connected to the base and extending above the platen so that when the roller mechanism is lowered, said roller mechanism strikes the formed piece,



said striking resulting in the base being pushed down on the depressible spring means and the pegs being lowered.

4,893,561
PRINTING PLATE FASTENING AND TENSIONING ASSEMBLY

Heinrich K. Grosshauser, and Georg Schneider, both of Würzberg, Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzberg, Fed. Rep. of Germany
Division of Ser. No. 76,285, Jul. 22, 1987, Pat. No. 4,848,229.
This application Feb. 2, 1989, Ser. No. 305,439
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626243
Int. Cl.[4] B41F *27/00*
U.S. Cl. 101—382.1 6 Claims



1. A printing plate fastening and tensioning assembly usable to fasten and tension a flexible printing plate on a plate cylinder of a rotary printing machine, said fastening and tensioning assembly comprising:

a movable plate fastening and tensioning element positioned for pivotable movement in an axial groove extending along a surface portion of the plate cylinder, said plate fastening and tensioning element being pivotable in said groove about a central pivot axis which extends along said axial groove between printing plate fastening and tensioning positions in which positions the spacing of an outer portion of said plate fastening and tensioning element with respect to a first edge of said groove is varied;

means on said outer portion of said plate fastening and tensioning element for securing a first end of the printing plate;

a spring lot in said plate fastening and tensioning element for applying a spring force to said plate fastening and tensioning element, said spring force tending to exert a plate tensioning force on said first end of said printing plate;

means to secure a second end of said printing plate to a second edge of said axial groove, and

at least a first magnet means carried by an inner end of said plate fastening and tensioning element, said magnet means exerting a magnetic force to magnetically attract said inner end of said plate fastening and tensioning element toward said first edge of said groove when said plate fastening and tensioning element is in said printing plate tensioning position and to magnetically attract said inner end of said plate fastening and tensioning element toward said second edge of said groove when said printing plate fastening and tensioning element is in said printing plate fastening position.

4,893,562
BEARER WIPER ASSEMBLY

Albert W. Robertson, Christopher, Ill., assignor to Air Stamping, Inc., Christopher, Ill.
Continuation of Ser. No. 827,755, Feb. 7, 1986, Pat. No. 4,704,964. This application Nov. 9, 1987, Ser. No. 118,659
The portion of the term of this patent subsequent to Nov. 10, 2001, has been disclaimed.
Int. Cl.[4] B41F *35/02*
U.S. Cl. 101—425 7 Claims

1. In a printing apparatus having rotatable bearer members, a bearer wiper assembly comprising:

(a) a support means,

(b) an extensible arm having opposed ends one of said ends being attached to the support means,

(c) a wiper means removably attached to the extensible arm, said wiper means including a wiper pad having a direct bearer-engageable portion provided with a plurality of collection apertures for collecting foreign matter and

(d) the wiper pad being generally ell-shaped having a forward bearer-engageable portion and a rearward mounting portion and means for mounting said mounting portion to the extensible arm.

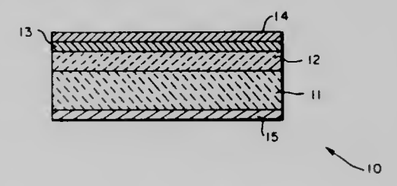
4,893,563
MONOLITHIC RF/EMI DESENSITIZED ELECTROEXPLOSIVE DEVICE

Thomas A. Baginski, Auburn, Ala., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 5, 1988, Ser. No. 280,049
Int. Cl.[4] F42C *19/12*
U.S. Cl. 102—202.2 24 Claims

1. A monolithic RF/EMI desensitized electroexplosive device comprising:

a substrate of silicon, coated on a first side with a layer of silicon dioxide; and

a patterned layer of nichrome over said silicon dioxide layer to form a resistive bridgewire; and



a pattern layer of copper over said nichrome layer said layer of copper forming lead attachment points for the device.

4,893,564
ELECTRIC DETONATOR OF DELAY TYPE

Koji Ochi, Iwamizawa, and Masahide Harada, Sapporo, both of Japan, assignors to Nippon Oil & Fats Co., Ltd., Japan and Harada Electronics Industry, Japan
Filed Oct. 12, 1988, Ser. No. 256,642
Claims priority, application Japan, Oct. 20, 1987, 62-262810
Int. Cl.[4] F42C *11/00*
U.S. Cl. 102—218 4 Claims

1. An electric detonator of delay type comprising

a pair of leg wires which are connectable to bus wires connected to a blaster;

a capacitor connected across said leg wires and storing the electric energy supplied from the blaster via the bus wires and the leg wires;

a delay circuit connected to be energized by a terminal voltage generated across said capacitor and generating an igniting signal at a predetermined timing;

a switching circuit connected to be made conductive upon receipt of said igniting signal from said delay circuit and constituting a discharge passage for the electric energy stored in said capacitor;

an igniting resistor connected in said discharge passage and igniting the detonator when the electric energy is discharged through the discharge passage;

a low voltage protection circuit connected across the leg wires and discharging the electric energy stored in the capacitor, when a power supply voltage applied across the leg wires is smaller than the lowest voltage of a normal operation range; and

a high voltage protection circuit connected across the leg wires and discharging said electric energy stored in the capacitor when the power supply voltage exceeds the highest voltage of the normal operation range and supplying to said delay circuit an inhibit signal which inhibits a time counting operation of the delay circuit for determining said predetermined timing.

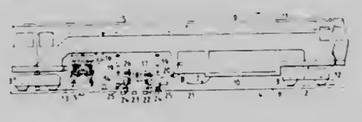
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4,893,565

MOBILE TRACK SWITCH WORKING MACHINE

Josef Theurer, Vienna, and Wilhelm Praschl, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 156,416, Feb. 16, 1988, abandoned. This application May 22, 1989, Ser. No. 357,671
Claims priority, application Austria, Feb. 27, 1987, 445/87; Jul. 8, 1987, 1722/87
Int. Cl.[4] E01B *27/17*
U.S. Cl. 104—7.2 **15 Claims**



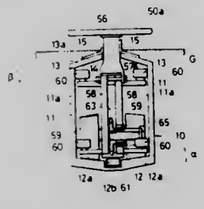
1. A mobile track working machine comprising a machine frame mounted for mobility in an operating direction along a track including two rails fastened to ties defining cribs therebetween, each rail having a rail head, a rail foot, a field side and a gage side, and an apparatus for lifting and laterally moving the track in a switch section, the apparatus comprising
(a) a vertically and laterally movable tool carrier frame,
(b) power-actuated drives linking the tool carrier frame to the machine frame for vertically and laterally moving the tool carrier frame with respect to the machine frame,
(c) a pair of flanged wheels supporting the tool carrier frame for mobility on the track,
(1) a respective one of the flanged wheels being associated with each track rail and serving as track lining element,
(d) a rail gripping device associated with each flanged wheel and mounted on the tool carrier frame for engagement with the field side of the associated rail, the rail gripping device including
(1) two rail gripping hooks transversely and vertically adjustable for selective engagement with the head or foot of the associated rail at the field side thereof and spaced from each other in the operating direction a distance corresponding to at least one average crib width, and
(e) independent drives connected to each rail griping hook for independent vertical and lateral adjustment thereof.

4,893,566

GOLF CART SYSTEM

Tomiichi Fukuda, 3-23-18, Denenchofu, Ohta-ku, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,631
Claims priority, application Japan, Dec. 11, 1986, 61-295167
The portion of the term of this patent subsequent to Jan. 9, 2004, has been disclaimed.
Int. Cl.[4] B61F *13/00*
U.S. Cl. 104—140 **1 Claim**



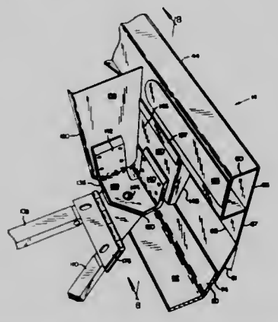
1. A golf cart system comprising:
a track adapted to be embedded in the ground, and
a cart adapted to run on said track,
said track including
a generally horizontally extending bottom wall,
two opposed side walls each generally vertically extending from said bottom wall,
two top walls each extending from an upper end of each side wall toward a center of said track,
a top groove defined between said two top walls, and
a bottom groove defined between inner surfaces of said bottom wall,
said cart including
a base frame,
two supporting posts extending vertically and downwardly from said base frame through said top groove into an interior of said track,
a guiding wheel supporting frame and a driven wheel supporting frame being mounted on a different one of said supporting posts and being movable within said track and movable with respect to each other,
drive means mounted on said base frame,
driving wheels mounted on said driven wheel supporting frame being driven by said drive means from said base frame to run on the inner surfaces of said bottom wall of said track,
first anti-rolling rollers mounted on said guiding wheel supporting frame and said driven wheel supporting frame to run on inner surfaces of said side walls,
second anti-rolling rollers mounted on said guiding wheel supporting frame and said driven wheel supporting frame to run within said bottom groove of said bottom wall,
anti-pitching rollers mounted on said guiding wheel supporting frame and said driven wheel supporting frame to run on inner surfaces of said two top walls, and
guiding wheels mounted on a front end of said guiding wheel supporting frame for guiding said cart along said track.

4,893,567

RAILROAD FREIGHT CAR WITH WELL FOR STACKED CARGO CONTAINERS

Charles C. Hill; Thomas Gareth R., both of Del Mar, Calif.; Gary S. Kaleta, Warren, and Gregory J. Saxton, Portland, both of Oreg., assignors to Gunderson, Inc., Portland, Oreg.

Filed Aug. 18, 1988, Ser. No. 234,332
Int. Cl.[4] B61D *17/08*
U.S. Cl. 105—419 **16 Claims**



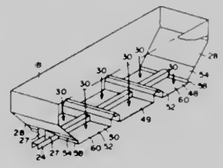
1. A container support assembly for use in a railroad freight car including a pair of side sills defining a well for receiving and carrying intermodal cargo containers and other loads concentrated at separate discrete locations rather than being spread uniformly over large areas, said container support assembly comprising:
(a) a main load support member of high strength steel plate bent to include a horizontal load-supporting foot portion and at least one upwardly directed leg portion;
(b) an attachment hanger bracket assembly of thinner metal plate members welded together and adapted to fit against and be welded to one of said side sills; and
(c) a plurality of mechanical fasteners attaching a respective one of said upwardly directed leg portions to said hanger bracket assembly.

4,893,568

RAILWAY CAR CONVERSION TO GONDOLA CAR

Norman S. Adams, Cincinnati, Ohio, assignor to Trinity Industries, Inc., Dallas, Tex.

Filed Dec. 7, 1987, Ser. No. 129,799
Int. Cl.[4] B61D *17/10*
U.S. Cl. 105—416 **13 Claims**



1. A railway car comprising:
a generally longitudinally extending center sill and laterally spaced pair of side walls;
said side walls each including a side sill;
a crossbearer structure positioned above said center sill and extending between the side walls;
a floor extending between the side walls and being connected with the crossbearer structure in a manner that substantially covers the cross bearer structure; and
a floor frame structure connected with the side sills and extending below and engaging the floor for supporting and rigidifying the floor,
said floor frame structure comprising substantially straight support members extending from one side wall to the other side wall transversely of the center sill, beneath said floor and center sill and in engagement therewith along a substantially flat surface.

4,893,569

SAFETY WALL AND A SAFETY CAGE FOR TIRE INFLATION

Arne H. Hansen, Virringvej 2, DK-8660 Skanderborg, Denmark

Continuation of Ser. No. 56,656, Jun. 2, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 206,492
Int. Cl.[4] E05G *3/00*; E06B *9/00*
U.S. Cl. 109—1 S **4 Claims**



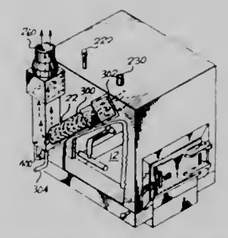
1. A safety wall structure for separating a tire inflation area from an adjacent area, the safety wall structure including at least two substantially parallelly arranged wall portions made of a net material of a type having mesh strip portions with substantially planar surfaces twisted out from a plane of the respective wall portions so as to be oblique relative thereto and form an open-mesh net, the wall portion as being arranged with a mutual spacing of at least 1 cm and with opposed mesh stripped portions being oblique in mutually opposite directions with respect to the planes of the wall portions so as to cause a double change in direction of an air flow of an exploding tire thereby preventing a discharge of strong air pressure waves, and wherein mesh junctions of one of the wall portions are staggered with respect mesh junctions of the other wall portions.

4,893,570

COMBUSTION FURNACE

Robert J. Boucher, P.O. Box 985, Bonner, Mont. 59823

Division of Ser. No. 32,972, Apr. 2, 1987, Pat. No. 4,829,914, which is a continuation of Ser. No. 672,132, Nov. 16, 1984, abandoned. This application Nov. 28, 1988, Ser. No. 276,883
Int. Cl.[4] F23J *15/00*
U.S. Cl. 110—203 **15 Claims**



1. A solid fuel combustion furnace comprising:
a solid fuel combustion chamber formed as a six-sided enclosure having a trapezoidal cross section with the forward wall being shorter than the rear wall and the top section sloping upwardly from front to rear, said top section being provided with a gas exhaust port proximate said rear wall; and
a gas combustion chamber for combusting the gas flow produced by combustion of the solid fuel in the solid fuel combustion chamber, the gas combustion chamber formed as a six-sided enclosure having an inverted, generally trapezoidal cross section with the rear wall being shorter than the forward wall and the bottom section sloping upwardly from front to rear, said bottom section being parallel to the top section of said solid fuel combustion chamber, said gas combustion chamber bottom section being provided with a gas intake port proximate to the exhaust port of said combustion chamber for receiving said gas flow, the top section of said gas combustion chamber being provided with an exhaust port proximate the forward wall of said gas combustion chamber for venting said gas flow,
whereby the expanding shape of the gas combustion chamber produces gas flow turbulence to thereby promote combustion.

4,893,571

METHOD AND DEVICE FOR PLANTING BALLED SEEDLINGS

Reijo Hilkki, Iso-Vimma; Leo Lahde, and Esa Lahde, both of Köylö, all of Finland, assignors to Lannen Tehtaat Oy, Finland

Filed Jul. 26, 1988, Ser. No. 224,328
Claims priority, application Finland, Nov. 2, 1987, 874883
Int. Cl.[4] A01C *11/02*
U.S. Cl. 111—105 **11 Claims**

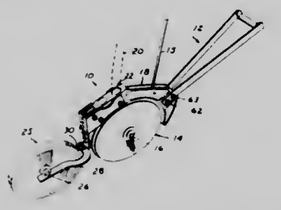
1. A method of planting balled seedlings taken from a con-

tainer tray having a top and a bottom, wherein each balled seedling is taken hold of and removed from the container through the top, the improvement comprising taking hold of the balled seedling and removing it from the container by



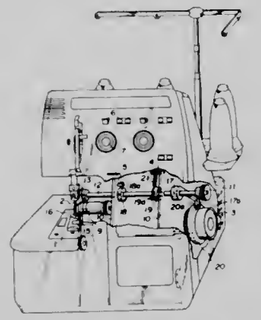
means of a spike-like element by pushing the seedling from the bottom into the spike-like element, which remains in a substantially horizontal position during the pushing operation, and subsequently releasing the seedling by rotating the spike-like element into a substantially vertical position.

4,893,572
GRAIN DRILL PLANTING DEPTH CONTROL
Michael J. Schaefer, P.O. Box 544, Okarche, Okla. 73762
Filed Sep. 12, 1988, Ser. No. 242,586
Int. Cl.[4] A01C *5/06*
U.S. Cl. 111—194 **1 Claim**



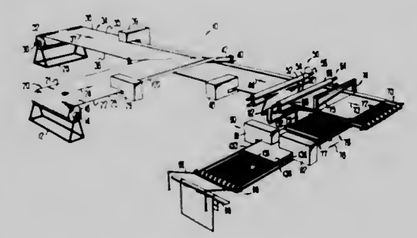
1. An attachment for use with an agriculture seeding implement having a seed planting apparatus comprising a pair of furrow opening disks substantially aligned with respect to the intended direction of travel in a seed planting action of the implement and having a superposed disk support journalling the disks and connected in rearward longitudinal trailing fashion with the implement by a pair struts, comprising: a pressure wheel disposed rearwardly of and in substantial
alignment with said pair of disks;
means including a pressure arm for journalling said wheel;
telescoping tongue and bracket means connecting said arm with the disk support for vertically positioning said wheel relative to said disks and limiting the earth penetrating action of said disks to a predetermined depth,
said telescoping tongue and bracket means including a U-shaped bracket having generally para[illegible] legs straddling and connected with opposing sides o[illegible]id support and having a generally vertically disposed bight portion disposed rearwardly of the support,
said telescoping tongue and bracket means further including a generally vertically disposed tongue secured at its depending end with the end of said pressure arm opposite the pressure wheel in vertically slidable contact and with bight portion,
said bight portion and said tongue each having a series of vertically spaced bolt receiving openings,
said pair of struts being bolted to the forwardly projecting portion of said support; and,
a strut link interposed between and connecting said support with said pair of struts,
said link having an arcuate slot permitting a selected angular attitude of said seed planting apparatus with respect to said struts and the surface of the earth.

4,893,573
OVERLOCK SEWING MACHINE
Akira Moriya, Tendo, Japan, assignor to Suzuki Manufacturing Co., Ltd., Japan
Filed May 22, 1989, Ser. No. 354,833
Claims priority, application Japan, Oct. 14, 1988, 63-259205
Int. Cl.[4] D05B *87/02*
U.S. Cl. 112—225 **2 Claims**



1. An overlock sewing machine comprising a needle vertically moving while passing through a needle plate, a knife for cutting a marginal portion of a cloth at a side of said needle plate, and a looper for hemstitching the marginal portion thus cut of the cloth in cooperation with said needle,
and a threading unit comprising a shaft disposed crosswisely to the feed direction of the cloth, a threading member fixed on said shaft and swingable in the rear of said knife, a thread setting hook fixed on said threading member and retractably passable through the eye of said needle, and a knob for rotating said shaft.

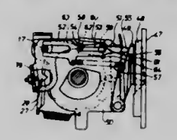
4,893,574
METHOD FOR MANUFACTURING PILLOWCASES
Darrell D. O'Neal, 2081 Merle Dr., Conyers, Ga. 30207, and Parks C. Stewart, 1005 Winding Creek Trail, Atlanta, Ga. 30328
Division of Ser. No. 233,466, Aug. 18, 1988, Pat. No. 4,856,439.
This application Jun. 8, 1989, Ser. No. 364,258
Int. Cl.[4] D05B *97/00*
U.S. Cl. 112—262.2 **8 Claims**

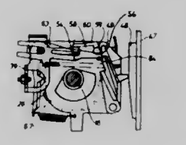


1. A method of constructing a pillowcase or the like, comprising the steps of:
conveying an upper layer of fabric having obverse and reverse surfaces and being of indeterminate length along a first predetermined path with its obverse surface facing upwardly;
forming a first cuff along a first lateral edge of said upper layer of fabric;
stitching said first cuff to said first lateral edge of said upper layer of fabric;
conveying a lower layer of fabric having obverse and reverse surfaces and being of indeterminate length along a second predetermined path with its obverse surface facing upwardly;
forming a second cuff along a first lateral edge of said lower layer of fabric;
stitching said second cuff to said first lateral edge of said lower layer of fabric;
reversing said upper layer of fabric so that its obverse surface faces downwardly;
bringing said upper and lower layers of fabric together with their obverse sides mutually facing and their first cuffed lateral edges mutually corresponding;
conveying said mutually facing upper and lower layers of fabric together along a third predetermined path;
stitching said upper and lower layers of fabric together along the second lateral edges of said layers of fabric opposite said first cuffed lateral edges;
measuring said indeterminate length upper and lower layers of fabric to a predetermined length substantially equal to the desired width of a finished pillowcase;
cutting said upper and lower layers of fabric perpendicular to said first and second lateral edges at said predetermined length to form a rectangular unitary workpiece comprising upper and lower panels of fabric having obverse surfaces in mutually facing superposition, said panels being stitched together along one transverse edge and cuffed at their opposite transverse edge, and the remaining two edges of said rectangular unitary workpiece comprising longitudinal edges;
conveying said rectangular unitary workpiece along a path parallel to said longitudinal edges of said rectangular unitary workpiece; and
stitching said upper and lower panels of said rectangular unitary workpiece together along said longitudinal edges of said rectangular unitary workpiece, whereby said rectangular unitary workpiece is stitched closed along both longitudinal edges and one transverse edge and is open at the opposite cuffed transverse edge.

4,893,575
FANCY SEAM SEWING MACHINE WITH AN INFINITELY VARIABLE ZIGZAG MODULE
Karl I. F. Rendahl, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden
Filed May 12, 1988, Ser. No. 193,402
Claims priority, application Sweden, May 25, 1987, 8702192
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—465 **3 Claims**

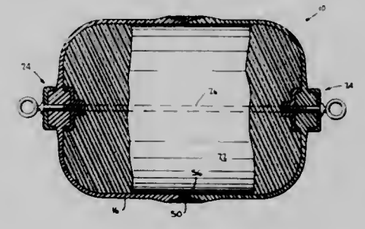
1. In a fancy seam sewing machine with a zigzag control arrangement for producing fancy seams, said machine having a cam disk unit (30) rotatable with a driving shaft provided in the machine, an elastic member (34) influenced cam selecting unit (33) which, by means of a pattern selection control device (20) is adjustable relative to the cam disk unit and connectable to cam disks in said cam disk unit as well as connected to a guide (58) journalled in the control device for carrying out an oscillatory movement effected by one of said cam disks, and a sensor (51) included in the control device and cooperating with the guide and journalled in bearings for oscillatory and sliding movements and connected to a needle bar unit (10) of the machine, the improvement wherein the sensor comprises a slide with extension and displaceability within the same plane as said oscillatory movement of the guide and continuously adjustable in its longitudinal direction by means of a zigzag control (47) on any position relative to the guide to transfer an





arbitrary amplitude of said oscillatory movement to the slide and therefrom to the needle bar unit.

4,893,576
MARINE FENDER
John T. Day, Winfield; Robert O. Herder, Easton, and Robert B. McNatt, Annapolis, all of Md., assignors to Rubber Millers, Inc., Baltimore, Md.
Continuation of Ser. No. 467,241, Feb. 17, 1983, Pat. No. 4,628,850, which is a continuation-in-part of Ser. No. 352,255, Feb. 25, 1982, abandoned. This application Dec. 12, 1986, Ser. No. 941,149
Int. Cl.[4] B63B *59/02*
U.S. Cl. 114—219 **9 Claims**



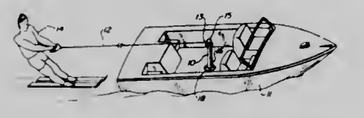
1. A fender for marine use comprising a unitary elastomeric shell having two ends and a cavity at each end thereof, said unitary shell having been formed by joining two sections each having one of said two ends and said cavity being less than about 25 percent of the diameter of said shell; mooring fittings fitted onto each of said cavities and interconnected, and contained within said shell a solid, flexible foam bun, said bun having a diameter substantially as great as the internal diameter of said shell and a length substantially as great as the internal length of said shell, said shell including a thickened area where said shell sections are joined substantially equal distance from each of said ends.

4,893,577
TOW ROPE PYLON WITH ROTATABLE BUSHING
Michael D. Jennings, Maryville, Tenn., assignor to Mastercraft Boat Co., Maryville, Tenn.
Filed May 18, 1988, Ser. No. 195,589
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—253 **6 Claims**

1. A pylon for a tow rope comprising:

a base having upper and lower ends for mounting the pylon on a support structure,

a bushing rotatably mounted on the upper end of the base, the bushing having a tubular central portion and radially enlarged upper and lower ends for restraining movement of a tow rope off of the tubular central portion,



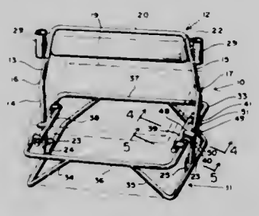
said base including an elongated body portion, a transversely enlarged support flange adjacent the upper end of the base for supporting the bushing, and a rod portion which extends through the tubular central portion of the bushing.

4,893,578

COMBINATION LEANING BAR AND SUPPORT STRUCTURE FOR A BOAT SEAT

Richard E. Doerfer, Cape Coral, and William B. Nesbitt, Fort Lauderdale, both of Fla., assignors to Aquasport Marine Industries, Inc., Hialeah, Fla.

Filed Aug. 22, 1988, Ser. No. 235,012
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—363 **8 Claims**



1. Combination leaning bar apparatus and support structure apparatus for a boat seat comprising

a boat seat support structure comprising

a substantially rectangularly shaped tubular frame with legs attached thereto and extending downward therefrom, said substantially rectangularly shaped tubular frame comprising

a forward U-shaped member, an aft U-shaped member arranged in a plane with a space between the ends of the U-shaped members, a side bar attached to adjacent ends of said U-shaped members and offset so as to maintain the space between the ends of the U-shaped members,

a leaning bar assembly pivotally attached to said boat seat support structure, said leaning bar assembly having vertical side members respectively fitting within said spaces,

locking means for locking said leaning bar assembly in a forward position, an aft position and an intermediate position therebetween.

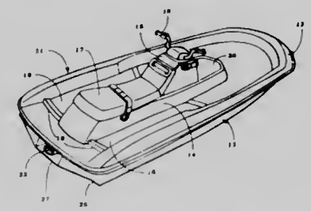
4,893,579

COMPACT PLANING TYPE BOAT

Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 26, 1988, Ser. No. 237,505
Claims priority, application Japan, Aug. 28, 1987, 62-213010
Int. Cl.[4] B63B *35/86*
U.S. Cl. 114—363 **7 Claims**

1. A hull configuration for a watercraft having a bow portion, an intermediate bridge portion, supporting means for steering said watercraft, and a stern portion, a rear seat for seating at least two riders in said stern portion in straddle, tandem relationship to the rear of said bridge portion so that the forwardmost rider may steer said watercraft, and a forward seat for one of said riders in said bow portion forwardly of said bridge portion, a depressed foot area around a front portion and side portions of said forward seat and side portions of the rear seat and said bridge portion for placement of the riders feet, the unladen center of gravity of said hull being juxtaposed



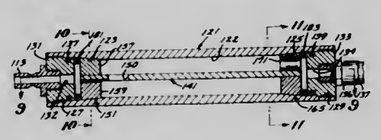
in a longitudinal direction in proximity to said bridge, said hull being configured such that said hull assumes a generally upwardly inclined position when riders are seated in tandem on said rear seat and said hull is travelling forwardly at speed and in a substantially horizontal condition when said watercraft is not travelling and riders of approximately equal weight are seated respectively on said forward and rear seats at approximately equal distances from said bridge.

4,893,580

SCUBA WHISTLE

Alan W. Joseph, Jr., 302 Washington Ave., Mount Vernon, Ind. 47620, and Timothy E. Joseph, 540 Kellon Ave., Los Angeles, Calif. 90021

Division of Ser. No. 40,161, Apr. 20, 1987, Pat. No. 4,852,510. This application May 15, 1989, Ser. No. 352,009
Int. Cl.[4] G10K *5/00*; B06B *3/00*
U.S. Cl. 116—137 R **5 Claims**



1. An underwater whistle adapted to be coupled with a pressure hose leading from a pressure regulator mounted on the scuba diver's pressurized tank and regulating air pressure to a predetermined pressure, said whistle comprising:

an elongate housing tube formed with a resonant chamber therein, said resonant chamber having inlet and outlet bosses, said inlet and outlet bosses each being formed with internal screw threads;

an elongate reed plate disposed within said resonant chamber projecting from said inlet boss to said outlet boss and formed medially with a sound generating orifice;

inlet and outlet fittings formed with external screw threads screwed into said inlet and outlet bosses, respectively, and configured with respective inlet and outlet ports;

inlet and outlet plug means interposed between said respective inlet fitting and reed plate and said outlet fitting and reed plate and configured to direct air from said inlet fitting to one side of said orifice and from the other side of said orifice to said outlet fitting;

inlet coupling means for coupling said pressure hose leading from said pressure regulator to said inlet fitting; and

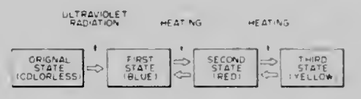
a control valve for controlling air flow from said outlet fitting, whereby a diver may controllably open said control valve to communicate air supplied by said pressure hose to said resonant chamber and through said orifice to cause said reed plate to vibrate and generate an audible sound vibration.

4,893,581

IMAGE FORMING METHOD

Hiroshi Matsuda, Yokohama, and Toshihiko Miyazaki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 157,142, Feb. 10, 1988, abandoned, which is a continuation of Ser. No. 812,067, Dec. 23, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 273,137
Claims priority, application Japan, Dec. 28, 1984, 59-274828; Dec. 28, 1984, 59-274829
Int. Cl.[4] B41M *5/26*
U.S. Cl. 116—201 **9 Claims**



1. An image-forming method comprising imparting thermal energy to a medium in a first state to thereby change said medium to either a second state or a third state, wherein said change from said first state to said second state is reversible, said change from said first state to said third state is irreversible, and said medium in said third state is capable of being reversibly changed to said second state; said medium in a first state being a polymerized Langmuir-Blodgette monomolecular film or built-up monomolecular film of a diacetylene derivative compound represented by the formula

$$R_1—C{\equiv}C—C{\equiv}C—R_2—X$$

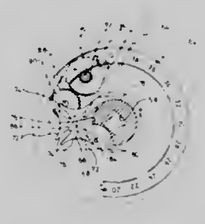
wherein X is selected from the group consisting of carboxyl groups, hydroxyl groups, amino groups, nitrile groups, thioalcohol groups, imino groups, sulfonic acid groups, derivatives of sulfonic acid groups, salts of sulfonic acid groups, sulfinic acid groups, derivatives of sulfinic acid groups, and salts of sulfinic acid groups; R_1 and R_2 are each selected from the group consisting of alkyl groups, olefinic hydrocarbon groups, aryl groups, alkylene groups, and alkenylene groups.

4,893,582

DECK BOX VALVE OPERATOR AND POSITION INDICATOR ASSEMBLY

Bruce P. Kalamon, and David P. Yasnsko, both of Pottstown, Pa., assignors to Teleflex Incorporated, Limerick, Pa.

Filed Nov. 19, 1986, Ser. No. 932,693
Int. Cl.[4] F16K *37/00*
U.S. Cl. 116—277 **11 Claims**



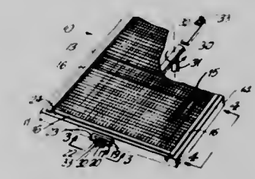
1. A deck box valve operator and position indicator assembly (10) comprising; housing means (18) for mounting to a support structure (16), spindle means (46) rotatably supported in said housing means (18) said housing means including means for reading said ring means (62), said spindle means (46) having a lower end (56) for connection to the operating shaft (14) of a valve (12), said spindle means (46) having an upper end (58) for receiving a tool for rotating said spindle means (46), ring means (62) rotatably supported in said housing means (18) for indicating the position of the valve (12) between open and shut positions, and transmission means operatively interconnecting said spindle means (46) and said ring means (62) for rotating said ring means in proportion to the rotation of said spindle means (46), said transmission means being characterized by a sprocket (66) supported by said housing means (18) for rotation about a sprocket axis (68) adjacent said spindle means (46), said sprocket (66) having a plurality of radial arms (72) having slots (74) extending thereinto from the distal ends thereof, said sprocket (66) having arcuate peripheries (76) extending between adjacent arms (72), said spindle means (46) having a circular circumference (78) interrupted by a concave recess (80) axially aligned with said sprocket (66), said arcuate peripheries (76) between said arms (72) of said sprocket (66) being complementing to said circular circumference (78) of said spindle means (46), said concave recess (80) being concentric to said axis (68) of said sprocket (66) when radially aligned therewith, said arms (72) of said sprocket (66) extending into said concave recess (80) when radially aligned therewith, a coaxial pin (84) supported by said spindle means (46) radially outside of said circular circumference (78) thereof and on the radial center of said concave recess (80) so that said sprocket (66) is prevented from rotating by an arcuate periphery (76) complimentary said circular circumference (78) of said spindle means (46) with the adjacent arms (72) extending about said circular circumference (78) until said spindle means (46) is rotated sufficiently to slide said pin (84) into the slot (74) of one of said arms (72) to rotate said sprocket (66) as the pin-engaged arm (72) rotates through said concave recess (80) where the next adjacent arcuate periphery (76) compliments the approaching circular circumference (78) of said spindle means (46) and said pin (84) slides radially out of engagement with the pin-engaged arm (72).

4,893,583

STRETCHER MEANS FOR USE IN A SPIN ART MACHINE

David Jaffa, Franklin Lakes, N.J., assignor to Artwave America, Inc., Hawthorne, N.J.

Continuation of Ser. No. 106,450, Oct. 8, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 332,447
Int. Cl.[4] B05B *13/02*; B05C *11/08*
U.S. Cl. 118—52 **19 Claims**



1. A stretcher for use in a spin art machine in which a rotating carrier member engages the stretcher and spins the stretcher about a spin axis so as to spread over the surface of a fabric mounted on the stretcher, under the action of centrifugal force, a liquid coloring agent that has been applied to said fabric surface, said stretcher comprising in combination:

an expanse of resilient material adapted to absorb pressure applied at the point of application of the coloring agent, thereby promoting smooth, continuous application thereof;

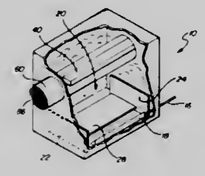
means suspending said resilient material for supportingly engaging the undersurface of a section of said fabric

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whose outer surface is to receive said coloring agent, said means including means for maintaining out of engagement with said resilient material any portion of said fabric that extends around and behind said expense of material, said suspending means comprising a perimetric frame suspending said resilient material substantially in a plane; and
means for enabling a rotatable carrier to engage said resilient material suspending means at opposite ends thereof along a selectable one of a group of parallel straight lines so that said stretcher may be spun about a selectable axis normal to the plane of said resilient material, said axis passing through the mid-point of the selected line.

4,893,584
LARGE AREA MICROWAVE PLASMA APPARATUS
Joachim Doehler, Union Lake, and Jeffrey M. Krisko, Highland, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.
Filed Mar. 29, 1988, Ser. No. 174,659
Int. Cl.[4] C23C *16/48*
U.S. Cl. 118—723 **54 Claims**

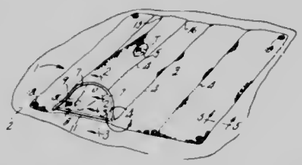


1. Microwave energy apparatus for sustaining a substantially uniform plasma over a relatively large area, comprising:
a vacuum vessel for initiating and sustaining a plasma in a plasma region thereof;
means in said vessel for supporting substrate means in operative juxtaposition relative to the plasma region;
means for maintaining said vessel at a desired, relatively low substantially sub-atmospheric preasure;
means for introducing process gases into said vessel;
non-evanescent applicator means at least partially extending into the interior of said vessel, said applicator means adapted to substantially uniformly radiate microwave energy from a source into the interior of said vessel for sustaining a plasma from the process gases introduced thereinto;
means for isolating the microwave radiating applicator means from the plasma region; said isolating means (1) formed from a material through which microwave energy can be radiated from said applicator means into said vessel, and (2) configured in a shape substantially optimized to withstand pressure differentials, whereby the thickness of the isolating means may be minimized and the microwave radiating applicator means and the isolating means are adapted to perform a substantially uniform plasma operation along an elongated surface of substrate means disposed in said vessel.

4,893,585
ZEOLITES IN POULTRY HATCHING
Sebastian M. Laurent, Greenwell Springs, La., assignor to Ethyl Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 927,373, Nov. 6, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 123,281
Int. Cl.[4] A01K *45/00*
U.S. Cl. 119—1 **14 Claims**

1. A method of improving the hatching parameters of poultry eggs which comprises incubating the egg for about one day at about 100° F., placing the warm incubated egg in a water suspension of zeolite wherein the temperature of the suspension is from about 1.5° F. to about 30° F. lower than the temperature of the egg just prior to being placed therein, soaking the egg in such solution, and thereafter incubating the egg to cause hatching of a poultry chick to occur.

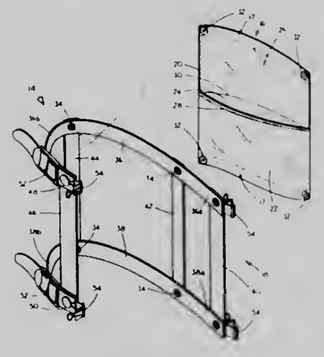
4,893,586
SLEEPING BAG FOR PETS
Betty J. Carson, P.O. Box 989, Canyonville, Oreg. 97417
Filed May 26, 1988, Ser. No. 199,140
Int. Cl.[4] A01K *1/035*
U.S. Cl. 119—1 **1 Claim**



1. A sleeping bag for household pets, said sleeping bag comprising,
a fabric top member and a fabric bottom member having generally corresponding perimetrical edges, said top member being of quilted construction,
stitching extending along the perimetrical edges to join the top and bottom members,
spaced apart top and bottom segments of said perimetrical edges defining an opening for ingress and egress of a pet with the top segment having a rolled and stitched edge to provide a degree of rigidity to same to provide an arch, and
said top member being folded at intervals along one of said edges to provide pleats in the top member contributing to the formation of tunnel extending substantially the length of the top member and accessible through said arch into which the pet may crawl.

4,893,587
URINE COLLECTION DEVICE
Aubrey Bailey, Jr., 3341 South 42nd, Omaha, Nebr. 68506
Filed Sep. 22, 1988, Ser. No. 247,726
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—95 **7 Claims**

1. In combination:
a horse blanket draped over a female horse;
said horse blanket having a rearward edge with first and second spaced-apart vertical portions located on opposite sides of the horse's vulva; and
a urine collection device detachably secured between said first and second vertical portions of said horse blanket adjacent to the horse's vulva;
said collection device comprising:
bag means detachably mounted to a framework of flexible straps;
said strap framework being selectively and adjustably secured between said vertical portions of said blanket adjacent to said vulva so as to permit said bag means to collect a urine sample;
said bag means having a back portion and a front portion and being sealed along a lower edge and two side edges to form a container open at the upper edge of said front portion;
said back portion extending a greater length than said front portion to form a deflection flap extending upwardly beyond the upper edge of said front portion;
said strap framework including upper and lower horizontally-oriented straps;
means for removably securing said bag means to said strap framework, comprising:
first coacting fastener means having a first half secured to the upper edge of said flap and a second half secured to said upper horizontal strap; and
second coacting fastener means having a first half secured to the lower edge of said bag means and a second half secured to said lower horizontal strap;
said bag means being removably secured to said strap framework with said front portion upper edge located parallel to, and generally midway between, said horizontal straps;



each end of said upper and lower straps having clamping means connected thereto for removably securing said strap framework to a blanket on said horse;
said upper strap being removably secured between said vertical portions and extending horizontally above the vulva and below the anus of the horse;
said lower strap being removably secured between said vertical portions and extending horizontally below the horse's vulva;
said strap framework being secured to said blanket to locate the upper edge of said front portion slightly below and adjacent to the horse's vulva with said flap extending upwardly therefrom to said upper strap, said flap located to deflect horse feces away from said container and thereby permit collection of a urine sample free from contamination.

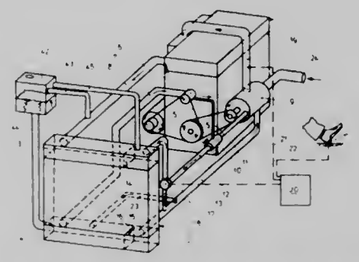
4,893,588
ADAPTIVE CONTROL TECHNIQUE FOR STEAM GENERATOR CLEANING
Jiri Jekerle, Baunatal Altenritte, and Jean-Claude Heis, Niddatal, both of Fed. Rep. of Germany, assignors to Schmidt'sche Heissdampf GmbH, Kassel-Bettenhausen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 263,176, Oct. 27, 1988. This application Jul. 7, 1989, Ser. No. 376,689
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736668; Oct. 28, 1988, 3836707
Int. Cl.[4] F22B *37/18, 37/48*
U.S. Cl. 122—379 **7 Claims**

1. An adaptive control method for the cleaning of a heat exchange surface of a steam generator by means of causing vibration thereof, the vibration being produced by an actuator which is driven with a constant force, the actuator being mechanically coupled to the surface to be cleaned, the method comprising the steps of:
measuring the number of vibrations of the surface resulting from operation of the actuator with the surface in a clean state;
measuring the operational time of the steam generator in which the surface reaches the permissible level of dirt accumulation;
measuring the number of vibrations of the surface resulting from operation of the actuator with the permissible level of dirt accumulation on the surface,
cleaning the heating surface by causing vibration thereof for a first period of time;



operating the steam generator for a further period of time and then again causing vibration thereof for the said first time period and measuring the number of vibrations which occur in a short time period;
comparing the measured numbers of vibrations and calculating a parameter of the vibrational cleaning cycle as a function of the ratio of at least the last two measured numbers of vibrations; and
continually repeat the measuring and calculating during the operation of the steam generator.

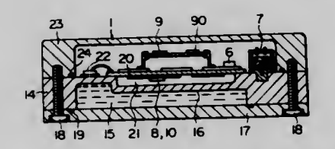
4,893,589
WATER COOLING SYSTEM FOR A SUPERCHARGED INTERNAL-COMBUSTION ENGINE
Fritz Spinnler, Ariedorf, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland
Filed Jul. 14, 1988, Ser. No. 218,909
Claims priority, application Switzerland, Aug. 3, 1987, 2964/87
Int. Cl.[4] F01P *1/06*
U.S. Cl. 123—41.31 **12 Claims**



1. A water cooling system for an internal-combustion engine supercharged by means of a mechanical supercharger, comprising:
a main cooling circuit including a water pump, a radiator, and an internal-combustion engine;
said radiator including a compartmentalized part;
a secondary cooling circuit for the supercharger, which secondary cooling circuit is operated with the same working medium of the main cooling circuit;
means for driving the working medium in the secondary cooling circuit, which working medium in the secondary cooling circuit is fed from the main cooling circuit;
whereby said working medium in the secondary cooling circuit is cooled in the compartmentalized part of the radiator.

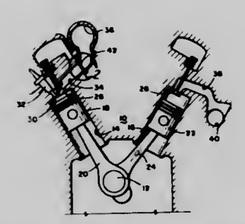
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4,893,590
AUTOMOTIVE LIQUID-COOLED ELECTRONIC CONTROL APPARATUS
Yuichi Kashimura; Shinshiro Watanabe, both of Katsuta, and Seiji Suda, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 28, 1988, Ser. No. 250,064
Claims priority, application Japan, Sep. 30, 1987, 62-243747
Int. Cl.⁴ F01P *1/06*
U.S. Cl. 123—41.31 **10 Claims**



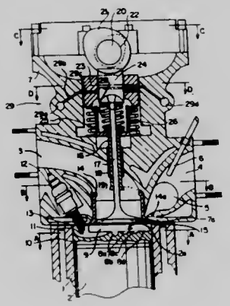
1. An electronic control apparatus for use in an automobile, comprising:
(a) a base having a passage defined therein for circulation of an engine cooling water and semiconductor devices disposed on a side of said base, said base being made of a material having a good thermal conductivity; and
(b) an enclosure fixed to said side of said base to hermetically cover said semiconductor devices;
wherein a flow control valve is disposed at an inlet side of said passage, said flow control valve being arranged to open when a temperature of said engine cooling water has reached a predetermined temperature.

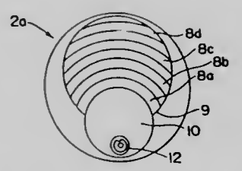
4,893,591
MANIFOLD FLAME ARRESTOR
Kevin G. Nelson, Tulsa, Okla., assignor to Facet Enterprises, Inc., Tulsa, Okla.
Filed Sep. 22, 1988, Ser. No. 247,739
Int. Cl.⁴ F02B *75/18*
U.S. Cl. 123—52 MF **2 Claims**



1. With an internal combustion engine having a plurality of cylinders, each cylinder having an intake valve and a means of ignition of combustible mixtures drawn into the cylinder through the intake valve, and an intake manifold communicating with the intake valves of the plurality of cylinders, a system of reducing the possibility of the transmission of combustion producing flame from within a cylinder into the intake manifold, comprising:
a flame arrestor member sealably positioned in the path between the intake manifold and each intake valve, each flame arrestor member permitting bidirectional passage of combustible mixtures but prohibiting the passage of flame therethrough.

4,893,592
COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE
Avelino Falero, P.O. Box 2590, Juncos, P.R. 00666
Filed Nov. 7, 1988, Ser. No. 268,276
Int. Cl.⁴ F01L *1/28*
U.S. Cl. 123—79 C **17 Claims**

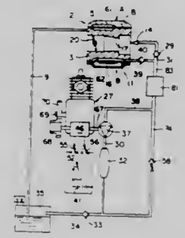




1. In an internal combustion engine, an arrangement for providing controlled combustion in a combustion chamber thereof, comprising:
a cylinder and piston guided in said cylinder;
a combustion chamber delimited laterally by the cylindrical walls of said cylinder, delimited at a lower end by a face of said piston and delimited in part at an upper end by valve means for allowing the controlled admission of an air-fuel charge into said combustion chamber and subsequent exhaust of combustion gases therefrom,
said valve means comprising co-axially aligned exhaust and intake valve mechanisms actuated by camming means,
said piston face comprising a shallow bowl for accommodating therein the spark gap of a spark plug when the piston is at top dead center, and a plurality of arcuately shaped grooves situated at least partially about said shallow bowl:

4,893,593
START-FUEL SUPPLY DEVICE IN INTERNAL COMBUSTION ENGINE FOR PORTABLE EQUIPMENT
Yoshimi Sejima, Urayasu; Kohji Nagasaka, Kawasaki, and Takeshi Kobayashi, Yokohama, all of Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan
Filed Nov. 21, 1988, Ser. No. 273,891
Claims priority, application Japan, Jan. 18, 1988, 63-8187
Int. Cl.⁴ F02M *1/08*
U.S. Cl. 123—187.5 R **3 Claims**

1. A start-fuel supply device in an internal combustion engine for a portable equipment comprising a start-fuel primer pump rotatively coupled to a starter motor of the engine, a fuel metering device for receiving a charge of fuel from a metering chamber of a carburetor during the reverse rotation of the start-fuel primer pump, and a fuel nozzle for injecting fuel from the fuel metering device to an air intake passage of the carburetor during the normal rotation of the fuel-start primer pump.



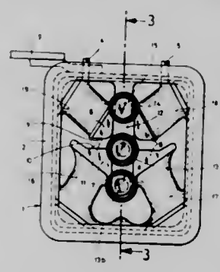
4,893,594
START-FUEL SUPPLY DEVICE IN INTERNAL COMBUSTION ENGINE FOR PORTABLE EQUIPMENT
Takeshi Kobayashi, Yokohama, Japan, assignor to Walbro Far East, Inc., Kawasaki, Japan
Filed Nov. 21, 1988, Ser. No. 273,890
Claims priority, application Japan, Dec. 1, 1987, 62-303806
Int. Cl.⁴ F02M *1/08*
U.S. Cl. 123—187.5 R **7 Claims**



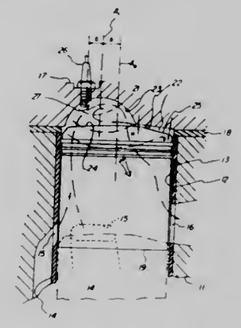
1. Start-fuel supply device in an internal combustion engine for portable equipment characterized in that a fuel nozzle is disposed at an intake passage of a diaphragm type carburetor, a fuel reservoir is connected to the metering chamber of the diaphragm carburetor through a check valve, a fuel metering device, a reversible primer pump, and a passage between the check valve and the fuel metering device connected to the fuel nozzle via a second check valve which allows a flow to the fuel nozzle.

4,893,595
DAMPING BLOCK DESIGNED IN PARTICULAR FOR MOUNTING AN ENGINE IN A MOTOR VEHICLE
Theobald Mertens, Niederflechbach, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 135,009, Dec. 18, 1987, Pat. No. 4,829,953. This application Jun. 27, 1988, Ser. No. 211,796
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724771
Int. Cl.⁴ F16F *1/52*; B60K *5/12*
U.S. Cl. 123—192 R **7 Claims**

1. A motor vehicle engine mount comprising a rigid outer portion, a rigid inner portion connected to the outer portion by flexible rubber webs, said inner portion having two inner bodies which are opposite each other and spaced apart and which are connected to each other by an adjustable connecting piece for transmitting forces from one inner body to the other, characterized in that the rubber webs are connected non-releasably to the two inner bodies and the connecting piece includes adjustable securing means detachably bridging the inner bodies, and further characterized in that the connecting piece is connected to one of the inner bodies by a release member operating in a slot in the connecting piece that allows limited movement between the connecting piece and said one inner body.



4,893,596
COMBUSTION CHAMBER FOR SPARK IGNITED ENGINE
Kimihiro Nonaka, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed Dec. 1, 1986, Ser. No. 936,337
Claims priority, application Japan, Nov. 29, 1985, 60-267418
Int. Cl.⁴ F02B *23/00*
U.S. Cl. 123—193 P **10 Claims**



1. In a two cycle crankcase compression type internal combustion engine having a cylinder defining a cylinder bore, a piston reciprocating in said cylinder bore, a cylinder head affixed to said cylinder and closing said cylinder bore, a cylinder head gasket between said cylinder head and said cylinder and surrounding said cylinder bore, a clearance volume defined between said cylinder head and said piston when said piston is in the top dead center position, the peripheral edge of said piston being below said cylinder when said piston is in top dead center position, said clearance volume including a combustion recess formed in said cylinder head surrounded at least in part by a squish area adjacent at least a portion of said cylinder bore, said squish area having a height in the direction of the axis of said cylinder bore greater adjacent said cylinder bore than at a point spaced inwardly toward said cylinder bore axis for providing clearance between said piston and said cylinder head and said cylinder head gasket, a spark plug in said cylinder head with the gap in said combustion recess, and

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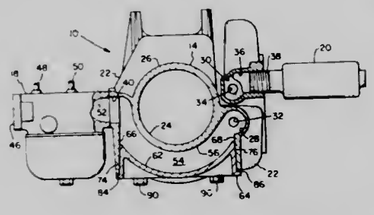
intake ports and exhaust ports in said cylinder configured to achieve loop scavenging, said combustion recess being disposed on the side of said cylinder bore opposite to said exhaust port.

4,893,597

ENGINE CYLINDER ASSEMBLY HAVING AN INTAKE CROSS-PASSAGEWAY

William C. Kandler, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Apr. 24, 1989, Ser. No. 342,186
Int. Cl.[4] F02F 7/00
U.S. Cl. 123—195 HC **13 Claims**



1. In an internal combustion engine of the type having a crankshaft and a cylinder, a cast cylinder assembly comprising:

a cast cylinder including: a piston bore, an intake valve cavity for receipt of an intake valve, an exhaust valve cavity for receipt of an exhaust valve, the intake and exhaust valve cavities located proximate one another on one side of the piston bore, an integrally cast cross-passageway communicating with the intake valve cavity and curving around the piston bore to the other side of the piston bore opposite the intake and exhaust valve cavities, an opening having side walls communicating with the cross-passageway and open to the exterior of the cylinder;

a cover having side walls and a curved inner surface having a curvature corresponding to the curvature of the cross-passageway, the curved inner surface and side walls of the cover being disposed within the opening with the side walls of the cover lying adjacent the side walls of the opening; and

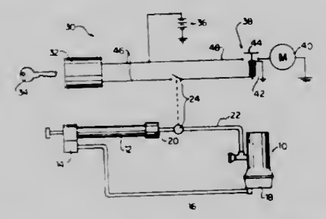
means for sealing the cover to the cylinder to preclude air passage through the opening.

4,893,598

PRE-START LUBRICATOR

Michael Stasiuk, Vancouver, Canada, assignor to Stasiuk Engineering Ltd., Vancouver, Canada

Filed Apr. 18, 1989, Ser. No. 339,699
Int. Cl.[4] F01M 1/00
U.S. Cl. 123—196 S **8 Claims**



1. An oiling apparatus for an internal combustion engine comprising:

a manually actuated positive displacement oil pump with an inlet and an outlet;

an oil suction line connecting the oil pump inlet to an engine oil sump;

an oil feed line connecting the oil pump outlet to an oil gallery in the engine;

an oil pressure switch in the oil feed line, normally open and closing in response to the presence of an oil pressure in the feed line greater than a predetermined pressure;

an ignition switch, normally open, and selectively closed by an operator for starting the engine;

a relay switch, normally open, with two switched terminals and a coil;

a starter motor;

an electric battery;

a first electric line connecting the battery to the relay coil through the ignition switch and the oil pressure switch such that the coil is energized and the switched terminals of the relay are closed only when the ignition switch is closed and the oil pressure in the oil feedline is above said predetermined oil pressure;

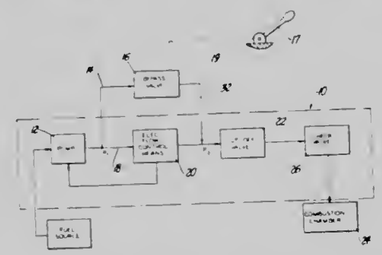
a second electric line connecting the battery to the starter motor through the switched terminals of the relay, such that the starter motor is disabled until the ignition switch is closed and the oil pressure in the feed line is above said predetermined pressure.

4,893,599

MANUAL BYPASS FOR AN ELECTRONIC FUEL INJECTOR

George Melnik, New Castle County, Del.; Bruce Amrein, Harford County, Md.; Curtis L. McCoy, Harford, Md., and James A. Martin, Lancaster, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1988, Ser. No. 268,812
Int. Cl.[4] F02M 39/00
U.S. Cl. 123—198 D **12 Claims**



1. A bypass mechanism for an electronically governed fuel flow control means, comprising:

a valve assembly including a housing defining a fuel entry chamber, a fuel exit chamber, a bore intersecting the fuel entry chamber, and a flow restriction orifice connecting the bore to the fuel exit chamber;

the bore defining a radially smaller cylinder and a radially larger cylinder, the larger cylinder being at least partly threaded;

a rotatable metering shaft in the bore having a threaded end matingly engaged with the larger cylinder, the shaft defining a pin-like end in the fuel entry chamber having an end face opposed to and larger than the orifice, the shaft having a shank fitting closely through the smaller cylinder, the pin-like end being no shorter than the width of the fuel entry chamber, so the shank never enters the fuel entry chamber to affect flow therein, the juxtaposition of the end face and the orifice being substantially the sole means to vary flow into the orifice;

an elongate frame demountably attached to the engine compartment of a tank and having the housing mounted to one end thereof;

a lever attached to the metering shaft in the housing;

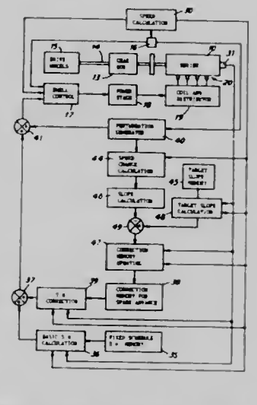
a push-pull cable connected to actuate the lever, the cable detachably and slideably retained at the other end of the frame, the cable extending into connection with a remote manual control means for rotating the metering shaft.

4,893,600

ADAPTIVE CONTROL FOR AN INTERNAL COMBUSTION ENGINE

Michael Holmes, Derridge, United Kingdom, assignor to Lucas Industries plc, Birmingham, England

Filed Jun. 27, 1988, Ser. No. 212,319
Claims priority, application United Kingdom, Jun. 27, 1987, 8715130
Int. Cl.[4] F02P 5/15; F02D 41/26
U.S. Cl. 123—419 **59 Claims**



1. An adaptive control system for an internal combustion engine having cylinders and at least one engine control parameter affecting an engine output, said control system comprising;

(a) means for establishing a base value for an engine control parameter;

(b) perturbation generation means for perturbing said an engine control parameter about said base value, said perturbation means comprising means for generating a perturbation waveform having a cycle comprising a first part and a second part and for applying a positive perturbation to said an engine control parameter during said first part of each said cycle and a negative perturbation to said an engine control parameter during said second part of each said cycle, said first part and said second part of said waveform having respective durations such that each cylinder of said engine experiences equal numbers of said positive perturbations and said negative perturbations compared with other cylinders irrespective of engine speed;

(c) monitoring means for monitoring said engine output;

(d) slope calculation means, responsive to said monitoring means, for calculating a slope of said engine output with respect to said an engine control parameter; and

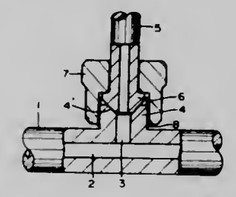
(e) correction means, responsive to said slope calculation means, for applying corrections to said at least one engine control parameter so as to obtain a desired value of said slope, wherein said engine has a drivetrain combination having at least one resonant frequency, and said perturbation waveform has a perturbation frequency greater than said resonant frequency of said drivetrain.

4,893,601

MANIFOLD FOR CONVEYING A HIGH-PRESSURE FUEL

Keizo Sugao, Tagata, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Apr. 15, 1988, Ser. No. 182,102
Claims priority, application Japan, May 23, 1987, 62-78009[U]
Int. Cl.[4] F02M 35/00
U.S. Cl. 123—468 **8 Claims**



1. In a manifold for conveying a high-pressure fuel of at approximately 1000 kg/cm^2 comprising a metal main pipe having an outside diameter of approximately 20 mm and a wall thickness of approximately 6 mm, said main pipe having an axial bore and a plurality of ports formed through its wall, connected with said bore and spaced apart from one another along the length of said pipe, and a plurality of branch pipes each connected at one end thereof with one of said ports, the improvement wherein said main pipe is provided with a plurality of short cylindrical projections unitary with said main pipe and extending laterally outwardly from its wall and each having an axial bore defining one of said ports and a wall thickness approximately equal to the wall thickness of the main pipe, each of said projections having an outer end provided with a recessed surface, and an outer peripheral surface provided with a screw thread, and each of said branch pipes has a diametrically enlarged connecting head closely fitting said recessed surface of one of said projections and is provided with a nut cooperating with said screw thread for holding said head against said recessed surface.

4,893,602

PROCESS FOR FUEL METERING

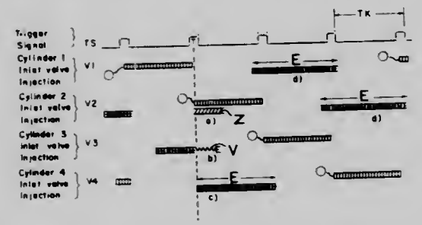
Helmut Gross, Gerlingen; Wolfgang Höptner, Uhingen, and Günther Kaiser, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00283, § 371 Date Mar. 2, 1988, § 102(e) Date Mar. 2, 1988, PCT Pub. No. WO88/00285, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 23, 1987, Ser. No. 165,274
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623041
Int. Cl.[4] F02D 41/10, 41/34
U.S. Cl. 123—492 **3 Claims**

1. A process for metering fuel into a plurality of cylinders of an internal combustion engine during acceleration operations, said cylinders having a plurality of intake valves for said fuel, comprising the steps of determining an operating state; injecting a fuel quantity corresponding to said operating state so determined; determining an acceleration state; establishing an additional fuel quantity associated with said acceleration state; injecting said additional fuel quantity of said acceleration state after determining said acceleration state; delivering said additional fuel quantity after determining said acceleration state to at least one of said cylinders having an open intake valve; prolonging said injecting of said fuel quantity corresponding to said operating state of at least one other of said cylinders in which said injecting has not been concluded when said acceler-

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ation state has been determined; and immediately injecting in another of said cylinders when said acceleration state has been



detected said fuel amount determined in correspondence with said operating state that was to be injected at a future time.

4,893,603

LOW PRESSURE FUEL INJECTION SYSTEM WITH FUEL PREHEATING FOR AN AIR-COMPRESSING, INJECTION INTERNAL COMBUSTION ENGINE

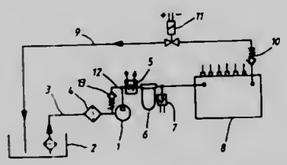
Karl-Heinz Siebels, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,278

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710807

Int. Cl.[4] F02M *31/12, 37/18, 37/22, 55/00*

U.S. Cl. 123—514 **6 Claims**



1. Low pressure fuel system with fuel preheating for an air-compressing, injection internal combustion engine, having a supply main connected to a fuel tank and leading via a feed pump to a high pressure injection pump: a heat exchanger effective at low fuel temperature, a prefilter and a fine filter are in said supply main, a return main between the high pressure injection pump and the fuel tank; said high pressure injection pump; and a shut-off valve means in the return main for interrupting fuel return at low fuel temperatures without return to said main supply; and a thermostat in the supply main between said prefilter and said high pressure injection pump, for controlling fuel flow to aid heat exchanger.

4,893,604

FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Geoffrey W. West, Freehills, Dodwell Lane, Bursledon, Hampshire, England

Continuation of Ser. No. 26,577, Mar. 3, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 270,481

Claims priority, application United Kingdom, Jul. 4, 1985, 8516939

Int. Cl.[4] F02M *31/00, 31/08*

U.S. Cl. 123—543 **9 Claims**

1. A fuel system for an internal combustion spark ignition engine having an inlet manifold with a pressure depression for receiving a charge of air and an exhaust manifold for discharging hot exhaust gases, comprising:

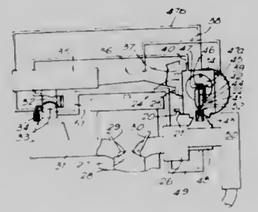
means for conveying a charge of air to the inlet manifold;

a venturi-type spray nozzle for atomizing fuel;

fuel metering and regulating means for supplying liquid fuels to said venturi-type spray nozzle at a regulated pressure which is not subjected to the inlet manifold pressure depression, for atomizing the liquid fuel, said metering and regulating means having a fuel exit;

means defining a space between said fuel exit and said spray nozzle and across which the metered and regulated liquid fuel flows to the spray nozzle for mixing of the metered and regulated liquid fuel with air from said space to form an atomized air/fuel mixture, said space being maintained at atmospheric pressure not being subjected to the inlet manifold pressure depression;

heat exchanger means with a heated surface connected in heat exchange relationship to the exhaust manifold for receiving heat from the exhaust gases, said spray nozzle



being connected to said heat exchanger means for directly spraying the atomized fuel onto the heated surface of the heat exchanger means to heat the atomized fuel to form a vaporized gaseous fuel, said heat exchanger means including a portion surrounding the exhaust manifold for being heated by exhaust gases passing through the exhaust manifold and means for swirling the hot exhaust gases leaving the exhaust manifold for increasing an exchange of heat between the hot exhaust gases and said heat exchanger means; and

means for conveying the vaporized gaseous fuel from said heat exchanger means to the inlet manifold for mixture of the gaseous fuel with the charge of air supplied to the inlet manifold.

4,893,605

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

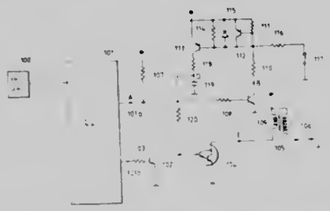
Masayuki Ozawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,013

Claims priority, application Japan, Jun. 25, 1987, 62-158032; Jun. 25, 1987, 62-158033

Int. Cl.[4] F02P *1/08*

U.S. Cl. 123—651 **3 Claims**



1. An ignition device for an internal combustion engine, comprising: an angle signal generator for producing a timing signal in synchronism with an engine rotation, an ignition control device responsive to an output signal of said angle signal generator for performing a predetermined ignition timing calculation to produce an ignition timing control signal, and for detecting an engine stop condition to produce a stop signal, a semiconductor switch element having a control gate supplied with said ignition timing control signal for supplying current to an ignition coil upon receipt of said ignition timing control signal to on-off control the current supply to said ignition coil, a capacitor for supplying charge to said control gate of said semiconductor switch element, a switch circuit for maintaining said capacitor fully charged by continuously supplying a current thereto during normal running of the engine, and means for cutting said current to said capacitor off when either said ignition control device produces said stop signal or a stop switch is operated such that said capacitor gradually discharges to a level at which said switch element is rendered non-conductive, to thereby preclude dieseling or the like.

4,893,606

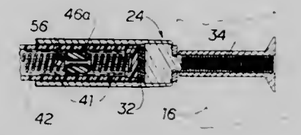
DISTRIBUTED MASS, INERTIAL ARCHERY BOW STABILIZER AND VIBRATION DAMPER

Frank W. Sisko, 159 Elkin Ave., Indiana, Pa. 15701

Filed Aug. 19, 1988, Ser. No. 233,807

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—89 **11 Claims**



1. A stabilizer for an archery bow, comprising:

an elongated casing defining a central chamber;

means at one end of the casing for mounting the stabilizer to project forwardly from the bow at an angle substantially normal to the bow string;

the central chamber extending from immediately adjacent the mounting means and along the entire length of the casing;

a high density fluid in the chamber occupying the chamber's full length but less than the chamber's full space whereby the fluid is inertially responsive to shifting;

flow restricting means in the chamber for restricting fluid shifting in one longitudinal direction to a rate substantially less than the rate of fluid shifting in the other longitudinal direction; and

the flow restricting means including a baffle located generally intermediate the length of the casing.

4,893,607

WIRE DRIVE APPARATUS FOR WIRE SAW

Setsuo Kabo, Kyoto, Japan, assignor to Kabushiki Kaisha Dymosha, Japan

Filed Jul. 21, 1988, Ser. No. 222,547

Claims priority, application Japan, Jul. 31, 1987, 62-118367[U]

Int. Cl.[4] B28D *1/08*

U.S. Cl. 125—21 **12 Claims**

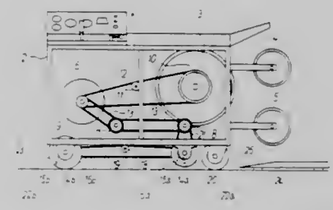
1. A wire drive apparatus comprising:

a carriage;

a plurality of supplemental wheels rotatably mounted to said carriage for movably supporting said carriage on a base surface;

a plurality of rail wheels rotatably mounted to said carriage for movably supporting said carriage on a plurality of rails mounted on the base surface;

pulley means for circulating an endless cutting wire; and



drive means for driving said pulley means and at least one of said rail wheels.

4,893,608

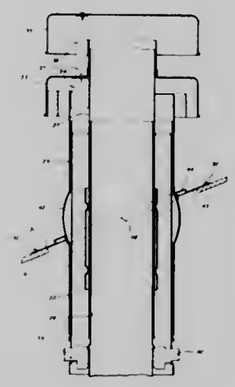
FURNACE ROOF JACK WITH PIVOTING FLASHING PLATE

Greg Reaser, Wichita, Kans., assignor to Coleman Heating & Air Conditioning Products, Inc., Wichita, Kans.

Filed Jul. 5, 1988, Ser. No. 215,272

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—85 B **9 Claims**



1. A tube assembly for communicating a burner, with the outside of a dwelling through the roof of a dwelling comprising an elongated cylindrical tube adapted to be attached to the burner, and a substantially flat flashing plate having an opening through which the tube extends, the flashing plate engaging the tube and being pivotally attached to the tube for pivoting movement about an axis which extends perpendicularly to the axis of the tube, whereby the tube can extend through an opening in the roof of the dwelling and the flashing plate can be secured to the roof.

4,893,609

WIND-RESISTANT OUTDOOR HEATING APPLIANCE

Attilio G. Giordani, Panorama City, Calif., and Jack W. Sergeant, East Greenwich, R.I., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 26, 1986, Ser. No. 912,519

Int. Cl.[4] F23I *11/00*

U.S. Cl. 126—350 R **53 Claims**

1. In a method of providing and operating an outdoor heat-

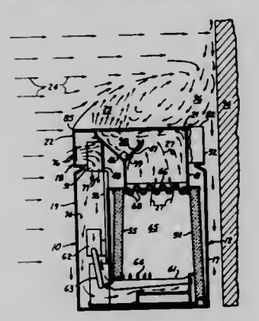
ing appliance wherein internal flames produce flue products inside a housing of said heating appliance,

the improvement of rendering the operation of the heating appliance wind resistant, comprising in combination the steps of:

providing said heating appliance above said housing with a top structure having a top surface;

defining said top surface with a stationary airfold generating in a region above said top surface and in response to wind an air pressure lower than an air pressure of said wind;

providing below said top surface and said airfoil inlet openings for receiving part of said wind;



penetrating said top surface with exhaust openings for said flue products in said region, whereby said flue products are exhausted from said outdoor heating appliance by said wind; and

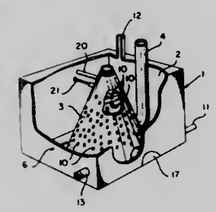
sustaining combustion generating said flue products inside the heating appliance and imparting to said flue products a positive pressure toward the exhaust openings aiding exhaustion of said flue products during occurrence of said wind by providing wind deflectors or diverters inside said inlet openings and by guiding air from said received part of the wind with said wind deflectors or diverters into and through a channel in the heating appliance to said internal flames.

4,893,610

LIQUEFIED PETROLEUM GAS AND ELECTRIC WATER HEATER

Jong K. Kang, 393-1 Daga-Dong, Cheonan-Si, Chooegnam-Do, Rep. of Korea

Filed May 31, 1989, Ser. No. 359,693
Int. Cl.[4] F24C *5/04*
U.S. Cl. 126—360 R **8 Claims**



1. A liquefied petroleum gas and electric water heater comprising:

a water heater body,

a water tank disposed within said water heater body, said water tank including:

a conical combustion chamber, disposed therewithin containing a plurality of water conduits, said conical combustion chamber containing a burner disposed therewithin for exposing the flame from said burner to the outer surface of said plurality of water conduits so as to uniformly heat the water in the water tank, and

a separate electric heater disposed therewithin,

a control box associated with said burner in the conical combustion chamber and said separate electric heater for selecting as a heat source the burner or the electric heater so as to efficiently, economically heat the water in the water tank, said control box being provided with an on/-off switch connected to an ignition spark for said burner and being electrically connected to said electric heater,

means for sensing the temperature of the water in the water tank, and

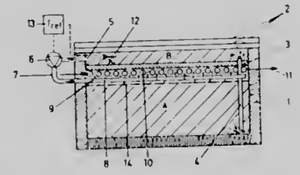
means for monitoring the temperature, the pressure, and the flame of the water heater.

4,893,611

SOLAR ENERGY COLLECTION AND STORAGE APPARATUS

Jürgen Kleiswichter, Kandern-Egisholz, Fed. Rep. of Germany, assignor to Ulrich Laboschik, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,214
Int. Cl.[4] F24J *2/20*
U.S. Cl. 126—437 **5 Claims**



1. An apparatus for the collection and storage of solar energy, comprising:

a storage container having a transparent covering, a dark absorbent bottom, and delivery and offtake lines for fresh and industrial and household water, said dark bottom comprising thermally insulating intermediate bottom dividing the container horizontally into a smaller upper water volume and a larger lower water volume; and a device for attaining a thermal equalization between the upper volume and the top of the lower volume wherein the device for thermal equalization comprises a pump apparatus for drawing water from the upper volume and delivering water to a top portion of the lower volume, and at least one connecting line penetrating the intermediate bottom.

4,893,612

RADIANT ENERGY COLLECTOR

Robert E. Dawson, 1656 Susquehanna Rd., Rydel, Pa. 19046

Continuation-in-part of Ser. No. 124,032, Feb. 25, 1980, abandoned, which is a continuation of Ser. No. 907,151, May 17, 1978, abandoned. This application Nov. 17, 1987, Ser. No. 121,716
Int. Cl.[4] F24J *2/08, 2/10*
U.S. Cl. 126—438 **33 Claims**

1. A radiant energy collector for receiving and collecting incident radiation, comprising:

A. an absorber;

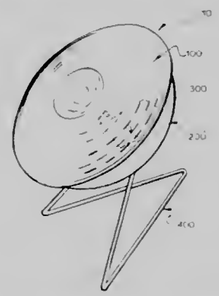
B. reflector means surrounding the absorber and having an upright axis and a concave reflective inner surface distributed about the axis for reflecting said radiation onto the absorber; and

C. a lens member extending across the axis of and above the reflector means for receiving an energy flux from a source

of radiant energy and having a plurality of prismatic elements distributed about the reflector axis in the lens member for

(1) receiving incident radiation on one side of the axis from a source located on the other side of the axis, the axis being viewed perpendicular to a plane including the axis and passing through the source, and

(2) maintaining, during variation of the angle of incidence between the incident radiation and the axis as viewed in said plane, refraction of the incident radiation and emission of the resultant refracted radiation through emit-



ting surfaces of said elements which are inclined for continuing during such variation, to direct radiation away from the source, above the absorber and toward the reflector with an upward component of refraction as compared to the inclination of the incident radiation and to distribute the resultant reflected radiation across a portion of the absorber which faces away from the source,

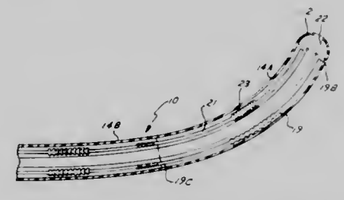
whereby re-reflection and loss of rays can be controlled and the collector can operate efficiently throughout a substantial range of angles of incidence.

4,893,613

ENDOSCOPE CONSTRUCTION WITH MEANS FOR CONTROLLING RIGIDITY AND CURVATURE OF FLEXIBLE ENDOSCOPE TUBE

Lawrence W. Hake, R.R. #2, P.O. Box 108, Grand Island, Nebr. 68803

Continuation of Ser. No. 125,534, Nov. 25, 1987. This application Oct. 21, 1988, Ser. No. 260,522
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **6 Claims**



1. In a flexible endoscope of the type including an elongate flexible tube having a distal end and a proximal end; and

a medical procedure system having at least a part thereof extending through the tube from the proximal end to the distal end, said system being capable of transmitting diagnostic data from the distal end to the proximal end or conducting a medical procedure at the distal end from the proximal end;

the improvement comprising, in combination:

means within the tube for controlling the curvature of a longitudinal segment of the tube; and

means external the tube for controlling the means within the tube segment;

said means for controlling curvature comprising at least one flexible tube segment, said segment having a longitudinal center axis, said segment further including at least two longitudinal, flexible, hollow conduits generally parallel to the axis, said conduits each being elastically deformable in the longitudinal direction in response to increased pressure within the conduits; and

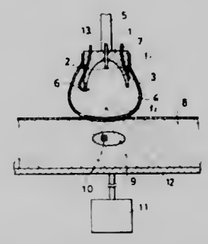
said means for controlling comprising means for inflating the conduits independently by increasing fluid pressure in one of the conduits beyond the plastic limit to thereby elastically deform the conduit in the longitudinal direction and effect elongation of said conduit and attached tube to thereby effect controlled curvature of the tube segment.

4,893,614

APPARATUS FOR DISINTEGRATING A CALCULUS BY AN UNDERWATER SHOCK WAVE FROM OUTSIDE THE HUMAN BODY

Kazuyoshi Takayama; Masaaki Kuwahara, both of Miyagi, and Shuzo Kimura, Chiba, all of Japan, assignors to Yachiyoda Sangyo Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 878,236, Jun. 25, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,671
Claims priority, application Japan, Jun. 26, 1985, 60-137997
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A **33 Claims**



31. An apparatus for disintegrating a calculus in a human body, said apparatus comprising:

(a) a shock wave generation chamber having a solely pseudo-elliptical interior surface, an end surface with an opening therethrough, and a substantially solid exterior side surface;

(b) an entirely flexible container adapted to receive and hold a liquid, said container having an open mouth portion which is positioned about the exterior side surface of said shock wave generation chamber, said flexible container further having an interior which is in fluidic communication with the solely pseudo-elliptical interior surface and a portion of the exterior side surface of said shock wave generation chamber; and

(c) means for attaching said exterior side surface of said shock wave generation chamber to an interior surface of the mouth of said container wherein most of the exterior side surface of said shock wave generation chamber is in fluidic communication with the interior of the flexible container.

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4,893,615

OXYGENATION AND RELAXATION CABIN

Liouisia Khabirova, 17 allée de l'Arlequin, 92000 Nanterre, France

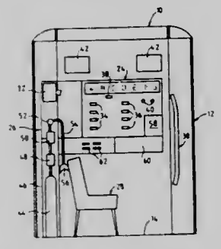
PCT No. PCT/FR87/00294, § 371 Date Mar. 23, 1988, § 102(e) Date Mar. 23, 1988, PCT Pub. No. WO88/00480, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 24, 1987, Ser. No. 180,983

Claims priority, application France, Jul. 24, 1986, 86 10765

Int. Cl.[4] A61H *1/00, 21/00*

U.S. Cl. 128—24.2 **3 Claims**



1. In a controlled environment enclosure wherein an occupant may selectively control and regulate environmental conditions within the enclosure, the combination comprising a closed housing including an access door for ingress and egress to and from the interior of said housing, occupant support means within said housing, self-contained air supply means for said enclosure including means for selectively delivering said air generally into said housing or directly to a user oriented delivery mask, means for regulating and varying the quality and condition of the air supplied by said air supply means, variable lighting means within said housing controllable by the occupant, audio-visual generating means and control means therefor in said housing operable by the occupant, check controlled latching means for said access door to said housing variable to enable a user to select a predetermined occupancy period in response to payment of a corresponding sum of money, timing means interconnected between said latch and the various control devices within said housing to initiate and terminate actuation thereof in accord with the predetermined occupancy period selected and paid for by the user, and means associated with said access door and responsive to opening of said access door for actuating said air supply means at the end of each user occupancy to provide a fresh supply of air for a subsequent occupant.

4,893,616

IMPOTENCE SUPPORT

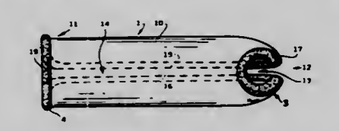
Toivo Immonen, Vellamoukatu 16 A 1, SF-00550 Helsinki, Finland

Filed Jan. 27, 1988, Ser. No. 148,857

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723746

Int. Cl.[4] A61F *5/41*

U.S. Cl. 128—79 **10 Claims**



1. A penis support for enabling sexual intercourse to be performed by a sufferer of impotency, comprising a tubular shell element having a first open end for facing the root of the penis and a second open end for facing the top of the penis, and a longitudinal split extending down said tubular shell element from said first open end to said second open end; wherein said second open end is formed with a mouth portion adapted to fit behind the penis glans and to prevent the penis foreskin from moving to the glans neck groove or over the plans; said longitudinal split has lipwise strengthened, opposing edges; and end portion of said second open end is shaped to taper curvingly towards the glans, an upper half of said second open end portion tapering towards the glans, and in which a wall surface limited by the mouth portion of the tubular shell element is anatomically shaped to correspond to and give support to the sloping rear surface of the glans, an edge of the wall of the tubular shell element limiting the open end being shaped and dimensioned to fit the deepening of the neck groove of the glans; wherein a lower half of said second open end divided by the longitudinal split tapers towards the glans, and in which there are outer tips of the tubular shell element, and in which bordering edges of the tubular shell element are shaped to leave the frenum of the penis free and to come into the deepening of the neck groove of the glans with the tips of the tubular shell element.

4,893,617

RESILIENT SEMI-RIGID ORTHOPEDIC SUPPORT DEVICES

Dennis C. Bartial, and Anthony J. Campagna, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 903,281, Sep. 3, 1986. This application Aug. 7, 1987, Ser. No. 83,685

Int. Cl.[4] A61F *5/04, 15/00*

U.S. Cl. 128—90 **26 Claims**

1. A method of supporting a body part, the method comprising the steps of:

wrapping a layer of cushioning material around the body part;

preparing a flexible sheet material impregnated with a curable resin, which resin-impregnated sheet material, upon exposure to a curing agent, is capable of being cured into a resilient and semi-rigid state having an Immobilization Value between about 45 pounds and about 400 pounds and a Resiliency Value of at least about 80 percent;

exposing said resin-impregnated sheet material to the curing agent;

wrapping said resin-impregnated sheet material around the cushioning material; and

allowing said resin-impregnated sheet material to cure such that said resin-impregnated sheet material has an Immobilization Value between about 45 pounds and about 400 pounds and a Resiliency Value of at least about 80 percent.

4,893,618

EXTERNAL FIXATION APPARATUS

Wolfgang Herzberg, Holmer Strasse 165, D-2000 Wedel/Holstein, Fed. Rep. of Germany

PCT No. PCT/EP87/00486, § 371 Date Apr. 21, 1988, § 102(e) Date Apr. 21, 1988, PCT Pub. No. WO88/01488, PCT Pub. Date Mar. 10, 1988

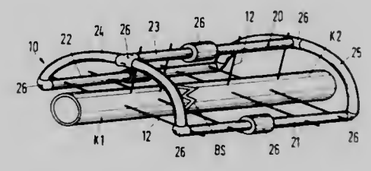
PCT Filed Aug. 26, 1987, Ser. No. 188,398

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1986, 3628972

Int. Cl.[4] A61F *5/04*

U.S. Cl. 606—54 **26 Claims**

1. An external bone fixation apparatus, comprising at least one flexible tube-shaped portion which is externally arrangeable on a patient, opposite bone fragments to be fixed; and connecting means securable in the bone fragments for connecting with the at least one flexible tube-shaped portion, the tube-shaped portion being filled with a hardenable material which, subsequent to hardening thereof, forms a rigid frame with the connecting means so as to hold the bond fragments in a desired position to enable healing thereof, the tube-shaped portion being formed of a glass fiber-reinforced material, and one of transparent and clear plastic in the shape of a spiral tube having



a bead-like reinforcement which is arranged in a closed tube system, the hardenable material being a quick-curing plastic which is filled into the interior of the closed tube system.

4,893,620

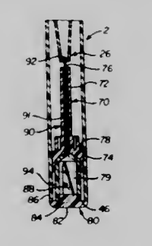
MULTIPURPOSE NASAL AIRWAY

Rajindar K. Wadwha, 2482 Mt. Royal Rd., Pittsburgh, Pa. 15217

Continuation-in-part of Ser. No. 716,589, Mar. 27, 1985, abandoned. This application Feb. 18, 1988, Ser. No. 157,946

Int. Cl.[4] A61M *25/00, 15/06, 15/08, 17/32*

U.S. Cl. 128—202.13 **21 Claims**



1. A nasal airway comprising

a tubular housing having a first end and a second end,

a first internal threaded portion at the first end of said tubular housing and a second internal threaded portion at the second end thereof,

an airway tube being of smaller diameter than said housing, said airway tube having a free end insertable into a patient's nostril and an external threaded portion on the opposite end from said free end,

said airway tube when in a storage position having said free end within said tubular housing and said external threaded portion secured to said first internal threaded portion of said tubular housing and when in a use position having said free end external of said tubular housing and said external threaded portion secured to said first internal threaded portion of said tubular housing,

tracheostomy tube means removably secured within said housing generally adjacent to said second end, and

cannula means removably secured within said tracheostomy tube means.

4,893,619

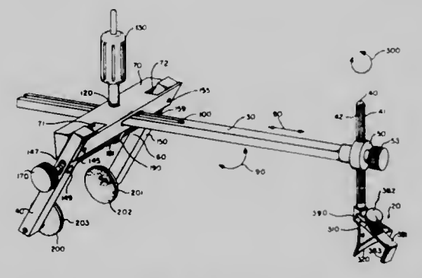
HUMERAL OSTEOTOMY GUIDE

James L. Dale, Austin; Brian D. Burkinshaw, Pflugerville, and Wayne Z. Burkhead, Dallas, all of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Filed Feb. 4, 1988, Ser. No. 152,145

Int. Cl.[4] A61F *5/04*

U.S. Cl. 606—87 **21 Claims**



19. A device for guiding an osteotomy to be performed on the proximal end of a humerus comprising:

a proximal sawguide alignable on a selected surface of the proximal end of the humerus for defining a saw line theron;

a radial arm connecting the sawguide to a distal means for stably aligning the sawguide, the distal alignment means comprising a pair of opposing lateral and medial epicondyle arms pivotably engageable with the lateral and medial sides of the distal end of the humerus, the epicondyle arms being pivotably mounted in a distal cross arm, the distal end of the radial arm being slidably mounted in the cross arm for distal to proximal slidable movement therein;

the proximal end of the radial arm being rotatably connected to the sawguide through a proximal guide bar;

the radial arm being supported above the humerus by the proximal guide bar and the epicondyle arms.

4,893,621

SLIPOVER ANTEGRADE LOADING CALCULUS EXTRACTION INSTRUMENT SYSTEM

Arnold M. Heyman, 2071 W. Alameda Ave., Ste. 406, Burbank, Calif. 91505

Filed Aug. 22, 1986, Ser. No. 899,669

Int. Cl.[4] A61B *17/00*

U.S. Cl. 606—127 **7 Claims**



1. A method for passing a medical instrument system through a ureter and beyond a lodged foreign body, said medical instrument system comprising:

a flexible thin guide with a fine soft bendable tip for passing along said tubular body beyond said lodged foreign body;

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an elongated hollow tubular catheter, said catheter having an inner diameter larger than said outer diameter of said guide and adapted to be passed over said guide, and byond said lodged foreign body; and

an umbrella like stone basket, said basket having open and closed modes, said closed mode being when said basket has its smallest cross-sectional area, said open mode being when said basket has its largest cross-sectional area, when open said basket configured to entangle and extract lodged foreign bodies in an antegrade manner and when closed said basket configured to pass through and within said catheter and exit from said catheter; the method comprising the steps of:

passing said guide through said tubular body beyond said lodged foreign body;

coaxially sliding said catheter over said guide up said ureter to be positioned beyond said lodged foreign body;

removing said guide; and

passing coaxially within said positioned catheter said stone basket to be positioned beyond said foreign body for its extraction, said basket being in a closed position as it proceeds through said catheter.

4,893,622

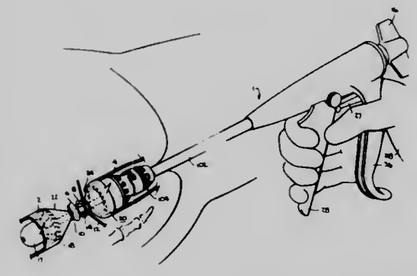
METHOD OF STAPLING TUBULAR BODY ORGANS

David T. Green, Norwalk, and Herbert W. Korthoff, Wilton, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 920,581, Oct. 17, 1986, Pat. No. 4,752,024. This application Mar. 31, 1988, Ser. No. 176,229

Int. Cl.⁴ A61B *17/04*

U.S. Cl. 227—180 **4 Claims**



1. A method of stapling the tubular ends of a pair of vessels together, said method comprising the steps of

clamping the tubular ends of the two vessels between an anvil assembly at a distal end of a surgical stapling apparatus and a surgical fastener holding assembly on the apparatus;

driving an annular stapling part located on one side of the clamped ends of the vessels and having prongs thereon through the clamped ends of the vessels in an annular retaining part removably supported on the anvil assembly and on an opposite side of the clamped vessels;

severing the clamped ends of the vessels on a circular cutting line disposed radially within the stapling part;

moving the anvil assembly away from the stapled ends of the vessels to withdraw the anvil assembly from the annular retaining part;

thereafter collapsing the anvil assembly radially inwardly of said retaining part and said cutting line; and

then withdrawing the stapling apparatus from the stapled-together vessels.

4,893,623

METHOD AND APPARATUS FOR TREATING HYPERTROPHY OF THE PROSTATE GLAND

Robert F. Rosenbluth, Laguna Niguel, Calif., assignor to Advanced Surgical Intervention, Inc., San Clemente, Calif.

Continuation-in-part of Ser. No. 939,754, Dec. 9, 1986, Pat. No. 4,762,128. This application Nov. 20, 1987, Ser. No. 120,981

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.⁴ A61M *29/00*

U.S. Cl. 128—343 **17 Claims**

1. An apparatus for relieving the symptoms of hypertrophy of the prostate gland, comprising:

an axially elongate catheter shaft comprising at least one lumen therethrough and having an annular recess thereon for receiving a stent;

an expandable balloon mounted on said shaft in said recess and in communication with said lumen; and

a removably mounted, radially outwardly deformable and expandable tubular stent coaxially disposed about said balloon and situated in said recess, wherein said stent has an opening at each axial end and a central lumen therethrough, wherein said stent is radially expandable by deformation to a preselected configuration in response to pressure from said balloon, and the outside diameter of the stent, in its unexpanded state, is not substantially greater than the outside diameter of the adjacent catheter shaft, and wherein said adjacent catheter shaft has a substantially uniform diameter.

4,893,624

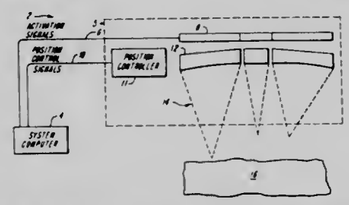
DIFFUSE FOCUS ULTRASOUND HYPERTHERMIA SYSTEM

Padmakar P. Lele, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 21, 1988, Ser. No. 209,520

Int. Cl.⁴ A61F *7/00*

U.S. Cl. 128—399 **28 Claims**



1. An ultrasonic hyperthermia system for delivering hyperthermic therapy to a subject, the system comprising:

a plurality of piezoelectric transducer elements arranged in a two-dimensional array to provide multiple sources of ultrasonic energy;

variable activation means for activating the transducer elements individually and at variable electrical energy levels to permit the multiple sources of ultrasonic energy to vary in intensity;

a further plurality of lens elements, coupled to the plurality of transducer elements, to transmit the multiple sources of ultrasonic energy to the subject as a diffuse-focus beam having a selected dimension in a direction substantially perpendicular to a direction of propagation; and

focusing means for dynamically varying the position of the lens elements individually to permit variations in the focal regions of the multiple sources of ultrasonic energy, said variations in focal regions including variations in the selected dimension of the diffuse-focus beam.

4,893,625

INSERTION TYPE ELECTRODE ARRANGEMENT FOR CONTINUOUS PO_2 MEASUREMENT IN LIVING SKIN TISSUE

Rolf Schuhmann, Grosser Hasenpfad 25, D-6000 Frankfurt am Main 70, Fed. Rep. of Germany

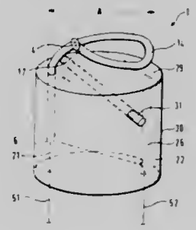
PCT No. PCT/DE86/00210, § 371 Date Jan. 20, 1987, § 102(e) Date Jan. 20, 1987, PCT Pub. No. WO86/06945, PCT Pub. Date Dec. 4, 1986

PCT Filed May 17, 1986, Ser. No. 20,942

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518463

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—635 **13 Claims**



1. A system for continuous pO_2 measurements in living, restlessly moving tissue, comprising an outer spiral metal tube electrode having a longitudinal wall, a spiral tubular plastic body arranged in the outer metal tube and an electrically insulated platinum wire electrode arranged in the spiral plastic body, and a cylindrical plastics body, wherein both metal electrodes (2, 14) are fit with one terminal end (6) in the cylindrical plastics body (26), the electrodes having a free end extending from the plastics body and having a ground-off front end face, the front end face and the longitudinal wall including an angle of about 20°, an insertion assistance means for inserting the electrodes into the tissue, the cylindrical plastics body being fastened in the insertion assistance means, the electrodes extending from the cylindrical plastics body, the system further comprising a pO_2 measuring apparatus, the platinum wire electrode being connected to the pO_2 measuring apparatus, and a second measuring apparatus, the metal tube electrode being connected to the second measuring apparatus, the two measuring apparatus having reference electrodes (54) independent of each other.

4,893,626

ELECTRODE FOR ELECTROTHERAPY, ELECTROSURGERY AND MONITORING

Ernest J. Henley, and William Price, both of 10518 Kinghurst, Houston, Tex. 77099

Filed Dec. 11, 1986, Ser. No. 940,657

Int. Cl.⁴ A61B *5/04*; A61N *1/04*

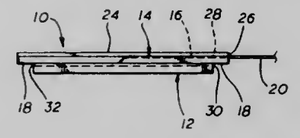
U.S. Cl. 128—640 **18 Claims**

3. An electrode for use in medical devices comprising:

(a) a layer of aqueous conductive gel containing an electrolyte,

(b) an insulating layer comprised of natural rubber,

(c) an electrical current distribution or collection means in electrical contact with said aqueous conductive gel situated between said aqueous conductive gel layer and said insulating layer.



4,893,627

METHOD FOR NUCLEAR MAGNETIC RESONANCE IMAGING USING DEUTERUM AS A CONTRAST AGENT

Joseph J. Kehayias, Chestnut Hill, Mass.; Darrel D. Joel, Setauket, N.Y.; William H. Adams, Eastport, N.Y., and Harry L. Stein, Glen Head, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 26, 1988, Ser. No. 200,811

Int. Cl.⁴ A61B *5/05*

U.S. Cl. 128—654 **2 Claims**

1. A method for in vivo NMR imaging consisting of positioning a patient within the magnetic field of an energized NMR system, administering an acceptable NMR imaging amount of stable, high-purity D_2O in isosmotic water solution by injecting the solution through a catheter into a blood vessel of the patient, said acceptable amount of D_2O being sufficient to enable the administered D_2O to form dark dye-like images as the solution is subjected to the H-1 resonance of the system, said H-1 resonance being effected at a frequency at which D_2O will not resonate, detecting H-1 resonance signals, and processing said signals to provide an image.

4,893,628

DUAL ELEMENT ULTRASONIC TRANSDUCER PROBE FOR COMBINED IMAGING OF TISSUE STRUCTURES AND BLOOD FLOW IN REAL TIME

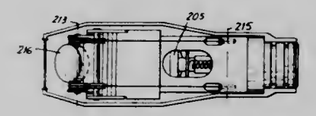
Bjorn Angelsen, Dept. of Biomedical Eng., University of Trondheim, Trondheim-Rit, Norway (N 7006)

Filed Apr. 4, 1988, Ser. No. 176,881

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.⁴ A61B *8/00*

U.S. Cl. 128—660.05 **15 Claims**



1. An ultrasonic probe for use in combined and time shared ultrasonic imaging of biological tissue structures together with blood velocity measurements and imaging of blood flow based on the Doppler principle, in which rapid changes of sweep movements of the probe between the respective imaging measurement modes of operation are performed, said probe having two mechanically steerable ultrasonic beams, comprising:

a linear motion electric drive motor having a stationary magnet means and a coil assembly which is linearly move-

able with respect to said magnet means by the application of electric current to said coil assembly;

two ultrasonic transducers for emitting respective ultrasonic beams and disposed to be pivotable around separate axes within separate angular sectors for sweeping the two ultrasonic beams within the two separate angular sectors, respectively;

mechanical coupling means for connecting the linear drive motor to the pivotable transducer elements, converting the linear motion of the motor coil assembly into a limited rotary motion of the transducers within said angular sectors;

said mechanical coupling means comprising at least three pulleys mounted at a distance from each other, and at least one flexible pulling element trained about and rotatably connecting said at least three pulleys with each other;

said ultrasonic transducers being each rotatably connected to a separate one of the pulleys, and at least one of the pulleys to which one of said transducers is connected having a non-circular circumference with an angle dependent radius; and

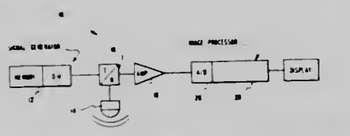
said motor coil assembly being mechanically connected to said at least one pulling element at a portion thereof lying between two pulleys of said at least three pulleys, whereby reciprocating linear movement of the coil assembly causes said angular sweeping of the transducer elements.

4,893,629

ULTRASONIC MEDICAL IMAGING APPARATUS HAVING A POLYVINYLIDENE FLUORIDE TRANSDUCER

George K. Lewis, Andover, Mass., assignor to Analogic Corporation, Peabody, Mass.

Filed Oct. 15, 1987, Ser. No. 111,128
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.07 5 Claims



1. An ultrasonic medical imaging apparatus comprising;

an ultrasonic transducer constructed with polyvinylidene fluoride;

circuit means for generating an energizing pulse for the transducer, said pulse having a predetermined length and an instantaneous frequency which is varied by said circuit means from a first frequency to a second frequency during the period;

means for digitizing electrical signals from the transducer which electrical signals represent ultrasonic reflections received by the transducer in response to the energizing pulse; and

signal processing means for cross-correlating the digitized electrical signals with the energizing pulse.

4,893,630

APPARATUS AND METHOD FOR ANALYZING PHYSIOLOGICAL CONDITIONS WITHIN AN ORGAN OF A LIVING BODY

Robert S. Bray, Jr., Houston, Tex., assignor to Trinity Computing Systems, Inc., Houston, Tex.

Filed Apr. 6, 1984, Ser. No. 597,518
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—671 23 Claims

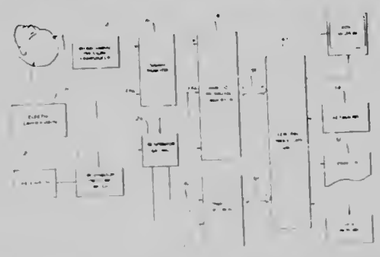
1. An apparatus for analyzing changes in the waveform generated by variations of pressure within an organ of a living body comprising:

pressure sensing means adapted to be placed within an organ of a living body for measuring the pressure within said organ of said body;

pressure transducer means connected to said pressure sensing means for converting the measured values of pressure to an analog electrical signal waveform indicative of the waveform generated by the variations of pressure over time within said organ of said body;

analog to digital converter means electrically connected to said pressure transducer means for converting said analog electrical signal waveform into digital electrical signals indicative of said pressure waveform, for digital computer analysis;

computing means electrically connected to said analog to digital converter means for mathematically computing a



distribution of the amplitude of said pressure waveform versus the frequency components of said pressure waveform and analyzing said frequency distribution to indicate physiological conditions within said organ of said body;

electrical transducing means, adapted to be connected to the living body to obtain parameters of the cardiac cycle and the respiratory cycle to be correlated with said analog electrical signal waveform from said pressure transducer means to determine the optimal time during said cardiac and respiratory cycles for analysis of said frequency distribution to achieve the most accurate physiological interpretation of said frequency distribution, said electrical transducing means being connected to said analog to digital converter means; and

output means electrically connected to said computing means for displaying the results of said mathematical analysis.

4,893,631

ACTIVE ELEMENT SELECTION FOR CONTINUOUS BLOOD PRESSURE MONITOR TRANSDUCER

Dennis J. Wenzel; Dean C. Winter, and Kevin S. Honeyager, all of San Antonio, Tex., assignors to Colin Electronics Co., Ltd., Komaki, Japan

Filed Feb. 25, 1988, Ser. No. 160,146
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—672 8 Claims

1. A system for the continuous external measurement of blood pressure in an underlying artery of a subject, including an array of individual pressure sensitive elements, the length of which array exceeds the diameter of the underlying artery, comprising

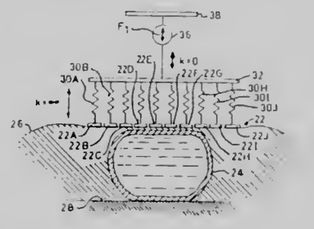
means for selecting an ordered set Q which includes of said elements ordered with respect to their physical position;

means for selecting a set L of those elements having local minima on a plot of diastolic or systolic pressure versus transducer element number;

means for computing a spatially weighted average of pulse amplitude values from the set Q centered about each element of set L;

means for specifying the number of elements over which said spatially weighted average of pulse amplitude values is to be computed; and

means for operatively selecting the output of the element



from set L which has the largest spatially weighted average of pulse amplitude values centered about it as the single measurement to represent the blood pressure existing in said underlying artery.

4,893,632

METHOD AND APPARATUS FOR COMPARING WAVEFORM SHAPES OF TIME-VARYING SIGNALS

Robert M. Armington, West Peabody, Mass., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 181,027
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 15 Claims

1. A method for comparing sequential waveshape portions of at least one time-varying signal, comprising:

forming sequential initial templates, each initial template consisting of a plurality of digital signal sample values representative of the amplitude of successive time-spaced samples of a respective portion of said time-varying signal;

forming from each of said initial templates a corresponding reduced template having a plurality of digital signal elements which is less in number than the plurality of sample values in its corresponding initial template, each element of said reduced template comprising a combination of at least two sample values from its corresponding initial template; and

processing correspondingly positioned elements of at least two of said reduced templates for deriving a comparison signal representative of the degree of similarity of the respective portions of said time-varying signal represented by said at least two reduced templates.

4,893,633

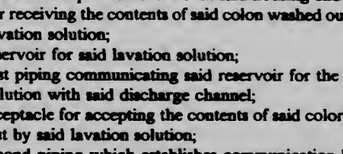
METHOD OF TEMPERATURE MEASUREMENT

Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Continuation of Ser. No. 73,633, Jul. 15, 1987, abandoned, which is a division of Ser. No. 786,746, Oct. 11, 1985, Pat. No. 4,681,098. This application Oct. 24, 1988, Ser. No. 261,257
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—736 3 Claims

1. A method for measuring the temperature of a part of a subject's body comprising the steps of:

placing the subject's body in a supine position in a substantially rigid body mold having an impression intimately matching the entire length of the dorsal half of the subject's body and having a temperature transducer which produces a voltage output representative of temperature



embedded therein whereby the subject's body comes into contact with said transducer; and

recording the voltage output of the temperature transducer to provide a measurement of the subject's temperature.

4,893,634

DEVICE FOR CLEANSING MEASURING PRESSURE IN THE COLON

Yaroslav P. Kulik, and Alexei A. Malaev, both of Blagoveschensk Amurskoi, U.S.S.R., assignors to Problemnaya Nauchno-Issledovatelskaya Laboratoria Vysokogotchnogo Kroveobrascheniia, Blagoveschensk, U.S.S.R.

Filed Jul. 27, 1987, Ser. No. 77,895
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—748 4 Claims

1. A device for cleansing the colon, comprising:

a cylinder-shaped housing made of an elastic material;

working end of said housing;

a discharge channel in said housing;

ports of said discharge channel in said housing end adapted for delivering a lavation solution into the colon;

an aspiration channel in said housing, isolated from said discharge channel;

ports of said aspiration channel in said housing end adapted for receiving the contents of said colon washed out by said lavation solution;

a reservoir for said lavation solution;

a first piping communicating said reservoir for the lavation solution with said discharge channel;

a receptacle for accepting the contents of said color washed out by said lavation solution;

a second piping which establishes communication between said receptacle and said aspiration channel;

an endoscope accommodated in said aspiration channel and having a working portion brought outwards from said channel through an opening in said housing working end;

an expandable transparent balloon provided on said working portion of said endoscope extending through and out of

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said aspiration channel through an opening in said working end of said housing;

means for expanding said balloon after it has been introduced into the colon to achieve effective pressurization and sealing in the area of contact between the walls of the balloon and the colon walls;

a tube means extending in said discharge channel for transmitting the pressure in the colon, one end of said tube means extending out of said working end of said housing and the other end of said tube means extending out of a proximal end of said housing for connection to a pressure measuring means; and

means for adjusting the pressure head and the suction head in said respective first and second pipings.

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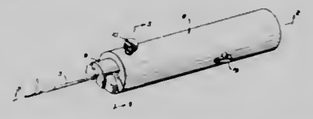
APPARATUS FOR PERFORMING A BIOPSY

William J. de Groot, #1 Cedar Lawn South, Galveston, Tex. 77550; Theodore J. de Groot, 53 Lafayette St., Norwich, Conn. 06360, and Joseph B. de Groot, 50 Morahapa Rd., Centerport, L.I., N.Y. 11721

Division of Ser. No. 918,927, Oct. 15, 1986, Pat. No. 4,766,907. This application Jun. 1, 1988, Ser. No. 200,859

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—754 **3 Claims**



1. Non-aspiration apparatus for obtaining cells in lung tissue while performing a percutaneous biopsy on a patient comprising, a relatively long thin cannula needle in the range of 18 to 21 gauge having an angled shape cutting tip, a cell retrieving instrument slidably mounted in said needle, a syringe assembly, said syringe assembly including a cylinder portion and a plunger portion slidably mounted in said cylinder portion, one end of said needle being connected to the syringe cylinder portion, and wire means connecting the cell retrieving instrument to the syringe plunger portion, whereby cells are obtained from the patient's lung by inserting the needle, with the cell retrieving instrument wholly contained therein, inwardly through the patient's chest into the lung, maintaining the cell retrieving instrument fixed while sliding the needle outwardly relative thereto, to thereby expose the cell retrieving instrument within the patient's lung, maintaining the needle fixed while sliding the cell retrieving instrument in an outward direction into the needle, and removing the needle, the wholly contained instrument and retrieved cell from the patient's lung.

4,893,636

MEDICAL CONTAINER STOPPER

Boyce W. Cook, Deland, Fla., and William R. Fiehler, St. Louis, Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

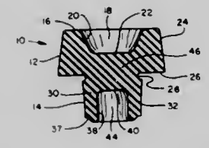
Filed Mar. 9, 1988, Ser. No. 165,806

Int. Cl.[4] A61M *5/18*

U.S. Cl. 128—764 **8 Claims**

1. In combination, a tube having an opening, a stopper for closing the opening in said tube, and a holder for said tube and stopper, comprising:

a holder body closed at one end and open at an opposite end with an axially extending hollow needle positioned therein such that one end of said needle extends into said holder body toward said opening and an opposite end of said needle extends outside said holder body, a hollow elongated blood collection tube having a tubular side wall portion terminating at one end of said tube in a closed end wall portion and having a round in diameter open end opposite the closed end wall portion of said tube, a stopper body having round and connected flange and plug portions, the flange portion of said stopper body being substantially larger in diameter than the plug portion of said stopper body and sized to be slidably moved into the holder body and against the needle end extending into said



holder body, the largest diameter of the flange portion of said stopper body exceeding the largest diameter of the sidewall portion of said tube proximate the opening in said tube by a factor of at least 1.4 and, means forming aligned and opposed cavities in the flange and plug portions defining a relatively thin diaphragm portion therebetween.

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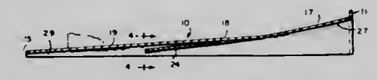
APPARATUS AND METHODS FOR MAKING COMPONENTS OF A SMOKING ARTICLE

Lloyd H. Hancock, Walnut Cove; Jesse A. Stigall, King, and Donald R. Wilkinson, Clemmons, all of N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.

Filed Sep. 15, 1987, Ser. No. 97,240

Int. Cl.[4] A24C *5/00, 5/18*

U.S. Cl. 131—280 **35 Claims**



1. A device for forming a composite member for use in making a smoking article, the composite member comprising a removable support member circumscribed by a layer of compressible and resilient material, the device comprising (a) an elongate structure having a curved inner surface that tapers from a larger proximal end to a smaller distal end, the proximal end of the structure being adapted to receive the support member and the layer of material which are fed simultaneously into the device, the tapering inward curved inner surface causing the longitudinal edges of the layer of material to bend around the inner support member, and (b) a curved forming surface that causes a first longitudinal edge of the material to fold over the support member while permitting the second longitudinal edge to pass by the forming surface, the curved inner surface of the device further tapering to the distal end causing the longitudinal second edge of the material to fold over the support member proximate to the first longitudinal edge.

4,893,638

CIGARETTE

John H. Lauterbach, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

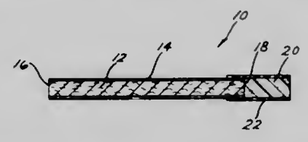
Filed Dec. 9, 1988, Ser. No. 281,599

Int. Cl.[4] A24D *1/00*; A24B *1/00*

U.S. Cl. 131—364 **4 Claims**

1. A cigarette comprising:

a tobacco column consisting of ground tobacco with a particle size in the range of about 0.5 mm to about 3.0 mm, said tobacco column having a circumference of from about 10 mm to about 19 mm and a packing density in the range of approximately 350 g/cm^3 to 450 mg/cm^3; and,



a circumscribing wrapper of combustible paper circumscribing said tobacco column.

4,893,639

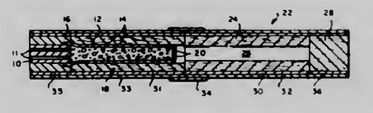
DENSIFIED PARTICULATE MATERIALS FOR SMOKING PRODUCTS AND PROCESS FOR PREPARING THE SAME

Jackie L. White, Pfafftown, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jul. 22, 1986, Ser. No. 888,534

Int. Cl.[4] A24C *15/18*; A24D *1/18*

U.S. Cl. 131—369 **13 Claims**



1. A process for preparing densified particulate materials suitable for use in smoking products, which process comprises the sequential steps of:

(a) forming an extrudable mixture comprising a suitable solvent and a solid selected from the group consisting of carbon, tobacco, and mixtures thereof;

(b) extruding said mixture into rod-type members;

(c) feeding said rod-type members to a centrifugal granulation apparatus; and

(d) subjecting said rod-type members to sufficient centrifugal force in said granulation apparatus for a sufficient period of time to increase their density by at least 20 percent.

4,893,640

MULTIPLE-ROD CIGARETTE MAKING MACHINE
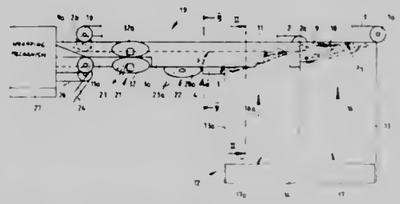
Uwe Heitmann, and Manfred Goldbach, both of Hamburg, Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 275,078

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1987, 3742251

Int. Cl.[4] A24C *5/18, 5/31*

U.S. Cl. 131—84.4 **13 Claims**



1. Machine for simultaneously producing a plurality of rods which contain a fibrous material of the tobacco processing industry, comprising first and second conveyors defining elongated paths; means for supplying fibrous material into first portions of said paths so that the first and second conveyors accumulate and advance along the respective paths discrete first and second streams each of which contains a surplus of fibrous material; and discrete first and second surplus removing apparatus adjacent second portions of the respective paths downstream of said supplying means, each of said apparatus comprising a pair of substantially coplanar rotary trimming discs, the trimming discs of said first apparatus being disposed in a first plane and the trimming discs of said second apparatus being disposed in a different second plane.

4,893,641

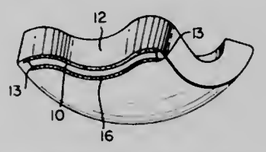
FLEXIBLE RAZOR, METHOD OF USE

Edward Strickland, 2500 Kalakua Ave., Apt. 502, Honolulu, Hi. 96815

Continuation-in-part of Ser. No. 172,258, Mar. 23, 1988, Pat. No. 4,845,848. This application May 5, 1989, Ser. No. 347,582

Int. Cl.[4] B26B *19/44*

U.S. Cl. 132—200 **8 Claims**



1. A method for shaving hairs from the surface of the skin with a razor means in the form of flexible razor blade fixed to a flexible support member by manually manipulating said razor means comprising pressing the blade against the skin while moving said blade over the skin, apply said pressure to the back side of the support member by contact with one or the other of the thumb and fingers of the manipulator, and using said pressure for flexing the blade to follow the changing contour of the surface being shaved.

4,893,642

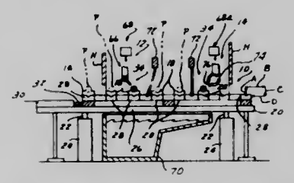
PRODUCTION LINE PART DEBURRING APPARATUS

Harold W. Parslow, Jr., and Timothy M. Parslow, both of Mt. Clemens, Mich., assignors to GraPar Corporation, Warren, Mich.

Filed Jan. 11, 1989, Ser. No. 296,189

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—66 **16 Claims**



1. An apparatus for production line deburring of like parts, each part having an established axis of rotation and opposite ends said apparatus comprising:

conveying means for advancing the parts in succession in intermittent step-by-step movement along a fixed path;

part rotating means mounted at a first location on said path for supportingly engaging the opposite ends of a part on said conveying means and for driving the engaged part in high speed rotation about said established axis of rotation; and

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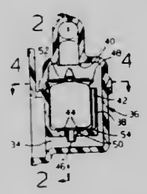
deburring means adjacent said first location for spraying a high pressure fluid against said part while said part is driven in high speed rotation by said part rotating means to remove microburrs and flashings from said part by a combination of centrifugal forces produced by the high speed rotation and impingement forces produced by the high pressure fluid.

4,893,643

TANK VAPOR VENT VALVE ASSEMBLY WITH IMPROVED OVERFILL PROTECTION

William E. Gifford, Hemlock; Carl H. Sherwood, Brockport; Charles H. Covert, Manchester, and Kenneth W. Turner, Webster, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1989, Ser. No. 316,001
Int. Cl.[4] B01D *53/04*
U.S. Cl. 137—202 **3 Claims**



1. In a vehicle fuel tank vapor recovery system of the type that has a vapor storage canister and a tank vapor vent valve assembly that routes the flow of fuel vapor displaced from the fuel tank during fuel fill to said canister, but which blocks liquid fuel from reaching said canister, the improvement comprising,

a lightweight and buoyant float with an elongated axis having a seal at its upper end,

a float chamber through which said flow of displaced tank vapor passes, said chamber having an interior wall within which said float is slidably received so as to move up and down along its axis, said interior wall having an inner surface that forms a thin envelope of space about said float while leaving said float upper end free, said interior wall also having an outer surface that is exposed to said flow of displaced tank vapor,

a pressure tube extending through said float chamber interior wall so as to open at its inner end into said space envelope and at its outer end into said flow, and,

a vapor vent line running from said canister to said float chamber and opening through said float chamber above said float seal,

whereby, during fuel fill, as displaced tank vapor flows through said float chamber and past said pressure tube outer end, a negative pressure is created in said envelope of space that serves to keep said float down, and should liquid fuel reach said float chamber, it will flow into said envelope of space and around said float, buoying it freely up along its axis until its seal blocks said vapor vent line.

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NON-RETURN VALVE FOR SUPPLY COCKS

Marco Giacomini, Novara, Italy, assignor to Sirio S.p.A., Italy

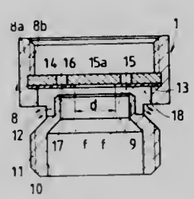
Filed Aug. 31, 1988, Ser. No. 239,134
Claims priority, application Italy, Sep. 4, 1987, 21799 A/87
Int. Cl.[4] F16K *24/00*
U.S. Cl. 137—218 **14 Claims**

1. A non-return valve for water supply cocks, comprising:

(a) a one-piece, elongated, tubular, valve body having a cup-shaped portion at an inlet end and an integral base at an opposite outlet end, said cup-shaped portion having an interiorly threaded section for connection to a water supply cock, said base having an exteriorly threaded section for connection to a hose coupling, said base and cup-shaped portion bounding a passage along which water from the inlet end flows in one direction to the outlet end, said base and cup-shaped portion bounding therebetween a bypass channel open to the exterior of the valve;

(b) a substantially rigid washer separate from, and mounted within, the cup-shaped portion and having one surface for sealing engagement with the cock, an opposite surface, and apertures extending through the washer surfaces; and

(c) a flexible annular membrane mounted within the cup-shaped portion adjacent the washer, said membrane having an outer peripheral section stationarily mounted in a fixed position by the washer, and an inner movable valve portion having a central hole, said valve portion being movable from an open position in which the valve portion is positioned by water flowing along said one direction away from the washer and permits water to flow along the passage through the apertures and the central hole to the outlet end, to a closed position in which the valve portion is positioned against the washer and blocks the apertures, thereby routing return water flowing in the return direction opposite to said one direction into the bypass channel to the valve exterior.

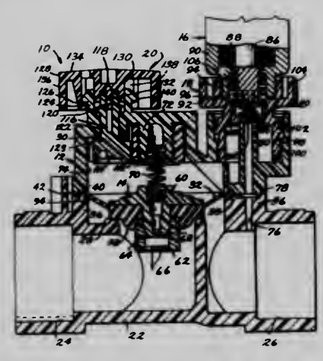


4,893,645

CONTROL VALVE WITH IMPROVED DUAL MODE OPERATION AND FLOW ADJUSTMENT

Andrius R. Augustinas, Peoria, Ill., and Raymond F. Lippitt, Bethesda, Md., assignors to L. R. Nelson Corporation, Peoria, Ill.

Filed Nov. 7, 1988, Ser. No. 267,567
Int. Cl.[4] F16K *43/00, 31/385, 31/40*
U.S. Cl. 137—315 **23 Claims**



22. A control valve comprising

a valve body having an inlet for receiving water under pressure, an outlet, a main valve seat communicating between said inlet and said outlet and a first flanged annular mounting portion surrounding said main valve seat providing a first annular diaphragm edge receiving surface means,

a main valve mounted in said valve body structure for movement between an engaged position with respect to said main valve seat preventing communication of said inlet with said outlet through said main valve seat and a spaced position with respect to said main valve seat allowing communication of said inlet with said outlet through said main valve seat,

said main valve having a diaphragm connected therewith and extending outwardly therefrom,

a valve bonnet having a second flanged annular mounted portion providing a second annular diaphragm edge receiving surface means

means for removably securing said valve bonnet on said valve body with a marginal edge of said diaphragm engaged between the first and second flanged annular diaphragm edge receiving surface means so that said diaphragm defines with said valve bonnet a control chamber,

pressure control means operatively associated with said control chamber and said inlet and outlet for (1) utilizing the water under pressure communicating with said inlet to create sufficient water pressure in said control chamber to maintain said main valve in said engaged position and (2) for discharging water under pressure from said control chamber to said outlet to reduce the water pressure in said control chamber sufficient to enable said main valve to move into said spaced position,

said control means comprising control passage means from said control chamber to said outlet having a control valve seat therein,

a solenoid assembly including a control plunger spring biased toward an extended position and a solenoid coil means energizable to retract said control plunger from said extended position against the spring bias thereof into a spaced retracted position,

means mounting said solenoid assembly on said bonnet in a solenoid operating position wherein said control plunger is (1) spring biased to engage said control valve seat when in an intermediate position between said extended and retracted positions so as to prevent communication of said control chamber with said outlet through said control passage means and (2) retractable from said intermediate position by the energization of said solenoid coil means to permit communication of said control chamber with said outlet through said control passage means, and

an adjusting mechanism carried by said bonnet for manual movement into selected positions for selectively varying the distance between said main valve and said main valve seat when said main valve is in said spaced position,

said bonnet mounting means comprising:

said first flanged annular mounting portion having a series of annularly spaced threaded bores formed therein,

a series of headed bolts threaded into said threaded bores,

the second flanged annular mounting portion of said bonnet having a series of flange sections corresponding with the series of bolts,

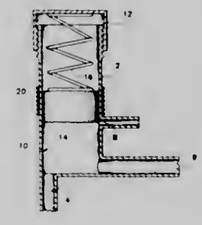
said flange sections including bolt receiving slots having open ends opening in the same annular direction and being shaped to enable said bonnet to be moved (1) from a separated condition in a direction toward said valve body into a preliminary position of cooperation between said first and second annular diaphragm receiving surface means wherein said bolt are disposed adjacent the open ends of said slots and (2) from said preliminary position in an annular direction into an operating position wherein said bolts are disposed in said slots in positions to be tightened onto the associated flange sections.

4,893,646

FLUID PRESSURE REGULATOR

Guenther W. Wimmer, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 28, 1988, Ser. No. 187,666
Int. Cl.[4] G05D *16/20*
U.S. Cl. 137—487.5 **8 Claims**



1. A fluid pressure regulator comprising:

a housing defining a cylindrical chamber, an inlet opening for introducing fluid into the chamber, an outlet opening for allowing fluid to leave the chamber, the outlet opening being in open communication with the inlet opening, and a bleed orifice in communication with a space at constant pressure,

a source of fluid under pressure connected to the inlet opening,

a piston member of ferromagnetic material fitted in the chamber and slidable therein within a range of positions such that the bleed orifice is partially covered by the piston member, and

magnetic means which bias the piston member at a substantially constant force when it is within said range of positions, the magnetic means comprising an electrical conductor having first and second opposite terminals and a current source connected to said terminals for supplying a flow of current through the conductor.

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IN-TANK FUEL RESERVOIR WITH RESERVOIR FUEL LEVEL CONTROL

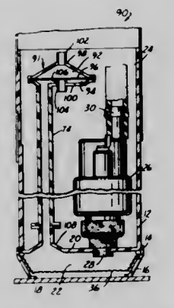
Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Division of Ser. No. 153,316, Feb. 8, 1988, Pat. No. 4,831,990, which is a continuation-in-part of Ser. No. 49,537, May 14, 1987, Pat. No. 4,807,582, which is a continuation-in-part of Ser. No. 928,184, Nov. 7, 1986, Pat. No. 4,747,388. This application Feb. 24, 1989, Ser. No. 314,878
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] F16K *17/19*; F02M *37/10*
U.S. Cl. 137—493 **4 Claims**

1. A fuel delivery system for automobile engines and the like comprising: a canister for positioning within a fuel tank and having a lower end with an opening in communication with said fuel tank and an internal wall spaced from said lower end dividing said canister into upper and lower chambers, an electric fuel pump positioned within said canister having an inlet coupled to draw fuel solely from said lower chamber through said internal wall and an outlet for delivering fuel under pressure, means for returning excess fuel to said upper chamber, and means responsive to fuel level in said upper chamber for selectively feeding fuel from said upper chamber to said lower chamber when fuel level in said upper chamber approaches maximum capacity of said upper chamber, said level responsive means comprising passage means in said internal wall and

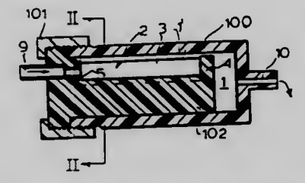
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a standpipe extending from said passage to an upper end at a position corresponding to maximum capacity fuel level in said



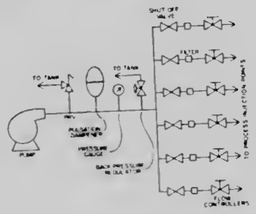
upper chamber, and further comprising pressure valve means carried at said upper end of said standpipe.

4,893,648
CONTROL VALVE
Eduard Horvath, Vienna, Austria, assignor to Otto Bock Orthopedische Industrie Besitz - und Verwaltungs - KG, Duderstadt, Fed. Rep. of Germany
Filed Sep. 30, 1988, Ser. No. 252,859
Claims priority, application Austria, Oct. 2, 1987, 2511/87
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—504 **14 Claims**



1. A control valve for the control of a liquid flow, especially to a hydraulic piston-and-cylinder damper, said control valve comprising:
an elongated housing having an axis, formed with a generally cylindrical wall over at least a portion of the periphery thereof and provided with an outlet at one end of said housing;
means in said housing formed with a pair of substantially parallel flexible lamellar-like walls extending parallel to generatrices of said cylindrical wall and reaching toward said cylindrical wall, a first end wall proximal to said end of said housing, and another end wall remote from said end of said housing, said lamellar-like walls and said end walls defining a trough-shaped pressure chamber in said member opening toward said cylindrical wall with said lamellar-like walls and said first end wall defining a throttle gap between said pressure chamber and said outlet decreasing in flow cross section as fluid pressure in said chamber increases as a result of outward deflection of said lamellar-like walls; and
means for feeding said liquid flow to said chamber.

4,893,649
CONSTANT FLOW RATE CONTROLLER VALVE
Paul K. Skogland, P.O. Box 968, Woodinville, Wash. 98072
Filed Sep. 30, 1988, Ser. No. 251,920
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—504 **8 Claims**

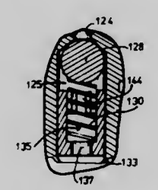


1. A valve mechanism for regulating gas or fluid flow comprising:
a housing having an inlet and outlet forming a flow passage through said housing;
a piston mounted in a bore formed in said flow passage, said piston intersecting said flow passage, said piston dividing a portion of said flow passage into first and second chambers located at opposite sides of said piston and respectively communicating with said inlet and outlet;
an orifice through said piston, said orifice connecting said first and second chambers, said orifice calibrated for a predetermined flow rate and being the sole gas or fluid flow passage from said inlet to said outlet;
a valve stem connected with said piston for movement therewith by a first spring means, said valve stem having a small surface area in relation to the surface area of said piston;
a valve seat between said piston and said outlet, said valve seat aligned to seat and unseat said valve stem based on the relative position of said piston within said housing;
a second spring means biasing said piston toward said inlet, said spring means providing a bias force that establishes a substantially constant pressure differential between said first chamber and said second chamber to enable a substantially constant outlet flow at varied pressures without substantial movement of said piston after flow is initiated; and,
a screw adjustment means in contact with said valve seat, said valve seat being variable in position within said housing based upon adjustment of said screw adjustment means.

4,893,650
ONE WAY HIGH PRESSURE FLOW CONTROL FITTINGS
Bill Chisholm, 10 Coachway Rd., S.W., Apt. #171, Calgary, Alberta, Canada (T3H 1E5), and Roger E. Frei, Box 8, Site 12, RR #9, Calgary, Alberta, Canada T2J 5G5
Filed Sep. 12, 1988, Ser. No. 242,495
Int. Cl.[4] F16K *15/04*
U.S. Cl. 137—539 **3 Claims**

1. A fitting adapted to be installed upon an apparatus to at least temporarily provide one way fluid flow communication from a source of lubricant, bridging agents, or grease having an output pressure in the order of 10,000 PSI, said fitting comprising:
a flow channel for conducting substances interiorly through said fitting, said flow channel comprising coaxial inlet and outlet passageways, the outlet passageway having a diameter substantially greater than the input passageway;
a valve seat disposed between said inlet passageway and said outlet passageway for selectively permitting fluid flow

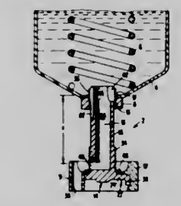
communication between said inlet and outlet passageways;
a ball valve disposed within said outlet passageway for selectively blocking said valve seat, said ball valve having a diameter greater than the diameter of said inlet passageway but smaller than the diameter of said outlet passageway;
a spring disposed within said outlet passageway for normally yieldably biasing said ball valve into blocking contact with said valve seat;
a rigid, castellated cage disposed within said outlet passageway at the bottom of said fitting for controlling said spring during fluid flow to prevent spring deformation and cylinderization and for limiting travel of said ball valve, thereby positively insuring flow through said fitting, said cage comprising:
a generally cylindrical passageway coaxial with said flow



channel and coaxially containing and seating said spring, said cylindrical passageway forming a fluid exit from said fitting;
a plurality of upwardly extending legs symmetrically radially spaced apart about said cylindrical passageway and said spring for limiting axial displacement of said ball valve to prevent cylinderization and for centering said ball valve to prevent spring twisting and bending; and,
a plurality of radially spaced apart relief slots defined between adjacent legs providing fluid flow communication to said cylindrical passageway about the periphery of said ball valve;
whereby positive one way flow is maintained through said valve orifice, around said ball valve, through said slots, between exposed adjacent spring windings, through the hollow interior of the spring partially compressed within said cage, and out through said fluid exit.

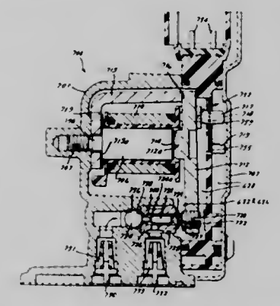
4,893,651
SELF-VENTING DRAIN VALUE ASSEMBLY
Peter K. Herman, Cookeville, Tenn.; Jean Y. Bouchet, Quimper, and Daniel Fertil, Plogonnec, both of France, assignors to Cummins Engine Company, Inc., Columbus, Ind.
Filed Jan. 6, 1989, Ser. No. 293,964
Int. Cl.[4] F16K *24/00*
U.S. Cl. 137—588 **51 Claims**

1. A self-venting valve assembly for draining liquid from a vessel, comprising:
a body portion containing an opening through which liquid may drain and gas may simultaneously enter the vessel; and
a valve means for selectively permitting and preventing flow through said opening, said valve means being positioned for reciprocating movement within said opening between a closed position in which the liquid and gas movement through said opening is prevented and an open position in which gas entry and a liquid drainage occur along separate fluid paths formed in said valve means, said valve means comprising a stem containing at least one groove formed in the exterior surface of said stem, said stem and said body cooperating to form one of said fluid paths through said groove wherein an upper portion of said



groove remains in said vessel while said valve means is in said open position.

4,893,652
DIRECT-ACTING, NON-CLOSE CLEARANCE SOLENOID-ACTUATED VALVES
Thomas D. Nogle, Troy, and James R. Klotz, Mt. Clemens, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Apr. 29, 1988, Ser. No. 188,598
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—596.17 **14 Claims**



1. A valve assembly for controlling fluid flow between a fluid supply source and fluid actuating device in a vehicle transmission, said assembly comprising:
means forming a housing having a supply port for connection with a fluid supply source, an element port for connection with the fluid actuating device, and a passageway communicating with said supply port and said element port;
a ball disposed within said passageway and moveable between positions which cause said element port to be either connected to said supply port or a vent port;
means forming a plunger having a longitudinal axis aligned with the center of said ball to move said ball;
electromagnetic means for producing a magnetic field when electrically energized; and
armature means moveable in response to the presence and absence of a magnetic field for actuating said plunger means, said armature means comprising an armature member axially spaced from the electromagnetic means and extending outwardly in a plane perpendicular to an axial length of the electromagnetic means and having an offset portion extending toward and at least partially disposed inside the electromagnetic means to cause a working air gap between the armature means and electromagnetic means to be disposed inside and offset toward the center of the electromagnetic means for more efficient magnetic

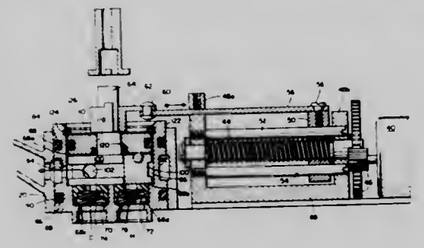
flow, wherein said armature member has one end spaced transversely from said offset portion for actuating said plunger means to move said ball.

4,893,653

ELECTRICALLY CONTROLLED FAUCET

Joseph T. Ferrigno, 151-45 27th Ave., Flushing, N.Y. 11354

Filed Jan. 4, 1989, Ser. No. 293,214
Int. Cl.[4] F16K *11/24*
U.S. Cl. 137—607 16 Claims



1. An electrically controlled faucet comprising, in combination:

a main body having a cylindrical bore and a pair of inlets at one end for inflow of fluids of two different temperatures, and an external circumferential passage to which a fluid of one temperature or a mixture of the two different temperature fluids discharges through an opening communicating the bore with the circumferential passage;

a circular disk-shaped mixing valve having top and bottom surfaces supported for limited rotation in the bore of said main body, said valve having a circumferential fluid passage formed in its external surface intermediate its top and bottom surfaces, and first and second input ports extending upwardly from the bottom surface and communicating with the circumferential passage, said first and second input ports being angularly spaced relative to the inlets in said main body so that in a first rotational position of said valve only fluid from one of said inlets flows through said first input port to said circumferential passage, in a second rotational position only fluid from the other of said inlets flows through said second input port to said circumferential passage, in a third rotational position fluids from both of said inlets flow through respective first and second input ports to said circumferential passage, and in a fourth rotational position there is no fluid flow from either of said inlets;

a cylindrical outer shell surrounding said main body in sealing rotational relationship therewith, said outer shell having an outspout through which fluid discharges from the external circumferential fluid passage of said main body; and

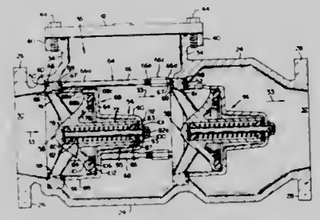
circuit means including a first reversible DC motor mechanically coupled to said mixing valve and operative when energized to rotate said valve, a source of DC potential, and switch means including at least first, second and third manually-actuable switches each having a pair of contactors connected to said source of DC potential and a pair of contacts selectably connectable to respective terminals of said first motor through a respective wafer-type switch having stationary contacts and relatively rotatable contacts mechanically coupled to said mixing valve for rotation therewith for controlling application of DC potential to said first motor in dependence on actuation of a selected one of said first, second or third manually-actuable switches for rotating said mixing valve to a corresponding one of said first, second or third rotational positions thereby to discharge fluid from said outspout at one or the other of said different inlet temperatures or a predetermined blend of said inlet temperatures.

4,893,654

DOUBLE CHECK VALVE BACKFLOW PREVENTER ASSEMBLY

John G. Feuz, 10595 SE. Hillcrest, Portland, Oreg. 97266

Filed Jul. 8, 1988, Ser. No. 216,857
Int. Cl.[4] F16K *15/00*
U.S. Cl. 137—614.2 15 Claims



1. A double check valve backflow preventer assembly for installation in a liquid supply line in a space of predetermined length dimension between a pair of gate valve assemblies normally occupied by a single check valve backflow preventer assembly, said double check valve backflow preventer assembly comprising:

a single unitary valve body having substantially said predetermined length dimension and opposite end coupling means for coupling to corresponding coupling means of said gate valve assemblies and defining opposite end liquid inlet and outlet openings;

said valve body defining a single access opening between said opposite end inlet and outlet openings and a removable access cover for closing said access opening,

a first annular valve seat within said valve body on the inlet side of said access opening,

a second annular valve seat within said valve body on the outlet side of said access opening,

a first check valve assembly for mounting within said valve body to open in a downstream direction with respect to said inlet and outlet openings and including a first stationary valve cage having a ring for seating against said first valve seat,

a second check valve assembly for mounting within said valve body to open in a downstream direction with respect to said inlet and outlet openings and including a second stationary valve cage having a ring for seating against said second valve seat,

and releasable seating means operable to seat said first valve cage ring against said first valve seat and said second valve cage ring against said second valve seat, said seating means being operable to seat and release said cage rings from their seated engagement with said valve seats through said single access opening.

4,893,655

DOUBLE VALVE MECHANISM FOR AN ACOUSTIC MODULATOR

Robert B. Anderson, Stamford, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1989, Ser. No. 397,549
Int. Cl.[4] F16K *31/08, 3/26;* H04R *9/00*
U.S. Cl. 137—625.33 10 Claims

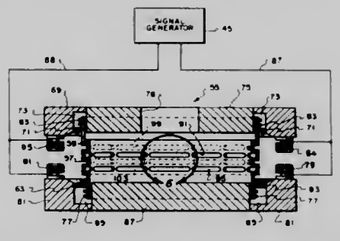
1. A valve mechanism for an acoustic modulator comprising: first and second cylindrical shaped members with said first cylindrical shaped member being positioned inside of said second cylindrical shaped member;

first and second support members;

said first cylindrical shaped member having at least a first plurality of ports located in a plane near the upper end thereof, and a second plurality of ports located in a plane below said first plurality of ports;

said second cylindrical shaped member having at least a first plurality of ports located in a plane near the lower end thereof, and a second plurality of ports located in a plane above said first plurality of ports;

spring means connecting said first cylindrical shaped member to said first support member and said second cylindrical shaped member to said second support member;



first and second driver means, said first driver means being positioned near the lower end of said first cylindrical shaped member and said second driver means being positioned near the upper end of said second cylindrical shaped member; and

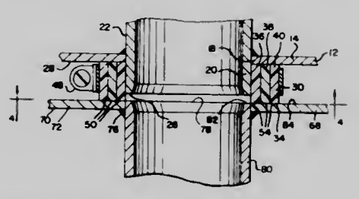
said first and second driver means being excited by an electrical sinusoidal input signal so as to cause movement of said first and second cylindrical shaped members thereby obstructing or permitting the passage of air through the ports of said first and second cylindrical shaped members such that the pulse shape of an acoustic energy output waveform provided by said valve mechanism is full-wave rectified and has a frequency twice the frequency of said electrical sinusoidal input signal.

4,893,656

DIVERTER VALVE

Walter Willhoft, P.O. Box 95, Waco, Ill. 60183

Filed Jan. 30, 1989, Ser. No. 303,807
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—874 10 Claims



1. A diverter-type valve comprising:

a valve body,

a first and a second discharge tube having inlet ends carried by said body,

a movable member pivotally attached to said valve body by a pair of spaced apart link bars,

an intake tube having an outlet end carried by said movable member,

operative means attached to said movable member to selectively swing said movable member to align said intake tube outlet end with either said first or second discharge tube inlet end, and

gasket means positioned about said aligned intake tube outlet end and said discharge tube inlet end, said means having a sealing surface forming a series of arcuate shaped seals to inhibit egress from or ingress into said aligned ends,

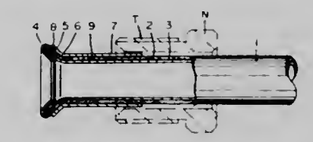
wherein material may flow through said valve in a leak resistant and contaminant resistant manner.

4,893,657

STRUCTURE OF THE CONNECTING END PORTION OF COMPOSITE TUBE HAVING SMALL DIAMETER

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka Prefecture, Japan

Continuation of Ser. No. 125,556, Nov. 25, 1987, abandoned.
This application Jan. 25, 1989, Ser. No. 301,659
Int. Cl.[4] F16L *35/00*
U.S. Cl. 138—109 6 Claims



1. A reconnectable structure of a connecting end portion of a small diameter composite tube consisting of a thin metal tube having a small diameter and a resin tube closely fitted on the outer periphery of said metal tube and extending substantially along the entire length thereof, the metal and resin tubes being substantially cylindrical and of uniform respective thicknesses adjacent the connecting end portion, said connecting end portion having a coaxial and outwardly opening flare which is formed integrally with said composite tube and with the metal and resin tube portions along said outwardly opening flare being of uniform respective thickness, characterized by the inclusion of:

a metal sleeve washer having a uniform radial thickness substantially equal to the thickness of the metal tube fitted on the outer periphery of said composite tube, said metal sleeve washer and said thin metal tube being formed from the same metal material, said metal sleeve washer having substantially the same shape as that of said composite tube with said flare and comprising a trumpet-like open wall which is contacted with the outer surface of said flare, and a cylindrical wall fitted on the outer periphery of the cylindrical portion of said composite tube adjacent to said flare, a nut having a central cylindrical through aperture surrounding the cylindrical wall of the metal sleeve washer, said nut having a flared entry to said through aperture, said flared entry conforming to the shape of and engaging the trumpet-like wall of said metal sleeve washer, whereby said metal sleeve washer prevents friction related damage to the resin tube and further increases the strength of the connecting end portion thereby reducing torsional stress and preventing breakage such that said metal sleeve washer increases the life and enables reuse of said structure.

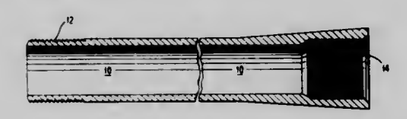
VOL 1110 ISS 3 JA 16 1990 UMI

4,893,658

FRP PIPE WITH THREADED ENDS

Kunitoshi Kimura, Osaka; Tetsuo Arai, Takarazuka; Hiroshi Matsuoka, Tsu, and Toshiharu Nakagawa, Suzuka, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Nitto Electric Industrial Company, Ltd., both of Osaka, Japan

Filed May 26, 1988, Ser. No. 199,923
Claims priority, application Japan, May 27, 1987, 62-130586
Int. Cl.[4] F16L 9/14
U.S. Cl. 138—109 20 Claims



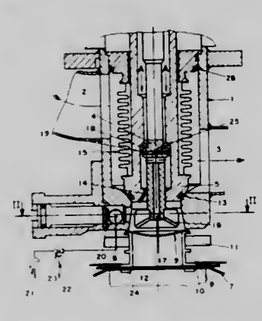
1. An oil well FRP pipe having threaded surfaces at both ends thereof, the pipe including means comprising a metal plating formed on the surface of at least one of the threaded ends for preventing bonding of thread compound thereto.

4,893,659

FILLING HEAD APPARATUS FOR ASEPTICALLY FILLING A PACK

Willi Löliger, Kaiseraugst, Switzerland, assignor to Nestec S. A., Vevey, Switzerland

Filed Feb. 18, 1988, Ser. No. 157,383
Claims priority, application Switzerland, Mar. 2, 1987, 785/87
Int. Cl.[4] B65B 43/42
U.S. Cl. 141—85 7 Claims



1. A filling head apparatus for aseptically filling a pack comprising:

an elongated housing having a fluid inlet port and a fluid outlet port in the housing sides and having one end defining a filling head space and a second end having a sterilizing medium entry port;

a first elongated valve for regulating flow of a sterilizing medium selected from a group consisting of steam and sterile air for sterilizing the filling head space, the first valve being elongated parallel with the elongation of the housing and being centrally disposed within the housing, the first valve being displaceable along its longitudinal axis;

a second elongated valve for regulating flow of fluid from the housing fluid inlet port to the filling head space, the second valve circumscribing and being displaced from the first valve thereby defining a first passage disposed between the second valve and the first valve which communicates with the sterilizing medium entry port for allowing the sterilizing medium to flow in the first passage between the second valve and the first valve, and being displaceable coaxially with respect to the first valve, the second valve further being displaced from the housing thereby defining a second passage disposed between the second valve and the housing for allowing fluid from the housing inlet to flow in the second passage between the second valve and the housing to the filling head space;

an emptying pipe connected laterally to the housing at the filling head space for removal of sterilizing medium and residual fluid from the filling head space;

an emptying pipe valve for regulating emptying of the sterilizing medium and residual fluid from the filling head space, the emptying pipe valve being positioned with the emptying pipe and being displaceable along a longitudinal axis perpendicular to the longitudinal axes of the first and second valves; and

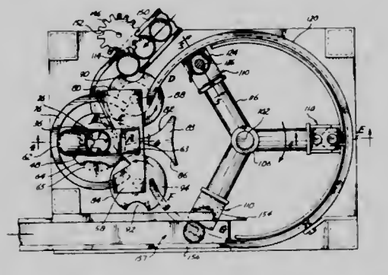
means for actuating the first valve, second valve and emptying pipe valve along their respective longitudinal axes.

4,893,660

CONTAINER FILLING SYSTEM

Marvin I. Berg, Tacoma; Stavros Mihail, Seattle, and John E. Osman, Edmonds, all of Wash., assignors to Promation Incorporated, Seattle, Wash.

Continuation of Ser. No. 81,972, Aug. 5, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 271,385
Int. Cl.[4] B65B 39/12
U.S. Cl. 141—144 21 Claims



1. A container filling system for introducing controlled volumes of filler material into containers, the system comprising:

measuring means for receiving a predetermined volume of filler material, said measuring means rotatable about a primary axis;

feed means for introducing filler material into said measuring means under pressure and along a first axis defined with respect to said measuring means; and

discharge means for discharging material from said measuring means along said first axis and into one of the containers, said discharge means rotatable about a secondary axis different from said primary axis.

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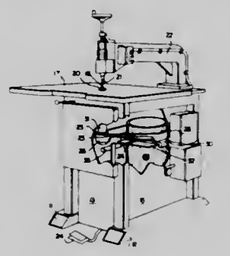
DRIVE BELT TENSION CONTROL APPARATUS FOR INVERTED ROOTER

Thomas C. Onsrud, Troutman, N.C., assignor to C. R. Onsrud, Inc., Troutman, N.C.

Filed Feb. 22, 1989, Ser. No. 313,983
Int. Cl.[4] B27C 5/02
U.S. Cl. 144—134 A 18 Claims

1. In an inverted router characterized by having a drive motor, a motor driven pulley, a spindle, and a drive belt for transferring power from the motor driven pulley to said spindle, the improvement comprising drive belt tension control apparatus, said drive belt tension control apparatus comprising:

(a) mounting means for mounting said motor driven pulley in continuously variable spaced-apart relation to said spindle during machine operation;



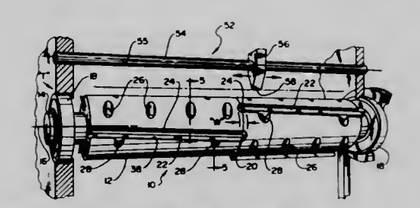
(b) pressure means for exerting a predetermined pressure on said motor driven pulley and thereby a predetermined tension on said drive belt during machine operation.

4,893,662

CUTTING TOOL

Vito Gervasi, 1888 Derby Dr., Oregon, Wis. 53575

Filed Dec. 6, 1988, Ser. No. 280,553
Int. Cl.[4] B27C 1/02; B27G 13/00
U.S. Cl. 144—230 35 Claims



1. In a wood planer, apparatus comprising:

(a) a generally cylindrical cutterhead having an axis of revolution, an outer surface and at least one generally elongated slot in said surface, said slot having a bottom and one long wall joined to said bottom, said one long wall of said slot being defined by a flat plane which is inclined at acute angle relative to a flat plane which contains said axis;

(b) a flat cutting blade adapted to fit within said slot and against said one long wall, said blade having two parallel spaced apart flat sides, a flat base between said sides, two opposite ends which are generally perpendicular to said base and said sides, and a straight flat bevelled cutting edge which is located opposite to said base; and

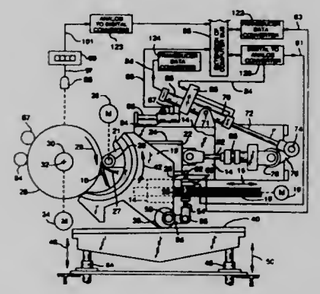
(c) alignment and holding means, carried by said cutterhead, for holding said blade in said cutterhead against said one long wall of said slot and for aligning said blade relative to said outer surface to have one end of said cutting edge present a first predetermined cutting angle and an opposite end of said cutting edge present a second predetermined cutting angle which is greater than said first predetermined cutting angle and to have said one end of said cutting edge located substantially at the same distance from said axis as said opposite end of said cutting edge, said first and second angle being selected to optimize the planing of a family of hardwoods or one species of hardwood.

4,893,663

CONTROL SYSTEM AND METHOD FOR AUTOMATIC ADJUSTMENT OF LATHE COMPONENTS IN RESPONSE TO TEMPERATURE OF LOG

Gary W. Ely, Canby, Oreg., assignor to The Coe Manufacturing Company, Portland, Oreg.

Continuation-in-part of Ser. No. 276,969, Nov. 18, 1988. This application Apr. 14, 1989, Ser. No. 337,897
Int. Cl.[4] B27B 1/00; B27L 5/02
U.S. Cl. 144—356 15 Claims



1. A method of operating a veneer lathe apparatus including the steps of:

rotating a log with powered drive means about an axis of rotation;

peeling veneer from the log with a lathe knife as the log is rotated;

compressing the surface of the log during peeling with a nose bar means at a position immediately in front of the lathe knife and spaced from said knife by a knife gap;

sensing the temperature of the outer surface of the log with temperature sensor means during peeling to produce an electrical control signal corresponding to the sensed temperature; and

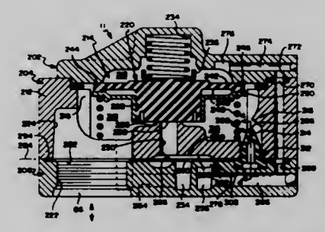
automatically adjusting at least one lathe component engaging the log in response to said control signal.

4,893,664

WHEEL END VALVE FOR CENTRAL TIRE INFLATION SYSTEM

Jerry M. Ottens, Windsor, Canada, assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 12, 1988, Ser. No. 243,005
Int. Cl.[4] B60C 29/00
U.S. Cl. 152—416 4 Claims



1. A wheel end valve assembly for a central tire inflation system comprising a valve body having a first fluid connection defined by a first port for connection to a selectively pressurized and exhausted conduit, a second fluid connection defined by a second port for connection to the interior pressurized

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chamber of an inflatable tire, said valve assembly comprising first valve means responsive to pressurization of said selectively pressurized and exhausted conduit to assume a first position for establishing fluid communication between said first and second ports and responsive to exhausting to atmosphere of said selectively pressurized and exhausted conduit to assume a second position for blocking fluid communication between said first and second ports thereof, said first valve means comprising a valve member having a first surface exposed to fluid pressure at said first port and an opposed second larger surface, said valve assembly comprising second valve means constantly in fluid communication with said second port and responsive to a sensed pressurization of said interior chamber of said tire being less than a predetermined minimum reference pressure and an isolation circuit to conduct fluid from said first port past said second valve means to said second large surface to maintain said first valve means in said second position thereof in response to said sensed pressurization of said tire being less than said minimum reference pressure, said assembly characterized by:

a normally opened third valve means in fluid communication with said first port and said isolation circuit thereby maintaining a zero reference pressure differential between said first port and said second larger surface, said third valve means being responsive to a rapid increase in pressure at said first port to close said third valve means and thereby permit said first valve means to open.

4,893,665

CABLES FOR REINFORCING DEFORMABLE ARTICLES AND ARTICLES REINFORCED BY SAID CABLES

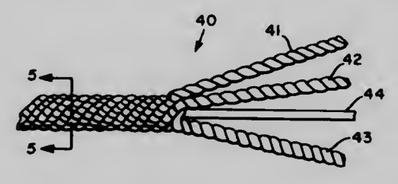
René F. Reuter, Bürden, and Thomas N. H. Walter, Keispelt, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 17, 1988, Ser. No. 156,621

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] D02G *3/48*; B60C *9/18*

U.S. Cl. 152—451 5 Claims



1. A cable comprising:

(a) at least two yarns each of which consist only of aramid filaments; and

(b) a single core yarn which is not twisted together with or around any other yarn and consists of at least one filament selected from the group consisting of polyamides having a structure which is at least partially oriented and polyesters having a structure which is at least partially oriented such that a force of about 4 grams per denier is required to elongate said core yarn to 107% of its beginning length, said aramid yarns being adjacent to one another and twisted about said core yarn but not about one another, the denier of said core yarn being in the range of 5% to 30% of the sum of the deniers of said aramid yarns, said cable having a twist multiplier in the range of 5 to 12, and the ratio of twist in the aramid yarns to the twist in the cable being in the range of 1.0 to 2.0.

4,893,666

ARTICULATED OVERHEAD GATE

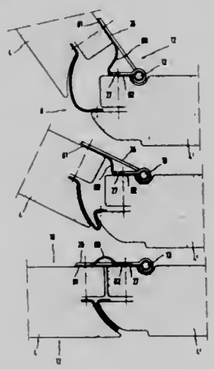
Michael Hörmann, Steinhagen, Fed. Rep. of Germany, assignor to Hörmann KG Brockhagen, Steinhagen/Brockhagen, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,295

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726699; May 18, 1988, 3816985

Int. Cl.[4] E05D *15/10*

U.S. Cl. 160—229.1 28 Claims



1. An articulated overhead gate comprising: a series of adjacent and mutually articulated panels having sides facing one another; each panel having an uppermost side in a closed position of said gate, said uppermost side facing a preceding panel and having a curved surface being convex in vertical section; each panel having a lowermost side facing a subsequent panel, said lowermost side having a curved surface being concave in vertical section, each pair of adjacent panels having mutually facing convex and concave curved surfaces defining a curved space therebetween: hinge means connecting adjacent panels, said space being dependent on said hinge means; said hinge means having a pivot axis, said facing convex and concave surfaces shifting in relation to each other as they move about said pivot axis from the closed position of said gate to an open position of said gate, said space being reduced during at least part of said shifting of said facing convex and concave surfaces; said curved space extending from the panel's outer surface, corresponding to the gate's outer surface toward the gate's inner surface through at least a portion of the panel's thickness, said hinge means being connected to said panels on the gate's inner surface; a concave mortise shoulder formed by a surface extending outward from the convex surface and connecting to a surface extending toward the interior of the panel; a resilient tenon shoulder extending out of said concave surface and projecting outward from the side of the panel, said shoulders being located within the remaining portion of the panel's thickness; said shoulders engaging each other as a mortise and tenon joint in the closed position of the gate.

4,893,667

PERFORATED WINDOW COVERINGS

William F. Dunn, 6050 Melody La., Suite 105, Dallas, Tex. 75231

Filed Oct. 2, 1987, Ser. No. 104,212

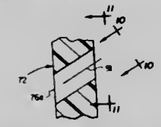
Int. Cl.[4] E06B *9/00*

U.S. Cl. 160—236 8 Claims

1. A light transmitting window covering for placement generally adjacent to a window pane on the building interior space side thereof to provide for admission of a predetermined amount of light to said interior space and substantially unrestricted visibility through said covering from said interior space, said covering including:

a panel formed of substantially opaque material, said panel including a substantial number of small spaced apart apertures formed therein to permit direct, generally horizontal rays of light to be transmitted through said panel, and transparent means covering said apertures to form a barrier to air flow through said panel;

said panel including opposed panel portions disposed on opposite sides of said transparent means, each of said panel portions including a set of apertures corresponding to the



set of apertures of the other panel portions, and said panel portions being aligned with each other such that said apertures permit direct transmission of light through said window covering and the registration portions of said transparent means intevening between said panel portions, respectively;

said transparent means including a transparent sheet and said panel portions being spaced from said sheet over a major portion of said sheet to form an insulating air space between said panel portions and said sheet, respectively;

and means for mounting said panel inside a building adjacent to a window pane.

4,893,668

CURTAIN WITH SUCKING DISKS

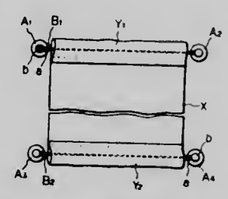
Chieko Nomura, Fukui, Japan, assignor to Home Lace Kyodokumiai (Home Lace Co-operative Union), Japan

Filed Aug. 3, 1988, Ser. No. 227,798

Claims priority, application Japan, Sep. 8, 1987, 62-137328[U]

Int. Cl.[4] E06B *3/80*; A47H *3/00*

U.S. Cl. 160—327 2 Claims



1. A curtain apparatus comprising a curtain sheet, passages formed at upper and lower sides of the curtain sheet, rubber cords passed through respective said passages, and sucking disks attached to both ends of each of the rubber cords.

4,893,669

SYNTHETIC RESIN HEAT EXCHANGER UNIT USED FOR COOLING TOWER AND COOLING TOWER UTILIZING HEAT EXCHANGER CONSISTING OF SUCH HEAT EXCHANGER UNIT

Ken Kashiwada, Fujisawa; Tadanobu Muto, Tokyo, and Tetsuo Sasaki, Fujisawa, all of Japan, assignors to Shinwa Sangyo Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 286,291

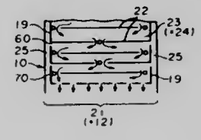
Claims priority, application Japan, Feb. 5, 1988, 62-25388; Mar. 17, 1988, 62-64536

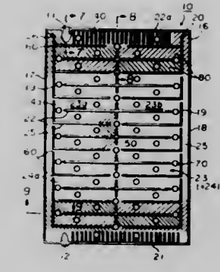
Int. Cl.[4] G05D *15/00*; F28F *3/00, 21/06*

U.S. Cl. 165—36 20 Claims

1. A synthetic resin heat exchanger unit used for a cooling tower, of a flat and thin hollow body formed as a whole by two wall plates wherein the interior functions as a liquid flowing passage, a cooling water feed part open externally is formed on an upper portion of the hollow body, a discharge part open externally is also provided on a lower end of the liquid flowing passage which is a lower edge of the hollow body, a major breadth portion of the liquid flowing passage forms a liquid falling speed reducing part, the liquid falling speed reducing part has horizontally extending deflectors distributed vertically throughout the unit each defining a stage, the deflectors are dislocated every other to form a zigzag passage therebetween;

said heat exchanger unit being characterized in that the





liquid falling speed reducing part is disposed to abut on a vertically extending overflowed-liquid escaping conduit through one vertical sealing part at least, an upper end of the vertical sealing part is shaped like a dam, said overflowed-liquid escaping conduit and a reservoir portion on the uppermost stage in the liquid falling speed reducing part communicate with each other through the dam, and an air vent crosses over said vertical sealing part and opens into said overflowed-liquid escaping conduit and is formed at a bent position of said zigzag liquid falling speed reducing part, and a raise is formed as a spacer on outer surfaces of both said wall plates.

4,893,670

INTEGRAL RADIATOR HOSE AND OIL COOLER

Shrikant M. Joshi, Getzville; Lee C. Whitehead, Middleport, and Frederick V. Oddi, Orchard Park, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 24, 1989, Ser. No. 356,162

Int. Cl.[4] B60H *1/00*; B61D *27/00*; F28F *21/06*; F01M *5/00*

U.S. Cl. 165—40 3 Claims

1. In an automotive cooling system, a compound radiator hose for transmitting coolant flow from a radiator to an engine and for cooling oil, comprising:

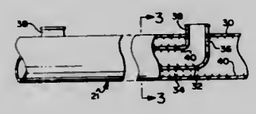
an outer hose for coupling to one of the radiator and the oil source,

an inner hose within the outer hose and radially spaced therefrom to provide a first passage between the inner and outer hoses, and a second passage within the inner hose,

means for coupling the inner hose to the other of the radiator

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and the oil source, whereby heat from the oil is conducted through the wall of the inner hose to the coolant passage so that coolant in the coolant passage can cool the oil, and the inner hose constructed of polymer material and having flexible vanes extending from at least one surface thereof into the respective passage for causing turbulence in the



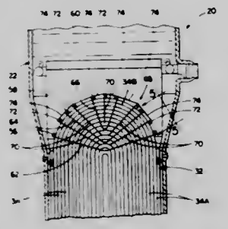
flow through the respective passage, the vanes being deflected by fluid flow to extend further into the passage during low flow rates in the passage than during high flow rates whereby turbulence in the flow is increased at low flow rates and pressure drop caused by the vanes is reduced at high flow rates.

4,893,671

STEAM GENERATOR TUBE ANTIVIBRATION APPARATUS AND METHOD

Hermann O. Lagally, Hempfield Township, Westmoreland County, and Thomas A. Pitterle, Unity Township, Westmoreland Township, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1988, Ser. No. 208,714
Int. Cl.[4] F28F 7/00
U.S. Cl. 165—162 **13 Claims**



1. In a steam generator for a nuclear reactor power plant including a bundle of U-shaped heat transfer tubes arranged in spaced rows and columns thereof, at least a pair of spaced rows of elongated primary antivibration bars installed between U-shaped portions of said tubes in said spaced columns thereof, and at least a pair of spaced apart retainer members disposed about the exterior of U-shaped portions of said tubes with opposite ends of said bars being rigidly attached to said respective retainer members, an antivibration apparatus for substantially closing gaps between said U-shaped tube portions in said columns thereof and said primary antivibration bars, said apparatus comprising:

(a) at least one row of a plurality of elongated supplementary antivibration bars having pairs of opposite ends, being disposed between said rows of said primary antivibration bars, and extending between said U-shaped portions of said tubes through the space between, at the most, every other one of said spaced columns thereof; and

(b) means for supporting said supplementary bar at respective outer ends thereof such that said supplementary bars are unsupported at respective inner ends thereof and thereby extend in cantilevered fashion between said U-shaped portions of said tubes;

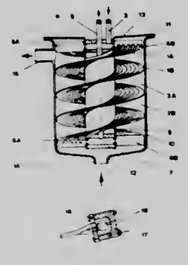
(c) each of said supplementary bars being capable of expansion in a transverse dimension thereof extending between said tubes so as to cause deformation laterally outward away from said respective bars of longitudinal spans of said tubes extending between said spaced row of primary antivibration bars for substantially closing any gaps existing between said U-shaped tube portions in said columns thereof and said primary antivibration bars.

4,893,672

COUNTER-FLOW HEAT EXCHANGER WITH HELICAL TUBE BUNDLE

Emil E. Bader, Zürcherstrasse 1, CH-8142, Uitikon Waldegg, Switzerland

PCT No. PCT/CH87/00106, § 371 Date Apr. 21, 1988, § 102(e) Date Apr. 21, 1988, PCT Pub. No. WO88/01363, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 21, 1987, Ser. No. 193,299
Claims priority, application Switzerland, Aug. 21, 1986, 3348/86
Int. Cl.[4] F28D 7/02
U.S. Cl. 165—163 **8 Claims**



1. In a counter-flow heat exchanger of the type comprising:

at least one helical tube bundle arranged in an annular chamber between a core tube and a coaxial tubular shell and connected to a primary inlet and a primary outlet for flow of a primary fluid through said helical tube bundle;

a plurality of contiguous helical tubes associated with said bundle and connected in parallel to said primary inlet and said primary outlet, said helical tubes being coiled in a corresponding helical plane with constant pitch around a common longitudinal axis and being closely arrayed without interruption between said core tube and said tubular shell so as to define therewith at least one closed helical channel connected to a secondary inlet and a secondary outlet so as to thereby provide for flow of a secondary fluid through said closed helical channel in countercurrent with the primary fluid flowing through said helical tube bundle, the improvements comprising;

said helical tube bundle being equipped with two auxiliary connecting compartments lying within said annular chamber and each consisting of a perforated auxiliary connecting plate arranged perpendicular to said corresponding helical plane and a removable cover sealingly mounted on said auxiliary connecting plate and connected to said primary inlet or outlet; and

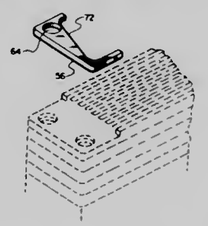
said auxiliary connecting plate comprising staggered perforations arranged parallel to said corresponding helical plane and offset with respect thereto so that the ends of said contiguous helical tubes are accommodated in corresponding perforations and sealingly secured in said connecting plate without undergoing significant bending with respect to said corresponding helical plane.

4,893,673

ENTRY PORT INSERTS FOR INTERNALLY MANIFOLDED STACKED, FINNED-PLATE HEAT EXCHANGER

Irwin E. Rosman, Rancho Mirage, and William R. Wagner, Los Angeles, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 31, 1984, Ser. No. 666,866
Int. Cl.[4] F28F 3/08, 3/04
U.S. Cl. 165—167 **5 Claims**



1. An internal plate assembly for a plate-stacked heat exchanger comprising:

a four-sided plate having an upper face and a flat lower face, the upper face having a flat surface adjacent two opposite sides thereof, the upper surface having a wall upstanding therefrom extending along each of the other two sides, a plurality of upstanding fins centrally located upon said upper face and extending substantially parallel with and between the walls, the spaces between the fins defining a plurality of channels, the plate further including first and second ports located in each of the flat surfaces adjacent the sides at such locations that the plate may be rotated 180° from another such plate and the ports in both plates will still occupy mating positions; and

means for passing a fluid flowing along a first plate to an alternate plate stacked above it and for preventing the flow from entering a next adjacent plate above the first plate through an entry port in the adjacent plate, said next adjacent plate being stacked between said first plate and said alternate plate, said means including a pair of substantially identical flat inserts, each of said inserts having a port therethrough to mate with one of the ports adjacent one side of said plate and further being formed to avoid covering the second port in the same side of said plate, the top surface of the insert being coplanar with a top surface of the walls and fins such that said pair of inserts and the walls enclose the periphery of said fins, and said inserts and the flat surfaces on the upper face of said plate form an open manifold area providing fluid communication between one of said ports in said plate and the plurality of channels.

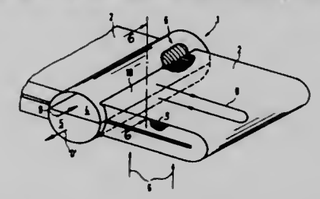
4,893,674

METHOD OF PRODUCING A TUBULAR DISTRIBUTOR OF A HEAT EXCHANGER FROM JUXTAPOSED POROUS STRIPS OF MATERIAL

Klaus Hagemeister, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1988, Ser. No. 259,183
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735846
Int. Cl.[4] F28D 7/06
U.S. Cl. 165—176 **20 Claims**

20. A fluid distributor of a heat exchanger comprising a tubular distributor for a heat exchange fluid, and a plurality of heat exchange tubes sealingly connected to said distributor for flow of the heat exchange fluid between the distributor and the heat exchange tubes, said tubular distributor being constituted as an integrated assembly of a plurality of successive layers of juxtaposed strips of fiber material squeezed together and deformed around rows of said heat exchange tubes interposed between adjacent strips and a metallic material filling said strips of fiber material.



4,893,675

SECTION MILLING TOOL

Uvon Skipper, 7409 S. Rice Ave., Bellaire, Tex. 77401

Filed Nov. 21, 1988, Ser. No. 273,906
Int. Cl.[4] E21B 29/00
U.S. Cl. 166—55.8 **13 Claims**



1. A miller for lowering into a cased well for milling a casing from the well, the miller comprising:

(a) an elongate outer tubular body having an inner axial passage therealong and adapted to be connected at the upper end thereof to a pipe string in the casing for rotation and lowering into the casing;

(b) a movable inner mandrel within said outer body, said inner mandrel movable between an initial position in said outer body and an operative position relative to the initial position therein;

(c) first cutters movably mounted on and supported by said outer body and having outwardly facing cutting edges for contact against surrounding casing wherein said cutters are constructed with cutting surfaces for cutting the casing on rotation of said outer body;

(d) first shoulder means movable with said inner mandrel for operatively moving said first cutters radially outwardly into a cutting position;

(e) second cutters movably mounted on and supported by said outer body and having outwardly facing cutting edges for contact against surrounding casing wherein said second cutters are constructed with cutting surfaces for cutting the casing on rotation of said outer body;

(f) second shoulder means movable with said inner mandrel for operatively moving said second cutters, said second

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shoulder means causing said second cutters to move radially outwardly into a cutting position;

(g) telescoping means cooperating with said inner mandrel for moving said first shoulder means, thereby actuating said first cutters, and simultaneously positioning said second shoulder means for operation of said second cutters prior to moving said second cutters outwardly into a cutting position, said telescoping means slidably positioning said second shoulder means for sliding movement relative to said body.

4,893,676

WELL TREATING METHOD AND ASSOCIATED APPARATUS FOR STIMULATING RECOVERY OF PRODUCTION FLUIDS

Gilman A. Hill, 7128 S. Poplar La., Englewood, Colo. 80112, assignor to Gilman A. Hill, Englewood, Colo.

Continuation-in-part of Ser. No. 139,614, Dec. 30, 1987, Pat. No. 4,823,875, which is a continuation-in-part of Ser. No. 943,551, Dec. 18, 1986, Pat. No. 4,718,493, which is a continuation-in-part of Ser. No. 686,990, Dec. 27, 1984, Pat. No. 4,633,951. This application Feb. 28, 1989, Ser. No. 317,623

Int. Cl.[4] E21B *33/138, 33/16, 43/267*

U.S. Cl. 166—280 **34 Claims**



1. A method of accurately and reliably sealing off a relatively short earth fracturing perforation zone which is formed in a well casing, has upper and lower ends, and is positioned adjacent a subterranean fracture zone, the well casing having a first fluid column therein with an upper end positioned above the perforation zone, said method comprising the steps of:

forming a perforation plugging slurry column, having a predetermined volume, within the casing above the first fluid column;

forming a second fluid column within the casing above said perforation plugging slurry column;

interposing first sliding plug seal means between the first fluid column and said perforation plugging slurry column, said first sliding plug seal means being operative, during forced downward movement of said perforation plugging slurry column, to prevent significant intermixing between said perforation plugging slurry column and the first fluid column;

interposing second sliding plug seal means between said perforation plugging slurry column and said second fluid column, said second sliding plug seal means being operative, during forced downward movement of said perforation plugging slurry column and said second column, to prevent significant intermixing between said perforation plugging slurry column and said second fluid column; and

forcing said second fluid column downwardly through the well casing to drive said perforation plugging slurry column, in an essentially plug-like longitudinally undistorted configuration, toward the perforation zone, and then causing it to enter the perforation zone and form therealong a perforation plug structure defined in part by a longitudinal portion of said perforation plugging slurry column.

20. A sliding plug seal structure interposable between facing end portions of first and second cylindrical fluid sections, disposed in a pipe having an inside diameter, to prevent significant intermixing between said facing end portions when said first and second cylindrical fluid sections are driven axially along the interior of the pipe, said sliding plug seal structure comprising:

a cylindrical section of high strength, flexible sealing gel material having a diameter equal to the inside diameter of the pipe; and

at least one pipe-sized solid sealing element positioned within a longitudinally intermediate portion of said cylindrical sealing gel material section.

4,893,677

GUIDELINELESS REENTRY SYSTEM WITH RETRACTING ROLLERS

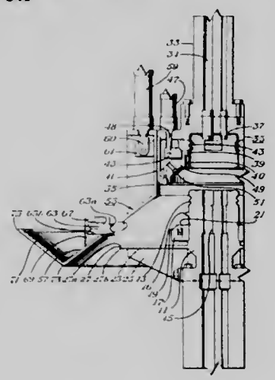
Norman Brammer, Turriff, Scotland, and Charles E. Jennings, Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Continuation-in-part of Ser. No. 99,360, Sep. 21, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 278,898

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] E21B *43/013*

U.S. Cl. 166—341 **8 Claims**



1. An apparatus for connecting a riser extending from a floating vessel to a subsea well assembly of the type having an upward extending tubular mandrel with a plurality of grooves on its exterior, comprising in combination:

a guide frame mounted to the mandrel a selected distance below the top of the mandrel;

an annular hydraulic manifold mounted to the mandrel above the guide frame and below the top of the mandrel, having a plurality of hydraulic passages for communicating hydraulic fluid delivered from the floating vessel to equipment on the subsea well;

a mandrel connector mounted to the lower end of the riser for landing on the top of the mandrel to communicate the interior of the mandrel with the interior of the riser;

a plurality of dogs carried by the mandrel connector for radial movement between an outer retracted position and an inner locked position in engagement with the grooves on the mandrel;

cam means carried by the mandrel connector and hydraulically actuated for moving the dogs between the retracted and locked positions;

an annular hydraulic manifold connector mounted to the mandrel connector, having a plurality of hydraulic passages for connection to a supply of hydraulic fluid on the vessel, the manifold connector being positioned to engage the manifold;

a downward facing guide funnel carried by the riser for insertion over the mandrel into engagement with the guide frame;

roller means carried by the funnel for latching the funnel to the guide frame for preventing upward movement of the funnel relative to the guide frame and for allowing rolling engagement of the funnel relative to the guide frame after the funnel has latched to the guide frame to allow the mandrel connector to be rotated to a proper orientation;

means operatively connected between the mandrel connector and funnel for moving the funnel from a lower extended position relative to the riser and mandrel connector as the funnel is being lowered into engagement with the guide frame to an upper retracted position once the funnel has landed on the guide frame, causing the riser and mandrel connector to move downward relative to the funnel onto the mandrel and the manifold connector onto the manifold, and positioning the cam means around the mandrel, to allow the cam means to operate to move the dogs to the locked position to secure the mandrel connector to the mandrel.

4,893,678

MULTIPLE-SET DOWNHOLE TOOL AND METHOD

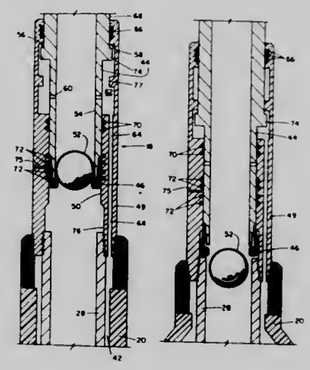
Charles O. Stokley, and Lawrence Sanford, both of Houston, Tex., assignors to Tam International, Houston, Tex.

Continuation of Ser. No. 204,087, Jun. 8, 1988, Pat. No. 4,823,882. This application Dec. 30, 1988, Ser. No. 292,235

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] E21B *23/04*

U.S. Cl. 166—374 **20 Claims**



1. A multiple-set downhole tool assembly for selectively positioning within a well bore while suspended from a tubing string having a passageway, the downhole tool assembly adapted to be activated in the well bore by lowering a ball having a selectively sized diameter through the tubing string to plug the passageway and thereafter pressurizing fluid in the passageway above the set ball, the downhole tool assembly comprising:

a body defining at least in part an expandable and retractable fluid chamber:

a control sub secured to the body and having an interior guide wall, a recessed cavity radially outward of the guide wall and a flow path in pressure communication with the fluid chamber whereby the fluid chamber may be expanded by fluid pressure in the flow path in the control sub;

a sleeve axially movable within the control sub from a ball stop position to a ball release position, the sleeve having a cylindrical-shaped interior surface having a selectively sized diameter slightly larger than the diameter of the ball, and having a port for fluid communication between the passageway in the tubing string and the flow path in the control sub when the sleeve is in the ball stop position;

a seal for automatically closing off communication between the passageway in the tubing string and the flow path in the control sub when the sleeve is in the ball release position; and

a stop member carried by the sleeve and radially movable from an inward position such that the ball is axially stopped by the stop member within the cylindrical shaped interior surface of the sleeve, to an outward position such that the ball may be passed axially by the sleeve and the stop member;

the stop member being restricted from radially outward movement to its outward position by the interior guide wall of the control sub when the sleeve is axially in the ball stop position, and the stop member being movable radially outward into the recessed cavity within the control sub when the sleeve is axially in the ball release position, whereby the ball may be lowered into engagement with the stop member when the sleeve is in the ball stop position, pressurized fluid in the passageway above the ball passed through the port in the sleeve and the flow path in the control sub for activating the downhole tool assembly in the well bore, and the sleeve thereafter moved to the ball release position to seal pressurized fluid in the body and permit the ball to pass by the stop member as the stop member is positioned radially outward into the recessed cavity.

4,893,679

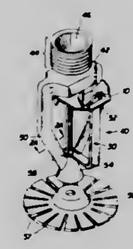
HEAT-RESPONSIVE ELEMENT FOR FIRE PROTECTION SPRINKLERS OR THE LIKE

James M. Martin, East Greenwich; Leo W. Fleury, Jr., North Smithfield, and Michael A. Fischer, West Kingston, all of R.I., assignors to Grinnell Corporation, Exeter, N.H.

Filed Mar. 1, 1988, Ser. No. 162,679

Int. Cl.[4] A62C *37/12*

U.S. Cl. 169—39 **12 Claims**



8. In a fire protection sprinkler head of the type including a base having a throat of predetermined cross-section through which a stream of fire retardant fluid can flow,

the improvement wherein

said fire protection sprinkler head further comprises a heat-responsive element comprising two link members joined

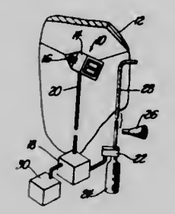
with a thin solder layer in a face-to-face relationship over an extended surface area, the components of opposed surfaces of said link members in contact with said solder layer and said solder layer being adapted to alloy with each other in the regions immediately adjacent each of said opposed surfaces to form alloy bonds between said opposed surfaces and said solder layer, the strength of said alloy bonds being greater than the strength of said solder layer, and at least said opposed surfaces of said link members comprises an alloy-forming amount of a member selected from the group consisting of nickel, cobalt, chromium and iron, or of an alloy of a member selected from the group consisting of nickel, cobalt, chromium, and iron.

4,893,680

FIRE SUPPRESSION ACTIVATOR

Donald R. Witthrodt, Ft. Mill, S.C., and Wilbert Simkovitz, Southfield, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 17, 1988, Ser. No. 258,948
Int. Cl.[4] A62C *37/18*
U.S. Cl. 169—60 **2 Claims**



1. A fire suppression control system for use with a vehicle subject to catastrophic incidents the fire suppression system containing at least one pressurized container of halogenated material suitable for suppressing a fire, a distribution system for distributing the halogenated material to the situs of a fire within the vehicle, a valve disposed between the bottle and the distribution system to maintain the halogenated material in the bottle until needed and adapted to open rapidly when the fire suppression material is needed, a fire sensor which will sense the presence of a fire which will require the dispensing of the fire suppressing material and generate a signal that action is necessary, a control amplifier adapted to receive the signal from the sensor and in response to the signal activate the system by opening the valve, a source of power to provide power to operate the system, the improvement comprising an amplifier circuit having an amplifier maintained at a nominal voltage in the quiescent state, a circuit portion adapted to maintain the amplifier's nominal voltage, a second circuit element adapted to sense when the electrical connection between the sensor and the amplifier is broken and generate an increased voltage which will activate the valve to dispense extinguishant to the damaged area, a third circuit element which will pass a sensor signal to the amplifier and open the valve when the sensor signals the presence of a fire.

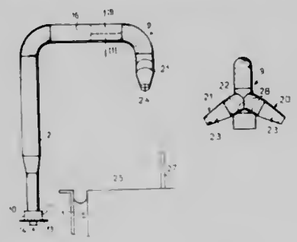
4,893,681

FIREFIGHTING INSTALLATION FOR FLOATING ROOF HYDROCARBON STORAGE TANKS

Rene Flandre, 495 rue du II Novembre, Zone Industrielle, 76650 Petit Couronne, France

Filed Sep. 29, 1988, Ser. No. 250,763
Int. Cl.[4] A62C *3/12*
U.S. Cl. 169—66 **4 Claims**

1. Firefighting installation for floating roof hydrocarbon storage tanks comprising a series of vertical pipes disposed regularly around a storage tank, a sprayer at the top of each pipe adapted to form a flat jet of extinguishing foam directed towards the interior of the tank along its inside wall, a pressurized water supply connected to said pipes, emulsifying agent feed means between said water supply and said pipes, and an air injector on each pipe near said sprayer to favor the formation of the foam, wherein said sprayer include two nozzles set at an angle to each other and directed towards said floating roof and each nozzle incorporates a longitudinal slot in its end portion opposite its free end and facing towards said floating roof.

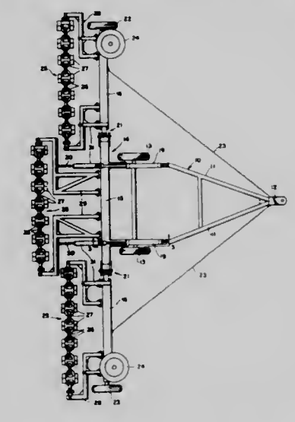


4,893,682

ROTATING FLEXIBLE IMPLEMENT FOR SOIL EROSION CONTROL

Bruce W. Smallacombe, Capella, Queensland, 4702, Australia

Continuation-in-part of Ser. No. 44,193, Apr. 30, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 277,974
Claims priority, application Australia, Jan. 10, 1986, PH6318
Int. Cl.[4] A01B *29/06, 35/16*
U.S. Cl. 172—311 **8 Claims**



1. An agricultural implement for soil erosion control, of the type having a mobile mounting frame capable of being moved across an area to be treated, and a soil working assembly connected to carrier means to the mounting frame transversely of the direction of travel, wherein the soil working assembly comprises:

a flexible chain of interconnected links connected at its opposite ends to the carrier means for rotation of the chain about its axis, the axis of the chain being transverse to the direction of travel; and

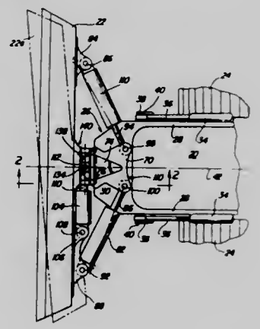
a pair of blades fixed to and extending in opposite directions from opposite sides of each link, said blades being adapted to penetrate gravitationally and scoop hollows from the soil as the implement is advanced, rotating the chain over the soil.

4,893,683

DOZER BLADE MOUNTING ASSEMBLY

Rudolf Horsch, Wausau, and Claude M. Frisbee, Schofield, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 83,533, Aug. 7, 1987, Pat. No. 4,828,044. This application Apr. 28, 1989, Ser. No. 344,623
Int. Cl.[4] E02F *3/815*
U.S. Cl. 172—821 **6 Claims**



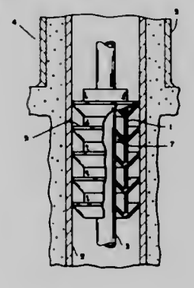
3. A mounting assembly supporting a blade on a tractive vehicle, comprising a blade support frame at the forward end of said vehicle, a universal joint interconnecting a lower midportion of said blade and said frame generally in a longitudinal axis of said vehicle, a mast assembly connected to said frame and extending upwardly from said frame adjacent said blade midportion, a pair of hydraulic angling cylinders, each of said angling cylinders having one end pivotally connected to one side of said blade and an opposed end pivotally connected to said mast assembly adjacent said longitudinal axis, said angling cylinders extending outwardly from said mast assembly at an angle to said vehicle longitudinal axis for angling said blade about said universal joint, a hydraulic tilt cylinder pivotally connected between one side of said blade and said mast assembly for tilting said blade about said universal joint, and a bracket assembly including bracket members connected to an upper midportion of said blade and said mast assembly spaced vertically above said universal joint, one of said bracket members including an elongated slot having generally parallel side surfaces extending generally perpendicular to said vehicle longitudinal axis and the other of said bracket members having a slide member rotatably supported thereon and disposed in said one bracket member slot, said slide member having a width substantially equal to the width of said slot measured perpendicular to said side surfaces preventing pitching of said blade about said universal joint and said slide member having a length substantially less than the length of said slot permitting tilting of said blade, and said bracket and slide including means for permitting adjustable positioning of said blade to a selected pitch position.

4,893,684

METHOD OF CHANGING WELL FLUID

Robert L. Alexander, Spring, Tex., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 63,190, Jun. 17, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 334,019
Int. Cl.[4] E21B *7/00, 37/04*
U.S. Cl. 175—65 **2 Claims**



1. A method of changing well fluid comprising the steps of:

(a) performing well drilling operations with a first drilling fluid and then setting casing;

(b) inserting around an inner tubular member which does not include drill bit attached to the lower end thereof an elastomeric annular wiper plug into an annular space between the well casing and the inner tubular member, said annular wiper plug having inner and outer ribs said outer ribs adapted to fit snugly into said well casing and said inner ribs adapted to fit snugly around said inner tubular member said annular space substantially filled with a first well fluid;

(c) circulating a second well fluid downwardly through the annular space between the casing and inner tubular member above said wiper plug, said wiper plug wiping the outside of said inner tubular member with said inner ribs and the inside of said casing with said outer ribs said wiper plug preventing the mixing of said first well fluid and said second well fluid;

(d) tripping out to attach a drill bit to the lower end of said inner tubular member, and tripping back in; and

(e) performing well drilling operations with said second well fluid.

4,893,685

SCALE

Donald A. Bergman, Roscoe, and Robert A. O'Neil, Glen Ellyn, both of Ill., assignors to Newell Co., Freeport, Ill.

Filed Jan. 12, 1989, Ser. No. 296,571
Int. Cl.[4] G01G *23/14*
U.S. Cl. 177—174 **17 Claims**



1. A scale comprising a base, a housing, and means for mea-

suring and indicating weight applied to said housing, said means including a rotating indicator and stationary indicia means carried by said housing having values corresponding to said weight,

an upper surface of said housing including an opening for receiving a shaft to which said indicator is attached.

4,893,686

DRAFT PROTECTION DEVICE FOR PRECISION BALANCES

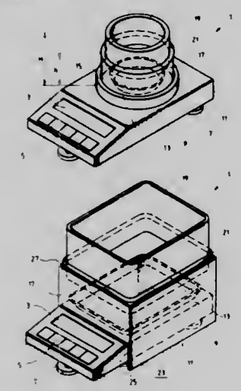
Philippe Chretien, Dietlikon, and Bruno Benert, Ebertswil, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed May 1, 1989, Ser. No. 345,780

Claims priority, application Switzerland, Jun. 21, 1988, 2379/88

Int. Cl.[4] G01G *21/28*

U.S. Cl. 177—180 **11 Claims**



1. A draft protection device for a precision balance including an exposed weighing dish, the draft protection device comprising a first hollow body surrounding the weighing dish, and at least one second hollow body, the first hollow body and the at least one second hollow body each being open at the top and the bottom thereof, the at least one second hollow body being mounted on the first hollow body so as to be telescopically slidable relative to the first hollow body.

4,893,687

MOUNTING ARRANGEMENT FOR A POWER TRAIN MODULE OF A VEHICLE

Gerald P. Simmons, Morton, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 126,379, Nov. 30, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 318,433

Int. Cl.[4] B62D *55/065, 55/096*

U.S. Cl. 180—9.1 **21 Claims**

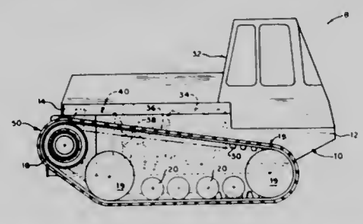
1. A mounting arrangement for a power train module of a vehicle having a frame and a pair of endless tracks, comprising:

the power train module having a pair of oppositely outwardly extending hollow trunnions, a wheel rotatably supported on each of the trunnions and drivingly engaging each of the tracks, and output means for drivingly rotating each of the wheels;

the frame defining a pair of generally longitudinally arranged, semicylindrical pockets that face inclinably upwardly and longitudinally outwardly;

bushing assembly means for resiliently supporting each of the trunnions in the respective pockets of the frame along a transverse axis; and

mount means connected to the frame longitudinally inwardly of the pockets for resiliently resisting rotational forces of the power train module about the transverse axis,



the bushing assembly means and the mount means minimizing the transmission of noise to the frame.

4,893,688

ELECTRIC REAR WHEEL STEERING APPARATUS

Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

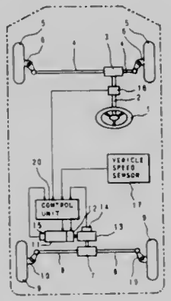
PCT No. PCT/JP87/00928, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/04251, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 30, 1987, Ser. No. 245,438

Claims priority, application Japan, Dec. 4, 1986, 61-290671

Int. Cl.[4] B62D *5/04, 6/02, 7/14*

U.S. Cl. 180—79.1 **2 Claims**



1. An electric rear wheel steering apparatus for steering rear wheels of a vehicle by a motor

having a worm

reduction gear

(11) depending on the steering state of front wheels of said vehicle, comprising: a steering wheel steering state sensor (16) for detecting at least one of the steering states of the steering direction, steering angle, steering torque, and steering speed of the steering wheel , a vehicle speed sensor (17) for detecting the vehicle speed, a motor rotation speed sensor (15) for detecting the rotation direction and rotation speed of said motor, a rear wheel steering angle sensor (14) for detecting the steering angle of rear wheels, an electromagnetic clutch (12) disposed between said motor and said worm reduction gear (13) for transmitting the rotation force of the motor having a reversion efficiency of zero or lower so as to engage or disengage the rotation force of the motor, a gear box (7) for steering the rear wheels being driven by the output of said worm reduction gear, and a control unit (20) for receiving signals from said steering wheel steering state sensor, said vehicle speed sensor, said motor rotation speed sensor, and said rear wheel steering angle sensor to drive and control the motor in response to

said sensor signals, and for cutting off the current supply to the motor and disengage the electromagnetic clutch when an abnormal operation other than predetermined operation is ascertained.

4,893,689

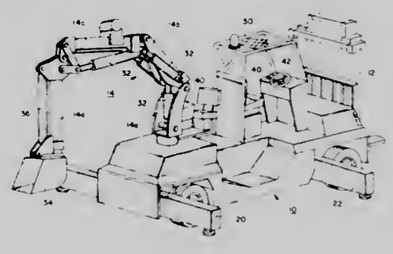
METHOD AND APPARATUS FOR STEERING A MOTOR VEHICLE

Victor R. Laurich-Trost, 34600 McAfee Dr., Solon, Ohio 44139

Continuation of Ser. No. 69,096, Jul. 2, 1987, abandoned. This application May 24, 1988, Ser. No. 198,720

Int. Cl.[4] B62D *7/14*

U.S. Cl. 180—140 **10 Claims**



3. A vehicle comprising: a vehicle body; two front wheels rotatably mounted to the body for synchronous turning movement; two rear wheels rotatably mounted to the body for synchronous turning movement; four hydraulically driven steering motors, each coupled to an associated one of said front and rear wheels for effecting a turning of said wheels; a source of pressurized fluid for powering said motors; first conduit means for supplying said pressurized fluid to the front wheels and second conduit means for supplying said pressurized fluid to the rear wheels; and a power steering system, said power steering system comprising:

(a) a steering control valve interposed between the pressurized source and the first and second conduit means, said steering control valve coupled to a vehicle steering mechanism to turn the vehicle to the right and to the left by directing fluid pressure to said steering motors;

(b) on/off valve means coupled to said first and second conduit means to direct pressurized fluid from the steering control valve to steering motors for steering a master set of front or rear wheels;

(c) servo control means coupled to the pressurized source to direct pressurized fluid to steering motors for turning a slave set of wheels not coupled to the steering control valve by the on/off valve means;

(d) feedback control means including means for monitoring the orientation of at least one wheel of the master set of wheels and at least one wheel of the slave set of wheels and activating the servo control means to cause the slave wheels to be re-oriented based upon said monitoring; and

(e) mode select means controllable by a vehicle user and coupled to the on/off valve means, servo control means, and feedback control means to select a master and slave set of wheels and a mode of response of the slave wheels to the monitoring of the wheel orientation.

4,893,690

FOUR-WHEEL STEER CONTROL SYSTEM

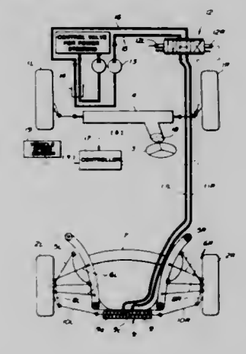
Kazunori Mori, Ebina; Fukashi Sugasawa, Yokohama; Kenji Kawagoe, Kamakawa, and Hiroshi Mori, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 30, 1988, Ser. No. 277,744

Claims priority, application Japan, Nov. 30, 1987, 62-299688; Feb. 12, 1988, 63-28858

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—140 **5 Claims**



1. A steering control system for a wheeled vehicle having a set of steerable front wheels, a set of steerable rear wheels, a steering wheel and a steering gear, comprising:

means for performing a main steer of said front wheels by an angle determined by said steering gear in response to a steering operation of said steering wheel;

means for performing, in addition to said main steer, a secondary steer of said front and rear wheels in response to said steering operation of said steering wheel by angles computed using a steer angle steer angle angular velocity θ and vehicle speed V from the following formulas,

$$\delta f = \frac{1}{N}\{Kf \cdot \theta + Tf \cdot \theta\}$$

$$\delta r = \frac{1}{N}\{Kr \cdot \theta + Tr \cdot \theta\}$$

where δf is a front wheel secondary steer angle, δr is a rear wheel secondary steer angle, N is a steering gear ratio and Kf, Kr, Tf and Tr are control constants which are functions of vehicle speed;

means for correcting said control constants Kf and Kr in such a way that said control constants Kf and Kr become a steady-state value when said steer angle is larger than a predetermined value and become smaller than said steady-state value when said steering angle becomes smaller than said predetermined value;

means for correcting said control constants Tf and Tr in such a way that said control constants Tf and Tr become a steady-state value when said steer angle is larger than a predetermined value and become smaller than said second mentioned steady-state value when said steer angle becomes smaller than said second mentioned predetermined value;

means for correcting said control constants Kf and Kr in such a way that said control constant Kr reduces at the rate larger than said control constant Kf as said steer angle reduces from said first mentioned predetermined value; and

means for correcting said control constants Tf and Tr in such a way that said control constant Tf reduces at the

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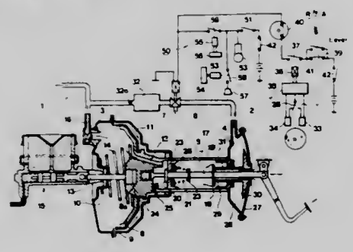
rate larger than said control contant Tr as said steer angle reduces from said second mentioned predetermined value.

4,893,691

AUTOMATIC BRAKING SYSTEM FOR A VEHICLE

Jong S. Park, 282-4, Sangil-dong, Kangdong-ku, Seoul, Rep. of Korea

Filed Feb. 12, 1988, Ser. No. 155,576
Int. Cl.[4] B60T *7/12*
U.S. Cl. 180—169 **7 Claims**



1. An automatic braking system for a vehicle comprising:
a brake pedal;
a master cylinder;
a first power brake cylinder having a first diaphragm and a plate which is provided with a valve rod connected to the brake pedal and a push rod connected to the master cylinder;
a valve cylinder axially extending generally perpendicular to the plate;
a second power brake cylinder;
a vacuum pipe connecting said first power brake cylinder to said second power brake cylinder;
a three-directional electromagnetic valve positioned in said vacuum pipe, said three-directional electromagnetic valve being movable to switch said vacuum pipe between atmosphere or vacuum; and
control means connected electrically with said three-directional electromagnetic valve for sensing one of forward and backward movement of the vehicle.

4,893,692

SNOWMOBILE

Morley L. Smith, Beaconsfield, Canada, assignor to GSM Design, Saint-Laurent, Canada

Filed Aug. 11, 1988, Ser. No. 231,339
Int. Cl.[4] B62D *25/16*
U.S. Cl. 180—190 **8 Claims**



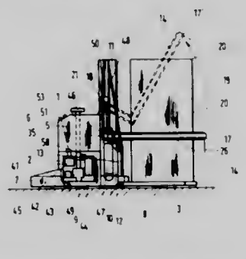
1. A floatable snowmobile comprising an elongated one-piece molded polymeric/copolymeric synthetic plastics body; a pair of skis, means for supporting said skis relative to said body; said body including a front engine compartment portion, an elongated bench-seat portion, and a cargo support portion; the engine compartment portion of the body defining a recess for receiving an engine and accessories; at least the bench-seat portion defining a track run recess in the bottom thereof for accommodating a track assembly; said body being defined by a generally hollow shell; said hollow shell setting-off hollow front, medial and rear hollow compartment portions; a pair of side walls on each side of said body; each pair of side walls defining an upstanding hollow side wall compartment portion; said hollow side wall compartment portions being on opposite sides of a floor of said front engine compartment portion; and high buoyancy polymeric/copolymeric synthetic cellular foamed in situ plastics generally filling said hollow compartment portions and said hollow side wall compartment portions.

4,893,693

SAFETY ARRANGEMENT FOR FORK TRUCKS

Hans-Jürgen Hachmann, Elmshorn, and Siegfried Hoener, Hamburg, both of Fed. Rep. of Germany, assignors to Firma Jungheinrich Unternehmensverwaltung KG, Hamburg, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,826
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732724
Int. Cl.[4] B60P *7/06*; B60T *7/22*
U.S. Cl. 180—275 **16 Claims**



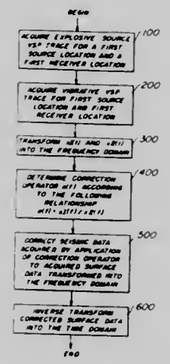
1. A collision-preventing safety arrangement for load-carrying trucks comprising a truck body (2) and a load carrier (3, 4), which is provided at one end of the truck body and is closely spaced above the ground at least when the truck is travelling with a load (20) carried by the load carrier, wherein
said truck body comprises a control pedestal (5) including control means (6) and is provided with a steerable drive wheel (9) and laterally disposed supporting rollers or wheels (10),
said truck body contains energy sources, a travel drive as well as a control circuitry,
a safety device is provided, which in response to a contact with or detection of an obstacle initiates an emergency stopping of the travel drive motor, and
the improvement resides in that
said safety device at least adjacent to said load carrier (3, 4) confines a space which is adapted to contain a load that is carried by the load carrier,
said safety device comprises laterally immovable side bars (15, 16, 28),
said safety device is provided in an elevation within the height range of a human being,
said safety device in an operative position is adapted to retain in said space the load that is carried by the load carrier,
said safety device is arranged to be raised from the operative position in the space containing the load, said safety device permits the load on the load carrier (3, 4) to be moved and handled by means of the load carrier at least toward an end thereof remote from the truck body (2), and
a functional link between the safety device and the travel drive is provided as well as circuitry for disabling the travel drive when the safety device has been raised.

4,893,694

VSP-BASED METHOD AND APPARATUS FOR TIEING SEISMIC DATA SHOT USING DIFFERENT TYPES OF SEISMIC SOURCES

Richard T. Houck, Carrollton, and J. J. Solanki, Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,710
Int. Cl.[4] G01V *1/36*
U.S. Cl. 181—111 **25 Claims**



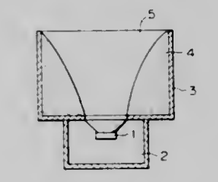
19. A seismic exploration system comprising:
means for generating a first type of seismic energy into the earth, said first type of seismic energy characterized by a first source waveform;
means for generating a second type of seismic energy into the earth, said second type of seismic energy characterized by a second source waveform different from that of said first source waveform;
means for receiving reflections of said first type of seismic energy off subsurface reflecting interfaces;
means for receiving reflections of said second type of seismic energy off subsurface reflecting interfaces;
means for producing a first VSP data set for the subsurface;
means for producing a second VSP data set for the subsurface;
means for separating downgoing and upgoing wavefields of VSP data;
means for determining a first minimum phase operator for said first VSP from said downgoing wavefield for said first VSP;
means for determining a second minimum phase operator for said second VSP from said downgoing wavefield for said second VSP, said downgoing wavefield for said second VSP being different from that of said first VSP; and
means for applying said first minimum phase operator to said first type of reflections and applying said second minimum operator to said second type of reflections and applying spiking deconvolution to said first and second applied traces to tie said first type of reflections and said second type of reflections together.

4,893,695

SPEAKER SYSTEM

Tadashi Tamura, Kadoma; Shuji Seiki, Hirakata, and Kazue Sato, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 14, 1988, Ser. No. 206,377
Claims priority, application Japan, Jun. 16, 1987, 62-149646; Nov. 20, 1987, 62-294419; Apr. 28, 1988, 63-106355; May 2, 1988, 63-109343
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—151 **13 Claims**



1. A speaker system, comprising at least one diaphragm having front and rear surfaces; an acoustic path for guiding sound waves generated on said front surface of said diaphram; a sound absorbing member having an inner surface defining said acoustic path; and a partition member disposed on said inner surface of said sound absorbing member to surround a portion of said acoustic path, whereby said partition member is disposed such that said sound absorbing member is exposed to said acoustic path at at least one part of said sound absorbing member, said at least one part being located at any position of said sound absorbing member except at a region thereof just adjacent said diaphragm.

4,893,696

WORKING CATWALK FOR BRIDGE INSPECTION APPARATUSES

Alfons Moog, Untersiggingen, Fed. Rep. of Germany, assignor to Rita Moog née Schlick, Deggenhausertal, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 222,117
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1987, 3723925
Int. Cl.[4] E04G *3/08*
U.S. Cl. 182—223 **8 Claims**



1. A catwalk, comprising:
a central frame section,
a central floor section attached to said central frame section extending a set longitudinal and lateral distance in a horizontal plane,
first and second lateral frame sections each attached to said central section at plurality of pivotal joints, each joint rotatable about an axis perpendicular to said horizontal plane, and said lateral frame sections being movable between a retracted position and an extended position, and
first and second lateral floor sections attached to said first and second lateral frame sections and overlapping said central floor section when said lateral frame sections are in said retracted position.

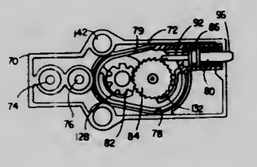
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4,893,697

INJECTION LUBRICATOR WITH PULSE COUNTER

Robert B. Tosi, Littleton, Colo., assignor to Watts FluidAir Div. of Robert Shaw Controls Company, Kittery, Me.

Filed Dec. 5, 1988, Ser. No. 280,007
Int. Cl.[4] F16N *13/16*
U.S. Cl. 184—7.4 **23 Claims**



1. An injection lubricator for providing a pulse of lubrication after counting a plurality of pneumatic pulses, said lubricator comprising

a lubricant pump having a pumping piston actuated by a pneumatic pulse to deliver a pulse of lubricant to a lubricant delivery outlet,

a first rotatable counting member that provides a pneumatic pulse to said pump after a fixed number of incremental rotations of said first rotatable counting member,

a second rotatable counting member that carries a displacement member that provides an incremental rotation of said first rotatable counting member after a plurality of incremental rotations of said second rotatable counting member, and

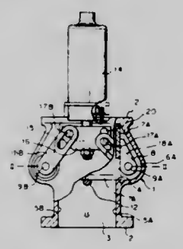
a counting piston that is mounted within a piston chamber to receive pneumatic pulses and to provide an incremental rotation of said second rotatable counting member upon receiving each pneumatic pulse.

4,893,698

EXHAUST BRAKE UNIT EQUIPPED WITH A PAIR OF SWING FLAP VALVES

Ryoichi Suzuki, Mishima, Japan, assignor to USUI Kokusai Sangyo Kaisha, Ltd., Shizuoka, Japan

Filed Jul. 1, 1988, Ser. No. 214,646
Claims priority, application Japan, Jul. 4, 1987, 62-166287
Int. Cl.[4] F02D *9/06*; F22B *21/00*
U.S. Cl. 188—273 **5 Claims**



1. An exhaust brake unit, comprising:

a case defining an exhaust passage therethrough, said exhaust passage having a longitudinal axis, said case including a pair of cavities opening onto said exhaust passage, the openings of said cavities being disposed in facing relation across said exhaust passage, and valve seat means in said exhaust passage disposed substantially normal to said longitudinal axis;

a first shaft rotatably mounted in one of said cavities;

a second shaft rotatably mounted in the other of said cavities;

a first swing flap fixed to said first shaft;

a second swing flap fixed to said second shaft; and

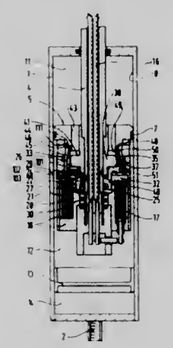
means for moving said first and said second swing flaps between an open position to thereby at least substantially open said exhaust passage and a closed position in which said swing flaps abut with respective portions of said valve seat means to thereby at least substantially block said exhaust passage, said means for moving including means for producing a time lag between the movement of said first swing flap from said closed to said open position and the movement of said second swing flap from said closed to said open position.

4,893,699

SHOCK ABSORBER

Kurt Engelsdorf, Besigheim; Karl-Heinz Hagele, Vaihingen/-Enz; Bernd Tanbitz, Schwieberdingen; Quang N. Tran, Stuttgart, and Peter Zieher, Eberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 172,896
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710972; Jan. 14, 1988, 3800864
Int. Cl.[4] F16F *9/35*
U.S. Cl. 188—299 **29 Claims**



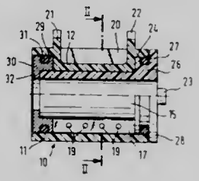
1. A shock absorber particularly for vehicles, which comprises a jacket tube, a cylinder formed by said jacket tube, a piston guided in said cylinder inside said jacket tube, a piston rod secured to said piston, said piston dividing said cylinder into two work chambers, at least one flow connection between said two work chambers by way of which at least a portion of a damping fluid flows back and forth between said two work chambers, an electromagnetic adjusting device including a magnetic coil and an armature confined within said piston, a control slide connected to said armature, said control slide including a first control edge having a plurality of graduated axially extending protrusions and indentations which at any time determine a throttling of a damping fluid inside said at least one flow connection via a plurality of throttling openings, and said control slide (33) is embodied as narrow ian a radial direction on one face end (46) which forms said slide control edge (48).

4,893,700

DAMPING DEVICE, IN PARTICULAR FOR OPERATING MEMBERS IN AUTOMOTIVE VEHICLES

Rainer Gramss, Norderstedt, Fed. Rep. of Germany, assignor to ITW-ATECO, GmbH, Norderstedt, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,283
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 8707936[U]
Int. Cl.[4] F16F *9/14*; E05F *3/04*
U.S. Cl. 188—306 **11 Claims**



1. A damping device, comprising:

a housing;

a chamber defined within said housing;

a liquid phase medium disposed within said housing chamber;

a shaft extending through said chamber so as to be relatively pivotable with respect to said housing and said chamber defined therein;

at least one radial vane secured to said shaft so as to be relatively pivotable therewith with respect to said housing and said housing chamber, and defining first and second chamber sections within said housing within which said liquid phase medium is disposed:

at least one throughbore defined within said vane so as to permit said liquid phase medium disposed within said first and second chamber sections of said housing to flow between said first and second chamber sections of said housing as said vane is pivotably moved relative to said housing and said first and second chamber sections defined therein during a damping operation;

a first recess means defined within a first end of said bousing;

an annular support ring disposed within said first recess means of said housing and having a radially inwardly projecting shoulder portion for seating and supporting a first end of said shaft;

first groove means annularly defined within an outer peripheral surface portion of said annular support ring;

first O-ring means disposed within said first groove means of said annular support ring so as to be interposed between said annular support ring and said first recess means of said housing for sealing said first end of said housing;

a second recess means defined within a second end of said housing;

an annular shoulder portion integrally formed with said shaft for disposition within said second recess means of said housing;

second groove means annularly defined within an outer peripheral surface portion of said shoulder portion of said shaft; and

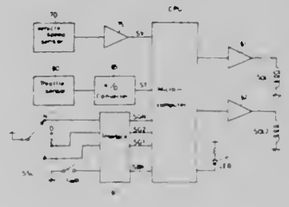
second O-ring means disposed within said second groove means of said shaft shoulder portion so as to be interposed between said shaft shoulder portion and said second recess means of said housing for sealing said second end of said housing.

4,893,701

CONTROLLING DEVICE FOR AUTOMATIC SPEED CHANGE MECHANISM

Nobuyuki Isoso, and Nobuyasu Suzamura, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 15, 1989, Ser. No. 323,907
Claims priority, application Japan, Mar. 15, 1988, 63-60945
Int. Cl.[4] B60K *41/26*
U.S. Cl. 192—4 A **3 Claims**



1. A controlling device for an automatic speed change mechanism comprising:

a speed change mechanism adapted to be disposed between an engine of an automobile and an output shaft and adapted to be connected in one of a plurality of modes such as connected states having different reduction ratios and a non-connected state;

a switching means for the connection modes of the said speed change mechanism;

a shift position detection means for emitting electric signals indicating the selection state of a manual shift means for shifting the connection mode of the said speed change mechanism;

a braking detection means for emitting electric signals corresponding to the actuation/non-actuation of a braking device; and

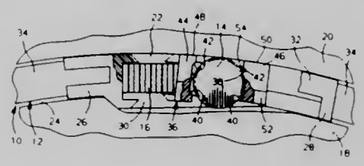
an electronic controlling means for monitoring the electric signals emitted by said shift position detection means and said braking detection means, controlling said switching means corresponding to the selection state of manual shifting means to switch over the connection mode of said speed change mechanism, and during the non-actuation of the braking device, if the manual shifting means commands a switch-over from the non-connected state to a connected state, establishes a connected state having a relatively small reduction ratio compared with the case of brake actuation.

4,893,702

ROLLER CLUTCH WITH COMPACT WEAR PEDUCTION MECHANISM

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1989, Ser. No. 372,488
Int. Cl.[4] F16D *41/06*
U.S. Cl. 192—45 **3 Claims**



1. An overrunning roller clutch of the type that is adapted to be located in the space between a cam race and a coaxially

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disposed pathway race, said space being comprised of an evenly spaced plurality of wedging pockets, each extending in one circumferential direction from a wide to a narrow end and separated from one another by a plurality of annular bearing spaces, and in which a cylindrical roller located in each wedging pocket requires a predetermined travel path within its respective wedging pocket as said clutch operates, said clutch comprising,

a cage adapted to be installed between said races including a plurality of journal blocks which substantially fill said annular bearing spaces, thereby accurately maintaining the configuration of said wedging pockets,

a plurality of energizing springs, each of which requires a predetermined spring space in which to operate between a respective wedging pocket wide end and roller first side in order to be capable of continually biasing said roller in said one circumferential direction, toward the narrow end of said wedging pocket, so as to be ready to quickly wedge between said races when said cam race attempts to rotate relative to said pathway race in the opposite circumferential direction, while said cam race may freely overrun relative to said pathway race in said one circumferential direction,

a plurality of roller control blocks, each of which has a central roller receiving pocket located such that a first portion of said block, upon which a respective spring bears, has a circumferential width substantially equal to the wedging pocket space available between said roller travel path and said spring space, while a second portion of said block has a circumferential width substantially equal to the wedging pocket space available between said roller travel path and said wedging pocket narrow end, said roller further being received within said central pocket with sufficient clearance that said control block can be moved radially toward said pathway race sufficiently far that a rubbing surface of said control block portions will contact said pathway race, and,

means for so radially moving each control block radially during overrun so as to engage the rubbing surface of said control block portions with said pathway race with sufficient force to induce a frictional force on said control block in the opposite circumferential direction,

whereby, when said cam race overruns relative to said pathway in said one circumferential direction, each of said control blocks will tend to be moved toward the wide end of its respective wedging pocket by the frictional force induced on it by said pathway race and will consequently tend to move its respective roller toward the wide end of its wedging pocket, opposing its energizing spring while remaining entirely within its wedging pocket, by virtue of the width of said block portions, with the frictional force of said pathway race on said control block ending as said cam race reverses its relative direction.

4,893,703

ELECTROMAGNETIC CONTROL ASSEMBLY AND METHOD FOR A VISCOUS FLUID FAN CLUTCH

Lawrence C. Kennedy, Kettering, and James O. Strader, Spring Valley, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

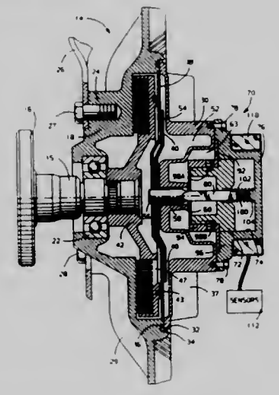
Filed May 22, 1989, Ser. No. 355,538
Int. Cl.[4] F16D *33/12*
U.S. Cl. 192—58 B **4 Claims**

1. An electromagnetic control assembly for a viscous fluid clutch assembly having a rotatable valve plate for controlling the flow of fluid to a shear zone, the control assembly comprising:

(a) a shaft connected to the valve plate;

(b) a ferromagnetic element slidably mounted on the shaft and connected to the shaft so that rotation of the ferromagnetic element is transferred to the shaft;

(c) means for creating a magnetic flux mounted adjacent the ferromagnetic element; and



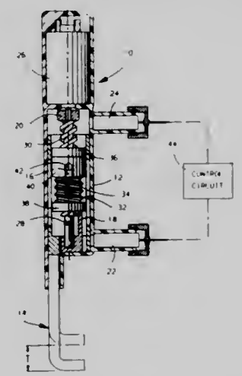
(d) means for rotating the ferromagnetic element as it slides to the flux.

4,893,704

POWER DOOR LOCK ACTUATOR

Timothy J. Fry, Spring Valley, and Lowell T. Greentaner, Huber Heights, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1989, Ser. No. 328,992
Int. Cl.[4] E05B *47/00*; F16H *27/02, 29/20*
U.S. Cl. 192—141 **3 Claims**



1. An actuator for a power door lock system of the type that has a reversible motor and an axially slidable lock rod that is manually movable over a predetermined throw between locked and unlocked positions, said actuator comprising,

a main shaft that has an external first stage thread of one hand and which is turned by said motor,

a secondary shaft that is internally threaded to move axially back and forth on said first stage thread and which has an external second stage thread of the opposite hand,

a drive member that is internally threaded to move axially back and forth on said second stage thread,

first and second bumpers fixed to said secondary shaft so as to define first and second limits of motion of said drive member on said secondary shaft,

first and second fixed stop surfaces defining first and second limits of motion of said secondary shaft on said main shaft, and,

a first catch located on said lock rod so as to be engageable with said drive member when said lock rod is in its locked position, said drive member is at its first limit of motion, and said secondary shaft is at its second limit of motion, thereby defining a power locked-neutral mode of said actuator, and,

a second catch on said lock rod spaced from said first catch by substantially said throw so as to be engageable with said drive member when said lock rod is in its unlocked position, said drive member is at its second limit of motion, and said secondary shaft is at its first limit of motion, thereby defining a power unlocked-neutral mode of said actuator,

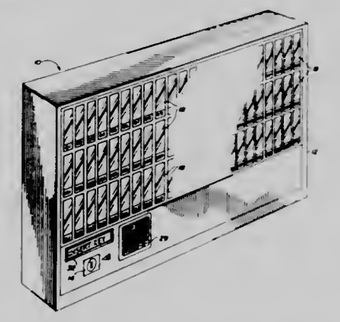
whereby, if said motor runs in one direction when said actuator is in said power locked-neutral mode, said secondary shaft moves on said first stage thread in one axial direction to its first limit of motion, thereby moving said lock rod to its unlocked position, after which said drive member moves on said second stage thread to its second limit of motion, and conversely if said actuator is in said power unlocked-neutral mode and said motor runs in the opposite direction, said lock rod thereby being manually movable to the opposite position when said actuator is in either neutral mode without substantial resistance.

4,893,705

VENDING MACHINE HAVING PLURAL COMPARTMENTS WHICH ARE INDEPENDENTLY SELECTED AND CONTROLLED

Leonard C. Brown, Penthouse, Warner Doone Flats, Warner Beach, Durban, Natal, South Africa

Division of Ser. No. 129,967, Dec. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 745,115, Jun. 17, 1985, abandoned. This application Aug. 1, 1988, Ser. No. 206,225
Int. Cl.[4] G07F *7/02*
U.S. Cl. 194—211 **8 Claims**



1. Apparatus for dispensing video cassettes and other articles, comprising:

a cabinet having a plurality of compartments for storing and dispensing video cassettes and other articles, said cabinet arranged so that all of said plurality of compartments may be simultaneously viewed by a customer;

each compartment having an individual, visually transparent and lockable door panel;

first sensing means with each compartment for detecting the presence of an electrically conductive portion of a video cassette or other article which has been correctly inserted therein;

means with each compartment for independently controlling the opening of the corresponding compartment door panel;

second sensing means with each compartment for detecting when the corresponding compartment door panel is open;

compartment selection means operable by a customer for providing an electronic indication representative of a selected compartment;

means for providing an electronic indication representative of the receipt of a customer payment token for the video cassette or other article located in the selected compartment and for verifying the customer payment token;

means for retaining said customer payment token until the customer has properly closed the door panel to the selected compartment following removal of the video cassette or other article; and

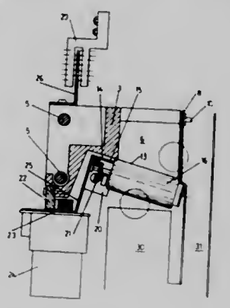
electronic circuit means for receiving inputs from said first and second sensing means, said compartment selection means and said customer payment indication means and for selectively operating said compartment door panel opening means for the selected compartment to open only that door panel and permit access by the customer only to the selected compartment, but only if a video cassette or other article having a correct electronically conductive portion is located therein as determined by said first sensing means and only if the door panel for said selected compartment is previously closed as determined by said second sensing means.

4,893,706

MECHANISM FOR THE RECEPTION AND COLLECTION OF COINS IN COIN-OPERATED MACHINES

Jesús E. Ibarrola, Navarra, Spain, assignor to Azkoyen Industrial, S.A., Peralta, Spain

Filed Mar. 2, 1988, Ser. No. 163,249
Claims priority, application Spain, Mar. 3, 1987, 8700583
Int. Cl.[4] G07F *1/04, 9/04*
U.S. Cl. 194—346 **10 Claims**



1. A mechanism for the reception and collection of coins in coin-operated machines, comprising a frame movable along guides, located immediately below an exit of a coin entry selector of a coin-operated machine; a series of identical vertical chambers including a top and bottom and lateral walls, formed consecutively in the frame by a series of vertical partitions, the chambers being open at said top and bottom, as well as at one of said lateral walls; means for opening and closing the bottom and said one lateral wall of the chambers; frame driving means for moving the frame in a direction perpendicular to the chambers so that the open top of said chambers is successively positioned under the exit of the selector; and means for driving said means for opening and closing the bottom and said one lateral wall of the chamber; said chambers being of a length and height greater than the diameter of a largest acceptable coin and of a width slightly larger than the

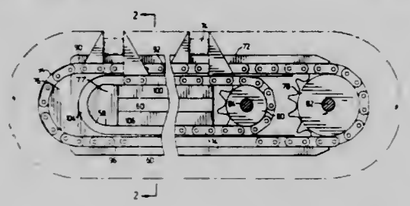
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thickness of the largest acceptable coin, a decoder on the frame; a reader stationary with respect to the decoder for reading the decoder to produce information concerning the position of the frame at any given moment; and said means for driving the frame and said means for driving said opening and closing means being controllable by a microprocessor, based on information provided concerning the chamber in which each coin is located and information from the reader concerning the position of the frame at any given moment.

4,893,707
CHAIN CONVEYORS

Marinus J. M. Langen, Toronto, and Peter Gattinger, Milton, both of Canada, assignors to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Nov. 16, 1988, Ser. No. 271,690
Int. Cl.[4] B65G 15/14
U.S. Cl. 198—627 **6 Claims**



1. In a conveyor mechanism for transporting articles along a conveyor path, the conveyor being of the type having first and second conveyor chains which have co-extensive portions of their length which are guided by first and second guide tracks respectively so as to extend along the conveyor path in close proximity to one another, each chain having first and second side edges and first and second load confining members mounted on the first side edges of the first and second chains respectively for movement therewith along the conveyor path, the improvement wherein;

(a) said first guide track is located more closely adjacent the conveyor path than the second guide track and said first and second guide tracks are arranged one above the other in an overlapping relationship with the first side edge of the first guide track being spaced laterally inwardly from the first side edge of the second guide track such that the first and second load confining members are arranged to extend in first and second load confining planes which are laterally spaced from one another by an amount which is less than the lateral width of said second conveyor chain thereby to provide a narrow array of load confining members along an edge of said conveyor path.

4,893,708
CONVEYOR FOR FREEZING FOOD PACKAGES

David G. Machacek, Northfield, Minn., assignor to Northfield Equipment and Manufacturing Co., Inc., Northfield, Minn.

Filed Sep. 28, 1988, Ser. No. 246,636
Int. Cl.[4] B65G 21/18
U.S. Cl. 198—778 **5 Claims**

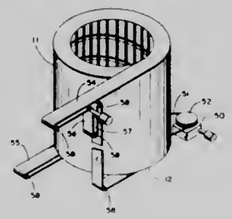
1. In a conveyor system for freezing articles such as food packages comprising a cylindrical core, a generally coaxially arranged cylindrical shell disposed outwardly of said core and with inner and outer walls defining an annular thermal treatment zone therebetween;

(a) a spirally-arranged conveyor platform within said annular zone;

(b) means comprising a plurality of axially and radially spaced apart support arms mounted on one of said walls and supporting said spirally-arranged conveyor platform along a predetermined spiral course through said annular freezing zone;

(c) said support arms being characterized in that:

(1) each of said support arms having an inner end defining a root and an outer end defining a tip and with a certain generally constant height dimension and a generally

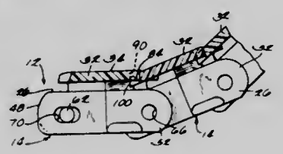


frusto-conical width dimension tapering inwardly from said root to said tip so as to provide a stable support with a low dimensional profile with the loading stresses within said support arm upon normal weighting of said spirally-arranged conveyor platform being generally constant from root to tip.

4,893,709
BACK-FLEXING ARTICLE CARRYING CHAIN

Roger H. Schroeder, Hartland; William G. Hodkewsky, Greendale, both of Wis., and James F. Murphy, Lynchburg, Va., assignors to Rexnord Corporation, Milwaukee, Wis.

Filed Aug. 18, 1988, Ser. No. 234,335
Int. Cl.[4] B65G 17/06
U.S. Cl. 198—852 **11 Claims**

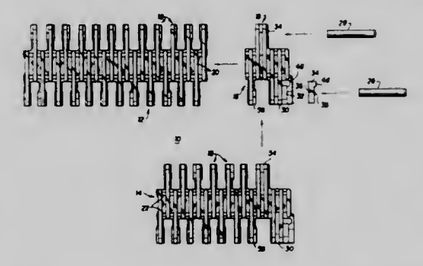


1. A chain link for a chain including a plurality of said links joined to one another in end to end relationship, said link comprising a unitary member including a top plate, a forward knuckle portoin formed below said top plate, and a pairof spaced side bar portoins extending rearwardly from said knuckle portion formed below said top plate, and a pair of spaced side bar portions extending rearwardly from said knuckle portion below said top plate and dimensioned to receive therebetween the knuckle portion of the next following chain link, said chain link being adapted to be included in a chain including a plurality of connecting pins extending through said spaced side bars and said knuckles received therebetween to join adjacent ones of said links and to permit limited pivotal movement between adjacent ones of said links around a substantially horizontal axis extending substantially between adjacent ones of said links and around a substantially vertical axis oriented substantially perpendicularly to said forward and rearward edges including a portion which is beveled from the upper surface downwardly towrd the adjacent link, the other of said forward and rearward edges including a portion which lies in a plane perpendicular to the plane defined by said upper surface of said top plate and which is located so as to move into substantially face to face mating contact with the beveled edgeof the top plate of the next adjacent chain link when adjacent chain links are rotated to a predetermined position around said horizontal axis.

4,893,710
PLASTIC MODULAR CONVEYOR BELTS AND MODULES THEREFOR

Peter K. Bailey, Easton, and Michael L. Spangler, Cambridge, both of Md., assignors to Cambridge Wire Cloth Company, Cambridge, Md.

Filed Jan. 13, 1989, Ser. No. 296,792
Int. Cl.[4] B65G 17/06
U.S. Cl. 198—853 **14 Claims**



1. A conveyor belt module of the type for constructing a conveyor belt of modules linked together by interfitting link ends and a pivot rod extending through aligned holes in all of the link ends, with means for maintaining the rod captive in the belt by blocking the holes in the outermost of the link ends, the hole blocking means comprising:

(a) an outer edge link end having a slot therein extending perpendicular to the longitudinal axis of the rod, the slot extending past the rod hole in the outermost link end;

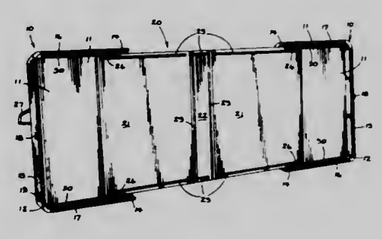
(b) a rod movement blocking member shaped to be removably inserted by sliding into the slot; and

(c) holding means on the blocking member projecting outwardly from the blocking member and cooperating with the rod hole to hold the blocking member in place during operation but to allow manual removal.

4,893,711
CONVERTIBLE CARRYING CASE AND EXPANDABLE EASEL

Everett C. Gustafson, Vancouver, Canada, assignor to Multicard Enterprised Limited, New Westminster, Canada

Filed Mar. 16, 1989, Ser. No. 324,188
Int. Cl.[4] B65D 25/22, 25/28; A45C 9/00
U.S. Cl. 206—45.24 **5 Claims**



1. A convertible carrying case and expandable easel, comprising:

first and second three-sided trays, each tray having a bottom with oppositely facing inner and outer surfaces, the inner surface of each bottom being partially rimmed by three walls, the walls of the first and second trays having complementary peripheral edges adapted to abut one another when the trays are closed to form an enclosure that is open across one end;

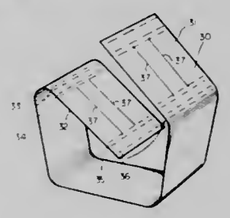
a liner having first and second rectangular panels hinged to a central spine along two parallel hinge axes, said first and second panels and said trays including cooperating means whereby said panels are slidably guided within the first and second trays, respectively, at positions in which the panels are adjacent to the inner surfaces of the tray bottoms for relative movement between them in the planes of the respective panels in directions perpendicular to the hinge axes; and

foldable handle means movably mounted on at least one tray for suspending the trays and interconnecting liner while the trays are closed and for alternately supporting the trays in side-by-side positions across the inner while resting in upwardly-open, inclined positions.

4,893,712
CAN PACKAGES

Fred C. Allen, Waterville, and Scott W. Steele, Perrysburg, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Division of Ser. No. 106,941, Oct. 14, 1987, which is a continuation of Ser. No. 908,444, Sep. 17, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 239,934
Int. Cl.[4] B65D 7/06, 75/56
U.S. Cl. 206—150 **8 Claims**



1. A one-piece tubular band of plastic material adapted to be stretched about the periphery of a group of cans,

said band comprising spaced circumferentially extending slits in said band extending longitudinally of said band to form a handle, the length of said slits being such as to span the space between at least a pair of cans such that the fingers can be inserted through one slit in the space between a pair of cans to engage the band and thereafter through the other slit to carry the can package about which the band is stretched.

4,893,713
PROTECTOR PALLET FOR AIRCRAFT WHEEL ASSEMBLIES

William A. Thomas, 2444 Santa Ynez Way, Palm Springs, Calif. 92264

Filed Mar. 3, 1989, Ser. No. 318,607
Int. Cl.[4] B65D 85/06
U.S. Cl. 206—304 **16 Claims**

1. For aircraft wheel assemblies each including a tire mounted on a hub, a protector comprising:

- an annular lower main protective member including

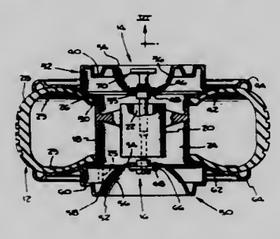
an annular lower cover having a lower central fastening portion and a protruding portion,

a lower mainly concave wall portion for enclosing bearings and protruding wheel members,

a lower flange portion extending in a radial direction over a lower tire sidewall for enclosing and sealing the hub, for at least partially covering the lower tire sidewall, and for comprising a lower horizontal lifting and stacking surface; and

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a centrally secured lower reinforcing member;
- an annular upper main protective member including
an annular upper cover having an upper central fastening portion and a receiving recess portion for receiving the protruding portion of the lower cover of an adjacent, horizontally stacked wheel assembly;
an upper mainly concave wall portion,
an upper flange portion extending in a radial direction over an upper tire sidewall for enclosing and sealing the hub, for at least partially covering the upper tire sidewall, and for comprising an upper horizontal lifting and stacking surface; and
a centrally secured upper reinforcing member;



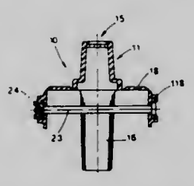
- the receiving recess portion and the protruding portion being located at a greater axial distance than the upper and lower flange portions, respectively, for providing an interspace between adjacent horizontally stacked wheel assemblies; and
- clamping means for clamping the protective members to either side of each wheel assembly, the clamping means extending through the upper reinforcing member, through a central bore in the hub, and through the lower reinforcing member, and comprising an externally threaded shaft member, and a tubular shaft member including grasping means and provided for adjustably receiving an upper end of the threaded shaft member, the threaded shaft member being provided with a locking T-member for securely seating in a groove in the lower reinforcing member.

4,893,714

SUPPORT FOR PRINT-OUTS

Amos D'Agaro, Udine; Giuliano Cossetti, Tolmezzo, and Elio Capellari, Udine, all of Italy, assignors to Seima Italiana SpA, Tolmezzo, Italy

Filed Feb. 19, 1988, Ser. No. 158,220
Claims priority, application Italy, Jul. 21, 1987, 60411/87[U]
Int. Cl.[4] A47F *7/16*
U.S. Cl. 211—46 **10 Claims**



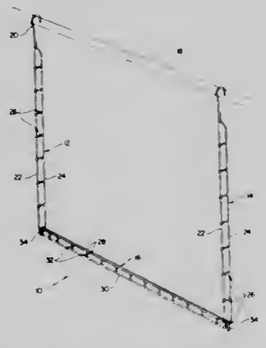
1. A support for print-outs which is suitable to bear print-outs along the axis of the support itself (10), comprising: a generally rectangular central body having terminal ends, sides and a center and further (11) having support attachments (12,13) located longitudinally at said terminal ends and center for facilitating hanging the support, a handle (14) on said central body for carrying the support, side panels (17) located symmetrically at the sides and along the length of the central body (11), the central body (11) including at least one terminal limiting means (16) for positioning print-outs longitudinally within the support, each of the side panels (17) including an inner portion (18) adjacent the central body and an outer portion (118) adjacent the inner portion and spaced from the central body, the inner portion being pivotally connected to the central body for pivotal movement thereabout, and the outer portion being pivotally connected to the inner portion for pivotal movement thereabout.

4,893,715

CLOSET EXTENDER

John Papazian, New Rochelle, and William Kiernan, Larchmont, both of N.Y., assignors to Lillian Vernon Corporation, Mount Vernon, N.Y.

Filed Jan. 9, 1989, Ser. No. 295,199
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—118 **4 Claims**



1. A closet extender comprising first and second elongated frame members adapted to be suspended from a substantially horizontal closet pole so that they extend downwardly therefrom in substantially parallel spaced relation and an elongated support member adjustably securable to said frame members at a plurality of different locations wherein it extends therebetween in a substantially horizontal disposition in downwardly spaced relation to said closet pole, said support member being adapted for suspending a plurality of clothes hangers therefrom, said frame members each having upper and lower ends and each comprising a pair of spaced, substantially parallel, substantially rigid, longitudinal frame wire elements, a plurality of spaced, substantially parallel, substantially rigid connecting frame wire elements extending between the longitudinal frame wire elements thereof, and a hook element at the upper end thereof, said hook elements being receivable on said closet pole for suspending said frame members therefrom, said support member comprising support hook means at the opposite ends thereof, each of said support hook means being releasably received in engagement on a transverse connecting frame wire element of a different frame member for releasably supporting said support member on said frame members.

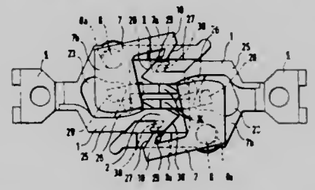
4,893,716

CLAW COUPLING FOR TOY AND MODEL TRAINS

Hans Diller, Heroldsberg, Fed. Rep. of Germany, assignor to Gebr. Fleischmann, Nuremburg, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,346
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728240
Int. Cl.[4] B61G *1/00*
U.S. Cl. 213—75 TC **7 Claims**

1. A claw coupling for toy model trains comprising a . coupling support head having hook means, claw means, pivotal means pivotably mounting said claw means on said coupling support head for a movement between a coupled and an uncoupled position, a decoupling pin depending from said claw means, said coupling support head having opening means in which said decoupling pin is received, said decoupling pin being free to move in said opening means, said claw means having two arms disposed generally at right angles to one another, one of said arms having said hook means, the other of



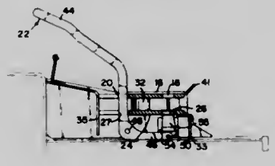
said arms having said depending decoupling pin, said coupling support head having a mandrel operable to be disposed in a position juxtaposed to the other of said arms of a claw means of another like coupling to preclude the last said claw means from pivoting to a decoupling position, said pivotal means comprising a pivot pin extending from said claw means and a hole in said coupling support head in which said pivot pin is received, said hole having at least a partial conical surface to prevent said pivot pin from being wedged in said hole as said pivot pin is moved axially in said hole.

4,893,717

TRAILER HITCH FOR USE WITH A RAILROAD CAR

William K. Berry, Arlington, Tex., and Gary S. Kaleta, Warren, Oreg., assignors to Burlington Northern Railroad, Fort Worth, Tex.

Filed Jan. 27, 1989, Ser. No. 303,469
Int. Cl.[4] B61G *1/28*
U.S. Cl. 213—188 **17 Claims**



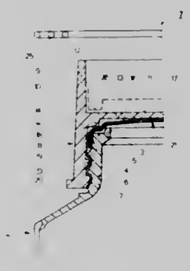
17. A hitch for releasably connecting a double stack trailer to a road railer car having a tongue having an opening, comprising:
(a) a top wall, bottom wall, back wall, and first and second side walls cooperatively connected to form a housing for receiving the tongue of the road railer car, the housing having a generally circular upper pin receiving opening in the top wall, and a generally circular lower pin receiving opening in the bottom wall, the pin receiving openings in alignment, the side walls extending below the bottom wall and having a forward portion generally flared outward so as to provide a guider for the tongue and a backward portion, wherein the forward portion is positioned between the top wall and the bottom wall, the back wall positioned between the top and bottom walls;
(b) a shaft positioned below the bottom wall and cooperatively connected between the first side wall and the second side wall;
(c) a lever having an upper arm cooperatively connected to a lower arm and a pivot point positioned between the arms, the lever having a portion of the upper arm extending above the top wall, and the lower arm positioned below the bottom wall, the top wall having a first slot sized and configured to correspond to the lever which provides an area in which the lever travels, the bottom wall having a second slot sized and configured to correspond to the lever which provides an area in which the lever travels;
(d) a generally frusta-conical shaped pin cooperatively connected to the lower arm, the pin having engaged and disengaged positions, whereby when in the disengaged position the pin is in the lower pin receiving opening and in the engaged position when the upper arm is depressed and the pin moves upward through the upper pin receiving opening thereby securing the tongue through its opening which has been positioned in the housing;
(e) a pin carrier cooperatively connected to the pin;
(f) four pin guides cooperatively connected to the side walls thereby providing a guide for the pin carrier;
(g) a bracket cooperatively connected to the housing, the bracket having an opening sized and configured to receive the lever, and a latch means for securing the lever into the bracket.

4,893,718

CONTAINER WITH WELDED ON COVER AND SCREW CAP

Frédéric Delespaul, and Bernard Schneider, both of Sainte-Ménéhould, France, assignors to CEBAL, Clichy, France

Filed Nov. 22, 1988, Ser. No. 274,953
Claims priority, application France, Dec. 23, 1987, 87 18527
Int. Cl.[4] B65D *41/62*
U.S. Cl. 215—232 **6 Claims**



1. A pack comprising:
a tube having an externally threaded, plastic neck;
an internally threaded, plastic cap which can be fixedly screwed onto the neck; and
a cover which can be welded over the end of the neck while it is held in place by said cap fixed onto the neck, said cover being generally circular, of a diameter substantially equal to the outside diameter of the end of the neck, having at least one radially projecting tab used for removal of the welded cover from the neck, being deformable with little or no springback effect, and comprising at least two external plastic-based layers and at least one barrier layer therebetween; wherein
said cap has a closed end abutted internally by a peripheral shoulder for pressing the cover over the end of the neck, said shoulder having an inside diameter between the inside and outside diameters of the neck, said closed end thereby being recessed so as not to press said cover onto any burr which may be at the end of the neck, the circular portion of the cover straddling any such burr without danger of bursting; and
fixing said cap to said neck forms a space between the outside of the neck and the inside of the cap below the shoulder, said space for containing said at least one tab bent back along the neck.

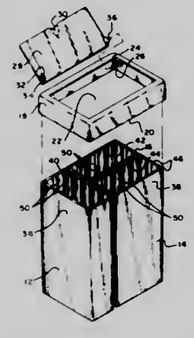
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4,893,719

COMPARTMENTALIZED SEPARATING CONTAINER

John J. Lombardi, Marlton; Michael Handline, Williamstown, both of N.J., and Gary Goode, Davie, Fla., assignors to T and C Associates, Williamstown, N.J.

Filed Jul. 11, 1988, Ser. No. 217,164
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—1 T **31 Claims**



1. A compartmentalized container to allow separation of different types of material and allow the segregated material to be disposed of separately, the compartmentalized container comprising:

(a) at least two separate containers, each container comprising:

(i) an open, generally unobstructed top,

(ii) vertical side walls, each terminating at an upper edge,

(iii) a closed bottom, and

(iv) a sufficient size and shape that the containers are nestable together so that the upper edges not abutting another upper edge form a periferial shape of an outer edge shape,

(b) an integral frame member coextensive with the outer edge shape comprising a depending edge over the outer edge shape sized to hold the nested containers together,

(c) a top cover means to integrally cover the combined nested tops of the containers, and

(d) hinge means to hingeably attach the top cover means to the device to allow the top cover means to hingeably uncover and cover the combined tops of the nested containers.

4,893,720

TILTING SANITARY TANK

Edward F. McKiernan, Big Prairie, and Carl E. Bochmann, Brecksville, both of Ohio, assignors to Sealand Technology, Inc., Big Prairie, Ohio

Continuation-in-part of Ser. No. 252,797, Sep. 30, 1988, abandoned. This application Feb. 21, 1989, Ser. No. 312,169
Int. Cl.[4] B65D *90/00*
U.S. Cl. 220—5 A **22 Claims**

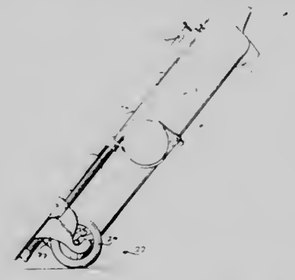
1. A transportable tank system for handling waste water and the like, comprising:

a tank body having first and second opposite ends, and first and second opposite faces between said first and second ends;

discharge valve means provided in said tank first face for selectively providing or preventing fluid communication between the interior of the tank and the exterior thereof;

wheel means provided at said first end of said tank for mounting said tank for rolling movement; and

tilting means operatively connected to said tank for mounting said tank for tilting movement from a first position, in which said tank is transportable by said wheel means with said wheel means engaging the ground and supporting said tank, to a second position in which said wheel means do not support said tank, and said discharge valve means



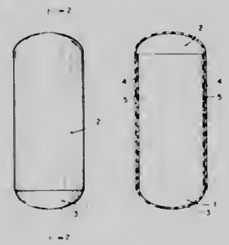
is elevated with said first face extending substantially horizontally so that it may be disposed directly over a toilet to discharge the contents of the tank into the toilet.

4,893,721

TAMPER-PROOF CAPSULES

Hans U. Bodenmann, Maenchenstein, Switzerland; Steven A. Roberts, Greenwood, S.C., and Fritz Wittwer, Lupsingen, Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 438,148, Oct. 29, 1987, abandoned. This application Nov. 21, 1984, Ser. No. 674,348
Int. Cl.[4] B65D *43/10*; A61B *19/02*
U.S. Cl. 220—8 **4 Claims**



1. A hard shell capsule comprising cylindrical, telescopically and frictionally joinable, co-axial cap and body parts, each of said parts having a side wall, an open end and a closed end, wherein the side wall of each of said parts has substantially the same length and said side wall length is substantially greater than said capsule diameter, the closed end of said body part being shaped to resist gripping and, when telescopically joined, the side all of said cap part encases the entire side wall of said body part forming a tamper-proof capsule, whereby the side wall of said body part is prevented from being griped.

4,893,722

COMPARTMENTED WASTE RECEPTACLE

Gregory H. Jones, 2300 W. Norwegian St., Pottsville, Pa. 17901

Filed Aug. 5, 1988, Ser. No. 228,525
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—1 T **9 Claims**

1. A compartmented waste receptacle for segregating different types of waste comprising:

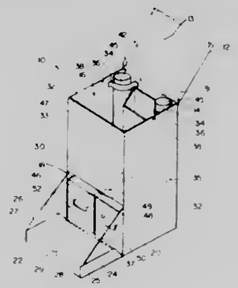
a bottom including two side walls and a back wall extending upwardly therefrom;

said bottom further including a lower compartment lid having a first end and a second end, said second end being pivotally secured to said bottom;

a base positioned above said bottom such that the distance between said base and said bottom is less than the distance between said first and second ends of said lower compartment lid;

said base extending between said two side walls and said back wall and further including a front wall extending upwardly therefrom to substantially the same height as said other walls;

said base further including a first aperture positioned adjacent one of said side walls and said back wall and a second



aperture positioned adjacent the other of said side walls and said back wall;

said apertures being surrounded by a chute which extends upwardly therefrom to the same height as said walls;

a first and a second lower compartment container each disposed between said base and said bottom and positioned beneath said first and second apertures, respectively; and

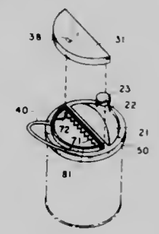
an upper compartment lid pivotally secured to an upper edge of one of said walls.

4,893,723

PAINT CAN ATTACHMENT

John K. Seabolt, 405 Jones Chapel Rd., Richlands, Va. 24621

Filed Jun. 28, 1988, Ser. No. 212,585
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—85 SP **7 Claims**



1. An apparatus for attachment to a rim at the top of a cylindrical container for liquids, comprising:

means for removably attaching and sealing said apparatus to the rim of said cylindrical container;

a pour spout having a pour aperture at the end of said pour spout;

removable cap means adapted to close said pour aperture;

said apparatus including an access aperture therein, said access aperture defining a semicircular configuration;

a cover for said access aperture; and

a slot defined by a portion of the edge of said access aperture, said slot providing a squeegee, whereby said squeegee may engage and scrape liquid from both sides of a stir paddle simultaneously, and alternatively retain a stir paddle in a vertical position.

4,893,724

CLOSURE FOR A CANISTER

Wolfram Schiemann, Eugen-Nagele Str. 17, D-1740 Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,969
Int. Cl.[4] B65D *43/26*
U.S. Cl. 220—263 **38 Claims**



1. A closure for a plastic canister in the 20–30 liter range, said canister having integral therewith a plastic pouring spout with an end face,

said closure comprising

a collar coaxial with said pouring spout, having a rearward periphery and sides having two abutments, said abutments having lower surfaces arranged to cooperate with claws of a claw-type closure,

a cap with a sealing ring therein and lateral and rearward edge regions, said cap being arranged to swing between an open condition and a closed condition relative to said collar,

a first hinge half projecting from said rearward periphery of said collar,

a second hinge half on said rearward edge region of said cap that cooperates with said first hinge half,

said first and second hinge halves being shaped to prevent said cap from swinging to said closed condition when said cap is in said open condition,

two journals arranged on said lateral edge regions of said cap, and

a claw that is approximately U-shaped, seen in plan view, with a transverse gripping web with end regions, and two longitudinal webs emanating from said end regions,

each of said longitudinal webs ending at a free end in a fork having an upper and a lower prong as seen in said closed condition of said cap,

each of said upper prongs being arranged to form a swivel hinge with said journals,

each of said lower prongs having an inner surface arranged to cooperate with said lower surfaces of said abutments such that when said gripping web is pressed downward said sealing ring in said cap is pressed onto said end face of said pouring nozzle,

said collar being arranged to fit against said cap with minimal spacings and said claw being arranged to fit against said collar and said cap with minimal spacings, when said cap is in said closed condition, said spacings permitting relative movement of said claw and said cap during opening and closing of said cap, said spacings being smaller than deformations occuring as a result of impact loads on said closure,

said claw being composed of plastic.

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4,893,725

METHODS OF MAKING METAL CAN ENDS WITH PLASTICS CLOSURES

Martin F. Ball, Wantage; Andrew P. Pavely, Blunsdon, and Joseph S. Taylor, Long Wittenham, all of England, assignors to CMB Packaging (UK) Limited, Reading, England

Continuation-in-part of Ser. No. 163,186, Feb. 25, 1988, Pat. No. 4,813,837, Continuation of Ser. No. 906,887, Sep. 15, 1986, abandoned. This application Jul. 8, 1988, Ser. No. 216,473
Claims priority, application United Kingdom, Sep. 20, 1985, 8523263
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[4] B65D 17/34
U.S. Cl. 220—269 25 Claims



1. A metal can end comprising a peripheral flange, a peripheral wall inboard of the peripheral flange, and a central panel inboard of the peripheral wall; a flange extending from the plane of the central panel and defining an aperture therein; said aperture being closed by a closure formed of nylon or polypropylene in situ injection-moulded upon said central panel; said moulded closure including a top surface defining an exterior flange and a pull tab; a plug portion of said moulded closure obturating said aperture; an inner flange of said closure holding said closure in interlocked engagement with said aperture defining flange; said plug portion being adhered to a plastics coating on an interior surface of said central panel; said aperture-defining flange being a generally peripheral wall extending substantially transverse to the plane of the central panel; said aperture-defining flange terminating in a burr directed laterally relative to said aperture; said inner flange having a residual portion set-off between a terminal edge of said aperture-defining flange and an interior surface of said inner flange; said residual portion covering said terminal edge and being in the range of 0.125 mm to 0.5 mm; said residual portion having an opening forming starting end and a last-to-open end remote from said pull tab; said residual portion having a greater thickness at said last-to-open end than at said starting end; and said interior surface plastics coating being a polymer similar to that of said plug closure whereby said plug closure and interior surface coating are bonded and fused into sealing engagement upon the in situ injection-moulding of said moulded closure.

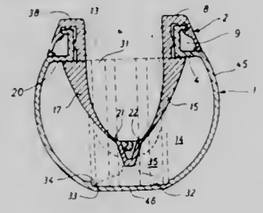
4,893,726

CONTAINER FOR CONTROLLED RELEASE OF A PREFERABLY LIQUID MEDIUM

Steen Vesberg, Bruxelles, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Jul. 20, 1988, Ser. No. 221,700
Int. Cl.[4] B65D 47/00
U.S. Cl. 220—403 14 Claims

1. A locking apparatus adapted for coupling to a container including a flange part which extends inwardly in a radial direction to define a container opening, the flange part having an inner surface, the container opening being centered on a longitudinal axis normal to the radial direction, the locking apparatus comprising a locking insert removably inserted in the container opening, the locking insert including a counterpart fitted within said container opening, a locking part, and an insert opening, said locking part including a first blade having one end which is swingably hinged by a first hinge part to said counterpart, and another end thereof hingably joined by a second hinge part to a connection body positioned in said insert opening, said one end of said first blade having an abutting surface, and said connection body being being movable longitudinally along said axis between first and second stable positions, so that when said connection body is in said first stable position, said abutting surface of said one end of said first blade extends radially inward of said container opening, thereby allowing insertion of said locking insert in said container opening, and when said connection body is moved to said second stable position, said first blade swings on said first and second hinge parts to extend said abutting surface radially outward and in abutment against said inner surface of said flange part, thereby locking said locking insert in said container opening.

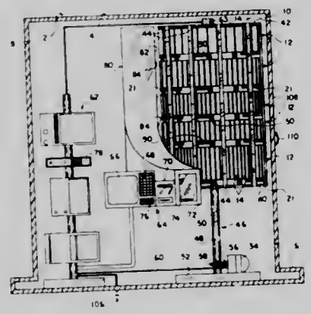


4,893,727

AUTOMATED RETAIL SERVICE DELIVERY SYSTEM

Michael A. Near, 10101 Tuxford Rd., Richmond, Va. 23236

Filed Aug. 8, 1988, Ser. No. 229,465
Int. Cl.[4] G07F 11/00
U.S. Cl. 221—81 10 Claims



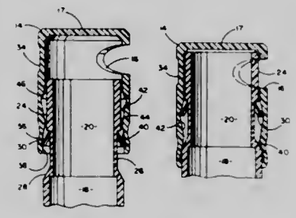
1. An automated delivery system comprising:
a wheel assembly including a plurality of circular tiers,
each said tier provided with a plurality of storage bins adapted to contain a product to be dispensed,
each said bin having a gate assembly displaceable between an open and a closed position,
horizontal bin support means beneath said bins of each said tier,
means interlocking said tiers into a unitary assembly,
wheel assembly support means engageable with and maintaining said wheel assembly at a fixed elevation,
a delivery chute adjacent the outer periphery of said wheel assembly,
indexing motor means operable to rotate said wheel assembly to position a selected one of said bins on any said tier juxtaposed said delivery chute,
discharge motor means on each said tier operable to displace any one said bin gate assembly on its respective tier, whereby upon displacement of any one said gate assembly, any product within the respective said bin is directed into said delivery chute,
said gate assembly includes a lever pivotally attached to each said bin, and
said lever and discharge motor means are provided with cooperating cam surfaces.

4,893,728

ARTICLE DISPENSER

Paul D. Jennings, 1039 E. Almond Ave., Orange, Calif. 92666, and Kenneth L. Jennings, P.O. Box 83-4, Rte. 2, Strafford, Mo. 65757

Continuation of Ser. No. 24,847, Mar. 17, 1987, abandoned, which is a continuation of Ser. No. 781,040, Sep. 27, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 218,470
Int. Cl.[4] B65D 41/18
U.S. Cl. 221—306 13 Claims



1. An article dispenser for containing a plurality of articles and providing a path for dispensing said articles upon selective actuation of said article dispenser, comprising:
a container member having a compartment for containing said articles, said container member having a dispenser portion including a first aperture through which said articles may pass; and,
a dispenser control member relatively displaceable with respect to said container member, said dispenser control member having a second aperture, said container member dispenser portion including a ring member of tubular contour, said ring member defining flexible means for positive engagement between said container member and said dispenser control member, said flexible means including a plurality of discrete flexible protrusions, said discrete flexible protrusions being radially displaced upon displacement of said container member and said dispenser control member, said dispenser control member having an internally inclined surface for contiguous interface with said flexible protrusions upon displacement of said dispenser control member and said container member, said flexible protrusions and inclined surface providing a varying force during radial displacement of said discrete protrusions.

4,893,729

SELECTABLE MIXING BOTTLE

Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321, and Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, assignors to Jerry R. Iggulden, Santa Clarita and Donald A. Streck, Ojai, both of, Calif., a part interest to each

Filed Jul. 8, 1988, Ser. No. 216,289
Int. Cl.[4] B67D 5/22
U.S. Cl. 222—42 5 Claims

1. A bottle for holding, mixing, and dispensing a mixture of two liquid components comprising:
(a) a plastic bottle having two compartments for containing respective ones of the two liquid components and having a cylindrical neck at the top thereof containing a first bore therethrough concentrically disposed in said neck and communicating with one of said compartments and a second bore therethrough peripherally disposed with respect to said first bore and communicating with the other of said compartments, one of said two compartments being a chamber for holding a lotion, the other of said two compartments being a chamber for holding an active ingredient for imparting variable qualities to a mixture of said lotion and said active ingredient;
(b) a generally cylindrical mixing chamber member disposed over said neck, said mixing chamber member having an internal mixing chamber communicating with said first and second bores on a bottom end thereof and having a third bore therethrough at a top end thereof for the egress of the two liquid components following their being squeezed from said two compartments through said first and second bores into said mixing chamber, said mixing chamber member further having threads formed on an outer surface thereof for removably receiving an internally threaded cap, said first bore being sized for passing known quantities of said lotion, said second bore being



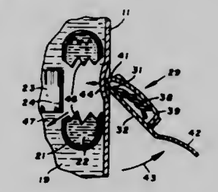
sized in relation to said first bore so as to add a quantity of said active ingredient which will impart a pre-selected quality to dispensed quantities of mixtures of said lotion and said active ingredient; and additionally,
(c) means for adjusting the size of said second bore comprising a selector dial rotatably mounted on said neck, said selector dial having a central cap portion covering said neck over which said mixing chamber member is disposed, said central cap portion having a central bore through a top member thereof concentrically disposed over said first bore and a plurality of various diameter metering bores disposed peripherally through said top member concentrically disposed to pass over said second bore as said selector dial is rotated on said neck whereby the quantity of said active ingredient and thereby the quality of dispensed quantities of mixtures of said lotion and said active ingredient are adjustable.

4,893,730

AEROSOL DISPENSER FOR DUAL LIQUIDS

Lee R. Bolduc, 6416 Gainsborough Dr., Raleigh, N.C. 67612

Filed Jul. 1, 1988, Ser. No. 214,477
Int. Cl.[4] B67B 7/24
U.S. Cl. 222—80 25 Claims



1. An aerosol dispenser comprising: a container having a deformable side wall and an internal chamber for storing a propellant and at least one first component to be sprayed therefrom, normally closed valve means mounted on said container

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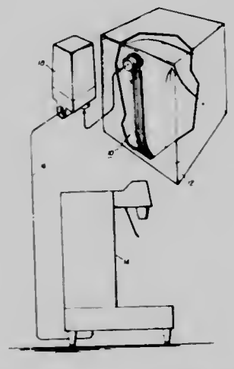
to retain the propellant and component in said chamber, said valve means being movable to an open position to dispense aerosol to a desired location, frangible ampule means located within said chamber containing a second component that is separated from the first component within the chamber until said ampule means is broken, means for holding the ampule means in said chamber adjacent a portion of the side wall of the container, said means for holding the ampule means in said chamber includes means having a loop surrounding a portion of the ampule means to hold said ampule means in said chamber adjacent said portion of the side wall, a first arm, and a second arm positioned in engagement with the inside of said side wall, said loop having ends joined to the first and second arms, said ends spacing the ampule means from said portion of the side wall, and means mounted on said container engagable with said portion of the side wall and operable to deform said portion of the side wall toward the ampule means to break said ampule means thereby releasing the second component into said chamber.

4,893,731

COLLAPSIBLE BAG WITH EVACUATION PASSAGEWAY AND METHOD FOR MAKING THE SAME

Simon J. Richter, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 20, 1988, Ser. No. 287,187
Int. Cl.[4] B65D *35/00*
U.S. Cl. 222—92 29 Claims



1. A collapsible bag for use in containing and dispensing a liquid comprising:

(a) a liquid tight bag having a flexible bag wall;

(b) a spout attached to said bag wall and having a spout opening therethrough in liquid communication with the inside of said bag;

(c) an elongated reinforcing strip sealed to an outside surface of said bag wall and extending from adjacent to said spout to a position remote from said spout; and

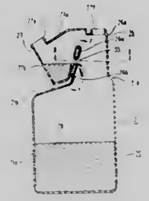
(d) said reinforcing strip including at least one elongated groove therein which also exists in the portion of said bag wall attached to said reinforcing strip, said groove providing at least one elongated liquid passageway inside of said bag in liquid communication with said spout opening, said at least one passageway having a depth and a width such that as said bag wall collapses during dispensing of liquid from the bag, the bag wall can not collapse into and block said passageway, such that said passageway remains open to achieve complete withdrawal of liquid from said bag as said bag collapses.

4,893,732

EXACT VOLUME DISPENSING CONTAINER

J. T. Jennings, Mountainside, N.J., assignor to Container Mfg. Inc., Middlesex, N.J.

Filed Jan. 12, 1989, Ser. No. 364,180
Int. Cl.[4] G01F *11/26*
U.S. Cl. 222—109 4 Claims



1. In a dispensing container, comprising: a primary storage container for storing liquid and a measuring head having a pour-out spout with a removable closure disposed above said primary storage container, a neck disposed between said primary storage container and the base of said measuring head, a modified pour-spout at the side of said measuring head, said modified pour-spout comprising a tube formed by a barrier connected at its lower end at said neck, said barrier being spaced-apart from said pour-out spout whereby said tube receives liquid from said storage container and transports said liquid to said measuring head through a passage at the upper end of said tube adjacent the side of said measuring head opposite to said pour-out spout for measuring said liquid when said container is first tilted and then righted and dispensing said liquid from said measuring head through said pour-out spout when said closure is removed and said container is again tilted, the improvement wherein:

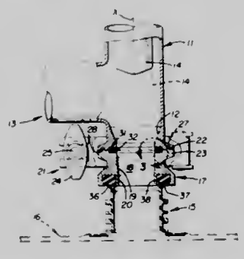
a drainback opening is interposed through said barrier for connecting the interior of said measuring head to the interior of said tube at a level below the upper end of said tube for draining liquid above a preselected level stored in said measuring head back through said drainback opening into said primary storage container, whereby the level of liquid to be dispensed from said measuring head is equal to the exact volume stored in said measuring head.

4,893,733

FILLING HEAD WITH QUICK-CHANGE NOZZLE

Peter N. Thomsen, 138 Baumont Ave., San Francisco, Calif. 94118

Filed Nov. 22, 1988, Ser. No. 274,821
Int. Cl.[4] B65B *55/08*
U.S. Cl. 222—153 12 Claims



1. A filling head for communicating a liquid product through a generally cylindrical gland, defining an annular bearing surface on an upper end thereof, said filling head comprising

a fill tube having an outlet at a distal end thereof,

an inlet conduit communicating with said fill tube for supplying said liquid product thereto,

piston means reciprocally mounted in said fill tube for movement between a raised position for permitting said product to flow from said inlet conduit through the outlet of said fill tube and a lowered position blocking flow of said product from said inlet conduit through the outlet of said fill tube,

an annular nozzle having a proximal end positioned at the distal end of said fill tube and defining a flow passage therethrough communicating with the outlet of said fill tube,

attachment means for releasably attaching the proximal end of said nozzle to the distal end of said fill tube, and

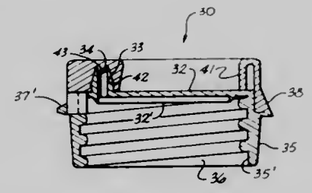
annular sealing means secured on a distal end and bottom side of said nozzle for engaging the annular bearing surface of said gland in sealing contact therewith.

4,893,734

RESEALABLE CLOSURE AND CONTAINER EMPLOYING SAME

Walter K. Calystan, 327 St. James Dr., Spartanburg, S.C. 29302

Filed Aug. 24, 1988, Ser. No. 235,541
Int. Cl.[4] B67B *5/00*
U.S. Cl. 222—153 25 Claims



1. An improved closure for a dispensing container comprising a top wall, a skirt secured to said top wall and depending downwardly therefrom, said skirt being adapted to be removably securable to a portion of a container about which is to be received, said top wall defining a vent opening therein, a cap hingedly secured to a portion of said closure, said cap residing over said top wall in a closed position and being moveable about said hinge connection to an open position, said cap having means for closing said vent opening when in the closed position and having means thereon matable with a portion of said closure for removably locking said cap in the closed position, said closure further having means thereon matable with a portion of a container on which said closure is to be received when said cap is in the closed position only to preclude removal of said closure from said container.

4,893,735

APPARATUS FOR CONTROLLING HYDRAULIC JACKS MOUNTED ON A ROTARY HOPPER

Emile Lonardi, L-Bascharage, Luxembourg, assignor to Paul Wurth S.A., Luxembourg

Filed Mar. 16, 1988, Ser. No. 168,902
Claims priority, application Luxembourg, Mar. 24, 1987, 86823
Int. Cl.[4] B67D *5/64*
U.S. Cl. 222—168 10 Claims

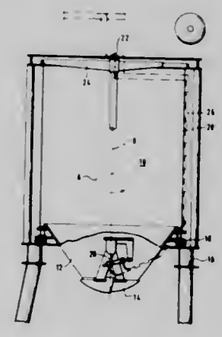
1. An apparatus for controlling hydraulic jacks, comprising:

a support member;

a rotary hopper, rotatably mounted on the support member, said hopper having an outer wall and a bottom portion;

a plurality of hydraulic jacks mounted directly on the rotary hopper;

a hydraulic unit mounted directly on said outer wall of the bottom portion of said hopper, said hydraulic unit including means for supplying hydraulic fluid to said hydraulic jacks; and



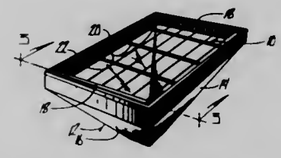
energy source means for actuating said hydraulic unit, said energy source means located adjacent to said bottom portion of said hopper, but being independent from said bottom portion.

4,893,736

GRAIN WAGON BOX WITH SAFETY GRID

Charley B. Naig, P.O. Box 283, Graettinger, Iowa 51324

Filed May 16, 1988, Ser. No. 194,331
Int. Cl.[4] E04C *2/42*
U.S. Cl. 222—185 16 Claims



1. A grain wagon box having opposite end walls and side walls and a bottom center discharge opening wherein the improvement compriaes,

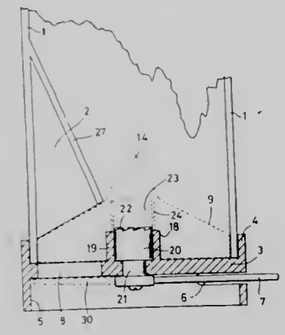
a safety grid structure positioned over at least the substantial center area of said box over said center discharge opening and which is detachably secured to at least the opposite side walls of said box whereby direct human access to said center discharge opening from the top of said box is prevented without interfering with the flow of grain through said grid,

said grid including a plurality of cross members connected to said wagon side walls and a plurality of longitudinal members interconnecting said cross members, and

each of said cross members having one end being secured to one side wall of said box by a bolt extending through one of said side walls and being connected to said cross member by a bracket means longitudinally movably connected to said cross member for said grid to fit in boxes of varying size with only the outer end of the bolt being exposed on the outside of said box and the remainder of said bolt extending along the length of said cross member inside said box.

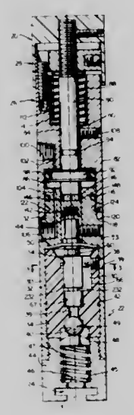
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4,893,737
DISPENSING APPARATUS
Hans Borjesson, Hestra, Sweden, assignor to AB Ersol, Hestra, Sweden
PCT No. PCT/SE86/00423, § 371 Date Jun. 30, 1987, § 102(e) Date Jun. 30, 1987, PCT Pub. No. WO87/02013, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 22, 1986, Ser. No. 54,566
Claims priority, application Sweden, Sep. 25, 1985, 8504424
Int. Cl.[4] G01F *11/10*
U.S. Cl. 222—360 4 Claims



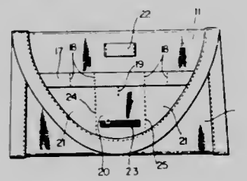
1. A dispensing apparatus for dispensing pulverent goods such as ground coffee, comprising:
a container for receiving the goods and having a bottom with a discharge opening therein,
a rotor rotatably provided in the container and covering substantially the whole bottom thereof, said rotor having a number of radially extending vanes defining compartments therebetween for receiving the goods,
a drive mechanism for rotating said rotor in rotational steps which each correspond to the length of one compartment, said drive mechanism being operable to move the rotor to a plurality of stop positions which are located as to place consecutive compartments of the rotor in registration with said discharge opening,
said rotor having a bore in its center, said drive mechanism including an upper coupling member which is axially slidable but non-rotatable in said bore, a lower coupling member connected to an operating lever and being provided with teeth, said upper coupling member having a member of teeth for engaging corresponding teeth on the lower coupling member, the teeth being operable to connect the two coupling members rotationally together when the lever is being pivoted in one direction to advance the rotor one step but to disengage the upper coupling member by axially lifting it when the lever is pivoted in the other direction,
a wiper means fastened to said container and covering a portion of the rotor in the region of the discharge opening, said wiper means having a wall facing the interior of said container, said wall sloping from a region above the center of the rotor upwardly to join the wall of said container at an acute angle.

4,893,738
SELF-ALIGNING POSITIVE DISPLACEMENT DISPENSER
William A. Gelinas, Hadley, Mass., assignor to Loctite Corporation, Newington, Conn.
Filed Oct. 11, 1988, Ser. No. 255,877
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—380 28 Claims



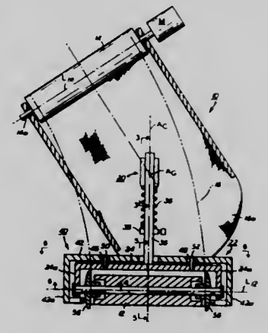
16. A dispenser barrel for dispensing a fluid product comprising:
a housing defining a fluid reservoir and having an inlet for delivery of fluid to said reservoir and an outlet for dispensing the fluid product from said reservoir;
a product piston movable between an inactive position within said reservoir and an active position associated with said outlet to dispense fluid product therethrough;
said fluid reservoir being defined by a plurality of subreservoirs, forming walls providing guide surfaces for said product piston to provide self-alignment of said product piston, said plurality of sub-reservoirs being interconnected by means for facilitating flow of said fluid product therebetween.

4,893,739
POCKET FOR GOLF ACCESSORIES
Gail B. Conner, P.O. Box 307, 15 Hunting Ridge Rd., Manakin Sabot, Va. 23103
Continuation-in-part of Ser. No. 625,816, Jun. 28, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,300
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—240 4 Claims



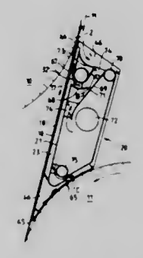
1. A pouch suitable for carrying golf balls and golf accessories comprising a main section having a lower portion and a flap portion; said lower portion secured in opposing facing relationship to a first sheet by suitable side edge attachment means to form a pouch-like receptacle; said flap portion arranged to fold downwardly upon the outside wall of said pouch-like receptacle and thus forming a closed receptacle; said flap portion containing means to secure in a closed position said flap to said receptacle; said flap portion including a retaining loop for a pencil; and a second sheet shaped to conform to the shape of said flap, and secured in an opposing facing relationship to said flap by suitable attachment means to form slot-like receptacles, said slot-like receptacles containing spaced locations for one or more golf tees, and a divot tool, and also containing a button-hole type slot for receiving one or more ball markers.

4,893,740
WEB TRACKING MECHANISM
Edwin A. Hediger, Fairport; Michael Kenin, and Peter G. Izzo, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 21, 1988, Ser. No. 274,177
Int. Cl.[4] B65H *23/025*
U.S. Cl. 226—23 8 Claims



1. Apparatus for controlling the lateral movement of a travelling web, said apparatus comprising;
a steering roller about which a travelling web is at least in part entrained;
first means for supporting said steering roller for rotation about its longitudinal axis, and for mounting said steering roller for angular adjustment about a caster axis perpendicular to such longitudinal axis at the mid-point of said steering roller;
second means for supporting said first means for rotation about a gimbal axis intersecting, and perpendicular to, said caster axis;
sensing means for engaging at least one edge of said web to sense lateral movement of a web supported on said steering roller relative to said steering roller in the direction of said longitudinal axis, said sensing means moving in a corresponding direction to sensed lateral movement of said web; and
a member associated with said sensing means so as to follow said sensing means, said member including at least one slot defined therein at an angle to the direction of movement thereof, and at least one pin attached to said first means, said pin engaging said slot whereby movement of said slot effects movement of said pin in a direction transverse to the direction of movement of said slot to rotate said first means and thus said steering roller about said caster axis in response to movement of said sensing means to counteract sensed lateral movement of said web.

4,893,741
AIR GUIDE BOX FOR STABILIZING THE PATH OF A PAPER WEB
Helmut Heinzmann, Bohmenkirch, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany
Filed Nov. 14, 1988, Ser. No. 270,787
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739338
Int. Cl.[4] F26B *13/08*; B65H *23/24*
U.S. Cl. 226—196 14 Claims



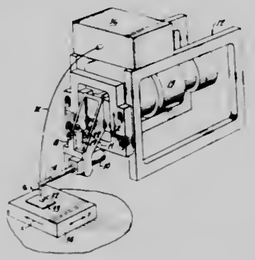
1. An air guide box for stabilizing a running web, the air guide box configured to be placed within an entrance gore defined by a web and a guiding means for guiding the web, said air guide box comprising:
first wall for guiding said web, said first wall being positioned along a running path of said web, said first wall and said web defining a gap, said web carrying an air boundary layer in said gap;
second wall facing the guiding means and joining said first wall near the gore;
intermediate wall extending from said first wall to said second wall opposite the gore;
a plurality of side walls connected to said first, second, and intermediate walls, with said first wall, said second wall, said intermediate wall and said side walls defining an interior region of said air guide box;
air suction means located within said interior region for sucking air from said air boundary layer, said first wall having an entrance opening for a first end of said air suction means;
discharge means located at a second end of said air suction means for venting sucked air away from said air boundary layer, said discharge means spaced from said first wall and second wall; and
drive jet nozzle coupled to said air suction means and extending into said air suction means, said nozzle directed toward said discharge means such that air flow from said air boundary layer to said discharge means increases when said drive jet nozzle blows air into said air suction means.

4,893,742
ULTRASONIC LASER SOLDERING
Peter W. Bullock, San Luis Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 21, 1988, Ser. No. 287,763
Int. Cl.[4] B23K *20/10*, *26/00*
U.S. Cl. 228—110 21 Claims

19. A wire bonder comprising:
a support,
a worktable connected to the support for carrying an object to which a wire is to be bonded,
a bonder frame,
means for mounting the frame to the support for motion in a first direction toward and away from the worktable,
motor means for driving the frame in said direction,
a transducer support,

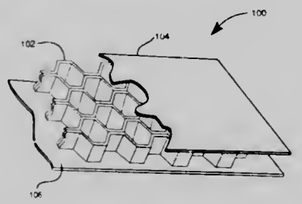
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an ultrasonic transducer carried on said support,
a bonder tool connected to the transducer for movement therewith, said tool comprising a capillary having a solid pressure tip for pressing a lead to be bonded against an object on the worktable, said capillary having a bore extending to the tip, said tip being transparent to laser energy,



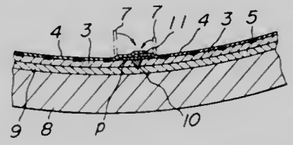
means for mounting the transducer support to the bonder frame for motion relative to the bonder frame in said direction,
an optical fiber positioned in the bore and having a fiber end at said pressure tip, and
a laser having a laser beam output connected to said optical fiber.

4,893,743
METHOD TO PRODUCE SUPERPLASTICALLY FORMED TITANIUM ALUMINIDE COMPONENTS
Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed May 9, 1989, Ser. No. 349,471
Int. Cl.[4] B23K *20/00, 20/22*
U.S. Cl. 228—181 **15 Claims**



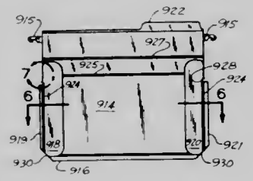
1. A method for producing a titanium aluminide honeycomb-core structural panel which comprises the steps of:
(a) forming a plurality of rapidly solidified titanium aluminide strips into waveform structures;
(b) assembling a plurality of said waveform structures to produce a honeycomb core;
(c) positioning said core between two cover pieces of rapidly solidified titanium aluminide sheetstock; and
(d) diffusion bonding said core to each of said cover pieces

4,893,744
LINING METHOD USING CLAD PIECES AND A CLAD PIECE FOR THE METHOD
Akira Takayasu, 5-1, Horita-Dori, Mizuho-Ku, Nagoya City, Aichi Pref., Japan
Continuation of Ser. No. 451,829, Dec. 21, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 621,121
Claims priority, application Japan, Dec. 25, 1981, 56-215612
Int. Cl.[4] F16B *5/08*
U.S. Cl. 228—184 **3 Claims**



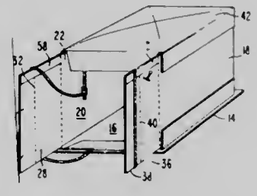
1. A method of lining chemical apparatus, comprising:
(a) providing clad pieces consisting of a liner layer and a corrosion resistant metal surface layer, said surface layer being superposed on the entire area of said liner layer and said surface layer having raised projecting edges;
(b) arranging at least two of said clad pieces side by side on the inner surface of a chemical apparatus whereby the liner layers of said clad pieces abut forming a seam;
(c) welding together the abutting liner layers of said clad pieces and welding together said clad pieces and said apparatus thereby forming a weld bead;
(d) covering the weld bead with an insert strap of corrosion resistant metal;
(e) superposing the raised projecting edges of the surface layers adjacent the weld bead over said insert strap; and
(f) welding together the superposed projecting edges of said surface layers and said insert strap.

4,893,745
SUSPENDABLE FOLDER
Todd A. Weber, Germantown; Albert Narr, Hubertus; Richard A. Lang; James A. Beck, both of Milwaukee; John J. Weber, Jr., Mequon, and Gary F. Rasmussen, Wauwatosa, all of Wis., assignors to Semco, Inc., Milwaukee, Wis.
Filed Feb. 13, 1989, Ser. No. 309,226
Int. Cl.[4] B65D *27/00*
U.S. Cl. 229—1.5 R **13 Claims**



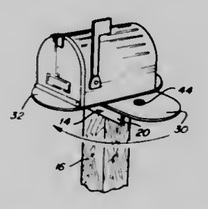
1. A folder having a front panel and a back panel joined at a bottom seam at the bottom of said panels and side seams at the lateral edges of said panels wherein:
(a) each said side seam begins near said bottom seam and extends for a length not greater than approximately two thirds the total length of the lateral edge of said back panel;
(b) said front panel has at least one transverse score line above the upper end of each said side seam; and
(c) each said side seam comprises means for distributing tearing forces applied to said side seams.

4,893,746
COLLAPSIBLE, REUSABLE SHIPPING CONTAINER
David E. Swanhart, Trenton, and Carl A. Angelini, Spring Lake, both of N.J., assignors to Trent Box Manufacturing Co., Inc., Trenton, N.J.
Filed Feb. 13, 1989, Ser. No. 309,529
Int. Cl.[4] B65D *88/52*
U.S. Cl. 229—23 R **17 Claims**



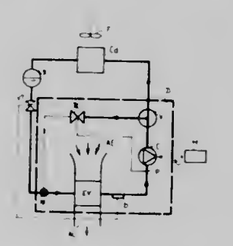
1. An improved collapsible, reusable shipping container being particularly usable for carrying aircraft cargo, which comprises:
(a) a housing means defining a containment chamber therein for holding articles, said housing means comprising:
(1) a base member comprising a floor extending generally horizontally;
(2) a side wall means extending upwardly from said base member to define inwardly facing inner wall means and defining door opening means;
(b) a door means positioned selectively extendable over said door opening means and including:
(1) at least one first door member attached with respect to said side wall means adjacent said door opening means and selectively positionable extending across at least one half thereof, said first door member including:
(a) a first inner door panel extending vertically adjacent said side wall means;
(b) a first outer door panel extending vertically adjacent said first inner door panel spatially disposed from said side wall means;
(2) at least one second door member attached with respect to said side wall means adjacent said door opening means and selectively positionable extending across the other half of said door opening means and at least partially overlapping said first door member, said second door member including;
(a) a second inner door panel extending vertically adjacent said side wall means;
(b) a second outer door panel extending vertically adjacent said first inner door panel spatially disposed from said side wall means and at least partially overlapping said first outer door panel;
(c) a top means extending across said housing means and including:
(1) a base layer;
(2) an outside layer;
(3) a top filler means positioned between said base layer and said outside layer, said top filler means being thinner in the outer area of said top means adjacent said side wall means than in the inner area thereof to provide a convex arcuate profile to said outside layer of said top means;
(d) a first end strap means extending from said top means downwardly to said base member across said first outer door panel of said first door member; and
(e) a second end strap means extending from said top means downwardly to said base member across said second outer door panel of said second door member.

4,893,747
ROTATABLE MAILBOX
Alfred C. Roth, 2388 Yost Blvd., Ann Arbor, Mich. 48104
Filed Jul. 19, 1989, Ser. No. 382,814
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—39 **8 Claims**



1. A rotatable mailbox support means comprising:
a base member having a top plate and downwardly extending side members defining a generally U-shaped channel, said base member having mounting means for mounting said base member to a support member;
a support plate rotatably mounted to said base member substantially parallel thereto such that said support plate can rotate with respect to said base member;
a rotational means interconnecting said base member and said support plate permitting rotation of said support plate with respect to said base member;
a control means interconnected to said support plate operably controlling the rotation of said support plate;
whereby said control means can be operated to release said support plate and permit rotation of said support plate with respect to said base member and to lock said support plate in a fixed position with respect to said base member.

4,893,748
HEATING METHOD AND DEVICE FOR VEHICLES REQUIRING LIMITED POWER
David Baldacci, Toulouse, France, assignor to ABG SEMCA, Paris, France
Continuation of Ser. No. 843,223, Mar. 24, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 154,494
Claims priority, application France, Mar. 26, 1985, 85 03392
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A **10 Claims**



1. Heating device for vehicles with limited power, of the type comprising air conditioning by flowing atmospheric air over a coolant fluid circuit comprising a compressor whose delivery side is connected to a condenser then to a buffer reservoir, a thermostatic valve and an evaporator, further comprising a diverting means for diverting the delivery from the compressor to a depression generating device for heating the atmospheric air flow through the evaporator in order to heat this air, which causes expansion of the coolant fluid in the gaseous phase without loss of energy, before it enters the cabin,

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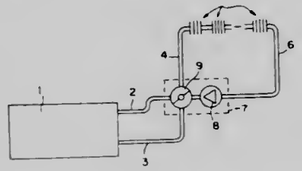
said diverting means and depression generating device being connected between the delivery side of the compressor and the evaporator.

4,893,749

MIXER VALVE FOR HEATING INSTALLATIONS

Karl Schichl, Warngau, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,745
Int. Cl.[4] F16K *19/00*; F24H *9/20*
U.S. Cl. 237—8 C **7 Claims**



1. In a mixer valve suitable for a heating installation having a hot water inlet, a heater line outlet, a heating return inlet, and a boiler return line outlet communicating with the interior of the mixer valve and a mixer actuator provided with blades disposed within the interior of said mixer valve for directing water flow within the interior of said valve from the hot water inlet to the heater line outlet and heating return line inlet to the boiler return line outlet, said valve integrated within the housing of a circulating pump and controllably coupled to a running wheel drive within the circulation pump for effecting movement of the blades and thereby directing flow of hot water therefrom and return of heating water thereto, the improvement which comprises:

an actuator having blades of a reduced width relative to a space defined therefor within said interior, thereby creating a space between the ends of the blades and the interior such that about 10 percent of any hot water supplied through said hot water inlet will mix with any water returned through said heating return line inlet regardless of a position of the actuator, whereby the heating water returning along the boiler line is reliably heated prior to returning to the heating installation.

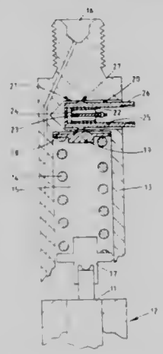
4,893,750

FUEL INJECTION NOZZLE

Roy Haworth, Greenford; Michael F. Russell, Chalfont St. Peter, and Adrian R. Tolliday, Kingslynn, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Aug. 5, 1988, Ser. No. 229,180
Claims priority, application United Kingdom, Aug. 15, 1987, 8719372
Int. Cl.[4] G01M *15/00*; F22G *7/14*
U.S. Cl. 239—71 **6 Claims**

1. A fuel injection nozzle for supplying fuel to a compression ignition engine comprising a valve member which is biased to a closed position by means of a spring and which is moved to an open position against the force exerted by the spring by fuel under pressure supplied to an inlet, the nozzle including a body which defines a support surface for the end of the spring remote from the valve member, the nozzle further including a transducer for providing an electrical signal indicative of when the valve member moves to the open position, characterised in that said body defines a blind bore which is open to the exterior of the body, said transducer being located in said bore, and the bore being located in the vicinity of said surface whereby the transducer will provide an electrical signal indicative of changes in the stress in the spring as the valve member is moved to the open position wherein said transducer is contained within a tubular member which is located in the bore, the tubular member being provided with a rib which is a close



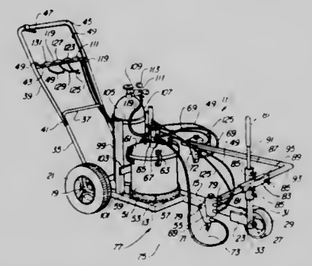
fit within the bore to concentrate deformation of said tubular member to maximize the output of said transducer.

4,893,751

CARBON DIOXIDE POWERED STRIPING MACHINE FOR PAINTING LONG TERM PARKING SURFACES

Carl R. Armstrong, 8386 Homer St., Detroit, Mich. 48209

Filed Aug. 5, 1988, Ser. No. 228,938
Int. Cl.[4] E01C *23/16*
U.S. Cl. 239—150 **7 Claims**



1. A striping machine for painting parking surfaces including long-term parking surfaces comprising:

a frame having a platform;

a laterally arranged arm upon one side of the frame and extending forwardly thereof;

a pair of rear wheels journaled upon the frame;

a front wheel journaled upon one end of said arm;

said wheels being movable over the parking surface to be striped;

an upright support post secured to said arm;

a transverse support tube slidably and adjustably mounted upon said post relative to the parking surface;

a first upright spray head mounted upon said support tube and having a depending normally closed spray outlet directed toward said surface;

a pressurized paint pot storing paint mounted upon said platform and having an outlet conduit connected to said spray head;

a rearwardly and upwardly inclined U-shaped handle connected to said frame;

a tank of carbon dioxide pressurized in the range of 800 to 1500 psi, mounted and anchored upon said platform and having an outlet;

a manifold pipe connected to said tank outlet and having a plurality of outlet connections;

a first conduit interconnecting a first one of said outlet connections and said first spray head for pressurizing said spray head with carbon dioxide;

a second conduit interconnecting a second one of said outlet connections on said manifold and said paint pot to pressurize the interior thereof;

a three-way manual control valve mounted upon said handle;

a third conduit interconnecting a third one of said outlet connections on said manifold with said control valve;

said third conduit extending from said control valve and connected to said spray head for controlling opening of the spray outlet;

with said spray outlet adapted for directing a spray of atomized paint onto said parking surface and forming a line thereon as the frame is moved in a rectilinear path along said surface; and

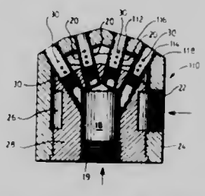
said spray head being inclined forwardly at an acute angle up to 5 degrees for blowing away loose dirt and dust upon the parking surface as the frame is advanced thereon.

4,893,752

SPRAY NOZZLE DESIGN

Donald R. Spink, and Edward F. Spink, both of Waterloo, Canada, assignors to Turbotak Inc., Waterloo, Canada

Filed May 6, 1988, Ser. No. 190,828
Claims priority, application United Kingdom, May 6, 1987, 8710685
Int. Cl.[4] B05B *7/04*
U.S. Cl. 239—427.3 **5 Claims**



1. A nozzle for the formation of an atomized spray of fine liquid droplets in a continuous gaseous phase or of fine gas bubbles in a continuous liquid phase, which comprises:

first chamber means for communicating with a source of liquid,

second chamber means for communicating with a source of gas,

a plurality of individual cylindrical mixing chamber means communicating with said first and second chamber means for mixing said gas and liquid to form a two-phase mixture of said gas and liquid in each of said individual cylindrical mixing chamber means for ejection from said nozzle, and

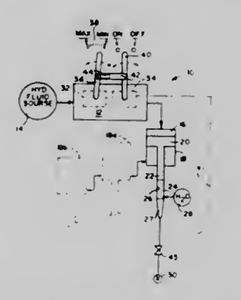
a plurality of cylindrical orifice means immediately downstream of, of the same diameter as and communicating with said plurality of individual cylindrical mixing chamber means with each combination of cylindrical orifice means and cylindrical mixing chamber means being arranged at a different angle with respect to each other for ejection of said two-phase mixture from each said individual mixing chamber to form said atomized spray.

4,893,753

PRESSURE SPIKE SUPPRESSING APPARATUS

Jose P. Munoz, Joplin, Mo., and Raymond M. Jordan, Wixom, Mich., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 69,914, Jul. 6, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,082
Int. Cl.[4] A63H *3/18*
U.S. Cl. 239—578 **7 Claims**



1. A waterjet cutting apparatus for limiting pressure spikes caused by hydraulic pressure surges, comprising:

hydraulic pump means for pressurizing hydraulic fluid used to operate the apparatus;

an intensifier driven by the hydraulic pump means;

an on-off nozzle valve coupled to the pump means and to the intensifier;

a first linkage;

a second linkage having a lost motion slot formed therein;

an output control means in the pump for controlling output from the pump and controlling the level of hydraulic fluid pressure admitted to the intensifier;

a first control arm coupled to the output control means and movable between a "MAX" and a "MIN" position;

an on-off nozzle valve actuator means for opening and closing the on-off nozzle valve remotely with the first linkage;

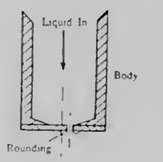
a second control arm coupled to the on-off nozzle valve actuator means and movable between an "ON" and an "OFF" position, the first and second control arms being interconnected by the second linkage, whereby the lost motion slot permits the first control arm to move from the "MAX" to the "MIN" position before the nozzle valve is closed by movement of the second control arm to the "OFF" position, thereby suppressing pressure spikes.

4,893,754

GENERATION OF FLAT LIQUID SHEET AND SPRAYS BY MEANS OF SIMPLE CYLINDRICAL ORIFICES

Francisco Ruiz, 831 S. Euclid Ave., Oak Park, Ill. 60304

Filed Nov. 13, 1987, Ser. No. 119,973
Int. Cl.[4] B05B *1/04*
U.S. Cl. 239—601 **1 Claim**



1. An atomizer for generating a flat liquid sheet spray comprising:

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a hollow cylindrical container having a central longitudinal axis, said container being devoid of any obstacle to fluid flow and devoid of any additional air supply, said hollow cylindrical container having a substantially flat closed end; and

an orifice disposed in said flat closed end eccentrically offset from the axis of said container, said orifice being cylindrical and having a length substantially equal to its width and having an adjacent outwardly flared portion to provide a gradually opening outlet; and

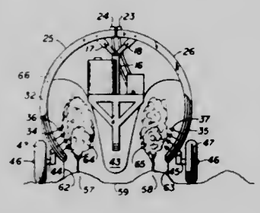
wherein the eccentricity of the orifice enables generation of a secondary flow of liquid consisting of a pair of counter-rotating vortices so that the flat liquid sheet spray emerges through said orifice, said flat liquid sheet spray being stabilized by the Coanda effect acting on said gradually opening outlet.

4,893,755

PESTICIDE SPRAYING APPARATUS

J. Phillip Keathley, 25330 S. Raess Rd., Ripon, Calif. 95366

Filed Oct. 31, 1988, Ser. No. 265,267
Int. Cl.[4] B05B *5/00, 1/20, 15/04*
U.S. Cl. 239—696 10 Claims



1. In the apparatus for spraying pesticides or the like comprising:

an arcuately configured canopy open at each end forming a front door and rear door and having a substantially imperforate arcuate inner wall and open along the bottom thereof;

roller means on the exterior of said canopy for rolling the same along a horizontal surface; and

fluid conduit means extending along the upper portion of said inner wall having a plurality of apertures therealong for directing fluid arcuately along said inner arcuate wall, said fluid conduit means also opening along the interior of both said front and rear doors and directing fluid in a direction generally parallel to the plane of said front and rear doors to provide "air doors" thereat

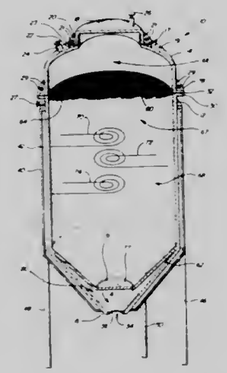
wherein said fluid conduit means includes first fluid directing means for directing fluid in a first direction from said front door to generally the middle of said canopy generally parallel to the curve of said arcuate inner wall and second fluid directing means for directing fluid in a second direction from generally the middle of said canopy to said rear door generally parallel to the curve of said arcuate inner wall opposite that of said first directing means.

4,893,756

HYDRIDE REACTOR APPARATUS FOR HYDROGEN COMMINUTION OF METAL HYDRIDE HYDROGEN STORAGE MATERIAL

Michael A. Fetcenko, Royal Oak; Thomas Kaatz, Drayton Plains; Steven P. Sumner, and Joseph LaRocca, both of Warren, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sep. 22, 1988, Ser. No. 247,569
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—33 25 Claims



1. Apparatus for size reduction of metal hydride hydrogen storage alloy material, said apparatus comprising:

(a) a reactor body having a substantially hollow interior volume, said volume divided into at least two regions, a comminuting first region and a collection second region;

(b) at least one reaction gas inlet port into said hollow interior volume and one reaction gas outlet port therefrom;

(c) heating and cooling means for maintaining said interior volume at a preferred temperature;

(d) means for loading said materials into and unloading said materials from the interior of said reactor body; and

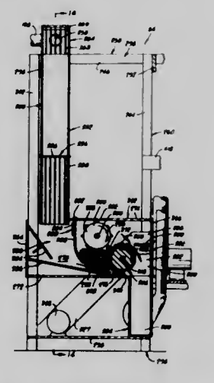
(e) a rigid, wide mesh, wire screen adapted to support said hydrogen storage alloy material within said first region of said reactor body so as to provide maximum surface area exposure of said bulk materials, said wire mesh screen further adapted to provide for a uniform, low density powder bed of comminuted hydrogen storage alloy material in said second collection region to insure easy unloading thereof.

4,893,757

APPARATUS AND METHOD FOR PRODUCING WEIGHED CHARGES OF LOOSELY AGGREGATED FILAMENTARY MATERIAL FROM COMPACTED BALES OF THE MATERIAL

Donald E. Weder; E. H. Weder; Howard M. Ruth, all of Highland; Michael J. King, Staunton, all of Ill.; Franklin J. Craig, Valley Park, Mo.; Larry J. Jones, Highland; Kenton D. Badgley, Alton, both of Ill.; Harry J. Saider, deceased, late of Phoenix, Ariz.; S. Owen Dye, Highland; Clay R. Wiedner, Trenton, both of Ill.; Bill C. Weder, Highland, Ill.; Robert L. Langenberg, San Jose, Calif., and Laura L. Saider (legal representative of said Harry J. Saider, deceased), assignors to Highland Manufacturing and Sales Company, Highland, Ill.

Division of Ser. No. 916,892, Oct. 8, 1986, Pat. No. 4,776,521, which is a division of Ser. No. 640,517, Aug. 13, 1984, Pat. No. 4,646,388. This application Mar. 3, 1988, Ser. No. 163,596
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—34 14 Claims



1. An apparatus for disintegrating bales of compacted filamentary material, comprising:

a tubular drum having an input port at one end thereof and an output port at the other end thereof;

support means for supporting the drum and rotating the drum about the drum axis, wherein a plurality of spikes are fixed to the drum to extend from the wall of the drum into the interior of the drum, each spike having a hook portion extending generally in the direction of rotation of the drum to terminate in a free end for snagging the filamentary material as the drum rotates; and

a blower positioned adjacent the input port of the drum and facing the drum to direct a stream of air through the drum from the input port thereof to the output port thereof.

4,893,758

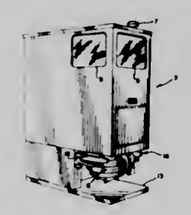
BREWING FUNNEL SUPPORT MEANS FOR COFFEE GRINDERS

Henry L. Foley, Chatham; Raymond Bledsoe, Springfield, and James H. Anson, Auburn, all of Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Feb. 27, 1989, Ser. No. 315,802
Int. Cl.[4] A47J *42/40*
U.S. Cl. 241—100 6 Claims

1. In combination with a coffee-grinder having a downwardly discharging ground coffee outlet in a horizontal underside surface of an overhanging portion of said grinder, means for releasably supporting one at a time brewing funnels which are non-uniform in respect to size and shape each having a rim and support flange at its rim in insertable and removable relationship with respect to said grinder comprising:

a pair of bifurcated spring clips each clip having a proximal end and a distal end on each of its branches and including mounting means on its proximal end mounted to said grinder so that said spring clips extend in cantilever manner and brewing funnel support relationship beneath said horizontal underside surface, each said branch being one of a cooperating pair and each said pair of branches being vertically spaced with respect to each adjacent pair, said pairs of branches having different sizes for supporting brewing funnels having sizes falling in different respective size ranges, the brewing funnel engaging portions of said



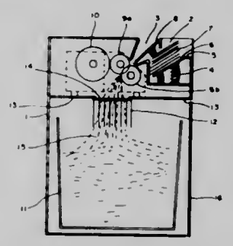
spring clips being spaced sufficiently below said horizontal underside surface so as to accommodate between said surface and said clips said flange on the rim of a supported brewing funnel, each said branch having an arcuate formation between its distal and proximal ends which formation supportingly engages an inserted brewing funnel and each said pair of clips being sufficiently yieldably spreadable without appreciable permanent distortion to permit insertion of a brewing funnel having a size in its said respective size range.

4,893,759

PAPER SHREDDER WITH CHARGE REMOVING MEANS

Takehisa Mizobata, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 163,693, Mar. 3, 1988, abandoned. This application May 18, 1989, Ser. No. 355,121
Claims priority, application Japan, Mar. 5, 1987, 62-32777
Int. Cl.[4] B02C *4/28*
U.S. Cl. 241—100 8 Claims



1. In a paper shredder having paper shredding means and a receptacle means below said paper shredding means for receiving and storing pieces shredded by said paper shredding means, the improvement wherein said shredder further comprises charge removing means disposed below said paper shredding means and above said receptacle means for removing static electricity from pieces shredded by said paper shredding means before said shredded pieces contact said receptacle means.

4,893,760

MIXING ARM FOR A DOMESTIC FOOD PROCESSOR

Bernard Bois, and Alain P. C. Bouverie, both of Sté Moulinex-Z.I., Route de St-Jean-des Baisants, 5000 St. Lo, France

Filed Dec. 20, 1988, Ser. No. 286,883
Claims priority, application France, Dec. 31, 1987, 87 18474
Int. Cl.[4] B02C *18/22*
U.S. Cl. 241—282.2 9 Claims



1. A mixing arm, especially for chopping foodstuffs immersed in a liquid and comprising;

a tubular guard having an upper part adapted to be mounted on a drive unit and a lower part comprising a bell having a top wall;

a rotatable shaft disposed longitudinally in the tubular guard and having an upper end adapted to be coupled to a rotating drive to be driven at high speed by the drive unit, and a lower end which passes through the top wall of the bell; and

a mixing tool fixed to the lower end of the shaft for rotation therewith and extending transversely to the shaft;

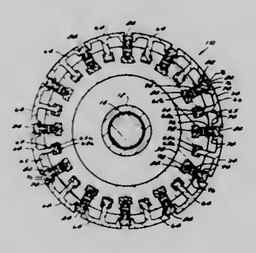
wherein the bell further comprises a partition extending downwards and transversely beneath the top wall of the bell and thus dividing the space beneath the bell into a suction zone in which the mixing tool is located and a compression zone situated between the external face of the partition and the corresponding wall portion of the bell; the upper region of the partition having an oblong transfer opening extending in width in the partition and making the suction zone communicate with the compression zone.

4,893,761

AIR PRESSURE ACTIVATED COLLET

Benjamin A. Gay, Spartanburg, S.C., assignor to Gay & Wagner Research Corporation, Spartanburg, S.C.

Filed Mar. 30, 1988, Ser. No. 175,207
Int. Cl.[4] B65H *54/54, 75/30*
U.S. Cl. 242—46.4 6 Claims



1. A collet for use in winding continuous filaments comprising:

(a) a shaft with a central axis;

(b) a hub assembly rotatably mounted on said shaft;

(c) a housing assembly associated with said hub assembly for rotation therewith, said housing assembly including:

(i) a plurality of finger means and wedge means mounted for movement substantially along radial lines emanating from said central axis between respective retracted positions and expanded positions;

(ii) said finger and wedge means each having heads with curved outer surfaces collectively forming a substantially continuous surface when in said respective expanded positions, each of said finger means having a shoulder extending from a terminal end of each side and said head of each wedge means engaging said shoulder of adjacent finger means when said wedge means are moved inwardly to move said finger means to said retracted position, said finger means coupled to said wedge means and moving to said expanded position in response to outward movement of said wedge means; and

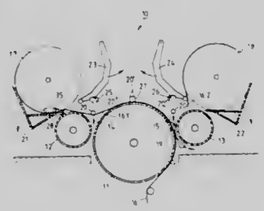
(d) means for moving said wedge means between said respective expanded and retracted positions.

4,893,762

WINDING MACHINE WITH A DEVICE TO SEVER THE WINDING ROLL FROM THE WEB

Friedrich Kuhn, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,895
Claims priority, application Fed. Rep. of Germany, May 5, 1988, 8805965[U]
Int. Cl.[4] B65H *19/26*
U.S. Cl. 242—56 R 6 Claims



1. A winding machine comprising:

a drum, across which a web to be wound is guided;

a lowering table for taking up and ejecting a winding roll from said machine;

severing means for severing a winding roll from a tensioned web, said severing means being embedded in a plate of said lowering table and located along an edge area of said lowering table near said drum;

actuating means, connected to said severing means, for moving said severing means between a rest position and an operating position;

said severing means adapted to move out of said plate when said actuating means enables said severing means to assume an operating position.

4,893,763

ROLL SUPPORT AND FEED APPARATUS

R. Langdon Wales, Lincoln, and H. W. Crowley, Newton, both of Mass., assignors to Roll Systems, Inc., Burlington, Mass.

Filed Dec. 22, 1987, Ser. No. 136,812
Int. Cl.[4] B65H *19/30*
U.S. Cl. 242—58.6 41 Claims

1. Apparatus for supporting and feeding web material from a roll having a support core to a utilization means that draws the web material thereto, said apparatus comprising;

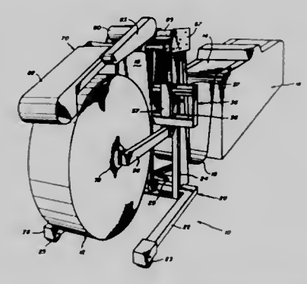
a frame having a base with wheel means for support and movement of the frame, and upright support means extending from said base at one side thereof,

arm means including a pair of spacedly disposed arms,

chuck means supported at the free ends of said arm for receiving the roll core for support of the web material roll,

means for supporting the arm means from said frame with the arms extending from said upright support means in spaced apart relative parallel position and disposed over the frame base,

drive means including a drive belt for engaging the outer periphery of the roll to drive the roll,



means for supporting the drive means from the frame including a support member for support of the drive belt and pivotally connected at one end thereof to said frame at a position over said arms,

roller means receiving the web material from the roll for support and guiding of the web material between the roll and utilization means,

means for supporting the roller means at a location from the upright support means and that is over the position where the arms extend from the upright support means,

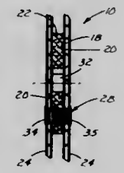
and control means for sensing the draw of the web material into the utilization means to in turn control the rate of the drive of the drive means.

4,893,764

COMPONENT REEL

Timothy J. Justanes, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 9, 1988, Ser. No. 204,676
Int. Cl.[4] B65H *75/14*
U.S. Cl. 242—71.9 10 Claims



1. A reel adapted to carry a helically wound packaging tape comprising a carrier tape with spaced pockets containing components along its length and at least one cover tape adhered over the pockets to enclose the components, said reel comprising:

a generally cylindrical hub of a resiliently flexible material, having an axis, side surfaces at right angles to said axis, and a peripheral surface;

two circular flanges of a material having greater rigidity than said hub each having an axis, having opposite major side surfaces, being of substantially larger diameter than said hub, and being positioned coaxially along opposite side surfaces of said hub; and

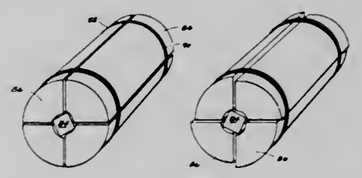
means fastening said flanges together through said hub and axially compressing said hub for providing a predetermined dimension for said reel axially of said hub and flanges, said means comprising a plurality of spaced rivets extending axially through the flanges, each of said rivets including a hollow tubular portion and a cylindrical portion frictionally engaged in said tubular portion a distance sufficient to provide the desired axial dimension for the reel.

4,893,765

FRICTION CORE HOLDER

Glenn E. Randolph, 5234 Furman Rd., Charlotte, N.C. 28210

Continuation-in-part of Ser. No. 115,484, Nov. 2, 1987. This application Jan. 25, 1989, Ser. No. 301,633
Int. Cl.[4] B65H *75/22*; B23B *31/40*
U.S. Cl. 242—72 R 21 Claims



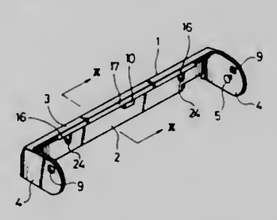
1. Apparatus for holding a coiling tube on to a mandrel, said mandrel having longitudinal flat surfaces, said apparatus comprising a plurality of arcuate tube insert segments, each of said segments having an inner arc, an outer arc, and two end sections defining the entire peripheral edge of the segment, each of said inner arcs and said outer arcs having a corresponding center point defining a circle upon which each of said inner and outer arcs lie respectively, wherein the centerpoint of said inner arc and the centerpoint of said outer arc are offset by a predetermined distance of from about 0.015 to about 0.35 inches, whereby when said arcuate segments are mated, the peripheral edges abut to form stops that limit the relative rotation of the mandrel and the apparatus.

4,893,766

TAPE CASSETTE HAVING A FRONT LID AND A BACK LID

Shuichi Yamashina, Tochigi; Minoru Yahagi, and Yuji Iwahashi, both of Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 279,539
Claims priority, application Japan, Dec. 28, 1987, 62-200440
Int. Cl.[4] G11B *23/04*
U.S. Cl. 242—198 4 Claims



1. A tape cassette in which upon non-use a tape-exposed portion is closed by a front lid and a back lid provided at said

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tape-exposed portion of a reel-to-reel type tape cassette, comprising an injection gate provided at a thick portion of a top plate of said front lid at its central portion so that when said front lid is opened, said injection gate portion is untouchably covered by a recess of said back lid, said injection gate being used to mold said front lid.

4,893,767

HELICOPTER CABLE AND EQUIPMENT GUIDE WITH SHOCK ABSORBENCY

John R. Ferraro, Clinton; Philip P. Foerster, Waterbury; Alan Rockall, Oxford, all of Conn., and Steven R. Schwarz, Cranbury, N.J., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 24, 1988, Ser. No. 210,960
Int. Cl.[4] B64C *1/22*
U.S. Cl. 244—118.1 **10 Claims**



1. A guide for disposition within an opening in the fuselage of a helicopter for deploying and retrieving equipment tethered to the interior of said helicopter by a cable, said guide comprising a funnel for receiving said cable and equipment therethrough said funnel being mechanically loaded by the impact of said equipment thereon and by said cable bearing thereagainst, said guide being characterized by:

said funnel comprising a single thickness of a malleable and polishable material; and

means for mounting said funnel for three dimensional movement thereof with respect to said helicopter fuselage, said mounting means comprising:

a first shock absorbing means for accommodating said loading by resiliently opposing vertical movement of said funnel independently of any longitudinal or lateral movement thereof; and

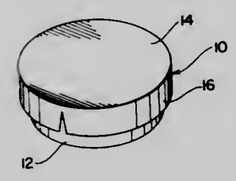
a second shock absorbing means, mounted separately from said first shock absorbing means, for accommodating said loading by resiliently opposing longitudinal and lateral movement of said funnel independently of any vertical movement thereof.

4,893,768

UTENSIL REST AND COMBINATION THEREOF WITH FOOD CONTAINER

Anson L. Hall, 22 Daggett Rd., Attleboro, Mass. 02703

Filed Jun. 20, 1988, Ser. No. 208,978
Int. Cl.[4] A47G *21/14*
U.S. Cl. 248—37.3 **12 Claims**



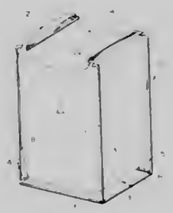
1. A utensil rest comprising a bottom wall portion adapted to be received on a supporting surface and an upstanding peripheral sidewall portion on said bottom wall portion, said sidewall portion terminating in an upper edge and having a pair of spaced upwardly opening peripheral notches therein for receiving and supporting the blade end portion of a table knife so that it is received in both of said notches, said bottom wall portion and said peripheral sidewall portion being dimensioned for supporting the eating end portion of an additional table utensil on said upper edge when said table knife is received in said notches and being further dimensioned such that the handle end portions of said table knife and said additional table utensil are supportable on said supporting surface with said table knife and said additional utensil in substantially parallel relation when the blade end portion of said knife is received in said notches and the eating end portion of said additional utensil is supported on said upper edge.

4,893,769

SUPPORT FRAME FOR PLASTIC BAGS

John L. Rotelli, 706-32nd Ave., San Francisco, Calif. 94121

Continuation of Ser. No. 933,865, Nov. 24, 1986, abandoned.
This application Jan. 4, 1989, Ser. No. 295,010
Int. Cl.[4] A63B *55/04*
U.S. Cl. 248—97 **2 Claims**



1. A support frame with limp plastic bags having strap like hand-grips, comprising:

(a) a unitary base quadrilateral in its configuration and formed from four integral rod-like members lying in a common horizontal plane;

(b) a pair of flexible upright side members extending vertically upwardly from two opposite sides of said unitary base, each side member formed from a pair of perpendicularly extending posts lying in a common plane and having an upper end and a lower end and being integrally attached at the lower end to said base, each side member defining an outer face and an inner face the inner face of one side member being opposed to the inner face of the other side member and parallel therewith when upright;

(c) horizontal inwardly extending hook means having inner and outer ends and shallow U-shaped middle sections, the outer ends being integral with the upper ends of corresponding flexible side members and lying inside the plane in which the corresponding said side members lie said hook means receiving, positioning and retaining in an open position said limp plastic bag with said hand-grips removably draped in said U-shaped middle sections of said hook means, whereby said plastic bag is suspended over said base and between said side members; and

(d) a pair of elongated generally parallel handles lying in a common horizontal plane, each handle being integral with the inner ends of the hook means formed on corresponding side members, and proximate the upper end of each side member, each handle being spaced laterally inwardly from said hook means and toward the other handle from the inner face of its corresponding side member whereby the handles lie inside said hook means and thus inside the hand-grips of a plastic bag draped in said U-shaped middle sections of said hook means, said flexible side members being sufficiently flexible that upon grasping of said handles the upper ends of said flexible side members are displaced toward each other, thereby simultaneously closing

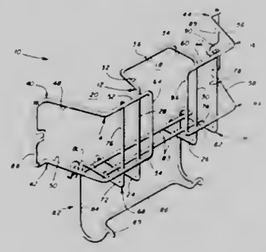
the opening of the limp plastic bag for transportation purposes.

4,893,770

APPLIANCE AND ACCESSORIES ORGANIZER

Thomas R. Bejak, LaGrange Park, and John P. Chap, Lemont, both of Ill., assignors to Selfix, Inc., Chicago, Ill.

Filed Jan. 13, 1989, Ser. No. 297,556
Int. Cl.[4] D06F *75/40*
U.S. Cl. 248—117.1 **15 Claims**



1. A storage device for household appliances and related items mountable on a support, comprising:

a frame assembly defining a generally upwardly opening appliance storage region and a pair of additional storage regions adjacent thereto;

hanger means depending from said frame assembly and configured to support an article hung therefrom of the type having a portion depending below said hanger means;

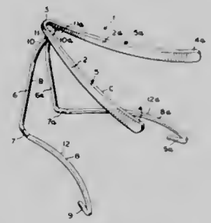
said hanger means comprising a pair of spaced-apart, forward opening hook means, each connected to said frame assembly, and means interconnecting said hook means for maintaining a substantially constant spacing therebetween, said interconnecting means being located to permit access by an article with such a depending portion to both of said hook means through said forward opening portion for support thereon.

4,893,771

COOKING POT LID STAND

Glenn T. Kaneshiro, 99-217 Leomanu Pl., Aiea, Hi. 96701

Filed Dec. 5, 1988, Ser. No. 279,958
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—176 **3 Claims**



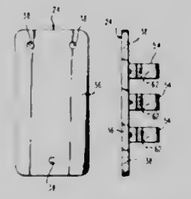
1. A stand comprising of a base and a cradle; the base includes two L-shaped rods; the cradle includes a V-shaped bar; each L-shaped rod includes a vertical and a horizontal, the vertical has a curved portion and the horizontal has a flat section, an arch, and a bend; each of the two L-shaped rods is attached to the underside of a leg of the V-shaped bar, near an end portion of the V-shaped bar, wherein the V-shaped bar includes an end portion and two legs which are arced outward; each leg includes an arc portion and an end portion.

4,893,772

FITTING FOR WIRE STORAGE PRODUCT

William Scott, 505 Bella Capri Dr., Merritt Island, Fla. 32952

Filed Feb. 22, 1988, Ser. No. 158,410
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—235 **4 Claims**



1. A fitting for securing a shelf to at least two nearby surfaces, said surfaces being skewed relative to one another, said shelf including at least one support rod, said fitting comprising:

a base portion for connection to one of said surfaces;

a bracket portion having an open channel member adapted to receive an end of said support rod; and,

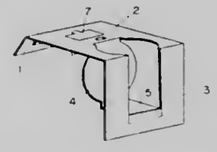
hinge means connecting the base portion to the bracket portion, whereby said base portion of said fitting can be connected to one of said surfaces, whereby the bracket portion can be pivoted about the hinge means relative to the skew angle between said surfaces, so as to permit engagement between said open channel member and said end of said support rod and wherein said channel member comprises at least one upwardly opening channel, whereby an end of said support rod can be positioned in said channel by moving said end of said support rod in a direction substantially parallel to said surface and through said open end into said channel.

4,893,773

ARTICLE HOLDER FOR USE IN A CAR DOOR

Takeo Fujimoto, #A102 Migawa Manshion 85-2, Migawa 2-chome, Mito-shi, Ibaraki-ken, 310, Japan

Filed Oct. 18, 1988, Ser. No. 259,289
Claims priority, application Japan, Mar. 22, 1988, 63-37388[U]
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 **4 Claims**



1. A collapsible article holder for use in a car door comprising:

a strip of sheet material having an insertion portion, a lateral holding portion and a longitudinal holding portion; said insertion portion being adapted for insertion between a window and an inside surface of said car door and having an engagement member provided at a central portion thereof, said engagement member being defined by a

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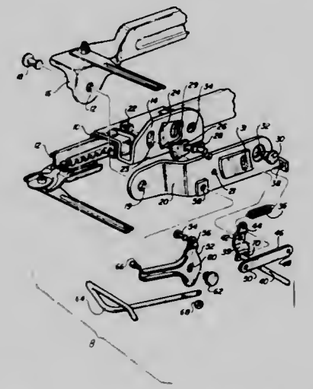
plurality of cut-lines and a fold-line and adapted for engagement with said inside surface of said car door so as to force said insertion portion into contact with said window, said insertion portion being joined to said lateral holding portion through a plurality of fold-lines, said plurality of fold-lines serving as means for adjusting the location of said engagement member inside said car door; said lateral holding portion being adapted to extend in a lateral direction away from said car door and comprises a support member and a truncated disc member, said support member having at least one fold-line provided therein and a tab portion adapted for insertion into a slit provided in said lateral holding portion to fixedly secure said support member in a desired position, said support member additionally being adapted for engagement with an upper surface of said car door at a fold-line provided therein and support said lateral holding portion thereon, said truncated disc member being defined by fold-lines provided at a forward and rearward portion thereof and a plurality of cut-lines joining said fold-lines and adapted to form an opening in said lateral holding portion said truncated disc member being joined to said lateral holding portion at said forward portion fold-line when said truncated member is disposed in a vertical position, said lateral holding portion being joined to said longitudinal holding portion by a pair of fold-lines; said longitudinal holding portion having a lateral article support member defined therein, said lateral article support member being defined by said truncated disc rearward portion fold-line, at least one lateral article support member rearward portion fold-line and a pair of cut-lines and forming a lateral support surface when said truncated disc member is disposed in said vertical position.

4,893,774

RECLINER MECHANISM FOR AUTOMOBILE SEATS

Edward A. Cornsell, Oxford, and Elaine S. Schultz, Troy, both of Mich., assignors to Semec, Inc., Troy, Mich.

Filed Nov. 7, 1988, Ser. No. 268,128
Int. Cl.[4] A45D *19/00*
U.S. Cl. 248—398 **3 Claims**



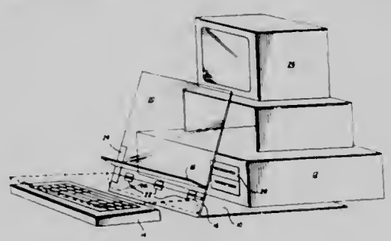
2. A recliner mechanism for an automobile seat assembly mounted on a vehicle floor comprising:
- a first plate member constrained from rotating relative to the vehicle floor;
- a second plate member selectively lockable with said first plate member;
- locking gear teeth formed within a recess in said first plate member;
- a pawl member operably connected to said second plate member;
- said pawl member sandwiched between said recess in said first plate member and a recess in said second plate member and being actuated into and out of engagement with said locking gear teeth of said first plate member to selectively lock said second plate member at a selected rotated position with respect to said first plate member;
- said second plate member being pivotally connected to said first plate member at a first axial position on said second plate member;
- a pin being disposed in said second plate member at a second axial position on said second plate member, said pin including a cam member which engages said pawl member;
- a slot formed in said first plate member;
- said pin sliding in said slot for a limited angular extent thus guiding said second plate member when it pivots with respect to said first plate member;
- said pawl member bieng disposed between said first and second axial position on said second plate member;
- an actuator handle being connected to said second plate member operably connected to said pin and said handle acting to actuate said pawl member through said pin and cam member out of engagement with said gear teeth thus allowing said second plate member and an associated vehicle seat to be rotated through a desired angular extent.

4,893,775

COPY HOLDER STAND

Roy J. Long, 8207 Bowie Dr., Omaha, Nebr. 68114-1525

Filed Dec. 16, 1988, Ser. No. 285,426
Int. Cl.[4] A47F *37/14*
U.S. Cl. 248—442.2 **3 Claims**



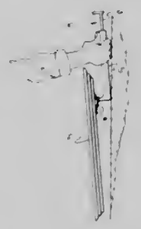
1. A copy holder stand device for use with a computer including a keyboard, said device comprising:
- a planar base adapted to be disposed beneath a computer and behind the computer keyboard;
- an upwardly extending support member attached to the front edge of said base;
- a movable copy holder back against which, in use, materials to be copied rest;
- a hinge means for attaching said movable copy holder back to said upwardly extending support member, said hinge means including a generally horizontal pivot axis for providing pivoting of said movable copy holder back between a first position in which said movable copy holder back projects forwardly and horizontally and a second position in which said movable copy holder back extends upwardly and rearwardly, and forms an extension of said upwardly extending support member so that materials to be copied can rest thereon; and
- abutment means for limiting the degree of motion of said movable copy holder back between said first position and said second position, said abutment means comprising, a shelf mounted perpendicular to, and intermediate to, said upwardly extending support member, the front of said shelf being of the same height as the top of said upwardly extending support member and adapted to maintain the movable copy holder back in said first, generally horizontal, position, and a brace attached parallel to the rear surface of, and extending above, the upwardly extending support member, and adapted to maintain the movable copy holder back in said second, generally upright position.

4,893,776

PICTURE HANGING APPARATUS

John F. Floyd, 858 Glendayln Ave., Spartanburg, S.C. 29302

Filed Sep. 20, 1988, Ser. No. 246,790
Int. Cl.[4] G01B *3/02*
U.S. Cl. 248—475.1 **17 Claims**



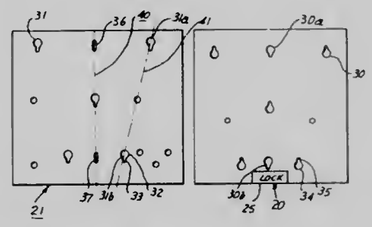
6. A device for locating a point on a surface for installation of a hanger for an item to be hung on the wall comprising: an elongated support element, said element having means thereon for removably receiving an item to be hung, said element further having guide means located opposite said item hanging means; said guide means defining an arcuate surface located along said element; a plunger associated with said elongated element for movement with respect thereto, a marking means operably associated with said plunger and said guide means, said marking means being movable by said plunger between a non-marking and a marking position; said elongated support element defining an opening therealong, said plunger and said marking means being movable along said opening; and said marking means being flexible such that upon being moved by said plunger against said arcuate surface, said marking means deflects generally transversely with respect to said element and moves outwardly from said element to its marking position.

4,893,777

SECURITY MOUNT

Mark M. Gassaway, 2201 Stern La., Oxnard, Calif. 93035

Division of Ser. No. 947,676, Dec. 30, 1986. This application May 19, 1988, Ser. No. 195,942
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—551 **8 Claims**



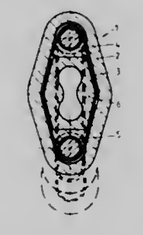
1. A security device comprising:
- a mounting plate adapted to be attached to a surface, said plate having an axis of relative motion, said plate having a plurality of keyhole slots therethrough, each said slot having an enlarged portion and a narrowed neck portion, said neck portions extending parallel to said axis, and a plurality of said slots being disposed at a different location along said axis, at different lateral distances therefrom;
- a coupler respective to each of said last-mentioned slots mounted to structure in a like relationship, each coupler having a shank and a head, the head being proportioned to pass through the enlarged portion but not through the neck portion, the shanks being proportioned to enter the neck portions, the length of the shanks being sufficient to enable the heads to pass through the mounting plate; and releasable lock means to hold the device in a security condition;
- said security device including a base plate adapted to lay parallel to said mounting plate, said base plate being adapted to receive an article to be protected and in which said base plate is provided with a plurality of similarly situated and shaped, but oppositely directed keyhole slots, and said couplers including a second such head spaced from said first head to be passed through the respective enlarged portion, the shank being proportioned to fit in both neck portions.
- said mounting plate includes a plurality of alignment keyhole slots aligned along said axis, with neck portions oppositely directed from the other keyhole slots in said mounting plates; in which an alignment slot is formed in said base plate respective to each alignment keyhole slot, extending axially; and in which an alignment pin comprises a shank, a head to engage in the alignment keyhole slots in said mounting plate, and a pin adapted to fit and slide in said alignment slots, said slots being disposed and arranged as to limit axial movement of the base plate in an unlocking direction.

4,893,778

SUSPENSION SYSTEM FOR AN EXHAUST SYSTEM OF A MOTOR VEHICLE

Walter Dribing, Niestetal, and Kurt Fiedler, Zierenberg, both of Fed. Rep. of Germany, assignors to WEGU Gummi- und Kunststoffwerke, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 267,808
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3737987
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—610 **6 Claims**



1. A suspension eye for an exhaust system of a motor vehicle comprising a pair of spaced bushes (4,5), a continuous band of elastomer material (2) surrounding said bushes and having a generally rhombus-like initial unloaded shape, and a continuous liner (3) of extensible, resiliently compliant material positioned interiorly of said continuous band and surrounding said bushes and having a generally rhombus-like shape dimensionally compatible with said band when said band is in said initial unloaded shape so that said band and said liner change shape from a rhombus shape to an oval shape as said spaced bushes move further apart in response to an increasing load being applied to said pair of spaced bushes substantially without said liner bearing any of the load until said liner assumes a stretched configuration, whereupon a further load applied to said sus-

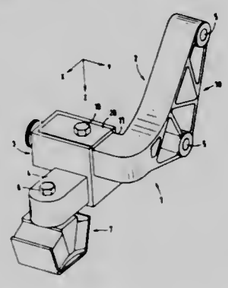
VOL 1110 ISS 3 JA 16 1990 UMI

pension eye causes said liner to bear part of the load applied to said bushes,.

4,893,779
MOUNTING DEVICE FOR POWER TRAIN ASSEMBLY OF A MOTOR VEHICLE

Dieter Bergelt, Rüsselsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1989, Ser. No. 331,711
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811259
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—638 **9 Claims**

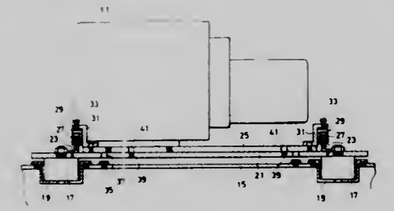


1. Mounting device attaching for a power train assembly of a motor vehicle to a vehicle body by a damping member, characterized in that the mounting device comprises a housing, a bracket slideable and fixable in said housing and connected to the assembly, and a sliding block slideable and fixable in the housing perpendicularly to the direction of sliding of the bracket and connected to the damping member.

4,893,780
GAS BLOWER SUPPORT DEVICE FOR LASER GENERATORS

Ryoji Koseki, La Habra, Calif., assignor to Amada Company, Limited, Japan

Filed Jun. 21, 1988, Ser. No. 210,574
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—638 **2 Claims**

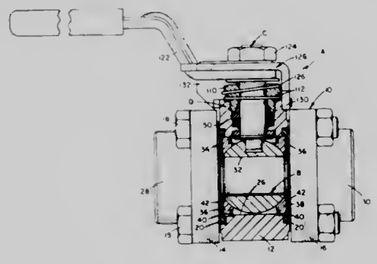


1. A blower support device including means for supporting a blower on a frame of a laser generator comprising:
a plurality of air-mounted isolators disposed on horizontal portions of the frame of the laser generator;
an air-mounted base having a surface supported by the plurality of air-mounted isolators; and
means provided on the air-mounted base for supporting the surface of the air mounted base wherein the blower supporting means comprises a plurality of guide rails provided on the air-mounted base and a plurality of wheels provided on the blower and engaged with the guide rails.

4,893,781
STEM PACKING ASSEMBLY FOR FREQUENT CYCLING VALVE

Terry M. Kalain, Willoughby; Edward M. Yusko Jr., Denmark, and Peter C. Williams, Cleveland Heights, all of Ohio, assignors to Whitey Co., Highland Hts., Ohio

Filed May 19, 1988, Ser. No. 196,368
Int. Cl.[4] F16K *41/04*; F16J *15/20*
U.S. Cl. 251—214 **12 Claims**

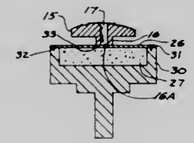


1. A valve comprising:
a body having a chamber communicating with an inlet and outlet;
a valve member disposed in said chamber for selective rotation between open and closed positions;
an actuating stem operatively associated with said valve member extending outwardly from said chamber through a stem passage defined in said body; and,
a packing assembly received in said stem passage and around a portion of said stem, said packing assembly including first, second, third, and fourth members extending respectively outward from said chamber, said first member disposed closest to said chamber, said second member having a greater hardness than said first member, said third member having a greater hardness than said second member, and said fourth member having a greater hardness than said third member, and engaging said body to establish a predetermined compression on said first, second, and third members wherein said second member has a tapering portion engaging a mating, inwardly tapering region of said stem passage for urging said second member toward said stem and limiting extrusion of said first member therepast, said third and fourth members include first and second slippage surfaces for providing axial slipping engagement therebetween.

4,893,782
METALLIC SEAT FOR FLUID VALVE

Charles G. Franke, Hilltown, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 28, 1988, Ser. No. 173,991
Int. Cl.[4] F16K *1/36*
U.S. Cl. 251—356 **6 Claims**

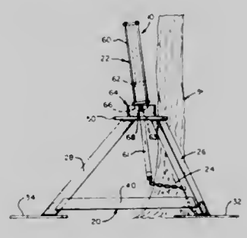


1. A valve head for controlling flow relative to a valve body that has a sealing seat surface for controlling flow through a passageway in the valve body, said valve head comprising a valve head housing, a chamber formed in said valve head housing and having an open side surrounded by a peripheral rim that has an outer edge defining a plane, in substantially planar metal disc overlying said open side and resting on the edge of the peripheral rim, and being sealed with respect to said peripheral rim of said valve head housing to enclose said chamber, and a filling of flowable, substantially non-compressible fluid in said chamber selected for providing support for the disc across the side of the means facing said chamber and relative to the valve head housing.

4,893,783
TREE AND TREE STUMP REMOVAL APPARATUS AND ASSOCIATED METHOD

Robert G. Diener, 1287 Woodruff Pl., Morgantown, W. Va. 26505, and Ian R. Domigan, Lincoln Agricultural College, New Zealand

Continuation of Ser. No. 66,131, Jun. 24, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 303,037
Int. Cl.[4] B66F *1/08*
U.S. Cl. 254—1 **17 Claims**



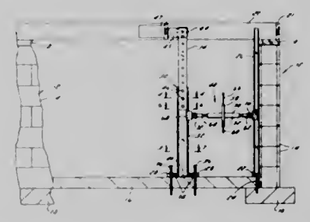
1. A tree removal apparatus comprising
a frame having its upper portion spaced from a lower portion,
pivotally mounted hydraulic means secured near said upper portion of said frame including a cylinder, a piston reciprocable within said cylinder, strut means operatively associated with said piston and extending axially therefrom, and pivot means for permitting rotation of said cylinder relative to said frame, and
engagement means secured to said strut means to engage a tree, whereby said pivotally mounted hydraulic means will apply a generally upward force to said tree through the engagement means in order to effectively lift said tree along with its associated roots out of the ground.

4,893,784
METHOD AND APPARATUS FOR JACKING BASEMENT WALLS

Robert S. Abraham, Wild Rose, and Dennis L. Koehler, Neenah, both of Wis., assignors to Robert S. Abraham, Wild Rose, Wis.

Continuation of Ser. No. 57,353, Jun. 2, 1987, Pat. No. 4,763,878, which is a continuation-in-part of Ser. No. 835,519, Mar. 3, 1986, Pat. No. 4,669,704. This application Jul. 25, 1988, Ser. No. 223,917
Int. Cl.[4] B66F *11/00*
U.S. Cl. 254—100 **6 Claims**

1. Apparatus for jacking a vertical wall having moved inward out of its proper position, said wall resting on a lower surface, said apparatus comprising:
a vertical wall brace having a top end and a bottom end, said bottom end being provided with means for attaching to said lower surface adjacent to said wall to be jacked in such a manner as to permit movement of the brace relative to said attaching means;
an upstanding beam including means for being removably attached to at least said lower surface a suitable distance from said wall to be jacked;

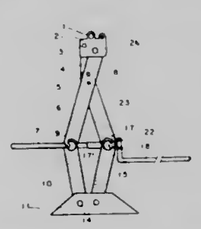


a jacking assembly having two ends, one end slidably attached to said wall brace, the opposite end slidably attached to said upstanding beam, for moving said brace and in turn said wall outward back to its proper position; and
means for anchoring the top end of said brace such that when said wall has reached its proper position, said wall is thereby prevented from moving out of position again.

4,893,785
LIFTING DEVICE

Robert E. Rose, Rua Dr. Procópio Ribeiro dos Santos, 187, City of Sao Paulo, State of Sao Paulo, Brazil

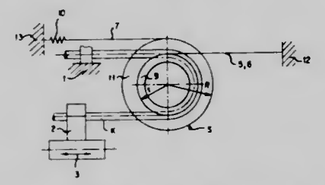
Filed Dec. 3, 1987, Ser. No. 128,203
Claims priority, application Brazil, Jan. 12, 1987, 6700026
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—126 **10 Claims**



1. A compact, pantographic-type jack, comprising
a lower pair of arms supported on a base, an upper pair of arms coupled with said lower pair, with a respective arm of said upper pair being coupled to a respective arm of said lower pair,
one of said arms of said upper pair being longer than the other of said upper pair of arms,
a movable support provided at a free end of said longer arm, and
a support linkage articulated to said shorter arm and coupled to said movable support,
wherein said arms of said upper pair are additionally coupled to one another, and said arms of said lower pair remain uncoupled from one another, and
said longer arm is coupled to said shorter arm at a point on said shorter arm between coupling of said articulated linkage and coupling of said respective lower arm to said shorter arm,
whereby said movable support remains level while said jack is being raised or lowered.

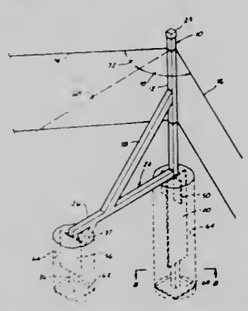
VOL 1110 ISS 3 JA 16 1990 UMI

4,893,786
CABLE CONDUIT APPARATUS
Ernst Huber, Wettingen, Switzerland, assignor to GRETAG Aktiengesellschaft, Regensdorf, Switzerland
Continuation of Ser. No. 89,125, Aug. 25, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 279,299
Claims priority, application Switzerland, Aug. 29, 1986, 3482/86
Int. Cl.[4] B66D *1/50*
U.S. Cl. 254—414 10 Claims



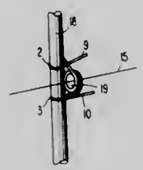
1. A conduit apparatus for a cable connecting a stationary first member with a second member that is displaceable relative to said first member along a linear path, comprising:
a cable having a first end connected to said stationary first member and a second end connected to said displaceable second member;
cable drum means for at least partially looping the cable thereover, said cable drum means having first and second diameters; and
first and second stationarily mounted supporting
cord layouts from which said cable drum means is rotatably suspended and which extend essentially parallel to the linear path and are looped around said cable drum means in directions opposing one another, said first and second cord layouts supporting said cable drum means between opposed stationary parts.

4,893,787
FENCE CORNER POST
Terry D. Watson, P.O. Box 374, Cheyenne, Okla. 73628
Filed Feb. 24, 1988, Ser. No. 159,719
Int. Cl.[4] E04H *17/02*
U.S. Cl. 256—35 5 Claims



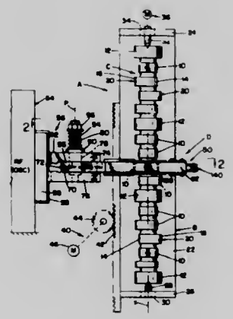
1. A fence corner post assembly comprising:
a steel main post fabricated of square steel tubing and having an upper end, medial portions and a lower end;
a steel brace member welded to the medial portions of the main post, the brace member fabricated of square steel tubing and having a body portion extending substantially perpendicularly from one side of the main post and a downturned leg portion extending substantially parallel to the main post;
a steel strut welded to upper portions of the main post and the body portion and extending therebetween, whereby the main post, brace member and strut are formed into a rigid, generally planar structure;
a steel first stabilization plate welded to the main post and the body portion of the brace member, the first stabilization plate projecting laterally from opposite sides of the main post in the plane formed by the main post, brace member and strut to extend downwardly from the body portion of the brace member a selected distance along the main post toward the lower end thereof;
a steel additional stabilization plate welded to the leg portion of the brace member to project laterally to opposite sides thereof in a substantially perpendicular relation to the plane formed by the main post, the brace member and the strut and to extend along the leg portion a distance from the body portion toward the extensive end of the leg portion;
a steel first anchor plate welded to the lower end of the main post; and
a steel second anchor plate welded to the extensive end of the leg portion of the brace member.

4,893,788
FENCE CLIP
Barry J. Chave, Auckland, New Zealand, assignor to Techlink Development Limited, Auckland, New Zealand
Filed Oct. 24, 1988, Ser. No. 263,413
Int. Cl.[4] B21F *27/08*
U.S. Cl. 256—47 6 Claims



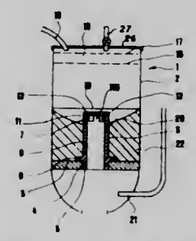
1. A fence clip of elongated wire-like material, said fence clip comprising:
a pair of spaced apart loops resiliently biased into planes inclined one to another;
manually actuable lever means attached to said pair of loops for resiliently moving said pair of loops towards parallel planes relative to one another against the resilient bias thereof and for simultaneously increasing the apparent diameter of each one of said pair of loops when viewed along an axis passing through each one of said pair of loops, and each one of said pair of loops being sufficiently large for causing the apparent diameter of each one of said pair of loops to encircle a fence post or standard for being placed thereon when said lever means biases said loops towards parallel planes, and each one of said pair of loops gripping an encircled post or standard when said lever means no longer biases said pair of loops towards parallel planes and said pair of loops returns to planes inclined one to another; and
holding means attached to said pair of loops for holding a wire, tape, or the like.

4,893,789
METHOD AND APPARATUS FOR HARDENING CAM LOBES ON A CAMSHAFT
Donald E. Novotny, Pleasant Ridge, Mich., assignor to Tocco, Inc., Boaz, Ala.
Division of Ser. No. 944,510, Dec. 22, 1986, Pat. No. 4,759,808. This application May 19, 1988, Ser. No. 195,953
Int. Cl.[4] C21D *9/30*
U.S. Cl. 266—129 19 Claims



1. Apparatus for inductively heating and hardening like finish ground cam lobes axially spaced on a camshaft closely apart a distance less than their axial thickness, said apparatus comprising: an inductor mounted in a fixed position and having a single conductor loop with a cam lobe encircling inner surface contoured to correspond to substantially the entire surface profile of said cam lobes and adapted to receive the cam lobes individually in inductive heating position therein in the same rotatively oriented position about the axis of said camshaft as the inner surface contour of the inductor, with a uniform minimal inductive coupling gap therebetween and completely therearound of less than around 0.1 inch, means mounting and actuating said camshaft for axial and rotative index movement relative to said inductor to position each of the cam lobes of said camshaft individually in said inductor in the said same rotatively oriented position therein, high frequency power supply means for selectively energizing said inductor by input leads at a frequency greater than 200 KHz and with a high intensity power density of at least 25 KW/inch^2 at the surface profile of the cam lobe positioned in said inductor, and means for energizing said power supply for less than 1.0 second whereby to substantially instantaneously inductively heat the said positioned cam lobe uniformly therearound to a predetermined elevated heat treating temperature preparatory to subsequent quench hardening without causing unacceptable heat distortion of the finish ground surface profile of the heated cam lobe and without causing stray flux heating and drawback tempering of the previously hardened adjacent cam lobe, said conductor loop having two elongated segments joined at one end by a pressure electrical connector and connected to respective said input leads at the other ends, and means for allowing said inductor to selectively convert between a heating condition, with said segments electrically connected, and a clearance condition with said segments laterally separated and moved laterally outwardly from said camshaft a distance allowing both the said axial and rotative index movement of said camshaft with respect to said inductor.

4,893,790
APPARATUS FOR PRODUCING METAL ZIRCONIUM BY THE REDUCTION OF ZIRCONIUM TETRACHLORIDE
Jean Boutin, St Martin D'Heres; Pierre Brun, Grenoble, and Alry-Pierre Lamasse, Jarrie, all of France, assignors to Compagnie Europeenne du Zirconium Cezus, Courbevoie, France
Division of Ser. No. 94,425, Sep. 9, 1987, Pat. No. 4,752,331. This application Mar. 15, 1988, Ser. No. 168,151
Claims priority, application France, Sep. 19, 1986, 86 13306
Int. Cl.[4] C22B *34/14*
U.S. Cl. 266—168 14 Claims



14. Apparatus for the production of metal zirconium by reduction of Zr tetrachloride with molten magnesium, resulting in a mass of Zr, Mg and supernatant, molten $MgCl_2$, comprising:
a reactor;
a hearth plate for collecting said mass thereon disposed laterally across the interior of said reactor, said hearth plate having an orifice therein, and defining a portion of said reactor above said hearth plate, and a portion of said reactor below said hearth plate;
means for supplying gaseous Zr tetrachloride to the interior of said reactor above said hearth plate;
means for heating said reactor;
means for drawing a vacuum in said reactor;
chimney means having one end removably fitted into the orifice in the hearth plate end thereby sealingly fixed to the orifice in said hearth plate, and rising therefrom above said hearth plate to a top end at a level corresponding to the expected height of the supernatant $MgCl_2$ at the conclusion of the reduction, said chimney means being at least partially open to its interior at said top end, thereby providing communication and a flow path for molten $MgCl_2$ from the interior of said reactor at said top end through said chimney means and said orifice and to the interior of said reactor below said hearth plate;
a cap connected to the open top end of said chimney means by an apertured connecting portion, said cap and connecting portion comprising a lifting portion;
means for removing molten $MgCl_2$ from the reactor disposed in the interior of said reactor below said hearth plate.

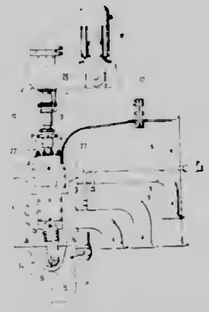
4,893,791
AUTOMATIC LANCE CHANGEOVER DEVICE
Hubert Stoemp, Howald; Carlo Heintz; Andre Kremer, both of Luxembourg; Jean Monsel, Petange, all of Luxembourg; Daniel Fries, Arlon, Belgium, and Serge Devillet, Bissen, Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg
Filed Sep. 7, 1988, Ser. No. 241,530
Claims priority, application Luxembourg, Sep. 7, 1987, 86985
Int. Cl.[4] C21C *5/46*
U.S. Cl. 266—226 14 Claims
1. Automatic lance changeover device for coupling lances to a vertically displaceable lance carriage during metal refining, the substances required for the metal refining being delivered

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to a lance carriage coupling head on the lance carriage and being transferred into the lance, comprising:

at least one pair of lance receiving hooks attached to said lance carriage coupling head, one each of said hooks being positioned on opposed sides of said lance carriage coupling head;

vertical displacement means for the synchronous vertical



displacement of said hooks relative to said lance carriage and to said coupling head;

pivoting means for pivoting said hooks about a horizontal axis of rotation of said hooks while said horizontal axis is vertically displaced by said vertical displacement means; and

load detection means for detecting the load acting on said hooks.

4,893,792

COLD TRAP

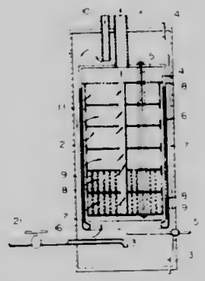
Kiyomitsu Nemoto; Norikatsu Yokota, both of Hitachi; Yoshihiko Sato, Ibaraki; Shigehiro Shimoyashiki, Hitachi; Kenji Mokuya, Hitachi, and Hiroshi Haino, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 268,759

Claims priority, application Japan, Nov. 16, 1987, 62-287330

Int. Cl.[4] C21B *3/04*

U.S. Cl. 266—227 **16 Claims**



1. A cold trap wherein at least one mesh screen and at least one mesh having higher strength and wider mesh holes than said at least one mesh screen are contained within a shell through which liquid passes, each of said meshes is disposed so that the surfaces of the respective meshes intersect the flow of said liquid, and said at least one spacer mesh extends at a location of an inflow surface through which said liquid is delivered to an assembly of said at least one spacer mesh and said at least one mesh screen, at a location of an outflow surface through which said liquid is discharged out of said assembly and in at least one position between adjacent parts of said at least one mesh screen.

4,893,793

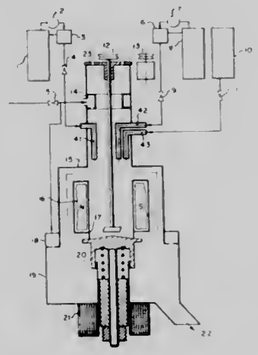
APPARATUS FOR THE MANUFACTURE OF A THERMOSTABLE AMORPHOUS FERROMAGNETIC POWDER

Dimiter T. Butchkov; Yovka D. Dragieva; Zvetan K. Nikolov; Georgi G. Georgiev; Mina S. Slavtcheva-Staikova, and Ivanka S. Grozdanova, all of Sofia, Bulgaria, assignors to VMEI LENIN, Sofia, Bulgaria

Division of Ser. No. 913,786, Sep. 30, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 171,991

Int. Cl.[4] C21C *7/00*

U.S. Cl. 266—233 **8 Claims**



6. An apparatus for manufacture of thermostable amorphous ferromagnetic powder comprising:

a vertical reactor with stirrer and electromagnet for generating a magnetic field, said reactor further comprising:

a reaction vessel with a plurality of inlet tubes, said tubes each being connected by means of valves to a source of reactor solutions, said reaction vessel being provided with overflow tubes connected to a surrounding collecting vessel and said reaction vessel having an openable bottom opening into said collecting vessel,

said apparatus being provided with a plurality of shower washing means for terminating a reaction in said apparatus;

one of said washing means being located above said overflow tubes and another of said washing means being provided below said overflow tubes.

4,893,794

DEVICE FOR MOUNTING A GRIPPER TO A PIERCING MACHINE

Pierre Mailliet, Howald, and Jean Metz, Luxembourg, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Sep. 22, 1988, Ser. No. 250,688

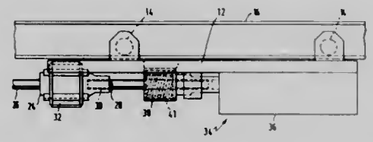
Claims priority, application Luxembourg, Oct. 6, 1987, 87010

Int. Cl.[4] C21B *7/12*

U.S. Cl. 266—271 **5 Claims**

1. Device for mounting a gripper to a working tool, the working tool being mounted on a sliding carriage of a piercing machine, the gripper being adapted for coupling a rod to the working tool for piercing the taphole of a shaft furnace, the gripper having a female thread for threading onto a threaded endpiece of the working tool, including:

support cage means fixed to the sliding carriage, said supporting cage means including means for maintaining vertical and lateral support of the gripper and means for allow-



ing the gripper to slide longitudinally relative to the support cage.

4,893,795

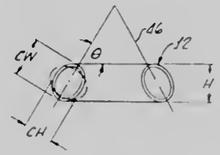
RADIALLY LOADED CANTED COILED SPRING WITH TURN ANGLE

Peter J. Balsells, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsells and Joan C. Balsells, both of Santa Ana, Calif.

Filed Aug. 15, 1988, Ser. No. 232,430

Int. Cl.[4] F16F *1/06*

U.S. Cl. 267—1.5 **16 Claims**



1. A radially resilient canted coiled spring comprising:

a plurality of coil means, interconnected and canted along a centerline thereof, for causing the coiled spring to exert a generally constant force over a preselected range of deflection of the coiled spring in response to radial loading;

back angle means for defining the disposition of a trailing portion of each coil with respect to a line normal to the centerline;

front angle means for defining the disposition of a leading portion of each coil with respect to the normal line, said front angle means being greater than said back angle means; and

means, orienting said plurality of coil means at a turn angle, for controlling the magnitude of the generally constant force within the preselected range of deflection, said turn angle being greater than zero degrees and less than 90 degrees.

4,893,796

PENDULUM VIBRATION ISOLATOR AND DAMPER

Derek F. Hickman, Chessington, and Raymond H. Boshier, Basingstoke, both of England, assignors to Racal Marine Electronics Limited, United Kingdom

PCT No. PCT/GB88/00033, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/05507, PCT Pub. Date Jul. 28, 1988

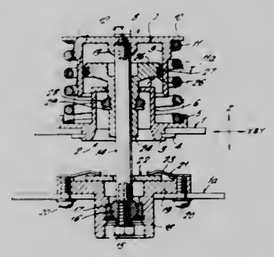
PCT Filed Jan. 19, 1988, Ser. No. 250,626

Claims priority, application United Kingdom, Jan. 27, 1987, 8701772

Int. Cl.[4] F16M *1/00, 13/00;* F16F *1/00*

U.S. Cl. 261—136 **9 Claims**

1. A vibration isolator and damper comprising a base (3), a pendulum assembly (8,14), a spring support (11) which supports one end of the pendulum assembly with respect to the base and provides resilience lengthwise of the assembly while allowing swinging movement of the pendulum assembly, a pivoted coupling means (16,17) provided at the other end of the pendulum assembly, first and second damping means (9,25,22) and first and second means for coupling (7, 28, 19, 23) the first and second damping means to the pendulum assembly



for damping lengthwise and swinging movement of the pendulum assembly only after a predetermined amount of respective lengthwise and swinging movement of the pendulum assembly while supported by the spring support.

4,893,797

HYDROELASTIC SUPPORT, IN PARTICULAR FOR THE SUSPENSION OF A MOTOR IN A VEHICLE

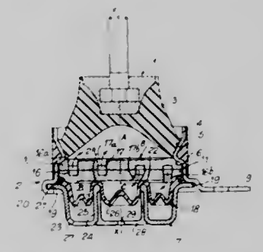
Marcel Le Fol, Chateaugiron, and Pascal Robic, Guignen, both of France, assignors to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly, both of, France

Filed Jul. 6, 1988, Ser. No. 215,516

Claims priority, application France, Jul. 7, 1987, 87 09650

Int. Cl.[4] F16F *13/00*

U.S. Cl. 267—140.1 **8 Claims**



1. A hydroelastic support comprising armatures, a block of elastomeric material interconnecting the armatures, a work chamber partly defined by the block of elastomeric material, and means defining a first expansion chamber, a first duct for connecting the expansion chamber to the work chamber, means defining at least one second expansion chamber, means for isolating the second expansion chamber from the first expansion chamber, the first and second expansion chambers being disposed concentrically, a second cut for connecting the second expansion chamber to the work chamber, the first duct and the second cut having characteristics of length and/or section, said characteristics of the second cut being different from said characteristics of the first duct, said support further comprising liquid filling said chambers, the expansion chambers being disposed on the same side of the work chamber, a rigid partition carried by one of the armatures separating the two expansion chambers, said ducts being at least partly defined in said partition, a single diaphragm defining the expansion chambers with said partition, means for applying an intermediate portion of said diaphragm against the partition in a

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sealed manner, and said means for applying said intermediate portion of said diaphragm against the partition includes a cover which is connected to said armature which carries the partition.

4,893,798

FLUID-FILLED ELASTIC BUSHING HAVING MEANS FOR LIMITING ELASTIC DEFORMATION OF AXIAL END PORTIONS OF ELASTIC MEMBER DEFINING PRESSURE-RECEIVING CHAMBER

Masayuki Hibi, Komaki; Nobuo Matsumoto, Nagoya, and Yoshiki Funahashi, Iwakura, all of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Dec. 5, 1988, Ser. No. 279,794
Claims priority, application Japan, Dec. 7, 1987, 62-309292
Int. Cl.[4] F16M *5/00, 13/00*
U.S. Cl. 267—140.1 **7 Claims**



1. A fluid-filled elastic bushing for damping or isolating a vibrational load, comprising:

an inner sleeve and an outer sleeve disposed radially outwardly of said inner sleeve;

a generally annular elastic member formed between and elastically connecting said inner and outer sleeves, so as to provide an assembly having a plurality of fluid chambers which are spaced apart from each other in a circumferential direction of said sleeves and are filled with a non-compressible fluid, said assembly further having orifice means for fluid communication between said fluid chambers;

a wing member disposed in at least one of said plurality of fluid chambers to which the vibrational load is applied, said wing member being supported by one of said inner and outer sleeves and said elastic member, said wing member cooperating with said assembly to define a restricted portion within each of said at least one fluid chamber; and

a restrictor member fixedly disposed so as to extend in a portion of said elastic member in an axial direction of the elastic bushing, for limiting axial elastic deformation of said elastic member at axial end portions thereof which define opposite ends of said each fluid chamber as viewed in said axial direction of the elastic bushing, and minimizing changes to the restricted portion.

4,893,799

VIBRATION ISOLATION APPARATUS

Etienne de Fontenay, Decize, France, assignor to Kleber Industrie, Versailles Cedex, France

Filed Jan. 22, 1988, Ser. No. 147,296
Claims priority, application France, Jan. 23, 1987, 87 00762
Int. Cl.[4] F16F *9/00*
U.S. Cl. 267—140.1 **13 Claims**

1. A vibration isolation apparatus, said apparatus comprising:

an external tube member;

a first intermediate tube member positioned substantially concentric with and within said external tube member;

said external tube member and said first intermediate tube member forming a first annular space therebetween;

at least one additional tube member positioned substantially concentric with and within said first intermediate tube member;

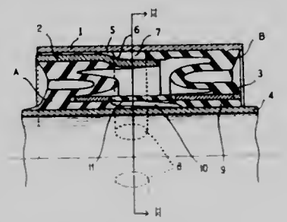
said first intermediate tube member and said at least one additional tube member forming a second annular space therebetween;

said external tube member, said first intermediate tube member and said at least one additional tube member each having a first end and a second end;

first flexible lateral end wall means for flexibly positioning and interconnecting said first ends of said first intermediate tube member and said at least one additional tube member;

second flexible lateral end wall means for flexibly positioning and interconnecting said second ends of said first intermediate tube member and said at least one additional tube member;

a first substantially nonpermeable partition positioned within said first annular space and extending between said first and second flexible lateral end wall means;



substantially nonpermeable divider means for dividing said second annular space into first and second chambers;

first orifice means for establishing communication between said first annular space and said first chamber;

second orifice means for establishing communication between said first annular space and said second chamber; and

a damping fluid contained within said first annular space and said first and second chambers;

wherein said at least one additional tube member is provided with flexible peripheral means for expanding said second annular space in response to pressure transmitted by said damping fluid; and

wherein said flexible peripheral means comprises at least one window opening provided in side at least one additional tube member, and a flexible membrane extending over said at least one window opening.

4,893,800

ELECTRONICALLY CONTROLLED VIBRATION DAMPER FOR MOUNTING AUTOMOTIVE INTERNAL COMBUSTION ENGINES AND THE LIKE

Toshiyuki Tabata, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 11, 1988, Ser. No. 231,014
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 62-201191
Int. Cl.[4] F16M *5/00, 13/00*; F16F *15/03*
U.S. Cl. 267—140.1 **8 Claims**

1. A system comprising:

a first vibratable body;

a second vibratable body;

first and second suspensions, said first suspensions suspending said first vibratable body on said second vibratable body, and said second suspension suspending said second vibratable body on a surface, said first suspension including a mounting device for damping vibration which is applied to said second vibratable body from said first vibratable body by way of said first suspension and from said surface by way of said second suspension, said mounting device comprising:

a housing, said housing containing a a fluid exhibiting electrorheopectic properties;

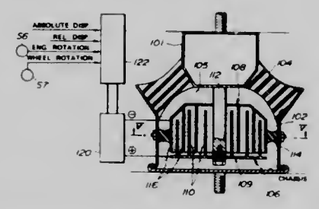
first and second electrode structures suspended in said housing in a manner to be immersed in said electrorheopectic fluid, said first electrode structure being operatively connected with said first vibratable body so as to be movable therewith, said second electrode structure being connected to said housing through a resilient member, said electrorheopectic fluid undergoing a change in viscosity when a voltage is applied across said first and second electrode structures;

a spring, said spring being operatively connected to both said first vibratable body and said first electrode structure, said spring being subject to compression when the relative displacement between said first and second vibratable bodies decreases;

sensor means for sensing:

absolute displacement of said mount;

relative displacement of said mount;



a first predetermined parameter which varies with the vibration produced by said first vibratable body; and

a second predetermined parameter which varies with the frequency of the vibration applied to said second vibratable body by way of said second suspension;

a control circuit operatively interposed between said sensor means and said first and second electrode structures, said control circuit being responsive to inputs from said sensor means for selectively applying the voltage to said first and second electrode structures; and

a vibration generator, said vibration generator being arranged in a manner to selectively produce preselected vibrations; wherein said spring takes the form of an elastomeric member which is operatively connected between said housing and a connection member, said connection member being detachably connected to said first vibratable body, said elastomeric member and said connection member closing said housing in a manner to define a closed chamber therein,

said vibration generator is disposed in said connection member and operative to selectively produce predetermined vibrations.

4,893,801

CLAMP

Robert W. Flinn, 2806 Balmoral Ct., Fort Collins, Colo. 80525

Filed Dec. 16, 1988, Ser. No. 285,210
Int. Cl.[4] B25B *5/02*
U.S. Cl. 269—6 **15 Claims**

1. A clamp operable with one hand, said clamp comprising:

(a) elongated support means having first and second ends; said support means comprising two spaced-apart, parallel, horizontal support arms;

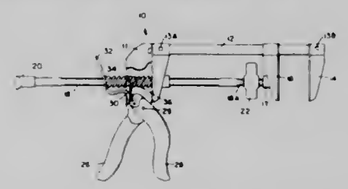
(b) a base member secured to said first end of said support means;

(c) handle means carried by said base member, said handle means including a movable lever arm;

(d) a stationary jaw member secured to said second end of said support means and extending downwardly therefrom;

(e) a movable jaw member supported by said support means and being movable therealong; said movable jaw member extending downwardly from said support means and being pivotable with respect thereto;

(f) an elongated pressure arm having first and second ends, said second end being attached to said movable jaw member; wherein said pressure arm extends through said base member; and wherein said pressure arm is disposed below and parallel to said horizontal support arms;



(g) advance means carried by said base member and being operable by said lever arm; said advance means being adapted to advance said pressure arm through said base member in a manner such that said movable jaw member is advanced toward said stationary jaw member;

(h) releasable catch means carried by said base member for preventing rearward movement of said pressure arm; and

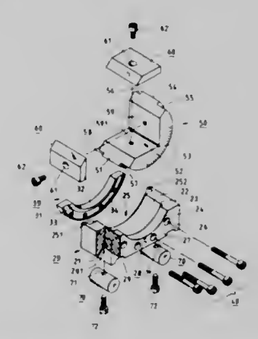
(i) lock means carried on said second end of said pressure arm; wherein said lock means is adapted to pivot said movable jaw member relative to said support means so as to lock said movable jaw member in a fixed position.

4,893,802

ANGLE-ADJUSTABLE WORKPIECE SEAT

Charles Lin, Taichung, Taiwan, assignor to Jason Wu, Taichung, Taiwan

Filed Jul. 14, 1988, Ser. No. 207,107
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—74 **4 Claims**



1. An angle-adjustable workpiece seat comprising: a base having: a bottom surface, a top surface having a concavely arcuate primary supporting surface, a confining surface upwardly extending at an incline from a first arcuate side edge of said primary supporting surface towards a central portion of the primary supporting surface, a concavely arcuate receiving groove downwardly extending from a second arcuate side edge of said primary supporting surface, said receiving groove having at least a shoulder surface being in connection with said primary supporting surface and a stopping surface laterally extending from a bottom edge of said shoulder surface, a plu-

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rality of holes extending parallelly in relation to each other and to an axis of curvature of said primary supporting surface, said plurality of holes extending through said shoulder surface a concavely arcuate secondary supporting surface extending laterally from the; a top portion of the confining surface with an axis of curvature coincident with said axis of curvature of the primary surface;

a substantially crescent shaped locking piece slidably positioned in said receiving groove, extending substantially over the length of said groove and having, said locking piece pressing surface being in connection with said primary supporting surface and being upwardly inclined toward the central portion of the primary surface, a second concavely arcuate secondary supporting surface extending laterally from a top portion of said pressing surface said second secondary supporting surface having an axis of curvature coincident with the axis of curvature of the primary surface: an arcuate shallow groove adjacent to said pressing surface: and a plurality of holes corresponding to said holes of said base extending from said groove; whereby said pressing surface, said primary supporting surface and said confining surface together form a sliding groove of dovetail cross-section;

a plurality of threaded elements respectively threaded through corresponding ones of said holes of said base and said locking piece, said threaded elements being capable of driving said locking piece to laterally translate in said receiving groove; and

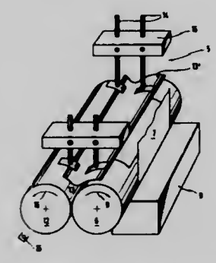
a sliding member having a substantially V-shaped top positioning surface, formed by two plane surface each surface having means for receiving a detachable pad piece said sliding member further including a bottom sliding rail of dovetail cross-section complementary to said sliding groove, having a primary sliding surface matching, slidable on said primary support surface, a contacting surface upwardly extending from one side edge of said sliding surface and capable of matching said pressing surface, and two secondary sliding surfaces for sliding on said secondary supporting surfaces respectively.

4,893,803

METHOD OF AND DEVICE FOR FOLDING A SHEET

Heino Petersen, Wabern, Switzerland, assignor to Eltex-Elektrostatik Gesellschaft mbH, Weil am Rhein, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,735
Int. Cl.[4] B42C *1/04*
U.S. Cl. 270—47 14 Claims



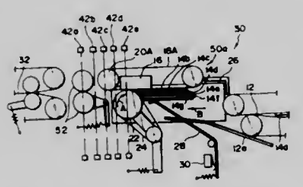
1. A method of folding a sheet cut from at least one advancing web of material bonded electrostatically on at least one side, comprising the steps of: transferring said sheet to a collecting cylinder; picking up said sheet in vicinity of a midline of said sheet by a folding cylinder resting against said collecting cylinder in a nip along said midline; drawing said sheet completely over said folding cylinder while folding both halves of the sheet together along said midline during rotation of said cylinders; rotating said cylinders in opposite directions; charging said web at least outside said cylinders if necessary; exerting a force of attraction in said nip by an electrostatic field, said electrostatic field producing a nonadhesive effect to prevent formation of corners during folding of said sheet, said nip being upstream with respect to the direction of rotation of said cylinders, said force being exerted on top of said sheet for pulling the sheet off in a direction opposite the direction of rotation of said collecting cylinder and moving said sheet toward a guide, so that the sheet is attracted and transferred to said folding cylinder, pulling off a part of the folded sheet in a direction opposite to the direction of rotation of the folding cylinder producing an adhesive effect.

4,893,804

APPARATUS FOR FEEDING SHEET ARTICLES

Tsutomu Sasage; Masahiko Nogachi; Hiroyuki Nagatani, and Toshiharu Kubota, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 29, 1988, Ser. No. 212,933
Claims priority, application Japan, Jul. 1, 1987, 62-101993[U]; Jul. 23, 1987, 62-185077
Int. Cl.[4] B65H *1/02, 7/14*
U.S. Cl. 271—3.1 6 Claims



1. An apparatus for accumulating a plurality of sequential individual sheet articles temporarily in a feeder section of said apparatus and feeding the articles sequentially one by one out of said feeder section toward a subsequent processing stage, comprising:

upstream transport means for transporting the articles into said feeder section;

support and transport means for driving the articles coming in from said upstream transport means to said feeder section while supporting said articles;

stop means for stopping the articles arrived in said feeder section by causing said articles to abut against said stop means;

said stop means comprises a reverse belt against which the articles transported by said base belt abut to be stopped, and a reverse roller rotatable at a low speed in the opposite direction to an intended direction of article feed, said reverse belt being wound around said reverse roller;

suction transport means located to face said stop means at a spacing which accommodates only one of the articles for sucking and driving the articles to a downstream side;

suction means for supplying a sucking force to said suction transport means;

downstream transport means for transporting the articles which are sent out one by one by said suction transport means toward the subsequent processing stage one at a time by nipping said articles;

said downstream transport means comprises a downstream transport path and feed means interposed between said downstream transport path and said suction transport means for feeding the articles one by one to said downstream transport path, said feed means comprises a pick-up gap control roller pair which is controllable in rotation speed;

said gap control rollers situated in a position just past said suction transport means with respect to the intended direction of sheet feed;

detector means for detecting an amount of the articles which have been stopped in abutment against said stop means;

drive control means for deactivating said upstream transport means when said detector means determines that the amount of the articles has reached a predetermined reference amount;

a plurality of sensor means;

a first of said sensor means being responsive to the leading edge of the article which has been nipped by said gap control rollers;

at least one second sensor means responsive to an interval between the article being transported by said downstream transport means and the next article; and

drive means for deactivating said suction transport means in response to a sense output of said first sensor means and reactivating said suction transport means in response to a sense output of said second sensor means.

4,893,805

TRANSPORT APPARATUS FOR PRINTED PRODUCTS AND USE OF SUCH TRANSPORT APPARATUS

Jürg Eberle, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Aug. 22, 1988, Ser. No. 234,731
Claims priority, application Switzerland, Aug. 28, 1987, 319/87
Int. Cl.[4] B65H *29/04*
U.S. Cl. 271—204 8 Claims



1. A transport apparatus for transporting printed products, especially newspapers arriving in an imbricated formation, comprising:

an individual conveyor for engaging the printed products for transport thereof in a predeterminate direction;

said individual conveyor being provided with a plurality of controlled grippers arranged at a substantially uniform spacing from one another for the clamping engagement of the printed products;

said individual conveyor defining a product removal region;

a driven endless revolving product removal conveyor moving substantially in the same sense as the individual conveyor at the region of the product removal location thereof;

said product removal conveyor being provided with controlled product removal grippers;

each of said product removal grippers engaging an associated printed product;

each of said grippers of said individual conveyor having a mouth opening;

each of said product removal grippers of said product removal conveyor having a mouth opening;

the mouth openings of said grippers and the mouth openings of said product removal grippers confronting one another;

means for controlling the grippers of the individual conveyor at the product removal location;

means for controlling the product removal grippers of the product removal conveyor;

said controlling means for the grippers of the individual conveyor and said controlling means for the product removal grippers of the product removal conveyor controlling said grippers and said product removal grippers, respectively, at the product removal region such that said grippers and product removal grippers are oppositely controlled in relation to one another;

said product removal conveyor comprising a driven endless traction element;

said product removal grippers of the product removal conveyor being arranged at a substantially uniform spacing from one another at the driven endless traction element;

each of said product removal grippers comprising a movable jaw and an associated fixed jaw;

means for pivoting the movable jaw of each product removal gripper into an open gripper position laterally of the associated fixed jaw and for pre-biasing the movable jaw in said open gripper position by a first resilient action;

each product removal gripper in a closed gripper position thereof having the movable jaw directed substantially in the same direction as the associated fixed jaw;

means for blocking the movable jaw of each product removal gripper in said closed gripper position by a second resilient action;

said second resilient action overcoming the first resilient action;

a shaft provided for each product removal gripper;

the movable jaw of each product removal gripper being secured to said shaft thereof;

cantilever means provided for each shaft and laterally protruding from said driven endless traction element;

each shaft being pivotably and axially displaceably mounted at the cantilever means thereof;

said means for pivoting the movable jaw of each product removal gripper comprises a compressible and torsionable helical spring surrounding the shaft of the associated product removal gripper;

said helical spring being pre-biased in a closing direction of the associated product removal gripper;

said helical spring in a relaxed and non-torsioned state thereof retaining the movable jaw in the laterally pivoted out position;

endless guide rail means;

said traction element being guided in said endless guide rail means;

a driven deflection wheel; and

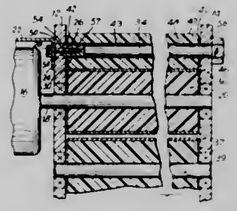
said traction element being trained about said driven deflection wheel at the product removal region.

4,893,806

PINCH ROLLER DEVICE

Thomas McLaughlin, Ossining, N.Y., assignor to Technical Support Services, Inc., Ossining, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,355
Int. Cl.[4] B65H *5/02*
U.S. Cl. 271—272 6 Claims



1. A method of correcting misfeeding of deposit envelopes in an Automatic Teller Machine having a pair of opposed, endless deposit envelope conveyor belts travelling between a pair of first and second identically fabricated frame members, said deposit envelopes being drawn into said machine by movement

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of said conveyor belts with respect to one another, at least one of said conveyor belts being driven by a foam-like drive roller itself rotatably driven by a motor located outside of said frame members, said motor having a housing secured by a bolt and nut passing through a first aperture in a first of said frame members, comprising the steps of:

(a) removing said nut from said bolt to expose the threads of said bolt;

(b) locating a pinch roller between said frame members, above said foam-like drive roller;

(c) locating a pinch roller axle through a second aperture of said second frame member corresponding in position to said first aperture;

(d) locating said pinch roller axle through said pinch roller; and

(e) securing said pinch roller axle to said exposed threads of said bolt such that said pinch roller bears down on one of said conveyor belts against said foam-like drive roller.

4,893,807

PLAYGROUND SLIDE

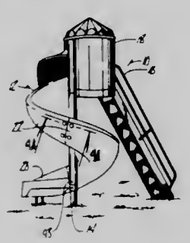
Paul W. Ahrens, Monett, Mo., assignor to Miracle Recreation Equipment Company, Monett, Mo.

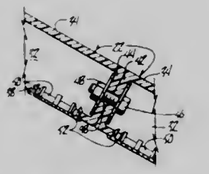
Continuation-in-part of Ser. No. 55,431, May 28, 1987, Pat. No. 4,811,943. This application Nov. 21, 1988, Ser. No. 273,948

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] A63G *21/02*

U.S. Cl. 272—56.5 R **8 Claims**





1. A playground slide comprising,

a plurality of interconnected bedway sections,

a ground-supported post, and each of said sections including an integral sleeve portion telescopically engaging said post,

each of said bedway sections having a hollow interior construction, including top, bottom, opposite side and end walls,

said interconnected hollow bedway sections including said end walls on contiguous sections being opposed and interconnected by adjustable fasteners which extend into the interior of said hollow bedway sections,

said bedway sections having the interconnected opposed end walls having access openings in one of the adjacent walls of at least one of the bed sections to provide access into the interior of the hollow bedway sections for adjustment of the fasteners, and

a cap is provided on each of said access openings to give a finished smooth appearance to said one wall and conceal said fasteners within said hollow section.

4,893,808

EXERCISE APPARATUS FOR THE NECK

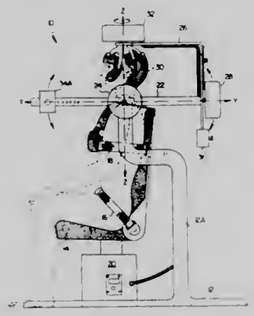
Donald R. McIntyre, P.O. Box 23, Polks Landing, Chapel Hill, N.C. 27514; Paul J. Hollahan, 109 Turnage Ridge Rd., Chapel Hill, N.C. 27514, and James A. Sawhill, 408 N. Hayes, Moscow, Id. 83843

Filed Jan. 26, 1988, Ser. No. 148,665

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—94 **14 Claims**



1. An apparatus for exercising the neck of a user and comprising:

a stationary frame having two upwardly extending posts;

an adjustable seat secured to said frame for positioning a user between said two posts;

a neck exercise assembly pivotably mounted to said posts and including a pivotably movable Ushaped support member having an arm extending forwardly and rearwardly on each side of a user positioned in said seat, and an adjustable length inverted L-shaped member extending generally upwardly therefrom for securing the head of a user, said U-shaped support member being pivotably movable relative to said frame about a horizontal axis which corresponds to an axis of rotation which is coaxial with the axis of flexion/extension movement of the neck, and said adjustable length inverted L-shaped member for securing the head being pivotably movable relative to said U-shaped support member about an axis of rotation which is generally perpendicular to said horizontal axis and coaxial with the axis of lateral flexion movement of the neck;

a head engagement pivotably mounted to said adjustable length inverted L-shaped member for securing the head, said head engagement device being adjustable relative to said U-shaped support member and pivotably movable relative to said inverted L-shaped member about a vertical axis which is generally perpendicular to said horizontal axis and coaxial with the axis of rotation movement of the neck;

first resistance means operatively connected to and cooperating with said U-shaped support member of said neck exercise assembly for resisting flexion/extension movement of the neck of a user;

second resistance means operatively connected to and cooperating with said inverted L-shaped member of said neck exercise assembly for resisting lateral flexion movement of the neck of a user;

third resistance means operatively connected to and cooperating with said head engagement device for resisting rotational movement of the neck of a user;

a counterweight operatively secured to said U-shaped support member;

a counterweight operatively secured to said inverted L-shaped member; and

restraint means for securing the user to said seat during exercise of the neck;

whereby said neck exercise assembly and said head engagement device carried thereby permit simultaneous multi-axial pivotal movement of the neck about its natural axes, said adjustable seat and adjustable inverted L-shaped member for securing the head allowing for coalignment of the axes of rotation of the exercise apparatus with the natural cervical axes of flexion/extension, lateral flexion and rotation, and said counterweights rendering the exercise assembly gravity independent.

4,893,809

JUMP BALL

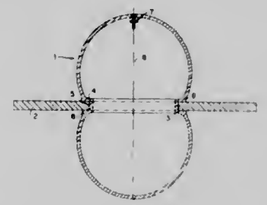
Joseph L. Blankenzee, Bodegraven, Netherlands, assignor to Interchain N.V., Curacao, Netherlands Antilles

Filed Aug. 4, 1986, Ser. No. 892,949

Claims priority, application Netherlands, Aug. 5, 1985, 8502188; Oct. 2, 1985, 8502690

Int. Cl.[4] A63B *25/08*

U.S. Cl. 272—114 **7 Claims**



1. Recreational apparatus comprising an inflatable ball body of elastic material of sufficient strength to support the weight of a person and a rigid annular plate operatively coupled to said ball body and of sufficient strength to support the weight of a person, and means for mechanically interlocking said ball body and said plate when said ball body is inflated so that said plate is disposed intermediate the top and the bottom of the ball body and constrained from movement in an axial direction with respect to said ball body, said means for mechanically interlocking said ball body and said plate comprising male and female profile parts, said female profile parts being integral with said ball body and comprising an annular groove, the bottom of said groove facing generally outwardly, said male profile part comprising a portion of said plate and adapted to fit into said groove and to seat therein when said ball body is inflated, the cross-section of said groove being defined by outwardly extending walls of said ball body, said walls having thickened portions at their radial outward extremes for supporting said plate and the weight of a person.

4,893,810

QUICK RELEASE COLLAR

Scott H. Lee, R.R. 2, Box 10, Church St., Putnam, Conn. 06260

Continuation of Ser. No. 163,131, Feb. 23, 1988, abandoned, which is a continuation of Ser. No. 888,516, Jul. 21, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 282,876

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 **18 Claims**

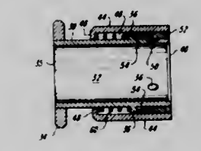
1. A quick release collar adapted to be axially received on and to be removably fixed at any selected location along the length of an elongated element, comprising:

a collar body having an axially extending passage extending therethrough for receiving said element, a radially outwardly extending first flange on the outer surface of said collar body, and a plurality of radial openings in said collar body;

radially movable balls located within the openings in said collar body;

a sleeve surrounding said collar body and defining a space therebetween, said sleeve including a second flange extending radially inwardly toward said collar body at a location spaced axially from said first flange;

a tension ring integrally associated with and surrounded by said sleeve, said tension ring being located in the space between said sleeve and said collar body, said sleeve and said tension ring being axially slidable as a unit with respect to said collar body between a locked position and an unlocked position, said tension ring having an end portion



with a tapered inner surface, said tapered inner surface having a relatively small dimensioned segment which urges said movable balls radially inwardly into said passage in the locked position, and having a relatively large dimensioned segment accommodating radial movement of said movable balls out of said passage in the unlocked position; means for accomodating radial flexure of substantially the entire length of said end portion in relation to both said collar body and said sleeve; and,

biasing means positioned in said space between said first and second flanges for normally biasing said sleeve and said tension ring axially with respect to said collar body toward the locked position, said tension ring and said first flange being coactively engageable to limit the extent of movement of said sleeve and said tension ring toward the locked position.

4,893,811

EXERCISER

Clayton D. Dilmore, 8325 Capps Ave., Northridge, Calif. 91324

Filed Jan. 12, 1989, Ser. No. 295,993

Int. Cl.[4] A63B *21/24*

U.S. Cl. 272—129 **1 Claim**

1. An exerciser comprising:

a stand adapted to be fixedly located on a supportive surface, said stand including a ceiling section adapted to be located in a vertically spaced position above a human being user;

a sheet material cover fixed on said ceiling section, said sheet material cover having an inner chamber, a mounting plate being fixedly mounted on said sheet material cover, said mounting plate being located within said inner chamber;

a plurality of electromagnets mounted on said mounting plate

a shaft mount fixedly mounted on said cover, said mounting plate including a central enlarged hole, said shaft mount located within said enlarged hole, a bearing assembly mounted within said shaft mount;

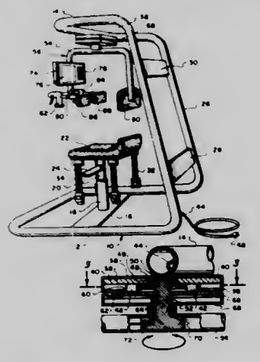
a shaft having an inner end and an outer end, said inner end connecting with said shaft mount, said shaft being rotationally supported by said bearing assembly, said outer end being fixed to a tubular member, pivotal movement of said tubular member is permitted by the rotational mounting of said shaft on said shaft mount;

said sheet material cover having a peripheral inwardly ex-

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tending flange, said flange defining an enlarged opening, said electromagnet being partially located within said enlarged opening;

a metallic plate fixed to said shaft, said metallic plate covering said enlarged opening with the peripheral portion of said metallic plate abutting against said flange, said metallic plate being slightly spaced from said electromagnet with said flange preventing said metallic plate from deflecting and connecting said electromagnet;



said electromagnet and said metallic plate are adapted to supply a resistance in response to an electrical energy; and
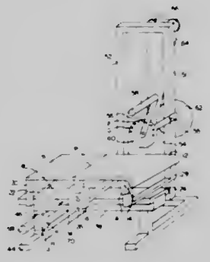
said tubular member permits said user to simultaneously rotate said shaft in either clockwise or counterclockwise direction and work against said resistance, whereby when said electrical energy is increased to said electromagnets, the amount of resistance is increased.

4,893,812

ADJUSTABLE MULTIPURPOSE TRUNK EXERCISER

Fredric O. Dawson, Jr., and Matthew F. Dawson, both of 1401 Newport Ave., San Jose, Calif. 95125

Filed Jan. 28, 1988, Ser. No. 71,492
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **3 Claims**



1. An exercise apparatus comprising:

a frame;

a lever means including a rotatable shaft fixed to said frame and a lever arm having a first end attached perpendicularly to said shaft and a second end to which a handle means is attached;

a resistance means coupled to said lever means for providing a force opposiong rotation of said lever means;

a bench means including a first bench portion mounted on said frame, said first bench portion having a first end and a second bench portion having a quick detachable means for removably mounting said second bench portion to the first end of said first bench portion; and,

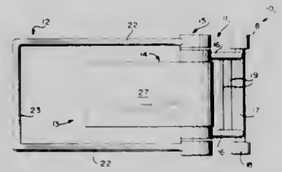
a bench support means mounted on said frame for adjustably supporting the first end of said first bench portion in a plurality of locations.

4,893,813

BACK EXERCISE DEVICE

Christopher Murray, 2007 South Rd., Baltimore, Md. 21209, and Binyamin Rothstein, 3213 Shelburne, Baltimore, Md. 21208

Filed Sep. 16, 1988, Ser. No. 245,262
Int. Cl.[4] A63B *1/02*
U.S. Cl. 272—145 **10 Claims**



4. An exercise device for a human user, comprising:

a platform comprising an interior relatively rigid core with cushioning means surrounding said core for supporting a user's torso;

a first support having a pair of parallel legs with a cross bar extending therebetween adjacent a first, bottom, end thereof;

a second support having a pair of parallel legs with at least one cross bar extending therebetween;

means for pivotally connecting said first and second supports for movement with respect to each other for changing the angular relationship between said first and second supports;

stop means for positively stopping said first and second supports so that they cannot move any further angularly with respect to each other; and

means for mounting said platform so that it is movable with respect to said supports and operatively positively supported thereby in at least first and second positions;

said platform including a pair of arms extending outwardly from the core thereof, and having free ends opposite said core; and wherein said means for mounting said platform receives said arms to positively support said arms in either a first position, in which said platform extends downwardly at an angle to the horizontal, or a second position, in which said platform extends generally horizontally; and said stop means including a pair of channel shaped members, one stationarily mounted to each of said first and second supports on the outside thereof adjacent said means for pivotally connecting said supports together.

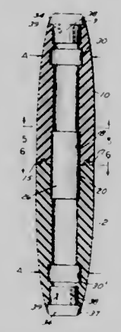
4,893,814

PLASTIC CANDLEPIN CONSTRUCTION

Albert N. Bertozzi, P.O. Box 478, Pawtucket, R.I. 02860

Filed Feb. 8, 1988, Ser. No. 153,354
Int. Cl.[4] A63B *9/00*
U.S. Cl. 273—82 R **2 Claims**

1. A bowling pin having a body defining curved sides tapering from a central portion to each end, said pin having two mating halves joined at a medial point by interlocking edges, said pin having a substantially hollow core defined by hollow walls, said central portion having a central counterbore extending inwardly from the mating interlocking edges, said central portion containing dense material secured to the hollow walls thereof, bases affixed to each end of said body closing the hollow core, the hollow walls remote from the inner portion of the bases being thinned substantially at the strike zone thereof to provide a lively pin, the thinning and central



counterbore compensating for the weight added at the central portion of the pin said dense weight equaling the removed material from the core of the pin.

4,893,815

INTERACTIVE TRANSECTOR DEVICE COMMERCIAL AND MILITARY GRADE

Larry Rowan, 3440½ Caroline Ave., Culver City, Calif. 90230

Filed Aug. 27, 1987, Ser. No. 90,036
Int. Cl.[4] F41B *15/04*
U.S. Cl. 273—84 ES **13 Claims**

1. A transector system for tracking and neutralizing a designated target body, including:

sensing means for sensing signals associated with any body within the range of the system and producing an output signal characteristic of that body;

central computer means including signal processing means coupled to said sensing means and responsive to said output signal to digitize and store the same;

said computer means including, in addition, repertoire storage means and comparator means;

said repertoire storage means having stored therein digitized signals representing the signals emanating from the target body;

said comparator means being coupled to said sensing means and to said repertoire storage means for comparing output signals from said sensing means with said stored digitized signals in said repertoire storage means and for producing a lock-on output signal when said output signal from said sensing means corresponds to said digitized signal representing said target body;

said signal processing means including means to determine the range, azimuth and elevation of each body, the signals from which are being sensed, and, in particular, producing a digital location signal representative of the location of the target body when the lock-on signal occurs;

projectile means including a projectile computer, said projectile computer having projectile signal-processing means and volatile storage means therein;

said volatile storage means being coupled, before launch of said projectile, to said signal processing means for updating said projectile computer with the latest digitized target body location signal;

said projectile computer including an expert program for controlling said projectile signal-processing means and for controlling the flight of said projectile.

4,893,816

COMPETITIVE DICE AND CUBE GAME

Hal Levy, and Brett M. Levy, both of 165 West End Ave., New York, N.Y. 10017

Continuation-in-part of Ser. No. 155,080, Feb. 11, 1988, abandoned. This application Dec. 23, 1988, Ser. No. 289,805
Int. Cl.[4] A63F *9/04*
U.S. Cl. 273—146 **8 Claims**



1. A method of playing a game utilizing dice and a doubling cube comprising the steps of:

providing a objective total cumulative count to win the game,

assigning a value to each face of the dice,

establishing a value for each throw of the dice relating to the value assigned to each face of the cube of the dice,

establishing an initial entry level to allow a player to continue accumulating and maintaining a cumulative count according to the throw of the dice,

allowing a player to selectively stop at a retained cumulative count which is in excess of the initial value at any time during the player's turn,

commencing the accumulation of said count during the player's next turn and allowing the player to selectively stop his turn at a second retained cumulative count,

returning the count to the last stopped cumulative count depending upon the value of the throw of the dice whereby said player surrenders the newly accumulated count above that of the last set cumulative count and

recommences his next turn at the last set cumulative count,

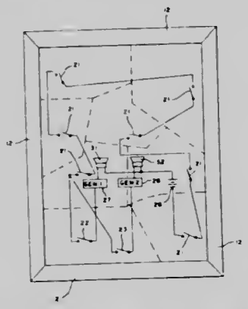
providing a doubling cube to be selectively used by the player whose turn is about to begin, the player offering the doubling cube to the opponent whereby the stakes of the game are doubled if the opponent accepts the doubling cube or the game is won by the player if the opponent refuses to accept the doubling cube,

the doubling cube remaining in the possession of the opponent for so long as the game continues or is offered to the first player by the opponent to redouble the stakes of the game,

the game being won at the stakes then operative in the game by the use of the doubling cube when either player reaches the total objective cumulative count or a player refuses to accept the doubling cube.

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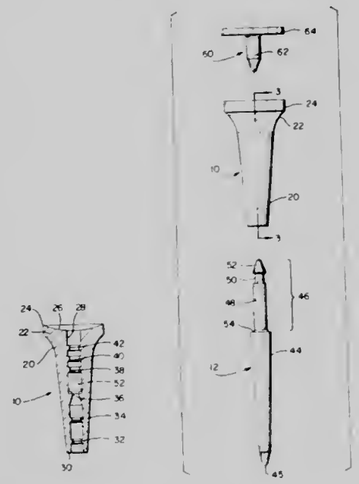
4,893,817
MUSICAL JIGSAW-TYPE PUZZLE
Rosen Shilo, 1575 Tenaka Pl. #01, Sunnyvale, Calif. 94087
Filed Oct. 17, 1988, Ser. No. 258,822
Int. Cl.[4] A63F *9/10*
U.S. Cl. 273—157 R **4 Claims**



1. A jigsaw-type puzzle comprising a base having edge frame members, a plurality of irregularly-shaped puzzle pieces each having a portion of a picture on its upper face, said puzzle pieces being shaped to fit together resting on said base within said frame members, at least some of said puzzle pieces having switch actuating means, said base having switch means in positions corresponding to said switch actuating means when said puzzle pieces are fitted together, said switch actuating means and said switches co-acting to close said switches when positioned in proximity to each other, a source of power, an electrical device, wiring to connect in series said switch means, said source of power and said electrical device, whereby said electrical device is energized only when all said puzzle pieces are fit together to fill the area above said base and within said frame members, a second plurality of second irregularly-shaped puzzle pieces each having second switch actuating means and a key puzzle piece having third switch actuating means, said base having second switch means and a second electrical device connected thereto, said second switch means and said second electrical device being in series with said source of power and said amplifier and to all but one of said first-mentioned switches, said second switch actuating means corresponding in position to all but one of said first-mentioned switch-actuating means when said second puzzle pieces are fit together to fill the area above said base and within said frame member, said third switch actuating means being positioned in proximity to said second switch means, whereby said second electrical device is energized and said first-mentioned electrical device is not energized.

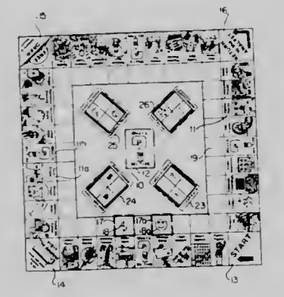
4,893,818
GOLF TEE
Patrick Liccardello, P.O. Box 23475, Albuquerque, N. Mex. 87192-1475
Filed Aug. 3, 1988, Ser. No. 227,984
Int. Cl.[4] A63B *67/14*
U.S. Cl. 273—212 **6 Claims**

1. A golf tee comprising
an elongated body portion made of a soft plastic material, said body having an axial bore and a concaved ball support surface at one end thereof,
a stem made of a hard plastic material, said stem including a point for ground penetration at one end and an integral spear at its other end,
said spear including a shaft having a conical tip, said shaft having an annular groove adjacent said tip, and



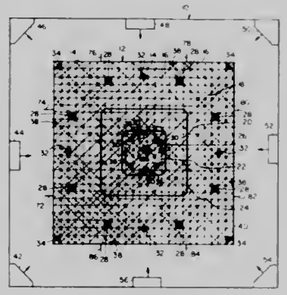
at least one annular ridge disposed within said bore engaging said groove and thereby retaining said spear within said bore of said body portion.

4,893,819
PERSONALITY TYPE BOARD GAME
Donald A. Wright, 56 Dakota Drive, Oromocto New Brunswick, Canada E2V 1L4
Filed Mar. 1, 1988, Ser. No. 162,812
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—243 **17 Claims**



6. A board game as in claim 5 comprising board markers matching the Feature Squares and adapted to be randomly arranged on the board, as well as, stored on each player's Personality Type Tabulator when acquired by a player.

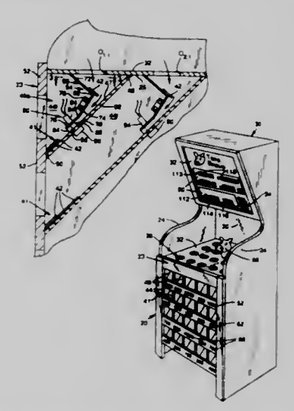
4,893,820
GAME APPARATUS AND METHOD
Andrew Silverman, 313 Thunder Circle, Bensalem, Pa. 19020
Filed Sep. 1, 1987, Ser. No. 91,899
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 **5 Claims**



1. A game apparatus, comprising:
a playing board having a grid of interconnected segments depicted thereon for defining a plurality of selectable player movement paths, said grid further having unique indicia thereon;
a grid position marker for each plyaer;
a set of progress markers for each player, the progress markers of each set corresponding by unique and respective features to indicia on the movement grid;
a plurality of movement direction markers, each defining at least one direction of movement on the grid, from which sets of movement direction markers can be accumulated by each player by random selection for subsequent use in repositioning each grid marker in turn;
first chance means for defining a magnitude of movement for repositioning each grid marker in turn, whereby players may coordinate the direction markers and the first chance means to move respective position markers on the grid and collect progress markers; and,
second chance means bearing indicia corresponding to the unique indicia of the progress markers, whereby progress markers may be forfeited and collected between respective players.

5. A method for competing as a player in a game, of the kind played on a grid having a plurality of interconnected segments defining a plurality of selectable player movement paths, comprising the steps of:
accumulating movement direction markers by random selection from a set of such markers, each player receiving an initial subset of said direction markers to and from which subsequent direction markers will be added and removed as play proceeds, each of the direction markers defining at least one direction of movement of the grid;
successively moving a position marker on the grid, in turn by:
selecting one of the direction markers from the subset to define the direction of movement; and,
operating a first chance means to define a magnitude of movement in the selected direction;
collecting a set of progress markers, the progress markers corresponding by unique and respectve features to indicia on the grid, by successively moving the position marker to the unique indicia; and,
selectively collecting progress markers from another player by operating a second chance means bearing indicia corresponding to the unique indicia of the progress markers.

4,893,821
SCORING SYSTEM FOR GAME APPARATUS
Mariano deOrbegoso; Jane Moe, both of Sheridan, and Chris Masterson, Beaverton, all of Oreg., assignors to Non Plus Ultra, Inc., Sheridan, Oreg.
Filed May 6, 1988, Ser. No. 190,712
Int. Cl.[4] A63F *7/30*
U.S. Cl. 273—371 **4 Claims**



1. In a game apparatus that includes a target member that has a plurality of openings, wherein the openings are formed to receive tokens that are pitched toward the target member, and wherein the openings are arranged on the target member in a matrix of multiple rows and multiple columns, a scoring system comprising:
a plurality of chutes, each chute having a first end connected to the target member near an associated opening and configured to move tokens that are pitched into the associated opening through a detecting passage formed within the chute;
a sensor fastened to each chute and selectively activated for providing on one of a plurality of output lines a first detection signal whenever a token passes through the detection passage of the chute to which the sensor is fastened; each column of sensors being connected to a common output line; and
score control means for:
(a) sequentially activating each row of sensors;
(b) simultaneously monitoring the output lines to receive a first detection signal provided by any of the sensors associated with the activated row of sensors;
(c) generating a score signal in response to the received first detection signals, the score signal including the particular detection passage through which each pitched token moves.

4,893,822
ELECTRONIC THROWING DART FOOTBALL
J. Rudolph Tess, and George Spector, both of 23 Broadway, Rm. 3615, New York, N.Y. 10007
Filed Jul. 27, 1984, Ser. No. 635,432
Int. Cl.[4] F41J *5/02*
U.S. Cl. 273—376 **2 Claims**

1. A throwing dart football game which comprises :
(a) a vertical football playing field board having a plurality of yard indicating lines;
(b) a dart board having a plurality of moveable spring loaded pie shaped scoring pieces and a touchdown bulls-eye piece activated by a dart, said dart board is mounted in center of said football playing field board;
(c) a plurality of contact members, each said contact member

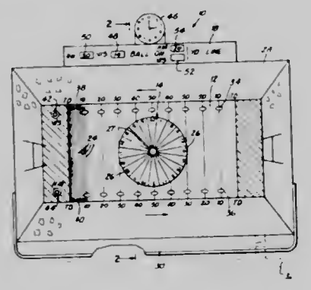
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is located on back of each said pie shaped scoring piece and said touchdown bulls-eye piece;

(d) a score board mounted above said football playing field board;

(e) a plurality of darts to be thrown by players at said dart board to make contact with said pie shaped scoring pieces and said touch-down bulls-eye piece thereby activating said contact members;

(f) means responsive to activation of contact members for carrying information between said activated contact members and said score board and automatically registering and displaying said information on said score board to indicate to said players the status of play of said football game, said means including a spaced pair of aligned indicators on each side of the board indicating ball positions and including score indicators coordinated with the ball positions and information conveyed as a result of a thrown dart hitting a particular scoring piece;



(g) two sets of intermediate yard round shaped indicating lamps one said set placed above said dart board on each said intermediate yard indicating line for one team and other said set placed below said dart board on each said intermediate yard indicating line for other team;

(h) two switches mounted to said football playing field board, each said switch to control one said set of ten yard football shaped indicating lamps and one said set of intermediate yard round shaped indicating lamps; and

(i) means for carrying information electronically between said activated contact members and said ten yard football shaped indicating lamps and said intermediate yard round shaped indicating lamps to automatically display said information on said football playing field board to indicate to said players the position of football on said football playing field board and the score after each dart is thrown.

4,893,823

SEAL ASSEMBLY

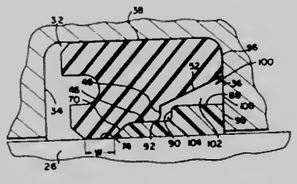
Gary L. Strouse, Telford, and Thorval L. Berg, Hatfield, both of Pa., assignors to Greene, Tweed & Co., Kulpsville, Pa.

Filed Dec. 21, 1988, Ser. No. 287,958
Int. Cl.[4] F16J 9/06, 15/32
U.S. Cl. 277—165 **4 Claims**

1. A seal assembly for installation in an annular groove having an inner radial surface and an outer radial surface interconnected by an axial surface, the seal assembly comprising:

a generally annular energizer element formed of an-elastomeric material including a body portion and a generally radially extending sealing lip to provide a low pressure seal when installed within the groove, the energizer element engaging at least a portion of the axial surface of the groove and a first portion of the outer radial surface of the groove proximate the axial surface of the groove, the sealing lip extending beyond the groove for engagement with an element to be sealed to define a low pressure sealing lip contact area of a first predetermined axial width; and

a generally annular heel bearing element formed of a generally rigid material to provide a high pressure seal when installed within the groove, the heel bearing element engaging at least a portion of the energizer element proximate the sealing lip and engaging a second portion of the outer radial surface of the groove distal from the axial surface of the groove, a portion of the heel bearing element engaging the element to be sealed with the energizer element, the heel bearing element and a third portion of the outer radial surface of the groove extending between the first and second portions thereof establishing a first generally annular void, the annular void being generally triangular in cross section whereby upon the application



of pressure below a first predetermined pressure limit the sealing lip of the energizer element functions to perform primary sealing and upon the application of pressure at or above the predetermined pressure limit the energizer element is compressed and a portion of the energizer element moves into the annular void, drawing at least a portion of the sealing lip into the groove to reduce the axial width of the low pressure sealing lip contact area and applying radial pressure upon the heel bearing element so that the heel bearing element performs the primary sealing function, the shape and location of the annular void is forced out of the annular void by the energizer element and passes out of the groove between the outer radial surface of the groove and the heel bearing element.

4,893,824

HAND TRUCK FOR FILE CABINETS

John E. Turek, Hastings, and Carl J. Schoberg, Zumbro Falls, both of Minn., assignors to Liberty Diversified Industries, New Hope, Minn.

Filed Sep. 9, 1988, Ser. No. 242,323
Int. Cl.[4] B62B 1/14
U.S. Cl. 280—47.27 **15 Claims**

1. A hand truck for transporting an article such as a file cabinet, said article having a top surface and a bottom surface and a height measured therebetween, said article further having a front side and a back side and a depth measured therebetween, said hand truck comprising:

a generally upright frame, said frame having a top end and a bottom end and a height measured therebetween, a pair of opposing sides and a crossbar extending therebetween, said frame further defining a generally upright forward facing retention plane;

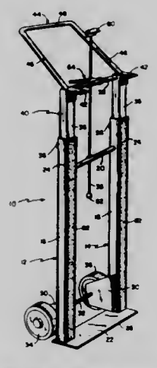
a handle section, said handle section being connected to said frame proximate to the top end thereof;

a toe plate, said toe plate connected to and extending forwardly from said frame proximate to the bottom thereof, said toe plate having a top planar surface oriented generally perpendicular to said retention plane;

a pair of wheels, each said wheel being rotatably mounted to one of said opposing sides of said frame proximate to the bottom thereof, said wheels extending generally rearwardly from and said frame;

a retaining arm, said retaining arm having a distal end including a gripping means connected thereto, said retaining arm being mounted on said frame for pivotal movement relative to said frame such that said distal end of said retaining arm may be pivoted in a vertical plane generally perpendicular to said retention plane, said retaining arm also be mounted for longitudinal sliding movement relative to said frame simultaneously with said pivotal movement; and

a clamping assembly, said clamping assembly being connected to said frame, said retaining arm being connected to said clamping assembly, said clamping assembly including a collar mounted on said crossbar for rotational movement about said crossbar, a housing connected to and carried on said collar for rotational movement about said crossbar, said housing further including at least one aperture through which said retaining arm is slidably inserted,



a clamping means, said clamping means being connected to said housing and capable of exerting a clamping force upon said retaining arm to prevent said retaining arm from moving slidably through said aperture in said housing and longitudinally relative to said crossbar, and means for selectively releasing said clamping means,

whereby the toe plate of the hand truck may be inserted under the article with the front side of the article closely confronting the retention plane of the frame, and the retaining arm may be pivoted forwardly and downwardly and slidably moved forwardly relative to the frame so that the distal end of the retaining arm extends across the top surface of the article and the gripping means engages the back side of the article to retain and secure the article in contact with the toe plate and the retention plane when the hand truck is tilted backward onto the wheels.

4,893,825

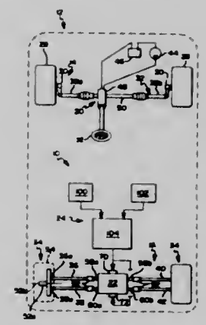
CONTROLLED COMPLIANCE FOR REAR WHEEL STEERING

David A. Janson, Plymouth, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 2, 1988, Ser. No. 240,881
Int. Cl.[4] B62D 6/04
U.S. Cl. 280—81.6 **7 Claims**

1. An apparatus for varying the steer angle of rear wheel assemblies of a vehicle having longitudinal and transverse axes and steerable front wheels, each wheel assembly including a wheel mounted for rotation and track parallel to the longitudinal axis on a stub axle supported from the vehicle chassis by at least pairs of transverse and substantially parallel swing links pivotally attached at one end to the wheel assembly ahead of and to the rear of the axle center line; the apparatus comprising:

rear steer means including means for mounting the other end of at least one of each pair of links for movement transverse to the vehicle, means for biasing the transversely movable ends in opposite direction transverse to the vehicle, and latch means having a first position locking the movable ends in a position wherein the rear wheels track



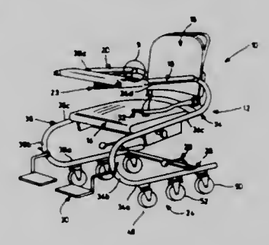
parallel to the longitudinal axis and a second position allowing the movable ends to move transverse in the same direction in response to transverse forces acting on the rear wheels.

4,893,826

MOBILITY SUPPORT DEVICE

Adele E. Ward; J. R. Kingsley Ward, both of Richmond Hill; Kevin R. Lucas; Jeffrey D. Stringer, both of Mississauga; John H. Royce, Kleinberg, and A. Edward Moore, L'Acadie, all of Canada, assignors to Canhart Industries, Inc., Richmond Hill, Canada

Filed May 6, 1987, Ser. No. 46,828
Int. Cl.[4] A61H 3/04
U.S. Cl. 280—87.021 **36 Claims**



1. A mobile support device for a handicapped person and rollable along a reaction surface, the mobile support device comprising:

first and second longitudinally extending frame sections oriented in spaced relationship, each of said frame sections having a lower portion and a front portion;

joining means for joining said first and second frame sections together;

a back support portion extending between and coupled with the first and second frame sections;

a seat portion secured to and extending between the first and second frame sections and centrally disposed above said lower portions; and

a wheel assembly mounted on said lower portions so as to engage the reaction surface, said wheel assembly including a pair of front caster wheels, a pair of rear caster wheels, and a pair of central wheels, each of said central wheels having a fixed transverse axis of rotation and being positioned intermediate said front and rear caster wheels

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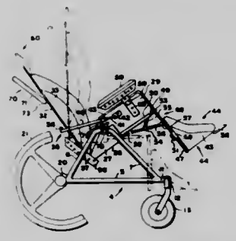
to inhibit transverse motion, each of said frame sections carrying one of said front caster wheels, one of said central wheels, and one of said rear caster wheels, said front and rear caster wheels and said central wheel on each of said frame sections being substantially aligned in parallel with a central longitudinal axis of said mobility support device, each of said wheels having a lower most tangent lying in a common plane, said spaced frame sections defining a free region in front of and beneath said seat portion through which a user's feet can reach said reaction surface and provide a propelling force to said mobility support device, said wheels being disposed outside said free region, and said wheel assembly constituting means to inhibit rocking of said mobile support device about said central wheels so that contact between all of said wheels with said reaction surface is maintained, the front portions of said frame sections being spaced from one another and said joining means being arranged so that unrestricted access is provided for the handicapped person to said seat portion, said back support portion, and to said free region.

4,893,827

CHAIR CONSTRUCTION FOR INCAPACITATED PERSONS

Dwight S. Gay, Fenton, and John W. Hoornstra, Vassar, both of Mich., assignors to Gunnell, Inc., Vassar, Mich.

Filed Aug. 31, 1988, Ser. No. 238,861
Int. Cl.[4] A61G 5/00
U.S. Cl. 280—250.1 **31 Claims**



1. An incapacitated person's chair construction comprising frame means; body support means having a seat member and a back member; hinge means coupling said seat and back members to one another; and pivot means rockably connecting said support means to said frame means, said hinge means enabling relative pivotal movement of said seat and back members and said pivot means enabling conjoint tilting of said seat and back members relative to said frame means, said pivot means being separable enabling separation of said support means and said frame means.

4,893,828

BOAT TRAILER ROLLER BUNK APPARATUS

Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445

Filed Dec. 29, 1988, Ser. No. 292,217
Int. Cl.[4] B60P 3/10
U.S. Cl. 280—414.1 **6 Claims**

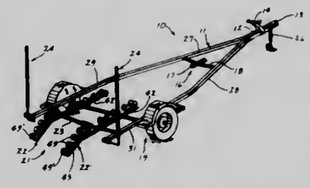
1. In a trailer for hauling a boat having a hull with a trim tab at its rear, the trailer having a wheel and axle supported frame including a pair of frame members extended rearwardly from a tongue connection in a diverging then parallel and laterally spaced manner, a cross member assembly extended between the frame members adjacent the axle, a roller bunk apparatus comprising:

roller bunk means disposed on either side of the longitudinal axis of the frame;

means mounting each said roller bunk means to the cross member assembly;

each said roller bunk means including elongated tubular means disposed longitudinally of the frame and parallel a frame member, said tubular means having front and rear portions;

roller carrying means mounted on each of said front and rear end portions for engaging the hull of the boat being carried by the trailer, one of said roller carrying means pivotally movable on said tubular means;



and further wherein said one roller carrying means is pivotally mounted on said rear end portion;

and further wherein each roller carrying means includes an elongated element connected to each said front and rear end portions;

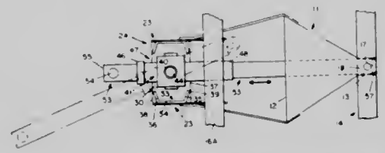
and further wherein each element embraces a said end portion in a nested manner, said one roller carrying means retaining said nested condition while being pivotally movable.

4,893,829

SELF ALIGNING COUPLING APPARATUS

Darrel B. Davis, 170 Macleay Rd., Sequim, Wash. 98382

Filed Mar. 3, 1989, Ser. No. 318,764
Int. Cl.[4] B60D 1/00
U.S. Cl. 280—479.2 **10 Claims**



1. A self aligning coupling apparatus for mounting on a towing vehicle or a towed vehicle whereby the self aligning means will apply equally as well on either vehicle to couple the other vehicle, comprising:

a funnel having an entrance and exit, a top, bottom and sides suspended longitudinally under a vehicle frame, including a first hole through the top side of the exit end for a latch connection,

a cradle-like strap support with the intermediate portion of the opposite ends secured to the bottom side of the exit and having the opposite end attached to the frame,

a pair of longitudinally extending straps with inner ends and outer ends secured to the opposite sides of the entrance end of the funnel,

a first housing comprising spaced L-shaped end plates having a horizontal portion attached to the outer ends of the longitudinal straps and the vertical portion extending upward to a straddled end attachment around said frame, and including spaced top and bottom plates having inner and outer side edges and opposite ends connected to the inside horizontal portion of the L-shaped ends, and a second hole bored centrally through the top and bottom plates,

a second housing mounted between said top and bottom

plates comprising spaced horizontal plates joined at opposite ends to spaced vertical plates, the vertical plates having a third hole bored centrally therethrough and including a pair of opposite gimbal axles mounted on the horizontal plates rotatably inserted in the second holes provided in the first housing,

an elongated sleeve constructed similarly to the second housing with horizontal and vertical plates having an outer end secured within said second housing and an inner end extending beyond the inner edges of said top and bottom plates, and including a gimbal axle mounted centrally on each vertical plate inserted rotatably in the third holes,

an elongated coupler slidably enclosed in the sleeve having a hitch connection on an outer end and a hole through the top side of an inner end, the inner end adapted to slide angularly into the entrance of said funnel for a locking engagement therein urged by the direction of thrust applied by the backing vehicle on the coupled hitch of the towing vehicle and towed vehicles,

a latch pin enclosed in the fourth hole having an end portion with a rounded tip projecting outside of said hole adapted to plunge in to the first hole in said funnel when said inner end of said coupler enters said exit end to lock each together,

a coiled spring attached in said fourth hole adopted to exert upward end pressure on the latch pin,

a lever having a fifth hole on the upright end, the lower end being secured in a pivot mounted on the top side of said funnel exit, and including an arcuate extension having a lower end arranged to enter said first hole,

a drive rod extending from an inner end connection in the fifth hole to an outer end on a side of one of said housing end plates, said end plate including an eyebolt fastened thereto for receiving the outer end of the rod therethrough, and

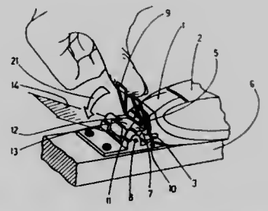
a handle attached to said outer end for pushing or pulling the rod whereby in pulling said rod the lever pivots to drive the arcuate extension into said first hole to purge the tip portion of the latch pin therefrom to release said coupling from said funnel.

4,893,830

APPARATUS FOR THE RETENTION OF A BOOT ON A SKI

Josiane Dunand, Cran-Gevrier; Paul Arnulf, Alby sur Cheran, and Denis Gasquet, Annecy, all of France, assignors to Salomon S.A., Annecy Cedex, France

Continuation of Ser. No. 832,700, Feb. 25, 1986. This application Feb. 8, 1989, Ser. No. 307,533
Claims priority, application European Pat. Off., Mar. 5, 1985, 85400413
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[4] A63C 9/00
U.S. Cl. 280—615 **39 Claims**



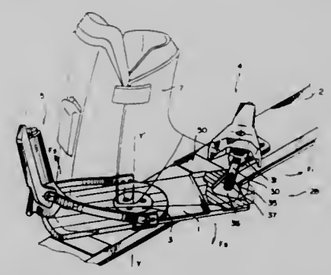
1. A cross-country ski binding for the retention of a shoe or boot on a ski comprising a mobile lock for engaging a front portion of said shoe or boot for retaining said front portion of said shoe or boot on a ski and for allowing a rear portion of said shoe or boot to be raised from said ski, a control lever for moving said mobile lock between a stable lock position and a stable unlocking position, an elastic system for biasing said lock in said stable lock position, wherein movement between said stable positions is performed by means of a toggle-joint system, wherein said elastic system comprises an actuating member for said mobile lock which, together with said mobile lock, constitutes said toggle-joint system, and wherein said elastic system further comprises said control lever.

4,893,831

SAFETY SKI BINDING

Roger Pascal, Annecy-Le-Vieux, and Jean P. Dimier, Rumilly, both of France, assignors to Salomon S.A., Annecy, France

Filed Mar. 6, 1987, Ser. No. 944,230
Claims priority, application France, Jun. 20, 1983, 83 10819
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] A63C 9/081
U.S. Cl. 280—618 **25 Claims**



1. A ski binding for releasably securing a boot to a ski, said binding comprising:

(a) a pivotable plate adapted to be pivotably secured to said ski whereby said plate is pivotable on said ski around an axis substantially perpendicular to the upper surface of said ski, said plate pivoting to an unaligned position relative to said binding during release of said boot;

(b) first and second means for securing the front and rear of said boot, respectively, onto said ski, said first means being elastically pivotable to allow for release of said boot with pivoting of said first means, wherein said second means is mounted on said plate;

(c) said first means being operatively associated with said plate so that said plate and said first means together comprise means for automatic realignment of said plate in response to release of said boot, wherein said first means is operatively associated with said plate only by means of linkage means for linking said first means with said plate, and transmitting the rotational movement of said first means to said plate.

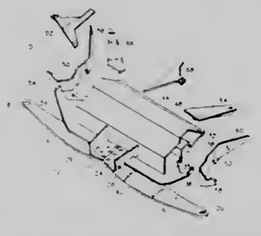
VOL 1110 ISS 3 JA 16 1990 UMI

4,893,832

DIHEDRAL COMPOSITE VEHICLE SUSPENSION

Benjamin V. Booher, Leucadia, Calif., assignor to Suspension Group, Ltd., Encinitas, Calif.

Continuation of Ser. No. 29,100, Mar. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 835,187, Mar. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 717,791, Mar. 29, 1985, abandoned, which is a continuation of Ser. No. 525,011, Aug. 22, 1983, Pat. No. 4,509,744. This application Aug. 26, 1988, Ser. No. 237,698
Int. Cl.[4] B60G *11/02*
U.S. Cl. 280—719 5 Claims



1. A vehicle suspension assembly for supporting a body of a vehicle on laterally spaced wheel assemblies, comprising:
- an elongated transverse mount structure for mounting between the side structure of a vehicle body which comprises a generally tubular box-like section having a generally horizontal bottom panel and a vertically spaced upper panel, each said bottom panel and upper panel having at least one vertical surface;
- a central mount mounted on the underside of said transverse mount structure substantially on a longitudinal centerline thereof, said central mount comprising a longitudinally extending channel with an inverted V-shape; and
- a combination spring and control arm assembly having a generally inverted V-configuration, secured to said central mount at said inverted V and comprising first and second arms formed of a composite material, each having a substantially uniform thickness along the length thereof extending in opposite directions from said central mount for supporting a wheel assembly at the outer end thereof for free vertical movement.

4,893,833

CLOSURE FOR AN AIR BAG DEPLOYMENT OPENING

Anthony J. DiSalvo, Allen Park, and David J. Bauer, West Bloomfield, both of Mich., assignors to Tip Engineering Group, Inc., Farmington Hills, Mich.

Filed Sep. 8, 1988, Ser. No. 241,893
Int. Cl.[4] B60R *21/16*
U.S. Cl. 280—732 17 Claims



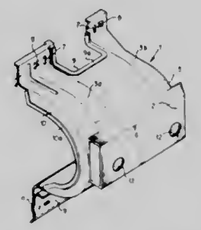
1. A closure arrangement for an opening defined within an auto interior structure, said opening adapted to accommodate deployment of an inflatable safety cushion through said opening, said closure arrangement comprising:
- a closure panel member configured to be interfit into said opening;
- hinging means operatively associated with one side of said closure panel to enable outward pivoting of said of said closure panel away from said opening;
- frangible locking means extending along another side of the said closure panel member than said side associated said hinging means, said frangible locking means normally locking said closure panel to prevent hinging open of said closure, said frangible locking means comprising interfit projecting and recess rigid portions each respectively affixed to one of said auto interior structure or said closure panel member mating together to create a lock therebetween preventing hinging opening of said closure panel by shear loading of said projecting portion, said projecting portion shearing free upon exertion of a predetermined outward pressure on said closure panel member applied by said inflatable cushion as it begins to be deployed towards said opening.

4,893,834

AUTOMOTIVE KNEE BOLSTER

Kiyoshi Honda; Tsukasa Itoh, and Takashi Kojima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,829
Claims priority, application Japan, Jun. 18, 1987, 62-152034
Int. Cl.[4] B60R *21/04, 21/055*
U.S. Cl. 280—751 9 Claims



1. An automotive knee bolster for supporting a knee of a vehicle occupant in case of a vehicle crash, comprising:
- a deformable, energy absorbing member adapted to be placed opposite to the knee of the vehicle occupant, said energy absorbing member consisting of a sheet metal member having a predetermined lateral width; and
- a substantially rigid, load spreading member attached thereto to spread an impact force applied thereto by the knee to a substantial area of said energy absorbing member, said load spreading member comprising a front plate opposite to the knee of said vehicle occupant and a rear plate securely attached to the front plate by means of an upper connecting member and a lower connecting member such that said front and rear plates extend in parallel with and in a spaced relationship with each other.

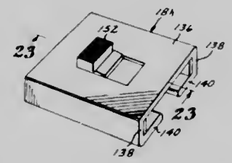
4,893,835

VEHICLE SEATBELT DEFLECTION DEVICE

Scott R. Linden, 17154 Ryeland Rd., Hesperia, Calif. 92345

Continuation-in-part of Ser. No. 143,639, Jan. 12, 1988, Pat. No. 4,796,919. This application Aug. 11, 1988, Ser. No. 231,203
Int. Cl.[4] A47C *31/00*
U.S. Cl. 280—808 9 Claims

1. In combination with a vehicle seat belt which extends in a substantially vertical run from an outside anchorage on one side of a vehicle seat to a door post anchorage, and which then extend in a diagonal run from the door post anchorage to a buckle means adapted for detachable connection to an inside anchorage on the other side of the vehicle seat, an improved deflection device for shortening the diagonal run and disposing it at a greater angle relative to the vertical run to suit the seatbelt to a smaller seat occupant, the deflection device comprising:
- clamping means operative to fixedly clamp the diagonal run to the vertical run below the door post anchorage at a



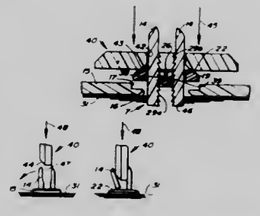
location which is selected to dispose the diagonal run at a desired angle relative to the vertical run, the clamping means including a channel shape frame having a base and overlying flanges spaced apart to define a belt entry throat; slide means in the channel movable between a first position wherein the diagonal and vertical runs are freely received through the entry throat and between the slide means and the flanges, and a second position wherein the diagonal and vertical runs are clamped between the slide means and the flanges and constrain the diagonal and vertical runs against relative movement.

4,893,836

BOOK BINDING CONNECTOR AND BINDING-DEBINDING TOOL

Charles T. Groswith, III, Los Altos; Edwin A. Seipp III, Menlo Park, both of Calif., and Thomas P. Myers, Cleveland Heights, Ohio, assignors to Taurus Holdings, Inc., Mountain View, Calif.

Filed Mar. 17, 1988, Ser. No. 169,558
Int. Cl.[4] B42B *5/08*
U.S. Cl. 281—28 16 Claims



1. A paper sheets stack binding and debinding tool for a binding connector having headed ratchet-containing spaced posts passing through an aperture in a paper sheets stack and a headed pawl-containing locking collar, said tool comprising an essentially flat diac having a through-aperture to accommodate a pair of spaced connector posts, a finger-engageable surface and a locking collar-engageable surface for ratcheting and engaging a locking collar of a binding connector and said pair of connector posts together to hold a stack of paper sheets; and a debinding bit extending from a surface of said disc to shear an engaged pawl from said locking collar and allow separation of said pair of connector posts from said locking collar.

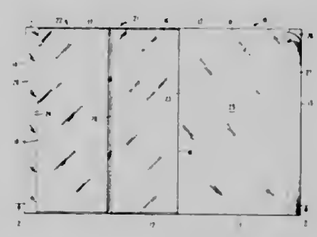
4. An apertured paper sheets binding connector comprising:
- a binding member including a pair of elongated parallel spaced posts integrally extending from a common head, said common head having a D-shaped configuration, said posts having at least one ratcheted surface thereon, and an integral rim extending longitudinally from said common head adjacent root portions of said posts, said rim including a double-bevelled peripheral ridge adjacent an extremity of said rim;
- a locking collar having a pair of matching through-apertures, an integral medial cross-bar extending between and separating said apertures, and at least one pawl hingedly mounted to said cross-bar, said through-apertures allowing sliding passage of said posts therepast and said at least one pawl to ratchet along said at least one ratcheted surface of said posts, said locking collar having a D-shaped configuration; and
- a pair of multi-apertured binding strips positionable along opposed margins of a stack of paper sheets adjacent at least two paper sheets apertures; and where each aperture of each of said strips includes a D-shaped counterbore therein, said locking collar head and said binding member common head being insertable oppositely into each of said counterbores in opposed ones of said pairs of strips to clamp a stack of paper sheets together, and where said peripheral ridge of said binding member has a diameter greater than a diameter of a strip aperture such that said binding member is click locked into said strip aperture upon insertion of said common head into a counterbore receiving said common head.

4,893,837

PROTECTIVE BOOK COVERING AND METHOD OF MAKING IT

Joseph S. Pugliese, Lewisburg, and Charles L. Garman, Jersey Shore, both of Pa., assignors to Brodart Co., Williamsport, Pa.

Filed Mar. 29, 1989, Ser. No. 330,213
Int. Cl.[4] B42D *3/00*
U.S. Cl. 281—31 9 Claims

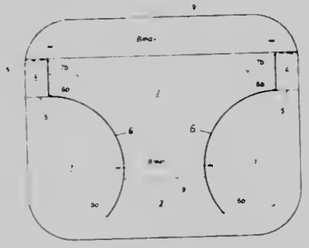


1. A protective book covering for a book having a front cover, a rear cover, and a spine between the rear edges of the covers, the protective book covering comprising:
- a relatively long piece of sheet material having parallel longitudinal edges, and two end edges extending from one of its longitudinal edges to the other,
- a relatively short piece of sheet material overlying the long piece, the short piece having two longitudinal edges in registry with and sealed to the two longitudinal edges, respectively, of the long piece, and the short piece having two end edges extending from one of its longitudinal edges to the other, and
- a seal and tear line extending from one to the other of the longitudinal edges of both pieces and being located between and spaced from the transverse edges of the short piece, the seal and tear line serving to seal together the two pieces and form a line of severance along which the pieces can be torn to produce two units, each unit having a pocket adjacent to the seal and tear line for accommodating one of the book covers and at least one of the units having a section, extending from the pocket of that unit,

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long enough to wrap around the spine of the book when a book cover is in place within that pocket.

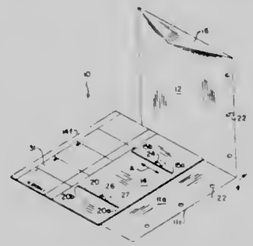
4,893,838
HOLDING DEVICE FOR PRINTED MATTER
Irmfried Wiber, No. 1018, A-3042, Würmla, Austria
Filed Jan. 21, 1988, Ser. No. 289,501
Claims priority, application Austria, Jul. 9, 1987, 1733/87
Int. Cl.[4] B42D *3/08, 17/00;* B42F *15/00;* B65D *27/00*
U.S. Cl. 281—45 4 Claims



1. A holding device for printed and paper goods, comprising a blank sheet of transparent material having two sides, a top and a bottom and a front and back wall, which sheet is subdivided into a first and second panel by two semicircular cuts, each cut beginning at a distance from the bottom of said sheet and continuing toward the top of said sheet in a semicircle, said semicircle forming at least a quarter circle, but less than a half circle, with each of the upper ends of said semicircular cuts terminating in a straight cut further extending toward the top of said sheet and terminating at a distance short of the top of said sheet, so that said first panel comprises a first web along the bottom of said sheet with sides delinated by said semicircular and straight cuts and a second web along the top of said sheet, with a first and second fold line extending between said straight cut and the side of said sheet, and so that said second panel comprises that portion of sheet material delineated by the semicircular and straight cuts with a third fold line extending between said semicircular cuts, which is placed between the lower ends of said semicircular cuts and that part of said semicircular cuts corresponding to at least a quarter circle.

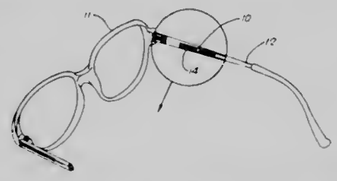
4,893,839
MOVABLE INDEX SHEET UNIT
George O. Podd; Robert J. Mangler, both of Chicago, and Anne J. Maraland, Schaumburg, all of Ill., assignors to Wilson Jones Company, Chicago, Ill.
Filed Nov. 17, 1988, Ser. No. 272,368
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—65 4 Claims

1. A movable index sheet unit comprising
- a base sheet having a forward and a rear edge such base sheet having a first and second spaced-apart track follower means;
- a movable index sheet with forward and rear edges having slot track means to permit reciprocation of the index sheet guided by the track follower means within limits from an exposed position for complete index viewing in which the forward index sheet edge is remote from the forward base sheet edge to a retracted position;
- the track follower means including tab means formed from and extending from the base sheet through the



track slot means and bent to be oriented in a plane substantially parallel to the base sheet.

4,893,840
ARTICLE IDENTIFICATION LABEL AND METHOD OF ARTICLE IDENTIFICATION
William E. Berkowitz, 4931 Birchwood, Skokie, Ill. 60077
Filed Apr. 15, 1988, Ser. No. 181,941
Int. Cl.[4] B42D *15/00;* G09F *3/00;* G02C *1/00;* B05D *3/06*
U.S. Cl. 283—81 5 Claims

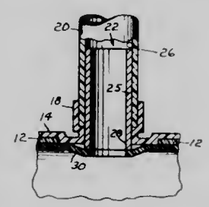


1. An identification label for eyeglasses having a frame comprising:
- identifier means mounted on a surface of the frame of the eyeglasses, said identifier means being visible to the naked eye;
- a hard transparent coating means for protecting the identifier means from being separated from the surface of the eyeglasses, said coating means substantially covering the identifier means and being formed when a hardenable liquid is applied to the identifier means so as to substantially cover the identifier means and is allowed to harden to form a transparent coating capable of withstanding wear from prolonged usage of the eyeglasses.

4,893,841
REAMER GUIDE FOR PRIMARY SEWER LINE TAPS
William D. Bowen, 123 S. W. 87, Oklahoma City, Okla. 73139
Filed Apr. 20, 1989, Ser. No. 340,836
Int. Cl.[4] F16L *55/18*
U.S. Cl. 285—15 2 Claims

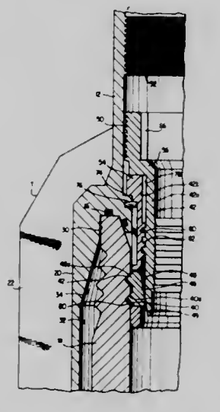
1. In a subterranean liquid and waste primary drain line having a cylindrical bore and having a tee interposed in the line and cooperatively forming a continuation of the cylindrical bore with the lateral opening of the tee connected in communicating relation with the discharge end portion of a lateral secondary drain line and having the surface defining its cylindrical bore imperviously sealed by a the wall of a plastic material tube, the improvement comprising:

a sleeve contained by the lateral line in its end portion connected with the tee,



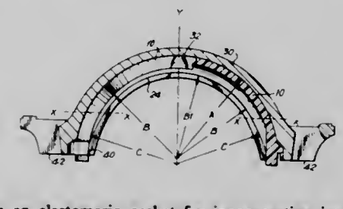
said sleeve having one of its end surfaces abutting and closed by the wall of the liner tube.

4,893,842
WELLHEAD TIEBACK SYSTEM WITH LOCKING DOGS
Norman Brammer, Scotland, United Kingdom, assignor to Vetco Gray Inc., Houston, Tex.
Filed Sep. 27, 1988, Ser. No. 250,022
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 5 Claims



1. In a conductor tieback connector for connecting a conductor to a subsea wellhead of the type having a tubular body sealably and rigidly connectible to the conductor, a downwardly opening funnel means connected to the tubular body for aligning the connector, and upward and downward facing abutting surfaces on the wellhead and the tubular body, respectively, for abutting when the tubular body is fully engaged within the wellhead, an improved lockdown means for locking the connector to the wellhead, comprising in combination:
- at least one internal circumferential groove formed in the wellhead, the groove having a load shoulder that inclines downward and inward relative to a longitudinal axis of the wellhead;
- an inner ring;
- an outer ring;
- means for carrying the inner ring within the outer ring;
- means for carrying the rings in the tubular body;
- a locking element;
- a means for carrying the locking element with the outer ring for radial movement relative to the outer ring and for preventing any axial movement of the locking element relative to the outer ring, the locking element having an inner surface and a load shoulder that inclines upward and outward relative to a longitudinal axis of the outer ring for engaging the load shoulder of the groove;
- the inner ring having an outer surface that is positioned for engaging an inner surface of the locking element;
- an upward facing ledge formed internally within the tubular body;
- a collar on the exterior of the outer ring for bearing against the ledge;
- means in the inner ring for receiving a running tool for moving the inner ring downward relative to the outer ring and the tubular body, causing the inner ring outer surface to slide on the locking element inner surface to force the locking element outward into the groove; and
- the distance between the locking element load shoulder and the collar being slightly less than the distance between the ledge and the groove load shoulder when the abutting surfaces of the wellhead and tubular body engage each other, so as to cause an interfering engagement of the load shoulders, exerting a preload force on the abutting surfaces as the locking element load shoulder slides outward against the groove load shoulder.

4,893,843
LUBRICANT-FREE ELASTOMERIC GASKET
Peter G. DeRaymond, Nazareth, Pa., assignor to Victaulic Company of America, Easton, Pa.
Filed Mar. 13, 1989, Ser. No. 322,789
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—112 21 Claims



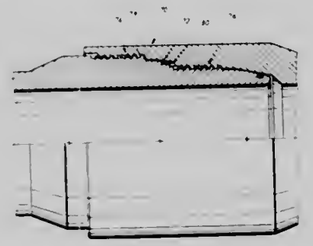
1. In an elastomeric gasket for incorporation into a segmented pipe coupling comprised of arcuate coupling segments, said elastomeric gasket being of an arcuate length greater than the arcuate length of a said arcuate coupling segment and having at least one sealing lip extending in a generally axially direction on a radially inner surface thereof, the improvement comprising:
- a first portion of said sealing lip of a first radius intermediate the ends of said gasket; and,
- second portions of said sealing lip extending between the ends of said first portion and the respective ends of said gasket, each said second portion being of a radius greater than said first portion, and, at least equal in radius to the external radius of a pipe for which the segmented pipe coupling is intended;
- whereby said elastomeric gasket can be positioned over a said intended pipe in the substantial absence of frictional engagement with said pipe.

4,893,844
TUBULAR COUPLING WITH VENTABLE SEAL
K. Darrel Chelette, Katy, and Charles A. Bellfram, Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Continuation of Ser. No. 489,752, Apr. 29, 1983, abandoned.
This application Aug. 28, 1985, Ser. No. 771,137
Int. Cl.[4] F16L *15/04*
U.S. Cl. 285—113 2 Claims

1. A threaded coupling that resists thread separation of two mating tubular members, comprising:
- an internally hook threaded box on one tubular member;

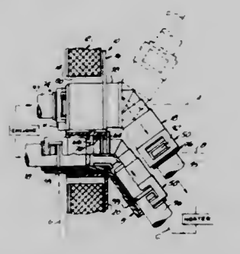
VOL 1110 ISS 3 JA 16 1990 UMI

an externally hook threaded pin on the other tubular member engaging the threaded box to resist jump out;
a stop shoulder between the two members;
a first seal surface on the box;
a second seal surface on the pin to form a metal-to-metal seal of selected interference with the first seal surface of the box;
a seal groove in one of the tubular members between the metal-to-metal seal and the end of the pin;



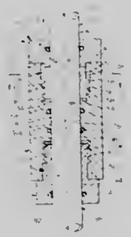
a gap between the seal groove and the end of the pin; and
seal means seated in said seal groove with an interference in the range of substantially six to ten times the interference of the metal-to-metal seal wherein pressure build-up between the threads is vented into said tubular members and fluid flow from within said tubular members is isolated from the threads.

4,893,845
FIREWALL HEATER LINE ADAPTER
Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Mt. Clemens, Mich.
Filed Apr. 18, 1988, Ser. No. 183,640
Int. Cl.[4] F16L *5/00, 37/00*
U.S. Cl. 285—137.1 **8 Claims**



1. A flowthrough connector assembly for passing a high heat fluid between first and second reservoirs separated by a wall having an opening therein, comprising in combination an adapter body mountable on said wall and including at least two tubular conduits each defining a central passageway and extending into the opening, a pair of angled elbows each having a first and a second end portion, each elbow being adapted to have its first end portion removably mounted in a respective conduit such that its second end portion is spaced from the adapter and positionable angularly for desired mating, the elbows being independently angularly positionable relative to one another, and retainer means in each said elbow for retaining a fluid conduit in a swivelable sealed connection therewith, each said elbow and fluid conduit being swivelable independently of one another.

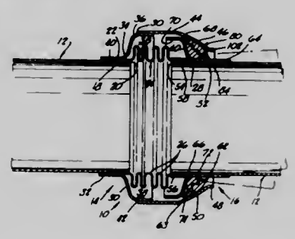
4,893,846
CONNECTOR FITTINGS
Doonan D. McGraw, 245 Saint James Way, Naples, Fla. 33942-6715
Filed May 2, 1989, Ser. No. 346,473
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—156 **24 Claims**



1. A fitting of the spring cantilever clamp action type having spring cantilever clamping legs and a plurality of normally engaged camming surfaces, said spring cantilever clamping legs being resiliently moved to the cantilever clamping position from an unclamped normal position by the cooperative camming action of said plurality of engaged camming surfaces acting in one direction and by cantilever spring action returning to the unclamped normal position when the cooperative camming action of said camming surfaces acting in said one direction is reversed, said camming surfaces being positioned obliquely relative to said clamping legs and also obliquely relative to the direction of resilient movement of said clamping legs to and from the clamping position;
said fitting being constructed and arranged to have said camming surfaces internally contained so as to be protected against accidental impact damage during normal handling, transport, the process of attachment to at least one cylindrical member, and in its installed position;
said fitting comprising:
a nut defining a fitting main body and having a plurality of ends, said nut further having a bore therein defining at one bore end an enlarged recess opening outwardly of said bore through one of said nut ends, said recess being provided with a first one of said camming surfaces defined by an internal thread in axially inwardly spaced relation to the outward opening of said recess;
a cap bolt having a bore therethrough, a bolt head, a longitudinally segmented annular bolt shank extending axially from said bolt head and provided with a second one of said camming surfaces defined by an interrupted external thread at the remote end of said segmented annular bolt shank from said bolt head, said second camming surface being in axially spaced relation to said bolt head so that said segmented annular bolt shank is fully received in said nut recess when said cap bolt is threaded into said nut until said bolt head engages said nut one end at said recess outer opening to prevent further movement of said bolt head axially toward said recess and to fully contain said internal and said external thread camming surfaces protectively within said recess, said segmented annular bolt shank comprising shank segments defining said spring cantilever clamping legs;
and means sealing said cap bolt bore in the area of said cap bolt head and also sealing said nut recess axially beyond said internal camming surface thread;
said internal and external camming threads cooperating in camming relation to move said shank segment clamping legs in cantilever fashion inwardly when said cap bolt is rotated in a further inwardly threading direction, said shank segment clamping legs then being adapted to clamp-

ingly grip a member received in said bore in the axial area of said external thread camming surface.

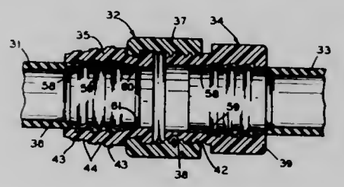
4,893,847
BEARING SEAL FOR UNIVERSAL BALL JOINT
Robert A. Hess, Altadena, Calif., assignor to Stainless Steel Products, Inc., Burbank, Calif.
Filed Jul. 5, 1988, Ser. No. 214,944
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—226 **5 Claims**



1. In a universal ball joint, for an annular bleed high temperature air ducting which includes at least two pieces each having a plane with said universal ball joint interposed between said pieces of ducting, said universal ball joint capable of angulation to change the direction of said pieces of ducting, said universal ball joint having an annular first half secured to one of said pieces of said ducting, and an annular second half secured to the other of said pieces of said ducting an annular bellows within said ball joint between and uniting each of said pieces of ducting one with the other, said first half of said ball joint having a race portion overlying said bellows and a portion of said second half, said second half of said ball joint having a retainer portion underlying said race creating a bearing seal space therebetween, and said race portion movable with respect to said retainer portion when either of said halves angulate with respect to each other, the improvement comprising:
an annular non-deflecting bearing seal adapted to be interfitted within said bearing seal space to act as a bearing and seal upon which said race rides with a low coefficient of friction, said bearing seal includes a non-layered graphite composition multifaced band, and a reinforcing core of a different material than said graphite composition;
said retainer portion of said second half of said ball joint having two faces at angles one to the other and two faces of said multifaced band correspond to the angular relationship of said two faces of said retainer whereby said bearing seal is seated thereagainst in a fixed position; and
said race portion of said first half of said ball joint includes a seal bearing face above said retainer portion of a different angle than either of said two faces of said retainer and said bearing includes another of its multifaces corresponding to the angle of said bearing face.

4,893,848
HOSE COUPLING
Edward L. Melcher, Grosse Pointe Park, Mich., assignor to Winzeler Stamping Company, Montpelier, Ohio
Filed Nov. 8, 1988, Ser. No. 268,452
Int. Cl.[4] F16L *33/20*
U.S. Cl. 285—258 **11 Claims**

1. In a coupling member for hoses, a flexible coupling section having a central bore of a diameter substantially equal to the outside diameter of said hose and adapted to fit over the end segment of said hose, said coupling section including a threaded portion for coupling said member to a mating coupling section, said bore being defined by an interior cylindrical wall within said coupling member, a series of annular barbs formed in said cylindrical wall and defining spaced apexes separated by recessed areas, said annular barbs having a reverse rake angle, each said barb comprising a base sloping rearwardly and outwardly to a juncture with a radial wall extending inwardly and forwardly therefrom, said juncture defining a said apex, said apexes being longitudinally aligned along lines parallel to the longitudinal axis of said central bore,



and a tubular ferrule within the interior of said end segment urging the wall of said hose section outwardly into said barbs, said tubular ferrule including a central passageway having a cross-sectional area substantially equivalent to the interior passage of said hose, and an annular rib projecting toward a said recessed area between apexes of said barbs.

4,893,849
REMOTE LATCHING MECHANISM
Richard E. Schlack, Unionville, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Sep. 24, 1987, Ser. No. 100,623
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—7 **20 Claims**



1. A remote latching mechanism comprising:
(a) an actuator assembly;
(b) at least one elongate rod affixed to said actuator assembly for lateral movement in response to actuation of said assembly;
(c) a bracket; and
(d) a pawl connected to said rod at a location remote from said actuator assembly and disposed within said bracket for sliding and pivoting movement in response to the lateral movement of said rod; wherein said bracket comprises a pair of opposing side walls and a back wall connected to said side walls, wherein said pair of side walls is each provided with a longitudinal slot therein and a flange connected thereto, said flanges comprising means for mounting said bracket to a closure member, and wherein said slots comprise means for facilitating the guiding and pivoting of said pawl.

4,893,850
OPENING/CLOSING DEVICE
Akira Mizusawa, Utsunomiya, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Nov. 17, 1988, Ser. No. 272,369
Claims priority, application Japan, Nov. 30, 1987, 62-180959[U]
Int. Cl.[4] E05C *19/12*
U.S. Cl. 292—128 **20 Claims**

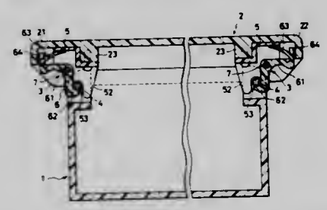
1. An opening/closing device for detachably coupling an end portion of a closure member to an end portion of a body having an opening to be opened and closed by said closure member, comprising:

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a locking shaft fixedly mounted upon said body within the vicinity of said end portion of said body;

notch means defined within said closure member for engaging a first portion of said locking shaft of said body when said closure member is disposed at its closed position upon said body;

an operating lever, including pawl means formed upon one end thereof, pivotably mounted upon said closure for movement member between a first position at which said pawl means is engaged with a second portion of said locking shaft so as to cooperate with said notch means for



retaining said closure member at said closed position upon said body, and a second position at which said pawl means is disengaged from said locking shaft so as to permit said closure member to be moved from said closed position to an open position; and

spring means operatively connected to said operating lever and engaged with an inner undersurface portion of said closure member for biasing said operating lever and said pawl means thereof toward said first position at which said pawl means is engaged with said second portion of said locking shaft so as to retain said closure member at said closed position upon said body.

4,893,851

THUMB TURN LATCH

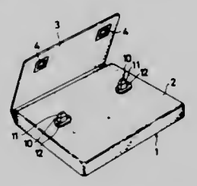
Ryukichi Murai, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,357

Claims priority, application Japan, Oct. 1, 1987, 62-159020[U]

Int. Cl.[4] E05C *5/02*

U.S. Cl. 292—204 **7 Claims**



1. A thumb turn latch comprising:

(a) a latch body having a grip head and a split shank extending perpendicularly from a lower surface of said grip head and terminating in an enlarged foot, said grip head having on said lower surface at least one locking ridge extending radially relative to a central axis of said split shank; and

(b) a retainer movably holding thereon said latch body and including a bearing portion slidably receiving therein said split shank of said shank body, said bearing portion having a stepped hole including a small-diameter portion extending downwardly from an upper surface of said bearing portion and a large-diameter portion contiguous to said small-diameter portion and receiving therein said enlarged foot of said split shank, said large-diameter portion having an upwardly tapering cam surface disposed adjacent to said small-diameter portion and engageable with said enlarged foot to urge said latch body downwardly toward said retainer, said bearing portion further having in said upper surface a crisscross guide groove extending radially outwardly from said stepped hole for receiving therein said locking ridge to lock said latch body in position against rotation relative to said retainer.

4,893,852

DUAL SENSOR ELECTROMAGNETIC DOOR LOCK SYSTEM

Daniel J. Harris, West Hartford, and Richard W. Gladych, Burlington, both of Conn., assignors to Harrow Products, Inc., Grand Rapids, Mich.

Filed Jan. 17, 1989, Ser. No. 297,700

Int. Cl.[4] E05C *17/56*

U.S. Cl. 292—251.5 **13 Claims**



1. An electromagnetic lock system adaptable for providing controlled access through a doorway having a frame mounting a door with an armature comprising:

housing means mountable to the door frame;

electromagnetic lock means mounted to said housing means and selectively electrically energizeable for magnetically bonding with the armature to provide a locked state;

ultrasonic sensor means mounted in said housing means for generating an ultrasonic detection beam traversing a path remote from said housing and for receiving reflected echoes from said beam;

passive infrared sensor means mounted in said housing means for sensing radiant energy temperature changes from a detection zone remote from said housing means;

processing means mounted in said housing means for processing said received reflected echoes to detect the presence of a foreign object in said beam and for processing said sensed radiant energy to detect the movement of a foreign object into the detection zone; and

lock release means responsive to said processing means for automatically transforming said electromagnetic lock means to a non-locked state for a pre-established time interval upon detection of a foreign object in said beam and movement of the object into said detection zone.

4,893,853

PADLOCK-TYPE SECURITY SEAL

Richard S. Geller, Newton, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jan. 24, 1989, Ser. No. 300,895

Int. Cl.[4] E05B *39/02*

U.S. Cl. 292—320 **10 Claims**

1. A security seal comprising:

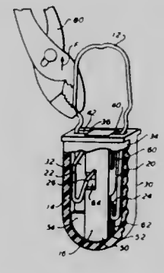
a shackle having at least one leg with a resilient locking element thereon;

a seal body having a chamber therein and an opening in one side thereof contiguous with said chamber;

a locking insert mounted in said seal body;

said insert having a slot in at least one wall thereof with an opening contiguous with said chamber; and

means in said slot for engaging said locking element and retaining said shackle leg in said chamber and for forcing



said element against a predetermined portion of said body when a sufficient force is applied to said shackle.

4,893,854

SELF-ADJUSTING DOOR STRIKE

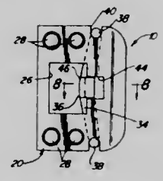
Hagen Dietrich, Delta, Canada, assignor to Masco Building Products Corp., Taylor, Mich.

Continuation of Ser. No. 9,434, Feb. 2, 1987, Pat. No. 4,813,724. This application Aug. 23, 1988, Ser. No. 235,247

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] E05B *15/02*

U.S. Cl. 292—341.12 **7 Claims**



1. A door strike for receiving an elongated latch bolt of a door lock mechanism longitudinally movable between an extended and a retracted position, said door strike comprising:

a plate member having rear and front faces and a plurality of apertures for mounting said plate member to the frame of the door in alignment with the door lock mechanism, said plate member having a central opening having a configuration of the latch bolt, said bolt longitudinally extendable through said central opening; and

a resilient biasing member attached to said rear face of said plate member, said biasing member including an elongated arm having opposite ends slidably attached to said plate member and an intermediate apex extending across said central opening of said plate member to engage the latch bolt upon longitudinal extension thereof, said arm biasingly engaging the latch bolt upon extension of the bolt through said central opening, said biasing member positionally captured between said plate member and the door frame wherein said plate member includes a camming lip integrally formed therewith and extending forwardly beyond the edge of he door frame for preliminarily engaging the latch bolt.

4,893,855

CATCH UNIT FOR A LATCH DEVICE

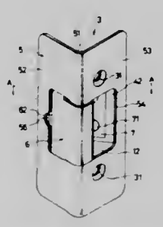
Ryoichi Itakura, Tokyo, assignor to Janco Corporation, Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,953

Claims priority, application Japan, May 27, 1988, 63-69250[U]

Int. Cl.[4] E05B *15/02*

U.S. Cl. 292—341.17 **3 Claims**



1. A catch unit for a latch device, comprising:

a catch body formed by bending a metallic plate in an L-shaped cross section, having a front leg and a side leg meeting each other along an edge, and provided with an opening for receiving a latch member therein, and upper and lower projections projecting respectively from the upper and lower sides of the opening on the extension of the edge;

a base plate attached along the opposite side edges to the backside of the catch body so as to form a predetermined space behind the opening of the catch body;

a plate spring provided within the space and fixed to the base plate; and

a catch door having one end pivotally joined to the plate spring with a hinge pin, and the other end provided with a detaining part which engages the projections of the catch body;

characterized in that the catch door closes a portion of the opening of the catch body when attached to the catch body with the detaining part thereof in engagement with the projections of the catch body, and the plate spring urges the hinge pin constantly away from the projections of the catch body to hold the catch door closed.

4,893,856

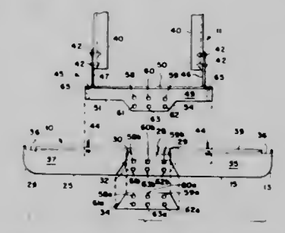
COMBINED TRAILER HITCH AND STORAGE BUMPER

Jackie L. Council, 5801 Greenway Ave., Newport News, Va. 23605

Filed Feb. 21, 1989, Ser. No. 313,442

Int. Cl.[4] B60R *19/02, 19/24*

U.S. Cl. 293—106 **18 Claims**



15. A combined trailer hitch/storage bumper for pickup trucks, vans or like vehicles, comprising in combination:

(A) a first structure comprising a bracket support for a vehicle bumper and including

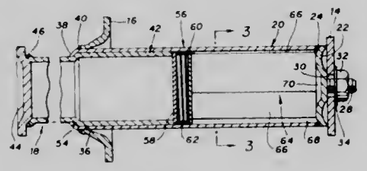
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(1) a pair of elongated metal segments each having a first and a second end, and a plurality of spaced openings provided along a portion of their length at said first end thereof;
(2) a transverse elongated mounting bracket having a vertical and a horizontal flat side, said vertical side of said transverse elongated mounting bracket being welded to said second end of each of said elongated metal segments at an area spaced from the ends of said transverse mounting bracket and serving to maintain said pair of elongated metal segments in spaced parallel relationship;
(3) a horizontal flat plate member having a first side disposed substantially intermediate the length of said horizontal flat side of said transverse mounting bracket, a pair of sides tapering and extending from said first side of said horizontal flat plate member to a second side parallel with and of reduced length relative to said first side of said horizontal flat plate;
(4) a pair of spaced openings provided through said vertical flat side of said transverse mounting bracket; and
(5) a plurality of openings provided in said horizontal flat plate member;
(B) a second structure comprising a vehicle bumper and adapted to be attached to said first structure and including
(1) a vehicle bumper having a storage compartment at each end thereof and provided with a central connecting area for said storage compartments;
(2) a single piece metal member forming the central connecting area as well as the front and ends of said storage compartments;
(3) said single piece metal member having a first curved area and forming an end of one storage compartment; a first flat area extending from said first curved end and forming the front of said one storage compartment; an angular segment extending from said first flat area and forming the major portion of the other end of said one storage compartment; a second flat area extending from said angular segment and forming a portion of the central connecting area between the two storage compartments; a second angular segment leading from said second flat area and forming the major portion of an end of the other of said storage compartments; a third flat area in the same plane and having the same dimensions as said first flat area and extending from said second angular segment and forming the front of said other storage compartments; and a second curved area extending from said third flat area and forming an end of said other storage compartment;
(4) a bottom plate member conforming in shape to the curved ends and having an edge extending the length of said single piece metal member, said bottom plate member being parallel with said first and third flat areas of said said single piece metal member and being attached to said single piece metal member to serve as the bottom surface of each said compartment;
(5) a flat plate extension of said bottom plate member disposed perpendicular thereto and serving as the back of each of said compartments; each said compartment back being provided with at least one through opening therein and in alignment with said pair of through openings provided in the vertical side of said transverse mounting bracket;
(6) a rain drain channel member attached to and extending in back of each said compartment and;
(7) a closure top for each said compartment, each said closure top being hingedly connected along one side thereof to said flat plate extension member serving as the back of said compartments, each said closure top having an overlaying lip surface on all sides thereof;
(8) sealing means disposed about the interior periphery of each said closure top to provide a watertight seal for each said compartment when said closure tops are in closed position; and
(C) means for connecting said first structure to the frame of a vehicle and for connecting said second structure to said first structure.

4,893,857
TELESCOPIC ENERGY ABSORBER UNIT FOR VEHICLE BUMPER MOUNTING

David A. Bobinger, Middletown; Abayomi O. Folarin, and James H. Childress, both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1988, Ser. No. 240,291
Int. Cl.[4] B60R *19/30, 19/28*
U.S. Cl. 293—136 **7 Claims**



1. An energy absorbing unit for mounting a bumper assembly at a predetermined and pre-impact position relative to an automobile comprising:
(a) a support cylinder defining a chamber;
(b) an energy absorbing medium of resilient elastomeric material operatively mounted in said chamber said energy absorbing medium including a plurality of longitudinal side walls parallel to the longitudinal axis of said energy absorbing medium, and only some of said side walls being in full-time engagement with an inner wall of said support cylinder;
(c) compressed, resilient preload piston means operatively mounted in said chamber for full-time engagement therewith and operatively associated at a first end with said energy absorbing medium;
(d) a piston tube having an inner end engaging a second end of said preload piston means and extending from said support cylinder to an outer end for operative connection with the bumper assembly;
whereby an impact load applied to said bumper assembly will cause the deflection of said preload piston means and the subsequent deflection of said energy absorber medium so that said impact load is stored, said energy absorbing medium and said preload piston means providing a force of restitution to move said piston tube outwardly and said bumper assembly to said pre-impact position subsequent to removal of said impact load.

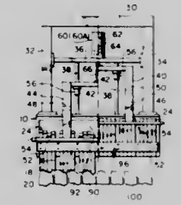
4,893,858
MOVABLE YOKE-TYPE LIFTING MAGNET DEVICE

Naoyuki Yoshitani; Mitsunori Minamisawa, and Tomomi Kishi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 24, 1988, Ser. No. 210,931
Claims priority, application Japan, Jun. 26, 1987, 62-97361[U]
Int. Cl.[4] B66C *1/06*
U.S. Cl. 294—65.5 **17 Claims**

1. A movable yoke-type lifting magnetic device comprising:
a magnetic core having first and second ends and adapted to be selectively magnetically excited;
at least one yoke provided at each of said first and second ends of said core, respectively, each said yoke having a lower end adapted to magnetically couple with a workpiece to be lifted, and each said yoke being configured to be slidable relative to said core in a vertical direction when said core is not magnetically excited and to be magnetically coupled to said core when said core is magnetically excited;

a movable framework supported so as to be movable relative to said core in the vertical direction, said movable framework including means for engaging with each said yoke to lift each said yoke when said movable framework is moved upwards, and for releasing each said yoke so as to

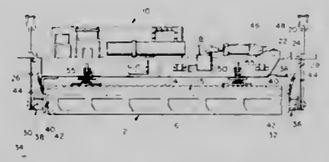


allow each said yoke to move downwards by its own weight when said movable framework is moved downwards; and
drive means, mounted to connect said core and said movable framework, for lifting and lowering said movable framework in the vertical direction relative to said core.

4,893,859
CONCRETE SLAB LIFTING CLAMP

Richard C. Nash, New Prague, Minn., assignor to Fabcon, Inc., Savage, Minn.

Filed Aug. 3, 1988, Ser. No. 227,768
Int. Cl.[4] B66C *1/42*
U.S. Cl. 294—103.1 **6 Claims**

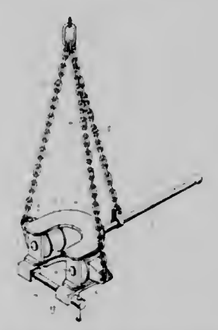


1. In an apparatus for lifting concrete panels, said apparatus including two or more lifting clamps, each of which comprises: a first beam; a second beam; a first clamping head connected to said first beam; said first clamping head constructed and arranged to engage said panel on one sidewall thereof; a second clamping head connected to said second beam, said second clamping head constructed and arranged to engage said panel on an opposite sidewall thereof; means for moving said first beam relative to said second beam to selectively engage and disengage one or both of said clamping heads from the sidewall of said panel; and connection means connected to said apparatus and constructed and arranged for connection to a lifting cable, said connection means providing for pivotal movement of said apparatus and said first and second clamping heads about an axis through said panel below said beams, the improvement comprising: each of said clamping heads including diamond crystals bonded to a panel engaging face of said clamping head wherein said diamond crystals are bonded to said clamping head by a braze alloy in a monolayer of crystals positioned at diverse points on said clamping head faces so as to distribute the points at which a load may be applied to said clamping heads.

4,893,860
DEVICE FOR GRIPPING AND SUSPENDING DRILL PIPE STAND

Nariman G. K. O. Kurbanov; Vagif A. Ali-Zade; Vladimir A. Kartashev, and Elder T. O. Zeinalov, all of Baku, U.S.S.R., assignors to Azerbaidjansky Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Neftyanogo Mashino-Stroeniya, Baku, U.S.S.R.

Filed Jun. 30, 1988, Ser. No. 213,625
Int. Cl.[4] B66C *1/44*
U.S. Cl. 294—114 **3 Claims**



1. A Device for gripping an elongated article such as a drill pipe stand, the device comprising a yoke-shaped housing having opposed, substantially parallel arm portions each extending from a base portion of the housing, the arm portions defining a passageway therebetween for embracing the article, an eccentric gripper pivotally mounted in each arm portion about a respective pivot axis, a lever connected with each gripper for moving the gripper between a gripping position and a release position with respect to the passageway, the lever extending outwardly from the respective arm portion, a lifting member, a flexible element extending between each lever and the lifting member for suspending the housing from the lifting member with the arm portions and the pivot axes extending substantially horizontally, an elongate operating handle extending outwardly from the base portion of the housing, and a flexible member extending between the lifting member and a part of the handle located between the housing and an outer end of the handle, the device being configured for tensioning the flexible member while relaxing the flexible elements when downward pressure is applied to the outer end of the handle and for relaxing the flexible member while tensioning the flexible elements when said pressure is released, and each gripper being configured for assuming the release position when the respective flexible element is relaxed and the gripping position when the respective flexible element is tensioned.

4,893,861
DRUM LIFTER RING

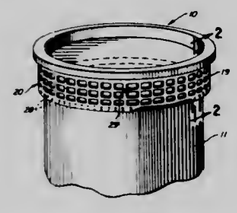
Michael D. Stoltzmann, Lake Forest, Ill., assignor to International Precision Components Corporation, Lake Forest, Ill.

Filed May 23, 1988, Ser. No. 197,644
Int. Cl.[4] B65D *25/22;* **B66C** *1/18*
U.S. Cl. 294—119.2 **15 Claims**

1. A drum lifter ring for use in lifting a drum by means of an upwardly directed lifting hook, the drum having a top wall and a sidewall provided with an annular, outwardly opening groove spaced below the top wall, said lifter ring comprising
a one-piece ring of moulded synthetic resin having an annular thin-walled midportion defining a radially outer surface, a radially inner surface, and a plurality of recesses spaced circumferentially therein, and opening radially outwardly through said outer surface, an annular rigid top wall having a radially outer portion projecting outwardly

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beyond said midportion outer surface and defining a downwardly opening annular recess for receiving an upwardly extending lifting hook, and an annular rigid bottom wall having a radially inner portion projecting inwardly beyond said radially inner surface of the midportion to be fixedly received in an annular groove of a drum to which the lifter ring is to be mounted, a radially outer portion, and at least one downwardly opening recess in said bottom wall disposed between said radially inner portion and said radially outer portion.

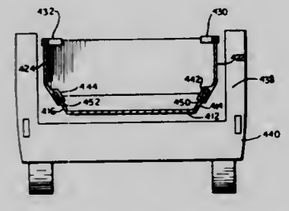


4,893,862

REMOVABLE CARGO BED LINER

Robert A. Hollenbaugh, Sr., Erie, Pa., assignor to R & R Enterprises, Erie, Pa.

Continuation of Ser. No. 60,639, Jun. 11, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,393
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—39.1 1 Claim



1. A cargo area liner for a vehicle comprising a bottom panel, a first side panel, a second side panel, a first end panel, a second end panel, the bottom panel having a first side flange, a second side flange, a first end flange and a second end flange at a first side, a second side, a first end and a second end thereof respectively,

said end flanges and said side flanges of said bottom panel being integrally attached to said bottom panel and extending upwardly and outwardly therefrom,

said first end panel having a first part and a second part,

said second end panel having a first part and a second part,

said first side panel having a first part and a second part,

said second side panel having a first part and a second part,

said first part of said first side panel and said first part of said second side panel and said first part of said first end panel and said first part of said second end panel extending upwardly and outwardly and integrally attached to said second parts of said side panels and said end panels respectively,

first means supporting said first part of said first end panel on said second side flange,

second means supporting said first part of said second end panel on said first side flange,

third means supporting said first part of said first side panel on said first end flange and fourth means supporting said first part of said second side panel on said second end flange respectively,

said first side panel and said second side panel each having a first end and a second end,

said first end panel and said second end panel each having a first end and a second end engaging said first ends and said second ends of said end panels at a first angular corner, a second angular corner, a third angular corner and a fourth angular corner,

angular corner members,

said angular corner members, being U-shaped in cross section, and receiving the upper ends of said second parts of said panels at said corners holding said side panels and said end panels in end-to-end relation to each other,

whereby said bottom panel, said side panels and said end panels provide a cargo area liner for a vehicle.

4,893,863

ADJUSTABLE DECK LID HINGE PIVOT

Raymond S. Skonieczny, Warren; Douglas A. Ford, Rochester Hills, and Robert W. Pryor, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1989, Ser. No. 306,719
Int. Cl.[4] B62D *25/10*
U.S. Cl. 296—76 3 Claims



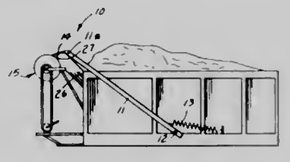
1. In an automotive vehicle having body structure including spaced side quarter panels and spaced supports extending transversely to said quarter panels which together define a compartment having a top opening, a closure, a pair of spaced hinge assemblies for swingably supporting said closure for movement between an open position to permit access to said compartment and a closed position in which said closure covers said compartment, each of said hinge assemblies comprising a hinge box having spaced vertical sides and top and with the hinge box being mounted to one of said transverse supports, a generally horizontal pivot means extending through aligned openings in the sides of said hinge box, a hinge strap having one end mounted to said closure and another end pivotally connected to said pivot means, and adjustment means for vertically raising and lowering the pivot means and hence the closure so that an exterior surface thereof will be flush with adjacent exterior body structure of the vehicle, the improvement being that the adjustment means for raising and lowering said closure comprises providing vertically extending slots in the sides of said hinge box and providing an eye bolt and nut for raising and lowering said pivot means, said eye bolt at one end being pivotally connected to said pivot means and being threaded at another other end and extending through an opening in the top of said hinge box, said nut being threadably engaged with said threaded end of said eye bolt and engageable with the top of said hinge box, said nut being rotatable to cause said eye bolt and pivot means to be moved vertically within the slots in the sides of the hinge box so that the closure can be raised and lowered at an end thereof adjacent the hinge box to enable the closure to be vertically adjusted so that exterior sides thereof will be flush with the adjacent vehicle body structure.

4,893,864

EXTENSIBLE AND RETRACTABLE COVER APPARATUS

Barbara Bailey, 329 Slagle Rd., Leesville, La. 71446

Filed Dec. 5, 1988, Ser. No. 279,492
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—98 1 Claim



1. A truck bed covering apparatus for use in combination with a truck bed assembly including an open truck bed formed of four side walls and a bottom wall wherein said truck bed covering apparatus comprises,

a pair of parallel pivoting arm means each of said pair pivotally secured relative to said truck bed proximate one terminal end of said arm means and

secured to flexible covering material proximate the other terminal end of each of said arm means, and

said covering material being of finite length defined by two ends wherein one end is secured to said interconnecting element and a second end is secured to a drum assembly means, and

said drum assembly means is secured by use of support rods to said truck bed and positioned proximate an upper side wall, and

said drum assembly means is positioned and formed for furling and unfurling said covering material about a central axis, and

said parallel pivoting arm means is pivotal from a first position enabling furling of said covering material and to a second position effecting unfurling of said drum assembly means, and

spring means mounted to each of said pair of pivoting arm means for normally biasing each of said pair of pivoting arm means to said second position, and

motive means enabling furling of said covering material, and

said motive means including a first sprocket coaxially aligned with said drum assembly means, and a second sprocket spaced from and underlying the first sprocket including a continuous chain member operative associating the first and second sprocket, and a manually manipulatable handle axially secured to and projecting outwardly of the second sprocket to enable retraction of the flexible covering material to the first position, and a detent sprocket coaxially aligned and operatively associated with said second sprocket to maintain the second sprocket to maintain the second sprocket in a selected position, and

further including a curvilinear contact surface member remote from said drum assembly positioned between said central axis and said truck bed for maintaining said cover materials in a wrinkle-free condition during furling and unfurling thereof by the drum assembly means.

4,893,865

UNITIZED COWL AND WIPER ARM ASSEMBLY

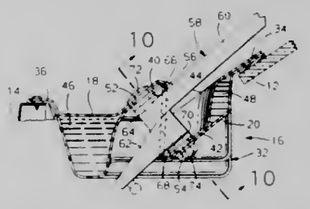
Michael J. McClain, Dayton; Harry C. Buchanan, Jr., Spring Valley, and Glenn R. Reed, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1988, Ser. No. 230,942
Int. Cl.[4] B62D *25/08*
U.S. Cl. 296—192 3 Claims

1. A unitized cowl and wiper arm assembly for a vehicle having a windshield and vehicle body a portion of which is spaced from a windshield, said assembly comprising,

a wiper arm having a drive member at one end and a blade support at the other end offset from one another, and,

a shell having upper and lower panels seamed together at their outer edges to form a structurally complete member with first and second peripheral flanges adapted to be secured to said vehicle body portion and windshield respectively, said lower panel being crimped up against said upper panel at a first location substantially midway between said peripheral flanges and said upper panel being crimped down in the opposite direction against said lower panel at a second location adjacent said first location so as to create a localized area of increased stiffness integral



with said shell bounded by a lower shell portion offset at a central wall from an upper shell portion sufficiently to allow said wiper arm to pass through an aperture in said central wall and between said upper and lower shell portions,

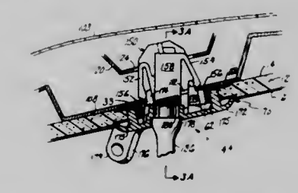
whereby, said wiper arm may be passed through said aperture at said area of increased stiffness and pivoted to said shell at said area with said blade support located above said lower shell portion and with said drive member located below said upper shell portion, thereby forming an assembly that can be installed to said vehicle as a unit, after which any disturbing forces acting on said wiper arm will be resisted by said area of increased stiffness and substantially the entire shell.

4,893,866

MOTOR VEHICLE BODY STRUCTURE FOR RECEIVING SNAP-FIT MODULAR HEADLINER FASTENERS

James D. Dowd, Farmington Hills, and David M. Hilborn, Sterling Heights, both of Mich., assignors to United Technologies Automotive Inc., Dearborn, Mich.

Filed Jan. 10, 1988, Ser. No. 204,663
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—214 10 Claims



1. A motor vehicle body support structure for receiving a snap-fit modular headliner wherein the motor vehicle has a front and back, a roof, a left side and a right side, which comprises:

left side A-pillar sheet metal means extending in a generally horizontal plan adjacent the front left side of the roof and defining a left side A-pillar opening having a longitudinal axis extending in a first direction; and

right side A-pillar sheet metal means extending in a generally

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horizontal plane adjacent the front right side of the roof and defining a right side A-pillar opening having a longitudinal axis extending in said first direction; and

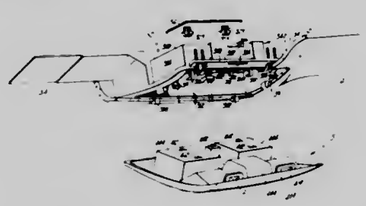
a header extending adjacent the roof from the left side A-pillar sheet metal means to the right side A-pillar sheet metal means, said header defining a left side header opening having a longitudinal axis extending in a second direction generally perpendicular to said first direction and a right side header opening extending in said second direction, said header openings being positioned in alignment with the A-pillar openings.

4,893,867

CONSOLE MOUNTED TO A HEADLINER

David M. Hilborn, Sterling Heights, and Stephen P. McGarry, Rochester Hills, both of Mich., assignors to United Technologies Automotive Inc., Dearborn, Mich.

Filed Jun. 10, 1988, Ser. No. 205,265
Int. Cl.[4] B60J 7/08
U.S. Cl. 296—214 **31 Claims**



11. A combination headliner and console for a motor vehicle having a roof, which comprises:

a substrate generally configured to be mounted adjacent the roof, said substrate having a decorative surface facing the interior of the vehicle when the substrate is assembled to the vehicle and a non-show surface facing the roof of the vehicle;

said substrate defining a substrate opening therein; and

a console sized to fit within said opening, said console including fastening means for securing the console to the substrate with the console mounted within the opening, said console further including a trim bezel sized to cover said opening;

said trim bezel extending to mate with the decorative surface of the adjacent substrate to fully cover the opening and to eliminate large gaps between the bezel and the substrate;

said substrate including a depressed portion displaced downwardly therefrom and wherein the opening is defined within the depressed portion.

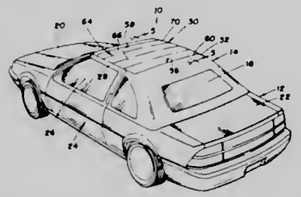
4,893,868

VEHICLE DOOR-TO-DOOR SUNROOF ASSEMBLY

William D. Miller, Troy, Mich.; Alain J. Clenet, Santa Barbara, Calif., and Charles P. Hines, Northville, Mich., assignors to Cars & Concepts, Inc., Brighton, Mich.

Filed Jul. 18, 1988, Ser. No. 220,623
Int. Cl.[4] B60J 7/047, 7/06
U.S. Cl. 296—219 **13 Claims**

1. In a vehicle body including an outer roof panel having side edges and also having inner rails that cooperate with the side edges of the outer roof panel to provide a pair of hollow side rails, and side doors having upper edges located adjacent the side edges of the outer roof panel, a sunroof assembly comprising: a roof opening in the outer roof panel; said roof opening having forward and rearward edges and having side edges exposing the interior of the side rails of the roof; a pair of tracks each of which includes a plurality of inclined ramps and horizontally extending portions connecting the ramps; each ramp extending downwardly in a forward direction; one of the tracks being mounted within one of the side rails and the other track being mounted within the other side rail; a sunroof including a plurality of panels having elongated shapes extending laterally with respect to the vehicle body; each panel having opposite ends one of which has a front support mounted by one track in one of the side rails and the other of which has a front support mounted by the other track in the other side rail; said tracks cooperating to support the panels for forward and rearward movement with respect to the vehicle body; said panel ends being located generally adjacent the upper edges of



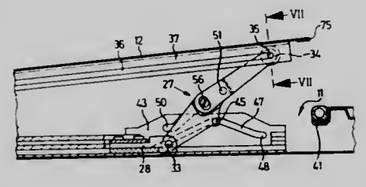
the closed side doors to provide a generally continuous door-to-door construction; said sunroof also including a flexible sheet-like cover that extends between the panels and has connections to the panels; said connections to adjacent panels being spaced along the cover with greater spacings than the front-to-rear dimensions of the panels; and said sunroof being movable between a closed position with respect to the roof opening where the panels are spaced from each other with the cover extending therebetween and an open position where the panels are positioned adjacent the rear edge of the roof opening in a partially overlapping relationship with the cover stored therebetween in a folded condition.

4,893,869

VEHICLE ROOF

Arpad Fuerst, Germering, Fed. Rep. of Germany, assignor to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,774
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735686
Int. Cl.[4] B60J 7/057
U.S. Cl. 296—220 **29 Claims**



1. A vehicle roof having a cover which, at a front edge, is slidably guided in lateral guide rails extending below a fixed roof surface, said cover being additionally supported at the guide rails by lifting levers, each of said lifting levers being connected at a first end with a respective guide rail and at an opposite end with the cover, in a manner enabling said levers to be displaceable relative to said guide rails in a vehicle longitudinal direction and to be pivotable around parallel rotational axes, during displacement in the vehicle longitudinal direction, by a pin and slot type interaction with a fixed roof-mounted retaining bracket, whereby the cover, selectively, can be

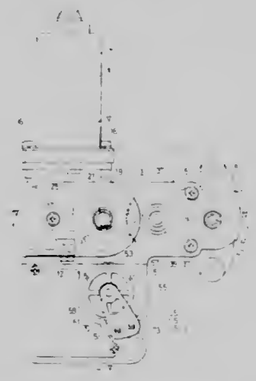
shifted to a closed position covering an opening in the fixed roof surface, a vent position wherein a rear edge of the cover is lifted above the fixed roof surface by a pivoting movement, and an open position wherein the cover is rearwardly retracted above the fixed roof surface; wherein separate first and second drive elements are provided permanently coupled, respectively, with the cover and with one of the lifting lever ends for producing the longitudinal and pivotal displacements of the cover.

4,893,870

DRIVE APPARATUS OF A ROOF STRUCTURE FOR A VEHICLE

Masaichi Moriya; Masaaki Miyamoto; Kazumi Nakahara, and Junichi Maekawa, all of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 96,536, Sep. 15, 1987, abandoned. This application May 15, 1989, Ser. No. 352,624
Claims priority, application Japan, Sep. 25, 1986, 61-226603; Jan. 16, 1987, 62-3599; Feb. 13, 1987, 62-29821
Int. Cl.[4] B60J 7/057
U.S. Cl. 296—223 **5 Claims**



1. A drive apparatus of a roof structure for a vehicle, said apparatus comprising:

a positionable lid disposed in the roof structure;

a drive gear system rotatably supported by a casing of the apparatus;

a first transmission gear drive means for opening and closing the lid;

switch means having a plurality of switches stacked with respect to each other and attached to the casing by attachment means;

a second transmission gear control means including a rotary member having a plurality of stacked rotary control surfaces thereon, each surface in controlling contact with a respectively positioned one of the switches for switching the switches to detect the position of the lid, said plurality of control surfaces being disposed in upward and downward positions of the outer circumferences of the rotary member such that positions of all of the switches are completely adjusted by determining only one of the positions thereof at the attachment means;

a motor;

a main gear and a main shaft, disposed in said drive gear system; and

means for connecting the motor, the main gear and the main shaft; wherein

said motor being connected to drive the main shaft through the main gear, said first and second transmission gear means being driven by the motor through said means for connecting;

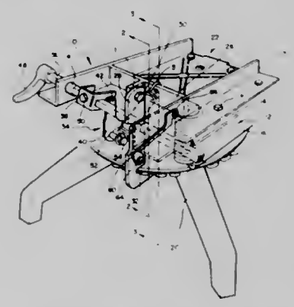
said rotary member being disposed such that the rotary member does not overlap and does not underlap the main gear and the first transmission gear drive means.

4,893,871

SWIVEL ROCKER STOP ASSEMBLY

Jerome R. Kowalski, Hickory, N.C., assignor to Hickory Springs Manufacturing Co., Hickory, N.C.

Filed Dec. 12, 1988, Ser. No. 283,242
Int. Cl.[4] A47C 3/02
U.S. Cl. 297—270 **15 Claims**



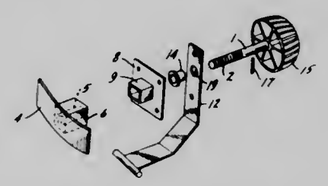
1. In a rocker-swivel assembly of the type having a rocker unit including first and second spaced rocker plates connected for relative rocking movement about a generally horizontal rocking axis and a swivel plate connected to said first rocker plate for relative rotational swiveling movement about a generally vertical swiveling axis, the improvement comprising means, coupled to one of said second rocker plate and said swivel plate and movable selectively into and out of a locking disposition in gripping engagement with the other of said second rocker plate and said swivel plate, for selectively disabling both said relative rocking movement of said rocker plates and said relative rotational movement of said swivel plate and said first rocker plate, and manually-operable actuating means connected to said disabling means for selectively manipulating movement thereof into and out of said locking disposition.

4,893,872

OFFICE CHAIR WITH WAIST SUPPORTER

Kiyoshi Sugai, Kawagoe, Japan, assignor to United Business Systems, Taiwan and Moriya & Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,327
Claims priority, application Japan, Jul. 18, 1987, 62-109584; Taiwan, Oct. 3, 1987, 76209618
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—284 **2 Claims**



1. A waist supporter for an office chair having a back board

frame (11) covered, on the user's side, with buffer material (21), said waist supporter including, in combination,

a generally planar waist support member (4) disposed within a cavity (22) in the buffer material (21), and

means for moving the waist support member toward and away from the back board frame (11), said means comprising

locating structure (8, 9, 8',8', 9'9') fixed to back board frame (11) and projecting toward the waist support member (4),

guide means (6) carried by the waist support member (4) and projecting toward the back board frame (11),

said locating structure being non-rotatably and telescopically coupled with the guide means for adjusting movement toward and away from the waist support member,

adjustment means (15, 1, 16, 17, 2, 5) for moving the locating structure toward and away from the guide means,

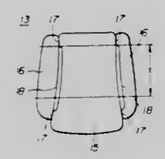
said adjustment means including screw means (1, 19, 14, 17, 12, 15, 16) which are rotatable, but not reciprocable, with respect to the back board frame, and connector means (2, 5) which cooperate to permit the guide means, and thus the waist support member, to move toward and away from the back board frame.

4,893,873

SEAT CUSHION ASSEMBLY

Hiroaki Iwamoto, and Masaaki Kogure, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jan. 13, 1989, Ser. No. 296,968
Claims priority, application Japan, Jan. 19, 1988, 63-4885[U]
Int. Cl.[4] A47C *7/18*
U.S. Cl. 297—452 **4 Claims**



1. A seat cushion assembly comprising:

a seat frame having opposed side frame portions;

a foam cushion pad including a major part and longitudinally extending side parts each having two end portions, and which are arranged along both sides of said major part, said cushion pad being directly mounted on said seat frame having said side parts thereof respectively directly mounted on said opposed side frame portions; and

an outer skin member covering each of said major and side parts of said cushion pad,

wherein each side part is connected only at both end portions thereof to said major part leaving an intermediate portion thereof separated from said major part.

4,893,874

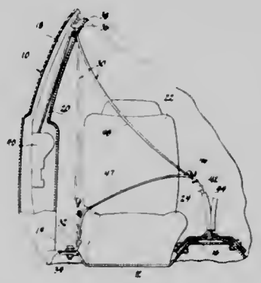
FREE FALLING LATCH PLATE ASSEMBLY

Keith D. Childress, Richmond; Thomas J. Corbett, Sterling Heights, and Michele A. Smith, Davisburg, all of Mich., assignors to Saturn Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 74,199, Jul. 16, 1987. This application Oct. 5, 1988, Ser. No. 253,528
Int. Cl.[4] A62B *35/00*
U.S. Cl. 297—483 **8 Claims**

1. In a seat belt system with a continuous length of belt having an upper end mounted adjacent the occupant shoulder and a lower end mounted adjacent the occupant lap, a retractor associated with at least one end of the belt to pull the belt to a stored condition extending generally vertically between the upper and lower ends and permit extension of the belt across the torso of a seated occupant for buckling by a belt buckle mounted inboard of the seat, and a latch plate carried by the belt for engagement by the buckle and including a housing having a planar base wall with a tongue projecting from one end thereof for latching engagement by the buckle, a pair of flanges integral with the base wall and extending perpendicularly therefrom at a lateral spacing somewhat greater than the width of the belt, and a lock bar slidably mounted in slots provided in the flanges, the improvement comprising:

said housing being oriented with the flanges facing toward the occupant torso and the belt being routed through the space between the base wall and the sliding bar so that when the belt is stored extending generally vertically between the upper and lower anchors, the belt extends in



a minimally convoluted path through the latch plate, thereby permitting gravity induced sliding movement of the latch plate along the belt toward the lower anchor;

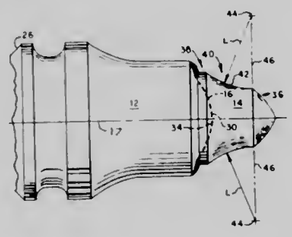
and an abutment structure carried by the housing at the end thereof opposite the tongue and adapted upon the migration of the sliding lock bar along the slot with the occurrence of generally colinear overlying orientation of the lap and shoulder belts upon buckling of the belt to introduce a substantially convoluted path of the belt through the latch plate and trap the belt between the sliding lock bar and the abutment structure so that the belt is cinched and travel of the belt through the latch plate is effectively prevented at least in the direction which would extend the length of the lap belt portion.

4,893,875

GROUND ENGAGING BIT HAVING A HARDENED TIP

Alan H. Lonn, Edelstein, and Gene R. Klett, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 16, 1988, Ser. No. 285,564
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—91 **7 Claims**



1. A ground engaging bit, comprising:

a body having a generally convex non-linear forward end surface; and

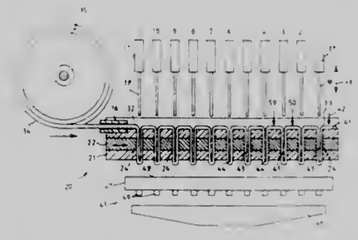
a hardened tip having a generally concave non-linear rearward end surface mating with the generally convex non-linear forward end surface of the body, said rearward end surface of the hardened tip being bonded to the forward end surface of the body and the hardened tip also having a substantially conical forward end portion, a cylindrical rearward flange portion, and a middle portion having a continuous concave surface of revolution disposed between and merging at its opposite ends with the forward end portion and the rearward flange portion, said continuous concave surface of revolution defining a radius having a center of radius located substantially on a plane which passes through the intersection of the conical forward end portion and the middle portion and the radius has a length (L) approximately twenty to thirty five percent less than the diameter of the rearward flange portion.

4,893,876

PROCESS AND APPARATUS FOR PRODUCING BRISTLE ARTICLES AND USE OF THE PROCESS FOR IMPLEMENTS HAVING A SIMILAR CONSTRUCTION

Georg Weihrauch, Wald-Michelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Wald-Michelbach, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 204,735
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719823
Int. Cl.[4] A46D *1/00*
U.S. Cl. 300—8 **38 Claims**



1. In a process for producing bristle articles such as brushes, brooms, paintbrushes, combs, and mats comprising combining a bristle carrier and bristles, optionally combined into bundles and connected thereto, in spaced manner in at least one row, a bristle section is shaped by means of a drawing tool to a double layer whilst forming a loop and the loop is fixed by one of its ends to the bristle carrier, the improvement comprising said bristle section is drawn from an endless strand wound onto a roll in a length corresponding to the length required for all the bristles of a row, plus a length resulting from the sum of the spacing of the bristles of a row, the length is then secured at its free end and all the loops in the row are drawn from the bristle section, accompanied by removing the necessary length from the roll and finally simultaneously fixing all of the loops by one of their ends to the bristle carrier.

4,893,877

SELF-GENERATED LIGHTED HUBCAB

Manual Powell, 8210 Woodlawn Ave., Detroit, Mich. 48213, and Lawrence J. Goffney, Jr., Detroit, Mich., assignors to Manual Powell, Detroit, Mich.

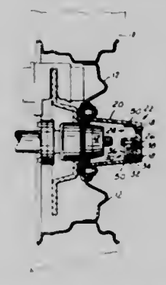
Filed Aug. 23, 1988, Ser. No. 235,179
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 301—108 R **3 Claims**

1. A lighted hubcap assembly comprising:

a cap body having an outboard side and an opposing inboard side, the cap body for securement to the wheel of a passenger vehicle with the outboard side facing away from the vehicle, the cap body including a cantilevered bearing mount extending from the inboard side generally perpendicularly to the cap body;

a permanent magnet assembly including contiguous, oppositely polarized magnetic arcuate sections forming together a north side and a south side, each side being bounded by and affixed to a soft iron hemidisc which is polarized in accordance with the polarity of the arcuate section that bounds the hemidisc, the permanent magnet assembly having a center of gravity disposed remotely from the bearing mount, so that any tendancy for the permanent magnet assembly to rotate with a pivoting of the bearing mount, which rotates with the cap body, will produce a moment generated by the force of gravity to realign the permanent magnet assembly to a substantially fixed orientation;

bearings rotatably mounting the permanent magnet assembly to the bearing mount of the permanent magnet assembly so that the permanent magnet assembly is kept in a substantially fixed orientation with respect to the passenger vehicle when the vehicle wheel rotates relative thereto;



at least one light emitting diode mounted on the cap body so that light from the diode is emitted from the outboard side of the cap body when the diodes are energized;

electrically conducting windings secured to the inboard side concentrically about the permanent magnet assembly and connected to the light emitting means, the windings being in magnetic flux coupling relationship with the permanent magnet assembly so that upon rotation of the wheel and, concomitantly, the windings about the generally fixedly oriented permanent magnet assembly, alternating current is generated in the winding for energizing the light emitting means.

4,893,878

INLINE PROPORTIONING VALVE FOR BRAKE SYSTEMS

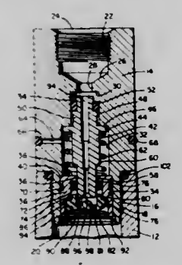
Joe S. Cole, Mesquite, and Jack D. Hutcheson, Garland, both of Tex., assignors to Hilite Industries, Inc., Carrollton, Tex.

Filed Sep. 27, 1988, Ser. No. 249,682
Int. Cl.[4] B60T *8/26*
U.S. Cl. 303—9.75 **7 Claims**

1. An inline proportioning valve for the hydraulic brake system of a vehicle comprising a housing of one-piece construction with one end of the housing being connected with a master cylinder of the brake system and the other end of the housing being connected with a fluid flow line extending to vehicle wheel cylinders, said housing including an axial inlet port in the end thereof connected with the master cylinder and an outlet port in the end thereof connected to the fluid flow line, said housing including a plurality of axially extending chambers in communication with each other with each chamber being of cylindrical configuration and decreasing in diameter from the inlet port to the outlet port, said housing including three chambers with a peripheral, radially extending shoulder

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at the juncture between adjacent chambers, a differential area piston positioned in said chambers in sealed relation thereto, said piston including an axial passageway therethrough, said piston including a larger pressure contact area in the chamber adjacent the outlet port than the pressure contact area in the chamber adjacent the inlet port whereby pressure passing through the passageway in the piston will react against the piston to force the piston towards the inlet port due to the differential contact areas, calibrated spring means biasing the piston toward the outlet port to resist movement of the piston toward the inlet port, said chamber adjacent the inlet port including an insert engaging the shoulder at the inner end of the chamber adjacent the inlet port with the insert forming a closure for the chamber adjacent the inlet port and including a central opening guidingly receiving the piston with the diameter of the portion of the piston guided by the insert being



smaller than the diameter of the piston received in the chamber adjacent the outlet port, a valve member mounted in the insert in normally open relation to the passageway through the piston to enable pressure flow through the piston, said valve member closing the passageway through the piston when the piston moves toward the inlet port to control and stop flow through the passageway when the differential piston is moved a predetermined distance toward the inlet port by compressing the calibrated spring means, said housing includes a radial vent passage communicating with the central chamber in the housing, a peripheral groove in the exterior of the housing communicated with the vent passage and an O-ring seal in the peripheral groove forming a closure for the vent passage but enabling outflow of pressure which may leak into the central chamber of the housing but preventing inflow of air and preventing entrainment of particulate into the interior of the housing.

4,893,879

FAIL-SAFE WHEEL SERVICE BRAKE SYSTEM

Paul J. Middelhoven, 10948 SE Ankeny, Portland, Oreg. 97216; Mark J. Albertson, 14701 S.E. Valencia, #90, Vancouver, Wash. 98684, and Eric Johnson, 1525 S.W. Miller Ct., Gresham, Oreg. 97080

Filed Feb. 12, 1988, Ser. No. 155,204

Int. Cl.[4] B60T *13/22*; F16D *65/24*; B60K *41/26*

U.S. Cl. 303—71 **7 Claims**

1. A wheel braking system for a vehicle comprising:

brake housing for association with a vehicle wheel,

rotatable wheel means extending into the brake housing,

friction means movable into frictional interaction with the wheel means for retarding and stopping wheel rotation,

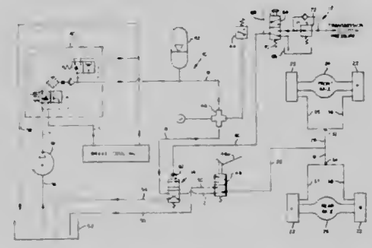
braking means including energy storage means within the brake housing for applying a braking force to the friction means and moving the friction means into frictional interaction with the rotatable wheel means to retard and stop wheel rotation,

fluid pressure-operated brake release means for applying a brake releasing force in opposition to the braking force applied by the braking means to release the friction means from frictional interaction with the rotatable wheel means,

brake release operating means for selectively operating the brake release means and operable to control the magnitude of the brake releasing force to provide a controlled release of the friction means,

the braking means comprising a brake piston means and the energy storage means comprising mechanical spring means,

the brake release means comprising a fluid pressure chamber within the housing defined in part by the piston means such that fluid pressure applied to the piston means within the chamber urges the piston means away from the friction means in opposition to the spring means,



the brake release operating means including a first manually operable brake valve means in a pressure fluid circuit for controlling the fluid pressure within the fluid pressure chamber and thereby the brake releasing force, and

a second manually operable valve means operable in a first position to activate the first valve means and operable in a second position to deactivate the first valve means to prevent operation of the brake release means, wherein the second valve means includes a manually-operated park valve member and a pilot pressure-operated control valve member, the control valve member being operated by pilot pressure from a transmission clutch fluid pressure circuit.

4,893,880

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

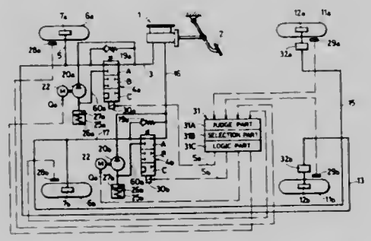
Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A B S, Ltd., Tokyo, Japan

Filed May 13, 1988, Ser. No. 194,414

Claims priority, application Japan, May 16, 1987, 62-119832

Int. Cl.[4] B60T *8/62*

U.S. Cl. 303—110 **44 Claims**



1. In an anti-skid control apparatus for a vehicle braking system including:

(A) a pair of front wheels, and a pair of rear wheels;

(B) wheel speed sensors associated with said wheels, respectively;

(C) a first fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of one of said front wheels, arranged between a first fluid pressure generating chamber of a tandem master cylinder and said wheel cylinder of the one front wheel;

(D) a second fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of another of said front wheels, arranged between a second fluid pressure generating chamber of said tandem master cylinder and said wheel cylinder of the other front wheel; and

(E) a control unit receiving outputs of said wheel speed sensors for measuring or judging the skid conditions of said front and rear wheels and for generating instructions for controlling said first and second fluid pressure control valve devices and in which said control unit discriminates the frictionally lower one (designated as "low side") of the sides of the road on which said wheels are running, on the basis of the measuring or judging results of the skid conditions of said rear and/or front wheels, combines logically the measuring or judging result of the skid condition of the one rear wheel running on said low side of the road, with that of the one front wheel running on the same side as said low side, for generating the instruction for controlling said first or second fluid pressure control valve device for the corresponding front wheel, and generates the instruction for controlling said second or first fluid pressure control valve device for the other front wheel, on the basis of the measuring or judging result of the skid condition of the other front wheel running on the high side (frictionally higher side) independently of those of said rear wheels, the improvements in which a brake relieving instruction for decreasing the brake fluid pressure, of the instructions for controlling the first or second fluid pressure control valve device, is formed on the basis of the judging result of the one of the front wheel and rear wheel on the low side which generates a brake relieving signal for decreasing the brake fluid pressure, sooner than the other thereof.

4,893,881

HYDRAULIC ANTI-LOCK BRAKING SYSTEMS FOR VEHICLES

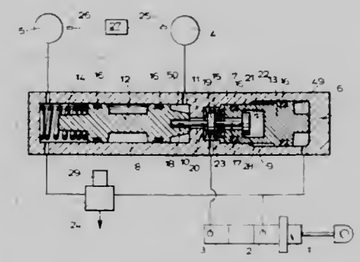
Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Sep. 26, 1988, Ser. No. 249,443

Claims priority, application United Kingdom, Oct. 3, 1987, 8723269

Int. Cl.[4] B60T *8/34, 8/32*

U.S. Cl. 303—113 **20 Claims**



1. An hydraulic anti-lock braking system for a vehicle of the four wheel type comprising first and second separate brake means, a tandem master cylinder having a primary pressure space, and a secondary pressure space, an anti-lock modulator, and a copy value, wherein said valve comprises a housing having a first bore, and a second bore of stepped outline, a partition between said first and second bores, a first piston working in said first bore and hydraulically connected at opposite ends to said separate brake means, a second piston working in said second bore and hydraulically connected at opposite ends to said pressure spaces of said master cylinder, said second piston being of complementary differential outline, said pistons being movable relative to each other between a first operative position, a second position in which said first piston moves relatively away from said second piston, and a third position in which said second piston moves relatively away from said first piston, and an isolating valve co-operating with both said pistons and said partition, said isolating valve being in an open position when said pistons are in said first position, in a closed position when said pistons are in said second positions, and in an open position when said pistons are in said third position, said second piston having outer and inner ends, connecting means connecting said primary pressure space to said outer end, and a first spring means acting between said inner end and said partition to urge said second piston relatively away from said partition whereby upon failure of said connecting means said pistons are moveable into said third position by said first spring means, and said second piston co-operates with said isolating valve to hold said isolating valve open.

4,893,882

ANTILOCKING SYSTEM

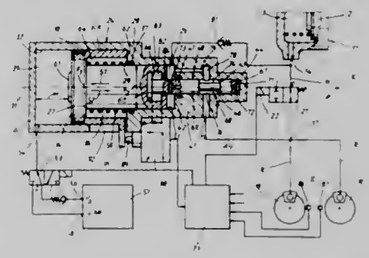
Heinz Leiber, Oberriexingen, and Manfred Steiner, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,109

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812832

Int. Cl.[4] B60T *8/32/8/42*

U.S. Cl. 303—115 **20 Claims**



1. Antilocking installation for a road vehicle having a hydraulic multi-circuit brake system which includes at least one static brake circuit which is connected to an outlet pressure space of a brake unit means for providing brake pressure to the wheel brakes;

the outlet pressure space of the brake unit is connected to the wheel brakes of the static brake circuit by means of an electrically actuated brake pressure control valve means;

the brake pressure system providing for controlling brake pressure reduction, brake pressure retention and brake pressure restoration phases for antilocking control installation, and operating on the pump-back principle, at least when the antilocking control system demands high magnitude pressure reductions according to which, in a pressure reduction phase, brake fluid is drained from the wheel brakes subject to the control system and is pumped back into the output pressure space of the brake unit;

a pumping means is provided for this pumping back and includes:

a stepped cylinder with two bore sections of different diameters, offset relative to one another by means of a radial housing step;

a displaceable step piston means located in these bore sections and having piston flanges of correspondingly different diameters;

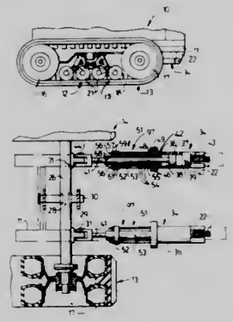
the stepped piston means being guided so that it can be displaced in a pressure-tight manner;

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the larger diameter flange of the stepped piston means forming an axially movable boundary of a drive pressure space;
an electrically actuatable antilocking control valve means for connecting the drive pressure space with a high pressure outlet of a hydraulic auxiliary pressure source and for alternatively connecting the pressure space to a sump tank of the auxiliary pressure source for displacing the stepped piston means;
the small diameter flange of the stepped piston means forming a movable boundary of a functional chamber acting as the pump chamber in pump-back operation of the brake pressure setting means;
said functional chamber being connected via an outlet non-return valve means to the output pressure space associated with the static brake circuit and via an inlet valve means to the wheel brakes of the static brake circuit;
a return spring means for bissing the stepped piston means into a position associated with a maximum volume of the functional chamber which can be connected to the wheel brakes;
an electronic control means providing actuation signals for switching of a brake pressure control valve means and the electrically actuatable antilocking control valve means in response to a process of comparing and differentiating electrical output signals from wheel rotational speed sensors which are a measure of wheel peripheral speeds in signal level and/or frequency;
wherein the inlet valve means is designed as a 2/2-way valve controlled by motion of the stepped piston;
wherein the inlet valve means is held in an open position when the stepped piston is positioned to cause a minimum volume of the functional chamber which can be connected to the wheel brakes,
wherein the inlet valve means, starting from this open position, can only reach its shut off position by a displacement of the stepped piston means taking place in the sense of increasing the volume of functional chamber;
wherein when the stepped means piston has reached a position in the immediate vicinity of its end position associated with a maximum volume of the functional chamber, the inlet valve means returns to an open position caused by a displacement of the stepped piston means taking place in the sense of reducing the volume of the functional chamber after the stepped piston means has executed a minimum stroke, relative to this end position;
a position indicator means for generating electrical output signals which are characteristic of the positions of the stepped piston means and which continually vary with changes in the position;
the output signal of the position indicator being applied as an additional information input to the electronic control unit means which generates signals in response to the position of the stepped piston means for switching over the antilocking control valve means to a pump-back operation of the stepped piston;
and wherein a difference in volume of the functional chamber between its maximum and minimum values is between 1/5 and ½ of that volume of brake fluid which must be forced into the wheel brakes of the static brake circuit in order to achieve the maximum brake pressure permitted by the brake installation.

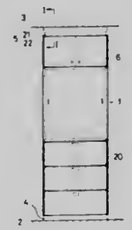
4,893,883
BELT TENSION CONTROL SYSTEM
Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed Mar. 2, 1988, Ser. No. 162,830
Int. Cl.[4] B62D *55/30*
U.S. Cl. 305—10 **6 Claims**

1. A belt tension control system for maintaining tension in an endless drive belt entrained about a drive wheel and an idler wheel, said idler wheel being movable relative to the drive wheel for adjusting the tension in the belt, comprising:
a hydraulic actuator including a cylinder, a piston slidably disposed in the cylinder and defining an actuating chamber, and a piston rod connected to the piston, one of the cylinder and the piston rod being operatively connected to one of the wheels and movable in a first direction to increase tension in the belt when the actuating chamber is pressurized;
a pump;
conduit means connecting the pump to the actuating chamber;
means for establishing a fluid pressure in the conduit means and the actuating chamber at a level sufficient to generate



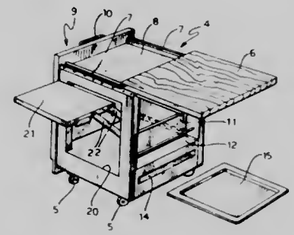
a predetermined belt tension in the belt when the pump is operating;
recoil means for permitting the displacement of pressurized fluid from the actuating chamber so that said one of the cylinder and the piston rod can move in a second opposite direction when foreign matter becomes trapped between the drive belt and one of the wheels; and
means for frictionally locking the piston rod relative to the cylinder and maintaining the predetermined belt tension in the belt when the pump stops operating and the fluid pressure established by the fluid pressure establishing means drops below a predetermined level.

4,893,884
WALL CABINET
Shigeki Tsuchida, Kusatsu; Saburou Sumi, Omihachiman, and Motohiro Nakagawa, Ikoma, all of Japan, assignors to Itoki Co., Ltd. and Itoki Kosakusho Co., Ltd., both of Osaka, Japan
Filed Jan. 27, 1989, Ser. No. 302,526
Int. Cl.[4] A47B *77/00*
U.S. Cl. 312—107 **10 Claims**



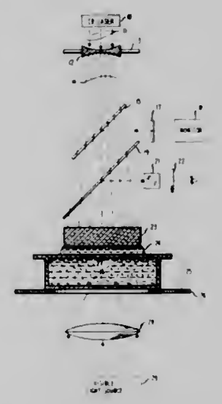
1. A wall cabinet held between a floor and a ceiling, said wall cabinet comprising:
a container part including various cabinets, said container part having upper and lower base plates;
a first adjustable means positioned at said lower base plate for adjusting a distance between said lower base plate and the floor;
an under frame extending from a circumference of said lower base plate toward the floor for covering said first adjustable means;
a second adjustable means positioned at said upper base plate for adjusting a distance between said upper base plate and said ceiling, said second adjustable means having upper and lower top frames slidably interposed, and a locking member for locking said upper and lower top frames in order to conform with the distance between said upper base plate and said ceiling.

4,893,885
MODULAR KITCHEN UNIT
Marco Borello, Genova, Italy, assignor to Salvarani Industrie S.p.A., Parma, Italy
Filed Dec. 15, 1988, Ser. No. 284,636
Claims priority, application Italy, Mar. 3, 1988, 52939/88[U]
Int. Cl.[4] A47B *91/00*
U.S. Cl. 312—250 **2 Claims**
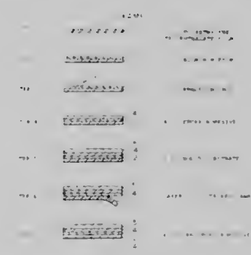


1. A movable unit for a modular kitchen, said unit having wheels and being adapted to be removably located in a space provided below a countertop forming part of said modular kitchen, said unit comprising:
housing means having front, rear, two side and bottom walls defining compartment means therein, said front wall being adapted to match said modular kitchen when said unit is fitted into said space;
said compartment means comprising an upper compartment, a guide means provided on an upper surface of said housing and a slidable cutting board movably mounted on said guide means to provide access to said upper compartment;
said rear wall having a recess therein defining a lower shelf for supporting a plurality of containers and retaining means associated with said recess for holding said containers on said lower shelf;
one of said side walls having a recess therein defining a lower shelf, said lower shelf having a plurality of slot means formed therein for vertically supporting cutlery in said recess;
said compartment means including a main compartment, the other of said side walls having an opening providing access to said main compartment; and
auxiliary shelf means movably supported on lever means in said housing for movement between a position within said housing and a raised position in which said auxiliary shelf projects from the unit through said opening.

4,893,886
NON-DESTRUCTIVE OPTICAL TRAP FOR BIOLOGICAL PARTICLES AND METHOD OF DOING SAME
Arthur Ashkin, Rumson, and Joseph M. Dziedzic, Clark, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 17, 1987, Ser. No. 98,120
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—1.1 **5 Claims**



1. Apparatus for generating a single-beam gradient force optical trap of particles, said apparatus comprising a laser for generating a light beam at a predetermined wavelength and means for focusing said light beam with sufficient convergence to form said optical trap in a predetermined region, said apparatus
characterized in that
said predetermined wavelength is substantially included in the infrared range of wavelengths between 0.8 μm and 1.8 μm inclusively, so that said trap non-destructively confines at least one biological particle.

4,893,887
HOLOGRAPHIC IMAGE TRANSFER PROCESS
Don M. Coates, Midlothian, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 12, 1983, Ser. No. 560,747
Int. Cl.[4] G03H *1/04*; G02B *5/18*
U.S. Cl. 350—3.6 **3 Claims**



1. A process for applying a metallic hologram to a solid substrate which comprises the following steps in sequence:
(a) forming a thin metallic hologram;

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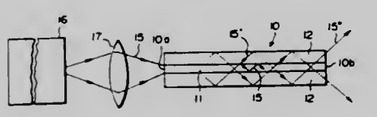
(b) coating a first side of said thin metallic hologram with a crosslinkable liquid adhesive resin;
(c) contacting the coating on the thin metallic hologram with a solid substrate;
(d) curing said crosslinkable liquid adhesive resin to form a tough solvent-resistant film while said metallic hologram and said solid substrate are in contact with said crosslinkable liquid adhesive resin;
(e) coating a second side of the thin metallic hologram with a transparent crosslinkable liquid adhesive resin; and
(f) curing the transparent liquid adhesive resin to form a tough solvent-resistant film while it is in contact with said second side of the thin metallic hologram.

4,893,888

OPTICAL WAVELENGTH CONVERTER DEVICE

Yoji Okazaki; Koji Kamiyama, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1988, Ser. No. 221,972
Claims priority, application Japan, Jul. 20, 1987, 62-180775; Jul. 19, 1988, 62-179644
Int. Cl.[4] G02B 6/10; H03F 7/00
U.S. Cl. 350—96.12 **7 Claims**



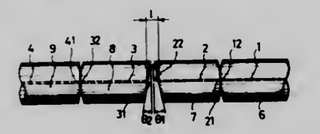
1. An optical wavelength converter device comprising:
(i) cladding having a first refractive index; and
(ii) a waveguide of a nonlinear optical material disposed in said cladding and having a second refractive index lower than said first refractive index, for converting the wavelength of a fundamental guided through said waveguide and radiating the wavelength converted waves into said cladding, said nonlinear optical material comprising an organic nonlinear optical material having a maximum light absorption coefficient at a wavelength close to the wavelength of at least one of said fundamental and said wavelength converted waves.

4,893,889

OPTICAL ATTENUATOR

Toyokazu Iwakiri; Akira Sugiyama; Yoshio Kashima; Ikuo Botsui, and Nobuo Suzuki, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 237,893
Claims priority, application Japan, Sep. 4, 1987, 62-221485
Int. Cl.[4] G02B 6/26, 6/42
U.S. Cl. 350—96.15 **8 Claims**



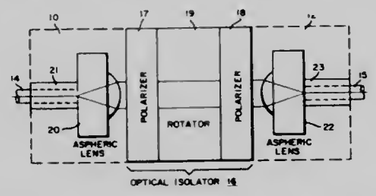
1. An optical attenuator comprising a pair of optical fibers having mutually facing non-parallel end surfaces separated by an air gap and having non facing end surfaces thereof polished spherically.

4,893,890

LOW-LOSS, HIGH-ISOLATION, FIBER-OPTIC ISOLATOR

George F. Lutes, 3509 Stancrest Dr., Glendale, Calif. 91208

Filed May 4, 1988, Ser. No. 190,185
Int. Cl.[4] G02B 6/32, 5/30; G02F 1/00
U.S. Cl. 350—96.18 **5 Claims**



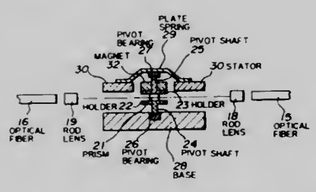
1. A low-loss, high-isolation apparatus for isolating a source of an incident light beam transmitted through a first optical fiber a first portion of said beam of light reflected by a second optical fiber and scattered by an isolator assembly and for transmitting a second portion of said beam of light to said second optical fiber from said first optical fiber, comprising
an isolator assembly comprised of a Faraday rotator with parallel planar surfaces on opposite sides and two polarizers with planar surfaces parallel to said planar surfaces of said rotators, said polarizers being oriented at an angle between their directions of polarization equal to the angle α of rotation of said Faraday rotator, and
two aspheric lenses having their aspheric surfaces facing each other, and having said isolator assembly between them, and each having planar surfaces opposite said aspheric surfaces parallel to said planar surfaces of said rotator, each of said aspheric lenses having their axes angularly and laterally aligned, and having a narrow angle of acceptance of light, said narrow angle of acceptance being less than about 0.003 radians offset from the axes of said aspheric lenses for a loss of −30 dB, and less than about 0.0045 radians from their axes for a loss of −70 dB.

4,893,891

OPTICAL SWITCHING DEVICE INCLUDING PIVOT BEARING MECHANISM

Masayuki Fujita, and Sakashi Oyama, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Oct. 12, 1988, Ser. No. 256,634
Claims priority, application Japan, Oct. 15, 1987, 62-258377
Int. Cl.[4] G02B 6/36; H01H 67/02
U.S. Cl. 350—96.20 **10 Claims**



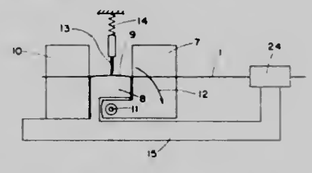
1. An optical switching device comprising:
an optical medium for changing-over optical paths,
a body for supporting said optical medium,
at least one input provided on said body,
at least one output provided on said body, and
a pivot bearing mechanism, wherein said optical medium is rotatively held in said body by means of said pivot bearing mechanism.

4,893,892

METHOD AND APPARATUS FOR CONNECTING MULTIPLE FIBER OPTIC CONDUCTORS

Gerhard Ziemek; Harry Staschewski, both of Langenhagen, and Klaus Procher, Lehrte, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,847
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735886
Int. Cl.[4] G02B 6/40
U.S. Cl. 350—96.22 **13 Claims**



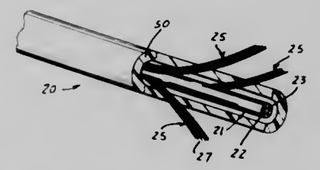
1. Method for connecting a first plurality of optical waveguides arranged in a first ribbon line to a second plurality of optical waveguides arranged in a second ribbon line, each optical waveguide of the first plurality of optical waveguides comprising a first glasfiber with a surrounding protective covering, each optical waveguide of the second plurality of optical waveguides comprising a second glasfiber with a surrounding protective covering, said first plurality of optical waveguides being positioned between two support tapes of said first ribbon line that maintain a first predetermined spacial orientation of said first glasfibers, said second plurality of optical waveguides being positioned between two support tapes of said second ribbon line that maintain a second predetermined spacial orientation of said second glasfibers; comprising the steps of:
removing an end portion of each of said two support tapes and said protective coverings from said first plurality of optical waveguides to expose first end portions of said first glasfibers, and removing an end portion of each of said two support tapes and said protective coverings from said second plurality of optical waveguides to expose second end portions of said second glasfibers;
fixing the spacial orientation of said first exposed end portions by clamping said first exposed end portions between a first terminal block and a second terminal block which maintain said first exposed end portions in axial tension, and fixing the spacial orientation of said second exposed end portions by clamping said second exposed end portions between a third terminal block and a fourth terminal block which maintain said second exposed end portions in axial tension;
scratching a surface of each of said first exposed end portions in axial tension in a first common plane, transverse of the axial direction of said first exposed end portions for causing each of said first exposed end portions to separate and form a new end face lying in said first common plane, and scratching a surface of each of said second exposed end portions in axial tension in a second common plane, transverse of the axial direction of said second exposed end portions for causing each of said second exposed end portions to separate and form a new end face lying in said second common plane;
maintaining the fixed spacial orientation of said first exposed end portions with said new end faces in said first common plane by means of said first terminal block, and maintaining the fixed spacial orientation of said second exposed end portions with said new end faces in said second plane by means of said third terminal block;
positioning said first and third terminal blocks in a face-to-face orientation, with said new end faces of said first exposed end portions adjacent to corresponding new end faces of said second exposed end portions; and
welding said new end faces of said first exposed end portions to said adjacent new end faces of said second exposed end portions.

4,893,893

STRENGTHENED BUFFERED OPTICAL FIBER

James D. Claxton, Lawrenceville; Gerald A. Scheidt, Dunwoody, and Stanley C. Shores, Atlanta, all of Ga., assignors to American Telephone and Telegraph Co., AT&T Bell Laboratories, Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.

Continuation-in-part of Ser. No. 825,709, Jan. 31, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 154,424
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **16 Claims**



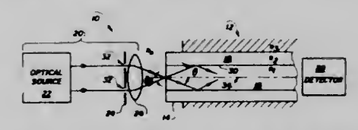
1. A buffered optical fiber, which comprises:
an optical fiber which includes a silica glass composition optical core, a silica glass composition optical cladding and a protective ultra-violet cured coating which is disposed about said silica glass composition optical core and cladding and which engages said silica glass composition optical cladding and which has an outer diameter of about 300 μm;
at least one length of a fibrous strength member which entends along and in engagement with the coating of said optical fiber, said at least one fibrous strength member covering a substantial portion of the periphery of said optical fiber; and
a buffer layer which encloses and engages said at least one strength member and which is made of a plastic material, said buffer layer having a compressive engagement with said at least one strength member which is controlled to achieve desired strippability of said buffer layer from said cable and to avoid microbending losses when said cable is subjected to a predetermined temperature range.

4,893,894

EVANESCENT SENSOR

Frank M. Cabal, Vero Beach, Fla., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Apr. 29, 1988, Ser. No. 187,860
Int. Cl.[4] G02B 6/02, 6/16
U.S. Cl. 350—96.29 **11 Claims**



1. A sensor for detecting species concentrations in an analyte comprising:
an optical fiber used for detecting species concentrations in an analyte, said optical fiber having a core and an intermediate dielectric layer circumferentially surrounding the core, said core having an index of refraction greater than

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the index of refraction of the intermediate dielectric layer, said intermediate dielectric layer maintaining its integrity by not reacting with the analyte and enabling an evanescent wave to pass therethrough with minimal decay and being unreactive to light; and

a modal selector disposed to launch light into the core of the optical fiber at a desired mode.

4,893,895

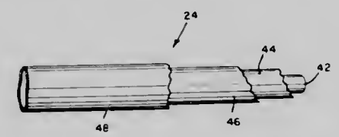
AN IMPROVED ENCASED HIGH TEMPERATURE OPTICAL FIBER

John W. Berthold, Salem, and H. Randy Carter, Alliance, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 177,751, Apr. 5, 1988, Pat. No. 4,843,234. This application Feb. 15, 1989, Ser. No. 311,312

Int. Cl.[4] G02B *6/20, 6/44*

U.S. Cl. 350—96.29 **5 Claims**



1. An encased optical fiber, comprising:

an optical fiber having a core, a doped cladding, and a buffer coating; and

a metal tube swaged on the optical fiber, said metal tube crimping the optical fiber with the buffer coating of the optical fiber yielding to the swaged metal tube so as to prevent the optical fiber from slipping therein.

4,893,896

ENERGY TRANSMISSION OPTICAL FIBER

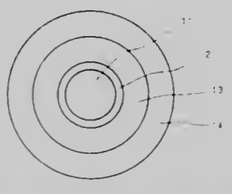
Hiroyuki Tanaka; Takeshi Satake; Toshikazu Gozen; Toshiya Suzuki, and Atsushi Utsumi, all of Itami, Japan, assignors to Mitsubishi Cable Industries, Ltd., Amagasaki, Japan

Filed Jul. 8, 1988, Ser. No. 216,382

Claims priority, application Japan, Jul. 10, 1987, 62-106229[U]; Feb. 26, 1988, 63-44847

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.31 **9 Claims**



1. An energy transmission optical fiber comprising:

a core formed of pure silica containing an OH-group at a content of 500 ppm or more, and having a core refractive index which is constant in a radial direction;

a first clad disposed around said core and having a first refractive index which has a first value at an inner circumferential side which is less than said core refractive index and which gradually decreases in an outward radial direction; and

a second clad disposed around said first clad and having a second refractive index which is constant in a radial direction.

4,893,897

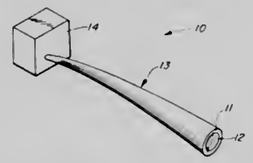
PLASTIC OPTICAL FIBER FOR IN VIVO USE HAVING A BIOCOMPATIBLE POLYURETHANE CLADDING

Theodore L. Parker, Walnut Creek; David R. Pedersen, Clayton, and Jerry D. Moseley, Walnut Creek, all of Calif., assignors to Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1988, Ser. No. 163,056

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.34 **17 Claims**



1. A flexible optical fiber for in vivo use in the tissue of a living mammal, which optical fiber comprises:

(a) a flexible organic polymeric optical fiber core, and

(b) an adherent flexible organic polymeric cladding selected from a poly(urethane) on the outer surface of the optical fiber core wherein the optical fiber core has a refractive index of at least 0.01 greater than the refractive index of the polymeric cladding.

4,893,898

LOW DIFFERENTIAL 3-D VIEWER GLASSES AND METHOD WITH SPECTRAL TRANSMISSION PROPERTIES TO CONTROL RELATIVE INTENSITIES

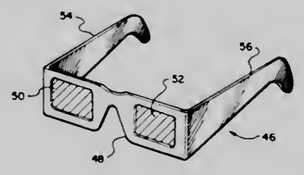
Terry D. Beard, 1407 N. View Dr., Westlake Village, Calif. 91362

Continuation of Ser. No. 154,068, Feb. 9, 1988, Pat. No. 4,836,647. This application Jan. 9, 1989, Ser. No. 294,868

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] G02B *27/22*; G03B *21/32*

U.S. Cl. 350—132 **6 Claims**



1. A 3-D television system for creating a stereoscopic effect when viewing a television image in which at least portions of the image exhibit a lateral movement, comprising:

a television which includes a television screen having a spectral-energy emission characterized by radiant energy peaks at spaced wavebands along the spectrum, and

viewer glasses for viewing said television screen, said viewer glasses comprising:

first means for transmitting light from the television screen to the viewer's left eye,

second means for transmitting light from the television screen to the viewer's right eye,

one of said light transmitting means being lighter than the other light transmitting means and having a spectral transmission characterized by a substantially greater transmissivity at wavelengths corresponding to each of said energy peaks, relative to both its transmissivity at other wavelengths within the visible spectrum and to the transmissivity of the other light transmitting means at said peak energy wavelengths, whereby the differential in light transmission between said first and second light transmitting means is greater when viewing the television screen than in normal ambient light, and

means for holding said first and second light transmitting means in place on a viewer's face in front of his or her respective eyes.

4,893,899

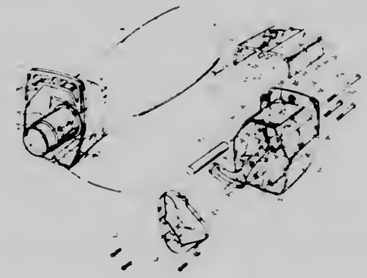
ADJUSTABLE CONTROL MECHANISM FOR OPTICAL INSTRUMENTS

Claus O. Huckenbeck, Tehachapi, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,989

Int. Cl.[4] G02B *7/02*

U.S. Cl. 350—255 **18 Claims**



1. A control mechanism for slidably positioning an optical component along an optical axis of an optical viewing device, the control mechanism comprising:

a rocker externally mounted on the optical viewing device and rotatable from an intermediate position in both clockwise and counterclockwise directions about an axis substantially parallel to the optical axis;

an actuating pin movable up or down along an essentially fixed upright axis in response to rotation of the rocker, the actuating pin having a lower end spaced from its connection to the rocker; and

an elongated lever arm pivoted on a fixed pivot axis and spaced from the axis of rotation of the rocker, said lever arm having a first end portion on one side of the fixed pivot axis and a second end portion on an opposite side of the fixed pivot axis;

the first end portion of the lever arm being pivotally secured to the lower end of the actuating pin for rotating about said fixed pivot axis in response to movement of the actuating pin;

the second end portion of the lever arm having an elongated arcuate sliding connection to a drive pin carried on the optical component, the drive pin being adapted for reciprocating travel along the optical axis of the viewing device, rotation of the first end portion of the lever arm about the pivot axis of the lever arm being translated to arcuate travel of the second end portion of the lever arm about its pivot axis for causing sliding reciprocating travel of the drive pin for slidably positioning the optical component along the optical axis of the viewing device in response to clockwise or counterclockwise rotation of the rocker, the drive pin including means for retaining the sliding connection of the pin to the lever arm during arcuate travel of the second end portion thereof.

4,893,900

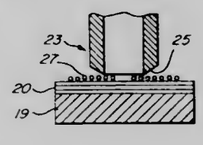
METHOD OF ALTERING REFLECTIVITY OF OPTICAL ELEMENTS

Paul F. Robusto, Carlsbad; David D. Scofield, San Diego; Chan H. Wang, Poway, and John C. Hausacher, Vista, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 20, 1988, Ser. No. 246,709

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—320 **19 Claims**



1. A method of forming an optical element comprising the steps of:

providing an optical element having a surface of substantially uniform reflectivity; and

imparting a step function approximation of a taper to said reflectivity.

4,893,901

ELECTRO-OPTICAL ASSEMBLY

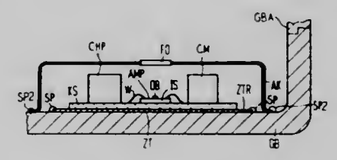
Franz Taumberger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,798

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732391

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—321 **12 Claims**

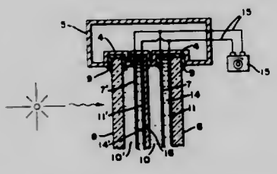


1. An electro-optical assembly containing optical components and a film circuit arranged on a substrate, the film circuit having at least one opto-electrical component, the assembly being contained in a sealed housing having a metallic housing floor, comprising:

an intermediate carrier secured in large area fashion to the substrate on the surface side of the substrate facing away from the film circuit, said intermediate carrier being composed of a comparatively thin sheet of metal and having an area larger than the substrate, said intermediate carrier including edge strips projecting beyond the substrate along at least two opposite sides, said edge strips being joined to the housing floor by welds.

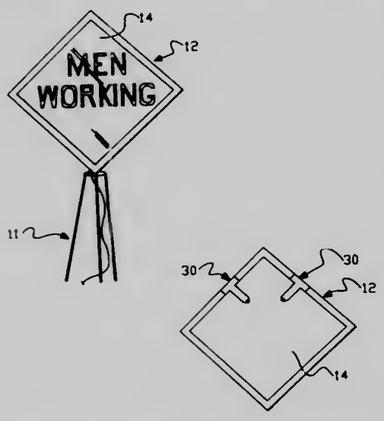
VOL 1110 ISS 3 JA 16 1990 UMI

4,893,902
DUAL-PANE THERMAL WINDOW WITH LIQUID CRYSTAL SHADE
Ray H. Baughman, Morris Plains; Ernest D. Buff, Far Hills; Helmut Eckhardt, Madison, and Gerhard H. Fuchs, Far Hills, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Division of Ser. No. 66,299, Jun. 25, 1987. This application May 12, 1989, Ser. No. 350,808
Int. Cl.[4] G02F *1/133*; E04C *2/54*
U.S. Cl. 350—331 R **2 Claims**



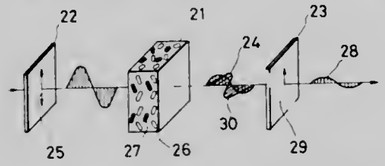
2. A thermal-pane window unit resistant to radiative heat transfer as well as conductive heat transfer, comprising:
(a) a plurality of substantially parallel, spaced window panes, mounted in a window frame;
(b) a plurality of liquid crystal cells, each of said cells being affixed to a different one of said panes; and
(c) a plurality of thermal breaks, each of said thermal breaks being a space delimited between a wall of each of said cells and a face of each of said panes.

4,893,903
FLASHING ADVISORY SIGN
David H. Thakar, Alamo, and Michael N. Thakar, Oakland, both of Calif., assignors to Taliq Corporation, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 731,412, May 6, 1985, abandoned. This application Apr. 28, 1986, Ser. No. 856,356
Int. Cl.[4] G02F *1/13*; G09F *9/00*
U.S. Cl. 350—331 R **9 Claims**



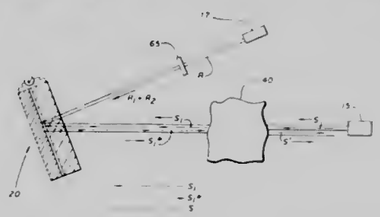
1. For use with a conventional advisory sign having a visible message, and optical shutter device for alternately blocking and transmitting the message, said device comprising:
spacer means attached to the sign in front of the message;
electrically operable optical shutter means coupled to said spacer means for alternately blocking and transmitting light between the message and a viewing region in front of said device; and
hanger means for removably attaching said spacer means to the sign such that said optical shutter means is in front of the message.

4,893,904
LIQUID CRYSTAL LIGHT SHUTTER
Morio Ohta, and Hideaki Inoue, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufac. Co. Ltd., both of Tokyo, Japan
Continuation of Ser. No. 814,797, Dec. 30, 1985, abandoned. This application Jun. 21, 1988, Ser. No. 220,953
Claims priority, application Japan, Feb. 22, 1985, 60-34135
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—337 **2 Claims**



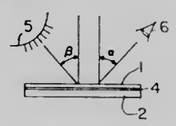
1. A liquid crystal light shutter of the Guest-Host type in combination with and interposed between a light source and a photosensitive body, said shutter comprising:
(a) two substantially transparent plates, each of which has an electrode;
(b) a first polarizing plate located between one of said transparent plates and said light source;
(c) a mixture of a liquid crystal material and a dichroic dye sealed between said two transparent plates, said liquid crystal material behaving as a host, and said dye behaving as a guest, and being wholly responsive to the application of a high frequency signal to said electrodes for effecting homogeneous alignment substantially parallel to the direction of polarization of said first polarizing plate according to the direction of orientation processing of said two plates to prevent transmission of light through the shutter, and being wholly responsive to the application of a low frequency signal to said electrodes for effecting homeotropic alignment substantially perpendicular to said direction of polarization to effect transmission of light through said shutter;
(d) means for applying to said electrodes a signal composed of said high frequency signal and/or said low frequency signal corresponding to recorded information for effecting control of the transmission of light from said source to said photosensitive body only through the absorption of light by said dichroic dye;
(e) means for heating said liquid crystal material for raising its temperature to and holding its temperature at a predetermined level enabling high speed operation of the shutter; and
(f) a second polarizing plate located between the other of said plates and said photosensitive body, and having a direction of polarization substantially parallel to that of said first polarizing plate for the purpose of interrupting light which is transmitted through said mixture and is not absorbed by said dichroic dye due to a misalignment of said homogenous orientation of said liquid crystal material and said dichroic dye for improving the contrast capabilities of said liquid crystal shutter, the last mentioned light transmitted through said mixture being caused by a greater shift in homogeneous orientation at said predetermined level of temperature.

4,893,905
OPTICAL LIGHT VALVE SYSTEM FOR PROVIDING PHASE CONJUGATED BEAM OF CONTROLLABLE INTENSITY
Uzi Efron, Los Angeles, and Yuri Owechko, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 10, 1988, Ser. No. 204,646
Int. Cl.[4] G02F *1/133, 1/135, 1/01*
U.S. Cl. 350—338 **11 Claims**
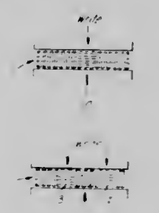


1. An optical light valve system comprising:
means for providing a coherent signal beam of a first polarization state;
means for providing a coherent reference beam having a first component of said first polarization state and a second component of a second polarization state; and
light valve means for phase conjugating said second component of said reference beam in response to said signal beam.

4,893,906
DISPLAY FORMS USING LIQUID CRYSTALS
David M. Makow, 14 Davidson Crescent, Gloucester, Ontario, Canada K1J 6M2
Filed Mar. 9, 1988, Ser. No. 165,821
Claims priority, application Canada, Mar. 17, 1987, 532251
Int. Cl.[4] G02F *1/133*; C09K *19/00*
U.S. Cl. 350—350 R **15 Claims**



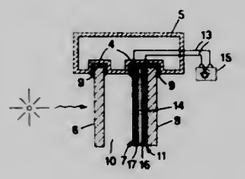
1. A display device comprising a light source, a panel with an interior and exterior surface, said exterior surface exposed to an onlooker and being on the reverse side of said panel, relative to said internal surface, at least a portion of said panel being coated with a liquid crystal coating which has a melting point above its operating temperature, and which is perceived as changing colour with a change in the angle between the line from said onlooker to a point which is viewed on the said exterior surface of said panel and the said exterior surface, or with the change in the angle between a line from said light source to a point on said exterior surface which is being viewed and a said exterior surface.

4,893,907
OPTICAL DEVICES
Stephen R. Mallinson, Ipswich, England, assignor to British Telecommunications Public Limited Company, United Kingdom
PCT No. PCT/GB87/00217, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/06019, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 31, 1987, Ser. No. 130,462
Claims priority, application United Kingdom, Apr. 4, 1986, 8608276
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S **23 Claims**



1. A liquid crystal device having smectic A phase liquid crystal material in only two transparent states of differing molecular orientation, which present differing respective refractive indices to polarised light transmitted through the device;
the smectic A phase liquid crystal material in one transparent state having a molecular orientation substantially orthogonal to the material in the other transparent state; and
the liquid crystal material being interposed between two major bounding surfaces the orientation in one state being homogeneous and substantially parallel to the major bounding surfaces and the orientation in the other state being homeotropic and substantially orthogonal to the major bounding surfaces.

4,893,908
ADJUSTABLE TINT WINDOW WITH ELECTROCHROMIC CONDUCTIVE POLYMER
James F. Wolf, Dover; Granville G. Miller, Morristown; Lawrence W. Shacklette, Maplewood; Ronald L. Elsenbaumer, Morris Township, Morris County, and Ray H. Baughman, Morris Plains, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Jun. 27, 1988, Ser. No. 211,537
Int. Cl.[4] G02F *1/17, 1/25*
U.S. Cl. 350—357 **24 Claims**



1. A method for decreasing radiative heat transfer and adjustably limiting visible light and near infrared radiation transfer ad glare through a window, comprising the steps of: (a) mounting within a frame of said window a plurality of spaced window panes, a first and second of said panes having oppos-

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ing faces; (b) assembling between said opposing faces a conductive polymer cell, said cell having a first wall composed of a transparent conductive layer affixed to said first pane and having deposited thereupon an electroactive electro-optically responsive conductive polymer composed of either p-type or n-type conjugated polymers and a second wall comprised of a transparent conductive layer coated on said second pane, said layer being optionally coated with a second electro-optically responsive conductive polymer, said conjugated polymers being chain-oriented in a plane parallel to the plane of the window so as to create a polarization of the transmitted light, said first and second walls delimiting a cavity containing an ion-conducting electrolyte which contacts opposing surfaces of the first and second walls, and (c) applying a potential between said first and second walls to provide a selected light transmittance upon passage of current therebetween.

4,893,909

MAGNETO-OPTICAL LIGHT SWITCHING ELEMENT AND METHOD OF MANUFACTURING SAME

Peter Hansen, Appen; Claus-Peter Klages, Hamburg; Klaus-Peter Schmidt, Quickborn; Wolfgang F. M. Tolksdorf, Tornesch, and Klaus Witter, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

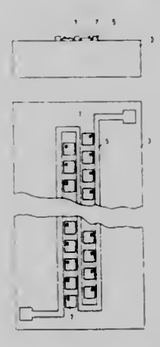
Filed Mar. 3, 1987, Ser. No. 21,109

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607346

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[4] G02F *1/01*; G02B *5/30*

U.S. Cl. 350—377 **18 Claims**



1. A magneto-optical light switching element comprising:

a magnetically unordered, optically transparent, (100)-oriented garnet substrate;

a plurality of islands formed from an epitaxial layer on said substrate, said layer formed on the basis of bismuth-substrated rare earth metal iron garnet;

a plurality of integrated heating resistors disposed on said plurality of islands; and

an integrated coil formed on said substrate having turns which surround and are proximate to said islands, said integrated coil generating a magnetic flux which in combination with the heat produced by said heating resistors, controls light passage through said islands.

4,893,910

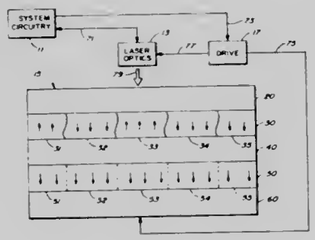
MAGNETO-OPTICAL RECORDING SYSTEM HAVING MEDIUM WITH DOMAINLESS CONTROL LAYER

Henryk Birecki, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 16, 1988, Ser. No. 168,710

Int. Cl.[4] G02F *1/29*

U.S. Cl. 350—377 **24 Claims**



1. A system comprising:

a medium having distributed optical and thermal properties, said medium including a magneto-optical storage layer and a magnetic control laser, said medium having a predetermined ambient temperature range;

said storage layer having at least one domain which can alternatively acquire a first magnetic orientation and a second magnetic orientation,

said control layer having a control layer Curie temperature, said control layer including a region the temperature of which determines the magnitude and direction of a magnetic field applied at said domain so as to define a zero-net-field temperature at which said field has substantially zero magnitude, said field having an initial direction when said region is between said ambient temperature range and said zero-net-field temperature, said zero-net-field temperature being above said ambient temperature range and below said control layer Curie temperature, said field having an inverted direction when said region is between said zero-net-field temperature and said control layer Curie temperature;

said distributed optical and thermal properties being selected so that there exists:

a first laser beam type that when directed toward said domain causes said domain to be heated to a first peak domain temperature and causes said region to be heated to a first peak region temperature above said zero-net-field temperature and below said control layer Curie temperature so that said domain cools through its switching temperature before said region cools through its zero-net-field temperature, and

a second laser beam type that when directed toward said domain causes said domain to be heated to a second peak domain temperature and causes said region to be heated to a second peak temperature above said zero-net field temperature and below said first peak region temperature so that said domain cools through its switching temperature after said region cools through its zero-net-field temperature.

4,893,911

POLARIZERS BASED ON POLYACETYLENE, AND THE PRODUCTION THEREOF

Karl-Heinz Ostoja-Starzewski, Bad Vilbel; Josef Witte, Cologne, and Uwe Claussen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,330

Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615765

Int. Cl.[4] G02B *5/30*; B29D *11/00*

U.S. Cl. 350—398 **20 Claims**

18. Polarizers which comprise a polymer matrix with polyacetylene homogeneously distributed therein as a light-polarizing substance.

4,893,912

DEVICE FOR OBSERVING A HOT REACTION SPACE IN THE INTERIOR OF A REACTOR OPERATING AT INCREASED PRESSURE

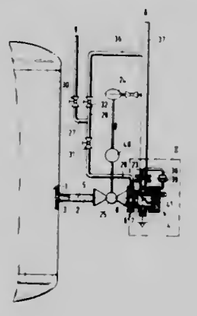
Klaus Köhnen, Mühlheim/Ruhr; Hans Niermann, and Lothar Semrau, both of Essen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 796,391

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3431346

Int. Cl.[4] G02B *23/08*

U.S. Cl. 350—506 **3 Claims**



1. A device for observing a hot reaction space in the interior of a reactor operating at an increased pressure, comprising: a tubular housing having an inlet portion for communicating with an observation opening in the reactor, an intermediate portion enclosing a reflecting mirror inclined at an angle to light rays passing through the observation opening, and a closed rear portion; a transverse tubular viewing piece communicating at one end thereof with the intermediate portion opposite said inclined reflecting mirror to receive the reflected light rays; a glass prism sealingly mounted in said inlet portion to separate said intermediate portion from the pressurized interior of the reactor; and another glass prism sealingly mounted at a second end axially opposite the end communicating with the intermediate portion of the tubular housing; and further comprising a transverse pressure relieving tubular piece communicating with said intermediate portion, and being provided with a rupture plate.

4,893,913

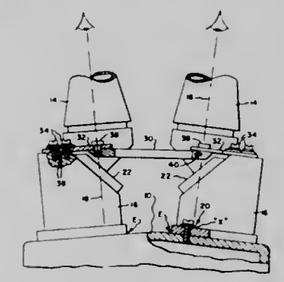
STEROMICROSCOPE HAVING STABILIZER FOR PREVENTING TIPPING OF EYEPIECE ASSEMBLIES

James A. Clark, Honeoye Falls, and Henry J. Emmel, Rochester, both of N.Y., assignors to Cambridge Instruments Inc., Buffalo, N.Y.

Filed Mar. 23, 1987, Ser. No. 28,858

Int. Cl.[4] G02B *21/22*

U.S. Cl. 350—515 **4 Claims**



1. An optical instrument having stereo vision, comprising:

a. a housing having supported therein a pair of optical systems each being aligned along a separate optical axis;

b. a pair of pivot plates each being spring biased to said housing at a pivot point so as to be rotatable about one of said optical axes, each pivot plate having mounted thereto an eyepiece assembly having an optical axis offset from , but parallel to, one of said optical axes and a mirror assembly for directing light rays along said optical axes through said eyepiece assemblies; and

c. link means spaced from said housing and coupling said pivot plates to prevent tipping of said pivot plates with respect to said housing as the eyepiece assemblies are rotated to thereby accommodate for variations in interpupillary distance.

4,893,914

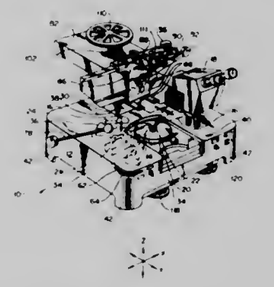
TEST STATION

Robert D. Hancock; Kenneth F. Hollman, and Gene A. Porter, all of Carson City, Nev., assignors to The Micromanipulator Company, Inc., Carson City, Nev.

Filed Oct. 12, 1988, Ser. No. 256,672

Int. Cl.[4] G02B *21/26, 21/32*

U.S. Cl. 350—530 **17 Claims**



14. A test station comprising:

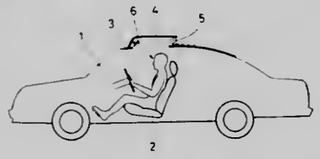
a base;

a movable frame supported on said base for rectilinear vertical motion;

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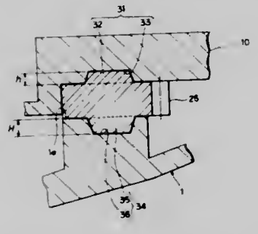
a microscope supported on said frame;
a stage supported on said frame; and
means for effecting rectilinear vertical motion of said frame so that said microscope and said stage can be moved in said rectilinear vertical motion without movement relative to one another, thereby permitting said frame to be moved vertically relative to said objects on said base while objects supported on the stage remain in focus for purposes of viewing through said microscope during said rectilinear motion of said frame.

4,893,915
BACK MIRROR DEVICE FOR VEHICLE
Kanito Tagawa, 2361 East Manoa Rd., Honolulu, Hi. 96822
Filed Oct. 18, 1988, Ser. No. 259,057
Int. Cl.[4] G02B 5/08
U.S. Cl. 350—606 **1 Claim**



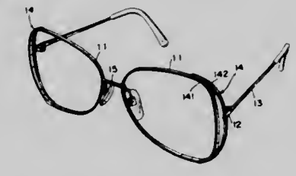
1. A back mirror device in a vehicle comprising a rectangular, upwardly projecting housing elongate in the width direction of the vehicle and provided as a portion of the ceiling of the vehicle slightly ahead of a front seat, a transparent window provided at the rear end of said upwardly projecting housing, and a mirror means for reflecting images received through said window to an occupant of the front seat, said mirror means consisting entirely of a transversely elongate back mirror provided on the inner side of a front wall of said upwardly projecting housing and capable of angle adjustment in the vertical and lateral directions said mirror being positioned for reflecting images received through said window directly to the occupant of the front seat when the occupant looks into the mirror.

4,893,916
AUTOMATICALLY STORED VEHICLE MIRROR
Torasoosuke Sakuma, and Hiroyuki Saitoh, both of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan
Filed Feb. 10, 1988, Ser. No. 154,647
Claims priority, application Japan, Feb. 10, 1987, 62-27230
Int. Cl.[4] G02B 5/08, 7/18; B60R 1/06
U.S. Cl. 350—637 **6 Claims**



1. An electrically and manually operable exterior storage type mirror for a vehicle comprising:
a base for mounting said storage type mirror to a body of said vehicle;
a mirror housing rotatably coupled to said base;
a transmission gear rotatably coupled to said base and provided between said base and said mirror housing;
a first clutch means provided between one surface of said transmission gear and said mirror housing, said first clutch means comprising convex parts on said one surface of said transmission gear, concave parts on said mirror housing engaging with said convex parts and spring means for causing said convex and concave parts to be in resilient engagement;
a second clutch means provided between another surface of said transmission gear and said base, said second clutch means having an engaging force greater than an engaging force of said first clutch, said second clutch means comprising convex parts on said another surface of said transmission gear, concave parts on said base engaging with said convex parts and spring means for causing said convex and concave parts to be in resilient engagement; and
a means fixed to said mirror housing and provided within said mirror housing for rotating said transmission gear when electric power is applied to said means; and
wherein the height of said convex parts of said first clutch is less than a height of said convex members of said second clutch.

4,893,917
FRAME STRUCTURE FOR GLASSES HAVING AN EXCELLENT RESTORABILITY
Kenji Ebata, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Mar. 21, 1988, Ser. No. 171,379
Claims priority, application Japan, Mar. 27, 1987, 62-45368[U]
Int. Cl.[4] G02C 5/14, 5/16, 5/02
U.S. Cl. 351—41 **13 Claims**

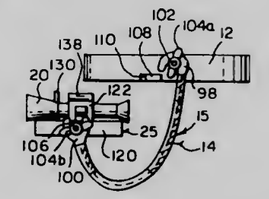


1. A frame structure for eyeglasses, comprising:
a pair of rims adapted to support respective lenses,
a bridge interposed between said rims and connecting said rims to one another,
a pair of temple members, and
a pair of resilient metal wire means for connecting said pair of temple members to said pair of rims, respectively,
each of said resilient metal wire means being of arcuate shape extending alongside a periphery of the corresponding rim and having opposite end parts secured to the periphery of said rim and an intermediate part spaced outwardly from said rim,
each of said temple members being secured to said intermediate part of the corresponding resilient metal wire means.

4,893,918
CONTACT OR INTRAOCULAR LENS FROM LIGHTLY CROSSLINKED POLYMER OR COPOLYMER OF 2-HYDROXYETHYL METHACRYLATE AND A METHOD FOR PRODUCING THEREOF
Jiri Sulc, and Zazna Krcova, both of Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia
Filed Jan. 6, 1988, Ser. No. 141,622
Claims priority, application Czechoslovakia, Jan. 12, 1987, 215-87
Int. Cl.[4] G02C 7/04
U.S. Cl. 351—160 H **3 Claims**

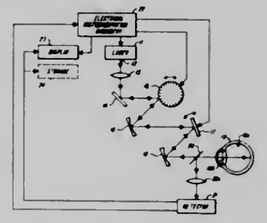
1. A method for producing a contact or intraocular lens comprising treating a shaped lens comprised of a lightly crosslinked 2-hydroxyethyl methacrylate polymer or a lightly crosslinked 2-hydroxyethyl methacrylate copolymer in which at least 50 percent of the monomer units are 2-hydroxyethyl methacrylate units, and the remaining monomer units are of non-hydrophilic comonomer, with an alkaline-reacting solution of a salt which will not cause the lens to swell for a time sufficient to form a hydrophilic-swellable and transparent partially saponified portion on said lens, and subsequently freeing the lens of all soluble substances by washing.

4,893,919
HEAD SUPPORTED OPTICAL SUSPENSION SYSTEM
Edmund Nightingale, 3314 Steuben Ave., Bronx, N.Y. 10467
Filed Apr. 21, 1988, Ser. No. 184,188
Int. Cl.[4] A61B 3/10; G02C 1/00
U.S. Cl. 351—205 **22 Claims**



1. A head supported optical suspension system which comprises:
(a) an endless annular headband for engaging around head of a person above ears;
(b) a suspension unit dependent on each side of said headband substantially extending downward and forward the ears of the person;
(c) a support frame assembly attached to said suspension unit so that said support frame assembly is adjacent eyes of the person; and
(d) an optical device carried in said support frame assembly, said optical device includes eyepieces to be placed close to the eyes of the person for viewing therethrough, so that hands of the person are free to do other work and all hand tremors, which are magnified by the optical power of said optical device are eliminated, said optical device further comprising a first connector attached to front of said headband, a front flexible tube attached at one end to said front connector, a second connector attached to said front flexible tube and contacts center of said optical device, a plurality of stiffening rods extending through said front flexible tube so that said optical device can further be supported and adjusted therefrom.

4,893,920
OPTICAL SCANNING SYSTEM AND METHOD INCLUDING CORRECTION FOR CROSS SCAN ERROR
Robert H. Webb, Lincoln, Mass., assignor to Eye Research Institute of Retina Foundation, Boston, Mass.
Filed Aug. 9, 1988, Ser. No. 229,990
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—221 **13 Claims**



1. An optical scanning system for scanning an object through an objective lens comprising,
a laser source for generating a beam of laser light,
an anamorphic beam shaping element placed to intercept said laser beam and provide a specific asymmetrical cross sectional shape to said laser beam,
a first scanning element in the form of a rotating polygon having a plurality of reflecting facets positioned to receive said laser beam from said beam shaping element and scan said beam along a first coordinate;
a second scanning element positioned to receive said laser beam from said first scanning element and scan it along a coordinate normal to said first coordinate onto said objective lens to a focus on said object;
a spherical mirror and lens characterized by a first focal length and position on the optical axis of said system in a plane normal to the axis of said system to focus light impingement upon it onto said objective lens,
an anamorphic focusing element positioned between said first scanning element and said second scanning element, said anamorphic focusing element having a focal length along said first coordinate such that it focuses the image along the first coordinate from said first scanning element at approximately the plane of said second scanning element, said anamorphic focusing element having a focal length along said second coordinate such that it focuses the image of said first scanning element at a point substantially beyond the plane of said second scanning element.

4,893,921
PROCESS FOR RECORDING CODED INFORMATION ON THE MARGINAL PART OR A PERFORATED CINEMATOGRAPHIC FILM
Jean-Pierre Beauviala, Grenoble, France, assignor to AATON R.G., Grenoble, France
Filed Oct. 12, 1988, Ser. No. 256,869
Claims priority, application France, Oct. 30, 1987, 87 15098
Int. Cl.[4] G03B 21/50
U.S. Cl. 352—92 **1 Claim**



1. A process for recording, on the marginal part of a perfo-

rated cinematographic film, coded information or "addresses" associated respectively with the various images of the film, in the form of dots disposed in a matrix of longitudinal rows and of transverse columns, in which, before each matrix of dots corresponding to a group of coded information or "address" of an image, a transverse framing pattern constituted by a single combination of dots, is recorded, then, during the recording, in the different transverse columns, of the different successive characters constituting the same "address", a longitudinal framing pattern is recorded, along a longitudinal row bordering the matrix, this longitudinal framing pattern being constituted by an alternation, along said row, of dots and absences of dots aligned respectively with the various transverse columns of the matrix, the dots being recorded on the film by means of a recording device constituted by a transverse assembly of adjacent light sources illuminating the film respectively at the location of each longitudinal row,

wherein, in order to form the dots on the film, the light sources are energized by pairs of adjacent sources so as to form on the film, for each element of information, a transverse dot occupying the location of two longitudinal rows, in other words having a length of a pitch corresponding to the total width of two adjacent rows, and the successive groups of information or "addresses" are recorded, offsetting them alternately by a half-pitch in the transverse direction.

4,893,922

MEASUREMENT SYSTEM AND MEASUREMENT METHOD

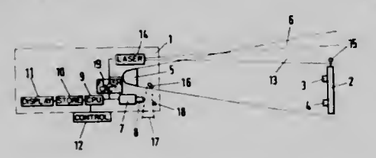
Kurt Eichweber, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 935,741, Nov. 28, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 291,377

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623083

Int. Cl.[4] G01C *3/22;* **B25J** *19/00;* **H04N** *7/18*

U.S. Cl. 356—1 **15 Claims**



1. A system for the measurement of a target object, comprising:

first and second retroreflectors carried by the object with a known spacing therebetween, each retroreflector adapted to return substantially all of any light impinging thereon from a light source;

a measuring device including a light including

a light source for projecting a single light beam onto both of the retroreflectors from a source location,

a matrix CCD video camera at the source location oriented to receive first and second reflected source light beams from the first and second retroreflectors and to generate respective first and second image points,

means for analyzing the distance relationship of the first and second image points in the camera to determine the measurement attributes of at least location of the object relative to the source location, and

means for transmitting information from the measuring device to the object.

4,893,923

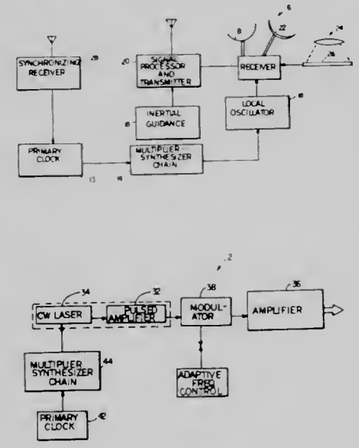
DOPPLER LASER RADAR SYSTEM

Ali Javan, Cambridge, Mass., assignor to Laser Science, Inc., Cambridge, Mass.

Filed Oct. 6, 1986, Ser. No. 915,650

Int. Cl.[4] G01P *3/36;* **G01C** *3/08*

U.S. Cl. 358—28.5 **59 Claims**



1. In a laser radar-Doppler system for detecting remote targets each independently capable of generating a return signal when illuminated by a laser beam, the combination comprising

a laser transmitter including

means for transmitting a pulsed target-illuminating laser beam having a beamwidth selected so that said beam is capable of simultaneously illuminating a plurality of said targets,

a reference oscillator, and

first stabilizing means for maintaining a predetermined relationship between the frequency of said oscillator and the frequency of said illuminating beam, and

a plurality of spaced receiver modules separate from said transmitter and each including

means for receiving the return laser beam from at least one of said targets,

a local oscillator,

second stabilizing means independent of said first stabilizing means for precisely controlling the frequency of said local oscillator to bear a predetermined fixed relationship with the frequency of said reference oscillator in said transmitter, and

means for comparing the frequency of the return laser beam with the frequency of said local oscillator.

4,893,924

METHOD OF REMOTELY DETECTING SUBMARINES USING A LASER

Donald A. Leonard, Cupertino, and Harold E. Sweeney, Menlo Park, both of Calif., assignors to GTE Government Systems Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 64,375, Jun. 22, 1987, Pat. No. 4,867,558. This application Jul. 20, 1988, Ser. No. 222,598

Int. Cl.[4] G01J *5/00*

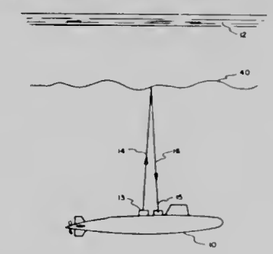
U.S. Cl. 356—43 **23 Claims**

1. An underwater method of detecting the wake of a first submerged submarine from a second submerged submarine comprising the steps of:

generating from within said second submarine a pulsed laser beam;

directing said beam upwardly from said second submarine with an intensity sufficient to penetrate the thermocline of said water;

detecting in said second submarine the Rayleigh and Brillouin backscatter light components produced by the interaction of said beam with said water;



mixing said Rayleigh and Brillouin light components and thereby producing a heterodyne signal having a frequency f_B;

periodically converting the heterodyne signal into a temperature/depth profile; and

translating said temperature/depth profile into spatial patterns for comparison with patterns characteristic of the wake of a moving submarine.

4,893,925

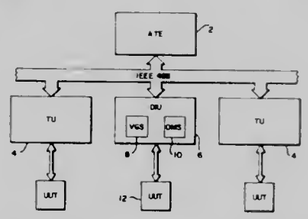
OPTICAL MEASUREMENT SYSTEM FOR A DISPLAY INTERFACE UNIT

Kevin T. Sweeney, Hicksville; Joseph P. Mattal, Smithtown; Mitchell L. Kushner, Bayside, and Robert H. Lemke, Huntington Station, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 26, 1988, Ser. No. 199,075

Int. Cl.[4] H04N *17/04;* **G01N** *21/84*

U.S. Cl. 356—72 **20 Claims**



1. Apparatus for evaluating optical characteristics provided by a stationary display unit under test, comprising:

means for sensing optical characteristics of the viewing area of the display unit, the sensing means having a field of view and a plurality of detectors resident within the field of view responsive to the optical characteristics;

focus means interposed between the display unit and the sensing means;

means for positioning the sensing means relative to the focus means along three directions such that any to be evaluated portion of the viewing area of the display unit can be chosen and projected onto the field of view of the sensing means;

whereby the optical characteristics of any chosen to be evaluated portion are measured by the detectors and evaluated by prestored image processing algorithms to determine the optical performance of the display unit.

4,893,926

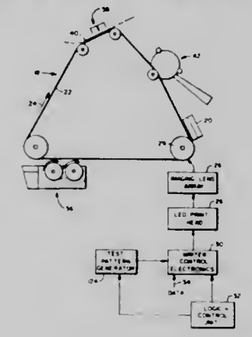
FOCUSING FOR OPTICAL PRINT HEADS

Roger L. Willis, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1987, Ser. No. 29,117

Int. Cl.[4] G06K *15/12;* **G03G** *15/04*

U.S. Cl. 356—123 **7 Claims**



1. In a device for generating printed output having an array of light sources focused across a photoresponsive surface such that there exists a predetermined distance between the surface and the light sources whereat best focus is obtained, the improvement being apparatus for locating the array substantially at the position of best focus comprising:

means for activating selected ones of the light sources along the array such that a desired pattern of activated and unactivated light sources results, said pattern being such that pairs of light sources which lead to the creation of an image on the output are separated by a light source which does not lead to the creation of an image, whereby the width of the space between the two marks provides an indication of the degree of focus of the light sources on the photoresponsive surface; and

means for adjustably mounting the light sources on the device for movement relative to the photoresponsive surface such that the light sources can be moved toward and away from the surface to a position of best focus.

4,893,927

METHOD AND APPARATUS FOR ALIGNING A ZOOM LENS WITH AN IMAGE SENSOR

Martin L. Miller, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,803

Int. Cl.[4] G01B *9/00*

U.S. Cl. 356—127 **9 Claims**

1. A method of aligning the optical axis of a zoom lens with an optical center of an image sensor comprising:

capturing an image of a target having a pattern with the image sensor;

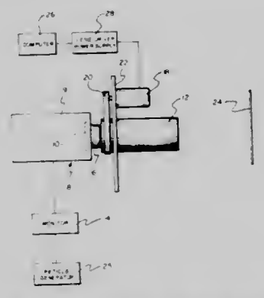
moving said lens between different states of magnification;

displaying the pattern image on a screen while moving said lens;

observing said pattern during said lens movement;

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identifying a stationary portion of said pattern image during such observation; and



adjusting said lens relative to the image sensor to cause the stationary portion to coincide with the optical center of the sensor.

4,893,928

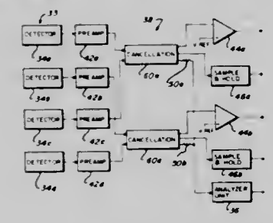
HIGHLY SENSITIVE PARTICLE SIZE DETECTION DEVICE HAVING NOISE CANCELLATION

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 851,477, Apr. 14, 1986, Pat. No. 4,798,465. This application Sep. 13, 1988, Ser. No. 243,988

Int. Cl.[4] G01N *15/02, 21/53*

U.S. Cl. 356—336 **15 Claims**



1. In a particle size detection device having first means for enabling a medium having particles therein to be passed through a predetermined sensing region and second means for illuminating said sensing region so that particles in said sensing region cause light scattering, an improved particle sensing system comprising:

detecting means for receiving and detecting light scattered at said sensing region, said detecting means including a plurality of detectors positioned so that predetermined ones of said detectors receive light scattered from predetermined portions of said sensing region, with said predetermined portions of said sensing region being spaced with respect to one another, and with each of said detectors providing an output that can include both noise and signals indicative of sensed light scattered by particles within said predetermined portion of said sensing region monitored by that detector; and

processing means including noise cancellation means connected with said predetermined ones of said detectors, said noise cancellation means causing noise included in said outputs from said predetermined ones of said detectors to be substantially cancelled so that the output from said processing means is effectively indicative of said particles causing said light scattering in said sensing region.

4,893,929

PARTICLE ANALYZING APPARATUS

Moritoshi Miyamoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,497

Claims priority, application Japan, Mar. 13, 1987, 62-58301; Jun. 12, 1987, 62-146656

Int. Cl.[4] G01N *15/02, 21/53*

U.S. Cl. 356—336 **4 Claims**



1. A particle analyzing apparatus comprising:

irradiating means for applying a light beam to a particle to be examined flowing through an observation portion;

a plurality of light detecting means for respectively detecting intensities of a plurality of components of scattered light emitted from said particle to be examined at the same moment and which differ in scattering angle;

correcting means for multiplying outputs of said plurality of light detecting means by correction coefficients and adding them together and providing an output value; and

operation means for calculating the particle diameter of said particle to be examined from the output value of said correcting means;

the output value of said correcting means and said particle diameter being in the relation of 1 to 1.

4,893,930

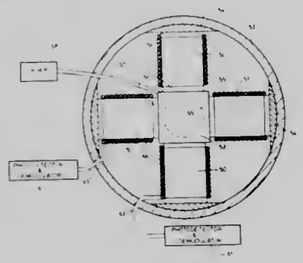
MULTIPLE AXIS, FIBER OPTIC INTERFEROMETRIC SEISMIC SENSOR

Steven L. Garrett, Pebble Beach, and David L. Gardner, Monterey, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1988, Ser. No. 147,968

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—345 **3 Claims**



3. A mechanical vibration sensor comprising:

a seismic mass;

an even-numbered plurality of at least four resilient supports connected to said seismic mass and spaced in predetermined angular relation, said resilient supports being disposed in pairs with such resilient supports of each pair disposed oppositely of said seismic mass;

a plurality of lengths of optical fiber equal in number to the number of resilient supports and wound individually thereabout; and

an enclosure surrounding said seismic mass and said plurality of resilient supports and connected to each of said supports so as to support said seismic mass therebetween.

4,893,931

METHOD FOR THE DETECTION OF POLARIZATION COUPLINGS IN A BIREFRINGENT OPTICAL SYSTEM AND APPLICATION OF THIS METHOD TO THE ASSEMBLING OF THE COMPONENTS OF AN OPTICAL SYSTEM

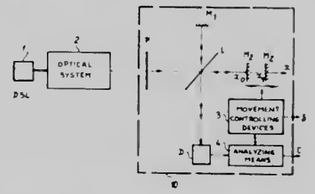
Hervé Lefevre, Paris; Jean P. Bettiai, Perthes, and Serge Botti, Viroflay, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 10, 1988, Ser. No. 166,492

Claims priority, application France, Mar. 13, 1987, 87 03459

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—351 **8 Claims**



1. An apparatus for detecting and locating localized polarization couplings in a birefringent optical system comprising:

a light source for entering polarized light into a birefringent optical system;

a polarizer, placed in non-alignment with the birefringent axis of said optical system, for receiving light emerging from said optical system;

an interferometer placed after said polarizer and for receiving the polarized light output of said polarizer, having two optical paths, with one of said paths having a variable length, and with a means for interference analysis of the optical system;

means for varying the length of said variable optical path in response to the abscissa z of an analyzed point of the optical system;

means in said interference analyzing means for analyzing fringes caused by the variation of the variable length optical path; and

means for determining the contrast of said fringes, which is related to the level of coupling at the point of the abscissa z, being known from the difference in the lengths of the optical paths.

4,893,932

SURFACE ANALYSIS SYSTEM AND METHOD

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Continuation of Ser. No. 859,054, May 2, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 262,216

Int. Cl.[4] G01N *21/01*

U.S. Cl. 356—369 **21 Claims**

1. A surface analysis system, comprising:

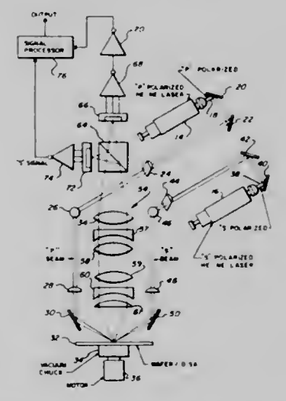
beam generating means for providing first and second illuminating beams having predetermined different polarizations;

beam directing means for directing said beams to a monitoring region;

support means for supporting a material having a surface to be analyzed for the presence of submicron particles on and below said surface with said surface being positioned at said monitoring region so that said beams impinge on said surface in a manner such that light is scattered by contamination and defects on and below said surface due to the presence of said submicron particles;

collecting means for collecting intensities of said light scattered by said contamination and defects on and below said surface;

separating means for separating said intensities of scattered light collected by said collecting means into first and second components with said first component including intensities of scattered light from said first beam and said second component including intensities of scattered light from said second beam;



first and second detecting means, said first detecting means receiving said first component of scattered light intensities from said separating means and said second detecting means receiving said second component of scattered light intensities from said separating means, said first and second detecting means, responsive to receipt of said components of scattered light intensities, providing separate outputs indicative thereof; and

processing means for receiving said outputs from said detecting means and utilizing the same to provide an output indicative of said submicron particles on and below said surface.

4,893,933

AUTOMATIC BOF VESSEL REMAINING LINING PROFILER AND METHOD

Gary L. Neiheisel, Cincinnati; Karl T. Bagdal, Middletown; Bradley R. Hoover, Hamilton, and Robert H. Jacks, Middletown, all of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Sep. 30, 1987, Ser. No. 103,069

Int. Cl.[4] G01B *11/02*

U.S. Cl. 356—376 **27 Claims**

1. Inspection apparatus for use with a refractory lined vessel of the type having bottom, sides and an open top, the interior walls of said lining being subject to wear and generally at a temperature substantially higher than ambient, said inspection apparatus being configured to measure the actual remaining lining thickness and including:

a. inspection means comprising:

i. a laser transmitter for directing a laser light beam toward the interior vessel wall through the vessel opening;

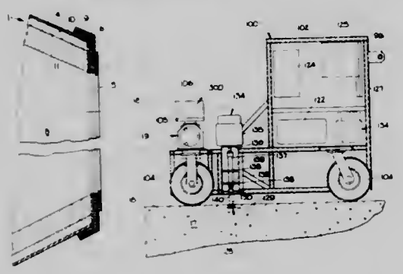
ii. a receiver for detecting the laser light beam scattered from the interior vessel wall comprising a linear array receiver having a plurality of optical elements positioned in side-by-side relationship;

iii. means for automatically directing the laser beam sequentially at a plurality of predetermined points on the

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interior vessel wall comprising a preselected area less than the entire area of the interior vessel wall;

iv. means for correlating the displacement of the detected laser light beam with respect to said optical elements with the actual remaining lining thickness at each of



said points within the preselected area of the interior vessel wall; and

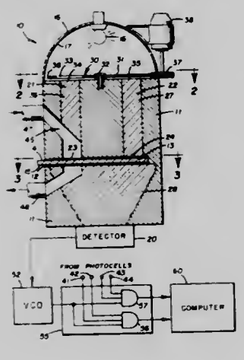
v. means for accurately and repeatably positioning said inspection means at a predetermined fixed location externally of and adjacent to said vessel.

4,893,934

AETHALOMETER

Anthony D. Hansen, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 25, 1988, Ser. No. 148,328
Int. Cl.[4] G01N 21/01, 21/59
U.S. Cl. 356—434 **5 Claims**



1. An improved aethalometer comprising:

a housing having a slot for the reception of a light transmitting filter,

a single light source secured against movement relative to said housing,

a single light detector secured against movement relative to said housing,

means forming first and second light paths through said housing for the transmission of light from said light source to said light detector, said first and second light paths passing through first and second separate areas of a filter disposed in said slot, said means including first and second separate solid light-transmitting solid members disposed in said first and second light paths respectively between said light source and said slot, said first and second solid members each having an end disposed for reception of light from said light source,

shutter means for allowing light from said light source to pass alternately through said light paths and alternately solely through one of said first and second areas of a filter disposed in said slot while completely blocking light from said light source from passing through the other of said first and second areas of said filter, said shutter means including an opaque member disposed between said light source and said ends of said first and second light-transmitting solid members said opaque member having an opening therethrough, and means for moving said opaque member in a path of movement between a first position wherein said end of said first light-transmitting solid member is completely exposed through said opening to light from said light source and said end of said second light-transmitting solid member is completely blocked from said light, and a second position wherein the exposure and blocking of said ends of said light-transmitting solid members is reversed,

a first pair of photocells associated with said end of said first light-transmitting solid member, said photocells being fixed to said housing and on opposite sides of said first solid member end along said path of movement of said opaque member,

a second pair of photocells associated with said end of said second light-transmitting solid member, said photocells being fixed to said housing and on opposite sides of said second solid member end along said path of movement of said opaque member,

said opening of said opaque member being greater in size than either of said ends of said first or second light-transmitting solid members and the photocells associated therewith,

means forming a flow path for passage of gas through said housing, said flow path allowing gas to pass through one only of said first and second areas of a filter disposed in said slot,

a single generating means for generating signals proportional to the magnitude of light received by said light detector,

logic means for alternately outputting said signals during the time while light from said light source is passing through said opening of said opaque member simultaneously to said end of said first light-transmitting solid member and both of said first pair of photocells, and then during the time while light is passing through said opening of said opaque member simultaneously to said end of said second light-transmitting solid member and both of said second pair of photocells.

4,893,935

APPARATUS AND METHOD FOR OPTICAL DENSITY MEASUREMENTS OF BIOMASS PROCESSES

William R. Mandel, 122 B Avenida Dr., Berkeley, Calif. 94708, and Anthony J. Dekovich, 14930-C Reedley St., Moorpark, Calif. 93021

Filed Aug. 19, 1988, Ser. No. 234,367
Int. Cl.[4] G01N 21/00
U.S. Cl. 356—436 **8 Claims**

1. A method for monitoring a dynamic biological system in a biological reactor containing developing culture fluid media, by measuring the transmitted light in a defined cell, the steps which simultaneously comprise:

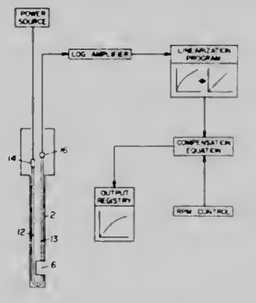
(a) irradiating fluid media in the cell;

(b) continually agitating the culture fluid media;

(c) detecting the transmitted light;

(d) converting the detected transmitted light to a non-linear electrical output signal;

(e) linearizing said non-linear electrical output signal;



(f) compensating said linearized output signal for the effect of agitation; and

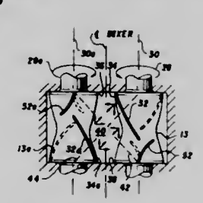
(g) recording the signal.

4,893,936

MIXING MACHINE WITH NON-INTERMESHING PAIR OF ROTORS DRIVEN SOLELY AT THE SAME ROTOR SPEED IN OPPOSITE DIRECTIONS AND HAVING A PREDETERMINED ROTATIONAL ALIGNMENT RELATIONSHIP BETWEEN THE TWO COUNTER-ROTATING ROTORS

Frank J. Borzenski, Branford, and Narku O. Nortey, Trumbull, both of Conn., assignors to Farrel Corporation, Ansonia, Conn.

Filed May 16, 1986, Ser. No. 864,096
Int. Cl.[4] B01F 7/12; B29B 7/18, 7/24
U.S. Cl. 366—76 **9 Claims**



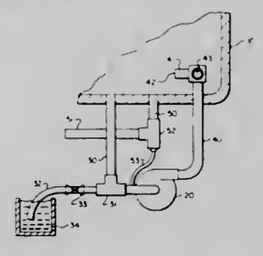
1. A mixing machine of the batch type for mixing batches of ingredients comprising housing means defining two horizontally opposed parti-cylindrical cavities with open sides facing one another and defining a chamber, said housing means having vertically spaced inlet and outlet openings communicating with said chamber and with said cavities, axially opposed end walls for said cavities and chamber, a ram for closing said inlet opening, a door for closing said outlet opening, two opposed non-intermeshing mixing rotors, respective ones of said rotors being provided in respective ones of said cavities, each said rotor having at least two generally spiral shaped wings, each wing having a leading end and a trailing end, drive means for rotating said rotors on parallel axes in said parti-cylindrical cavities, said drive means solely driving said rotors at the same speed and at opposite directions, said axes and end walls defining a rectangle in a horizontal reference plane extending across said cavities and chamber, said mixing rotors being non-intermeshing and turning in opposite directions at identical rotary speed to provide a window between the rotors and within said rectangle, said window having a cyclically variable geometry repeatable during each and every revolution of the rotors as a result of the rotor wings moving through said rectangle in the horizontal reference plane, each said rotor wing leading end being located adjacent one of said end walls and each rotor wing trailing end being located intermediate said end walls and being spaced circumaxially behind its leading end by an angle alpha relative to the direction of rotor rotation, said wings of opposed rotors being arranged in opposed pairs, a first pair of opposed rotor wings being on opposite sides of a first diagonal of said rectangle as said first pair of opposed rotor wings are moving through said rectangle at identical rotor speed, said first pair of opposed wings having leading ends that simultaneously move through said rectangle in the horizontal reference plane at approximately a same first time when said rotors turning at identical rotor speed have a predetermined constant rotational alignment relationship between them, said predetermined constant rotational alignment relationship being within ±20 degrees of zero degree alignment of the leading ends of said first rotor wings for transverse and axial squeeze mixing of the ingredients between said first pair of opposed rotor wings moving through said rectangle in the horizontal reference plane, said transverse and axial squeeze mixing between said first pair of rotor wings being toward said first diagonal from opposite sides of said first diagonal, and a second pair of opposed rotor wings being on opposite sides of a second diagonal of said rectangle as said second pair of opposed rotor wings are moving through said rectangle at identical rotor speed, said leading ends of said second pair of opposed rotor wings simultaneously moving through said rectangle in the horizontal reference plane at approximately a same second time, said second time being at a point in time after said first pair of opposed rotor wings have passed through said rectangle for transverse and axial squeeze mixing of the ingredients between said second pair of rotor wings moving through said rectangle in the horizontal reference plane, said transverse and axial squeeze mixing between said second pair of rotor wings being toward said second diagonal from opposite sides of said diagonal, said pairs of opposed wings cooperating to define successively formed window shapes and sizes that are repeated during each and every revolution of the opposed rotors, whereby ingredients in the chamber are mixed and urged from one parti-cylindrical cavity to the other parti-cylindrical cavity, and the mix is squeezed axially towards an intersection of said first and second diagonals of said rectangle at least twice during each and every revolution of the counter-rotating rotors turning at identical rotary speed.

4,893,937

APPARATUS AND METHOD FOR SUSPENDING SOLIDS

Ryszard Brasa, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

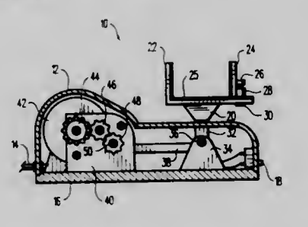
Filed Jun. 30, 1988, Ser. No. 213,815
Int. Cl.[4] B01F 15/02
U.S. Cl. 366—136 **6 Claims**



1. In mixing apparatus for use with a container of liquid, the apparatus comprising a centrifugal recirculating pump having inlet means for receiving liquid from a container and discharge means for delivering liquid to such container, the improvement wherein there is provided means for introducing a slurry of

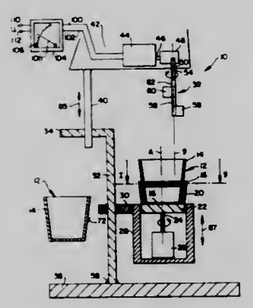
highly concentrated solids to said inlet means from a source that is separate from the container.

4,893,938
CONTAINER SHAKING DEVICE
Hilda K. Anderson, P.O. Box 5103, Goose Creek, S.C. 29445
Filed Mar. 8, 1989, Ser. No. 320,601
Int. Cl.[4] B01F *11/00*
U.S. Cl. 366—208 7 Claims



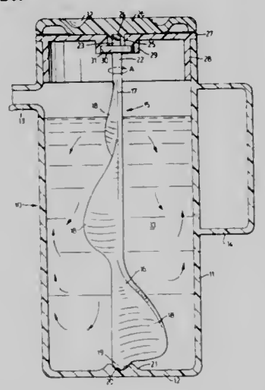
1. A container shaking device, comprising:
container holding means, said container holding means including an L-shaped member having a first leg portion and a second leg portion provided with an aperture for receiving a container neck;
a pivotal arm secured to said first leg portion of said container holding means;
an elongated reciprocal bar having a first end secured for pivoting said pivotal arm;
an elongated slot formed adjacent an opposite end of said reciprocal bar;
a rotary arm having a transverse pin received in said slot; and
means for rotating said rotary arm.

4,893,939
MIXING APPARATUS AND MIXING METHOD
Klaus Burk, and Ulrich Burk, both of Overath, Fed. Rep. of Germany, assignors to Kunststoff-Spritzgusswerk Ing. Klaus Burk KG, Fed. Rep. of Germany
Filed Mar. 3, 1987, Ser. No. 21,203
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3608038
Int. Cl.[4] B01F *9/12*
U.S. Cl. 366—224 10 Claims



1. Mixing means (10) comprising at least one mixing tool (52) and at least one mixing vessel (12) for mixing products, the mixing vessel (12) having a mixing chamber therein, where said mixing tool (52) is disposed, with respect to said mixing vessel (12), for providing a relative motion of said mixing tool (52) with respect to said mixing vessel (12), such that said mixing tool (52) is, at least partially, in contact with the mixing chamber of said mixing vessel (12) during the mixing process, the mixing tool (52) being provided with a shaft (122, 124) and stirring wings (134, 136, 138, 140), protruding from said shaft (122, 124) and comprising an inner section (134*a*, 136*a*, 138*a*, 140*a*) adjacent to said shaft (122, 124) and an annexed outer section (134*b*, 136*b*, 138*b*, 140*b*), said outer section (134*b*, 136*b*, 138*b*, 140*b*) being substantially more flexible than said inner section (134*a*, 136*a*, 138*a*, 140*a*),
wherein a rotating means (22, 24, 26) is provided for rotating said mixing vessel (12),
wherein said rotating means (22, 24, 26) comprises receiving means (18, 20) for said mixing vessel (12),
wherein said receiving means (18) and said mixing vessel may be detachably secured to each other by means of locking means (64, 66, 68, 70, 72, 74).

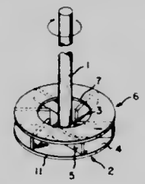
4,893,940
STIRRER DEVICE FOR A BEVERAGE PITCHER, AND BEVERAGE PITCHER INCORPORATING SUCH A STIRRER DEVICE
Stephen L. Waisberg, 6 Farningham Crescent, Islington, Ontario, Canada M9B 3B5
Filed Mar. 9, 1987, Ser. No. 23,681
Int. Cl.[4] B01F *7/18*
U.S. Cl. 366—247 16 Claims



1. A stirrer device for a beverage pitcher, the stirrer device comprising elongated vane means which has a first end and an opposed second end and which comprises a plurality of axially spaced vane lobes substantially equiangularly spaced about a longitudinal axis, the maximum radial extent of the vane lobes from the longitudinal axis decreasing in the direction from said first end towards said second end of the vane means, and each vane lobe being of generally spiral form about the longitudinal axis with the edge thereof merging smoothly from the maximum radial extent of said vane lobe towards said longitudinal axis.

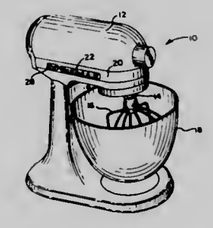
4,893,941
APPARATUS FOR MIXING VISCOUS LIQUID IN A CONTAINER
Joseph M. Wayte, 14301 Greenbelt Drive E, Sumner, Wash. 98392
Continuation-in-part of Ser. No. 69,813, Jul. 6, 1987, abandoned. This application Jun. 29, 1988, Ser. No. 213,078
Int. Cl.[4] B01F *5/12*
U.S. Cl. 366—265 14 Claims

1. A mixing device for mixing a body of liquid and dispersed solids confined in an open top consisting comprising in combination;
a rotatable mixing shaft, said shaft being substantially vertical and having a top and a bottom end for insertion into said container,
a planar imperforated circular disc having top and bottom surfaces with the top surface thereof fixedly connected to the bottom end of said shaft at the center point of the disc for rotation therewith,
said disc being normal to said shaft and having a substantially smooth circular unobstructed flat bottom surface,
a plurality of vane means fixed to the top surface of said disc and spaced equidistantly about the circumference thereof for driving liquid in a lateral direction away from said mixing shaft upon rotation of the shaft in one direction,



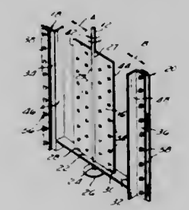
said vane means being located within the peripheral confines of said disc, and
baffle means overlying each said vane means for preventing upward vertical flow in the area of said vanes so as to concentrate the flow of liquid laterally along said vanes,
said baffle means being spaced radially outwardly from said shaft to provide a controlled flow passage for downward vertical flow of liquid as it is drawn downwardly by the lateral flow produced by said vanes,
whereby liquid is caused to flow vertically downwardly along said shaft and then moved laterally along said vanes with great force upon rotation of said shaft in said one direction, said flat smooth bottom and the circular configuration of the disc permitting operation of the mixing device on the bottom surface and inside peripheral edge of the container without damage to the container walls.

4,893,942
MEMBRANE POTENTIOMETER SPEED SELECTION CONTROL FOR AN ELECTRIC FOOD MIXER
Richard L. Stottmann, Louisville, Ky., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 23, 1987, Ser. No. 137,459
Int. Cl.[4] B01F *7/18*; H02P *5/06, 7/18*
U.S. Cl. 366—279 19 Claims



1. An electric food mixer comprising:
at least one beater;
a motor for rotating said beater;
elongated membrane speed selection means having a plurality of contiguous locations along the length of said means representing a plurality of selectable running speeds of said motor and responsive to a user's touch at one of said locations for providing a signal representing a selected motor speed; and
means responsive to said selected motor speed signal for controlling the speed of said motor.

4,893,943
METHOD AND APPARATUS FOR LOW FROTH AGITATION OF TANKED FLUIDS
John L. McKelvey, Lakeland, Fla., assignor to The Ink Company, West Sacramento, Calif.
Filed Jun. 27, 1988, Ser. No. 212,268
Int. Cl.[4] B01F *7/16*
U.S. Cl. 366—312 14 Claims



1. A fluid mixing and tank wall wiping device positionable within a holding tank having an inner wall surface, said device comprising:
a vertical shaft member positionable at a first location within said holding tank and operative to undergo at least partial rotational movement therewithin;
at least one perforated panel having an upper edge, a lower edge, an inner edge, an outer edge, and a plurality of apertures extending therethrough, said panel being positioned such that the inner edge thereof is in alignment with at least a portion of said vertical shaft, said panel being thereby disposed in a vertical plane which extends laterally from said vertical shaft;
at least one elongate tank wall wiper blade, each said elongate wiper blade being positioned laterally outboard of, and held a fixed distance from the outer edge of a selected perforated panel, thereby defining a void between each selected perforated panel and its corresponding tank wall wiper blade positioned laterally outboard thereof; and
means for operatively connecting (a) said vertical shaft, (b) said at least one perforated panel, and (c) said at least one wiper blade, such that rotational movement of the vertical shaft member will result in corresponding rotational movement of said at least one panel and said at least one wiper blade;
said mixing assembly being sized and configured so that, when said vertical shaft is positioned at said first location within said holding tank, said at least one wiper blade will be in contact with the inner wall surface and upon said rotational movement thereof, will travel along said inner wall surface to separate liquid therefrom.

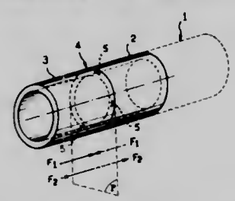
4,893,944
NON-DESTRUCTIVE METHOD OF TESTING A WELD OBTAINED BY PRESSURE WELDING TWO METAL PARTS
Jöel Leroux, Evreux, France, assignor to Sarimar, Société a Responsabilité Limitée, Levallois Perret, France
Filed Dec. 29, 1988, Ser. No. 291,629
Claims priority, application France, Dec. 30, 1987, 87 18362
Int. Cl.[4] G01N *03/18*
U.S. Cl. 374—46 6 Claims

1. In a method of non-destructively testing a weld between

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two metal parts butt-welded to each other at their junction surface by being heated to a predetermined welding temperature and subjected to a forging pressure applied to said parts so as to exert thereon a predetermined compression stress directed perpendicularly to said junction surface and of such a magnitude as to compact any defects in the weld to a substantially plane state; the improvement comprising the steps of:

applying a tensile stress to said weld perpendicularly to said



junction surface of said parts and on either side thereof directly after completion of the welding operation and while the weld is still hot between a maximum temperature close to the welding temperature and a predetermined minimum temperature, thereby to enlarge any defects in the weld present at said junction surface into a three-dimensional state; and

inspecting said weld with the aid of conventional fault detection means for detecting said three-dimensional defects.

4,893,945

TEMPERATURE SENSOR

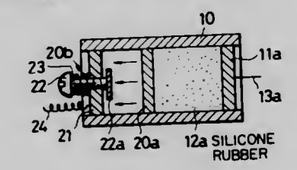
Teruo Okano, Houjo, and Tomomi Nagata, Tokyo, both of Japan, assignors to Nibex Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 72,206

Claims priority, application Japan, Dec. 2, 1986, 61-185044[U]; Dec. 27, 1986, 61-199832[U]; Jan. 8, 1987, 62-1090

Int. Cl.[4] G01K *5/48*; H01H *37/46*

U.S. Cl. 374—188 3 Claims



1. A temperature sensor comprising:

a heat sensing electrically insulating housing;

an electrically conductive silicone rubber means having thermal expansion and contraction characteristics which vary linearly with respect to changes in temperature conformably fitted within the housing;

an operating portion substantially positioned within one end of the housing for moving in response to the silicone rubber means, the operating portion including a fixed member and a movable member extending across the housing;

wherein the operating portion operates electrically in response to the thermal expansion and contraction of the silicone rubber means, the movable member being moved by the silicone rubber means for effecting, in conjunction with the fixed member, an electrical circuit.

4,893,946

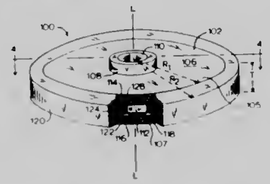
ROLLER FOR SPINNING FRAME

David W. Tesh, and David D. Wesner, both of Greensboro, N.C., assignors to Ankor Industries, Inc., Greensboro, N.C.

Filed May 15, 1989, Ser. No. 352,001

Int. Cl.[4] F16C *19/20*

U.S. Cl. 384—549 21 Claims



1. A spinning frame roller, comprising:

(a) a unitary, disc-shaped core body having a central axis and an outer peripheral surface with a radially reentrant dovetail channel therein, the core body having a central circular opening extending axially therethrough for mounting of the roller on a shaft for rotation therewith;

(b) a peripheral annular ring coextensive in axial thickness with a radially outer portion of the core body, the ring being characterized by:

(i) an inner facing surface having a dovetail protrusion radially inwardly extending therefrom, so that the inner facing surface and dovetail protrusion respectively matably engage the outer peripheral surface and dovetail channel of the core body;

(ii) a radial thickness W and an axial thickness T which are related to one another such that the aspect ratio W/T of the ring is from 0.25 to 0.65; and

(ii) being formed of an elastic, material having durometer value of from 55 to 90.

4,893,947

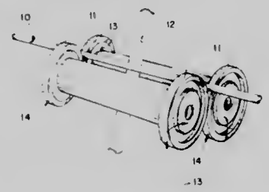
SPINNING MACHINE ROTOR SHAFT DISK

Robert E. Hurley, Route #3, Box 375-B, Sophia, N.C. 27350

Filed Jan. 23, 1989, Ser. No. 300,586

Int. Cl.[4] F16C *13/00*; D01H *7/882*

U.S. Cl. 384—549 17 Claims



1. A disk to support a spinning machine rotor shaft comprising: a hub formed from a rigid material, a tire, said tire formed from an elastomeric material, said hub having a substantially circular periphery, said periphery defining an indention, said indention having a width below the outer circular surface of said periphery greater than the width of said indention at said outer circular surface, said indention for receiving said tire for affixing said tire to said hub.

4,893,948

DEVICE FOR BEARING MOUNTING MECHANISM

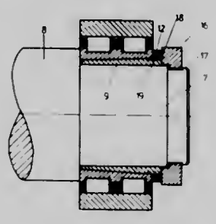
Paul-Gerhard Hoch, Schweinfurt, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,882

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727150

Int. Cl.[4] F16C *19/28*

U.S. Cl. 384—551 5 Claims



1. Device for mounting a bearing including an inner ring with a conical bore on a bearing seat, said device comprising a conical clamping sleeve having a larger diameter end projecting an axial distance (A) beyond the inner ring, and means for mounting the bearing to provide a different degree of pretension by a single clamping sleeve using spacers of different thicknesses, said spacer (12) loosely and non-threadedly mounted on the outer conical surface of the clamping sleeve, the thickness of said spacer being less than that of the axial projection (A) in the preassembled state by an amount equal to the stroke (B) required to press in the clamping sleeve (9), the spacer thus limiting the distance (B) of the inward stroke to achieve a predetermined radial tension and a nut member (16) for axially displacing the spacer and sleeve relative to one another said distance (B).

4,893,949

DISTANCE ADJUSTER FOR A PRINT HEAD OF AN OFFICE MACHINE

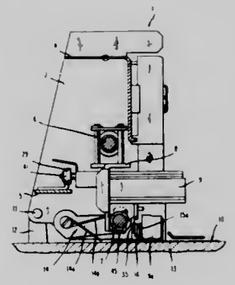
Alois Limberger, Grüningen; Berhard Nolte, Villingen, and Dieter Stellmach, Bad Dürrheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,916

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706573

Int. Cl.[4] B41J *11/20*

U.S. Cl. 400—56 20 Claims



1. A device for adapting a distance of a print head relative to a thick print material in an office machine comprising

a frame;

a print surface support attached to the frame;

guide rails attached to the frame running substantially parallel to the print surface support;

a print head carriage supported by the guide rails so that the print head carriage can be moved back and forth in parallel to the print surface support between end positions; a print head disposed on the print-head carriage to be carried by the print head carriage in parallel to a print surface support between defined end sections, where the print head can be set perpendicular with respect to the print surface support against a spring force relative to the print surface support;

a bendable strip running parallel to the print-surface support, where the bendable strip rests during the printing process solidly on the thick print material, wherein the bendable strip is disposed in a rest position at a distance running parallel and corresponding to the thickest print material to be printed above the print support, where at least one strip end is longitudinally attached to the frame under a tension spring force in the longitudinal directions, where cutout sections in the bendable strip are disposed near the defined end position sections and wherein the bendable strip exhibits at least for the length of the cutout sections a laterally staggered strip width section;

a rotatable roller supported on the print-head carriage, which roller has a running surface and which roller rests on the bendable strip, where the print-head carriage can be lifted by the print material in a limited amount at the end positions of the print head carriage over the defined end position sections, and where the cutout sections do not allow a transfer of a support force onto the bendable strip with the running surface of the rotatable roller.

4,893,950

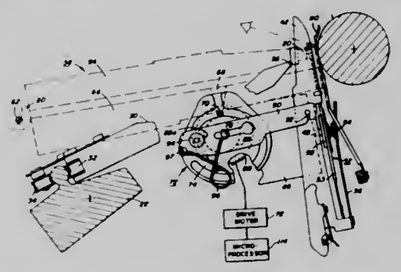
APPARATUS AND METHOD FOR CONTROLLING THE POSITIONING OF MARKING ELEMENTS IN A SERIAL IMPACT PRINTER

Robert A. Ragen, Hayward; Andrew Gabor, Alamo; Ivor Weller, Castro Valley; Michiel Frankhuizen, Martinez, and Brian E. Jagger, Pleasanton, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1988, Ser. No. 250,798

Int. Cl.[4] B41J *1/30*

U.S. Cl. 400—185 9 Claims

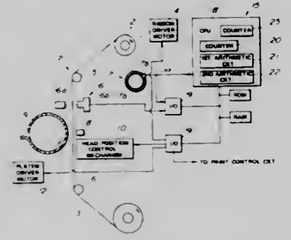


1. A serial impact printer including a platen mounted for rotation about its axis, a scanning carriage mounted for movement along a path parallel to said axis and supporting thereon character imprinting means, a ribbon assembly including a marking ribbon and a correcting ribbon disposed one above the other, and hammer means for impacting said character imprinting means, said printer being characterized by marking element position control means comprising

a unitary cam for raising and lowering said ribbon assembly and for moving said character imprinting means toward

and away from said platen to vary a throat gap distance therebetween,
drive means for rotating said cam means,
sensor means for generating a signal when said throat gap distance deviates from a predetermined reference distance, and
computing means for receiving said signal and for controlling the energization of said drive means in response thereto.

4,893,951
INK RIBBON POSITIONING SYSTEM FOR COLOR PRINTING APPARATUS
Mitsuo Iwatani, Kanagawa; Hiroaki Takano, Tokyo, and Masatoshi Mikuriya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 17, 1988, Ser. No. 169,510
Claims priority, application Japan, Mar. 20, 1987, 62-65969
Int. Cl.[4] B41J *33/34*
U.S. Cl. 400—225 **8 Claims**



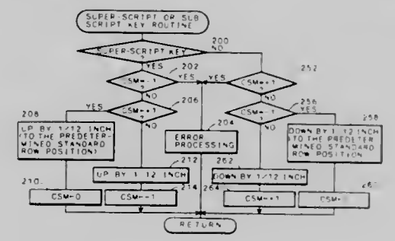
1. An ink ribbon positioning system for a color printing apparatus, comprising:
a paper platen on which a printing paper is arranged;
a platen driver motor coupled to said platen;
an ink ribbon having a plurality of color sets, each color set having a plurality of color ink regions and a color set marker provided at a beginning of each of said color sets on the ink ribbon;
a take-up reel and a supply reel for transporting said ink ribbon therebetween, said ink ribbon being wound on each of said reels with winding diameters that change during said transporting;
a printer head movable between a head-down position and a head-up position;
head control means coupled to said printer head for moving said printer head between said head-down position and said head-up position, said printing paper and said ink ribbon being pressed against said paper platen by said printer head at said head-down position of said printer head for performing a printing operation;
a sensor for detecting said color set marker of said ink ribbon, whereby a positioning of said first color ink region of said each color set to a print start position is performed in response to detection of said color set marker;
a pulse generator coupled to one of said take-up and supply reels;
a counter circuit connected to said pulse generator for counting the number of pulses N_1 during said printing operation of said first color ink region over a constant length l_1, at said head-down position of said printer head, whereby said counter circuit produces a variable output based on N_1 and l_1;
a calculation circuit responsive to the variable output of said counter circuit for calculating a number of pulses N_2 to be generated by said pulse generator for positioning a second color ink region of the each color set to said print start position and producing an output signal based on the calculation; and
an ink ribbon drive circuit for causing said take-up reel and supply reel to transport said ink ribbon to position a second color ink region of said each color set in response to the output signal from said calculation circuit, said second color ink region being displaced from said first color ink region by a constant distance l_2;
wherein N_1 and N_2 are updated during said transporting in view of changes in said winding diameters.

4,893,952
DOT MATRIX PRINTING SYSTEM INCLUDING IMPROVED INK TRANSFER MECHANISM
Eduard Svystaky, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Oct. 16, 1987, Ser. No. 109,474
Int. Cl.[4] B41J *3/12, 27/02*
U.S. Cl. 400—470 **8 Claims**



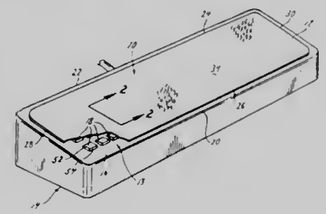
1. A printing system including a cavitated ink transfer means carrying a predetermined amount of ink in its cavities for use in an electronically controlled printer that includes a dot matrix printing head having impression pin means, at least one workpiece carried by a support medium in spaced relation to said cavitated ink transfer means, said at least one workpiece adapted to be pushed sequentially by said pin means from its backside through said support medium to cause its front surface to pick up predetermined amounts of said ink from said cavitated ink transfer means in predetermined symbol array, said ink transfer means being a roller wherein said cavities are indiscriminately placed in close tight relation providing cavities for retention of ink material by surface tension as series of ink droplets positioned in close proximity, whereby movement of said impression pins of said matrix printing head moves selected areas of said at least one workpiece into contact with certain of said droplets to form indicia means on the surface of said workpiece, said ink transfer roller further including an assembly having a central generally cylindrical portion, said plurality of cavities being impressed in the surface of said central portion, at least one guide roller positioned adjacent at least one end of said cylindrical portion, said guide roller having a diameter slightly larger than said central portion, the difference in the radial extent between said roller and said central portion being at least as great as the thickness of said at least one workpiece, said support medium riding on said guide roller and supporting a plurality of said at least one workpiece individually and sequentially in position over said central portion, said impression pins locally depressing said support medium and one of said at least one workpiece into contact with the ink carried by said central portion, and thereby sequentially creating a predetermined symbolic array on each of said at least one workpiece.

4,893,953
PRINTER FOR NORMAL LINE FEED BY A CARRIAGE RETURN
Yuji Kawakami, and Sae Kawakami, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Apr. 7, 1988, Ser. No. 178,536
Claims priority, application Japan, Apr. 14, 1987, 62-91320
Int. Cl.[4] B47J *11/44;* B41J *19/76*
U.S. Cl. 400—582 **9 Claims**



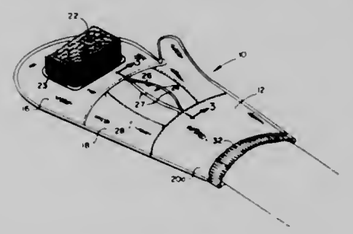
1. A printer comprising:
line feed control means for moving a print position vertically;
memory means for storing data of vertical movement of the print position from one of a plurality of predetermined standard row positions when the print position is moved vertically by the line feed control means from one of said predetermined standard row positions, distance between the predetermined standard row positions corresponding to a preset line feed amount;
carriage return control means responsive to a carriage return code for moving the print position down by the preset line feed amount by utilizing the line feed control means, and for moving the print position to a preset left margin position; and
compensating means for adjusting the preset line feed amount to be moved by the carriage return control means based on the vertical movement data stored in the memory means.

4,893,954
REMOVABLE KEYBOARD COVER FOR OFFICE MACHINES
Donald R. Kotur, 839 Castlebar Ct., Ballwin, 63021
Filed May 13, 1987, Ser. No. 49,095
Int. Cl.[4] B41J *11/62*
U.S. Cl. 400—714 **6 Claims**



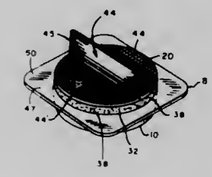
1. A removable protective cover for the keys of a keyboard for computers, typewriters, word processors, and calculators with the keys having top portions, the said cover comprising:
(a) a thin sheet of flexible material for placing over the keyboard keys;
(b) the sheet having an upper surface and a lower surface, and
(c) the lower sheet surface having a plurality of shallow recesses shaped for receiving and engaging the top portions of the keys, the recesses being at least substantially contained within the thickness of the sheet and having surfaces so that contact between the keys and the surfaces of the recesses resists sliding movement of the sheet away from the keys, and wherein the cover must be removed from the keyboard so that an operator can press the keys to operate the computer, typewriter, word processor or calculator, the upper surface of the cover being substantially flat and of sufficient friction so that the cover may be placed on the surface of a desk and used for a mouse pad.

4,893,955
THERAPEUTIC SCRUBBING MITTEN
Karmella Zielinski, 3 Northumberland Dr., Mount Holly, N.J. 08060
Filed Feb. 5, 1988, Ser. No. 152,833
Int. Cl.[4] A46B *11/00;* A47L *13/19*
U.S. Cl. 401—7 **13 Claims**



1. A mitten for therapeutic cleansing of the scalp comprising:
a body of flexible sheet material formed to fit over a hand, said body having a front panel and a back panel, said front panel having a finger portion, a palmar portion and a panel opening formed in the palmar portion, said panel opening having a major dimension coextensive with the palmar portion of said front panel;
a plurality of soft bristles secured to the finger portion of said front panel;
reservoir means underlying said palmar portion for holding a quantity of liquid, said reservoir means communicating with the panel opening; and
means for retaining said body on the hand.

4,893,956
PACKAGING FOR MEDICAMENTS
Michael A. Wojcik, and Steven L. Kliff, both of Oak Brook, Ill., assignors to Blistex Inc., Oak Brook, Ill.
Filed Nov. 18, 1988, Ser. No. 272,916
Int. Cl.[4] A45D *33/00;* A61M *35/00*
U.S. Cl. 401—130 **13 Claims**



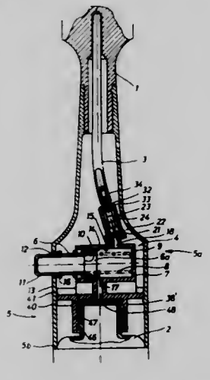
13. An ointment-conserving applicator comprising a first disk-like member having an ointment, receiving side of nonpermeable material, and

a second disk-like member of nonpermeable material on the opposite side of the applicator including a foldable handle, a compressible sponge-like plastic pad sandwiched between said first and second disk-like members and permanently affixed thereto, said side of said first member on said nonpermeable material preventing the ointment from seeping into said pad.

4,893,957
DISPENSER BRUSH

Ole Byriel, Jyllinge, Denmark, assignor to Eveline A/S, Jyllinge, Denmark

PCT No. PCT/DK88/00051, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/07339, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 25, 1988, Ser. No. 275,058
Claims priority, application Denmark, Mar. 26, 1987, 1559/87
Int. Cl.[4] A46B *11/02*
U.S. Cl. 401—146 **9 Claims**

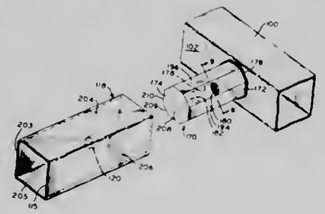


1. A dispenser brush assembly which comprises
an elongated brush element which defines a longitudinal axis and which includes a head having discharge openings for a liquid, a tubular handle connected to said head, and a tube means for conveying liquid to said discharge openings, said tubular handle having a side wall with an opening for an actuator button and an entry end opposite said head,
an insert assembly which includes a cylinder having a side wall and a bottom wall, a piston which is movable within said cylinder between a first position and a second position, said second position being closer to said bottom wall than said first position, an actuator button connected to said piston, a spring means biasing said piston into said first position, a first hollow stub connected to said cylinder and communicating with an outlet opening in said side wall thereof near said second position, a second hollow stub connected to said cylinder and communicating with an inlet opening in said side wall thereof near said first position, a flange connected to said second stub, said flange including an opening in communication with the interior of said second hollow stub and a tubular protrusion in which the neck of container means for liquid can be positioned, and a venting element located within said tubular protrusion and positionable between said flange and the neck of a container means positioned within said tubular protrusion, said flange being dimensioned so that said insert assembly can be inserted into the entry end of said tubular handle such that said cylinder will be perpendicularly oriented relative to said longitudinal axis and said actuator button will extend through said opening in said side wall of said tubular handle, and
a closing member for preventing liquid flow into said cylinder through said first stub, movement of said piston by said actuator button from said first position of said second position within said cylinder causing a controlled amount of liquid to flow to and through said discharge openings.

4,893,958
JOINT FOR DEMOUNTABLE FURNITURE

Roy M. Wieland, Fort Wayne, Ind., assignor to R. M. Wieland Company, Grabill, Ind.

Continuation-in-part of Ser. No. 95,767, Sep. 11, 1987, which is a continuation-in-part of Ser. No. 499,812, Jun. 1, 1983, abandoned. This application Oct. 5, 1988, Ser. No. 253,665
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—7 **9 Claims**



1. A joint for attaching a first component of an article of furniture to a second component thereof, comprising:
an elongated polygonal tubular member having at least one edge portion, said tubular member mounted at one end to said first component, said tubular member having an end opening, a plurality of generally planar sidewalls and an access opening in said edge portion;
an elongated polygonal bar member mounted at one end to said second component and being adapted to axially slip fit into said tubular member through said end opening, said bar member including a transverse threaded bore having an end opening, said bar member having at least two generally planar sides located adjacent said bore end opening, said access opening being located to align with said threaded bore when said bar member is slip-fitted into said tubular member;
and means for locking said bar member within said tubular member when said bar member and said tubular member are operatively assembled with two of said bar member planar sides respectively aligned with and bearing against two of said planar side walls, and said end opening spaced away from said edge portion, said locking means comprising set screw means threadedly engaged with said transverse threaded bore for directly contacting and simultaneously bearing against two of said side walls of said tubular member.

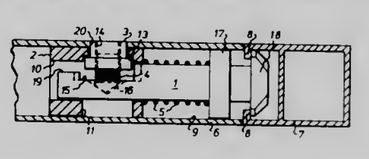
4,893,959
CONNECTOR

Adrian G. Offenbroich, Düsseldorf, Fed. Rep. of Germany, assignor to Foga EHT-System AB, Mahno, Sweden

Filed Jun. 7, 1988, Ser. No. 203,104
Claims priority, application Sweden, Jun. 10, 1987, 8702398-2
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—12 **7 Claims**

1. A connector for releasably connecting a first building element to a second building element, the first building element including an engageable edge and the second including a connection end having a cavity, said connector comprising:
a first sleeve having the same cross-sectional shape as the cavity so as to be insertable therein, said first sleeve having a longitudinal hole,

an elongate clamping member provided to be receivable within said longitudinal bole, said clamping member comprising, at an outer end portion thereof, a hook formed for engagement with the engageable edge and, on a portion thereof received in said first hole, a bevelled surface,
a second sleeve having a threaded hole, and
a clamping screw which, when turned in said threaded hole in said second sleeve, is movable transversely of said

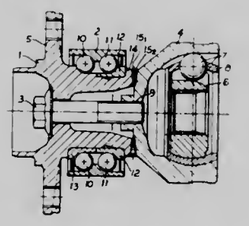


clamping member to a position with the tip of said screw against said bevelled surface under spring bias between said first sleeve and said clamping member, said bevelled surface being provided in a transverse recess in said clamping member, said second sleeve being depressable into said transverse recess against the spring bias to a position in which said second sleeve is located completely inside of said first sleeve.

4,893,960
WHEEL BEARING/CONSTANT VELOCITY JOINT UNIT

Rudolf Beier, Offenbach am Main, and Hans-Heinrich Welschof, Rodenbach, both of Fed. Rep. of Germany, assignors to Lohr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 113,008
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636243
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—24 **7 Claims**

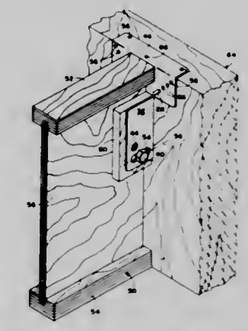


1. A wheel bearing/constant velocity joint unit with a constant velocity joint, a double row bearing (2) provided with at least one inner bearing ring (12) separate from a wheel hub (1) and said inner bearing ring is axially held or tensioned by a formed collar (14) on the wheel hub (1), wherein the improvement comprises that said collar extends radially outward at least partially coextensive with and in contact with said inner bearing ring, spur or helical teeth (15) are formed into the formed collar (14) of the wheel hub (1) in the region at least partially coextensive with the inner bearing ring (12), and said spur or helical teeth are directly and non-rotatingly connectable to one joint component (4) of said constant velocity joint.

4,893,961
JOIST HANGER

Kevin B. O'Sullivan, and Arthur L. Troutner, both of Boise, Id., assignors to Trus Joist Corporation, Boise, Id.

Filed Jan. 5, 1989, Ser. No. 361,591
Int. Cl.[4] F16L *3/00*; E04C *7/00*
U.S. Cl. 403—232.1 **20 Claims**

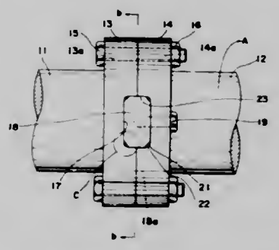


1. A glued-block hanger system for supporting an I-beam joist on a support, comprising:
a block which is secured to the web of an I-beam joist at the ends thereof intermediate the top and bottom chords, said block and the web having a bore extending therethrough at a predetermined position;
a hanger including a top tab and an end plate, said top tab being constructed and arranged to extend over the top of a support with said end plate extending down a side of the support, and a pair of opposed, spaced apart flanges extending outward from said end plate, said flanges being spaced apart to snugly receive the joist web and block therein, each of said flanges further including an opening formed therein, said opening being aligned with said bore when the top chord of the joist is aligned with said top tab; and
a connector which extends through said bore and said opening, thereby fastening the joist on the hanger.

4,893,962
COUPLING

Nobuo Komeyama, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jan. 26, 1989, Ser. No. 301,942
Claims priority, application Japan, Jan. 27, 1988, 63-9082[U]
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—288 **5 Claims**



1. A coupling, comprising:
a pair of connecting members adapted to be fixed to associated ends of two shafts to be coupled together;

a keyway in each of said connecting members in the side of each said connecting member substantially facing the other said connecting member, each of said keyways having at least one side wall;

key means disposed between said connecting members and received in said keyways, said key means having side faces abutting associated ones of said side walls of said keyways for transferring torque, said key means and said keyways having spaced substantially facing portions which do not transfer torque and which define gaps within said keyways; and

watertight seal means within said gaps.

4,893,963

SYSTEM FOR COUPLING TWO BODIES, FOR EXAMPLE A CARRIAGE AND A MACHINING STATION

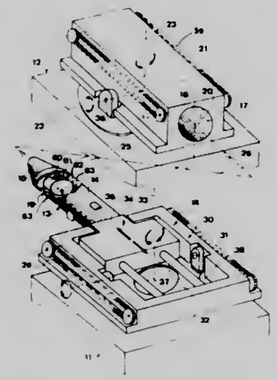
Jean-Francois Le Goff, Vitry-sur-Seine, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Sep. 2, 1988, Ser. No. 239,625

Claims priority, application France, Sep. 11, 1987, 8712617[U]

Int. Cl.[4] F16B *21/00*

U.S. Cl. 403—322 **7 Claims**



3. A system for coupling two bodies able to move relatively with respect to each other, comprising:

a frame mounted on one body of said two bodies and able to rotate about a first axis with respect to said one body, a head mounted on said frame and able to rotate about a second axis with respect to said body, said head having a cavity and being biased by first and second spring biasing means to a reference position, said first spring biasing means being disposed between said one body and said frame and said second spring biasing means being disposed between said frame and said head;

a plate mounted on the second of said two bodies and able to rotate about a first axis with respect to said second body, a base mounted on said plate and able to rotate about a second axis with respect to said body, said base having an extendable projecting part able to penetrate into said cavity and being biased by first and second spring biasing means being disposed between said second body and said plate, and said second spring biasing means being disposed between said plate and said base;

said extendable projecting part having transverse expandable means able to contact the inner wall of said cavity.

4,893,964

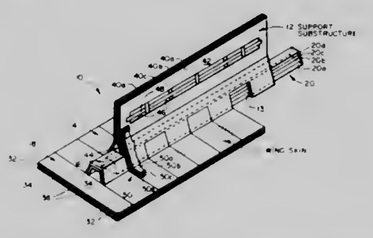
INTERLOCKING STRUCTURAL MEMBERS UTILIZING OVERLYING COMPOSITE STRIPS

Robert E. Anderson, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 6, 1989, Ser. No. 306,179

Int. Cl.[4] F16B *1/00*

U.S. Cl. 403—376 **13 Claims**



7. An integrally formed joint for interlocking first and second structural members comprising:

a) a first structural laminate member having a plurality of alternating bonded sequences of first, second and third plies, the member more particularly including

i) first plies each having a plurality of spaced parallel strips wherein each strip is raised at an intermediate point to form a projection;

ii) second plies each having a plurality of parallel spaced strips located perpendicular to the strips of the first ply;

iii) third plies each having a plurality of parallel spaced strips, each strip being respectively parallel and adjacent to a strip of the first ply;

b) a second structural laminate member having a plurality of bonded plies and including an elongated base portion having an open cross section and spaced recesses therealong which receive corresponding overlying projections of the first member thereby forming interdigital engagement therebetween; and

c) an elongated laminate bar formed from a plurality of bonded plies and received within the interdigitating projections and base portion for securing engagement of the first and second structural members.

4,893,965

SYSTEM FOR OFFSHORE OPERATIONS

Peter A. Jordan, 'Rosslyn' Lower Road, Cookham Rise, Maidenhead, Berkshire, Great Britain

PCT No. PCT/GB87/00174, § 371 Date Mar. 3, 1988, § 102(e) Date Mar. 3, 1988, PCT Pub. No. WO87/05577, PCT Pub. Date Sep. 24, 1987

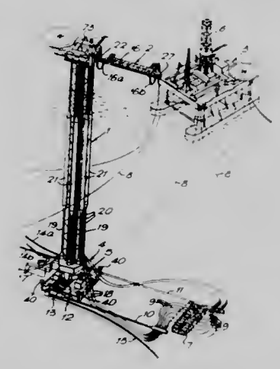
PCT Filed Mar. 13, 1987, Ser. No. 124,103

Claims priority, application United Kingdom, Mar. 13, 1986, 8606225

Int. Cl.[4] E02B *17/02*

U.S. Cl. 405—202 **18 Claims**

1. A system for offshore operations comprising a base for attachment to the seabed, a column for articulation to the base to extend upwardly therefrom, the articulation including first and second universal joints, the first universal joint including a plurality of relatively rotatable joint surfaces disposed radially outwardly of the longitudinal axis of the column whereby to provide an axial opening through the first joint, the second universal joint being disposed in said axial opening, the first and second joints being so arranged that normally the first joint is loaded by the column and said second joint is substantially unloaded, but in the event of failure of the first joint said second joint is arranged to assume the entire column load without failure thereof, and a plurality of risers extending longitudi-



nally of the column through said space in the first universal joint for coupling to the seabed.

4,893,966

LOCK APPARATUS FOR INTRODUCING DRY GRANULAR MATERIALS INTO A PNEUMATIC CONVEYING CONDUIT AND SPRAY GUN FOR SUCH MATERIALS

Franz Roehl, Peter-Boehler-Strasse 3, D-6000 Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 212,883

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722314; European Pat. Off., Jan. 16, 1988, EP88100582.1; Fed. Rep. of Germany, Jun. 9, 1988, 8807520[U]

Int. Cl.[4] B65G *53/46, 53/40, 53/52, 53/54*

U.S. Cl. 406—127 **4 Claims**

4. Spraying apparatus for substantially dry concrete mixtures or similar building materials, characterized in that it comprises a plurality of lock apparatuses, each lock apparatus being adapted to deliver such materials from a material supply means into a pneumatic spray conveying conduit, each lock apparatus comprising a lock chamber, a tubular connecting piece communicating with the pneumatic spray conveying conduit, first conduit means interposed between and in communicating relationship with the material supply means and the lock chamber, and second conduit means interposed between and in communicating relationship with the lock chamber and the tubular connecting piece, the said materials passing from the material supply means through the first conduit means, the lock chamber, the second conduit means, the tubular connecting piece into the pneumatic spray conveying conduit, each lock apparatus being characterized by:

(a) the lock chamber (44) is positioned below the material supply means (2) and above the tubular connecting piece (30),

(b) an upper hose (16) defines said first conduit means,

(c) a lower hose (22) defines said second conduit means,

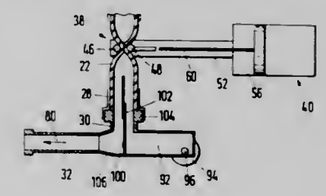
(d) inlet shut-off means (34) are provided between said lock chamber (44) and said material supply means (2), said inlet shut-off means (34) being adapted to engage the exterior of upper hose (16) to close or selectively to open said upper hose (16),

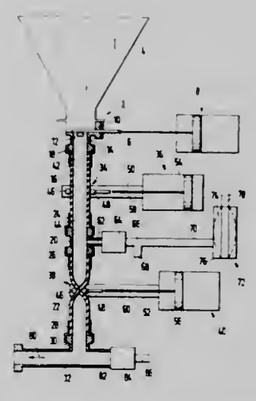
(e) first operating means (36) operatively connected to said inlet shut-off means (34) are provided and are adapted to actuate said inlet shut-off means (34) to close or selectively to open said upper hose (16),

(f) outlet shut-off means (38) are provided between said lock chamber (44) and said tubular connecting piece (30), said outlet shut-off means (38) being adapted to engage the exterior of lower hose (22) to close or selectively to open said lower hose (22).

(g) said tubular connecting piece (30) communicates with said spray conveying conduit (32) at a position between ends of said spray conveying conduit (32),

(h) a partition (100) is provided transversely within said spray conveying conduit (32) to define therein a first passageway for said materials leading to one end of said spray conveying conduit (32) and a second passageway leading





to a chamber (92) adjacent the opposite end of said spray conveying conduit (32),

(i) a blowing air connection (96) is provided in communication with said chamber (92),

said spraying apparatus being characterized in that:

(j) said plurality of lock apparatuses are actuable in phase-displaced timing,

(k) an air overflow conduit (90) connects those portions of upper hose (16) above the inlet shut-off means (34) of all of said plurality of lock apparatuses.

4,893,967

CUTTING TOOL ARRANGEMENT

Leonard A. Briese, 5039 Browndeer La., Rancho Palos Verdes, Calif. 90274

Division of Ser. No. 102,038, Sep. 29, 1987, Pat. No. 4,828,436. This application Feb. 22, 1989, Ser. No. 313,757

Int. Cl.[4] B23B *27/12*

U.S. Cl. 407—7 **36 Claims**

1. An improved rotating cutting tool cartridge arrangement comprising, in combination:

an annular bushing means having a predetermined axis, a first end surface and second end surface and said second end surface axially spaced a predetermined distance from said first end surface, an outside surface, a threaded inside surface, a pair of spaced apart walls defining a slot extending axially from said first end surface to said second end surface and radially from said outside surface to said inside

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surface, and said pair of spaced apart walls having limited resilient movement towards and away from each other;
bearing means coaxially mountable in said bushing means and having an outer end and an inner end, first walls defining an external surface extending from said outer end to said inner end, said external surface having:
a first threaded portion extending from said inner end towards said outer end for threading engagement with said threaded inside surface of said split bushing means;
a second shoulder portion adjacent said outer end; and,
a tapered bearing surface extending from said outer end inwardly towards said axis to said inner end;
spindle means coaxially mountable in said bearing means and having an insert end and an interior end, said interior end having a thrust bearing means mounting portion, said insert end having an internal cutting insert matching surface, and an exterior surface having:
a first threaded portion at said insert end;
a second boss portion adjacent said first threaded portion; and
an external bearing surface for engaging said internal bearing surface of said bearing means for relative rotary motion therebetween, and extending from said second boss portion to said thrust bearing means mounting portion;



thrust bearing means mountable on said thrust bearing portion of said spindle means for rotation therewith and having a thrust bearing surface means for rotary engagement with said inner end of said bearing means;
cutting insert means mountable in said insert end of said spindle means and having a medial plane, a cutting edge end and a mounting end spaced axially a predetermined distance from said cutting edge end, an external flank surface tapering inwardly from said medial plane to said cutting edge end, an external mounting surface tapering inwardly from said medial plane to said mounting end, said mounting surface of said cutting insert means positionable contiguous said matching surface of said spindle means; and
a clamping nut means having a spindle means end and a clamping end, first walls extending from said spindle means end defining an internal threaded surface for threading engagement with said first threaded portion of said spindle means, second walls extending from said insert end defining an internal clamping surface for clamping engagement with said flank surface of said cutting insert;
whereby said cutting insert is rigidly clamped between said clamping nut means and said spindle means.

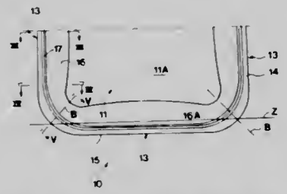
4,893,968
END MILL
Zadok H. Levy, 114 Hagolan St., Tel-aviv, Israel
Filed Mar. 15, 1988, Ser. No. 168,153
Int. Cl.[4] B26D *1/12*
U.S. Cl. 407—54 8 Claims

1. An end mill comprising a cylindrical rod having a smooth cylindrical shank portion of circular cross-section and an integrally formed cutting portion with at least one helical flute extending from the transition between said shank portion and said cutting portion to the end of said cutting portion, the



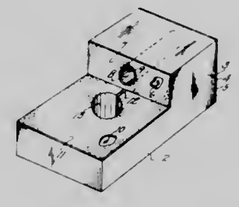
depth of grind of said flute being linearly tapered from a minimum depth proximate said transition to a maximum depth proximate said end of said cutting portion.

4,893,969
CUTTING INSERT AND METHOD FOR CHIP REMOVING MACHINING
Anders B. I. Hessman, Sandviken, and Leif R. Nyström, Järbo, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden
Filed Nov. 2, 1988, Ser. No. 265,898
Claims priority, application Sweden, Nov. 3, 1987, 8704280
Int. Cl.[4] B26D *1/00*
U.S. Cl. 407—114 9 Claims



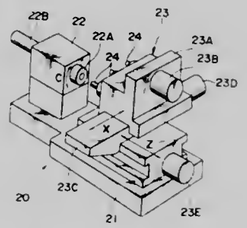
1. Indexable cutting insert for chip removing machining, comprising a rake face and a clearance face, a cutting edge being provided at the line of intersection of said faces, said rake face comprising at least two adjacent, elongated ridges which extend along at least a part of the cutting edge and wherein a first ridge connects to the cutting edge, characterized in that each ridge in cross-section at least partly describes a convex curve and in that a second ridge connects to the first ridge and is arranged below the first ridge such to become active after a substantial wear of the first ridge, the cutting insert being of polygonal basic shape having corner portions defining bisectors and in that major portions of the ridges are arranged beyond a first imaginary line intersecting the bisectors of two adjacent corner portions at the cutting edge of said corner portions.

4,893,970
HAND HELD DRILL GUIDE
Charles E. Becraft, 1640 McKinley Ct., Eugene, Oreg. 97402
Filed Apr. 29, 1988, Ser. No. 188,022
Int. Cl.[4] B23B *49/02*
U.S. Cl. 408—72 R 4 Claims



1. A drill guide for manual retention on a workpiece having right angular intersecting surfaces and comprising in combination,
a main body having first and second perpendicularly orientated faces,
said main body defining through openings one in each of said faces,
a wear resistant sleeve in one of said openings for receiving a drill and the other of said openings being for the viewing of a marking on the workpiece, and
grit friction enhancing means in place on said faces and engageable with the workpiece during guide use to inhibit movement of the guide.

4,893,971
NC MACHINING APPARATUS
Takahiro Watanabe; Isao Matsumoto; Masakazu Suga, all of Hiroshima, and Toshimitsu Iwai, Kure, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jan. 3, 1989, Ser. No. 293,006
Claims priority, application Japan, Jan. 20, 1988, 63-10092
Int. Cl.[4] B23C *1/14*; G05B *13/00*
U.S. Cl. 409—80 3 Claims



1. A machining apparatus for making the scroll parts which comprises a headstock means including a spindle for supporting a workpiece for rotation;
a tool holding means for supporting a machining tool;
a first carriage means supported for movement of the tool holding means in a direction perpendicular to the spindle (an X-axis);
a second carriage means supported for movement of the tool holding means in a direction parallel to the spindle; and
a control device for controlling the movement of the first carriage means and the rotation of the spindle;
said control device being programmed so as to calculate the distance x between the center of the base circle generating a desired involute curve depicted by the scroll parts and the center of the machining tool according to the following equation (I) and also to calculate the angle of rotation C of the spindle relative to the distance x according to the following equation (II):
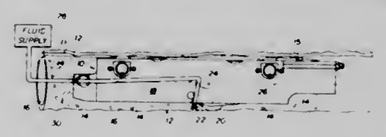
$$x = \sqrt{a^2 + [a(\theta + \psi) + D/2]^2} \quad \text{(I)}$$

and

$$C = \theta - \tan^{-1}\{[a(\theta + \psi) + D/2]\}/a \quad \text{(II)}$$

wherein a represents the radius of the base circle generating the involute curve, θ represents the involute angle, Ψ represents the angle as measured between the X-axis and the starting point of the involute curve, and D represents the diameter of the machining tool.

4,893,972
CUTTING TOOL
Lester J. Blaho, Monaca, Pa., assignor to Pittsburgh Tube Company, Monaca, Pa.
Filed Nov. 18, 1988, Ser. No. 273,275
Int. Cl.[4] B23D *1/24*
U.S. Cl. 409—299 13 Claims

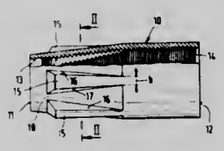


1. A cutting tool for removing upset from inside a tube and which does not force splatter into the inside surface of the tube comprising:
a holder;
means for enabling the tube to move along the holder, said enabling means connected to said holder and in contact with a bottom of the inside surface of the tube;
means for removing the upset from the inside surface of the tube, said removing means connected to the holder such that as the tube moves along the holder, the removing means removes the upset from the inside surface of the tube; and
means for preventing splatter from being forced into the inside surface of the tube by the enabling means as the tube moves along the holder by introducing fluid upstream from the enabling means to form a fluid barrier therewith which prevents splatter from being forced into the inside surface of the tube.

4,893,973
EXPANSION DOWEL WITH AXIALLY EXTENDING PROJECTIONS
Armin Herb, Apfeldorf, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum Liechtenstein, Liechtenstein
Filed Sep. 15, 1988, Ser. No. 245,131
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 3730860
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—55 9 Claims

1. Expansion dowel comprising an axially extending sleeve having a leading end to be inserted first into a borehole and a trailing end, said sleeve being at least partially axially slit from the leading end thereof, said sleeve having an outside surface and an inside surface with the inside surface forming an axially extending bore with the bore being threaded from the trailing end at least toward the leading end, at least an axially extending portion of said sleeve being conically shaped and diverging from the leading end toward the trailing end, the conically

shaped axially extending portion including axially extending conically-shaped outside surface sections diverging from the leading end toward the trailing end, said sleeve having axially extending projections extending outwardly from the axially extending outside surface sections thereof and located at least in the conically-shaped portion thereof, said projections spaced circumferentially apart by said outside surface sections,



said projections having at least one axially extending surface located outwardly from the outside surface and forming an outside planar surface inclined relative to the axis of said sleeve, said outside inclined planar surface having a leading end and a trailing end with the leading end thereof spaced from a line parallel to the central axis and passing through the trailing end thereof.

4,893,974

COMPOSITE PLUG FOR MOUNTING OBJECTS IN A DRILLED HOLE IN MASONRY

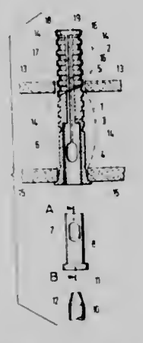
Artur Fischer, and Jörg Fischer, both of Waldachtal/Tumlingen, Fed. Rep. of Germany, assignors to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal/Tumlingen, Fed. Rep. of Germany

Filed Jan. 9, 1989, Ser. No. 295,118

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800833

Int. Cl.[4] F16B *39/00, 39/02*

U.S. Cl. 411—82 **13 Claims**



1. A plug, comprising a plug body having a screw passage for receiving a mounting screw and an expanding region expandable by insertion of said mounting screw, said screw passage having a portion with an increased diameter, said plug body being provided with outlet openings for mortar introduced into said plug body; means forming guide surfaces in said screw passage, said guide surfaces leading to said outlet openings and subdividing said screw passage into a front region and a rear region, said outlet openings being located in said front region; means forming longitudinal channels extending along an outside of said plug body, said outlet openings merging into said longitudinal channels; and a stopper which is inserted in said portion of said increased diameter and formed as a hollow member, said stopper having openings which are in alignment with said outer openings.

4,893,975

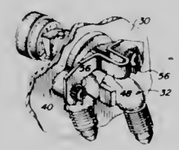
LOCKING DEVICE FOR ENGAGEMENT ONTO BOLT HEADS

William M. Anthony, Scottsdale, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Filed Nov. 7, 1988, Ser. No. 268,312

Int. Cl.[4] F16B *39/02, 39/04*

U.S. Cl. 411—87 **13 Claims**



1. A locking device for securing against undesired loosening relative rotation a plurality of spaced apart threaded fasteners at least two in number each having an outwardly disposed torque-transmission surface and all generally in a planar array, at least two adjacent fasteners of said plurality of fasteners being without line-of-sight relationship therebetween, said locking device comprising a unitary deformably shape-retaining body, said body including a plurality of spaced apart fastener-engaging portions matching in number with and each encompassing a respective torque-transmission surface of one of said plurality of fasteners, each of said plurality of fastener-engaging portions defining cooperating interengageable means for when interengaged with a respective torque-transmission surface of a fastener preventing relative rotation therebetween, a respective connecting portion integral with and extending between each fastener-engaging portion and the next-adjacent fastener-engaging portion of said plurality of portions to prevent relative rotation thereof, the respective connecting portion extending between said two adjacent fasteners extending generally in the plane of said planar array parallel to but spaced laterally from a connecting line between said two adjacent fasteners, each connecting portion including a deformable section deformation of which changes the spacing between said adjacent fastener-engaging portions, and resilient means for removably securing said locking device into interengagement with said plurality of fasteners.

4,893,976

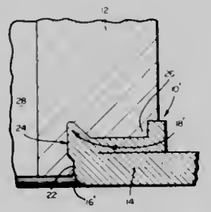
CLINCH TYPE FASTENING STRUCTURE

John S. Milliser, Rochester, Ind., and James T. McGuire, Royal Oak, Mich., assignors to Textron Inc., Providence, R.I.

Filed Mar. 1, 1988, Ser. No. 162,681

Int. Cl.[4] F16B *37/02, 37/04*

U.S. Cl. 411—180 **4 Claims**



1. A joint assembly in which a fastener of the self-clinching

type is secured to an apertured sheet material, comprising: a fastener including a head and shank portion with a locking groove formed in said shank; an apertured sheet material including a flanged circumferential periphery including an annular, bent-over portion thereof formed at the aperture to define engagement of dual layers of said peripheral material, wherein said fastener shank portion projects through said aperture and said fastener head is embedded within said bent-over portion of said peripheral material such that a portion of said peripheral material is disposed within said groove to form mechanical interlock therewith securing said joint assembly.

4,893,977

SELF-LOCKING UNIT

Giancarlo Tramezzani, Ponte Tresa, Switzerland, assignor to Alian International AG, Triesen, Liechtenstein

Division of Ser. No. 208,833, Jun. 20, 1988, abandoned, which is a continuation of Ser. No. 938,345, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 673,129, Nov. 16, 1984, abandoned. This application Jul. 25, 1989, Ser. No. 385,923

Claims priority, application Italy, Jan. 16, 1984, 52838[U]

Int. Cl.[4] F16B *39/22*

U.S. Cl. 411—278 **2 Claims**



1. A self-locking nut assembly, comprising a nut including a main body and an internally threaded annular collar upwardly extending from said main body and being integral therewith, said main body having an upper face facing said collar and formed with a substantially circular recess; and a helical spring supported in said circular recess and extending upwardly therefrom to surround said collar, said collar being provided with a plurality of circumferentially spaced vertically extending slots defining therebetween a plurality of arcuate segments compressed by said helical spring, said main body being formed in said upper face with a plurality of circumferentially spaced-apart longitudinal slots being in radial alignment and in communication with said slots of said collar and formed radially outwardly from said slots of said collar and forming therewith continual slots, each of said continual slots having at said upper face of said main body in a non-screwed and non-compressed position of said nut a width which is smaller than the width of said continual slots at an open end thereof at said collar so as to enable automatic expulsion of dirt accumulating in said collar slots during tightening or loosening the nut assembly on a screw, each continual slot being of a double U-shape, comprising a narrow U-shape and a wide U-shape, said narrow U-shape extending upwardly from said main body into said wide U-shape, said wide U-shape extending to said open end.

4,893,978

QUARTER-TURN DETENT TWISTLOCK

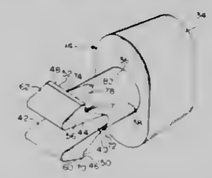
Francis G. Frano, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 9, 1989, Ser. No. 307,918

Int. Cl.[4] F16B *21/00*

U.S. Cl. 411—553 **6 Claims**

1. A twistlock fastener comprising a latching member and a base member, said base member having a socket portion with a square-shaped internal bore, said latching member comprising a head portion and a shank portion, said shank portion having a cylindrical section with one end adjacent to said head portion and a pair of resilient leg elements connected to the other end of said cylindrical section, each of said leg elements including a latching shoulder, said shoulders extending in opposite radial directions from an axis of said shank portion, the length of said shoulder across each leg element being slightly less than the length of a side wall of said square-shaped bore, each of said shoulders being of a width in said radial directions sufficient to



retain said shank portion in said square-shaped bore, opposite side surfaces of said leg elements each lying in a common flat plane perpendicular to and at opposite ends of said shoulders, the surface on each of said leg elements which extends axially from said shoulder at an intermediate location being flat and being perpendicular to said common flat planes, and corner surfaces formed along and adjacent to each of said opposite side surfaces being rounded to permit the rotation of said latching member relative to said base member.

4,893,979

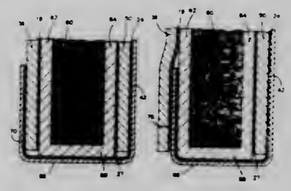
SUPPLEMENTAL BOOK COVER

Fred W. Alpers, 12485 Rockhaven Rd., Chesterland, Ohio 44026

Continuation-in-part of Ser. No. 162,276, Feb. 29, 1988, abandoned. This application Jan. 19, 1989, Ser. No. 368,970

Int. Cl.[4] B42C *17/00;* **D42D** *3/00*

U.S. Cl. 412—4 **9 Claims**



1. A method for reinforcing a book with a spine, a first cover and a second cover, comprising the steps of: removing a first liner from a portion of an adhesive-backed stiff first sheet; adhering the thereby exposed portion to the second cover; removing a second liner from the remainder of the first sheet; adhering the thereby exposed portion to the second cover; removing a third liner from a flexible region of the second sheet; adhering a part of the thereby exposed flexible region to the spine and the remaining part of the flexible region to the first sheet; and removing a fourth liner from a stiff region of an adhesive-backed second sheet; and adhering the thereby exposed stiff region to the first cover.

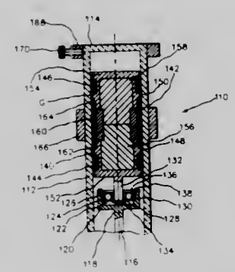
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4,893,980

DEVICE FOR MOVING OBJECTS WITHIN A SEALED CHAMBER

Valentin Balter, Cupertino, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.

Filed Dec. 19, 1988, Ser. No. 286,602
Int. Cl.[4] B25J *1/00*
U.S. Cl. 414—3 **20 Claims**



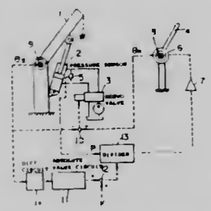
1. A sample transfer device for moving objects within a sealed chamber, comprising:
a tubular housing closed at one end thereof and open at the other end thereof for attaching said housing to a sealed chamber;
an elongated member located in said housing, said elongated member being moveable axially inside said housing, said elongated member having one end located near said closed end of said housing, and a second end being capable of protruding from said housing into said sealed chamber;
a translatory motion unit having a drive member located outside said housing and moveable axially along said housing, and a driven member located inside said housing, said driven member being rigidly connected to said first end of said elongated member, said drive member of said translatory motion unit having contactless positive connection with said driven member, said driven member being located and fixed inside a sealed hollow body; and
means for centering and guiding said hollow body in said housing.

4,893,981

MASTER/SLAVE TYPE MANIPULATOR

Hiroshi Yoshinada, Machida, and Shu Takeda, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,887
Int. Cl.[4] B25J *3/04*
U.S. Cl. 414—5 **4 Claims**



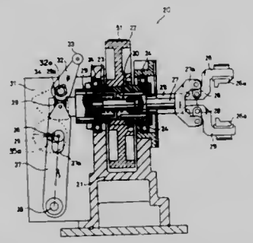
1. A master/slave type manipulator, comprising:
slave means in the form of a working machine operated by a first actuator;
master means in the form of a control level similar to said working machine and having a second actuator for providing a torque to said control lever in a direction opposite to an operating direction of the control lever;
a first position sensor for detecting an actuated position of the working machine;
a second position sensor for detecting an operated position of the control lever;
first driving means for driving said first actuator to make zero a difference between outputs of said first and second position sensors;
means for detecting a load acting on the working machine; and
second driving means for driving said second actuator in accordance with an output of said load detecting means, wherein said second driving means comprises:
calculating means for differentiating said output of the first position sensor and dividing an output of said load detecting means by an absolute value of said differentiated value and;
means for driving said second actuator in accordance with an output of said calculating means.

4,893,982

APPARATUS FOR CONVEYING WORKPIECE

Takaharu Yamaguchi, Toyokawa, Japan, assignor to Taiho Seiki Co., Ltd., Toyota, Japan

Filed Dec. 28, 1987, Ser. No. 138,727
Claims priority, application Japan, Sep. 17, 1987, 62-233321; Sep. 17, 1987, 62-233322
Int. Cl.[4] B65G *65/08*
U.S. Cl. 414—753 **31 Claims**



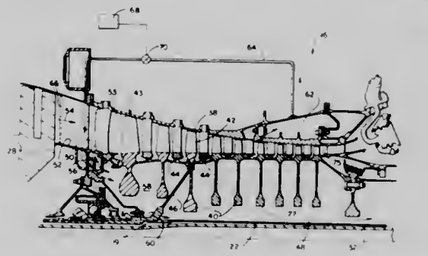
18. An apparatus for conveying a workpiece comprising:
(a) at least one workpiece holder movably between a workpiece receiving position and a workpiece discharging position, said at least one workpiece holder comprising a workpiece clamping mechanism movable between a workpiece clamping position and a workpiece releasing position;
(b) a clamp reversing device for each said at least one workpiece holder for movement therewith between said receiving position and said discharging position, said clamp reversing device being actuable for moving said workpiece clamping mechanism between said workpiece clamping position and said workpiece releasing position; and
(c) means for actuating each said clamp reversing device by engagement therewith, said means for actuating said clamp reversing device comprising a driven member for engaging said clamp reversing device and being located at each of said workpiece receiving position of said apparatus and said workpiece discharging position of said apparatus.

4,893,983

CLEARANCE CONTROL SYSTEM

William F. McGreehan, Westchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 7, 1988, Ser. No. 178,734
Int. Cl.[4] F01D *17/00*
U.S. Cl. 415—48 **12 Claims**



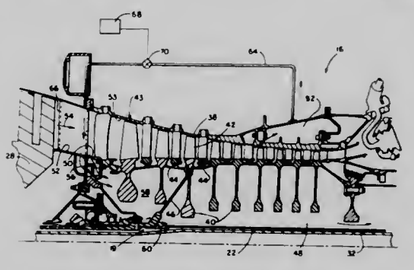
1. A system for controlling the temperature of a rotor of a turbomachine comprising:
means for supplying a heat transfer fluid flow (w_b) to said rotor;
means for varying the temperature of w_b; and
means for controlling said varying means as a function of the heat carrying capacity of w_b.

4,893,984

CLEARANCE CONTROL SYSTEM

Samuel H. Davison, Milford, and William F. McGreehan, Westchester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 7, 1988, Ser. No. 178,721
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Int. Cl.[4] F01D *17/00*
U.S. Cl. 415—48 **19 Claims**



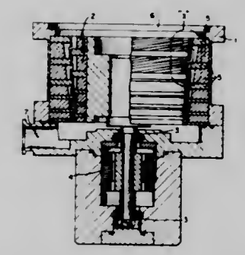
1. A system for controlling the temperature of a rotor of a turbomachine comprising:
means for supplying a cooling fluid to said rotor;
means for supplying a heating fluid to said rotor; and
means for controlling only the flow of said heating fluid.

4,893,985

MULTI-STAGE MOLECULAR PUMP

Kurt Hölas, Huettenberg, Fed. Rep. of Germany, assignor to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,499
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1987, 3728154
Int. Cl.[4] F01D *1/36*
U.S. Cl. 415—90 **11 Claims**



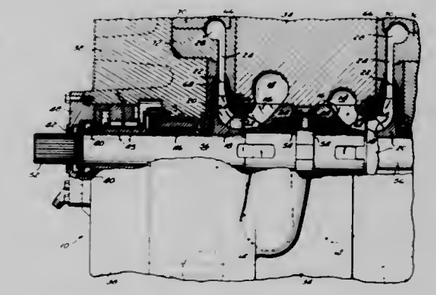
1. A molecular pump for handling gases comprising a rotor and a stator which are disposed concentrically to one another, the rotor being inside the stator, wherein rotor (2) and stator (5) each consist of a plurality of portions (8,9; 10,11) which together form a plurality of pump stages and each pump stage is in turn composed of various pump sections, wherein the rotor (2) consists alternately of portions (8) which are provided with helical grooves at the outside, and of portions (9) the outer surfaces of which are smooth.

4,893,986

HIGH-PRESSURE HIGH-TEMPERATURE COAL SLURRY CENTRIFUGAL PUMP AND LET-DOWN TURBINE

Fritz C. Catterfeld, and George S. Wong, both of Los Angeles, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

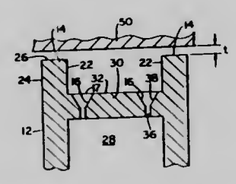
Continuation of Ser. No. 88,884, Oct. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 33,085, Apr. 25, 1979, abandoned. This application Sep. 30, 1985, Ser. No. 783,045
Int. Cl.[4] F03C *13/00*; F04D *1/06, 7/04*
U.S. Cl. 415—100 **20 Claims**



1. A centrifugal pump for an abrasive slurry comprising:
a unitary pump housing;
an inlet means and an outlet means located through the periphery of the pump housing and substantially transverse to an axis of the pump;
two end plates detachably connected to said pump housing for enhancing on-line maintenance of said pump;

a pump shaft axially located between and supported by said end plates;
an impeller coaxially located on said pump shaft for increasing momentum energy of an abrasive slurry passing therethrough;
means for circumferentially directing fluid flow, said means being located along the interior wall of said pump housing for turning fluid flow in the direction of impeller rotation and reducing inlet relative velocity at the impeller inlet and primarily at the impeller inlet tip diameter, said means comprising pre-rotator vanes located along the interior wall of said pump housing;
a wall in said housing disposed about the periphery of said impeller defining a vaneless radial diffuser means to receive the output of abrasive slurry from said impeller and reduce its velocity a sufficient amount to inhibit abrasive erosion of downstream surfaces, said diffuser means comprising replaceable abrasive-resistant inserts which form an inner surface of said diffuser means which is exposed to the abrasive slurry;
an arcuate fold-over volute extending substantially continuously about the periphery of said wall defining said diffuser means;
a cutwater interposed in an opening in said wall between said diffuser means and said volute for directing abrasive slurry from said diffuser means tangentially into said volute and;
means for sealing and supporting said pump shaft wherein said sealing and supporting means is coaxially positioned along said pump shaft and interposed said impeller and said end plates for preventing leakage of said slurry and for providing bearing means for said shaft.

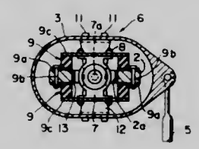
4,893,987
DIFFUSION-COOLED BLADE TIP CAP
Ching P. Lee; Eugene T. Vaughn, both of Cincinnati, and Nicholas C. Palmer, Loveland, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Dec. 8, 1987, Ser. No. 130,597
Int. Cl.[4] F01D *5/18*
U.S. Cl. 416—92 **36 Claims**



1. A gas turbine engine cooled turbine blade tip comprising:
an endwall having at least one diffusion cooling hole for passing cooling flow therethrough.

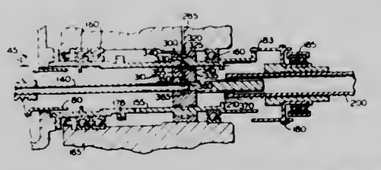
4,893,988
SYSTEM FOR DAMPING LEAD-LAG MOTION OF ROTOR BLADES OF HELICOPTER
Tetsuro Sato, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1988, Ser. No. 269,365
Claims priority, application Japan, Nov. 10, 1987, 62-283742
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—140 **6 Claims**

1. A system for damping lead-lag motion of rotor blades of a helicopter, which comprises a central mast rotated by a power source, at least two flexbeams each connected with the central mast at an inboard portion thereof to rotate about the rotational axis of the central mast and secured to one of the rotor blades at an outboard end thereof, pitch sleeve means secured at one end thereof to the rotor blade to enclose each of the flexbeams, said pitch sleeve means having a substantially elliptical cross section, pitch change means for changing the pitch of the rotor blades by moving the pitch sleeve means, and damping means for damping the lead-lag motion of the rotor blades, wherein the damping means comprises:
at least one torque arm coupled with the pitch sleeve means at upper and lower sides of the pitch sleeve means;
an elastomeric pivot having at least one central shaft supported by the torque arm, said elastomeric pivot also having upper and lower extensions; and



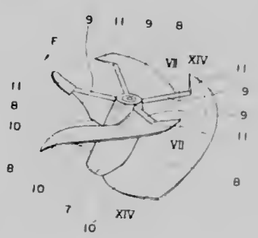
elastomeric dampers mounted on upper and lower surfaces of each of the flexbeams at one end portions thereof and fastened to the upper and lower extensions of the elastomeric pivot at the other end portions thereof, respectively, to damp the lead-lag motion of the rotor blade so as to prevent changing of relative positional relationship between the pitch sleeve means and the elastomeric pivot even when change of relative positional relationship occurs between the flexbeam and the pitch sleeve means by the operation of the pitch change means.

4,893,989
VARIABLE PROPELLER SYSTEM INCORPORATING A FORWARD TRANSFER BEARING
Paul A. Carvalho, Westfield, Mass., assignor to United Technologies Corporation, Hartford, Conn.
Filed Mar. 7, 1989, Ser. No. 320,690
Int. Cl.[4] B63H *3/08*
U.S. Cl. 416—157 R **6 Claims**



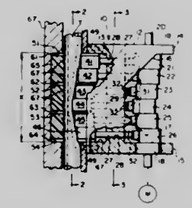
1. In a variable pitch propeller system having a rotating side and a stationary side, the rotating side comprising a hub mounting a plurality of variable pitch propeller blades, a drive shaft, a transfer tube disposed within said drive shaft and rotatable relative thereto, and a hydromechanical pitch change mechanism, the stationary side having a controller and a housing, and a transfer bearing, the controller having a rotatable portion for receiving the transfer tube and imparting rotatable pitch change signals thereto, wherein the improvement comprises:
means for transferring hydraulic fluid from said housing through said drive shaft and through said transfer tube while allowing relative rotation between said housing and said drive shaft and between said drive shaft and said transfer tube, said means being disposed forward of said rotatable portion of said controller.

4,893,990
MIXED FLOW IMPELLER
Teruhiko Tomohiro, Nara, and Masahiro Atarashi, Kusatsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 5, 1988, Ser. No. 253,861
Claims priority, application Japan, Oct. 7, 1987, 62-252877
Int. Cl.[4] F24F *11/04, 11/02*
U.S. Cl. 416—228 **8 Claims**



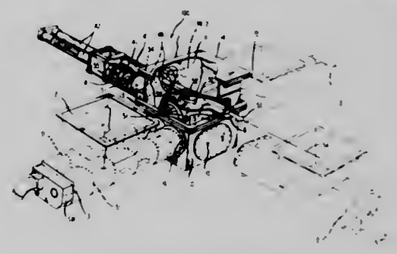
1. A mixed flow impeller which comprises a hub portion of a generally truncated conical shape, and a plurality of blade members secured to a peripheral portion of said hub portion, each of said blade members being arranged to be generally in a straight line shape at its leading edge portion as viewed in a direction of a rotary axis thereof, and having an approximately arcuate shape in a cross section at said leading edge portion, with a thickness larger than that of said blade member.

4,893,991
METHOD AND MEANS FOR IMPROVING EFFICIENCY OF PERISTALTIC PUMPS
James F. Hemingway, 10899 W. Shelby, Medina, N.Y. 14103, and Eric P. Freischlag, 4281 Chestnut Rd., Wilson, N.Y. 14172
Continuation of Ser. No. 55,982, May 27, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 262,205
Int. Cl.[4] F04B *43/12, 45/08*
U.S. Cl. 417—53 **9 Claims**



1. A method of improving the efficiency of peristaltic pumps of the type which utilize a plurality of reciprocable fingers for repeatedly contracting a section of flexible tubing at a point, and moving the point of contraction unidirectionally and cyclically along the tube section to force fluid along the tube section in front of the contraction, comprising
mounting a section of flexible, generally cylindrical tubing having a bore in a peristaltic pump, said section being in operative relation to said fingers,
partially constricting said tubular section so that each portion of said tubular section is compressed along its length, and
causing said fingers repeatedly to compress and release said partially constricted tubular section by cyclically urging said fingers successively and one after the other into extended positions in which each finger substantially closes the bore at a point along said tubular section and retracted positions in which each member is drawn away from said tubular section but only far enough to permit said tubular section to assume a generally oval configuration in cross section without permitting any portion of said section to return to its generally cylindrical configuration, whereby the drop in the flow rate of said pump, during operation thereof, is maintained in a range of approximately +2% to 0% by preventing any portion of said section from returning to its generally cylindrical configuration during reciprocation of said fingers.

4,893,992
TWO-CYLINDER THICK-MATERIAL PUMP
Karl Schlecht, Stuttgart, Fed. Rep. of Germany, assignor to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Fed. Rep. of Germany
Filed Jun. 24, 1988, Ser. No. 210,849
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721248
Int. Cl.[4] F04B *19/00, 39/10*
U.S. Cl. 417—238 **18 Claims**



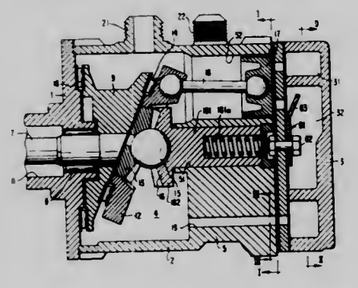
10. A two-cylinder, thick material pump with a pipe switch tiltably disposed in a hopper and alternatingly connecting transport cylinders with a transport line and with a pre-compression unit flanged to a wall of the hopper and comprising at least one conveyor worm wherein the improvement comprises that the hopper is provided at several locations with openings (16), which can be covered or at which the pre-compression unit (3) can be flanged on as desired.

4,893,993
LUBRICATION SYSTEM FOR A REFRIGERANT COMPRESSOR
Keiichi Shimizu, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Aug. 3, 1987, Ser. No. 80,610
Claims priority, application Japan, Aug. 1, 1986, 61-118789[U]
Int. Cl.[4] F04B *1/14*
U.S. Cl. 417—269 **7 Claims**

1. A slant plate refrigerant compressor for use in a refrigerant circuit comprising:
a compressor housing having a cylinder block which is provided with a plurality of cylinders, the inner wall surface of said housing forming the outer wall of a crank chamber which is adjacent to said cylinder block, said housing haveing a plurality of housing fastener holes for receiving a fastener;
a front end plate disposed on one end of said housing;
a rear end plate disposed on the other end of said housing adjacent said cylinder block, said rear end plate including a discharge chamber disposed at its center, and a suction chamber disposed around said discharge chamber, said rear end plate having a plurality of end plate fastener holes for receiving a fastener, said end plate fastener holes being aligned with said housing fastener holes;
a piston slidably fitted within each of said cylinders;

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a drive mechanism disposed in said crank chamber and coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported in said housing, a rotor coupled to said drive shaft and rotatable therewith, and coupling means for drivingly coupling said rotor to said pistons such that the rotary motion of said rotor is converted into reciprocating motion of said pistons, said coupling means including a member having a surface disposed at an incline angle relative to said drive shaft;



an inlet port formed on said housing to provide fluid communication directly into said crank chamber from the external refrigerant circuit; and

a plurality of communication holes formed through an outer portion of said cylinder block and extending from a location adjacent said outer wall of said crank chamber to said suction chamber to provide communication therebetween, said communication holes being formed spaced from and independent of said housing fastener holes and said end plate fastener holes, to thereby reduce refrigerant pressure loss.

4,893,994

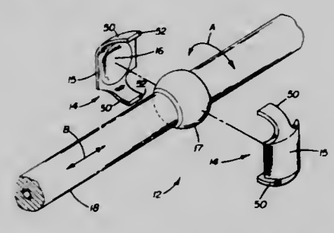
GUIDE ASSEMBLY AND GUIDE SHOE FOR A VARIABLE ANGLE WOBBLE PLATE COMPRESSOR

Carl A. Copp, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1989, Ser. No. 356,494

Int. Cl.[4] F04B *1/14*

U.S. Cl. 417—269 **4 Claims**



1. An improved guide assembly for a variable displacement axial compressor, said compressor including a wobble plate and a stationary guide rod in operative engagement with said wobble plate for preventing rotation of said wobble plate, comprising:

guide bearing means slidingly engaged on said guide rod; and

at least a pair of guide shoes for engaging said wobble plate, said guide shoes being slidably mounted on said guide bearing means, said guide shoes further including positioning means having substantially juxtaposed bearing surfaces for distributing load and substantially maintaining the relative position of said guide shoes during compressor operation;

whereby guide shoe friction and wear against the guide rod is prevented and an increase in efficiency of the compressor is provided.

4,893,995

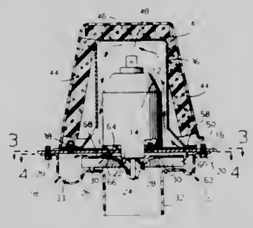
ELECTRIC MOTOR-DRIVEN IMPELLER-TYPE AIR PUMP

Gibson O. Hufstader, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1988, Ser. No. 280,044

Int. Cl.[4] F04D *29/28*

U.S. Cl. 417—370 **3 Claims**



1. An air pump having an electric motor secured to one side of a mounting plate, and a housing secured to the opposite side of said plate, said motor having a shaft that extends into a working chamber defined between said plate and said housing, said shaft supporting and driving an impeller in said chamber to centrifugally induce air flow through said chamber, wherein a cover is secured to said plate and encloses said motor in a sealed chamber defined between said cover and said plate, said plate has a series of peripherally spaced apertures opening to said sealed chamber from the high pressure zone of said working chamber near the outer rim of said impeller, said plate also has a series of peripherally spaced apertures opening from said sealed chamber to a central low pressure zone of said working chamber between said plate and the back of said impeller, and said impeller induces a portion of the air flow to recirculate from said high pressure zone through said sealed chamber, about said motor and into said low pressure zone to cool said motor.

4,893,996

INTERENGAGING ROTOR DEVICE WITH LUBRICATION MEANS

William Loran, 100 Thorndale Dr., #356, San Rafael, Calif. 94903, and Merritt A. Robinson, 475 Fawn Dr., San Anselmo, Calif. 94960

Division of Ser. No. 79,704, Jul. 30, 1987, abandoned, which is a division of Ser. No. 252,811, Oct. 3, 1988, Pat. No. 4,848,295. This application May 26, 1989, Ser. No. 357,185

Int. Cl.[4] F04C *29/02*

U.S. Cl. 418—99 **2 Claims**

1. An interengaging rotary device comprising:

a housing;

a pair of meshing rotors mounted for rotation in said housing;

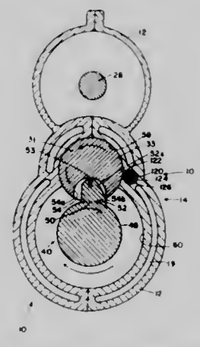
said rotors having tangentially engaging circular bodies;

a work chamber in said housing, said work chamber having a pair of circular portions, each closely but rotatably receiving one of said rotors;

a cylindrical lubrication gallery in said housing adjacent and generally parallel to one of said circular portions of the work chamber;

a source of pressurized lubricant in communication with said lubrication gallery;

a series of small lube passageways extending between said lubrication gallery and said one circular portion;



a lubrication shaft rotatably received in said lubrication gallery;

a narrow helical groove around said lubrication shaft; and

means rotating said lubrication shaft in timed relation to said rotors.

4,893,997

INTERNAL-GEAR MACHINE

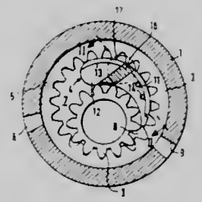
Otto Eckerle, Malsch, Fed. Rep. of Germany, assignor to Otto Eckerle GmbH & Co. KG, Malsch, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,194

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723557

Int. Cl.[4] F04C *1/06, 15/00*

U.S. Cl. 418—126 **13 Claims**



1. An internal-gear machine comprising:

a casing;

an internally toothed annular gear in the casing;

an externally toothed pinion disposed within the annular gear and meshing with a portion of the annular gear, a clearance being provided between said pinion and the remaining portion of the annular gear;

a filling member of a configuration generally corresponding to half a sickle shape so as to taper from a first end towards a second end thereof and having circumferential faces and side surfaces, the filling member being disposed in said clearance and extending substantially in the circumferential direction of the annular gear with said circumferential faces thereof in contact with the tips of the teeth on the pinion and on the annular gear and partitioning said clearance into an intake chamber on the side of said first end and a pressure chamber on the side of said second end, said filling member having a groove formed in a side surface thereof;

means supporting said filling member on said casing rotatably and displaceably therein, said supporting means comprising mounting pin means mounted rotatably in a bore in said casing, and a mounting portion carried on said mounting pin means in projecting relationship therefrom, said mounting portion being received in said groove in the side surface of said filling member, said mounting pin means being disposed at a spacing away from said first end of said filling member, towards said second end thereof.

4,893,998

INSTALLATION FOR PRODUCING A FIBER OPTIC CABLE COMPONENT

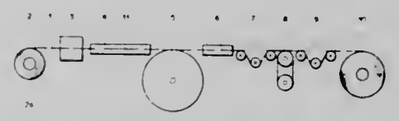
René Schlaeppi, Prilly, and Rémy Bruggmann, Bruut, both of Switzerland, assignors to Maillefer S.A., Ecublens, Switzerland

Division of Ser. No. 804,119, Dec. 3, 1985, Pat. No. 4,772,435. This application May 23, 1988, Ser. No. 197,314

Claims priority, application Switzerland, Dec. 14, 1984, 5966/84

Int. Cl.[4] B29C *47/88*; B29D *11/00*

U.S. Cl. 425—114 **2 Claims**



1. An installation for producing a fiber optic stranding element formed of at least one light-waveguide component loosely encompassed in at least one sheath, said installation comprising:

at least one payout reel for holding at least one light-waveguide component,

an extrusion head located downstream of said at least one payout reel for forming at least one sheath loosely encompassing said at least one light-waveguide component to form said stranding element,

braking means associated with said at least one payout reel for regulating the tension of said at least one light-waveguide component,

cooling means for cooling said at least one sheath, said cooling means being located downstream of said extrusion head and including a first vat for cooling said at least one sheath to a first temperature T_1 and a second vat for cooling said at least one sheath to a second temperature T_2 lower than said temperature T_1,

main withdrawal means for simultaneously pulling said at least one light-waveguide component through said extrusion head and said stranding element through said first vat,

auxiliary withdrawal means for pulling said stranding element through said second vat with as low a tractive force as possible,

at least one takeup reel disposed downstream of said auxiliary withdrawal means for receiving and storing said stranding element, and

means for driving said at least one takeup reel.

4,893,999

APPARATUS FOR THE CONTINUOUS PRODUCTION OF POLYMERS AND COPOLYMERS OF WATER-SOLUBLE MONOMERS

Miroslav Chmelir, Krefeld, and Josef Panea, Willich, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 942,330, Dec. 16, 1986, Pat. No. 4,857,610. This application Sep. 24, 1987, Ser. No. 225,983

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544770

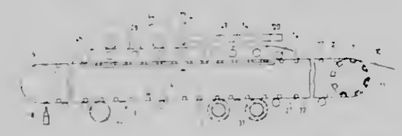
Int. Cl.[4] B29D *7/00*

U.S. Cl. 425—174.4 **8 Claims**

1. In an apparatus for the continuous production of polymers

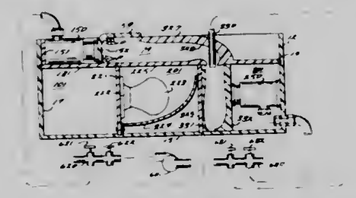
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and copolymers of water-soluble monomers, if desired with additional comonomers, said production of polymers and copolymers comprising producing polymer gel strands by polymerization of an aqueous monomer solution optionally containing catalysts and/or photoinitiators, the monomer solution being applied in a layer at least one centimeter thick on a moving endless conveyor belt and thereafter polymerized, the apparatus comprising an endless moving conveyor belt having an upper and lower run, an upper surface, and side edges, an endless conveyor means, at least two guide rollers for the conveyor belt, at least one of which guide rollers is driven and one of which is adjustable, horizontal conveyor belt support elements, and optionally a dispensing means for delivering to the upper surface of the conveyor belt a stretched separation sheet capable of being carried along with the conveyor belt, and a delivery and metering means for the monomer solution, as well as optionally irradiating means, which irradiating means is located upstream of the dispensing and metering



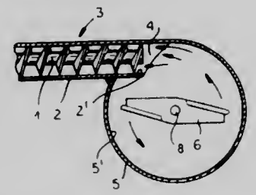
means, cooling and heating means, and a removal means for the polymer gel strand formed, which removal means is located adjacent to the guide roller or guide rollers for the conveyor belt, wherein the improvement comprise, (a) upwardly extending support elements (14) on both sides of the conveyor belt (2) in the region of the upper run (21) of the conveyor belt (2), beginning in the region of the dispensing and metering means (1), the upwardly extending support elements (14) having axes (140) intersecting one another at a point below the upper run (21) of the conveyor belt, the side edges of the conveyor belt being vertically supported by the upwardly extending support elements (14) thereby forming a trough shape across the width of the conveyor belt and (b) at least one pressure-roller (44, 45), upstream of the dispensing and metering means (1) to prevent backflow of the monomer solution, said pressure-roller (44, 45) having the profile of the trough formed in the conveyor belt run (21), being adjacent to the upper surface thereof and being located parallel to the horizontal support elements.

4,894,000
MOLDING SYSTEM
Richard C. Coates, Jr., 505 Joy La., Dundee, Ill. 60118
Filed Nov. 19, 1987, Ser. No. 122,385
Int. Cl.[4] B29C *69/00, 49/04*
U.S. Cl. 425—190 **6 Claims**



1. An assembly useful in heating thermoplastic stock and forming plastic articles therefrom, said assembly comprising:
a substantially rectangular housing defined by a back wall, a bottom wall and a front wall pivotally attached to said bottom wall, said walls extending between a first and second end wall, said walls cooperatively combining to form a common interior cavity, the interior surfaces of said first and second end, bottom and front end walls each including a plurality of grooves aligned in a series of planes transverse to the corresponding walls;
a plurality of separator plates each defined by a peripheral edge received in aligned ones of said grooves at said peripheral edges thereof;
heating means attached to a selected one of said separator plates;
an air pump including an air inlet and an air outlet;
a plurality of air cylinders inserted in said interior cavity adjacent said first end wall;
manifold means for selectively connecting said outlet of said air pump to said air cylinders;
suctions means selectively connected to said inlet of said air pump and deployed to produce suction in a selected portion of said cavity between said second end wall and the adjacent one of said separator plates; and forming means received in said grooves and aligned to receive said thermoplastic stock to form said articles therefrom.

4,894,001
APPARATUS FOR PROCESSING SYNTHETIC THERMOPLASTIC MATERIAL
Goetz Petschner, Zollikon, Switzerland, assignor to Indupack AG, Zug, Switzerland
Filed Oct. 5, 1988, Ser. No. 254,387
Int. Cl.[4] B29C *47/60*
U.S. Cl. 425—200 **1 Claim**



1. An apparatus for processing synthetic thermoplastic material comprising:
a receiving container having an axis running along a longitudinal direction thereof, said container defined by a wall and having an opening therein;
a disintegrating-blending member disposed near a bottom of said receiving container and rotatable about said axis; and
a screw extruder comprising a screw within a cylinder, said cylinder having a front-end charging opening being in flow connection with said opening in said wall, said cylinder at its front-end charging opening intersecting said wall at a tangent thereto, said cylinder having a guiding wall forming part of said front-end charging opening extending at least partially into said receiving container opposing rotational flow in said receiving container to achieve deflection of synthetic thermoplastic material into said cylinder.

4,894,002
APPARATUS FOR CONFIGURING AN EXTRUDATE
E. Terry Groff, 3011 Leisz's Bridge Rd., Muhlenberg Park, Reading, Pa. 19605
Filed Aug. 1, 1988, Ser. No. 226,454
Int. Cl.[4] A21C *3/08*
U.S. Cl. 425—319 **7 Claims**

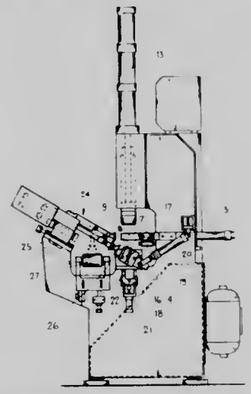
1. Apparatus for configuring an extrusion of food, comprising an extruder discharging downwardly, a support beneath

said extruder for receiving extrudate, the support having an upper side and an underside, support and extruder mounting means mounting the same for relative movement in a selected path to selectively configure the extrudate on the upper side of the support, additional support mounting means mounting said



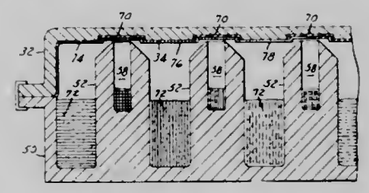
support for overturning movement to gravitationally remove the configured extrudate from the support and present the underside of the support upwardly toward the extruder for further receiving extrudate, and a receiver beneath said support for receiving the gravitationally removed configured extrudate.

4,894,003
CONTROL SYSTEM FOR MOLDING MACHINES OF PASTY PRODUCTS
Ottorino Pisoni, Busto Arsizio, Italy, assignor to Meccaniche Moderne S.r.l. Chemical Plants Division, Busto Arsizio, Italy
Filed Jun. 1, 1988, Ser. No. 201,479
Int. Cl.[4] B29C *33/30*
U.S. Cl. 425—399 **4 Claims**



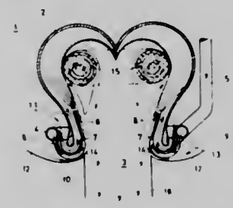
1. A machine for molding a piece of a pasty product which comprises a conveyor belt (4) for said piece (5) to be molded, gripping means for said piece comprising a fork (2), a rear pneumatic piston (3) connected to said fork (2), said fork being aligned with said belt (4), a pusher (6) at the free end of said fork, adjustable jaws (7), a lower fixed die (8) and a mobile upper mold (9) aligned with said pusher; said lower die being fixed to pins (17), said jaws being aligned with said fixed die (8) and with said upper mobile mold (9), said conveyor belt (4) stopping when said piece (5) reaches the position of alignment with said fork and said rear piston (3) pushes said fork forward, said pusher pushing said piece between said jaws, and said piece is molded between said die (8) and said mold (9), a centering device for said lower die (8), said centering device comprising a bolt (14), a pneumatic piston (21) driving said bolt, said bolt in forward position engaging in a corresponding seat (15) formed on at least one first side lever (16) connected to said pins (17), said centering device fixing the lower die (8) when in alignment position with the upper mobile mold (9), extraction means (24) for extracting said bolt (14) after the molding operation is complete, said extraction comprising a pneumatic control piston (25) and suckers (26) fixed to the free end of the rod of said piston, a device for rotating said lower die (8) comprising at least one second side lever (16) fixed to said lower die (8) and supported at the end of a rod (19) of a pneumatic piston (20), said piston driving the lateral displacement of said second lever; said displacement causing the rotation of the die from alignment position with the upper mold (9) and with the extractor means (24) and vice versa.

4,894,004
APPARATUS FOR MOLDING MULTI-COLORED PLASTIC SHELLS
Alfred F. Brault, South Berwick, Me., assignor to Davidson Textron Inc., Dover, N.H.
Filed Nov. 4, 1988, Ser. No. 267,356
Int. Cl.[4] B28B *7/24, 1/16, 1/20*; B29C *39/12*
U.S. Cl. 425—435 **4 Claims**



1. In a mold and powder box assembly connected together by suitable clamp means, and wherein the mold includes a casting surface having a plurality of raised alternate surfaces and recesses having spaced wall portions and a bottom, a powder box comprising a housing, spaced dams mounted in the housing providing compartments therebetween and adapted to carry thermoplastic powder in each compartment, means for connecting said powder box to said mold for aligning each dam adjacent one of said recesses, each dam having a length which provides a predetermined clearance gap between said dam and said one of said recesses and a hollow section formed in the end of each dam adjacent the longitudinal central portion of each recess.

4,894,005
COMBUSTION CHAMBER ARRANGEMENT WITH A PRE-COMBUSTION CHAMBER FOR SUBSTOICHIOMETRIC COMBUSTION
Jakob Keller, Dottikon, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland
Filed Jun. 18, 1987, Ser. No. 63,480
Claims priority, application Switzerland, Jul. 8, 1986, 2748/86
Int. Cl.[4] F23L *1/00*
U.S. Cl. 431—115 **13 Claims**



1. A combustion chamber apparatus, comprising:
a. precombustion chamber for substoichiometric combustion, said precombustion chamber having a housing in which a fuel mixture is burned incomplete, said housing having a first and a second end;

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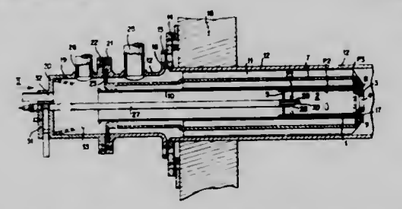
said housing of the precombustion chamber including a body formed by the rotation of a symmetrical generatrix about an axis of symmetry of the generatrix, said housing including a curved interior region for guiding a flow of gases into a substantially annular vortex that is substantially concentric with said axis of symmetry;
an outlet channel formed on said housing for permitting gases to flow out of said housing along said axis of symmetry;
combustion air conduit means located about an outer periphery of said outlet channel for feeding combustion air into said housing parallel to the curved interior region of the housing such that said combustion air forms a layer adjacent the curved interior region;
liquid fuel injection nozzle means directed into the housing and located adjacent to and radially inwardly of the combustion air conduit means for directing liquid fuel into the housing with a flow that is parallel to and in the same direction as the flow of the combustion air entering through said combustion air conduit means, said flow of liquid fuel being separated from the curved interior region of the housing by said combustion air;
annular supplemental air conduit means provided at the outlet channel for blowing supplemental air into the gases exiting from the housing through the outlet channel; and
a postcombustion chamber located at the outlet channel thereby communicating with the interior of the housing, gases from the housing being completely burned with the supplemental air in the post combustion chamber.

4,894,006

BURNER SYSTEM IN PARTICULAR WITH A HIGH VELOCITY OF THE BURNT GASES

Jean-Pierre Cassagne, Fontenay Sous Bois, and Laurent Scrive, Paris, both of France, assignors to Gaz De France, Paris, France

Filed Jan. 10, 1968, Ser. No. 204,757
Claims priority, application France, Jan. 11, 1987, 87 00147
Int. Cl.[4] F23L *15/00*
U.S. Cl. 431—116 **21 Claims**



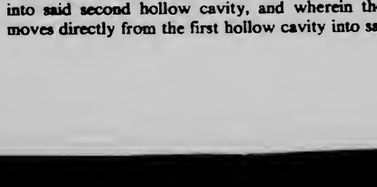
1. A burner system in particular with a high outlet velocity of the burnt gases, comprising: a central hearth tube defining a combustion chamber in which is admitted a mixture of combustible gas and of combustion-supporting gas such as air; a tubular element coaxially surrounding said hearth tube so as to form an annular space thereabout to allow flow of combustion-supporting air to be admitted into the hearth tube; the hearth tube having an outlet end and the outlet end being formed with a reduced portion made from thermomechanical ceramic for increasing the outlet speed of the gases; the tubular element having an outlet end having a radial restriction which forms an axial and radial positioning stop for the hearth tube, the hearth tube being axially biased into assembly with the other component parts of the burner by an assembly means for producing an axial pressure force under the impact of which the hearth tube bears against said stop through a radial shoulder provided in the reduced portion of the hearth tube, the system further comprising a tube made from a metal alloy, the tube having a portion adjacent to said hearth tube with substantially the same diameter as said hearth tube and the tube being axially aligned with the hearth tube inside of said tubular element and a duct extending in the tube, the duct feeding gas to said combustion chamber; and a burner shell, said assembling means producing an axial assembling force between said tube and a stationary portion of the burner shell, the assembling means comprising first and second annular magnets, each of the magnets having ends of opposite polarity, the first magnet being arranged on said tube and the second magnet being mounted on the shell of the burner in confronting relation to said first magnet in the axial direction of the burner so that the ends with the same magnetic polarity of the magnets are in an axially confronting relationship to produce an axial repelling force.

4,894,007

APPARATUS FOR PROVIDING FLUID TO A ROTATABLE MEMBER

Stephen T. Opresko, Lancaster, Pa., assignor to Thomson Consumer Electronics, Princeton, N.J.

Filed Dec. 12, 1988, Ser. No. 283,442
Int. Cl.[4] F23D *11/04*
U.S. Cl. 431—168 **2 Claims**



1. In a seal assembly for providing gas to a rotatable member, said seal assembly having a seal including a torroidal magnet arranged between annular ferromagnetic end closures, the bores of said enclosures rotatably receiving a shaft having a series of grooves, and a ferrofluid between said end closures and said shaft whereby said end closure, said ferrofluid, said shaft and said magnet form a magnetic flux path to attract said ferrofluid into the spaces between said shaft and said end closures to form an effective seal about said shaft, an improvement comprising a chamber between the bore of said magnet and said shaft, fluid inlet means for providing fluid to said chamber, said shaft being hollow from said chamber to one end and having means communicating with said chamber for providing fluid to said one end, said rotatable member being affixed to said one end for receiving fluid from said chamber.

2. The improvement of claim 1 wherein said fluid is a flammable gas and said rotatable member is a gas burner.

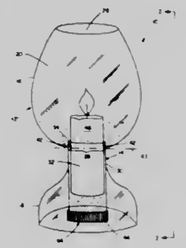
4,894,008

CANDLE HOLDING DEVICE

Sun Lee, 13812 W. 59th Ave., Arvada, Colo. 80004

Filed Apr. 4, 1989, Ser. No. 333,436
Int. Cl.[4] F23D *3/16*
U.S. Cl. 431—290 **22 Claims**

1. A device for holding a candle using fluid, comprising:
a first container defining a first hollow cavity, said first container having first and second openings;
at least one second container being adapted to receive and guide the candle and for holding fluid, said second container defining a second hollow cavity and having a third opening, an outer edge of said second container being fixedly mounted to said first container adjacent to said second opening, wherein said second container is immovable relative to said first container and a section of said second container protrudes into said first hollow cavity of said first container;
wherein said second container includes means for communicating a portion of the fluid held in said first hollow cavity into said second hollow cavity, and wherein the fluid moves directly from the first hollow cavity into said second hollow cavity and the candle is supported by the fluid communicated into said second hollow cavity;
means for supporting connected to one of said first container and said second container; and



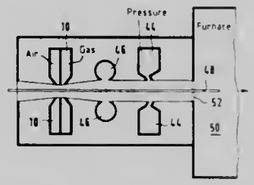
wherein said means for supporting includes a base having a hollow section and a bottom section of said second container is readily accessed via said hollow section.

4,894,009

APPARATUS FOR CONTACTLESS SEALING OF AN OPENING AGAINST EMERGING OR ENTERING GAS

Carl Kramer, Am Chorusberg 8, and Hans J. Gerhardt, Louisbergstrasse 58, both of, 5100 Aachen, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,228
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743598
Int. Cl.[4] F27B *7/00*
U.S. Cl. 432—64 **12 Claims**



1. An apparatus for contactless sealing of an opening against emerging or entering gas by means of at least one barrier gas jet, wherein the or each barrier gas jet is divided by a separating plane extending in the vicinity of its longitudinal axis along a separating plane and wherein different gases flow out in the two sub-jets adjoining the separating plane, and wherein the momentum-flow density for the two sub-jets of the or each barrier gas jet in the exit cross-section is identical.

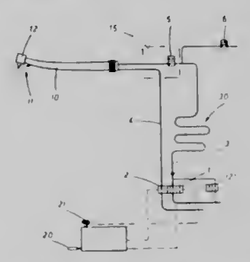
4,894,010

APPARATUS PREVENTING THE RETURN OF ATOMIZED SPRAY INTO DENTAL SURGERY INSTRUMENTS HAVING SEPARATE AIR AND WATER LINES

Franco Castellini, Bologna, Italy, assignor to Castellini S.p.A., Bologna, Italy

Filed May 13, 1988, Ser. No. 193,883
Claims priority, application Italy, May 29, 1987, 3497 A/87
Int. Cl.[4] A61C *1/00, 3/00*
U.S. Cl. 433—27 **8 Claims**

1. Apparatus to prevent the return of atomized spray into power driven dental surgery handpieces connected to separate air and water supply lines, comprising: shut-off air and water valve means connected to the air and water lines respectively and located between the air and the water lines and said dental handpiece;
a dentist controller pedal connected to said air and water valves means to simultaneously open and close said air and water valve means;



a compressed air reservoir connected in series with the air line at a point downstream of said air valve means, since compressed air reservoir having a capacity which is such that air will continue to flow from the handpieces for a short duration after closing said shut-off air and water valve means.

4,894,011

APPLIANCE FOR USE IN APPLYING FILLER MATERIAL TO AN ENDODONTICALLY PREPARED ROOT CANAL

William B. Johnson, 4254 E. 78th St., Tulsa, Okla. 74136

Filed Nov. 2, 1988, Ser. No. 265,942
Int. Cl.[4] A61C *5/02*
U.S. Cl. 433—81 **16 Claims**

1. An appliance for applying a filler material such as guttapercha or the like to an endodontically prepared root canal of a tooth, comprising;
an elongated shaft having a distal portion and a proximal portion and of length such that the distal portion is positionable in at least substantially the full length of the root canal, at least the shaft distal portion being of material having high biological tolerance, and the distal portion having a spiral groove formed on the exterior surface thereof;
filler material formed onto said distal portion, the spiral groove serving to improve retention of the filler material

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and for augering the filler material into a root canal when the appliance is rotated after insertion into a root canal, said distal portion of said shaft being severable from said proximal portion, the distal portion remaining in the root canal and, in conjunction with said filler material, serving to fill the canal; and

a manually manipulatable handle portion at said shaft proximal portion.

4,894,012

PASSIVE DENTAL APPLIANCES OF FIBER-REINFORCED COMPOSITES

A. Jon Goldberg, West Hartford, and Charles J. Burstone, Farmington, both of Conn., assignors to The University of Connecticut, Farmington, Conn.

Filed Nov. 16, 1987, Ser. No. 121,178

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—215 **14 Claims**

1. In a passive dental appliance system wherein said system is selected from the group consisting of orthodontic retainers, bridges, space maintainers, tooth replacement appliances and splints, the improvement wherein a structural component thereof is fabricated as a preformed shape of high stiffness, strength, and stability, which exhibits ease of processing for subsequent application to a patient from an effective fiber-reinforced composite material comprising a polymeric matrix and a reinforcing fiber component embedded within the matrix, the reinforcing fiber component comprising at least about 30% by weight of the composite material and being substantially fully wetted by the polymer matrix, the composite material being substantially free of voids and having a modulus of elasticity greater than 0.5×10^6 psi.

4,894,013

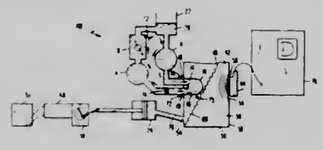
ANTHROPOMORPHIC CARDIAC ULTRASOUND PHANTOM

Stephen W. Smith, Rockville, and Jean E. Rinaldi, Silver Spring, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 13, 1988, Ser. No. 257,174

Int. Cl.[4] G09B *23/28*

U.S. Cl. 434—268 **7 Claims**



1. An anthropomorphic cardiac ultrasound phantom for providing ultrasound imaging and Doppler signals of a simulated human blood flow, comprising

first means for simulating a flexible portion of a human heart, comprising valve means for controlling inflow to and outflow there-from;

pressurizing chamber means for substantially surrounding said first means, said chamber means having a drain and a hydraulic fluid flow port and also having a first ultrasound viewing means comprising a flexible membrane to enable ultrasound viewing therethrough, said means placed in a first chamber wall located at a selected distance from said first means;

reservoir means for holding a quantity of a blood analog fluid and communicating with said valve means to form a closed loop blood-analog fluid flow circuit with said first simulating means; and

hydraulic flow means for providing a controlled flow of a pressurized hydraulic fluid into and out of said chamber outside of said first means to pressurize said first means and drive a corresponding blood-analog fluid flow therethrough.

4,894,014

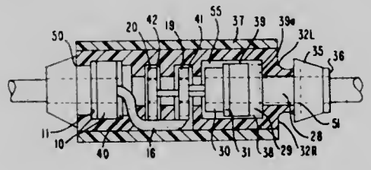
APPARATUS FOR PREVENTING THE TWISTING OF ELECTRICAL CABLES

Joseph Palus, 123 Gracey St., Edison, N.J. 08817, and Joseph A. Kapler, 197 Fresh Ponds Rd., South Brunswick, N.J. 08831

Filed Aug. 29, 1988, Ser. No. 237,449

Int. Cl.[4] H01R *35/00*

U.S. Cl. 439—17 **12 Claims**



1. An apparatus for preventing the undesirable twisting of an input electrical cable section having a one conductor wire, comprising:

a housing having an input port and an output port and having an internal hollow with a plurality of component carrying compartments,

with a one conductor wire directed via said input port into said housing,

a conductive bearing assembly having an outer and an inner race which are operative to rotate with respect to one another about a common axis, with a central aperture associated with said inner race, said bearing assembly located in a compartment of said housing with said outer race restrained against rotation by said housing, with said one conductor wire electrically coupled to said outer race, a first clamping device module located in another compartment of said housing and operative to clamp said one conductor wire to prevent said one conductor wire from being pulled out of said input port, an output wire electrically coupled to said inner race, and directed through said output port, a second clamping device module located in a compartment of said housing and operative to clamp said output wire, an idler bearing assembly having an inner and an outer race, with said output wire directed through an aperture of said idler bearing assembly inner race prior to leaving said output port, and a bearing retainer surrounding said output wire, said bearing retainer extending from said idler bearing through said output port while having a portion contained in said housing with an opening adjacent said idler bearing assembly, whereby as said inner race of said conductive bearing assembly rotates with said idler bearing, said second clamping device module rotates with said output wire with said bearing retainer serving as a restraining guide to enable said output wire and clamping device to follow rapid rotation of said inner race of said conductive bearing assembly.

4,894,015

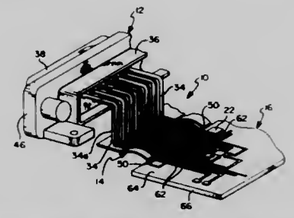
FLEXIBLE CIRCUIT INTERCONNECTOR AND METHOD OF ASSEMBLY THEREOF

David M. Stockero; Bruce A. Myers, and Robert H. Obremski, all of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 31, 1988, Ser. No. 238,943

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—67 **10 Claims**



1. An interconnect assembly for electrically connecting a connector housing having pin connectors with tail ends thereon and a circuit board having a printed conductor pattern thereon and wherein the pin connectors and printed conductor patterns are interconnectible along one side of the circuit board at a fine pitch spacing therebetween the interconnect assembly comprising:

a thin flexible sheet of dielectric polymeric material having a mating end and a connector end;

means defining a plurality of holes directed through said thin sheet of flexible dielectric polymeric material along the mating edge thereof arranged at spacings corresponding to the fine pitch spacing of pin connectors on a connector housing and each of the plurality of holes adapted to receive the tail end of one of the plurality of pin connectors on the connector housing;

means defining a plurality of electrically conductive runners on one side of said flexible sheet, each of said electrically conductive runners having a thickness which permits bending thereof as said thin sheet is bent and each of said runners having a first end located at one of said plurality of holes and the other end thereof extending adjacent the connector end of said thin flexible sheet;

means for electrically connecting each of said tail ends to one of said electrically conductive runners at one end thereof and wherein the opposite end of each of said electrically conductive runners is adapted to overlie an end of a printed conductor path printed on a circuit board for electrical connection thereto;

said thin flexible sheet having a bent portion between said mating end and said connector end when said thin flexible sheet interconnected to said tail ends and the circuit board; said bent portion having a self holding shape which accommodates differential thermal expansion between the interconnected connector housing and circuit board; and

said thin flexible sheet having a thickness in the order of 2 mils and including means on the mating end thereof to strengthen the sheet at the points thereon having said holes formed therethrough.

4,894,016

ELECTRICAL CONNECTOR

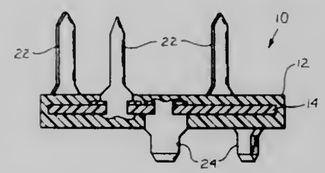
John O. Wright, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 27, 1988, Ser. No. 211,945

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—76 **2 Claims**

1. An electrical connector comprising: an electrically insulating housing; a printed-circuit board within said housing, said printed circuit board having first and second sets of aperatures therein interconnected in a desired pattern; a first collection of electrical contacts fixed in said first set of apertures and extending outwardly therefrom, through said housing in a given direction; a second collection of electrical contacts fixed in said second set of apertures and extending outwardly therefrom, through said housing and in a direction opposite to said given direction; the number of contacts in said second collection being less than the number of contacts in said first collection.



4,894,017

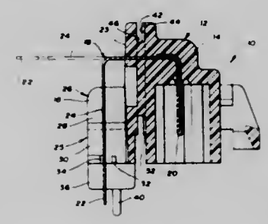
ELECTRICAL HEADER ASSEMBLY

William L. Stein; Randy L. Fink, both of Warren, and Bruce J. Serbin, Austintown, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1989, Ser. No. 296,568

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—78 **10 Claims**



1. An electrical header assembly for a printed circuit board or the like comprising:

a housing of thermoplastic material having a mating portion and a conductor portion,

a row of laterally spaced blade terminals of stamped sheet metal construction disposed in said mating portion and said conductor portion,

said blade terminals having tails which project longitudinally from an end of the conductor portion of the housing and which are bent vertically at a location spaced from the end of the conductor portion to provide vertical legs, and

means to position the vertical legs of the blade terminals for attachment to conductors of a printed circuit board or the like, said means including:

a plurality of vertical partitions at the said end of the conductor portion of the housing which form a plurality of vertical channels which receive vertical legs of the respective terminals,

said partitions having lower portions which form laterally deflectable lock walls on each side of each of the vertical channels,

said laterally deflectable lock walls having stop nibs which limit the movement of the vertical legs toward the said end of the conductor portion and latch ramps which retain the vertical legs in the longitudinal direction away from the said end of the conductor portion.

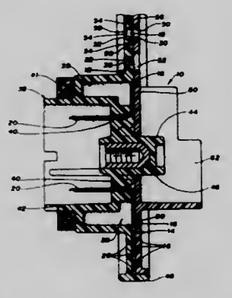
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,018

LOW PROFILE ELECTRICAL CONNECTOR

Kevin P. Phillips, Chagrin Falls, and William R. Stein, Sr., Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1988, Ser. No. 229,872
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—81 **10 Claims**



1. An electrical connector comprising:
a circuit board of relatively rigid thermoplastic material, a support plate of thermoplastic material and a plurality of metallic bus strips disposed in channels of the circuit board which are covered by the support plate,
each of the bus strips having a female terminal portion disposed in a terminal cavity of its associated channel and a male terminal portion,
the circuit board having a rectangular opening and a pair of side slots communicating with each of the terminal cavities,
the support plate having an array of pin holes communicating with the respective terminal cavities and rectangular openings of the circuit board,
the female terminal portions including cantilevered contact fingers which are disposed over the rectangular openings of the circuit board so that the contact fingers deflect into the rectangular opening whereby pin terminals are easily inserted into the female terminal portions of the bus strips,
the cantilevered contact fingers having angularly disposed ends which are aligned with the pin holes of the support plate and extend into the rectangular openings of the circuit board to engage pin terminals inserted into the pin holes of the support plate, and
the female terminal portions having side flanges which are disposed in the side slots to resist bowing of the female terminal portions and assist in locating the female terminal portions with respect to the circuit board.

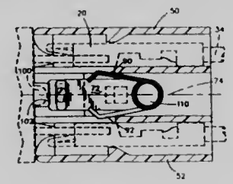
4,894,019

TORSION SPRING SHORTING CONNECTOR

William A. Howard, Burton, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Continuation of Ser. No. 208,142, Jun. 16, 1988, abandoned. This application Jan. 20, 1989, Ser. No. 372,212
Int. Cl.[4] H01R 13/703
U.S. Cl. 439—188 **7 Claims**

1. Apparatus comprising:
(a) a housing having spaced side walls that define a housing interior for enclosing metal contacts in spaced apart relation and further defining a passageway leading to the housing interior to accommodate passage of signal carrying conductors coupled to the spaced apart metal contacts, said housing defining interior ribs that separate said two metal contacts and define a slot in said housing interior;
(b) an actuator movably supported in said slot for engagement with a mating connector that holds the actuator in a recessed position in the housing when the mating connector is brought into engaging relationship to the housing, said actuator having a post thereon; and
(c) a torsion spring shorting wire carried by the actuator and including a central loop embracingly engaging the post mounted on the actuator and having elongated contact portions, said elongated contact portions normally engaging the two metal contacts to short said contacts and being movable out of engagement with said contacts by said interior ribs when the actuator moves said shorting wire into the slot in response to contact by the mating connector said shorting wire biasing the actuator to move the elongated contact portions back into engagement with the two metal contacts if the mating connector becomes disengaged from the housing.

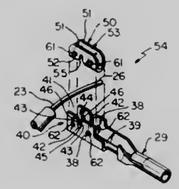


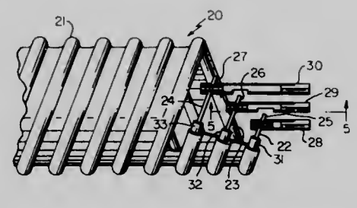
4,894,020

VACUUM CLEANER HOSE CONSTRUCTION AND METHOD OF MAKING THE SAME

Homer N. Holden, Sylva; Philip K. Loyer, Waynesville, both of N.C.; Lowell T. Noyes, Redding, Conn., and Janos J. Legrady, Putnam Valley, N.Y., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Aug. 26, 1988, Ser. No. 237,344
Int. Cl.[4] H01R 4/60
U.S. Cl. 439—191 **18 Claims**





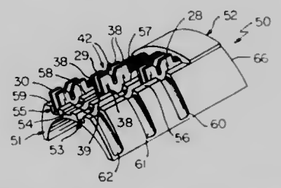
1. In a vacuum cleaner hose construction that comprises an elongated vacuum hose having an electrical conductor extending therealong and being provided with an end portion, and an electrical connector carried by said hose and being fixed to said end portion, said connector having a pair of spaced apart knife-like portions each being provided with opposed edges defining sides of a slot therein that has an open end and a closed end, said knife-like portions of said connector having said open ends of said slots thereof facing in the same direction and being interconnected together at one end thereof to an intermediate part of said connector whereby said portions and said part define a U-shaped configuration that has a bight facing in the same direction as said open ends of said slots, said end portion being disposed in said slots of said connector and being wedged between said opposed edges thereof for providing electrical connection therebetween, said connector having holding means carried thereby and disposed adjacent said conductor to hold said conductor in said slots by trapping said conductor between said holding means and said closed ends of said slots, said holding means comprising a U-shaped holding member having a pair of spaced apart legs and a cross member interconnecting said legs together, said legs being respectively disposed adjacent said knife-like portions and between the same, the improvement wherein the bight of said U-shaped holding member faces in the same direction as said bight of said connector and wherein each leg of said holding member has a pair of spaced apart snap-fitting means snap-fitting with its respective knife-like portion of said connector to hold said holding member to said connector, each pair of said snap-fitting means being disposed on a line that generally passes through said conductor, said legs of said holding means comprising a pair of knife-like portions disposed in spaced apart parallel relation and being interconnected together by said cross member, each knife-like portion of said holding means having opposed edges defining sides of a slot therein that has an open end and a closed end, said knife-like portions of said holding means having said open ends of said slots thereof facing in a like direction that is opposite to the direction that said slots of said connector face.

4,894,021

VACUUM CLEANER HOSE CONSTRUCTION, INSERT THEREFOR AND METHODS OF MAKING THE SAME

Homer N. Holden, Sylva; Roger D. Meadows, and Philip K. Loyer, both of Waynesville, all of N.C., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Aug. 22, 1988, Ser. No. 234,783
Int. Cl.[4] H01R 4/60
U.S. Cl. 439—191 **12 Claims**



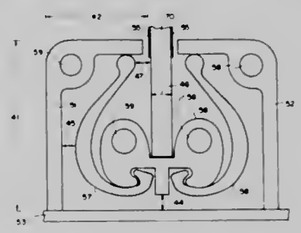
1. In a vacuum cleaner hose construction that comprises an elongated vacuum hose having an end and an electrical conductor extending helically therealong and being provided with an end portion at said end, an electrical terminal connector carried by said hose and being fixed to said end portion, an enlarged cuff disposed onto said end of said hose and covering at least part of said connector to hold said connector and its interconnected end portion in a predetermined position on said hose, and an insert for initially holding said connector and its interconnected end portion in said position before said cuff is disposed thereon, said insert also being at least partially covered by said cuff, the improvement wherein said insert has opposed ends one of which has a substantially straight slot means therein and an angular groove means therein leading to said slot means and intersecting the same at an angle relative thereto, the other of said opposed ends of said insert having opening means therein, said connector having opposed ends respectively disposed in said slot means and said opening means to be held thereby, said end portion of said conductor being disposed in said angular groove means.

4,894,022

SOLDERLESS SURFACE MOUNT CARD EDGE CONNECTOR

Peter U. Guckenheimer, Campbell, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 28, 1988, Ser. No. 225,679
Int. Cl.[4] H01R 13/193, 23/70
U.S. Cl. 439—260 **15 Claims**



1. A connector for providing electro-mechanical connection between a first printed circuit board and a second printed circuit board, the connector comprising:
a spring connector portion including,
a plurality of contacts, electrically insulated from one another, the contacts being adjacent to electrically conducting regions of the first printed circuit board, and
support means (56,163,131,132), mechanically coupled to the first printed circuit board, for holding the contacts in a predetermined unsprung position;
a plurality of fingers laid on a first portion of the second printed circuit board, the first portion of the second printed circuit board being inserted into the spring connector portion; and
attachment means, coupled to the first printed circuit board and the second printed circuit board, for attaching the first printed circuit board to the second printed circuit board in a fully engaged position;
wherein the plurality of contacts, the support means and the plurality of fingers are arranged so that when the attachment means places the first printed circuit board and the second printed circuit board in the fully engaged position the first portion of the second printed circuit board places pressure on the plurality of contacts so that each contact from the plurality of contacts is pressed downward onto an electrically conducting region from the electrically conducting regions of the first printed circuit board at a pivot point on the contact, the contact pivoting around the pivot point thereby converting the downward pressure into horizontal pressure horizontally pressing the contacts to the plurality of fingers and thus establishing electrical contact between the contacts and the electrically conducting regions and between the contacts and the fingers.

4,894,023

CONNECTOR ASSEMBLY FOR ANODE RING OF CATHODE RAY TUBE

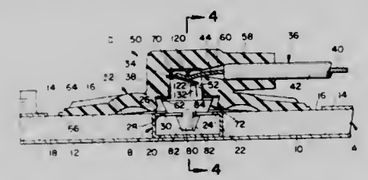
Harold E. Hall, 14767 Madison Rd., Middlefield, Ohio 44062

Filed Sep. 6, 1988, Ser. No. 240,683
Int. Cl.[4] H01R 13/52
U.S. Cl. 439—278 **67 Claims**

1. An anode connector assembly for electrically connecting a bared wire end of an insulated anode supply conductor to a standard anode button disposed in the glass envelope wall of a

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cathode ray tube, said assembly comprising a resilient cap having a center axis and a head portion with a flexible, axially extending, circular skirt portion protruding laterally outwardly therefrom, a U-shaped sheet metal connector clip firmly supported interiorly of said cap within the said head portion thereof and having spaced mounting legs extending



from said head portion into and exposed within the spatial confines of said skirt portion for engaging the said anode button, and an anode supply conductor having a bared wire end extending into the said head portion of said cap, said clip being directly pinch clamped in situ to said bared wire end interiorly of said cap by a pinch pad portion of said clip to electrically connect it to said bared wire end.

4,894,024

TELECOMMUNICATIONS WALL OUTLETS

George Debortoli, Ottawa, and Brian T. Osborne, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 25, 1988, Ser. No. 275,885
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—535 **8 Claims**



1. A telecommunications wall outlet comprising a housing for a circuit assembly, and a circuit assembly for mounting within a chamber in the housing:

the housing comprising:

a base and a plurality of walls extending from the base to define the chamber of the housing, and an opening to the chamber remote from the base; and

at least one region of a said wall of the housing providing guide means projecting inwardly into the chamber and extending in a direction from the opening towards the base, for guiding the circuit assembly into a desired operational position within the chamber; and

said region of the wall also defining a cable guide formed in an outer surface of the wall for receiving and guiding a cable therein along the wall from the base towards the opening to the chamber; and

the circuit assembly comprising

a circuit member which provides a support element rigidly carrying electrical pathways in intimate contact with the support element, a modular telecommunications jack and a connector;

the circuit member having two sides, the jack and the connector both being mounted upon the circuit member and both having electrical terminal members, said electrical pathways on the support element interconnecting terminal members of the jack with terminal members of the connector; and

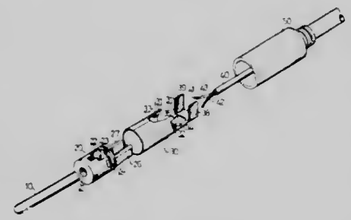
the circuit member having an edge with a recessed part cooperable with the guide means of the housing for guiding the circuit assembly as it is moved through the opening into the desired operational position with one of the two sides of the circuit member facing the base of the housing.

4,894,025

PLUG

Yu Feng Cheng, No. 7, Fu Hsing St., Tu Cheng Ind. Dist., Taipei, Taiwan

Filed May 8, 1989, Ser. No. 348,384
Int. Cl.[4] H01R *17/04*
U.S. Cl. 439—578 **1 Claim**



1. A plug comprising:

a substantially rod-shaped prong (**10**) having a conical end part;

a cylindrical insulating member (**20**) including a lengthwise oriented central circular slot (**21**) for receiving said prong (**10**), a vertically oriented rectangular slot (**22**), a slit (**23**), two recesses (**24**) and (**25**) on lateral sides thereof respectively, and two fixing plates (**26**), (**27**) lengthwise protruded from an end face remote from said slot (**21**);

a clamping sleeve (**30**) including a notch (**31**), two cutouts (**32**), (**33**) besides said notch (**31**), two engaging bodies (**34**), (**35**) adjacent to said two cutouts (**32**) and (**33**) respectively, said two engaging bodies (**34**) and (**35**) being engageable in the two recesses (**24**) and (**25**) respectively, said clamping sleeve (**30**) further including an extension piece which is formed with a circular hole (**36**) and a rectangular hole (**37**), and end of said extension piece being further extended to define two clamping plates **938**), (**39**);

a cord (**40**) including a conducting wire (**41**) and a copper wire **942**) therein, said conducting wire (**41**) being encased with an insulating layer (**43**); and

a plastic sleeve (**50**) enclosing said clamping sleeve (**30**);

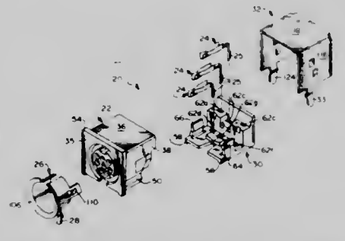
whereby said conducting wire (**41**) is connectable to said prong (**10**) by using a lower electric pole (**61**) and an upper electric pole (**62**); said plug is adjusted such that said circular hole **936**) of said clamping sleeve **930**) is in alignment with said lower electric pole (**61**) so that said lower electric pole (**61**) is in contact with said prong (**10**), said upper electric pole (**62**), which is electrified, is pressable against said prong **910**), through said notch (**33**) and said rectangular slot **922**), so as to press said conducting wire **941**) against said prong (**10**), whereby discharging between said upper electric pole **962**) and said lower electric pole (**61**) causes said insulating layer (**43**) of said conducting wire (**41**) to melt such that a copper part inside said conducting wire (**41**) contacts with an upper side of said prong (**10**).

4,894,026

MINIATURE CIRCULAR DIN CONNECTOR

Daniel A. Dixon; Hsin Lee, both of Naperville; Eugene J. Mysiak, Lisle, and Henry Zielke, Hoffman Estates, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation-in-part of Ser. No. 275,818, Nov. 25, 1988. This application Feb. 14, 1989, Ser. No. 310,979
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—609 **19 Claims**



1. A miniature DIN connector for mating with a DIN connector plug having a conductive shield extending thereabout, said miniature DIN connector comprising:

a nonconductive housing having opposed front and rear ends, a top and a bottom, a plurality of terminal-receiving apertures extending between the front and rear ends of said housing, said housing comprising channels generally adjacent the rear thereof and extending from each of said terminal-receiving apertures to the bottom of said housing for positively positioning and retaining portions of terminals extending from the apertures in the housing to a circuit board, said housing further comprising an internal shield aperture extending into the front end thereof and generally around said terminal-receiving apertures, said housing comprising an external shield aperture extending therethrough and into the internal shield aperture;

a plurality of electrically conductive terminals having pin-receiving contact portions engaged in the terminal-receiving apertures of said housing and board contact portions positively retained in the channels of said housing and extending beyond the bottom of said housing;

an internal shield mounted in the internal shield aperture extending into the front end of said housing, said internal shield comprising contact means extending therefrom for electrical connection to a ground and comprising a slot generally aligned with the external shield aperture;

a base having an array of apertures extending therethrough for receiving the board contact portions of said terminals, said base being mountable to the circuit board and comprising means for lockingly engaging the housing to the base; and

an external shield substantially defining at least three external sides of said miniature DIN connector and comprising a first contact means for grounding said external shield, said external shield comprising a second contact means extending through the external shield aperture of the housing and through the slot of the internal shield for directly contacting the shield of the DIN connector plug matable with the miniature DIN connector.

4,894,027

LAMP SOCKET TERMINAL

Duane L. Brantingham, Cortland, and Patrick J. Reedy, Youngstown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1989, Ser. No. 313,916
Int. Cl.[4] H01R *33/06*
U.S. Cl. 439—699 **10 Claims**

1. A terminal for use in a lamp socket for a lamp bulb having a wedge base which includes a central vent tube bounded by laterally extending side wings, a pair of contact wires extending out of the respective ends of the side wings and bent over onto first sides of the respective side wings which are on opposite sides of the wedge base, and a pair of laterally extending troughs in second sides of the respective side wings which are on opposite sides of the wedge base, the terminal comprising:

a receptacle portion and an attachment portion for attaching the terminal to an electrical conductor;

the receptacle portion having a base wall and a pair of side walls forming a channel which is spaced rearwardly of a forward end of the base wall,

a spring contact arm which is integrally connected to a forward edge of one side wall of the channel in cantilever



fashion and projects forwardly to engage a contact wire extending out of an end of one side wing of the wedge base,

a spring detent arm which is integrally connected to the forward edge of the other side wall of the channel in cantilever fashion and projects forwardly to engage a trough in the one side wing of the wedge base, and

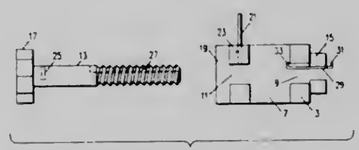
a stop tab which is connected to one of the side walls of the channel and which is disposed between the spring contact arm and the spring detent arm to engage the end of the one side wing when it is inserted into a space between the spring contact arm and the spring detent arm so as to properly locate the trough for engagement by the spring detent arm.

4,894,028

SELF-EXPANDABLE BATTERY TERMINAL CLAMP

James R. Deem, 1855 Belmont St., Boise, Id. 83706

Filed Apr. 12, 1988, Ser. No. 180,396
Int. Cl.[4] H01R *4/42*
U.S. Cl. 439—762 **14 Claims**



1. A self-expandable clamp comprising:

a generally C-shaped partial ring structure having first and second end portions defining an opening, said first and second end portions each having an elongated and flattened portion, said elongated and flattened portion extending radially outwardly from said C-shaped partial ring structure defining said opening;

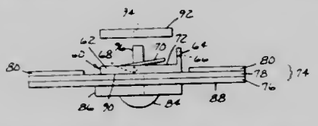
a nut and bolt assembly, said flattened and elongated portion of said first of said first and second end portions each having a hole therethrough for receiving said bolt, said nut engaging said bolt when said bolt is inserted through said holes, said first and second end portions being urged together when said nut is tightened on said bolt thereby compressing said partial ring structure; and

means coupling said nut and bolt assembly to at least one of said first and second end portions, said means responsive

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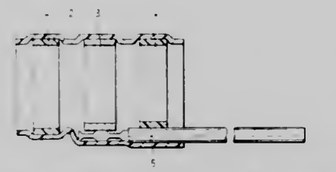
to said nut being untightened on said bolt to urge said first and second end portions apart thereby expanding said partial rin structure.

4,894,029
CONTACT FOR METALLIZED FILM
Richard A. Pope, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 17, 1989, Ser. No. 325,154
Int. Cl.[4] H01R *13/00*
U.S. Cl. 439—816 **20 Claims**



1. An article for electrically connecting a metallized film to a conductor, comprising:
a contact member having upper and lower surfaces, said contact member being constructed of an electrically conductive material;
means for fastening said contact member to the metallized film; and
bias means for urging said lower surface of said contact member against the metallized film.

4,894,030
ELECTRICAL CONNECTOR
Patrick R. Chavaroux, Jouy-Le-Moutier, France, assignor to Raychem Pontoise S.A., France
Continuation of Ser. No. 240,990, Sep. 6, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 338,486
Claims priority, application United Kingdom, Sep. 4, 1987, 8720876
Int. Cl.[4] H01R *4/02*
U.S. Cl. 439—874 **4 Claims**



1. An electrical connector for forming an electrical solder connection, which comprises an electrically insulating open-ended sleeve that is capable of receiving an electrical conductor, the sleeve having a pre-installed elongate electrical conductor that extends beyond the sleeve and a quantity of solder for forming an electrical connection between the conductors, wherein the pre-installed conductor has a region which will be contacted by the solder when the connection is formed and which has a cross-section that changes along its length so as to increase the force required to pull the two conductors apart in the completed solder connection.

4,894,031
ELECTRONIC SOCKET CARRIER SYSTEM
Neil F. Damon, Fort Pierce, Fla., and Ronald E. Senor, North Attleboro, Mass., assignors to Augat Inc., Mansfield, Mass.
Continuation-in-part of Ser. No. 125,349, Nov. 25, 1987. This application May 19, 1988, Ser. No. 196,038
Int. Cl.[4] H01R *9/24*
U.S. Cl. 439—885 **12 Claims**



1. An electronic socket carrier system comprising:
a plurality of lead sockets each including:
a sleeve having an internal bore and an entrance opening at one end of said sleeve, said entrance opening of said internal bore defining a lead entry to said one end;
said sleeve including a head portion having a first diameter surrounding said one end;
a first portion contiguous with said head portion;
a plurality of circumferentially spaced barbs formed in said first portion by machining said first portion in an axial direction to remove material therefrom to provide outwardly extending barbs circumferentially spaced about said first portion, each barb having an upper edge tapering away from said head portion, and wherein said upper edges of said plurality of circumferentially spaced barbs define a circumferential band;
a plurality of machined channels formed in said first portion by machining said first portion in the axial direction to remove material therefrom, each of said plurality of channels being formed between adjacent ones of said plurality of circumferentially spaced barbs; and
a flexible carrier strip having a plurality of holes therethrough, each said hole sized to press-fit receive and releasably retain corresponding ones of said lead sockets, and wherein said circumferential band of upper edges of said barbs of each socket interface with one surface of the flexible carrier strip to retain said lead sockets in said carrier strip.

4,894,032
FLOATATION APPARATUS
Adolphe Sbrana, 11 Chemin de Font Sarrade, Martigues 13500, France
Continuation of Ser. No. 122,532, Nov. 9, 1987, abandoned, which is a continuation of Ser. No. 923,496, Oct. 27, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 295,000
Claims priority, application France, Nov. 5, 1985, 85 16470
Int. Cl.[4] A63B *35/02*
U.S. Cl. 440—13 **8 Claims**

1. A flotation apparatus comprising:
(a) a buoyant body having an upper most planar surface with an essentially circular periphery for supporting a passenger and a lower surface including a flat bottom section and a sloping section extending upwardly at an oblique angle from said flat bottom towards said circular periphery; and
(b) means for controlling the position of the flotation apparatus when in water operably associated with said body, said means for controlling consisting essentially of:
(i) a flap having a length sufficient to extend substantially across said flat bottom section;
(ii) a rotatable shaft having a longitudinal axis eccentric with respect to a vertical axis extending through the center of said body with an end attached directly to an end of said flap and another end provided with means for manipulating said shaft to alter the attitude of said flap 360° whereby said flap extends substantially across said flat bottom section at some time during a 360° attitude alteration of said flap; and
(iii) a hollow channel for accommodating said shaft.



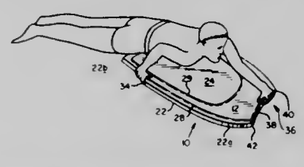
4,894,033
MULTIPURPOSE AND INFLATABLE RAFT
Herry Chang, No. 371-7, Hsin Ming Road, Nei Hu District, Taipei, Taiwan
Filed Feb. 19, 1988, Ser. No. 158,327
Int. Cl.[4] B63B *35/72*
U.S. Cl. 441—40 **12 Claims**



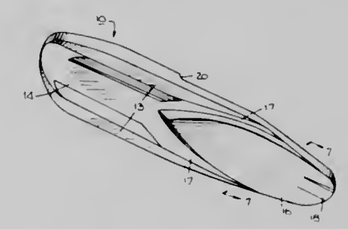
1. A multipurpose inflatable raft comprising:
an inflatable buoyant outer raft formed in a U-shape and defining a longitudinal axis, with each leg of said U-shaped portion being essentially parallel with said longitudinal axis, wherein said outer raft unit comprises a plurality of retainer plates attached in spaced relationship along the top, bottom and outer surfaces of said outer raft, and a plurality of retaining rings attached in spaced relationship along the outer surface of said outer raft;
an inflatable buoyant inner raft further comprising a plurality of retaining rings attached in a spaced relationship along the top periphery thereof and the bottom periphery thereof, wherein said inner raft may be positioned at spaced locations along said longitudinal axis whereby said retainer plates on said outer raft may be fastened to said retaining rings on said inner raft.

4,894,034
BODYBOARD WITH INTEGRALLY-CONTOURED HAND-HOLDS FOR ENHANCING CONTROL DURING RIDING
Russell S. Brown, III, Honolulu, Hi., assignor to Kransco, San Francisco, Calif.
Filed Oct. 2, 1987, Ser. No. 104,339
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—65 **7 Claims**

1. A bodyboard for supporting a rider during travel in ocean surf comprising:
an elongate, substantially planar board of substantially equal thickness having a top riding surface, a bottom planing surface, a forward section extending a major portion of the length of the board terminating in a front nose end for the board, a tail section extending a minor portion of the length of the board terminating in a rear end for the board, opposed fore side edge portions bounding opposite sides of said forward section and opposed aft side edge portions bounding opposed sides of said tail section, said fore side edge portions having rear ends adjacent the forward ends of said aft side edge portions and rear ends of the fore side edge portions being spaced laterally a greater distance than the forward ends of the aft side edge portions and the aft side edge portions extending nondivergently to the rear end of the board; and
hand-hold means disposed on each side of the board contoured for being securely gripped by a hand of the rider and for orienting and maintaining that hand in a predetermined position relative to the length of the board, wherein each hand hold means is defined by an offset edge section extending from the rear end of a fore side edge portion to the forward end of an aft side edge portion and oriented at an angle generally in the range of 90 to 160 degrees relative to the rear end of the fore side edge portion and dimensioned with an overall length sufficient for accommodating a rider's palm thereby to inhibit forward slippage of the rider's hand when the board is gripped at the offset edge section.



4,894,035
WATER CRAFT
Francesco A. Pia, 3 Boulder Brae La., Larchmont, N.Y. 10538
Continuation of Ser. No. 89,270, Aug. 25, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 263,612
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—79 **21 Claims**



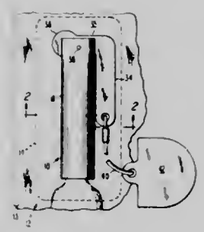
12. A water craft of board-like shape having a U-shaped bow section including a pair of longitudinally disposed runners on an underside and an unobstructed recessed central portion extending longitudinally between said runners; and
a parabolically shaped stern section including a centrally disposed longitudinally extending chine on an underside disposed in spaced relation to said runners to define a pair of channels therebetween, said chine extending across said stern section from side to side with each said channel communicating with said recessed central portion of said bow section and extending from said central portion laterally outwardly to a side of said stern section.

4,894,036

INFLATOR ASSEMBLY FOR LIFE VESTS

Stanley Switlik, Pennington, N.J., assignor to Switlik Parachute Company, Inc., Trenton, N.J.

Filed Aug. 8, 1988, Ser. No. 229,400
Int. Cl.[4] B63C 9/16
U.S. Cl. 441—93 15 Claims



1. For use in a life vest of the type having at least one cell inflatable by the expansion of gases escaping from a cartridge in which they have been confined in a compressed condition, an improved inflator assembly comprising:

(a) a housing mountable upon said cell and having a bore in which the cartridge is mountable and a gas exit port communicating the bore with the interior of the cell;

(b) a plunger sliding in the bore and adapted to pierce the cartridge to allow escape and expansion of the confined gases, the bore having communicating first and second spring chambers and the plunger being normally disposed therein in a standby position, the plunger having first and second seal means engaging, in the standby position of the plunger, the walls of the respective chambers at opposite sides of the port;

(c) first and second springs disposed in the first and second chambers respectively, the first spring being tensioned to bias the plunger from its standby position in a direction to pierce the cartridge and the second spring being tensioned to bias the plunger in an opposite direction to at least partially withdraw the same from the cartridge;

(d) a handle pivotally mounted in the housing for movement between standby and final operating positions respectively; and

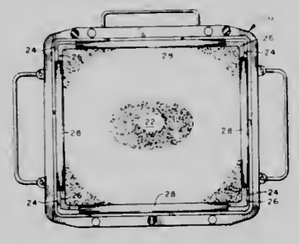
(e) a spring seat interposed between the cam surface and the first spring, said cam surface being adapted, when the handle is moved from its standby position, to shift the spring seat to place the springs under tension and effect direct contact of the spring seat with the plunger to bias the plunger to its cartridge-piercing position, the continued movement of the handle being adapted to lower the cam surface for bias of the plunger by the second spring in its opposite direction, to withdraw it from the pierced cartridge and thereby allow escaping gases to bias the plunger away from the cartridge a distance sufficient for both of said seal means to move fully to one side of the port, thus to permit exit of the gases through the port into the cell for inflating the same, the handle when fully thrown to its final operating position having its cam surface located to allow expansion of both springs to return the plunger to a position in which said seal means are again located at opposite sides of the port and will prevent leakage of said gases from the inflated cell through said bore.

4,894,037

FACTORY FIXTURE FRAME WITH MEANS FOR TEMPORARILY AND REMOVABLY SUPPORTING AN IN-PROCESS TENSION MASK FOR A COLOR CATHODE RAY TUBE

James R. Fendley, Arlington Hts., and John M. Jarosz, Skokie, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 31, 1987, Ser. No. 139,892
Int. Cl.[4] H01J 9/227
U.S. Cl. 445—30 11 Claims



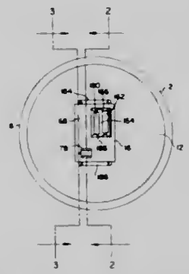
1. For use in the manufacture of a color cathode ray tube having a flat faceplate and a tensed foil shadow mask, a factory fixture frame for mounting an in-process shadow mask, the frame including peripheral groove means for receiving an edge of the shadow mask, and an elongate, generally cylindrical rod-like member which is split lengthwise thereof to provide compressibility and to press-fit into said groove means for temporarily and removably supporting an in-process shadow mask in tension.

4,894,038

FRISBEE DISK AND BALL DROP ASSEMBLY

Frederick F. Giese, 1012 Market St., P.O. Box 184, Monticello, Ill. 61856

Continuation of Ser. No. 133,103, Dec. 14, 1987. This application Mar. 27, 1989, Ser. No. 328,914
Int. Cl.[4] A63H 27/00
U.S. Cl. 446—46 11 Claims



1. An aerodynamic disk and carried member for flight through the air, in which said disk has an upwardly facing surface which faces generally upward and away from the earth during flight and a downwardly facing surface which faces generally downward and toward the earth during flight and a carried member carried by said disk during flight and separatable therefrom during flight, remote controlled separation means to separate said carried member from said disk on command during flight, and remote control transmitting means to command said separation means to separate said carried member from said disk during flight, wherein said remote controlled separation means includes a discharge chamber to hold said carried member, said discharge chamber including a discharge aperture for discharge of said carried member from said discharge chamber on command from said remote control means, wherein said remote controlled separation means includes retention and discharge means movable between an aperture closed and aperture open position to respectively retain said carried member in said discharge chamber when in said aperture closed position and discharge said carried member from said discharge chamber when in said aperture open position, wherein said remote controlled separation means includes operating means to move said retention and discharge means between said aperture closed and aperture open positions, power means to drive said operating means, and a remote control receiver to start said power means and initiate operation of said operating means, said remote control transmitting means including a remote control transmitter operable to transmit a signal to said remote control receiver, wherein said retention and discharge means includes a gate member pivotally mounted for pivotable movement between said aperture open and aperture closed positions, biasing means to normally bias said gate member to said aperture closed position, said gate member including a projecting portion for engagement by a gate opening member, said operating means including said gate opening member, gear means to operate said gate opening member, said power means including a battery power supply to power an electric motor and an electric motor to drive said gear means, an operating and control circuit connected between said electric motor and said battery power supply to energize said motor upon receipt of a said signal by said remote control receiver from said remote control transmitter, said remote control receiver being connected in said operating and control circuit, including limit switch means to interrupt said operating and control circuit and stop said motor after a determined movement of said gear means, said gear means includes a planar gear having a planar surface, a first annular contact path extending around said planar surface of said planar gear, a second annular contact path extending around said planar surface of said planar gear spaced apart radially from said first annular contact path and concentric therewith, said first annular contact path being continuously electrically conductive throughout its entire circumference, said second annular contact path having a first arcuate portion which is electrically conductive and a second arcuate portion which is electrically non-conductive, a first electrical contact in continuous contact with said first annular contact path as said planar gear rotates, a second electrical contact in continuous contact with said second annular contact path as said planar gear rotates, said first and second electrical contacts being connected in a disconnect circuit, including said disconnect circuit, said disconnect circuit being completed and energized when said second electrical contact is in contact with said first electrical conductive arcuate portion of said second annular contact path and being interrupted and de-energized when said second contact is in contact with said second non-conductive arcuate portion of said second annular contact path, said limit switch means being in said disconnect circuit and connected to interrupt said operating and control circuit and stop said motor when said planar gear rotates said first conductive arcuate portion of said second annular contact path into contact with said second electrical contact.

4,894,039

LEVITATING TOY FLYING SAUCER PACKAGING AND STORAGE

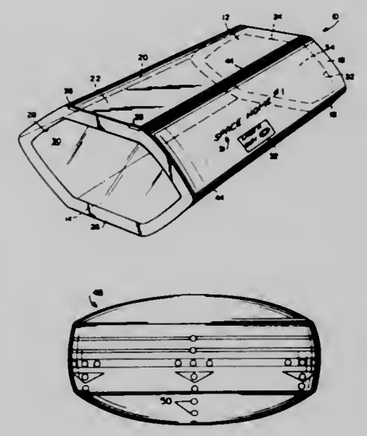
Zenn R. Taylor, 4333 Harbor House Dr., Tampa, Fla. 33615, and Lester D. Barton, 12833 N. 17th Ave., Phoenix, Ariz. 85029

Filed Sep. 1, 1988, Ser. No. 239,308
Int. Cl.[4] A63H 27/10
U.S. Cl. 446—75 9 Claims

1. A combination balloon toy and storage container comprising:

(a) an inflatable balloon toy shaped to resemble a toy flying saucer-type vehicle;

(b) a container for storing said balloon toy in at least a partially inflated state, said container shaped and provided



with indicia to simulate the appearance of a toy space station, said container including at least one openable wall for permitting said balloon toy to be inserted and withdrawn from said container.

4,894,040

TOY BUILDING ELEMENT WITH ELEMENTS FOR PROVIDING POSITIONAL INFORMATION

Erik Bach, Billund, and Allan Toft, Vejle, both of Denmark, assignors to Interlego AG., Switzerland

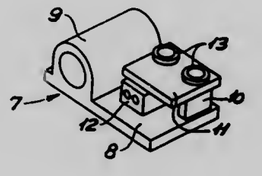
PCT No. PCT/DK87/00005, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/04365, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 21, 1987, Ser. No. 102,145
Claims priority, application Denmark, Jan. 22, 1986, 325/86
Int. Cl.[4] A63H 33/04, 30/00, 33/22, 33/26
U.S. Cl. 446—91 8 Claims

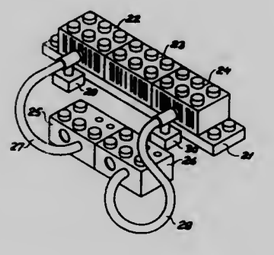
1. A toy building set with elements featuring projections on one surface engageable with apertures on a surface of another element;

at least one element for providing positional information by detection of reflected energy, such as light, said one element including both an energy radiating source and an energy receiving detector and including at least one of said projections on one surface and said apertures on another surface which provide means for mechanically coupling said one element with other elements belonging to the building set, a power input means for driving said

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energy radiating source and a signal output means as a conduit for a signal from said energy receiving detector; energy reflecting means; and,



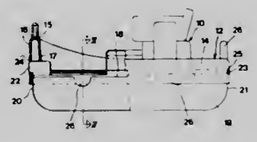


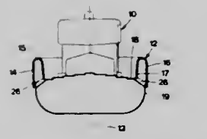
means for operatively coupling said one element with said energy reflecting means.

4,894,041
TOY BOAT

Leonart Dahlgren, Askim, Sweden, assignor to Aqua Toys AB, Askim, Sweden

Continuation of Ser. No. 844,501, Jul. 11, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 251,997
Int. Cl.[4] A63H *23/02, 23/00*
U.S. Cl. 446—160 **2 Claims**



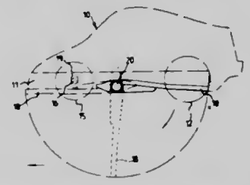


1. A toy boat comprising:
a hollow hull produced by blow moulding of a thermoplastic material in a mould, said hull comprising a deck having an outer perihery and an upper surface, an outer skin, a plurality of positional portions protruding from said outer skin and a bottom;
at least one ring forming a gunwale for said hull, said ring surrounding the outer periphery of said deck and an adjacent portion of said skin, said ring having a U-shaped cross section having a longer and a shorter shank, the latter having a lower end which rests on the upper surface of the deck of the hull, said ring further having a plurality of recesses cooperating with respective ones of said positional portions of said hull for detachably connecting said ring to said hull and positionally locating the ring relative to the hull.

4,894,042
FLIP-OVER TOY VEHICLE

Hiromi Kamikawa, Tokyo, Japan, assignor to Maple Toys International Ltd., Hong Kong

Filed May 19, 1988, Ser. No. 196,018
Claims priority, application Japan, Nov. 19, 1987, 62-176699
Int. Cl.[4] A63H *17/00, 17/26*
U.S. Cl. 446—437 **6 Claims**

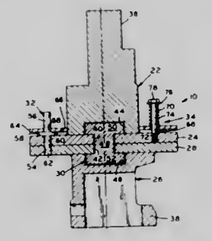


1. A flip-over toy vehicle, comprising a vehicle body, wheels supported for rotation relative to the body, at least one of the wheels being connected to a motor for driving said wheel and at least one other of said wheels being a non-driven wheel, a spring-loaded flip-over device connected to the body and movable relative to the body between a first and a second position to cause the toy vehicle to flip over, a rotatable latching device for releasably holding the spring-loaded flip-over device in its first position, and a release mechanism for releasing the latching device, said non-driven wheel being mounted for rotation with a worm, the release mechanism having a toothed gear engageable with the worm and an operating arm connected to the toothed gear, the latching device including a bifurcated arm having bifurcations for interacting with the operating arm of the release mechanism such that upon rotation of the non-driven wheel the operating arm of the release mechanism acts to unlatch the flip-over device.

4,894,043
TORQUE TRANSMITTING COUPLER WITH SHEAR CAPABILITY AND COMPONENT SEPARATION CONTAINMENT

Robert E. Nixon, Jr., 3138 Riddle Rd., West Palm Beach, Fla. 33406

Filed Feb. 9, 1988, Ser. No. 153,980
Int. Cl.[4] F16D *9/00*
U.S. Cl. 464—33 **6 Claims**

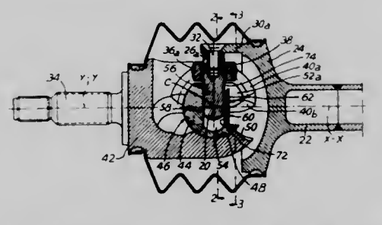


1. A torque transmitting coupler for drivingly connecting a rotary drive mechanism and a rotary driven tool, said torque transmitting coupler comprising:
(a) a driving member having a driving plate rigidly attached on an inner portion thereof, said driving plate encompassing and extending radially outward from said driving member;
(b) a driven member having a driven plate rigidly attached on an inner portion thereof, said driven plate encompassing and extending radially outward from said driven member;
(c) a swivel connecting means inter connecting said driving and said driven members together in a coupled relation at their respective inner portions such that said members are rotatable relative to one another and said respective driving and driven plates thereon are disposed in an adjacent relation to one another;
(d) at least one shearable element interconnecting said driving and said driven plate together so as to cause transmitting of torque from one of said members to the other via said respective plates, said element being designed to shear at a predetermined torque load imposed thereon by one of said members via its respective plate, said driving and driven plates having respective holes being alignable with each other for receiving a respective and portion of said shearable element;
(e) retaining means for capturing and maintaining said shearable element adjacent to one of said driving and driven plates both before and after said element has been sheared, said retaining means including a disk attached on said shearable element between its opposite end portions and an annular retainer plate having a hole for receiving one of said end portions of said shearable element;
(f) said retaining means further including a plurality of spring-loaded posts mounted on one of said driving and driven plates and movably mounting said retainer plate so as to receive the other of said end portions of said shearable element and overlie said disk on said pin, thereby capturing said other shearable element end portion and said disk between said retainer plate and said one of the driving and driven plate even after said one end portion of said pin has sheared;
(g) said swivel connecting means interconnecting said driving and said driven members so as to maintain them together in said coupled relation even after shearing of said shearable element.

4,894,044
HOMOKINETIC JOINT COMPRISING AN AXIALLY RETAINED TRIPOD ELEMENT

Bernard Poulin, Conflans Ste Honorine, and Francois Verbrugge, Cergy, both of France, assignors to Glaenzer-Spicer, Poissy, France

Filed Sep. 26, 1988, Ser. No. 249,558
Claims priority, application France, Oct. 1, 1987, 87 13595
Int. Cl.[4] F16D *3/30*
U.S. Cl. 464—111 **17 Claims**

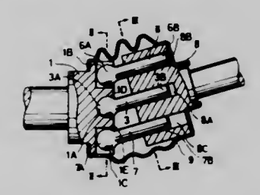


1. A homokinetic joint for coupling two shafts, said joint comprising:
a tulip element connectable to a first shaft, said tulip element comprising a plurality of branches extending axially of said element and collectively defining a concave spherical recess therewithin, and said tulip element defining three rolling ways;
a tripod element connectable to a second shaft to be coupled to the first shaft, said tripod element comprising three trunnions and rollers rotatively mounted to said trunnions, said rollers disposed and rollable on said rolling ways; and
axial retaining means connected between said tripod element and said tulip element for positioning said tripod element relative said tulip element,
said axial retaining means including an intermediate element disposed in said concave spherical recess defined by the branches of said tulip element and in which intermediate element said tripod element is received, and a retaining element restraining said tripod element from moving axially relative to said intermediate element,
said intermediate element having an outer surface portion having the shape of a portion of a sphere so as to be complementary to said spherical recess and confronting said tulip element at said spherical recess, said intermediate element defining an equatorial cavity therein in which said tripod element is received and is movable relative to said intermediate element in directions lying in a plane extending perpendicular to the axial direction in which said tripod element is restrained from moving by said retaining element, and said intermediate element defining three notches therein open to said equatorial cavity for facilitating the insertion of said tripod element into said cavity,
said notches having widths that are only slightly larger than the outer diameters of said trunnions, respectively, and said tripod element being substantially immovable relative to said intermediate element in said directions when disposed in said notches yet movable in said directions once said tripod element has been inserted into said cavity through said notches.

4,894,045
UNIVERSAL JOINT HAVING DRIVING PINS PARALLEL TO ONE OF COUPLED SHAFTS AND SWINGABLY AND RADIALLY SLIDABLE TO THE OTHER SHAFT

Hisanobu Kanamaru, and Kouji Harada, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 200,066
Claims priority, application Japan, Jun. 5, 1987, 62-139781
Int. Cl.[4] F16D *3/48*
U.S. Cl. 464—138 **11 Claims**



1. A universal joint comprising:
first and second rotating members each having a rotating axis and arranged end to end with a distance therebetween;
a guide pin having a spherical portion at one end thereof and rotatable and swingably held by one of said first and second members at the rotating axis, and the other end of said guide pin being slidably inserted in the other member along the rotating axis; and
at least a pair of driving pins arranged symmetrically with respect to said guide pin, and each having one end swingably and radially slidably held by said first member and the other end inserted in said second member, one end of each of said driving pins being axially slidable, and said driving pins each being parallel to the rotating axis of said second member so that an angle between each of said

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driving pin and the rotating axis of said second member is fixed.

4,894,046

CONTROL UNIT FOR CHAIN SHIFTER

Bruce W. Browning, 98 Union St., Seattle, Wash. 98101

Filed May 13, 1988, Ser. No. 193,738
Int. Cl.[4] F16H *9/00*
U.S. Cl. 474—78 **10 Claims**



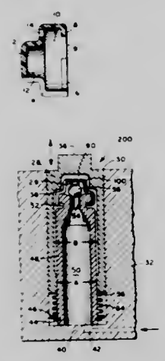
1. A control unit for a chain shifter comprising:
a reversible electric selector motor;
a pawl guide housing having a pawl guideway formed therethrough;
a cam selector pivotably connected in the pawl guideway;
a pair of pivoted latch arms;
a lobe positioned between the latch arms and driven by the motor;
spring means biasing portions of the latch arm apart;
a key positioned between the latch arms and beld by the latch arms and the spring when the lobe is centered and turned by the latch arms when the lobe is turned off center by the motor; and
means transmitting rotary motion of the key to the cam selector.

4,894,047

RETAINING CAGE FOR CHECK-VALVES AND SLACK ADJUSTERS USING SAME

Mark S. Breon, and Leslie L. Ecklund, both of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 26, 1989, Ser. No. 343,232
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—110 **22 Claims**



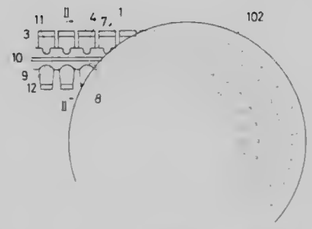
1. A cage for holding a check-valve in registration with a passageway through an end wall of a substantially cylindrical member separating a pair of fluid chambers for controlling fluid flow therebetween, said cylindrical member having a groove in the outer surface thereof facing radially outwardly away from the passageway in proximity to the end wall, said cage configured in the form of a hollow end-cap having a base having an entrance-way thereinto surrounded by a flange extending radially inwardly theretowards and operative to extend into the groove and resiliently secure the cage thereto, said cage having a first cavity therewithin adjacent the entrance-way that is adapted to receive thereinto the cylindrical member between the end wall and the groove, said cage having a second cavity therewithin that communicates with the first cavity on the opposite side thereof from the entrance-way thereinto and is smaller than the first cavity and aligned substantially concentrically therewith and operative to receive the check-valve thereinto and hold the check-valve in registration with the passageway, said cage having at least one aperture adapted to enable the fluid to flow between the chambers therethrough, and said cage operable to enable the check-valve against the passageway to prevent the fluid from flowing from one chamber into the other chamber when the fluid pressure in the other chamber exceeds the fluid pressure in said one chamber by a prescribed amount and to enable the check-valve to release from the passageway sufficiently to enable the fluid to flow from one said chamber into the other chamber when the fluid pressure in said chamber exceeds the fluid pressure in the other chamber by a prescribed amount.

4,894,048

V BELT WITH BLOCKS

Masahiro Inukai, and Hiroshi Matsuoka, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Division of Ser. No. 90,064, Aug. 27, 1987, Pat. No. 4,813,920. This application Sep. 13, 1988, Ser. No. 243,747
Claims priority, application Japan, Aug. 28, 1986, 61-132455; Sep. 30, 1986, 61-150844
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—240 **6 Claims**



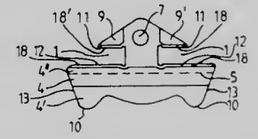
1. A V belt for high load transmitting comprising: a plurality of blocks; and endless load carriers, wherein said blocks are engaged with said endless load carriers having tensile members in a lengthwise direction along said belt, and wherein at least a part of a cross-section of a side surface of each block is substantially formed in an arcuate shape, wherein the center of gravity of said blocks is substantially close to said tensile members of said load carriers, and said blocks in substantially perpendicular state in relation to the load carriers in a straight running state.

4,894,049

TRANSMISSION BELT, CROSS ELEMENT FOR A TRANSMISSION BELT AND METHOD AND DEVICE FOR THE PRODUCTION THEREOF

Willem Koppelaars, Oisterwijk, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilberg, Netherlands

Filed Jan. 22, 1988, Ser. No. 146,872
Claims priority, application Netherlands, Jan. 23, 1987, 8700156
Int. Cl.[4] F16G *1/22*
U.S. Cl. 474—240 **7 Claims**



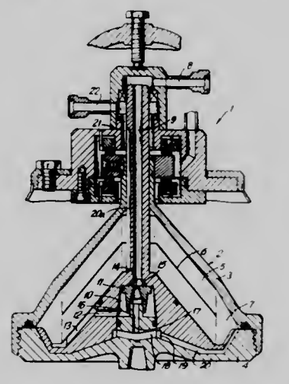
1. Cross element for a transmission belt having an endless carrier in the form of at least one metal band and a plurality of said cross elements, said cross element comprising at least two main sides and at least one recess for receiving the carrier, a bevel extending radially inwardly with respect to the belt for enabling bending of the transmission belt, whereby said bevel passes into the main side by a tilting line, at least three calibrated, separated, mutually parallel surfaces provided on at least one of said main sides, said surface being at substantially the same level relative to each other, whereby adjacent cross elements abut against each other, respectively with said main side and with said at least three surfaces.

4,894,050

STERILE LABORATORY CENTRIFUGE

Werner Kohlstette, and Ulrich Rotermund, both of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separtor AG, Oelde, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,499
Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817473
Int. Cl.[4] B04B *11/00*
U.S. Cl. 494—30 **6 Claims**



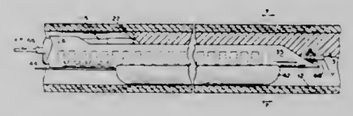
1. In a centrifuge, having an intake channel for material being centrifuged, a runoff channel for a clear phase, and a drum with a centrifuging space comprising a separation space having a package of disks and a solids space, means for effecting an initial operation wherein material to be centrifuged is introduced into the separation space and solids are separated from the clear phase followed by another operation that wherein intake of material to be centrifuged is discontinued and rinse is introduced into the drum through the clear-phase runoff channel, the improvement wherein the means for effecting the initial and another operations comprises the intake channel for supplying material to be centrifuged during the initial operation having two sections, a valve chamber between the two channel sections, a channel for diverting solids and extending from a periphery of the solids space to the valve chamber, and a valve body slidably received in the valve chamber and movable between a first position during the initial operation wherein the two channel sections are in communication and the solids-diversion channel is closed and a second position to initiate the second operation wherein one channel section which leads from the valve chamber to the separation space, is separated from the other channel section and connect the solids-diversion channel is connected to the other channel section, to allow solids to be extracted through the other channel section.

4,894,051

ATHERECTOMY SYSTEM WITH A BIASING SLEEVE AND METHOD OF USING THE SAME

Samuel Shiber, Mundelein, Ill., assignor to Surgical Systems & Instruments, Inc., Mundelein, Ill.

Continuation-in-part of Ser. No. 243,900, Sep. 13, 1988, which is a continuation-in-part of Ser. No. 78,042, Jul. 27, 1987, Pat. No. 4,818,634, and a continuation-in-part of Ser. No. 205,479, Jun. 13, 1988, and a continuation-in-part of Ser. No. 225,880, Jul. 29, 1988, Pat. No. 4,842,579, which is a continuation-in-part of Ser. No. 18,083, Feb. 24, 1987, which is a continuation-in-part of Ser. No. 874,546, Jun. 16, 1986, Pat. No. 4,732,154, which is a continuation-in-part of Ser. No. 609,846, May 14, 1984, abandoned. This application Dec. 19, 1988, Ser. No. 286,509
Int. Cl.[4] A61B *17/32*
U.S. Cl. 604—22 **24 Claims**



1. An atherectomy system for coring, ingesting and removing an obstruction from within a patient's vessel, comprising in combination:
a flexible guide-wire insertable into the vessel,
a flexible rotary catheter, rotably disposed and insertable into the vessel over said flexible guide-wire, having at its distal end a rotary coring means for making a circular cut in an obstruction located in front of it, and coupling means at its proximal end,
a continuous passage, for ingesting the cored obstruction material, defined between said flexible rotary catheter and said flexible guide-wire, where the relative motion between said flexible rotary catheter and said flexible guide-wire assists in moving said ingested obstruction material proximally in said continuous passage, and,
a sleeve in which said flexible catheter is slidably disposed, said sleeve having an elongated tongue extending from its distal end, said tongue defining inside said vessel an eccentrically biased trajectory for said coring means to move along.

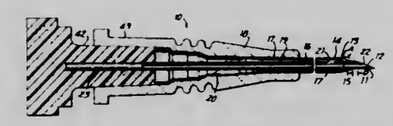
VOL 1110 ISS 3 JA 16 1990

4,894,052

FLASH DETECTION IN AN OVER THE NEEDLE CATHETER WITH A RESTRICTED NEEDLE BORE

Mark A. Crawford, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 22, 1988, Ser. No. 234,664
Int. Cl.[4] A61M 5/18
U.S. Cl. 604—63 **17 Claims**



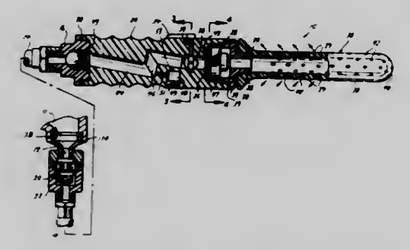
1. A catheter introducer for carrying a coaxially placed over the needle catheter into a blood vessel comprising:
a needle assembly including an elongate hollow tube including a wall defined by an inside and an outside surface with a bore therethrough and a tip at one end of said tube and a hub at the other;
a tubular translucent catheter formed for coaxial placement over said needle tube and to be carried thereby during a penetration procedure for introducing said catheter into a blood vessel and said catheter being elongate with an end positioned just proximal to said needle tip and extending therefrom over and along said tube toward said hub;
a catheter adapter having a body connecting to said catheter at an end near said needle hub and fitted to said catheter in fluid tight relation, and said body including an internal chamber shaped to fit over at least a part of said hub coaxially aligning said catheter relative to said needle tube;
a cavity located between said outside surface of said tube, said catheter extending along said needle tube from said catheter tip end to said hub end;
a port passing through said needle tube from said bore to said cavity for permitting fluid communication from said needle bore near said needle tip to said cavity near said hub;
restriction means associated with said hub for substantially inhibiting flow through said bore within an area in said bore between said port and said hub; and
blood separation and venting means associated with said hub for cooperating with said catheter adapter chamber to allow liquid in said cavity to remain in a portion of said hub which contains liquid blood and vents gas.

4,894,053

DOUCHE APPARATUS

David C. Reddick, 3866 Fairview, St. Louis, Mo. 63116

Filed Aug. 26, 1988, Ser. No. 236,723
Int. Cl.[4] A61M 3/00
U.S. Cl. 604—85 **4 Claims**



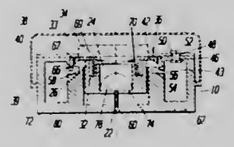
1. A douche apparatus, comprising:
a. means for adapting said apparatus to a source of combined hot and cold water from individual supplies that permit adjustment of flow and mix for volume and temperature setting,
b. a nearly cylindrical handle having a first threaded female receptacle at one end, and second female threaded receptacle at its opposite end, and a hollow, liquid, axial flow channel between said female receptacles, said flow channel having a transverse transition at a location intermediate the opposing ends of said handle,
c. means connected between said adapting means and said first threaded female receptacle of said handle for communicating water from said source,
d. an additive chamber radially disposed between the outer surface of said handle and said flow channel at a point downstream from said transition, said chamber having a fluid input connection from said transverse transition and a fluid return connection to said axial flow channel after said transition, said additive chamber having a female threaded entry and a cap with corresponding male threads for positive closure,
e. a gate valve rotatably disposed in said axial flow channel between said fluid return and said second female receptacle said gate valve connected to a rotatable stem transversely exiting said handle to an attached valve handle rotatably operable upon the surface of said douche apparatus handle between two stops located thereon, said stops corresponding to the fully closed and open conditions of said gate valve in said flow channel,
f. a macro screen receptacle between the terminus of said flow channel and said second female receptacle,
g. a micro screen within said second female receptacle abutting said macro screen,
h. a handle end cap threaded into said second female receptacle,
i. a cylindrically-shaped tube having a hollow central portion and an open end with one side of a mating connector for connection to the exit of said nearly cylindrical handle, said cylindrically-shaped tube having a plurality of holes spiralling radially downward and around said tube toward its open end, from said hollow, central portion to its exterior, and a semi-spherically-shaped tip at its opposite end, said tip having a hollow central portion connecting with the hollow central portion of said cylindrically-shaped tube, and a plurality of holes directed radially downward and around said tip towards said holding means, from said hollow, central portion of said tip to its exterior,
j. a thermostaticaly controlled valve connected between said adapting means and said communicating means, and
k. a back-flow prevention valve connected between said adaptive means and said nearly cylindrical handle.

4,894,054

PRELOADED AUTOMATIC DISPOSABLE SYRINGE

Shir A. Miskinyar, 13342 Clinton St., Garden Grove, Calif. 92643

Filed Jun. 20, 1988, Ser. No. 208,486
Int. Cl.[4] A61M 5/20
U.S. Cl. 604—136 **22 Claims**



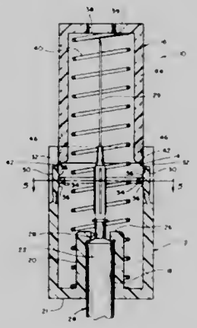
1. A disposable, subcutaneous injection syringe which comprises:
a. a cylindrical housing having an outer diameter greater than its length and having a central, cylindrical well, a first aperture in its bottom wall and a second aperture in its top wall;
b. a cylinder having an outer diameter to be received in said cylindrical well of said housing and received therein for sliding movement between said apertures, a through bore in the bottom wall of said cylinder and a hypodermic needle permanently mounted therein, and a piston slidably received in said cylinder;
c. a dispenser carriage mounted in said housing and moveable therein through an axial distance less than said outer diameter of said cylinder, between retracted and extended positions;
d. a trigger button carried on said carriage and projecting through said second aperture;
e. means coupling said piston to said carriage;
f. cylinder retraction means within said housing to maintain said needle withdrawn in said housing;
g. a single actuator spring received within said housing and bearing against said cylinder to extend said needle through said first aperture in the bottom wall of said housing;
h. a single detent, which engages said carriage in its retracted position and restrains its movement in said housing; and
i. a sterile seal cover extending across said first aperture.

4,894,055

NEEDLE GUARD ASSEMBLY FOR USE WITH HYPODERMIC SYRINGES AND THE LIKE

Paul J. Sadnak, 1210 Cote Sans Dessein, Fulton, Mo. 65251

Filed Dec. 28, 1988, Ser. No. 291,062
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—198 **27 Claims**



1. A needle guard assembly for use in conjunction with a syringe device having a needle projecting from one end portion thereof comprising a first tubular member having spaced opposed end portions and an inner and outer surface, said first tubular member having means associated with one end portion thereof for cooperatively receiving the needle end portion of a syringe device with the needle extending therethrough, a second tubular member telescopingly positioned within said first tubular member and extending endwardly from the free end portion of said first tubular member, said second tubular member being movable between an extended position and a position wherein said member is at least partially retracted within said first tubular member, means biasing said second tubular member to its extended position, bendable tab means associated with said first tubular member adjacent the free end portion thereof including means biasing said tab means outwardly so that the inner surface thereof is substantially coplanar with the inner surface of said first tubular member, movement of said second tubular member into said first member moving the means biasing said tab means out of engagement with said tab means enabling said tab means to move inwardly behind the one end portion of said second tubular member when said biasing means moves said second tubular member to its extended position thereby preventing said second tubular member from again moving into said first tubular member.

4,894,056

METHOD AND APPARATUS FOR CLEARING OCCLUDED LUMENS OF ENTERAL FEEDING TUBES

Alexander A. Bommarito, 12555 W. Freeland Rd., Freeland, Mich. 48623

Continuation-in-part of Ser. No. 56,453, Jun. 1, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 163,749
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—267 **1 Claim**



1. A method for removing occlusions from tubes employed for enteral feeding which comprises inserting an inner polycarbonate tube having a first end and a second end into said occluded tube, said inner tube having pressure distributor means slidably and fixedly positioned between said first and second ends, said inner tube being positioned such that said first end is adjacent to the occlusion to be removed, said second end being adapted to supply water or enzyme solutions to said inner tube, and passing warm water or an enzyme solution through said inner tube while applying a force to the pressure distributor means and providing a rotary and/or oscillatory motion to said inner polycarbonate tube which pushes said tube against said occlusion so as to dislodge and remove said occlusion, the pressure distributor means being adjusted such that said means slide on said inner tube before a force sufficient to perforate said enteral feeding tube is reached.

4,894,057

FLOW ENHANCED MULTI-LUMEN VENOUS CATHETER DEVICE

Randolph M. Howes, 4540 Fort Macomb Rd., New Orleans, La. 70129

Filed Jun. 19, 1987, Ser. No. 63,918
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—280 **11 Claims**

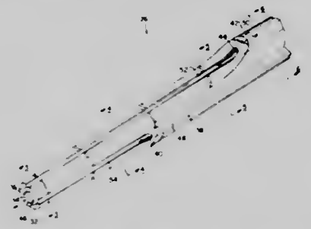
1. A venous catheter device comprising:
an elongated flexible catheter tube having an outer wall, a proximal end and a longitudinally extending distal end portion with a catheter tube distal terminus for insertion into and capable of being fed longitudinally through a vein;
at least three independent lumens extending through said catheter tube including a distal lumen, a middle lumen and a proximal lumen;
each of said lumens having a wall, a proximal end and a lumen distal terminus formed in said longitudinally extending distal end portion;
said lumen distal termini being spaced longitudinally from

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each other to define a diatal lumen distal terminus, a middle lumen distal terminus, and a proximal lumen distal terminus, respectively;

at least two of said distal lumen termini cooperating with groove means located in the outer wall of said distal end portion and communicating with said at least two distal



lumen termini for providing a flow-enhanced outflow path from said at least two distal lumen termini along the outer wall of said distal end portion, and each of the proximal ends of said lumens including lumen adapter means for permitting connection to independent fluid devices.

4,894,058

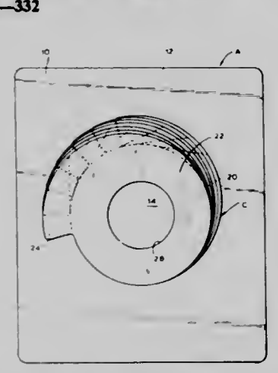
ADHESIVE CONNECTING RINGS FOR AN OSTOMY DEVICE

Ole R. Jensen, River Vale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 145,975, Jan. 20, 1988, abandoned, which is a division of Ser. No. 917,070, Oct. 8, 1986, Pat. No. 4,753,703. This application May 10, 1989, Ser. No. 351,276

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—332 **1 Claim**



1. An ostomy device comprising a faceplate, adapted for use with a collection pouch, a plurality of stacked adhesive connecting ports on the surface of the faceplate in angularly offset relation, each of said parts comprising a substantially annular base layer adhesively coated on both surfaces and a cover layer situated on one of said adhesively coated base layer surfaces, said cover layer comprising an annular portion which substantially covers said base layer and a radially extending gripping portion defined by a first straight edge extending substantially radially outwardly from said annular portion and a second substantially circumfrentially extending edge of a substantially greater length than said first edge which gradually tapers from said first edge until it is substantially coincident with the peripheral edge of said annular portion, the top one of said parts having a cover layer with a gripping portion which substantially obscures the gripping portions of the underlying parts but is angularly offset therefrom to facilitate removal thereof, each of said parts being adapted to removably mount a collection pouch to said faceplate when the cover layer which forms a portion thereof is removed.

4,894,059

CATHETER APPLICATOR FOR URINARY INCONTINENCE EQUIPMENT

J. K. Larsen, Allerod, and Michael Morris, Copenhagen, both of Denmark, assignors to Coloplast A/S, Denmark

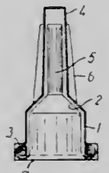
PCT No. PCT/DK86/00105, § 371 Date May 22, 1987, § 102(e) Date May 22, 1987, PCT Pub. No. WO87/01582, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 22, 1986, Ser. No. 60,392

Claims priority, application Denmark, Sep. 24, 1985, 4317/85

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—349 **7 Claims**



1. A male urinary incontinence device comprising a male catheter for external application which includes a draining portion and a rolled-up portion, said rolled-up portion being capable, of unrolling into a substantially cylindrical body of elastic material open at an end farthest from said drainage portion for receiving a male penis; and in contact with said catheter, an applicator having a substantially cylindrical tubular member comprised of material having greater rigidity than said catheter, said tubular member having an opening for receiving part of said catheter other than said rolled-up portion and said tubular member further having an external surface which includes a means for contacting and retaining said rolled-up portion of said male catheter in a position along an outer circumference of said tubular member and of retarding the unrolling of said rolled-up portion until said rolled-up portion is unrolled by a user, said tubular member including a hollow gripping member having an internal cavity capable of encircling the entire length of said drainage portion of said catheter.

4,894,060

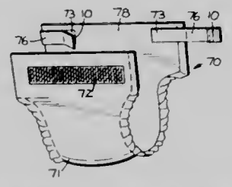
DISPOSABLE DIAPER WITH IMPROVED HOOK FASTENER PORTION

Susan K. Nestegard, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 11, 1988, Ser. No. 142,551

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—391 **13 Claims**



1. A disposable garment or diaper including a flexible laminate adapted to be applied around a portion of an individual, and hook and loop fastener means for fastening together spaced portions of said laminate to secure said garment or diaper to the individual, said fastener means includes at least one loop fastener portion defining loops attached to one of said portions, and at least one unitary hook fastener portion of a resiliently flexible, polymeric resin comprising a base having generally parallel upper and lower major surfaces with said lower surface fastened to a different one of said portions of said laminate, and at least 45 spaced hook members per square centimeter projecting at generally a right angle from the upper surface of said base and adapted to releasably engage the loops of said loop fastener portion, said hook members having a height from said upper surface of less than 1.5 millimeters and each comprising a stem portion attached at one end to said base, and a head portion at the end of said stem portion opposite said base, which head portion has a rounded surface opposite said stem portion, said stem and bead portions having generally the same thickness of less than 0.046 centimeter in a first direction parallel to the surfaces of said backing said stem portion having a width in the range of 0.018 to 0.03 centimeter in a second direction generally at a right angle to said first direction and parallel to the surfaces of said backing; and said head portion having a width at least 0.007 centimeter greater than said stem portion and a total width of less than about 0.1 centimeter in said second direction, the total cross sectional area of said head portions in a plane parallel to said upper surfaces being less than 32 percent of the area of said upper surface.

4,894,061

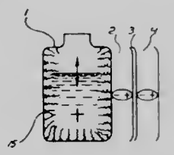
CONTAINER FOR AND METHOD OF PRESERVING AND INCREASING BACTERICIDAL PROPERTY OF POSITIVE SILVER IONS SOLUTIONS

Meisey Dobrushkin, 483 Ocean Pkwy., Brooklyn, N.Y. 11218

Filed Nov. 30, 1987, Ser. No. 126,872

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—403 **17 Claims**



15. A container for preserving bactericidal property of positive silver ions solutions, comprising

a wall bounding an inner chamber for accommodating a positive silver ions solution; and

means for supplying additional energy to the positive silver ions solution so as to prevent decrease of electric charge of the positive silver ions solution accommodated in said inner chamber, said means including a layer associated with said wall and electrically charged so as to additionally charge the positive silver ions solution through said wall.

4,894,062

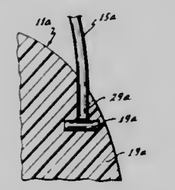
STAKING ANCHOR FOR SOFT IOL

Patrica M. Knight, Laguna Niguel; Vladimir Portnoy, Irvine; F. Richard Christ, Orange; Alan E. Alonso, El Toro; Stanley L. Van Gent, Irvine, and Lyle E. Paul, El Toro, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 804,674, Dec. 4, 1985, Pat. No. 4,834,751. This application Dec. 2, 1988, Ser. No. 279,439

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **6 Claims**



1. An intraocular lens comprising:

an optic which is deformable to facilitate insertion of the optic through an incision into the eye;

first and second fixation members, each of said fixation members having a proximal end portion;

first and second anchors coupled to the proximal end portions of the first and second fixation members, respectively, at least one of said anchors including a filament extending transversely on both sides of the associated fixation member at the location where said one anchor is coupled to such fixation member, said filament being substantially perpendicular to the associated fixation member at said location;

said optic being molded over said anchors and said proximal end portions;

said anchors and proximal end portions being within peripheral regions of the optic whereby the anchors assist in attaching the fixation members to the optic; and

said anchors being spaced apart whereby the deformable optic can be folded to facilitate insertion of the optic through an incision into the eye.

4,894,063

BARRIER LAYER FOR IMPLANTABLE TENDONS AND LIGAMENTS

Aws S. Nashef, Costa Mesa, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed May 24, 1983, Ser. No. 497,490

Int. Cl.[4] A61F *2/08*

U.S. Cl. 623—13 **30 Claims**



1. A method of interfacing a tendon or ligament within a channel of resected bone, comprising: inserting a substantially cylindrical sleeve having an outer surface of soft biological tissue through a channel of resected bone such that the biological tissue is in contact with said resected bone and a barrier is formed between said resected bone and a tendon or ligament inserted therethrough; said sleeve having a first and second open end portion, a longitudinal passage extending between

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said first and second end portions, wherein said longitudinal passage has internal dimensions sufficient to receive a tendon or ligament therethrough, and overall external dimensions sufficient to extend through at least a portion of the resected bone channel.

4,894,064

ENDOPROSTHESIS FOR A HIP-JOINT SOCKET

Martin Imhof, Rothrenz, Switzerland, assignor to W. Hermann AG, Steinhausen, Switzerland

Filed Nov. 4, 1988, Ser. No. 267,314

Claims priority, application Switzerland, Nov. 9, 1987, 4364/87

Int. Cl.[4] A61F *2/36*

U.S. Cl. 623—22 **7 Claims**

1. An endoprosthesis for a hip-joint socket, comprising:

shell sleeve member capable of receiving a bearing socket;

id shell sleeve member possessing a pole region and an outer surface;

said shell sleeve member possessing the shape of a body of revolution which tapers towards said pole region;

self-tapping thread means provided at said outer surface of said shell sleeve member;

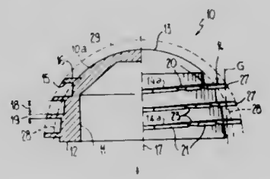
said self-tapping thread means comprising substantially flat upper and lower thread flanks;

said body of revolution defining a lengthwise axis;

said upper and lower thread flanks being parallel and disposed at approximately right angles to said lengthwise axis of said body of revolution;

said self-tapping thread means comprising thread flights which are spaced from one another;

said self-tapping thread means having an essentially constant pitch;



each of said thread flights having cutting means formed therein;

said cutting means being circumferentially spaced from each other along each said thread flight and defining thread portions between each two successive cutting means; and

each one of said thread portions defining a circumferential portion containing an undercut region.

4,894,065

METHOD FOR PRODUCING WOOL DYEINGS OF IMPROVED LEVELNESS AND DYE MIXTURES USEFUL THEREFOR: PARAMETERS FOR COMBINATION CAPACITY AND COMPENSATION OF VARIABLE AFFINITY FOR WOOL FROM ROOT TO TIP OF FIBER

Oskar Annen, Aesch; Wolfgang Beck, Basel, and Josef Franeaknecht, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 3, 1988, Ser. No. 163,444

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706909

Int. Cl.[4] C09B *67/22, 69/04;* D06P *1/60, 3/16*

U.S. Cl. 8—638 **21 Claims**

1. A mixture of anionic dyestuffs, each anionic dyestuff having a skitteriness value SK' at pH5 in the range 1 to 5 and a combinability value K' at pH5 in the range 1 to 10 and said dyestuffs being present in a weight ratio such that the mixture has a value SK' at pH5 of from 3 to 4 and a value K' at pH5 of from 4 to 5.

4,894,066

METHOD TO PRODUCE FUEL FROM SOLID URBAN REFUSE, THE METHOD INCLUDING ALSO AN ORGANIC COMPOSTED FRACTION

Luigi Castelli, Trieste, Italy, assignor to Daneco Danieli Ecologia SpA, San Giovanni Al Natisone, Italy

Filed Apr. 19, 1988, Ser. No. 183,221

Claims priority, application Italy, Apr. 28, 1987, 83365 A/87

Int. Cl.[4] C10L *5/40, 5/00*

U.S. Cl. 44—589 **5 Claims**

1. A method for producing fuel from solid urban refuse, comprising composting the organic fraction of the refuse with an accelerated forced-draught system, and mixing the composted organic fraction with dry, mature compost.

4,894,067

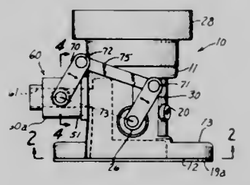
LOW PROFILE GASEOUS FUEL CARBURETOR

Richard Bayerstock, Long Beach, Calif., assignor to Carbumatic B.V., Rijswilk, Netherlands

Filed Nov. 18, 1987, Ser. No. 121,981

Int. Cl.[4] F02M *21/04;* G05G *7/02*

U.S. Cl. 48—180.1 **10 Claims**



1. A gaseous fuel carburetor comprising:

a body having a passage wall forming a passage having an axis of downstream flow, an upstream air intake port, and a downstream mixture outlet port, said passage incorporating a reduced venturi between said ports;

an adjustable throttle valve means in said passage, said throttle valve means including a rotatable throttle shaft to set the throttle valve means;

said passage wall having a plurality of gas injector ports opening into said passage so as to discharge gas into said passage, and a plurality of deflector vanes on said passage wall, each vane of said plurality of deflector vanes being upstream from and overhanging a respective injector port, each said deflector vane having an upstream facing face, a downstream facing face and a free tip end, said faces extending from said wall into said passage, and sloping downstream, there being substantial spacings between the tip ends of said vanes and between said vanes to permit unimpeded axial flow of air past them; and

a gas supply conduit connected to said gas injector ports for supplying gas to the injector ports.

10. A gaseous fuel carburetor comprising:

a body having a passage wall forming a passage having an axis of downstream flow, an upstream air intake port, and a downstream mixture outlet port, said passage incorporating a reduced venturi between said ports;

an adjustable throttle valve means in said passage, said throttle valve means including a rotatable throttle shaft to set the throttle valve means;

said passage wall having a plurality of gas injector ports opening into said passage so as to discharge gas into said passage;

a rotary metering valve mounted to said body, said metering valve having an inlet port, a valving chamber, and a valving port in that order, said valving chamber having a cylindrical wall with a valving axis said valving port being disposed in said valving chamber wall, a valve rotor rotatably mounted in said valving chamber, said valve port being connected to said gas supply conduit, and said inlet port being adapted to receive gas to be metered by said metering valve.

said throttle shaft and said valve rotor each having a respective center or rotation, the centers of rotation of said throttle shaft and of said valve rotor being spaced apart by a fixed reference spacing, a throttle lever being fixed to said throttle shaft to rotate it, and a rotor lever being fixed to said rotor to rotate it; and a linkage pivotally attached to pivot pins and disposed on both levers at pivot points equally distant from said centers of rotation to maintain the separation of the pivot points from one another substantially equal to the reference spacing and defining a separation axis, whereby the two shafts rotate simultaneously through substantially equal rotation angles,

said linkage comprising a pair of identical plates held in and laid in flat sliding adjacency to one another, each of said plates having a pair of slots located at opposite ends of the plate defining contact surfaces facing in the same direction along the separation axis to engage a respective pin at a respective pivot point, and said plates being laid reversely relative to one another so that the contact surfaces of one plate face toward the respective contact surfaces of the other plate, the contact surfaces on both plates being spaced apart by a distance equal to the reference spacing, and resilient bias means connected to said plates in tension so as to draw the contact surfaces against respective pivot pins, and the pivot pins having identical dimensions in contact with said contact surfaces.

4,894,068

PROCESS FOR CAPTURING NITROGEN FROM AIR USING GAS SEPARATION MEMBRANES

Arthur W. Rice, O'Fallon, Mo., assignor to Permea, Inc., St. Louis, Mo.

Filed Dec. 27, 1988, Ser. No. 289,836

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **5 Claims**

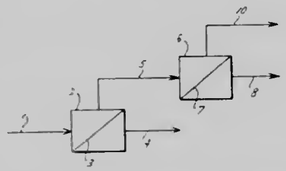
1. A process for producing refined relatively pure nitrogen gas wherein the oxygen level is less than about 2,000 ppm from air, the process comprising:

(a) moving compressed air into a first separator containing a first set of a plurality of hollow fiber membranes confined in a container, the first separator being adapted to permit selectively the passage therethrough of oxygen, carbon dioxide and water vapor while restraining the passage therethrough of nitrogen;

(b) maintaining a pressure differential between the bore surface of the hollow fiber membranes and the external surface of the hollow fibers membranes;

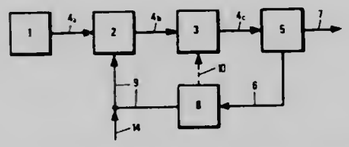
VOL 1110 ISS 3 JA 16 1990 UMI

(c) moving the resulting nonpermeate gas longitudinally through the bores of the hollow fiber membranes and out the ends of the hollow fiber membranes and from the first separator;
(d) venting the resulting permeate gas from the external surfaces of the membranes in the first separator;
(e) moving the resulting nonpermeate gas whose nitrogen content has been increased as compared to the source air and whose oxygen content has been significantly reduced as compared to the source air from the first separator without additional compressional forces being applied thereto into internal contact with a second separator containing a second set of a plurality of hollow fiber membranes confined in a container, the separator being



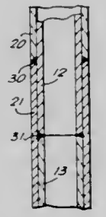
adapted to permit selectively the passage therethrough of oxygen, carbon dioxide and water vapor while restraining the passage therethrough of nitrogen;
(f) maintaining a pressure differential between the bore surface of the second set of hollow fiber membranes and the external surface of the second set of hollow fiber membranes;
(g) moving the noopermeate gas longitudinally through the bores of the second set of hollow fiber membranes and out the ends of the second set of hollow fiber membranes and from the second separator;
(h) venting the resulting permeate gas from the external surfaces of the membranes in the second separator; and
(i) thereafter collecting under pressure the nonpermeate gas from the second separator.

4,894,069
METHOD OF CONVEYING AN ESSENTIALLY GASEOUS FLUID THROUGH A PIPE
Marcel Arnaudeau, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France
Continuation-in-part of Ser. No. 802,904, Nov. 29, 1985, abandoned, which is a continuation of Ser. No. 343,624, Jan. 28, 1982, abandoned, and a continuation of Ser. No. 11,818, Feb. 13, 1979, Pat. No. 4,325,712. This application Jun. 28, 1988, Ser. No. 212,079
Claims priority, application France, Feb. 13, 1978, 78 04331
The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—89 **16 Claims**



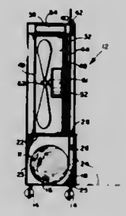
1. A method for pressurizing and conveying a substantially gaseous fluid from a site of a geological source to a remote location through a pipe having an inlet connected to the geological source from which the gaseous fluid is obtained, which method comprises the steps of:
(a) establishing communication between said pipe and a pump having an outlet and an inlet, the pump being capable of pumping and increasing the pressure of diphasic fluids;
(b) admixing said substantially gaseous fluid with a liquid at the inlet of the pump to produce diphasic fluid comprising a mixture of a gas and a liquid, sufficient liquid being added in said mixing for producing a diphasic fluid having a gas-to-liquid volumetric ratio substantially equal to the maximum value capable of being pumped by the pump;
(c) pumping and increasing the prssure of the diphasic fluid from step (b) with the pump capable of pumping and increasing the pressure of diphasic fluids for producing a pressurized diphasic fluid, this pressurized diphasic fluid comprising a gaseous phase and a liquid phase; and
(d) conveying the pressurized diphasic fluid from step (c) through the pipe to said remote location.

4,894,070
FILTRATION OF FLUID MEDIA
Wolfram Keidel; Wilhelm Baring, and Rolf Loos, all of Borken, Fed. Rep. of Germany, assignors to Foseco International Limited, Birmingham, England
Filed Nov. 10, 1988, Ser. No. 269,826
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 8715130
Int. Cl.[4] B01D *29/32, 46/24*
U.S. Cl. 55—96 **15 Claims**



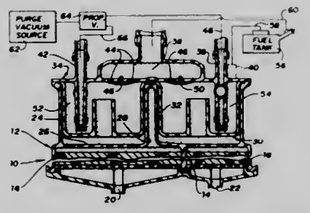
1. A method of filtering particulate matter from a fluid media comprising the steps of providing an elongated tubular porous ceramic filter, forming said filter by forming a plurality of tubular portions formed of ceramic fiber and a binder in two different diameters, overlapping the tubular portions of different diameters one with the other with a first set thereof received within a second set thereof, and bonding the sets of tubular portions in end-to-end relation respectively, using an adhesive at bonding points therebetween such that the end-to-end bonding points of the two different sets of tubular portions are axially offset one from the other, and passing the media through the elongated tubular porous ceramic filter so that fluid passes through the filter body, but the particulate matter does not.
4. An elongated tubular filter comprising:
a plurality of porous ceramic material tubular portions, each tubular portion comprising ceramic fiber and a binder;
said plurality of tubular portions comprising a first plurality having a first cross-sectional area, and further comprising a second plurality having a second cross-sectional area greater than said first cross-sectional area, so that said second portions are adapted to receive said first portions therein; and
means for holding said first and second pluralities of said tubular portions in axially aligned end-to-end relation, respectively, to form a composite elongated tubular filter, comprising means defining an overlapping configuration of the portions including said second portions receiving said first portions, and an adhesive at bonding points associated with said overlapping configuration including between the ends of said axially aligned first and second pluralities of said tubular portions, respectively, and wherein the bonding points between the portions of said first plurality are off-set axially with respect to the bonding points between said second plurality.

4,894,071
PORTABLE AIR CLEANER
Max Klein, Shrewsbury, N.J., assignor to Tech Paper, Inc., Pittsfield, Mass.
Filed Sep. 27, 1988, Ser. No. 249,855
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—97 **18 Claims**



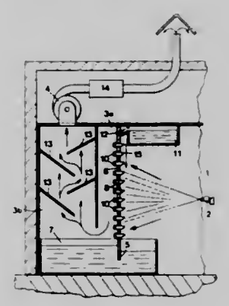
1. A method of cleaning air from pollutants in a workshop having a free space comprising the steps of providing a free-standing hollow frame having an open front, an open back, and an axial fan therein, placing a sheet of filter medium across the open front of said casing so that operation of the fan draws air from the free space into the casing through said sheet of filter medium and discharges the air to said free space, placing said frame in the vicinity of a pollution-generating location within the workshop so that the open front and open back of the frame communicate with said free space, energizing said fan to create a substantial flow of air through said open front and open back of said frame and said sheet of filter medium, said flow causing pollutants entrained in the air to lodge in said filter medium, periodically removing at least a portion of said sheet of filter medium from said frame and replacing it with a fresh sheet of filter medium, and disposing of the pollutants lodged in said removed sheet of filter medium.

4,894,072
HIGH EFFICIENCY VAPOR STORAGE CANISTER
Kenneth W. Turner, Webster; Charles H. Covert, Manchester, and Patti S. DuBois, Hamlin, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 27, 1989, Ser. No. 328,916
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—179 **2 Claims**



1. For use in a vehicle having a fuel tank from which a relatively smaller volume of diurnal fuel vapors is continually generated, and from which a relatively larger volume of fuel fill vapors is displaced less frequently during the fill operation, and also having a source of purge air, a vapor storage canister providing improved efficiency in the storage and purging of both said diurnal and said fuel fill vapors, said canister comprising,
a generally elongated, adsorbent filled housing having a total volume partitioned into a pair of separate bed portions, including a relatively larger first bed portion, and a relatively smaller second bed portion having just sufficient capacity to store said diurnal fuel vapors,
a diurnal vapor inlet opening only to said second bed portion,
a fill vapor inlet opening to both said first and second bed portions and adapted to distribute said fuel fill vapors simultaneously to each of said first and second bed portions in proportion to the ratio of its particular volume to the total volume, and,
purge means allowing purge air to be selectively applied to said bed portions,
whereby, said second bed portion may be loaded separately by said diurnal vapors only and later purged more thoroughly by a given volume of purge air than would an adsorbent bed of greater volume purged by the same volume of purge air, and during fuel fill, both bed portions may be loaded simultaneously and substantially at the same rate by said fuel fill vapors and then purged later, thereby giving an effective capacity substantially equal to a single bed with a volume equal to both of said bed portions.

4,894,073
FILTER
Erhard C. Andrese, CH - 1122, Romanel-sur-Morges, Switzerland
Filed Mar. 23, 1989, Ser. No. 327,554
Claims priority, application United Kingdom, Apr. 9, 1988, 8808372
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—240 **4 Claims**



1. Apparatus comprising: a housing defining a vacuum chamber; a wet wall comprising at least part of the housing, which wet wall is provided with a plurality of through holes including a plurality of tubes positioned in the holes which tubes communicate respectively with the vacuum chamber and with the surroundings of the housing; a plurality of deflector means situated in the vacuum chamber and being spaced from said tubes; a liquid source; and a liquid collecting tank, which tank communicates with both the vacuum chamber and said surroundings and into which tank the wet wall extends; said liquid source being located such that liquid therefrom flows over a surface of the wet wall external to the housing, and is drawn together with air from the surroundings and any impurities carried in that air, via the plurality of tubes, into the vacuum chamber as a liquid-air mixture, the movement of this

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liquid-air mixture in a direction parallel to the tubes being impeded by the deflector means.

4,894,074

FILTER FOR CLEANING EXHAUST GASES OF DIESEL ENGINES

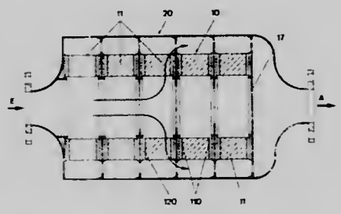
Tiberiu Mizrah, Schaffhausen; Albert Maurer, Thayngen, and Jean-Pierre Gabathuler, Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 28, 1988, Ser. No. 264,265

Claims priority, application Switzerland, Nov. 18, 1987, 4504/87

Int. Cl.[4] F01N *3/02*

U.S. Cl. 55—482 **4 Claims**



1. Filter for cleaning exhaust gases which comprises: a filter cup having an active filter section; an end plate made of gas-impermeable material as an insert for said filter cup; hollow cylindrical open-pore ceramic foam elements in said active filter section having a cylinder axis and end faces thereof; wherein exhaust gases flow through the active filter section essentially perpendicularly to the cylinder axis; and level, plane parallel, temperature resistant and thermal shock-resistant layers of material which are plastic at room temperature bonded on said end faces, thereby precluding bending moments from breaking the ceramic foam elements in the use, wherein said ceramic foam elements comprise cylindrical elements with two end faces with said bonded layers on each end face thereof, and including a plurality of said ceramic foam elements with bonded layers assembled in said filter cup.

4,894,075

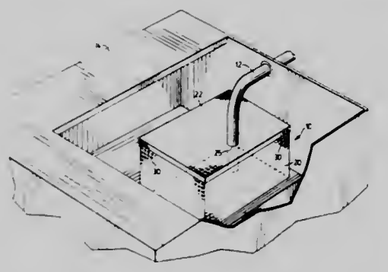
FILTER FOR A FLUIDIZED BED POWDER COATING APPARATUS

Richard A. Gerrard, Brantford, Canada, assignor to Richard A. Gerrard, Brantford, Canada

Filed Mar. 9, 1989, Ser. No. 321,093

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—484 **8 Claims**



1. A filter for a fluidized bed powder coating apparatus, said apparatus having a fluidized hopper in which powder coating particles are maintained in a fluidized state by the flow of air therethrough, and having a tubular conduit extending from the fluidized hopper through which powder coating particles may exit the hopper, the filter comprising:

an enclosure sized to fit within the hopper, the enclosure having a fitting for receiving an end portion of the tubular conduit and having a wall defining a plurality of apertures each being from about 1 mm to about 5 mm in diameter, the powder coating particles being required to pass through the filter before entering the tubular conduit.

4,894,076

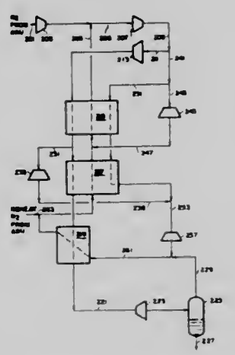
RECYCLE LIQUEFIER PROCESS

Thaddeus N. Dobracki, Emmaus; John D. Dubbs, Coopersburg; Roger M. McGuinness, Macungie, and Janice C. Peterson, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 17, 1989, Ser. No. 297,463

Int. Cl.[4] F25J *1/00*

U.S. Cl. 62—9 **9 Claims**



1. A process for the liquefaction of an atmospheric gas comprising:

(a) compressing in a compression zone one or more atmospheric gas feed streams to produce an intermediate pressure stream and a high pressure stream;

(b) cooling the high pressure stream;

(c) removing at least a portion of the high pressure stream as a high pressure stream, side-stream and expanding the high pressure stream, side-stream in a first expansion step thereby providing refrigeration and producing a first expansion discharge;

(d) further cooling and expanding the cooled high pressure stream in a second expansion step thereby producing a partially liquefied second expansion discharge;

(e) phase separating the partially liquefied second expansion discharge into a vapor stream and a liquid product stream;

(f) removing at least a portion of the intermediate pressure stream as an intermediate pressure stream, side-stream and expanding the intermediate pressure stream, side-stream in a third expansion step, thus providing refrigeration and producing a third expansion discharge;

(g) cooling the intermediate pressure stream;

(h) combining the cooled intermediate pressure stream of step (g) the first expansion discharge of step (c) to form a first combined stream, and expanding the first combined stream in a fourth expansion step, thus providing refrigeration and producing a fourth expansion discharge; and

(i) warming and subsequently recycling to the compression zone the fourth expansion discharge of step (h), the vapor stream from step (e) and the third expansion discharge of step (f).

4,894,077

METHOD OF ACCUMULATING AND RESTITUTING COLD AND DEVICE FOR IMPLEMENTING SUCH METHOD

Laszlo Simon, Satigny, and Jean Pfau, Collonge-Bellerive, both of Switzerland, assignors to Coldeco S.A., Carouge, Switzerland

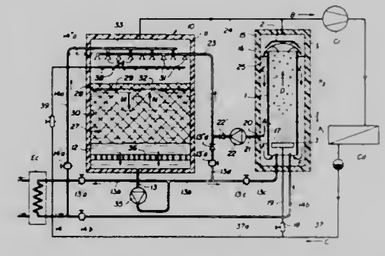
PCT No. PCT/CH87/00007, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987, PCT Pub. No. WO87/04509, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 16, 1987, Ser. No. 110,691

Claims priority, application Switzerland, Jan. 18, 1986, 00180/86

Int. Cl.[4] F25D *3/00*

U.S. Cl. 62—59 **23 Claims**



1. In a method of accumulating and restituting cold, wherein, during cold-accumulating phases, in a storage vessel containing a mass of cold-accumulating and cooling liquid, a cluster of rigid aggregates of crystals of said liquid is accumulated in a frozen state, and wherein, during cold-restitution phases, the cold accumulated in said storage vessel is restituted to a utilization circuit comprising at least one heat exchanger by fusion of said crystals in said vessel, by circulating a stream of said liquid in a closed circuit successively through said cluster and said utilization circuit, the improvement wherein during the cold-accumulation phases, a rigid piston is created formed of a porous compact cluster of said crystal aggregates, of uniform thickness and height and of homogeneous structure, free from cavities, free spaces and other defects of macroscopic homogeneity of its structure, said piston being impregnated with cold-accumulating and cooling liquid, up to the height of a free surface of said mass of liquid, said piston being created by forming said rigid crystal aggregated directly in said vessel on the upper surface of said cluster and by uniformly resorbing said piston from the top, in the course of said cold-restitution phases, by uniformly spraying an upper surface thereof with cold-accumulating and cooling liquid which is withdrawn at the bottom of said storage vessel and reheated above its freezing temperature after passage thereof in the utilization circuit, and wherein said piston is permitted to slide freely, as a whole, along the vertical wall surfaces of said storage vessel, downwardly during the cold-accumulation phases and upwardly during the cold-restitution phases whereby to maintain the integrity of the structure of said piston.

4,894,078

METHOD AND APPARATUS FOR PRODUCING OPTICAL FIBER

Hiroaki Takimoto, and Katsuji Sakamoto, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 3, 1988, Ser. No. 252,107

Claims priority, application Japan, Oct. 14, 1987, 62-257234

Int. Cl.[4] C03C *25/02*

U.S. Cl. 65—3.4 **4 Claims**

1. A method for producing an optical fiber comprising the steps of:

drawing a fiber from a preform for an optical fiber which is heated and melted by a heating source at a constant tension,

cooling the drawn fiber by use of a cooling gas blown from a non-symmetrical blowout hole layout in such a manner that, in one of a first plane which is perpendicular to an axis of the drawn fiber and a first conical surface which has a cone point on the axis of the drawn fiber, the cooling gas is blown against the fiber from one direction on one of said first plane and said first cone surface, and in one of a second plane which is perpendicular to the axis of the drawn fiber and apart from said first plane and a second conical surface which has a cone point on the axis of the drawn fiber and is apart from said first conical surface, the cooling gas is blown against the fiber from another direction on one of said second plane and said second conical surface so that a sum of components of all vectors of the cooling gas in x and y dimensions in a three-dimensional space having a z dimension in the drawn fiber direction is substantially zero where a length and a direction of the vector are represented by a flow rate and a direction of the cooling gas, respectively, and then

coating the cooled fiber with a resin melt to obtain a finished optical fiber.

2. An apparatus for producing an optical fiber comprising:



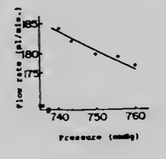
means for drawing a fiber from a preform for an optical fiber which is heated and melted by a heating source and drawn at a constant tension,

a pipe means for cooling the drawn fiber which has blowout holes arranged in a non-symmetrical layout such that, in one of a first plane which is perpendicular to an axis of the drawn fiber and a first conical surface which has a cone point on the axis of the drawn fiber, the cooling gas is blown against the fiber from one blowout hole, and in one of a second plane which is perpendicular to the axis of the drawn fiber and apart from said first plane and a second conical surface which has a cone point on the axis of the drawn fiber and is apart from said first conical surface, the cooling gas is blown against the fiber from a second blowout fiber hole such that a sum of components of all vectors of the cooling gas in x and y dimensions in a three-dimensional space, within said pipe means, with a z dimension in the drawn fiber direction is substantially zero where a length and a direction of the vector are represented by a flow rate and a direction of the cooling gas, respectively, and which is provided around the drawn fiber,

means for coating the cooled fiber with a resin melt to obtain a finished optical fiber.

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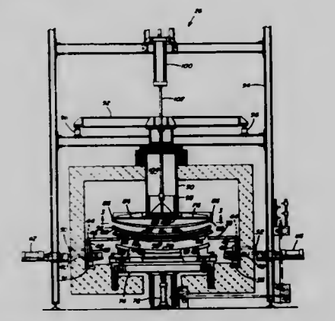
4,894,079
METHOD AND APPARATUS FOR SUPPLYING GLASS FORMING RAW MATERIAL
Akio Shiomi, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed May 17, 1989, Ser. No. 353,033
Claims priority, application Japan, May 17, 1988, 63-118069
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 **3 Claims**



1. A method for supplying a glass forming raw material in a reactor, which method comprises bubbling a carrier gas into a liquid glass forming raw material contained in a container and supplying a mixture of the glass forming raw material and the carrier gas in the reactor, wherein pressure of an atmosphere surrounding said container and said reactor is kept constant.

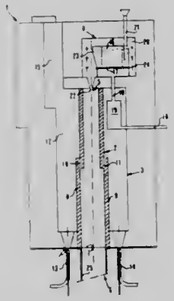
3. An apparatus for supplying a glass forming raw material in a reactor, which apparatus comprises a container for containing a glass forming raw material, means for bubbling a carrier gas in the glass forming raw material, a pressure adjusting room in which said container and said reactor are installed and means for adjusting pressure in said pressure adjusting room so as to keep said pressure constant.

4,894,080
IN-LEHR GLASS SHEET PRESS BENDING USING PRESSURIZED GAS
Thomas J. Reese, Buffalo Township, Butler County, and Joseph J. Fisher, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sep. 26, 1988, Ser. No. 248,679
Int. Cl.[4] C03B *23/023*
U.S. Cl. 65—106 **14 Claims**



1. An apparatus for shaping heat softened sheet material to a predetermined shape comprising:
- a first mold having a full surface press face and a shaping surface contoured to generally correspond to the final desired curvature of said sheet to be shaped;
- a second mold having a peripheral shaping surface corresponding to the final desired contour of the periphery of the sheet to be shaped and complimenting a corresponding portion of said shaping surface of said first mold, and a chamber defined by said peripheral shaping member;
- means to support and position said sheet to be shaped;
- means to position said support means between said first and second molds;
- means to move said first and second molds and said support means relative to each other to lift said sheet off said support means and engage said sheet between said first and second molds; and
- means to apply a fluid force to a central portion of said sheet to be shaped to urge said sheet toward said first mold press face when said sheet is engaged between said molds.

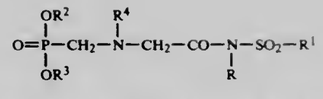
4,894,081
SPHERULIZING FURNACE
Hubert Neusy, Montignies-sur-Sambre, Belgium, assignor to Glaverbel, Brussels, Belgium
Filed Jul. 8, 1988, Ser. No. 216,646
Claims priority, application United Kingdom, Jul. 9, 1987, 8716188
Int. Cl.[4] C03B *19/10*
U.S. Cl. 65—142 **15 Claims**



1. A spherulizing furnace for manufacturing vitreous beads, comprising:
- a chamber;
- means for heating the chamber;
- feed means for delivering a particulate feedstock to one end of the chamber; and
- means for collecting vitreous beads from another end of the chamber,
- wherein the chamber comprises a pair of opposed walls which are spaced apart by a distance less than their breadth and which are angled to the horizontal so that the chamber has an upper end and a lower end, the feed means is arranged to deliver feedstock to the upper end of the chamber so that the feedstock can pass through the chamber under gravity, and the means for heating the chamber is arranged to heat at least one wall of the pair of opposed walls so that feedstock passing between the pair of opposed walls is heated by radiant heat.

4,894,082
N-SULPHONYL-N-(N'-PHOSPHONOMETHYLGLYCYL-)AMINE
Guy Borrod, and Guy Lacroix, both of Lyons, France, assignors to Rhone-Poulenc Agrochimie, Lyons, France
Division of Ser. No. 635,226, Jul. 27, 1984, Pat. No. 4,738,708. This application Apr. 14, 1988, Ser. No. 181,489
Claims priority, application France, Jul. 27, 1983, 83 12620; Feb. 23, 1984, 84 02968
Int. Cl.[4] C07F *9/40*; A01N *57/04*
U.S. Cl. 71—87 **21 Claims**

1. A compound of the formula

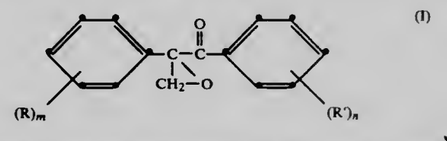


and the agriculturally acceptable salts thereof in which: R^1 denotes a hydrocarbon radical of 1 to 18 carbon atoms selected from alkyl, aryl and cycloalkyl radicals, said hydrocarbon radical being optionally substituted by one or more of the groups of haloen, phenyl, cyano, alkoxy and alkylcarboxylate; R denotes a hydrogen atom or has one of the meanings given for R^1; R^2 and R^3 are selected from alkyl and aryl groups which are optionally substituted by one or more halogen, phenyl, cyano, alkoxy and alkylcarboxylate groups; R^4 denotes a hydrogen atom or a hydrogenolyzable group.

14. A process for weeding, in which an effective dose of an active ingredient according to claim 1 is applied in contact with the leaves of the plants to be eliminated.

4,894,083
HERBICIDAL EPOXIDES
Hermann Rempfler, Ettingen, and Walter Kunz, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation-in-part of Ser. No. 934,298, Nov. 24, 1986, Pat. No. 4,849,007. This application Feb. 29, 1988, Ser. No. 161,812
Claims priority, application Switzerland, Dec. 2, 1985, 5131/85; Jun. 30, 1986, 2617/86
Int. Cl.[4] A01N *43/20*; C07D *303/32*
U.S. Cl. 71—88 **12 Claims**

1. A herbicidal and plant growth regulating composition which contains as active ingredient an effective amount of a 2-benzoyl-2-phenyloxirane of formula I

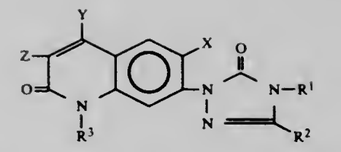


(I)

wherein each of m and n independently of the other is 0, 1, 2 or 3 and each of R and R' independently of the other is a halogen atom, a C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl or C_1–C_4 haloalkoxy group or the nitro or cyano group or a phenoxy group which is substituted by $(R)_m$, in the form of a racemate or an optically active enantiomer, together with inert adjuvants selected from (a) solid carriers with or without surfactants and (b) liquid carriers plus effective amounts of surfactants.

4,894,084
SUBSTITUTED QUINOLINONYL AND DIHYDROQUINOLINONYL TRIAZOLINONE HERBICIDES
George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.
Filed Dec. 29, 1987, Ser. No. 138,975
Int. Cl.[4] A01N *43/64*; C07D *401/04*
U.S. Cl. 71—92 **28 Claims**

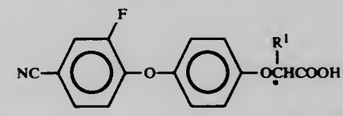
1. An herbicidal compound of the formula



in which:
- R^3 is H, alkyl, alkenyl, alkynyl, haloalkyl, haloalkenyl, alkoxyalkyl, alkoxyalkoxyalkyl, cycloalkyl, alkylthioalkyl, aralkyl, cyanoalkyl, alkoxycarbonylalkyl, hydroxy, or alkoxy;
- X is H, halogen, alkyl, or haloalkyl;
- Y is H, halogen, alkyl, haloalkyl, alkoxycarbonyl, cyano, or nitro;
- Z is H, halogen, alkyl, haloalkyl, alkoxy, alkenyl, alkynyl, haloalkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxycarbonyl, cyano, or nitro;
- R^1 is alkyl, alkenyl, alkynyl, haloalkyl, alkoxyalkyl, or haloalkoxyalkyl; and
- R^2 is alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, or halogen.

4,894,085
HERBICIDAL CYANOFLUOROPHENOXYPHENOXYALKANOIC ACIDS AND DERIVATIVES THEREOF
R. Garth Pews, Midland, Mich.; Lucinda A. Jackson, Pleasant Hill, Calif., and Christyn M. Carson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 82,830, Aug. 5, 1987, abandoned. This application Nov. 29, 1988, Ser. No. 277,619
Int. Cl.[4] A01N *37/40*
U.S. Cl. 71—105 **35 Claims**

1. A herbicidally active compound or a resolved optically-active isomer thereof having the formula



wherein R^1 represents a C_1–C_3 alkyl group; or an agriculturally acceptable derivative of the alkanoic acid group thereof that can be hydrolyzed and/or oxidized in plants or soil to said alkanoic acid moiety that, depending on the pH, is in the undissociated and/or dissociated form.

4,894,086
METHOD OF PRODUCING DISPERSION HARDENED METAL ALLOYS
Werner Huether, Karlsfeld; Wolfgang Betz, Gauting, and Gerhard Andreas, Munich, all of Fed. Rep. of Germany, assignors to MTU- Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 190,993
Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715979
Int. Cl.[4] B22F *3/12, 5/00*
U.S. Cl. 75—0.5 A **16 Claims**

1. In a method of producing a dispersion hardened metal alloy for structural parts of complicated shape which are resistant to high temperatures, in which particles of a second phase are integrated into a metallic matrix by forming a colloidal suspension of said particles in a salt solution of the metal alloy, the particles of the second phase being non reactive with the metals and their salt solution, adding a deglomerating agent to

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the solution, spraying the solution, to form atomized particles thereof, removing the solvent of the solution and reducing the atomized particles to form powders of the metal matrix with said particles of the second phase integrated therein, the improvement comprising

forming integrated dispersed powders of metal matrix and reactive metals using as starting materials for said solution a salt of a reducible metal and admixing as the second phase to the salt solution, powder particles of metals or their alloys whose salts or oxides cannot be subjected directly to a reduction process whereby highly reactive metals are alloys whose salts and oxides are non reducible and integrated into the produced powders.

4,894,087

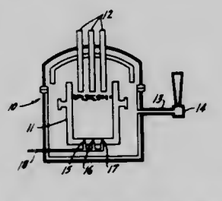
SIMPLIFIED METHOD AND APPARATUS FOR TREATING MOLTEN STEEL

Charles W. Fiskl; Bruce Linnstaiser, both of Chicago, and Herbert S. Philbrick, Jr., Wilmette, all of Ill., assignors to A. Finkl & Sons Co., Chicago, Ill.

Continuation-in-part of Ser. No. 910,704, Sep. 23, 1988, Pat. No. 4,780,134. This application Oct. 24, 1988, Ser. No. 261,444

Int. Cl.[4] C22B *4/00*; C21C *7/10*

U.S. Cl. 75—10.39 **20 Claims**



1. In a method of decreasing the content of undesired gasses in molten steel the steps comprising

isolating molten steel having a content of undersired gasses and/or sources thereof from ambient atmosphere which, upon solidification, would result in an unacceptably high final content of said gasses from the atmosphere, whereby a non-atmospheric region is established above the molten steel,

passing a purging agent upwardly through the molten steel from a location beneath the surface exposed to a non-atmospheric region,

diverting gasses in the region above the molten steel to air ejector means at a rate sufficient to create a sub-atmospheric pressure in the region above the molten steel, and

discharging the gasses drawn from the region above the molten steel, and additional gasses which may be added to the air ejector means, toward a baghouse containing bag means from the air ejector means at a temperature which is within the temperature tolerance range of the baghouse.

4,894,088

PELLET FOR FABRICATING METAL MATRIX COMPOSITE AND METHOD OF PREPARING THE PELLET

Yoshihiro Yamaguchi; Hiroyuki Murata, both of Kobe; Shunichi Minakami, Akashi; Kenichiro Ohuchi, Kobe; Hiroyuki Morimoto, Hinagi, and Jun Hirose, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

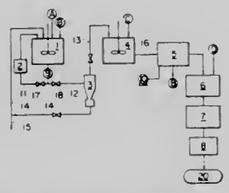
Filed Dec. 15, 1987, Ser. No. 133,434

Claims priority, application Japan, Dec. 16, 1986, 61-300540

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—232 **14 Claims**

1. A pellet consisting essentially of a mixture of a matrix member of a metal powder and at least one reinforcement selected from whiskers, short fibers and particles, the reinforcement being uniformly distributed in a matrix of the metal powder and said mixture being kept in a shape with a binder, wherein said pellet has a surface layer of dried and rigid portion of said mixture which is rigid enough to keep its shape under an external compressing force applied thereto.



4,894,089

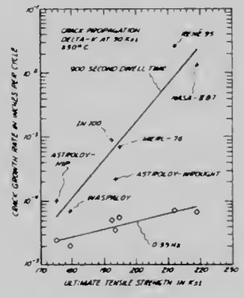
NICKEL BASE SUPERALLOYS

Michael F. Henry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1987, Ser. No. 103,851

Int. Cl.[4] C22C *29/14, 29/00*

U.S. Cl. 75—246 **6 Claims**



1. As a composition of matter an alloy containing the following ingredients in the follow proportions:

Ingredient	Concentration in weight % Claimed Composition From	To
Ni	balance	
Co	12	18
Cr	7	13
Mo	2	4
Al	3	5
Ti	3.5	5.5
Ta	6	8
Nb	0.5	2.5
Re	0.0	3.0
Hf	0.0	0.75
Zr	0.00	0.10
V	0.0	2.0
C	0.0	0.20
B	0.01	0.10
W	0.0	1.0
Y	0.0	0.1

4,894,090

POWDER PARTICLES FOR FINE-GRAINED HARD MATERIAL ALLOYS

Carl S. G. Ekemar, Saltsjö-Boo, and Rolf G. Oskarsson, Rönninge, both of Sweden, assignors to Santrade Limited, Luzern, Switzerland

Continuation of Ser. No. 906,437, Sep. 12, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 163,155

Claims priority, application Sweden, Sep. 12, 1985, 8504167

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—252 **8 Claims**

1. Powder particles for the preparation of a fine-grained hard material alloy for cutting tools consisting essentially of hard principles and binder metal with greater contents of hard principles than in high speed steel, in which the hard principles are compounds of one or more elements in the groups IVA, VA and VIA of the periodical system and Si with C, N and/or B, and the binder metal being based upon Fe, Co and/or Ni, characterized in that the hard principles are formed in situ, the particle is composed of binder metal alloy in an effective binding with the fine-grained hard principles, the volume fraction of hard principles in the particles is 35–90 percent by volume and where Si, Ti, Zr, Hf, V, Nb and/or Ta are ≧55 atomic percent of the hard principle forming metals, balance being Cr, Mo and/or W, and the mean size of the particles is 1–16 μm and at the most 5% of the number of particles have a size of >30 μm.

4,894,091

PHENOLIC BENZOTHIAZOLE DERIVATIVES AND THEIR USE AS CORROSION INHIBITORS

Adalbert Braig, Weil-Friedlingen, Fed. Rep. of Germany; Hans-Rudolf Meier; David G. Leppard, both of Marly, Switzerland; Robert C. Wasson, and Emyr Phillips, both of Cheshire, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

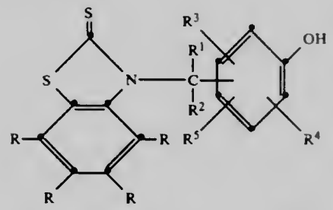
Filed Aug. 17, 1987, Ser. No. 86,337

Claims priority, application United Kingdom, Aug. 27, 1986, 8620668

Int. Cl.[4] C04B *9/02*

U.S. Cl. 106—14.16 **19 Claims**

1. A composition composed of a coating material and containing 0.1 to 20% by weight, based on the solids content of the coating material, of at least one compound of the formula I



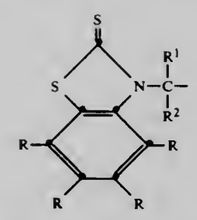
(I)

in which each R independently of one another is hydrogen, C_1–C_{12}-alkyl, C_1–C_4-halogenalkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-alkylthio, phenylthio, benzylthio, C_1–C_{12}-alkylsulfonyl, phenyl, C_7–C_{15}-alkylphenyl, C_7–C_{10}-phenylalkyl, C_5–C_8-cycloalkyl, halogen, —NO_2, —CN, —COOH, —COO—(C_1–C_4-alkyl), —OH, —NH_2, —NHR^6, —$N(R^6)_2$, —$CONH_2$, —$CONHR^6$ or —$CON(R^6)_2$,

R^1 is hydrogen, C_1–C_{12}-alkyl, phenyl, phenyl which is substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or —NO_2, pyridyl, thienyl, or furyl,

R^2 is hydrogen or C_1–C_4-alkyl,

R^3 and R^4 independently of one another are hydrogen, halogen, C_1–C_4-alkoxy, cyano, nitro, C_1–C_{20}-alkyl, —$(CH_2)_m$—$COOR^7$, —$(CH_2)_m$—$CONHR^6$, —$(CH_2)_m$—$CON(R^6)_2$, C_3–C_{20}-alkenyl, C_7–C_{10}-phenylalkyl, phenyl, cyclohexyl, cyclopentyl or a group of the formula II



(II)

R^5 is hydrogen, C_1–C_{20}-alkyl, C_3–C_{20}-alkenyl or hydroxy, or R^3 and R_5 together or R^4 and R^5 together form a ring fused to the phenolic moiety which ring may be a carbocyclic or heterocyclic ring containing oxygen, nitrogen or sulfur as heteroatoms, each ring being optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R^6 is C_1–C_{12}-alkyl, C_3–C_{12}-alkyl which is interrupted by one or more O atoms, C_5–C_8-cycloalkyl, benzyl, phenyl, or phenyl which is substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or nitro, or —$N(R^6)_2$ is a pyrrolidino, piperidino or morpholino group, R^7 is hydrogen or C_1–C_{20}-alkyl, which may be substituted by halogen or hydroxyl or R^7 is C_3–C_{20}-alkyl which is interrupted by one or more oxygen atoms and may be substituted by hydroxyl and m is 0, 1 or 2.

4,894,092

PROCESS FOR PREPARING COATED HEAT-RESISTANT PIGMENT

Akira Nishihara, and Makoto Tsunashima, both of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,219

Claims priority, application Japan, Jan. 20, 1986, 61-142811

Int. Cl.[4] C09C *1/10*; C08J *7/04*

U.S. Cl. 106—452 **18 Claims**

1. A process for preparing a coated heat-resistant cadmium-based pigment consisting essentially of:

(a) contacting a hydrophilic cadmium-based pigment with a mixture of a metal alkoxide selected from the group consisting of an alkoxide of boron, silicon, titanium, zirconium and zinc, and a water-miscible or semi-water-miscible solvent to form a primary coating;

(b) repeating the above procedure at least once more to form a secondary coating or secondary and further coatings; and

(c) collecting the thus coated pigment and drying the same.

4,894,093

PROCESS FOR PRODUCING BARIUM SULFATE WITH REACTIVE SURFACE

Clemens Aderbold, Krefeld, and Hans-Joachim Röhrborn, Neukirchen-Vluyn, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,982

Claims priority, application Fed. Rep. of Germany, May 30, 1987, 3718277

Int. Cl.[4] C01F *5/42, 11/46*; C08K *3/24*

U.S. Cl. 106—461 **8 Claims**

1. A process for producing a barium sulfate pigment having a chemically reactive halogen, hydroxyl, amino, imino, mercapto or terminal olefinic functional group bonded to its surface, said functional group capable of effecting a covalent interaction between said pigment and an organic resin, which comprises the steps of:

(a) coprecipitating barium sulfate and a poorly soluble bar-

ium salt of an additional anion by providing barium ions in the presence of sulfate ions in an aqueous medium containing said additional anion in the form of a water-soluble organic salt or compound selected form the group consisting of alkali metal alkyl or aryl sulfonates, alkali metal alkyl or aryl sulfates, and alkyl or aryl phosphoric acid esters, wherein said alkyl or aryl groups are unsubstituted or substituted by halogen, hydroxyl, amino, imino or mercapto, or contain a terminal olefinic functional group, said additional anion being corprecipitable with barium ions to form said poorly water-soluble barium salt;

(b) recovering the resulting corpreciate from the aqueous medium; and

(c) drying the coprecipitate and afterwards treating the corprecipitate with a silane or siloxane.

4,894,094

DISAZO COMPOUNDS AND FORMULATIONS CONTAINING SAME

Wolfgang Ruff, Stuttgart; Egon Liedek, Esslingen; Gerhard Berger, Stuttgart, and Hans W. Soszeborn, Schwaebisch Gmuend, all of Fed. Rep. of Germany, assignors to Basf Lacke & Farben Aktiengesellschaft, Muenster, Fed. Rep. of Germany

Filed Aug. 19, 1987, Ser. No. 86,780

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630278

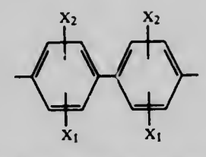
Int. Cl.[4] C09B *35/037*

U.S. Cl. 106—496 **22 Claims**

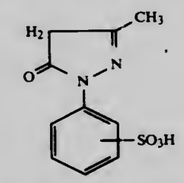
1. A mixture of disazo compounds based on 4,4'-diaminodiphenyl compounds, which contains not less than 50% by weight of a disazo compound of the formula

A—N=N—Z—N=N—B

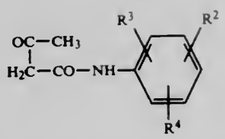
where Z is



where X_1 and X_2 independently of one another are each hydrogen, chlorine, bromine, methoxy or methyl and are arranged symmetrically, A is a radical of a coupling component



where the benzene radical is not further substituted or is additionally monosubstituted or disubstituted by chlorine, methyl or methoxy, and B is a radical of a coupling component



where R^2, R^3 and R^4 independently of one another are each hydrogen, methyl, methoxy or chlorine.

4,894,095

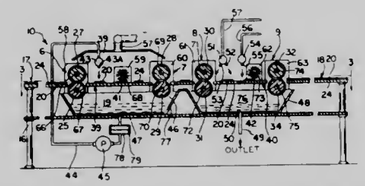
METHOD FOR WASHING AND RINSING OF USED LITHOGRAPHIC PLATE MEMBERS

Gary L. Schramm, Brookfield; Ralph G. Postillo, New Berlin, and Richard J. Hladilek, West Allis, both of Wis., assignors to Law Offices of Dick and Harris, Chicago, Ill.

Division of Ser. No. 738,468, May 28, 1985, Pat. No. 4,733,422. This application Jan. 5, 1988, Ser. No. 141,483

Int. Cl.[4] B08B *3/08, 3/10*

U.S. Cl. 134—2 **26 Claims**



1. A method for cleaning, storing and unsealing at least one lithographic plate member having pre-formed peripheral flanges and ink residue and other contaminants on its surface, comprising the steps of:

removing at least one plate member from the press plate drum;

placing said plate member on feed fixture means;

longitudinally propelling said plate member by drive means;

applying at least one cleaning solvent to said surface of said plate member;

scrubbing said surface of said plate member;

rinsing said surface of said plate member with at least one rinse liquid;

scrubbing further said surface of said plate member;

removing of excess rinse liquid from said surface of said plate member;

sealing said surface of said plate member with a water soluble preserving substance so as to reduce the moisture sensitivity of said plate member after applying at least one cleaning solvent to said surface of said plate member, scrubbing said surface, rinsing said surface, scrubbing further said surface and removing of excess rinse liquid from said surface,

said water soluble substance enabling removal of said substance during a subsequent press run from the press's own water train;

receiving said plate member from removal fixture means; and

storing said plate member until reuse thereof.

4,894,096

PRODUCTS BASED ON ALUMINUM CONTAINING LITHIUM WHICH CAN BE USED IN THEIR RECRYSTALLIZED STATE AND A PROCESS FOR OBTAINING THEM

Philippe Meyer, Voiron, France, assignor to Cegedur Pechiney, Voreppe, France

Filed Jun. 23, 1986, Ser. No. 877,178

Claims priority, application France, Jun. 25, 1985, 85 10031

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—2 **6 Claims**



1. In a method for producing a recrystallized alloy based on Al, consisting essentially of, by weight, 1 to 3.5% Li, up to 4% Cu, up to 5%, up to 3% Zn and additions of Mn, Cr and/or Zr, and comprising the steps of casting, hot working, placing in solution, quenching, and tempering, the improvement comprising forming said alloy from:

$Zr \leqq 0.10\%$

$Mn \leqq 0.8\%$

$Cr \leqq 0.20\%$

$$\text{with } \frac{\%Zr}{0.03} + \frac{\%Mn}{0.3} + \frac{\%Cr}{0.07} > 1.$$

and carrying out the tempering at temperatures (T) less than 190° C. and in a region of less than or equal to the isothermal tempering temperature (T_M) giving rise to maximum hardness, the period during which the isotherm t(T) is maintained at (T) being less than the period during which the isotherm tm(T) is maintained, which brings about the maximum hardness at said temperature (T).

4,894,097

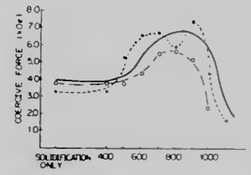
RARE EARTH TYPE MAGNET AND A METHOD FOR PRODUCING THE SAME

Kenzaburou Iijima; Masayuki Takamura, and Takeo Sata, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Division of Ser. No. 694,336, Jan. 24, 1985. This application Dec. 31, 1987, Ser. No. 140,296

Int. Cl.[4] H01F *1/02*

U.S. Cl. 148—101 **11 Claims**



5. A method for producing improved rare earth type magnet comprising the steps of

preparing molten alloy containing Fe, Gd, Nd and two or more metalloid elements chosen from a group consisting of B, Si and P, at an atomic ratio defined by $(Fe_{1-x}M_x)_y(Gd_zNd_{1-z})_{1-y}$ wherein x is in a range from 0.05 to 0.4, y is in a range from 0.7 to 0.95, z is in a range from 0.05 to 0.8 and M is the total of said two or more metalloid elements

subjecting said molten alloy to solidification by cooling to produce solidified alloy,

subjecting said solidified alloy to pulverization to produce pulverized alloy,

further subjecting said pulverized alloy to compaction in a magnetic field to produce shaped alloy, and

further subjecting said shaped alloy to hot hydraulic compaction to produce a magnet having a coercive force of at least 7.3 KOe and a magnetic susceptibility of at least 40.3 emu/g.

4,894,098

PROCESS FOR PREPARING MAGNETIC LAYER AND MAGNETIC HEAD PREPARED USING THE SAME

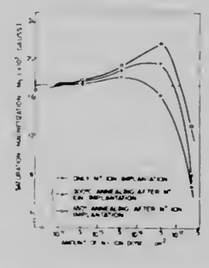
Shigekazu Otomo, Sayama; Noriyuki Kamasaka, Ome; Ryo Imura, Tokorozawa; Ryo Suzuki, Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 768,965, Aug. 23, 1985, Pat. No. 4,772,976. This application Jul. 28, 1988, Ser. No. 225,368

Claims priority, application Japan, Aug. 27, 1984, 59-176856; Dec. 14, 1984, 59-262777

Int. Cl.[4] G11B *5/845*

U.S. Cl. 148—122 **18 Claims**



1. A process for preparing a magnetic layer comprising the steps of implanting ions into the surface region of a thin transition element-based magnetic film, and annealing said film to form an ion-diffused layer to thereby control the composition of said surface region for forming a desired magnetic compound layer.

4,894,099

METHOD FOR INFLUENCING THE INTERNAL STRESS STATE OF SOLID RAILROAD WHEELS

Werner Mombrei; Peter Ottlinger; Klaus Wächter, all of Dresden; Walter Rode, Halle, and Günter Schulz, Delitzsch, all of German Democratic Rep., assignors to Ministerium fuer Verkehrswesen, Berlin, German Democratic Rep.

Filed Aug. 3, 1988, Ser. No. 227,956

Claims priority, application German Democratic Rep., Sep. 29, 1987, 307372

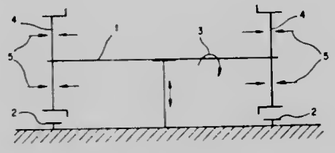
Int. Cl.[4] C21D *9/32*

U.S. Cl. 148—146 **5 Claims**

1. A method for relieving the active internal stress state in the wheel rim of solid railroad wheels caused by thermal stresses, comprising homogeneously heating a wheel center of a solid railroad wheel having a wheel rim, a hub and therebetween a wheel center, individually or in a wheel set, over its circumference until a plastic deformation occurs in an area including an area of maximum internal stress, the temperature

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of the wheel rim being less than the temperature of the heated wheel center and not exceeding 300 deg. C. and the temperature difference between the heated region of the wheel center and the wheel rim being at least 100 deg. C.

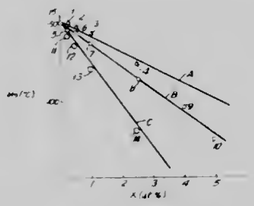


4,894,100

TI-NI-V SHAPE MEMORY ALLOY

Kiyoshi Yamauchi; Shoichi Sato, and Hideo Takaara, all of Miyagi, Japan, assignors to Tokin Corporation, Miyagi, Japan

Filed Jan. 7, 1988, Ser. No. 142,672
Claims priority, application Japan, Jan. 8, 1987, 62-2089
Int. Cl.[4] C22C *19/00*
U.S. Cl. 148—402 **11 Claims**



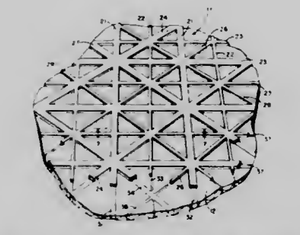
1. A shape memory alloy having a good workability and a reduced temperature difference between a martensitic transition start point and an austenitic transition finish point, which consists of V 0.25–2.0 at %, Ti 48.5 at % or more, and the balance Ni, the atomic ratio of Ni/Ti being 0.96–1.06, said nickel excluding 50 at %.

4,894,101

METHOD OF MAKING PROTECTION COVER

Terrance W. Sachetti, 5930 W. Broadway, Crystal, Minn. 55428

Division of Ser. No. 934,462, Nov. 24, 1986, Pat. No. 4,759,090. This application Jul. 25, 1988, Ser. No. 223,424
Int. Cl.[4] B44C *1/28*
U.S. Cl. 156—67 **32 Claims**



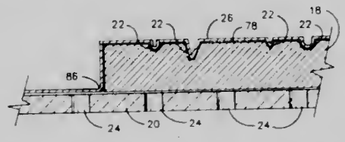
1. A method of making a cover having a surface provided with a light emitting protection grid comprising: providing a fabric having color means and a size and shape of the cover, bleaching the fabric along bands that depict the the grid of the cover to remove color means from the fabric along said bands, appling continuous ribbons of phosphorescent material to the fabric along the bands to cover the bands with phosphorescent material and curing the phosphorescent material and anchoring the phosphorescent material to the fabric whereby the phosphorescent material becomes permanently affixed to the fabric and provides a protection grid that emits light when subjected to light and subsequently located in a dark environment.

4,894,102

METHOD FOR REFINISHING BUILDING PANELS

Kenneth F. Halls, 6972 W. 76th Ave., Arvada, Colo. 80003, and Donald W. Harrison, Golden, Colo., assignors to Kenneth F. Halls, Arvada, Colo.

Continuation of Ser. No. 19,932, Feb. 27, 1987, which is a continuation-in-part of Ser. No. 707,908, Mar. 4, 1985, Pat. No. 4,666,540. This application Dec. 5, 1988, Ser. No. 282,954
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—94 **5 Claims**



1. A method of refinishing a building panel, such as a ceiling panel or tile and the like, having a worn or discolored decorative front surface, a back surface and side edges forming a periphery, said method comprising the steps of:

placing the building panel on a vacuum support surface having a plurality of perforations through which air can be drawn to form a partial vacuum, said building panel being placed so that its back surface is in contact with the perforated support surface and its decorative surface is exposed, said building panel being positioned on the perforated support surface so that its periphery is surrounded by exposed uncovered perforations;

applying adhesive to one of the decorative surfaces of the building panel and a side of an air impervious sheet;

placing the sheet over the decorative surface of the building panel with the adhesive therebetween, which sheet has a peripheral edge extending over the exposed perforations in the vacuum support surface around the periphery of the panel to form a vacuum chamber;

leaving the peripheral edge of the sheet completely unrestrained; and

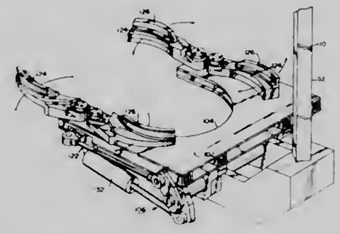
drawing a partial vacuum via the perforations in the vacuum chamber formed between the sheet and the perforated support surface ;sufficient to hold the unrestrained peripheral edge of the sheet in sealing engagement with the support surface to create a partial vacuum across the entire decorative surface of the building panel which enables ambient air pressure to force or collapse the sheet tightly against the decorative surface and allows the unrestrained peripheral edge to be drawn up so that the sheet substantially assumes the contour or texture of the decorative surface and is adhered thereto by the adhesive.

4,894,103

ROBOT FOR TIRE BUILDING MACHINE AND METHOD OF OPERATION

David W. Bailey, Waterloo, Canada, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed May 26, 1988, Ser. No. 199,080
Int. Cl.[4] B29D *30/20*
U.S. Cl. 156—111 **6 Claims**



1. A method of transporting a cylindrical tire carcass and a cylindrical green tire between various processing locations comprising:

providing a robot having a pair of pivotally supported arms with contoured free ends movable toward and away from each other, the arms having first interior surfaces of a size and shape to thereby grasp the exterior cylindrical surface of a carcass when the arms are moved toward each other, the arms also having second exterior surfaces of a size and shape to thereby grasp the interior cylindrical surface of a green tire when the arms are moved away from each other;

moving the robot between a pick up location, a tire building machine, and an inspection location;

closing the arms by pivotal movement toward each other at the pick up location to grasp the exterior cylindrical surface of a carcass with first surfaces and then transporting the grasped carcass to the tire building machine through the moving of the robot; and

opening the arms by pivotal movement away from each other at the tire building machine to grasp the interior cylindrical surface of a green tire with second surfaces and then transporting the grasped green tire to the inspection location by the moving of the robot.

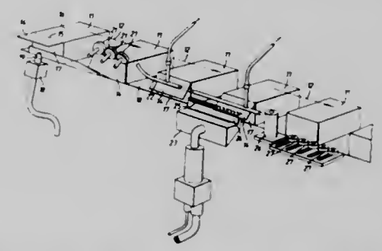
4,894,104

METHOD AND APPARATUS FOR SEALING CARTONS

David S. Hemus, Cirencester, England, assignor to MB Group plc, Reading, England

Filed Nov. 29, 1988, Ser. No. 277,265
Claims priority, application United Kingdom, Dec. 17, 1987, 8729478
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—152 **12 Claims**

1. A method of sealing a carton by sticking together facing surfaces of a hinged flap and a wall of the carton using a solvent-based adhesive, wherein a deposit of the adhesive is applied to one of the surfaces, the two surfaces are then brought together to transfer some of the adhesive to the other of the surfaces and to thin out and spread the deposit of adhesive on the first-mentioned surface, the surfaces are separated so as to lie at an acute angle to one another, hot air is directed on to the surfaces to effect partial drying of the adhesive, and the surfaces are then pressed together to stick them to one another.

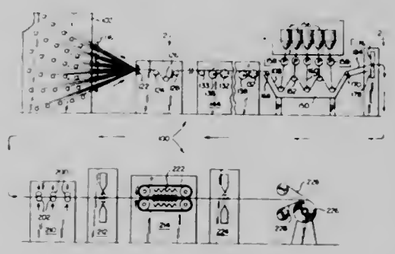


4,894,105

PRODUCTION OF IMPROVED PREIMPREGNATED MATERIAL COMPRISING A PARTICULATE THERMOPLASTIC POLYMER SUITABLE FOR USE IN THE FORMATION OF SUBSTANTIALLY VOID-FREE FIBER-REINFORCED COMPOSITE ARTICLE

Robert Dyksterhouse, and Joel Dyksterhouse, both of Marathon, Fla., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 928,917, Nov. 7, 1986, abandoned. This application Nov. 4, 1987, Ser. No. 114,362
Int. Cl.[4] B29B *15/12*; C08J *5/00*; B29C *67/14*
U.S. Cl. 156—181 **161 Claims**



1. A method for the production of an improved fibrous material suitable for the formation of a substantially void-free composite article comprising a plurality of adjoining substantially parallel reinforcing filaments in association with a matrix-forming thermoplastic polymer comprising:

(a) preparing a dispersion of solid particles of a thermoplastic polymer in an aqueous medium which contains an effective amount of a dissolved polymeric binding agent,

(b) substantially increasing the viscosity of said dispersion to form an improved impregnation bath whereby the viscosity of the resulting bath becomes at least 50,000 cps. and said impregnation bath has a plastic flow characteristic with shear-thinning behavior which is sufficient to substantially uniformly suspend said particulate thermoplastic polymer within said bath,

(c) impregnating said adjoining substantially parallel reinforcing filaments with said bath under conditions wherein said bath is caused to flow between said adjoining filaments by the application of work wherein said bath flow inherently results in a reduction of the viscosity of said bath which aids in the incorporation of said particulate thermoplastic polymer between adjoining filaments, and

(d) controlling the content of said aqueous medium in the resulting fibrous material to provide a product having said particles of matrix-forming thermoplastic polymer substantially uniformly dispersed between adjoining filaments in the absence of fusion bonding which inherently (1) is drapable and tacky at ambient conditions, (2) is handleable without segregation of said particles within the fibrous material, and (3) which upon the application of heat and pressure can be transformed into a substantially void-free fiber-reinforced composite article of a predetermined configuration wherein said solid particles form the matrix phase.

4,894,106

METHOD FOR MANUFACTURE OF LABELS

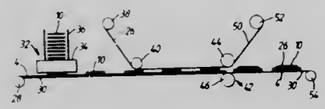
David J. Instance, Guinea Hall, Sellindge, Kent, United Kingdom

Filed Jan. 13, 1987, Ser. No. 2,810

Claims priority, application United Kingdom, Jan. 24, 1986, 8601695

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—227 **7 Claims**



1. A method of producing labels, the method comprising the steps of:

(a) providing an elongate support web;

(b) disposing a succession of individual discrete folded printed sheets in a row along the length of the support web;

(c) covering the succession of sheets on the support web with a web of a self-adhesive laminar material which is adhered by the self-adhesive surface thereof over the succession of sheets and the support web;

(d) cutting through the laminar material and through the support web so as to form a succession of multiple labels each of which has a respective one of the sheets adhered to the support web by the laminar material; and

(e) cutting, either before, after or simultaneously with cutting step (d), at least one cut through the laminar material, through the respective sheet and through the support web of each of the multiple labels so as to divide each multiple label into at least two labels, each of which has a respective portion of the respective sheet which is adhered to a respective portion of the support web by a respective portion of the laminar material.

4,894,107

PROCESS FOR MAKING MULTIPLE LAYER POLYMERIC FILMS

Samuel W. Tse, Appleton; Almer T. Widiger, Neenah, and Keith D. Lind, Appleton, all of Wis., assignors to American National Can Company, Greenwich, Conn.

Filed May 16, 1985, Ser. No. 735,082

Int. Cl.[4] B32B *31/30*

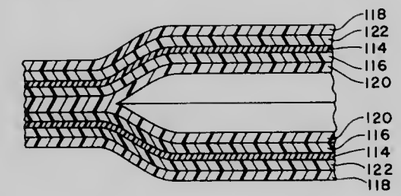
U.S. Cl. 156—229 **25 Claims**

1. A process for making a multiple layer molecularly oriented film, said process comprising the steps of:

(a) forming a multiple layer film having first and second layers whose compositions comprise at least 10% by weight ethylene vinyl acetate copolymer and a third layer of vinylidene chloride copolymer disposed between said first and second layers;

(b) heating said multiple layer film to an elevated temperature appropriate for molecular orientation, and molecularly orienting said multiple layer film; and

(c) after said orienting of said multiple layer film, subjecting said multiple layer film, containing said first, second, and third layers, to irradiation in an amount of at least 1.5



megarads, said irradiation after said orienting comprising an initial irradiation exposure for each of said first, second, and third layers.

4,894,108

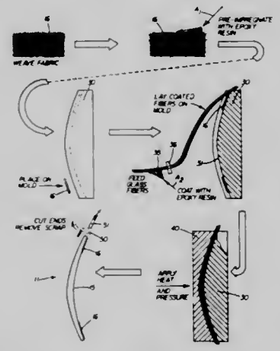
METHOD OF FORMING A COMPOSITE LEAF SPRING WITH FABRIC WEAR PAD

David S. Richard, Dayton; John E. Mutzner, Covington; John F. Eilerman, and Thomas E. Rau, both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1988, Ser. No. 258,757

Int. Cl.[4] B29C *43/02*

U.S. Cl. 156—245 **2 Claims**



1. A method of forming a composite leaf spring for a vehicle suspension system in a mold with a contour corresponding to the spring comprising:

coating elongated fibers with adhesive;

selecting a fabric pad of synthetic fibers woven in a double plane weave with about 70–90 picks/inch in the warp direction and about 10–14 picks/inch in the fill direction;

applying the pad in a location in the mold to form an end of the spring with the pad arranged so that the warp direction extends longitudinally of the spring;

laying the coated fibers in layers in the mold over the pad; and

applying heat and pressure to the coated fiber layers to form and cure the spring and to integrally bond the pad to the spring;

whereby the spring is formed with a wear surface at the end.

4,894,109

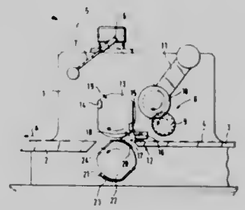
METHOD AND APPARATUS FOR TACKING TOGETHER THE COPIES OF MULTICOPY FORMS

Bodo Brehme, Gumbertstrasse 133, D-4000 Duesseldorf, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 227,690

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—256 **16 Claims**



1. The method of tacking together multipage forms having pin feed holes, comprising the steps of:

(a) providing a multipage form;

(b) providing a supply of adhesive tacking tape;

(c) longitudinally advancing the form;

(d) advancing a length of the tape parallel to the direction in which the form advances;

(e) severing the tape with rotary cutter means so that the severed length is deposited on the form overlying one of the pin feed holes;

(f) advancing the form through compression means and thereby causing the deposited tape to be tacked on the form;

(g) pushing a portion of the severed tape through the associated pin feed hole; and,

(h) folding back the tape portion extending through the pin feed hole for causing the portion to engage the opposite side of the form.

4,894,110

IDENTIFICATION CARD WITH A VISIBLE AUTHENTICITY FEATURE

Joseph Lass; Hansjürgen Merkle, both of Munich; Wolfgang Becker, Neubiberg; Werner Herget, and Erwin Lob, both of Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

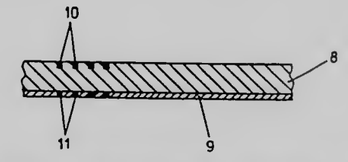
Division of Ser. No. 919,006, Oct. 15, 1986, Pat. No. 4,766,026.

This application Jun. 29, 1988, Ser. No. 213,253

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536740

Int. Cl.[4] B29C *71/04*; B29D *9/00*

U.S. Cl. 156—272.8 **12 Claims**



1. A method for manufacturing an identification card containing a plurality of synthetic layers in which information is provided by means of a laser beam, said information being visible as changes in the optical properties of the synthetic layers due to irreversible changes in the material caused by the laser beam, characterized in that

the individual layers are joined together to form a card compound, at least a first and a second synthetic layer having transparent areas which overlap,

the first layer and the second layer have a property of changing visibly when exposed to the laser beam, this change being effected only as of certain intensity values, a particular intensity value required herefor being lower for the first layer than for the second layer,

the card compound is oriented toward the laser in such a way that the second layer comes to lie on a side facing the laser,

at least parts of the information are provided with an intensity which causes visible changes of material to occur simultaneously in the first and second layers, and

first and second pieces of information are provided in such a way as to be visible overlapping at a first viewing angle and singly at a second viewing angle, the appearance of the pieces of information changing in accordance with the viewing angle.

4,894,111

PLUG PART FOR RELEASABLE PLUG-TYPE CONNECTIONS OF EIGHT WAVEGUIDE

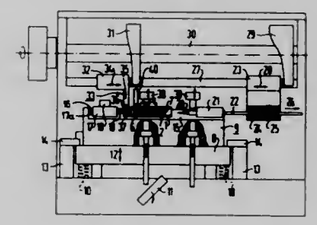
Dieter Krause; Josef Sedlmaier, and Norbert Odemar, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 22, 1986, Ser. No. 856,433

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310973

Int. Cl.[4] B32B *31/06*

U.S. Cl. 156—294 **8 Claims**



1. A method of manufacturing a plug part for releasable plug-type connections of light waveguides comprising:

a capillary tube having a hollow interior with acceptance openings at each end for the acceptance of a light waveguide,

a hollow plug body in which said capillary tube is inserted such that its hollow interior is coaxially aligned relative to the outside circumference of said plug body, and

a hardenable bonding agent for securing said capillary tube in said plug body, wherein said hardenable bonding agent is introduced into an annular gap formed between the outside circumference of said capillary tube and the inside circumference of said plug body, comprising the following steps:

(a) loosely introducing the capillary into the plug body,

(b) engaging the capillary between two centering means,

(c) coaxially aligning the acceptance opening of the capillary relative to the outside circumference of the plug body with the assistance of the centering means, and

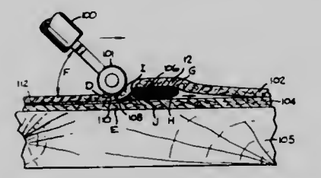
(d) fixing the capillary in the plug body by means of curing a hardenable booding agent introduced into the annular gap.

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4,894,112
METHOD AND APPARATUS FOR JOINING OVERLAPPING SHEETS OF THERMALLY SEALABLE MATERIAL

Glenn W. Lippman, 169 S. Buchanan Ave., Louisville, Colo. 80027-9505

Filed Nov. 13, 1987, Ser. No. 120,117
Int. Cl.[4] B32B *31/26, 31/00*
U.S. Cl. 156—308.4 **16 Claims**



1. A hand-held apparatus for joining overlapping sheets of thermally sealable material together, said apparatus comprising:

a handroller having a handle and a roller; and

a hand held heating means having a handle and a heating body for heating opposing surfaces of the overlapping sheets when said heating body is positioned between and in contact with the opposing surfaces of the sheets and against an upstream face of a moving compressed portion of the sheets, the moving compressed portion being compressed and moved along the overlapping sheets by an individual pressing downwardly on the sheets with the handroller, the sheets thereby being pressed together when they are engulfed by the moving compressed portion, said heating body defining generally parallel top and bottom surfaces and two generally parallel rounded sides, said rounded sides being sized and configured to serve as an abutment for the roller of the handroller so that the roller moves the heated body sin unison with the roller as the roller is moved along the edge of the sheets with one of said rounded sides positioned against the upstream face of the moving compressed portion, said bottom surface of said rounded sides also being sized and configured to heat the opposing surfaces of the sheets as such movement in unison takes place so that the surfaces liquify to form a liquified interfacial region between the sheets when the sheets are pressed together as they are engulfed by the moving compressed portion, the liquified interfacial region joining the sheets when it cools, each of said rounded sides also being tapered and extending from a back edge to a front portion of said heating body, said back edge being rigidly attached to said handle, said front portion being generally wedge shaped so as to taper to a rounded front edge which adjoins each of said rounded sides and which terminates along an arcuate path lying in a plane which is parallel to said top and bottom surfaces, said rounded front edge facilitating insertion of said body between the sheets.

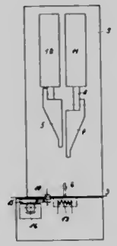
4,894,113
APPARATUS FOR MANUFACTURING A CORRUGATED MEMBER

Otto J. Hofer, Im Gafos 8, 9494 Schaan, Liechtenstein

Continuation of Ser. No. 6,329, Jan. 14, 1987, abandoned, which is a continuation of Ser. No. 456,445, Jan. 17, 1983, abandoned.
This application Jan. 21, 1988, Ser. No. 211,088
Claims priority, application Switzerland, Jan. 13, 1982, 175/82
Int. Cl.[4] B31F *1/20*
U.S. Cl. 156—462 **13 Claims**

1. In an apparatus for manufacturing a corrugated member having a carrier web with a top web arranged thereon in a corrugated configuration, wherein the top web is joined to the carrier web in the region of the respective depressions which extend transversely with respect to the direction of the web, said apparatus comprising a shaping station having a deformation table on which the carrier web can be transported forward with a stepping motion in the longitudinal direction by means of a feed arrangement, feed means for feeding the top web over the carrier web, shaping means above the top web, which shaping means has at least two pressing means that can be pressed against the top web and the deformation table, and at least one drive and control means for cyclic advance of the feed arrangement and for cyclic displacement of the pressing means into the deformation position, wherein the improvement comprises;

a deformation element at the shaping station arranged laterally and displaceable relative to the corrugations to be produced and cyclically displaceable by said drive and control means such that it can be laterally inserted between the top web and the carrier web to shape a corrugation portion and, after the shaping operation, can be laterally retracted again from the closed corrugation portion;



said at least two pressing means include a first pressing means arranged downstream of the deformation element and a second pressing means arranged upstream of the deformation element relative to the feed direction, and wherein the first and second pressing means can by actuated independently of one another; and

said drive and control means comprise means for first laterally inserting said deformation element, then pressing said first pressing means against the top web, then pressing said second pressing means against said top web, then raising said first pressing means and laterally withdrawing said deformation element, and then raising said second pressing means, advancing the carrier web in its stepping motion, and repeat the cycle.

4,894,114
PROCESS FOR PRODUCING VIAS IN SEMICONDUCTOR

Harvey C. Nathanson, Pittsburgh; Michael C. Driver, McKeesport; Michael W. Cresswell, Plum Borough, all of Pa.; Ronald G. Freitag, Baltimore, Md.; Donald K. Alexander, and Daniel F. Yaw, both of Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 13,490, Feb. 11, 1987, Pat. No. 4,823,136.
This application Jan. 3, 1989, Ser. No. 292,973
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—631 **1 Claim**

1. A metal evaporation method of producing vias within a semiconductor substrate, said vias operable to facilitate the transmission of electrical signals from the bottom surface of said semiconductor substrate to the top surface of said semiconductor substrate, said method comprising:

thinning of a wafer of semiconductor material, said wafer having a top and a bottom surface to a thickness of approximately 100 microns;

mounting of said thinned wafer of semiconductor material face down upon a wafer holder such that said top surface of said wafer is mounted upon said wafer holder using an adhesive means;

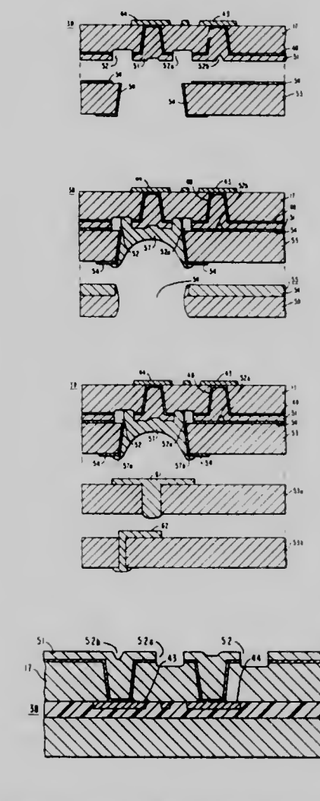
application of a first layer of photoresist material upon said bottom surface of said wafer;

patterning of said first layer of photoresist, said patterning operable to define the holes through said semiconductor substrate for said vias to be etched;

formation of said vias within said semiconductor substrate utilizing an etching technique;

selective removal of said first layer of photoresist material from said bottom surface of said wafer;

sputtering of metal over said bottom surface of said semiconductor wafer, thereby forming a metallization layer upon said bottom surface of said semiconductor wafer;



application of a second layer of photoresist material upon said metallization layer upon said bottom surface of said semiconductor wafer, said second layer of photoresist selectively patterned about said vias;

application of a thin layer of a highly conductive metal upon the surface of said second layer of photoresist;

selective removal of said second layer of photoresist material such that said sputtered metal layer is selectively exposed;

light etching of said semiconductor wafer to insure its insulating properties and to clean said bottom surface;

demounting of said wafer from said wafer holder means;

removal of said adhesive means from said top surface of said wafer;

application of a heat sink means, said heat sink means comprising semi-insulating material having good thermal conductive properties and an expansion coefficient closely matched to said wafer, said heat sink means applied to said bottom side of said wafer;

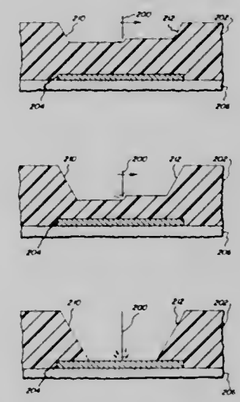
placement of a metal shadow mask upon said wafer such that an orifice in said mask is placed directly over said via; and

evaporation of metal into the orifice in said metal shadow mask and said via, said evaporation of metal operable to form solid electrical connections through said semiconductor substrate, said solid electrical connections operable to interconnect said top and said bottom surfaces, electrically.

4,894,115
LASER BEAM SCANNING METHOD FOR FORMING VIA HOLES IN POLYMER MATERIALS

Charles W. Eichelberger, Schenectady; Robert J. Wojnarowski, Ballston Lake, and Kenneth B. Welles, II, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1989, Ser. No. 310,169
Int. Cl.[4] B44C *1/22;* B29C *37/00;* C03C *15/00, 25/06*
U.S. Cl. 156—643 **27 Claims**



1. A method for producing via holes in a polymer dielectric layer comprising the steps of:

scanning a predetermined area of the polymer dielectric layer with a laser beam in a predetermined pattern at a sufficient level of energy and speed to heat a small volume of the polymer dielectric to a point of vaporization during a predetermined laser beam dwell time, said volume being the product of the laser beam maximum energy spot area and the depth of a surface layer portion of the polymer dielectric layer; and

repeating said scanning of said area for a sufficient number of times to etch a desired amount of polymer dielectric layer from said predetermined area.

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4,894,116

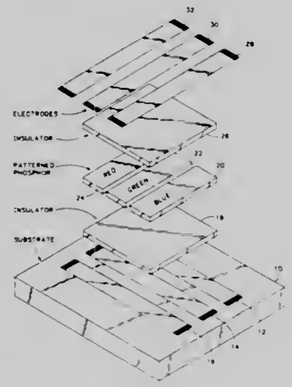
PHOSPHOR ONLY ETCHING PROCESS FOR TFEL PANEL HAVING MULTIPLE-COLORED DISPLAY

William A. Barrow, Aloha; Richard T. Tuenge, Hillsboro, and Hal Merritt, Aloha, all of Oreg., assignors to Planar Systems, Inc., Oreg.

Continuation-in-part of Ser. No. 161,283, Feb. 29, 1988, abandoned, which is a division of Ser. No. 58,658, May 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 844,614, Mar. 27, 1986, abandoned. This application Jan. 13, 1989, Ser. No. 296,608

Int. Cl.[4] **B44C** *1/22*; **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **7 Claims**



1. A method of constructing a multicolored TFEL display screen comprising the steps of:
(a) depositing on a substrate a first set of elongate transparent electrodes;
(b) depositing an insulating layer on top of said electrodes;
(c) depositing over said insulating layer a first thin film comprising a first color-producing phosphor;
(d) etching said first thin film to leave stripes of said first color-producing phosphor extending perpendicular to said transparent electrodes;
(e) depositing an etch stop layer on top of said stripes of said first thin film;
(f) depositing a second thin film comprising a second color-producing phosphor on top of said etch stop layer;
(g) etching said second thin film to leave stripes of a second color-producing phosphor lying adjacent to and extending parallel to said stripes of said first color-producing phosphor; and
(h) depositing an insulating layer and a second set of elongate electrodes over said first and second stripes to extend colinearly therewith.

4,894,117

PROCESS FOR MANUFACTURING HIGH BULK DENSITY PARTICULATE FABRIC SOFTENING SYNTHETIC ANIONIC ORGANIC DETERGENT COMPOSITIONS

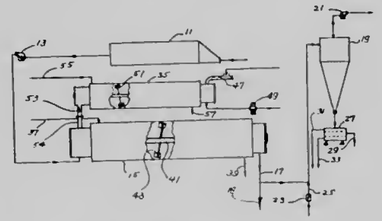
Antonio Bianchi, and Gualtiero Barletta, both of Rome, Italy, assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Apr. 28, 1988, Ser. No. 187,103

Int. Cl.[4] **B01D** *1/14, 1/24*; **C11D** *1/12*

U.S. Cl. 159—49 **8 Claims**

1. A process for manufacturing a high bulk density particulate detergent composition, suitable for mixing with high bulk density particulate builder compositions for such detergent to make built high bulk density particulate laundry detergent compositions, which comprises turbodrying, which is drying a dryable mix while repeatedly subjecting it and any particles resulting from such turbodrying to centrifugal and axial forces, which create thin films of the mixture, which are pulled apart during such turbodrying, in a turbodrying zone where turbodrying takes place, a mixture of synthetic organic detergent, water insoluble powdered carrier for such detergent, and aqueous medium for such detergent and carrier, in which the



ratio of detergent: carrier weights is in the range of 1:1 to 1:4 and the proportion of water present is 20 to 50%, to convert such mixture to high bulk density agglomerate particles, which particles comprise detergent, carrier and less water than the mixture, which particles are subjected to further such turbodrying and are converted thereby to high bulk density particles of substantially globular shape.

4,894,118

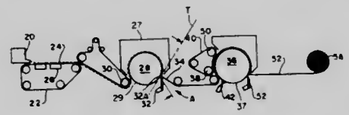
RECREPED ABSORBENT PRODUCTS AND METHOD OF MANUFACTURE

Steven L. Edwards, Fremont, and William D. Lloyd, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 755,147, Jul. 15, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 894,371

Int. Cl.[4] **D21H** *5/24*

U.S. Cl. 162—112 **25 Claims**



1. A method of making a tissue product comprising:
(a) forming a non-layered wet web of cellulosic fibers having a selected basis weight from an aqueous stock slurry comprising secondary fibers;
(b) partially dewatering said web to remove a portion of the water therein, such that interfiber adhesion is enhanced within said web;
(c) conveying said web to a first drying cylinder and affixing said web to said cylinder such that further interfiber adhesion is effected upon further dewatering to a fiber consistency of at least 90%;
(d) creping said web from the first drying cylinder with a doctor blade, such that said interfiber adhesion is disrupted;
(e) conveying said web to a second drying cylinder and affixing said web thereto at the location of a nip formed between the second cylinder and an imprinting fabric having a pattern of raised knuckle areas thereon;
(f) differentially compressing the web to the second cylinder with said imprinting fabric, said compression resulting in adhesion of said web to said cylinder being greatest in discrete points corresponding to the knuckles of said imprinting fabric;
(g) differentially creping the same side of said web from the second cylinder; and
(h) converting said web into a one-ply or two-ply facial tissue or bath tissue product.

4,894,119

RETENTION AND/OR DRAINAGE AND/OR DEWATERING AID

Joseph J. Baron, Jr., Morris Plains; Tamara Nowakowski, Boonton Township, Morris County; Thomas A. Farrington, Sparta, and Frederick R. Mahn, Verona, all of, assignors to Drew Chemical Corporation, Boonton, N.J.

Filed Apr. 10, 1985, Ser. No. 721,876

Int. Cl.[4] **D21H** *3/38*

U.S. Cl. 162—168.2 **10 Claims**

1. A process for improving the retention and/or drainage in the manufacture of paper, comprising:
adding to a paper pulp stock prior to forming a paper sheet an effective amount consisting essentially of both a nonionic polymer and a cationic polymer wherein the nonionic polymer is polyacrylamide and the only cationic polymer added is selected from the group consisting of copolymers of acrylamide and a cationic monomer, diallylamine polymers and polymers of aminoalkyl esters of acrylic and methacrylic acid.

4,894,120

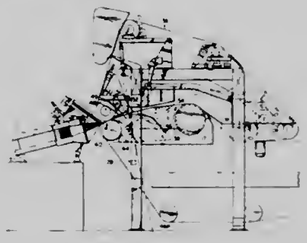
TWIN WIRE FORMING APPARATUS

Merle W. North, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 878,964, Apr. 30, 1986, abandoned. This application Dec. 2, 1987, Ser. No. 127,525

Int. Cl.[4] **D21F** *1/00*

U.S. Cl. 162—301 **9 Claims**



1. A forming apparatus for forming a web from stock, said apparatus comprising:
a frame;
a first plurality of guide rolls rotatably connected to said frame;
a first continuous forming wire loop extending around, and guided by, said first plurality of rolls;
a second plurality of guide rolls rotatably connected to said frame;
a second continuous forming wire loop extending around, and guided by, said second plurality of rolls;
said first and second wires cooperating together to define therebetween a substantially horizontal forming section in which the web is formed, said forming section having a first and a second end;
a headbox disposed directly adjacent to, and upstream relative to said first end of said forming section such that the stock is ejected from said headbox towards said first end of said forming section so that the stock moves together with, and between, said wires and along said forming section in a direction from said first towards said second end of said forming section, said headbox being structured so that the stock impinges on said first wire prior to said second wire;
a dewatering shoe disposed adjacent to said first end of said forming section and downstream relative to said headbox for dewatering the web, said shoe being connected to a source of partial vacuum;
said dewatering shoe defining a curved surface which abuts against said first wire, said curved surface having a center of curvature disposed on the opposite side of said first wire relative to said second wire such that a first portion of water is removed from the stock through said first wire and said curved surface and a second portion of water is removed from the stock through said second wire due to the centrifugal force of the stock moving along said first wire as said first wire passes over said curved surface;
a vacuum slot disposed adjacent to said second wire for collecting said second portion of water, said vacuum slot being disposed adjacent to said second wire such that said wires are disposed between said vacuum slot and said dewatering shoe, said vacuum slot being connected to a source of partial vacuum;
a radius top suction box disposed downstream relative to said vacuum slot such that said wires are disposed between said vacuum slot and said suction box, said suction box further reducing the moisture content of the formed web by removing water through said first wire, said suction box being connected to a source of partial vacuum;
a roll disposed downstream relative to said suction box between said suction box and said second end of said forming section, said roll being disposed on the same side of said first wire as said dewatering shoe;
said wires wrapping said roll such that a third portion of water is removed from the stock through said second wire;
said roll having a radius of curvature which is less than the radius of curvature of said curved surface, such that when said wires move around and wrap said roll, said third portion of water is removed by centrifugal force from the stock through said second wire so that dewatering of the stock from said first towards said second end of said forming section gradually increases so that the removal of fines from the web is minimized and two-sidedness of the resultant web is inibited; and
said second wire loop being devoid of dewatering elements between said vacuum slot and said roll.

4,894,121

PRESSURE PULP WASHER

Oscar Luthi; Frederick S. Lewis, both of Nashua, and Lawreace A. Carlsmith, Amherst, all of N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

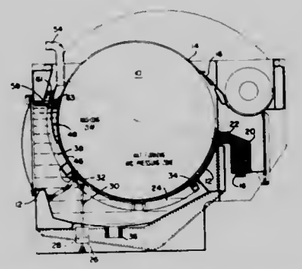
Continuation of Ser. No. 893,968, Aug. 7, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 244,570

Int. Cl.[4] **D21C** *9/02, 9/06*

U.S. Cl. 162—329 **4 Claims**

1. In an apparatus for forming a pulp mat from a pulp slurry; a vat; a rotatable drum mounted in the vat, said rotatable drum being constructed to permit liquid flow radially into the drum to form a pulp mat on the outside surface of the drum; a mat forming and pressing baffle disposed in spaced circumferential relationship about the periphery of said drum to form a first part of a circumferential space for forming and pressing the mat; a washing baffle disposed in spaced circumferential relationship about the periphery of said drum to form a second part of a circumferential space having its upstream edge circumferentially separated from the downstream edge of the mat forming and pressing baffle to provide a longitudinal slot through which wash water is flowed into the circumferential space separating the washing baffle from the drum, the upstream edge of the washing baffle having a wiper; a valve for controlling the velocity of the flow of liquid through the longitudinal slot, said valve having a surface facing the drum and continuously in contact with the wiper; and means interconnecting

said valve, the mat forming and pressing baffle, and the washing baffle constructed to widen and narrow the slot to move



the washing baffle outwardly and inwardly respectively, when the mat forming and pressing baffle moves outwardly and inwardly respectively.

4,894,122

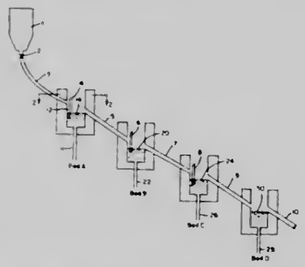
CONTINUOUS PROCESS FOR THE DESULPHURIZATION OF CARBONACEOUS RESIDUALS FROM DISTILLATION OF PETROLEUM USING A PLURALITY OF FLUIDIZED BEDS

Arturo Lazcano-Navarro, Monclova, and Andres Geronimo-Torres, Saltillo, both of Mexico, assignors to Instituto Mexicano de Investigaciones Siderurgicas, Saltillo, Mexico

Continuation-in-part of Ser. No. 64,808, Jun. 22, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,524

Int. Cl.[4] C01B *31/02*

U.S. Cl. 201—17 **3 Claims**



1. A continuous process for the desulphurization of particles of undevolatilized petroleum coke having a particle size of from about −20 to about +80 mesh and having an initial sulphur content of over 5% by weight to obtain a final sulphur level of between about 0.9% and about 0.5% by weight, said process comprising: providing four separate fluidized beds that are interconnected in series by individual inclined conduits to provide a first fluidized bed, a second fluidized bed in communication with said first fluidized bed, a third fluidized bed in communication with said second fluidized bed, and a fourth fluidized bed in communication with said third fluidized bed so that the particles of petroleum coke slide by gravity from one fluidized bed to a successive fluidized bed through a respective inclined conduit, each of said first, second and third fluidized beds having a respective particulate material inlet and a respective vertical wall opposite to and spaced from the particulate material inlet for deflecting entering particles of petroleum coke downwardly before the particles of petroleum coke pass into respective electrical heating zones in each of the first three beds; introducing a fluidized gas upwardly through the bottom of each of said four beds, wherein each of said first, second, and third fluidized beds is a heating bed and includes an electrically operated heating zone and said fourth fluidized bed is a cooling bed; introducing undevolatilized particles of petroleum coke into the inlet of said first fluidized bed; deflecting the particles of petroleum coke downwardly into a preliminary heating zone; heating the particles of undevolitilized petroleum coke in the preliminary heating zone between the particulate material inlet and the vertical wall in said first fluidized bed by thermal conduction to a temperature of about 1000° C. to substantially devolatilize the particles of petroleum coke; passing the substantially devolatilized particles of petroleum coke under a lower edge of said vertical wall of said first fluidized bed into the electrical heating zone of said first fluidized bed; maintaining the temperature of the particles of petroleum coke in said first fluidized bed at between about 1500° C. and about 1600° C. for a period of from about 0.5 hour to about 1 hour to reduce the sulphur content of the particles of petroleum coke from over 5% by weight to between about 3% and about 4% by weight; permitting the particles of petroleum coke to slide by gravity from said first fluidized bed to said second fluidized bed through a connecting inclined conduit; deflecting the particles of petroleum coke downwardly by the vertical wall in said second fluidized bed to cause the particles of petroleum coke to gradually enter the electrical heating zone in said second fluidized bed; maintaining the temperature of the particles of petroleum coke in said second fluidized bed at between about 1650° C. and 1700° C. for a period of from about 0.5 hour and about 1 hour to provide particles of petroleum coke having a sulphur content of from about 1.2% to about 1.8% by weight; permitting the particles of petroleum coke to slide by gravity from said second fluidized bed to said third fluidized bed through a connecting inclined conduit; deflecting the particles of petroleum coke downwardly by the vertical wall in said third fluidized bed to cause the particles of petroleum coke to gradually enter the electrical heating zone in said third fluidized bed; maintaining the temperature of the particles of petroleum coke in said third fluidized bed at between about 1950° C. and about 2200° C. for a period of from about 0.5 hour to about 1 hour to provide particles of petroleum coke having a sulphur content of from about 0.9% to about 0.5% by weight; permitting the particles of petroleum coke to slide by gravity from said third fluidized bed to said fourth fluidized bed through a connecting inclined conduit; cooling the particles of petroleum coke within said fourth fluidized bed by introducing fluidizing gas into said fourth fluidized bed and maintaining the particles in fluidized condition within said fourth fluidized bed for a period of from about 0.25 hour to about 0.5 hour; and thereafter passing the cooled particles of petroleum coke through a conduit for storage.

4,894,123

HIGH EFFICIENCY WATER DISTILLER

Arthur R. Helmich, Rte. 5, Box 5150, Benton, Ark. 72015-9525

Filed Nov. 1, 1988, Ser. No. 265,587

Int. Cl.[4] B01D *3/02*

U.S. Cl. 202—176 **19 Claims**

1. A distillation apparatus for removing contaminants from water, the apparatus comprising:

an outer enclosure including an incoming water inlet port and a condensed water outlet port;

a preheat unit including (a) a steam receiving bowl for receiving steam from the evaporator unit, and (b) an incoming water bowl within the steam receiving bowl for removing heat from the steam to preheat water to the evaporator unit;

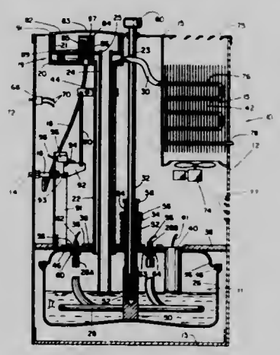
a water inlet conduit for passing incoming water from the inlet port to the incoming water bowl;

a valve for controlling the flow of incoming water through the water inlet conduit;

an evaporation unit for heating incoming water with contaminants to generate steam, the evaporation unit including (a) a heating bowl disposed within the enclosure for housing the incoming water, (b) an electrical heating element positioned within the heating bowl, and (c) a first cover affixed within the enclosure and over the heating bowl;

a substantially vertical steam chimney extending from the heating bowl, through the cover, and to the steam receiving bowl;

a substantially vertical water chimney positioned within the vertical steam chimney for passing water from the incoming water bowl to the heating bowl while removing heat from the steam in the vertical steam chimney to heat the water passing through the water chimney; and



a condenser unit for cooling the steam to form condensate water, the condenser unit comprising a fin-and-tube heat exchanger including (a) at least one tube in fluid communication at one end with the steam receiving bowl and in fluid communication at the opposite end to the condensed water outlet port for condensing steam to form condensate water, (b) a plurality of spaced fins each thermally connected to at least one tube for transmitting heat from at least one tube to the fins, and (c) a powered blower for blowing air between the fins and thus removing heat from the condenser unit.

4,894,124

THERMALLY STABLE DUAL METAL COATED LAMINATE PRODUCTS MADE FROM TEXTURED POLYIMIDE FILM

Daniel P. Walsh, Peabody, Mass., and Philip D. Knudsen, South Berwick, Mich., assignors to Polyonics Corporation, Newbury Port, Mass.

Division of Ser. No. 155,897, Feb. 16, 1988. This application Oct. 31, 1988, Ser. No. 268,246

Int. Cl.[4] C25D *5/54*

U.S. Cl. 204—30 **25 Claims**

1. A process for coating both surfaces of a polyimide sheet with copper in the absence of an adhesive, said process comprising contacting said sheet with a one- phase solution comprising a diamine with the formula $H_2N(CH_2)_nNH_2$ wherein n is an integer between 2 and 6, an alkali metal hydroxide, a water miscible alcohol and water for a time, and at a temperature sufficient to render the surfaces uniformly and substantially completely textured, treating said surfaces with a catalyst to create surfaces receptive to the electroless deposition of nickel or cobalt, depositing nickel or cobalt on said receptive surface by electroless deposition to form nickel or cobalt coated surfaces of said sheet, said deposited nickel or cobalt coatings being electrically conductive, forming microcracks in each of said nickel or cobalt coatings, baking said polyimide sheet coated with nickel or cobalt containing microcracks to volatilize components in said polyimide sheet while avoiding delamination of said coatings and depositing copper on said nickel surface or cobalt surface by electrolytic deposition to form exposed copper coatings on said polyimide sheet.

4,894,125

OPTICALLY BLACK PLIABLE FOILS

Robert J. Fenolia, Broomfield; Donald F. Shepard, Evergreen, and Sharon L. Van Loon, Conifer, all of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed May 20, 1988, Ser. No. 196,497

Int. Cl.[4] C25D *5/36, 5/44*; F24J *2/36*

U.S. Cl. 204—33 **13 Claims**

1. A composite ductile metal foil having an optically black surface comprising:

a. a metal foil substrate having a thickness effective for shaping and reshaping;

b. a black chromium surface applied to at least one side of said substrate by electrodeposition, said black chromium surface having:

1. a solar absorptivity of at least about 0.95;

2. an emissivity in the range of about 0.4 to about 0.8; and

3. an adhesion strength effective to resist spalling when a two inch by two inch sample of said composite foil is subjected to repeated deformation around a one mil diameter mandrel.

4,894,126

ANODIC COATINGS ON ALUMINUM FOR CIRCUIT PACKAGING

Issa S. Mahmoud, 10500 Settler's Trail, Austin, Tex. 78750

Filed Jan. 15, 1988, Ser. No. 145,805

Int. Cl.[4] C25D *11/08*

U.S. Cl. 204—58 **3 Claims**

1. An aqueous electrolytic anodizing bath for aluminum and its alloys comprising per liter:

from about 6 to about 24 ml sulfuric acid,

from about 5 to about 10 g complexing agent,

from about 2 to about 5 g urea; and

from about 4 to about 8 ml ammoniated colloidal silica

4,894,127

METHOD FOR ANODIZING ALUMINUM

Chun-Ming Wong, and Yukimori Moji, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 24, 1989, Ser. No. 356,099

Int. Cl.[4] C25D *11/08*

U.S. Cl. 204—58.5 **4 Claims**

1. An improved method of anodizing an aluminum alloy workpiece comprising the steps of:

providing an aqueous anodizing solution consisting essentially by weight of about 3 to 5 percent sulfuric acid, from about 0.5 to 1 percent boric acid and not more than about 3.7 percent aluminum ion and 0.2 percent chloride ion;

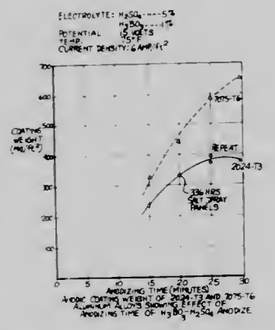
maintaining said bath at a temperature from about 70 to about 90 degrees F;

immersing said workpiece in said bath;

ramping the voltage applied across said workpiece in said bath from about 5 to about 20 volts; such that the current density is substantially uniform across the workpiece and the average current density does not exceed about 10 amperes per square foot; and

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maintaining said workpiece in said bath for a time such that an adherent coating of aluminum oxide is applied thereto



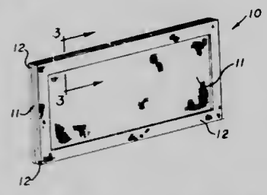
having a coating weight between about 200 and 600 milligrams per square foot.

4,894,128

MEMBRANE UNIT FOR ELECTROLYTIC CELL

Richard N. Beaver, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 5, 1986, Ser. No. 860,703
Int. Cl.⁴ C25B *1/16, 1/24, 9/00*
U.S. Cl. 204—98 **23 Claims**



1. An ion exchange membrane unit adapted for electrolyzers of the filter press type having at least one anode frame member and at least one cathode frame member, said electrolyzer adapted for producing an alkali metal hydroxide and a halogen by electrolysis of an alkali metal halide, comprising:

(a) at least one sheet of a hydraulically impermeable cation exchange membrane comprised of fluorocarbon polymers having a plurality of pendant groups selected from the group consisting of sulfonic acid groups, carboxylic acid groups, and mixtures thereof, said membrane material adapted for producing an alkali metal hydroxide and a halogen by electrolysis of an alkali metal halide, said ion exchange membrane having a gasket-bearing surface portion and an active surface portion; and

(b) at least one non-gasket, non-supporting frame reinforcement means for strengthening the gasket-bearing surface portion of the membrane such that tearing or shear stresses on the gasket-bearing surface portion of the membrane is minimized when the gasket-bearing surface portion of the membrane is under a compressive force,

said reinforcement means positioned only along the gasket-bearing surface portion of the membrane on at least one side of the membrane.

19. A method of electrolyzing an alkali metal salt to form an alkali metal hydroxide and a halogen comprising:

(a) interposing at least one membrane unit between at least a cathode frame member having a cathode and at least an anode frame member having an anode forming a catholyte and anolyte compartment;

(b) interposing at least one gasket member between at least one electrode frame member and the membrane unit,

said membrane unit comprising at least one sheet of a hydraulically impermeable cation exchange membrane comprised of fluorocarbon polymers having a plurality of pendant groups selected from the group consisting of sulfonic acid groups, carboxylic acid groups, and mixtures thereof, said membrane material adapted for producing an alkali metal hydroxide and a halogen by electrolysis of an alkali metal halide, and at least one non-gasket, non-supporting frame reinforcement means for strengthening the gasket-bearing surface portion of the membrane such that tearing or shear stresses on the gasket-bearing surface portion of the membrane is minimized when the gasket-bearing surface portion of the membrane is under a compressive force,

said reinforcement means positioned only along the gasket-bearing surface portion of the membrane on at least one side of the membrane;

(c) compressing the electrode frame members, membrane unit and gasket member with a compressive force;

(d) feeding an aqueous alkali metal halide solution to the anode compartment; and

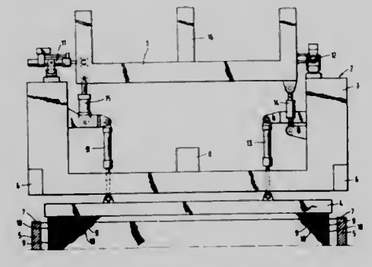
(e) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

4,894,129

METHOD AND APPARATUS FOR POSITIONING SHEET-LIKE OBJECTS

Matti O. Leiponen, and Kylä-Heikkilä Väinö I., both of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jan. 20, 1988, Ser. No. 146,236
Claims priority, application Finland, Jan. 22, 1987, 870285
Int. Cl.⁴ C25D *17/06*
U.S. Cl. 204—198 **8 Claims**



1. A method for positioning sheet-like objects, anodes and/or cathodes, in an electrolysis tank when the positioning is carried out by utilizing a gripping device connected to a loading member, wherein the gripping device can be moved with respect to the loading member and the electrolysis tank so that the position of the gripping device is adjusted essentially accurately with respect to the electrolysis tank and the loading member, on the basis of the measurements carried out by the aid of identification marks located in the electrolysis tank including making use of measurements of the shape and position of said identification marks in order to adjust the position of the gripping device.

4,894,130

PROCESS FOR ELECTROLYTICALLY DETACHING A PROTECTIVE COATING FROM A BASE METAL SUPERALLOY

Vladimir Sova, Remetschwil, Switzerland, assignor to ASEA Brown Boveri AG, Baden, Switzerland

Filed Dec. 1, 1988, Ser. No. 278,467
Claims priority, application Switzerland, Dec. 1, 1987, 4673/87
Int. Cl.⁴ C25F *5/00*
U.S. Cl. 204—129.35 **9 Claims**

1. A process for electrolytically removing a high chromium and nickel-containing or cobalt-containing protective coating from a nickel-based or cobalt-based superalloy base metal component having said protective coating, comprising the steps of:

(i) submerging the component having said protective coating in a solution of 20% NaOH, thereby activating said component;

(ii) submerging the activated component in concentrated HCl for 2 hours;

(iii) placing the component from step (ii) as the anode into an electrolytic cell, said cell containing an electrolyte which contains an oxidizing component which releases oxygen; and

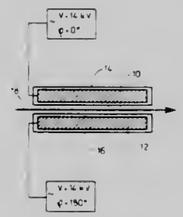
(iv) subjecting the anode component to electrolysis to remove said protective coating.

4,894,131

APPARATUS FOR THE SURFACE TREATMENT OF SYNTHETIC FIBERS OR YARNS

Martinez J. Jacobs, Geleen, and Hendrickus J. J. Rutten, Maastricht, both of Netherlands, assignors to Dyneema V.O.F., Sittard, Netherlands

Filed Sep. 30, 1988, Ser. No. 251,456
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733443
Int. Cl.⁴ C07C *17/00*
U.S. Cl. 204—165 **10 Claims**



1. An apparatus for the surface treatment of synthetic fibers or yarns, useful for treating polyethylene fibers of ultra-high molecular weight for improvement of the adhesion by means of a corona comprising two elongate linear, insulated, active electrodes, between which the fibers or yarns are passed.

4,894,132

SPUTTERING METHOD AND APPARATUS

Makoto Tanaka, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

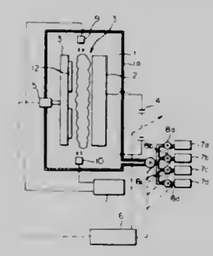
Filed Oct. 19, 1988, Ser. No. 259,780
Claims priority, application Japan, Oct. 21, 1987, 62-267158
Int. Cl.⁴ C23C *14/54*
U.S. Cl. 204—192.13 **6 Claims**

1. A sputtering method comprising:

sputtering a target metal in a glow discharge in sputtering gases to deposit the target metal on a wafer;

measuring an absorption spectrum of the sputtering gases during sputtering of the target metal; and

controlling the sputtering conditions in response to said measurements, including varying the separation between



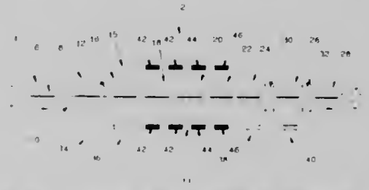
the target metal and the wafer, to provide a predetermined absorption spectrum.

4,894,133

METHOD AND APPARATUS MAKING MAGNETIC RECORDING DISK

Virgle L. Hedgcoth, 1524 Hacienda Pl., Pomona, Calif. 91768, assignor to Virgle L. Hedgcoth, Pomona, Calif.

Continuation of Ser. No. 926,676, Nov. 3, 1986, abandoned, which is a division of Ser. No. 796,768, Nov. 12, 1985, Pat. No. 4,735,840. This application Jun. 22, 1988, Ser. No. 210,119
Int. Cl.⁴ C23C *14/34*; B65H *1/00*
U.S. Cl. 204—192.15 **27 Claims**



1. A direct current planar magnetron sputtering source process of producing magnetic thin film memory disks with coatings on both sides of the disk, comprising the steps of:

providing substrates;

physically abrading the substrates to provide a uniform series of concentric grooves having a radial roughness factor within the range of 50 to 500 angstroms to encourage a circular anisotropic orientation of crystal growth during subsequent sputtering steps;

providing means for unidirectional transportation of substrates through a sequential series of continual concurrent sputtering processing steps in a deposition chamber having a series of partition walls with apertures for dividing the deposition chamber into separate sputtering chambers at a common pressure level including a carrier for supporting the substrates in vertical positions;

reducing the initial ambient pressure to a reduced common pressure level within a pressure range to enable a sputtering operation while eliminating atmospheric contaminants;

providing a first pair of elongated direct current planar magnetron sputtering sources of a nucleating layer, one on either side of the path of travel of the vertical substrates;

providing a gas in a plasma state of sufficient density to ensure acceptable amplitude modulation characteristics in the finished disks;

bombarding the first pair of nucleating sources with ions from the plasma gas to uniformly deposit a nucleating layer on both sides of the substrate to enable a predeter-

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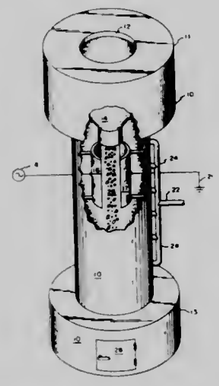
mined epitaxial growth of a subsequent magnetic layer while moving the substrates continually past the sources;
providing a second pair of elongated direct current planar magnetron sources of a magnetic layer on either side of the path of travel of the substrate at a position separate and downstream of the first pair of nucleating sources;
bombarding the second pair of magnetron sources during the same time period as the first nucleating sources are being bombarded to form a magnetic layer whereby a continual coating process on both sides of a substrate can be performed sequentially as substrates are transported through the sputtering process steps;
providing a third pair of elongated direct current planar magnetron sources of a protective layer on either side of the path of travel of the substrate at a position separate and downstream of the second pair of magnetic sources;
bombarding the third pair of protective coating sources to form a protective coating during the same time period as the second magnetron sources are being bombarded to provide a third state of a continual coating process as the substrates are transported through the sputtering process steps; and
removing the coated memory disk without effecting the sputtering operation pressure range.

4,894,134

MINERAL REFINEMENT BY HIGH RF ENERGY APPLICATION

Stephen M. Birken, 23 Mohawk Trail, and Karl Birken, 38 Grant Hill Ct., both of Clifton Park, N.Y. 12065

Filed Nov. 27, 1987, Ser. No. 125,938
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—193 7 Claims



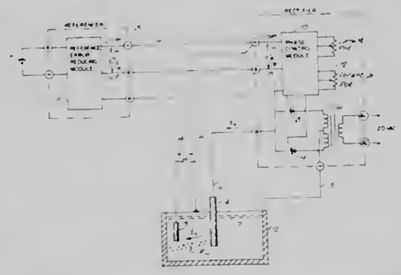
1. A refinement apparatus for selectively removing impurities and other unwanted inclusions from a base material comprising:
deposit and collection areas for holding said base material, said deposit area to provide temporary storage means for said base material preparatory to moving it downstream through said refinement apparatus to said collection area, said collection area comprising a repository for refined base material;
conduit means subject to less than ambient atmospheric conditions for transferring said base material from said deposit area towards said collection area;
tunable alternating current radiation means consisting of at least one electrode within the confines of said conduit means for irradiating said base material with high power, variable frequency, radio frequency energy in order to selectively heat and vaporize undesired particulate material that is included within said base material and to fracture encapsulations of undesirable particulate material captured by said base material; and
containment and gas removal means for maintaining said refinement apparatus isolated from ambient atmospheric conditions and for further evacuating said vaporized undesirable particulate material from said conduit means.

4,894,135

ELECTROLYTE IR VOLTAGE COMPENSATOR FOR CATHODIC PROTECTION SYSTEMS OR THE LIKE

Anthony Farque, 6600 S. 223rd East St., Tulsa, Okla. 74014

Continuation-in-part of Ser. No. 28,361, Mar. 20, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,873
Int. Cl.[4] C23F *13/02*
U.S. Cl. 204—196 17 Claims



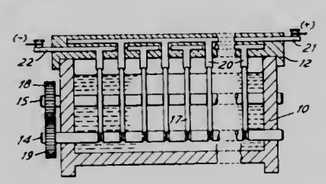
1. In an impressed current cathodic protection system having a controller for rectified AC impressed current passing through an electrolyte with an input for receiving a signal from a reference cell, an IR compensator circuit comprising
a first operational amplifier adapted to receive a signal from a reference cell,
a rectifier diode connected from the output of said amplifier to a node point having a measurable voltage thereat,
a feedback connected from said node point for said amplifier,
a substantially constant current source connected to said node point,
a capacitor connected between said node point and a ground potential point, and
means for supplying said voltage at said node point as the reference cell signal to said controller input.

4,894,136

ELECTROLYTIC TREATMENT OF A SURFACE

Thomas P. Murphy, Wantage, England, assignor to CMB Packaging (UK) Limited, Reading, England

Division of Ser. No. 186,861, Apr. 27, 1988, Pat. No. 4,828,662. This application Oct. 11, 1988, Ser. No. 255,302
Claims priority, application United Kingdom, May 12, 1987, 8711201
Int. Cl.[4] C25F *7/00*
U.S. Cl. 204—212 7 Claims



1. Apparatus for removing a layer of cobalt from a nickel surface on a disc, said apparatus comprising a trough to contain

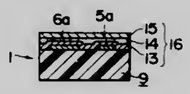
electrolyte sufficient to immerse most of the disc, means to support the disc for rotation, and means to make electrical contact with the periphery of the discs at a point above the meniscus of the electrolyte.

4,894,137

ENZYME ELECTRODE

Koichi Takizawa; Satoshi Nakajima, both of Kyoto, and Masato Arai, Muko, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 14, 1987, Ser. No. 95,977
Claims priority, application Japan, Sep. 12, 1986, 61-216391; Sep. 17, 1986, 61-220018; Oct. 3, 1986, 61-236870; Oct. 6, 1986, 61-237298; Oct. 27, 1986, 61-255294; Oct. 29, 1986, 61-257868; Nov. 25, 1986, 61-280346
Int. Cl.[4] C12Q *1/00*
U.S. Cl. 204—403 20 Claims



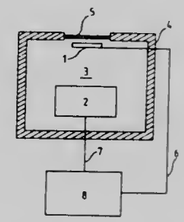
1. An enzyme electrode comprising:
an insulative base;
at least two electrodes including a working electrode and a reference electrode provided on the surface of said insulative base and each having an exposed portion and a connecting portion, the area of the exposed portion of the reference electrode being larger than that of the exposed portion of the working electrode;
an insulative protection film covering the portions excluding said exposed portions and connecting portions of said electrodes; and
an immobilized enzyme film which covers integrally at least the exposed portions of said working electrode.

4,894,138

ELECTROCHEMICAL GASEOUS MEASUREMENT CELL

Rudolf Gambert, Arfrade, and Uwe Kuehn, Lubeck, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Lübeck, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,385
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729287
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—415 10 Claims



1. An electrochemical measurement cell, comprising a housing, an acid electrolyte for galvanic measurement of gases comprising an aqueous solution of an organic acid containing polyfunctional groups suitable to yield protons during measurement, an anode and a cathode arranged in said electrolyte in spaced relationship, a gas evaluation unit connected between said anode and cathode for measuring the gas, and a permeable membrane closing off said electrolyte against the surrounding atmosphere being investigated.

4,894,139

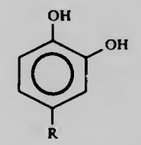
METHODS FOR DEACTIVATING COPPER IN HYDROCARBON FLUIDS

Paul V. Roling, Spring; Dwight K. Reid, Houston, both of Tex., and Joseph H. Y. Niu, Wanaque, N.J., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 904,598, Sep. 5, 1986, Pat. No. 4,749,468. This application May 24, 1988, Ser. No. 198,811
Claims priority, application Canada, May 28, 1987, 538373; European Pat. Off., Aug. 21, 1987, 87307421.5
Int. Cl.[4] C10G *21/00*
U.S. Cl. 208—48 AA 18 Claims

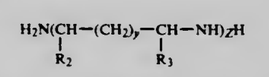
1. A method of deactivating a copper species already present in a hydrocarbon medium during high temperature processing, wherein in the absence of said deactivating method said copper would initiate decomposition of the hydrocarbon medium, said method comprising adding to said hydrocarbon medium an effective amount to deactive said copper species of an effective Mannich reaction product formed by reaction of reactants (A), (B), and (C), wherein (A) comprises an alkyl substituted catechol of the structure

FORMULA I



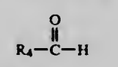
wherein R is selected from the alkyl, aryl, alkaryl, or arylalkyl of from about 1 to 20 carbon atoms (B) comprises a polyamine of the structure

FORMULA II



wherein z is a positive integer, R_2 and R_3 are the same or different and are independently selected from H, alkyl, aryl, aralkyl, or alkaryl having from 1 to 20 carbon atoms, y being 0 or 1; and (C) comprising an aldehyde of the structure

FORMULA III



wherein R_4 comprises H or C_1–C_6 alkyl.

4,894,140

METHOD OF TREATING WASTE OIL

Christian O. Schön, Römerstrasse 1, D-7590 Achern 18, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 116,856
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3638606; Feb. 3, 1987, 3703110
Int. Cl.[4] C10G *9/14, 51/02;* C10M *1/75*
U.S. Cl. 208—72 27 Claims

1. A method of continuously treating waste oil or pyrolysis oil, comprising the steps of conveying the oil along a single elongated path in a tubular reactor; heating the oil to progressively higher temperatures in a plurality of successive portions of said path; maintaining the oil in at least some portions of said path at a pressure and velocity such that the oil yields a succession of fractions as a result of heating, pressurization and periods of conveying along said at least some portions of said path; withdrawing the fractions at the downstream ends of the re-

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spective portions of said path; and immediately distilling the withdrawn fractions.

4,894,141

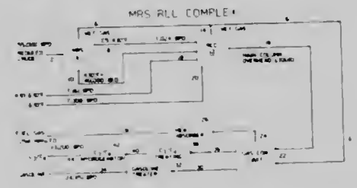
COMBINATION PROCESS FOR UPGRADING RESIDUAL OILS

Lloyd E. Busch; Paul W. Walters, and Oliver Zandona, all of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 355,661, Mar. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 304,992, Sep. 1, 1981, Pat. No. 4,434,044. This application Jan. 3, 1984, Ser. No. 567,487

Int. Cl.⁴ C10G *51/02, 51/04*

U.S. Cl. 208—73 **15 Claims**



1. A method for upgrading high boiling residual portions of crude oils comprising metal contaminants, porphyrins, asphaltenes and high molecular weight multi-ring hydrocarbon material, which method comprises:

A. charging a high boiling residual portion of crude oil admixed with diluent in contact with suspended upflowing substantially inert fluidizable solids particulate material at an elevated thermal visbreaking temperature in a riser contact zone for a time sufficient to recover therefrom a vaporous hydrocarbon product higher boiling than gasoline partially decarbonized and demetallized to a lower contaminating metals level,

B. quenching said vaporous product of thermal visbreaking below its dew point after separation from solids,

C. charging quenched thermally modified high boiling hydrocarbon product comprising metal contaminants in admixture with thermally produced naphtha in contact with a crystalline zeolite cracking catalyst maintained under cracking conditions for a hydrocarbon residence time in a riser cracking zone in the range of 0.5 to 3 second providing a riser outlet product temperature within the range of 510° C. (950° F.) to 593° C. (1100° F.),

D. recovering a hydrocarbon conversion product of said zeolite cracking operation comprising gasoline, lower and higher boiling product components separated from catalyst particles,

E. separating a combined C_4 minus wet gas product stream of said visbreaking and zeolite catalyst cracking operating to recover a C_3–C_4 rich fraction separately from a C_2 minus dry gas product fraction, and

F. regenerating said crystalline zeolite containing catalyst comprising carbonaceous deposits of said cracking operating in a sequence of separate regeneration zones provided with catalyst cooling transferred between zones under conditions to produce a CO rich flue as and high temperature catalyst particles suitable for recycle to said zeolite cracking operation; wherein vaporous hydrocarbon products of each said inert solids and catalyst contacting steps comprise naphtha and lower boiling materials which are processed together under conditions to effect the recovery of a C_3 minus dry gas stream from a C_3–C_4 rich gaseous product stream and a naphtha boiling range product separated from a light cycle oil product is used to effect separation of C_2 minus products from a C_2–C_4 rich product stream.

4,894,142

HYDROCRACKING PROCESS EMPLOYING LOW ACIDITY Y ZEOLITE

Karl Z. Steigleder, Glen Ellyn, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 29,938, Mar. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 781,562, Sep. 9, 1985, abandoned. This application Feb. 28, 1989, Ser. No. 316,723

Int. Cl.⁴ C10G *23/00, 47/20*

U.S. Cl. 208—111 **19 Claims**

1. In a hydrocraking process for the production of middle distillates having boiling points of 149°–371° C. in which a hydrocarbon feed stream is passed into contact with a catalyst composition comprising a refractory inorganic oxide matrix and a hydrogen form zeolite having the characteristic X-ray powder diffraction pattern of zeolite Y, with the zeolite having a unit cell size between about 24.2 and 24.40 Angstroms, at hydrocracking conditions and a product stream is recovered; the improvement which comprises employing as said zeolite a low acidity zeolite having an ion exchange capacity greater than 0.07, and a bound hydroxyl content sufficiently low to provide an Ammonia temperature programmed desorption (NH_3-TPD) acidity strength value of less than about 2.00.

4,894,143

CATALYTIC CRACKING PROCESS EMPLOYING AN ALUMINUM SILICON SPINEL-MULLITE-GAMMA ALUMIA CONTAINING CATALYST

Roger J. Lussier, Ellicott City, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 63,374, Jun. 8, 1987, abandoned, which is a division of Ser. No. 802,484, Nov. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 657,859, Oct. 5, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 248,758

Int. Cl.⁴ C10G *11/05*

U.S. Cl. 208—120 **5 Claims**

1. A method for catalytically cracking hydrocarbons which comprises reacting a hydrocarbon feedstock with a catalytic composition comprising an aluminum silicon spinel-mullite-gamma alumina bound composite in which the spinel phase has a silica to alumina ratio of above about 0.40 and characterized by a surface area of from about 100 to 300 m2/g, a total pore volume of from about 0.30 to 0.70 cc/g, the x-ray pattern set forth in Table B, and an alkali-metal oxide content of below about 0.50 weight percent.

4,894,144

PREPARATION OF LOWER SULFUR AND HIGHER SULFUR COKES

Bruce A. Newman, and Bharat S. Chahar, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 23, 1988, Ser. No. 275,295

Int. Cl.⁴ C10G *31/06*

U.S. Cl. 208—131 **8 Claims**

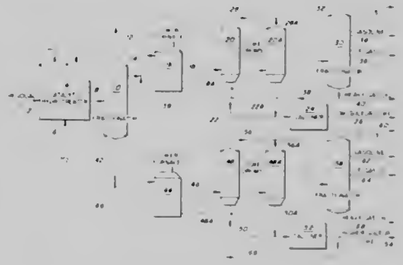
1. A process for producing a lower sulfur coke and higher sulfur coke from a single feedstock which comprises:

(1) catalytically hydrotreating a virgin heavy oil having an API gravity of from about −5 to about 25 and an initial boiling point of from about 550° F. to about 1,000° F. to reduce the sulfur content of the hydrotreated product to not more than about 0.75 weight percent.

(2) separating the hydrotreated product into a heavy fraction and a light fraction,

(3) separately subjecting each fraction to delayed coking,

(4) calcining the resulting green coke products to obtain (a) from the coked light fraction a low sulfur calcined coke,



and (b) from the coked heavy fraction a higher sulfur calcined coke.

4,894,145

AUTOMATIC CONTROL OF FEEDSTOCK VACUUM TOWERS

Bruce A. Jensen, Bartlesville, Okla., assignor to Applied Automation, Inc., Bartlesville, Okla.

Filed Jul. 19, 1988, Ser. No. 221,484

Int. Cl.⁴ B01D *3/42*

U.S. Cl. 208—350 **15 Claims**



11. A method for maintaining a desired cut point between fractions withdrawn from a fractional distillation tower, wherein a feed oil stream containing hydrocarbons is distilled in said tower, wherein the hydrocarbon components of said feed oil stream exhibit a sufficiently wide boiling point range to yield a plurality of fractions, wherein a total drawoff tray is located at a first point along the length of said fractional distillation tower, wherein the volume of said fractional distillation tower above said total drawoff tray defines a section of said fractional distillation tower, wherein an overhead vapor stream is withdrawn from an upper portion of said fractional distillation tower, cooled, and then provided to an overhead accumulator, said method comprising the following steps:

maintaining a liquid level above said drawoff tray, such that said section of said fractional distillation tower includes a liquid zone and a vapor zone;

withdrawing a first liquid fraction from said overhead accumulator;

providing a reflux stream at a second point along the length of said fractional distillation tower wherein said second point is located above said first point in the upper part of said vapor zone;

withdrawing a second liquid fraction from said fractional distillation tower from said total drawoff tray;

withdrawing a bottom fraction from said fractional distillation tower;

establishing a first signal representative of the vapor pressure at the top of said fractional distillation tower;

establishing a second signal representative of the pressure differential between said total drawoff tray and the top of said fractional distillation tower;

establishing a third signal representative of the vapor temperature in said vapor zone;

establishing a fourth signal which is representative of the cut point temperature between said first liquid fraction and said second liquid fraction;

comparing said fourth signal and said fifth signal and for establishing a sixth signal responsive to the difference between said fourth signal and said fifth signal; and

manipulating the flow rate of said reflux stream in response to said sixth signal to thereby maintain said fourth signal substantially equal to said fifth signal.

4,894,146

THIN CHANNEL SPLIT FLOW PROCESS AND APPARATUS FOR PARTICLE FRACTIONATION

John C. Giddings, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 67,487, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 822,529, Jan. 27, 1986, abandoned. This application May 20, 1988, Ser. No. 196,449

Int. Cl.⁴ B03B *7/00;* **B03C** *5/00*

U.S. Cl. 209—12 **32 Claims**



1. A continuous process for fractinating small particles as small as polypeptides and no larger than biological cells contained in a fluid stream comprising:

a. continuously introducing two or more fluid substreams of different composition into the inlet end of a thin enclosed channel having an inlet end possessing at least two inlet means and an outlet end possessing at least two outlet means and having a thickness which is very thin compared to the other two dimensions and is less than 5 millimeters, and has a length of not more than about 20 centimeters, and bringing a substream into contact with adjacent substreams so as to collectively form a series of thin laminae flowing parallel to one another within the channel and in contact with one another over a sufficient length of channel to allow a desired level of mass transport between and through the laminae without substantial hydrodynamic mixing between the laminae,

b. continuously introducing a fluid medium containing the particles to be separated by means of one of said inlet means into one or more of the fluid substreams and varying the fluid composition of the non-particle containing substreams as needed to realize separation,

c. at the outlet end of the channel splitting the collective channel stream into another set of substreams so as to permit separate recovery of at least two of the substreams at separate outlet means at the outlet end of the channel,

d. adjusting the flow rates at the inlet end as well as at the outlet end so as to obtain the desired separation,

e. continuously removing all of the substreams being separated at least two separate outlet means at the outlet end of the channel,

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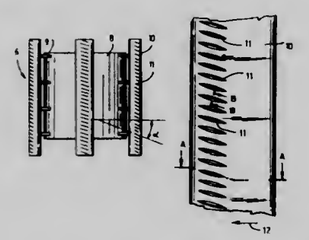
f. during the separation process subjecting the channel to one or more transverse driving forces or gradients having a component perpendicular to the plane of the flow stream in the channel, and being selected from the group consisting of gravitation, centrifugation, electrical, dielectrical forces, cross-flow forces, temperature gradients, density gradients and concentration gradients, and combinations thereof.

4,894,147

DEVICE FOR SCREENING PULP AND A BLADE FOR THE SCREENING DEVICE

Veli-Matti Rajala, Tampere, Finland, assignor to OY Tampella AB, Tampere, Finland

Filed Feb. 22, 1989, Ser. No. 314,375
Claims priority, application Finland, Mar. 7, 1988, 881049
Int. Cl.[4] B07B *1/20*
U.S. Cl. 209—273 **13 Claims**



1. A device for screening pulp for removing a rejected pulp fraction from a desired pulp fraction, comprising

a screen drum (2) having a surface provided with openings and allowing the passage of the desired pulp fraction therethrough, and

a plurality of substantially upwardly extending blades (10) mounted close to the surface of the screen drum (2), one of the screen drum (2) and the blades (10) being mounted rotatably for movement in a predetermined direction around the axis of the screen drum (2) so that the blades (10) and the surface of the screen drum (2) move with respect to each other through a rotatory motion, and the pulp being introduced into the screening device to one end of the screen drum (2) and said rejected pulp fraction traveling along the axis of the screen drum in a discharge direction to be discharged from the other end thereof, characterized in that in order to transfer the rejected pulp in the discharge direction, at least some of the blades (10) are provided with grooves (11) transverse to the upward extend of the blades (10), said grooves being so inclined with respect to the direction of the movement of the blades (10) with respect to the surface of the screen drum (2) that a foremost end of each groove (11) in the direction of movement is, along the axis of the drum in the discharge direction, at a greater distance from the other end of the screen drum than a rearmost end of the same groove (11) in the direction of movement.

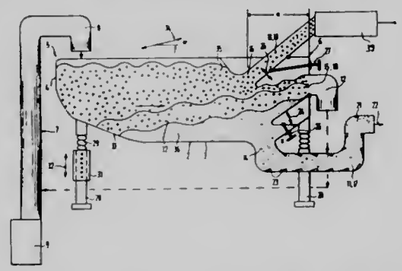
4,894,148

DEVICE FOR SEPARATING A HETEROGENEOUS MASS OF SOLID MATERIAL INTO FRACTIONS

Josef Frei, Oberehrendingen, Switzerland, assignor to Organ-Faser Technology B.V., Haarlem, Netherlands

Filed Apr. 28, 1987, Ser. No. 43,373
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1986, 3614324
Int. Cl.[4] B03B *13/00*
U.S. Cl. 209—479 **2 Claims**

1. A device for separating high density and low density constituents from a heterogeneous mass of solid material in household, industrial, and other similar waste, in which the material is first dried and then separated into said constitutents, comprising a trough-shaped container having a material charging end for receiving the mass, a vibrator connected to said container to produce vibrations causing the segregation of said high density constituents downwards and said low density constituents upwards, said container having a lower zone and an upper zone; take-off devices in both said lower zone and upper zone, and an intermediate take-off device arranged between the take-off devices in said upper and lower zones, said take-off devices being operable for removing the separated constituents from the container, said intermediate take-off device being connected to a material charging device which



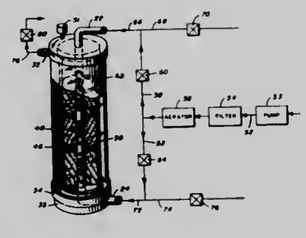
leads back to the upper zone of the container, said take-off devices in said upper and lower zones and said intermediate take-off device each having a take-off opening and a conveyor means subsequent thereto, each of said take-off devices further constituting pipes such that at least one of the take-off openings is arranged in a wall of the container, wherein the conveyor means of the take-off device in said upper zone includes an exhaust device connected thereto, the take-off pipe of said device in said upper zone projects into the container from above, and further wherein the take-off pipe of said device in said upper zone is inclined towards the material charging end of said container and the inclination is adjustable to ensure that the take-off device in the upper zone removes only the low density constitutents.

4,894,149

BIOLOGICAL FILTRATION DEVICE

Steven J. Block, 9368 Oakwilde Ave., Stockton, Calif. 95212

Filed Sep. 16, 1988, Ser. No. 245,169
Int. Cl.[4] B01D *27/02*
U.S. Cl. 210—101 **21 Claims**



1. A filtration device comprising:

an assembly of three concentric elongated tubular members adapted for use in a generally vertical position, having a closure wall at each end, the inner and middle tubular members being perforated over substantially their entire lengths to permit water flow therethrough, and the outer tubular member being substantially imperforate over its entire length;

a first inlet means communicating with the interior of said inner tubular member at one end thereof, and a second inlet means communicating with the interior of said inner tubular member at the other end thereof;

outlet means communicating with the interior of said outer tubular member;

a filtration medium in the space between said middle tubular member said inner tubular member defining a filtration chamber, the perforations of said inner and middle tubular members not passing said medium therethrough; and

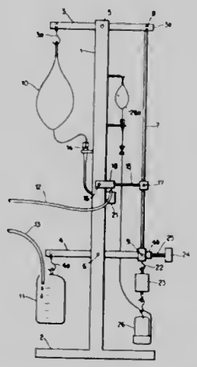
dividing means laterally dividing said inner tubular member into upper and lower non-communicating portions and laterally dividing said filtration chamber into upper and lower non-communicating filtration chambers.

4,894,150

MECHANICAL DEVICE FOR SIMPLIFYING FLUID BALANCE IN HEMOFILTRATION

Hans-Joachim Schurek, Sperlingsfeld 9, and Jörg-Dieter Biela, Wilhelm-Blum-Str. 19, both of D-3000 Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 820,442, Jan. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 483,280, Apr. 8, 1983, abandoned. This application Jun. 2, 1988, Ser. No. 205,618
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213390
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—101 **30 Claims**



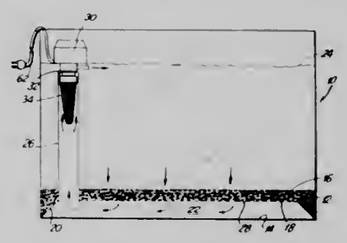
1. A device for equalizing the rate of flow of substitution liquid and the rate of flow of filtrate in a filtration system, where a waste-enriched liquid is filtered, a portion of the waste-enriched liquid is removed as filtrate, and the removed portion of the waste-enriched liquid is at least partially replaced by the substitution liquid, said device comprising: a filter for waste-enriched liquid, said filter including an inlet means in communication with means defining a supply of the waste-enriched liquid, a first outlet means in communication with means defining a source of substitution liquid, and a second outlet means in communication with means defining a reservoir for the filtrate; a mechanical balancing system including a stand, means provided on said stand for supporting the source of the substitution liquid at a first level above the filter, and means on said stand for supporting the reservoir for the filtrate at a second level below the filter, said balancing system undergoing deflection in response to a difference between an instantaneous equilibrium force and the instantaneous total weight of the liquid in the source and the reservoir on the respective supporting means; a control unit provided on said stand at a third level between said first and second levels and including means for regulating the rate of flow of the substitution liquid from the source on the respective supporting means to the reservoir for the filtrate; a counterweight connected to each of said supporting means to perform movements jointly with the source and the reservoir; and a mechanical linkage having means for mechanically transmitting motion between said balancing system and said control unit in such a manner that said control unit changes the flow rate of the substitution liquid from the source on the respective supporting means in response to deflection of said balancing system.

4,894,151

FILTER CARTRIDGE FOR AN UNDERGRAVEL AQUARIUM FILTER

Klaus Woltmann, Demarest, N.J., assignor to Willinger Brothers, Inc., Oakland, N.J.

Filed Oct. 12, 1988, Ser. No. 256,904
Int. Cl.[4] A01K *63/04*
U.S. Cl. 210—169 **14 Claims**



1. A combination of an undergravel filter with a power head for filtering water in an aquarium, comprising:

a perforated plate carrying thereon a gravel bed and forming with a bottom wall of an aquarium chamber;

a riser tube extending upwardly from said perforated plate and connecting said chamber with said power head, said power head being mounted at the top of said riser tube and constructed so as to suck water from said chamber, said power head including means for returning water sucked from said chamber into an aquarium tank; and

a filter cartridge connected to said power head and immersed into said riser tube to filter the water before it is returned into said aquarium tank by said power head,

wherein said cartridge includes a substantially elongated perforated portion of a substantially conical configuration and a cylindrical portion, said conical portion containing a filter material, and

wherein said cartridge further includes a perforated plug inserted thereinto between said conical portion and said cylindrical portion, said plug being of a substantially conical configuration to provide for an increased filtering surface for the water passing towards the power head.

4,894,152

FLUID CONTROL DEVICE

Arthur E. Colvin, Jr., Mount Airy, Md., and Matthew W. Hanley, Washington, D.C., assignors to Cerex Corporation, Gaithersburg, Md.

Filed Aug. 13, 1987, Ser. No. 84,880
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **7 Claims**

1. A fluid control device for a fluid chromatography system comprising:

a plate;

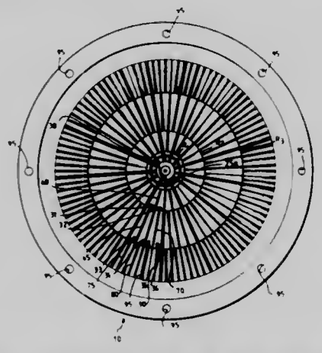
an aperture centrally located through said plate for introducing fluid to said system;

radially oriented channels formed in one side of said plate and radiating outward from said aperture with a slope

such that the channels decrease in depth from the center portion to the outer edge portion of said plate;

raised radial flutes located in said radially oriented channels to divide said channels into at least two radially oriented subchannels;

structure wherein said radially oriented channels are confined to a region extending from an inner edge at the edge of said centrally located aperture in the plate to an outer edge at a predetermined radius from the center of said centrally located aperture with:



radius r_1 located between said inner and outer edges; a first set of equally spaced, raised radial flutes extending from said inner edge to said outer edge defining a first set of channels;

a second set of equally spaced, raised radial flutes extending from radius r_1 to said outer edge and being positioned so as to bisect said first set of channels into a first set of equal subchannels; and

a porous plug located in the centrally located aperture located through said plate adjacent said radially oriented channels for helping force fluid into

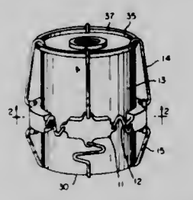
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4,894,153

MAGNETIC ATTACHMENT FOR A FILTER

Hossein A. Shirdavani, 14425 NE. 37th Pl., Apt. G6, Bellevue, Wash. 98007

Filed Nov. 28, 1988, Ser. No. 276,529
Int. Cl.[4] B01D *35/06*
U.S. Cl. 210—222 **2 Claims**



1. Apparatus for augmenting the function of a filter for liquids, said filter having a casing, a top rim, a length and a bottom having a center, said apparatus comprising:

a plurality of magnets,

first springs interconnecting said magnets,

links connecting said magnets to said top rim,

a ring positioned at said center of said bottom and

second springs interconnecting said magnets to said ring, whereby said first springs position said magnets around said casing and said links, ring and second springs position said magnets along said length on said casing.

4,894,154

INDIVIDUAL PORTABLE WATER-TREATMENT DEVICE

Bernard Roz, Brüs Sous Forge, and Jacques Andre, Sainte Genevieve des Bois, both of France, assignors to Societe de Recherche Techniques et Industrielles (SRTI), Buc, France

Filed Jun. 15, 1988, Ser. No. 206,728
Claims priority, application France, Jun. 19, 1987, 87 08657
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—266 **14 Claims**



1. An individual, portable water-treatment device comprising as water-treatment components a first filtering device, for the filtering of suspended matter, a charge of absorbent, a charge of ion exchangers and a second filtering device for filtering micro-organisms, wherein said components are contained in an elongated enclosure comprising a confining wall, an inlet end and an outlet end, a first closure at the inlet end provided with an inlet for water to be treated and, at its outlet end a second closure provided with an outlet for treated water, and means for imperviously closing the outlet during off periods and opening the outlet during on periods and wherein the first filtering device is in a chamber of the enclosure adjacent to the inlet end closure and separated from the rest of the enclosure containing the charges and the second filtering device by a impervious partition wall fixed to the confining wall of the elongated enclosure and provided with means defining a hole and means fixed at the hole for closing the hole imperviously during off periods and for permitting opening of the hole during on periods.

4,894,155

SINGLE MEMBRANE DISC SUPPORTING UPPER AND LOWER MEMBRANES

Richard A. Leoncavallo, Pittsford, and Gregory R. Phillips, Penfield, both of N.Y., assignors to Nalge Company, Rochester, N.Y.

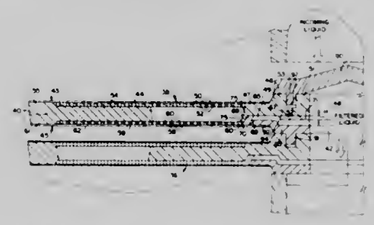
Filed Apr. 14, 1988, Ser. No. 181,417
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.84 **8 Claims**

1. A filter assembly comprising a housing having a central filter chamber, said housing having an inlet for allowing entry of a liquid to be filtered, filter means disposed in said filter chamber for filtering of a liquid entering said chamber and an exhaust port for allowing exit for the liquid that has been filtered from said filter chamber, said filter means comprising at least one disc shaped filter assembly having a central opening for communication with said exhaust port, said disc shaped filter assembly comprising:

an upper annular integrally formed support disc having a top membrane support surface, a central axial opening communicating with said exhaust port, and a lower membrane support surface, said upper top membrane support surface and a lower membrane support surface each having a plurality of primary annular extending grooves for channeling a liquid and a plurality of main radially extending collection grooves for collecting said liquid from said primary grooves, said disc having at least one axial groove for connecting said collection grooves in said upper top membrane support surface with said collection grooves in said lower membranes support surface;

a first filter membrane disposed on said top surface covering said primary grooves and said connecting grooves, said membrane being sealingly secured to said top surface so that only liquid passing through said first membrane flows onto said primary and collection grooves;

a lower aligning integrally formed support disc for mating with the bottom surface of said upper annular support disc, said aligning support disc having an axial opening for communication with said axial opening of said upper annular support disc, said aligning support disc having a top surface facing said upper annular support disc, said top surface having a plurality of radially extending ribs which engage the bottom surface with said upper annular support disc and form a plurality of radially extending grooves which connect said collection grooves of said lower mombrane support surface with said axial opening of said upper angular support disc;



a second filter membrane disposed on said lower membrane support surface overlapping at least a portion of said lower aligning disc, said second filter membrane covering said primary and connecting grooves on said bottom surface and the space between said support disc and aligning disc and sealingly secured thereto so that only liquid which has passed through said first or second membrane passes to said axial opening;

means for aligning said lower aligning support disc with said upper annular support disc, said means comprising an annular shoulder in said lower surface of said upper annular support disc in said central portion and an annular projection on the upper surface of said upper aligning disc for mating with said annular shoulder; and

means for allowing stacking a plurality of said disc assemblies comprising a recess in the upper surface of said upper top membranes surface and an annular projection on the upper surfaces of said aligning support disc, said projection being designed to engage said recess.

4,894,156

HOSE CONSTRUCTION, COUPLING ARRANGEMENT THEREFOR AND METHOD OF MAKING THE SAME

Joseph S. Murken, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 192,326, Apr. 25, 1988, Pat. No. 4,806,248, which is a continuation of Ser. No. 92,788, Sep. 2, 1987, abandoned, which is a division of Ser. No. 881,533, Jul. 2, 1986, Pat. No. 4,707,262. This application Oct. 13, 1988, Ser. No. 257,371
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—448 **1 Claim**

1. In a method of making a coupling arrangement for conveying fluid therethrough and having a filter unit disposed therein to filter the fluid flow through said coupling arrangement, the improvement comprising the steps of forming said coupling arrangement to be a quick connect-disconnect coupling arrangement that comprises a first tubular coupling member having opposed open ends, a second tubular coupling member having opposed open ends one of which is telescopically disposed in one of said ends of said first coupling member, and a removable fastening member securing said one ends of said coupling members together in the telescoping relation thereof, forming said filter unit to have means that is held between said one ends of said coupling members when said one ends are in said secured telescoping relation thereof whereby said filter unit is secured in said coupling arrangement by said means thereof, disposing an annular flexible sealing member to



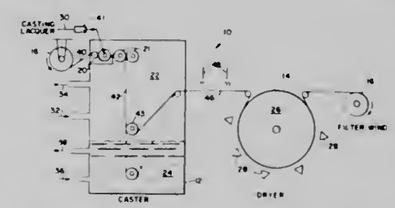
be carried by said coupling arrangement and be in a compressed relation therein to provide a loading force on said filter unit and on said fastening member, forming said means of said filter unit to comprise an outwardly directed annular flange, forming said one end of said first coupling member to have an internal annular shoulder means, forming said one end of said second coupling member to have an annular shoulder means, disposing said annular flange of said filter unit to be held in sandwiched relation between said shoulder means when said one ends are in said secured telescoping relation, and forming one of said shoulder means to carry said annular flexible sealing member in said compressed relation between said one shoulder means and said annular flange of said filter unit when said one ends are in said secured telescoping relation.

4,894,157

PROCESS FOR PRODUCING SUPPORTED CELLUOSIC MEMBRANES AND PRODUCTS

James S. Johnson, Acton, Mass., assignor to Micron Separations, Inc., Westborough, Mass.

Filed Oct. 5, 1987, Ser. No. 103,960
Int. Cl.[4] B01D *31/00*
U.S. Cl. 210—490 **25 Claims**



1. A continuous process for producing an integral, bubble pointable microporous cellulosic membrane filter having an integral support web embedded therein, comprising:

(a) preparing a casting lacquer comprising at least one cellulosic polymer, at least one solvent for the polymer, and at least one non-solvent pore former wherein the casting lacquer is at the point of incipient gelation;

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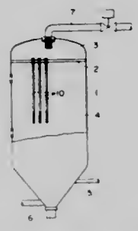
(b) conveying a non-woven polymer support web through the casting lacquer from step (a) so as to effect complete wetting of the web and coating of the lacquer as a fluid-film of uniform thickness on either surface of the web;
(c) conveying the film coated web through an environmentally controlled atmosphere for a time sufficient to effect evaporation of the solvent and non-solvent pore formers and gelation of the cellulosic polymer occurs, thereby forming a microporous cellulosic membrane on either side of the web; and
(d) drying the membrane coated support to remove residual solvents and non-solvent.

4,894,158

POROUS FILTER ELEMENT WITH UNDULATIONS

Tadashi Morita, Gamagori; Kazuhiro Nomura, Sayama, and Yoshiyuki Matsushima, Tokyo, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 80,304
Claims priority, application Japan, Sep. 11, 1986, 61-214526
Int. Cl.[4] B01D *27/04*
U.S. Cl. 210—497.2 **8 Claims**



1. A porous filter element for filtering a liquid, said filter element comprising a plurality of seamless filter element units that are made of stainless steel powder wherein the range of particle diameter of said stainless steel powder is between 0.100–0.355 mm, wherein these particles are sintered into a final shape at a sintering density of 4.0–5.8 g/cc, a pore ratio of 28–50% and a nominal passage pore size of 10–40μ, and wherein an outside surface of said filter element units is formed with minor undulations so as to form bedding surfaces that facilitate the adhesion of an auxiliary filtering agent to the filter element units.

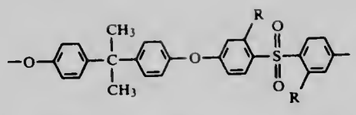
4,894,159

METHOD OF MANUFACTURING A REVERSE OSMOSIS MEMBRANE AND THE MEMBRANE SO PRODUCED

Michael D. Guiver, Ottawa; André Y. Tremblay, and Chung M. Tan, both of Vanier, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Jun. 5, 1989, Ser. No. 361,341
Int. Cl.[4] B01D *13/00, 13/04*
U.S. Cl. 210—500.41 **10 Claims**

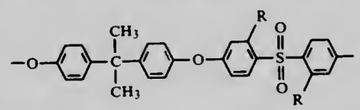
1. A method of manufacturing a reverse osmosis membrane; comprising:
(a) casting a polysulfone casting composition on to a support, the polysulfone casting composition comprising:
(i) an aromatic polysulfone derivative having repeat units, at least an average of about 20% of which are carboxylated and are of the formula I:



(I)

, wherein each R in each formula is ortho to the sulfone, at least one R in each formula is a carboxyl group with any remainder thereof being hydrogen, and
(ii) a solvent for the aromatic polysulfone derivative, then
(b) evaporating solvent from the cast polysulfone casting composition, then
(c) gelling the cast polysulfone casting composition in a gelation medium to form a reverse osmosis membrane therefrom.

10. A reverse osmosis membrane of an aromatic polysulfone derivative having repeat units, at least an average of about 20% of which are carboxylated and are of the formula I:



(I)

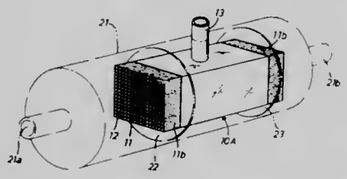
wherein each R in each formula is ortho to the sulfone, at least one R in each formula is a carboxyl group with any remainder thereof being hydrogen.

4,894,160

HONEYCOMB STRUCTURE FOR FLUID FILTRATION

Fumio Abe, Handa, and Hiroshi Mori, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Sep. 6, 1988, Ser. No. 240,723
Claims priority, application Japan, Sep. 4, 1987, 62-222771; Sep. 4, 1987, 62-222772
Int. Cl.[4] B01D *29/00*
U.S. Cl. 210—510.1 **14 Claims**



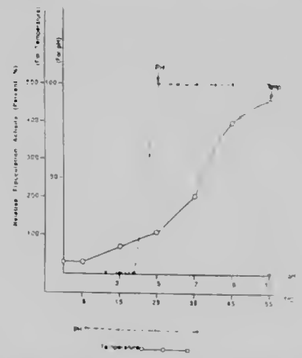
1. A honeycomb structure for fluid filtration comprising means for providing a resistance ratio between a selective membrane and a support of porous ceramic material sufficient to substantially enhance filtration efficiency of the honeycomb structure, said structure comprising:
a support of porous ceramic material having a plurality of axially parallel passageways extending therethrough and uniformly spaced by porous partition walls to permit flow of pressurized fluid therethrough; and
a selective membrane coated onto the surface of the passageways to separate one or more components from the fluid and to permit flow of filtrate passing therethrough to be carried through the porous partition walls to an exterior surface of the partition walls for collection, said selective membrane having an average pore size of about 10–10,000 angstroms;
wherein the porous partition walls are formed to permit the passage of filtrate therethrough at a flow quantity which is more than 20 times the flow quantity of filtrate passing through said selective membrane and said partition walls, collectively.

4,894,161

PROCESS FOR CLARIFYING A LIQUID USING A POLYMERIC SUBSTANCE

Moshe Shilo, Jerusalem, and Ali Fattom, Maale Hagalil, both of Israel, assignors to Solmat systems, Ltd., Yavne, Israel

Division of Ser. No. 634,535, Jul. 26, 1984, Pat. No. 4,649,110, which is a continuation of Ser. No. 403,047, Jul. 29, 1982, abandoned. This application Nov. 7, 1986, Ser. No. 927,947
Int. Cl.[4] C02F *1/54*
U.S. Cl. 210—602 **17 Claims**



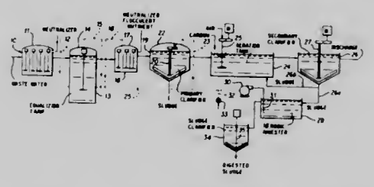
1. A process for clarifying a liquid containing particulates comprising treating said liquid by adding a bioflocculant excretion of a bacteria selected from the group of cyanobacteria of the Phormidium genus in a concentration sufficient of flocculate particles in the liquid.

4,894,162

TREATMENT OF VOLATILE ORGANIC SUBSTANCES AT WASTE WATER TREATMENT PLANTS

Richard Cournoyer, Whitehouse Station, N.J.; Thomas Jakopp, Kaisten, Switzerland, and G. E. Friberg, Toms River, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 27, 1988, Ser. No. 187,035
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—603 **7 Claims**



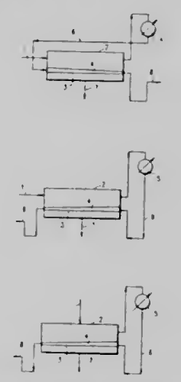
1. In a method for purifying industrial waste effluent including both waste water and off-gases containing volatile organic solvents by an aerobic biological waste water treatment system containing an aerobic treatment zone comprising a mixture of biologically active solids and activated carbon for treating the waste water, which involves subjecting the industrial waste water to a primary treatment to at least adjust the pH of the industrial waste water and remove the solids therefrom, subjecting the thus treated waste water to treatment in an aerobic biological treatment zone, supplying the biological treated waste water to a separation zone to separate the sludge produced in the aerobic treatment zone from the waste water to purify the waste water, transferring at least a portion of this sludge to an aerobic digesting zone, wherein the sludge is reduced in volume by action of aerobic microorganisms located therein, the improvement comprising concurrently collecting the off-gases containing volatile organic solvents in the industrial waste water primary treatment system, directing the thus collected off-gases to either the aerobic treatment zone or the aerobic digesting zone or to both the aerobic treatment zone and the aerobic digesting zone to biologically degrade and substantially eliminate the volatile organic solvents in the off-gases.

4,894,163

SEPARATION OF LIQUID MIXTURES

Kazunori Watanabe, Tsukuba, and Yoshio Fuchigami, Okayama, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jun. 6, 1988, Ser. No. 202,527
Claims priority, application Japan, Jun. 12, 1987, 62-147305
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—640 **14 Claims**



1. A method of separating liquid mixtures by pervaporation which comprises feeding a feed liquid mixture to a membrane separator in the form of a mixed fluid at least part of which is in the form of a vapor to thereby cause said vapor to come into direct contact with a liquid film originating from the liquid mixture and occurring on a permeation membrane such that said vapor is partially condensed in said liquid film, to obtain a permeate fraction and a non-permeated liquid portion.

4,894,164

APPARATUS FOR TREATING BLOOD IN AN EXTRACORPOREAL CIRCUIT

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg von der Hohe, Fed. Rep. of Germany

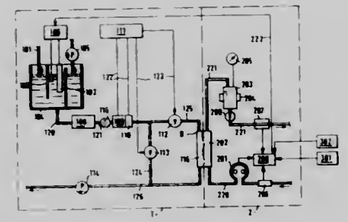
Filed Oct. 27, 1987, Ser. No. 114,346
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1986, 3636995
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—646 **22 Claims**

1. A method for withdrawing heat from blood in a extracorporeal circuit employing a treatment solution wherein blood is brought into contact with the treatment solution along a membrane and wherein the treatment solution has been heated in a source supplying the treatment solution, in order to maintain energy balance of a patient, the method comprising:
establishing a reference temperature value for the blood prior to starting treatment;

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measuring the temperature of blood emerging from said patient's body during use of the treatment solution to obtain a first measured temperature value correlated with the body temperature of the patient;

comparing the first measured temperature value with the reference value to obtain a comparison value; and



continuously adjusting the temperature of the treatment solution in response to the comparison value to maintain the comparison value in order to maintain an energy balance of the patient.

4,894,165

REJECTION ENHANCING COATINGS FOR REVERSE OSMOSIS MEMBRANES

Richard F. Fibiger, Midland; Michael J. Colucci, Saginaw; David J. Forgach, Midland; Ritchie A. Wessling, Midland, and Donald L. Schmidt, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

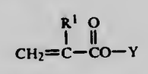
Division of Ser. No. 162,824, Mar. 2, 1988, Pat. No. 4,828,700, which is a continuation-in-part of Ser. No. 75,497, Jul. 20, 1987. This application May 8, 1989, Ser. No. 348,928

Int. Cl.[4] B01D *13/00*

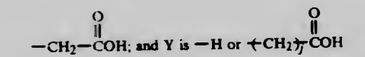
U.S. Cl. 210—654 **3 Claims**

1. A process for separation of water having a reduced solute concentration from a concentrated aqueous solution comprising contacting a reverse osmosis membrane with the concentrated solution at conditions which promote selective permeation of water through the membrane wherein said membrane comprises a cellulose diacetate, cellulose triacetate or polyamide reverse osmosis membrane having an effective amount of a water-soluble, vinyl-addition polymer deposited on the membrane sufficient to enable a reduction in salt passage by at least about 20 percent while decreasing water flux by not more than about 20 percent at standard reverse osmosis test conditions or enabling an increase in water flux by at least 5 percent without any substantial increase in salt passage, wherein said polymer is derived from:

(a) at least about 5 weight percent of a carboxylic acid monomer of the formula



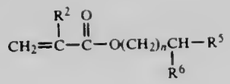
wherein R^1 is hydrogen, methyl, $-CH_2OH$ or



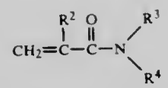
wherein j is an integer from 1 to 5; and

(b) a remaining amount of a compatible ethylenically unsaturated monomer, with the proviso that where R^1 is hydrogen, then at least 5 weight percent of

(c) an ethylenically unsaturated monomer of the Formula II or III



(II)



(III)

must be present, wherein R^2 at each occurrence is independently methyl, ethyl, or $-CH_2OH$; R^5 is —H, —OH, methyl or ethyl; R^6 is —OH, $-OCH_2CH_2-_mOH$, $-NR^7R^7$ or $-CH_2OH$; n is an integer from 1 to 3; m is an integer from 1 to 15; R^7 is at each occurrence independently —H, $-CH_3$, $-CH_2CH_3$ or $-CH_2CH_2OH$; R^3 is —H, $-CH_2-_kOH$, methyl or ethyl; R^4 is —H, $-CH_2-_kOH$, methyl or ethyl and k at each occurrence is an integer from 1 to 4, and wherein (a) and (c) together account for at least about 50 weight percent of the monomers from which the vinyl-addition polymer is derived.

4,894,166

METHOD FOR CLEANING OIL-CONTAMINATED WATER IN A SWIMMING OR BATHING AREA

Robert L. Pitts, Fremont, Ohio, assignor to Packaging Industries Group, Inc., Hyannis, Mass.

Continuation of Ser. No. 947,820, Dec. 30, 1986, abandoned. This application Aug. 28, 1988, Ser. No. 237,628

Int. Cl.[4] C02F *1/28*

U.S. Cl. 210—663 **9 Claims**

1. A method for cleaning oil-contaminated water in a closed recirculating swimming or bathing system which includes a skimmer device comprising:

circulating at least one oil absorber comprising compressible, oleophilic, hydrophobic crosslinked polyolefin foam on a surface of said oil-contaminated water, said at least one absorber having a compressible curved outer surface, and

skimming oil contaminants from the surface of the water, whereby said at least one absorber removes oil from the surface of said water.

4,894,167

PROCESS FOR REMOVING HEAVY METAL CATIONS AND/OR ALKALI METAL CATIONS FROM AQUEOUS SOLUTIONS WITH AN ION EXCHANGER MATERIAL

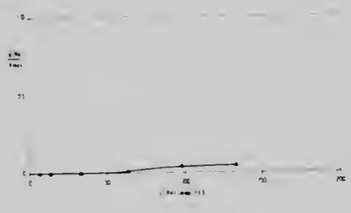
Wolfgang Holl, Ettlingen; Siegfried Eberle, Eggenstein, and Jurgen Horst, Karlsruhe, all of Fed. Rep. of Germany, assignors to Keraforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 179,779

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 87105409

Int. Cl.[4] B01J *49/00;* **C02F** *1/42*

U.S. Cl. 210—673 **5 Claims**



1. Process for removing heavy metal cations and/or alkali metal cations from an aqueous solution with an ion exchanger material that contains a cation exchanger loaded with alkaline earth metal ions, and subsequently regenerating the loaded or exhausted ion exchanger material comprising:

contacting an aqueous solution which contains heavy metal ions and/or alkali metal ions with an ion exchange material comprising a cation exchanger loaded with alkaline earth metal ions, and

subsequently regenerating the loaded or exhausted cation exchanger, either alone or in a mixture with an anion exchanger, by introducing a CO_2-containing gas into an aqueous suspension containing at least one (a) slightly soluble carbonate of an alkaline earth metal ion, (b) slightly soluble hydroxide of an alkaline earth metal ion, or (c) a completely or partially calcined natural carbonate wherein the partial pressure of the CO_2 in the suspension is from 0.1 to 10 bar, and bringing the CO_2-containing suspension into contact with the loaded or exhausted cation exchanger.

4,894,168

PROCESS FOR THE REMOVAL OF CATIONS OF AN ALKALINE EARTH METAL SPECIES FROM AQUEOUS SOLUTIONS WITH AN ION EXCHANGER MATERIAL

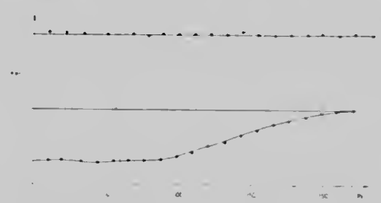
Wolfgang Holl, Ettlingen; Siegfried Eberle, Eggenstein, and Jurgen Horst, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 179,780

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 87105409

Int. Cl.[4] B01J *49/00;* **C02F** *1/42*

U.S. Cl. 210—673 **2 Claims**



1. Process for selectively removing cations of a first alkaline earth metal species from an aqueous solution containing several alkaline earth metal species with an ion exchanger material that is a cation exchanger or contains one, and subsequently regenerating the loaded or exhausted ion exchanger material, comprising:

(a) contacting the aqueous solution containing several alkaline earth metal species with a cation exchanger that has been loaded in advance with cations of a second alkaline earth metal species, to remove the cations of the first alkaline earth metal, and

(b) regenerating the cation exchanger that is loaded or exhausted with the first species to be removed by bringing the loaded or exhausted cation exchanger into contact with an aqueous suspension of a slightly soluble carbonate and/or hydroxide of the second alkaline earth metal species, either alone or in combination with an anion exchanger, and introducing a CO_2-containing gas into the suspension, to elute the first alkaline earth metal species from the cation exchanger and to condition the cation exchanger with the second alkaline earth metal species in a single processing step.

4,894,169

METHOD OF INHIBITING IRON SALT DEPOSITION IN AQUEOUS SYSTEMS USING UREA SALTS

Mona Delitsky, Pasadena, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 177,191, Apr. 4, 1988, abandoned. This application Oct. 13, 1988, Ser. No. 257,253

Int. Cl.[4] C02F *5/12*

U.S. Cl. 210—698 **5 Claims**

1. A method for inhibiting precipitation of iron salts including iron phosphate in an aqueous system, said method comprising adding to said system an effective amount of a water soluble urea salt selected from the group consisting of urea nitrate, urea disodium salt and urea sulfate at concentrations ranging from 10 mg/l to 400 mg/l.

4,894,170

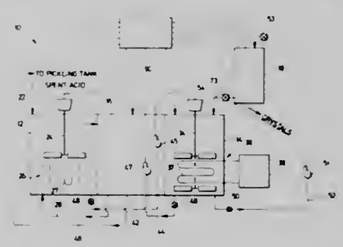
LIQUID RECOVERY SYSTEM AND METHOD

Richard D. Billmyre, 4822 Fauna La., Indianapolis, Ind. 46234

Filed Feb. 27, 1989, Ser. No. 315,809

Int. Cl.[4] B01D *17/00, 21/00*

U.S. Cl. 210—712 **30 Claims**



1. A liquid recovery system for separating dissolved solid material from a spent liquid to provide a recovered liquid comprising:

means for providing continuous operation and means for providing batch operation; said means for providing batch operation first including

a first tank;

input means for delivering spent liquid to

said means for providing continuous operation first including said first tank in a substantially continuous manner;

said means for providing batch operation next including

a second tank;

first fluid coupling means for transferring a quantity of spent liquid from said first tank to said second tank;

a separator for separating solid material from said spent liquid in said second tank to provide a recovered liquid in said second tank;

a third tank;

second fluid coupling means for transferring a quantity of recovered liquid from said second tank to said third tank; and

said means for providing continuous operation next including

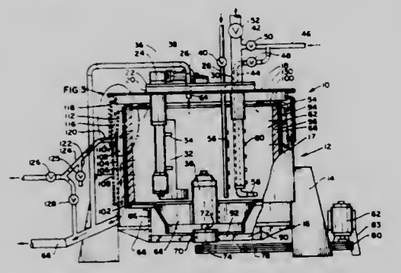
output means for delivering recovered liquid out of said third tank in a substantially continuous manner.

4,894,171

METHOD FOR REMOVING SALTS FROM HERBICIDE SOLUTIONS

Keith H. Nichols, Houston, Tex., assignor to Fermenta Plant Protection Company, Mentor, Ohio

Filed Feb. 29, 1988, Ser. No. 162,094
Int. Cl.[4] B04B *3/00*
U.S. Cl. 210—772 **7 Claims**



1. A method for removing salts from a herbicide solution comprising the steps of:

applying a filter media onto the internal walls of a rotating spin basket of a centrifugal apparatus having:

an outer cylindrical casing for enclosing a vertically rotatable spin basket, having a top wall, vertical side walls and a bottom wall;

wherein said top wall supports: a means for applying filter media onto the internal walls of said spin basket;

a means for spraying a herbicide solution containing salt solids from a feed tank onto the filter media present on the internal walls of said spin basket thereby separating the salt solids from the solution which penetrates through the filter media;

a means for spraying solvent onto the salt solids and filter media present on the internal walls of said spin basket thereby washing excess solution from the salt solids and the filter media; and

a vertically rotatable plowing means for plowing the salt solids and spent filter media from the spin basket;

wherein said vertical side walls support:

an internal upper collection trough for collecting liquid overflow from said spin basket when said spin basket is rotated; and

with said bottom wall, an internal lower radial collection chamber for collecting filtrate which flows through said spin basket when said spin basket is rotated; and wherein said bottom wall has openings for passage of spent filter media and means for supporting the spin basket within said casing;

wherein said spin basket is of smaller diameter and shorter height than said casing and is centered on a vertical axis and rotatable relative to said supporting means about said axis by means of a central hub having a plurality of spokes secured at their inner ends to the hub and at their outer ends to said spin basket;

wherein said basket has means for supporting a filter bed including a radially outer layer of fine mesh screening and a radially inner layer of precoat filter media;

and wherein said basket has a closed top ledge portion to support said filter bed, an open top portion to permit solution overflow when flow through said precoat filter bed is restricted and an open bottom to permit passage of spent filter media;

an overflow discharge outlet in communication with said upper overflow collection trough, wherein said overflow discharge outlet is connected to piping for transporting fluid collected from said upper overflow collection trough;

a filtrate discharge outlet in communication with said lower collection chamber, wherein said filtrate discharge outlet is connected to piping for transporting fluid collected from said lower collection chamber; and

a driving means for rotating said spin basket;

spraying a herbicide solution containing salt solids onto the filter media present on the internal walls of said rotating spin basket where the centrifugal force produced by the rotating spin basket forces (i) a first portion of the salt solution to penetrate through the filter media and the spin basket into the internal layer radial collection trough of the apparatus, thereby depositing the salt solids present in the herbicide solution onto the filter media, and (ii) a second portion of the salt solution to progress vertically up the filter media surface, over the top ledge of the rotating spin basket, and into the internal upper radial collection trough of the apparatus;

spraying a solvent solution onto the salt solids and the filter media present on the internal walls of said rotating spin basket where the centrifugal force produced by the rotating spin basket forces (i) a first portion of the solvent solution to penetrate through the salt solids, the filter media, and the spin basket into the internal lower radial collection trough, thereby washing the excess herbicide solution from the salt solids and the filter media, and (ii) a second portion of the solvent solution to progress vertically up the filter media surface containing the salt solids, over the top ledge of the rotating spin basket into the internal upper radial collection trough of the apparatus, thereby washing the herbicide solution from the salt solids, the filter media surface, and the internal radial collection trough;

recycling a portion of said solvent solution from the upper radial collection trough to said feed tank

increasing the rotation speed of said spin basket thereby increasing the centrifugal force produced by the rotating spin basket and forcing excess solvent and herbicide solution out of said filter media into said internal lower radial collection trough; and,

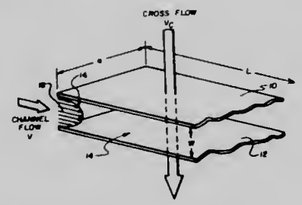
decreasing the rotation speed of said spin basket and plowing the salt solids and spent filter media from the spin basket whereby the plowed solids fall through openings in the bottom of said spin basket and casing.

4,894,172

PROCESS FOR PROGRAMMING OF FIELD-FLOW FRANCTIONATION

Philip S. Williams, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Aug. 29, 1988, Ser. No. 237,188
Int. Cl.[4] B03B *5/00*
U.S. Cl. 210—748 **9 Claims**



5. In a field-flow fractionation process wherein a carrier fluid containing a small particulate, polymeric or macromolecular sample to be separated is forced through a thin flow channel with the carrier fluid flowing in the direction of the flow axis and a field force or gradient is used to induce a driving force acting across the thin channel perpendicular to the flow axis, the improvement comprising holding the field strength S of the field force constant at an initial level S_o for a time-lag period t_1, and then decaying the field strength with time t according to the equation

$$S = S_0\left[\frac{t_1 - t_a}{t - t_a}\right]^p$$

wherein $t \geq t_1 > t_a$, $t_1 \geq 0$ and $p > 0$, and holding the mean channel flow velocity $\langle v \rangle$ constant, with the above symbols representing the following

S=field strength

S_o=field strength at initial constant level

t_1=time lag period which is time for field strength held constant

t=time for decaying field strength

t_a=remaining time parameter

p=number of power when decaying field strength

$\langle v \rangle$=mean channel flow velocity.

4,894,173

DIVALENT ION TOLERANT AROMATIC SULFONATES

Roman Loza, Solon; Arthur J. Cooper, Garfield Heights, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 204,061, Jun. 8, 1988, Pat. No. 4,836,283. This application Nov. 14, 1988, Ser. No. 270,869
Int. Cl.[4] E21B *43/22*
U.S. Cl. 252—8.554 **12 Claims**

1. A surfactant composition for use in enhanced oil recovery comprising a compound having the following formula:

where

x=0 to 4

R'=H or CH_3

$R=CH_3(CH_2)y$ and y=1 to 15.

2. The surfactant composition of claim 1 further comprising a second compound having the following formula:

wherein R, x, y, and R' are the same as defined in claim 1.

4,894,174

ANTI-OXIDANT COMPOSITIONS

Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 60,183, Jun. 9, 1987, Pat. No. 4,764,299. This application Jun. 24, 1988, Ser. No. 188,589
Int. Cl.[4] C10M *135/22*; C07C *149/14*
U.S. Cl. 252—48.2 **25 Claims**

1. A composition of the formula

$RS(AS_xAO)_yAS_xASR^1$

wherein x is 1 or greater, y is 1 or greater and R and R^1 are hydrocarbyl groups, A is an alkylene group and provided further that one of R and R^1 contains at least 5 carbon atoms.

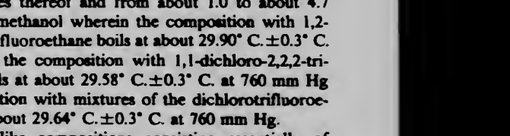
4,894,175

CRUDE OIL WITH A DEPRESSED POUR POINT

Götz Koerner; Dietmar Schaefer, both of Essen; Roland Berger, Bochum; Hans-Ferdi Fink, and Heinz Duman, both of Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 27,518, Mar. 18, 1987, abandoned. This application Feb. 18, 1988, Ser. No. 157,734
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614412
Int. Cl.[4] C10M *1/50*; H01B *3/20*
U.S. Cl. 252—78.3 **12 Claims**

1. A crude oil having a depressed pour point, containing from about 0.005 to about 0.5 weight percent of a pour point depressant compound of the general formula:



in which

R^1 is alkyl with 18 to 36 carbon atoms with at least 40% of the alkyl grous having at least 22 carbon atoms,

R^2 is hydrogen, methyl or a substituent containing polar groups, with

R^2 being the same or different within the average molecule,

$n \geq 30$ and

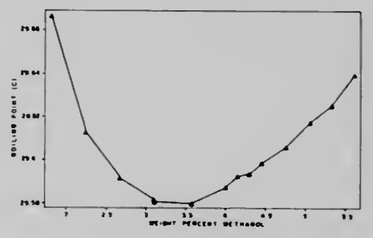
m=0 to n/2; and mixtures thereof.

4,894,176

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE, DICHLOROTRIFLUOROETHANE AND METHANOL

Ellen L. Swan, Rancocas Woods; Rajat S. Basu, and Ian R. Shankland, both of Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 290,124, Dec. 27, 1988. This application Jan. 17, 1989, Ser. No. 297,467
Int. Cl.[4] C11D *7/50, 7/30*
U.S. Cl. 252—171 **20 Claims**



1. Azeotrope-like compositions consisting essentially of from about 60.0 to about 94.0 weight percent 1,1-dichloro-1-fluoroethane, from about 5.0 to about 35.5 weight percent dichlorotrifluoroethane selected from the group consisting of 1, 2-dichloro-1,2,20trifluoroethane, 1,1-dichloro-2,2,2-trifluoroethane or mixtures thereof and from about 1.0 to about 4.7 weight percent methanol wherein the composition with 1,2-dichloro-1,2,2-trifluoroethane boils at about 29.90° C.±0.3° C. at 760 mm Hg, the composition with 1,1-dichloro-2,2,2-trifluoroethane boils at about 29.58° C.±0.3° C. at 760 mm Hg and the composition with mixtures of the dichlorotrifluoroethanes boils at about 29.64° C.±0.3° C. at 760 mm Hg.

8. Azeotrope-like compositions consisting essentially of 1,1-dichloro-1-fluoroethane, dichlorotrifluoroethane selected

VOL 1110 ISS 3 JA 16 1990 UMI

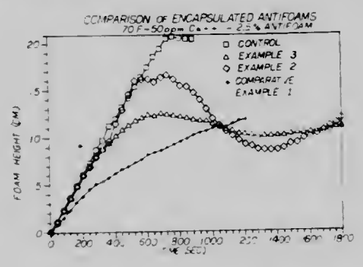
from the group consisting of 1, 2-dichloro-1,2,2-trifluoroethane, 1,1-dichloro-2,2,2-trifluoroethane or mixtures thereof and methanol wherein the composition with 1,2-dichloro-1,2,2-trifluoroethane boils at about 29.70° C.±0.3° C. at 760 mm Hg, the composition with 1,1-dichloro-2,2,2-trifluoroethane boils at about 29.58° C.±0.3° C. at 760 mm Hg and the composition with mixtures of the dichlorotrifluoroethanes boils at about 29.64° C.±0.3° C. at 760 mm Hg.

4,894,177

AGGLOMERATED GRANULES FOR THE DELAYED RELEASE OF ANTIFOAMING AGENTS IN LAUNDERING SYSTEMS

Michael S. Starch, Lincoln Township, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 7, 1988, Ser. No. 178,951
Int. Cl.[4] B01D *19/02, 19/04;* **C11D** *3/22, 3/37*
U.S. Cl. 252—174.15 **52 Claims**



1. A delayed release antifoam laundry additive consisting essentially of one or more conventional silicon based antifoam agents held on a carrier comprising water soluble modified cellulose, wherein said antifoam agent is contained in said laundry additive in an amount of from about 10 to 45' wt. % based on the weight of said antifoam agent and said carrier taken together, said delayed release antifoam laundry additive being formed by the process comprising the steps of:

(i) first uniformly loading said antifoam agent on said carrier;

(ii) then mixing said carrier in the presence of an amount of a solvent for said carrier sufficient to cause agglomeration of said carrier: and

(iii) then driving the solvent from the carrier.

51. A method of forming agglomerated granules for the delayed release of antifoam agent in water which comprises loading one or more conventional silicon based antifoam agents on a carrier of water soluble modified cellulose, wherein said antifoam agent is contained in said laundry additive in an amount of from about 10 to 45 wt. % based on the weight of said antifoam agent and said carrier taken together then mixing the carrier loaded with antifoam agent in the presence of a solvent for the carrier in an amount sufficient to agglomerate said carrier.

4,894,178

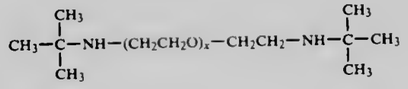
ABSORBENT COMPOSITION CONTAI ING SEVERELY-HINDERED AMINE MIXTURE FOR THE ABSORPTION OF H_2S

W. S. Winston Ho, Annandale; Eugene L. Stogryn, Edison, and Guido Sartori, Annandale, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 13, 1987, Ser. No. 106,796
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—189 **4 Claims**

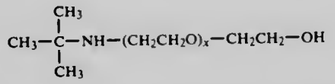
1. An absorbent composition comprising a mixture of:

(1) a first severely hindered amine with the formula:



and

(2) a second severely hindered amine with the formula:



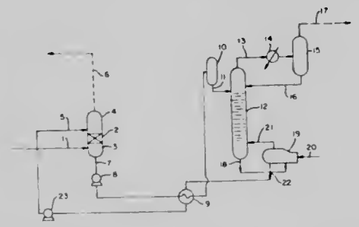
wherein said first and second severely hindered amines have a cumulative $-E_s$ value greater than 1.75, with x being an integer ranging from 2 to 6 and the weight ratio of the first amine to the second amine ranging from 0.43:1 to 2.3:1.

4,894,179

ABSORBENT COMPOSITION CONTAINING A TERTIARY AMINO AZABICYCLIC ALCOHOL AND AN AMINE SALT

Guido Santori; W. S. Winston Ho, both of Annandale, and Eugene L. Stogryn, Edison, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 13, 1987, Ser. No. 106,797
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—189 **10 Claims**



1. A composition comprising: (1) at least one tertiary amino azabicyclic alcohol and (2) an amine salt, said amine salt being the reaction product of said azabicyclic alcohol and a component selected from the group consisting of an acid having at least one pKa of not more than about 7, a decomposable salt of an acid having at least one pKa of not more than about 7, a compound capable of forming an acid having a pKa of not more than about 7 and a mixtures thereof, said amine salt and said tertiary azabicyclic alcohol being present in said composition in a mole ratio of said amine salt to said tertiary amino azabicyclic alcohol of at least about 0.2:1 to 4:1.

4,894,180

LIQUID CRYSTAL OPTICAL ELEMENT

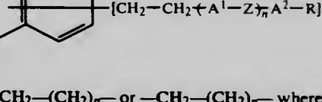
Takashi Takayanagi, and Hideo Kawaguchi, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 7, 1988, Ser. No. 141,381
Claims priority, application Japan, Jan. 7, 1987, 62-1383; Jan. 8, 1987, 62-2465
Int. Cl.[4] C09K *19/52*
U.S. Cl. 252—299.01 **10 Claims**

1. A liquid crystal optical element comprising a nematic side chain type polymeric liquid crystal having added therein at least one compound selected from the group consisting of:

(a) adamantane, 1,3-dimethyladamantane, 1-bromoadamantane, 1-chloroadamantane, 2-bromoadamantane, 2-chloroadamantane, 2-adamantanol, 1,3-dimethyladamantane-5,7-diol, 1-hydroxymethyladamantane, 1-cyanoadamantane, ethyl 1-adamantanecarboxylate, 1-acetylaminoadamantane, and 1-aminomethyladamantane, and

(b) terphenyl or a terphenyl derivative represented by the formula:



wherein X and Y each represents a hydrogen atom, an alkyl group, an oxyalkyl group, a halogen atom, a nitrile group, a nitro group, or an alkyl ester group,

wherein said compound or compounds is or are present in a total amount of from 0.01 to 15% by weight based on the polymeric liquid crystal.

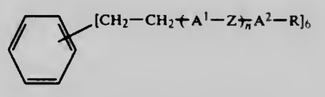
4,894,181

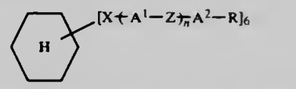
CARBOCYCLIC COMPOUNDS

Klaus Praefcke; Bernd Kohne, both of Berlin, and Elke Poetsch, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

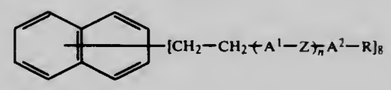
Division of Ser. No. 843,406, Mar. 24, 1986, Pat. No. 4,758,373. This application May 16, 1988, Ser. No. 194,668
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510325
Int. Cl.[4] C09K *19/34, 19/32, 19/30, 19/20, 19/12*
U.S. Cl. 252—299.61 **16 Claims**

1. A carbocyclic compound of the formula 1a, 1b or 1c


1a


1b

wherein the substituents $[X\text{-}(A^1\text{-}Z)_n\text{-}A^2\text{-}R]$ opposite each other are situated equatorially and in the trans-position,


1c

wherein

X is $-CH_2-(CH_2)_p-$ or $-CH_2-(CH_2)_p-$ wherein one or two non-adjacent CH_2 groups are replaced by —O—, —S—, —CO—, —O—CO—, —CO—O— or —CH=CH,

p is 0, 1 or 2,

A^1 and A^2 independently are each 1,4-phenylene or 1,4-phenylene substituted by halogen, CH_3 or CN; 1,4-phenylene or 1,4-phenylene substituted by halogen, CH_3 or CN wherein one or more CH groups are replaced by N atoms; 1,4-cyclohexylene, 1,4-cyclohexylene substituted in the 1-position or 4-position by CN or 1,4-cyclohexylene wherein one or two non-adjacent CH_2 groups are replaced by —O— or —S—; piperidine-1,4-diyl; or 1,4-bicyclo[2.2.2]octylene,

Z is —CO—O—, —O—CO—, —O—, $-CH_2-$, $-CH_2O-$, $-OCH_2-$, $-CH_2CH_2$, —CHCN—CH_2—, —CH=CHCN—, —CH=CH—, —CH=N, —N=CH—, —NO=N—, —N=NO— or a single bond,

n is 0, 1 or 2 and

R is alkyl of 1 to 20 C atoms or alkyl having 1 to 20 C atoms wherein one or more non-adjacent CH_2 groups are replaced by —O—, —CO—, —O—CO—, —CO—O— or —CH=CH—, F, Cl, Br, I, OH, NH_2, COOH or CN.

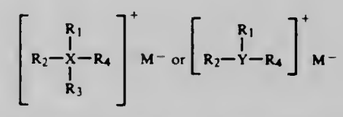
4,894,182

ORGANOPHILIC CLAY GELLANT AND PROCESSES FOR PREPARING ORGANOPHILIC CLAY GELLANTS

Charles A. Cody, Robbinsville, and Steven J. Kennetz, Trenton, both of N.J., assignors to NL Chemicals, Inc., Hightstown, N.J.

Filed Oct. 19, 1987, Ser. No. 109,393
Int. Cl.[4] B01J *13/00;* **C08K** *9/04;* **C08L** *67/00*
U.S. Cl. 252—315.2 **32 Claims**

1. An organophilic clay gellant comprising the reaction product of a smectite-type clay having a cation associated therewith and having a cation exchange capacity of at least about 75 milliequivalents per 100 grams of said clay and an organic cation derived from an organic cation/anion compound having the general formula:



or mixtures thereof wherein X is a nitrogen or phosphorus, Y is sulfur, M^- is an anion, R_1 is a lineal or branched, saturated or unsaturated alkyl group having 12 to 22 carbon atoms and R_2, R_3 and R_4 are independently selected from (a) lineal or branched alkyl group having 1 to 22 carbon atoms; (b) aralkyl groups which are benzyl and substituted benzyl moities including fused ring moieties having lineal or branched 1 to 22 carbon atoms in the alkyl portion of the structure; (c) aryl groups including phenyl and substituted phenyl including fused ring aromatic substituents; (d) data, gamma, unsaturated groups having six or less carbon atoms or hydroxyalkyl groups having 2 to 6 carbon atoms; and (e) hydrogen and wherein the improvement comprises the reaction product of the cation from the smectite-type clay and M^- is water, a gas, an insoluble compound having a solubility constant of 1×10^{-2} or less in water at room temperature or a mixture thereof.

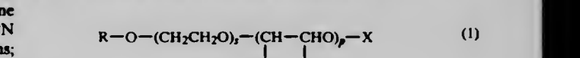
4,894,183

COMPOSITION AND USE THEREOF AS DYEING OR TEXTILE AUXILIARY

Rosemarie Töpfl, Dornach, and Heinz Abel, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 835,001, Feb. 28, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 147,093
Claims priority, application Switzerland, Mar. 7, 1985, 1024/85
Int. Cl.[4] B01D *17/00*
U.S. Cl. 252—358 **13 Claims**

1. A composition which comprises a mixture of which at least one component is an acid ester of the formula


(1)

wherein

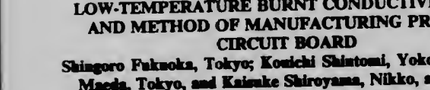
s is 3 to 10, p is 5 to 15,

R is an aliphatic radical of an unsaturated or saturated monoalcohol containing 6 to 24 carbon atoms;

one of Z_1 and Z_2 is methyl and the other is hydrogen, and

X is the acid radical of a low molecular aliphatic dicarboxylic acid, and

at least one other component of which composition is an acid ester of the formula:



(2)

wherein

m is 3 to 10, n is 5 to 15,

R_1 is an aliphatic radical of not less than 6 carbon atoms or is alkylphenyl containing 4 to 16 carbon atoms in the alkyl moiety;

one of Z_1 and Z_2 is methyl and the other is hydrogen, and

X_1 is the acid radical of an inorganic oxygen-containing acid.

4,894,184

LOW-TEMPERATURE BURNT CONDUCTIVE PASTE AND METHOD OF MANUFACTURING PRINTED CIRCUIT BOARD

Shingoro Fukuoka, Tokyo; Koichi Shintomi, Yokohama; Ryu Maeda, Tokyo, and Kaisuke Shiroyama, Nikko, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 43,096

Claims priority, application Japan, Aug. 27, 1986, 61-200731

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252—512 **13 Claims**

1. A low-temperature burnt conductive paste comprising an organic vehicle having dispersed therein a composition comprising 50 to 95% by weight of a powder of at least one conductive material selected from the group consisting of a copper alloy, a copper oxide and a copper alloy oxide and 5 to 50% by weight of a glass powder having a softening point of 300° to 600° C. and a coefficient of thermal expansion of 6 to 13×10^{-6}° $C.^{-1}$, said copper alloy being selected from the group consisting of Cu-Ag, Cu-Sn and Cu-Ag-Sn, said Ag-containing alloys having a Ag content of from 0.05 to 50% by weight and, said Sn-containing alloys having a Sn content of from 0.01 to 10% by weight, and each of said copper oxide and copper alloy oxide having an oxidation ratio of 0.1 to 100%.

4,894,185

COPRECIPITATION METHOD FOR THE MANUFACTURE OF ZINC OXIDE BASED DOPED POWDERS

Gérald Djega-Mariadassou, Igny, France; Vinh H. Tran, Bruxelles Belgique, Belgium; Monique Bureau Tardy, Paris, and Alain Lagrange, Maroussay La Cote, both of France, assignors to Compagnie Europeenne De Composants Electroniques LCC, Courbevoie, France

Filed Nov. 30, 1987, Ser. No. 126,853

Claims priority, application France, Dec. 2, 1986, 8616803

Int. Cl.⁴ H01C 7/10

U.S. Cl. 252—519 **16 Claims**

1. A method of forming zinc oxide based doped powder, comprising:

(a) preparing one or more aqueous solutions of soluble salts of zinc and at least one other metal element employing quantities of said zinc and metal elements sufficient to achieve a zinc oxide based powder in which zinc and said metal elements are present in the relative quantities desired;

(b) separately preparing an aqueous buffer solution saturated with salts of each of the elements in the solutions prepared in step (a), and possessing a pH which is selected so as to cause precipitation of the hydroxylated compounds of said zinc and other metal elements in the solution of step (a);

(c) adding the one or more prepared solutions of step (a) to the buffer solution of step (b), thereby forming a mixed solution and causing the precipitation of a mixed hydrated metal oxide product from the mixed solution, and compensating for any drop in pH in the mixed solution obtained by the addition of an appropriate amount of base while maintaining the volume of the buffer solution constant by the withdrawal of the appropriate quantities of solution as the solutions of step (a) are added to the buffer solution; and

(d) preparing a zinc oxide based doped powder from said precipitate by calcining it in air.

4,894,186

SUBSTITUTED PYRAZOLINE HAVING NON-LINEAR OPTICAL PROPERTIES

Paul F. Gordon, and Brian Bothwell, both of Rochdale, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

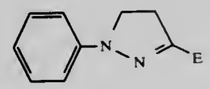
Division of Ser. No. 98,996, Sep. 21, 1987, Pat. No. 4,780,543. This application Sep. 23, 1988, Ser. No. 262,391

Claims priority, application United Kingdom, Oct. 7, 1986, 8624020; Oct. 14, 1986, 8624643

Int. Cl.⁴ C07D 231/06; G02B 5/00

U.S. Cl. 252—582 **6 Claims**

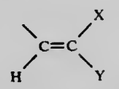
1. A crystal of a compound of the formula:



I

wherein

E is an ethenyl group of the formula:



II

in which X is H and Y is NO_2;

Y is H and X is NO_2; or

X is CN and Y is CN

in which a substantial proportion of the molecules of the defined compound are aligned in the same manner so that the crystal has non-linear optical properties.

4,894,187

FLAME RESISTANT COMPOSITIONS AND METHOD OF USING SAME

Evelyne Bonnet, Lamorlaye; Andre Gagnieur, Rochetaille sur Saone, and Bernard Gartner, Gresoble, all of France, assignors to Atochem, Courbevoie, France

Filed Feb. 8, 1988, Ser. No. 153,181

Claims priority, application France, Feb. 12, 1986, 86 01917

Int. Cl.⁴ C09K 21/00

U.S. Cl. 252—609 **18 Claims**

1. A flameproofing composition comprising:

(a) a halogenated imide product by a process comprising:

reacting hydrazine and a halogenated dicarboxylic acid anhydride in an aqueous medium at a temperature ranging from 40° to 225° C. with a molar ratio of anhydride/hydrazine equal to about 2 for a sufficient time to form the halogenated imide; and

(b) up to 80% by weight of a mixture of N-aminoimide and an anhydride of the dicarboxylic acid of the imide.

4,894,188

PROCESS FOR PRODUCING FATTY ACIDS AND THEIR ESTER DERIVATIVES

Takehiko Takahashi; Makoto Takagawa; Tomiyoshi Furuta, all of Niigata; Toshio Hidaka, Hiratsuka, and Kazuo Takada, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 507,912, Jun. 27, 1983, abandoned, which is a continuation of Ser. No. 258,529, Apr. 28, 1981, abandoned. This application Feb. 13, 1985, Ser. No. 700,347

Claims priority, application Japan, Jun. 23, 1980, 65-84916

Int. Cl.⁴ C07C 67/36, 67/37, 67/38, 51/12, 51/14

U.S. Cl. 260—410.9 R **11 Claims**

1. In a process for producing fatty acids and their esters which comprises reacting an olefin, carbon monoxide and water in the presence of a hydrogen fluoride catalyst, or reacting an alcohol or its ether and carbon monoxide in the presence of a hydrogen fluoride catalyst containing water, and thermally decomposing the resulting reaction product containing water, the improvement comprising conducting the thermal decomposition under reflux of at least one hydrocarbon or halogenated hydrocarbon having a boiling point lower than the reaction product and being selected from the group consisting of aliphatic hydrocarbons having 2–6 carbon atoms, halogenated aliphatic hydrocarbons having 2–6 carbon atoms, aromatic hydrocarbons having 6–8 carbon atoms and halogenated aromatic hydrocarbons having 6–8 carbon atoms, whereby the reaction product of fatty acid or its ester has 0.05 or less mole of fluorine per mole of fatty acid or its ester.

4,894,189

PROCESS FOR THE PRODUCTION OF SPHERICAL PARTICLES

Dilip Dave, Twickenham; Andrew Holt, Camberley, and Timothy K. McNiff, Weybridge, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Apr. 28, 1988, Ser. No. 187,483

Claims priority, application United Kingdom, May 9, 1987, 8711005

Int. Cl.⁴ B29B 9/08, 9/16

U.S. Cl. 264—15 **7 Claims**

1. A method for making spherical particles having a diameter in the range from 10 to 1000 microns suitable for use in fixed, moving, or mobile catalyst beds, which comprise:

(a) kneading powdered raw material selected from oxides, borides, nitrides, carbides and fluorides of aluminum, silicon, magnesium, titanium, mixtures thereof and chemical combination thereof, liquid in the amount of 5 to 65% v/w on powder, and wax in the amount of 2 to 10% w/w, to form a dough/agglomerated granules,

(b) separating the dough/agglomerated granules to a predetermined size fraction without extruding, and

(c) spheridizing the granules in a rotating bowl heated to a temperature of from 25° to 100° C.

4,894,190

STAGED PULTRUSION MOLDING OF COMPOSITES

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 26, 1988, Ser. No. 248,673

Int. Cl.⁴ B29C 35/10

U.S. Cl. 264—22 **5 Claims**

1. A method of molding a composite comprising:

(a) substantially filling a pressure chamber with a solid flowable polymer, said pressure chamber having a series of subchambers separated by a series of spaced apart baffles, said subchambers connected through baffle openings in said baffles;

(b) displacing said solid flowable polymer through a tube, said tube connecting at least two subchambers, a transferring subchamber and a receiving subchamber, said displacement causing said receiving subchamber to have a higher pressure than said transferring subchamber and said displacement producing a polymer flow in said chamber through said baffle openings from said high pressure receiving subchamber to said low pressure transferring subchamber; and



(c) passing a composite precursor through said pressure chamber by entering said precursor through said low pressure chamber wherein said composite precursor is exposed to pressure caused by the solid flowable polymer in order to cure the composite.

4,894,191

PREPARATION OF POLYOLEFIN FOAMS

Hermann Tatzel, Hirschberg; Ludwig Zaera, Bad Duerkheim; Hans D. Zettler, Gruenstadt; Wolfgang Schneider, Heidelberg, and Gerhard Dembek, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,491

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708291

Int. Cl.⁴ C08J 9/22

U.S. Cl. 264—53 **6 Claims**

1. A process for the preparation of a polyolefin foam having a density of from 30 to 300 g/l which comprises extruding through a die a homogeneous mixture of a polyolefin and from 10 to 50% by weight, based on the polyolefin, of a volatile blowing agent, with or without conventional additives, the said mixture being 10–50° C. below the DSC maximum of the polyolefin and under a pressure higher than the vapor pressure of the blowing agent at this temperature, wherein said mixture is extruded through said die into a chamber pressurized from 0.1 to 10 bar gage to form a foam and said foam is maintained at this pressure until it has cooled to a temperature which is at least 20° C. below the expansion temperature, thereafter said

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foam is let down to atmospheric pressure, such that a polyolefin foam having a density of from 30 to 300 g/l. is produced.

4,894,192

PROCESS FOR PRODUCING MOLDED BODIES FROM PAPER AND A THERMOPLASTIC MATERIAL

Hans Warych, Birkenkamp 23, 4650 Gelsenkirchen, Fed. Rep. of Germany

Filed Aug. 2, 1988, Ser. No. 227,206

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725965

Int. Cl.[4] B29C *35/02, 47/00, 47/78*

U.S. Cl. 264—68 **14 Claims**

1. A process for producing a molded body from paper and a thermoplastic material, comprising the steps of:

collecting scrap material, comprising paper coated with a thermoplastic material uponn at least one side thereof, wherein the quotient ratio defined between the base weight of said paper with respect to the base weight of said thermoplastic material coated thereon is within the range of 1.0–6.5;

shredding said scrap material comprising said paper and said thermoplastic material coated thereon into shreds;

introducing said shreds into a screw extruder so as to melt said thermoplastic material and form an extrudable mixture; and

forming said mixture of molten thermoplastic material and paper shreds into a molded body.

4,894,193

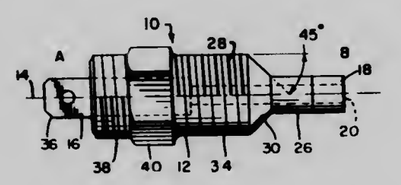
METHOD OF FORMING A HIGH-TEMPERATURE-FLUID SENSOR

F. William Capp, Winston-Salem; Don J. Gerhardt, Clemmons, and Randal A. Little, Mocksville, all of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 26, 1988, Ser. No. 249,023

Int. Cl.[4] B29C *45/14*

U.S. Cl. 264—104 **14 Claims**



1. A method of forming an high-temperature-fluid sensor with a fusible detector, comprising the steps of:

providing a pair of elongate, electrical conductors;

providing a mold;

holding the conductors in a spaced-apart and substantially parallel, juxaposed disposition in said mold;

introducing polymer into the mold and forming a polymer body (a) about intermediate portions of said conductors, and (b) between said portions of said conductors; wherein said introducing step comprises introducing polymer between juxtaposed, terminal ends of said conductors, at one, common end thereof and forming thereat an electrically inert buffer between said ends;

depositing electrically conductive fusible material on and about said terminal ends of said conductors, and about said buffer to electrically bridge between said terminal ends; and

forming said buffer with a surface discontinuity for lockingly engaging said fusible material therewith, prior to performing the fusible material depositing step.

4,894,194

METHOD FOR MOLDING CERAMIC POWDERS

Mark A. Janney, Knoxville, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Feb. 22, 1988, Ser. No. 158,485

Int. Cl.[4] C04B *38/06*

U.S. Cl. 264—109 **6 Claims**

1. A method for molding ceramic powders, comprising:

(a) forming a slurry mixture comprising ceramic powder, a dispersant for said ceramic powder, and a monomer solution consisting essentially of trimethylol propane triacrylate monomer, hexane-dioldiacrylate monomer, a free-radical initiator compound and an organic solvent;

(b) transferring said slurry mixture into a mold;

(c) heating said mold containing said slurry mixture at a temperature of about 100° to 120° C. for at least 5 minutes to cause said monomers to polymerize and crosslink to form a firm polymer-solvent gel matrix, whereby said slurry mixture is formed into a solid, shaped product;

(d) removing said solid, shaped product from said mold;

(e) heating said solid, shaped product at a temperature greater than about 130° C. for about 2 to 6 hours to substantially remove said organic solvent from said product; and

(f) further heating said solid, shaped product at a temperature greater than about 500° C. for a time sufficient to substantially remove said polymer from said product.

4,894,195

PROCESS FOR THE PREPARATION OF COATED LARGE DIAMETER ORIENTED MONOFILAMENTS

Teh-Chuan Wang, Parkersburg, W. Va., assignor to E. I. Du-Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 18,385, Feb. 25, 1987, Pat. No. 4,839,132. This application Jun. 27, 1988, Ser. No. 212,299

Int. Cl.[4] D01F *8/04*

U.S. Cl. 264—134 **8 Claims**

1. A process for the preparation of oriented monofilaments of semi-crystalline linear condensation polymer having improved resistance to delamination, which process comprises

(a) melt extruding a core of semi-crystalline linear condensation polymer,

(b) quenching the core to solidify the polymer in a substantially void-free condition;

(c) coating the core with additional molten semi-crystalline linear condensation polymer in a round configuration in an amount sufficient to increase the diameter of the core by about from 10 to 100 mils,

(d) quenching the resulting structure to solidify it in a substantially void-free condition,

(e) orienting the structure by drawing at least about 3.5 times its original length within the orientation temperature range of the polymer to provide an oriented filament having a diameter of at least about 60 mils, and

(f) coating the resulting oriented structure with about from 10 to 100 mils of polymeric material.

4,894,196

METHOD AND APPARATUS FOR LONGITUDINAL COMPRESSIVE TREATMENT OF WEBS

Richard R. Walton, Boston, Mass., and George E. Munchbach, Roslindale, Mass., assignors to Richard R. Walton, Boston, Mass.

Continuation of Ser. No. 803,059, Nov. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 594,670, Mar. 29, 1984, abandoned. This application Sep. 19, 1988, Ser. No. 246,917

Int. Cl.[4] B29C *53/28;* **D06C** *21/00*

U.S. Cl. 264—282 **12 Claims**

1. A machine for microcreping a running length of web comprising

a driven roll,

a stationary primary pressing surface for pressing the web against the surface of said roll to drive the web forward at a drive nip, and

first and second generally stationary downstream web-contacting surfaces on sides of the web corresponding to said roll and primary surface, respectively, adapted to define an extrusion orifice to provide an extrusion retarding effect to the oncoming web, said second generally stationary downstream web-contacting surface being an extension of said stationary primary pressing surface,

the driving and retarding of said web being adapted to cause its longitudinal compressive treatment in a cavity defined in the region of transition of the web from said roll to said downstream surfaces,

that improvement wherein:

the machine is adapted to treat the web in response to retarding forces produced by tangential extrusion,

said first and second generally stationary downstream web-contacting surfaces defining an extrusion orifice (TEO) the axis X of which extends at an angle substantially parallel, i.e., at an angle less than 20°, to the tangent to the roll at the final point P of positive drive of the web, the extrusion resistance force R provided solely by the surfaces defining said orifice, serving to maintain a substantially straight retarded column of treated web material capable of resisting forward movement of material freshly driven by said roll, to cause said longitudinal compressive treatment of the web, said first web-contacting surface being defined by a generally plate-form blade member, said plate-form member being resiliently urged toward the driven nip by a force acting generally parallel to the tangent to the roll in the manner to enable resilient self adjusting movement of said plate member in its plane in response to operating conditions of said machine.



12. A method for microcreping a running length of web comprising pressing the web between the surface of a driven roll and a stationary primary pressing surface to drive the web forward at a drive nip, and

providing an extrusion retarding effect to the oncoming web by employing first and second generally stationary web-contacting surfaces on sides of the web corresponding to said roll surface and primary surface, respectively,

the driving and retarding of said web causing its longitudinal compressive treatment in a cavity defined in the region of transition of the web from said roll to said downstream surfaces,

that improvement wherein:

the web is treated by an extrusion resistance force formed solely by tangential extrusion between web-contacting surfaces comprising first and second generally stationary surfaces that define an extrusion orifice the axis of which extends substantially parallel, i.e., at an angle less than 20°, to the tangent to the roll at the final point P of positive drive of the web to maintain a substantially straight retarded column of treated web material capable of resisting forward movement of material freshly driven by said roll,

the extrusion retarding effect is resiliently maintained by providing a plate-form member to provide said first web-contacting surface, and resiliently urging said plate-form member toward the drive nip by a force acting generally parallel to the tangent to the roll in the manner to enable resilient self-adjusting movement of said plate-form member in the direction of its plane in response to operating conditions of said process.

4,894,197

METHOD FOR RUNNERLESS INJECTION MOLDING SYNTHETIC RESIN BY INTERMITTENT COOLING SYSTEM AND APPARATUS THEREOF

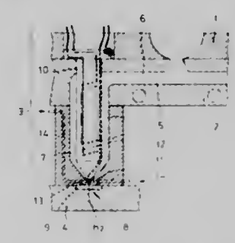
Shigeru Tsutsumi, Tokyo, Japan, assignor to Sanri Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,717

Claims priority, application Japan, Mar. 26, 1987, 62-70414

Int. Cl.[4] B29C *45/72*

U.S. Cl. 264—297.2 **6 Claims**



1. A method for runnerless injection molding of a synthetic resin which comprises injecting a molten resin from a runner through a gate into a cavity in a mold-compactng state using injection means, removing the molded product in the cavity in a mold-separating state after cooling and solidification of the resin, and returning the cavity to a mold-compacting state thereby repeatedly and continuously performing the injection molding operation using the injection means, wherein the molten resin is continuously heated by a first heater heating separately the runner and by a second heater heating constantly only the gate, while said resin is intermittently cooled and solidified in the gate only using a cooling medium during every injection molding operation while said gate is constantly heated by said second heater.

4,894,198

PROCESS FOR PRODUCING HOLLOW BODIES OF ORIENTED THERMOPLASTIC MATERIAL

Peter Albrecht, Hamburg; Karl-Heinz Balkau, Oststeinbek; Vinco Cujic, Hamburg; Tilman Döring, Hamburg; Claus Horwege, Hamburg; Wolfgang Reymann, Hamburg; Klaus Vogel, Barbüttel, and Walter Wiedenfeld, Hamburg, all of Fed. Rep. of Germany, assignors to Krupp Corpoplast, Hamburg, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 129,025

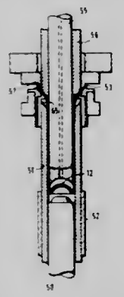
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3705947

Int. Cl.[4] B29C *55/22, 57/00, 53/08, 49/64*

U.S. Cl. 264—521 **11 Claims**

1. A process for producing a hollow body of oriented thermoplastic material comprising a wall portion having first and second ends, an opening at the first end and a bottom at the second end, from a hollow blank comprising a substantially cylindrical wall having first and second ends, an opening at said first end and a bottom portion at said second end thereof, wherein the first end portion of said wall of the blank which has said opening is subjected to a pre-expansion operation, the pre-expanded end portion is clamped, and thereafter a heating mandrel is introduced into said blank through said opening of said blank by a relative movement between said heating mandrel and said blank, said mandrel bearing against the wall of said blank and being operative to heat at least the wall of said blank to the temperature required for thermo-fixing of at least said wall and wherein said pre-expanded blank is firstly cen-

tered and held between an axially displaceable holding mandrel introduced into said blank through said opening thereof until it comes to bear against said bottom portion thereof and an axially displaceable bottom mandrel which is caused to bear against the outside of said bottom portion, a support sleeve which is disposed around said bottom mandrel and whose inside diameter substantially corresponds to the outside diameter of said blank in the non-pre-expanded region thereof is thereupon displaced upwardly into a position just below said pre-expanded end portion of said blank, a first movable clamping ring which is disposed in coaxial relationship with said support sleeve is displaced axially upwardly to clamp said pre-expanded end portion of said blank between said movable clamping ring and a second clamping ring which surrounds said holding mandrel, said heating mandrel which is arranged in coaxial relationship with said holding mandrel and axially displaceably with respect thereto is then introduced through said opening into said blank, said heating mandrel which bears with its outside surface against the inside surface of said wall of



said blank being introduced into said blank which is held by said first and second clamping rings, by a relative movement between said mandrel and said blank, at the same time said support sleeve is displaced downwardly substantially synchronously with the downward movement of said heating mandrel until said heating mandrel has reached an end position in which it is towards said bottom portion of said blank, after a residence time of said heating mandrel which is sufficient to cause thermofixing of said blank a cooling sleeve which is arranged in coaxial relationship with the support sleeve and the bottom mandrel and which is of an inside diameter slightly larger than the outside diameter of the blank which has been heated by said heating mandrel and at least slightly expanded is pushed axially upwardly over said blank, and thereupon a pressure medium is introduced into said blank whereby the wall portion of said blank is lifted off said heating mandrel and pressed with its outside peripheral surface against said cooling sleeve and cooled thereby until it attains a condition of adequate stability in respect of shape.

4,894,199

BEAM FUSION DEVICE AND METHOD

Norman Rostoker, 18 Aspen Tree La., Irvine, Calif. 92715

Continuation-in-part of Ser. No. 872,888, Jun. 11, 1986, abandoned. This application Jun. 11, 1987, Ser. No. 51,899

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—107 **25 Claims**

1. A fusion device wherein atomic nuclei react to generate reaction products with kinetic energies convertible to useful energy, said device comprising

wall means defining and confining a reaction chamber,

means for generating a substantially constant unidirectional magnetic field of predetermined strength in at least a portion of said reaction chamber,

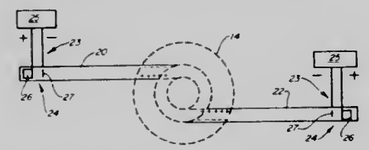
first and second source means for providing respective first and second positive hot ions at temperatures in a range where said first and second positive hot ions have substantially optimum cross sections for their mutual fusion reaction to generate said reaction products,

first and second means for accelerating said first and second positive hot ions, respectively, to predetermined velocities,

means for neutralizing said accelerated positive hot first and second positive ions by electrons,

means for directing said first and second positive hot ions neutralized by electrons into said portion of said reaction chamber substantially orthogonally of said magnetic field utilizing self-polarization, and

means for draining the polarization of said neutralized and



polarized first and second positive hot ions to separate the neutralizing electrons from the respective first and second positive hot ions, the predetermined strength of the magnetic field and the predetermined velocities to which said first and second positive hot ions are accelerated being such as to provide centripetal force on the respective separated first and second positive hot ions to confine the ions to respective orbits within said portion of said reaction chamber, and the directions and relative ions being such as to make the respective said orbits for said first and second positive hot ions substantially coextensive, with the first and second positive hot ions moving in substantially the same direction at substantially the same mean velocity.

4,894,200

METHOD OF OPERATING A NUCLEAR REACTOR

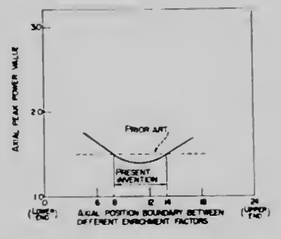
Junichi Yamashita, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 915,580, Jun. 15, 1978. This application Nov. 18, 1983, Ser. No. 553,232

Claims priority, application Japan, Jun. 20, 1977, 52-73693

Int. Cl.[4] G21C *7/06*

U.S. Cl. 376—237 **15 Claims**



1. A method of operating a nuclear reactor having a core construction in the form of an array of a plurality of fuel assemblies, each fuel assembly including a plurality of fuel rods and being divided into two sections along the length of each fuel assembly to form an upper section and a lower section, the lower section having a smaller mean infinite multiplication factor than the upper section, predetermined ones of the fuel assemblies having an overall mean infinite multiplication factor

smaller than the others of the fuel assemblies, the method of operating comprising the steps of providing a plurality of control rods wherein a respective control rod is adapted to be inserted between selected ones of the fuel assemblies, positioning selected ones of the control rods to be utilized for power adjustment to be adjacent the predetermined ones of the fuel assemblies having the overall mean infinite multiplication factor smaller than the other fuel assemblies when inserted in the core, inserting the power adjusting control rods in the core, positioning the other control rods to be utilized as reactor shutdown control rods to be adjacent the other of the fuel assemblies when inserted in the core, maintaining the reactor shutdown control rods withdrawn from the core, adjusting reactor power by at least partially withdrawing at least a selected one of the power adjusting control rods from the core during normal power operation of the reactor, and shutting down the reactor when desired by inserting the reactor shutdown control rods into the core, wherein the step of adjusting reactor power includes varying the insertion position of the power adjusting control rods to increase reactor power during normal power operation of the reactor without reducing reactor power prior to varying of the insertion position of the reactor power adjusting control rods.

4,894,201

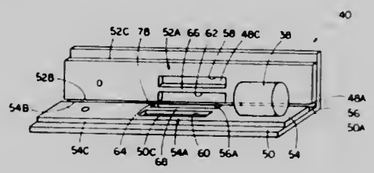
NUCLEAR FUEL PELLET SURFACE DEFECT INSPECTION APPARATUS

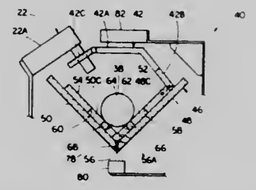
Hassan J. Ahmed, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1988, Ser. No. 199,735

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—261 **13 Claims**





1. In an apparatus for inspecting nuclear fuel pellets for surface defects, the combination comprising:

(a) an inspection chamber;

(b) a pellet guide chute assembly extending through said inspection chamber and including

(i) a support substrate composed of a pair of elongated wall sections rigidly attached together to have a generally V-shaped configuration in cross section, and

(ii) a pair of elongated plates attached on respective upper adjacent sides of said support substrate wall sections for supporting a nuclear fuel pellet between and on adjacent longitudinal portions of said plates located in said inspection chamber,

(iii) said plates having aperture means underlying the pellet at said adjacent longitudinal portions of said plates which expose portions of said support substrate wall sections also underlying the pellet such that acoustical energy can be propagated to and from bottom and side portions of the pellet adjacent said adjacent longitudinal portions of said plates via reflection of the acoustical energy from said exposed support substrate wall section portions;

(c) an acoustical energy reflecting cover disposed over said guide chute assembly at said inspection chamber; and

(d) means for transmitting and receiving acoustical energy into and from said inspection chamber for propagating such energy to and from the pellet therein.

4,894,202

METHOD OF INHIBITING RADIOACTIVE SUBSTANCES FROM ELUTING INTO COOLING WATER IN A NUCLEAR PLANT AND AN APPARATUS THEREFOR

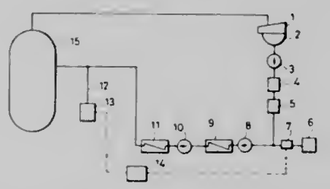
Makoto Nagase, Hitachi; Yamato Asakura, Katsuta; Hidetoshi Karasawa, Katsuta; Masaharu Sakagami, Katsuta; Shunsuke Uchida, Hitachi; Toshio Sawa, Hitachi, and Katsumi Ohsumi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,705

Claims priority, application Japan, Oct. 3, 1986, 61-234641

Int. Cl.[4] G21C *1/01*

U.S. Cl. 376—306 **13 Claims**



1. A method of inhibiting radioactive substances from eluting into the cooling water in a nuclear plant, wherein, after a new fuel cladding is loaded into a nuclear reactor, a source of iron ions is injected into the cooling water, during nuclear heating, in order to form an iron oxide layer on a surface of the new fuel cladding with a covering ratio of 100%; and, after said iron oxide layer has been formed on said surface of the new fuel cladding, an amount of said source of iron ions injected into the cooling water is decreased so that a Fe/Ni molar concentration ratio in the cooling water is set in a range of from about 2 to 10.

4,894,203

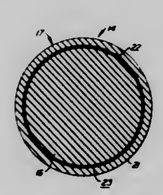
NUCLEAR FUEL ELEMENT HAVING OXIDATION RESISTANT CLADDING

Ronald B. Adamson, Fremont, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Feb. 5, 1988, Ser. No. 152,507

Int. Cl.[4] G21C *3/00*

U.S. Cl. 376—416 **10 Claims**



1. An improved nuclear fuel element of the type including a zirconium alloy tube, a zirconium barrier layer metallurgically

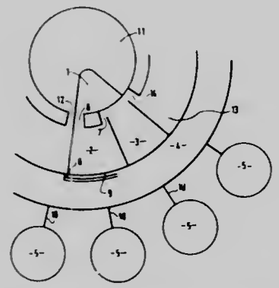
bonded to the inside surface of the alloy tube, and a central core of nuclear fuel material partially filling the inside of said tube so as to leave a gap between said sponge zirconium barrier and said nuclear fuel material, said improvement comprising an alloy layer formed on the inside surface of the zirconium barrier layer, said alloy layer being composed of one or more impurities present in a thin layer region of the zirconium barrier in amounts less than 1% by weight but sufficient to inhibit the oxidation of said inside surface of the zirconium barrier layer without substantially affecting the plastic properties of said barrier layer, wherein said impurities are selected from the group consisting of iron, chromium, copper, nitrogen, and niobium.

4,894,204

ROTOR WITH DYNAMIC PIPETING FOR A CENTRIFUGE ANALYSIS DEVICE

Bruno Cornat, Pau, France, assignor to Inovelf, Courbevoie, France

Continuation of Ser. No. 149,530, Jan. 28, 1988, abandoned, which is a continuation of Ser. No. 810,601, Dec. 19, 1985, abandoned. This application Dec. 9, 1988, Ser. No. 282,855
Claims priority, application France, Dec. 21, 1984, 84 19617
Int. Cl.[4] G01N *21/07*
U.S. Cl. 422—72 **8 Claims**



1. A rotor of a centrifuge analysis device, the rotor having a center and a periphery which rotor comprises from the center of the periphery thereof:

(1) central receptacles for liquids to be diluted before analysis,

(2) calibration vessels and overflow vessels disposed circumferentially adjacent to each other in respect to a circle concentric with the rotor, the calibration and overflow vessels thereby being spaced at substantially the same distance from the center of the rotor, and wherein each calibration vessel is provided with

(i) a feed orifice through which it communicates with one of the central receptacles,

(ii) an exit orifice located in the wall of said calibration vessel opposite the feed orifice and permanently open, and

(iii) an overflow orifice located at a position between said feed and exit orifices and through which the calibration vessel is connected to one of the overflow vessels, the exit orifice of said calibration vessel having a cross sectional area much smaller as compared to that of the feed and overflow orifices that during the time taken to fill the calibration vessel practically no fluid escapes from said exit orifice,

(3) a mixing vessel communicating with each calibration vessel through the exit orifice of said calibration vessel, and

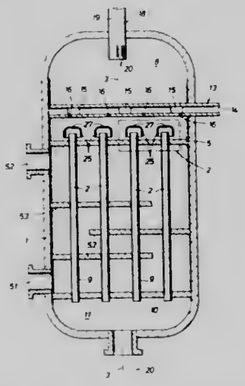
(4) a plurality of measuring cells, each connected to the mixing vessel through a duct.

4,894,205

MULTITUBE REACTOR

David Westerman, and Franciscus J. M. Schrauwen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 14, 1988, Ser. No. 244,234
Claims priority, application United Kingdom, Sep. 18, 1987, 8721964
Int. Cl.[4] B01J *8/06*
U.S. Cl. 422—197 **6 Claims**



1. A multitube reactor for carrying out a process for catalytic conversion, comprising:

a normally substantially vertically extending vessel having:

an inner wall;

a central longitudinal axis;

a fluid inlet chamber disposed in the upper interior part of said vessel;

liquid supply means for supplying liquid to said fluid inlet chamber and capable of being connected to supply of liquid;

gas supply means for supplying gas to said fluid inlet chamber and capable of being connected to a supply of gas;

an effluent collecting chamber disposed in the lower part of said vessel;

outlet means in fluid communication with said effluent collecting chamber for passing reaction effluent from said vessel;

an upper tube plate disposed in the upper part of said vessel below said fluid inlet chamber, and supported by the inner wall of said vessel;

a lower tube plate disposed in the lower part of said vessel above said effluent collection chamber and supported by the inner wall of said vessel;

a plurality of open-ended reactor tubes disposed within said vessel and parallel to its longitudinal axis for holding catalyst particles, said reactor tubes being fixed to said upper tube plate and having upper ends extending above said upper tube plate and communicating with said fluid inlet chamber, said reactor tubes having lower ends fixed to said lower tube plate, and communicating with said effluent collecting chamber; and

a plurality of gas and liquid supply devices, each of said gas and liquid supply devices being disposed above the upper end of a reactor tube of said plurality of reactor tubes, each said gas and liquid supply device comprising:

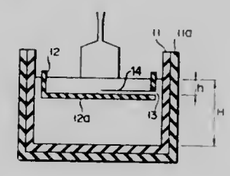
a generally arcuate cap having a lower skirt extending around the uppermost portion of the upper end of said reactor tube and spaced apart from said tube thereby providing a generally annular inlet for liquid to flow from said fluid inlet chamber below said skirt to the open upper end of said reactor tube, said cap further having in its upper part an aperture for admitting gas from said fluid inlet chamber to said reactor tube, said aperture having a diameter in the range from 2 to 30% of the inner diameter of said reactor tube.

4,894,206

CRYSTAL PULLING APPARATUS

Youji Yamashita, Yokohama; Masakatu Kojima, Yokosuka; Yoshiaki Matsushita, Kawasaki, and Masanobu Ogino, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 1, 1987, Ser. No. 91,947
Claims priority, application Japan, Sep. 22, 1986, 61-221896
Int. Cl.[4] C30B *15/30*
U.S. Cl. 422—249 **22 Claims**



1. A crystal pulling apparatus comprising:

an outer crucible for containing an undoped melt;

an inner crucible, arranged concentrically and integrally with said outer crucible, containing a melt doped with an impurity, and having a diameter $\sqrt{k}$ times that of said outer crucible, when a segregation coefficient of the impurity if k;

a through hole formed in said inner crucible; and

melt supply means, one end of which is located in said through hole and an other end of which is located in the melt contained in said outer crucible, for supplying the melt contained in said outer crucible into said inner crucible during crystal pulling, for preventing diffusion of the doping impurity between the melt in said outer crucible and that in said inner crucible, and for preventing exchange of the melt between said outer crucible and said inner crucible before the forming of a crown, said melt supply means being a passage having a length equal to or greater than a diffusion constant $\sqrt{2DT}$, where D is the diffusion coefficient of the doping impurity in the melt and T is the time interval from the dissolving of the doping impurity into the melt until the end of neckdown.

4,894,207

RECIRCULATING HIGH VELOCITY HOT AIR STERILIZING DEVICE

Virgil L. Archer, and M. Keith Cox, both of Dallas, Tex., assignors to Archer Aire Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 44,909, Apr. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 915,116, Oct. 3, 1986, abandoned. This application Feb. 10, 1989, Ser. No. 310,031
Int. Cl.[4] A61L *2/00, 2/04, 2/06*
U.S. Cl. 422—292 **23 Claims**

1. A recirculation hot air impingement device for sterilizing medical and dental instruments or the like, comprising:

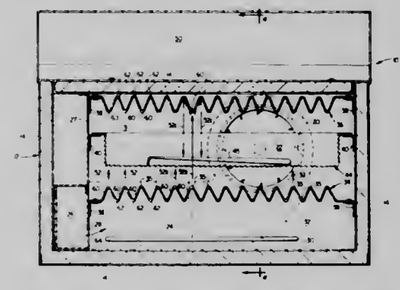
a housing having a sterilizing chamber therein;

nonplanar air supply wall means, extending continuously across said sterilizing chamber and having formed therethrough a mutually spaced series of jet-forming supply openings, for utilizing pressurized air from a source thereof to create in said chamber a spaced series of impingement air jets having a predetermined velocity;

air deflector wall means, extending across said chamber in a spaced, generally parallel, opposing relationship with said air supply wall means, for intercepting and rearwardly deflecting said impingement air jets;

heated air recirculating means, including blower means and air heating means, for creating within said sterilizing chamber a recirculating flow of air which is heated to a predetermined sterilizing temperature and is sequentially flowed through said supply openings toward said air deflector wall means, deflected therefrom toward said air supply wall means, and then flowed again through said supply openings toward said air deflector wall means, and

support means for supporting an object to be sterilized in a stationary position within said chamber generally centrally between and spaced apart from each of said air supply wall means and said air deflection wall means in a manner such that the stationary object is positioned to be impinged by both heated air discharged from said supply openings and heated air deflected from said air deflector wall means to thereby be continuously enveloped by a turbulent layer of heated air,



said heated air recirculating means including return means for drawing air from said turbulent layer across the object in a direction generally transverse to said impingement jets, and then flowing the air outwardly from said chamber.

4,894,208

SYSTEM FOR SEPARATING RADIOACTIVE NA FROM AL

Henry C. Griffin, Ann Arbor, and Thomas D. Steiger, Saline, both of Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Jul. 14, 1988, Ser. No. 219,092
Int. Cl.[4] C22B *26/10*
U.S. Cl. 423—2 **5 Claims**

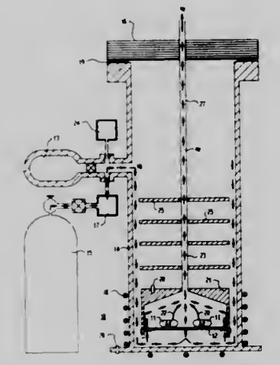
1. A method of separating and collecting radioactive sodium from aluminum, the method comprising the steps of:

heating the aluminum to a melting temperature for releasing the sodium therein as a vapor;

first subjecting the radioactive sodium separated from the aluminum to a draft of an inert gas;

transporting the radioactive sodium in the inert gas into an exhaust tube; and

second subjecting the exhaust tube to a thermal gradient whereby as the inert gas passes through a cooled region of



the exhaust tube the radioactive sodium therein is plated to the interior of the exhaust tube.

4,894,209

PROCESS FOR OBTAINING A URANIUM-BEARING CONCENTRATE OF HIGH PURITY FROM LIQUORS CONTAMINATED WITH ZIRCONIUM

Jacques M. M. Moret, Saint Pardoux; Nicole Peyriere, Limoges, and Andre L. N. Textoris, Bessines, all of France, assignors to Compagnie Generale des Matieres Nucleaires, Velizy-Villacoublay, France

Continuation-in-part of Ser. No. 762,006, Aug. 2, 1985, abandoned. This application Jan. 18, 1987, Ser. No. 63,370
Claims priority, application France, Aug. 2, 1984, 84 12252
Int. Cl.[4] C01G *43/00*
U.S. Cl. 423—15 **21 Claims**

1. A process for selectively removing zirconium from an aqueous uranium-containing solution, in which the weight ratio of uranium to zirconium is at least about 25; said process comprising the step of:

providing said solution with a pH of 2.5 to 3 and heating said solution to a temperature of about 30° C. to 60° C., whereby zirconium selectively precipitates from said solution.

4,894,210

PURIFICATION OF A HYDROCARBON MIXTURE

Patrick J. Denny, County Durham; Alan E. Thomas, and Peter J. Carnell, both of Cleveland, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Jun. 20, 1986, Ser. No. 876,747
Claims priority, application United Kingdom, Jul. 9, 1985, 8517333
Int. Cl.[4] C01B *31/20*
U.S. Cl. 423—230 **4 Claims**

1. A continuous process for the desulphurisation of a raw gas stream containing methane in admixture with at least one higher boiling component selected from water and one or more hydrocarbons of higher molecular weight than methane, said raw gas stream having such a composition and being at such a temperature, in the range of −10° to +10° C., and pressure, in the range 10 to 200 bar abs., that the concentration of at least one of said higher boiling components is at least 90% of the concentration of said higher boiling component at which said raw gas stream would be saturated with said higher boiling component, comprising:

(a) heating an inlet gas stream consisting of said raw gas stream, or a major part thereof, to a temperature that is at least 10° C. above the dew point of said raw gas stream and is in the range 80° to 200° C. thereby producing a heated gas stream;

(b) contacting said heated gas stream with a bed of a particulate solid absorbent material comprising zinc oxide, thereby producing a desulphurised gas stream; and

(c) combusting a gas stream consisting of:

(i) part of the desulphurised gas stream, or

(ii) where said inlet gas stream is a major part of the raw gas stream, the remainder of the raw gas stream, or

(iii) a combination of (i) and (ii) thereby providing a heated combustion products stream; said heating step (a) being effected by:

heat exchanging the inlet gas stream with the desulphurised gas steam, thereby forming a partly heated inlet stream and a cooled desulphurised gas stream that has a temperature below 25° C. and that is at least 5° above the temperature of said raw gas stream; and

further heating said partly heated inlet stream by heat exchanging the partly heated gas stream with the heated combustion products stream.

4,894,211

PROCESS FOR THE PRODUCTION OF GRANULAR SODIUM PERBORATE MONOHYDRATE HAVING GOOD MECHANICAL STRENGTH

Antonino Condo', and Renzo Ferrario, both of Milan, Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed May 15, 1986, Ser. No. 863,529
Claims priority, application Italy, May 16, 1985, 20744 A/85
Int. Cl.[4] C01B *15/12*
U.S. Cl. 423—266 **9 Claims**

1. A process for the manufacture of granular sodium perborate monohydrate, comprising the formation of a mixed composition consisting of sodium perborate tetrahydrate and sodium silicate, by adding sodium silicate, having an SiO_2/Na_2O molar ratio between 0.4 and 2.0, to sodium perborate tetrahydrate in motion and drying said mixed composition until sodium perborate monohydrate is obtained.

4,894,212

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-11

John P. McWilliams, Woodbury, N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,496
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **11 Claims**

1. In a method for synthesizing a crystalline silicate having the structure of ZSM-11 exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises preparing a mixture capable of forming said silicate, said mixture comprising a source of alkali metal cations (M), a source of silicon and water, maintaining said mixture under sufficient conditions until crystals of said silicate are formed and recovering said crystalline silicate having the structure of ZSM-11, the improvement wheren said mixture further comprises octyalmine (R) and seed crystals of ZSM-11 structure, said mixture having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3=40–2000
H_2O/SiO_2=5–50
OH^{-1}/SiO_2=0.05–0.5
M/SiO_2=0.05–0.5
R/SiO_2=0.03–1.0

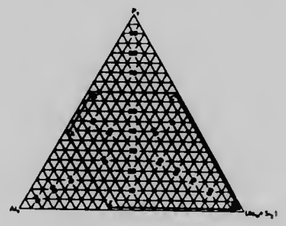
said recovered crystalline silicate containing said R and M.

4,894,213

ARSENIC-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVE COMPOSITIONS

Edith M. Flanigen, White Plains; Brent M. T. Lok, New City; Robert L. Patton, Katonah, and Stephen T. Wilson, Shrub Oak, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 599,808, Apr. 13, 1984, abandoned. This application Mar. 31, 1986, Ser. No. 845,984
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **28 Claims**



1. Crystalline molecular sieves comprising three-dimensional microporous framework structures of AsO_2, AlO_2, PO_2 and SiO_2tetrahedral units having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(As_wAl_xP_ySi_z)O_2$$

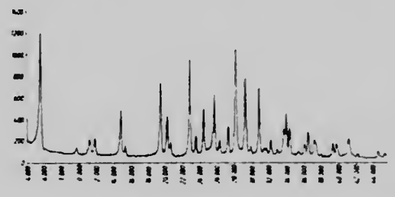
wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(As_wAl_xP_ySi_z)O_2$ and has a value of zero to about 0.3; and "w", "x", "y" and "z" represent the mole fractions of arsenic, aluminum, phosphorus and silicon, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D, and E of FIG. 1, said crystalline molecular sieves having a characteristic X-ray powder diffraction pattern which contains at least the d-spacings set forth in one of Tables C, F, K, M, P, T, V, W herein.

4,894,214

ZEOLITE L PREPARATION

Johannes P. Verduijn, Spijkenisse, and Pieter E. Gellings, Oostvoorne, both of Netherlands, assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Feb. 25, 1988, Ser. No. 160,362
Claims priority, application United Kingdom, Feb. 25, 1987, 8704365; Jan. 4, 1988, 8800051
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **6 Claims**



1. A process for the preparation of a zeolite L containing caesium in which said zeolite L is crystallised from a synthesis mixture with a molar composition (expressed as oxides) of:

K_2O/SiO_2: 0.15 to 0.40
K_2O/Cs_2O: 3 to 10
H_2O/K_2O: 40 to 100 and
SiO_2/Al_2O_3: 7 to 13

and containing at least 0.5 ppm (by weight) of divalent metal cations in an effective amount to obtain substantially only zeolite L by limiting the formation of pollucite, erionite and zeolite W.

4,894,215

PROCESS FOR PRODUCING POROUS MATERIALS OF CARBON

Takamasa Kawakubo, Tano; Mitsuru Yoshida, Fujioka, and Yoshihisa Sada, Maebashi, all of Japan, assignors to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,414
Int. Cl.[4] C01B *31/02*
U.S. Cl. 423—449 **9 Claims**

1. A process for producing porous materials of carbon, comprising:

introducing particles of an organic polymer in a vessel of an arbitrary shape, and

dissolving a particle surface layer to produce point bondings between the particles, thereby producing a porous organic polymer having continuous pores,

then insolubilizing or infusibilizing said porous organic polymer, and

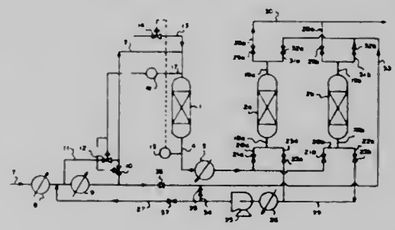
further calcining said porous organic polymer in an inert gas atmosphere.

4,894,216

CATALYTIC PROCESS FOR PRODUCING SULPHUR FROM H_2S CONTAINING SOUR GAS

Georges Kvasnikoff, Meucin; Jean Neuzayrode, Pau, and André Philippe, Orthez, all of France, assignors to Société Nationale Elf Aquitaine (Production), Paris, France

PCT No. PCT/FR86/00367, § 371 Date Jun. 25, 1987, § 102(e) Date Jun. 25, 1987, PCT Pub. No. WO87/02655, PCT Pub. Date May 7, 1987
PCT Filed Oct. 24, 1986, Ser. No. 75,746
Claims priority, application France, Oct. 25, 1985, 85 15904
Int. Cl.[4] C01B *17/04*
U.S. Cl. 423—574 R **31 Claims**



1. A catalytic process for producing sulphur from a sour gas containing H_2S in a concentration ranging from about 0.2 to about 20% by volume, which comprises:

(a) feeding a stream of said sour H_2S-containing gas which is substantially free of sulphur and SO_2 and splitting the sour gas into two portions, one portion being fed to the H_2S oxidation catalyst for partial oxidation of the H_2S within the sour gas and the other portion being fed to a sulphur-laden CLAUS catalyst for regeneration of the CLAUS catalyst, feeding the portion of sour gas for partial oxidation with a controlled and limited quantity of a gas containing free oxygen to a H_2S oxidation catalyst, partially oxidizing the H_2S to sulphur and SO_2, while operating at a temperature above 150° C. and producing a gaseous

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effluent containing H_2S and SO_2 in a H_2S to SO_2 molar ratio of about 2:1 and elemental sulphur,

(b) cooling said gaseous effluent to a temperature lower than about 160° C.,

(c) contacting the cooled gaseous effluent from step (b) with the CLAUS catalyst at a sufficiently low temperature for the H_2S to react with SO_2 and forming sulphur which is deposited on the catalyst and forming a substantially desulphurated gaseous effluent stream,

(d) periodically regenerating the sulphur-laden CLAUS catalyst from step (c) by sweeping said catalyst with said other portion of the sour gas at a temperature between about 200° C. and 500° C., and recovering the sweeping gas after regeneration of the catalyst,

(e) cooling the regenerated CLAUS catalyst to a temperature below about 160° C. suitable for further contacting with the gaseous effluent from step (b), and

(f) recycling the H_2S-containing sweeping gas which is substantially free of sulphur and SO_2 recovered from the regeneration of the sulphur-laden CLAUS catalyst in step (d) and mixing the sweeping gas recovered from the regeneration of the sulphur-laden CLAUS catalyst in step (d) with the stream of sour gas, feeding one portion of the mixture of sweeping gas and sour gas to the H_2S oxidation catalyst for partial oxidation of the H_2S within the mixture and feeding the other portion of the mixture for regeneration of the sulphur-laden CLAUS catalyst.

4,894,217

PROCESS FOR CAUSTICIZING OF AN AQUEOUS SOLUTION CONTAINING ALKALI CARBONATE

Per H. Östman, Jorvas, Finland, assignor to Ekono Oy, Espoo, Finland

PCT No. PCT/FI86/00131, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/03314, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 21, 1986, Ser. No. 128,652

Claims priority, application Finland, Nov. 22, 1985, 854628

Int. Cl.⁴ C01F *1/00*; C01D *3/06*; C01B *1/00*; D21C *9/00*

U.S. Cl. 423—659 **3 Claims**

1. A process for causticizing a raw aqueous alkali carbonate solution (41) with calcium hydroxide (15) by contacting the raw aqueous alkali carbonate solution (41) with the calcium hydroxide (15) and separating an alkali hydroxide solution (21) produced in the causticizing (C,D) from a calcium carbonate precipitate (24), characterized in that:

(a) an unused bed (16) of calcium hydroxide and calcium carbonate is at least partially formed by mixing calcium oxide (37) and calcium carbonate (36) with a part (18) of the alkali hydroxide solution (21) from a prior such causticizing (C);

(b) the raw aqueous alkali carbonate solution (41) is first led through a partially used bed (20) of calcium hydroxide and calcium carbonate to produce a partly causticized aqueous alkali carbonate solution (25), the partially used bed (20) having been formed when such a partly causticized aqueous alkali carbonate solution (25) was led through an unused bed (16) at a prior time, the carbonate molar quantity of the raw aqueous alkali carbonate solution (41) being greater than the total calcium hydroxide molar quantity of the partially used bed (20) before being led therethrough;

(c) the resulting partly causticized aqueous alkali carbonate solution (25) is led through the unused bed (16), through which an aqueous alkali carbonate solution has not previously been led, such that the alkali hydroxide solution (21) and a partially used bed (20) are formed; and

(d) an excess portion (22) of the alkali hydroxide solution (21) produced in the causticizing (C) is withdrawn.

4,894,218

THERAPY AGENTS, METHODS OF PREPARATION, AND METHODS OF USE

Barry L. Engelstad, Orinda; David L. White, Oakland, and John P. Haberty, Corte Madera, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed May 31, 1988, Ser. No. 200,476

Int. Cl.⁴ A61K *43/00*; C07C *129/12*

U.S. Cl. 424—1.1 **4 Claims**

1. A compound having the formula

in which the position of the ^{211}At atom is a member selected from the group consisting of ortho-, meta- and para-.

4,894,219

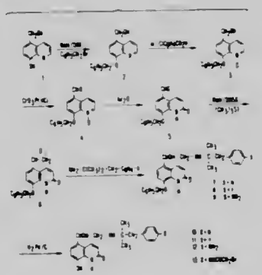
BETA-AGONIST CARBOSTYRIL DERIVATIVES, ASSAY METHOD AND PHARMACOLOGICAL COMPOSITION

Stephen P. Baker, Gainesville, Fla., and Josef Pitha, Baltimore, Md., assignors to University of Florida, Gainesville, Fla.

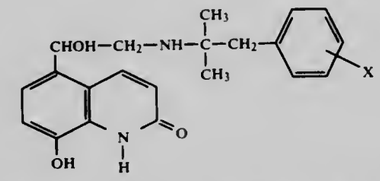
Filed Mar. 29, 1988, Ser. No. 174,874

Int. Cl.⁴ A61K *49/00, 31/47*; C07D *215/20*

U.S. Cl. 424—9 **9 Claims**



1. A compound having beta-adrenergic receptor agonist properties having the formula:



wherein X may be the ortho, meta or para position and is selected from the group consisting of halogen, amino and substituted and unsubstituted lower alkanoylamino having from 1 to 6 carbon atoms wherein said substituents are pharmaceutically acceptable and pharmaceutically acceptable salts and complexes thereof.

4,894,220

ANTIBACTERIAL ANTIPLAQUE ORAL COMPOSITION

Nuran Nabi, North Brunswick, and Abdul Gaffar, Princeton, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 8,901, Jan. 30, 1987. This application Dec. 29, 1988, Ser. No. 291,712

Int. Cl.⁴ A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 **18 Claims**

1. An oral composition comprising in an orally acceptable vehicle, a water-humectant phase, said water and humectant comprising at least about 10% by weight of said oral composition, an efective antiplaque amount of a substantially water insoluble noncationic antibacterial agent selected from the group consisting of halogenated diphenyl ethers and about 0.0005–4% by weight of a systematic anionic linear polymeric polycarboxylate having a molecular weight of about 1,000 to about 1,000,000, wherein said humectant includes a solubilizing agent selected from the group consisting of propylene glycol, dipropylene glycol, methyl cellosolve, ethyl cellosolve, olive oil, castor oil, amyl acetate, ethyl acetate, glyceryl tristearate and benzyl benzoate mixed with at least one of glycerine and sorbitol, the amount of said solubilizing humectant being sufficient to dissolve said antibacterial agent.

4,894,221

METHOD OF TREATING PLAQUE USING MORPHOLINE COMPOUNDS

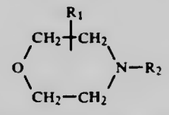
Sven E. H. Hernestam; Nils A. Nilsson, and Willard Lars-Olof, all of Malmo, Sweden, assignors to AB Ferrosan, Malmo, Sweden

Continuation-in-part of Ser. No. 245,441, Mar. 19, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,399

Int. Cl.⁴ A61K *7/22*

U.S. Cl. 424—54 **2 Claims**

1. Method of keeping the oral cavity and the surfaces of the teeth free from plaque or removing plaque already formed by treating the oral cavity and especially the surface of the teeth with a compound having the general formula



wherein R_1 is a straight or branched alkyl group containing 8 to 10 carbon atoms at the 2- or 3-position of the morpholino ring, and R2 is a straight or branched alkyl group containing 2 to 6 carbon atoms, substituted with a hydroxy group except in the alpha-position, the sum of the carbon atoms in the groups R_1 and R_2 being 12 to 16; and pharmaceutically acceptable salts thereof, in an aqueous solution or in a composition containing the same.

4,894,222

WATERPROOF SUNSCREEN

Peter Matravers, San Marino, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.

Filed Apr. 4, 1988, Ser. No. 177,090

Int. Cl.⁴ A61K *7/027, 7/40, 7/42, 7/48*

U.S. Cl. 424—59 **14 Claims**

1. A composition of matter for waterproofing mammalian skin containing in weight percent from about 1 to about 10 percent C_{18}–C_{36} saturated synthetic fatty acid wax, from 3 to about 30 percent anhydrous hydrophobic starch dispersed in about 60 to about 96 percent of pharmacologically acceptable water-free carrier.

4,894,223

USE OF THIOREDOXIN, THIOREDOXIN-DERIVED, OR THIOREDOXIN-LIKE DITHIOL PEPTIDES IN HAIR CARE PREPARATIONS

Vincent P. Pigiet, Neshanic Station, N.J., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 770,498, Aug. 28, 1985, which is a continuation-in-part of Ser. No. 674,893, Nov. 26, 1984, abandoned. This application Jan. 4, 1988, Ser. No. 140,353

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.⁴ A61K *7/06, 7/09*

U.S. Cl. 424—71 **1 Claim**

1. A process for softening human or animal hair which comprises applying to said human or animal hair a composition comprising a sulfite or bisulfite compound at a concentration of about 0.01 M to about 0.2 M, and a thioredoxin, or thioredoxin-derived, or thioredoxin-like dithiol peptide at a concentration of about 1 nmole/ml to about 100 nmole/ml.

4,894,224

ORGANOPOLYSILOXANE COMPOSITION

Satoshi Kuwata, Annaka, and Ikuo Fukui, Joetsu, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 183,879

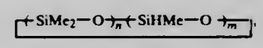
Claims priority, application Japan, Apr. 20, 1987, 62-96700

Int. Cl.⁴ A61K *7/00, 7/06, 7/48*

U.S. Cl. 424—78 **9 Claims**

1. An organopolysiloxane composition which comprises, in admixture:

(A) from 90 to 30% by weight of a cyclic organopolysiloxane represented by the general formula



in which Me is a methyl group and m and n are each zero or a positive integer not exceeding 8 with the proviso that m + n is a positive integer of 3 to 8;

(B) from 5 to 50% by weight of an oleaginous material selected from the group consisting of esters of a saturated fatty acid having 8 to 20 carbon atoms in a molecule and a saturated aliphatic alcohol having 1 to 20 carbon atoms in a molecule, animal oils, vegetable oils, squalane and petrolatum; and

(C) from 2 to 30% by weight of a cellulose ether having ester-forming substituent groups derived from a saturated fatty acid having 10 to 20 carbon atoms in a molecule,

the total amount of the components (A), (B) and (C) being taken as 100% by weight.

4,894,225

COMBINATION THERAPY USING ANTITUMOR IMMUNOTOXINS WITH TUMOR NECROSIS FACTOR

Robert Zimmerman, Lafayette, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Filed Mar. 2, 1987, Ser. No. 20,443

Int. Cl.⁴ A61K *37/02, 39/00, 39/395*

U.S. Cl. 424—85.1 **9 Claims**

1. A composition which comprises a pharmacologically effective mixture of TNF and a suitable immunotoxin.

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4,894,226
SOLUBILIZATION OF PROTEINS FOR PHARMACEUTICAL COMPOSITIONS USING POLYPROLINE CONJUGATION
Lois Aldwin, San Mateo, and Danute E. Nitecki, Berkeley, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.
Filed Nov. 14, 1986, Ser. No. 931,197
Int. Cl.[4] A61K *37/02, 45/02*
U.S. Cl. 424—85.2 16 Claims

1. A pharmaceutical composition comprising a non-toxic, inert, pharmaceutically acceptable aqueous carrier medium in which is dissolved a biologically active protein, selected from the group consisting essentially of interferons, interleukins, colony stimulating factors, and immunotoxins, covalently conjugated via a flexible spacer arm to polyproline, wherein said protein in its unconjugated form is not readily soluble in said aqueous carrier medium at pH 6–8 in the absence of a solubilizing agent.

4,894,227
COMPOSITION OF IMMUNOTOXINS WITH INTERLEUKIN-2
Paul Stevens; L. L. Houston, both of Oakland; Kirston E. Kotha, El Cerrito, and Brian Isnell, Moraga, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.
Continuation-in-part of Ser. No. 892,596, Aug. 1, 1986. This application May 29, 1987, Ser. No. 55,681
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[4] A61K *37/02*
U.S. Cl. 424—85.2 10 Claims

1. A composition comprising a mixture, in pharmacologically effective amounts, of IL-2 from a mammalian species and at least one immunotoxin that binds selectively to cells containing the tumor burden.

4,894,228
VACCINE AGAINST HEPATITIS A VIRUS
Robert H. Purcell, Boyds; John R. Ticehurst, Kensington, both of Md.; Jeffrey L. Cohen, Newton, Mass.; Suzanne U. Emerson, Silver Springs, Md.; Stephen M. Feinstone; Richard J. Daemer, both of Washington, D.C., and Ian D. Gust, Melbourne, Australia, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Continuation-in-part of Ser. No. 905,146, Sep. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 652,067, Sep. 19, 1984, Pat. No. 4,628,978. This application Jul. 12, 1988, Ser. No. 217,824
Int. Cl.[4] A61K *39/29*
U.S. Cl. 424—89 6 Claims

1. An attenuated hepatitis A virus comprising a genome characterized by the following nucleotides: cytosine at positions 3919, 4043, 4222 and 4810; guanine at positions 964 and 3196; adenine at positions 1742, 2864, 4185, 4563, 5204, 6147 and 6522; and thymine at positions 3025, 3889, 4087 and 5232.

4,894,229
CARRIER-BOUND IMMUNOGENIC DETERMINANTS AND CARRIER THEREFOR
Alfred Polson, Camps Bay, and Kirsten J. Van der Merwe, Stellenbosch, both of South Africa, assignors to South African Inventions Development Corporation, South Africa
Continuation-in-part of Ser. No. 399,093, Jul. 16, 1982, abandoned. This application Apr. 21, 1986, Ser. No. 854,242
Claims priority, application South Africa, Jul. 17, 1981, 81/4898
Int. Cl.[4] C12N *17/20*; A61K *39/00, 37/00*
U.S. Cl. 424—92 43 Claims

1. A carrier substance for immunogenic determinants, comprising immunogenicity-increasing carrier particles derived from gram-negative bacterial cells substantially devoid or depleted of natural immunogenic determinants of the cells and comprising that region of the cells which includes lipid A and from there ranges inwardly towards the cell interior and including cell wall material, the particles having been chemically treated with a linking reagent in an amount to provide covalently bonded intermediate linking moieties exposed on the particles, providing reactive functional groups adapted to be bonded covalently to an immunogenically effective amount of selected haptens or immunogens comprising immunogenic determinants, while preserving the adjuvant character of the lipid A and cell wall material.

4,894,230
DELAYED HYDROLYSIS OF METAL PHOSPHIDES
Wolfgang Friemel, Heppenheim; Volker Barth, Ludwigshafen, and Hildegund Dierks, Erbach, all of Fed. Rep. of Germany, assignors to Detia Freyberg GmbH, Laudenbach, Fed. Rep. of Germany
Filed Dec. 29, 1987, Ser. No. 138,772
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1987, 3700176
Int. Cl.[4] A01G *25/08*
U.S. Cl. 424—409 25 Claims

1. A phosphine gas generating pest control agent comprising a a hydrolyzable alkaline earth or earth metal phosphide composition in the form of molded or shaped even surfaced bodies, each of which even surfaced bodies are coated with an uninterrupted coating of a moisture permeable solid organic material of predetermined moisture permeability which initially prevents and later restricts the access of water to the phosphide, which coating completely envelops the even surfaced bodies, retards the phosphine gas generation for a predetermined initial delay period after the pest control agent is exposed to ambient moisture of one or more hours, during which delay period phosphine gas generation is substantially prevented and after which delay period bursting of the coating occurs and generation of phosphine gas begins substantially uninhibited by the coating, the duration of the delay period and the timing of the commencement of uninhibited generation of phosphine gas being predetermined by the moisture permeability of the coating.

4,894,231
THERAPEUTIC AGENT DELIVERY SYSTEM
Jacques-Pierre Moreau, Upton, and Judith P. Kitchell, Newton, both of Mass., assignors to Biomeasure, Inc., Hopkinton, Mass.
Filed Jul. 28, 1987, Ser. No. 78,534
Int. Cl.[4] A61F *2/00*; A61K *9/14*
U.S. Cl. 424—426 9 Claims

1. A therapeutic agent delivery system comprising a biodegradable polymer and a therapeutic agent, said delivery system being coated with a barrier substance that decreases the quantity of said agent released from said system, compared with the quantity of said agent released from a said system not coated with said barrier substance, in the forty-eight hours subsequent to the parenteral injectioo or implantation of said system into a living person or animal, said barrier substance being selected from the group consisting of a paraffin, beeswax, or a silicone oil and being adapted to dissipate from said delivery system within a short time period after said injection or implantation.

4,894,232
BASE FOR MUCOSAL AND DENTURE ADHESIVE PASTES, A PROCESS FOR THE PREPARATION THEREOF, AND PASTES HAVING THIS BASE
Bernhard Reiß, Königstein/Taunus, and Walter Petri, Niederhausen/Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Apr. 26, 1988, Ser. No. 186,387
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714074
Int. Cl.[4] A61K *9/06, 6/00*
U.S. Cl. 424—439 12 Claims

1. A base for mucosal and denture adhesive pastes comprising, a solid swelling agent which is swellable only in water and is dispersed in a colloidal solution of an organic second swelling agent in a water-soluble, physiologically tolerated organic solvent, wherein the organic second swelling agent is swellable in water and is an ionic swelling agent xanthum gum.

4,894,233
NOVEL DRUG DELIVERY SYSTEM FOR DECONGESTANTS
Shri C. Sharma, 40 Oak Knoll Rd., Mendham, N.J. 07945; James J. Shaw, S-9 Farmhouse La., Morristown, N.J. 07960, and Robert K. Yang, 90 Sun Valley Way, Morris Plains, N.J. 07950
Division of Ser. No. 701,470, Feb. 14, 1985, Pat. No. 4,797,288, Continuation-in-part of Ser. No. 658,099, Oct. 5, 1984, Pat. No. 4,597,970. This application Jul. 26, 1988, Ser. No. 224,594
Int. Cl.[4] A61K *9/20, 9/28*
U.S. Cl. 424—440 19 Claims

1. A dry particulate drug delivery system designed to be chewed or swallowed whole comprising:
(A) a decongestant in an amount of about 1%, to about 75%; and
(B) a hydrophobic matrix comprising
(i) about 0.5% to about 20% by weight of an emulsifier; and
(ii) about 61% to about 95% by weight of an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; and
(iii) at least one glyceride, wherein the decongestant and hydrophobic matrix form an agglomerate, and
(C) a coat effective to delay hydration until ingested comprising about 200% to about 400% by weight of the agglomerate an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; wherein the coat forms a protective barrier effective to prevent unpleasant taste perception for the decongestant agglomerate.

4,894,234
NOVEL DRUG DELIVERY SYSTEM FOR ANTIARRHYTHMICS
Shri C. Sharma, 40 Oak Knoll Rd., Mendham, N.J. 07945; James J. Shaw, S-9 Farmhouse La., Morristown, N.J. 07960, and Robert K. Yang, 90 Sun Valley Way, Morris Plains, N.J. 07950
Division of Ser. No. 701,470, Feb. 14, 1985, Pat. No. 4,797,288, which is a continuation-in-part of Ser. No. 658,099, Oct. 5, 1984, Pat. No. 4,752,485. This application Jul. 26, 1988, Ser. No. 224,602
Int. Cl.[4] A61K *9/20, 9/28, 9/42*
U.S. Cl. 424—440 17 Claims

1. A dry particulate drug delivery system designed to be chewed or swallowed whole comprising:
(A) an antiarrhythmic in an amount of about 1%, to about 75%; and
(B) a hydrophobic matrix comprising
(i) about 0.5% to about 20% by weight of an emulsifier; and
(ii) about 61% to about 95% by weight of an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; and
(iii) at least one glyceride, wherein the antiarrhythmic and hydrophobic matrix form an agglomerate, and
(C) a coat effective to delay hydration until ingested comprising about 200% to about 400% by weight of the agglomerate an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; wherein the coat forms a protective barrier effective to prevent unpleasant taste perception for the antiarrhythmic agglomerate.

4,894,235
NIFEDIPINE-CONTAINING FORM OF ADMINISTRATION AND METHOD FOR ITS PRODUCTION
Hans Köhne, Oberursulmetingen; Wolfgang Lahr, Laupheim, and Hein U. Schmersahl, Ehingen-Gamerschwang, all of Fed. Rep. of Germany, assignors to Dr. Rentschler, Arzneimittel GmbH & Co., Laupheim, Fed. Rep. of Germany
Filed Oct. 3, 1985, Ser. No. 783,862
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1984, 3438830
Int. Cl.[4] A61K *9/48, 9/66*
U.S. Cl. 424—452 22 Claims

1. In an administratable composition in the form of a hard gelatin capsule containing an effective amount of Nifedipine molecularly dispersed within a solidified melt comprised of a mixture of liquid and non-liquid polyethylene glycols selected from the group consisting of polyethylene glycols which are liquid, semi-solid solid and solid at room temperature, the improvement wherein said liquid and non-liquid polyethylene glycols are present in said solidified melt in a weight ratio of liquid to non-liquid polyethylene glycols ranging from about 7:23 to 23:7, the solidification temperature of the mixture ranging from about 25° C. to 62° C. and the mixture having a viscosity ranging from about 1 to 180,000 poise when measured at 20° C. in admixture with up to about 40 percent by weight of water, whereby leakage of the polyethylene glycol melt upon solidification of same from said capsule is avoided and the molecularly dispersed Nifedipine will not recrystallize with said melt while avoiding decreased bioavailability of the Nifedipine due to the reduced solubility exhibited by the recrystallized Nifedipine.

4,894,236
DIRECT COMPRESSION TABLET BINDERS FOR ACETAMINOPHEN
Choong-Gook Jang, 2 Michelle La., Warren, N.J. 07060, and Yoon Im, North Brunswick, N.J., assignors to Choong-Gook Jang, New Brunswick, N.J.
Filed Jan. 12, 1988, Ser. No. 142,909
Int. Cl.[4] A61K *9/26*
U.S. Cl. 424—470 6 Claims

1. A dry, direct, compressed product consisting essentially of from 60 to 90 weight percent of acetoaminophen and from 10 to 40 weight percent of hydrogenated cottonseed oil whereby said product has a hardness of at least 5 kilograms.

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4,894,237

ANTIINFLAMMATORY PHARMACEUTICAL COMPOSITION ENDOWED WITH SUSTAINED EFFECT FOR TOPICAL USE

Pietro Bellasi, and Luigi Valcareghi, both of Milan, Italy, assignors to Cooperativa Farmaceutica Soc. Coop. R.L., Milan, Italy

Filed Aug. 22, 1988, Ser. No. 234,182
Claims priority, application Italy, Sep. 4, 1987, 21981A/87
Int. Cl.[4] A61K *9/14*
U.S. Cl. 424—486 9 Claims

1. Sustained effect pharmaceutical composition, suited for the topical administration, comprising as the active principle the piperazine salt of (S) 6-methoxy-α-methyl-2-naphthaleneacetic acid in micronized form in admixture with primary carriers selected in the group consisting of polyethylene glycol, propylen glycol, glycerine, purified water and isopropyl alcohol or mixtures thereof and with an hydrophylic, pH-independent, matrix consisting of cellulose alkyl derivative of cellulose and/or polyvinyl alcohol.

4,894,238

CONTROLLED RELEASE COMPOSITIONS

Mostyn P. Embry, Woodstock, Great Britain, and Neil B. Graham, Bearsden, Scotland, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 6,328, Jan. 14, 1987, abandoned, which is a continuation of Ser. No. 854,072, Apr. 17, 1986, abandoned, which is a continuation of Ser. No. 630,357, Jul. 16, 1984, abandoned, which is a continuation of Ser. No. 387,774, Jun. 14, 1982, abandoned, which is a continuation of Ser. No. 212,735, Nov. 5, 1980, abandoned. This application Jun. 14, 1988, Ser. No. 208,849
Claims priority, application United Kingdom, Mar. 21, 1979, 7909853
Int. Cl.[4] A61K *47/00, 9/00, 9/02*
U.S. Cl. 424—486 18 Claims

1. A controlled release composition comprising an active substance other than a prostaglandin, and a polymeric carrier therefore comprising residues which are cross-linked through urethane groups, or analogues thereof, and which comprise polyethylene oxide having a ratio of number average molecular weight to functionality greater than 1,500, the degree of cross-linking being such that there is at least one cross-linking point per ten residues comprising the said polyethylene oxide but such that the proportion of the said polyethylene oxide is greater than 50% by weight of the polymeric carrier which is a crystalline hydrogel in the dry form and exhibits syneresis in the wet form.

4,894,239

SUSTAINED-RELEASE PREPARATION AND PRODUCTION THEREOF

Museo Nonomura; Yasuyuki Suzuki, both of Osaka, and Masayuki Yamada, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 16, 1988, Ser. No. 194,210
Claims priority, application Japan, Jun. 2, 1987, 62-138781
Int. Cl.[4] A61K *9/16*
U.S. Cl. 424—497 13 Claims

1. A sustained-release microcapsule preparation comprising:
(a) an ion exchange resin which is about 6 to 16% cross-linked,
(b) a drug adsorbed onto the ion exchange resin in an amount not less than 80% of its theoretical ion adsorption amount, and
(c) a water-permeable polymer coating.

4,894,240

CONTROLLED ABSORPTION DILTIAZEM FORMULATION FOR ONCE-DAILY ADMINISTRATION

Edward J. Geoghegan; Seamus Mulligan, both of Athlone, Ireland, and Donald E. Panoz, Tuckerstown, Bermuda, assignors to Elan Corporation plc, Athlone, Ireland

Continuation-in-part of Ser. No. 684,661, Dec. 20, 1984, Pat. No. 4,721,619. This application Nov. 16, 1987, Ser. No. 121,225
Int. Cl.[4] A61K *9/16*
U.S. Cl. 424—497 28 Claims

1. A diltiazem pellet formulation for oral administration, said pellet comprising a core to diltiazem or a pharmaceutically acceptable salt thereof in association with an organic acid, the diltiazem component and the organic acid being present in a ratio of from 20:1 to 1:1, and a multi-layer membrane surrounding said core and containing a major proportion of a pharmaceutically acceptable film-forming, water insoluble synthetic polymer and a minor proportion of a pharmaceutically acceptable film-forming, water soluble synthetic polymer, the number of layers in said membrane and the ratio of said water soluble to water insoluble polymer being effective to permit release of said diltiazem from said pellet at a rate allowing controlled absorption thereof over a twenty four hour period following oral administration, said rate being measured in vitro as a dissolution rate of said pellet, which when measured in a type 2 dissolution apparatus (paddle) according to U.S. Pharmacopoeia XXI in 0.05M KCl at pH 7.0 and at 100 r.p.m. substantially corresponds to the following dissolution pattern:
(a) from 0 to 35% of the total diltiazem is released after 2 hours of measurement in said apparatus;
(b) from 5 to 45% of the total diltiazem is released after 4 hours of measurement in said apparatus;
(c) from 30 to 75% of the total diltiazem is released after a total of 8 hours of measurement in said apparatus;
(d) from 60 to 95% of the total diltiazem is released after 13 hours of measurement in said apparatus; and
(e) not less than 85% of the total diltiazem is released after 24 hours of measurement in said apparatus.

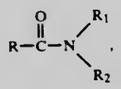
4,894,241

HALOPHOR COMPOSITION

Paritosh M. Chakrabarti, Pittsburgh, Pa.; Roger A. Crawford, Wadsworth, and Robert H. Juda, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 16, 1986, Ser. No. 819,443
Int. Cl.[4] A61K *33/36, 59/00;* C11D *3/48*
U.S. Cl. 424—672 18 Claims

1. A substantially water-free halophor comprising a complex of (a) halogen selected from the group consisting of bromine and iodine, (b) tertiary amide represented by the graphic formula:



wherein R is selected from the group consisting of hydrogen and C_1–C_2 alkyl, R_1 is a C_1–C_4 alkyl, and R_2 is selected from the group consisting of C_1–C_4 alkyl and phenyl, and (c) halide represented by the formula, MX, wherein M is alkali metal selected from the group consisting of sodium, potassium and lithium, or alkaline earth metal selected from the group consisting of calcium and magnesium, and X is bromine, chlorine or iodine, the mole ratio of halide to halogen being from about 1:1 to 1:12, and the amount of halogen in the complex being between about 10 and about 50 weight percent.

4,894,242

NUTRITIONAL RICE MILK PRODUCT

Cheryl R. Mitchell; Pat R. Mitchell, both of 446 N. Powers, Manteca, Calif. 95336, and Robert Nissenbaum, 750 Homer Ave., Palo Alto, Calif. 94301

Division of Ser. No. 856,300, Apr. 24, 1986, Pat. No. 4,744,992. This application Mar. 29, 1988, Ser. No. 174,832
Int. Cl.[4] A23L *1/10, 2/38*
U.S. Cl. 426—29 26 Claims

1. A nutritional rice milk product produced by a method comprising the steps of
selecting a starting material as a whole grain rice and dividing it into particles of reduced size,
liquifying the whole grain rice particles with a alphaamylase enzyme in an aqueous medium to form a liquid slurry, and
treating the liquid slurry with glucosidase enzyme in a saccharification step for a period of less than about three hours in order to yield a rice milk product retaining nutritional components from the whole grain rice, having a glucose content of about 5 to 70% of solids, a protein content on a dry-weight basis of less than about 3.5%, the rice milk product being distinctly cloudy and colloidal or non-filtratable.

4,894,243

METHOD OF REDUCING THE HEALTH RISKS DURING THE HANDLING OF PACKAGED NON-STERILIZED FOODSTUFFS

Lennart Ahrné , Bjärred, Sweden, assignor to AB Tetra Pak, Lund, Sweden

Filed Jul. 27, 1987, Ser. No. 78,114
Claims priority, application Sweden, Aug. 14, 1986, 8603420
Int. Cl.[4] A23C *9/12*
U.S. Cl. 426—43 7 Claims

1. A method for reducing health risks during handling of packaged, non-sterilized milk comprising the steps of:
adding bacteria including Lactobacilli, Lactococci, or Leuconostocci to the milk at least one of before and directly following the packaging of the milk;
the bacteria not being capable of substantial growth at temperatures below 7°–10° C. capable of provoking growth of harmful microorganisms; and the bacteria being added in an amount effective to compete out and prevent multiplication of undesirable bacteria in the packaged milk upon exposure of the milk to temperatures higher than 7°–10° C. capable of provoking growth of harmful microorganisms.

4,894,244

PROCESS FOR TREATING A HYDROCARBON PLANT MATERIAL AND PRODUCT PRODUCED THEREBY

Nicole Kanter, Metz, France, assignor to S.E.T.A., Meltz, France

Filed Oct. 27, 1987, Ser. No. 114,076
Int. Cl.[4] A23J *1/14;* A23L *1/20, 1/214, 1/212*
U.S. Cl. 426—46 12 Claims

1. A process for treating a hydrocarbon plant substrate containing glucids and proteins to obtain a food product having a higher protein content than the starting plant material and a particular flavor which is dependent upon the thermolysis conditions employed, comprising the combinative steps of:
first hydrolyzing said substrate with a hydrosolubilizing enzyme to form hydrosolubilized glucids;
fermenting the resulting product including said hydrosolubilized glucids with a yeast at a pH from 3 to 5 and subjecting the thus fermented product to thermolysis at a temperature ranging from 80° C. to 140° C. for a corresponding period of time of 30 seconds to one hour; wherein during said thermolysis step differing flavors are obtained depending upon the selected temperature and time combinations employed.

4,894,245

COATED FROZEN CHEESE GRANULES

Lester O. Kielsmeier, Lakewood; Richard L. Barz, Longmont, and Wesley J. Allen, Littleton, all of Colo., assignors to Leprino Foods Company, Denver, Colo.

Continuation of Ser. No. 142,910, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 36,022, Apr. 8, 1987, Pat. No. 4,753,815. This application Dec. 15, 1988, Ser. No. 285,305
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[4] A23C *19/00;* A23L *1/03*
U.S. Cl. 426—68 11 Claims

1. A frozen cheese product for use as a topping on baked foods, comprising quick-frozen cheese granules having a thin aqueous coating frozen on the exterior surface of the individual granules, said coating being distributed over the outer surface of the individual granules, the coated granules being in free-flowing condition, the amount of said coating comprising about 0.5 to 4 parts by weight per each 100 parts of uncoated granules, and the coating consisting of at least one layer containing at least one cheese additive.

4,894,246

PROCESSES AND DOUGH COMPOSITIONS FOR PRODUCING COOKIES CONTAINING LOW-MELTING FAT

Clemence K. Dartey, Oakland; John W. Finley, Whippany, and Robert R. Thulin, Wyckoff, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Continuation of Ser. No. 786,097, Oct. 10, 1985, Pat. No. 4,722,849. This application Aug. 7, 1987, Ser. No. 82,540
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] A21D *8/00, 13/00*
U.S. Cl. 426—94 26 Claims

1. A cookie dough composition for preparing a cookie less susceptible to halo and bloom effects, said composition comprising flour, a sugar, chocolate chips, fat or shortening having a solid fat index in the range of about 15 to about 25 percent at 70° F., said fat or sbortening being solid up to at least about 80° F., and a low-melting fat, the low-melting fat having a solid fat index of from about 18 to 31 at 50° F., a solid fat index of from about 7 to about 11 at 80° F. and being essentially completely liquid at about 100° F., the low-melting fat comprising from about 5 to about 30 percent by weight of the total weight of fat and shortening in the cookie dough composition.

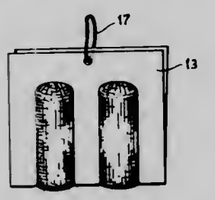
11. A process for preparing a multi-textured cookie, which process comprises:
mixing flour, a humectant and fat or shortening to form a first cookie dough;
mixing flour, a sugar, fat or shortening having a solid fat index in the range of about 15 to about 25 percent at 70° F., said fat or shortening being solid up to at least about 80° F., and a low-melting fat to form a second cookie dough, the low-melting fat having a solid fat index of from about 18 to 31 at 50° F., a solid fat index of from about 7 to about 11 at 80° F. and being essentially completely liquid at 100° F., the low-melting fat comprising from about 5 to about 30 percent by weight of the total weight of fat and shortening in the second cookie dough;
enrobing a portion of the first cookie dough within a portion of the second cookie dough to produce a composite dough piece; and
baking the composite dough piece to form a multi-textured cookie with a soft-textured center and a firm outer layer.

4,894,247

FIBROUS MICROWAVE SUSCEPTOR PACKAGE

Dan S. C. Fong, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1987, Ser. No. 131,663
Int. Cl.[4] A23L *3/10*; H05B *6/64*
U.S. Cl. 426—107 20 Claims



1. A package useful for heating or cooking a food item in a microwave oven, comprising

(a) a drapable, liquid permeable, microwave susceptive composite material comprising a fibrous dielectric substrate treated with at least one microwave susceptor material, said composite material being folded over said food item and in contact with the exterior surfaces of said food item, said composite material forming extensions beyond the periphery of said food item, the inner surfaces of the extensions being in contacting relationship with each other, the extensions forming a flap around at least a part of the periphery of said food item, and

(b) a holder comprising two substantially flat parts, each part being provided with a cutout portion of a size and shape suitable for encompassing said food item contained within said composite material,

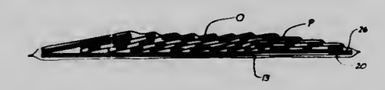
wherein the parts of said holder are joined together face to face, the cutout portions being opposite each other and encompassing said food item and composite material, and wherein the flap formed from said composite material extends beyond said cutout portion and is sandwiched between the two flat parts of said holder, thereby securing said food item in the cutout portion.

4,894,248

WINDOWED BACON PACKAGE

John J. Pappas, Kansas City; James G. Keeley, Parkville, and Keith D. Bender, Kansas City, all of Mo., assignors to Container Corporation of America, Clayton, Mo.

Continuation of Ser. No. 79,595, Jul. 30, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,908
Int. Cl.[4] B65D *57/00, 75/00, 77/24*
U.S. Cl. 426—121 3 Claims



1. A sliced bacon package comprising a relatively thin, flat opaque, backing member and a plurality of bacon slices arranged lengthwise in partially overlapped relation on said backing member and overwrapped with a transparent film, said backing member, comprising:

(a) a main support panel presenting an outer surface and an inner surface supporting said bacon slices, and having, immediately adjacent one side edge thereof, at least one window opening extending therethrough to accommodate the viewing of at least a portion of a bottom surface of a lowermost bacon slice;

(b) an additional product identification panel integral with and foldably joined, at one side edge thereof, to another side edge of said main support panel and adapted to be folded back toward said main support panel to overlie at least a portion of an upper surface of an uppermost bacon slice;

(c) said backing member being formed of:

(i) a sheet of wax saturated paperboard, coated on each of said surfaces with a layer of a low density, extruded polyethylene film;

(ii) a third layer of transparent film laminated to the entire inner surface of said coated wax saturated paperboard sheet and completely covering said window opening;

(iii) said third film layer being formed from a material selected from the group consisting of polyester and polypropylene.

4,894,249

CURING PROCESS FOR MEATS

Herbert F. Angermeier, Essex Falls, N.J., assignor to Liberty Provisions, Inc., Clifton, N.J.

Filed Mar. 13, 1989, Ser. No. 322,367
Int. Cl.[4] A23B *4/02*
U.S. Cl. 426—264 13 Claims

1. A method for curing fresh primal cuts of meat to provide a substantially sodium-free product including the steps of:

a. forming a curing composition consisting of ammonium chloride, ammonium phosphate, and potassium phosphate, and

b. treating the meat with said curing composition as a function of the weight of the meat being treated to provide the desired meat product.

4,894,250

THERMO-IRREVERSIBLE EDIBLE GELS OF GLUCOMANNAN AND XANTHAN GUMS

Gary D. Munson, and Colin T. Prest, both of Melton Mowbray, United Kingdom, assignors to Mars G.B. Limited, Berkshire, United Kingdom

Filed May 5, 1988, Ser. No. 190,581
Claims priority, application United Kingdom, May 6, 1987, 8710704
Int. Cl.[4] A23L *1/06*
U.S. Cl. 426—573 13 Claims

1. A method for making a thermo-irreversible aqueous gel, which comprises subjecting a gellable combination of xanthan gum and a glucomannan gum at a pH above 6.5 to a heat treatment under conditions of temperature and time to form a gel and to cause the gel to become thermo irreversible.

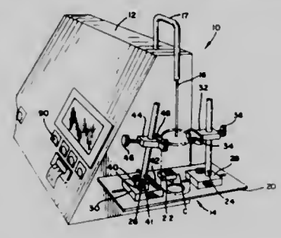
4,894,251

METHOD AND APPARATUS FOR INSPECTING CONTAINERS

Walter J. Sieverin, McHenry, Ill., assignor to American National Can Company, Chicago, Ill.

Filed Jun. 20, 1988, Ser. No. 209,323
Int. Cl.[4] B05C *13/02*
U.S. Cl. 427—8 9 Claims

1. A method of detecting the integrity of a coating on an inner surface of a container having an outwardly-directed flange surrounding an open end thereof with said flange having an uncoated peripheral edge comprising the steps of introducing an electrolytic solution into said container, producing a ground connection with said peripheral edge of said container, introducing a probe into the solution in said container, producing a voltage of increasing intensity to said probe, and taking a



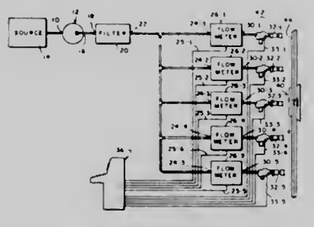
reading of said voltage when the current flow reaches a predetermined intensity.

4,894,252

COATING MATERIAL ORIFICE CLOGGING INDICATION METHOD AND APPARATUS

Francis W. Bonges, Indianapolis; Richard D. Combs, Westfield; James C. Foster, Danville, and Donald G. Godfrey, Indianapolis, all of Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Nov. 30, 1988, Ser. No. 277,971
Int. Cl.[4] B05D *1/02*; B05C *11/10*
U.S. Cl. 427—8 4 Claims



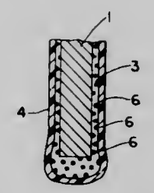
1. A method of coating articles with a coating material on a coating material application line having one or more coating material application stations, the method comprising the steps of providing at each coating station a plurality of coating material dispensing devices, only one of which is operative at any time from which devices coating material can be dispensed onto the articles, providing a source of coating material, coupling each of the devices to the source of coating material through a respective flow rate sensor for each dispensing device, triggering a first selected one of the dispensing devices to dispense coating materials onto an article, sensing the flow of coating material from the selected one of the dispensing devices with the flow rate sensor which couples the source to the first selected one of the dispensing devices, and triggering the first selected one of the dispensing devices to terminate dispensing of coating material and another selected one of the dispensing devices to dispense coating material when the flow rate sensor which couples the source to the first selected one of the dispensing devices senses a flow rate of coating material below a predetermined threshold to the first selected one of the dispensing devices.

4,894,253

METHOD FOR PRODUCTION OF COATED ELECTRODE

William R. Heineman; James E. Mark, both of Cincinnati, Ohio; Emory S. Decastro, Emeryville, Calif., and Christos Geliatsatos, Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Division of Ser. No. 895,782, Aug. 12, 1986. This application Aug. 8, 1988, Ser. No. 229,720
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—36 19 Claims



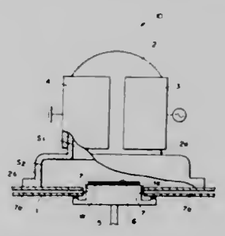
1. A method of producing an electrode which comprises applying to an electroconductive core a liquid inner layer and a liquid outer layer by dipping, spraying or spin coating at a temperature not higher than about 100° C., said inner and outer layers being different materials, at least said outer layer being polymerizable, cross-linking said outer polymerizable layer in situ into a network, and controlling the pore size of said layer to obtain a permeable polymer network.

4,894,254

METHOD OF FORMING SILICONE FILM

Museo Nakayama, Tokyo; Akira Hashimoto, Kanagawa; Toshihiro Nishimura, Kanagawa; Akira Uehara, Kanagawa, and Isamu Hijikata, Kanagawa, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1988, Ser. No. 272,083
Claims priority, application Japan, Nov. 17, 1987, 62-290308
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 22 Claims



1. A method of forming a silicone film, comprising the steps of:

(a) coating a solution for forming a silicone film on a substrate and drying the coated solution at a temperature below 150° C. to form a silicone film on the substrate;

(b) treating the silicone film in a plasma produced from a gas mainly composed of oxygen; and

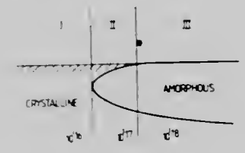
(c) heating the plasma treated silicone film at a temperature of at least 150° C.

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4,894,255
MODIFICATION OF SURFACE PROPERTIES OF CERAMICS

Trevor F. Page, Girton, and Philip J. Barnett, Cambridge, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 596,721, Apr. 4, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,889
Claims priority, application United Kingdom, Apr. 15, 1983, 8310298
Int. Cl.[4] C23C *14/48*
U.S. Cl. 427—38 6 Claims

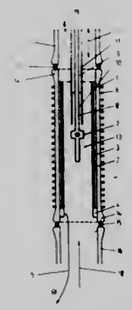


1. A method of treating of the surface of a body of a crystalline metal oxide ceramic material to render the said surface less susceptible to brittle fracture, comprising the operation of subjecting the said surface to bombardment with ions having an energy sufficient to disrupt the crystal lattice of the body, and continuing the ion bombardment until an amorphous layer formed in the body as a result of the ion bombardment extends to the surface of the body, wherein the ions are selected from the group consisting of Ti^+, Cr^+, Y^+, and Zr^+.

4,894,256
PROCESS FOR GLOW-DISCHARGE-ACTIVATED REACTIVE DEPOSITION OF METAL FROM A GAS PHASE

Georg F. Gärtner, Aachen, and Peter A. Janiel, Würselen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,488
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738993
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 6 Claims



1. A process for the reactive deposition of tubular metal bodies on a tubular substrate from a flowing gas phase containing a metal halide by a glow discharge generated in said gas phase and extending between an inner electrode and an outer electrode, one of which electrodes is tubular and serves as said substrate, characterized in that the absolute mass flow of the metal halide is adjusted to at least 60 sccm and the reactive deposition from the gas phase is carried out in the high plasma resistance range.

4,894,257
METHOD OF OVERCOATING A HIGH CURRENT DENSITY CATHODE WITH RHODIUM

Bernard Smith, Ocean Township, Monmouth County; Gerard L. Freeman, Freehold Township, Monmouth County, and Louis E. Branovich, Howell Township Monmouth County, all of N.J., assignors to The United States of America as represented by the Secretary of America, Washington, D.C.

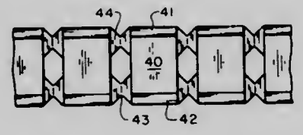
Filed Jul. 5, 1988, Ser. No. 215,081
Int. Cl.[4] B05D *5/12*; H01J *1/15, 9/04*
U.S. Cl. 427—78 8 Claims

1. A method of making a high current density cathode overcoated with rhodium from a tungsten-iridium billet using chemical vapor deposition techniques, said method including the steps of:
(A) impregnating the billet with a chemical mixture of barium oxide, strontium oxide, and aluminum oxide, by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,
(B) placing the impregnated billet in a vacuum system with feedpipe for the introduction of a precursor of rhodium slightly above the impregnated billet, the impregnated billet also being so positioned that the only surface of the impregnated billet to be exposed to the desired precursor of rhodium is the face of the impregnated billet that is desired for emission, and
(C) heating the impregnated billet to about 450° C. and then introducing preheated hexadecacarbonylhexarhodium (O), slightly above the impregnated billet causing rhodium to deposit on the hot impregnated billet.

4,894,258
CHIP RESISTOR

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 171,321, Mar. 21, 1988, abandoned. This application Jan. 9, 1989, Ser. No. 294,443
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—103 9 Claims

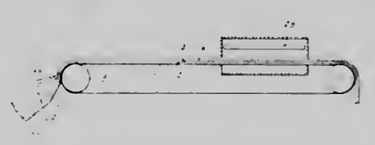


1. A method for fabricating thick film resistor assemblies comprising the steps of:
applying a ceramic adhesive dielectric material to one side of a metallic carrier substrate so as to form a plurality of resistive units on said substrate, including fracture areas between any two adjacent resistive areas;
heating said ceramic adhesive-coated carrier substrate to cure said ceramic adhesive, whereby said adhesive becomes solid;
applying a coating of resistive material to said solidified ceramic adhesive dielectric material;
heating the resultant assembly to eliminate any organic component from said resistive material;
applying conductive material to form one or more conductors to said resistive material;
heating the resultant assembly to eliminate any organic component in said conductive material;
firing the total assembly to a temperature of at least 704 degrees centigrade for a period within the range of from 40 to 80 minutes with the temperature reaching its maximum range for a period within the range of 8 to 12 minutes centered about the midpoint of said firing period, to eliminate the adhesive characteristic of said ceramic material;
separating said carrier substrate from said assembly; and
separating said resistive units by manually applying pressure at each of said fracture areas, whereby said resistive units are separated from each other.

4,894,259
PROCESS OF MAKING A UNIFIED PRESSURE-SENSITIVE ADHESIVE TAPE

Douglas H. Kuller, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 90,671, Aug. 27, 1987, which is a continuation-in-part of Ser. No. 84,781, Aug. 17, 1987, which is a continuation-in-part of Ser. No. 900,372, Aug. 29, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 212,596
Int. Cl.[4] B05D *5/10*
U.S. Cl. 427—208.8 3 Claims

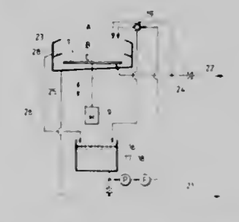


1. A process for making a pressure-sensitive adhesive tape comprising a plurality of concurrently coated simultaneously photopolymerized superimposed layers, said layers having been simultaneously photopolymerized, at least one outer layer being a pressure-sensitive adhesive layer, said pressure-sensitive adhesive layer comprising at least one alkyl acrylate ester of a nontertiary alcohol, and a photoinitiator, contiguous layers defining an interface therebetween, each of said layers comprising a photopolymerized matrix of polymeric chains; said polymeric chains extending from the matrix of one of said layers through said interface into the matrix of a contiguous layer; said polymeric chains comprising polymerized monomers having migrated from the matrix of each contiguous layers, said process comprising the steps of:
(1) preparing a plurality of coatable compositions, each of said coatable compositions comprising at least one photopolymerizable monomer; at least one of said coatable compositions being curable to a pressure-sensitive adhesive state, monomers of each of said coatable compositions being copolymerizable when blended and subjected to photopolymerization conditions;
(2) concurrently coating said coatable compositions to provide a plurality of superimposed layers with contiguous layers defining an interface therebetween, with one composition which is curable to a pressure-sensitive adhesive state being coated as an outer layer;
(3) permitting migration of photopolymerizable monomers through said interface between contiguous layers; and
(4) subjecting said superimposed layers to irradiation to simultaneously photopolymerize said monomers in each layer, and to provide polymeric chains comprised of copolymers of photopolymerizable monomers originating from contiguous layers extending through said interface therebetween;
thereby to produce a tape having layers which cannot be delaminated.

4,894,260
ELECTROLESS PLATING METHOD AND APPARATUS

Osamu Kumasaka, and Nobuki Yamaoka, both of Yamanashi, Japan, assignors to Pioneer Electronic Corporation, Tokyo and Pioneer Video Corporation, Yamanashi, both of, Japan

Filed Sep. 19, 1988, Ser. No. 246,387
Claims priority, application Japan, Sep. 19, 1987, 62-235371
Int. Cl.[4] B05D *3/12*
U.S. Cl. 427—241 5 Claims



1. An electroless plating method for plating a disk, comprising the steps of rotating said disk to be plated with its main surface upturned, causing a plating-pretreating solution to fall onto said main surface from above said main surface so as to bring said plating-pretreating solution into contact with said main surface, causing a cleaning solution to fall from above said main surface onto said main surface to thereby clean said main surface, causing a plating solution to fall from above said main surface onto said main surface to bring said plating solution into contact with said main surface, and causing a cleaning solution to fall from above said main surface onto said main surface to thereby clean said main surface.

4,894,261
PRODUCTION OF A MULTILAYER COATING

Erich Gulbins, Heidelberg, and Gregor Ley, Wattenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,614
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724369
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—379 5 Claims

1. A process for the production of a multilayer coating on a substrate which comprises:
applying to a substrate as a basecoat an aqueous dispersion containing effective amounts of
(A) a carbonyl-containing copolymer of mono-olefinically unsaturated compounds, not less than 10% by weight of which have carbonyl groups which react with hydrazide groups, and
(B) polyhydrazides,
flashing off the water from the dispersion, whereupon the carbonyl groups of the copolymer react with the polyhydrazides to form a crosslinked film on the substrate, and thereafter
applying one or more further coats to the base-coat.
5. The process of claim 1, wherein the basecoat and the additional coats are baked for from 10 to 60 minutes at from 70 to 180° C.

4,894,262
LUMBER END SEALING MACHINE

Thomas A. Heitmanek, Portland, Oreg., assignor to API, Inc., Eugene, Oreg.

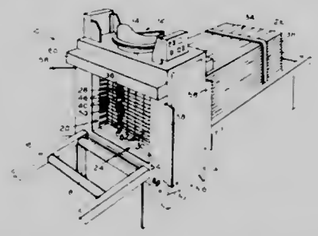
Filed Oct. 24, 1988, Ser. No. 261,740
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—393 8 Claims

7. A method of end sealing of packages of lumber being

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transported by conveyor means, comprising the following steps:

a. Detecting the leading end face of the package of lumber proceeding on the conveyor means;
b. Stopping the package of lumber so that its leading end face halts substantially at the center of an exhaust chamber;
c. Initiating movement of a sealer paint spraying means, including spraying guns, transversely across the end face in the exhaust chamber;
d. Initiating spraying of sealer paint upon the end face in the exhaust chamber as the spray guns of the spraying means pass a first vertical side edge thereof, with the spray guns located to the inside of the first vertical side edge of the end face, and the spray directed outwardly against said first vertical side edge;
e. Continuing transverse movement of the spraying means across the end face and concurrently rotating the spray guns so that the spray passes through a perpendicular orientation to said end face;



f. Terminating the spraying of sealer paint when the spray of the spray guns reaches a second, and opposing, vertical side edge of the end face, the spray guns still being inside the second and opposing vertical side edge of the end face, and the spray being directed outwardly against said second and opposing vertical side edge of the end face of the package of lumber in the exhaust chamber;
g. Continuing transverse movement of the sealer paint spraying means until the spray guns clear to the outside of the second and opposing vertical side edge of the end face in the exhaust chamber;
h. Starting the conveyor for continuation of movement of the package of lumber through the exhaust chamber;
i. Detecting the trailing end face of the package of lumber proceeding on the conveyor;
j. Stopping the package of lumber so that its trailing end face halts at substantially the center of the exhaust system;
k. Repeating steps 'c' through 'g' with a second sealing paint spraying means; and
m. Starting the conveyor so as to move the end-sealed package of lumber out of the exhaust chamber and on down the conveyor.

4,894,263

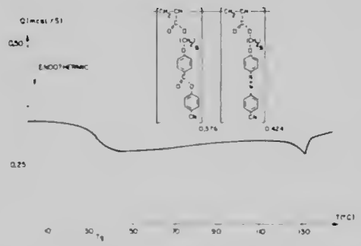
MESOMORPHIC POLYMER MATERIAL USABLE IN NON LINEAR OPTICS

Jean C. Dubois, Remy les Chevreuses; Gilles Ravaux, Les Ulis, and Pierre Le Barny, Orsay, all of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 37,729, Apr. 13, 1987. This application Oct. 24, 1988, Ser. No. 265,337
Claims priority, application France, Apr. 15, 1986, 86 05362
Int. Cl.[4] C09K *19/00;* **C08F** *220/36*
U.S. Cl. 428—1 **10 Claims**

1. In an optoelectronic article, the improvement comprising using a mesomorphic polymeric material whose structure includes a skeleton to which side chains are attached, the material resulting from the association of a first and a second monomer, each of the monomers possessing an element of said skeleton and a side chain characteristic of this monomer, wherein:

the skeleton is a polyacrylate, a polymethacrylate, a polychloroacrylate or a polysiloxane;
the side chains are formed of an element specific to the monomers and a spacer allowing attachment thereof to the skeleton element;
the spacer is of the type $-(CH_2)_n-$ with $2 \leqq n \leqq 15$ or $-(CH_2-CH_2-O)_n-$ with $1 \leqq n \leqq 5$;



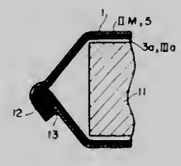
the element specific to the first monomer is a mesomorphogenic group having a positive dielectric anisotropy;
the element specific to the second monomer is a group having the following structure: D-(delocalized π electron system)-A, where D is an electron donating group and A an electron accepting group, this specific element being joined to the spacer on the group D side.

4,894,264

GUSSET BAG FOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Mutsuo Akao; Koji Inoue, and Hiroyuki Osanai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Apr. 26, 1988, Ser. No. 186,470
Claims priority, application Japan, Apr. 28, 1987, 62-103156
Int. Cl.[4] B32B *3/04, 15/04, 27/08*
U.S. Cl. 428—34.2 **4 Claims**



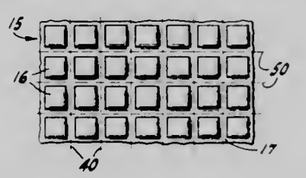
1. A single-sheet gusset bag of multilayer construction for photographic photosensitive materials comprising a metal foil layer or metallized flexible sheet layer, a water-absorptive, and heat-resistant flexible sheet layer which resists dust formation selected from the group consisting of white glassine paper, coated paper, dustless paper, cellophane, synthetic pulp-blended paper, nonwoven fabric, resin saturated paper, synthetic paper, neutral paper, water-repellent paper and calendered paper, said flexible sheet layer being laminated on the outside of said metal foil layer or metallized flexible sheet layer, and a light-shielding polyolefin resin film layer containing linear low density polyethylene resin in an amount of more than 40 wt. %, a resin selected from the group consisting of homopolypropylene resin, propylene-ethylene random copolymer resin, propylene-ethylene block copolymer resin, LDPE resin, HDPE resin, EVA resin, EEA resin and polyisobutylene resin, carbon black and an antioxidant, said film layer having a thickness of more than 50 μm and being laminated on the inside of said metal foil layer or metallized flexible sheet layer, and the bottom seal portion is turned or rolled and fixed by an adhesive or adhesive tape.

4,894,265

BUBBLE-TYPE CUSHIONING AND PACKAGING SHEET AND METHOD OF MANUFACTURE

Ted B. Chang, San Francisco, and Arthur Graham, Portola Valley, both of Calif., assignors to Free-Flow Packaging Corporation, Redwood City, Calif.

Filed Jan. 15, 1988, Ser. No. 144,529
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—34.6 **11 Claims**



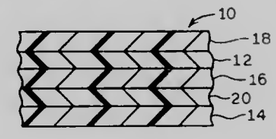
1. In a flexible cushioning sheet comprising a pair of thin films joined together to define a plurality of sealed gas bubbles therebetween, the improvement wherein each film has a thickness profile ABA where B is linear low density polyethylene, A is selected from medium density polyethylene and high density polyethylene, and the sheet has a thickness profile ABABA.

4,894,266

MULTIPLE LAYER PACKAGING SHEET MATERIAL

Frank T. Bauer, Appleton; Yong J. Kim, and Roger P. Genske, both of Neenah, all of Wis., assignors to American National Can Company, Chicago, Ill.

Continuation-in-part of Ser. No. 81,789, Aug. 5, 1987, which is a continuation-in-part of Ser. No. 802,910, Nov. 29, 1985, Pat. No. 4,764,404, which is a continuation-in-part of Ser. No. 45,003, Apr. 30, 1987. This application Dec. 23, 1987, Ser. No. 138,222
Int. Cl.[4] B29D *27/00*
U.S. Cl. 428—35.4 **45 Claims**



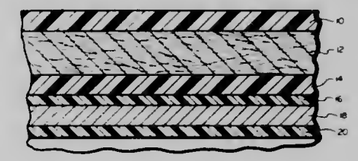
1. A multiple layer sheet material, comprising:
(a) a first layer of vinylidene chloride copolymer, said first layer having a first softening temperature;
(b) a second sealant layer having a second softening temperature no lower than 20° C. less than said first softening temperature;
(c) a third layer, between said first and second layer, said third layer having a third softening temperature greater than said first and second softening temperatures, and comprising polyethylene terephthalate;
(d) a fourth layer having a fourth softening temperature greater than said first and second softening temperatures, said first layer being between said third and fourth layers; and
(e) a fifth impact layer between said second and third layers, the composition of said impact layer comprising (i) as a first component, a base material drawn from the same family of materials as a material component comprising at least 40% by weight of said second sealant layer, and (ii) as a second component, a composition providing elastomeric properties to said impact layer and increased shock tolerance to said multiple layer sheet material.

4,894,267

BLOW-MOLDED PLASTIC BOTTLE WITH BARRIER STRUCTURE FOR FOOD PACKAGES

Griscom Bettle, III, and Christopher W. Gargano, both of Box 338, Bradenton, Fla. 33506

Filed Sep. 28, 1987, Ser. No. 101,730
Int. Cl.[4] B65D *65/38, 15/22;* **B32B** *1/02, 27/06*
U.S. Cl. 428—36.7 **8 Claims**



1. A blow-molded plastic bottle adapted for use as a food package, said bottle having therein a barrier structure consisting of:
a first layer of ethylene-vinyl alcohol copolymer, said first layer positioned as the innermost layer of said bottle, said first layer adapted to contact the food;
a second layer of ethylene-vinyl alcohol copolymer; and
moisture barriers adhered to both sides of said second layer of ethylene-vinyl alcohol copolymer, wherein said bottle further comprises a structural layer.

4,894,268

STRETCH BLOW-MOLDED POLYETHYLENE TEREPHTHALATE WIDE MOUTH CONTAINER AND INTERMEDIATE ARTICLE

Donald L. Greenwood, Hartsville, and Donald W. Hayward, Florence, both of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Dec. 7, 1987, Ser. No. 129,706
Int. Cl.[4] B65D *1/02, 23/00*
U.S. Cl. 428—36.42 **16 Claims**



3. An intermediate article formed by stretch blow-molding an injection-molded preform of polyethylene terephthalate for fabrication into a wide-mouth container suitable for packaging tennis balls or other contents under pressure and being characterized by a construction which will withstand internal pressures with minimal distortion at the base and by a flange construction surrounding the mouth of desired strength and thickness for receiving a closure; said intermediate article comprising:
a tubular body portion of high biaxial molecular orientation;
a base portion of low biaxial molecular orientation and inte-

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grally extending from a lower end of said tubular body portion and having means for providing free-standing ability to the fabricated container and for controlling distortion by internal pressure; and

an accommodation portion integrally extending from an upper end of said tubular body portion and comprising (1) a flange of high biaxial molecular orientation extending around and radially outwardly from the upper open end of said tubular body portion and being adapted to be annularly cut at an intermediate location to remove said accommodation portion during fabrication of the wide-mouth container from said intermediate article, and (2) a stepped wall portion of decreasing biaxial molecular orientation extending around and upwardly and inwardly from said flange and including at least two successive upwardly and inwardly extending step means for collecting a quantity of polyethylene terephthalate during blow-molding and for increasing biaxial molecular orientation and controlling the thickness of said flange.

4,894,269

SYSTEM AND METHOD FOR SECURELY AFFIXING AN ELEMENT TO A STRUCTURE

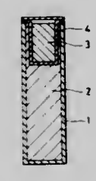
Michio Kimura, Nagoya, Japan, assignor to Nippon Decoluxe Kabushiki Kaisha, Japan

Filed Dec. 3, 1987, Ser. No. 127,811

Claims priority, application Japan, Dec. 5, 1986, 61-288938; Dec. 5, 1986, 61-288939; Mar. 3, 1987, 62-046734

Int. Cl.[4] B65D *65/28*

U.S. Cl. 428—43 **23 Claims**



1. A system for securely affixing an element to a structure formed to have a recess for receiving therein an affixation portion of said element, comprising:

frangible first containment means formed of a first material, for containing a quantity of a second material, and shaped and sized for placement and subsequent breakage thereof inside said recess by a force applied thereto by said affixation portion also received in said recess; and

a second containment means comprising a quantity of a third material, cooperating with said first containment means to contain said second material therein until said breakage of said first containment means and for enabling a reaction between said second and third materials upon occurrence of said breakage to form a reaction product securely affixing said affixation portion of said element to said structure in said recess.

4,894,270

FOLD AND BOND FOR CONSTRUCTING CEMENT LAMINATE STRUCTURAL SHAPES

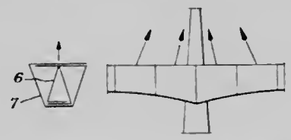
Robert L. Nichols, Civil Engrg. Dept., Univ. of Delaware, Newark, Del. 19716

Continuation-in-part of Ser. No. 937,735, Dec. 4, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 131,255

Int. Cl.[4] B05D *1/36, 5/00*; B32B *3/04, 13/00*

U.S. Cl. 428—125 **5 Claims**

1. A folded, structural member shaped from hardened, fabric-reinforced cement mortar laminates comprising a first, hardened fabric-reinforced cement mortar laminate having at least one hardened folded area, adhesively bonded to a second, hardened fabric-reinforced cement mortar laminate having a least one folded area; said folded areas of the first an second laminate including a hardened penetrant of polymer latex that



hardens said first and second laminates at said folded areas thereof.

4,894,271

METAL-CORE PRINTED WIRING BOARD AND A PROCESS FOR MANUFACTURE THEREOF

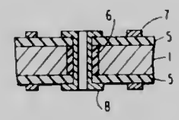
Kiyoshi Hani; Mutsuko Hayama; Yoshio Nishimoto, all of Hyogo; Hiroshi Hishiki; Minoru Kimura, both of Kanagawa, and Tatsushi Nakai, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1988, Ser. No. 190,986

Claims priority, application Japan, May 6, 1987, 62-110016

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—137 **13 Claims**



1. A metal-core printed wiring board, comprising:

(a) a metal core having a core wall defining a through hole extending between two major surfaces of said metal core;

(b) a pair of insulating layers, one of said insulating layers being formed on a respective one of said surfaces of said core, said insulating layers containing ceramic paper, wherein said ceramic paper consists essentially of short ceramic fibers having a maximum diameter of five microns and a length of 5 to 500 microns and contains 3 to 10% by weight of microfibrillated cellulose fibers as a binder for said ceramic fibers, said microfibrillated cellulose fibers having a diameter of no more than one micron;

(c) two wiring patterns, each of said wiring patterns being formed on respective ones of said insulating layers; and

(d) a through hole conductor extending through said through hole of said core for connecting said wiring patterns electrically to each other, an insulator being formed between said through hole conductor and said core wall, said insulator comprising a material which is substantially identical in composition to said ceramic paper.

4,894,272

SIMULATED TILE COUNTER TOP

William J. Ainley, Malibu, Calif., assignor to Jensen General Corp., Los Angeles, Calif.

Continuation of Ser. No. 12,439, Feb. 9, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 233,906

Int. Cl.[4] B32B *3/00*

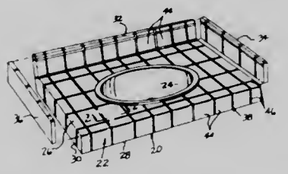
U.S. Cl. 428—156 **5 Claims**

1. A single piece single layer color tinted counter top of material formed to simulate tile and grouting therearound, said tile comprising:

a hardened single sheet single layer color tinted matrix formed with a top surface and peripheral dimension wherein said color is blended throughout said single sheet single layer;

a plurality of first parallel grooves extending in one direction along said top surface of said counter top;

a plurality of second parallel grooves extending normal to and crossing said first parallel grooves;



rectangles created between said crossing parallel grooves adopted to simulate a plurality of tiles and said grooves are adapted to simulate paths of grouting which enclose each of said simulated tile rectangles on said top surface of said single piece counter top.

4,894,273

BONDING ADDITIVES FOR REFRACTORY METALLIZATION INKS

Sheldon I. Lieberman, Burlington; Eric A. Barringer, Waltham, and Brian C. Foster, Sutton, all of Mass., assignors to Ceramics Process Systems Corp., Milford, Mass.

Continuation-in-part of Ser. No. 53,323, May 22, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 207,394

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—137 **20 Claims**

1. A ceramic body essentially devoid of glass and composed of >96% alumina and having co-sintered metallization, the metallization derived from a composition having a metallizing portion consisting essentially of 84–97% refractory metal, 2–10% alumina, 0.05–5% sintering aid, and 0.5–5% bonding additive selected from the group consisting of the oxides or molybdenum, tungsten, niobium, manganese, yttrium, titanium and mixtures of such oxides.

4,894,274

PASTE-THE-WALL WALLCOVERINGS

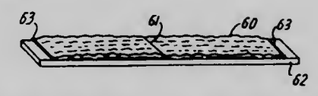
Thomas Graham, Clitheroe, and Philip G. Radford, Blackburn, both of England, assignors to Crown Decorative Products Limited, Derby, England

Filed Jul. 11, 1988, Ser. No. 217,220

Claims priority, application United Kingdom, Jul. 2, 1987, 8715533; Jul. 2, 1987, 8715535

Int. Cl.[4] D06N *7/04*

U.S. Cl. 428—151 **17 Claims**



1. A paste-the-wall wallcovering comprising a paper/plastics laminate in which the paper ply is embossed and the plastics laminate is flat, water-vapour porous, and capable of restraining the paper ply against any significant wet expansion in the course of hanging and drying of the hanging paste.

4,894,275

FLOOR MAT/FOOT PAD FOR AUTOMOBILES

Helmut Pelzer, Neue Strasse 5, D-5804 Herdecke-Ende, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,908

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733286; Oct. 2, 1987, 3733285

Int. Cl.[4] B32B *3/02, 3/30*

U.S. Cl. 428—166 **2 Claims**



1. In a floor mat for automobiles made of a sound absorbing material having a back and underside, the improvement comprising:

a plurality of open pocketlike indents in the underside of said pad containing a viscous adhesive agent, the pockets having been filled with the viscous adhesive agent prior to installation of the floor mat in an automobile; and

the pockets being provided with undercut and overhung portions such that, as the pad hangs vertically for storage, the viscous material will not flow out of these open pockets.

4,894,276

BONDED GLASS FABRIC EDGE

Michael I. Bryant, Thomasville, N.C., assignor to BGF Industries, Inc., Greensboro, N.C.

Filed May 16, 1986, Ser. No. 863,725

Int. Cl.[4] D03D *5/00, 15/00, 25/00*; D06C *27/00*

U.S. Cl. 428—193 **9 Claims**

6. A process of bonding a feathered glass fabric edge and securing the selvage of glass fabric woven on a shuttleless loom, the process including the steps of:

(1) providing a glass yarn coated with a hot melt composition that is non-tacky and solid at about 70° F. and forms a melt at at least about 200° F., the hot melt coating constituting at least about 40% of the weight of the yarn;

(2) weaving glass warp and weft yarns into a fabric on a shuttleless loom and inserting at least one coated glass warp yarn, woven leno fashion, adjacent a longitudinal edge only of the glass fabric;

(3) heating the glass fabric woven in step (2) along the longitudinal edge at which the coated glass warp yarn was inserted and thermobonding the adjacent glass yarns thereby securing and bonding the glass yarns of the longitudinal edge of the fabric.

9. The feathered glass fabric with its edges bonded by a hot melt composition produced by the process of claim 6.

4,894,277

APPLICATION METHOD AND PRODUCTS THAT USE A FOAMED HOT MELT ADHESIVE

Toshiro Akasaki, Tokyo, Japan, assignor to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 818,815, Jan. 14, 1986, abandoned. This application Nov. 3, 1986, Ser. No. 926,132

Claims priority, application Japan, Jan. 16, 1985, 60-6501; Apr. 26, 1985, 60-90167

Int. Cl.[4] B32B *3/26*

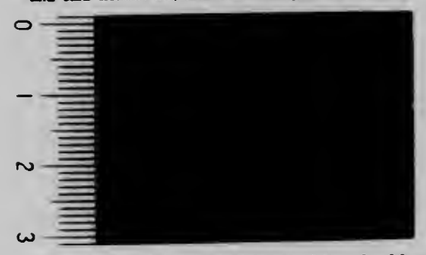
U.S. Cl. 428—198 **9 Claims**

1. A method of applying a foamable hot melt adhesive to a

first substrate for adhering said first substrate to a second substrate, comprising:

ejecting a foamable hot melt adhesive from the discharge orifice of a nozzle, and impacting said foamable hot melt adhesive ejected from said nozzle with heated air;

controlling the flow rates of said foamable hot melt adhesive and said heated air, and controlling the temperature of



said heated air, so as to form elongated strands of foamed hot melt adhesive;

depositing said elongated strands of foamed hot melt adhesive onto said first substrate so that said elongated strands form an open weave film having a spider web like configuration; and

thereafter bonding said second substrate to said first substrate.

4,894,278

PROCESS OF MANUFACTURING A DECORATIVE MIRROR

Albert Servais, Gerpinnes, and Bernard Somerhausen, Nivelles, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Jun. 22, 1988, Ser. No. 210,011

Claims priority, application United Kingdom, Jun. 23, 1987, 8714667

Int. Cl.[4] B05D *5/06;* **B32B** *3/00*

U.S. Cl. 428—201 **11 Claims**



1. A process of manufacturing a decorative mirror comprising at least one reflective silver layer provided on one face of a transparent sheet, the process comprising the steps of:

a. wetting the face of the transparent sheet with a silvering solution to form a wet layer comprised of silver thereon; and

b. contacting the wet layer, while the wet layer is still wet with the silvering solution, with randomly distributed droplets of a salt solution comprised of a metallic salt, which metallic salt reacts with silver to oxidize same or form a complex therewith, and causing reaction thereof with the silver in the wet layer to provide a first silver layer having reaction products including non-metallic silver therein, thereby creating randomly distributed areas containing reaction products including non-metallic silver within the first silver layer of the at least one reflective silver layer, whereby the visible light reflectance of the decorative mirror is modified or interrupted and wherein said silvering solution and said salt solution are made up using different solvents.

4,894,279

ELECTROEROSION PRINT MEDIA HAVING PROTECTIVE COATINGS MODIFIED WITH ORGANOTITANIUM REAGENTS

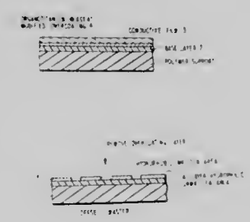
Krishna G. Sachdev, Wappingers Falls; Keith S. Pennington, Somers, and Mitchell S. Cohen, Ossining, all of N.Y., assignors to International Business Machines Corporation, Amonk, N.Y.

Filed May 9, 1986, Ser. No. 861,393

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] B41C *1/10;* **B41M** *5/24;* **G01D** *15/06*

U.S. Cl. 428—216 **13 Claims**



1. An electroerosion recording material comprising:

a non-conductive support,

an electroerodible conductive layer; and

an abrasion resistant overlayer which comprises a cross-linked polymer matrix formed by interaction of a hydroxyl group-containing polymer with one or more organo-titanium reagents wherein said overlayer is dried and cured to a final dry thickness of about 0.05 μm to about 0.6 μm.

4,894,280

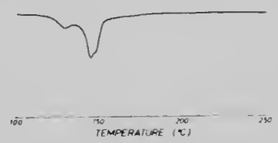
FLEXIBLE, TEAR RESISTANT COMPOSITE SHEET MATERIAL AND A METHOD FOR PRODUCING THE SAME

David W. Guthrie, Roswell, and Robert E. Weber, Marietta, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 21, 1987, Ser. No. 136,235

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—224 **6 Claims**



1. A flexible tear resistant composite sheet material comprising:

a layer of melted and partially fused thermoplastic microfibers having a plurality of intact staple fibers having an average diameter less than or equal to 10 microns homogeneously dispersed throughout said layer, said staple fibers having an average length ranging from about 10 mm to 100 mm and a denier from about 3 to about 30, said staple fibers being present in said layer in a weight ratio of staple fibers to microfibers ranging from 80:20 to 35:65, said staple fibers further having a melting point at least 10° C. greater than said microfibers, said composite having a plurality of voids dispersed therein such that said composite has a percent void volume of about 33 to about {percent and a slit trapezoidal tear resistance greater than or equal to 1.7 kg per 100 g/m^2 equivalent basis weight as measured in the machine direction.

4,894,281

FIBER-REINFORCED POLYMER MOLDED BODY

Kazuo Yagi, Ohtake, and Hitoshi Mantoku, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,956

Claims priority, application Japan, May 29, 1987, 62-131396; May 29, 1987, 62-131397; Jun. 26, 1987, 62-157511

Int. Cl.[4] B32B *27/04, 27/12, 27/08, 25/10*

U.S. Cl. 428—286 **13 Claims**

1. A fiber-reinforced polymer molded body which comprises a matrix of a polymer having a processing temperature lower than 220° C. and at least one reinforcing layer of a molecularly oriented and silane-crosslinked ultra-high-molecular-weight polyethylene fiber, wherein said reinforcing layer is laminated with or embedded in the matrix in a state where the ends of said layer are restrained, said matrix is thermally formed or thermally cured, and the reinforcing layer substantially restrains the orientation crystal structure of the molecularly oriented and silane-grafted ultra-high-molecular-weight polyethylene fiber in the molded body.

4,894,282

SAFETY IMPACT RESISTANT LAMINATES HAVING IMPROVED INTERLAYER MATERIALS

Donald G. LeGrand, Burnt Hills, and William V. Olszewski, Stillwater, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 870,664, Jun. 2, 1986, abandoned, which is a continuation of Ser. No. 652,896, Sep. 21, 1989, abandoned. This application Mar. 16, 1988, Ser. No. 169,077

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] B32B *17/10, 27/36*

U.S. Cl. 428—332 **2 Claims**

1. A method for bonding safety and penetration resistant laminates which consists essentially of contacting under pressure a plurality of laminae selected from the group consisting of glass laminae and thermoplastic laminae where there is situated between adjacent laminae a composite pressure sensitive adhesive inner layer comprising:

(i) at least one thermoplastic sheet having a combined thickness of about 1 to 30 mils, and

(ii) a pressure sensitive adhesive sheet adhered to each face of said thermoplastic sheet.

2. A laminate produced by the method of claim 11.

4,894,283

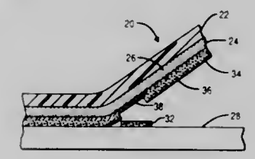
REUSEABLE THERMAL TRANSFER RIBBON

Mary A. Wehr, Hamilton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 10, 1988, Ser. No. 192,794

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—341 **8 Claims**



1. A reuseable, thermal sensitive transfer element comprising a substrate, a functional coating containing as essential ingredients about 55% carbon black, about 35% hydrocarbon wax, and about 10% ethylene vinyl acetate copolymer, all by dry weight, and a binding layer positioned between and binding said substrate and said functional coating and containing 100% ethylene vinyl acetate copolymer, by dry weight.

4,894,284

CROSS-LINKED POLYETHYLENE-INSULATED CABLE

Shosuke Yamanouchi, Osaka; Yoshiyuki Inoue, and Masaaki Kondo, both of Kanagawa, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 8, 1983, Ser. No. 549,843

Claims priority, application Japan, Nov. 9, 1982, 57-197084

Int. Cl.[4] H01B *9/02*

U.S. Cl. 428—378 **6 Claims**

1. A cross-linked polyethylene-insulated cable comprising a conductor core, an inner semiconductive layer, an outer semiconductive layer and an insulating layer between said inner semiconductive layer and said outer semiconductive layer, wherein the insulating layer has a thickness of at least 6 mm and is made of a cross-linked polyethylene prepared by a dry cross-linking method with 2,5-dimethyl-2,5-di(tert-butylperoxy)hexane or 2,5-dimethyl-2,5-di(tert-butylperoxy)hexyne-3 as a cross-linking agent.

4,894,285

SINTERED SPHERICAL PELLETS CONTAINING CLAY AS A MAJOR COMPONENT USEFUL FOR GAS AND OIL WELL PROPPANTS

Jeremiah J. Fitzgibbob, 415 Woodvale Ave., Apt 106B, Lafayette, La. 70503

Division of Ser. No. 40,534, Apr. 20, 1987, which is a continuation of Ser. No. 712,909, Mar. 15, 1985, abandoned, which is a continuation of Ser. No. 565,429, Dec. 27, 1983, abandoned, which is a division of Ser. No. 405,055, Aug. 4, 1982, Pat. No. 4,427,068, which is a continuation-in-part of Ser. No. 347,210, Feb. 9, 1982, abandoned. This application Dec. 2, 1987, Ser. No. 127,715

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[4] C04B *35/02;* **C09K** *3/00*

U.S. Cl. 428—402 **8 Claims**

1. A gas and oil well proppant comprising a plurality of composite, sintered, spherical pellets having a permeability to brine at about 200° F. (93.3° C.) which decreases not more than about three-fourths when the applied pressure on said pellets is increased from 2,000 to 10,000 psi (140 to 700 kg/cm^2), said pellets being prepared from a mixture of calcined clay and calcined bauxite, said mixture containing at least 40% clay on a dry weight basis, and said pellets having an alumina to silicia ratio on a dry weight basis of from about 8.28:1 to 1.17:1, more

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than 6.12 wt. % of other than alumina and silicia, a diameter of between 0.1 and about 2.5 mm, an apparent specific gravity of less than 3.40 but greater than 2.75 g/cc and a bulk density greater than 88 lbs./cubic ft., said pellets being made by a process including the steps of:

(a) forming a particular mixture of calcined clay and calcined bauxite, having an average particle size of less than 15 microns in a high intensity mixture;

(b) while stirring the mixture adding sufficient water to cause formation of composite spherical pellets from the mixture;

(c) drying the pellets at a temperature ranging from about 100° C. to about 300° C.; and

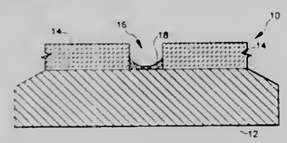
(d) furnacing the dried pellets at a furnace temperature ranging from about 1350° C. to about 1550° C. for a period sufficient to enable recovery of sintered spherical pellets.

4,894,286

OXIDATION RESISTANT REFRACTORY COATED CARBON-CARBON COMPOSITES

Paul E. Gray, La Costa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 7, 1988, Ser. No. 268,015
Int. Cl.[4] B32B *9/00, 31/00*
U.S. Cl. 428—408 **12 Claims**



1. An oxygen resistant high temperature structure comprising:

a carbonous matrix;

an outer refractory coating over said matrix;

silicon, in elemental form and/or as a moiety of a compound dispersed throughout said matrix;

boron, in elemental form and/or as a moiety of a compound dispersed throughout said matrix;

titanium, in elemental form and/or as a moiety of a compound dispersed throughout said matrix;

said silicon and said boron oxidizing when exposed to a high temperature oxidizing environment to form silicon oxide and boron oxide; and

said titanium forming titanium oxide stabilizing a molten phase of the boron oxide wherein the composition range is about $0.170 \leqq (Ti+Si)/B < 210$.

4,894,287

DENSIFIED CARBONACEOUS BODIES

Edward E. Hucke, Ann Arbor, Mich., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 568,066, Jan. 4, 1986, Pat. No. 4,503,215, which is a division of Ser. No. 305,777, Sep. 25, 1981, Pat. No. 4,425,316. This application Feb. 22, 1985, Ser. No. 704,300
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—408 **5 Claims**

1. A densified carbonaceous body comprising: a permeable carbonaceous body, the pores of said body being filled with the pyrolyzation product of a resin obtained by polymerizing a liquid impregnant containing furfural, furfural alcohol or a mixture thereof, an acid catalyst, and a glycol or mixture of glycols.

4,894,288

THERMAL TRANSFER MATERIAL

Tsuguhiro Fukuda, and Hiroshi Sato, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1988, Ser. No. 197,960
Claims priority, application Japan, May 26, 1987, 62-130470
Int. Cl.[4] B41M *5/20*
U.S. Cl. 428—422 **8 Claims**



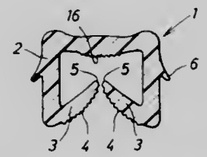
1. A thermal transfer material comprising: a support, an intermediate layer, and a heat-transferable ink layer which comprises a heat fusible material disposed in this order on the support; said intermediate layer comprising oxidized polyethylene having a number-average molecular weight of 1300–2500, and at least one species selected from the group consisting of polyoxyethylene alkylaryl ether, resin acid, and sulfuric acid ester salt.

4,894,289

LAMINATE AND MOLDED ARTICLE PREPARED THEREFROM

Yasuhiko Otawa; Kunihide Hirsoka; Toshiyuki Maeda, al of Ichihara; Katsuo Okamoto, Funabashi; Noboru Sakamaki, Ichihara, and Shizuo Shimizu, Honya, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,594
Claims priority, application Japan, Oct. 30, 1986, 61-256872; Dec. 11, 1986, 61-293482; Dec. 15, 1986, 61-296797
Int. Cl.[4] E06B *7/16*
U.S. Cl. 428—424.2 **23 Claims**



1. A laminate comprising a layer composed of (a) a partially crosslinked graft-modified polyolefin elastomer formed by dynamically heat-treating a blend comprising (i) 10 to 100 parts by weight of a peroxide-crosslinking olefin copolymer comprising olefin and non-conjugated diene, (ii) 0 to 90 parts by weight of an olefinic plastic, the sum of the amounts of the components (i) and (ii) being 100 parts by weight, and (iii) 0.01 to 10 parts by weight of an unsaturated carboxylic acid or derivative thereof, in the presence of an organic peroxide, and a layer of (b) a polyamide, polyurethane or polyester.

4,894,290

COATED GLASS

Peter Chesworth, Burscough Town, and Martin Lowe, Wigan, both of England, assignors to Pilkington Brothers P.L.C., Helens, England

Division of Ser. No. 8,377, Jan. 29, 1987, Pat. No. 4,749,397. This application Jan. 13, 1988, Ser. No. 143,195
Claims priority, application United Kingdom, Jan. 29, 1986, 8602128; Dec. 18, 1986, 8630254
Int. Cl.[4] C23C *13/00*; C03C *17/36*; C08J *7/06*
U.S. Cl. 428—426 **16 Claims**

1. A coated glass substrate with a coating comprising a layer

of additional metal selected from aluminum, titanium, zinc, tantalum and zirconium, a silver layer from 5 nm to 30 nm thick over the layer of additional metal, a further layer of additional metal selected from aluminum, titanium, zinc, tantalum and zirconium over the silver layer, and an anti-reflection metal oxide layer over said further layer of additional metal which coated glass substrate, when subjected to a bending and/or toughening cycle in which the glass is heated in air to a temperature above the softening temperature of the glass, develops an increased light transmission, with the thickness of any anti-reflection metal oxide layer overlying the silver layer plus the thickness of the oxidised additional metal over the silver being in the range of from 10 nm to 80 nm.

4,894,291

INCREASED REGRIND USAGE IN COEXTRUDED STRUCTURES

David E. Ofstein, Williamsburg, Va., assignor to Rampart Packaging Inc., Williamsburg, Va.

Filed Jan. 28, 1988, Ser. No. 149,279
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—518 **17 Claims**

1. A laminate for use in oxygen barrier applications which comprises:

(a) a protective outer layer made of a material selected from the group consisting of polypropylene, polyethylene and copolymers of propylene and ethylene;

(b) an adhesive layer;

(c) an inner barrier layer made of a material selected from the group consisting of ethylene vinyl alcohol copolymers and polyvinylidine chloride;

(d) interposed between layers (a) and (b), an intermediate regrind layer formed of a blend of the materials from which layers (a), (b) and (c) are formed; and

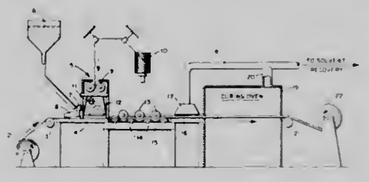
(e) interposed between layers (a) and (d), a buffer layer which is formed from a blend of the materials from which layers (a) and (d) are formed and which comprises from about 5% to about 100% of the material of layer (d).

4,894,292

THERMOSETTING PHENOLFORMALDEHYDE SHEET MOLDING COMPOSITIONS AND METHOD OF PREPARATION

Jeno J. Dibuz, Mercer Island, Wash., and Leland R. Miller, Auburn, Me., assignors to Reichbold Chemicals Inc., White Plains, N.Y.

Continuation of Ser. No. 733,537, May 13, 1985, abandoned, which is a continuation of Ser. No. 469,452, Feb. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 381,502, May 24, 1982, abandoned, which is a continuation of Ser. No. 170,167, Jul. 18, 1980, abandoned. This application Jul. 25, 1986, Ser. No. 888,638
Int. Cl.[4] R29C *39/14*
U.S. Cl. 428—524 **29 Claims**



1. A flexible fibrous reinforced "B" stage phenol-formaldehyde sheet molding composition in the form of a flexible sheet and capable of rapid curing to an infusible state, said composition formed in the absence of cementaceous material or a reactive divalent base thickening agent, from a mixture consisting essentially of:

(a) a resin composition containing from about 30 to about 70 weight percent resin solids of a phenol-formaldehyde condensate resin blend comprising a water soluble phenol-formaldehyde resin solution having a formaldehyde-to-phenol ratio of about 1.2–1.8:1.0, and a solid phenol-formaldehyde resin having a formaldehyde-to-phenol ratio of about 0.6–2.2:1.0;

(b) about 15 to 30 percent by weight of a miscible organic solvent;

(c) from about 20 to about 40 percent by weight of an inert filler;

(d) from about 0.5 to about 5.0 percent by weight of an internal lubricant;

(e) from about 0.5 to about 5.0 percent by weight of a catalyst capable of polymerizing the phenol-formaldehyde condensate resin; and

(f) from about 1 to about 50 percent by weight of a fibrous reinforcing material based on the weight of the sheet molding composition; said composition being in the form of a flexible sheet in a partially cured non-tacky moldable state with the fibrous material dispersed therein, and having stable properties for several months when stored at temperatures of about 32° to 36° F.

4,894,293

CIRCUIT SYSTEM, A COMPOSITE METAL MATERIAL FOR USE THEREIN, AND A METHOD FOR MAKING THE MATERIAL

Henry F. Breit, Attleboro; Karen A. Augustou, Brightou, both of, and Joseph M. Gondusky, Warwick, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1988, Ser. No. 166,290
Int. Cl.[4] C22C *9/00*
U.S. Cl. 428—614 **19 Claims**



1. A composite metal material comprising a continuous matrix of a first metal material securing a plurality of discrete elements of other metal materials in dispersed relation therein, the discrete elements embodying ferrous metal materials having relatively low coefficient of thermal expansion for cooperating with the continuous matrix material to provide the composite metal material with a selected coefficient of thermal expansion relatively much lower than that of the continuous matrix material, characterized in that the continuous metal matrix material comprises a copper material of relatively high thermal conductivity substantially free of ferrous metal constituents therein for providing the composite metal material with an improved effective thermal conductivity between opposite surfaces of the composite metal material.

4,894,294

ELECTROLYTIC SOLUTION SUPPLY TYPE BATTERY

Koichi Ashizawa, Tokyo; Hidehara Ogino, Matsudo, and Shunji Shimizu, Tokyo, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,557
Claims priority, application Japan, Jun. 5, 1984, 59-114738; Apr. 11, 1985, 60-54198[U]
Int. Cl.[4] H01M *8/24*
U.S. Cl. 429—18 **3 Claims**

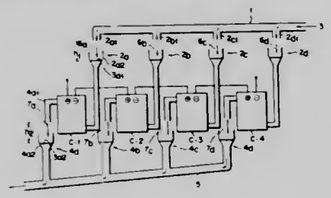
1. An electrolytic solution supply type battery comprising:

a plurality of unit cells which are electrically series-connected or stacked;

a plurality of distribution liquid path means for supplying an

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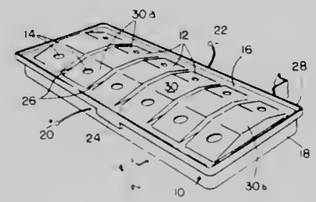
electrolytic solution to each of said plurality of unit cells from a common supply path;
a plurality of exhaust liquid path means for exhausting the electrolytic solution from each of said plurality of unit cells to a common exhaust path; and
a liquid flow interrupt means formed at least at one of said distribution and exhaust liquid path means for obtaining discontinuity of the electrolytic solution by natural fall so as to prevent liquid short-circuit between each two adjacent unit cells of said plurality of unit cells;
each of said liquid flow interrupt means including upper and lower pipes for a corresponding one of said distribution or exhaust liquid path means, said upper and lower pipes being vertically separated from each other by a predetermined natural fall distance for obtaining said discontinuity of the electrolytic solution, and an upper end of said lower pipe having an enlarged diameter for receiving the falling electrolytic solution;



each of said liquid flow interrupt means having a liquid collection chamber at a lower end of said upper pipe, said liquid collection chamber comprising:
an upper portion and a lower portion;
a first partition means arranged in said upper portion to extend parallel to a flow of the electrolytic solution and to define a plurality of upper divided chambers for equally dividing a flow amount of the electrolytic solution into at least two substantially equal parts;
a second partition means arranged in said lower portion in a direction substantially perpendicular to said first partition means to define a plurality of lower divided chambers which equally divide an interior of said lower portion into the same number of parts into which the upper portion is divided by said first partition means, each of said lower divided chambers having a liquid fall port means for allowing the electrolytic solution to fall therethrough, and each of said upper divided chambers being in communication with a corresponding one of said lower divided chambers.

4,894,295
METAL-ALLOY AIR BATTERY
Michael C. Cheiky, 1776 Eucalyptus Hill, Santa Barbara, Calif. 93103
Filed Sep. 14, 1988, Ser. No. 244,828
Int. Cl.[4] H01M *4/00*
U.S. Cl. 429—77 **19 Claims**

1. A metal-air battery, comprising: a base having a base cavity therein and having a flexible, substantially concave non-planar bottom surface;
a lid located on top of said base cavity and joined with said base, said lid including:
at least one air chamber housing that encloses an air chamber through which air may pass;
at least one inlet duct in said air chamber housing for allowing air to pass into said air chamber housing;
at least one outlet duct in said air chamber housing for allowing air to pass out of said air chamber housing;
an anode located in said base cavity;
an electrolyte located in said base cavity in chemical reactive proximity to said anode;
an air cathode located near the junction between said base and said lid, said air cathode being in chemical reactive proximity to said electrolyte;

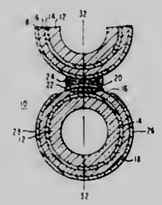


a negative terminal connected to said anode; and
a positive terminal connected to said cathode.

4,894,296
CATHODE FOR ZINC AIR CELLS
Alex Borbely, Framingham, Mass., and Jaynal Molla, Santa Clara, Calif., assignors to Duracell Inc., Bethel, Conn.
Filed Oct. 27, 1987, Ser. No. 113,708
Int. Cl.[4] H01M *4/00*; B29C *59/00*
U.S. Cl. 429—27 **19 Claims**

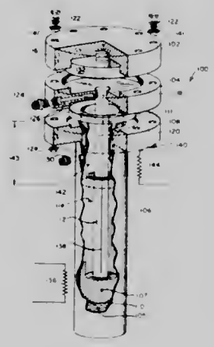
1. A zinc-air electrochemical cell having an anode comprised of zinc, an alkaline electrolyte, and a hydrophobic cathode; wherein hydrophobic the cathode comprises an admixture of discrete particles of gamma manganese dioxide and carbon and at least 20% of a polymeric halogenated hydrocarbon binder.

4,894,297
ELECTROCHEMICAL GENERATOR APPARATUS CONTAINING MODIFIED FUEL ELECTRODES FOR USE WITH HYDROCARBON FUELS
Prabhakar Singh, Pittsburgh; Roswell J. Ruka, Chruchill, and Raymond A. George, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 7, 1988, Ser. No. 280,908
Int. Cl.[4] H01M *8/10*
U.S. Cl. 429—31 **15 Claims**



1. An electrochemical generator apparatus (30), containing an electrochemical cell assembly comprising at least one electrochemical cell (10) containing a fuel electrode (18), where a fuel (46) containing hydrocarbons contacts the fuel electrode, the improvement characterized in that the fuel electrode is impregnated with chemicals which form metal oxides upon heating, where the metal of the oxide is selected from the group consisting of Mg, Ca plus Al, Sr plus Al, Zr, Y, Ce, and mixtures thereof.

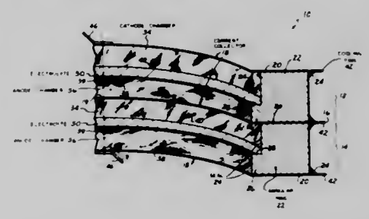
4,894,298
ALKALI AND HALOGEN RECHARGEABLE CELL WITH REACTANT RECOMBINATION
Stephen P. Vukson, Tipp City; David H. Fritts, Dayton; John F. Leonard, and Kwang Y. Kim, both of Beavercreek, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 24, 1988, Ser. No. 261,802
Int. Cl.[4] H01M *10/39*
U.S. Cl. 429—50 **25 Claims**



1. A rechargeable sodium and sulfuryl chloride secondary electrical battery cell comprising the combination of:
an enclosed vessel;
a first sodium inclusive anode reactant material disposed in a first receptacle portion of said vessel;
a second sulfuryl chloride catholyte reactant material disposed in a second receptacle lower portion of said vessel;
a sodium ion transporting solid electrolyte member disposed between said first and second receptacle portions and thereby between said reactant materials in said vessel;
reactant recombination means including a vacated chamber disposed in the upper portion of said enclosed vessel for storing and recombining gaseous reaction products of the cell discharging reaction between said first and second reactant materials and the cell charging reaction regeneration of said reactant materials and for returning said recombined reaction products to said vessel second receptacle portion;
means for controlling the temperature of said first and second receptacle portions of said vessel at a first predetermined reaction enabling temperature;
means for controlling the temperature of said recombination chamber upper portion of said enclosed vessel at a second lower predetermined recombination enabling temperature.

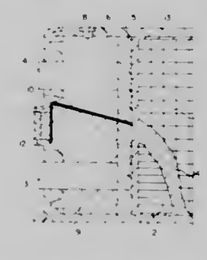
4,894,299
CELL HAVING A DOME-SHAPED SOLID CERAMIC ELECTROLYTE
Elliott M. Morse, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio
Filed Dec. 2, 1988, Ser. No. 279,035
Int. Cl.[4] H01M *6/20*
U.S. Cl. 429—104 **15 Claims**

1. An electrochemical cell comprising, in sequential adjoining order,
a first current collector,
anode material contained in an anode chamber,
a solid, ionically conductive ceramic electrolyte,
cathode material contained in a cathode chamber, and
a second current collector; and
annular means surrounding and closing said anode and cathode chambers,
said anode and cathode materials being electrochemically active during operation of the cell,
said electrolyte formed of a ceramic material across which ions are transferred during discharge of the cell from one said chamber to the other said chamber,



said electrolyte and first and second current collectors all being in the form of domed disks of substantially similar curvature,
said electrolyte and current collectors being axially aligned but spaced apart, to present said chambers between them.

4,894,300
SEALED MAINTENANCE-FREE LEAD-ACID STORAGE BATTERY
Wolgang Kugler, Ortenberg, Fed. Rep. of Germany, assignor to Accumulatorenfabrik Sonnenschein GmbH, Budingen, Fed. Rep. of Germany
Filed Aug. 19, 1988, Ser. No. 234,077
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727763
Int. Cl.[4] H07M *6/14*
U.S. Cl. 429—190 **9 Claims**



1. A sealed, maintenance-free lead-acid storage battery of high capacity employing a thixotropic sulfuric acid gel as the electrolyte, comprising positive and negative electrode plates which are separated by a separator and connected to a positive and a negative terminal, respectively, and further comprising a gel layer on top of the electrode plates and therebetween, and having a free gas space on top of the gel layer, and a housing lid and a pressure relief valve confronting on said free gas space, and characterized by
(a) the storage battery being horizontally arranged, the positive terminal thereof being disposed in the lower portion of said battery and said free gas space, and the pressure relief valve being disposed in the upper portion of said battery,
(b) the lower portion of said free gas space containing the positive terminal being filled with electrolyte-resistant and electrolyte-impermeable material, and
(c) a parting angle piece extending transversely across the free gas space, said angle piece operatively separating said

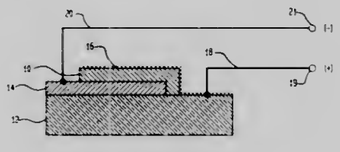
upper portion of said free gas space from the lower, material containing portion thereof.

4,894,301

BATTERY CONTAINING SOLID PROTONICALLY CONDUCTING ELECTROLYTE

Christopher K. Dyer, Chatham Township, Morris County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 3, 1989, Ser. No. 389,507
Int. Cl.[4] H07M 6/16
U.S. Cl. 429—193 **15 Claims**



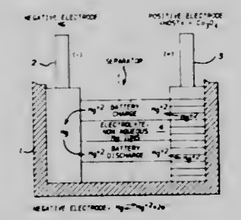
1. A rechargeable battery comprising
positive electrode means including a first metal species,
negative electrode means including a second metal species,
and a solid electrolyte including protonically conducting hydrated aluminum oxide between and in contact with said positive and negative electrode means,
said negative electrode means being responsive to an external charging source connected to said positive and negative electrode means to form a metal hydride and capable, during a discharging cycle, to supply protons to said solid electrolyte and to supply electrons to an external load connected to said positive and negative electrode means.

4,894,302

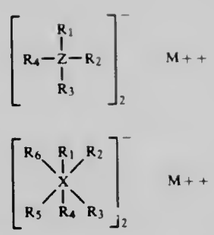
ALKALINE EARTH METAL ANODE-CONTAINING CELL HAVING ELECTROLYTE OF ORGANOMETALLIC ALKALINE EARTH METAL SALT AND ORGANIC SOLVENT

Ronald J. Hoffman; Richard C. Winterton, and Thomas D. Gregory, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 744,827, Jun. 14, 1985. This application Dec. 1, 1986, Ser. No. 936,531
Int. Cl.[4] H01M 6/14; C07F 5/02
U.S. Cl. 429—194 **11 Claims**



1. In an electrochemical cell containing an alkaline earth metal anode, an intercalation cathode, and a nonaqueous, liquid electrolyte, the improvement comprising:
using as said electrolyte
(A) at least one organic solvent and
(B) at least one electrolytically active alkaline earth metal salt represented by the formula:



(I)

(II)

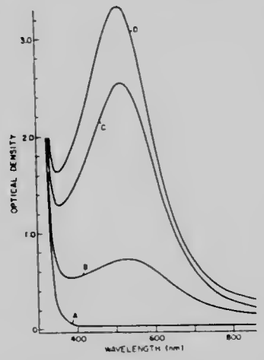
in which Z is selected from the group consisting of boron and aluminum; X is selected from the group consisting of phosphorus and arsenic; M is an alkaline earth metal; and in which R_1–R_6 can be the same or different and are radicals independently selected from the group consisting of unsubstituted or inertly substituted alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, allyl, heterocyclic alkyl, and cyano groups with the proviso that R_1–R_6 cannot be all alkyl or all aryl and triarylalkylborate or aluminate anions and trialkylarylborate or aluminate anions are excluded.
wherein said intercalation cathode is capable of containing an intercalated ionic species in its structure.

4,894,303

HIGH ENERGY BEAM-SENSITIVE GLASSES

Che-Kuang Wu, Riverside, Calif., assignor to Canyon Materials Research & Engineering, Riverside, Calif.

Division of Ser. No. 619,809, Jun. 24, 1984, Pat. No. 4,670,366, which is a continuation-in-part of Ser. No. 507,681, Jun. 24, 1983, Pat. No. 4,567,104. This application Jun. 1, 1987, Ser. No. 57,349
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.[4] G03C 1/36, 1/04, 1/49
U.S. Cl. 430—13 **68 Claims**



1. A photo tool used in photolithographic processes comprising a glass plate bearing a recorded image readable in actinic radiation, said glass plate having an integral ion-exchanged surface layer (IIES layer) bearing the recorded image, said IIES layer composed of a glass layer of a glass composition that has been ion-exchanged with an acidic aqueous solution containing soluble ionic silver to diffuse silver ions into said glass layer to render said IIES layer sensitive to high energy beams, said glass composition comprising of at least one alkali metaloxide selected from the groups of Li_2O, Na_2O, K_2O, Cs_2O and Rb_2O, at least one photosensitivity inhibitor and/or RS-Suppression agent, SiO_2, and up to saturation of chloride in its glass melts, said IIES layer having Ag^+ ions therein and/or a large number of AgCl-containing and/or Ag_2O-containing and/or Ag^+ ion-containing microcrystals and/or microphases therein, containing silanol groups and/or water in the concentration range between about 0.01–12% by weight H_2O, the concentrations of alkali metal ions in said IIES layer being less with an increase in the concentrations of Ag^+ ions, said IIES layer containing at least a portion of the amount of the photosensitivity inhibitors, the RS-Suppression agents, the glass network formers and chloride contained in said glass composition, the glass composition containing a sufficient amount of the photosensitivity inhibitors to render the IIES layer insensitive to at least the spectral portion of the actinic radiation having wavelengths longer than 300 nm, the surface quality and surface figure of said IIES layer remaining substantially the same before and after ion exchange reactions, said IIES layer having been exposed to high energy beams in a predetermined pattern to reduce at least a portion of the silver ions of said IIES layer to elemental silver to produce the recorded image.

4,894,304

PHOTOSENSITIVE MEMBER WITH MAGNESIUM FLUORIDE DISPERSED IN TRANSPARENT PROTECTIVE RESIN LAYER

Hideaki Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,295
Claims priority, application Japan, Nov. 6, 1987, 62-281788
Int. Cl.[4] G03G 5/14, 5/04
U.S. Cl. 430—58 **6 Claims**

1. A photosensitive member with a transparent protective resin layer formed on a photoconductive layer formed over an electrically conductive substrate, wherein the transparent protective resin layer comprises magnesium fluoride of 1 μm or less in maximum particle size and of 0.1 μm or less in mean particle size dispersed in resin at the content of 5–60% by weight to the resin.

4,894,305

CARRIER AND DEVELOPER COMPOSITIONS GENERATED FROM FLY ASH PARTICLES

Robert J. Hagenbach, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 611,294, May 17, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 850,650
Int. Cl.[4] G03G 9/10, 9/14; C03G 49/08
U.S. Cl. 430—106.6 **71 Claims**

1. Spherical carrier compositions prepared from fly ash and comprised of particles with an average particle diameter of greater than 44 microns, a magnetic moment of from about 60 to about 70 electromagnetic units per gram, and an apparent density of equal to, or greater than about 2.4 grams/cm^3.

4,894,306

ION DEPOSITION PRINTING PAPER

H. Herbert Schubring, Island Pond, Vt., assignor to James River Corporation of Virginia, Oakland, Calif.

Filed Jul. 28, 1986, Ser. No. 890,824
Int. Cl.[4] G03G 13/16
U.S. Cl. 430—126 **4 Claims**

1. In the ion deposition printing process wherein a digital signal is converted to an image in the form of an electrostatic charge which is transferred by ion deposition to a dielectric drum, and the image is developed by a toner which is fused to a sheet of paper, the improvement wherein the paper contains an antistatic composition comprising a water-soluble electrolytic salt and water-miscible organic solvent for the salt, the solvent having a boiling point greater than about 190° C., and the paper having a surface resistivity between about 10^9 and 10^{12} ohms/cm^2.

4,894,307

PROCESSES FOR PREPARING AND CONTROLLING THE FRACTIONATION OF CHALCOGENIDE ALLOYS

Santokh S. Badesha, Pittsford; Geoffrey M. T. Foley, and Paul Cheria, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 4, 1988, Ser. No. 270,184
Int. Cl.[4] G03G 5/082
U.S. Cl. 430—128 **35 Claims**

1. A process for the preparation of chalcogenide alloys which comprises providing a chalcogenide alloy source component, crystallizing the source component, admixing the crystallized source component with an organic component, and evaporating the source component in the presence of the organic component.

4,894,308

PROCESS FOR PREPARING ELECTROPHOTOGRAPHIC TONER

Hadi K. Mahabadi, Mississauga; Shean V. Kao; Gerald R. Allison, both of Oakville, all of Canada; Hui Chang, Pittsford, and Edward J. Gutman, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1988, Ser. No. 259,239
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—137 **35 Claims**

1. A process for preparing a toner composition which comprises (1) premixing a pigment and a charge control additive in the absence of a solvent; (2) subsequently admixing the premixed pigment and charge control additive obtained in step 1 with a resin; and (3) extruding the mixture of pigment, charge control additive, and resin obtained in step 2.

4,894,309

PROCESSES FOR THE PREPARATION OF CROSSLINKED COPOLYMERS

Michael K. Georges, Guelph; Lapu Alexandru, Toronto; William J. Dale, Scarborough; Paul D. Szabo, Weston, all of Canada, and Robert A. Nelson, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1988, Ser. No. 246,070
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—137 **11 Claims**

1. A toner composition comprised of the resin particles of crosslinked styrene butadiene ternary copolymers prepared by a free radical suspension polymerization process which comprises the polymerization of styrene monomers, butadiene monomers, and crosslinked components in the presence of a surfactant, a stabilizer, and a first and second initiator; and wherein the aforementioned components are present in an aqueous phase; heating the resulting aqueous mixture at a temperature of from about 50° C. to about 110° C. thereafter heating the mixture at a temperature of from about 110° C. to about 150° C.; followed by cooling; and isolating the desired product, second toner resin particles, pigment particles, a low molecular weight wax component, and a charge enhancing additive.

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4,894,310

PHOTO-SENSITIVE RECORDING MEDIUM

Jun Sakai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 27, 1988, Ser. No. 290,650
Claims priority, application Japan, Dec. 28, 1987, 62-333336; Jan. 14, 1988, 63-5941
Int. Cl.⁴ G03C *1/72*
U.S. Cl. 430—138 **5 Claims**



1. A photo-sensitive recording medium comprising:
a sheet shaped supporting member; and
microcapsules coated on said supporting member, each of said microcapsules comprising a capsule wall made of an inorganic material and enveloping therein a photo-curing substance and a color component.

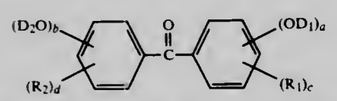
4,894,311

POSITIVE-WORKING PHOTORESIST COMPOSITION

Kazuya Uenishi; Yasumasa Kawabe, and Tadayoshi Kokubo, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 29, 1987, Ser. No. 113,951
Claims priority, application Japan, Oct. 29, 1986, 61-257525
Int. Cl.⁴ G03C *1/54, 1/60*
U.S. Cl. 430—192 **8 Claims**

1. A positive-working photoresist composition for fine photofabrication comprising an alkali-soluble novolak resin in admixture with at least one photosensitive compound represented by formula (I)



(I)

wherein D_1 and D_2, which may be the same or different, each represents a 1,2-naphthoquinonediazido-5-sulfonyl group or a 1,2-naphthoquinonediazido-4-sulfonyl group; R_1 and R_2, which may be the same or different, each represents an alkoxy group, or an alkyl ester group, and a, b, c, and d each is 0 or an integer from 1 to 5, provided that $(a+b) \geqq 1$ and $(c+d) \geqq 1$, wherein said resin and said photosensitive compound are present in sufficient amounts to provide a positive resist pattern.

4,894,312

DYE DIFFUSION PROCESS WITH BASE PRECURSOR SALTS OF STRONG ORGANIC BASES AND WEAK ORGANIC ACIDS

Holger Ohst, Bergisch Gladbach; Carlhans Süling, Odenthal; Günther Schenk, Cologne; Kaspar Wingender; Manfred Peters, both of Leverkusen, and Immo Boie, Leichlingen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 201,948
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719765
Int. Cl.⁴ G03C *5/54*
U.S. Cl. 430—203 **6 Claims**

1. Process for the production of color images by the photographic dye diffusion process in which a first light-sensitive sheet material is imagewise exposed, at least one of said first light-sensitive sheet material and a second light-insensitive sheet material is moistened with an aqueous liquid and the two sheet materials are heated to 50°–120° C. with their coated surfaces in contact and then separated, said first light-sensitive sheet material containing, on a layer support, at least one light-sensitive silver halide emulsion layer and at least one color providing compound which is capable of producing an image-wise distribution of a diffusible dye on development and said second light-insensitive sheet material containing in at least one binder layer a base precursor compound wherein said base precursor compound is a salt of a weakly acidic organic compound and a strong organic base and said weakly acidic compound corresponds to the following formula II:

$$R^5—SO_2—NH—R^6 \qquad II$$

wherein R^5 stands for alkyl, aryl or a heterocyclic group and R^6 stands for R^5 or hydrogen.

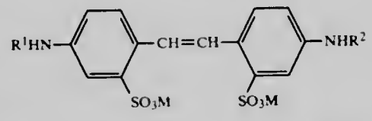
4,894,313

PHOTOSENSITIVE RECORDING ELEMENT COMPRISING MIGRATION RESISTANT DYES

Peter Neumann, Wiesloch, and Guenter Wallbillich, Neustadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 48,751
Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618373
Int. Cl.⁴ G03C *1/495, 1/68, 1/70, 1/76*
U.S. Cl. 430—271 **4 Claims**

1. A photosensitive recording element for the production of printing plates, relief plates or resist images, which consists essentially of
(a) a dimensionally stable base, and
(b) a solid photopolymerizable or photodegradable recording layer on the base and developable with a liquid developer,
said photosensitive recording element containing in the recording layer (b) in concentrations graduating over the layer thickness, one or more light-absorbing, unreactive, migration resistant compounds of the formula (I)



(I)

where M is a hydrogen atom or proton, an alkali metal cation, the ammonium cation or an amine cation and R^1 and R^2 are identical or different and are each a substituted s-triazine ring.

2. A photosensitive recording element as defined in claim 1, which has one or more intermediate layers (c) between the base and the recording layer in which the light-absorbing, unreactive compound is present in a concentration which differs from that in the photosensitive recording layer.

4,894,314

PHOTOINITIATOR COMPOSITION CONTAINING BIS KETOCOUMARIN DIALKYLAMINO BENZOATE, CAMPHORQUINONE AND/OR A TRIPHENYLIMIDAZOLYL DIMER

Robert Barr, Huntington Beach; Leo Roos, Laguna Beach, and Lawrence Crane, Tustin, all of Calif., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 43,054, Apr. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 930,686, Nov. 12, 1986, abandoned. This application Nov. 16, 1988, Ser. No. 273,757
Int. Cl.⁴ G03C *1/68, 1/70*
U.S. Cl. 430—281 **35 Claims**

1. A composition for initiating and sensitizing the photopolymerization or photocrosslinking of ethylenically unsaturated photocurable materials, said composition comprising:
(a) 3,3'-carbonyl bis(7-diethylaminocoumarin);
(b) an alkyl ester of p-dialkylamino benzoic acid; and
(c) a compound selected from the group consisting of camphorquinone and a 2,4,5-triphenylimidazolyl dimer.

7. A composition for initiating and sensitizing the photopolymerization or photocrosslinking of ethylenically unsaturated photocurable materials, said composition comprising:
(a) 3,3'-carbonyl bis(7-diethylaminocoumarin);
(b) an alkyl ester of p-dialkylamino benzoic acid;
(c) camphorquinone; and
(d) a 2,4,5-triphenylimidazolyl dimer

12. In a photopolymerizable composition comprising an addition polymerizable compound containing ethylenic unsaturation, and a photopolymerization initiating and sensitizing composition, the improvement wherein the photopolymerization initiating and sensitizing composition comprises:
(a) 3,3'-carbonyl bis(7-diethylaminocoumarin);
(b) an alkyl ester of p-dialkylamino benzoic acid; and
(c) a compound selected from the group consisting of camphorquinone and a 2,4,5-triphenylimidazolyl dimer.

18. In a photopolymerizable composition comprising an addition polymerizable compound containing ethylenic unsaturation, and a photopolymerization initiating and sensitizing composition, the improvement wherein the photopolymerization initiating and sensitizing composition comprises:
(a) 3,3'-carbonyl bis(7-diethylaminocoumarin);
(b) an alkyl ester of p-dialkylamino benzoic acid;
(c) camphorquinone; and
(d) a 2,4,5-triphenylimidazolyl dimer.

4,894,315

PROCESS FOR MAKING FLEXOGRAPHIC PRINTING PLATES WITH INCREASED FLEXIBILITY

Bernard Feinberg, Englishtown; Michael Fryd, Moorestown, both of N.J., and Ernst Leberzammer, Glen Mills, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 30, 1988, Ser. No. 238,105
Int. Cl.⁴ G03C *1/68, 7/00*
U.S. Cl. 430—281 **11 Claims**

1. In a process for making a printing relief from a flexographic photosensitive element comprising:
(a) imagewise exposing to actinic radiation a layer of a photosensitive composition, said photosensitive composition comprising a binder having thermoplastic and elastomeric domains, a first addition polymerizable, ethylenically unsaturated monomer having some compatibility with both domains of the binder and an addition polymerization initiator or initiating system;
(b) removing the unexposed portions; and
(c) applying post development treatment; wherein the improvement comprises increasing the flexibility of the flexographic printing relief by adding at least one additional ethylenically unsaturated monomer which produces a hard polymer when photopolymerized, said monomer being substantially incompatible with the elastomeric domain of the binder, the ratio of first monomer to the additional monomer is in the range 1:4 to 4:1 based on total weight of monomer, and said additional monomer is added to the photosensitive composition prior to image-wise exposing the layer.

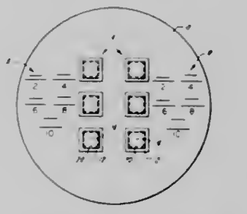
4,894,316

ADJUSTMENT OF THIN FILM CAPACITORS

Richard A. Hjulstrom, Kingston, N.Y., assignor to Electro-Films, Inc., Warwick, R.I.

Filed Jun. 22, 1988, Ser. No. 210,034
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—316 **2 Claims**

1. A method for adjusting during fabrication the capacitance value of thin film capacitors formed on a substrate, comprising the steps of:
providing a first plurality of adjustment patterns on a mask which defines metallized capacitor plate areas of thin film capacitors;
using said mask to form said capacitor plate areas and a second plurality of adjustment patterns on the substrate;



aligning selected portions of said first plurality of adjustment patterns on said mask and said second plurality of adjustment patterns on said substrate to provide an intended offset between said mask-defined capacitor plate areas and said capacitor plate areas formed on the substrate, which offset defines portions of said capacitor plate areas formed on the substrate; and
removing said offset-defined portions of said capacitor plate areas.

4,894,317

METHOD OF FORMING A PRINTED CIRCUIT AND THE PRINTED CIRCUIT FORMED THEREFROM

Tsutomu Maruyama, and Tadaaki Satoh, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Apr. 1, 1988, Ser. No. 176,466
Claims priority, application Japan, Apr. 2, 1987, 62-82134
Int. Cl.⁴ G03C *11/00, 5/00*
U.S. Cl. 430—319 **3 Claims**

1. A method of forming a printed circuit, comprising the steps of:
coating a photo-curable resin coating composition, comprising a photo-curable or ionizing radiation-curable powder coating composition containing a thermoplastic resin selected from a group consisting of (1) vinyl or acrylic polymer having polymerizable unsaturated group on the side chain; (2) polyester or polyether having polymerizable unsaturated group on the side chain or terminal; (3) unsaturated polyester prepared by use of polybasic acid; (4) unsaturated epoxy ester prepared from unsaturated acid and epoxy resin; (5) polyurethane prepared by using unsaturated acid or unsaturated alcohol as one component; (6) melamine resin prepared by introducing unsaturated group; (7) oil-modified alkyd resin and oil-modified aminoalkyd resin having polymerizable unsaturated group; and (8) silicone-modified resin having polymerizable unsaturated group, onto a copper foil plated insulative plate, said thermoplastic resin being in a solid state at normal temperature and having 0.5 to 5 of a polymerizable unsaturated group per 1000 of number average molecular weight, as a film-forming component;
heat-fusing the powder coating composition coated on the insulative plate to a fused liquid state;
exposing the coated plate to light through a pattern mask;
removing a non-exposed area of the coated plate followed by developing an exposed area to form a resist film;
metal plating exposed copper foil;
removing the resist film; and
removing the resulting exposed copper foil.

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4,894,318

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL COMPRISING A MAGENTA COUPLER AND A FORMALDEHYDE SCAVENGER AND METHOD OF PROCESSING THEREFOR

Jun Arakawa, and Keiji Mihayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1986, Ser. No. 862,870

Claims priority, application Japan, May 13, 1985, 60-101077; Dec. 13, 1985, 60-280374

Int. Cl.[4] G03C 7/40, 7/32

U.S. Cl. 430—372 **50 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein the silver halide color photographic material contains an uncolored magenta coupler and at least one compound capable of reacting with and fixing formaldehyde vapor, and at least 70 mol % based on the total amount of the uncolored magenta coupler present in the silver halide color photographic light-sensitive material is an uncolored 5-pyrazolone 2-equivalent magenta coupler.

4,894,319

COLOR IMAGE-FORMING PROCESS FOR HIGH SILVER CHLORIDE COLOR PHOTOGRAPHIC MATERIAL HAVING IMPROVED SPECTRAL SENSITIVITY AND SILVER REMOVABILITY

Tadashi Ikeda; Tadashi Ogawa, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

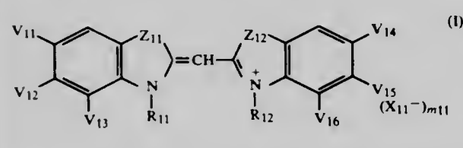
Division of Ser. No. 59,669, Jun. 8, 1987, Pat. No. 4,837,140. This application Nov. 16, 1988, Ser. No. 271,988

Claims priority, application Japan, Jun. 6, 1986, 61-131583

Int. Cl.[4] G03C 7/16

U.S. Cl. 430—383 **21 Claims**

1. A color image-forming process which comprises imagewise exposing a silver halide color photographic material, processing said photographic material with a color developer, then processing said photographic material with a solution having a pH of not more than about 6.5 and having a bleaching ability within about 75 seconds, said photographic material comprising a reflective support having thereon a blue-sensitive silver halide emulsion layer containing a yellow dye-forming coupler, a green-sensitive silver halide emulsion layer containing a magenta dye-forming coupler and a red-sensitive silver halide emulsion layer containing a cyan dye-forming coupler, the total silver amount of said silver halide on said reflective support being up to about 0.78 g/m^2, and at least one of said emulsion layers comprising a silver halide emulsion substantially excluding silver iodide and comprising about 80 mol % or more silver chloride and containing a spectral sensitizing dye represented by the following general formula (I), (II) or (III):



(I)

wherein:

Z_{11} represents an oxygen atom, a sulfur atom or a selenium atom;

Z_{12} represents a sulfur atom or a selenium atom;

R_{11} and R_{12}, which may be the same or different, each represents an optionally substituted alkyl group or alkenyl group containing up to 6 carbon atoms, with at least one of R_{11} and R_{12} being a sulfo-substituted alkyl group;

when Z_{11} represents an oxygen atom, V_{11} and C_{13} each represents a hydrogen atom, and V_{12} represents an optionally substituted phenyl group, or V_{11} and V_{12}, or V_{12} and V_{13}, may be linked to each other to form a fused benzene ring;

when Z_{11} represents a sulfur atom or a selenium atom, V_{11} represents an alkyl group containing up to 4 carbon atoms, an alkoxy group containing up to 4 carbon atoms or a hydrogen atom, V_{12} represents an alkyl group containing up to 5 carbon atoms, an alkoxy group containing up to 4 carbon atoms, a chlorine atom, a hydrogen atom, an optionally substituted phenyl group or a hydroxy group, and V_{13} represents a hydrogen atom, or V_{11} and V_{12}, or V_{12} and V_{13}, may be linked to each other to form a fused benzene ring;

when Z_{12} represents a selenium atom, V_{14}, V_{15}, and V_{16} are respectively the same as defined for V_{11}, V_{12}, and V_{13} in connection with the case where Z_{11} represents a selenium atom;

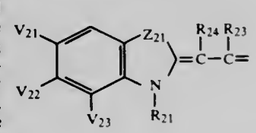
when Z_{12} represents a sulfur atom and Z_{11} represents a selenium atom, V_{14} represents a hydrogen atom, an alkoxy group containing up to 4 carbon atoms or an alkyl group containing up to 5 carbon atoms, V_{15} represents an alkoxy group containing up to 4 carbon atoms, an optionally substituted phenyl group, an alkyl group containing up to 4 carbon atoms, a chlorine atom or a hydroxy group, and V_{16} represents a hydrogen atom, or V_{14} and V_{15}, or V_{15} and V_{16}, m ay be linked to each other to form a fused benzene ring;

when Z_{11} and Z_{12} both represent a sulfur atom, V_{14} and V_{16} each represents a hydrogen atom, and V_{15} represents an optionally substituted phenyl group, or V_{14} and V_{15}, or V_{15} and V_{16}, may be linked to each other to form a ring;

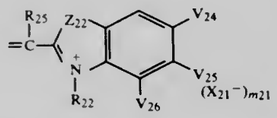
when Z_{11} represents an oxygen atom and z_{12} represents a sulfur atom, V_{14} and V_{16} each represents a hydrogen atom, and V_{15} represents a chlorine atom, an optionally substituted phenyl group or an alkoxy group containing up to 4 carbon atoms, or V_{15} and V_{16} may be linked to each other to form a fused benzene ring;

X_{11} represents a counter ion which is required to neutralize a charge on a cyanine dye of formula (I) or (II); and

m_{11} represents 0 or 1;



(II)



wherein:

Z_{21} represents an oxygen atom, a sulfur atom, a selenium atom, or



Z_{22} represents an oxygen atom or



R_{21} and R_{22} are the same as defined for R_{11} or R_{12} in general formula (I), or R_{21} and R_{24}, or R_{22} and R_{25}, may be linked to each other to form a 5- or 6-membered carbon ring;

R_{23} represents a hydrogen atom when at least one of z_{21} and Z_{22} represents



or represents an ethyl group, a propyl group or a butyl group in other cases;

R_{26} and R_{27} are the same as defined for R_{11} in general formula (I), provided that R_{21} and R_{26}, and R_{22} and R_{27}, do not represent a sulfo group-containing substituent at the same time;

R_{24} and R_{25} each represents a hydrogen atom;

V_{21} represents a hydrogen atom when Z_{21} represents an oxygen atom, or represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms or an alkoxy group containing up to 5 carbon atoms when Z_{21} represents a sulfur atom or a selenium atom, or represents a hydrogen atom or a chlorine atom when Z_{21} represents



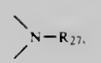
V_{22} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, an alkoxy group containing up to 5 carbon atoms, a chlorine atom or an optionally substituted phenyl group, or V_{22} may be bonded to V_{21} or V_{23} to form a fused benzene ring when Z_{21} represents an oxygen atom and Z_{22} represents



or V_{22} represents an optionally substituted phenyl group or may be bonded to V_{21} or V_{23} to form a fused benzene ring when Z_{21} and Z_{22} both represent an oxygen atom, or V_{22} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, an alkoxycarbonyl group containing up to 5 carbon atoms, an alkoxy group containing up to 4 carbon atoms, an acylamino group containing up to 4 carbon atoms, a chlorine atom, or an optionally substituted phenyl group when Z_{21} represents a sulfur atom or a selenium atom, or may be bonded to V_{23} to form a fused benzene ring when Z_{21} represents a sulfur atom, or represents a chlorine atom, a trifluoromethyl group, a cyano group, an alkylsulfonyl group containing up to 4 carbon atoms or an alkoxycarbonyl group containing up to 5 carbon atoms when Z_{21} represents



V_{24} represents a hydrogen atom when Z_{22} represents an oxygen atom, or represents a hydrogen atom or a chlorine atom when Z_{22} represents



V_{25} represents an alkoxy group containing up to 4 carbon atoms, a chlorine atom or an optionally substituted phenyl group or may be bonded to V_{24} or V_{26} to form a fused benzene ring when Z_{22} represents an oxygen atom, or is bonded to V_{24} or V_{26} to form a fused benzene ring when Z_{21} represents



an oxygen atom, a sulfur atom or a selenium atom, or, when Z_{22} represents

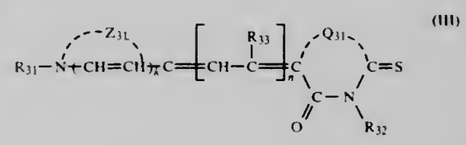


V_{25} represents a chlorine atom, a trifluoromethyl group, a cyano group, an alkylsulfonyl group containing up to 4 carbon atoms or a carboxyalkyl group containing up to 5 carbon atoms;

V_{26} represents a hydrogen atom;

X_{21} represents a counter ion which is required to neutralize a charge on a cyanine dye of formula (I) or (II); and

m_{21} represents 0 or 1;



(III)

wherein:

Z_{31} represents atoms forming a heterocyclic nucleus of thiazoline, thiazole, benzothiazole, naphthothiazole, selenazoline, selenazole, benzoselenazole, naphthoselenazole, benzimidazole, naphthoimidazole, oxazole, benzoxazole, zole, selenazoline, selenazole, benzoselenazole, naphthoselenazole, benzimidazole, naphthoimidazole, oxazole, benzoxazole, naphthoxazole or pyridine, with the heterocyclic nucleus being optionally substituted;

when Z_{31} represents atoms forming a benzimidozole nucleus, one or more substituents in the fused benzene ring are selected from among a chloride atom, a cyano group, an alkoxycarbonyl group containing up to 5 carbon atoms, an alkylsulfonyl group containing up to 4 carbon atoms, and a trifluoromethyl group;

when Z_{31} represents atoms forming heterocyclic nuclei other than benzimidozole, thiazoline and selenazoline, one or more substituents in the fused benzene ring or naphthalene ring are selected from among an alkyl group containing up to 8 carbon atoms, a hydroxy group, an alkoxycarbonyl group containing up to 5 carbon atoms, a halogen atom, a carboxy group, a furyl group, a thienyl group, a pyridyl group, a phenyl group and a substituted phenyl group;

when Z_{31} represents atoms forming a selenazoline or thiazoline nucleus, one or more substituents in the nucleus is selected from among an alkyl group containing up to 6 carbon atoms, a hydroxyalkyl group containing up to 5

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carbon atoms and an alkoxycarbonylalkyl group containing up to 5 carbon atoms;

R_{31} is the same as defined for R_{11} or R_{12} in general formula (I);

R_{32} is the same as defined for R_{11} or R_{12} in general formula (I) or represents a hydrogen atom, a furfuryl group or an optionally substituted aryl group, provided that at least one of R_{31} and R_{32} represents a substituent having a sulfo or carboxy group and the other represents a substituent having no sulfo group;

R_{33} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, a phenethyl group, a phenyl group or a 2-carboxyphenyl group;

Q_{31} represents an oxygen atom, a sulfur atom, a selenium atom or



provided that, when Z_{31} represents atoms forming a thiazoline, selenazoline or oxazole nucleus, Q_{31} represents a sulfur atom, a selenium atom or



R_{34} represents a hydrogen atom, a pyridyl group, a phenyl group, a substituted phenyl group, or an aliphatic hydrocarbyl group optionally containing an oxygen atom, a sulfur atom or a nitrogen atom in the carbon chain, optionally having a substituent or substituents, and containing a total of up to 8 carbon atoms;

k represents 0 or 1; and

n represents 0 or 1 provided that, when n represents 1 and Z_{31} represents atoms forming a pyridine nucleus, Q_{31} represents an oxygen atom.

4,894,320

PHOTOGRAPHIC METHOD USING BLEACHING SOLUTION CONTAINING FERRIC COMPLEX SALTS AND AN AROMATIC COMPOUND

Shinji Ueda; Masakazu Morigaki, and Kozo Aoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

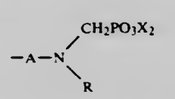
Filed Sep. 25, 1987, Ser. No. 101,319

Claims priority, application Japan, Sep. 25, 1986, 61-224905

Int. Cl.[4] G03C *7/42*

U.S. Cl. 430—393 **9 Claims**

1. A method of processing an imagewise exposed silver halide color photographic material comprising developing the material with a color developing solution, and then processing the material with a solution having a bleaching ability, wherein said processing solution having a bleaching ability contains a ferric complex salt comprising an aminocarboxylic acid ferric salt, and, as a complexing agent, an aromatic compound having at least one group represented by the following general formula (I):



(I)

wherein X represents a hydrogen atom or an organic or inorganic cation, A represents a single bond or a divalent linking group, and R represents a hydrogen atom, and aliphatic group, an aromatic group, a heterocyclic group, an acyl group, a sulfonyl group, said A or $—CH_2PO_3X_2$ wherein X is as defined above, and wherein said aminopolycarboxylic acid ferric salt and said complexing agent are present in a molar ratio of from about 1/10 to about 10/1 and further provided that said ferric complex salt is present in said processing solution in an amount of from about 0.1 to about 1 mol per liter.

4,894,321

PHOTOGRAPHIC SUPPORT AND COLOR PHOTOSENSITIVE MATERIAL

Tadashi Ogawa, Minami-Ashigara; Tetsuro Fuchizawa, Fujinomiya; Masaru Sano, Minami-Ashigara; Seiichi Taguchi, Minami-Ashigara, and Keisuke Shiba, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jul. 15, 1987, Ser. No. 73,767

Claims priority, application Japan, Jul. 17, 1986, 61-168801; Jul. 17, 1986, 61-168803

Int. Cl.[4] G03C *1/87*

U.S. Cl. 430—496 **19 Claims**

1. A photographic support comprising, on a substrate, a filling layer having a secondary diffuse-reflective surface, comprising a fine solid metal powder selected from the group of aluminum, silver, gold, nickel, magnesium, or alloys thereof, and a resin, wherein said filling layer has a reflectance of at least 0.5 and wherein said metal powder has an average particle diameter of from 0.01 to 100μ and is dispersed in the resin.

4,894,322

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shigeto Hirabayashi; Syoji Matsuzaka; Yukio Ohya, and Yoshiyuki Nonaka, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,993

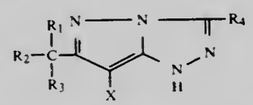
Claims priority, application Japan, Feb. 27, 1985, 60-36278

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] G03C *7/38, 1/02*

U.S. Cl. 430—505 **11 Claims**

1. A light-sensitive silver halide color photographic material having photographic constituent layers including a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer on a support, wherein the content of silver bromide of the silver halides in said green-sensitive silver halide emulsion layer and red-sensitive silver halide emulsion layer is 5 to 65 mole %, and said green-sensitive silver halide emulsion layer contains at least one of the compounds represented by the formula [I] shown below:



wherein X represents a halogen atom or a monovalent organic group eliminable through coupling reaction with an oxidized product of a developing agent; R_1 to R_3, which may be either identical or different, each represent a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, a cycloalkenyl group, an alkynyl group, an aryl group, a heterocyclic group, an acyl group, a sulfonyl group, a sulfinyl group, a phosphonyl group, a carbamoyl group, a sulfamoyl group, a cyano group, a spiro compound residue, a bridged hydrocarbon compound residue, an alkoxy group, an aryloxy group, a heterocycloxy group, a siloxy group, an acyloxy group, a carbamoyloxy group, an amino group, an acylamino group, a sulfonamide group, an imide group, a ureido group, a sulfamoylamino group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylthio group, an arylthio group or a heterocyclic thio group, with proviso that at least two of R_1 to R_3 are not hydrogen atoms; R_4 represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an acylamino group, an alkylamino group, an anilino group, an alkoxycarbonyl group or an alkylthio group.

4,894,323

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING A POLYOXYETHYLENIC COMPOUND AND A SENSITIZING DYE

Kiyoshi Kawai, and Mikio Ihama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

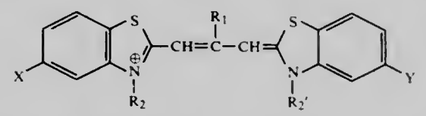
Filed May 26, 1987, Ser. No. 53,673

Claims priority, application Japan, May 27, 1986, 61-121781

Int. Cl.[4] G03C *1/19, 1/28*

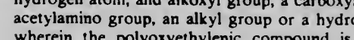
U.S. Cl. 430—569 **11 Claims**

1. A silver halide photographic material which comprises a support having provided thereon at least one silver halide emulsion layer containing a silver halide emulsion and which contains at least one polyoxyethylenic compound in said emsulion layer or at least one other hydrophilic colloid layer, wherein silver halide grains contained in the silver halide emulsion are chemically sensitized in the presence of a water-soluble spectral sensitizing dye having a solubility in 20° C. water of 0.2 g/100 ml H_2O or more, or said water-soluble sensitizing dye is added to the silver halide emulsion after chemical sensitization and before coating, wherein said sensitizing dye is a cyanine dye having the formula:

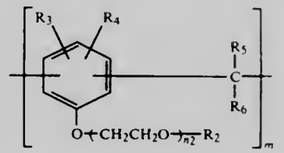


(I)

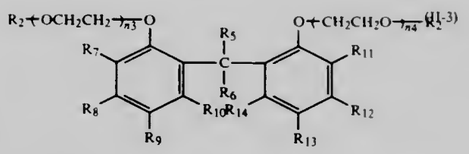
where R_1 represents an alkyl group; R_2 and R_2' are the same or different and represent a carboxyalkyl group or a sulfoalkyl group; and X and Y are the same or different and represent a hydrogen atom, and alkoxyl group, a carboxyalkyl group, an acetylamino group, an alkyl group or a hydroxy group, and wherein the polyoxyethylenic compound is selected from surface active agents represented by the general formulae (II-1), (II-2) and (II-3):



(II-1)



(II-2)



(II-3)

wherein R_1 represents a hydrogen atom, or a substituted or unsubstituted alkyl, alkenyl or aryl group having 1 to 30 carbon atoms, A represents an —O— group, an —S— group, a —COO— group, an —N—R_{15} group, a —CO—N—R_{15} group, or an —SO_2N—R_{15} group in which R_{15} represents a hydrogen atom, or a substituted or unsubstituted alkyl group, R_2 has the same meaning as R_1 or R_1-A, R_3, R_4, R_8, R_{10}, R_{12} and R_{14} each presents a hydrogen atom, a substituted or unsubstituted alkyl, aryl or alkoxy group, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group, or a sulfamoyl group, R_7, R_9, R_{11} and R_{13} each represent a substituted or unsubstituted alkyl, aryl or alkoxy group, a halogen atom, an acryl group, an amido group, a sulfonamido group, a carbamoyl group, or a sulfamoyl group, R_5 and R_6 each represent a hydrogen atom, or a substituted or unsubstituted alkyl, aryl or heterocyclic aromatic ring, n_1, n_2, n_3 and n_4 each represent an average polymerization degree of oxidized ethylene ranging from 2 to 100, and m represents an average polymerization degree of 5 to 50, with the proviso that R_5 and R_6, R_7 and R_8, R_9 and R_{10}, R_{11} and R_{12}, and R_{13} and R_{14} each may be connected to each other to form a substituted or unsubstituted ring.

11. A silver halide photographic material as claimed in claim 1, wherein silver halide grains contained in the silver halide emulsion are chemically sensitized in the presence of a water-soluble sensitizing dye having a solubility in 20° C. water of 0.2 g/100 ml H_2O or more, or said water-soluble sensitizing dye is added to the silver halide emulsion after chemical sensitization and before cooling to coagulate.

4,894,324

HARDENERS FOR PROTEINS, A LAYER OF BINDER HARDENED THEREWITH AND A PHOTOGRAPHIC RECORDING MATERIAL CONTAINING SUCH A LAYER

Wolfgang Himmelmann; Johannes Sobel, both of Leverkusen; Hans Öhlschläger, Bergisch Gladbach, and Karl-Wilhem Schranz, Odenthal-Hahnenberg, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

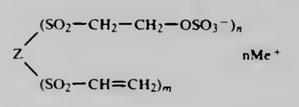
Filed Mar. 3, 1988, Ser. No. 163,738

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708541

Int. Cl.[4] G03C *1/30*

U.S. Cl. 430—622 **5 Claims**

1. Hardened binder layers in which the binder contains a protein, characterized in that they are hardened with a water soluble sulphate corresponding to the following formula



wherein

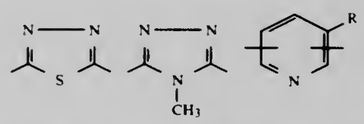
Me denotes a metal cation,

n represents an integer >0,

m represents an integer ≥ 0,

M+n represents 2 and

Z corresponds to one of the following formulae:



wherein R denotes C_1–C_4 alkyl, phenyl or C_1–C_4 alkoxy.

4,894,325

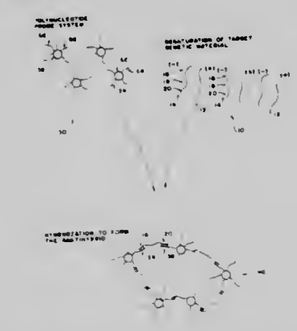
HYBRIDIZATION METHOD FOR THE DETECTION OF GENETIC MATERIAL

Dean L. Engelhardt, and Elazar Rabbani, both of New York, N.Y., assignors to Enzo Biochem, Inc., New York, N.Y.

Continuation of Ser. No. 653,816, Sep. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 605,022, Apr. 27, 1984, abandoned. This application Jan. 15, 1987, Ser. No. 5,327

Int. Cl.[4] C12Q *1/68;* **G01N** *33/552, 33/546*

U.S. Cl. 435—6 **15 Claims**



1. A method for the detection of single-stranded target genetic material comprising the steps of:

(a) contacting, under conditions permissive of hybridization, said target genetic material with

(i) a first polynucleotide probe comprising a first partic to which is attached a plurality of first single-stranded polynucleotide segments complementary to a first portion of said target genetic material, and

(ii) a second polynucleotide probe comprising a second particle having attached thereto a plurality of second single-stranded polynucleotide segments complementary to a second portion of said target genetic material;

(b) permitting hybridization of said first polynucleotide segments to said first portion of target genetic material and said second segments to said second portion of target genetic material, said hybridizations resulting in agglutination; and

(c) detecting said agglutination.

4,894,326

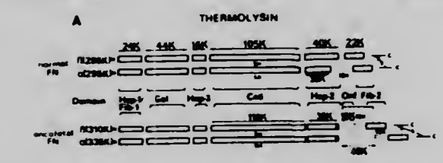
MONOCLONAL ANTIBODY DEFINING ONCOFETAL STRUCTURE OF FIBRONECTIN

Hidemitsu Matsuura, and Sen-itiroh Hakomori, both of Mercer Island, Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Apr. 9, 1986, Ser. No. 849,694

Int. Cl.[4] C07K *15/14;* **G01N** *33/574, 33/577*

U.S. Cl. 435—7 **16 Claims**



1. An immunological binding partner defined by specifically binding with the COOH-terminal region released by cathepsin D digestion of oncofetal fibronectin but not with either normal adult fibronectin or the Hep-2 or Fib-2 fragments released by thermolysin digestion of oncofetal fibronectin.

4,894,327

ANTI-HUMAN MESOTHELIAL CELL MONOCLONAL ANTIBODY

Hajime Yoshida, Sagamihara, Japan, and Nobuo Hanai, Mercer Island, Wash., assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,149

Claims priority, application Japan, Oct. 28, 1986, 61-256142

Int. Cl.[4] G01N *33/577, 33/574;* **C12N** *5/00, 15/00*

U.S. Cl. 435—7 **3 Claims**

1. An anti-human mesothelial cell monoclonal antibody, which is produced from hybridoma cell line KM-277, ECACC No. 86102303, belongs to the class IgG and reacts with human mesothelial cell but not with other normal human cells and human tumor cells.

4,894,328

IMMUNODIAGNOSTIC TEST FOR SYPHILIS AND OTHER TREPONEMAL INFECTIONS

John F. Alderete, and Joel B. Baseman, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 844,340, Mar. 26, 1986, abandoned, which is a continuation of Ser. No. 498,751, May 27, 1983, abandoned. This application May 4, 1987, Ser. No. 46,277

Int. Cl.[4] G01N *33/53, 33/552, 33/544;* **C07K** *15/14*

U.S. Cl. 435—7 **11 Claims**

6. An immunoassay for the detection of anti-*Treponema pallidum* antibody present in a biological sample, the method comprising:

(a) providing insolubilized fibronectin having bound thereto antigenic outer membrane proteins extracted from *Treponema pallidum* so as to form an insolubilized fibronectin, treponemal protein product;

(b) contacting and incubating the insolubilized fibronectin, treponemal protein product for a sufficient time and with a sufficient quantity of the biological sample to permit binding reactions to occur between said insolubilized fibronectin, treponemal protein product and said biological sample; and

(c) determining the presence of anti-*Treponema pallidum* antibody bound to the insolubilized fibronectin, treponemal protein product by contacting the insolubilized fibronectin, treponemal protein product with a quantity of indicator antibody sufficient for binding with the anti-*Treponema pallidum* antibody.

4,894,329

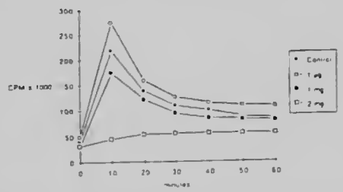
METHOD OF ASSAYING THE BIOACTIVITY OF A THYMIC EXTRACT

Linda Harrington-Fowler, Medfield, and Martin S. Wilder, Amherst, both of Mass., assignors to Serono Pharmaceutical Partners, Boston, Mass.

Filed Feb. 27, 1987, Ser. No. 19,681

Int. Cl.[4] C12Q *1/02*

U.S. Cl. 435—29 **4 Claims**



1. A method of assaying the bioactivity of a thymic extract which comprises:

(a) incubating macrophages derived from the HRS/J mouse with said extract,

(b) incubating the product of (a) with a phagocytic stimulator,

(c) adding a luminescent detecting solution to the product of (b),

(d) measuring the chemiluminescence response of the product of (c), and

(e) comparing the results obtained in (e) to those obtained using a control extract of known activity.

4,894,330

PURIFICATION OF RECOMBINANT BETA-INTERFERON INCORPORATING RP-HPLC

Susan Hershenson, San Francisco, and Ze'ev Shaked, Berkeley, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Dec. 23, 1986, Ser. No. 946,083

Int. Cl.[4] C12P *21/00;* **A61K** *45/02;* **C07K** *15/26*

U.S. Cl. 435—69.51 **34 Claims**

1. A method for purifying recombinant interferon-β (IFN-β) which comprises isolating the IFN-β from hosts transformed to produce it and passing the isolated IFN-β through at least one bonded phase, wide pore, silica gel, reverse-phase high performance liquid chromatography column using a solvent system comprising an organic modifier comprising from about 50% to 100% acetonitrile and an organic acid selected from the group consisting of heptafluorobutyric acid (HFBA) and trifluoroacetic acid (TFA).

4,894,331

PARTIAL MARKER CASSETTE MUTAGENESIS OF XYLOSE ISOMERASE

Barry J. Ratzkin, and Carlos A. Fisher, both of Thousand Oaks, Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Filed Sep. 27, 1985, Ser. No. 781,220

Int. Cl.[4] C12P *21/00, 19/24;* **C12N** *15/00, 9/92*

U.S. Cl. 435—94 **16 Claims**

1. A structural gene which, when inserted in an appropriate vector used to transform an appropriate host, is capable of expressing an enzyme which isomerizes glucose to fructose and which is characterized by the presence of an adenosine residue at position 784 of the nucleotide sequence as given in [Table I] FIG. 7 and is also characterized as having a nucleotide sequence sufficiently similar to the nucleotide sequence of [Table I] FIG. 7 to permit said enzyme to isomerize glucose to fructose.

4,894,332

DNA SEQUENCES CODING FOR *MYCOPLASMA HYPOPNEUMONIAE* SURFACE ANTIGENS, METHODS OF USE TO MAKE THE CORRESPONDING PROTEINS

Heinz E. Schaller, and Mo-Quen Klinkert, both of Heidelberg, Fed. Rep. of Germany, assignors to Biogen, Inc., Cambridge, Mass.

Filed Mar. 27, 1985, Ser. No. 716,564

Int. Cl.[4] C12P *21/00, 21/02;* **C12N** *15/00, 7/00*

U.S. Cl. 435—69.3 **11 Claims**

1. A DNA sequence selected from the group consisting of

GAACAACAACAATGAAAAAAAGAAATAATGCGT-
GATTTTTTTGAAAKGGGAAG
AAAAGGCCTTTTTTTATTACCAGT-
TATATGGCCCTCTTTTC;

AAATAATCCTGAATCAAAATCGCAAGATAATG-
CAAATAAAGGAAATTATCTT
TCTTTAAATATTGGTTATCGTAGTTTTGCT-
GATAAACCTGACTTGCTGATGG TTTTAT-
TACAGTCCCAAAAGTTGGTAAAGAACTTAG-
TAAATCGACAATTATG GCTGATCCTGTC-
CCATAAAAAACAGGTAAAAAAAGTCATC-
GAAAACGGG CAAAAAATAG-
CAAAAGACCTTGGTGAA;

GAATTCAAAGATGAGTTTAAAAAATACTGAACC-
TAATTTTTTTGTCGGCATC TATGAAAAGG-
CAATTGATAAACGTTTTTCTTT-
GATAGATAAAATTAAAATCG;

GAATTCGACCGTAAGTGAAACACGTGATTTTATT-
CAAAAATTTGACATTTTC TATCAG-
GAAAATGTGGGCAAAATCAAAGAAGATT-
TAGATTTTGCAATAGCTC CAAGTTTTATATCTT-
TATCACTAATTICTAAGTCCTTGACTAAAAAAT-
TAGA AATTGCTGCTCAAAATCTTAGTCAGTTT-
GATTCAGGAGCCTTTACTGGGGAA ATCAGTG-
GCAAAATGCTGCAGGATTTAGG-
GACAAAATATGTAATT; and

GAATTCTGGACCTGTATATGGGCCATTTT-
TACCGGGCGAAGATAAGCGCGAA CTCAACC-
CAATTGTGGCAAAAAGTGCTAATTCAAT-
CACAATTGATCTTAATA TTTTATCGATAATAAC-
CAAAACAAAATTATCAGAGAGAGTTGCAGCCT-
TAAG CAGAGTTGAATTC.

4,894,333

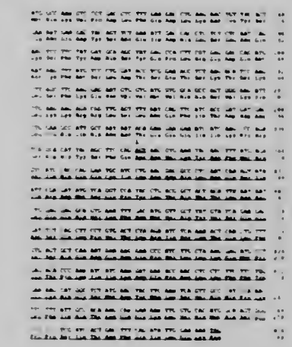
BOVINE INTERLEUKIN-1α

Douglas P. Cerretti; Charles R. Maliszewski, and Michael A. Schoenborn, all of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Filed May 28, 1987, Ser. No. 55,108

Int. Cl.[4] C12N *1/18, 1/00, 15/00, 1/22;* **C12P** *21/00, 21/02;* **C07H** *15/12;* **C07K** *13/00*

U.S. Cl. 435—69.52 **13 Claims**



1. An isolated DNA sequence encoding bovine interleukin-1α (bIL-1α).

4,894,334

METHOD OF IMPROVING THE YIELD OF HETEROLOGOUS PROTEIN PRODUCED BY CULTIVATING RECOMBINANT BACTERIA

Aric Ben-Bassat, Walnut Creek; Glenn Dorin, San Rafael, and Keith Bauer, Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 594,250, Mar. 28, 1984, Pat. No. 4,656,132. This application Apr. 6, 1987, Ser. No. 35,069

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 1/38, 1/20*

U.S. Cl. 435—69.1 **9 Claims**

1. A method for improving heterologous protein yield from a recombinant *E. coli,* the method comprises:

inoculating a liquid nutrient medium with the *E. coli* and cultivating the *E. coli* at conditions which favor growth; and

adding a composition to the *E. coli* culture when the cul-

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ture's cellular density is at least 2 OD units when measured at 680 nm, the composition supports bacterial growth during the terminal portion of the cultivation and is absent from the liquid nutrient medium prior to the addition;

the composition comprises: from 0.5 to 5.0 v/v % ethanol; or from 0.5 to 5.0 w/v % of a protein hydrolysate or a mixture of amino acids; or mixtures thereof.

4,894,335

OIL-IN-WATER EMULSIONS CONTAINING HETEROPOLYSACCHARIDE BIOPOLYMERS

Michel Peignier, Versailles; Michel Garcia, Antony; Alain Seneschal, Maisons-Alfort; Pierre Gagne, Tassin-la-Demi Lune; Dominique Lespinasse, Jassans Riottier, and Jean-Bernard Chaux, Tassin-la-Demi-Lune, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 627,674, Jul. 5, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 26,188

Claims priority, application Japan, Jul. 4, 1983, 58-11060

Int. Cl.[4] C12P *19/06;* **E21B** *43/16;* **C09K** *3/00;* **C10G** *32/00*

U.S. Cl. 435—104 **16 Claims**

1. An oil-in-water emulsion which comprises (i) 40 to 99 parts by weight of an aqueous phase comprising from 10 to 60% by weight of a heteropolysaccharide biopolymer and from 40 to 90% by weight of water, (ii) 1 to 60 parts by weight of oil, and (ii) 1 to 40% by weight, with respect to the combined weight of the components (i) plus (ii), of at least one surface active agent, the oil-in-water emulsion containing greater than 15 up to 60% by weight of the heteropolysaccharide biopolymer.

4,894,336

RACEMIC DISSOCIATION OF 3-ACYLOXY BICYCLO(3.3.0)OCTAN-7-ONE-2-CARBOXYLIC ACID ESTERS BY STEREOSPECIFIC ENZYMATIC OR MICROBIOLOGICAL ACYLATE HYDROLYSIS

Karl Petzoldt; Helmut Dahl, and Werner Skuballa, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE87/00513, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/03567, PCT Pub. Date May 19, 1988

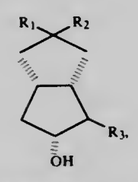
PCT Filed Nov. 12, 1987, Ser. No. 237,109

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638758

Int. Cl.[4] C12P *41/00, 17/02, 7/42;* **C07C** *177/00*

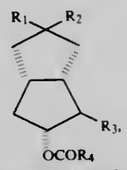
U.S. Cl. 435—146 **10 Claims**

1. Process for the production of optically active (+)-bicyclo[3.3.0]octanol of formula (+)- I,



(+)-I

in which R_1 and R_2 together mean an oxygen atom or the double-bond radical —O—X—O— with X as straight-chain or branched-chain alkylene with 1–7 C atoms or R_1 and R_2 mean in each case the radical OR_5 with R_5 as straight-chain or branched-chain alkyl with 1–7 atoms and R_3 means the radical COOZ with Z as hydrogen atom, straight-chain or branched-chain alkyl with 1–7 C atoms, cycloalkyl with 3–6 C atoms, phenyl or aralkyl with 7–10 C atoms or R_3 means the radical $-(CH_2)_n-O-COR_4$ with n meaning 1–4 and R_4 as straight-chain or branched-chain alkyl with 1–7 C atoms, cycloalkyl with 3–6 C atoms, phenyl or aralkyl with 7–10 C atoms, characterized in that racemic 3alpha-acyloxy-cis- bicyclo[3.3.0]octane derivatives of the formula (±)-II,



(±)-II

in which R_1, R_2, R_3 and R_4 have the above-indicated meanings, are enzymatically or microbiologically subjected to a stereospecific acylate hydrolysis and the resulting (+)-bicyclo[3.3.0]octanol derivative (+)-I is separated from the unsaponified bicyclo[3.3.0]octanol acylate of formula (−)-II or the unsaponified enantiomer (+)-II is separated from the saponified bicyclo[3.3.0]octanol derivative (−)-I and then subjected to a chemical acylate hydrolysis.

4,894,337

PROCESS FOR THE BIOPRODUCTION OF CYCLIC HYDROXIDES

Patrick J. Oriel, Midland, and Gopalakrishnan Gurujeyalakshmi, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jan. 17, 1989, Ser. No. 297,041

Int. Cl.[4] C12P *7/22, 7/02/1/04;* **C12R** *1/07*

U.S. Cl. 435—156 **18 Claims**

1. A process for producing a cyclic hydroxide from a compound having a benzene ring which comprises:

(a) providing a *Bacillus stearothermophilus* which metabolizes phenol in a growth medium containing between about 5 mM and 20 mM of phenol with the compound having the benzene ring and an effective amount of tetracycline which inhibits degradation of the cyclic hydroxide by the *Bacillus stearothermophilus*; and

(b) modifying the compound having the benzene ring with the Bacillus to produce the cyclic hydroxide.

4,894,338

YEAST STRAINS PRODUCING CELLULOLYTIC ENZYMES AND METHODS AND MEANS FOR CONSTRUCTING THEM

Jonathan Knowles; Merja Penttilä; Tuula Teeri, all of Helsinki; Helena Nevalainen, Vaajakoski; Irma Salovuori, Järvenpää , and Päivi Lehtovaara-Helenius, Helsinki, all of Finland, assignors to Oy Alko AB, Helsinki, Finland

PCT No. PCT/FI85/00039, § 371 Date Jan. 30, 1986, § 102(e) Date Jan. 30, 1986, PCT Pub. No. WO85/04672, PCT Pub. Date Oct. 24, 1985

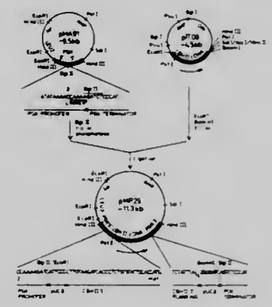
PCT Filed Apr. 12, 1985, Ser. No. 817,942

Claims priority, application Finland, Apr. 13, 1984, 841500

Int. Cl.[4] C12N *15/00, 9/42, 1/16;* **C07H** *21/00*

U.S. Cl. 435—172.3 **13 Claims**

1. A substantially pure DNA sequence or its single or multiple base substitutions, deletions, insertions or inversions, encoding an amino acid sequence comprising the mature cellobiohydrolase II protein amino acid sequence shown in FIG. 5, or a portion thereof having cellobiohydrolase II activity.



4,894,339

IMMOBILIZED ENZYME MEMBRANE FOR A SEMICONDUCTOR SENSOR

Yoshio Hanazato; Satoru Shiono; Mamiko Nakako, and Satoshi Yamada, all of Hoa, Japan, assignors to Seitaikinouriyou Kagakuhin Sinseizogijutsu Kenkyu Kumiai, Japan

Filed Dec. 17, 1986, Ser. No. 942,797

Claims priority, application Japan, Dec. 18, 1985, 60-283056; Jan. 27, 1986, 61-13900; Jan. 27, 1986, 61-13902

Int. Cl.[4] C12N *11/04, 11/08;* **C12M** *1/40;* **G01N** *27/26*

U.S. Cl. 435—182 **56 Claims**

1. A membrane containing an immobilized enzyme comprising:

a water soluble photosensitive resin including poly-vinyl pyrrolidone having a high molecular weight crosslinked to 2, 5-bis (4'-azide2'-sulfobenzal) cyclopentanone sodium salt; and an enzyme.

4,894,340

MICROBIAL SULFHYDRYL OXIDASE AND METHOD

Frank E. Hammer; Don Scott, both of Schaumburg, Ill.; Fred W. Wagner, Lincoln, Nebr.; Lee Ray, Elk Grove Village, Ill., and Rebecca S. de la Motte, Lincoln, Nebr., assignors to Suomen Sokeri Oy, Helsinki, Finland

Filed Dec. 21, 1987, Ser. No. 136,723

Int. Cl.[4] C12N *9/02*

U.S. Cl. 435—189 **14 Claims**

1. An isolated microbial sulfhydryl oxidase which is a flavoprotein and is characterized by a pH optimum of about 5.5 for the oxidation of glutathione in an acetate buffer at 25 degrees Centigrade, absorbance maxima at about 442.5 nanometers, 364.5 nanometers and 274 nanometers, and a molecular weight of about 106,000 as determined by equilibrium sedimentation; said sulfhydryl oxidase being constituted by subunits with a molecular weight of about 50,000 to about 55,000 as determined by SDS polyacrylamide gel eletrophoresis.

4,894,341

PRODUCTION OF CYANIDE HYDRATASE

Kenneth R. Richardson, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 3, 1987, Ser. No. 10,489

Claims priority, application United Kingdom, Feb. 19, 1986, 8604069; Mar. 26, 1986, 8607595

Int. Cl.[4] C12N *9/78, 9/88;* **C12P** *13/02;* **C12R** *1/77*

U.S. Cl. 435—227 **11 Claims**

1. A process for the production of fungal cells containing the enzyme cyanide hydratase which comprises aerobically cultivating cells of a fungal strain selected from the group consisting of *Fusarium lateritium* Nees CMI 300533 and variants and mutants derived therefrom in an aqueous culture containing sources of carbon, appropriate inorganic nutrients and cyanide sufficient to induce production of the enzyme, and recovering fungal cells containing cyanide hydratase from the culture.

4,894,342

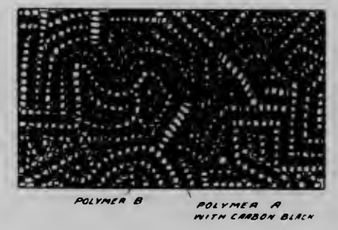
BIOREACTOR SYSTEM

Perry W. Guinn, Oregon City, and Gary N. Mills, Gladstone, both of Oreg., assignors to C. D. Medical, Inc., Miami Lakes, Fla.

Continuation-in-part of Ser. No. 862,014, May 12, 1986. This application Sep. 22, 1986, Ser. No. 909,962

Int. Cl.[4] C12M *1/04, 1/14, 1/34*

U.S. Cl. 435—291 **6 Claims**



1. A bioreactor system comprising:

nutrient fluid reservoir means for containing nutrient fluid;

bioreactor means for culturing biological materials;

fluid inlet means for connection to a source of fresh nutrient fluid;

fluid outlet means for connection to a used nutrient fluid drain;

first pump means operatively coupled to the nutrient fluid reservoir means and the bioreactor means for causing nutrient fluid to recirculate from the nutrient fluid reservoir means through the bioreactor means and back into the nutrient fluid reservoir means;

reversible second peristaltic pump means operatively coupled to the nutrient fluid means and being operable in first and second directions and having first and second tubes, the first tube coupling the fluid inlet means to a fresh fluid input circuit of the bioreactor system and the second tube coupling the fluid outlet means to a used fluid output circuit of the bioreactor means; and

check valve means connected to the first and second tubes of the second pump means for:

allowing the second pump means to pump fresh fluid from the fluid inlet means to the fresh fluid input circuit when operated in the first direction, but not pump fluid from the fluid outlet means to the used fluid output circuit when operated in said first direction; and

allowing the second pump means to pump used fluid from the used fluid output circuit to the fluid outlet means when operated in the second direction, but not pump fluid from the fresh fluid input circuit to the fluid inlet means when operated in said second direction.

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4,894,343

CHAMBER PLATE FOR USE IN CELL FUSION AND A PROCESS FOR PRODUCTION THEREOF

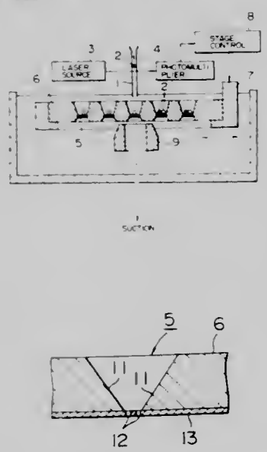
Shinji Tanaka, Akishima; Kazuo Sato, Tokyo; Tsuneo Terasawa, Hachioji; Yoshio Kawamura, Kokubunji, and Hisashi Tsuruoka, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,269

Claims priority, application Japan, Nov. 19, 1986, 61-274031

Int. Cl.[4] C12M *1/20*

U.S. Cl. 435—301 **5 Claims**



1. A chamber plate for use in the fusion of biological cells comprising a plate of single crystal silicon in which a plurality of chambers for holding at least a pair of unit cells is formed in an array, each of said chambers having side and bottom walls for isolating the cells and for defining a base area keeping the cells in contact with each other, the bottom wall having a slit which allows passage of fluid, but which does not allow passage of the cells.

4,894,344

METHOD FOR MANUFACTURING 2-AMINO-2-DEOXY-D-MANNITOL

Makoto Sugiyama, Kyoto; Yoji Ezure, Otsu; Nobutoshi Ojima, Moriyama; Kiyotaka Konno; Takashi Seto, both of Kyoto; Teruya Nakamura, Kusatsu, and Masabu Itoh, Otsu, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Nov. 28, 1988, Ser. No. 276,785

Claims priority, application Japan, Nov. 28, 1987, 62/300600

Int. Cl.[4] C12R *1/56, 1/465;* **G09B** *11/08, 27/08*

U.S. Cl. 435—899 **9 Claims**

1. A process for the production of 2-amino-2-deoxy-D-mannitol which comprises culturing a 2-amino-2-deoxy-D-mannitol producing strain of the genus Streptomyces in a medium suitable for culturing Actinomycetes, isolating the 2-amino-2-deoxy-D-mannitol from the culture medium and recovering the isolated 2-amino-2-deoxy-D-mannitol.

4,894,345
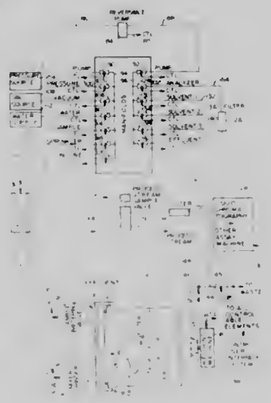
PROCESS FOR PREPARATION OF SAMPLES FOR ANALYSIS

Andre Metzger, Le Verger, France; Peter Grimm, Frenkendorf, Switzerland; Andre J. Nohl, Menlo Park, and Vance J. Nau, Cupertino, both of Calif., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 942,353, Dec. 16, 1986. This application Oct. 14, 1987, Ser. No. 89,857

Int. Cl.[4] G01N *1/28*

U.S. Cl. 436—43 **1 Claim**



1. A process for preparing a solid sample for chemical assay by an assay system comprising the steps of:

(a) placing a known amount of a solid sample into a sample preparation chamber having a grinding and stirring mechanism therein and using a programmable electronic control system which possesses data regarding the quantity of said known amount of sample which has been placed into said sample preparation chamber to perform steps (b) through (m) automatically;

(b) grinding the known amount of sample in the sample preparation chamber until it is in pieces small enough to be efficiently dissolved in a solvent;

(c) placing a known quantity of a solvent in the sample preparation chamber;

(d) mixing said known amount of a sample with said known quantity of solvent in the sample preparation chamber, thereby creating a homogeneous mixture;

(e) withdrawing a known volume of said homogenized mixture from the sample preparation chamber into a sample metering valve;

(f) pressurizing said withdrawn volume of said homogenized mixture in said sample metering valve to compress any gas bubbles in said withdrawn volume of said homogenized sample, thereby generating a pressurized, homogenized mixture;

(g) isolating a known volume of said pressurized, homogenized mixture in said sample metering valve to obtain a non-isolated volume of said homogenized mixture in the sample preparation chamber and an isolated known volume of said pressurized, homogenized mixture which is isolated from the sample preparation chamber;

(h) flushing said non-isolated volume of homogenized mixture from the sample preparation chamber to waste;

(i) releasing the isolated known volume of said pressurized homogenized mixture back into the sample preparation chamber;

(j) if a predetermined sample concentration has been reached, continuing on to step (k), but if the predetermined sample concentration has not been reached, repeating steps (c)–(i) until the predetermined sample concentration has been reached and then continuing on to step (k);

(k) pumping a predetermined volume of the released, homogenized mixture to said assay device

(l) flushing any released, homogenized mixture remaining in the sample preparation chamber to waste; and (m) washing down said sample preparation chamber with a solvent and flushing the solvent to waste to thereby prepare said sample preparation chamber to process another sample.

4,894,346

METHOD FOR THE COLORIMETRIC DETERMINATION OF POLYCARBOXYLATES IN AQUEOUS SYSTEMS

Ronald R. Myers, Coraopolis, and Jack E. Fink, Darlington, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 11, 1983, Ser. No. 540,330

Int. Cl.[4] G01N *21/78, 33/44*

U.S. Cl. 436—85 **10 Claims**

1. A method for determining the concentration of polycarboxylate compounds, added as scale or corrosion inhibitors, in an aqueous solution, consisting essentially of:

(a) adjusting the pH of a portion of said aqueous solution containing polycarboxylate compounds to a pH between 3.0 and 12.0;

(b) adding an effective amount of an aqueous solution of a metachromatic dye to the pH-adjusted portion of Step (a), wherein an effective amount refers to an amount of said dye solution which will, when added to the portion of Step (a), result in a dye to polycarboxylate group mole ratio between 0.1 and 100.0 in the admixture, thereby causing a shift in said dye's wavelength of maximum absorbance for that portion of said dye which alligns with anionic charges of said polycarboxylate compounds;

(c) measuring the absorbance of the admixture resulting from Step (b) at said shifted wavelength of maximum absorbance;

(d) comparing the absorbance from Step (c) with absorbances of standard samples containing known concentratons of polycarboxylic compounds and said effective amount of the dye solution of Step (b), thereby determining the polycarboxylate concentration of the portion of Step (a).

4,894,347

ERYTHROCYTE AGGLUTINATION ASSAY

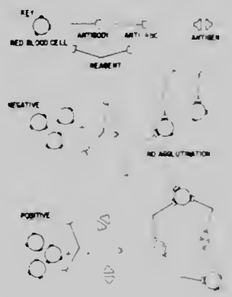
Carmel J. Hillyard, Brisbane; Dennis B. Rylatt, Rosalie; Bruce E. Kemp, Kew, and Peter G. Bundesen, Fig Tree Pocket, all of Australia, assignors to Agen Limited, Australia

Continuation-in-part of Ser. No. 111,313, Oct. 22, 1989. This application Jan. 13, 1988, Ser. No. 143,343

Claims priority, application Australia, Sep. 17, 1987, PI4400

Int. Cl.[4] G01N *33/541*

U.S. Cl. 436—540 **5 Claims**



1. A direct agglutination assay for the presence of an analyte in a whole blood sample from a subject which comprises contacting a blood sample containing erythrocytes endogenous to the subject with an agglutination reagent which comprises a conjugate of (a) an intact multivalent monoclonal antibody which binds to erythrocyte membranes or a multivalent binding fragment thereof, and (b) an analyte binding molecule, said conjugate being essentially incapable of agglutinating said erythrocytes in the absence of analyte, observing whether the erythrocytes are agglutinated and directly correlating the agglutination with the amount of analyte present; said assay being further characterized in that at no time are the sample or the conjugate with erythrocytes exogenous to the subject.

4,894,348

FLUORESCEIN-CONJUGATED PROTEINS WITH ENHANCED FLUORESCENCE

Ronald Robert C., Rte. #1, Box 844, Pullman, Wash. 99163; Phuc H. Nguyen, 1735 Pine Hollow Cir., San Jose, Calif. 95133, and Gerald L. Rowley, 7150 Rainbow Dr., #20, San Jose, Calif. 95129

Filed Jul. 1, 1987, Ser. No. 69,288

Int. Cl.[4] G01N *33/533*

U.S. Cl. 436—546 **11 Claims**

1. In a method for the determination of analyte in a sample by means of a specific binding assay, said assay comprising the step of measuring the presence or amount of analyte by detecting or quantitating a fluorescent label present in one of the phases of a two-phase system, the improvement wherein said label is supplied as a compound of the formula:

$$(4\text{-Fl})\text{—NHCOCR}_2\text{XL'—Y' or}$$
$$(5\text{-Fl})\text{—NHCOCR}_2\text{XL'—Y'}$$

wherein

4-Fl and 5-Fl represent a fluoroscein residue or a substituted fluorescein residue conjugated to the adjacent NH through the 4 or 5 position of the fluorescein nucleus respectively;

each R is independently H or lower alkyl (1-4C);

X is $\text{—S—S—(CH}_2)_n\text{—}$, wherein n is 1-4;

L' is the residue of L, wherein L is a functional group capable of forming a covalent bond, L being selected from the group consisting of carboxyl, sulfhydryl, amino, halomethyl, epoxide, aldehyde, hydroxy, derivatized carboxyl and vinyl; and

Y' is the residue of Y, wherein Y is a biological ligand or a biological ligand conjugated to linker wherein the linker is capable of reactivity with L.

4,894,349

TWO STEP VAPOR-PHASE EPITAXIAL GROWTH PROCESS FOR CONTROL OF AUTODOPING

Yoshihiko Saito, Yokosuka, and Yoshiaki Matsushita, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 15, 1988, Ser. No. 284,512

Claims priority, application Japan, Dec. 18, 1987, 62-320431

Int. Cl.[4] H01L *21/20*

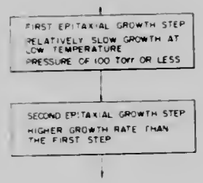
U.S. Cl. 437—95 **10 Claims**

1. A vapor-phase epitaxial growth process comprising:

(i) a step of performing a vapor-phase epitaxial growth at a temperature of 600° C. to 900° C. by using a reaction gas prepared by mixing at least one kind selected from a group consisting of SiH_xF_{4-x} (x=0 to 3) and $Si_2H_xF_{6-x}$ (x=0–5), and at least one kind selected from a group consisting of SiH_4 and Si_2H_6thereby to form a first epitaxial layer on a silicon wafer having a high impurity concentration buried layer containing arsenic (As) or boron (B) as a dopant; and

(ii) a step of performing a vapor-phase epitaxial growth at a growth rate higher than that performed in step (i) by using a reaction gas a group consisting of SiH_4 and Si_2H_6, or a

reaction gas containing at least one kind of the silane and at least one kind of silane fluoride selected from a group



consisting of SiH_xF_{4-x} (x=0 to 3) and $Si_2H_xF_{6-x}$ (x=0–6), thereby forming a second epitaxial layer on said first epitaxial layer.

4,894,350

METHOD FOR MANUFACTURING OHMIC CONTACTS HAVING LOW TRANSFER RESISTANCES

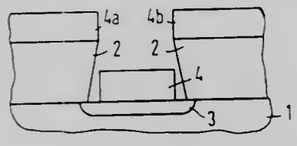
Hans P. Zwicknagl, Stuttgart; Helmut Tews, Unterhaching, and Thomas H. Hager, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,114

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3732043

Int. Cl.[4] H01L *29/46, 21/265*

U.S. Cl. 437—184 **3 Claims**



1. A method for manufacturing ohmic contacts having low transfer resistances on a semiconductor layer of a III–V semiconductor material, where the semiconductor layer is first provided with a mask layer and an implantation for producing at least one p-doped region, comprising the steps of:

(a) applying a metallization onto said semiconductor layer material implanted with said p-doping implantation, the metallization being chosen from the group consisting of: titanium, platinum, and titanium in this sequence; titanium and platinum and gold in this sequence; in this sequence; and germanium, gold, chrome, and gold in this sequence;

(b) removing said mask layer and a portion of the metallization situated thereon; and

(c) annealing said implantation and alloying in said metallization simultaneously.

4,894,351

METHOD FOR MAKING A SILICON IC WITH PLANAR DOUBLE LAYER METAL CONDUCTORS SYSTEM

Michael W. Batty, Dresher, Pa., assignor to Sprague Electric Company, North Adams, Mass.

Filed Feb. 16, 1988, Ser. No. 156,048

Int. Cl.[4] H01L *21/00, 21/02;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 437—190 **11 Claims**

1. A method for making a silicon integrated circuit with a double metal film system of conductors comprising:

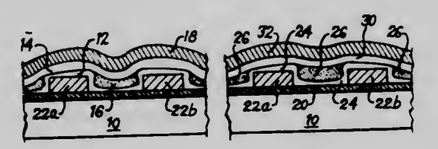
(a) forming over a side of a silicon substrate a first metal film having one and another portion separated by a gap;

(b) depositing a first blanket silicon dioxide layer over said substrate side and said first metal film so that the surface of said first layer has a depression at said gap;

(c) depositing a silica coat directly over said blanket silicon dioxide layer to be thicker at said gap than over said first metal film portions;

(d) spinning on a layer of an organic resin over said silica coat and curing said resin;

(e) using an etching process for removing at about the same



rate said resin, said silica and said silicon dioxide, etching until said resin coating is entirely removed and until at areas over which said resin layer had been thinnest prior to said etching, said silica coat is removed and the exposed regions of said first blanket silicon dioxide layer are thinned;

(f) depositing a second silicon dioxide layer, and

(g) forming over said second silicon dioxide layer a second metal film.

4,894,352

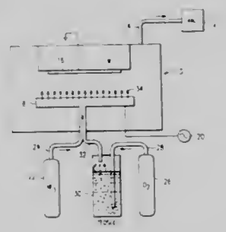
DEPOSITION OF SILICON-CONTAINING FILMS USING ORGANOSILICON COMPOUNDS AND NITROGEN TRIFLUORIDE

Andrew P. Lane, Westminster; Douglas A. Webb, Allen, and Gene R. Frederick, Mesquite, all of Tex., assignors to Texas Instruments Inc., Dallas, Tex.

Filed Oct. 26, 1988, Ser. No. 263,162

Int. Cl.[4] H01L *21/00, 21/02, 21/56, 21/425*

U.S. Cl. 437—238 **40 Claims**



1. A composition for depositing a layer of silicon-containing compound on a substrate within a low-pressure reactor, comprising:

between about four and about seventy percent by volume of an organosilicon gas compound; and

between about two percent and about seventy percent by volume of nitrogen trifluoride.

4,894,353

METHOD OF FABRICATING PASSIVATED TUNNEL OXIDE

Effiong E. Ibok, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

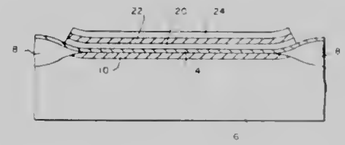
Filed Apr. 29, 1988, Ser. No. 187,738

Int. Cl.[4] H01L *21/316*

U.S. Cl. 437—239 **16 Claims**

1. A method of fabricating a high-quality oxide layer on a substrate, comprising the sequential steps of:

(a) oxidizing the substrate in an atmosphere comprising oxygen and nitrogen at a temperature greater than or equal to 950° C. and less than or equal to 1000° C.; and



(b) oxidizing the substrate in an atmosphere comprising HCl, oxygen, and argon (Ar) at a temperature greater than 1050° C., said steps (a) and (b) being conducted for times sufficient to form an oxide layer having a total thickness of less than 200 Å.

4,894,354

METHOD OF MAKING A CONVERSION CATALYST HAVING AN ANATASE VANADIUM PASSIVATING AGENT FOR TREATING A HEAVY HYDROCARBON FEEDSTOCK

Nelson P. Martinez, San Antonio de Los Altos; Jose R. Velasquez, and Juan A. Lujano, both of Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Division of Ser. No. 109,409, Oct. 19, 1987, Pat. No. 4,816,135, and a continuation-in-part of Ser. No. 864,812, May 19, 1986, Pat. No. 4,704,375. This application Oct. 28, 1988, Ser. No. 263,814

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—64 **8 Claims**

1. A method for the preparation of a cracking catalyst for use in the demetallization of hydrocarbon feeds characterized by a vanadium concentration of at least 1.0 ppm consisting essentially of: providing a matrix material with added aluminosilicate zeolite; diluting said matrix in water so as to form a slurry; preparing a vanadium passivating agent containing a stabilized anatase crystalline form of TiO_2 as TiO_2/P_2O_5, $TiO_2/SO_4^=$, TiO_2/Nb_2O_5 and mixtures thereof; and impregnating said matrix with said vanadium passivating agent.

4,894,355

FLEXIBLE, WATER-REPELLENT BAKED CARBON PLATE, ITS PRODUCTION, FUEL CELL ELECTRODE, FUEL CELL ELECTRODE PLATE AND ITS PRODUCTION AND FUEL CELL

Seiji Takeuchi, Hitachiohta; Katsuya Ebara, Mito; Tomoichi Kamo, Ibaraki; Kazuo Iwamoto, Hitachi; Tatsuo Horiba, Hitachi; Teruo Kumagai, Hitachi; Kouki Tamura, Hitachi, and Kunko Kitami, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 787,117, Oct. 15, 1985. This application Jan. 20, 1988, Ser. No. 146,192

Claims priority, application Japan, Oct. 17, 1984, 59-216229; Dec. 20, 1984, 59-269424

Int. Cl.[4] H01M *4/88;* **B05D** *5/12*

U.S. Cl. 502—101 **20 Claims**

11. A process of producing a flexible fuel cell electrode, comprising the steps of:

preparing a carbon paper comprising carbon fiber and a carbonized binder made from an organic binder;

infiltrating a suspension of polytetrafluoroethylene into the carbon paper so as to provide a carbon paper impregnated with polytetrafluoroethylene;

kneading a mixture of catalyst powder and a polytetrafluoroethylene dispersion to provide a paste catalyst;

coating the paste catalyst on the carbon paper;

baking the coated carbon paper impregnated with polytetrafluoroethylene at a temperature more than a melting point temperature of the polytetrafluoroethylene and not more than a decomposition temperature thereof; and

reducing thickness of the coated carbon paper to cut the carbon fiber so as to provide a number of cutting edges



thereof and to cause the polytetrafluoroethylene to infiltrate into the cutting edges to bind the carbon fiber having the cutting edges, thereby providing a flexible fuel cell electrode comprising a baked carbon plate and a catalyst layer thereon.

4,894,356

CATALYSTS FOR AIR-DRYING COMPOSITIONS

Christopher J. Hardiman, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 49,752, May 13, 1987, Pat. No. 4,826,923. This application Dec. 19, 1988, Ser. No. 286,412

Int. Cl.[4] B01J *31/16, 31/04*

U.S. Cl. 502—170 **3 Claims**

1. A free radical polymerization catalyst comprising a fatty acid salt of cobalt or manganese and at least one acetylacetonate of niobium, zirconium, titanium, tungsten, or aluminum, wherein said acetylacetonate has a solubility in methyl ethyl ketone, ethanol or toluene of at least about 0.1 percent by weight.

4,894,357

PROCESS FOR ADJUSTING THE STRUCTURAL AND/OR SURFACE CHARACTER OF OXIDES

Bernd Hupe, Hameln, and Robert Walter, Langenhagen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,206

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440018

Int. Cl.[4] C01B *35/158, 33/16;* **B01J** *21/06, 21/04*

U.S. Cl. 502—233 **18 Claims**

1. A process for dehydration of a water-containing, inorganic oxide gel under supercritical conditions, wherein a water-containing, inorganic oxide gel having a water content from about 30 to about 95 weight percent is produced by combining an aqueous solution of a salt selected from the group consisting of salts of magnesium, aluminum, silicon, zinc, titanium, zirconium, hafnium and mixtures thereof with an inorganic acid followed by base exchange treatment, and is dehydrated to a free water content of less than 1 percent by treatment with an extraction agent which is gaseous at standard temperature and pressure, and said treatment is carried out at a pressure above the critical pressure of the extraction agent.

2. A process according to claim 1, wherein the oxide gel is formed of material selected from the group consisting of oxides of magnesium, aluminum, silicon, zinc, titanium, zirconium, hafnium, and mixtures of one or more of the foregoing.

15. A process for dehydration of a water-containing, inorganic oxide gel under supercritical conditions, wherein an inorganic oxide gel comprising a solvent having a water content of at least 50 weight percent of the total solvent, whereby said gel comprises at least about 30 weight percent water, is produced by combining an aqueous solution of a salt selected from the group consisting of salts of magnesium, aluminum,

silicon, zinc, titanium, zirconium, hafnium and mixtures thereof with an inorganic acid followed by base exchange treatment, and is dehydration to a free water content of less than 1 percent by treatment with an extraction agent which is gaseous at standard temperature and pressure, and said treatment is carried out at a pressure above the critical pressure of the extraction agent.

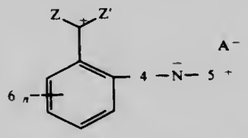
4,894,358

THERMAL IMAGING WITH YLIDE DYES

Michael P. Filosa, Medfield; Stephen R. Herchen, Duxbury, and Cheryl P. Petersen, Acton, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 31, 1988, Ser. No. 238,476
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—201 **10 Claims**

1. A heat responsive recording medium comprising a support carrying a recording layer comprising a film-forming binder and a colored dye ylide of the formula

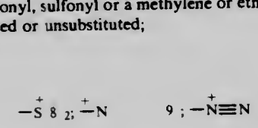


said dye compound when heated to a temperature above 100° C. cleaves at the $-\overline{N}-$ 5 $^{+}$ bond with 5 departing and with the nitrogen atom bonding to the meso carbon atom to form a 5- or 6-membered ring and rendering the compound colorless, wherein:

Z and Z' taken individually represent the moieties to complete the auxochromophoric system of a triarylmethane dye and Z and Z' when taken together represent the bridged moieties to complete the auxochromophoric system of a bridged triarylmethane dye;

4 is carbonyl, sulfonyl or a methylene or ethylene radical, substituted or unsubstituted;

5 $^{+}$ is



6 is hydrogen or a monovalent radical, n being 1, 2, 3, or 4;

8 are substituted or unsubstituted aryl groups;

9 represents the atoms to complete a heterocyclic ring or ring system, substituted or unsubstituted; and

A— is an anion.

2. A thermal imaging method which comprises heating imagewise to a temperature above at least 100° C. the heat responsive recording medium of claim 1 whereby said dye compound is rendered colorless in an imagewise pattern corresponding to said imagewise heating.

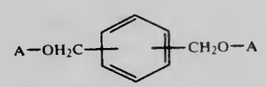
4,894,359

HEAT-SENSITIVE RECORDING PAPER

Ryuzo Ueno, Nishinomiya; Shinichi Katsura, Toyonaka; Yoshirou Uchiyama, Nishinomiya, and Satomi Inoue, Osaka, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Japan

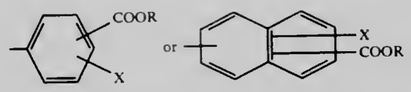
Division of Ser. No. 66,476, Jun. 26, 1987, Pat. No. 4,855,482. This application May 31, 1988, Ser. No. 200,553
Claims priority, application Japan, Feb. 7, 1986, 61-154233
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 **10 Claims**

1. A heat sensitive recording paper which contains in its heat sensitive layer a leuco dye, developer, and either of a bis(-phenoxymethyl)benzene derivative or bis(naphthoxymethyl)-benzene derivative having the general formula (I):



(I)

wherein: A represents a group ,



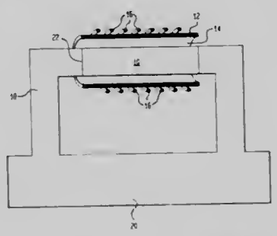
where R represents a C_1-C_4 alkyl group, a phenyl group or benzyl group, and X represents hydrogen atom or halogen atom.

4,894,360

METHOD OF USING A FERROMAGNET MATERIAL HAVING A HIGH PERMEABILITY AND SATURATION MAGNETIZATION AT LOW TEMPERATURES

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 19, 1989, Ser. No. 355,582
Int. Cl.[4] H01F *7/22*
U.S. Cl. 505—1 **8 Claims**



1. Method of using a ferromagnet material having a high permeability and saturation magnetization to induce superconducting currents in a ring of superconductive material where the ferromagnet material has a lower transition temperature than the superconductive material, said method including the steps of:

(A) placing a bar of a ferromagnet material in an annular ring of a superconductive material at a temperature above both the transition temperature of the ferromagnet material and the transition temperature of the superconductive material,

(B) applying an axial magnetic field of sufficient strength to saturate the ferromagnet when the ferromagnet is cooled below its transition temperature,

(C) cooling the ferromagnet to below its transition temperature without cooling the superconductive material so that the superconductive material does not become superconducting before the saturation of the ferromagnet,

(D) cooling the superconductive material to below its transition temperature,

(E) removing the ferromagnet and the applied field, and

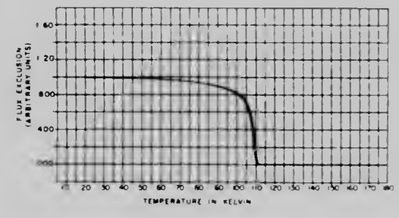
(F) allowing the system to warm to a convenient operating temperature which must be below the transition temperature of the superconductive material.

4,894,361

SUPERCONDUCTING METAL OXIDE TL-PB-CA-SR-O COMPOSITIONS AND PROCESSES FOR MANUFACTURE AND USE

Munirpallam A. Subramanian, New Castle, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 230,631, Aug. 10, 1988, abandoned. This application Aug. 24, 1988, Ser. No. 236,068
Int. Cl.[4] C01F *11/02*; C01G *3/02, 21/00*; H01L *39/12*
U.S. Cl. 505—1 **4 Claims**



1. A superconducting composition having the nominal formula

$$Tl_aPb_bCa_bSr_cCu_dO_x$$

wherein

a is from about 1/10 to 3/2,

b is from about 1 to 4,

c is from about 1 to 3

d is from about 1 to 5

e is from about 3/10 to 1

$x=(a+b+c+d+e+y)$

where

y is from about ½ to 3,

said composition having a superconducting transition temperature of at least 70 K.

4,894,362

EEL GROWTH HORMONE

Kazuo Yamaguchi, Sagamihara; Akiko Saito, Machida; Susumu Sekine, Machida; Moriyuki Sato, Machida; Seiga Itoh, Sagamihara; Kunikatsu Shirahata, Komae; Tetsuya Hirano, Tokyo, and Hiroshi Kawauchi, Iwate, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1986, Ser. No. 883,051
Claims priority, application Japan, Jul. 10, 1985, 60-151847; Jul. 22, 1985, 60-161429; Mar. 31, 1986, 61-74061
Int. Cl.[4] C07K *7/10*; A61K *37/02*
U.S. Cl. 514—12 **10 Claims**

1. An essentially pure fish growth hormone derived from *Anguilla japonica* which is a polypeptide having the following physicochemical properties:

(i) Amino acid composition: as indicated in Column A, Table 1;

(ii) The sequence of the amino acids is as follows:

H_2N—Val—Glu—Pro—Ile—Ser—Leu—Tyr—Asn—Leu—
Phe—Thr—Ser—Ala—Val—Asn—Arg—Ala—Gln—His—Leu—
His—Thr—Leu—Ala—Ala—Glu—Ile—Tyr—Lys—Glu—Phe—
Glu—Arg—Ser—Ile—Pro—Pro—Glu—Ala—His—Arg—Gln—
Leu—Ser—Lys—Thr—Ser—Pro—Leu—Ala—Gly—Cys—Tyr—
Ser—Asp—Ser—Ile—Pro—Thr—Pro—Thr—Gly—Lys—Asp—
Glu—Thr—Gln—Glu—Lys—Ser—Asp—Gly—Tyr—Leu—Leu—
Arg—Ile—Ser—Ser—Ala—Leu—Ile—Gln—Ser—Trp—Val—
Tyr—Pro—Leu—Lys—Thr—Leu—Ser—Asp—Ala—Phe—Ser—
Asn—Ser—Leu—Met—Phe—Gly—Thr—Ser—Asp—Gly—Ile—
Phe—Asp—Lys—Leu—Glu—Asp—Leu—Asn—Lys—Gly—Ile—
Asn—Glu—Leu—Met—Lys—Val—Val—Gly—Asp—Gly—Gly—
Ile—Tyr—Ile—Glu—Asp—Val—Arg—Ans—Leu—Arg—Tyr—
Glu—Asn—Phe—Asp—Val—His—Leu—Arg—Asn—Asp—Ala—
Gly—Leu—Met—Lys—Asn—Tyr—Gly—Leu—Leu—Ala—Cys—
Phe—Lys—Lys—Asp—Met—His—Lys—Val—Glu—Thr—Tyr—
Leu—Lys—Val—Thr—Lys—Cys—Arg—Arg—Phe—Val—Glu—
Ser—Asn—Cys—Thr—Leu—OH;

(iii) Molecular weight: about 23,000;

(iv) Isoelectric point: 6.3;

(v) Soluble in an alkaline aqueous solution and hardly soluble or insoluble in neutral and acidic aqueous solutions;

(vi) Classification as basic or acidic properties: acidic polypeptide;

(vii) Color and form of substance: white powder; and

(viii) Polyacrylamide gel electrophoresis: a single band.

4,894,363

DERIVATIVES OF SEROTONIN

László Mester, and Madeleine Mester nee Szadeczky-Kardoss, both of 3 Parc de Béarn, Saint-Cloud, France (92210)

Continuation of Ser. No. 944,577, Dec. 22, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 151,815
Claims priority, application France, Jul. 18, 1975, 75 22577
Int. Cl.[4] A61K *31/70*; C07H *5/06*
U.S. Cl. 514—23 **4 Claims**

1. A serotonin derivative in which at least one of the atoms of hydrogen of the primary amino group of serotonin is substituted by a 1-desoxy sugar selected from the group consisting of tagarose, ribulose, xylulose, and their water-soluble physiologically acceptable salts.

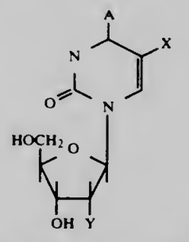
4,894,364

METHOD AND MATERIALS FOR SENSITIZING NEOPLASTIC TISSUE TO RADIATION

Sheldon B. Greer, 8320 SW 86 Ter., Miami, Fla. 33143

PCT No. PCT/US84/01735, § 371 Date Oct. 26, 1984, § 102(e) Date Jan. 1, 1901, PCT Pub. No. WO85/01871, PCT Pub. Date May 9, 1985
Continuation-in-part of Ser. No. 545,693, Oct. 26, 1983, abandoned. This PCT application Oct. 26, 1984, Ser. No. 749,540
Int. Cl.[4] A61B *19/00*; C07H *17/00*; A61K *31/70*
U.S. Cl. 514—49 **11 Claims**

1. A method of sensitizing susceptible tumor tissue to x-ray, gamma, beta, ultraviolet light, or near visible light (313 nm) radiation, said tissue having elevated levels of cytidine deaminase, deoxycytidine kinase, dCMP deaminase, or combinations thereof, which comprises administering to a patient having such tissue a radiation-sensitizing amount of a deoxycytidine compound of the formula:



wherein A is —NH_2; X is chloro; Y is hydrogen ——— is a double bond; and a systemic deamination-preventing amount of a deamination inhibitor selected from the group containing of tetrahydrouridine and 2'-deoxytetrahydrouridine.

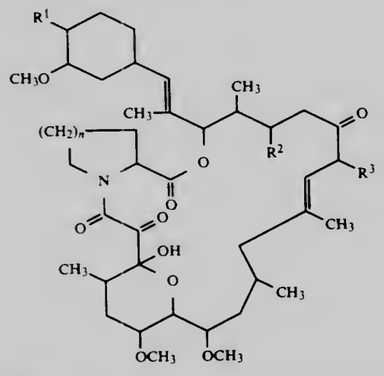
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,365
COMBINATIONS OF FU AND BVU AS ANTI-ADENOCARCINOMA AGENTS
Erik De Clercq, Leuven, Belgium, and Masaaki Iigo, Kitamoto, Japan, assignors to Stichting Rega VZW, Leuven, Belgium
Filed Feb. 11, 1988, Ser. No. 154,193
Claims priority, application Netherlands, Feb. 13, 1987, 8700366
Int. Cl.[4] A61K *31/70, 31/505*
U.S. Cl. 514—50 **6 Claims**

1. A method for treating adenocarcinomas which comprises administering to a patient an effective amount of an active ingredient for reducing adenocarcinoma tumor weight selected from the group consisting of 5-fluorouracil and N_1-(2'-tetrahydrofuryl)-5-fluorouracil, in combination with an effective amount of an ingredient for potentiating said active ingredient, said potentiating ingredient being selected from the group consisting of (E)-5-(2-bromovinyl)-uracil and (E)-5-(2-bromovinyl)-2'-deoxyuridine.

4,894,366
TRICYCLO COMPOUNDS, A PROCESS FOR THEIR PRODUCTION AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME
Masakuni Okuhara; Hirokazu Tanaka; Toshio Goto, all of Ibaraki; Tohru Kino, Tsuchiura, and Hiroshi Hatanaka, Ibaraki, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan
Filed Nov. 20, 1985, Ser. No. 799,855
Claims priority, application United Kingdom, Dec. 3, 1984, 8430455; Feb. 5, 1985, 8502869; Apr. 1, 1985, 8508420
Int. Cl.[4] A61K *31/395, 31/695;* **C07D** *498/16;* **C07F** *7/04*
U.S. Cl. 514—63 **12 Claims**

1. A compound of the formula:



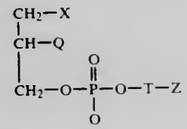
(I)

wherein
R^1 is hydroxy or pharmaceutically acceptable protected hydroxy selected from 1-(lower alkylthio)(lower)alkyloxy, tri(lower)alkylsilyloxy, lower alkyl-diphenylsilyloxy, pharmaceutically acceptable organic carboxylic acyloxy and pharmaceutically acceptable organic sulfonic acyloxy,
R^2 is hydrogen, hydroxy or lower alkanoyloxy,
R^3 is methyl, ethyl, propyl or allyl,
n is an integer of 1 or 2, and
the symbol of a line and dotted line is a single bond or a double bond, provided that when R^1 and R^2 are each hydroxy, n is an integer of 2 and the symbol of a line and dotted line is a single bond, then R^3 is methyl, propyl or allyl, and a pharmaceutically acceptable basic salt thereof.

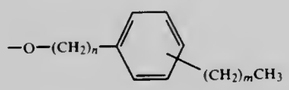
12. An immunosuppressive or antimicrobial pharmaceutical composition containing an effective amount of a compound of claim 1, as an active ingredient, in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,894,367
ANTIHYPERTENSIVE PHOSPHATE DERIVATIVES
Allan Wissner, Ardsley; Phaik E. Sum, New York, both of N.Y., and Robert E. Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.
Division of Ser. No. 679,788, Dec. 10, 1984, Pat. No. 4,762,942. This application Jul. 18, 1988, Ser. No. 194,748
Int. Cl.[4] A61K *31/685*
U.S. Cl. 514—78 **12 Claims**

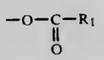
1. A method of treating hypertension in a warm-blooded animal comprising administering to said animal on effective amount of a compound, including the individual R and S enantiomers and racemic mixture, represented by the formula:



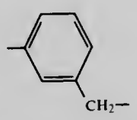
wherein: X is selected from the group consisting of
C_1–C_{24} branched or straight chain alkyl;
C_1–C_{24} branched or straight chain alkoxy;



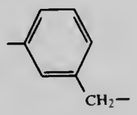
wherein n and m are integers from 0 to 25 and the sum of n and m is less than or equal to 25; substituted phenoxy, wherein the substituents are selected from the group consisting of halogen, trifluoromethyl, phenyl and substituted phenyl; Q is selected from the group consisting of:



wherein R_1 is selected from the group consisting of hydrogen, C_1–C_4 branched or straight chain alkyl, C_1–C_4 branched or straight chain alkoxy and C_1–C_4 branched or straight chain alkylamino; T is a bivalent radical selected from the group consisting of —$(CHR)_p$— and



wherein p is an integer from 1 to 15, the moiety —$(CHR)_p$— represents an alkylene chain substituted at any position with one or more C_1–C_{10} alkyl groups or phenyl groups, and the moiety

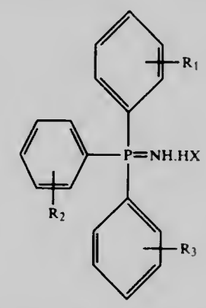


is bound with the oxygen atom attached directly to the aromatic ring; and Z is
$-N^+(R_2)_3$

wherein R_2 is hydrogen or C_1–C_4 branched or straight chain alkyl.

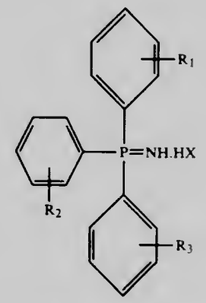
4,894,368
CERTAIN TRIPHENYLPHOSPHINIMIDE DERIVATIVES
Andrew S. Tomcufcik, Bergen; John E. Emma, Rockland; Nancy H. Endy, Orange; Joseph W. Marsico, and Howard Newman, both of Rockland, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Division of Ser. No. 888,613, Jul. 23, 1986, Pat. No. 4,767,749. This application Jun. 17, 1988, Ser. No. 207,846
Int. Cl.[4] C07F *9/02;* **A61K** *33/42*
U.S. Cl. 514—137 **5 Claims**

1. A compound selected from those of the formula:



wherein R_1, R_2 and R_3 are each at the ortho or meta position and are selected from hydrogen and alkyl(C_1–C_3); and X is an pharmaceutically acceptable acid addition salt.

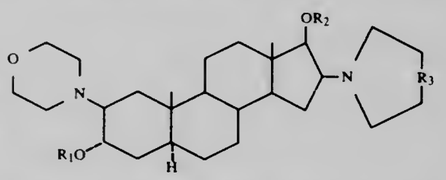
5. A pharmaceutical composition of matter in dosage unit form comprising from about 10 mg to 500 mg of a compound selected from those of the formula:



wherein R_1, R_2 and R_3 are each at the ortho or meta position and are selected from hydrogen and alkyl(C_1–C_3); and X is an pharmaceutically acceptable acid addition salt in association with a pharmaceutically acceptable carrier.

4,894,369
NOVEL 2β-MORPHOLINO-ANDROSTANE DERIVATIVES
Thomas Sleigh, Wishaw; David S. Savage, New Mearns, and Ian C. Carlyle, Hamilton, all of Scotland, assignors to Akzo N.V., Arnhem, Netherlands
Filed Apr. 13, 1988, Ser. No. 181,139
Claims priority, application United Kingdom, Apr. 14, 1987, 8708886
Int. Cl.[4] A61K *31/58;* **C07J** *71/00, 43/00*
U.S. Cl. 514—176 **6 Claims**

1. Compounds having the formula:



wherein R_1 is H or an optionally substituted acyl group having 1–12 carbon atoms,
R_2 is H or an acyl group having 1–12 carbon atoms and
R_3 is C, N—CH_3 or a direct bond, and mono- or bisquaternary ammonium compounds thereof and acid addition salts of the non- or mono-quaternary ammonium compounds.

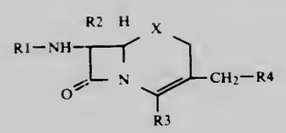
4,894,370
COMPOSITIONS HAVING FERMENTATION ANALOGS OF VIRGINIAMYCIN M_1 AS ACTIVE INGREDIENT
Yiu-kuen T. Lam, Plainsboro, N.J.; Raymond S. Chang, Lansdale, Pa.; Otto D. Hensens, Red Bank, N.J.; Cheryl D. Schwartz, Westfield, N.J., and Deborah L. Zink, Manalapan, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 934,231, Mar. 25, 1988, Pat. No. 4,762,923. This application Mar. 25, 1988, Ser. No. 173,342
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/42, 31/33*
U.S. Cl. 514—183 **9 Claims**

1. A pharmaceutical composition useful for treating gastrointestinal disorders, central nervous system disorders and regulating appetite in mammals comprising a pharmaceutically effective amount of virginiamycin M_1 and an acceptable pharmaceutical carrier.

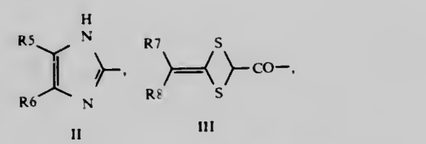
4,894,371
3-SUBSTITUTED-AMINOMETHYL CEPHALOSPORIN DERIVATIVES
Frederic H. Jung, Rilly la Montagne, France, assignor to ICI Pharma, Cergy Cedex, France
Continuation of Ser. No. 800,112, Nov. 20, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 940,161
Claims priority, application European Pat. Off., Nov. 29, 1984, 84402449.7
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] C07D *501.18;* **A61K** *31/545*
U.S. Cl. 514—202 **9 Claims**

1. A cephalosporin of the formula

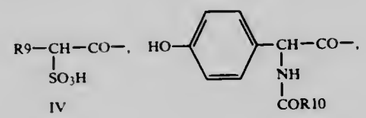
VOL 1110 ISS 3 JA 16 1990 UMI



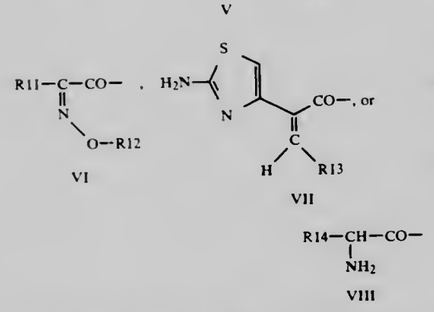
in which
X is sulphur or sulphinyl (R or S configuration);
—R1 is of the formula



II III

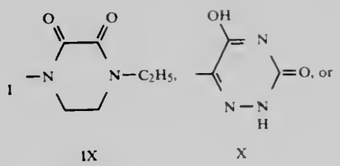


IV V

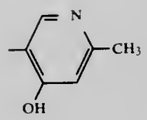


VI VII

VIII

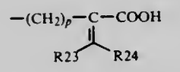


IX X



XI

R11 is 2-aminothiazol-4-yl or 2-aminooxazol-4-yl each optionally substituted in the 5-position by fluorine, chlorine or bromine, or R11 is 5-aminoisothiazol-3-yl, 5-amino-1,2,4-thiadiazol-3-yl, 3-amino-pyrazol-5-yl, 3-aminopyrazol-4-yl, 2-aminopyrimidin-5-yl, 2-aminopyrid-6-yl, 4-aminopyrimidin-2-yl, 2-amino-i,3,4-thiadiazol-5-yl or 5-amino-1-methyl-1,2,4-triazol-3-yl;
R12 is hydrogen, (1–6C)alkyl, (3–8C)cycloalkyl, (1–3C)alkyl(-3–6C)cycloalkyl, (3–6C)cycloalkyl-(1–3C)alkyl, (3–6C) alkenyl, (5–8C)cycloalkenyl, (3–6C)alkynyl, (2–5C)alkylcarbamoyl, phenylcarbamoyl, benzylcarbamoyl, triphenylmethyl, (1–3C)haloalkyl, (2–6C)hydroxyalkyl, (1–4C)alkoxy(2–4C)alkyl, (1–4C)alkylthio(2–4C) alkyl, (1–4C(alkanesulphinyl-(1–4C)alkyl, (1–4C)alkanesulphonyl(1–4C)alkyl, (2–6C)aminoalkyl, (1–4C)alkylamino(2–6C)alkyl, (2–8C-)dialkylamino(2–6C) alkyl, (1–5C)cyanoalkyl, (1–4C-)azidoalkyl, (2–5C)ureidoalkyl, 3-amino-3-carboxypropyl, 2-(amidinothio)ethyl, 2-(N-aminoamidinothio)ethyl, tetrahydropyran-2-yl, thietan-3-yl or 2-oxotetrahydrofuran-3-yl,
or —R12 is of the formula —$(CH_2)_N$—R15 in which n is 1 to 4 and R15 is piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazino, each value of R15 being optionally substituted by (1–4C)alkyl, phenyl or benzyl,
or —R12 is of the formula —$(CH_2)_m$—W—R16 in which m is 0 to 3, W is sulphur or a direct bond, and R16 is phenyl or pyridinio(1–4C)alkylene or R16 is pyridyl, imidazolyl, 1,3,4-thiadiazolyl tetrazolyl, 1-(1–4C)-alkyltetrazolyl thiazolyl, isothiazolyl or isoxazolyl in which the link with W is via a carbon or uncharged nitrogen, each value of R16 being optionally substituted, where possible, by one or two groups selected from (1–4C) alkyl, amino, hydroxy, carboxy, carbamoyl, nitro, (2–5C)alkoxycarbonyl, cyano and sulpho,
or —R12 is of the formula —$(CH_2)_n$—CO—R17 in which n is 1 to 4 and R17 is (1–4C)alkyl, phenyl or benzyl,
or —R12 is of the formula —COR18 or —$(CH_2)_N$—OCO—R18 in which n is 1–4 and R18 is hydrogen, (1–4C)alkyl, (1–4C)haloalkyl, phenyl or benzyl,
or —R12 is of the formula —G—CH_2—R19 in which G is carbonyl or a direct bond and R19 is phthalimido,
or —R12 is of the formula

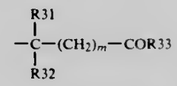


XII

in which p is 1 or 2 and R23 and R24 are hydrogen or (1–4C)alkyl,
or —R12 is of the formula —P(O)R25R26 in which R25 is hydroxy, (1–4C)alkoxy, (2–8C)dialkylamino, phenoxy phenylamino or one of the values given above for R15, and R26 is (1–4C)alkyl, (1–4C)alkoxy, (2–8C)dialkylamino, phenoxy, phenylamino, piperidinyl, pyrrolidinyl, morpholinyl, piperazinyl or N-methyl-piperazinyl,

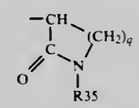
in which R5 and R6, same or different, are hydrogen, halogen, cyano, hydroxy, carboxy, pyridyl, (1–6C)alkyl, (1–6C-)aminoalkyl, (1–6C)hydroxyalkyl, (2–6C)alkoxycarbonyl, (2–10C)alkylaminoalkyl, (3–15C)dialkylaminoalkyl, or phenyl optionally substituted by 1 or 2 radicals selected from halogen, nitro, amino, hydroxy, carboxy, cyano, (1–6C)alkyl and (2–6C)alkoxycarbonyl;
R7 is carboxy, (2–6C)alkoxycarbonyl, benzyloxycarbonyl, carbamoyl, (2–6C)alkylcarbamoyl, (3–8C)dialkylcarbamoyl, carbazoyl, cyano or (2–6C)alkoxycarbonylamino;
R8 is hydrogen, (1–4C)alkyl, (1–4C)alkoxy, (2–5C)alkanoyl, (1–4C)alkylthio, (1–4C)-alkanesulphinyl, (1–4C)alkanesulphonyl, phenyl, benzoyl, carboxy, (2–6C)alkoxycarbonyl, benzyloxycarbonyl, carbamoyl, carbazolyl, cyano, (2–5C-)alkenyl, sulphamoyl, (1–4C)hydroxyalkyl, (2–4C)carboxyalkyl, benzyl, hydroxyphenyl, [(1–4C)alkoxy]phenyl, pyridyl or (methylthio)thiadiazolyl, the point of attachment of said pyridyl or (methylthio)thiadiazolyl being a carbon atom;
R9 is hydrogen, (1–6C)alkyl or phenyl;
R10 is of the formula

or —R12 is of the formula —$CH_2P(O)R27R28$ in which R27 and R28 are hydroxy or (1–4C)alkoxy,
or —R12 is of the formula —CH(SR29)COOR30 in which R29 is (1–4C)alkyl and R30 is hydrogen or (1–6C)alkyl,
or —R12 is of the formula



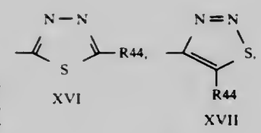
XIII

in which m is 0–3, R31 is hydrogen, (1–3C)alkyl or methylthio, R32 is hydrogen, (1–3C)alkyl, (3–7C) cycloalkyl, cyano, carboxy, (2–5C)carboxyalkyl or methanesulphonylamino, or phenyl optionally substituted by amino or hydroxy, or R31 and R32 are joined to form, together with the carbon to which they are attached, a (3–7C)carbocyclic ring and R33 is hydroxy, amino, (1–4C)alkoxy, (1–4C)alkylamino, phenylamino or of the formula R15 given above or of the formula NHOR34 in which R34 is hydrogen, (1–4C)alkyl, phenyl or benzyl,
or —R12 is of the formula

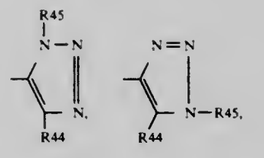


XIV

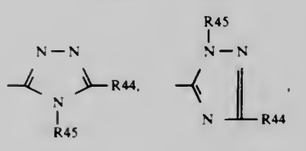
in which q is 2 or 3 and R35 is hydrogen or (1–6C)alkyl,
provided that when R12 contains phenyl, and unless otherwise stated, the phenyl is optionally substituted by 1 or 2 groups selected from halogen, hydroxy, amino, carboxy, nitro, carbamoyl, cyano and aminomethyl;
R13 is hydrogen or of the formula R39-Y- in which Y is a direct bond or of the formula $S(O)_p$ in which p is 1 or 2 and R39 is (1–6C)alkyl or (3–8C)cycloalkyl each optionally substituted by (1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkylthio, (1–6C)alkylamino, (2–8C)dialkylamino, (2–6C)alkoxycarbonyl or phenyl, the phenyl itself being optionally substituted by halogen, (1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkylthio, (1–6C)alkylamino, (2–8C)dialkylamino or (2–6C)alkoxycarbonyl,
or R39 is phenyl optionally substituted by one to four substituents selected from halogen, (1–6C)alkyl, hydroxy, trifluoromethyl, nitro, cyano, (1–6C)alkoxy, (1–6C)alkylthio, carboxy, (2–6C)alkoxycarbonyl, carbamoyloxy and sulpho,
or R39 is a monocyclic or bicyclic heterocyclic aromatic ring system selected from thiophene, furan, imidazole, thiazole, pyridine, pyrimidine, benzthiophene or benzfuran, said heterocyclic system being optionally substituted by halogen, (1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkylthio, (1–6C)alkylamino, (2–8C)dialkylamino or (2–6C)alkoxycarbonyl,
and when Y is of the formula $S(O)_p$ R39 may also be hydroxy,
or R13 is halogen, cyano, carbamoyl, (1–6C) alkylthio or (1–6C) alkoxycarboimidoyl,
or —R13 is of the formula —Z—R40 in which Z is oxygen or sulphur and R40 is hydrogen or (1–6C)alkyl or (2–6C)alkenyl each of which is optionally substituted by one or two substituents selected from hydroxy, cyano, carbamoyl and COOR41 in which R41 is hydrogen, (1–6C)alkyl, acetoxymethyl, t-butyl, diphenylmethyl, p-methoxybenzyl, p-nitrobenzyl, triphenylmethyl or tri(1–4C)alkylsilyl;
R14 is phenyl, benzthienyl or naphthyl, each optionally substituted on a benzene ring by halogen, hydroxy, nitro, amino, methylenedioxy, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkanoylamino or (1–4C)alkyl-sulphonylamino, or R14 is furyl, thienyl or cyclohexa-1,2,4,5-dienyl;
R2 is hydrogen, methoxy or formylamino;
R3 is carboxy or a biodegradeable ester thereof;
R4 is of the formula —NR42R43 in which
R42 is hydrogen, (1–4C)alkyl or benzyl;
—R43 is a non-positively charged heterocycle of the formula



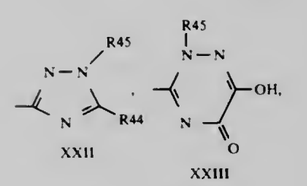
XVI XVII



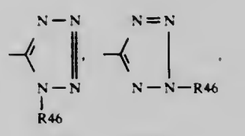
XVIII XIX



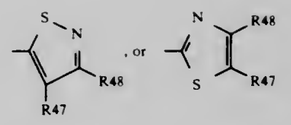
XX XXI



XXII XXIII



XXIV XXV



XXVI XXVII

in which R44 and R45 are selected from hydrogen and (1–6C)alkyl;
R46 is hydrogen, (1–6C)alkyl, (2–6C)carboxyalkyl, (1–6C)sulphoalkyl, (2–6C)aminoalkyl, (1–4C)alkylamino-(2–6C)alkyl, (2–8C)dialkylamino(1–6C)alkyl, (2–6C)hydroxyalkyl or (1–6C)sulphoaminoalkyl;
R47 and R48 are selected from hydrogen, cyano, (1–6C)alkyl, hydroxy, carboxy and (2–6C)carboxyalkyl, provided that at least one of R47 and R48 is hydroxy, carboxy or carboxyalkyl;
and the pharmaceutically-acceptable base addition salts thereof.

4,894,372

PYRIDINE COMPOUNDS WHICH HAVE USEFUL HISTAMINE-H_2 ANTAGONIST ACTIVITY

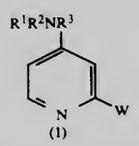
David G. Cooper, Letchworth, and George S. Sach, Welwyn, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 793,510, Oct. 31, 1985, Pat. No. 4,758,576, which is a division of Ser. No. 473,520, Mar. 9, 1983, Pat. No. 4,574,126. This application Apr. 19, 1988, Ser. No. 183,567

Int. Cl.[4] A61K *31/55, 31/44;* **C07D** *213/53, 401/12*

U.S. Cl. 514—212 **9 Claims**

1. A compound of formula (1):



(1)

or a pharmaceutically acceptable salt thereof, where

R^1 and R^2 are the same or different and are C_{1-6}alkyl or with the nitrogen atom to which they are attached form a pyrrolidino or piperidino group;

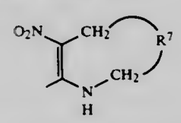
R^3 is C_{1-4} alkylene;

W is a group $—XYCH_2CH_2NHR^4$ in which

Y is methylene or sulphur;

X is methylene or oxygen, provided that it is methylene when Y is sulphur,

and R^4 is a group of formula (3):



where R^7 is a covalent bond or methylene or ethane-1, 2-diyl unsubstituted or substituted with one C_{1-6} alkyl group or a second C_{1-6} alkyl group or a phenyl (C_{1-6} alkyl) group.

4,894,373

ANTIESTROGENS AND THEIR USE IN TREATMENT OF MENOPAUSE AND OSTEOPOROSIS

Ronald L. Young, Houston, Tex., assignor to BCM Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 660,510, Oct. 12, 1984, Pat. No. 4,729,999. This application Jan. 12, 1988, Ser. No. 143,081

Int. Cl.[4] A61K *31/535, 31/445, 31/40, 31/19*

U.S. Cl. 514—239.2 **15 Claims**

1. A method of treating and preventing bone tissue loss or osteoporosis in a patient, comprising administering a true antiestrogen selected from the group consisting of clomiphene, an isomer of clomiphene, a citrate of clomiphene, a derivative of clomiphene, tamoxifen, nafoxidine, CI-680, CI-628, CN-55,956-27, MER-25, U-11,555A, U-11,100A, ICI-46,669, ICI-46,474, diphenolhydrochrysene, erythro-MEA, Parke Davis CN-35,945, allenolic acid, cyclofenil, ethamoxytriphetol, and triparanol to said patient, without concomitant estrogen administration.

4,894,374

SUBSTITUTED 1,2-DIHYDRO-4H-3,1-BENZOXAZIN-4-ONE DERIVATIVES INHIBITORS OF INTERLEUKIN 1

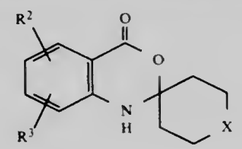
Jerauld S. Skotnicki, Chadds Ford, and Ahmed F. Abdel-Magid, Drexel Hill, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 17, 1988, Ser. No. 233,186

Int. Cl.[4] H61K *31/535;* **C07D** *498/10*

U.S. Cl. 514—230.5 **3 Claims**

1. A method of treating immunoinflammatory, inflammatory/proliferative and enzymatic tissue destruction conditions which comprises administering to a mammal so afflicted an effective amount of a compound having the formula:



wherein

X is CHR, NR, S or O;

R is hydrogen, lower alkyl, lower alkenyl, or unsubstituted or substituted phenyl, naphthyl, pyridyl, quinolinyl, pyrazinyl, pyrimidinyl, quinoxalinyl or quinazolinyl, wherein the substituents are selected from halo, carboxy, lower alkoxycarbonyl, lower alkylsulfonyl, cyano, nitro and trifluoromethyl; and

R^2 and R^3 are each, independently, hydrogen, halo, lower alkyl, lower alkenyl, lower alkoxy, hydroxy, amino, mono- or diloweralkylamino, carboxy, lower alkoxycarbonyl, nitro or cyano.

4,894,375

METHOD OF CONTROLLING MYCOTIC INFECTIONS AND COMPOSITIONS THEREFOR

Hans H. Gadebusch, Yardley, Pa., and Mary E. Valiant, Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 913,044, Sep. 29, 1986, Pat. No. 4,782,059. This application Nov. 1, 1988, Ser. No. 265,449

Int. Cl.[4] A61K *31/50, 31/495, 31/135*

U.S. Cl. 514—249 **8 Claims**

1. A fungicidal composition in unit dosage form suitable for treating mycotic infections comprising a mycotic infection controlling amount in combination of:

(1) from about 200 to 400 milligrams of a compound having 14α-methyldemethylase inhibitor activity and named cis-1-acetyl-4-[4-[[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-ylmethyl)-1,3-dioxolan-4-yl]methoxy]phenyl]piperazine (ketoconazole), and

(2) from about 200 to 400 milligrams of a compound having squalene epoxidase inhibitor activity and named (E)-N-(6,6-dimethyl-2-hepten-4-ynyl-N-methyl-naphthalenemethylamine (terbinafine).

4,894,376

METHODS OF TREATING DISEASES CHARACTERIZED BY HYPEREXCITABILITY OF NEURONS

Martin Morad, Newtown Square, and Cha-Min Tang, Overbrook Hills, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

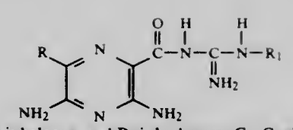
Filed Feb. 26, 1988, Ser. No. 160,835

Int. Cl.[4] A61K *31/495;* **C07D** *241/20*

U.S. Cl. 514—255 **58 Claims**

1. A method of regulating the excitability of neurons in a mammal comprising:

administering to said mammal a substituted pyrazinoylguanidine having the formula



wherein R is halogen; and R_1 is hydrogen, C_1–C_4 alkyl, benzyl or substituted benzyl; said substituted pyrazinoylguanidine being administered to said mammal in an amount sufficient to effect said regulation.

4,894,377

β-CARBOLINES AND THEIR USE AS MEDICINAL AGENTS

Dieter Seidelmann; Ralph Schmiechen; Andreas Huth; Dieter Rahtz, all of Berlin, Fed. Rep. of Germany; Claus T. Braestrup, Roskilde, and Mogens Engelstoft, Vaerlose, both of Denmark, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

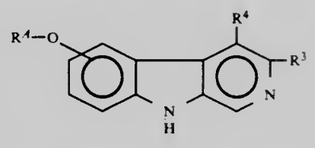
Continuation of Ser. No. 623,610, Jun. 22, 1984, abandoned. This application Jan. 14, 1987, Ser. No. 3,179

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322895

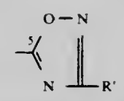
Int. Cl.[4] C07D *471/14;* **A61K** *31/40*

U.S. Cl. 514—292 **25 Claims**

1. A substituted β-carboline of the formula



wherein R^3 is a 5- oxadiazolyl group of the formula

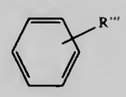


or —COOR", wherein R' is C_{1-3} alkyl or C_{3-6} cycloalkyl and

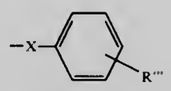
R" is C_{1-4} alkyl;

R^4 is hydrogen, methyl, ethyl or methoxymethyl; and

R^A is aryl of the formula



or aralkyl of the formula



wherein X is C_{1-12} is straight-chain, branched-chain, saturated or unsaturated alkyl or a corresponding alkyl group with a CH_2-group substituted by a carbonyl group and R"' is one or more of fluorine, chlorine, bromine, or iodine, C_{1-3} alkoxy, C_{1-5} alkanoyloxy, benzoyloxy, phenyl, C_{2-5} alkylenedioxy, trifluoromethyl, nitro or $—NR^{IV}R^{V}$ wherein R^{IV} and R^{V}, which can be the same or different, are hydrogen, C_{1-3} alkyl, C_{1-5} alkanoyl, benzoyl or phenyl, or collectively with the nitrogen atom form an ethyleneimino, 2'-methyl pyrrolidino, piperidino, morpholino, thiomorpholino or N-methyl-piperazino ring.

4,894,378

LOWERING BLOOD SUGAR WITH NOVEL 4-THIENYL-DIHYDROPYRIDINES

Siegfried Goldmann; Hilmar Bischoff; Walter Puls; Joachim Bender, all of Wuppertal; Dieter Petzinna, Wesel, and Klaus Schlossmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 937,870, Dec. 4, 1986, Pat. No. 4,801,715. This application Jan. 22, 1988, Ser. No. 210,061

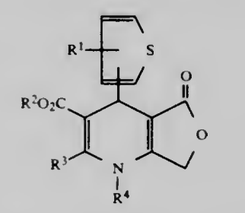
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544693

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/44;* **C07D** *491/048*

U.S. Cl. 514—302 **7 Claims**

1. A 4-thienyl-dihydropyridine of the formula



in which

R^1 represents fluorine or chlorine, or represents straight-chain or branched alkyl with up to 4 carbon atoms,

R^2 represents a straight-chain, branched or cyclic hydrocarbon radical which has up to 8 carbon atoms, is optionally interrupted by an oxygen atom and is optionally substituted by one or more fluorine, chlorine, phenyl, hydroxyl, cyano, amino, C_1–C_3-alkylamino, di-C_1–C_3-alkylamino or N-benzyl-N-methyl-amino groups,

R^3 represents C_1–C_4-alkyl which is optionally substituted by hydroxyl and

R^4 represents methyl or straight-chain, branched or cyclic alkyl radical with 3 to 6 carbon atoms,

or a physiologically acceptable salt thereof.

4,894,379

FUNGICIDAL PYRIDYL IMIDATES

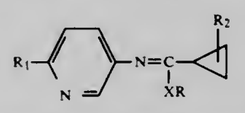
Don R. Baker, Orinda, and Keith H. Brownell, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 36,543, Apr. 15, 1987, Pat. No. 4,767,771, which is a continuation-in-part of Ser. No. 944,170, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 859,153, May 2, 1986, abandoned. This application May 26, 1988, Ser. No. 198,906

Int. Cl.[4] C07D *401/12, 405/12;* **A01N** *43/40*

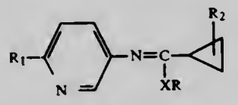
U.S. Cl. 514—332 **5 Claims**

1. A compound having the structural formula



wherein R is furfuryl or pyridyl, R_1 is selected from the group consisting of halogen, C_1–C_3 alkoxy and C_1–C_3 haloalkoxy, R_2 is hydrogen, and X is S or O; or a fungicidally acceptable organic or inorganic salt thereof.

4. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein R is furfuryl or pyridyl,

R_1 is selected from the group consisting of halogen, C_1–C_3 alkoxy and C_1–C_3 haloalkoxy, R_2 is hydrogen, and X is S or O; or a fungicidally acceptable organic or inorganic salt thereof.

4,894,380

2-MERCAPTO-5-PYRIDYL-1,3,4-OXADIAZOLES AND 2-MERCAPTO-5-PYRIDYL-1,3,4-THIADIAZOLES OF THE FORMULA I

Robert Nyfeler, Basel, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany; Ernst Beriger, Allschwil, and Odd Kristiansen, Möhlin, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

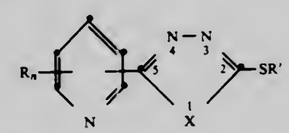
Filed Mar. 25, 1988, Ser. No. 176,483

Claims priority, application Switzerland, Apr. 3, 1987, 1293/87

Int. Cl.[4] **C07D** *413/04;* **A61K** *31/41*

U.S. Cl. 514—340 **24 Claims**

1. A 2-mercapto-5-pyridyl-1,3,4-oxadiazole or 2-mercapto-5-pyridyl-1,3,4-thiadiazole of the formula (I)



wherein

X is oxygen or sulfur,

R' is C_1–C_3alkyl which is substituted by bromine, fluorine, C_1–C_3alkoxy or cyano; unsubstituted or halogen-substituted C_3–C_7alkenyl; halogen-substituted C_4–C_7alkynyl,

R is C_1–C_3alkyl; or halo-C_1–C_3alkyl unsubstituted C_1–C_3alkoxy or C_1–C_3alkoxy which is substituted by halogen or C_1–C_3alkoxy; unsubstituted or halogen-substituted C_3–C_7alkenyl; C_3–C_7alkynyl, C_1–C_3alkylthio; halogen; cyano; hydroxy, amino or amino which is substituted by one or two C_1–C_3alkyl groups; or is aminocarbonyl; and

n is 0, 1, 2, 3 or 4,

or a salt thereof.

4,894,381

MICROBICIDAL (AZOLYL-VINYL)-PHENOL ALKENYL ETHERS

Gerold Schade, Cologne; Wilhelm Brandes, Leichlingen, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

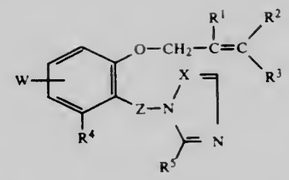
Filed Jun. 9, 1988, Ser. No. 204,471

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721336; Apr. 15, 1988, 3812483

Int. Cl.[4] **A01N** *43/653, 43, 50;* **C07D** *233/60*

U.S. Cl. 514—383 **7 Claims**

1. An (azolyl-vinyl)-phenol alkenyl ether, or acid or metal salt addition product thereof, of the formula



in which

R^1 represents hydrogen, fluorine, chlorine, bromine or alkyl with 1 to 4 carbon atoms,

R^2 represents hydrogen, fluorine, chlorine, bromine, alkyl with 1 to 4 carbon atoms, or alkenyl with 2 to 4 carbon atoms optionally substituted by optionally substituted aryl, or represents phenyl which is optionally substituted by one to three identical or different substituents from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and/or halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, or

R^1 and R^2 together represent a C—C bond, thus forming an alkine bond between the carbon atoms which carry the,

R^3 represents hydrogen, fluorine, chlorine, bromine, iodine or alkyl with 1 to 12 carbon atoms, or represents phenyl which is optionally substituted by one to three identical or different substituents from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and/or halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms,

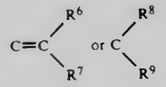
R^4 represents hydrogen,

R^5 represents hydrogen or alkyl with 1 to 4 carbon atoms,

W represents hydrogen, fluorine, chlorine or bromine,

X represents nitrogen or a CH group and

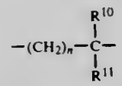
Z represents the groupings



wherein

R^6 represents phenyl which is optionally substituted by one to three identical or different substituents from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and/or halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, or

R^6, together with R^4, represents the grouping



R^7 represents hydrogen or alkyl with 1 to 4 carbon atoms,

R^8 represents hydrogen or alkyl with 1 to 4 carbon atoms,

R^9 represents hydrogen or alkyl with 1 to 4 carbon atoms,

R^{10} represents hydrogen or alkyl with 1 to 4 carbon atoms,

R^{11} represents hydrogen or alkyl with 1 to 4 carbon atoms and

n represents the number 0, 1 or 2.

6. A method of combating microbes which comprises applying to such microbes or to a locus from which it is desired to exclude such microbes a microbicidally effective amount of a compound or addition product thereof according to claim 1.

4,894,382

SUBSTITUTED 1,3-DIAZOLYL-2-PROPANOLS AND THEIR USE AS ANTIMYCOTIC AGENTS

Hans-Ludwig Elbe; Graham Holmwood; Erik Regel, all of Wuppertal; Karl H. Büchel, Burscheid; Klaus Schaller, Wuppertal, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

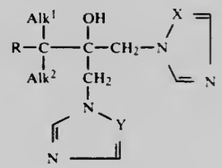
Continuation of Ser. No. 578,237, Feb. 8, 1984, abandoned. This application Oct. 29, 1986, Ser. No. 924,658

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307217

Int. Cl.[4] **A61K** *31/415, 31/41;* **C07D** *249/08, 403/06*

U.S. Cl. 514—383 **16 Claims**

1. A substituted 1,3,-diazolyl-2-propanol of the formula



in which

Alk^1 represents straight-chain or branched alkyl with 1 to 4 carbon atoms; and

Alk^2 represents straight-chain or branched alkyl with 1 to 4 carbon atoms; or

Alk^1 and Alk^2 together represent a 3-membered to 7-membered cycloaliphatic ring,

X represents a nitrogen atom or the CH group;

Y represents a nitrogen atom or the CH group; and

R represents phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl part, phenoxy, phenylthio, phenoxyalkyl with 1 to 4 carbon atoms in the alkyl part, phenylthioalkyl with 1 to 4 carbon atoms in the alkyl part, benzyloxy or benzylthio, each of which is optionally mono-, di- or tri-substituted in the phenyl part by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 to 4 carbon atoms, halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, nitro, cyano, hydroxyl, hydroxycarbonyl, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part, hydroximinoalkyl with 1 to 4 carbon atoms in the alkyl part, alkoximinoalkyl with 1 to 4 carbon atoms in each alkyl part, and phenyl, phenoxy, benzyl and benzyloxy, each of which is optionally substituted by halogen and/or alkyl with 1 or 2 carbon atoms,

or a physiologically acceptable acid addition salt thereof.

4,894,383

FUNGICIDAL HYDROXYALKYL-TRIAZOLYL DERIVATIVES

Graham Holmwood, Wuppertal; Udo Kraatz, Leverkusen; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

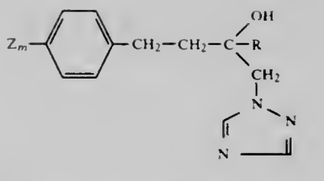
Filed May 5, 1988, Ser. No. 190,733

Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716559

Int. Cl.[4] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **9 Claims**

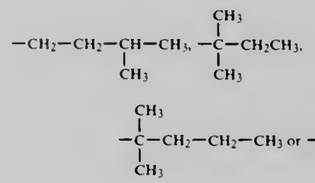
1. A hydroxyalkyl-triazolyl derivative of the formula

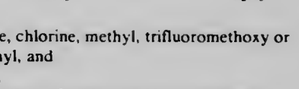


in which

R represents a radical of the formula $-CH_2-CH(CH_3)_2$,

$-(CH_2)_4-CH_3$, $-(CH_2)_5-CH_3$, $-(CH_2)_6-CH_3$,





Z represents fluorine, chlorine, methyl, trifluoromethoxy or methoximinomethyl, and

m represents 0 or 1,

or an addition product thereof with an acid or metal salt.

4,894,384

ALPHA-(1-TRIAZOLYL)-KETO-DERIVATIVES HAVING FUNGICIDAL ACTIVITY

Mirella Cecere; Franco Gozzo; Antonio Malandra, and Luigi Mirenna, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

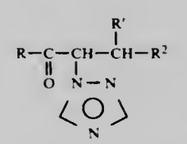
Continuation-in-part of Ser. No. 913,314, Sep. 30, 1986, abandoned, which is a continuation of Ser. No. 556,336, Nov. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 500,360, Jun. 2, 1983, abandoned. This application Feb. 29, 1988, Ser. No. 165,382

Claims priority, application Italy, Jun. 3, 1982, 21665 A/82; Dec. 30, 1982, 25048 A/82

Int. Cl.[4] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **4 Claims**

1. A compound of formula



in which:

R is selected from the group consisting of phenyl, phenyl substituted by at least one group selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, and halogen atoms;

R' is selected from the group consisting of phenyl, C_1–C_4 alkyl, —COOR substituted by C_1–C_4 alkyl; and

R^2 is a phenyl carbonyl group, a phenyl carbonyl group in which the phenyl is substituted by at least one substituent selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy and halogen atoms.

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4,894,385

IMIDAZOLE DERIVATIVES AS INHIBITORS OF TXA_2 SYNTHESIS

Isao Kawamoto; Rokuro Endo; Keiichi Matsuda; Shigeru Ushiyama, and Takeshi Oshima, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

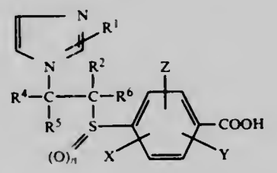
Filed Jan. 14, 1986, Ser. No. 818,873

Claims priority, application Japan, Jan. 16, 1985, 60-4055

Int. Cl.[4] A61K *31/415;* **C07D** *405/06, 409/06*

U.S. Cl. 514—397 **34 Claims**

28. A method for the treatment or prophylaxis of diseases and disorders arising from an imbalance in the level of TXA_2 in an animal, which comprises administering to said animal an effective amount of an inhibitor of the synthesis of TXA_2, wherein said inhibitor is selected from the group consisting of compounds of formula (I):



(I)

wherein:

R^1 represents a hydrogen atom or a methyl group;

R^2 represents a hydrogen atom, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, a C_2–C_6 alkynyl group, a C_3–C_8 cycloalkyl group, a C_3–C_8 cycloalkyl group having at least one substituent selected from C_1–C_6 alkyl groups, an aryl group, a heterocyclic group or a carboxy group, or one of said alkyl, alkenyl and alkynyl groups having at least one substituent selected from the group consisting of: (a) C_1–C_4 alkoxy groups, C_1–C_6 alkanoyloxy groups, C_1–C_6 alkanoyl groups, carboxy groups, C_2–C_7 alkoxycarbonyl groups, C_2–C_7 alkoxycarbonyloxy groups, carbamoyloxy groups, alkylcarbamoyloxy groups in which the alkyl part is C_1–C_4 alkyl, dialkylcarbamoyloxy groups in which each alkyl part is C_1–C_4 alkyl, carbamoyl groups, alkylcarbamoyl groups in which the alkyl part is C_1–C_4 alkyl, dialkylcarbamoyl groups in which each alkyl part is C_1–C_4 alkyl, hydroxy groups, carboxylic acylamino groups, C_1–C_6 alkylthio groups, nitro groups, cyano groups, amino groups, C_1–C_6 haloalkyl groups, halogen atoms, C_1–C_6 alkylsulfinyl groups, C_1–C_6 alkylsulfonyl groups, aryl groups, heterocyclic groups C_3–C_8 cycloalkyl groups, and C_3–C_8 cycloalkyl groups having at least one substituent selected from C_1–C_6 alkyl groups;

R^4 represents a hydrogen atom, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, a C_2–C_6 alkynyl group, an aryl group or an aromatic heterocyclic group, or said alkyl, alkenyl or alkynyl group having at least one substituent selected from the group consisting of:

C_1–C_6 alkoxy groups, C_1–C_6 haloalkyl groups, halogen atoms, aryl groups and aromatic heterocyclic groups;

R^5 and R^6 are independently selected from the group consisting of hydrogen atoms, C_1–C_6 alkyl groups, C_2–C_6 alkenyl groups and C_2–C_6 alkynyl groups;

X, Y and Z are independently selected from the group consisting of hydrogen atoms, C_1–C_6 alkyl groups, C_1–C_6 alkoxy groups, C_1–C_6 alkanoyloxy groups, hydroxy groups, C_1–C_6 alkylthio groups, cyano groups, amino groups, halogen atoms, C_1–C_6 alkylsulfinyl groups and C_1–C_6 alkylsulfonyl groups;

n is 0, 1 or 2

said aryl groups are C_6–C_{14} carbocyclic aryl groups which are unsubstituted or have at least one substituent selected from the group consisting of C_1–C_6 alkyl groups and substituents (a) other than said aryl groups; and

said aromatic heterocyclic groups are selected from the group consisting of

2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-thiazolyl, 4-thiazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrazinyl, 2-pyrrolyl, 1-methyl-2-pyrrolyl, 1-imidazolyl, 1,2,4-triazol-1-yl and 2-pyrimidyl;

said heterocyclic groups are selected from the group consisting of

2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-thiazoyl, 4-thiazolyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrazinyl, 2-pyrrolyl, 1-methyl-2-pyrrolyl, 1-imidazolyl, 1,2,4-triazol-1-yl and 2-pyrimidyl; and 2-tetrahydrofuryl, 2-tetrahydropyranyl, 2-pyrrolidinyl, 1-pyrrolidinyl, piperidino, 2-piperidiyl, 3-piperidyl, 4-piperidyl, 4-thiazolidinyl, 1-piperazinyl, 4-acetyl-1-piperazinyl, 4-formyl-1-piperazinyl, morpholino and thiomorpholino;

said heterocyclic groups and said aromatic heterocyclic groups being unsubstituted or having at least one substituent selected from the group consisting of C_1–C_6 alkyl groups and substituents (a) other than said heterocyclic groups;

provided that when both R^2 and R^6 are individually selected from the group consisting of hydrogen and alkyl, then at least one of R^4 and R^5 is not selected from the group consisting of hydrogen, unsubstituted alkyl and unsubstituted alkenyl;

or a pharmaceutically acceptable ester, amide or salt thereof.

4,894,386

ALIPHATIC CARBOXAMIDES

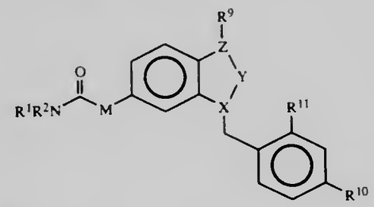
Frederick J. Brown, Crewe, England, and Victor G. Matassa, Chadds Ford, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 181,455, Apr. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 103,490, Oct. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 38,853, Apr. 15, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 255,914

Int. Cl.[4] C07D *209/22, 209, 24;* **A61K** *31/405*

U.S. Cl. 514—414 **14 Claims**

1. A compound of formula I



1

wherein:

the group >Z—Y—X< is selected from a group consisting of:

(a) >C═CH—< and

(b) >N—CH═C<;

in which ">" indicates two separate bonds;

the groups R^1 and R^2 are each selected from the following groups:

(a) R^1 is hydrogen or (1-3C)alkyl and R^2 is selected from a group consisting of (1-10C)alkyl which may contain 1 or 2 double or triple bonds, (1-10C)heteroalkyl containing an oxygen or sulfur atom, (3-7C)cycloalkyl which may be substituted by 1 or 2 (1-3C)alkyl groups, (3-7C)cycloalkyl(1-4C)alkyl which may be substituted on the cycloalkyl portion 1 or 2 (1-3C)alkyl groups, phenyl which may be substituted by a member selected from a group consisting of (1-3C)alkyl, (1-3C)alkoxy, fluoro, bromo, chloro and iodo, and phenyl(1-4C)alkyl which may be substituted on the phenyl by a member selected from a group consisting of (1-3C)alkyl, (1-3C)alkoxy, fluoro, bromo, chloro and iodo;

(b) R^1 and R^2 are each independently selected from a group consisting of hydrogen, (1-6C)alkyl, (2-4C)alkenyl, (2-4C)alkynyl, (3-7C)cycloalkyl and (3-7C)cycloalkyl(1-4C)alkyl; and

(c) R^1 and R^2 together with the nitrogen atom to which they are attached form a ring selected from a group consisting of azetidino, pyyrolidino, morpholino, thiomorpholino, piperidino and piperazino and wherein any of said rings may be substituted by 1 or 2 (1-3C)alkyl groups;

M is selected from a group consisting of CH_2, $C(R^5)(R^6)CH_2$, $C(R^5)$═CH, $C(R^5)(R^6)CH_2CH_2$, $C(R^5)(R^6)CH$═CH, $C(R^5)(R^6)CH_2CH_2CH_2$ and $C(R^5)(R^6)CH_2CH$═CH, wherein (a) R^5 and R^6 are each, independently, hydrogen or methyl, or (b) R^5 is hydrogen and R^6 is ethyl, propyl or isopropyl;

R^9 is selected from a group consisting of hydrogen, (1-10C)alkyl which may contain 1 or 2 double or triple bonds wherein said group may be substituted by a member selected from CO_2H, (1-4C)alkoxycarbonyl and $CONR^7R^8$ where R^7 is hydrogen or (1-6C)alkyl, and R^8 is hydrogen, (1-6C)alkyl, (3-6C)cycloalkyl, (3-6C)cycloalkyl(1-3C)alkyl, phenyl (which may be substituted by a member selected from a group consisting of (1-3C)alkyl, (1-3)alkoxy and halogeno), or phenyl(1-3C)alkyl, or R^7 and R^8, together with the nitrogen to which they are attached, form a ring selected from a group consisting of morpholino, N-propylpiperazino, pyrrolidino, 4,4-dimethylpiperidino, piperidono, thiomorpholino and piperazino and wherein any of said rings formed by R^7 and R^8 may be substituted by 1 or 2 (1-3C)alkyl groups; or R^9 is (3-6C)cycloalkyl, (3-6C)cycloalkyl(1-4C)alkyl or $CONR^7R^8$;

R^{10} is selected from a group consisting of CO_2H, $CONHSO_2R^{12}$, 1H-tetrazol-5-yl and $COCH_2SO_2R^{12}$;

R^{11} is selected from hydrogen, (1-4C)alkoxy, (1-2C)alkyl and hydroxy;

R^{12} is selected from a group consisting of (6-12C)aryl, pyridyl, and (6-12C)aryl(1-4C)alkyl, in any of which the aromatic or pyridyl moiety may bear 1 or 2 substitutents selected from a group consisting of halogeno, (1-4C) alkyl, (1-4C)alkoxy, trifluoromethyl, nitro and amino;

or salts thereof, including pharmaceutically acceptable salts.

12. A method of antagonizing the action of at least one type of leukotriene in a mammal requiring such treatment comprising administering to said mammal an effective amount of a compound of claim **1**.

group NR_aR_b or $CONR_aR_b$, where R_a and R_b, which may be the same or different, each represents a hydrogen atom, C_{1-3} alkyl, C_{3-4}alkenyl;

R_2 represents a hydrogen atom or a C_{1-3}alkyl group;

R_3 and R_4, which may be the same or different, each represents a hydrogen atom, C_{1-3}alkyl, propenyl or R_3 and R_4 together form a benzylidene group; Alk represents an alkylene chain containing two or three carbon atoms which may be unsubstituted or substituted by not more than two C_{1-3}alkyl groups; and

n and m which may be the same or different, each represents an integer from 1 to 4 or n may be zero;

and physiologically acceptable salts and hydrate thereof.

9. A method for the treatment of pain resulting from dilatation of the cranial vasculature which comprises administering to a patient an effective amount of a compound as claimed in claim **1** to relieve said pain.

4,894,387

5-SUBSTITUTED-3-AMINOALKYL INDOLE DERIVATIVES

Darko Butina, Arlesey; Michael D. Dowle, Ware, and Ian H. Coates, Pertford, all of England, assignors to Glaxo Group Limited, London, England

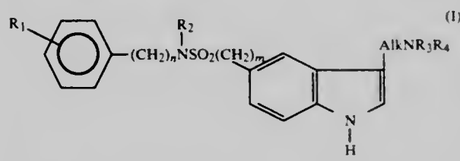
Continuation of Ser. No. 679,029, Dec. 6, 1984, abandoned. This application Mar. 26, 1987, Ser. No. 30,235

Claims priority, application United Kingdom, Dec. 6, 1983, 8332437

Int. Cl.[4] A61K *31/40;* **C07D** *209/14*

U.S. Cl. 514—415 **9 Claims**

1. A compound of formula:



(I)

wherein

R_1 which may be in the ortho, meta or para position, represents a halogen atom, C_{1-3}alkyl, C_{1-3}alkoxy, hydroxy, a

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4,894,388

GLYCOSIDASE INHIBITORS AND USE THEREOF

George W. J. Fleet, Oxford, United Kingdom, assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1988, Ser. No. 288,735

Int. Cl.[4] C07D *207/12;* **A61K** *31/40*

U.S. Cl. 574—425 **7 Claims**

1. A compound selected from the group consisting of 1,4-dideoxy-1,4-imino-L-allitol and its N-substituted alkyl and benzyl derivatives and the pharmaceutically acceptable acid salts thereof in which the alkyl group contains from one to six carbon atoms.

6. The method of substantially changing the specificity of glycosidase inhibitory activity of 1,4-dideoxy-1,4-imino-L-allitol or its HCl salt consisting essentially of substituting the ring nitrogen with an alkyl substituent in which the alkyl group contains from one to six carbon atoms.

7. The method of substantially changing the specificity of glycosidase inhibitory activity of 1,4-dideoxy-1,4-imino-L-allitol or its HCl salt from predominantly an inhibitor of α-D-mannosidase to one that selectively inhibits α-L-fucosidase consisting essentially of substituting the ring nitrogen with a benzyl group.

4,894,389

NOVEL AMINOALKYL-SUBSTITUTED HETEROCYCLIC SULFUR COMPOUNDS

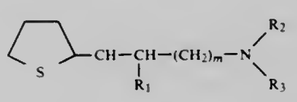
Thomas M. Bargar, Clayton, Calif.; Robert J. Borersma, Noblesville, and Lawrence C. Creemer, Indianapolis, both of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Oct. 2, 1987, Ser. No. 104,195

Int. Cl.[4] A61K *31/38;* **C07D** *333/12*

U.S. Cl. 514—438 **6 Claims**

1. A compound of the formula



wherein

m is an integer of from 0 to 4, with the proviso that when m is 0, one of R_1, R_2, or R_3 must be other than hydrogen,

R_1 is hydrogen or lower alkyl of from 1 to 6 carbon atoms,

R_2 is hydrogen, lower alkyl of from 1 to 6 carbon atoms, hydroxy, amino or amidino, and

R_3 is hydrogen or lower alkyl of from 1 to 6 carbon atoms, and the therapeutically acceptable acid addition salts thereof.

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4,894,390

SUBSTITUTED THIENO[2,3-b]THIOPHENE-2-SULFONAMIDES AS ANTIGLAUCOMA AGENTS

George D. Hartman, Lansdale, and John D. Prugh, Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 191,085, May 4, 1988, which is a continuation-in-part of Ser. No. 162,532, Mar. 1, 1988, abandoned, and a continuation-in-part of Ser. No. 80,851, Aug. 3, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 260,632

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[4] **A61K** *31/38;* **C07D** *333/32*

U.S. Cl. 514—443 **3 Claims**

1. 5-[N-Methoxyethyl-N-methoxyethoxyethyl)aminomethyl]thieno[2,3-b]thiophene-2-sulfonamide.

4,894,391

NOVEL PROSTACYCLIN DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF, AND USE THEREOF AS MEDICINAL AGENTS

Werner Skuballa; Helmut Dahl; Bernd Radüchel; Helmut Vorbrüggen, and Olaf Loge, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

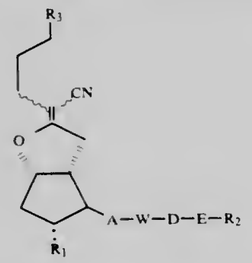
Filed Jun. 25, 1984, Ser. No. 623,869

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322893

Int. Cl.[4] **A61K** *31/34;* **C07D** *307/395*

U.S. Cl. 514—452 **21 Claims**

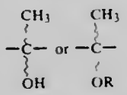
1. A 5-cyanoprostacyclin of the formula



wherein

A is a $-CH_2-CH_2-$, trans-$CH=CH-$, or $-C\equiv C-$;

W is hydroxymethylene, RO-methylene, or

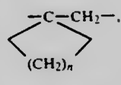


wherein the OH- or OR-group can be in the α- or β-position;

R is tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;

D and E together are a direct bond, or

D is



a straight-chain--C_{1-5}-alkylene group or a branched- or straight-chain, -alkylene, -alkenylene or group of 2–5 carbon atoms, or one of these groups substituted by fluorine and

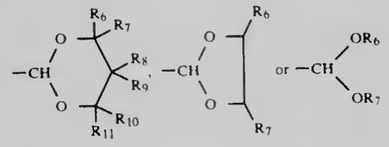
E is oxygen, sulfur, $-C\equiv C-$, a direct bond, or $-CR_4=C-R_5-$ wherein R_4 and R_5 are different and each is hydrogen, halogen or alkyl of 1–4 carbon atoms;

n is 1, 2, or 3;

R_2 is (a) C_{1-10} alkyl or alkenyl; (b) C_{1-10} alkyl or alkenyl, each substituted by C_{6-10} aryl or by C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; (c) C_{3-10} cycloalkyl, (d) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-10} aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms;

R_1 is OH or OR; and

R_3 is



wherein R_6, R_7, R_8, R_9, R_{10}, and R_{11} can be identical or different and each is hydrogen, C_{1-5}-alkyl, C_{6-10} aryl, or C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group.

4,894,392

AMINOALKYL NAPHTHALENEDIOLS AS HOST RESISTANCE ENHANCERS

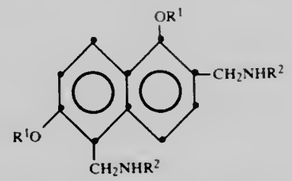
Philippe L. Durette, New Providence, N.J., and Timothy F. Gallagher, Harleysville, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 90,403, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 803,036, Nov. 29, 1985, abandoned. This application May 12, 1988, Ser. No. 195,353

Int. Cl.[4] **A61K** *31/35, 31/34, 31/135*

U.S. Cl. 514—459 **4 Claims**

1. A method of enhancing host resistance against bacterial or fungal infection comprising adminstering to said host a compound of the formula:



where R^1 is independently selected from H, C_1–C_6alkyl; R2 is independently selected from the group consisting of: 1-adamantylmethyl, 2-adamantylmethyl; 3-methyl-1-adamantylmethyl, 3-methyl-2-adamantylmethyl, 3,5-dimethyl-1-adamantylmethyl, 3-ethyl-1-adamantylmethyl, 3-propyl-1-adamantylmetyl, 3-methoxy-1-adamantylmethyl, 3-ethoxy-1-adamantylmethyl, cyclohexylmethyl-, 2-, 3-, 4-trimethyl-cyclohexylmethyl-, 2,4-dimethylcyclohexylmethyl-, 2-methoxycyclohexylmethyl-, 4-t-butoxycyclohexylmethyl-, 3-isopropoxycyclohexylmethyl-, tetrahydropyranyl-4-methyl, 2-methyletrahydropyranyl-4-methyl, 2,5-dimethoxytetrahydropyranyl-4-methyl, cyclopentylmethyl, methylcyclopentylmethyl tetrahydrosufyl unsubstituted or C1–C4 alkyl or alkoxy substituted monocycloalkyl, di- or tri- cycloalkyl, or heterocycloalkyl containing one oxygen hereto atom, and pharmaceutically acceptable acid addition salts thereof; in a physiologicaly acceptable mediu in an amount effective to impart resistance against bacterial or fungal infection.

4,894,393

DITHIOCARBAMATE-CHOLINE ADDUTS AND USE THEREOF IN TREATMENT OF BRAIN DISEASES

Dat-Xuong Nguyen, Antony; Jean Rapin, Paris, and Thadée Staron, Noisy le Roi, all of France, assignors to Lafon Pharma S.A., Fribourg, Switzerland

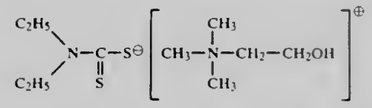
Filed Sep. 16, 1988, Ser. No. 245,243

Claims priority, application France, Sep. 18, 1987, 87 12968

Int. Cl.[4] **C07C** *155/06;* **A61K** *31/27*

U.S. Cl. 514—476 **7 Claims**

1. Choline diethyl-dithio-carbamate having the formula:



7. Process for the treatment of degenerative brain diseases of the class consisting of senile dementia, Alzheimer's Disease and dementias of the Alzheimer type, which comprises administering to a human in need thereof an effective amount of choline diethyl-dithio-carbamate.

4,894,394

PROCESS FOR THE MANUFACTURE OF METHANOL IN COMBINATION WITH STEAM REFORMING OF LIGHT HYDROCARBONS

Arjan Van Dijk, and Swan T. Sie, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1988, Ser. No. 256,522

Claims priority, application United Kingdom, Nov. 27, 1987, 8727774

Int. Cl.[4] **C07C** *27/06*

U.S. Cl. 518—700 **7 Claims**

1. Process for the production of methanol which comprises:

(a) reacting a mixture of steam, carbon dioxide and light hydrocarbons at a pressure from 20–30 bar in a reforming zone heated by the oxidation of carbonaceous fuel to obtain steam reformate containing hydrogen and carbon monoxide in a molar ratio of hydrogen to carbon monoxide in the range from 2.8 to 4.5;

(b) passing said steam reformate to a carbon dioxide separation zone to obtain a carbon dioxide steam and a treated stream reformate stream having substantially less carbon dioxide than said feed to step (b);

(c) recycling at least part of said carbon dioxide stream from step (b) as feed to step (a);

(d) reacting said treated stream reformate from step (b) in a single pass through a reaction zone at a temperature in the range from 70°–140° C. and a pressure from 15–25 bar in the presence of a catalyst system resulting from combining

(1) a nickel salt;

(2) an alcoholate of an alkali or an alkaline earth metal, and at least one of the following components:

(3) a hydride of an alkali metal or an alkaline earth metal, or

(4) an alcohol or an in-situ alcohol providing agent to obtain a reaction product containing methanol formed in the liquid phase, carbon monoxide and a mixture of other gases;

(e) partially condensing said reaction product from step (d) to obtain a methanol product stream and an uncondensed off-gas stream; and

(f) passing said uncondensed off-gas stream as fuel to heat the reforming zone of step (a).

4,894,395

EXPANDABLE POLYOLEFIN COMPOSITIONS AND POLYOLEFIN FOAM PREPARATION PROCESS

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US87/00139, § 371 Date Sep. 21, 1987, § 102(e) Date Sep. 21, 1987, PCT Pub. No. WO87/04445, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 21, 1987, Ser. No. 138,907

Int. Cl.[4] **C08J** *9/14*

U.S. Cl. 521—79 **15 Claims**

1. A process for preparing closed-cell olefin polymer foamed articles which comprises:

(a) heat plastifying a normally solid olefin polymer

(b) admixing said heat plastified resin under elevated temperature and pressure with

(1) a stability control agent which functions to control the dimensional stability of the foam during the curing period, and

(2) a mixed blowing agent selected from the group consisting of:

(i) a mixture comprising 1,2-dichlorotetrafluoroethane, from about 60 to about 95 weight percent, and from about 5 to about 50 weight percent of ethyl chloride or trichloro-fluoromethane and

(ii) a mixture which comprises from about 5 to about 85 weight percent of 1,2-dichlorotetrafluoroethane, from about 5 to about 85 percent of dichlorodifluoromethane and from about 5 to about 50 weight percent of a aliphatic hydrocarbon, a halogenated hydrocarbon compound physical blowing agent or mixture thereof having an atmospheric pressure boiling point ranging from about 0° C. to about 50° C., and

(c) extruding the resultant mixture into a zone of lower temperature and pressure to thereby form said olefin polymer foam, wherein the foam produced thereby does not shrink to less than about 80 percent of its initial volume at 65° C. for a prolonged period of time.

4,894,396

IMPRESSION MATERIAL

Robert G. Fisher, Beckenham, England, assignor to ESPE Stiftung & Co. Produktions- und Vertriebs-KG, Seefeld, Fed. Rep. of Germany

Continuation of Ser. No. 40,806, Apr. 21, 1987, abandoned. This application Jun. 21, 1988, Ser. No. 211,122

Claims priority, application United Kingdom, Apr. 23, 1986, 8609851

Int. Cl.[4] **A61K** *6/10;* **A61C** *9/00*

U.S. Cl. 523—109 **11 Claims**

1. A two part impression material comprising a first part comprising a product of the reaction of an alpha, beta-ethylenically unsaturated dicarboxylic acid anhydride and a liquid polydiene resin and a second part comprising a setting agent for the reaction product which setting agent is an alkoxylated fatty monoamine or an alkoxylated fatty polyamine having from 2 to 30 moles of alkoxylate per mole of the fatty amine, the alkoxylate groups being one or more alkoxylates selected from the group comprising ethoxylate, propoxylate and butoxylate, the impression material being characterized in that the first part and/or the second part also comprises an organic liquid which, when blended into the first part and/or second part of the impression material, forms a relatively stable emulsion in which the organic liquid is the dispersed phase and the reaction product or the setting agent is the continuous phase.

4,894,397

STABLE EMULSION POLYMERS AND METHODS OF PREPARING SAME

Lee W. Morgan, Racine; Richard J. Esser, Nieuwkoop, and Dennis P. Jensen, Burlington, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 21, 1988, Ser. No. 184,480
Int. Cl.[4] C08F 9/00, 265/04; C08G 9/00; B32B 3/10
U.S. Cl. 523—201 **18 Claims**

1. In a process for producing a latex, which comprises the steps of:

(a) reacting latex-forming monomers under predetermined emulsion-polymerization reaction conditions to form a hydrophilic, first-stage polymer; and

(b) coatacting the first-stage polymer with an effective amount of at least one hydrophobic, latex-forming monomer under predetermined emulsion-polymerization reaction conditions to form a hydrophobic, second-stage polymer, wherein the second-stage hydrophobic polymer partitions into the first-stage hydrophilic polymer thereby producing an inverted core-sheli emulsion polymer,

wherein the improvement comprises the additional step of adjusting the pH of the inverted core-shell emulsion polymer by an amount effective to dissolve the first-stage hydrophilic polymer, the first-stage hydrophilic polymer being dissolvable and the second-stage hydrophobic polymer being insoluble upon adjustment of pH, for thereby producing a stabilized latex comprising a continuous aqueous phase containing the first-stage hydrophilic polymer and a discontinuous phase containing discrete, stabilized particles of the second-stage hydrophobic polymer.

4,894,398

METHOD FOR STABILIZING UNSATURATED ORGANOSILICONE COMPOSITIONS

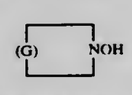
Howard M. Bank, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 120,256, Nov. 13, 1987, Pat. No. 4,798,889.
This application Sep. 19, 1988, Ser. No. 246,234
Int. Cl.[4] C08K 5/46
U.S. Cl. 524—83 **19 Claims**

1. A method for stabilizing an organosilicone selected from organopolysiloxanes having a reactive organic group bearing at least one radical selected from the group consisting of acryloxy, methacryloxy, acrylamide, methacrylamide, styryl and vinylbenzyl radicals, said method comprising adding to said organosilicone a stabilizing amount of a hydroxylamine compound selected from the group consisting of those having the general formula

$$Q_2NOH$$

in which Q independently denotes an alkyl radical having 1 to 12 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms or an aryl group having 6 to 9 carbon atoms, and those having the formula



in which G denotes a hydrocarbyl group having 5 to 11 carbon atoms.

4,894,399

LIGHT-STABILIZED POLYMER MICROPARTICLES CONTAINING EPOXY GROUPS

Jean Rody, Riehen; Mario Slongo, Tafers; Franciszek Sitek, Therwil, all of Switzerland, and Andreas Valet, Eimeldingen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,724
Claims priority, application Switzerland, Jun. 4, 1987, 2113/87
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 **23 Claims**

1. Light-stabilized polymer microparticles having a particle size distribution of 0.01–20 μm, obtainable by copolymerization of (a) one or more ethylenically unsaturated monomeric compounds or/and one or more different monomers selected from the group comprising polyalcohols, polycarboxylic acids, hydroxycarboxylic acids, lactones, aminocarboxylic acids, aminoalcohols and polyamines, and (b) at least one epoxide compound which contains at least one further reactive group, essentially only the latter taking part in the copolymerization, so that the resulting microparticles contain free epoxy groups, which microparticles contain 0.1 to 30% by weight, relative to the monomers employed, of one or more light stabilizers, wherein at least part of the polymerization of the monomers is carried out in the presence of the light stabilizer.

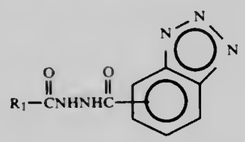
4,894,400

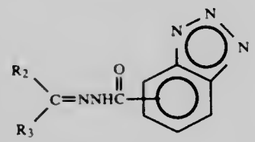
STABILIZED SYNTHETIC POLYMER COMPOSITION

Tohru Haruna, Okegawa; Masayuki Takahashi, Tokorozawa, and Kazunori Nishikawa, Matsudo, all of Japan, assignors to Adeka Argus Chemical Co. Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 229,144
Claims priority, application Japan, Aug. 5, 1987, 62-195554
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 **3 Claims**

1. A synthetic polymer composition which comprises 100 parts by weight of a synthetic polymer and 0.001 to 5 parts by weight of at least one of benzotriazol compounds represented by the formulae (I), (II) and (III):







in which R_1 is an organic monocarboxylic radical selected from the group consisting of formic acid, acetic acid, butyric acid, octylic acid, neodecanoic acid, lauric acid, stearic acid, hydroxystearic acid, benzoic acid, toluylic acid, 4-t-butylbenzoic acid, 3,5-di-t-butyl-4-hydroxybenzoic acid, salicylic acid; 3-methyl-salicylic acid, 5-methyl-salicylic acid, 5-methoxy-salicylic acid, 5-t-butyl-salicylic acid, 5-t-octyl-salicylic acid, 5-cyclohexyl-salicylic acid; 3,5-di-t-butyl-4-hydroxyphenylpropionic acid, 3-t-butyl-4-hydroxy-5-methylphenylpropionic acid, phenoxypropionic acid and laurylthiopropionic acid; 3,5-di-t-butyl-4-hydrozybenzylthioacetic acid and benzotriazolecarboxylic acid, R_2 and R_3 are members selected from the group consisting of hydrogen, alkyl and aryl radicals, and R_4 is an organic dicarboxylic radical.

4,894,401

COLOR STABILIZED IRRADIATED POLYCARBONATE COMPOSITIONS

Linda H. Nelson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 22, 1986, Ser. No. 944,035
Int. Cl.[4] C08K 5/15; C08F 283/02
U.S. Cl. 524—109 **11 Claims**

1. A composition sufficiently irradiated to achieve sterilization comprising:

(i) at least one aromatic carbonate resin; and

(ii) an antiyellowing upon exposure to sterilizing irradiation effective amount of at least one epoxide compound selected from epoxides containing at least 1 quaternary oxirane ring carbon atom, epoxides having each of the 2 oxirane ring carbon atom bonded to at least 1 aromatic hydrocarbon moiety or substituted aromatic hydrocarbon moiety, or mixtures thereof.

4,894,402

POLYPHENYLENE COMPOSITIONS HAVING IMPROVED MELT BEHAVIOR AND IMPACT

Visvaldis Abolins, Delmar; Joseph C. Golba, Jr., Ballston Spa, and Thomas A. Morelli, Delmar, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 810,465, Dec. 18, 1985, abandoned.
This application Apr. 30, 1987, Ser. No. 44,868
Int. Cl.[4] C08J 11/28; C08L 71/04
U.S. Cl. 524—157 **10 Claims**

1. A thermoplastic composition having improved impact strength and melt behavior consisting essentially of:

(a) a polyphenylene ether resin having an intrinsic viscosity less than approximately, 0.42 dl/g as measured in chloroform at 25° C.;

(b) a compound of the formula R-SO $_3$X wherein R represents an alkyl or aralkyl radical having 5 to 25 carbon atoms and X represents an alkali metal ion, in an amount effective for improving the melt behavior of said polyphenylene ether resin; and

(c) an impact strength improving amount of an acrylate-styrene-acrylonitrile terpolymer.

4,894,403

POLYISOCYANATE COMPOSITIONS CONTAINING RIGID COMPOUNDS OR POLYMERS, AND POLYURETHANES PREPARED THEREFROM

Oomman P. Thomas; Richard D. Peffley, both of Lake Jackson, and Earl E. Burt, III, Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 14, 1987, Ser. No. 73,045
Int. Cl.[4] C08G 18/14
U.S. Cl. 524—216 **13 Claims**

1. A solution or dispersion in a polyisocyanate of a polymer of an ethylenically unsaturated monomer having a rigid moiety comprising at least two aromatic nuclei which are connected by a covalent bond or a connecting group which is capable of participating in conjugation with the aromatic nuclei.

4,894,404

MOLDING COMPOSITIONS BASED ON POLY(1,4-CYCLOHEXYLENE DIMETHYLENE TEREPHTHALATE) CONTAINING AN AMIDE CRYSTALLIZATION AID

Larry A. Minnick, Bluff City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 19, 1988, Ser. No. 245,599
Int. Cl.[4] C08K 5/20
U.S. Cl. 524—226 **6 Claims**

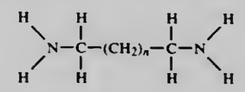
1. A reinforced polyester molding composition having an improved crystallization rate comprising

(a) poly (1,4-cyclohexylene dimethylene terephthalate) having an inherent viscosity of about 0.5 to 1.0,

(b) about 10% to 55%, based on the total composition weight, of glass fibers having a length of about ¼ to 2 inches, and

(c) about 2% to 15%, based on the total composition weight, of the reaction product of

(1) an aliphatic diamine of the formula



wherein n is an integer of from 0 to 10, and

(2) a monocarboxylic acid selected from aliphatic organic acids having a carbon chain length of 8 to 36, benzoic acid, and benzoic acid substituted with an alkyl group of 1 to 12 carbon atoms.

4,894,405

CONCRETE AND MASONRY WATERPROOFING COMPOSITION

Larry R. Barron, Mentor, Ohio, assignor to Tremco Incorporated, Cleveland, Ohio

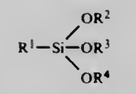
Filed Nov. 25, 1988, Ser. No. 276,004
Int. Cl.[4] C08L 75/04
U.S. Cl. 524—265 **20 Claims**

1. A coating penetrant composition, comprising:

from about 60 percent to about 95 percent by weight of a polyisocyanate terminated polyurethane prepolymer based upon the total weight of said polyurethane prepolymer and a penetrant, from about 5 percent to about 40 percent by weight of a penetrant based upon the total weight of said penetrant and said polyurethane prepolymer, said polyisocyanate terminated polyurethane prepolymer made from the reaction of a polyether polyol intermediate, a polyester polyol intermediate, or combinations thereof, with a polyisocyanate,

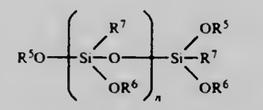
said penetrant being an organosilane having the formula:

(FORMULA I)



wherein R^1 is an aliphatic having from 1 to 18 carbon atoms, wherein R^2, R^3 and R^4, independently, is an alkyl having from 1 to 6 carbon atoms; or an organosiloxane having the formula:

(FORMULA II)



wherein R^7 is an aliphatic having from 1 to 18 carbon

atoms, and wherein R^5 and R^6, independently is an alkyl having from 1 to 6 carbon atoms, wherein n is from 2 to 20; or combinations thereof.

4,894,406

LOW ODOR COALESCING AID FOR LATEX PAINTS

Richard L. Smith, Kingsport, Tenn., and Garland P. Sprinkle, Jr., Louisville, Ky., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1988, Ser. No. 233,778
Int. Cl.[4] C08K *5/10*
U.S. Cl. 524—310 **2 Claims**

1. A paint composition which comprises a water-based latex dispersion and an effective amount of a coalescing aid selected from the group consisting of 2-ethyl-1,3-hexanediol monobutyrate, 2-ethyl-1,3-hexanediol isobutyrate, 2-methyl-1,3-hexanediol isobutyrate, and 2-methyl-1,3-hexanediol monobutyrate.

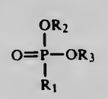
4,894,407

COMPOSITION FOR EXTRACTING GOLD AND SILVER ANIONS FROM ALKALINE SOLUTIONS AND PROCESSES FOR MAKING SAME

Jan D. Miller, Salt Lake City, Utah, and Spiro D. Alexandratos, Knoxville, Tenn., assignors to University of Utah, Salt Lake City, Utah

Continuation of Ser. No. 774,549, Sep. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 527,311, Aug. 26, 1983, Pat. No. 4,540,435. This application Aug. 15, 1988, Ser. No. 232,309
Int. Cl.[4] C08K *3/10*
U.S. Cl. 524—413 **7 Claims**

1. A composition comprising;
a solid substrate;
a strong solvating extractant attached to said solid substrate, wherein said strong solvating extractant is a phosphonate ester having the following formula:



wherein R_1 is poly (vinyl benzyl) and R_2 and R_3 are alkyl groups having from one to ten carbon atoms; and gold cyanide anions or silveer cyanide anions in contact with said strong solvating extractant.

4,894,408

THERMOPLASTIC OLEFIN COMPOSITIONS OF EPDM RUBBER AND ETHYLENE COPOLYMER RESIN

Donald R. Hazelton, Chatham, and Robert C. Puydak, Cranbury, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 23, 1988, Ser. No. 235,858
Int. Cl.[4] C08L *23/28, 23/32, 23/08, 33/00*
U.S. Cl. 524—425 **23 Claims**

1. A thermoplastic olefin composition comprising an EPDM rubber fully cured by dynamic vulcanization in a thermoplastic resin consisting of (A) from 25 to 100 wt% of an ethylene copolymer resin selected from the group consisting of copolymers of ethylene with vinylacetate, copolymers of ethylene with alpha, beta monoethylenically unsaturated monocarboxylic acids and copolymers of ethylene with alkyl esters of said acids and (B) from 0 to 75 wt% of at least one additional polyolefin resin selected from the group consisting of polybutylene, low density polyethylene, very low density polyethylene, and linear low density polyethylene.

4,894,409

RUBBER COMPOSITION

Noboru Shimada, Yokkaichi; Iwakazu Hattori, Aichi; Mitsuhiko Sakakibara, Matsudo; Noboru Oshima, Suzuka; Tatsuro Hamada, Higashimurayama; Hiromi Fukuoka, Kodaira, and Tatsuo Fujimaki, Higashimurayama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Bridgestone Corporation, both of Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 218,797
Claims priority, application Japan, Jul. 17, 1987, 62-179670
Int. Cl.[4] C08F *4/00*; C08J *3/34*
U.S. Cl. 524—492 **13 Claims**

1. A rubber composition comprising not less than 20% by weight of an amino group-containing diene based polymer in a rubber component, and 10 to 100 parts by weight of silica as a filler with respect to 100 parts by weight of the rubber component, said amino group-containing diene based polymer being obtained by polymerizing a monomer or copolymerizing said monomer in an organic solvent in the presence of at least one of an organic alkali metal and an organic alkaline earth metal.

4,894,410

FLUORINE-CONTAINING POLYMERS WITH PENDENT THIOORGANO GROUPS

Robert E. Kolb, St. Paul, Minn.; Paul F. Tuckner, Hudson, Wis., and Richard A. Gueathner, Birchwood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 9, 1988, Ser. No. 165,936
Int. Cl.[4] C08F *8/34*
U.S. Cl. 524—545 **8 Claims**

1. Fluorine-containing polymers consisting essentially of (A) fluorine-containing homo- or co-polymers containing 20 to 76 weight percent carbon-bonded fluorine and comprising interpolymerized, repeating units of one or more fluoromonomers, and optionally one or more non-fluorinated monomers, wherein said non-fluorinated monomers are selected from the group consisting of ethylene, propylene, and butene and (B) a plurality of pendent, monothioorgano groups.

4,894,411

COMPOSITE MATERIAL AND PROCESS FOR PRODUCING THE SAME

Akane Okada; Masaya Kawasumi; Masao Kohzaki; Megumi Fujimoto; Yoshitsugu Kojima; Toshio Kuranchi, and Osami Kamigaito, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Mar. 14, 1988, Ser. No. 168,133
Claims priority, application Japan, Mar. 18, 1987, 62-63365; Jul. 3, 1987, 62-167250
Int. Cl.[4] C08K *3/34, 5/13, 5/17, 5/52*
U.S. Cl. 524—710 **12 Claims**

1. A process for producing a composite material which comprises a contacting step of contacting a layered clay mineral having a cation exchange capability of 50 to 200 milliequivalents per 100 g with a swelling agent, thereby forming a complex which has the property of being swollen by a molten polyamide monomer, a mixing step of mixing said complex with a monomer of polyamide, and a polymerization step of polymerizing said monomer contained in said mixture by heating said mixture, and adding a substance to control the crystalline structure or molecular structure of the polyamide-containing resin in the mixing step and/or the polymerization step wherein the substance is a polyamine and is at least one member selected from diamines, triamines, and tetramines, pentamines, and aliphatic polyamines.

2. A process for producing a composite material which comprises a contacting step of contacting a layered clay mineral having a cation exchange capacity of 50 to 200 milliequivalents per 100 g with a swelling agent, thereby forming a complex which has the property of being swollen by a molten polyamide monomer, a mixing step of mixing said complex

with a monomer of polyamide, and a polymerization step of polymerizing said monomer contained in said mixture by heating said mixture, and adding a substance to control the crystalline structure of molecular structure of the polyamide-containing resin in the mixing step and/or the polymerization step wherein the substance is a stabilizer and is at least one member selected from phenol derivatives and organophosphoric compound and is present in an amount of 0.05 to 5 parts by weight per 100 parts by weight of the resin.

4,894,412

PROCESS FOR PREPARING SELF-CROSSLINKABLE AMINOSILOXANE EMULSION

Fumio Okada, Takasaki; Masaki Tanaka, and Hiroshi Ohashi, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 18, 1988, Ser. No. 195,650
Claims priority, application Japan, May 19, 1987, 62-121985
Int. Cl.[4] C08K *5/16*
U.S. Cl. 524—714 **13 Claims**

1. A process for preparing a self-crosslinkable aminosiloxane emulsion, comprising:
dispersing by emulsification in water in the presence of a cationic surface active agent and a nonionic surface active agent;
(A) an organosilicon compound represented by formula (I):

$$R_a^1R_b^2SiO_{\frac{4-(a+b)}{2}} \quad (I)$$

wherein R^1 represents a monovalent hydrocarbon group having 1 to 20 carbon atoms; R^2 has the same definition as R^1 or represents a group represented by the formula: —OX, where X represents a hydrogen atom or a monovalent hydrocarbon group having 1 to 6 carbon atoms; and a represents a number of $0<a\leqq 3$ and b represents a number of $0\leqq b<3$, satisfying $1\leqq a+b\leqq 3$;
(B) an organosilicon compound represented by formula (II):

$$R_c^3R_d^2SiO_{\frac{4-(c+d)}{2}} \quad (II)$$

wherein R^3 represents a monovalent hydrocarbon group containing a nitrogen atom; R^2 is as defined above; and c represents a number of $0<c\leqq 3$ and d represents a number of $0\leqq d<3$, satisfying $1\leqq c+d\leqq 3$; and
(C) at least one member selected from the group consisting of an organosilane represented by formula (III):

$$R^1Si(OX)_3 \quad (III)$$

wherein R^1 and X are as defined above,
and a partial hydrolysis-condensation product thereof;
subsequently carrying out emulsion polymerization in the presence of an alkaline catalyst selected from the group consisting of sodium hydroxide, potassium hydroxide, rubidium hydroxide, sodium carbonate and tetraalkyl ammonium hydroxides; and
thereafter neutralizing the reaction mixture with an acid selected from the group consisting of organic acids and inorganic acids.

4,894,413

POLYBUTADIENE-EPOXY-ANHYDRIDE LAMINATING RESINS

Ephraim H. Catsiff, Palos Verdes Peninsula, and William E. Elias, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 9, 1987, Ser. No. 107,144
Int. Cl.[4] C08G *59/24*; C08L *51/00*
U.S. Cl. 525—65 **5 Claims**

1. In a method for preparing a resin composition for use as a laminate material in printed wiring boards, wherein said method comprises mixing an epoxy-anhydride prepolymer with maleated polybutadiene and a suitable solvent, wherein the improvement comprises:
preparing said epoxy-anhydride prepolymer by mixing a first solid monoanhydride with a cycloaliphatic epoxy wherein the amount of said first solid monoanhydride in less than one half of stoichiometric with respect to the epoxide groups in said cycloaliphatic epoxy, and reacting said mixture of monoanhydride and cycloaliphatic epoxy in the presence of an initiator for a sufficient time to form a prepolymer precursor wherein less than half of the epoxide groups have been reacted;
mixing said prepolymer precursor with an additional second liquid monoanhydride in an amount sufficient to react with the remaining unreacted epoxide groups to forms said epoxy-anhydride prepolymer for further mixing with said maleated polybutadiene to form said resin composition for use as a laminate material in printed wiring boards.

4,894,414

RUBBER-MODIFIED CYANATE ESTER RESINS AND POLYTRIAZINES DERIVED THEREFROM

Philip C. Yang, Midland, and Dale M. Pickelman, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1987, Ser. No. 79,378
Int. Cl.[4] C08L *67/06*
U.S. Cl. 525—66 **46 Claims**

1. A method of preparing a cyanate ester resin having incorporated therein grafted rubber particles, comprising the steps of:
(a) emulsifying at least one emulsion polymerizable monomer in an aqueous colloidal dispersion of discrete resin-insoluble rubber particles maintained in a reasonably stable state with a surfactant or emulsifier, wherein the quantity of the emulsion polymerizable monomer is no greater than about 50 percent by weight of the resin-insoluble rubber particles,
(b) polymerizing the resulting emulsion to form a stable colloidal dispersion of resin-insoluble rubber particles wherein essentially every rubber particle is grafted with one or more resin-soluble polymer molecules resulting from the polymerization such that substantially all of the rubber particles are maintained in a discrete spaced apart relationship to each other by the resin-soluble polymer molecules, and
(c) mixing the grafted rubber particles with the cyanate ester resin to a degree sufficient to achieve a homogeneous dispersion.

4,894,415

POLYPHENYLENE ETHER RESIN COMPOSITION

Isao Sasaki; Naoki Yamamoto, both of Hiroshima, and Akira Yanagase, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 95,001
Claims priority, application Japan, Sep. 11, 1986, 61-214871
Int. Cl.[4] C08F *283/12, 71/04*
U.S. Cl. 525—68 **10 Claims**

1. A polyphenylene ether resin composition comprising
(A) a polyphenylene ether resin,

(B) a polystyrene resin, and
(C) a graft copolymer
prepared by graft-polymerizing one or more vinyl monomers onto a compound rubber having an average particle diameter of 0.08 to 0.6 μm and a structure wherein 10 to 90% by weight of a polyorganosiloxane rubber component and 90 to 10% by weight of a polyalkyl (meth)acrylate rubber component are tangled with each other so as not to separate, the total amount of the polyorganosiloxane rubber component and the polyalkyl (meth)acrylate rubber component being 100% by weight of the compound rubber.

4,894,416

LOW GLOSS THERMOPLASTIC BLENDS

Robert R. Gallucci, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1988, Ser. No. 289,938
Int. Cl.[4] C08L *51/00*
U.S. Cl. 525—74 **11 Claims**

1. A low-gloss thermoplastic blend comprising a core-shell ASA (acrylate-styrene-acrylonitrile interpolymer) resin blended with an effective gloss-reducing amount of at least one polymer of glycidyl (meth)acrylate.

4,894,417

POLYMERIC COMPOSITION

Geoffrey Holden, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1988, Ser. No. 256,517
Int. Cl.[4] C08L *23/10, 23/18, 53/02*
U.S. Cl. 525—98 **9 Claims**

1. A thermoplastic elastomer composition comprising:
(a) from about 20 to about 70 weight percent of a polymer of a lower α-olefin having from 2 to 5 carbon atoms;
(b) from about 20 to about 70 weight percent of a polymer of a 4-methyl-1-pentene polymer; and
(c) from about 5 to about 25 weight percent of a block copolymer comprising at least two polymeric blocks predominantly polymerized from monoalkenyl-aromatic hydrocarbon monomer units and at least one polymeric block predominantly polymerized from conjugated diolefin monomer units which at least one polymeric block is selectively hydrogenated after polymerization.

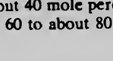
4,894,418

VULCANIZABLE COMPOSITIONS OF FLUOROELASTOMERS HAVING IMPROVED CHARACTERISTICS OF PROCESSABILITY AND OF CHEMICAL STABILITY

Ezio Strepparola, Trevigio; Giovanni Moggi, Milan; Ciazia Di Fede, Casciago, and Gianna Cirillo, Genoa, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 928,407, Nov. 10, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,200
Claims priority, application Italy, Nov. 15, 1985, 22865 A/85
Int. Cl.[4] C08J *3/18*; C08L *27/16, 27/18, 27/20*
U.S. Cl. 525—185 **10 Claims**

1. Vulcanizable compositions of fluoroelastomers based on vinylidene fluoride having improved processability and improved chemical stability, comprising, as a processing coadjuvant, a mono- or di-hydroxypolyfluoroether, the hydroxy group being present at one end of the polyether chain in the case of the mono-hydroxypolyfluoroether and the two hydroxy groups being present at the opposite ends of the polyfluoroether chain in the case of the di-hydroxypolyfluoroether, said mono- or di-hydroxypolyfluoroether having no other functional groups beside the hydroxy group at the end or ends of the polyfluoroether chain, and having a mean molecular weight ranging from 400 to 10,000 for the mono-hydroxypolyfluoroether and ranging from 2,500 to 10,000 for the di-hydroxypolyfluoroether, wherein the mono-hydroxypolyfluoroether comprises repeating fluoropolyoxylalkylene units selected from the units;
(1) C_3F_6O and CFXO whre X=F or CF_3 and said units are statistically distributed along the fluoropolyoxylalkylene chain,
(2) C_3F_6O or
(3) $CH_2CF_2CF_2O$, and wherein the di-hydroxypolyfluoroether comprises fluoropolyoxyalkylene units;
(4) C_2F_4O and CF_2O and said units are statistically distributed along the fluoropolyoxyalkylene chain,
(5) C_3F_6O, C_2F_4O and CFXO where X=—F or —CF_3 and said units are statically distributed along the fluoropolyoxyalkylene chain,
(6) $CH_2—CF_2—CF_2—O—$ and said units within the fluoropolyoxyalkylene chain are linked to one another in the following manner, $—(O—CF_2—CF_2CH_2)_p—O—R_f—O—(CH_2—CF_2—CF_2—O)_q—$, wherein R_f is a fluoroalkylene group, and p and q are integers, or
(7)



and said units are linked to one another inside the fluoropolyoxyalkylene chain in the following manner



wherein R_f is a fluoroalkylene group, z is 0 or 1, and a and b are integers, said mono- or di- hydroxypolyfluoroethers being used in an amount from 0.5 to 15 parts by weight per 100 parts of fluoroelastomers.

4,894,419

BIAXIALLY-STRETCHED FILM MADE OF POLY(ARYLENE SULFIDE) RESIN COMPOSITION AND PRODUCTION PROCESS THEREOF

Toshiya Mizuno; Yoshikichi Teramoto; Takeshi Saito, all of Tsuchiura, and Juichi Wakabayashi, Tamari, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed May 6, 1988, Ser. No. 191,131
Claims priority, application Japan, May 15, 1987, 62-116777; Mar. 23, 1988, 63-67272
Int. Cl.[4] C08L *81/06*; B29D *7/26*
U.S. Cl. 525—189 **6 Claims**

1. In a biaxially-stretched film made of a poly(arylene sulfide) resin composition, the improvement wherein the composition comprises 100 parts by weight of a substantially linear poly(arylene sulfide) having a melt viscosity of at least 1,000 poises and 10–80 parts by weight of a polystrene resin.

4,894,420

TIRE WITH TREAD OF SELECTIVE RUBBER BLEND

Richard M. Scriver, Atwater, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 14, 1988, Ser. No. 243,970
Int. Cl.[4] C08L *9/00, 9/02/9/06, 7/00*
U.S. Cl. 525—237 **5 Claims**

1. A pneumatic tire having an outer circumferential tread where said tread is a sulfur cured rubber composition comprised of, based on 100 parts by weight rubber (phr). (A) about 30 to about 90 parts by weight cis 1,4-polyisoprene rubber having a cis 1,4-content of about 96 to about 99 percent, (B) about 5 to about 20 parts by weight of at least one synthetic rubber selected from at least one of isoprene/acrylonitrile copolymer and butadiene/acrylonitrile copolymer comprised of from about 20 to about 40 mole percent units derived from acrylonitrile and about 60 to about 80 mole percent units derived from isoprene or butadiene in which the glass transition temperature of the rubber is from about −40° C. to about -31 5° C. where said copolymers are random emulsion polymerization prepared copolymers, and (C) about 0 to about 35 parts by weight of at least one of styrene/butadiene copolymer rubber, 1,4-polybutadiene rubber containing up to 10 percent vinyl unsaturation and 1,4-polybutadiene rubber having from 30 to 70 percent vinyl unsaturation, isoprene/butadiene rubber or styrene/isoprene/butadiene rubber.

4,894,421

LOW-CRYSTALLINE PROPYLENE RANDOM COPOLYMER COMPOSITION, PROCESS FOR PRODUCTION THEREOF, AND POLYPROPYLENE COMPOSITE LAMINATED STRUCTURE

Mamoru Kioka; Masahiro Sugi; Akinori Toyota, and Norio Kashiwa, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 106,585, Oct. 9, 1987, Pat. No. 4,822,840. This application Dec. 30, 1988, Ser. No. 292,539
Claims priority, application Japan, Oct. 9, 1986, 61-239340; Oct. 9, 1986, 61-239341; Jul. 15, 1987, 62-174833
Int. Cl.[4] C08F *255/04*; C08L *23/16*
U.S. Cl. 525—243 **16 Claims**

1. A process for producing a low-crystalline propylene random copolymer composition, which comprises, in combination,
(1) a suspension polymerization step of copolymerizing propylene, ethylene and an alpha-olefin having 4 to 20 carbon atoms in liquid propylene as a solvent in the presence of an alpha-olefin pre-polymerized catalyst and optionally an electron donor, said catalyst being obtained by pre-polymerizing an alpha-olefin having 2 to 10 carbon atoms in the presence of a catalyst formed from (A) a highly active and highly stereoregular titanium catalyst component comprising magnesium, titanium, halogen and an electron donor as essential ingredients and having an average particle diameter of about 5 to about 200 microns and a geometric standard deviation of its particle size distribution of less than 2.1, (B) an organometallic compound of a metal of Groups I to III of the periodic table and (C) an electron donor, the amount of the alpha-olefin being 1 to 2000 g per gram of the titanium catalyst component (A),
(2) a step of vaporizing the liquid unreacted materials in the polymerization reaction mixture obtained in the suspension polymerization step (1) by flushing, thereby to form a propylene random copolymer [I] composed of 86 to 97 mole % of recurring units (a) derived from propylene, 0.5 to 6 mole % of recurring units (b) derived from ethylene and 2 to 13 mole % of recurring units (c) derived from an alpha-olfein having 4 to 20 carbon atoms, the mole ratio c/(b+c) being from 0.3 to 0.9, and
(3) a vapor-phase polymerization step of copolymerizing propylene and an alpha-olefin having 4 to 20 carbon atoms in the presence of the propylene random copolymer [I] under such conditions that the reaction system form a vapor phase, thereby to form a low-crystalline propylene random copolymer [II] composed of 10 to 90 mole % of recurring units (d) derived from propylene and 10 to 90 mole % of recurring units (e) derived from the alpha-olefin having 4 to 20 carbon atoms.

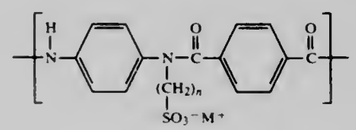
4,894,422

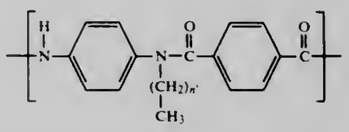
N-SULFOALKYL POLYAMIDE WATER SOLUBLE HYDROPHOBICALLY-ASSOCIATING RIGID ROD POLYMER

Dennis G. Peiffer, East Brunswick, and Jeff J. Kaladas, South Bound Brook, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 135,973, Dec. 21, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,098
Int. Cl.[4] C08G *69/48*
U.S. Cl. 525—420 **3 Claims**

1. A water soluble or brine soluble rod-like polymer having recurring units of the formula:





wherein n and n' are a 2 to 22 straight chained or branched chained alkyl or cycloalkyl group, and the level of sulfonation is about 20 to about 100 mole and M is a tertiary amine or a metal cation selected from the group consisting of aluminum, iron, lead, Groups 1A, 11A, 1B and 11B of the Periodic Table of Elements and level of alkylation is about 1.0 to about 60 mole %.

4,894,423

ENVIRONMENTAL STRESS FAILURE RESISTANT POLYCARBONATE

Hani Farah, Sugarland; Chai J. Chou, Missouri City, and Stephen M. Hoenig, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1988, Ser. No. 268,132
Int. Cl.[4] C08F *283/02*; C08L *69/00*
U.S. Cl. 525—468 **11 Claims**

1. A thermoplastic molding composition, comprising:
A. an aromatic polycarbonate; and
B. a copolymer of ethylene and carbon monoxide.

4,894,424

POLYMERISATION OF OLEFINS USING MODIFIED ZIEGLER-NATTA CATALYST

Dominique Lassalle, Martigues, France, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 911,472, Sep. 25, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 204,984
Claims priority, application France, Oct. 11, 1985, 85 15239
Int. Cl.[4] C08F *4/64, 10/00*
U.S. Cl. 526—125 **9 Claims**

1. A process for polymerising ethylene or propylene, or copolymerising ethylene with alpha-olefins comprising from 3 to 12 carbons, or propylene with ethylene and/or 1-butene, in suspension in a liquid hydrocarbon diluent or in a gas phase, under a pressure from 0.5 to 5 MPa and at a temperature from 50° C. to 110° C., in the presence of a Ziegler-Natta catalytic system comprising, as catalyst, a particulate solid material based on magnesium, chlorine, titanium and/or vanadium prepared under substantially anhydrous conditions and being substantially free from metal/carbon chemical bonds, and as co-catalyst, at least one organoaluminium compound charac-

terised in that prior to contacting the catalyst with the co-catalyst to form the catalytically active system, the particulate solid material is treated with from 0.1 to 5 moles of water per gram atom of titanium and/or vanadium present in the catalyst.

4,894,425

PREPARATION OF POLYISOPRENE HAVING HIGH CONTENT OF 1,2- AND 3,4-STRUCTURAL UNITS BY ANIONIC POLYMERIZATION

Walter Hellermann, Dorsten; Karl-Heinz Nordsiek, Marl, and Jürgen Wolpers, Haltern, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 29, 1987, Ser. No. 55,543

Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618351; Jun. 27, 1986, 3621628; Dec. 18, 1986, 3643250; Mar. 7, 1987, 3707434

Int. Cl.[4] C08F *4/48*

U.S. Cl. 526—181 **11 Claims**

1. A process for the preparation of polyisoprene which may possess functional groups and contains more than 70% of 1,2- and 3,4-structural units by anionic polymerization of isoprene in an inert hydrocarbon solvent in the presence of an organolithium compound as the catalyst and an ether as the cocatalyst, wherein the cocatalyst used is an ethylene glycol dialkyl ether of the formula

$$R_1—O—CH_2—CH_2—O—R_2$$

in which R_1 and R_2 are alkyl groups having different numbers of C atoms, from the group consisting of methyl, ethyl, n- and isopropyl and n-, iso-, sec.- and tert. -butyl, and wherein the sum of the C atoms in the two alkyl groups R_1 and R_2 is 5 to 7.

4,894,426

FAST-CURE POLYURETHANE SEALANT COMPOSITION CONTAINING SILYL-SUBSTITUTED PIPERAZINE ACCELERATORS

Jamil Baghdachi, Northville, and Keith H. Mahoney, Grosse Pointe City, both of Mich., assignors to BASF Corporation, Clifton, N.J.

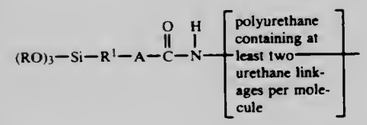
Filed Aug. 19, 1988, Ser. No. 234,221

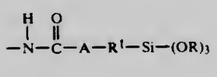
Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—22 **11 Claims**

1. A one-component, moisture-curable sealant composition comprising a mixture of

(a) a silane-terminated polyurethane polymer of the formula





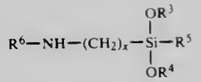
wherein

R is lower alkyl of from 1 to 6 carbon atoms;

R^1 is a divalent bridging radical selected from the group consisting of a divalent hydrocarbon radical, a divalent hydrocarbon ether radical, and a divalent hydrocarbon amino radical;

A is selected from the group consisting of —S— and $—NR_2—$ where R^2 is hydrogen or alkyl of from one to six carbon atoms;

(b) from 0.2 to 1.0 parts by weight of an aminosilane per 100 parts by weight of said silane-terminated polyurethane polymer, said aminosilane having the structure



wherein

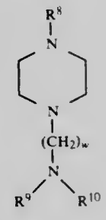
x is an integer of from one to three;

R^3 and R^4 may be the same or different and are selected from alkyl of from one to four carbon atoms;

R^5 is alkyl of from one to four carbon atoms or alkoxyl of from one to four carbon atoms;

R^6 is hydrogen or $—(CH_2)_yNHR^7$ wherein R^7 is hydrogen or $—(CH_2)_yNH_2$ and y and z may be the same or different and are integers of from one to three;

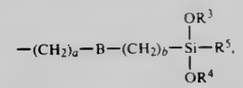
(c) from 0.2 to 1.0 parts by weight of an accelerator per 100 parts by weight of said silane-terminated polyurethane polymer, said accelerator selected from the group consisting of compounds or mixtures thereof having the structure



where

w is an integer of from one to five,

R^8, is hydrogen or

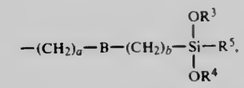


where a is an integer of from one to four, b is zero or an integer of from one to four, B is a direct bond or is a divalent hydrocarbaryl radical or a divalent cyclohydrocarbyl radical, and R^3, R^4, and R^5 are as previously defined,

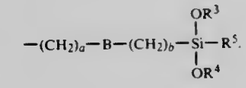
R^9 and R^{10} are independently

hydrogen,

alkyl of from one to five carbon atoms, or



where a, b, B, R^3, R^4, and R^5, are as defined above, with the proviso that at least one of R^8, R^9 and R^{10} must be



4,894,427

AROMATIC POLYESTER-POLYORGANOSILOXANE BLOCK COPOLYMER

Naoki Yamamoto; Hiroshi Mori, both of Hiroshima; Akira Nakata, Otake, and Misayo Suehiro, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,859

Claims priority, application Japan, Sep. 30, 1987, 62-243561; Aug. 8, 1988, 63-196019

Int. Cl.[4] C08G *77/04*

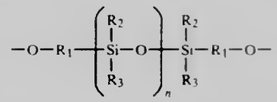
U.S. Cl. 528—26 **11 Claims**

1. An aromatic polyester-polyorganosiloxane block copolymer comprising a polyester segment consisting essentially of:

(a) an aromatic polyester of an aromatic dicarboxylic acid, or mixtures thereof, and a dihydric phenol, a lower aliphatic diol, an alicyclic diol, or mixtures thereof,

(b) an aromatic polyester of an aromatic hydroxycarboxylic acid or mixtures thereof, or

(c) a copolymer of (a) and (b), and a polyorganosiloxane segment having a recurring unit represented by the following formula:



in which R_1 represents a lower alkylene group or a lower alkylene ether group; R_2 and R_3 independently represent a methyl group or a phenyl group; and n represents an integer not smaller than 10, in which bonding between the polyester segment and the polyorganosiloxane segment is an ester linkage formed by a condensation reaction between the terminal carboxyl group of the polyester segment and the terminal hydroxyl group of the polyorganosiloxane segment.

4,894,428

PROCESS FOR COATING SUBSTRATES WITH POLYURETHANE UREAS

Wilhelm Thoma, Leverkusen; Josef Pedain, Cologne, and Waldemar Kling, Kuerten-Bechen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jan. 3, 1989, Ser. No. 292,698

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1988, 3800435

Int. Cl.[4] B05D *3/02*; C08G *18/10*

U.S. Cl. 528—45 **9 Claims**

1. A process for coating a substrate with a polyurethane urea which comprises reacting a prepolymer based on an aromatic polyisocyanate containing an average of two ketoxime blocked NCO groups and having an average molecular weight of about 500 to 15,000 with (B) a chain-extending agent corresponding to the formula

$$H_2N—R'—NH_2$$

in which R' is an aliphatic or cycloaliphatic radical, in the presence of a solvent at a temperature of greater than 50° C. and at an equivalent ratio of blocked isocyanate groups to NH_2 groups of 1.43 to 1.02 until about 40 to 90% of the amino groups have reacted, applying the partially reacted prepolymer to a substrate and crosslinking the coating at a temperature of greater than 120° C.

9. A coated substrate produced in accordance with the process of claim 1.

4,894,429

PROCESS FOR THE PREPARATION OF POLYURETHANES CONTAINING URETDIONE RINGS

Gerhard Grögler; Heinrich Hess, both of Leverkusen, and Richard Kopp, Köln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 120,303, Nov. 13, 1987, Pat. No. 4,786,655.

This application Aug. 26, 1988, Ser. No. 237,117

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640855

Int. Cl.[4] C08G *18/00*

U.S. Cl. 528—45 **4 Claims**

1. A process for the production of a polyurethane in which

(a) an organic polyisocyanate which is at least 50 wt. % diisocyanate containing a uretdione ring, wherein said diisocyanate is in a blocked solid form,

is reacted with

(b) a relatively high molecular weight organic dihydroxyl compound

in the presence of

(c) a bismuth salt of an organic carboxylic acid and

(d) a low molecular weight aromatic diamine in a quantity which is from 5 to 10 times the quantity of the bismuth salt (c) used.

4,894,430

NEW POLYESTER POLYOLS AND THEIR USE AS POLYOL COMPONENT IN TWO-COMPONENT POLYURETHANE LACQUERS

Peter Höhlein, Kempen; Hans-Joachim Höfer; Josef Pedain, both of Cologne, and Manfred Schönfelder, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,056

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740933

Int. Cl.[4] C08G *18/62*

U.S. Cl. 528—75 **5 Claims**

1. A polyester polyol having a hydroxyl number of about 80 to 250 and comprising the reaction product of

(a) about 52 to 60 mole % of a polyol component comprising

(i) about to 2 to 30 mole % of at least one dihydric aliphatic alcohol other than neopentyl glycol which has at least two carbon atoms,

(ii) about 5 to 40 mole % of at least one aliphatic alcohol which has three or more hydroxyl groups and at least three carbon atoms,

(iii) about 20 to 60 mole % of bis-(hydroxymethyl)-cyclohexane and

(iv) about 10 to 50 mole % of neopentyl glycol and

(b) about 40 to 48 mole % of a dicarboxylic acid component comprising

(v) about 50 to 99 mole % of at least one aliphatic, saturated dicarboxylic acid or anhydride of such acid containing at least two carbon atoms and

(vi) about 0.5 to 50 mole % of at least one aliphatic, unsaturated dicarboxylic acid or an anhydride of such an acid containing at least four carbon atoms,

the percentages given under (a) and (b) adding up to 100.

4,894,431

ACCELERATED CURING SYSTEMS FOR EPOXY RESINS

Robert F. Armbruster, Okemos; Rajan Eadara, East Lansing, and William L. Miller, Okemos, all of Mich., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1988, Ser. No. 197,479

Int. Cl.[4] C08G *59/68*

U.S. Cl. 528—90 **14 Claims**

1. A curing system for epoxy resins comprising anhydrous methane sulfonic acid and at least one aliphatic or cycloali-

phatic primary or secondary amine, said acid and said amine being present in a weight ratio of 1:99–10:90.

4,894,432

POLYCARBONATE POLYMER FROM TETRA ARYLENE TRIPHENOL

Kenichi Mizuno; Yozo Jujo, and Hajime Oyoshi, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

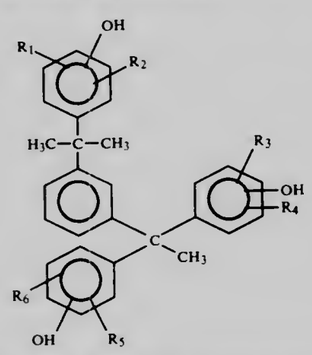
Division of Ser. No. 916,099, Oct. 7, 1986, Pat. No. 4,778,936. This application Aug. 3, 1988, Ser. No. 227,773

Claims priority, application Japan, Oct. 8, 1985, 60-224305; Dec. 20, 1985, 60-287288

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—204 **6 Claims**

1. A polycarbonate comprising (A) a carbonic acid component unit, (B) a divalent phenol component unit, and (c) a triphenol compound component unit derived from the triphenol compound having the formula (I):



wherein R_1, R_2, R_3, R_4, R_5, and R_6, independently, represent hydrogen, a halogen, a C_1–C_5 alkyl group or a C_1–C_5 alkoxy group, the amount of the triphenol compound unit (C) being 0.01 to 10 mol%, based on the divalent phenol component (b) and the intrinsic viscosity, determined at 25° C. in methylene chloride, of the polycarbonate being 0.4 to 1.0 dl/g and the glass transition temperature (Tg), determined by a differential scanning calorimeter, being 150° C. to 300° C.

4,894,433

WATER DISPERSIBLE POLYAMIDE DIETHANOLAMINE ESTER

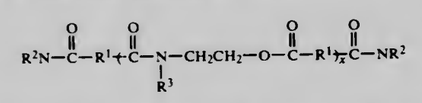
Walter K. Borsack, Jr., Amherst; Roy C. Williams, Orchard Park, both of N.Y., and Keith R. McNally, Bedminster, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Feb. 5, 1988, Ser. No. 152,638

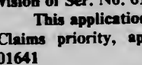
Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 **12 Claims**

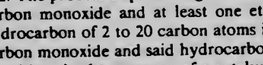
1. A composition comprising the formula:



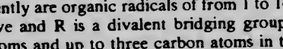
wherein x is an integer of 0–5; R^1 is independently at each occurrence an aliphatic group of up to 40 carbon atoms or polyamide segment; R^2 is independently at each occurrence



(where B is an aliphatic group of up to 10 carbon atoms) or



where E is an aliphatic group of up to 10 carbon atoms or the residue of a cyclic carboxylic anhydride bearing at least one free carboxyl group;



4,894,434

POLYCYANOARYL THIOETHER AND PREPARATION THEREOF

Tetsuya Asahi, and Yozo Kondo, both of Mie, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed May 19, 1988, Ser. No. 195,927

Claims priority, application Japan, May 20, 1987, 62-121392

Int. Cl.[4] C08G *75/14*

U.S. Cl. 528—388 **5 Claims**

1. A polycyanoaryl thioether having a melting point of from 400°–460° C., represented by formula:

where n is a number of not less than 3.

4,894,435

POLYMERIZATION OF OLEFIN/CARBON MONOXIDE WITH NON-TRANSITION METAL SALT, BIDENTATE P LIGAND AND CARBOXYLIC ACID ESTER

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 61,615, Jun. 15, 1987, Pat. No. 4,810,774. This application Sep. 23, 1988, Ser. No. 248,066

Claims priority, application Netherlands, Jun. 24, 1986, 8601641

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **14 Claims**

1. The process of producing a linear, alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon of 2 to 20 carbon atoms inclusive, by contacting carbon monoxide and said hydrocarbon under polymerization conditions in the presence of a catalyst composition prepared from a palladium compound, a non-transition metal salt of non-hydrohalogenic acid having a pKa less than about 6, a bidentate phosphorus ligand of the formula R^1R^2—P—R—P—R^3R^4 in which R^1, R^2, R^3 and R^4 independently are organic radicals of from 1 to 14 carbon atoms inclusive and R is a divalent bridging group of up to 20 carbon atoms and up to three carbon atoms in the bridge, and a carboxylic ester of from 3 to 20 carbon atoms inclusive that is a hydrocarbyl ester or substituted hydrocarbyl ester with substituents which are inert under polymerization conditions, said substituents being selected from hydroxyl, halo or alkoxy group, said carboxylic ester being free from ethylenic unsaturation.

4,894,436

HOMOLOGS OF APROTININ PRODUCED FROM A RECOMBINANT HOST, PROCESS EXPRESSION VECTOR AND RECOMBINANT HOST THEREFOR AND PHARACEUTICAL USE THEREOF

Ernst-August Auerswald; Werner Schröder; Eugen Schnabel; Wolfgang Bruns; Gerd Reinhardt, all of Wuppertal, Fed. Rep. of Germany, and Michael Kotick, Elkhart, Ind., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,501

Claims priority, application United Kingdom, Mar. 26, 1986, 8607523

Int. Cl.[4] C07R *7/10*

U.S. Cl. 530—324 **8 Claims**

1. A microbially produced aprotinin or aprotinin homolog which is substituted in position 52 by an amino acid selected from the group consisting of Glu, Leu, Val, Thr and Ser.

4,894,437

NOVEL RENIN INHIBITING POLYPEPTIDE ANALOGS CONTAINING S-ARYL-D- OR L- OR DL-CYSTEINYL, 3-(ARYLTHIO)LACTIC ACID OR 3-(ARYLTHIO)ALKYL MOIETIES

Ruth E. TenBrink, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

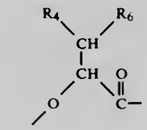
PCT No. PCT/US86/02227, § 371 Date Jun. 29, 1987, § 102(e) Date Jun. 29, 1987, PCT Pub. No. WO87/02986, PCT Pub. Date May 21, 1987

Continuation of Ser. No. 798,459, Nov. 15, 1985, abandoned. This PCT application Oct. 21, 1986, Ser. No. 85,674

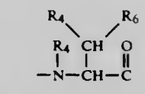
Int. Cl.[4] C07K *7/06*; A61K *37/43*; C07C *101/30*

U.S. Cl. 530—328 **6 Claims**

1. A renin inhibitory peptide, having a stable transition state insert corresponding to the 10,11 position of the renin substrate, and additionally having a moiety of the formula XL_1 or XL_2 corresponding to the 8-position of the renin substrate



XL_1



XL_2

wherein R_4 at each occurrence is the same or different and is
(a) hydrogen, or
(b) C_1–C_5 alkyl; and
wherein R_6 is
(a) —S—aryl,
(b) —S—C_3–C_7 cycloalkyl, or
(c) —S—C_1–C_5 alkyl.

4,894,438

SYNTHETIC PEPTIDIC SUBSTRATE FOR DETERMINATION OF TRYPSIN AND α_1-ANTITRYPSIN

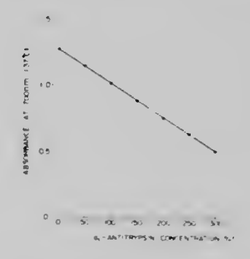
Takeshi Nagasawa, Uraws; Yuko Gemba, Fukushima; Yoshio Nakamura, and Katsumasa Kuroiwa, both of Koriyama, all of Japan, assignors to Nitto Boseki Co., Ltd., Japan

Filed Nov. 21, 1986, Ser. No. 934,249

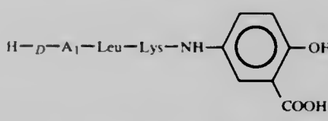
Claims priority, application Japan, Nov. 26, 1985, 60-265388

Int. Cl.[4] C07K *5/08*

U.S. Cl. 530—331 **3 Claims**



1. A synthetic peptide of the formula:



(I)

wherein A_1 is a prolyl (Pro) or alanyl (Ala) group; Leu is a leucyl group; and Lys is a lysyl group, or an acid addition salt thereof.

4,894,439

N-TERMINAL DERIVATIVES OF TUMOR NECROSIS FACTOR PURIFIED BY MICROPOROUS PTFE MEMBRANES

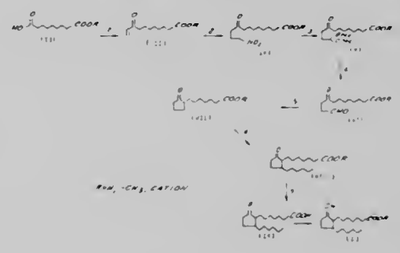
Glenn Dorin, San Rafael, Calif.; Wolfgang H. Haunsch, Brisbane, Australia; James W. Thomson, Albany, Calif.; Sidney N. Wolfe, El Cerrito, Calif., and Leo S. Lin, Walnut Creek, Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed May 22, 1986, Ser. No. 866,213

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] C07K *13/00*

U.S. Cl. 530—351 **9 Claims**



1. A purified TNF composition wherein the TNF is N-terminally deleted, lacking from 1 to 10 amino acids, and is substantially free of pyrogens as determined by the USP rabbit pyro-

gen test at a dosage range of about 1.0 to 2.4×10^5 U/Kg, and is substantially non-bindable to a hydrophobic porous membrane.

4,894,440

METHOD OF ISOLATING MEGAKARYOCYTE STIMULATORY FACTOR

Robert D. Rosenberg, Brookine, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 17, 1986, Ser. No. 908,183
Int. Cl.[4] C07K *3/28*
U.S. Cl. 530—351 **13 Claims**

1. A method for isolating a megakaryocyte stimulatory factor comprising:

a. preparing a concentrated serum-free supernatant from the cell culture medium of HEK cells;

b. contacting said supernatant with ammonium sulfate having greater than 50% saturation, under conditions sufficient to cause precipitation of proteins in the supernatant;

c. contacting the precipitated proteins obtained in step (b) with buffer comprising Tris-HCl and NaCl under conditions sufficient to solubilize the protein containing the megakaryocyte stimulatory factor;

d. contacting the soluble fraction obtained in step (c) with a lectin-Sepharose resin under conditions sufficient to cause the protein containing the megakaryocyte stimulatory factor to bind to the resin;

e. contacting the lectin-Sepharose resin with chitin oligosaccharides under conditions sufficient to elute the megakaryocyte stimulatory factor from the resin;

f. contacting the eluant from step (e) with a first size-exclusion gel and collecting the fractions obtained therefrom;

g. contacting the fractions obtained in step (f) with a second size-exclusion gel, and collecting the purified megakaryocyte stimulatory factor therefrom.

4,894,441

PROCESS FOR THE PREPARATION OF COLLAGEN AND OBTAINED PRODUCT

Claudio Menicagli, Pisa, Italy, assignor to Istituto Gentili S.p.A., Pisa, Italy

Filed Mar. 3, 1988, Ser. No. 163,531
Claims priority, application Italy, Mar. 12, 1987, 19659 A/87
Int. Cl.[4] C07K *15/20*; C07G *7/00*; A01N *63/02*; B01D *13/00*
U.S. Cl. 530—356 **3 Claims**

1. A process for treating bovine tendon to extract high purity collagen in the form of a viscous gel, said extracted collagen having the triple helix configuration of natural collagen and being suitable for direct use in surgical sponges and the like, said extraction being effected without the use of an enzymatic treatment to solubilize the collagen and said extracted collagen not being subjected to a cross-linking procedure to modify its structure, which comprises: suspending a finely divided mass of bovine tendon in a 0.5-14 2.0 M aqueous acetic acid solution in an amount to provide a bovine tendon/acid weight ratio of 01-0.01/1; mildly agitating the resultant suspension for a period of 24–72 hrs. at a temperature not exceeding about 25° C.; separating the suspended solid phase and precipitating collagen from the liquid phase by the addition thereto of sodium chloride, said precipitated collagen being in the form of a gummy, thready product of milky white color; separating said precipitated collagen and suspending it in acetic acid and agitating until complete gelatin is obtained; diluting the resultant collagen gel to a concentration of 0.005-0.5% and subjecting it to tangential filtration through a molecular exclusion membrane having an exclusion limit of 10,000-100,000 using acetic acid of 0.01–1.0 M whereby a filtrate containing impurities of molecular weight below the exclusion is removed while the collagen gel is retained recycling the collagen gel through tangential filtration until all impurities are removed; recovering and drying the purified collagen gel and lyophilizing the same.

4,894,442

MONOCLONAL ANTIBODIES THAT BIND TO ALPHA-ACID GLYCOPROTEIN

Sakuji Toyama, Kyoto, and Masao Tanihara, Kurashiki, both of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Filed Apr. 8, 1986, Ser. No. 849,328
Claims priority, application Japan, Apr. 12, 1985, 60-78965
Int. Cl.[4] C07K *15/00*
U.S. Cl. 530—387 **2 Claims**

1. A monoclonal antibody specific for α_1-acid glycoprotein, which is selected from the group consisting of HA-5 and HA-7.

2. A monoclonal antibody having all the identifying characteristics of HA-13.

4,894,443

TOXIN CONJUGATES

Lawrence I. Greenfield, Albany, Calif.; Donald A. Kaplan, Midland, Mich., and Danute E. Nitecki, Berkeley, Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 578,115, Feb. 8, 1984, abandoned. This application Sep. 7, 1984, Ser. No. 648,759
Int. Cl.[4] A61K *39/00, 39/02*
U.S. Cl. 530—388 **3 Claims**

1. A recombinant polypeptide, useful in making toxin conjugates, comprising:

a diptheria toxin, or an enzymatic fragment of diptheria toxin;

and a spacer covalently linked to said diptheria toxin comprising an amino acid sequence which has the formula:

Gly-Thr-Gly-Ser-Gly-(Pro)$_6$-Ser-Gly-Ser-Gly-Thr-Cys.

4,894,444

RECOVERY AND PURIFICATION OF IMMUNOGENS FROM IMMUNOGEN-ALUM COMPLEXES

Edgar M. Scattergood, Lansdale, Pa., and Roy W. Grabner, Ballwin, Mo., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 16, 1987, Ser. No. 74,376
Int. Cl.[4] C07K *3/26, 3/28*
U.S. Cl. 530—414 **10 Claims**

1. A process for recovering hepatitis B surface antigens from hepatitis B surface antigen alum complexes without altering the immunogenicity of the hepatitis B surface antigens which comprises the following steps:

a. dissolution of the hepatitis B surface antigen alum complex by treating the complexes with a concentration of from about 1% to about 5% of an alkali metal salt of a carboxylic acid, at a pH between about 8.9 and 9.5, at a temperature of from about 10° to about 27° C., for about 60 to about 240 minutes; followed by

b. sterilization;

c. concentration; and

d. purification.

4,894,445

METAL-ISONITRILE ADDUCTS FOR PREPARING RADIONUCLIDE COMPLEXES

Alan P. Carpenter, Jr., Tyngsboro; Leo J. Mabeu, Andover; Michael A. Patz, Somerville, all of Mass.; Thomas H. Tulip, Nashua, N.H.; Karen E. Linder, Somerville, Mass.; Vinayakam Subramanyam, Towson, Md., and Jeffery S. Thompson, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 762,392, Aug. 5, 1985, abandoned. This application Jun. 25, 1986, Ser. No. 880,349
Int. Cl.[4] A61K *49/02*; C07C *119/02*; C07F *1/08, 9/00*
U.S. Cl. 534—14 **7 Claims**

1. A method for preparing a coordination complex of an isonitrile ligand and a radioactive metal selected from the class consisting of radioactive isotopes of Tc, Ru, Co, Pt, Fe, Os, Ir, W, Re, Cr, Mo, Mn, Ni, Rh, Pd, Nb and Ta, said method comprising admixing a lyophilized soluble copper adduct of said isonitrile ligand with a radioactive metal in a suitable solvent to replace said copper with the radioactive metal thereby forming said coordination complex.

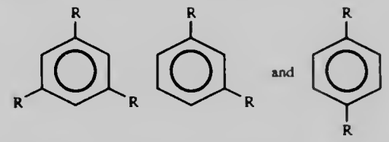
4,894,446

VOLATILE LANTHANUM COMPLEXES AND THEIR USES

Frederick G. N. Cloke, Brighton, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jun. 13, 1988, Ser. No. 206,208
Claims priority, application United Kingdom, Jun. 16, 1987, 8714072
Int. Cl.[4] C07F *5/00, 7/08*; C07C *15/04*; C23C *16/06*
U.S. Cl. 534—15 **7 Claims**

1. Homoleptic bis (π-arene) yttrium or lanthanide complexes having the general formula ML_2 wherein M is yttrium or a lanthanide metal and the L ligands are independently selected from



wherein the R groups are independently selected from (a) C_3 to C_{20} hydrocarbyl radicals or (b) $Si(R^1)_3$ or $CH(Si(R^1)_3)_2$ groups wherein the R^1 groups are independently C_1 to C_{20} hydrocarbyl radicals.

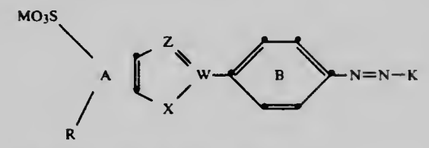
4,894,447

SURFLONATED AZO DYES CONTAINING A DIAZO COMPONENT CONSISTING OF A TWO RING HETEROCYCLE WITH AN AMINOPHENYLENE GROUP

Jean-Marie Adam, Roseaux, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 9, 1987, Ser. No. 36,416
Claims priority, application Switzerland, Apr. 16, 1986, 1521/86-3
Int. Cl.[4] C09B *29/033, 29/33, 29/50, 29/52*
U.S. Cl. 534—775 **16 Claims**

1. An azo dye of the formula



(1)

or tautomeric forms thereof, in which:

Z is N or CH,

X is O,

W is C,

K is a coupling component,

R is hydrogen, C_1–C_6-alkyl, C_1–C_4-alkoxy, halogen, nitro, —CN, —NHR_1, —NH-acyl, phenoxy, —COOH, —$COOR_1$, —$CONHR_1$, phenyl or phenyl which is substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro or sulfo; wherein acyl is C_2–C_6-alkanoyl, benzoyl or benzoyl which is substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro or sulfo; R_1 being hydrogen, C_1–C_6-alkyl, C_1–C_6-alkyl which is substituted by OH, C_1–C_4-alkoxy or C_1–C_4-hydroxyalkoxy, phenyl or phenyl which is substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro or sulfo,

M is $H^{\oplus}$, $Li^{\oplus}$, $Na^{\oplus}$, $K^{\oplus}$, $NH_4^{\oplus}$, or C_4–C_{12}-trialkylammonium, C_4–C_{12}-diammonium or C_2–C_{12}-alkanolammonium,

A is a benzene or pyridine ring which is unsubstituted or substituted by halogen, nitro, —CN, C_1–C_4-alkoxy or C_1–C_4-alkyl,

B is a 1,4-phenylene radical which is unsubstituted or substituted by sulfo, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro or —CN.

4,894,448

PROCESS FOR THE PREPARATION OF LOW-VISCOSITY CELLULOSE ETHERS

Heinz Pelzer, Oestrich-Winkel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 901,297, Aug. 28, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 271,347
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530857
Int. Cl.[4] C08G *18/34*
U.S. Cl. 536—84 **9 Claims**

1. A process for the preparation of low-viscosity cellulose ethers, comprising the steps of:

subjecting cellulose to alkalization with an aqueous sodium hydroxide solution;

subsequently etherifying the alkalized cellulose; and

before said etherifying step, adding an aqueous sodium chlorite solution.

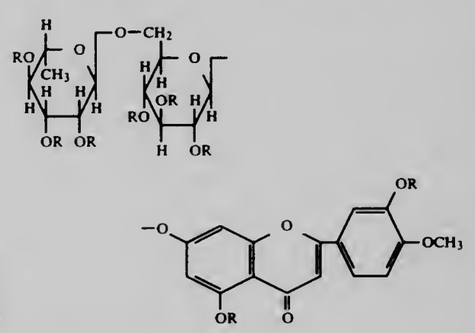
4,894,449

DIOSMIN OCTAKIS (HYDROGEN SULFATE) ALUMINUM COMPLEX

Aurelio O. Venero, Paseo del Puerto, 24 48990 Neguri, and Ramon M. Pestana, Avenida Iparraguirre, 20, 7° A, 48940 Lejona, both of Spain

Filed Jul. 28, 1988, Ser. No. 225,544
Claims priority, application European Pat. Off., Jul. 7, 1987, 87.500.053.1; Spain, Jul. 7, 1987, 8702270
Int. Cl.[4] C07H *11/00, 15/00, 17/06, 15/24*
U.S. Cl. 536—118 **1 Claim**

1. Diosmin octakis (hydrogen sulfate) aluminium complex, with molecular formula:



in which R represents

$SO_3Al_2(OH)_5$.

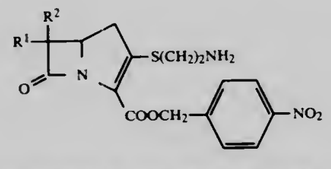
4,894,450

PROCESS FOR 2-(AMINOALKYLTHIO) CARBAPENEMS

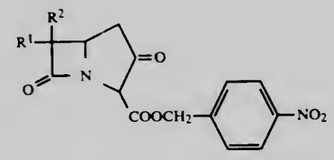
Edward J. J. Grabowski, Westfield, and David L. Hughes, Old Bridge, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 11, 1987, Ser. No. 48,341
Int. Cl.[4] C07D *487/04*
U.S. Cl. 540—350 **3 Claims**

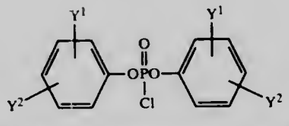
1. A process for preparing a compound of the formula



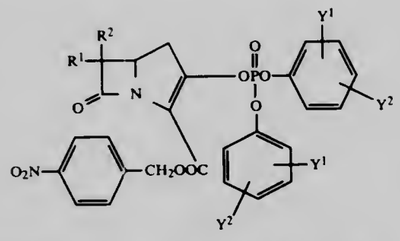
or a pharmaceutically acceptable acid addition salt thereof;
wherein one of R^1 or R^2 is hydrogen and the other of R^1 or R^2 is 1-hydroxyethyl; comprising:
(a) reacting a mixture of diisopropylethylamine and a compound of the formula



wherein R^1 and R^2 are defined as above; with a phosphorochloridate of the formula



wherein Y^1 is 4-chloro, Y^2 is hydrogen or 2-chloro; in N-ethylpyrrolidinone at a temperature of about −50° to form an enol phosphate intermediate of the formula



wherein R^1, R^2, Y^1, and Y^2 are defined as above; and
(b) adding to the enol phosphate intermediate cysteamine hydrochloride at a temperature of from about −70° to about −60°.

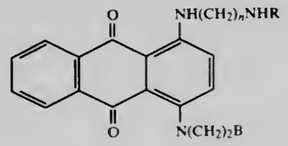
4,894,451

UNSYMMETRICAL 1,4-BIS(AMINOALKYLAMINO)-ANTHRACENE-9, 10-DIONES AND DERIVATIVES

A. Paul Krapcho, South Burlington; Miles P. Hacker, Williston, both of Vt.; John J. Landi, Jr., Cresco, Pa.; J. J. McCormack, Burlington, Vt., and Kenneth J. Shaw, Orangeburg, N.Y., assignors to The University of Vermont, Burlington, Vt.

Continuation of Ser. No. 718,103, Apr. 1, 1985, abandoned. This application Jul. 19, 1988, Ser. No. 222,360
Int. Cl.[4] C07C *87/64*; C07D *295/12*
U.S. Cl. 544—156 **11 Claims**

1. A compound having the formula



(I)

wherein:
B represents a radical selected from a dialkyl amino group having 1 to 4 carbons and a N-heterocyclic radical having 4, 5 or 6 carbon atoms,
n represents 3, 4 or 5, and
R represents alkanoyl or a non-toxic physiologically acceptable salt thereof.

4,894,452

CYANURIC ACID PRODUCTION BY CONTROLLED PYROLYSIS OF BIURET

Kurt F. Stephan, Wenatchee, Wash., assignor to Lenroc Company, Ephrata, Wash.

Filed Apr. 18, 1988, Ser. No. 182,504
Int. Cl.[4] C07D *251/32*
U.S. Cl. 544—192 **12 Claims**

1. A process in which urea is pyrolytically converted to cyanuric acid, said process comprising heating, in dry, particulate, and essentially solid state, a partially pyrolyzed reaction product containing less than about 40% urea by weight an at least from about 30% biuret by weight, the heating of such feedstock occurring while maintaining the particles in essentially solid phase and at a temperature substantially at or slightly below the softening temperature of the particles with forced hot gas flow interstitially through the particles for a sufficient time to increase the cyanuric acid content thereof until the reaction product is principally cyanuric acid, partly by conversion of urea to biuret and in turn by conversion of biuret to cyanuric acid.

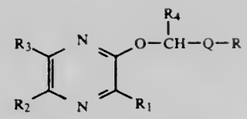
4,894,453

2-SUBSTITUTED ALKOXY-3-SUBSTITUTED-PYRAZINES

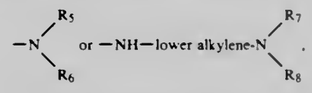
Masao Yaso; Yukio Suzuki; Kensuke Shibata; Daisuke Mochizuki, and Eiichi Hayashi, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 30, 1987, Ser. No. 68,228
Claims priority, application Japan, Jun. 30, 1986, 61-153742; Jun. 30, 1986, 61-153743
Int. Cl.[4] C07D *241/38, 241/18, 403/12*
U.S. Cl. 544—354 **4 Claims**

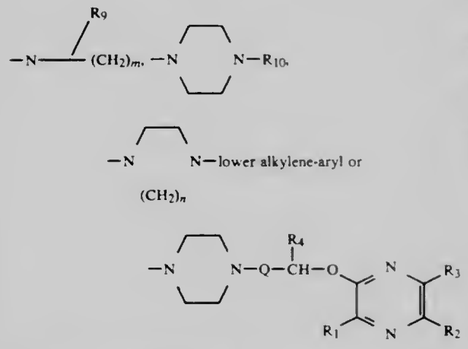
1. A compound of the formula



wherein Q is —CO— or —CH_2—, R is hydroxyl, lower alkoxy, halogen, -NH-lower alkylene-OH, -NH-lower alkylene-arylthio, -NH-lower alkylene-halogen,



is dilower alkylamino, cycloalkyl-amino, morpholino,



in which R_9 is hydrogen, lower alkyl or aryl, R_{10} is hydrogen, lower alkyl, hydroxy-lower alkyl, hydroxy-lower alkoxy-lower alkyl, aryl or di(aryl)-lower alkyl, m is an integer from 4 to 6, n is 2 or 3, R_1 is alkyl or aryl-lower alkyl, R_2 and R_3 together form tetramethylene, R_4 is hydrogen, lower alkyl or aryl, in which aryl is phenyl which is optionally substituted with a group selected from the group consisting of 1–3 halogen, nitro, lower alkyl and lower alkoxy, or a pharmaceutically acceptable salt thereof.

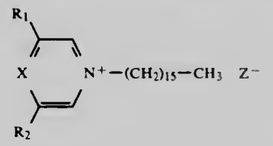
4,894,454

PHARMACEUTICAL PREPARATIONS

Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice Chem.-Pharm. Fabrik, Putter GmbH & Co., KG, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,773
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626700
Int. Cl.[4] C07D *241/19, 241/24*
U.S. Cl. 544—406 **2 Claims**

1. A compound having the formula



in which:
X is a member selected from the group consisting of N and N^+—$(CH_2)_n$—CH_3;
R_1 is a member selected from the group consisting of H, C(O)—O—$(CH_2)_n$—CH_3, and OH;
R_2 is a member selected from the group consisting of H, C(O)—O—$(CH_2)_n$—CH_3, C(O)—NH_2 and OH;
n is 8 to 20; and
Z^- is an anion selected from the group consisting of chloride, bromide, iodide, maleate, formate, acetate, propionate, HSO_4^-, malate, fumarate, salicylate, alginate, gluconate, glucoronate, galactoronate, ethyl sulfate and $H_2PO_4^-$.

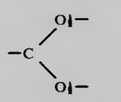
4,894,455

PHARMACEUTICALLY ACTIVE ZINC COMPLEXES

Robert C. Hider, St. Osyth; George Kontoghiorghes; Jack Silver, both of London, and Michael A. Stockham, Saffron Walden, all of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 666,905, Oct. 31, 1984, Pat. No. 4,665,064. This application Feb. 18, 1987, Ser. No. 16,083
Claims priority, application United Kingdom, Oct. 31, 1983, 8329043
Int. Cl.[4] C07F *9/80*
U.S. Cl. 546—2 **39 Claims**

1. A zinc(II) complex in which each ligand is provided by the same or a different compound selected from the group consisting of:
(1) 3-hydroxy-4-pyrone and a 3-hydroxy-4-pyrone in which one or more of the hydrogen atoms attached to ring carbon atoms are replaced by an aliphatic hydrocarbon group of 1 to 6 carbon atoms;
(2) a 3-hydroxypyrid-2-one in which the hydrogen atom attached to the nitrogen atom is replaced by an aliphatic acyl group, by an aliphatic hydrocarbon group of 1 to 6 carbon atoms, or by an aliphatic hydrocarbon group substituted by one or more substituents selected from aliphatic acyl, alkoxy, aliphatic amide, aliphatic ester, halogen and hydroxy groups and in which one or more of the hydrogen atoms attached to ring carbon atoms may be replaced by one of said substituents, by an aliphatic hydrocarbon group of 1 to 6 carbon atoms, or by an aliphatic hydrocarbon group substituted by an alkoxy, aliphatic ester, halogen or hydroxy group; and
(3) an alternative compound providing a physiologically acceptable, monobasic, bidentate ligand which is capable of bonding covalently to zinc and which (a) contains a first grouping which is an enolic hydroxy group or a carboxy group and a second grouping which is an amine group or a hydroxy group, (b) is a monocarboxylic acid providing an anion containing a group



or (c) is a 3-hydroxypyrid-4-one in which the hydrogen atom attached to the nitrogen atom is replaced by an aliphatic acyl group, by an aliphatic hydrocarbon group of 1 to 6 carbon atoms, or by an aliphatic hydrocarbon group substituted by one or more substituents selected from aliphatic acyl, alkoxy, aliphatic amide, aliphatic ester, halogen and hydroxy groups and in which one or more of the hydrogen atoms attached to ring carbon atoms may be replaced by one of said substituents, by an aliphatic hydrocarbon group of 1 to 6 carbon atoms, or by an aliphatic hydrocarbon group substituted by an alkoxy, aliphatic ester, halogen or hydroxy group; but with the proviso that at least one ligand is of type (1) or (2) and excluding complexes in which the ligand is provided by a compound, or each ligand is provided by the same com-

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pound, which is 3-hydroxy-4-pyrone, 3-hydroxy-2-methyl-4-pyrone or 3-hydroxy-6-methyl-4-pyrone.

4,894,456

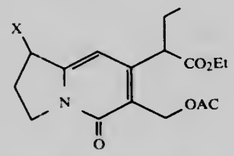
SYNTHESIS OF CAMPTOTHECIN AND ANALOGS THEREOF

Monroe E. Wall, Chapel Hill; Mansukh C. Wani, Durham; Allan W. Nicholas, and Govindarajan Manikumar, both of Raleigh, all of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

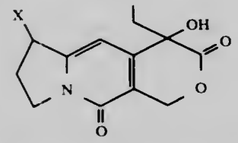
Filed Mar. 31, 1987, Ser. No. 32,449
Int. Cl.[4] A61K *31/47*; C07D *491/147, 491/22*
U.S. Cl. 546—41 **12 Claims**

1. A method for synthesizing camptothecin and analogs thereof, comprising the steps of:

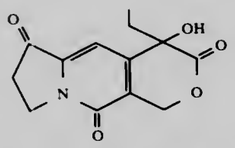
cyclizing a compound of the formula shown below, wherein X is an organic group which is converted to a carbonyl group when treated with an acid; in the presence of a basic catalyst, and a source of oxygen,



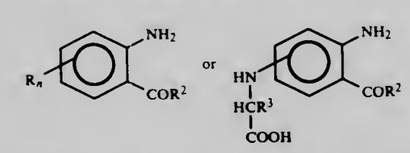
to form a lactone having the formula



deprotecting said lactone to form a hydroxyl-containing tricyclic compound having the formula shown below, and



reacting said hydroxyl-containing tricyclic compound in the presence of an acid or base catalyst, with a substituted ortho-amino compound of the formula



wherein n=1-2 and wherein each R is selected from the group consisting of cyano, methylenedioxy, formyl, hydroxy, C_{1-8} alkoxy, nitro, amino, chloro, bromo, iodo, fluoro, C_{1-8} alkyl, trifluoromethyl, aminomethyl, amido, azido and hydrazino groups; R^2 is H or C_{1-8} alkyl; and R^3 is the side-chain of any of the twenty naturally occurring amino acids.

12. The compound 10,11-methylenedioxy-20(RS)camptothecin.

4,894,457

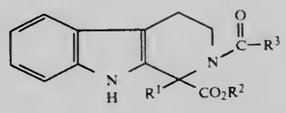
7-BROMO-BETA-CARBOLINE COMPOUND AND METHOD FOR PRODUCING SAME

Masaaki Kubo, Sayama; Hiroshi Umezawa, and Kazuhiro Okura, both of Kawagoe, all of Japan, assignors to Kawaken Fine Chemicals Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,392
Claims priority, application Japan, Dec. 25, 1986, 61-310496
Int. Cl.[4] C07D *471/04*
U.S. Cl. 546—85 **9 Claims**

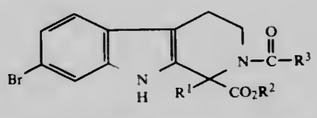
1. A method for producing a 7-bromo-β-carboline compound comprising the steps of:

(A) reacting a β-carboline compound of the formula (II):



(II)

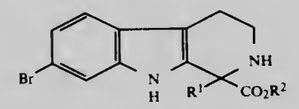
wherein R^1 represents a member selected from the group consisting of a hydrogen atom and alkyl radicals having 1 to 5 carbon atoms, R^2 represents a member selected from the group consisting of alkyl radicals having 1 to 5 carbon atoms and a benzyl radical, and R^3 represents a member selected from the group consisting of a hydrogen atom, alkyl radicals having 1 to 5 carbon atoms, alkoxy radicals having 1 to 5 carbon atoms and a benzyloxy radical, with a brominating agent selected from the group consisting of bromine and N-bromosuccinimide, in an amount of 0.8 to 1.5 molar equivalent weight per molar equivalent weight of the β- carboline compound of the formula (II), in an organic solvent in the presence of an alkali at a temperature lower than the boiling point of the organic solvent, to prepare a precursory 7-bromo-β-carboline compound of the formula (II1):



(III)

wherein R^1, R^2 and R^3 are as defined above; and

(B) hydrolyzing the precursory compound of the formula (III) in a solvent in the presence of a mineral acid at a temperature of 80° C. or less, to provide a 7-bromo-β-carboline compound of the formula (I):



(I)

wherein R^1 and R^2 are as defined above.

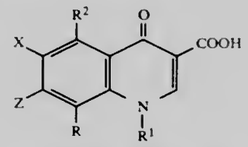
4,894,458

QUINOLONECARBOXYLIC ACID DERIVATIVES AND THEIR PREPARATION

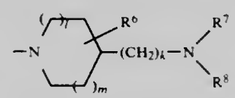
Kuniyoshi Masuzawa, Koga; Seigo Suzue; Keiji Hirai, both of Kuki, and Takayoshi Ishizaki, Washimiya, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 26,194, Mar. 16, 1987, abandoned. This application Aug. 18, 1988, Ser. No. 233,363
Claims priority, application Japan, Mar. 17, 1986, 61-59016
Int. Cl.[4] C07D *401/04*
U.S. Cl. 546—156 **8 Claims**

1. A compound of the formula:



wherein R indicates straight or branched lower alkyl, R^1 indicates cycloalkyl having 3 to 6 carbon atoms, straight or branched lower alkyl, halogenalkyl, alkenyl, hydroxyalkyl, lower alkylamino or phenyl, R^2 indicates hydrogen, halogen, nitro or amino, X indicates halogen, Z indicates pyrrolidino or piperidino of the following formula:



wherein k is 0, 1 or 2, l is 0 or 1 or 2, m is 0 or 1, R^6 indicates hydrogen, lower alkyl or hydroxy, R^7 indicates hydrogen, lower alkyl, halogenoalkyl or hydroxyalkyl, R^8 indicates hydrogen, lower alkyl, lower acyl, alkoxycarbonyl or benzyl; and the hydrates and pharmaceutically acceptable acid addition or alkali salts thereof.

4,894,459

PROCESS FOR THE PREPARATION OF MORPHOLOGICALLY HOMOGENEOUS FORMS OF THIAZOLE DERIVATIVES

Péter Bod, Gyömro; Kálmán Harsányi, Budapest; Béla Hegedüs, Budapest; Erik Bogach, Budapest; Éva Fekecs, Budapest; Imre Péter, Budapest; Zsuzsanna Aracs né Trischler, Budapest; Sándor Miszori, Budapest, and Mária Stiller, Budapest, all of Hungary, assignors to Richter Gedeon Vehyeszeti Gyar Rt., Budapest, Hungary

Filed Aug. 4, 1987, Ser. No. 81,423
Claims priority, application Hungary, Aug. 5, 1986, 3370/86
Int. Cl.[4] C07D *277/42*
U.S. Cl. 548—197 **4 Claims**

1. A process for preparation of morphologically homogeneous Famotidine [chemical name: N-sulfamoyl-3-(2-guanidinothiazole-4-yl-methylthio)-propionamidine], characterized by dissolving Famotidine of optional morphological composition in water and/or a lower aliphatic alcohol under heating and

(a) in the case of the preparation of the form "A" the hot-saturated solution is crystallized by using a cooling rate of about 1° C./min or less, or

(b) in the case of the preparation of the form "B" the product is precipitated from its oversaturated solution, which was oversaturated at a temperature lower than 40° C.,

and in both cases the required product is separated from the obtained suspension of crystals.

4,894,460

BASIC ESTERS EXHIBITING AN ANTAGONISTIC ACTIVITY TO CALCIUM, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREFROM

Silvia Z. Tricerri, Carimate; Cesare Casagrande, Arese; Franco de Marchi, Milan, and Massimo Nicola, Pavia, all of Italy, assignors to Pierrel S.p.A., Napoli, Italy

Continuation-in-part of Ser. No. 498,247, May 26, 1983, abandoned. This application Dec. 19, 1983, Ser. No. 563,008
Claims priority, application Italy, Jun. 3, 1982, 21678 A/82; May 11, 1983, 21043 A/83
Int. Cl.[4] C07D *401/00*
U.S. Cl. 544—331 **2 Claims**

1. The compound 2[4-(2-thiazolyl)]piperazino-ethyl 2,6-dimethyl-4-(3-nitrophenyl)-5-methoxycarbonyl-1,4-dihydropyridine-3-carboxylate.

4,894,461

3-(γ-CHLOROPROPYL)-6-FLUORO-1,2-BENZISOXAZOLE

Larry Davis, Sergeantsville, and Richard C. Effland, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation of Ser. No. 257,698, Apr. 27, 1981, abandoned. This application Feb. 27, 1986, Ser. No. 833,587
Int. Cl.[4] C07D *31/42*
U.S. Cl. 548—241 **1 Claim**

1. The compound 3-(γ-chloropropyl)-6-fluoro-1,2-benzisoxazole.

4,894,462

PREPARATION OF SPHEROIDAL 3-NITRO-1,2,4-TRIAZOLE-5-ONE

Steven L. Collignon, Waldorf, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1988, Ser. No. 213,037
Int. Cl.[4] C07D *249/12*
U.S. Cl. 548—265 **6 Claims**

1. A process for producing spheroidal crystals of 3-nitro-1,2,4-triazol-5-one comprising the following steps in order:

(1) completely dissolving 3-nitro-1,2,4-triazol-5-one in a low molecular weight alcohol of from 1 to 5 carbon atoms at a temperature of from 40° C. up to just below the boiling point of the alcohol at ambient pressure;

(2) cooling the 3-nitro-1,2,4-triazol-one/alcohol solution at a rate of from 6° C./minute to 20° C./minute while the solution is agitated until the solution is at a temperature in the range of from −10° C. to +5° C.; and

(3) isolating the product spheroidal crystals of 3-nitro-1,2,4-triazol-5-one.

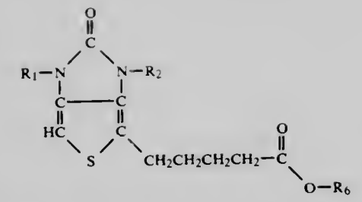
4,894,463

PROCESS FOR PREPARING THIOPHENE DERIVATIVES

Holger Blum, Parkalee 75, 2000 Hamburg 13, Fed. Rep. of Germany

Filed Aug. 16, 1988, Ser. No. 232,678
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727428; European Pat. Off., Sep. 15, 1987, 87113493.8
Int. Cl.[4] C07D *235/00*
U.S. Cl. 548—303 **4 Claims**

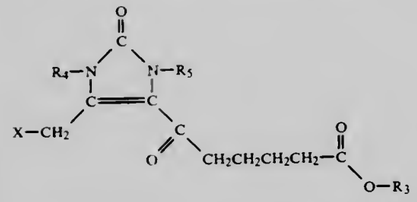
1. A process for preparing thiophene derivatives of the general formula



wherein R_1 and R_2, which may be the same or different, are each hydrogen or lower acyl, and R_6 is hydrogen or lower alkyl, characterized by

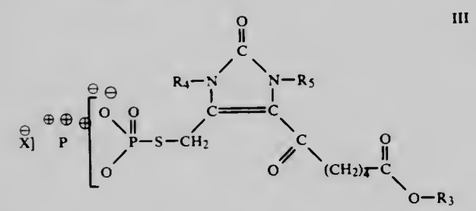
(a) reacting a compound of the general formula

II



wherein R_3 is lower alkyl, R_4 and R_5 are lower acyl and X is chlorine, bromine or iodine, with a strong basic quaternary ammonium anion exchange resin in the monothiophosphate form to form a polymer compound of the general formula

III



wherein R_3, R_4 and R_5 have the above significance and $(P)^{+++}$ represents a polymer cation,

(b) separating the polymer intermediate product of formula (III) obtained in step (a) from non-reacted accompanying substances by washing with a washing liquid capable of dissolving the accompanying substances, and then

(c) reacting the washed polymer intermediate product of formula (III) in an acidic medium to form the thiophene derivative of formula (I).

4,894,464

BRANCHED AMIDES OF L-ASPARTYL-D-AMINO ACID DIPEPTIDES

Thomas M. Brennan, and Michael E. Hendrick, both of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

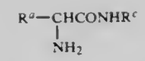
Division of Ser. No. 796,173, Nov. 8, 1985, Pat. No. 4,804,782, which is a division of Ser. No. 496,428, May 20, 1983, abandoned, which is a division of Ser. No. 201,745, Nov. 5, 1980, Pat. No. 4,411,925, which is a continuation-in-part of Ser. No. 113,800, Jan. 21, 1980, abandoned. This application Oct. 26, 1988, Ser. No. 262,627

Int. Cl.[4] C07D *331/04, 333/36, 335/02*

U.S. Cl. 549—88 **3 Claims**

1. A D-amino acid amide compound of the formula

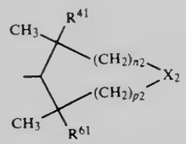
I



wherein

R^a is methyl, ethyl, isopropyl or n-propyl and

R^c is a



where n_2 and p_2 are each 0 or 1 and

when n_2 and p_2 are each zero: R^{41} and R^{61} are each methyl and X_2 is S, or SO_2,

when n_2 is zero and p_2 is 1: R^{41} and R^{61} are each methyl and X_2 is S or SO_2, and

when n_2 is 1 and p_2 is 1: R^{41} and R^{61} are each hydrogen and X_2 is S or SO_2.

4,894,465

INTERMEDIATES AND PROCESSES FOR 6-HYDROXYMETHYL HMG-COA REDUCTABLE INHIBITORS

Ta J. Lee, and William F. Hoffman, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

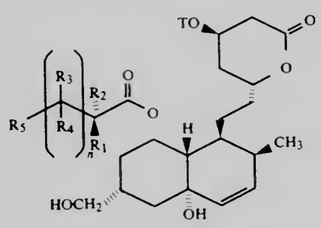
Filed Feb. 29, 1988, Ser. No. 161,530

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—214 **4 Claims**

1. A compound of structural formula (H):

(H)



wherein

n is 0 to 3;

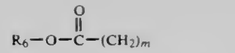
R_1 and R_2 independently are hydrogen, $C_{1\text{-}5}$alkyl, or R_1 and R_2 together with the carbon atom to which they are attached form a carbocyclic ring of 3 to 8 carbon atoms;

R_3 and R_4 are independently hydrogen, $C_{1\text{-}3}$ alkyl, $C_{3\text{-}7}$ cycloalkyl, $C_{1\text{-}3}$ alkylthio, phenyl, phenylthio or substituted phenyl in which the substituents are V and W and when n is 2 to 3, each of the R_3s and R_4s are independently hydrogen, $C_{1\text{-}3}$ alkyl, $C_{3\text{-}7}$ cycloalkyl or only one of the R_3s or R_4s on the chain of carbons is phenyl or substituted phenyl;

R_5 is hydrogen, tosylate, OT, $C_{1\text{-}5}$alkyl or $C_{1\text{-}5}$alkyl substituted with tosylate or OT, or $C_{3\text{-}7}$cycloalkyl or $C_{3\text{-}7}$cycloalkyl; substituted with $C_{1\text{-}3}$alkyl, tosylate or OT, $C_{2\text{-}5}$ alkenyl, phenyl or substituted phenyl in which the substituents are V and W, or R_5 in a group selected from:

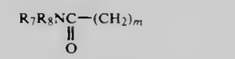
(a) $C_{1\text{-}5}$-alkanoyloxy-$C_{1\text{-}4}$-alkyl,

(b)



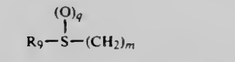
in which m is 0 to 3 and R_6 is $C_{1\text{-}5}$ alkyl;

(c)



in which R_7 and R_8 are independently $C_{1\text{-}5}$ alkyl or R_7 and R_8 together with the nitrogen atom to which they are attached form a heterocycle selected from piperidinyl, morpholinyl, pyrrolidinyl, piperazinyl or thiomorpholinyl;

(d)



in which q is 0 to 2 and R_9 is $C_{1\text{-}5}$alkyl or phenyl or substituted phenyl in TO-$C_{1\text{-}3}$alkyl which the substituents are V and W;

V and W independently are hydrogen, halogen, hydroxy, trifluoromethyl, $C_{1\text{-}3}$alkyl, $C_{1\text{-}3}$alkyloxy and TO-$C_{1\text{-}3}$alkyl;

T is tert-butyldimethylsilyl, tert-butyldiphenylsilyl, trimethylsilyl, triethylsilyl, triisopropylsilyl or tetrahydropyranyl.

4,894,466

INTERMEDIATES AND PROCESSES FOR β-6-HYDROXYMETHYL HMG-COA REDUCTABLE INHIBITORS

Ta Jyh Lee, and William F. Hoffman, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

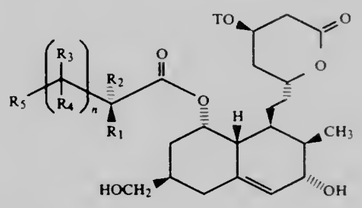
Filed Feb. 29, 1988, Ser. No. 161,529

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—292 **4 Claims**

1. A compound of structural formula (9):

(9)



wherein:

n is 0 to 3;

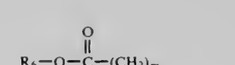
R_1 and R_2 independently are hydrogen, $C_{1\text{-}5}$ alkyl, or R_1 and R_2 together with the carbon atom to which they are attached form a carbocyclic ring of 3 to 8 carbon atoms;

R_3 and R_4 are independently hydrogen, $C_{1\text{-}3}$ alkyl, $C_{3\text{-}7}$ cycloalkyl, $C_{1\text{-}3}$ alkylthio, phenyl, phenylthio or substituted phenyl in which the substituents are V and W and when n is 2 to 3, each of the R_3s and R_4s are independently hydrogen. $C_{1\text{-}3}$ alkyl, $C_{3\text{-}7}$ cycloalkyl or only one of the Rs and R_4s is phenyl or substituted phenyl;

R_5 is hydrogen, tosylate, OT, $C_{1\text{-}5}$alkyl or $C_{1\text{-}5}$alkyl substituted with tosylate or OT, or $C_{3\text{-}7}$cycloalkyl or $C_{3\text{-}7}$-cycloalkyl substituted with $C_{1\text{-}3}$alkyl, tosylate, or OT, $C_{2\text{-}5}$ alkenyl, phenyl or substituted phenyl in which the substituents are V and W, or R_5 is a group selected from:

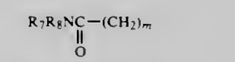
(a) $C_{1\text{-}5}$-alkanoyloxy-$C_{1\text{-}4}$-alkyl,

(b)



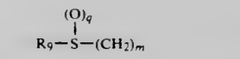
in which m is 0 to 3 and R_6 is $C_{1\text{-}5}$ alkyl;

(c)



in which R_7 and R_8 are independently $C_{1\text{-}5}$ alkyl or R_7 and R_8 together with the nitrogen atom to which they are attached form a heterocycle selected from piperidinyl, morpholinyl, pyrrolidinyl, piperazinyl or thiomorpholinyl;

(d)



in which q is 0 to 2 and R_9 is $C_{1\text{-}5}$ alkyl or phenyl or substituted phenyl in which the substituents are V and W;

V and W independently are hydrogen, halogen, hydroxy, trifluoromethyl, $C_{1\text{-}3}$ alkyl, $C_{1\text{-}3}$ alkyloxy and TO-$C_{1\text{-}3}$ alkyl;

T is tert-butyldimethylsilyl, tert-butyldiphenylsilyl, trimethylsilyl, triethylsilyl, triisopropylsilyl or tetrahydropyranyl.

4,894,467

VAPOR PHASE OXIDATION OR STYRENE TO STYRENE OXIDE

Patricia R. Blum, Macedonia, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 16, 1986, Ser. No. 919,722

Int. Cl.[4] C07B *301/10*

U.S. Cl. 549—534 **7 Claims**

1. A process for making styrene oxide which comprises contacting styrene in the vapor phase with a molecular oxygen-containing gas over a silver metal catalyst containing a promoting amount of at least one alkali metal hydroxide selected from sodium, potassium and lithium hydroxides, on an inert solid inorganic support at contact times of from 0.6 to 10 seconds and temperatures from 200° to 350° C.

4,894,468

SUBSTITUTED SILICA

Meir Wilchek, and Karin Cabrera, both of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

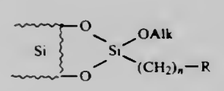
Filed May 1, 1987, Ser. No. 44,475

Claims priority, application Israel, Apr. 27, 1986, 78678

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—416 **10 Claims**

1. A compound of the general formula



wherein:

Alk is lower alkyl and Si is silica, and where:

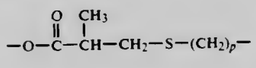
a. the compound is a primary hydroxy silica compound, wherein R is hydroxyl or R is $-(CH_2)_n-O-(CH_2-)_m-CH_2-OH$,

b. a derivative thereof wherein:

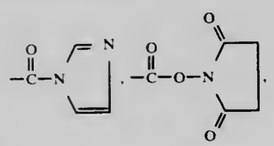
R is $-O-(CH_2)_m-R^1-OR^2$,

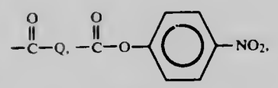
R^1 is a group selected from:

$-CH_2-$, $-O-CH_2-$, $-O-CH_2-CH_2-$,



R^2 is selected from: hydrogen, $-CN$, $-SO_2CH_2-CF_3$,





where Q is a group $-HN-(CH_2)_n-NH_2$, $-HN-(CH_2-)_n-COOH$, —HN—peptide or —HN—protein, where n, m and p are small integers, where m may also be zero.

4,894,469

PROCESS FOR MAKING HALOGENATED PHOSPHONOPHOSPHORIC ACID-ESTERS AND THEIR USE

Horst Staendeke, Lohmar, and Werner Krause, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

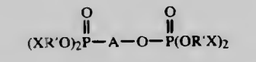
Filed Dec. 4, 1987, Ser. No. 128,805

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643684

Int. Cl.[4] C07F *9/20*

U.S. Cl. 558—90 9 Claims

1. A process for making halogenated phosphonophosphoric acid esters of the general formula:



in which

X stands for a halogen

R' stands for an alkylene having from 1 to 4 carbon atoms

A stands for $>C=CR_2'''$

R''' stands for identical or different alkyl groups having from 1 to 4 carbon atoms, a halogen or hydrogen

comprising the steps of:

(a) reacting phosphorus (III) chloride with alkylene oxide in the presence of a catalyst at a temperature between −20° and +20° C. and a reaction period between 0.5 and 5 hours;

(b) freeing the resulting reaction product consisting substantially of phosphorous acid trialkylester from alkylene oxide in excess;

(c) reacting the said reaction product with a halogenoacyl halide having from 2 to 6 carbon atoms in a molar ratio of 2:(1–1.5) at a temperature between 0° and 100° C. and a reaction period between 0.5 and 5 hours;

(d) repeatedly scrubbing the resulting phosphonophosphoric acid ester with an aqueous medium; and

(e) separating said phosphonophosphoric acid ester in a distillation step.

4,894,470

PROCESS FOR THE PREPARATION OF DIALKYL VINYLPHOSPHONATES

Günter Roscher, Kelkheim; Hans-Jerg Kleiner, Kronberg-/Taunus; Gabriele Ibl, Frankfurt am Main, and Hermann Leipe, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,797

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707149

Int. Cl.[4] C07F *9/40*

U.S. Cl. 558—142 20 Claims

1. A process for the production of dialkyl esters of vinyl phosphonic acid which comprises subjecting dialkyl esters of 2-acetoxyethane phosphonic acid to cleavage by contacting with an acidic liquid catalytically acting medium at a temperature in the range from 150°to 270° C. and under a pressure such that the partial pressures of the total of the components of the reaction system is in the range from 1 to 500 mbar, and drawing off the resulting dialkyl esters of vinyl phosphonic acid and other volatile reactions products.

4,894,471

CONTINUOUS PROCESS FOR THE ALKYLATION OF CH-ACID COMPOUNDS WITH ALKYL CARBONATES IN GAS-LIQUID PHASE TRANSFER CATALYSIS-CONDITIONS

Enrico Angeletti; Franco Trotta; Pietro Tundo, and Paolo Venturello, all of Turin, Italy, assignors to Consiglio Nazionale Delle Richerche, Rome, Italy

Filed Mar. 30, 1987, Ser. No. 31,598

Claims priority, application Italy, Apr. 3, 1986, 19971 A/86

Int. Cl.[4] C07C *121/66, 121/68*

U.S. Cl. 558—378 8 Claims

1. A continuous process for the monoalkylation of a CH-acid compound selected from (1) an arylacetonitrile in which the aryl is, 6-methoxy-2-naphthyl, phenyl, p-isobutylphenyl, 3-phenoxy-phenyl, 3-fluoro-4-phenyl-phenyl, and 3-chloro-4-cyclohexyl phenyl and (2) methyl or ethyl malonic acid diester, which comprises introducing a liquid mixture of said CH-acid compound and a C_1–C_4 dialkyl carbonate in a compound/carbonate molar ratio of 1:1–60 into a vapor phase reaction zone maintained at a temperature of 120°–250° C. and a pressure of 0.01–5 bar and containing a catalyst bed comprising (a) a base selected from an alkali or alkaline earth metal carbonate, bicarbonate or hydroxide, (b) a phase transfer catalyst selected from polyalkylene glycols and block or random copolyalkylene glycols, condensation products of ethylene oxide and propylene oxide, and polyamides and copolyamides, and (c) an inert catalyst support comprising alumina in particulate form; the flow of said liquid mixture into said reaction zone being at a rate of 5–50ml.hr of mixture per 100 g of catalyst bed; and recovering the monalkylated CH-acid product by condensing the resultant reaction products.

4,894,472

DICYANOETHYLARYL DERIVATIVES AND PROCESS FOR THEIR PREPARATION

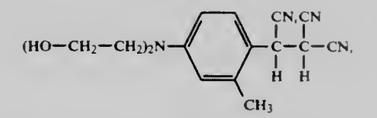
Florin Seng, Gladbach, and Klaus Wehling, Wuppertal, both of Fed. Rep. of Germany, assignors to Miles Inc., Elkhart, Ind.

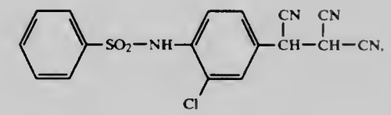
Filed Mar. 21, 1988, Ser. No. 170,754

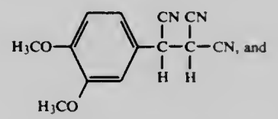
Int. Cl.[4] C07C *121/66;* C12Q *1/28*

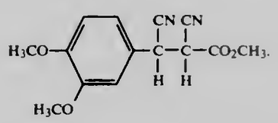
U.S. Cl. 558—405 2 Claims

1. A compound selected from the group consisting of









4,894,473

PROCESS FOR PREPARING 7-(2-HEXYL-5-HYDROXY-CYCLOPENTYL)-HEPTANOIC ACID

Umberto Valcavi, Milan; Sergio Innocenti, Melegnano; Enrico Bosone, Milan; Paolo Farina, Milan; Vittorio Marotta, Milan, and Gianbattista Zabban, Milan, all of Italy, assignors to Istituto Biochimico Italiano Giovanni Lorenzini S.p.A., Italy

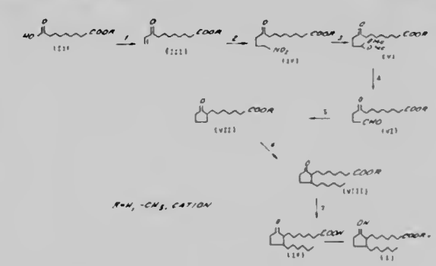
Continuation of Ser. No. 744,406, Jun. 13, 1985, abandoned.

This application Nov. 5, 1987, Ser. No. 117,669

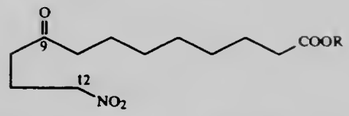
Claims priority, application Italy, Jun. 5, 1984, 19043 A/84; European Pat. Off., Dec. 15, 1984, 84115548; Japan, Jun. 27, 1985, 60-139202

Int. Cl.[4] C07C *177/00*

U.S. Cl. 560—156 11 Claims



1. A compound having the formula



(IV)

wherein R=H, CH_3, C_2H_5, C_3H_7or C_4H_9.

4. The process of claim 3 wherein the hydrolysis step (e) is effected with hydrochloric acid.

4,894,474

PREPARATION OF ALKYL PENTENOATES

Robert Maerkl, Frankenheim; Werner Bertleff, Viernheim; Hans J. Wilfinger, Schifferstadt; Gunter Schuch, Ludwigshafen; Wolfgang Harder, Weinheim; Gebhard Knebn, Ludwigshafen, and Paul Panitz, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 225,823

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725241

Int. Cl.[4] C07C *67/36*

U.S. Cl. 560—206 20 Claims

1. A process for preparing an alkyl pentenoate, comprising: reacting butadiene with carbon monoxide and an alkanol in the presence of a cobalt carbonyl complex and a tertiary aromatic heterocyclic nitrogen base at from 80° to 160° C. under from 100 to 1,000 bar in the presence of from 0.1 to 10% by volume of hydrogen, based on the amount of carbon monoxide used.

4,894,475

ALPHA-ACYLOXYKETONE DERIVATIVES

Hiroaki Tan, Ohtake; Koji Kato, Waki; Junichi Imuta, Ohtake, and Noriaki Kihara, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

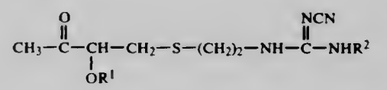
Filed Dec. 28, 1987, Ser. No. 138,076

Claims priority, application Japan, Dec. 26, 1986, 61-308538

Int. Cl.[4] C07C *149/437, 149/243*

U.S. Cl. 560—251 7 Claims

1. An alpha-acyloxyketone derivative represented by the formula (I)



(I)

wherein R^1 represents a lower aliphatic acyl group, and R^2 represents a lower alkyl group having 1–4 carbon atoms.

4,894,476

GABAPENTIN MONOHYDRATE AND A PROCESS FOR PRODUCING THE SAME

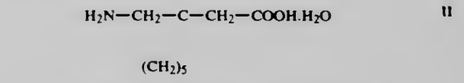
Donald E. Butler, Holland, and Barbara J. Greenman, Door, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 2, 1988, Ser. No. 188,819

Int. Cl.[4] C07C *101/14*

U.S. Cl. 562—504 2 Claims

1.



(II)

exhibiting essentially the following X-ray diffraction data:

Spacing 'd'	Relative Intensities
14.255	99
7.196	99
5.438	4
4.848	99
4.575	7
4.291	7
3.633	99
3.376	21
3.220	9
2.903	28
2.771	23
2.356	7

VOL 1110 ISS 3 JA 16 1990 UMI

-continued

Spacing 'd'	Relative Intensities
2.344	12

4,894,477

PROCESS FOR REGENERATING A CARBONYLATION CATALYST SOLUTION TO REMOVE CORROSION METALS AND CARBONYLATION OF METHANOL TO ACETIC ACID

Mark O. Scates, Pearland; G. P. Torrence, Corpus Christi, and Ronny G. Wood, Houston, all of Tex., assignors to Hoechst Celanese Corporation, Sommerville, N.J.

Filed Oct. 14, 1986, Ser. No. 918,740
Int. Cl.[4] C07C *51/12, 53/08, 51/47*
U.S. Cl. 562—519 18 Claims

1. A process for the regeneration of carbonylation catalyst solutions containing rhodium and lithium and further containing corrosion metal contaminants which comprises intimately contacting said catalyst solution with a cation exchange resin in the lithium form and recovering a catalyst solution of reduced metal contaminant content.

10. In a process for the carbonylation of methanol to acetic acid in a carbonylation reactor by passing carbon monoxide through a reaction medium contained in said reactor and comprising methanol and a catalyst solution of low water content comprising rhodium, a methyl iodide promoter, methyl acetate and lithium iodide to produce acetic acid and said acetic acid is recovered from the effluent of said reactor by concentrating the effluent into a variety of process streams comprising one or more of the components of said catalyst solution and product acetic acid wherein said streams contain lithium and corrosion metal contaminants, the improvement comprising: removing said metal contaminants from at least one of said process streams by intimately contacting said stream with a cation exchange resin in the lithium form and recovering a process stream of substantially reduced metal contaminant content.

4,894,478

PROCESS OF PRODUCING KETOXIMES

Paolo Roffia, Saronno; Giuseppe Paparatto, Cinisello Balsamo; Alberto Cesana, Carate Brianz, and Giorgio Tauszik, Milan, all of Italy, assignors to Montedipe S.p.A., Milan, Italy

Filed Jul. 25, 1988, Ser. No. 223,403
Claims priority, application Italy, Jul. 29, 1987, 21493 A/87
Int. Cl.[4] C07C *131/04*
U.S. Cl. 564—267 14 Claims

1. A process for the manufacture of cyclohexanone-oxime characterized in that:

(a) cyclohexanol is subjected to a partial low-temperature oxidation in the liquid phase, by means of oxygen or an oxygen-containing gas, an oxidized mixture being thereby formed which contains an excess of unreacted cyclohexanol, the ketone corresponding to said cyclohexanol, hydrogen peroxide, and organic compounds having a hydroperoxidic and/or peroxidic structure; and

(b) directly reacting said oxidized mixture with ammonia in the liquid phase, in the presence of an ammoximation catalyst consisting essentially of a titanium-silicalite, the oxidation temperature being from 50° to 150° C.

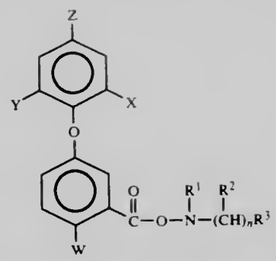
4,894,479

HERBICIDAL DIPHENYL ETHERS

John W. Ashmore, North Wales, and Ted Fujimoto, Churchville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 1, 1981, Ser. No. 269,224
Int. Cl.[4] C07L *53/00*
U.S. Cl. 564—300 11 Claims

1. A compound of the formula



wherein X is hydrogen, halo, trihalomethyl, alkyl, nitro or cyano; Y is hydrogen or halo; Z is halo, trihalomethyl-or pentahaloethyl; W is nitro, cyano, halo or a radical of the formula: $S(O)_{n'}R$ wherein R is lower alkyl or trihaloalkyl; n' has a value of from 0 to 2; R^1 is hydrogen or a substituted or unsubstituted, saturated or unsaturated hydrocarbyl radical; R^2 is hydrogen or lower aikyl; n has a value of 0 to 3; R^3 is alkoxycarbonyl, alkylcarbonyl, aminocarbonyl, mononuclear aryloxy or carboxy including agronomically acceptable amides, esters or salts thereof or R^1 and R^2 may be joined together with the nitrogen to which they are attached to form a heterocyclic ring containing one nitrogen atom and from 4 to 8 nuclear carbon atoms.

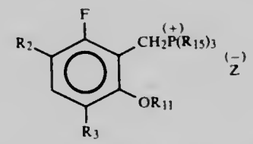
4,894,480

PHENYL SUBSTITUTED-2,4,6,8-NONATETRAENOIC ACID

Edward R. Aig, Fair Lawn; John W. Coffey; Allen J. Lovey, both of West Caldwell, and Michael Rosenberger, Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 79,974, Jul. 31, 1987, abandoned, which is a division of Ser. No. 922,430, Oct. 23, 1986, Pat. No. 4,780,251, which is a division of Ser. No. 746,812, Jun. 20, 1985, Pat. No. 4,648,996, which is a continuation-in-part of Ser. No. 635,100, Jul. 27, 1984, abandoned. This application Dec. 16, 1988, Ser. No. 285,258
Int. Cl.[4] C07F *9/02*
U.S. Cl. 568—11 2 Claims

1. A compound of the formula:



wherein R_{15} is aryl; Z is a halide ion, R_2 is chlorine, fluorine, trifluoromethyl, loweralkoxy, trifluoromethylloweralkoxy, hydroxy or hydroxy protected with a hydrolizable ester group or hydrogen; R_3 is hydrogen, lower alkyl or chlorine or fluorine R_{11} is an alkyl group containing 8 to 10 carbon atoms or $—CH_2-(CH_2)_n-CH_2OR_{17}$; n is an integer of from 6 to 7; and $—OR_{17}$ forms hydroxy or an ether protecting group convertible to hydroxy by hydrolysis.

4,894,481

METHOD OF MAKING CYCLIC ARYL CHLOROPHOSPHITES

Edward A. Burt, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 5, 1988, Ser. No. 215,283
Int. Cl.[4] C07F *9/02*
U.S. Cl. 568—12 17 Claims

1. A process of making a cyclic chlorophosphite, said process comprising reacting phosphorus trichloride with a 2,2'-bridged bisphenol in which the bridging group is a direct bond or a group selected from alkylene, alkylidene, thio, polythio and $—CH_2SCH_2—$ in an inert solvent and in the presence of a catalytic amount of a solid cross-linked polyvinylpyridine resin wherein the cross-linking agent is divinylbenzene or divinylpyridine.

4,894,482

PROCESS FOR DRYING HYDROGEN FLUORIDE-CARBOXYLIC ACID MIXTURES

Daniel D. Lindley, Eppstein, Fed. Rep. of Germany, and Carl D. Murphy, Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Sommerville, N.J.

Filed Dec. 6, 1988, Ser. No. 281,302
Int. Cl.[4] C09C *45/46*
U.S. Cl. 568—319 17 Claims

1. A process of removing water from a mixture of hydrogen fluoride (HF), a carboxylic acid, and water by extractive distillation in the presence of a Lewis base as solvent, which does not azeotrope with water, forms bonds with the HF and carboxylic acid which can be broken by heat and has a boiling point at atmospheric pressure at least about 20° C. above that of the carboxylic acid, and taking off an overhead vapor comprising a major proportion of the water in said mixture.

8. A process comprising subjecting an aromatic compound to a Friedel-Crafts acylation with a carboxylic acid in the presence of hydrogen fluoride as catalyst to obtain a product mixture containing an aromatic ketone, hydrogen fluoride, said carboxylic acid, and water of reaction, subjecting said product mixture to a solvent assisted distillation in the presence of an assisting solvent which has an atmospheric boiling point up to about 200° C. and is stable with respect to HF, to obtain an overhead vapor containing said assisting solvent and most of the HF, carboxylic acid, and water of reaction in the product mixture, and a liquid residue containing most of the aromatic ketone in the product mixture, separating assisting solvent from the overhead of said solvent assisted distillation and recycling it to said solvent assisted distillation, subjecting the remainder of the overhead from the solvent assisted distillation comprising hydrogen fluoride, carboxylic acid and water to an HF recovery distillation to separate excess HF as overhead which does not azeotrope with the water and carboxylic acid present, recycling said excess HF to said Friedel-Crafts acylation, subjecting the residue of said HF recovery distillation comprising a mixture of hydrogen fluoride (HF), carboxylic acid, and water to an extractive distillation in the presence of a Lewis base as solvent, which does not azeotrope with water, forms bonds with the HF and carboxylic acid which can be broken by heat and has a boiling point at atmospheric pressure at least about 20° C. above that of the carboxylic acid, taking off an overhead vapor from said extractive distillation comprising a major proportion of the water in said product mixture, subjecting the residue of said extractive distillation to a solvent regeneration distillation, recycling the overhead of said solvent regeneration comprising HF and carboxylic acid to said Friedel-Crafts acylation, and recycling the residue of said solvent regeneration distillation comprising said Lewis base solvent to said extractive distillation.

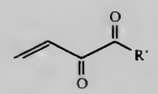
4,894,483

PREPARATION OF VINYLGLYOXAL DERIVATIVES, NOVEL VINYLGLYOXAL DERIVATIVES AND THEIR USE

Peter Neumann, Wiesloch; Hans-Dieter Martin, Duesseldorf; Roland Kramme, Hilden, and Ralf T. Weimann, Duesseldorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,121
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638489
Int. Cl.[4] C07C *49/217*
U.S. Cl. 568—335 12 Claims

1. A compound of the formula



(1')

where R' is methyl, ethyl, n-propyl, iso-propyl, n-butyl, isobutyl, hexyl, heptyl, octyl, allyl, butenyl, pentenyl, hexenyl, $C_3—C_7$-cycloalkyl, or phenyl which is unsubstituted or substituted by $C_1—C_{12}$-alkyl, $C_1—C_{12}$-alkoxy, halogen, cyano or CF_3.

4,894,484

PYROLYSIS OF PERFLUOROPOLYETHERS

Richard J. Lagow, Georgetown; Thomas R. Bierschenk; Timothy J. Juhlke, both of Roundrock, and Hajime M. Kawa, Austin, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 796,624, Nov. 8, 1985, abandoned. This application Sep. 3, 1987, Ser. No. 92,465
Int. Cl.[4] C07C *41/01, 43/30, 43/4*
U.S. Cl. 568—615 14 Claims

1. A method of cleaving perfluoropolyethers to lower molecular weight fragments, comprising the steps of:

(a) providing a perfluoropolyether selected from the group consisting of perfluoropoly(ethylene oxide), perfluoropolypropylene oxide, perfluoroethylene oxide/-methylene oxide/copolymers, perfluoroethylene oxide/-propylene oxide copolymers, perfluoropoly(tetramethylene oxide) and perfluoropoly(cyclohexyl oxide);

(b) pyrolyzing the perfluoropolyether at a temperature above about 350° C. to cleave the perfluoropolyether into lower molecular weight perfluoropolyethers in the absence of a metal oxide or metal fluoride catalyst; and

(c) condensing and collecting lower molecular weight perfluoropolyethers.

4,894,485

ALKALINE EARTH METAL SALTS OF ETHER CARBOXYLIC ACIDS AS ALKOXYLATION CATALYSTS

Ansgar Behler, Bottrop; Uwe Ploog, Hans, and Elvira Scholz, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 14, 1988, Ser. No. 206,623
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1987, 3719968; Jan. 25, 1988, 3802044
Int. Cl.[4] C07C *41/03*
U.S. Cl. 568—618 8 Claims

1. The process of ethoxylating or propoxylating a fatty alcohol consisting essentially of contacting said fatty alcohol with ethylene oxide or propylene oxide in the presence of from about 0.1 to about 2% by weight, based on the weight of the ethoxylated or propoxylated compound, of an alkaline earth metal salt of an ether carboxylic acid corresponding to the following formula

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$$[RO-(C_mH_{2m}O)_n-CH_2-COO^-]_xM^{2+} \quad (I)$$

in which

R is a substituent selected from the group consisting of C_1-C_{22} alkyl, C_3-C_{22} alkenyl, phenyl, alkylphenyl containing 1 to 3 C_1-C_{15} alkyl radicals, benzyl and phenylethyl,

M is an alkaline earth metal selected from the group consisting of Ca, Sr and Ba,

m is the number 2 or 3,

n is a number from 1 to 20 and

x is the number 2; or

R is a group corresponding to the following formula

$$-CH_2-COO^-$$

x is the number 1 and

M, m and n are as defined above.

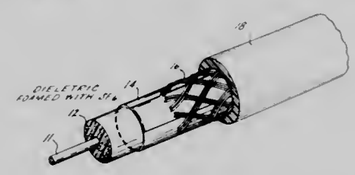
4,894,486
STABILIZER FOR BISPHENOLS AND PROCESS OF USING SAME
Lawrence E. Neil, Jr., Angleton, and Theodore J. Gormanos, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 22, 1988, Ser. No. 289,083
Int. Cl.[4] C07C *37/88*
U.S. Cl. 568—702 **11 Claims**

1. In a process for inhibiting the degradation of a bisphenol in which a hydroxycarboxylic acid is employed as the inhibitor, the improvement which comprises employing as the inhibitor a compound selected from the group consisting of lactic, malic and glyceric acids and mixtures thereof.

4,894,487
PREPARATION PROCESS OF 4-(4-HYDROXYPHENYL)-CYCLOHEXANOL
Tohru Miura; Masayuki Furuya, and Teruyuki Nagata, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Filed Aug. 4, 1988, Ser. No. 228,186
Claims priority, application Japan, Aug. 14, 1987, 62-201939
Int. Cl.[4] C07C *35/23, 35/27*
U.S. Cl. 568—832 **6 Claims**

1. Process for preparation of 4-(4-hydroxyphenyl)cyclohexanol, comprising catalytically reducing 4-(4-hydroxyphenyl)-3-cyclohexen-1-ol in the presence of an amount of hydrogeneffective to achieve said catalytic reduction and din the presence of a catalytically effective amount of at least one effective hydrogenation catalyst, said catalytic reduction being conducted at an effective temperature at which said catalytic reaction occurs, and said catalytic reaction being conducted at an effective pressure at which said catalytic reaction occurs.

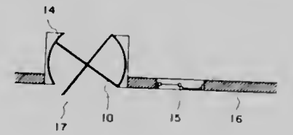
4,894,488
HIGH FREQUENCY SIGNAL CABLE WITH IMPROVED ELECTRICAL DISSIPATION FACTOR AND METHOD OF PRODUCING SAME
Chakra V. Gupta, Conover, N.C., assignor to Comm/Scope, Inc., Catawba, N.C.
Continuation-in-part of Ser. No. 170,774, Mar. 21, 1988, abandoned. This application Feb. 10, 1989, Ser. No. 309,831
Int. Cl.[4] H01B *11/18, 13/14*
U.S. Cl. 174—28 **32 Claims**



1. A high frequency signal cable having improved electrical attenuation properties, comprising at least one inner signal conductor, an outer shielding conductor surrounding said at least one inner signal conductor, and a foam dielectric disposed between said inner signal conductor and said outer shielding conductor, said foam dielectric comprising a polymer matrix having a multiplicity of cells formed therein, said cells containing residual blowing agent comprising sulfurhexafluoride.

17. A method of producing a high frequency signal cable with improved electrical attenuation properties at high frequencies which comprises extruding a mixture of a molten polymer and a blowing agent comprising sulfurhexafluoride around at least one inner signal conductor, expanding the mixture to form a foam dielectric, and applying an outer shielding conductor around the expanded foam dielectric.

4,894,489
ELECTROMAGNETIC SHIELD-TYPE DOORWAY FOR BUILDINGS AND ELECTROMAGNETIC SHIELDING SYSTEM THEREFOR
Takeshi Takahashi; Masatake Nakamura; Yoshiji Yabana; Toshiyuki Ishikawa, and Koji Nagata, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan
Filed May 20, 1987, Ser. No. 52,635
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 MS **1 Claim**



1. An electromagnetic shield-type doorway for a building in which electromagnetic shielding members are used to construct a body of the body and window and doorway openings to provide the overall building with an electromagnetic shielding structure, characterized in that electrically conductive brushes are attached to at least a lower edge and side edge of a revolving door arranged in said doorway, thereby filling gaps at said edges, said electrically conductive brushes being electrically interconnected and grounded at a rotary shaft of said revolving door and electrical wave absorbers are positioned around the periphery of said revolving door.

4,894,490
HIGH TENSION CABLE AND METHOD OF MANUFACTURE THEREOF
Terutsugu Fujimoto, Suzuka, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan
Filed Dec. 28, 1987, Ser. No. 138,324
Claims priority, application Japan, Dec. 27, 1987, 62-315273
Int. Cl.[4] H01B *7/22*
U.S. Cl. 174—108 **19 Claims**



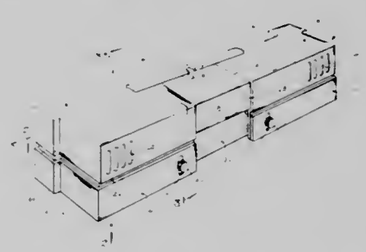
1. A method of making a cable comprising passing a tension member through an extruder to form a settable plastic layer thereon under conditions such that substantially no setting of said plastic layer occurs,

thereafter, winding a wire around said plastic layer to form a plurality of coils at least partially embedded in said plastic layer,

thereafter extruding an insulation layer over said coils, and causing said plastic layer to set.

17. A cable which is the product of the method of claim 1.

4,894,491
CABLE COVER ASSEMBLY
Gordon Glau, Moreno Valley, Calif., assignor to Kraft Systems, Inc., Vista, Calif.
Filed Jan. 17, 1989, Ser. No. 297,992
Int. Cl.[4] H05K *5/03*
U.S. Cl. 174—135 **8 Claims**



1. A cover assembly comprising:

a central support member having a first surface disposed substantially perpendicular to a second surface, said second surface having a first elongated slot formed therein;

at least one end member slidably engaged with said central support member, said end member having third, fourth and fifth surfaces disposed substantially perpendicularly to each other, said fourth surface having an opening formed therein registered with said first elongated slot;

said central support member having a lip formed on said first surface receiving an edge of said end member to permit slidable movement of said end member with respect to said central support member, and prevent vertical movement of said central support member with respect to said end member;

at least one bracket member slidably engaged with said end member, said bracket member having a sixth surface disposed substantially perpendicular to a seventh surface, said bracket member having a second elongated slot formed therein registered with said first elongated slot and said opening;

said bracket member having a second lip formed thereon

253-573 O.G.-90-13

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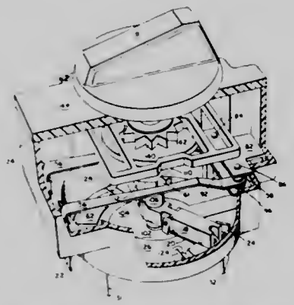
receiving an edge of said fifth surface of said end member for permitting slidable movement of said bracket member with respect to said end member.

4,894,492

MOTOR CONTROL VARIABLE SPEED REVERSING SWITCH

Nicholas R. Palumbo, 28 Redwood Dr., Cumberland, R.I. 02864

Filed Sep. 1, 1988, Ser. No. 239,506
Int. Cl.[4] H01H *9/00*
U.S. Cl. 200—1 V **6 Claims**



1. A rotary switch for interconnecting a motor, a direct current power source, and a resistor network, providing a plurality of selectable forward and reverse motor speeds responsive to displacement of a single control in a single degree of freedom, comprising:

a case, a switch control supported by said case, a shaft rotatable within said case about an axis, responsive to motion of said control, and a plurality of switch outputs supported by said case,

two electrical conductors, each having a switch input portion fixed in said case for connection to said power source, and a movable portion providing a contact,

a source terminal fixed in said case and connected to one of said switch outputs for connection to said motor,

an integral switch bus having a polarity terminal and an axially spaced track terminal,

cooperative reversal means carried on said shaft and said conductors for moving said two conductor movable portion contacts interdependently between said source terminal and said bus polarity terminal, for a first polarity condition and an opposite polarity condition, responsive to said shaft moving between two rotational conditions, and for holding said two conductor contacts in a power OFF condition, responsive to said shaft being in a third rotational condition,

three circular tracks disposed at three radially spaced positions centered about said axis, each of said tracks comprising conductive and non conductive arcuate segments, at least one said track conductive segment being said bus track terminal, defining a powered track, each said conductive segment of each track other than said powered track being connected to a said switch output for connection to said resistor network,

two arcuately spaced electrical bridging elements carried on said shaft, each said bridging element providing three spaced electrically connected track contacts, said contacts of a first said bridging element being disposed for connecting at least two said conductive segments of a first pair of said tracks including a said powered track, said contacts of the other said bridging element being disposed for connecting at least two said conductive segments of a distinct pair of said tracks including a said powered track,

said track conductive segments, said electrical bridging elements, and said track contacts being mutually arcuately, axially and radially spaced such that, at successive spaced rotational positions of said shaft, said bridging elements successively connect distinct sets of said conductive segments, successively to provide at said switch outputs a plurality of distinct switch output conditions including a switch output OFF condition,

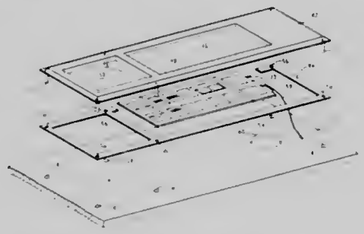
said bridging elements being arcuately spaced with respect to said reversal means such that a first plurality of said switch output conditions is provided in said first polarity condition, a second plurality of said switch output conditions is provided in said opposite polarity condition, and said switch output OFF condition is provided in said power OFF condition.

4,894,493

MEMBRANE TOUCH CONTROL PANEL ASSEMBLY FOR AN APPLIANCE WITH A GLASS CONTROL PANEL

John M. Smith, and Howard R. Bowles, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1988, Ser. No. 267,507
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—5 A **8 Claims**



5. A membrane touch switch control panel assembly for a cooking appliance having a plurality of surface units and a glass control panel disposed proximate at least one of the surface units, said assembly comprising:

a laminated membrane switch array disposed on the outer surface of the glass control panel;

said switch array including an outer appearance graphics layer formed of a flexible resilient material capable of withstanding temperatures in excess of 220° F.;

mounting means circumscribing said switch array for sealingly securing said switch array at the edges thereof to the glass control panel;

said outer appearance graphics layer and said mounting means together simulating the appearance of a glass capacitive touch panel.

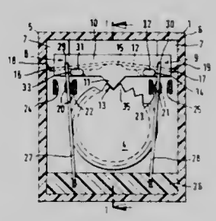
4,894,494

PULSE GENERATOR

Wolfgang Rösl, Eckental, and Jochen Rose, Röthenbach, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Jul. 13, 1988, Ser. No. 220,429
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724898; Nov. 20, 1987, 3739296
Int. Cl.[4] H01H *19/20*
U.S. Cl. 200—11 R **14 Claims**

1. A pulse generator comprising a gear and an actuating member having a projection which engages a tooth space of the gear in the rest position and which is deflectable toward one side or the other depending on the direction of rotation of the gear, with said actuating member being capable of actuating one of two laterally disposed contacts in each of its deflected positions; and wherein: said actuating member is made of insulating material and is movable both sideways and in the direction of the teeth of the gear; a compression spring designed as a pressure and restoring spring is provided which presses said actuating member against the teeth of the gear and which forces the projection into engagement with the tooth space in the rest position; said actuating member is pivotable on



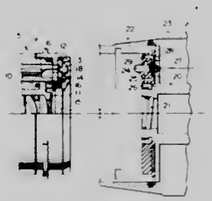
a journal extending into an oblong hole of the actuating member, and movable in the direction of the line connecting the axis of rotation of the gear and the projection; and said journal is provided on a shaft of the gear.

4,894,495

WATERTIGHT ELECTRICAL CONTACT UNITS

Masato Toda, Hachioji, Japan

Continuation of Ser. No. 19,352, Feb. 26, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 222,339
Claims priority, application Japan, Mar. 13, 1986, 61-055854
Int. Cl.[4] H01R *33/96*
U.S. Cl. 200—51.12 **11 Claims**



1. Apparatus comprising:

component mounting means including first and second mounting sections relatively movable between first and second positions;

electrical switch means including first and second cooperating contact members that are carried by the respective first and second mounting sections, said cooperating contact members being engaged when said mounting sections are in said first position and are disengaged when said mounting sections are in said second position;

a watertight electrical contact unit secured to said first mounting section, said contact unit including a watertight elastic member and said first contact member;

said first contact member including:

(a) a contact portion at a first side of said elastic member;

(b) a conductor connecting portion for electrically connecting said first contact member to a conductor when said first and second mounting sections are in said first position and for connecting said first contact member to the conductor when said first and second mounting sections are in said second position, said conductor connecting portion being located at a side of said elastic member which is opposite to said first side of said elastic member; and

(c) another portion excluding said contact portion and said conductor connecting portion;

with said mounting sections in said first position said contact portion being in direct engagement with said second contact member;

said elastic member being interposed between said first mounting section and said first contact member, and being a molded unitary body wherein said another portion of said contact member is embedded;

said contact portion being operatively positioned to engage said second contact when the latter is disposed forward of said contact portion;

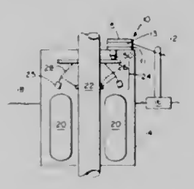
said elastic member including an annular groove open at its rear facing side and formed around said first contact member so as to facilitate movement of said first contact member in the axial direction relative to said first mounting section when said first contact member is being placed in contact with said second contact member.

4,894,496

AUXILIARY WINDING CUT-OUT SWITCH FOR SUMP PUMP MOTOR

Nicholas R. Palumbo, 28 Redwood Dr., Cumberland, R.I. 02864

Filed Jun. 29, 1988, Ser. No. 213,089
Int. Cl.[4] H01H *35/10*
U.S. Cl. 200—80 R **9 Claims**



1. For use in controlling power from a power source to a sump pump motor having main windings and auxiliary windings, and having a rotor providing a control surface axially movable, responsive to rotor speed, between a first motor-off position and a second predetermined-speed position, which is assumed when said motor attains a predetermined speed an auxiliary winding cut-out switch comprising

a housing providing guide means and first and second terminal-retaining structures,

a housing cover providing a spring seat,

a first electrically conductive terminal having a fixed contact, said first terminal being fixed in said first terminal-retaining structure for electrical connection between a power source and said motor auxiliary windings,

a second electrically conductive terminal, fixed in said second terminal-retaining structure for electrical connection between said power source and said motor auxiliary windings, having a contact arm pivotable with respect to said second terminal-retaining structure, and having a cooperating contact carried on said contact arm for cooperation with said fixed contact,

controlled deflection means for positioning said cooperating contact with respect to said fixed contact, comprising

a first element axially slidable within said housing guide means and having

a follower portion for following contact with said control surface,

a first element spring seat remote from said follower portion, and

a stop portion engageable with said guide means for limiting axial travel of said first element away from said housing,

a second element axially slidable within said guide means, having

a second element lower spring seat,

an upper spring seat,

a stop portion for limiting axial travel of said second element away from said housing, and

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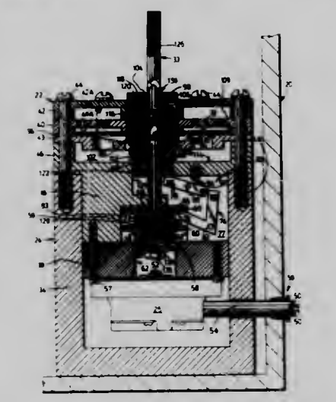
an offset coupler,
a first removable coil compression spring seated between said first element spring seat and said second element lower spring seat, said first spring being electrically unconnected with either said terminal,
a second removable coil compression spring seated between said second element upper spring seat and said cover spring seat, said second spring being electrically unconnected with either said terminal,
said first and second elements, said guide means, said cover spring seat, and said first and second springs all being concentric and colinear.

4,894,497

HIGH TEMPERATURE PRESSURE SWITCH ASSEMBLY FOR USE WITH EXPLOSION-PROOF ENCLOSURES

Jennings Lycan, Huntington, W. Va., assignor to Service Machine Company, Huntington, W. Va.

Filed Feb. 8, 1989, Ser. No. 308,141
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—83 R **13 Claims**



8. A high temperature pressure switch assembly according to claim 4 in which:
said housing has a cylindrical bore in one wall thereof;
a bushing secured to and movable with the pressure responsive member is reciprocably slidable within said cylindrical bore and is accessible from the exterior of the housing for testing;
whereby the bushing can be displaced to move the pressure responsive member and thereby simulate movement of the pressure responsive member in response to a sudden rise in ambient air pressure.

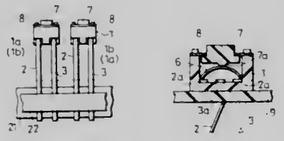
4,894,498

PUSH BUTTON SWITCH HAVING RADIAL LEADS

Kazuyoshi Kagawa, and Takeshi Hakozaki, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 187,824
Claims priority, application Japan, Jun. 4, 1987, 62-86191[U]
Int. Cl.[4] H01H *13/10*
U.S. Cl. 200—284 **1 Claim**

1. A push button switch for use with radial lead automatic insertion equipment comprising:
a case;
fixed contacts arranged on an inner bottom surface of said case and positioned in a substantially horizontal plane;
a movable contact supported in said case for movement vertically with respect to said horizontal plane;
a push button stem movably supported in said case in an operative relationship with said movable contact for movement vertically with respect to said horizontal plane;
a pair of terminals formed integrally with said fixed contacts and extending away from said fixed contacts in a same direction, said fixed contacts and said terminals being formed of metal sheet material;
a pair of recesses formed in an outer bottom surface of said case, each of said recesses having a vertical wall and a horizontal wall,
said terminals projecting out from said case horizontally



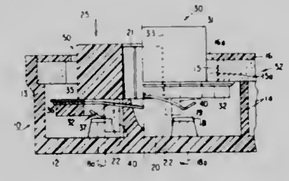
where said recesses are located, said terminals projecting through said vertical wall of said recesses at a point where said horizontal and vertical walls of said recesses meet,
said terminals being identically bent at substantially right angles with respect to said fixed contacts so as to be arranged against an outside surface of said vertical walls of said recesses,
portions of said terminals which are at substantially right angles with respect to said fixed contacts being parallel, coplanar and positioned in a single row so as to form radial leads of said push button switch.

4,894,499

ELECTRIC PUSH-BUTTON SWITCH

Hans Beck, Zürich; Heinz Waser, Schlieren, and Peter Bettschart, Zürich, all of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Sep. 26, 1988, Ser. No. 249,610
Claims priority, application Switzerland, Sep. 30, 1987, 03794/87
Int. Cl.[4] H01H *5/02*
U.S. Cl. 200—404 **6 Claims**



1. An electric push-button switch, comprising:
a housing portion;
fixed counter contact means including a plurality of spaced counter contacts provided for the housing portion;
a push-button portion which is generally linearly moveable in a predetermined direction of movement;
means defining a snap-action mechanism for said push-button portion;
said push-button portion being generally linearly moveable between a rest position and an operating position while overcoming a snap action of said snap-action mechanism;
contact bridge means comprising resilient contact arms provided for coaction with said fixed counter contact means;
said fixed counter contact means being contactingly engaged by said resilient contact arms when said push-button portion assumes said operating position;

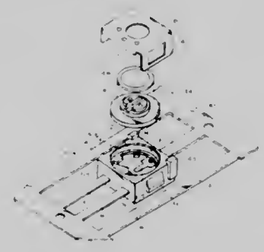
said resilient contact arms being inclined with respect to said predetermined direction of movement of the push-button portion;
said housing portion being provided with guide column means;
said push-button portion being provided with guide column means;
said guide column means of said housing portion and said guide column means of said push-button portion mutually contactingly engaging with one another for generally linearly guiding and securing said push-button portion against undesired rotation;
said guide column means of said housing portion and said guide column means of said push-button portion, viewed in the predetermined direction of movement of said push-button portion, being arranged at a region located between said plurality of spaced counter contacts;
said guide column means of said housing portion and said guide column means of said push-button portion being in multiple linear non-planar contact with one another and which multiple linear non-planar contact extends in said predetermined direction of movement of the push-button portion; and
said multiple linear non-planar contact changing in length during the movement of said push-button portion and being greatest when said push-button portion assumes said operating position thereof.

4,894,500

ROTARY SELECTOR SWITCH

Atsuo Yamazaki; Toshiaki Kaba, both of Iruma, and Kenji Sakaguchi, Hanno, all of Japan, assignors to Copal Electronics Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 127,506
Int. Cl.[4] H01H *21/62*
U.S. Cl. 200—565 **2 Claims**



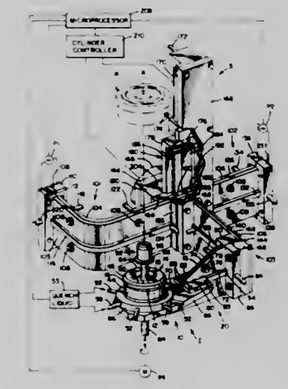
1. In a rotary selector switch having a wiper means on a rotor which is rotatably mounted in a cavity in a housing and having a cover holding the rotor in the cavity, the rotor being rotatable in the cavity for causing the wiper means to contact fixed contact elements on said housing to connect electrically at least one of the fixed contact elements with one of the remaining fixed contact elements, the improvement comprising, in combination:
a rotor stopper means comprising a pair of ridges extending inwardly from said housing into said cavity, each ridge having opposite circumferentially spaced side walls, and a further ridge projecting from said rotor into said cavity and which has a pair of dovetail portions on radially opposite ends thereof each of which has circumferentially spaced vertical walls, the side walls of said ridges being abutted by corresponding vertical walls of the dovetail portions of said further ridge upon the rotation of the rotor in clockwise or counterclockwise direction for stopping the rotation of the rotor, and
a click mechanism for providing an audible sound to an operator comprising projections projecting from said housing into said cavity at equally spaced circumferential positions, one of the contact elements being disposed on the bottom of said cavity and having a hole therethrough and one of the projections protruding through said hole, one of the dovetail portions of said further ridge having a slot in the radially outer end thereof engageable with the projections during rotation of the rotor for producing an audible click.

4,894,501

METHOD AND APPARATUS FOR INDUCTION HEATING OF GEAR TEETH

George D. Pfaffmann, Farmington; Norbert R. Balzer, Troy; George M. Mucha, Parma Hts., and Donald E. Novorsky, Pleasant Ridge, all of Mich., assignors to Tocco, Inc., Boaz, Ala.

Continuation-in-part of Ser. No. 185,588, Apr. 21, 1988, which is a continuation of Ser. No. 1,624, Jan. 8, 1987, Pat. No. 4,757,170, which is a continuation-in-part of Ser. No. 878,186, Jun. 25, 1986, Pat. No. 4,675,488. This application Mar. 2, 1989, Ser. No. 318,347
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] H05B *6/14*
U.S. Cl. 219—10.43 **47 Claims**



1. A method of hardening the undulating generally circular teeth surface of an axially elongated gear having a central axis, said teeth surface including teeth and connecting roots, said method comprising the steps of:
(a) providing an inductor coil coaxially aligned with said gear and having a circular inductor surface closely spaced from said teeth surface;
(b) causing first relative axial movement between said inductor surface and said teeth surface to define a first axially moving band area at said teeth surface corresponding to said inductor surface;
(c) progressively preheating said teeth surface along said first axially moving band area sufficiently to heat said roots to a temperature below a quench hardening temperature;
(d) causing second relative axial movement between said inductor surface and said teeth surface to define a second axially moving band area at said teeth surface corresponding to said inductor surface;
(e) progressively finally heating said preheated surface along said second axially moving band sufficiently to heat said preheated surface to a quench hardening temperature; and,
(f) quenching said finally heated surface immediately following said final heating thereof.

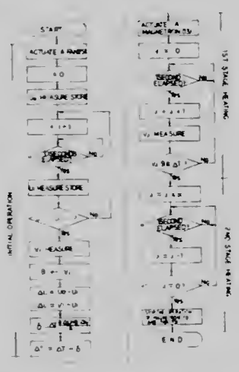
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,502

AUTOMATIC COOKING CONTROL SYSTEM FOR A MICROWAVE OVEN

Ki T. Oh, Kyungsangnam, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 13, 1988, Ser. No. 256,964
Claims priority, application Rep. of Korea, Oct. 13, 1987, 11354/1987
Int. Cl.[4] H05B *6/68*
U.S. Cl. 219—10.55 M **12 Claims**



1. A method of optimally cooking food in a microwave oven having a heating chamber, a fan and a magnetron and using an automatic cooking control system, comprising the steps of:

(a) actuating the fan to cause an air temperature in an interior of the heating chamber to become uniform;

(b) setting a first variable to zero;

(c) measuring and storing a first incremental value for a first temperature of air flowing into the heating chamber, the first incremental value being related to a present value of the first variable;

(d) incrementing the first variable by one;

(e) delaying for a period of ten seconds;

(f) measuring and storing the first incremental value for the first temperature of the air flowing into the heating chamber;

(g) determining if a present first incremental value is equal to the first incremental value measured ten seconds previously;

(h) measuring a second incremental value for a second temperature of air flowing out of the heating chamber, when the present first incremental value is equal to the first incremental value measured ten seconds previously, the second incremental value being related to the present value of the first variable;

(i) storing the second incremental value as a first reference value;

(j) calculated a first temperature difference, the first temperature difference being equal to a difference between the first incremental value when the first variable is equal to zero and the present first incremental value;

(k) calculating a second temperature difference, the second temperature difference being equal to a difference between the present incremental value and the present first incremental value;

(l) calculating a temperature compensation value;

(m) calculating a compensated temperature by adding a predetermined temperature difference to the temperature compensation variable;

(n) actuating the magnetron for a first period of time; and

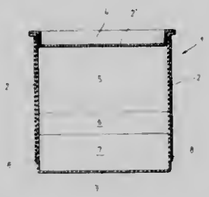
(o) actuating the magnetron for a second period of time, thereby automatically cooking food in the microwave oven.

4,894,503

PACKAGES MATERIALS FOR SHIELDED FOOD CONTAINERS USED IN MICROWAVE OVENS

Dan J. Wendt, Lino Lakes, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 23, 1987, Ser. No. 113,171
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **39 Claims**



1. A package for heating of food material representing a low load in a microwave environment employing a conductive sheet in close proximity to a dielectric material that is selected to minimize failure of the dielectric material during microwave heating, comprising:

a conductive sheet, the conductive sheet being exposed to microwave radiation when the package is placed in a microwave oven and the oven is energized, the conductive sheet having an edge, the conductive sheet causing a gain in electrical field strength greater than 3 near at least a portion of an edge;

a rigid, dimensionally stable dielectric support for the conductive sheet, the dielectric support being mechanically associated with the conductive sheet to maintain dimensional stability of the combination of the dielectric support and the conductive sheet, the dielectric support extending beyond at least a portion of an edge of the conductive sheet, the dielectric support being spaced less than 0.5 inch from the conductive sheet, the dielectric support being composed of material selected to avoid failure of the dielectric support in high electrical fields which may exist near the conductive sheet during microwave irradiation, the dielectric support material having a dielectric loss factor less than 0.005, the dielectric support material having a failure temperature greater than 101° C.;

the package being an intrinsically nonarcing package;

food supported by the package, the food representing a low load in a microwave oven cavity, where microwave cooking is continued for a predetermined period of time desired according to the food selected for the package when the package is placed in a microwave oven cavity.

4,894,504

METHOD APPARATUS FOR GENERATING MULTIPLE SPARKS FOR AN ELECTRICAL DISCHARGE WIRE CUTTING MACHINE

Thomas J. Truty, Streamwood, Ill., assignor to T-Star Industrial Electronics Corporation, Wheeling, Ill.

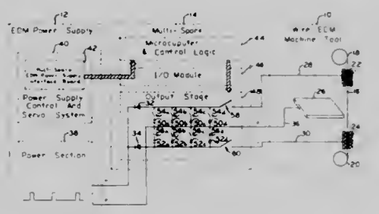
Filed Jun. 30, 1988, Ser. No. 214,113
Int. Cl.[4] B23H *7/04*
U.S. Cl. 219—69.12 **21 Claims**

1. An apparatus for controlling the flow of electrical energy between an electrically conductive piece part and a wire electrode of an electrical discharge wire cutting machine, comprising:

a pulse type power supply having first and second leads of opposite polarity, said first lead being electrically connected to said piece part and said second lead having first and second portions connected to said wire electrode at two separate spaced apart locations;

first and second storage means connected between said first lead line and said first and second portions of said second lead line; and,

means for electrically isolating said first and second portions of said second lead line whereby said first and second portions of said second lead line are electrically independent from one another and whereby electrical energy may flow independently through said first and second portions of said second lead line.

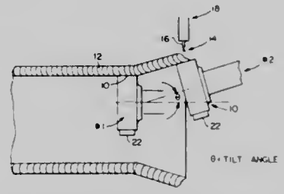


4,894,505

MODIFIED ROTATING REUSABLE PREFORM

Gregory D. Malone, Powell; Michael D. McAninch, and Patrick M. Ryan, both of Alliance, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 22, 1988, Ser. No. 288,587
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.11 **15 Claims**



1. An apparatus for building a workpiece by deposit welding, comprising:

a welding head for depositing molten weld material;

a rotatable, reusable preform for forming, supporting, and cooling the molten weld material deposited directly on the surface thereof;

means for varying the shape of rotatable, reusable preform; and

means for moving the workpiece which continuously provides a new region of said rotatable, reusable preform surface underneath said welding head.

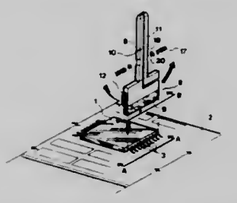
4,894,506

METHOD AND APPARATUS FOR REFLOW SOLDERING OF ELECTRICAL COMPONENT LEADS, INCLUDING FLOATING HEATER BAR

Klaus D. Woerner, Cambridge, Canada, assignor to Automation Tooling Systems Inc., Kitchener, Canada

Filed Sep. 20, 1988, Ser. No. 246,796
Int. Cl.[4] B23K *1/12*
U.S. Cl. 219—85.22 **18 Claims**

1. A method of reflow soldering a row of electrical component leads to a printed circuit board using a heater bar, comprising the steps of, firstly, moving the heater bar to a position above the location of said leads and allowing said heater bar to rock within its plane to float into proper position, and secondly, then clamping said heater bar, supplying voltage to heat said heater bar, and applying soldering pressure.

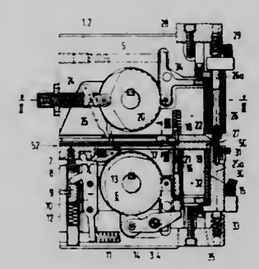


4,894,507

WELDING DEVICE

Horst Thode, Holbeinstrasse 41, D-7880 Bad Säckingen, Fed. Rep. of Germany

Filed May 4, 1988, Ser. No. 190,006
Int. Cl.[4] B23K *11/32*
U.S. Cl. 219—86.7 **11 Claims**



1. A device for welding a contact piece onto support material, said device comprising:

two electrodes for welding the contact piece onto the support material, said electrodes being arranged along a longitudinal axis;

first feed means for feeding the support material between said electrodes with the surface of the support material to which the contact is to be welded being fed perpendicular to said longitudinal axis;

second feed means for separately feeding the contact piece between said electrodes and adjacent to the support material;

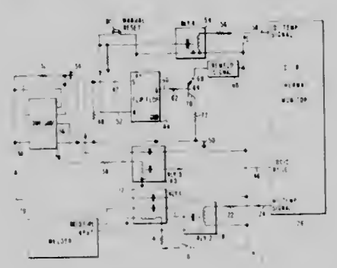
an electrode insert associated with one of said electrodes for engaging the contact piece when the contact piece is adjacent to the support material;

electrode rotating means for rotating said one of said two electrodes to thereby rotate the contact piece with respect to the support material; and

synchronization means for synchronizing said first feed means, said second feed means, and said electrode rotating means.

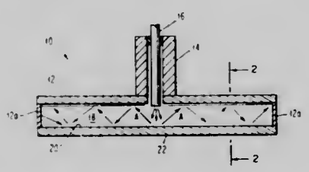
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,508
WELDER CONTROL SYSTEM
Gregory S. Glenn, Los Angeles, and William O. Moatjar, Palmdale, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Nov. 4, 1988, Ser. No. 267,422
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—110 **11 Claims**



1. A welding arrangement comprising:
a welding apparatus for welding in response to a weld fire signal;
an infrared monitor for sensing weld temperature generated by said welding apparatus and generating output signals at a predetermined low temperature and a predetermined high temperature;
pulse generating means for generating a pulse of a predetermined width;
switch means for simultaneously triggering said pulse generating means to generate said pulse of a predetermined width and generating a weld fire signal to weld;
flip-flop circuit means being set by said pulse generated by said pulse generating means and being reset by a low temperature signal from said infrared monitor;
reweld signal generating means responsive to the output of said flip-flop circuit means for generating a reweld signal upon a low temperature signal from said infrared monitor; and
means for terminating said weld fire signal upon a high temperature signal from said infrared monitor.

4,894,509
LASER ASSISTED HEATER BAR FOR MULTIPLE LEAD ATTACHMENT
Pedro A. Chalco, Yorktown Heights, and Joseph C. Andreshak, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 13, 1988, Ser. No. 283,668
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.6 **19 Claims**



1. Heater apparatus comprising:
a thermally conductive body portion having an internal hollow cavity enclosed within, the cavity having surfaces substantially reflective to incident optical radiation and partially absorptive of the incident optical radiation such that said body portion is heated by the absorbed optical radiation; and
means coupled to the cavity for delivering the optical radiation thereto, said delivering means being comprised of an optical fiber having an output end in optical communication with the cavity and an input end for coupling to a source of optical radiation.

4,894,510
APPARATUS FOR UNIFORMLY DISTRIBUTING PLASMA OVER A SUBSTRATE
Koichiro Nakanishi; Hiroki Ootera; Minoru Hanazaki, and Toshihiko Minami, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Sep. 3, 1987, Ser. No. 92,590
Claims priority, application Japan, Sep. 5, 1986, 61-209836; Sep. 10, 1986, 61-214828; Mar. 2, 1987, 62-47307
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.43 **22 Claims**

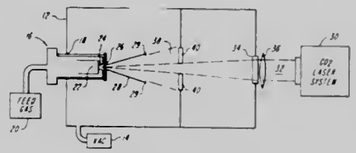


1. A plasma processor comprising:
a plasma generation portion which generates a plasma through electron cyclotron resonance; and
a plasma reaction portion in which a substrate to be processed with the plasma generated by said plasma generation portion is located;
said plasma generation portion having a center axis running through the substrate and including:
a plasma generating glass tube which can supply a plasma generating gas,
a radio frequency (r.f.) waveguide which accommodates said plasma generating glass tube therein and which establishes a nonuniform r.f. electric field perpendicular to an axial direction of said plasma generation portion,
coil means arranged around said r.f. waveguide for establishing a nonuniform magnetostatic field in the axial direction, the r.f. electric field and the magnetostatic field causing plasma to flow as a plasma current in the axial direction, the plasma current having a plasma current axis, and
power source means connected to provide current to at least a part of said coil means for subjecting a motion to a magnetic field induced by at least said part of said coil means, the motion of the magnetic field causing a motion of the plasma current including a deviation of the axis of the plasma current from the center axis of the plasma generation portion, thereby distributing plasma over the substrate with improved uniformity.

4,894,511
SOURCE OF HIGH FLUX ENERGETIC ATOMS
George E. Caledonia, Milton; Robert H. Krech, Saugus; Byron D. Green, Reading, and Anthony N. Pirri, Andover, all of Mass., assignors to Physical Sciences, Inc., Andover, Mass.
Filed Aug. 26, 1986, Ser. No. 900,616
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.52 **36 Claims**

1. Apparatus for generating a nearly mono-energetic, high flux beam of high velocity atomic gas particles comprising:
a vacuum chamber;

nozzle means within the vacuum chamber for ejecting a confined flow of a gas into a narrow aperture;
means for causing breakdown of the gas flow into a plasma within the narrow aperture;



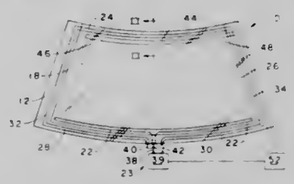
means for accommodating volumetric expansion of the plasma to produce a high velocity nearly mono-energetic atomic beam.

4,894,512
METHOD AND DEVICE FOR UNDERWATER ELECTRICAL WELDING
Rey Heusi, Colmar; Bernard Durand, Marseille, and Philippe Blanchard, Draveil, all of France, assignors to Electricite De France (Service National), Paris and Compagnie Maritime D'Expertises, Marseille-Cedex, both of, France
Filed Jun. 30, 1988, Ser. No. 213,389
Claims priority, application France, Jul. 1, 1987, 87 09438
Int. Cl.[4] B23K *9/06*
U.S. Cl. 219—130.4 **8 Claims**



1. Method of underwater arc welding comprising the steps of:
placing a welding electrode nearby a parent material to be welded, immerged in water,
generating a high frequency voltage between said electrode and said parent material for starting a striking arc between said electrode and said parent material through said water, and thus supplying a high frequency current to said electrode, after said striking arc has been initiated.
generating a welding voltage between said electrode and said parent material supplying a nominal welding current to said electrode, for producing a weld at said parent material, and
sustaining the high frequency current superimposed to the welding current and much smaller than the welding current, for stabilizing said welding arc across a film of said water during the whole time duration of the underwater arc welding.

4,894,513
HEATABLE WINDSHIELD TEMPERATURE CONTROL
Harry S. Koontz, Penn Hills Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jul. 5, 1988, Ser. No. 215,147
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—203 **15 Claims**



1. In an electrically heatable transparent article including a dielectric substrate, an electroconductive coating on a surface of said substrate, and first and second spaced apart bus bars along opposing edge portions of said coating to pass a current from one of said bus bars through said coating to the other said bus bars, wherein current flow from said one of said bus bars through said coating to said other of said bus bars results in a selected portion of said coating having a higher temperature than the remaining portions of said coating, the improvement comprising:
an electrically conductive member for sensing temperature changes wherein resistance of said member varies as the temperature of said selected portion of said coating varies;
said member positioned within said transparent article and electrically insulated from said coating and in close proximity to said selected portion of said coating to sense temperature variations in said selected portions wherein resistance output of said member indicates the temperature of said selected portions of said coating.

4,894,514
HEATED TRANSPARENCY WITH MALFUNCTION DETECTION MEANS
Wayne A. Delvin, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jul. 5, 1988, Ser. No. 215,473
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—203 **4 Claims**



1. An electrically heated transparency system comprising a transparent sheet, a heating circuit associated with the transparent sheet including an electrically conductive coating on a surface of the sheet and bus bars in contact with the coating and extending to a terminal area at a marginal edge portion of the sheet, electrically conductive leads extending from the terminal area to a rectifier section of a power supply means, Hall effect current sensor means electromagnetically coupled to at least one of the leads between the rectifier and the terminal area, the output from the Hall effect sensor connected to operational amplifier means for generating a warning signal in response to a predetermined change in the output from the

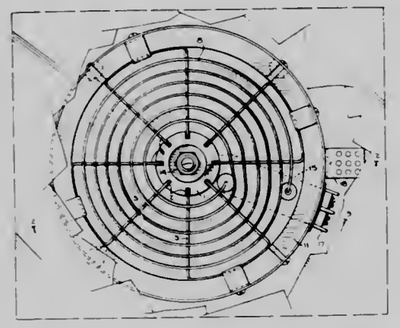
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Hall effect sensor, whereby a change in the resistance of the heating circuit on the transparency is indicated.

4,894,515
HOT PLATE FOR COOKING

Bohdan Hurko, Louisville, Ky., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Apr. 8, 1985, Ser. No. 720,733
Int. Cl.[4] H05B *3/68*; F24H *9/02*
U.S. Cl. 219—345 **11 Claims**

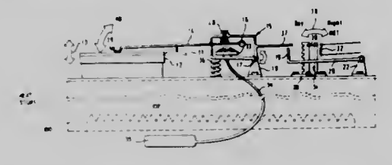


1. A hot plate comprising a hub from which spokes radially extend in a horizontal plane, the spokes being formed by refractory fibrous or woven flat strips each positioned in a vertical plane and having upper edges in which downwardly extending notches are formed, and molybdenum disilicide wire in the form of a flat, spiral having convolutions with portions inserted in the notches, the wire having terminating ends, and means for connecting the ends with electric current.

4,894,516
ELECTRICAL STORAGE HEATERS

Gordon Ellis, Bramshall, and Richard J. Lane, Stone, both of United Kingdom, assignors to Creda Limited, Staffordshire, United Kingdom

Filed Aug. 11, 1988, Ser. No. 231,033
Claims priority, application United Kingdom, Aug. 11, 1987, 8718965
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—378 **12 Claims**

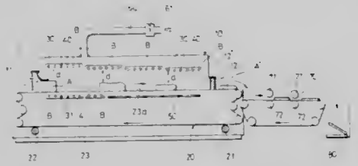


1. An electrical storage heater comprising a heat store, electrical heating means for heating the heat store, a circuit including charge control means for regulating the flow of current to the electrical heating means during an off-peak charging period, means providing for flow of air or other heat distributing fluid into contact with the heat store and thereafter to a space or place to be heated, and flow control means for controlling the flow of heat distributing fluid, wherein the flow control means has associated therewith a setting means which is operative during an on-peak period to variably set the heat flow from the heater, and resetting means operative automatically to cancel the setting of the setting means during the next subsequent off-peak period.

4,894,517
SHRINKING APPARATUS

Masanori Oguri, Nara, Japan, assignor to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara; Hoton Ceramics Kabushiki Kaisha, Kanazawa and Nichido Sangyo Kabushiki Kaisha, Tokyo, all of, Japan

Filed Jul. 19, 1988, Ser. No. 221,142
Claims priority, application Japan, Jul. 20, 1987, 62-180628
Int. Cl.[4] F27B *9/06*; F27D *11/00*
U.S. Cl. 219—388 **10 Claims**



1. A shrinking apparatus for heating and shrinking articles such as molded articles of thermoplastic expanded resin to reduce said articles in bulk,

said shrinking apparatus comprising a furnace having an inlet and an outlet; conveying means extending through said furnace and including a belt conveyor; a plurality of far-infrared heaters in said furnace disposed at distances opposite said conveying means, the distances between said conveying means and the far-infrared heaters opposite thereto being gradually reduced in a direction from the furnace inlet to the furnace outlet; scraper means for scraping off shrunk articles from the belt conveyor, said scraper means coming into contact with an end portion of the belt conveyor; and air blowing means provided outside of said furnace in the vicinity of said outlet for blowing compressed air against the shrunk articles to cool and solidify the articles.

4,894,518
TOASTER OVEN WITH INITIAL TEMPERATURE COMPENSATION AND SENSOR CHECK

Kazuhiko Ishikawa, Kashiwara, and Yoichi Takahashi, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 135,549, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 65,660, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 796,886, Nov. 12, 1985, abandoned. This application Jan. 6, 1989, Ser. No. 294,994
Claims priority, application Japan, Dec. 6, 1984, 59-259746; Jan. 12, 1985, 60-2665
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—413 **10 Claims**

1. A toaster oven comprising

a heating chamber for heating pieces of bread therein,

heating means for heating said heating chamber,

temperature detecting means for measuring the temperature inside said heating chamber,

target temperature setting means for calculating a target temperature by a linear equation $aT_0+(b? c)$ where T0 is an initial temperature inside said heating chamber measured by said temperature detecting means at the start of a heating process by said heating means, a and b are experimentally predetermined constants and c is a parameter selectably adjusted according to desired darkness of bread,

judging means for determining whether the temperature inside said heating chamber measured by said temperature detecting means has reached said target temperature, and heater control means programmed to stop the power supply to said heating means automatically either when said judging means determines that the temperature detected

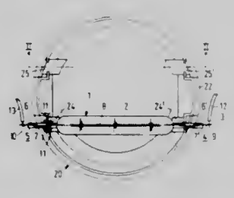


by said temperature detecting means has reached said target temperature or when the time elapsed form the start of said heating process has reached a preset maximum time interval independently of whether or not the temperature inside said heating chamber detected by said temperature detecting means has reached said target temperature.

4,894,519
ELECTRIC COOKER UNIT AND ELECTRIC COOKING APPARATUS PROVIDED WITH IT

Victor R. Noteiteirs, Turnhout, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 168,195, Mar. 15, 1988, abandoned. This application Apr. 25, 1989, Ser. No. 344,541
Claims priority, application Netherlands, Mar. 30, 1987, 8700734
Int. Cl.[4] H05B *3/74*
U.S. Cl. 219—464 **14 Claims**



1. An electric cooking apparatus, comprising:

an electric lamp for producing infrared radiation, said lamp comprising a tubular glass lamp envelope, a glass pinch seal at each end of said envelope for sealing said envelope in a gas-tight manner, said pinch seal having a pair of opposing major faces and a pair of opposing minor faces, a filament within said lamp envelope extending between said pinch seals, and a pair of current-supply conductors each connected to said filament, passing through a respective pinch seal, and extending away from said lamp envelope;

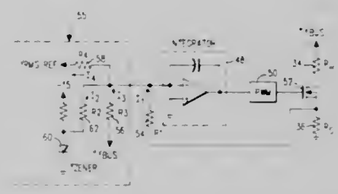
a housing for holding said lamp, said housing comprising a base, and a wall portion having an aperture shaped and positioned for receiving a said pinch seal; and

securing means securing said lamp in said housing, said securing means comprising a face of a said glass pinch seal having a profile, said aperture having an edge portion engaging said profile and preventing translation of said lamp in a direction transverse to said wall portion.

4,894,520
CIRCUIT FOR CONTROLLING POWER DISSIPATED BY AN ELECTRICAL RESISTANCE

Steven A. Moran, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 13, 1988, Ser. No. 205,694
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **21 Claims**



1. A circuit for controlling power dissipated by an electrical resistance coupled to a supply voltage, comprising:

first means, electrically coupled to the electrical resistance, for providing a feedback current in dependence upon the current flowing through the electrical resistance without using a squaring circuit;

second means for providing a correction current corresponding to variations in the supply voltage; and

third means for receiving the correction current and the feedback current, for amplifying an error indicated by the correction current and the feedback current, and for controlling the current flowing through the electrical resistance to control the power dissipated by the electrical resistance.

4,894,521
ELECTRIC HEATING ELEMENT FOR FUSING THERMOPLASTIC MATERIALS

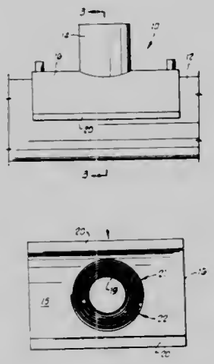
Harold J. Evans, Perkins, Okla., assignor to Central Plastics Company, Shawnee, Okla.

Filed Nov. 21, 1988, Ser. No. 273,930
Int. Cl.[4] H05B *3/58*
U.S. Cl. 219—535 **15 Claims**

1. An electric heating element for electrically fusing thermoplastic materials positioned adjacent thereto comprising an

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elongated thermoplastic insulated wire having a portion thereof wound in a substantially planar spiral configuration



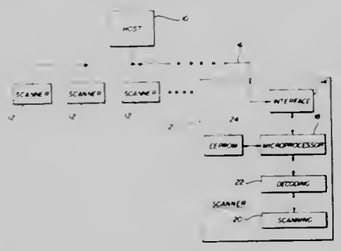
and having adjacent surfaces of said thermoplastic insulation of said wire in said spirally configured portion adhered together.

4,894,522

INTERFACE APPARATUS

Randy D. Elliott, Eugene, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Nov. 19, 1987, Ser. No. 123,356
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **10 Claims**



1. Interface apparatus for interfacing between a personal computer and an optical scanner of the type which scans bar code labels and provides data related thereto to a host computer, the interface apparatus permitting the personal computer to act as the host computer for the scanner, said scanner including a microprocessor for controlling operation of said scanner, and an interface circuit, which connects said microprocessor to a host computer and transfers data from said microprocessor to said host computer, comprising:

a printed circuit board,

output means, mounted on said printed circuit board, for transmitting data from the personal computer to the scanner interface circuit under control of an output strobe signal,

input means, mounted on said printed circuit board, for transmitting data from the scanner interface circuit to the personal computer under control of an input strobe signal, and

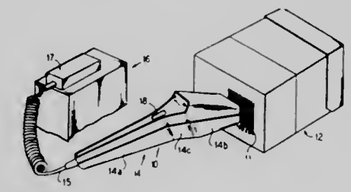
address means, mounted on said printed circuit board, for providing said output and input strobe signals to said output means and said input means, respectively.

4,894,523

INSTANT PORTABLE BAR CODE READER

George E. Chadima, Jr., Cedar Rapids, Iowa, and Vadim Laser, Cincinnati, Ohio, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 234,880, Aug. 19, 1988, said Ser. No. 234,880, is a division of Ser. No. 827,286, Feb. 7, 1986, Pat. No. 4,766,300, said Ser. No. 827,286, is a continuation of Ser. No. 637,693, Aug. 6, 1984, Pat. No. 4,570,057, said Ser. No. 637,693, is a continuation of Ser. No. 334,811, Dec. 28, 1981, abandoned. This application Apr. 18, 1989, Ser. No. 339,953
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **20 Claims**



1. A portable instant reader comprising:

a hand-held reader unit, said hand-held reader unit having a portion thereof defining at least in part an illumination window, a flashable illuminator disposed near said illumination window and means for producing a flash of light therethrough;

said hand-held reader unit having a portion thereof defining at least, in part, a light receiving window for receiving reflections of light emitted through said illumination window;

a photodetector positioned within said hand-held reader in the path of light rays reflected into and through said light receiving window;

a light gathering means positioned between said light receiving window and said photodetector for receiving a light pattern from said light receiving window and focusing the same onto said photodetector;

said light gathering means comprising a lens system with a sensing field in front of said window having a width of at least about fifty millimeters, said photodetector having an image plane for receiving an image of a pattern in said sensing field, and said light gathering means comprising a lens system providing a resolution at the image plane of at least forty line pairs per millimeter with a depth of focus of at least ten millimeters in front of said window.

4,894,524

LASER RECORDING APPARATUS WITH LASER INTENSITY CONTROL

Masakazu Murase, and Takashi Shoji, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1988, Ser. No. 259,632
Claims priority, application Japan, Oct. 20, 1987, 62-265008
Int. Cl.[4] G05D *25/02*; H01J *40/14*
U.S. Cl. 250—205 **1 Claim**

1. A laser recording apparatus for recording a continuous tone image on a photosensitive material by striking the photosensitive material with an intensity-modulated light beam, which light beam is put out by a semiconductor laser, which laser is controlled by a drive current based on an emission light level instruction signal corresponding to an image signal and

by scanning said photosensitive material with said light beam, comprising:

a photosensor for detecting the intensity of said light beam;

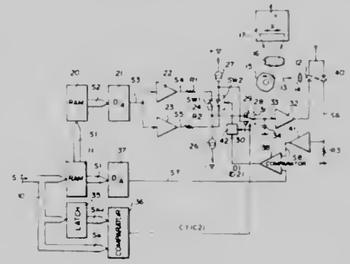
a converter for converting said emission light level instruction signal into a drive current change rate instruction signal for causing the semiconductor laser light output to be a linear function of said image signal and to be changed at a rate proportionate with changes in said emission light level instruction signal;

a non-inverting amplifier for amplifying said drive current change rate instruction signal without sign inversion;

an inverting amplifier for amplifying said drive current change rate instruction signal with sign inversion;

a driver for supplying a drive current, which drive current controls said semiconductor laser;

a first comparator for comparing an image signal for each image element and an image signal for an image element immediately succeeding said each image element in a light beam scanning direction and providing a signal C1 if the



former signal is greater than the latter while providing a signal C2 in the converse case;

a second comparator for comparing the semiconductor laser emission light level indicated by said emission light level instruction signal and the actual emission light level indicated by the output of said photosensor and providing a signal D1 if the latter level is greater than the former level while providing a signal D2 in the converse case;

positive and negative current sources;

a capacitor having one terminal connected to an input line of said driver; and

a switching circuit for receiving the outputs of said first and second comparators and connecting, to said input line of said driver one of the following: said negative current source when said signals C1 and D1 are being received, said non-inverting amplifier when said signals C1 and D2 are being received, said inverting amplifier when said signals C2 and D1 are being received and said positive current source when said signals C2 and D2 are being received.

4,894,525

OPTICAL POWER CONTROL DEVICE FOR SEMICONDUCTOR LIGHT EMITTING ELEMENT

Yoshiyuki Kakuta, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,771
Claims priority, application Japan, Sep. 16, 1988, 63-231893
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **6 Claims**

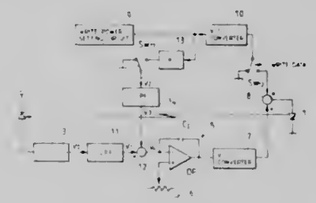
1. An optical power control device for a semiconductor light emitting element, said element including light detecting means for receiving part of a light beam emitted by said element to control the optical power of said element according to a detection output of said light detecting means' said device comprising:

means for supplying to said element a read current corresponding to a read power set value;

first averaging means for averaging said detection output to produce a first averaged signal;

first modulating means for modulating a signal corresponding to a write power set value with write data to produce a first modulated signal;

second averaging means for averaging said first modulated signal to produce a second averaged signal;



subtractor means for subtracting said second averaged signal from said first averaged signal to produce a subtraction output;

means for controlling said read current according to the difference of said subtraction output and said read power set value;

second modulating means for modulating a write current corresponding to said write power set value with said write data to produce a second modulated signal; and

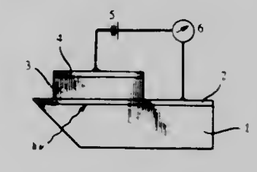
means for superposing said second modulated signal on said read current.

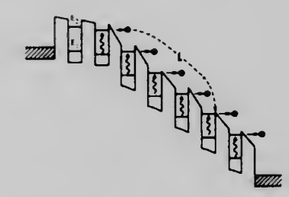
4,894,526

INFRARED-RADIATION DETECTOR DEVICE

Clyde G. Bethea, Plainfield; Kwong-Kit Choi, North Plainfield; Barry F. Levine, Livingston; Roger J. Malik, Summit, and John F. Walker, Westfield, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 4,191, Jan. 15, 1987. This application Sep. 15, 1987, Ser. No. 97,567
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 R **22 Claims**





1. A device comprising an infrared-radiation detector, said detector comprising

a substrate-supported heterostructure superlattice compris-

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ing semiconductor layers forming a plurality of quantum wells doped for one and the same conductivity type, at least one of said quantum wells having at least two confined states and having an adjoining first barrier which permits tunneling of photo-excited carriers out of said quantum well, subsequent transport of said carriers being at energies above the barrier-top energy of a second barrier, and

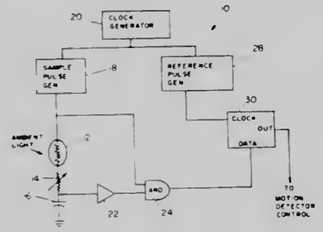
contact means for electrically biasing said superlattice and for sensing an electrical signal in response to radiation incident on said superlattice.

4,894,527

LIGHT DEPENDENT RESISTOR DIGITAL CONTROL CIRCUIT

Edgar M. Smith, Millersville, Pa., assignor to Burle Technologies, Inc., Lancaster, Pa.

Filed Mar. 17, 1989, Ser. No. 324,677
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 AL **3 Claims**



1. A digital ambient light level detector circuit which changes its output signal as an ambient light level passes through a preselected value comprising:

a light dependent resistor with a first terminal and a second terminal;

a capacitor with a higher voltage terminal interconnected with the first terminal of the light dependent resistor, the capacitor also interconnected with a circuit return;

a sample pulse generator generating a pulse voltage, its output interconnected with and applying the pulse voltage to the series circuit of the light dependent resistor and the capacitor, the pulse voltage being of such amplitude and duration to significantly charge the capacitor;

a logic buffer circuit connected to the higher voltage terminal of the capacitor and having an input and an output, the logic buffer circuit generating a signal on its output when a specific threshold voltage is applied to its input;

a reference pulse generator synchronized with the sample pulse generator and generating a pulse voltage on its output which begins after the pulse voltage generated by the sample pulse generator; and

a logic circuit with a clock input, a data input and an output, one signal being generated on the output only when its clock input signal precedes its data input signal, and another signal being generated on the output at all other conditions, the data input being interconnected with the output of the logic buffer circuit and the clock input being connected to the output of the reference pulse generator, and the output of the logic circuit serving as the output of the ambient light level detector circuit.

4,894,528

LASER BEAM LAWN TENNIS NET REFEREE

Sever Diaconu, and Alen Diaconu, both of P.O. Box 9517, Hickory, N.C. 28603

Filed Jun. 20, 1988, Ser. No. 209,186
Int. Cl.[4] G01V *9/04*; G08B *23/00*
U.S. Cl. 250—222.1 **5 Claims**



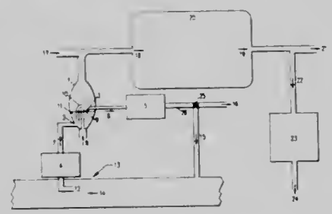
1. A monitoring system for net faults in a net game, wherein said net game comprises a court with a central net, said net having two ends and an upper edge and having a lowered net center, said system comprising two pairs of radiation sources, each pair being positioned on an opposite side of the court from the other pair, wherein the radiation sources in each pair are positioned on opposite sides of the upper edge of the net from one another, with each radiation source positioned higher than the net and projecting a radiation beam at a downward angle from near one end of the net to a receiver near the other end of the net, said beam extending parallel to the upper edge of the net between the source and the lowered net center.

4,894,529

REAL-TIME PARTICLE COUNTER FOR LIQUIDS WITH NEBULIZER AND DRYER

Peter G. Borden, Palo Alto, and Jon Munson, Sunnyvale, both of Calif., assignors to High Yield Technology, Inc., Mountain View, Calif.

Filed Nov. 3, 1988, Ser. No. 267,205
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—222.2 **11 Claims**



1. A particle detector apparatus for detecting contaminant particles in a liquid comprising:

a source of a liquid to be monitored;

a nebulizer for aspirating said liquid to form an aerosol of droplets containing particles;

means for directing said liquid from said source to said nebulizer;

a drying chamber coupled to said nebulizer for evaporating said aerosol droplets to separate said particles in said chamber; and

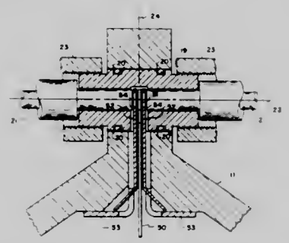
a particle counter coupled to said drying chamber for counting and sizing said particles.

4,894,530

FIBER OPTIC SNAP ACTING SWITCH

Robert D. Kitchen, Johnson City, Tenn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Mar. 31, 1987, Ser. No. 32,798
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **5 Claims**



1. A fiber optic snap switch comprising:

a housing adapted to hold the ends of a pair of optical fibers in substantial alignment with an axis and with opposing end faces of the fiber on opposite sides of and parallel with a plane transverse to the axis, the end faces being separated by a gap, said housing being formed so as to define first and second nonparallel stop surfaces, each stop surface extending between first and second edges, the second edge being located further from the axis than the first edge, the first edges of the first and second stop surfaces being spaced further apart than the second edges thereof;

a carrier having a first portion located between the first and second stop surfaces and being movable in said plane between first and second positions in which the first portion thereof contacts the first and second stop surfaces respectively;

a shutter fixed to said carrier and having a light blocking portion in said plane positioned for movement into and out of the gap between opposing end faces of the optical fibers as said carrier is moved to its first and second positions respectively; and

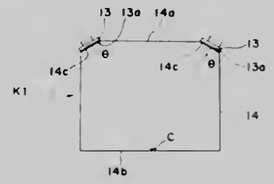
an over center snap acting mechanism including an actuator plunger operable to bias said carrier toward the first or second stop surfaces, depending on the plunger position.

4,894,531

PHOTODETECTOR FOR RECEIVING AN INDEX SIGNAL OF A BEAM-INDEX CATHODE-RAY TUBE

Katsumi Terada, and Tetsuya Enomoto, both of Hirakata, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Oct. 13, 1987, Ser. No. 106,847
Claims priority, application Japan, Oct. 17, 1986, 61-247911
Int. Cl.[4] H01J *29/10*
U.S. Cl. 250—227 **3 Claims**



1. In a photodetector including a planar light guide of a quadrilateral shape in which organic phosphor is dispersed in a transparent shape in which organic phosphor is dispersed in a transparent support material, and a pair of photoelectric conversion elements such that light having a wavelength range for exciting said organic phosphor is introduced into said light guide and light generated from said organic phosphor upon excitation of said organic phosphor is guided to said photoelectric conversion elements, with said photoelectric conversion elements being sensitive to a wavelength of the light generated from said organic phosphor, the improvement comprising:

said light guide being formed, at opposite end portions of one side thereof, with a pair of light emitting end surfaces, wherein said light emitting end surfaces are formed by obliquely cutting off the opposite end portions of the one side of said light guide;

said photoelectric conversion elements being, respectively, provided at said light emitting end surfaces such that a light receiving surface of each of said photoelectric conversion elements confronts each of said light emitting end surfaces, and wherein said light emitting end surfaces are formed to have a geometric relationship with a lower side of said light guide, opposite said one side, such that a line extending from the center of the lower side of the light guide to each photoelectric conversion element is generally perpendicular to and substantially bisects each light receiving surface of each photoelectric conversion element, in order to raise a detection level of an index beam in the vicinity of the center of the lower side of the light guide.

4,894,532

OPTICAL FIBER SENSOR WITH LIGHT ABSORBING MOISTURE-SENSITIVE COATING

Steven H. Peterson, Murrysville; Alfred R. Pebler, Wilkinsburg; Rajender K. Sadhir, Plum Boro; Henry A. Pearce Jr., Stoneboro, and C. Clair Claiborne, Sharpsville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1988, Ser. No. 173,897
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **23 Claims**



1. A method for sensing changes in moisture condition in a fluid environment comprising:

placing an optical fiber having a moisture sensitive coating thereon in a fluid environment where changes in moisture conditions are to be sensed,

said coating being capable of undergoing a change in its light absorption properties depending upon the degree of moisture in the fluid environment;

causing light to be transmitted through said fiber; and

detecting changes in the spectra of the light transmitted through the fiber as a function of changes in the moisture conditions in the environment.

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4,894,533

OPTICAL ROTARY ENCODER

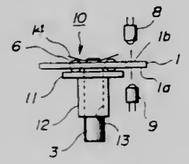
Hiraku Abe, 8-1-305 Koinabe-cho; Yoji Shimojima, 83-4 Aza-Kanagoria, Inaba, and Yoshihiro Takahashi, 93-2 Aza-Kanagoria, Inaba, all of Furukawa-shi, Miyagi-ken, Japan

Continuation of Ser. No. 915,735, Oct. 6, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 220,998

Claims priority, application Japan, Oct. 7, 1985, 60-152469[U]

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **2 Claims**



1. An optical rotary encoder comprising:

a code plate mounted at its center on a rotatable shaft and having a plurality of indicia portions arranged circumferentially at one radial position thereon, retaining means formed in said code plate, and a click member retained by said retaining means so as to project from a surface of said code plate;

a light emitting element and a light receiving element mounted to a stationary part of said encoder such that light emitted by said light emitting element irradiates said indicia portions of said code plate rotated with said shaft and is provided therefrom to said light receiving element in order to derive position signals indicating corresponding rotational positions of said code plate; and

a stationary plate mounted in said encoder facing opposite the surface of said code plate having said click member projecting therefrom, said stationary plate having a plurality of recesses formed therein engageable by said click member, said recesses being positioned on the stationary plate in correspondence with definite rotational positions of said code plate to be indicated by the position signals derived from said indicia portions of said code plate,

wherein said retaining means includes perforations formed through said code plate at another radial position different from that of said indicia portions, and said click member includes balls held in said perforations, and further comprising a spring plate mounted on said shaft on one side of said code plate for resiliently biasing said balls to project from the other side of said code plate in engagement with said recesses of said stationary plate.

4,894,534

LOGGING APPARATUS AND METHOD

William C. Paske, Pearland, and Richard F. Roesler, Houston, both of Tex., assignors to Baroid Technology, Inc., E. Harris County, Tex.

Continuation-in-part of Ser. No. 872,949, Jun. 11, 1986, Pat. No. 4,829,176. This application Jan. 16, 1987, Ser. No. 4,107

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] G01V *5/12*

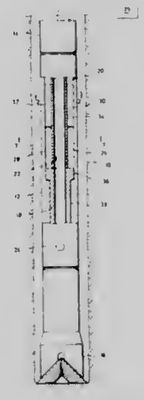
U.S. Cl. 250—254 **34 Claims**

1. Apparatus for measuring downhole parameters in a borehole, comprising:

a. a generally elongate housing having a longitudinal axis;

b. a source of gamma radiation carried by said housing so that radiation from said source may be emitted outside said housing; and

c. radiation detection means carried by said housing and comprising first and second pairs of detectors, said first pair of detectors including first and second detectors positioned diametrically opposite each other on opposite sides of said longitudinal axis of said housing, and said second pair of detectors including third and fourth detectors positioned diametrically opposite each other on opposite sides of said longitudinal axis of said housing such that



the configuration of the combination of said first pair of detectors and said radiation source is different from the configuration of the combination of said second pair of detectors and said radiation source;

d. said detectors being for sensing radiation from the environment of said housing due to radiation emitted from said radiation source and interacting with said environment.

4,894,535

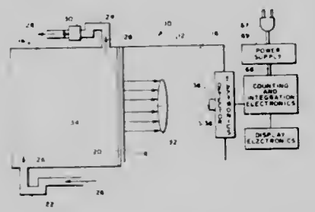
RADON GAS DETECTOR

Peter A. Madnick, 627 Valley Oak La., Thousand Oaks, Calif. 91360, and Russell W. Sherwood, 3719 N. Wells, Kingman, Ariz. 86401

Filed Oct. 3, 1988, Ser. No. 251,793

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—255 **8 Claims**



1. A radon gas detector comprising:

a housing having an interior chamber, said interior chamber being completely closed to ambient light, said interior chamber being divided into an environment connecting chamber and a radiation ascertaining chamber;

radiation sensitive means mounted between said environment connecting chamber and said radiation ascertaining chamber;

air movement means mounted in connection with said environment connecting chamber, said air movement means for moving ambient air through said environment connecting chamber;

electronic means for detecting radiation within the air which is passing through said environment connecting chamber, said electronic means also including radiation counting means, said electronic means producing an output based on the type and quantity of radiation in said environment connecting chamber; and

display electronics for receiving said output and displaying accordingly a display representative of the amount and type of radiation located within said environment connecting chamber and hence within the ambient air.

4,894,536

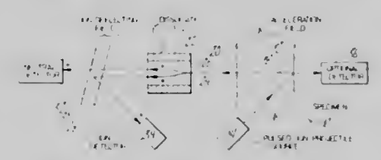
SINGLE EVENT MASS SPECTROMETRY

Robert J. Conzemius, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 23, 1987, Ser. No. 124,023

Int. Cl.[4] H01J *49/26*

U.S. Cl. 250—287 **30 Claims**



1. A single event time of flight mass spectrometer for analysis of a specimen material, the single event being the evolution of a molecular formulation from the same bombarding primary projectile into a secondary particle and subsequent fragmentation into component formulations, comprising:

pulsed projectile source means for imposing on the order of single pulsed primary projectiles on a small localized area on the specimen to induce a corresponding emission of on the order of single, temporally isolated secondary ion particles from the small, localized area, the intensity of the pulsed projectile source being controlled so that each pulse of the pulsed projectile source produces only a very small number, generally on the average between zero and one, of primary projectiles;

detector means for individually detecting and timing the arrival of the secondary particles.

4,894,537

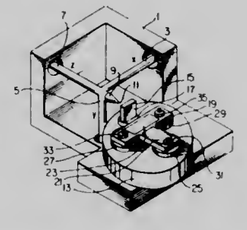
HIGH STABILITY BIMORPH SCANNING TUNNELING MICROSCOPE

Bradford L. Blackford; Douglas C. Dahn, and Manfred H. Jericho, all of Nova Scotia, Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jul. 21, 1988, Ser. No. 222,623

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—306 **7 Claims**



1. A scanning tunneling microscope, comprising:

a support block made of an electric and thermal conductive metal, and having three orthogonal walls, each having a flanged hole therein,

adjustable sample holding means adjustably positioned on the said support block to carry a sample thereon,

tunneling tip means comprising an electrically conductive tunneling tip and x, y and drive arms, the latters of which are made of hollow tubes of the same metal as that of the said support block and oriented along three orthogonal x, y and z axes respectively, the said x, y and z drive arms being joined together at one end of each arm and carrying the said tunneling tip thereat, the said tip being oriented along the z axis and positioned at a predetermined distance away from the said sample to produce a tunneling current therebetween,

three bimorph disks, each being clamped at its perimeter in the said flanged hole and connecting the said support block and each of the x, y and z drive arms at the other end thereof, for relative movements therebetween along the axis thereof, and

electrical means connected to the said three bimorph disks to control the said relative movements along x, y and z axes.

4,894,538

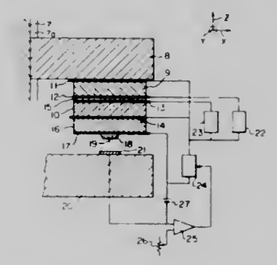
SCANNING DEVICE FOR SCANNING TUNNELING MICROSCOPE

Masashi Iwatsuki; Kimio Ohi; Kazuma Suzuki, and Kiyoshi Miyashita, all of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,066

Int. Cl.[4] H01J *37/26*

U.S. Cl. 250—306 **4 Claims**



1. In a scanning tunneling microscope having a scanning device and a probe tip whose front end is located close to a sample surface that is maintained in the xy-plane of a rectangular coordinate system consisting of x-, y-, and z-axes, the front end of the tip being maintained parallel to the z-axis, the scanning device causing the tip to make two-dimensional scans of the sample surface while a voltage is applied between the sample and the tip to produce a tunneling current between them, the microscope acting to obtain information about the sample surface from the tunneling current, the scanning device comprising two drivers, which, when a voltage is applied to them, expand or contract along the x- and y-axes, respectively, and each of which consists of a piezoelectric or electrostrictive element,

the improvement wherein the two drivers are stacked on top of each other and each shaped into a sheet, and wherein, when a voltage is applied across each driver, a strain is produced parallel to the surface of the driver.

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4,894,539

LEAK DETECTOR

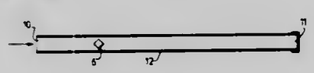
James A. Hurst, Stockton-on-Tees, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 88,359, Aug. 24, 1987, abandoned. This application May 16, 1989, Ser. No. 352,611

Claims priority, application United Kingdom, Aug. 22, 1986, 8620500

Int. Cl.[4] G21H *5/02*

U.S. Cl. 250—303 **5 Claims**



1. A method for determining the position of a leak in a pipeline or conduit which comprises

(i) providing within the pipeline or conduit a carrier body housing a radioactive isotope sealably enclosed within it, said carrier body being of a size and a shape such as to enable it to move freely along said pipeline or conduit;

(ii) providing radiation detection means for scanning the pipeline or conduit to determine the progress and location therein of the radioisotope housed within the carrier body;

(iii) pressuring up the pipeline or conduit from a first end with the second end closed and determining the location of cessation of the movement of the carrier body with said radiation detection means; and

(iv) opening up the closed end of the pipeline or conduit to detect movement of the carrier body towards said closed end to indicate that said cessation of movement is due to a leak and not to a constriction in the pipeline or conduit.

4,894,540

IMAGE FORMING METHOD USING SECONDARY ELECTRONS FROM OBJECT FOR NOISE ELIMINATION

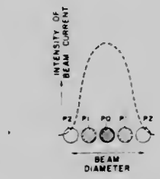
Fumio Komatsu, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 14, 1988, Ser. No. 257,557

Claims priority, application Japan, Oct. 14, 1987, 62-259208

Int. Cl.[4] G21K *1/00*

U.S. Cl. 250—307 **12 Claims**



1. An image forming method comprising:

the first step of irradiating a primary beam, having a beam diameter, onto an object, using an intensity corresponding to an image area onto which the beam was irradiated as the intensity of a pixel at the center of said image area, and scanning a beam throughout an inspection area of said object to obtain an image within said inspection area as a collection of pixels arranged at intervals smaller than the beam diameter; and

the second step of assigning a pixel of said collection of pixels to be processed and neighboring pixels with coefficients in accordance with a secondary beam intensity distribution, multiplying the intensity of each pixel by each assigned coefficient, determining a new intensity of said pixel to be processed in accordance with the sum of the respective products, and repeating the new intensity determining process for pixels to be processed.

4,894,541

APPARATUS UTILIZING CHARGED-PARTICLE BEAM

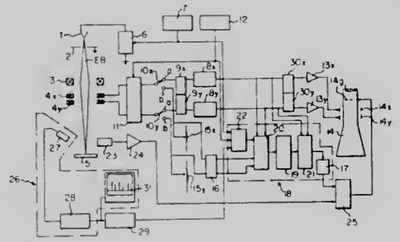
Akishige Ono, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,342

Claims priority, application Japan, Jul. 31, 1987, 62-192098

Int. Cl.[4] H01J *37/256*

U.S. Cl. 250—310 **4 Claims**



1. An apparatus utilizing a charged-particle beam for scanning a specimen in a two-dimensional manner and displaying an image of the specimen based upon x-rays or backscattered electrons emitted from the specimen on a display device having a viewing screen, said apparatus comprising:

a position-specifying means for specifying a desired position within the image of the specimen and displaying that position as a first mark upon the viewing screen;

a means for fixing the charged-particle beam on the position specified by the position-specifying means;

a means for switching the accelerating voltage at which the beam is accelerated to at least one other value;

a means for receiving the at least one other value of the accelerating voltage;

a means for detecting the x-rays or backscattered electrons emitted from the specimen in response to the irradiation of the fixed beam;

a means for receiving the mean atomic number of the irradiated portion of the specimen; and

a second mark display means which superimposes a second mark indicating the position and the size of an analyzed region on the image of the specimen displayed on the viewing screen according to information indicating the accelerating voltage and information indicating the mean atomic number of the specimen.

4,894,542

BROADBAND SUPERCONDUCTING DETECTOR

Richard T. Schneider, Alachua, Fla., assignor to Progress Technology Corporation, St. Petersburgh, Fla.

Filed Dec. 23, 1987, Ser. No. 137,131

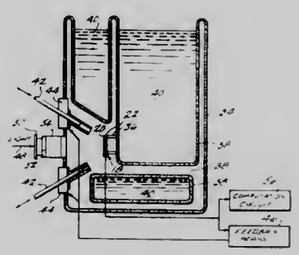
Int. Cl.[4] H01L *39/00*; G01J *5/00*

U.S. Cl. 250—336.2 **23 Claims**

1. A broadband photon detector comprising:

superconducting material such that at least within a given range incident photons increase the temperature of said material and the resistivity of said material varies in accordance with the temperature of said material;

means for maintaining said material at a temperature within said given range using blackbody radiation that an increase in temperature of said material will cause an increase in the resistivity of said material; and



means for sensing an increase in the resistivity of said material.

4,894,544

ARRAYS OF INFRARED DETECTOR ELEMENTS

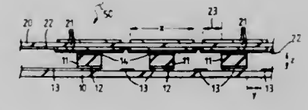
Andrew A. Turnbull, Reigate, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jan. 14, 1988, Ser. No. 206,648

Claims priority, application United Kingdom, Jul. 10, 1987, 8716238

Int. Cl.[4] G01J *5/06*

U.S. Cl. 250—338.3 **12 Claims**



1. An array of infrared detector elements mounted on a support, each element comprising a capacitor formed by a body of pyroelectric or ferroelectric material between a front electrode and a back electrode at respective front and back major faces of the body, which back major face faces the support, the elements having individual electrical connections to their back electrode from which there are derived electrical signals which differ as the temperature of the body changes in response to incident infrared radiation, which individual electrical connections are provided by a pattern of conductors carried by the support, each element having at least an infrared-collection area of larger lateral dimensions than the portion of the electrical connection to the back electrode which underlies the back electrode whereby a peripheral part of each element overhangs and is separated vertically from an underlying part of the support, characterised in that the elements are arranged in a 2-dimensional array with inner elements of the array surrounded by outer elements of the array, and in that the conductors which provide said individual electrical connections to the inner detector elements extend on a part of the support between the outer detector elements and below the overhanging peripheral parts of these outer elements.

4,894,543

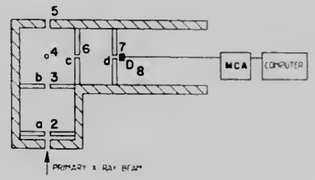
METHOD FOR MEASURING X-RAYS OR GAMMA RADIATION AND DEVICE FOR THIS

Roland Ribberfors, Allmogegatan 92, Linköping, Sweden (S-583 30), and Georg Matscheko, Drottninggatan 41, Linköping, Sweden (S-582 27)

Filed Mar. 3, 1988, Ser. No. 163,545

Int. Cl.[4] G01T *1/16*

U.S. Cl. 250—336.1 **14 Claims**



8. A device for use in measuring a high-energy electromagnetic radiation beam traveling along a path by means of Compton scattering, comprising:

a chamber enclosing at least a portion of said beam;

a scattering element disposed in the beam path, so as to scatter the beam, including at least one of said filament and said rod, having a length substantially greater than its cross-sectional dimensions at a point where the beam is scattered toward a detector;

a detector arranged in the same plane with the radiation beam and a cross-section of the scattering element and disposed at an angle to the beam path to measure radiation scattered by said scattering element; and

said scattering element having a longitudinal axis extending generally perpendicular to said plane and having a cross-section in the plane of dimensions substantially less than the length of the scattering element so as to scatter a portion of the beam toward the detector, the scattered portion having a spectrum indicative of the spectrum of the radiation beam, whereby the spectrum of the beam may be reconstructed from the spectrum of the scattered radiation.

4,894,545

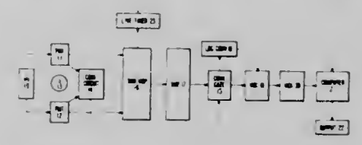
LIQUID SCINTILLATION COUNTING

Charles L. Dodson, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 27, 1988, Ser. No. 263,067

Int. Cl.[4] G01T *1/208, 1/00*

U.S. Cl. 260—364 **19 Claims**



1. A method for determining radioactivity in a liquid scintillation counter comprising:

a. obtaining count rates for a standard sample for multiple channels of a multichannel analyzer over at least part of the spectrum of the standard sample;

b. determining the counting efficiencies for multiple channels of the analyzer;

c. obtaining count rates for an unknown sample for multiple channels of the multi-channel analyzer over at least part of the spectrum of the unknown sample;

d. determining a regression equation from the integrated count rates of the unknown sample and the counting efficiencies of the standard sample;

e. selecting a region of the spectrum of the unknown sample

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to obtain a selected modified regression equation reducing error below a predetermined level; and

f. extrapolating the modified regression equation to provide the activity of the unknown sample.

4,894,546

HOLLOW CATHODE ION SOURCES

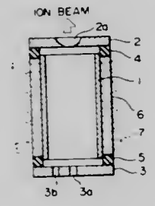
Ryota Fukui, Fujisawa; Kenichi Takagi; Riichi Kikuchi, both of Chigasaki; Kazuo Takayama, Machida, and Akira Tonegawa, Hatano, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 7, 1988, Ser. No. 164,803

Claims priority, application Japan, Mar. 11, 1987, 62-54110; Feb. 3, 1988, 63-22065

Int. Cl.[4] H01J *27/00*

U.S. Cl. 250—423 R **12 Claims**



1. A hollow cathode ion source comprising a cylindrical cathode having a diameter at least about half its length, a first anode provided on one end of said cylindrical cathode and having an ion extraction opening, a second anode provided on the other end of said cylindrical cathode and having at least one opening for introducing a gaseous medium, a discharge means between said cylindrical cathode and each of said first and second anodes to ionize said gaseous medium to produce ions which are extracted through said ion extraction opening in the axial direction of said cylindrical cathode, and means for cooling said cathode.

4,894,547

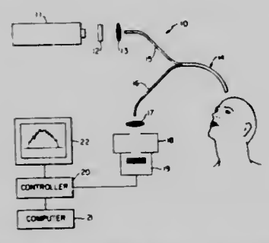
OPTICAL METHOD AND APPARATUS FOR DETECTING AND MEASURING AGING, PHOTOAGING, DERMAL DISEASE AND PIGMENTATION IN SKIN

David J. Leffell, Ann Arbor, Mich., and Lawrence Deckelbaum, Woodbridge, Conn., assignors to Yale University, New Haven, Conn.

Filed Sep. 28, 1987, Ser. No. 101,944

Int. Cl.[4] G01N *33/16; A61B 5/00*

U.S. Cl. 250—461.2 **29 Claims**



12. A method for inducing naturally occurring fluorescence in untreated human skin, in vivo, comprising the steps of:

developing laser light energy of a predetermined ultraviolet band wavelength; and

directing said laser light energy to an area of untreated skin to be induced to endogenous fluorescence.

4,894,548

RADIATION IMAGE RECORDING AND REPRODUCING METHOD AND RADIATION IMAGE STORAGE PANEL EMPLOYED FOR THE SAME

Kenji Takahashi; Takashi Nakamura, and Yuichi Hosoi, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Minami, Japan

Continuation of Ser. No. 47,596, May 19, 1987, abandoned, which is a continuation of Ser. No. 723,873, Apr. 16, 1905, abandoned. This application Jan. 19, 1988, Ser. No. 147,572

Claims priority, application Japan, Apr. 17, 1984, 59-77226

Int. Cl.[4] C09K *11/61*

U.S. Cl. 250—484.1 **16 Claims**

1. A radiation image recording and reproducing method comprising steps of:

(i) causing a divalent europium activated complex halide phosphor having the formula (I):

$$M^{II}X_2 \cdot aM^{II}X'_2 \cdot bMgX''_2 : xEu^{2+} \quad (I)$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I, and $X \neq X'$; X'' is at least one halogen selected from the group consisting of F, Cl, Br and I; and a, b and x are numbers satisfying the conditions of $0.1 \leqq a \leqq 10.0$, $2 \times 10^{-5} \leqq b \leqq 2 \times 10^{-2}$ and $0 < x \leqq 0.2$, respectively, to absorb a radiation having passes through an object or having radiated from an object;

(ii) exposing said stimulable phosphor to an electromagnetic wave having a wavelength within the range of 450–1000 nm to release the radiation energy stored therein as light emission; and

(iii) detecting the emitted light.

4,894,549

APPARATUS FOR DEMAGNIFICATION OR FULL-SIZE ION PROJECTION LITHOGRAPHY

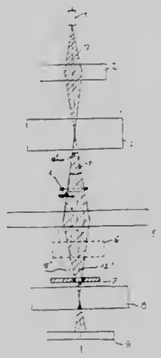
Gerhard Stengl, Kärnten, Austria, assignor to IMS Ionen Mikrofabrikations Systeme Gesellschaft m.b.H., Vienna, Austria

Filed Mar. 4, 1988, Ser. No. 164,106

Claims priority, application Austria, Mar. 5, 1987, 507/87

Int. Cl.[4] H01J *27/00*

U.S. Cl. 250—492.2 **18 Claims**



1. An apparatus for demagnification or full-size ion projection lithography, comprising:

an ion source for projecting an ion beam along a path;

a structured mask disposed along said path;

an image plane disposed along said path and receiving an image of the structure of said mask projected onto the image plane by said ion beam;

an immersion lens between said mask and said image plane along said path for focussing said ion beam and forming a crossing point for ion rays thereof;

a projection lens along said path;

a Wien ExB mass-separation filter along said path between the source and the mask; and

a diaphragm cooperating with said Wien ExB mass-separation filter and provided with an aperture passing a predetermined kind of ions generated by said source and intercepting ions different from said predetermined kind upon deflection by said filter, said diaphragm being positioned between said immersion lens and said image plane at a distance from said Wien ExB mass-separation filter so as to substantially reduce the distortion caused by the diffraction of said filter.

4,894,550

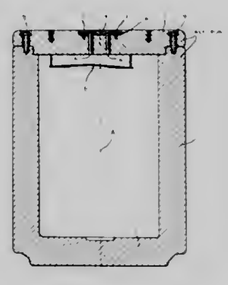
SHIELDED RADIOACTIVE-WASTE CONTAINER

Henning Baatz, and Dieter Rittscher, both of Essen, Fed. Rep. of Germany, assignors to GNS Gesellschaft fur Nuklearservice MBH, Essen, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,227

Int. Cl.[4] G21F *5/00*

U.S. Cl. 250—506.1 **4 Claims**



1. A shielded container for the treatment of radioactive waste, the container comprising:

an upwardly open cast-iron vessel having a closed bottom, solid walls unitary therewith, and an open upper mouth, said vessel having a smooth outer surface shaped to interfit with a heater;

a cast-iron lid sealingly engaged over and completely blocking the mouth, the lid being formed with separate vertically throughgoing intake and outlet passages;

means including screwthread formations for hermetically securing the lid over the mouth;

a flow deflector aligned inside the vessel and spaced directly underneath the outlet passage, said deflector being a horizontal plate;

a single unitary cover sealingly engageable on the lid over both the passages; and

means including screwthread formations for hermetically engaging the cover over the passages.

4,894,551

SECTIONAL FORM MEASURING APPARATUS

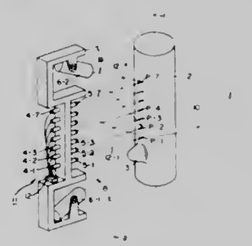
Hideo Kishimoto, Chofu; Hirohisa Tsubakimoto, Hachiouji, and Takao Nakajima, Chofu, all of Japan, assignors to Anima Corporation, Chofu, Japan

Filed May 26, 1988, Ser. No. 199,271

Claims priority, application Japan, Jun. 5, 1987, 62-139655; Jun. 5, 1987, 62-139656; Jun. 5, 1987, 62-139657; Jun. 30, 1987, 62-161371

Int. Cl.[4] G01N *21/86;* **G01B** *11/24*

U.S. Cl. 250—560 **10 Claims**



1. Sectional form measuring apparatus, comprising in combination:

a plurality of light sources for irradiating an object positioned on a reference axis with irradiation directed toward a plurality of positions on the reference axis, said light sources and said object being relatively rotatable, about said reference axis, comprising in combination, lenses mounted on the light sources to focus irradiated light from said light sources on the surface of said object, a plurality of detectors located at different positions respectively for receiving reflected light from the surface of said measuring object from at least a portion of the light sources, means for separately measuring distances from said reference axis to the surface of said object in response to detected signals from the respective detectors, and means for producing sectional forms of said object along said reference axis obtained at a plurality of positions on said reference axis from the detected signals in response to relative rotation about the reference axis.

4,894,552

DIFFERENTIAL-REFLECTANCE PHOTOMETER

Helmut Gasseahuber, Starnberg, and Walter Ziegler, Munich, both of Fed. Rep. of Germany, assignors to LRE Relais & Elektronik GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,260

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 8711377

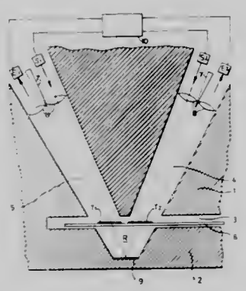
Int. Cl.[4] G01N *21/88*

U.S. Cl. 250—572 **3 Claims**

1. A differential-reflectance photometer for quantitatively evaluating test strips, especially for chemical analysis, characterized in that two channels, each containing an optical emitter and receiving arrangement, are provided in a housing and are arranged to form a V, that at the apex of the V the two channels enter a common space, that on the bottom of the common space is provided a reference field associated with both of the optical emitting and receiving arrangements, that the two optical emitting and receiving arrangements are connected with a common evaluating apparatus, and that between the reference field and the emitting and receiving arrangements of the two channels is a receiving slot for a test strip having two test fields associated respectively with the channels and which receiving slot intersects both of the channels, whereby when a test strip is positioned in said slot each of said two optical emitting and receiving arrangements is responsive to the light

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reflected from the associated one of said two test fields and whereby when a test strip is not positioned in said slot each of



said two optical emitting and receiving arrangements is responsive to the light reflected from said reference field.

4,894,553

ENGINE STARTING AND CHARGING DEVICE

Kazutoshi Kaneyuki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00127, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/06377, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 9, 1988, Ser. No. 265,860
Claims priority, application Japan, Feb. 12, 1987, 62-30022
Int. Cl.[4] H02K *17/12, 17/42*
U.S. Cl. 290—31 **6 Claims**



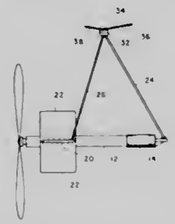
1. An engine starting and charging device, comprising: revolving-field poles mounted on a crankshaft of engine; field coils which are divided in the plural number and wound about a field core secured to an engine body and excite said revolving field poles; an armature core secured on said engine body and an armature coil wound thereabout; a crank angle detector which detects the angle of rotation of said revolving-field poles; an armature current changeover circuit which changes the direction of the electric current flowing into said armature coil in accordance with an output signal produced by said crank angle detector such that, at the time of engine starting, said armature coil will form a revolving field having a specific phase difference in relation to the field of said revolving-field poles; a rectifying means which converts the voltage produced by said armature coil into the direct current after engine starting; and a field coil control circuit which connects in parallel said field coils that have been divided in the plural number described above, at the time of engine starting, and in series after engine starting.

4,894,554

CABLE SUSPENDED WINDMILL

Moses G. Farmer, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 15, 1988, Ser. No. 246,594
Int. Cl.[4] F03D *9/00*
U.S. Cl. 290—55 **21 Claims**



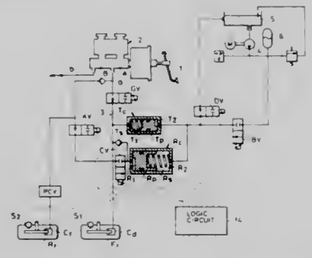
1. A windmill apparatus comprising:
an airframe having an upwind end and a downwind end;
a first rotor rotatably mounted on the airframe;
a generator supported by the airframe and being operatively connected to the rotor;
ground based support means for supporting the airframe in a vertically elevated disposition; and
suspension means for suspending the airframe from the support means.

4,894,555

BRAKE CONTROL SYSTEM AND METHOD FOR A VEHICLE

Namio Watanabe; Kinji Ogino, and Satomi Ookubo, all of Saitama, Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,999
Claims priority, application Japan, Nov. 21, 1986, 61-276450; Dec. 16, 1986, 61-297798
Int. Cl.[4] B60T *8/32*
U.S. Cl. 303—113 **5 Claims**



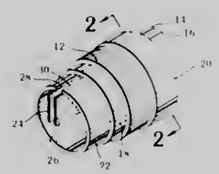
1. A brake control system for use in a motor vehicle, comprising:
a master cylinder generating a fluid pressure for a brake;
a brake device having a wheel cylinder;
a fluid passage communicating said master cylinder with said wheel cylinder;
a gate valve of a normally open type provided at said fluid passage, said gate valve closing during the skid-preventing control of a wheel and the acceleration slip-preventing control of a driving wheel;
a compression cylinder device provided at said fluid passage between said gate valve and said wheel cylinder, said compression cylinder device having a compression piston reciprocately disposed therein, said compression piston dividing an inside of said compression cylinder device into a fluid supply chamber communicating with said fluid passage and a rear chamber;
a decompression cylinder device provided at said fluid passage between said gate valve and said wheel cylinder, said decompression cylinder device having a decompression piston disposed therein, said decompression piston dividing an inside of said decompression cylinder device into a decompression chamber and a back chamber;
a close valve of a normally close type provided between said decompression chamber and said fluid passage, said close valve being opened by a wheel lock signal;
an accumulator accumulating a hydraulic pressure; and a valve system provided between said accumulator and said rear and back chambers of said compression and decompression cylinder devices, said valve system selectively supplying the hydraulic pressure in said accumulator to said rear and back chambers during the skid-preventing control of the vehicle wheel and the acceleration slip-preventing control of the driving wheel.

4,894,556

HYBRID PULSE POWER TRANSFORMER

Mohamed A. Hilal; Jerome F. Parmer; Scott D. Peck, and Eddie M. W. Leung, all of San Diego, Calif., assignors to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Jun. 15, 1987, Ser. No. 61,761
Int. Cl.[4] H03K *3/00;* **H01F** *36/00*
U.S. Cl. 307—106 **6 Claims**



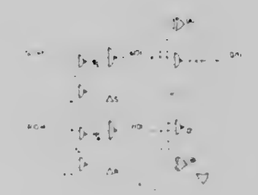
1. A highly efficient high power transformer comprising:
a primary winding formed from a conductor means which has a minimal resistance when in a superconducting first state and high substantially uniform resistance along its length when a second conducting state;
a load:
a secondary winding formed from a normal conductor connected across said load;
means for establishing said primary winding in said first state;
power means for charging said primary winding to its maximum capacity with stored energy while in said first state:
means for changing said primary winding from said first state to said second state; and
a first and second switch, said first switch in series with said power means which is closed when charging said primary winding and open when discharging said stored energy from said primary winding and said second switch positioned across said primary winding which when open allows said primary winding to become charged and when closed causes said stored energy in said primary winding to be transferred to said secondary winding and said load, said first and second switches are simultaneously switched.

4,894,557

ASYNCRONOUS EDGE-TRIGGERED RS FLIP-FLOP CIRCUIT

Angelo Beltramini, Galliate, Italy, assignor to Montedison S.p.A., Milan, Italy

Filed May 9, 1988, Ser. No. 191,363
Claims priority, application Italy, May 15, 1987, 20536 A/87
Int. Cl.[4] H03K *3/037*
U.S. Cl. 307—291 **13 Claims**



1. An asyncronous flip-flop comprising:
an RS flip-flop output circuit having at least one output Q, at least one set (s) input and at least one reset (r) input, said RS flip-flop circuit being formed by a pair of cross-coupled logical gate circuits, each of which has at least a first input receiving an output signal from the other cross-coupled gate circuit and a second input as a respective one of the set (s) and reset (r) inputs;
a first circuit connected to one of said set (s) and reset (r) inputs and comprising:
means for accepting at least one input signal Xa;
means responsive to a change in state of said one input signal Xa for producing a change in state in an output signal Ya from a rest state to another state, said output signal Ya being coupled with one of said set (s) and reset (r) inputs;
means for accepting at least one feedback signal F representing the output Q of said RS flip-flop,
means responsive to a change in state of said feedback signal F for returning said output signal Ya to its rest state;
a second circuit connected to the other of said set (s) and reset (r) inputs and comprising:
means for accepting at least one input signal Xb;
means responsive to a change in state of said one input signal Xb for producing a change in state of an output signal Yb from a rest state to another state, said output signal Yb being coupled to the other of said set (s) and reset (r) inputs;
means for accepting said at least one feedback signal F representing the output Q of said RS flip-flop, and
means responsive to a change in state of said feedback signal F for returning said output signal Yb to its rest state; and
means for generating said feedback signal F and comprising:
a first XOR gate having an output and first and second inputs respectively coupled to the first and second inputs of one of said cross-coupled gates; and
a second XOR gate having an output and first and second inputs respectively coupled to the first and second inputs of the other of said cross-coupled gates; and,
an OR gate having first and second inputs respectively coupled to the outputs of said first and second XOR gates, and an output which supplies said feedback signal F in common to said first and second circuits.

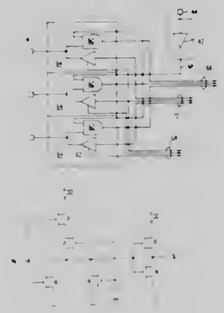
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4,894,558

POWER SAVING INPUT BUFFER FOR USE WITH A GATE ARRAY

Cecil Conkle, Palo Alto, Calif.; Masahiko Shoji, and Noriaki Takagi, both of Tokyo, Japan, assignors to NEC Electronics Inc., Mountain View, Calif. and NEC Corporation, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,227
Int. Cl.[4] H03K *19/096, 19/003, 17/687, 3/013*
U.S. Cl. 307—296.3 **7 Claims**



1. A device for conserving power in a gate array circuit comprising:
means for supplying a first control signal;
AND gate means having a first input port and a second input port and providing a first output signal, said first control signal being applied to said first input port and a first signal being applied to said second input port, wherein said first output signal is coupled to a gate array means and follows said first signal when said first control signal represents a logical one and represents a logical zero when said first control signal represents a logical zero.

4,894,559

BUFFER CIRCUIT OPERABLE WITH REDUCED POWER CONSUMPTION

Shouji Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,557
Claims priority, application Japan, Sep. 9, 1986, 61-213164
Int. Cl.[4] H03K *17/04, 3/356, 19/01;* **G11C** *7/00*
U.S. Cl. 307—530 **6 Claims**

1. A buffer circuit comprising a flip-flop circuit having first and second input terminals, and first and second output terminals; a first boot-strap circuit coupled to said first output terminal, and including a first capacitor and a first precharge circuit for operatively charging said capacitor; a second boot-strap circuit coupled to said second output terminal and including a second capacitor and a second precharge circuit for operatively charging said second capacitor; a first control circuit coupled to said first precharge circuit for enabling said first precharge circuit when said first output terminal is to be made high in level and disenabling said first precharge circuit when said first output terminal is to be made low in level; and a



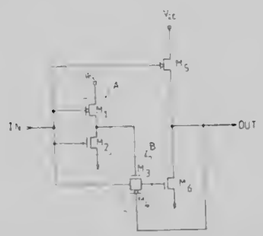
second control circuit coupled to said second precharge circuit for enabling said second precharge circuit when said second output terminal is to be made high in level and disenabling said second precharge circuit when said second output terminal is to be made low in level.

4,894,560

DUAL-SLOPE WAVEFORM GENERATION CIRCUIT

Hyung-Sub Chang, Seoul, Rep. of Korea, assignor to Samsung Semiconductor and Telecommunications Co. Ltd., Gumi, Rep. of Korea

Filed Sep. 16, 1988, Ser. No. 247,048
Claims priority, application Rep. of Korea, Dec. 8, 1987, 87-14053
Int. Cl.[4] H03K *5/12, 17/16*
U.S. Cl. 307—263 **3 Claims**



1. A dual-slope waveform generation circuit comprising:
a pull-up transistor and a pull-down transistor connected in series with each other, one of said pull-up and pull-down transistors being directly connected to an input signal node, the other of said pull-down and pull-up transistors being connected to the sources of a pair of parallel connected P and N type MOS transistors forming a transmission gate, and a terminal interconnecting said pull-up and pull-down transistors being connected to an output signal node, said transmission gate being controlled sequentially by, first, a delayed and inverted input signal generated by an inverter and, second, an output feedback signal, the drains of said P and N type MOS transistors of said transmission gate being connected to the input signal node; and
the invertor being composed of P and N type MOS transistors connected in series with each other, gates of said P and N type MOS transistors being connected to the input signal node, a source of said P type MOS transistor and a

drain of said N type MOS transistor being connected together at an inverter output node, said inverter output node being connected to said transmission gate for controlling the transmission through one of the transistors thereof, a source of said N type MOS transistor of said inverter being connected to ground, and said output signal node being connected to and controlling the transmission through the other of said transmission gate transistors.

4,894,561

CMOS INVERTER HAVING TEMPERATURE AND SUPPLY VOLTAGE VARIATION COMPENSATION

Kazutaka Nogami, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 13, 1988, Ser. No. 256,664
Claims priority, application Japan, Dec. 18, 1987, 62-320416
Int. Cl.[4] H03K *17/14*
U.S. Cl. 307—443 **7 Claims**



1. A semiconductor integrated circuit comprising:
a pair of P-channel and N-channel MOS output transistors connected in series between a power source voltage node and a ground node;
a first logic circuit for controlling a gate potential of said P-channel MOS output transistor;
a first current control circuit for controlling a current flowing into a ground potential path of said first logic circuit;
a second logic circuit for controlling a gate potential of said N-channel MOS output transistor;
a second current control circuit for controlling a current flowing into a power source potential path of said second logic circuit; and
said first and second current control circuits having a current-temperature characteristic and a current-power source voltage characteristic which are inversely proportional to those of said MOS output transistors.

4,894,562

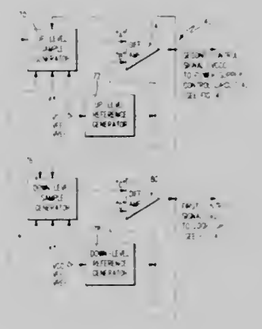
CURRENT SWITCH LOGIC CIRCUIT WITH CONTROLLED OUTPUT SIGNAL LEVELS

Joseph R. Cavaliere, Hopewell Junction, and George E. Smith, III, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,489
Int. Cl.[4] H03K *19/086, 19/003, 17/14, 17/16*
U.S. Cl. 307—455 **20 Claims**

1. A logic circuit network for producing an adjustable first logic level and a different adjustable second logic level in response to at least one input signal, comprising:
a logic circuit having at least one input terminal, at least one output terminal, at least one power supply terminal for receiving power, circuit components having parameters and a first control terminal;
a control circuit coupled to the logic circuit and having a second control terminal;
means for independently generating a first control signal and a second control signal responsive to changes in the power supply, temperature and logic circuit component parameters; and
means for supplying the control signals to the first and second control terminals, respectively, so as to maintain the first and second logic levels at different predetermined





reference levels despite changes in the power supply, temperature and logic circuit component parameters.

4,894,563

OUTPUT MACROCELL FOR PROGRAMMABLE LOGIC DEVICE

Keith H. Gudger, Sunnyvale, Calif., assignor to Atmel Corporation, San Jose, Calif.

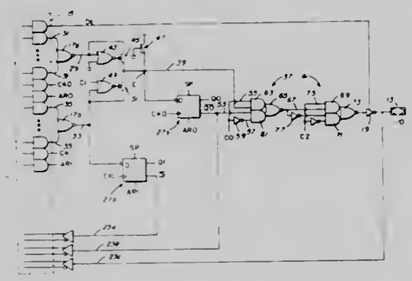
Filed Oct. 11, 1988, Ser. No. 256,915
Int. Cl.[4] H03K *19/177*
U.S. Cl. 307—465 **15 Claims**

1. An output macrocell for a programmable logic device comprising,
an input/output pin connectable to an external but for transferring data into and out of the programmable logic device,
an output buffer connected to said pin,
a product term programmable output enable means connected to said output buffer for selectively enabling data placed in said output buffer to be output to the bus through said input/output pin,
a dedicated path from said input/output pin to a programmable AND array of the programmable logic device, said dedicated path feeding data output through said input-/output pin back to said array whenever said output buffer is enabled, said dedicated path inputting data from said

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external bus into said array whenever said output buffer is disabled by said enable means,

a first flip-flop register with an input connected to a first sum term line from said array via a first OR gate and with an output in selectable data communication with said output buffer, said output also connected to a dedicated feedback path to said array, and



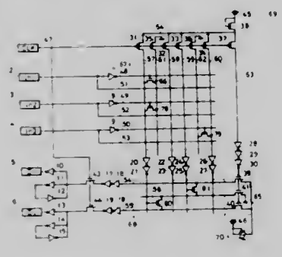
a second flip-flop register with an input connected to a second sum term line from said array via a second OR gate and with an output connected to a feedback path to said array, said second sum term line being selectively connectable to an input of said first OR gate producing said first sum term line.

4,894,564

PROGRAMMABLE LOGIC ARRAY WITH REDUCED PRODUCT TERM LINE VOLTAGE SWING TO SPEED OPERATION

Kazuhiro Sakashita; Takashi Ohya, and Takeshi Hashizume, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,231
Claims priority, application Japan, Oct. 23, 1987, 62-268914
Int. Cl.[4] H03K *17/04, 19/177*
U.S. Cl. 307—465 **6 Claims**



1. A programmable logic array for outputting a logic signal previously programmed in synchronization with a clock signal, comprising:

logic circuit means (**67, 68**) comprising a plurality of input lines (**48–53**), a plurality of product term lines (**57–60**) each provided intersecting with said input lines, and at least one output line (**54, 55**) provided intersecting with said plurality of product term lines for outputting a logical product signal by connecting transistors (**66, 78, 79**) to intersections of said plurality of input lines and any of said plurality of product term lines as required, to be programmed, as well as outputting an logical sum signal by connecting transistors (**80, 81**) to intersections of said plurality of product term lines and at least one output line, to be programmed,

clock gate means (**31–34, 39, 40**) connected to said plurality of product term lines and said at least one output line, respectively, and responsive to said clock signal to be rendered conductive, and

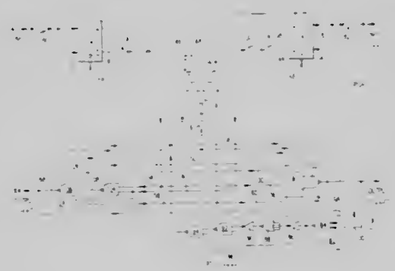
pull-up circuit means (**38, 42**) comprising first and second conduction terminals and a gate electrode, said first conduction terminal and said gate electrode being connected to power supply terminals (**45, 46**) and the second conduction terminal being connected to said clock gate means, said pull-up circuit means being responsive to conduction of said clock gate means for precharging said plurality of product term lines and said at least one output line to a potential lower than the power-supply potential.

4,894,565

ASYNCHRONOUS DIGITAL ARBITER

Douglas E. Marquardt, San Jose, Calif., assignor to American Microsystems, Inc., Eastlake, Ohio

Filed Aug. 11, 1988, Ser. No. 231,420
Int. Cl.[4] H03K *5/26, 17/28*
U.S. Cl. 307—518 **16 Claims**



1. An asynchronous arbiter comprising:

first and second input terminals for receiving the asynchronous signals to be arbitrated;

a first flip-flop having an input terminal connected by an inverter to the first input terminal, and having a clock terminal, an output terminal, an inverted output terminal, and a reset terminal;

a second flip-flop having an input terminal connected by an inverter to the second input terminal, and having a clock terminal, an output terminal, an inverted output terminal, and a reset terminal;

a first and second output logic means each having an output terminal and input terminals;

a logic means having input terminals and output terminals;

means connecting each of the first and second input terminals to, respectively, a first and a second input terminal of the logic means;

means connecting the inverted output terminals of the first and second flip-flops to, respectively, a third and a fourth input terminal of the logic means;

means connecting the input terminal of the first flip-flop to a first input terminal of the second output logic means;

means connecting the input terminal of the second flip-flop to a first input terminal of the first output logic means;

means connecting a first output terminal of the logic means to the clock terminals of the first and second flip-flops;

means connecting a second output terminal of the logic means to a second input terminal of, respectively, the first and second output logic means;

means connecting the output terminal of the first flip-flop to a third input terminal of, respectively, the first and second output logic means; and

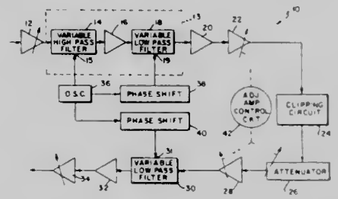
means connecting the output terminal of the second flip-flop to a fourth input terminal of the first output logic means, so the output terminals of the first and second output logic means provide arbitrating signals between the first and second input signals.

4,894,566

NOISE REDUCTION CIRCUIT

Michael J. Rush, R.R. 1, Box 115, Owensburg, Ind. 47453

Filed Oct. 18, 1988, Ser. No. 259,123
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—542 **12 Claims**



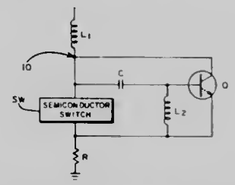
1. A circuit for reducing noise on an electrical signal, comprising a variable band-pass filter having an input to which the noisy electrical signal is coupled, means for repetitively varying the band-pass of the variable band-pass filter through a first frequency range, means for coupling the varying means to the variable band-pass filter, a clipping circuit, means for coupling an output of the variable band-pass filter to an input of the clipping circuit, and the clipping circuit having an output at which a noise reduced electrical signal is produced.

4,894,567

ACTIVE SNUBBER CIRCUIT

Ronald J. Lenk, Albuquerque, N. Mex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 17, 1988, Ser. No. 258,560
Int. Cl.[4] H03K *17/16, 17/56*
U.S. Cl. 307—542 **1 Claim**



1. Electronic circuit apparatus for actively clamping high frequency ringing on a semiconductor switch having first and second poles where the ringing is due to leakage inductance comprising:

(a) a capacitor having first and second capacitive plates wherein the first capacitive plate is connected to the first pole of the switch;

(b) a bipolar transistor connected at its base to the second capacitive plate, connected at its collector to the first capacitive plate and having its emitter connected to the second pole of the switch; and

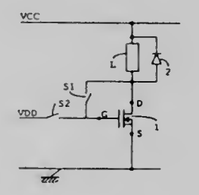
(c) a shunting inductance connected between the base and emitter of the transistor.

4,894,568

GATE CONTROL CIRCUIT FOR A SWITCHING POWER MOS TRANSISTOR

Antoine Pavlin, Aix en Provence, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Feb. 2, 1989, Ser. No. 305,333
Claims priority, application France, Feb. 4, 1988, 88 01550
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—584 **5 Claims**



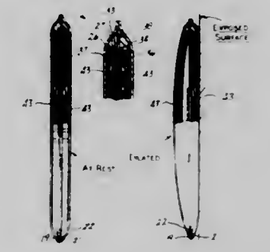
1. A gate control circuit for a power MOS transistor (1), the first main electrode of which (D) is connected to a high current voltage (V_{CC}) through a load (L), the second main electrode of which (S) is grounded and the gate (G) of which is connected, during the switching ON period, to a low voltage source (V_{DD}), comprising switching means (S1) for connecting, at the switching On of said power MOS transistor, said first main electrode to said gate.

4,894,569

ELECTRO-EXPULSIVE SEPARATION APPARATUS

Benjamin G. Lardiere, Jr., Milford, and Joshua I. Goldberg, Woodbridge, both of Conn., assignors to Dataproducts New England, Inc., Wallingford, Conn.

Filed Jun. 13, 1988, Ser. No. 205,637
Int. Cl.[4] B64D *15/00;* **H02K** *3/04*
U.S. Cl. 310—10 **9 Claims**



1. An electro-expulsive separation apparatus comprising:

at least two discrete electrical conductors,

a first flexible jacket means surrounding and sealing substantially each conductor separately to define individual packets,

insulator means sandwiched between said packets,

said insulator means being keyed to one of said first jacket means to preclude relative motion between said insulator means and said one of said first jacket means,

a tab portion of each conductor being free of each said first jacket means,

a spot electrical connection between said conductors at said tab portions,

a second flexible jacket means enclosing and sealing said jacketed packets including said tab portions into a unitary flexible package, and,

positive and negative electrodes connected to said conduc-

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tors, whereby said jacketed packets are separable partially within said second jacket means to create a void between said jacketed packets in response to repelling forces created by a magnetic field developed when said electrical conductors are energized by an electric current.

4,894,570

COMPACT UNITARY STARTING MOTOR AND CHARGING GENERATOR WITH RECESSED CLUTCH

Kazutoshi Kaneyuki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

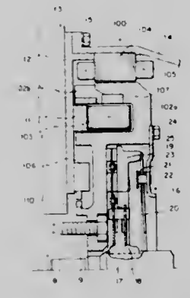
PCT No. PCT/JP88/00126, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/06369, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 9, 1988, Ser. No. 265,867

Claims priority, application Japan, Feb. 12, 1987, 62-19110

Int. Cl.⁴ H02K *21/16, 16/04*

U.S. Cl. 310—113 **2 Claims**



1. A unitary engine starting motor and charging generator device including a plurality of revolving-field poles (**102*a*, 102*b***) mounted on a crankshaft (**8**) of an engine and serving as a carrier for a clutch (**16**) operably coupled between said crankshaft and a transmission drive shaft (**17**), field coils (**103**) for exciting said revolving-field poles, an armature core (**104**) secured on an engine body (**13**), and an armature coil (**105**) wound thereabout, characterized in that a first annular recess (**25**) is formed in the axial direction in an end of said revolving-field poles on a clutch side thereof, a clutch disc (**18**) which contacts said revolving-field poles, a pressure plate (**19**) which presses said clutch disc toward the revolving-field poles, and a disc-shaped clutch spring (**20**) are disposed fully within said recess to attendantly reduce the overall axial length of the device, a second annular, axial recess is formed in an opposite end of said revolving field poles on a crankshaft side thereof, and an elongate crank angle detector (**106**) is disposed within said second recess in a radial orientation to further reduce the axial length of the device, and wherein said motor and generator are commutatorless.

4,894,571

APPARATUS FOR MAKING ELECTRICAL CONNECTIONS IN A DYNAMOELECTRIC MACHINE

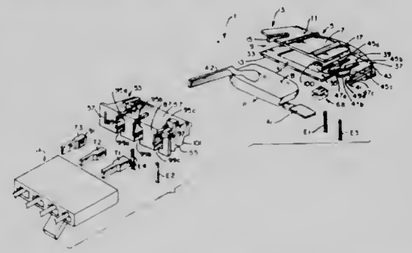
Eugene F. Hildebrandt, and Thomas V. Ottersbach, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 7, 1988, Ser. No. 255,727

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 C **28 Claims**

1. In a dynamoelectric machine having a stator assembly comprised of one or more sets of electrical windings, each end of each set of windings being adapted for connection to external electrical leads by which an electric current is applied to the windings, a plurality of electrical terminals for making the connection between the external leads and the sets of windings, and protector means connected between at least one external lead and at least one set of windings for sensing an operating condition of the stator assembly and interrupting flow of current to the sets of windings when a sensed condition exceeds a predetermined level, the improvement comprising apparatus for electrically interconnecting the external electrical leads, protector means and ends of said at least one of windings, said apparatus including a first means for commonly connecting



one end of said winding set with the protector means and for housing the protector means, and a second means interlocking with the first means to hold the protector means in place, said second means including means for effecting connection of the protector means to one of the external leads and for connecting the other end of said at least one winding set to another of the external leads.

4,894,572

DISK-TYPE BRUSHLESS FAN MOTOR

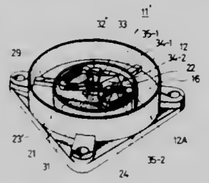
Manabu Shiraki, Yamato, Japan, assignor to Shicoh Engineering Co., Ltd., Kanagawa, Japan

Filed Oct. 30, 1986, Ser. No. 924,903

Claims priority, application Japan, Feb. 19, 1986, 61-23420[U]

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 B **9 Claims**



1. A single-phase disk-type brushless fan motor, comprising:

a rotatably mounted magnet rotor having 2P alternate north and south poles, P being an integer equal to or greater than 1;

a stator yoke provided in an opposing relationship to said magnet rotor with an axial air gap left therebetween;

at least one coreless armature coil provided at a same-phase position on said stator yoke;

at least one cutaway portion formed in said stator yoke at a position for allowing self-starting of said brushless fan motor;

a printed circuit board provided on a lower face of said stator yoke;

an energization controlling circuit provided on a lower face of said printed circuit board for detecting a magnetic pole of said magnet rotor to switchably energize said coreless armature coil;

a position-detecting element for detecting a magnetic pole of said magnet rotor said position-detecting element being provided on an upper face of said printed circuit board at a region opposing said magnet rotor through said cutaway portion of said stator yoke; and

cutaway means formed in said printed circuit board at said region for allowing opposite leads of said coreless armature coil to extend therethrough, so that said opposite leads of said coreless armature coil are guided through said cutaway portion of said stator yoke and through said cutaway means to said lower face of said printed circuit board and are connected electrically to said energization controlling circuit.

4,894,573

ROTARY ELECTRICAL MACHINES

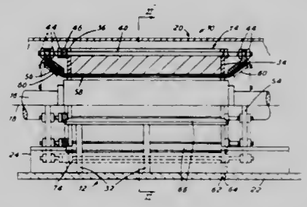
John Simpson, Whitley Bay, England, assignor to Northern Engineering Industries PLC, Newcastle Upon Tyne, England

Filed Dec. 8, 1988, Ser. No. 281,831

Claims priority, application United Kingdom, Dec. 11, 1987, 8729045; Aug. 30, 1988, 8820485

Int. Cl.⁴ H02K *5/04, 15/02*

U.S. Cl. 310—217 **15 Claims**



1. A rotary electrical machine having a stator, the stator comprising an annular core and a rotor extending through the core and mounted for rotation about a horizontal axis, the annular core comprising a series of laminations and respective end plates at opposite ends of the core, the laminations being held under compression between said end plates, the machine being further provided with an open-topped structure for assembly of the core, the core having downwardly directed faces on opposite sides of a vertical plane through the axis of rotation, said structure comprising supports that engage said downwardly directed faces, whereby the core laminations can be assembled on the structure by lowering them onto said supports with the structure horizontal.

4,894,574

STATOR SUPPORT FOR ELECTRIC MACHINE

Istvan Ragaly, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00326, § 371 Date Jnl. 1, 1987, § 102(e) Date Jul. 1, 1987, PCT Pub. No. WO87/03147, PCT Pub. Date May 21, 1987

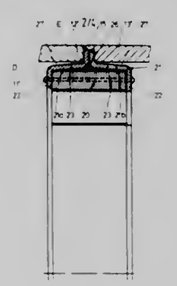
PCT Filed Aug. 13, 1986, Ser. No. 86,699

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 3539298

Int. Cl.⁴ H02K *1/12*

U.S. Cl. 310—258 **22 Claims**

1. A device for supporting a stator of an electric machine, wherein the stator has a stator yoke with an axis and an outer annular surface and the electric machine has a housing with housing parts which have at least one borehole, the device comprising an intermediate ring which is arranged radially outwardly of the outer annular surface of the stator yoke between the stator yoke and the housing parts at a predetermined radial distance from the latter, said ring including two half-shell-shaped ring portions arranged to embrace the stator yoke at both axial sides and each including a lateral annular flange, an axially extending half-ring surface, and a vertical flange; means for clamping said intermediate ring between the housing parts of the housing, said vertical flanges of said half-shell-shaped ring portions abutting against one another and being clamped in the borehole so as to form said clamping



means; and means connecting said intermediate ring with the stator yoke.

4,894,575

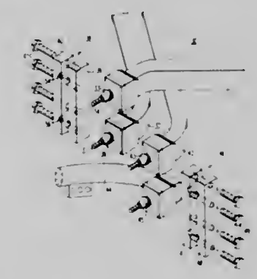
BOLTED SPHERICAL SERIES/PHASE GENERATOR CONNECTIONS

Lennart S. Nilsson, Winter Springs; John M. Butler, III, Orlando; Hector O. Ponce, Pensacola, and Darrell R. Morrison, Orlando, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 7, 1988, Ser. No. 268,103

Int. Cl.⁴ H02K *3/46, 3/50*; H01R *4/28*

U.S. Cl. 310—260 **4 Claims**



3. In an electrical generator having stator coil sections, connectors connecting pairs of said coil sections at their ends, said ends having a spacing therebetween and respective axes of projection, and means for mechanically connecting at least one of said connectors to the end of each coil section of its pair, the improvement wherein at least one of said connectors comprises a solid bar of a conductive material, said bar having two detents of a spacing equal to said coil end spacing, said detents having an axis corresponding to said axis of projection, said coil ends each having a header cap terminating in a spherical portion, each of said detents tightly receiving said predetermined geometry portion of one of said header caps.

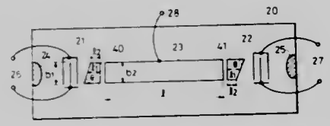
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,576

SURFACE-ACOUSTIC-WAVE CONVOLVER

Takeshi Okamoto, and Syuichi Mitsutsuka, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 177,507
Claims priority, application Japan, Apr. 10, 1987, 62-088548; Apr. 10, 1987, 62-088549
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 D **16 Claims**



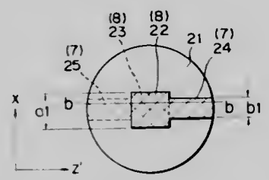
1. A surface-acoustic-wave convolver comprising:
a pair of input electrodes;
an output electrode for obtaining convolution signals of input signals applied to respective said input electrodes; and
refraction means provided between said input electrodes to refract surface acoustic waves travelling from respective said input electrodes;
wherein said refraction means is provided between each said input electrode and said output electrode; and
wherein said refraction means includes a pair of trapezoid electrodes which are symmetrical about a center point of said output electrode.

4,894,577

PIEZOELECTRIC VIBRATOR WHEREIN THE RELATIVE VIBRATION LEVEL OF UNNECESSARY VIBRATIONS IS DAMPED, AND METHOD OF DAMPING THE RELATIVE VIBRATION LEVEL OF UNNECESSARY VIBRATIONS OF THE PIEZOELECTRIC VIBRATOR

Yukihiro Okamoto, Hanno; Hitoshi Sekimoto, Yokohama, and Toshiki Suganuma, Tokorozawa, all of Japan, assignors to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,374
Claims priority, application Japan, May 16, 1987, 62-119249; Jun. 10, 1987, 62-144775; Mar. 17, 1988, 63-64115
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—320 **13 Claims**



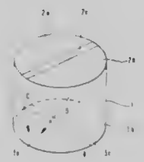
1. A piezoelectric vibrator comprising:
a piezoelectric member having two major surfaces;
at least one pair of exciting electrodes formed opposite to each other on the major surfaces of the piezoelectric member, said exciting electrodes and that portion of the piezoelectric member which is held at least between the exciting electrodes, forming a resonance region where thickness-shear vibrations of plural modes are excited;
at least one waveguide path having a cut-off frequency higher than the frequency of a thickness-shear vibration of at least one desired vibration mode excited in the resonance region but lower than the frequency of at least one thickness-shear vibrations excited in the resonance region, said waveguide path extending in substantially the same direction as the propagating direction of said thickness-shear vibration whose damping is desired, and said waveguide path having a width which is substantially equal to or greater than the corresponding width of said resonance region; and
a vibration absorbent arranged in the waveguide path.

4,894,578

ULTRASONIC DRIVING DEVICE

Keisuke Honda, Aichi, Japan, assignor to Honda Electronic Co., Ltd., Aichi, Japan

Filed Jul. 20, 1988, Ser. No. 221,719
Claims priority, application Japan, Jul. 26, 1987, 62-187341
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **6 Claims**



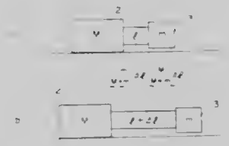
1. An ultrasonic driving device comprising:
a stator including a columnar piezoelectric vibrator and at least two divided electrodes at end portions of the piezoelectric vibrator,
a member to be driven on one end portion or side portion of the stator, and
means for supplying an alternating current voltage having a resonant frequency for producing vibration in a thickness direction of the piezoelectric vibrator, to at least two of said electrodes.

4,894,579

APPARATUS FOR EFFECTING FINE MOVEMENT BY IMPACT FORCE PRODUCED BY PIEZOELECTRIC OR ELECTROSTRICTIVE ELEMENT

Toshiro Higuchi, Yokohama, and Masahiro Watanabe, Tokyo, both of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,254
Claims priority, application Japan, May 29, 1987, 62-131304
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **8 Claims**



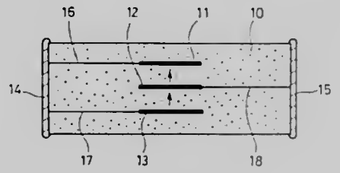
1. An apparatus for effecting a fine movement, comprising:
(a) a moving member;
(b) a piezoelectric/electrostrictive element means attached to said moving member for generating moving force;
(c) means for driving said piezoelectric/electrostrictive element; and
(d) an inertia member means attached to said piezoelectric-/electrostrictive means for imparting inertial energy to said moving member.

4,894,580

CHIP-TYPE RESONATOR AND METHOD OF MANUFACTURING THE SAME

Toshio Ogawa, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 7, 1988, Ser. No. 216,036
Claims priority, application Japan, Jul. 7, 1987, 62-170330
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—320 **7 Claims**



1. A chip-type resonator comprising:
a piezoelectric member;
a plurality of inner electrodes embedded in the interior of said piezoelectric member parallel to one another and spaced apart at inervals along the direction of thickness of the member, said inner electrodes being provided in an odd number of at least three; and
a pair of outer electrodes provided on opposite side surfaces of said piezoelectric member and connected with said inner electrodes, said inner electrodes being alternately connected to said outer electrodes, by leads extending alternately in opposite directions;
said portions of said piezoelectric member between said one pair and each said adjacent pair of inner electrodes being polarized in the same direction, so that when any one portion thereof located between one pair of the inner electrodes expands, each adjacent portion between each adjacent pair of the inner electrodes simultaneously contracts upon application of voltage between said outer electrodes, and said simultaneous expansion and contraction of said portions cancel each other, so that the chip-type resonator remains outwardly in a non-vibrating state as a whole and said expansion and contraction do not substantially cause vibration of the exterior of the chip-type resonator.

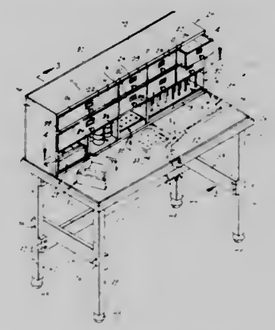
4,894,581

TABLE AND CABINET COMBINATION FOR FLY TYING

George D. Roberts, 241 Dobbin Rd., St. Louis, Mo. 63119

Filed Oct. 26, 1988, Ser. No. 262,748
Int. Cl.[4] A47B *95/00*
U.S. Cl. 312—305 **20 Claims**

1. A table and cabinet combination for storing fly tying supplies and for use in tying fish lures comprising:
a table top having a work surface,
a plurality of legs for supporting the table top with the work surface facing upwardly,
a cabinet supported by the work surface,
a spool holder having a base and a plurality of dowels projecting upwardly from the base and adapted to receive spools on them,
means in the cabinet defining a spool holder compartment having a top, side and bottom walls defining a height and width and adapted for slidable reception of the spool holder within the spool holder compartment whereby when the spool holder is slid into the spool holder compartment the top wall prevents removal of spools from the dowels and when the spool holder is slid from the spool holder compartment spools can be installed on and removed from the dowels,
a tool holder comprising a flat tray having a plurality of recesses of various sizes in it for receiving various tools and implements for fly tying,
means in the cabinet defining a tool holder compartment having top, side and bottom walls defining a height and width adapted for receiving the tool holder with tools



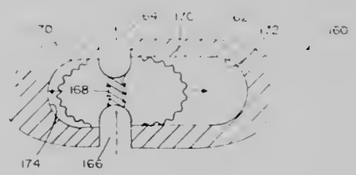
supported in the recesses and projecting upwardly from the tray,
means in the cabinet defining a lazy Susan compartment having top, side and bottom walls,
A lazy Susan comprising a disk rotateably supported from the top wall of the lazy Susan compartment, a plurality of container lids supported from the bottom of the disk, and a plurality of clear stackable containers removably support by the lids,
and a plurality of drawers slidably supported by the cabinet.

4,894,582

METHOD AND APPARATUS FOR ENHANCING SPARK CHANNEL RECOVERY BY SPARK-GENERATED UNSTEADY FLOWS

William J. Thayer, III, Kent, Wash., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Oct. 12, 1988, Ser. No. 257,377
Int. Cl.[4] H01T *1/08*; H01J *7/24*
U.S. Cl. 313—231.01 **28 Claims**



1. A spark gap switch for transferring electrical energy from a source to a load in a series of sparks, comprising:
a spark channel having two electrodes for supporting the series of sparks therebetween, one electrode being connected to the source and the other electrode being connected to the load; and
a closed spark chamber containing a dielectric fluid and being defined by a wall enclosing the spark channel, the wall being shaped to produce an unsteady flow of the fluid contained within the spark chamber from the spark cham-

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ber through the spark channel by resonating the fluid in response to each spark produced between the two electrodes.

4,894,583

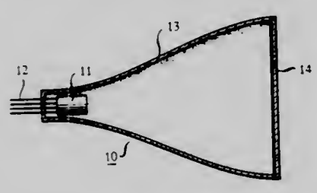
DISPLAY DEVICES WITH YTTRIUM ORTHOSILICATE PHOSPHORS

George W. Berkstresser, Bridgewater; Charles D. Brandle, Jr., Basking Ridge; Joseph Shmulovich, New Providence, and Alejandro J. Valentino, Colonia, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 885,229, Jul. 14, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 239,715

Int. Cl.[4] C09K *11/79*

U.S. Cl. 313—468 **4 Claims**



1. Display device comprising a cathode ray tube, said cathode ray tube comprising:
a. excitation source comprising a beam of electrons;
b. screen comprising phosphor;
c. means for electrical connection to outside source of electrical signal;
d. enclosure attached to the screen;
in which the phosphor comprises yttrium orthosilicate doped with europium and terbium trivalent ions with concentrations of each ion between 0.05 and 25.0 mole percent of the yttrium and in which the output of the europium ions is increased by the presence of terbium ions.

4,894,584

ELECTRIC LAMP PROVIDED WITH A GETTER INCLUDING PALLADIUM

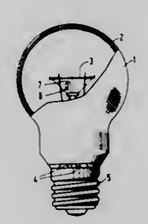
Maarten W. Steinmann, Eersel; Wilhelmus A. A. A. Martens, and Johannes J. G. S. A. Willems, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1988, Ser. No. 192,430

Claims priority, application Netherlands, May 13, 1987, 8701136

Int. Cl.[4] H01J *61/26*

U.S. Cl. 313—557 **5 Claims**



1. An electric lamp provided with
a translucent lamp vessel sealed in a vacuum-tight manner;
a light source arranged within the lamp vessel;
current supply conductors extending from the light source through the wall of the lamp vessel to the exterior;
and a getter within the lamp vessel comprising an intermetallic compound of a first metal with a second metal, characterized in that
the getter contains Pd as a first metal, which metal is chemically bound to at least one second metal selected from the group consisting of Zr and Y, the ratio "mole first metal×100%/(mole first metal plus mole second metal)" lying in the range of 0.4–15%,
and further contains chemically bound oxygen, the ratio "mole O/mole second metal" lying in the range of 0.02–1.0 and the getter having a particle size of mainly ≦40 μm.

4,894,585

COMBINATION LAMP

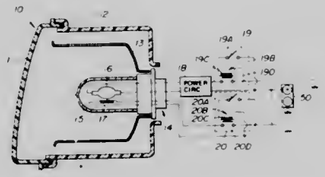
Toru Segoshi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 23, 1986, Ser. No. 945,679

Claims priority, application Japan, Feb. 25, 1986, 61-38338

Int. Cl.[4] H01J *61/52*

U.S. Cl. 315—112 **11 Claims**



10. An automotive headlight system comprising:
(a) a high intensity discharge lamp operable for emitting a high intensity beam of light;
(b) an auxiliary incandescent lamp located proximate to, and selectively operable independently of, said high intensity discharge lamp for emitting and radiating light and heat energy; and
(c) a heat reflector for concentrating said heat energy from said auxiliary incandescent lamp onto said high intensity discharge lamp to preheat said high intensity discharge lamp.

4,894,586

CROSSED-FIELD AMPLIFIER BIAS CIRCUIT AND METHOD FOR IMPROVED STARTING

Carl R. Crager; Kenneth F. Ramacher, both of Montoursville, and Frank A. Zawada, Williamsport, all of Pa., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 18, 1988, Ser. No. 157,644

Int. Cl.[4] H01J *25/34*; **H03F** *3/54*

U.S. Cl. 315—39.51 **10 Claims**

1. In a crossed-field amplifier having an anode and a cathode creating an electric field across a magnetic field in an interaction area, the improvement comprising:
electric bias circuit means connected to said cathode for generating a potential from said cathode across said interaction area for causing the presence of electrons in said interaction area after said amplifier is turned off to provide for a fast start of said amplifier.



4,894,587

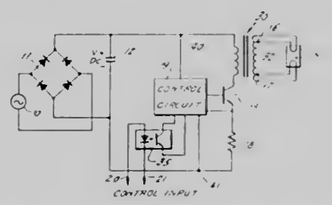
HIGH FREQUENCY GAS DISCHARGE LAMP DIMMING BALLAST

Aaron Jungreis, Allentown; Dennis Capewell, Penllyn, and David G. Luchaco, Macungie, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation-in-part of Ser. No. 642,072, Aug. 17, 1984, Pat. No. 4,663,570. This application May 4, 1987, Ser. No. 45,898

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—200 R **25 Claims**



1. An electronic ballast for a gas discharge lamp; said electronic ballast being dimmable over a large range; said ballast comprising: an a-c input circuit; a rectifier having a-c terminals connected to said a-c input circuit and having d-c output terminals; a filter capacitor connected across said d-c output terminals; a gas discharge lamp connected in circuit relation with said d-c output terminals and deriving its total energy therefrom; a single semiconductor switching means having a control electrode and first and second power terminals; a current sensing means; a control circuit connected to said control electrode and operable to turn said switching means on and off at a controlled duty cycle rate; a dimming level set circuit connected to said control circuit to set said duty cycle to a value related to a given degree of dimming of said lamp; said current sensing means being connected to said control circuit and operable to adjust said duty cycle to a value which maintains the current through said current sensing means at a value related to that called for by said dimming level set circuit; an energy storage inductor and a coupling capacitor; said d-c output terminals, said energy storage inductor, said single semiconductor switch means and said current sensing means being connected in closed series relation, said coupling capacitor coupling said ballast to said single semiconductor switch means.

4,894,588

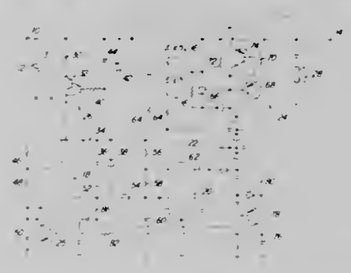
HIGH EFFICIENCY FLASHER

Thomas E. Stack, Troy, Mich., assignor to Vultron, Inc., Auburn Heights, Mich.

Filed Jan. 25, 1988, Ser. No. 148,088

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—241 P **7 Claims**



1. A high effciency high load flasher for incandescent lamps comprising;
input terminals for coupling to a DC source and output terminals for coupling to incandescent lamps,
MOSFET switch means between the input and output terminals for switchably controlling output current flow,
gate supply means for supplying gate voltage to the switch means for switch operation,
oscillator means for periodically enabling and disabling the gate supply means to effect periodic output current flow,
protective means responsive to said current flow for preventing damaging current flow to the MOSFET switch means,
and measn for disabling the protective means during current inrush to the incandescent lamps.

4,894,589

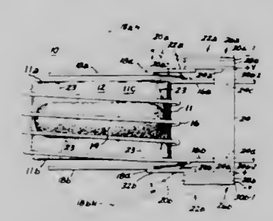
STARTING MEANS, WITH PIEZOELECTRICALLY-LOCATED CAPACITIVE STARTING ELECTRODES, FOR HID LAMPS

Joseph C. Borowiec, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1988, Ser. No. 229,187

Int. Cl.[4] H05B *41/24*

U.S. Cl. 315—248 **11 Claims**



1. Means for aiding starting of a plasma arc discharge within an arc tube of an electrodeless high-intensity-discharge (HID) lamp of the type having said arc tube situated within the bore of an excitation coil and within which arc tube said plasma arc discharge is to be formed and driven by the excitation coil, comprising:
a pair of starting electrodes;
means for positioning each of the starting electrodes, at least during commencement of the plasma arc discharge, to a

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first location adjacent to the exterior surface of an associated one of a pair of opposed surfaces of the arc tube, responsive to the presence of a stimulus, and for repositioning each starting electrode to a second location different from said first location, with respect to said arc tube, responsive to the absence of said stimulus; and

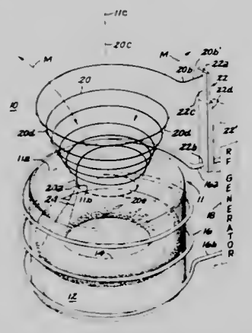
means for coupling an externally-provided high-voltage signal between the pair of starting electrodes to cause creation, at least at said plasma arc discharge commencement, of a glow discharge within the arc tube due to capacitive current flow therethrough from said starting electrodes.

4,894,590

SPIRAL SINGLE STARTING ELECTRODE FOR HID LAMPS

Harald L. Witting, Barat Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1988, Ser. No. 226,584
Int. Cl.[4] H05B *41/24*
U.S. Cl. 315—248 **9 Claims**



1. A starting electrode for an electrodeless high-intensity-discharge (HID) lamp of the type having an arc tube situated within the bore of an excitation coil and within which arc tube a plasma arc discharge is to be formed and driven by the excitation coil, comprising:

a single starting electrode having a spiral shape and positioned, at least during commencement of the plasma arc discharge, with a narrower end adjacent to a selected point on an exterior surface of the arc tube; and

means for positioning the electrode with a wider end at a selected location, to place the electrode within magnetic flux, generated by the excitation coil, sufficient to cause creation, at least at said plasma arc discharge commencement, of a glow discharge within the arc tube.

4,894,591

INVERTED EXCITATION COIL FOR HID LAMPS

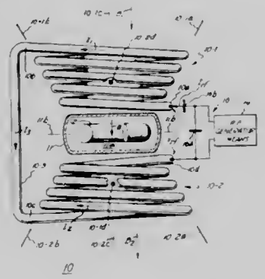
Harald L. Witting, Barat Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,331
Int. Cl.[4] H05B *41/24*
U.S. Cl. 315—248 **19 Claims**

1. An excitation coil, adaptable for use with an arc tube in an electrodeless high-intensity-discharge (HID) lamp, comprising:

first and second solenoidal portions of coiled conductor, each with an axis substantially aligned with the axis of the other portion, each wound in a common direction to produce, responsive to a signal current flowing in the same direction through both portions, a magnetic field adding in-phase to the magnetic field of the other portion, and each with a first end located nearest to a central volume in which said arc tube can be positioned and a second end located further from the other portion than the first end; and

another conductive portion connecting the two second ends to one another;



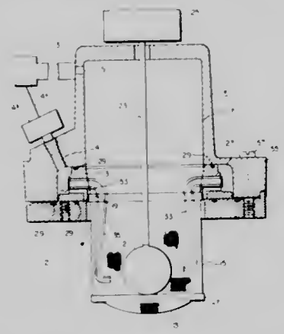
the pair of first ends being adapted to receive a radio-frequency signal of characteristics selected to cause said coil to start and maintain a plasma arc discharge in said arc tube.

4,894,592

ELECTRODELESS LAMP ENERGIZED BY MICROWAVE ENERGY

Robert M. Ervin, Silver Spring, and Joseph Perret, Germantown, both of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed May 23, 1988, Ser. No. 197,351
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—248 **4 Claims**



1. An electrodeless lamp comprising:

(a) a microwave cavity;

(b) a source of microwaves in communication with said cavity;

(c) a lamp envelope containing a plasma-forming medium mounted within said microwave cavity;

(d) a gas manifold for feeding gas to at least one gas passageway for directing a stream of gas to the outer surface of said envelope;

(e) a gas leak passageway leading from said gas manifold;

(f) a conductive mesh assembly for retaining microwaves within said cavity and permitting light to be emitted from said cavity, said assembly including gas flow blocking means for preventing the flow of gas through said gas leak passageway when said screen is in place in the lamp; and,

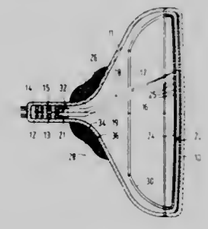
(g) means for shutting off said source of microwaves when the gas pressure in said manifold drops below a predetermined value.

4,894,593

METHOD OF CORRECTING ELECTRON BEAM MISCONVERGENCE IN A COLOR DISPLAY TUBE AND A COLOR DISPLAY TUBE SYSTEM

Piet G. J. Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1987, Ser. No. 47,752
Claims priority, application United Kingdom, May 9, 1986, 8611321
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—368 **16 Claims**



1. A method of correcting electron beam misconvergence in a colour display tube comprising: an envelope consisting of an optically transparent faceplate, a conical portion and a neck, and within the envelope an electron gun system in the neck and a cathodoluminescent screen on the inside of the faceplate; electron beam deflection means being arranged on the neck-cone transition of the envelope; the method comprising: providing at least one magnetisable substantially annular element externally of the envelope at, or on the screen side of, the plane of deflection of the deflection means; measuring the convergence of the electron beams at the screen with the deflection means in place; and magnetising the annular element as a multipole, the number of poles and their respective strengths being such as to correct for the measured dynamic convergence errors.

4,894,594

SERVO SYSTEM SPEED CONTROL APPARATUS

Hideaki Kawamura, Hachioji; Kentaro Fujibayashi, Mitaka, and Nozomu Arimoto, Hino, all of Japan, assignors to Fanuc Ltd, Yamanashi, Japan

PCT No. PCT/JP88/00049, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO88/05566, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 23, 1988, Ser. No. 255,192
Claims priority, application Japan, Jan. 24, 1987, 62-013328
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—567 **5 Claims**

1. A servo system speed control apparatus for controlling speed of a servo system by using a computer, said servo system speed control apparatus comprising:

a block speed pre-read means for reading beforehand a speed value designated for a plurality of blocks;

a deceleration start position calculating means for calculating; at a start position of said blocks read beforehand, a deceleration start position to maintain said servo system at a speed below said designated speeds for said blocks; and

a servo system deceleration means for lowering said speed of said servo system from said calculated deceleration start



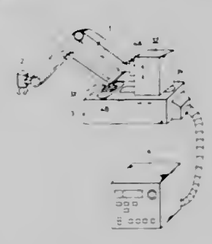
position to thereby control deceleration of said servo system with a high degree of accuracy.

4,894,595

INDUSTRIAL ROBOT

Kenji Sogawa; Makoto Doi, and Mikio Hasegawa, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 6, 1988, Ser. No. 178,165
Claims priority, application Japan, Apr. 8, 1987, 62-86045
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.24 **12 Claims**



1. An industrial robot comprising:

(a) a movable arm;

(b) an electric motor dirving the arm;

(c) means for controlling a current flowing through the motor, and moving the arm into predetermined positions and balancing the arm in the predetermined positions sequentially;

(d) means for memorizing values of the motor current at which the arm is balanced in the respective predetermined positions;

(e) means for calculating a target value of the motor current on the basis of the memorized motor current values, the target motor current value allowing the arm to be balanced in a given position.

4,894,596

VELOCITY CONTROL APPARATUS

Ryuichi Hara, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

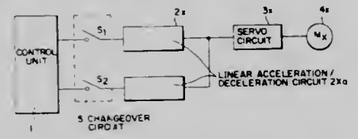
PCT No. PCT/JP88/00420, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO88/08562, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 27, 1988, Ser. No. 265,676
Claims priority, application Japan, Apr. 30, 1987, 62-107262
Int. Cl.[4] G05B *11/18*
U.S. Cl. 318—568.1 **2 Claims**

1. A velocity control apparatus having drive mechanisms for a plurality of axes for controlling movement of a movable

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member along a set trajectory at a predetermined velocity, comprising:

velocity override means for changing and setting a commanded velocity of the movable member at a predetermined rate based on a velocity commanded for each direction of movement; and



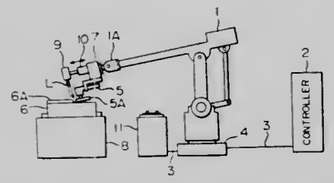
acceleration/deceleration means, having a time constant capable of being changed in inverse proportion to a velocity set by said velocity override means, for driving the movable member.

4,894,597

DEBURRING ROBOT

Sadayuki Ohtomi, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 18, 1988, Ser. No. 195,292
Claims priority, application Japan, May 21, 1987, 62-124361
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.22 **7 Claims**



1. A deburring robot, operated by a controller storing predetrmined taught position data, for removing burrs remaining on a workpiece, comprising:

an arm-like member movably mounted on a pedestal;

a grinder mounted onto said arm-like member and having a grinding wheel for removing the burrs remaining on the workpiece;

a detecting means mounted on said arm-like member in the vicinity of said grinder for detecting the position of the workpiece and the positions and shapes of the burrs remaining thereon; and

a positioning means for positioning said grinder in accordance with said detecting means by correcting the predetermined taught position data.

4,894,598

DIGITAL ROBOT CONTROL HAVING AN IMPROVED PULSE WIDTH MODULATOR

Kenneth E. Daggett, Murrysville, Pa., assignor to Staubli International AG, Switzerland

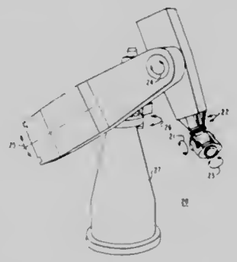
Continuation of Ser. No. 932,841, Nov. 20, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 231,627
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.16 **24 Claims**

1. A digital pulse width modulator circuit for operating power amplifiers and joint motors during positive, negative and non-forcing motor drive requests by measuring the motor current in an associated sense resistor for each joint motor in a robot control comprising:

up/down counter means for generating a sawtooth waveform, having positive and negative apexes adapted for timing the current measurement within a control pulse interval, by counting up to and down from an upper endpoint to a lower endpoint as a function of time;

means for comparing the count of the counter means for the sawtooth waveform to a signal representing a control command so as to define a time span needed to operate a power amplifier and energize an associated joint drive motor in accordance with the control command;

means for generating a first output control pulse for power



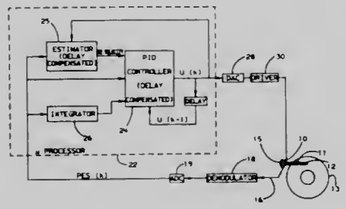
amplifier switching when one drive polarity is commanded, said first output control pulse having a width corresponding to the defined time span and based on a count comparison referenced to the upper endpoint of the sawtooth waveform; and means for generating a second output control pulse for power amplifier switching when the other polarity is commanded, said second output control pulse having a width corresponding to the defined time span and based on a count comparison referenced to the lower endpoint of the sawtooth waveform.

4,894,599

DEADBEAT CONTROL OF DISK DRIVE ACTUATOR

Hjalmar H. Ottesen, Rochester, Minn.; Yuzo Nakagawa, Hiratsuka, and Shyunji Ono, Fujisawa, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,699
Int. Cl.[4] G05B *21/02*
U.S. Cl. 318—636 **8 Claims**



1. A rotating data storage device having transducer means mounted on an actuator for movement from track to track comprising

motor means connected to said actuator for effecting track to track movement of said transducer means; and

servo control means for causing said motor means to position said actuator, said servo control means including seek control means for moving said transducer means from an initial position to a position within a predetermined distance of the target track centerline and settle mode control means for controlling transducer positioning from said predetermined distance to alignment with said target track centerline,

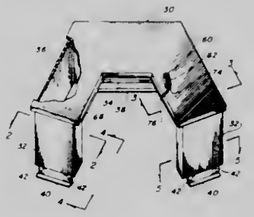
said settle mode control means comprising a deadbeat control sequence of a predetermined number of servo data samples to position said transducer means at said target track with no steady-state error and no ripple between settle mode servo samples.

4,894,600

ADAPTIVE WORK STATION

Deborah A. Kearney, 165 Front St., Chicopee, Mass. 01013

PCT No. PCT/US88/01205, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988
PCT Filed Apr. 18, 1988, Ser. No. 261,012
Int. Cl.[4] B64C *17/06*
U.S. Cl. 318—649 **15 Claims**



1. A work station adapted for facilitating physically challenged and developmentally disabled personnel comprising:

(a) a work table top in a truncated "U" shape having a center, angular sides, and ends on the outside periphery, formed of a flat, relatively hard material suitable for working thereupon, further having the structural integrity to support objects placed thereupon,

(b) a pair of end vertical panels extending downward from the ends of the table top to support the top at a convenient height from a floor,

(c) a vertical panel extending downward from the rear of the table top furnishing structure to support the table top and form an enclosing surface,

(d) a pair of side skirts extending downward from the angular sides of the table top contiguously abutting the end vertical panels and the rear vertical panel forming a protective vertical enclosure and weight bearing member, and

(e) height-adjusting means allowing the distance from a floor to the top of the table top to be altered such that different size wheelchairs may be accommodated under the table top.

4,894,601

TESTING AND BATTERY EXERCISING METHOD AND CONTROL FOR AN EMERGENCY LIGHTING UNIT

Harley (Jim) E. Watkins, 14425 Garden Rd., Golden, Colo. 80401

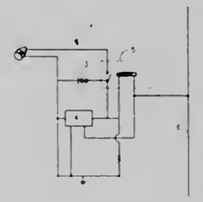
Filed Jun. 16, 1988, Ser. No. 207,737
Int. Cl.[4] G01J *5/18;* G08B *13/18;* F21V *33/00;* H02J *7/00*
U.S. Cl. 320—14 **19 Claims**

1. A method of testing and exercising an emergency lighting unit, the unit electrically connected to a primary power source and including illuminating means powered by a rechargeable power source, means for recharging the rechargeable power source from a primary power line and switching means responsive to a reduction of voltage in the primary power line to switch on the illuminating means to illuminate a pre-selected illumination area comprising the steps of:

sensing a heat pattern over the pre-selected illumination area and determining when a change in said heat pattern occurs;

sensing ambient light in the pre-selected area and determining when the ambient light in the preselected area is less that or equal to a preselected threshold; and

simulating a reduction in voltage of the power line in such a manner as to activate the switching means in response to



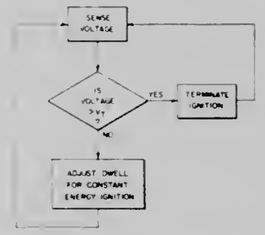
a change in the heat pattern only when the ambient light is less than or equal to the preselected threshold whereby an inspector may observe the function of the unit by entering the illumination area when it is in darkness.

4,894,602

OVERVOLTAGE PROTECTION SYSTEM FOR MARINE IGNITION AND REGULATOR CIRCUITRY

James A. Davis, Ripon, and William B. Mayer, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jun. 2, 1988, Ser. No. 201,545
Int. Cl.[4] H02P *9/04;* F02P *9/00*
U.S. Cl. 322—38 **1 Claim**



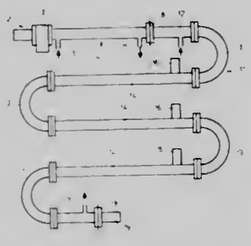
1. A marine propulsion system comprising an internal combustion engine driving a voltage generator supplying system voltage to ignition circuitry providing spark ignition for running said engine in normal operation, said ignition circuitry including voltage sensing circuitry sensing said system voltage and adjusting ignition dwell in accordance therewith to maintain substantially constant energy for said spark ignition in said normal operation, a marine battery charged by said system voltage, a voltage regulator sensing and regulating said system voltage, said voltage sensing circuitry of said ignition circuitry sensing said system voltage and respoading to system voltage below a given threshold to continue said normal operation and said substantially constant energy for said spark ignition, said voltage sensing circuitry of said ignition circuitry responding to system voltage above said given threshold to reduce engine speed, to reduce said system voltage, wherein said given threshold is below a given overvoltage for protection of said ignition circuitry and is also below a given overvoltage for protection of said voltage regulator, and wherein the same said voltage sensing circuitry of said ignition circuitry provides all three of said functions of (a) sensing system voltage for adjusting ignition dwell to maintain substantially constant energy for said spark ignition, (b) sensing system voltage for protection of said ignition circuit against overvoltage, and (c) sensing system voltage for protection of said regulator against overvoltage.

4,894,603

METHOD AND APPARATUS FOR ANALYSIS OF GAS BY MEANS OF ABSORPTION FREQUENCY REGULATION

Lutz Berger, Eggenstein; Heimo Breton, Oberaldingen; Helmut Giraud, Stutensee; Gunther Krieg, Karlsruhe; Horst Günther, Eggenstein-Leopoldshafen, and Gerhard Schmitt, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,657
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3622957
Int. Cl.[4] G01N *22/00*
U.S. Cl. 324—639 24 Claims



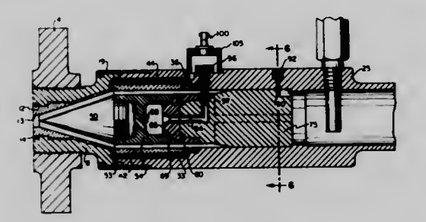
1. A method for analyzing a gaseous medium with respect to a component having a characteristic absorption frequency spectral line, comprising: generating microwave radiation at a selected frequency; generating a first Stark voltage selected to have a value such that a reference signal produced by subjecting the component to the microwave radiation and the first Stark voltage has a zero passage, resulting from the change in polarity between the spectral line and the Stark voltage lines, at a frequency coinciding with the characteristic absorption frequency spectral line; and regulating the microwave radiation frequency as a function of frequency shifts of the zero passage of the reference signal.

4,894,604

FLUID CAPACITANCE SENSING MEANS AND METHOD

Donald J. Dowling, and Jackie C. Sims, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 3, 1988, Ser. No. 269,341
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—690 7 Claims



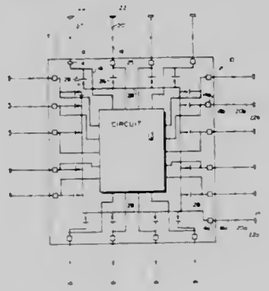
1. A capactive fluid sensor comprising:
means receiving a stream of fluid for converting the fluid flow to annular fluid flow; and
capactive sensing means for providing a capacitance signal related to the dielectric constant of the annular flowing fluid, said capacitive sensing means includes:
a cylindrical electrode,
electrode means, cylindrical in shape, spatially arranged with the electrode so that the fluid flows between both the electrode and the electrode means for providing an internal capacitance for the capacitive sensing means substantially greater than a capacitance derived from the dielectric constant of the fluid, and
output means connected to the electrode and to the electrode means for providing the capacitance signal.

4,894,605

METHOD AND ON-CHIP APPARATUS FOR CONTINUITY TESTING

Diethelm Ringleb, Andover; Reinhard Schumann, Stow; Elsworth Stearns, Hudson; Tom Stylianos, Jr., Acton, all of Mass., and John Sweeney, Derry, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 24, 1988, Ser. No. 159,757
Int. Cl.[4] G01R *27/02, 31/28*
U.S. Cl. 324—537 12 Claims



1. A continuity test circuit for an integrated semi-conductor component comprising circuit components fabricated on a section of semi-conductor material, the semi-conductor component having a plurality of contact pads to which external conductive leads are bonded, and a like plurality of contact pad conductors, each extending between a separate contact pad and the individual circuit components, the continuity test circuit comprising:
A. a common conductor fabricated on the integrated semi-conductor component, said common conductor connected to a test contact pad on the semi-conductor component to which external test leads are bonded thereto; and
B. a plurality of current gate means fabricated on the integrated semi-conductor component each of said gate means having at least a first terminal and a second terminal, each first terminal of said gate current means connected to a separate contact pad conductor, each second terminal of said current gate means connected to said common conductor; each of said current gate means controlling current flow so that when a test signal is applied to only the associated first terminal or only the associated second terminal, a measurable response signal will appear at the terminal the test signal is not applied to.

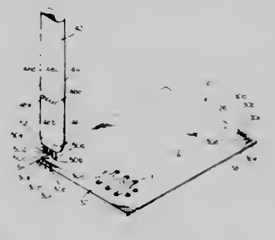
4,894,606

SYSTEM FOR MEASURING MISREGISTRATION OF PRINTED CIRCUIT BOARD LAYERS

Tom R. Paur, 400 East Lake Samm Road S.E., Redmond, Wash. 98053

Filed Jul. 7, 1988, Ser. No. 216,080
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—65 R 4 Claims

1. A system for measuring the amount of misregistration of printed circuit board layers, comprising:
a printed circuit board with a plurality of layers fabricated in face-to-face juxtaposition, each having electrically conductive traces which require interconnection between said layers, said layers including an exterior layer and a plurality of inner layers inwardly located relative to said exterior layer, said layers being positioned in registration with each other within a predetermined maximum tolerance range;
a plurality of electrically conductive planes, each having a plurality of apertures therethrough and a common contact portion, said apertures and common contact portion for each said plane having a substantially identical placement pattern on said plane, each said plane being attached to one of said inner layers at a substantially identical location and orientation on said inner layer as the others of said planes are attached to the others of said inner layers, attachment being made prior to the assembly of said inner layers together to fabricate the circuit board, whereby said apertures of each one of said planes are in general alignment within said maximum tolerance range with correspondingly positioned ones of said apertures of the others of said planes, subject to deviation from perfect alignment as a result of said inner layers being positioned out of registration with said exterior layer during fabrication of the circuit board;
a plurality of electrically conductive through-hole conductors formed in said layers after fabricated in face-to-face juxtaposition, said conductors being located relative to said exterior layer to position each said conductor to extend through to extend through said layers and within correspondingly positioned ones of said apertures of each said plane attached to said inner layers, said conductors each having a conductor contact portion at said exposed exterior surface of said exterior layer, each of said conductors and the correspondingly positioned ones of said apertures through which extending having relative sizes to produce a clearance therebetween if said inner layer is in perfect registration with said exterior layer, with said clearance for each of said conductors being of a predetermined and incrementally increasing size, said conductors being out of electrical contact with any of said planes if each said inner layer is in perfect registration with said exterior layer, and one or more of said conductors being in electrical contact with at least one of said planes if said inner layer to which attached is out of registration with said exterior layer by an amount at least as great as the smallest of said clearances, the incrementally increasing clearances for any of said conductors in electrical contact with one of said planes indicating the amount of misregistration of at least one of said inner layers with said exterior layer;
an electrically conductive, common through-hole conductor formed in said layers and being located relative to said exterior layer to position said common conductor to extend through each of said common contact portions of said planes in electrical contact therewith, said common conductor having a monnon conductor contact portion at said exposed exterior surface of said exterior layer, when any one of said inner layers is out of registration with said exterior layer by a sufficiently large amount within said maximum tolerance range, one or more electrically conductive paths are established between the corresponding ones of said conductors, said plane of said inner layer out of registration and said common conductor, and the greater any one of said inner layers is out of registration with said exterior layer, the more of said conductors with the greater of said clearances with respect to the correspondingly positioned ones of said apertures are in electrical contact with said plane of said inner layer which is out of registration, with the particular ones of said conductors in electrical contact with said plane indicating the amount of misregistration of said inner layer within said maximum tolerance range; and
a tester having a plurality of electrically conductive probes with a probe placement pattern corresponding to the placement pattern on said exterior surface of said exterior layer of said conductor contact portion of said conductors and said common conductor contact portion of said common conductor, each of said probes being movable into electrical contact with a correspondingly positioned one of said conductor contact portions of said common conductor contact portion, said tester including means electrically connected to said probes for determining if a conductive path exists between any one of said conductor contact portions and said common conductor contact portion and for indicating the ones of said conductor contact portions for which a conductive path is determined to exist, whereby the amount of layer misregistration is quantitatively indicated.

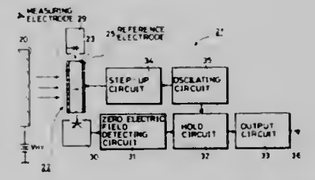


4,894,607

SURFACE POTENTIAL DETECTING APPARATUS

Akira Kumada, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 6, 1988, Ser. No. 254,457
Claims priority, application Japan, Oct. 6, 1987, 62-251852
Int. Cl.[4] G01R *23/16;* G02F *1/03*
U.S. Cl. 324—96 13 Claims



1. A surface potential detecting apparatus comprising:
an electro-optical crystal element having a measuring electrode thereon to which an electric field from a surface to be measured is directly or indirectly applied, and a reference electrode thereon for receiving a reference potential, to establish a potential difference between itself and said measuring electrode;
alternating voltage means for supplying said reference potential as an alternating voltage of a prescribed frequency to said reference electrode;
detecting means for detecting the electric field strength formed between said measuring electrode and said reference electrode as by measuring an intensity of light transmitted through said crystal element; and
means for deriving the electric field strength of the surface to be measured based on the detected intensity of the transmitted light.

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4,894,608

ELECTRIC CURRENT SENSOR USING THE FARADAY EFFECT

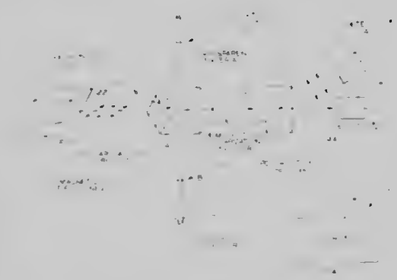
Edward A. Ulmer, Jr., Clearwater, Fla., assignor to Square D Company, Palatine, Ill.

Filed Jul. 22, 1987, Ser. No. 76,456

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] G01R *31/00;* **G02F** *1/31*

U.S. Cl. 324—96 **29 Claims**



24. An electric current detector, comprising:

a material substantially transparent to light, said material having at least one characteristic direction in the absence of a magnetic field, and said material exhibiting the Faraday effect in response to a magnetic field generated by said electric current;

means for generating said light in a substantially linear polarization in a predetermined polarization direction and for injecting said light having a predetermined polarization direction into said material with an orientation with respect to said at least one characteristic direction such that a predetermined angle of substantially 22.5 degrees is established between said polarization direction and said at least one characteristic direction;

means for separating light emerging from said material into a first component having a first polarization to form a first emerging light beam, and into a second component having a second polarization to form a second emerging light beam;

a first photodetector for detecting an intensity of said first emerging light beam;

means, responsive to said first photodetector, for computing a first ratio of an AC component to a DC component of said intensity of said first emerging light beam;

a second photodetector for detecting an intensity of said second emerging light beam;

means, responsive to said second photodetector, for computing a second ratio of an AC component to a DC component of said intensity of said second emerging light beam;

means for producing a first average value of said first ratio;

means for producing a second average value of said second ratio;

means for computing said quotient by dividing said first average value of said ratio, by said second average value of said second ratio;

means for computing a stress birefringence of said material by using the expression

$$\beta L = 2 * \sin^{-1}(K1 * (R-1)/(R+1))$$

wherein said R is a symbol standing for said quotient and said K1 is a numerical constant to account for polarization leakage in a polarizer;

means, responsive to said birefringence βL, for computing a first correction factor CF(1,βL), for said first ratio;

means for correcting said first ratio by said correction factor;

means, responsive to said first ratio and responsive to said first correction factor, for estimating a magnitude, J, of said electric current;

means, responsive to said birefringence βL, for computing a spread function SF(βL);

means for adjusting said correction factor using the expression

$$ACF(J,\beta L) = (CF(1,\beta L) - SF(\beta L) * (J/J_{max})^2$$

means for iterating a calculation of said quantity ACF(J,βL) until a new value differs from a last value by less than a predetermined amount; and,

means, responsive to said past value of said quantity ACF(J,β), for computing a final value of said electric current.

4,894,609

ELECTRICAL MEASURING DEVICE

Toshisada Fujiki, Kasugai; Taikichi Kondo, Gifu; Yoshinari Furukawa, Tokoname; Kazuaki Kato, Chita; Akimichi Okimoto, and Kenji Tsuge, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

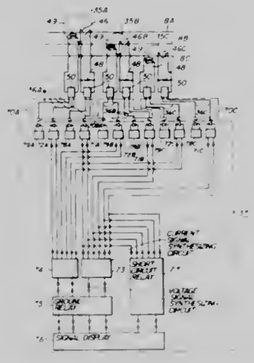
PCT No. PCT/JP86/00402, § 371 Date May 26, 1987, § 102(e) Date May 26, 1987

PCT Filed Aug. 6, 1986, Ser. No. 34,150

Claims priority, application Japan, Aug. 7, 1985, 60-174554; Aug. 7, 1985, 60-174555; Aug. 7, 1985, 60-174556

Int. Cl.[4] G01R *19/00, 31/00, 21/00*

U.S. Cl. 324—107 **6 Claims**



1. An electric measuring device for a three-phase line, comprising:

sensing units having a current transformer and a collector electrode unit, each one of said sensing units being coupled with a respective line conductor of the three-phase line;

first and second optical sensors with electro-optic elements connected to each said current transformer and each said collector electrode unit, respectively;

a resistor connected in parallel to each said current transformer and each one of said first optical sensors;

a measuring unit connected to each sensing unit;

wherein said measuring unit comprises light detectors for current measurement connected to each one of said first sensors, light detectors for voltage measurement connected to each one of said second sensors, light emitters for optical power connected to said light detectors, a current signal synthesizing circuit connected to said light-detectors for current measurement, a voltage signal synthesizing circuit connected to said light-detectors for voltage measurement, a ground relay connected to said current signal synthesizing circuit and said voltage signal synthesizing circuit, a signal display connected to said ground relay, a short circuit relay connected to said light detectors for current measurement and said signal display, and optical transmission lines made of optical fiber cable serially connected to each one of said first and second optical sensors, said light detectors and said light emitters, respectively.

4,894,610

CURRENT-TRANSFORMER ARRANGEMENT FOR AN ELECTROSTATIC METER

Richard Friedl, Braunschweig, Fed. Rep. of Germany, assignor to LOZ Landis & Gyr Zug AG, Zug, Switzerland

PCT No. PCT/EP86/00515, § 371 Date Jun. 12, 1986, § 102(e) Date Jun. 12, 1987, PCT Pub. No. WO87/01812, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 8, 1986, Ser. No. 57,918

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532911

Int. Cl.[4] G01R *11/02*

U.S. Cl. 324—127 **14 Claims**



1. A transformer arrangement for use in a static electricity meter comprising:

a primary conductor for carrying an alternating current to be measured,

a secondary winding comprising at least two identical coils arranged in series and having axes oriented parallel to each other, and

integration means connected to the output of said secondary winding to produce a frequency independent output signal,

wherein said conductor carrying said current to be measured is formed to include at least one loop to generate maximum magnetic field strength,

wherein at least one of the coils of the secondary winding is arranged as closely as possible to said loop for maximum magnetic coupling without the use of any magnetic material and so as to engage as completely as possible the magnetic flux that is generated by the loop,

wherein the coils of the secondary winding extend in their axial direction over an as small as possible partial length of the magnetic field lines generated by said current in said primary conductor so that no closed integration path is formed by the secondary winding; and

wherein said coils of said secondary winding are arranged astatically and as close to each other as possible for optimum external magnetic field compensation.

4,894,611

SYSTEM FOR MEASURING CHARACTERISTICS OF ELECTRON EMITTING SOURCES

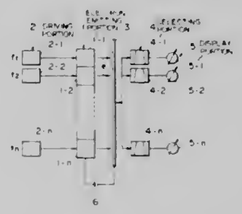
Isamu Shimoda, Zama; Mamoru Miyawaki, Tokyo; Akira Suzuki; Tetsuya Kaneko, both of Yokohama; Takeo Tsukamoto, Atsugi; Toshihiko Takeda, and Masahiko Okunuki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,963

Claims priority, application Japan, Apr. 28, 1987, 62-103023

Int. Cl.[4] G01R *29/00, 31/26*

U.S. Cl. 324—158 R **8 Claims**



1. A system for measuring characteristics of electron sources, said system comprising:

driving means for driving said electron sources at predetermined frequencies so that each electron source emits an electron flow;

collecting means for collecting the electron flows emitted from said electron sources;

selecting means for selecting and extracting signals having components corresponding to said predetermined frequencies, out of the electron flows as collected by said collecting means; and

measuring means for measuring an operation characteristic of an electron source responsive to the selection of, and corresponding to a signal selected by, said selecting means, independently from other electron sources.

4,894,612

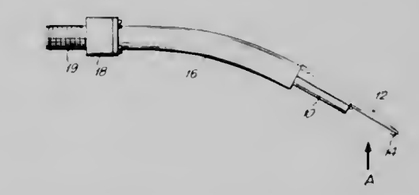
SOFT PROBE FOR PROVIDING HIGH SPEED ON-WAFER CONNECTIONS TO A CIRCUIT

Robert E. Drake, Somers; Sadeg M. Faris, Pleasantville; Roy M. Patt, Walden, and Zhi-Yuan Shen, Ossining, all of N.Y., assignors to Hypres, Incorporated, Elmsford, N.Y.

Continuation-in-part of Ser. No. 84,953, Aug. 13, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,101

Int. Cl.[4] G01R *1/06*

U.S. Cl. 324—158 P **7 Claims**



1. A soft miniaturized probe for providing a connection to an on-wafer circuit comprising:

a soft flexible substrate;

a center strip line disposed on a first surface of said substrate;

first and second ground planes, each disposed on said first surface of said substrate, one ground plane disposed on either side of said center strip line;

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a plurality of contacts, one contact disposed on said center strip line and one contact disposed on said first ground plane, said contacts providing a conductive path between said on-wafer circuit and said strip line and between said on wafer circuit and said first ground plane; and

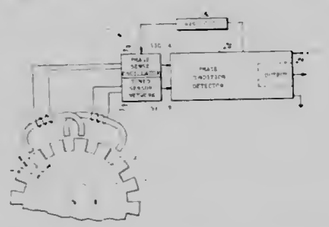
a metallic bridge disposed on said first surface of said soft flexible substrate in close proximity to said plurality of contacts electrically connecting said first and second ground planes which are disposed on either side of said center strip line.

4,894,613

INDUCTIVE SPEED SENSOR HAVING SWITCHING HYSTERESIS FOR INCREASING THE MAGNITUDE OF A PHASE SHIFT

Terumi Tsugawa, Fountain Valley, Calif., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed Sep. 2, 1988, Ser. No. 240,783
Int. Cl.[4] G01P *3/48*
U.S. Cl. 324—173 **6 Claims**



1. A speed detector apparatus for use in combination with a tone wheel having multiple metal teeth, the detector apparatus and tone wheel being adapted for relative displacement and further being susceptible to relative backward displacement, comprising:

an oscillator including a first inductive sensing coil adapted to be positioned adjacent to passing teeth on said tone wheel to thereby change inductance, the oscillator having a first output signal having a frequency determined at least partly by the inductance of said first coil, the oscillator further including means for providing said first output signal as a digital pulse waveform, the duty cycle of said digital waveform being at least partly a function of the DC voltage of the oscillator;

a tuned circuit interconnected with said oscillator and including a second inductive sensing coil, said tuned circuit being driven by said oscillator to provide a second output signal and said second inductive sensing coil being adaptive to be positioned adjacent to passing teeth on said tone wheel to thereby change inductance, the tuned circuit including means for providing said output signal as a digital pulse waveform, the duty cycle of said digital waveform being at least partly a function of the DC voltage of the tuned circuit;

said first and said second inductive sensing coils being offset from one another relative to the passing teeth on the toned wheel, such that their respective said changes of inductance are relatively out-of-phase;

the phase of said second output signal relative to said first output signal shifting and reversing cyclically as a function of the relative positioning of said teeth to the respective said first and second sensing coils during said relative displacement of the tone wheel;

means coupled to said oscillator and said tuned circuit for detecting a said reverse of said phase of one of said first and said second output signals relative to the other and thereby providing timing reference signals recurring at intervals representative of the relative speed of said tone wheel; and

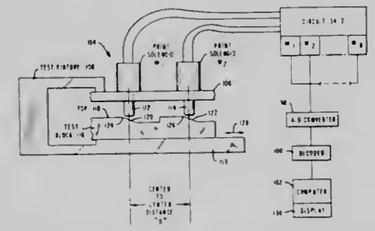
hysteresis circuit means connected between said phase-reversal detecting means and at least one of said oscillator and said tuned circuit for automatically adjusting said DC voltage of the respective said oscillator or said tuned circuit upon said detection of a phase reversal to thereby increase the magnitude of the phase shift.

4,894,614

APPARATUS FOR MEASURING THE CENTER-TO-CENTER DISTANCE BETWEEN POINT WIRES OF PRINT SOLENOIDS

John G. Mitchell, Trumansburg, N.Y., assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 945,996, Dec. 24, 1986. This application Mar. 9, 1989, Ser. No. 321,027
Int. Cl.[4] G01B *7/14*; B41J *9/38, 11/18*
U.S. Cl. 324—208 **3 Claims**



1. An apparatus for measuring the centerline-to-centerline distance between first and second electromagnetic devices, respectively, comprising:

a mounting support for mounting said first and second movable members thereon to establish a centerline-to-centerline distance between said first and second moveable members;

support means having a planar surface and also having means for supporting said mounting support so that the centerlines of said first and second moveable members are perpendicular to said planar surface;

a test block having a top surface and a bottom surface which are parallel to each other, said top surface having first and second bevel surfaces which are parallel to each other, spaced apart at a predetermined distance and extend from said top surface towards said bottom surface; and

a circuit coupled to said first and second electromagnetic devices for measuring the displacement of said first and second moveable members when the associated first and second electromagnetic devices are energized;

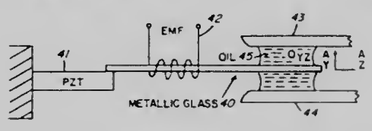
said circuit giving a first indication of the displacement of said first and second moveable members when the top surface of said test block is positioned in said support means to enable said first and second members to impact against said top surface when said first and second electromagnetic devices are energized, and said circuit also giving a second indication of the displacement of said first and second moveable members when said test block is moved in said support means to enable said first and second members to impact against first and second bevel surfaces, respectively, when said first and second electromagnetic devices are energized, with the difference in displacement of said first moveable member from said first and second indications and with the difference in displacement of said second moveable member from said first and second indication being used as a measure of said centerline-to-centerline distance.

4,894,615

STRESS-RELIEVED AMORPHOUS METAL RIBBON MAGNETOMETER HAVING VISCOUS FLUID INTERFACE

Marc D. Mermelstein, Chevy Chase, Md., assignor to Geo-Centers, Inc., Newton Centre, Mass.

Continuation-in-part of Ser. No. 835,545, Mar. 3, 1986, Pat. No. 4,769,599. This application Mar. 11, 1988, Ser. No. 166,706
Int. Cl.[4] G01R *33/02, 33/00*
U.S. Cl. 324—244 **23 Claims**



1. A magnetometer for detecting an applied magnetic field comprising:

a magnetostrictive element having a longitudinal axis extending between opposing ends of the element;

means for supporting the element so that the element is free to vibrate longitudinally, said supporting means including a piezoelectric driver;

means for applying an oscillating electrical driving signal to the driver such that the driver applies an oscillating dither stress to the element which induces magnetization fluctuations along the longitudinal axis of the element of a magnitude proportional to the strength of an applied magnetic field;

means operated on by the magnetization fluctuations for producing an oscillating electrical measuring signal corresponding thereto;

means for detecting the measuring signal; and

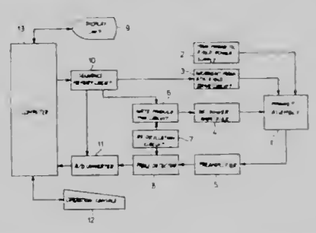
a viscous fluid disposed between the magnetostrictive element and the supporting means for reducing the transmission of stresses at a frequency substantially below that of the driving signal which stresses introduce low-frequency noise and change the calibration by changing the piezomagnetic modulus of the element.

4,894,616

SELECTIVE EXCITATION METHOD FOR NMR IMAGING

Eiji Yoshitome; Kazuya Hoshino, and Susumu Kosugi, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP87/00141, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO87/05201, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 6, 1987, Ser. No. 251,213
Claims priority, application Japan, Mar. 7, 1986, 86/50143
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **3 Claims**



1. A selective excitation method for NMR imaging, comprising the steps of

applying an excitation RF signal to excite nuclear spins in a non-scan area of a subject;

spoiling an excited nuclear spin area with a gradient magnetic field;

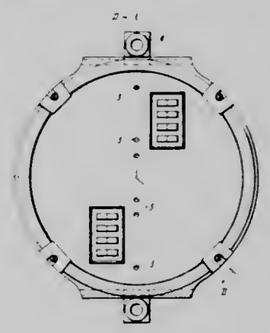
collecting magnetic resonance data from an unspoiled scan area by applying an excitation RF signal and gradient magnetic field to the subject after the spoiling of the excited nuclear spin.

4,894,617

DEVICE FOR LOCATING STEEL RODS BURIED IN HIGH-DENSITY REINFORCED CONCRETE

Alessio Urbani, Monza, Italy, assignor to Ansaldo S.p.A., Genoa, Italy

Filed Apr. 25, 1988, Ser. No. 185,533
Int. Cl.[4] G01V *3/08, 3/10*; G01N *27/72*; G01R *33/12*
U.S. Cl. 324—329 **2 Claims**



1. A device for locating steel rods buried in a high-density reinforced concrete structure comprising:

a disk-shaped support having an upstanding peripheral rim, said support being movable over an area of a surface of said high-density reinforced concrete structure transversely to the direction of steel rods in said structure,

a disk-shaped cover seated on said upstanding rim,

an inductor coil fed with low frequency alternating current extending around the periphery of said support and generating a magnetic field in the surrounding area,

a plurality of small detector coils which detect an increase of the magnetic field generated by said inductor coil due to the presence of ferromagnetic material when passing over a steel rod buried in said structure, said detector coils being dispersed on said support within said inductor coil and being spaced apart from one another on a diameter of said inductor coil and located on opposite sides of the center of said inductor coil, and

a like plurality of signalling lamps on said cover in alignment with respective detector coils, thereby indicating the location of respective detector coils.

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4,894,618

METAL DETECTOR USING CROSS-CORRELATION BETWEEN COMPONENTS OF RECEIVED SIGNALS

Bruce H. Candy, Basket Range, Australia, assignor to Minelab Electronic Industries Ltd., Adelaide, Australia

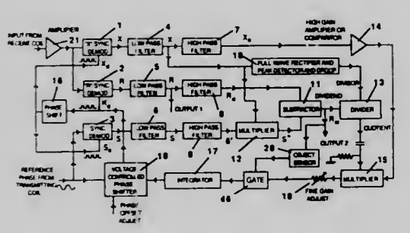
PCT No. PCT/AU86/00253, § 371 Date May 19, 1987, § 102(e) Date May 19, 1987, PCT Pub. No. WO87/01463, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 29, 1986, Ser. No. 61,276

Claims priority, application Australia, Aug. 29, 1985, PH02201

Int. Cl.⁴ G01V *3/11*; G01R *33/12*

U.S. Cl. 324—329 **16 Claims**



1. Apparatus for detecting remote metal objects in an interrogated environment by means of magnetic interrogation, comprising:

transmitting means for transmitting an alternating magnetic signal;

receiving coil means for receiving induced signals, which are in part from the transmitting means and from the interrogated environment;

means, connected to the receiving coil means, for amplifying the received signals.

first and second synchronous demodulator means connected to said amplifier means, for synchronously demodulating with respect to a transmitting frequency;

a first and second low-pass filter means, respectively receiving outputs of said first and second synchronous demodulator means;

a first and a second signal change determining means, respectively connected to outputs of said first and second low-pass filter means, for detecting changes in a magnitude of said first and second low-pass filter output signals;

means for cross correlating outputs of said first and second signal change determining means;

integrator means for integrating an output of said cross correlator means;

controlled phase shifter means receiving an output of said integrator means, for producing a controlled phase shift based thereon, a signal provided by said transmitting means being fed to an input of said controlled phase shifter means;

wherein an output of said controlled phase shifter means is fed to a reference input of said first synchronous demodulator means, and

first phase shifting means coupled to the controlled phase shifter means for shifting the output thereof, and for providing the shifted signal as a reference to said second synchronous demodulator means.

4,894,619

IMPULSE INDUCED EDDY CURRENT TYPE DETECTOR USING PLURAL MEASURING SEQUENCES IN DETECTING METAL OBJECTS

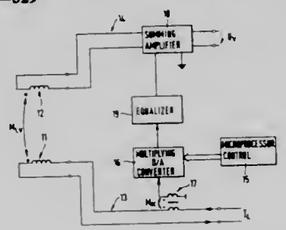
Erkki I. Leinonen, Vantaa, and Kari T. J. Aittoniemi, Espoo, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jul. 22, 1987, Ser. No. 76,288

Claims priority, application Finland, Aug. 15, 1986, 863309

Int. Cl.⁴ G01V *3/11*; G01R *33/00*

U.S. Cl. 324—329 **9 Claims**



1. A method for improving the signal/interference ratio and material identification in the detection of metal objects by detecting and measuring eddy currents induced in such objects, comprising: using an impulse-type metal detector of the type providing a signal representing detected current having a transmitter and a receiver, causing a cut-off peak signal of brief duration to result from mutual inductance between the transmitter and the receiver by cutting off a flow of current to the transmitter, detecting said cut-off peak signal with the receiver, automatically compensating for mutual inductance between the transmitter and the receiver by using a compensation circuit, conducting measurements of signals caused by the presence of a metal body in at least two measuring sequences within the brief duration of said cut-off peak and in at least one measuring sequence after the cut-off peak and including comparing a signal measured during said cut-off peak with a predetermined alarm limit, comparing a signal measured after said cut-off peak with a predetermined alarm limit, and activating an alarm only when both said alarm limits are surpassed.

4,894,620

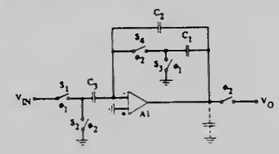
SWITCHED-CAPACITOR CIRCUIT WITH LARGE TIME CONSTANT

Krishnaswamy Nagaraj, Scotch Plains, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 11, 1988, Ser. No. 179,714

Int. Cl.⁴ G06G *7/18*; H03B *1/00*

U.S. Cl. 328—127 **8 Claims**



1. An analog device including a first circuit, the first circuit comprising amplifying means, a switched capacitor network connected between a signal input and an input of the amplifying means and a first feedback capacitance connected between an output of the amplifying means and the input to the amplifying means,

said first circuit being CHARACTERIZED IN THAT the switched capacitor network comprises

a sampling capacitance switched during a first clock phase for sampling an input signal at the signal input for transferring the resulting sample charge to the first feedback capacitance and switched during a second clock phase to withdraw the same charge from the first feedback capacitance,

and wherein the first circuit is further CHARACTERIZED BY

a second feedback capacitance switched in one of the clock phases to acquire a charge proportional to the output voltage of the amplifying means and switched in other of the phases to distribute any charge acquired during said one clock phase with the first feedback capacitance.

4,894,621

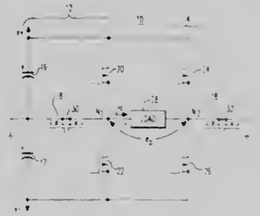
CIRCUIT FOR FIVE LEVEL WAVEFORM SYNTHESIS

Lawrence W. Koenig, Linthicum, and David W. Cripe, Pasadena, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 13, 1988, Ser. No. 205,696

Int. Cl.⁴ H03F *3/217*

U.S. Cl. 330—251 **4 Claims**



2. A power amplifier including a bridge circuit for outputting a periodic switching waveform containing five voltage levels, comprising:

a first half bridge;

a second half bridge connected to said first half bridge;

switching circuits, connected within said first and second half bridges of the bridge circuit, for switching between three different power supply voltages, the three different power supply voltages including a positive power supply voltage, a negative power supply voltage, and an intermediate power supply voltage between the positive and negative power supply voltages, said switching circuit of each of said first and second half bridges including:

a first switch connecting the positive power supply voltage and an output node;

a second switch connecting the negative power supply voltage and the output node; and

a third switch connecting the output node and the intermediate power supply voltage, said first and second switches being DC switches and said third switch being an AC bidirectional switch;

a capacitive circuit, connected to said switching circuits, for providing constant voltage to said switching circuits; and

load means connected between said third switch of each of said first and second half bridges.

4,894,622

INTEGRATED CURRENT-MIRROR ARRANGEMENT COMPRISING VERTICAL TRANSISTORS

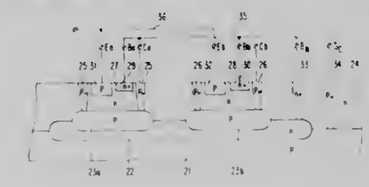
Pieter Buitendijk, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1988, Ser. No. 281,565

Claims priority, application Netherlands, Jun. 15, 1988, 8801520

Int. Cl.⁴ H03F *3/24*

U.S. Cl. 330—288 **6 Claims**



1. An integrated current-mirror arrangement comprising a first and a second transistor whose bases are interconnected and coupled to a collector of the first transistor, wherein the transistors are constucted as vertical transistors each having a collector region of a first conductivity type, isolated from a substrate of the first conductivity type by an intermediate layer of a second conductivity type, a connection being provided between said intermediate layer and the interconnected bases of the two transistors.

4,894,623

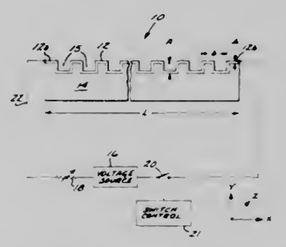
COMPACT TUNABLE RF GENERATOR USING A CURRENT CARRYING DIFFRACTION GRATING

David B. Chang, Tustin, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1988, Ser. No. 223,990

Int. Cl.⁴ H03B *28/00*

U.S. Cl. 331—96 **10 Claims**



1. A tunable generator of radio frequency (RF) electromagnetic energy, comprising:

a diffraction grating formed from an electrically insulative substrate comprising a plurality of aligned grooves, having a depth A, formed in said substrate;

a thin film of an electrically conductive material formed on said diffraction grating, said film having a thickness significantly less than depth A; and

means for applying a variable voltage to said conductive film so that a current flows in the film in a direction substantially perpendicular to the grooves of the

whereby RF energy is radiated from said film, the frequency of the radiation being dependent on the grating spacing and the magnitude of applied voltage.

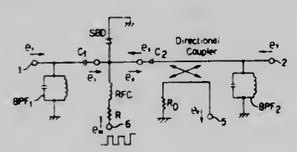
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,624

COMBINED AMPLITUDE MODULATOR AND FREQUENCY CONVERTER

Akira Gokan, Oi, and Hiroshi Wakabayashi, Hanno, both of Japan, assignors to New Japan Radio Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 883,669, Jul. 9, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 140,505
Claims priority, application Japan, Jul. 26, 1985, 60-115646
Int. Cl.[4] H03C *1/02*
U.S. Cl. 332—164 **3 Claims**



1. A combined amplitude modulator and frequency converter comprising:

a non-linear solid state device having a conversion loss which varies in accordance with a DC bias applied thereto;

means for applying a first alternating current signal e_1 of frequency f_1 to a terminal of said device;

means for applying a second alternating current signal e_2 of frequency f_2 to said terminal of said device;

means for applying to said terminal of said device a modulating signal e_m comprising an amplitude modulated direct current voltage; and

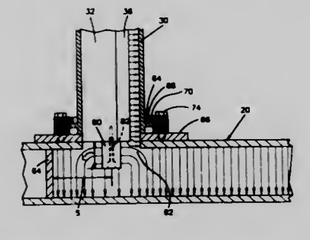
output circuit means connected to said terminal of said device for transmitting therefrom output signals of frequency $n_1f_1 \pm n_2f_2$, where n_1 and n_2 are integers, the output signals being modulated by the modulating signal e_m.

4,894,625

RECTANGULAR WAVEGUIDE TO CIRCULAR WRAPPED RECTANGULAR WAVEGUIDE TRANSITION

Rex L. Niekamp, and William A. Kerkhoff, both of Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 29, 1988, Ser. No. 277,230
Int. Cl.[4] H01P *5/02*
U.S. Cl. 333—33 **9 Claims**



1. Apparatus for providing a direct waveguide to waveguide transition coupling between a first rectangular waveguide and a second circular wrapped rectangular waveguide with both waveguides operating in a TE_{10} mode, comprising

said second waveguide includes an elongated metallic annular wall having an upper end and a lower end and a partition member extending radially inward from said annular wall and having an inner edge thereof located near the central axis of said annular wall and extending longitudinal for a length corresponding with that of said annular wall,

an elongated metal probe having one end secured to the lower end of said particular member at a location corresponding with said central axis and extending beyond said lower end;

said first rectangular waveguide having parallel rectangular broad walls interconnected by narrower narrow walls, said rectangular waveguide being oriented perpendicular to the axis of said annular wall and having a circular aperture in one of said broad walls facing said lower end, said circular aperture being in coaxial alignment with said annular wall; and

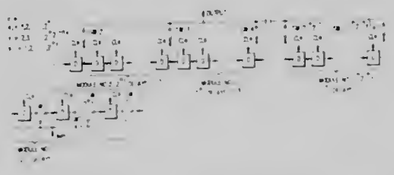
means securing said first and second waveguides together with said probe extending through said aperture into the interior of said first waveguide.

4,894,626

VARIABLE LENGTH SHIFT REGISTER

James J. Kubinec, Incline Village, Nev., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 30, 1988, Ser. No. 251,724
Int. Cl.[4] H03K *5/14, 5/139*
U.S. Cl. 333—101 **7 Claims**



1. Apparatus for providing variable length time delays of Δt, $2\Delta t$, $3\Delta t$, . . . , $MN\Delta t$, where Δt is a predetermined time interval and M and N are predetermined positive integers with $N \geq 2$, the apparatus comprising:

first time delay means, having an input terminal, a clock input terminal, an output terminal and a first plurality of programmable switch means, with each switch means having a first state and a second state, for producing a time delay of any of the lengths Δt, $2\Delta t$, $3\Delta t$, . . . , $M\Delta t$ by programming of the first plurality of programmable switch means, with the input terminal of the first time delay means receiving the signal that is to be delayed in time; and

second time delay means, having an input terminal connected to the output terminal of the first time delay means, a clock input terminal, and output terminal and a second plurality of programmable switch means, with each switch means having a first state and a second state, for producing a time delay of any of the lengths 0, $M\Delta t$, $2M\Delta t$, . . . , $(N-1)M\Delta t$ at the output terminal of the second time delay means, where at most one programmable switch means from the first time delay means and precisely one programmable switch means from the second time delay means is programmed to be in a first state for any operation of the apparatus; and

a source of periodic clock pulses having a clock cycle of length substantially Δt that is connected to the clock input terminal of each of the first time delay means and the second time delay means.

4,894,627

DIRECTIONAL WAVEGUIDE-FINLINE COUPLER

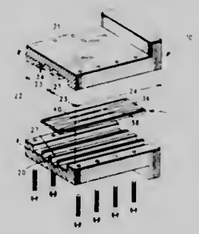
Robert C. Kane, Woodstock, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1989, Ser. No. 292,980
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—113 **9 Claims**

1. A directional energy coupler for transferring radio frequency energy traveling in a first waveguide to an adjacent second waveguide, said first and second waveguides having substantially rectangular cross-sections, and a common wall separating said waveguides said coupler comprised of:

first mode converter means for converting waveguide-mode radio-frequency energy in said first waveguide to finline-mode radio-frequency energy in said first waveguide; and,

energy coupling means for coupling finline-mode radio-frequency energy from said first mode converter means in said first waveguide to finline-mode radio-frequency energy in said second waveguide, said energy coupling means being a single elongated slot oriented with its widest dimension orthogonal to said waveguide cross-sections, said slot separating said common wall into first and second sections.

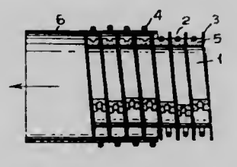


4,894,628

TRANSMISSION DELAY LINE AND METHOD OF MANUFACTURE

Peter J. Dadswell, Gawler, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU87/00104, § 371 Date Dec. 2, 1987, § 102(e) Date Dec. 2, 1987, PCT Pub. No. WO87/06065, PCT Pub. Date Oct. 8, 1987
PCT Filed Apr. 2, 1987, Ser. No. 163,966
Claims priority, application Australia, Apr. 2, 1986, PH5293
Int. Cl.[4] H01P *9/00, 9/02, 11/00*
U.S. Cl. 333—160 **15 Claims**



1. A coaxial transmission delay line, comprising:

a cylindrical tube of electrically-conductive material having a radially outwardly-extending helical wall cycling helically thereabout between axially opposite ends of said cylindrical tube on a radially outer peripheral surface of said cylindrical tube, said helical wall having a radially outer edge which is disposed a constant radial distance from said radially outer peripheral surface of said cylindrical tube, successive turns of said helical wall being axially spaced so as to define a helical slot of space;

a sleeve of electrically-conductive material radially surrounding said helical wall between said axially opposite ends of said cylindrical tube, said sleeve having a radially inner peripheral surface engaging said radially outer edge of said helical wall, thereby defining a radially outer limit to said helical slot of space so that said helical slot of space forms a helical channel having a given transverse cross-sectional shape, viewed on a longitudinal section of said coaxial transmission delay line;

support means made of low density dielectric material, said support means being received in said helical channel so as to be present at at least a plurality of sites per helical turn of said helical channel, said support means being supported from said radially outer peripheral surface of said cylindrical tube and having a thickness, extending radially outwardly of said radially outer peripheral surface of said cylindrical tube, which is less than said constant radial distance, whereby a helical gap remains between a radially outer surface of said support means and said radially inner peripheral surface of said sleeve;

means defining a radially outwardly-facing seat means on said support means, said seat means being located laterally intermediate respective adjacent turns of said helical wall, said seat means extending helically with said helical channel so as to be located generally centrally of said helical channel at said sites;

a single center conductor formed in a helix and extending helically of said cylindrical tube, generally between said opposite ends of said cylindrical tube, in said gap of said helical channel, supported in said seat means of said support means;

said single center conductor being so sized that a portion of said gap between said single center conductor and respective adjacent turns of said helical wall and between said single center conductor and said radially inner peripheral surface of said sleeve, remains unoccupied;

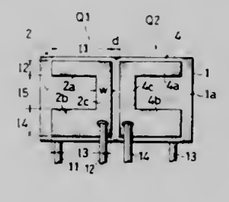
said unoccupied porton of said gap provides an unbroken and unimpeded helical passageway for an introduced gas between opposite ends of said coaxial transmission delay line.

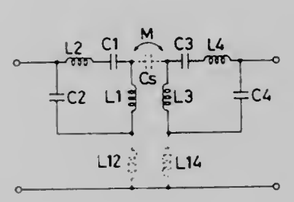
4,894,629

BANDPASS FILTER HAVING MAGNETICALLY COUPLED RESONATORS

Hisatake Okamura; Teruhisa Tsuru, and Masahiko Kawaguchi, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 2, 1987, Ser. No. 21,051
Claims priority, application Japan, Mar. 4, 1986, 61-46856; Apr. 25, 1986, 61-97316; Jan. 22, 1987, 62-12929; Jan. 22, 1987, 62-12930
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[4] H03H *7/09*
U.S. Cl. 333—177 **15 Claims**



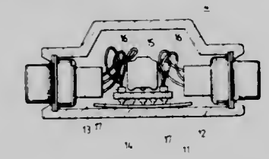


1. A bandpass filter comprising:

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a plurality of resonators; and
a magnetic induction coupling being established between adjacent pairs of said resonators, wherein each of said resonators includes
an LC series circuit, and
first capacitance element connected in parallel to said LC series circuit,
said LC series current including a second capacitance element and two inductance elements, said second capacitance elements connected in series between said two inductance elements, and
said magnetic induction coupling being provided by a coupling between at least one of said inductance elements of each adjacent pair of said resonators.

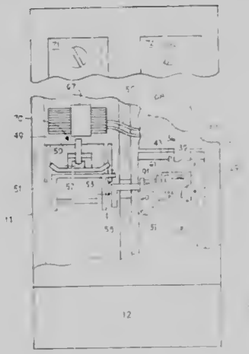
4,894,630
CONVERSION ADAPTER
Masamichi Ueta, and Yukihiro Kobayashi, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan
Filed Nov. 23, 1988, Ser. No. 275,747
Claims priority, application Japan, Nov. 28, 1987, 62-181773
Int. Cl.[4] H03H *7/01*
U.S. Cl. 333—185 **5 Claims**



1. A conversion adapter comprising:
first and second connectors each including means defining a predetermined number of pin connections on one side thereof and wires electrically connected to said pin connections and extending from another side thereof;
an adapter frame body for supporting said first and second connectors such that said first and second connectors are spaced from one another and said pin connections of each of said first and second connectors face in directions opposite each other and have different pin connection configurations with respect to each other;
a printed circuit board disposed between said first and second connectors;
at least one noise filter arranged on said printed circuit board; and
board-in connector elements coupled to said wires for connecting said wires from said first and second connectors to said printed circuit board to connect said first and second connectors to respective sides of said at least one noise filter arranged on said printed circuit board.

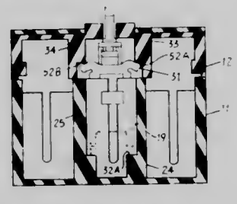
4,894,631
MOLDED CASE CIRCUIT BREAKER ACTUATOR-ACCESSORY UNIT
Roger N. Castonguay, Terryville; Joseph G. Nagy, Plainville; Richard E. Bernier, Southington; Ronald D. Ciarcia, Bristol, and Keith W. Klein, Simsbury, all of Conn., assignors to General Electric Company, New York, N.Y.
Filed Sep. 6, 1988, Ser. No. 240,885
Int. Cl.[4] H01H *9/20*
U.S. Cl. 335—167 **24 Claims**

1. A molded case circuit breaker having a combined trip actuator and accessory unit comprising:
a molded case circuit breaker case and cover;
a circuit breaker operating mechanism arranged for separating a pair of contacts to interrupt circuit current through said contacts;
a trip actuator-accessory unit within a recess in said circuit breaker cover proximate said operating mechanism and including a trip actuator latch and a reset lever pivotally attached to a support housing for articulating said operating mechanism to separate said contacts automatically upon overcurrent conditions through said contacts, said reset lever and said trip actuator latch each comprising a radial cam surface for receiving and guiding a trip latch pin and allowing said trip actuator latch and said reset lever to move in unison with said trip latch pin;



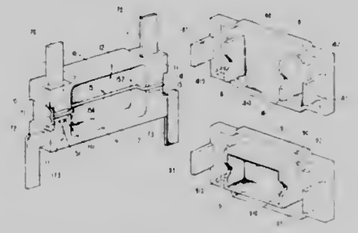
an operating lever within said case proximate said operating mechanism and interfacing with said actuator-accessory unit through a latch support arm, said latch support arm including a latch pin being retained by said trip actuator latch in the absence of said overcurrent conditions through said contacts; and
an electromagnetic coil and a spring-biased plunger within said actuator-accessory unit, said plunger being restrained from moving said trip actuator latch away from said latch pin.

4,894,632
MOLDED CASE CIRCUIT BREAKER OPERATING MECHANISM FOLD-DOWN ARRANGEMENT
Roger N. Castonguay, 5 Ellen Dr., Terryville, Conn. 06786, and David J. Meiners, 186 Pondview Dr., Southington, Conn. 06489
Filed Nov. 21, 1988, Ser. No. 274,224
Int. Cl.[4] H01H *9/02*
U.S. Cl. 335—202 **10 Claims**



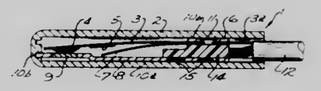
1. A molded case circuit breaker comprising:
a molded plastic case and cover forming an enclosure;
a pair of separable contacts within said enclosure arranged for separation upon occurrence of an overcurrent condition through said contacts; and
an operating mechanism within said enclosure intermediate an operating handle and said separable contacts, said operating mechanism including latch means for retaining said separable contacts from being separated in the absence of said over-current condition, said operating mechanism including a pair of arms extending from a top part of said operating mechanism interacting with said cover to retain said operating mechanism within said enclosure said arms becoming deformed when said cover is attached to said case.

4,894,633
FUSE APPARATUS
Richard P. Holtfreter, Columbus, Ohio, assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed Dec. 12, 1988, Ser. No. 282,789
Int. Cl.[4] H01H *85/34*
U.S. Cl. 337—278 **17 Claims**



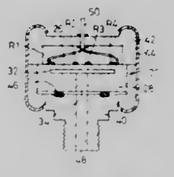
1. An electrical fuse comprising
a fuse element for interrupting an electrical circuit upon an occurrence of a fault condition in the electrical circuit, and
means having externally projecting terminal means engaging said fuse element with an air cavity formed therein and with cover means having an arc-suppressant structure internally extending into said air cavity and wedged against opposing side walls of said air cavity holding said terminal means for supporting and deflecting said fuse element between said arc-suppressant structure and said opposing side walls of said air cavity to shield said terminal means from voltage arcs occurring upon a failure of the fuse element in response to the fault condition.

4,894,634
SWITCH DEVICE
Masakazu Nezuka, Gotemba; Yuji Saito, Susono, and Yasuhiro Sato, Gotemba, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 19, 1988, Ser. No. 259,833
Int. Cl.[4] H01H *37/74, 37/54*
U.S. Cl. 337—343 **4 Claims**



1. A switch device comprising a housing forming a switch chamber, a stationary electrical contract mounted in the housing, an elongated movable contact arm having two opposite ends, one end mounting thereon a movable electrical contact adapted to move into and out of engagement with the stationary contact to respectfully close and open an electrical circuit, a bimetallic member having two opposite ends, a support mounted in the housing, an end of the bimetallic member and the other end of the movable contact arm placed one on top of the other and cantilever mounted on the support, a heat sink member mounted in heat transfer relationship with the cantilever mount of the movable contact arm and the bimetallic member, the movable contact arm and the bimetallic member both extending into the switch chamber in generally the same direction but with the free end of the bimetallic member spaced from the movable contact arm during normal operating conditions, the movable contact being biased into engagement with the stationary contact during normal operating conditions and the bimetallic member deformable in dependence on variations in its temperature so that with increasing temperature the free end of the bimetallic member moves toward the movable contact arm.

4,894,635
STRAIN SENSOR
Yasuhita Yajima; Kazuyoshi Shitaba, both of Nagoya, and Syunzo Mase, Aichi, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed May 24, 1988, Ser. No. 198,085
Claims priority, application Japan, May 27, 1987, 62-130878
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—2 **6 Claims**

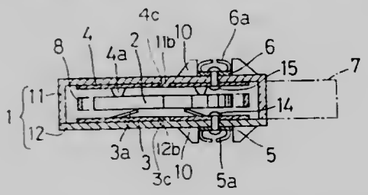


1. A strain sensor including a ceramic substrate deformable in response to a stress exerted thereon, and an electrically resistive layer formed on the ceramic substrate, a strain of the ceramic substrate caused by the stress being detected as a change in a resistance value of the electrically resistive layer, wherein the improvement comprises:
said electrically resistive layer having a composition which includes a dielectric material selected from the group consisting of glasses and ceramics, and at least one principal electrically conductive component in the form of a powder selected from the group consisting of: borides, carbides and nitrides and silicates of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W; borides of Y, Sc and lanthanide series; BN; B_4C; SiC; and Si_3N_4.

4,894,636
OIL LEAKAGE DETECTION DEVICE
Hiroyuki Sagibuchi, and Juji Akiba, both of Saitama, Japan, assignors to Junkosha Co., Ltd., Japan
Filed Oct. 21, 1988, Ser. No. 260,497
Claims priority, application Japan, Jan. 28, 1988, 63-9909[U]
Int. Cl.[4] H01C *7/06*
U.S. Cl. 338—9 **1 Claim**

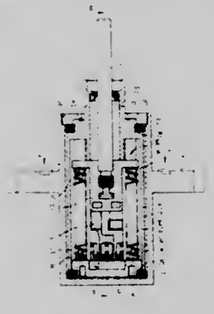
1. Oil leakage detection apparatus having a detection unit comprising: (a) an oil leakage detecting sensor which exhibits a positive resistance-temperature characteristic in response to changes in temperature, connected, in series, to (b) an oil leakage detecting sensor which exhibits a negative resistance-temperature characteristic in response to changes in temperature.

4,894,637
POSITIVE TEMPERATURE COEFFICIENT THERMISTOR DEVICE
Yoshihiro Yamada, Ohmihachiman; Yuichi Takaoka, Shiga; Masahito Mihara, and Takashi Shikama, both of Yokaichi, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Sep. 6, 1988, Ser. No. 240,926
Claims priority, application Japan, Sep. 7, 1987, 62-223817
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—22 R **10 Claims**



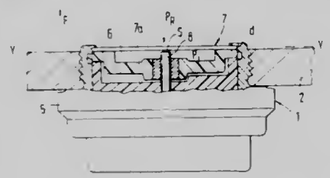
1. A positive temperature coefficient thermistor device comprising:
a substantially thermally and electrically insulating case,
a positive temperature coefficient thermistor element disposed in said case,
a pair of first terminals disposed in said case and having electrodes extending from said first terminals and in contact with corresponding respective portions of said thermistor element,
a pair of second terminals respectively connected with said first terminals, and connecting means for electrically connecting said first terminals with said second terminals, wherein said second terminals are mounted on an outer surface of said case opposite said respective first terminals and said connecting means comprises a pair of pin members which penetrate said case to mechanically and electrically connect the first terminals with the second terminals.

4,894,638
POTENTIOMETER HAVING VIBRATION DAMPING MEANS
Werner Flierl, Höhenkirchen, and Horst Pissulla, Ottobrunn, both of Fed. Rep. of Germany, assignors to Wilhelm Ruf Kg. Munich, Fed. Rep. of Germany
Filed Apr. 29, 1988, Ser. No. 187,775
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714348
Int. Cl.[4] H01C *10/32*
U.S. Cl. 338—162 **19 Claims**



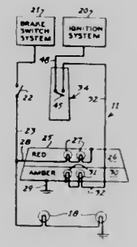
1. A potentiometer that can be attached to an object that can vibrate and used to produce an electrical signal responsive to a signal from said object comprising.
an outer housing;
an inner housing disposed substantially within said outer housing;
damping means disposed between said inner housing and said outer housing for damping vibrations;
a resistor plate having at least one resistor path attached to said inner housing;
actuating means for detecting said signal;
electrically conductive sliding means attached to said actuating means for contacting said at least one resistor path at a location that corresponds to said position;
an electrical output disposed on said outer housing for outputting said electrical signal;
a plurality of electrodes disposed within said inner housing that are electrically connected to said at least one resistor path and said sliding means; and
means for establishing an electrical connection between said electrical output and said plurality of electrodes, said electrical connection means also being flexible enough to withstand vibrations between said inner housing and said outer housing.

4,894,639
PRESSURE SWITCH FOR MONITORING TIRE PRESSURE, PARTICULARLY OF MOTOR VEHICLE TIRES
Wolfgang Schmierer, Pforzheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Prosche AG, Weissach, Fed. Rep. of Germany
Filed Mar. 24, 1989, Ser. No. 328,541
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810763
Int. Cl.[4] B60C *23/00*
U.S. Cl. 340—444 **20 Claims**



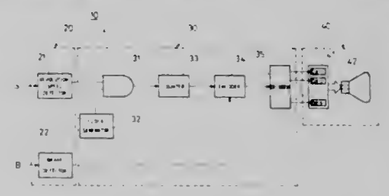
1. A pressure switch for monitoring tire pressure of motor vehicle tires, which is fastened at a wheel rim of the tire and is actuated by inflating pressure in the tire, comprising:
a reference pressure chamber which faces in the direction of the tire and is sealed off from the tire by an electrically conductive switching diaphragm:
the chamber supports a contact pin which interacts with this switching diaphragm to close an electric circuit between the pin and diaphragm; and
the switching diaphragm has applied to it a force responsive to the tire pressure and a mass which is controlled as a function of centrifugal force indicative of tire rotational speed so that closing points of the pressure switch are determined by tire pressure that varies automatically with tire rotational speed.

4,894,640
REAR SIGNAL LIGHT SYSTEM FOR AUTOMOTIVE VEHICLES
Jerry W. Beasley, 645 Dutchman Dr., and Robert H. Jennings, 4368 Baton Rouge Dr., both of Hermitage, Tenn. 37076
Filed Mar. 17, 1986, Ser. No. 840,196
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—464 **3 Claims**



1. A signal light system for an automotive vehicle having a rear portion, an electrical brake switch system, a carburetor, an accelerator link arm cooperatively connected to the carburetor, and an electrical ignition system, comprising:
(a) an electrical amber warning lamp,
(b) means mounting said amber warning lamp in the rear portion of an automotive vehicle and visible to the rear of said vehicle,
(c) an accelerator pedal member comprising a pedal housing having an upper portion and a lower portion, an enclosing bottom wall and side walls, and a treadle on said upper portion, defining a hollow space within said pedal housing, guide post means connecting said treadle to said bottom wall, and spring coil means surrounding said guide post means and biasing said treadle upward upon the absence of downward pressure by the operator's foot,
(d) means mounting said bottom wall of said pedal housing on the accelerator link arm of a motor vehicle,
(e) an accelerator electrical switch member comprising a microswitch having a switch casing,
(f) means fixing said switch casing on said bottom wall within said hollow space,
(g) said microswitch having a normally closed circuit position and an open circuit position,
(h) said microswitch member comprising a movable switch actuator projecting upward from said switch casing in the upper portion of said pedal housing and adapted to change the mode of said microswitch between said closed circuit position and said open circuit position,
(i) said microswitch being electrically connected in series solely between the electrical ignition system of the automotive vehicle and said amber warning lamp,
(j) an electrical red warning lamp,
(k) means mounting said red warning lamp in the rear portion of said automotive vehicle, and visible to the rear of said vehicle,
(l) said red warning lamp electrically connected in the electrical brake switch system of said automotive vehicle for illumination solely when said brake switch system is energized,
(m) said switch actuator being adapted to move downward to change the mode of said microswitch to said open circuit position simultaneously with the downward pressure on said switch actuator by the operator's foot on said treadle, whereby said amber lamp is not illuminated, and
(n) said switch actuator being adapted to move upward to change the mode of said microswitch to said closed circuit position when the downward pressure on said switch actuator by the operator's foot on said treadle has been removed, to continuously illuminate said amber lamp as long as said microswitch is in said closed circuit position, the illumination of said amber warning lamp and said red warning lamp being independent of each other.

4,894,641
REAL-TIME SPEED DISPLAY APPARATUS
Bill Yang, Taipei, Taiwan, assignor to Cotron Corporation, Taipei, Taiwan
Filed Jan. 24, 1989, Ser. No. 301,051
Int. Cl.[4] B60Q *1/54*
U.S. Cl. 340—466 **6 Claims**

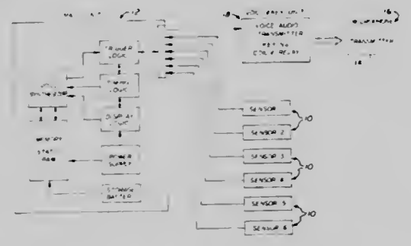


1. A real-time display apparatus for displaying the speed of a vehicle having a transmission shaft, with lights of different colors, comprising:
detection means for detecting the speed of the vehicle, said detection means including means, responsive to rotation of the transmission shaft of the vehicle, for outputting a speed signal in the form of a pulse signal having a pulse rate which varies as a function of the speed of revolution of the transmission shaft;
control means coupled to said detection means for generating a display control signal in response to the speed signal, said control means including
a clock generator for generating a clock signal,
a timing gate having first and second inputs respectively electrically connected to said detection means and said clock generator, for converting the speed signal into a periodic signal having the same number of pulses as that of the speed signal during predetermined periods of time, the periods of time being controlled by the clock signal,
a counter, electrically connected to said timing gate, for counting the number of pulses of the periodic signal during each of the predetermined periods of time,
an encoder, connected to said counter, for encoding the count of said counter at the end of each predetermined period of time to obtain a sequence of code signals, and
a decoder, connected to said encoder, for decoding the sequence of code signals to obtain the display control signal; and
display means, coupled to said control means, for generating different colors of light in response to the display control signal.

4,894,642
VOICE SECURITY SYSTEM
Charles F. K. Ashbaugh, and Neal K. Henderson, both of Tampa, Fla., assignors to Cyclone Corporation, Tampa, Fla.
Filed Nov. 3, 1988, Ser. No. 266,814
Int. Cl.[4] G08B *19/00*
U.S. Cl. 340—539 **3 Claims**

1. An improved voice security system of the type including a remote signalling apparatus having at least one sensor for detecting a predetermined condition and generating a signal in response to a sensed condition, logic circuit means for receiving the signal, and voice synthesizer means for generating an audible message in response to the sensed condition wherein the improvement comprises means for transmitting the audible

message to a remote location utilizing a two-way radio having a microphone, said means comprising a voice and key unit



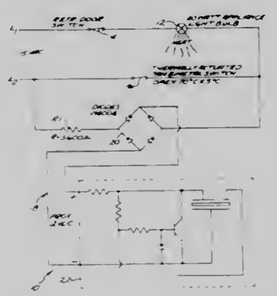
interposed between said voice synthesizer and said microphone of said two way radio.

4,894,643

APPLIANCE DOOR ALARM APPARATUS

Herbert A. Thompson, Cumberland, and Glenn J. Doell, No. Providence, both of R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1989, Ser. No. 344,779
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—593 **7 Claims**



1. An appliance door alarm indicator system for providing an indication that a door has been left ajar for longer than a preselected period comprises a heat generating light bulb, a normally closed thermostatic switch mounted in heat transfer relation with the light bulb, an appliance door switch adapted to be closed when the appliance door is open and open when the appliance door is closed, the door switch electrically connected in series with the light bulb and the thermostatic switch, an electrically energizable alarm indicator coupled across the thermostatic switch so that when the thermostatic switch receives sufficient heat from the bulb to cause it to move to an open contacts position the alarm indicator is concomitantly energized.

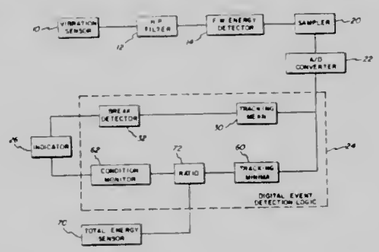
4,894,644

TOOL BREAK/WEAR DETECTION USING A TRACKING MINIMUM OF DETECTED VIBRATIONAL SIGNAL

Charles E. Thomas, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,026
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—680 **19 Claims**

1. A method of detecting machining tool wear comprising the steps of sensing vibration energy produced upon machining a workpiece with said tool; generating an electrical vibration signal corresponding to the sensed vibration energy; processing the vibration signal to produce a tracking minimum signal which tracks the minimum values of the vibration signal; com-



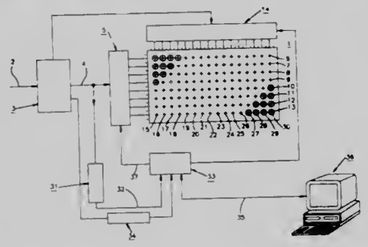
paring the tracking signal to a predetermined threshold level; and indicating in response to the comparing, the tracking signal attaining a predetermined level relative to the predetermined threshold level.

4,894,645

INCANDESCENT MATRIX DISPLAY WITH HIGH FREQUENCY LAMP DRIVING

Lars B. G. Odlen, Stockholm, Sweden, assignor to Prisma Skyltreklam AB, Sweden

Filed May 27, 1988, Ser. No. 199,527
Claims priority, application Sweden, Jun. 3, 1987, 8702307
Int. Cl.[4] G09F *9/32*; H04N *3/12*
U.S. Cl. 340—780 **4 Claims**



1. An electronic sign with a number of light bulbs provided in rows and columns, the bulbs being turned on either row-by-row or column-by-column, the electronic sign comprising:

a switched mains unit for receiving a mains voltage having a mains frequency and for providing an alternating current to operate the bulbs, the frequency of the alternating current substantially exceeding the mains frequency; and

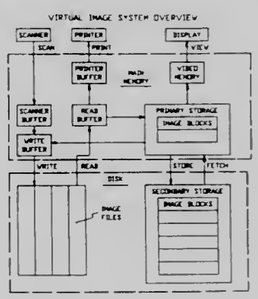
a logic unit for controlling the row and column operation, the shifting of the row and column operation being synchronized with the alternating current from the switched mains unit.

4,894,646

METHOD AND SYSTEM FOR PROCESSING A TWO-DIMENSIONAL IMAGE IN A MICROPROCESSOR

Arthur G. Ryman, Toronto, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1987, Ser. No. 122,827
Claims priority, application Canada, Mar. 30, 1987, 533370
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—747 **21 Claims**



1. An image processing system including a display device, a first store and a second store,

means for loading digital representations of images to be displayed into said first and second stores, each said image being subdivided into a plurality of sub-images,

a table associated with each image and each sub-image, each said table associated with each image defining view characteristics for said associated image, each said table for each said sub-image defining view characteristics for said associated sub-image,

means for selecting a view of a stored image for display on said display device as a viewed image having view characteristics, said selecting means accessing said view of said stored image by selecting sub-images for display, said selecting means including means for comparing said view characteristics of said viewed image to said view characteristics of a selected sub-image and means for changing said view characteristics of said selected sub-image to the view characteristics of said viewed image before displaying said sub-image.

4,894,647

SCINTILLATING HANDLE FOR BEVERAGE TAP

Donald M. Walden, Jr., Franklin, and John P. Glueckstein, Hubertus, both of Wis., assignors to Everbrite Electric Signs, Inc., Greenfield, Wis.

Filed Jan. 11, 1988, Ser. No. 142,026
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—815.200 **2 Claims**

1. A scintillation device for operating a tap for dispensing liquid, said device comprising:

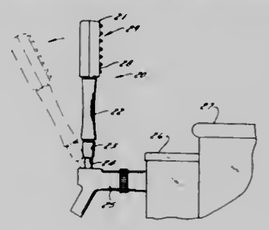
handle means and means for coupling said handle means to said tap such that when said handle means is tilted from an inactive position to an active position said tap is caused to open for dispensing a liquid,

said handle means comprises a casing and a stem joined to said casing, said stem having said means for coupling said handle means to said tap,

a display comprised of a plurality of electrically activated light emitting elements arranged in a pattern and mounted to said handle means,

electronic circuit means mounted on said handle means and having electrical connections to said light emitting elements, said circuit means including switch means responsive to said handle means being tilted by closing to activate said circuit means to initiate repeatable scintillation sequences wherein said circuit means energizes some of said light emitting elements and concurrently deenergizes other of said elements cyclically,

said circuit means being mounted in said casing,



face plate means applied to said casing for enclosing the same,
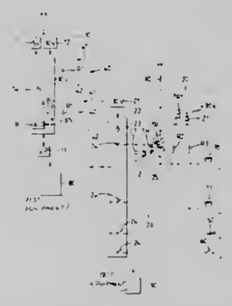
said light emitting elements projecting from said face plate means.

4,894,648

INFORMATION HANDLING AND CONTROL SYSTEMS, AND METHODS OF TESTING THE CONDITION OF ELECTRICAL LOADS IN SUCH SYSTEMS

Kevin T. Talbot, Lichfield, England, assignor to Salplex Limited, England

Filed Sep. 6, 1988, Ser. No. 240,502
Claims priority, application United Kingdom, Sep. 21, 1987, 8722194
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.060 **25 Claims**



1. An information handling and control system comprising:

(a) at least one power switch provided in a local unit to control a high current each to a respective load;

(b) a low current signalling link provided between the local unit and a remote intelligent unit;

(c) at least one capacitor provided in the local unit each connected to the control electrode of a respective said power switch;

(d) means provided in the local unit for connecting each capacitor to the signalling link during a respective time slot assigned to the respective power switch in successive frame periods;

(e) drive voltage means provided in the intelligent unit for applying a first or a second drive voltage within a said respective assigned time slot respectively to charge or discharge said respective capacitor to a high or a low voltage value sufficient respectively to turn the respective power switch on or off, the respective capacitor maintaining the respective power switch continuously on or con-

tinuously off between successive frame periods when the respective load is in normal condition;

(f) charging means provided in the local unit effective to charge each said capacitor to an intermediate voltage value only when the respective load is in open-circuit condition following the respective capacitor being discharged to said low voltage value by said second drive voltage and while no drive voltage is applied to the respective capacitor from the drive voltage means; and

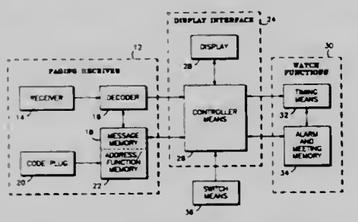
(g) detection means provided in the intelligent unit which are operable to detect the condition of each said capacitor at a time in a selected said respective assigned time slot when the respective capacitor will be at said intermediate voltage value if the respective load is in open-circuit condition and hence to detect whether or not the respective load is in open-circuit condition.

4,894,649

PAGER HAVING TIME CONTROLLED FUNCTIONS

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,457
Int. Cl.[4] H04Q 7/00
U.S. Cl. 340—825.44 **8 Claims**



1. A portable communication device comprising:

a receiver for receiving selective call paging signals and messages;

programmable timing means, for generating time signals and at least a first control signal starting at a first predetermined time for a first predetermined time interval, and a second control signal further starting at a second predetermined time for a second predetermined time interval;

memory means, having an address memory area for storing at least first and second predetermined addresses;

controller means, coupled to said memory means, and responsive to said first control signal for enabling the selection of the first predetermined address during the first predetermined time interval, and further responsive to the second control signal for enabling the selection of the second predetermined address during the second predetermined time interval;

a decoder, responsive to the received selective call paging signals matching the predetermined address selected during the first and second predetermined time intervals, for generating an alert control signal in response thereto; and

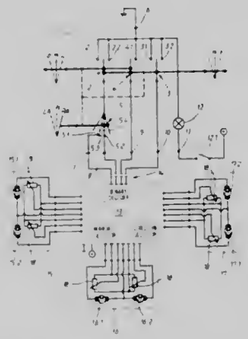
alerting means, responsive to the alert control signal for generating a sensible alert.

4,894,650

CONTROL UNIT FOR MANUALLY CONTROLLING REVERSIBLE ELECTROMECHANICAL ADJUSTING DEVICES

Karl-Heinz Krieg, Ebersbach, and Siegfried Klink, Schönaich, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 203,319
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721267
Int. Cl.[4] H04Q 1/00
U.S. Cl. 340—825.52 **10 Claims**



1. A control unit for manually controlling reversible electromechanical adjusting means used for adjusting the position of three motor vehicle rear view mirrors, comprising:

a switch arrangement means moved by a single moveable lever means for positioning a first selecting switch means movable contact bridge means which rests against a first fixed contact in one of three switching positions and against a second fixed contact in another of said switching positions;

and for also positioning three key switch means wherein at least a first and a second of these key switch means are change-over key switch means having one moveable contact bridge each, which can be switched to a first or to a second fixed contact depending on a direction of movement of the lever;

the moveable contact bridge of the first change-over key switch means being electrically and permanently connected to the moveable contact bridge of the selecting switch means and moved jointly with a least one other moveable contact bridge of one of the other two switch means;

said third key switch means also having a moveable contact bridge and a first fixed contact;

a common connecting terminal which is electrically and permanently connected to each of the fixed contacts of each of three key switch means;

four further connecting terminal means which are individually and permanently connected, with the first of the four further connecting terminal means being connected to the first fixed contact of the selecting switch means, the second of the four further connecting terminal means connected to the second fixed contact of the selecting switch means, the third of the four further connecting terminal means connected to the moveable contact bridge means of the second key switch means and the fourth of the four further connecting terminal means connected to the moveable contact bridge means of the third key switch means;

the moveable contact bridge means of the selecting switch means of the switch arrangement means, in its third

switching position electrically connects the first and second fixed contact of the selecting switch together;

the four further connecting terminal means each being connected to a spatially remotely arranged decoding and control circuit via a multi-core line for transmitting a four-digit binary code with the symbols "no potential" and "potential of the common connecting terminal" to said decoding and control circuit, each adjusting means is addressed in a required adjusting direction by two digits of the binary code from said decoding and control circuit; wherein the first two connecting terminal means connected to the two fixed contacts of the selecting switch means determine which one of the three rear view mirrors is to be adjusted while the third and fourth connecting terminal means connected to the contact bridges of the second and third key switch means determine which directions the mirrors are to be adjusted by said adjusting means; and

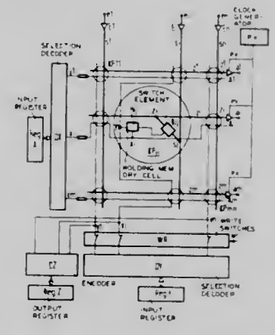
wherein the decoding and control circuit operates the adjusting means via control lines in accordance with the binary code therein caused by the lever handle actuating the three key switch means.

4,894,651

BROADBAND SIGNAL SWITCHING EQUIPMENT

Gerhard Trumpp, Puchheim; Wilhelm Koenig, Munich, and Thomas Lang, Taufkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1987, Ser. No. 62,677
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620468
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.91 **8 Claims**



1. In a broadband signal switching apparatus having a crosspoint matrix construction using field effect transistor devices, the matrix including a plurality of input lines each having a resistance and extending in one direction, and a plurality of output lines each temrinating in an output terminal extending in another direction and intersecting said input lines to form crosspoints, and in which a plurality of first selection lines extend parallel to said output lines and a plurality of second selection lines extend parallel to said input lines, said selection lines also extending through said crosspoints so that a bit at a potential at a selected input line is conducted via said crosspoint to a selected output line, the improvement comprising:

a plurality of crosspoint switches, each of said crosspoint switches located at a respective crosspoint and having a control electrode, and a controlled path connected between an input line and an output line intersecting at the crosspoint at which said crosspoint switch is located, said controlled path having a high forward resistance in the conducting state in comparison to the resistance of the matrix input line connected thereto;

a plurality of output amplifiers, each of said output amplifiers having an input and an output connected in a respective output line and comprising a network of an inverting complementary metal-oxide-semiconductor logic element, a network switch and a holding element, said holding element having a signal input, a clock input, and an output forming said output of said output amplifier, said logic element having an input forming said input of said output amplifier, a switching threshold and an output connected to said signal input of said holding element, said network switch having a controlled switching path connected between said input of said output amplifier and a reference voltage source, and a control electrode controlling said switching path connected to a clock line and to said clock input of said holding element, said switching path having a low forward resistance in comparison to the resistance of said crosspoint switch for the respective output line; and

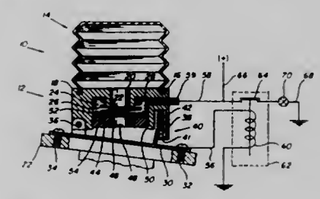
means for charging said clock line with a clock signal subdividing a bit switching time interval into a preliminary phase and an actual switching phase, said clock signal rendering said switching path of said network switch conductive during said preliminary phase to reset the respective output line substantially to the potential of the switching threshold of said logic element to prepare said logic element for reloading, proceeding from said potential, by said crosspoint switch during said actual switching phase to a potential corresponding to a bit conducted to the output amplifier by the crosspoint switch respectively connected thereto.

4,894,652

VEHICLE BRAKELIGHTS ACTIVATING DEVICE

Mordechai Eckstein, Kiron, and Adir Shapira, Moshav Tal-Shahar, both of Israel, assignors to Atat Technology Ltd., Israel

Division of Ser. No. 873,979, Jun. 13, 1986, Pat. No. 4,788,526.
This application Oct. 7, 1988, Ser. No. 254,738
Claims priority, application Israel, Oct. 24, 1985, 76813
Int. Cl.[4] B60Q 1/26
U.S. Cl. 340—467 **3 Claims**



1. A signalling device comprising:

a first member;

a second member, the first member being adapted to be affixed to the accelerator pedal of a vehicle and the second member being adapted to be pressed and movable by the accelerator pedal operating foot of a driver;

displaceable mounting means between the first and second members allowing relative movement therebetween;

first and second terminals associated with an electrical circut for operating the brakelights of a vehicle;

the first and second members forming a hollow housing within which there is defined an air chamber having an air inlet opening and a displaceable, lightweight, freely floating conductive metal flap at the vicinity of the air inlet opening, the arrangement being such that during normal, pressed position of the accelerator pedal, the flap is kept at a small distance from the air inlet opening, and upon an abrupt release of the pedal, the flap becomes sucked by a sub-pressure momentarily prevailing within the air cham-

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ber, and engages a portion of the air inlet opening thereby making the circuit;

means for making the circuit upon an abrupt relative displacement of the members away one from the other to actuate the circuit; and

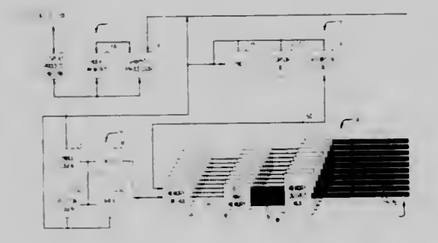
adjusting means for adjusting the effective amount of relative movement for making the circuit.

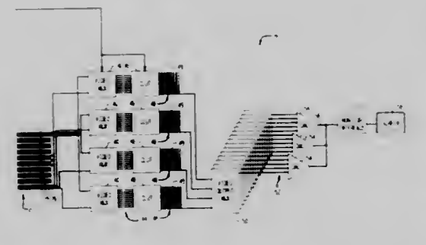
4,894,653

METHOD AND APPARATUS FOR GENERATING VIDEO SIGNALS

David C. Frankenbach, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 24, 1988, Ser. No. 211,492
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 **4 Claims**





1. In an apparatus for generation color video signals of the type employing a refresh memory subsystem and a video data subsystem for providing an analog serial bit stream for a display device, the improvement being means for increasing the pixel frequency rate of the analog serial bit stream comprising:

(a) a plurality of bit map memory arrays, the number of bit map memory arrays related to the number of variations of color intensity for each pixel at said display device, each said bit map memory array providing an X-bit parallel data word at a first clock frequency;

(b) a video bus;

(c) a plurality of memory output multiplexers, one of said plurality of memory output multiplexers coupled to receive the X-bit parallel data word at the first clock frequency from a corresponding one of said plurality of bit map memory arrays, each of said memory output multiplexers operating to time-division multiplex each X-bit parallel data word into Y consecutive data words having X/Y parallel bits, said Y consecutive X/Y-bit parallel data words being coupled to said video bus;

(d) X/Y video multiplexers, each of said video multiplexers coupled to said video bus for receiving one of the X/Y bits from each of said X/Y-bit parallel data words at the first clock frequency, the output of said X/Y video multiplexers being a parallel-bit data word containing a color intensity code related to the number of bit map memory arrays;

(e) X/Y color look-up tables, one of said color look-up tables being coupled to one of said X/Y video multiplexers for receiving the color intensity code from said video multiplexers, said color look-up tables providing a multiple-bit color word in response to said color intensity code;

(f) a plurality of video output multiplexers coupled to receive the multiple-bit color word from the color look-up tables, said video output multiplexers performing time-division multiplexing on the multiple-bit color word to provide a plurality of one-bit output words at a final pixel frequency that is X/Y times the first clock frequency; and

(g) digital to analog converter means for converting the plurality of one bit data words to an analog signal.

4,894,654

METHOD AND APPARATUS FOR RESERVING PARKING SPACES AND/OR SECURITY

George B. Serenbetz, P.O. Box 196, Carnelian Bay, Calif. 95711

Filed Aug. 19, 1988, Ser. No. 233,761
Int. Cl.[4] G08G *1/14*; B60Q *1/48*
U.S. Cl. 340—932.2 **11 Claims**



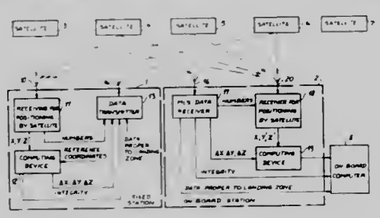
6. An apparatus for securing a parking area from unauthorized use comprising in combination: an opening in the surface of the parking area extending a distance below the surface area; a first activating device anchored to the bottom of said opening in the surface; a second activating device cooperable with, and mounted cooperatively with, said first activating device; a cylinder connected to said first and second activating devices and being mounted within said opening in such manner that the top of said cylinder is flush with the surface of the parking area; power means carried within said cylinder in such manner as to be able to impart movement to said first and second activating devices so as to cause said cylinder to be capable of ascent and descent relative to the surface area.

4,894,655

LANDING ASSISTANCE SYSTEM USING NAVIGATION SATELLITES

Jean C. Joguet, Noisy Le Roy, and Michel Schilliger, Morangis, both of France, assignors to LMT Radioprofessionnelle, Boulogne Billancourt, France

Filed Feb. 26, 1988, Ser. No. 161,099
Claims priority, application France, Feb. 27, 1987, 87 02648
Int. Cl.[4] G01S *1/02*
U.S. Cl. 340—988 **4 Claims**



1. A landing assistance system using navigation satellites, said system comprising several navigation satellites emitting signals controlled by a clock, a fixed station located in the vicinity of landing strips, said fixed station comprising:

a receiver for positioning by satellite, said receiver giving an estimate of the position of said fixed station, and computing means giving correction data representing the deviation between this estimate and a reference position;

radio transmission means transmitting in a radio channel according to the standards of the microwave landing system known as MLS, to transmit correction data, and landing data associated with each landing strip respectively, including the magnetic alignment, the coordinates of the approach, end of the landing strip and the identity of the landing strip;

said system further comprising a station on-board each aircraft, said on-board station comprising:

a conventional radio receiver to receive data transmitted by a microwave landing system known as MLS;

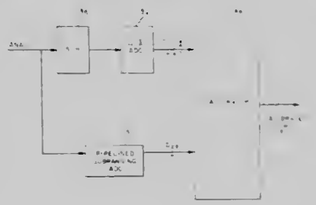
a receiver for positioning by satellite, and computing means that give an estimate of the position of the aircraft, corrected by means of the correction data received by the radio receiver.

4,894,656

SELF-CALIBRATING PIPELINED SUBRANGING ANALOG-TO-DIGITAL CONVERTER

Jyh-Ping Hwang; Wen-Tai Lin, both of Schenectady; Miran Milkovic, Scotia, and Sharbel E. Noujaim, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,819
Int. Cl.[4] H03M *1/10*
U.S. Cl. 341—120 **10 Claims**



1. A self-calibrating pipelined subranging analog-to-digital converter comprising:

sample-and-hold means for sampling an analog signal to be converted to a digital output,

a pipeline of elemental stages connected for sampling said analog signal to generate a low-resolution output digital code;

calibration means including memory and arithmetic means addressed by said low-resolution output digital code for storing nonlinearity information and computing a second output digital code based on an interpolation of said low-resolution output digital code with said nonlinearity information; and

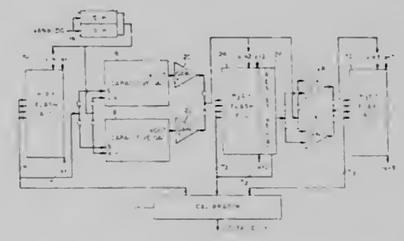
a high-resolution analog-to-digital converter connected to said sample-and-hold means and responsive to samples of said analog signal to generate a high-resolution output digital code, said high resolution output digital code serving as a reference, said calibration means being periodically responsive to said high resolution output digital code for calibrating said memory and arithmetic means.

4,894,657

PIPELINED ANALOG-TO-DIGITAL ARCHITECTURE WITH PARALLEL-AUTOZERO ANALOG SIGNAL PROCESSING

Jyh-Ping Hwang, Schenectady, and Miran Milkovic, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,821
Int. Cl.[4] H03M *1/44*
U.S. Cl. 341—158 **8 Claims**



1. A pipelined analog-to-digital converter with parallel-autozero analog signal processing comprising:

first and second sample-and-hold circuits for alternately sampling and holding an analog voltage signal to be converted to a digital code;

a plurality of stages coupled in series in a pipeline, a first stage of the pipeline being connected to receive output signals from said first and second sample-and-hold circuits and producing a first part of said digital code and a residue voltage, each stage of the pipeline comprising a flash analog-to-digital subconverter, respectively, the subconverter of each of an intermediate and a final stage converting a residue voltage from a preceding stage to a succeeding part of said digital code, each of the first and intermediate stages including parallel circuit paths;

first switching means coupled to said first and second sample-and-hold circuits and to said parallel circuit path in said first stage for alternately connecting one of said first and second sample-and-hold circuits, respectively, and said parallel circuit path of said first stage in a signal path and for autozeroing the sample-and-hold circuit and circuit path not connected in said signal path; and

second switching means coupled to said parallel circuit path in said second stage for alternately connecting said parallel circuit path of said second stage in said signal path;

whereby signal flow at the output of said pipelined analog-to-digital converter is continuous without degradation due to offset voltages.

4,894,658

METHOD OF DATA REDUCTION IN NON-COHERENT SIDE-LOOKING AIRBORNE RADARS

Robert Hecht-Nielsen, Del Mar, Calif., and Laird C. Taylor, Higley, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1983, Ser. No. 548,732
Int. Cl.[4] G01S *13/89*
U.S. Cl. 342—90 **16 Claims**

8. In a side-looking airborne radar of the real aperture type a method of processing and displaying moving target data comprising the steps of:

generating a first image comprising moving target data, said moving target data having been converted to a ground track-true range reference system and having been digitized;

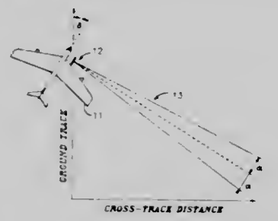
identifying data cells in a current track lane of said first image containing moving target return energy;

determining, with respect to each said identified data cell,

whether said cell represents a new target footprint or a continuation of a previous target footprint;

accumulating, for each target footprint, length and range information;

identifying each target footprint ending in a previous track lane of said first image;



classifying each said ended target footprint as corresponding to one of clutter, an individual target and an extended target; and

generating a second image comprising truncated versions of target footprints corresponding to extended targets and centroids of target footprints corresponding to individual targets.

4,894,659

RADAR ALTIMETER SYSTEMS

Frank P. Andrews, Easton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Oct. 4, 1988, Ser. No. 253,029

Claims priority, application United Kingdom, Oct. 7, 1987, 8723566; Nov. 27, 1987, 8727756

Int. Cl.[4] G01S *13/08*

U.S. Cl. 342—121 **15 Claims**



1. An aircraft microwave altimeter system comprising: means for transmitting microwave signals to the ground; means for receiving microwave signal reflected from the ground and objects on the ground; means for deriving from the received signals information as to the height of the aircraft above the ground or objects on the ground; threshold detector means, said threshold detector means being arranged to provide a first set of output signals in accordance with height at a first threshold level, and a second set of output signals in accordance with height at a second threshold level greater than said first threshold level; display means; means supplying said first set of output signals to said display means; navigation means; and means supplying said second set of output signals to said navigation means, such that said navigation means is supplied with signals representative of the height of the aircraft above ground whereas said display means is supplied with signals representative of the height of the aircraft above objects on the ground.

4,894,660

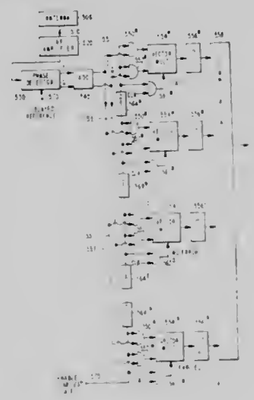
RANGE SIDELOBE REDUCTION BY APERIODIC SWEPT-FREQUENCY SUBPULSES

Don N. Thomson, Haddonfield, and David E. Maron, Marlton, both of N.J., assignors to General Electric Company, Moorestown, N.J.

Filed Oct. 12, 1988, Ser. No. 256,681

Int. Cl.[4] G01S *13/26, 13/30, 13/38*

U.S. Cl. 342—129 **12 Claims**



1. A method for determining the range of a distant target, comprising the steps of:

steering the phase control elements of an array antenna to direct the antenna beam toward the target;

applying a sequence of pulses of carrier to said antenna for transmission, each of said pulses including a plurality of sequential subpulses, each of said subpulses being of carrier of monotonically changing frequency, said plurality of subpulses having nonuniform durations and being separated by nontransmitting periods of constant duration;

estimating the range to said target, and for each of said pulses generating a reference signal comprising at least a part of said plurality of sequential subpulses at a time corresponding to the expected time of return of a reflection from said target;

in the period between said pulses, receiving returned signal from said target and phase detecting said returned signal by use of said reference signal to produce phase detected signals including information relating to the error between the actual range and the estimated range; and

Fourier transforming said phase detected signals to generate range error information.

4,894,661

FISH SCHOOL DETECTING METHOD OR APPARATUS

Kiyotaka Furuno; Hidetoshi Tanigaki, both of Nishinomiya; Kouji Yano, Itami; Tadashi Ozaki, Kobe; Yoshihisa Fukuda, Kawanishi; Takumi Fujikawa, Takarazuka, and Makoto Tanaka, Nishinomiya, all of Japan, assignors to Furuno Electric Company, Limited, Hyogo, Japan

Filed Apr. 21, 1987, Ser. No. 40,797

Claims priority, application Japan, Apr. 23, 1986, 61-94164; Apr. 28, 1986, 61-64918[U]

Int. Cl.[4] G01S *13/06*

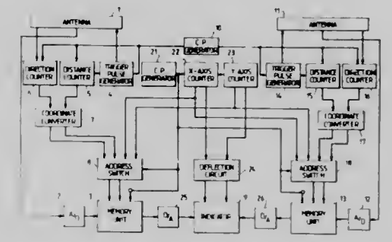
U.S. Cl. 342—140 **18 Claims**

1. A fish school detecting method, comprising:

(i) radiating search signals with their carrier frequency being in the S-band frequency range from an antenna, successively in different azimuthal directions within a wide angular range,

(ii) receiving an echo signal reflected by a bird or birds and indicative of the location of a school of fish,

(iii) processing echo signals received during a plurality of rotations of the antenna so that the echo signals reflected by the bird are emphasized, and



(iv) displaying the resultant processed signals representative of the location of said bird or birds and therefore indicative of the location of said school of fish on the screen of an indicator, thereby locating and detecting the school of fish under the bird or birds.

4,894,662

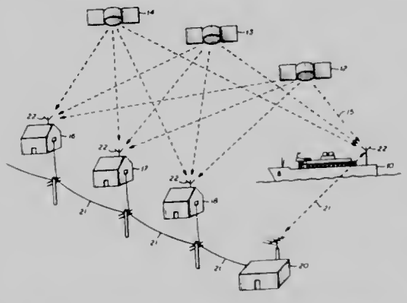
METHOD AND SYSTEM FOR DETERMINING POSITION ON A MOVING PLATFORM, SUCH AS A SHIP, USING SIGNALS FROM GPS SATELLITES

Charles C. Counselman, Belmont, Mass., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 353,331, Mar. 1, 1982, Pat. No. 4,667,203. This application Apr. 14, 1986, Ser. No. 852,016

Int. Cl.[4] G01S *5/02*

U.S. Cl. 342—357 **64 Claims**



1. A method of determining range data from a composite of code modulated, overlapping spread spectrum signals received on a moving platform from a plurality of GPS satellites, comprising the steps of:

developing estimates of the phase and delay of selected signals inherent in the composite;

using the estimates to measure the phase and delay of the selected signals;

updating the estimates in response to the measurements to derive phase and delay observations; and

time averaging the observations to derive instantaneous platform range data.

4,894,663

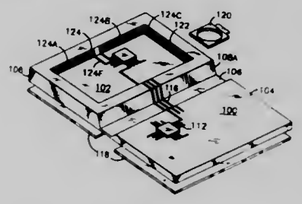
ULTRA THIN RADIO HOUSING WITH INTEGRAL ANTENNA

Glenn F. Urbish, Coral Springs; Quirino Balzano, Plantation; Dale W. Dorinski, Coral Springs; Martin J. McKinley; Leng H. Ooi, both of Sunrise; John A. Stoutland, Margate, and Anthony B. Suppelsa, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 16, 1987, Ser. No. 121,322

Int. Cl.[4] H01Q *1/24*

U.S. Cl. 343—702 **13 Claims**



1. An ultra-thin radio housing integral antenna, comprising in combination:

a thin base having upper and lower surfaces and including a peripheral wall attached to said upper surface and extending substantially around the perimeter of said base, the peripheral wall includes a portion sloped at an acute angle relative to the base; and

a loop antenna disposed at least partially on said peripheral wall sloped section of said base.

4,894,664

MONOLITHIC THERMAL INK JET PRINTHEAD WITH INTEGRAL NOZZLE AND INK FEED

Alfred I. Tsung Pan, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 856,740, Apr. 28, 1986, abandoned. This application Nov. 25, 1987, Ser. No. 125,433

Int. Cl.[4] G01D *15/8;* **B41J** *30/4*

U.S. Cl. 346—1.1 **5 Claims**

1. A process for increasing the lifetime of a resistive heater element in a thermal ink jet printhead of the type having an orifice plate mounted on a thin film substrate, including the steps of:

a. providing a flexible suspended beam containing a resistive heater element in an ink reservoir of said thin film substrate and extending from one side of said reservoir to another, and

b. providing electrical connections into said resistive heater element, whereby the utilization of said suspended beam in the ink within said reservoir allows the ink to cool said heater element and to absorb cavitational forces produced by ink ejected from said orifice plate and thereby increase printhead lifetime.

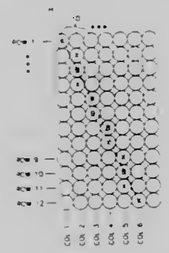
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,665

METHOD OF GENERATING AN EXPANDED COLOR SET OF A LOW RESOLUTION COLOR PRINTER

Randall L. Davis, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 20, 1989, Ser. No. 340,839
Int. Cl.[4] G01D *9/00*; G03F *3/08*
U.S. Cl. 346—1.1 **18 Claims**



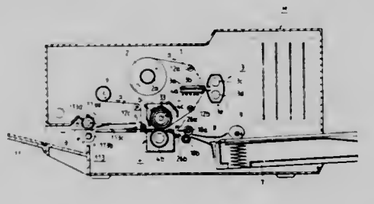
1. In a low resolution color printer which prints a pattern by printing selected pixels, said printer having a predetermined number of colors thereby making a color set of said printer, said printer also having a color black, a method of generating shaded colors thereby expanding the color set of said printer, said method comprising the steps of:
(a) determining if a critical line is to be printed;
(b) determining if the shaded color is to be printed;
(c) if a shaded pattern (any pattern but a critical line) is to be printed utilizing one of said predetermined colors, generating a print buffer in accordance with a first algorithm;
(d) if a critical line having the shaded color is to be printed, generating a print buffer in accordance with a second algorithm; and
(e) otherwise, generating a print buffer using the designated color.

4,894,666

IMAGE RECORDING METHOD AND APPARATUS

Noriyoshi Ishikawa, Yokohama; Toshiaki Harada, Kawasaki; Toshiharu Inui, Yokohama; Tadashi Yamamoto, Kawasaki; Kazuhiro Nakajima, and Masanori Takenouchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,896
Claims priority, application Japan, Oct. 22, 1987, 62-265423; Jun. 13, 1988, 63-143683
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **23 Claims**



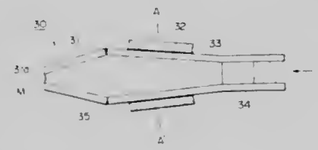
1. An image recording apparatus having:
conveying means for conveying a transfer recording medium having a transfer recording layer whose transfer characteristic is varied upon application of first energy and second energy differing from said first energy;
a recording section having first energy imparting means for imparting said first energy to said transfer recording medium and second energy imparting means for imparting said second energy to said transfer recording medium provided along the conveyance route of said transfer recording medium conveyed by said conveying means;
a transfer section for transferring an image formed on said transfer recording medium in said recording section to a recording medium; and
applying means for applying predetermined heat energy and a shearing force to said recording medium to which the image has been transferred in said transfer section.

4,894,667

INK JET RECORDING HEAD HAVING A SURFACE INCLINED TOWARD THE NOZZLE FOR ACTING ON THE INK

Jiro Moriyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 9,873
Claims priority, application Japan, Feb. 5, 1986, 61-22054
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **12 Claims**



1. An ink jet recording head comprising:
a member forming an ink flow path communicating with an opening for discharging ink therefrom; and
an electro-mechanical converting element provided along said ink flow path at an ink acting surface inclined with respect to an ink flow direction so as to increase the sectional area of said ink flow path toward said ink discharging opening,
wherein a thickness of said member at said ink acting surface is substantially constant.

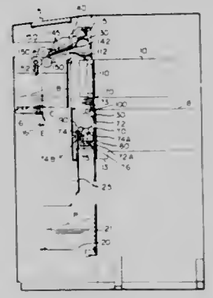
4,894,668

RECORDER HAVING MEANS FOR SUPPORTING THE ENTIRE WIDTH OF A CONTINUOUS RECORDING MEDIUM

Masa K. Ozawa, Ebina; Kunitaka Ozawa, Isehara; Katsunori Hatanaka, Yokohama; Tetsuo Suzuki, Hiratsuka; Tetsuzo Mori, Hirtsuka; Tadashi Shiina, Hiratsuka, and Ryuichi Ebinuma, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 3,052, Jan. 13, 1987, abandoned, which is a division of Ser. No. 733,389, May 13, 1985, Pat. No. 4,651,173. This application Nov. 28, 1988, Ser. No. 277,522
Claims priority, application Japan, May 19, 1984, 59-101508; May 19, 1984, 59-101509; May 19, 1984, 59-101510; May 19, 1984, 59-101511; May 19, 1984, 59-101512
Int. Cl.[4] G01D *15/28*; B41J *30/4*
U.S. Cl. 346—136 **7 Claims**

1. An ink jet recorder for recording on a continuous form recording medium, the recorder comprising:
a feed roller for feeding the recording medium past recording means, wherein said feed roller is disposed above an accommodation position at which the recording medium is accommodated when the recorder is in an operating position;
a press roller for pressing the recording medium against said feed roller at a pinch position upstream of the recording means in the path of the recording medium; and
de-skew support means for supporting the weight of the recording medium across the entire width thereof between the accommodation position and the pinch position, wherein said de-skew support means is disposed adjacent



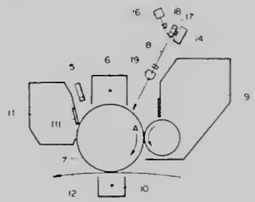
to said feed roller so as to cause the recording medium to contact the periphery of said feed roller for a predetermined wrapping angle before reaching the pinch position.

4,894,669

LASER BEAM PRINTER

Yoshinori Sugiura, Kawasaki, and Akihiko Takeuchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 339,695
Claims priority, application Japan, Apr. 20, 1988, 63-097533
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 **24 Claims**



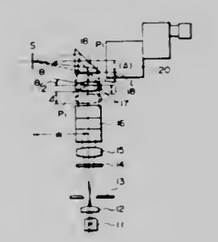
1. A laser beam printer, comprising:
laser beam producing means for producing a laser beam modulated in accordance with image information;
deflecting means for deflecting the laser beam produced by said laser beam producing means to effect a scanning operation, said deflecting means is rotatable to deflect the laser beam;
a rotatable photosensitive member for being exposed to the laser beam deflected by said deflecting means;
control means for controlling said deflecting means and for controlling rotation of said photosensitive member; and
wherein upon printing signal, said control means causes said deflecting means to start its rotation, and thereafter, causes said photosensitive member to start its rotation.

4,894,670

SLIT PROJECTION APPARATUS

Takashi Masuda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,408
Claims priority, application Japan, Jan. 26, 1987, 62-15753
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—214 **13 Claims**



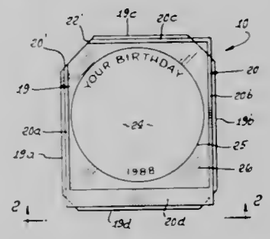
1. A slit projection apparatus comprising:
slit light beam forming means;
a projection optical system for projecting a slit image onto an object to be examined in at least first and second elevation angles, said projection optical system including means for maintaining the slit and the object conjugate to each other when projecting the slit image in the first and second elevation angles, said projection optical system being provided with a light deflecting member which is movable in the direction of the optical axis of said projection optical system and is rotatable for generating the at least first and second elevation angles and at least a lens which is movable with said light deflecting member in the direction of the optical axis of said projection optical system in accordance with changes in the elevation angle; and
means for moving said light deflecting member and said lens in a body in the direction of the optical axis.

4,894,671

FILM PACK SUPPORT OF IMAGE-BEARING TEMPLATE

Alton D. Wheeler, 3940 Fox Meadow La., Pasadena, Tex. 77504

Filed Nov. 7, 1988, Ser. No. 267,830
Int. Cl.[4] G03B *17/24*
U.S. Cl. 354—108 **12 Claims**



1. A device for use in a camera in conjunction with exposure of a photographic film carried by carrier structure including a frame bounding a light passing zone, and comprising
(a) a template in the form of a locally transparent, generally planar and rectangular sheet adapted to carry an image to be reproduced on the film,
(b) there being multiple elongated ribs integral with said sheet, and projecting outwardly from the plane of the sheet,

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(c) said multiple ribs substantially bounding all of said light passing zone to block light access to said zone in directions parallel to the plane of the sheet,

(d) said ribs including a first laterally elongated rib at one end of the template to engage the frame adjacent said one end of the template to prevent removal of the template in response to endwise removal of exposed film from the carrier structure, whereby the template sheet remains in the path of light transmission in directions generally normal to the plane of the sheet and to unexposed film carried by the carrier structure.

4,894,672

CAMERA HAVING FOCAL LENGTH ADJUSTING LENS

Hitoshi Tanaka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,066
Claims priority, application Japan, Dec. 18, 1987, 62-320838
Int. Cl.[4] G03B *3/19*
U.S. Cl. 354—195.12 **22 Claims**



1. A camera having a focus adjusting lens assembly, comprising a camera body, a lens barrel which can move in the optical axis direction with respect to the camera body, a first variable power lens group which is supported to move in the optical axis direction with respect to the lens barrel, a second variable power lens group integrally connected to the lens barrel so as to move therewith, a deformable link mechanism which movably connects the camera body and the lens barrel so as to vary distance therebetween, and means for moving the first power lens group to a predetermined position in the lens barrel in accordance with the deformation of the link mechanism.

4,894,673

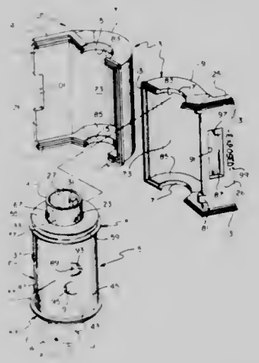
FILM CASSETTE

David E. Beach, Stowe, Vt., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,466
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—275 **2 Claims**

1. An improved film cassette wherein (a) respective throat portions define a film passage slit to the outside of the cassette shell, (b) a normally unexposed filmstrip has a film leader originally located within said film passage slit, and (c) a film spool is rotatable in a winding direction to wind said film leader from said film passage slit further into said cassette shell after said filmstrip is completely exposed, and wherein the improvement comprises:

exposure-completed indicator means positioned within said film passage slit to be normally covered by said filmstrip, and to be uncovered by the filmstrip only when said film leader is further wound into said cassette shell in response to rotation of said film spool in the winding direction; and window means defining an opening in one of said throat portions for permitting said exposure-completed indicator means to be viewed when it is not covered by said filmstrip.

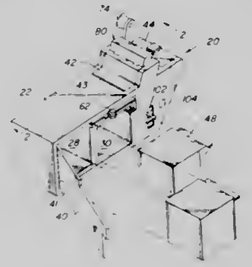


4,894,674

DAYLIGHT BULK FILM LOADING SYSTEM

Mitchell C. Radov, 631 Montroyale Dr. E., Erie, Pa. 16504

Filed Sep. 22, 1988, Ser. No. 247,627
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—275 **42 Claims**



1. Apparatus for daylight loading bulk photosensitive film of different format sizes on a camera film feed spool, the film being supplied in bulk form from a rolled strip within a rectangular cartridge and dispensable through a slot in one side of the cartridge, comprising, in combination:

a casing partitioned by a divider to form a film compartment and a loading compartment, said film compartment being formed of interface slidably with the cartridge, said loading compartment being formed to support axially the spool, and a passageway in said divider at the cartridge slot for admitting the film into said loading compartment;

drive means rotatably mounted in said casing and extending into said loading compartment for removably coupling to the spool and winding the film thereon;

selector means mounted on said casing for producing an output indicative of a manually selected format size for loading on the spool; and

computer means operatively connected to said drive means and said selector means for multiplying the number of revolutions of said drive means by the selector means output and producing an output indicative of the product

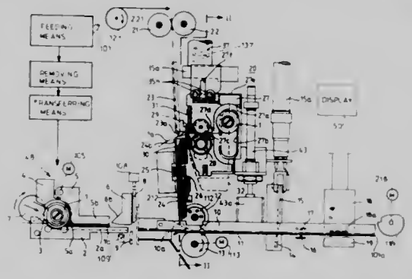
thereof and of the number of frames of the selected size wound on said spool.

4,894,675

APPARATUS FOR SPLICING TOGETHER UNDEVELOPED CUSTOMER FILMS IN A DARKROOM

Reinhart Würfe, Munich; Helmut Zangenfeind, Puchheim, and Rainer Türcke, Taufkirchen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,806
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737801
Int. Cl.[4] G03D *13/06*
U.S. Cl. 354—308 **33 Claims**



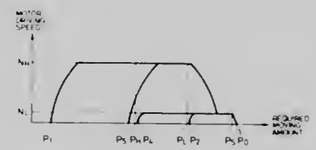
1. Apparatus for converting undeveloped photographic roll films which are convoluted on reels into a continuous web of coherent films, comprising a darkroom; first and second film unwinding units in the interior of said darkroom; web collecting means in said darkroom; means defining in said darkroom a first film channel extending from said first unit toward said collecting means; means for splicing together successive films in said channel end-to-end so as to convert such films into a web; and means defining a second film channel extending from said second unit to a portion of said first channel between said splicing means and said first unit, said darkroom having at least one normally sealed inlet for affording access to said units by at least one hand for manual transfer of reels from said first unit into said second unit and, if necessary, for threading the film on a transferred reel into said second channel.

4,894,676

AUTOMATIC FOCUSING DEVICE FOR CAMERA

Ichiro Ohnuki, and Shinichi Matsuyama, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,100
Claims priority, application Japan, Jan. 12, 1987, 62-004593
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—400 **11 Claims**



1. An automatic focusing device for moving a photographing optical system to a in-focus position by a driving motor, comprising:

(a) first control means for driving said motor at a high speed, when said photographing optical system is distanced in excess of a first amount from said in-focus position, thereby moving said photographing optical system to said in-focus position with a high speed, said first control means being further adapted to change said motor to a low driving speed when said photographing optical system reaches a position distanced from said focused position by a predetermined amount;

(b) second control means for driving said motor at a low speed, when said photographing optical system is distanced less than a second amount from said in-focus position, thereby moving said photographing optical system to said in-focus position with a low speed; and

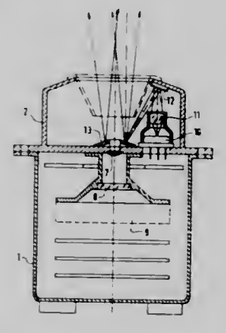
(c) third control means for prohibiting said high-speed driving even when said photographing optical system is distanced in excess of said first amount from said in-focus position, if said motor, upon reaching a predetermined high speed after the start of the high-speed drive, cannot be maintained at said predetermined high speed for a predetermined period.

4,894,677

HIGH-POWER ILLUMINATION DEVICE FOR A CAMERA

Henri Bourcier, Marolles en Brie, and Pierre Turon Lacarrieu, Seguy, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1988, Ser. No. 281,574
Claims priority, application France, Dec. 18, 1987, 87 17714
Int. Cl.[4] G03B *3/00*; G02B *13/16*; H04N *5/225, 5/30*
U.S. Cl. 354—403 **4 Claims**



1. A high-power illumination device integrated with a camera for measuring the direction, distance and/or attitude of two objects relative to each other, whilst one of said objects carries the device, which camera images the other object on a detector via an input-optical system, said device comprising a plurality of elementary sources each associated with an optical system for adjusting the field of view of each source to that of the input-optical system of the camera, characterized in that said elementary sources are regularly spaced in a ring configuration around the pupil of said input-optical system, the light beam from the optical system of each source being focused via a deflecting mirror arranged opposite each source onto a facet mirror surrounding the pupil of the input-optical system and comprising as many facets as there are light sources, each facet being inclined so as to align the direction of the reflected beam with the direction of the field of view of the camera in such a way that the light beams from the said mirror facets are quasi-superimposed all around the optical axis of the camera.

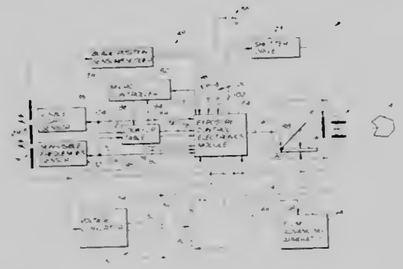
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4,894,678

PREFLASH PSEUDOFOCUS/EXPOSURE CONTROL SYSTEM

David L. Farrington, Boxborough; Norman D. Staller, Beverly, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 1, 1989, Ser. No. 345,959
Int. Cl.[4] G03B 15/05
U.S. Cl. 354—415 12 Claims



1. A camera for forming a photographic image of optimum sharpness and overall scene exposure having means for defining a film plane comprising:

a fixed focus lens for directing image-carrying light rays along an optical path from a scene onto photosensitive material located in the film plane;

a blade mechanism mounted for movement between a blocking arrangement in which said blade mechanism is in light blocking relation with respect to the optical path so as to preclude scene light from being transmitted along the optical path to the film plane and an unblocking arrangement in which said blade mechanism is in light unblocking relation with respect to the optical path so as to allow the passage of scene light to the film plane through an exposure aperture, said blade mechanism serving to provide an exposure aperture whose size varies in a predetermined manner when said blade mechanism is actuated between its said light blocking and unblocking arrangements to produce an exposure interval;

a source of artificial light for directing visible and non-visible electromagnetic frequencies toward the scene;

means for sensing ambient scene light before or at the early stages of and during an exposure interval and for generating signals representative thereof;

means for sensing non-visible electromagnetic frequencies reflected from a scene subject before or at the early stages of and during an exposure interval and for generating signal representative thereof;

means responsive to the said ambient scene light signal and the said non-visible electromagnetic frequencies signal generated prior to or at the early stages of an exposure interval for generating a signal representative of a minimum blade mechanism exposure aperture size at which said source of artificial light is to be actuated to illuminate the scene during an exposure interval; and

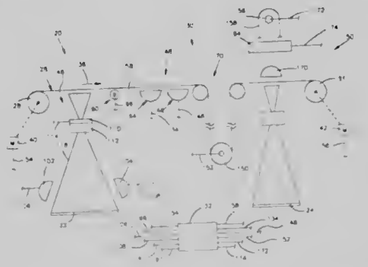
control means for (1) actuating said light source to direct a first pulse of light containing at least said non-visible electromagnetic frequencies toward a subject in a scene before or at the early stages of an exposure interval, (2) for actuating said light source to direct a second pulse of light containing both of said visible and non-visible electromagnetic frequencies toward the scene in correspondence with said exposure aperture size signal and the said non-visible electromagnetic frequencies signal generated during the exposure interval, and (3) for actuating said blade mechanism to generate the exposure interval in correspondence with the said ambient scene light signal generated during the exposure interval to thereby form a photographic image of optimum sharpness and overall scene exposure.

4,894,679

METHOD AND APPARATUS FOR USE IN TRANSFERRING AN IMAGE

Ervin J. Rachwal, Sarasota; George deClaire, Bradenton, and Frederick J. Elia, Sarasota, all of Fla., assignors to Graphics LX Corp., Sarasota, Fla.

Filed Jun. 3, 1988, Ser. No. 202,794
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—18 71 Claims



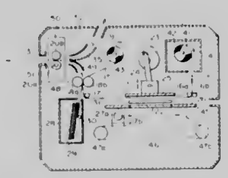
51. An apparatus comprising a linear array of stations, means for moving a carrier along a path extending through each station of the linear array of stations, means for forming an intermediate image on the carrier at the image forming station, means for transferring an enlargement of the intermediate image on the carrier to photosensitive material at the transfer station, said means for transferring an enlargement of the intermediate image to the photosensitive material including means for transmitting radiant energy through the carrier onto a surface of the photosensitive material with an energy level of at least 500 ergs per square centimeter at the surface of the photosensitive material.

4,894,680

IMAGE RECORDING APPARATUS

Kiyoharu Hayakawa, Ama; Yumio Matsumoto, Kasugai; Masashi Ueda, Nagoya; Akira Sago, Nagoya, and Osamu Takagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 6, 1988, Ser. No. 203,318
Claims priority, application Japan, Jun. 8, 1987, 62-88462; Jun. 12, 1987, 62-91191; Jun. 15, 1987, 62-91497; Dec. 15, 1987, 62-191009
Int. Cl.[4] G03B 27/32, 27/52
U.S. Cl. 355—27 58 Claims



1. An image recording apparatus utilizing a developing sheet, which comprises:

a housing provided in its wall with an external insertion opening;

a pair of heat-treatment rollers arranged within said housing, said pair of heat-treatment rollers defining therebetween a nip;

means for defining a first predetermined transport paths which extends through the nip between said pair of heat-treatment rollers, said developing sheet having carried thereon an image being transported along said first predetermined transport path, wherein said developing sheet is caused to pass through the nip between said pair of heat-treatment rollers and is heat-treated thereby so that the image on said developing sheet is fixed and recorded onto said developing sheet;

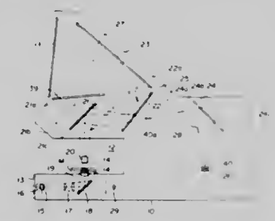
means for defining a second predetermined transport path extending through the nip between said pair of heat-treatment rollers, said second predetermined transport path being different from said first predetermined transport path and extending from said external insertion opening, wherein an article inserted through said external insertion opening can travel along said second predetermined transport path so that the article is caused to pass through the nip between said pair of heat-treatment rollers and is heat-treated thereby.

4,894,681

IMAGE READER

Yutaka Watanabe; Hideaki Kusano, and Masaaki Ito, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 194,921, May 17, 1988, abandoned.
This application Jun. 22, 1989, Ser. No. 370,156
Claims priority, application Japan, May 21, 1987, 62-125343; Sep. 30, 1987, 62-244250
Int. Cl.[4] G03B 13/28, 27/80, 23/08
U.S. Cl. 355—45 20 Claims



15. An image reader for reading an image from a microfilm having images recorded thereon, which image reader comprises:

a light source for illuminating said images recorded on said microfilm;

a screen for said image to be projected as magnified thereon;

projecting means for projecting an optical image of the microfilm on said screen;

scanning means for scanning the optical image of the microfilm, which includes photoelectric transferring means for emitting electric signals in response to the amount of light impinging thereon; and

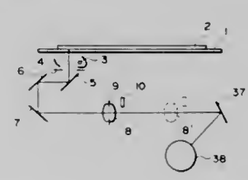
beam attenuating means disposed in front of said photoelectric transferring means and adapted to attenuate the luminous energy of the light emitted from said light source and exposed on said photoelectric transferring means.

4,894,682

VARIABLE MAGNIFICATION COPYING APPARATUS

Kazuyuki Kondo, Kawasaki; Jun Koide, Yokohama; Kanji Yano, Kawasaki; Makoto Tanaka, Tokyo, and Haruo Tsuboi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1987, Ser. No. 100,453
Claims priority, application Japan, Sep. 30, 1986, 61-232769; Nov. 13, 1986, 61-174640
Int. Cl.[4] G03B 27/52, 27/71
U.S. Cl. 355—55 30 Claims



1. A variable magnification exposure apparatus, comprising:

a light-receiving member;

a light source for illuminating an original;

projecting means for projecting through a slit an image of an original illuminated by said light source on said light-receiving member, said projecting means including lens means movable in accordance with a magnification of projection selected;

a correcting member, disposed in a fixed positional relation to said lens means, for correcting non-uniformity of exposure of said light-receiving member to the projected image along a longitudinal direction of the slit; and

an aperture stop member movable in a direction substantially perpendicular to an optical axis of said lens in accordance with the magnification selected;

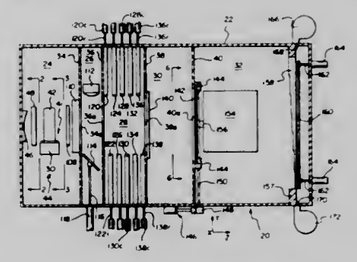
wherein, by movement of said aperture stop member, the relative position between said correcting member and the light rays that pass through said lens means, is maintained with high precision.

4,894,683

VARIABLE BRIGHTNESS LIGHT GENERATORS

Kevin P. McGuire, Rochester, and James D. McKay, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,623
Int. Cl.[4] G03B 27/72
U.S. Cl. 355—71 7 Claims



1. A variable brightness light generator, including:

a spherical mirror;

a lamp located at the center of the spherical form of said mirror; and

a modulator located between the lamp and the mirror for

modulating the brightness of the image of the bulb on the bulb.

4,894,684

IMAGE FORMING APPARATUS WITH DEVELOPING DEVICE ACCOMMODATING APPARATUS

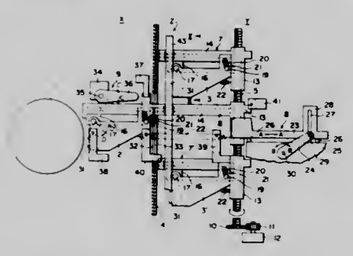
Hisao Nakajima, Kawasaki, and Ken Tanabe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 166,004

Claims priority, application Japan, Mar. 10, 1987, 62-052916; Mar. 10, 1987, 62-052919

Int. Cl.[4] G03L *15/01*

U.S. Cl. 355—207 **8 Claims**



1. An image forming apparatus, comprising:

a main assembly having a developing position, an opening for receiving and delivering a developing device and a developing device transportation passage extending between the developing position and the opening;

developing device accommodating means for accommodating a plurality of developing devices and for supplying them to the opening;

detecting means for detecting a malfunction of an image forming operation; and

means for transporting a selected one of said developing devices to said developing device accommodating means in response to detection by said detecting means.

4,894,685

MULTICOLOR IMAGE FORMING METHOD AND APPARATUS

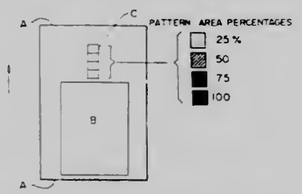
Hisashi Shoji, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 106,856

Claims priority, application Japan, Oct. 7, 1986, 61-239739; Oct. 7, 1986, 61-240739

Int. Cl.[4] G03G *15/04, 15/08*

U.S. Cl. 355—246 **16 Claims**



1. A multicolor image forming method comprising the steps of:

forming a multicolor toner image on an image retainer by a plurality of developing means; and

transferring said multicolor toner image to a transfer material,

wherein the improvement comprises:

forming a reference toner image on a non-transfer portion of said image retainer by any of said developing means; said reference toner image being a pattern having a predetermined recording area percentage.

reading out the reflective density of said reference toner image; and

setting image forming conditions in accordance with the reflective density read out.

4,894,686

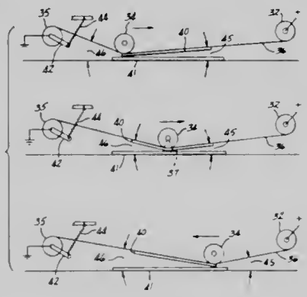
TRANSFER ROLLER

David P. Bujese, 14 Stony Hill Rd., Butler, N.J. 07405

Continuation-in-part of Ser. No. 91,617, Aug. 31, 1987, Pat. No. 4,763,157. This application Jul. 29, 1988, Ser. No. 224,963

Int. Cl.[4] G03G *15/168*

U.S. Cl. 355—271 **21 Claims**



21. Apparatus for the electrostatic transfer of a developed image from an electrostatically developable surface supported by carrier means to an electrically chargeable receiving surface, the improvement comprising in combination:

(a) transfer means contactable with the carrier means to move the electrostatically developable surface adjacent to, but not in contact with the receiving surface to effect the electrostatic transfer of the developed image, the transfer means being reversible and traversing the carrier means a distance equal to at least the length of the electrostatically developable surface;

(b) tensioning means for tensioning the carrier means causing the carrier means to form a trailing angle with the receiving surface as the transfer means traverses the carrier means during the electrostatic transfer; and

(c) retention means for retaining the carrier means and positioned such that the transfer means is intermediate the tensioning means and the retention means causing the carrier means to form a leading angle with the receiving surface as the transfer means traverses the carrier means during the electrostatic transfer.

4,894,687

PRESSURE TRANSFIXING OF TONER IMAGES USING SKEWED ROLLERS

Leo A. Beaudet, Milford, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 426,466, Sep. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 180,218, Aug. 21, 1980, abandoned. This application Sep. 30, 1988, Ser. No. 252,089

Int. Cl.[4] G03G *15/14*

U.S. Cl. 355—277 **16 Claims**

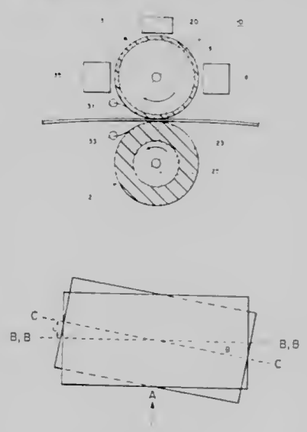
1. Apparatus for forming an image on a receptor sheet, comprising:

an image roller with a hard, smooth surface with a finish that is better than 20 microinch RMS;

means for forming a toner image on said image roller; and

a transfer roller in rolling contact under high pressure with the image roller, including a surface material selected from the class consisting of engineering thermoplastic and engineering thermoset materials,

said transfer roller having a non-parallel axial orientation and an angle of skew of between 0.5 and 1.5 degrees with respect to said image roller.



wherein the toner image is transferred from the image roller and simultaneously fused to a receptor sheet which is fed through a nip between said image roller and said transfer roller, and wherein said receptor sheet adheres to the surface of said transfer roller at the nip in preference to the surface of the image roller, causing a surface motion differential between the receptor sheet and the image roller at said nip.

4,894,688

DEVICE FOR CIRCULATING DEVELOPER

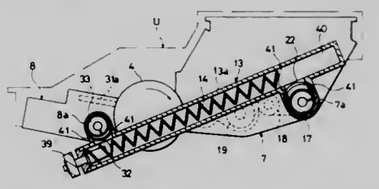
Masami Taniguchi, and Junichi Takamatsu, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 29, 1988, Ser. No. 161,646

Claims priority, application Japan, Mar. 3, 1987, 62-49603; Mar. 3, 1987, 62-49604; Mar. 3, 1987, 62-49605; Mar. 3, 1987, 62-49608; Mar. 3, 1987, 62-49609

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—298 **32 Claims**



1. A device for use with an image forming apparatus having a photosensitive drum and a developing device and a cleaning device disposed around said photosensitive drum for conducting developer recovered in said cleaning device to said developing device comprising:

a circulating passage means provided between said developing device and said cleaning device so as to communicate said developing device with said cleaning device;

discharging means for discharging developer recovered in said cleaning device to said circulating passage means;

conveying means disposed in said circulating passage means for conveying developer in said circulating passage means to said developing device, said conveying means and said circulating passage means being constructed to provide a space between said conveying means and said circulating passage means such that a portion of the developer is allowed to be temporarily retained in said space; and

supplying means for supplying developer conveyed by said conveying means into said developing device.

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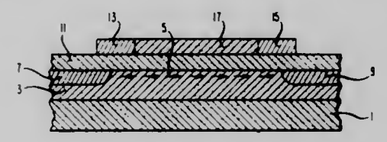
TRANSFERRED ELECTRON DEVICE

James A. Cooper, Jr., West Lafayette, Ind., and Karvel K. Thornber, Berkeley Heights, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1984, Ser. No. 687,127

Int. Cl.[4] H01L *27/26, 47/00, 47/02*

U.S. Cl. 357—3 **11 Claims**



1. A microwave device comprising

a semiconductor region, said region having a regime of negative differential mobility;

a source of carriers in said region;

a drain electrode to said region, a channel in said region between said source and said drain electrode;

an electrically conducting region separated from said channel; and

first and second electrodes to said electrically conducting region, at least two of said electrodes biasing said semiconductor region into said regime of negative differential mobility.

4,894,690

THIN FILM TRANSISTOR ARRAY INCORPORATING A SHORTED CIRCUIT BYPASS TECHNIQUE

Kazuya Okabe, Moriya; Hideyuki Matsuda, Iwaki; Yasuhiko Kasama, Izumi, and Hiroyuki Hebiguchi, Sendai, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,751

Claims priority, application Japan, Apr. 22, 1987, 62-99175

Int. Cl.[4] H01L *27/10, 29/44*

U.S. Cl. 357—4 **2 Claims**

1. A thin film transistor array comprising:

a substrate;

a first plurality of buses disposed on the substrate;

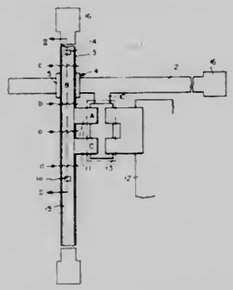
a second plurality of buses disposed on the substrate and intersecting said first plurality of buses at cross over points;

a plurality of thin film transistors grouped in pairs, each transistor of the pair being parallel to point and connected to a bus of said first plurality thereof and a bus of said second plurality thereof for driving a liquid crystal display;

a bypass bus disposed along a bus of said first and second pluralities thereof;

a passivation layer disposed between said bypass bus and said bus of said first and second pluralities thereof, the

bypass bus contacting said bus of said first and second pluralities thereof through contact holes, wherein said contact holes are defined through said passivation layer at predetermined locations, whereby in the event of an electrical short developing in the contacted bus between said contact holes, a portion of said contacted bus between said contact holes may be severed, with the bypass bus providing connection to the remaining portions of said contacted bus through said contact holes.

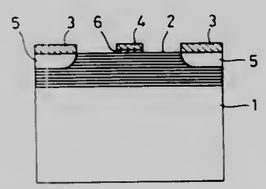


4,894,691

COMPOUND SEMICONDUCTOR DEVICE WITH SUPERLATTICE CHANNEL REGION

Yuichi Matsui, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 24, 1987, Ser. No. 42,330
Claims priority, application Japan, Apr. 30, 1986, 61-99928
Int. Cl.[4] H01L *29/205, 29/80*
U.S. Cl. 357—22 **15 Claims**



1. A compound semiconductor device incorporating a channel layer coupled to a source electrode and a drain electrode and which is made of periodically layering compound semiconductor thin-film layers substantially being different from each other comprising;

a first type of said compound semiconductor thin-film layers having a specific energy difference between conduction band and valence band being less than that of a second type of said compound semiconductor thin-film layers, a specific electron mobility which is greater than that of the second type of said compound semiconductor thin-film layers in low electric field application, a specific electron mobility which is less than that of the second type of the compound semiconductor thin-film layers in high electric field application, and causes impact ionization of valence electrons to occur at lower electric field application than the second type of said compound semiconductor thin-film layers; and

the second type of said compound semiconductor thin-film layers having a specific energy difference between conduction band and valence band being more than that of said first type of said compound semiconductor thin-film layers, a specific electron mobility which is greater than that of said first type of said compound semiconductor thin-film layers in high electric field application, allows conduction electrons to preferentially flow through said first type of said compound semiconductor thin-film layers in low electric field application and also conduction electrons highly energized by acceleration to preferentially flow through said second type of said compound semiconductor thin-film layers in high electric field application, and also allows conduction electrons highly energized by acceleration in high electric field application to move from said first type of said compound semiconductor thin-film layers to the second type of said compound semiconductor thin-film layers before said conduction electrons cause impact ionization of valence electrons and inter-valley scattering to occur in said conduction band inside of said first type of said compound semiconductor thin-film layers;

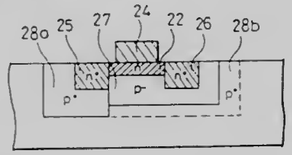
wherein said first type of said compound semiconductor thin-film layers are substantially composed of either InAs or InSb compound semiconductor, whereas the second type of said compound semiconductor thin-film layers are substantially composed of InP compound semiconductor.

4,894,692

MESFET WITH ALPHA PARTICLE PROTECTION

Minoru Noda, and Noriyuki Tanino, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 2, 1988, Ser. No. 203,295
Claims priority, application Japan, Jun. 3, 1987, 62-139171
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—23.2 **7 Claims**



1. An integrated circuit comprising:

a semi-insulating semiconductor substrate having a surface;

a first conductivity type embedded region disposed in said semi-insulating substrate;

second conductivity type drain and source regions disposed in and at the surface of said semi-insulating substrate;

a gate electrode disposed on the surface of said semi-insulating substrate between said drain and source regions;

a second conductivity type channel layer disposed in said substrate and at the surface proximate said gate electrode between said drain and source regions; and

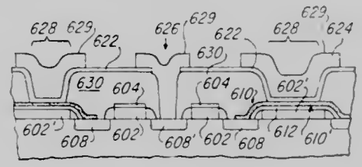
a first conductivity type buried region disposed in said substrate between and bounded by said channel layer, said drain and source regions, and said embedded region, said drain and source regions being completely surrounded in said substrate by and contiguous with said embedded region wherein said embedded region is heavily doped relative to said buried region and said source and drain regions are heavily doped relative to said channel layer.

4,894,693

SINGLE-POLYSILICON DRAM DEVICE AND PROCESS

Howard L. Tigelaar, 505 Meadowcreek Dr., Allen, Tex. 75002; Roger A. Haken, 4236 Goodfellow Dr., Dallas, Tex. 75229, and Thomas C. Holloway, 7007 Walling La., Dallas, Tex. 75231

Continuation-in-part of Ser. No. 837,611, Mar. 7, 1986, abandoned, and a continuation-in-part of Ser. No. 729,318, May 1, 1985, Pat. No. 4,821,085. This application Dec. 5, 1986, Ser. No. 938,486
Int. Cl.[4] H01L *29/78, 27/02, 29/04, 23/48*
U.S. Cl. 357—23.6 **26 Claims**



1. A read/write memory cell formed at a surface of a semiconductor body, comprising:

a pass transistor, comprising:

first and second diffused regions at said surface of said semiconductor body, said first diffused region clad with a metal silicide; and

a gate electrode disposed above a portion of said surface lying between said first and second diffused regions; and

a storage capacitor, comprising:

a first plate;

a storage dielectric disposed adjacent said first plate; and

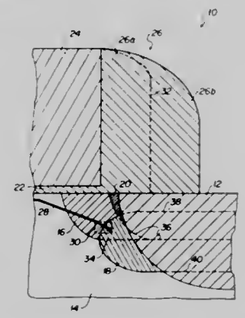
a second plate, disposed adjacent said storage dielectric opposing said first plate, said second plate of a material comprising the metal of said metal silicide and in contact with said first diffused region.

4,894,694

MOSFET STRUCTURE AND METHOD FOR MAKING SAME

Kit M. Cham, Sunnyvale, and Paul V. Voorde, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 926,318, Oct. 31, 1986, Pat. No. 4,746,624. This application Jan. 20, 1988, Ser. No. 146,068
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.3 **5 Claims**



1. A MOSFET structure comprising:

a source region, a drain region, a channel region located between said source region and said drain region, and gate means disposed over said channel region;

a tip region disposed between said channel region and said drain region, said tip region having a lower conductivity than said drain region;

a buried region disposed below said tip region and shifted laterally towards said drain region relative said tip region, said buried region having a higher conductivity than said tip region but a lower conductivity than said drain region; and

a blocking region disposed between said tip region and said drain region and above said buried region, said blocking region having a lower conductivity than said tip region,

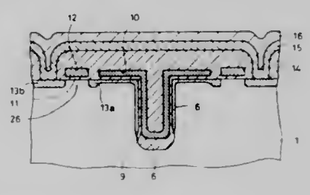
wherein said source region, said drain region, said tip region and said buried region are all p-type regions.

4,894,695

SEMICONDUCTOR DEVICE WITH NO STRESS GENERATED AT THE TRENCH CORNER PORTION AND THE METHOD FOR MAKING THE SAME

Tatsuya Ishii; Yoshinori Okumura, and Masao Nagatomo, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,062
Claims priority, application Japan, Mar. 23, 1987, 62-69431
Int. Cl.[4] H01L *29/78, 29/06, 27/12*
U.S. Cl. 357—23.6 **14 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a main surface, a prescribed impurity concentration of a first conductivity type and a trench;

a thick insulating film formed on either a bottom portion or a sidewall portion of said trench, an end portion of said thick insulating film extending in either a vertical upward direction when said thick insulating film is formed on the bottom portion or a horizontal direction when the thick insulating film is formed on the sidewall portion;

a thin insulating film extending in the direction orthogonal to said thick insulating film and connected to the end portion of said thick insulating film; and

a first impurity region of a second conductivity type formed in said semiconductor substrate on either the sidewall portion or the bottom portion and the sidewall portion of said trench on which said thick insulating film is not formed, only in the side portion or lower portion of said thin insulating film, said thick insulating film is formed by

forming a two-layer film constituted by an oxide film and a nitride film on the main surface of said semiconductor substrate, side portions and a portion of the bottom portion of the trench, and

forming a selective oxide film to form said thick insulating film on the bottom portion of the trench of said semiconductor substrate by oxidizing said semiconductor substrate with said two-layer film formed thereon, whereby

the direction of extension of the end portion of said selective oxide film changing from horizontal to vertical upward with a large curvature.

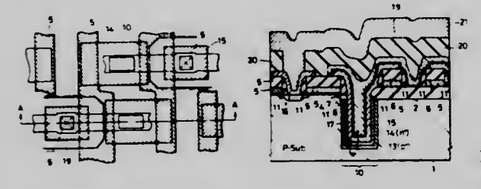
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4,894,696

DYNAMIC RANDOM ACCESS MEMORY HAVING A TRENCH CAPACITOR

Eiji Takeda, Koganei; Kiyoo Itoh, Higashikurume; Ryoichi Hori, Tokyo; Katsuhiro Shimohigashi, Musashimurayama, and Katsutaka Kimura, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,967
Claims priority, application Japan, Dec. 10, 1985, 60-276076
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.6 30 Claims



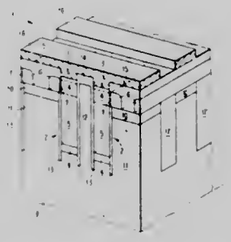
1. A semiconductor device comprising:
a semiconductor body;
a field effect transistor provided on the semiconductor body, including a gate electrode and sidewall insulators formed on side surfaces of said gate electrode; and
a trench capacitor which is at least partly formed in said semiconductor body,
wherein the trench of said trench capacitor is a substantially vertical wall trench and is formed being self-aligned to said sidewall insulator of said gate electrode, said trench capacitor forming the memory capacitor of a transistor memory cell of a dynamic random access memory,
and wherein said memory capacitor is provided in the trench and extends over said gate electrode.

4,894,697

ULTRA DENSE DRAM CELL AND ITS METHOD OF FABRICATION

Daeje Chin, Seoul, Rep. of Korea, and Sang H. Dhong, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,418
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.6 13 Claims



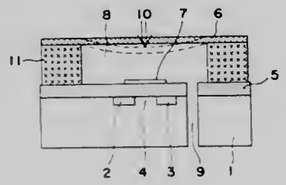
1. An ultra dense dynamic random access memory array comprising:
a conductive substrate (8)(11)(12) having a plurality of rows of single crystal semiconductor devices (2) disposed in insulated spaced relationship with said substrate (8)(11)(12) said substrate having insulation (10) covered portions (11) which extend between pairs of devices (2) in each row and between insulation regions (17') rows of which are disposed between said rows of semiconductor devices (2), the tops of said insulation regions (17') being level with the tops of said insulation (10) covered portions (11) forming a plurality of gate conduits perpendicular to said rows of semiconductor devices (2), a pair of gate electrodes (6) disposed in each of said gate conduits, each of said pair of gate electrodes being in insulated spaced relationship with each other and with a portion (4) of each of said semiconductor devices (2) in an associated column of said semiconductor devices (2), and a plurality of conductive bit lines (16) disposed orthogonally with said gate electrodes (6) each of said lines contacting a portion (3) different from said first mentioned portion (4) of each of said semiconductor devices (2) arranged in the same row.

4,894,698

FIELD EFFECT PRESSURE SENSOR

Masaya Hijikigawa, Yamatokoriyama; Shuji Miyoshi, Nara, and Hisashi Akiyama, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 227,489, Aug. 1, 1988, abandoned, which is a continuation of Ser. No. 921,196, Oct. 21, 1986, abandoned. This application Apr. 17, 1989, Ser. No. 338,545
Claims priority, application Japan, Oct. 21, 1985, 60-235945; Dec. 20, 1985, 60-288200
Int. Cl.[4] H01L 29/84, 29/66, 29/78; G01L 9/12
U.S. Cl. 357—26 3 Claims



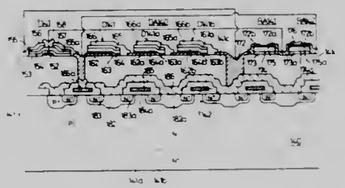
1. A pressure sensor, comprising:
a field effect transistor, including,
a semiconductor substrate,
a source region and a drain region formed in said semiconductor substrate,
a channel formed between said source and drain regions,
a gate insulation film formed over said source, drain and channel regions,
an auxiliary gate electrode formed over a portion of said gate insulation film,
an upper gate electrode formed above said auxiliary gate electrode, and
a spacer located between said upper and auxiliary gate electrodes;
said upper gate electrode, spacer and gate insulation film forming boundaries of a hollow chamber located between said upper and auxiliary gate electrodes, said hollow chamber being in communication with an outside surface of said substrate through an orifice extending through said semiconductor substrate and said gate insulation film;
said upper and auxiliary gate electrodes forming an electrostatic capacitor, said upper gate electrode being deformable with pressure to vary the distance between said upper and auxiliary gate electrodes to change the electrostatic capacitance of said capacitor;
a pressure difference between the pressure on said upper gate electrode and the pressure communicated to said hollow chamber by said orifice being detected as a variation in drain current of said filed effect transistor.

4,894,699

OPTICAL CONTROL CIRCUIT AND SEMICONDUCTOR DEVICE FOR REALIZING THE CIRCUIT

Yutaka Hayashi, Ibaragi; Shigeaki Tomonari, and Keizi Kakite, both of Osaka, all of Japan, assignors to Agency of Industrial Science & Technology, Ibaragi and Matsushita Electric Works, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 87,645, Aug. 19, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 302,079
Claims priority, application Japan, Aug. 20, 1986, 61-195810
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 14 Claims



1. A semiconductor device comprising at least two different semiconductor devices taken from a group consisting of a photoconductor, a resistor, and a transistor, said two different semiconductor devices each comprising and being operatively connected through an identical semiconductor layer structure of a first conduction type semiconductor layer, a low impurity concentration semiconductor layer, and a second conduction type semiconductor layer stacked in that order on a substrate, wherein one of said two different semiconductor devices further comprises a pair of mutually separated electrode layers stacked on said second conduction type semiconductor layer to form first and second conductive electrodes, said second conduction type semiconductor layer comprises mutually separated first and second parts, and said first and second conductive electrodes are provided in contact with said first and second parts of said second conduction type semiconductor layer.

4,894,700

IMAGE SENSOR

Mamoru Nobue, and Sadahiro Tei, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Apr. 7, 1986, Ser. No. 849,145
Claims priority, application Japan, Apr. 9, 1985, 60-74766; Apr. 30, 1985, 60-93055; Jul. 17, 1985, 60-157182; Aug. 23, 1985, 60-185282
Int. Cl.[4] H01L 45/00; H01J 40/14
U.S. Cl. 357—30 18 Claims



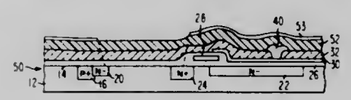
1. An image sensor comprising:
a substrate;
a plurality of light receiving elements of a sandwich type juxtaposed with each other on said substrate, each of said light receiving elements including a lower electrode, a photoconductive layer disposed over said lower electrode and an upper electrode disposed over said photoconductive layer, one of said lower electrode and said upper electrode being light permeable, said lower electrode, said photoconductive layer and said upper electrode partially overlapping each other to form an overlapped region for each of said light receiving elements, said overlapped region having an area and a capacitance whose magnitude is determined in accordance with the area;
light shielding means disposed to cover said overlapped region for each of said light receiving elements and formed with a plurality of windows of a predetermined size for allowing light to enter a part of said overlapped region;
driving means for driving said light receiving elements;
a plurality of connecting sections formed on said substrate, each of said connecting sections having a length and a capacitance whose magnitude is determined in accordance with the length connecting each of said light receiving elements to said driving means; and
wherein the area of the overlapped region for each of said light receiving elements is determined such that the sum of the capacitance of said overlapped region for one of said light receiving elements and the capacitance of the one of said connecting sections associated with the overlapped region for said one of said light receiving elements is made equal to the sum of the capacitance of said overlapped region for another one of said light receiving elements and the capacitance of another one of said connecting sections associated with the overlapped region for said another one of said light receiving elements.

4,894,701

SEMICONDUCTOR DEVICE DETECTOR AND METHOD OF FORMING SAME

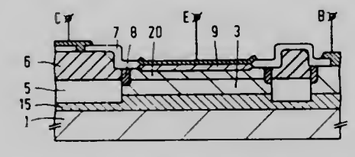
Harry G. Erhardt, Fayetteville, N.Y., and Walter F. Kosonocky, Skillman, N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed May 9, 1988, Ser. No. 192,043
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 7 Claims



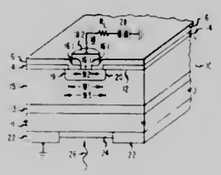
1. A semiconductor device for detecting radiation comprising:
a substrate having a major surface;
a first insulating layer overlying a portion of said surface;
a first level semiconductor layer disposed completely within said first insulating layer;
a second insulating layer overlying said first level semiconductor layer;
a first metallic contact which extends through said second insulating layer and electrically contacts said first level semiconductor layer;
a third insulating layer overlying said metallic contact; and
a detector region which is spaced apart from said metallic contact and said detector region extends through said first, second and third insulating layers to said major surface.

4,894,702
HIGH EFFICIENCY, SMALL GEOMETRY SEMICONDUCTOR DEVICES
Henricus G. R. Maas; Johannes W. A. Van Der Velden; Peter H. Kraaen; Albertus T. M. Van De Goor, and Date J. W. Noorlag, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,428
Claims priority, application Netherlands, Mar. 18, 1987, 8700640
Int. Cl.[4] H01L *29/72, 29/04, 29/40, 23/48*
U.S. Cl. 357—34 **5 Claims**



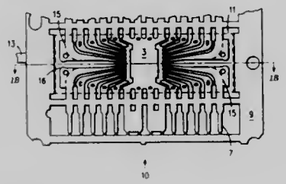
1. A semiconductor device comprising a monocrystalline semiconductor body of silicon, in which at least a first region of a first conductivity type is laterally bounded by a second region comprising a countersunk oxide layer, a highly doped silicon layer of the second conductivity type opposite to that of the first conductivity type disposed on said oxide layer, and a second oxide layer which is disposed on said oxide layer, and a second oxide layer which is disposed on said highly doped silicon layer, is at least partly countersunk into it and extends into the first region, a highly doped contact zone of the second conductivity type, said silicon layer adjoining said highly doped contact zone of the second conductivity type, a semiconductor zone formed in said first region which is substantially bounded by the edge of the second oxide layer and forms part of a semiconductor circuit element, said contact zone being electrically coupled to said semiconductor zone and said silicon layer being connected to a connection conductor, the upper side of the silicon layer being located at a higher level than the surface of the first region, and further comprising an intermediate region located in the first region at least in part directly below the second oxide layer and having a lower doping concentration than that of the contact zone, said contact zone being electrically coupled to said semiconductor zone by said intermediate region.

4,894,703
RESTRICTED CONTACT, PLANAR PHOTODIODE
Mahmood A. E. Hamamsy, Watchung; Stephen R. Forrest, Chatham, and John R. Zaber, Piscataway, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 359,988, Mar. 19, 1982, abandoned. This application Aug. 20, 1985, Ser. No. 767,613
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **5 Claims**



1. A two-terminal back-illuminated, planar photodiode comprising a Group III-V compound semiconductor body having a first major surface and an opposite major surface,
a first silicon nitride single layer formed on said first surface, said first layer having a first opening therein for introducing a dopant into said body to form a p-n junction which intersects said surface at points recessed from the edge of said first opening.
a second silicon nitride layer formed so as to contact said first layer along its entire length, said second layer having a second opening which lies within said first opening,
a single electrical contact to said first surface, said contact including: a pedestal portion formed in said second opening so as to have an interface with said second layer and positioned remote from the points where said junction intersects said surface, and a cap portion overlapping said pedestal portion so as to seal said interface, said pedestal portion being positioned sufficiently remote from said points so as to reduce stress induced at said points, and
a second electrical contact to said opposite major surface, said second contact being adapted to permit lightwaves to be detected to be incident on said opposite major surface.

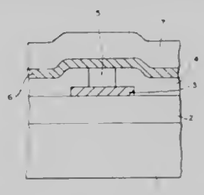
4,894,704
LEAD FRAME HAVING PROJECTIONS FOR RESIN MOLDING
Kazuyuki Endo, Aizuwakamatsu, Japan, assignor to Motorola Inc., Schaumburg, Ill.
Filed Dec. 12, 1988, Ser. No. 282,646
Claims priority, applicatioo Japan, Jan. 28, 1988, 63-15858
Int. Cl.[4] H01L *23/48, 23/28*
U.S. Cl. 357—70 **5 Claims**



1. A lead frame comprising:
an inner lead part electrically connected to an internal device and contained within a mold cavity together with the internal device for being resin molded;
and an outer lead part connected to the inner lead part;
characterized in that said inner lead part has at least one projection with which a flow of resin for molding passed through a gate of the mold is collided thereby eliminating voids throughout said molding resin.

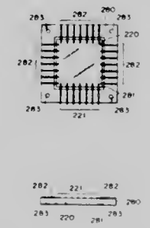
4,894,705
SEMICONDUCTOR DEVICE
Setsufumi Kamuro, Chiba, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 24, 1987, Ser. No. 100,920
Claims priority, application Japan, Dec. 16, 1986, 61-300673
Int. Cl.[4] H01L *23/48, 23/52*
U.S. Cl. 357—71 **11 Claims**

1. A semiconductor device comprising
a first wiring layer,
a second wiring layer,
an inter-layer insulative film between said first wiring layer and said second wiring layer, and
a plurality of polysilicon sections sandwiched between said first and second wiring layers, different ones of said polysilicon sections being separated by said inter-layer insulative film, selected ones of said polysilicon sections being low-resistance polysilicon sections and the rest of said polysilicon sections being high-resistance polysilicon sections such that said first and second wiring layers are



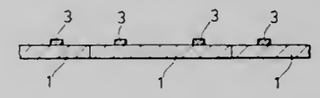
electrically connected with each other through each of said low-resistance polysilicon sections.

4,894,706
THREE-DIMENSIONAL PACKAGING OF SEMICONDUCTOR DEVICE CHIPS
Yoshiyuki Sato; Kazuhide Kiuchi, both of Atsugi; Junji Watanabe; Kunio Koyabu, both of Tokyo; Masanobu Oohata, Atsugi, and Katsuhiko Aoki, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tolyo, Japan
PCT No. PCT/JP86/00065, § 371 Date Oct. 9, 1986, § 102(e) Date Oct. 9, 1986
PCT Filed Feb. 14, 1986, Ser. No. 919,001
Claims priority, application Japan, Feb. 14, 1985, 60-25180; Nov. 12, 1985, 60-252016; Jan. 25, 1986, 61-12989
Int. Cl.[4] H01L *23/28*
U.S. Cl. 357—72 **33 Claims**



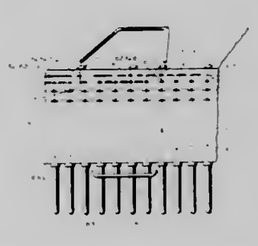
1. An elementary unit for a three-dimensional packaging structure for semiconductor device chips, comprising:
a semiconductor device chip;
a chip carrying member having a first surface and a second surface substantially parallel to each other, a device opening with which said semiconductor device chip is loosely engaged and at least one aperture for receiving an aligning rod, said chip carrying member having leads disposed on said first surface for holding said semiconductor device chip to said carrying member; and
a plastic insulating material layer having at least one aperture which is aligned with a corresponding aperture of said chip carrying member, said plastic insulating material layer being fixed to the second surface of said chip carrying member.

4,894,707
SEMICONDUCTOR DEVICE HAVING A LIGHT TRANSPARENT WINDOW AND A METHOD OF PRODUCING SAME
Masao Yamawaki, and Takashi Kondo, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 12, 1988, Ser. No. 155,598
Claims priority, application Japan, Feb. 12, 1987, 62-30551
Int. Cl.[4] H01L *21/56*
U.S. Cl. 357—74 **8 Claims**



1. A semiconductor device having a light transparent window, comprising:
a semiconductor chip having a light receiving section formed on a portion of a first surface of said semiconductor chip;
a wall disposed on said first surface of said semiconductor chip surrounding said light receiving section;
a molding resin formed to predetermined dimensions over the surfaces of said semiconductor chip excluding said portion of said first surface having said light receiving section formed thereon for forming an opening in said molding resin to said light receiving section; and
a light introduction section formed by attaching the light transparent window to said molding resin over said opening, said semiconductor chip being separated from the light transparent window by a distance determined by said predetermined dimensions of said molding resin.

4,894,708
LSI PACKAGE HAVING A MULTILAYER CERAMIC SUBSTRATE
Toshihiko Watari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 12, 1984, Ser. No. 630,266
Claims priority, application Japan, Jul. 19, 1983, 58-131422
Int. Cl.[4] H01L *39/02, 27/02*
U.S. Cl. 357—80 **9 Claims**



1. A large scale integrated package comprising:
a substrate;
a plurality of first input/output terminals mounted onto a first face of said substrate;
a plurality of first pads mounted onto a second face of said substrate for receiving integrated chip terminals, each of said plurality of first pads corresponding to a different one of said plurality of first input/output terminals;
a plurality of second input/output terminals mounted onto said first face of said substrate, wherein said plurality of second input/output terminals are spare terminals;

a plurality of second pads mounted onto said second face of said substrate, each of said second pads corresponding to a different one of said plurality of second input/output terminals, wherein said second pads are spare pads;

a plurality of electrically conductive first paths formed within said substrate for connecting each of said first pads to said corresponding one of said first input/output terminals;

a plurality of electrically conductive second paths formed within said substrate for connecting each of said second pads to said corresponding one of said second input/output terminals; and

wherein, in operation, a signal passes through said second paths only when at least one of said plurality of second pads is connected to one of said plurality of first pads via a first repair wire.

4,894,709

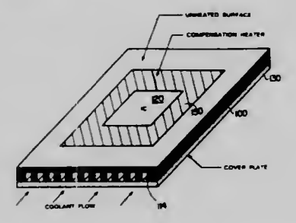
FORCED-CONVECTION, LIQUID-COOLED, MICROCHANNEL HEAT SINKS

Richard J. Phillips, Billerica; Leon R. Glicksman, Lynnfield, and Ralph Larson, Bolton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 9, 1988, Ser. No. 166,512

Int. Cl.[4] H01L *25/04*

U.S. Cl. 357—82 **10 Claims**



1. A method of using a microchannel heat sink to cool a high power device such as an integrated circuit, said method comprising the steps of:

forcing a fluid into an input port of said microchannel heat sink;

passing said fluid through a plurality of channels in said microchannel heat sink to create a turbulent flow through said channels, said channels having a width between 125 and 300 micrometers, and being in thermal contact with said high power device to thereby transfer heat from said high power device to said fluid; and

discharging said fluid from said microchannel heat sink to thereby dissipate said heat.

4,894,710

SYSTEM FOR PROCESSING COLOR TELEVISION SIGNALS WITH AMPLITUDE MODULATION ENCODED CHROMINANCE INFORMATION

Silvio Cucchi, Gaggiano; Marco Modena, Milan, and Roberto Peruta, Ponte S. Pietro, all of Italy, assignors to Telettra Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Dec. 14, 1987, Ser. No. 132,428

Claims priority, application Italy, Dec. 17, 1986, 22717 A/86

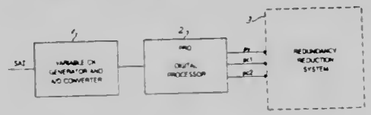
Int. Cl.[4] H04N *11/04*

U.S. Cl. 358—13 **8 Claims**

1. A system for processing color television signals having amplitude modulation encoded chrominance information comprising chrominance signals c1 and c2 and a baseband component comprising a luminance signal y, said system permitting the encoding of said color television signals through a unidimensional or bidimensional transform with high efficiency, said system comprising:

(a) means for performing analog to digital conversion of said composite color television signal in conjunction with a variable frequency sampling clock ck(t); and

(b) means for periodically transforming the signal output from said analog to digital conversion means into signals



py, pc1 and pc2 comprising a pseudo luminance signal and two pseudo chrominance signals, respectively, which are correlated to, but are otherwise different than, said component signals y, c1, c2.

4,894,711

BEAM INDEX DISPLAY TUBE AND DISPLAY SYSTEM INCLUDING THE BEAM INDEX DISPLAY TUBE

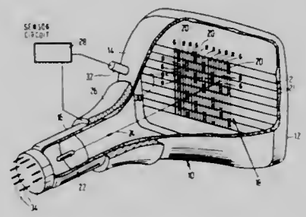
Piet G. J. Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,930

Claims priority, application United Kingdom, Oct. 16, 1987, 8724320

Int. Cl.[4] H04N *9/24*

U.S. Cl. 358—68 **17 Claims**



1. A beam index display tube comprising an envelope; and electron gun; and a cathodoluminescent screen, the cathodoluminescent screen comprising a plurality of transversely extending substantially contiguous lines, each line comprising a plurality of triplets of different colour emitting elements and index elements spatially positioned between at least one pair of color emitting elements of at least some of the triplets, selected index elements in each line being offset heightwise in opposite directions to partially overlap their adjacent lines; and means for detecting index signals produced in response to scanning the index elements by an electron beam produced by the electron gun.

4,894,712

DENSITY GRADATION CONTROL TYPE THERMAL PRINTER

Tadashi Katsukawa, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Oct. 24, 1988, Ser. No. 261,616

Claims priority, application Japan, Oct. 23, 1987, 62-267424; Apr. 27, 1988, 63-104983

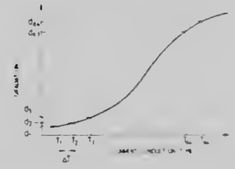
Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **5 Claims**

1. A density gradation control type thermal printer for printing a plurality of print lines, each having a plurality of picture elements, comprising:

a plurality of heating resistor elements arranged in one-to-one correspondence with said plurality of picture elements on every print line;

first means for selectively energizing said heating resistor elements for each print line into current conduction, each for a time equivalent to an integer multiple of a current conduction unit time, to thereby give density gradation to said picture elements; and



second means for selectively starting said energizing in a descending order of current conduction time for every print line.

4,894,713

METHOD OF CODING VIDEO SIGNALS

Paul Delogne, Limelette; Benoît Macq, Brussels, and Luc Vandendorpe, Dottignies, all of Belgium, assignors to The Belgian State, Brussels, Belgium

Filed Jun. 1, 1988, Ser. No. 200,933

Claims priority, application Belgium, Jun. 5, 1987, 8700623

Int. Cl.[4] H04N *7/133, 7/137*

U.S. Cl. 358—133 **10 Claims**



1. A method of coding video signals comprising:

reading data relative to a a still or moving video image in successive blocks;

subjecting the data to orthogonal transformation;

quantizing the transformed coefficients;

storing by rank signals representing the coefficients in organized blocks of memory;

retrieving from memory signals representing the coefficients in groups of blocks, in a predetermined scanning order, the signals of each coefficient in each set being taken in a separate block belonging to said group of blocks; and

applying the coefficients of the transformation in the form of binary signals to a variable length coder.

9. A method of coding video signals comprising:

reading data relative to a still or moving video image in successive blocks;

subjecting the data to orthogonal transformation;

quantizing the coefficients of the transformation; and

applying the coefficients of the transformation to a redundancy reducing coder;

wherein each one of the transformed coefficients (Y_{n1n2}) of the transformation is obtained by multiplying the transformed coefficients (X_{n1n2}) of a unitary transformation known in itself by factors ($\sqrt{W_{n1n2}}$) such that the quantization noise power weighted by the sensitivity of the eye as a function of the spatial frequencies is minimal, said weighting being carried out independently of the statistical properties of the images.

4,894,714

APPARATUS USING TELETEXT TO PROVIDE CHANNEL IDENTIFICATION INFORMATION IN A TELEVISION TRANSMISSION SYSTEM

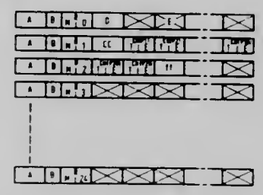
Wilhelmus J. Christis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1987, Ser. No. 104,319

Claims priority, application Netherlands, Oct. 3, 1986, 8602494

Int. Cl.[4] H04N *7/10, 7/087*

U.S. Cl. 358—86 **17 Claims**



1. A receiver comprising:

(i) a teletext decoding circuit for capturing and decoding teletext pages;

(ii) a programmable tuning data memory for programmably storing and for supplying translations of station identifiers into tuning data which are characteristic of respective transmission channels;

(iii) a receiver tuning circuit for tuning the receiver to a transmission channel in response to a tuning datum from the tuning data memory; and

(iv) a control circuit which is coupled to the teletext decoding circuit, to the tuning data memory, and to the tuning circuit and which controls a scanning and storing operation comprising controlling:

(a) the tuning circuit to tune the receiver to a present channel;

(b) the teletext decoding circuit to capture and decode teletext data from the present channel, control actions of (a) and (b) being repeated on further channels until teletext data is captured and decoded which includes at least a repetitive part of an information page including information regarding which transmission channels are utilized for transmitting TV stations; and

(c) the tuning data memory to store tuning data in response to the information page, which tuning data are characteristic of the transmission channels indicated on the information page and utilized for transmitting TV stations, whereby the receiver thereafter automatically and repeatably associates all user requests for a desired station identifier with an appropriate tuning datum for an appropriate TV transmission channel according to the information captured and decoded from the information page.

4,894,715

ELECTRONIC ENDOSCOPE

Akinobu Uchikubo; Masahiko Sasaki; Katsuyuki Saito; Masahide Kanno, all of Hachioji, and Jun Hasegawa, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 244,215

Claims priority, application Japan, Jan. 8, 1988, 63-002044

Int. Cl.[4] H04N *7/18*; A61B *1/04*

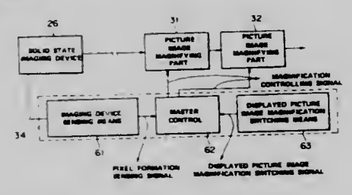
U.S. Cl. 358—98 **40 Claims**

1. An electronic endoscope apparatus comprising:

an imaging means having an elongated insertable part to be inserted into a body cavity and a solid state imaging device outputting as an electric signal an object image obtained through an observing window provided in the tip part of said insertable part;

a video signal processing means driving said solid state

imaging device and processing said read out electric signal to produce a video signal;
a picture image displaying rate varying means capable of either magnifying or contracting in at least one of the vertical direction and horizontal direction said object image imaged by said solid state imaging device on the basis of the picture image displaying rate by inputting said video signal;
a monitor means displaying said object image magnified or contracted by said picture image displaying rate varying means;



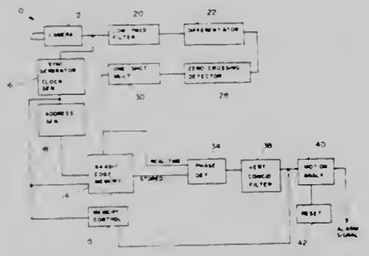
a picture image displaying rate controlling means capable of controlling independently in at least one of the vertical direction and horizontal direction the picture image displaying rate of said picture image displaying rate varying means adjust the view angle of the picture image displayed by said monitor means; and
a sensing and instructing means sensing or instructing the factor varying said displaying view angle and outputting a signal relating to the picture image displaying rate to said picture image displaying rate controlling means.

4,894,716

T.V. MOTION DETECTOR WITH FALSE ALARM IMMUNITY

Felix Aschwanden, Thalwil, and Theodor E. Bart, Kindhausen, both of Switzerland, assignors to Burle Technologies, Inc., Lancaster, Pa.

Filed Apr. 20, 1989, Ser. No. 341,076
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—105 **5 Claims**



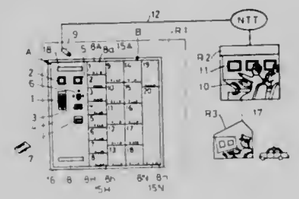
1. In a motion detector for a television viewing field of the type in which a television camera's output signal is processed in series by a low pass filter, a differentiator, a zero crossing detector and digital pulse generator so that digital signals related to edges visible in the viewing field are furnished to a following storage memory and to a comparison circuit which receives the real-time signals from the digital pulse generator and also the stored signals of a previous field from the storage memory and compares them and produces an alarm output signal if a difference between them indicates edge movement, the improvement wherein the comparison circuit comprises a phase detector circuit comprising an XOR gate receiving the real-time and stored signals with the XOR gate output connected to a first monostable multivibrator whose output is connected to a first input of a second monostable multivibrator and with the XOR gate output also connected to a second trigger input of the second monostable multivibrator, the output of which produces a motion indicating signal only when the difference in real-time and stored signals surpasses the output pulse length of the first monostable multivibrator.

4,894,717

DELIVERED ARTICLE STORAGE CONTROL SYSTEM

Yutaka Komei, Osaka, Japan, assignor to Kabushiki Kaisha Fulltime System, Osaka, Japan

Filed Mar. 27, 1989, Ser. No. 328,623
Claims priority, application Japan, Mar. 28, 1988, 63-40980; Mar. 8, 1989, 64-27053
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—108 **5 Claims**



1. A delivered article storage control system comprising a control box equipped with a receipt issuing printer, an instruction display and/or an audio message output speaker, an identification card reader, a monitor display for a burglar detection camera and an input keyboard, and a delivered article storage box equipped with a plurality of lockers, each of which is equipped with a door which can be opened when an identification card is entered into said card reader and an article presence/absence detection sensor, wherein said two boxes and said burglar detection camera are installed in a visitor reception room, said monitor display for said burglar detection camera is installed in a control room and said two rooms are connected to each other via a telephone line, and a control unit is further provided to control said burglar detection camera, printer, instruction display and/or speaker, monitor display and card reader so that said identification card entered into said card reader can be read and so that said door of said corresponding locker is opened/closed according to the information stored on said card.

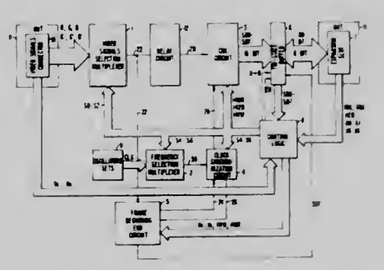
4,894,718

METHOD AND SYSTEM FOR TESTING VIDEO

Chan C. Hung, Hsin Chu, Taiwan, assignor to Acer Incorporated, China

Filed Mar. 29, 1989, Ser. No. 329,921
Int. Cl.[4] H04N 17/04
U.S. Cl. 358—139 **2 Claims**

1. A video signal testing system for connecting with a data bus of an expansion slot of a unit under test for two way data transmissions for receiving IOR, IOW, AEN, and address signals therefrom, and for receiving video signals from a video connector, wherein the system comprises:
tri-state buffer means connecting with the data bus of the expansion slot of the unit under test for two-way data transmissions under control of input ENABLE and DIRECTION signals;
control logic means for receiving data signals from the tri-state buffer means, the IOR, IOW, AEN and address signals from the expansion slot of the unit under test, and for supplying horizontal and vertical sync signals, the ENABLE signal and DIRECTION signal to the tri-state buffer, and supplying a start-up signal and read-out signals;
an oscillator set for supplying clock signals corresponding to the testing video signals;
a frame beginning-end circuit for detecting the completion of the video signals of a full-frame in response to the horizontal sync and vertical sync signals, the start-up signal, the read-out signals, and video signals, and for supplying the detection signal to the tri-state buffer;
clock synchronization circuit for generating a sync clock which is synchronous in frequency and phase with the video signals of said unit under test in response to the



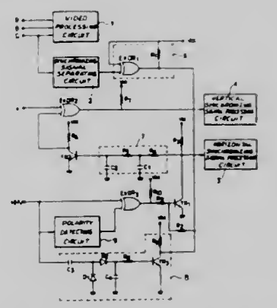
clock signals from the oscillator set and the clock enable signal from the frame beginning-end circuit;
delay circuit connected to receive video signals from the video connector and supply the video signals, after being delayed for a specific amount of time; and
cyclic redundancy check circuit for receiving the start-up signal from the control logic means, video signals from the delay circuit and the sync clock from the clock synchronization circuit, wherein the video signals and sync clock enter the cyclic redundancy check circuit substantially at the same time causing one sync clock to sample one video signal, and wherein a fixed value is supplied to the tri-state buffer under the control of the read-out signals.

4,894,719

SYNCHRONIZING SIGNAL AUTOMATIC SELECTING CIRCUIT

Ik H. Moon, Kyungsangbook, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 25, 1988, Ser. No. 223,551
Claims priority, application Rep. of Korea, Jul. 30, 1987, 8367/1987
Int. Cl.[4] H04N 5/08
U.S. Cl. 358—153 **6 Claims**



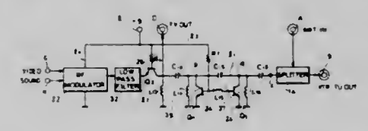
1. A synchronizing signal automatic selecting circuit having a horizontal and horizontal/vertical synchronizing signal terminal HHV which circuit is coupled to a horizontal synchronizing signal processing circuit, a vertical synchronizing signal processing circuit, and a vertical synchronizing signal input terminal V comprising a synchronizing signal separating circuit for separating a synchronizing signal from color signals or a color signal, a signal inverter means for inverting the synchronizing signal output from said synchronizing signal separating circuit, a synchronizing signal detecting element for detecting the synchronizing signal when the synchronizing signal is inputted to the horizontal and horizontal/vertical synchronizing signal input terminal HHV and grounding the output signal of said signal inverter means, a polarity detecting means for detecting the synchronizing signal polarity of said horizontal and horizontal/vertical synchronizing signal input at said terminal HHV, an exclusive OR-gate for combining the output signal of said polarity detecting means and the synchronizing signal of the horizontal and horizontal/vertical synchronizing signal input terminal, a first transistor for inverting the output signal of said exclusive OR-gate or the output signal of the signal inverter means and applying it to the horizontal synchronizing signal processing circuit, a vertical synchronizing signal separate means for separating the vertical synchronizing signal from the output signal of said first transistor, a second transistor for inverting the output signal of said vertical synchronizing signal separator means and an exclusive OR-gate for combining the output signal of said second transistor and the vertical synchronizing signal of the vertical synchronizing signal input terminal and applying it to the vertical synchronizing signal processing circuit.

4,894,720

CIRCUIT FOR SELECTIVELY OUTPUTTING HIGH FREQUENCY SIGNALS

Shuhei Kamada, Misou, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 28, 1988, Ser. No. 225,319
Claims priority, application Japan, Jul. 31, 1987, 62-193282; Jul. 31, 1987, 62-118379[U]
Int. Cl.[4] H04N 5/268
U.S. Cl. 358—181 **15 Claims**



1. A circuit for selectively outputting high frequency signals which selectively switches between first high frequency signals inputted from an input terminal and second high frequency signals outputted from a RF modulator to output the same from an output terminal, comprising:
a first transmission line transmitting said first high frequency signals from said input terminal to said output terminal;
a second transmission line transmitting said second high frequency signals from said RF modulator to said output terminal;
first filter means including a plurality of first passive devices interposed in series in said first transmission line for determining high frequency signal passing characteristics of the first transmission line;
first switch means provided in said first transmission line for switching between passage and cut off of the high frequency signal in said first transmission line in response to an applied first control voltage;
second switch means provided in said second transmission line for switching complementary with said first switch means between the passage and cut off of the high frequency signals in said second transmission line in response to an applied second control voltage;

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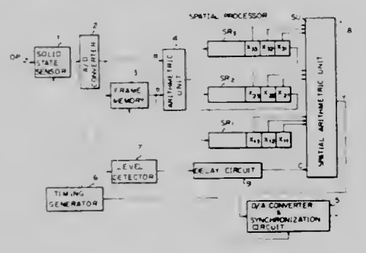
first control voltage supplying means for supplying said first control voltage to said first switch means; and
second control voltage supplying means for supplying said second control voltage to said second switch means; wherein
said first switch means comprises
at least two grounding transistors having their collectors and emitters interposed between both ends of a first passive device and a reference potential point and their bases receiving said first control voltage, and
a second passive device connected between bases of said at least two grounding transistors; and
when said grounding transistors are turned on, said second passive device is connected in parallel to said first passive device to form a parallel resonance circuit with the first passive device, with the parallel resonance circuit has its resonance frequency selected to stop the passage of signals in the same band as said second high frequency signals.

4,894,721

METHOD AND APPARATUS FOR SOLID STATE IMAGE PROCESSING

Hikaru Matsuda, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,411
Claims priority, application Japan, Mar. 19, 1987, 62-64959
Int. Cl.[4] H04N *5/217*
U.S. Cl. 358—213.17 **6 Claims**



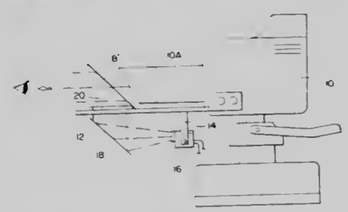
1. A method of solid state image processing comprising the steps of:
(a) converting an external uniformly illuminated scene into reference digital signals corresponding to respective pixels;
(b) deriving from said reference digital signals corresponding respective offset signals;
(c) establishing a predetermined reference level;
(d) comparing said corresponding respective offset signals with said predetermined reference level to determine defective pixels;
(e) converting an external scene into digital signals corresponding to respective pixels;
(f) subtracting said respective offset signals from said corresponding respective digital signals to determine an output video signal corresponding to a respective pixel;
(g) substituting a video signal for said output video signal if said corresponding pixel is defective.

4,894,722

PROMPTER

Nobuo Suzaki, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Nov. 28, 1988, Ser. No. 276,806
Claims priority, application Japan, Dec. 4, 1987, 62-306933
Int. Cl.[4] H04N *5/222*
U.S. Cl. 358—225 **5 Claims**



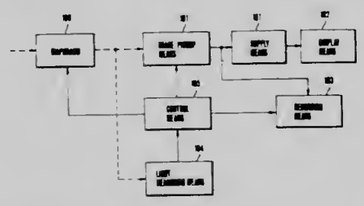
1. A prompter comprising:
a video camera for photographing materials such as broadcasting manuscripts and the like;
a projection unit disposed in front of a TV camera and including a transmissible liquid crystal display panel for displaying said materials as optical images in accordance with a video signal from said video camera, a drive circuit for driving said liquid crystal display panel, a light source for illuminating said liquid crystal display panel from behind, a group of condenser lenses for collecting light from said light source onto said liquid crystal display panel, and a group of projection lenses for enlargedly projecting the display images of said liquid crystal display panel;
a screen disposed in front of said TV camera for displaying the optical images that have been enlargedly projected by said group of projection lenses of said projection unit; and
a half mirror disposed in front of a taking lens of said TV camera and inclined obliquely for displaying said optical images on said screen.

4,894,723

IMAGE SENSING APPARATUS

Kan Takaiwa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,551
Claims priority, application Japan, Apr. 30, 1987, 62-104537; Apr. 30, 1987, 62-104538
Int. Cl.[4] H04N *5/238*
U.S. Cl. 358—228 **34 Claims**



1. An image sensing apparatus comprising:
(A) image pickup means for photo-electrically converting incident light;
(B) a diaphragm for controlling the amount of light incident on said image pickup means;

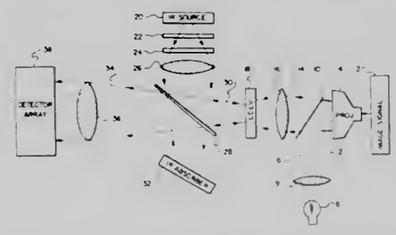
(C) display means for displaying an output of said image pickup means;
(D) recording means for recording the output of said image pickup means;
(E) light measuring means for measuring an ambient brightness; and
(F) control means, operable at times when said display means displays the output of said image pickup means and said recording means is inoperative, for setting said diaphragm to a predetermined aperture size, and for controlling an image pickup period of said image pickup means in accordance with the brightness measured by said light measuring means.

4,894,724

SYSTEM AND METHOD FOR PRODUCING A FLICKER-FREE VIDEO IMAGE

Murray S. Welkowsky, Chatsworth, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 23, 1987, Ser. No. 137,543
Int. Cl.[4] H04N *5/33*
U.S. Cl. 358—231 **9 Claims**



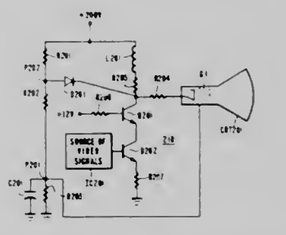
1. A system for modulating an infrared (IR) or ultraviolet (UV) beam to present a substantially flicker-free video target image, comprising:
(a) a video projector, comprising:
(1) an electro-optic crystal having first and second opposed surfaces and an impedance sufficient to prevent substantial spreading of localized electric charges on the crystal, said crystal being at least partially transparent to a predetermined light waveband,
(2) a conductive grid adjacent to but spaced from said first crystal surface,
(3) means for applying a video voltage signal across the conductive grid and said crystal,
(4) an electron gun arranged to scan said first crystal surface with an electron beam in synchronism with said video voltage signal, the electron beam producing a conducting path between the conductive grid and the portion of the first crystal surface under the electron beam to transfer a localized charge to said crystal surface and induce in said crystal corresponding localized birefringence, the amount of said charge transfer being controlled by said video voltage signal on the conductive grid at the time of said transfer, the electron beam forming a video pattern of localized charges on said first crystal surface, and a corresponding pattern of localized birefringences in the crystal, as scanning proceeds in synchronism with said video voltage signal, and
(5) a mirror arranged to reflect back through the crystal light which is transmitted through the crystal from said second crystal surface,
(b) polarizing means for polarizing an input optical beam which includes at least part of said predetermined light waveband and is directed through the crystal from said second crystal surface, for analyzing the polarization pattern of a reflected beam reflected back through the crystal from said input optical beam, and for transmitting a video projector output beam which comprises a video pattern of said reflected beam, said video pattern corresponding to a polarization rotation pattern imposed upon the reflected beam by said pattern of localized birefringences, and
(c) a liquid crystal light valve (LCLV) positioned to receive said video projector output beam as a control input to the LCLV, and to modulate an IR or UV readout beam applied to the LCLV in accordance with the video pattern carried by the video projector output beam, said LCLV converting the video projector output beam to a spatial voltage pattern and modulating the IR or UV readout beam in accordance with any portions of the spatial voltage pattern which exceed a threshold voltage, and the video projector having differing WRITE and ERASE periods, at least one of which is longer than the frame period of the video target image, the identity of the longer period depending upon the voltage polarity applied to the conductive grid, wherein said means for applying the video voltage signal across the conductive grid and said crystal applies a voltage polarity to the conductive grid which produces a shorter WRITE period, said LCLV having a response time such that its spatial voltage pattern is below its threshold voltage at the end of an ERASE period from the video projector, thereby inhibiting the LCLV from modulating said applied IR or UV readout beam at such time even if the video projector output beam and the LCLV spatial voltage pattern are greater than zero.

4,894,725

BIASING CLAMP FOR A CRT

Gene K. Sendelweck, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Mar. 15, 1988, Ser. No. 167,750
Int. Cl.[4] H04N *5/44, 5/68*
U.S. Cl. 358—243 **5 Claims**



1. In a television receiver, apparatus, comprising:
a picture tube having a cathode element and a grid (G1) element; and
a kine driver circuit including,
an amplifier means having an input terminal for receiving video signals to be amplified, and an output terminal coupled to said cathode element, at which output terminal amplified signals and an output voltage level are developed, said picture tube being susceptible to periods of excessive beam current in response to said amplified signals and said output voltage level;
means for applying a bias voltage to said grid (G1) element; and
diode means coupled between said grid (G1) element and said cathode element and having a conductive state wherein said beam current is limited and having a nonconductive state, said diode means being responsive to said output voltage level at said cathode element for maintaining said bias voltage on said grid (G1) element at a level lower than said output voltage level at said cathode element.

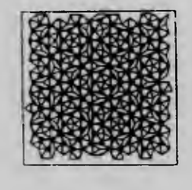
VOL 1110 ISS 3 JA 16 1990 UMI

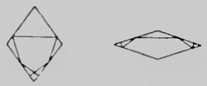
4,894,726

METHODS AND APPARATUS FOR ELIMINATING MOIRé INTERFERENCE USING QUASIPERIODIC PATTERNS

Paul J. Steinhardt, Wynnewood, and Phillip Taylor, Philadelphia, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Jul. 21, 1988, Ser. No. 222,201
Int. Cl.[4] H04N *1/00*
U.S. Cl. 358—298 **21 Claims**





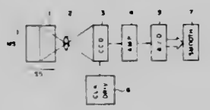
15. In a method of printing an image upon an object comprising the step of converting a continuous tone image into at least one half-tone image having areas to be substantially filled with color and areas to be substantially free from color, the improvement wherein said areas to be substantially filled with color and areas to be substantially free from color are arrayed substantially in accordance pattern comprising a plurality of identifiable elements, the intervals between said elements and the frequencies with which said elements appear being described by ratios which cannot be expressed as the ratio of two whole numbers.

4,894,727

IMAGE PROCESSING SYSTEM AND METHOD

Tomio Sasaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 17, 1988, Ser. No. 258,835
Claims priority, application Japan, Oct. 20, 1987, 62-262760; Nov. 9, 1987, 62-281069; Aug. 5, 1988, 63-194630
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—429 **13 Claims**





13. An image processing method of processing input data related to a dot image which is obtained by scanning a document repeatedly in a main scanning direction along a sub scanning direction, said image processing method comprising the steps of:

smoothing the density of a dot image based on a predetermined smoothing matrix so as to successively output smoothened picture element data which constitute an image data;

delaying the smoothened picture element data by a first predetermined time in the main scanning direction;

delaying the smoothened picture element data by a second predetermined time in the sub scanning direction;

successively averaging two picture element data having a mutual time difference equal to said first predetermined time in the main scanning direction to output first average values;

successively averaging two picture element data having a mutual time difference equal to said second predetermined time in the sub scanning direction to output second average values;

successively averaging said first and second average values to output third average values; and

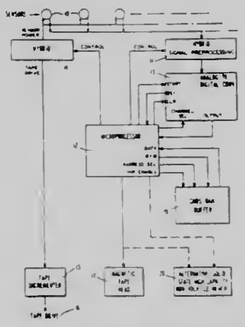
subjecting the third average values to a pseudo halftone process.

4,894,728

DATA ACQUISITION AND RECORDING SYSTEM

Robert M. Goodman, 7811 Mill Rd., Elkins Park, Pa. 19117

PCT No. PCT/US86/01385, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988, PCT Pub. No. WO88/00384, PCT Pub. Date Jan. 14, 1988
Continuation-in-part of Ser. No. 706,022, Feb. 27, 1985, abandoned. This PCT application Jun. 27, 1986, Ser. No. 288,794
Int. Cl.[4] G11B *5/00, 5/09*
U.S. Cl. 360—6 **26 Claims**



1. A portable data acquisition and recording system capable of being carried on an ambulatory subject for monitoring selected conditions of the subject over a selected time period having a recording tape and power supply, the system comprising:

(a) sensor means in communication with the subject for sensing at least one selected parameter of the subject and having a sensor circuit for producing signals representing the parameter being sensed;

(b) an interface circuit connected with the sensor circuit for converting the signals originating at the sensor circuit into digital signals of a selected format;

(c) a recording head for recording digital signals on said recording tape in a limited area adjacent said recording head;

(d) tape drive means having a tape drive circuit for advancing the tape to permit recording of successive digital signals on said tape;

(e) a microprocessor for controlling system circuit operation, for processing signals and for enabling digital signals to be supplied to the recording head for recording onto the tape; and

(f) power control means associated with the system for continuously optimizing power usage of the system during subject monitoring, the power control means being connected to said circuits and energizing said sensor circuit to produce signals, and, in response to the signals produced by said sensor circuit, selectively preventing power from energizing any selected circuit of the system at time periods during monitoring when any such selected circuit is not required by said signals to perform functions requiring power usage and selectively enabling power to energize any selected circuit of the system at time periods during monitoring when any such selected circuit is required by said signals to perform a desired function requiring power usage.

4,894,730

MANUALLY SWEEPING CONTACT SENSITIVE COPIER WITH IMAGE DATA MEMORY

Nikio Yanagawa; Kenji Honda, and Hiroshi Okumura, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 24, 1988, Ser. No. 197,989
Claims priority, application Japan, May 26, 1987, 62-128822; Apr. 27, 1988, 63-56895[U]
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—473 **13 Claims**



1. A hand-held manually sweepable apparatus, comprising:

housing means arranged to be manually sweepable across an original that has image data thereon;

image-data processing means provided in said housing means, for reading the image data from the original while said housing means is swept manually across the original;

memory means provided in said housing means, for storing the image data read by said image-data processing means;

touch-detecting means associated with said housing means, for detecting whether or not said housing means contacts the original and for generating a detection signal when said housing means contacts the original;

manual switching means associated with said housing means, for generating an ON-signal when turned on, and an OFF-signal when turned off;

signal-condition detecting means provided in said housing means, for detecting the detection signal output from said touch-detecting means and the ON-signal and the OFF-signal output said manual switching means, and for generating a start signal when both of the detection signal and the ON-signal are output, and for generating a stop signal in response to at least one of the two conditions wherein (1) no detection signal is output from said touch-detection means, and (2) the OFF-signal is output from said manual switching means, after the start signal is generated;

distance-detecting means associated with said housing means, for detecting when said housing means has been swept across the original for a first predetermined distance from when the start signal is generated by said signal-condition detecting means;

memory control means provided in said housing means, for controlling a writing operation of said memory means so as to start the writing operation of said memory means when said distance-detecting means detects that said housing means has been swept across the original for the first predetermined distance; and

invalidating means provided in said housing means, for invalidating a predetermined amount of image data last read from the original and stored in said memory means, when the stop signal is output from said signal-condition detecting means.

4,894,729

PICTURE ELEMENT DATA GENERATING METHOD

Noboru Murayama, Machida, and Koichi Suzuki, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Sep. 28, 1987, Ser. No. 102,380
Claims priority, application Japan, Oct. 2, 1986, 61-235080; Oct. 7, 1986, 61-239919; Oct. 7, 1986, 61-239920
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—447 **13 Claims**



1. A picture element data generating method comprising the steps of:

extracting a noticeable pixel and a plurality of reference pixels from image data of first numbers(s) of gradation levels, said reference pixels being adjacent to said noticeable pixel;

generating a pixel positioned within a closed minimum polygon formed by a least number of line segments, said polygon being formed so as to include said noticeable pixel and said reference pixels as vertexes thereof or to include said reference pixels as vertexes and said noticeable pixel on a line segment thereof, a gradation level of said pixel being calculated by use of weighted gradation levels of said noticeable and reference pixels; and

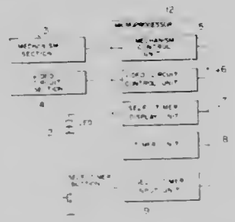
repeating said generating step to generate a plurality of pixels of second number(s) of gradation levels around said noticeable pixel by forming a plurality of closed minimum polygons, each said minimum polygon including said noticeable pixel, so that the gradation of said image data can be represented by an increased number of gradation levels.

4,894,731

METHOD OF SHOOTING BY CAMERA INTEGRATED WITH VTR

Seiko Nakasuna, Katsuta; Takeshi Kawarai; Shuji Toyoshima, both of Ibaraki; Hirotaka Kobayashi, Katsuta, and Takanori Nishiyama, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 151,965
Claims priority, application Japan, Feb. 6, 1987, 62-24511
Int. Cl.[4] H04N *5/782*
U.S. Cl. 360—9.1 **10 Claims**



1. A method of photographing by a VTR-integrated camera in which a VTR section with a recording function and a video camera section are integrally constituted, comprising the steps of:

setting said VTR section to a camera recording standby state;

supplying to a display section a repetitive signal for allowing said display section to be alternately repetitively lit on and off every first predetermined time by operating a self timer operating element;

calculating a total time after the supply of said repetitive signal to the display section was started, when said total time has reached a second predetermined time longer than said first predetermined time, supplying a light-on signal to the display section to thereby light on the display section, supplying an operation signal to said VTR section, cancelling said camera recording standby state, and thereby starting a recording; and

calculating a time after the recording was started, when said time has reached a third predetermined time longer than said first predetermined time, stopping the supply of said light-on signal to the display section to thereby light off the display section, stopping the supply of said operation signal to said VTR section, and thereby returning to said camera recording standby state.

4,894,732

PROGRAMMED REPRODUCTION SYSTEM FOR STILL PICTURE RECORDING/REPRODUCTION DEVICE

Tadashi Ueda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

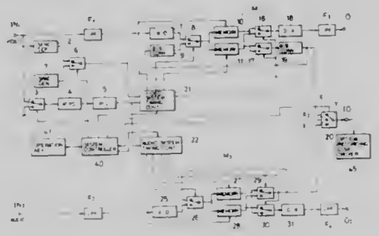
Filed Sep. 21, 1987, Ser. No. 98,828
Claims priority, application Japan, Sep. 20, 1986, 61-222740
Int. Cl.[4] H04N *5/78*
U.S. Cl. 360—10.1 **4 Claims**

1. A reproducing system in a still picture recording and reproduction device, comprising:

disk recording and reproducing means for selectively recording and reproducing data onto or from a designated recording position of a recording disk;

a video memory for storing data including video information, so that data reproduced from said recording disk by said disk recording and reproducing means are written into said memory and then repeatedly read out of said memory so as to be output to perform still picture reproducing in accordance with a user request;

means for selecting one of a first quantity and a second, different quantity of data in accordance with said user selection, from the data reproduced from said recording disk by said disk recording and reproducing means so as to be written into said video memory; and



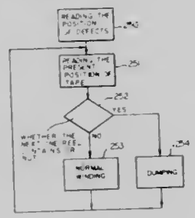
means for repeatedly reading out of said video memory said data of the selected quantity in accordance with said user selection, wherein read-out speed and resolution achieved by reading out said first quantity differs from that achieved by reading out said second quantity.

4,894,733

TAPE WINDING METHOD AND MACHINE

Toshiya Odaka, Tokyo, Japan, assignor to Otari Electric Company Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,113
Claims priority, application Japan, Mar. 16, 1987, 62-61664
Int. Cl.[4] G11B *27/36;* **G01R** *33/12*
U.S. Cl. 360—31 **6 Claims**



1. A tape winding method for winding a tape supplied from a tape supply reel into an empty cartridge so that a completed magnetic tape cartridge can be obtained, comprising the steps of:

inspecting said tape for defects prior to winding said tape into said empty cartridge;

recording the results of said inspection concerning said defects of said tape; and

winding portions of said tape not containing any defects into said empty cartridge while those portions of said tape containing defects are discarded based upon said results of said inspection.

4,894,734

METHOD AND APPARATUS FOR CONSTANT DENSITY RECORDING

Al Fischler, San Jose, and Ross Wilson, Menlo Park, both of Calif., assignors to Maxtor Corporation, San Jose, Calif.

Filed May 15, 1987, Ser. No. 50,753
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—51 **5 Claims**

1. A circuit for reading and writing data with a read/write head at a plurality of constant frequency zones on a data storage disk comprising:

identifying means coupled to said read/write head for detecting a first identification signal identifying a track of said storage disk and assigning one of a plurality of zone select codes to said track, each zone select code corresponding to one of said constant frequency zones;

clock signal generating means coupled to said zone select code and to a first clock signal having a first frequency, said clock signal generating means outputting a second clock signal having a second frequency dependent on said zone select code such that a different frequency is produced for each said constant frequency zones;

data separating means coupled to said second clock signal for defining data recovery windows for separating data during a read operation, said data separating means outputting a data clock for controlling the frequency of a write operation;

a read channel coupled to said read/write head and to said data separating means for converting analog data signals into digital data signals;

encoding means coupled to said data separating means for



writing data at a frequency corresponding to said second frequency;

decoding means coupled to said data separating means for reading data from said constant frequency zones of said data storage disk at said second frequency;

said zone select code comprising a digital code having a numerical value dependent on said constant frequency zone;

said clock signal generating means comprising means for multiplying said first clock signal by a weighting factor corresponding to said numerical value of said zone select code;

said data separating means comprising a variable frequency oscillator (VFO) and said data separating means may be selectively coupled to said clock signal generating means and said read channel;

said data separating means further including a digital to analog converter coupled to said zone select code, said digital to analog converter having an output defining a center frequency of a voltage controlled oscillator (VCO).

4,894,735

DISK DRIVE HOUSING STRUCTURE

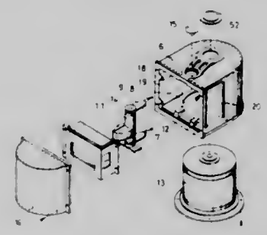
Mikio Takahashi, Odawara; Yoshihiro Moribe; Hideo Maekawa, both of Chigasaki; Takaaki Abo, Odawara; Yasuo Yamamoto, Odawara; Shigeo Nakamura, Odawara, and Osamu Beppu, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,270
Claims priority, application Japan, Jun. 26, 1987, 62-157632
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97.01 **10 Claims**

1. A housing structure for a disk drive that includes a disk for recording information, a rotatable spindle shaft supporting said disk, a transducer for writing and reading information to and from said disk and a transducer positioner positioning said transducer to a desired position on said disk, comprising:

a disk housing having parts for supporting both ends of said spindle shaft and for enclosing said disk, spindle shaft, transducer and transducer positioner, said disk housing comprising a first housing and second housing,

said first housing being separated from said second housing along a plane substantially in parallel with said spindle shaft; and wherein said first housing includes supports for both ends of said spindle shaft, and one of said supports



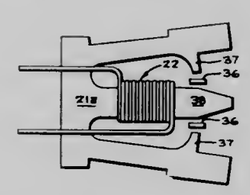
being at a first aperture greater than a plane size of the disk for enabling insertion of said disk with said spindle shaft supporting said disk into the first housing, and the end of said spindle shaft corresponding to said first aperture being supported by a supporting member fixed to said first aperture.

4,894,736

BENDABLE E-SHAPED TRANSDUCER

Gregory A. Orton, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 30, 1987, Ser. No. 116,110
Int. Cl.[4] G11B *5/127, 5/17*
U.S. Cl. 360—126 **16 Claims**



1. An electromagnetic transducer comprising: a prewound electrically conducting coil; and

a core member constructed of laminations all parallel to a predetermined plane of laminations being bonded to one another and being formed of material that is magnetically permeable and bendable but inelastic;

said core member being of the E-shape type having one middle and two outer pole portions defining two magnetic circuits, each including a transducing gap of low magnetic permeability between the middle and respective outer portions, said coil linked with the middle portion and passing around a portion of the outside of the coil in said plane of lamination, each of said gaps having a width dimension orthogonal to said plane of lamination, and a length dimension in the plane of lamination, and in the direction of motion of said transducer with respect to a magnetic recording medium, said gaps being spaced along the tape direction of motion; and

said pole piece portions having at least one critical relationship dimension between the middle pole piece portion and the oppositely facing faces of the outer pole piece portions that is too small to permit non-distorting disassembly of said core and coil.

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4,894,737

MAGNETIC HEAD APPARATUS HAVING PROJECTIONS EXTENDING FROM AT LEAST A FRONT SIDE THEREOF

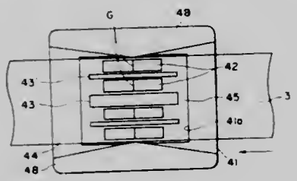
Junji Hamana, Hanno; Shinichi Hara, Fukaya, and Makoto Miyagi, Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,947

Claims priority, application Japan, Dec. 5, 1986, 61-UM186790[U]; Dec. 12, 1986, 61-294732; Dec. 25, 1986, 61-UM196483[U]; Jan. 23, 1987, 62-012214; Jul. 31, 1987, 62-189969

Int. Cl.⁴ G11B *15/60, 5/105*

U.S. Cl. 360—130.21 **16 Claims**



1. A magnetic head, comprising:
a magnetic core having a first contact face for contacting a recording medium;
a fixing material surrounding said magnetic core and having a second contact face for contacting the recording medium; and
a case housing said magnetic core and said fixing material, provided with an aperture exposing said first contact face of said magnetic core and said second contact face of said fixing material and provided further with a pair of projecting members, each of said projecting members projecting from a position adjacent said aperture and outside a path of the recording medium,
wherein said projecting members on said case project from at least one of said first contact face of said magnetic core and said second contact face of said fixing material a distance which is within a range of 0.01 mm to 0.5 mm.

4,894,738

DISK STORAGE DRIVE

Dieter Elsasser, St. Georgen; Johann von der Heide, Schramberg, and Heinrich Cap, Peterzell, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

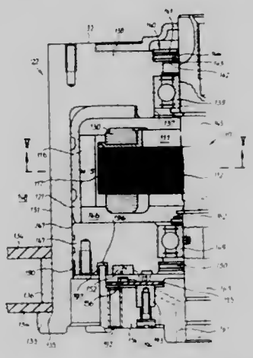
Continuation-in-part of Ser. No. 38,049, Apr. 14, 1987, Continuation-in-part of Ser. No. 767,671, Aug. 21, 1985, Pat. No. 4,658,312, Continuation of Ser. No. 412,093, Aug. 27, 1982, abandoned. This application Jun. 2, 1988, Ser. No. 201,736

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135385

Int. Cl.⁴ G11B *5/012*

U.S. Cl. 360—97.1 **18 Claims**

1. A disk memory drive comprising: a brushless drive motor having an internal space defined therein and a stator including winding means defining magnetically active parts of the drive motor and having a given axial extension, the motor having an outer rotor with an open end coaxially encircling the stator and a substantially cylindrical air gap defined between the stator and the rotor, the rotor including a hub and including permanent magnet means having a predetermined axial extension fixedly connected therewith for magnetic interaction with said winding means; a disk mounting section provided on the hub for accomodating at least one storage disk located in a clean chamber surrounding said rotor, the mounting section along its axial length being adapted to extend through a central aperture of the storage disk, the winding means and the magnet means interacting therewith being disposed for at least half of the axial extension thereof within a space surrounded by the disk mounting section of the hub; and upper and lower bearing means having inner and outer races on a stationary shaft rotatably mounting the rotor and the hub on the shaft, the rotor also including rotational position indicator means interacting with stationary rotational position sensor means for determining the



rotational position of the rotor, the internal space of said motor, which includes the internal portions thereof with the bearing means, being sealed off against the clean chamber containing the disk, and a disk-shaped ring member being located with precision at the open end of the rotor between the inner circumference of the rotor and the outer race of the lower bearing means.

4,894,739

DISC RECORDING AND/OR REPRODUCING APPARATUS

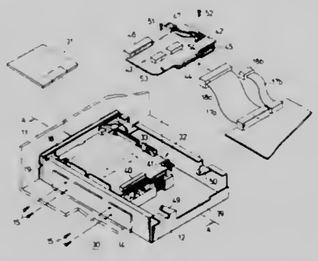
Ko Kobayashi, Higashikurume, Japan, assignor to Teac Corporation, Japan

Continuation of Ser. No. 67,928, Jun. 29, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 307,215

Claims priority, application Japan, Jul. 4, 1986, 61-102071[U]

Int. Cl.⁴ G11B *5/012*

U.S. Cl. 360—97.02 **1 Claim**



1. A magnetic disc recording and/or reproducing apparatus for cooperation with an external information processing system for recording and/or reproduction of digital data on and from a flexible magnetic disc comprising:
a frame having a size substantially identical to a standardized frame used in a first standardized magnetic recording and/or reproducing apparatus for accommodating a first recording/reproducing unit for recording and/or reproducing a digital data on and from a first standardized flexible magnetic disc having a first standardized diameter, said frame being adapted to be mounted on a body of the external information processing system in a detachable manner;
a second recording/reproducing unit mounted on said frame for recording and/or reproducing a digital data on and from a second standardized flexible magnetic disc having a second standardized diameter smaller than the first standardized diameter, said second recording/reproducing unit having a second size substantially smaller than the size of the first recording/reproducing unit;
a front panel closing a front end of the frame and having an inserting opening with a size so as to allow insertion of said second standardized flexible magnetic disc therethrough; and
a connector mounted on a rear end of the second recording-/reproducing unit, said connector having a design identical to a standardized connector used in the first standardized apparatus; and
an intervening member connected to said rear end of the second record/reproducing unit, said intervening member having a size measured perpendicularly to the front panel such that an overall size of the second recording/reproducing unit and the intervening member connected to the second recording/reproducing unit becomes substantially identical to that of the first recording/reproducing unit when measured perpendicularly to the front panel, said intervening member carrying a socket corresponding to said connector at a first side making contact with the rear end of the second recording/reproducing unit and a second connector on a second side opposite to said first side, and electrically connecting the second recording/reproducing unit to the external information processing system.

4,894,740

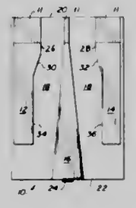
MAGNETIC HEAD AIR BEARING SLIDER

Devendra S. Chhabra; Dien Le Van, and Henry S. Nishihira, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,686

Int. Cl.⁴ G11B *5/60, 21/21*

U.S. Cl. 360—103 **14 Claims**



1. A magnetic disk recording system comprising:
a magnetic recording medium having a recording surface;
a magnetic transducer and an air bearing slider supporting said transducer;
head arm means for supporting said air bearing slider with said magnetic transducer closely adjacent to the recording surface of said magnetic recording medium;
accessing means for supporting said head arm means and for moving said head arm means relative to the recording surface of said magnetic recording medium;
said air bearing slider having leading and trailing ends and an air bearing surface;
side rails disposed along the sides of said air bearing surface of said air bearing slider, said side rails being substantially coplanar and extending from the leading end of said slider part way to the trailing end of said slider, said side rails having a tapered section formed on the air bearing surface at said leading end, each said side rail having a width measured normal to the leading to trailing dimension of said slider which does not substantially exceed the width of said side rails at said leading end of said slider; and
a center rail disposed along the central region of said air bearing surface, said center rail being separated from said side rails by recessed. Areas which extend from said leading end to said trailing end of said slider, said center rail having a taper section at said leading end, said center rail having a width measured normal to the leading to trailing dimension of said slider which is small at said leading end and which is greatest at said trailing end of said slider whereby said slider is positioned adjacent said magnetic recording medium in an orientation having a predetermined pitch angle and a predetermined spacing with respect to said moving magnetic recording medium in which the minimum spacing between said slider and said magnetic medium occurs at the trailing end of said slider.

4,894,741

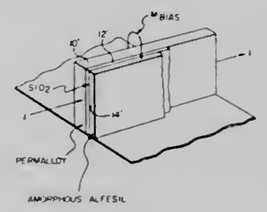
MAGNETO-RESISTIVE HEAD WITH IMPROVED SENSITIVITY

William W. French, Cardiff-by-the-Sea, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1988, Ser. No. 191,087

Int. Cl.⁴ G11B *5/30*

U.S. Cl. 360—113 **4 Claims**



1. In a magneto-resistive head of the type having
a. a field-responsive sense film of magnetic material adapted to carry a sense current,
b. a relatively electrically non-conductive film layered with said sense film of magnetic material,
c. a magnetic biasing layer of magnetic material covering said relatively electrically non-conductive film, the improvement wherein said magnetic biasing layer has a resistivity substantially greater than the resistivity of said sense film, and
d. said relatively electrically non-conductive film is less than 50 Angstroms in thickness.

4,894,742

THIN-FILM LAMINATED MAGNETIC HEADS OF FE-SI-AL ALLOY

Kazuhiro Saito, and Taiichi Mori, both of Toda, Japan, assignors to Nippon Mining Company, Limited, Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 915,299

Claims priority, application Japan, Oct. 7, 1985, 60-223415

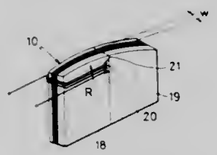
Int. Cl.⁴ G11B *5/147*

U.S. Cl. 360—126 **3 Claims**

1. A thin-film laminated magnetic head comprising a pair of half blocks which are mated and bonded through a non-magnetic gap spacer, at least one of the half blocks formed with a groove for receiving coil winding, each of said half blocks having a pair of opposed substrates, and alternately laminated Fe-Si-Al alloy films and non-magnetic insulating films therebetween and entrapping in each alloy film an amount of argon ranging between about 0.01 to about 0.3 wt % based upon the

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weight of the alloy film, so that internal stresses in said alloy films are substantially zeroed said substrates having a thermal



expansion coefficient lower than that of said Fe-Si-Al alloy films.

4,894,743

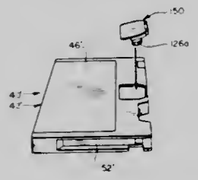
REPLACEABLE CLEANER/DRIVE MEMBERS FOR A TAPE DRIVE MACHINE

Eivind Clausen, Bellingham, Wash., assignor to Allsop, Inc., Bellingham, Wash.

Continuation-in-part of Ser. No. 818,120, Jan. 10, 1986, Pat. No. 4,816,952. This application May 10, 1988, Ser. No. 192,197

Int. Cl.[4] G11B *5/41*

U.S. Cl. 360—128 **11 Claims**



1. An apparatus to perform a cleaning operation on a machine which receives data from and/or imparts data to a magnetic tape, where the machine comprises:

a. a structure defining an operation location to receive a tape cassette, said operating location having a front area, a rear area and first and second side areas;

b. a read and/or write head located at the front area, with the head having a rearwardly facing operating surface, positioned to operatively engage a magnetic tape in the tape cassette;

c. a drive system comprising a drive member to move the magnetic tape by the head;

said apparatus comprising:

a. a main housing having a configuration to fit within said operating location in an operating position, said main housing having a forward portion, a rear portion, first and second side portions, a center portion, and a longitudinal center axis extending from the front portion, through the center portion to the rear portion;

b. a cleaning member mounted in said main housing to be movable on a cleaning path to clean said head;

c. drive means positioned in said housing to operatively engage said drive member so as to be driven thereby, to move said cleaning member on said cleaning path;

d. a first drive cartridge adapted to be removably mounted in said main housing at a cartridge location and having a drive element to form a drive connection between said drive member and said drive means to cause the cleaning member to move on said cleaning path;

e. a second cleaning cartridge adapted to be removably mounted in said main housing at said cartridge location in place of said first cartridge and having a cleaning pad means to engage said drive member to clean the drive member.

4,894,744

INFORMATION HANDLING AND CONTROL SYSTEMS, AND METHODS OF TESTING THE CONDITION OF ELECTRICAL LOADS IN SUCH SYSTEMS

Kevin T. Talbot, Lichfield, England, assignor to Salplex Limited, England

Filed Sep. 6, 1988, Ser. No. 240,678

Claims priority, application United Kingdom, Sep. 21, 1987, 8722195

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 **8 Claims**



1. An information handling and control system comprising:

(a) a power switch provided in a local unit and having a control electrode to control a high current to a load;

(b) a low current signalling link provided between the local unit and a remote intelligent unit;

(c) a capacitor provided in the local unit connected to the power switch control electrode;

(d) means provided in the local unit for connecting the capacitor to the signalling link during a time slot assigned to the power switch in successive frame periods;

(e) drive voltage means provided in the intelligent unit for applying a first or a second drive voltage within a said assigned time slot respectively to charge or discharge said capacitor to a high or a low voltage value sufficient respectively to turn the power switch on or off, the capacitor maintaining the power switch continuously on or continuously off between successive frame periods when the load is in normal condition;

(f) power switch protection means connected to the power switch and to the capacitor, the protection means being non-conductive when the load is in normal condition and becoming conductive when the power switch is on with the load in short-circuit condition, such that when the protection means is conductive the capacitor discharges to said low voltage value via the protection means and the power switch turns off; and

(g) detection means provided in the intelligent unit which are operable to detect the condition of the capacitor at a time in a selected said assigned time slot when the capacitor will be at said low voltage value only if the load is in a short-circuit condition and hence to detect whether or not the load is in short-circuit condition.

4,894,745

METHOD AND APPARATUS FOR PROTECTING AGAINST SEMICONDUCTOR POWER CONTROL FAILURE

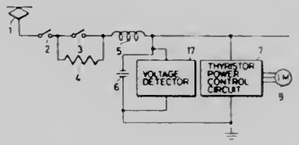
Eiji Akagawa; Hideo Obi, and Yumiko Asano, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,486

Claims priority, application Japan, Apr. 16, 1985, 60-83020

Int. Cl.[4] H02H *7/09*

U.S. Cl. 361—42 **6 Claims**



1. In a power control, circuit including an electric power control device which is operable to control the application of power from a D.C. source through a current collector to a driving motor of an electric train; the circuit including, connected in a series circuit between the current collector and the power control device equipment, a first switch, a parallel circuit of a normally open second switch and a resistor, and an inductor, and also including a capacitor connected to the series circuit, said capacitor, when said first switch is closed, being charged through a charging path, consisting of said first switch, said resistor and said inductor, to a charge voltage in a predetermined time interval set by the time constant of the charging path, and after the predetermined time interval said second switch being closed and subsequently said power control device being operated to apply power to the driving motor;

a method of protecting said power control device comprising the steps of;

determining for the capacitor a reference charge voltage which is lower than the lowest value in a range of voltage variation of said D.C. source;

detecting the voltage on the capacitor during the predetermined time interval; and

if the detected voltage does not reach said reference charge voltage during said predetermined time interval maintaining second switch in an opened state.

4,894,746

LAMINATED CAPACITOR WITH FUSE FUNCTION

Susumo Mori, and Katuhiko Maruta, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 2, 1988, Ser. No. 201,609

Claims priority, application Japan, Jun. 6, 1987, 62-141922; Jun. 6, 1987, 62-141923

Int. Cl.[4] H01G *1/11, 4/10*

U.S. Cl. 361—275 **5 Claims**

1. A laminated capacitor comprising:

a dielectric laminated structure including a plurality of dielectric layers and having first and second end surfaces;

a first set of internal electrodes each positioned at an interface between a respective pair of adjacent dielectric layers and each comprising a first capacitance forming portion and a first external connection portion electrically connected to said first capacitance forming portion and extending to said first end surface;

a second set of internal electrodes each positioned at respective interfaces between adjacent pairs of dielectric layers, such that each of said dielectric layers is held between one of said second set of internal electrodes and an adjacent one of said first set of internal electrodes, and each of said second set of internal electrodes comprising a second capacitance forming portion opposed to said first capacitance forming portion and a second external connection portion electrically connected to said second capacitance forming portion and extending to said second end surface;

first and second external electrodes formed on said first and second end surfaces, respectively, and electrically connected respectively to the first and second external connection portion;

each electrode of each of said first and said second sets of



internal electrodes comprising a fuse portion which electrically interconnects said capacitance forming portion and said external connection portion, said fuse portion being adapted to be melted earlier than said capacitor forming portion and said external connection portion by the Joule heat produced when a current higher than a predetermined value flows through the fused portion; and

said fuse portion, said capacitance forming portion and said external connection portion are all positioned between said adjacent pair of dielectric layers.

4,894,747

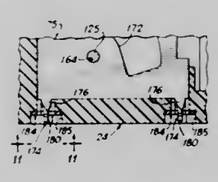
SIDE PLATE TAPERED TWIST TAB FASTENING DEVICE FOR FASTENING SIDE PLATES TO THE BASE

John K. Livesey, Carnegie, and Alfred E. Maier, Beaver Falls, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1988, Ser. No. 256,880

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—376 **11 Claims**



1. A circuit breaker including a housing, a molded base having an aperture, an operating mechanism, a pair of separable main contacts and a pair of side plates for carrying a portion of said operating mechanism, said side plates including means for attachment to said molded base comprising:

one or more twist tabs extending downwardly from a bottom edge of said side plate, each twist tab having a shank portion, an enlarged head portion and a tapered portion therebetween; and

one or more spin plates, each spin plate having a slot for receiving said tapered portion of said twist tabs and adapted to be disposed adjacent said molded base such that said slot is aligned with said aperture.

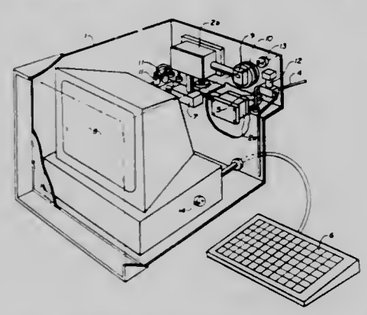
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,748

CONTROL TERMINAL FOR HAZARDOUS LOCATIONS

Henry Shefet, 1425 Montfort Dr., Harrisburg, Pa. 17110

Filed Dec. 19, 1988, Ser. No. 286,533
Int. Cl.[4] H05K 7/00
U.S. Cl. 361—380 10 Claims



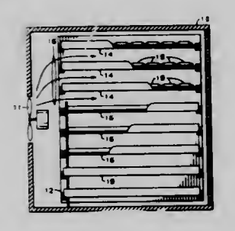
1. In an electronic control terminal system for use in hazardous atmospheres or atmospheres which are deleterious to electronic equipment, the combination comprising an enclosure pressurized with air or inert gas, through a normally open solenoid valve, purge check valves equipped with flame and spark suppressors, a mechanically operated low pressure cut-out switch which operates at a positive gauge pressure, a mechanically operated gas demand switch which operates at a gauge pressure between 3 and 5 inches of water column, an explosion-proof flow switch which assures a sufficient flow rate to purge the enclosure in the desired time, a purge timer, an internal atmospherically isolated explosion-proof junction box containing all components which are electrically active prior to purge completion except for the explosion-proof flow switch, an external atmospherically isolated explosion-proof junction box containing all external power terminals, a PAC seal connection between the external explosion-proof junction box and local electrical power conduit, and explosion-proof union for interconnection between the external and internal explosion-proof junction boxes, a cathode-ray tube monitor and data processing unit, a first overtemperature purge control switch, a second overtemperature terminal power cut-off switch and a pendant intrinsically safe keyboard.

4,894,749

OPTION SLOT FILLER BOARD

Gary W. Elko, Summit, N.J.; Paul Howard, Hinsdale, Ill., and Daniel A. Quinlan, Andover, Mass., assignors to AT&T Information Systems Inc American Telephone and Telegraph Company, New York, N.Y.; AT&T Information Systems, Morristown and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Aug. 31, 1987, Ser. No. 91,244
Int. Cl.[4] H05K 7/20; H02K 5/24
U.S. Cl. 361—383 6 Claims



1. An arrangement for use with an electronic apparatus providing a plurality of slots, each slot for connection to the apparatus of an optional circuit package,

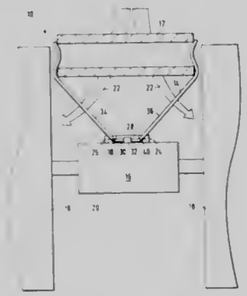
the arrangement for connecting to a slot of the plurality of slots instead of the optional circuit package, the arrangement being a dummy optional circuit package having protrusions extending therefrom toward adjacent slots across a direction of coolant flow to block the flow of the coolant between two adjacent slots when the arrangement and an identical arrangement are connected one to each of the two adjacent slots.

4,894,750

HOLDER FOR DISPOSING AN ELECTRICAL COMPONENT ON A HOUSING

Joachim Schulz, Amorbach, Fed. Rep. of Germany, assignor to Aurora Konrad G. Schulz GmbH & Co., Mudau/Odenwald, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 239,182
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 8711826[U]
Int. Cl.[4] H05K 7/20, 7/02
U.S. Cl. 361—383 17 Claims



1. A holder disposing an electrical component, especially a cylindrical component such as a resistor which is adapted to receive an air flow, on a housing, the improvement wherein:

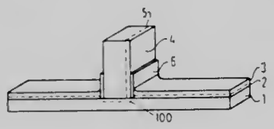
said holder is elongated, with that portion which the air flow would first reach having a round cross-sectional shape, said holder furthermore having an essentially U-shaped central portion and two ends, with said ends extending into openings of said component, and with said central portion being held in guide means of said housing.

4,894,751

PRINTED CIRCUIT BOARD FOR ELECTRONICS

Ulrich Wehnelt, Soecking, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 197,602
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 68711105
Int. Cl.[4] H05K 1/18
U.S. Cl. 361—398 21 Claims



1. A printed circuit board system, comprising:

a meltable carrier having electronic components mounted thereon, the components each having a bottom portion and a conductive coating at connecting zones at sides of the components adjacent the bottom portion;

the carrier having interconnects thereon formed of a solderable metal, said interconnects being positioned at least at a surface of said carrier at which said interconnects connect to the electronic components; and

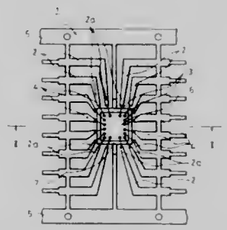
the electronic components being partially sunk at the bottom portion into a melted portion of the carrier for mechanical stability and being connected to the interconnects at said surface by said solderable metal, a flowed and previously melted portion of said solderable metal being in contact with the conductive coating of the components.

4,894,752

LEAD FRAME FOR A SEMICONDUCTOR DEVICE

Akihiko Murata, and Toshihiko Shimada, both of Nagano, Japan, assignors to Shinko Electric Industries, Co., Ltd., Nagano, Japan

Filed Jul. 14, 1988, Ser. No. 218,882
Claims priority, application Japan, Jul. 14, 1987, 62-175481
Int. Cl.[4] H05K 5/02
U.S. Cl. 361—421 7 Claims



1. A lead frame for mounting a semiconductor chip having a plurality of connecting terminals, comprising:

upper and lower guide rails;

a die pad on which the semiconductor chip is mountable;

a plurality of leads coupled to the upper and lower guide rails and being disposed around said die pad;

each of said leads having a tip defining a wire bonding area which is connectable with a wire to a corresponding connecting terminal of said semiconductor chip when mounted on said die pad; and

a thin silver film plating having a thickness in a range between a molecular level to about 0.1 μm, covering the entire lead frame.

4,894,753

ELECTRICAL CIRCUITRY SUPPORT APPARATUS

Brian C. Wadell, Reading, and Bernard M. Caddy, Cambridge, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

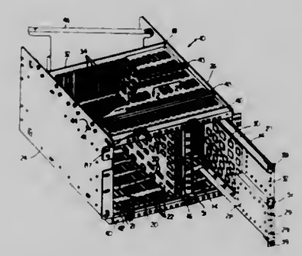
Filed Sep. 9, 1988, Ser. No. 243,068
Int. Cl.[4] H05K 9/00
U.S. Cl. 361—424 15 Claims

1. Electrical circuitry support apparatus comprising

a card cage having two sets of facing slots for removably receiving circuit boards in a region between said two sets of slots, said card cage employing a ground bar extending along an opening to said region, and

a plurality of circuit boards in said slots, each board being received in one slot of one set and one slot of the other set,

at least one circuit board being a high-frequency board assembly including a shielded enclosure on a first side of said high frequency board assembly, said high-frequency board assembly containing a high-frequency device, the enclosure providing shielding inhibiting transmission of high-frequency signals from or to said device, said high-frequency board assembly having an ear that extends from



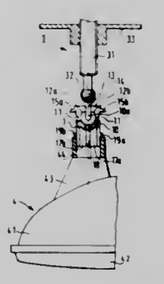
said high-frequency board assembly and is electrically connected to said ground bar.

4,894,754

UNIT FOR FIXING AND PIVOTING AN OPTICAL ASSEMBLY

Alain Levilain, Paris, France, assignor to Valeo Vision, Bobigny Cedex, France

Filed Dec. 12, 1988, Ser. No. 284,057
Claims priority, application France, Dec. 14, 1987, 87 17407
Int. Cl.[4] B60Q 1/06; F21V 3/18
U.S. Cl. 362—66 18 Claims



9. In a headlamp assembly for an automotive vehicle having a control screw held by a fixed support, said control screw having a connecting ball, a unit for fixing and pivoting said head lamp assembly to said control screw comprising:

a socket moulded from plastics material and having a concave seat adapted to receive said ball of said screw, said socket comprising a first part having a plurality of arms, each said arm having a concave internal shape, said arms extending substantially in the direction of and around the longitudinal axis of said socket, and each said arm separated from an adjacent said arm by a slot in said first part of said socket extending substantially in the direction of said longitudinal axis, and a second part, said first and said second parts connected by a live hinge, said arms of said first part pivotable about said live hinge, and said second part having a substantially cylindrical formation connected to said second part of said socket;

wherein said head lamp assembly includes a housing and said substantially cylindrical formation is adapted to fit into said housing to connect said socket to said head lamp assembly.

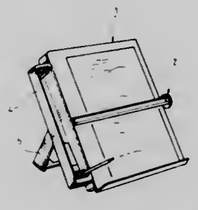
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,755
RETRACTABLE TIRE CHANGE LIGHTS FOR AUTOMOTIVE VEHICLES
Daniel E. Chandler, P.O. Box 1893, Cave Creek, Ariz. 85331
Continuation-in-part of Ser. No. 184,937, Apr. 22, 1988, Pat. No. 4,802,069. This application Oct. 21, 1988, Ser. No. 260,530
Int. Cl.[4] B60Q *1/32*
U.S. Cl. 362—83 **13 Claims**



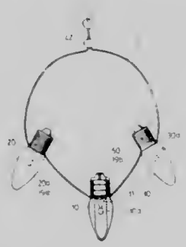
1. A tire-changing safety assembly comprising in combination:
(a) an automotive vehicle having a body and a plurality of tires, each of said tires being mounted for rotation in a different wheel well in said body;
(b) a plurality of cut-outs formed in the body of said vehicle, each of said cut-outs being formed proximate a different one of said wheel wells; and
(c) a plurality of tire change lights, each of said lights being mounted in a different one of said cut-outs, each of said lights comprising:
(i) a pivotable door mounted for swinging movement from a closed position covering one of said cut-outs to an open position extending outwardly from said vehicle;
(ii) a light source mounted on the inner surface of said pivotable door; and
(iii) a box-like casing mounted in the interior of said cut-out for isolating said light source from the underside of said vehicle.

4,894,756
DIVERSIFIED BOOKREST
Boo Lin Jan, No. 78, BO I Street, Shinchu City, Taiwan
Filed Sep. 23, 1988, Ser. No. 248,100
Int. Cl.[4] A47B *23/06*
U.S. Cl. 362—97 **1 Claim**



1. A diversified bookrest comprising: a transparent rectangular board having corner positioners; a mounting frame having a first sub-frame and a second sub-frame which is pivotally attached to said first sub-frame and held attached behind said rectangular board and includes vertically spaced mounting elements; a fluorescent lamp assembly capable of being selectively mounted on one of said mounting elements; a rule secured to said positioners and capable of being 3-dimensionally adjusted with respect to said board; a pen stand secured to said positioners for being placed alongside one side of said rectangular board; a positioning rod secured to said positioners; a mounting piece slidably fixed on said positioning rod, and having a hole receiving therein a ball engaging with said positioning rod, a spring and a threaded piece capable of being rotated to urge said spring against said ball; and a securing rod slidably and rotatably mounted on said mounting piece and securing thereto said rule.

4,894,757
ILLUMINATION APPARATUS FOR ORNAMENTS
John D. Frusha, 12539 N. Oakhills Parkway, Baton Rouge, La. 70810, and Sam S. Lee, 12F., Tun HWA S. Rd., Taipei, Taiwan
Filed Aug. 22, 1988, Ser. No. 235,025
Int. Cl.[4] F21L *15/08*
U.S. Cl. 362—104 **10 Claims**



1. An illumination apparatus, comprising:
a plurality of lamps;
a plurality of housings each encasing at least one of said lamps;
at least one of said housings having a tubular neck portion with a threaded wall;
a printed circuit board mounted in said tubular neck portion for electrical connection to at least one said lamp;
at least one battery means provided in said neck portion, with means for electrical connection to said printed circuit board;
a cap enclosing said neck portion and including switch means for switching the electrical power of said battery to said printed circuit board; and
electrical connecting means for electrically connecting said printed circuit board to the other of said lamps.

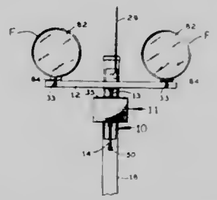
4,894,758
LIGHTING COVER AND COMBINATION FOR CORNER INSTALLATION
John M. O'Toole, Culver City, Calif., assignor to Theresa A. Hasty and Donald B. Hasty, both of Los Angeles, Calif.
Filed Sep. 5, 1989, Ser. No. 402,764
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 **22 Claims**

1. A lighting fixture for installation in a corner between a first wall and a second wall, comprising:
a light cover for placement in the corner between the first wall and the second wall, said light cover being made of a rectangular segment of material which is bent along a diagonal thereof at approximately a ninety degree angle, said light cover being made of material which will allow light to pass therethrough;
a socket assembly for holding a lamp in position under said light cover in the corner between the first wall and the second wall; and



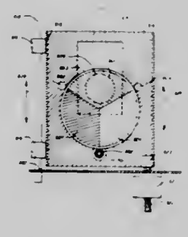
means for mounting said light cover in position in the corner between the first wall and the second wall.

4,894,759
PRE-WIRED UNITARY SUPPORT ASSEMBLY FOR FLOODLIGHTS
Steven L. Siems, 1491 S. W. 21st Ave., Fort Lauderdale, Fla. 33312
Filed Jan. 19, 1989, Ser. No. 298,700
Int. Cl.[4] F21S *1/10*
U.S. Cl. 362—250 **13 Claims**



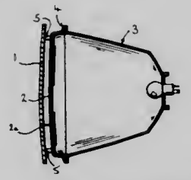
1. A pre-wired unitary support assembly for mounting floodlights on a pole comprising:
a vertically elongated back member attachable to the pole;
an electrical junction box rigidly affixed to said back member, said junction box having a bottom opening and a top opening therein;
a tubular wiring sleeve extending down from said bottom opening in the junction box;
a horizontally elongated hollow cross arm rigidly affixed to said back member above said junction box, said cross arm having a bottom opening therein above said top opening in the junction box, said cross arm having laterally spaced openings therein, and wiring fittings on said cross arm at said laterally spaced openings therein;
tube means attached at its lower end to said junction box and at its upper end to said cross arm, said tube means extending from said top opening in the junction box up to said bottom opening in the cross arm;
and electrical wiring extending from behind said wiring fittings on said cross arm along the inside of said cross arm to said bottom opening therein and down through said tube means and through said top opening in the junction box into the inside of the junction box.

4,894,760
ADDITIVE COLOR-MIXING LIGHT FIXTURE EMPLOYING A SINGLE MOVEABLE MULTI-FILTER ARRAY
Michael Callahan, 40 W. 94th St., New York, N.Y. 10025
Continuation-in-part of Ser. No. 66,790, Jun. 25, 1987, Pat. No. 4,797,795, which is a continuation of Ser. No. 750,873, Jul. 1, 1985, Pat. No. 4,697,227, which is a continuation of Ser. No. 443,127, Nov. 19, 1982, Pat. No. 4,527,198. This application Sep. 28, 1988, Ser. No. 250,316
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—293 **3 Claims**



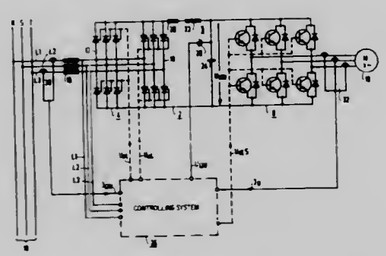
1. A color-mixing lighting fixture, said lighting fixture producing a beam suitable for entertainment lighting, and capable of the remote adjustment of the apparent color of said beam, said lighting fixture comprising:
(a) a light source and associated light collecting means;
(b) means for forming a beam suitable for illuminating a distant subject, said beam having an elongated optical centerline, said means for forming a beam cooperating with said light collecting means and providing at least a first plane substantially oblique to said centerline at which light energy passing through substantially any point in said first plane is substantially equally distributed across a second plane that is substantially oblique to said centerline where said beam illuminates said distant subject;
(c) at least one filter array disposed substantially coplanar with said first plane, said filter array comprising at least thee filter segments mechanically coupled in a common array, each of said filter segments having a bandpass different than the others of said filter segments and generally spaced about an effective center;
(d) means for carrying said filter array and for displacing it relative to said centerline to any selected one of a substantially continuous range of possible positions between a first position at which substantially all of the light energy in said beam passes through said filter segments and a second position at which substantially none of the light energy in said beam passes through any of said filter segments;
(e) means for rotating said filter array about said effective center to any selected one of a substantially continuous range of possible orientations such that the relative proportion of said energy passing through each filter segment in said filter array may be selected; and,
(f) means, operable from a remote location and cooperating with said means for displacing and with said means for rotating, for conforming said filter array to said selected position and said selected orientation, such that the apparent color of said beam may be varied.

4,894,761
PROTECTIVE SHIELD FOR A VEHICLE LAMP ASSEMBLY
Derick Gray, Warwickshire, England, assignor to Signam Limited, Warwick, United Kingdom
Filed Oct. 7, 1987, Ser. No. 105,238
Claims priority, application United Kingdom, Aug. 10, 1987, 8718876
Int. Cl.[4] F21V *15/00*
U.S. Cl. 362—376 **14 Claims**



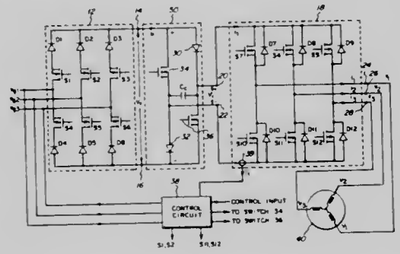
1. A device for protecting the light-emitting face of a vehicle lamp assembly, said face having a peripheral edge, comprising:
a light transmitting shield in the form of a sheet of plastics material for covering at least a portion of said face and protecting said face from impact damage;
a plurality of mutually spaced distance pieces secured to said shield for spacing said shield from said face in use, each distance piece comprising a releasable two part connector; and
an adhesive for attachment of said distance pieces to said face, said distance pieces being arranged for attachment directly to said light-emitting face at positions inset from the peripheral edge thereof.

4,894,762
METHOD AND APPARATUS TO AVOID COMMUTATION FAILURE IN A REGENERATIVE CONVERTER
Axel Steinhorn, Wittighausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed May 11, 1989, Ser. No. 350,310
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826402
Int. Cl.[4] H02M *5/44;* **H02H** *7/00*
U.S. Cl. 363—35 **6 Claims**



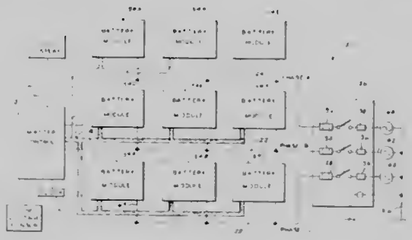
1. A method of preventing commutation failure in a regenerative converter of a supply reversible converter of a voltage-source converter during dynamic voltage depression or during a system voltage dip, with control of the firing of the regenerative converter and of a supply converter of the supply reversible converter being a function of the value of a link current setpoint of the voltage-source converter, the method comprising the steps:
generating the link current setpoint from a measured link voltage actual value and a controllable link voltage setpoint;
monitoring a measured link current setpoint to detect overcurrent;
generating an overcurrent status message when overcurrent is detected; and
supplying control signals to the regenerative converter regardless of the presence of an overcurrent status message, when either a switch in current conduction is made from the supply converter to the regenerative converter, or during operation of the regenerative converter.

4,894,763
AC-AC CONVERTER USING SWITCHES IN A DC LINK
Khai D. T. Ngo, Gainesville, Fla., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 5, 1988, Ser. No. 279,636
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **8 Claims**



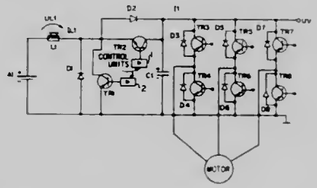
1. Apparatus for converting polyphase AC electric power at a first frequency and voltage to AC electric power at a second frequency and voltage, comprising:
a polyphase rectifier having input terminals for connection to a source of polyphase electric power and having a first and a second output terminal for providing rectified electric power;
a polyphase inverter having first and second input terminals for connection to a source of rectified electric power and having plural output terminals for connection to a load;
a first unidirectional current-carrying device connected between said first output terminal of said rectifier and said first input terminal of said inverter;
a second unidirectional current-carrying device connected between said second input terminal of said inverter and said second output terminal of said rectifier, said first and second unidirectional current-carrying devices being poled oppositely to each other;
first controllable switch means connected between said first output terminal of said rectifier and said second input terminal of said inverter;
second controllable switch means connected between said first input terminal of said inverter and said second output terminal of said rectifier; and
control means responsive to instantaneous polarity of current at one of said first and second input terminals of said inverter and to instantaneous polarity of the input line voltages for selectively gating said first and second controllable switch means substantially in synchronism into and out of conduction such that current at said rectifier output terminals is unidirectional regardless of current direction at said inverter input terminals and such that the rectified voltage at said inverter input terminals is maintained unipolar.

4,894,764
MODULAR AC OUTPUT BATTERY LOAD LEVELLING SYSTEM
John F. Meyer, Eagle, and David G. Porter, East Troy, both of Wis., assignors to Omnion Power Engineering Corporation, Mukwonago, Wis.
Filed Apr. 8, 1988, Ser. No. 179,158
Int. Cl.[4] H02M *7/68;* **H02J** *9/00*
U.S. Cl. 363—65 **23 Claims**



1. An electrical load levelling system, comprising:
a plurality of modules, each having an AC power input and an AC power output;
electrical energy storage means associated with each said module, said energy storage means having a DC power input and a DC power output;
power conversion means associated with each said module for converting output DC power from said energy storage means to AC power for output from said module, and input AC power to said module to DC power for input to said energy storage means;
power transfer means associated with each said module for inputting and outputting said AC power to and from said module; and
control means for controlling the supply of AC power to said system and the output of AC power from said system;
so that said system is adapted to receive electrical energy during periods of off-peak electrical demand, store said electrical energy until demand exists for said stored electrical energy and said demand is detected by said control means, and output electrical energy in response to said demand.

4,894,765
BI-DIRECTIONAL D.C./D.C. CONVERTER COMPATIBLE WITH AN INVERTER BRIDGE
Matti Kähkipuro, Hyvinkää, Finland, assignor to Kone Elevator GmbH, Finland
Continuation of Ser. No. 139,093, Dec. 22, 1987, abandoned.
This application May 31, 1989, Ser. No. 361,661
Claims priority, application Finland, Dec. 22, 1986, 865280
Int. Cl.[4] H02M *7/00*
U.S. Cl. 363—124 **28 Claims**



5. Apparatus for directly coupling an inverter and a converter by connecting an elevator inverter, having a power stage which includes a d.c. circuit, to a storage battery having a battery voltage lower than the voltage in said d.c. circuit, said apparatus comprising:
means for storing energy;
first voltage matching means for causing said battery voltage to equal the voltage in said d.c. circuit when power is flowing from said storage battery to said d.c. circuit;
said first voltage matching means comprising first semiconductor switch means for charging said energy storing means and first diode means for discharging energy from said energy storing means to said d.c. circuit; and
second voltage matching means for causing the voltage of said d.c. circuit to equal said battery voltage when power is flowing from said d.c. circuit to said storage battery means;
said second voltage matching means comprising second semiconductor switch means for charging said energy storing means and second diode means for discharging energy from said energy storing means to said storage battery means.

4,894,766
POWER SUPPLY FREQUENCY CONVERTER
William De Agro, Levittown, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.
Filed Nov. 25, 1988, Ser. No. 275,840
Int. Cl.[4] H02M *5/22*
U.S. Cl. 363—159 **5 Claims**



1. Apparatus for converting a supplied alternating current (AC) input signal into an AC output signal having a selected lower frequency than the frequency of said AC input signal, comprising:
means for translating individual half cycles of said supplied AC input signal to an intermediate output signal with selected amplitude and polarity such that during successive pairs of first and second periods, each said period corresponding to a predetermined number of half cycles of said AC input signal, the translated half cycles of said AC input signal all have the same first selected polarity during said first periods and have the same second selected polarity during said second periods, said first and second polarities being opposites; and
means for filtering said intermediate output signal to develop said AC output signal having said selected lower frequency.

4,894,767
METHOD FOR YIELD TIGHTENING OF SCREWS
Tabito Doaiwa, Hachioji, Japan, assignor to Daiichi Dentsu Kabushiki Kaisha, Chofu, Japan
Filed Mar. 31, 1988, Ser. No. 175,749
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—153 **8 Claims**

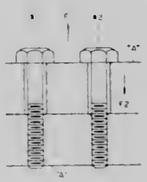
1. A method for yield tightening of screws by use of a wrench including a device for detecting a tightening torque, a device for converting a tightening angle and an electric motor for generating a screwing torque, and a controller including a device for receiving electric signals corresponding to the tightening torque and the tightening angle, a device for driving the electric motor, a read only memory for storing sequences

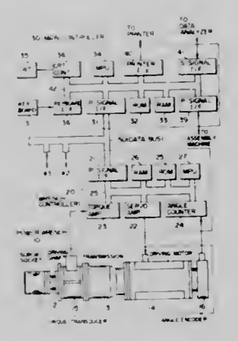
VOL 1110 ISS 3 JA 16 1990 UMI

necessary for a tightening process, a calculating step and a judgement step, a random access memory for storing present data necessary for the tightening process and data obtained during the tightening process, a microprocessor for performing calculations and judgements necessary for the tightening process, a device for displaying the various data and a device for transmission and reception of a judgement signal and various data between the controller and external systems, the method comprising:

a step wherein after an actual tightening torque passes a certain preset torque limit, "n" (equal to or more than 4) pieces of actual torque data stored in a preset means are integrated by two integration stages and an average torque rate is calculated on the basis of a difference between the respective integrated values by the two stages;

a step wherein it is recognized that an actual torque curve has reached a yield area when it is determined that the average torque rate is smaller than a preset target torque rate;





a step wherein the tightening process is stopped immediately when the said recognition has been given in succession a plurality of times greater in number than ½ of the number "n";

a step wherein when the tightening process proceeds to a condition in which the next new data is provided, the oldest piece of data is removed from a routine of calculating the average torque rate and a new piece of data is added to the routine, the calculation being performed in succession updating the data to be calculated until the tightening process is stopped; and

a step wherein after the actual tightening torque reaches the torque limit, an integrated value is calculated by subtracting the torque limit from the actual tightening torque, the area of a right triangle inscribed in the area of the integrated value is calculated, a difference value between the integrated value and the area of the right triangle is calculated, and when the difference value is larger than an area calculated by the use of a present target angle limit, the tightening process is immediately stopped.

4,894,768

DATA PROCESSING SYSTEM WITH COPROCESSOR

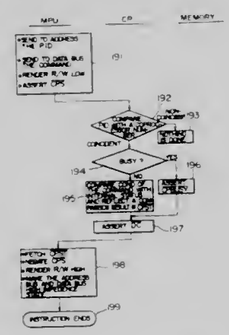
Kazuhiko Iwasaki, Hachioji; Tauneo Funabashi, Tokyo; Ikuya Kawasaki, Kodaira; Hideo Inayoshi, Koknbunji; Atsushi Hasegawa, Koganei; Takao Yaginuma, Hitachiota, and Eiki Kondoh, Hitachi, all of Japan, assignors to Hitachi, Ltd.; Hitachi Microcomputer Engineering, Ltd., both of Tokyo and Hitachi Engineering Co., Ltd., Hitachi, all of, Japan

Filed Mar. 2, 1987, Ser. No. 21,007

Claims priority, application Japan, Mar. 17, 1986, 61-56844

Int. Cl.⁴ G06F *13/00, 15/16*

U.S. Cl. 364—200 **3 Claims**



1. A data processing system comprising:

a first processor;

a second processor;

a memory;

an address bus interconnecting said first processor, said second processor and said memory;

a data bus interconnecting said first processor, said second processor and said memory;

a first signal line interconnecting said first processor and said second processor;

wherein said first processor fetches an instruction to be processed by said second processor;

wherein a command which corresponds to said instruction is sent to said second processor by said first processor over said data bus,

wherein instructions fetched by said first processor include a conditional branch instruction whose branch depends on whether a condition for branch is satisfied in said second processor,

wherein within one bus cycle said first processor sends a conditional branch command which corresponds to said conditional branch instruction to said second processor over said data bus,

and wherein within said one bus cycle said second processor sends a first signal to said first processor over said first signal line indicative of whether said condition for branch is satisfied.

4,894,769

INCREASED BANDWITH FOR MULTI-PROCESSOR ACCESS OF A COMMON RESOURCE

Joseph A. Conforti, Phoenix, Ariz., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Feb. 20, 1987, Ser. No. 17,385

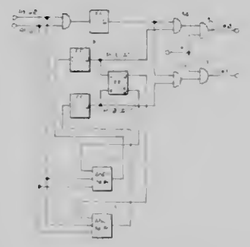
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.

Int. Cl.⁴ G06F *13/00, 13/14*

U.S. Cl. 364—200 **18 Claims**

1. In combination with an arbitration controller which provides for equal priority sharing of duplicate copy resources by active ones of first and second pluralities of duplicate pairs of

CPUs, said arbitration controller including first and second means for initialization each providing for a first signal; corresponding first and second pluralities of arbitration circuits, each plurality of arbitration circuits including a first, at least one successive and a last arbitration circuit; each of said means for initialization being connected to at least one of said corresponding plurality of arbitration circuits; first and second pluralities of CPU buses, each of said CPU buses of said first plurality of CPU buses connected to a respective one of said CPU buses of said second plurality of CPU buses and each of said CPU buses of said second plurality of CPU buses connected to a respective one of said CPU buses of said first plurality of CPU buses; first and second common buses, each common bus connected between an associated and corresponding one of said first and second pluralities of duplicate pairs of CPUs and a respective one of said duplicate copies of said resources via a corresponding one of said plurality of arbitration circuits; first and second pluralities of circuit connections, each of said plurality of circuit connections including a circuit connection between each said first arbitration circuit and each successive arbitration circuit, said last arbitration circuits being connected to said first arbitration circuit of its respective plurality of arbitration circuits forming ring connections and each arbitration circuit propagating said first signal through said ring connections; one arbitration circuit of each plurality of arbitration circuits operated in response to said first signal and to a common bus request signal from an active CPU to access each of said duplicate copy resources simultaneously; and each



arbitration circuit including: first arbitration gating means being operated to propagate said first signal along said ring connections at a high rate of speed; arbitration latching means connected to said first arbitration gating means and being operated to produce a second signal for allowing said active CPU to access said duplicate resources; and second arbitration gating means connected to said arbitration latching means and being operated to propagate a third signal from one said arbitration circuit to a next successive arbitration circuit for said ring connection; the improvement comprising:

clock means for generating a clock signal of a predetermined frequency;

means for detecting simultaneous access requests of a first and a second CPU of said first and second pluralities of duplicate pairs of CPUs respectively, said means for detecting being connected to a corresponding and respective arbitration circuit of said first and second plurality of arbitration circuits and being operated in response to said simultaneous access requests to produce a contention signal;

means for disabling connected to said means for detecting, to a corresponding and respective arbitration circuit of said first and second plurality of arbitration circuits and to said clock means, said means for disabling being operated in response to said contention signal and to an indication that said first CPU was previously granted access to said resources, to inhibit transmission of said clock signal to said arbitration circuit of said second plurality of arbitration circuits corresponding to said second CPU; and

means for enabling connected to said means for detecting, to a corresponding and respective arbitration circuit of said first and second plurality of arbitration circuits and to said clock means, said means for enabling being operated in response to said contention signal and to an indication that said first CPU was previously granted access to said resources, to transmit said clock signal to said arbitration circuit of said second plurality of arbitration circuits corresponding to said second CPU.

4,894,770

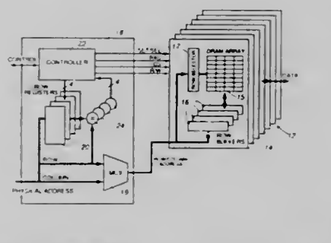
SET ASSOCIATIVE MEMORY

Stephen A. Ward, Chestnut Hill, and Robert C. Zak, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 1, 1987, Ser. No. 57,272

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 364—200 **41 Claims**



1. A memory comprising:

a memory array logically arranged as rows and columns of storage elements addressable by row addresses, each element being capable of storing a single bit of data, each row of storage elements being directly accessible independent of other rows;

means responsive to row addresses received by memory for directly addressing rows of storage elements of the array for storage of rows in data buffers;

a plurality of data buffers, each data buffer being connected to the memory array to receive and store a row of data from any addressed row of the array and to provide data as an output of the memory;

means for selecting one of the data buffers to receive and store data from the memory array;

means responsive to a column address for addressing bits within a selected data buffer to access the data stored in an addressed location;

a plurality of address registers for storing row addresses of rows of the memory array of data stored in the data buffers;

comparator means for comparing received addresses with addressses stored in the address registers to determine whether data to be addressed by a received row address is retained in a data buffer; and

control means for causing a read from the memory array to a selected buffer when the row indicated by the received row address is not stored in a data buffer and for selecting a data buffer for direct access when the data is already stored in the buffer.

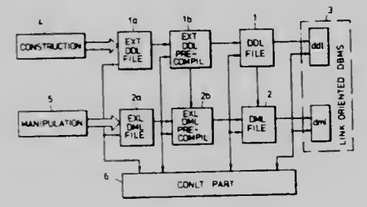
VOL 1110 ISS 3 JA 16 1990 UMI

4,894,771

DATA BASE MANAGEMENT SYSTEM EXTENDING STRUCTURE

Hideko Kunii, Tokyo; Issei Fujishiro, Tsukuba; Yasuto Shirai, and Toshiyasu Kunii, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Sep. 29, 1988, Ser. No. 251,097
Claims priority, application Japan, Dec. 19, 1987, 62-321796
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **18 Claims**



1. A data base management system extending structure based on a link-oriented data model, said data base management system extending structure comprising:

a data base management system;

an extended data base language pre-compiler for pre-compiling an input file described in an extended data base language into an output file described in a data base language with which said data base management system can make an access; and

a control part for controlling operations of said data base management system and said extended data base language pre-compiler,

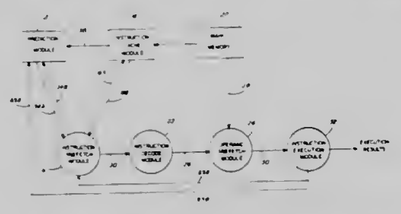
said extended data base language being added with a link attribute information to the data base language, said link attribute information specifying relationships of representation objectives.

4,894,772

METHOD AND APPARATUS FOR QUALIFYING BRANCH CACHE ENTRIES

Brian K. Langendorf, Worcester, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Jul. 31, 1987, Ser. No. 80,452
Int. Cl.[4] G06F *9/38, 13/00*
U.S. Cl. 364—200 **30 Claims**



1. A look ahead fetch system for a pipelined digital computer for predicting in advance of decoding the outcome of a branch instruction, comprising:

(A) branch cache means including "n" associative sets, where "n" is a positive number, each set storing a plurality of branch cache entries, each branch cache entry including data representing a branch outcome address corresponding to a branch instruction;

(B) instruction cache means for storing a plurality of instruction entries, said entries including branch instructions;

(C) coupling memory means, associated with said instruction cache, for storing a plurality of coupling codes, each coupling code being associated with an associated instruction entry.

(D) means, coupled to said coupling memory means, for generating and writing to said coupling memory means said coupling codes, each indicating whether said branch cache contains a branch outcome address corresponding to the associated instruction cache entry, and

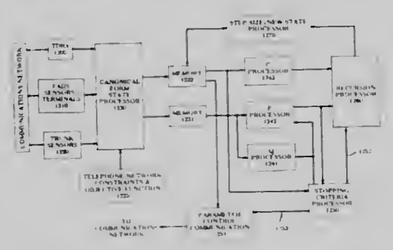
(E) means, coupled to receive said coupling codes from said coupling memory means and said branch outcome addresses from said branch cache means, for selecting the corresponding branch outcome address, if any, as the predicted address of the next instruction, in accordance with the corresponding coupling code.

4,894,773

METHOD AND APPARATUS FOR OPTIMIZING SYSTEM OPERATIONAL PARAMETERS THROUGH PROJECTIVE TRANSFORMATIONS

Jeffrey C. Lagarias, Summit, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1986, Ser. No. 899,109
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—402 **10 Claims**



1. Apparatus for adjusting, within respective constraint values, the values of a plurality of controllable operational parameters of a commercial system, to achieve an improved operational state of said system, said optimizing being accomplished when said controllable operational parameters are adjusted within a preselected set of constraints to minimize a set of preselected operational criterion values, comprising:

sensors coupled to said commercial system to be optimized for developing signal representations of said values of said operational parameters;

a first processor portion, responsive to said signal representations of said sensors, to values of said preselected set of constraints and to said preselected set of operational criterion values, for developing a canonical form signal representation of said operational state of said system, such that said minimizing is effected by

$$\begin{aligned} &\text{minimizing:} && c^T x \\ &\text{Subject to:} && Ax = 0 \\ & && e^T x = n \\ & && x \geqq 0 \end{aligned}$$

with side condition

$$Ae = 0,$$

where $\underline{x}$ is a vector related to said operational parameters, $\underline{T}$ is the transpose of a vector related to said set of preselected criterion values, n is the number of said operational parameters, $\underline{A}=(a_{11}, a_{12}, \ldots, a_{ij}, \ldots, a_{mn})$ is an m by n matrix of coefficients related to said preselected set of constraints, and $\underline{e}$ is a vector of n components, each of which is equal to 1, e^T is the transpose of the vector e; said canonical signal representation forming a multidimensional space, with said operational parameters being the variables of said space, said matrix defining a polytope in said space, and said $\underline{c}$ vector specifying a direction in said space;

a second processor portion, responsive to said first processor portion, for projecting said operational parameters, said matrix, and said $\underline{c}$ vector unto a transformed space, and developing a matrix $\underline{Q}=(\underline{A}\underline{A}^T)^{-1}\underline{A}$, a matrix $\underline{P}=(\underline{I}-\underline{A}^T\underline{Q})$, and a vector $\underline{c}=\underline{P}\underline{D}\underline{c}$, where $\underline{D}=\text{diag}(x_i)$, $\underline{A}$ is a matrix that is the matrix $\underline{A}$ with an additional row of all 1's appended to it, $\underline{A}$ is the transpose of the matrix $\underline{A}$;

a third processor portion, responsive to said second processor portion, for computing a power series function in said transformed space of order greater than one that approximates a trajectory curve in consonance with said set of operational criterion values; and

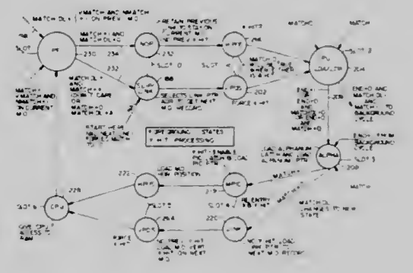
a controller, responsive to said third processor portion, for developing control signals, for physically setting said operational parameters of said system at values corresponding to a point along said trajectory curve.

4,894,774

LOOKAHEAD PIPELINE FOR PROCESSING OBJECT RECORDS IN A VIDEO SYSTEM

Patrick J. McCarthy, 1547 Sun La., San Jose, Calif. 95132, and George E. Logg, 1410 Cedar Pl., Los Altos, Calif. 94022

Filed Oct. 15, 1986, Ser. No. 919,234
Int. Cl.[4] G06F *15/44*
U.S. Cl. 364—410 **12 Claims**



1. An apparatus for searching a linked list of database records describing objects on a playfield to determine which meet display criteria and for displaying at least portions of objects meeting said display criteria, comprising:

means including a cathode ray tube for displaying a window portion of said playfield

and a plurality of selected objects located in said window on said cathode ray tube;

means coupled to said display means for storing graphic data defining the appearance of objects on said cathode ray tube;

means for storing a plurality of database records defining all the movable objects on said playfield, said database records organized in linked list format, each record defining the position and size of the associated object on said cathode ray tube by position and size data and containing a picture pointer portion including the address in said means for storing graphic data where the graphic data that defines the appearance of the associated object may be located, and each said database record including a link pointer portion pointing to the address of the next database record on said linked list;

first means for determining which objects represented by records on said linked list are to be displayed in said window by sequentially retrieving selected records for objects having records linked by said linked list and, for each record so retrieved, comparing the portions of said record defining the position and size of said object on said playfield to the boundaries of said displayed window portion of said playfield and for selecting those records which meet said display criteria in that said records have position and size information which indicates that the associated objects will be at least partially visible in said window portion;

second means coupled to said first means, for retrieving and storing said picture pointer portion of each said record selected by said first means as associated with an object which is to be at least partially displayed in said window portion, and for displaying, for each selected object record, at least some of the graphic data pointed to by said picture pointer portion of each selected record; and

third means coupled to said first and second means for speeding the process of locating records associated with objects which have positions and sizes such that the objects will be at least partially visible within said window portion by continuing the process of sequentially retrieving position and size data for subsequent records on said linked list after a record is selected by said first means by accessing the database record pointed to by the link pointer of the database record associated with the object selected by said first means and comparing said position and size data of said subsequent record to said window position to determine if any said subsequent record meets said display criteria and for continuing to search said linked list sequentially in this manner by accessing the link pointer portion of any data base record found to have a position on said playfield which will not be at least partially visible in said window portion and accessing the database record for the next record on said linked list as pointed to by said link pointer and retrieving and comparing said position and size data of said next record to the position of said window portion to determine if said display criteria is met until a database record is found for an object which meets said display criteria and for causing said second means to retrieve, store and display the graphic data for any object corresponding to a database record so found by said third means when said second means finishes retrieving and storing said graphic data for the record selected by said first means, and, if no record is found by said third means by the time said second means finishes retrieving and storing the graphic data for the object selected by said first means, for causing said first means to continue sequentially examining the records on said linked list for the next record on the linked list starting with the record on said linked list following the record last examined by said third means to locate the next record for an object which satisfies said display criteria.

4,894,775

RECONSTRUCTION IN CT SCANNERS USING DIVERGENT BEAMS WITH FLATNESS CORRECTION FOR REORDERED DATA

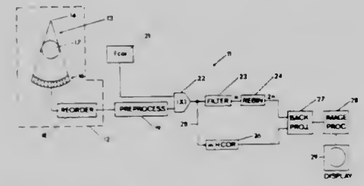
Eliahu Kritchman, Tel Aviv, and Jerome S. Arenson, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Jul. 6, 1988, Ser. No. 215,762
Claims priority, application Israel, Jul. 17, 1987, 83233
Int. Cl.[4] G06F *15/42*; A61B *6/03*
U.S. Cl. 364—413.16 **28 Claims**

1. A method for detecting, modifying and rearranging divergent beam derived data to obtain tomographic images with maximum spacial resolution and with minimum artifacts, said method enabling fast processing, the method includes the steps of:

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(a) directing a divergent beam of penetrating radiation through a body being examined from source means on one side of said body,
(b) angularly displacing the divergent beam relative to the body,
(c) detecting radiation that is passed through the body at a number of angularly spaced positions within the angles subtended by the divergent beam,
(d) deriving sets of detected radiation data representative of the variety of angularly and laterally spaced projections



indicative of the transmission of the radiation through respective portions of the body,
(e) reordering the sets of detected radiation data to obtain laterally unequally spaced sampled data corresponding to parallel projections,
(f) correcting the reordered data for flatness,
(g) rebinning the sets of data corresponding to said reordered data to obtain laterally equally spaced parallel views, and
(h) back-projecting said laterally equally spaced parallel views to form tomographic images.

4,894,776

BINARY SPACE INTERPOLATION

Doron Dekel, Haifa, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Oct. 19, 1987, Ser. No. 109,400
Claims priority, application Israel, Oct. 20, 1986, 80364
Int. Cl.[4] G06F *15/42, 15/72, 15/353*
U.S. Cl. 364—413.13 **18 Claims**



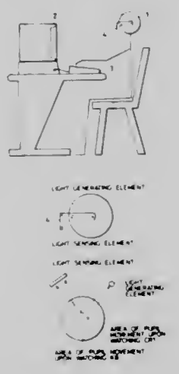
1. A process for constructing three dimensional images of an object in a body being imaged, said process comprising the steps of:
acquiring two dimensional maps of image data of two spaced apart planes in the interior of said body,
interpolating the acquired image data to provide image data for a plurality of planes between said spaced apart planes, said interpolating step comprising:
converting said maps of image data of said spaced apart planes to spaced apart binary bit maps where a presence of said image data of said object is indicated by one binary value and a lack of said image data of said object, is indicated by the other binary value, said one binary value indicating the interception of the object by a plane of said spaced apart planes, and the other binary value indicating the non-interception of the object by a plane of said spaced apart planes said image data comprising intersecting rows and columns of image values, each intersecting row and column representing a corresponding element of said planes and a corresponding pixel of said image,
determining corresponding elements of each of said spaced apart planes with different binary values,
determining the distance from one of said spaced apart planes to where there is a transition of binary values between said corresponding elements,
using said distance to provide interpolated binary data for said planes between said spaced apart planes,
converting said interpolated binary data to interpolated image data, and
using said acquired image data of said spaced apart planes and said interpolated image data of said planes between said spaced apart planes to provide three dimensional images.

4,894,777

OPERATOR MENTAL CONDITION DETECTOR

Hirokazu Negishi, Epsom Survey, United Kingdom, and Masao Hosaka, Sagamihara, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,647
Claims priority, application Japan, Jul. 28, 1986, 61-175718
Int. Cl.[4] A61B *5/00*
U.S. Cl. 364—419 **65 Claims**



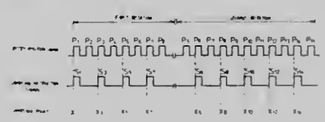
1. An information apparatus comprising:
processing means for performing various information processing operations in accordance with an instruction from an operator;
detection means for detecting a mental condition of the operator by detecting information indicating the personality of the operator during the information processing operations performed by said processing means in accordance with an instruction from the operator; and
output means for outputting information corresponding to the detected mental condition of the operator for relaxing the operator.

4,894,778

X-RAY COMPUTERIZED TOMOGRAPHIC DEVICE

Shigeru Matsumura, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,356
Int. Cl.[4] G06F *15/42; G01T 1/17*
U.S. Cl. 364—413.15 **2 Claims**



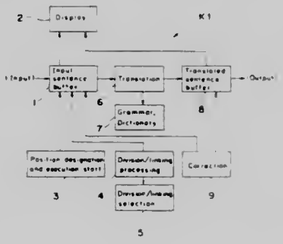
1. An X-ray computerized tomographic device comprising
a radiation source (1) rotatable in a rotary orbit around a subject to be examined while continuously radiating X-ray beams along sections of said subject;
a radiation detector (2) disposed opposite said radiation source with said subject being disposed therebetween, said radiation detector comprising a plurality of detection devices for detecting radiation in said subject, said radiation detector generating sample output signals when the position of said radiation source matches one of a plurality of sampling points arranged at equal intervals on said rotary orbit of said radiation source;
data collection means (6, 11, 15) for collecting data from said radiation detector at N·M−1 sampling points, wherein N is an integer, during M rotations of said rotation source in the same direction, wherein data is collected from a forward sampling point after skipping an M−1 sampling point adjacent to a point from which data was collected during a specific rotation, said data collecting means comprises a rotary encoder comprising N·M−1 marker means, and means for frequency dividing an output signal from said rotary encoder at a rate of 1/M and for outputting a sample time signal to said marker means; and
a computer (7) for reconfiguring collected data into tomographic images of said subject.

4,894,779

TRANSLATING APPARATUS

Hitoshi Suzuki; Shinobu Shiotani; Shinji Tokunaga, all of Nara; Tokuyuki Hirai, Yamatokoriyama; Yoji Fukumochi, Nara; Shuzo Kugimiya, Nara, and Ichiko Sata, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1987, Ser. No. 125,365
Claims priority, application Japan, Nov. 28, 1986, 61-284490; Nov. 28, 1986, 61-284492; Nov. 28, 1986, 61-284494
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 **2 Claims**



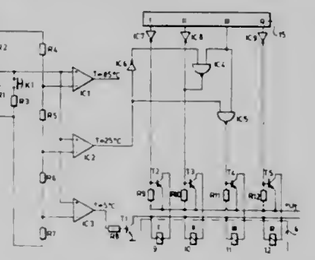
1. A translating apparatus for translating an input sentence and outputting its translated sentence, which apparatus displays the input sentence and the translated sentence comprising:
means for dividing the input sentence at a designated location into at least two character-strings, each said character-string being identifiable as a separate sentence;
means for linking a plurality of designated character-strings into the input sentence, each said character string being identifiable as a separate sentence;
means for selecting either one of said means for dividing or said means for linking when viewing one or more input sentences to the translated;
means for continuously inputting a plurality of sentences into the translating apparatus;
means for separating said continuously input plurality at sentences into separate sentences;
means for performing line feed of separate sentences; and
means for executing said means for separating prior to translation of the separately designated sentences.

4,894,780

PROCESS FOR SWITCHING THE GEAR-CHANGE OF AUTOMATIC TRANSMISSIONS OF MOTOR VEHICLES IN DEPENDENCE OF THE TEMPERATURE OF THE COOLING WATER

Sándor Simonyi, Salgótarján; György Ternóczky, Szigetszentmiklós; György Válóczi, and István Tóth, both of Salgótarján, all of Hungary, assignors to Csepel Autogyár, Salgotarján, Hungary

Filed Jan. 21, 1988, Ser. No. 146,516
Int. Cl.[4] B60K *41/18, 31/00*
U.S. Cl. 364—424.1 **5 Claims**



2. In an apparatus for controlling a motor vehicle automatic transmission system for preventing premature transmission engagement and premature loading, and wherein the system is of the type having a manual selector control for the selection of at least I, II, III and R gears, individual control solenoids associated with each of said gears for effecting gear changes, a control system, including individual energizing circuits for said solenoids, for actuating said solenoids in a sequence in accordance with the position of said manual selector and the driving conditions experienced by said vehicle, and an engine temperature-responsive control associated with said control system for modifying the control of said solenoids as a function of engine temperature, the improvement which comprises,
(a) first circuit means responsive to sensing of engine temperature lower than a predetermined minimum to disable the energizing circuits for all of said solenoids and thereby prevent said vehicle transmission from being engaged in any of said gears,
(b) second circuit means responsive to the sensing of engine temperature higher than said predetermined minimum but lower than a predetermined normal level of engine temperature, to selectively disable the energizing circuit for one or more of the forward gears higher than the I gear,
(c) third circuit means responsive to the sensing of engine temperature at or above a predetermined normal temperature to enable the energizing circuits of all of said solenoids, and
(d) override circuit means for enabling the energizing cir-

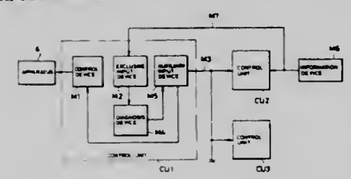
cuits for all of said solenoids independently of engine temperature.

4,894,781

COMMUNICATION CONTROL SYSTEM

Yoshihisa Sato, Nagoya; Susumu Akiyama, Kariya; Yuji Hirabayashi, Aichi; Katsuhiro Ina, Okazaki; Katsunori Ito, Aichi; Takao Saito, Nagoya, and Tetsuo Tanigawa, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Aichi, Japan

Filed Oct. 1, 1987, Ser. No. 103,271
Claims priority, application Japan, Oct. 2, 1986, 61-234778
Int. Cl.[4] G06F *15/16*; G05B *15/02*
U.S. Cl. 364—431.11 **7 Claims**



1. A communication control system comprising:
- a plurality of control means, each controlling a defined number of controlled devices;
- common signal line means for transmitting information between said plurality of the control means;
- where said plurality of the control means control the respective controlled devices based on said information transmission via said common signal line means;
- first information generating means for generating first information necessary for control of a first controlled device which is controlled by a first control means among said plurality of the control means;
- exclusive input means inputting the information from the first information generating means via an exclusive signal line;
- wherein the information of the first information generating means is also applied to a second control means among said plurality of the control means;
- wherein said first control means controls said first controlled device based on said information inputted by said exclusive input means;
- wherein said first control means comprises means for judging whether said exclusive input means is operating normally, and controlling means for, when said exclusive input means is not operating in a normal manner, inputting the information of said first information generating means into said controlling means from said second control means via said common signal line means and controlling said first controlled device.

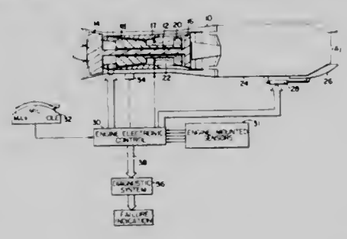
4,894,782

DIAGNOSTIC SYSTEM FOR DETERMINING ENGINE START BLEED STRAP FAILURE

Joseph F. Alcock, Palm Beach Gardens, and Roger D. Tull, West Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 135,022, Dec. 18, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 361,732
Int. Cl.[4] G06F *15/20*; F02C *9/18*
U.S. Cl. 364—431.02 **9 Claims**

1. In a gas turbine engine with operating conditions including a control mode and an engine operating power level having a band of intermediate power levels, the engine further having an engine start bleed strap, a diagnostic system for use with an engine electronic controller, said diagnostic system comprising:
- a means for receiving signals indicative of a plurality of engine parameters including temperature of an engine turbine, engine inlet total temperature, pressure in an engine burner and engine inlet total pressure; and
- a computing means receiving said parameter signals and signals indicative of the engine operating conditions, said computing means for comparing said engine operating signals with preselected values thereof and, in dependence on said comparison, for computing a relationship between said engine temperatures and a relationship between said



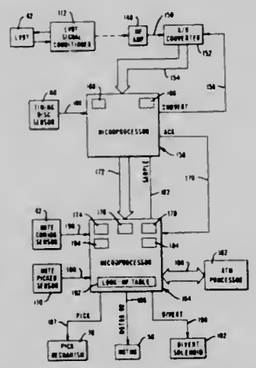
engine pressures, said computing means further for arithmetically determining a computed engine temperature - pressure relationship from said computed engine temperature relationship and said engine pressure relationship, comparing said computed engine temperature - pressure relationship with preselected values thereof and automatically providing signals indicative of a failed engine start bleed strap based on said comparison.

4,894,783

APPARATUS FOR DETECTING THE PASSAGE OF MULTIPLE SUPERPOSED SHEETS ALONG A FEED PATH

Douglas L. Milne, West Ferry, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 16, 1988, Ser. No. 245,200
Claims priority, application United Kingdom, Jun. 2, 1988, 8813025
Int. Cl.[4] G06F *15/20*; B65H *7/12*
U.S. Cl. 364—479 **10 Claims**



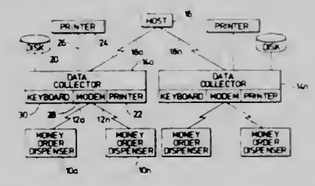
1. In an apparatus for detecting the passage of superposed sheets along a feed path, including first and second cooperating rollers, said first roller having a fixed axis of rotation, and the diameter of one of said rollers being equal to, or a multiple of, the diameter of the other roller, means for feeding sheets along said feed path between said rollers, and means for mounting said second roller so that its axis is movable relative to that of said first roller and so that it is biased towards said first roller to enable said second roller to be displaced away from said first roller in response to a single or multiple sheet passing between said first and second rollers, the improvement comprising:
- voltage generating means associated with said second roller and arranged to produce an output voltage which varies linearly with movement of the axis of said second roller towards or away from the axis of said first roller;
- analog-to-digital converter means to which said output voltage is applied;
- pulse generating means for generating timing pulses in timed relationship with the revolution of said rollers; and
- data processing means connected to the output of said converter means and to the output of said pulse generating means, said data processing means being arranged to perform the following steps: (a) sampling the value of said output voltage, as represented by the output of said converter means, a predetermined number of times for one complete revolution of said one of said rollers when no sheet is passing between said rollers, (b) storing a first digital value representative of the sum of the values of said output voltage sampled in step (a), (c) sampling the value of said output voltage, as represented by the output of said converter means, said predetermined number of times for one complete revolution of said one of said rollers when a single or multiple sheet is passing between said rollers, (d) storing a second digital value representative of the sum of the values of said output voltage sampled in step (c), and (e) subtracting said first digital value from said second digital value to produce a third digital value on the basis of which a determination is made of the number of sheets which passed between said rollers in step (c).

4,894,784

APPARATUS FOR DISPENSING MONEY ORDERS

Lawrence G. Smith, Orlando, Fla., assignor to Republic Money Orders, Inc., Dallas, Tex.

Continuation of Ser. No. 60,762, Jun. 8, 1987, which is a division of Ser. No. 877,539, Oct. 31, 1986, Pat. No. 4,699,532, which is a division of Ser. No. 596,291, Apr. 3, 1984, Pat. No. 4,625,275. This applicatioo Dec. 10, 1987, Ser. No. 132,661
Int. Cl.[4] G06F *15/30*
U.S. Cl. 364—479 **3 Claims**



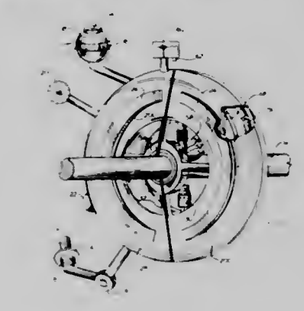
1. A system for dispensing money orders at at least one retail establishment comprising:
- a money order dispenser for dispensing money orders at a retail establishment;
- a digital processor for controlling the operation of the dispenser;
- a memory associated with the digital processor for storing the transaction data and control data;
- a printer with a compartment for storing blank money order forms and coupled to the money order dispenser for receiving a blank money order form from said compartment and printing alphanumeric indicia thereon;
- a host device remotely located from the retail establishment and coupled to the money order dispenser for management and control of the dispenser system;
- a data collector remotely connected to the money order dispenser for issuing a polling command; and
- means in the data collector for receiving transaction information from the money order dispenser upon issuance of said polling command.

4,894,785

HIGH VOLTAGE CONDUCTOR MOUNTED LINE POWERED MONITORING SYSTEM

Roosevelt A. Fernandes, 104 Ruby Rd., Liverpool, N.Y. 13088

Filed Sep. 11, 1987, Ser. No. 95,158
Int. Cl.[4] G06F *15/54*; G01W *1/14*
U.S. Cl. 364—483 **11 Claims**



1. A sensor module for monitoring the presence and magnitude of precipitation occurring closely adjacent to a high voltage electrical conductor, said module comprising in combination:
- (a) housing means mountable to and removable from said conductor while the latter is in an energized state;
- (b) sensor means mounted upon said housing means and operable to generate an electrical signal having a value commensurate with the presence and magnitude of precipitation on a portion of said housing means;
- (c) means mounted upon said housing means for encoding and processing said electrical signal for transmission as an RF signal;
- (d) transmitting means including a hot stick directionally adjustable transmitting antenna mounted on said housing for transmitting said RF signal to a selected orbiting satellite; and
- (e) power supply means mounted on said housing for operating said encoding and processing means and said transmitting means, said power supply means deriving power from said conductor.

4,894,786

SIGNAL PROCESSING METHOD FOR ANALYZING AUTORADIOGRAPH

Makoto Hara, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 31, 1987, Ser. No. 140,222
Claims priority, application Japan, Jan. 6, 1987, 62-897
Int. Cl.[4] G06F *15/42*; C12Q *1/68*; C12N *15/00*
U.S. Cl. 364—497 **8 Claims**

1. A signal processing method for analyzing an autoradiograph to identify locations of radioactively labeled substances on a support medium, said labeled substances being resolved in a pattern along a one-dimensional developing direction on the support medium by subjecting to digital signal processing digital image data including a plurality of signals of different levels and values obtained by placing the support medium and a radiographic film together in layers to record the autoradiograph of the radioactively labeled substances on said radiographic film as a visible image, and photoelectrically reading out the autoradiograph visualized on the radiographic film, wherein said digital signal processing includes the steps of:
- (a) dividing said digital image data into two or more blocks

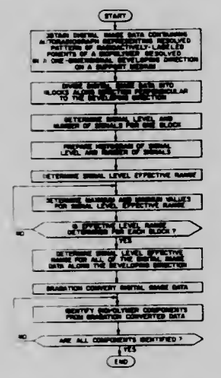
VOL 1110 ISS 3 JA 16 1990 UMI

along a direction perpendicular to the developing direction;

(b) determining the signal level and the number of signals for each of said blocks;

(c) preparing a histogram representative of the relationship between signal level and number of signals for each of said blocks.

(d) determining an effective range of signal level and the maximum value and the minimum value of said effective range of signal level from said histogram;



(e) determining an effective level range over all of the digital image data at every position along the developing direction on the basis of the effective level range determined for each block;

(f) using the effective level range determined in step (e), converting the digital image data to produce a gradation of digital signals dependent on the maximum and minimum signal values determined in step (d); and

(g) identifying the positions of the radioactively labeled substances on the support medium from the gradation converted digital signals produced in step (f).

4,894,787

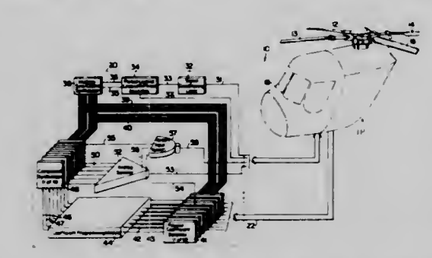
AUTOMATIC LOAD MONITORING SYSTEM WITH REMOTE SENSING

William G. Flannelly, South Windsor; Clifford T. Gunsallus, North Canton, both of Conn., and George F. Lang, Glen Rock, N.J., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Apr. 28, 1988, Ser. No. 187,227

Int. Cl.[4] G01M *7/00*

U.S. Cl. 364—508 **32 Claims**



8. An apparatus for use in generating, from a first set of signals measured in a first member indicative of a first member parameter, a relational set of signals equating with said first signal set a second set of signals indicative of said parameter as measured in a cooperative second member, said apparatus comprising:

means directly configured with the first member for measuring a signal set indicative of a first member parameter;

means directly configured with the second member for measuring a second signal set including signals indicative of said parameter;

a controller including

means for Fourier decomposing said first member signal set into signals corresponding to a selected time independent first Fourier coefficient signal set

means for Fourier decomposing said second member signal set into signals corresponding to a selected time independent second Fourier coefficient signal set;

said first and second Fourier coefficient signal sets corresponding to respective first and second mathematical vectors lying in a vector space with each of said signal sets mathematically configured into respective first and second matrices comprised of elements corresponding to Fourier coefficient signals thereof arranged in rows and columns,

said controller for computing, from said second Fourier coefficient signal set, a substantially independent signal subset thereof having a plurality of elements that substantially spans said mathematical vector space, and for generating a relational signal set comprised of a mathematical pseudo inverse of said substantially independent signal subset and said first Fourier coefficient signal set.

4,894,788

METHOD FOR POSITIONING A TOOL OF A MULTI-JOINT ROBOT

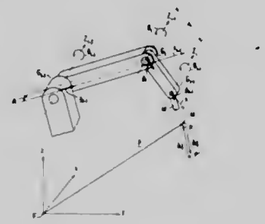
Joerg Stelzer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,371

Claims priority, application Fed. Rep. of Germany, May 4, 1987, 3714806

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—513 **1 Claim**



1. A method for positioning a tool of a multi-joint robot having a plurality of rotatable joints (G_{i-1}, G_i, G_{i+1}) defining robot joint axes, with one of the joints being connected to the tool and the location and the orientation of the tool being represented in a reference coordinate system and the respective position of the tool relative to the reference coordinate system and the angular positions of the robot joint axes being linked by a coordinate-transformation equation system having parameters which are determined by the desired distances and desired directions of the robot joints representing the ideal kinematic of the robot, comprising the following steps:

(a) determining a preliminary desired angular position (θ_{i-1}, θ_i, θ_{i+1}) for each of the joints, respectively, for a desired position in space ($\underline{x}$) of the tool based upon reference distances (a_{i-1}, a_i, a_{i+1} d_{i-1}, d_i, d_{i+1}) and directions of the joint axes required to position the tool in the desired position;

(b) determining the positioning error ($\Delta\underline{x}$) of the tool due to the difference between the reference distance (a_{i-1}, a_i, a_{i+1}, d_{i-1}, d_i, d_{i+1}) and the desired directions and the actual spacings and actual direction of the joints (G_{i-1}, G_i, G_{i+1});

(c) transforming the determined positioning error ($\Delta\underline{x}$) into corresponding angular correction values ($\Delta\theta$) for the preliminary desired angular positions (θ_{i-1},θ_i, θ_{i+1}) of the joints (G_{i-1}, G_i, G_{i+1}) by means of the inverse Jacobi matrix ($F\theta(\theta_i,F_{ref})^{-1}$) of the ideal kinematic of the robot of the coordinate-transformation equation system;

(d) calculating the error-corrected angular position (θ_f) for each of the joints (G_{i-1}, G_i, G_{+1}) by addition of the angular correction values ($\Delta\theta$) determined in step c) to the preliminary desired angular positions (θ_{i-1},θ_i, $\theta i+1$) determined in step a); and

(e) moving the tool to the desired position by rotating the joints in accordance with the error-corrected angular position (θ_f) calculated in step (d).

4,894,789

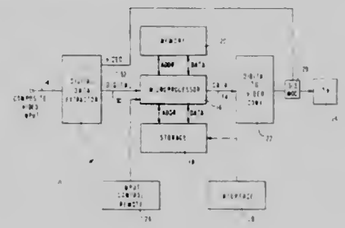
TV DATA CAPTURE DEVICE

Keen Y. Yee, 57 Ogden Ave., White Plains, N.Y. 10605

Filed Feb. 22, 1988, Ser. No. 158,592

Int. Cl.[4] H04N *7/10*

U.S. Cl. 364—521 **14 Claims**



1. A digital data capture apparatus used by a receiving party and operating in combination with a receiving tv set or monitor, comprising:

a tv set or monitor,

means associated with said tv set or monitor for receiving a composite video-digital signal, said signal including digital data having no addresses associated therewith,

an extraction circuit enabling the receiving party to extract selected digital data from said composite signal,

storage means for storing said selected digital data under control of instructions directed to a microprocessor,

memory means communicating with said microprocessor for storing programs, said selected digital data, and addresses therefor,

a microprocessor for receiving said selected digital data from said extraction circuit, said microprocessor communicating with said memory means and with said storage means for controlling the selected storage, retrieval, and display of said selected digital data, and

a digital-to-video converter for converting said selected digital data to video signals suitable for display on the screen of said tv set or monitor.

4,894,790

INPUT METHOD FOR REFERENCE PRINTED CIRCUIT BOARD ASSEMBLY DATA TO AN IMAGE PROCESSING PRINTED CIRCUIT BOARD ASSEMBLY AUTOMATIC INSPECTION APPARATUS

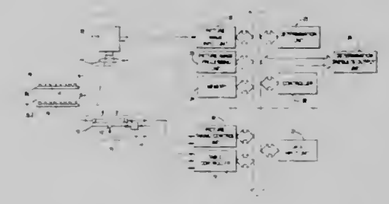
Teruhisa Yotsuya, and Hideaki Takahara, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 5, 1987, Ser. No. 11,481

Claims priority, application Japan, Feb. 5, 1986, 61-23294; Feb. 14, 1986, 61-31719

Int. Cl.[4] G06F *7/02, 15/20;* **G01N** *21/88, 21/91*

U.S. Cl. 364—552 **15 Claims**



1. A method for automatic inspection of printed circuit board assemblies having component parts mounted on a base printed circuit board by processing an image which is obtained from said base printed circuit board mounted with said component parts and by inputting reference printed circuit board assembly data to an inspection step in said method, said method comprising the steps of:

preparing a reference base printed circuit board with reference component parts mounted thereon in which the visual distinction between said reference base printed circuit board and said reference component parts is clear;

obtaining an image from said reference base printed circuit board mounted with said reference component parts;

processing said image to obtain said reference printed circuit board assembly data, which contains information of predetermined characteristics of said reference component parts;

storing said reference printed circuit board assembly data; and

inspecting said printed circuit board assemblies by obtaining an image therefrom, processing said image to obtain printed circuit board assembly data containing information of characteristics of the component parts mounted on said printed circuit board assemblies, inputting said reference printed circuit board assembly data and comparing the component part characteristics in the printed circuit board assembly data so obtained with the reference component part characteristics in the stored reference printed circuit board assembly data to determine acceptability of the printed circuit board assemblies,

wherein said reference base printed circuit board is arranged to have low visual brightness, while said reference component parts are arranged to have high visual brightness.

4,894,791

DELAY CIRCUIT FOR A MONOLITHIC INTEGRATED CIRCUIT AND METHOD FOR ADJUSTING DELAY OF SAME

Ching-Lin Jiang, Dallas, and William J. Podkowa, Plano, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Feb. 10, 1986, Ser. No. 828,230

Int. Cl.[4] H03K *5/13*

U.S. Cl. 364—570 **17 Claims**

1. A delay circuit fabricated in a monolithic integrated circuit, said delay circuit being adapted for receiving an input

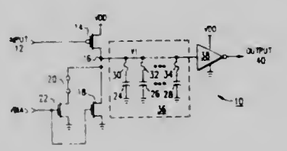
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signal and having a ground, an internal signal node, and an output node, comprising:

a. a plurality of capacitors;

b. a plurality of laser-fusible links equal in number to said capacitors, each of said laser-fusible links being electrically connected in series with a corresponding one of said capacitors between said ground node and said internal signal node;

c. an enhancement-made field effect transistor, connected to precharge said internal signal node to a first predetermined voltage when said input signal is at a first binary state;



d. an enhancement-mode field-effect transistor, connected the discharge said internal signal node to a second predetermined voltage when said input signal transitions to the binary logic opposite that of said first binary logic state; and

e. voltage detector means responsive to the voltage level of said internal signal node and coupled to said output node for generating an output signal on said output node to indicate when the voltage of said internal signal node has discharged to said second predetermined voltage;

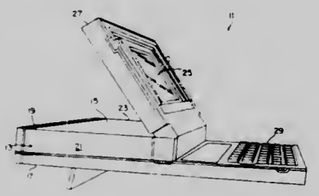
whereby an output signal is provided having a delay that is reducibly adjustable with respect to said input signal.

4,894,792

PORTABLE COMPUTER WITH REMOVABLE AND REPLACEABLE ADD-ON MODULES

Dennis R. Mitchell, San Jose; James R. Molenda, Fremont, and Karl S. Nakamura, Palo Alto, all of Calif., assignors to Tandy Corporation, Fort Worth, Tex.

Filed Sep. 30, 1988, Ser. No. 252,177
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **11 Claims**



1. A portable computer and plug-in modules constructed to permit add-on cards and add-on components in the modules to access the computer bus by direct plug-in of the modules to the computer without cabling and without altering the portability of the computer,

said portable computer comprising,

an outer case having a top, bottom, back and sides,

a main logic board mounted within the outer case,

bottom plug-in connector means connected to the main logic board and including a bottom plug-in connector extending through the bottom of the outer case for engagement with a related connector of a bottom add-on module,

said bottom add-on module comprising,

a frame support,

a power supply board mounted within the frame support,

an add-on card mounted within the frame support and operatively associated with the power supply board, and

an add-on module connector positioned to be directly connectable and disconnectable from said bottom connector without cabling,

said computer including a battery tray compartment within the back of the outer case for permitting a battery to be inserted into and remove from the computer,

a battery tray compartment plug-in board at the inner end of the battery tray compartment and having a plug-in connector operatively connected to the main logic board for providing general purpose access to the computer bus through said plug-in connector,

a removable, battery tray compartment, plug-in module comprising,

an outer housing having an outer configuration shaped to slide smoothly into and out of the battery tray compartment and having internal supports for a component board,

at least one compartment board supported within the outer housing and having a back connector and a front connector at opposite ends of the component board,

a back plate attached to the housing and having an opening for the back connectors of the plug-in board so that the back connector of the component board is directly connectable to and detachable from the connector on the plug-in board without cabling when the outer housing is inserted into and removed from the battery tray compartment,

a mass storage area opening within one side of the outer case for permitting general purpose access and particularly selected mass storage apparatus access to the computer bus,

a drawer board located at the inner end of the mass storage area and having a connector operatively connected to the main logic board for providing general purpose access to the computer bus through the connector,

a drawer carrier attached within the outer case of the computer in the mass storage area,

a plug-in drawer tray insertable in the drawer carrier,

a component board mounted within the tray and having a back connector and a front connector with the back connector located to be directly connectable to said connector on the drawer board, and

fasteners for locking the tray into the outer case of the portable computer after the tray has been inserted and the back connector of the component board has been connected to the connector on the drawer board,

whereby function cards, mass storage devices, communication devices, interface display devices, interface to instrumentation interfaces, interfaces to small servers (and any other part connectable to the computer bus) is incorporated in the portable computer by direct plug in of a module and without requiring redesign or change to the existing, internal component structure of the computer itself.

4,894,793

CALORIE CALCULATOR WITH MENU RETRIEVAL FUNCTION

Yutaka Ikemoto, and Akiyoshi Yamashita, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 30, 1985, Ser. No. 728,888
Claims priority, application Japan, May 10, 1984, 59-94367
Int. Cl.[4] G06F *15/42, 3/00, 13/00*
U.S. Cl. 364—709.03 **6 Claims**

1. A calorie calculator comprising:

keyboard means for manually controlling the operation of the calorie calculator;

said keyboard means comprises first menu item retrieval key means for selecting the heading letters of menu items, second menu item retrieval key means for selecting the names of menu items, and third menu item retrieval key means for presenting menu item data in reverse order;

memory means for storing a plurality of items of menu data and the corresponding calorie data;

retrieval means responsive to the operation of said keyboard means for retrieving a particular item of the menu data and the corresponding calorie data from said memory means; and

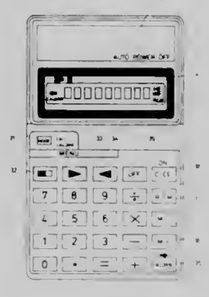
output means responsive to said retrieval means for outputting the particular item of the menu data and the corresponding calorie data.

6. A calorie counter comprising

keyboard means having a plurality of keys for carrying out different functions,

a mode selection key for selecting a first and a second mode of the calculator,

a first data memory operated only in the first mode,





a display means for displaying information,

a second data memory for storing the menu and the corresponding calorie data,

said second data memory is operated only in said second mode,

predetermined memory contents in the second data memory provided in succession to be selected in one or the opposite direction by actuating keys repeatedly for displaying said memory contents as information on said display means,

a further key is provided for summing up parts of the memory contents of different memory areas of said second data memory when actuating said further key, and

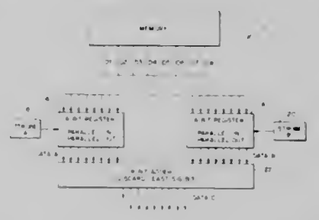
a character generator is provided for generating a display pattern on said display means corresponding to the particular memory contents.

4,894,794

SYSTEM FOR PROVIDING CONTINOUS LINEAR INTERPOLATION

Edwin K. Sbenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 15, 1985, Ser. No. 787,639
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—723 **8 Claims**



1. A system for continuously linearly interpolating intermediary binary numbers from a continuous stream of binary numbers, said system comprising:

a first register for receiving and storing one binary number at a time from the continuous stream of binary numbers;

a second register for receiving and storing one binary number at a time from the continuous stream of binary numbers;

averaging means connected to receive output binary numbers from said first and second registers for providing an output binary number equal to the average value of the binary numbers received from said first and second registers;

first means for strobing said first register so that said first register sequentially receives for storage therein binary numbers one at a time from said continuous stream of binary numbers and simultaneously outputs the stored binary number therefrom to said averaging means; and

second means for strobing said second register so that said second register sequentially receives for storage therein binary numbers one at a time from said continuous stream of binary numbers and simultaneously outputs the stored binary number therefrom to said averaging means, said first and second strobing means being coordinated with respect to each other so that each of said binary numbers from the continuous stream of binary numbers is simultaneously stored by both of said first and second registers during each respective one of a plurality of first succeeding time intervals and each pair of adjacent binary numbers from the continuous stream of binary numbers is stored, respectively, by said first and second registers during each respective one of a plurality of second time intervals alternating with said first time intervals, said averaging means operating to provide output binary numbers equal to the average value of said stored binary numbers during said first and second intervals, respectively, wherein the average values provided during said second intervals correspond to interpolated binary numbers.

4,894,795

HIGH-RESOLUTION TECHNIQUE FOR TIME-FREQUENCY SIGNAL ANALYSIS USING MODIFIED WIGNER-VILLE ANALYSIS

Harper J. Whitehouse, San Diego, Calif., and Boualem Boashash, Quunsland, Austria, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1987, Ser. No. 43,651
Int. Cl.[4] G06G *7/19*
U.S. Cl. 364—807 **39 Claims**

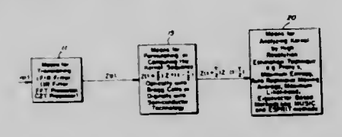
1. A method of improving the resolution of a linear FM

VOL 1110 ISS 3 JA 16 1990 UMI

signal $s(t)=a(t)\cos\Phi(t)$ where $\Phi(t)=2\pi(s_0t+\alpha t^2)$ and in which α is a chirp parameter comprising the steps of:

translating in translating means received linear FM signals $r(t)=\Sigma^N_{i=1}\ a_is(t-\tau_i)$ to an analytic signal of the form $z(t)=\Sigma^N_{i=1}\ a_i\Phi(t-\tau_i)$;

formulating in formulating means the analytic signal form $z(t)$ into a Wigner-Ville kernel sequence $z(t+\tau/2)z^*(t-\tau/2)$;



analyzing in analyzing means the frequency of the kernel sequence $z(t+\tau/2)z^*(t-\tau/2)$ by a high resolution estimation technique to provide a signal having an improved time/frequency representation; and

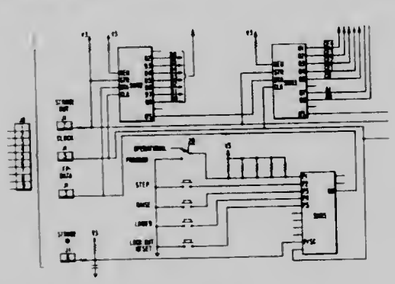
applying the improved time/frequency representation signal in an appropriate processing means to present a degree of resolution of an order of magnitude greater than a discrete Fourier transform implemented by a fast Fourier transform.

4,894,796

AUTOMATIC TRANSFER SWITCH WITH PROGRAMMABLE DISPLAY

Joseph C. Engel, Monroeville Boro, and James L. Lagree, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 17, 1986, Ser. No. 840,241
Int. Cl.[4] G06F *3/14*; G09G *3/00*
U.S. Cl. 364—900 **13 Claims**



1. Display apparatus, comprising:

M display means each with X parallel input ports for converting X bits of parallel input data to a display symbol;

first shift register means with X parallel output ports, a serial input port and a separate serial output port for receiving at said serial input port said X bits in series and for providing said X bits of serially entered data simultaneously, one each at each of said X parallel output ports;

second shift register means with N parallel output ports and a serial input port which is connected to said serial output port of said first shift register means for receiving N bits of serial data therefrom and for providing N bits of serially entered data simultaneously, one each at each of said N parallel output ports;

X bit parallel data bus means communicating with said X parallel output ports, and with said X parallel input ports of each of said display means for delivery of said X bits of parallel input data to all of said M display means simultaneously;

each of said M display means having a separate enabling means which is interconnected with a combination of said N parallel output ports for being enabled thereby to display said symbol as a function of the occurrence of a coded combination of enabling bits on said N parallel output ports; and

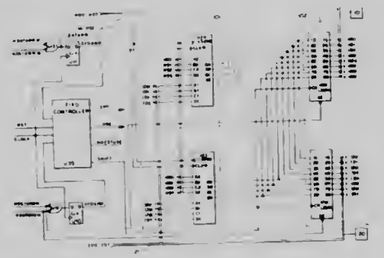
formatting means serially interconnected with said serial input port of said first shift register means or supplying a serial digital word of data comprising said N bits and said X bits in series to said first shift register means, wherein said N bits are serially passed therethrough to said second shift register means wherein said N bits contain only one coded combination of said enabling bits per said word for said N out ports so that only a predetermined one of said M display means is enabled per said digital word to display said symbol associated with said X bits.

4,894,797

FIFO DATA STORAGE SYSTEM USING PLA CONTROLLED MULTIPLEXER FOR CONCURRENT READING AND WRITING OF REGISTERS BY DIFFERENT CONTROLLERS

Patrick K. Walp, Peungrove, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 931,505, Nov. 17, 1986, abandoned. This application Jun. 16, 1988, Ser. No. 210,147
Int. Cl.[4] G06F *13/00, 13/10, 13/12*
U.S. Cl. 364—900 **2 Claims**



1. A data storage device for storage and retrieval of data by first and second control units, the data storage device comprising:

a first register comprising first data storage means, and means for multiplexing data between one of the first and second control units and the first data storage means;

a second register comprising second data storage means, the second data storage means comprising means for receiving data from the first data storage means, the second register comprising means for allowing data to be retrieved from the second data storage means by the first and second control units; and

a controller electrically connected to at least one of the first or second register and receiving a clock signal CLOCK, a read request SYDARD synchronized with the clock signal, a write request SYDAWR synchronized with the clock signal and a reset signal RESET; wherein the controller is operative to control the data transfer from the first register to the second register by means of a signal SHIFT and to output a register full status signal DRF and a register empty status signal; and wherein the signals CLOCK, SYDARD, SYDAWR, RESET, SHIFT, DRF, and DRE are generated in accordance with the following relations:

NOEXTUSE = (DRE* & DRF & SHIFT* & SYDAWR
NOEXTUSE & DRF & SHIFT
NOEXTUSE & DRE & DRF* & SHIFT* & SYDAWR*
DRE* & DRF & SHIFT & SYDARD* & SYDAWR*

-continued

NOEXTUSE* & DRE & DRF* & SHIFT & SYDARD* & SYDAWR*
NOEXTUSE & DRE* & DRF & SYDARD*);
SHIFT = (DRE* & DRF & SHIFT* & SYDAWR
NOEXTUSE & DRE* & DRF & SYDAWR
NOEXTUSE* & DRE & DRF & SYDAWR*
NOEXTUSE* & DRF & SYDARD* & SYDAWR
NOEXTUSE* & DRE & SHIFT & SYDARD & SYDAWR*);
DRE = (NOEXTUSE & DRE & DRF & SHIFT
DRE & DRF* & SHIFT*
NOEXTUSE* & DRF* & SHIFT* & SYDARD*
NOEXTUSE* & DRE & DRF* & SYDARD*
NOEXTUSE* & SHIFT* & SYDARD* & SYDAWR*
NOEXTUSE* & DRE & SYDAWR*); and
DRF = (DRE* & DRF & SHIFT*
NOEXTUSE & DRE* & DRF
NOEXTUSE* & DRF* & SHIFT* & SYDAWR*
NOEXTUSE* & DRF & SYDARD*
DRE* & DRF & SYDAWR*)

where # represents the boolean OR operation and & represents the boolean AND operation;

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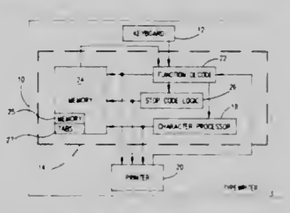
the controller operative to control a nonvirtual transfer of data from the first register to the second register such that data may be stored in the first register by one of the first and second control units while independently data is being retrieved from the second register by an other of the first and second control units and the data retrieved is a longest stored data in the data storage device.

4,894,798

AUTOMATIC STOP CODE INSERTION FEATURE FOR A WORD PROCESSING APPARATUS

Marguerite H. Doyle; Roger W. Early; Steven R. Myers; Terrence W. Ringle, and David R. Smith, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1986, Ser. No. 876,615
Int. Cl.[4] G06F *3/12*; B41J *21/16*
U.S. Cl. 364—900 **8 Claims**



1. A word processing apparatus comprising:

a keyboard for inputting first commands to said word processing apparatus to effect the printing of text and to control the storage of said text said keyboard further comprising means for inputting of second commands for controlling functions affecting printing operations of said apparatus;

a print means for forming an image on a record sheet upon command from said keyboard;

control means comprising means for storing codes representative of said text and parameters defining the formatting of said text;

said control means responsive to said keyboard and connected to said spring means for controlling said print means to print images corresponding to said first commands through the keyboard and to print text stored in said control means;

said control means comprising means for detecting changes in said functions and means for determining whether any said change in said functions requires operator intervention;

insertion means, responsive to said means for determining, for inserting into said stored text a stop code without operator action,

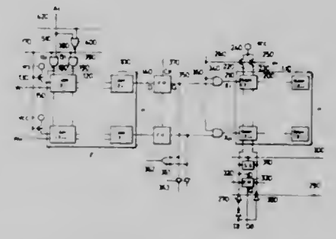
whereby when said text is played out said apparatus will respond to said stop code and interrupt playout operations pending said operator intervention.

4,894,799

CONTENT-ADDRESSABLE MEMORY

Makoto Hanawa, Kokubunji, and Takuichiro Nakazawa, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,942
Claims priority, application Japan, May 13, 1987, 62-114599
Int. Cl.[4] G11C *15/00*
U.S. Cl. 365—49 **7 Claims**



1. A content-addressable memory comprising;

a storage bit cell for holding a first data and a second data, these first and second datas being in opposite phases;

signal supplying means for supplying a first signal and a second signal, respectively, to a first data line and a second data line of the storage bit cell in response to an input signal, the first and second signals being in opposite phases;

comparison means for detecting a first relation between the first data stored in the storage bit cell and the first signal on the first data line supplied from the signal supplying means and a second relation between the second data stored in the storage bit cell and the second signal on the second data line supplied from the signal supplying means,

controlling means for controlling a potential of a word coincidence line based on the result of detecting by the comparison; and,

means for reading out information of the word coincidence line, wherein the signal supplying means has a means for dissolving the opposite phase relation between the first signal on the first data line and the second signal on the second data line in response to a control signal and the input signal.

4,894,800

RECONFIGURABLE REGISTER BIT-SLICE FOR SELF-TEST

Charles L. Hudson, Jr., Plymouth, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Sep. 23, 1988, Ser. No. 248,888
Int. Cl.[4] G11C *13/00*
U.S. Cl. 371—22.5 **16 Claims**

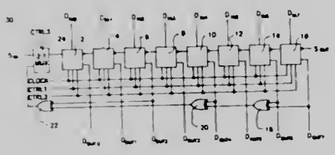
1. A register bit-slice, comprising:

(a) memory means for storing a bit, the memory means comprising an input for receiving a data signal; and

(b) front-end logic means, comprising:

(i) an output logically coupled to the input of the memory means;

(ii) control input means for receiving one or more control input signals;
(iii) first data input means for receiving a first data input signal;
(iv) second data input means for receiving a second data input signal;
(v) a current switch;
(vi) means for operating in a first operational mode by logically coupling the first data input means to the input of the memory means while switching at most one current switch along a signal path from the first data input means to the input of the memory means;



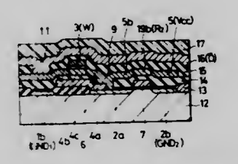
(vii) means for operating in a second operational mode by logically coupling the second data input means to the input of the memory means;
(viii) means for operating in a third operational mode by providing to the input of the memory means a logical function generated from the input signals received from the first and second data input means; and
(ix) means for selectively configuring to one of the operational modes based on the one or more control input signals.

4,894,801

STACKED MOS TRANSISTOR FLIP-FLOP MEMORY CELL

Ryuichi Saito, Tokyo, and Naohiro Momma, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1987, Ser. No. 77,176
Claims priority, application Japan, Aug. 1, 1986, 61-179969
Int. Cl.⁴ G11C *7/00, 11/40*
U.S. Cl. 365—154 **26 Claims**



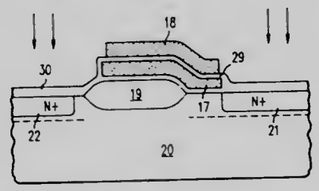
1. A semiconductor memory including a pair of driver MOS elements constituting a flip-flop, a pair of resistor elements and a pair of transfer MOS elements for address selection, comprising:
gate electrodes for said pair of driver MOS elements which are formed by respective first and second parts of a first-level polycrystalline silicon layer;
source and drain regions for said pair of transfer MOS elements for address selection which are disposed within a second-level polycrystalline silicon layer; and
gate electrodes for said pair of transfer MOS elements which are disposed in respective parts of a third-level polycrystalline silicon layer.

4,894,802

NONVOLATILE MEMORY CELL FOR EEPROM INCLUDING A FLOATING GATE TO DRAIN TUNNEL AREA POSITIONED AWAY FROM THE CHANNEL REGION TO PREVENT TRAPPING OF ELECTRONS IN THE GATE OXIDE DURING CELL ERASE

Steve K. Hsia, Saratoga, and Chan-Sui Pang, Sunnyvale, both of Calif., assignors to Catalyst Semiconductor, Inc., Santa Clara, Calif.

Filed Feb. 2, 1988, Ser. No. 151,379
Int. Cl.⁴ G11C *11/40*; H01L *29/79*
U.S. Cl. 365—185 **3 Claims**



1. A nonvolatile memory cell comprising:
a body of semiconductor material of first conductivity type;
source and drain regions of second conductivity type extending into said body from a surface;
a channel region extending to said surface between said source and drain regions;
a first layer of insulating material of a first thickness on said surface above said source, drain and channel regions;
a tunnel window insulation area included on said surface and within said first insulating material, said tunnel window insulation area having a thickness less than said first thickness and said tunnel window insulation area having a portion extending above a portion of said drain region and a portion extending above said surface of the body adjacent to said drain region;
a floating gate on said first layer of insulating material and over at least a portion of said tunnel window insulation area, said floating gate having one edge overlying a portion of said drain region with said overlying edge portion extending over said tunnel window insulation area thereby defining a floating gate to drain region tunnel area in which the floating gate is closer to said drain region than is the remaining portion of said floating gate edge overlying said drain region, said floating gate to drain tunnel area being positioned such that the distance from said source region to floating gate to drain tunnel area is greater than the shortest distance, measured across said channel region, between said source region and said drain region;
a second layer of insulating material covering said floating gate; and
a control gate on said second layer of insulating material overlying said floating gate.

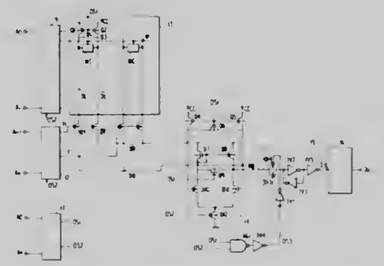
4,894,803

MEMORY CIRCUIT WITH IMPROVED DATA OUTPUT CONTROL

Shingo Aizaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,806
Claims priority, application Japan, Feb. 27, 1987, 62-45730
Int. Cl.⁴ G11C *7/00, 11/40*
U.S. Cl. 365—189.05 **7 Claims**

1. A memory circuit comprising a memory cell array having a plurality of memory cells arranged in a matrix form of rows and columns, row lines arranged in rows and column lines arranged in columns, precharge means coupled to said column lines for operatively precharging said column lines thereby setting said column lines at a predetermined potential, means for receiving address input signals, a sense amplifier having an input end and an output end, a selection circuit connected between said column lines and the input end of said sense amplifier for selectively transferring a signal at one end of said column lines to the input end of said sense amplifier in accordance with said address input signals, a latch circuit having an input end and an output end for holding a signal at the input end thereof, a transfer circuit connected between the output end of said sense amplifier and the input end of said latch circuit for operatively providing a signal path therebetween, an output circuit having an input end coupled to the output end of said latch circuit for generating an output signal, a control



signal generator coupled to said receiving means for generating first and second control signals when the level of at least one of said address input signals is changed, said second control signal being generated after the generation of said first control signal and terminated after the termination of said first control signal, first control means for enabling said precharge means in response to said first control signal, a second control means for enabling said sense amplifier in response to said second control signal, and a third control means for enabling said transfer circuit only when said second control signal is present and said first control signal is not present, whereby said memory cell array is first laid in a reset state in response to said first control signal in which said column lines are precharged and then laid in an enabled state in which read out signals from the memory cells are generated on said column lines after the termination of said first control signal under the presence of said second control signal.

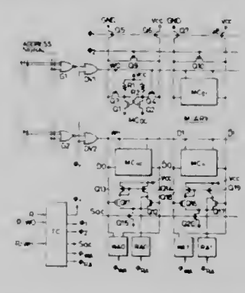
4,894,804

RESETTING ARRANGEMENT FOR A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING SEMICONDUCTOR MEMORY

Makio Uchida, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 860,411, May 7, 1986, Pat. No. 4,758,990. This application Jun. 28, 1988, Ser. No. 212,575
Claims priority, application Japan, May 7, 1985, 60-95487
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—190 **31 Claims**

1. A static memory comprising:
a plurality of static type memory cells which store data therein;
a plurality of word lines and a plurality of pairs of complementary data lines coupled to said plurality of memory cells so that each static type memory cell is coupled to a word line and a pair of complementary data lines; and
selecting means coupled to said plurality of word lines including decoder means responsive to address signals for selecting one of said plurality of word lines and further including simultaneous selection means responsive to a



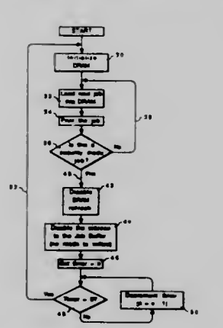
control signal for simultaneously bringing predetermined word lines into a selection state.

4,894,805

SECURITY PRINTER/COPIER

Russell L. Godshalk, Hilton, and Gary W. Shope, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1988, Ser. No. 187,135
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—222 **4 Claims**



1. In a copier/printer having a memory for storing job image data, the memory being of the type requiring periodic refresh to prevent degradation of stored data; the improvement comprising security means for disabling memory refresh for a time period sufficient to allow the data to degrade sufficiently to be unrecoverable in recognizable form.

4,894,806

ULTRASONIC IMAGING SYSTEM USING BUNDLE OF ACOUSTIC WAVEGUIDES

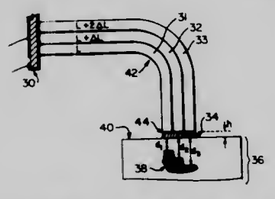
Cheng K. Jen, Brossard, and Gerald W. Farnell, Montreal, both of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Feb. 9, 1987, Ser. No. 12,279
Claims priority, application Canada, Apr. 3, 1986, 505801
Int. Cl.⁴ G03B *42/06*
U.S. Cl. 367—7 **7 Claims**

1. An ultrasonic imaging system for transmitting ultrasonic pulses into an object and detecting reflected ultrasonic waves from the object comprising:
electrical pulse generator means for producing electrical pulses;
transducer means for converting the electrical pulses to

ultrasonic pulses and also converting the reflected ultrasonic waves to electrical signals;

probe means for transmitting the ultrasonic pulses into the object and detecting the reflected ultrasonic waves from the object, the said probe means having a bundle of cladded acoustic waveguides, each of the acoustic waveguides having a core made of solid or a liquid material and a solid cladding thereabout, the bulk longitudinal and shear wave velocities of the material of the core being smaller than



those of the material of the cladding, and each of the said acoustic waveguides further having a different predetermined delay characteristic for introducing different delays in the ultrasonic pulses carried by each waveguide in that each of the said acoustic waveguides receives substantially only the reflected ultrasonic waves resulting from pulses transmitted by itself; and

display means for displaying acoustic discontinuities of the object in response to the electrical signals.

4,894,807

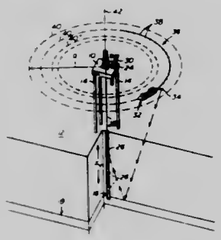
SIMULTANEOUS VERTICAL-SEISMIC PROFILING AND SURFACE SEISMIC ACQUISITION METHOD

M. Aftab Alam, Weybridge, England, and Akkas Manzur, Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 16, 1988, Ser. No. 152,969

Int. Cl.[4] G01V *1/20*

U.S. Cl. 367—15 **14 Claims**



4. A method of seismic exploration, comprising the steps of

(a) deploying at least one sensor in a borehole located at a predetermined depth;

(b) towing a seismic streamer cable behind a vessel steering a partial circle of predetermined radius and having an orbital focus located substantially above said borehole;

(c) generating seismic signals from a source associated with said vessel;

(d) receiving reflected seismic signals from said source at said at least one sensor located in said borehole while simultaneously receiving reflected seismic signals at s id streamer cable, said at least one sensor and said streamer cable providing an output indicative of the received seismic signals; and

(e) correlating the output indicative of the received seismic signals from a reflected subsurface horizon common to said at least one sensor and said streamer cable.

4,894,808

FLOW NOISE REDUCTION

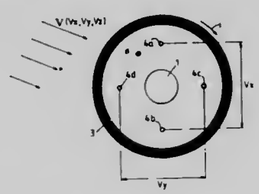
Mark Pedley, Cambridge, and William J. Fitzgerald, Madingley, both of England, assignors to The Marconi Company Limited, England

Continuation of Ser. No. 143,739, Jan. 13, 1988, abandoned. This application May 31, 1989, Ser. No. 359,220

Claims priority, application United Kingdom, Jan. 16, 1987, 8701067; Mar. 13, 1987, 8706076

Int. Cl.[4] G01V *1/36, 1/38*

U.S. Cl. 367—21 **5 Claims**



1. A method of reducing noise in the output signal of a pressure transducer, where the noise is caused by fluid flowing over the transducer, comprising the steps of:

(a) generating a pressure transducer output signal comprising both a wanted signal representative of an input acoustic signal to be detected, and an unwanted noise signal representative of fluid flow noise detected by said transducer;

(b) generating a fluid velocity noise signal representing the fluid velocity immediately adjacent said pressure transducer by providing a set of electrodes comprising two pairs of electrodes, each pair being spaced along a line perpendicular to a magnetic field, the line of one pair being perpendicular to the line of the other pair, so that the electric field induced by two perpendicular components of fluid flow is detectable;

(c) applying said fluid velocity noise signal to an adaptive filter to produce a corresponding fluid pressure noise signal according to an adaptive characteristic of said adaptive filter;

(d) subtracting said fluid pressure noise signal from said pressure transducer output signal to produce said wanted signal; and

(e) controlling said adaptive filter characteristic in dependence upon said wanted signal to minimize the error between said unwanted noise signal and said fluid pressure noise signal.

4,894,809

METHOD FOR BIN, MOVEOUT CORRECTION AND STACK OF OFFSET VERTICAL SEISMIC PROFILE DATA IN MEDIA WITH DIP

George P. Moeckel, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

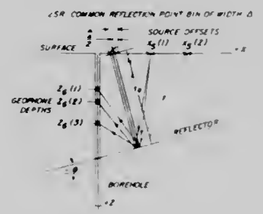
Continuation-in-part of Ser. No. 737,352, May 23, 1985, Pat. No. 4,802,146, and a continuation-in-part of Ser. No. 737,356, May 23, 1985, Pat. No. 4,802,147. This application Jun. 13, 1988, Ser. No. 205,767

Int. Cl.[4] G01V *1/36*

U.S. Cl. 367—57 **10 Claims**

1. A method for binning, moveout correcting and stacking vertical seismic profile data for a dipping media comprising the steps of:

(a) receiving vertical seismic profile data from an acoustic pulse receiver located in a borehole beneath the earth's surface and horizontally offset from any acoustic pulse generator on the surface causing acoustic pulses reflected from said dipping media to be received by said acoustic pulse receiver or receiving vertical seismic profile data from acoustic pulse receivers located on the earth's surface horizontally offset from a borehole containing an



acoustic pulse generator causing acoustic pulses reflected by said dipping media to be received by said acoustic pulse receivers located on the earth's surface;

(b) selecting zero source-receiver, common reflection point bins for said received vertical seismic profile data according to the following bin range criteria:

for $\theta > 0$, if $x_s(p) > z_G(k)\tan\theta$ $\quad z_G(k)\tan\theta < X < \frac{x_s(p) + z_G(k)\tan\theta}{2}$;

for $\theta > 0$, if $x_s(p) < z_G(k)\tan\theta$ $\quad \frac{x_s(p) + z_G(k)\tan\theta}{2} < X < a_G(k)\tan\theta$;

for $\theta > 0$, if $x_s(p) = z_G(k)\tan\theta$ $\quad X = x_s(p)$;

for $\theta < 0$, if $x_s(p) < z_G(k)/\tan|\theta|$: $z_G(k)\tan\theta < X < \frac{x_s(p) + z_G(k)\tan\theta}{2}$;

for $\theta < 0$, if $x_s(p) > z_G(k)/\tan|\theta|$: $\frac{x_s(p) + z_G(k)\tan\theta}{2} < X < x_s(p)$.

where

η = angle of dip for said media,

x = horizontal coordinate of VSP reflection loci,

x_s = source-wellhead offset distance on the surface,

z_G = the depth of the geophone in a borehole,

k = geophones 1, 2, . . . , k, and

p = shotpoints 1, 2, . . . , p;

(c) placing said received vertical seismic profile data in said zero source-receiver common reflection point bins determining a normal incidence two-way reflector time for said dipping media to provide boundaries for the time intervals of said zero source receiver common reflection point bins;

(d) moveout correcting said binned vertical seismic profile data;

(e) stacking said moveout corrected vertical seismic profile data in said zero source-receiver, common reflection point bins; and

(f) displaying said moveout corrected, zero source-receiver binned, vertical seismic profile data.

4,894,810

METHOD AND A DEVICE FOR MEASURING A DISTANCE BY MEANS OF ULTRASONIC PULSES

Esko H. Jukkala, Turku, Finland, assignor to Mikrovalmiste U.J. Pulkkanen Oy, Turku, Finland

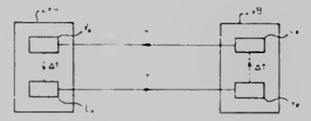
PCT No. PCT/FI87/00014, § 371 Date Sep. 4, 1987, § 102(e) Date Sep. 4, 1987, PCT Pub. No. WO87/04527, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 27, 1987, Ser. No. 99,920

Claims priority, application Finland, Jan. 28, 1986, 860394

Int. Cl.[4] G01S *3/80*

U.S. Cl. 367—118 **4 Claims**



1. A method for measuring a distance between two points by means of ultrasonic pulses, comprising the steps of:

(a) sending an ultrasonic pulse (USP_1) by means of a transceiver (LVA) positioned at a point of origin to a target point, whereby a counter (8) in the transceiver (LVA) is started;

(b) receiving said ultrasonic pulse (USP_1) by a transceiver (LVB) positioned at the target point, whereby a first predetermined delay time of the transceiver (LVB) is started;

(c) sending an ultrasonic pulse (USP_2) by the transceiver (LVB) to the point of origin after said first determined delay time is finished, whereby a counter (8) in the transceiver (LVB) is started;

(d) receiving said ultrasonic pulse (USP_2) by means of the transceiver (LVA) at the point of origin, whereby a second predetermined delay time of the transceiver (LVA) is started simultaneously, the counter (8) thereof is stopped, and the measuring result is displayed in the transceiver (LVA);

(e) sensing an ultrasonic pulse (USP_3) by the transceiver (LVA) to the target point after said second predetermined delay time of the transceiver (LVA) is finished whereby the counter (8) thereof is started;

(f) receiving the ultrasonic pulse (USP_3) by means of the transceiver (LVB) at the target point, whereby said first predetermined delay time of the transceiver (LVB) is started simultaneously, and the counter (8) thereof is stopped,

characterized in that

said first predetermined delay time is equal to said second predetermined delay time, and equal frequencies are used in the transceivers (LV_A, LVB), whereby

(g) in step (f) the measuring result is displayed also in the transceiver (LVB) positioned at the target point; and

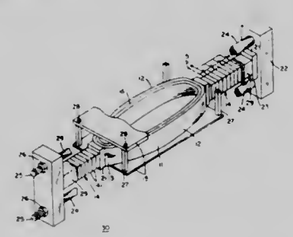
(h) the measuring is continued from step (c) until it is interrupted.

4,894,811

OUTBOARD-DRIVEN FLEXTENSIONAL TRANSDUCER

Raymond Porzio, Narragansett, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed May 18, 1987, Ser. No. 51,336
Int. Cl.[4] H04R *17/00, 15/00*
U.S. Cl. 367—174 **22 Claims**



1. A flextensional transducer comprising:
a compressible shell having an inner and outer surface;
an electromechanical drive in contact with the outer external surface of said shell; and
means for compressing said drive against said shell.

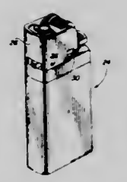
4,894,812

REMOVABLE AND REUSABLE CAP WITH TIMEPIECE FOR A MODIFIED DISPOSABLE CIGARETTE LIGHTER

Eddie M. Wood, 6322 N. 47th Ave., Glendale, Ariz. 85301

Filed Jun. 29, 1989, Ser. No. 372,774
Int. Cl.[4] G04B *27/00;* **F23Q** *2/32*
U.S. Cl. 368—10 **5 Claims**





1. A disposable cigarette lighter and disposable cigarette lighter cap comprising:
a disposable cigarette lighter;
a disposable cigarette lighter cap with timepiece, with cooperative means for holding said timepiece to said cap, and cooperative means for pivoting and holding said cap on said lighter in apparent integrated unity, and cooperative means for removing said cap from said lighter simply by pulling said cap from said lighter.

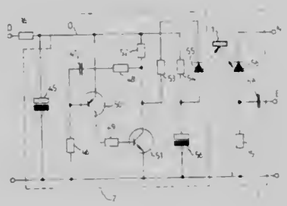
4,894,813

ALARM SHUT-OFF DEVICE, WITH A WAKE UP SIGNAL DELIVERING INTEGRATED CIRCUIT AND A RECEIVING AND SIGNAL SHAPING NETWORK

Lothar Pächer, Mainz, and Heinz Schiebelhuth, Frankfurt, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 199,155
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719087
Int. Cl.[4] G04C *21/16*
U.S. Cl. 368—256 **20 Claims**





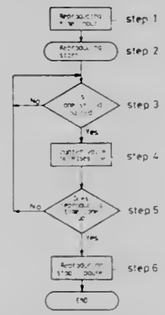
1. An alarm shut-off device, in particular for an alarm clock or timer, with a clockwork containing an integrated circuit which, when the clock time matches the alarm time, delivers a wake-up signal to a signal generator preferably configured as an electroacoustic transducer, with a receiving and signal shaping network which includes a receiver sensitive to radiation a filter amplifier, and a threshold switching stage for receiving and further processing a shut-off signal issued by the user of the clock, means responsive to said wake-up signal for connecting said receiving and signal shaping network to its voltage supply following which said receiving and signal shaping network processes said shut-off signal such that its application to an input of said integrated circuit causes said circuit to interrupt the delivery of said wake-up signal,
said receiving and signal shaping network further including a rectifier and differentiator stage, said rectifier and differentiator stage including rectifier circuitry and a differentiator connected subsequent to said rectifier circuitry, the output signal of said differentiator being determined by the variation with time of the radiation detected by said receiver.

4,894,814

OPTICAL DISC PLAYER WITH PAUSE FUNCTION IN RESPONSE TO ELAPSED PRESET MAXIMUM PLAYBACK TIME PERIOD

Jiro Yamada, Neyagawa; Susumu Kinoshita, Katano, and Haruhisa Tomoda, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 21, 1987, Ser. No. 52,331
Claims priority, application Japan, May 23, 1986, 61-119741
Int. Cl.[4] G11B *7/085*
U.S. Cl. 369—19 **4 Claims**



1. An optical disc player comprising:
input means for entering a desired reproducing time period during which an optical disc is to be reproduced and a start signal by which reproduction of said optical disc is started;
optical pick-up means for reading optical digital signals stored in said optical disc and for issuing electric digital signals corresponding to said optical digital signals;
memory means for storing said desired reproducing time period;
disc reproducing means for controlling the position of said optical pick-up means;
timer means for counting elapsed time from the start of the reproduction of said optical disc at receipt of said start signal from said input means; and
logic processing means for comparing said desired reproducing time period stored in said memory means with said elapsed time counted by said timer means, and for issuing a control signal to said disc reproducing means for stopping said optical pick-up means on a position where it is at in a pausing state when said elapsed time coincides with said desired reproducing time period; and
said logic processing means includes causing restarting said disc reproducing means for controlling the position of said optical pick-up means from said position where said optical pick-up means is stopped when another start signal is entered by said input means.

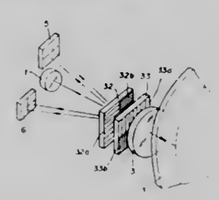
4,894,815

OPTICAL HEAD FOR READING INFORMATION FROM A MAGNETOOPTIC RECORDING MEDIUM

Yutaka Yamanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 175,978
Claims priority, application Japan, Apr. 1, 1987, 62-81571
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—112 **4 Claims**

1. An optical head for reading information from a magnetooptic recording medium, comprising:
a semiconductor laser device from which a light beam radiates;
an objective lens for focusing said light beam on said magnetooptic recording medium;
first and second optical gratings provided serially on a light axis of said light beam which is reflected from said magnetooptic recording medium, said first and second optical gratings diffracting said reflected light beam to supply first and second light beams having polarized components orthogonal to each other; and



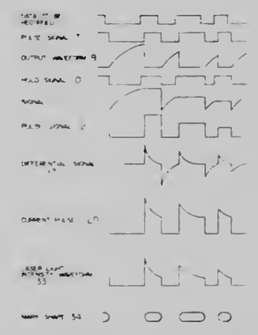
first and second photodetectors for detecting said first and second diffracted light beams to read information stored in said magnetooptic recording medium, and to detect tracking and focusing errors.

4,894,816

OPTICAL INFORMATION RECORDING APPARATUS

Hirofumi Sukeda, Kokubunji; Masahiro Ojima, Tokyo, and Atsushi Saito, Ichikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,803
Claims priority, application Japan, Feb. 12, 1987, 62-28248; Jun. 5, 1987, 62-139723
Int. Cl.[4] G01D *15/14;* **G11B** *21/10, 7/00*
U.S. Cl. 369—54 **15 Claims**



1. An optical information recording apparatus, in which binary information is recorded by irradiating recording medium with laser light pulses corresponding to pulses to be recorded so as to vary locally characteristics of the recording medium by thermal energy of the laser light pulses, comprising:
means for setting the light energy at the front and the rear end portions of said laser light pulse;
means for discriminating the interval between said pulses to be recorded; and
means for giving said means for setting the light energy a control signal controlling energy at the front end portion of each of said laser light pulses, depending on the output of said means for discriminating the interval.

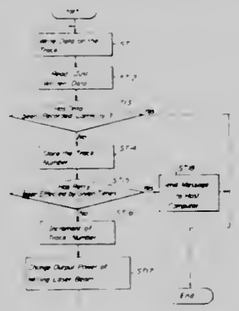
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4,894,817

METHOD OF WRITING DATA ON OPTICAL CARD BY PROJECTING THEREON INTENSITY MODULATED LIGHT BEAM

Hisakatsu Tanaka, Chofu; Takao Rokutan, Higashimurayama, and Nagahiro Gocho, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 10, 1988, Ser. No. 166,380
Claims priority, application Japan, Mar. 16, 1987, 62-59068
Int. Cl.[4] G11B *7/125*; G06K *5/00, 7/10*
U.S. Cl. 369—54 **14 Claims**



1. A method of writing data on an optical card having a record layer on which a number of tracks are formed, by projecting a writing light beam whose output power is modulated in accordance with the data to be recorded, comprising the steps of:

(1) first writing the data in a track of the optical card with the aid of a light beam having a predetermined output power;

(2) reading the data just written on the optical card to derive reproduced data;

(3) checking the reproduced data to confirm whether the relevant data has been written on the optical card correctly or not;

(4) upon confirming that the relevant data has not been correctly written on the card, changing the output power of the writing light beam in a stepwise manner;

(5) repeating the writing of the relevant data in a different track on the optical card, after the output power of the writing light beam has been stepwise changed;

(6) repeating steps (2), (3), (4) and (5) until a repetition of step (3) confirms that the relevant data has been correctly written on the optical card; and

(7) subsequently recording data on an optical card using the same output power of the writing light beam as used in the last repetition of step (5) which confirmed that the relevant data had been correctly written on an optical card.

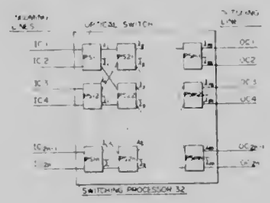
4,894,818

OPTICAL PACKET SWITCHING SYSTEM USING MULTI-STAGE COMBINATION OF LIGHT TRIGGERING SWITCHES

Masanobu Fujioka, Ohmiya, and Katsuyuki Utaka, Musashino, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,157
Claims priority, application Japan, Oct. 22, 1987, 62-265386
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **5 Claims**

1. An optical packet switching system for switching optical packets each of which an information part and a packet end code of optical signals and an optical routing signal of a wavelength-multiplexed optical signal, the optical packet switching system comprising a switching network receptive of the optical packets and formed by a multi-stage combination of light triggering switches turned ON or OFF depending on the presence or absence respectively of a predetermined wavelength of the routing signal in the wavelength-multiplexed optical signal.

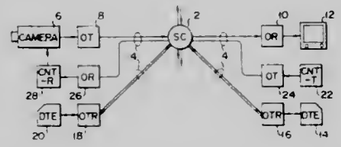


4,894,819

DATA TRANSMISSION METHOD IN OPTICAL STAR NETWORK AND OPTICAL STAR NETWORK SYSTEM FOR REALIZING THE SAME

Toshinori Kondo, and Takao Okikawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 7, 1988, Ser. No. 241,266
Claims priority, application Japan, Sep. 9, 1987, 62-225510; Sep. 14, 1987, 62-230001
Int. Cl.[4] H04J *3/26*
U.S. Cl. 376—4 **18 Claims**



1. An optical star network system wherein a first packet is transmitted between first and second terminals, which are functionally coupled to an optical star network, using a predetermined wavelength band in accordance with a CSMA/CD (Carrier Sense Multiple Access/Collision Detection) system, said optical star network system comprising:

generation means in a third terminal for generating a second packet having a predetermined bit length and including dummy data, a bit length of said dummy data being greater than a maximum bit length of said first packet which is transmitted before interruption of transmission of said first packet, when collision of said first and second packets occurs, the predetermined bit length of said second packet being not equal to an integer multiple of a bit length of a data unit of said first packet; and

transmission means for transmitting said second packet to a fourth terminal through a transmission path using said predetermined wavelength band.

4,894,820

DOUBLE-TALK DETECTION IN AN ECHO CANCELLER

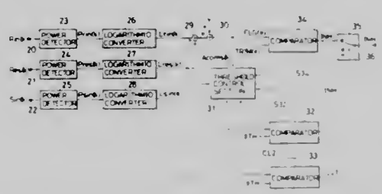
Ryoichi Miyamoto; Yoshio Itoh; Yoshikazu Nakano; Mitsuo Tsujikado, and Kenichiro Hosoda, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,487
Claims priority, application Japan, Mar. 24, 1987, 62-69589; Mar. 26, 1987, 62-72748; Jun. 30, 1987, 62-163654
Int. Cl.[4] H04B *3/23*
U.S. Cl. 370—32.1 **4 Claims**

1. A method of double-talk detection in an echo canceller that uses an adaptive digital filter to adaptively estimate, from a received signal and a transmitted signal to which an echo signal of the received signal is added, the characteristics of an echo path and generate an echo replica signal, and substracts this echo replica signal from the transmitted signal in order to transmit a residual signal from which the echo signal has been removed, and which during the course of this operation detects a double-talk state according to a double-talk detection threshold and inhibits the adaptive estimation by the adaptive digital filter, wherein:

a determination is made as to whether the received signal is active or idle and, if it is idle, the adaptive estimation by the adaptive digital filter is inhibited and the double-talk detection threshold is held constant;

if the received signal is active, a determination is made as to whether the echo signal is active or idle, and if the echo signal is idle, the inhibition of the adaptive estimation by the adaptive digital filter is cleared and the double-talk detection threshold is rapidly reduced;



if the received signal is active and the echo signal is active, the levels of the received signal and residual signal are determined, a margin is added to the difference between them, the result is compared with the double-talk detection threshold, and if the former is less than the latter, the double-talk state is detected and the adaptive estimation by the adaptive digital filter is inhibited, whereas if the former is greater than the latter, the single-talk state is detected and the inhibition of the adaptive estimation by the adaptive digital filter is cleared; and

the double-talk detection threshold is updated while the adaptive digital filter is estimating, in accordance with integration of its past values, the received signal, and the residual signal.

4,894,821

TIME DIVISION SWITCHING SYSTEM WITH TIME SLOT ALIGNMENT CIRCUITRY

Shin-Ichiro Hayano, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 28, 1987, Ser. No. 101,759
Claims priority, application Japan, Sep. 30, 1986, 61-233632; Jan. 7, 1987, 62-2240
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58.1 **26 Claims**

1. A time division switching system comprising:

a space switch;

a reference pulse generator for generating reference timing pulses at constant intervals;

means for controlling said space switch in response to said reference timing pulses;

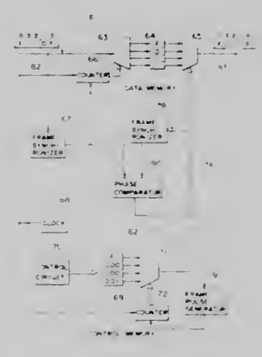
a plurality of input lines;

first and second variable phase pulse generators for generating first and second trains of variable phase timing pulses;

processing means for processing data signals on a first group of said input lines in response to the timing pulses of said first train to produce a first time division multiplexed (TDM) signal and processing data signals on a second group of said input lines in response to the timing pulses of said second train to produce a second TDM signal;

first and second highways for carrying said first and second TDM signals respectively to said space switch; and

timing control means for detecting time differences between said first and second variable phase timing pulses from said pulse generators and said reference timing pulses and



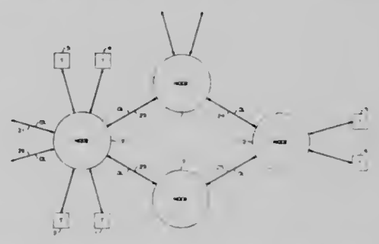
respectively controlling said first and second variable phase pulse generators in accordance with the detected differences so that the timing of each of said first and second TDM signals coincides with each other in said space switch.

4,894,822

FAST PACKETIZED DATA DELIVERY FOR DIGITAL NETWORKS

Rolfe E. Buhrke, Westchester; James A. Davis, Glen Ellyn, all of Ill., and Douglas A. Spencer, Boulder, Colo., assignors to AT&T Information Systems American Telephone and Telegraph Company, Holmdel, N.J.

Filed Nov. 24, 1987, Ser. No. 126,074
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **41 Claims**



1. In a data communication network comprising a plurality of data switching points, a method of transmitting packetized digital information from a source terminal to a destination terminal comprising the steps of:

responsive to a request for setting up a data connection from said source terminal to said destination terminal, selectively assigning to one of said plurality of data switching points in a data path between said source and said destination terminals a mode indicator; and

responsive to reception of said packetized digital information in said one of said plurality of data switching points of said data path, executing one of a plurality of sequences of program steps identified by said mode indicator for processing said packetized digital information.

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4,894,823

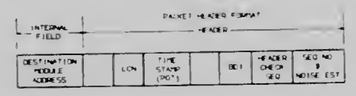
TIME STAMPING FOR PACKET SYSTEM NODES

Harry W. Adelmann, Neptune, and James D. Tomcik, Aberdeen, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 834,617, Feb. 28, 1986, abandoned. This application Sep. 11, 1987, Ser. No. 96,754

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **8 Claims**



1. Apparatus for measuring packet delay in a network node, the packet including a header having a time stamp field, the apparatus comprising,

means for generating a local time signal,

means for generating a packet originate time value representative of the difference between the local time signal value upon the packet entering the network node and a time stamp value from the packet header time stamp field, and

means for inserting said packet originate time value in the packet header time stamp field.

4,894,824

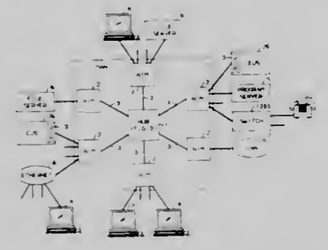
CONTROL NETWORK FOR A RAPID CONNECTION CIRCUIT SWITCH

Jayant G. Hemmady, Naperville; Michael J. Knudsen, Wheaton; Robert K. Nichols, Glen Ellyn; Gaylord W. Richards, Naperville, and Gary A. Roediger, Downers Grove, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,543

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—58.3 **12 Claims**



1. In a distributed control circuit switch, a method of sending requests from a plurality of requesters to a plurality of network controllers for controlling said switch comprising the steps of:

transmitting a request comprising an identity of an output link of said circuit switch from a requester to one of said plurality of network controllers and making resources of said requester unavailable;

testing for the availability of said output link in said one controller; and

when said testing step indicates that said output link is unavailable, transmitting an output link busy indication from said one controller to said requester for making said resources of said requester available.

4,894,825

FREQUENCY-DIVISION MULTIPLEX BROADBAND MULTIMEDIA NETWORK

Hiroshi Kobayashi, Tokyo; Hideaki Haruyama, and Kazuyoshi Ozawa, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 140,793, Jan. 5, 1988, abandoned. This application May 15, 1989, Ser. No. 353,141

Claims priority, application Japan, Jan. 12, 1987, 62-3324

Int. Cl.[4] H04J *1/00*; H04H *1/02*

U.S. Cl. 370—124 **11 Claims**



1. An information communication network comprising:

a head end;

a plurality of information transmission paths coupled through said head end;

a plurality of terminal devices respectively connected to said plurality of information transmission paths;

transmission path switches, at least one transmission path switch being connected to each of said plurality of information transmission paths, and switching between one transmission path corresponding thereto and another information transmission path;

wherein said network has a tree topology wherein a head end side corresponds to an upstream side and a terminal device side corresponds to a downstream side, and each of said transmission path switches comprises transmission path monitor means for monitoring one of said information transmission paths, and, when its transmission path is in an abnormal operating state, outputting a detection signal indicating so;

switch means, responsive to the detection signals from said transmission path monitor means, for connecting a portion of the corresponding information transmission path downstream of the corresponding transmission path switch to another information transmission path;

a current source for supplying a current to the downstream side of the information transmission path;

current value detection means for monitoring a current value from said current source, and outputting a detection signal upon detecting that the current value is below a predetermined value; and

second switch means, responsive to the detection signal from said current value detection means, for disconnecting the downstream portion of the information transmission path.

4,894,826

MESSAGE GENERATING COMMUNICATION APPARATUS HAVING A MESSAGE PREAMBLE FORMAT ALLOWING PARTS OF CERTAIN MESSAGES TO BE IGNORED

John R. Aggers, Apple Valley, and Roger R. Roth, Minnetonka, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

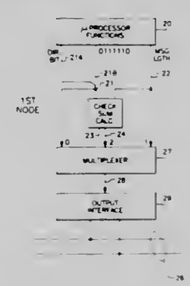
Filed Jan. 30, 1989, Ser. No. 303,417

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—85.1 **3 Claims**

1. In a communications network system of the type having a plurality of nodes all connected to a single data bus comprising an electrically conductive path, at least a first one of said nodes of the type for transmitting on the data bus to the other nodes electrical signals serially encoding a plurality of messages each

comprising a variable number of digits, each digit of which occupies a predetermined time interval, some of said messages including destination node addresses and message codes; and a plurality of second nodes each having a unique network address, and each having a processing element and an input interface element, said input interface element selectively supplying or denying to the processing element the messages transmitted on the data bus by the first node accordingly as a byte interrupt disable signal received by said interrupt interface element has respectively a first or second value, and responsive to equality between a destination node address within a message and a second node's network address, accepting the message and performing predetermined processing according to the message code, wherein the improvement comprises in each first node, preamble-generating apparatus for providing in each message sent by the node a preamble having a predetermined format signifying the presence of a message, comprising preamble generating means for providing a signal encoding the preamble and including in determined positions therein a sequence containing preselected preamble identification digits, a variable message type code which may have a plurality of values, the first of which specifying that the message is not directed to the second node, a message length value specifying the number of digits in the message, and a first redundancy value of a predetermined mathematical function of the numeric value of the preamble identification digits, the message type code, and the message length value; and wherein the improvement further comprises in each second node, apparatus receiving each message sent on the data bus, comprising



(a) preamble-detecting means connected to the input interface element, for receiving from the input interface element the signals on the data bus from the first node, and (i) for testing successive digit sequences encoded therein for equality to the identification digits, (ii) for using preselected preamble identification digits, a message type code, and a message length value from the successive digit sequences encoded therein to calculate a second redundancy value using the predetermined mathematical function and for testing the second redundancy value equal to the first redundancy value from the successive digit sequences, and (iii) for testing the variable message type code for equality to its first value, and responsive to equality in all three tests for a specific sequence of successive digits, for providing a preamble present signal having a second value and the message length value within said specific sequence, the preamble present signal having a first value otherwise; and

(b) timer means receiving the message length value and the preamble present signal from the preamble-detecting means for providing a digit interrupt disable signal to the input interface, said digit interrupt disable signal responsive to the preamble present signal having its second value for a duration corresponding to the message length value and its first value otherwise.

4,894,827

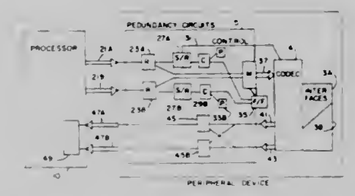
REDUNDANCY AND BUFFERING CIRCUITS

John Ramsay; Thomas Quellette, both of Herndon, and Richard N. Deglin, Reston, all of Va., assignors to International Telesystems Corporation, Herndon, Va.

Filed Mar. 2, 1988, Ser. No. 163,243

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—8.2 **12 Claims**



1. Redundancy and buffering circuit apparatus for connecting between peripheral devices and processors comprising first and second identical processor output buses, first and second identical receivers individually connected to the first and second output buses, a multiplexer having inputs and outputs, the multiplexer inputs being connected to outputs of the first and second receivers, and peripheral device inputs connected to the multiplexer outputs, first and second shift registers connected respectively to the first and second receivers, first and second comparators having strapped signals and connected respectively to the first and second shift registers, a flip-flop connected to the first and second comparators and to the multiplexer for receiving signals from the comparators and for controlling state of the multiplexer and for providing signals from the multiplexer outputs according to the received signals from the comparators.

4,894,828

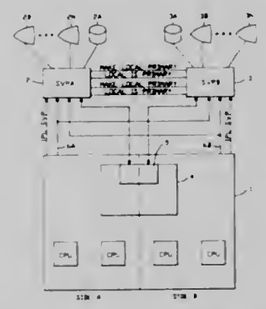
MULTIPLE SUP SWAP MECHANISM

Robert Novy, Redwood City; Richard Guyon, Mt. View, both of Calif., and Moreno A. Chimenti, Rome, Italy, assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Dec. 22, 1987, Ser. No. 136,409

Int. Cl.[4] G06F *11/20*

U.S. Cl. 371—11.3 **18 Claims**



9. In a data processing system having at least one main processor performing system tasks and a plurality of service processors, including a first service processor performing primary service functions and a second service processor performing secondary service functions, apparatus for providing service facilities from said service processors, comprising:

first means in said main processor for detecting a failure indication in said first service processor; and

second means responsive to said failure indication for trans-

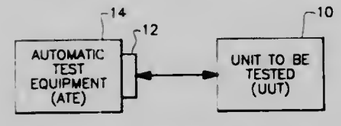
VOL 1110 ISS 3 JA 16 1990 UMI

ferring said primary service functions from said first service processor to said second service processor.

4,894,829
COMPREHENSIVE DESIGN AND MAINTENANCE ENVIRONMENT FOR TEST PROGRAM SETS

Vijaykumar S. Monie, Edina; Elaine N. Frankowski, Minneapolis; James A. Larson, Roseville; Stephen V. Metz, St. Paul; Mohammed Nasiruddin, St. Louis Park; Michael D. Reed, Minneapolis; Rose Mae M. Richardson, Roseville; Orvil E. Wilsey, Dayton, and William T. Wood, Crystal, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 21, 1988, Ser. No. 184,536
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—20.1 **6 Claims**



1. A source computer program for generating an object computer program for use in operating a particular automatic test equipment unit (ATE), said ATE being useable for testing a variety of electrical equipment type units each of which is referred to with relation to said ATE as a unit under test (UUT); said UUT being characterized by having labeled input, output and load terminals; said ATE being characterized by having a variety of power and signal stimuli resources with associated parameter values, a variety of sensor resources with associated parameter values, a variety of load applying resources with associated parameter values, and a computer facility which is programmable to apply parameter modified ones of said resources to selected ones of said terminals of said UUT to perform various desired tests on said UUT; said source program comprising:

lists of resources and respectively associated parameter values indexed relative to said resources of said ATE;

a database structure for storing data;

associated operational coding means for each of said resources of said lists to effect a programmed operation thereof;

interactive graphical facilities formatted to facilitate:

(1) selecting the identities of desired ones of said resources from said lists;

(2) selecting the identities of desired ones of said associated parameter values from said lists to define parameter modified ones of said resources;

(3) storing said identities of selected ones of said resources and selected ones of said parameter values in said database structure;

(4) selecting and storing in said database structure labels for said identities of said parameter modified resources corresponding to said UUT labeled input, output and load terminals;

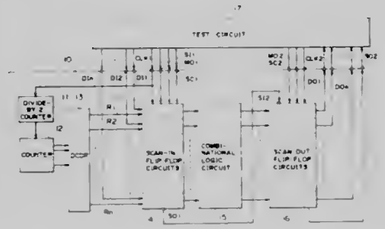
conversion program means for accessing data in said database structure and utilizing said data to automatically generate an object program for use in operating a particular ATE by incorporating therein said associated operational coding means for operating selected ones of said parameter modified resources; and

means for assembling and ordering said desired tests to form said object program.

4,894,830
LSI CHIP WITH SCANNING CIRCUITRY FOR GENERATING REVERSALS ALONG ACTIVATED LOGICAL PATHS

Masato Kawai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,069
Claims priority, application Japan, Jan. 17, 1987, 62-7442
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—22.3 **4 Claims**



1. An integrated circuit chip comprising:

scanning means for generating a scanning pulse at one of a plurality of terminals and successively shifting said scanning pulse from said one terminal to the next at clock intervals;

a plurality of first flip-flops respectively associated with said terminals;

a logic circuit having a plurality of inputs coupled respectively to outputs of said first flip-flops and a plurality of logical paths between said inputs thereof and a plurality of outputs thereof, said logical paths being activated when said first flip-flops assume a predetermined logic state;

a plurality of first data loading means respectively coupled between a respective one of said terminals and a respective one of said scan-in flip-flops, said data loading means being operable during a test mode for loading scan data into said first flip-flops to cause same to assume said predetermined logic state to thereby activate said logical paths and causing each of said flip-flops to momentarily change state in response to said scanning pulse, whereby successive reversals occur in the loaded scan data, resulting in propagation of a signal through each of said activated logical paths, said data loading means being further operable during a normal mode for loading normal data into said first flip-flops;

a plurality of second flip-flops; and

a plurality of second loading means respectively coupled between a respective one of said outputs of said logic circuit and a respective one of said second flip-flops for loading output data of said logic circuit into said second flip-flops and causing said second flip-flops to generate a serial output during said test mode and parallel outputs during said normal mode.

4,894,831
LONGITUDINALLY PUMPED LASER OSCILLATOR

Anthony J. Alfrey, Half Moon Bay, Calif., assignor to Spectra-Physics, San Jose, Calif.

Filed Sep. 7, 1988, Ser. No. 241,698
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—19 **11 Claims**

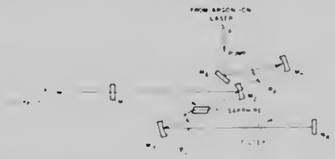
1. An apparatus for generating cavity mode, comprising:

a resonant cavity supporting a cavity mode along a resonant path, the cavity characterized by a segment of the resonant path in which the cavity mode is astigmatic;

a laser medium mounted within the segment of the resonant path so that a volume of the astigmatic cavity mode within the laser medium defines a cavity mode volume;

means, mounted with the resonant cavity, for supplying a pump beam having a wavelength different from the cavity mode;

astigmatic focusing means, mounted at a preselected angle of incidence with the pump beam, for focusing the pump



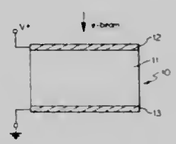
beam along a longitudinal axis to define a pumped volume in the laser medium, such that the best average match of the pumped volume and the cavity mode volume within the laser medium is achieved to thereby maximize output power from the laser medium; and

means, mounted with the resonant cavity, for abstracting energy from the cavity mode to produce an output beam.

4,894,832
WIDE BAND GAP SEMICONDUCTOR LIGHT EMITTING DEVICES

Sel B. Colak, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Sep. 15, 1988, Ser. No. 244,379
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **18 Claims**



1. Wide band gap, single conductivity type semiconductor light emitting device, the device having at least two electrodes and an active region between the electrodes, the active region including a carrier recombination region and comprising an essentially single crystal semiconductor compound of a single conductivity type selected from the group of II-VI and III-V semiconductor compounds and mixed compounds, characterized in that separate means for carrier introduction into the active region is provided, wherby in operation, application of a bias potential across the electrodes below that required for carrier multiplication by avalanche breakdown enables excitation of light emission by separate carrier introduction at a lower energy than would be required without the bias potential.

4,894,833
SURFACE EMITTING LASERS WITH COMBINED OUTPUT

Donald B. Carlin, West Windsor Township, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1988, Ser. No. 230,105
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **3 Claims**

1. A surface emitting semiconductor laser device for emitting an output light signal perpendicular to a major surface thereof, comprising:

a substrate having first and second opposing major surfaces;

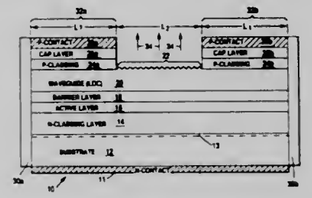
first contact means over said first major surface of said substrate;

first and second longitudinally spaced apart and laterally aligned laser regions defining a central region therebetween and said laser regions being disposed on said second major surface of said substrate;

an optical medium extending over the central region and the first and second laser regions through which light generated by the first and second laser regions propagates;

a capping laver and second contact means overlying the optical medium;

a single optical grating surface etched into the second contact means and the capping layer to extend over said



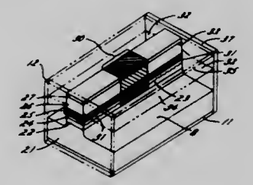
central region in optical communication with the optical medium to define said major surface of said laser device wherein the first and second laser regions are disposed on opposing sides longitudinally of the grating surface, said grating surface having grating periods for phase locking and combining the light propagations in the optical medium and generated by said first and second laser regions and for allowing said output light signal to be emitted therethrough perpendicular to said major surface of said laser device; and

wherein the first and second laser regions each comprise a plurality of laterally aligned phase-locked lasers disposed on said second major surface of said substrate with corresponding spaced-apart lasers of each of the first and second longitudinal laser regions being longitudinally aligned.

4,894,834
SEMICONDUCTOR LASER AND METHOD FOR PRODUCTION THEREOF

Syoichi Kakimoto; Masatoshi Fujiwara, and Syogo Takahashi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 9, 1989, Ser. No. 321,529
Claims priority, application Japan, Mar. 16, 1988, 63-64521
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **10 Claims**



1. A distributed feedback semiconductor laser comprising, in combination, an active layer associated on one side with a corrugated light guide and on the other side with a cladding layer, the cladding layer and corrugated light guide being of

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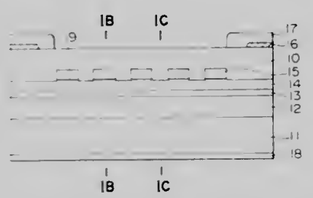
opposite conductivity types, the active layer being a multi-quantum well having alternating well and barrier layers, the active layer, light guide and cladding layers being formed into a stripe having a longitudinal axis perpendicular to the corrugations, and phase shift means in the active layer for introducing a phase shift, said phase shift means comprising a relatively small length of the active layer stripe in which the multi-quantum well is disordered by impurity diffusion thereby altering the propagation constant in the disordered length.

4,894,835

SURFACE EMITTING TYPE SEMICONDUCTOR LASER

Kazuhisa Uomi, Hachioji; Shinji Tsuji, Saitama; Makoto Okai, Koganei; Shinji Sakano, Hachioji, and Naoki Chinone, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,870
Claims priority, application Japan, Sep. 30, 1987, 62-243730
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **12 Claims**



1. In a semiconductor laser of the surface emitting type comprising:

a substrate; and

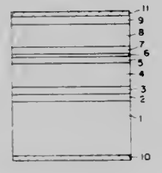
a plurality of semiconductor layers stacked on the substrate, wherein the semiconductor layers include a light emitting region which has a plurality of strips regions and gap regions each placed between adjacent stripe regions, the stripe regions being optically coupled to each other through the gap regions, an active region which radiates light, and two semiconductor layers with smaller refractive indexes than the active region located above the below the active region; the light emitting region has 2N-th order gratings where N is an integer, wherein the grating is formed in at least one of the two layers above and below the active region.

4,894,836

SEMICONDUCTOR DEVICE

Toshiro Hayakawa, Nara; Takahiro Suyama; Masafumi Kondo, both of Tenri, and Kosei Takahashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 24, 1988, Ser. No. 159,797
Claims priority, application Japan, Feb. 24, 1987, 62-42258
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **2 Claims**



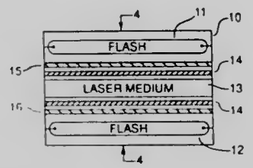
1. In a semiconductor device using the quantum effect of one dimension, said device comprising a substrate, a first electrode formed under said substrate, a device structure selected from a quantum well structure, a superlattice structure, and a modulation-doped heterostructure disposed on said substrate, and a second electrode formed on said device structure, the device wherein said quantum effect of one dimension based on said device structure arises in the direction vertical to the plane of said substrate on which said device structure is disposed, and wherein the plane of said substrate is substantially the (111) plane, where said quantum well structure comprises successively a first cladding layer, a quantum well layer having a thickness of about 100 Å or less, and a second cladding layer; said superlattice structure including a multiple well structure comprises a first cladding layer, a multi-layered well layer comprising alternate layers of well layers and barrier layers having a thickness of about 200 Å or less formed on said first cladding layer, and a second cladding layer formed on said multi-layered well layer; and said modulation-doped heterostructure comprises an undoped layer of a first semiconductor, an undoped spacing layer of a second semiconductor having a thickness of about 200 Å or less formed on said undoped layer, and a doped carrier supplying layer of the second semiconductor formed on said undoped spacing layer.

4,894,837

ABSORBING FILTER IN PUMP CAVITY FOR CONTROL OF BEAM QUALITY

John C. DiFonzo, San Mateo County, and Bertram C. Johnson, Sunnyvale, both of Calif., assignors to Spectra-Physics, San Jose, Calif.

Filed Nov. 18, 1988, Ser. No. 273,210
Int. Cl.⁴ H01S *3/93*
U.S. Cl. 372—72 **37 Claims**



1. An apparatus for amplifying coherent radiation propagating along an optical path, comprising:

a laser medium mounted along the optical path, the medium exhibiting thermally induced distortions;

a flash lamp, mounted adjacent the laser medium outside of the optical path to provide laser pumping radiation for the laser medium, the lamp having an output spectrum characterized by a first band with low fluorescence efficiency in the laser medium, and a second band with high fluorescence efficiency in the laser medium;

a filter mounted between the flash lamp and the laser medium for absorbing the first band of the output spectrum of the lamp to control the thermally induced optical distortions in the laser medium while transmitting the second band; and

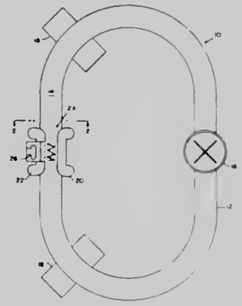
a pump cavity enclosing the laser medium, flash lamp and filter with a liquid cooling medium flowing through the cavity to remove heat; wherein the filter includes a coating resistive to the cooling medium.

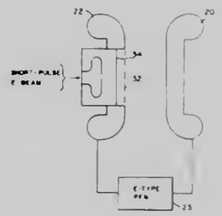
4,894,838

ELECTRON BEAM PREIONIZATION OF A HIGH PRESSURE SELF-SUSTAINING GAS LASER

Robert Kraft, 79 Glenmere Cir., Reading, Mass. 01867, and Victor H. Hasson, 12 Madison Ave., West, Winchester, Mass. 01890

Filed Oct. 19, 1988, Ser. No. 259,687
Int. Cl.⁴ H01S *3/03*
U.S. Cl. 372—86 **8 Claims**





1. In a high pressure self-sustained laser having a gaseous medium, an endless duct for containing said gaseous medium, heat exchangers disposed adjacent said duct for cooling said gaseous medium, and blower means disposed to circulate said gaseous medium through said duct, the improvement comprising:

(a) electrode means comprising an anode and a cathode disposed parallel to each other within opposite walls of said duct for exciting the atoms and molecules of said gaseous medium to cause it to lase and to generate a laser beam along an optical axis; and

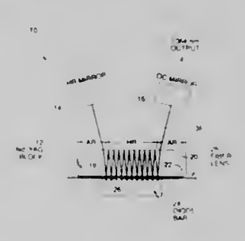
(b) an electron beam transfer disposed adjacent one of said electrodes outside of said duct for transmitting a short-pulse electron beam perpendicularly through one of said electrodes to preionize the gaseous medium between said electrodes, said electron beam also being transmitted perpendicularly to said optical axis of the laser beam generated by said laser.

4,894,839

HIGH EFFICIENCY MODE-MATCHED SOLID-STATE LASER WITH TRANSVERSE PUMPING

Thomas M. Baer, Mountain View, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Continuation of Ser. No. 103,557, Sep. 30, 1987, which is a continuation-in-part of Ser. No. 35,530, Apr. 7, 1987, which is a continuation-in-part of Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056. This application Aug. 11, 1988, Ser. No. 231,192
Int. Cl.⁴ H01S *3/081*
U.S. Cl. 372—93 **25 Claims**



1. A mode matched diode pumped solid state laser, comprising:

a block of laser material having a pair of opposed sides,

adjustable cavity forming means positioned around the block to define a laser cavity having a tightly folded zig-zag resonator portion within the block between the opposed sides having vertices at an adjustable preselected fold angle,

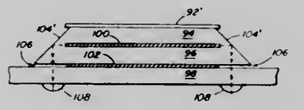
a plurality of laser diode pumping sources positioned adjcent to at least one of the opposed sides and substantially aligned with the vertices of the zig-zag portion of the resonator the fold angle being steep, and selected to substantially match the mode volume in the cavity with diverging pump radiation from said laser diode pumping sources.

4,894,840

SURFACE EMITTING LASER

Zong-Long Liau, Arlington, and James N. Walpole, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 109,945, Oct. 19, 1987, Pat. No. 4,784,722, which is a continuation of Ser. No. 693,207, Jan. 22, 1985, Pat. No. 4,718,070. This application Jun. 27, 1988, Ser. No. 211,888
The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—108 **16 Claims**



1. In a surface emitting laser, the improvement comprising:

(a) an active region formed in a semiconductor body extending longitudinally in a plane to a light emitting edge at the end of said region;

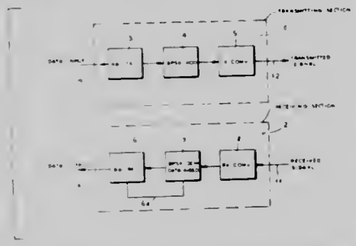
(b) a smooth light reflective surface in said body opposite said edge for redirecting light emitted from said edge in a direction normal to said active region;

(c) a lens formed in said body in the path of said redirected light for collimating said light.

4,894,841
DIGITAL DIRECT-SEQUENCE SPREAD-SPECTRUM MODEM

Francesco Martinino, Campobasso; Andrea Pagnaloni, and Maurizio Tripodi, both of Rome, all of Italy, assignors to Selenia Spazio S.P.A., L'Aquila, Italy

Filed Jun. 23, 1988, Ser. No. 210,725
Claims priority, application Italy, Jun. 26, 1987, 48114 A/87
Int. Cl.[4] H04L *9/00*
U.S. Cl. 375—1 **11 Claims**



1. A digital direct-sequence spread-spectrum modem comprising:

a transmitting section having an information input and a transmitted-signal output and, between said information input and said transmitted-signal output, in sequence:

a base band transmitter including a base band code generator for translation of an input data sequence generated by an external source connected to said information input into a coded signal sequence to be transmitted,

a BPSK modulator connector to said base band transmitter for digital BPSK modulation of said coded signal sequence to be transmitted, and

a frequency shifter connected to said BPSK modulator for shifting the BPSK modulated coded signal sequence to be transmitted from a carrier frequency to a standard intermediate frequency; and

a receiving section having a received-signal input and an information output and, between said received-signal input and said information output, in sequence;

a frequency shifter connected to said received signal input for shifting a standard intermediate frequency of a received signal to a carrier frequency for spread spectrum operation,

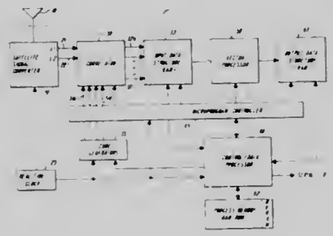
a BPSK data-aided demodulator fully under microprocessor algorithm control connected to the frequency shifter of said receiving section for direct coherent demodulation of the received signal to a BPSK standard, and

a base band processor connected to said BPSK data-aided demodulator for extracting a data sequence from the demodulated received signal and delivering said data sequence to said information output, said receiving section being provided with microprocesor means controlling carrier code recovery clock and data extraction correlation in accordance with microprocessor control algorithms wholly digitally.

4,894,842
PRECORRELATION DIGITAL SPREAD SPECTRUM RECEIVER

Paul V. Broekhoven, Needham; Daniel Fitzmartin, Newton; Paul Blasche, Arlington; Duncan B. Cox, Jr., Manchester, and Triveni Upadhyay, Burlington, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Boston, Mass.

Filed Oct. 15, 1987, Ser. No. 108,922
Int. Cl.[4] H04K *1/02*
U.S. Cl. 375—1 **7 Claims**



1. A direct sequence spread spectrum RF receiver for receiving and processing an RF signal having plural modulated channel component RF signals broadcast from plural sources, each channel component RF signal being a spread spectrum signal modulated in accordance with channel code, wherein the receiver comprises

A. means for receiving said plural component RF signals and forming from said component RF signals a linear composite RF signal,

B. baseband converter means for converting said linear composite RF signal to a baseband signal,

N-bit digitizing means for converting said baseband signal to a succession of N-bit digital signals at a sampling frequency, each digital signal being representative of a corresponding value of said baseband signal,

D. code generator means for generating a plurality of offset local code signals,

E. a correlator for correlating said N-bit digital signals with said plurality of offset local code signals and for producing plural digital signal/code correlation signals, each said signal/code correlation signal being representative of the correlation of said N-bit digital signal with a local code signal having a different offset, and

F. tracking means responsive to said correlation signals for tracking the code state and carrier of a component of said baseband signal derived from a modulated channel component RF signal broadcast from a single source.

4,894,843
DATA COMMUNICATION SYSTEM

Takehiro Yoshida, and Takuji Nakatsuma, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

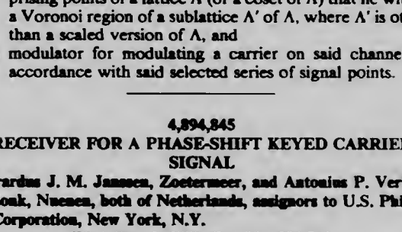
Filed Oct. 6, 1986, Ser. No. 915,430
Claims priority, application Japan, Oct. 7, 1985, 60-221882; Oct. 25, 1985, 60-239037; Aug. 14, 1986, 61-191482
Int. Cl.[4] H04N *1/21, 1/32*
U.S. Cl. 375—8 **16 Claims**

1. A data communication apparatus comprising:

data communication means for performing data communication;

calculation means for calculating a time required for the completion of the data communication on the basis of the amount of data to be communicated by said data communication means; and

display means for displaying the remaining time required for completing the data communication for the data which is then being processed by said data communication means



in response to the time calculated by said calculation means.

4,894,844
SIGNAL CONSTELLATIONS

George D. Forney, Jr., Cambridge, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Jun. 12, 1987, Ser. No. 62,497
Int. Cl.[4] H04L *27/04*
U.S. Cl. 375—42 **18 Claims**

1. Apparatus for communicating data over a channel comprising

an encoder for selecting a series of signal points from a constellation of available points, said constellation comprising points of a lattice Λ (or a coset of Λ) that lie within a Voronoi region of a sublattice Λ′ of Λ, where Λ′ is other than a scaled version of Λ, and

a modulator for modulating a carrier on said channel in accordance with said selected series of signal points.

4,894,845
RECEIVER FOR A PHASE-SHIFT KEYED CARRIER SIGNAL

Gerardus J. M. Janssen, Zoetermeer, and Antonius P. Verlijsdonk, Nuenen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1988, Ser. No. 201,512
Claims priority, application Netherlands, Jun. 2, 1987, 8701290
Int. Cl.[4] H03D *3/22*
U.S. Cl. 375—83 **2 Claims**

1. A receiver for a passband signal generated by a phase-shift keying of a carrier in accordance with a data signal of a predetermined symbol rate 1/T, the receiver comprising:

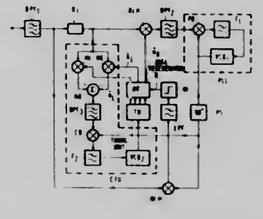
demodulation means for demodulating said received passband signal and thereby producing a demodulated data signal;

regeneration means coupled to said demodulation means for regenerating said demodulated data signal with the aid of a local clock as provided by a local clock generator and thereby producing a regenerated data signal; and

carrier recovery means coupled to said demodulation means, which comprises a phase-locked loop having a local carrier generator for providing a local carrier, and a first remodulator for phase-shift keying of said received passband signal in accordance with said regenerated data signal and thereby producing a carrier component as an input signal for said phase-locked loop;

a local clock generator connected to the regeneration characterized in that,

said regeneration means produces a delayed and advanced versions of the regenerated data signal with a delay and an advance, respectively, relative to the regenerated data signal, over a time interval Δ less than symbol interval T, and

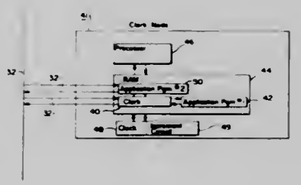


said receiver also includes means responsive to said received passband signal and said local carrier for generating a baseband control signal for said local clock generator, said baseband control signal being representative of the difference between the correlation function of the data signal inherent to said received passband signal with said delayed version of the regenerated data signal and the correlation function of the data signal inherent to said received passband signal with said advanced version of the regenerated data signal, said local clock generator, in response to said baseband control signal, providing said local clock to said regeneration means so that said regenerated data signal is in synchronism with said data signal which is inherent to said received passband signal applied to said first remodulator.

4,894,846
METHOD FOR MAINTAINING A CORRECT TIME IN A DISTRIBUTED PROCESSING SYSTEM

Michael Fine, Cambridge, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1988, Ser. No. 213,746
Int. Cl.[4] H04L *7/04*
U.S. Cl. 375—107 **43 Claims**



41. A time provider node in a distributed processing system containing a plurality of interconnected server nodes, the time provider node maintaining a correct time and comprising:

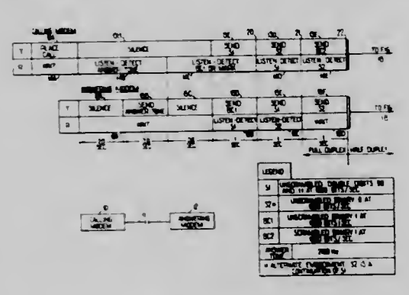
VOL 1110 ISS 3 JA 16 1990 UMI

a memory;
a local clock keeping a local time having an associated inaccuracy;
increment circuit means connected to said local clock for causing said local time to increase periodically;
external time source interface means for receiving an external time value from an external time source;
means, connected to the external time source interface means and executing instructions stored in the memory, for ascertaining an inaccuracy of the external time source;
means, connected to the ascertaining means and executing instructions stored in the memory, for calculating a correct time, including the external time value and an interval reflecting the inaccuracy of the external time source, from said external time value and said inaccuracy of said external time source; and
means connected to said calculating means and executing instructions stored in the memory for adjusting the local time kept by said local clock according to said calculated correct time.

4,894,847
HIGH SPEED HALF DUPLEX MODEM WITH FAST TURNAROUND PROTOCOL

Tarana Tjahjadi, Duluth; German E. Correa, Alpharetta; Matthew F. Easley, Lilburn; John N. Martin, Atlanta; Charles H. McCorvey, Jr., Dunwoody; Randy D. Nash, Dacula; Cynthia A. Panella, Alpharetta; Michael L. Rubinstein; Martin H. Sauser, Jr., both of Atlanta; David F. Strawn, and George R. Thomas, both of Marietta, all of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed May 26, 1987, Ser. No. 54,419
Int. Cl.[4] H04L *23/00*
U.S. Cl. 375—121 **54 Claims**

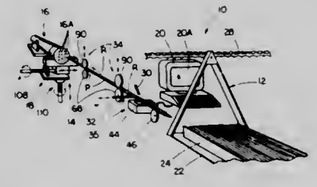


1. A V.22 bis compatible handshake method for an originating modem for establishing communications with an answering modem at a selected speed of 1200 bits per seconds (bps), 2400 bps, or greater than 2400 bps, comprising:
(a) said originating modem sending a first sequence for a first predetermined period;
(b) said originating modem sending a second sequence for a second predetermined period while listening for said first sequence from said answering modem;
(c)
(1) if said first sequence from said answering modem was not heard by said originating modem, said originating modem commencing communications with said answering modem at 1200 bps;
(2) if said first sequence from said answering modem was heard by said originating modem, said originating modem sending a third sequence for a third predetermined period while listening for said second sequence from said answering modem;
(d)
(1) if said second sequence from said answering modem was not heard by said originating modem, said originating modem continuing to send said third sequence for an additional period of time and then commencing training and communications with said answering modem at 2400 bps; and
(2) if said second sequence from said answering modem was heard by said originating modem, said originating modem commencing training and communications with said answering modem at a speed greater than 2400 bps.

4,894,848
AUTOMATED NUCLEAR FUEL ROD PATTERN LOADING SYSTEM

David V. Lambert, St. Matthews; Theodore W. Nylund, Columbia; John W. Byers, West Columbia; Damon E. Haley, Jr., Sumter, and Joseph V. Cioffi, Cola, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1988, Ser. No. 247,181
Int. Cl.[4] G21C *21/00*
U.S. Cl. 376—261 **22 Claims**



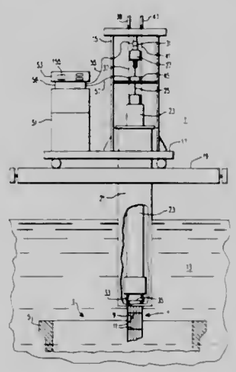
17. Apparatus for loading fuel rods in a desired pattern, comprising:
(a) a carrousel having a plurality of movable gondolas for stocking thereon fuel rods of known enrichments;
(b) an elongated magazine defining a matrix of elongated slots being open at their forward ends for receiving fuel rods;
(c) a workstation defining a fuel rod feed path and including
(i) means for receiving successively one at a time along said feed path fuel rods from selected ones of said gondolas of said carrousel and verifying the identity of the fuel rods,
(ii) means for feeding successively one at a time along said feed path the verified fuel rods into selected ones of the slots in said magazine, and
(iii) means disposed along the feed path between said fuel rod identity verifying means and said fuel rod feeding means for movement between blocking and unblocking positions relative to the feed path to respectively prevent passage of a fuel rod to said feeding means until the identify of the fuel rod is verified as correct and to allow such passage of the fuel rod after such verification is made; and
(d) an holder and indexing mechanism for movably supporting said magazine and being actuatable for moving the magazine along X-Y axes to successively align one at a time selected ones of said slots with said feed path for loading in said magazine the successive fuel rods in a desired enrichment pattern.

4,894,849
APPARATUS AND METHOD FOR TRANSFERRING NUCLEAR REACTOR FUEL ASSEMBLIES

Thomas L. Robosky, West Mifflin; Kenneth J. Swidwa, N. Versailles, and James R. Marshall, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1988, Ser. No. 252,218
Int. Cl.[4] G21C *19/10*
U.S. Cl. 376—268 **18 Claims**

9. Apparatus for transferring fuel assemblies to and from a nuclear reactor core immersed in a pool of water, said apparatus comprising:
a gripper mast;
cable means for raising and lowering said gripper mast;
gripper means carried by the mast for engaging fuel assemblies;
load sensing means for measuring the loads suspended by the cable means including the weight of the gripper mast, the gripper means and any fuel assembly engaged by the gripper means;

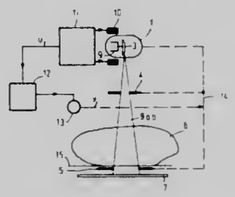


height measuring means for measuring the height of the gripper means carried by the gripper mast for said reactor core;
control means comparing the load sensed by the load sensing means with selected load limits and to inhibit operation of said cable means when said measured load is outside said limits, and means for adjusting said load limits for changes in the buoyancy of said gripper mast as a function of said height measured by the height measuring means.

4,894,850
X-RAY APPARATUS FOR SLIT RADIOGRAPHY

Gottfried Frings, Stolberg; Walter Hillen, and Ulrich Schiebel, both of Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,585
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728878
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—62 **5 Claims**

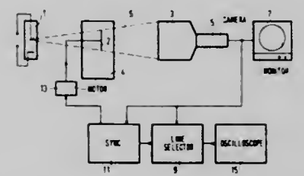


1. An X-ray apparatus comprising:
an x-ray tube which includes a rotating anode;
diaphragm means for forming an X-ray radiation beam from X-rays produced at a focal spot on the anode;
X-ray recording means disposed in the beam;
means which effect a relative movement of the recording means with respect to the beam during an X-ray exposure of the recording means; and
synchronizing means which adjust the rate of rotation of the anode and/or the relative speed of said beam with respect to the recording means as a function of an intensity profile of the beam at the recording means to compensate the exposure of the recording means for fluctuations in the intensity of the beam which are caused by periodic movement of the focal spot.

4,894,851
METHOD OF AND DEVICE FOR MEASURING IMAGE LAG IN X-RAY SYSTEM

Johannes N. Kroon, and Franciscus Schaal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1989, Ser. No. 337,500
Claims priority, application Netherlands, Apr. 27, 1988, 8801094
Int. Cl.[4] G01D *18/00*
U.S. Cl. 378—99 **8 Claims**



1. A method of measuring image lag in an X-ray system comprising an X-ray source, an image intensifier and a video camera, in which a disc having a pattern of comparatively strongly and comparatively weakly X-ray-absorbing areas is placed between the X-ray source and the image intensifier with its axis substantially parallel to the axis of an X-ray beam emitted by the X-ray source, which disc is made to rotate about its axis, and in which the image lag of the X-ray system is determined from the output signal of the video camera, characterized in that the pattern of the disc comprises at least a coiled comparatively strongly X-ray-absorbing area which is coaxial with the disc, that at least one video line, that is situated in a part of the image on which the centre of the disc is displayed, is selected from the video signal produced by the video camera that the signal amplitude of the selected video line is determined, and that the image lag is measured from the ratio of the signal amplitude measured while the disc is stationary and the signal amplitude measured while the disc is rotating at a given speed.

4,894,852
X-RAY SOURCE WITH DUAL MONOCRYSTAL TARGETS

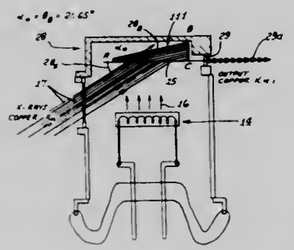
Kamalaksha Das Gupta, 2918-69th St., Lubbock, Tex. 79413

Filed Apr. 30, 1987, Ser. No. 44,232
Int. Cl.[4] H01S *3/16*
U.S. Cl. 378—119 **17 Claims**

1. In an X-ray source with dual monocrystal targets, the combination comprising:
(a) a first monocrystal having parallel lattice planes, and an optically flat, slant cut, planar face extending at an angle θ_B relative to said lattice planes where θ_B is the Bragg angle,
(b) first means located to excite the first monocrystal at said face, and along a line at the intersection with said face of another plane normal to said face and normal to said lattice planes,
(c) and other means producing beams of Kossel $K\alpha_1$ photons

impinging on said line at said face, said beams directed at angles $2\theta_B$ relative to said line,

(d) whereby intense X-ray emission occurs, in a direction which is an extension of said line,



(e) said other means comprising a second monocrystal having a face at an angle θ_B relative to said line, and electron gun means directing second beams of electrons at said face of the second monocrystal.

4,894,853

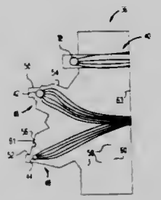
CATHODE CUP IMPROVEMENT

James J. Dowd, Niles, Ill., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Division of Ser. No. 27,787, Mar. 19, 1987, Pat. No. 4,868,842. This application Jun. 21, 1989, Ser. No. 369,415

Int. Cl.[4] H01J *35/06*

U.S. Cl. 378—138 **10 Claims**



1. An improved x-ray tube cathode cup focusing slot having means for applying a side wall potential for providing a focal spot on an anode having high emission, said focusing slot having electron beam focusing sidewalls of electrically conductive material at a potential substantially equal to the cathode potential in the x-ray tube, wherein said focusing sidewalls comprise:

a slot having a generally vee-shaped cross-section comprising first, second and third slot sections formed adjacent one another in the named order within successively deeper portions of a cathode cup;

said first slot section beginning at the surface of said cathode cup and said third slot section forming an apex for said focusing slot;

said first and third slot sections having parallel sidewalls, with the sidewalls of said third slot section being spaced apart by an amount so as to at least partially receive a generally helical elongated filament and yet spaced closer together than the sidewalls of said first slot section; and

the spacing between the sidewalls of said second slot section becoming gradually smaller in a direction deeper into said cathode cup, said sidewalls of said second slot section comprising opposed convex surfaces.

4,894,854

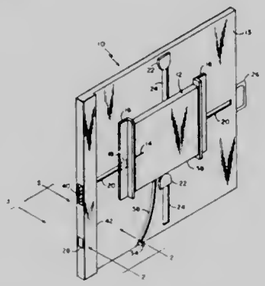
SIZE SENSING X-RAY CASSETTE TRAY

Robert F. Guba, Orange, Conn., and Karl Leschanz, New Rochelle, N.Y., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 28, 1988, Ser. No. 187,206

Int. Cl.[4] G03B *42/02*

U.S. Cl. 378—181 **3 Claims**



1. An apparatus for sensing the length and width dimensions of a substantially rectangular X-ray cassette mounted on an X-ray cassette tray comprising:

front and rear cassette engaging clamp means slidably mounted on said tray for centering and holding an X-ray cassette on said tray;

linking means including a first arm pivotly mounted on said tray for enabling the movement in unison of said front and rear cassette engaging clamp means towards and away from each other;

a first potentiometer possessing a wiper attached to said first arm adapted to move in electrical contact with a flat arcuate resistive track mounted on said tray as said first arm rotates on its pivot, said first potentiometer having nonlinear output characteristics such that equal displacements of said front and rear cassette engaging clamp means result in substantially equal changes in resistance;

a second arm pivotly mounted on said tray having one end adapted for rotating to contact an unclamped side of an X-ray cassette held by said front and rear cassette engaging clamp means on said tray;

a second potentiometer possessing a wiper attached to said second arm adapted to move in electrical contact with a flat arcuate resistive track mounted on said tray as said second arm rotates on its pivot, said second potentiometer having nonlinear output characteristics such that equal increments in the distance between the unclamped sides of a substantially regular X-ray cassette held and centered on said tray result in substantially equal changes in resistance.

4,894,855

X-RAY DIAGNOSTICS SYSTEM HAVING SUSPENDED POSITION ADJUSTABLE COMPONENTS

Heinz Kresse, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 912,041, Sep. 26, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 289,429

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536079

Int. Cl.[4] H05G *1/02*

U.S. Cl. 378—196 **8 Claims**

1. An x-ray diagnostics system comprising:

an x-ray source;

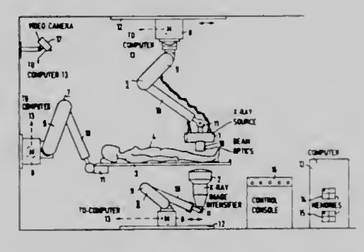
a patient support bed;

an x-radiation receiver for detecting radiation passing through an examination subject on said patient support bed;

means for suspending said x-ray source including a base, a first lever having a first end connected to said base so as to be swivelable about a first axis, and a second end, a second lever having a first end connected to said second end of said first lever so as to be swivelable about a second axis, said first and second axes being parallel, and a second end connected to said x-ray source, said base containing a motor for operating said means for suspending said x-ray source;

means for suspending said patient support bed including a base, a first lever having a first end connected to said base so as to be swivelable about a first axis, and a second end, a second lever having a first end connected to said second end of said first lever so as to be swivelable about a second axis, said first and second axes being parallel, and a second end connected to said patient support bed, said base containing a motor for operating said means for suspending said patient support bed;

means for suspending said x-radiation receiver including a



base, a first lever having a first end connected to said base so as to be swivelable about a first axis, and a second end, a second lever having a first end connected to said second end of said first lever so as to be swivelable about a second axis, said first and second axes being parallel, and a second end connected to said x-radiation receiver, said base containing a motor for operating said means for suspending said x-radiation receiver;

said means for suspending said x-ray source, said means for suspending said patient support bed and said means for suspending said x-radiation receiver all being disposed separately from each other; and

a computer connected to said means for suspending said x-ray source, to said means for suspending said patient support bed and to said means for suspending said x-radiation receiver for controlling and coordinating movement of said x-ray source, said x-radiation receiver and said patient support bed, said computer including a programmable memory containing a plurality of different program sequences for simultaneously moving said x-ray source, said patient support bed and said x-radiation receiver along predetermined paths.

4,894,856

CORDLESS TELEPHONE SET OPERATED UNDER MULTI-CHANNEL ACCESS

Akio Nakanishi, Sagamihara; Ken-ichi Ikegaya, and Takao Naitoh, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 18, 1987, Ser. No. 86,503

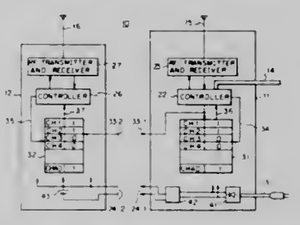
Claims priority, application Japan, Aug. 19, 1986, 61-192152

Int. Cl.[4] H01Q *7/04*

U.S. Cl. 379—61 **17 Claims**

1. A cordless telephone set operated under multi-channel access, comprising a base unit and a handset unit between which a radio frequency (RF) link is formed through a channel selected from previously allotted channels, wherein

the base unit and the handset unit are each provided with a channel random access memory (RAM) for storing up-to-date channel information indicating whether each of the channels is busy or idle, which channel information is searched for by said base unit and is continuously renewed



and the same channel information is written to both channel RAM's during a stand-by mode, the RAM's being coupled to the base unit during the standby mode, and utilized for a quick establishment of the RF link.

4,894,857

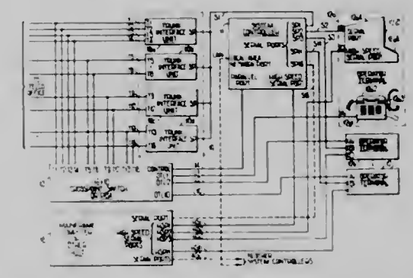
METHOD AND APPARATUS FOR CUSTOMER ACCOUNT SERVICING

Aleksander Szlam, Norcross; James W. Crooks, Jr., Marietta, both of Ga.; Curtis G. Marks, Eden Prairie, Minn., and Charles L. Warner, II, Stone Mountain, Ga., assignors to Inventions Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 62,944, Jun. 16, 1987, Pat. No. 4,797,911. This application Dec. 20, 1988, Ser. No. 287,008

Int. Cl.[4] H04M *1/276, 11/00*

U.S. Cl. 379—67 **68 Claims**



39. For use with a customer account servicing system having a host and a plurality of operator terminals, said host containing a plurality of customer account records, each operator terminal of said operator terminals comprising a data terminal and a corresponding audio communications means, said host using a predetermined applications program and communicating with a plurality of said data terminal using a predetermined instruction set and a predetermined data format, an apparatus for upgrading said customer account servicing system to provide for automated call placement and handling while still using said predetermined applications program, said predetermined instruction set and said predetermined data format, comprising:

trunk switching means responsive to switching control signals for connecting selected ones of a plurality of telephone trunks to selected ones of a plurality of said audio communications means;

trunk interface means responsive to interface control signals for performing selected functions on said telephone trunks and providing a status for said telephone trunks; and

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control means having a host interface port for communicating with said host using said predetermined instruction set and said predetermined data format, at least one terminal interface port connected to said plurality of said data terminal, a switching control port for providing said switching control signals, and a trunk interface control port for providing said interface control signals, said control means obtaining a predetermined number of said customer account records from said host using said predetermined instruction set and said predetermined data format and, for at least one record, extracting a customer telephone number, causing said trunk interface means to place an outgoing call by dialing said customer telephone number on a selected trunk of said telephone trunks, responding to said trunk interface means providing an indication that said outgoing call has been answered by causing said trunk switching means to connect said selected trunk for said outgoing call which has been answered to a said audio communications means of an available operator, and causing said host to send at least a portion of said record to said data terminal of said available operator.

40. For use with a customer account servicing system having a host and a plurality of operator terminals, said host containing a plurality of customer account records, each operator terminal of said operator terminals comprising a data terminal and a corresponding audio communications means, said host using a predetermined applications program and communicating with a plurality of said data terminal using a predetermined instruction set and a predetermined data format, an apparatus for upgrading said customer account servicing system to provide for automated incoming call handling while still using said predetermined applications program, said predetermined instruction set and said predetermined data format, comprising:

trunk switching means responsive to switching control signals for connecting selected ones of a plurality of telephone trunks to selected ones of said audio communications means;

incoming call detection means for providing a ring detect signal when an incoming call occurs on a said telephone trunk; and

automatic number identification (ANI) decoder means responsive to predetermined signals on said telephone trunk which has said incoming call for providing a calling party telephone number;

control means having a host interface port for communicating with said host using said predetermined instruction set and said predetermined data format, at least one terminal interface port connected to said plurality of said data terminal, and a switching control port for providing said switching control signals, said control means responding to said ring detect signal by causing said trunk switching means to connect said telephone trunk which has said incoming call to said audio communications means for an available operator, and responding to said calling party telephone number by using said predetermined instruction set and said predetermined data format to cause said host to provide to said data terminal for said available operator at least a portion of a customer account record which has a customer telephone number corresponding to said calling party telephone number.

4,894,858

PORTABLE THROUGH-DOOR INTERCOM

Michael R. Collingwood, 10260 Warner Ave. #B, Fountain Valley, Calif. 92708

Filed May 26, 1989, Ser. No. 358,151
Int. Cl.[4] H04M *1/04, 9/04*
U.S. Cl. 379—167 **21 Claims**

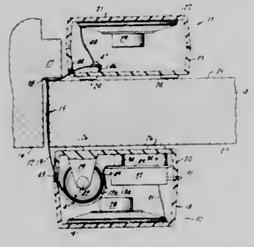
1. A through-door security intercom system, which comprises:

(a) an outside electrical intercom unit,

(b) an inside electrical intercom unit, said units being small in size,

(c) means to mount said outside and inside units near the outside and inside surfaces, respectively, of a door adjacent an edge of said door,

said mounting means including, at least in part, means that extend between said outside and inside units adjacent



said door edge between said edge and the jamb of said door, there being nothing that extends into or through said door, and

(d) means to electrically connect said outside and inside units to each other.

4,894,859

APPARATUS FOR CONNECTING A PLURALITY OF CHANNELS

Takayoshi Sou; Toshio Oshima, and Kazuhiko Nakamura, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation-in-part of Ser. No. 880,702, Jul. 1, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 277,405
Claims priority, application Japan, Jul. 5, 1985, 60-146469
Int. Cl.[4] H04M *3/56*
U.S. Cl. 379—204 **4 Claims**



1. Apparatus for connecting a plurality of channels comprising:

A plurality of line interface means for interconnecting channels respectively connected to a plurality of remote apparatus and a plurality of terminal devices;

a control signal transmission/reception circuit connected to terminal device side terminals of respective network control units, said control signal transmission/reception circuit detecting an acknowledge signal and a channel close instruction signal which are originated from said remote apparatus received through said line interface means to send out detected information and sending said acknowledge signals in response to a first control signal and said channel close instruction signals in response to second control signal to said channels through said line interface means;

a control panel including means for inputting an information regarding connection of said channels and means designating connection and disconnection of said channels;

memory means for storing said connecting information inputted from said control panel; and

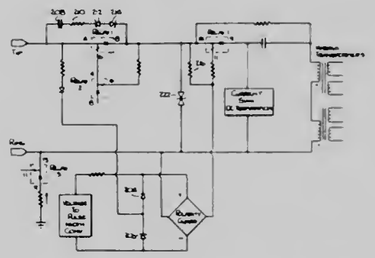
control means for outputting the first and second control signals to said control signal transmission/reception circuit when a calling signal is received from said remote apparatus and when an instruction designating the disconnection of the channel is received from said control panel, respectively, and, responsive to the detected information output of said responsive to the detected information output of said control signal transmission/reception circuit and an output of said control panel for controlling respective line interface means so as to interconnect said channels and the terminal devices when said acknowledge signal is received from said remote apparatus and to close said channels when said channel close instruction signal is received from said remote apparatus.

4,894,860

TRUNK INTERFACE CIRCUITRY FOR TELEPHONE SYSTEMS

Vincent V. Korsky, Shelton; Rajmund Krzyszczyk, New Britain, and Jin T. Lim, Trumbull, all of Conn., assignors to TIE/communications, Inc., Shelton, Conn.

Filed Jun. 7, 1988, Ser. No. 203,722
Int. Cl.[4] H04M *3/22, 7/14*
U.S. Cl. 379—240 **12 Claims**



9. An interface circuit for interfacing a local telephone network to a trunk line of a central office of the telephone company comprising:

(a) means for establishing a loop current path in the trunk line between a telephone of the local network and the central office; and

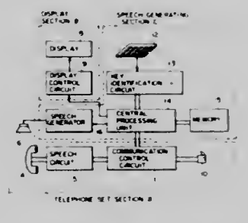
(b) a voltage-to-pulse width converter for measuring the voltage across the trunk line to monitor the condition and status of the trunk line.

4,894,861

TERMINAL IN COMMUNICATION NETWORK FOR NOTIFYING ORIGINATING PARTY'S NUMBER

Masanobu Fujioka, Ohmiya, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,213
Claims priority, application Japan, Dec. 10, 1987, 62-310839
Int. Cl.[4] H04M *1/57, 3/42*
U.S. Cl. 379—374 **3 Claims**



1. A terminal for use with a communication system for receiving incoming calls of originating parties of the communication system and for notifying individual terminating parties by an audible indication of individual subscribers' incoming calls being received the terminal comprising,

means for connecting the terminal to the communication system for receiving incoming calls therefrom,

memory means for pre-registering a plurality of subscriber's numbers whose incoming calls are anticipated and ID information corresponding to each individual subscribers number,

control means connected to said memory means and receptive of incoming calls for determining whether an incoming call number corresponds with a registered subscriber's number and for generating a command signal output representative of the subscriber's registered number when correspondence of an incoming call number and a subscriber's registered number occurs, and

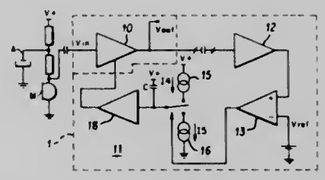
speech generating means for receiving and responding to said control means command signal output for providing an audible indication of the ID information corresponding to the registered subscriber's number corresponding to an incoming call number of an originating party.

4,894,862

SIGNAL COMPRESSION CIRCUIT, PARTICULARLY FOR A TELEPHONE SET

Bruno Defretin, Saint-Egreve, and Thierry Arnaud, Meylan, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 19, 1988, Ser. No. 222,432
Claims priority, application France, Jul. 21, 1987, 87 10604
Int. Cl.[4] H04M *9/08*
U.S. Cl. 379—390 **9 Claims**



1. A signal compression circuit for a handsfree-type telephone set, comprising:

a preamplifier, having an input for receiving an input signal to be processed; and

a preamplifier gain control device for servo-controlling, to a predetermined value, the amplitude of an output signal supplied by said preamplifier, wherein said gain control device is responsive to a voltage across a capacitor of a circuit including said capacitor and first and second current sources, said circuit for determining two time constants which respectively control rise time and fall time of the preamplifier gain in response to the amplitude of said input signal,

said gain control device including a rectifying circuit for extracting an instantaneous peak value of said output signal of said preamplifier, a comparator circuit for comparing said instantaneous peak value with a reference value corresponding to said predetermined value, and, in response to said comparison, selectively connecting one of said current sources across said capacitor.

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METHOD FOR GAIN CONTROL IN TELEPHONE SETS HAVING AN ELECTRONIC SPEECH CIRCUIT, AND APPARATUS FOR PERFORMING THE METHOD

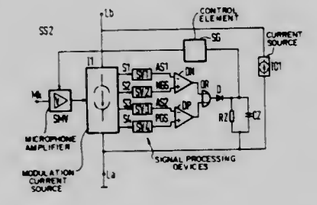
Emil Navratil, and Armin Doll, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,385

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633232

Int. Cl.⁴ H04M *1/60*

U.S. Cl. 379—395 **27 Claims**



1. In a telephone set having an electronic speech circuit, including a modulation current source, two line terminals connecting the modulation current source to a telephone line, and a microphone amplifier having an input connected to a microphone terminal and an output controlling the modulation current source for generating a line signal, a method for gain control which comprises the steps of:

(a) deriving from the modulation current source measurement signals and threshold value signals;

(b) comparing the measurement signals and threshold value signals with one another;

(c) regulating the gain of the microphone amplifier as a function of the result of the comparison; and

(d) further deriving dynamically the threshold value signals as a function of both the current and voltage of the telephone line as threshold value signals for upper and lower current amplitude limits of the electronic speech circuit.

4,894,864

INTERFACE CIRCUIT

John W. Cook, Ipswich, England, assignor to British Telecommunications public limited company, London, United Kingdom

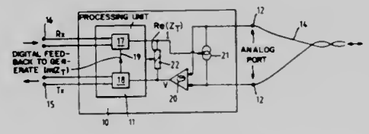
PCT No. PCT/GB86/00707, § 371 Date Jul. 14, 1987, § 102(e) Date Jul. 14, 1987, PCT Pub. No. WO87/03440, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 19, 1986, Ser. No. 95,573

Claims priority, application United Kingdom, Nov. 22, 1985, 8528843

Int. Cl.⁴ H04B *3/03*

U.S. Cl. 379—398 **5 Claims**



1. A transmission system comprising:

an analog loop,

means for coding analog signals from said loop to provide a digital output,

means for decoding a digital input to supply analog signals to said loop,

a digital filtering means for supplying a portion of the digital output to the digital input to synthesize the imaginary component of a terminating impedance Z_T for the analog loop

characterized by a variable resistance terminating the analog loop and processing means controlling said digital filtering means, said means for coding and said means for decoding and also including means for simultaneously changing the resistance of said variable resistance and for changing the transfer function of the digital filtering means such as to change the value of the terminating impedance without substantially changing the frequency response of the transmission system.

305,475

SKI BOOT

Mariano Sartor, Montebelluna, and Valerio Tooel, Barbisano, both of Italy, assignors to Nordica S.p.A., Montebelluna TV, Italy

Filed Oct. 30, 1987, Ser. No. 116,129

Claims priority, application Italy, May 12, 1987, 59385/87[U]

Term of patent 14 years

U.S. Cl. D2—276



305,477

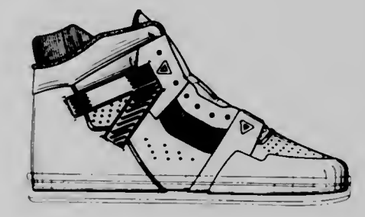
SHOE UPPER

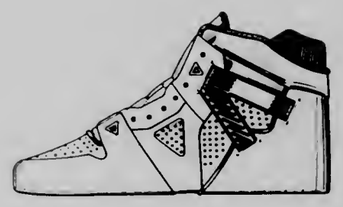
Angelo Maccano, Simi Valley, and Ric Claveria, Loma Linda, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.

Filed Aug. 16, 1988, Ser. No. 232,917

Term of patent 14 years

U.S. Cl. D2—314





305,476

COMBINED ATHLETIC SHOE UPPER AND SOLE PERIPHERY

Lin Yung-Mao, Taichung, Taiwan, assignor to Autry Industries, Inc., Dallas, Tex.

Filed Feb. 5, 1987, Ser. No. 11,133

Term of patent 14 years

U.S. Cl. D2—314



305,478

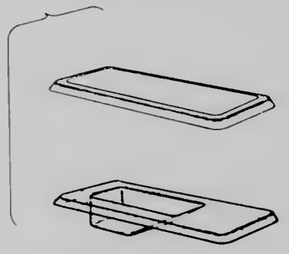
CONTACT LENS PACKAGE

William Lahm, Jacksonville, Fla., and Robert Cerwin, Pittstown, N.J., assignors to Vistakon, Inc., Jacksonville, Fla.

Filed Jun. 20, 1986, Ser. No. 878,724

Term of patent 14 years

U.S. Cl. D3—34

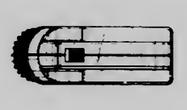


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305,479
CYLINDRICAL JEWELRY CASE
Cal R. Williams, 132 NE. Ainsworth, Portland, Oreg. 97211
Filed Sep. 2, 1986, Ser. No. 903,066
Term of patent 14 years
U.S. Cl. D3—75

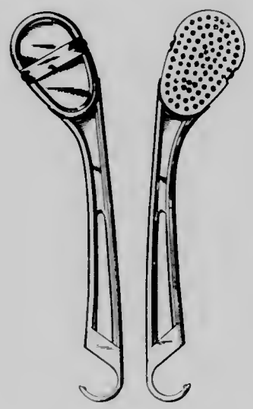


305,480
POWER DRIVEN SHOE BRUSH
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jul. 17, 1987, Ser. No. 74,913
Claims priority, application United Kingdom, Jan. 23, 1987, 1039464
Term of patent 14 years
U.S. Cl. D4—102





305,481
BATH BRUSH
Robert H. Bruno, Avon, and Keith A. Morrison, Suffield, both of Conn., assignors to Kellogg Brush Manufacturing Co., Easthampton, Mass.
Filed Apr. 23, 1987, Ser. No. 41,362
Term of patent 14 years
U.S. Cl. D4—132

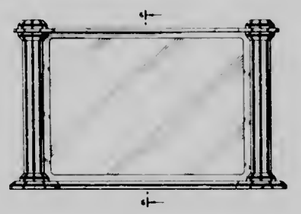




305,482
TEXTILE FABRIC
Giancarlo Utili, Via Faentina Nord 27, 48026 Russi (Ravenna), Italy
Filed Nov. 6, 1985, Ser. No. 803,999
Claims priority, application Italy, May 6, 1985, 21731/85[U]
Term of patent 14 years
U.S. Cl. D5—27

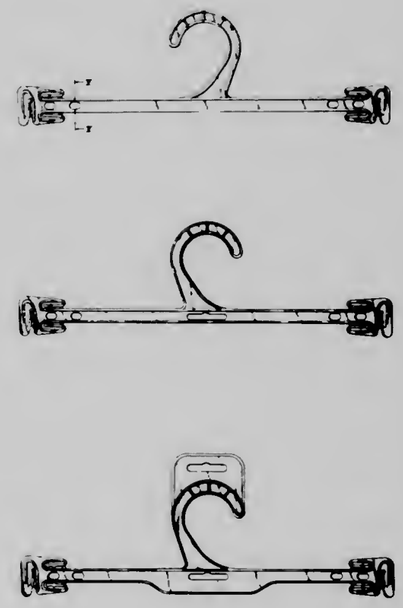


305,483
PHOTO FRAME
Junior C. S. Hsu, 4th Floor, No. 16, Min Tsu East Road, Taipei, Taiwan
Filed Nov. 5, 1986, Ser. No. 927,416
Term of patent 14 years
U.S. Cl. D6—310





305,484
CLOTHES HANGER
Gerhard Fildan, Dr. Körner Str. 64, A-2521 Trumau, Austria
Filed Apr. 30, 1987, Ser. No. 44,974
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, MR-561
Term of patent 14 years
U.S. Cl. D6—326



305,485
CHILD'S BOOKCASE AND TOY CHEST UNIT
Jon Zalesak, 813 S. Nash St., Hortonville, Wis. 54944
Filed Oct. 23, 1986, Ser. No. 922,548
Term of patent 14 years
U.S. Cl. D6—438



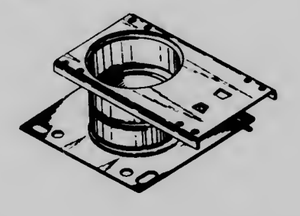
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305,486
MAGAZINE AND FILE FOLDER ORGANIZER
Donald B. Rabig, Elizabeth, N.J., assignor to Sterling Plastics Co., Mountainside, N.J.
Filed Apr. 13, 1987, Ser. No. 37,446
Term of patent 14 years
U.S. Cl. D6—475

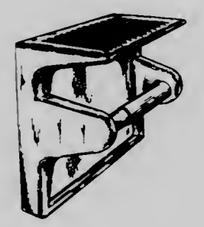




305,487
SEAT MOUNT
Frank L. Kinda, 12112 E. Centralia St., Hawaiian Gardens, Calif. 90716
Filed Jan. 27, 1987, Ser. No. 7,391
Term of patent 14 years
U.S. Cl. D6—496



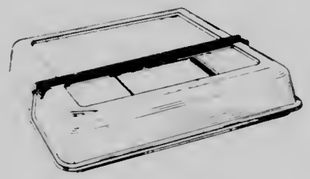
305,488
COMBINED TOILET PAPER HOLDER AND SHELF
E. Pekka Korpijaako, 85 Washington St., Rocky Hill, N.J. 08553
Filed Nov. 19, 1986, Ser. No. 932,489
Term of patent 14 years
U.S. Cl. D6—523



305,489
COVER
Terrance W. Sachetti, 5930 W. Broadway, Crystal, Minn. 55428
Filed Sep. 26, 1986, Ser. No. 911,820
Term of patent 14 years
U.S. Cl. D6—603



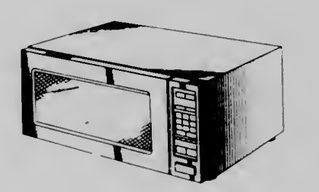
305,490
INSULATED FOOD DELIVERY CARRIER
James R. Conley; Neill E. Bryan, and Dan J. Jonker, all of Wichita, Kans., assignors to Coleman Outdoor Products, Inc., Wichita, Kans.
Filed Apr. 3, 1987, Ser. No. 33,637
Term of patent 14 years
U.S. Cl. D7—77

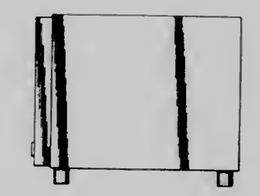


305,491
LADLE
Mark W. Levie, New York, N.Y., assignor to LK Manufacturing Corporation, West Babylon, N.Y.
Filed Oct. 3, 1986, Ser. No. 915,337
Term of patent 14 years
U.S. Cl. D7—104

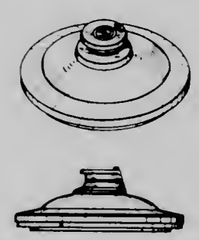


305,492
MICROWAVE OVEN
Masayoshi Kawaishi, and Koji Satake, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 19, 1986, Ser. No. 898,008
Claims priority, application Japan, Feb. 19, 1986, 61-5901
Term of patent 14 years
U.S. Cl. D7—351

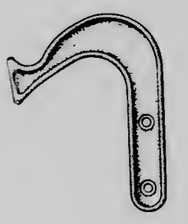




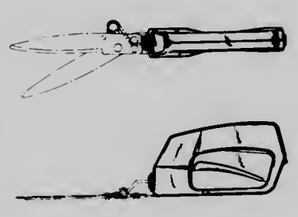
305,493
PRESSURE COOKER COVER OR THE LIKE
Theophil Ryser, Beckenried, Switzerland, assignor to AMC International Alfa Metalcraft Corporation, Switzerland
Filed Apr. 25, 1986, Ser. No. 857,464
Claims priority, application World Int. Prop. O., Oct. 30, 1985, DMA/000436
Term of patent 14 years
U.S. Cl. D7—391



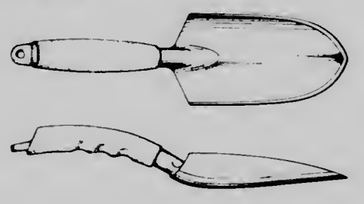
305,494
POLE-MOUNTED PRUNER HOOK
Stephen Jasperson, Riverside, Calif., assignor to Corona Clipper Company, Corona, Calif.
Filed Oct. 31, 1988, Ser. No. 264,512
Term of patent 14 years
U.S. Cl. D8—7



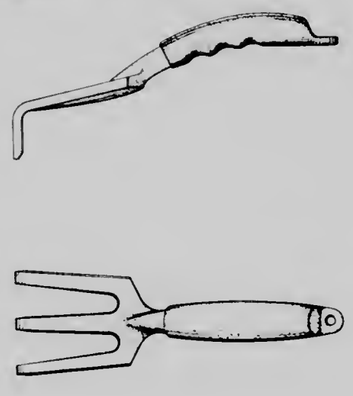
305,495
HANDLE FOR GRASS SHEARS
Larry D. Carter, 358 Burma Rd., Mosinee, Wis. 54455, assignor to Fiskars Oy Ab, Helsinki, Finland
Filed Mar. 23, 1988, Ser. No. 172,132
Term of patent 14 years
U.S. Cl. D8—8



305,496
GARDEN TROWEL
Stephen Jasperson, Riverside, Calif., assignor to Corona Clipper Company, Corona, Calif.
Filed Jul. 25, 1988, Ser. No. 223,539
Term of patent 14 years
U.S. Cl. D8—10



305,497
GARDEN CULTIVATOR
Stephen Jasperson, Riverside, Calif., assignor to Corona Clipper Company, Corona, Calif.
Filed Jul. 25, 1988, Ser. No. 223,765
Term of patent 14 years
U.S. Cl. D8—13



305,498
ROUTER BIT
Will M. Lassiter, P.O. Box 1624, High Point, N.C. 27261
Filed Oct. 5, 1988, Ser. No. 253,741
Term of patent 14 years
U.S. Cl. D8—70



305,499
CARTON CUTTER
Henry Walker, 7500 Manford Ct., Charlotte, N.C. 28210
Filed May 7, 1987, Ser. No. 47,704
Term of patent 14 years
U.S. Cl. D8—98



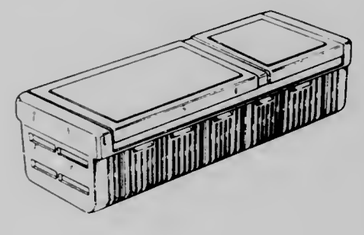
305,500
FURNITURE CASTER
Hans G. Lättgen, Montabaur, Fed. Rep. of Germany, assignor to Albert Schulte Söhne GmbH & Co., Wermelskirchen, Fed. Rep. of Germany
Filed Jul. 23, 1986, Ser. No. 888,890
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, MR273
Term of patent 14 years
U.S. Cl. D8—375



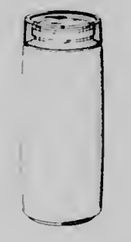
305,501
ADHESIVE DISPENSER HEAD
Volker Hundertmark, Bad Muender, and Albert Stoeffler, Duesseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Apr. 14, 1986, Ser. No. 852,516
Claims priority, application Int'l Pat. Institute, Nov. 18, 1985, DM/006 099
Term of patent 14 years
U.S. Cl. D9—448



305,502
STORAGE CONTAINER FOR A PICKUP OR THE LIKE
John E. Waters, Waco, Tex., assignor to Durakon Industries, Inc., Lapeer, Mich.
Filed Feb. 10, 1986, Ser. No. 827,859
Term of patent 14 years
U.S. Cl. D9—341



305,503
JAR
Pier L. Bormioli, Mariano, Italy, assignor to Vetreria Padana Polesana S.p.A., Bergantino, Italy
Continuation-in-part of Ser. No. 554,990, Nov. 25, 1983. This application Jan. 29, 1986, Ser. No. 823,601
Term of patent 14 years
U.S. Cl. D9—352



305,504
FUEL CAN
Earl L. Fischer, Rogers, Ark., and John R. Elmburg, Miami, Okla., assignors to U.S. Metal Container Co., Miami, Okla.
Filed Jan. 12, 1987, Ser. No. 2,271
Term of patent 14 years
U.S. Cl. D9—374

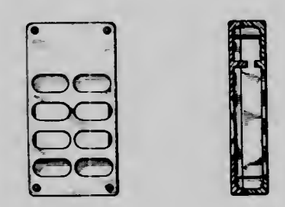


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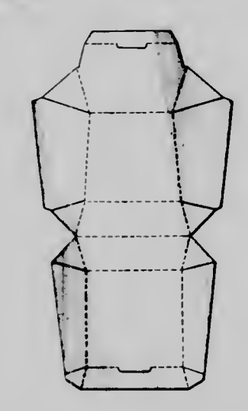
305,505
BOTTLE AND CAP
Edward J. Kunesh, Kenosha, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jun. 30, 1987, Ser. No. 67,855
Term of patent 14 years
U.S. Cl. D9—413



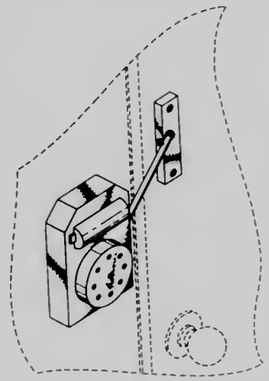
305,506
PLASMA CONTAINER OR THE LIKE
Otto Sittig, 4143 Rosewood Ave., Los Angeles, Calif. 90004
Filed Mar. 23, 1987, Ser. No. 29,487
Term of patent 14 years
U.S. Cl. D9—418



305,507
CARTON BLANK
Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Oct. 9, 1987, Ser. No. 106,326
Term of patent 14 years
U.S. Cl. D9—433



305,508
AUDIBLE WINDOW AND DOOR INTRUSION ALARM
Daniel L. Lothamer, 8720 Stellhorn Rd., Fort Wayne, Ind. 46815
Filed Jul. 15, 1986, Ser. No. 885,729
Term of patent 14 years
U.S. Cl. D10—106



305,509
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,116
Claims priority, application Italy, Oct. 31, 1986, 36209/86[U]
Term of patent 14 years
U.S. Cl. D11—17



305,510
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,192
Claims priority, application Italy, Oct. 31, 1986, 36208/86[U]
Term of patent 14 years
U.S. Cl. D11—17



305,511
RING
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,108
Claims priority, application Italy, Jun. 22, 1987, 35871/87[U]
Term of patent 14 years
U.S. Cl. D11—27



305,512
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,191
Claims priority, application Italy, Oct. 31, 1986, 36202[U]
Term of patent 14 years
U.S. Cl. D11—86



305,513
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,110
Claims priority, application Italy, Oct. 31, 1986, 36206[U]
Term of patent 14 years
U.S. Cl. D11—93



305,514
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,112
Claims priority, application Italy, Oct. 31, 1986, 36203-B/86
Term of patent 14 years
U.S. Cl. D11—93



305,515
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,126
Claims priority, application Italy, Oct. 31, 1986, 36217-B/86
Term of patent 14 years
U.S. Cl. D11—93



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305,516
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,127
Claims priority, application Italy, Oct. 31, 1986, 36200 B/86
Term of patent 14 years
U.S. Cl. D11—93



305,517
LINK ELEMENT
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,129
Claims priority, application Italy, Oct. 31, 1986, 36201-B/86
Term of patent 14 years
U.S. Cl. D11—93

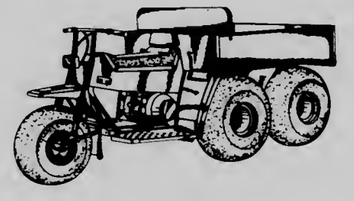




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LINK ELEMENT
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Filed Apr. 30, 1987, Ser. No. 44,130
Claims priority, application Italy, Oct. 31, 1986, 36205-86[U]
Term of patent 14 years
U.S. Cl. D11—93



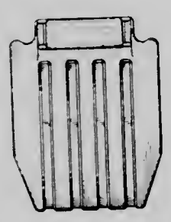
305,519
UTILITY HAULING VEHICLE
William E. Crookes, Waldwick, N.J.; David D. Drenner, Cedar Falls, Iowa; Owen C. Kolstad, Waterloo, Iowa; John F. Peacock, Dike, Iowa, and James H. Polacek, Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Sep. 4, 1987, Ser. No. 93,411
Term of patent 14 years
U.S. Cl. D12—5



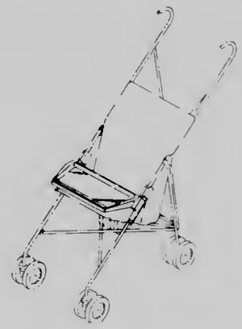
305,520
MOTORCYCLE
Junji Kikuchi; Nobuyuki Shiwa, and Yuji Watanuki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1987, Ser. No. 56,522
Claims priority, application Japan, Dec. 1, 1986, 61-47511
Term of patent 14 years
U.S. Cl. D12—110

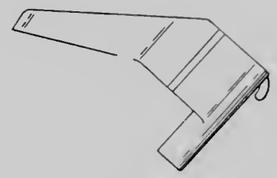


305,521
WHEELCHAIR FOOTBOARD
Thomas R. Wiatrak, Brunswick, and Roger H. Ramsey, Copley, both of Ohio, assignors to Invacare Corporation, Elyria, Ohio
Filed Jan. 8, 1987, Ser. No. 1,553
Term of patent 14 years
U.S. Cl. D12—133

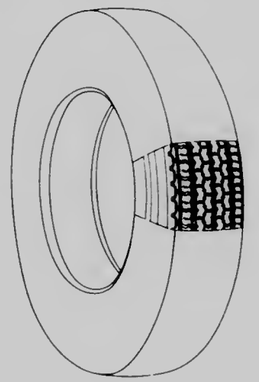


305,522
STOWABLE TRAY FOR A COLLAPSIBLE STROLLER
Louis M. Kohus; John V. Mariol, both of Cincinnati, Ohio, and David Saint, Elverson, Pa., assignors to Graco Metal Products Inc., Elverson, Pa.
Filed Apr. 14, 1987, Ser. No. 38,802
Term of patent 14 years
U.S. Cl. D12—133

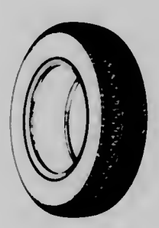




305,523
TIRE
Edward M. Remick, Taylors, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Apr. 1, 1987, Ser. No. 30,930
Term of patent 14 years
U.S. Cl. D12—146



305,524
AUTOMOBILE TIRE
Mitsuhige Idei, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Feb. 26, 1987, Ser. No. 19,077
Claims priority, application Japan, Oct. 21, 1986, 61-41504
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147

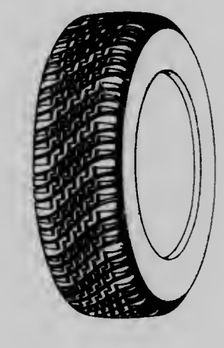


305,525
AUTOMOBILE TIRE
Mitsuhige Idei, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 17, 1987, Ser. No. 26,647
Claims priority, application Japan, Oct. 21, 1986, 61-41505
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



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305,526
TIRE
Maurice Graas, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 28, 1987, Ser. No. 8,457
Claims priority, application Benelux, Sep. 3, 1986, 30536-00
Term of patent 14 years
U.S. Cl. D12—149



305,527
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 17, 1987, Ser. No. 26,564
Claims priority, application Japan, Dec. 9, 1986, 61-48715
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—149

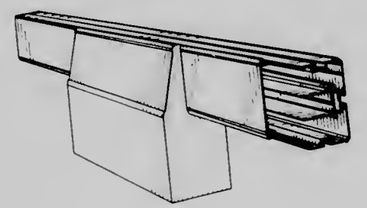


305,528
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 17, 1987, Ser. No. 26,648
Claims priority, application Japan, Dec. 9, 1986, 61-48716
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—149

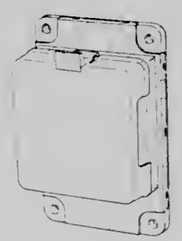


305,529
ACCESSORY FOR OPEN BED TRUCKS FOR SUPPORTING LIGHTS THEREON ABOVE THE CAB OF THE TRUCK
Gary A. Milby, 2372 Meadowfalls, Diamond Bar, Calif. 91765, and Donald J. Kronmeyer, 6224 Plymouth Ct., Yorba Linda, Calif. 92686
Filed Apr. 3, 1987, Ser. No. 33,638
Term of patent 14 years
U.S. Cl. D12—156

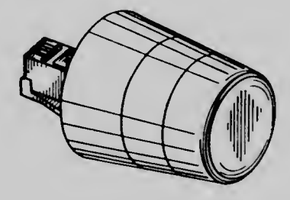
305,530
COMBINED ELECTRICAL WIRING RACEWAY AND OUTLET HOUSING
Hans Strand, Upsala, and Peter Lawton, Täby, both of Sweden, assignors to Thorsman & Co. AB, Nykoping, Sweden
Filed May 23, 1986, Ser. No. 867,273
Claims priority, application Sweden, Dec. 11, 1985, 85-3029
Term of patent 14 years
U.S. Cl. D13—13



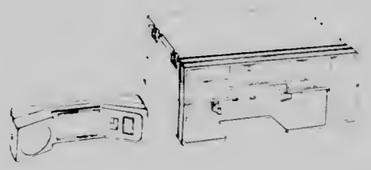
305,531
ELECTRICAL JUNCTION BOX FOR AUTOMOBILE WIRING SYSTEM
Hiroshi Suzuki, and Etsuji Matsumoto, both of Kosai, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 10,114
Claims priority, application Japan, Aug. 7, 1986, 61-030685
Term of patent 14 years
U.S. Cl. D13—24



305,532
ROTATABLE MODULAR CONNECTOR FOR A TELEPHONE
Bruce Gallo, Chester, and Charles Hannon, Clinton, both of N.J., assignors to Telcor, Inc., Chester, N.J.
Filed Jan. 7, 1986, Ser. No. 816,803
Term of patent 14 years
U.S. Cl. D14—256



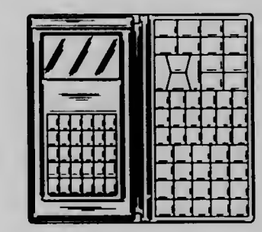
305,533
COMBINATION TELEPHONE STAND AND HANDSET
George Perkins, Eugene, Oreg., and Thomas P. Eisenstadt, Solana Beach, Calif., assignors to TeleQuest, Inc., San Diego, Calif.
Filed Dec. 10, 1986, Ser. No. 940,635
Term of patent 14 years
U.S. Cl. D14—151



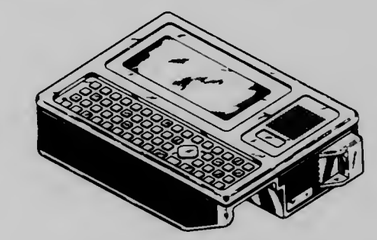
305,534
MOBILE INPUT/OUTPUT DATA TERMINAL
Howard F. Weber, Springhill, Fla., and Donald E. Metivier, Denton, Tex., assignors to ElectroCom Automation, Inc., Houston, Tex.
Filed Apr. 13, 1987, Ser. No. 37,575
Term of patent 14 years
U.S. Cl. D14—100



305,535
ELECTRONIC MEMORANDUM INPUT/OUTPUT TERMINAL
Hiroshi Sakaguchi, and Tadahiko Saimea, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 26, 1987, Ser. No. 54,366
Claims priority, application Japan, Nov. 26, 1986, 61-47035
Term of patent 14 years
U.S. Cl. D14—100

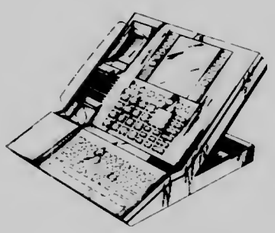


305,536
PORTABLE TERMINAL OR SIMILAR ARTICLE
Scott H. Richards, Sunrise; Raymond W. Burbank; Kevin C. Reid, both of North Lauderdale, and Ronald C. Tate, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 27, 1987, Ser. No. 78,495
Term of patent 14 years
U.S. Cl. D14—100

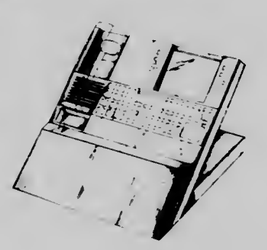


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305,537
COMMUNICATIONS WORKSTATION
Arthur H. Gilmore; Chris G. Johnson, both of New York, N.Y.; Norman W. Petty, Boulder, Colo.; Barbara A. Seelye, Arvada, Colo., and Thomas J. Tierney, Jr., Aurora, Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Apr. 8, 1987, Ser. No. 35,943
Term of patent 14 years
U.S. Cl. D14—101



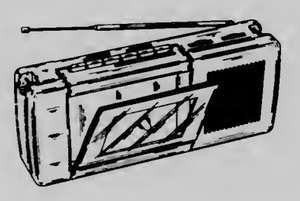
305,538
COMMUNICATIONS WORKSTATION
Arthur H. Gilmore; Chris G. Johnson, both of New York, N.Y.; Norman W. Petty, Boulder, Colo.; Barbara A. Seelye, Arvada, Colo., and Thomas J. Tierney, Jr., Aurora, Colo., assignors to American Telephone and Telegraphy Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Apr. 8, 1987, Ser. No. 35,944
Term of patent 14 years
U.S. Cl. D14—101



305,539
READER FOR HAND COPYING MACHINE
Hiroshi Sakaguchi, and Tadahiko Saimen, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 22, 1987, Ser. No. 41,342
Claims priority, application Japan, Oct. 23, 1986, 61-42222
Term of patent 14 years
U.S. Cl. D14—105



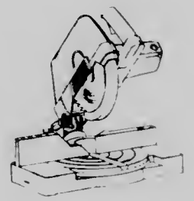
305,540
COMBINED TAPE RECORDER AND RADIO
Kazuo Kawabe, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 30, 1987, Ser. No. 44,458
Claims priority, application Japan, Nov. 4, 1986, 61-43551
Term of patent 14 years
U.S. Cl. D14—163



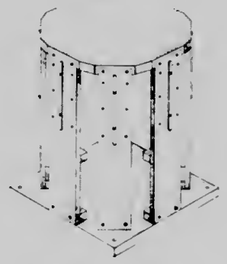
305,541
HEADPHONE
Tomoyuki Hirose, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 16, 1987, Ser. No. 109,850
Claims priority, application Japan, Apr. 22, 1987, 62-15789
Term of patent 14 years
U.S. Cl. D14—205



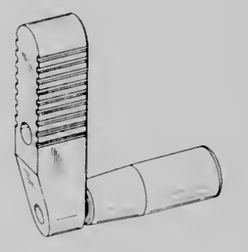
305,542
ELECTRIC MITER SAW
Kouichi Miyamoto; Tomoshige Dehari, both of Hiroshima, and Kiyoshi Hoshino, Tokyo, all of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Apr. 27, 1987, Ser. No. 43,137
Claims priority, application Japan, Oct. 27, 1986, 61-42748
Term of patent 14 years
U.S. Cl. D15—133



305,543
SUPPORT BASE FOR USE IN AUTOMATED PRODUCTION
A. Roger Guillemette, 37 Fairview Ave., West Warwick, R.I. 02893
Filed Jan. 5, 1987, Ser. No. 2,701
Term of patent 14 years
U.S. Cl. D15—140



305,544
CRANK HANDLE FOR LATHES OR THE LIKE
Bernhard Ganter, Tribergstrasse 3, Furtwangen, Fed. Rep. of Germany 7743
Filed Jan. 8, 1987, Ser. No. 1,552
Term of patent 14 years
U.S. Cl. D15—142



305,545
IMAGING BAFFLE FOR SPLIT IMAGE PRINTS
Randall E. Hopkins, Houston, Tex., assignor to Prestige Images, Inc., Houston, Tex.
Filed Feb. 24, 1986, Ser. No. 836,187
Term of patent 14 years
U.S. Cl. D16—237

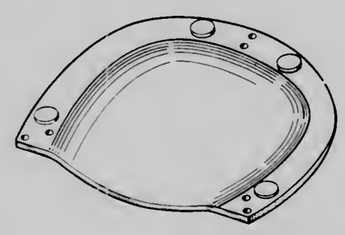


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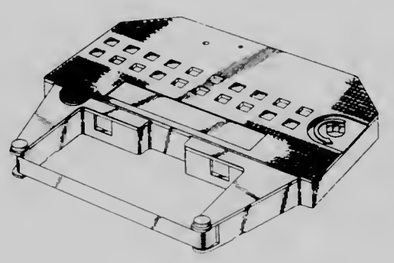
305,546
GUITAR
Howard M. Roberts, 8209 182nd Pl., S.W., Edmonds, Wash. 98202
Filed Jul. 17, 1987, Ser. No. 74,508
Term of patent 14 years
U.S. Cl. D17—14



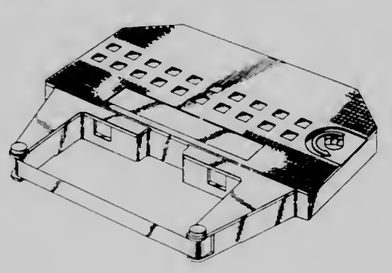
305,547
SHOULDER PAD FOR VIOLIN OR THE LIKE
Steven W. McMillan, 2615 Waugh Dr., #177, Houston, Tex. 77006
Filed Apr. 3, 1986, Ser. No. 847,844
Term of patent 14 years
U.S. Cl. D17—20



305,548
PRINTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Dec. 15, 1987, Ser. No. 133,367
Claims priority, application Italy, Jun. 22, 1987, 53456-B/87
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—12



305,549
PRINTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Dec. 15, 1987, Ser. No. 133,442
Claims priority, application Italy, Jun. 22, 1987, 53452-B/87
The portion of the term of this patent subsequent to Jan. 16, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—12



305,550
DATA OUTPUT PRINTER
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 12, 1988, Ser. No. 143,150
Claims priority, application Japan, Jul. 14, 1987, 62-28830
Term of patent 14 years
U.S. Cl. D18—13



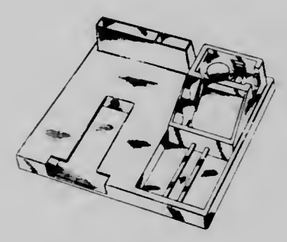
305,551
PEN CAP OR SIMILAR ARTICLE
Shigeo Oka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 27, 1987, Ser. No. 32,081
Claims priority, application Japan, Sep. 27, 1986, 61-38304
Term of patent 14 years
U.S. Cl. D19—57



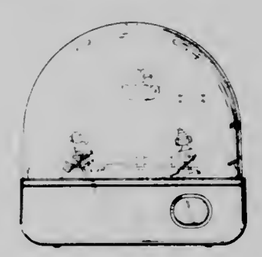
305,552
PEN CAP OR SIMILAR ARTICLE
Kunio Itoh, Funabashi, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 26, 1986, Ser. No. 935,694
Claims priority, application Japan, May 30, 1986, 61-20816
Term of patent 14 years
U.S. Cl. D19—57



305,553
MULTI-PURPOSE DESK ACCESSORY
David C. Pugliese, 218 S. Pine Apt. 206, Arlington Heights, Ill. 60005, and Edward P. Pugliese, 1832 Sitka La., Mt. Prospect, Ill. 60056
Filed Nov. 24, 1986, Ser. No. 934,476
Term of patent 14 years
U.S. Cl. D19—75



305,554
WATER GAME HOUSING
Makiko Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 11, 1987, Ser. No. 24,407
Claims priority, application Japan, Sep. 13, 1986, 61-36245
Term of patent 14 years
U.S. Cl. D21—12



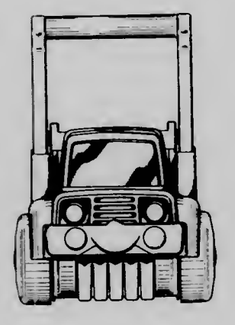
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305,555
TOY TRUCK
Lee Spielberger, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 11, 1988, Ser. No. 256,928
Term of patent 14 years
U.S. Cl. D21—134

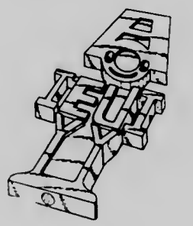


305,556
COMBINED TOY TRACKWAY AND TOY ANIMALS THEREFOR
Woon S. Lo, Zhu Hai Shi, China, assignor to Zhu Hai Shi Wan Chai Industrial Company, Kwantung Province, China
Filed Oct. 8, 1986, Ser. No. 916,684
Claims priority, application United Kingdom, Apr. 15, 1986, 1033797
Term of patent 14 years
U.S. Cl. D21—143





305,557
TOY FIGURE OR THE LIKE
Guy-Claude Joseph, 7955 S. Ashland Ave., Chicago, Ill. 60620
Filed Oct. 31, 1986, Ser. No. 925,410
Term of patent 14 years
U.S. Cl. D21—155



305,558
TOY BIRD
Beverly A. Kessler, 5624 Belmont Ave., Cincinnati, Ohio 45224
Filed Dec. 22, 1986, Ser. No. 944,539
Term of patent 14 years
U.S. Cl. D21—160



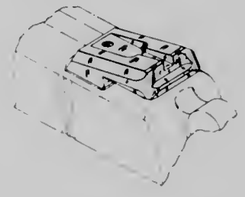
305,559
DOLL BODY OR SIMILAR ARTICLE
Voula Begley, 393A Spotswood Englishtown Rd., Monroe, N.J. 08831
Filed Jul. 25, 1986, Ser. No. 889,411
Term of patent 14 years
U.S. Cl. D21—189



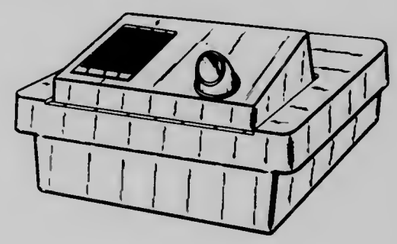
305,560
SKATE BOOT
Thomas B. Hoshizaki, Ville St. Pierre; Kenneth Hall, Pointe Claire, and Rene Bourque, Duvernay, all of Canada, assignors to Canstar Sports Group, Inc., Lachine, Canada
Filed Jun. 22, 1987, Ser. No. 64,452
Term of patent 14 years
U.S. Cl. D21—225



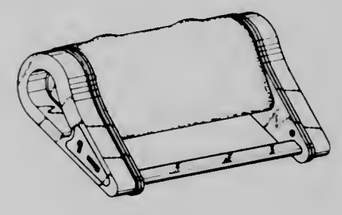
305,561
REAR SIGHT FOR A PISTOL
Wayne F. Novak, 1206-1/2 30th St., P.O. Box 4045, Parkersburg, W. Va. 26102
Filed Jan. 15, 1988, Ser. No. 144,387
The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—109



305,562
HUMIDIFIER
Robert Martinez, Stow, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Filed Oct. 22, 1987, Ser. No. 111,312
Term of patent 14 years
U.S. Cl. D23—356



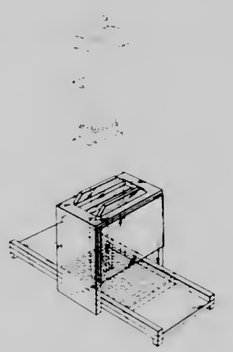
305,563
MASSAGER
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka, Japan
Filed Mar. 3, 1987, Ser. No. 21,062
Term of patent 14 years
U.S. Cl. D24—36



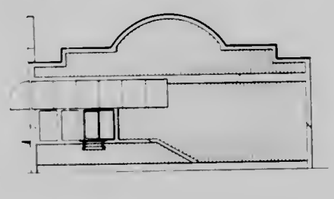
305,564
SUSPENDABLE, THERMALLY INSULATED JACKET FOR I.V. FLUID BAGS
Robert K. Smith, Rte. 2, Box 147, Astoria, Oreg. 97103, and Alan C. Pochert, 3926 NE. 32nd Ave., Portland, Oreg. 97212
Filed Apr. 6, 1987, Ser. No. 35,560
Term of patent 14 years
U.S. Cl. D24—52



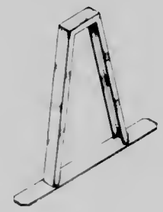
305,565
PIPETTING WORK STATION
Don Malinoff, Granada Hills, Calif., assignor to D.B.M. Scientific Corp., Granada Hills, Calif.
Filed Jun. 30, 1986, Ser. No. 880,484
Term of patent 14 years
U.S. Cl. D24—55



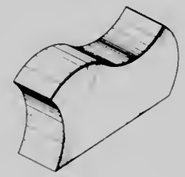
305,566
BUILDING
Robert Cates, Kaufman, and Gary M. Johnson, Dallas, both of Tex., assignors to La Cocina, Inc., Kaufman, Tex.
Filed Dec. 17, 1987, Ser. No. 134,520
Term of patent 14 years
U.S. Cl. D25—18



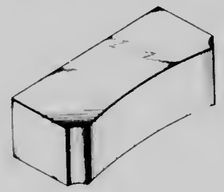
305,567
STAND FOR SUPPORTING PANELS ON EDGE
Ernest D. Scott, 12316 5th NE., Seattle, Wash. 98125
Filed Sep. 10, 1986, Ser. No. 905,986
Term of patent 14 years
U.S. Cl. D25—67



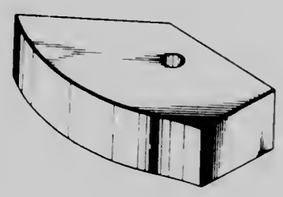
305,568
TILE
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed May 18, 1987, Ser. No. 51,282
Claims priority, application Japan, Nov. 19, 1986, 61-45446
Term of patent 14 years
U.S. Cl. D25—113



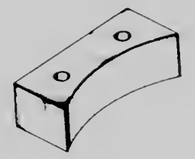
305,569
TILE
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed May 18, 1987, Ser. No. 51,283
Claims priority, application Japan, Nov. 21, 1986, 61-45859
Term of patent 14 years
U.S. Cl. D25—113



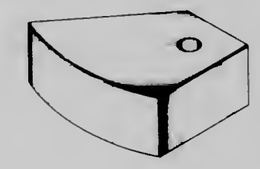
305,570
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,887
Claims priority, application Japan, Oct. 15, 1986, 61-40563
Term of patent 14 years
U.S. Cl. D25—114



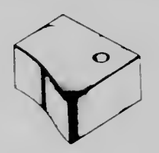
305,571
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,888
Claims priority, application Japan, Oct. 15, 1986, 61-40557
Term of patent 14 years
U.S. Cl. D25—114



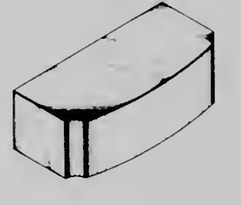
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BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,890
Claims priority, application Japan, Oct. 15, 1986, 61-40561
Term of patent 14 years
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305,573
BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Hyung Hee, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 38,892
Claims priority, application Japan, Oct. 15, 1986, 61-40562
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BRICK
Kiyoshi Sakata, Tokyo, Japan, assignor to Park Kyung Hee, Tokyo, Japan
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Bellani, Pietro; and Valcarenghi, Luigi, 4,894,237, Cl. 424-486.000.

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Yamazaki, Atsuo; Kaba, Toshiaki; and Sakaguchi, Kenji, 4,894,500, Cl. 200-565.000.

Copp, Carl A., to General Motors Corporation. Guide assembly and guide shoe for a variable angle wobble plate compressor. 4,893,994, Cl. 417-269.000.

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Cornut, Bruno, to Inovelf. Rotor with dynamic pipeting for a centrifuge analysis device. 4,894,204, Cl. 422-72.000.

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Yang, Bill, 4,894,641, Cl. 340-466.000.

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Broekhoven, Paul V.; Fitzmartin, Daniel; Blasche, Paul; Cox, Duncan B., Jr.; and Upadhyay, Triveni, 4,894,842, Cl. 375-1.000.

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Bruce, Robert; and Whitney, Robert W., 4,893,452, Cl. 53-420.000.

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Creda Limited: *See—*
Ellis, Gordon; and Lane, Richard J., 4,894,516, Cl. 219-378.000.

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Nathanson, Harvey C.; Driver, Michael C.; Cresswell, Michael W.; Freitag, Ronald G.; Alexander, Donald K.; and Yaw, Daniel F., 4,894,114, Cl. 156-631.000.

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Szlam, Aleksander; Crooks, James W., Jr.; Marks, Curtis G.; and Warner, Charles L., II, 4,894,857, Cl. 379-67.000.

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Simonyi, Sandor; Ternoczky, Gyorgy; Valoczi, Gyorgy; and Toth, Istvan, 4,894,780, Cl. 364-424.100.

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Dadswell, Peter J., to Commonwealth of Australia, The. Transmission delay line and method of manufacture. 4,894,628, Cl. 333-160.000.

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Dalla Lana, Antonio, to Lange International S.A. Inner shoe for shell-type ski boot. 4,893,417, Cl. 36-10.000.

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Castelli, Luigi, 4,894,066, Cl. 44-589.000.

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Dartey, Clemence K.; Finley, John W.; and Thulin, Robert R., to Nabisco Brands, Inc. Processes and dough compositions for producing cookies containing low-melting fat. 4,894,246, Cl. 426-94.000.

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Davis, Darrel B. Self aligning coupling apparatus. 4,893,829, Cl. 280-479.200.

Davis, James A.; and Mayer, William B., to Brunswick Corporation. Overvoltage protection system for marine ignition and regulator circuitry. 4,894,602, Cl. 322-38.000.

Davis, James A.: *See—*
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Davis, Walter L., to Motorola, Inc. Pager having time controlled functions. 4,894,649, Cl. 340-825.440.

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Defretin, Bruno; and Arnaud, Thierry, to SGS-Thomson Microelectronics S.A. Signal compression circuit, particularly for a telephone set. 4,894,862, Cl. 379-390.000.

Deglin, Richard N.: *See—*
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DeRaymond, Peter G., to Victaulic Company of America. Lubricant-free elastomeric gasket. 4,893,843, Cl. 285-112.000.

Detia Freyberg GmbH: *See—*
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Dobruskin, Moisey. Container for and method of preserving and increasing bactericidal property of positive silver ions solutions. 4,894,061, Cl. 604-403.000.
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Komatsu, Fumio, to Kabushiki Kaisha Toshiba. Image forming method using secondary electrons from object for noise elimination. 4,894,540, Cl. 250-307.000.

Komei, Yutaka, to Kabushiki Kaisha Fulltime System. Delivered article storage control system. 4,894,717, Cl. 358-108.000.

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Kotur, Donald R. Removable keyboard cover for office machines. 4,893,954, Cl. 400-714.000.

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Kraft, Robert; and Hasson, Victor H. Electron beam preionization of a high pressure self-sustaining gas laser. 4,894,838, Cl. 372-86.000.

Kraft Systems, Inc.: *See*—
Glau, Gordon, 4,894,491, Cl. 174-135.000.

Kramer, Carl; and Gerhardt, Hans J. Apparatus for contactless sealing of an opening against emerging or entering gas. 4,894,009, Cl. 432-64.000.

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Krause, Dieter; Sedlmaier, Josef; and Odemar, Norbert, to Siemens Aktiengesellschaft. Plug part for releasable plug-type connections of eight waveguide. 4,894,111, Cl. 156-294.000.

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Kruck, Richard W.; Iannelli, Ronald F.; and Laundroche, Kevin S., to Whirlpool Corporation. Modular refrigeration appliance which can be assembled at a remote location. 4,893,478, Cl. 62-126.000.

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Kubo, Setsuo, to Kabushiki Kaisha Dymosha. Wire drive apparatus for wire saw. 4,893,607, Cl. 125-21.000.

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Yamawaki, Masao; and Kondo, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a light transparent window and a method of producing same. 4,894,707, Cl. 357-74.000.
Yamazaki, Atsuo; Kaba, Toshiaki; and Sakaguchi, Kenji, to Copal Electronics Co., Ltd. Rotary selector switch. 4,894,500, Cl. 200-565.000.
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Yoshida, Hajime; and Hanai, Nobuo, to Kyowa Hakko Kogyo Co., Ltd. Anti-human mesothelial cell monoclonal antibody. 4,894,327, Cl. 435-7.000.
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Yoshinada, Hiroshi; and Takeda, Shu, to Kabushiki Kaisha Komatsu Seisakusho. Master/slave type manipulator. 4,893,981, Cl. 414-5.000.
Yoshitani, Naoyuki; Minamisawa, Mitsunori; and Kishi, Tomomi, to Toyota Jidosha Kabushiki Kaisha. Movable yoke-type lifting magnet device. 4,893,858, Cl. 294-65.500.
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Ziemek, Gerhard; Staschewski, Harry; and Procher, Klaus, to Kabelmetal Electro GmbH. Method and apparatus for connecting multiple fiber optic conductors. 4,893,892, Cl. 350-96.220.
Zimmer, Ernst, to Kuka GmbH. Device for automatic joining and machining. 4,893,398, Cl. 29-568.000.
Zimmerman, Robert, to Cetus Corporation. Combination therapy using antitumor immunotoxins with tumor necrosis factor. 4,894,225, Cl. 424-85.100.
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Allen, Robert J.: *See*—
Petrow, Henry G.; and Allen, Robert J., Re. 33,149, Cl. 429-40.000.

Carrell, Edwin A.; and Spivey, David H., to Flair International Corporation. Occupancy responsive temperature control system. Re. 33,146, Cl. 165-11.100.

Flair International Corporation: *See*—
Carrell, Edwin A.; and Spivey, David H., Re. 33,146, Cl. 165-11.100.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sakata, Mamoru; and Minakawa, Masaaki, Re. 33,148, Cl. 280-666.000.

Minakawa, Massaki: *See*—
Sakata, Mamoru; and Minakawa, Masaaki, Re. 33.148, Cl. 280-666.000.

Petrow, Henry G.; and Allen, Robert J., to Prototech Company. Finely particulated colloidal platinum compound and sol for producing the same and method of preparation of fuel cell electrodes and the like employing the same. Re. 33,149, Cl. 429-40.000.

Prototech Company: *See*—
Petrow, Henry G.; and Allen, Robert J., Re. 33,149, Cl. 429-40.000.

Reiker, Kenneth H. Ceiling fan mounting assembly. Re. 33,147, Cl. 248-200.100.

Sakata, Mamoru; and Minakawa, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Strut type suspension for automobile. Re. 33,148, Cl. 280-666.000.

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Energy Conversion Devices, Inc.: *See*—
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Entropose GTM pour les Petroliers Maritimes ETPM: *See*—
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Hill, James B.; and Hill, Sally F. Baby carrier. B1 4,436,233, 1-16-90, Cl. 224-159.000.

Hill, Sally F.: *See*—
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Lieberman, Leonard N, to TIF Instruments, Inc. Regulating circuit for gaseous impurity detector. B1 4,282,521, 1-16-90, Cl. 340-632.000.

Madan, Arun: *See*—
Ovshinsky, Stanford R.; and Madan, Arun, B1 4,703,336, Cl 357-30.000.

Ovshinsky, Stanford R.; and Madan, Arun, to Energy Conversion Devices, Inc. Photodetection and current control devices. B1 4,703,336, 1-16-90, Cl. 357-30.000.

Sherrill, John C., to Innovative Products Corporation. Pool vacuum. B1 4,240,173, 1-16-90, Cl. 15-1.700.

Sun-Flex Co.: *See*—
Thomsen, Erik J.; and Brennan, Patrick W., B1 4,253,737, Cl. 350-276.00R.

Tandon, Jag S., to American Environmental International Inc. Air pollution control system method and apparatus. B1 4,662,899, 1-16-90, Cl. 55-80.000.

Thomsen, Erik J.; and Brennan, Patrick W., to Sun-Flex Co. Anti-glare device for a computer terminal display. B1 4,253,737, 1-16-90, Cl. 350-276.00R.

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Idei, Mitsushige, to Sumitomo Rubber Industries, Ltd. Automobile tire. 305,525, 1-16-90, Cl. D12-147.000.

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202.2 4,893,563
218 4,893,564

CLASS 104
7.2 4,893,565
140 4,893,566

CLASS 105
416 4,893,568
419 4,893,567

CLASS 106
14.16 4,894,091
452 4,894,092
461 4,894,093
496 4,894,094

CLASS 109
1 S 4,893,569

CLASS 110
203 4,893,570

CLASS 111
105 4,893,571
194 4,893,572

CLASS 112
225 4,893,573
262.2 4,893,574
465 4,893,575

CLASS 114
219 4,893,576
253 4,893,577
363 4,893,578
4,893,579

CLASS 116
137 R 4,893,580
201 4,893,581
277 4,893,582

CLASS 118
52 4,893,583
723 4,893,584

CLASS 119
1 4,893,585
4,893,586
95 4,893,587

CLASS 122
379 4,893,588

CLASS 123
41.31 4,893,589
4,893,590
52 MF 4,893,591
79 C 4,893,592
187.5 R 4,893,593
4,893,594
192 R 4,893,595
193 P 4,893,596
195 HC 4,893,597
196 S 4,893,598
198 D 4,893,599
419 4,893,600
468 4,893,601
492 4,893,602
514 4,893,603
543 4,893,604
651 4,893,605

CLASS 124
89 4,893,606

CLASS 125
21 4,893,607

CLASS 126
85 B 4,893,608
350 R 4,893,609
360 R 4,893,610
437 4,893,611
438 4,893,612

CLASS 128
4 4,893,613
24 A 4,893,614
24.2 4,893,615
79 4,893,616
90 4,893,617
202.13 4,893,620
343 4,893,623
399 4,893,624
635 4,893,625
640 4,893,626
654 4,893,627
660.05 4,893,628
660.07 4,893,629
671 4,893,630
672 4,893,631
696 4,893,632
736 4,893,633
748 4,893,634
754 4,893,635
764 4,893,636

CLASS 131
84.4 4,893,640
280 4,893,637
364 4,893,638
369 4,893,639

CLASS 132
200 4,893,641

CLASS 134
2 4,894,095
66 4,893,642

CLASS 137
202 4,893,643
218 4,893,644
315 4,893,645
487.5 4,893,646
493 4,893,647
504 4,893,648
4,893,649
539 4,893,650
588 4,893,651
596.17 4,893,652
607 4,893,653
614.2 4,893,654
625.33 4,893,655
874 4,893,656

CLASS 138
109 4,893,657
4,893,658

CLASS 141
85 4,893,659
144 4,893,660

CLASS 144
134 A 4,893,661
230 4,893,662
356 4,893,663

CLASS 148
2 4,894,096
101 4,894,097
122 4,894,098
146 4,894,099
402 4,894,100

CLASS 152
416 4,893,664
451 4,893,665

CLASS 156
67 4,894,101
94 4,894,102
111 4,894,103
152 4,894,104
181 4,894,105
227 4,894,106
229 4,894,107
245 4,894,108
256 4,894,109
272.8 4,894,110
294 4,894,111
308.4 4,894,112
462 4,894,113
631 4,894,114
643 4,894,115
4,894,116

CLASS 159
49 4,894,117

CLASS 160
229.1 4,893,666
236 4,893,667
327 4,893,668

CLASS 162
112 4,894,118
168.2 4,894,119
301 4,894,120
329 4,894,121

CLASS 165
11.1 Re.33,146
38 4,893,669
40 4,893,670
162 4,893,671
163 4,893,672
167 4,893,673
176 4,893,674

CLASS 166
55.8 4,893,675
280 4,893,676
341 4,893,677
374 4,893,678

CLASS 169
39 4,893,679
60 4,893,680
66 4,893,681

CLASS 172
311 4,893,682
821 4,893,683

CLASS 174
28 4,894,488
35 MS 4,894,489
108 4,894,490
135 4,894,491

CLASS 175
65 4,893,684

CLASS 177
174 4,893,685

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CLASS 180

9.1 4,893,687
79.1 4,893,688
140 4,893,689
4,893,690
169 4,893,691
190 4,893,692
275 4,893,693

CLASS 181

111 4,893,694
151 4,893,695

CLASS 182

223 4,893,696

CLASS 184

7.4 4,893,697

CLASS 188

273 4,893,698
299 4,893,699
306 4,893,700

CLASS 192

4 A 4,893,701
45 4,893,702
58 B 4,893,703
141 4,893,704

CLASS 194

211 4,893,705
346 4,893,706

CLASS 198

627 4,893,707
778 4,893,708
852 4,893,709
853 4,893,710

CLASS 200

1 V 4,894,492
5 A 4,894,493
11 R 4,894,494
51.12 4,894,495
80 R 4,894,496
83 R 4,894,497
284 4,894,498
404 4,894,499
565 4,894,500

CLASS 201

17 4,894,122

CLASS 202

176 4,894,123

CLASS 204

30 4,894,124
33 4,894,125
58 4,894,126
58.5 4,894,127
98 4,894,128
129.35 4,894,130
165 4,894,131
192.13 4,894,132
192.15 4,894,133
193 4,894,134
196 4,894,135
198 4,894,129
212 4,894,136
403 4,894,137
415 4,894,138

CLASS 206

45.24 4,893,711
150 4,893,712
304 4,893,713

CLASS 208

48 AA 4,894,139
72 4,894,140
73 4,894,141
111 4,894,142
120 4,894,143
131 4,894,144
350 4,894,145

CLASS 209

12 4,894,146
273 4,894,147
479 4,894,148

CLASS 210

101 4,894,149
4,894,150
4,894,151
169 4,894,152
198.2 4,894,153
222 4,894,154
266 4,894,155
321.84 4,894,156
448 4,894,157
490 4,894,158
497.2 4,894,159
500.41 4,894,160
510.1 4,894,161
602 4,894,162
603 4,894,163
640 4,894,164
646 4,894,165
654 4,894,166
663 4,894,167
673 4,894,168
698 4,894,169
712 4,894,170
748 4,894,172
772 4,894,171

CLASS 211

46 4,893,714
118 4,893,715

CLASS 213

75 TC 4,893,716
188 4,893,717

CLASS 215

232 4,893,718

CLASS 219

10.43 4,894,501
10.55 E 4,894,503
10.55 M 4,894,502
69.12 4,894,504
76.11 4,894,505
85.22 4,894,506
86.7 4,894,507
4,894,508
121.43 4,894,510
121.52 4,894,511
121.6 4,894,509
130.4 4,894,512
203 4,894,513
4,894,514
345 4,894,515
378 4,894,516
388 4,894,517
413 4,894,518
464 4,894,519
497 4,894,520
535 4,894,521

CLASS 220

1 T 4,893,719
4,893,722
5 A 4,893,720
8 4,893,721
85 SP 4,893,723
263 4,893,724
269 4,893,725
403 4,893,726

CLASS 221

81 4,893,727
306 4,893,728

CLASS 222

42 4,893,729
80 4,893,730
92 4,893,731
109 4,893,732
153 4,893,733
4,893,734
168 4,893,735
185 4,893,736
360 4,893,737
380 4,893,738

CLASS 224

B1 4,436,233
159 4,893,739
240 4,893,740

CLASS 226

23 4,893,741
196 4,893,742

CLASS 227

180 4,893,622

CLASS 228

110 4,893,743
181 4,893,744
184

CLASS 229

1.5 R 4,893,745
23 R 4,893,746

CLASS 232

39 4,893,747

CLASS 235

472 4,894,522
4,894,523

CLASS 237

2 A 4,893,748
8 C 4,893,749

CLASS 239

71 4,893,750
130 4,893,751
427.3 4,893,752
578 4,893,753
601 4,893,754
696 4,893,755

CLASS 241

33 4,893,756
34 4,893,757
100 4,893,758
4,893,759
282.2 4,893,760

CLASS 242

46.4 4,893,761
56 R 4,893,762
58.6 4,893,763
71.9 4,893,764
72 R 4,893,765
198 4,893,766

CLASS 244

118.1 4,893,767

CLASS 248

37.3 4,893,768
97 4,893,769
117.1 4,893,770
176 4,893,771
200.1 Re.33,147
235 4,893,772
311.2 4,893,773
398 4,893,774
442.2 4,893,775
475.1 4,893,776
551 4,893,777
610 4,893,778
638 4,893,779
4,893,780

CLASS 250

205 4,894,524
4,894,525
211 R 4,894,526
214 AL 4,894,527
222.1 4,894,528
222.2 4,894,529
227 4,894,530
4,894,531
4,894,532
231 SE 4,894,533
254 4,894,534
255 4,894,535
287 4,894,536
303 4,894,539
306 4,894,537
4,894,538
307 4,894,540
310 4,894,541
336.1 4,894,543
336.2 4,894,542
338.3 4,894,544
423 R 4,894,546
461.2 4,894,547
484.1 4,894,548
492.2 4,894,549
506.1 4,894,550
560 4,894,551
572 4,894,552

CLASS 251

214 4,893,781
356 4,893,782

CLASS 252

8.554 4,894,173
48.2 4,894,174
78.3 4,894,175
171 4,894,176
174.15 4,894,177
189 4,894,178
4,894,179
299.01 4,894,180
299.61 4,894,181
315.2 4,894,182
358 4,894,183
512 4,894,184
519 4,894,185
582 4,894,186
609 4,894,187

CLASS 254

1 4,893,783
100 4,893,784
126 4,893,785
414 4,893,786

CLASS 256

35 4,893,787
47 4,893,788

CLASS 260

364 4,894,545
410.9 R 4,894,188

CLASS 261

136 4,893,796

CLASS 264

15 4,894,189
22 4,894,190
53 4,894,191
68 4,894,192
104 4,894,193
109 4,894,194
134 4,894,195
282 4,894,196
297.2 4,894,197
521 4,894,198

CLASS 266

129 4,893,789
168 4,893,790
226 4,893,791
227 4,893,792
233 4,893,793
271 4,893,794

CLASS 267

1.5 4,893,795
140.1 4,893,797
4,893,798
4,893,799
4,893,800

CLASS 269

6 4,893,801
74 4,893,802

CLASS 270

47 4,893,803

CLASS 271

3.1 4,893,804
204 4,893,805
272 4,893,806

CLASS 272

56.5 R 4,893,807
94 4,893,808
114 4,893,809
123 4,893,810
129 4,893,811
134 4,893,812
145 4,893,813

CLASS 273

82 R 4,893,814
84 ES 4,893,815
146 4,893,816
157 R 4,893,817
212 4,893,818
243 4,893,819
249 4,893,820
371 4,893,821
376 4,893,822

CLASS 277

165 4,893,823

CLASS 280

47.27 4,893,824
81.6 4,893,825
87.021 4,893,826
4,893,827
250.1 4,893,828
414.1 4,893,829
479.2 4,893,830
615 4,893,831
618 Re.33,148
666 4,893,832
719 4,893,833
732 4,893,834
751 4,893,835
808

CLASS 281

28 4,893,836
31 4,893,837
45 4,893,838

CLASS 283

65 4,893,839
81 4,893,840

CLASS 285

15 4,893,841
24 4,893,842
112 4,893,843
113 4,893,844
137.1 4,893,845
156 4,893,846
226 4,893,847
258 4,893,848

CLASS 290

31 4,894,553
55 4,894,554

CLASS 292

7 4,893,849
128 4,893,850
204 4,893,851
251.5 4,893,852
320 4,893,853
341.12 4,893,854
341.17 4,893,855

CLASS 293

106 4,893,856
136 4,893,857

CLASS 294

65.5 4,893,858
103.1 4,893,859
114 4,893,860
119.2 4,893,861

CLASS 296

39.1 4,893,862
76 4,893,863
98 4,893,864
192 4,893,865
214 4,893,866
4,893,867
4,893,868
219 4,893,869
220 4,893,870
223

CLASS 297

270 4,893,871
284 4,893,872
452 4,893,873
483 4,893,874

CLASS 299

91 4,893,875

CLASS 300

8 4,893,876

CLASS 301

108 R 4,893,877

CLASS 303

9.75 4,893,878
71 4,893,879
110 4,893,880
113 4,893,881
4,894,555
115 4,893,882

CLASS 305

10 4,893,883

CLASS 307

106 4,894,556
263 4,894,560
291 4,894,557
296.3 4,894,558
443 4,894,561
455 4,894,562
465 4,894,563
4,894,564
4,894,565
518 4,894,559
530 4,894,566
542 4,894,567
584 4,894,568

CLASS 310

10 4,894,569
68 B 4,894,572
68 C 4,894,571
113 4,894,570
217 4,894,573
258 4,894,574
260 4,894,575
313 D 4,894,576
320 4,894,577
4,894,580
323 4,894,578
328 4,894,579

CLASS 312

107 4,893,884
250 4,893,885
305 4,894,581

CLASS 313

231.01 4,894,582
468 4,894,583
557 4,894,584

CLASS 315

39.51 4,894,586
112 4,894,585
200 R 4,894,587
241 P 4,894,588
248 4,894,589
4,894,590
4,894,591
4,894,592
368 4,894,593

CLASS 318

567 4,894,594
568.1 4,894,596
568.16 4,894,598
568.22 4,894,597
568.24 4,894,595
636 4,894,599
649 4,894,600

CLASS 320

14 4,894,601
38 4,894,602

CLASS 324

65 R 4,894,606
96 4,894,607
4,894,608
107 4,894,609
127 4,894,610
158 P 4,894,612
158 R 4,894,611
173 4,894,613
208 4,894,614
244 4,894,615
309 4,894,616
329 4,894,617
4,894,618
4,894,619
537 4,894,605
639 4,894,603
690 4,894,604

CLASS 328

127 4,894,620

CLASS 330

251 4,894,621
288 4,894,622

CLASS 331

96 4,894,623

CLASS 332

164 4,894,624

CLASS 333

33 4,894,625
101 4,894,626
113 4,894,627
160 4,894,628
177 4,894,629
185 4,894,630

CLASS 335

167 4,894,631
202 4,894,632

CLASS 337

278 4,894,633
343 4,894,634

CLASS 338

2 4,894,635
9 4,894,636
22 R 4,894,637
162 4,894,638

CLASS 340

444 4,894,639
464 4,894,640
466 4,894,641
467 4,894,652
539 4,894,642
593 4,894,643
632 B1 4,282,521
680 4,894,644
703 4,894,653
747 4,894,646
780 4,894,645
815.200 4,894,647
825.060 4,894,648
825.44 4,894,649
825.52 4,894,650
825.91 4,894,651
932.2 4,894,654
988 4,894,655

CLASS 341

120 4,894,656
158 4,894,657

CLASS 342

90 4,894,658
121 4,894,659
129 4,894,660
140 4,894,661
357 4,894,662

CLASS 343

702 4,894,663

CLASS 346

1.1 4,894,664
4,894,665
76 PH 4,894,666
4,894,712
136 4,894,668
140 R 4,894,667
160 4,894,669

CLASS 350

1.1 4,893,886
3.6 4,893,887
96.12 4,893,888
96.15 4,893,889
96.18 4,893,890
96.20 4,893,891

96.22 4,893,892
96.23 4,893,893
96.29 4,893,894
4,893,895
96.31 4,893,896
96.34 4,893,897
132 4,893,898
255 4,893,899
276 R B1 4,253,737
320 4,893,900
321 4,893,901
331 R 4,893,902
4,893,903
337 4,893,904
338 4,893,905
350 R 4,893,906
350 S 4,893,907
357 4,893,908
377 4,893,909
4,893,910
398 4,893,911
506 4,893,912
515 4,893,913
530 4,893,914
606 4,893,915
637 4,893,916

CLASS 351

41 4,893,917
160 H 4,893,918
205 4,893,919
214 4,894,670
221 4,893,920

CLASS 352

92 4,893,921

CLASS 354

108 4,894,671
195.12 4,894,672
275 4,894,673
4,894,674
308 4,894,675
400 4,894,676
403 4,894,677
415 4,894,678

CLASS 355

18 4,894,679
27 4,894,680
45 4,894,681
55 4,894,682
71 4,894,683
207 4,894,684
246 4,894,685
271 4,894,686
277 4,894,687
298 4,894,688

CLASS 356

1 4,893,922
43 4,893,924
72 4,893,925
123 4,893,926
127 4,893,927
336 4,893,928
4,893,929
345 4,893,930
351 4,893,931
369 4,893,932
376 4,893,933
434 4,893,934
436 4,893,935

CLASS 357

3 4,894,689
4 4,894,690
22 4,894,691
23.2 4,894,692
23.3 4,894,694
23.6 4,894,693
4,894,695
4,894,696
4,894,697
26 4,894,698
30 4,894,699
4,894,700
4,894,701
4,894,703
B1 4,703,336
34 4,894,702
70 4,894,704
71 4,894,705
72 4,894,706
74 4,894,707
80 4,894,708
82 4,894,709

CLASS 358

13 4,894,710
28.5 4,893,923
68 4,894,711
86 4,894,714
98 4,894,715
105 4,894,716
108 4,894,717
133 4,894,713
139 4,894,718
153 4,894,719
181 4,894,720
213.17 4,894,721
225 4,894,722
228 4,894,723
231 4,894,724
243 4,894,725
298 4,894,726
429 4,894,727
447 4,894,729
473 4,894,730

CLASS 360

6 4,894,728
9.1 4,894,731
10.1 4,894,732
31 4,894,733
51 4,894,734
97.01 4,894,735
97.02 4,894,739
97.1 4,894,738
103 4,894,740
113 4,894,741
126 4,894,736
4,894,742
128 4,894,743
130.21 4,894,737

CLASS 361

42 4,894,745
91 4,894,744
275 4,894,746
376 4,894,747
380 4,894,748
383 4,894,749
4,894,750
398 4,894,751
421 4,894,752
424 4,894,753

CLASS 362

66 4,894,754
83 4,894,755
97 4,894,756
104 4,894,757
147 4,894,758
250 4,894,759
293 4,894,760
376 4,894,761

CLASS 363

35 4,894,762
4,894,763
65 4,894,764
124 4,894,765
159 4,894,766

CLASS 364

153 4,894,767
200 4,894,768
4,894,769
4,894,770
4,894,771
4,894,772
402 4,894,773
410 4,894,774
413.13 4,894,776
413.15 4,894,778
413.16 4,894,775
419 4,894,777
4,894,779
424.1 4,894,780
431.02 4,894,782
431.11 4,894,781
479 4,894,783
4,894,784
483 4,894,785
497 4,894,786
508 4,894,787
513 4,894,788
521 4,894,789
552 4,894,790
570 4,894,791
708 4,894,792
709.03 4,894,793
723 4,894,794
807 4,894,795
900 4,894,796
4,894,797
4,894,798

CLASS 365

49 4,894,799
154 4,894,801
185 4,894,802
189.05 4,894,803
190 4,894,804
222 4,894,805

CLASS 366

76 4,893,936
136 4,893,937
208 4,893,938
224 4,893,939
247 4,893,940
265 4,893,941
279 4,893,942
312 4,893,943

CLASS 367

7 4,894,806
15 4,894,807
21 4,894,808
57 4,894,809
118 4,894,810
174 4,894,811

CLASS 368

10 4,894,812
256 4,894,813

CLASS 369

19 4,894,814
54 4,894,816
4,894,817
112 4,894,815

CLASS 370

3 4,894,818
32.1 4,894,820
58.1 4,894,821
58.3 4,894,824
60 4,894,822
4,894,823
85.1 4,894,826
124 4,894,825

CLASS 371

8.2 4,894,827
11.3 4,894,828
20.1 4,894,829
22.3 4,894,830
22.5 4,894,800

CLASS 372

19 4,894,831
44 4,894,832
4,894,833
4,894,834
45 4,894,835
4,894,836
72 4,894,837
86 4,894,838
93 4,894,839
108 4,894,840

CLASS 374

46 4,893,944
188 4,893,945

CLASS 375

1 4,894,841
4,894,842
8 4,894,843
42 4,894,844
83 4,894,845
107 4,894,846
121 4,894,847

CLASS 376

4 4,894,819
107 4,894,199
237 4,894,200
261 4,894,201
4,894,848
268 4,894,849
306 4,894,202
416 4,894,203

CLASS 378

62 4,894,850
99 4,894,851
119 4,894,852
138 4,894,853
181 4,894,854
196 4,894,855

CLASS 379

61 4,894,856
67 4,894,857
167 4,894,858
204 4,894,859
240 4,894,860
374 4,894,861
390 4,894,862
395 4,894,863
398 4,894,864

CLASS 384

549 4,893,946
4,893,947
551 4,893,948

CLASS 400

56 4,893,949
185 4,893,950
225 4,893,951
470 4,893,952
582 4,893,953
714 4,893,954

CLASS 401

7 4,893,955
130 4,893,956
146 4,893,957

CLASS 403

7 4,893,958
12 4,893,959
24 4,893,960
232.1 4,893,961
288 4,893,962
322 4,893,963
376 4,893,964

CLASS 405

202 4,893,965
224 B1 4,505,620

CLASS 406

127 4,893,966

CLASS 407

7 4,893,967
54 4,893,968
114 4,893,969

CLASS 408

72 R 4,893,970

CLASS 409

80 4,893,971
299 4,893,972

CLASS 411

55 4,893,973
82 4,893,974
87 4,893,975
180 4,893,976
278 4,893,977
553 4,893,978

CLASS 412

4 4,893,979

CLASS 414

3 4,893,980
5 4,893,981
753 4,893,982

CLASS 415

48 4,893,983
4,893,984
90 4,893,985
100 4,893,986

CLASS 416

92 4,893,987
140 4,893,988
157 R 4,893,989
228 4,893,990

CLASS 417

53 4,893,991
238 4,893,992
269 4,893,993
4,893,994
370 4,893,995

CLASS 418

99 4,893,996
126 4,893,997

CLASS 422

72 4,894,204
197 4,894,205
249 4,894,206
292 4,894,207

CLASS 423

2 4,894,208
15 4,894,209
230 4,894,210
266 4,894,211
328 4,894,212
4,894,213
4,894,214
449 4,894,215
574 R 4,894,216
659 4,894,217

CLASS 424

1.1 4,894,218
9 4,894,219
52 4,894,220
54 4,894,221
59 4,894,222
71 4,894,223
78 4,894,224
85.1 4,894,225
85.2 4,894,226
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89 4,894,228
92 4,894,229
409 4,894,230
426 4,894,231
439 4,894,232
440 4,894,233
4,894,234
452 4,894,235
470 4,894,236
486 4,894,237
4,894,238
497 4,894,239
4,894,240
672 4,894,241

CLASS 425

114 4,893,998
174.4 4,893,999
190 4,894,000
200 4,894,001
319 4,894,002
399 4,894,003
435 4,894,004

CLASS 426

29 4,894,242
43 4,894,243
46 4,894,244
68 4,894,245
94 4,894,246
107 4,894,247
121 4,894,248
264 4,894,249
573 4,894,250

CLASS 427

8 4,894,251
4,894,252
36 4,894,253
38 4,894,254
4,894,255
39 4,894,256
78 4,894,257
103 4,894,258
208.8 4,894,259
241 4,894,260
379 4,894,261
393 4,894,262

CLASS 428

1 4,894,263
34.2 4,894,264
34.6 4,894,265
35.4 4,894,266
36.42 4,894,268
36.7 4,894,267
43 4,894,269
125 4,894,270
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166 4,894,275
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201 4,894,278
216 4,894,279
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332 4,894,282
341 4,894,283
378 4,894,284
402 4,894,285
408 4,894,286
4,894,287
422 4,894,288
424.2 4,894,289
426 4,894,290
518 4,894,291
524 4,894,292
614 4,894,293

CLASS 429

18 4,894,294
27 4,894,296
31 4,894,297
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50 4,894,298
77 4,894,295
104 4,894,299
190 4,894,300
193 4,894,301
194 4,894,302

CLASS 430

13 4,894,303
58 4,894,304
106.6 4,894,305
126 4,894,306
128 4,894,307
137 4,894,308
4,894,309
138 4,894,310
192 4,894,311
203 4,894,312
271 4,894,313
281 4,894,314
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316 4,894,316
319 4,894,317
372 4,894,318
383 4,894,319
393 4,894,320
496 4,894,321
505 4,894,322
569 4,894,323
622 4,894,324

CLASS 431

115 4,894,005
116 4,894,006
168 4,894,007
200 4,894,008

CLASS 432

64 4,894,009

CLASS 433

27 4,894,010
81 4,894,011
215 4,894,012

CLASS 434

268 4,894,013

CLASS 435

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CLASS 436

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540 4,894,347
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CLASS 437

95 4,894,349
184 4,894,350
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CLASS 439

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67 4,894,015
76 4,894,016
78 4,894,017
81 4,894,018
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762 4,894,028
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885 4,894,031

CLASS 440

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CLASS 441

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65 4,894,034
79 4,894,035
93 4,894,036

CLASS 445

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CLASS 446

46 4,894,038
75 4,894,039
91 4,894,040
160 4,894,041
437 4,894,042

CLASS 464

33 4,894,043
111 4,894,044
138 4,894,045

CLASS 474

78 4,894,046
110 4,894,047
240 4,894,048
4,894,049

CLASS 494

30 4,894,050

CLASS 982

64 4,894,354

CLASSIFICATION OF PATENTS

101	4,894,355		4,894,384	714	4,894,412	331	4,894,438	241	4,894,461	12	4,894,481
170	4,894,356	397	4,894,385		**CLASS 525**	351	4,894,439	265	4,894,462	319	4,894,482
233	4,894,357	414	4,894,386	65	4,894,413		4,894,440	303	4,894,463	335	4,894,483
	CLASS 503	415	4,894,387	66	4,894,414	356	4,894,441		**CLASS 549**	615	4,894,484
201	4,894,358	438	4,894,389	68	4,894,415	387	4,894,442	88	4,894,464	618	4,894,485
209	4,894,359	443	4,894,390	74	4,894,416	388	4,894,443	214	4,894,465	702	4,894,486
	CLASS 505	452	4,894,391	98	4,894,417	414	4,894,444	292	4,894,466	832	4,894,487
1	4,894,360	459	4,894,392	185	4,894,418		**CLASS 534**	534	4,894,467		**CLASS 574**
	4,894,361	476	4,894,393	189	4,894,419	14	4,894,445		**CLASS 556**	425	4,894,388
	CLASS 514		**CLASS 518**	237	4,894,420	15	4,894,446	416	4,894,468		**CLASS 604**
12	4,894,362	700	4,894,394	243	4,894,421	775	4,894,447		**CLASS 558**	22	4,894,051
23	4,894,363		**CLASS 521**	420	4,894,422		**CLASS 536**	90	4,894,469	63	4,894,052
49	4,894,364	79	4,894,395	468	4,894,423	84	4,894,448	142	4,894,470	85	4,894,053
50	4,894,365		**CLASS 523**		**CLASS 526**	118	4,894,449	378	4,894,471	136	4,894,054
63	4,894,366	109	4,894,396	125	4,894,424		**CLASS 540**	405	4,894,472	198	4,894,055
78	4,894,367	201	4,894,397	181	4,894,425	350	4,894,450		**CLASS 560**	267	4,894,056
137	4,894,368		**CLASS 524**		**CLASS 528**		**CLASS 544**	156	4,894,473	280	4,894,057
176	4,894,369	83	4,894,398	22	4,894,426	156	4,894,451	206	4,894,474	332	4,894,058
183	4,894,370	91	4,894,399	26	4,894,427	192	4,894,452	251	4,894,475	349	4,894,059
202	4,894,371		4,894,400	45	4,894,428	331	4,894,460		**CLASS 562**	391	4,894,060
212	4,894,372	109	4,894,401		4,894,429	354	4,894,453	504	4,894,476	403	4,894,061
230.5	4,894,374	157	4,894,402	75	4,894,430	406	4,894,454	519	4,894,477		**CLASS 606**
239.2	4,894,373	216	4,894,403	90	4,894,431		**CLASS 546**		**CLASS 564**	54	4,893,618
249	4,894,375	226	4,894,404	204	4,894,432	2	4,894,455	267	4,894,478	87	4,893,619
255	4,894,376	265	4,894,405	272	4,894,433	41	4,894,456	300	4,894,479	127	4,893,621
292	4,894,377	310	4,894,406	388	4,894,434	85	4,894,457		**CLASS 568**		**CLASS 623**
302	4,894,378	413	4,894,407	392	4,894,435	156	4,894,458	11	4,894,480	6	4,894,062
332	4,894,379	425	4,894,408		**CLASS 530**		**CLASS 548**			13	4,894,063
340	4,894,380	492	4,894,409	324	4,894,436	197	4,894,459			22	4,894,064
383	4,894,381	545	4,894,410	328	4,894,437						
	4,894,382	710	4,894,411								
	4,894,383										

CLASSIFICATION OF DESIGNS

D2—	276	305,475	351	305,492	D11—	17	305,509	149	305,526	140	305,543	189	305,559
	314	305,476	391	305,493			305,510		305,527	142	305,544	225	305,560
		305,477	D8—	7	305,494		27	305,511		305,528	D16—	237	305,545	D22—	109	305,561
D3—	34	305,478		8	305,495		86	305,512	156	305,529	D17—	14	305,546	D23—	356	305,562
	75	305,479		10	305,496		93	305,513	D13—	13	305,530		20	305,547	D24—	36	305,563
D4—	102	305,480		13	305,497			305,514		24	305,531	D18—	12	305,548		52	305,564
	132	305,481		70	305,498			305,515	D14—	100	305,534			305,549		55	305,565
D5—	27	305,482		98	305,499			305,516			305,535		13	305,550	D25—	18	305,566
D6—	310	305,483		375	305,500			305,517			305,536	D19—	57	305,551		67	305,567
	326	305,484	D9—	341	305,502			305,518		101	305,537			305,552		113	305,568
	438	305,485		352	305,503	D12—	5	305,519			305,538		75	305,553			305,569
	475	305,486		374	305,504		110	305,520		105	305,539	D21—	12	305,554			305,574
	496	305,487		413	305,505		133	305,521		151	305,533		134	305,555		114	305,570
	523	305,488		418	305,506			305,522		163	305,540		143	305,556			305,571
	603	305,489		433	305,507		146	305,523		205	305,541		155	305,557			305,572
D7—	77	305,490		448	305,501		147	305,524		256	305,532		160	305,558			305,573
	104	305,491	D10—	106	305,508			305,525	D15—	133	305,542						

CLASSIFICATION OF PLANTS

P.—	34	7,106	69	7,108	70	7,110	7,112	71	7,114	7,115
	68	7,107		7,109		7,111	7,113			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,893,355	4,893,900	4,894,613		4,894,854		4,893,961	19 :	4,893,736
	4,893,563	4,893,903	4,894,623		4,894,860		4,894,028		4,893,828
04 :	4,893,448	4,893,905	4,894,653	10 :	4,893,599	17 :	4,893,363		4,894,523
	4,893,975	4,893,910	4,894,654		4,894,247		4,893,375		4,894,536
	4,894,665	4,893,924	4,894,658		4,894,270		4,893,390	20 :	4,893,608
	4,894,755	4,893,930	4,894,664		4,894,361		4,893,433	21 :	4,893,638
	4,894,769	4,893,934	4,894,694	12 :	Re.33,147		4,893,452		4,893,942
	4,894,812	4,893,935	4,894,724		4,893,365		4,893,497		4,894,141
	4,240,173	4,893,950	4,894,734		4,893,434		4,893,562		4,894,493
05 :	4,893,469	4,893,967	4,894,736		4,893,435		4,893,645		4,894,515
	4,894,123	4,893,980	4,894,740		4,893,455		4,893,656		4,894,798
06 :	4,893,358	4,893,986	4,894,741		4,893,535		4,893,685	22	4,893,457
	4,893,368	4,893,996	4,894,758		4,893,550		4,893,687		4,893,585
	4,893,403	4,894,022	4,894,774		4,893,578		4,893,754		4,893,864
	4,893,408	4,894,054	4,894,792		4,893,636		4,893,757		4,894,057
	4,893,409	4,894,062	4,894,795		4,893,772		4,893,758		4,894,285
	4,893,423	4,894,063	4,894,797		4,893,846		4,893,770		4,894,481
	4,893,453	4,894,067	4,894,802		4,893,894		4,893,839		4,894,757
	4,893,458	4,894,133	4,894,828		4,893,943		4,893,840	23 :	4,894,004
	4,893,459	4,894,149	4,894,83.		4,894,031		4,893,861	24 :	4,893,393
	4,893,474	4,894,169	4,894,837		4,894,039		4,893,875		4,893,481
	4,893,476	4,894,190	4,894,839		4,894,043		4,893,883		4,893,488
	4,893,499	4,894,199	4,894,858		4,894,105		4,893,952		4,893,576
	4,893,559	4,894,203	4,253,737		4,894,219		4,893,956		4,893,710
	4,893,567	4,894,218	4,282,521		4,894,267		4,893,978		4,893,813
	4,893,609	4,894,222	4,893,385	08 :	4,894,364		4,894,000		4,894,013
	4,893,621	4,894,225	4,893,405		4,894,542		4,894,026		4,894,143
	4,893,623	4,894,226	4,893,413		4,894,575		4,894,037		4,894,152
	4,893,633	4,894,227	4,893,427		4,894,608		4,894,038		4,894,228
	4,893,655	4,894,242	4,893,531		4,894,642		4,894,051		4,894,462
	4,893,673	4,894,265	4,893,676		4,894,649		4,894,087		4,894,592
	4,893,713	4,894,272	4,893,697		4,894,663		4,894,142		4,894,615
	4,893,728	4,894,286	4,893,801		4,894,679		4,894,251		4,894,621
	4,893,729	4,894,295	4,893,928		4,894,759		4,894,258	25 :	Re.33,149
	4,893,733	4,894,303	4,893,932		4,894,763		4,894,340		4,893,364
	4,893,742	4,894,314	4,894,008		4,894,782		4,894,504		4,893,437
	4,893,755	4,894,330	4,894,102		4,894,784		4,894,625		4,893,487
	4,893,769	4,894,331	4,894,112	13 :	4,893,381		4,894,627		4,893,551
	4,893,777	4,894,334	4,894,125		4,893,400		4,894,822		4,893,624
	4,893,780	4,894,379	4,894,245		4,897,456		4,894,824		4,893,627
	4,893,795	4,894,389	4,894,601		4,893,541		4,894,853		4,893,629
	4,893,811	4,894,413	4,893,543	09 :	4,893,547		4,662,899		4,893,632
	4,893,812	4,894,439	4,893,622		4,893,574	18 :	4,893,580		4,893,738
	4,893,815	4,894,443	4,893,767		4,893,731		4,893,958		4,893,763
	4,893,817	4,894,491	4,893,810		4,893,893		4,893,976		4,893,768
	4,893,832	4,894,508	4,893,852		4,894,280		4,894,015		4,893,920
	4,893,835	4,894,529	4,893,936		4,894,847		4,894,170		4,893,923
	4,893,836	4,894,535	4,894,012		4,894,857		4,894,252		4,893,989
	4,893,847	4,894,545	4,894,464	15 :	4,893,641		4,894,401		4,894,124
	4,893,890	4,894,556	4,894,569		4,893,771		4,894,416		4,894,157
	4,893,897	4,894,558	4,894,631		4,893,915		4,894,566		4,894,196
	4,893,898	4,894,563	4,894,632		4,894,034		4,894,689		4,894,231
	4,893,899	4,894,565	4,894,787	16 :	4,893,523		4,894,725		4,894,273

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4,894,293
4,894,296
4,894,329
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January 23, 1990 Volume 1110 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 20, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,637,074 through 4,638,508
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 18, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,368,544 through 4,369,525
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 5, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,298,360	06/230,650	11/03/81
4,298,973	06/218,703	11/03/81
4,550,455	06/548,227	11/05/85
4,550,457	06/612,897	11/05/85
4,550,461	06/573,281	11/05/85
4,550,462	06/307,249	11/05/85
4,550,467	06/357,603	11/05/85
4,550,468	06/660,298	11/05/85
4,550,469	06/318,739	11/05/85
4,550,476	06/570,280	11/05/85
4,550,479	06/467,190	11/05/85
4,550,504	06/452,376	11/05/85
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4,550,512	06/641,654	11/05/85
4,550,517	06/511,550	11/05/85
4,550,521	06/606,513	11/05/85
4,550,524	06/643,554	11/05/85
4,550,527	06/486,193	11/05/85
4,550,529	06/664,354	11/05/85
4,550,531	06/563,214	11/05/85
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4,551,033	06/487,959	11/05/85
4,551,041	06/619,744	11/05/85
4,551,045	06/588,229	11/05/85
4,551,046	06/521,553	11/05/85
4,551,060	06/440,439	11/05/85
4,551,061	06/485,654	11/05/85
4,551,063	06/586,262	11/05/85
4,551,065	06/449,505	11/05/85
4,551,066	06/473,001	11/05/85
4,551,072	06/580,498	11/05/85
4,551,075	06/487,005	11/05/85
4,551,080	06/543,465	11/05/85
4,551,083	06/612,419	11/05/85
4,551,091	06/605,318	11/05/85
4,551,095	06/696,556	11/05/85
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4,551,102	06/602,167	11/05/85
4,551,103	06/671,885	11/05/85
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4,551,127	06/438,092	11/05/85
4,551,129	06/483,279	11/05/85
4,551,132	06/445,690	11/05/85
4,551,135	06/379,779	11/05/85
4,551,152	06/718,580	11/05/85
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4,551,156	06/570,816	11/05/85
4,551,165	06/486,192	11/05/85
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4,551,186	06/525,769	11/05/85
4,551,193	06/550,695	11/05/85
4,551,197	06/634,635	11/05/85
4,551,199	06/394,208	11/05/85
4,551,200	06/629,517	11/05/85
4,551,201	06/629,516	11/05/85
4,551,216	06/632,476	11/05/85
4,551,220	06/517,957	11/05/85
4,551,228	06/605,741	11/05/85
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4,551,246	06/428,773	11/05/85
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NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(20, in view of the Petition to Accept Late Payment of the manitenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 27 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,535,796	06/608,051	8/20/85	2/10/84	10/11/89
4,537,211	06/495,247	8/27/85	5/17/83	12/06/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,377,024, Re. S. N. 07/432,301, Filed Oct. 20, 1989, Cl. 029/157, METHOD OF MAKING A HEAT EXCHANGER, Zalman Saperstein, Owner of Record: *Modine Manufacturing Company*. Attorney or Agent: William A Van Santen, Ex. Gp.: 326

4,433,951, Re. S. N. 834,988, Filed Feb. 28, 1986, Cl. 414/217, MODULAR LOADLOCK, George R. Koch, Owner of Record: *Lam Research Corporative, Santa Clara, Calif.*, Attorney or Agent: James M. Heslin, et al., Ex. Gp.: 317

4,667,538, Re. S. N. 445,051, Filed Nov. 24, 1989, Cl. 74/785, RANGE GEARBOX FOR MOTOR VEHICLES HAVING AN AXIALLY SHIFTABLE RING GEAR, Lena Larson, Owner of Record: *A. B. Volvo, Gothenburg, Sweden*, Attorney or Agent: Robert L. Patch, et al., Ex. Gp.: 352

4,680,756, Re. S. N. 07/379,643, Filed July 13, 1989, Cl. 370/88, MULTI-NETWORK SYSTEM, Norihiko Sugimoto, Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 263

4,706,712, Re. S. N. 446,501, Filed Dec. 12, 1989, Cl. 138/126, HOSE CONSTRUCTION, Donald L. Ogleshy, et al., Owner of Record: *Dayco Products, Inc., Dayton, Ohio*, Attorney or Agent: Joseph V. Tassone, et al., Ex. Gp.: 242

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,143,760, Reexam. No. 90/001,907, Requested Dec. 13, 1989, Cl. 198/750, RECIPROCATING CONVEYOR, Olof A. Hallstrom, Owner of Record: *Inventor, Tillamook, Oreg.*, Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: Raymond K. Foster, Madras, Oreg.

4,455,417, Reexam. No. 90/001,905, Requested Dec. 11, 1989, Cl. 528/272, CRYSTALLIZABLE THERMOPLASTIC POLYMERS, Nicholas Vanderkooi, et al., Owner of Record: *Allied Corp. Morris Township, N.J.*, Attorney or Agent: Patrick L. Henry, Ex. Gp.: 150, Requester: The Goodyear Tire and Rubber Co., Akron, Ohio

4,508,769, Reexam. No. 90/001,906, Requested Dec. 11, 1989, Cl. 428/36, PROCESS TO FORM AMORPHOUS CRYSTALLIZATION THERMOPLASTIC POLYMERS, Nicholas Vanderkooi, Owner of Record: *Allied Corp., Morris Township, N.J.*, Attorney or Agent: Patrick L. Henry, Ex. Gp.: 150, Requester: The Goodyear Tire and Rubber Co., Akron, Ohio

4,819,569, Reexam. No. 90/001,904, Requested Dec. 7, 1989, Cl. 108/113, MOVABLE TABLE WITH STABILIZING APPARATUS, John B. Bastian, et al., Owner of Record: *Hamilton Industries, Inc., Two Rivers, Wis.*, Attorney or Agent: Tilton, Fallon, Logmus and Chestnut, Ex. Gp.: 350, Requester: Midwest Folding Products Mfg. Corp., Chicago, Ill.

REGISTRATION TO PRACTICE

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Oct. 11, 1989 were mailed to 650 candidates. The following list contains the names of persons who successfully passed the examination. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR 10.9(a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute, 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Feb. 23, 1990. Send information to be considered to the following address: U. S. Patent and Trademark Office, Box OED, Washington, D. C. 20231.

Dec. 27, 1989

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline

Abramson, Fredric D., 21155 Burnham Rd., Gaithersburg, Md. 20882
Alworth, Charles W., 5 Hillcrest Dr., Ponca City, Okla. 74604
Anderson, Floyd E., 3401 N. Columbus Blvd., Unit 18-J, Tucson, Ariz. 85712
Anderson, Robert D., 5001 S. 7th Rd., #301, Arlington, Va. 22204
Anderson, William B., 1158 Harriet Ave., Campbell, Calif. 95008
Areaux, Raymond G., 35 Moselle Dr., Kenner, La. 70065
Askoff, Keith G., 303 Chiquita Ave., #13, Mountain View, Calif. 94041
Bailey, Matthew T., 604 Constitution Ave., N.E., Washington, D.C. 20002
Bakshi, Reena, 717 Marguerite Ave., Corona Del Mar, Calif. 92625
Banner, Pamela I., 1813 N. Uhle St., Arlington, Va. 22201
Barkume, Anthony R., 5 Baylor Dr., Smithtown, N.Y. 11787
Barrus, Craig S., 1172 W. 1300 North, Provo, Utah 84604
Bauman, Steven C., 505 Lagvardia Pl., New York, N.Y. 10012
Baumeister, Kirk, 13 W. Salisbury Dr., Wilmington, Del. 19809
Baxter, Murray B., 8695 Bent Arrow Ct., Springfield, Va. 22153
Bever, Patrick T., 3447 Forbes Ave., Santa Clara, Calif. 95051
Biek, David L., 918 Judson Ave, #3A, Evanston, Ill., 60202
Biska, Janis J.O., 28-14th Ave., San Mateo, Calif. 94402
Blecher, Melvin, 4329 Van Ness St., N.W., Washington, D.C. 20016
Block, Jacob, 14112 Parkvale Rd., Rockville, Md. 20853
Blosser, George H., 1536 Oakglen Dr., Fenton, Mo. 63026
Boley, William F., 3702 Applewood, Midland, Miss. 48640
Bolton, Craig E., 14215 Seneca Rd., Darnestown, Md. 20874
Bonar, Laurence C., 1121 Via Alamosa, Alameda, Calif. 94501
Borucki, Andrea T., 5896 N. Sturgeon Rd. Rt.11, Midland, Miss. 48640
Boswell, Mary J., 1330 New Hampshire Ave., N.W., Washington, D.C. 20036
Boyle, James F., 3550 N. Pilgrim Rd, Brookfield, Wis. 53005
Brandau, Rebecca J., 4637 Shenandoah, Apt. 2E, St. Louis, Mo. 63110
Brueske, Curtis B., 630A S. 15th St., Arlington, Va. 22202
Brumm, Margaret M., 2703 Castle Bluff Ct., S.E., Kenwood, Miss. 49512
Bruns, Gregory Allen, 4612 Bruce Ave. S., Minneapolis, Minn. 55424
Bruttomesso, Raymond L., Jr., 8118 Nectar Dr., #621, Canton, Miss. 48187
Buckley, Delmas R., Jr., 330 Lincoln Ave., Livermore, Calif. 94550
Burstyn, Harold L., 216 Bradford Pkwy., Syracuse, N.Y. 13224
Bushendorf, Deanna C., 3725 Inglewood Blvd., Apt. 1, Los Angeles, Calif. 90066
Butter, Gary M., 193 Evergreen Rd., Apt. 3A, Edison, N.J., 08837
Campbell, Jay R., 2855 Sharon-Copley Rd., Medina, Ohio 44256
Campbell, Ronald J., 109 Lewis Brook Rd., Pennington, N.J. 08534
Caplan, Mark J., 529 Country Club Dr., Wilmington, Del. 19803
Carson, Matt W., 1248 Redlands Way, Concord, Calif. 94521

Carter, John P., 169 Dumbarton Rd., Baltimore, Md. 21212
Carvellas, Michael J., 8417 Alyce Pl., Alexandria, Va. 22308
Champion, Aileen M., 604 E. Line Ave., Ellwood City, Pa. 16117
Chan, Michael, 5450-A Cascade Ct., Willoughby, Ohio 44094
Chapman, Bruce G., 1001 N. Randolph St., #317, Arlington, Va. 22201
Chen, Robert H., 8 Captain Dr., #452, Emmerville, Calif. 94608
Cheng, Julie J., 144 Uptown Rd., Apt. C-209, Ithaca, N.Y. 14850
Cheng, Kent H., 12 Jackson St., Cos Cob, Conn. 06807
Cherskov, Michael J., 8441 W. 127th St., Palos Park, Ill. 60464
Childress, Ellen C., 105 Green St., Reading, Mass. 01867
Chisholm, Malcolm J., Jr., 2 Hubbard Hill Rd., Sunderland, Mass. 01375
Cimbala, Michele A., 2916 Birchtree La., Silver Spring, Md. 20906
Citron, Joel D., 2003 Ferndale Dr., Wilmington, Del. 19810
Clark, Robert F., 251 Linwood St., Brockton, Mass. 02401
Clifford, Lisa Ann, 1441 Veteran Ave., #417, Los Angeles, Calif. 90024
Cochenour, Craig G., 455 Huntingdon Ave., North Huntingdon, Pa. 15642
Collopy, Daniel R., P.O. Box 3466, Boynton Beach, Fla. 33424
Cona, Franklin J., 6460 MOurning Dove Dr., #395, Bradenton, Fla. 34210
Conde, Dominick A., 72 Bradhill La., Concord, N.H. 03301
Connaughton, Martin P., 2641 Edgemont, Trenton, N.J. 48183
Conover, John C., 4580 Bannock Dr., Bozeman, Mont. 59715
Conway, Robert T., 3 Long Ave., Belmont, Mass. 02178
Corless, Peter F., 48 Main St., Southborough, Mass. 01772
Covel, Richard A., 143 Cross St., Norwell, Mass. 02061
Cox, Ray Forrest, Jr., 8112 McDaniel Dr., Little Rock, Ark. 72209
Cross, Ryan N., 512 Conestoga, Yukon, Okla. 73099
Dahl, Bruce E., 7290 S. Cook Cir., Littleton, Colo. 80122
Dahl, Nancy K., 3045 33rd St., San Diego, Calif. 92104
Danyko, Richard J., Jr., 15 Northview Pl., Yonkers, N.Y. 10703
Darkes, Paul R., 1808 Braeburn Terrace, Lansdale, Pa. 19446
Darnley, James D., Jr., 3530 Burton Ridge Dr., S.E., #1, Grand Rapids , Mich. 49546
Davidge, Ronald V., 4160 NW 113 Ave., Coral Springs, Fla. 33065
Deaton, Betty J., 466 High St. Ext., Fairport, N.Y. 14450
Deditch, Aaron C., 41 Ward Pl., East Hanover, N.J. 07936
Delaney, Tim Q., 1232 Reading Ct., Wheaton, Ill. 60187
Delsing, Gita Angelika, 6906 Chelsea Rd., Mclean, Va. 22101
Deneufbourg, Daniel J., 1936 N. 19th Ave., Melrose Park, Ill. 60160
DeRenzi, Bruce D., 155 Penn Ave., Staten Island, N.Y. 10306
Deshmukh, Sudhir Govind, 47 Covington La., Voorhees, N.J. 08043
Dey, Maureen E., 476 Commonwealth Ave., #4, Boston, Mass. 02215
Dickinson, Margie R., 254 N. Eckhoff St., Orange, Calif. 92668
Dinner, Dara L., P.O. Box 59297, Philadelphia, Pa. 19102
Dobrusin, Eric M., 33511 Heritage Hills, Farmington Hills, Miss. 48331
Dockrey, Jasper W., 606 Brookhollow Dr., Pflugerville, Tex. 78660
Dolce, Carla Jo, 319 Connecticut Ave., N.W., Atlanta, Ga. 30307
Domingue, Charles D., 606 Colonial Dr., Lafayette, La. 70506
Donovan, Patricia A., 5957 Lemay Rd., Rockville, Md. 20851
Downey, Robert M., 8950 Old Cutler Rd., Miami, Fla. 33156
Duffy, Roseanne R., 14 Benjamin Run Dr., Landenberg, Pa. 19350
Dunner, Jennifer A., 1660 N. LaSalle, Apt. 1007, Chicago, Ill. 60614
Dustman, Wayne J., 6304 Pilgrim Ct., Bensalem, Pa. 19020
Edmondson, James W., 6809 Houndmaster Rd., Springfield, Va. 22152
Elchuk, Mark D., 35320 Drakeshire, Apt. 101, Farmington, Miss. 48024
Erdman, Kevin R., 6500 St. Joe Rd., Apt. 8-14, Fort Wayne, Ind. 46835
Erickson, Randall T., 808 Lyford La., Wheaton, Ill. 60187
Evans, Linda S., 2957 Sycamore St., Alexandria, Va. 22305
Evens, Carl Jay, 2815 Elm St., Oceanside, N.Y. 11572
Fabian, Gary R., 345 Sheridan Ave., # 306, Palo Alto, Calif. 94306
Featherstone, Donald J., 1804 N. Quinn St., #503, Arlington, Va. 22209
Fedowich, Valerie M., 18 N. Cottage St., Valley Stream, N.Y. 11580
Feng, Paul Y., 88 Robsart Rd., Kenilworth, Ill. 60043
Fenster, Paul, 59 Ahad Haam St., Petach Tikua Isreal
Ferber, Donna M., 4543 Starboard Dr., Boulder, Colo. 80301
Ference, Stanley D., III, Apt. 4R, 236 East 74th St., New York, N.Y. 10021
Fiedler, Alan W., 180 Lafayette Ave., #11-I, Passaic, N.Y. 07055
Fish, Robert D., 12682 Senda Acantilada, San Diego, Calif. 92128
FitzGerald, Joseph T., 5712 Gladden Ct., Alexandria, Va. 22303
Flanagan, Thomas V., 10900 Rockville Pike, Rockville, Md. 20852
Floyd, Linda A., 28 Medbury Rd., Wallingford, Pa. 19086
Flynn, Kerry A., 4849 Connecticut Ave, N.W., #627, Washington, D.C. 20006
Forman, David S. , 4301 Massachusetts Ave., N.W., A-204, Washington, D.C. 20016
Fraser, Stewart A., 32302 Electric Blvd., Avon Lake, Calif. 44012
Friedman, Barry I., 1230 D Chatham Park Dr., Pittsburgh, Pa. 15216
Friedman, Mark M., 4319 Breakwood, Houston, Tex. 77096
Friscia, Michael R., 802 Park Ave., #1L, Hoboken, N.J. 07030
Galliani, William S., 501 Forest, #705, Palo Alto, Calif. 94301
Gananian, Jeffrey S., 1111 Johnson St., Menlo Park, Calif. 94025
Gard, Vernon R., 3829 Panda La., San Jose, Calif. 95117
Gardner, Arthur A., 3657 Longfellow Trail, Marietta, Ga. 30062
Garner, Charles C., 4167 Courtshire Dr., Dallas, Tex. 75229
Gerardi, Michael M., 5840 Cameron Run Terrace, #1406, Alexandria, Va. 22303
Gieser, Susan Christine, 15 Pioneer Ct., Ewing, N.J. 08628
Glaister, Debra Jo, 3651 Sunset Dr., San Bruno, Calif 94066
Glynn, Patrick J., 5818 East University, #129, Dallas, Tex. 75206
Goldsmith, Amy B., 5 Deerfoot La., Dobbs Ferry, N.Y. 10522
Golub, Daniel H., 95 Cherry Hill La., Broomall, Pa. 19008
Gortler, Hugh P., 23 Thurston Dr., Livingston, N.J. 07039
Gould, James M., 2950 Van Ness St., N.W., Apt, 929, Washington, D.C. 20008
Graham, Robert W., 3340 Rosewood La., Oklahoma City, Okla. 73120
Gray, Michael K., 8519 Culver Pl., Alexandria, Va. 22308
Gribbell, Frederick H., 3263 Bellacre Ct., Cincinnati, Ohio 45248
Griebenow, Lori J., Texas Instruments Inc. P.O. Box 655474, M/S 219, Dallas, Tex. 75075
Grolz, Edward W., 1986 Potter Ave., N. Merrick, N.Y. 11566
Guard, Lynndon M., 201 N.W. 33rd St., Oklahoma City, Okla. 73118
Hahl, Robert W., 3510 S. Wakefield St., Arlington, Va. 22206
Hamilton, Amy E., 3718 E. Southport Rd., Indianapolis, Ind. 46227
Hampton, Steven J., 140 East Vermont St., Villa Park, Ill. 60181
Hanover, Gabriel N., II, 3488 Rubio Crest Dr. Altadena, Calif. 91001
Harbin, Alisa A., 4360 Ivymount Ct., #58, Annandale, Va. 22003
Harmuth, Raymond J., 5813 Montgomery Sq. Dr., #2A, Kettering, Ohio 45440
Harper, Blaney, 1625 Tanyard Hill Rd., Gaithersburg, Md. 20879
Harrold, Wayne H., Jr., 905 Ash Rd., Hoffman Estates, Ill. 60195
Hartman, Gary M., 15071 Bradner Rd., Plymouth, Miss. 48170
Hayes, Darlene W., 977 El Camino Real, #203, Burlingame, Calif. 94010
Hayes, John W., 221 N. Harvard Ave., Arlington Heights, Ill. 60005
Hochstetler, Douglas C., 414 Julian St., Waukegan, Ill. 60085
Hoffmann, Richard W., 39342 Heatherheath Dr., Mt. Clemens, Miss. 48044
Hohenschutz, Liza D., 231 N. 3rd St., #417, Philadelphia, Pa. 19106
Hollaar, Lee A. , 1367 East 100 South, Salt Lake City, Utah 84102
Holtz, Douglas E., 418 Jordan St., Oceanside, N.Y. 11572
Hoskins, Hartley, 42 Haynes Ave., Falmouth, Mass. 02540

Hotchkiss, Edward S., 50 N. 4th Ave., #4B Minneapolis, Minn. 55401
Howard, Kathryn Mary, 16152 Sheldon Ave., Eden Prairie, Minn. 55344
Howell, John M., 2991 Pine Grove La., Maineville, Ohio 45039
Hubert, Dan L., 4444 Westheimer, #573, Houston, Tex. 77027
Huffstutler, Miles C., Jr., 1608 W. 155th St., Burnsville, Minn. 55337
Hull, Julia A., 37-25 61st Street, Woodside, N.Y. 11377
Hurlocker, Mary M., 2225 Thomas La., White Bear Lake, Minn. 55110
Ingraham, Donald S., 109 Boulder La., Chapel Hill, N.C. 27514
Inskeep, James W. , 43 Quincy Pl., N.E., Washington, D.C. 20002
Isacson, John P., Jr., 30 East Division St., #6B, Chicago, Ill. 60610
Jackson, Miriam, 4925 E. Weldon, Phoenix, Ariz. 85018
Jackson, Robert W., 1020 15th St., #5B, Denver, Colo. 80202
James, Kurt F., 5561 Genesta Walk, St. Louis, Mo. 63123
Janda, Steven R., 217 E. 10th St., Ellsworth, Kans. 67439
Jaron, Linda T., 2406 N. Dearing St., Alexandria, Va. 22302
Jondle, Robert J., 16712 Shea La., Gaithersburg, Md. 20877
Jones, Edward H., Jr., 1427 Adams St., Pittsburgh, Pa. 15233
Jones, Huw R., 566 Commonwealth Ave., #1201, Boston, Mass. 02215
Jordan, Andrew S., 17900 Schoenborn St., #21, Northridge, Calif. 91325
Karel, Karin J., 104 Country Club Dr., Wilmington, Del. 19803
Karjeker, Shaukat A., 1911 Fountainview, #49, Houston, Tex. 77057
Katz, Mitchell A., 3800 Powell La., #909, Falls Church, Va. 22041
Kelly, David B., 5817 Elmwood, Monroe, Miss. 48161
Kelly, John M., 111507 Bender Court, Chhaska, Minn. 55318
Kelly, Michael R., 301 N. Edison St., Arlington, Va. 22203
Kelly, Robert H., 2034 Swallow Hill Road, #310, Pittsburgh, Pa., 15220
Keown, Wayne A., 1442 Wilmette Ave., Wilmette, Ill. 60091
Kersey, James Ray, 173 Montrose Dr., Durham, N.C. 27707
Kettelberger, Denise M., 5806 Burlinghall, Houston, Tex. 77035
King, David L., 3495 Tipp Cowlesville Rd., Tipp City, Ohio, 45371
Kinghorn, Curtis D., 289-23 Corry Village, Gainesville, Fla. 32603
Kinsinger, David L., 1653 SE Kings Drive, #218, Bartlesville, Okla. 74006
Kirsch, Alan D., 129 E. 19th St., Idaho Falls, Id. 83404
Kitchell, Barbara S., 5713 Calton Dr., Raleigh, N.C. 27612
Kivlin, Bruce N., 1095 Newhall St., #A, San Jose, Calif. 95126
Klein, Daniel J., 250 West 89th St., #9C, New York, N.Y. 10024
Klumper, William A., 4903 California St., #1, Omaha, Nebr. 68132
Koenig, Sandra M., 825 E. Parkhaven Dr., Seven Hills, Ohio 44131
Kokko, Kent S., 3326 Lexington Ave., N., Shoreview, Minn. 55126
Kolomayets, Andrew G., 938 Hidden Lake Dr., Buffalo Grove, Ill. 60089
Korman, Alan S., 1546 Delaware Ave., Buffalo, N.Y. 14209
Kormos, Alexander L., 12688 Dewey St., Los Angeles, Calif 90066
Kosakowski, Richard H., 1485 Suffield St., Unit 95, Agawam, Mass. 01001
Kosturakis, Irene, 3123 Castle Lane, Sugar Land, Tex. 77478
Kramer, Bruce E., 4849 Connecticut Ave., N.W., #632, Washington, D.C. 20008
Kramer, Karen J., 72 Mitchell Rd., Somers, N.Y. 10589
Kurtz, Richard E., 4233 Raleigh Ave. #402, Alexandria, Va. 22304
Kuyper, Bruce D., 385 Ledroit St., Laguna Beach, Calif. 92651
Kwok, Edward C. F., 3052 Balardo Way, San Jose, Calif. 95148
La Terza, Vincent J., 180 East Rutherford St., #3, Athens, Ga. 30605
Lake, Michael D., 2154 West Charleston St., Chicago, Ill. 60647
Lambiris, Elias J., 170 East 83rd St., New York, N.Y. 10028
Landry, Thomas K., 28 Birch Brook Rd., Yonkers, N.Y. 10708
Langley, Stuart T., 4861 E. Calle Redonda, Phoenix, Ariz. 85018
Lanquist, Edward D., Jr., 1011 Hermitage Park Dr., Hermitage, Tenn. 37076
LaRoche, Michelle B., 388 S. Mammoth Rd., Manchester, N.H. 03103
Lee, John Leslie, 56 Creeden St., Mansfield, Mass. 02048
Lehnhardt, Susan K., Rd #4, 170 Blue Church Rd, Coopersburg, Pa. 18036
Lelkes, Robert S., 21834 Addington Blvd., Rocky River, Ohio 44116
Lentini, David P.K., 1300 Oak Creek Dr., #217, Palo Alto, Calif. 94304
Lentz, Jerry D., 63 Bradford St., N. Andover, Mass. 01845
Leonard, Robert B., 583 Belland Ave., #1, Vadnais Heights, Minn. 55127
Levine, Michael L., Suite 2151511 SW Park Ave., Portland, Oreg. 97201
Lin, Bo-In, 13445 Mandoli Dr., Los Altos, Calif. 94022
Livnat, Shmuel, 9010 Sudbury Rd., Silver Spring, Md. 20901
Logan, April C., 930 Via Mil Cumbres, #13, Solana Beach, Calif. 92075
Lohmann, Victor F., III, 21 Robbins St., #13, Waltham, Mass. 02154
Longanecker, Stacey Jean, 1510 Elwyn Ave., Crofton, Md. 21114
Lovitz, Michael S. L. , 1400 Redwood La., Wyncotte, Pa. 19095
Luther, Barbara J., 297 Pembroke Dr., Lake Forest, Ill. 60045
Lyles, Macelle M., 1332 East 18th St., Tulsa, Okla. 74120
Macheledt, Jean M., 1401 St. Andrews Dr., Broomfield, Colo. 80020
Maher, Kathleen L., 99 Clinton St., #122, Concord, N.H. 03301
Mancini, Ralph J., 21 Ramble La., Levittown, N.Y. 11756
Marvin, Prisca C., Route 3, Box 101A, Denton, Md. 21629
Matthews, David G., 4500 Keswick Dr., Raleigh, N.C. 27609
Mauney, Michael E., 5216 Swisswood Dr., Raleigh, N.C. 27613
Mayfield, Denise L., 2705 Rockingham Dr., Austin, Tex. 78704
McClearn, Diane H., 3490 4th St., Boulder, Colo. 80304
McCollister, Scott A., 8080 Harbor Creek, Apt. 701, Mentor, Ohio 44060
McCormack, Joan V., 1003 Verdemar Dr., Alameda, Calif. 94501
McDaniel, Claude S., 7506 Honey Creek, Houston, Tex. 77095
McDonough, Thomas C., 1134 W. Oakdale, #2R, Chicago, Ill. 60657
McFadden, Roger R., P.O. Box 160, Okmulgee, Okla. 74447
McFarlin, Donald S., 450 W. Byberry Rd., Townhouse No. 25, Philadelphia, Pa. 19116
McGlynn, Gerald E., III, 1045 Iroquios Blvd., Royal Oak, Miss. 48067
McMasters, David D., 27308 23rd Place S., #43, Federal Way, Wash. 98003
McNees, Wliiam S., P.O. Box 224, Pennington, N.J. 08534
Meadows, James H., 1830 Marich Way, Mountainview, Calif. 94040
Meek, Kevin J., 14709 Birchridge, Dallas, Tex. 75240
Meles, Pablo, 115 7th Terrace, Miami Beach, Fla. 33139
Mercanti, Michael N., 65-65 Wethrrole St., #1A, Rego Park, N.Y. 11374
Michaelsen, Karen A., 5 Dorchester Ave., Cranford, N.J. 07016
Michel, Michelle M., 1386 Scheffer Ave., St. Paul, Minn. 55116
Miller, Philip E., 628 Halstead Rd., Wilmington, Del. 19803
Milner, Richard S., 7 Wallace St, Rockville Centre, N.Y. 11570
Mofford, Donald F., 39 Reynolds Ave., Randolph, Mass. 02368
Moll, Robert G., 3301 S. Bear St., #47B, Santa Ana, Calif. 92704
Monroe, James B., 1900 S. Eads St., #709, Arlington, Va. 22202
Moore, Charles L., 10 ChancellorLondon Square Apts., Clifton Park, N.Y. 12065
Moro, Dolores, A., 61 Jane St., Apt. 3G, New York, N.Y. 10014
Moseley, Kenneth R., 2047 Sheridan, Houston, Tex. 77030
Mosher, Stephen S., 2804 Ryan Place Dr., Ft. Worth, Tex. 76110
Mueller, Janice M., 400 Selby Ave., #205, St. Paul, Minn. 55102
Mueller, Wesley, O., 2661 N. Burling St., Chicago, Ill. 60614
Mueting, Ann M., 1300 W. Med. Lk. Dr., #120, Plymouth, Minn. 55441
Muirhead, Donald W., 19-1 Arthur Dr., South Windsor, Conn. 06074
Murphy, Keith J., 44 Edcris La, Huntington, N.Y. 11743
Musco, Cathy A., 1206 Whitney Rd., Southampton, Pa. 18966
Nakamura, Dean H., 781 Quince Orchard Blvd., #14, Gaithersburg, Md. 20878
Nash, William B., 330 Branch Oak Way, San Antonio, Tex. 78230

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Naumann, Adrienne B., 8210 N. Tripp, Skokie, Ill. 60076
Naumann, Steven T., 8219 N. Tripp, Skokie, Ill. 60076
Nemo, Thomas E., 212 Tanglewood La, Naperville, Ill. 60540
Nesbitt, Daniel F., 630 Woodsway Dr., Loveland, Ohio 45140
Nicholas, Frank C., 316 Huntington La, Elmhurst, Ill. 60126
Oathout, Mark A., 2626 Holly Hall, #1204, Houston, Tex. 77054
O'Connell, Patrick J., 3012 w. 121st. St., Leawood, Kans. 66209
Odar, Thomas J., 175 North Harbor Dr., Apt. 1215., Chicago, Ill. 60601
O'Gorman, Carmella A., 21 Osage Dr. East, Ossining, N.Y. 10562
Orum, Keith H., 1240 Morgan Ave., La Grange Park, Ill. 60525
Osborne, Kevin B., 113-B E., Glebe Rd, Alexandria, Va. 22305
Osha, Jonathan P., 1005 Jeff. Ryan Dr., Herndon, Va. 22070
Otto, Charlotte R., 102 Willow Glen Dr., Kennett Square, Pa., 19348
Panitch, Gerson S., 1301 N. Court House Rd., #1001, Arlington, Va. 22201
Panzer, Curtis C., 687 Friar Dr., Yardley, Pa. 19067
Park, Ellen K., 4595 Chestnut Ridge, #8, Amherst, N.Y. 14221
Paschburg, Donald B., 520 Sixth St., Lyndhurst, N.J. 07071
Patel, Ken Ketan, 11632-4 Timber Ridge La., Cincinnati, Ohio 45241
Pegg, Randall K., 61 Flintridge, Hillsborough, N.C. 27278
Pelto, Don J., 1514 Seventh St., #304, San Diego, Calif 92101
Perez, Daniel F., 3334 Briaroaks, Garland, Tex. 75044
Pershon, James M., 494 Barron Park Ct., San Jose, Calif. 95136
Pickholtz, Andrew W., 3613 Glenbrook Rd., Fairfax, Va. 22031
Pintzuk, Marcia D., 3730 Levy La., Huntingdon Valley, Pa. 19006
Polansky, Paul J., 8902 Deer Haven Rd., Austin, Tex 78737
Polit, Robert, B., 1652 Dover Ct., Unit B, Wheaton, Ill. 60187
Porcelli, James G., 4297 Greensburg Pike, #3401, Pittsburgh, Pa. 15221
Premutico, Mauro, P.O. Box 8097, Ward Hill, Mass. 01835
Prior, Patricia L., 1525 Bridgeton Dr., Columbus, Ohio 43220
Prout, William F., 92 Avondale Dr., Akron, Ohio 44313
Pugh, John D., 3633 Erica Way, Birmingham, Ala. 35243
Quan, Stacy, 123-A St. Joseph Ave., Long Beach, Calif. 90803
Quirk, William H., IV, 333 Blue Bonnet Blvd., San Antonio, Tex. 78209
Ray, Michael B., 17 Bonza Dr., Concord, N.H. 03303
Reece, Daniel B., IV, Rt. 3, 487-B Poplar Hills Rd., Johnson City, Tenn. 37601
Reedich, Douglas, E., 8877 Lake Jane Trail, Lake Elmo, Minn. 55042
Renk, Christopher James, 1842 1/2 N. Mohawk, Chicago, Ill. 60614
Rettig, Phillip E., 23701 Heartwood, Novi, Mich. 48050
Rewoldt, Dana Sue, 30312 Rainbow Hill, Golden, Colo. 80401
Richardson, Joy, L., 2608-I Paces Place, Atlanta, Ga. 30339
Rincon, Elena C., 416 Warren Dr., #2, San Francisco, Calif, 94131
Rinik, Christine, 176 Trapelo Rd, Belmont, Mass. 01278
Rissman, John A., 7125 Glouchester Ave., Edina, Minn. 55435
Rodgers, Marcia J., 8710 N. Helena, #389, Kansas City, Mo. 64154
Romanchik, Richard A., 32 Midland Dr., Coldchester, Conn. 06415
Rosenberg, Marshall E., 15 Wyman St., Unit 63, Concord, N.H. 03301
Ross, Adma Antonia, 65 Campbell Rd., Suffern, N.Y. 10901
Ross, Alan J., 427 Bassett Rd., Bay Village, Ohio 44140
Rothenberg, Larry L., 5050 7th Rd. S., #301, Arlington, Va. 22204
Rowald, Kent Arlan, 4528 Luella, Deer Park, Tex. 77536
Rowe, Brian F., 837 17th St., #C, Santa Monica, Calif. 90403
Rucker, Jeffery K., 908 Edgewood Rd., Havertown, Pa. 19083
Ruff, Deborah S., 910 Wolfram-Apt.1, Chicago, Ill. 60657
Ruffing, S. Linda, 577 Grospoint La., Oakdale, Minn. 55128
Ryan, John William, 55 E. 93rd St., #2E, New York, N.Y. 10128
Sabourin, Anne G., 4510 Elmhurst, Royal Oak, Mich. 48073
Sales, James J., 254 Grace Ct., Crown Point, Ind. 46307
Schadel, William E., 3616 Fernwood Dr., Raleigh, N.C. 27612
Schaffer, Robert D., 252 W. 76th St., #9C, New York, N.Y. 10023
Schenian, John R., 745 N. Frost Dr., Saginaw, Mich. 48603
Schmidt, Michael J., 750 Westchester, Grosse Pointe Park, Mich. 48230
Schreck, Patricia Anne, 241 Old Eagle School Rd., Wayne, Pa. 19087
Schwadron, Janet L., 42 Lakeview Avenue West, Peekskill, N.Y. 10566
Schwyn, Thomas A., 1534 Wilson Rd., St. Joseph, Mich. 49085
Secrist, Lila T., 87 Tallow Wood Dr., Cilfton Park, N.Y. 12065
Seidman, Stephanie L., 2301 S. Jeff. Davis Hwy., #530, Arlington, Va. 22202
Severance, Sharon K., 2113 Belaire St., Midland, Mich. 48640
Shaddox, Robert C., 5211 Willowbend, Houston, Tex. 77096
Schaffer, Mark S., 101 Washington Ave., #338, Oakmont, Pa. 15139
Shanks, Mark R., 165 N. McKnight Rd., #113, St. Paul, Minn. 55119
Sharp, Janice A., 402 Falling Star, Irvine, Calif 92714
Shaw, Brian B., 1069 Buckingham, #4, Newport Beach, Calif. 92660
Sherman, Kenneth L., 3510 Howard Blvd., Baldwin, N.Y. 11510
Shue, Suzanne Elizabeth, 1506 Delaware Ave., #2B, Wilmington, Del. 19806
Sickert, Dugal S., 2887 Columbia Trail, Loveland, Ohio 45140
Sigmond, David M., 11160 Jollyville, Apt. 307, Austin, Tex. 78759
Silfin, Ira E., 15 Audley Cir., Plainview, N.Y. 11803
Silverio, John V., 22 Latern La., Cherry Hill, N.J. 08002
Sinnott, Jessica M., 2 Blackburn Pl., Summit, N.J. 07901
Skinner, Joel D., Jr., 382 County Rd. E, Houlton, Wis. 54082
Skladony, William P., 3 Pierce Rd., Watertown, Mass. 02172
Skolnick, Malcolm H., 733 Brogden Rd., Houston, Tex. 77024
Skolnick, Steven E., 1378 Dewberry Ct., N.E., #8, Grand Rapids, Mich. 49503
Slavin, Michael A., 11 W. Kenilworth, Prospect Heights, Ill. 60070
Slayden, Bruce W., III, 4104 Cole Apt. 204, Dallas, Tex. 75204
Slicer, Penny R., P.O. Box 143, Point Lookout, Mo. 56726
Slifkin, Neal L., 257 Sharon Dr., Pittsburgh, Pa. 15221
Smat, Robert J., 1305 Birch La., Wilmington, Del. 19809
Smink Rogowski, Patricia J., 119 Whitney Dr., Avondale, Pa. 19311
Smith, John G., 2224 Fortieth St., N.W., No. 1, Washington, D.C. 20007
Smith, Michael E., 121 Lookout Dr., Ashville, N.C. 28804
Smith, Richard B., 30 Northgate Rd., Twwksbury, Mass. 01876
Spaeth, Frederick A., 1 Colonial Dr., #A-12, Arlinington, Mass. 02174
Stacey, David R., 13002 Waldemere, Houston, Tex. 77077
Stahl, Scott B., 417 Amos Ave., Kalamazoo, Mich. 49008
Standley, Jeffrey S., 6570 Green Haven Dr., Clarkston, Mich. 48016
Steel, Gregory W., 2626 Bach Ave., Portage, Minn 49002
Stephens, Donald L., Jr., 7570 Charolais Ct, Gladstone, Oreg. 97027
Stercho, Yuriy P., 340 Mettinghouse La., Narberth, Pa. 19072
Stewart, Charles W., IV, 1517 Smysor, Bartlevilles, Okla. 74006
Stibitz, Gerald F., 312 Lyon Blvd., South Lyon, Mich 48178
Strozier, Robert W., 173 Elmdale Ave., Akron, Ohio 44313
Stull, Paul M., 1002 17th St., Hermosa Beach, Calif. 90254
Stults, Larry W., 330 Winterbery Dr., Athens, Ga. 30606
Sudderth, David S., 501 Brookhollow Cir. Marietta, Ga. 30067
Sueoka, Greg T., 575 W. 19th St., #F151, Costa Mesa, Calif. 92627
Superko, Mark A., 1616 Tanyard Hill Rd., Gaithersburg, Md. 20879
Sutton, Jeffrey A., 126 Meadowview La., Mont Clare, Pa. 19453
Tabachnick, Gene A., 1129B 19th St., Santa Monica, Calif. 90403
Taddeo, Joseph H., 1500 Laclede Rd, S. Euclid, Ohio 44121
Tankha, Ashok, 36 Greenleigh Dr., Sewell, N.J. 08080
Thompson, Douglas M., 3175 S. Hoover St., #414, Los Angeles, Calif. 90007
Tidwell, Greer C., Jr., 7544 Lakeview Dr., Nashville, Tenn. 37209
Touslee, Robert D., 28 Lodge La., San Rafael, Calif. 94901
Towler, Oscar A., III, 2627 Sigmona St., Falls Church, Va. 22046
Townsennd, Guy K., 6366 Ridge Dr., Bethesda, Md. 20816
Tsao, Yuan-Kai, 11 Mandalay Rd, Newtown, Mass. 02159
Tsavaris, John E., II, 34 Perth Pl., East Northport, N.Y. 11731
Tullett, Rodney C., 21 Lyndon St., Concord, N.H. 03301
Turkevich, Leon B., 5001 S. 7th Rd., #301, Arlington, Va. 22204

Urica, Benjamin E., 2101 Crystall Plaza Arcade, #275, Arlington, Va. 222-2
Uren, John R., 716 South Beach, Pt. Roberts, Wash. 98281
Valentyn, Thomas E., 2650 N. 91st St., Wauwatosa, Wis. 53226
Vander Leest, Kirk A., 5904 N. Cypress, #1011, Peoria, Ill. 61615
Vassiliou, Eustathios, 12 South Townview La., Newark, Del. 19711
Veseli, Ralph R., 63 Smith St., Wellesley, Mass. 02181
Vick, John E., Jr., 2100 One Galleria Tower, Dallas, Tex. 75240
Vierra, Larry E., 105 Springwood Way, S. San Francisco, Calif. 94080
Villacorta, Gliberto M., 811 Washington St., #1-L, Hoboken, N.J. 07030
Volles, Warren Karl, 607 S. Yale Ave., Arlington Hgts., Ill. 60005
Wagret, Fredric, C., 4527 Oakshire, Houston, Tex. 77027
Walters, Todd Ray, 5204 Edgewood Rd., College Park, Md. 20740
Ward, James A., 6345 Caminito Flecha, San Diego, Calif 92111
Ward, John F., 5430 Netherland Ave., Riverdale, N.Y. 10471
Warner, Wayne A., 5 Palm Dr., Shalimar, Fla. 32579
Watkins, Mark A., 2029 Tenth St., Cuyahoga Falls, Ohio 44221
Watson, Amy L., 7897 Pinehurst Rd., Woodbury, Minn. 55125
Whelan, Dorothy P., 495 Walnut St., Newtonville, Mass. 02160
Whitaker, Charlotte B., 13206 Elysian Fields Cove, Austin, Tex. 78727
White, Kathleen A., 5885 Forest View, #513, Lisle, Ill. 60532
Wieder, Bruce T., 8422 Seminary Ridge Dr., Austin, Tex. 78745
Wilson, Leslie B., 720 S. Dearborn St., #503, Chicago, Ill. 60605
Wilson, Mary L., 2400 Johnson Ave., #3C, Bronx, N.Y. 10463
Winfield, Augustus W., 4745 Venturi La., Fort Collins, Colo. 80525
Wise, Michael J., 6700 Vista del Mar, Playa del Rey, Calif. 90293
Wright, Debbie K., 4423 Wimbleton Way, Kalamazoo, Mich. 49009
Wright, Robert O., R.D.#2, Box 203, Little Falls, N.Y. 13365
Young, Don Michael, 1525 Brook Mill Ct., Carmel, Ind. 46032
Young, Jason, J., 825 Tappan, Apt. 5, Ann Arbor, Mich. 48104
Zachmann, Jeffery T., 518 Gregory Ave., Unit A-212, Weehawken, N.J. 07087
Zegger, Paul J., 425 First St., Brooklyn, N.Y. 11215
Zervas, Albert J., Apt. 210, 4450 Conn Ave., N.W., Washington, D.C. 20008
Ziurys, Julia C., 926 Breakwater Dr., Annapolis, Md. 21403

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PATENT NOTICES

Certificates of Correction For Week of January 23, 1990

D. 300,037	4,804,412	4,819,751	4,825,902
Re. 32,399	4,804,974	4,819,754	4,825,939
4,044,891	4,805,011	4,819,853	4,826,430
4,322,450	4,805,438	4,819,948	4,826,534
4,386,887	4,806,007	4,820,094	4,826,799
4,531,738	4,808,148	4,820,150	4,826,860
4,656,734	4,808,326	4,820,295	4,826,912
4,667,373	4,808,350	4,820,310	4,827,147
4,687,732	4,808,470	4,820,331	4,827,203
4,688,935	4,808,600	4,820,368	4,827,634
4,712,044	4,808,622	4,820,502	4,827,762
4,725,593	4,809,041	4,820,644	4,827,949
4,728,692	4,811,103	4,821,271	4,828,012
4,734,190	4,811,165	4,821,835	4,828,529
4,745,013	4,811,385	4,821,853	4,828,812
4,774,961	4,812,219	4,821,948	4,829,097
4,781,917	4,812,511	4,822,158	4,829,558
4,781,989	4,812,962	4,822,203	4,830,347
4,783,538	4,814,327	4,822,353	4,830,408
4,790,022	4,814,331	4,822,366	4,830,623
4,791,643	4,814,465	4,822,387	4,830,789
4,792,932	4,814,494	4,822,443	4,832,068
4,794,037	4,814,680	4,822,491	4,832,189
4,794,292	4,814,751	4,822,733	4,832,627
4,794,843	4,814,893	4,822,802	4,833,080
4,795,146	4,816,573	4,822,855	4,833,275
4,796,166	4,816,882	4,822,890	4,833,532
4,796,305	4,816,928	4,823,213	4,833,725
4,800,014	4,817,629	4,823,361	4,833,845
4,801,535	4,817,638	4,823,572	4,833,879
4,802,614	4,818,289	4,823,688	4,834,139
4,802,832	4,818,312	4,824,433	4,834,987
4,803,289	4,818,695	4,824,457	4,835,171
4,804,144	4,818,824	4,824,514	4,841,455
4,804,394	4,819,220	4,824,686	4,849,816
4,804,406	4,819,663	4,825,746	4,858,488

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New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775

Reference Collection of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 2, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	11-16-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-7-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	10-30-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REEXAMINATIONS

JANUARY 23, 1990

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,301,163 (1193rd)
AMINO-ETHER OXIDES AND USE THEREOF IN THERAPY
Diéan R. Torossian, Bourg-la-Reine; Claude P. Roux, Paris, and Gilbert G. Anbard, Palaiseau, all of France, assignors to Societe Industrielle de Produits de Synthese, Aurille, France
Reexamination Request No. 90/001,646, Nov. 23, 1988.
Reexamination Certificate for Patent No. 4,301,163, issued Nov. 17, 1981, Ser. No. 164,931, Jul. 1, 1980.
Filed Nov. 23, 1988, Ser. No. 164,931
Claims priority, application France, Jul. 11, 1979, 7917986
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—357

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

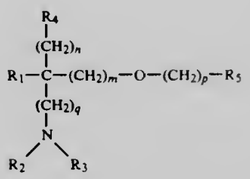
The patentability of claim **9** is confirmed.

Claim **3** is cancelled.

Claims **1** and **5** are determined to be patentable as amended.

Claims **2, 4** and **6–8**, dependent on an amended claim, are determined to be patentable.

1. Amino-ether oxide of formula:



in which;
R_1 is lower alkyl,
R_2 and R_3 which are the same or different are hydrogen or lower alkyl,
R_4 is a phenyl or phenoxy nucleus optionally monosubstituted to trisubstituted by substituents which are the same or different, halogen or lower alkoxy,
R_5 is a phenyl radical optionally monosubstituted to trisubstituted by substituents which are the same or different, halogen, lower alkyl, lower alkoxy or nitro, *or* a pyridyl radical **[**or a lower alkyl radical**]**,
n is equal to zero, 1 or 2,
m and q are equal to 0 or 1,
p is an integer from 0 to 9 with the proviso that n, m and p are not all equal to 0 when q is equal to 1, and its acid addition salts.

7. Amino-ether oxide according to claim **1**, which is 1-[(3,4,5-trimethoxy)benzyloxymethyl]-1-phenyl-N-methyl-n-propylamine.

B1 4,379,168 (1194th)
PESTICIDES CONTAINING D-LIMONENE
Vincent Dotolo
Reexamination Request No. 90/000,387, May 27, 1983.
Reexamination Certificate for Patent No. 4,379,168, issued Aug. 24, 1981, Ser. No. 295,448, Apr. 5, 1983.
Continuation of Ser. No. 130,318, Mar. 14, 1980, abandoned. This application May 27, 1983, Ser. No. 295,448
Int. Cl.[4] A01N *27/00*
U.S. Cl. 514—763

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–37** are cancelled.

[1. A pesticide composition for topical application on small animals, i.e., an animal pesticide dip consisting essentially of about 2-25% D-limonene from citrus products about 1-15% liquid, water soluble, surface-active agent capable of emulsifying the D-limonene, and the remainder water, by volume.**]**

B1 4,495,030 (1195th)
FILTER PAPER
Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Reexamination Request No. 90/001,419, Jan. 11, 1988.
Reexamination Certificate for Patent No. 4,495,030, issued Jan. 22, 1985, Ser. No. 561,752, Dec. 15, 1983.
Filed Jan. 11, 1988, Ser. No. 561,752
Int. Cl.[4] A62B *23/00, 23/04;* B01D *39/14, 39/16, 39/20*
U.S. Cl. 162—145

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** and **8** is confirmed.

1. A high efficiency, toxic vapor absorptive, non-woven filter material comprising a wet-laid sheet containing fibrillated binder fiber, active carbon and submicron size glass fiber.

B1 4,581,516 (1196th)
PLASMA TORCH WITH COMMON GAS SOURCE FOR THE PLASMA AND FOR THE SECONDARY GAS FLOWS
Bruce O. Hatch, and Richard A. Spaulding, assignors to Thermal Dynamics Corporation, West Lebanon, N.H.
Reexamination Request No. 90/001,665, Dec. 12, 1988.
Reexamination Certificate for Patent No. 4,581,516, issued Apr. 8, 1986, Ser. No. 515,913, Jul. 20, 1983.
Filed Dec. 12, 1988, Ser. No. 515,913
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.48

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3, 4, 10, 11** and **13** is confirmed.

Claims **1, 2, 5, 7** and **12** are cancelled.

Claims **6** and **8** are determined to be patentable as amended.

Claim **9**, dependent on an amended claim, is determined to be patentable.

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New claim **14** is added and determined to be patentable.

14. A plasma arc torch for cutting a workpiece comprising:
a torch housing defining a housing chamber which has an outlet at an end of the housing;
means for supplying a gas to the housing chamber flowing towards said outlet, said gas being suitable for generating a plasma and for a secondary gas flow which will cool the torch and the workpiece;
an electrode in the housing chamber near the outlet; and
means in the housing chamber for separating said gas flowing towards the outlet of the housing into a primary gas flow adjacent to the electrode for generating a plasma and a secondary gas flow away from the electrode for cooling the torch and the workpiece, said primary and secondary gas flows being distinctly different gas flows that issue from the outlet at two locations spaced apart from each other, wherein said electrode is elongated with one end facing the outlet and wherein said gas separating means comprises:
a cup-shaped torch tip having a rim in the shape of an annular flange which is shaped to fit into the outlet of the torch housing, said rim and the housing defining a passage for passageof gas from the housing chamber towards the workpiece to form the secondary gas flow, wherein said torch tip surrounds said end of the electrode to define there between a tip chamber, said tip further defining a passageway in the bottom of the cup-shaped tip for passage of a transferred arc, said passageway and said passage being spaced apart thereby causing the primary and secondary gas flows to issue at spaced apart locations; and
an annular gas distributor surrounding the electrode, said distributor being so shaped and so connected to the torch tip and electrode that it defines an annular chamber between it and the electrode in communication with the tip chamber, said distributor further defining therein a plurality of channels that are substantially tangential to the annular chamber and that connect the housing chamber to the annular chamber so that gas from the gas supplying means will travel from the housing chamber to the annular and tip chambers through said channels forming a primary gas flow and generating a vortex at said end of the electrode for directing the transferred arc from said end of the electrode to the workpiece through the passageway.

B1 4,660,936 (1197th)
ARRANGEMENT TO MINIMIZE REFLECTED AMBIENT LIGHT IN A DISPLAY
Richard W. Nosker, Princeton, N.J., assignor to RCA Corporation
Reexamination Request No. 90/001,727, Mar. 10, 1989.
Reexamination Certificate for Patent No. 4,660,936, issued Apr. 28, 1987, Ser. No. 898,112, Aug. 20, 1986.
Filed Mar. 10, 1989, Ser. No. 898,112
Claims priority, application United Kingdom, Jan. 2, 1986, 8600022
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 D

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2–5** and **9** having been finally determined to be unpatentable, are cancelled.

Claims **1**, **6–8** are determined to be patentable as amended.

Claims **10–15**, dependent on an amended claim, are determined to be patentable.

New claims **16–28** are added and determined to be patentable.

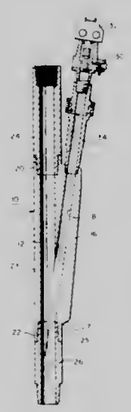
1. A display comprising
means for changing the polarization of light having first and second opposing sides;
first means for analyzing light disposed adjacent to said first side; **[**and**]**
means for diffusing light disposed between said first side and said analyzing means**[**.**]**;
means for illuminating said polarization changing means disposed adjacent said second side, said illuminating means comprising a light source, a reflector and a Fresnel lens in the proximity of said reflector;
and means for polarizing light disposed between said light source and said second side.

REISSUES

JANUARY 23, 1990

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,150
BOREHOLE DRILL PIPE CONTINUOUS SIDE ENTRY OR EXIT APPARATUS AND METHOD
Harper Boyd, Lake Charles, La., assignor to Boyd's Bit Service Inc., Lake Charles, La.
Original No. 4,681,162, dated Jul. 21, 1987, Ser. No. 830,824, Feb. 19, 1986. Application for reissue Jul. 17, 1989, Ser. No. 381,027
Int. Cl.[4] E21B *17/00, 19/08*
U.S. Cl. 166—242 7 Claims



2. A side entry sub for use in combination with a hydraulic pressure pack-off assembly for freeing a stuck drill pipe of a drill pipe string without disassembly of a top drive drilling motor assembly which comprises:
(a) a main body section;
(b) a main passage through said main body section off-center with respect to the center line of said main body section and of the same diameter as the inside diameter of said drill pipe; said main passage having upper and lower threaded ends, at least said lower end provided with internal female pipe threads;
(c) a side entry passage in said main body section which intercepts said main passage and extends in the same direction as said main passage at an angle of about 6½ degrees relative to said main passage and of a smaller diameter than said main passage, said side passage having an outer end with internal femal pipe threads;
(d) a short pipe section secured to the lower threaded end of said main passage in said main body section in which said short pipe section includes pipe threads on the outer surface of its upper end to assume a greater amount of wear on the threaded end of the short pipe section as the wireline is moved between the side entry passage and the main passage, the short pipe section replaceable when worn.

Re. 33,151
TOUCH CONTROL SYSTEM FOR CONTROLLABLE APPARATUS
Robert Adler, Northfield, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Original No. 4,791,416, dated Dec. 13, 1988, Ser. No. 755,036, Jul. 12, 1985. Continuation-in-part of Ser. No. 698,306, Feb. 5, 1985, Pat. No. 4,700,176. Application for reissue Apr. 17, 1989, Ser. No. 339,564
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—712 21 Claims



1. For use with touch control apparatus, a system for recognizing touch positions along a predetermined axis on a surface associated with said apparatus comprising:
a substrate positioned at a location remote from said apparatus and having a surface capable of propagating surface acoustic waves and being so characterized that a touch on said substrate surface causes a perturbation, in the form of at least a partial absorption of energy, of a surface wave propagating through the region of the touch;
input surface wave transducer means coupled to said substrate surface for launching a burst of surface waves on said surface;
output surface wave transducer means coupled to said substrate for receiving said burst of surface waves;
surface wave redirecting means coupled to said substrate surface for redirecting surface wave burst components derived from said launched surface wave burst across said substrate surface to said output transducer means along a plurality of paths of different lengths which are respectively associated with different positions along said axis on said substrate surface; and
circuit means coupled to said input and output transducer means for initiating surface wave bursts on said substrate surface and for detecting touch-induced perturbations of received wave burst components, said circuit means including means for determining, by an analysis based on the transit time of the detected perturbed wave burst component, which of said plurality of paths was traversed by the touch-perturbed wave burst component and thus the location of the touch along said axis of said substrate surface.

Re. 33,152
RADAR DETECTION OF HAZARDOUS SMALL SCALE WEATHER DISTURBANCES
David Atlas, 7420 Westlake Ter., Bethesda, Md. 20817
Original No. 4,649,388, dated Mar. 10, 1987, Ser. No. 812,442, Dec. 23, 1985. Continuation-in-part of Ser. No. 796,086, Nov. 8, 1985, abandoned. Application for reissue Dec. 5, 1988, Ser. No. 279,453
Int. Cl.[4] G01S *13/95*
U.S. Cl. 342—26 57 Claims

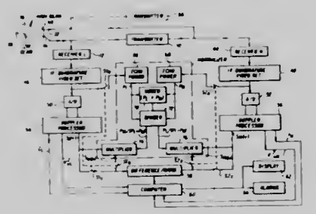
57. A method for detecting hazardous relatively small scale

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weather disturbances in an area of surveillance, comprising the steps of:

radiating at least one Doppler radar beam toward a region of scatterers;

receiving echo signals in at least first and second vertically overlapping beams from said scatterers in said first and second beams from a sequence of range bins, wherein the effective differential two way beam gain of said first and second beams is of a first polarity at all angles below a predetermined null level and a second polarity at all angles above said null level, wherein said null level corresponds to the elevation angle at which the effective two way gain of said first beam equals that of said second beam, and wherein said first and second polarities may be mathematically operated upon



selectively to provide first and second parameters equivalent to said first and second polarities;

determining a set of predetermined parameters which are functions of the mathematical characteristics of the Doppler velocity spectra corresponding to said first and second beams from said sequence of range bins;

operating mathematically upon said set of parameters to produce at least one parameter which is a measure of the radial wind component along the direction of the beam and which corresponds to the wind speed at a height representative of the near surface wind speed; and

providing at least one indication of the variation of the near surface winds speed with respect to range and azimuth as a signature of the weather disturbances including wind shear.

Re. 33,153

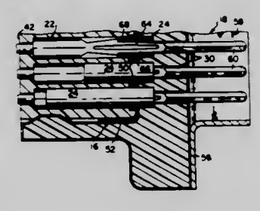
SOLDERLESS MOUNTED FILTERED CONNECTOR

Rickie M. Althouse, Harrisburg; Robert E. Beamenderfer, Palmyra; Roger W. Durbin, Lancaster; Robert D. Hollyday, Elizabethtown, and John P. Kling, Mount Joy, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Original No. 4,519,665, dated May 28, 1985, Ser. No. 562,638, Dec. 19, 1983. Application for reissue May 27, 1987, Ser. No. 56,937

Int. Cl.[4] H01R *13/648, 13/66*

U.S. Cl. 439—608 **10 Claims**



1. A solderless, filtered electrical connector comprising:

a first elongated housing *member* of insulative material defining a forwardly directed mating face, a rearwardly directed cavity, a plurality of passages extending between said cavity and said mating face, [and at least one lateral latching opening,] said housing *member* being plated with a conductive material except in and immediately adjacent said passages;

a second housing *member* of insulative material dimensioned to be received in said cavity of said first housing *member* and having a like plurality of passages extending between forward and rearwardly directed faces[, at least one laterally directed latching lug positioned to engage a respective latching opening in said first housing];

a grounding member of conductive material interposed between said first and second housing members and having a plurality of apertures aligned with the respective [passageways] *passages*, each aperture being profiled by a plurality of inwardly directed tines; and

a plurality of filtered terminals each formed by a filter sleeve mounted on a compliant portion of a pin terminal, *said terminals being disposed in said aligned passages and apertures of said housing members and grounding members respectively.*

PLANT PATENTS

GRANTED JANUARY 23, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,116

ROSE PLANT—MEINEBLE VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Dec. 22, 1988, Ser. No. 288,579

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of shrub rose plant characterized by the following combination of characteristics:

(a) forms attractive, stable and long lasting single guardsman red blossoms having a white center,

(b) exhibits a strong creeping growth habit,

(c) exhibits very good resistance to diseases, and

(d) is particularly well suited for growing in the landscape; substantially as herein shown and described.

7,117

ROSE PLANT—MEIGEROKA VARIETY

Marie-Louise Meilland, deceased, late of Antibes, France (by Jean-Pierre Le Naour, legal representative), assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Dec. 22, 1987, Ser. No. 136,382

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of shrub rose plant characterized by the following combination of characteristics:

(a) forms throughout the season attractive semi-double blossoms which are dark carmine pink in coloration,

(b) forms petals which are firm and drop off cleanly,

(c) exhibits a bush growth habit,

(d) exhibits good disease resistance, and

(e) is particularly well-suited for growing in the landscape; substantially as herein shown and described.

7,118

APPLE CULTIVAR 'EMPRESS'

Roger D. Way, Stanley, and Robert C. Lamb, Geneva, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 7, 1988, Ser. No. 281,297

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. The new and distinct apple cultivar herein described and illustrated and identified by the characters enumerated above.

7,119

PLUM 'GYPSY RED'

James W. Taylor, Dinuba, Calif., assignor to Ito Packing Co., Inc., Reedley, Calif.

Filed May 19, 1988, Ser. No. 195,859

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree with fruit of a red fleshed cling type, substantially as herein shown and described, and having a late maturity period, making it available for the late season, with fruit having a low acid and high sugar content, the fruit being very large with a deep purplish red exterior color.

7,120

FRAXINUS PENNSYLVANICA LEDNAW

Willet N. Wandell, Rte. #1 Box 286, Ocuawka, Ill. 61469

Filed Oct. 3, 1988, Ser. No. 252,498

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinctive variety of *Fraxinus pennsylvanica* named 'Lednaw', as described and illustrated herein, that differs from all other varieties by the unique combination of: (1) very narrow columnar growth habit; (2) dense symmetrical crown due to closely spaced, strongly ascending branches that overlap each other; and (3) leaves dark green and semi-lustrous above, paler below, turning yellow in autumn.

7,121

KOHLERIA NAMED ORANGEGLOW

Gerhard Reuther, Geisenheim, Fed. Rep. of Germany, assignor to Scipla Trust, Liechtenstein

Filed Nov. 18, 1988, Ser. No. 273,401

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kohleria plant named Orangeglow, as shown and described.

7,122

GERANIUM PLANT NAMED MARLIMON

Siegfried Klemm, Hanfacker 8, D-7000 Stuttgart 50, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 246,284

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive geranium cultivar, substantially has herein shown and described, and particularly characterized by its very many violet pink florets forming a close, compact group in a full, umbel-formed cluster.

7,123

CARNATION NAMED DIGIDIA

Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe, France

Filed Jan. 10, 1989, Ser. No. 295,460

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinctive carnation plant, substantially as herein shown and described, particularly characterized by the very large size of its flower and the creamy white flower coloration, the blooms being grown on long, strong, upright stems and being produced profusely during its recurrent blooming seasons.

7,124

CARNATION NAMED CHANTAL

Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-Les Maures, France

Filed Dec. 21, 1988, Ser. No. 294,519

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct standard carnation variety, substantially as herein shown and described, particularly characterized by the very large size of its Venetian Pink colored flowers and the produce production of flowers on strong, upright stems having moderately abundant foliage during the recurrent flowering periods of the plant.

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CARNATION NAMED DIGIDARK

Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-Les Maures, France

Filed Jan. 10, 1989, Ser. No. 295,370
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—73 1 Claim

1. The new and distinct standard carnation variety, substantially as herein shown and described, particularly characterized by the Cardinal Red coloration of its very large blooms and the profuse production of flowers on strong, upright stems having moderately abundant foliage during the recurrent flowering periods of the plant.

CARNATION NAMED DIGIDARK

Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-Les Maures, France

Filed Jan. 10, 1989, Ser. No. 295,370
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—73 1 Claim

1. The new and distinct standard carnation variety, substantially as herein shown and described, particularly characterized by the Cardinal Red coloration of its very large blooms and the profuse production of flowers on strong, upright stems having moderately abundant foliage during the recurrent flowering periods of the plant.

PATENTS

GRANTED JAN. 23, 1990

ERRATA

For CLASS	See PATENT NO.
070-284	4,895,036
062-048	4,895,050
606-054	4,895,141
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428-472	4,895,608
521-159	4,895,883
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PATENTS

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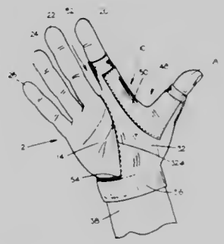
GENERAL AND MECHANICAL

4,894,865
FOAM SCARF
Bruno Ieraci, 248 Rockaway Pkwy., Valley Stream, N.Y. 11580
Filed Apr. 26, 1989, Ser. No. 343,427
Int. Cl.[4] A41D *23/00*
U.S. Cl. 2—91 9 Claims



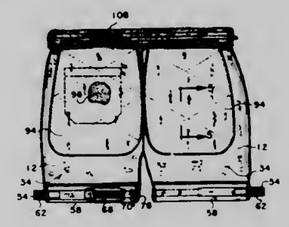
1. A scarf comprising an elongated, lightweight body of foam material having a pair of faces, a pair of ends, and a length at least somewhat greater than the circumference of a wearer's neck and which is bounded by spaced, parallel, peripheral edges, a plurality of spaced transverse slits located towards one end of said body, and opposing notches located in said body towards the opposite end and forming a hook-like shape in said body and making said scarf adjustable for use by wearers having different neck sizes when said hook-like shape is inserted through said slits.

4,894,866
BARTENDER'S GLOVE
Caroline L. Walker, 2637 2nd Ave., #5, Council Bluffs, Iowa 51501
Filed Oct. 6, 1988, Ser. No. 255,354
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 R 2 Claims



1. A bartender's glove, for use in removing twist-off bottle caps, comprising:
- a two-fingered glove formed from a stretchable, water-resistant material,
- said glove having,
- an index finger portion adapted to receive at least a portion of an index finger,
- a thumb portion, adapted to receive at least a portion of a thumb,
- a juncture portion connecting said index finger portion and thumb portion and adapted to cover the juncture between the index finger and the thumb of a hand,
- a wristband portion adapted to embrace the wrist of the hand,
- said wristband portion having an adjustable fastener means adapted to selectively adjust the length thereof,
- a front portion adapted to cover at least a portion of the palm of a hand, said front portion extending from said index finger portion and thumb portion laterally to a front seam,
- said front seam extending from said index finger portion diagonally to said wristband portion at a location generally centered at the juncture of the palm of a hand and a wrist, said front seam extending at an angle adapted to expose a portion of the palm of the hand and three fingers and adapted to conform said front portion in full contact with the hand during gripping and other movements thereof;
- a back portion adapted to cover at least a portion of the back of the hand, said back portion extending from said index finger portion and said thumb portion laterally to a back seam,
- said back seam extending from said index finger portion diagonally to said wristband portion at a location adjacent the juncture of the back of the hand and wrist which is distal said thumb portion, said back seam extending at an angle adapted to expose a portion of the back of the hand and three fingers and adapted to conform said back portion in full contact with the hand during gripping and other movements thereof; and
- a flexible gripping portion formed from a leather material and adapted for frictionally engaging a bottle cap, said gripping portion being secured to said juncture portion and extending from said index finger portion to said thumb portion and adapted to cover an area of the glove utilized in gripping a twist-off bottle cap to rotate the bottle cap on a bottle.

4,894,867
SPORTS TRUNK
Darryl J. Ceravolo, Palm Beach Gardens, and Joseph J. Ceravolo, West Palm Beach, both of Fla., assignors to Soft Short, Inc., Lake Worth, Fla.
Continuation-in-part of Ser. No. 181,498, Apr. 14, 1988. This application Jan. 23, 1989, Ser. No. 299,262
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—238 12 Claims



1. A bifurcated, thigh length trunk, having front and rear, left-hand and right-hand quarter portions, with open-ended leg portions, comprising:
- flexible padding substantially covering at least said rear left-hand and rear right-hand quarter portions and extending into said leg portions; and,
- closure means for adjusting the circumferential fit of the open-ended leg portions, whereby the wearer will be protected against abrasion and bruising by said flexible padding, whereby said closure means can be utilized during strenuous activity to secure said open-ended leg portions against the thighs of a wearer, and whereby said padding extends a sufficient distance into said leg portion

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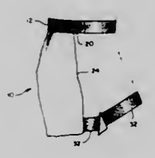
to be influenced by said closure means so as to retain said flexible padding in a protective position.

4,894,868
SHOULDER PAD HARNESS
Pamela E. Christopher, 5820 McCommas, No. 2, Dallas, Tex. 75206
Filed Dec. 9, 1988, Ser. No. 281,674
Int. Cl.[4] A41D *27/26*
U.S. Cl. 2—268 **9 Claims**



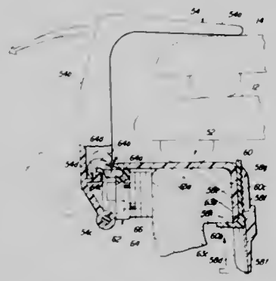
1. A shoulder pad harness adapted to be used exclusively of a brassiere, comprising:
an adjustable narrow band extending around a torso of the wearer below but not covering the wearer's breasts;
first and second adjustable shoulder straps each having first and second ends and an intermediate portion, the first end of each shoulder strap being secured to a front portion of the narrow band with the second end of each shoulder strap being secured to a back portion of the narrow band such that in use the intermediate portion of each shoulder strap is supported generally transversely to the adjustable narrow band; and
first and second shoulder pads secured to the first and second shoulder straps, respectively, with each shoulder pad secured to the intermediate portion of one of the shoulder straps and adapted to be securely and comfortably supported on the wearer's shoulders independent of the wearer's brassiere.

4,894,869
PROTECTIVE UNDER GARMENT
Edward J. Boll, P.O. Box 277, Ottiville Rd., Niverville, N.Y. 12130
Filed Jul. 5, 1988, Ser. No. 215,079
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—400 **3 Claims**



1. A protective undergarment comprising:
a waistband;
a seat portion having a top margin secured to and extending along a segment of said waistband, said seat portion also having free side margins extending downwardly from the waistband forming an open faced garment;
a crotch portion at the center, bottom of the seat, said crotch portion having two side panels secured to each other along their top edges, forming a center line, said center line extending outwardly from the seat, said side panels extending down on either side of the garment, the rearward edge of each of said side panels secured to the seat; and
leg bands secured at one end toward the side margins of the seat and at the other end each leg band secured substantially along the entire forward edge of a side panel.

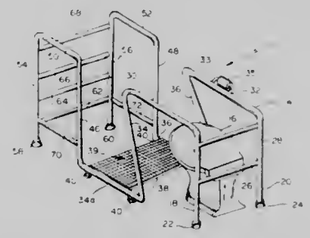
4,894,870
TOILET SEAT LATCH
Dennis J. Buckshaw, 9610 Melrose, Livonia, Mich. 48154, and James A. Clark, 7309 Manner Cir., Apt. 202, Westland, Mich. 48185
Continuation of Ser. No. 180,286, Apr. 11, 1988, abandoned, which is a division of Ser. No. 759,143, Jul. 26, 1985, Pat. No. 4,736,472, which is a continuation-in-part of Ser. No. 535,934, Sep. 26, 1983. This application May 26, 1989, Ser. No. 358,531
Int. Cl.[4] A47K *13/24*
U.S. Cl. 4—253 **10 Claims**



1. Apparatus for releasably latching a toilet seat cover hinged to a toilet bowl in a closed position overlaying said bowl comprising:
A. a base element mounted to said bowl;
B. a latch bar element pivotally connected to said base element and movable between a latching position overlying the toilet seat cover to prevent opening of the cover and a non-latching position allowing opening of the cover;
C. a hook member pivotally connected at one end thereof to one of said elements at a point adjacent but spaced from the pivotal connection between said latch bar element and said base element and defining a hook portion at the other end thereof;
D. latch means on the other of said elements coacting with said hook portion of said hook member in response to movement of said latch bar from its non-latching position to its latching position overlying the toilet seat cover to lock said latch bar in its latching position and prevent opening of the cover; and
E. means for manually pivoting said hook member to a released position clear of said latch means to allow movement of said latch bar to its non-latching position to allow opening of the cover.

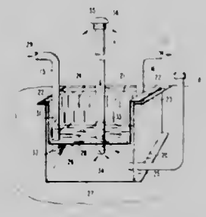
4,894,871
TRANSFER AID
Joseph Schmerler, 140 Devon Rd., Tenafly, N.J. 07670
Filed Feb. 1, 1989, Ser. No. 304,467
Int. Cl.[4] A61H *3/00*
U.S. Cl. 4—254 **12 Claims**

1. A transfer aid for assisting weight transfer between a seated and a standing position comprising an integral space frame enclosing an interior of the transfer aid, said space frame including a rear section adapted to surround and be secured to a commode, a front section positioned forwardly therefrom for providing lift support, and an intermediate section connecting said front and rear sections for providing a transitional weight bearing support, said front section including at least one assist bar adapted for hand reachable grasp by the commode user to initiate a pivotal movement from a seated to a standing posi-



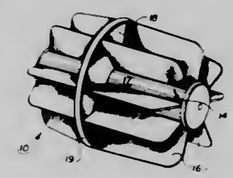
tion, said support of said intermediate section including a footpad secured thereto for stabilizing said frame with respect to a horizontal support surface by the weight of the user on said footpad when in transition from said seated to said standing positions, said space frame further including at least one user access opening, said access opening located between the rear and front sections for allowing access to the interior of the transfer aid proximate the footpad.

4,894,872
WATERLESS SANITATION SYSTEM WITH VENTILATION
Charles M. Anderson, Jr., and Stephen C. Cline, both of Zionsville, Ind., assignors to Outdoor Sanitation Corp., Zionsville, Ind.
Filed Oct. 28, 1988, Ser. No. 264,028
Int. Cl.[4] A47K *11/00*
U.S. Cl. 4—482 **10 Claims**



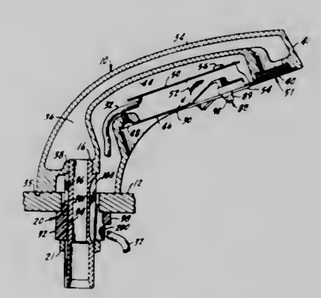
1. A waterless sanitation system comprising:
toilet means to receive liquids and solids;
a first basket mounted beneath said toilet means to receive said liquids and solids, said basket including aperture means operable to allow said liquids to flow downwardly but blocking flow of solids;
a holding tank in which said first basket is mountingly suspended, said tank positioned to catch and hold said liquids flowing through said aperture means;
an inlet conduit extending from outdoors into and through said basket and into said holding tank, said inlet conduit directing external air into said basket and said holding tank; and,
an outlet conduit extending from inside said holding tank through said basket to outdoors, said outlet conduit directing gas out of said basket and said holding tank.

4,894,873
WAVE SUPPRESSION MEANS
Jack K. Kiefer, 3710 Lawson Rd., Glenview, Ill. 60025; Dale A. Kiefer, 15323 Bestor Blvd., Pacific Palisades, Calif. 90272, and Roger Eddy, 3101 Fernwood La., New Castle, Pa. 16105
Filed Apr. 21, 1988, Ser. No. 184,338
Int. Cl.[4] E04H *3/16*
U.S. Cl. 4—497 **5 Claims**



1. A wave suppression means for use in the demarcation of swimming pool lanes comprised of
a. a cylindrical core member having an inner and outer surface and including
i. a plurality of fins radially extending from its outer surface and positioned substantially coextensively along the length of said core members;
ii. at least one space member circumferentially positioned about and connected to said core member and fins; and
b. a flotation means axially positioned within said core member and compression fit against its inner surface, said flotation means including a central axial opening for receiving a means for stringing a plurality of wave suppression means together to form a lane demarcation.

4,894,874
AUTOMATIC FAUCET
John R. Wilson, Naperville, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed Mar. 28, 1988, Ser. No. 173,883
Int. Cl.[4] E03C *1/05*
U.S. Cl. 4—623 **7 Claims**

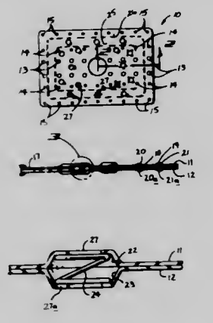


1. A faucet for automatic operation, defining a base and an elongated spout body extending therefrom including a discharge outlet spaced from the base, said spout body defining a generally planar surface disposed at about an angle of 20° to horizontal,
sensing means operative to automatically operate said faucet by detecting the presence of a user comprising a signal emitter and a signal detector disposed intermediate said base and said outlet, said emitter and detector each being disposed on the longitudinal centerline of the spout body, and said emitter and detector and said discharge outlet each face outwardly from said planar surface, said detec-

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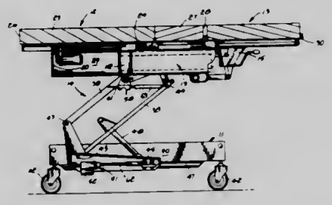
tor having a field of view symmetrical about an axis, said axis being parallel to a centerline of said discharge outlet,
said sensing means being able to communicate with a faucet control means adapted to automatically operate said faucet, and
a drip guard disposed between said emitter and detector extending from said planar surface and being generally arcuate in a direction transverse to the longitudinal center of the spout body.

4,894,875
SINK MAT ORGANIZATION
Jack B. Oxley, and Joel T. Oxley, both of Star Rte. Box 145, Hico, W. Va. 25854
Filed Dec. 5, 1988, Ser. No. 279,515
Int. Cl.[4] A47K *00/00*; E03C *00/00*
U.S. Cl. 4—657 **1 Claim**



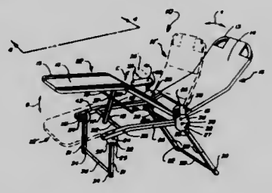
1. A sink mat for accommodation of a variety of sink sizes and contours comprising,
a flexible pad including an upper surface and a parallel lower surface, and
a through-extending central opening in said pad to overlie a fluid rate in said sink, and
at least one continuous channel formed parallel to a continuous terminal edge of said pad, and
an elongate deformable rod captured in said channel, and
wherein said deformable rod is formed of memory retentent material to retain a predetermined configuration subsequent to manipulation of said rod to said configuration, and
wherein said pad comprises an upper and lower flexible laminate secured together to form said channel wherein said channel includes a semi-circular channel formed in each confronting surface of said upper and lower laminant and of complementary semi-circular configuration to define a circular conduit to capture said rod, and
further including a plurality of cup-shaped recesses formed in said upper and lower laminate of complementary configuration to define a cell wherein said cell includes a resilient member captured therewithin to provide impact resistance to said pad, and
wherein each of said cells are formed in a plurality of arrays wherein said arrays include a first circular array formed about said central opening, and further including a second circular array spaced outwardly of said first array about said central opening, and
further including plural rows of first openings formed centrally along said mat, and plural rows of second openings of lesser diameter than said first openings formed exterior of said said second openings positioned outwardly of said second openings and said terminal edge of said mat.

4,894,876
MULTIPURPOSE MATERNITY CARE BED
Loel Fenwick, Spokane, Wash., assignor to Hill-Rom Company, Inc., Batesville, Ind.
Filed Jul. 15, 1988, Ser. No. 220,029
Int. Cl.[4] A61G *7/00*
U.S. Cl. 5—65 **29 Claims**



1. An elevationally adjustable bed, comprising:
a rigid bed frame having opposed sides;
a floor-supported base located elevationally beneath the bed frame;
longitudinal mattress means on the bed frame for supporting the body of a user; and
lift means operably connected between the bed frame and the base for elevationally raising or lowering the bed frame relative to the base, the lift means partially overlapping the bed frame in a nesting relationship;
the lift means comprising:
a base transport movably mounted on the base;
parallel arms positioned in pairs alongside the respective sides of the bed frame, the paired arms extending respectively from two lower horizontal pivot connections on the base transport to two upper horizontal pivot connections;
guide means on the base operably mounting the base transport for horizontal longitudinal movement relative to the base; and
restraining means operably connected between the base and the arms for causing the arms to move angularly relative to the base about their two lower horizontal pivot connections in response to horizontal longitudinal movement of the base transport relative to the base.

4,894,877
MOBILE LOUNGE
William C. Marsh, P.O. Box 1509, Project City, Calif. 96079
Filed Sep. 15, 1988, Ser. No. 245,652
Int. Cl.[4] A01G *7/00*; A47C *17/64*
U.S. Cl. 5—68 **4 Claims**



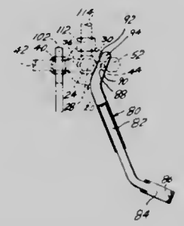
1. A mobile lounge, adapted to support a user of the lounge in various positions, including raised and lowered positions of the back and leg portions of the user, comprising:
a base frame having a front end and a back end;
a front leg pivotally attached with respect to said base frame near said front end of said base frame, foldable against said base frame;
a back leg pivotally attached with respect to said base frame near said back end of said base frame, foldable against said base frame;
a seat section, foldable against said base frame, of a sufficient size to support the buttocks and legs of a user, said seat section being pivotally connected to the base frame near the back end of the base frame, said seat section being raisable and lowerable relative to the base frame, said seat section including a support means adapted to cooperate with the base frame to hold the seat section in a raised position, and
a back section foldable against the seat section, pivotally attached with respect to said base frame near said back end of said base frame the lounge being adapted to be folded into a compact configuration.

4,894,878
SLEEPING BAG
Raegan L. Roach, Chico, Calif., assignor to Caribou Mountaineering, Inc., Chico, Calif.
Filed May 25, 1988, Ser. No. 198,274
Int. Cl.[4] A47G *9/08*
U.S. Cl. 5—413 **32 Claims**



1. A sleeping bag comprising:
an outer shell;
an inner liner within the outer shell to define a space therebetween:
the shell and the liner joined at a user access region: and
a plurality of longitudinally extending insulation batts housed within the space, each batt comprising a unitary body with edges secured to the shell and/or the liner the batts arranged in an overlapping, shingled arrangement for enhanced insulation effectiveness.

4,894,879
HAND TOOL
Albert J. Therkildsen, 1820 Maple La., Apt. L69, and Ronald A. Kvinge, 619 N. Summit Ave., both of, Kent, Wash. 98031
Division of Ser. No. 668,414, Nov. 5, 1984, abandoned. This application Apr. 7, 1986, Ser. No. 848,797
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—169 **20 Claims**



1. A unitary tool comprising:
a. a shank;
b. said shank having a first end and a second end;
c. said first end being enlarged as compared to the width of said shank;
d. a passageway in said first end;
e. said passageway having an interior wall;
f. said second end being a finger;
g. said finger being reduced in width as compared to the width of the shank and enlarged in thickness as compared to the thickness of the shank; and,
h. said finger extends onto said shank to have a thicker central area in said shank than that part of said shank near said first end.

4,894,880
TOOTH BRUSH
Martin P. Aznavoorian, 2 Rebecca Str., Auldana, 5072; S. A., Australia
Filed Feb. 3, 1989, Ser. No. 305,718
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167.2 **12 Claims**

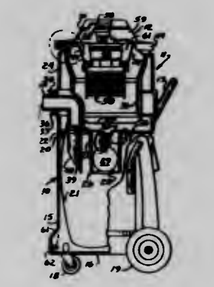


1. In a tooth brush having a longitudinal body, one end of the body forming a handle and the other end of the body having a series of generally parallel longitudinal rows of bristles, the improvement comprising
a. a pair of outer rows of bristles, each outer row being located at an opposite side of said rows of bristles, the bristles of said outer rows having a first stiffness,
b. a pair of inner rows of bristles, each inner row being located adjacent one of said outer rows, the bristles of said inner rows having a second stiffness greater than said first stiffness,
c. a central row of bristles located between said inner rows, the bristles of said central row having a third stiffness not less than said second stiffness,
d. the bristles of said central row terminating at and forming a generally flat brushing plane,
e. at least a first portion of the bristles of said inner and outer rows on one side of said central row terminating at a first inclined brushing plane and at least a first portion of the bristles of said inner and outer rows on the other side of said central row terminating at a second inclined brushing plane, saidn inclined brushing planes being oriented at an angle of from about 80° to 100° to one another, and
f. a second portion of the bristles of said outer rows terminating at a flat surface generally parallel to and spaced from said flat brushing plane.

4,894,881
WET/DRY VACUUM MACHINE
Gary E. Palmer, Roselle, and Rick McCleod, Lake in the Hills, both of Ill., assignors to Hako Minuteman, Inc., Addison, Ill.
Filed Mar. 3, 1989, Ser. No. 318,821
Int. Cl.[4] A47L *9/12*
U.S. Cl. 15—328 **5 Claims**

1. In a vacuum machine for removing hazardous materials in liquid or dry condition, the improved combination comprising: a reservoir for storing collected materials, said reservoir including an upright side wall defining an upper edge for receiving and holding the inlet edge of a collection container extending downwardly into the reservoir; an adapter comprising a side wall and an integral bottom wall received on said reservoir and sealingly engaging said upper edge of said reservoir, said bottom wall defining an air intake aperture communicat-

ing the interior of said reservoir with the interior of said adapter; an intake conduit having a first section extending through the side wall of said adapter for receiving an intake hose and a second section extending downwardly through said bottom wall of said adapter and into said reservoir; a float valve in operative relation with said air intake aperture of said adapter bottom wall for sealing said aperture when the liquid level in said reservoir reaches a predetermined level; a lid



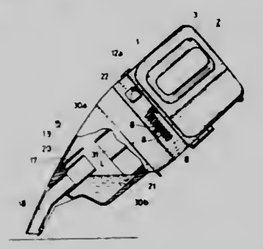
mounted to cover the top of said adapter; a vacuum motor beneath said lid and at least partially encompassed by said adapter side wall; filter means for filtering air passing through said adapter; whereby said machine may be used as a liquid vacuum machine without a collection container or as a dry vacuum machine with the mouth of a sack folded over said upper edge of said reservoir and sealed thereagainst when said adapter is assembled thereto.

4,894,882

PORTABLE VACUUM CLEANER

Syouiti Toya, Sumoto, Japan, assignor to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Jan. 11, 1988, Ser. No. 142,656
Claims priority, application Japan, Jan. 13, 1987, 62-5248
Int. Cl.[4] A47L *5/24*
U.S. Cl. 15—344 10 Claims



1. A portable vacuum cleaner operable for use in concurrent dry and wet operations, comprising:

a main body case having intake and discharge openings;

a fan housed in the main body case between the intake and discharge openings;

a dust case having a suction nozzle adapted to draw in water, air and debris during operation of said vacuum cleaner, said dust case having a top and being removably secured to the main body case adjacent the intake opening so as to completely cover the intake opening;

a filter housing having a through hole, said filter housing being removably installed in the dust case adjacent the intake opening and having an intake side distal from the intake opening, and said through hole being provided for the passage of air and debris drawn in through the suction nozzle during operation of the vacuum cleaner;

a filter disposed in the filter housing so as to cover the intake opening;

a seal member peripherally interposed between the filter housing and the dust case; and

an annular projecting wall mounted in the dust case adjacent the intake side of the filter housing and having an open end in opposed relation to the suction nozzle to form a well for storing, during periods of nonuse with said vacuum cleaner oriented so as to upwardly point said suction nozzle, water drawn in through the suction nozzle during operation of the vacuum cleaner;

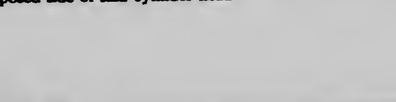
said through hole in the filter housing being defined between the annular projecting wall and the top of the dust case, the position of the through hole being effective for minimizing passage through said through hole of liquid drawn in through the suction nozzle during operation of the vacuum cleaner.

4,894,883

DOOR CLOSERS

Eugene T. Fleischhauer, 1413 Wexanne La., Midlothian, Va. 23113

Filed Jan. 28, 1987, Ser. No. 7,514
Int. Cl.[4] E05F *3/00*
U.S. Cl. 16—66 2 Claims



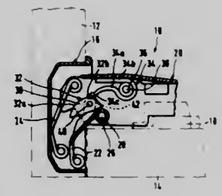
1. A door closer comprising: an elongated cylinder; a first attachment means at one end of said cylinder; a piston rod slidably mounted in and extending from the opposite end of said cylinder, said piston rod and said cylinder being tiltable relative to each other in a vertical direction; a centrally apertured cylinder head at said opposite end of said cylinder, said piston rod extending through the aperture in said cylinder head; second attachment means at the exposed end of said piston rod; means continuously urging said piston rod toward a retracted relationship relative to said cylinder; and means for maintaining said piston rod in an extended relationship relative to said cylinder, the means for maintaining said piston rod in said extended relationship relative to said cylinder comprising a notch in said piston rod, said notch having a transversely extending face engageable with the exposed side of said cylinder head when a door to which said closer is attached is opened to extend said piston rod relative to said cylinder and said piston rod is thereafter tilted to align said transversely extending notch face with said exposed side of said cylinder head and said piston rod being rotatable in said cylinder about the longitudinal axis of the cylinder, whereby said piston rod can be rotated: (a) into a first position in which said notch faces downwardly, whereby said cylinder can be tilted upwardly relative to said piston rod to engage said transversely extending notch face with said exposed side of said cylinder head when a door to which the door closer is attached is opened to extend said piston rod relative to said door closer cylinder and thereby position said transversely extending notch face opposite said exposed face of said cylinder head; and (b) a second position in which said notch faces upwardly and said cylinder can tilt downwardly relative to said piston rod to engage said transversely extending notch face with said exposed side of said cylinder head when a door to which said door closer is attached is opened to extend said piston rod relative to said door closer cylinder and position said notch face opposite said exposed side of said cylinder head.

4,894,884

OVER-CENTER SELF-CLOSING HINGE FOR CABINET DOORS

Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 324,204
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808585
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—278 6 Claims



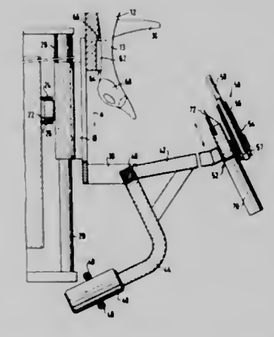
1. An over-center self-closing hinge comprising: a wall-related part having means for attachment to a wall of a cabinet, a door-related part for attachment to a door of a cabinet, a first hinge link, and a second hinge link, a first shaft pivotally connecting said first hinge link to said wall-related part, a second shaft for pivotally connecting said first hinge link to said door-related part, means for pivotally connecting said second hinge link to said wall-related part and to said door-related part, said first hinge link being closer to said means for attachment to the wall than said second hinge link, a single-arm lever forming a compression spring and having a stationary end journaled in said wall-related part and also having a free end, a cam body having a cam edge engaged by said free end of said single-arm lever of said compression spring, a third shaft for pivotally supporting said cam body in said wall-related part, said third shaft being journaled on two ears provided laterally on opposite longitudinal margins of the first hinge link and bent into the area between the two hinge links such that the cam body forms a two-armed lever, said two-armed lever being engaged by the spring on the side opposite the first hinge link; when seen in side view, said cam edge having a first section of substantially arcuate shape substantially concentric with said first shaft, a second section adjoining said first section, the third shaft being so disposed in relation to the first shaft that when the hinge moves from the open to the closed position and nears the closed position, a plane passing through the first and third shafts intersects said cam edge in the area of contact with the spring and the direction of action of the spring force exerted by the spring on the cam edge is applied approximately in said plane; in the hinge movement from the open position to the closed position, up to the line of intersection with the plane passing through the first and third shaft, at the beginning the first section of the cam edge is acted upon by the engaging spring, said second section of the cam edge being acted upon by the spring in the remaining closing movement, said second section having such a shape that the force exerted by the spring on said second section exerts a torque on the first hinge link in the hinge-closing direction.

4,894,885

KILLING DEVICE FOR POULTRY

Heinrich W. Markert, Otterlo, Netherlands, assignor to Stork PMT B.V., Netherlands

Filed Apr. 28, 1988, Ser. No. 187,200
Claims priority, application European Pat. Off., Apr. 28, 1987, 87106151.1
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 15 Claims



1. A killing device for animals such as poultry secured by the legs to a conveyor with the head and neck hanging downward and being conveyed one behind the other along a conveyor path, the device comprising movable support means, catching means mounted on said support means for movement along said conveyor path for catching, holding and stretching of the neck, said catching means including means defining a catching slot disposed essentially transversely relative to the conveying path with said slot being closed at one end and open at the other end, neck holding means pivoted on said catching means for movement toward and away from said catching slot for engaging the neck and pushing said neck against the closed end of said catching slot, head aligning means located on said catching means below said catching slot, means for movably mounting said catching means on said support means for movement substantially perpendicular to the conveyor path along the length of the neck for locating the head in the head-aligning means and cutting means pivotally mounted on said catching means for movement toward and away from said catching slot.

4,894,886

BLENDED YARN PRODUCING DEVICE

Toshifumi Morihashi, Obtsu, Japan, assignor to MurataKikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 16, 1987, Ser. No. 97,601
Claims priority, application Japan, Sep. 18, 1986, 61-219966
Int. Cl.[4] D01H *1/00*; D02G *3/36*
U.S. Cl. 19—244 17 Claims



1. A blended yarn producing device for a spinning apparatus which includes a draft device having back rollers, middle rollers and front rollers, and a twisting device succeeding said draft rollers, the device comprising:

a trumpet guide device for introducing fiber slivers of first

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and second different types separately, located on the sliver entrance side of said back rollers; and

blended sliver forming means for forming the sliver of the first type around the circumference of the sliver of the second type resulting in a blended sliver having a circumferential layer of fiber of the sliver of the first type substantially surrounding an inner layer of fibers of the sliver of the second type.

4,894,887

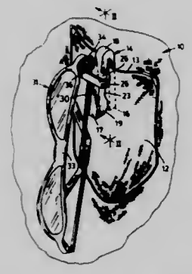
EYEGLASS RETAINER

Seth Ward, II, Little Rock, Ark., assignor to POM Incorporated, Russellville, Ark.

Continuation of Ser. No. 941,304, Dec. 12, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 136,112

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—3 C **10 Claims**



1. A pair of eyeglasses and an eyeglass retainer for supporting the pair of flat folded eyeglasses from clothing of an eyeglass user comprising:

a pair of eyeglasses including an eyeglass frame and lens, the eyeglass frame including a pair of temple sidepieces for supporting the eyeglasses on the head of the user;

the eyeglass retainer including a clip portion having first and second elongated finger members arranged in opposing relationship and being interconnected to an upper region with downward extending distal ends which are resiliently biased together to clip on clothing of an eyeglass user,

the eyeglass retainer further including a nonflaccid transverse looped hanger portion formed integral wth said first finger member and extending outwardly therefrom, the hanger portion being disposed intermediate the upper region and said distal end of said clip portion and adapted to receive the temple sidepiece of the pair of eyeglasses, and

means associated with said hanger portion to support and maintain the eyeglasses in a controlled peadulous orientation comprising a substantially oval cross-sectional shaped opening extending vertically through said hanger portion with a support edge for abutting a portion of the eyeglasses the opening and support edge cooperating with the temple sidepiece, said opening having a side-to-side width; a front-to-back depth and a top-to-bottom length in which the length of the opening is generally equal to the depth of the opening to accommodate limited forward and backward movement of the eyeglasses relative to said hanger portion of the eyeglass retainer wherein the eyeglasses are maintained in a substantially downward suspended inclination.

4,894,888

DEVICE FOR TEMPORARILY CONNECTING THE ENDS OF TWO STRUCTURES OF WHICH AT LEAST ONE IS FLEXIBLE

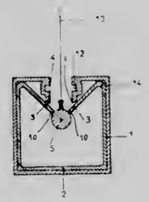
Pierre H. Bassouls, 7 rue du Boeuf, 69005 Lyon, France

Filed Jun. 6, 1988, Ser. No. 202,968

Claims priority, application France, Jun. 5, 1987, 87 08101

Int. Cl.[4] A44B *19/10*

U.S. Cl. 24—400 **9 Claims**



1. Apparatus for temporarily connecting two structures, one of which is flexible, that includes

a rigid elongated housing disposed along the length of a structure, said housing having an opening in one wall thereof,

a bead contained along a length of a flexible structure that is adapted to be introduced into said rigid housing through the opening,

said rigid housing containing therein two tongues aligned along said opening between which is formed a gap that is smaller than the thickness of the bead,

said tongues being flexible so that their gap forming ends can be moved away from each other to widen the gap when the tongues are pressured in one direction away from said opening,

stop means mounted in the housing to prevent movement of the tongues in an opposite direction toward said opening to prevent widening of the gap when the tongues are pressured in said opposite direction,

a slide means movable along the housing that has an envelope that partially encloses the bead and permits the bead to pass through the envelope as the slide moves along the rigid housing, said slide means being arranged to pressure the tongues in said one direction to open the gap sufficiently to permit the bead to be introduced below the tongues into said rigid housing as the slide member is moved along the rigid housing in a first direction thereby connecting the two structures, and removing the bead from beneath the tongues and out of the rigid housing as the slide member is moved in a second direction to disconnect the two structures.

4,894,889

LASHING SYSTEM

William N. Johnson, 19 St. Mary's Court, Stamford Brook Road, London, W6, United Kingdom, and Gunnar Holmqvist, Farjgardstorget 24, 5th Fl., S11643 Stockholm, Sweden

PCT No. PCT/GB86/00758, § 371 Date Feb. 29, 1988, § 102(e) Date Feb. 29, 1988, PCT Pub. No. WO87/03660, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 11, 1986, Ser. No. 173,412

Claims priority, application United Kingdom, Dec. 12, 1985, 8530899

Int. Cl.[4] F16G *15/00*

U.S. Cl. 24—68 CT **4 Claims**

1. A tensioning and securing device for a lashing system comprising a first member and a second member, an actuating device having two relatively movable parts, means on said first member for anchoring a lashing element, means on said second member for anchoring a lashing element, said first member

being in the form of a U-shaped bar having two parallel legs and a portion connecting one end of each leg to the adjoining end of the other leg thereby defining a base, said second member being a cross-piece extending across said parallel legs perpendicular thereto and having two apertures therethrough, each of said parallel legs of said first member extending through a respective said aperture, whereby the cross-piece is movable along said parallel legs through a range of positions therealong, locking means for locking said cross-piece with



respect to said parallel legs in a selected one of said positions, said parallel legs having, at their free ends, inwardly projecting formations providing abutment surfaces facing towards the base of the U-shaped bar whereby said actuating device can be applied with said parts thereof lying between, on the one hand, said abutment surfaces and, on the other hand, the part of the cross-piece between said legs, and the actuating device operable to force the cross-piece along the legs away from said inwardly projecting formations, the actuating device being releasably engageable with said abutment surfaces.

4,894,890

BUCKLE ASSEMBLY

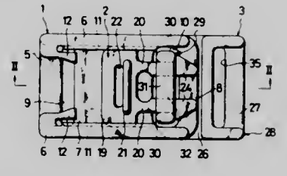
Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,552

Claims priority, application Japan, Oct. 6, 1987, 62-153121[U]

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—573 **15 Claims**



1. A buckle assembly for releasably connecting three belts, comprising:

(a) a retainer base for being attached to a first belt and having an aperture extending through said retainer base in a direction perpendicular to a plane of said retainer base;

(b) a plug for being attached to a second belt and slidably mounted on said retainer base, said plug having a pair of resilient legs and slidably movable between a first position in which said resilient legs are retracted from said aperture, and a second position in which said resilient legs extend across said aperture; and

(c) a socket for being attached to the third belt and having an upstanding generally C-shaped locking lug receivable in said aperture in said retainer base from said direction when said plug is disposed in said first position, said C-shaped locking lug being snappingly engageable with said resilient legs to couple said retainer base and said socket when said plug is disposed in said second position.

4,894,891

APPARATUS FOR MEASURING THE WEFT THREAD POSITION AND FOR ALIGNING THE WEFT THREAD IN TEXTILES

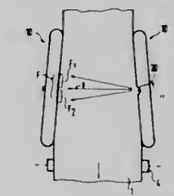
Hellmut Beckstein, Bad Abbach, Fed. Rep. of Germany, assignor to Mahlo GmbH & Co. KC, Saal Donau, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,597

Claims priority, application Fed. Rep. of Germany, May 18, 1987, 371579

Int. Cl.[4] D06H *3/12*

U.S. Cl. 26—51.4 **2 Claims**



1. An apparatus for measuring the position of weft threads and for aligning the weft threads in continuously traveling textile sheets comprising first and second chain guides being arranged in parallel to a travelling direction for moving the textile sheets in said travelling direction,

said first chain guide having a projection perpendicular to said travelling direction for introducing a tension force at a point of the textile sheet,

said second chain guide having force detector means being arranged, in said travelling direction, symmetrically with respect to said projection for detecting forces applied to said weft threads by said projection and for generating an output signal in accordance to said detected forces;

aligning elements; and

means for adjusting said aligning elements in response to the output of said force detector means.

4,894,892

METHOD FOR PROCESSING A WARP SHEET OF YARNS

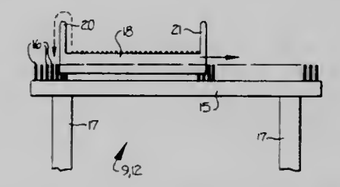
Peter Duda, Radevormwald-Herbeck, Fed. Rep. of Germany, assignor to Barmag, AG, Remscheid, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 229,014

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726350

Int. Cl.[4] P02H *5/02*; D02J *1/08*

U.S. Cl. 28—172 **3 Claims**



1. A method of threading a longitudinally extending warp sheet of yarns onto a yarn reed of the type comprising an elongate frame member which extends in the transverse direction, and a plurality of pins extending upwardly from said frame member, and with the pins being aligned in the transverse direction and being separated a uniform and predeter-

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mined distance so that adjacent pins define a yarn receiving slot therebetween, and comprising the steps of

positioning an elongate support rail in an operative position above and parallel to said row of pins, with said support rail covering a portion of the length of said row of pins and having an upper yarn support surface extending along its length,

positioning a plurality of longitudinally extending yarns across said upper yarn support surface while said support rail is in said operative position, and then

transferring the yarns from said support surface into individual ones of said yarn receiving slots which are exposed adjacent one end of said support rail, and while periodically moving the support rail transversely to expose further ones of said yarn receiving slots.

4,894,893

PNEUMATIC REED DRAWING-IN APPARATUS

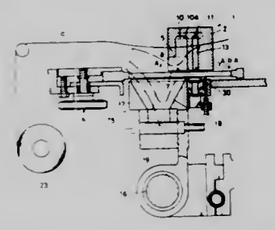
Tetsuo Okuda, Hashima, Japan, assignor to C K D Kabushiki Kaisha, Komaki, Japan

Filed May 20, 1988, Ser. No. 197,031

Claims priority, application Japan, Jan. 11, 1987, 62-90179[U]; Oct. 9, 1987, 62-154948[U]

Int. Cl.[4] D03J *1/14*

U.S. Cl. 28—204 **4 Claims**



1. A pneumatic reed drawing-in apparatus comprising, a nozzle, a reed having reed blades, said nozzle being movable above said reed transversely of the reed blades thereof, said nozzle having a warp end feeding slit opening in a front side of said nozzle and partially extending through said nozzle from an upper portion down to a lower side thereof adjacent said reed blades, said warp end feeding slit having its upper opening as a warp end inlet, its lower opening as a warp end outlet and its front opening narrower than the interior of said warp end feeding slit itself as a way of warp escape, an air injection port formed in said nozzle to inject a stream of presurized air downwardly into said warp end feeding slit substantially in the form of a parallel-flow so that an ejector effect of said stream of pressurized air develops a stream of air flowing through said warp end feeding slit from said warp end inlet towards said warp end outlet, wherein, after said warp end outlet has been aligned with a gap defined between each pair of adjacent ones of said reed blades, an end of warp guided into said warp end feeding slit is blown out with said air stream through said warp end outlet and drawn-in through said gap of the adjacent reed blades while an intermediate portion of warp is let escape through said way of warp escape, a warp end suction device having a narrow suction port alignable with said gap defined between the adjacent reed blades and to suck said warp end under effect of a negative pressure and wherein said warp end suction device is movable in unison with said nozzle, and said nozzle being provided adjacent said warp end outlet with an auxiliary air injection port and wherein said nozzle carries, below said reed, a support movable integrally with said nozzle, said support carrying a shield to block said gap of said adjacent reed blades associated with said auxiliary air injection port so that a stream of pressurized air injected from said auxiliary air injection port impinges on said shield to curve said adjacent reed blades to effectively widen said gap.

4,894,894

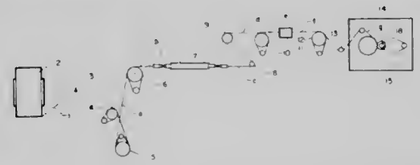
CONTINUOUS HIGH SPEED METHOD FOR MAKING A COMMINGLED CARPET YARN

Andrew M. Coons, III, Anderson, and James P. Sullivan, Seneca, both of S.C., assignors to BASF Corporation, Williamsburg, Va.

Continuation of Ser. No. 895,648, Aug. 12, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 243,170

Int. Cl.[4] D02G *1/16, 1/18, 1/20, 3/04*

U.S. Cl. 28—220 **10 Claims**



1. A continuous, integrated, high speed process for making a carpet yarn having a high degree of filament intermixture, the process comprising the steps of:

(a) forwarding an undrawn multifilament carpet yarn;

(b) drawing the yarn until the elongation of the filaments has been reduced to an acceptable level for end use in carpeting applications, the drawn yarn having a denier between 2,000 and 4,000, the drawn filaments each having a denier between 18 and 35;

(c) crimping the filaments with a jet crimping means;

(d) overfeeding the crimped filaments between 1% and 10% through a chamber in an intermixing jet, the chamber having a length to diameter ratio of about 2.4 and further having a 180° slit through which steam enters the chamber under supersonic flow conditions, striking the filaments in an inescapable flow of steam, thereby continuously intermixing the drawn, crimped yarn along the entire length thereof to a standard elevation of less than 6.0 as measured by a Standard Yarn Streak Potential Test; and thereafter

(e) taking up the drawn, crimped, intermixed yarn at a speed of at least 800 meters per minute.

4,894,895

METHOD OF MAKING AN ULTRASONIC PROBE

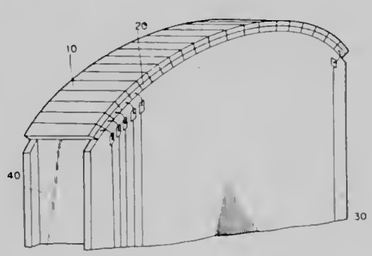
Haruyasu Rokurokita, and Kazufumi Ishiyama, both of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 157,785, Feb. 19, 1988. This application Jan. 11, 1989, Ser. No. 295,745

Claims priority, application Japan, Feb. 24, 1987, 62-39158

Int. Cl.[4] H01L *41/22*

U.S. Cl. 29—25.35 **1 Claim**



1. A method of manufacturing an ultrasonic probe, comprising the steps of: joining a piezoelectric vibrator blank and an auxiliary electrode plate blank having a plurality of electrode patterns to each other and then dividing said piezoelectric vibrator blank and said auxiliary electrode plate blank at prescribed pitches to produce a piezoelectric vibrator and an auxiliary electrode plate; bending said piezoelectric vibrator and said auxiliary electrode plate to a predetermined curvature; placing an electrode plate having a plurality of electrode patterns and a distal end curved to the same curvature as that of said auxiliary electrode plate, such that said curved distal end extends along said bent auxiliary electrode plate; and electrically connecting the electrode patterns of said auxiliary electrode plate respectively to the electrode patterns of said electrode plate.

4,894,896

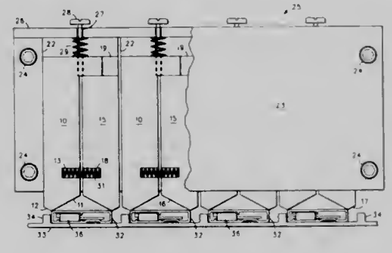
PRECISION CENTERING DEVICE

Milo W. Frisbie, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Del.

Filed Nov. 21, 1988, Ser. No. 273,764

Int. Cl.[4] B65G *47/00*

U.S. Cl. 29—33 P **8 Claims**



1. A precision centering device for holding items in a predetermined position, comprising: a first portion and a second portion each having a tapered bottom end and a mating top end; a frame for receiving the first and second portions, the frame having an opening to allow the tapered bottom end of the first and second portions to extend therefrom and having a screw receiving hole opposite from the opening; a first spring means positioned between the first and second portions; a second spring means positioned between the top ends of the first and second portions and the screw receiving hole; and a screw positioned through the screw receiving hole and the second spring means and engaging the first portion.

4,894,897

LINEAR BEARING ASSEMBLY

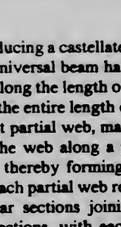
Albert R. McCloskey, Fairfield, Conn., assignor to Incom International, Inc., Pittsburgh, Pa.

Division of Ser. No. 577,480, Feb. 6, 1984, Pat. No. 4,545,626. This application Jul. 29, 1989, Ser. No. 760,118

Int. Cl.[4] B21D *53/10*

U.S. Cl. 29—149.5 NM **3 Claims**

1. The method of assembling linear bearings comprising molding and permanently embedding races in a moldable plastic shell, sliding a cage axially into the shell with an open end of a ball guide sliding along an inward extended portion of a race and closing the open end of the ball guide by inserting a single cap having a curved ball guide portion axially into the



shell, whereby the ball guide portion of the cap completes the ball guide of the cage.

4,894,898

METHOD OF MAKING CASTELLATED BEAMS

Peter A. Walker, Halifax, England, assignor to Wescol Structures Limited, Halifax, United Kingdom

Filed Jan. 10, 1989, Ser. No. 295,444

Claims priority, application United Kingdom, Jan. 12, 1988, 8800610; Sep. 22, 1988, 8822275

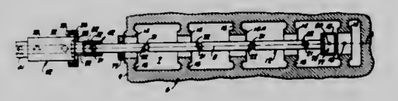
Int. Cl.[4] B23P *17/00*

U.S. Cl. 29—155 R **13 Claims**

1. A method of producing a castellated beam, comprising the steps of providing a universal beam having a web which has a centreline extending along the length of the web, making a first continuous cut along the entire length of the web along a path, thereby forming a first partial web, making a second cut along the entire length of the web along a path differing from the path of the first cut, thereby forming a second partial web, each cut defining on each partial web rectilinear sections and at least partly curvilinear sections joining the closest ends of adjacent rectilinear sections, with each rectilinear section of the first cut lying on a side of the centreline that is opposite to the side of the centreline upon which each rectilinear section of the second cut lies, the at least partly curvilinear sections of the first and second cuts bordering areas of the web located therebetween separating the partial halves of the beam, removing the bordered areas of the web, and abutting the rectilinear sections of the first partial web with the rectilinear sections of the second partial web, and then welding the rectilinear sections of the first partial web to the rectilinear sections of the second partial web.

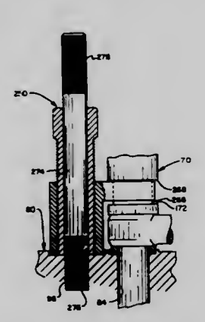
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4,894,899
CAMSHAFT BUSHING POSITIONER
George Hamstead, Rte. 1, Box 400, Clarksburg, Calif. 95612
Filed May 4, 1988, Ser. No. 188,348
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—252 8 Claims



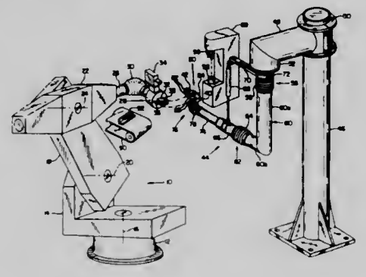
1. A camshaft bushing positioner for use with an engine block having a face and having a camshaft alley with bushing holders aligned along a main axis and of predetermined inside dimensions across said axis, comprising a bar adapted to extend concentrically with said axis in said bushing holders, a yoke adapted to abut said face, means on said yoke for receiving said bar for relative sliding ;motion along said axis, means interconnecting said bar and said yoke for sliding said bar relative to said yoke and along said axis, a sleeve adapted to encompass said bar and having an outside dimension across said axis no greater than said predetermined inside dimensions of said bushing holders, said sleeve being split in an axial dimension and being movable transversely of said axis between a position alongside said bar and a position encompassing said bar, and means for preventing relative axial motion between said sleeve and said bar.

4,894,900
TOOL FOR REMOVING A FUEL INJECTION NOZZLE
Robert Rassfeiser, Simsbury; David A. Chace, Canton Center, and Leon P. Janik, Suffield, all of Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.
Division of Ser. No. 61,711, Jun. 15, 1987, Pat. No. 4,790,055.
This application Sep. 9, 1988, Ser. No. 243,287
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—256 4 Claims



1. A tool for removing a fuel injection nozzle from a socket in the cylinder head of an engine, comprising:
- a yoke member having a threaded bore and a laterally extending yoke portion for engaging the nozzle;
- a jackscrew having a screw portion engaging the bore of the yoke member, means for rotating the jackscrew relative to the yoke member and a smooth bore traversing the jackscrew coaxial with the bore of the yoke member; and
- a jacking bolt traversing the jack screw bore and including a threaded lead end for engaging the cylinder head and a trailing end projecting upwardly from the jack screw for rotating the bolt to engage the cylinder head.

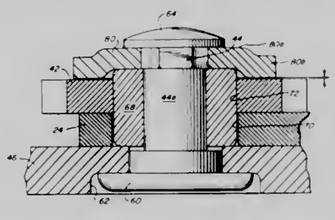
4,894,901
METHOD FOR POSITIONING A ROBOTIC WORK SYSTEM
Mark S. Soderberg, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.
Division of Ser. No. 944,659, Dec. 22, 1986, Pat. No. 4,785,528.
This application Aug. 8, 1988, Ser. No. 229,287
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—428 5 Claims



1. A robotic method for assembling two parts by means of a fastening tool, a powered robot arm, and a non-powered robot arm, said method comprising:
- picking up and positioning a first said part for holding by said non-powered robot arm employing said powered robot arm including engaging said non-powered robot arm with said powered robot arm and positioning the non-powered robot arm in first predetermined work locating position for said first said part relative to said fastening tool,
- locking said non-powered robot arm in said position,
- disengaging said powered robot arm from said non-powered robot arm,
- picking up a second said part with said powered robot arm,
- positioning said powered robot arm carrying said second said part in a second predetermined work locating position for said second said part relative to said fastening tool, said first and second positions being adjacent one another, and
- performing a fastening operation on said first and second parts with said tool as said parts are simultaneously held in said first and second positions by said non-powered and powered arms.

4,894,902
WINDOW OPERATOR ASSEMBLY METHOD
Daniel G. Tucker, Elysian, Minn., assignor to Truth Incorporated, Owatonna, Minn.
Division of Ser. No. 196,378, May 20, 1988, Pat. No. 4,840,075.
This application Apr. 21, 1989, Ser. No. 341,715
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—437 5 Claims

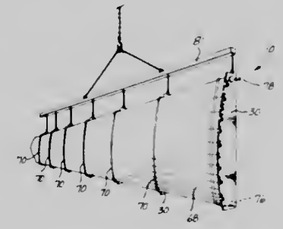
1. A method of assembling pivotal components of a window operator comprising, assembling a pair of members on a bushing mounted on a pivot pin extending from a base and with a metal washer on the pivot pin adjacent an end thereof, compressing said washer against the bushing while at the same time forming a head on the end of the pivot pin, and thereafter force forming an annular outer part of the washer down around the bushing and against one of said members to take up all clearances between the base and said members, whereby after release of the forming force the elasticity of the washer enables



spring-back of the annular outer part thereof to provide controlled clearance for pivoting of said

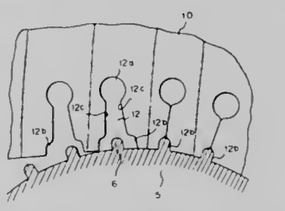
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4,894,903
ASSEMBLY JIG AND METHOD FOR MAKING WING PANELS
Quentin T. Woods, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Jul. 6, 1988, Ser. No. 216,702
Int. Cl.[4] B25B *1/20*; B23P *11/00*
U.S. Cl. 29—448 1 Claim



1. A method of using a single assembly jig for manufacturing wing skin panel sections consisting of a plurality of elongated stringers covered by a sheet of material, said method comprising:
- defining a fixed centerline on said assembly jig, wherein said centerline is a common centerline for any panel section to be manufactured;
- providing a plurality of sets of panel headers, each header of each set having a panel-forming edge curved to have the shape of at least a portion of a certain airfoil profile, said edge including a plurality of stringer registration recesses, each recess being shaped to receive a portion of a stringer, wherein the panel-forming edges of the headers in each respective set cooperatively define the airfoil profile of a separate skin panel section that is dedicated for use in connection with a certain wing;
- providing a plurality of fixed header attachment points substantially along said centerline;
- selecting a particular header set; followed by
- connecting each header in said selected set to said fixed header attachment points, in a manner so that said panel-forming edges of said selected set define the curvature of a particular skin panel section; followed by
- placing stringers across said selected set of headers, in a manner so that said stringers are received in said stringer registration recesses of said headers; followed by
- placing a skin sheet over said panel-forming edges of said selected set and said stringers; followed by
- placing webbing straps across the outer surface of said skin sheet, one webbing strap each being positioned adjacent a header in said selected set; followed by
- fastening each end of each webbing strap to its adjacent header, in a manner so that said webbing strap may be tightened across the outer surface of said skin sheet; followed by
- tightening said webbing straps, thereby forcing and bolding said skin sheet against said stringers and said panel-forming edges of said selected set of headers; followed by
- detaching said selected set of headers from said fixed header attachment points; and
- moving said selected set of headers, with said stringers and said webbing-held skin sheet attached thereto, to an assembly location for fastening said skin sheet to said stringers.

4,894,904
METHOD OF FORMING ARMATURE CORE OF ELECTRIC ROTATING MACHINE
Toshinori Tanaka, and Keiichi Konishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 11, 1988, Ser. No. 166,718
Claims priority, application Japan, Mar. 12, 1987, 62-59145
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—598 7 Claims



1. A method of forming an armature core of an electric rotating machine, said method including the steps of:
- forming a core sheet means having an annular shape;
- said method characterized in that said step of forming the core sheet means comprises the steps of:
- providing a band-shaped metal sheet having two longitudinal edges, one of said edges corresponding to the outer circumference of said annular shape and having a multiplicity of first notches formed therealong, and the other edge corresponding to the inner circumference of said annular shape and having a multiplicity of second notches formed therealong;
- winding said band-shaped metal sheet around a mandrel having projections thereon so that said second notches engage with said projections to form said annular shape; and
- closing said second notches at least at the inner circumference of said annular shape to form the inner circumference into a continuity.

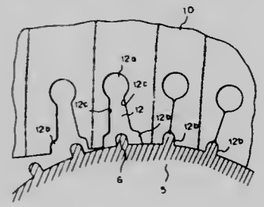
VOL 1110 ISS 4 JA 23 1990 UMI

4,894,905

METHOD OF FORMING ARMATURE CORE OF ELECTRIC ROTATING MACHINE

Toshinori Tanaka, and Keiichi Konishi, both of Hyogoken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 166,718, Mar. 11, 1988. This application Jan. 28, 1988, Ser. No. 212,428
Claims priority, application Japan, Mar. 12, 1987, 62-59145
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—598 **5 Claims**



1. A method of forming an armature core of an electric rotating machine, said method including the steps of:

forming a core sheet means having an annular shape by spiral winding;

said method characterized in that said step of forming a core sheet means comprises the steps of:

providing a band-shaped metal sheet having two longitudinal edges, one of said edges corresponding to the outer circumference of said annular shape and having a multiplicity of first notches formed therealong, and the other edge corresponding to the inner circumference of said annular shape and having a multiplicity of second notches formed therealong;

spirally winding said band-shaped metal sheet around a mandrel having projections thereon so that said second notches engage with said projections to form said annular shape; and

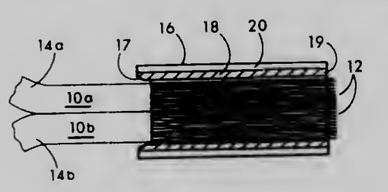
closing said second notches at least at the inner circumference of said annular shape to form the inner circumference into a continuity.

4,894,906

SUPERCONDUCTIVE JOINT FOR MULTIFILAMENT SUPERCONDUCTING AND METHOD OF FORMING

Yuchi Hsang, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Dec. 23, 1987, Ser. No. 137,178
Int. Cl.[4] H01R *4/68*
U.S. Cl. 29—599 **24 Claims**



1. A method of forming a joint of at least two superconductive composite conductors in which a plurality of superconductive filaments are embedded in a normal conducting matrix, the method comprising the steps of

(a) removing the normal conducting matrix from along a length of at least two superconductive composite conductors at the ends thereof to expose the superconductive filaments;

(b) inserting the exposed superconductive filaments from both conductors together into a sleeve of bimetal material, the inner surface of the bimetal sleeve being composed of superconducting material, and the outer surface of the bimetal sleeve being composed of normal conducting material;

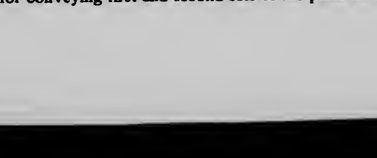
(c) crimping the sleeve over the superconductive filaments so as to produce a pinch-off region in the sleeve.

4,894,907

METHOD OF MAKING A LONGITUDINALLY CONTOURED CONDUCTOR FOR INDUCTIVE ELECTRICAL DEVICES

Julian A. Watt, Falls Villiage, and Richard S. Leazing, Farmington, both of Conn., assignors to The Superior Electric Company, Bristol, Conn.

Division of Ser. No. 201,342, May 27, 1988, which is a continuation-in-part of Ser. No. 900,118, Aug. 25, 1986, abandoned. This application Jan. 5, 1989, Ser. No. 293,793
Int. Cl.[4] H01F *41/07*
U.S. Cl. 29—602.1 **8 Claims**



1. A method of forming a conductor for an induction device having varying current carrying requirements along the length of the conductor, comprising the steps of:

(a) providing a tubular member of conductive material; and

(b) machining the tubular member to form (1) a coil with the cross sectional area of the conductor forming the coil substantially continuously varying along its length in proportion to the varying current carrying requirements.

4,894,908

METHOD FOR AUTOMATED ASSEMBLY OF ASSEMBLIES SUCH AS AUTOMOTIVE ASSEMBLIES AND SYSTEM UTILIZING SAME

Anthony R. Haba, Jr., Lake Orion; S. Craig Clough, Birmingham; Ronald E. Koeske, Fenton, and Richard P. Maxwell, Jr., Redford, all of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Division of Ser. No. 87,690, Aug. 20, 1987, Pat. No. 4,815,190. This application Sep. 30, 1988, Ser. No. 251,341
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—711 **19 Claims**

1. A system for assembling a series of sets of parts movable along a guide track having a closed loop in an assembly area, the system comprising:

a kitting station in the assembly area including a program-controlled kitting robot having a work envelope;

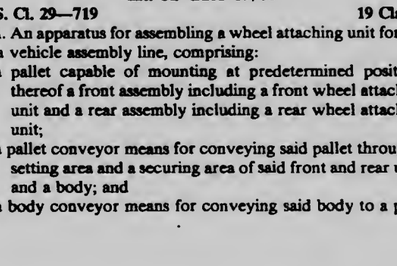
means for storing sets of parts at the kitting station within the work envelope of the kitting robot;

an assembly station in the assembly area to assemble each set of parts into an assembly;

an unload station for unloading each of the assemblies wherein each of the stations is located along the guide track;

transport means including first and second assembly pallets for conveying first and second sets of the parts along the guide track and for stopping and maintaining each of the assembly pallets in a stationary, predetermined position relative to the guide track during the kitting, assembly and unloading functions performed in the kitting, assembly and unload stations, respectively; and

control means for causing the kitting robot to pick and place the first set of the parts on the first assembly pallet at a first set of predetermined positions thereon, to pick and place the second set of parts on the second assembly pallet at a second set of predetermined positions thereon and for causing the transport means to move the first and second assembly pallets in an asynchronous fashion to each of the different stations along the guide track, wherein the control means further causes the transport means to move the first and second assembly pallets from the unload station to the kitting station after unloading of the assemblies for



further assembly of additional sets of parts, wherein the system further comprises a plurality of kitting stations in the assembly area, and a like plurality of means for storing sets of the parts within the respective kitting stations wherein each of the stations is located along the guide track, the control means further causing the transport means to move the first and second assembly pallets to and from the kitting stations and causing each kitting robot to pick and place at least one part on the assembly pallets at a predetermined position thereon;

and wherein the control means automatically monitors and coordinates operation of each of the kitting robots with the automatic transferring of the assembly pallet to and from the kitting stations to control the flow of parts and the pallets in the assembly area and in the event of failure of a kitting robot the control means automatically redistributes any remaining work of the failed kitting robot.

4,894,909

APPARATUS FOR ASSEMBLING WHEEL ATTACHING UNIT FOR USE IN VEHICLE ASSEMBLY LINE

Shunji Sakamoto; Hisaki Katsuki, both of Hiroshima; Junichi Usui; Haruo Oda, both of Osaka, and Tsuyoshi Watanabe, Hiroshima, all of Japan, assignors to Mazda Motor Corp., Hiroshima, Japan

Filed Oct. 27, 1988, Ser. No. 263,425
Claims priority, application Japan, Oct. 28, 1987, 62-272340; Oct. 29, 1987, 62-274485; Oct. 30, 1987, 62-276859; Feb. 22, 1988, 63-38919
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—719 **19 Claims**

1. An apparatus for assembling a wheel attaching unit for use in a vehicle assembly line, comprising:

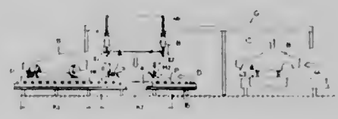
a pallet capable of mounting at predetermined positions thereof a front assembly including a front wheel attaching unit and a rear assembly including a rear wheel attaching unit;

a pallet conveyor means for conveying said pallet through a setting area and a securing area of said front and rear units and a body; and

a body conveyor means for conveying said body to a position above said setting area and for lowering said body to set said front and rear assemblies to the body;

wherein said pallet includes a holding portion for at least one of said front assembly and said rear assembly, with said holding portion being positionally adjustable in forward and rearward directions thereof,

said pallet further including securing member holding means



for holding a securing member for fixedly positioning said at least one of said front and said rear assembly relative to said body,

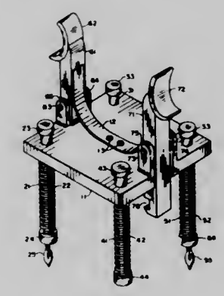
said securing member holding means for said front assembly or rear assembly supported by said holding portion positionally adjustable in the forward and rearward directions being movable into a position corresponding to the secured position of said assembly relative to said pallet.

4,894,910

PIN GRID ARRAY REMOVAL TOOL

William A. Reimer, Wheaton, and David L. Vonder, Addison, both of Ill., assignors to GTE Communication Systems, Inc., Phoenix, Ariz.

Filed Aug. 29, 1988, Ser. No. 237,462
Int. Cl.[4] H05K *13/04*
U.S. Cl. 29—764 **12 Claims**



1. Apparatus for the removal of elements which have been soldered to printed wiring cards, from said cards, said apparatus comprising:

a platform, including top and bottom sides;

a plurality of posts, each including first and second ends, passing through said platform;

each of said posts including at said first and second ends projections to prevent said post from being removed from said platform;

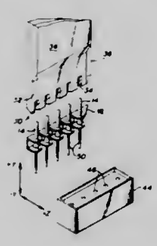
said posts each further including a helical spring surrounding said post and extending between said bottom side of said platform and said projection at said second end of said post;

a plurality of arms pivotally mounted to said platform;

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each of said arms including retention means for grasping said element;
and one or more of said posts further including means adjacent to said second end projection to secure said apparatus to a printed wiring card;
whereby in response to securing of said apparatus to a printed wiring card and said retention means grasping said element, said springs are compressed, and in response to placement of said apparatus, said element and printed wiring card, into a high temperature environment, said solder joining said element to said printed wiring card is caused to reflow and said springs expand to raise said platform to withdraw said element from said printed wiring card.

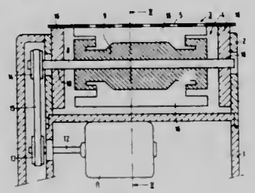
4,894,911
METHOD AND APPARATUS FOR LOADING ELECTRICAL CONTACTS INTO A CONNECTOR BODY
Gerald M. Jones, Titusville, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Feb. 9, 1989, Ser. No. 308,066
Int. Cl.[4] H01R *9/24*; B23P *19/00*
U.S. Cl. 29—842 **2 Claims**

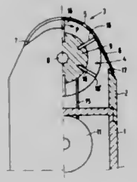


1. Apparatus for simultaneously loading a plurality of electrical contacts into a connector body comprising; a supply means for said electrical contacts; means for delivering a linear array of said contacts from said supply to a first work station; clamping means at said first work station for engaging said linear array of said contacts; transfer means for transferring said clamped linear array of contacts to a second work station located at a transverse distance from said first work station, said transfer means including first motor means for moving said clamping means in a Y direction and second motor means for moving said transfer means in a Z direction; means for providing a connector body at said second work station, said connector body containing a plurality of apertures to receive said contacts; and means for inserting said electrical contacts into said apertures.

2. In the method of making an electrical connector having a plurality of electrical contacts therein, the steps comprising: feeding a plurality of said electrical contacts, in a linear array, from a supply thereof to a first work station; engaging a clamp at said first work station to engage said plurality of contacts; moving said clamp in a +Y direction by actuating first means; transferring said clamped array of contacts to a second work station by actuating a second motor means to move said clamp in a +Z direction; providing a connector body at said second work station, said connector body having a plurality of contact receiving apertures therein; depositing said contacts into said apertures by moving said clamp in a −Y direction by again actuating said first motor means; releasing said clamp; and returning said clamp to said first work station.

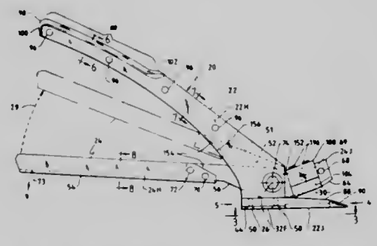
4,894,912
SHAVING APPARATUS
Eduard W. Tietjens, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Jan. 25, 1988, Ser. No. 147,849
Claims priority, application Netherlands, Jan. 27, 1987, 8700186
Int. Cl.[4] B26B *19/14, 19/10, 19/06*
U.S. Cl. 30—43.6 **8 Claims**





1. A shaving apparatus having a housing with a holder for a flexible cutting plate and a cutting member which can be driven so as to be rotatable with respect to the cutting plate comprising a shaft and rigid cutting elements with radial ends, the cutting elements comprising cutting sides at the radial ends, and wherein the cutting plate is stretched over individual supporting disks provided on each side of the cutting member, the shaft being journalled in the holder and in the individual supporting disks.

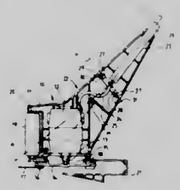
4,894,913
STRAP CUTTING TOOL
Eli M. Ladin, 1608 Morton, Ann Arbor, Mich. 48104
Filed Feb. 23, 1988, Ser. No. 159,196
Int. Cl.[4] B26B *11/00*; B25G *1/00*
U.S. Cl. 30—134 **36 Claims**



1. In a work performing tool that has a working jaw mechanism operated by a pair of pivotally connected handles that are squeezed to operate the working jaw mechanism, the improvement which comprises one of said handles comprising an elongate non-metallic handle member forming a major portion of said one handle and a pair of elongate metallic members laterally sandwiching said non-metallic handle member in covering relation to at least a portion of each side of said non-metallic handle member, said metallic members being organized and arranged relative to said non-metallic handle member to form a throat that is bounded laterally by said metallic members and is free of said non-metallic handle member, and the pivotal connection between the pair of handles comprises a pivot connection that passes through said throat free of said non-metallic handle member, means joining said metallic members to said non-metallic handle member, and means attaching said metallic members to a portion of the working jaw mechanism that is operated by the handles.

4,894,914
GRASS TRIMMING DEVICE
David E. Mead, Co.Durham, United Kingdom, assignor to Electrolux Northern Limited, Durham, United Kingdom
Filed Jan. 20, 1988, Ser. No. 209,272
Claims priority, application United Kingdom, Jun. 24, 1987, 8714817
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 **11 Claims**

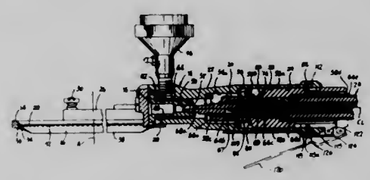




1. A grass trimming device comprising:
a cutting head including a grass cutting means rotatable in a cutting plane;
shaft means including a coupling section and an elongate shaft, the coupling section coupling together the cutting head and the shaft means, the elongate shaft having a first end defining or connected to the coupling section and a second end having an associated handle;
the cutting head including a surface defining a parting plane at which plane the said coupling section is coupled to the cutting head, said parting plane extending laterally with respect to the length of said shaft means, means permitting relative angular movement at the parting plane between the coupling section and the cutting head about a turning axis which is disposed substantially perpendicular to the parting plane and obliquely to the shaft so that relative movement between the coupling section and the cutting head about the parting plane positions the cutting plane in different operating orientations.

4,894,915
CABLE DRIVEN RING BLADE KNIFE
Richard B. Decker, and Richard P. Bozzi, both of Vermilion, Ohio, assignors to Bettcher Industries, Inc., Vermilion, Ohio
Continuation-in-part of Ser. No. 842,131, Mar. 20, 1986. This application Feb. 11, 1987, Ser. No. 9,061
Int. Cl.[4] B26B *25/00*
U.S. Cl. 30—276 **17 Claims**

1. A cable-driven rotary hand knife comprising a handpiece; a ring-like housing on the handpiece; a rotary ring blade with gear teeth; a rotary pinion supported in the handpiece and engaged with the gear teeth; and a drive transmission at least partially received within the handpiece, said transmission comprising a coupler having a rotary output element connected to the pinion, a rotary input element constructed to receive a rotary drive cable and means to selectively transmit rotation between the two elements, a movable member slidably received for relative motion within the handpiece, said member having means to receive and retain a cable and cable sheath, means cooperable with the handpiece for releasably retaining the member in the handpiece while allowing relative movement between first and second positions, means movable relative to the coupler to cause said elements to rotate together when said member is in said first position and to allow relative rotation between the two elements when said member is in said second position, and means biasing the member toward the second position; and means, including a retainer positioned to be gripped by an operator holding the handpiece, for retaining the member in the first position when said retainer is gripped and for allowing the member to move to the second position when released.



4,894,916
ADJUSTABLE STABILIZER WHEEL
Harold Nimz, and P. Jack Morales, both of 13926 SE. Powell, Portland, Oreg. 97236
Filed Apr. 14, 1988, Ser. No. 150,848
Int. Cl.[4] A01G *3/06*
U.S. Cl. 30—296 A **3 Claims**



1. An improved weed trimming device comprising:
an elongated shaft,
a nylon cutting head,
a handle,
a portable wheel stabilizer,
wherein said elongated shaft having one end and an opposite end, said handle is connected to said one end for holding and said nylon cutting head is fixed at the opposite end for weed trimming, and said portable wheel stabilizer is adjustably attached to said shaft proximate said nylon cutting head,
whereby the wheel stabilizer can be placed against a surface while a trimming operation is being performed, said portable wheel stabilizer comprising,
a bracket having a first end and a second end opposite to said first end in a longitudinal direction,
a cylindrical slot is formed at said first end such that an axial pin, consisting of a top portion and bottom portion, having its bottom portion snuggly inserted in said cylindrical slot,
said axial pin having said top portion fitted into a central opening of a wheel, a cotter pin securing said wheel to said axial pin, said second end of said bracket forming a half circle geometry to receive said shaft,

a clamping means cooperating with said bracket to hold said portable wheel stabilizer on said shaft.

4,894,917

CUTTING MEANS

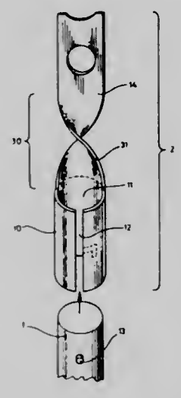
Peter J. Nicolson, Comberton, England, assignor to C4 carbides (International) Limited, Cambridge, England

Filed Apr. 11, 1989, Ser. No. 336,033

Claims priority, application United Kingdom, Apr. 12, 1988, 8808601

Int. Cl.[4] B26B *9/02*

U.S. Cl. 30—346 **10 Claims**



1. A saw blade for use in a jig saw mechanism in which a drive member is caused to reciprocate axially and to reciprocate a saw blade carried by one end only thereof on said drive member, which saw blade comprises:

a. an axially elongated generally rod-like blade member having a grit edge cutting surface thereto;

b. a blade mounting member comprising an axial socket into which one end of the blade member is secured; and

c. a securing member extending axially from the said mounting member and adapted to be secured to the reciprocating drive member of the jig saw mechanism.

4,894,918

BASIC PATTERN SKETCH DRAWING TECHNIQUE FOR SLEEVE TAILORING

Ding S. Huang, 5th Floor, No. 9-16, Lane 344, Nanking W. Rd., Taipei, Taiwan

Filed May 16, 1988, Ser. No. 194,318

Int. Cl.[4] A41H *3/00*

U.S. Cl. 33—17 R **6 Claims**



1. In a process of preparing a sketch to be used as a pattern for tailoring at least a portion of a garment to fit a human figure of predetermined dimensions, wherein

firstly the terminal ends of each shoulder are defined as shoulder points,

secondly the circumference around each arm beneath each respective armpit is defined as measure (2), while the shortest distance from the shoulder point to the respective armpit is defined as measure (2A),

thirdly the circumference around each arm 2.5 cm above a respective elbow is defined as measure (3), while the shortest distance from a shoulder point to the respective preceeding circumference is defined as measure (3A),

fourthly the circumference around a largest part of each arm beneath a respective elbow is defined as measure (4), while the shortest distance from a shoulder point to the respective preceeding circumference is defined as measure (4A);

fifthly the circumference around another largest part of each arm beneath a respective elbow and below said measure (4) is defined as measure (5), while the shortest distance from a shoulder point to the respective preceeding circumference is defined as means (5A),

sixthly the circumference around each respective wrist is defined as measure (6),

seventhly the distance from each shoulder point to a respective cuff of the garment is defined as measure (7), and

eightly the distance from each front armpit to each respective back armit is defined as measure (8),

the steps comprising

drawing a horizontal line,

setting a central point (1) on said horizontal line,

drawing a line in a downward direction from point (1),

marking a point (2) along said downwardly directed line spaced 6.3 cm from said point (1),

drawing a horizontal line through said point (2),

marking a point (3) along said downwardly directed line 11.5 cm below said point (1),

drawing a horizontal line through said point (3),

marking a point (4) on said preceeding horizontal line at 2.5 cm rightward from said point (2),

drawing a vertically upward directed line through said point (4) to intersect with the horizontal line passing through said point (1) so as mark an intersection point (5),

marking points (6) and (7), respectively, rightwardly and leftwardly from said point (4) on the horizontal line passing through said point (4), at respective distances equalling ¼ of the measure (2)+5 cm,

marking a point (8) along said horizontal line passing through said point (4) 2.5 cm leftwardly from said point (6), so as to yield an intersection point (9) with said horizontal line passing through said point (1),

marking a point (10) on said horizontal line passing through said point (2) 2 cm rightwardly from said point (7),

drawing an upwardly directed vertical line through said point (10) so as to yield an intersection point (11) with said line passing through said point (1),

drawing downwardly slanting lines passing through points (6) and (9), and points (7) and (11), respectively,

drawing horizontal lines (14) and (15) in parallel with said horizontal line passing through said point (1) at a distance of 7 cm+¼ of the measure (2) therefrom, so as to yield respective intersections points (14A) and (15A) with the lines passing through points (6) and (9), and (7) and (11), respectively,

drawing a first S-shaped curved line from said point (1) so as to pass beneath said point (9) at a vertical distance of 1.7 cm therefrom, and so as to be tangent to the line passing downwardly through said points (6) and (13) until the intersection with the last-named line with said horizontal line passing through said point (3), so as to yield an intersection point (13), and so as to pass above said point (14A) at a vertical distance of 1.2 cm therefrom, until it intersects with the horizontal line passing through said point (14) yieldin an intersection point (16),

drawing a second S-shaped curved line from said point (1) so as to pass beneath said point (11) at a vertical distance of B2 cm therefrom, and so as to be tangent to the line passing downwardly through said points (11) and (7) until the intersection with the last-named line with said horizontal line passing through said point (3), so as to yield an intersection point (12), and so as to pass above said point (15A) at a vertical distance of B1 cm therefrom, until it intersects with the horizontal line passing through said point (14) yielding an intersection point (17),

said S-shaped curves being tangent to the horizontal near said point (1),

marking a point (18) downwardly along the vertical line passing through said point (1) according to measure (2A),

marking points (19), (20), (21) and (22), along the line passing vertically downwardly from the point (1) according to measures (3A), (4A), (7A) and (7), respectively,

drawing horizontal lines through points (19), (20) and (21), respectively, the last-named line defining a cuff line,

marking a point (23) 2.5 cm leftwardly from the point (22) on said cuff line,

connecting points (23) and (18) to yield intersection points (19A), (20A), and (21A) with the horizontal lines passing through the points (19), (20) and (21), respectively,

marking points (24) and (25) at rightward and leftward spacings of ¼ the measure (2) from the point (18), respectively,

marking points (26) and (27) rightwardly and leftwardly from the point (19A), at a distance equal to ¼ the measure (3), respectively, along the horizontal line passing through the point (19A),

marking points (28) and (29) rightwardly and leftwardly from the point (21A), at a distance equal to ¼ the measure (5), respectively, along the horizontal line passing through the point (21A),

marking points (30) and (31) rightwardly and leftwardly from the point (23), at a distance equal to ¼ the measure (6), respectively, along the horizontal line passing through the point (23),

marking points (32) and (33) 4 cm rightwardly and leftwardly from the points (30) and (31), respectively, along the horizontal line passing through the point (23),

drawing an upward vertical line (34) to connect the points (33) and (17) so as to intersect at intersection points (34) and (35A) with the horizontal lines passing through the points (21) and (20), respectively, and setting points (29) and (35) at 1 cm rightwardly from said points (34) and (35A), respectively, along corresponding of said horizontal lines,

drawing a curved line so as smoothly connect the points (15), (25), (27), (35), (29), and (33),

drawing a downwardly directed line (36) to connect points (16) and (32), and extending the line (36) 0.5 cm downwardly from the point (32) so as to obtain a point (37), and

drawing a smoothly curved line connecting the points (33) and (37) so that a peak point of said smoothly curved line is situated 0.5 cm above the straight line connecting the points (32) and (33).

4,894,919

GARMENT PATTERN ADAPTATION SYSTEM

Beate I. E. Ziegert, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 16, 1988, Ser. No. 194,175

Int. Cl.[4] A41H *3/00*

U.S. Cl. 33—17 R **8 Claims**

1. A garment pattern adaptation system for adapting a woven fabric garment pattern for use with a stretch fabric, said system including:

selecting a particular stretch fabric;

ascertaining individual fabric stretch percentages for said selected fabric in two directions of stretch of said fabric;

utilizing said individual fabric stretch percentages to provide stretch fabric length and width reduction factors;

providing a modified garment pattern;

applying said stretch fabric length and width reduction factors to said modified pattern; and



forming a stretch fabric pattern useable with said particular stretch fabric to produce body contouring garments.

4,894,920

TREAD HEIGHT MEASURING DEVICE

Kim D. Butler, San Angelo; Wesley H. Gibbs, Bronte; Teddy J. Holt, and James L. Lee, both of San Angelo, all of Tex., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 31, 1988, Ser. No. 238,785

Int. Cl.[4] G01B *3/22, 3/28*

U.S. Cl. 33—203.11 **10 Claims**

1. A device for measuring the height of a tread element of a tire comprising:

two support members which are to be disposed to either side of the tread element to be measured;

a spacing means disposed between and attached to said support members for providing separation between said support members;

a measuring means carried by said spacing means for providing height information of said tread element; and

wherein said support members are releasably and movably attached to said spacing means.

4,894,921

RANGEFINDER BOW SIGHT

William J. Barlow, Rt. 1, Box 504, Norwood, N.Y. 13668

Filed Dec. 19, 1988, Ser. No. 286,155

Int. Cl.[4] F41G *1/32*

U.S. Cl. 33—265 **7 Claims**

1. A rangefinder archery sight to be mounted on a bow for sighting at an archery target from an elevated shooting position, comprising;

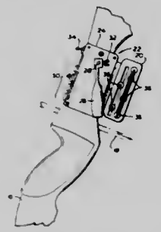
a bousing including means affixing the housing to the bow;

an electrical power source in said housing;

a plurality of lamps disposed so as to be visible to an archer when aiming the bow;

a plurality of sight pins vertically spaced from one another

each designating a respective shooting range and each sight pin corresponding to an associated one of said lamps; switch means in said housing operatively connecting said power source to each of said lamps to indicate respective angular inclinations of said bow; and



pendulum means swingably mounted on said housing for actuating said switch means to light said lamps in accordance with the inclination angle of said bow.

4,894,922

HAND BEARING COMPASS

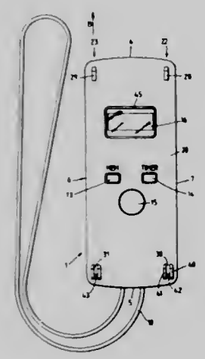
Richard Lovelock, Emsworth, England, assignor to Nautech Limited, Portsmouth, England

Filed Feb. 26, 1988, Ser. No. 160,843

Claims priority, application United Kingdom, Feb. 26, 1987, 8704560

Int. Cl.[4] G01C *17/12, 17/30*

U.S. Cl. 33—272 **14 Claims**



1. A hand bearing compass for measuring magnetic bearings in a substantially horizontal plane, the compass comprising:

(a) a compass body of generally thin and flat shape, the body having upper and lower major surfaces and a longitudinal median plane, said upper major surface being generally flat;

(b) a direction-finding sensor mounted in the compass body, the sensor having a direction-finding plane to be aligned substantially horizontally in use, and means mounting the sensor in the body with the direction-finding plane thereof held fixed substantially parallel to the flat upper body surface, whereby said surface provides an index for visual alignment with a remote reference to level the direction-finding plane laterally in use;

(c) a first longitudinal sight projecting from the flat upper surface of the compass body, said first longitudinal sight defining a first viewing axis for visual alignment with a bearing to be measured, said first viewing axis being spaced laterally from the longitudinal median plane on one side and parallel thereto;

(d) a second longitudinal sight projecting from the flat upper surface of the compass body, said second longitudinal sight defining a second viewing axis for visual alignment with a bearing to be measured, and said second viewing axis being spaced laterally from the longitudinal median plane on the other side from said first viewing axis, and parallel thereto;

(e) means for actuating said sensor, said means comprising a manually engageable actuator portion disposed on the compass body on the longitudinal median plane of the compass body between the first and second viewing axes, whereby the actuator portion and first and second longitudinal sights form a substantially symmetrical array about the longitudinal median plane such that the compass body can be held by its major surfaces between the finger and thumb of either hand with the manually engageable actuator portion engaged by that hand and with one of said viewing axes unobscured;

(f) a display and a memory recall actuator on the compass body; and

(g) electronic microprocessor circuitry in said compass body, said circuitry being connected to the actuator portion, the sensor, the display and the memory recall actuator, and comprising:

(i) means for causing said sensor to measure the value of the magnetic bearing along the viewing axis upon operation of the manually engageable actuator portion, and to display the value on the display;

(ii) memory means for storing a plurality of magnetic bearing values so measured, and

(iii) memory recall means for recalling plural stored bearing values to the display upon operation of the memory recall actuator.

4,894,923

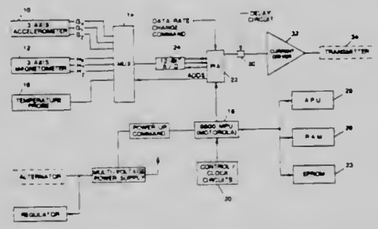
METHOD AND APPARATUS FOR MEASUREMENT OF AZIMUTH OF A BOREHOLE WHILE DRILLING

Martin E. Cobern, Cheshire; Richard D. DiPersio, Meriden, both of Conn., and Edmund M. Hamlin, Tehachapi, Calif., assignors to Alcan International Limited, Montreal, Canada

Filed May 27, 1987, Ser. No. 54,552

Int. Cl.[4] E21B *47/02*

U.S. Cl. 33—304 **12 Claims**



1. A method for determining the azimuth angle of a borehole being drilled by instruments contained downhole in the drillstring, including the steps of:

(1) sensing with accelerometer means while the drillstring is rotating the components Gx, Gy and Gz of the total gravity field Go at the location of the instrument;

(2) sensing with magnetometer means while the drillstring is rotating the components of Hx, Hy and Hz of the total magnetic field Ho at the location of the instrument;

(3) the components Gz and Hz being along the axis of the drillstring, the components Gx and Gy being orthogonal to Gz and the components Hx and Hz being orthogonal to Hz;

(4) determining from a predetermined set of measurements of Gx, Gy, Gz, Hx, Hy, Hz the invariant quantities

(a) HxGy−HyGx

(b) Gx^2+Gy^2

(c) HxGx+HyGy

(d) Gz

(e) Hz

(5) determining azimuth angle A from the relationship

$$A = \arctan \frac{HX\,Gy - Hy\,Gx\,(/Go/)}{Hz\,(Gx^2 + Gz^2) + Gz\,(Hx\,Gx + Hy\,Gy)}$$

where

$$/Go/ = \sqrt{Gx^2 = Gy^2 + Gz^2}$$

4,894,924

METHOD FOR MEASURING LEVEL OF LARGE STRUCTURE

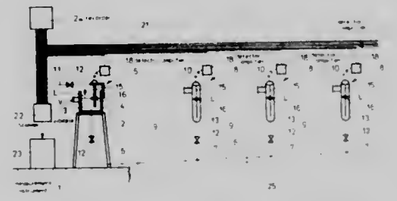
Takenori Nakanishi, Tokyo; Sumio Honma, Funabashi; Takao Nishizawa, and Takuo Mizutani, both of Tokyo, all of Japan, assignors to Ishikawajima Kensa Keisoku Kabushiki Kaisha, Japan

Continuation of Ser. No. 68,522, Jul. 1, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,688

Claims priority, application Japan, Nov. 7, 1986, 61-265361

Int. Cl.[4] G01C *5/04*

U.S. Cl. 33—367 **1 Claim**



1. A method of measuring vertical displacement of a large structure relative to a stationary reference point, comprising the steps of: placing at the stationary reference point a vessel having an upper portion open to atmosphere; disposing reference liquid-level sensor means in said vessel; said reference liquid-level sensor means comprising a liquid-level sensor body vertically secured in said vessel, a float around an outer periphery of the sensor body and vertically movable with the level of a liquid in said vessel, and a displacement indicator vertically movable in unison with said float; placing a plurality of liquid tubes respectively at a plurality of measuring points of said large structure and substantially at the same level as said vessel, each of said liquid tubes having an upper portion open to atmosphere and communicating with said vessel through liquid distribution line means; disposing displacement sensor means in each of said liquid tubes; said displacement sensor means comprising a liquid-level sensor body secured centrally in the respective liquid tube, a float around an outer periphery of the last-mentioned sensor body and vertically movable with the liquid level in the respective liquid tube, and a displacement indicator movable in unison with said last-mentioned float; effecting electrical detection of the liquid level by said reference liquid-level sensor means and said displacement sensor means; generating a measuring point liquid level initial output signal for each measuring point using the displacement sensor means at each measuring point, generating a reference liquid level initial output signal for said reference point using the reference liquid-level sensor means at the reference point; storing the initial output signal from said reference liquid-level sensor means and the initial output signals from said displacement sensor means in a storing means; and thereafter re-effecting electrical detection of the liquid level using said liquid-level sensor means and said displacement sensor means liquid tubes and generating further measuring point liquid level output signals for each measuring point, and detecting displacements at the measuring points by comparison of the further measuring point liquid level signals to the initial measuring point liquid level output signals stored in said storing means and correcting for any variation of the reference point liquid level by re-effecting electrical detection of the reference point liquid level using the reference point liquid-level sensor means, generating a further reference point liquid level output signal, comparing the further reference point liquid level output signal to the initial reference point liquid level output signal stored in the storing means, defining a correction factor which corresponds to the difference between the further reference point liquid level output signal and the initial reference point liquid level output signal, and applying the correction factor to the further measuring point liquid level output signals.

4,894,925

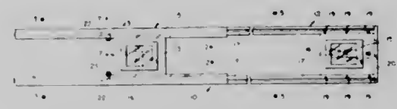
EXTENDABLE LEVEL

Jonathan C. Langmaid, Yalmouth, Me., assignor to Jonathan C. Langmaid, Inc., Yarmouth, Me.

Filed Jul. 14, 1988, Ser. No. 218,886

Int. Cl.[4] G01C *9/28*

U.S. Cl. 33—374 **18 Claims**



1. An extendable level comprising a main body and a slidable extension, said main body including a longitudinal edge, said main body's longitudinal edge including a level plane, said main body including a webbing, said slidable extension including a slide strip, said slide strip including a longitudinal edge, said slide strip's longitudinal edge including a level plane, said slidable extension including a webbing, a track, said track in said main body's longitudinal edge, said slide strip and track adapted to interslide, said main body and slide strip having a contiguous level plane along said respective longitudinal edges, said extendable level including a plurality of bubble vials, and said track in said main body's longitudinal edge including a slot adapted to receive said slidable extension's webbing extending from said slide strip.

4,894,926

DIPSTICK GUIDE

Robert N. Sahr, Marietta, Ga.

Filed Mar. 1, 1989, Ser. No. 317,814

Int. Cl.[4] G01F *23/04*

U.S. Cl. 33—726 **11 Claims**

1. An apparatus for guiding a dipstick into an outer end of a dipstick tube comprising: an upper body having converging side portion defining an open mouth at one end and, a smaller opening at its other end, said smaller opening being sufficiently large that a stem of said dipstick can pass therethrough, a hollow tube connected by one end to said other end of said upper body, and there being provided a slot extending through a side portion of said body and said tube from said mouth of said upper body to an outer end portion of said hollow tube,

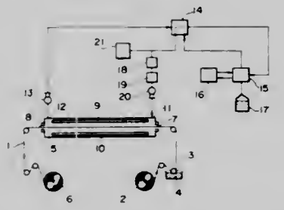
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said slot being sufficiently wide that the stem of said dipstick will pass through said slot, the outer end portion of said hollow



tube being adapted to be received on the outer end of said dipstick tube.

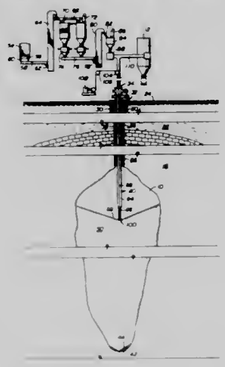
4,894,927
PROCESS FOR DRYING COATED WEB
Masaharu Ogawa, and Takao Ogawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan
Filed Dec. 21, 1987, Ser. No. 136,122
Claims priority, application Japan, Dec. 23, 1986, 61-305266
Int. Cl.[4] F26B *3/32*
U.S. Cl. 34—32 **5 Claims**



1. A process for drying a moving web coated with a coating composition containing an inflammable organic solvent which comprises, drying said coated web by passing through a closed-type oven filled with an inert gas and provided with planar heaters on the upper side and lower side of the path of the moving web so as to heat the web and evaporate organic solvent thereby forming an exhaust gas comprised of said inert gas and said evaporated organic solvent, removing the exhaust gas from the closed-type oven, and separating said organic solvent from the exhaust gas of said oven by condensation.

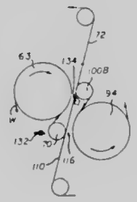
4,894,928
SUBTERRANEAN GRAIN STORAGE
William M. Bishop, Katy, Tex., assignor to PB-KBB, Inc., Houston, Tex.
Filed Mar. 31, 1988, Ser. No. 176,051
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—60 **29 Claims**

1. A structure for the storage of grain, comprising:
an enclosed subterranean cavern which has earthen walls that are substantially gas impermeable;
a controlled atmosphere with substantially no oxygen within said enclosed cavern;
a controlled access into said enclosed cavern;



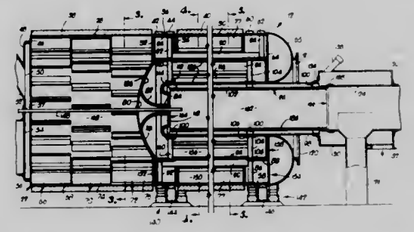
means for loading said cavern with the grain; and
means for unloading the grain from said cavern.

4,894,929
APPARATUS FOR DRYING A WEB
Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Continuation-in-part of Ser. No. 14,569, Feb. 13, 1987. This application Feb. 11, 1988, Ser. No. 167,672
Int. Cl.[4] F26B *13/04*
U.S. Cl. 34—117 **9 Claims**



1. A single tier drying section for drying a web comprising in combination:
a dryer;
a felt guided about said dryer such that the web is disposed between said dryer and said felt for drying a first side of the web;
a further dryer disposed downstream relative to said dryer;
a further felt guided about said further dryer such that the web is disposed between said further dryer and said further felt for drying a second side of the web;
dryer transfer means for transferring the web from said dryer to said further dryer;
said dryer transfer means transferring the web without open draw from said dryer to said further dryer;
said dryer transfer means further including: a joint run of said felt and said further felt such that the web is disposed between said felt and said further felt during passage through said joint run; and
vacuum means disposed downstream relative to said joint run for positively maintaining the web in close conformity with said further felt when said felt and further felt diverge relative to each other downstream relative to said joint run.

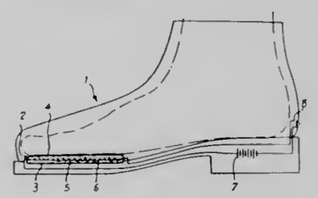
4,894,930
ROTARY DRUM DRYER WITH NONCONDUCTING NONSTICK SURFACE
Donald E. Shinn, Independence, Kans., assignor to Productization, Inc., Independence, Kans.
Continuation-in-part of Ser. No. 125,864, Nov. 27, 1987, Pat. No. 4,802,288, which is a division of Ser. No. 33,344, Apr. 1, 1987, Pat. No. 4,729,176. This application Nov. 4, 1988, Ser. No. 267,292
Int. Cl.[4] F26B *11/02*
U.S. Cl. 34—136 **8 Claims**



1. A device for treating a particulate product with an additive for producing a treated product, said device comprising:
a rotatable body having walls defining:
a continuous, product flow path through said body,
a product inlet for directing product to be treated into said flow path,
a product outlet for recovering treated product from said flow path,
an additive entry between said inlet and outlet for introducing an additive into said flow path, and
a treatment zone in said flow path between said additive entry and said product outlet;
a coating of electrically non-conducting material on at least those of said walls defining said treatment zone;
means for creating air currents within said body and along said flow path for conveying said product in a co-current fashion from said inlet to said outlet, and for creating a static electric potential difference between said product within said treatment zone and said zone-defining walls; and
means for introducing said additive into said flow path through said additive entry and into said treatment zone with said additive and product having a static electric potential difference therebetween for mutual attraction and adherence in order to produce said treated product.

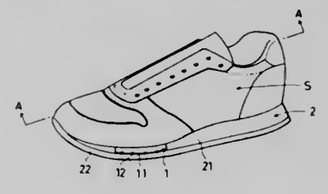
4,894,931
HEATING DEVICE
Olivier Senee, Annecy, and Philippe Billet, Annecy-Le-Vieux, both of France, assignors to Salomon S. A., Annecy Cedex, France
Continuation of Ser. No. 86,986, Aug. 19, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 298,232
Claims priority, application France, Aug. 19, 1986, 86 11847
Int. Cl.[4] A43B *7/02, 5/04*
U.S. Cl. 36—2.6 **6 Claims**

1. A heating device incorporated in an article of wear, notably a ski boot, comprising an electrical heating resistance connected, by a switch, to a current source, said heating resistance being located adjacent a foot to be heated, said device comprising a sealed enclosure (2) in contact with said foot, containing a salt (5) which changes phase between liquid and solid and has a latent fusion heat of a temperature close to the normal temperature of said foot in the range of 30° to 40° C., said heating resistance (6) being in a heat exchange relation with said salt and constituting means for liquefying said salt by heat exchange for a short period of time, termination of said heat exchange causing said salt to return to a solid state, releasing



heat progressively over a prolonged period of time, while maintaining a substantially constant comfortable temperature.

4,894,932
AIR-PERMEABLE SHOE
Masasuke Harada, Kurume; Yutaka Kumagawa, Chikugo, and Yoshiharu Morosaga, Kitashigeyasu, all of Japan, assignors to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Feb. 4, 1988, Ser. No. 152,374
Claims priority, application Japan, Feb. 4, 1987, 57-15678
Int. Cl.[4] A43B *7/06, 13/12*
U.S. Cl. 36—3 R **14 Claims**

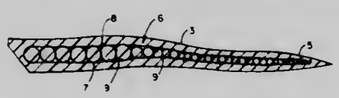


1. An air-permeable shoe comprising:
a sole constructed of an open-cell rubber foam; and
a base cloth attached to said sole or inset therein;
said sole and said base cloth of the shoe being exposed on a side surface of the sole of the shoe wherein a top side surface of said sole is in communication with the inside of the shoe and the ambient atmosphere for enabling air and humidity within said shoe to be discharged through the open-cell rubber foam and the side surface of the sole by a capillary action.

4,894,933
CUSHIONING AND IMPACT ABSORPTIVE MEANS FOR FOOTWEAR
Raymond F. Toukel, Maryland Heights, Mo., and Alexander L. Gross, Boston, Mass., assignors to Kangaroos U.S.A., Inc., St. Louis, Mo.
Continuation of Ser. No. 948,221, Dec. 30, 1986, which is a division of Ser. No. 705,659, Feb. 26, 1985, Pat. No. 4,656,760. This application Jul. 8, 1988, Ser. No. 216,498
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] A43B *13/18*
U.S. Cl. 36—28 **6 Claims**

1. A cushioning and impact absorption means for application within the midsole of footwear, said footwear being of the type wherein a sole is affixed to a shoe upper, said sole formed at least partially of polymer like material, said upper secured to said shoe sole, a cellular insert applied within the polymer like material forming at least a part of said sole, said footwear sole being formed having an outsole portion and a midsole portion,

said midsole portion located within said outsole portion, and said cellular insert incorporated within said midsole portion during footwear construction, said cellular insert having cavities generally formed therethrough and being substantially horizontally arranged and aligned within the midsole portion during shoe usage, said cellular insert comprising a layer of woven polymer material, and having a series of cellular like woven coils arranged adjacent each other and being aligned horizontally within said midsole portion, said cellular insert



also being formed of polymer material and having a hardness greater than the polymer like material forming at least a part of said sole and midsole portion, said midsole portion formed having the cellular insert fabricated therein with the combination of the midsole portion and the cellular insert emplaced within the outsole portion during its fabrication and being concealed between the outsole portion and the shoe upper upon fabrication of the footwear, whereby the cellular insert formed within the midsole portion effecting absorption of the forces of impact encountered by the footwear during usage.

4,894,934

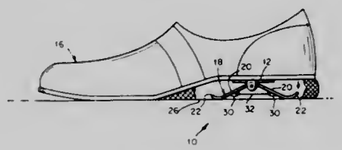
REBOUND HEEL DEVICE

Vito J. Illustrato, 928 Peace St., Pelham Manor, N.Y. 10803

Filed Jan. 23, 1989, Ser. No. 300,309

Int. Cl.[4] A43B *21/26, 21/32*

U.S. Cl. 36—037 **4 Claims**



1. A rebound heel device for a shoe which comprises:

a. a base plate, for securement to a heel portion of said shoe;

b. a pivotal leaf hinge secured to said base plate, for engagement with an anti-friction material

c. a bottom heel member having said anti-frictional material secured thereto;

d. an endless rubber belt secured to said pivotal leaf hinge, for providing tension means for a pair of leaves of said leaf hinge that causes a rebound of said heel portion of said shoe; and

e. a canvas member secured to said shoe, providing protective covering and ventilation means for said rebound heel device.

4,894,935

STEAM BOARD WITH ADJUSTABLE GARMENT SUPPORT

David C. Kretz, 3533 Heather Ridge Dr. NE, Cedar Rapids, Iowa 52402

Filed Apr. 3, 1989, Ser. No. 332,045

Int. Cl.[4] D06C *3/00*

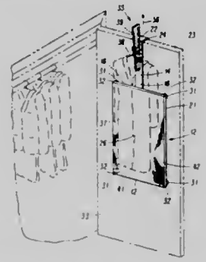
U.S. Cl. 38—137 **7 Claims**

1. A steam board with adjustable garment support comprising:

a rigid board having front and back surfaces;

a mounting bracket having an elongate body portion and upper and lower ends located t opposite ends of the body portion, the body portion having first and second major surfaces, the lower end of such body portion attached to the back surface of the board adjacent an edge of the board with the first major surface of the body portion facing the back surface of the board, said body portion extending from said attachment beyond and away from said edge of the board, the mounting bracket including means for mounting the steam board to a further surface;

a garment hanger bracket having top and bottom ends and front and rear surfaces, said front and rear surfaces extending substantially the length of the garment hanger bracket, a plurality of spaced recesses formed along and into the front surface of the garment hanger bracket, such recesses adapted to receive and retain the hook of a garment hanger, and a plurality of key members formed along the length of and defining the shape of said ear surface of the garment hanger bracket, each of said key members being attached to and part of said garment hanger bracket at an end toward the top end of the garment hanger bracket and



extending such end toward the top end substantially in parallel to the rear surface toward the bottom end of the garment hanger bracket; and

means for receiving at least one selected one of the key members of the garment hanger bracket in retaining engagement, said receiving means located on the first major surface of the body portion of said mounting bracket adjacent said upper end of said body portion of said mounting bracket, whereby the position of said at least one key member determines the distance at which the garment hanger bracket will be located with respect to the board when said at least one key member is in such retaining engagement and steam applied to portions of a garment hanging in front of the rigid board is blocked from contacting said further surface by the rigid board being located between said further surface and the garment portions when the steam board is mounted to said further surface and the garment is suspended from said garment hanger bracket of the steam board.

4,894,936

SYSTEM FOR THE SIMULATION OF HUMAN MOVEMENTS IN A PUPPET SHOW, PROCEDURE FOR PROGRAMMING SUCH A SYSTEM AND A PUPPET SHOW SO OBTAINED

Marianus J. L. Van Heumen; Hendricus Smulders, both of Kaatsheuvel, and Antoni N. J. Merkx, Drunen, all of Netherlands, assignors to De Efteling B.V., Kaatsheuvel, Netherlands

Continuation of Ser. No. 946,418, Dec. 23, 1986, abandoned.

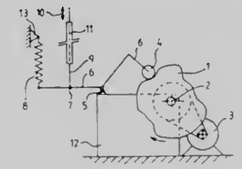
This application Aug. 23, 1988, Ser. No. 236,301

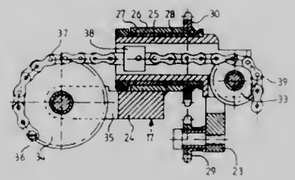
Claims priority, application Netherlands, Dec. 24, 1985, 8503561

Int. Cl.[4] G09F *19/08*

U.S. Cl. 40—414 **4 Claims**

1. A system for simulating human movements of a puppet having mutually hingeable limb members and which is used in a programmable puppet show comprising: a solid frame member which rotatably supports a drive shaft; a plurality of cam disks adapted to be synchronously driven by a driving motor, said cam disks being operatively associated with said drive shaft; a plurality of rolls, each of which communicates with one of said cam disks; a lever having a first end associated with one of said rolls; a spring associated with a second end of said lever, said spring being externally disposed with respect to said puppet; a Bowden cable having a first and a second end, said first end of said Bowden cable being associated with said lever; and at least one sprocket wheel, positioned inside of the puppet and associated with said limb member, said at least one





sprocket wheel having a chain passed thereover, one end of said chain being associated, within the puppet, with said second end of said Bowden cable, whereby when said drive shaft is rotated by said driving motor, said roll causes said lever to bidirectionally move causing said Bowden cable to transmit the bidirectional movement of said lever, via said chain and said first sprocket wheel, to said limb member to permit said limb member to move in a predetermined manner which simulates the human movement, and whereby said spring enables said roll to remain in communication with said cam disks as said cam disk is being rotated by said drive shaft.

4,894,937

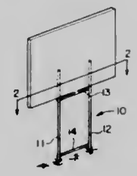
SIGN STAKE

R. P. Stephen Davis, 434 Mammoth Oaks Dr., Charlotte, N.C. 28226

Filed May 5, 1988, Ser. No. 190,670

Int. Cl.[4] G09F *15/00*

U.S. Cl. 40—606 **3 Claims**



1. A stake for holding a sign upright above a ground surface and comprising:

(a) at least two parallel and spaced-apart elongate wire-like legs having opposed free ends, one free end of which legs for being driven into the ground and the other free end of which legs for supporting a sign above the ground, said sign being of the type having a pair of sign faces separated by a corrugated spacer defining open areas extending vertically as the sign is oriented to the ground for receiving therein said other free ends of said legs;

(b) at least two longitudinally spaced-apart cross-members secured to and connecting said legs together;

(c) at least one of said cross-members comprising a step for being used to drive the two legs into the ground for supporting a sign on the other end thereof, and the other of said cross-members for supporting the sign at a predetermined distance above the cross-member which comprises the step.

4,894,938

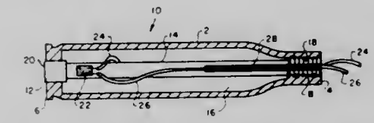
FIRING PIN FORCE TRANSDUCER

William R. Davis, Harford County, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 30, 1989, Ser. No. 361,459

Int. Cl.[4] F41C *31/04*

U.S. Cl. 42—1.01 **4 Claims**



1. An apparatus for measuring the impact force and energy of a firing pin of a firearm, said apparatus comprising:

a substantially cylindrical cartridge facsimile insertable into the firing chamber of a firearm, said cartridge facsimile having a first and second end and an interior void;

said first end having in the center a smooth aperture and said second end having in the center a threaded aperture;

a rod disposed in said cartridge facsimile for transducing the mechanical effect of a firing pin impact to an electrical effect, said rod having a first and second end, said rod first end having a simulated primer and said rod second end having threads, said rod being anchored by said rod second end threads to said threaded aperture of said second end of said cartridge facsimile, said rod having a strain gage bonded near said first end of said rod;

said rod being made from steel;

means electrically coupled with said transducing mens for detecting the electrical effect of an impact of a firing pin in a firearm whereby the force and energy of a firing pin may be determined.

4,894,939

SAFETY FOR FIRE ARMS

Wayne R. Perry, 41333 Loudon Dr., Parker, Colo. 80134

Filed Oct. 31, 1988, Ser. No. 264,456

Int. Cl.[4] F41C *17/08*

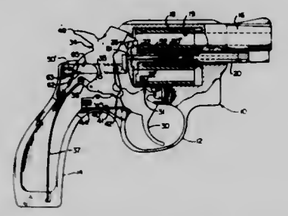
U.S. Cl. 42—66 **6 Claims**

1. In a revolver wherein a frame includes a hammer pivotal at one end of said frame, a barrel, a trigger to actuate said hammer, a cylinder mounted in a recess in said frame such that actuation of said hammer will cause said hammer to strike one end of a cartridge in a chamber of said cylinder, said cylinder mounted for rotation about a center pin, said center pin normally urged in an axial direction into an opening in said frame, and a bolt having a projection at one end aligned with said opening for engagement with said center pin, said bolt having an abutment at one end slidable into and out of the path of pivotal movement of said hammer, the improvement comprising:

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a first spring member associated with said center pin for urging said center pin rearwardly into the opening in said frame;

a second spring member associated with said abutment for urging said abutment into a position in the path of said hammer, said first and second spring members acting in opposition to one another, the spring force of said second spring member being sufficient to overcome the urging of



said first spring member to normally position said abutment in the path of movement of said hammer; and

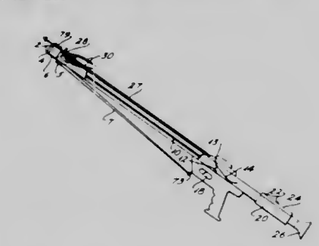
manually engageable slide means movable with said bolt and movable through a slot in said frame in a first direction causing said projection to engage said center pin to release said center pin from said frame and further movcable in a second direction causing said abutment to slide out of the path of pivotal movement of said hammer.

4,894,940

LIGHT PROJECTING SPEARGUN

Patrick Frain, and Denise Frain, both of 628 SE. 5th St., Delray Beach, Fla. 33483

Filed Mar. 1, 1989, Ser. No. 317,556
Int. Cl.[4] F41B *5/08*; F41G *1/34*
U.S. Cl. 42—103 **6 Claims**



1. A light projecting speargun comprising:

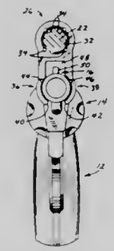
an elongated tubular barrel having a forward end, a rear end, an upper spear support means, a hollow hand grip attached intermediate the rear end of said barrel, a pivotally attached trigger means located inside said hand grip, a pivotally attached sear means engaging said trigger means, a spear means for slidably engaging said spear support means, said spear means having one of its ends for releaseably engaging said sear means and further having at one said end, means for releaseably attaching sear propelling means; a safety means for automatically locking said trigger and sear means and to release said sear means when said trigger and safety means are simultaneously activated, said sear propelling means being elastic means attached to and stretched from the forward end of said barrel and attached to said spear means at one end, a light projecting means attached inside the forward end of said barrel, said light projecting means sealed in a watertight case, a power source means, an elongated wire means connecting said light projecting means to said power source,an elongated holder means protecting said wire means from breakage and environmental exposure, a switch means to activate said light projecting means on and off.

4,894,941

DEVICE FOR RELEASABLY SECURING A FLASHLIGHT OR THE LIKE TO A FIREARM

Harold E. Karow, Jr., 1115 E. Manitoba St., Milwaukee, Wis. 53207

Filed Nov. 18, 1988, Ser. No. 273,205
Int. Cl.[4] F41G *1/34*
U.S. Cl. 42—103 **10 Claims**



9. A mounting device for detachably securing a flashlight or the like to a firearm having a barrel, comprising:

a first portion adapted for detachably mounting to said firearm barrel by application of a push-on force in a direction substantially transverse to the axis of said firearm barrel, said first portion being defined by a pair of spaced sidewalls having inner surfaces shaped correspondingly to the outer surface of said firearm barrel, said spaced sidewalls being adapted to flex outwardly during mounting of said firs portion to said firearm barrel and to thereafter return at least partially to their original position for clamping said firearm barrel therebetween and retaining said mounting device thereon, said first portion being constructed of a resilient plastic material so as to allow said outward flexing of said spaced sidewalls;

resilient means projecting inwardly from said sidewalls for engaging said barrel and securing said mounting device thereto; and

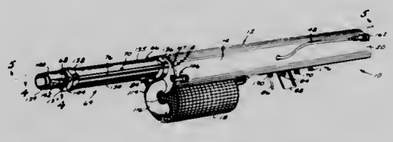
a second portion including a longitudinally extending passage adapted to receive said flashlight or the like.

4,894,942

UNDERWATER SPECIMEN COLLECTING DEVICE

Charles Winkler, 722 Ellery Dr., San Pedro, Calif. 90732

Filed Jul. 25, 1988, Ser. No. 223,616
Int. Cl.[4] A01K *73/00*
U.S. Cl. 43—4 **20 Claims**



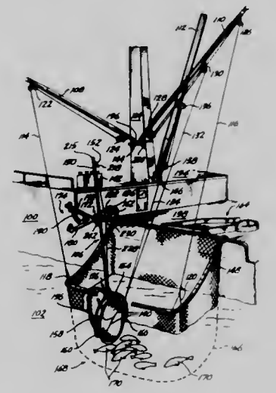
1. In a device for collecting live biological specimens under water in a receiving chamber and which employs a pneumatically operated plunger for creating a suction at an intake to said receiving chamber, the improvement comprising a nozzle having a movable end remote from said intake and a pneumatic nozzle activator operated in tandem with said plunger to extend said movable nozzle end away from said intake when said plunger creates a suction at said intake.

4,894,943

METHOD AND APPARATUS FOR GATHERING FISH FROM THE BUNT OF A NET

Robert F. Allen, Rancho Santa Fe, and Douglas H. Dirks, La Mesa, both of Calif., assignors to Marco Seattle, Inc., Seattle, Wash.

Filed Jan. 5, 1989, Ser. No. 293,811
Int. Cl.[4] A01K *79/00*
U.S. Cl. 43—6.5 **18 Claims**



1. An apparatus for removing fish from a bunt of a net located alongside a fishing vessel comprising:

a brailer handle;

a brailer hoop and brail net attached to said hoop;

means for hingedly connecting said hoop to said handle;

bracket means for receiving and holding said brailer handle, said brailer handle being mounted for reciprocating movement along its longitudinal axis in said bracket means; and

mounting means for mounting said bracket means to said vessel adjacent said bunt for allowing said brailer handle to swing about horizontal and vertical axes relative to said vessel.

4,894,944

SNAP RING CONNECTOR

Eustilio Jimenez, 926 Aqua Tiba, Chula Vista, Calif. 92011

Filed Sep. 21, 1988, Ser. No. 247,406
Int. Cl.[4] A01K *75/00*; A44B *21/00*
U.S. Cl. 43—7 **9 Claims**

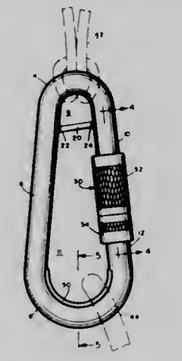
1. A snap ring connector for releasably connecting a pair of lines, comprising:

a curved member in a substantially closed configuration in defining an ovate shaped confinement area, said curved member being formed from a material having a first hardness;

a cross piece connected to said curved member within said ovate shaped confinement area;

a snap release mechanism, movable in said member to a first position opening said configuration, and to a second position closing said configuration;

a line-engaging surface on said curved member, said line-engaging surface facing said confinement area; and



a material deposit on said line-engaging surface, said material deposit, having a second hardness relatively greater than said first hardness.

4,894,945

FISHING LURE

Ronald J. Perrine, 8780 Fort Amanda Rd., Spencerville, Ohio 45887

Filed Sep. 15, 1988, Ser. No. 244,445
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—42.5 **11 Claims**



11. A fishing lure for connection to a fishing line, comprising:

a spoon-shaped body member having rounded leading and trailing edges and a longitudinal axis extending from said leading edge to said trailing edge, said member being constructed by a metal material;

said spoon-shaped body member having extra structural support extending along said longitudinal axis from said trailing edge to a first point disposed between said trailing edge and said leading edge,

wherein said extra structural support further comprises a hook having a lower end extending through a hole in said spoon-shaped body member at said trailing edge and an upper end attached to said spoon-shaped body member at a second point between a weed guard screw and said trailing edge, said hook being aligned along said axis.

wherein said spoon-shaped body member has a definite dividing region along said axis formed by two symmetrical concave portions meeting about said axis said concave portions extending longitudinally along the entire length of said spoon-shaped body member, said two concave portions being formed so that a tangent to either of said two concave portions does not intersect the other of said two concave portions, and

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wherein said extra structural support facilitates bending of said lure along a line transverse to said longitudinal axis on a side of said weed guard screw near said leading on said spoon-shaped body member.

4,894,946

OTTER BOARD

Tsutomu Fukushima, Shimonoseki, Japan, assignor to Nichimo Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 239,543
Claims priority, application Japan, Feb. 8, 1988, 63-15337
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—43.13 **24 Claims**



1. An otter board comprising a front board member and rear board member, wherein the rear board member is connected to the front board member through variable connecting mechanism which permits free adjustment of the relative positions of both the front and rear board members so that they may be brought into and fixed in positions to exhibit a proper net spreading force.

4,894,947

INSECT FEEDING STATION

Eugene H. Brandli, Towaco, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 681,079, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 406,671, Aug. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 251;684, Apr. 6, 1981, abandoned. This application Apr. 4, 1988, Ser. No. 180,718
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 **2 Claims**



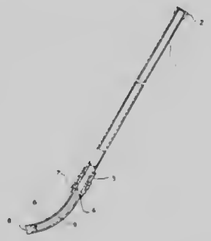
1. An insect feeding station for administering poison to insects comprising a base portion and a cover, said base portion having a floor with a concentric feeding area at the center thereof, poison located in said feeding area, and a plurality of walls arcuate in the horizontal plane extending from the periphery of the floor only to the periphery of the feeding area, and extending perpendicularly from the floor to the cover, said walls forming a plurality of openings at the periphery of said floor and at the periphery of said feeding area, and said walls further forming guide means to guide insect from said peripheral floor openings to said feeding area, said guide means also serving to guide insects away from said feeding area to said peripheral floor openings, and said cover extending to the outer ends of said walls.

4,894,948

HAND HELD APPARATUS FOR SELECTIVE APPLICATION OF LIQUID HERBICIDE

Tommy A. Eubanks, Glenmora, La., assignor to Sefco, Inc., Lafayette, La.

Filed Nov. 28, 1988, Ser. No. 276,949
Int. Cl.[4] A01M *21/00*
U.S. Cl. 47—1.5 **8 Claims**



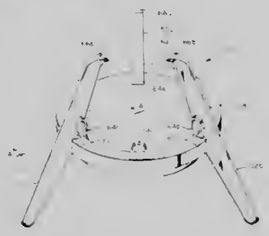
1. A hand-held apparatus for wipingly applying liquid herbicide to unwanted vegetation comprising:
(a) an elongated tubular handle-reservoir for containing a quantity liquid herbicide and conducting same to a wiper head, said handle comprising a desired length of tubing impervious to liquid herbicide, a cap or plug sealingly affixed to the upper end of said tubing and threadable means at the lower end of said tubing, for screwingly attaching a wiper head to said handle-reservoir; and,
(b) a tubular wiper head containing a quantity of liquid herbicide and for conducting same to the outer surface of the wiper, said wiper head comprising porous rubber irrigation piping of a porosity which leaks water from 0.01 g.p.m. per linear foot to 0.03 g.p.m. per linear foot at a pressure of 10 psi, a cap or plug sealingly attached to the lower end of said irrigation piping, threadable means attached to the upper end of said irrigation piping which mates with the threadable means on the lower end of the handle-reservoir, and, bendably shapable stiffener internally disposed in said irrigation piping.

4,894,949

CHRISTMAS TREE HOLDER

William E. Anderson, 4210 174th SE., Bothell, Wash. 98012

Continuation-in-part of Ser. No. 470,389, Feb. 28, 1983, Pat. No. 4,796,382. This application Jul. 11, 1988, Ser. No. 216,958
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[4] A47G *33/12*
U.S. Cl. 47—40.5 **5 Claims**



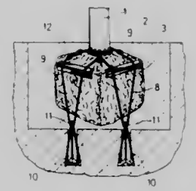
1. A tree holder comprising
a. a container having a bottom and a rim, said rim having an outer lip, said outer lip having a portion extending outwardly and a portion extending downwardly, said outer lip having at least three sets of slots therein;
b. at least three legs, each leg having a top portion for contacting and supporting a tree, each leg having a bottom portion contacting the ground, each leg having pin means adapted to be received by one of said at least three sets of slots in said outer lip so as to allow rotation of said legs about a longitudinal axis runing through said pin means whereby the weight of a tree placed within the top portions of said legs into said container and contacting the bottom of said container, depresses said container to the ground and causes the top portions of said legs to contact and support the tree, and each leg having a recessed portion;
c. spring means having a top and bottom, the top of said spring means contacting the recessed portion of said legs and the bottom of said spring means contacting said outer lip for maintaining said container in a position above ground level prior to insertion of a tree therein.

4,894,950

TREE SUPPORT-CONSTRUCTION METHOD

Kida Yukio, Osaka, and Haruto Kobayashi, Tokyo, both of Japan, assignors to Toho Perlite Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 230,889
Claims priority, application Japan, Oct. 1, 1986, 61-235387
Int. Cl.[4] A01G *17/04*
U.S. Cl. 47—42 **8 Claims**



1. A method for positioning and supporting a tree having a tree stem and a rootball comprising the following steps:
forming a hole in a ground surface;
positioning anchors within said hole;
positioning block fragments around said tree stem;
wrapping a securing member around said block fragments and said tree stem for securing said block fragments to said tree stem;
positioning said rootball within said hole;
mounting a tension member to said securing member and said anchors;
securing a tightening member to said tension member for adjusting the tension of said tension member for retaining said tree within said hole; and
burying said rootball positioned within said hole.

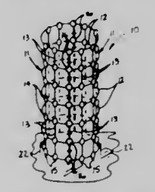
4,894,951

PLANT CAGE APPARATUS

Charles P. Risley, 34 Hanford Ave., Apt. 2, Bridgeport, Conn. 06605

Filed Nov. 21, 1988, Ser. No. 274,367
Int. Cl.[4] A01G *9/12*
U.S. Cl. 47—45 **1 Claim**

1. A plant cage apparatus comprising,
at least two semi-circular plant cage organization including a plurality of parallel spaced horizontal members, and
a plurality of parallel spaced vertical members wherein each of said vertical members is formed with a first and second vertical end, and
each of said horizontal members is formed with a first and second end, and
each of said ends of said horizontal and vertical member is adjustably secured within a connector member at a juncture of said horizontal and vertical ends wherein said connector members is adjustably secured each said ends therewithin, and
said plant cage organization is defined by a first and second vertical perimeter wherein a series of terminal horizontal members extend coextensively along said first vertical perimeter and extend coextensively with an adjacent horizontal member, and
said second vertical perimeter is defined by a series of terminal connector members aligned with and adjacent a horizontal member, and
wherein the terminal connector members of a first plant cage organization accept the terminal horizontal members of a second plant cage organization to define a generally cylindrical plant cage apparatus, and



wherein said terminal horizontal members each include a tapered end for enhancing securement interiorly of an associated terminal connector member, and
wherein each of said connector members includes a plurality of through-extending orthogonally intersecting channels, and
wherein each of said channels includes an axially parallel slit formed on each channel wall, and said slit is of a length less than the length of said channel, and
wherein each end of each horizontal and vertical member is formed with an integrally and upwardly projecting node slidingly positionable within said slit to maintain the respective horizontal and vertical member operatably associated with a respective connector member, and
further including a plurality of "U" shaped ground connector means for securement of the plant cage apparatus relative to an associated plant wherein each connector means is of a generally "U" shaped configuration including a plurality of legs wherein a first leg is a greater length than a second leg, and the second leg overlies a horizontal member.

4,894,952

PROXIMITY DETECTOR

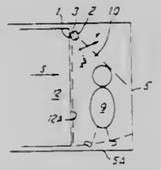
John Trett, Marlow, and Peter F. Bradbeer, Slough, both of United Kingdom, assignors to Formula Systems Limited, Eynsham, United Kingdom

PCT No. PCT/GB86/00683, § 371 Date Aug. 12, 1987, § 102(e) Date Aug. 12, 1987, PCT Pub. No. WO87/03100, PCT Pub. Date May 21, 1987
PCT Filed Nov. 6, 1986, Ser. No. 88,109
Claims priority, application United Kingdom, Nov. 6, 1985, 8527277
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—25 **10 Claims**

1. A movable door having a first leading planar surface,
a structure having a second planar surface extending parallel to the first planar surface to define with the first surface a variable gap, said structure supporting the door for movement in a sense to vary the gap,
the movable door incorporating a proximity detection system for sensing obstructions in the gap,

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the system comprising,
a transmitter mounted adjacent the first surface of the door to transmit energy across the gap in directions to impinge upon the second surface at an acute angle,
a receiver mounted to receive the energy transmitted from



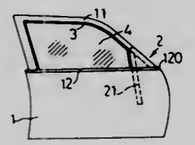
the transmitter when reflected by obstructions in the path of the door, but not energy reflected by the second surface and
a barrier mounted between the transmitter and the receiver to prevent energy transmitted by the transmitter from being directly received by the receiver.

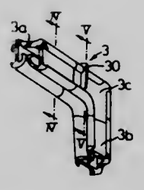
4,894,953

DOOR GLASS RUN FOR MOTOR VEHICLE

Masahiro Nozaki, Ama, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 8, 1989, Ser. No. 348,607
Claims priority, application Japan, May 9, 1988, 63-60958[U]
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—440 **5 Claims**





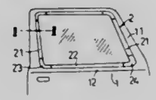
1. A door glass run made of an elastic material, which is to be attached to a door frame of a door of a motor vehicle, provided with a door mirror bracket, the door frame being composed of an inclined front frame portion, and a vertically extending frame portion for supporting the door mirror bracket, an upper end of the vertically extending frame portion being connected with the inclined front frame portion, comprising:
a straight extruded door glass run to be mounted in the inclined front frame portion;
another straight extruded door glass run to be mounted in the vertically extending frame portion; and
a molded door glass run in the form of a corner for connecting said straight extruded door glass run and said another straight extruded door glass run;
said molded door glass run being provided with a flange-shaped sealing wall in its outer periphery for sealing a space between said molded door glass run and the opposite door frame.

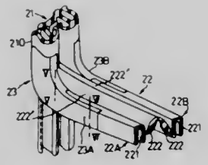
4,894,954

WEATHER STRIP FOR VEHICLE

Masahiro Nozaki; Hisayuki Kisanuki, both of Ama, and Mitsuo Hamabata, Bisai, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 15, 1988, Ser. No. 271,279
Claims priority, application Japan, Dec. 24, 1987, 62-327640; Jun. 20, 1988, 63-81422[U]
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—479 **7 Claims**





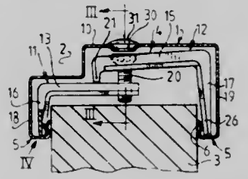
1. A weather strip to be attached along a door frame and a door belt line of a vehicle, comprising:
one extruded weather strip extending along an inner periphery of the door frame, which is provided with a seal lip to come in sealing contact with a side periphery of a window glass;
another extruded weather strip extending along the door belt line, which is provided with a seal lip to come into sliding contact with and seal against the door glass when the door glass is closed and is further provided with a means for engaging the door belt line of the vehicle;
a molded corner member having a shape like a L and connected to one end of said extruded weather strip and to one end of said another extruded weather strip;
an extruded extension seal lip fitted in a side surface of said molded corner member, said extruded extension seal lip extending from an end of said means for engaging in a longitudinal direction of said seal lip of said another weather strip so as to define a continuous sealing surface for coming into sliding contact with and to seal against the window glass when the window glass is closed;
said seal lip of said one weather strip, said seal lip of said another strip and said extruded extension seal lip being respectively provided with a lubricity-treated layer on a surface thereof.

4,894,955

FRAME PROFILE AND PROFILE CLAMP THEREFOR

Laurens Metz, Hilversum, Netherlands, assignor to Bomar Kozijnen B.V., Netherlands

Filed Jun. 21, 1988, Ser. No. 209,368
Claims priority, application Netherlands, Jun. 22, 1987, 8701445
Int. Cl.[4] E06B *1/04*
U.S. Cl. 49—504 **7 Claims**



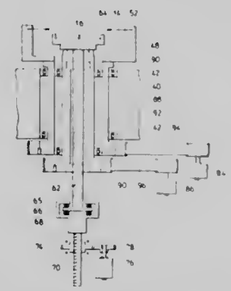
1. A frame profile of substantially U-shaped configuration and having at least one substantially U-shaped edge including an inner edge flange, said flange together with the edge portion connected thereto being of substantially S-shape and having an end edge spaced from said edge portion, clamping means engaging said flange for urging said end edge into anchoring engagement with an associated wall, said flange having a local deformation at the position of said clamping means.

4,894,956

APPARATUS AND METHOD FOR SLICING A WAFER

Katsuo Houda, and Susumu Sawafuji, both of Mitaka, Japan, assignors to Tokyo Seimitsu Co., Ltd., Japan

Division of Ser. No. 150,376, Jan. 29, 1988. This application Apr. 28, 1989, Ser. No. 344,956
Claims priority, application Japan, Oct. 29, 1987, 62-274536; Oct. 29, 1987, 62-274537
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—5 B **2 Claims**



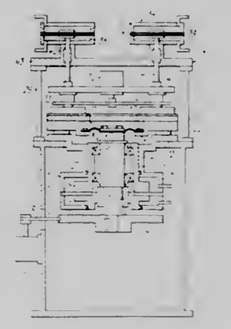
1. A wafer slicing method comprising the steps:
locating an inner periphery slicing blade and a grind stone coaxially with each other;
rotating a cylindrical-shaped material and moving it outwardly in the radial direction of said inner periphery slicing blade so as to slice said material into thin pieces; and,
matching the axis of said cylindrical-shaped material with the annular grinding section of said cup-shaped grind stone and then grinding the sliced end of said cylindrical-shaped material with said grind stone while rotating said cylindrical material.

4,894,957

APPARATUS FOR ABRASIVE MACHINING OF PLANAR SURFACES

Teimuraz N. Loladze; Boris I. Batlashvili, and David S. Butskhrikidze, all of Tbilisi, U.S.S.R., assignors to Gruzinsky Politekhnichesky Institut, Tbilisi, U.S.S.R.

PCT No. PCT/SU88/00051, § 371 Date Nov. 7, 1988, § 102(e) Date Nov. 7, 1988, PCT Pub. No. WO87/06951, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 3, 1988, Ser. No. 283,273
Claims priority, application U.S.S.R., Mar. 10, 1987, 4201396
Int. Cl.[4] B24B *5/00*
U.S. Cl. 51—131.1 **2 Claims**



1. A machine tool for abrasive machining of planar surfaces, comprising a workhead (28) mounted on a bed (1), a faceplate (9) carrying an abrasive tool (11), mounted for rotation by means of a thrust bearing (13) on an annular support (12) secured to the bed (1) and rotated by means of a coaxial drive shaft (3) journalled in antifriction bearings, and an adjustable means for pressing the faceplate (9) against the annular support (12), comprising an air-powered diaphragm (21) having a hollow rod, the drive shaft (3) extending through the hollow rod, characterized in that the annular support (12) has a coaxial bushing (14) in which the hollow rod (15) is mounted for axial movement and which supports a casing (22) of the air-powered diaphragm (21), and in that the antifriction bearings (16) of the drive shaft (3) are mounted on the hollow rod (15), the drive shaft (3) being coupled to the faceplate (9) by means of an elastic member (8).

4,894,958

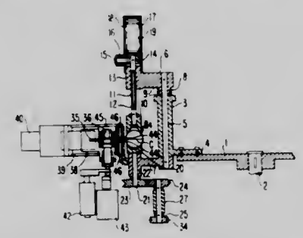
APPARATUS FOR SCRAPING OFF BURRS AT RESIN OUTER LAYER OF A GOLF BALL

Seiichi Takasaki, Takatsuki, Japan, assignor to Hisode Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 142,158
Claims priority, application Japan, Jan. 13, 1987, 62-5677
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—289 R **1 Claim**

1. A burr scraping machine for scraping burrs from a golf ball having a resin outer layer thereon, said machine comprising:
an indexing table rotatable in a plane;
a plurality of spindles mounted on said indexing table around the periphery thereof at equal angular intervals;
an upper arm piece and a lower arm piece rotatably mounted on each spindle;
an upper shaft loosely extending through said upper arm piece for movement through said upper arm piece in a direction perpendicular to the plane of said indexing table;
a lower shaft rotatably mounted in said lower arm piece coalixal with said upper shaft;

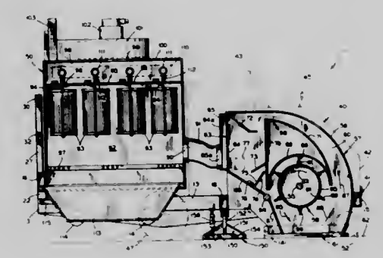
an upper gripper rotatably mounted on the lower end of said upper shaft for gripping the top part of a golf ball;
a lower gripper fixed to the upper end of said lower shaft in spaced opposed relation to said upper gripper for gripping the lower part of a golf ball;
pivoting spring means engaged with one of said arm pieces for urging said arm pieces and grippers, when a golf ball is gripped therebetween, to swing radially inwardly of said indexing table;
a driven wheel on the end of said lower shaft opposite the end on which said lower gripper is fixed;
drive wheel means resiliently movable into and out of engagement with said driven wheel for swinging said arm pieces and grippers radially outwardly of said indexing table and rotating said lower shaft;
a bite assembly adjacent the periphery of said indexing table having a bite member support movably mounted at about the equatorial portion of a golf ball held between said



upper and lower grippers for movement toward and away from the golf ball and means for urging said bite member support toward and away from the golf ball, a bite member having a plurality of scraping edges thereon and movably mounted on said bite member support for bringing successive scraping edges one at a time into position opposite the equatorial portion of a golf ball for contacting the golf ball when said bite member support is urged toward a golf ball and against which a golf ball held between said upper and lower grippers is urged by said resiliently movable drive wheel means for scraping burrs from the golf ball; and
a pair of upper and lower profile rollers positioned above and below said bite member, respectively, and in positions for engaging a golf ball held against said scraping edge for removal of burrs therefrom for preventing the golf ball from being moved toward the scraping edge more than a predetermined distance.

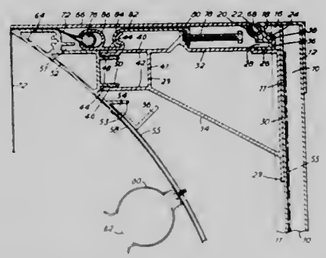
4,894,959
METHOD AND APPARATUS FOR CLEANING A SURFACE UTILIZING SHOT BLASTING
Robert E. Hoover, Toledo, Ohio, assignor to Hoover & Wells, Inc., Toledo, Ohio
Filed May 19, 1988, Ser. No. 196,486
Int. Cl.[4] B24C *3/06*
U.S. Cl. 51—429 **20 Claims**

1. A mobile apparatus for treating a surface by shot blasting, comprising:
a frame;
at least two surface engaging wheels mounted on said frame;
a power plant mounted on said frame;
hydraulic drive means mounted on said frame and coupled between said power plant and two of said wheels and including a control for actuating said drive means to rotate said wheels and move said frame across a surface to be treated;
a blast wheel mounted on said frame and coupled to said drive means for rotation, said blast wheel including a cylindrical drum mounted on a drive shaft, a plurality or radially extending fins coupled to a cylindrical peripheral surface of said drum by a plurality of hinges, each of said hinges having a hinge pin for selectively removing the associated one of said vanes;
a blast head chamber connected between a shot reservoir and a shot recovery passageway and enclosing said blast wheel;



fan means coupled to said drive means for generating a suction in said recovery passageway; and
filter means connected between said fan means and said recovery passageway for separating contaminants loosened from the surface.

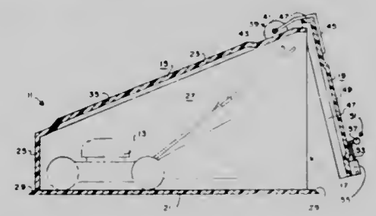
4,894,960
CANOPY ASSEMBLY
Roger W. Hill, and Martin L. Hill, both of Bristol, England, assignors to Universal Components Limited, Bristol, England
Filed Mar. 31, 1988, Ser. No. 176,197
Claims priority, application United Kingdom, Apr. 2, 1987, 8707919
Int. Cl.[4] E04F *19/00*
U.S. Cl. 52—28 **3 Claims**



1. A canopy assembly for mounting to an upright surface so as to extend horizontally therefrom, said canopy assembly having lateral ends, a top, a bottom and a rear, and further comprising:
(a) respective vertically extending rear support girders at the lateral ends of the canopy assembly, said support girders having rear faces which define the rear of the canopy assembly;
(b) a pair of substantially identical upper and lower support arrays mounted respectively at the top and the bottom of the canopy assembly in relatively inverted orientations, each said support array comprising:
(i) a hinge bracket that extends the full length of the canopy assembly, said hinge bracket having a channel portion which provides a channel extending the full length of the canopy assembly, the channel in the upper support array being open downwardly and the channel in the lower support array being open upwardly, and said rear support girders having upper and lower end portions engaged in

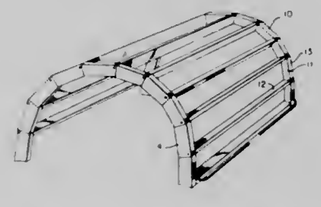
respective channel portions of the hinge brackets, said hinge bracket further comprising, forwardly of the channel portion thereof, an arm shaped to define a narrow-mouthed channel which extends the full length of the canopy assembly;
(ii) a pair of support brackets extending forwardly from respective rear support girders;
(iii) a front piece extending the full length of the canopy assembly and carried by the support brackets; and
(iv) an openable roof panel extending the full length of the canopy assembly and having a rear bead portion hingedly received in the narrow-mouthed channel of the hinge bracket so that said roof panel is pivotable about the narrow-mouthed channel between a normal position within the roof panel extends forwardly to abut the front piece and a further position wherein an access opening is provided between the front piece and the hinge bracket;
(c) a visible canopy facia extending between the front piece of the top and bottom arrays to provide the front faces of the canopy assembly; and
(d) lighting means, mounted within the canopy assembly so as to be accessible through said access opening when said roof panel is in the further position thereof, for illuminating the canopy facia from behind.

4,894,961
LAWN MOWER SHELTER
Robert D. Robbins, 4827 Parkside, Memphis, Tenn. 38117
Filed Jul. 21, 1988, Ser. No. 222,175
Int. Cl.[4] E04B *1/344*; E04H *6/02*
U.S. Cl. 52—69 **1 Claim**



1. The combination of a walk-behind type lawn mower, and an improved shelter for enclosing said walk-behind type lawn mower, said lawn mower having a width, a length and a height, wherein said improved shelter comprises:
(a) a housing having a hollow interior for receiving said lawn mower, said interior having a width slightly wider than said width of said lawn mower, having a length slightly longer than said length of said lawn mower, and having a height slightly higher than said height of said lawn mower; said housing having an opening for allowing said lawn mower to be pushed into and pulled from said interior; said housing including a bottom member, a top member, a rear wall member, and a pair of side wall members joined to one another to form a hollow box-like structure having a substantially open front to allow said lawn mower to be pushed into and pulled from the interior of said housing; said bottom member having first and second ends, said housing including a flange extending outward of each of said first and second ends of said bottom member and having ridges formed in said top member and said side wall members thereof to strengthen said top member and said side wall members; said housing having vent apertures therein for allowing a transfer of air between the interior and exterior of said housing, said vent apertures including a number of louvers in said side wall members arranged so as to allow air to be transferred therethrough while preventing the passage of rain; said housing being shaped with said top member angled downward toward said rear wall member to provide clearance for the handle of said lawn mower;
(b) a door for selectively closing said opening; and
(c) hinge means for pivotally attaching said door to said housing to allow said door to be moved between a closed position and a fully open position to allow said lawn mower to be easily pushed into and pulled from the interior of said housing; each hinge means including a pair of spaced ears attached to said top member adjacent said opening, a pivot rod extending through said ears, and a hinge plate having one end attached to said pivot rod and having another end attached to said door; said ears of said hinge means being molded as an integral, one-piece unit with said housing.

4,894,962
ARCHED STRUCTURE COMPRISING PRE-MANUFACTURED COMPONENTS
C. R. Coan, Rte. 2, Box 169A, Colville, Wash. 99114
Filed May 1, 1989, Ser. No. 346,521
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—86 **5 Claims**



1. An erectable/dismantleable structure comprising at least one assembly, said assembly having first and second ends and comprising:
a plurality of components
two cables having first and second cable ends,
means for securing said first and second cable ends at said first and second assembly ends,
each of said components comprising:
at least one beam having first and second beam ends, and
two fixtures, one attached to said at least one beam at said first beam end, the other attached to said at least one beam at said second beam end,
each of said fixtures having a boxlike shape, a top, a bottom, a first fixture end, a second fixture end and first and second faces, said top and bottom being parallel to each other, said first and second faces being parallel to each other, said faces being frusto-triangular in shape, said shape having a base, said base being at said top,
each of said fixtures having a cable hole extending from said first fixture end to said second fixture end and near said bottom,
means for pivotal attachment of said plurality of components by pivotal connections near said tops and said first and second ends of said fixtures,
whereby said assembly is formed by pivotal attachment of said plurality of said components by said means for pivotal attachment,
said two cables being threaded through said cable holes, one through said fixtures at said first ends of said beams, the other through said fixtures at said second ends of said beams,
said first cable ends being secured at said first end of said assembly, by said means for securing,
whereby tension applied to said two cables pivots

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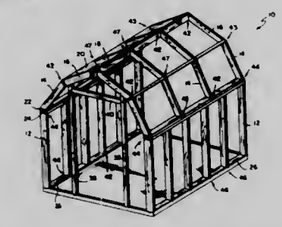
said ends of said fixtures on said components about said means for pivotal attachment into contact with adjacent fixtures and, by virtue of the frusto-triangular shapes of said faces of said fixtures, said assembly assumes an arch shape and is maintained in said shape by securing said second ends of said two cables to said second end of said assembly by said means for securing said cable ends.

4,894,963

BUILDING KIT

Stephen J. Campbell, Carmel, Ind., assignor to Heartland Industries, Inc., Carmel, Ind.

Filed Apr. 11, 1988, Ser. No. 180,143
Int. Cl.[4] E04B 1/19
U.S. Cl. 52—90 **3 Claims**



1. A kit for the assembly of a building structure, the kit comprising:

a plurality of precut building members, each building member having end portions configured to abut adjacent building members to form a building structure, each building member having a predetermined position relative to the remaining building members in the building structure; and

coding means located on an exterior surface of the end portion of each of the building members for indicating the predetermined position of each building member so that selected building members to be interconnected can be determined by visual inspection to facilitate the assembly of the building structure, wherein the plurality or precut building members includes a plurality of side boards to forms four outer walls including two end walls and two side walls, for defining an inner region of the building structure, the building members also including a plurality of roof boards to form a roof over the inner region and a plurality of base boards to form a foundation for the structure, and the end portions includes means for permitting interconnection of adjacent pairs of building members having male connector portions and female connector portions formed on selected building members to permit interconnection of the side boards with both the roof boards and baseboards by mating selected male and female portions, where the ends of the roof boards are connected adjacent the ends of the side boards, the coding means being located in close proximity to the male and female portions to provide a visual indication of which male and female portions should be mated to form the building structure.

4,894,964

BUILDING STRUCTURE AND METHOD

Richard E. Thrift, Peculiar, and Harold W. Young, Kansas City, both of Mo., assignors to U.S. Truss Steel Buildings, Inc., Peculiar, Mo.

Continuation-in-part of Ser. No. 217,086, Jul. 7, 1988. This application Jan. 25, 1989, Ser. No. 302,571
Int. Cl.[4] E04B 7/02
U.S. Cl. 52—90 **5 Claims**

1. A building structure, which comprises:

(a) a foundation;

(b) a first floor associated with and supported by said foundation;

(c) a multiplicity of arch units each including:

(1) a pair of vertical truss members each having a lower end mounted on said first floor and an upper end;

(2) a horizontal truss member having opposite ends each connected to a respective vertical truss member adjacent to its upper end at a respective floor joist joint;

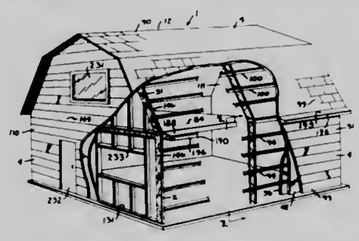
(3) a pair of lower arch truss members each having a lower, outer end connected to a respective vertical truss member upper end at an eave joint and an upper, inner end, each said lower arch truss member sloping upwardly and inwardly from its lower end to its upper end;

(4) a pair of upper arch truss members each including a lower, outer end connected to a respective lower arch truss member upper end at a knee joint and an upper, inner end, said upper arch truss member ends being connected at a ridge joint;

(5) each said truss member comprising inner and outer pairs of angle sections with respective flanges forming inner and outer truss member faces, said flanges forming side walls defining laterally-open, vertically-extending truss member channels;

(6) each said truss member including a chord member extending in a zig-zag configuration between said inside and outside pairs of angle sections between said channels;

(7) each said truss member including a pair of endpieces each at a respective end thereof, each said endpiece



comprising a pair of angle sections connected to and extending between said inner and outer pairs of angle sections, said endpiece angle sections having coplanar flanges, said coplanar flanges of respective endpieces at said joints including aligned bolt receivers and aligned ventilation ports, said ventilation ports communicating air between innerconnected truss members through said connecting joints; and

(8) each said truss member including a plurality of angle-section clips each located in said channel and including a flange extending perpendicularly across said channel and including a clip receiver, adjacent pairs of said truss members including horizontally aligned clips;

(d) a plurality of side cross-members extending between adjacent pairs of said vertical truss members;

(e) a plurality of floor joist cross-members extending between adjacent pairs of said horizontal truss members;

(f) a plurality of roof cross-members extending between adjacent pairs of said lower arch truss members;

(g) a plurality of roof cross-members extending between adjacent pairs of said upper roof truss members;

(h) each said cross-member having opposite ends, each said end being compressed across its width and compression-fit within a respective channel against a respective clip;

(i) a plurality of screws each placed in a respective clip receiver and in a respective cross-member end;

(j) each said arch unit including at least one nailer mounting plate at each said joint, each nailer mounting plate including a proximate bolt receiver aligned with respective endpiece receivers and receiving a respective truss member connecting bolt, a ventilation port aligned with said endpiece ventilation ports and a distal receiver positioned in laterally-spaced relation from said joint, said nailer mounting plates being positioned in opposed, horizontally-aligned pairs on adjacent arch units;

(k) a plurality of nailers each having opposite ends connected to respective nailer mounting plates by screws placed in said distal receivers and in said nailer ends; each said nailer extending horizontally between adjacent arch units in proximity to corresponding arch unit joints;

(l) each said clip flange forming a pocket with respective truss member side walls, each said pocket being adapted to receive a respective cross-member end and having a width less than the width of said cross member between a respective adjacent pair of truss members mounting same;

(m) an outer side wall attached to the outside of said side wall cross-members on the outside of said building structure;

(n) an inner side wall attached to the inside of said side wall cross-members on the inside of said building structure and to a respective nailer extending between said floor joists joints;

(o) a second floor including said horizontal truss members, said floor joist cross-members and a subfloor mounted on top of said floor joists and connected to said nailer extending between said floor joist joints;

(p) roof sheathing mounted on said roof cross-members and attached to said nailers extending between said eave joints, said knee joints and said ridge joints;

(q) roofing material mounted on said roof sheathing;

(r) a pair of end walls each including:

(1) a lower end wall comprising a bottom plate attached to said first floor and extending generally between the lower ends of a respective pair of vertical truss members and a top plate attached to the underside of a respective horizontal truss member and a plurality of studs extending vertically between said bottom and top plates; and

(2) an upper end wall including a bottom plate attached to said second floor and extending generally between the lower ends of respective lower arch truss members, a pair of lower arch plates each attached to the underside of a respective lower arch truss member, a pair of upper arch plates each attached to the underside of a respective upper arch truss member and a plurality of vertical studs extending between said bottom plate and said arch plates; and

(s) a ventilation system comprising:

(1) a plurality of crossbeams extending horizontally between said cross-members connected to said upper arch truss members in spaced relation below said ridge nailer;

(2) a ceiling panel fastened to the undersides of said crossbeams;

(3) a plenum formed between said ridge nailer and said ceiling panel, said plenum communicating with said air passages in said upper arch truss members; and

(4) a pair of gable vents each located in a respective end wall and communicating with said plenum.

4,894,965

METHOD FOR RESTRAINING VIBRATION OF A BUILDING AND STRUCTURE THEREFOR

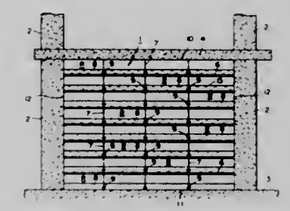
Takanori Sato, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,438
Claims priority, application Japan, Apr. 10, 1987, 62-88396; Apr. 27, 1987, 62-63917[U]
Int. Cl.[4] E04B 1/98
U.S. Cl. 52—167 DF **22 Claims**

1. A vibration-resistant building comprising:

a framework of structural members;

means for restraining vibration of said building, said restraining means including first and second wall members disposed parallel to each other and defining an inner space therebetween, a plurality of reservoirs positioned within said inner space, each of said reservoirs including a liquid therein, said liquid in each of said reservoirs having a free surface so as to be able to slosh within said reservoirs, the geometrics of said reservoirs and the depth of said liquid



within each reservoir being such that the sloshing natural frequency of said liquid within each of said respective reservoirs coincides with a natural frequency of said building;

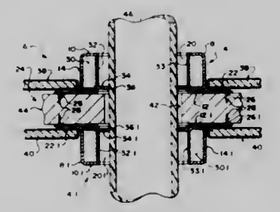
said restraining means being supported by said framework, said restraining means includes at least one vertically oriented separation wall within said inner space, separating two of said reservoirs.

4,894,966

FIRE STOPPING APPARATUS

Paul R. Bailey, 9020 Dixon Avenue, Richmond, B.C., Canada (V6Y 1E4), and Khashayar Yamini, 306 - 1497 Marine Drive, West Vancouver, B.C., Canada (V7T 1B8)

Filed Nov. 8, 1988, Ser. No. 268,867
Int. Cl.[4] E04B 1/94
U.S. Cl. 52—317 **16 Claims**



1. A fire-stopping apparatus, comprising:

a metal casing having two side walls with co-extensive openings, and an annular outer wall extending between the side walls, the outer wall being located radially outwardly from the openings, forming an inwardly open, annular channel;

means on the casing for mounting the apparatus to a barrier about an opening therethrough;

an intumescent material within the channel; and

a resilient gasket extending from the casing and having an annular inner wall extending inwardly beyond the intumescent material.

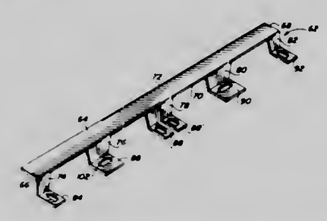
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4,894,967

FLUTED DECK DIAPHRAGM AND SHEAR RESISTING MEMBER THEREFOR

Virgil R. Morton, Benicia, Calif., assignor to Verco Manufacturing Co., Phoenix, Ariz.

Filed Oct. 28, 1988, Ser. No. 264,070
Int. Cl.[4] E04B 1/24, 5/17
U.S. Cl. 52—334 26 Claims



1. A diaphragm for use in a building structure, said building structure including a series of horizontal load bearing members for supporting said diaphragm and a series of vertical load resisting members for supporting the horizontal load bearing members, said diaphragm comprising in combination:

a. a fluted deck having a longitudinally axis and including a plurality of alternating top and bottom flutes extending parallel to the longitudinal axis of said fluted deck between first and second ends thereof, said plurality of top flutes lying substantially in a first plane, and said plurality of bottom flutes lying substantially in a second plane spaced apart from and parallel to said first plane, said fluted deck including a plurality of webs extending parallel to the longitudinal axis of said fluted deck and interconnecting alternating top and bottom flutes, said plurality of bottom flutes of said fluted deck each having an upper surface and a lower surface, the lower surfaces of said bottom flutes overlying at least one of said horizontal load bearing members for being supported thereby, the longitudinal axis of said fluted deck extending generally perpendicular to said at least one horizontal load bearing member;

b. a shear resisting member for stiffening said fluted deck and increasing the resistance of said fluted deck to deformation induced by horizontal shear loads imposed upon said diaphragm by transferring such horizontal shear loads to said at least one horizontal load bearing member, said shear resisting member including an elongated section extending generally perpendicular to the longitudinal axis of said fluted deck and extending over a plurality of said top flutes of said fluted deck, said shear resisting member extending generally above and parallel to said at least one horizontal load bearing member, said shear resisting member further including a plurality of spaced tabs extending downwardly from said elongated section toward the upper surface of one of said bottom flutes, each of said spaced tabs extending within a trough formed by one of said bottom flutes and said webs interconnected therewith, each of said spaced tabs having a lowermost portion disposed adjacent the upper surface of one of said bottom flutes;

c. first welds for rigidly securing said elongated section of said shear resisting member to said plurality of top flutes of said fluted deck over which said shear resisting member extends; and

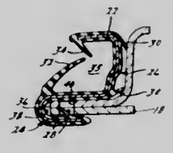
d. second welds for rigidly securing the lowermost portion of each of said spaced tabs of said shear resisting member to the upper surface of one of said bottom flutes and for securing each said bottom flute to said at least one horizontal load bearing member.

4,894,968

GLASS RUN CHANNEL WEATHER STRIP AND/OR BELT WEATHER STRIP RETAINING SYSTEM

Robert A. Vaughan, Dearborn, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Nov. 9, 1988, Ser. No. 269,132
Int. Cl.[4] E06B 7/16
U.S. Cl. 52—400 9 Claims



1. A system for attaching automotive weather stripping on a vehicle comprising:

weather stripping adapted to be secured on a flange of the vehicle, said weather stripping including a reinforcement member covered with a polymeric skin which surrounds the interior and exterior of said reinforcement member and means for retaining said weather stripping on the flange, said retaining means extending from said reinforcement member and integrally formed with said polymeric skin; and

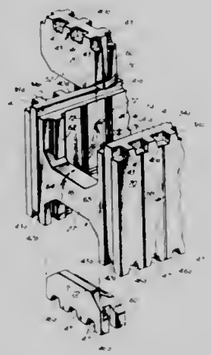
one or more indentations on said flange, said one or more indentations coupled with said weather stripping retaining means such that said retaining means projects into said one or more indentations for enhancing the retention of said weather stripping on said flange.

4,894,969

INSULATING BLOCK FORM FOR CONSTRUCTING CONCRETE WALL STRUCTURES

David D. Horobin, Anaheim, Calif., assignor to AG-Tech Packaging, Inc., Anaheim, Calif.

Filed May 18, 1988, Ser. No. 195,263
Int. Cl.[4] E04C 2/04
U.S. Cl. 52—309.12 1 Claim



1. An improved concrete block formed from expandable polystyrene material for use in building insulated concrete-wall structures wherein cavities are defined to receive concrete, comprising:

a substantially rectangular, box-like, block form having a pair of oppositely disposed, parallel, side walls and oppositely disposed end walls which define a body cavity;

interlocking means formed about the peripheral edges of said side walls and said end walls, said interlocking means having an elongated rail member formed longitudinally along the upper edge of each of said side walls and said end walls, said rail member including laterally outward extended side-arm members equally spaced apart from each other along the length thereof;

an elongated channel member formed longitudinally along the lower edge of each of said side walls and end walls, said channel member including laterally outward extended channel members, and said rail and arm members being positioned to be interlocked within respective channels of the lower edges of said walls when said blocks are stacked in a vertical position to form a building structure;

said rail and said lateral arm members defining a multiplicity of contiguous sockets adjacent the outer edges of said wall members, and said lateral channel members defining a multiplicity of contiguous post members that are arranged to be lockingly engaged in corresponding sockets when said block forms are stacked one above the other;

wherein said matching sockets and post located along the longitudinal edges of said side walls are formed with corresponding, tapered, wall surfaces for firm interlocking action between stacked block forms;

a plurality of intermediate, transverse, strut members formed with a pair of tongue members vertically located adjacent the inner surfaces of said side walls, which are integrally formed together with said oppositely disposed side walls, said transverse members including means to be selectively formed as end walls when the length of said block form is cut to a reduced length as needed;

wherein a multiplicity of cells are defined by said transverse strut member;

said end walls being defined by a centrally positioned strut member integrally formed between and adjacent the ends of said side walls, and including removable upper and lower insert members, and said insert members being further formed to be mounted to any one of a selected intermediate strut member so as to define an end wall when said block form is reduced in length;

said upper and lower insert members being formed with vertical side grooves arranged for engagment with matching tongue members formed as part of each strut member, a flanged transverse edge and a shoulder member being further included for mounting engagement with said strut member, so that when said inserts are selectively mounted to any one of said strut means an end wall structure of said block form is established; and

means for cutting said block form transversely to a selective length, comprising:

a plurality of vertical grooves equally spaced along the outer surfaces of said side walls and recessed therein;

a plurality of vertical grooves formed on the inner surfaces of said side walls, said inner-surface grooves being defined by a pair of parallel rib members, whereby said inner and outer cutting grooves are aligned with each other, and wherein additional cutting grooves are formed in the upper and lower surfaces of said transverse strut member, whereby said strut member may be divided to receive said upper and lower inserts to define an end wall.

4,894,970

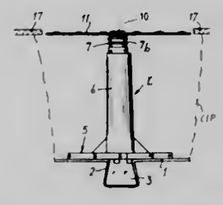
SPACER CAP FOR COVERING VARIOUS BUILDINGS

Richard Lebraut, Chatou, France, assignor to L. R. Etanco, Yvelines, France

Filed Jun. 27, 1988, Ser. No. 212,329
Claims priority, application France, Jun. 25, 1987, 87 08941
Int. Cl.[4] E04B 5/00
U.S. Cl. 52—410 1 Claim

1. A device for covering various buildings wherein an isolating layer is maintained on top of a plate forming an inner roofing of a building by tightening the isolating layer between an upper surface of the plate and upper fixation elements placed above the isolating layer with interposition from place to place of a plurality of spacers, and wherein:

(a) each spacer comprises a rotatably lockable foot portion of a polygonal cross section, typically a rectangular parallelogramm cross section, which is caused to be locked by a rotation comprised between 0° and 180° in a correspondingly profiled part of the plate, each foot portion being topped by a star shaped surface and extended by a vertical rod or column terminated by a head portion, fastening means (10) taken among a screw and the like being provided for maintaining the upper fixation element onto the head portion;



(b) the spacer is made of an isolating plastics material preventing provision of a thermal bridge;

(c) the head portion has a shape taken among a frustoconical shape and a cylindrical shape and is hollow for enabling to position the fastening means of the upper fixation elements;

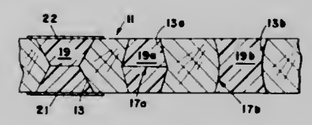
(d) each of the upper fixation elements is suitably stiffened by corrugation means and is provided with a center hole for passage of the fastening means, said upper fixation elements being made of a material taken among metal and plastic materials.

4,894,971

BOARD REPAIR FOR CORRECTING DEFECTS IN LUMBER OR THE LIKE

Thomas F. Cortese, 3333 Guido St., Oakland, Calif. 94602

Filed Jul. 24, 1989, Ser. No. 383,448
Int. Cl.[4] E02D 37/00; E04G 23/00; B27G 1/00
U.S. Cl. 52—514 18 Claims



1. A repaired board of lumber or similar material having a bore in the original material of the board that extends between opposite surfaces of the board and which is at a region at which a defect in the board has been removed in the course of cutting the bore, said board further having a plug of filler material filling said bore and wherein the width of the bore and plug changes at a first location along the length of the bore and undergoes a reversed change at another location along the length of the bore thereby interlocking said plug with said board.

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4,894,972

WINDOW ASSEMBLY AND METHOD OF PRODUCING SAME

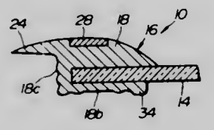
Masato Endoh, Tokyo; Masayoshi Ohgoshi, Yokohama, and Yoshio Horiki, Matsuzaka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Dec. 17, 1987, Ser. No. 134,093

Claims priority, application Japan, Dec. 19, 1986, 61-301414; Dec. 19, 1986, 61-194491[U]; Dec. 23, 1986, 61-305280; Dec. 23, 1986, 61-305281; Dec. 23, 1986, 61-305282

Int. Cl.[4] B60J *1/02*; E06B *3/54*

U.S. Cl. 52—716 **29 Claims**



1. A window assembly to be installed to a support body, said window assembly comprising:

a transparent plate member;

a frame member made of plastic and integrally formed with a peripheral section of said plate member so that said plate member peripheral section is inserted in said frame member, said frame member including

means for accomplishing location of said frame member relative to the support body and for allowing said frame member to be fitted with the support body,

means for allowing at least a part of said frame member to tightly contact with a surface of the support body,

means defining a space for adhesive between said frame member and the support body,

a rigid member fixedly secured to said frame member, and

a coil spring disposed in said frame member and located to contact with said rigid member.

4,894,973

REINFORCING AND MOUNTING STRUCTURE FOR FRAMES

Helmut Over, Hallstattweg 4, 5352 Zuelpich, Fed. Rep. of Germany

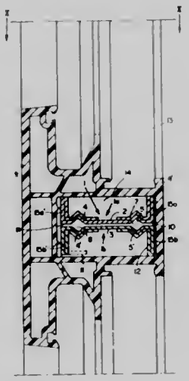
Filed Jun. 20, 1988, Ser. No. 209,345

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 8714076[U]

Int. Cl.[4] E04C *3/30*

U.S. Cl. 52—732 **8 Claims**

1. A reinforcing and mounting structure for frames, especially window frames, comprising a hollow frame member defining a longitudinally extending channel inside said frame member, sectional insert means inserted in said longitudinal channel for reinforcing said hollow frame member, said sectional insert means comprising two half members each having an approximately U-shaped cross-section including a base shank and two leg shanks, said two half members being arranged with their base shanks mirror-symmetrically and in back-to-back fashion inside said longitudinally extending channel, each base shank comprising two lengthwise extending parallel pleats spaced a distance apart from one another, said pleats facing each other for forming two hollow screw channels extending lengthwise between said two half members for receiving screws, said two half members being so dimensioned that at least ends of said half members are wedged apart by screws received lengthwise in said screw channels for securing



said sectional insert means inside said longitudinally extending channel.

4,894,974

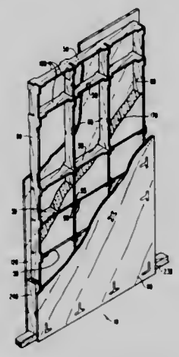
STRUCTURAL INTERLOCK FRAME SYSTEM

David Mayhew, Hollister, and E. Nolan Scheid, Morgan Hill, both of Calif., assignors to Walter J. Jaworski, Cupertino, Calif.

Filed Jul. 5, 1988, Ser. No. 215,080

Int. Cl.[4] E04C *2/54*

U.S. Cl. 52—785 **5 Claims**



1. A structural interlock frame system, comprising:

at least one first rib having at least one tab along one edge thereof;

at least one second rib for positioning at an angle with respect to said first rib to form a skeleton for the frame system with said first and second ribs connected at a junction, said second rib having at least one tab along one edge thereof;

means for fastening said first rib to said second rib at said junction, said fastening means including indentations in each of said first and second ribs, with said indentations being positioned on said first and second ribs, respectively, so as to register with one another at said junction;

a wood panel having a slot that receives said tabs in a manner to attach it to said ribs, thereby providing strength and rigidity to the frame system,

said slot being of a depth such that said tabs form a substantially flush surface with said panel when said tabs are inserted therein; and

adhesive for fastening said panel to said junction of said first and second ribs, thereby distributing stress over the entire frame system.

4,894,975

METHOD AND APPARATUS FOR MAKING RECLOSABLE BAGS WITH FASTENER STRIPS IN A FORM FILL AND SEAL MACHINE

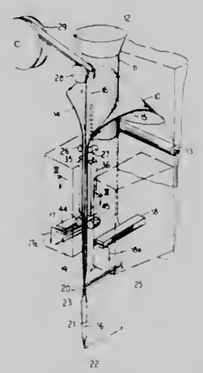
Steven Ausalt, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Mar. 9, 1988, Ser. No. 166,024

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] B65B *61/18*, *9/08*

U.S. Cl. 53—412 **19 Claims**



1. The method of forming a vertical tubular form fill reclosable bag from a sheet of plastic film comprising the steps:

continuously feeding a supply of thin thermoplastic film from a supply means;

wrapping the film into tubular shape over a filling spout bringing the lateral edges of the film together in adjacent relationship to form a tube;

feeding a continuous supply of plastic zipper strip having webs with first and second reclosable pressure interlocking members thereon into a space between said film edges;

attaching the webs of said members to the film between said film edges so that said strip provides the sole means joining said edges and said strip provides a reopenable closure for a bag formed of said film; and

wherein said interlocking members are joined by one of said webs and said one web must be separated for access to the interior of a bag formed by said film.

4,894,976

MISSING CARD CIRCUIT FOR A SLICING MACHINE

Gary L. Wallace, Jeffersontown; Robert K. Moore, Louisville, and Richard L. Beckner, Pendelton, all of Ky., assignors to AMCA International Corporation, Hanover, N.H.

Filed Aug. 25, 1988, Ser. No. 236,178

Int. Cl.[4] B65B *25/08*

U.S. Cl. 53—435 **9 Claims**

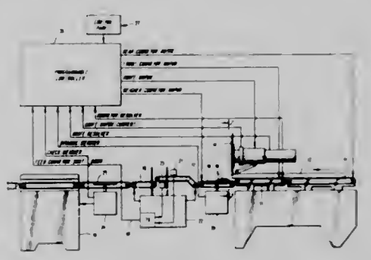
1. A method for controlling a slicing machine of the type in which a product is advanced into a continuously rotating cutting knife, comprising the steps of:

cutting and grouping slicing of the product into drafts;

transporting said drafts to a card dispensing position in a card dispensing machine;

detecting the approach of a draft to said card dispensing position;

detecting whether a card has been dispensed by said card dispensing machine;



activating a missing card function when the dispensing of a card is not detected despite prior detection of an approaching draft to the card dispensing position; and

wherein said missing card function is only activated if the dispensing of a card is not detected during the occurrence of at least two consecutive draft approach detections.

4,894,977

METHOD AND DEVICE FOR THE LENGTH RECTIFICATION OF A FOIL STRIP OF A MATERIAL WHICH SHRINKS DURING COOLING IN MACHINES FOR THE PRODUCTION AND SEPARATION OF PACKAGES

Herbert Rittinger; Dieter Janek; Peter Auer, and Rudolf Scheffold, all of Laupheim, Fed. Rep. of Germany, assignors to Josef Uhlmann Maschinenfabrik GbmH & Co. KG, Laupheim, Fed. Rep. of Germany

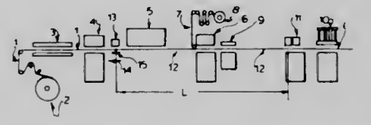
PCT No. PCT/DE87/00029, § 371 Date May 8, 1987, § 102(e) Date May 8, 1987

PCT Filed Jan. 27, 1987, Ser. No. 50,881

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3602604

Int. Cl.[4] B65B *57/02*, *47/10*

U.S. Cl. 53—453 **8 Claims**



1. A process for rectifying a length of a thermally shrinkable foil strip in a machine for producing and separating packages that successively includes a forming station, a further work station and a separating station, said length rectification comprising:

transporting a foil strip in a longitudinal direction of said machine, said transport including passing said foil strip through said forming, further work and separating stations;

heating said foil strip;

deep drawing said foil strip;

allowing said heated and deep drawn foil strip to cool and shrink while travelling between said forming and said separating stations;

upon an interruption of said transport, securing against displacement a strip segment of length L of said heated foil strip at one end thereof, said length L covering a distance from a point immediately downstream from said forming station in the travel direction to beyond said further work

station but not greater than a point past said separating station;

stretching length L during said interruption via traction at an end of said foil opposite said one end to obtain a longer length L', said stretching being maintained over a transport interruption time T but stretching for a shorter period where complete cooling of the strip segment occurs at cooling time T' which is faster than T; and

regulating stretching to achieve an elongation that is the difference between L and L', that when no longer subjected to traction allows said foil to revert to its original length L, and that any modifications in package size and intervals between packages caused by the stretching are each no larger than a maximal tolerance permitted by a work process of a subsequent further work station.

4,894,978

APPARATUS FOR PREPARING FORMED OR MOLDED BODY

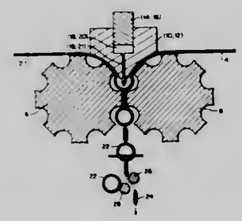
Holger Schönmann, and Hans P. Eck, both of Eberbach/Baden, Fed. Rep. of Germany, assignors to R. P. Scherer GmbH, Eberbach/Baden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 285, Jan. 2, 1987, Pat. No. 4,772,472. This application Apr. 28, 1988, Ser. No. 187,299

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1986, 3600084

Int. Cl.[4] B65B *1/04, 47/00*

U.S. Cl. 53—560 **1 Claim**



1. An apparatus for manufacturing a formed body having a common enclosure of polymer material and a filling inside said enclosure consisting essentially of:

(a) means for delivering two endless bands of polymer material;

(b) a plurality of rotating rolls adapted to form said common enclosure from said endless bands; and

(c) means located above said rotating rolls for delivering said filling material through nozzle means to said common enclosure; the improvement comprising:

(d) said means for delivering said filling material comprising within one single filling block a plurality of parallel conduits and a corresponding plurality of nozzles introducing a plurality of different phases of said filling material simultaneously into said common enclosure.

4,894,979

SICKLE GUARD HAVING ADJUSTABLE KNIFE SECTION HOLD-DOWN STRUCTURE

Howard R. Lobrentz, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed May 26, 1983, Ser. No. 498,412

Int. Cl.[4] A01D *34/18*

U.S. Cl. 56—305 **6 Claims**

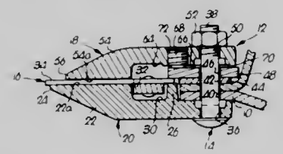
1. A cutter assembly for crop harvesting apparatus comprising:

support bar means having a plurality of forwardly extending, laterally spaced apart lower guard fingers secured thereto;

a sickle shiftably carried by said fingers for transverse reciprocation relative thereto;

a plurality of forwardly extending, laterally spaced apart upper guard fingers secured to said bar means above said sickle in overlying relation ship to respective ones of said lower finger whereby to define a sickle-receiving gap between the upper and lower fingers;

elongated fastener means attaching said fingers to said bar means and tending to hold the same against relative movement increasing the size of said gap; and means for adjustably relatively shifting said upper and lower fingers



toward and away from each other to vary the size of said gap,

said adjustment means comprising a downwardly extending projection on each of said upper fingers disposed rearwardly of said fastener means and bearing against said bar means, said adjustment means further comprising a set screw projecting downwardly from each of said upper fingers forwardly of said fastener means and bearing against said bar means for separating the fingers and enlarging the gap therebetween when the set screws are adjustably extended downwardly from the upper fingers.

4,894,980

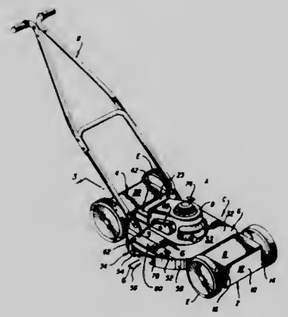
APPARATUS FOR TRIMMING LAWNS AND THE LIKE

Dallas W. Jones, New Hartford; Lauren J. Young, Poland, and Richard P. Nadeau, Frankfort, all of N.Y., assignors to Trim-A-Lawn Corporation, Utica, N.Y.

Filed Apr. 29, 1988, Ser. No. 188,508

Int. Cl.[4] A01D *34/84*

U.S. Cl. 56—320.1 **12 Claims**



1. A housing deck for lawn trimmers and the like, comprising:

(a) a top surface including first, second and third portions;

(b) said second portion extending between said first and third portions, and including a first section and a second section removably secured to said first section;

(c) a skirt extending along at least a portion of the outer periphery of said first, second, and third portions;

(d) said skirt forming an angle with said first, second, and third portions;

(e) said second portion including means for mounting an engine thereon; and

(f) means for directing the exhaust of the engine under said top surface of said housing for significantly reducing the noise of the engine.

4,894,981

SUSPENSION CABLE CASING SYSTEM

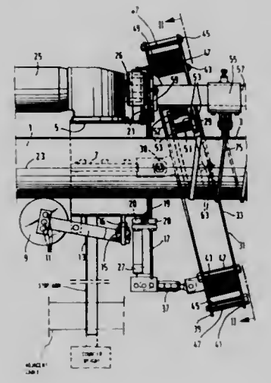
Xaver Lipp, Hohenstaufenstrasse 30, 7090 Ellwangen, Fed. Rep. of Germany

Division of Ser. No. 76,722, Jul. 23, 1987, Pat. No. 4,821,501. This application Dec. 2, 1988, Ser. No. 278,793

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626886

Int. Cl.[4] B21C *37/12;* B21D *39/02;* D07B *1/16*

U.S. Cl. 57—10 **15 Claims**



1. An apparatus for producing a metal casing on a suspension cable, comprising:

an outer cover having guide means for sliding longitudinally on a cable to be encased;

a winding member rotatably mounted on said outer cover for rotation about a rotary axis coinciding with a longitudinal axis of the cable, said winding member having a frame for partially surrounding the cable and having a periphery with supply means for holding a feed roll including a supply of metal strip, said winding member surrounding the cable as a ring;

strip handing means, mounted on the winding member, for feeding the metal strip during rotation of said winding member from an inside winding of said feed roll to and around a periphery of the cable; and

strip working means, mounted on the winding member, including a profiling means arranged on a strip movement path from said feed roll to the cable periphery, said profiling means including bending tools for outwardly bending and profiling longitudinal edges of the metal strip out from a plane of the metal strip, and folding tools for folding adjacent profiled longitudinal edges together of adjacent metal strip windings.

4,894,982

TWISTING MACHINE PARTICULARLY FOR TWISTED THREADS

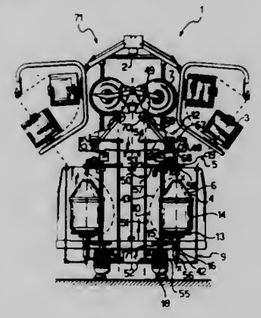
Franco Bianchi, Milan, Italy, assignor to Officine Meccaniche Riva S.r.l., Como, Italy

Filed Oct. 4, 1988, Ser. No. 253,071

Claims priority, application Italy, Oct. 13, 1987, 22249 A/87

Int. Cl.[4] D01H *7/00;* D02G *3/28*

U.S. Cl. 57—58.36 **12 Claims**



1. A yarn twisting machine, comprising:

a main frame;

first reel support means connected to said frame for carrying a first pay-off reel of yarn;

a spindle journalled for rotation to said frame for carrying a second pay-off reel of yarn;

a flyer for engaging and twisting two yarns to each other at a gathering point to form a twisted thread, said flyer being journalled for rotation to said frame;

take-up reel support means connected to said frame for carrying a take-up reel for taking up twisted yarn from said flyer;

means defining a first path for yarn from said first reel support means to said gathering point;

means defining a second path for yarn from said spindle to said gathering point;

means defining a path for twisted thread from said gathering point to said take-up reel support means;

a capstan feed journalled for rotation to said frame in said path for twisted thread for positively feeding twisted thread from said gathering point to said take-up reel support means; and

positive mechanical drive means interconnected between said capstan feed, said flyer and said spindle for positively rotating said capstan, said flyer and said spindle together at least during a start up period for the machine.

4,894,983

OPENING ROLLER FOR AN OPEN-END SPINNING ARRANGEMENT

Friedbert Schmid, Bad Überkingen, Fed. Rep. of Germany, assignor to Wilhelm Stahlecker GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1989, Ser. No. 336,021

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814514

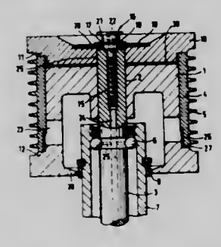
Int. Cl.[4] D01H *7/895;* D01G *19/10*

U.S. Cl. 57—408 **7 Claims**

1. An opening roller for an open-end spinning arrangement, having a basic body, which is pressed onto a shaft, an exchangeable ring mounting being pushed onto this basic body, and this ring mounting, by means of its front faces, being held between a flange of the basic body and a tension disk, which is fitted onto the shaft and which is loaded in axial direction by means of the head of a screw, which is screwed axially into the

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shaft, wherein the head of the screw, in the operative position, is fixed against the front face of the shaft, and wherein a spring



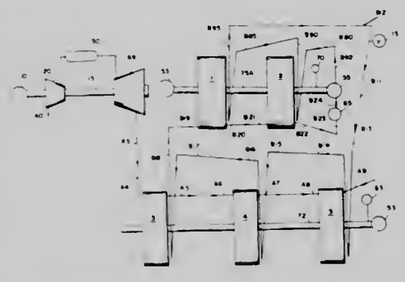
element is arranged between the head of the screw and the tension disk.

4,894,984

TURBINE SYSTEMS WHICH OPERATE FROM THE EXHAUST HEAT ENERGY OF GAS OR STEAM TURBINE POWER PLANTS

Demos Papastavros, 2429 NE. 184th Ter., N. Miami Beach, Fla. 33160

Filed Feb. 1, 1988, Ser. No. 150,636
Int. Cl.[4] F02C *6/18*
U.S. Cl. 60—39.17 **8 Claims**



1. In a gas turbine power plant having a conventional gas turbine system, a medium power plant system which partially consists of a plurality of N turbines, where N is a whole number greater than one, each having a fluid inlet and a fluid outlet and a low power plant closed loop system;

a conventional gas turbine system which comprises the combination of:

a gas turbine having a fluid inlet and a fluid outlet mounted on a first shaft;

a compressor having a fluid inlet and a fluid outlet and a compressing means between its inlet and outlet, said compressor operatively connected to said first shaft;

a generator means operatively connected to said first shaft;

a combustion chamber having a fluid inlet and fluid outlet and a combusting means between its inlet and outlet;

a fluid conduit means operatively connecting the following in an open loop cycle, the environment to the inlet of said compressor, the outlet of said compressor to the inlet of said combustion chamber, the outlet of said combustion chamber to the inlet of said gas turbine, the outlet of said gas turbine to the inlet of the first of the plurality of N turbines of the medium power plant system, said fluid conduit then connecting the outlets of each of said plurality of N turbines of the medium power plant system to the inlet of the next of said plurality of N turbines of the medium power plant system and the outlet of the last of said plurality of N turbines of the medium power plant system to the environment;

a medium power plant system which comprises the combination of:

said plurality of N turbines, where N is a whole number greater than one, each having a fluid inlet and a fluid outlet and each mounted on a second shaft;

a generator means operatively connected to said second shaft;

a starter means operatively connected to said second shaft;

each of said plurality of N turbines of the medium power plant system is designed to receive heat energy to operate from the exhaust energy of said gas turbine;

a low power plant closed loop system which comprises the combination of:

a plurality of N turbines each having a fluid inlet and a fluid outlet and each mounted on a third shaft;

a generator means operatively connected to said third shaft;

a starter means operatively connected to said third shaft;

a pump having a fluid inlet and a fluid outlet and a pressurizing and circulating means between its inlet and outlet said pump operatively connected to said third shaft;

a condenser having a fluid inlet and a fluid outlet and a condensing means between its inlet and outlet;

a fluid conduit means operatively connecting the following in a closed loop, the outlet of said pump to the inlet of the first of the said plurality of N turbines of the low power plant closed loop system, the outlets of each of the said plurality of N turbines of the low power plant closed loop system to the inlet of the next of said plurality of N turbines of the low power plant closed loop system, the outlet of the last of said plurality of N turbines of the low power plant closed loop system to the inlet of said condenser, the outlet of said condenser to the inlet of said pump;

said fluid conduit means operatively connecting the outlet of said pump to the inlet of the first of said plurality of N turbines of the low power plant closed loop system is designed to first pass by and receive exhaust heat energy from the outlet of each of said plurality of N turbines of the low power plant closed loop system and second pass by and receive exhaust heat energy from the outlets of each of said plurality of N turbines of the medium power plant system, both through the use of a heat exchange relationship therefore preheating the working fluid which is used to operate the turbines of the low power plant closed loop system, as heat energy is received from the outlets of said turbines a pressure drop occurs at the outlets of said turbines.

4,894,985

THRUST REVERSER WITH MOVABLE DEFLECTOR

Claude A. G. Dubois, Honfleur, and Xavier R. Y. Lore, Le Havre, both of France, assignors to Societe Anonyme Dite: Hispano Suiza, Saint Cloud, France

Filed Jul. 22, 1988, Ser. No. 223,021
Claims priority, application France, Jul. 29, 1987, 87 10731
Int. Cl.[4] F02K *1/70*
U.S. Cl. 60—226.2 **26 Claims**

1. In a turbofan-type turbojet engine having an annular wall defining an exhaust passage substantially coaxial with the longitudinal axis of the engine for air driven by the turbofan in an upstream-to-downstream direction, the annular wall defining at least one generally laterally facing opening, an outer air flow surface and an inner air flow surface, the improved thrust reversing device comprising:

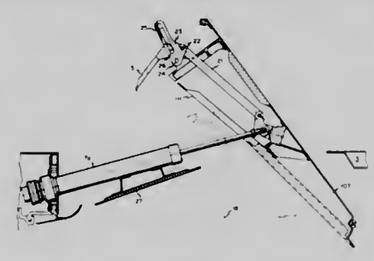
(a) at least one thrust reversing door having an upstream edge, a downstream edge, an outer surface and an inner surface;

(b) means for pivotally attaching the thrust reversing door to the annular wall such that it pivots about a first pivot axis;

(c) actuating means for moving the thrust reversing door between a first position wherein it covers the at least one laterally facing opening such that the outer surface is substantially flush with the outer air flow surface of the annular wall and air flow through the exhaust passage is unimpeded, and a second position wherein the laterally facing opening is uncovered and the thrust reversing door directs air outwardly through the opening so as to have an upstream acting component;

(d) deflector means having a distal edge; and,

(e) attaching means for movably attaching the deflector



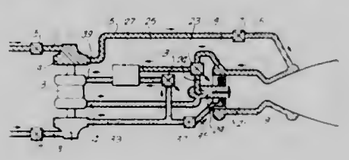
means to the thrust reversing door adjacent to the upstream edge such that it is movable between a retracted position wherein the distal edge does not extend beyond the inner surface of the thrust reversing door when the door is in the first position thereby allowing the inner surface of the thrust reversing door to be generally flush with the inner air flow surface of the annular duct, and an extended position wherein the distal edge extends substantially beyond the inner surface when the door is in the second position so as to direct the air emanating from the lateral opening in a generally upstream direction.

4,894,986

BIPROPELLANT ROCKET ENGINES

Colin J. Etheridge, Buckingham, England, assignor to Royal Ordnance, London, England

Filed Apr. 26, 1989, Ser. No. 343,444
Claims priority, application United Kingdom, May 11, 1988, 8811126
Int. Cl.[4] F02K *9/52*
U.S. Cl. 60—258 **10 Claims**



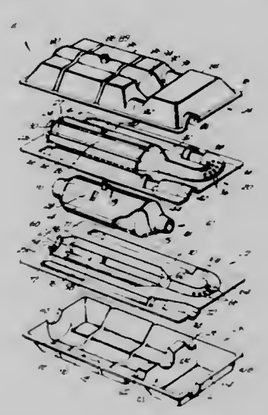
1. A construction for the delivery of propellant constituents to the main combustion chamber of a hypergolic liquid bipropellant rocket engine having a staged combustion cycle incorporating at least one precombustor comprising a mixer for mixing together prior to delivery to the main combustion chamber a first propellant constituent comprising oxidant together with exhaust gas from the precombustor, injector means for injecting the mixture of the oxidant and exhaust gas provided by the mixer into the main combustion chamber in such a manner that the injected mixture forms a recirculation zone inside the main combustion chamber, an inlet into the main combustion chamber for a second propellant constituent comprising fuel, and a delivery channel to the said inlet, the said inlet and delivery channel being disposed laterally of the injector means relative to the main direction of flow through the injector means in such a position that fuel delivered into the main combustion chamber thereby is delivered into the said recirculation zones.

4,894,987

STAMP FORMED MUFFLER AND CATALYTIC CONVERTER ASSEMBLY

Jon W. Harwood; Michael Clegg, and Bruno A. Rosa, all of Toledo, Ohio, assignors to AP Parts Manufacturing Company, Toledo, Ohio

Filed Aug. 19, 1988, Ser. No. 234,261
Int. Cl.[4] F01N *3/20*
U.S. Cl. 60—299 **19 Claims**



1. A catalytic converter and exhaust muffler assembly having an inlet and an outlet for connection to pipes of an exhaust system, said assembly comprising:

a catalytic converter;

first and second internal plates formed to engage said catalytic converter and to define channels disposed to define an array of tubes between said plates, said array of tubes being in communication with the catalytic converter and with the inlet and outlet of the assembly, selected portions of said channels being provided with perforations extending therethrough; and

at least one external shell secured to and surrounding at least portions of said internal plates, said external shell being stamp formed to define at least one expansion chamber surrounding and enclosing the perforations in the channels.

4,894,988

HYDRAULIC SYSTEM FOR OPERATING SWITCHING OR LIKE DEVICES

Albert J. Hoppenjans, Belleville, Ill., assignor to Turner Electric Corporation, Fairview Heights, Ill.

Continuation of Ser. No. 917,786, Oct. 10, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 205,571
Int. Cl.[4] H01H *3/24*; H02B *5/02*
U.S. Cl. 60—418 **14 Claims**

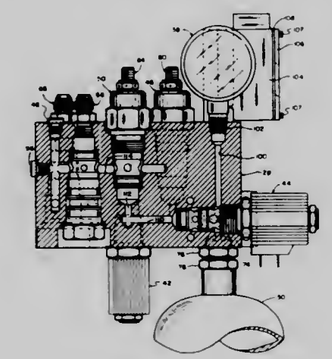
12. In a hydraulic switch actuated control apparatus having a hydraulic actuator assembly including a housing with a member movable therein between a first position and a second position in response to the application of hydraulic pressure into the actuator housing on opposite sides of the movable member, said actuator housing having a first inlet for introducing hydraulic pressure therein to move the movable member from the first to the second position thereof and a second inlet for alternatively introducing hydraulic pressure therein to move the movable member from the second to the first position thereof,

a source of hydraulic fluid under pressure and means for selectively applying pressure from said source to the first and second actuator housing inlets,

the improvement comprising a one piece multi-sided block member having an inlet port in one face, a pair of outlet ports in another face and first and second separate sets of connecting passageways in said block member extending between the inlet and each outlet port of said pair, all of the passageways of said first and second sets extending into the block member and formed by passage portions extending substantially normal to respective block faces,

means connecting the outlet ports of the pair to the respective first and second inlets to the hydraulic actuator assembly,

the first set of connecting passageways in the block member including angularly related communicating passages including a first passageway extending into the block member in communication with the inlet port, communicating second and third passageways extending between and communicating the first passageway with one of the pair of outlet ports, solenoid operated valve means associated with the first passageway to control communication be-



tween the inlet port and said one outlet port, means associated with the second passageway adjustable to predeterminately limit communication between the inlet port and said one outlet port,

the second set of connecting passageways in the block including angularly related communicating passages extending between the inlet port and the other of said outlet ports, said second set of passageways including a first passageway extending into the block in communication with the inlet port, and parallel connected second and third passageways in the block communicating the first passageway of said second set with the other outlet port, solenoid operated valve means associated with the first passageway of said second set to control communication between the inlet port and said other outlet port, means associated with said parallel second passageway of the second set adjustable to predeterminately limit communication between the inlet port and the other outlet port,

the parallel connected third passageway in the block including associated solenoid operated valve means to control communication therethrough and other means in said parallel connected third passageway adjustable to predeterminately limit communication therethrough.

4,894,989

HEATER FOR A STIRLING ENGINE

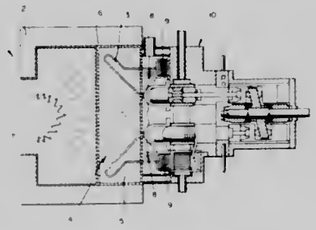
Tomokimi Mizuno, Chiryu; Tetsumi Watanabe, Osazaki; Nobuhiro Tanatsugu, and Ryojiro Akiba, both of Tokyo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 90,512, Aug. 28, 1987. This application Jan. 8, 1989, Ser. No. 364,556

Claims priority, application Japan, Aug. 29, 1986, 61-204321

Int. Cl.[4] F02G *1/04*

U.S. Cl. 60—517 **16 Claims**



1. A heater for a Stirling engine, comprising:

a burner;

heater tubes disposed in the burner;

a primary high-temperature heat source providing a variable amount of heat for heating the heater tubes; and

a space formed around the heater tubes in the burner and filled with heat-storing material, the heat storing material being in direct contact with the heater tubes and the space being separated from said primary heat source by a seal member, heat produced by the primary heat source being supplied to the heater tubes solely through the heat-storing material, the heat-storing material acting as a secondary heat source for supplying stored heat by phase change or chemical reaction to the heater tubes, wherein the heat-storing material is substantially free of sensible heat-storing material.

4,894,990

VARIABLE-CAPACITY EXHAUST GAS TURBINE SUPERCHARGER

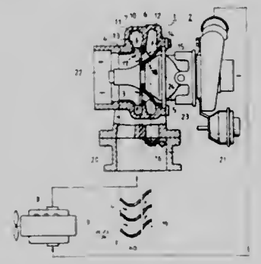
Haruyoshi Tsubouchi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 251,818

Claims priority, application Japan, Oct. 5, 1987, 62-249826

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—602 **5 Claims**



1. A variable-capacity exhaust gas turbine supercharger having a radial turbine and a compressor fixedly mounted on a same shaft, and a partition means provided in a casing of said radial turbine for dividing an interior of a scroll portion of said casing into two scroll chambers, one of said scroll chambers is in constant communication with an exhaust manifold to form an open scroll chamber, a control valve means is provided in said exhaust manifold for interrupting communication between the other of said scroll chambers and the exhaust manifold when a flow rate of an exhaust gas in said exhaust manifold is lower than a certain value thereby forming a closed scroll chamber and permitting the closed scroll chamber to communicate with said exhaust manifold when the flow rate of the exhaust gas is higher than the certain value, said open scroll chamber having an opening disposed in opposition to a circumferential portion of turbine blades of said radial turbine, said closed scroll chamber having an opening disposed in opposition to a rear surface of said turbine blades as viewed in a direction of flow of the exhaust gas through the radial turbine, and wherein a plurality of guide vanes are provided between said opening of said closed scroll chamber and said rear surface of said turbine blades so that the guide vanes directly face said rear surface of said turbine blades.

4,894,991

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH TURBOCHARGER

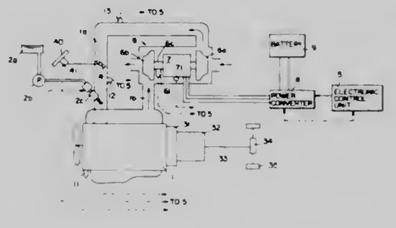
Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,267

Claims priority, application Japan, Dec. 28, 1987, 62-335121

Int. Cl.[4] F02B *37/14*

U.S. Cl. 60—608 **3 Claims**



1. A control system for an internal combustion engine having a turbocharger, comprising:

an electric rotary machine disposed on a rotatable shaft of said turbocharger;

an accelerator pedal position sensor for detecting the degree of depression of an accelerator pedal which controls operation of the engine;

an engine speed sensor for detecting the speed of rotation of said engine;

an amount-of-air sensor for detecting the amount of air downstream of a throttle valve disposed in an intake pipe connected to said engine;

means for calculating an amount of air commensurate with an amount of fuel to be supplied which corresponds to the degree of depression of the accelerator pedal, based on detected signals from said engine speed sensor and said accelerator pedal position sensor;

means for calculating electric power to be supplied to said electric rotary machine, which corresponds to the difference between said commensurate amount of air and the amount of air detected by said amount-of-air sensor, when a value produced by subtracting the amount of air detected by said amount-of-air sensor from said commensurate amount of air is larger than a predetermined value;

means for supplying the calculated electric power to said electric rotary machine;

means for calculating an amount of fuel to be supplied which corresponds to the amount of air detected by said amount-of-air sensor, after said electric rotary machine is operated; and

means for supplying said engine with said calculated amount of fuel.

4,894,992

TURBO COMPOUND ENGINE

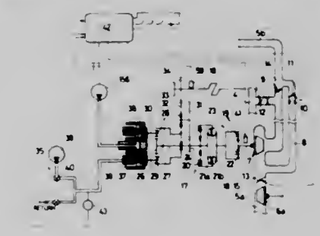
Shigeo Sekiyama, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,670

Claims priority, application Japan, Oct. 28, 1987, 62-270330

Int. Cl.[4] F02G *5/00*

U.S. Cl. 60—624 **6 Claims**



1. A turbo compound engine, comprising:

an engine possessing an intake air passage, an exhaust gas passage and a crankshaft;

a power turbine disposed in the exhaust gas passage, the power turbine being rotatable both in normal and reverse senses;

a reversing mechanism including a friction type clutch having an engagement mode for connecting the power turbine with the crankshaft such that the rotational direction of the power turbine is reversed when the friction type clutch is switched to its engagement mode; and

biasing means for exerting pressure on the friction type clutch so as to adjust the strength of engagement between the crankshaft and the power turbine in a manner such that the biasing means causes the friction type clutch to produce a first amount of frictional torque sufficient in magnitude to stop the power turbine from rotating in the normal direction when the clutch is switched to its engagement mode and to produce a second amount of frictional torque when the power turbine starts rotating in the reverse direction, said second amount being greater than said first amount.

4,894,993

METHOD OF AND APPARATUS FOR PRODUCING POWER FROM SOLAR PONDS

Gad Assaf, Rehovot, and Uriyel Fisher, Haifa, both of Israel, assignors to Solmat Systems, Ltd., Yavne, Israel

Filed Dec. 4, 1987, Ser. No. 128,824

Int. Cl.[4] F03G *7/02*; F01K *9/00*

U.S. Cl. 60—641.8 **31 Claims**

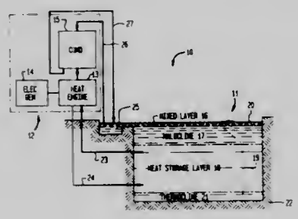
1. A method for producing power from a salt water solar pond having an upper wind-mixed layer, a halocline and a lower convective heat storage layer for storing heat from solar radiation incident on the surface of the solar pond, said method comprising the steps of

(a) using heat from said storage layer to operate a power plant having a heat engine producing power and heat depleted working fluid, and having a condenser; and

(b) cooling the heat depleted working fluid in the condenser using a direct contact heat exchange with droplets of fluid from the upper wind-mixed layer; and

(c) selecting the size of the droplets and their residence time

in the condenser such that the majority of the liquid content of most of the droplets absorbs the heat transferred in



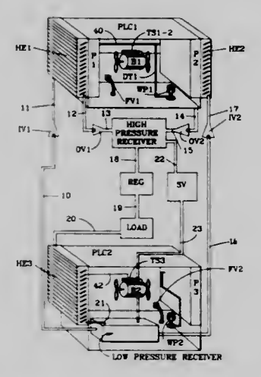
the condenser while releasing a minimum amount of gases contained in the droplets.

4,894,994

SEALED HEAT ENGINE

Loanie S. Carter, P.O. Box 544, Ashland, Kans. 67831

Filed May 20, 1988, Ser. No. 196,295
Int. Cl.[4] F01K *25/10*
U.S. Cl. 60—671 2 Claims



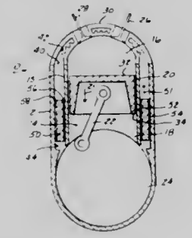
1. A solar apparatus for generating a gas for driving an engine having an inlet and outlet comprising:
(a) first and second plenum means;
(b) a high pressure and a low pressure reservoir means;
(c) liquid to gas conversion means mounted in said first plenum means, said liquid to gas conversion means comprising heat exchange means and an evaporative cooling means, bidirectional fan means and temperature sensing means coupled to said fan means whereby when said fan means is operating in one direction, air will pass through said heat exchange means and through said evaporative cooling means causing said heat exchange means to increase in temperature thereby converting said liquid into a gas and wherein when said heat exchange means reaches a predetermined temperature said fan means is reversed in direction causing air to move through said evaporative cooling means and then said heat exchange means thereby causing said heat exchange means to cool, resulting in liquid moving from said low pressure reservoir means to said heat exchange means so that said cycle can be repeated;
(d) gas to liquid conversion means mounted in said second plenum means;
(e) means coupling said low pressure reservior means to said liquid to gas conversion means;
(f) means coupling said liquid to gas conversion means to said high pressure reservior means;
(g) means for coupling said high pressure reservior means to said inlet of said engine means;
(h) means for coupling said outlet of said engine means to said gas to liquid conversion means and, means for coupling said gas to liquid conversion means to said low pressure reservior means;
whereby said low pressure liquid is converted to a gaseous state and transferred from said high pressure reservior means through said engine means to said low pressure reservoir means.

4,894,995

COMBINED INTERNAL COMBUSTION AND HOT GAS ENGINE

Lawrence LaSota, 15745 N. Park, E. Detroit, Mich. 48021, assignor to Lawrence LaSota, E. Detroit, Mich.

Filed May 22, 1989, Ser. No. 354,836
Int. Cl.[4] F01B *29/04*
U.S. Cl. 60—712 19 Claims



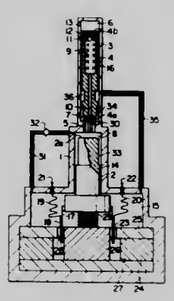
1. A combined internal combustion and heat engine having an engine block, the engine comprising:
a combustion cylinder formed in the engine block;
a piston reciprocally mounted within the cylinder and movable between compression and expansion ends of the cylinder;
a working space formed in the engine block surrounding the cylinder, the working space disposed in fluid flow communication with the cylinder on one side of the piston and having a hot end disposed adjacent the combustion end of the cylinder and a cold end disposed in fluid flow communication with the expansion end of the cylinder;
a working fluid filling the working space;
a displacer reciprocally mounted in the working space for moving the working fluid from the hot end of the working space adjacent the compression end of the cylinder, wherein the working fluid picks up heat from the combustion end of the cylinder, through the working space to the cold end of the working space and into the expansion end of the cylinder; and
means for reciprocally driving the displacer in a timed phase relation with the piston.

4,894,996

GAS REFRIGERATOR

Yoshio Kazumoto; Kazuo Kashiwamura; Yoshiro Furuishi, and Takuya Suganami, all of Amagasaki City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 330,325
Claims priority, application Japan, Mar. 28, 1988, 63-73722; Jun. 8, 1988, 63-140962
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 16 Claims



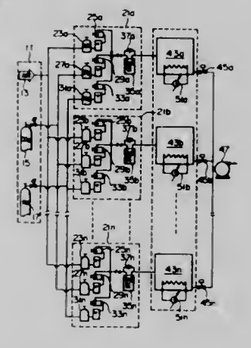
1. A refrigerator comprising:
a cold finger in which a working gas is filled;
A displacer disposed within said cold finger and defining therein an expansion space and a first compression space, said displacer being reciprocatingly movable to change volumes of said expansion space and said first compression space;
a regenerator communicating with said expansion space and said first compression space;
a cylinder in which a working gas is filled;
a piston disposed within said cylinder and defining therein a second compression space and a buffer space, said piston being reciprocatingly movable to change volumes of said second compression space and said buffer space;
a communication pipe communicating said first compression space to said second compression space;
said expansion space, said first compression space, said commmunication pipe, said second compression space and said regenerator defining a working space filled with the working gas;
wherein a thermodynamic cycle can be generated in said working gas within said working space to generate coldness within said expansion space by reciprocatingly moving said piston and said displacer with a predetermined phase relationship therebetween;
a first connecting circuit having a check valve therein and connecting said working space and said buffer space;
said cold finger defining therein a drain space;
a second connecting circuit connecting said drain space and said buffer space; and
a hydrostatic displacer bearing disposed between said displacer and said cold finger for hydrostatically supporting said displacer against said cold finger utilizing a pressure difference of the working gas between said working space and said drain space.

4,894,997

METHOD OF STORING FRUITS AND VEGETABLES

Saeo Urushizaki, Tsukuba; Kazuhiko Ibe; Yutaka Matsumoto, both of Yokosuka; Kazuo Kershina, Kamakura; Shinichi Yamada, Kiyokawa, and Hitoshi Ozaki, Tokyo, all of Japan, assignors to Director General of National Institute of Agrobiological Resources, Tsukuba and Sumitomo Heavy Industries, Ltd., Tokyo, both of, Japan

Filed May 13, 1988, Ser. No. 193,912
Claims priority, application Japan, May 18, 1987, 62-118777; May 18, 1987, 62-118778
Int. Cl.[4] F24F *3/16*
U.S. Cl. 62—78 6 Claims



1. A method of storing fruits and/or vegetables immediately after harvest, which comprises the steps of
placing said fruits and/or vegetables in an enclosed storage chamber containing a controlled atmosphere consisting of a mixture of gases comprising oxygen and carbon dioxide, said mixture of gases having a total pressure of not lower than 400 Torr and up to 700 Torr, an oxygen partial pressure of from about 15 Torr to about 145 Torr and a carbon dioxide partial pressure of about 15 Torr to about 115 Torr, maintaining the relative humidity of said mixture of gases at not lower than 90% and maintaining the temperature of the mixture of gases at from about 0 to 15° C., mixing air and carbon dioxide from external sources under controlled pressures and flow rates to prepare a gaseous feed mixture having the same pressure and the same oxygen and carbon dioxide partial pressures as said controlled atmosphere in said storage chamber, and continuously supplying said gaseous feed mixture into said storage chamber while simultaneously exhausting the controlled atmosphere from said storage chamber at the same rate as said gaseous feed mixture is fed into said storage chamber.

4,894,998

ABSORPTION SYSTEM HOT AND COLD WATER SUPPLY APPARATUS

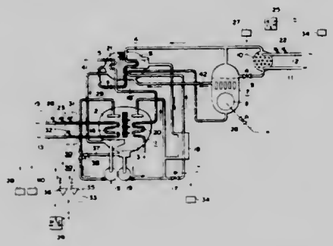
Toshiyuki Kaneko; Shigenori Tatsuhita, both of Ota; Norio Sawada, Oizumi; Hisao Honda, and Takaki Iwaya, both of Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 3, 1988, Ser. No. 227,878
Claims priority, application Japan, Aug. 26, 1987, 62-212559
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—148 6 Claims

1. An absorption system hot and cold water supply apparatus, comprising:
a generator, a condenser, an evaporator having means for conducting water in heat exchange relation therethrough for obtaining cold water and having a cold water outlet, an absorber, a solution heat-exchanger, and a solution pump, and piping forming a refrigerant circulation path

for circulating a refrigerant and an absorbent solution circulation path for circulating an absorbent solution through the generator, the condenser, the evaporator, the absorber, the solution heat exchanger and the solution pump;

refrigerant blow means connected to said absorbent solution circulation path and controllable for blowing refrigerant into said absorbent solution circulation path and stopping spray of refrigerant into said evaporator;



thermo-capacity control means for controlling at least the quantity of heat produced by said generator in response to a water temperature of water supplied by said apparatus; and

controlling means forming part of said thermo-capacity control means and connected to said refrigerant blow means for controlling the operation of said refrigerant blow means in response to the cold water outlet temperature from said evsporator.

4,894,999

AUTOMATIC AIR CONDITIONING SYSTEM WITH VARIABLE DISPLACEMENT COMPRESSOR, FOR AUTOMOTIVE VEHICLES

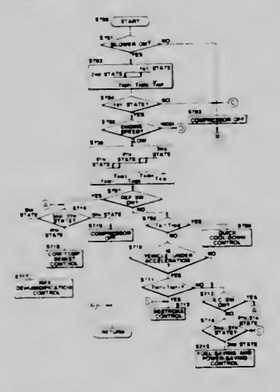
Masaki Kaiju; Toshimitsu Nose; Hideyuki Sakamoto, and Ikuo Kiminami, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 30, 1989, Ser. No. 330,550

Claims priority, application Japan, Mar. 31, 1988, 63-81995

Int. Cl.[4] F25B *1/00*

U.S. Cl. 62—158 **32 Claims**



1. An automatic air conditioning system for automotive vehicles with a variable displacement compressor comprising:

first detecting means for detecting a first physical quantity indicative of a cooling condition of an evaporator of said automatic air conditioning system;

discharge changing means for essentially changing the discharge of said compressor on the basis of the difference between said first physical quantity and its preset value;

first signal generating means for generating a first signal in response to a requirement for quick-cooling; and

preset value changing means for changing said preset value of said first physical quantity in such a manner that, when said preset value changing means does not receive said first signal, said preset value is set to a first value at which an intake air temperature, defined by the temperature of air flowing through said evaporator as measured just behind said evaporator, reaches a freezing start possible temperature, an intake air temperature such that the freezing of said evaporator starts, and when said preset value changing means receives said first signal, said preset value is set to a second value at which said intake air temperature reaches a predetermined temperature lower than said freezing start possible temperature.

4,895,000

AIR CONDITIONING SYSTEM FOR VEHICLES

Tadahiro Takahashi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

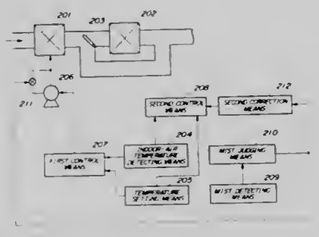
Division of Ser. No. 22,285, Mar. 5, 1987, Pat. No. 4,783,970.

This application Jul. 22, 1988, Ser. No. 223,273

Claims priority, application Japan, Mar. 12, 1986, 61-034637[U]; Mar. 28, 1986, 61-045767[U]; Apr. 30, 1986, 61-099933

Int. Cl.[4] F25D *17/06*

U.S. Cl. 62—176.3 **5 Claims**



1. An air conditioning system for a vehicle, said vehicle having a compartment and a windowpane, comprising:

cooling means for cooling air, said cooling means including a compressor of a variable capacity type;

heating means for heating air having passed through said cooling means;

damper means for controlling an amount of air flowing from said cooling means toward said heating means and an amount of air flowing from said cooling means and by-passing said heating means;

temperature detecting means for detecting a temperature of air within the compartment of the vehicle;

means for setting a desired temperature within the compartment of the vehicle;

first control means for controlling the capacity of said compressor in relation to a deviation between said detected temperature and said set temperature;

second control means for controlling an opening degree of said damper means in relation to said deviation;

mist detecting means for detecting a mist on the windowpane of the vehicle;

judging means, receiving an output from said mist detecting means, for judging whether or not the windowpane is misted; and

first correction means, responsive to an output from said judging means, for increasing the capacity of said compressor by a predetermined amount when it is judged by said judging means that the windowpane is misted;

the improvement comprising:

second correction means, responsive to an output from said judging means, for correcting the opening degree of said damper means to a position where the amount of air flowing toward said heating means is increased by a predetermined amount when it is judged by said judging means that the windowpane is misted;

said predetermined amount by which the opening degree of said damper means is increased by the second correction means being set to such a value as to compensate for an increase in cooling degree due to the increase in the capacity of said compressor, to thereby avoid a sudden change in temperature within the compartment.

4,895,001

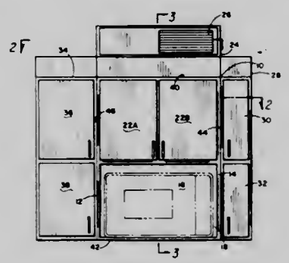
EXPANDABLE REFRIGERATION SYSTEM

Joseph S. Jondahl, 9305 S. College, Unit 304, Tulsa, Okla. 74137

Filed Mar. 17, 1989, Ser. No. 324,724

Int. Cl.[4] F25B *27/00*

U.S. Cl. 62—326 **6 Claims**



1. An expandable refrigeration system for use in dispensing products to the public, comprising:

a base unit having a product containing chamber;

a refrigeration system having a compressor and a condenser supported adjacent said base unit and a fan for moving ambient air past said condenser;

an evaporator cabinet supported adjacent said refrigeration system and said base unit and having an evaporator therein, and means connecting the flow of refrigerant between said compressor, said condenser and said evaporator;

fan means for moving air past said evaporator;

means to direct air flowing past said evaporator into a first portion of said base unit product containing chamber and means for returning air from a second portion of said base unit product containing chamber to said evaporator whereby air is chilled by said evaporator and is circulated through both said portions of said base unit product containing chamber;

a slave unit having a product containing chamber, the slave unit being contiguous with said base unit;

first duct means communicating the interior of said slave unit product containing chamber with said base unit product containing chamber first portion; and

a second duct means communicating the interior of said slave unit product containing chamber with said base unit product containing chamber second portion whereby chilled air is circulated within said slave unit product containing chamber.

4,895,002

AIR CONDITIONING DEVICE

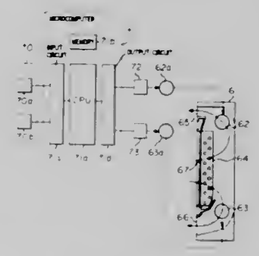
Hidenori Ishioka; Hiroyuki Umemura; Kenji Matsuda; Tetsuji Okada; Katsuyuki Aoki, and Seiji Kubo, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1989, Ser. No. 295,530

Claims priority, application Japan, Jan. 11, 1988, 62-3384; Jan. 14, 1988, 62-3318[U]; Mar. 18, 1988, 62-65182

Int. Cl.[4] F24B *1/06;* **F25D** *17/00*

U.S. Cl. 62—408 **3 Claims**



1. An air conditioning device comprising:

a refrigerant compression cycle having an electrically driven compressor;

an electric motor for driving the compressor;

frequency changing means for changing the frequency of a.c. power to be applied to the motor;

an outlet port for blowing off conditioned air;

flowing direction changing means for changing the flowing direction of the conditioned air from the outlet port;

a switch which is actuated by a user when he desires to allow the conditioned air to hit himself directly; and

control means for controlling the frequency changing means and the flowing direction changing means;

wherein when the switch is actuated during room cooling operation, the control means outputs to the flowing direction changing means a signal for directing the conditioned air from the outlet port in a downward flowing direction and wherein when said switch is actuated the frequency of said A.C. power supplied to said compressor is changed.

4,895,003

ABSORBER-TYPE HEAT PUMP

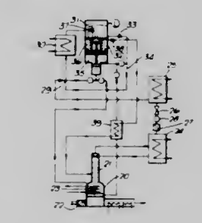
Fred Houghton, Hartlepool, and Paul Holmes, Hartburn, both of Great Britain, assignors to Foster Wheeler Energy Limited, Great Britain

Filed Jun. 17, 1988, Ser. No. 207,807

Claims priority, application United Kingdom, Jun. 19, 1987, 8714423

Int. Cl.[4] F25B *15/00*

U.S. Cl. 62—476 **13 Claims**

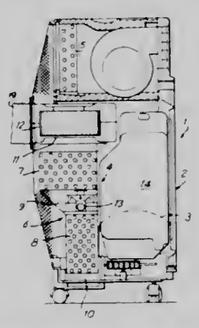


1. A closed circulatory heat-pump system comprising

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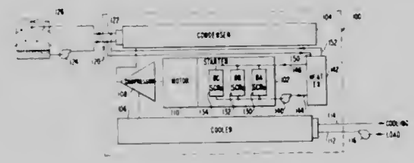
vapor generator means;
absorber means; and
absorber/solution pump means comprising a pump having a body containing a pumping chamber and a working chamber, said pumping chamber being separated from said working chamber by a reciprocating piston, said pumping chamber being positioned above said working chamber and exhausting its contents to said vapor generator means;
a tank for storing relatively strong concentration low-pressure liquor, said tank being situated immediately above said pumping chamber wherein liquor is drawn from said tank by said pump directly into said pumping chamber in a generally downward direction; and a gravity-actuated series circulatory loop external to said pump;
wherein said tank is disposed at the high point ins aid gravity-actuated series circulatory loop, said loop including said absorber means upstream of said tank and a system vapor input at the inlet to said absorber means, and
wherein said working chamber of said pump has an inlet/exhaust port through which it receives, as the working fluid, relatively weak concentration high-pressure liquor from said vapor generator means and through which it exhausts its working fluid to a low-pressure point in said gravity-actuated circulatory loop.

4,895,004
AIR CONDITIONING APPARATUS
Giuseppe De'Longhi, Treviso, Italy, assignor to Miralfin S.P.A., Treviso, Italy
Filed Sep. 26, 1988, Ser. No. 249,323
Claims priority, application Italy, May 13, 1988, 20576 A/88
Int. Cl.[4] F25B *39/04*
U.S. Cl. 62—506 **1 Claim**



1. Air conditioning apparatus of the type including a compressor for refrigerant fluid, a first heat exchanger for cooling compressed refrigerant fluid, an expander for expanding said cooled refrigerant fluid, and a second heat exchanger in which said expanded refrigerant fluid is heated, further including:
a first section of said first heat exchanger, and a second section of said first heat exchanger, said first section being arranged vertically above said second section;
means for traversing cooling air serially upwardly across said second section and then said first section;
a connection from said compressor to an upper end of said first section;
a connection from a lower end of said first section to an upper end of said second section;
a connection from a lower end of said second section and said expander for compressed refrigerant fluid; and,
selectively operable means for water cooling said second section;
whereby, when said water cooling means is operative, said heated refrigerant fluid from said compressor is subjected to an initial decrease in temperature by air cooling in said first section, and is then subjected to a final decrease in temperature by combined air and water cooling in said second section, said initial decrease in temperature in said first section being operative to reduce the temperature of refrigerant fluid supplied to said second section and in turn reduce the rise in temperature and rate of evaporation of said coolant water employed for cooling said second section, cooling in said first section being further assisted by water vapor and droplets produced in said second section and entrained in the air flow traversing said second section, droplets trapped by said first section being returned by gravity to said second section; and,
whereby, when said water cooling means is inoperative, cooling air of ambient temperature is first employed to cool said second section containing refrigerant fluid of lower temperature in order to provide maximum temperature differential at said second section, and is then employed to cool said first section.

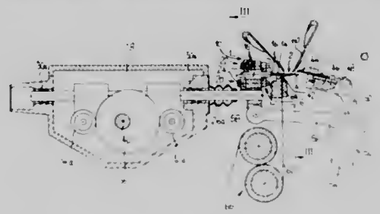
4,895,005
MOTOR TERMINAL BOX MOUNTED SOLID STATE STARTER
Dean K. Norbeck, York, and Harold R. Schneczka, II, Spring Grove, both of Pa., assignors to York International Corporation, York, Pa.
Filed Dec. 29, 1988, Ser. No. 291,779
Int. Cl.[4] H02B *1/00*
U.S. Cl. 62—506 **28 Claims**



1. A power regulation system for an electric motor, said motor including motor power leads for connection to a source of electrical power for driving the motor, said system comprising:
a terminal box;
a plurality of power semiconductor devices, coupled between the electric power source and the power leads and housed within said terminal box, for regulating power flow to the motor at least during a starting period of motor operation;
means for cooling each said semiconductor device by use of a liquid coolant, said cooling means including a sealed liquid flow element, independent of and housed within said terminal box, through which liquid coolant enters and exits; and
control means coupled with said power semiconductor devices for driving said power semiconductor devices according to a control signal.

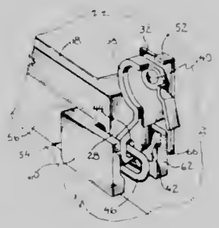
4,895,006
CROCHETING MACHINE
Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland
Filed Jul. 28, 1988, Ser. No. 225,524
Claims priority, application Switzerland, Jul. 30, 1987, 02921/87
Int. Cl.[4] D04B *23/00*
U.S. Cl. 66—203 **9 Claims**

1. A crocheting machine, comprising a knock-over rail, a plurality of slide needles mounted for crosswise to-and-fro motion with respect to the knock-over rail, a warp thread guide for each slide needle and at least one tube filling yarn guide mounted for movement across said slide needles for cooperating with said slide needles to produce knitting, said slide needles each comprising a knitting needle and a slide slidably engaged with said knitting needle, a knitting needle bar connected to the knitting needle of all of said slide needles and a slide bar connected to the slide of all of said slide needles, said slide bar being mounted above the knitting needle bar, said knitting needle and slide bars having sides which face each other and said knitting needles and slides being mountable to said respective knitting needle and slide bars on said sides which face each other, said knitting needle and slide bars being



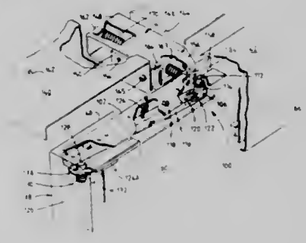
mounted for movement parallel to each other and each having a side extending substantially parallel to the direction of movement for said knitting needle and slide bars, said knitting needles and slide bars being connected to said sides of said knitting needles and slide bars, respectively, each of said knitting needles and slides including a dovetailed projection, and clamping means for clamping said dovetailed projections of said knitting needles and slides to said knitting needle and slide bars, respectively.

4,895,007
SECURITY DEVICE FOR PADLOCKS
David S. Eberly, 5407 Touraine Dr., Tallahassee, Fla. 32808
Filed Jul. 27, 1988, Ser. No. 224,844
Int. Cl.[4] E05B *67/38*
U.S. Cl. 70—54 **1 Claim**



1. In combination, a roll-up type truck door including a locking mechanism, and a padlock security device, said truck door locking mechanism including a first latch member pivotally connected to the truck door, and a second latch member pivotally connected to said truck door adjacent said first latch member, a plate having a stop projection positioned adjacent said second latch member, said first and second latch members shiftable between an unlocked position and a mutually cooperable locked position, and a padlock having a housing and a shackle extending through said first and second latch members in the locked position, said padlock security device including a block having a bore therethrough to accept said padlock shackle, two spaced peripheral longitudinal flanges extending outwardly from said block in a parallel orientation, said flanges constituting means for shielding said padlock shackle and housing when the latch members are in their said locked position, and a slot defined in one of said flanges adjacent to said block and positioned between the shackle and the door in the locked position, said slot constituting means for accommodating said second latch member and said plate stop projection when the second latch member is in its said locked position.

4,895,008
SECURITY SYSTEM
David C. Blake, 264 Geelong Rd., West Footscray, Victoria, 3012, Australia
PCT No. PCT/AU87/00014, § 371 Date Sep. 21, 1987, § 102(e) Date Sep. 21, 1987, PCT Pub. No. WO87/04481, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 21, 1987, Ser. No. 135,030
Claims priority, application Australia, Jan. 23, 1986, PH04313; Aug. 6, 1986, PH07350
Int. Cl.[4] E05B *65/46*
U.S. Cl. 70—86 **5 Claims**

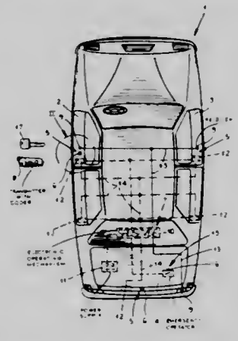


1. An electrically operable release mechanism including a longitudinal channel-shaped member with opposing faces, a rotatable cam located between said opposing faces, said cam adapted to engage a pin member when in a first or locked position, said cam pivotally coupled at one end of a resiliently biased pivotally mounted lever located between said opposing faces, the other end of said lever being held by a plunger of a solenoid when in said first position, the plunger entering the channel-shaped member through an aperture in one of said faces and said lever moving to a second or release position when said solenoid is actuated to withdraw said plunger causing said cam to rotate and release said pin member under resilient bias.

4,895,009
DOOR-LOCKING SYSTEM FOR A MOTOR VEHICLE
Frank Kleefeldt, Heiligenhaus, and Peter Bartel, Hattingen/-Buhr, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany
Filed Nov. 4, 1988, Ser. No. 267,385
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737468
Int. Cl.[4] E05B *53/00*
U.S. Cl. 70—264 **3 Claims**

1. In a door-closing system for a motor vehicle having a trunk lid and a plurality of motor vehicle doors comprising a mechanical motor vehicle door lock in each of said motor vehicle doors and in said trunk lid, a mechanical lock cylinder in said door lock of the driver's door of said motor vehicle doors and a remotely controllable electronic operating device with a transmitter acting as an electronic key, a receiver and decoder and a power supply, said motor vehicle door locks in said motor vehicle doors having at least one locked configuration and an additional theft preventative configuration and a central lock mechanism drive with control positions for engagement and/or disengagement of said theft preventative configuration and said central lock mechanism drive being operable by said electronic operating device, the improvement wherein said decoder and said receiver of said electronic oper-

ating device are independent components which are connected only electrically so that said receiver is located outside in said driver's door, and is operable only from said outside by said transmitter, said decoder is located in the interior of said motor vehicle and is connected electrically with said central lock mechanism drive and an emergency device for disengagement or release of said theft preventative configuration is provided,



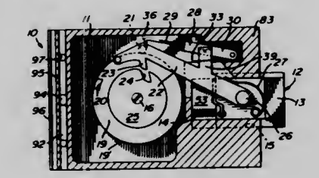
said emergency device operating electrically on said central lock mechanism drive and having a theft preventative mechanism disengaging switch, said theft preventative mechanism disengaging switch being located in a space closed by said trunk lid which has one of said motor vehicle door locks with one of said central lock mechanism drive which cannot take one of said theft preventative configurations and is operable by a mechanical key.

4,895,010

COMBINATION LOCK WITH SELF-CANCELING MECHANISM

Claude Legault, Quebec, Canada, assignor to C. L. Industries Inc., Pierrefonds, Canada

Filed Mar. 23, 1988, Ser. No. 172,249
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—314 **12 Claims**



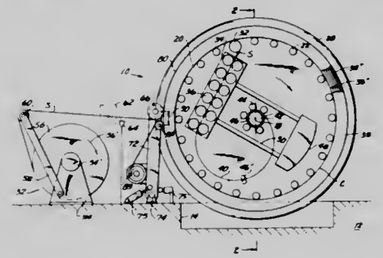
1. In a combination door lock having a lock housing, a spring-biased bolt having a locking free end, said bolt being spring-biased for sliding movement so that said free end is normally biased extending out of said housing, a manually operable combination element outside said housing, said combination element displacing one or more combination discs rotatable upon a common axis, each said one or more discs having a notch formed in an outer periphery thereof, a bolt retracting cam displaceable about said common axis, a bolt retracting lever pivotally connected to said bolt, said retracting lever having a retracting cam engaging means and a support pin supported on the outer periphery of said discs, said bolt retracting cam having means to engage said retracting cam engaging means, said one or more combination discs when positioned at a predetermined position by said combination element causing said notch(es) to align and said support pin to enter said notch(es) of said one or more discs and causing said retracting cam engaging means to engage said bolt retracting cam whereby upon further rotation of said combination element said bolt will be retracted by said bolt retracting lever, the improvement comprising self-cancelling combination means secured inside said housing and having disc engaging means for engaging one or more of said one or more combination discs when said one or more combination discs are positioned at said predetermined position, said disc engaging means being a spring-biased hook finger engaging in said notch of its associated combination disc for displacing its associated engaged disc out of position when said support pin moves out of said notch of said one or more discs prior to full retraction of said bolt by said retracting cam.

4,895,011

CONTINUOUSLY BALANCED APPARATUS FOR STORING AND DISPENSING ELONGATE MATERIALS

Andre Varga, Willowdale, Canada, assignor to Ceeco Machinery Mfg. Co. Inc., Ltd., Concord, Canada

Filed Mar. 20, 1989, Ser. No. 325,641
Int. Cl.[4] B21C *37/12, 47/00*; B65H *20/24, 20/26*
U.S. Cl. 72—49 **22 Claims**



1. A continuously balanced apparatus for storing and dispensing elongate material for use with a rotating machine having a machine axis, the apparatus comprising:

a. a support member mounted for rotation about the machine axis;

b. drive means for rotating said support member;

c. inlet guide means for guiding elongate material from an external supply to said support member;

d. storage guide means mounted on said support member serving as a reservoir for storing elongate material as a single row of substantially circular overlapping convolutions concentrically arranged in relation to said machine axis;

e. outlet guide means mounted on said support member for guiding the innermost convolution of the stored elongate material radially inwardly of the support member proximate to said machine axis for being dispensed in a manufacturing operation;

f. tension means for maintaining tension on the elongate material; and

g. sensing means for sensing when elongate material is about to be depleted from said reservoir storage guide means;

h. means actuated by said sensing means for deactivating said drive means and stopping rotation of said support member;

i. means for attaching, while said support member is stopped, a trailing end of a stored length of elongate material to a leading end of a new supply of elongate material; and

j. means for reactivating said drive means for resuming rotation of said support member to wind said new supply of elongate material on said storage guide means.

4,895,012

METHOD AND APPARATUS FOR TRANSFERRING RELATIVELY FLAT OBJECTS

Steven T. Cook, Bellbrook, and James R. Gregg, Springboro, both of Ohio, assignors to Daytos Reliable Tool & Mfg. Co., Dayton, Ohio

Continuation-in-part of Ser. No. 19,734, Feb. 27, 1987, Pat. No. 4,770,022. This application Aug. 30, 1988, Ser. No. 238,651
Int. Cl.[4] B21D *45/04*
U.S. Cl. 72—361 **16 Claims**



1. Apparatus for transferring a relatively flat object from a work station along a transfer path, comprising:

means located within the work station for locating the object in a ready position at one end of the transfer path by causing an upper surface of the object to adhere to said locating means, whereby the object is unsupported along a lower surface thereof;

means defining a plurality of orifices located on the opposite side of said ready position from said transfer path, each directed toward said ready position at an angular relationship with respect to the others of said orifices such that gas flow from said orifices converge toward the object and propel the object along the transfer path;

manifold means interconnecting said orifices;

supply means connected to said manifold means for connecting said orifices to a source of pressurized gas;

valve means disposed within said supply means for initiating and discontinuing flow of pressurized gas through said orifices; and

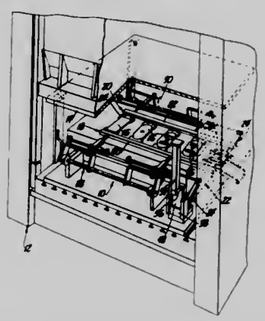
control means for controlling said valve means to direct a stream of pressurized gas through said orifices toward said ready position at least when an object is located in said ready position, thereby causing the transfer of said object in free flight from the work station.

4,895,013

WORKPIECE TRANSFER APPARATUS FOR A PUNCH PRESS

Hugh M. Sofy, 201 Warrington Dr., Bloomfield Hills, Mich. 48013

Filed Dec. 8, 1988, Ser. No. 281,543
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—405 **32 Claims**



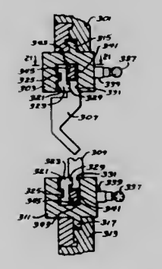
1. A workpiece transfer apparatus (10) for a press (12) of the type including a reciprocating forming member (14) actuated against a series of in-line progressively forming die stations, said apparatus (10) comprising: first engagement means (18) for engaging one side of a workpiece (16) disposed in a die station; second engagement means (20) for engaging the other side of the workpiece (16) disposed in the die station; drive means (22) for imparting a driving force to said first (18) and second (20) engagement means to move the workpiece (16) from the die station; and characterized by including clutch means (24) operatively connecting said drive means (22) to said first (18) and second (20) engagement means for disconnecting one of said first (18) and second (20) engagement means from said drive means (22) upon a predetermined resistance against said driving force applied to the one of said first (18) and second (20) engagement means while the other of said first (18) and second (20) engagement means remains operatively connected to said drive means (22), said cluctch means (24) including a first clutch (26) operatively connecting said first engagement means (18) to said drive means (22), and a second clutch (28) distinct from said first cluth (26) operatively connecting said second engagement means (20) to said drive means (22).

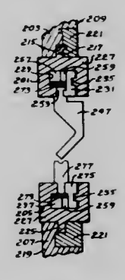
4,895,014

FAILSAFE TOOL CLAMPING SYSTEM FOR PRESS BRAKE

David L. Houston, 7444 Brookside Dr., Hanover Park, Ill. 60103

Continuation-in-part of Ser. No. 901,438, Aug. 28, 1986, Pat. No. 4,787,237. This application Jun. 2, 1988, Ser. No. 201,541
Int. Cl.[4] B21D *37/04*
U.S. Cl. 72—481 **22 Claims**





1. A press brake apparatus comprising:

a substantially stationary bed structure; and

a ram structure supported for relative reciprocal movement toward and away from the bed structure;

the ram structure and the bed structure including first and second tool structures adapted to coact for working stock place therebetween during reciprocation of the ram structure;

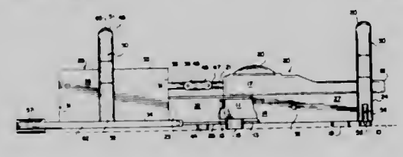
one of said tool structures comprising:

a body portion having first and second wall portions generally facing each other to define a recess therebetween in

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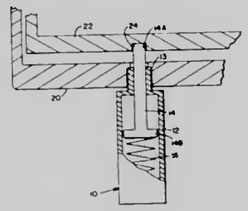
the body portion, the recess being oriented to generally face the other of the tool structures;
a tool member supported in said recess for co-acting with the other of the tool structures to work stock;
clamping means supported in said recess and movable therein between a release position and a clamped position, said clamping means in the clamped position securing the tool member in the recess and in the release position permitting the tool member to be withdrawn from the recess;
biasing means engaging said clamping means and said first wall portion, said biasing means urging said clamping means to move to the clamped position;
releasing means operatively associated with the clamping means for moving said clamping means to the release position, said release means being selectively activatable by an operator to cause the clamping means to move to the release position to release the tool member for replacement thereof.

4,895,015
HORIZONTAL PULL SLIPMETER
William English, 3018 Hunt Rd., Oakton, Va. 22124
Filed Mar. 1, 1989, Ser. No. 317,583
Int. Cl.[4] G01N *19/02*
U.S. Cl. 73—9 **3 Claims**



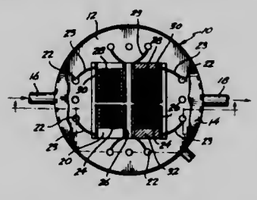
1. An improved Horizontal Pull Slipmeter having a sled assembly comprised of:
(a) a drag weight having top and bottom surfaces and opposed sides,
(b) downwardly directed slider feet emergent from said bottom surface, and adapted to simultaneously contact a flat surface whose coefficient of friction is to be measured, and
(c) a force gage affixed to said drag weight and having a visual display scale and a forwardly directedactivating plunger,
said improvement comprised of:
(a) a pair of horizntally disposed elongated parallel guide means having forward and rear extremities and upper and lower retaining shoulders which define facing channels adapted to slidably embrace the opposed sides of said drag weight, premitting said sled assembly horizontally reciprocating unencumbered movement along said guide means,
(b) a servo assembly comprising:
(1) a housing having front, rear, upper and lower surfaces and opposed sides, said housing being attached to the forward extremities of said guide means,
(2) an electric motor coupled to transmission means having a rearwardly directed threaded output shaft which rotates at a constant speed,
(3) a propulsion bar coextensive with said output shaft, extending through the rear surface of said housing and terminating in a free rear extremity, said propulsion bar being threadably engaged with said output shaft so as to undergo reciprocal axial motion,
(4) a battery power source to energize said motor,
(5) means for controlling the rotational speed of said motor,
(6) forward and rear limiting switches adapted to limit the length of stroke of said propulsion bar in said reciprocal movement, and
(7) a DPDT switch adapted to control the direction of rotation of said output shaft,
(c) a linkage having first and second extremities, said first extremity pivotably engaging the free rear extremity of said propulsion bar, said second extremity pivotably engaging the activating plunger of the force gage,
(d) forward and rear lifting means, each comprised of paired opposed upright support arms having upper and lower extremities, said upper extremities associated with handles oriented traversely to the guide means,
(e) four fixed support feet disposed in a substantially rectangular array and adapted to simultaneously rest upon said flat surface, and
(f) an activation switch associated with the rear extremity of at least one of said guide means, said switch having a downwardly directed touch rod whose bottom extremity extends lower than said support feet, whereby said touch rod contacts said flat surface simultaneously with the slider feet, causing the propulsion bar to begin forward movement of the sled assembly while the servo assembly and guide means remain stationary.

4,895,016
TIMING PIN ASSEMBLY
Charles M. Cameron, 904 Briar Ct., and George R. Waymack, 1529 Hellwig Rd., #15, both of Cheyenne, Wyo. 82007
Filed Oct. 13, 1988, Ser. No. 257,430
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 **7 Claims**



1. A timing pin assembly for insertion into a threaded aperture in a bell housing of an engine to be timed, wherein said engine includes a flywheel within said bell housing, and wherein said flywheel includes at least one detent, said timing pin assembly comprising:
(a) a tubular housing having first and second ends; wherein said first end includes an opening; wherein said first end is threaded and is adapted to be threadably secured in said aperture;
(b) an elongated pin member slidably received in said tubular housing through said opening; said pin member having first and second ends; wherein said pin member is movable between extended and retracted positions; wherein said first end is tapered;
(c) bias means within said housing which is adapted to urge said pin member to said extended position; wherein said bias means comprises a spring; wherein said bias means is adapted to urge said pin member to said extended position in a manner such that said first end of said pin member extends into said detent to lock said flywheel against movement; wherein said housing includes an elongated longitudinal slot therein; said assembly further comprising retraction means carried by said second end of said pin member; wherein said retraction means projects through said slot in said housing.

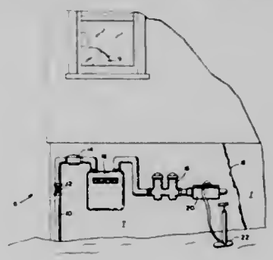
4,895,017
APPARATUS AND METHOD FOR EARLY DETECTION AND IDENTIFICATION OF DILUTE CHEMICAL VAPORS
Stephen C. Pyke, Monroe, and Harold E. Hager, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jan. 23, 1989, Ser. No. 300,367
Int. Cl.[4] G01N *31/06*
U.S. Cl. 73—23 **30 Claims**



1. Apparatus for rapidly detecting and identifying a chemical substance, comprising:
(a) a sensor having a surface exposed to the chemical substance and comprising a material selectively absorptive of a group of chemical substances of which said chemical substance is a member, a physical parameter associated with that surface changing as the quality of the chemical substance absorbed by diffusion into the material changes;
(b) monitoring means, coupled to the sensor, for monitoring the change in the physical parameter associated with said surface due to absorption of the chemical substance, producing an electrical signal indicative of said charge;
(c) analysis means, connected to the monitoring means, for determining a predicted time constant for diffusion of the chemical substance into the material and a predicted equilibrium concentration of the chemical substance in the material as a function of the electrical signal, well before the concentration of the chemical substance in the material asymptotically approaches equilibrium; and
(d) identification means for identifying the chemical substance from said group of chemical substances based on both its predicted time constant for diffusion and predicted equilibrium concentration, which are generally characteristic of the chemical substance and different than those of other chemical substances of the group.

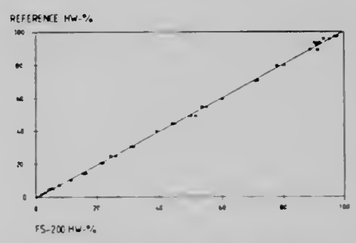
4,895,018
GAS LEAKAGE DETECTOR
Andrew F. Asbra, 861 Hinkley Rd., Burlingame, Calif. 94010
Continuation-in-part of Ser. No. 189,120, May 2, 1988, abandoned. This application Mar. 10, 1989, Ser. No. 321,960
The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.
Int. Cl.[4] G01M *3/20*
U.S. Cl. 73—40.5 R **9 Claims**

1. A permanent in-line gas leakage detector comprising: a housing having coupling means for enabling the housing to be installed in a gas supply line downstream of a main gas shutoff valve, the coupling means disposed on opposed ends of the housing, the housing having interior structure defining a flow path through the housing, valve means within the housing for cutting off the downstream gas supply line from the source of gas, the valve means having a valve seat with a flow through opening, the valve seat surrounding a valve body with a transverse opening therethrough, a gas pressure indicator joined to the flow path of the interior structure of the housing by a passageway, and an external gas source connecting means for enabling a one way flow of an optional charging gas from a



source thereof to enter the housing and pass into the downstream gas supply line.

4,895,019
PROCEDURE FOR MEASURING THE RELATIVE QUANTITIES OF PULP COMPONENTS IN WOOD OR PAPER PULP
Keijo Lehmikangas, and Jouni Tornberg, both of Kajaani, Finland, assignors to Kajaani Electronifikka OY, Kajaani, Finland
Filed May 2, 1988, Ser. No. 189,430
Int. Cl.[4] G01N *33/46*
U.S. Cl. 73—63 **7 Claims**

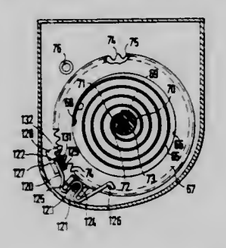


1. A method for measuring the relative amounts of different pulp components in a pulp mixture comprising determining for the individual pulp components the distribution function of a given fiber specific characteristics for each pulp, calculating from the distribution functions obtained the distribution functions corresponding to the pulp mixture, measuring the distribution function of the corresponding characteristic of the pulp mixture and determining the proportions of the different pulp components by correlation of the distribution function of the pulp under examination with the distribution functions obtained by the calculation.

4,895,020
AIR FLOW RATE METER FOR INTERNAL COMBUSTION ENGINES
Erwin Naegele, Hemmigheim, and Armin Witzig, Renningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 31, 1989, Ser. No. 304,139
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807049
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.2 **3 Claims**

1. An air flow rate meter for internal combustion engines

that includes an air flow intake tube through which air is aspirated, having a baffle plate provided with a shaft disposed in the air intake tube of the engine substantially transversely to the aspirated air flow direction, said baffle plate being adjustable counter to a spring force, a hub connected to said baffle plate and supported at one end in an air flow rate meter housing associated with said air flow intake tube, a spiral spring associated with said shaft adapted to generate a force for the baffle plate, said spiral spring having inner and outer end portions, the outer end portion of said spring being secured in a



recess of a spring housing provided with a toothed ring (**75**) on its circumference, the spring housing further adapted to be rotatably supported coaxially with said shaft and lockable after adjustment of an initial spring tension, by means of a locking spring (**120**) includes an end (**122**) which engages a detent element (**128**), that is oriented toward the toothed ring (**75**) of the spring housing (**67**) and provided with an inside serration (**129**), said inside serration having teeth of reduced spacing by comparison with the spacing of the toothed ring (**75**) which teeth on said inside serration when pressed by the force of the locking spring (**120**), engages the toothed ring (**75**).

4,895,021

METHOD OF TESTING A VEHICLE ACCELERATION SENSOR FOR AN ANTI-LOCK BRAKE CONTROL SYSTEM

Seiichi Ishizeki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1989, Ser. No. 304,174
Claims priority, application Japan, Feb. 3, 1988, 63-23526
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **5 Claims**



1. A method of testing a vehicle acceleration sensor mounted on a motor vehicle, the acceleration sensor forming a part of an anti-lock brake control system which is incorporated with the vehicle and which includes a control circuit relying on the acceleration sensor for automatically controlling an amount of rotational anti-lock during braking, said control circuit having a sensor check terminal for inputting a check signal, and a warning device responsive to said check signal through said control circuit, the method comprising:
(a) connecting the sensor check terminal and the warning device to the control circuit, warning device being normally held in a first prescribed state and being actuable to a second prescribed state;
(b) applying a check signal to the sensor check terminal and so causing the control circuit to actuate the warning device from the first to the second prescribed state;
(c) tilting the motor vehicle into such an angle with respect to the plane of the horizon as to correspond to a predetermined degree of vehicle deceleration at which the acceleration sensor is to be activated; and
(d) causing the control circuit to deactuate the warning device into the first prescribed stat if the acceleration sensor is activated on tilting the vehicle, the control circuit holding the warning device in the second prescribed state if the acceleration sensor is unactivated on tilting the vehicle.

4,895,022

ARRANGEMENT IN PRECIPITATION GAUGES

Bengt Norén, Jädraås 4560, S-816 00 Ockelbo, Sweden

PCT No. PCT/SE87/00077, § 371 Date Aug. 18, 1988, § 102(e) Date Aug. 18, 1988, PCT Pub. No. WO87/05116, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 16, 1987, Ser. No. 235,888
Claims priority, application Sweden, Feb. 20, 1986, 8600761
Int. Cl.[4] G01W *1/14*
U.S. Cl. 73—171 **13 Claims**



1. In an arrangement in a precipitation gauge of the type comprising a transducer including a tube having a vertical axis and provided with an inlet opening at the top, the improvement wherein there is provided in association with the inlet opening of the tube, a planar disc extending transversely of said vertical axis of the tube and serving to restrict the area above said opening from the influence of any wind field distortion that may occur around the transducer.

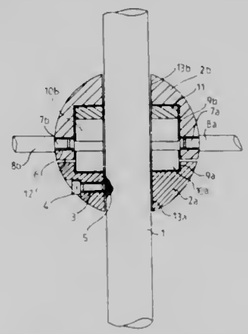
4,895,023

WEATHERVANE WITH MAGNETIC BEARING

Michel M. Roubinet, Paris, and Jacques A. Bauman, Bontigny Sur Essone, both of France, assignors to Franklin France, Paris, France

PCT No. PCT/FR88/00063, § 371 Date Oct. 5, 1988, § 102(e) Date Oct. 5, 1988, PCT Pub. No. WO88/05916, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 5, 1988, Ser. No. 275,136
Claims priority, application France, Feb. 9, 1987, 87 01522
Int. Cl.[4] G01P *13/02;* **G10D** *11/02;* **F16C** *39/06*
U.S. Cl. 73—188 **8 Claims**

1. A weathervane comprising a pointer (**8***a*, **8***b*) provided with a vane and mounted for rotation on a vertical shaft (**1**) by means of a magnetic bearing (**2***a*, **2***b*), characterized in that:
the magnetic bearing (**2***a*, **2***b*) includes a lower block (**2***a*) mounted fixedly on the shaft and an upper block (**2***b*) connected for free rotation around the shaft (**1**) with the pointer (**8***a*, **8***b*) connected to the upper block (**2***b*),
the lower block (**2***a*) has an upper surface and the upper block (**2***b*) has a lower surface arranged opposite the upper surface,



a first permanent magnet (**10***a*) on the upper surface and a second permanent magnet (**10***b*) on the lower surface, said first and second magnets being of the same polarity.

4,895,024

IONICALLY CONDUCTIVE ACCELEROMETER

John E. Shaw, Middlesex, England, assignor to Thorn EMI plc, London, England

Filed Nov. 4, 1988, Ser. No. 267,424
Claims priority, application United Kingdom, Nov. 5, 1987, 8725911
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R **9 Claims**

1. An ionically conductive accelerometer comprising a body of an ionically conductive material provided with at least three electrodes which are so arranged as to define a respective ionically conductive path extending between one of the electrodes and each of the other electrodes, the accelerometer being responsive to an acceleration, or a component of acceleration acting along each said path.

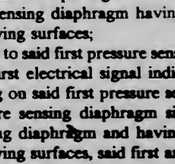
4,895,025

DESTRUCTIVE INSECT INDUCED VIBRATION DETECTOR

William B. Betts, Alva, Okla., assignor to Sound Technologies, Inc., Kilgore, Tex.

Continuation-in-part of Ser. No. 906,880, Sep. 15, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,843
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—587 **9 Claims**

1. An apparatus for non-invasively detecting the presence of hidden insects actively destroying an article comprising:
(a) transducer means for directly detecting the vibrations in the article and generating electrical signals in response to the detected vibrations, wherein said transducer means includes:
(i) a housing having an aperture formed therein;
(ii) piezoelectric means situated inside said housing which generates electrical signals in response to mechanical stresses applied thereto;
(iii) probe means extending through the aperture in said housing wherein said probe means has a free end situated outside said housing for placement in contact with the article to be inspected and a fixed end situated inside said housing which is attached to said piezoelectric means for directing the vibrations from the article through said probe means to said piezoelectric means; and



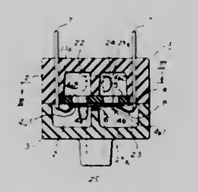
(iv) mounting means for flexibly mounting said piezoelectric means inside said housing wherein said piezoelectric means is mounted on the mounting means such that piezoelectric means becomes unbalanced when stress is applied to said piezoelectric means by vibrations transmitted through said probe means;
(b) means for selectively amplifying the portion of the electrical signals representative of the frequency range of vibrations generated by insects which may inhabit such articles; and
(c) means for analyzing the electrical signals representative of the vibrations to identify the species within the article.

4,895,026

SEMICONDUCTOR PRESSURE SENSOR

Yasuo Tada, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,485
Claims priority, application Japan, Mar. 1, 1988, 63-27668[U]; Mar. 1, 1988, 63-27669[U]
Int. Cl.[4] G01L *7/08, 9/06*
U.S. Cl. 73—721 **7 Claims**



1. A pressure sensor comprising:
a first pressure sensing diaphragm having first and second pressure receiving surfaces;
means connected to said first pressure sensing diaphragm for generating a first electrical signal indicative of the fluid pressure acting on said first pressure sensing diaphragm;
a second pressure sensing diaphragm similar to said first pressure sensing diaphragm and having first and second pressure receiving surfaces, said first and second pressure sensing diaphragms are positioned substantially in a common plane with their first pressure receiving surfaces on one side of said common plane and their second pressure receiving surfaces on the other side of said common plane;
means connected to said second pressure sensing diaphragm for generating a second electrical signal indicative of the

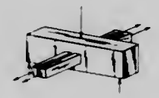
pressure acting on said second pressure sensing diaphragm;
means for defining a first fluid passage connectable to a first pressure source, said first fluid passage being in communication with said first pressure receiving surface of said first pressure sensing diaphragm and said second pressure receiving surface of said second pressure sensing diaphragm;
means for defining a second fluid passage connectable to a second pressure source, said second fluid passage being in communication with said second pressure receiving surface of said first pressure sensing diaphragm and said first pressure receiving surface of said second pressure sensing surface;
means for making a substraction of said first and second electrical signals and providing an output electrical signal proportional to the magnitude of the result of said substraction between said first and second electrical signals.

4,895,027

DETERMINING PLANE STRAIN FRACTURE TOUGHNESS AND THE J-INTEGRAL FOR SOLID MATERIALS USING STRESS FIELD MODIFIED MINIATURE SPECIMENS

Michael P. Manahan, Sr., Dublin, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 19, 1988, Ser. No. 145,830
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—799 **23 Claims**



1. A process of determining mechanical behavior of solid material, comprising:
(a) providing a specimen of the material having a volume and smallest dimension sufficient to establish continuum behavior in all directions, and with a volume not more than 10^7 times said sufficient volume;
(b) modifying the stress field of the specimen by applying a first load to the specimen so as to induce and/or modify the existing stress field in the specimen and obtain a selected stress state;
(c) deforming the specimen by applying a second load on the specimen in a direction different than the orientation of the first load of (b) above;
(d) measuring at least one key variable in step c; and
(e) determining the behavior of the material from the measurements taken according to the principles of the finite element method and/or the principles of linear or nonlinear material mechanics or both.

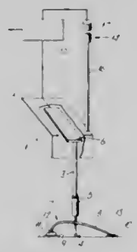
4,895,028

METHOD OF PULL-TESTING WIRE CONNECTORS ON AN ELECTRICAL DEVICE

Robert T. Mayer, Rye, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1989, Ser. No. 303,522
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—827 **4 Claims**

1. A method of pull-testing wire bonds at the ends of a wire loop on an electrical device in which at least one of the bonds is located in a predetermined plane, said method including applying a force to said wire loop by a device which moves away from said plane first to tauten said loop and then to apply a pulling force to said loop, measuring the pulling force and generating a signal signifying the measured pulling force, generating a signal indicating when said pulling force starts to apply stress to said wire loop and in response thereto generating a signal signifying the distance said force applying device



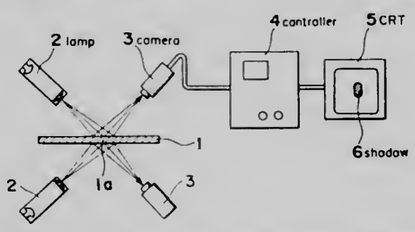
has moved to tauten said loop, and supplying said distance signal and said signal signifying the measured pulling force to a calculating device which calculates the actual pulling forces applied to said bonds in accordance with variations in the distance the force applying device has had to move to tauten said loop.

4,895,029

METHOD OF AND APPARATUS FOR DETECTING DEFECTS OF ELASTIC-MEMBER JOINT PORTION

Seiki Yamada, Ibaraki, and Akinori Kabota, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jan. 24, 1989, Ser. No. 300,930
Claims priority, application Japan, Jan. 28, 1988, 63-18332
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—827 **7 Claims**



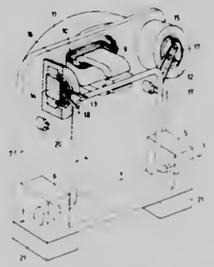
1. A method of detecting defects of an elastic-member sheet joint portion comprising the steps of:
grasping the joint portion of the elastic-member sheet so as to extend it by a given percentage;
detecting a property of at least one face of the joint portion of the extended elastic-member sheet by a measuring apparatus which includes an optical means;
inputting a detecting signal from the measuring apparatus into an operation processing unit; and
comparing and identifying, with a given reference value, a displacement amount of the joint portion represented by the detecting signal in the operation processing unit so as to automatically judge the defect of the joint portion.

4,895,030

PROCESS FOR THE MEASUREMENT OF WEIGHT FLOW-RATES AND RELATED DEVICES

Giorgio Bergamini, Bari; Nicola Campanale, Acquaviva Delle Fonti, and Onofrio Cocozza, Bari, all of Italy, assignors to Nuovo Pignone - Industrie Meccaniche e Fonderia, S.p.A., Italy

Filed Dec. 22, 1987, Ser. No. 136,907
Claims priority, application Italy, Dec. 23, 1986, 22813 A86
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **2 Claims**



1. A process for measuring the mass flow-rate of a fluid, comprising: making the fluid to be measured flow inside a pipe fastened at its ends to a support; making the pipe oscillate at a certain frequency with an amplitude controlled by an impulse force generating device wherein when the pipe is made to oscillate at exactly its twisting resonance frequency; measuring the deformations of the pipe caused by the Coriolis forces; counteracting the oscillations of the pipe with a plurality of brakes whose braking force is proportional to the speed at which the pipe shifts, said braking force being larger than the effect of the Coriolis forces; detecting the shifts of the pipe at two points which are symmetrically located relative to the pipe's center, these points being located where the largest twisting deformations occur; and determining, in order to measure the mass flow rate, the difference in the amplitudes of said two shifts, with the preliminary removal, by means of filtering, of any disturbances.

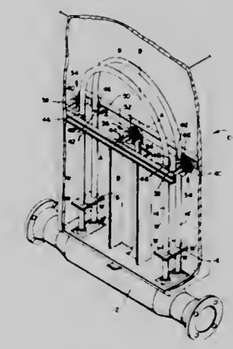
4,895,031

SENSOR MOUNTING FOR CORIOLIS MASS FLOW RATE METER

Donald Cage, Longmont, Colo., assignor to Micro Motion Inc., Boulder, Colo.

Continuation of Ser. No. 770,590, Aug. 29, 1985, abandoned.
This application Aug. 1, 1988, Ser. No. 226,554
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **7 Claims**

1. An apparatus for measuring the mass flow rate of a fluid having two flow conduits, each mounted for oscillation about an axis, of a length of each of said flow conduits through which the fluid to be measured is flowed, comprising:
(A) a first sensor means for detecting Coriolis force induced distortions of said flow conduits, said first sensor means having at least two sensor means components, said first sensor means components having essentially equal masses;
(B) a second sensor means for detecting Coriolis force induced distortions of said flow conduits, said second sensor means having at least two sensor means components, said second sensor means components having essentially equal masses;
(C) a first beam to which are attached at opposite ends a first sensor means component and a second sensor means component;
(D) a second beam, said beam having a mass essentially equal to that of said first beam, to which are attached at opposite ends of said second beam a first sensor means component and a second sensor means component;
(E) means for attaching said first beam to a first flow conduit so that the locations where said first beam is attached to said first flow conduit are at essentially equal first distances from the axis about which said first flow conduit is oscillated, and for attaching said first beam to said first flow conduit so that the center of gravity of said first beam in combination with said first and second sensor means components is essentially positioned on the axis about which generated Coriolis forces act; and



(F) means for attaching said second beam to a second flow conduit so that the locations where said second beam is attached to said second flow conduit are at essentially equal second distances from the axis about which said second flow conduit is oscillated, said first distances and said second distances being essentially equal, and for attaching said second beam to said second flow conduit so that the center of gravity of said second beam in combination with said first and second sensor means components is essentially positioned on the axis about which generated Coriolis forces act.

4,895,032

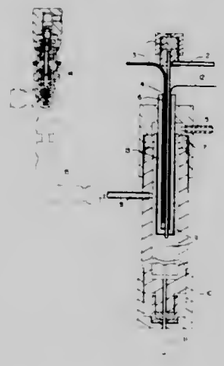
PROCESS AND DEVICE FOR SPLIT AND SPLITLESS SAMPLING ONTO CAPILLARY COLUMNS USING THE SYRINGE

Gerhard Schomburg, and Ulrich Hüsig, both of Mülheim/-Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle MbH, Mulheim/Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 146,909, Jan. 22, 1988, abandoned, Continuation of Ser. No. 935,473, Nov. 26, 1986, abandoned, Continuation of Ser. No. 777,978, Sep. 19, 1985, abandoned. This application Sep. 13, 1988, Ser. No. 243,954
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435216
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—864.86 **2 Claims**

1. In the split sampling gas chromatographic process for analyzing a liquid sample by introducing a needle of a syringe into a vaporization chamber of a gas chromatographic column, discharging the liquid sample from the syringe needle into the vaporization chamber, and passing the vapors of the sample through the chromatographic column along with a carrier gas from a first source, the improvement which comprises inserting the syringe needle into a first tube, passing a cooling gas downwardly from a second source substantially along the entire length of the syringe needle, said cooling gas disposed in a second tube directly adjacent said first tube, said cooling gas exiting the said second tube and flowing upwardly in an annular space provided by a third tube surrounding said first and

second tubes thereby to cool the sample before the sample is discharged from the needle, thereafter to conduct isothermal



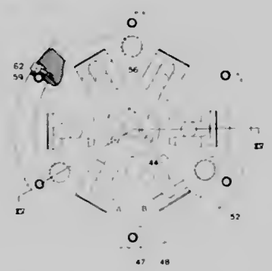
vaporization of the sample and avoid selective vaporization of the sample prior to the discharge of the sample from the needle.

4,895,033

SAMPLE HOLDER FOR USE IN THE GRINDING OR POLISHING OF SAMPLES

Jorgen T. Voss, Morescovej 14, DK-2920 Charlottenlund, and Asger P. Christensen, Hojbjerg Vaenge 35, DK-2730 Herlev, both of Denmark

Division of Ser. No. 135,455, Dec. 21, 1987. This application Jan. 30, 1989, Ser. No. 303,135
Int. Cl.[4] G01N *1/32*
U.S. Cl. 73—864.91 **2 Claims**



1. A sample holder for use in the grinding or polishing of samples for the purpose of producing exposed smooth inspection faces on said samples at a predetermined cross-sectional location thereof, said sample holder comprising

a disc portion having a front face constructed to define a front supporting plane perpendicular to a central axis of the disc portion,

a rim portion connected with said disc portion for angular adjustment relatively thereto,

said disc portion having a plurality of sample holding means for holding samples in such a manner as to protrude from said disc portion such as to have their potential inspection faces located at a predetermined distance from said front supporting plane,

said rim portion being provided with a plurality of calibrated stops extending in a forward direction and being constructed at their forward ends with surface portions hard enough to resist the abrasive action of a grinding face,

said disc portion and said rim portion having opposed contact faces adapted to be axially engaged with one another and, when so engaged, to define different distances between the front supporting plane of said disc portion and the forward ends of said calibrated stops in different positions of angular adjustment of said disc portion and said rim portion,

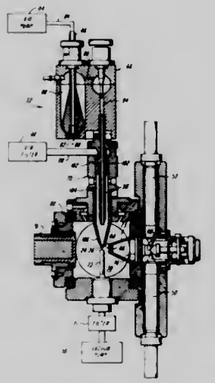
manually operable means operative between said disc portion and said rim portion for urging said opposed contact faces into firm axial engagement with one another and for loosening such engagement to permit relative angular adjustment of said disc portion and said rim portion, markings being provided to indicate selected positions of relative angular adjustment of said disc portion and said rim portion.

4,895,034

POWDER DISPERSER FOR AERODYNAMIC PARTICLE SIZING SYSTEM

Trent A. Poole, Amherst, Mass., assignor to Amherst Process Instruments, Inc., Amherst, Mass.

Filed Jul. 28, 1987, Ser. No. 78,828
Int. Cl.[4] G01N *15/02*
U.S. Cl. 73—865.5 **19 Claims**



1. Dispersing apparatus for providing a stream of particles from a powder sample, comprising:

a container for holding said powder sample and having an outlet for said stream of particles;

means for agitating the powder sample to produce a cloud of particles;

gas flow means for providing a gas flow through said container for carrying said cloud of particles to said outlet to thereby form said stream of particles; and

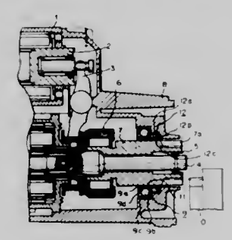
means for separating clusters of particles in said cloud of particles, said separating means including a pin having a tapered tip which extends into the outlet of said container and, in combination with the outlet, defines an annular shear region in said gas flow for separating clusters of particles, said container comprising a first chamber including said power sample and said agitating means, a second chamber including said separating means and said outlet, and a passage interconnecting said first and second chambers, said agitating means comprising an inlet tube passing through a wall of said first chamber, said tube having an enlarged and rounded end portion terminating in said first chamber in proximity to said powder sample for directing a jet of gas at said powder sample, said first chamber including a removable cup for holding said powder sample.

4,895,035

DEVICE FOR SUPPORTING PINION SHAFT OF ELECTRIC MOTOR FOR STARTING ENGINE

Kyoichi Okamoto, and Kazuo Takami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 171,951
Claims priority, application Japan, Mar. 26, 1987, 62-45224
Int. Cl.[4] F02N *15/06*; F16J *15/32*; F16C *21/00*
U.S. Cl. 74—7 A **8 Claims**



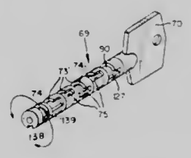
1. In an overhang-type starter having a housing with an opening therethrough, a shaft with an axis, a tubular pinion shaft with an axis coincident with said shaft axis, slidable over said shaft and being driven by said shaft, means for sliding said pinion shaft over said shaft through said housing opening and a ball bearing having an annular outer race mounted in said housing opening, an annular inner race through which said pinion shaft and said shaft slide and bearing balls located between said outer race and said inner race, the improvement wherein said bearing inner race has a surface facing said pinion shaft and said surface has at least one annular groove positioned perpendicularly to said pinion shaft axis, said groove holding lubricant which allows said pinion shaft to easily slide through said bearing inner race while said ball bearing allows said pinion shaft and said shaft to rotate freely.

4,895,036

KEY

Wayne F. Larson, and John J. Risko, both of Salem, Oreg., assignors to Supra Products, Inc., Salem, Oreg.

Continuation of Ser. No. 709,583, Mar. 8, 1985, which is a continuation-in-part of Ser. No. 706,710, Feb. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 661,085, Oct. 15, 1984, abandoned. This application May 16, 1988, Ser. No. 194,471
Int. Cl.[4] E05B *47/06, 37/00*
U.S. Cl. 70—284 **2 Claims**



1. A key comprising:

an elongate cylindrical member having a longitudinal groove to receive internal lugs of a lock;

said member having circumferential grooves extending from said longitudinal groove and terminating in circumferentially facing stop shoulders displaced coded circumferential distances from said longitudinal groove,

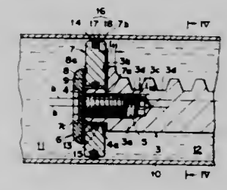
said member having a longitudinally extending bayonet groove formed next to at least certain of said stop shoulders to permit axial movement of said key relative to at least certain of said internal lock lugs, each bayonet groove being circumferentially spaced from said longitudinal groove.

4,895,037

RACK AND PINION STEERING APPARATUS

Shiniichi Komatsu, Hatano, Japan, assignor to Atsugi Motor Parts Company Limited, Kanagawa, Japan

Continuation of Ser. No. 777,619, Sep. 19, 1985, abandoned. This application Apr. 26, 1989, Ser. No. 344,435
Int. Cl.[4] B62D *3/12*
U.S. Cl. 74—422 **11 Claims**



1. A rack and pinion steering apparatus which comprises:

(a) an apparatus housing including a cylinder for housing hydraulic fluid, said cylinder having a central longitudinal axis;

(b) A pinion housed within said apparatus housing;

(c) a rack housed within said apparatus housing so as to gear with said pinion, said rack having a central axis coincident with said central longitudinal axis of said housing and being formed at one end thereof with a boss portion having a threaded portion, a longitudinal axis of the boss portion being offset from said rack central axis in the opposite direction of rack teeth;

(d) an inner elastic sealing member;

(e) an outer elastic sealing member;

(f) a piston elastically fitted to the boss portion of said rack through said inner elastic sealing member and into said apparatus housing through said outer elastic sealing member for partitioning said cylinder into two hydraulic fluid chambers, said piston having an eccentric hole into which the loss portion of said rack and the inner elastic sealing member are inserted, said hole having a center axis which is aligned with the longitudinal axis of the boss portion; and

(g) a piston mounting bolt for loosely supporting said piston to said rack with an axial piston clearance within an annular space formed between said rack and said mounting bolt.

4,895,038

REINFORCED DOUBLE TOOTHING PLANET WHEEL FOR A MICROMETRIC ARTICULATION USED MORE ESPECIALLY IN VEHICLE SEATS

Yves Pipon, and Georges Drouion, both of Flers, France, assignors to A. & M. Cousin Etablissements Cousin Freres, Flers, France

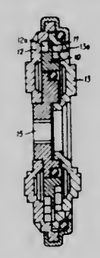
Filed Apr. 29, 1988, Ser. No. 188,050
Claims priority, application France, May 5, 1987, 87 06317
Int. Cl.[4] F16H *1/28*; A47C *1/024*; B21D *53/28*
U.S. Cl. 74—434 **7 Claims**

1. A reinforced double-toothed planet wheel for a micrometric articulation, especially for use in vehicle seats, with said planet wheel having opposite sides, whereby a first toothing is disposed on one side of said planet wheel and a second tooth-

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ing is disposed on the other side of said planet wheel, and with said toothings being produced by die stamping a disc to a predetermined depth so that said planet wheel comprises:

a central cheek that is disposed as a strengthening element in a median plane of said disc for the planet wheel even when reducing the thickness thereof, with said toothings bearing perfectly in register against said central cheek on



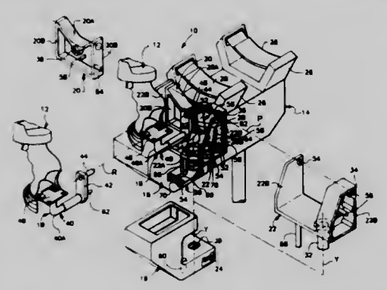
opposite sides thereof, each of said toothings being stiffened to resist crushing and deformation with said central cheek as a mounting support that assures a perfect symmetry and concentricity of said two toothings without any burrs and without having any punch to be maintained sharp during manufacture, now with a higher precision at a lower cost and at a greater production rate than with the punch.

4,895,039

HAND CONTROLLER HAVING PIVOT AXIS FOR MINIMIZING FOREARM MOVEMENT

Jeffrey W. Hegg, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1988, Ser. No. 221,683
Int. Cl.[4] G05G *9/04*
U.S. Cl. 74—471 XY **29 Claims**



1. In a hand controller for controlling operation of an apparatus, the combination comprising:

(a) a control grip;

(b) means for supporting an operator's forearm so that the operator's wrist joint and hand extend forwardly of said supporting means and the operator's hand can grip said control grip;

(c) a first motion coupling component being movably mounted at a first location disposed between said control grip and said operator's forearm supporting means and about a fore-and-aft extending roll axis defined along a base line of the operator's forearm when supported by said supporting means;

(d) a second motion coupling component being movably mounted at a pair of spaced second locations disposed above and at opposite lateral sides of said first location and about a side-to side extending pitch axis defined through the center of the operator's wrist joint and in transverse relation to and above said roll axis when the operator's forearm is supported by said supporting means; and

(e) a third motion coupling component being movably mounted at a third location disposed below said first location and about an up-and-down extending yaw axis defined through the center of the operator's wrist joint and in transverse relation to said roll and pitch axes when the operator's forearm is supported by said supporting means;

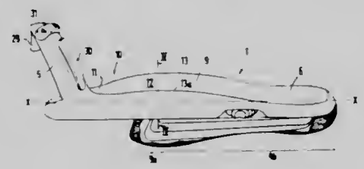
(f) said first, second and third motion coupling components being coupled to one another and to said control grip in a given sequence for facilitating pivotal motion of the operator's hand about said roll, pitch and yaw axes to activate hand control functions with minimal forearm movement.

4,895,040

MANUALLY ACTUATED ADJUSTING DEVICE FOR CONTROL VALVES

Richard Soederberg, Muehlacker, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,511
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728373
Int. Cl.[4] G05G *1/00*; B60K *26/00*
U.S. Cl. 74—491 **17 Claims**



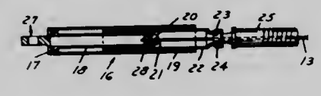
1. A manually actuated adjusting device for control valves of a hydraulic lift mechanism of a vehicle, comprising an armrest means supporting a lower arm, the armrest means being operatively connected with an adjusting means disposed below the armrest means and including a guide joint means and support elements, the armrest means being provided with a formed-out support surface extending on its top side over substantially the entire length of the lower arm which terminates at the end in an approximately upright shifting lever means that is integrally formed with the armrest means and includes within the area of its transition to the support surface a trough-shaped recess formed out of the plane of the support surface, whereby substantially the entire length of an operator's lower arm between the elbow and the hand is securely supported during shifting operations.

4,895,041

DUAL TRAVEL CABLE CONTROL SYSTEM

Barbara A. Cunningham, Royal Oak, Mich., assignor to Babcock Industries Inc., Fairfield, Conn.

Filed Dec. 12, 1988, Ser. No. 283,461
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—502.4 **7 Claims**



1. A dual travel cable control system for use in moving a device by a cable comprising

an assembly of a first tubular element to which a strand end of the cable is connected for relative motion in tension in one direction and lost motion in the other direction and a second element adapted to close the tubular element after assembly of the strand to the first tubular element for attachment to an actuator of the device

said first tubular element having an inner and outer wall, said inner wall having a transverse wall closing the space between the inner and outer walls and an end wall having an opening therethrough such that a cable may be extended through the opening in the end wall of the inner wall and a stop element mounted on the portion of the cable within the inner wall,

a second tubular element telescoped between said inner and outer walls of said first tubular element, a fitment adapted to be connected to a conduit surrounding the cable, said fitment engaging said second tubular element,

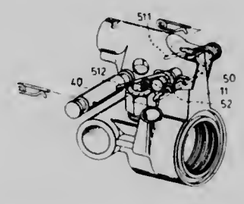
said second element comprising a cap mounted and fixed on the transverse wall of the first tubular element and closing the open end of the inner wall and adapted to be engaged with the device to be moved.

4,895,042

PUMP LEVER FOR A JACK

Akie Wang, No. 77, 3-1 Fl., Chung-San Rd., Chiayi City, Taiwan

Filed Sep. 16, 1988, Ser. No. 245,442
Int. Cl.[4] F16H *21/44*
U.S. Cl. 74—519 **4 Claims**



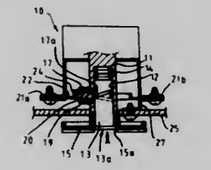
1. A pump lever for a jack comprising: a protrusion formed near a plunger of a fluid pump for said jack; a handle sleeve substantially having a first end and a second end, said first end being adapted to receive a handle and said second end being pivotally joined at said protrusion by a first pin, and in addition, a certain position between said first and second ends of said handle sleeve being pivotally joined with said plunger by a second pin; and a torsion spring having two pairs of counteraction portions and two loop portions formed between said pairs of counteraction portions, said torsion spring being made of a spring wire in the form of an opened loop which has a pair of parallel sides having a pair of corresponding free ends, forming one of said pair of counteraction portions, a closed side connected between said pair of parallel sides and forming the other of said pair of counteraction portions, and a pair of axially aligned loops respectively formed nearby the middle portions of said pair of parallel sides, constituting said loop portions, said loop portions being passed through and supported by said first pin, said protrusion being looped by said closed side of said torsion spring and said pair of corresponding free ends of which make contact with the bottom surface of said second pin, and said closed side of which makes contact with a side of said protrusion near the plunger so that said torsion spring will urge said handle sleeve to raise to its uppermost position when one frees said handle, the top end of which is received in said first end of said handle sleeve at a lowered position, the horizontal distance between said pair of parallel sides being larger than the pivotally axial width of the pivotally joined portions of said handle sleeve and said protrusion, so that said pair of axially aligned loops can be supported outside said handle sleeve by said first pin, and said pair of corresponding free ends can be engaged with said second pin outside said handle sleeve.

4,895,043

MEANS FOR LOCKING THE DIAL OF A TEMPERATURE CONTROLLER

Is S. Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 14, 1988, Ser. No. 270,044
Claims priority, application Rep. of Korea, Nov. 19, 1987, 20060
Int. Cl.[4] G05G *5/06*
U.S. Cl. 74—527 **3 Claims**



1. Means for locking the dial of a temperature controller comprising a controlling shaft having a cylindrical opening, a push rod for locking said controller when pushed once and releasing the locking to return to the original position when pushed again, said push rod having a spiral guide groove and being placed in said cylindrical opening, a spring for resiliently supporting said push rod, a locking pin for reciprocating upwardly and downwardly along the periphery of said controlling shaft according to the pushing of said push rod, a supporting tube for supporting said locking pin, another spring for resiliently supporting said locking pin, and a locking bracket for preventing the rotation of said controlling shaft, said locking bracket having a circular opening and a plurality of locking cuts formed concavely along the periphery of the circular opening, said controlling shaft being rotated in said circular opening with said locking pin being not protruded, whereby the rotation of said controlling shaft is prevented by said locking pin engaging with one of said locking cuts when said locking pin protruding.

4,895,044

HAND GRIP FOR CYCLE HANDLES

David L. Ekins, Calabasas, Calif., assignor to Aero Toys, Incorporated, Reseda, Calif.

Filed Feb. 22, 1989, Ser. No. 313,709
Int. Cl.[4] B62K *21/26*
U.S. Cl. 74—551.9 **5 Claims**



1. In a hand grip for the handle of a cycle, said hand grip comprising a hollow body having an axis, an internal passage defined by a peripheral wall so disposed and arranged as to fit over and upon the end of a cycle handle, and a peripheral outer surface on said body to be grasped by the hand, the improvement comprising:

an external lateral flange on the body adjacent to one end thereof, projecting radially beyond the outer surface to

limit axial movement of the hand; a blade projecting from and extending as a fragment of a helix, helically along said outer surface toward said flange to provide a thumb rest, there being a gap in the flange to pass the thumb, whereby the hand while gripping the grip is stabilized axially, and the hand is positioned and stabilized rotationally by gripping the blade between the thumb and first finger, the thumb being laid against the blade.

4,895,045

DIFFERENTIAL CAMSHAFT

Frederick M. Stidworthy, Long Compton, United Kingdom, assignor to LONRHO PLC, London, United Kingdom

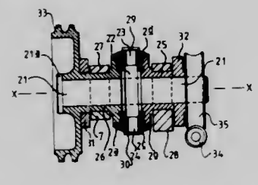
PCT No. PCT/GB87/00597, § 371 Date May 23, 1988, § 102(e) Date May 23, 1988, PCT Pub. No. WO88/01337, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 21, 1987, Ser. No. 187,532

Claims priority, application United Kingdom, Aug. 22, 1986, 8620416

Int. Cl.⁴ F16H *53/04*

U.S. Cl. 74—568 R **10 Claims**



1. A camshaft arrangement comprising a shaft defining an axis of rotation; first and second cams mounted on the shaft for rotation about the axis of rotation, at least one of the first and second cams being rotatable relative to the shaft; means maintaining the first and second cams at a given axial spacing on the shaft; a coupling axle projecting radially from the shaft and fixed to the shaft for rotation therewith; a coupling element rotatably mounted on the coupling axle and engaged with the first and second cams so as to couple with the cams for rotation about the axis of rotation with a selected relative phase; and phase adjusting means for adjusting the relative positions of the shaft and the first and second cams to vary the engagement between the coupling element and the first and second cams to vary the selected relative phase of rotation of the first and second cams about the axis of rotation.

4,895,046

INCREMENTAL DRIVES

Michael R. Everman, 4981 Yaple Ave., Santa Barbara, Calif. 93111

Filed Oct. 28, 1988, Ser. No. 264,092

Int. Cl.⁴ F16H *53/06*

U.S. Cl. 74—569 **10 Claims**

1. An incremental drive comprising:

a rotary driver shaft having an axis of rotation, said driver shaft being adapted to be driven by a power means;

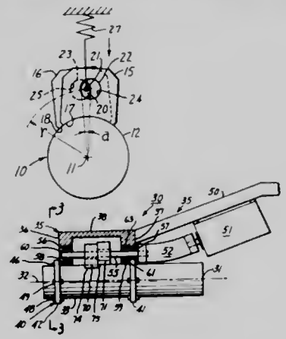
a plurality of cams mounted on said driver shaft which are rotated therewith and which have offset camming surfaces that are eccentric to the axis of rotation of the driver shaft;

a shoe respective to each of said cams, each shoe being fitted to its respective cam to be eccentrically moved by its cam when the driver shaft is rotated, each said shoe including an engagement face;

a driven element having an engagement surface so disposed and arranged as to be contacted by the face of said shoes;

bias means resiliently exerting a lateral force on said driver shaft to press it toward said driven element;

whereby rotation of said driver shaft causes said cams sequentially to press one of said shoes against said driven element and move it, while relieving another of said shoes



from such contact and returning it to a position where it will again be pressed against it, thereby to move the driven element.

4,895,047

VIBRATION DAMPER

Larry T. George, Greenfield, Ind., assignor to Household Manufacturing, Inc., Prospect Heights, Ill.

Filed Apr. 4, 1988, Ser. No. 177,069

Int. Cl.⁴ F16F *15/10, 15/22*

U.S. Cl. 74—574 **6 Claims**



1. A vibration damper which comprises:

a hub adapted to be coupled to a rotating shaft subject to torsional vibrations, said hub including a first, radially-inner sidewall, a second, radially-outer sidewall, and an annular, bottom wall connecting between the first and second sidewalls, the first and second sidewalls and the bottom wall together defining an annular cavity;

an annular inertia ring received within the cavity of said hub;

a first, inner elastomeric component located between and secured to each of the radially-inner sidewall and said inertia ring;

a second, outer elastomeric component located between and secured to each of the radially-outer sidewall and said inertia ring; and

a viscous damping fluid between the bottom wall and said inertia ring,

said radially-outer wall being angled axially-inward in the direction away from the bottom wall to inhibit movement of viscous damping fluid away from the bottom wall during rotation of the damper.

4,895,048

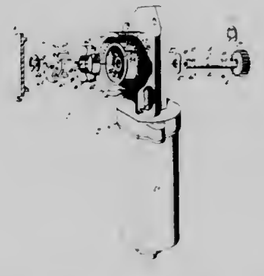
POWERED ACTUATOR WITH MANUAL OVERRIDE FEATURE

Leland J. Key, and Michael D. Harper, both of Dearborn, Mich., assignors to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Apr. 25, 1988, Ser. No. 185,625

Int. Cl.⁴ F16D *1/06*

U.S. Cl. 74—625 **1 Claim**



1. A powered actuator having a manual override feature comprising:

(a) an actuator housing;

(b) a motor means attached to the housing, said motor means having an armature and a first gear driven by the armature;

(c) a shaft extending through the housing, said shaft having a pinion end, an intermediate bearing surface and a plate end;

(d) a driven gear mounted upon a portion of the shaft the driven gear being positioned to coast with the first gear;

(e) an insert cushion engaged with the driven gear through bosses and cooperating recesses on the driven gear and insert cushion;

(f) a removable plate positioned to engage the plate end of said shaft and engage the insert cushion upon the removable plate being secured to the plate end of the shaft, the removable plate providing the sole driving connection between the insert cushion and the shaft.

4,895,049

STEPLESS SPEED REDUCER

Yasuo Kita, and Yoshihiko Nakakoji, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Aug. 1, 1988, Ser. No. 226,485

Claims priority, application Japan, Jul. 31, 1987, 62-335665

Int. Cl.⁴ F16H *47/04*

U.S. Cl. 74—687 **5 Claims**

1. A stepless speed reducer comprising:

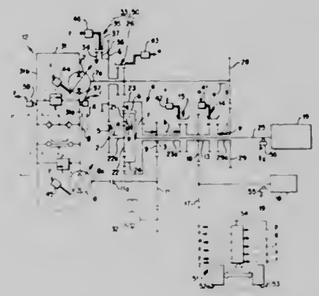
a differential gear unit including a first mechanical power transmission line for low speed and a second mechanical power transmission line for high speed, the two lines being in parallel with each other;

a fluid transmission main concluded by a pair of pump motors each provided in the respective power transmission lines, wherein one pump motor is for low speed, and the other is for high speed;

a first clutch for keeping the end of the first power transmission line for low speed into or out of engagement with a rotary power transmitter;

a second clutch for keeping the end of the second power transmission line for high speed into or out of engagement with the rotary power transmitter, wherein a low speed mode is selected when the ratio of output rotating speed to input rotating speed is smaller than an intermediate speed ratio at which the two clutches rotate at an equal speed, thereby keeping the first clutch into engagement with the power transmitter, and a high speed mode is selected when the ratio is larger than the intermediate speed ratio, thereby keeping the second clutch into engagement with the power transmitter;

means for controlling the displacement of the pump motor for high speed to increase the speed ratio so as to reach a maximum desired speed ratio at which the pump motor for low speeds stops when the speed ratio nears the maximum desired speed ratio;



a power distribution stop means including a locking means for preventing the shaft of the pump motor for low speed from rotation while the operation at the maximum desired speed ratio is maintained; and

a compensating means for controlling a displacement of the pump motor for high speed so that no pressure difference exists between two power transmission circuits while the operation at the maximum desired speed ratio is maintained.

4,895,050

BRANCHED INFINITELY-VARIABLE HYDROMECHANICAL TRANSMISSION FOR MOTOR VEHICLES

Michael Meyerle, Kiefernweg 9, D-7996 Meckenbeuren-Lochbrucke, Fed. Rep. of Germany

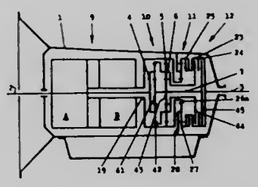
PCT No. PCT/DE86/00370, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/01782, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 17, 1986, Ser. No. 86,625

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533193

Int. Cl.⁴ F16H *47/04*

U.S. Cl. 74—687 **17 Claims**



1. An infinitely variable hydromechanical transmission mechanism having a power input shaft, a power output shaft and multiple path power-transmission means for transmitting power in at least two speed ranges from said input shaft to said output shaft, said transmission mechanism comprising:

hydrostatic drive means connected to said power input shaft and comprising a first hydrostatic unit and a second hydrostatic unit having a hydrostatic power outlet;

a four-shaft summation planetary gear train having a first

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shaft connected to the input shaft, a second shaft connected in constant driving relationship to the hydrostatic power outlet, a third shaft and a fourth shaft;

first clutch means for selectively drivingly connecting said third shaft and the output shaft;

second clutch means for selectively drivingly connecting said fourth shaft and the output shaft; and

a three-shaft planetary gear train having a shaft that is connected to either the second shaft or the third shaft of the four-shaft planetary gear train.

4,895,051

CLUTCH WITH TWO PRESSURE PLATES AND ONE STOP

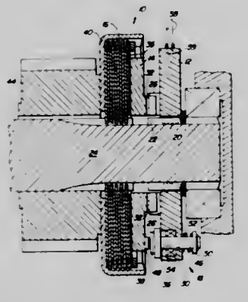
Heinz Weiss, Bensheim, and Herbert Gelb, Hockenheim, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Aug. 15, 1988, Ser. No. 232,824

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727510

Int. Cl.[4] F16H *1/44.5*

U.S. Cl. 74—711 15 Claims



1. A clutch with two pressure plates which move circumferentially relative to one another, each plate having a side facing the other plate and having contoured teeth on said side which project axially towards and are selectively engageable with the teeth of the other plate, characterized in that a stop is attached to one of the pressure plates and can selectively be brought into contact with the other pressure plate in order to stop relative motion between the two pressure plates and prevent engagement of the teeth, depending upon selected parameters.

4,895,052

STEER-DRIVEN REDUCTION DRIVE SYSTEM

Vernon E. Gleasman, 11 Pondview Dr., Pittsford, N.Y. 14534; Keith E. Gleasman, 11 McCord Woods Dr., Fairport, N.Y. 14450, and James Y. Gleasman, 1701 Laguna Loma Cove, Austin, Tex. 78746

Continuation-in-part of Ser. No. 27,748, Mar. 19, 1987, Pat. No. 4,776,235, which is a continuation-in-part of Ser. No. 728,575, Apr. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 544,390, Oct. 21, 1983, abandoned. This application Oct. 11, 1988, Ser. No. 255,663

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—720.5 37 Claims

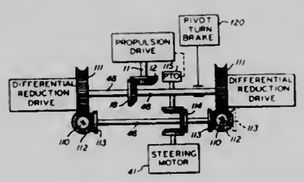
1. A steer-driven reduction drive system comprising:

a. a pair of differential reduction drives arranged respectively on opposite sides of a vehicle, each of said reduction drives having a worm wheel input used exclusively for input of steering control torque to said reduction drives;

b. a pair of worm gears meshed respectively with each of said worm wheel inputs to said reduction drives;

c. a steering control shaft spanning the distance between said worm gears;

d. bevel gears on end regions of said control shaft being meshed respectively with bevel gears turning with said worm gears so that said worm gears are rotationally interconnected by said steering control shaft to produce equal and opposite rotation of said worm wheels; and



e. a steering motor for rotating said worm gears to input steering control torque to said reduction drives so that said worm wheels rotate said differential reduction drives for combining said steering control torque with driving torque input to said differential reduction drives.

4,895,053

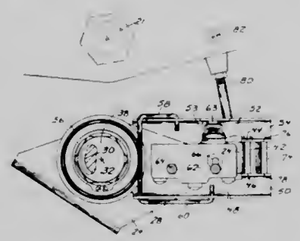
IGNITION ENABLING-DISABLING DEVICE

John M. Moffitt, Wichita, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 17, 1989, Ser. No. 297,660

Int. Cl.[4] B60K *41/18*

U.S. Cl. 74—850 18 Claims



1. In a device of the type having means for closing an ignition-enablement switch only if a drive control is in neutral position, the improvement comprising:

a stop member having first and second stops;

a switch mount movable between a position engaging the second stop and positions displaced therefrom;

a closing member movable between a position engaging the first stop and positions displaced therefrom;

the switch positioned on the switch mount such that it is closed by the closing member only when the closing member and switch mount are both in the stop-engaging positions;

means biasing the switch mount and closing member toward the stop-engaging positions; and

actuator means movable with the drive control between positions displacing the closing member and positions displacing the switch mount, through a position displacing neither.

4,895,054

MOTOR VEHICLE SWITCHING AND CONTROL DEVICE

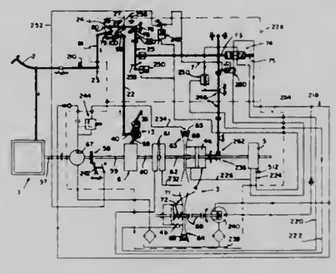
Josef Rauseker, Ostfildern; Josef Blass, Tamm; Rolland Weller, Salach, and Kurt Bessner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 13,059, Feb. 10, 1987, abandoned, and a continuation-in-part of Ser. No. 670,862, Nov. 13, 1984, abandoned. This application Dec. 27, 1988, Ser. No. 289,822

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340645

Int. Cl.[4] B60K *41/14. 41/28*

U.S. Cl. 74—877 10 Claims



1. Control apparatus for controlling a motor vehicle drive assembly of the type having:

motor braking means for operatively engaging the motor of the drive assembly to apply braking forces to the drive assembly, and gear switching means for switching gear change means between forward, neutral and reverse gears, said control apparatus comprising:

a manually operable selection element;

first mechanical linkage means for operatively connecting said selection element and said motor braking means;

second mechanical linkage means for operatively connecting said selection element and said gear switching means; and

a gear casing;

said selection element controlling said motor braking means and said gear switching means through said first and second mechanical linkage means respectively;

said drive assembly having a power adjustment element for a power control of the drive assembly, and said apparatus further comprising third mechanical linkage means for operatively connecting said adjustment element and said motor braking means;

said third mechanical linkage means including a detachable coupling and a lever arm coupling part, said coupling being detached by said first mechanical linkage means when said motor braking means is acutated through said first mechanical linkage means;

said first mechanical linkage means varying the transmission ratio between the rotational output speed and the rotational input speed of the gear change means comprising a continuously variable gear change between a higher ratio and a lower ratio;

said manually operable selection element being able to assume: a V position to select the forward gear; an R position to select the reverse gear; an N position to select neutral; an S position to select the higher ratio of the gear change; an L position to select the lower ratio of the gear change; and a P position for applying a parking brake:

said first and second mechanical linkages having a selection adjustment shaft, which is linked to said manually operable selection element, supported in a rotatable and axially displaceable manner relative to the gear casing and provided with at least one radial coupling pin, which is motionally fixed with respect to said shaft, and wherein on said selection adjustment shaft a rocking lever, which is connected to a switching device of said gear switching means and a rocking lever which is connected to said first mechanical linkage means for the motor bra-king operation,, are supported, with driving collars to be rotatable about said selection adjustment shaft; and wherein said driving collars are provided with corresponding coupling slots and arranged with respect to the gear casing to be axially undisplaceable in such a manner that said selection adjustment shaft can be shifted between two adjustment planes, which are normal to the axis of rotation of the selection adjustment shaft, with alternating engagement of said two driving collars with said coupling pin.

4,895,055

INSTALLATION TOOL FOR AN ANCHOR ELEMENT

Heinz Bisping; Erich Leibhard, both of Munich, and Peter Mauthe, Kleinberghofen, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Apr. 28, 1988, Ser. No. 187,225

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714102

Int. Cl.[4] B25B *13/50*

U.S. Cl. 81—53.2 6 Claims



1. Installation tool for placing anchor elements, said tool extending axially and having a first end and a second end spaced apart in the axial direction with the first end facing in the installation direction and the second end facing in the opposite direction, said tool having a first thread extending in the axial direction and located adjacent the second end, said first thread corresponding to a thread on an anchor element to be installed, and stop means for limiting the threaded engagement of said installation tool with the anchor element, wherein the improvement comprises means within said installation tool for forming a receiving space, said stop means comprises a ball located within said receiving space in said installation tool with the receiving space being open in the installation direction and extending in the axial direction of said installation tool for a dimension smaller than the diameter of said ball.

4,895,056

TONG AND BELT APPARATUS FOR A TONG

Jorg Schulze-Beckinghausen, Garbsen, Fed. Rep. of Germany, assignor to Weatherford U.S., Inc., Houston, Tex.

Filed Nov. 28, 1988, Ser. No. 276,697

Int. Cl.[4] B25B *17/00*

U.S. Cl. 81—57.17 19 Claims

1. Belt assembly for a tong for rotating a tubular member, said tong having a housing with opening means therein for receiving the tubular member and a rotary element rotatably mounted within the housing, the belt assembly comprising

mount means for mounting an anchor means, the mount means movably disposed within the housing adjacent to and movable with and with respect to the rotary element,

jaw means secured to the anchor means, the jaw means for holding the tubular member and centering it in the tong,

belt carrier means for carrying a belt means, the best carrier means mounted to the rotary element,

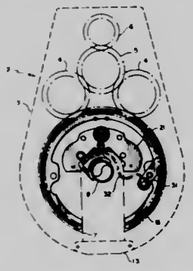
the anchor means for anchoring the belt means, the anchor

VOL 1110 ISS 4 JA 23 1990 UMI

means mounted to the mount means, the anchor means having a body with exterior cam surface means,

the belt means for wrapping around the tubular member, said belt means mounted about the anchor means and extending to and mounted about the belt carrier means,

the rotary element with the belt carrier means rotatable around the tubular member to wrap the belt means around the tubular member,



cam follower means movably connected to the belt carrier means for following the exterior cam surface means of the anchor means to facilitate wrapping the belt means around the tubular member, and

the rotary element, belt carrier means, anchor means and belt means movable together to rotate the tubular member.

4,895,057

MACHINE TOOL FOR BROACHING CRANKSHAFT CONNECTING ROD BEARINGS

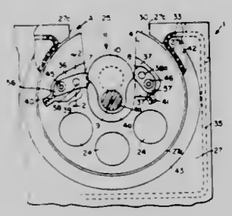
Garri Berstein, Erkelenz; Hans W. Obrig, Essen; Helmut Wittkopp, Erkelenz, and Hermann Wolters, Moenchengladbach, all of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Oct. 16, 1987, Ser. No. 109,934

Claims priority, application European Pat. Off., Oct. 22, 1986, 86114633

Int. Cl.[4] B23B *5/18*

U.S. Cl. 83—106 **8 Claims**



1. A machine tool for turn broaching crankshafts having main bearing pins and crank pins having an unbalance, comprising crankshaft mounting means for mounting a crankshaft for rotation about an eccentric rotational axis defined by said crank pins thereby permitting said crankshaft to rotate in an eccentric manner relative to its normal rotational axis defined by said main bearing pins, means for rotating said crankshaft about said eccentric rotational axis, broaching tool means mounted for performing a broaching operation on said crankshaft, said crankshaft mounting means including at least one steady rest means (1) including rotatable crankshaft support means (4, 5, 6) for supporting said crankshaft when it is rotating in an eccentric manner, said rotatable crankshaft support means comprising holding elements (7, 8) for contacting eccentric crankshaft portions (10) and means (38, 38*a*) journalling said holding elements for changing the position of said holding elements (7, 8) when said rotatable crankshaft support means are rotating so that radially outwardly directed centrifugal forces contribute to a radially inwardly directed holding force component exerted by said holding elements, whereby centrifugal forces caused by said eccentric crankshaft portions are at least partially compensated by said radially inwardly directed force component.

4,895,058

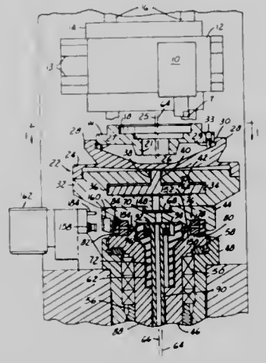
ECCENTRIC SPINDLE

John A. Watson, East Lansing, and Thomas D. Campbell, Grand Ledge, both of Mich., assignors to The Olofsson Corporation, Lansing, Mich.

Filed Oct. 6, 1988, Ser. No. 253,700

Int. Cl.[4] B23B *33/00*

U.S. Cl. 82—165 **7 Claims**



1. Apparatus for use in cutting a workpiece on different centers, comprising a work holder having means for supporting a workpiece, a spindle shaft having an axis of rotation, means for rotating said spindle shaft about said axis of rotation, means for mounting said work holder on said spindle shaft adjacent to a cutting tool in different positions spaced apart laterally relative to said spindle shaft axis, said mounting means comprising a rotatable member mounted on said spindle shaft for rotative adjustment on an eccentric axis parallel to and laterally spaced from said spindle shaft axis, releasable clamping means for clamping said rotatable member to said spindle shaft in selected rotative positions, said clamping means comprising cooperative clamping rings on said rotatable member and n said spindle shaft and centered on said eccentric axis, means for releasing said clamping means by moving said rotatable member axially relative to said spindle shaft to disengage said clamping rings, and, selectively operable means for retaining said rotatable member against rotation both when said clamping rings are engaged and also when they are disengaged, whereby, when said selectively operable means is operated to retain said rotatable member against rotation, said rotatable member and spindle shaft may be relatively axially moved to disengage said clamping rings, said spindle shaft may be rotated to effect a rotative adjustment of said rotatable member relative to said spindle shaft, and said spindle shaft and rotatable member may be relatively axially moved to reengage said clamping rings and lock in said rotative adjustment.

4,895,059

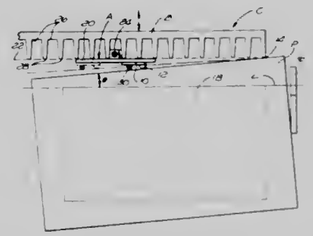
ADJUSTABLE BACK GAUGE SUPPORT DEVICE

Walter J. Peterson, 15125 Lincoln St., Lake Elsinore, Calif. 92330, and William L. Bennett, 1240 Deventer Dr., La Verne, Calif. 91750

Filed Mar. 29, 1989, Ser. No. 330,001

Int. Cl.[4] B26D *7/01*

U.S. Cl. 83—468.7 **15 Claims**



1. Apparatus for varying the angle at which a stack of paper is cut by a paper cutter having a flat cutting surface, a cutting blade disposed above the cutting surface and actuable downwardly thereagainst, a back gauge parallel to the cutting blade, and a side guide perpendicular to the cutting blade, the apparatus comprising:

a base mountable to the back gauge;

a movable element carried by the base for relative lateral movement between a plurality of operative positions, the movable element having a primary surface portion engageable with an edge of a stack of paper for orienting the edge at a different angle to the cutting blade in each of said operative positions; and,

means for releasably securing the movable element in a desired one of said operative positions to cut the stack of paper at a preselected angle.

4,895,060

ELECTRONIC DEVICE OF A TYPE IN WHICH MUSICAL TONES ARE PRODUCED IN ACCORDANCE WITH PITCHES EXTRACTED FROM INPUT WAVEFORM SIGNALS

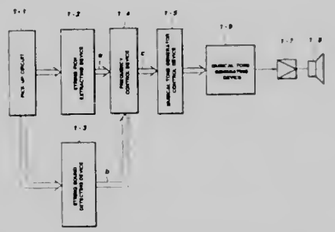
Naoaki Matsumoto, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,400

Claims priority, application Japan, Oct. 14, 1987, 62-259293; Aug. 31, 1988, 63-214926

Int. Cl.[4] G01R *23/02;* **G10H** *1/44, 3/18*

U.S. Cl. 84—616 **15 Claims**



1. A frequency control device of an electronic string musical instrument in which a vibration waveform is generated on the basis of string vibrations, a fundamental wave period is extracted from the vibration waveform and a sound having a frequency corresponding to the extracted period is generated, comprising:

period extracting means for extracting the fundamental wave period of said vibration waveform;

variation range detecting means for detecting a variation range of the fundamental wave period extracted by said period extracting means; and

smoothing means for smoothing a currently extracted fundamental wave period and a previously extracted fundamental wave period to obtain another fundamental wave period, when said variation range detecting means detects that the variation range of the fundamental wave period remains within a predetermined musical interval difference, said smoothing means including means for defining the frequency of an output sound in accordance with said another fundamental wave period.

4,895,061

SHOULDER-BORNE WEAPON FOR USE AS ROCKET LAUNCHER

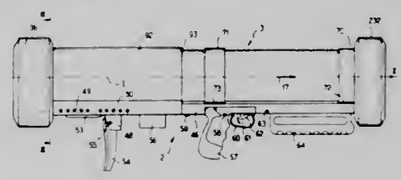
Jean Baricos, Ramonville St. Agne; Denis Dilhan, Auterive, and Michel Castarede, Mauvezin, all of France, assignors to Etienne Lacroix Tous Artifices S.A., Muret, France

Filed Jan. 11, 1989, Ser. No. 295,913

Claims priority, application France, Jan. 12, 1988, 88 00286

Int. Cl.[4] F41F *3/04*

U.S. Cl. 89—1.818 **14 Claims**



1. A shoulder-borne weapon for use as a rocket launcher, having at least one longitudinal weapon tube and one barrel at least partially juxtaposed transversally with it, shoulder rest means, grip means and firing control means, wherein the weapon tube is of a type having a closed transversal end placed towards the rear with reference to a determined longitudinal firing direction, and wherein the weapon tube is connected to the barrel by means of connecting devices comprising:

means for guidance in relative, longitudinal, sliding motion, mutual stop means restricting the longitudinal sliding motion of the weapon tube at least frontwards, with respect to said direction, in relation to the barrel, and

means for exerting longitudinal elastic force on the weapon tube frontwards with respect to said direction, in relation to the barrel.

4,895,062

COMBUSTION AUGMENTED PLASMA GUN

George S. Chryssomallis, Golden Valley; Chris S. Sorenson, Edina; Stephen F. Mulich, Jr., Blaine, and Charalampos D. Marinos, Brooklyn Park, all of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 18, 1988, Ser. No. 182,683

Int. Cl.[4] F41F *1/04*

U.S. Cl. 89—7 **14 Claims**

1. A combustion augmented plasma propulsion apparatus for use in projecting a projectile comprising:

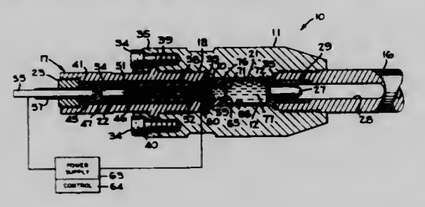
a cartridge having a capillary chamber, a fuel chamber and an oxidizer chamber;

a plurality of membranes mounted between said chambers;

a plasma base mounted in said capillary chamber;

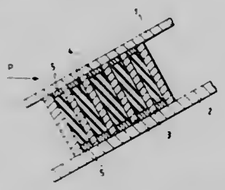
an anode mounted adjacent to a first end portion of said capillary chamber;

a cathode mounted adjacent to a second end portion of said capillary chamber;
a fuse wire mounted in said capillary chamber between said anode and said cathode for ignition of said plasma base;
a fuel mounted in said fuel chamber;
an oxidizer material mounted in said oxidizer chamber;



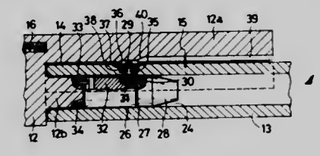
means for providing electrical power between said anode and said cathode to cause said fuse wire to ignite a portion of said plasma base; and
means for providing a controlled amount of electrical power to said plasma base in said capillary chamber to control a rate of burning of said plasma base and thereby control a rate of combustion of said fuel and of said oxidizer material.

4,895,063
COMPOSITE ARMOR
Peter G. Marlow, Harrogate; Melvyn Perry, Wetherby, and Donald Jepson, Leeds, all of England, assignors to Royal Ordnance plc, London, England
Filed Dec. 8, 1987, Ser. No. 130,274
Int. Cl.[4] F41H *5/04*
U.S. Cl. 89—36.02 **5 Claims**



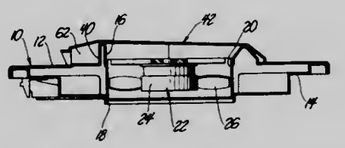
1. A composite armor comprising a forward metal armor plate, a metal armor backing plate spaced from and generally parallel to the forward armor plate and between the forward armor plate and the armor backing plate an array of armor layers each inclined relative to the plane of the backing plate, said armor layers including spaced metal plates separated by layers of non-metallic material and wherein spacer strips are fixed to the surfaces of the forward armor plate and armor backing plate each of which spacer strips extend between an adjacent pair of said spaced metal plates so as to locate and maintain the spacing of the metal plates of said array and wherein each of said layers of non-metallic material substantially fills each space defined by a pair of adjacent said spaced metal plates and a pair of opposed spacer strips whereby relative sliding of the forward armor plate and of the armor backing plate relative to the array of armor layers is resisted due to expansion of said layers of non-metallic material when said composite armor is penetrated by a projectile.

4,895,064
MACHINE-PISTOL FOR CARTRIDGES OF DIFFERENT TYPES
Alessandro Marzocco, Milan, Italy, assignor to SO.C.I.MI.-Societa' Construzioni Industriali Milano S.p.A., Milan, Italy
PCT No. PCT/EP87/00104, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/05384, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 24, 1987, Ser. No. 123,154
Claims priority, application Italy, Feb. 27, 1986, 19566 A/86
Int. Cl.[4] F01B *15/00*
U.S. Cl. 89—196 **2 Claims**



1. A machine pistol for cartridges of different types, comprising:
a barrel having an axis,
a cartridge chamber within said barrel for housing a cartridge in a firing position,
a magazine for feeding cartridges to said cartridge chamber,
a percussion pin for firing said cartridge,
a breech block movable relative to the barrel for actuation of said percussion pin, a longitudinal portion of said breech block having a small radial clearance relative to a wall of said barrel and defining a semicylindrical chamber surrounding the barrel over a certain longitudinal length, said percussion pin being positioned in the wall of the barrel and radially movable relative to said barrel under the action of a portion of an actuator device movable with the breech block, the actuator device including a bell crank hinged on the breech block and movable in a plane passing through the axis of the barrel and a stop tooth, for causing the bell crank to pivot about its hinge, integral with the barrel, said stop tooth located on said barrel in such a position as to engage the bell crank at an end of a forward stroke of the breech block.

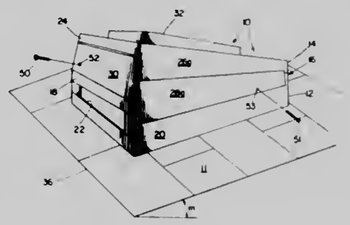
4,895,065
COMBINED STATIC AND POWERED VENT DEVICE
Ronald C. Lamparter, Grosse Pointe Shores, Mich., assignor to Transpec Inc., Troy, Mich.
Filed Oct. 24, 1988, Ser. No. 261,592
Int. Cl.[4] B60H *1/26*
U.S. Cl. 98—2.14 **1 Claim**



1. A combined static and powered vent device adapted to be disposed in the roof of a vehicle said device comprising:
A. panel (10) having
(1) vertically spaced upper and lower walls (12 and 14),
(2) aligned openings (16 and 18) formed in said panel walls for venting the vehicle interior to the outside atmosphere,

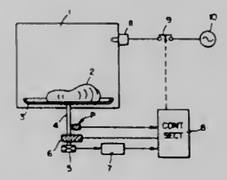
(3) baffle means (38–40) formed on and projecting vertically above the upper panel wall (12) for diverting water from said panel openings;
B. motor-fan means (22) mounted in said panel and generally disposed between said upper and lower walls (12 and 14), said fan means being adapted to force air to flow through the panel openings to exhaust vehicle interior air; and
C. a domed cover member (42) mounted upon the upper panel wall (12) and enclosing said wall openings and said baffle means, said cover including a rear wall (46) facing the rear of the vehicle, vent openings (48–50) formed in said rear wall, said cover (42) and said baffle means (38–40) coacting to define passages (60–62) through which air may flow from the interior of the vehicle and be expelled through said cover vent openings (48–50); said baffle means includes a first planar portion (38) surrounding said panel opening (16), said portion being parallel to and elevated above the upper panel wall (12) to provide a first barrier against wafer flowing into said panel openings, a baffle segment (40) projecting upwardly from said planar portion (38) and extending generally around the rear half circumference of the upper panel opening (16), the upper surface of the baffle segment (40) abuttingly engaging the dome cover (42) whereby the segment and cover block the passage of water into the panel openings; the upper panel wall (12) includes a first raised dome-supporting rib (64) extending transversely of the panel generally tangentially to the forward edge of panel opening (16), and a pair of longitudinally extending ribs (56 and 58) laterally spaced from the upper panel opening (16); said cover including an upper wall adapter to seat upon the upper surface of the ribs (56, 58 and 64).

4,895,066
ROOF JACK
Fay O. Carnahan, Cathedral City, Calif., assignor to Glen C. Podell, Ridgecrest, Calif.
Filed Jan. 15, 1988, Ser. No. 144,116
Int. Cl.[4] F24F *7/00, 13/00*
U.S. Cl. 98—42.22 **4 Claims**



1. A roof mounting for an air conditioner or the like for supplying air through an opening in the roof for ducting to a room or rooms therein, comprising:
a lower rectangular frame member having peripheral bottom flanges for fastening to the roof decking of a structure and a compartment with a front opening to accommodate a damper device or the like;
an upper rectangular frame member hingedly mounted on said lower member, for pivotal movement along the rear edges thereof, and having the remaining sides arranged for telescopic engagement with the sides of said lower members and said remaining sides being left, right and front panels;
said left and right panels having frictionally mounted quadrangular extension members dimensionally fabricated to be set on opposite sides and to be interchangeable between sides to accomodate low and high roof slope settings respectively of said frame members;
said front panel being dimensioned to fit over the front of said lower frame member in the lowest setting without obstructing access to said compartment therein and adapted to be frictionally fitted with a grooved quadrangular panel in a like manner as and sides and adapted to be trimmed to fit positions less than maximum.

4,895,067
HEAT COOKING APPARATUS
Keazo Ohji, Ikoma; Shuji Itou, Nara; Kazuho Sakamoto, Nara, and Makoto Mihara, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 144,348, Jan. 15, 1988, abandoned. This application Jan. 17, 1989, Ser. No. 297,936
Claims priority, application Japan, Jan. 16, 1987, 62-8509; Feb. 16, 1987, 62-33058; Mar. 9, 1987, 62-53313
Int. Cl.[4] A47J *27/00*; H05B *6/64*
U.S. Cl. 99—325 **7 Claims**

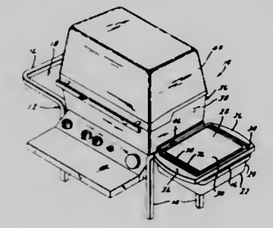


1. A cooking apparatus comprising:
a turntable rotatably mounted in the apparatus, and drive means operatively connected to said turntable for rotating said turntable,
a weight sensor operatively connected to said turntable for detecting the weight of food disposed in the apparatus on said turntable, and for issuing signals corresponding to the weight detected;
cooking means for heating food disposed in the apparatus on said turntable; and
control means operatively connected to said weight sensor and said cooking means for receiving the signals issued by said weight sensor while food disposed in the apparatus on said turntable is heated, for calculating changes in the weight of the food as the food is heated based on the signals issued, and for controlling said heating means to heat the food to a temperature based on the calculated changes in the weight of the food during the heating thereof.

4,895,068
GAS GRILL COOLER SHELF
Joseph J. Hanagan, and Mark R. Rakowski, both of Freeport, Ill., assignors to King-Seeley Thermos Company, Freeport, Ill.
Continuation of Ser. No. 175,942, Mar. 31, 1988, abandoned. This application Jan. 6, 1989, Ser. No. 362,285
Int. Cl.[4] B28D *1/32*; A21B *1/00*
U.S. Cl. 99—357 **13 Claims**

1. A grill and storage apparatus comprising:
a grill having a containment means for containing at least one heat source;
at least one insulated container;
an external frame for receiving and supporting said grill, said frame having an outwardly and laterally extending support portion which defines an opening, said support portion further being substantially thermally isolated from said containment means and operable to support said insulated container about a portion of its periphery;
said insulated container being removably supported by said support and nestably engaging said opening;
a heat shield means comprising a unitary rebent sheet mem-

ber disposed in spaced relation between said containment means and said insulated container for protecting said



insulated container from heat developed by said heat source.

4,895,069

APPARATUS FOR SHELLING BOILED EGGS

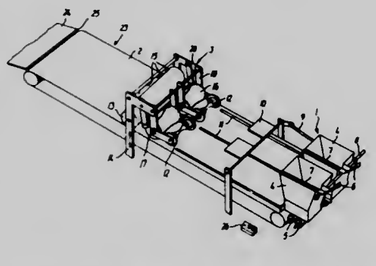
Jens Kristian S. Kristensen, Odense, Denmark, assignor to Samovo Engineering A/S, Odense, Denmark

Filed Jan. 4, 1989, Ser. No. 293,367

Claims priority, application Denmark, Jan. 20, 1988, 237/88

Int. Cl.[4] A23J *1/00*

U.S. Cl. 99—574 **5 Claims**



1. An apparatus for shelling boiled eggs to separate egg shell from an egg body comprising a first section means for crackling an egg shell by impact action for a certain period, a second section means for clearing egg shell fragments from the egg body, and means for transferring the egg from the first section means to the second section means, wherein

the first section means includes two shafts rotatable in the same direction of rotation, and a tubular egg positioning member with an upper opening and a lower opening, the lower opening being positioned above the two shafts during crackling, and

the second section means includes a conveyor belt with an upper side, a cylinder and a retainer roller mounted in spaced relationship from the cylinder, the roller and the cylinder being rotatable about substantially parallel axis of rotation and being capable of contacting the upper side of the conveyor belt.

4,895,070

LIQUID TRANSFER ASSEMBLY AND METHOD

John W. Bird, Westport, Conn., assignor to Birow, Incorporated, Westport, Conn.

Filed Jul. 11, 1988, Ser. No. 217,412

Int. Cl.[4] B41L *23/00*

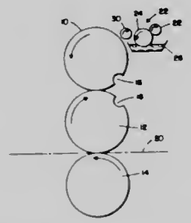
U.S. Cl. 101—148 **4 Claims**

1. In an assembly for transferring a predetermined thickness of liquid to a moving surface, said liquid exhibiting a relatively constant velocity over the operating conditions experienced by said assembly, the combination comprising:

supply means for producing a source of said liquid:

a liquid bearing applicator roll movable at a first speed and adapted to contact said supply means and obtain a coating of said liquid on said surface;

a plate cylinder juxtaposed to said applicator roll and adapted to be moved at a second speed different from said



first speed, said plate cylinder being maintained out of contact with said applicator roll but sufficiently close thereto that said liquid coating on said applicator roll comes in contact with said plate cylinder at the nearest point of proximity of said roll and cylinder, whereby said liquid coating is subjected to a shearing action at said nearest point of proximity with a determined amount thereof being transferred to said plate cylinder by shearing action.

4,895,071

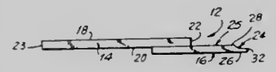
UNITARY DOCTOR BLADE ASSEMBLY

Robert R. C. Benton, Princeton Junction, N.J., assignor to Benton Graphics, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 851,165, Apr. 14, 1986, abandoned. This application Jun. 17, 1987, Ser. No. 63,639

Int. Cl.[4] B41F *9/10, 31/04*

U.S. Cl. 101—169 **17 Claims**



1. An apparatus for use in a gravure press for wiping excess ink from the surface of a gravure cylinder, comprising a one-piece doctor blade structure formed of two attached sections, said first section being made from a metallic, non-doctor blade material and including a first surface, said second section being made of doctor blade steel and including a leading portion and a trailing portion, said leading portion being of reduced thickness as compared to the thicknesses of the trailing portion, said leading portion including means for wiping the excess ink from the surface of a gravure cylinder, said second section including a first surface, a portion of said first section first surface in contact with a portion of said second section first surface, and means for setting a predetermined controlled camber in said second section by adhering stressed portions of said second section to said first section to form a rigid one-piece doctor blade assembly which has a flexural strength and spring constant not altered by the presence between said first and second sections of the material being doctored either in liquid, semi-

solid or solid state, whereby said rigid one-piece doctor blade assembly can be inserted into and used in a gravure press.

4,895,072

VIBRATION DAMPING DEVICE FOR ROTATING CYLINDERS

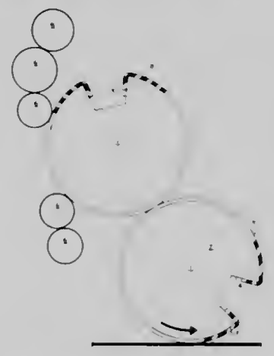
Gerard Rich, Soultz, and Bertrand Felly, Bollwiller, both of France, assignors to Rollin, S.A., Steinbach, France

Continuation of Ser. No. 921,977, Oct. 22, 1986. This application Feb. 16, 1988, Ser. No. 159,472

Claims priority, application France, Oct. 28, 1985, 85 15995

Int. Cl.[4] B41F *13/08*

U.S. Cl. 101—376 **2 Claims**



1. In a rotating cylinder having a gap with a front edge and a rear edge, a damping device comprised of a housing and an insert, the housing being a recess formed in the cylinder surface adjacent an edge of the gap the improvement comprising the insert being a laminated piece formed by the super-imposing of a first resilient layer selected from the group consisting of natural rubber, cured or uncured, nitrile polymers, polychloroprene polymers, butyl polymers, polyvinyl chloride polymers, silicone polymers, polybutadiene polymers, polyethylene polymers, epoxy resins, phenolic resins, polyimides, polyesters, and copolymers or mixtures thereof, and a second rigid layer selected from the group consisting of sheet metal and foils, fiberglass mats, wire mesh, plastic sheets, plastic meshes, hard epoxy resins and hard phenolic resins further comprising one or more orifices formed in and through at least a portion of the insert, the one or more orifices having additional damping materials inserted into them, the additional materials having damping properties different from that of the first resilient layer and second rigid layer of the insert.

4,895,073

SHEET TURN-OVER ASSEMBLY

Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Continuation of Ser. No. 86,551, Aug. 18, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 265,335

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1986, 3628907

Int. Cl.[4] B41F *21/06*

U.S. Cl. 101—409 **1 Claim**

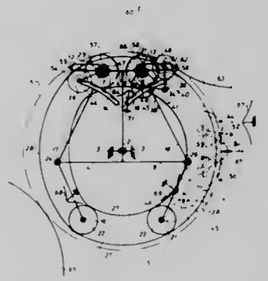
1. A sheet turn-over assembly for a sheet transfer apparatus positioned between first and second printing units in a sheet-fed rotary printing machine, said sheet turn-over assembly comprising:

a rotatable sheet turn-over drum positioned, in the direction of sheet transfer in the sheet transfer apparatus, after a sheet storage drum which receives sheets from the first printing unit, and before the second printing unit;

at least a first pair of cooperating first and second sheet gripper sets, said first sheet gripper set being pivotable about a first, radially fixed pivot axis and said second sheet gripper set being pivotable about a second, radially fixed pivot axis, each of said first and second sheet gripper sets being rotatably carried by said sheet turn-over drum and within the periphery of said sheet turn-over drum;

each of said first and second sheet gripper sets having coacting sheet gripper fingers and sheet abutment surfaces, said gripper fingers in each of said sets being carried on a gripper finger shaft, and said abutment surfaces in each of said sets being carried on an abutment surface shaft, said gripper finger shaft and said abutment surface shaft for each of said first and second sheet gripper sets being coaxially aligned shafts which are positioned one within the other and rotatable with respect to each other while being carried by said rotatable sheet turn-over drum;

first and second control rollers carried by said first sheet gripper set for actuation of said first sheet gripper finger shaft, said first and second control rollers being rotatable in first and second separate adjacent planes to contact first and second separate gripper opening cam segments in said



first and second separate adjacent planes to open said first sheet gripper set twice during each complee rotation of said sheet turn-over drum to initially grasp a trailing end of a sheet being transferred from said first printing unit and to subsequently release the sheet to said second sheet gripper set;

a third control roller carried by said second sheet gripper set for actuation of said second sheet gripper finger shaft, said third control roller being rotatable in a third plane to contact third gripper opening cam segments in said third plane to open said second sheet gripper set twice during each complete rotation of said sheet turn-over drum to initially receive the trailing edge of a sheet being transferred from said first sheet gripper set and to subsequently release the sheet to said second printing unit; and

means for pivoting said first and said second sheet gripper sets in said at least first cooperating pair in opposing directions about their said first and second radially fixed pivot axes with respect to each other to periodically bring said first and second sheet gripper sets into adjacency to effect the transfer of the trailing edge of the sheet being transferred from said first gripper set to said second gripper set, and to separate said first and second sheet gripper sets once sheet transfer to said second gripper set has been accomplished.

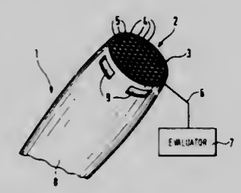
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,074

IGNITION TRIGGER DEVICE

Andreas Hilsig, Denkingen, Fed. Rep. of Germany, assignor to Gebrüder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,362
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731447
Int. Cl.[4] F23Q *5/00*
U.S. Cl. 102—206 **9 Claims**



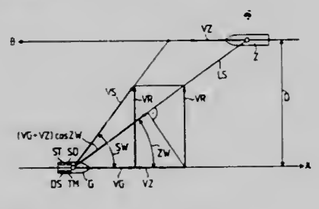
1. An underwater triggering device comprising a body having a water inlet and a water outlet defining a water flow path, a sensor arranged in said water flow path for detecting the presence of water therein, said sensor including a network of electrically charged electrical contact paths forming a surface area, said electrically charged contact paths being electrically charged in the absence of water in said water flow path and being normally electrically insulated from one another, said electrically charged contact paths arranged to be placed into electrical connection with one another in response to being cross-linked by water in said water flow path, and electronic means electrically connected to said network for evaluating the extent of said network surface are cross-linked by water.

4,895,075

METHOD OF, AND APPARATUS FOR, DETONATING A PROJECTILE IN THE PROXIMITY OF A TARGET

Klaus Münzel, Klingnau, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Sep. 22, 1988, Ser. No. 247,830
Claims priority, application Switzerland, Sep. 29, 1987, 782/87
Int. Cl.[4] F42C *13/04, 13/06*
U.S. Cl. 102—214 **14 Claims**



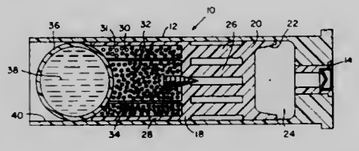
1. An apparatus for detonating a projectile in the proximity of a target, comprising:
sensor means for determining a plurality of encountering velocity values of the projectile relative to the target;
said sensor means for determining said plurality of encountering velocity values being located in said projectile;
said projectile containing detonating means for producing fragments upon detonation of said projectile at a predetermined one of said plurality of encountering velocity values of said projectile relative to said target and at which predetermined encountering velocity value said target is hit by said fragments;
a firing control system;
said firing control system controlling the firing of said projectile and containing means for computing a reference value associated with said predetermined encountering velocity value;
said sensor means for determining said plurality of encountering velocity values being located in said projectile and containing means for determining actual values derived from respective ones of said plurality of encountering velocity values;
storage means operatively connected with said means for determining said actual values derived from respective ones said plurality of encountering velocity values;
said storage means storing, upon firing of said projectile, said reference value associated with said predetermined encountering velocity value;
comparator means connected with said storage means and with said means for determining said actual values derived from respective ones of said plurality of encountering velocity values;
said comparator means comprising said actual values derived from respective ones of said plurality of encountering velocity values, with said reference value stored in said storage means;
said comparator means producing a detonating signal for detonating said detonating means in response to a predetermined result of said comparison of said actual values derived from respective ones of said plurality of encountering velocity values, with said stored reference value associated with said predetermined encountering velocity value;
said means for determining said actual values derived from respective ones of said plurality of encountering velocity values, determining a plurality of actual values represented by c/2VB, wherein c is the velocity of light and VB is the encountering velocity value from which a respective one of said plurality of actual values is derived;
said storage means having stored therein as said reference value, a reference value in a form of c/2VBg, wherein c is the velocity of light and VBg is the predetermined encountering velocity value; and
said comparator means producing said detonating signal whenever said predetermined result of said comparison is that the actual value derived from said respective one of said plurality of said encountering velocity values selectively is either (i) substantially equal to or (ii) greater than said stored reference value associated with said predetermined encountering velocity value.

4,895,076

SUB-CALIBER TRAINER ROUND

Lonnie L. Looger, deceased, late of Madison, Ala. (by Joyce H. Looger, executor), and John W. Byrd, Owens Cross Roads, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 8, 1989, Ser. No. 325,613
Int. Cl.[4] F42B *11/00, 11/18*
U.S. Cl. 102—439 **5 Claims**



1. A projectile comprising a body section that is generally cylindrical and has a rear section and a forward section that are innerconnected by rib means, said forward section having a forwardly opening cavity therein and securing means at the base of said cavity, said cavity having pelletized weighted means bonded therein and to said securing means, and marker means secured at the forward end of said cavity, said projectile being constructed for weight distribution such that the projectile has a center of gravity that is in front of a center of pressure of the projectile.

4,895,077

PROJECTILE CORE FOR A SABOT PROJECTILE

Hansruedi Miethlich, Elgg, and Nicole Chabarekh, Weisslingen, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed May 22, 1989, Ser. No. 356,061
Claims priority, application Switzerland, May 24, 1988, 01953/88
Int. Cl.[4] F42D *13/06*
U.S. Cl. 102—517 **4 Claims**



1. A projectile core for a sabot projectile, comprising:
projectile-core nose;
a projectile-core tail;
a projectile-core central section located between the projectile-core nose and the projectile-core tail;
a projectile-core rod;
said projectile-core nose, said projectile-core tail and said projectile-core central section being connected to one another by said projectile-core rod;
said projectile-core central section being manufactured of relatively frangible tungsten;
said projectile-core rod possessing an armor-piercing tip; and
said projectile-core rod being formed of a relatively ductile armor-piercing material.

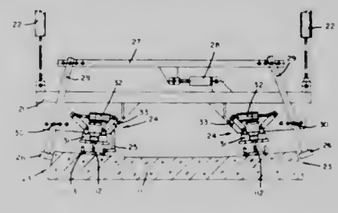
4,895,078

SYSTEM FOR THE CONTINUOUS RECIPROCAL SELF-ALIGNMENT OF RAILS ON SLEEPERS

Flavio Mancini, Brescia, Italy, assignor to Danieli & C. Officine Meccaniche SpA and ITI/CLM Impianti Tecnici Industriali SpA, both of Buttrio, Italy

Filed Mar. 28, 1988, Ser. No. 173,815
Claims priority, application Italy, Apr. 10, 1987, 83348 A/87
Int. Cl.[4] E01B *33/00*
U.S. Cl. 104—8 **10 Claims**

3. An apparatus for continuously positioning and aligning two rails on sleepers, each of said sleepers having locking means for locking the rails thereon, said apparatus comprising:
a crossbar frame;
means for gripping the rails and securing the rails at a predetermined position relative to said crossbar frame; and
means for positioning said crossbar frame at a predetermined position relative to a lateral profile of one of said sleepers



so as to properly position the rails relative to the one of the sleepers.

4,895,079

VEHICLE HAULING PROCESS AND APPARATUS

Robert A. Beatty, 76 78 Hayes Avenue, Camira, Queensland 4300, Australia

Continuation of Ser. No. 27,444, Mar. 18, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,859
Claims priority, application Australia, Mar. 19, 1986, PH5109
Int. Cl.[4] B61B *11/00*
U.S. Cl. 104—174 **7 Claims**



1. A method of mining an open cut mine so as to provide for transfer of mined material from the open cut mine to the top of a trackless incline adjacent thereto, comprising the steps of:
(i) attaching a line member to a first unloaded motorized vehicle supported by ground engaging wheels at the top of the incline;
(ii) attaching said line member to a second motorized vehicle, said second motorized vehicle being loaded with mined material and supported by ground engaging wheels at the bottom of said incline;
(iii) hauling the loaded motorized vehicle using its motive power up to the top of the incline and assisting said hauling by lowering of said first unloaded motorized vehicle from the top of said incline down the incline; and
(iv) loading said first motorized vehicle with mined material at the bottom of said incline; and
(v) unloading the second motorized vehicle at the top of said incline.

4,895,080

INTERLOCKING FREIGHT PALLET

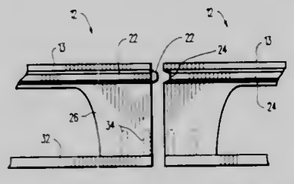
Peter C. Thomas, 6750 Riverside Boulevard, Sacramento, Calif. 95831

Filed Feb. 10, 1989, Ser. No. 308,673
Int. Cl.[4] B65D *19/12*
U.S. Cl. 108—56.1 **7 Claims**

1. A freight pallet formed from at least two interlocking construction units, each of said units comprising:

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a square thin support plate;
a projecting rib extending along each of a first two adjacent perpendicular side edges of said plate;
a complementary formed groove extending along each of a second two adjacent perpendicular side edges of said plate;
a right angle corner support member perpendicularly at-



tached at each corner on a bottom surface of said support plate;
a support brace member extending between each adjacent pair of said corner support members; and
said units formed from a plastic material and said projecting ribs and grooves at least partially formed from a thermoplastic material having a lower fusing point than the rest of said unit.

4,895,081

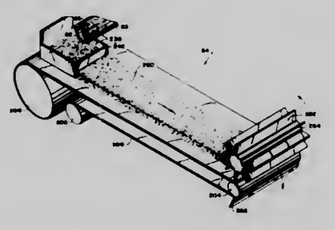
GRAVIMETRIC FEEDER, ESPECIALLY ADAPTED FOR USE IN A CALORIMETRY SYSTEM

John C. Homer, Chardon; Shahriar Nowshiravani, Mayfield Heights; Steven L. Ross, Cleveland, and Gilbert F. Lutz, Chesterland, all of Ohio, assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 153,741, Feb. 8, 1988, Pat. No. 4,846,081, which is a continuation-in-part of Ser. No. 36,048, Apr. 8, 1987, Pat. No. 4,809,190. This application May 8, 1989, Ser. No. 348,845

Int. Cl.[4] F23K *3/00*

U.S. Cl. 110—101 CC **16 Claims**



1. A gravimetric feeder for measuring the mass feed rate of particulate material, such as coal particles which comprises an endless belt disposed around tail and head pulleys which are spaced from each other and at least one of which is rotated to rotate said belt at certain speed, means defining a fulcrum on which said belt is pivotally mounted, means for forming said material into a moving body on said belt, said body having a length extending along one side of said belt, means for measuring the force due to the weight of said body, and means engageable with said body for maintaining said length at a certain length.

4,895,082

TECHNIQUE FOR CONTROLLING THE COMBUSTION OF FUEL HAVING FLUCTUATING THERMAL VALUES

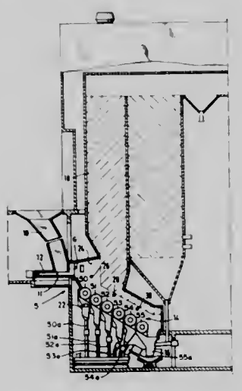
Kurt-Henry Mindermann, Eggerscheidter Str. 112, D-4030 Ratingen, and Franz Wintrich, Berkenberg 25a, D-4300 Essen 13, both of Fed. Rep. of Germany

Filed Oct. 24, 1988, Ser. No. 261,514

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736067

Int. Cl.[4] F23N *5/18*

U.S. Cl. 110—186 **15 Claims**



1. A method for controlling combustion of fuel having widely fluctuating thermal values, comprising the steps of:
feeding said fuel to a grid in a combustion chamber via an inlet thereof;
conveying said fuel along said grid through a degassing and evaporating zone, a primary combustion zone, and a secondary combustion zone in said combustion chamber to an ash removal station;
supplying primary combustion air to said grid from therebeneath;
determining a thermal value of said fuel from properties of combustion gases detected in an area including said inlet and said degassing and evaporating zone;
determining fuel density on said grid in said area from air pressure drop in the primary combustion air; and
controlling the feeding of fuel to said grid in response to said thermal value and said fuel density so as to derive a constant thermal output.

4,895,083

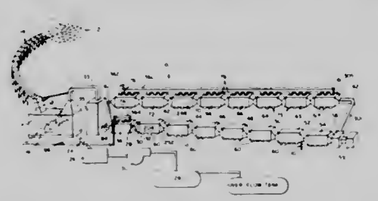
WHOLE TIRE DISPOSAL SYSTEM

John A. McDilda, P.O. Box 351, Claxton, Ga. 30417

Filed Nov. 14, 1988, Ser. No. 270,512

Int. Cl.[4] F23G *5/12*; B09B *3/00*

U.S. Cl. 110—235 **32 Claims**



1. Apparatus for the processing of tires and the recovery of

carbon black, oils and other components therefrom, comprising:
a substantially horizontal incinerator housing having a front end, a rear end, a top wall and a bottom;
first means dividing said chamber into a burn chamber and an exhaust chamber;
a grate disposed in said housing substantially parallel to said bottom and spaced therefrom;
second means to feed tires into said burn chamber;
third means in said burn chamber to ignite tires therein;
said incinerator formed with an air inlet draft opening having a pre-selected dimension;
fourth means below said grate for collecting oil resulting from burning said tires;
a stack disposed over said exhaust chamber and in communication therewith;
first and second baffles in said stack and defining an opening approximating said preselected dimension;
a cooling means;
a first intake tank;
a conduit between said exhaust chamber and said intake tank that traverses said cooling means;
a blower having an intake and an outlet; a series of tanks between said first tank and said blower;
fifth means serially communicating all of said intake tanks with said blower;
power means causing said blower to draw gases of combustion through said air inlet draft opening and subsequently through said stack, cooling means and said first and series of said intake tanks;
a plurality of exhaust tanks serially communicated with one another and said blower outlet;
filter means in each of said exhaust tanks; and
sixth means causing said gases of combustion to return to said incinerator or to atmosphere through said filter means.

4,895,084

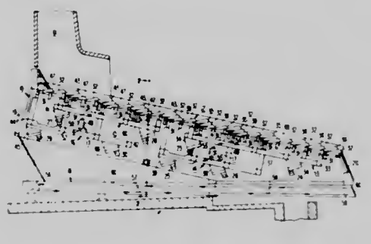
STOKER FOR REFUSE INCINERATORS

Stanley W. Kroon, Long Island City, and Thomas Tsaveras, Elmont, both of N.Y., assignors to Morse Boulger, Inc., Long Island, N.Y.

Filed Dec. 18, 1987, Ser. No. 134,830

Int. Cl.[4] F23B *1/22*

U.S. Cl. 110—255 **24 Claims**



1. A stoker for an incinerator comprising a support means, a stationary assembly of longitudinally spaced sets of grates mounted on said support means, a first movable assembly of longitudinally spaced sets of grates mounted on said support means, said first movable assembly having first and second pluralities of sets of grates, said first plurality of grate sets being disposed in a first set of alternate spaces between sets of grates of said stationary assembly, said second plurality of grate sets being disposed in successive spaces between sets of grates of said stationary assembly, a second movable assembly of longitudinally spaced sets of grates mounted on said support means, said sets of grates of said second movable assembly being disposed in a second set of alternate spaces between sets of grates of said stationary assembly, and means for reciprocating said first and second assemblies.

4,895,085

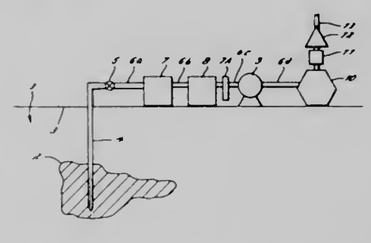
METHOD AND STRUCTURE FOR IN-SITU REMOVAL OF CONTAMINATION FROM SOILS AND WATER

Mark D. Chips, 980 Kiely Blvd., Apt. #303, Santa Clara, Calif. 95051

Filed Jan. 11, 1988, Ser. No. 142,726

Int. Cl.[4] F23G *5/00*

U.S. Cl. 110—346 **17 Claims**



1. A structure for the in situ removal of contamination from soil or water comprising:
means for extracting contaminated vapor from said soil or water while said soil or water remain in situ; and
an internal combustion engine for causing destruction of said vapor.

4,895,086

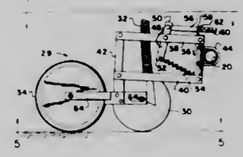
PARALLEL LINKAGE PLANTER CARRIER

John M. Tye, III, P.O. Box 218, Lockney, Tex. 79241

Filed Dec. 11, 1984, Ser. No. 680,301

Int. Cl.[4] A01C *5/06*

U.S. Cl. 111—134 **5 Claims**



1. A planter for planting land having
a. a plurality of planting units each including
i. furrow means for forming a furrow in which to drop the seed,
ii. a seed chute through which seed may be dropped into the furrow, and
iii. cover means for covering the seed in the furrow;
b. a planter tool bar having a longitudinal axis; and
c. each planting unit connected to the tool bar by a four link parallel motion linkage, including
i. a first link thereof attached to the tool bar,
ii. a fourth link thereof rigidly attached to the planting unit, and
iii. a second and third link thereof connecting the first and fourth link;
wherein the improved structure comprises in combination with the above:
d. a main tool bar,
e. said planter tool bar is journaled to the main tool bar for rotation about its longitudinal axis,
f. an adjustable element extending between

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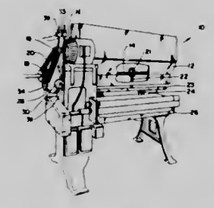
i. a lever on the planter tool bar, and
ii. a connection on the main tool bar, forming
g. an adjustment means for positioning and holding the planter tool bar in angular position so that the planting units have the proper angular orientation to the land to be planted;
h. a tension lever having a lower and upper end,
j. the tension lever is pivotally attached between its ends to the second link between the ends of said second link,
k. a helical tension spring extending from the lower end of the tension lever to the connection of the first and third link,
l an adjustment bar pivoted to the upper end of the tension lever,
m. a perforated ear on the second link above the first link,
n. the adjustment bar extending through the perforated ear,
o. a pin in one of several holes in the adjustment bar at the perforated ear, and
p. the bar, perforated ear, and pin forming stress means for fixing the tension lever in a selected angular position to the second link so that the spring exerts a selected stress upon the linkage.

4,895,087

CONTROLLED STARTING AND STOPPING OF TUFTING MACHINES

Kim K. Amos, Dalton, Ga., assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Aug. 16, 1989, Ser. No. 394,672
Int. Cl.[4] D05C *15/20*; D05B *69/10*
U.S. Cl. 112—80.18 **15 Claims**



1. A tufting machine comprising a frame, a main shaft journally mounted in said frame, A.C. motor means operatively connected to said shaft for rotatably driving said shaft, a needle bar reciprocably mounted in said frame and operably driven by said shaft when said shaft is rotated, a multiplicity of needles carried by said needle bar for cyclically penetrating a base material fed beneath said needle bar first and second brake mean associated with said shaft and actuatable for arresting rotation of said shaft, and electrical circuit means, said circuit means including means for energizing and deenergizing said motor means selectively, means for actuating said first brake means in response to deenergizing of said motor means, and means for actuating said second brake means after said shaft has been slowed to a predetermined speed by said first brake means for stopping rotation of said shaft at a predetermined angular position with said needles disposed substantially at a maximum elevation above the base material.

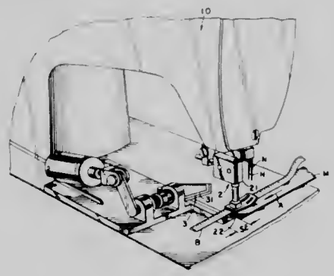
14. In a tufting machine having a frame, a mainshaft journally mounted in said frame, A.C. motor means operatively connected to said shaft for rotatably driving said shaft, a needle bar reciprocably mounted in said frame and operatively driven by said shaft when said shaft is rotated, means for feeding a base material beneath said needle bar, a multiplicity of needles carried by said needle bar for cyclically penetrating said base material, and first brake means for arresting rotation of said shaft, the improvement comprising: second brake means associated with said shaft, circuit means for energizing and deenergizing said motor means and for actuating said first and second brake means independently at spaced time intervals, said circuit means including means for actuating said first brake means upon deenergizing of said motor means and for subsequently actuating said second brake means upon reduction of the speed of said shaft to a predetermined speed such that said shaft may be rotatably stopped with said needle bar and said needles raised to a desired disposition above said base material.

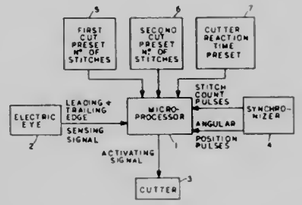
4,895,088

ACCURATE CUTTER SYSTEM FOR SEWING MACHINE

Angelo M. Pirrello, Kearney, and Philip M. Roth, Wallington, both of N.J., assignors to Clinton Industries, Inc., Carlstadt, N.J.

Filed Jun. 1, 1988, Ser. No. 201,089
Int. Cl.[4] D05B *37/04*
U.S. Cl. 112—130 **7 Claims**





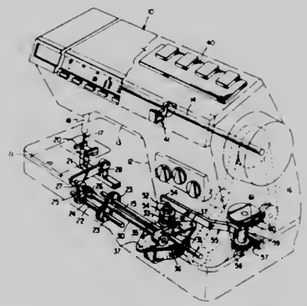
1. In a sewing machine having a reciprocatable needle for stitching material, sensing means for sensing the presence or absence of material, and a cutter spaced from said sensing means for effecting a cutting operation a predetermined time after receipt of a trigger signal, the improvement comprising:
cutter control means connected with said cutter, said cutter control means comprising:
triggering means connected to said sensing means for applying a triggering signal to said cutter a preselected period of time after operation of said sensing means; and
speed detection means connected to said sewing machine for producing a signal proportional to the speed of the sewing machine upon operation of said sensing means and for producing additional signals proportional to the speed of the sewing machine at times after operation of said sensing means and until application of said triggering signal to said cutter;
said triggering means including compensation means connected to said speed detection means and responsive to the signal generated thereby for varying said preselected period of time in accordance with the speed of said machine as detected by said speed detection means.

4,895,089

STEPPER DRIVEN WORK FEED PATTERNING FOR SEWING MACHINES

Kenneth D. Adams, Madison, N.J., assignor to SSMC Inc., Fairfield, N.J.

Filed Feb. 1, 1989, Ser. No. 304,523
Int. Cl.[4] D05B *27/00*
U.S. Cl. 112—316 **4 Claims**



1. In a sewing machine having a frame, work feeding mechanism carried in said frame, a stepper motor carried in said frame, drive mechanism responsive to actuation from said stepper motor for controlling magnitude and direction of work feed movement influenced by said work feeding mechanism, said drive mechanism including cam means having an axis of rotation in said sewing machine frame and follower means tracking said cam means in movement substantially parallel to the axis of rotation of said cam mechanism, and operator influenced mechanism for controlling the balance between forward and reverse directions of work feeding motion said operator influenced mechanism comprising:
spring means arranged between said cam means and said sewing machine frame biasing said cam means axially in one direction, a balance control cam arranged between said cam means and said sewing machine frame for applying force to said cam means axially in a direction opposite said spring bias, and operator influenced means for shifting said balance control cam.

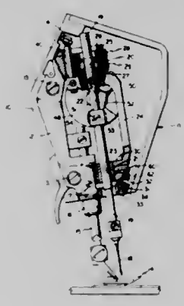
4,895,090

LOST MOTION COMPENSATION FOR SEWING MACHINE NEEDLE VIBRATING GATE

Kenneth D. Adams, Madison, and John Blackwood, Union, both of N.J., assignors to SSMC Inc., Fairfield, N.J.

Filed Feb. 10, 1989, Ser. No. 308,572
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—443 **4 Claims**

1. A zig zag sewing machine needle jogging mechanism including a needle carrying bar endwise reciprocable in a needle bar gate, spaced bearings pivotally supporting said needle bar gate in said sewing machine on an axis divergent from that said needle bar, one of said spaced bearings comprising a sewing machine supported stud having a spherical extremity and a bushing on said needle bar gate formed with a cylindrical stud accommodating bore on an axis coincident with that of said needle bar gate, and spring means acting between said one bearing components biasing said spherical stud extremity into point contact with said cylindrical bore to



eliminate backlash in oscillatory movement of said needle bar gate.

4,895,091

REVERSIBLE CAMBER LINE FLEXIBLE WING SAIL

Nuri E. Elmali, and Martha T. Elmali, both of 2532½ 49th St., St. Petersburg, Fla. 33707

Filed Oct. 17, 1988, Ser. No. 259,357
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—103 **14 Claims**



1. A flexible airfoil assembly functioning as a wing sail, said airfoil comprising:
(a) membrane sheets covering its sides to constitute flexible fairing surfaces so cut to feature sail twist;
(b) means for receiving attachment members connecting the said airfoil to a hoisting means, mounted at the head of the said airfoil;
(c) means for reefing the said airfoil;
(d) a boom running along the foot of the said airfoil, to which the said airfoil is adjustably attached.
(e) a plurality of batten assemblies constituting a variable spatial relationship between the said fairing surfaces, between which they are placed at vertical intervals along the span, extending from luff to leech wherein each said batten assembly is capable of attaining an asymmetrical chordal shape featuring a variable and reversible camber line achieved by the function of laterally movable and flexible members transmitting loads between the said fairing surfaces, creating different fairing curvatures on

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each side, wherein the said action of assuming, reversing and varying the chordal shape is achieved as a response to the higher surface pressure on the windward fairing surface at any tack and any attitude therein during operation, wherein said batten assemblies are capable of oscillating when said airfoil is luffed;

(f) a set of draft members at each batten assembly, placed transversally with respect to the camber line on the chordal plane forming a draft member assembly, and of which lengths vary congruously conforming to the pre-engineered chordal drafts corresponding to the location of each said member along the camber line, whereas said draft members are movably related to each other in such a manner that said draft members can be displaced against each other transversally, wherein the distance of each said member from the point of its intersection with the camber line to the chordal length varies, but the curvilinear distance from the same point to luff remains constant along the camber line;

(g) flexible batten channels placed in between each draft member assembly and the inside face of the fairing surfaces on both sides, whereas each batten channel features a longitudinal receptacle along its length, of which function is to receive the endpoints of said draft members, while the said batten channels are capable of flexing in conformance to the curvature determined by the variable loci of the endpoints of the said draft members, whereby upon which said batten channels, said fairing surfaces are removably attached;

(h) means to terminate the said draft members at their endpoints which allows the said draft members to be movably received by, and to travel longitudinally along the length of the said receptacle of the batten channels, and also to allow pivotal movement around the said endpoints;

(i) means to terminate the draft assembly at the luff, where the said batten channels and the draft member assembly are attached to their respective members which in turn are concentrically and rotatably assembled around a center element featuring an opening to serve as a receptacle means to receive means to relate the airfoil to a support system, wherein the total interaction of the said constituent members of the said batten assembly allows any one of the fairing surfaces upon which a higher surface pressure is built up, to push the said batten channels of its respective side to leeward, forcing them to conform to its acquired curvature in response to the said surface pressure, and hence cause the said batten channels to push the said draft members laterally with respect to the camber line and towards the leeward side, and in turn forcing the leeward batten member and the leeward fairing surface to conform to the curvature created by the locus of the leeward tips of the draft members.

4,895,092

MAINSAIL FURLING DEVICE FOR A SAILBOAT

Henry F. Schaefaing, 144-19 72nd Ave., Flushing, N.Y. 11367

Filed Dec. 16, 1988, Ser. No. 285,213
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—104 **5 Claims**



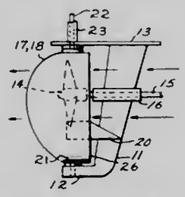
1. A mainsail furling device for a mainsail of a sailboat having a boom comprising a plurality of pairs of mounting brackets attached to said boom of said sailboat spaced from each other on said boom, each of said mounting brackets having a substantially L-shaped cross section and two approximately rectangular bracket panels containing a shorter bracket panel and a longer bracket panel and being connected to each other substantially perpendicularly, said shorter bracket panel having a folded-under flange portion with screw holes for securing said mounting bracket nondetachably to said boom and the free end of said longer bracket panel being attached nondetachably to said boom substantially parallel to the boom longitudinal direction, a mainsail retaining arm attached pivotally to each of said mounting brackets pivotable between a position folded against said boom and a deployed position substantially perpendicular to said boom, a means for pivotally mounting each of said mainsail retaining arms and a means for securing each of said mainsail retaining arms in said deployed position substantially perpendicular to said boom.

4,895,093

MANOEUVRING DEVICE FOR BOATS

Ola K. Dalsbö, Högreina 302, 7079 Flatasaen, Norway

PCT No. PCT/NO87/00073, § 371 Date Jul. 20, 1988, § 102(e) Date Jul. 20, 1988, PCT Pub. No. WO88/03891, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 9, 1987, Ser. No. 223,070
Claims priority, application Norway, Nov. 20, 1986, 864628
Int. Cl.[4] B63H *5/14*
U.S. Cl. 114—163 **7 Claims**



1. In a manoeuvring device for a boat and the like having a propulsion means (14) for developing a rearwardly directing stream of water for a reactive forward driving of the boat and the like, a pair of vertically elongate, transversely arced, pivotal tube plates (17, 18), one mounted to each side of the propulsion means and in the normal operating position thereof forming a tube around the propulsion means, said tube plates being mounted for swinging movement to bring the tube plates together along adjoining edges astern of and spaced from the propulsion means to form a blade for interrupting and diverting the rearwardly directed stream of water, the improvement wherein the tube plates extend downward below the propulsion means, and a tube wing (20) positioned transversely between the tube plates immediately under the propulsion means, said tube wing extending in the longitudinal direction and being transversely arced upward toward the propulsion means, said tube wing delimiting a passageway (19B), below and separate from the propulsion means and the rearwardly directed stream of water, for receiving and forwardly directing the diverted stream of water.

4,895,094

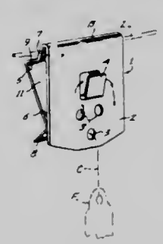
FENDER HANGER

Paul A. Carlstedt, 12545 3rd Ave. NW, Seattle, Wash. 98177

Filed Sep. 30, 1988, Ser. No. 252,217
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—218 **21 Claims**

1. A marine hanger for attachment to a railing or the like comprising a clip having a back portion and a front portion resiliently biased toward said back portion, said front and back portions forming a first recess there between for reception of the railing or the like engaged between said front and back portions, said clip including a portion integral with and joining

said front portion and said back portion, said joining portion forming a second recess opening into said first recess, said



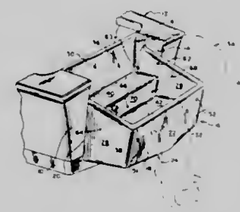
second recess being of substantially triangular cross section and having a maximum width much smaller than the maximum width of the first recess.

4,895,095

OUTBOARD MOTOR MOUNTING DEVICE

William S. Potter, Jr., 4235 Douglas Rd., Coconut Grove, Fla. 33133

Continuation of Ser. No. 764,543, Aug. 12, 1985, Pat. No. 4,708,087. This application Sep. 10, 1987, Ser. No. 95,349
Int. Cl.[4] B63B *5/12*
U.S. Cl. 114—343 **12 Claims**



1. An outboard motor mounting device for mounting on a boat having a transom cutout which is designed to accomodate an outboard motor comprising a body having a sealed hollow interior to provide buoyancy to said mounting device, a bottom wall, opposed side walls, a front wall, a first flange which is connected to said front wall and which extends upwardly from said device, said front wall and said first flange together having dimensions which when mounted on a boat seal an entire transom cutout of said boat substantially to the full height of its maximum freeboard, mounting means for mounting said body to said transom, a rear wall with an upwardly extending second flange for receiving and mounting an outboard motor and an upwardly facing concave formation into which a portion of the outboard motor can be moved when raising the propeller of the motor out of the water.

4,895,096

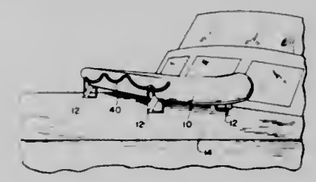
BOAT SUPPORT CHOCK

Raymond Goodwin, Shrewsbury, and Jack Carroll, Pepperell, both of Mass., assignors to Moaltor Marine Products, Inc., Amityville, N.Y.

Filed Nov. 7, 1988, Ser. No. 268,080
Int. Cl.[4] B63B *23/64*
U.S. Cl. 114—381 **6 Claims**

1. A boat support chock comprising a one-piece unitary molded plastic unit including a substantially rectangular flat base, means on the base co-planar with the base for attachment to a boat deck, a rear wall member at one end of the base and at a right angle to the flat base, longer than the base, and having the same width as the flat base, a front wall member at the other end of the rectangular flat base, at a right angle thereto parallel to the rear member and approximately one-half the length thereof,

a curved member connecting the top ends of the front and rear members, the curved member presenting an upper, boat supporting member on the chock with a concave upper surface, the arc presented by the curved member



having a radial projection at angles to the base and both rear and front wall members,

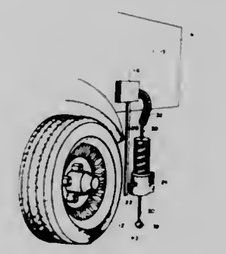
a supporting strut extending from the area of the junction of the base and the rear member, to the convex side surface of the curved member said strut having a width equal to the widths of base and members, the strut comprising two plane elements in spaced parallel relation, and including a web extending parallel to and between said two elements.

4,895,097

TIRE DEFLATION INDICATOR

Alfred M. Lechair, P.O. Box 6917, Gulfport, Miss. 39503

Filed Oct. 6, 1988, Ser. No. 254,241
Int. Cl.[4] B60C *23/08*
U.S. Cl. 116—34 R **8 Claims**



8. An apparatus for signalling loss of pressure within a pneumatic tire supporting a vehicle a distance above a road surface comprising:

(a) a removably affixable plate for mounting upon the frame of said vehicle proximate said tire;

(b) an elongate spring section affixed at a first end to said plate extending in a first position substantially perpendicular to the direction of travel of said vehicle;

(c) a signal rod section affixed to a second end of said spring section terminating in a tip end thereof;

(d) visual signal means, movably retained upon said rod section between said spring section and said tip;

(e) a clip affixed to said plate, extending in direction towards said road surface, retaining said signal rod section in a downward direction, proximate said road surface, said signal rod section being free to move from said clip upon application of a force from contact of said tip with said road surface;

(f) said plate being positioned such that, when said rod is restrained within said clip, said tip is positioned at a point distanced from said road surface when said pneumatic tire

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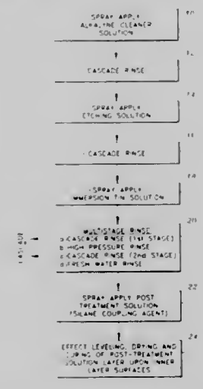
is inflated and in contact with said road surface when said pneumatic tire is deflated.

4,895,098
LUBRICANT APPLICATOR
Minoru Akagawa, Fremont, Calif.; Hisakazu Fukumoto, Tokyo, Japan; Michitane Kosaka; Masatoshi Suzuki, both of Chiba, Japan, and Takashi Nakayama, Ibaragi, Japan, assignors to Intelmatec Corporation, Fremont, Calif.
Filed Nov. 21, 1988, Ser. No. 273,564
Claims priority, application Japan, Feb. 4, 1988, 63-13068[U]
Int. Cl.[4] B05C *11/08*
U.S. Cl. 118—56 **3 Claims**



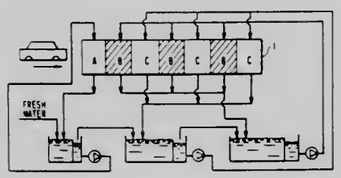
1. A lubricant applicator comprising
a rotatable spindle to which a disk is detachable attached so as to rotate coaxially with said spindle,
gas nozzles and lubricant nozzles disposed adjacent to surfaces of said disk,
a pair of tapes sandwiching said disk therebetween, and
gripping means for applying pressure through said tapes on said surfaces of said disk.

4,895,099
DEVICE FOR SEQUENTIAL SPRAY APPLICATION OF CHEMICAL SOLUTIONS USED IN THE PREPARATION OF CIRCUIT BOARD INNER LAYERS
Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada
Filed Nov. 3, 1988, Ser. No. 267,044
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—58 **21 Claims**



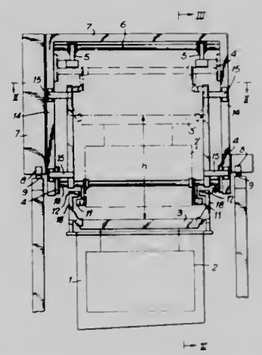
1. A device for sequentially applying chemical treatment solutions to copper surfaces of circuit board inner layers, said device comprising:
(a) a first sprayer apparatus for spray applying an alkaline cleaner solution onto the copper surfaces of the inner layers;
(b) a second sprayer apparatus for rinsing the alkaline cleaner solution from the copper surfaces of the inner layers;
(c) a third sprayer apparatus for spray applying an etching solution onto the copper surfaces of the inner layers;
(d) a fourth sprayer apparatus for rinsing the etching solution from the copper surfaces of the inner layers;
(e) a fifth sprayer apparatus for spraying an immersion tin solution onto the previously etched copper surfaces of the inner layers;
(f) a sixth/multistage sprayer apparatus for thoroughly rinsing the immersion tin solution from the copper surfaces of the inner layers by way of a multistage water rinse including at least one stage comprising a high pressure water spray at a pressure above approximately 100 psi;
(g) a seventh sprayer apparatus for spraying a post-treatment solution onto the copper surfaces of the inner layers, said post-treatment solution being operative to subsequently promote bonding between adhesive and said copper surfaces; and
(h) a leveling apparatus for removing excess post-treatment solution and for leveling said post-treatment solution upon the surfaces of the inner layers.

4,895,100
PAINTING INSTALLATION
Reinhard Kraus, Holzgerlingen, and Kurt Rapp, Eberdingen; both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Apr. 16, 1985, Ser. No. 723,906
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414320
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—326 **2 Claims**



1. A painting installation operating with exhaust air and having several treatment zones, at least one of the treatment zones having a solvent concentration different from a solvent concentration in another treatment zone and the same solvent concentration in still another treatment zone, comprising means for washing-out paint mists out of the exhaust air by water carried in circulation means, at least the treatment zones having essentially similar solvent concentration being combined with a water circulation means of their own, which is separate from a water circulation system for a zone having different solvent concentrations, wherein the water circulation means of each separate or combined treatment zone is operatively connected for purposes of replenishing evaporation losses with the water circulating means of the treatment zone or zones having the next lower solvent concentration in the exhaust air, and wherein only the water circulation means of the treatment zone with the lowest solvent concentration in the exhaust air is operatively connected with a fresh water supply.

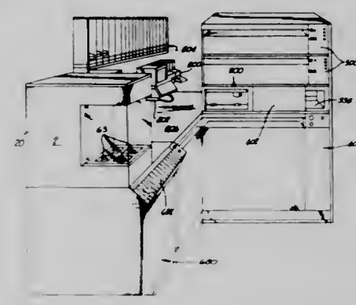
4,895,101
DEVICE FOR LOWERING AND LIFTING SUPPORTS HOLDING OBJECTS TO BE COATED WITH CHEMICAL SUBSTANCES IN PLATING BATHS
Heinrich Knorr, Feucht, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Berghamen, Fed. Rep. of Germany
Filed May 2, 1988, Ser. No. 189,466
Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714728
Int. Cl.[4] B05C *3/00*
U.S. Cl. 118—425 **8 Claims**



1. A device for lowering and lifting object holding supports having supporting arms into and from a bath containing chemical substances for coating the objects, said device comprising:
a carriage for transporting the object holding supports along the bath;
lifting means movable with said transporting carriage for vertically moving the object holding supports into and from the bath, said vertically moving means having means for engaging the supporting arms of the object holding supports; and
guiding means fixed to said transporting carriage and extending at least over a substantial part of a vertical movement path of the object holding supports for engaging the supporting arms of the object holding supports to guide the object holding supports in their movement along the vertical movement path, the supporting arms being each positioned at a respective side of an object holding support and including a guiding portion having a predetermined thickness, said guiding means including guiding strips fixed to said transporting carriage and arranged in pairs at each side of the object holding support, the guiding strips of each part being spaced from each other by a distance equal to the predetermined thickness of the guiding portion of each supporting arm so that each supporting arm with the guiding portion thereof is guided between two guiding strips of each pair.

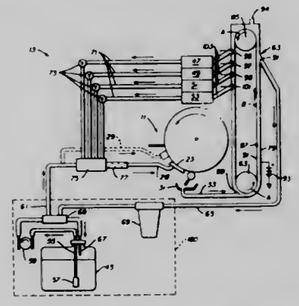
4,895,102
SPIN COATER
Theodore V. Kachel, Pittsburgh, Pa.; Clarence F. Rydeen, Ramona; Robert W. Millar, San Diego; Ralph C. Dawson, Carlsbad; Robert L. Griffith, Vista, and William H. Weitzel, Lakeside, all of Calif., assignors to Techna Vision Incorporated, Santee, Calif.
Filed Oct. 29, 1987, Ser. No. 113,965
Int. Cl.[4] B05C *11/00, 1/02*
U.S. Cl. 118—620 **8 Claims**

1. A spin coater comprising:
(a) a housing having separate front and rear chambers separated such that light in the rear chamber is substantially blocked from the front chamber;
(b) a drawer carrying at least one spin coater element each of which is suitable for spin coating a spectacle lens mold,



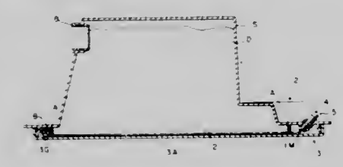
said drawer being slideably mounted within said housing to move between front and rear positions in which the spin coater is disposed in the front and rear chambers, respectively.

4,895,103
AUTOMATIC CLEANING METHOD FOR IMAGE DEVELOPMENT APPARATUS
Gene F. Day, Hillsborough, Calif., assignor to Precision Image Corporation, Redwood City, Calif.
Continuation-in-part of Ser. No. 77,104, Jul. 23, 1987, Pat. No. 4,799,452. This application Aug. 22, 1988, Ser. No. 235,006
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[4] G03G *15/21*
U.S. Cl. 118—652 **12 Claims**



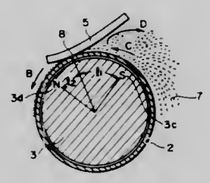
1. In an image development apparatus applying liquid toner to a surface bearing a latent image, a method of automatically cleaning toner contacting portions of the image development apparatus comprising,
continuously circulating a stream of clear fluid dispersant in a circulation path,
periodically injecting color concentrate into said clear fluid dispersant to form a dispersant-concentrate mixture for toning a latent image, then
decomposing the dispersant-concentrate mixture into clear dispersant and color concentrate after said toning said image so that said dispersant-concentrate mixture exists only during the toning of said latent image.

4,895,104
DEVELOPER RESERVOIR
Masahiro Yoshino; Keisuke Yamaguchi; Yoshinaga Mitsuhashi, and Susumu Owada, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Jul. 1, 1988, Ser. No. 214,671
Claims priority, application Japan, Jul. 13, 1987, 62-175383
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—653 **5 Claims**



1. A developer reservoir comprising a reservoir body containing a developer, a flexible seal member releasably bonded to a circumferential surface of an opening in a bottom portion of the reservoir body for sealing said opening, a portion extending from said bonded seal member and folded back to form a loop, a tip end of said extended portion of said seal member positioned outside said reservoir body, a stop member adapted for movement between a first position wherein said member is in said loop and a second position in which said member is outside said loop, the separation of the seal member being prevented when said stop member is in said first position and permitted when said stop member is in said second position, a sliding cover below said seal member and slidably mounted on said reservoir body, said sliding cover adapted to be drawn in a right angle direction to a separating direction of said seal member when said stop member is in said second position, thereby enabling said seal member to be separated and, when said seal member is drawn out, said opening is opened to permit said developer in said reservoir body to be discharged.

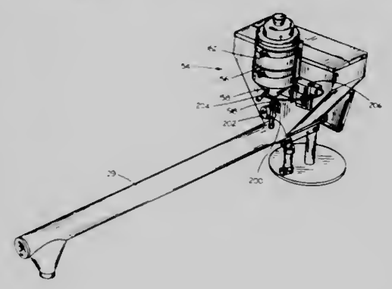
4,895,105
DEVELOPING APPARATUS WITH PRESSURE REGULATING MEMBER
Takahiro Kubo, Tokyo, and Hatsuo Tajima, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1988, Ser. No. 253,080
Claims priority, application Japan, Oct. 7, 1987, 62-251632
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—658 **12 Claims**



1. A developing apparatus for developing an electrostatic latent image, comprising:
a rotatable cylindrical member for carrying a developer;
a stationary magnet disposed in said cylindrical member;
means for supplying the developer to said cylindrical member;
regulating means for regulating a thickness of a layer of the developer supplied to the cylindrical member, said regulating means including an elastic member contacted to said cylindrical member at a position between two adjacent magnetic poles;
wherein a magnetic force F (Gauss) of that magnetic pole of the two adjacent magnetic poles which is disposed upstream of a contact position between said elastic member and said cylindrical member with respect to a rotational direction of said cylindrical member and a contact pressure P (g/cm) between said elastic member and said cylindrical member satisfy

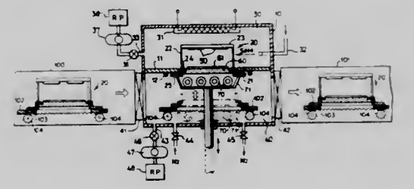
$$0.71P+385[<=]\leqq F\leqq -1.43P+1630.$$

4,895,106
SEED TREATER AND CONVEYING APPARATUS
Ronald A. Barnes, 915 S. 218th Street, Elkhorn, Nebr. 68022
Filed Jan. 3, 1989, Ser. No. 293,193
Int. Cl.[4] B05C *3/08*
U.S. Cl. 118—684 **2 Claims**



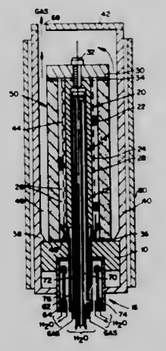
1. An apparatus for simultaneously conveying seed and applying
a liquid chemical treatment to it, comprising, in combination,
an elongated auger tube having opposite inlet and discharge ends, seed supply means adjacent the inlet end thereof, an applicator opening through said tube at a position spaced downstream from said seed supply means and an auger rotatably supported therein, said auger comprising an elongated center shaft and brush flighting extending outwardly from said center shaft,
an applicator for depositing liquid chemical treatment on the seed conveyed through the auger tube, said applicator comprising,
an upright tank having a discharge opening at the lower end thereof,
means for supporting said tank relative to said auger tube such that said discharge opening is in communication with said applicator opening,
a first valve means between said discharge opening of said upright tank and said auger tube for regulating the flow of liquid chemical into said auger tube,
a second electrically controlled valve means between said discharge opening of said upright tank and said auger tube which is normally closed but which is opened upon the actuation of said auger,
selectively actuatable motor means operably connected to said auger for rotating said auger;
said second valve means being electrically connected to said motor means so as to open upon actuation of said motor and so as to close upon deactivation of said motor.

4,895,107
PHOTO CHEMICAL REACTION APPARATUS
Kensaku Yano, Kanagawa; Akihiko Furukawa, Tokyo; Ryohei Miyagawa, Kanagawa, and Yoshinori Iida, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jul. 5, 1988, Ser. No. 215,175
Claims priority, application Japan, Jul. 6, 1987, 62-168028
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—722 **12 Claims**



1. A photo chemical reaction apparatus for treating a workpiece with a reaction gas and light, comprising:
a light source;
movable carrier means for transporting workpieces to be photo chemically treated, including a carrier tray, having supporting means and a light-penetrating window for exposing a workpiece to the light source; and
a processing vacuum container defining a reaction chamber for exposing the workpiece to the reaction gas and the light from the light source and a carrier chamber.

4,895,108
CVD APPARATUS AND PROCESS FOR THE PREPARATION OF FIBER-REINFORCED CERAMIC COMPOSITES
Anthony J. Caputo; Charles E. Devore, both of Knoxville; Richard A. Lowden, Powell, all of Tenn., and Helen H. Moeller, Concord, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Jun. 22, 1988, Ser. No. 209,830
Int. Cl.[4] C23C *16/30*
U.S. Cl. 118—728 **5 Claims**



1. An apparatus for the chemical vapor deposition of a matrix into a tubular porous preform, comprising:
a base adapted for supporting one axial end of the preform;
a stack connected to and extending axially from said base and adapted for extending into the preform, said stack having an outer surface, said stack having ports adjacent said base;
cooling means in said stack for cooling said stack;
retaining means connected to said stack and adapted to engage an opposite axial end of the preform, for retaining the preform against the base and for defining an inner annular chamber between the preform and said stack;
a housing connected to said base and extending axially from said base and around said stack to define an outer annular chamber with said stack which is adapted for receiving the preform;
a mandrel in said inner chamber and in contact with said outer surface of said stack to be cooled by said cooling means of said stack, said mandrel having an outer perforated portion adapted for contact with an inner surface of the preform for cooling the inner surface of the preform and an inner cylindrical portion in contact with the outer surface of said stack and in contact with said outer perforated portion, said inner portion of said mandrel having circumferentially spaced passages;
heating means for heating said housing to heat an outer surface of the preform; and
a gas supply means connected to said base, said ports of said stack and said circumferentially spaced passages of said mandrel communicating with said gas supply means for supplying a reactant gas into said inner chamber, which reactant gas reacts to form a matrix upon being heated, the reactant gas passing through the preform and moving through said outer chamber, the reactant gas depositing matrix initially at the outer heated surface of the preform, the matrix being deposited progressively inwardly of the preform.

4,895,109
MASH-FEED TROUGH
Cornelis J. De Groot, and Adrianus W. J. De Groot, both of 11, NL-6613 AG, Balgoij, Netherlands
PCT No. PCT/NL87/00027, § 371 Date Jun. 13, 1988, § 102(e) Date Jun. 13, 1988, PCT Pub. No. WO88/02597, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 13, 1987, Ser. No. 218,285
Claims priority, application Netherlands, Oct. 13, 1986, 8602572
Int. Cl.[4] A01K *5/02*
U.S. Cl. 119—51.5 **11 Claims**



1. An animal feed device comprising a length of generally cylindrical PVC plastic pipe having upper and lower portions and having a recess formed at an intermediate portion of the pipe to provide an access opening into the interior of the device for the head of an animal, said upper portion of the pipe encompassing a storage reservoir for storing animal feed, said bottom portion of the pipe supporting a dish-shaped feed trough for receiving feed from said storage reservoir, closing means supported by said pipe for closing off the underside of

said storage reservoir and including feed delivery means having a portion engageable by the head of an animal extending into said recess for actuating the feed delivery means, and liquid delivery means for delivering liquid to said feed trough.

4,895,110

ILLUMINATED PET COLLAR

Thomas LoCascio, West Dundee, Ill., assignor to Advance Designs and Concepts, Palatine, Ill.

Filed Jun. 22, 1988, Ser. No. 209,995

Int. Cl.[4] A01K *27/00*

U.S. Cl. 119—106 **16 Claims**



1. An improved illuminated pet collar having a light source disposed along an elongate strap, and a power source electrically connected to the light source to provide power thereto, the improvement comprising:

a buckle member affixed to one end of the collar and including a metallic stem portion, said stem portion being electrically connected to the power source; and

at least one punch hole located along the longitudinal axis of said collar, said punch hole being electrically connected to said light source and dimensioned to receive said stem portion therein such that retaining said stem portion within said punch hole completes an electrical circuit to thereby provide power to said light source.

4,895,111

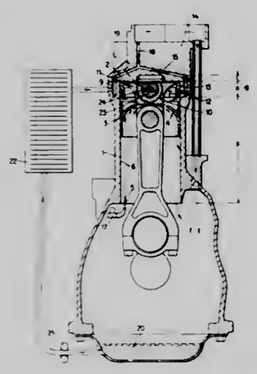
ENGINE COOLING SYSTEM

Ludwig Elsbett, Industriestrasse 14, 8543 Hilpolstein, Fed. Rep. of Germany

Continuation of Ser. No. 790,996, Oct. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 710,864, Mar. 12, 1985, Pat. No. 4,715,335. This application Aug. 5, 1988, Ser. No. 230,671

Int. Cl.[4] F01P *1/04*

U.S. Cl. 123—41.35 **4 Claims**



1. A lubricant-cooled internal combustion engine comprising a cylinder block having a bore with an open first end and a second end, and an internal surface surrounding said bore; a cylinder head closing said first end; a hollow piston reciprocable in said bore to and from a position adjacent said first end, said piston including a crown defining a combustion chamber confronting said cylinder head, and a skirt coupled to said crown and having deflector means adjacent said internal surface, said cylinder block defining an annular passageway surrounding said first end and having a length at least approximating the axial length of said crown; means for circulating lubricant in said passageway; and means for spraying lubricant into said bore by way of said second end so that the thus sprayed lubricant impinges upon said internal surface and is thereupon deflected by said deflector means into the interior of said piston to cool the crown in the region of said combustion chamber, said skirt and said crown being spaced apart from each other in the region of said internal surface so that lubricant which is deflected into the interior of the piston is free to contact the internal surface between the crown and the skirt.

4,895,112

INTAKE PIPE SYSTEM FOR A RECIPROCATING ENGINE

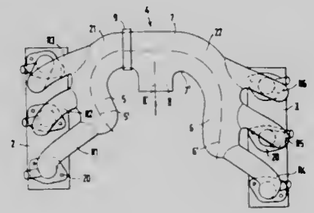
Erwin Rutschmann, Tiefenbronn, and Klaus Schneider, Tiefenbronn-Muehlhausen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

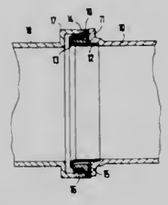
Filed Feb. 1, 1988, Ser. No. 151,191

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702902

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 MV **10 Claims**





1. An intake pipe system for a multi-cylinder reciprocating engine, having a collector intake pipe and individual intake pipes originating from the collector intake pipe and leading to cylinders that are arranged in two banks, wherein the collector intake pipe is U-shaped, wherein the individual intake pipes originate from U-legs of the collector intake pipe, and wherein an intake stub is mounted approximately at the center between the U-legs, said intake stub extending perpendicularly to a web connecting the U-legs, wherein the individual intake pipes are mounted at exterior sides of the U-legs and at an obtuse angle with respect to central axes of the intake pipes.

4,895,113

DEVICE FOR RELATIVE ANGULAR ADJUSTMENT BETWEEN TWO DRIVINGLY CONNECTED SHAFTS

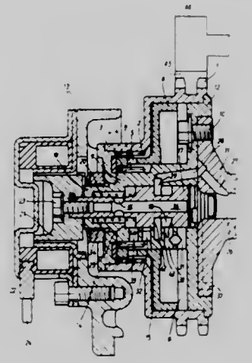
Wolfgang Speier, Tübingen, and Josef Schmitz, Scheidegg, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,459

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810804

Int. Cl.[4] F01L *1/34, 1/04*; F16D *3/10*

U.S. Cl. 123—90.17 **8 Claims**



1. Device for relative angular adjustment between at least two drivingly connected shafts, including a first shaft and at least one second shaft, the at least one second shaft carrying at its driving end a positioning element which is axially displaceable, is directly connected to the at least one second shaft via a helical toothing and, via a further helical toothing, is directly connected to and axially displaceable relative to a cylindrical hollow shaft which surrounds the positioning element and carries a driving wheel, the positioning element being provided with a positioning piston which is arranged in an annular space formed by the hollow shaft and the driving end of the at least one second shaft, the positioning piston dividing the annular space into first and second working spaces and, for the angular adjustment of the driving wheel relative to the at least one second shaft, the positioning piston being displaceable between a first position and a second position by pressure oil from a lubricating oil circuit under pressure, oil of the lubricating oil circuit being fed into one of the first and second working spaces as a function of first and second positions of a control piston, and pressure oil being directable through an oil return back into the lubricating oil circuit from the other of the first and second working spaces by the control piston, wherein the adjustment of the positioning piston out of one of the first and second positions into the other of the first and second positions is effected by pressure oil being directed into one of the first and second working spaces by the control piston, wherein the control piston for controlling the pressure oil of the first and second working spaces is provided with a circumferential oil groove which cooperates with oil-carrying feed and return bores in the driving end of the at least one second shaft so that the oil return from a working space subjected to pressure is blocked and the oil return of a nonpressurized working space is opened, and wherein the circumferential oil groove of the control piston has a width between mutually facing guiding edges which is greater than the distance between mutually opposed guiding edges of oil feed bores of the first and second working spaces.

4,895,114

INTERNAL COMBUSTION ENGINE DRIVEN DEVICE

Giichi Iida, Tokyo; Kazunori Takahashi, Kawagoe, and Taketomo Kodama, Tokyo, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 25, 1988, Ser. No. 276,036

Claims priority, application Japan, Dec. 15, 1987, 62-190447[U]

Int. Cl.[4] F02N *11/08*; F02M *1/02*

U.S. Cl. 123—179 G **2 Claims**



1. An internal combustion engine driven device of the type having an internal combustion engine, a choke valve for adjusting the amount of air supplied to the internal combustion engine, a starter motor for starting the internal combustion engine, and a starting switch device for supplying electricity to the starter motor to actuate it when starting the internal combustion engine, comprising: a knob operationally linked with a choke valve and adapted to move the choke valve from the open to the closed position, stationary contacts provided in an electric circuit between the starter motor and a power source, a movable contact mounted on said knob and arranged in the vicinity of said stationary contacts, a push-button switch provided on said knob and adapted to bring the movable contact into contact with the stationary contacts such as to supply the starter motor with electricity, and a contact section formed on said movable contact in such a manner as to come into contact with said stationary contacts to supply electricity to the starter motor when said knob is moved from a stationary position corresponding to the open position of the choke valve to an operational position corresponding to the closed position of the choke valve.

4,895,115

MOUNT WITH INSULATION FOR SOLID-CONDUCTED SOUND, IN PARTICULAR FOR AN INTERNAL COMBUSTION ENGINE

Otto Weber, Wolfsburg; Manfred Theeavitz, Braunschweig; Volkmar Keck, Wolfsburg, and Siegfried Grohnert, Cremlingen, all of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 308,097

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805145

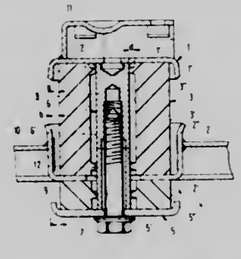
Int. Cl.[4] F16M *5/00*; F16F *15/04*

U.S. Cl. 123—195 A **3 Claims**

1. A sound-insulating mount for an internal combustion engine comprising at least one resilient pad means of elastomeric material, a pair of rigid force-transmitting members engaging opposed surfaces of the resilient pad means with pre-stress, and stop means for limiting the elastic radial displacement of the resilient pad means, the resilient pad means having a free surface portion between the opposed surfaces and

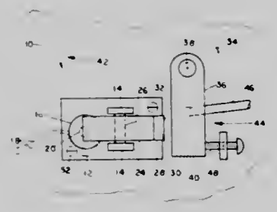
VOL 1110 ISS 4 JA 23 1990 UMI

the stop means comprising abutment means spaced from the free surface portion of the resilient pad means so that the free



surface portion engages the abutment means to limit the deformation of the resilient pad means.

4,895,116
SAFETY DEVICE FOR MOTOR VEHICLES
John Hayda, P.O. Box 585, Linden, N.J. 07036
Filed Nov. 22, 1988, Ser. No. 275,125
Int. Cl.[4] F02B *77/00*
U.S. Cl. 123—198 D **8 Claims**



1. Motor vehicle safety apparatus comprising:
a solenoid having a plunger-like rod, said rod being moveable in response to the energization of said solenoid,
a safety plate, one end of said safety plate being coupled to a free end of said rod, the other end of said safety plate being engageable with an operating arm of the throttle or fuel injection system of the motor vehicle in response to the energization of said solenoid, and
energizing means for energizing said solenoid, said energizing means being coupled to the gear train of the motor vehicle such that when the gear train is disposed out of park or neutral positions, said rod is moved so that said safety plate is not engaged with the operating arm, and when the gear train is in the park or neutral positions said rod is moved so that the other end of said safety plate prevents the operation of the operating arm.

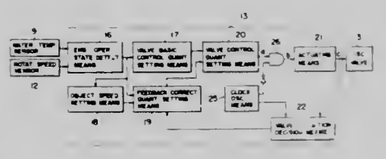
4,895,117
INTERNAL COMBUSTION ENGINE
Tai-Her Yang, 5-1,Tai-Pin Street, Si-Hu Town, Dzan-Hwa, Taiwan
Continuation of Ser. No. 737,261, May 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 363,932, Jul. 13, 1988, abandoned, which is a continuation-in-part of Ser. No. 397,870, Jul. 13, 1982, abandoned. This application Mar. 18, 1988, Ser. No. 170,831
Int. Cl.[4] F02B *53/00*
U.S. Cl. 123—222 **16 Claims**

1. An internal combustion engine, comprising:
gas chamber means including a fuel/air mixture intake and compression chamber for compressing a fuel/gas mixture and a combustion and exhaust chamber for combusting the fuel/gas mixture and for exhausting the waste gases, said intake and compression chamber and said combustion and exhaust chamber being defined by stationary wall means and moving wall means,
means for sequestering a portion of the gases from the compression chamber, for saving the sequestered gases, and for releasing the sequestered gases into the combustion and exhaust chamber at a predetermined time in the engine cycle after a partial suction is created in the combustion and exhaust chamber before the gases are exhausted from the engine, said sequestering, saving, and releasing means being controlled by said moving wall means and the position of said sequestering, saving, and releasing means with respect to the stationary wall,
wherein said means for sequestering a portion of the gases from the compression chamber, said means for saving the sequestered gases, and said means for releasing the sequestered gases into the combustion and exhaust chamber are contained in a gate plate means supported by one of said wall means and extending toward and in sliding contact with the other of said wall means which serves as a camming surface for controlling said gate plate means, said gate plate means including:
housing means,
piston means received by said housing means, said piston means having a piston wall which defines a pressure saving and transfer chamber means inside said piston means,



gas transmission guide hole means located in the wall of said piston means on a side of said piston means, said gas transmission guide hole means being blocked and unblocked by said wall means supporting said gate plate means, the blocking and unblocking of said gas transmission guide hole means being controlled by the contact of said gate plate means against said wall means serving as the camming surface, said gas transmission guide hole means being in direct communication with said gas chamber means when said guide hole is unblocked by said wall means supporting said gate plate means,
one-way intake valve means located in said piston means on a side of said piston means opposite to the side of the location of said gas transmission guide hole means, said one-way intake valve means being in direct communication with said gas chamber means when said intake valve means is open,
said piston means having a proximal end toward said housing and having a distal end away from said housing, said gas transmission guide hole means being located near said proximal end of said piston wall, said gas transmission guide hole means being capable of being blocked by the wall of said housing means and said one-way intake valve means being located near said distal end of said piston means;
bias means for urging said piston means out of said housing means.

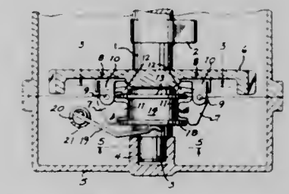
4,895,118
VALVE CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINES
Akihisa Nakamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 3, 1988, Ser. No. 252,604
Claims priority, application Japan, Oct. 6, 1987, 62-252740
Int. Cl.[4] F02D *41/16*
U.S. Cl. 123—339 **2 Claims**



1. In a system for controlling a valve means in an internal combustion engine, which system comprises sensors for monitoring respective variables indicative of the operational state of the engine and generating respectively corresponding detection signals and a control unit operating in response to said detection signals to control the opening degree of said valve means in accordance with said operational state of the engine, the improvement comprising:
detecting means for detecting the operational state of the engine and transmitting a corresponding detection signal;
control quantity setting means for receiving said detection signal and choosing the basic control quantity of said valve means from the data stored in ROM;
objective speed setting means for setting the objective speed of the engine in accordance with the cooling water temperature from said detecting means and generating its output signal;
feedback correction quantity setting means for receiving the actual engine speed from said detecting means and said output signal from said objective speed setting means and setting a feedback correction quantity;
valve control quantity setting means for setting the control quantity of said valve means in response to said detection signals and generating a first actuation signal in accordance with said control quantity;
actuating means for actuating the valve means in response to said first actuation signal;
clock oscillation means for generating a check signal shorter than the reaction time of said valve means;
synthesizing means for synthesizing said check signal and said first actuation signal to generate a synthesized signal, which is converted by said actuating means into a second actuation signal and a valve actuation state determination signal as outputs, which are transmitted to said valve means; and
valve actuation state decision means for detecting said valve actuation state determination signal and deciding the actuation state of said valve means.

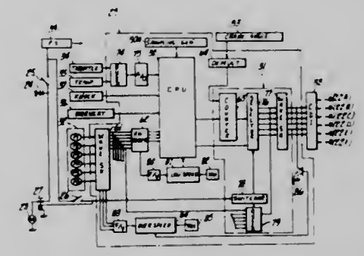
4,895,119
SPEED GOVERNING APPARATUS
Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed May 16, 1988, Ser. No. 194,322
Int. Cl.[4] F02D *9/00*
U.S. Cl. 123—376 **12 Claims**

1. A speed governing apparatus for an engine, comprising rotatable shaft means, an annular member mounted on said shaft means to rotate therewith, said annular member being movable axially relative to said shaft means, flyweight means connected to said shaft means and disposed to be moved by centrifugal force between a first inner position and a second outer position, said flyweight means having a section engaged with a first surface of said annular member, said section being constructed and arranged to move the annular member axially in a first direction as said flyweight means moves from said first position to said second position, non-rotatable means engaged with a second surface of said annular member and operably connected to a speed control mechanism for said engine, said nonrotatable means being constructed and arranged so that



axial movement of said annular member by said flyweight means will move said non-rotatable means to vary the speed of said engine, and means operably connected to said annular member for continuously oscillating said annular member in an axial direction and correspondingly oscillating said flyweight means in a radial direction relative to said annular member.

4,895,120
IGNITION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Motoi Tobinaga; Shingeo Okumura, and Kenichi Handa, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Continuation of Ser. No. 640,039, Aug. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 611,846, May 18, 1984, Pat. No. 4,606,315. This application Nov. 4, 1985, Ser. No. 794,959
Claims priority, application Japan, Aug. 13, 1983, 58-147325
Int. Cl.[4] F02B *77/08*; F02P *5/04*
U.S. Cl. 123—417 **19 Claims**



1. In an ignition system for a multi-color internal combustion engine, an ignition control system, comprising:
means for providing a speed signal indicative of the speed of said engine;
means for providing a flow signal indicative of the air flow to the induction system of said engine;
means for providing a lubricant signal indicative of the supply of lubricant for said engine;
means for detecting the crank angle of said engine;
ignition timing means for generating a spark timing signal which is responsive to said speed and flow signals during predetermined operating conditions of said engine, said ignition timing means including means for detecting a low lubricant level condition from said lubricant signal, and means for responding to said low lubricant level condition by providing a spark timing signal which is effective to cause at least one cylinder of said engine to intermittently

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cease fire at a rate which will cause a gradual decrease in the speed of said engine; and

means for generating an ignition signal in response to said crank angle detecting means and said spark timing signal during the running of said engine;

wherein said responding means initiates said intermittent cease firing only when said flow signal has exceeded a predetermined air flow level and said speed signal has exceeded a predetermined speed level.

4,895,121

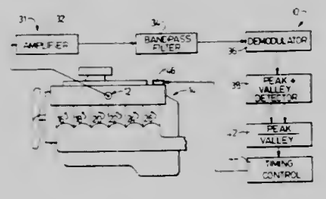
METHOD AND APPARATUS FOR MEASURING DETONATION IN AN INTERNAL COMBUSTION ENGINE

Steven R. McCoy, Washington; Thomas T. Stevenson, Dunlap; Douglas E. Carr, Chillicothe, and Kevin D. King, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 16, 1988, Ser. No. 245,186

Int. Cl.[4] F02P *5/14*

U.S. Cl. 123—425 **25 Claims**



1. A method of measuring the magnitude of knock in an internal combustion engine having at least one combustion chamber, comprising the steps of:

transmitting a signal responsive to vibrations of the engine;

filtering said transmitted signal in a frequency band about a cavity resonance frequency of a combustion chamber of the engine;

demodulating said filtered signal to produce an envelope of said filtered signal;

detecting the maximum and minimum of the envelope during a first period of time; and

determining a ratio of each maximum to each respective minimum, said ratio being correlative to the magnitude of knock.

16. An apparatus for measuring the magnitude of knock in an internal combustion engine having a plurality of combustion chambers, comprising:

an accelerometer mounted on a bank of the combustion chambers and arranged to deliver an electrical signal responsive to vibrations of the engine;

a filter for receiving the electrical signal and tuned to pass frequencies of said electrical signal in a band about a cavity resonance frequency of said combustion chambers;

a demodulator for detecting the envelope of the filtered electrical signal;

means for detecting the maximum and minimum magnitudes of the envelope in a preselected period of time; and

means for determining the ratio of each maximum to each respective minimum, said ratio being correlative to the magnitude of knock.

4,895,122

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

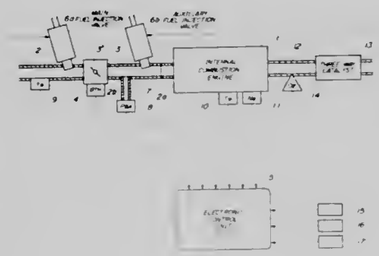
Kunio Noguchi, and Masayuki Ueno, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 228,009

Claims priority, application Japan, Aug. 17, 1987, 62-203680

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 **7 Claims**



1. A method of controlling in a feedback manner the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an intake system, at least one first fuel injection valve and at least one second fuel injection valve both arranged in said intake system for operating in respective different operating regions of the engine, the operating regions including an air-fuel ratio feedback control region, an exhaust system, and sensor means arranged in said exhaust system for sensing the concentration of an exhaust gas ingredient therein, wherein during operation of said engine in said air-fuel ratio feedback control region, the air-fuel ratio is controlled by the use of a coefficient which has an initial value and varies with change in the output of said sensor means, the method comprising the steps of:

(a) determining whether or not the engine is operating in a first operating region falling within said feedback control region, in which said first fuel injection valve is to operate;

(b) determining whether or not the engine is operating in a second operating region falling within said feedback control region, in which said second fuel injection valve is to operate;

(c) calculating an average value of values of said coefficient obtained during past operation of said engine in said first operating region, and storing the resulting average value as a first average value, when it is determined that the engine is operating in said first operating region;

(d) calculating an average value of values of said coefficient obtained during past operation of said engine in said second operating region, and storing the resulting average value as a second average value, when it is determined that the engine is operating in said second operating region;

(e) setting the initial value of said coefficient to a value based on said first average value to thereby start the feedback control of the air-fuel ratio, when the engine has shifted to said first operating region; and

(f) setting the initial value of said coefficient to a value based on said second average value to thereby start the feedback control of the air-fuel ratio, when the engine has shifted to said second operating region.

4,895,123

APPARATUS FOR CONTROLLING AIR-FUEL RATIO OF INTERNAL COMBUSTION ENGINE

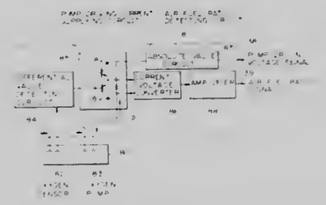
Masanobu Uchinami; Toshihisa Takahashi; Hiroyoshi Suzuki; Ryoji Nishiyama, and Shinichi Nishida, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 310,575

Claims priority, application Japan, Feb. 18, 1988, 63-36058

Int. Cl.[4] F02D *5/00*

U.S. Cl. 123—489 **2 Claims**



1. An air-fuel ratio control apparatus for an internal combustion engine, said apparatus including a wide range air-fuel ratio sensor, which includes an oxygen sensor section for generating a voltage according to the difference between the atmospheric pressure and the oxygen concentration of the engine exhaust gas and an oxygen pump section for flowing a pump-driving current so as to attain said voltage at a predetermined value, an air-fuel ratio detecting device for providing an air-fuel ratio detecting signal in response to said pump-driving current, and a control section for feedback controlling a mixed gas generation means in accordance with said air-fuel ratio detecting signal to obtain an air-fuel ratio having a required value, said apparatus further comprising a failure detecting means for detecting any failure of the wide range air-fuel ratio sensor by determining when the pump-driving voltage for flowing the pump-driving current remains outside a predetermined range for a predetermined period of time during the operation of the wide range air-fuel ratio sensor, and a feedback breaking means for stopping the feedback control of the air-fuel ratio when such a failure is detected by the wide range air-fuel ratio sensor.

4,895,124

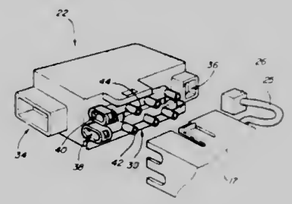
FUEL AND ELECTRICAL DISTRIBUTION SYSTEM FOR FUEL INJECTED ENGINES

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Mt. Clemens, Mich.

Filed Dec. 2, 1987, Ser. No. 127,378

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—510 **5 Claims**



1. A fuel injection system for use with internal combustion engines comprising:

a module adapted to be remotely positioned away from the internal combustion engines in an engine compartment, said module including:

fuel inlet and return means adapted for connecting with a fuel source and return such that fuel is pumped to said module fuel inlet means from said source and fuel is returned from said module fuel return means to the fuel return; fuel outlet means associated with said fuel inlet means, said fuel outlet means adapted to enable fuel to pass from the module to fuel injectors of the internal combustion engines;

second fuel return means associated with said first fuel return means, said second fuel return means adapted to enable fuel to enter the module from the fuel injectors of the internal combustion engines;

electronic means for controlling fuel distribution to and from the fuel injectors, said electronic means adapted to be associated with the fuel injectors for controlling fuel entering into the internal combustion engines; and

harness means adapted for distributing fuel to and from the module to and from the fuel injectors such that said harness means is adapted to couple with said fuel outlet means and said second fuel return means and for coupling said electrical means with the fuel injectors, said harness means is of a unitary construction.

4,895,125

APPARATUS FOR THE FEEDBACK OF EXHAUST GASES IN AN INTERNAL COMBUSTION ENGINE

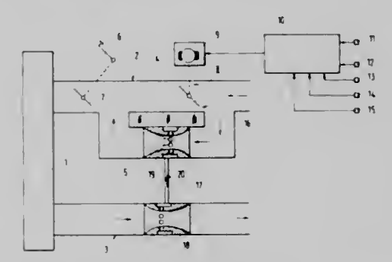
Istvan Geiger, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagen Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,943

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731909

Int. Cl.[4] F02M *25/06;* **F02D** *9/02*

U.S. Cl. 123—568 **8 Claims**



1. In an internal combustion engine having

an intake gas conduit;

an output setting member disposed in said intake gas conduit and arranged for controlling therein the flow of intake gas; and

an exhaust gas conduit;

the improvement comprising

(a) a throttle member disposed in said intake gas conduit upstream of said output setting member as viewed in the direction of flow of the intake gas;

(b) a bypass conduit having an inlet end coupled to said intake gas conduit upstream of said throttle member and an outlet end coupled to said intake gas conduit downstream of said throttle member;

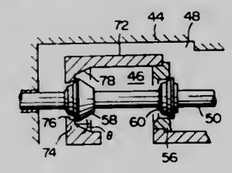
(c) an exhaust gas feedback conduit having an inlet end coupled to said exhaust gas conduit and an outlet end coupled to said bypass conduit; and

(d) control means for setting positions of said throttle member as a function of an operational parameter of the internal combustion engine for directing a quantity of intake air

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into said bypass conduit as a function of the operational parameter.

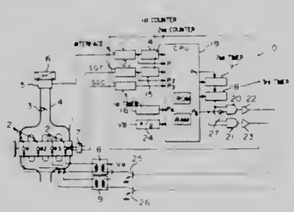
4,895,126
FLOW RATE CONTROL SYSTEM
Torazo Nishimiya, Mito; Tomoo Ito; Katsuzi Murao, both of Katsuta; Tohoru Ozawa, and Yoshiro Kabakura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 512,001, Jul. 8, 1983, abandoned. This application Feb. 8, 1989, Ser. No. 307,537
Claims priority, application Japan, Jul. 9, 1982, 57-118356
Int. Cl.[4] F02M *23/06, 23/10*
U.S. Cl. 123—585 **8 Claims**



1. A flow rate control system comprising:
a first valve body and a second valve body secured to a rod and spaced apart from each other longitudinally of the rod;
an outflow passageway extending transversely between said first valve body and said second valve body;
an inflow passageway located around said outflow passageway extending beyond the upstream side of said first valve body to said second valve body;
a partition wall separating said outflow passageway from said inflow passageway, said partition wall being formed with a first valve seat adapted to have said first valve body come into and out of engagement therewith and formed with a second valve seat adapted to have said second valve body come into and out of engagement therewith;
drive means for driving said rod to bring said first valve body and said second valve body into and out of engagement with said first valve seat and said second valve seat, respectively;
means formed on the inner peripheral surface of the first valve seat for causing a swirling flow of fluid to be produced on the upstream side of the valve seat and discharged to the outflow passageway to eliminate the occurrence of hunting in the flow rate of fluid including an annular protrusion formed on the first valve seat along a portion of an inner peripheral surface of an inlet side of said valve seat and a surface portion located downstream of said annular protrusion on an outlet of the inner peripheral surface of the first valve seat and divergently tapering in a direction toward a downstream side of the first valve seat.

4,895,127
IGNITION TIMING CONTROL SYSTEM
Toshiro Hara; Takanori Fujimoto, and Masahira Akasu, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 11, 1988, Ser. No. 192,529
Claims priority, application Japan, May 14, 1987, 62-119778; May 15, 1987, 62-119229; May 15, 1987, 62-119230
Int. Cl.[4] F02P *7/077, 11/00*
U.S. Cl. 123—643 **4 Claims**

1. In an ignition timing control device for an internal combustion engine comprising in combination:
load detecting means for detecting a load on the engine;
engine-revolution detecting means for detecting a number of revolution of the engine;
cylinder discrimination signal generating means for generating a cylinder discrimination signal;
operating means for operating the optimum ignition timing for the engine based on the output from the load detecting means and the engine-revolution detecting means;
drive signal generating means for a generating drive signal corresponding to the ignition timing for each of ignition coils provided in each cylinder; and
distribution means for distributing the drive signal to each of



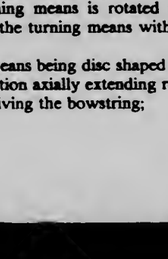
the ignition coils in appropriate sequence on the basis of the cylinder discrimination signal, wherein said distribution means predicts an ignition coil to which the drive signal is to be distributed and determines the ignition coil to which the drive signal is to be distributed, and determines the ignition coil to which the drive signal has been distributed previously, and distributes the drive signal to the predicted ignition coil in case an ignition coil designated by the cylinder discrimination signal is different from the predicted ignition coil.

4,895,128
UNDERWATER SPEAR GUN
Douglas Okada, 21203 S. Harvard, Torrance, Calif. 90501
Filed May 6, 1988, Ser. No. 191,182
Int. Cl.[4] F41B *7/04*
U.S. Cl. 124—22 **16 Claims**



1. In an underwater spear gun comprising a main stock section having an upper portion and a lower portion, said stock section having a front end and a rear end, a spear having a sharpened tip-end, and a shaft, said shaft having a first end connected to said tip-end and a second tail-end, at least one rubber power-band, and triggering means, wherein the improvement comprises:
a barrel affixed to said upper portion of said stock section, said barrel having a longitudinal central axis, and a circumferential wall defining a bore within said barrel in which may be placed said spear,
said circumferential wall of said barrel having a longitudinal channel formed in an upper part thereof, said longitudinal channel extending along at least most of the entire length said upper part of said barrel,
said spear having a plurality of substantially linearly-arranged tail fins projecting perpendicularly from said shaft, said tail fins being spaced apart along said shaft at least along projecting portions thereof, all of said tail fins projecting upwardly from said shaft and being substantially contained in the same vertical plane;
said shaft being positioned in said bore and said plurality of tail fins projecting outwardly from and beyond said bore through said longitudinal channel; said longitudinal channel having a width only slightly greater than the thickness of each said tail fin so that said tail fins may pass therethrough but be substantially prevented from lateral movement during their travel along said longitudinal channel; said circumferential wall enclosing the greater majority of the circumference of said shaft of said spear;
said at least one rubber power-band having a first end connected to said front end of said stock section, and a second end looped about a respective one of said tail fins whereby said at least one power-band is stretched for powering the spear upon the triggering of the gun by said triggering means.

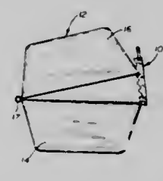
4,895,129
PEEP SIGHT WITH PEEP TURNER FOR A BOW
Roger G. Hedgpeth, 3205 S. Campbell, Springfield, Mo. 65807
Filed Jan. 30, 1989, Ser. No. 303,250
Int. Cl.[4] F41B *5/00*; F41G *1/00*
U.S. Cl. 124—87 **12 Claims**



12. A peep sight apparatus for use with a bow having bowstring in archery including:
(a) a single body sight means for positioning in strands of the bowstring generally at the locus of an archer's line of sight when aiming;
(b) said sight means providing a viewing path adapted to allow a target to be sighted by an archer when the bowstring is drawn proximate to the archer's eye;
(c) said peep sight means including a plurality of radial openings for use in allowing the archer to sight a target after the sight means have undergone generally any degree of realignment due to the rotation of the bowstring during the process of drawing the bowstring into a cocked position for releasing an arrow;
(d) said sight means having the general form of a polyhedron with four generally vertical faces; said sight means having a hollow internal chamber communicating with the openings centrally positioned in each of said four vertical faces;
(e) said internal chamber and openings cooperating to provide a plurality of viewing paths for sighting a target; said sight means having strand slots located at each vertical intersection of adjacent pairs of vertical faces for receiving strands of the bowstring;
(f) said peep sight apparatus further including turning means for mounting on the bowstring in spaced relation to said sight means for use in adjustment of the alignment of said sight means by the archer when the bowstring is fully drawn;
(g) said turning means being adapted to rotate the bowstring when said turning means is rotated through frictional engagement of the turning means with the surface of an archer's face;
(h) said turning means being disc shaped with an elongated hollow hub portion axially extending relative to said disc for tightly receiving the bowstring;

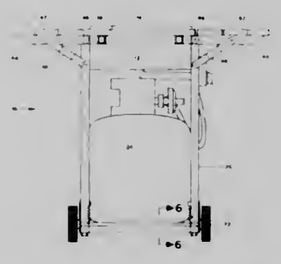
(i) said turning means having a radially outer surface generally in the form of a hexagon; and
(j) said outer surface having frictional means comprising friction nodes equidistantly spaced along said outer radial surface of said disc for improving a frictional engagement of the turning means on the archer's face.

4,895,130
BARBECUE LID POSITIONER
Marvin A. Staschke, 441 W. Leadora, Gleadora, Calif. 91740
Filed May 30, 1989, Ser. No. 358,133
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—25 R **5 Claims**



1. A barbecue lid positioner adapted for use with a barbecue grill of the type having a stove base and a lid, comprising:
an elongated arm having a forward side edge having defined therein a plurality of notches, each having a transversely extending bearing surface for carrying, in use, the lower edge of a barbecue lid, and each notch including an upwardly angled back wall surface for, in use, being struck by the lower edge of a barbecue lid when such lid is raised, pushing the arm rearwardly; and
said arm having a first end edge facing substantially longitudinally oppositely from said bearing surfaces of the shelves, said first end edge defining a bearing surface for, in use, being carried upon an upper edge of the stove base.

4,895,131
PORTABLE GAS GRIDDLE AND GRILL
James W. Overholser, 2185 Monticello Dr., Idaho Falls, Id. 83401
Filed Feb. 16, 1989, Ser. No. 311,357
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—41 R **6 Claims**



1. A portable hydrocarbon gas-fired cooking unit having a firebox, a flame unit, and a cooking surface, the improvement comprising:
a. the cooking surface in the form of a removable and interchangeable griddle surface and grill unit, the griddle surface and grill unit being of substantially identical dimensions and interfitting with the firebox in substantially identical positions, only one of the griddle surface or grill unit surface being utilized at a time;
b. a serving/eating portion affixed to the cooking unit and

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substantially surrounding the firebox, at least a portion of the serving/eating portion being hingedly connected to the cooking unit such that such portion may be folded downwardly for storage;

c. the cooking surface having a substantially co-planar relationship with an upper edge of the firebox and the serving-/eating portion; and

d. the firebox, flame unit, cooking surface and a hydrocarbon gas source mounted to a wheeled frame.

4,895,132

SPIRIT STOVE

Arne K. O. Boij, Verkstadsgatan 8, Trasås, Sweden (S-573 01)

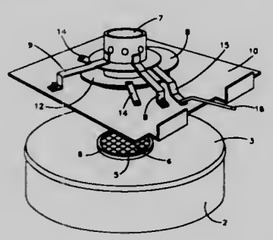
PCT No. PCT/SE87/00626, § 371 Date Aug. 15, 1988, § 102(e) Date Aug. 15, 1988, PCT Pub. No. WO88/04533, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 22, 1987, Ser. No. 235,890

Claims priority, application Sweden, Dec. 22, 1986, 8605528

Int. Cl.[4] F24C *5/00*

U.S. Cl. 126—48 **9 Claims**



1. Apparatus for burning spirit or similar liquid fuel having a fuel container (2) filled with a fuel absorbing mass with a partly exposed surface from which the fuel being burned evaporates and, a draught or burner tube (7) being so arranged with respect to the exposed surface that inlet flow of combustion air into the tube is safeguarded, the fuel container being separate and removable from the remaining parts of the apparatus and having top, bottom and sidewalls enclosing the absorbing mass, the top wall for providing the exposed surface comprising a central opening (4) which is limited by an edge part (5) on the top wall extending upwards with respect to the top of the surface container, the edge part having an annular upper surface (6) with which a movable control and extinguishing device cooperates by partly or completely covering the opening (4) for control and extinguishing purpose, characterized in that a seat ring (12) is placed between the annular upper surface (6) and a control and extinguishing plate (8) at such a distance above a heat protective metal plate (10) surrounding the upwards extending edge part (5) for completely or partly covering the opening (4) said metal plate (10) being below said annular upper surface (6), wherein spirit vapors and remaining flames if any are burned out between the control and extinguishing plate (8) and the heat protective metal plate (10) do not directly heat the top (3) of the container (2) due to the heat shielding effect of the metal plate (10).

4,895,133

HEAT PACK FOR SURVIVAL IN COLD WATER

Michael H. Collins, and Edward T. Provost, both of Chester, England, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 2, 1986, Ser. No. 914,699

Claims priority, application United Kingdom, Oct. 4, 1985, 8524543

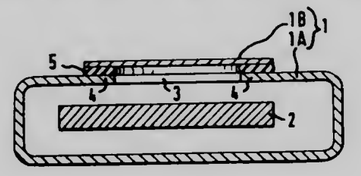
Int. Cl.[4] A61F *7/00*; F24J *1/00*

U.S. Cl. 126—204 **15 Claims**

1. A heat pack for supplying thermal energy to a wearer on immersion in cold water, comprising:

a capsule in which water can be admitted;

a tablet of a heat generating agent in the capsule having such a shape that the reactive surface created allows the agent



to react exothermally with the water at a controlled reaction rate; and

a flow stabilizing cover mesh connected to the capsule and covering the tablet.

4,895,134

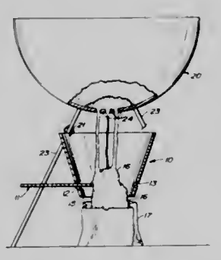
DEVICE FOR THE COLLECTION OF ASHES FROM A KETTLE-TYPE OF BARBECUE GRILL

Douglas Fielding, and Charles S. Adams, both of Oakland, Calif., assignors to Charcoal Companion, Berkeley, Calif.

Filed May 1, 1989, Ser. No. 345,484

Int. Cl.[4] F23J *1/00*

U.S. Cl. 126—243 **6 Claims**



1. A device for the collection of ashes from a kettle-type grill, including in combination:

an inverted frustoconical ash collector with a large top opening, tapering down to a smaller bottom opening, said frustoconical ash collector having a large horizontal slot about half the width thereof and a small slot opposite said larger slot, and

a non-combustible disk slidable in the large slot, the disk effectively closing said bottom opening, when the disk is inserted fully into the large slot, said disk having a locking tab for engagement with said small slot to hold said disk horizontally in place and to close off completely said bottom opening.

4,895,135

SELF-HEATING CONTAINER

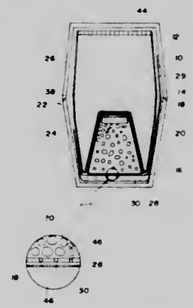
Masafumi Hamasaki, Tokorozawa, Japan, assignor to Fukubi Kagaku Kogyo Kabushiki Kaisha, Fukui; Chori Company, Ltd., Osaka and Hama Corporation Co., Ltd., Saitama, all of, Japan

Filed Aug. 2, 1988, Ser. No. 227,254

Claims priority, application Japan, Aug. 10, 1987, 62-122417[U]; Aug. 10, 1987, 62-122418[U]; Oct. 12, 1987, 62-154738[U]; Feb. 8, 1988, 63-14633[U]

Int. Cl.[4] F24J *1/00*

U.S. Cl. 126—263 **13 Claims**



1. A shelf-heating container comprising:

an outer shell member;

an envelope disposed in said outer shell member and enclosing an exothermic reaction agent for generating heat by hydration;

water bag means disposed in said outer shell member and filled with water for reaction with said exothermic reaction agent, said water bag means comprising a primary bag and a secondary bag, said primary bag being elongated and disposed between the bottom of said outer shell member and said envelope, and said secondary bag being housed in said envelope; and

a container body housed within said outer shell member for containing foodstuff, said container body being formed of a sheet member comprising a metal foil and a synthetic resin layer attached on at least one side of said metal foil, said sheet member being folded to have a substantially W-shaped cross section and heat-sealed at least along the vertical edges and upper edges by said synthetic resin layer, and an inverted V-shaped portion of the folded sheet member defining outside said container body a chamber for accommodating said envelope therein.

4,895,136

HIGH-TEMPERATURE HEATERS, METHODS AND APPARATUS

Dean A. Poppe, St. Petersburg, Fla., assignor to Kemco Systems, Inc., St. Petersburg, Fla.

Filed Sep. 2, 1988, Ser. No. 240,007

Int. Cl.[4] F24H *1/10*

U.S. Cl. 126—355 **14 Claims**

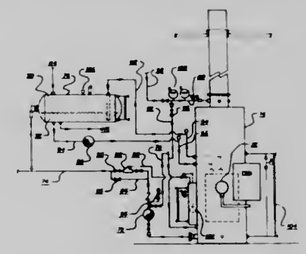
1. An improved gas-jet hot water heater system for the generation of high-temperature water at atmospheric pressure simultaneous with superheated water and/or steam comprising:

a primary tank for the generation and storage of high-temperature water at atmospheric pressure including an upper preheat zone containing heat transfer bodies therein through which water to be heated may pass, an intermediate combustion zone located beneath the preheat zone having a gas-jet burner for the heating of water passing therethrough, and a storage zone located beneath the combustion zone for receipt of the heated water passing through the combustion zone;

a supplemental water-heating sub-assembly including a pressurized remote storage tank, a heat exchanger in the intermediate zone for water being heated by the products of combustion of the gas-jet burner, the gas jet burner positioned for generating hot gases for preheating water in the preheat zone, for heating water in the intermediate zone and for maintaining the heat in the water in the storage zone and, concurrently, for heating water in the supplemental water heating sub-assembly, and conduit means coupling the heat exchanger with the remote storage tank whereby t be heat exchanger will create superheated water and the remote storage tank will store the superheated water in its lower extent and create steam in its upper extent;

means for withdrawing superheated water from the lower extent of the remote storage tank; and

means for withdrawing steam from the upper extent of the remote storage tank.



4,895,137

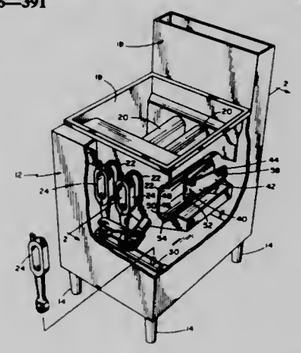
BAFFLE ASSEMBLY FOR A HEAT EXCHANGER TUBE

Douglas S. Jones, and Alfred E. Mullaney, Jr., both of Baltimore, Md., assignors to Vulcan-Hart Corporation, Louisville, Ky.

Filed May 4, 1989, Ser. No. 347,357

Int. Cl.[4] A47J *27/00*

U.S. Cl. 126—391 **6 Claims**

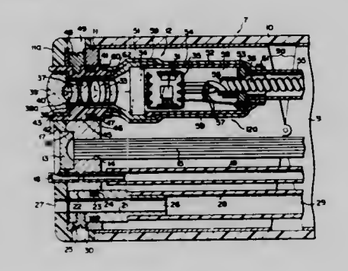


1. A baffle assembly for a burner tube of the type comprising a bollow, generally elongate heat transfer member, said baffle assembly comprising a perforated plate member formed into a generally V-shaped configuration defining a forward edge, and ears integrally formed on said plate member and adapted to engage an end of said burner tube for retaining the baffle

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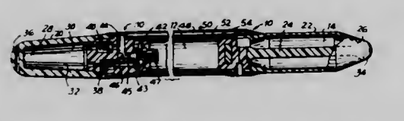
assembly within the burner tube, whereby combustion gases directed at said forward edge are partially deflected to the walls of the burner tube for enhanced heat transfer between the combustion gases and the burner tube.

4,895,138
ENDOSCOPE WITH A DETACHABLE OBSERVATION UNIT AT ITS DISTAL END
Hisao Yabe, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Dec. 24, 1985, Ser. No. 813,146
Claims priority, application Japan, Jan. 14, 1985, 60-4392
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **13 Claims**



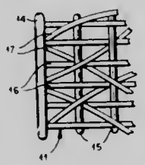
1. An endoscope comprising:
an operating section;
an insertion section extending from said operating section;
a distal end structure provided at the distal end of said insertion section;
illuminating means for projecting illuminating light from said distal end structure onto a desired portion;
an observation unit detachably attached to said distal end structure, said observation unit including support means detachably fitted to said distal end structure, an objective lens system disposed in said support means, for imaging an optical image of said portion illuminated by said illuminating means, a solid-state image sensor disposed in said support means, for converting the optical image imaged by said objective lens system into an electric signal, and electronic components disposed in said support means and connected to said solid-state image sensor; and
a controller for converting the electric signal from said solid-state image sensor into a processed image.

4,895,139
INFLATABLE PENILE PROSTHESIS WITH BEND RELEASE VALVE
Sidney F. Hauschild, Hendricks, and Denzo K. Levius, Bloomington, both of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.
Filed Aug. 29, 1988, Ser. No. 238,008
Int. Cl.[4] A61F *2/26*
U.S. Cl. 128—79 **11 Claims**



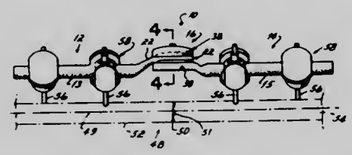
1. A unitary penile prosthesis implantable within one or both corpus cavernosa of the penis to simulate a natural erection comprising:
a generally tubular chamber within said penile prosthesis, inflatable from a flaccid to an erect state when filled with a fluid substantially to capacity and deflatable from the erect state to the flaccid state when substantially free of fluid,
a fluid reservoir in fluid communication with said tubular chamber, and
a manually actuatable valve system for controlling fluid flow between said tubular chamber and said fluid reservoir, said valve system movable between at least two different positions, a first open position allowing for change from the erect state to the flaccid state, and a second closed position allowing for change from the flaccid state to the erect state, said valve system being movable from said second closed position to said first open position by bending of the penis.

4,895,140
DEVICE FOR OVERCOMING MALE DYSFUNCTION OR IMPOTENCE
Leopold Bellak, Larchmont, N.Y., assignor to C.P.S. Inc., Larchmont, N.Y.
Filed Aug. 8, 1988, Ser. No. 229,630
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 **6 Claims**



1. A device for overcoming male dysfunction and sexual impotence which comprises a flexible woven stiffening sheath adapted to be unrolled along the penis and consisting of interwoven longitudinal and circular filaments, and mutually crossing filaments crossing said longitudinal and circular filaments and interwoven with said longitudinal and circular filaments to form a braid with one another.

4,895,141
UNILATERAL EXTERNAL FIXATION DEVICE
James B. Koeneman, Mesa; Thomas M. Hansen, Phoenix; Mark Phillips, Mesa, and Allan M. Weinstein, Paradise Valley, all of Ariz., assignors to Harrington Arthritis Research Center, Phoenix, Ariz.
Continuation-in-part of Ser. No. 791,222, Oct. 25, 1985, Pat. No. 4,747,400, which is a continuation-in-part of Ser. No. 604,047, Apr. 26, 1984, Pat. No. 4,584,995. This application Nov. 19, 1987, Ser. No. 122,397
Int. Cl.[4] A61F *5/04*
U.S. Cl. 606—54 **16 Claims**



1. An external fixation device for positioning and immobilizing the distal segment and proximal segment of a fractured bone to reduce the fracture, comprising:
a distal frame having means for clamping half pins insertable within the distal segment of the fractured bone, said distal frame being formed with a distal hinge element having an arcuate surface;
a proximal frame having means for clamping half pins insertable within the proximal segment of the fractured bone, said proximal frame being formed with a proximal hinge element having an arcuate surface matable with said arcuate surface of said distal hinge element of said distal frame;
means for interconnecting said distal hinge element with said proximal hinge element so that said mating arcuate surfaces thereof are movable relative to one another along a partially spherical-shaped surface defined by a radius of fixed length having an origin at approximately the center of the fracture to permit pivotal movement of said distal frame relative to said proximal frame for aligning the distal segment with the proximal segment of the fractured bone.

4,895,142
ARM SLING
Nancy Liptak, 7997 Pettibone Rd., Bainbridge Township, Cuyahoga County, Ohio 44022
Filed Jun. 30, 1988, Ser. No. 214,034
Int. Cl.[4] A61F *5/37, 5/40*
U.S. Cl. 128—94 **4 Claims**



1. An arm sling, which comprises:
a single elongated unitary length of material having a first end and a second end and an intermediate location therebetween,
one portion of the length extending from the first end to the intermediate location being generally rectangular with a first width sufficiently wide to permit the longitudinal sides of the portion to be connected together to form a front tubular sleeve portion, the sleeve portion having an opening at the intermediate location for insertion of a forearm into the sleeve portion up to the elbow while leaving the arm above the elbow substantially uncovered, the sleeve portion being adapted for enveloping the forearm and supporting the forearm diagonally across the front of the body toward the opposite shoulder, and the other portion of the length extending from the intermediate location to the second end having a second width that is approximately less than half as wide as the first width to form a back portion, the back portion comprising a continuation of one side of the sleeve portion, the back portion immediately adjacent to the opening in the sleeve portion alone providing a support for the elbow, the back portion adapted to extend from the elbow diagonally across the back to the opposite shoulder; and
attachment means for attaching the first end to the second end over the opposite shoulder.

4,895,143
MOUTHPIECE
Joseph A. Fisher, 113 Franmore Cir., Thornhill, Ontario, Canada (L4J 3B9), assignor to Joseph A. Fisher, Thornhill, Canada
Filed Dec. 21, 1987, Ser. No. 135,987
Claims priority, application Canada, Mar. 16, 1987, 532,083
Int. Cl.[4] A62B *18/08*
U.S. Cl. 128—206.29 **15 Claims**



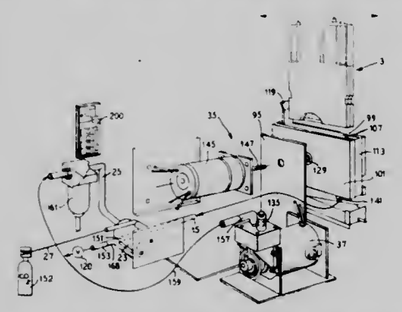
1. A mouthpiece through which a person may breathe consists essentially of a manifold having at least one first opening in the manifold, the manifold at the first opening extending to form a sealing flange for introduction into the mouth, the sealing flange comprising an upper palatine hood portion and a lower labial skirt portion, the palatine hood of a generally convex shape suitable to lie against the hard palate and the posterior side of the upper teeth extending laterally in both directions from proximate the central incisors to proximate the premolars inside the buccal cavity, the lower labial skirt of a generally concave shape suitable to lie between the posterior face of the lower lip and the anterior face of the lower gum and teeth extending laterally in both directions from proximate the central incisors to proximate the premolars inside the lower vestibule portion of the mouth, the peripheral shape of the upper palatine hood extending laterally from about its centre angularly downward on both sides to merge on both sides with the lateral limits of the lower labial skirt, the peripheral shape of the lower labial skirt extending laterally from about its centre upwardly to merge with the palatine hood such that the two laterally spaced areas of merger between the palatine hood and the lower labial skirt are at about the corners of the mouth when the sealing flange is introduced into the mouth; the manifold having at least a second opening for opening outside the mouth for the passage of inspired and expired air, the first opening and the second opening being in communication with one another through the manifold for the passage of air.

4,895,144
SUPPLY SYSTEM FOR STERILE FLUIDS AND GASES IN LASER SURGERY
Kenneth P. Cook, Blue Bell, and Robert M. Bross, Ivyland, both of Pa., assignors to Surgical Laser Technologies, Inc., Erlanger, Ky.
Filed Nov. 9, 1987, Ser. No. 118,255
Int. Cl.[4] A61B *17/36*
U.S. Cl. 606—2 **24 Claims**

1. A supply system for transporting sterile liquids and gases for use in laser surgery or other medical applications comprising:
(a) a disposable sterile cartridge having a gas input, a liquid input, and a common output;
(b) a gas supply connected to said gas input for delivering gas thereto;
(c) a liquid supply connected to said liquid input for delivering liquid thereto;

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(d) means for pressurizing the gas of said gas supply;
(e) means external to and separate from said cartridge and cooperating therewith to pump the liquid of said liquid



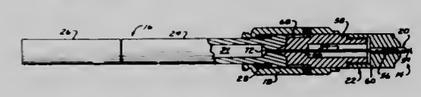
supply through the cartridge from the liquid input to the common output while maintaining the sterility of the liquid therein.

4,895,145

TWO-PIECE DISPOSABLE LASER DELIVERY SYSTEM

Stephen N. Joffe, Cincinnati; John Osborn, Loveland, both of Ohio, and Richard L. Studer, Villa Hills, Ky., assignors to Surgical Laser Technologies, Inc., Erlanger, Ky.

Continuation of Ser. No. 65,661, Jun. 23, 1987, Pat. No. 4,785,805, which is a continuation of Ser. No. 738,555, May 28, 1985, abandoned. This application Aug. 2, 1988, Ser. No. 227,193
The portion of the term of this patent subsequent to Nov. 22, 2006, has been disclaimed.
Int. Cl.[4] A61B *17/36*
U.S. Cl. 606—11 **6 Claims**



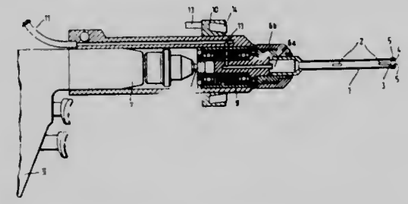
1. A laser delivery system for coupling laser energy from a laser source and for transmitting the laser energy through a laser optic fiber, the laser source having an output port and a laser interlock mechanism therein, the laser source generating laser energy at the output port when the interlock mechanism is actuated; the delivery system including a reusable portion and a generally disposable portion; means for rigidly securing the reusable portion in fixed relationship on the laser source whereby laser energy from the output port is coupled into the delivery system reusable portion; the disposable portion including an optic fiber for passing laser energy and fiber retaining means on one end thereof, means for affixing the retaining means on the optic fiber whereby said one end of the optic fiber remains exposed with respect to the retaining means; the reusable portion including means for actuating the laser source interlock mechanism only when the disposable portion retaining means in coupled to the reusable portion; coacting means on the fiber retaining means and on the reusable portion for detachably coupling said reusable portion to said retaining means, the coacting coupling means including means for positioning the optic fiber and retaining means in predetermined fixed orientation with respect to the reusable portion whereby laser energy entering the reusable portion may enter the disposable portion optic fiber; said coacting coupling means permitting attachment or removal of the disposable portion from the reusable portion by non-trained persons at the site of the laser source whereby laser energy entering the delivery system reusable portion is coupled into and transmitted through the optic fiber without adjustment of the reusable or disposable portions of the delivery system.

4,895,146

SURGICAL BONE-GRINDING INSTRUMENT

Klaus Draenert, Alte Landstrasse 26, D-8012 Ottobrunn, Fed. Rep. of Germany

Continuation of Ser. No. 548,884, Sep. 23, 1983, abandoned. This application Dec. 29, 1988, Ser. No. 290,863
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202193
Int. Cl.[4] A61B *17/32*
U.S. Cl. 606—79 **10 Claims**



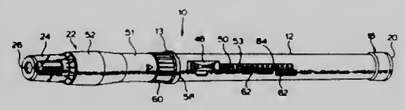
1. A bone-grinding instrumentality powered by a rotary tool, such as a drilling machine, for use in the removal of bone material and for preparation of transplant beds, the instrumentality comprising: a first rotating hollow bone grinding cylinder for preparing bone for the removal of bone material and for preparation of transplant beds having an inner and outer wall of selected internal and external diameters, respectively and an end base having coupling means thereon being releasably joined via the coupling means to a rotary power tool and being configured at one end as a grinding head having a rounded end face; the grinding head having an end surface with an abrasive coating thereon, the abrasive coating having a particle size between 30 and 350 μm; a coolant feed line, means for attaching the coolant feed line to the instrumentality in alignment with the interior of the first hollow bone-grinding cylinder wherein the cylinder is supplied with coolant by means of the coolant feed line whereby the first bone-grinding cylinder produces a first plug of bone material for removal from the bone to leave a space therein and, a second rotating hollow bone-grinding cylinder interchangeable with the first cylinder for preparing a transplant plug from other bone for implanting in the space left by removal of the first plug.

4,895,147

LANCET INJECTOR

Raymond O. Bodicky, Oakville, Mo., and Ronald W. Ausherman, Bethalto, Ill., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 28, 1988, Ser. No. 264,291
Int. Cl.[4] A61B *17/32*
U.S. Cl. 606—182 **33 Claims**



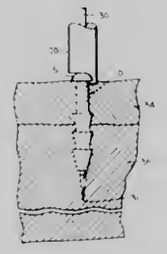
1. A lancet injector comprising
a generally elongate housing having distal and proximal ends and a generally longitudinally extending slot in the sidewall thereof said slot in communication with an inner chamber in said housing wherein said inner chamber extends from the distal end of said housing and into the proximal end of said housing,
a lancet guide having distal and proximal ends wherein said distal end includes a means for retaining a lancet thereon,
a spring means in said inner chamber wherein said spring means actuates movement of said lancet guide in said inner chamber,
a control member connected to said lancet guide and extending through said slot to the exterior of said housing, wherein said control member is moveable distally from a retracted position to an puncture position in said slot wherein said lancet guide moves against the force of said spring means to the retracted position and substantially with the force of the spring means to the puncture position, and
a penetration depth selector on said housing wherein the distance between the retracted position of said control member and the puncture position of said control member may be adjusted to vary the depth of the puncture created by the lancet in the puncture position.

4,895,148

METHOD OF JOINING TORN PARTS OF BODILY TISSUE IN VIVO WITH A BIODEGRADABLE TACK MEMBER

F. Barry Bays, Seminole; Arthur F. Trott, Largo, and Sam R. Marchand, Dunedin, all of Fla., assignors to Concept, Inc., Largo, Fla.

Division of Ser. No. 194,091, May 16, 1988, which is a division of Ser. No. 865,184, May 20, 1986, abandoned. This application Mar. 22, 1989, Ser. No. 326,994
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—213 **3 Claims**



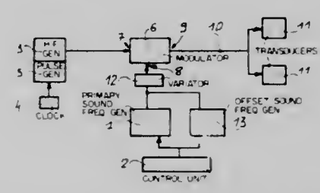
1. A method of joining torn parts of bodily tissue in vivo with a biodegradable tack member having a shaft extending from a proximal end to a distal end carrying barb members and an axial bore extending through the shaft comprising the steps of: in
(a) placing an insertion needle through the axial bore the tack member such that a sharpened point of the needle projects from the distal end of the tack member;
(b) inserting the needle and then the tack member through the torn parts of bodily tissue to cause the barb members to engage the torn parts of the bodily tissue;
(c) retracting the needle from the inserted tack member and from the torn parts of the bodily tissue without removing the tack member; and
(d) bolding said torn parts of bodily tissue together with the barb members of the tack member until the tack member dissolves, the biodegradable material of which the tack member is made being selected to have a dissolution time in vivo in excess of the time required for healing of the torn parts of bodily tissue.

4,895,149

APPARATUS FOR NON-INVASIVE STIMULATION OF ACUPUNCTURE POINTS

Jean-Bernard Morez, 6 bis Place de l'Europe, 59240 Dunkerque, France

Filed Aug. 27, 1984, Ser. No. 644,683
Claims priority, application France, Aug. 29, 1983, 83 14020
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 R **15 Claims**



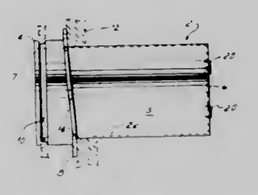
1. Apparatus for non-invasive stimulation of acupuncture points on a cutaneous surface of a human body comprising sound frequency generating means for generating five primary sound frequencies, each of which is a different higher order harmonic of one of five fundamental sound frequencies which are effective for treating different organs of the body, said five fundamental sound frequencies and the organs treated thereby, arranged in a predetermined order, being, approximately, 64 Hz corresponding to a liver, 54 Hz corresponding to a heart, 81 Hz corresponding to a spleen, 72 Hz corresponding to lungs, and 48 Hz corresponding to a kidney; transducer means for applying the primary sound frequencies to an acupuncture point on the body for treating the organs; and control means for controlling the sound frequency generating means such that the five primary sound frequencies are generated in seriatum in order of decreasing frequency, and wherein the different harmonic orders of the five primary sound frequencies are selected such that when the primary sound frequencies are applied in order of decreasing frequency the organs are treated in said predetermined order.

4,895,150

IMPLANTED POWER SOURCE

Milton S. Isaacson; Anthony P. Liol, both of Dayton; Gregory A. Thompson, Huber Heights, and Donald D. Kinsworthy, Dayton, all of Ohio, assignors to Nu-Tech Industries, Inc., Dayton, Ohio

Filed Mar. 24, 1988, Ser. No. 172,654
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 R **9 Claims**



1. The method of mounting a power supply in a human body comprising the steps of:
forming a hole in the skin;
inserting a cup shaped housing having an annular rim surrounding an aperture such that said rim extends outside the skin;
securing said housing to body tissue comprising bone matter at least in part; and
removably inserting a power supply into said aperture.

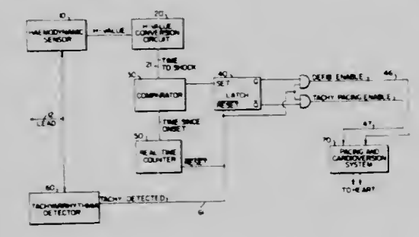
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,151

APPARATUS AND METHOD FOR THERAPY ADJUSTMENT IN IMPLANTABLE

Richard Grevis, Rose Bay, and Loraine Holley, Rockdale, both of Australia, assignors to Telectronics N.V., Curacao, Netherlands, Netherlands Antilles

Filed Jul. 20, 1987, Ser. No. 75,629
Int. Cl.[4] A61N *1/365, 1/39*
U.S. Cl. 128—419 PG **20 Claims**



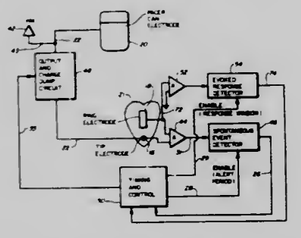
13. A medical device for treating tachyarrhythmias comprising means for detecting the presence of a patient tachyarrhythmia, first means responsive to said detecting means for first applying to the patient a first anti-tachyarrhythmia therapy at a first energy level, measuring and deriving means for measuring the haemodynamic condition of the patient and continually deriving during said first antitachyarrhythmia therapy a length of time to switchover during which said first antitachyarrhythmia therapy continues, said length of time being a function of said haemodynamic condition as measured by said measuring and deriving means, second means for applying to the patient a second antitachyarrhythmia therapy at a second energy level, and switchover means for causing an immediate switchover from the operation of said first means to the operation of said second means as soon as the time following operation of said detecting means exceeds said length of time until switchover.

4,895,152

SYSTEM FOR CARDIAC PACING

Frank J. Callaghan, Miami, and Edward A. Schroeppel, Miramar, both of Fla., assignors to Telectronics N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 823,610, Jan. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 807,547, Dec. 11, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 219,806
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **7 Claims**



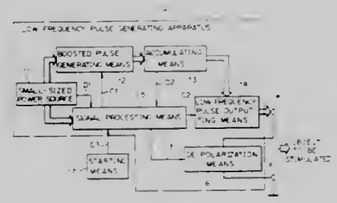
1. The method of cardiac pacing and sensing which comprises the steps of:
providing a pulse generator for emitting an electrical stimulus;
providing a cardiac pacing lead for connection to said pulse generator and having a first electrode at its distal end and a spaced, second electrode free of electrical connection to said first electrode;
providing an output capacitor;
positioning said lead in a heart chamber;
periodically emitting an electrical stimulus having a first polarity from said first electrode to stimulate cardiac contraction;
discharging an electrical charge, having a polarity that is opposite to the first polarity of the electrical stimulus, from said output capacitor through the heart muscle via said first electrode immediately following the emission of said electrical stimulus, whereby the post stimulation potential of said first electrode is reduced and sensing of an evoked response is enhanced;
thereafter sensing said evoked response by said second electrode carried by said lead and spaced from said first electrode and free of electrical connection thereto; and
transmitting said sensed evoked response to a point of use.

4,895,153

LOW FREQUENCY CURING APPARATUS APPLICABLE DIRECTLY TO ORGANISM

Mitsunori Takeuchi, Sagamihara, and Minoru Sasaki, Yokohama, both of Japan, assignors to Kabushiki Kaisya Advance, Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,865
Claims priority, application Japan, Mar. 25, 1987, 62-68956
Int. Cl.[4] A61N *1/36, 1/04*
U.S. Cl. 128—421 **15 Claims**



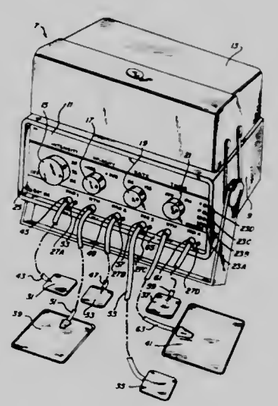
1. A low frequency curing apparatus comprising:
a small-sized power source;
boosted pulse generating means connected to said small-sized power source, for generating a train of boosted pulses having pulse widths and pulse intervals corresponding to first pulse signals;
accumulating means connected to said boosted pulse generating means for accumulating electrical energy to at least a predetermined amount for electrically stimulating an object;
low frequency pulse outputting means connected to said accumulating means, for outputting low frequency pulses having pulse widths and pulse intervals corresponding to second pulse signals, the low frequency pulses having an amplitude corresponding to the electrical energy accumulated in said accumulating means;
a pair of electrode members having planar portions for transmitting the low frequency pulses from said low frequency pulse outputting means to said object; and
signal processing means connected to said small-sized power source and including a predetermined algorithm for outputting the first pulse signals and the second pulse signals, wherein at least one of the first and second pulse signals have at least one of a changeable pulse width and pulse interval in accordance with the predetermined algorithm, whereby a variety of low frequency stimulation effects are applied to said object to be stimulated.

4,895,154

ELECTRONIC STIMULATING DEVICE FOR ENHANCED HEALING OF SOFT TISSUE WOUNDS

James T. Bartelt, and Alan R. Owens, both of Longmont, Colo., assignors to Staodynamics, Inc., Longmont, Colo.

Filed Feb. 19, 1988, Ser. No. 159,863
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—421 **20 Claims**



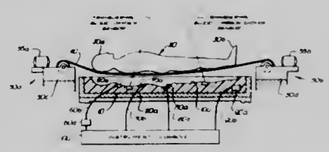
1. An electronic stimulating device for enhancing healing of soft tissue wounds, said device comprising:
signal generating means providing a stimulating signal suitable for enhancing healing of soft tissue, said stimulating signal having a peak current not greater than about 40 ma;
electrode means connected with said signal generating means for receiving said stimulating signal therefrom, said electrode means being adapted to be positioned contiguous to said soft tissue wound to be healed;
return electrode means adapted to be positioned adjacent to said soft tissue wound to be healed; and
control means connected with said signal generating means for controlling application of said stimulating signal to said soft tissue wound, said control means including timer means for causing application of said stimulating signal to said soft tissue wound for a predetermined time period.

4,895,155

METHOD FOR ESTIMATING BLOOD OXYGEN SATURATION

Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Continuation of Ser. No. 73,639, Jul. 15, 1987, abandoned, which is a division of Ser. No. 786,746, Oct. 11, 1985, Pat. No. 4,681,098. This application Oct. 24, 1988, Ser. No. 262,047
Int. Cl.[4] A61C *5/00*
U.S. Cl. 128—633 **2 Claims**



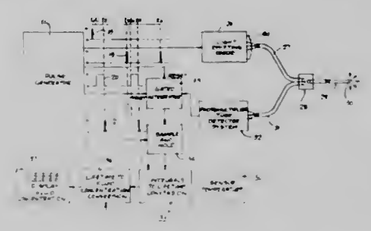
1. A method of estimating blood oxygen saturation of a subject comprising the steps of:
providing a substantially rigid body mold having an impression intimately matching the entire length of the dorsal half of the body of a subject, and embedding a skin color transducer in the body mold at a position to directly contact the body when it is placed in the body mold;
placing the subject's body in a supine position in the body mold to directly contact the transducer; and
analyzing the output of the skin color transducer to estimate the blood oxygen saturation.

4,895,156

SENSOR SYSTEM USING FLUOROMETRIC DECAY MEASUREMENTS

John E. Schulze, 1450 Cortez de Prima Vera, Thousand Oaks, Calif. 91360

Filed Jul. 2, 1986, Ser. No. 881,139
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—634 **24 Claims**



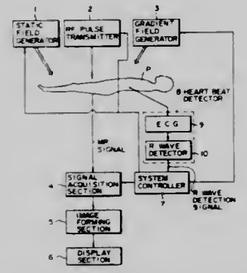
1. A measurement system for analysis of fluid concentration of a component inside a body, comprising:
pulse generator means for generating a number of time related pulses;
a fiber-optic equipped catheter for measuring a fluid component concentration; said catheter having a length to extend to a region of interest within a body while a proximal end portion of said catheter remains outside the body and including at least one fluorometric sensor in communication with one or more fiber optic light pipes within said catheter, said fluorometric sensor producing a fluorescent output in response to a light input, said fluorescent output having a fluorescent decay indicative of said fluid concentration in an environment of said fluorometric sensor;
temperature sensing means for monitoring a temperature in the vicinity of the body and producing a temperature signal;
light source means responsive to one or more of said pulses to generate pulses of output light, and for directing a portion of said light into said proximal end portion of said fiber-optic light pipe-equipped catheter;
a photosensor positioned relative to the proximal end portion for sensing the fluorescent output of said fluorometric sensor conveyed to the proximal end portion by one of said fiber optic light pipes;
sampling means for sampling an output of the photosensor at two or more predetermined times after initiation of a pulse of said output light to provide two or more fluorescent decay signals; and
analysis means for analyzing said fluorescent decay signal of said sampling means to obtain a lifetime signal related to the fluid concentration of the component in the environment of the fluorometric sensor; and
processing means for presenting a visual indication of the fluid component concentration by using the lifetime signal in a relation correlating the lifetime signal to component concentration of the form:

$$\frac{T_o}{T} = 1 + K_g T_o [Q]$$

where:

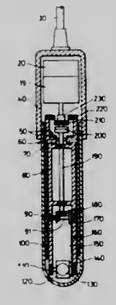
T_o=lifetime in absence of fluid component
T=measured lifetime in the presence of a given concentration [Q] of fluid component
K_g=bimolecular quenching factor
[Q]=fluid component concentration
and wherein the processing means includes temperature compensation means responsive to the temperature signal to adjust values of T_o and K_g with changes in the temperature in the vicinity of the body sensed by the temperature sensing means.

4,895,157
MAGNETIC RESONANCE IMAGING SYSTEM
Kyojiro Nambu, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 12, 1988, Ser. No. 155,572
Claims priority, application Japan, Feb. 16, 1987, 62-32874
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—653 A **5 Claims**



1. A magnetic resonance imaging system comprising:
static magnetic field forming means for forming a static magnetic field in a region including a selected slice of a subject having a varying portion which periodically varies in synchrony with heartbeats of said subject, and in which substantially at least two conditions of the varying portion of the subject alternately appear;
gradient magnetic field applying means for applying gradient magnetic fields to said subject placed in the static magnetic field;
high frequency magnetic field applying means for applying a high frequency magnetic field to at least said region including said selected slice of said subject for causing a magnetic resonance phenomenon in said region;
signal acquiring means for detecting and acquiring a magnetic resonance signal produced in said selected slice of said subject by said magnetic resonance phenomenon;
system control means for controlling said static magnetic field forming means, said gradient magnetic field applying means, said high frequency magnetic field applying means, and said signal acquiring means such that predetermined gradient and high frequency magnetic fields are repeatedly applied to said region including said selected slice of said subject in a predetermined sequence according to a phase encoding method to excite said magnetic resonance phenomenon in said selected slice, and the magnetic resonance signal due to the magnetic resonance phenomenon is acquired by said signal acquiring means;
image forming means responsive to the magnetic resonance signal acquired by said signal acquiring means to obtain magnetic resonance image information of said selected slice of said subject; and
heartbeat information detecting means for monitoring the heartbeats of said subject, and detecting timings of appearance of said at least two conditions, wherein
said system control means is responsive to said heartbeat information detecting means to control the repetition of said predetermined sequence, and causing said signal acquiring means to alternately acquire magnetic resonance signals at the time of said at least two conditions.

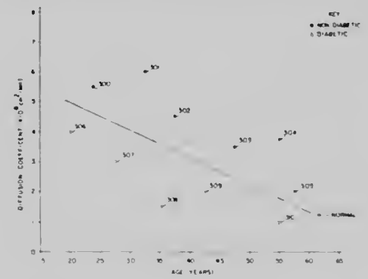
4,895,158
ULTRASONIC PROBE
Masami Kawabuchi, Yokohama, and Fumio Muramatsu, Atsugi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 70,256, Jul. 6, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 300,216
Claims priority, application Japan, Jul. 7, 1986, 61-104044[U]; Jul. 15, 1986, 61-108465[U]; Jul. 15, 1986, 61-165839
Int. Cl.[4] A61B *8/12*
U.S. Cl. 128—662.06 **11 Claims**



1. An elongate ultrasonic probe shaped and sized for insertion into coeloms of a body, comprising:
an ultrasonic transducer element;
a rotatable member supporting the transducer element;
a casing accommodating the transducer element and the supporting member and filled with ultrasonic wave propagation medium, wherein at least the forwardmost part of the casing is smoothly rounded and smoothly contiguous with the elongate portion of the casing to reduce discomfort to the person receiving the probe, this forwardmost part forming an ultrasonic wave transmission window;
means for controllably rotating the supporting member about a first axis and also about a second axis orthogonal to the first axis; and
means for detecting the positions of the supporting member with respect to both said first and second axes.

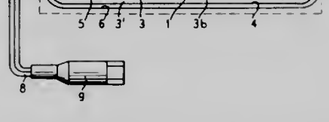
4,895,159
DIABETES DETECTION METHOD
Jeffrey N. Weiss, 2202 Lacaya Bend, E-4, Coconut Creek, Fla. 33066
Continuation-in-part of Ser. No. 416,654, Sep. 10, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,717
Int. Cl.[4] A61B *6/00, 10/00*
U.S. Cl. 128—665 **6 Claims**

1. A method of screening a patient for diabetes mellitus, comprising the steps of:
A. ascertaining the diffusion coefficient of the lens of the eye of each of a plurality of normal persons from variations in the intensity of light back-scattered from a clear site in the lens,
B. relating the ascertained diffusion coefficients with the respective ages of the normal persons to establish norms for nondiabetic persons of various ages,
C. ascertaining the diffusion coefficient of the lens of an in vivo eye of the patient from variations in the intensity of light back-scattered from a clear site in the lens, and



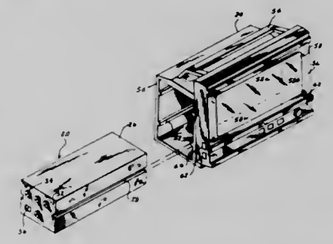
D. determining whether the patient's diffusion coefficient is lower than the norm for nondiabetic persons of the same age as the patient.

4,895,160
APPARATUS FOR MEASURING THE LIFE FUNCTIONS OF A HUMAN BEING, PARTICULARLY AN INFANT
Heinrich Reents, Magnolienweg 23, 475 Unna, Fed. Rep. of Germany
Filed May 22, 1986, Ser. No. 886,112
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—671 **11 Claims**



1. An apparatus for monitoring at least one life function of a life form, comprising:
a voltage source;
support means for supporting the life form including a resilient mat, a capacitance means mounted insulated in the mat connected to said voltage source and responsive to movements of the life form to produce life function signals representing such movements; and
a monitoring unit coupled to said capacitance means and including
a high-impedance first amplifier stage for receiving the life form signals, said high-impedance first amplifier stage having an input impedance on the order of 500K ohms or greater;
a second amplifier stage connected to said first amplifier stage for amplifying the life form signals by a first factor;
first filter means connected to said second amplifier stage for filtering out commercial supply hum and high frequencies at least above about 50 hz;
second filter means connected to said first filter means for filtering out any DC voltage components;
a third amplifier stage connected to said second filter means for amplifying the life form signals by a second factor;
third filter means connected to said third amplifier stage for filtering out commercial hum and high frequencies at least above about 50 hz; and
an image recognition and display means connected to said third filter means and operable to compare the life form signals to stored predetermined life form signals and produce an alarm when the current life form signals transgress a predetermined tolerance range.

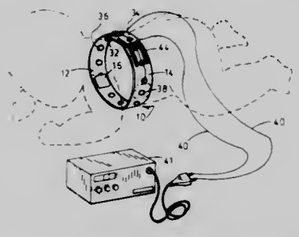
4,895,161
TRANSPORTABLE DATA MODULE AND DISPLAY UNIT FOR PATIENT MONITORING SYSTEM
Michael J. Cudahy, Delray Beach, Fla.; Carlos De La Huerga, Shorewood, Wis.; Harold N. Arneson, Waukesha, Wis.; R. Thomas Divers, Mequon, Wis., and Barry J. Altman, Mequon, Wis., assignors to Marquette Electronics, Milwaukee, Wis.
Division of Ser. No. 912,359, Sep. 26, 1986, Pat. No. 4,715,385.
This application Oct. 19, 1987, Ser. No. 112,469
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—710 **9 Claims**



1. A portable monitor unit for receiving and displaying physiological condition data of a patient, the patient having physiological condition data sensors applied thereto, said portable monitor unit being usable in conjunction with a unit not intended for transport for making possible a continuous display of physiological condition data, said unit not intended for transport displaying the physiological condition data in a predetermined manner, said unit not intended for transport having a recess of predetermined dimensions, said portable monitor unit comprising:
a module for receiving data from the sensors and having circuitry for processing the received data, said module having an exterior configuration with dimensions corresponding with dimensions of said recess so that said module may be inserted in said recess in the unit not intended for transport, said module having first data output connection means capable of coupling said module to the unit not intended for transport for providing a first plurality of physiological condition data to said unit not intended for transport, said module having second data output connection means providing a second plurality of physiological condition data, the data of said second plurality including at least a portion of the data of the first plurality;
a power supply operatively associated with said module for energizing said circuitry;
a portable member having means for removably retaining said module with said portable member, said portable member having a screen for displaying physiological condition data in a manner compatible with that of the unit not intended for transport; and
means for connecting said second data output connection means of said module to said portable member for providing, from said module to said member, said second plurality of physiological condition data so that said module may operate said screen to display physiological condition data.

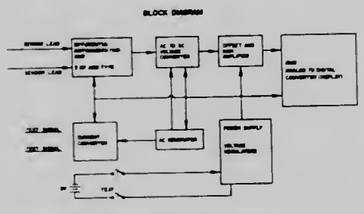
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,162
APNEA MONITOR BELT
Maria Dolliver, 11416 W. 126th Ave., Cedar Lake, Ind. 46303
Filed Sep. 15, 1988, Ser. No. 244,927
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—721 **10 Claims**



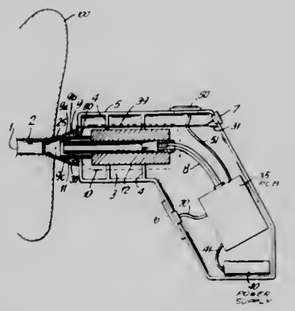
1. An improved apnea monitor belt comprising, in combination:
- a belt, said belt having a first end and a second end and defining at least one vent intermittent the first end and the second end;
- a first lead pocket at said first end of said belt, said first lead pocket having an upper and a lower end and defining a lead slot at one of said upper and lower ends and further defining a lead hole intermittent said upper and lower ends, said lead hole allowing access to the interior of said first lead pocket;
- a second lead pocket, at said second end of said belt, said second lead pocket having upper and a lower ends and defining a lead slot at one of said upper and lower ends and further defining a lead hole intermittent said upper and lower ends, said lead hole allowing access to the interior of said second lead pocket; and
- means for clasping the first end of said belt to the second end of said belt, whereby the belt can be securely fastened around the torso of an infant.

4,895,163
SYSTEM FOR BODY IMPEDANCE DATA ACQUISITION
Al Libke, Los Angeles, Calif., and Richard G. Wootea, Tigard, Oreg., assignors to Bio Analogics, Inc., Los Angeles, Calif.
Filed May 24, 1988, Ser. No. 197,995
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—734 **7 Claims**



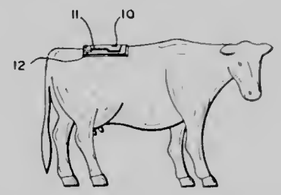
1. A system for acquisition of body impedance data quantitative measurement of the conductive potential of the body, the system comprising in combination:
- (a) a plurality of electrode sensors for mounting to a patient's body to be analyzed at prescribed locations forming a tetraspolar system;
- (b) mounting means for removably attaching said electrode sensors to a Kelvin Bridge bio-impedance meter system having four terminal leads;
- (c) means for generating a current flow through said electrode sensors at a frequency of from about 40 Kilohertz to about 60 Kilohertz, thereby producing an output range of from about 0 to 1,000 ohms;
- (d) means for accepting input variables comprised of biological patient data including, height, weight, age and sex and bio-impedance signals derived from step (c) to determine a population specific variable and to produce a correspondence electrical signal;
- (e) means for manipulating electrical signals derived from said means for generating a current flow and said means for accepting input variables to produce a resultant output signal; p1 (f) indicator means for displaying said resultant output signal to provide quantitative measurement of conductive potential of said patient's body based on lean tissue content of said patient; and
- (g) means for comparing said resultant output signal with a control signal to produce an output representative of fat tissue, lean tissue and body water.

4,895,164
INFRARED CLINICAL THERMOMETER
Don E. Wood, Irvine, Calif., assignor to Telatemp Corp., Fullerton and Temp-Stik Corporation, San Juan Capistrano, both of, Calif.
Filed Sep. 15, 1988, Ser. No. 244,738
Int. Cl.[4] A61B *5/00;* **G01J** *5/00;* **G01K** *1/08*
U.S. Cl. 128—736 **21 Claims**



1. An apparatus for measuring a temperature of an infrared radiation emissive target comprising: a housing having at least one infrared radiation receiving port; an infrared radiation sensor means enclosed in said housing and further comprising a wave guide means having one end accessible to infrared radiation, an infrared radiation detector means positioned to receive infrared radiation from said target as directed by said wave guide means, and further to generate a signal corresponding to a quantity of infrared radiation detected, a detector temperature sensor means positioned to measure a temperature of said infrared radiation detector means and further to generate a signal corresponding to said temperature of the infrared radiation detector means, said wave guide, and an isothermic block means, wherein said infrared radiation detector means and said detector temperature sensor means are held at or about an ambient temperature by said isothermic block means, a signal processing means for receiving said infrared radiation detector means signal and said detector temperature sensor means signal, and generating an output signal corresponding to the temperature of said infrared radiation emissive target.

4,895,165
ELECTRONIC ESTRUS DETECTOR
William D. Blair, 1000 Lakeshore Dr. #68, Brandon, Miss. 39042
Continuation-in-part of Ser. No. 103,647, Oct. 2, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 263,271
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—738 **13 Claims**



1. An estrus detector for detecting estrus in animals that manifest onset of estrus by standing for estrus mounting activity by another animal, comprising:
- means for sensing estrus mounts including means for generating estrus mount signals;
- means for processing said estrus mount signals, including:
  - means for numerically summing and storing sensed estrus mounts;
  - means for programming a desired sum of sensed estrus mounts;
  - means for detecting and storing the approximate time elapsed during a sensed estrus mount as an estrus mount time;
  - means for summing the estrus mount times for all sensed estrus mounts;
  - means for programming a desired sum of all estrus mount times;
  - means for determining that a first condition has been satisfied, wherein said first condition is that the sum of sensed estrus mounts is at least equal to the desired sum of sensed estrus mounts;
  - means for determining that a second condition has been satisfied, wherein said second condition is that the sum of all estrus mount times is at least equal to the desired sum of all estrus mount times; and
- indicating means, including means for indicating that both said first and second conditions have been satisfied.

4,895,166
ROTATABLE CUTTER FOR THE LUMEN OF A BLOOD VESEL
Andrew F. Farr, and Herbert R. Radisch, Jr., San Diego, both of Calif., assignors to Interventional Technologies, Inc., San Diego, Calif.
Filed Nov. 23, 1987, Ser. No. 123,713
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—751 **4 Claims**

1. A rotatable cutter for excising obstructive tissue from a lumen of a blood vessel comprising:
- a hollow cylindrical end portion;
- a hollow cylindrical tip portion coaxially aligned with and having a diameter less than that of said end portion; and
- a hollow conical portion extending integrally from said end portion to said tip portion for forming a pair of straight diametrically disposed blades with a pair of diametrically opposed openings between said blades, one of said pair of blades having a long cutting edge, and the other of said pair of blades having a short cutting edge, said long cutting edge facing in the same rotational direction as said short cutting edge, to establish alternate cutting by said long cutting edge and said short cutting edge to excise



obstructive tissue from the lumen of a vessel in response to a plurality of rotations of said blades.

4,895,167
URINE COLLECTING AND HOLDING DEVICE FOR DELIVERY TO ANALYTICAL LABORATORIES
Piergiacomo Guala, Alessandria, Italy, assignor to Sta.te. S.p.A., Alessandria, Italy
Filed Jan. 10, 1989, Ser. No. 295,912
Claims priority, application Italy, Oct. 10, 1988, 22245 A/88
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—760 **4 Claims**



1. A device for collecting and holding urine for use in analytical laboratories, characterized in that it comprises a cylindrical test tube-shaped container, a stopper fitted to the container and having a body through-penetrated coaxially by a first passageway and off-centrally by a second passageway, a funnel-shaped member having an outlet mouth fitted to the first passageway, a thin tube attached to the stopper, at the second passageway, and extending toward the container bottom as far as a predetermined distance off said bottom, a mount formed between the outlet mouth and the first passageway, for application of the mouth fitting in an univocally oriented fashion to the passageway, and a closure element for said passageways connected to the stopper by a hinge.

4,895,168
GUIDEWIRE WITH MOVABLE CORE AND EXTERNAL TUBULAR SAFETY COVER
James E. Machek, Bradfordwoods, Pa., assignor to Schneider (USA) Inc., A Pfizer Company, Plymouth, Minn.
Filed Jan. 21, 1988, Ser. No. 146,701
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—772 **21 Claims**

1. A movable core guidewire assembly absent an internal safety wire, said guidewire assembly comprising:
- an elongated cylindrical casing having a distal closed end and a proximal open end;

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an elongated resilient core wire movably positioned in said cylindrical casing; and

an elongated plastic safety cover coextensive with and surrounding the cylindrical casing, having a distal closed end positioned at the distal end of said casing and a proximal



open end positioned at the proximal end of the casing, said safety cover serving as an internal safety wire retaining any broken fragments of the guidewire in the event that the guidewire breaks inside the body of a patient. the space inside the casing that would be required by an internal safety wire being eliminated.

4,895,169

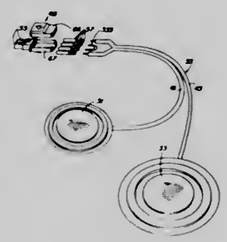
DISPOSABLE NON-INVASIVE STIMULATING ELECTRODE SET

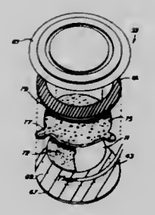
Roger L. Heath, Evanston, Ill., assignor to Durox Corporation, Niles, Ill.

Continuation of Ser. No. 946,179, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 840,471, Mar. 13, 1986, abandoned, which is a continuation of Ser. No. 708,107, Mar. 5, 1985, abandoned, which is a continuation of Ser. No. 476,327, Mar. 17, 1983, abandoned, which is a division of Ser. No. 176,270, Aug. 8, 1980, Pat. No. 4,419,998. This application Feb. 9, 1988, Ser. No. 150,509

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—798 **2 Claims**





1. A disposable stimulating electrode set for non-invasively stimulating a human patient comprising:

(a) first and second electrode element means for conveying electrical energy from a stimulating device to the body of the patient, each of said electrode means comprising:

a flexible electrically conductive plate, the flexibility of said plate permitting it to substantially conform to the area of a patient's body to which the electrode element is attached, said plate having a size large enough to convey stimulating energy to the body of the patient while minimizing the risk of burning the patient in high energy stimulation, an outer surface of said conductive plate being formed of an electrically conductive metal, a chloride of said electrically conductive metal being affixed to said outer surface of said metal to provide enhanced monitoring capability through the same electrode element used for stimulation,

(b) a flexible insulating base to which said conductive plate is secured, the flexibility of said base permitting it to substantially conform to an area of a patient's body with said conductive plate,

(c) an electrically conductive medium secured in the electrode element between said electrically conductive plate and the skin of the patient for enhancing electrical energy transfer between said conductive plate and the patient, and

(d) adhesive means secured to the electrode element for releasably attaching the electrode element to the patient;

connecting plug means; and

first and second conducting lines to connect said first and second electrode elements, respectively, to said connecting plug means, each conducting line having one end electrically connected to said conductive plate of its associated electrode element, said connecting plug means adapted to connect said electrode element to a stimulating device, either directly or by connection to an intervening cable.

4,895,170

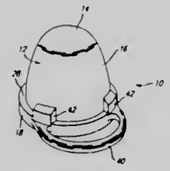
METHOD OF CONTRACEPTION USING DISPOSABLE CERVICAL CAP

Janet M. Tlapek, Saranac, Mich., and Margaret D. Tlapek, Prairie Village, Kans., assignors to Page Hanes, Inc., Saranac, Mich.

Division of Ser. No. 78,253, Jul. 20, 1987, Pat. No. 4,785,804. This application Jul. 25, 1988, Ser. No. 223,876

Int. Cl.[4] A61B *17/00*; A61F *5/00*

U.S. Cl. 128—832 **9 Claims**



1. A method of contraception for a female, comprising the steps of:

inserting a cervical cap having an inner and outer surface into the vagina, said cervical cap comprising a form-assuming, non-resilient dome having an apex and base portion, and further comprising a flexible rim integrally-molded to said dome, said rim including an inner and outer surface and a bottom surface and, further having an annular groove descending acutely from said inner wall toward said bottom surface of said rim, whereby said inner wall and groove define an ascending lip on said inner wall;

positioning said dome over the opening of the cervix;

positioning said flexible rim over the cervix;

positioning said ascending lip defined by said annular groove of said rim to provide intimate gripping contact of said ascending lip with the cervix wall; and

manipulating said flexible rim to form a seal between said ascending lip and the cervix wall.

4,895,171

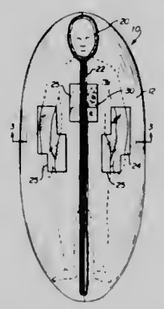
PATIENT ISOLATION BAG

Gary Onik, 263 Courtney Pl., Wexford, Pa. 15090

Filed Mar. 29, 1988, Ser. No. 174,765

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—846 **12 Claims**



1. A patient isolation bag, comprising:

a layer of surgical drape material;

a reinforcement layer;

a layer of adhesive attaching said surgical drape material to said reinforcement layer;

a layer of absorbent padded areas; and

a layer of adhesive attaching said layer of absorbent padded areas to said reinforcement layer;

wherein each of said layer is included within a laminate and further wherein said laminate forms a sheath which is adapted to encircle a patient's body.

4,895,172

GAS COLLECTION DEVICE

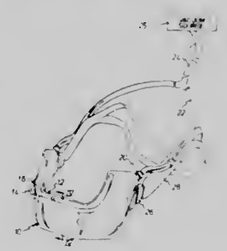
Erik A. Lindkvist, Korpralsvagen 38, S-902 52 Umea, Sweden

Continuation of Ser. No. 783,102, Oct. 2, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 58,710

Claims priority, application Sweden, Oct. 4, 1984, 84 04976-6

Int. Cl.[4] H11B *19/00*

U.S. Cl. 128—863 **11 Claims**



1. A gas collection device to be worn by a patient for collecting and removing gas exhaled by the patient, from an area around the mouth and nose of the patient, comprising:

first portion means for engaging with the chin of the patient;

second concave gas collector portion means projecting from the chin engaging portion means, said gas collector portion means for positioning below the nose and adjacent the mouth of the patient and in the flow path of the gas being exhaled from the mouth and nose of the patient, enabling collection of the exhaled gas, while allowing open communication between the surrounding atmosphere and the mouth and nose of the patient, and free and ready access to the mouth and nose of the patient;

attaching means connected to the chin engaging portion means for removably securing the chin engaging portion means to the patient's chin; and

gas removal conduit means connected in fluid communication with the concave gas collector portion means for removing collected gas from the concave gas collector portion means.

4,895,173

SPINEBOARDS

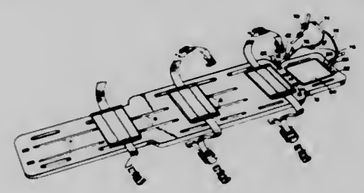
Richard Brault; Dianne Croteau, both of Toronto; Jonathan Vinden, Mississauga, all of Canada; Ruud P. Koorn, and Martin J. Spanjer, both of Hr Almelo, Netherlands, assignors to Duranamics International Inc., Toronto, Canada

Filed May 18, 1987, Ser. No. 50,573

Claims priority, application Canada, Jul. 8, 1986, 513325

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—870 **11 Claims**



1. A spineboard comprising:

a body supporting board having a length and width adapted to support a prostrate person, said board being fabricated of a molded polyethylene hollow shell having one or more stiffening beams inserted within said hollow shell extending lengthwise therealong with remaining portions of said shell being filled with polyurethane foam, said board having a plurality of sets of longitudinally extending tracks at generally longitudinally spaced positions therealong, each set of tracks comprising a pair of slots through the board, said board also having openings at one end;

a head harness comprising a forehead pad and three straps attached to said forehead pad, means for removably securing said straps to said board with each strap being received within a corresponding opening at said one board end;

said harness including slip connectors enabling the straps to be pulled and tightened in one direction and to resist slippage in the other direction whereby said harness is adapted to be tightened over and about the head of an individual to limit movement of the head without interfering with the movement of the chin;

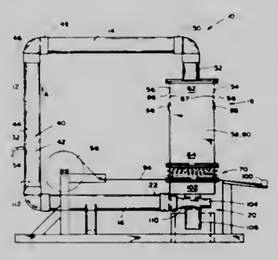
a plurality of body harnesses each comprising a pad overlying a corresponding set of longitudinal tracks on the board and central portions of said board and a strap, means carried by said pad for slidably receiving said strap along the underside of said pad, said strap extending through a pair of slots of said tracks of the board to permit the strap to slide with said pad longitudinally along the set of tracks to a predetermined longitudinal location along said board while enabling the strap to be secured to the board by means of engagement through the slots of said tracks, each said strap of said body harness having two ends, a hook carried by at least one of said strap ends to snap fit over an edge of the board, each said strap having slidable connectors which permit the strap to be drawn tight in one direction while resisting sliding of the strap through the connector in the reverse direction.

4,895,174

TOBACCO PARTICLE SEPARATOR

Calvin W. Henderson, Winston-Salem, N.C.; Stephen C. Jens, Ashland, Mass., and Malcolm E. Taylor, Pelham, N.H., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 19, 1988, Ser. No. 195,925
Int. Cl.[4] A24B *7/14;* **A24C** *5/32, 5/39*
U.S. Cl. 131—110 **18 Claims**



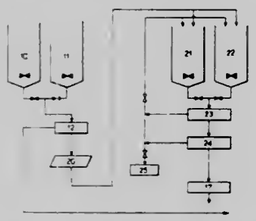
1. A tobacco particle separator for separating and singularizing tobacco particles, said separator comprising:
an air flow circulation path, said air flow circulation path including at least a first air flow conduit;
means to introduce tobacco particles into said air flow circulation path prior, in the direction of air flow, to said first air flow conduit for separation and singularizing of said tobacco particles;
a particle separating and singularizing hopper in said air flow circulation path subsequent, in the direction of air flow, to said first air flow conduit;
means for receiving and retaining tobacco particles from said hopper in separated and singularized condition; and
means for generating a flow of air in said air flow circulation path prior, in the direction of air flow, to said tobacco particle introduction means;
wherein said means to introduce tobacco particles into said path includes a cigarette clamp removably positionable in said path before said hopper.

4,895,175

METHOD FOR THE PREPARATION OF AROMATIZED RECONSTITUTED TOBACCO

Nicolas Bankevitch; Gilbert Ferrer, both of Perigne l'Eveque, and Laurent Wagner, Grasse, all of France, assignors to LTR Industries, paris, France

Filed Apr. 6, 1987, Ser. No. 34,926
Claims priority, application France, Apr. 7, 1986, 86 04938
Int. Cl.[4] A24B *3/14, 15/02*
U.S. Cl. 131—297 **17 Claims**



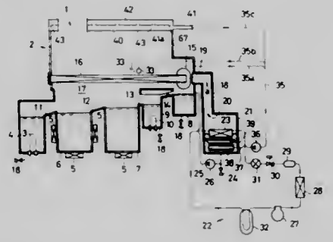
1. A method for the preparation of aromatized reconstituted tobacco from tobacco particles which comprises:
(a) extracting tobacco particles with water;
(b) separating the water extract from the extracted tobacco particles;
(c) innoculating the water extract with a yeast selected from the genera kluyveromyces and saccharomyces, and fermenting the water extract with the yeast;
(d) removing the yeast from the fermented water extract;
(e) concentrating the fermented water extract;
(f) preparing sheets of reconstituted tobacco from the water extracted tobacco particles;
(g) incorporating the concentrated fermented water extract into the sheets of reconstituted tobacco; and
(h) drying the sheets of reconstituted tobacco having the concentrated fermented water extract incorporated therein.

4,895,176

CHLORO-FLUORO-CARBON CLEANING APPARATUS

Shigeo Ohtsuka; Toshio Horimoto, and Shigeo Miyakoshi, all of 3-32, Kigawa-higashi, 3-chome, Yodogawa-ku, Osaka, Japan

Filed Nov. 6, 1989, Ser. No. 294,644
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—107 **3 Claims**



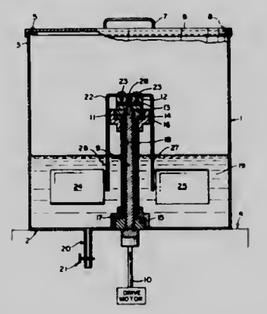
1. A chloro-fluoro-carbon cleaning apparatus comprising
a cleaning tank (2) for storing chloro-fluoro-carbon solvent;
means (16,4,6,7,8,9,) for forming a layer of chloro-fluoro-carbon vapor within said cleaning tank;
a suction duct (18) connected to said cleaning tank at a lateral position thereof where said layer of chloro-fluoro-carbon vapor is formed;
a collecting tank (21) connected to said suction duct (18) and including an evaporator (23) for cooling and liquifying gas generated from said chloro-fluoro-carbon vapor;
a return duct (25) extending from a bottom position of said collecting tank (25) to said cleaning tank (2) for returning chloro-fluoro-carbon solvent resulting from cooling and liquefying;
a cooling jacket (16) disposed in an upper position of said cleaning tank;
suction ports (33) arranged above and adjacent said cooling jacket for drawing high concentration chloro-fluoro-carbon gas;
a suction duct (35*a*,35*b*) connected to said suction ports; and
an air pump (36) connected to said suction duct;
said collecting tank (2) further including a porous filter (38) immersed in the chloro-fluoro-carbon liquid in said collecting tank, and said air pump (36) having a delivery end communicating with said porous filter (38).

4,895,177

CIRCUIT BOARD CLEANING APPARATUS

Andrew F. Niblett, and Martyn K. Freeman, both of Bristol, United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Jun. 2, 1986, Ser. No. 869,613
Claims priority, application United Kingdom, Jun. 1, 1985, 8513879
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—140 **9 Claims**



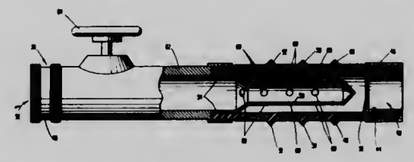
1. Circuit board cleaning apparatus for cleaning a circuit board, said apparatus including:
container means for containing a cleaning liquid;
carrying means for locating and carrying a circuit board in an immersed condition in a cleaning liquid disposed within said container means;
agitation means for effecting relative reciprocal rotational motion of the carrying means and the cleaning liquid;
said carrying means comprising means for mounting a circuit board by its edges with its face presented to the cleaning liquid at a selected angle of inclination to the direction of motion whereby the face is pushed through the cleaning liquid at least during one direction of motion and the cleaning liquid is caused to penetrate otherwise obscure portions of the board thereby cleaning said obscured portions.

4,895,178

DEVICE FOR CLEANING A DRAIN

George J. McHugh, Broomall, Pa., assignor to AGF Manufacturing, Inc., West Chester, Pa.

Filed Jun. 10, 1988, Ser. No. 205,214
Int. Cl.[4] B08B *9/02*
U.S. Cl. 134—167 C **11 Claims**



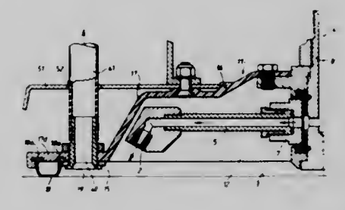
1. An apparatus for use in delivering fluid under pressure to a drain of a given diameter, comprising:
a bladder having an inlet end, an outlet end and an expandable wall having an outer diameter which is smaller than the given diameter of the drain when the bladder is unexpanded, the inlet end including an inlet having a fixed inlet diameter;
supply connection means for connecting the apparatus to a fluid supply source which supplies fluid under pressure to the inlet;
an orifice having a fixed orifice diameter and being located at the outlet end of the bladder, the orifice diameter being small relative to the inlet diameter so that a pressure buildup develops in the bladder sufficient to cause the expansion of the expandable wall when fluid is supplied to the bladder; and
flow directing means for directing the flow of fluid radially outwardly within the bladder toward the expandable wall whereby the expansion of the expandable wall of the bladder is facilitated by said radially directed flow, said flow directing means including a rigid hollow cylinder extending from the inlet end of the bladder toward the outlet end of the bladder, said rigid hollow cylinder having a cylindrical wall with a plurality of apertures adapted to direct fluid flowing from the inlet of the bladder radially outwardly toward the expandable wall of the bladder, said rigid hollow cylinder terminating at a closed end opposite the inlet.

4,895,179

CLEANING APPARATUS

Bernard E. Hart, Rossbank, England, assignor to Harben Systems Limited, Salisbury, England

Filed May 6, 1988, Ser. No. 191,249
Claims priority, application United Kingdom, May 13, 1987, 8711306
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—172 **16 Claims**



1. Cleaning apparatus for producing a jet of cleaning liquid which is directed against a surface to be cleaned and which rotates about an axis generally perpendicular to the surface to be cleaned, the apparatus comprising nozzle means, means for connecting the nozzle means to a supply of pressurized liquid, means mounting the nozzle means for rotation about said axis, said nozzle means being adapted to provide a jet of cleaning liquid and to cause rotation of the nozzle means about said axis, casing means having an open end for application against the surface to be cleaned, said casing means comprising a main portion and a peripheral portion, said main portion including means delimiting upwardly and laterally to define with the surface a chamber generally coaxial with said axis and surrounding said nozzle means and having a lower edge spaced from the surface said peripheral portion extending laterally from said main portion in the region of said lower edge thereof and including means for upwardly delimiting the height of a liquid collection region extending peripherally around said chamber in the region of said open end thereof, sealing means mounted on said peripheral portion for sealing against the surface to be cleaned and laterally outwardly delimiting said liquid collection region, said upwardly delimiting means of said liquid collection region reducing its height relative to the height of said chamber, said liquid collection region being in unrestricted communication with said chamber over substantially the full extent of said spacing of said lower edge of said main portion of the casing means from the surface for flow of liquid into said liquid collection region from said chamber, and

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outlet means opening through said peripheral portion into said liquid collection region for the removal therefrom of cleaning

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4,895,180
ANTI-BACKFLOW VALVE
Rudolf Vollmer, Mosbach, Fed. Rep. of Germany, assignor to Honeywell GmbH, Fed. Rep. of Germany
Filed Apr. 17, 1989, Ser. No. 339,280
Claims priority, application European Pat. Off., Apr. 26, 1988, EP88106643
Int. Cl.[4] E03C *1/10*
U.S. Cl. 137—117 **7 Claims**



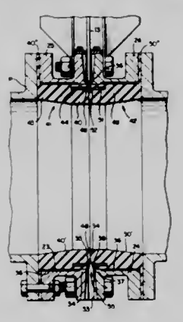
1. In an anti-back flow valve for preventing backflow of fluid in a fluid supply line having a housing having an inlet, an outlet and a discharge port, a first check valve,

a second check valve, a chamber connecting said first and second valves in series and in a common flow direction in said housing, a relief valve connected to said chamber between said first and second check valves, a cover for closing said housing, a diaphragm, said cover clamping said diaphragm to said housing, a valve stem, said diaphragm suspending said valve stem for acting on said relief valve, a chamber above the diaphragm connected to the inlet pressure with said check valves being arranged parallel to the valve stem of the relief valve,

the improvement comprising a cross-shaped housing within which both said check valves as well as said relief valve are arranged in one plane including said inlet and said outlet.

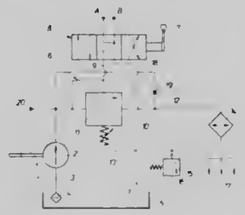
4,895,181
GATE VALVE
Thomas P. McKavanagh, Aurora, Canada, assignor to The Clarkson Company, Sparks, Nev.
Filed Nov. 21, 1988, Ser. No. 274,349
Int. Cl.[4] F16K *3/02*; F16L *7/00*
U.S. Cl. 137—375 **19 Claims**

9. In a gate valve assembly, two hollow housing members having coaxial cylindrical passages rigidly secured together end to end with axial spacer means between them defining a relatively narrow transverse gate receiving and guiding space disposed normal to said passages, sleeve units comprising annular bodies of greater axial length than said space lining each of said passages and having at one end annular resilient end lips that in the valve open position extend through said space into sealing engagement with each other, a reinforcing ring enclosed within each of said sleeves radially outwardly of its associated lip on the sleeve end, each of said lips projecting axially beyond its associated ring, a gate member having an imperforate portion slidable in said space between a valve closed position wherein it blocks flow through said valve and a valve open position wherein it permits unobstructed flow through said valve, said lips being sufficiently resilient to permit sliding movement of the gate member between said positions and being compressed in resilient sealing engagement with the sides of said gate member in the valve closed position, each of said sleeve bodies having its radially outer periphery formed to intersect with its gate engaging end in a rounded continuous surface, each of said reinforcing rings being positioned approximately equidistant from the radially outwardly surface and the axially inwardly surface of the respective sleeve body and wherein the size of each of said reinforcing rings in cross section is such that the axial length of each of said



rings is about ¼ to ⅓ the axial length of the respective sleeves body, and with the radial dimension or thickness of each of said rings being about 1/5 to ½ the radial thickness of the respective sleeve body from the inside diameter to the outside diameter of said sleeve body, whereby the inner faces of said sleeve bodies axially inwardly of the respective reinforcing rings are forcibly moved away from each other as the gate moves to a closed position, thereby increasing the axial compression in said sleeve bodies.

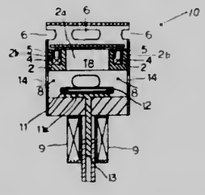
4,895,182
HYDRAULIC CONTROL UNIT
Maximilian Gerl, Peiting, Fed. Rep. of Germany, assignor to Hoerbiger Hydraulik GmbH, Schongau, Fed. Rep. of Germany
Filed Dec. 30, 1988, Ser. No. 292,334
Claims priority, application Austria, Jan. 11, 1988, 35/88
Int. Cl.[4] F15B *13/06*; F16D *25/11*
U.S. Cl. 137—596.12 **1 Claim**



1. A hydraulic control unit, particularly for switching-over a boat reversing gear, comprising a pump unit feeding a working pressure system from a tank, a switchable rotary slide valve combination by which two control junctions can be connected either to the working pressure system or to the tank, a working pressure relief valve having a spring compartment which is connected to a hydraulic circuit external to the working pressure system and a discharge side which is connected to a cooler, at least one lubrication point and a lubrication pressure relief valve, characterised in that the spring compartment of the working pressure relief valve is connected to the tank such that it is at the same pressure thereas, and the lubrication point

is connected between the cooler and the lubrication pressure relief valve.

4,895,183
VALVE FOR FLUID MAT AND APPARATUS FOR CONTROLLING AN ATTITUDE ASSUMED BY FLUID MAT
Junshiro Ogura, Tokyo, Japan, assignor to Ogura Jewel Industry Co., Ltd., Tokyo, Japan
Filed Nov. 8, 1988, Ser. No. 268,407
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—614.21 **1 Claim**



1. A valve assembly usable for an air mat comprising;

a main valve and

an auxiliary valve,

said main valve comprising;

a doughnut-shaped valve seat made of magnetic material, said valve seat having a U-shaped cross-sectional contour as viewed in a perpendicular plane relative to a plane extending through said valve seat, an inner diameter part of said doughnut-shaped valve seat serving as a passage through which air flows,

a valve disc made of magnetic material for opening and closing said inner diameter part passage in said valve seat through which air flows, said valve disc being located on a first plane side of said valve seat, and

a solenoid immovably disposed in said valve seat,

said auxiliary valve being located on a second plane side of said valve seat of said main valve for opening and closing said passage through which air flows,

said auxiliary valve including electromagnet means for displacing said auxiliary valve.

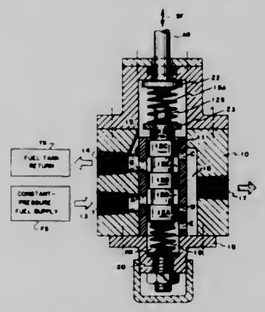
4,895,184
FLUID SERVO SYSTEM FOR FUEL INJECTION AND OTHER APPLICATIONS
Harold G. Abbey, 12735 Headwater Cir., Wellington, Fla. 33414
Filed Dec. 21, 1987, Ser. No. 135,738
Int. Cl.[4] F02M *39/00*
U.S. Cl. 137—625.29 **10 Claims**

1. A fluid servo system comprising:

a first fluid constant pressure source;

a signal force derived from and proportional to the varying flow rate of a second fluid and;

a valve mechanism having a valve member which is activated by said signal force displacing it to an extent determined by the strength of this force the mechanism including an input port coupled to said first fluid source, a return port coupled to a source reservoir, an output chamber coupled to an inflow port, an exhaust port, a countervailing pressure chamber, and a discharge outlet; the prevailing pressure of the source fluid in said output chamber being determined by the position of said valve member which when displaced in one direction simultaneously opens said inflow port and closes off said exhaust port, thereby increasing fluid pressure in said output chamber and in reverse decreasing fluid pressure by controlling the rate of inflow and exhaust from said output chamber, whereby the prevailing pressure in said output chamber being applied to said valve member as a countervailing force to said signal force causes said valve member to seek and assume a equilibrium position at which the forces are



balanced and the resultant mean fluid pressure of the source fluid yielded from said discharge outlet is proportional to said signal force.

4,895,185
EXPANDABLE HOSE DEVICE
Jacques J. Champleboux, Clermont-Ferrand; Bernard Ragout, Aubiere, and Maurice Rouby, Lezoux, all of France, assignors to Caoutchouc Manufacture et Plastiques, Beaune, France
Continuation of Ser. No. 862,637, May 13, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 143,958
Claims priority, application France, May 14, 1985, 85 07473
Int. Cl.[4] F16L *55/12*
U.S. Cl. 138—109 **15 Claims**

1. A flexible, elastic hose device, comprising at least one rigid end piece and a hose that is reinforced by at least two pairs of adjacent reinforcing layers made of flexible cables disposed helically and that is fastened at at least one end by compression of said at least two reinforcing layers against said rigid end piece, said rigid end piece comprising an inner supporting element and an outer gripping element, said inner supporting element and said outer gripping element being coaxial and having conical compression surfaces which diverge toward said at least one end; and at least one wedge arranged between said adjacent reinforcing layers of each pair at said at least one end to compress said at least adjacent two reinforcing layers between said at least one wedge and, respectively, said inner supporting element and said outer gripping element, wherein said conical compression surfaces are in contact with and are non-adhesive to surfaces of said at least two adjacent reinforcing layers; and wherein said at least one wedge is provided with at least two slits, said two slits being offset with respect to each other in opposite directions and extending through said wedge so as to define a strip therebetween, thereby producing a self-locking effect at said at least one end.

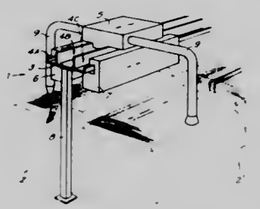
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,186

UNIVERSAL TRANSPORT MECHANISM FOR AUXILIARY DEVICES IN WEAVING MILLS

Henry Shaw, Vleteren, Belgium, assignor to Picanol N.V., Ieper, Belgium

Filed Jun. 24, 1988, Ser. No. 210,939
Claims priority, application Belgium, Jun. 29, 1987, 8700724
Int. Cl.[4] D03J *1/00*
U.S. Cl. 139—1 C 10 Claims
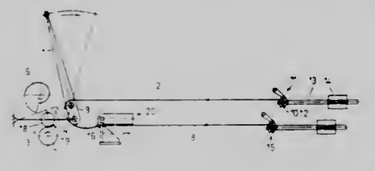


1. A universal transport mechanism for auxiliary devices in weaving mills including a plurality of weaving machines, comprising one single rail mounted above, and extending between the weaving machines and fixed relative to the weaving machines, said rail including a central axis about which a plurality of spaced guides are arranged to permit said auxiliary devices to travel past each other between weaving machines unhindered as the auxiliary devices move along the single rail to operate on a plurality of weaving machines.

4,895,187

PICKING DEVICE FOR THE PICKING MOTION OF A LOOM

Hans Grossmann, Heidenheim, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 18, 1988, Ser. No. 259,368
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 3735353
Int. Cl.[4] D03D *49/48*
U.S. Cl. 139—145 7 Claims



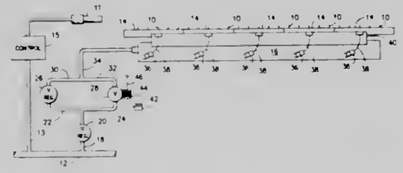
1. A picking device for the picking motion of a loom comprising a support, a pivot arm pivoted on said support at a pivot point, a pull string connected to said pivot arm for delivering energy for a pick to said pivot arm, cam means for tensioning said pull string and decelerating means for decelerating the pivot arm at the end of the pick, said decelerating means including a decelerating string connected to said pivot arm at a point spaced from said pivot point and having a stop mounted thereon a small distance from said pivot arm for engagement with said support when said pull string is tensioned.

4,895,188

AIR REGULATOR CONTROL FOR AIR JET LOOM

Wayne H. Long, Anderson, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 240,503, Sep. 6, 1988, abandoned. This application May 15, 1989, Ser. No. 352,054
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—439 7 Claims



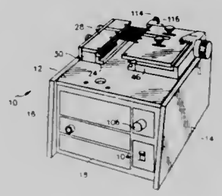
1. An air supply system for an air jet weaving machine comprising: a main air supply means for supplying air under pressure, a primary air jet to project yarn into a shed, means to supply air from said air supply means to said primary air jet, a container for air under pressure, a plurality of auxiliary air jet nozzles, means to supply air under pressure from said container to said auxiliary air jet nozzles, conduit means supplying air under pressure to said container and valve means connected to said conduit means between said container and said supply means to provide that air at a first pressure is supplied to said container upon start-up of the air jet weaving machine and that air at a lower second pressure is supplied to said container after a predetermined time after start-up.

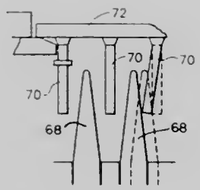
4,895,189

APPARATUS FOR STRAIGHTENING PIN GRID ARRAY LEADS

James C. Alemanni, Oceanside, Calif., assignor to American Tech Manufacturing Corp., Erlanger, Ky.

Continuation of Ser. No. 101,793, Sep. 28, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,093
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—147 6 Claims





1. Apparatus for straightening the leads of a pin grid array

device having a base and a plurality of generally parallel rows of pins projecting from one face of the base comprising:

a carriage having a plurality of elongated generally parallel blades fixed along their length to said carriage and projecting from one face thereof having unsupported tips projecting from one end of the carriage, adjacent blades being spaced to engage between rows of pins;

a pair of spaced generally parallel guide rails located above the plane of the upper face of the blades to confront and confine opposing sides of the base of the device and extending parallel to the blades and means for rectilinearly reciprocating the carriage transversely relative to the guide rails through a cycle which displaces the rows of pins to both sides of a true vertical pin centerline and terminates at the center.

4,895,190

ACTUATOR AND HOSE ASSEMBLY FOR AEROSOL CONTAINERS

Donald P. Gillen, Neodesha, Kans. 66757, assignor to Airosol Company, Inc., Neodesha, Kans.

Continuation of Ser. No. 158,863, Feb. 22, 1988, abandoned, which is a continuation of Ser. No. 23,449, Mar. 9, 1987, abandoned. This application Jun. 29, 1989, Ser. No. 373,632
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—1 10 Claims



1. A method of adding refrigerant to an air conditioning system having a refrigerant inlet fitting, said method comprising the steps of:

providing an aerosol container having an outwardly extending, tubular stem presenting an exposed end, said stem being axially shiftable between closed and fluid discharge positions and biased toward said closed position;

filling said container with refrigerant under pressure suitable for use by the system;

providing refrigerant transfer means for transferring refrigerant from said container the system, said transfer means including

a refrigerant hose presenting first and second opposed ends,

fitting connection means fluidically coupled with said first hose end for fluidically coupling said hsoe with the refrigerant inlet fitting, said connection means including check valve means for preventing refrigerant escape from the system when said fitting connection means is connected with the inlet fitting, and

actuator means fluidically coupled with said hose end for fluidically coupling said hose with said stem end and for selective manual shifting of said stem between said closed and discharge positions;

fluidically coupling said actuator means with said stem end;

fluidically connecting said connection means with the refrigerant inlet fitting; and

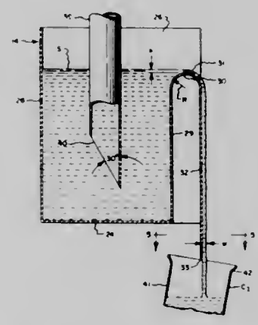
selectively manually shifting said stem to said discharge position for transferring refrigerant from said container through said transfer means into the air conditioning system.

4,895,191

METHOD AND APPARATUS FOR FILLING OPEN MOUTHED CONTAINERS BY PASSING SAID CONTAINERS BENEATH A SUB-LAMINAR SHEET OF FALLING LIQUID

Robert J. Drago, 37 Kenton Pl., Hamburg, N.Y. 14075

Filed May 4, 1989, Ser. No. 347,515
Int. Cl.[4] B65B *3/26*
U.S. Cl. 141—1 11 Claims



11. The method of filling a plurality of containers with liquid to a desired depth without contaminating the outer surface of said containers with said liquid, which method comprises the steps of:

arranging a multiplicity of open-mouthed containers each of said containers having an outwardly-extending flange portion about its mouth, in a series-abutting row such that the flange portions of two adjacent containers will be overlapped with respect to one another;

supplying liquid to a tank, said tank having a weir over which liquid may flow and having a guide plate arranged to guide the descent of liquid overflowing said weir, said guide plate having an upper end connected to said weir and having a lower end;

controlling the supply of liquid to said tank with respect to the configuration of said weir and plate that liquid overflowing said weir will descend along said guide plate and fall from said plate lower end as a continuous sub-laminar rectangular sheet having a substantially-constant transverse cross-sectional width and length; and

moving said multiplicity of series-abutting containers along the length of said sheet such that each container will be just filled with said liquid to the desired depth without contaminating the outer surface of said container.

4,895,192

PROCESS AND APPARATUS FOR FILLING A CONSTANT SPEED DRIVE

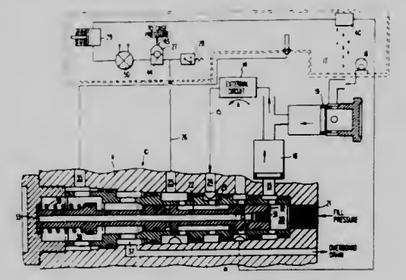
Jerome A. Mortenson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 24, 1987, Ser. No. 137,579
Int. Cl.[4] B65B *31/02*
U.S. Cl. 141—5 16 Claims

12. An apparatus for filling conduits of a hydraulic system with fluid under pressure in such a manner as to prevent overfilling while, during a filling operation, permitting gas trapped in the system to escape, comprising:

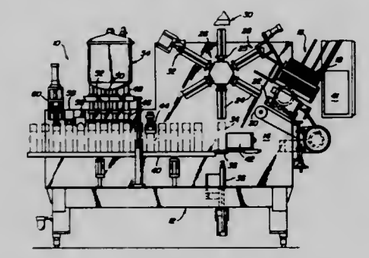
a valve comprising an inlet for connection to a source of fluid, a control piston slidable in the casing, biasing means for normally biasing the piston toward the inlet, and ports;

a first one of the ports serving to supply fluid under pressure from the valve, a second one of the ports serving to return the fluid under pressure to the interior of the valve; means for selectively communicating the first and second of the ports during the filling operation when the piston has been moved in opposition to the biasing means; and air purging float valve; an accumulator; a case for the hydraulic system; a third one of the ports operatively associated with the selective communication means and with the case; and pressure responsive switch means for sensing the



pressure in a conduit associated with the air purging float valve and selectively admitting the fluid from the third of the ports to the accumulator, wherein, during the filling operation, the filling fluid under pressure is returned to the valve and transmitted to the case until a predetermined pressure is reached, at which point the pressure responsive switch means directs the fluid to the accumulator and causes a signal to be transmitted to an operator to indicate that the filling operation is complete and entrapped gas has been removed from the system.

4,895,193
CONTAINER FILLING SYSTEM
Badruddin K. Rangwala, Farmington Hills, and Kenneth P. McDonald, Livonia, both of Mich., assignors to Elopak Systems A.G., Glattbrug, Switzerland
Filed Oct. 14, 1988, Ser. No. 257,845
Int. Cl.[4] B67C *3/20*; B67D *5/30*
U.S. Cl. 141—9 **6 Claims**



2. A method of filling liquid-carrying containers on a forming, filling and sealing indexing machine, said method comprising the steps of progressively filling each container at each of a predetermined number of stations with respective volumes of fluid in accordance with the following formula:

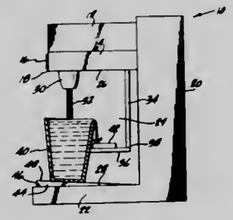
$$V_t = \sum_{i=1}^{n} V_i = V_1 + V_2 + V_3 \ldots + V_n$$

-continued

$$V_i = \frac{V_t}{2n^2}[n + 2i - 1]$$

wherein:
V_t=total carton volume
V_i=volume delivered at i station
i=station number
N=number of stations

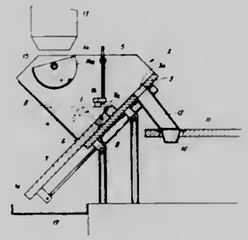
4,895,194
CONTAINER FOR LIQUID DISPENSER WITH AUTOMATIC SHUT OFF
Gerlad P. McCann, Los Angeles; Andrew J. Holoubek, Valencia, and Donald Verley, Saugus, all of Calif., assignors to McCann's Engineering and Manufacturing Co., Los Angeles, Calif.
Continuation of Ser. No. 124,065, Nov. 23, 1987, abandoned, which is a division of Ser. No. 840,895, Mar. 18, 1986, Pat. No. 4,712,591. This application Sep. 2, 1988, Ser. No. 241,819
Int. Cl.[4] B65B *3/26*
U.S. Cl. 141—198 **15 Claims**



1. A liquid container for use with a dispensing apparatus comprising:
a cup with a top opening for accepting liquid, the cup having a top portion and a bottom portion; and
a first stripe on said cup located in the top portion near the top opening of said cup, said first stripe adapted for being electrically contactable to liquid within said cup and to a contact point outside said cup wherein a sensing means communicating with said contact point may sense liquid in contact with said first stripe to determine when liquid in said cup has reached a given level.

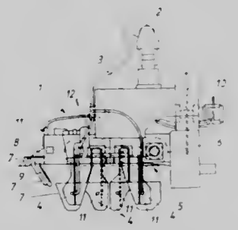
4,895,195
APPARATUS FOR VOLUMETRIC DOSING OF A FRAGILE BULK MATERIAL
Robert De Vaujany, Genas, France, assignor to Societe Anonyme dite "Manufacture Lyonnaise de Bouchage", Lyons, France
Filed Feb. 12, 1987, Ser. No. 14,411
Claims priority, application France, Feb. 12, 1986, 86 02349
Int. Cl.[4] G01F *11/00*
U.S. Cl. 141—258 **7 Claims**

1. An apparatus for dosing a fragile bulk material, the apparatus comprising:
a supply bin having an inclined side wall formed as a planar plate, forming an acute angle with the horizontal, and formed with a throughgoing aperture;
means for filling the bin with the bulk material to a predetermined level below the aperture and for maintaining this level below the aperture;
a slider formed as a planar plate with a throughgoing aperture like the wall aperture, sitting flat on the plate of the side wall, and slidable while in contact with the bulk material filling the bin along the wall between a lower position with the slider aperture wholly below the material level and to of alignment with the wall aperture and an upper position with the slider aperture above the level and aligned with the wall aperture; and



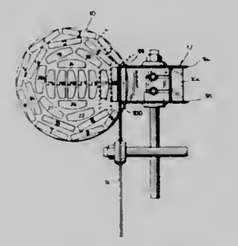
actuator means for reciprocating the slider between its positions and thereby filling its aperture with a dose of the material in the lower position, moving the dose up above the level while shedding material atop the slider on movement into the upper position, and dropping the dose through the wall aperture when in the upper position.

4,895,196
APPARATUS FOR REMOVING BRANCHES FROM TREETRUNKS
Gerold Hacker, Vienna, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria
Filed May 26, 1989, Ser. No. 358,066
Claims priority, application Austria, Jul. 6, 1988, 1750/88
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—2 Z **8 Claims**



1. In an apparatus for removing branches from and for cross-cutting treetrunks, comprising
a frame, which is adapted to be suspended from a lifting tackle over a treetrunk having a longitudinal axis extending in a predetermined, substantially horizontal direction,
gripping means, which protrude downwardly from said frame and are movably mounted on said frame and operable to move into and out of frictional engagement with the lower half of said treetrunk to support the latter,
branch-removing tools, which are mounted on said frame and distributed around the periphery of said treetrunk when it is thus supported by said gripping means, and
a longitudinal feeding device, which is mounted on said frame and operable to impart an axial feed movement to said treetrunk when it is thus supported by said gripping means,
the improvement residing in that
spray nozzle means for spraying liquid onto said treetrunk when it is thus supported by said gripping means are carried by said frame and supply line means for supplying said liquid to said spray nozzle means are connected to said spray nozzle means.

4,895,197
METHOD AND APPARATUS FOR SAWING LOGS
Erling J. Andersen, New Denmark N.B., New Denmark, New Brunswick, Canada (E0J 1T0)
Filed Jun. 3, 1988, Ser. No. 201,864
Claims priority, application Canada, Jun. 12, 1987, 539578
Int. Cl.[4] B27L *7/00*; B27C *9/00*
U.S. Cl. 144—369 **26 Claims**

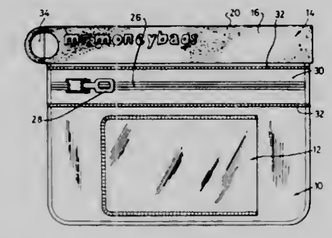


1. Apparatus for sawing logs comprising:
support means for supporting said log;
a trimming head mounted laterally of the longitudinal axis of said log;
said support means and said trimming head being disposed for movement one relative to the other in the direction of the longitudinal axis of said log;
the trimming head including first and second spaced-apart saw blades coaxially mounted and oriented so as to make two longitudinal blind cuts to a predetermined depth into said log during said relative movement;
a third saw blade oriented so as to provide a third longitudinal cut extending transversely to, and communicating with, said two blind cuts; and
means operable on completion of the cuts by said first, second and third saw blades, respectively, for rotating said log about its longitudinal axis to position a different portion of the circumference of the log between said first and second saw blades.

4,895,198
MONEY ORGANIZER AND CARRIER
Sydney W. Samuelson, 31 West Heath Avenue, Golders Green, London, United Kingdom (NW11 7QJ)
PCT No. PCT/GB87/00820, § 371 Date Aug. 1, 1988, § 102(e) Date Aug. 1, 1988, PCT Pub. No. WO88/04147, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 18, 1988, Ser. No. 228,918
Claims priority, application United Kingdom, Dec. 11, 1986, 8629629
Int. Cl.[4] A45C *1/00*
U.S. Cl. 150—138 **10 Claims**

1. A money organiser which comprises a flat, flexible and foldable carrier sheet having means enabling attachment of the sheet to a hooked supporting member generally in the form of a coat hanger in order to depend therefrom, said sheet being provided with a label holding pocket, currency-type labels which can be stored in the holding pocket of the carrier sheet, pouches of flexible plastics material for holding currencies of different types, said pouches each having on one face a window pocket with a transparent window for receiving a label transferred from the holding pocket, and said carrier sheet and the faces of the pouches opposite to said windowed pockets being provided with mutually cooperating means for attaching said pouches to said carrier sheet with the currency-type labels visible simultaneously in each said window when attached to

said carrier sheet, each pouch having an upper edging strip of rigid plastics material provided with attachment means com-



prising a part of said mutually cooperating means by which the pouch attaches to the carrier sheet.

4,895,199

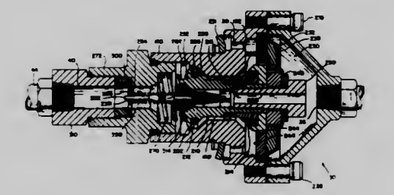
TIRE INFLATION AND DEFLATION VALVE

Roland A. Magnuson, Seattle, and Robert G. Shires, Kent, both of Wash., assignors to Paccar Inc, Bellevue, Wash.

Division of Ser. No. 893,081, Jul. 19, 1986, Pat. No. 4,744,399. This application Dec. 28, 1987, Ser. No. 138,647

Int. Cl.[4] B60C *23/00*

U.S. Cl. 152—415 **8 Claims**



1. A tire inflation and deflation valve for use on a vehicle having pressurized tires comprising:

a body defining a fluid chamber having a tire port, a supply port and an atmospheric exhaust port therebetween and two separate seal seats positioned in the chamber between the tire port and the exhaust port;

a three position seal support member movably positioned within the chamber between first, second and third positions, having first and second seals positioned thereon a distance apart greater than the separation distance between the seal seats for independent engagement with the seal seats so that the support member in the first and third positions prevents fluid communication between the tire port and the exhaust port and allows fluid communication therebetween to deflate the tire when the seal support is in the second intermediate position; and

a movable, pressure reaction member having first and second stages positioned in the fluid chamber between the exhaust and supply ports to control the position of the seal support member and responsive to pressure applied at the supply port, the first stage having a pressure reaction surface exposed to the supply port and means for transferring the motion thereof to the seal support member over a limited distance, the second stage having a pressure reaction surface and means for transferring motion thereof to the seal support member wherein the combined effective area of both reaction surfaces is substantially larger than the area sealable by the first seal and wherein the effective area of the second stage is larger than the area sealable by the second seal so that a supply pressure, less than the tire pressure and greater than a preselected fraction of the tire pressure causes both stages to traverse the limited distance and move the support member from the first sealing position to the second, intermediate exhaust position to deflate the tires and so that reduction of the tire pressure approximately to the supply pressure causes the second stage to move the support member from the second, intermediate exhaust position to the third, sealing position, preventing further deflation of the tires.

7. A tire inflation and deflation valve for use on a vehicle having pressurized tires comprising:

a valve body defining a fluid chamber having a tire port, a supply port and an atmospheric exhaust port;

valve means for allowing fluid communication between the tire and exhaust ports to deflate the tire, only when fluid pressure at the supply port is less than the tire port pressure and greater than a predetermined fraction of the tire port pressure wherein the valve means for allowing fluid communications between the tire and exhaust ports has restricting means for quickly preventing fluid flow therebetween when the tire port pressure is approximately equal to the supply port pressure and comprising means for decreasing the air flow-resistance of the restricting means while the valve means is closing, and

means for allowing fluid communication between the tire and supply ports to inflate the tire only when the supply port pressure exceeds the tire port pressure.

4,895,200

COPOLYESTER WHICH IS PARTICULARLY SUITABLE FOR USE IN MAKING TIRE CORD

Edward R. Terrill, and Douglas D. Callander, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 173,903, Mar. 28, 1988, Pat. No. 4,824,928. This application Nov. 25, 1988, Ser. No. 276,176

Int. Cl.[4] D02G *3/48*

U.S. Cl. 152—451 **7 Claims**

1. A tire cord which is comprises of a copolyester which is comprised of repeat units which are derived from (a) a diol component which is comprised of from about 80 to about 99 mole percent phenyl hydroquinone and from about 1 to about 20 mole percent of at least one member selected from the group consisting of 1,4-bis(4-hydroxycumyl) benzene, 1,3-bis(4-hydroxycumyl) benzene, alkyl substituted 1,4-bis(4-hydroxycumyl) benzene, and alkyl substituted 1,3-bis(4-hydroxycumyl) benzenes; and (b) a diacid component which is comprised of from about 90 to about 100 mole percent terephthalic acid and from 0 to about 10 mole percent isophthalic acid.

4,895,201

OXIDATION RESISTANT SUPERALLOYS CONTAINING LOW SULFUR LEVELS

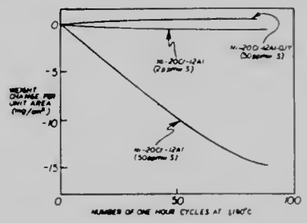
Michael A. DeCrescente, Wethersfield; Norman S. Bornstein, West Hartford, and John G. Smeggil, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 7, 1987, Ser. No. 70,489

Int. Cl.[4] B22D *1/00*

U.S. Cl. 164—56.1 **7 Claims**

3. A method for making an oxidation resistant nickel base superalloy casting, comprising the steps of melting an alumina scale forming composition which consists essentially of, by weight percent, 5–15Cr, 3–10Al, 0–15Co, 0–8Mo, 0–14Ta, 0–5Ti, 0–4Nb, 0–3Hf, 0–2V, 0–0.1Zr, 0–0.3C, 0–0.1B, balance nickel; contacting the molten superalloy with a rare earth compound to form rare earth containing sulfides; removing said sulfides; and solidifying the molten superalloy under conditions which result in a casting containing no intentional additions of rare earth elements, and having a sulfur activity which corresponds to the activity in the same composition



which contains no more than about 5 parts per million by weight.

4,895,202

ENDLESS TRACK TYPE CONTINUOUS CASTING MACHINE

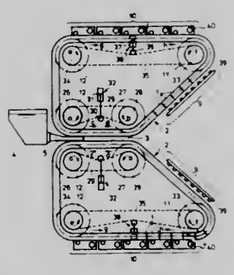
Hisashi Sato; Shuzo Takahashi; Shiro Onoda, all of Yokohama; Yutaka Tsuchida, Yokosuka, and Nobuhisa Hasebe, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of, Japan

Filed Nov. 15, 1988, Ser. No. 271,936

Claims priority, application Japan, Feb. 12, 1988, 63-30115

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—430 **5 Claims**



1. In an endless track type continuous casting machine having a pair of upper and lower endless-track-like mold assemblies each comprising a plurality of block molds interconnected and made to pass around gears, said mold assemblies being disposed such that opposing surfaces of said mold assemblies are driven in a same direction to thereby define a mold cavity, and horizontal cooling zones downstream of said mold cavity, an improvement comprising endless-track-like member means through which upstream- and downstream side gears for at least one of said mold cavity and said horizontal cooling zones are drivingly interconnected, and tensioner means operatively coupled to said member means passing on a side of the corresponding mold assembly.

4,895,203

HEAT EXCHANGER WITH HELICALLY COILED CONDUCT IN CASING

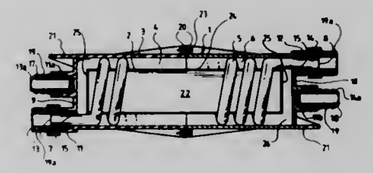
Keith S. McLaren, Queensland, Australia, assignor to Harold L. Hayes, Bulimba, Australia

Filed Nov. 20, 1986, Ser. No. 22,774

Claims priority, application Australia, Mar. 22, 1985, PG9873

Int. Cl.[4] B60H *1/08*; F28D *7/12*

U.S. Cl. 165—41 **2 Claims**



1. In a motor vehicle, the improvement comprising a heat exchanger for use with a motor vehicle engine to utilize waste heat from engine coolant, said heat exchanger comprising:

an elongate hollow jacket having an outer wall, an inner wall spaced from said outer wall and co-axial therewith about a longitudinal axis of said hollow jacket, and walls defining a closed annular space between said outer wall and said inner wall;

a helical tubular coil located closely between said outer wall and said inner wall within said annular space to define a helical fluid pathway between adjacent helixes of said coil;

inlet and outlet ports communicating with the interior of said tubular coil;

inlet and outlet ports communicating with said helical pathway;

said heat exchanger characterized in that said hollow jacket is comprised of substantially identical molded body halves joined by mating flanges intermediate opposed ends of said jacket, said body halves being composed of plastics material having low thermal conductivity, said tubular coil and said inner wall comprising a highly thermally conductive material mounted in an engine compartment of said motor vehicle, said inlet and outlet ports of said tubular coil being connected in fluid communication with a source of liquid coolant associated with said motor with a source of liquid coolant associated with said motor vehicle engine for circulation through said tubular coil, said inlet port communicating with said helical pathway being connectable to a source of liquid to be heated and said outlet port communicating with said helical pathway connected to a flexible hose to selectively draw heated liquid from said heat exchanger.

4,895,204

TUBE SUPPORT VIBRATION SUPPRESSION DEVICE AND METHOD

Robert H. Johnson, Budd Lake; Benjamin C. Esra, Livingston, and John Pelcer, Brookside, all of N.J., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Dec. 24, 1987, Ser. No. 138,502

Int. Cl.[4] F28F *9/00*

U.S. Cl. 165—162 **6 Claims**

1. A pressurizable vapor generator assembly including multiple tubes and having a tube support vibration suppression device for preventing induced vibrations of the tubes therein, comprising:

(a) a pressurizable vessel containing a plurality of U-bend shaped tubes connected to a header at the vessel lower end;

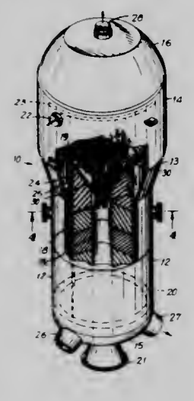
(b) a plurality of spacer supports each attached at its lower end to a support means, said spacer supports being ori-

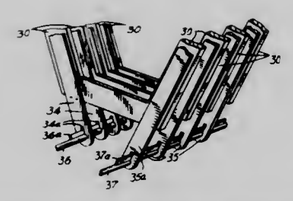
VOL 1110 ISS 4 JA 23 1990 UMI

ented to extend between adjacent said U-bend tubes at their upper portion;

(c) first and second nozzle/flanges each welded onto opposite sides of said vessel around an opening in said vessel in horizontal alignment with each other and at a level below said spacer supports, said first nozzle/flange containing a guide block unit;

(d) a step block unit having dual extension support rods extending through an opening in said guide block unit into the central portion of said vessel;





(e) a plurality of parallel suppressor blades placed on said dual extension rods and oriented between said spacer supports;

(f) a clamp block inserted through said second opening and placed against said step block unit and clamped into place; and

(g) a blind flange covering said first and second nozzle/-flanges, whereby said parallel suppressor blades are each inserted and retained between said adjacent spacer supports to effectively stabilize the spacer supports and tubes from induced vibrations during operation of the generator.

4,895,205

PIPE WASHER AND CHEMICAL APPLICATOR SYSTEM

J. P. Thompson, Rte. 1, Box 792 "A", Moselle, Miss. 39459; Henry Guillory, 205 Alcide Dr., Abbeville, La. 70510, and Alfred J. Thomas, II, 136 Teche Dr., Lafayette, La. 70503

Filed Oct. 19, 1987, Ser. No. 110,371

Int. Cl.[4] E21B *19/00*

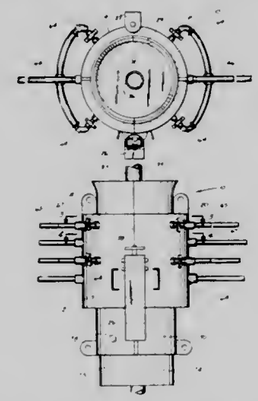
U.S. Cl. 166—90 **13 Claims**

1. An apparatus for cleaning sections of a continuous string of drill pipe being tripped out of a hole, the apparatus comprising:

a. an annular housing positionable on the bell nipple under the rig floor, the housing surrounding the drill pipe moving therethrough, further comprising first and second semi-circular portions hingedly engaged along a common edge, the portions movable between a first open position and a second closed position;

b. wiper means in the housing, having a bore for frictionally engaging the wall of the pipe as the pipe moves through the wiper means;

c. an annular base member, positioned within the annular housing upon which the wiper means rest in the housing;



d. means for providing a pressurized spray of fluid onto the wall of the pipe after the pipe has moved through the wiper means in the housing; and

e. means for wiping any excess water from the wall of the pipe following the spraying of the pipe with the pressurized fluid.

4,895,206

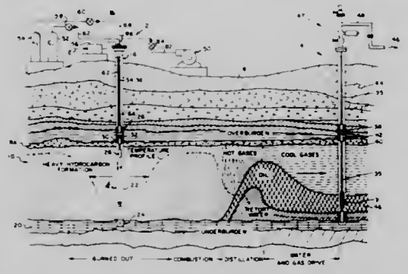
PULSED IN SITU EXOTHERMIC SHOCK WAVE AND RETORTING PROCESS FOR HYDROCARBON RECOVERY AND DETOXIFICATION OF SELECTED WASTES

Ernest H. Price, 1266 Pepper Dr., El Centro, Calif. 92243

Filed Mar. 16, 1989, Ser. No. 324,398

Int. Cl.[4] E21B *43/27, 43/243*

U.S. Cl. 166—260 **4 Claims**



3. A method for enhancing the recovery of hydrocarbons from a permeable formation comprising the steps of:

saturating a localized region within the formation with a mixture of hydrogen and chlorine gas;

initiating an exothermic reaction of the hydrogen and chlorine gas mixture within the saturated region to produce high temperature hydrogen chloride gas and an aqueous solution of hydrochloric acid; and,

reacting the hydrochloric acid with carbonaceous materials within the formation to precipitate nitrogenous, sulphurous and arsenic compounds as basic amines and insoluble amine salts.

4,895,207

METHOD AND FLUID FOR PLACING RESIN COATED GRAVEL OR SAND IN A PRODUCING OIL WELL

Robert H. Friedman, and Billy W. Surles, both of Houston, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Dec. 19, 1988, Ser. No. 285,996

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—276 **9 Claims**

1. In a method for forming a consolidated gravel pack in a washed out cavity adjacent to a producing well penetrating a subterranean oil formation comprising the steps of suspending resin coated gravel in a viscous aqueous carrier fluid and pumping the gravel into the portion of the formation where it is desired to form the consolidated gravel pack, said gravel particles being suspended in an viscous aqueous fluid containing hydroxyethylcellulose and a fluoreacent dye and having an initial pH in the range of from 6 to 8, wherein the improvement comprises

incorporating in the viscous aqueous carrier fluid an acid anhydride which reacts with the water component of the aqueous carrier fluid to form an acid, reducing the pH of the fluid to a value less than about 6 in from 2 to 6 hours which causes the viscosity of the aqueous carrier fluid to be reduced, thereby permitting the resin coated sand particles to come into close contact in order to form a dense permeable gravel pack.

4,895,208

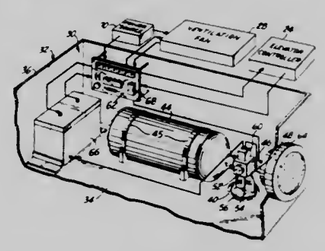
ELEVATOR CAB FIRE EXTINGUISHING SYSTEM

Victor Alasio, 196 Palisade Ave., Cliffside Park, N.J. 07010

Filed Sep. 22, 1988, Ser. No. 247,711

Int. Cl.[4] A62C *35/02, 37/12*; G08B *17/04*

U.S. Cl. 169—54 **9 Claims**



1. An elevator cab fire extinguishing system for use in extinguishing a fire within the interior of the cab of an elevator in response to the presence of the fire itself, the elevator cab fire extinguishing system comprising:

a source of non-toxic fire extinguishing agent maintained under superatmospheric pressure;

a conduit communicating with the source and the interior of the elevator cab; and

a valve in the conduit, the valve including temperature-responsive means associated with the interior of the elevator cab for maintaining the conduit closed in the presence of normal operating conditions in the interior of the elevator cab and for opening the conduit in response to a high temperature condition associated with a fire within the interior of the elevator cab to discharge the fire extinguishing agent from the source into the interior of the elevator cab.

4,895,209

COMBINE APPARATUS

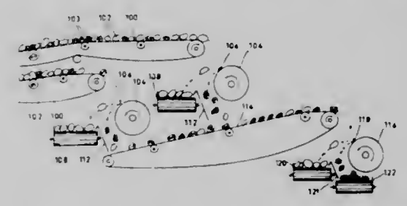
Ehud Margolin, Tel Aviv, and Ron Feller, Ramat Efal, both of Israel, assignors to State of Israel, Ministry of Agriculture, Bet Dagan, Israel

Filed Jan. 29, 1987, Ser. No. 68,151

Claims priority, application Israel, Jan. 29, 1986, 79276

Int. Cl.[4] A01D *13/00*

U.S. Cl. 171—18 **11 Claims**



1. Mobile combine apparatus for harvesting and separating a mixture of agricultural produce such as potatoes from other materials such as clods and stones comprising:

an impact element defining an impact surface; and

means for causing the mixture of agricultural products and stones to impinge on the impact surface in a predetermined direction irrespective of the orientation of the combine apparatus within a given range of operative orientations;

and wherein said means for causing the mixture of agricultural products and stones to impinge on the impact surface in a predetermined direction irrespective of the orientation of the combine apparatus within a given range of operative orientations comprises means for maintaining the impact surface in a predetermined orientation notwithstanding variations in the orientation of the combine, including an orientation sensor associated with said impact element and means for varying the orientation of said impact element relative to the ground surface underlying the mobile combine apparatus for maintaining the orientation of the impact element relative to the gravitational force vector of the earth in a predetermined orientation.

4,895,210

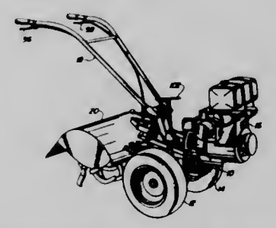
CLUTCH-BRAKE STEERING FOR SMALL AGRICULTURAL MACHINES

Homer D. Witzel, 1700 Gulf Blvd., Englewood, Fla. 34223

Filed Dec. 12, 1988, Ser. No. 282,524

Int. Cl.[4] A01B *33/08, 69/00*

U.S. Cl. 172—256 **17 Claims**



1. In a self-propelled, user-guided agricultural machine adapted to travel over the ground along a line of advance and having a transmission casing including a straight-through axle structure projecting laterally outwardly from the casing as right and left driving shafts and right and left ground engaging wheels, the improvement residing in steering and driving

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mechanism for the machine, comprising right and left means journalling the right and left wheels respectively on the right and left shafts, right and left clutch-brake units symmetrically arranged externally of the casing, each unit disposed between a side of the casing and the proximate wheel, each further having a clutch drum coaxially rotatable with the proximate shaft, a clutch band partly surrounding the drum and having first and second opposite ends spaced angularly apart, drive means connected to the first end of the band and drivably engaging the proximate wheel, a brake rotor journalled on the proximate shaft and having a connection to the second end of the band, means biasing the ends of the band together to grip the drum and thus to drive the proximate wheel, and control means for selectively engaging and retarding each brake rotor in opposition to the biasing means for alternately relaxing the grips of the bands on the drums.

4,895,211

LAND CLEARING ROOT PLOW AND SOIL AERATOR

Edwin D. Harris, Rt. 2, Box 27, Mathis, Tex. 78368

Filed Nov. 2, 1987, Ser. No. 115,348
Int. Cl.[4] A01B *13/00*
U.S. Cl. 172—271 **29 Claims**



1. A subsoil plow for aerating soil and pulling plants by their roots, which plow is adapted for use with a tractor, comprising:

a frame having a forward end and a rearward end;

means for connecting the forward end of said frame to a tractor;

a plow blade provided with a forward facing V-notch which has a central portion and an outer portion, said central portion being of an acute angle and said outer portion being of an obtuse angle; and

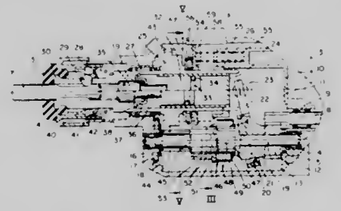
a first side arm and a second side arm connecting said plow blade to said frame, each of said side arms having a first member and a second member, the first member of each being rigidly connected to said frame at the rearward end thereof and extending downwardly therefrom, the second member of each being integral with the respective first member and extending downwardly at an obtuse angle from the lower end of the first member toward the second member of the other of said side arms, the second member of each of said side arms also being rigidly connected to said plow blade.

4,895,212

ROTARY HAMMER

Robert Wache, Wiesbaden, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 28, 1989, Ser. No. 317,180
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807078
Int. Cl.[4] B25D *11/10*
U.S. Cl. 173—48 **16 Claims**



1. A rotary hammer, comprising:

a rotatable tool-spindle;

a pneumatic hammer mechanism having a ram within said tool-spindle driven by a reciprocating piston;

a rotatably driven intermediate shaft for rotating said tool-spindle and for driving said hammer mechanism;

a coupling for drivingly connecting said intermediate shaft to a driving part of said hammer mechanism, said driving part being rotatably mounted on said intermediate shaft;

said coupling comprising a first coupling element connected to said driving part, and a second coupling element driven by said intermediate shaft and displaceable along the rotational axis of said intermediate shaft into positive coupling engagement with said first coupling element;

a synchronizing arrangement by which, when said coupling elements are brought close together, said first coupling element is accelerated to approximately the rotational speed of said second coupling element;

said synchronizing arrangement having a synchronizing element which first blocks axial approach of said coupling elements and only allows said positive coupling engagement to occur when said first coupling element has been accelerated at least approximately to the rotational speed of said second coupling element; and

the synchronizing arrangement having, non-rotatably connected to one of the coupling elements, a cup-shaped element which is open towards the other of the coupling elements and has an open region enlarged in relation to an adjacent wall region, the synchronizing element being connected to the other of the coupling elements and being radially enlargeable through forces acting on it in a circumferential direction, and upon approach of the coupling elements said synchronizing element coming into engagement with the enlarged open region of the cup-shaped element.

4,895,213

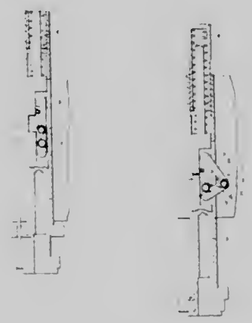
PRESS WITH A KNUCKLE JOINT ESCAPEMENT

Guy Neyret, 11, rue du Fort, 69340 Francheville, France

Filed Oct. 31, 1988, Ser. No. 264,360
Claims priority, application France, Nov. 6, 1987, 87 14751
Int. Cl.[4] B25D *9/00*
U.S. Cl. 173—119 **2 Claims**

1. An impact press of the type including a tool holder slidably mounted in a slide, a hammer sliding in said slide, means resiliently acting between the hammer and the slide to urge the hammer toward the tool holder, an escapement device disengaging the resiliently acting means from the hammer in a determined position of the stroke, characterized by the fact that said escapement device includes two connecting rods

articulated to each other about an axle at one end and the other end of which is articulated about axles respectively to the hammer and to the tool holder, a return spring tending to urge the connecting rods back to an aligned position in which the



articulation axles are in alignment along a straight line parallel to the path of the hammer, one of the connecting rods including a ramp with which cooperates a pin rigidly connected to the slide such that when the ramp contacts the pin, the connecting rods are deflected from alignment with each other.

4,895,214

DIRECTIONAL DRILLING TOOL

William N. Schoeffler, P.O. Box 91105, Lafayette, La. 70509

Filed Nov. 18, 1988, Ser. No. 272,787
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—38 **8 Claims**

1. A well bore deviation control tool for use on a fluid conducting drill string in a well being drilled, the tool comprising:

(a) an elongated generally cylindrical housing having an upper end, a lower end, and a generally centerline;

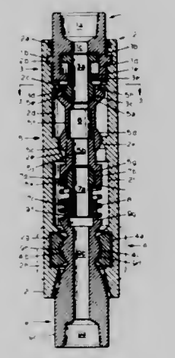
(b) a torque passing assembly extending along said general centerline, arranged for rotating therein and comprising, an input shaft journaled for rotation on said general centerline and having means for fluid tight attachment to an upwardly continuing portion of a drill string, an output shaft bearingly supported for rotation in said housing and extending from said lower end thereof with means for fluid tight attachment to a downwardly continuing portion of the drill string, a rigid mid-section shaft rotationally coupled by flexible joints between said input shaft and said output shaft, and at least one drilling fluid channel extending longitudinally through said assembly;

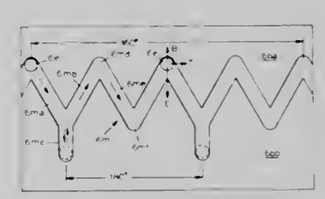
(c) well bore wall engagement surfaces on said housing to generally align said housing and the well bore;

(d) selector valve means situated in said channel and arranged to variably resist drilling fluid flow therethrough, responsive to drilling fluid flow rate changes of a first characteristic to produce a first fluid flow resistance when drilling fluid flow rate is increased a preselected amount and responsive to drilling fluid flow rate changes of other characteristics to produce a higher fluid flow resistance than said first fluid flow resistance when drilling fluid flow is increased said preselected amount;

(e) actuator means situated in said assembly, responsive to fluid flow resistance across said valve to move from a first position to a second position in response to said higher fluid flow resistance than said first fluid flow resistance;

(f) bias means situated on said assembly and arranged to move said actuator to said first position in response to said first fluid flow resistance;





(g) lateral displacement means mounted on said assembly, and responsive to movement of said actuator means to move said mid-section shaft a preselected radial distance relative to said housing when said actuator moves to said second position;

(h) gimbal mounting means in said housing arranged to rotationally support said output shaft for rotation about an angularly deflected axis relative to said centerline, said gimbal mounting means to serve as a fulcrum to deflect said angularly deflected axis when said mid-section shaft is moved said radial distance; and

(i) rotational coupling means, responsive to said positions of said actuator means, arranged to rotationally couple said assembly to said housing when said actuator is in said first position and to rotationally decouple said assembly from said housing when said actuator is in said second position.

4,895,215

SEAL CAGE ASSEMBLY FOR RELATIVELY MOVABLE MEMBERS

Allen K. Rives, 12211 Carols Way Cir., Houston, Tex. 77070

Filed Dec. 5, 1988, Ser. No. 279,998
Int. Cl.[4] E21B *10/22*; F16C *19/00*
U.S. Cl. 175—371 **22 Claims**

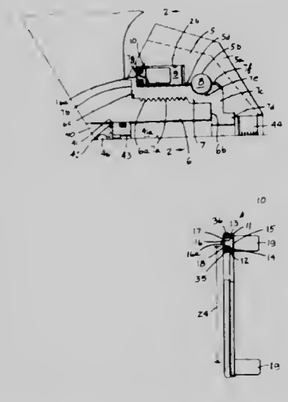
8. In a rotatable seal arrangement for sealing between the

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rotatable seal arrangement and each of a pair of relatively rotatable members wherein one member rotates at a different rate from a second member, the invention comprising:

a rotatable cage for supporting the seals in radial spaced relationship to seal between said rotatable cage and the first member and to seal between said rotatable cage and the second member, respectively, said cage including:

a ring defined by inner and outer circumferential edges joined by two side surfaces extending between said edges;



an annular projecting surface extending from one of said ring side surfaces between said ring inner and outer circumferential edges;

projecting means extending from the other of said ring side surfaces; and

means for engaging said projection means to rotate said rotatable cage between the first and second member in response to rotation of at least one of said rotatable members.

4,895,216

ELECTRICALLY DRIVEN POWER STEERING APPARATUS

Takehiko Fusimi, Kariya, and Naoji Sakakibara, Chiryu, both of Japan, assignors to Aisin Seiki Kabushikikaisha, Aichi, Japan

Continuation of Ser. No. 45,999, May 4, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,236

Claims priority, application Japan, May 6, 1986, 61-103666

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **8 Claims**

1. An electrically driven power steering apparatus comprising:

a direction controlling mechanism for turning the wheels relative to a car body;

steering means coupled to the direction controlling means for driving a car;

torque detector means for detecting the magnitude of a torque which is applied to the direction controlling means from the steering means;

an electric drive mechanism including an electric motor coupled to the direction controlling means;

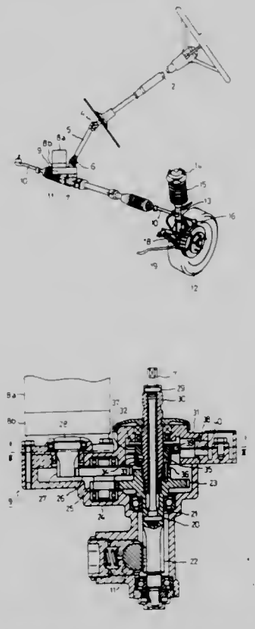
first energizing means for energizing the motor in the electric drive mechanism;

blocking means for cutting off and preventing the application of a driving force to the direction controlling means from the electric drive mechanism;

second energizing means for energizing the blocking means; and

an electrical control system:

first energization command means for commanding the first energizing means in order to generate an assisting torque corresponding to the torque detected by the torque detector means;



and second energization command means for causing the second energizing means to energize the blocking means whenever the torque detected by the torque detector means goes out of a preset reference range whereby abnormality of the torque detector means is detected.

4,895,217

DRIVE SYSTEM FOR TWO PAIRS OF WHEELS

Volker Hueckler, Radolfzell; Dieter Nobis, Lossee-Halzhausen, and Reinhard Schwarz, Gondelsheim, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Dec. 21, 1987, Ser. No. 136,047

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1987, 3643831

Int. Cl.[4] B60K *17/346, 23/08*; B60T *8/32*

U.S. Cl. 180—233 **14 Claims**

1. A drive system for a motor vehicle, comprising:

a front pair and a rear pair of wheels, at least one pair of which can be steered;

a front differential and a rear differential, each drivably connected to a respective one of said front and rear wheel pairs;

a center differential drivably connected to said front and rear differentials;

adjustment means comprising a gradually engageable lock for each said differential for adjusting the speeds of any relative rotation within each of said differentials;

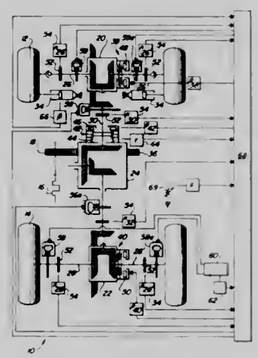
a sensor for determining a steering angle of said steerable pair of wheels;

a plurality of wheel speed sensors, each determining a rotational speed of a corresponding one of said wheels;

a plurality of differential speed sensors, each determining a rotational speed of a corresponding one of said front and rear differentials; and

a control circuit including means for controlling said adjustment means based upon the sensed steering angle and rotational speeds, said control circuit comprising:

means for calculating the ratio of the sensed rotational speeds of said front wheels;



means for comparing said calculated ratio to a reference value corresponding to the sensed steering angle; and

means for decreasing the degree of locking of said front differential by a first predetermined amount if said calculated ratio corresponds to said reference value, and for increasing the degree of locking of said front differential by a second predetermined amount if said calculated ratio does not correspond to said reference value.

4,895,218

MULTISHOT DOWNHOLE EXPLOSIVE DEVICE AS A SEISMIC SOURCE

Sen-Tsuen Chen, Sugar Land; Erik A. Eriksen, Houston; Mark A. Miller, Houston, and Thomas J. Murray, Jr., Houston, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 24, 1988, Ser. No. 261,957

Int. Cl.[4] G01V *1/06*

U.S. Cl. 181—116 **7 Claims**

1. An apparatus for generating a downhole seismic source, said apparatus comprising:

a capacitor;
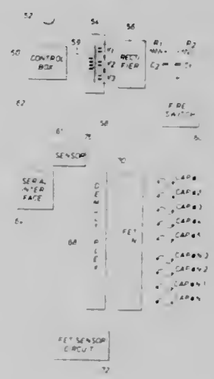
a firing switch connected in series with the capacitor and in series with a plurality of parallel field effect transistor switches;

a plurality of explosive charges connected in a series electrical arrangement to the firing switch and to the plurality of parallel field effect transistor switches;

a serial interface control for producing a binary coded command in response to a control signal;

means for receiving the binary coded command and activating at least one of the field effect transistor switches, whereby the plurality of explosive charges may be detonated in a sequence controlled from a remote location; and

a protective housing in which are mounted the capacitor, the firing switch, the field effect transistor switches, the serial interface control, and the means for receiving the binary



coded command and activating at least one of the field effect transistor switches.

4,895,219

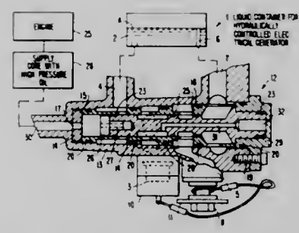
FILL VALVE FOR LIQUID CONTAINING DEVICE

Richard C. Welch, and Thomas A. Bolgert, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 11, 1988, Ser. No. 255,789

Int. Cl.[4] F01M *1/18*

U.S. Cl. 184—6.4 **14 Claims**



1. A device comprising means for containing liquid, fill passage means for adding liquid to the means for containing liquid, drain passage means for draining liquid from the means for containing liquid, movable valve means for opening and closing said fill passage means and said drain passage means, and means for positioning said valve means so as to open said drain passage means in response to application of a pressure filling pressure to said fill passage means.

4,895,220

METHOD FOR MONITORING OIL FLOW IN AN OIL-LUBRICATED VACUUM PUMP

Jean-Luc Abraham, Bourg les Valence; Jean-Luc Chavand, Granges les Valence, and Frederic Jezierowski, Valence, all of France, assignors to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,377

Claims priority, application European Pat. Off., Jun. 1, 1988, 88108768.8

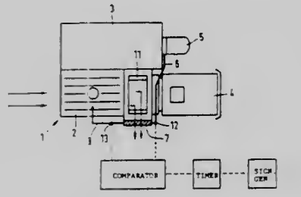
Int. Cl.[4] F01M *11/10*

U.S. Cl. 184—6.4 **7 Claims**

1. A method for monitoring of the amount of oil flowing in

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an oil-lubricated vacuum pump, an oil filter and an oil cooler disposed in the oil circulation system and the oil cooler being fashioned as a heat exchanger having the oil and a cooling medium flowing through it, and having a supply conduit and an exit conduit for each fluid, said method comprising the steps of:



measuring the temperature of a fluid at the respective supply conduit and at the respective exit conduit,

comparing the two temperature values to each other, and

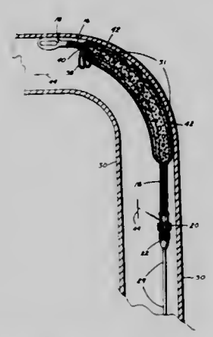
actuating a warning signal if the temperature difference reaches a pre-set value.

4,895,221

METHOD AND APPARATUS FOR INSTALLING A FISH TAPE IN A CONDUIT

Brian E. Carlson, Rte. 3 Box 32 C Eatler Ave., Chico, Calif. 95928

Filed Jul. 20, 1988, Ser. No. 221,881
Int. Cl.[4] H02G *1/08*; F16N *7/16, 7/24*; F16L *55/00*
U.S. Cl. 184—15.1 **11 Claims**



6. A method of lubricating a portion of an interior wall surface of at least one bend in a conduit immediately adjacent a free end of an advancing fish tape, comprising the steps of:

(a) fixedly adhering a pressure sensitive lubricant dispensing device at said free end of said fish tape;

(b) saturating said lubricant dispensing device with a fluid lubricant;

(c) inserting said free end of said fish tape into an opening in said conduit;

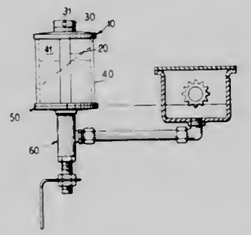
(d) pushing said fish tape forward in said conduit through said bend wherein said lubricant dispensing device is forced against a longer radius wall surface of said bend releasing said fluid lubricant prior to passage of said fish tape thereby reducing friction between said fish tape with said attached lubricant dispensing device and said longer radius wall surface of said bend.

4,895,222

CONSTANT LEVEL OILER

Ralph M. Hoffmann, Eden Prairie, Minn., assignor to Foxport, Inc., Eden Prairie, Minn.

Filed Jan. 23, 1989, Ser. No. 300,792
Int. Cl.[4] G05D *9/02*
U.S. Cl. 184—103.1 **7 Claims**



1. A constant level oiler comprising:

reservoir means for holding a supply of lubricating fluid therein;

top cover means for sealing the upper region of said reservoir means;

vent means disposed in said top cover means for providing an inlet for ambient gas;

bottom cover means for sealing the lower region of said reservoir having first and second flow apertures with an intermediate chamber disposed therebetween, said intermediate chamber having a substantially open region extending therefrom to said reservoir means;

isolation means having one end thereof connected to said vent means and the other end thereof connected to said bottom cover means about said first flow aperture for directing said ambient gas entering said vent means to said intermediate chamber;

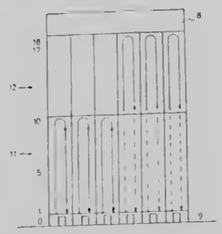
shank means connected to said bottom cover means about said second flow aperture for allowing a flow of said lubricating fluid from said reservoir therethrough to a specified lubrication point.

4,895,223

METHOD FOR SUB-ZONING AN ELEVATOR GROUP

Ralf Ekholm, Helsinki, and Riitta Partanen-Jokela, Hyvinkaa, both of Finland, assignors to Kone Elevator GmbH, Baar, Switzerland

Filed Jun. 15, 1988, Ser. No. 206,754
Claims priority, application Finland, Jun. 17, 1987, 872706
Int. Cl.[4] B66B *1/20*
U.S. Cl. 187—125 **7 Claims**



1. A method for increasing the transportation capacity of elevators in a building by dividing the elevators into two or more groups, each comprising one or more elevators, in such a manner that in certain loading conditions said groups will temporarily serve different zones of said building and wherein an upward peak traffic elevator condition is detected and the boundaries between said zones are determined and maintained by the following steps:

(a) detecting a peak traffic condition mainly on the basis of elevator loading time and/or the number of people arriving in an elevator lobby of said building.

(b) calculating an initial optimal zone boundary value, mainly on the basis of traffic statistics and existing transportation capacity.

(c) effecting transition of elevator operation to sub-zoning during upward peak traffic.

(d) re-calculating the optimal zone boundary value mainly on the basis of short-term traffic statistics, the number of people in the elevator lobby and the available transportation capacity.

(e) sensing the need for change in the zone boundary and effecting the change thereof as calculated in section (d) hereof.

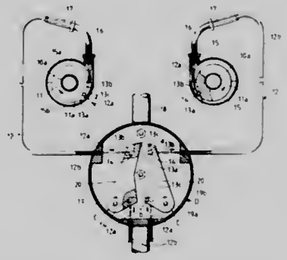
(f) cancelling the sub-zoning upon completion of the upward peak passenger period or when the volume of upward traffic has fallen below a predetermined limit.

4,895,224

BRAKE DEVICE FOR BICYCLES

Masanobu Sugihara, No. 2-18, Tamakushicho-Nishi 3 chome, Higashi-Osaka, Osaka, 578, Japan

Filed Jul. 21, 1988, Ser. No. 222,420
Claims priority, application Japan, Mar. 14, 1988, 62-34070[U]
Int. Cl.[4] B02L *3/00*
U.S. Cl. 188—24.14 **1 Claim**



1. In a brake device for bicycles, a handlebar which is provided with a rotary cylindrical grip member which is connected with an inner wire of a brake cable having an outer sheath fixed to said handle bar, and wherein the inner wire is connected with a force-increasing toggle mechanism for transforming a rotary twisting action of the cylindrical grip into a pull of increased force on a brake wire, the toggle mechanism being located on a part of the bicycle spaced from the grip member.

4,895,225

CYLINDRICAL HOSE GUIDE WHEEL CHOCK

John R. Parnell, 2101 Bateman Blvd., Camden, S.C. 29020

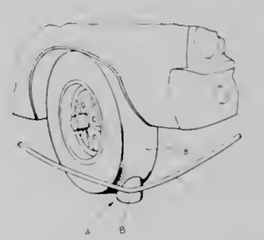
Filed Sep. 30, 1988, Ser. No. 251,244
Int. Cl.[4] B60T *3/00*; F16L *11/00*; B65H *23/04*; A62C *23/04*
U.S. Cl. 188—32 **14 Claims**

1. A hose guide chock for use with a vehicle having rubber tires to prevent a hose from being caught in a nip between the ground and a tread surface of the tires when the hose is pulled around a corner of the vehicle comprising:

a wedge-shaped body having a base supported on said ground;

a low body portion included in said wedge-shaped member which fits in said nip of one of said tires;

a high body portion included in said wedge-shaped body opposite said low body portion which extends upwardly from said base generally the entire distance from said ground to said tread surface so that an entrance space to said nip of the tire is completely closed; and



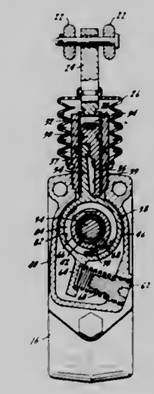
a rounded wall means carried by said base extending generally perpendicular between said low body portion and said high body portion which is engaged by said hose to guide said hose around said wedge-shaped body while said low body portion occupies said nip of said tire and said high body portion prevents said hose from entering said entrance space to said nip as said hose is pulled around the corner of said vehicle and said one tire.

4,895,226

VEHICLE AUTOMATIC SLACK ADJUSTER

Arthur A. Berg, Northbrook, Ill., and Frederic Lisson, deceased, late of Chicago, Ill. (by Edith Lisson, executrix), assignors to Midland Brake, Inc., Kansas City, Mo.

Filed Aug. 19, 1985, Ser. No. 766,590
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—79.55 **9 Claims**



1. In an automatic slack adjuster for vehicle brakes adapted to be mounted between the brake chamber and the brake operating shaft, a body, a drive member movable relative to and positioned by said body on the brake operating shaft, a lever arm pivoted to said body, an adjustable connection between said lever arm and drive member for adjusting the relationship between said drive member and body in response to the body movement required for a brake application, said

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adjustable connection including a stepped cam movable in response to lever arm travel, an adjustment member positioned for contact with said cam and movable in accordance with the position of the cam step to sense and take up a limited amount of slack, spring means urging said adjustment member toward said stepped cam, and a one-way clutch connecting said adjustment member and drive member, with said one-way clutch providing for slack take-up movement of said adjustment member and drive member during brake application movement of said body and brake operating shaft if slack is sensed, and permitting relative movement between said adjustment member and drive member during brake release.

4,895,227

SPRING BRAKE UNIT AND ITS APPLICATION TO A BRAKING SYSTEM

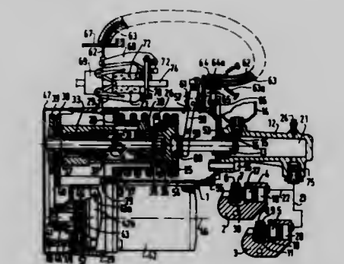
Michel Grenier, Dampert; Jean-Etienne De La Gorce, Paris; Daniel Cieplinski, Villemomble; Gérard Letargie, Auvers S/oise; Yvers Thuria, Sucy en Brie; Laurent Meret, Brunoy, and Christian Doireau, Paris, all of France, assignors to Wabco Westinghouse Equipements Ferroviaires, Sevran and Regie Autonome des Transports Prisiens "RATP", Paris, both of, France

Filed Feb. 27, 1987, Ser. No. 20,071

Claims priority, application France, Feb. 28, 1986, 86 02817

Int. Cl.[4] B60T *13/04;* **B61H** *11/14*

U.S. Cl. 188—173 **7 Claims**



1. A braking unit for a vehicle, of the type comprising at least one helical spring arranged to axially actuate a brake, said spring being maintained in a brake release position against its reaction force via a screw-nut system adapted to be driven in rotation by an electric motor which is powered to adjust the braking force of the unit, constituted by the axial reaction force of the spring reduced by the subtractive force produced by the screw-nut system rotationally driven by the electric motor, the spring being connected to the brake through the intermediary of at least a hydraulic master cylinder, the piston of which is axially activated by an abutment ring of the spring, the abutment ring being mechanically connected via the screw-nut system to the rotor of the electric motor and the master cylinder being branched to at least one receiving cylinder, piston of which is adapted to apply at last one brake lining the brakes on a braking surface of the vehicle, the abutment ring being also mechanically connected to a mechanism for actuating an emergency or park brake of the vehicle adapted to replace at last provisionally the master cylinder if it becomes defective, wherein the mechanical connection between the abutment and the actuating mechanism is constituted by a lever articulated on an axle integral with the unit body and one end of which rests upon the end abutment ring of the actuating spring while the other end is connected to a cable of a cable and sheath system for actuating the emergency or park brake, wherein the sheath is respectively adapted, in the application position of the emergency or park brake, to abut a rigid abutment and, in the inactive position of the emergency or park brake, to be released in order to allow the service brake to act freely via the hydraulic master cylinder and wherein the rigid abutment is movable and adapted either to be returned to the active position or to be brought into the inactive position, thereby releasing the sheath, by a remotely controlled member.

4,895,228

SLACK ADJUSTER

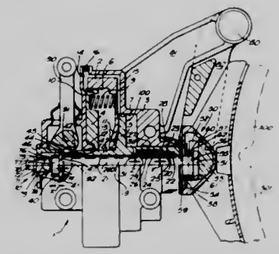
Jack Washbourn, Axminster, and Keith W. Langley, Bath, both of England, assignors to Westinghouse Brake & Signal Holdings Limited, Chippenham, England

Filed Jan. 23, 1989, Ser. No. 299,386

Claims priority, application United Kingdom, Jan. 27, 1988, 8801793; Jun. 28, 1988, 8815373

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—202 **7 Claims**



1. A slack adjuster having a non-rotatable fast-threaded output member threadedly engaged by a pair of nuts, one of the nuts being a first brake-force-transmitting nut clutchable to prevent rotation thereof and the other being a second adjustment nut clutchable to land, relative axial movement of these nuts relative to the output member being a measure of "excessive" brake clearance and restoration of the normal spacing between these nuts serving to restore brake clearance to "normal"; the nuts being housed in a housing which is non-rotatable but axially movable with respect to the output member, the first nut being clutchable to a thrust member resiliently loaded with a force which is overcome only by forces of the magnitude of braking forces transmitted through the slack adjuster, and there being a releasable coupling between the housing and the second nut which includes a splined connection and which is inoperative to prevent the second nut spinning on the output member except when the force transmitted by the slack adjuster is sufficient to overcome the resilient loading of the thrust member.

4,895,229

HYDRAULIC SHOCK ABSORBER

Tetsuo Kato, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Dec. 28, 1988, Ser. No. 291,298

Claims priority, application Japan, Dec. 28, 1987, 62-199860

Int. Cl.[4] F16F *9/348*

U.S. Cl. 188—282 **3 Claims**

1. In a hydraulic shock absorber including a cylinder containing a hydraulic fluid, a piston slidably received in said cylinder and defining first and second fluid chambers in said cylinder, said piston having first and second opposite end faces respectively facing said first and second chambers, a piston rod secured at one end thereof to said piston and having another end extending outside said cylinder, and a damping force generating mechanism attached to said piston, the improvement wherein said damping force generating mechanism comprises:

a first passage formed in said piston and communicated with said first chamber and with a recess in said second end face of said piston;

a second passage formed in said piston and communicated with said second chamber and with a recess in said first end face of said piston;

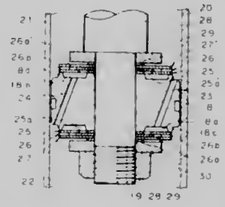
a first disc valve assembly mounted on said second end face of said piston and having an inner peripheral portion secured to said piston and an outer peripheral portion deflectable to open and close said first passage;

a second disc valve assembly mounted on said first end face of said piston and having an inner peripheral portion secured to said piston and an outer peripheral portion deflectable to open and close said second passage; and

each of said first and second disc valve assemblies comprising:

a first disc valve mounted on the respective said end face of said piston and having an opening communicated with said recess in said respective end face;

a second disc valve mounted on said first disc valve, said second disc valve having formed therein a fluid passage



having a first end open to the respective said chamber at that side of said piston at which said each disc valve assembly is disposed and a second end open to an interfacial area between said first and second disc valves; and

said first disc valve, upon said piston being moved in said cylinder in a direction into said respective chamber at speeds in a relatively low speed range, being deformable away from said second disc valve by a resultant pressure that is generated in said respective chamber and that is insufficient to deform said outer peripheral portion of the other said disc valve assembly disposed at the other said end face of said piston, such that hydraulic fluid is allowed to flow from said respective chamber and said fluid passage in said second disc valve, through a clearance defined between said first and second disc valves due to such deformation, and then into the other said chamber, thereby generating damping force with valve characteristics in said low speed range.

4,895,230

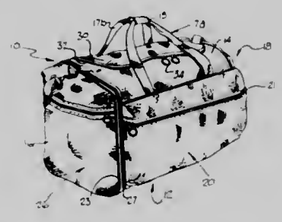
COLLAPSIBLE SOFTSIDE LUGGAGE CASE WITH SELF-ERECTING FEATURE

William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Sep. 22, 1988, Ser. No. 247,800

Int. Cl.[4] A45G *7/00*

U.S. Cl. 190—107 **10 Claims**



1. A collapsible soft luggage case comprising a plurality of panels which are connected together at the intersections thereof, said panels including a bottom panel on which a luggage case rests when in an erected condition, said bottom panel including means for stiffening said bottom panel when said luggage case is in the erected condition, opposed front and back panels connected along their lower edges to opposed edges of said bottom panel, opposed end panels normally connected to said opposed front and back panels and said bottom panel; at least a first one of said opposed front and back panels including means for selectively accessing the interior of said luggage case when said luggage case is in the erected condition, said end panels including means around the periphery thereof for stiffening said end panels, means for hingedly attaching said panels together to permit said end panels to be folded about their intersections between a second one of said opposed front and back panels to place said end panels generally parallel to said second one of said front and back panels, and means interconnecting said means for stiffening said bottom panel with said second one of said front and back panels to place said means for stiffening said bottom panel generally parallel with said second one of said front and back panels, whereby said means for stiffening said end panels may be folded towards one another to collapse said luggage case when not in use.

4,895,231

CARRYING CASE

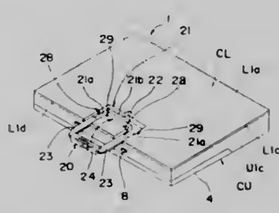
Shigeru Yamahuchi; Masasori Matsuishi, both of Nara, and Shunichi Miyako, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1988, Ser. No. 242,976

Claims priority, application Japan, Sep. 14, 1987, 62-140655[U]; Sep. 14, 1987, 62-140656[U]

Int. Cl.[4] B65D *25/28;* **A45G** *13/10*

U.S. Cl. 190—115 **7 Claims**



1. A lock mechanism for a carrying case which comprises a generally box-like casing accommodating various electric components therein and having a panel assembly generally hingedly supported for movement in a direction towards and away from the casing, and at least one lock mechanism operable to lock the panel assembly in a closed position to the casing, said lock mechanism comprising:

an engagement member secured to the panel assembly; and

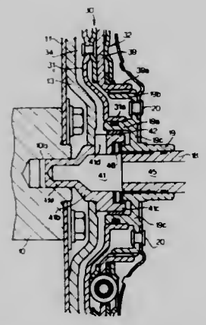
a release member of one-piece construction made of synthetic resin and including a release button, a support tongue formed integrally with and extending from the release button in a direction inwardly of the casing, a pawl member integrally formed with an extending from one end of the support tongue at a position remote from the release button, said pawl extending in a direction generally perpendicular to the support tongue, a pair of resiliently yieldable, generally plate-like arms formed integrally with and extending from the release button in a direction away from each other and also extending generally perpendicular to the support tongue, and a perforated fitting lug formed integrally with one end of each of the resiliently yieldable arms at a position remote from the release button and lying in a plane generally perpendicular to the associated resiliently yieldable arm.

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4,895,232
TORQUE CONVERTER FOR AN AUTOMATIC TRANSMISSION

Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 159,632, Feb. 23, 1988, abandoned.
This application Feb. 21, 1989, Ser. No. 315,230
Claims priority, application Japan, Mar. 18, 1987, 62-064776
Int. Cl.[4] F16H *45/02*
U.S. Cl. 192—3.3 8 Claims



7. A torque converter for a motor vehicle driven by an engine, the torque converter having a converter cover secured to a crankshaft of the engine, an impeller secured to the converter cover, an input shaft for an automatic transmission, a turbine secured to the input shaft at a turbine hub, and a lockup clutch including a lockup piston axially slidably mounted on the turbine hub for releasable engagement with said converter cover, comprising:

a pilot boss having an axial hollow therein and a valveless bore extending exclusively radially of an axis of the torque converter communicating a release side chamber formed between the converter cover and the lockup piston with said axial hollow, said pilot boss supporting the converter cover;

an outer end of the pilot boss being engaged in a hole formed in the crankshaft at the axis thereof, and an inner end of the pilot boss being rotatably mounted in the turbine hub to rotatably support the turbine hub;

an oil passage formed in the input shaft communicating with the axial hollow of the pilot boss for supplying release oil via said bore to said release side chamber so as to disengage the lockup piston from the converter cover.

8. A torque converter for a motor vehicle driven by an engine, the torque converter having a converter cover secured to a crankshaft of the engine, an impeller secured to the converter cover, an input shaft for an automatic transmission, a turbine secured to the input shaft at a turbine hub, and a lockup clutch including a lockup piston axially slidably mounted on the turbine hub for releasable engagement with said converter cover, comprising:

a pilot boss having an axial hollow therein, said pilot boss supporting the converter cover;

an outer end of the pilot boss being engaged in a hole formed in the crankshaft at the axis thereof, and an inner end of the pilot boss being rotatably mounted in the turbine hub to rotatably support the turbine hub;

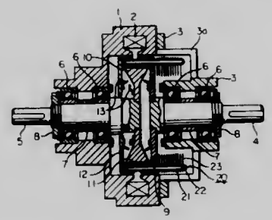
an axial thrust bearing positioned within a recess formed in the pilot boss and axially adjacent a sleeve portion of the turbine hub; and

an oil passage formed in the input shaft and the pilot boss for supplying release oil to a release side chamber formed between the converter cover and the lockup piston so as to disengage the lockup piston from the converter cover.

4,895,233
ELECTROMAGNETIC COUPLING APPARATUS EQUIPPED WITH HEAT PIPES

Hitoshi Inoue; Tadatoshi Takayanagi; Kenji Kataoka, all of Kobe; Ryosuke Okita, Himeji; Kiyohide Okamoto, Himeji, and Hideaki Takei, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 89,319, Aug. 25, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 334,754
Claims priority, application Japan, Sep. 30, 1986, 61-233568; Sep. 30, 1986, 61-233569; Sep. 30, 1986, 61-233586; Sep. 30, 1986, 61-233587; Sep. 30, 1986, 61-233588
Int. Cl.[4] F16D *37/02, 65/833*
U.S. Cl. 192—21.5 14 Claims



1. A magnetic particle-type electromagnetic coupling apparatus comprising:

a rotatable drive shaft;

a first coupling member secured to said rotatable drive shaft and including only one cylindrical coupling surface, said coupling surface being disposed generally parallel to an axis of said drive shaft for rotating therewith;

a second coupling member having a cylindrical coupling surface disposed opposite and radially inwardly from said cylindrical coupling surface of said first coupling member across an annular gap;

magnetic particles disposed in said annular gap for transmitting force from said first coupling member to said second coupling member when magnetized;

a stator surrounding said first coupling member;

an exciting coil housed inside said stator to magnetize said magnetic particles when an electrical current is passed through said exciting coil;

a plurality of heat pipes partially embedded in said first coupling member proximate said cylindrical coupling surface of said first coupling member and extending outside of said first coupling member; and

a protective housing secured to said stator surrounding said heat pipes, said protective housing having a plurality of openings formed therein proximate said heat pipes for the passage of cooling air.

4,895,234
UNIDIRECTIONAL ROTARY CLUTCH IN STARTER MOTOR

Ikuo Fujiso, Ashikaga, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

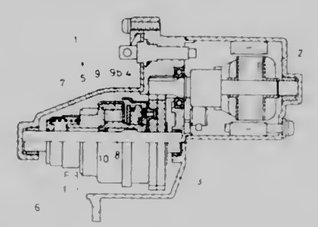
Filed Dec. 27, 1988, Ser. No. 289,674
Claims priority, application Japan, Dec. 28, 1987, 62-329735
Int. Cl.[4] F16D *41/07*
U.S. Cl. 192—42 2 Claims

1. A unidirectional rotary clutch in a starter motor, comprising:

a clutch inner connectively interlocking wih a motor unit on a power conveying route leading from said motor unit to a pinion gear which disengageably engages with a ring gear provided on the side of an engine;

a clutch outer connectively interlocking with said pinion gear;

a clutch roller biased by an elastic member incorporated into a roller groove chamber formed between said clutch inner and said clutch outer, so as to propagate power during forward rotation of said motor unit but to cut off the

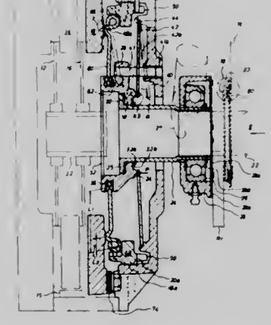


propagation of power in the case of reverse rotation, said roller groove chamber being filled with grease comprised of hydrocarbon fats and oils as a primary component and fluorocarbon resinous agent as a secondary component.

4,895,235
CLUTCH

Yoshio Nishimura; Seiichi Kitano; Yasunobu Fukatani; Masaaki Asada, and Kazuhiko Yoneda, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

PCT No. PCT/JP87/00374, § 371 Date Feb. 17, 1988, § 102(e) Date Feb. 17, 1988, PCT Pub. No. WO87/07929, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 10, 1987, Ser. No. 173,528
Claims priority, application Japan, Jun. 17, 1986, 61-142140
Int. Cl.[4] F16D *13/56, 23/14*
U.S. Cl. 192—70.3 5 Claims

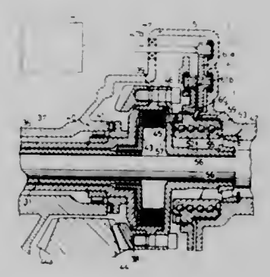


1. In a clutch having a releasing operation by pulling a release bearing away from a flywheel by means of a releasing lever connected to a clutch pedal; a flywheel, a transmission having an input shaft, a clutch disc between said flywheel and said transmission and spline fitted onto said input shaft, a sleeve on the outer periphery of said input shaft, a release bearing fastened to the transmission end of said sleeve, a flange portion on said sleeve at the flywheel end of said sleeve, said flange portion projecting radially outward from the outer periphery of said sleeve; a load transmitting retainer on said sleeve in pressing engagement with said flange portion for applying a thrust force to a thrust force transmitting member actuated thereby, said retainer and said sleeve being axially slidable on said input shaft; a clutch cover connected to said flywheel and covering a pressure plate for pressing said clutch disc against said flywheel when said thrust force is applied to said thrust force transmitting member; a disc-formed spring member disposed between said clutch cover and said retainer for applying a spring force to said load transmitting retainer and said thrust force transmitting member actuated by said retainer; circumferentially spaced pins between said retainer and said clutch cover and passing freely through said spring member, each of said circumferentially spaced pins, at one of its ends, being fixed to one of said retainer and said clutch cover and being slidable, at its other end, through the other of said retainer and said cover, said disc-formed spring member being a diaphragm spring having an inner peripheral part in engagement with said retainer with rolled pins between said inner peripheral part of said diaphragm spring and said retainer.

4,895,236
ACTUATOR FOR THE FRICTIONAL ENGAGING DEVICE

Shiro Sakakibara, Toyokawa, and Takaharu Fukaya, Kariya, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Jan. 27, 1988, Ser. No. 149,242
Claims priority, application Japan, Feb. 2, 1987, 62-37543
Int. Cl.[4] F16H *1/445*
U.S. Cl. 192—84 R 10 Claims



1. An actuator for a transfer mechanism for a four wheel drive vehicle, said transfer mechanism transferring torque from a transmission to at least one of a front wheel side output member and a rear wheel side output member, said actuator comprising:

a friction clutch connected to the front wheel side output member and the rear wheel side output member, said friction clutch controlling torque distribution to the front and rear wheel side output members,

a non-rotating casing for receiving the friction clutch therein,

an electric motor situated outside the casing,

a reduction mechanism connected to the electric motor, said reduction mechanism reversibly reducing rotational number of the motor,

a torque-thrust conversion mechanism situated inside the casing and connected to the reduction mechanism, said torque-thrust conversion mechanism reversibly converting rotation force transmitted from the reduction mechanism to linear movement,

a pressing member for pressing the friction clutch, and

a thrust bearing situated between the pressing member and the torque-thrust conversion mechanism so that when the electric motor is actuated, the friction clutch is moved smoothly and accurately to control distribution of torque between the front and rear wheel side output members, the front and rear wheel side output members being driv-

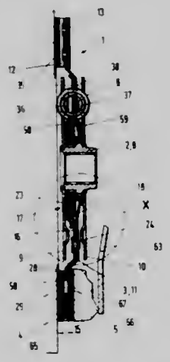
ingly connected to front and rear wheels, respectively, of the four wheel drive vehicle.

4,895,237

COMPONENT FOR USE IN THE POWER TRAIN OF A MOTOR VEHICLE

Paul Mancher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 166,622
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708107
Int. Cl.[4] F16D *3/14*
U.S. Cl. 192—106.2 **28 Claims**



1. A component of a power train in a motor vehicle, such as a clutch plate with damper means, which is to be installed in an aggregate, such as an engageable and disengageable friction clutch, comprising a hub; a carrier of friction linings, said hub and said carrier being rotatable relative to each other in at least one direction from a neutral position; and at least two dampers operative to oppose rotation of said hub and said carrier relative to each other in said at least one direction, said dampers comprising a primary damper which is originally the only damper of said at least two dampers to yieldably oppose with a first torque a first stage of rotation of said hub and said carrier relative to each other in said direction from said neutral position and is arranged to generate, upon completion of said first stage, a maximum moment of resistance to rotation of said hub and said carrier relative to each other in said at least one direction, the damping characteristic of said component varying at least within said first stage exclusively as a function of engagement of the friction clutch and as a function of transmission of torque exceeding said maximum moment of resistance, the original damping characteristic of the component being restored, at least within the first stage, only in response to disengagement of the clutch until the maximum moment of resistance is exceeded subsequent to reengagement of the clutch.

4,895,238

COIN DISCRIMINATOR FOR ELECTRONIC PARKING METER

Gary W. Speas, Little Rock, Ark., assignor to POM, Incorporated, Russellville, Ark.

Continuation-in-part of Ser. No. 37,252, Apr. 16, 1987, Pat. No. 4,823,928. This application Mar. 25, 1988, Ser. No. 173,580
Int. Cl.[4] G07F *17/24*
U.S. Cl. 194—319 **7 Claims**

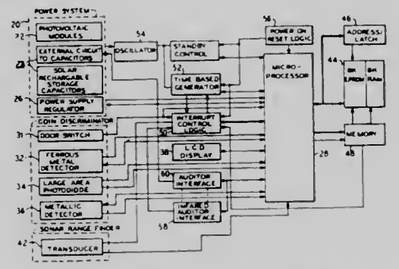
1. A coin discriminator system for use in an electronic parking meter comprising:

means for accepting a deposited coin in said electronic parking meter;

a single inductor;

means for guiding said deposited coin past said inductor, said deposited coin causing a momentary change in the value of inductance of said inductor;

phase lock loop electronic circuit having an input connected to said inductor, said phase lock loop electronic circuit providing a correction signal for said phase lock loop electronic circuit, said correction signal compensating for said change in the value of inductance of said inductor, said correction signal having a wave shape unique to said deposited coin; and



microprocessor receiving said correction signal waveform for comparison to a plurality of predetermined wave shapes of a plurality of known coins to thereby identify said deposited coin, said plurality of predetermined wave shapes stored in a memory connected to said microprocessor,

said phase lock loop electronic circuit having an L-C oscillator providing a predetermined input frequency and outputting a series of pulses when a deposited coin passes said inductor; and

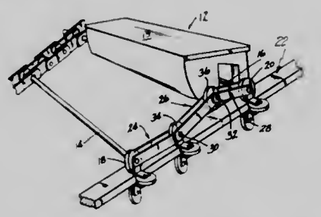
an integrating circuit for integrating said series of pulses and outputting said correction signal.

4,895,239

CURVED ESCALATOR WITH FIXED CENTER CONSTANT RADIUS PATH OF TRAVEL

Gerald E. Johnson, Farmington; Frank M. Sansevero, West Hartford, and Dat Nguyen, New Britain, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 27, 1989, Ser. No. 328,924
Int. Cl.[4] B66B *21/02*
U.S. Cl. 198—328 **5 Claims**



1. An escalator assembly having an arcuate path of travel defined by a constant radius derived from a fixed center as viewed in plan, the escalator including horizontal entry and exit landing zones, an intermediate constant slope zone, and entry and exit transition zones of continuously varying slope interconnecting the constant slope zone with the entry and exit landing zones respectively, said escalator having turn around

sprockets at each of said landing zones for reversing the direction of travel of the moving escalator components and said escalator assembly including:

(a) radially inner and outer tracks extending between said landing zones and through said transition and constant slope zones for guiding movement of steps along the path of travel of the escalator;

(b) a plurality of steps, each having: an upper tread which remains substantially horizontal throughout a passenger transporting portion of the path of travel of the escalator; a step axle at radially inner and outer sides of each step; radially inner and outer step axle rollers rotatably mounted on said step axles, said step axle rollers being operable to travel over said inner and outer tracks; and

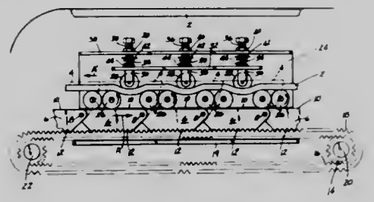
(c) a radially outer step chain forming a continuous connection between radially outer ends of said step axles whereby all of said steps are connected together by the outer step chain at their outer sides throughout the entire path of travel of the escalator, said outer step chain including step axle links which are rigidly fixed to said outer side step axles of each step so as to maintain a constant angular relationship to said step tread throughout the entire path of travel of the escalator; and a plurality of intermediate links connecting said step axle links to the next adjacent outer side step axle on the escalator, said intermediate links being pivotally connected to each other; to said step axle links; and to said next adjacent step axle to form a flexible connection between each step axle link and the next adjacent step axle connected to the outer step chain, said step axle links, by reason of their being rigidly fixed to said outer step axles, being operable to shorten the effective length of said outer step chain by forming kinks in said intermediate links in the transition and constant slope zones of the escalator.

4,895,240

COGBELT HANDRAIL DRIVE FOR PASSENGER CONVEYOR

Klaus Bruehl, Hanover, and Dietmar Thaler, Seggebruch, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 16, 1989, Ser. No. 324,079
Int. Cl.[4] B66B *21/00*
U.S. Cl. 198—331 **6 Claims**



1. A passenger conveyor assembly of the type having a moving tread and a moving handrail and including a handrail drive comprising:

a) a plurality of driven links connected to said tread to drive the latter along its path of travel, said links including smooth planar traction surfaces thereon; and

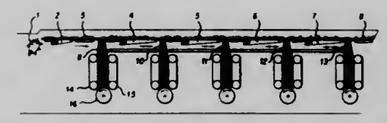
b) a plurality of traction rollers mounted adjacent to said traction surfaces, said traction rollers being rotated about their axes by said link traction surfaces, and said traction rollers contacting said handrail to drive the latter along its path of travel at the same rate of movement as said tread.

4,895,241

APPARATUS FOR DISTRIBUTION OF LOGS INTO GRINDER SUPPLY SHAFTS

Seppo Silenius, Kartano, Finland, assignor to Kone OY, Hyvinkaa, Finland

Filed May 4, 1988, Ser. No. 190,097
Claims priority, application Finland, May 5, 1987, 871990
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—358 **7 Claims**



1. An apparatus for the distribution of logs into the supply shafts of a plurality of successive grinders from a conveyor line consisting of a plurality of conveyors placed in succession and capable of carrying the logs transversely thereon, the logs being passed from one conveyor to the next and distributed into the supply shafts through logfilled gaps between the conveyors, which conveyors are automatically started for moving the logs on the conveyor line so as to fill shafts which have an insufficient supply of logs, the apparatus comprising:

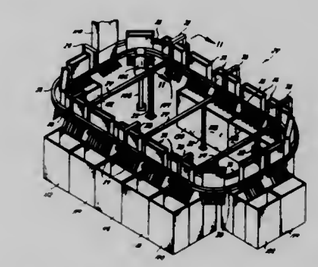
a plurality of sensors for sensing the height of the stack of logs on the conveyor line above each shaft, with two of said plurality of sensors being located at or above the level of each conveyor such that each sensor of said two sensors is adapted to control a respective one of the conveyors adjacent to a given supply shaft, said line being further provided with at least one sensor in each of said supply shafts and adapted to control said adjacent conveyors adjacent each of said supply shafts, so that said adjacent conveyors may be started in motion either simultaneously or separately towards the supply shaft between them to ensure that there is always a sufficient supply of logs at the corresponding grinder.

4,895,242

DIRECT TRANSFER SORTING SYSTEM

Thomas J. Michel, Oakland Park, Fla., assignor to G B Instruments, Inc., Hollywood, Fla.

Filed Oct. 26, 1987, Ser. No. 112,451
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 **18 Claims**



1. A transporting and sorting carrier for a sorting system which comprises a plurality of walls that define a space in which an object can be disposed, means for moving said carrier along a path, said carrier having a plurality of gates which are normally disposed in predetermined position to coact with said plurality of walls to hold an object within said space during the transporting of said object by said carrier, said gates being selectively disposable in different relative positions by means operably associated with said gates as said carrier moves along

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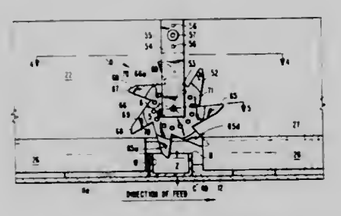
said path to permit said object to fall from said space, means for maintaining said gates in one of said predetermined relative positions to selectively guide said object toward a selected one of a plurality of predetermined areas adjacent said carrier as said object falls from said space, said gates being disposable in said different relative positions to guide said object for movement generally downwardly toward a first predetermined area, and means for moving said gates between first predetermined relative positions to guide said object for movement downwardly to a second predetermined are which is displaced in one direction from said first predetermined area and second predetermined relative positions to guide said object for movement downwardly to a third predetermined area which is displaced in a different from said first predetermined area, wherein said different relative position of said gates are displaced from the normal positions of said gates, wherein the first predetermined relative position of one of said gates is the normal position of said one gate but the first predetermined relative position of another of said gates is displaced from the normal position of said other gate, and wherein the second predetermined relative position of said other of said gates is the normal position of said other gate but the second predetermined relative position of said one gate is displaced from the normal position of said one gate.

4,895,243

STARWHEEL CAP SELECTING APPARATUS

S. Neal Graham, 365 Beechwood Dr., Noblesville, Ind. 46060, and Thomas E. Terry, R.R. 2, Box 92, Atlanta, Ind. 46031

Filed May 26, 1988, Ser. No. 198,831
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—392 **14 Claims**



1. An apparatus for feeding caps, comprising:

a disk rotatable about its normal axis and having a peripheral portion and a working surface;

means for containing caps disposed on said disk during rotation of said disk, each of said caps having a closed end and an open end;

primary cap selecting means for selecting properly oriented caps from a procession of caps rotating with said disk at said peripheral portion and for ejecting improperly oriented caps onto said working surface;

secondary cap selecting means, rotationally downstream from said primary cap selecting means, for ejecting, from said peripheral portion, improperly oriented caps passing said primary selecting means, said secondary cap selecting means including self-clearing means for interrupting said procession of caps at said secondary cap selecting means as said disk is rotating by restraining the downstream rotation of an improperly oriented cap while said improperly oriented cap is urged from said peripheral portion onto said working surface, whereby said procession of caps past said secondary cap selecting means resumes when said improperly oriented cap is urged from said peripheral portion; and

a stationary discharge chute intersecting said peripheral portion for feeding properly oriented caps after they have passed said secondary cap selecting means:

wherein said self-clearing means includes a starwheel rotatable in a plane generally perpendicular to said peripheral portion and having a plurality of spokes each having a tip, each of said spokes being adapted to enter the open end of a properly oriented cap adjacent said tip, whereby said spokes entering the open end of properly oriented caps rotating with said rotating disk are contacted by said properly oriented caps causing said starwheel to rotate; and

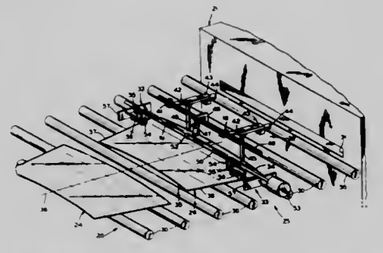
wherein said starwheel is arranged above said peripheral portion such that said tip of consecutive ones of said plurality of spokes enter the open ends of consecutive properly oriented caps when said starwheel is rotating, and at least one of said plurality of spokes contacts the closed end of an improperly oriented cap thereby interrupting the rotation of said starwheel.

4,895,244

APPARATUS FOR ALIGNING GLASS SHEETS IN A PRODUCTION LINE

Jeffery R. Flaugher, Carlton, Mich.; Allan T. Eak, Toledo, and Frank J. Hymore, Oregon, Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Continuation of Ser. No. 890,105, Jul. 28, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 231,652
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—394 **17 Claims**



1. An apparatus for aligning with respect to a reference point sheets of material of different dimensions moving along a path of travel, comprising:

at least two stop pins positioned in a plane in which sheets of material are to be aligned for engaging a leading edge of sheets of material in said plane to align said sheets with respect to a reference point;

at least one side aligning means positioned in said plane at a selected one of at least two different predetermined distances from said reference point, said side aligning means including a pusher means and reciprocating means for advancing said pusher means toward said reference point with said side aligning means positioned at each of said at least two different predetermined distances for engaging an end edge of sheets of material in said plane to align said sheets with respect to said reference point;

means for automatically selecting one of said predetermined distances in accordance with a predetermined sequence of delivery of sheets of material of different dimensions along said path of travel to said stop pins; and

means for moving said side aligning means relative to said reference point in response to said means for automatically selecting;

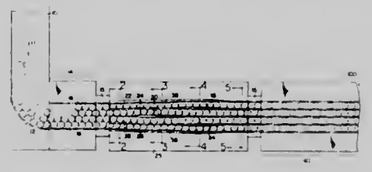
said means for moving said side aligning means including a sensor for detecting sheets of material and generating a sequence signal representing an identification of said sheets, and said means for automatically selecting being responsive to said sequence signal for controlling said means for moving said side aligning means.

4,895,245

ROUND CONTAINER ORIENTING SYSTEM

Barton M. Bauers, Wallingford; John L. Randat, North Madison, and Raymond C. Ehlers, Jr., Haddam, all of Conn., assignors to Standard-Knapp, Inc., Portland, Conn.

Filed Jul. 6, 1988, Ser. No. 215,827
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—458 **10 Claims**



1. A container orienting system for feeding round containers of diameter (D) into a case packer with side-by-side lanes of such width as to accept the containers in (N) side-by-side columns, said orienting system comprising:

(a) infeed conveyor means operating at a lineal speed (S) and including longitudinally extending infeed side guides for accumulating said round containers in a nested pattern wherein each container is tangent to at least two other containers such that the vertical central axes of these three containers define an equilateral triangle, one side of the triangle being formed by said at least two other containers and said triangle side oriented parallel to said longitudinally extending side guides,

(b) at least two side-by-side venturi conveyors, one of said venturi conveyors having an upstream segment longitudinally aligned with said each container, a second of said two venturi conveyors having an upstream segment that is longitudinally aligned with said one triangle side,

(c) said side-by-side venturi conveyors having divergent segments, said divergent segments being mutually divergent laterally with respect to one another downstream of said upstream segments for shifting said one venturi conveyor laterally away from said second venturi conveyor,

(d) lane guide means including a container separation wall between said shifted containers on said one and said second venturi conveyor divergent segments,

(e) discharge conveyor means downstream of said venturi conveyors, and including longitudinally extending discharge lane guides for restricting movement of said containers to movement in orderly columns for entry into a case packer.

4,895,246

DEVICE FOR THE RANDOM SELECTION OF SEGMENTS OF A MOVABLE WALL ON A ROLLER CONVEYOR

Italo Rizzi, Udine, Italy, assignor to Danieli & C. Officine Meccaniche SPA, Buttrio, Italy

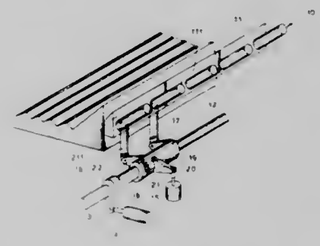
Filed Jul. 12, 1988, Ser. No. 217,900
Claims priority, application Italy, Jul. 31, 1987, 83421 A/87
Int. Cl.[4] B65G *39/00*
U.S. Cl. 198—463.4 **10 Claims**

1. A device for the random selection of segments of a movable wall on a roller conveyor which discharges rolled bars laterally to a cooling plate, comprising:

a movable wall for descending and ascending relative to a roller conveyor to laterally discharge rolled bars to a cooling plate, said movable wall including a plurality of segments positioned side-by-side in succession, each said segment being vertically movable; and

movement means for vertically moving the segments in a coordinated or independent manner, said movement means including an operating shaft and means for rotating the operating shaft through an angle to coordinately move said segments, and actuating means for independently moving each said segment, said actuating means including:

a frontal ring fixed to said operating shaft, a sleeve operatively connected to the segment and supported on the operating shaft for independent oscillation to vertically



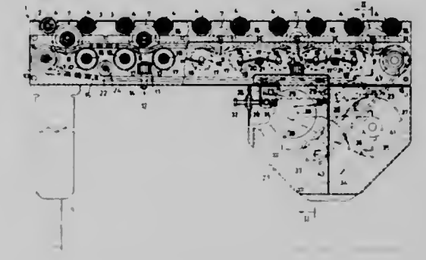
move the segment, a frontal connection between the frontal ring and the sleeve for selectively engaging said sleeve to move with said operational shaft or disengaging said sleeve out of movement with said operational shaft, and thrust means for oscillating the sleeve through an angle.

4,895,247

CONVEYOR TABLE FOR CONNECTING OPERATING UNITS OF A CARDBOARD BOX PACKING STATION

Augusto Marchetti, Via Caccialepori, 35, 20148 Milano, Italy

Filed Apr. 4, 1988, Ser. No. 177,137
Claims priority, application Italy, Apr. 8, 1987, 20023 A/87
Int. Cl.[4] B65G *13/071*
U.S. Cl. 198—790 **5 Claims**



1. A conveying table for connection between upstream and downstream units of a cardboard box-packing station, comprising:

a frame for supporting the conveying table;

a series of transversally-extending idling rollers spaced from one another along a conveying path and each journalled to said frame for rotation, for advancing a cardboard box along said path, from an upstream unit to a downstream unit of a cardboard box-packing station;

a driving unit, including:

a driving unit frame;

a series of transversally-extending driven rollers spaced from one another in the longitudinal direction of said path, each of said driven rollers having a frictional driving surface and being journalled for rotation on said driving unit frame;

said driven rollers are journaled to said frame by having

hubs thereof borne in slotted openings in transverselly spaced plate means of said driving unit frame, said slotted openings being elongated in such a sense as to permit said driven rollers to be pushed towards said idling rollers by said endless chain as, in turn, is pushed by said idle rollers as resiliently biased by said resilient means;

a source of rotary power mounted on said driving unit frame;

mechanical power transmission means transmitting rotary power from said rotary power source to said driven rollers, said mechanical power transmission means including an endless driving chain, and sprockets on said driven rollers, said driving chain entraining said sprockets; and

a series of transversally-extending idle rollers spaced from one another in the longitudinal direction of said path, said idle rollers being journalled for rotation on said driving unit frame by journalling means including resilient means resiliently bearing said idle rollers against said endless driving chain, in a sense to resiliently press said endless driving chain into driving relation with said sprockets; and

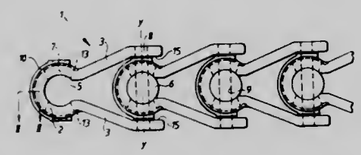
means readily releasably mounting said driving unit frame to said conveying table supporting frame, whereby said conveying table may easily be converted between powered and non-powered use, by mounting and demounting said driving unit, said frictional driving surfaces of said driven rollers, when said driving unit is mounted to said conveying table supporting frame being disposed in frictional driving engagement with respective of said idling rollers for power-rotating said idling rollers.

4,895,248

CONVEYOR BELT CHAIN

Mats E. Wahrén, Huvudstagatan 4, Vadstena, Sweden (S-59200)

Filed Jan. 9, 1989, Ser. No. 295,120
Claims priority, application Sweden, Jan. 8, 1988, 8800037
Int. Cl.[4] B65G *17/06*
U.S. Cl. 198—852 6 Claims



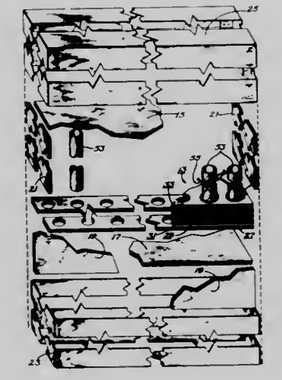
1. A conveyor belt chain having identical links each comprising a cylindrical head (2) and two legs (3) extending from the head in "V"-form and receiving between their outer free ends the cylindrical head of a next adjacent pivotably connected link (1), connection being provided by means of a coupling device allowing the links to pivot in relation to each other about the axis of the cylindrical head as well as about an axis perpendicularly intersecting said cylindrical head axis, spacing means being introduced between the ends of the legs and the cylindrical head, received therebetween, of a next adjacent link, characterized by a part-cylindrical sleeve (10, 20) having an internal part cylindrical bearing surface (11, 21) in slideable contact with the cylindrical outside of the cylindrical head (2), said sleeve serving as spacing means between the ends of the legs to guide and carry the cylindrical head therebetween in the direction of the intersecting axis (y—y) and as bearing means having a bearing surface (11, 21) partly enclosing the cylindrical head (2) to guide the cylindrical head in pivoting about its axis (x—x), the bearing sleeve (10, 20) consisting of a material differing from that of the link.

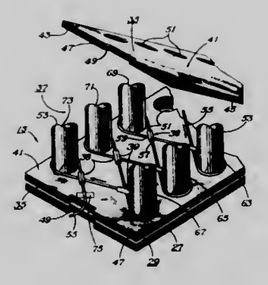
4,895,249

SYSTEM AND METHOD FOR PACKAGING DETONATING CORD FOR TRANSPORT

Billy F. Davis, Houston; Michael P. Hancock, Cleburne, and Scott L. Hayes, Mansfield, all of Tex., assignors to Pengo Industries, Inc., Fort Worth, Tex.

Filed Oct. 19, 1987, Ser. No. 110,227
Int. Cl.[4] B65D *81/02*
U.S. Cl. 206—3 25 Claims





1. A detonating cord transport package comprising a plurality of stacked sections, with each section comprising:

a. a detonating cord separator-support member having front and back face surfaces and edge surfaces;

b. detonating cord winding support means disposed interiorly of said edge surfaces of said separator-support member and projecting from said separator-support member front face surface;

c. a continuous length of detonating cord windingly disposed on said winding support means and traversing portions of said separator-support member front face surface such that there are a plurality of severing locations where a second detonating cord portion is disposed in proximity with a first detonating cord portion; and

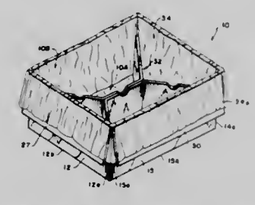
d. severing means interposed between said first and second detonating cord portions at each of said severing locations.

4,895,250

QUICK ASSEMBLY AND KNOCK-DOWN BOX AND OIL RECYCLING KIT USING SAME

Arthur Schifrin, 4652 Via Marina, Marina Del Rey, Calif. 90292

Filed Jan. 14, 1988, Ser. No. 206,419
Int. Cl.[4] B65D *5/48, 81/36;* F16N *33/00*
U.S. Cl. 206—223 7 Claims



1. An oil changing and recycling kit comprising a quick assembly and knock-down box comprising, in the assembled condition, first, second, third and fourth generally rectangular side walls each having a pair of spaced substantially parallel end edges and a pair of spaced substantially parallel top end bottom edges, adjacent side walls being connected to each other at associated end edges, said first and third side walls having substantially the same dimensions, and said second and fourth side walls having substantially the same dimensions, said side walls being arranged to define a generally rectangular space defined by spaced parallel first and third side walls which are substantially normal to spaced parallel second and fourth side walls; a bottom wall formed by first, second, third and fourth bottom panels connected to associated ones of said bottom edges of said first, second, third and fourth side walls, respectively, said first and third bottom panels having substantially the same dimensions and said second and third bottom panels having substantially the same dimensions, said second and fourth bottom panels each having a connecting panel portion movable out of the planes of respective second and fourth bottom panels along weakened lines, said second bottom panel connecting panel portion being fixedly joined to said first bottom panel and said fourth bottom panel connecting panel portion being fixedly joined to said third bottom panel, said top edges of said side walls defining an opening into said rectangular space, and said bottom panels being configured to form a substantially closed bottom wall in the assembled condition and to retract between said side walls in a collapsed condition of the box wherein each one of two pairs of two adjacent side walls are disposed in one of two proximate parallel planes to form a substantially co-planar assembly in the knock-down condition of the box; an inside bag for lining the interior of the box and providing a liquid seal to insure that oil received within said rectangular space is retained within said inside bag; and a baffle means within said rectangular space to limit liquid movements or sloshing within said box.

4,895,251

HINGE-LID PACK FOR CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,512
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727489
Int. Cl.[4] B65D *5/66*
U.S. Cl. 206—273 9 Claims

1. Hinge-lid pack for cigarettes, consistingof thin, foldable material, such as cardboard or the like, with a pack part having a front wall and a rear wall and with a hinge lid which is articulated on said rear wall of said pack part,

characterized in that projection means (28; 40, 41) diected inwards and formed from at least one of said pack rear wall (14) and said pack front wall (16) is disposed for the purpose of reducing the inside dimensions in the region of said walls of said pack part (11) from which said projection means is formed;

wherein said projection means comprises at least one supporting wall directed inwards and transitional walls directed transversely to said at least one supporting wall and leading into said pack wall from which said projection means is formed.





4,895,252

OPTICAL DISC PACKAGE

Ram R. Nomula, Huntsville, Ala., and Robert S. Parish, Minnetonka, Minn., assignors to Laservideo, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 134,805, Dec. 21, 1987. This application Aug. 26, 1988, Ser. No. 237,187
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—310 32 Claims

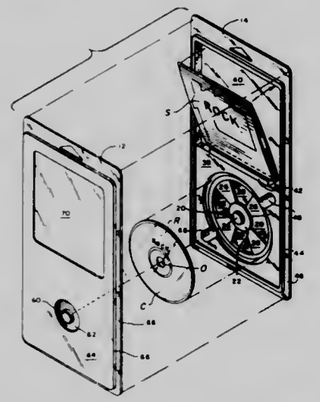
1. A package for an optical disc having a central opening and for an optical disc sleeve shaped to enclose the optical disc, said package comprising:

upper and lower formed plastic sheets sized to receive and support therebetween the optical disc and the optical disc sleeve in side by side relationship, at least one of the plastic sheets being transparent to allow the optical disc and the optical disc sleeve to be seen through the transparent plastic sheet, said upper and lower sheets forming upper and lower exterior surfaces of said package;

one of said sheets comprising a closed end, hollow hub which in its relaxed state is larger than the central opening of the optical disc, said hub deformable such that the optical disc can be pushed in place on the hub and the optical disc, once inserted on the hub, is held on the hub by an interference fit between the hub and the optical disc;

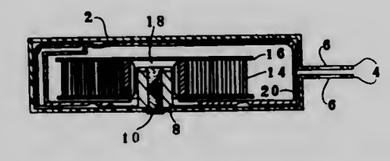
the other of said sheets defining a closed end receptacle shaped to receive an end portion of the hub;

said lower sheet defining a depression shaped to receive the optical disc;
said upper sheet shaped to cover the optical disc and the optical disc sleeve;



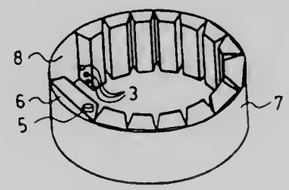
said upper and lower sheets defining peripheral shoulders shaped to fit together to increase the rigidity of the sheets;
said hub defining an array of axially oriented external edges positioned to form a friction fit with the optical disc.

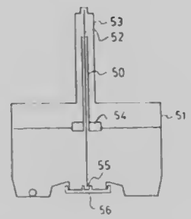
4,895,253
LOCKING DEVICE FOR RESTRICTING THE VIEWING OF VIDEO CASSETTES
Ivan Yaeger, 1277 NW. 88th St., Miami, Fla. 33147
Filed May 10, 1989, Ser. No. 350,092
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **1 Claim**



1. A device that restricts the viewing of a video cassette by preventing the insertion of said video cassette into video equipment, consisting of:
(a) a band composed of a strip of stiff, cut-resistant material, bent into a U-shape so as to conform widthwise around the outside of a video cassette, and featuring straight upper and lower segments that are slightly longer than the overall width of said video cassette,
(b) two front tabs, formed by the extension of the upper and lower segments of said band, that meet together a parallel fashion and feature a plurality of holes or projections to accommodate a locking device, and
(c) a cylinderical post which is securely mounted onto the inner side of the aforementioned straight lower segment of the aforementioned band and positioned to coincide with the tape-reel socket of a video cassette.

4,895,254
TANK-PLANT VESSEL-COMBINATION WITH WATER-LEVEL INDICATOR AS DEVICE FOR LONG TERM WATER SUPPLY FOR VARIOUS TYPES OF PLANT CULTURES
Hubert K. Block, Othestrasse 67, D-5275 Bergneustadt, Fed. Rep. of Germany
Filed Jun. 24, 1986, Ser. No. 877,771
The portion of the term of this patent subsequent to Sep. 23, 2005, has been disclaimed.
Int. Cl.[4] B65D *85/52*
U.S. Cl. 206—423 **17 Claims**





1. In a tank-plant vessel-combination having a water-level indicator and a tank device for a long-term water-supply for various types of plant cultures whereby the tank device operats under sub-atmospheric pressure, a porous plant vessel element, and a water-level float indicator and a supplement comprises a calcium sulphate-activated carbon compound, the improvement comprising:
a plurality of communicating partial tanks that are movable with respect to each other and are connected with each other to form a deformable container, said porous plant vessel element having a supplementary shaft extending outward, surface-frit coarse clay granules contained within said porous plant vessel and a double-compartment vessel which parts are fitted adjacent each other within the deformable container, said water-level float indicator positioned within at lwast one of the partial tanks having a transparent bollow body closed at a top and projecting upward, with at least one floating part which is in a clear space each guided by means of at least one of a guiding rod above and a transparent hollow body perforated pipe shaft below.

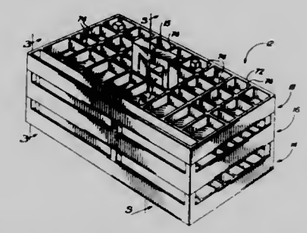
4,895,255
SHRINK WRAPPED SHIPPING BUNDLE OF BLISTER PACKAGES FOR WINDSHIELD WIPERS
Brian A. Fisher, Burlington, Canada, assignor to Tridon Limited, Oakville, Canada
Filed Aug. 22, 1988, Ser. No. 234,776
Int. Cl.[4] B65D *71/08*
U.S. Cl. 206—497 **1 Claim**

1. A shipping bundle of windshield wipers comprising:
a plurality of individual elongate blister packages having two ends, each of the packages having a substantially rectangular planar substrate and a blister attached to the substrate to define a sealed cavity containing a windshield wiper, the substrate including a header at one end defining an opening for suspending the package from a display, the individual packages being arranged adjacent one another in a rectangular grouping so that the needs of the packages are flush and define first and second ends of the grouping, the blisters of the outermost packages being directed inwardly towards one another such that their respective substrates define opposite external sides of the grouping;
a pair of self-supporting rectangular end caps of synthetic plastics material each having an end panel and four sides



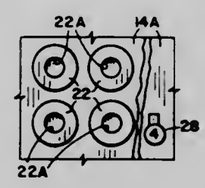
extending from the end panel, the end caps being located on respective ends of the grouping such that the plurality of packages is received therein and the orientation of the packages in the grouping is maintained; and
a transparent shrink wrap extending about the caps and the rectangular grouping and supported by the substrates of said outermost packages so as to contain the rectangular grouping, the loading created by the shrink wrap being distributed by the end caps over the ends of the rectangular grouping so as to minimize damage to the individual packages and preserve the appearance of the individual packages for subsequent display, the packages being visible through the shrink wrap to permit easy identification of the contents of the bundle.

4,895,256
AIR CONDITIONING SUPPLY CARRIER
James E. Johnston, 10810 SW. 84th St., #7A 1, Miami, Fla. 33173
Continuation of Ser. No. 200,724, Sep. 23, 1988. This application May 30, 1989, Ser. No. 359,093
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—501 **4 Claims**



1. A supply carrier for use by an air conditioning repair man comprising,
a lower tray, an upper tray and an intermediate tray, each tray being of substantially similar area and configuration as seen in plan, said tray each having a bottom peripheral walls and septums defining a plurality of compartments within each tray of various sizes,
said lower tray including a centrally arranged upstanding inverted generally U-shaped handle comprising a first and a second leg and a top carrying bar type handle and,
said lower tray including corner posts of common size each extending upwardly of the peripheral walls to a terminal end and each including a central upwardly extending pin,
said intermediate tray having recesses in the floor sized configured and located to receive the pins of the lower tray and said intermediate tray being supported in assembly on the corner posts, and said intermediate tray having a central passage way for passage of the handle through the intermediate tray when in stacked relation on the lower tray, and
said intermediate tray including four corner support posts of common size extending upwardly of the peripheral walls of the intermediate tray to a terminal end and each support post end including a central upwardly extending pin,
said upper tray having recesses in the floor sized and configured to receive the pins of the support post of the intermediate tray and said upper tray having a central through recess sized and configured for a passage of the handle when the upper tray is in stacked relation with the lower and intermediate tray.

4,895,257
CONTAINER SYSTEM FOR DISPENSING PHARMACEUTICAL PRESCRIPTION TO VISUALLY OR MEDICALLY IMPAIRED USERS
Phillip H. Winslow, 123 Patton Dr.-Medical Plz., Ponca City, Okla. 74601
Filed Jan. 23, 1989, Ser. No. 299,628
Int. Cl.[4] B65D *85/56*
U.S. Cl. 206—534 **9 Claims**



1. A container for use in dispensing a prescription pharmaceutical to a visually and/or medically impaired user for indicating to the user the pharmaceutical contained therein and the dosage rate, comprising:
an upright, open top container having a bottom, a sidewall having an internal and an external surface, and a removable closure;
the container having on the external surface thereof a visual and tactile indicia in the form of a raised symbol for each dosage requirement, the symbols being spaced from each other whereby the number and shape of the symbols are easily tactile and visually discernible, and the shape of the raised symbol or symbols being uniform and visually and tactilely distinctive whereby the user may determine the pharmaceutical prescription contained in the container by the shape of the symbol or symbols and the dosage rate from the number of symbols; and
a removable gummed tag affixed to the container, the tag visually indicating the shape of and the number of raised symbols on the container.
5. A container system for use by a pharmacist who keeps a record of the drugs dispensed to visually and/or medically

VOL 1110 ISS 4 JA 23 1990 UMI

impaired users having means of informing the user of the prescription and dosage requirements comprising:

a plurality of sets of individual upright open top containers, each container having a bottom, a sidewall having an internal and external surface and a removable closure;

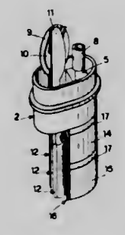
each container having on the external surface thereof a visual and tactile indicia in the form of at least one raised symbol, there being one raised symbol for each dosage requirement, the symbols being uniform and spaced apart from each other whereby the number of symbols is easily tactilely and visually discernible, and the shape of each raised symbol in each set being uniform and visually and tactilely distinctive from the symbols of other sets, the shape of each symbol in each set being correlatable with a specific prescription, and each set including containers having differing numbers of symbols from 1 to "n" thereon, "n" being the maximum dosage rate of the system, whereby the pharmacist selects a set having said distinctive symbols thereon for dispensing a specific prescription drug to a specific user and selects from such set of containers a container having the number of raised symbols thereon corresponding to the prescribed dosage rate.

4,895,258

COMPACT UTENSIL SET

Luigi Bertoli, Lamezzane, Italy, assignor to Abert Spa Dei Fratelli Bertoli fu Antonio, Italy

Filed Jul. 8, 1988, Ser. No. 216,793
Int. Cl.[4] B65D *85/62*
U.S. Cl. 206—541 **8 Claims**



1. A compact, self-containing utensil set comprising:

(a) bottom section having a base, a continuous, closed bottom sidewall wherein said bottom sidewall defines a constant cross-section and an open top, said bottom section defining a first interior volume.

(b) a top section with an open base of the same cross-sectional shape as said open top of said bottom section, a continuous, closed top sidewall and a closed top, said top section defining a second interior volume;

(c) a central section with an outer rim, said outer rim congruent in shape with said constant cross-section defined by said bottom sidewall, an interior section, said interior section defining a shaped hole allowing communication between the interior volume defined by said bottom section and the interior volume defined by said top section, and sidewalls of similar shape to said outer rim capable of snugly fitting within said top sidewall and said bottom sidewall; and

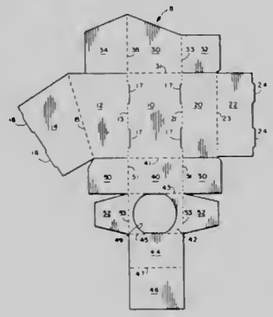
(d) an interior component defining a central passage capable of matingly engaging said shaped hole thereby allowing said central section to function as a funnel.

4,895,259

COLLAPSIBLE COMPARTMENTED CARTON

Sandra D. Paley, Cuyahoga, Ohio, assignor to Container Corporation of America, Clayton, Mo.

Filed Mar. 2, 1989, Ser. No. 317,753
Int. Cl.[4] B65D *5/22*
U.S. Cl. 206—565 **3 Claims**



1. An open top, tray type, compartmented carton, for serving separate food items such as pretzels and sauce, said carton being formed from a unitary blank of foldable paperboard and being self-locking so as not to require any outside securing means, said carton comprising:

(a) a generally rectangular, oblong, bottom wall panel having front and rear side walls and first and second end walls joined to and upstanding from front and rear side edges and first and second end edges, respectively;

(b) said front and rear side walls each including:

(i) an outer panel having a lower edge foldably joined to said bottom wall panel and having an upper edge;

(ii) an inner panel having an upper edge foldably joined to an upper edge of a related side wall outer panel, and having extending downwardly from a lower edge thereof at least one lock tab received within an opening in said bottom wall panel;

(iii) said rear side wall inner panel upper edge sloping upwardly from one of said end walls toward the other end wall;

(c) said end walls each including:

(i) a single panel having a lower edge foldably joined to an end edge of said bottom wall and having an upper edge;

(ii) said first end wall panel upper edge sloping upwardly from said front side wall toward said rear side wall;

(d) said end wall panels each having corner flaps foldably joined to opposite side edges thereof and inerposed between inner and outer panels of said front and rear side walls;

(e) an inner compartment structure including:

(i) a top wall panel having outboard and inboard end edges and front and rear side edges with said outboard edge foldably joined to said second end wall panel upper edge, said top wall panel extending inboardly from said second end wall over said bottom wall panel part way toward said first end wall panel, and having a central opening for receiving a food holding item such as a cup;

(ii) a pair of support flaps foldably joined to opposite side edges of said top wall panel and extending downwardly therefrom adjacent respective side walls to support said top wall panel;

(iii) a divider panel foldably joined to and extending downwardly from said top wall panel inboard edge to support said top wall panel and to divide the interior of said carton into separate compartments;

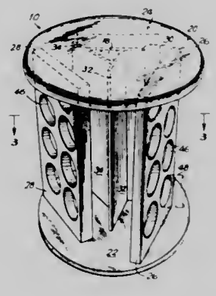
(v) an anchor flap having an end edge foldably joined to a lower edge of said divider panel and disposed to extend between said divider flap and said first end wall to maintain said divider panel in a generally vertical position.

4,895,260

RACK FOR CYLINDRICAL CONTAINERS

Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.

Filed May 16, 1989, Ser. No. 352,245
Int. Cl.[4] A47B *73/00*
U.S. Cl. 211—77 **20 Claims**



1. A device for holding and displaying a plurality of containers of a cylindrical nature having a circumferential wall, a bottom wall, and an opening opposite said bottom wall provided with a closure, comprising means defining three chambers circumferentially spaced about a central vertical axis, each of said chambers comprising a vertically-extending planar support wall, said planar support wall being provided with means defining at least one aperture through which one of said containers may be inserted, the planes of said three planar support walls intersecting to define sides of a first triangle, and back-up means associated with said support wall in spaced relation thereto, whereby a container inserted through said aperture is supported by engagement of its circumferential wall with the means defining the aperture and by engagement of its bottom wall with said back-up means, and whereby there is maximum utilization of the space in said device.

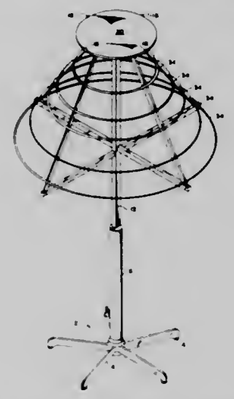
4,895,261

DISPLAY RACK ASSEMBLY

Ara Yacobian, 30 Rathbun Rd., Natick, Mass. 01760

Filed May 30, 1989, Ser. No. 357,777
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—196 **10 Claims**

1. A display rack assembly comprising a base portion, a tubular member fixed to said base portion and extending vertically therefrom, a rod rotatably mounted in an end of said tubular member remote from said base portion and extending axially therefrom, a bracket portion fixed to a free end of said rod and extending radially therefrom, a plurality of strut members pivotally attached to said bracket portion, a beam member pivotally attached to each of said strut members at ends of said strut members remote from said bracket portion, said rod having retention means thereon between said bracket portion and said tubular member for releasably retaining distal ends of said beam members such that said beam members are retained in a position generally normal to said rod, said strut members being provided with notches therein, and hoops adapted to set in said notches, said strut member notches being adapted to



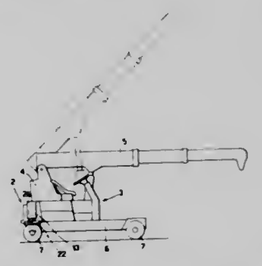
retain said hoops in a substantially horizontal position on said strut members.

4,895,262

OVERTURNING-PREVENTING DEVICE FOR CRANE TRUCKS AND SIMILAR MACHINES

Roberto Maso, Calendasco, Italy, assignor to Valla S.p.A., Milan, Italy

Filed Dec. 8, 1988, Ser. No. 281,547
Claims priority, application Italy, Feb. 16, 1988, 19418 A/88
Int. Cl.[4] B66C *13/50*
U.S. Cl. 212—154 **13 Claims**



1. Overturning-preventing device (1) for crane trucks (3) and similar machines, formed by a self-propelled truck (6) supporting operating means, with said truck (6) comprising a rear axle (2), the wheels (7) of which are linked to each other by means of a wheel axle (8) constrained to the truck (6) by means of vertical elements (10), characterized in that it is interposed between said vertical elements (10) of the rear axle (2) and the truck (6), and comprises: first plate means (20) integral with the vertical elements (10), second plate means (21) integral with the truck (6), a hinge (22) constraining, relatively to its own axis (26), said first plate means (20) and said second plate means (21), with said first plate means and said second plate means enabling, as the above mentioned rotation occurs, means (23) for discontinuing the operation of the crane (4).

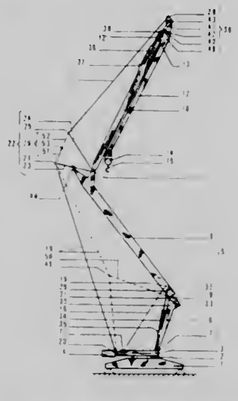
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4,895,263

FOLDABLE MACHINE FOR HANDLING AND LIFTING LOADS

Jean C. Saint Gerand, Loire, France, assignor to Potain, Societe Anonyme, Rhone, France

Filed Oct. 22, 1987, Ser. No. 111,724
Claims priority, application France, Oct. 27, 1986, 86 15095
Int. Cl.[4] B66C *23/34*
U.S. Cl. 212—185 **8 Claims**



1. A foldable machine for handling and lifting loads, including a mast foldable between at least two elements, a jib pivoted at a top portion of the mast, equipped with at least one counterbrace for straightening and holding the mast in the raised working position and a unit for holding the jib consisting of a tie, at least one post and a back holding cable connected to the back part of a rotating frame comprising, in combination:

(a) a first double-acting jack connected at one end to a lower mast element and at another end to a common joint of a system of connecting rods, the system of connecting rods having ends which are pivoted respectively on the base of an upper mast element and on the top of the lower mast element;

(b) a jib head member pivoted at a pivot point on one end of the jib, carrying means for suspension of a load and comprising, beyond the pivot pin on the jib, a foot having a connection with the tie of the holding unit; and

(c) a second double-acting jack connecting the jib to a joint located on the foot of the jib head member and acting as a lever support point for the jib head member, and

wherein connection between the foot of the jib head member and the tie of the holding unit consists of a connecting rod pivoted at a pivot point on the foot of the jib head member and connected to the tie, and a third jack pivoted at a pivot point on the foot of the jib head member and resting on a joint carried by the connecting rod.

4,895,264

INFANT FEEDING SYSTEM

Vichai Phisphoungphanich, Samut, Thailand, assignor to Royal Industries (Thailand) Co., Ltd., Krathumban, Thailand

Filed Oct. 22, 1986, Ser. No. 921,746
Int. Cl.[4] A61J *9/00, 9/08, 11/04*; B65D *71/08*
U.S. Cl. 215—11.1 **10 Claims**

1. Infant feeding system, comprising:

(a) a nipple formed of elastomer and made with an open lower end defined by a solid annulus,

(b) a generally circular base having a central bore with a radial groove adapted to receive the said annulus, and

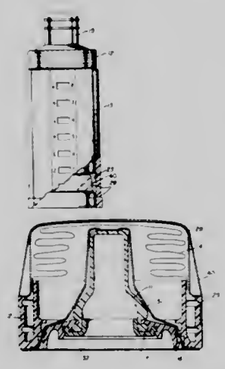
(c) a lock washer having a central tubular portion lying in the bore of the base and locking the annulus in the groove, the base and washer having a one-way fastening means for locking them in a fixed position.

4. Infant feeding system, comprising: (a) a nipple formed of elastomer and having an open bottom edge formed with an annulus,

(b) a circular base having a central bore with a concentric groove in which the annulus resides, the base having an outer conical surface, and

(c) a ring having a bore with a conical surface matching the conical surface on the base, the conical surfaces terminating in radial shelves that are in engagement when the base and ring are in locking position.

6. Infant feeding system, comprising:



(a) a ring having a central bore, a tubular portion concentric with the bore, extending from one side of the ring,

(b) a milk bag having an open end fitting tightly around the tubular portion,

(c) a cover enveloping the bag to hold it in compressed condition and contacting the ring,

(d) a protector having the general shape of a nipple riding in the bore of the ring and extending into the open end of the bag,

(e) a nipple, base, and washer joined together to form a nipple unit that resides in the protector, and

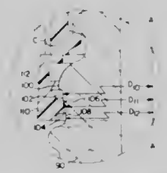
(f) a disk covering the side of the ring opposite the said one side to hold the nipple unit and protector in the bore of the ring.

4,895,265

CONTAINER FOR A TAMPER-EVIDENT CLOSURE

Daniel Luch, and David E. Babcok, both of Williamsport, Pa., assignors to The West Co., Phoenixville, Pa.

Continuation of Ser. No. 139,467, Dec. 29, 1987, abandoned, which is a continuation of Ser. No. 810,923, Dec. 19, 1985, Pat. No. 4,744,480. This application Aug. 25, 1988, Ser. No. 236,408
Int. Cl.[4] B65D *1/02*
U.S. Cl. 215—31 **4 Claims**



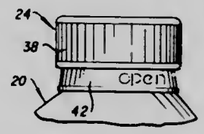
2. A container for a tamper-evident closure comprising a cap portion of cup like form, a tamper-evident band connected to the cap portion by fracturable means, said tamper-evident band comprising a retaining means projecting radially inwardly, said container comprising a neck portion having a discharge opening and closure engagement means which mate with the container engagement means of the cap portion so that the closure can be applied and removed from the container, a first radially outwardly directed retainer bead spaced below the closure engagement means on the container neck portion having a largest diameter greater than the smallest diameter of the band retaining means, a second radially outwardly directed band spaced axially below said first bead and having a largest diameter slighter greater than the smallest diameter of the retaining means of the tamper-evident band, said second bead further characterized by having a largest diameter less than the largest diameter of said first bead and a cylindrical connecting surface joining the beads coaxial with the container axis extending upward from and having the same diameter as the apex of said second bead.

4,895,266

TAMPER INDICATING BAND FOR PLASTIC CLOSURE

Douglas G. Begley, Palatine, Ill., assignor to Continental White Cap, Inc., Norwalk, Conn.

Filed Nov. 23, 1988, Ser. No. 275,414
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—230 **12 Claims**



7. A tamper indicating band for a plastic closure of the type having a skirt, said tamper indicating band being as molded an integrally connected extension of said skirt and being hingedly connected to said skirt for generally reverse folding to an upstanding radially inwardly sloping in use position for locking engagement beneath a neck finish bead, and circumferentially spaced rupturable bridges releasably connecting said tamper indicating band to said skirt, said tamper indicating band in use having tamper indicating indicia visible only when said tamper indicating band has separated from said skirt and dropped down away from said skirt.

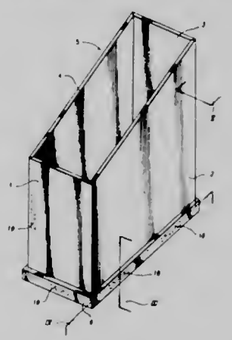
4,895,267

STORAGE UNIT, SUCH AS A LETTER TRAY OR A FILE HOLDER

Carina Karlsson, Älmhult, Sweden, assignor to Inter-Ikea A/S, Denmark

Filed Apr. 27, 1988, Ser. No. 186,630
Claims priority, application Denmark, Apr. 30, 1987, 2216/87
Int. Cl.[4] B65D *6/18*
U.S. Cl. 220—4 F **1 Claim**

1. A storage unit formed as a letter tray made of plastics and comprising a bottom member and at least two side members, the bottom member being connected to the side members by means of two snap locks provided along each longitudinal side at the bottom member, wherein groove-forming means receiving the side members are provided in the bottom member, the snap locks being undercut hooks cooperating with horizontal ribs projecting from the walls of recesses formed in the bottom member, said undercut hooks having projections facing away from the middle of the storage unit and the rear side of said hooks facing towards the middle of the storage unit being



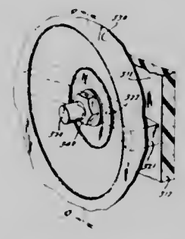
undercut, and at least two of the side members are interconnected by means of film hinges.

4,895,268

METHOD OF MAKING A HOLLOW PLASTIC ARTICLE

James P. Hyde, Saline, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 17, 1988, Ser. No. 233,103
Int. Cl.[4] B65D *1/00*
U.S. Cl. 220—85 R **3 Claims**



1. A motor vehicle fuel tank comprising a blow molded plastic exterior wall having at least one substantially solid attachment projection unitary therewith and projecting outwardly from an exterior surface of said wall, and a heat shield mounted to said attachment projection in fixed spaced relation to said exterior surface of said wall, wherein said attachment projection comprises:

(a) a substantially rectangular projection extending substantially at right angles to said exterior surfaces of said wall, having an outwardly facing concave surface,

(b) a substantially right-cylindrical projection normal to and extending outwardly from approximately the center of said concave surface, wherein said heat shield is mounted over said cylindrical projection and seats against at least a portion of said concave surface, and

(c) fastening means engaging said cylindrical projection outwardly of said heat shield to secure said heat shield in fixed spaced relation to said wall.

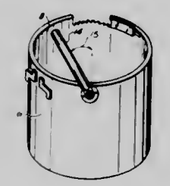
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PAINT BUCKET

Daniel W. Cade, 11140 Bayou Bernard Rd., Gulfport, Miss. 39503

Filed Apr. 25, 1988, Ser. No. 185,984
Int. Cl.[4] B65D *25/28*
U.S. Cl. 220—90 9 Claims



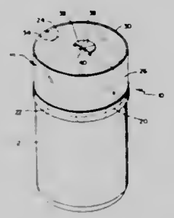
1. A paint bucket comprising:
(a) a bucket having a closed planar bottom;
(b) enclosed sidewalls arising vertically from the bottom defining an interior space for containing a material;
(c) said sidewall terminating in an upper rim;
(d) handle means affixed to a point on said sidewall, proximate said rim, said handle means being canted at a substantial angle from the point of attachment in a direction across said interior space;
(e) said handle means being additionally canted at a substantial angle sideways with respect to a vertical axis of said bucket.
(f) said bucket rim further comprising:
(g) a downwards, inwardly, smoothly curving interior tear drop shape having a first, shorter radius inwardly curving upper section smoothly adjoining a second longer radius outward curving lower section.

4,895,270

SANITARY COVER FOR POP-TOP BEVERAGE CONTAINER

Daniel M. Main, 8605 Queen Elizabeth Blvd., Annandale, Va. 22003, and James S. Ficklin, 5720 Dawes Ave., Alexandria, Va. 22311

Filed Feb. 6, 1989, Ser. No. 306,465
Int. Cl.[4] B65D *41/62*
U.S. Cl. 220—257 20 Claims



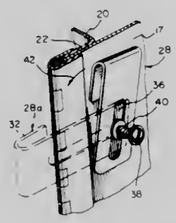
16. A pop-top container comprising a container body having a top with a pop-top opening mechanism therein and a sidewall; a form-fitting sanitary cover covering the top and extending axially along the sidewall for a predetermined distance from the top; means for attaching the cover to the sidewall; and means for rupturing the cover to expose an area about the pop-top opening mechanism.

4,895,271

CONTAINER WITH CLOSURE STAY

Jacques R. Desjardins; Gordon P. F. Clark, and Frederick H. Gill, all of Quebec, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 13, 1988, Ser. No. 256,932
Int. Cl.[4] B65D *43/24*
U.S. Cl. 220—335 2 Claims



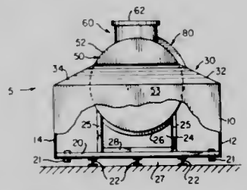
1. A container having:
a body comprising side walls defining an opening;
a closure having a closure wall and at least one side wall extending from the closure wall, the side wall of the closure and a side wall of the body hingedly connected together about a hinge axis to enable the closure to move between a closed pivotal position in which the closure wall covers the opening to the body and an open pivotal position in which the closure is hinged away from the opening to the body; and
a rigid stay operative for retaining the closure in said open pivotal position, the stay having two legs extending in spaced relationship from a base of the stay, one of the legs formed with a longitudinally extending slot, the stay being pivotally and slidably retained upon one of the side walls by a pin extending from said one side wall and through the slot with a spring means urging the stay towards the side wall and the stay being locatable in an operative position when the closure is in its open pivotal position with the hinged together side walls of the body and closure disposed between the two legs of the rigid stay.

4,895,272

LIQUID STORAGE SYSTEM

Louis De Benedittis, Neaconset, N.Y., and Charles Frey, Sr., Lancaster, Pa., assignors to Areo Power Unitized Fueler Company, Inc., Smithtown, N.Y.

Filed Jul. 11, 1988, Ser. No. 217,549
Int. Cl.[4] B65D *25/18, 25/24*
U.S. Cl. 220—85 S 13 Claims



1. An above-ground storage system for holding volatile, corrosive and toxic liquids, comprising:
a closed external containment vessel having a top which is open to the exterior of said storage system;
at least one closed internal storage tank mounted within the external containment vessel so as to protrude substantially thereabove and so as to form an outer storage space between said containment vessel and said internal storage tank;

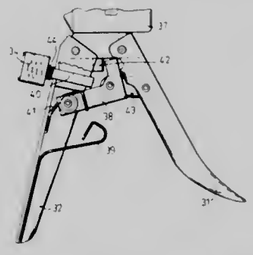
venting means mounted near the top of said internal storage tank for venting said interior storage tank to the atmosphere;
a roof structure extending from a point on said internal storage tank below said venting means and over said containment vessel so as to cover said outer storage space, while permitting venting of said outer storage space to the atmosphere; and
drainage means for providing liquid communication from said venting means to said outer storage space;
whereby vapors and liquid contained from said external storage tank which passing through said venting means are collected within said outer storage space through said drainage means.

4,895,273

SEMI AUTOMATIC DEVICE FOR APPLYING TEAR GAS

Jacob Bialy, Tel Aviv, Israel, assignor to ISPRA-Israel Product Research Co., Ltd., Herzlia, Israel

Filed Sep. 9, 1988, Ser. No. 243,065
Claims priority, application Israel, Sep. 15, 1987, 83907; May 23, 1988, 86468
Int. Cl.[4] B65D *83/00;* A62C *13/38*
U.S. Cl. 222—3 8 Claims



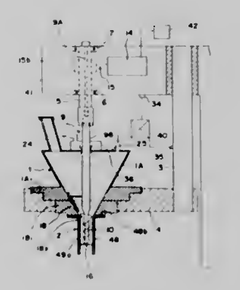
1. A semi automatic device for applying tear gas containing a compressed solution of a tear producing chemical disposed in a suitable solvent, said compressed solution being released from said vessel as desired by the gas in the pressure vessel through a valve disposed on said pressure vessel; said valve having a small orifice, said valve being controlled by a pin valve and said pin valve being operated by a triggering plate mounted coaxially to a helical spring on one of two triggering handles of said device, and the spring mounted on said one handle to operate said triggering plate when pressure is applied on it by the other handle, and a safety hammer mounted between the two handles which when pressed down by said one handle against the other handle causes said safety hammer to be released and said safety hammer to move down to press said spring and causes said spring to push said triggering plate to engage said gas pin valve thus releasing gas flow; said gas pin valve adapted to penetrate into a slanted pit at the end of the said triggering plate thus returning it to the original position by the action of a spring closing the said gas valve which results in a predetermined amount of tear gas flow and when the pressure is released and the said safety hammer moves up engaging the said two handles to lock same.

4,895,274

AUGER FEEDER

Shuji Morimoto, Osaka; Hiyoshi Doi, Izumisano, and Seiji Ohtani, Ibaraki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 9, 1988, Ser. No. 204,524
Claims priority, application Japan, Jun. 12, 1987, 62-147463; Jun. 12, 1987, 62-147464
Int. Cl.[4] G01F *11/20*
U.S. Cl. 222—63 14 Claims



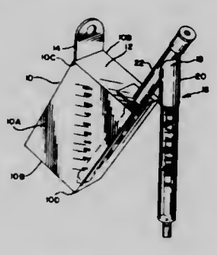
1. An auger feeder comprising:
a frame having a funnel support member thereon;
a funnel supported on said support member for accomodating a powder to be dispensed and having a metering cylinder at the lower end thereof;
drive means on said frame and having a rotational driving shaft;
an auger shaft having an upper and adjacent said drive means and extending through said funnel;
an easily disconnectible connecting means detachably connecting the end of said auger shaft adjacent said driving means with said rotational driving shaft of said driving means for causing said auger shaft and said rotational driving means to rotate together;
an auger screw secured to the lower end of said auger shaft and located within said metering cylinder with a space between the inner surface of said cylinder and said auger screw for causing powder accommodated within said funnel to be metered and dispensed in predetermined amounts in response to the rotation of said auger shaft through predetermined corresponding angles so as to feed powder into containers;
an easily assembled and disassembled supporting means on said funnel detachably mounting said funnel around the lower portion of said auger shaft so as to be able to easily disassemble the funnel and auger shaft from the support member of said frame;
a first conductive member on said frame and electrically connected with said metering cylinder and a second conductive member on said frame and electrically connected with said auger shaft, and an insulating means electrically insulating said conductive members from each other;
a power source for supplying electric power across said first and second conductive members; and
a detecting means connected to said conductive members and said power source for detecting a variation of electric power conducted between said conductive members due to an accidental contact between said metering cylinder and said auger screw.

4,895,275

DISPENSING SPIKE FOR PENETRABLE PRE-FILLED SHAPE RETENTIVE CONTAINERS

David G. Quinn, Grayslake; Robert B. Edwards, II, Libertyville, and Erik Anderson, Vernon Hills, all of Ill., assignors to Cerpak, Inc., Wheeling, Ill.

Filed Aug. 30, 1988, Ser. No. 238,391
Int. Cl.[4] B67B 7/24
U.S. Cl. 222—81 18 Claims



1. A device for dispensing therapeutic fluid from a penetrable shape retentive container containing a selected volume of the fluid, the container being suspendable to define an uppermost end and a lowermost end, the device penetrating the uppermost end of the container, comprising:

a tubular member having one arm angularly joined to an other arm, the tubular member having at least a fluid lumen passing through each arm, the fluid lumen having an inlet at one end of the member and an outlet at an other end of the member, the fluid inlet being disposed within the container near the lowermost end, the one arm having means for penetrating the container at the one end of the member, the other arm carrying fluid visualization means at the other end of the member;

the fluid visualization means including a chamber having means for viewing fluid contained therein to determine the volume of fluid in the container, the chamber being juxtaposed to and parallel with the container, the chamber having a height extending from near the uppermost end to below the lowermost end of the container, a fluid outlet being disposed at a bottom of the chamber; and,

an inlet tube disposed within the chamber, the tube being in fluid communication with the fluid lumen of the tubular member, the inlet tube having an aperture within the chamber for discharging fluid into the chamber, the aperture being vertically lower than the inlet of the fluid lumen, the inner diameter of the tube being larger than the inner dimensions of the fluid outlet so that fluid inflow into the chamber exceeds fluid outflow through the fluid outlet.

4,895,276

DUAL LIQUID CARTRIDGE DISPENSER

John E. Maldonado, San Antonio, Tex., assignor to Semi-Fresh International, Inc., San Antonio, Tex.

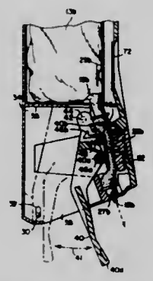
Continuation of Ser. No. 110,151, Oct. 19, 1987, abandoned.
This application Nov. 10, 1988, Ser. No. 269,620
Int. Cl.[4] B67D 5/60
U.S. Cl. 222—144.5 7 Claims

1. An apparatus for dispensing a viscous liquid from two disposable cartridges, each cartridge having an exit orifice through which fluid is dispensed when a pump portion of the cartridge is compressed, the apparatus comprising:

(a) means in the apparatus for supporting the two cartridges;

(b) a movable compression member located in the apparatus having a first position adjacent the pump portion of the first cartridge and remote from the pump portion of the second cartridge, and having a second position adjacent the pump portion of the second cartridge and remote from the pump portion of the first cartridge;

(c) a knob extending outside the apparatus and connected to the compression member for moving the compression member to the first position or to the second position in such manner that the compression member is moved out of the first position in response to movement thereof to the



second position and vice versa, thereby selecting only a single one of the two cartridges to be compressed; and

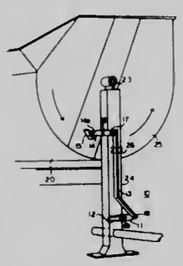
(d) a movable dispensing member mounted in the apparatus which compresses between the compression member and an opposed pinch surface in the apparatus only that single cartridge pump portion that is adjacent the compression member thereby causing fluid to be dispensed from the exit orifice of the selected cartridge.

4,895,277

FOOT OPERATED MORTAR DRUM LATCH ASSEMBLY

Marvin E. Whiteman, Jr., 2254 Braniff St., Boise, Id. 83706

Filed Feb. 3, 1989, Ser. No. 306,081
Int. Cl.[4] B28C 7/16; B67D 5/64; B01F 15/02
U.S. Cl. 222—166 1 Claim



1. In a mortar mixer having a horizontally oriented, generally cylindrical mortar mixing drum rotatable from a mixing position, with an opening in the drum located generally at the top of the drum, to a dumping position, said drum having end walls and being pivotally connected coincident to a cylindrical axis to a pair of opposing upright frame struts adjacent to said end walls, a foot operated mortar drum latch assembly which comprises:

a V-shaped stop tab extending normally from a drum end wall and oriented thereon such that one leg of the V-shaped stop tab is vertically oriented when the drum is in the mixing position and the other leg extending in a direction opposite of that for rotation of the drum to the dumping position;

a latch bar having a cambered end pivotally attached to the adjacent upright frame strut with its cambered end in frictional engagement against the vertically oriented arm of the V-shaped stop tab when the drum is in a mixing position so that drum rotation from a mixing position to a dumping position cannot occur unless the latch bar is pivoted to a release position, and such that the second leg of the V-shaped stop tab will frictionally engage the cambered end of the latch bar and pivot said latch bar from the engaged position to the release position;

a pivot arm being pivotally attached to the lower end of the upright frame strut and disposed to pivot about an axis substantially parallel to the cylindrical axis;

a foot peg extending normally out from one end of the pivot arm substantially parallel to the cylindrical axis;

an extension arm for pivotal attachment at one end of the pivot arm opposite that to which the foot peg is attached and pivotally attached at its other end to the latch bar so that when the pivot arm is pushed down at the foot peg end, the latch bar is pivoted down away from the engaged position with V-shaped stop tab to the release position; and

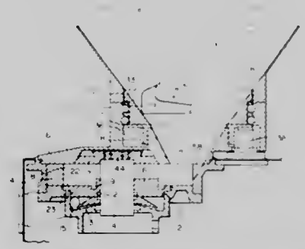
a drum handle attached to and extending radially upward from the drum at the end wall of the drum adjacent the upright frame member to which the pivot arm is attached, whereby, the handle and the foot peg are disposed to enhance the operator's body leverage when rotating the drum from a mixing position to a dumping position.

4,895,278

STUFFING-BATCHING MACHINES FOR FOOD PRODUCTS

Tomas S. Mataro, Génova 23, entlo. 8, esc B,, 08026 Barcelona, Spain

Filed Oct. 20, 1987, Ser. No. 110,349
Claims priority, application Spain, Oct. 20, 1986, 8602884
Int. Cl.[4] B65D 88/54
U.S. Cl. 222—288 5 Claims



1. In a stuffing-batching machine including a pump housing, a hopper through which feed material to be processed is passed to a pump chamber in the housing having a cylindrical wall and a central axis, a blade-type pump in the pump chamber, a pump chamber intake operatively connecting the hopper to the pump chamber for passing feed material to the pump chamber and a pump chamber outlet, the improvement comprising:

a set of removable and interchangeable plate-shaped members each usable independently for forming the bottom of the pump chamber and each having a top surface and a bottom surface;

a continuous recess in said top surface of each plate-shaped member for guiding the blades of the pump, said recess defining a guide path eccentric with respect to the cylindrical wall of the pump chamber;

radially sliding blades in the pump chamber;

means for driving said blades in a rotary path through said pump chamber about the central axis of the pump chamber;

lugs on said blades engageable in said recess for guiding said blades in the pump chamber so that said blades pump feed material from the pump chamber intake to the pump chamber outlet;

an annular seat on said housing below said pump chamber;

an annular seat on said bottom surface of each plate-shaped member slidably engageable on said annular seat of said housing; and

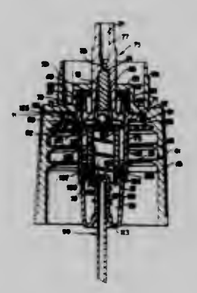
means for releasably locking said plate-shaped member in a predetermined angular position and against rotation in said pump chamber.

4,895,279

FLAT-TOP VALVE MEMBER FOR AN ATOMIZING PUMP DISPENSER

Robert S. Schultz, Old Greenwich, Conn., assignor to Emson Research Inc., Bridgeport, Conn.

Filed Jul. 25, 1988, Ser. No. 223,650
Int. Cl.[4] B65D 88/54
U.S. Cl. 222—321 20 Claims



1. An atomizing dispensing pump comprising:

(a) a pump chamber of substantially fixed volume, said pump chamber having an opening at the inner end thereof;

(b) a pump stem having a piston on the end thereof disposed for reciprocal motion in said pump chamber;

(c) said pump stem having a passageway therethrough with a dispensing outlet at the outer end of said passageway and an axial inlet port located inwardly thereof;

(d) an integrally molded plastic rigid valve member having:

(i) an outer part terminating in a flattened top portion and a sealing surface adjacent said flattened top portion, said sealing surface having a predetermined diameter and sealing against said axial inlet port, said outer part being of a first cross section;

(ii) an inner part being of a larger cross section than said outer part, and of a length corresponding to the range of movement of said piston, the outer diameter of said inner portion being no more than three times the diameter of said sealing surface;

(iii) an intermediate portion forming a generally conically tapered recess with a wide edge and a narrow end between said inner and outer parts, said recess being tapered at an acute angle with respect to the axis of said inner part;

(iv) a passage leading from the axial inner end of said inner part to said tapered recess;

(v) said intermediate portion openings in the vicinity of its outer end permitting communication between said recess and the area above said inner portion; and

(vi) a ball, having a diameter which is less than the diameter of said wide edge of said tapered recess but greater than the diameter of said narrow end, snapped into said tapered recess to thereby form therewith a check valve, said valve member thereby forming an inlet valve to said pump chamber,

(e) a throat at said opening at the inner end of said pump

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chamber, the radially outer portion of said inner part of said valve member cooperating with said throat to form means sealing the inner end of said pump chamber with a surface to surface seal at said throat, as said pump is operated by depressing said pump stem, to prevent any flow from said pump chamber through said throat when said pump is dispensing;

(f) a dip tube for supplying liquid in a container to said throat;

(g) a spring biasing said valve member outwardly so that the first end portion thereof closes off said inlet port, and thereby also biasing said pump stem outwardly; and

(h) the cross-sectional area closed off at said inlet port being smaller than the cross-sectional area of said second end portion of said valve member at the point where it is sealingly guided.

4,895,280

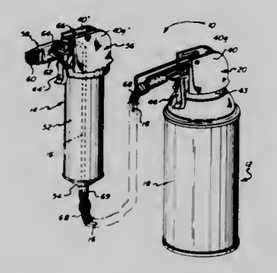
PRESSURIZED FLUID REMOTE DISPENSER INCLUDING IMPROVED LOCKING MEANS

Jay S. Tourigny, West Hartford, Conn., assignor to Microcare Chemical Corporation, Bristol, Conn.

Filed Jul. 27, 1988, Ser. No. 225,044

Int. Cl.[4] B65D *83/00*

U.S. Cl. 222—402.13 **11 Claims**



1. In a remote dispenser for dispensing a pressurized fluid from a base unit defining a chamber containing the pressurized fluid:

(a) the base unit having mounted thereon release means including (i) a valve assembly having a discharge bore in flow communication with the chamber, (ii) a displaceable member moveable between a normally closed position, in which flow of pressurized fluid through the discharge bore is blocked, and an open position in which the discharge bore is open to such flow, and (iii) a support means carrying a retainer seat positioned adjacent the displaceable member; and

(b) said remote dispenser including (i) a supply tube having a supply end dimensioned and configured to be slidably and removably connected in fluid flow communication with the discharge bore, and (ii) locking means secured to the supply tube at the supply end thereof and seatable in the retainer seat of said support means, the locking means being dimensioned and configured so that, when seated within the retainer seat, the locking means retains the displaceable member in its open position and secures the supply tube to the discharge bore; the improvement comprising, that the locking means comprises a clip member having (1) an anchor portion within which the supply tube is retained; (2) a pair of spaced-apart, resilient, opposed legs, the clip member being dimensioned and configured so that, (i) when said legs are compressed and then released to resiliently engage said retainer seat, said clip member resiliently grips and thereby engages said support means, and (ii) said clip member is disengageable therefrom by further compression of the legs to disengage them from said retainer seat; and (3) a stop member dimensioned and configured to restrict pivoting movement of said locking means relative to said support means when the locking means is engaged therewith.

4,895,281

ROTARY CLOSURE FOR A VESSEL

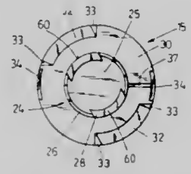
Horst Lorenz, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 234,963

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730540

Int. Cl.[4] A47G *19/14*

U.S. Cl. 222—465.1 **33 Claims**



1. A vessel for hot or cold beverages, particularly a vacuum bottle, comprising a housing defining a liquid-receiving compartment and having a bottom wall beneath and a top section above said compartment, said top section having an opening communicating with said compartment and a spout; and a cover overlying said opening and including an extension in said opening, said extension having an internal space communicating with said compartment and at least one lateral liquid-evacuating aperture communicating with said space, said extension including a top wall disposed above said space and having a first ramp adjacent said aperture, said extension being rotatable in said opening between a pouring position in which said aperture establishes a path for the flow of liquid from said compartment into said spout and a second position in which said extension seals the spout from said compartment, said cover further comprising a substantially washer-like portion spaced apart from and disposed above said top wall, said washer-like portion having a second ramp disposed radially outwardly of said first ramp.

4,895,282

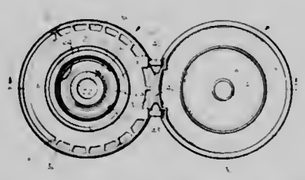
DISPENSING CLOSURE WITH PULL TAB FOR ENLARGING ORIFICE

Gerald R. Robinson, Perrysburg, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Aug. 1, 1988, Ser. No. 226,494

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—482 **7 Claims**



1. A molded plastic, child-resistant, pouring closure for a container comprising

a tubular inverted cup-shaped body including a top wall and integral skirt wall,

means on the skirt wall adapted for attaching the closure on the neck of the container,

an annular upstanding integral spout on said top wall of said body defining the primary orifice adapted for dispensing from said container,

a line of weakening in the top wall encircling said primary orifice means comprising an annular V-notch molded in said top wall defining a rupturable line encirclement of said primary orifice and adapted to define a larger secondary orifice,

an integral upstanding circular wall on the top wall encircling and spaced radially outwardly from said line of weakening therein,

a cover cap hinged to said tubular body near the periphery thereof for swinging movement over said body and away from said body between closed and open positions,

a ring pull member integrally connected to said top wall inwardly of the line of weakening and adapted for rupturing the top wall along said encircling line of weakening tearing out said upstanding spout, thereby providing said enlarged secondary orifice opening in the top wall of said body,

a circular wall on the underside of said cover cap adapted to encircle and enclose said circular wall on the top wall of said body, said circular walls including means engageable in closed position of the cover cap for bolding said cover cap closed,

a circular plug means on the underside of said cover cap adapted for inserting same in the primary pouring orifice for closing it when said cap is swung over said body,

a flexible annularly disposed vertical wall connected to said body radially spaced from the skirt wall and substantially encircling same,

said cap having a top wall and peripheral skirt, hingedly connected to said flexible wall of said body, said skirt of the cap being co-extensive with the flexible wall of said body in closed position to provide a smooth wall surface extending between said cap and said body,

said flexible annular wall being radially deflectable for disengaging the means holding the cover cap closed and for opening said cap, and

means on said skirt of said body engaging the container and locking the tubular body on the neck of the container against removal after said body is attached to the container rendering the closure child-resistant to its removal from the container.

4,895,283

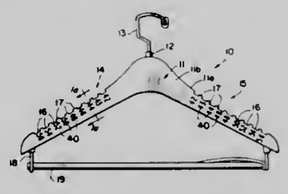
ADJUSTABLE GARMENT HANGER

Louis W. Evangelist, 1009 Black Oak Cir., Fairfield Glade, Tenn. 38555, and Robert Ysnarella, 38555 St. George Dr., Fairfield Glade, Tenn. 38575

Filed Oct. 14, 1988, Ser. No. 257,930

Int. Cl.[4] A47G *25/44*

U.S. Cl. 223—94 **7 Claims**



1. An adjustable garment hanger comprising:

(a) a hanger body having a central portion and two integrally formed arms depending therefrom, said central portion and arms having forwardly arched contours defining a continuous, forwardly arched contour for the hanger body;

(b) a bore formed in said central portion;

(c) a hook mounted in said bore for supporting the hanger;

(d) a plurality of notches provided in a curved top portion of each arm; and

(e) two hollow shoulder extensions having generally U-shaped cross sections with each of said shoulder extensions detachably connected to a respective arm and each of said shoulder extensions having a forwardly arched contour merging with the forwardly arched contour of the hanger body and a longitudinally projecting tongue member extending in a generally parallel direction from a top portion of said shoulder extension, said tongue member detachably retained in one of said notches whereby each shoulder extension closely fits over its respective arm.

4,895,284

CRASH HELMET STORAGE DEVICE FOR MOTORCYCLES

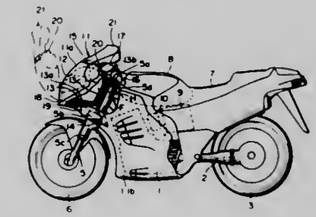
Yoshio Nogami, Okayama; Yoshihiro Matsuo, Saitama; Takayuki Fujii, Saitama, and Seiichi Urashi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,147

Claims priority, application Japan, Jul. 22, 1987, 62-180994

Int. Cl.[4] B62J *7/00*

U.S. Cl. 224—32 R **9 Claims**



1. A crash helmet storage device in a riding-astride type motorcycle having an engine positioned at an intermediate portion of the vehicle and having at least a portion disposed forwardly of a rider's seat, a fuel tank positioned upwardly of the engine and forwardly of the rider's seat, and a front cowl at least partially covering the engine and having a portion covering at least an area in front of a handlebar of the motorcycle, said crash helmet storage device comprising:

a receptacle disposed in said front cowl and having an open front side;

the receptacle being disposed upwardly of the engine and forwardly of the fuel tank;

a front cover serving as a component of said front cowl and positioned in front of said receptacle;

a pair of side covers serving as other components of said front cowl and covering lateral sides of said receptacle; and

said front cover being separate from said side covers and acting as a lid for selectively opening and covering said open front side of said receptacle.

4,895,285

GUN VEST

Joseph L. Dunn, 1309 Floyd St., Conway, S.C. 29526

Filed May 23, 1988, Ser. No. 197,423

Int. Cl.[4] F41C *23/02*

U.S. Cl. 224—149 **37 Claims**

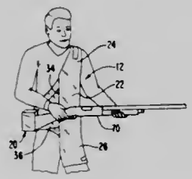
1. A gun vest comprising:

a torso portion designed to be worn about the midsection of a person;

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a single shoulder portion extending upward from said torso portion and designed to be worn about one shoulder of the person;

a single leg portion extending downward from said torso



portion and designed to be worn about one leg of the person; and

first means for receiving and retaining a gun stock therein, said first means being attached to at least one of said torso, shoulder and leg portions.

4,895,286

CAMERA SUPPORT

James V. DeRosa, 310A N. Second St., Sierra Vista, Ariz. 85635-1501

Filed Sep. 29, 1988, Ser. No. 250,664
Int. Cl.[4] A45F *3/10*
U.S. Cl. 224—265 **1 Claim**



1. A camera support, consisting of:

a horizontally disposed camera-supporting platform, a form-fitting saddle operatively attached to said camera supporting platform and configured to fit downwardly over the shoulder of a using person and having a depending rear part terminating short of the using person's waist area, means mounting the platform of the saddle, a strap having a connection to the saddle rear part and depending to a terminal end at about the waist of the using person, and said terminal end at about the waist of the using person, and said terminal end being configured to receive a belt encircling the waist of the using person; in which the connection of the strap to the saddle rear part is selectively vertically adjustable to vary the position of the terminal end of the strap; and further including a flexible element connected at one end to an upper rear portion of the saddle and having such length as to comfortably encircle the neck of the using person, said element having a free end provided with a detachable connector, and a front portion of the saddle having a connector-receiver for selective connection and disconnection of the connector.

4,895,287

WEB LOADING AND FEEDING SYSTEM

Kenneth O. Wood, Ellington; John E. Ladue, Tolland, and David J. Logan, Glastonbury, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Continuation-in-part of Ser. No. 156,730, Feb. 17, 1988, abandoned, which is a division of Ser. No. 73,404, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 809,053, Dec. 13, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 288,148
Int. Cl.[4] B65H *20/20*
U.S. Cl. 226—76 **6 Claims**



1. A web for use with a web handling machine having a pair of web feeding sprockets mounted for rotation about a common axis, each sprocket having a circumference with a first portion which contains only a plurality of driving pins spaced uniformly along said first portion of said circumference and a second portion which contains a keying projection, said driving pins and said keying projection of each web feeding sprocket being located in a common plane perpendicular to said common axis, said web comprising:

an elongated sheet-like member having parallel side edges and a plurality of driving holes and keying openings in each side edge portion for cooperation, respectively with said driving pins and said keying projection of a respective one of said sprockets to feed said web longitudinally of itself,

said driving holes and said keying openings in each side edge portion of said web being located on a straight line extending longitudinally of said web, and said driving holes in each side edge portion of said web being arranged in row segments, each row segment being separated from a next row segment by a keying zone including no openings except for one of said keying openings,

said driving holes of said row segments being spaced from one another at regular intervals along the length of each of said row segments and said driving holes being of uniform size and shape,

each of said keying zones having a length greater than two times and less than three times the length of one of said regular intervals, and

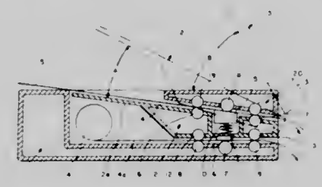
said keying opening of each keying zone being elongated in the direction longitudinally of said web so as to have a length and a shape different from each of said driving holes, so that each keying zone represents a readily visibly discernable interruption in the regular spacing of said driving hole insofar as each keying zone has a length not an integral multiple of the length of one of said regular intervals and insofar as the keying opening of each keying zone has a shape different from and a length longer than each of said driving holes.

4,895,288

FACSIMILE DEVICE

Matahira Kotani; Hiroshi Morimoto; Masafumi Matsumoto; Ryoichi Kawai; Hiroshi Shirakoshi, and Takashi Shinohara, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 71,988, Jul. 9, 1987. This application Nov. 17, 1988, Ser. No. 273,628
Claims priority, application Japan, Jul. 9, 1986, 61-161213
Int. Cl.[4] B65H *75/00*; G11B *23/02*; H04N *1/00*
U.S. Cl. 226—109 **9 Claims**



1. A facsimile device comprising

a first unit which serves as a base part for said device,

a second unit rotatably supported by said first unit, and

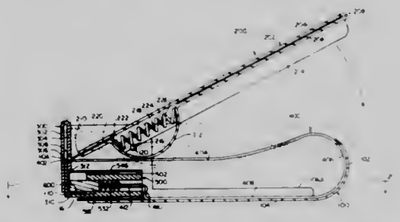
a third unit rotatably supported by said unit, said first unit and said second unit forming therebetween a recording sheet passageway which can be opened and closed by with respect to rotating said second unit. said first unit, said second unit and said third unit forming therebetween a document passageway which can be opened and closed by rotating said third unit with respect to said second unit.

4,895,289

OPHTHALMIC STAPLER

William D. Richards, Medway, and Ernesto E. Blanco, Belmont, both of Mass., assignors to Ophthalmic Ventures Limited Partnership, Norwood, Mass.

Continuation of Ser. No. 944,951, Dec. 22, 1986, abandoned. This application Jan. 12, 1989, Ser. No. 296,894
Int. Cl.[4] A61B *17/00*
U.S. Cl. 227—19 **23 Claims**



1. A stapler system for suturing tissue, said system comprising a stapler and a plurality of staples adapted to be implanted by said stapler,

each of said staples having two legs connected together by a concave bridge, said legs being curved and having pointed ends; and

said stapler comprising:

a body having a staple ejection aperture;

staple supporting means for slidably supporting said plurality of staples so that the latter can be slidably moved along a path terminating at a predetermined staple ejection position, said staple supporting means being adapted for reciprocal movement within said body into and out of a first position;

staple advancing means for urging said plurality of staples carried by said staple supporting means toward said predetermined staple ejection position when said staple supporting means is in its said first position so that leading ones of said plurality of staples are successively delivered to said predetermined staple ejection position;

an anvil carried by said staple supporting means, said anvil being disposed in line with a leading one of said plurality of staples located in said staple ejection position when said staple supporting means is in its said first position;

biasing means for yieldably positioning said staple supporting means in its said first position; and

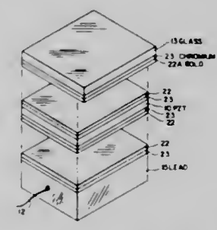
selectively actuatable staple ejecting means movably mounted to said body for driving a staple located in said staple ejection position out of said staple ejection position through said staple ejection aperture, said staple ejecting means comprising a staple driving ram that undergoes a drive stroke and a return stroke each time said selectively actuatable staple ejecting means is actuated, the drive stroke of said ram being such that said ram will sequentially (1) cause said bridge of said staple to engage said anvil and said legs of said staple to be deformed along a curved path under said anvil so that said legs pass through said staple ejection aperture and engage and draw together tissue disposed beneath said staple ejection aperture, and (2) cause said bridge of said staple to force said anvil and said staple supporting means to a second position that is far enough away from said first position to allow the bridge of said staple to pass by said anvil and out of said staple ejection aperture.

4,895,290

METHOD FOR BONDING MATERIALS

Clarence J. Dunarowicz, Los Angeles, Calif., and Joseph Callerame, Lexington, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 538,637, Oct. 3, 1983, abandoned, which is a division of Ser. No. 214,534, Dec. 8, 1980, Pat. No. 4,434,384. This application Mar. 3, 1986, Ser. No. 837,326
Int. Cl.[4] B23K *20/24*; H01L *41/22*
U.S. Cl. 228—116 **12 Claims**



1. A method for bonding materials comprising the steps of:

polishing surfaces of said materials to provide such surfaces with a predetermined degree of smoothness;

depositing in a vacuum of a vacuum chamber apparatus a smooth and clean gold film on each of said polished surfaces; and without allowing a substantial exposure of said surfaces to contamination above that of a Class 100 atmosphere, removing said materials from said vacuum apparatus and thereafter bonding said surfaces together by:

placing the gold film deposition on each of said surfaces in contact with one another;

applying a low pressure force transversely to the surfaces of said materials sufficient to bond the materials;

said polished step includes the step of measuring the degree of smoothness;

said step of depositing the gold film includes the prior step of depositing on each said surfaces a film of a metal adherent to said materials and to which said gold film is adherent;

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said step of depositing said film of adhering material is preceded by cleaning the surfaces of said materials in a non-vacuum after said polishing step; and

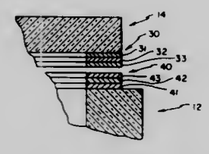
said cleaning step comprises the steps of washing said surfaces in a detergent in distilled water, rinsing in distilled water, and blow drying with nitrogen.

4,895,291

METHOD OF MAKING A HERMETIC SEAL IN A SOLID-STATE DEVICE

Edward J. Ozimek, Penfield, and Edward Carnall, Jr., Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 4, 1989, Ser. No. 347,091
Int. Cl.[4] B23K *1/19, 35/26*
U.S. Cl. 228—121 **9 Claims**



1. A method of making a hermetic seal in a solid-state device, said method comprising the steps of:

forming a metallization support on a housing;

forming a metallization support on a cover for said housing;

forming a layer of indium on one of said supports;

forming a layer of tin on the other of said supports;

positioning said cover and said housing such that said layers of indium and tin are in contact with each other;

heating said cover and housing to a temperature of between about 70% and about 90% of the melting temperature of a composite alloy of tin and indium to diffuse said tin and indium together;

heating said cover and housing to a temperature sufficient to melt said alloy after said diffusion is complete; and

slowly cooling the cover and housing to ambient temperature.

4,895,292

METHOD OF BRAZING TUNGSTEN CARBIDE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 262,384, Oct. 26, 1988, Pat. No. 4,853,291, which is a division of Ser. No. 174,278, Mar. 28, 1988, Pat. No. 4,839,141. This application Jun. 23, 1989, Ser. No. 370,474
Int. Cl.[4] B23K *1/04, 35/30*
U.S. Cl. 228—122 **7 Claims**

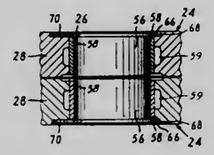
1. The method of joining a tungsten carbide part to another part comprising the steps of disposing a brazing alloy at the joint between the parts, the brazing alloy having a solidus temperature above and a liquidus temperature above 1018° C. and having a composition of, in weight percent, 5–30 gold, 15–35 palladium, 10–30 nickel, 20–48 copper, 5–25 manganese, and brazing the parts at a temperature of 1025°–1080° C. to form a uniform fillet at the joint.

4,895,293

FAST THERMAL RESPONSE MOLD

Robert A. Brown, Mattapoisett, Mass., assignor to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 902,229, Aug. 29, 1986, Pat. No. 4,757,972. This application May 2, 1988, Ser. No. 189,191
Int. Cl.[4] B23K *1/12*
U.S. Cl. 228—182 **2 Claims**



1. A method for making a mold frame for receiving a plurality of half molds comprising:

(a) forming in a mold plate at least four rows, each comprising a plurality of spaced cavities;

(b) forming a row bore in each row, said row bore interconnecting the cavities in each row and extending beyond the end cavity in each row;

(c) forming two cross-bores, one cross-bore interconnecting the row bores at one end of the rows and the second cross-bore interconnecting the row bores on the other end of the rows;

(d) fixing a sleeve to said frame by means by soldering or brazing in each of said cavities, said sleeve defining a space between itself and the walls of said cavity;

(e) sealing off one said cross-bore between the first and second and the third and fourth row bores and sealing off said second cross-bore between the second and third row bores;

(f) forming an inlet to a cross-bore in the first row; and

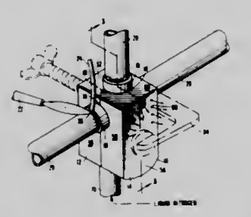
(g) forming an outlet from a cross-bore at the last row whereby a serpentine fluid communication is produced between said inlet through the row bore in each row of cavities and out of said outlet.

4,895,294

METHOD AND APPARATUS FOR CONTROLLING SOLDER FLOW IN METALLIC MEMBERS

George M. Thore, 5312 New Church Ct., Fairfax, Va. 22032

Filed Mar. 1, 1989, Ser. No. 317,554
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—222 **21 Claims**



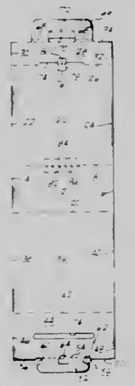
1. A solder and heat flow control apparatus comprising a first housing member and a second housing member, each of said housing members define an interior cavity, a front opening provided in each of said housing members leading into its interior cavity, each of said front openings being circumscribed by walls which terminate in front surfaces, at least one of said walls of each housing member is provided along its front surface with a recess, said recesses being provided in said housing members in corresponding walls, each of said recesses being adapted to receive a part of a first conduit member which is adapted to be oriented longitudinally in said recess, a coolant inlet provided in one of said housing members communicating with its interior cavity, said first and second housing members being adapted to be assembled around said first conduit member by placing said conduit member longitudinally in the recess of a first one of said housing members, and aligning the recess of the other of said housing members with said recess of said first one of said housing members whereby the front surface of the walls in which said recesses are provided completely surround said conduit member and said interior cavities of said housing members are aligned, such that a portion of said conduit member is completely enclosed within said assembled housing members, and an unenclosed portion of said conduit member projects outside of said housing members through said aligned recesses, whereby introduction of a cooling medium into said assembled housing members through said coolant inlet maintains said enclosed portion of said conduit member at a temperature lower than the temperature of said unenclosed portion.

4,895,295

MULTIPLE PRODUCT WRAPAROUND CARRIER

H. Curtis Montgomery, and David J. McKenna, both of Lacey, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 34,462, Apr. 3, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 257,131
Int. Cl.[4] B65D *5/42, 5/46*
U.S. Cl. 229—9 **2 Claims**



1. A flexible multiple egg flat carrier of the open ended wrap-around style, comprising:

a bottom wall,

first and second upstanding side walls,

first and second top wall forming portions,

a slot in the first top wall portion through which extends an upstanding hand hold hinged to the second top wall portion, and

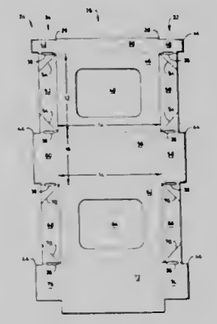
a pair of joined flaps along a bottom edge formed from a portion of the bottom wall and an adjacent upstanding side wall adapted to be pushed inwardly after egg flats are inserted in the erected carrier to engage and hold the egg flats removably in place.

4,895,296

SLEEVE CARTON WITH FLARING LIPS

William F. Trauschke, Topsfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 11, 1988, Ser. No. 255,235
Int. Cl.[4] B65D *5/06*
U.S. Cl. 229—40 **16 Claims**



1. A sleeve carton comprising:

(a) a hollow sleeve with at least three rectangular sleeve panels, each sleeve panel having two parallel and opposite seam edges and at least one opening edge intermediate the respective seam edges, each sleeve panel coupled along the respective seam edges to two respective adjacent sleeve panels thereby forming sleeve seams between the adjacent sleeve panels with the respective opening edges adjacent and coplanar thereby defining a sleeve with an enclosed cavity having an axis parallel to the sleeve panels, and parallel to the sleeve seams, and at least one open end defined by the coplanar opening edges one each from the respective sleeve panels, and

(b) at least one lip panel positioned in the enclosed cavity, hinged on a first lip panel edge to a first of the respective sleeve panels along the opening edge of the respective first sleeve panel, having a second edge of the flaring lip panel transverse to the first lip panel edge, and contacting a respective first sleeve seam formed between the first sleeve panel and an adjacent second of the respective sleeve panels, and a third edge of the flaring lip panel opposite the second edge of the flaring lip panel transverse to the first lip panel edge, and contacting a respective second seam formed between the first sleeve panel and an adjacent third of the respective sleeve panels, to receive a compressive force from the second sleeve panel and third sleeve panel, the lip panel thereby flaring into the enclosed cavity and away from the adjacent respective first sleeve panel.

4,895,297

BUSINESS FORM SET WITH CLOSABLE ENVELOPE

Michael K. Klamm, Belleville, Ill., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,106
Int. Cl.[4] B65D *27/10*
U.S. Cl. 229—69 **18 Claims**

1. A business form set comprising:

a plurality of rectilinear sheets forming a multi-ply set thereof and including first, second, third and fourth sheets;

said first, second and third sheets being comprised of paper;

means for releasably securing said first and second sheets one to the other along a common margin thereof;

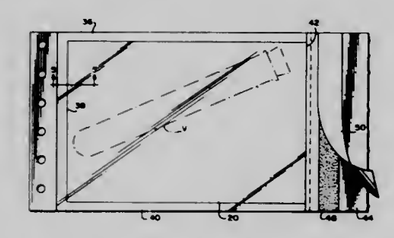
means for releasably securing said second and third sheets one to the other along a common margin thereof;

said fourth sheet being formed of a plastic material;

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means for adhering said fourth sheet to the side of said third sheet opposite said first and second sheets and continuously adjacent three of four substantially common margins of said third and fourth sheets to define an envelope on the back side of said form set having an opening located between a free margin of said fourth sheet and said third sheet, said free margin being inset from the corresponding margin of said third sheet to define a flap portion along said corresponding margin of the third sheet and foldable to overlie a portion of said fourth sheet to close said opening; and

means carried by said flap portion along the back side of said third sheet for securing said flap to said fourth sheet portion.



4,895,298

QUADRANGULAR SHAPED CONTAINER FOR FLUIDS

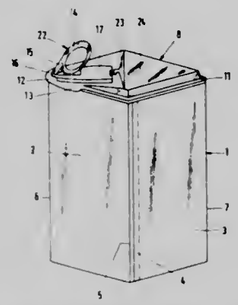
Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Finance & Trading S.A., Pully, Switzerland

Filed Aug. 16, 1988, Ser. No. 232,702

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727589

Int. Cl.[4] B65D *17/32, 43/24*

U.S. Cl. 229—125.01 **14 Claims**



1. In a container comprising a tubular body having first and second ends, a container bottom wall at said first end, and a lid with a pouring opening affixed to said second end in which the uppermost surface of said lid defines a plane which is parallel with said bottom wall, and a pouring device comprising closing means for said pouring opening, pull means for removing said closing means from said pouring opening and a depression in said lid in the region surrounding said pouring opening, the improvement which comprises hinged means for locking said closing means for said pouring opening in an open position, said hinged locking means comprising first and second engaging elements, said first engaging element comprising a stationary projection extending horizontally from the lid toward said closing means for said pouring opening, said second engaging element comprising a projection on said closing means which is in a plane substantially even with said first engaging element, said first and second engaging elements being adapted so as not to protrude transversally through the plane of said lid when the container is closed.

4,895,299

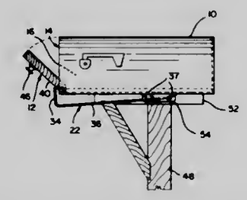
MAIL BOX WITH SIGNALLING DEVICE

Hideo Okunami, 10112 Park View Dr., Palos Park, Ill. 60464

Filed Apr. 3, 1989, Ser. No. 332,332

Int. Cl.[4] B65D *91/00*; A47G *29/12*

U.S. Cl. 232—35 **4 Claims**



1. In combination with a mail box having an open-ended mail receiving compartment and a closure pivotally mounted at the open end of said compartment for opening and closing the open end thereof, said mail box being adapted to be located some distance from a dwelling whereby it is necessary to leave the dwelling to retrieve mail deposited therein by a mail delivery person, a signalling device comprising: one-piece signalling means having an indicia bearing portion and an activating portion which overlies at least in part the closure of the mail box when the closure is in its normally closed position with relation to the open end of the mail-receiving compartment of the mail box, said activating portion of the signalling means being adapted to be engaged by the closure when it is pivoted away from the open end of the mail receiving compartment of the mail box, and retention means for engaging the indicia bearing portion of the signalling means, said retention means being mounted at a position in relation to the mail box which is remote from said closure and being adapted to release the indicia bearing portion of the signalling means in response to the force placed on the activating portion of the signalling means by the closure when it is pivoted away from the open end of the mail receiving compartment of the mail box.

4,895,300

PASSIVE MAIL FACING DEVICE

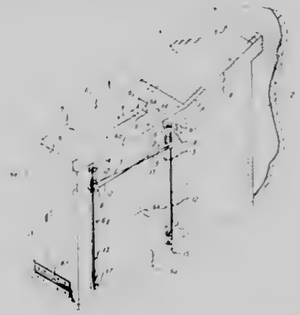
James Hammons, 917 Old Taylor Rd., and James G. Vaughan, 66 Sheila Dr., both of Oxford, Miss. 38655

Filed Mar. 14, 1989, Ser. No. 322,990

Int. Cl.[4] B65G *11/04*

U.S. Cl. 232—45 **9 Claims**

1. A mail facing device comprising, a chute, one end of said chute being positioned behind and adjacent to a Post Office wall having a standard mail drop slot, indicia provided on the front of said wall adjacent to said slot indicating the proper orientation of a letter for deposit and instructing the customer on how to insert mail into the slot, and a bin, the opposite end of the chute communicating with a horizontally disposed collection plate slidably mounted in a verticle plane within the bin, whereby properly orientated mail inserted through the mail slot is conveyed by the chute onto said collection plate where it is stacked in the proper orientation to facilitate the further processing of the deposited mail by the postal personnel and means operatively connected to the collection plate for controlling the movement of the plate within the bin.



4,895,301

ENGINE COOLANT SYSTEM AND METHOD OF MAKING THE SAME

Billy E. Kennedy, Alcoa, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

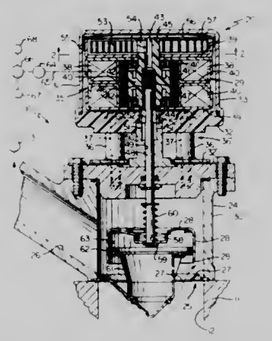
Division of Ser. No. 165,774, Mar. 9, 1988, Pat. No. 4,848,652.

This application May 12, 1989, Ser. No. 351,415

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[4] F61P *7/02*

U.S. Cl. 236—34.5 **18 Claims**



1. In a vehicle engine coolant system having a valve construction comprising a housing means provided with an inlet interconnected to the block of the internal combustion engine of said vehicle and an outlet interconnected to the radiator means of said engine and being separated from said inlet by a valve seat, and a movable valve member carried by said housing means for opening and closing said valve seat, the improvement comprising electrically operated stepper motor means carried by said housing means and being operatively interconnected to said valve member for positioning said valve member relative to said valve seat, and spring means operatively interconnected to said valve member to move said valve member to an open position thereof with said valve seat upon loss of electrical current to said motor means, said open position being less than a fully open position of said valve member but being

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4,895,302

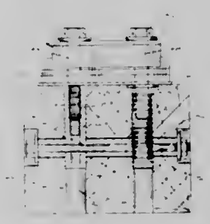
TIE PLATE RAIL FASTENING SYSTEM

Gordon E. Matlock, 554 Sappington Bridge Rd., Sullivan, Mo. 63080

Continuation-in-part of Ser. No. 98,688, Sep. 21, 1987, Pat. No. 4,828,172. This application Dec. 27, 1988, Ser. No. 292,549

Int. Cl.[4] E01B *13/02*

U.S. Cl. 238—298 **11 Claims**



1. In combination,

an elongated, substantially horizontally disposed wood cross tie having opposite ends,

a horizontally disposed wear plate having upper and lower surfaces mounted on the upper surface of said cross tie adjacent each end thereof, each of said wear plates being bonded to the tie by means of a plurality of teeth distributed across the entire lower surface of said plate and extending downwardly therefrom, said teeth being embedded in the tie,

said cross tie having a plurality of vertically disposed openings formed therein beneath each of said wear plates,

each of said wear plates having a plurality of openings formed therein which register with the vertically disposed openings in said tie, said wear plate having a plurality of tubular members secured thereto extending downwardly therefrom into the openings in said cross tie,

means securing said tubular members to said tie, said tubular members having an internally threaded portion adjacent the upper end thereof adapted to threadably receive a bolt member,

a tie plate positioned on each of said wear plates adapted to support a rail thereon, each of said tie plates having openings formed therein which register with said tubular members,

bolt members extending downwardly through the openings in said tie plate and being threadably received by the threaded portions of said tubular members,

and means for securing the rails to said tie plates.

4,895,303

SPRINKLER SYSTEM FERTILIZATION REGULATOR

Frank C. Freyvogel, 2061 Waltoffer Ave., North Bellmore, N.Y. 11710

Filed Jul. 15, 1988, Ser. No. 219,145

Int. Cl.[4] A01G *25/00*; B05B *12/04*

U.S. Cl. 239—61 **5 Claims**

1. A sprinkler system for irrigating a plurality of predetermined irrigation zones 1 through 5 having a fertilization regulator, comprising:

(a) an electrically operated proportional flow control valve that controls the flow of fresh water into said regulator wherein said flow of water is proportional to an electrical current input to said valve;

(b) a master sensor connected to the output of said proportional flow control valve wherein the electrical output of said master sensor is proportional to the rate of flow of water through said master sensor;

(c) a siphon pump connected to the output of said master sensor wherein said siphon pump siphons concentrated fluids and combines said concentrated fluids with said

fresh water such that the output of said siphon pump is a mixture of said fresh water and said concentrated fluids;

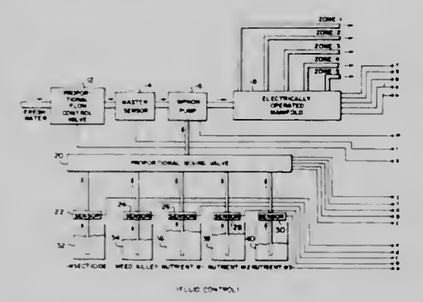
(d) an electrically operated manifold whose input is connected to the output of said siphon pump and whose outputs are each individually controllable by the application of an electrical current to said manifold so that said manifold outputs are attached to conventional sprinkler heads for the purpose of applying chemicals to a lawn or garden;

(e) a proportional mixing valve connected to the siphoning input of said siphon pump;

(f) a plurality of containers containing concentrated liquids wherein said containers are connected to each of the inputs of said proportional mixing valve such that the relative concentration of the combined concentrates is determined by electrical signals applied to said proportional mixing valve;

(g) sensors interposed between each of said containers and said proportional mixing valve, such that the electrical output of each of said sensors is proportional to the rate of concentrates for each respective container;

(h) means for controlling the operation of said proportional flow control valve, said electrically operated manifold, and said proportional mixing valve such that the concentration of each constituent fluid and the total amount of



fluid delivered to each manifold output is independent of the fresh water inlet pressure, said means for controlling the operation of said proportional flow control valve, said electrically operated manifold, and said proportional mixing valve further comprise a timer and a sequencer, wherein said timer may be set to cause said regulator to operate at a predetermined time of the day, and said sequencer's output being connected to said electrical input of said manifold such that said sequencer causes each of the fluid outputs of said manifold to operate in a predetermined sequence, sequencing of the zones 1 through 5 is determined by said sequencer whose output is connected to said electrically operated manifold, said manifold taking the water/chemical mixture from said siphon pump and directing it to each zone as directed by the electrical signals inputed to it, said timer connecting to said sequencer determines the days, time of day, and duration for watering each zone, through connections between the concentration control circuit and the sequence, each zone can output a water stream with a different concentration of chemicals; and

(i) indicator lamps connected to the output of said sequencer such that a visual indication is given to indicate which of said manifold's outputs is operating, said sequencer steps through the zones and as it activates each zone an appropriate zone indicator lamp lights.

4,895,304

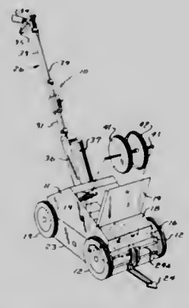
SPRAYING APPARATUS

Thomas J. Smrt, Cary, Ill., assignor to Fox Valley Systems, Inc., Cary, Ill.

Continuation of Ser. No. 3,501, Jan. 15, 1987, abandoned, which is a continuation of Ser. No. 278,164, Jun. 29, 1981, Pat. No. 4,641,780. This application Mar. 16, 1989, Ser. No. 325,017

Int. Cl.[4] B05B *9/04*

U.S. Cl. 239—150 **6 Claims**



1. A disc assembly used with a spraying apparatus for defining sharp edges in sprayed material provided by a material container of the spraying apparatus, said spraying apparatus being moveable on a supporting surface which receives the sprayed material, said disc assembly comprising: an axle member; and a pair of spaced apart discs mounted on said axle member; each disc including: a circular wall segment; a flange segment which extends axially outward from the wall segment toward the other disc and which lies a predetermined distance radially inward of the circumference of said disc, said flange segment receiving the edges of the sprayed material; and a rim segment which projects radially outward from the wall segment and which engages the supporting surface on which the spraying apparatus discharges the sprayed material, said rim segment disposed a predetermined distance axially away from the inner distal end of said flange wherein the inner distal end of said flange segment defines a radially inwardly extending retaining lip and said flange segment defines a retaining well for holding sprayed material.

4,895,305

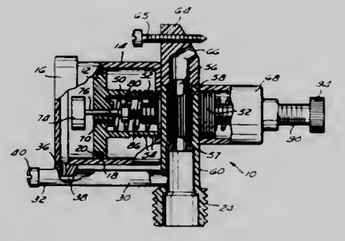
OSCILLATING PISTON DRIVEN SPRINKLER

Jonathan S. Powell, 5094 Tip Top Rd., Mariposa, Calif. 95338

Filed Nov. 21, 1988, Ser. No. 274,338

Int. Cl.[4] B05B *3/16*

U.S. Cl. 239—239 **11 Claims**



1. An oscillating sprinkler to connect at its upstream end to a water supply conduit, comprising:

(a) a sprinkler body having a cylinder with a closed end and a piston disposed in said cylinder operative to move toward and away from the closed cylinder end and a first compression spring urging said piston toward said closed cylinder end,

(b) a sprinkler nozzle to receive water from said conduit and supported on said sprinkler body to pivot about an upright axis, rack means operated by said piston and pinion means on said nozzle engaged with said rack means so that said nozzle rotates as said piston moves, said nozzle having an orifice adapted to direct water in a stream directed radially relative to the axis of pivoting of said nozzle, said stream pivoting as said nozzle pivots,

(c) said sprinkler body having a water inlet port to said cylinder and a bypass passageway connecting said upstream end of said sprinkler to said inlet port to bleed water thereto, and

(d) said piston having a water discharge passageway therethrough, a valve piece operable to close said discharge passageway disposed on the side of the piston toward said closed cylinder end, said piston having a bore and a valve stem secured to said valve piece and slidably disposed in said bore guiding said valve piece in movement from an open position away from said piston to a closed position closing said water discharge passageway, a valve foot at the opposite end of said stem from said valve piece, said sprinkler body supporting a second compression spring aligned with the axis of said stem facing said valve foot and pressing said valve foot with enough pressure to move said valve piece from said closed to said open position overcoming water pressure on said valve piece resisting opening when said piston has moved a selected distance from said closed end of said cylinder, said piston being returned to said closed end of said cylinder when said valve piece is moved to said open position.

4,895,306

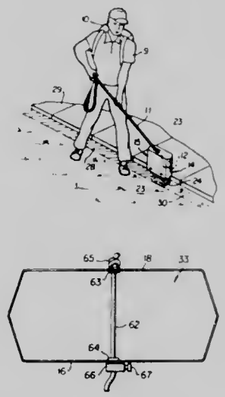
LIQUID TRIMMER SHIELD ACCESSORY FOR HERBICIDE SPRAY HEADS

Clarence D. Whitehurst, Jr., RFD 1, Box 37-A, Stokes, N.C. 27884

Continuation-in-part of Ser. No. 151,889, Feb. 17, 1988, abandoned. This application Aug. 15, 1988, Ser. No. 232,557

Int. Cl.[4] B05B *1/28*

U.S. Cl. 239—288 **2 Claims**



1. A hood accessory for a hand bell sprayer to be held above the ground for dispensing herbicides toward the ground along a restricted path, comprising in combination, a hollow hood body member having flexible walls defining a substantially closed end and an open end opening of defined shape for dispensing said herbicides in a pattern related to the shape of the opening, attachment means in the hood member for mounting internally a spray head of said sprayer in a position for directing herbicides out said open end and toward the ground when hand held and against the hood walls from which they may run downwardly for dispensing on the ground with the hood positioned to prevent the herbicides from being carried by the wind away from said pattern, and selectably adjustable means for retaining the hood opening in a plurality of shapes for defining various width herbicide dispensing flow paths from the spray head through the opening, wherein said attachment means directs spray of herbicides out of said opening onto said ground in said pattern along said path and wherein said hood body member with four thin plastic walls is shaped to form a substantially rectangular opening with bellows type structure in two opposite walls to permit the opening to attain said shapes by positioning of the remaining two sidewalls and a set of fastener members along the opening on opposite walls for holding the walls together, thereby to comprise said adjustable means.

2. A hood accessory for a hand held sprayer to be held above the ground for dispensing herbicides toward the ground along a restricted path, comprising in combination, a hollow hood body member having flexible walls defining a substantially closed end and an open end opening of defined shape for dispensing said herbicides in a pattern related to the shaped of the opening, attachment means in the hood member for mounting internally a spray head of said sprayer in a position for directing herbicides out said open end and toward the ground when hand held and against the hood walls from which they may run downwardly for dispensing on the ground with the hood positioned to prevent the herbicides from being carried by the wind away from said pattern, and selectably adjustable means for retaining the hood opening in a plurality of shapes for defining various width herbicide dispensing flow paths from the spray head through the opening, wherein said attachment means directs spray of herbicides out of said opening onto said ground in said pattern along said path and wherein a flexible cord is disposed through two opposing ones of said walls and has means operable therewith for adjustment of said opposing walls at various distances from each other.

4,895,307

ROTARY SPRAY DEVICE

Loan L. Swinehart, and Daniel A. Katt, both of N. Canton, Ohio, assignors to Washtronics, Inc., North Canton, Ohio

Filed Jul. 19, 1988, Ser. No. 221,342

Int. Cl.[4] B05B *3/12*

U.S. Cl. 239—263 **17 Claims**



1. A rotary spray device including:

(a) a lower housing;

(b) an upper housing mounted on and above the lower housing and generally isolated therefrom;

(c) a fluid supply conduit rotatably mounted within the lower housing and adapted to be connected to a source of high pressure fluid;

(d) nozzle means attached to the fluid supply conduit for

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spraying the high pressure fluid against a surface to be cleaned; and

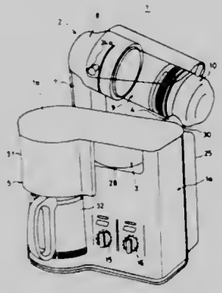
(e) motor means mounted within the upper housing and operatively connected to the fluid supply conduit by a drive belt for rotating said conduit and attached nozzle means, said drive belt passing through an opening formed between the upper and lower housings.

4,895,308

FULLY AUTOMATIC COFFEE MAKER

Mutuo Tanaka, No. 5-24-19, Sakaecho, Tachikawa-shi, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,860
Claims priority, application Japan, Jan. 25, 1988, 63-14086
Int. Cl.[4] B02C *1/08, 5/02*
U.S. Cl. 241—65 **12 Claims**



1. A fully automatic coffee maker comprising a roasting portion which heats coffee beans of the raw state by a heater so as to roast said coffee beans, a grinding portion which grinds coffee beans which have been roasted, said grinding portion being disposed at a height lower than a height of said roasting portion, a transfer portion which is connected between said roasting portion and said grinding portion and which after the roasting of the coffee beans by said roasting portion is completed automatically transfers the coffee beans which have been roasted from said roasting portion to said grinding portion, and an extracting portion into which the coffee beans which have been ground in said grinding portion are loaded and which extracts the coffee from the coffee beans loaded therein.

4,895,309

IMPACTOR FOR BREAKING LARGE METAL PIECES

Leonard Fritz, Romulus, Mich., assignor to Fritz Enterprises, Inc., Taylor, Mich.

Continuation of Ser. No. 93,631, Sep. 8, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 291,374
Int. Cl.[4] B02C *13/06*
U.S. Cl. 241—186 R **11 Claims**

1. An impactor for breaking large size, substantially solid, ferrous metal pieces into smaller pieces, comprising:

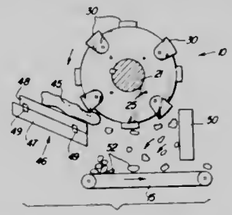
a massive, cylindrically shaped rotor having a horizontal axis, said rotor formed of a number of axially aligned, thick, large diameter, metal disks each having a circumferential edge, said disks fastened together in face to face relationship to form the rotor;

spaced apart, deep notches formed in the circumferential edges of the disks, with the notches located between end plates located at opposite ends of the rotor;

each notch having opposite sides covered by a face of the next adjacent disk, and each notch defined in said disk by a pair of opposing side walls connected at one end by a curved bottom wall and being open at the circumferential edge of its disk, said sidewalls diverging from said curved bottom wall such that each notch is wider at the circumferential edge than at the curved bottom;

an impact head rigidly mounted in each notch, with each impact head having an inner portion having a shape corresponding to said notch, which inner portion is inserted through the circumferential edge opening and received within the notch, and an outer portion extending radially outwardly of its respective notch, each of said impact heads being close to the same thickness as their notched disks and having its inner portion substantially and completely filling its respective notch;

the outer portion of each impact head extending from the circumferential edge of its disk a distance less than the depth of the notch and having an exposed curved free end substantially parallel to the circumferential edge of its disk with the outer portion of each impact head having side



faces and an end face which form a corner at their juncture with its exposed curved free end, with the corners forming the impact area of the head for concentrating the force of the rotor;

means for rotating the rotor about its horizontal axis at predetermined speeds;

means for feeding large, substantially solid metal pieces into the paths of rotation of the impact areas of the impact heads;

so that the impact areas each momentarily impact enormous concentrated forces upon any large pieces of metal in its path to break the large pieces into small pieces, as well as to disintegrate into small particles substantial parts of any inclusions contained within the large pieces, with the exposed curved free ends of the impact heads following along the path of the impact areas through the large piece of metal.

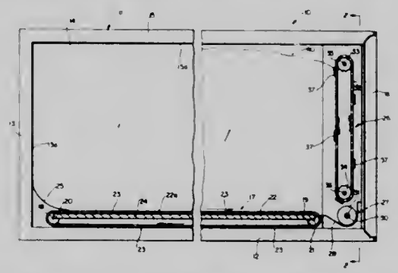
4,895,310

ICE BIN DISCHARGE MECHANISM FOR UNIFORM SIZE ICE

William F. Morris, Jr., P.O. Box 1046, Raleigh, N.C. 27602-1046

Filed Feb. 8, 1989, Ser. No. 307,532
Int. Cl.[4] B02C *11/02*
U.S. Cl. 241—200 **12 Claims**

1. An ice bin and discharge apparatus for discharge of uniform size ice to an outlet station for bagging or other use, comprising an ice bin in the form of an elongated insulated storage receptacle having insulated vertical side and end walls and horizontal bottom and top walls for containing a mass of ice, one of said end walls defining a discharge end wall, a base conveyor assembly adjacent and overlying the bottom wall spanning the length and width thereof and having a floor level conveyor means defining an upwardly facing flight having means for advancing the mass of ice toward said discharge end wall, first drive means for driving the floor level conveyor means at a predetermined speed, a transverse discharge conveyor inwardly adjacent the lower portion of said discharge end wall for conveying ice fragments conveyed thereto transversely of the bin through a discharge opening to said outlet station, an ice shearing mechanism at said discharge end wall comprising a plurality of thin elongated ice-shaving shearing blades positioned to lie in a vertical cutting path extending above and aligned with said discharge conveyor with said shearing blades collectively transversely spanning substantially the width of the bin at plural levels above the discharge conveyor, and second drive means for moving said shearing blades at a constant predetermined speed substantially through the height of the bin across the face of the ice mass being advanced toward said discharge end wall by said floor level conveyor



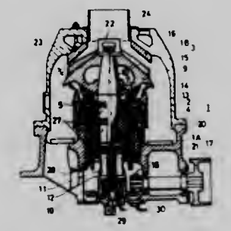
means to shear a selected thickness of ice particles of the confronting face of the ice mass to fall into the working zone of said discharge conveyor, said shearing blades being thin blade members of substantially rectangular cross-section having a cutting leading edge for shearing off ice particles from the face of the ice mass and the thin blades being of generally planiform configuration and arranged substantially in vertical planes paralleling said discharge end wall.

4,895,311

SUPPORTING STRUCTURE FOR THE CRUSHING HEAD OF A CONE CRUSHER

Kazuaki Arakawa, Osaka, Japan, assignor to Karimoto, Ltd., Osaka, Japan

Continuation of Ser. No. 115,566, Oct. 29, 1987, abandoned, which is a continuation of Ser. No. 924,106, Oct. 28, 1986, abandoned, which is a continuation of Ser. No. 721,722, Apr. 10, 1985, abandoned. This application Nov. 28, 1988, Ser. No. 277,395
Claims priority, application Japan, Dec. 28, 1984, 59-279646
Int. Cl.[4] B02C *2/04*
U.S. Cl. 241—207 **9 Claims**



1. A cone crusher, comprising:

a frame defining a sleeve having an upper end;

an eccentric situated for rotation within the frame;

a cylindrical socket shaft situated for reciprocal movement within the sleeve, said eccentric extending into and being supported by the socket shaft;

a crushing head partly defining a crushing chamber and having a portion extending into the eccentric for gyration of the crushing head relative thereto;

a hydraulic fluid chamber situated at the upper end of the sleeve below the crushing chamber, said hydraulic fluid chamber providing hydraulic pressure for reciprocating said eccentric and the crushing head; and

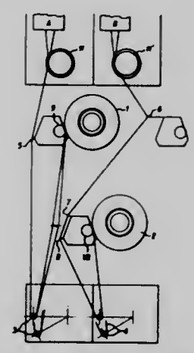
an outer cylinder which together with the upper end of the sleeve partly defines the hydraulic fluid chamber, said outer cylinder supporting said cylindrical socket shaft and being reciprocally moved by the hydraulic pressure in the hydraulic fluid chamber.

4,895,312

TAKE-UP MODULE FOR CONTINUOUS FILAMENTS

Pier G. Casalino; Carlo Serasso, and Mario Rossi, all of Vercelli, Italy, assignors to Industria Tessile Di Vercelli S.p.A., Milan, Italy

Filed Jul. 20, 1988, Ser. No. 221,862
Claims priority, application Italy, Jul. 29, 1987, 21492 A/87
Int. Cl.[4] B65H *54/20*
U.S. Cl. 242—35.5 R **3 Claims**



1. Take-up module for continuous filaments, in particular for cellulose acetate filaments, comprising:

a first take-up head equipped with a first and second take-up tube, each winding an individual thread;

a second take-up head equipped with a third and fourth take-up tube, each winding an individual thread, the axes of said first and second take-up heads lying in different parallel planes;

a first tension regulator along the path of a first pair of threads running between a first spinning cell and said first take-up head, said first tension regulator lying in a plane which differs from those in which the axes of the take-up heads lie;

a second tension regulator along the path of a second pair of threads running between a second spinning cell and said second take-up head, said second tension regulator lying in the same plane as said first tension regulator;

a first set of thread guides defining substantially a V-shape for said path of said first pair of threads, said first tension regulator being at the apex of said V-shape; and

a second set of thread guides defining a shape substantially in the form of consecutive first and second V's for said path of said second pair of threads, with a thread guide and said second tension regulator, respectively, at the apexes of said first and said second V, said path of said second pair of threads passing between said axes of said first and second take-up heads.

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4,895,313

TRAVELLING SERVICE UNIT FOR EXCHANGING WOUND BOBBINS

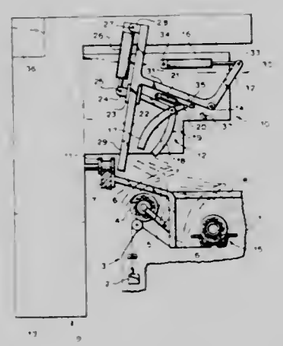
Frantisek Barysek, Ústí nad Orlicí, and Pavel Andrlík, Liberec, both of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Sep. 23, 1988, Ser. No. 249,485

Claims priority, application Czechoslovakia, Sep. 24, 1987, 6837-87

Int. Cl.[4] B65H *67/04, 67/06*

U.S. Cl. 242—35.5 A 9 Claims



1. A travelling service unit for exchanging wound bobbins removed from bobbin holders of a textile machine and for transferring them onto a conveyor belt arranged on the textile machine along said bobbin holders comprising

bobbin gripping and conveying means with driving means coupled to an operation control unit;

said gripping means attached to the conveying means arranged on a frame of the travelling service unit; and

conveying driving means for swinging said conveying means together with said gripping means transversely to a space above the conveyor belt about a longitudinal pivot extending in parallel to said conveyor belt;

said bobbin gripping means comprising a swinging gripper and a sliding gripper for seizing a wound bobbin at an outer diameter thereof, said swinging gripper and said sliding gripper being coupled to each other by a common pivot;

said swinging gripper having, outside said common pivot, a control arm coupled to gripping driving means secured to a sliding arm having a sleeve at its end;

said sleeve being coupled by means of a pivot to sleeve driving means and being adapted to slide along a guide rod and to swing together with said guide rod;

said guide rod being integral with one arm of a toggle lever arranged for swinging about said longitudinal pivot;

said guide rod having a control arm coupled by a pivot to said conveying driving means at one end of said conveying driving means; and

another end of said conveying driving means being journalled about a pivot on the frame of the travelling service unit.

4,895,314

DEVICE FOR UNWINDING A WEB OF MATERIAL FROM A REEL

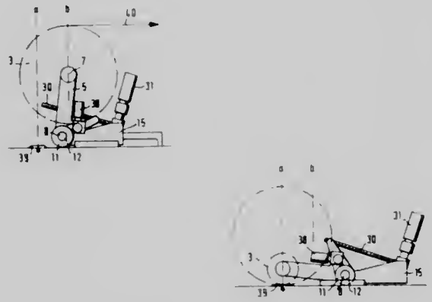
Karl Thievessen, Grevenbroich, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,338

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715475

Int. Cl.[4] B65H *19/10*

U.S. Cl. 242—58.6 5 Claims



1. In a device for unwinding a web of material from a reel, having two spaced apart supporting arms positioned on two sides of the web, means for pivoting the arms upwardly around an axis of rotation and wherein the arms have means for accommodating and holding the reel for rotation, the improvement wherein the means for pivoting comprises pivoting bearings for the supporting arms and means mounting the bearings for movement between two positions that extend horizontally and are mutually displaced across the axis of rotation, the means for pivoting the supporting arms including a rotating shaft that parallels the axis of rotation of a reel to be wound, means mounting the arms to the shaft to be non-rotatable with respect thereto and means for advancing the shaft horizontally across the axis of rotation of the reel, the advancing means comprising lateral casters and a carriage and a drive mechanism for advancing the carriage.

4,895,315

METHOD FOR REELING A WEB OF MATERIAL AND AN APPARATUS FOR IT

Jouko J. Salmela, Turku; Jukka Hietanen, and Timo Syrjänen, both of Heinola, all of Finland, assignors to Heinolan Newtec OY, Finland

Filed Jun. 17, 1982, Ser. No. 389,478

Claims priority, application Finland, Jun. 18, 1981, 811931

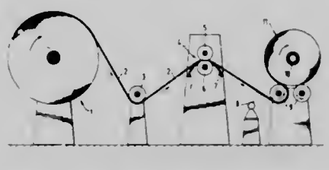
Int. Cl.[4] B65H *18/20, 35/02;* B31C *1/00*

U.S. Cl. 242—66 18 Claims

1. A continuous method of reeling a web of material onto a core base in a spindle-less reeling system to form a roll and core of desired thickness, in situ, which comprises

gluing the leading end of said web of material to a preformed core base, said preformed core base being supported by bearing rollers, said core base having insufficient strength and thickness to support the roll of desired thickness,

continuing gluing and rolling sufficient rounds of said web of material onto said core base such that the thickness of the core thus formed in situ, and thereby its strength, is sufficient for reeling the remainder of the roll and further handling of the roll, said core comprising said preformed core base having said sufficient rounds of said web of material glued thereto,



discontinuing gluing while continuously rolling additional rounds of said web of material until the roll is of the desired thickness,

cutting off the web of material, and attaching the trailing end of the web of material to the roll.

4,895,316

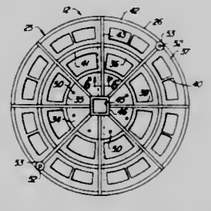
MOLDED SECTIONAL REEL

James S. Salloum, Troy, Mich., assignor to Creative Techniques, Inc., Auburn Hills, Mich.

Filed Aug. 15, 1988, Ser. No. 232,116

Int. Cl.[4] B65H *75/14, 75/22*

U.S. Cl. 242—71.8 18 Claims



1. A reel formed of a central hub with radially outwardly extending flanges on the opposite ends of the hub, comprising:

the hub being a plastic molded, thin-wall, relatively wide ring having an exterior wall surface, about which a reeled article may be wound, and an interior wall surface, and opposite, narrow, annular edges defining the opposite ends of the ring;

said flanges being formed of generally flat, disk-like plastic moldings having a central portion for overlying the ends of the hub and an outer portion for extending radially outwardly of the hub;

a continuous annular seat formed on the faces of the flanges adjacent to the hub ends and corresponding in shape to the hub edges, with said hub edges each engaging against its adjacent seat;

a number of elongated passageways integrally molded on the interior surface of the hub wall, with the passageways being circumferentially spaced apart and being arranged parallel to the axis of the hub;

elongated fasteners extending through the passageways and through corresponding aligned openings formed in the flange portions overlapping the ends of the hub, and with the fasteners rigidly securing the flanges to the hub;

said flanges being formed of plastic molded, substantially identical, radial sections, with each section having an exterior peripheral edge defining a portion of the periphery of the flange and having an outer portion forming part of the flange between the flange peripheral edge and the hub, and an inner portion overlapping a portion of the hub;

the adjacent radially directed edges of each section being formed to interengage with each other and being fastened together to form the rigid complete flanges;

whereby different flange sections may be interchanged and fastened together and to the hub for forming an assembled reel.

4,895,317

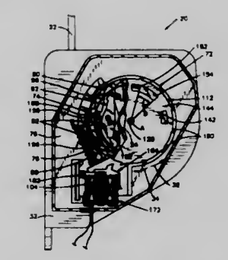
ELECTRICALLY ACTUATABLE LOCKING MECHANISM FOR A SEAT BELT RETRACTOR

Robert J. Rumpf, Grosse Pointe, and Angel Fernandez, Mt. Clemens, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Oct. 31, 1988, Ser. No. 264,638

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 R 13 Claims



1. A seat belt retractor comprising:

a spindle having seat belt webbing wound thereon, said spindle being supported for rotation in belt withdrawal and belt retraction directions;

a member movable between a first position in which said spindle is free to rotate in the belt withdrawal direction and a second position in which said spindle is blocked from rotation in the belt withdrawal direction;

a permanent magnet fixed to said member; and

an energizable electromagnet including a core located adjacent said permanent magnet for attracting said permanent magnet to thereby move said member to one of its first and second positions when said electromagnet is de-energized and for repelling said permanent magnet to thereby move said member to the other one of its first and second positions upon energization of said electromagnet.

4,895,318

MAGNETIC TAPE TRANSPORT WITH SIMPLIFIED THREADING ARRANGEMENT AND RELATED METHOD

George Wulfing, Huntington, N.Y., assignor to TDX Peripherals, Inc., Hauppauge, N.Y.

Filed Sep. 27, 1988, Ser. No. 249,722

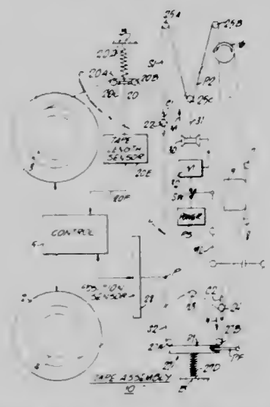
Int. Cl.[4] B65H *23/00*

U.S. Cl. 242—195 18 Claims

1. In a tape transport having a controllably rotatable supply reel means, a controllably rotatable take-up reel means, a capstan-head means to move tape for reproducing or recording, a translationally fixed supply idler means for guiding tape from the supply reel toward the capstan-head means, a translationally fixed take-up idler means for guiding tape from the capstan-head means to the take-up reel, and tape movement sensing means for controlling the rotation of the reels, the improvement comprising a translationally movable supply idler means for guiding tape in a U-shaped path from the translationally fixed supply idler means to the capstan-head means, a translationally movable take-up idler means displaced from said translationally movable supply idler means for guiding tape in a U-shaped path from the capstan-head means to the translationally fixed take-up idler means, a first non-stretchable flexible

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means interconnecting said translationally movable idler means, a first guiding means for guiding said first flexible means along a first path, a second non-stretchable flexible means interconnecting said translationally movable idler means, a second guiding means for guiding said second flexible means along a second path whereby movement of one of said translationally movable idler means in response to tape pulled



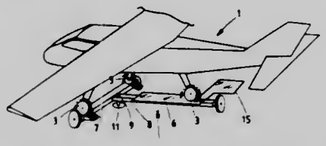
by the capstan-head means results in complementary movement by the other of said translationally movable idler means so that tape movement in a portion of the tape between the translationally fixed idler means in response to the pull of the capstan means is isolated from the reels, and means for connecting one of said flexible means to said tape position sensing means to give an indication of the amount of movement of said tape portion.

4,895,319

PARKING TROLLEY FOR LIGHT AIRCRAFT

Paul K. Bardsen, Johan Larsens vei 23, N-4230 Kopervik, and Endre Haraldseide, Skogveien 41, N-4250 Kopervik, both of Norway

PCT No. PCT/NO88/00032, § 371 Date Dec. 19, 1988, § 102(e) Date Dec. 19, 1988, PCT Pub. No. WO88/08393, PCT Pub. Date Nov. 3, 1988
PCT Filed Feb. 19, 1985, Ser. No. 286,890
Claims priority, application Norway, Apr. 27, 1987, 871735
Int. Cl.[4] B64F *1/22*
U.S. Cl. 244—115 **8 Claims**



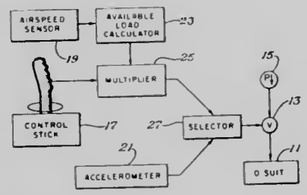
1. A parking trolley for light aircraft (1) with a couple of landing wheels (3,3), and a nose or rear supporting wheel (3'), comprising a substantially T-shaped frame (2) with supporting surfaces 4, 5 for the landing wheels (3,3), and a supporting surface (6) for the supporting wheel (3'), said T-frame (2) being at one turning point (9) arranged to be freely turnable about a vertical turning axis (11') in relation to a firm attachment (11) in the ground, to which the T-frame is turnably connected, and being supported by freely rotatable supporting members (12, 13, 14) at the two end portions of the T-frame, said parking trolley with a firmly clamped light aircraft swinging upwind in case of a wind load on the rudder of the aircraft, characterized in that the rotatable supporting members (12, 13, 14) consist of supporting wheels (12, 13, 14) having their wheel axes oriented like radii of said turning point (9), and with at least two of them (12,13) on the cross member (7) of T-frame (2) being releasably held and are swingable and lockable in a position with the wheel axes in parallel, preferably orthogonally to the main beam (8) of the T-frame, for turning a parking trolley about the firm point (11), and transport of the trolley with or without an attached aircraft, respectively.

4,895,320

ANTICIPATORY CONTROL SYSTEM FOR AN ANTI-G SUIT

Kenneth C. Armstrong, Hurst, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Nov. 8, 1988, Ser. No. 268,491
Int. Cl.[4] B64D *10/00*
U.S. Cl. 244—118.5 **3 Claims**



1. In an aircraft having a controller controlled by a pilot which provides a command for controlling pitch of the aircraft, an airspeed sensor which provides an airspeed value corresponding to airspeed, an accelerometer for providing an acceleration value as an indication of normal acceleration of the aircraft, and an inflation system having a compressed air system which supplies fluid pressure through a valve to an anti-G suit, a control means for controlling the pressure in the anti-G suit, comprising in combination:

available load means for computing an available load factor based on airspeed and weight of the aircraft;

means for monitoring the controller to detect a positive command signal when the pilot pulls on the control stick to begin a positive G-force maneuver;

modifying means for modifying the positive command signal by the available load factor to provide an anticipatory value corresponding to an estimated expected G-force based solely on the positive command signal and the available load factor, and for providing the anticipatory value substantially simultaneously with the giving of the positive command signal; and

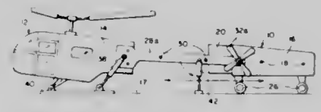
selector means for providing to the valve a signal representing the higher of the anticipatory value and acceleration value to control the valve to begin inflating the anti-G suit prior to actually undergoing the expected G-force if the anticipatory value is higher than the acceleration value and to maintain the anti-G suit at a correct pressure as the actual G-force increases and decreases.

4,895,321

HELICOPTER TRUCK DOLLY

John Huhn, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, c/o John Huhn, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jun. 1, 1982, Ser. No. 384,092
Int. Cl.[4] B64C *1/22*
U.S. Cl. 244—118.2 **2 Claims**



1. A helicopter removable container assembly, comprising in combination:

(A) a container;

(B) Means for securing said container to rear end of a helicopter fuselage whereby said container forms a continuation of said helicopter fuselage when attached thereto;

(C) a vehicle for transporting said container when said container is removed from said helicopter fuselage wherein said container further comprises:

(d) a storage compartment having a plurality of transverse threaded bolt holes in opposite side walls;

(e) a sleeve affix ®d to open end of said storage compartment;

(f) a pair of guides horizontal and transversely affixed to outer surface of said sleeve;

(g) a door placed across said open end of said storage compartment;

(h) a plurality of wheels mounted to bottom of said storage compartment, wherein said means for securing said container to rear end of helicopter fuselage comprises:

(i) a pair of rearwardly extending parallel booms each one having a plurality of bolt holes and affixed at one end to said helicopter fuselage for said container to travel therebetween;

(j) a pair of guide tracks horizontal and transversely affixed to inner surface of said helicopter fuselage so that said guides will position and allow said sleeve of said container to enter said helicopter fuselage;

(k) first hydraulic jack extending between rear end of runners and rear of said helicopter fuselage to support helicopter when securing said container;

(l) second hydraulic jack pivotally affixed to middle of said boom that extends to ground surface for additional support for said helicopter when securing said container; and

(m) a plurality of bolts each bolt engageable in each corresponding said bolt hole in each of said rearwardly extending booms and each corresponding said threaded bolt hole in said side wall of said storage compartment.

4,895,322

SELF-CONTAINED APPARATUS FOR DE-ICING AIRCRAFT SURFACES USING MAGNETIC PULSE ENERGY

Peter B. Zieve, 5766-27th Ave. NE., Seattle, Wash. 98105

Filed Sep. 18, 1987, Ser. No. 98,283
Int. Cl.[4] B64D *15/18*
U.S. Cl. 244—134 R **13 Claims**

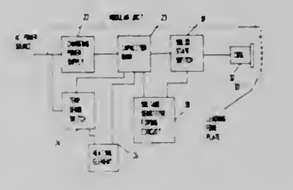
1. An electromagnetic de-icing system particularly useful for aircraft, comprising:

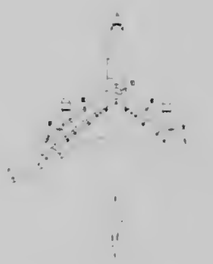
a plurality of individual, self-contained electromagnetic de-icing modules, connected in parallel, each de-icing module in turn comprising:

an actuator coil positioned in close proximity to an interior side of an aircraft surface to be de-iced, such as a leading edge of a wing of an aircraft, the actuator coil having a surface configuration which is substantially the same as the shape of the aircraft surface to be de-iced;

a power supply associated with said actuator coil, located in the immediate vicinity of and in a modular relationship with said actuator coil, each power supply in turn comprising:

a source of stored charge defining a selected voltage, said stored charge being sufficient to produce a current pulse





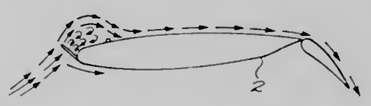
through said actuator coil when said source of stored charge is connected thereto, means responsive to the aircraft supply voltage for charging the source of stored charge, and control means for selectively connecting the source of stored charge to the actuator coil, thereby producing a current pulse in the actuator coil which produces a magnetic force which is large enough, when induced in the aircraft surface, to de-bond ice therefrom.

4,895,323

RAG CONTROL FOR POWERED LIFT AIRCRAFT

Fred W. May, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1983, Ser. No. 536,739
Int. Cl.[4] B64C *9/24*
U.S. Cl. 244—214 **10 Claims**



1. In an aircraft of the type in which during flight a part of the sustaining lift is derived from the propulsion system, apparatus comprising:

a generally laterally extending airfoil with a trailing edge at which jet flow from the propulsion system is deflected downwardly to provide sustaining lift during flight; and

a retractable member including a sharp edge and having a retracted position, and a deployed position in which it extends spanwise along at least a portion of the span of the

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airfoil substantially at the leading edge of the airfoil and projects forwardly and upwardly from the airfoil and in which its sharp edge is its forwardmost and upwardmost edge;

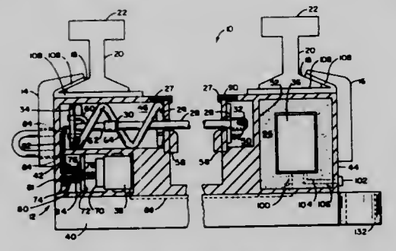
wherein when said member is in its deployed position, it causes flow around the airfoil rearwardly of itself to separate from the airfoil to reduce leading edge suction and leading edge thrust and thereby provide descent capability at a high propulsion system thrust setting but a slow aircraft speed.

4,895,324

REUSABLE DERAILMENT DETECTION AND SIGNALING DEVICE

Don R. Buckles, 316 Tucker St., Erwin, Tenn. 37650

Filed Jan. 12, 1989, Ser. No. 296,081
Int. Cl.[4] B61L *3/00, 1/20*
U.S. Cl. 246—170 **17 Claims**



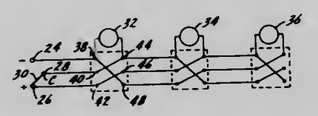
1. A portable, reusable derailment signaling device comprising elongated base means, clamping means on each end of said base means adapted to affix said base means firmly to the pedestals of spaced railroad tracks with said base means positioned therebetween, restraining means on said base means adjacent each end thereof, cable means attached at each of two respective ends to said restraining means and extending therebetween under substantial tension, one of said restraining means having a movable segment to which the cable end is attached such that derailment force applied to said cable in a generally normal direction to its axis will cause said cable to deflect from its axis and cause said segment to move, transmission means on said base means electrically energizeable to emit a radio signal, and electrical power means on said base means in electrical communication with said transmission means and actuable by said movement of said segment to energize said transmission means to emit said signal.

4,895,325

RAILROAD GATE ARM LAMP CIRCUIT

Donald L. LeVoir, Coon Rapids, Minn., assignor to Safetran Systems Corporation, Minneapolis, Minn.

Filed Nov. 10, 1988, Ser. No. 269,296
Int. Cl.[4] B61L *5/12*; B41L *9/04*; H05B *41/34*
U.S. Cl. 246—473.1 **3 Claims**



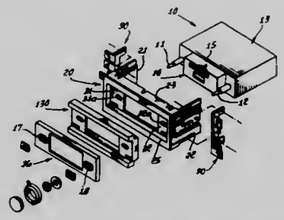
1. A railroad crossing gate arm electrical lamp system which provides two flashing lamps and one continuously operated lamp, each of said lamps having an internal electrical circuit therein, with the internal circuits being identical for each lamp, whereby the lamp are interchangeable in position with the lamp position determining its function, each lamp electrical circuit having a three-wire input connection and a three-wire output connection, the three-wire input connection of each lamp circuit including first, second and third terminals, with each first terminal being connected to a lamp light, the three-wire output connection of each lamp circuit including first, second and third terminals, with each first output terminal being connected to a lamp light, identical and reversible three-wire cables connecting the first flashing lamp with the second flashing lamp and the second flashing lamp with the continuously operated lamp, the three-wire input connection of the first flashing lamp adapted to be connected to line and common terminals of a power supply in which the common terminal is alternately connected to either one of the line terminals.

4,895,326

IN-DASH INSTALLATION KIT ADAPTABLE TO DIFFERENT RADIOS AND DIFFERENT DASH CONFIGURATIONS

Roy Nimpoeno, Northridge, and Rober J. Alves, Simi Valley, both of Calif., assignors to Scosche Industries, Inc., Moorpark, Calif.

Continuation-in-part of Ser. No. 199,797, May 27, 1988. This application Mar. 6, 1989, Ser. No. 319,114
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.1 **18 Claims**



1. In an in-dash radio installation kit, for installing a radio chassis or radio associated device chassis to a vehicle, the improvement comprising:

(a) a box-like, molded plastic frame having wall means including end walls and a main front panel interconnecting the side walls,

(b) the end walls having re-entrant recesses formed therein, said recesses having inner surfaces which are forwardly elongated,

(c) and through openings in said end walls for reception of connectors that connect the end walls to the chassis received between said end walls, with connector head means retained in said recesses and connector shanks passing through said openings that intersect said recesses,

(d) certain of said through openings being forwardly elongated for adjustment of the shanks therein,

(e) said recesses being forwardly elongated, the end walls being upright, and there being multiple of said recesses in each end wall, the multiple recesses vertically spaced apart,

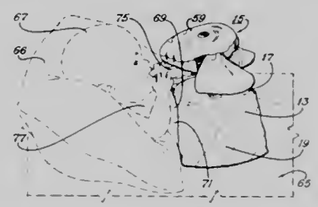
(f) and including brackets extending vertically over said recesses, and other holes through said end walls, and aligned with said brackets fastened to said end walls, said brackets also adapted for adjustable attachment to vehicle dash structure.

4,895,327

INFANT FEEDING AID APPARATUS AND METHOD

Shirley L. Malone, 1717 Avenue A, Grand Prairie, Tex. 75051, and Maxine R. Spurlock, P.O. Box 66, Venus, Tex. 76084

Filed Feb. 21, 1989, Ser. No. 313,052
Int. Cl.[4] A45C *9/00*
U.S. Cl. 248—102 **12 Claims**



1. An apparatus for aiding feeding of an infant while the infant is placed face-up on a substantially planar feeding surface with its torso in a substantially prone position, said torso defined in-part by a front and two sides comprising in combination:

a baby bottle;

a center section for placement across the front of the torso of the infant during feeding;

a first anchor section having two ends, coupled to said center section at one end and weighted at the opposite end for placement along one side of the torso of the infant during feeding;

a second anchor section having two ends, coupled at one end to said center section opposite from and axially aligned with said first anchor section and weighted at the opposite end for placement along the opposite side of the torso of the infant during feeding, wherein said first and second anchor sections cooperate to anchor the apparatus to said feeding surface, to secure said center section in position across the front of the torso of the infant, and to minimize side-to-side movement thereof, while minimizing the amount of weight placed on the infant's torso; and

means for securing said baby bottle to said center section in a position aligned with the infant's torso,

said means for securing comprising a cushion substantially filled with lightweight, compressible, resilient filler material, fastener means being located on one side of said cushion which engages cooperating fastener means on said center section, so as to secure said bottle between said cushion and said center section.

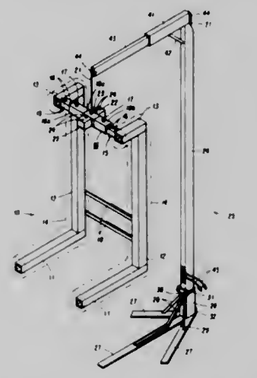
4,895,328

THERAPEUTIC DEVICE FOR SUFFERERS OF BACK PAIN

Terrance Ryan, Box 34, Macklin, Saskatchewan, Canada (S0L 2C0)

Continuation of Ser. No. 61,807, Jun. 15, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 362,889
Int. Cl.[4] A61H *1/02*
U.S. Cl. 248—124 **6 Claims**

1. A therapeutic device comprising a cradle assembly, the cradle assembly including a pair of laterally spaced, generally parallel arm members having forward and rearward ends, arm member supporting means adjacent the rearward ends of the arm members and rigidly connected thereto and to each other the arm member supporting means also rigidly interconnecting the arm members and including means for adjusting said spacing between the arm members, the arm members, said adjusting means comprising sliding joint connections which adjust each of said arm members and their corresponding arm member supporting means in parallel relationship to each other when adjusted being effective to closely straddle the body and to underlie the forearms of a person seated on an underlying surface with the person's elbows adjacent the rearward ends of the arm members and the person's upper arms generally upright; and elevating means for adjusting the height of the cradle assembly relative to said underlying surface effective to exert an upward force upon the seated person's arms sufficient to at least partially lift the weight of the person's body from said underlying surface.

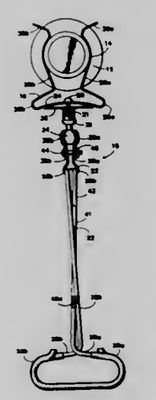


4,895,329

FLASHLIGHT CLAMP

Charles B. Sloan, Apt. No. 6, 11351 N.E. Glisan, Portland, Oreg. 97220

Filed May 24, 1989, Ser. No. 357,316
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—229 **2 Claims**



1. A flashlight holder and positioner comprising:

(a) a support member including a flat disk portion having respective top and bottom circular faces, with a threaded bore being centrally defined in said top circular face of said flat disk portion, and a pivoting ball portion transversely disposed from, and fixedly attached to, said bottom circular face of said flat disk portion;

(b) a threaded connector engaging said threaded bore;

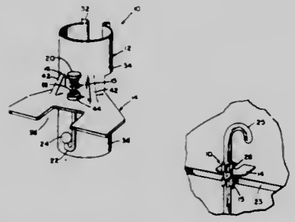
(c) a U-shape retaining member formed from a single strip of resilient spring-like material, said member including an arcuately-bent compressible portion having a central opening therein and a pair of opposed ends, said compress-

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ible portion thereof engaging said base portion of said support member in a manner wherein said opposed ends of said retaining member press against said top circular face of said flat disk portion of said support member, said retaining member being secured to said top circular face by said threaded connector passing through said central opening, said retaining member further having a pair of leg portions each extending from a respective opposed end of said compressible portion and folding back towards each other in opposing relationship, a pair of arcuately-bent retaining arm portions each extending from a respective leg portion, said retaining arm portions acting together to clamp a flashlight body therebetween in tension gripping fashion, said opposed ends pressing against said top circular face of said disk so as to permit said retaining member to be rotated about said threaded connector without creating a change in said tension applied by said retaining arms on the flashlight body, said tension being adjustable by rotational positioning of said threaded connector relative to said bore; and

(d) a clamping member connected to said pivoting ball portion of said support member for detachably clamping said holder/positioner to a suitable support surface.

4,895,330
CANE HOLDER
Richard F. Anstead, 52 Summer St., Norwell, Mass. 02061
Filed Mar. 13, 1989, Ser. No. 323,508
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—229 **7 Claims**



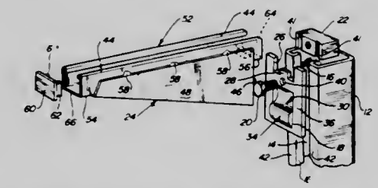
1. An apparatus for removably holding a cane on a generally planar member comprising:

a body having an elongate, substantially cylindrical tubular section and an opening for receiving said cane into said tubular section, said opening being substantially parallel to a longitudinal axis of said tubular section; and

a flange connected to said body, said flange extending in a plane substantially normal to the longitudinal axis of said tubular section; and

a means for securing said body and said flange to said generally planar member which is substantially normal to the longitudinal axis of said tubular section, said means for securing said body and said flange to said generally planar member comprising a spring-biased rod oriented substantially perpendicular to said flange and passing through an aperture in said flange, said spring-biased rod having a knob on one end and being substantially U-shaped on the opposite end, and biased such that said substantially U-shaped portion of said rod is biased toward said flange.

4,895,331
SHELF BRACKET
Charles O. Nehls, Allen Park, Mich., assignor to Unistrut International Corp., Ann Arbor, Mich.
Filed Mar. 31, 1989, Ser. No. 331,235
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—245 **11 Claims**



1. A cantilevered shelf support for installation on a vertically extending channel having a face containing a longitudinally extending slot bordered by inwardly projecting flanges comprising, in combination:

a substantially rectangular mounting plate having a channel engaging side with a channel projection for insertion into said channel slot, a support bracket side having a bracket projection, a mounting hole through said plate, and a vertically extending mounting tab;

a nut for engaging the interior of said channel and a bolt passing through said mounting hole engaging the nut for drawing the channel engaging side of said mounting plate into engagement with said channel face; and

a support bracket having a horizontal shelf engaging surface and a vertically extending bearing surface for engagement with the support bracket side of said mounting plate with a recess for receiving said bracket projection and a vertically extending socket for receiving said mounting tab;

whereby said mounting plate is affixed to said channel with said channel projection extending into said slot, and said nut and bolt drawing said mounting plate into securing contact with said channel face; and said support bracket is affixed to said mounting plate by bringing said bearing surface into contact with said mounting plate, inserting said mounting tab into said socket with said bracket projection in said recess.

4,895,332
ANTI-SLIP GRAB RAIL
Randall C. Hansen, Lake Forest, Ill., and Gilbert H. Krahn, Kenosha, Wis., assignors to A. L. Hansen Manufacturing Company, Waukegan, Ill.
Filed Sep. 6, 1988, Ser. No. 240,942
Int. Cl.[4] A47H *1/14*
U.S. Cl. 248—251 **29 Claims**

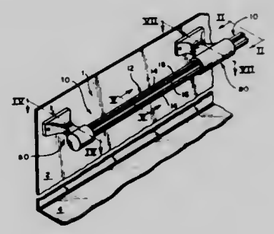
1. A grab rail mounted to a support surface, said grab rail comprising:

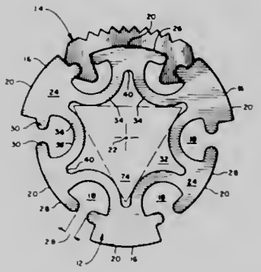
a rigid elongate bar having formed therein at least two outer cavities opening transversely outwardly of said bar;

at least two elastomeric inserts respectively disposed in said outer cavities and extending transversely outwardly at least to a location proximate an exposed surface of said bar, said at least two inserts and at least one exposed surface of said bar collectively forming gripping surfaces disposed so as to be contacted by the hand of a user who has gripped the grab rail; and

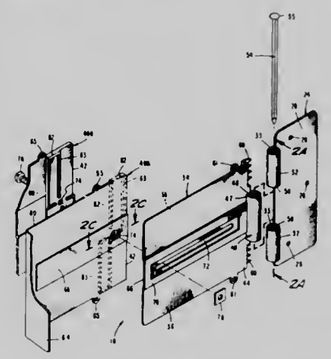
a mounting stanchion coupled to the bar and secured to the mounting surface;

said bar oriented in said stanchion such that at least one of said inserts is interposed between the bar and the support surface to provide an anti-slip surface when the user grips the bar with at least part of the hand extending between the bar and the support surface.





4,895,333
DRAPERY TIEBACK SUPPORT
James P. Antinora, 76 South Vincent, Apt. #56, Upland, Calif. 91786
Filed Mar. 28, 1988, Ser. No. 174,220
Int. Cl.[4] A47H *13/01*
U.S. Cl. 248—289.1 **28 Claims**



3. A support for holding a tieback and a return of each of two draperies in relationship to a vertical structure such as a wall, the draperies hanging down along the structure in vertically extending folds with the return projecting toward the structure, the support comprising:

(a) a base comprising a mounting flange for mounting to the vertical structure;

(b) a first extension arm having a proximal portion for attachment to the base and an outer end for supporting a portion of a first tieback and return;

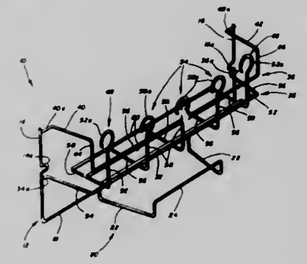
(c) means for adjustably securing the first extension arm to the base so that the distance between the outer end of the first extension arm and the structure can be adjusted;

(d) a second extension arm for supporting a portion of another tieback and return so that the support can be used for two pair of draperies such as at a corner of the structure, the second extension arm having a proximal portion for attachment to the base and an outer end for supporting a second tieback and return;

(e) means for maintaining the outer ends of the two extension arms spaced apart a sufficient distance from each other that the two tiebacks and two returns can fit between the two arms; and

(h) means for adjustably securing the second extension arm to base plate so that the distance between the distal end of the second extension arm and the structure can be adjusted.

4,895,334
WALL-MOUNTABLE CADDY
Thomas R. Bajek, LaGrange Park, and John P. Clasp, Lemont, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Jan. 17, 1989, Ser. No. 297,597
Int. Cl.[4] A47H *1/16*
U.S. Cl. 248—302 **10 Claims**



1. A wall-mountable caddy comprising:

main frame means mountable to a wall;

a basket portion supported by said main frame portion comprised of upper and lower basket frame members connected to said main frame means

a plurality of article holder means, a selected number of said holder means being attached to at least one of said basket frame members, said selected number being less than all of said holder means, and said unconnected holder means being spaced from said basket frame members to define an article receiving space therebetween; and

means connecting said holder portions to each other and thereby connecting said unconnected holder means to said caddy.

4,895,335
BOTTOM ADJUSTING LOAD SUPPORT
James Oliver, 28165-B Front St., #121, Temecula, Calif. 92390
Filed Apr. 24, 1989, Ser. No. 342,353
Int. Cl.[4] B66F *3/10*
U.S. Cl. 248—354.3 **4 Claims**

1. A load bearing support comprising:

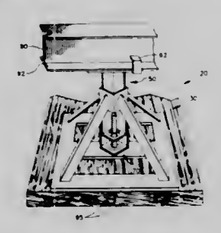
a collar having a vertical axis and a top end;

a stand including:

a base; and

leg means connected to said base, extending upward and

forming a pyramid for supporting at its vertex said collar top end above said base;
a vertical leg means connecting said collar to said base;
a vertical support member supported in a vertical position by and within said collar for vertical movement within said collar; said vertical support member including:
an upper end disposed above said collar top end including load support means for supporting a load; and
a lower end;



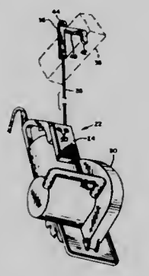
means for preventing said vertical support member from rotating within said collar; and
height adjustment means connected to said vertical support member lower end for adjusting the height of said vertical support member relative to said base; such that compressive forces from vertical loads applied to said load support means are transmitted to said base thru said adjustment means and such that forces caused by lateral loads applied to said load support means are transmitted to said base thru said collar and said legs.

4,895,336

IMPROVED POWER TOOL

Richard G. Lieberman, P.O. Box 245, Hanalei, Hi. 96714

Division of Ser. No. 52,598, May 20, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 268,782
Int. Cl.[4] B25B *15/00*
U.S. Cl. 248—690 **5 Claims**



1. An improved power tool comprising:
a power saw having first and second ends, the power saw also having a power saw body with an exterior surface positioned between the ends;
a hook adapted to hang from a wooden framing member, the hool having an elongated first leg with a longitudinal axis extending in a first direction and a hool forming portion at one end of the first leg, the hook forming portion having a hook end portion which together with the first leg defines a hook opening which is sized to hang from the framing member;
a hook attachment assembly having a housing detachably mounted to the exterior surface, the housing projecting outwardly from the exterior surface and from the power saw body, the housing having a socket for receiving the first leg of the hook, the hook attachment assembly having means engaging the hook to maintain the hook in a first position against pivoting movement relative to the housing with the first leg of the hook in the socket and the hook opening substantially closed by the tool body and permitting the shifting of the hook from the first position to a position in which the hook opening is open to receive the wooden framing member from which the tool is to be hung;
the hook attachment assembly being mounted to the body so as to prevent the hook from projecting beyond either of the first and second ends of the power saw when the hook is in the first position; and
the hook end portion being exposed when the hook is in the first position.

4,895,337

ADJUSTING INSTRUMENT FOR ELECTRICALLY ADJUSTING THE INTERIOR MIRROR OF A MOTOR VEHICLE ABOUT TWO MUTUALLY PERPENDICULAR AXES

Aane A. Oskam, De Meern, and Hermanus M. 1. Koot, Montfoort, both of Netherlands, assignors to IKU Holding Montfoort B.V., Montfoort, Netherlands

Filed Apr. 12, 1988, Ser. No. 180,782
Claims priority, application Netherlands, Apr. 14, 1987, 8700878
Int. Cl.[4] G02B *7/18*
U.S. Cl. 248—487 **6 Claims**

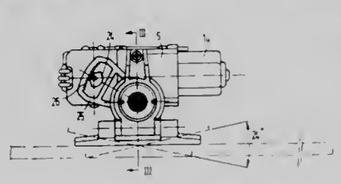
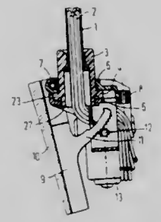


Fig. 7



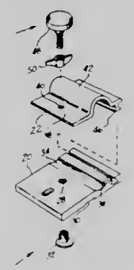
1. Electrically adjustable interior mirror structure of a motor vehicle, said structure comprising:
a suspension device suspendable at a point of suspension from a motor vehicle interior, said suspension device including a housing;
a mirror mounting plate connected to said suspension device and adjustable about two mutually perpendicular axes;
a mirror mounted to said plate; and
two electrically operable drive units accommodated in said housing, said drive units having respective output shafts extending perpendicular to one another and connected to said mirror mounting plate for adjusting said mirror mounting plate about said axes thereof, respectively,
said drive units and said mirror mounting plate having the mirror mounted thereto being so disposed relative to the point of suspension of said suspension device that when the suspension device is suspended, the torque exerted by said drive units at the point of suspension is equal but opposite to the torque exerted at the point of suspension by said mirror mounting plate and said mirror.

4,895,338

RELEASABLE ANCHOR FOR VEHICLE SEATS

Andrew Froutzis, P.O. Box 4110, Elkhart, Ind. 46514

Filed Dec. 27, 1988, Ser. No. 291,217
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—503.1 **2 Claims**



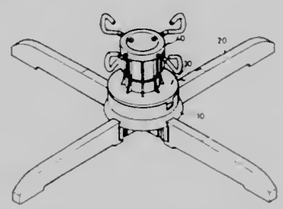
1. A bracket for releasably securing a piece of furniture to a vehicle floor, said bracket comprising a base member, means for securing said base member to a vehicle floor, said base member defining a first channel for cradling a depending elongated support tube from a piece of furniture, said base member further defining a second channel generally paralleling said first channel, a depending guide slidably fitted in said second channel, said guide slidable along a longitudinal direction with respect to said elongated support tube and base member, and an anchor member defining a channel part aligned with said first channel to encompass said support tube, said anchor member further including a flange extending from said channel part away from said guide, means extending through said flange into said base member for releasably securing the anchor member to the base member to clamp said support tube therebetween.

4,895,339

DETACHABLE SWIVELLING STRUCTURE

Chen Yang, 3th Fl., 21, Lane 20, Chung Cheng North Rd., San Chung City, Taipei Hsien, and Chu Ven-Chung, 3th Fl., 8, Lane 42, Yu Hsi St., Yung Ho City, Taipei Hsien, both of Taiwan

Filed Sep. 2, 1988, Ser. No. 240,092
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—522 **2 Claims**



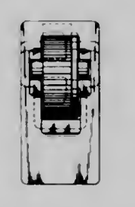
1. A detachable swivelling structure comprising a round base, four supporting legs being perpendicularly engaged together and being secured to said round base, a lid fixed on said round base, the upper portion of said lid fixedly mounting a bush, a series of ribs spaced around the periphery of said bush for rendering stability to said bush mounted on said round base, a turning base swivellingly secured in said bush, the bottom of said round base being provided with two channels disposed into a cross, and each of said channels being provided with two positioning pins, one of said pins being located near the circumference of said round base, while the other pin is located near the center of said round base, both sides of said positioning pin near the circumference of said round base having two movable tenons, respectively, a driving device being mounted inside said round base for driving said turning base, each of said supporting legs having a free end formed into a curved shape, while the other end of such supporting leg is provided with a tenon-and-mortise assembly, lateral sides of each of said supporting legs being provided with two vertical grooves, each of said supporting legs being furnished with a positioning pin hole, the upper portion of said turning base defining a pivotal sleeve provided with a number of transversely threaded openings, a corresponding number of hook screws passing through said openings for fastening a Christmas tree in said turning base, the lower portion of said turning base having a spindle for receiving driving power from said driving device.

4,895,340

CLAMP FOR ADJUSTING THE THROUGHFLOW CROSS-SECTION OF A TUBE, I N PARTICULAR FOR MEDICAL DEVICES INTENDED FOR ONCE-ONLY USE

Hans-Jürgen Forberg, Sebenter Weg 4, D-2432 Damlos, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,174
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738965
Int. Cl.[4] F16L *55/14*
U.S. Cl. 251—6 **5 Claims**



1. A clamp for adjusting the throughflow cross-section of a tube, in particular for medical devices intended for once only use, comprising:
an elongated clamp housing of substantially U-shaped cross-section having side walls and a cross-piece;
a clamping roller having a circumferential surface and being longitudinally displaceable in said housing, whereby a first part of the tube is adapted to be fully clamped between said housing cross-piece and said circumferential surface;
an annular concentric notch having annular surfaces provided in a peripheral corner area of said clamping roller for the purpose of forming a further clamping area, said annular surfaces being formed as clamping surfaces for the remaining tube portion; and
a clamping ridge having a clamping surface and being integral with a housing side wall and positioned axially opposite to the radial clamping surface of said annular notch and adapted to narrow the throughflow cross-section of the remaining portion of the tube in the longitudinal direction of the housing, at least one of said radial clamping surfaces of said annular notch and said clamping surface of said clamping ridge extending at an inclination to the clamping surface of said housing cross-piece for the purpose of defining a specific triangular cross-section of said further clamping area.

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4,895,341

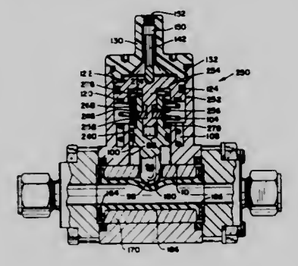
PINCH VALVE

Cal R. Brown, Euclid; Edward M. Yusko, Jr., Denmark, and Peter C. Williams, Cleveland Heights, all of Ohio, assignors to Whitey Co., Highland Hts., Ohio

Continuation-in-part of Ser. No. 252,257, Sep. 30, 1988, which is a continuation-in-part of Ser. No. 177,971, Apr. 5, 1988, Pat. No. 4,800,920. This application Dec. 19, 1988, Ser. No. 286,527

Int. Cl.[4] F16K *31/163*; F16L *55/...*

U.S. Cl. 251—8 **17 Claims**



1. A valve comprising:
a body having a bore extending therethrough;
a flexible member received in said bore and having a passage defined therethrough adapted to be selectively opened and closed;
a closure member at least partially received in said body, said closure member selectively engaging said flexible member for opening and closing said passage;
means for selectively advancing/retracting said closure member toward/away from said flexible member, said advancing/retracting means being movable between open and closed positions; and,
means for limiting forces imposed by said closure member on said flexible member when said advancing/retracting means is in said closed position.

4,895,342

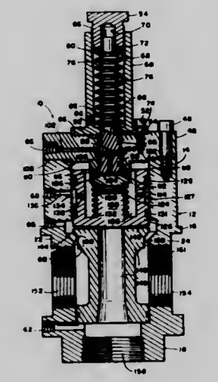
RADIAL FLOW VALVE ASSEMBLY

Eugene P. Feild, Webb City, Mo., assignor to Laminar Fluid Controls, Inc., Fort Wayne, Ind.

Filed Jun. 20, 1988, Ser. No. 209,421

Int. Cl.[4] F16K *47/04*

U.S. Cl. 251—120 **11 Claims**



1. In a valve assembly of the type having a housing; means in the housing for defining a valve capable of being opened and closed, said valve having a pair of valve members, one of which is moveable, each of the valve members having a working face; said housing having inlet means for permitting a flow of fluid thereinto and to a location adjacent to the outer periphery of the working faces; one of the valve members having an orifice extending thereinto from its working face, the working faces being engagable with each other to close the valve, the orifice being closed when the valve is closed; and means coupled with the housing for permitting a flow of fluid out of said orifice, wherein the improvement comprises means disposed between said inlet means and the outer peripheries of said working faces for restricting the flow of fluid therebetween said restricting means defining an annular opening disposed about the outer peripheries of said working faces and being defined by the outer surface of one of said valve members and by an inner surface of said housing, said annular opening having a cross-sectional area of less than approximately 200% of the cross-sectional area of said orifice.

4,895,343

APPARATUS FOR DRIVING A THROTTLE VALVE

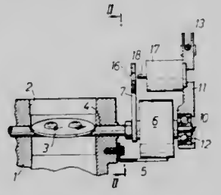
Makoto Sato, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1989, Ser. No. 322,853

Claims priority, application Japan, Mar. 14, 1988, 63-59990

Int. Cl.[4] F16K *31/04*; F02D *9/02*

U.S. Cl. 251—129.03 **9 Claims**



1. An apparatus for driving a throttle valve, comprising a throttle shaft provided with the throttle valve, the throttle shaft being rotatably supported on a support body and being urged by a spring in a direction of closing the throttle valve, electric driving means connected to the throttle shaft for electrically driving said shaft when energized and arranged so that when electric power is deenergized, connection to the throttle valve is released, a connecting member connected to the throttle valve such that no displacement in relative angle therebetween can occur, a lever connected to a manual operating member and mounted such that a displacement in relative angle with the throttle shaft can occur, said lever urged by another spring in a direction of closing the throttle valve, stoppers provided on the support body so as to define an angular displacement of the lever and of the connecting member on the side on which the throttle valve is closed, and electric connection means for connecting the connecting member and lever in the same phase when electric power is deenergized and releasing the connected state therebetween when electric power is energized.

4,895,344

ELECTRIC CONTROL MOTOR

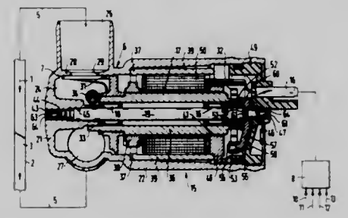
Günter Brand; Richard Gerber, both of Stuttgart; Gerold Grimm, Leonberg; Harald Kalippke, Besningen, and Harald Sailer, Markgroningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 8, 1988, Ser. No. 203,800

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728589

Int. Cl.[4] F16K *31/04*

U.S. Cl. 251—129.11 **5 Claims**



1. An electric control motor, in particular for controlling a throttle cross section in a line carrying a fluid to an internal combustion engine, having an armature (17) rotatable in a housing (22), a spiral spring (32) connected by an inner end to said armature which rotates said armature in said housing counter to the force of said spiral spring, said spiral spring including an outer end (53) which is secured on an adjusting element (58), said adjusting element is located such that it is variable independently of a rest position of said armature (17), in order to set a force of the spiral spring (32) on said armature, said adjusting element (58) is rotatably supported coaxially with said armature (17) and includes a driver arm (57) which engages said outer end (53) of said spiral spring (32), said housing (22) includes a threaded bore (43) into which an outer screw end (44) of an armature shaft (19) is threaded, and said adjusting element (58) is firmly connected to said shaft about which said armature (17) is rotatably supported.

4,895,345

VALVE SOCKET FOR THE ACCOMMODATION OF THE GAS BOTTLE VALVE OF COMPRESSED GAS CONTAINER MADE OF HIGH-ALLOY CHROME-NICKEL STEELS

Karl H. Gladbach, Frechen, and Martin Kesten, Roerath, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

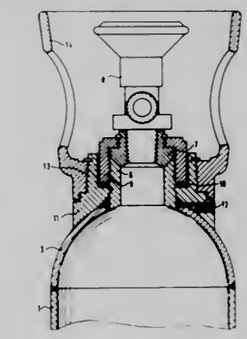
Filed Aug. 10, 1988, Ser. No. 230,495

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727326

Int. Cl.[4] F16K *51/00, 27/08*

U.S. Cl. 251—144 **5 Claims**

1. In a valve socket of a gas bottle valve of a compressed gas container made of high-alloy chrome-nickel steels wherein the compressed gas container has an upper cap to which the valve socket is secured, the improvement being in that said valve socket consists of a cylindrical neck piece welded to said upper cap, an insert being provided with a threaded opening in which said gas bottle valve is threadably connected, mounting means detachably connecting said insert with said neck piece in a gas



tight manner, and the inside diameter of said neck piece being larger than the diameter of said threaded opening of said insert.

4,895,346

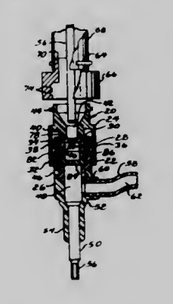
VALVE ASSEMBLY

Carl J. Steigerwald, Fox Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Filed May 2, 1988, Ser. No. 189,097

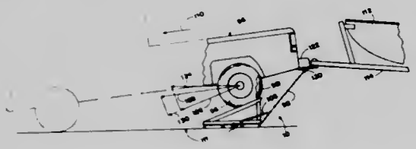
Int. Cl.[4] F16K *37/28*

U.S. Cl. 251—149.1 **18 Claims**



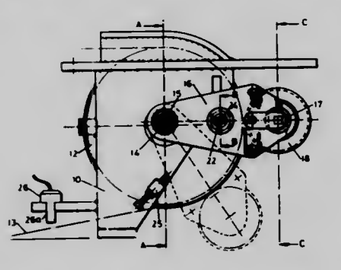
1. A valve assembly, comprising:
a hollow body member having a cavity;
a compression member received on one end of the body member and having an annular flange aligned with the cavity;
means for adjusting the position of the compression member relative to the body member;
a first elastic valve member received in the cavity and having a disc with slit means extending therethrough, and annular rim extending from the disc; and
a second elastic valve member received in the cavity and having a disc with slit means extending therethrough, and an annular rim extending from the disc, said first and second valve members sealingly engaging against a catheter passing therethrough, and being responsive to compression by the compression member to immobilize the catheter.

4,895,347
STARTING RAMP
Jerome J. Anderson, 20125 SW. Tualatin Valley Hwy., #2, 22A, Aloha, Oreg. 97006
Filed Nov. 21, 1988, Ser. No. 274,391
Int. Cl.[4] E02C *3/00*
U.S. Cl. 254—98 17 Claims



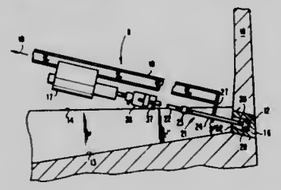
1. A starting ramp assembly for use with a wheeled vehicle for enhancing the starting ability of the vehicle comprising:
a wedge-shaped ramp having a ground-contacting base including a substantially rectangular frame having opposed, spaced apart sides and opposed, spaced apart ends, and having spaced cross pieces between the sides thereof forming plural, box-like regions within the frame, and which further includes plural base pads mounted to said frame in said regions and an inclined vehicle-support surface extending upward from one end of said base;
connecting means for connecting said ramp to the vehicle and for positioning the vehicle on said ramp at a predetermined location on said vehicle-support surface; and
direction orienting means connected to said ramp for providing ramp directional control after the vehicle is clear of said ramp.

4,895,348
BACK TENSION DEVICE FOR WINCHES
Thomas M. Craig, Midlothian, United Kingdom, assignor to MacTaggart Scott (Holdings) Ltd., Midlothian, Great Britain
Filed Jun. 16, 1988, Ser. No. 207,713
Claims priority, application United Kingdom, Jun. 20, 1987, 8714493
Int. Cl.[4] B66D *3/04*
U.S. Cl. 254—391 6 Claims



1. A back tension device for a winch for carrying cable, said device comprising a freely-rotatable pulley around which the cable is wound, said pulley adapted to be mounted adjacent a winch drum; an arm pivotally mounted about said pulley for pivotal movement about an axis which is offset relative to the axis of rotation of the pulley; means for effecting limited pivotal movement of the arm in response to rotation of the pulley; and means on said arm for engaging the cable wound around said pulley and urging the cable against the pulley when said limited pivotal movement of the arm is effected, in order to apply a back tension to the cable.

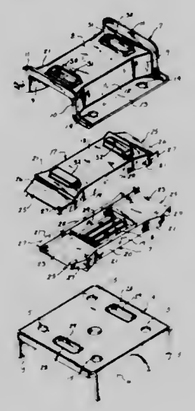
4,895,349
APPARATUS AND METHOD FOR BORING THROUGH THE TAPHOLE IN A MOLTEN METAL BLAST FURNACE
Gilbert R. Broom, Schererville, Ind., assignor to G.R.B. Enterprises, Inc., Schererville, Ind.
Continuation-in-part of Ser. No. 122,023, Nov. 18, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,157
Int. Cl.[4] C21B *7/12*
U.S. Cl. 266—45 19 Claims



1. A method for boring through the taphole in a molten metal blast furnace, comprising the steps of:
providing a rotary percussion drill adapted for reciprocal rectilinear motion;
providing a drill shaft assembly having:
a drill tool piece shaft having a first end and a second end and a passageway extending through at least a portion of its length,
a drill shaft having a first end connected with the second end of said drill tool piece shaft and having means for holding a drill bit, said drill shaft having a solid cross-section along substantially its entire length,
a drill bit held by the second end of said drill shaft,
air channel means disposed along the length of the drill shaft assembly for directing air flow toward but from a point above the second end of said drill shaft, said air channel means being in flow communication with the passageway of said drill tool piece, and
coupler means for connecting the second end of said drill tool shaft to the first end of said drill shaft;
operatively connecting the first end of said drill tool piece shaft with the rotary percussion drill;
applying pressurized air into the passageway at the first end of said drill tool piece shaft so that pressurized air is directed along the drill shaft assembly and toward said drill bit; and,
engaging said rotary percussion drill causing said drill bit to bore into the taphole of a molten metal blast furnace.

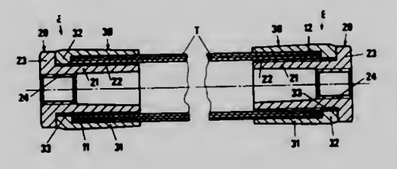
4,895,350
AXLE MOUNT CONSTRUCTION FOR A FIBER REINFORCED RESIN LEAF SPRING
Walter W. Schoof, Milwaukee, and James L. Wessel, Delafield, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.
Filed Aug. 1, 1988, Ser. No. 226,460
Int. Cl.[4] F16F *1/30*
U.S. Cl. 267—52 11 Claims

1. A mounting construction for attaching a fiber reinforced resin leaf spring to a vehicle, comprising a pair of clamping members defining a longitudinal channel, resilient insert means disposed within the channel and defining a longitudinal passage, a fiber reinforced resin leaf spring disposed within the passage, at least one onter surface of said insert means means having an undulation and a corresponding inner surface of one of said clamping members having a similar undulation to mate with the undulation of said insert means, at least one of said clamping members having an opening extending therethrough and elongated in a lateral direction, said opening being bordered by a flange that extends in a direction away from said



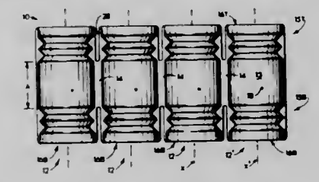
spring, and a laterally elongated projection on said insert means and disposed in the opening to resist relative longitudinal movement between said clamping members and said insert means.

4,895,351
TENSION-COMPRESSION STAY WITH FIBER-REINFORCED SYNTHETIC RESIN MATERIAL STRUT
Jean-Michel Devaud, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Dec. 2, 1985, Ser. No. 803,681
Claims priority, application Switzerland, Dec. 11, 1984, 5873/84
Int. Cl.[4] F16F *1/00*
U.S. Cl. 267—69 20 Claims



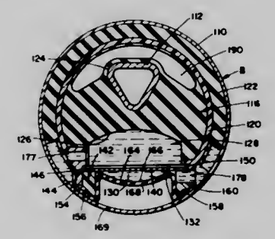
1. A tension-compression stay comprising a synthetic resin tubular strut, having two opposing ends and inner and outer walls, reinforced by fibers of high rigidity, and, at each of the two opposite ends of said strut, a force-introducing element of metal fastened to the respective end and comprising a metallic thread-bearing shaft having an external threading, said force-introducing elements being screwed directly into the ends of said synthetic resin tube by means of the threading of said shaft cutting into the inner wall of the tube ends.

4,895,352
MATTRESS OR CUSHION SPRING ARRAY
Walter Stumpf, Dunwoody, Ga., assignor to Simmons Company, Atlanta, Ga.
Filed Jan. 9, 1989, Ser. No. 295,063
Int. Cl.[4] F16F *3/00, 5/00;* A47K *11/04;* B29C *43/22*
U.S. Cl. 267—80 7 Claims



1. A load supporting structure, comprising:
(A) a first spring member itself of unitary blow molded construction, said first spring member comprising:
(1) a substantially tubular first body portion having a first longitudinal axis, and
(2) two opposing end portions, said end portions each defining a substantially planar supporting surface being deflectable relative to said first body portion along said first axis;
(B) a second spring member itself of unitary blow molded construction comprising:
(1) a second body portion having a second longitudinal axis, and
(2) two opposing end portions, said end portions each defining a substantially planar supporting surface being deflectable relative to said second body portion along a second axis; and
(C) means for interconnecting said first spring member and said second spring member such that said first axis is substantially parallel to said second axis, and wherein said end portions of said first spring member are spaced apart and independently deflectable relative to said end portions of said second spring member.

4,895,353
FLUID FILLED ELASTOMERIC DAMPING DEVICE
Stephen F. Roth, Berlin Heights, and L. Dale Coad, Sandusky, both of Ohio, assignors to The Pullman Company, Princeton, N.J.
Filed Jun. 28, 1988, Ser. No. 212,504
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—140.1 15 Claims



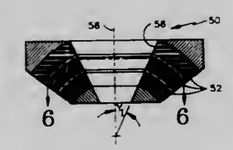
1. A fluid filled elastomeric vibration damping device of the circular bushing type which can be used to isolate a vibration generating member, such as an engine, from an associated support member, such as a support frame for the engine comprising:
a rigid inner member;

a rigid outer housing which is axially parallel to said inner member and substantially encircles the inner member;
a vibration absorbing resilient body interposed between said inner member and said outer housing, comprising a first fluid holding chamber;
a second fluid holding chamber which is in communication with said first fluid chamber through a first path of fluid flow said second fluid chamber being generally defined between said resilient body and said outer housing;
a rigid body which is movably mounted in said first path of fluid flow for movement perpendicular to the axis of said device for controlling fluid flow between said first and second fluid chambers, at two end positions of movement of said rigid body, blocking substantially all fluid flow between said first and second fluid chambers;
a means for providing a second path of fluid flow from said first fluid chamber; said means not in direct fluid communication with said second chamber; and,
a first diaphragm which is in fluid communication with said second fluid chamber.

4,895,354
EQUALIZING STRESS DISTRIBUTION IN EACH LAMINATE OF AN ASYMMETRICALLY LOADED ELASTOMERIC BEARING

Francis E. Byrnes, White Plains, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1985, Ser. No. 733,432
Int. Cl.[4] F16F *1/40*
U.S. Cl. 267—141.1 **4 Claims**



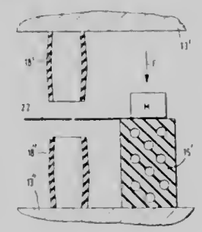
1. A spherical elastomeric bearing having a centerpoint, alternate laminates of elastomeric material and nonresilient material disposed at increasing radii about the centerpoint, and a bole disposed through each laminate normal to a bearing axis through the centerpoint, characterized in that the holes are elliptical, each elliptical hole having a major axis and a minor axis aligned with the respective major and minor axis of each other elliptical hole.

4,895,355
SPRING DEVICE FOR USE IN MOUNTING APPARATUSES

Franz Josef Wolf, and Hubert Pletsch, both of Bad Soden-Salmünster, Fed. Rep. of Germany, assignors to Woco Franz-Josef Wolf & Co., Fed. Rep. of Germany

PCT No. PCT/EP87/00469, § 371 Date Apr. 22, 1988, § 102(e) Date Apr. 22, 1988
PCT Filed Aug. 20, 1987, Ser. No. 201,121
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1986, 3628838
Int. Cl.[4] F16F *1/36, 1/06;* F16M *13/00*
U.S. Cl. 267—257 **11 Claims**

1. A spring device comprising:
first spring means for defining a wide, substantially linear force deflection curve;
second spring means for defining a force deflection curve having an initial steep rise section followed, after surpassing a critical deflection, by a substantially horizontal section; and
said first spring means including a suspension spring and said second spring means including a control spring, said suspension spring and said control spring being arranged in parallel with respect to each other so that deflection of said control spring occurs only after an initial predetermined deflection of said suspension spring when said suspension spring is uncoupled from said control spring,

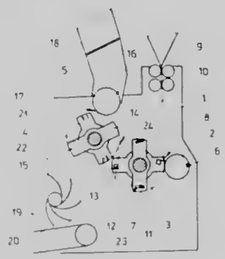


whereby the combination of the first and second spring means define a force deflection curve having a substantially linear range and an abrupt steep rise within the substantially linear range.

4,895,356
FOLDER

Stäb Rodolf, Frankenthal, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 219,788
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726239
Int. Cl.[4] B42C *1/04*
U.S. Cl. 270—49 **16 Claims**

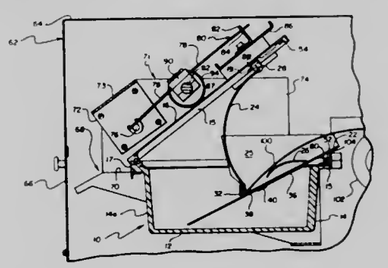


1. A folder for the production of products having at least one transverse fold and a cut parallel to the transverse fold, comprising a transverse cutting means, at least one transverse folding means and at least one smooth cut means made up of (a) scissors cut knives mounted on a folding cylinder which is provided with spaced apart folding jaws which are adapted to cooperate with the tucker blades of a collect cylinder, which knives are disposed in the part between the folding jaws and (b) at least one mating scissors cut knife set on the peripheral part of the folding cylinder moving from the collect cylinder and the folding cylinder consists of at least two coaxial fitting carriers, which are able to be turned in relation to each other and are driven at the same speed, and furthermore are fitted with folding jaws and, respectively scissors cut knives, and with coaxial drive wheels, which are coupled with each other by way of an adjustable bridge drive in a driving manner, the drive wheel of the one fitting carrier mounting the scissor cut knives engages a drive wheel of the knife cylinder and the drive wheel of the fitting carrier mounting the folding jaws is in engagement with a drive wheel associated with the tucker blades of the collect cylinder, and wherein the drive wheels coupled with each other by the bridge drive are arranged adjacent to each other and are connected respectively with a shaft, one of such shafts being in the form of a hollow shaft having the other shaft extending internally through it, said bridge drive having an adjustable shaft mounted parallel to the shafts of the drive wheels and two drivingly connected pinions in mesh with the drive wheels are mounted on the adjustable shaft.

4,895,357
LIGHTTIGHT FILM-DELIVERY BOX AND ACTUATOR APPARATUS THEREFOR

Steven R. Lippold, Oakfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,094
Int. Cl.[4] B65H *7/00*
U.S. Cl. 271—8.1 **4 Claims**



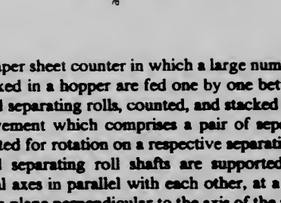
1. Actuator apparatus for a lighttight film-delivery box of the type having a lid movable between a closed lighttight position and an open position, and a clamshell mechanism, connected to said lid and arranged to carry a film sheet, having (1) a retracted position internal to said box when said lid is in its lighttight position, and (2) an open film-delivery position external to said box when said lid is in its open position, said actuator apparatus including:
(a) a control mechanism, attachable to said lid when said lighttight box is placed in a parked film-delivery position relative to a workstation, movable between (1) a rest position in which said lid is secured against movement from its closed position, and (2) an actuated position in which said lid is held in its open position; and
(b) energizable motor means, including an output connected to said control mechanism, having (1) a first deenergized state in which said output holds said control mechanism in its rest position whereby said clamshell mechanism is in its retracted position, and (2) a second energized state in which said output moves said control mechanism to its actuated position whereby said clamshell mechanism assumes its open position to deliver a film sheet carried thereby to the aforementioned workstation.

4,895,358
NOTE FEEDING DEVICE

Kiyoshi Kawasaki, Omihachiman, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 16,622, Feb. 19, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 265,280
Claims priority, application Japan, Feb. 20, 1986, 61-24033[U]
Int. Cl.[4] B65H *3/52*
U.S. Cl. 271—121 **1 Claim**

1. A note feeding device comprising:
a cartridge for storing notes to be fed out through a feeding out portion thereof, said cartridge including a support surface at said feeding out portion on which stored notes are edgewise stacked for feed out;
a feeding roller disposed at said feeding out portion of the cartridge for contacting a front surface of the stored notes to remove notes from said support surface of said cartridge, said cartridge providing a biasing force which biases said notes toward said feeding out portion and said feeding roller,
a spring plate separate from said cartridge and disposed opposite to and in direct contact with said feeding roller, a fed note passing from said support surface of said cartridge between said feeding roller and spring plate, said spring plate edgewise contacting fed notes and preventing the feeding of double notes from said cartridge by stopping the feeding from said cartridge of a note behind a note in contact with said feeding roller,

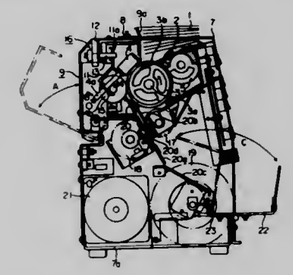


a lever having one end to which said spring plate is connected for moving it in a direction of contacting said feeding roller, said lever being rotatable about a fixed pivot point, and
a biassing member for biassing another end of said lever so that it causes said spring plate to move in said direction toward said feeding roller to keep said spring plate in contact therewith.

4,895,359
PAPER SHEET COUNTER SYSTEM

Hiroyuki Ookawa, Tokyo, Japan, assignor to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 162,606, Mar. 1, 1988, abandoned. This application Feb. 9, 1989, Ser. No. 308,569
Int. Cl.[4] B65H *3/56*
U.S. Cl. 271—125 **8 Claims**



1. In a paper sheet counter in which a large number of paper sheets stacked in a hopper are fed one by one between a pay-out roll and separating rolls, counted, and stacked in a stacker, the improvement which comprises a pair of separating rolls each mounted for rotation on a respective separating roll shaft where said separating roll shafts are supported with their longitudinal axes in parallel with each other, at a slight angle relative to a plane perpendicular to the axis of the pay-out roll, and located to maintain said separating rolls spaced from said pay-out roll to provide a gap therebetween through which said paper sheets are passed, said gap being small enough to allow

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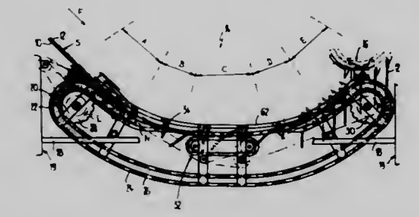
only one sheet to pass at a time while separating any additional sheets, and said angle is selected such that passage of a paper sheet causes rotation of said separating rolls.

4,895,360

METHOD AND APPARATUS FOR PROCESSING PRODUCTS ARRIVING IN AN IMBRICATED FORMATION, ESPECIALLY PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jul. 15, 1988, Ser. No. 219,202
Claims priority, application Switzerland, Jul. 21, 1987, 02754/87
Int. Cl.[4] B65H *29/04, 29/66*
U.S. Cl. 271—202 **18 Claims**



1. A method of processing substantially flat products, especially folded printed products, arriving in an imbricated formation, comprising the steps of:

infeeding the products in an imbricated formation such that leading regions of the infed products have a predetermined mutual spacing and each product bears upon a trailing printed product as viewed in a predeterminate direction of conveying of the products along a predeterminate conveying path;

individually engaging the products at their leading regions by means of grippers successively arranged at a mutual spacing substantially equal to said predetermined mutual spacing between the leading regions of the infed products in the predeterminate direction of conveying of the products and moved along the predeterminate conveying path; and

thereafter increasing the spacing between each two successive grippers to such an extent that each product is brought into non-overlapping separated relationship with respect to the trailing product.

4,895,361

FRONT GUIDE POSITION ADJUSTING DEVICE IN A SHEET-FED PRESS

Yutaka Fujii, and Hideki Doumoto, both of Fuchu, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Aug. 15, 1988, Ser. No. 232,101
Claims priority, application Japan, Aug. 17, 1987, 62-204846
Int. Cl.[4] B65H *9/04*
U.S. Cl. 271—253 **4 Claims**

1. A guide position adjusting device of a sheet-fed press including a guide member for effecting a positional adjustment of a printing sheet, said guide member being a front guide member elongated in its axial direction, for adjusting a portion of said printing sheet in a direction of transportation of said printing sheet, said device comprising:

input means for inputting numerical data representative of an adjusting position of said printing sheet;

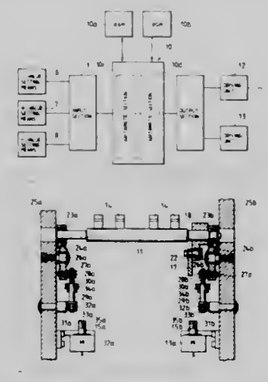
storage means for storing said numerical data;

processing means for implementing arithmetic operations upon reading said numerical data out of said storage means to provide first data corresponding to a first moving distance X of a first predetermined position of said guide member and second data corresponding to a second moving distance Y of a second predetermined position of said guide member;

first driving means receiving said first data from said processing means for moving said first predetermined position of said guide member in a direction perpendicular to said axial direction of said guide member by said first moving distance X defined by said first data; and

second drive means receiving said second data from said processing means for moving said second predetermined position of said guide member in a direction perpendicular to said axial direction of said guide member by said second moving distance Y defined by said second data wherein said first and said second predetermined positions of said front guide member are moved independently of each other substantially parallel to said sheet transportation direction;

wherein said numerical data input by said input means are l representative of a pitch between a first reference position



and a second reference position both on said printing sheet, m representative of a first sheet-moving distance by which said first reference position is moved when the positional adjustment of said printing sheet is effected, and n representative of a second sheet-moving distance by which said second reference position is moved when the positional adjustment of said printing sheet is effected, wherein a line connecting said first and second reference positions is parallel with a widthwise direction perpendicular to said sheet transportation direction, and wherein said processing means computes said first and said second moving distance X and Y in accordance with the following equations:

$$X=(L+1)/2l\cdot m-(L-1)/2l\cdot n \quad (1)$$

$$Y=(L+1)/2l\cdot n-(L-1)/2l\cdot m \quad (2)$$

where L is a length between said first and said second predetermined positions of said front guide member.

4,895,362

EXERCISE BICYCLE

Sherwood B. Ross, Miami, Fla., assignor to Ross Bicycles, Inc., Rockaway Beach, N.Y.

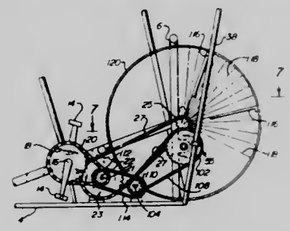
Continuation-in-part of Ser. No. 892,788, Jul. 31, 1986, Pat. No. 4,657,244. This application Apr. 13, 1987, Ser. No. 37,642
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 **6 Claims**

1. An exercise bicycle having a frame, a seat positioned on

said frame, foot pedal means, an energy-absorbing wheel and first transmission means to link the foot pedal means to the energy-absorbing wheel, wherein the improvement comprises:

wheel means rotatably mounted on said frame;

an eccentric means positioned on a surface of said wheel means;



reciprocating arm levers pivotally mounted on said frame and interacting with said eccentric means for rotation of said wheel means upon reciprocation of said arm levers; and

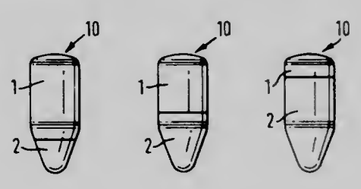
second transmission means to link said wheel means to the energy-absorbing wheel, whereby said first or second transmission means may independently operate said energy-absorbing wheel.

4,895,363

SET OF PARTS AND METHODS FOR TESTING AND/OR STRENGTHENING PELVIC FLOOR MUSCLES

Stanislav Plevnik, Na Grivi 20, Dragomer, Brezovica pri Ljubljani, Ljubljana, Yugoslavia, and Marko Stalar, Bratov Ucakar 90, 61000 Ljubljana, Yugoslavia

Continuation of Ser. No. 849,393, Apr. 8, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 239,027
Claims priority, application United Kingdom, Apr. 9, 1985, 8509008
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—93 **7 Claims**



1. A method of testing pelvic floor muscles utilizing a set of parts comprising a plurality of exercise devices each having a substantially identical size and shape and having a fixed volume such that each of said devices can be fully inserted into the vagina of a human subject, each of said exercise devices in said set having a weight different from each of the other exercise devices in said set , the method comprising:

fully inserting one of the devices and checking whether the pelvic floor muscles can support the device;

if so, replacing the device with a heavier device, and if not, replacing the device with a lighter device; and

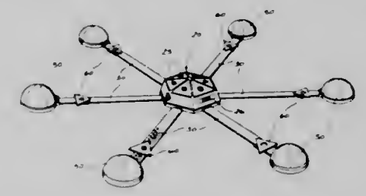
repeating the above steps until one of the devices is just capable of being supported, the weight of that device providing an indication of the pelvic floor muscle strength.

4,895,364

ELECTRONIC GAME APPARATUS

Robert J. Martel, Avalon, and Thomas G. Bishop, Newport, both of Australia, assignors to Great Games Pty. Ltd., Australia

Filed Jun. 17, 1988, Ser. No. 208,897
Claims priority, application Australia, Jun. 18, 1987, PI2543
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 GE **11 Claims**



1. An electronic game apparatus comprising:

electronic circuitry;

a main body enclosing the electronic circuitry;

a plurality of remote switching devices electrically connected to the electronic circuitry; and

a plurality of rigid arms pivotally connected to and extending from the main body to respective ones of the remote switching devices and arranged to carry the electrical connections between the electronic circuitry and respective ones of the remote switching devices;

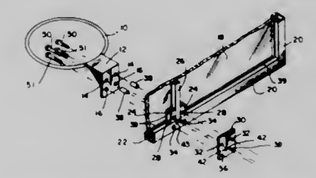
wherein the electronic circuitry is operable to sense operation of the remote switching devices and to indicate which device was first operated.

4,895,365

BASKETBALL GOAL MOUNTING AND BACKBOARD REINFORCING APPARATUS

Edward A. Schroeder, Algonquin, Ill., assignor to Porter Equipment Company, Chicago, Ill.

Filed May 16, 1989, Ser. No. 352,196
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 R **13 Claims**



1. A basketball goal supporting system for transferring stress applied to a basketball goal to a frame holding a basketball backboard comprising:

a basketball backboard;

a basketball backboard support means for supporting the basketball backboard and having at least upper and lower opposed support frame members;

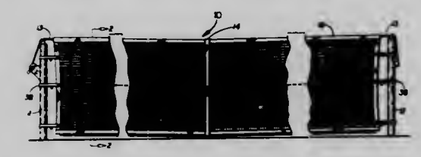
a basketball backboard vertical support means extending between facing opposed inner surfaces of the upper and lower support frame members and abutting a rear side of the basketball backboard for minimizing bowling and canting of said backboard and backboard support means;

two support means attached to the backboard lower support frame member, one on each side of the vertical support means;

rear plate means attached to the backboard lower support frame member and the two support means for providing rigidity to the basketball backboard;

a first trio of aligned aperture means in the two support means, the backboard and the rear plate means for receiving fastening means for the basketball goal;
a second pair of aligned aperture means in said lower support frame member and said rear plate means for receiving fastening means for the baseball goal; and
said fastening means for mounting a basketball goal to said system extending through said first trio and second pair of aperture means to transfer stresses from said basketball goal to said basketball backboard support means directly and through said two support means.

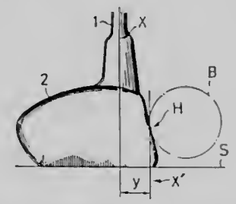
4,895,366
TENNIS NET
Joseph A. Bartasius, 3713 Valley Parkway, Lake Worth, Fla. 33467
Filed Jan. 23, 1989, Ser. No. 300,589
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—29 B **9 Claims**





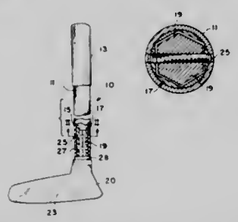
1. A tennis net having upper and lower longitudinal edges comprising:
(A) a pair of longitudinal meshworks comprised of pluralities of interconnected horizontal and vertical strands, said strands defining openings large enough to permit passage of a standard tennis ball,
(B) means connecting together said upper longitudinal edges edges of said meshworks and suspending said meshworks from a cable to define a tennis game net,
(C) two pluralities of flexible barrier strips each extending the length of one of said meshworks and being located between said pair of meshworks, said strips having upper and lower edges, the upper edge of each of said strips being fastened lengthwise to one of said horizontal strand and the lower edge of each of said strips hanging free, the width of each of said strips exceeding the vertical dimension of an adjacent said opening, said strips overlapping so as to cover substantially the entire surfaces of said meshworks, whereby, said net being suspended in use, balls passing through said openings of each meshworks will be deflected downwardly by strips and rest between said meshworks.

4,895,367
GOLF CLUB SET
Ryota Kajita, Chiba, and Hidekimi Inoue, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 6, 1988, Ser. No. 203,226
Claims priority, application Japan, Jun. 5, 1987, 62-140944
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—77 A **3 Claims**



1. A golf club set comprising first and second groups of golf clubs, the first group of clubs being of the wood type and the second group of clubs being of the iron type, each of the clubs in the set comprising a shaft connected to a head at one end of said shaft, each of the shafts having an axis X passing through the center of the shaft, each of the heads having a sole, a hitting face for hitting a golf ball and a hitting spot H which is the point of contact between the striking face and the ball when the sole of the club is squarely set on the playing surface, said hitting face being inclined to define a loft angle, each of the clubs having a distance y which is the distance between the axis X and a vertical axis X' passing through the hitting spot H, the axes X and X' lying in a plane perpendicular to the hitting face, the wood type clubs and the iron type clubs each being designated by a number which is a single digit, the greater the loft angle of the club the higher the digit by which the club is designated, and the difference in the distance y between the highest number club in the set of the wood type and the lowest number club in the set of the iron type being less than 10 mm.

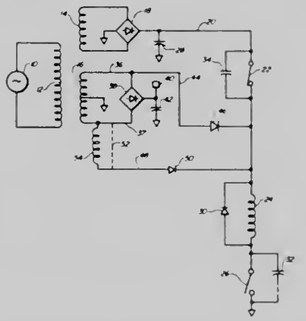
4,895,368
GOLF CLUB AND ASSEMBLY PROCESS
L. Michael Geiger, 156 Emmans Rd., Poquoson, Va. 23662
Filed Nov. 2, 1988, Ser. No. 265,946
Int. Cl.[4] A63B *53/02*
U.S. Cl. 273—80.1 **12 Claims**



1. In combination, a golf club shaft having a hand grip at one end and a hollow opening at the other end thereof and a golf putter head having a ball engaging face and a shank extending therefrom adapted to be inserted within the hollow open end of said shaft, the improvement therewith comprising:
a hollow insert fixed within at least a portion of the hollow open end of said shaft,
said hollow insert having an exterior surface conforming to the internal surface area of the open end of said shaft and an internal surface having female cross-sectional angular surfaced areas thereon,

said shank having an external male cross-sectional angular surface that mates with an snugly engages the female cross-sectional angular surface areas of said hollow insert when said shank is inserted into said hollow insert,
at least one axially aligned transverse tapped opening in each of said shaft, said insert and said shank,
a screw threadingly received through each said at least one axially aligned transverse tapped opening in said hollow shaft, said hollow insert and said shank to releasably attach said putter head to said hollow club shaft and, facilitate selective changing of putter heads on said hollow club shaft.

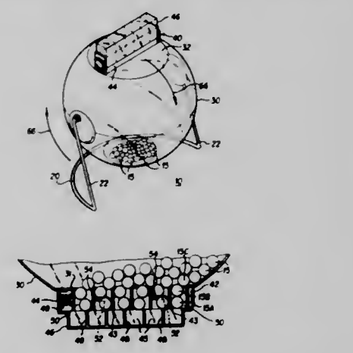
4,895,369
FLIPPER CONTROL CIRCUIT FOR PINBALL MACHINE
Kurt W. Deger, Palatine, Ill., assignor to Data East Pinball, Inc., Melrose Park, Ill.
Filed Apr. 24, 1989, Ser. No. 342,318
Int. Cl.[4] A63F *7/26*
U.S. Cl. 273—129 V **18 Claims**



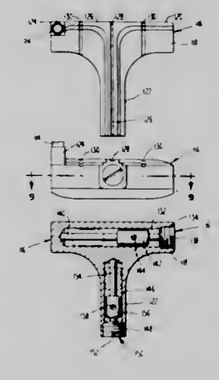
1. In a pinball machine having a flipper and including a flipper switch for activating the flipper and means for holding the flipper in an actuated position until the flipper switch is deactivated, and a solenoid coil for controlling the movement of the flipper in response to the voltage applied to the solenoid col, the improvement comprising, in combination:
first means for applying a first voltage to the solenoid coil when the flipper switch is activated;
second means for applying a second, holding voltage to the solenoid coil when the flipper is in the actuated position to hold the flipper in the actuated position until the flipper switch is deactivated; and
switch means for electrically disconnecting said first means from said solenoid coil when the flipper is in the actuated position.

4,895,370
RANDOM NUMBER SELECTION DEVICE
Michael A. Kline, 3245 K Port Royale Dr., Fort Lauderdale, Fla. 33308
Filed Jan. 17, 1989, Ser. No. 297,408
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—144 B **18 Claims**

1. A random number selection device, comprising:
a support base having a pair of extending substantially parallel arms;
a hollow container rotatably mounted between said arms and having at least one substantially planar surface, said planar surface having an aperture formed therethrough, said hollow container being eccentrically rotatably coupled between said arms;
a plurality of balls each having indicia representing a different numeric symbol inscribed thereon, said balls being located within said hollow container; and,
dispensing means coupled to said planar surface for receiving a portion of said plurality of balls through said aperture, said dispensing means including actuator means for substantially simultaneously distributing a predetermined number of said portion of said plurality of balls to a corresponding number of ball receiving chambers responsive to displacement of said actuator means.



4,895,371
GOLF PUTTER
Gerald F. Bushner, P.O. Box 246, Yuma, Colo. 80759
Filed Jul. 29, 1988, Ser. No. 225,776
Int. Cl.[4] A63B *53/00*
U.S. Cl. 273—164 **1 Claim**

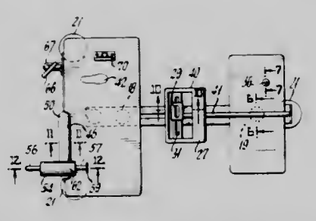


1. A golf putter comprising a T-shaped head having a flat putting face, the head having a first elongated recess therein parallel to, behind and substantially coextensive with the putting face, the first elongated recess having end walls at both ends including one removable end wall, comprising a plug threaded into the head, weight means in the recess comprising an elongated removable pin with its ends contacting the end walls respectively, a tubular weight disposed on the pin and of lesser length than the pin and adapted to be adustably fixed in a selected position along the pin, a first set screw threaded into a transverse hole in the weight and engaging the pin for fixing the weight at such selected position on the pin, an elongated tail extending perpendicularly rearward from a generally central location with respect to the length of the putter face, the

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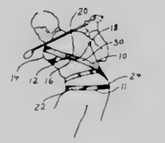
tail having visual sight lines on its top and having therein a second elongated recess commencing to the rear of the first elongated recess and disposed on the longitudinal axis of the tail and having a closed front end wall and a removable end wall at the rear end of the tail comprising a second plug threaded into the hed, second weight means in the second elongated recess comprising a second removable pin with its ends contacting respectively the end walls of the second elongated recess, a second tubular weight disposed on the second pin and of lesser length than the second pin and adapted to be adjustably fixed in a selected position along the second pin, and a second set screw threaded into a transverse hole in the weight and engaging the second pin for fixing the second weight at such selected position, the first and second elongated recesses being substantially co-planar whereby the plugs can be removed and the weights and pins can be removed from their respective recesses and the weight balance of the putter can be adjusted by adjusting and fixing the position of the weight on the respective pins.

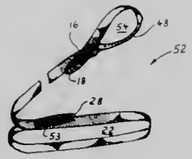
4,895,372
GOLF TRAINING DEVICE
Charles J. Muller, 549 Old Bridge Rd., Northport, N.Y. 11768
Filed Mar. 30, 1989, Ser. No. 330,771
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **9 Claims**



1. A golf-training device for use in training a user to hit a golf ball along a predetermined trajectory, comprising:
a. a foot platform connected to one end of a center rail and upon which the user stands;
b. a ball platform movably connected to the opposite end of said center rail and upon which the ball is placed;
c. a sighting device movably connected to and projecting upwardly from said center rail or said ball platform;
d. a right knee brace connected to and projecting upwardly from said foot platform;
e. a right hip guide movably connected to said foot platform;
f. a left thigh target connected to and projecting upwardly from said foot platform; and
g. a left knee guide movsbly connected to said foot platform in front of said left thigh target, whereby during the course of a swing, the user's head is trained to remain still by said sighting device, the right knee is prevented from straightening by said right knee brace, the right hip is trained to travel a correct distance during a back swing by said right hip guide and to remain on a constant plane which is perpendicular to the golf ball trajectory, the left thigh is trained to travel the correct distance during the down swing by said left thigh target and the left knee is trained to slide at a proper angle to the golf ball trajectory by said left knee guide.

4,895,373
TRAINING DEVICE FOR GOLFERS
Sidney Richmon, 5800 W. Club La., Richmond, Va. 23226
Filed Dec. 13, 1988, Ser. No. 283,714
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **13 Claims**



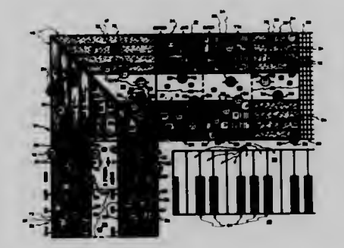


1. A training device for golfers comprising a body-engaging member for engaging an arm-shoulder region with a hip region and extending diagonally across a golfer's back, said body-engaging member promoting coordination of the golfer's body and limb motion preparatory to and during a swing, said body-engaging member comprising:
a continuous, elastic belt having a first end and a second end, said belt including:
a loop portion for looping said belt over a shoulder and under the arm in said arm-shoulder region;
a loop-fastening means for fastening said first end to a loop fastening region of said belt to establish said loop portion;
a hip-girding portion for girding said hip region;
a hip securing means for adjustably and releasably securing said second end to said hip-girding portion so that said hip region is securely girded; and,
a back portion connecting said loop portion to said hip portion.

4,895,374
BOARD GAME FOR TEACHING MUSIC
Illene W. Bowles, Salt Lake City, Utah, assignor to Music Ed, Inc., Salt Lake City, Utah
Filed Apr. 3, 1989, Ser. No. 332,078
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 **19 Claims**

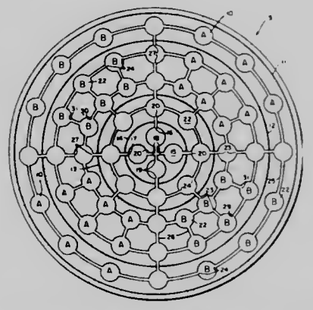
7. A board game used to instruct beginning music students in the basics of reading music comprising:
a generally rigid, rectangular game board comprising a display comprising a multi-colored grand music staff loop comprising measure representations and a series of landing spots on said measure representations, said landing spots each representing a musical letter note of the musical scale, and further comprising at least one piano keyboard representation juxtaposed the grand music staff loop said piano keyboard having keys corresponding to each of said letters of the musical scale;
a plurality of game dice for controlling the movement of the game pieces along said measure representations; and
a plurality of various colored game pieces for each player, each of which is embossed with one of said letters of the musical scale said keys are finishing spaces wherein said game pieces move from their respective landing spots to their respective keys.

16. A method of entertainingly learning musical notes in correlation with a piano keyboard comprising the steps of:
providing a display having a piano keyboard representation and a grand staff representation divided into measure representations and comprising visual musical indicia;
providing a plurality of tokens comprising note indicia and dice comprising numerical indicia and note indicia;



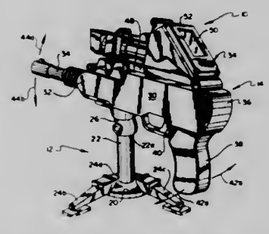
successively rolling the dice thereby identifying the length of each move and which token is to be moved along the grand staff representation;
correlating the visual musical indicia of the grand staff representation at sites where tokens are disposed at various points in time with the note indicia of the tokens and in turn further correlating with the note sites of the piano keyboard representation during transfer of a token from the grand staff representation to the keyboard representation.

4,895,375
BOARD GAME WITH MOVING PIECES
Eileen A. Blitz, and Harold Blitz, both of 1070 Pebblewood Pl., Gaithersburg, Md. 20878
Filed Jul. 13, 1988, Ser. No. 218,138
Int. Cl.[4] A63F *3/02*
U.S. Cl. 273—258 **11 Claims**



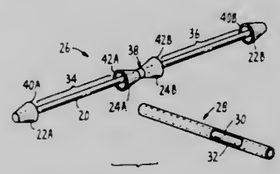
1. A board game upon which a plurality of movable game pieces are to be disposed, comprising:
a game board defining a game playing surface thereon;
a plurality of first position spaces defined within a central region of said game playing surface along two mutually orthogonal lines which intersect each other at a central point of said game playing surface wherein an equal number of spaces are disposed on each orthogonal line within said central region and not disposed on more than one orthogonal line;
a plurality of second position spaces defined radially outwardly of said plurality of first position spaces along radially extending lines;
a first set of movable piece path lines interconnecting a first portion of said second position spaces with each other and with said first position spaces along radial lines which are continuous extensions of said two mutually orthogonal lines;
a second set of movable piece path lines interconnecting a second portion of said second position spaces with each other along radial lines; and
a third set of movable piece path lines interconnecting said second set of movable piece path lines with said first set of movable piece path lines along circumferentially extending lines.

4,895,376
INTERACTIVE VIDEO GAME
Joseph J. Chiang Shiang-Fei, Kowloon, Hong Kong, assignor to Tigers Electronics, Inc., Vernon Hills, Ill.
Filed Jun. 17, 1988, Ser. No. 208,239
Int. Cl.[4] A63B *67/00*; A63F *7/06*
U.S. Cl. 273—313 **55 Claims**



1. An interactive apparatus, usable by an operator located outside of same, comprising:
a housing movable by the outside operator in at least a first direction;
means for sensing said movement;
means, carried by said housing, for displaying a relatively movable indicium;
means, coupled to said sensing means and said display means, for controlling relative location and movement of said indicium on said display at least in part in response to said sensed movement.

4,895,377
JUGGLING STICKS
Arbor, 1907 Delaware Ave., Santa Cruz, Calif. 95060
Filed Jan. 29, 1988, Ser. No. 149,844
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—327 **9 Claims**



1. A juggling stick comprising:
a rod having a rod central axis, a surface, a center and two ends wherein the surface of the rod is a striking surface;
first additional striking surfaces positioned at each of the ends wherein each said first additional striking surface is symmetrical about said axis and extends beyond the sur-

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face of the rod and of sufficient size to stop the rod traveling along the axis;

a pair of second additional striking surfaces positioned along the rod symmetrically about the center and spaced apart from the first additional striking surfaces wherein each said second additional striking surface is symmetrical about said axis and extends beyond the surface of the rod and of sufficient size to stop the rod traveling along the axis and further wherein each of the pair of second additional striking surfaces is comprised of a second ferrule, each said second ferrule having a second larger end, a second smaller end and a second ferrule central axis, each said second additional striking surface is coupled to the rod so that the second ferrule central axis is coincident with the rod central axis and each second smaller end is closer to the center of the rod than each second larger end.

4,895,378

SLIDABLE HIGH-TEMPERATURE SEAL

Charles W. Newquist, Seattle; Willard N. Westre, Bellevue; Robert A. Burns, Seattle, and Harry W. Dursch, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 15, 1988, Ser. No. 207,337
Int. Cl.[4] F16J *15/00, 15/34;* **B64B** *1/36;* **B64C** *15/00*
U.S. Cl. 277—12 **18 Claims**

1. A one-piece seal for preventing leakage of hot gases from a first side of a barrier to a second side of said barrier through a gap between an edge surface joining said first and second barrier sides and a substantially flat surface parallel to said edge surface, said barrier being movable in a direction that is parallel to said surfaces, the seal comprising:

first flange means for making sliding contact with said first side of said barrier:

a flexible sealing portion attached to said first flange means, said flexible sealing portion fitting in said gap and making sliding contact with said flat surface outside of said gap and outwardly from both of said barrier sides; and

means for attaching said seal to said barrier.

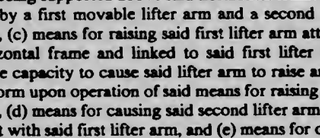
4,895,379

CONVERTIBLE TRICYCLE/RIDING TOY

Ray G. Kelly, St. Louis, Mo., assignor to Angeles Nursery Toys, Inc., Pacific, Mo.

Filed Sep. 16, 1988, Ser. No. 245,261
Int. Cl.[4] B62K *13/06*
U.S. Cl. 280—7.1 **10 Claims**

1. A convertible tricycle/riding toy interchangeable for use with any one of a variety of interchangeable frames, comprising, a handle bar and wheel frame including generally at least one vertically extending supporting member connected to generally horizontally extending handle bars at one end thereof and to a wheel hub at a second end thereof, a front tricycle wheel rotatably mounted on said wheel hub, and including foot pedals connected to and rotatably driving said front tricycle wheel, spaced rear tricycle wheels mounted for rotation thereof, and any one of a series of interchangeable frames for a variety of different uses each being separately and independently connected to said handle bar and wheel frame and rotatably mounting said rear wheels for operation of said convertible tricycle/riding toy, said interchangeable frames including a pivotal support for pivotally mounting the generally vertical handle bar supporting members of said handle bar and wheel frame, and a shaft support for the common shaft of said spaced rear wheels for free rotatable movement thereof, each interchangeable frame including a seat for the child user enabling gripping of the handle bars and operation of the foot pedals while seated, said seat being positioned intermediate the



front and rear tricycle wheels on said interchangeable frames and each of said interchangeable frames further being provided with an interconnected cargo carrier supporting frame extending behind said seat and supported by the common shaft of said rear tricycle wheels, and said interconnected cargo carrier supporting frame of one of said interchangeable frames including a generally horizontally extending lower cargo platform behind said seat and being generally aligned with said tricycle wheels, and fixed spaced gripping bars extending above said seat on opposite sides of said cargo platform to enable a child rider to stand on said lower cargo platform while gripping said fixed spaced gripping bars.

4,895,380

ADJUSTABLE VARIABLE SLOPE ELEVATING CREEPER

Ben Brooks, 1600 East Dunnam, Hobbs, Lea County, N. Mex. 88241-2324, and Frankie L. Brooks, 401 Springbrook Trail, Smyrna, Ga. 30080

Filed Feb. 17, 1988, Ser. No. 157,217
Int. Cl.[4] B25H *5/00;* **B62B** *11/00*
U.S. Cl. 280—32.6 **15 Claims**



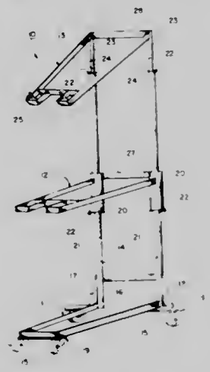
1. An improved adjustable variable slope elevating creeper comprising (a) a mobile horizontal frame, (b) a platform having sufficient length and rigidity to support a reclining person, said platform being supported above said horizontal frame at opposite ends by a first movable lifter arm and a second movable lifter arm, (c) means for raising said first lifter arm attached to said horizontal frame and linked to said first lifter arm and having the capacity to cause said lifter arm to raise and lower said platform upon operation of said means for raising said first lifter arm, (d) means for causing said second lifter arm to move in concert with said first lifter arm, and (e) means for operating said means for raising said first lifter arm positioned for convenient operation by said reclining person.

4,895,381

FURNITURE DISPLAY CART

Clifford B. Farlow, P.O. Box 1858, High Point, N.C. 27261

Filed Jul. 1, 1988, Ser. No. 214,650
Int. Cl.[4] B62B *3/02;* **A47F** *7/00*
U.S. Cl. 280—33.997 **9 Claims**



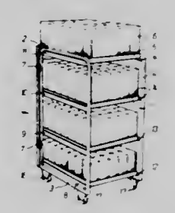
1. A furniture display cart comprising: a base frame for supporting furniture, a plurality of casters, said casters attached to said base frame, said casters for moving said cart, a pair of stanchions said base frame being somewhat wedge-shaped, said base frame attached to said pair of stanchions, an upper frame for supporting furniture, means for adjusting said upper frame along said stanchions, said adjusting means including a pair of stanchion sleeves, said sleeves affixed to said upper frame for sliding over said stanchions, and stanchion locking means, said locking means for releasably fixing said sleeves along said stanchions, said base frame and said pair of stanchions forming an opening between said pair of stanchions, whereby two or more carts can be nestled for compact storage when not in use and during use furniture can be placed on said base frame and said upper frame for display purposes.

4,895,382

DISTRIBUTION SYSTEM

Kjell Andersson, Löddeköpinge, Sweden, assignor to AB Tetra Pak, Lund, Sweden

Continuation of Ser. No. 104,946, Oct. 6, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,242
Claims priority, application Sweden, Oct. 17, 1986, 8604421
Int. Cl.[4] B62D *39/00*
U.S. Cl. 280—33.991 **6 Claims**



1. A system for distributing and displaying goods comprising:

a truck having:

a vertical end wall;

two side walls in hinged connection with said end wall so as to be swingable between an active lockable position wherein said side walls are parallel with one another and are substantially perpendicular to said end wall and a free position wherein said side walls diverge from said end wall;

each of said side walls including a rectangular frame defining the outer edges of the side wall;

a plurality of pairs of horizontal cross bars mounted in opposing manner on said side walls, said side walls being substantially open between the cross bars so as to permit access to the interior of the truck;

said cross bars being formed by L-shaped horizontal rails extending along substantially the entire width of said side walls of said truck, said rails projecting inwardly from said side walls; and

wheels on which said truck is supported; and

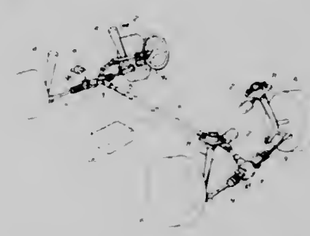
a plurality of transport trays, each tray having a bottom and a pair of edge portions projecting beyond the tray bottom, said edge portions being arranged on opposite sides of the tray bottom and said edge portions including open channels arranged in the underside thereof so as to form outward extending means for slidably engaging said L-shaped rails to enable said tray to be slid into said truck from the side of the truck opposite said vertical end wall and to support said transport tray on said truck and to secure said side walls of said truck in said active lockable position.

4,895,383

METHOD OF AND APPARATUS FOR CONTROLLING CAMBER OF REAR WHEELS OF FOUR-WHEEL-STEERABLE VEHICLE

Masaru Abe; Yoshimichi Kawamoto, and Takashi Kohata, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,262
Claims priority, application Japan, Apr. 21, 1987, 62-98242
Int. Cl.[4] B62D *7/14*
U.S. Cl. 280—91 **13 Claims**



8. An apparatus for controlling rear road wheel camber of a four-wheel-steerable vehicle having front and rear road wheels and a steering wheel, said apparatus comprising:

a front road wheel steering device operatively interconnecting the steering wheel and the front road wheels for steering said front road wheels in response to a steering force applied to said steering wheel;

a rear road wheel steering device for steering the rear wheels in the same direction as or opposite direction to that in which said front wheels are steered, in response to steering of said front wheels;

first detector means for detecting at least the direction in which said rear wheels are steered with respect to said front wheels;

rear road wheel suspensions supporting said rear wheels, respectively;

camber varying devices operatively coupled to said rear road wheel suspensions, respectively, for varying the camber of said rear wheels independently of the steering of said rear wheels;

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actuators for operating said camber varying devices, respectively; and

a control unit responsive to a first detected signal from said first detector means for applying a control signal to at least one of said actuators to control camber with respect to ground, of at least the rear road wheel on the outer side of a cornering curve followed by the vehicle when the vehicle's rear wheels are steered.

4,895,384

TOY TANK

Patrick G. Kaiser, 4975 Cathy La., Highland, Mich. 48031

Filed Nov. 16, 1988, Ser. No. 272,246
Int. Cl.[4] B62D *55/00*
U.S. Cl. 280—206 **1 Claim**



1. A rollable toy tank comprising:

(a) a flexible, tubular body adapted to be rollably disposed on a supporting medium;

(b) said flexible tubular body comprising a closed loop-shaped band which is open at the transverse sides thereof;

(c) said toy tank being adapted to be rolled forward on said supporting medium by a combination forward and downward directed force exerted on the internal surface of one end of the tubular body by the forward crawling action of at least one person inside of the tubular body;

(d) the outer surface of the tubular body is provided with transverse tread means;

(e) said tubular body is formed from a plurality of elongated, hollow members which are disposed in a side-by-side relationship to form a closed loop, and with adjacent members being fixed together; and,

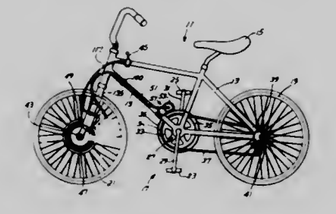
(f) said elongated, hollow members are formed from a thermal foam plastic material.

4,895,385

KIT FOR CONVERTING A BICYCLE TO A DUAL WHEEL DRIVEN CYCLE

Billie J. Becoat, 914 Hampton, Alton, Ill. 62002

Filed Sep. 18, 1987, Ser. No. 98,498
Int. Cl.[4] B62M *1/02*
U.S. Cl. 280—259 **7 Claims**



1. A kit for converting a bicycle having a frame, a first motive means including pedals, pedal gear, and chain, a pedal-chain driven first wheel and a non-driven second wheel, into a dual wheel driven bicycle, comprising:

a sprocket connectable in a fixed relation to the second wheel for conjoint movement therewith;

a drive gear means mountable with respect to the frame in the area of said first motive means, said drive gear means including a rotatable drive gear connectable to the first motive means for receiving power therefrom to rotate said drive gear;

a cable gear mountable with respect to the frame and meshable with said sprocket for driving said sprocket;

a rotatable drive cable means connectable to said cable gear and to said drive gear for transferring the rotational motion of said drive gear to the second wheel; and

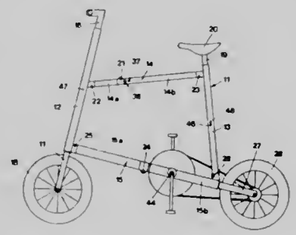
plastic straps strap means for attaching said drive cable means the frame.

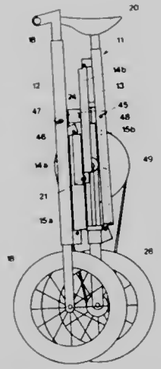
4,895,386

BICYCLE WITH A COLLAPSIBLE FRAME

Sven Hellestam, KåSerigaten 2, S-422 42 Hisings-Backa, and Otto Lisander, Kungshöjdsgatan 1, S-411 20 Göteborg, both of Sweden

Filed Sep. 15, 1987, Ser. No. 96,533
Claims priority, application Sweden, Sep. 16, 1986, 8603880
Int. Cl.[4] B62K *15/00*
U.S. Cl. 280—287 **13 Claims**





1. A collapsible-frame bicycle, comprising:

a front post having a front wheel rotatably mounted thereto;

a rear post having a rear wheel rotatably mounted thereto;

at least one cross-beam interconnecting said front post and said rear post;

said cross-beam including a front part and a rear part, and a first joint articulating said front part to said rear part about a first generally transverse, horizontally axis; and

second and third joints respectively articulating said front part of said cross-beam to said front post and said rear part of said cross-beam to said rear part, about respective second and third generally transverse, horizontal axes to provide a frame, whereby, upon folding said frame to a collapsed position from an erect position, said front post is brought closer to said rear post as said first, second and third joints respectively articulate about said first, second and third axes and front and rear parts of said cross-beam thereby fold towards one another and respectively towards said front and rear posts;

said cross-beam being a first, upper cross-beam, and said collapsible-frame bicycle further comprising:

a second, lower cross-beam;

said second cross-beam including a front part and a rear part, and a fourth joint articulating said front part of said second cross-beam to said rear part of said second crossbeam about a fourth generally transverse, horizontal axis; and

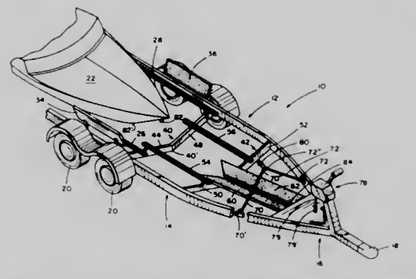
fifth and sixth joints respectively articulating said front part of said second cross-beam to said front post and said rear part of said second cross-beam to said rear post, about respective fifth and sixth generally transverse, horizontal axes, whereby, upon folding of said frame ot said collapsed position from said erect position, said fourth, fifth and sixth joints respectively articulate about said fourth, fifth and sixth axes, said front and rear parts of said second cross-beam thereby fold towards one another and respectively towards said front and rear posts.

4,895,387

SEMI-SUBMERSIBLE TRAILER FOR TRANSPORTING BOATS

Avalon K. Hawkins, Rt. 1, Box 248, and David Norcutt, Rt. 1 Logan Hill, both of Louisville, Tenn. 37777

Filed Feb. 21, 1989, Ser. No. 312,925
Int. Cl.[4] B60P *3/10*
U.S. Cl. 280—414.1 **18 Claims**



1. In a trailer for transporting a boat, said trailer comprising a main frame, said main frame comprising a forward portion upon which the bow of a boat is loaded, and a rearward portion, and wheels for rollingly supporting said main frame, the improvement comprising:

means for automatically centering the bow of a boat during the loading of the boat on said main frame mounted by said forward portion of said main frame;

said means for automatically centering comprising a first and a second elongated centering means each of the same length and each having a first end fixedly secured to a respective part of said forward portion of said main frame, and a second end;

said respective part of said forward portion to which is connected said first end of said first centering means being laterally opposite to said respective part of said forward portion to which is connected said first end of said second centering means;

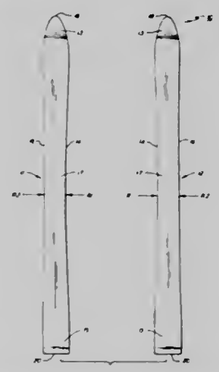
said means for automatically centering further comprising attaching means for releasable securement to the bow eye of the hull of a boat to be loaded on said main frame, said attaching means coupling together said second ends of said first and second centering means; whereby, upon connection of said attaching means to the bow eye of a boat, said means for automatically centering centers the hull of the boat along the longitudinal center of said main frame via said first and second centering means.

4,895,388

PAIR OF SKIS

William D. Richmond, 386 Antlers Dr., Rochester, N.Y. 14618

Continuation of Ser. No. 195,026, May 17, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 373,639
Int. Cl.[4] A63C *5/04*
U.S. Cl. 280—609 **5 Claims**



1. A single pair of skis suitable for use in both giant slalom or slalom skiing comprising:

a first interchangeable ski for use on either the right or left foot of the user having a right edge and left edge, said right edge having a first concave curvature said left edge having a second concave curvature having a radius smaller than said first concave curvature and;

a second interchangeable ski for use on either the right or left foot of the user having a right edge and the left edge, said right edge having a curvature substantially equal to that of said second concave curvature of said left edge of the first ski and said left edge of said second ski having a curvature substantially equal to said first concave curvature of said right edge of the first ski, said first curvature being specifically designed for giant slalom turns and said second curvature being designed for shorter slalom turns; wherein

said first interchangeable ski being used on the right foot of the skier and said second interchangeable ski being used on the left foot of the skier when slalom skiing; and,

said first interchangeable ski being used on the left foot of the skier and said second interchangeable ski being used on the right foot of the skier when giant slalom skiing.

4,895,389

RUPTURABLE COVER FOR A VEHICLE AIR BAG COMPARTMENT

Wesley D. Pack, Jr., Pontiac, Mich., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1988, Ser. No. 238,697
Int. Cl.[4] B60R *21/08*
U.S. Cl. 280—732 **9 Claims**

1. A rupturable cover for a vehicle air bag compartment, comprising:

(a) a unitary rupturable cover;

(b) said rupturable cover including first and second sections;

(c) said first and second sections being connected by a rupturable means;
(d) means for securing said first and second sections to the vehicle for closing the air bag compartment and spaced from said rupturable means;



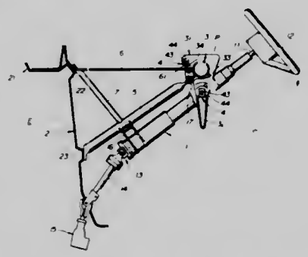
(e) said securing means including flexible S-shaped hinge means for permitting said first and second sections to pivot outwardly from each other when said rupturable means is ruptured.

4,895,390

STEERING MOUNTING ARRANGEMENT FOR AUTOMOTIVE VEHICLE FEATURING IMPROVED HEAD ON COLLISION CHARACTERISTICS

Tadahiro Fujikawa, Hiratsuka, and Takashi Tamura, Fujisawa, both of Japan, assignors to Nissan Shatai Company, Limited, Kanagawa, Japan

Filed Sep. 19, 1988, Ser. No. 245,505
Claims priority, application Japan, Apr. 4, 1988, 63-82797
Int. Cl.⁴ B62D *1/18*
U.S. Cl. 280—777 **6 Claims**



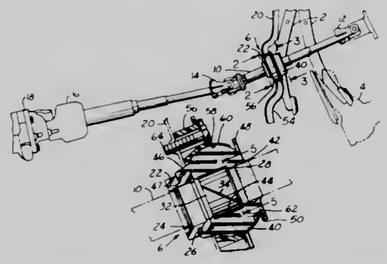
1. A mounting mechanism for mounting a steering column in a vehicle having an engine room and a passenger compartment which are separated by a first panel such that said steering column is pivotably displaced to a safe position in the event of a severe head on collision comprising:
- a mount member which supports a steering column, said steering column housing a steering shaft, said steering shaft having a steering wheel at one end and a steering gear operatively connected at the other end;
- a connection arrangement which interconnects said mount member to a second panel of said vehicle, said connection arrangement being designed to release said mount member and permit it to be pivotably displaced to a safe position and with it the steering column in response to the application of a force in excess of a predetermined magnitude caused by a head on collision;
- a first stay which extends between said mount member and a first site located on said first panel at a level lower than said mount member, said first stay being arranged to be resistant to bending forces; and
- a member which is connected to said first panel at a second site above said first site and one of said first stay and said mount member so as to form therewith a triangular truss wherein said member exerts a tractive force which induces said mount member and steering column to pivot about at said first site to a safe position.

4,895,391

AUTOMOTIVE STEERING DRIVESHAFT BEARING AND SEAL ASSEMBLY

John L. Groat, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 4, 1988, Ser. No. 228,207
Int. Cl.⁴ B62D *1/16*
U.S. Cl. 280—779 **18 Claims**



1. A bearing assembly for supporting a steering driveshaft of an automotive vehicle, comprising:
- a bearing for accepting said driveshaft, with said bearing being adjustable to accommodate variations in the diameter of said driveshaft;
- a driveshaft seal assembly for excluding environmental contamination from entering said rolling bearing from outside the passenger compartment of said vehicle, with said seal being engaged with said driveshaft; and
- a housing comprising a first cavity in which said rolling bearing is housed and a second cavity in which at least a portion of said seal assembly is housed.

4,895,392

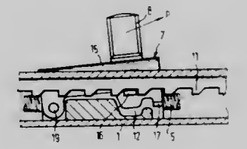
ADJUSTING DEVICE FOR THE SHOULDER STRAP HOLDING ELEMENT OF A SAFETY BELT

Paulus M. Schut, and Hermanus M. I. Koot, both of Montfoort, Netherlands, assignors to IKU Holding Montfoort B.V., Montfoort, Netherlands

Filed Apr. 21, 1988, Ser. No. 184,616
Claims priority, application Netherlands, Apr. 23, 1987, 8700961
Int. Cl.⁴ B60R *22/20*
U.S. Cl. 280—808 **9 Claims**

1. An adjusting device for the shoulder strap holding element of a safety belt, said device comprising:
- a rail section having a U-shaped cross section including legs flanged inwardly, at least one of said flanged legs having a saw-toothed section;
- a slide member movable along said rail section to an infinite number of positions therealong, said slide member including a guide block positioned within said rail section and guided by said flanged legs for movement along said rail section, said guide block enclosing therein a nut;
- a motor driven screw spindle engaging said nut for moving said nut and thereby said slide member along said rail section to any of said infinite number of positions; and

said slide member including means, responsive to a pulling force being exerted on a safety belt, movable, at any of said infinite number of positions of said slide member relative to said rail section, between an unlocked position,



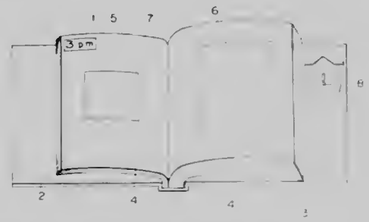
whereat said slide member is movable by said spindle along said rail section, to a locked position, whereat movement of said slide member along said rail section is prevented.

4,895,393

CLOCK-STUDYING PICTURE BOOK

Yuichi Shimizu, Kokubunji, Japan, assignor to Dainippon Kaiga Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 272,051
Claims priority, application Japan, Nov. 25, 1987, 62-179031[U]
Int. Cl.⁴ B42D *3/14, 3/12*; G04C *21/16*; G04B *21/00*
U.S. Cl. 281—15.1 **5 Claims**



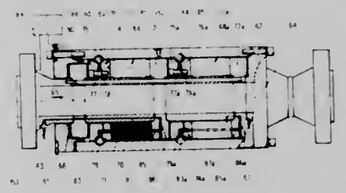
1. A clock studying picture book, comprising:
- a stack of a plurality of book pages at least some of which have thereon an indication of a time of day and at least one related picture;
- a clock means operatively associated with said book pages and having time indicating indicia and a manipulable time indicating means manipulate to correspond with selected ones of the time indicating indicia to indicate various times of day corresponding to the times of day on said at least some of said book pages;
- a switch means associated with at least some of said time indicating indicia and actuable by said time indicating means when said time indicating means correspond with the time indicating indicia to indicate a time of day; and
- circuit means to which said switch means are connected and having a sound generating means and means for causing said sound generating means to emit a distinctive sound for each of the respective time indicia having a switch means associated therewith when said switch means is actuated by a time indicating means positioned in correspondence therewith.

4,895,394

METHOD AND SYSTEM MAINTAINING TIGHTNESS BETWEEN PARTS ROTATING IN RELATION TO ONE ANOTHER

Guy R. Delamare, Herblay, France, assignor to Technip-Geoproduction, Cedex, France

Continuation of Ser. No. 758,338, Jul. 24, 1985, abandoned. This application Dec. 9, 1987, Ser. No. 130,479
Claims priority, application France, Jul. 24, 1984, 84 11838
Int. Cl.⁴ F16L *17/02*
U.S. Cl. 285—18 **11 Claims**



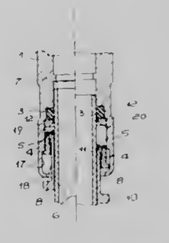
1. A system for maintaining tightness between two parts rotatable relative to each other, the system comprising at least two deformable sealing means, each of said sealing means having at least two possible states, a first state for insuring tightness between said two parts, and a second state wherein tightness is not insured, and wherein drive means are provided for intermittently actuating each of said sealing means in response to rotation of said two parts.

4,895,395

RAPID-ACTION CONNECTOR FOR FLEXIBLE TUBES OR PIPES WITH CONICAL RETAINING RING

Giuliano Ceriani, Marcallo Con casone, Italy, assignor to Finimpresa S.P.A., Mesero, Italy

Filed Nov. 14, 1988, Ser. No. 271,033
Claims priority, application Italy, Mar. 22, 1988, 19888 A/88
Int. Cl.⁴ F16L *37/00*
U.S. Cl. 285—39 **3 Claims**



1. A rapid-action connector comprising:
- an elongated hollow body having a longitudinal axis, an open end adapted to receive a tube connectable to said body, a first shoulder forming a seat spaced axially inwardly from said end, and a second shoulder spaced axially inwardly from said first shoulder;
- a generally toroidal seal member lying against said seat and sealingly engaging said tube for forming a seal between said body and said tube while permitting relative axial displacement between said tube and said seal, said tube being engageable with said second shoulder to limit said relative axial displacement;
- a slit conical ring diverging toward said open end, received in said body and formed with elastically bendable strips continuously connected together at a wide side of said

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ring turned toward said end and at which said ring has a continuous rim, said strips having free ends gripping said tube upon insertion of said tube through said ring and said seal member so that said ring is bodily displaced axially upon relative displacement of said tube and said body;

a sliding collar received in said body, said rim being fixed in said collar, said body being formed with a stop limiting axial displacement of said collar relative to said body toward said seal member, said body being further formed with an inwardly turned flange at said open end preventing withdrawal of said collar from said body, said body having a sliding seat between said stop and said flange on which said collar is guided; and

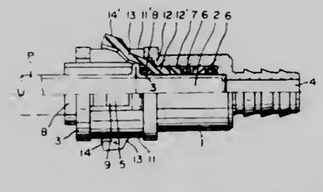
a release sleeve surrounding said tube, disposed within said sliding collar and extending into said body through said open end, said release sleeve having a conical ramp at an end thereof turned toward said ring for deflecting said strips away from said tube for quick release of said tube from said body upon displacement of said sleeve into said body.

4,895,396

CONNECTOR FOR CONNECTING SMALL DIAMETER PIPE

Katsushi Washiza, Saato, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Mar. 3, 1989, Ser. No. 319,254
Claims priority, application Japan, Mar. 8, 1988, 63-30865[U]
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—93 **5 Claims**



1. A connector for connecting a small diameter pipe, said pipe having an end and an annular swelling spaced from said end, said annular swelling having opposed sides, said connector comprising:

a connector body having opposed first and second ends and an axial hollow core interior extending therebetween, portions of the axial core interior adjacent the first end of the connector body defining a communication hole, a stepped small diameter chamber defining a portion of the axial core interior intermediate the first and second ends of the connector body and communicating with the communication hole and a stepped enlarged diameter chamber defining a portion of the axial core interior and disposed between said small diameter chamber and the second end of the connector body, the enlarged diameter chamber including a pair of engagement holes perforated in its peripheral wall at opposed locations thereon and a pair of slots perforated in the peripheral wall at opposed locations thereon, said slots being disposed substantially orthogonal to the engagement holes; sealing members attached to the inside of said small diameter chamber;

a bush so fitted as to sustain said sealing members within said small diameter chamber; a socket member provided with pawl-like walls having tip portions resiliently engageable with the side of said annular swelling opposite said pipe end of the pipe when said annular swelling has passed said tip portions and said pipe has been completely installed, the pawl-like walls of said socket member further being engageable with said engagement holes for securely retaining the pipe in the connector body; and

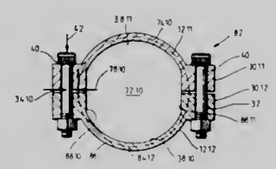
a confirmative member having an annular portion and a pair of flexible arms extending from the annular portion at substantially opposed locations thereon, said confirmative member and said socket member provided with coacting abutting surfaces whereby said socket member retains said confirmative member within said connector body, said confirmative member being disposed in the connector body such that the flexible arms are generally aligned with the slots of the connector body, the flexible arms being configured to be engaged by the annular swelling of the pipe and to be flexed outwardly through said slots and beyond the peripheral wall of the connector body, whereby protrusion of the flexible arms of said confirmative member beyond the peripheral wall of the connector body provides confirmation of complete insertion of the pipe, and whereby the orthogonal alignment of the slots and the engagement holes of the connector body enable outward flexing of the arms of the confirmative member independent of the socket member.

4,895,397

CLAMP

Jack E. Miller, Houston, Tex., assignor to International Clamp Company, Houston, Tex.

Continuation of Ser. No. 840,329, Mar. 14, 1986, Pat. No. 4,790,058. This application Aug. 26, 1988, Ser. No. 237,308
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—419 **20 Claims**



1. A pipe clamp having a pair of complementary clamping members to be clamped together to complete the clamp, each clamping member comprising:

(a) a clamp wall defining an outer wall surface and a curved inner wall surface, the clamp wall further defining a wall centerline projected along a radial path extending from a midpoint between the inner and outer surfaces, the curvature of the radial path generally corresponding to the curvature of the curved inner wall surface; and

(b) bolting flanges defining substantially planar inner wall flange surfaces extending longitudinally along the clamp and facing radially inward thereof, said flanges being laterally spaced at opposed circumferential ends of the clamp wall for use in bolting the clamping members together to complete the pipe clamp, each bolting flange defining a bolt force centerline, wherein the distance between the bolt force centerline and the wall centerline represents a centerline offset distance, the offset distance being optimized to provide a pipe clamp of minimized weight which meets at least minimum acceptable criteria for clamp wall thickness, a clamp body bending stress and bolt bending stress;
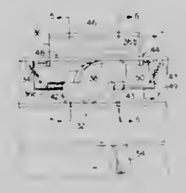
wherein when the complementary clamping members are completed for use, the distance between opposing inner wall flange surfaces is less than the distance between opposing curved inner wall surfaces.

4,895,398

LATCH FOR SLIDING CLOSURES

Peter Hauber, 9001 N. Glenoaks, Sun Valley, Calif. 91352

Continuation of Ser. No. 940,522, Dec. 10, 1986, abandoned. This application Aug. 3, 1988, Ser. No. 227,997
Int. Cl.[4] E05C *3/06*
U.S. Cl. 292—83 **18 Claims**



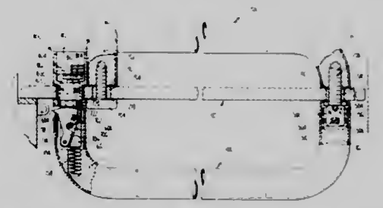
1. Latch for locking sliding closures, comprising: a housing adapted to be mounted on the stile of a sliding closure opposite an opposing jamb-mounted laterally enterable latch keeper, said housing having a front wall defing a slot; a latch having an inner portion within said housing and an outer portion registerable with said latch keeper beyond said housing, said latch being pivoted at said slot for selectively entering said latch keeper; and pivot means for deflecting said latch to enter said keeper, said pivot means being rotatably fixed to said housing about an axis of rotation and having laterally offset, oppositely facing, oppositely sloped first and second shoulders on opposite sides of said axis in a manner to have said shoulders cooperatively simultaneously engage said latch portion within said housing in deflecting relation when rotated in a first direction and to not deflectingly engage said latch portion when oppositely rotated, whereby said latch is supported by two shoulders when latched and yet is pivotable away from latching without interference from said shoulders.

4,895,399

PANIC HANDLE FOR DOORS

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Filed Mar. 18, 1988, Ser. No. 169,997
Int. Cl.[4] E05C *15/02*
U.S. Cl. 292—92 **29 Claims**



1. In combination, a panic handle and a door, comprising:

(a) a bar disposed horizontally along and carried by the inside of a door;

(b) pivot means for allowing limited pivotal movement of said bar between positions toward and away from the door; and

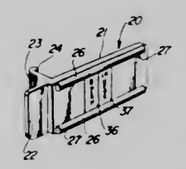
(c) a latching assembly comprising a housing affixed to the door and extending into said bar, said latching assembly being operably engaged with said bar for movement between unlatched and latched conditions upon respective movement of said bar toward and away from said door.

4,895,400

SLIDE LATCH FOR CABANA DOORS

George W. Harding, and George Hiskes, both of Whiting, Ind., assignors to Poly-John Enterprises Corp., Whiting, Ind.

Continuation of Ser. No. 20,571, Mar. 2, 1987, Pat. No. 4,793,100. This application Sep. 22, 1988, Ser. No. 247,729
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[4] E05C *1/10*
U.S. Cl. 292—145 **7 Claims**



1. A slide latch for latching the leading edge of a door panel of a cabana-like structure to a jamb-like member, with said panel being hinged so that its leading edge is arranged to be aligned with the jamb-like member, comprising:

a slider comprising an elongated, generally flat, rectangular-shaped, wide body portion which is arranged upon a surface of the panel for sliding in its elongated, lengthwise direction into latching engagement with an engagement portion of the jamb-like member;

said body portion having a lead end for arrangement at the jamb-like member, and a rear end, with two, opposite, elongated side edges extending the length of said body portion between said ends, and a pair of opposing faces on the opposite sides of the body portion;

an integral, narrow, rigid, elongated rib formed upon the surface of the body portion that faces said panel surface at each elongated side edge of the body portion and arranged in sliding engagement with said panel surface;

said ribs being of substantially uniform, narrow cross-section along their lengths and each having a narrow, elongated free edge surface which overlies and slidably engages its adjacent panel surface portions, with the body portion being otherwise out of engagement, that is, spaced a short distance from, said panel surface;

a loop on said panel surface arranged to extend around the body portion, which extends through the loop, for holding the body portion of the slider upon the panel and for guiding its sliding movement, with said loop being arranged between the opposite ends of the body portion and being considerably shorter in length then said body portion;

a tongue integral with said body portion and extending, substantially coplanar with the body portion, from said lead end substantially parallel to the panel surface, with said tongue being engagable with the jamb-like member;

a raised stop flange formed integral with said body portion and extending from said rear end of said body portion substantially normal to the surface of said body portion opposite said surface that faces said panel, and being engageable with said loop to limit the sliding movement of the slider towards the jamb-like member;

a second, flange-like member integral with the lead edge of the body portion and extending substantially normal to the surface of said body portion opposite its surface that faces said panel, and being engageable with the opposite end of the loop for limiting the sliding movement of the slider away from the jamb-like member and also for grasping the slider for manually sliding it relative to the loop so as to form a grip which is integral with the body portion.

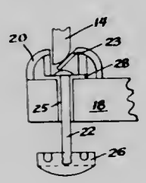
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,401

CABINET DOOR FASTENER

James C. Thorston, Welcome Lodge, Black Beck Wood, Bowness on Windermere, Cumbria, LA23 3LS, and James R. Marsden, Bowness on Windermere, both of England, assignors to James C. Thornton, Cumbria, England

Filed Sep. 10, 1987, Ser. No. 94,806
Int. Cl.[4] E05C *1/02*
U.S. Cl. 292—254 **2 Claims**



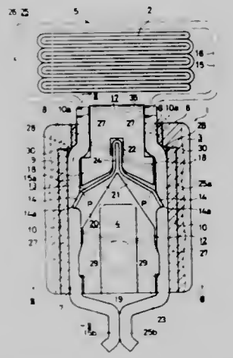
1. A child-proof cabinet door fastening and releasing device consisting of a spring-loaded bolt in a casing, said casing being adapted for mounting on a cabinet door so that said bolt is in a spaced relationship form said door, and so that said bolt normally projects downwardly on a generally vertical axis; a releasing device attached inside and to the base of a cabinet, comprising a keeper for said bolt and a releasing rod affixed therein and extending through said base, said releasing rod being disposed vertically, aligned axially with said bolt and being slidable in relation to said keeper and base; said releasing rod having a head located at its lower extremity whereby pressure applied upwardwardly on said head will release the bolt from the keeper.

4,895,402

DEVICE FOR SEALING COIN CONTAINING BAG OR THE LIKE

Sumio Tomita, Toyonaka, Japan, assignor to Takako Tange, Nara, Japan

Filed Apr. 5, 1988, Ser. No. 177,757
Claims priority, application Japan, May 7, 1987, 62-111983
Int. Cl.[4] B65D *77/10*
U.S. Cl. 292—307 R **8 Claims**



1. A device for sealing a coin containing bag or the like article comprising:
- a prismatic case having a through hole having openings at the front and rear ends thereof;
- a string pressing piece having string pressing portions at left and right sides thereof and fixed within said through hold adjacent to said opening at the rear end thereof; and
- a string holding piece having a concave portion for holding a string therein and fixed within said through hole adjacent to said rear opening over said string pressing piece thereby constituting a unitary structure;

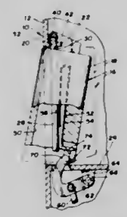
wherein said string is folded substantially at a center thereof so as to be held in said concave portion of said string holding piece in said case, and forms double loops for tightly closing an object be sealed by extending portions on the left and right sides of the folded portion, further extending portions of said string are held by said string pressing portions of said string pressing piece.

4,895,403

FLUSH DOOR HANDLE

Joseph M. Osenkowski, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1988, Ser. No. 217,590
Int. Cl.[4] E05B *3/00*
U.S. Cl. 292—336.3 **2 Claims**



1. A door handle adapted to seat within a recess and fit flush with the exterior of a vehicle body comprising:
- a handle bar of generally rectangular shape substantially filling the recess to present a flush concealed relationship with the vehicle exterior;
- a pivot shaft located within the recess and being mounted on the body for rotation about the axis of the pivot shaft;
- a handle bar pivot carried by the pivot shaft and having the handle bar mounted thereon for pivoting movement with respect to the pivot shaft so that the handle bar may be depressed to pivot the handle bar and the handle bar pivot about the axis of the pivot shaft to permit the handle bar to swing into the recess to be gripped so that the handle bar may then be pivoted by pulling the handle bar outwardly to pivot about the handle bar pivot;

and latch operating means actuated by the pivoting of the handle bar with respect to the pivot shaft.

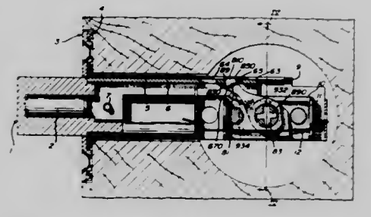
4,895,404

DOOR LATCH HAVING AN ADJUSTABLE BACKSET DISTANCE

Abraham Toledano, Laval, Canada, assignor to Ilco Unican Inc., Montreal, Canada

Filed Dec. 20, 1988, Ser. No. 289,005
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—337 **4 Claims**

1. A door latch having an adjustable backset distance, and comprising;
- an elongated latch housing having a first end and a second end;
- a bolt head slidably mounted in said latch housing for movement into and out of said latch housing through said first end thereof;
- an elongated bolt extension member having one end thereof coupled to said bolt head, whereby said bolt head and said bolt extension member will move together, the other end of said bolt extension member extending out of said latch housing through said second end thereof;
- said bolt extension member being U-shaped in cross-section and having a top surface which forms the bridge of the U;
- first and second spaced openings in said top surface of said bolt extension member adjacent said other end thereof;
- a latch cam having an engagement means at one end thereof and a circular boss means at the other end thereof;
- an extension housing arrangement extending from said second end of said latch housing, said bolt extension member being slidably housed in said extension housing;
- a latch cam holder arrangement movably housed in said extension housing to be movable from a first position, corresponding to a first backset distance, to a second position, corresponding to a second backset distance, whereby to adjust said backset distance;



said latch cam being pivotally held in said latch cam holder arrangement for pivoting about the center of said circular boss means;

wherein, in said first position, said engagement means of said latch cam extends through said first opening in said top surface of said bolt extension member, and in said second position, said engagement means of said latch cam extends through said second opening in said top surface of said bolt extension member;

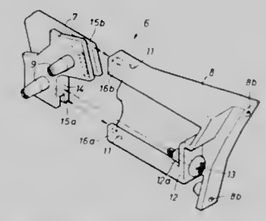
whereby, when the latch cam is pivoted in one direction, it engages the bolt extension member and causes it to slide in said extension housing arrangement in said one direction to extend said bolt head out of said latch housing, and, when the latch cam is pivoted in a second direction, opposite to said first direction, it engages said bolt extension and causes it to slide in said extension housing arrangement in said second direction to retract said bolt head into said latch housing.

4,895,405

BUMPER MOUNTING STRUCTURE FOR A VEHICLE

Nobuhiko Sasatake; Tsuneyuki Wada; Fumihiko Ebihara, and Kunimichi Odagaki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,683
Claims priority, application Japan, Sep. 1, 1987, 62-133753[U]
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—102 **6 Claims**



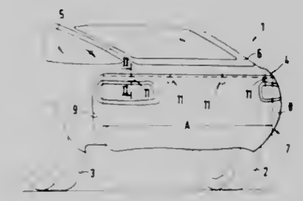
2. A bumper mounting structure in which a vertically extending parting line is defined between a bumper and a part of the vehicle body including a fender, comprising:
- a first member attached to said bumper;
- a second member attached to said fender;
- adjusting means for adjusting the mutual distance between said first member and said second member along a direction perpendicular to said vertical parting line, said adjusting means comprising screw means threaded to one of said two members and extending along fore-and-aft direction of said vehicle body, and a surface provided in the other member for abutting the free end of said screw means thereto.

4,895,406

BUMPER ARRANGEMENT WITH AN ADJUSTABLE COVERING FOR MOTOR VEHICLES

August-Wilhelm Goesse, Moensheim; Herbert Boegge, Schwieberdingen, and Ulrich Koemann, Liebenzell-Monakam, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,144
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3803386
Int. Cl.[4] B60R *19/00*
U.S. Cl. 293—102 **20 Claims**



1. A bumper arrangement for motor vehicles having an adjustable covering;
- a deformation-resistant support which extends transversely with respect to the longitudinal direction of the vehicle and is supported with respect to the vehicle;
- a covering means which covers the deformation-resistant support;
- an edge portion of the covering means being provided with a deformation-resistant strip which is fastened at an adjacent body portion of the motor vehicle;
- the improvement comprising: that the edge portion of the covering means is braced against a recess-shaped area of the adjacent body portion by locally arranged clamping element means;
- the clamping element means being prepositioned at the adjacent body and held in position by operatable screwable fastening elements; and
- the fastening elements interacting with spreading element means, operated from an interior space of the vehicle, to cause the spreading element means to apply a force to the clamping element means to cause the clamping element means to brace the edge portion of the covering means against the recessed-shaped area of the adjacent body portion.

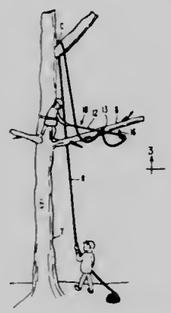
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,407

TREE LIMB HOOKER

Daniel S. Mozer, 126 Grandview Ave., Yardville Heights, N.J. 08620

Filed Aug. 29, 1988, Ser. No. 237,359
Int. Cl.[4] B25J *1/04*
U.S. Cl. 294—19.1 **11 Claims**



1. A device for attaching to the limb of a tree a rope having a loop at one end, comprising:
(a) an elongated handle;
(b) an arm extending laterally outwardly from said handle and having a recess disposed laterally outwardly from the handle, said recess opening upwardly whereby to travel around the side and over the top of said limb to thereafter open downwardly responsive to a half-turn of the handle about its longitudinal axis;
(c) means on said arm having a notch opening upwardly for supporting the looped end of the rope during travel of the arm around and over the limb, and thereafter opening downwardly responsive to said half-turn of the handle whereby to first carry the loop of the rope over the top of the limb and then free it to fall out of engagement with the supporting means; and
(d) means on the handle for engaging the loop after the rope has been positioned over the top of the limb and the loop has been disengaged from said means, whereby the loop may be made accessible to a user for passage of the other end of the rope through the loop and drawing of the rope tightly against the limb.

4,895,408

RAILWAY TRUCK AND TRUCK WHEELSET AND METHOD FOR LUBRICATING A RAILWAY RAIL

Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Filed Sep. 19, 1988, Ser. No. 245,516
Int. Cl.[4] B61K *3/00*
U.S. Cl. 295—34 **15 Claims**

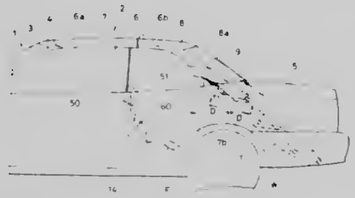
1. In an apparatus for applying lubricant to a longitudinally extending surface of a railway track rail head which is disposed laterally adjacent to the running surface of such a rail head, a lubricant applicator comprising:
a rotary member adapted for rotation about a central axis and including a surface of revolution disposed coaxially with respect to said central axis;
said surface of revolution including a tread surface for rolling engagement with such a running surface and a lubricant receiving surface disposed axially adjacent said tread surface and adapted to have such lubricant deposited thereon;
said lubricant receiving surface including a first generally annular surface portion which is adapted to be disposed in laterally adjacent confronting relationship with such a longitudinally extending surface for movement longitudinally thereof to apply the lubricant deposited thereon to such a longitudinally extending surface upon rotation of said rotary member with said tread surface in such rolling engagement; and
said lubricant receiving surface further including a second generally annular surface portion disposed radially inwardly, with respect to said central axis, from said first surface portion and extending intermediate said first surface portion and said tread surface, with said second surface portion being effective to contain lubricant deposited thereon in a manner to inhibit movement of such lubricant toward said tread surface and such a rail head and to direct such lubricant, upon rotation of said rotary member, onto said first surface portion for application thereof to such a longitudinally extending surface.

4,895,409

CONVERTIBLE VEHICLE BODY STRUCTURE

Takeshi Konishi, and Takanori Tuchiya, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 11, 1988, Ser. No. 141,763
Claims priority, application Japan, Jan. 12, 1987, 62-4618
Int. Cl.[4] B60J *7/16*
U.S. Cl. 296—107 **14 Claims**



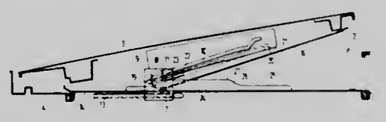
1. A convertible vehicle body comprising:
a body structure having a front windshield,
side panels defining a side belt line at upper edge portions thereof,
a passenger compartment provided in the body structure located rearward of said front windshield and between said side panels,
a roof structure including a rigid front roof panel section and a rigid rear roof panel section,
rear tire housings formed in said body structure for providing spaces for rear wheels,
a front storing section provided in said body structure and located at least partially forwardly of said rear tire housings and rearward from said passenger compartment for storing said rigid front roof panel section,
a rear storing section provided in said body structure and located at least partially rearwardly of said rear tire housings,
a swingable pillar connected with said front roof panel section and having legs pivotably connected with said side panels for movement together with said front roof panel section between an erected position wherein said front roof panel section is engaged at a front edge portion with said front windshield and a retracted position wherein said swingable pillar means and said front roof panel section are stored in said front storing section,
guide means provided in said rear storing section for guiding said rigid rear roof panel section into said rear storing section, said guide means being inclined downwardly and rearwardly,
slide means connected with said rear roof panel section and movable along said guide mans so that said rear roof panel section is movable between an extended position wherein said rear roof section is engaged at a front edge portion with an upper side of a rear edge portion of said front roof panel section and a retracted position wherein said rear roof panel section is retracted into said rear storing section,
said guide means including a pair of substantially parallel guide rails,
one of said guide rails being positioned rearwardly of the other of said guide rails,
said rear roof panel section being provided at a lower end portion with sliding plates having sliding shoes respectively engaged with said guide rails,
said one guide rail including a body portion extending rearwardly and downwardly and an upper bent portion extending toward said other guide rail and then away from said other guide rail in a substantially vertical direction,
a front end portion of said rear roof panel section being moved upwardly and rearwardly when moved from said extended position to said retracted position by movement of a respective one of said sliding shoes in said upper bent portion of said one guide rail.

4,895,410

SLIDING AND LIFTING ROOFS

Rainer Grimm, Wetzlar, and Horst Böhm, Frankfurt, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,696
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725727
Int. Cl.[4] B60J *7/05*
U.S. Cl. 296—214 **11 Claims**



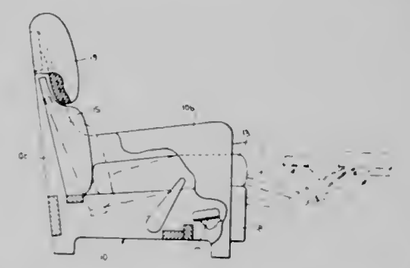
11. A sliding and lifting roof for an automobile having a roof and a roof opening, comprising;
front and rear sliding shoes guided along guide means for sliding movement along each side of said roof opening;
a sliding lid;
a lid liner for moving with said sliding lid, said lid liner having a flap hinged to said lid liner for pivotal movement relative to said lid liner;
a pair of laterally spaced guide blocks fixed to said sliding lid;
said sliding lid being mounted for sliding movement relative to said roof opening by said front and rear sliding shoes and journaled for pivotal movement about a horizontal axis extending transversely to said roof opening by pivot bearings carried by said front sliding shoes.
a guide pin carried by each of said rear sliding shoes and engaging one of said laterally spaced guide blocks within slot means,
a pair of control ramps fixed to said lid liner with each control ramp located adjacent one of said guide blocks and having a control ramp surface;
a pair of lifting levers with each lifting lever having one end pivotably connected to one of said rear sliding shoes, an opposite end engaging said flap and an intermediate portion between said one end and said opposite end and operatively contacting one of said control ramp surfaces; and
means for driving said rear sliding shoes to move said guide pins engaging said guide blocks and said sliding lid from a closed position to a position where the sliding lid has been pivoted about said horizontal axis to raise a rear portion of said sliding lid relative to said roof and to move said intermediate portions of said lifting levers on said control ramp surfaces during a starting phase of said pivotal movement of said sliding lid about said horizontal axis to lift said flap relative to said lid liner more rapidly than said sliding lid is lifted relative to said roof opening.

4,895,411

SHIFTABLE CARRIAGE MECHANISM FOR INCLINER CHAIR

James J. Pine, Tupelo, Miss., assignor to DBJU Inc., Verona, Miss.

Continuation-in-part of Ser. No. 250,115, Sep. 28, 1988. This application Nov. 8, 1988, Ser. No. 268,508
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—88 **15 Claims**



1. A support assembly for use in a shiftable carriage mechanism employed to support the seat, backrest, footrest and legrest of an incliner chair, said support assembly comprising
a frame subassembly which includes an elongated base member that is fixedly connectable to the incliner chair, an elongated mounting rail for supporting the seat and backrest of the incliner chair in a fixed relation to one another, and front and rear strut members which pivotally mount the mounting rail above the base member,
a toggle drive subassembly which is connected between the mounting rail and the base member of the frame subassembly and is capable of being in a locked state wherein it will cause the mounting rail to be fixed in position above the base member or in an unlocked state wherein it will cause the mounting rail to move downwardly towards the base member, and
a footrest-legrest subassembly for supporting the legrest and footrest of the incliner chair and which is connected to said frame subassembly and to said toggle drive subassembly so as to be in a retracted condition when the upper and lower toggle links of the toggle drive subassembly are in their locked state and in an extended condition when the upper and lower toggle links are in their unlocked state.

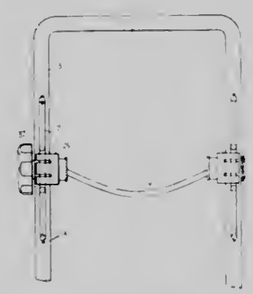
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4,895,412

MOTOR-VEHICLE SEAT HAVING LATERAL WINGS

Serge Deley, Seloncourt, and Francois Fourrey, Montbeliard, both of France, assignors to ECIA - Equipements Et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Oct. 28, 1988, Ser. No. 263,942
Claims priority, application France, Nov. 5, 1987, 87 15363
Int. Cl.[4] A47C *7/46*
U.S. Cl. 297—284 **9 Claims**



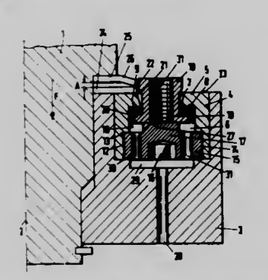
1. A motor vehicle seat comprising:
a sitting surface and a seat back, each having a frame comprising two lateral elements, at least one frame having wing wires, each of said wing wires comprising a central portion and two ends which are pivotally mounted in slots of the corresponding lateral element; and
adjusting means for adjusting an angular position of at least one wing wire;
said adjusting means comprising:
an offset in a middle part of said central portion; and
an adjusting member having a first part, forming a hook engaging directly onto said offset and surrounding said one wing wire over more than half a circumference thereof, and a second part forming a nut movable axially on a rotary control screw axially fixed in the lateral element.

4,895,413

CUTTER ROLLER WITH SPRAYING NOZZLE

Gerd Best, Sprockhovel, and Norbert B. Weikert, Dortmund, both of Fed. Rep. of Germany, assignors to Dipl.-Ing. Rudi Beyer, Bezirk Dusseldorf, Fed. Rep. of Germany

Filed Sep. 9, 1987, Ser. No. 94,589
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630636
Int. Cl.[4] F21C *7/08, 35/22*
U.S. Cl. 299—81 **7 Claims**



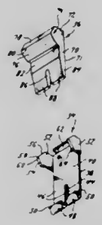
1. A cutter arrangement comprising at least one cutter roller means and a plurality of individually arranged spraying nozzle means for spraying a liquid on the cutter roller means, a nozzle holder means for accommodating the individual spraying nozzle means, duct means for accommodating the spray liquid and supplying said spray liquid to the respective spraying nozzle means, means for controlling an operation of the respective spraying nozzle means in response to forces applied to the cutter roller means during a cutting operation including means for preventing a supply of the spray liquid to the spraying nozzle means, and at least one spring means associated with the cutter roller means and adapted to tilt the nozzle holder means with respect to a longitudinal center axis thereof so as to enable the nozzle holder means to be displaced to an open position for spraying the spray liquid or a closed position blocking a flow of the spray liquid.

4,895,414

WHEEL COVER ATTACHMENT ASSEMBLY

Alvin R. Fleming, Barnhart, and John Chiodo, Chesterfield, both of Mo., assignors to Siegel-Robert, Inc., St. Louis, Mo.

Filed Feb. 1, 1988, Ser. No. 150,614
Int. Cl.[4] B60B *7/06*
U.S. Cl. 301—37 PB **45 Claims**



1. In a wheel cover for an automotive vehicle wheel having a rim, the rim having an interior annular groove with an interior surface;
an attachment assembly comprising:
(a) an engagement member for mounting to the wheel cover, the engagement member having a projection for engaging the interior surface of the annular groove of the rim; and
(b) a detent member made of a different material than the engagement member and mounted with the engagement member, the detent member having an extension for contacting the rim and fitting within the annular rim groove, the extension being positioned alongside the engagement member projection when the projection and extension are within the groove of the rim.

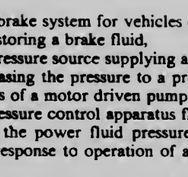
4,895,415

VEHICLE WHEEL COVER AND ASSEMBLY

Randall W. Stay, Redford, and Gerald F. Herbert, Bloomfield Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 9, 1987, Ser. No. 118,077
Int. Cl.[4] B60B *7/06*
U.S. Cl. 301—37 S **9 Claims**

1. A vehicle wheel assembly comprising:
a wheel having a rim portion and a spider portion, said spider portion having a central mounting portion and a peripheral rim engaging portion, said mounting portion defining a central hub receiving opening and a plurality of circumferentially spaced lug stud receiving openings arranged radially outwardly from said central opening;
a plurality of lug studs extending, one each, through a corresponding one of said lug stud receiving openings of said wheel;
a plurality of lug stud nuts engaging, one each, a corresponding one of said lug studs for operatively securing said wheel to the vehicle;
a wheel cover overlaying at least a central area of said spider portion, being formed with a plurality of circumferentially spaced openings, each of which is aligned with one of said lug stud receiving openings of said spider portion and through each of which spaced openings extends an end portion of a corresponding one of a plurality of said lug studs extending beyond its corresponding lug stud nut; and



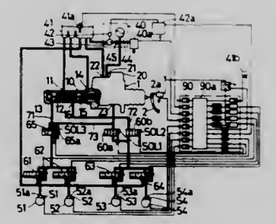
a plurality of wheel cover retainer nuts engaging, one each, a corresponding lug stud end portion, operatively securing said wheel cover to the wheel, each of said retainer nuts having (i) a polyhedral exterior surface portion with a longitudinal axis substantially parallel to that of the wheel, which polyhedral exterior surface portion is frustro-conical to limit lug wrench torque applicable thereto, and (ii) a knurled exterior surface portion outward of said polyhedral exterior surface portion.

4,895,416

HYDRAULIC BRAKE SYSTEM FOR VEHICLES

Kenji Tozu, Kariya; Masamoto Ando, Toyota; Tsuyoshi Yoshida, Obu; Kazutaka Kuwana; Michiharu Nishii, both of Toyota, and Genji Mizuno, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 21, 1988, Ser. No. 260,795
Claims priority, application Japan, Oct. 21, 1987, 62-265769
Int. Cl.[4] B60T *8/88*
U.S. Cl. 303—92 **2 Claims**



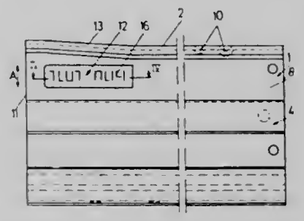
1. A hydraulic brake system for vehicles comprising:
a reservoir for storing a brake fluid,
a power fluid pressure source supplying a power fluid pressure by increasing the pressure to a predetermined pressure by means of a motor driven pump,
a brake fluid pressure control apparatus fluidically communicated with the power fluid pressure source and said reservoir in response to operation of a brake pedal of a vehicle,
a wheel cylinder fluidically communicated with said brake fluid pressure control apparatus via a plurality of fluid passages for operating a brake member in response to an output brake fluid pressure,
a first fluid passage fluidically communicating said wheel cylinder with said reservoir,
a second fluid passage accepting the power fluid pressure as an input,
an anti-lock control apparatus for open-close controlling said first and second fluid passages by a valve apparatus in response to a brake locking condition,
a fluid level detector for detecting the level of the brake fluid in said reservoir,
a fluid quantity discriminating means for discriminating whether the fluid quantity of the brake fluid is above a predetermined value or not by an output signal of the fluid quantity detector,
a motor control means for deactivating said motor driven pump when it is discriminated that the fluid quantity of the brake fluid falls below a predetermined value of the fluid quantity of the brake fluid by the fluid quantity discriminating means,
a pressure detector for detecting an output power fluid pressure of said power fluid pressure source,
a fluid pressure discriminating means accepting an output signal of said pressure detector as an input and discriminating whether the output power fluid pressure of said power fluid pressure source is above the predetermined value or not, and
an anti-lock control stop means for stopping the open-close control of said valve apparatus in said anti-lock control apparatus when it is determined that the fluid quantity of the brake fluid falls below the predetermined value by said fluid quantity discriminating means and the output power fluid pressure falls below the predetermined value by said fluid pressure discriminating means.

4,895,417

DRAWER SIDE WALL

Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Feb. 23, 1989, Ser. No. 314,074
Claims priority, application Austria, Mar. 31, 1988, 854/88
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—234.5 **16 Claims**



1. A drawer side wall for incorporation into a drawer to be mounted for sliding movement into and out of the body of an article of furniture, said drawer side wall having upper and lower sides and forward and rearward ends and comprising:
a vertical flange to define a lateral limit of the drawer;
a lower fastening flange extending laterally from a lower portion of said vertical flange and to be used for attaching said drawer side wall to a bottom of the drawer;
an upper horizontal running flange extending laterally from an upper portion of said vertical flange and to run on a support roller to be mounted on the body of the article of furniture;
said vertical flange, said lower fastening flange and said upper running flange comprising an integral and unitary metal structure resulting from the injection molding or extrusion of said metal;
said vertical flange having formed therein, adjacent a forward end thereof, a recess;
said upper running flange having a forward portion inclined upwardly toward a forward end thereof; and
said upwardly inclined forward portion of said upper run-

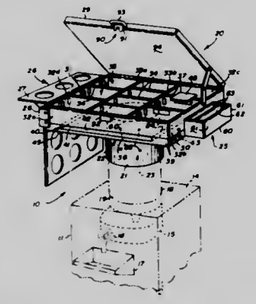
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ning flange resulting from upward deformation of the metal of said vertical flange above said recess upon the formation of said recess by mechanical deformation into said vertical flange.

4,895,418
REFRESHMENT CENTER FOR USE WITH BOTTTLED WATER DISPENSERS

David G. Medellin, and Robert A. Pope, both of San Jose, Calif., assignors to David G. Medellin, Honolulu, Hi.

Filed Sep. 29, 1988, Ser. No. 251,117
Int. Cl.[4] A47B *49/00*
U.S. Cl. 312—252 **43 Claims**



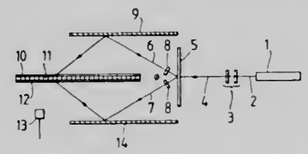
1. A refreshment center removably supportable on an inverted water bottle of a bottled water dispenser, comprising in operative combination:
(a) means for retaining a plurality of refreshment items, each segregatable by kind from the others in a plurality of individualized compartments, in a related adjacent spatial array;
(b) means for removably mounting said refreshment item compartment means in association with at least an upper substantially planar surface of said water bottle;
(c) said mounting means being attached to said refreshment item compartment means;
(d) said mounting means in combination with said compartment means defining a cap assembly dimensioned to receivingly engage and be removably supported by said water bottle to provide storage for and easy access to refreshment items disposed in said compartments; and
(e) said cap assembly extending downwardly from the inverted bottom end of said water bottle along at least a portion of a side wall of said bottle to stably retain said refreshment item compartment means on said water bottle during refreshment item use.

4,895,419
CONTACT COPYING OF REFLECTION OR VOLUME HOLOGRAMS

James Doyle, Wilmslow; Anthony I. Hopwood, Halton, and Alan Ashhead, New Mills, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1989, Ser. No. 308,662
Claims priority, application United Kingdom, Feb. 12, 1988, 8803283
Int. Cl.[4] G03H *1/20*
U.S. Cl. 350—3.69 **24 Claims**

24. A hologram prepared in accordance with a method consisting of the steps of:
forming an assembly by mounting a transmission hologram in register with a portion of light transparent photosensitive holographic material;
cutting-out zero order light transmitted through the transmission hologram using means for this function present between the transmission hologram and the holographic material, there being present on each side of the assembly which comprises the hologram and the holographic material a light reflecting surface;
subsequently causing a beam of light from a laser source to pass through a holographic optical element (H.O.E.) which splits the beam into two beams and causes both beams to scan in register over both the whole surface of the transmission hologram and the holographic material by directing the beams onto both reflecting surfaces so

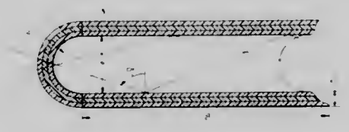


that one beam is reflected from one of said reflecting surfaces and on passing through the transmission hologram takes-up the image information and passes through the means to cut out the zero order light to the portion of transparent photosensitive holographic material where it interferes with the other beam which is reflected from the other reflecting surface into the holographic material, the two split portions of the beam being maintained in registration; and,
subsequently processing the holographic material to fix the holographic image therein.

4,895,420
HIGH REFLECTANCE LIGHT GUIDE

John F. Waymouth, Marblehead, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Aug. 22, 1988, Ser. No. 235,086
Int. Cl.[4] G02B *6/00, 6/14*
U.S. Cl. 350—96.10 **18 Claims**

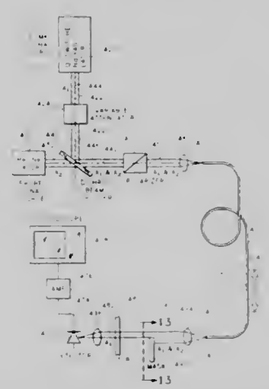


1. A light reflector comprising: A multiplicity of separable sheets of a first flexible, and substantially transparent material having a first index of refraction, and first layer thickness, mutually aligned to be substantially parallel, adjacent and separated one from another by layers of a second flexible, and substantially transparent material having a second index of refraction not equal to the first index of refraction, and a second layer thickness, to form a stack of alternating layers to reflect incident light.

4,895,421
DYNAMIC COUPLERS USING TWO-MODE OPTICAL WAVEGUIDES

Byoung Y. Kim, Menlo Park; Hee G. Park, Sunnyvale, and Herbert J. Shaw, Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 17,762, Feb. 20, 1987, Pat. No. 4,741,586. This application May 2, 1988, Ser. No. 189,050
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **30 Claims**

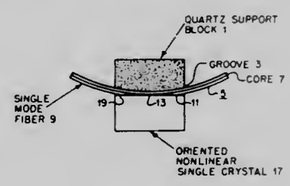


1. An apparatus for controlling an optical signal, comprising:
an optical waveguide segment having first and second spatial propagation modes, said first and second modes having first and second indices of refraction, respectively; and
a perturbational signal source coupled to introduce a perturbational signal into at least one of said spatial modes to optically perturb at least one of said first and second indices of refraction, said perturbational signal controllably varying the spatial intensity distribution of said optical signal.

4,895,422
PHASE-MATCHABLE, SINGLE-MODE FIBER-OPTIC DEVICE

Stephen C. Rand, Ann Arbor, Mich., and Robert A. Cronkite, Westlake Village, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 13, 1988, Ser. No. 283,699
Int. Cl.[4] G02F *1/35*
U.S. Cl. 350—96.15 **6 Claims**

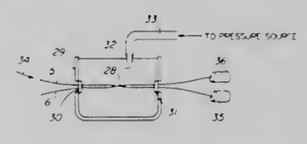


1. A nonlinear fiber-optic device comprising:
(a) a single mode optical fiber having a longitudinal axis, for transmitting light therethrough of a given wavelength, and having a core and a cladding layer, a portion of said cladding layer being removed until a remaining portion of said cladding layer has a thickness of about one half of said given wavelength or less; and
(b) a nonlinear optical crystal having an optical axis, in contact with said remaining portion of said cladding layer, the optical axis of said crystal being substantially perpendicular to the longitudinal axis of said fiber.

4,895,423
FABRICATION TECHNIQUE FOR LOW-LOSS FUSED TAPER DIRECTIONAL COUPLERS AND PRESSURE SENSOR PRODUCED THEREBY

Francois Bilodeau, Nepean; Kenneth O. Hill, Kanata; Sylvain Faucher, Hull, and Derwyn C. Johnson, Nepean, all of Canada, assignors to Canadian Patents and Development Limited, Ontario, Canada

Filed Jan. 3, 1989, Ser. No. 293,074
Claims priority, application Canada, Jan. 11, 1988, 556261
Int. Cl.[4] G02B *6/26; G01D 5/34; C03B 23/20; G01L 1/24*
U.S. Cl. 350—96.15 **16 Claims**

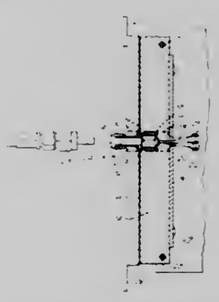


1. A method of forming a single mode biconical fiber optic coupler comprising holding 2 or more optical fibers parallel to and in contact with each other at spaced apart locations, exerting equal tension in opposite directions to the fibers at said spaced apart locations to stretch the fibers, fusing the fibers over a waist region, and scanning the tip of a flame from a microtorch back and forth along the fibers at a speed which is at least five times the speed of stretching of the fibers.

4,895,424
OPTICAL FIBRE ADAPTER MEANS FOR COUPLING OPTICAL SIGNALS

Howard G. Hughes, Abergele, Wales, assignor to Pilkington Communications Systems Limited, United Kingdom

Filed Sep. 14, 1988, Ser. No. 244,263
Claims priority, application United Kingdom, Sep. 25, 1987, 8722553
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **20 Claims**



1. A two-part optical fibre adapter means comprising in combination: a first part which is secured on a support member, said first part including attachment means for attaching an optical fibre connector thereto; and a second part incorporat-

ing an active opto-electronic device, said second part incorporating resilient means for resiliently mounting said second part on a further support member to enable dynamic alignment with , and slidable location within, said first part during insertion of said second part into said first part for directly optically coupling said active opto-electronic device and said optical fibre connector.

4,895,425

PLUG-IN OPTICAL FIBER CONNECTOR

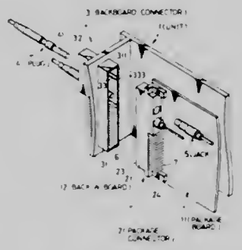
Shinichi Iwano, Mito; Etsuji Sugita, Tachikawa; Ryo Nagase, Mito; Kazunori Kanayama, Tokyo; Kenichi Nakano, Kokubunji, and Yasuhiro Ando, Hoya, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Japan

Filed Feb. 24, 1989, Ser. No. 314,784

Claims priority, application Japan, Feb. 26, 1988, 63-43842; Aug. 1, 1988, 63-190652

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **12 Claims**



1. A plug-in connector for connecting elements mounted on a package board (11) to other elements arranged on a back wiring board (12) disposed perpendicular to the package board, which comprises:

(a) at least one first optical fiber coupling means (5) mounted on the package board (11);

(b) at least one second optical fiber coupling means (4) arranged on the back wiring board (12) and coupled to said first optical fiber coupling means (5), said second optical fiber coupling means (4) being loosely passed through at least one hole (121) formed in the back wiring board (12);

(c) at least two guide pins (33) formed, respectively with a guide portion (333), a flange portion (335), a floating support portion (332) loosely passed through a hole (122) formed in the back wiring board (12), and a fixed portion (331);

(d) a package connector (2) fixed to the package board (11) and formed with at least two guide holes (22) including a truncated conical tapered portion (23), respectively to which the guide portion (333) of said guide pin is fitted, and with at least one hole (42J) to which said first optical fiber coupling means (5) is fitted;

(e) a first connector housing (31) fixed to the back wiring board and engaged with said package connector (2), said first connector housing (31) being formed with at least two guide pin through holes (312) through each of which the floating support portion (332) of said guide pin (33) is loosely passed and with at least one second optical fiber coupling means through hole (313) through which the second optical fiber coupling means (4) is loosely passed; and

(f) a second connector housing (32) formed with at least two guide pin fixing hole (322) to which the fixed portion (331)of said guide pin (33) is fixed and at least one hole (23P) to which the second optical fiber coupling means (4) is fitted, whereby said two guide pins (33) and said second optical fiber coupling means (4) all fixed to said second connector housing (31) loosely project, with a radial play, respectively from said back wiring board (12) and said first connector housing (31) via the through holes (312, 122 and 313, 121) formed in the back wiring board and said first connector housing, to support said second connector housing (32) under floating condition relative to the back wiring board, by sandwiching the back wiring board (12) and the first connector housing (31) between said second connector housing (32) and the flange portions (335) of said guide pins (33), when the first connector housing (31) is not connected to said package connector (2).

4,895,426

ELECTRICALLY CONDUCTING REINFORCED OPTICAL FIBER

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 20, 1988, Ser. No. 247,089

Int. Cl.[4] G12B *6/44*

U.S. Cl. 350—96.23 **11 Claims**



1. Cable apparatus for providing combined large bandwidth optical signal communication and electric power transmission between two spaced locations, the cable comprising:

an integral centrally located elongated fiber core of a first glass material for transmitting optical signals, said first glass material having a first refractive index;

an integral layer of a glass-like material intimately surrounding said fiber core, said glass-like material having a second refractive index less than said first refractive index;

a coating layer of a plastic material intimately surrounding said glass-like material layer;

conductor means for transmitting electrical power embedded in said coating layer; and

reinforcing means embedded in said coating layer.

4,895,427

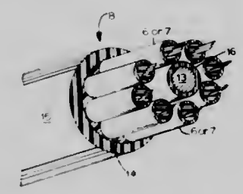
FIBER OPTIC CABLE

Heinrich A. Kraft, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Nov. 13, 1984, Ser. No. 670,992

Int. Cl.[4] G02B *5/16*

U.S. Cl. 350—96.23 **5 Claims**



1. A fiber optic cable, comprising:

(a) a tube in an optical cable; and

(b) a ribbon having two sides each having a plurality of slots disposed in the tube; and

(c) a plurality of optical fibers, each optical fiber disposed in a ribbon slot.

4,895,428

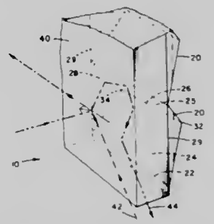
HIGH EFFICIENCY RETROREFLECTIVE MATERIAL

John C. Nelson, Santa Rosa, Calif., and Sanford Cobb, Jr., St. Mary's Point, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 26, 1988, Ser. No. 224,387

Int. Cl.[4] G02B *5/124*

U.S. Cl. 350—103 **24 Claims**



1. A retroreflective material comprising a transparent surface layer and an array of reflecting elements, each of said reflecting elements including:

(a) a rectangular base having a length L,

(b) two mutually substantially perpendicular tetragonal faces having a line of intersection of length Y, said length Y being less than said length L,

(c) a triangular face substantially perpendicular to said tetragonal faces; and

(d) a non-perpendicular triangular face forming an angle alpha with a plane perpendicular to said base, said angle alpha being about $\sin^{-1}(0.25/n)$ to $\sin^{-1}(1/n)$, where n is the refractive index of the reflecting elements;

said triangular face and tetragonal faces defining a cube corner therebetween and said non-perpendicular triangular face and said tetragonal faces forming a non-orthogonal corner therebetween, said reflecting elements arranged with their bases adjacent said surface layer.

4,895,429

REAR PROJECTION APPARATUS

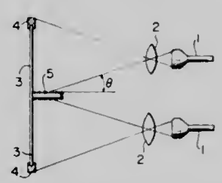
Yoshiaki Iwahara, Yokosuka; Masanori Oguino. and Yuzo Tamura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,114

Claims priority, application Japan, Sep. 30, 1987, 62-243709

Int. Cl.[4] G03B *21/56*

U.S. Cl. 350—124 **6 Claims**



1. A rear projection apparatus having means for joining and projecting at least two images as a single image on a screen, and at least two optical projection means, said rear projection apparatus comprising means for preventing reflection, said reflection preventing means being provided on a surface of a blocking plate for preventing an overlap of the adjacent images on said screen, and said reflection preventing means eliminating a projection of reflected light derived from a ray of light projected on said blocking plate, thus preventing a degradation in contrast.

4,895,430

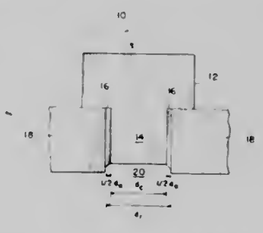
THERMAL COMPENSATING MOUNT

Antony Jalink, Jr., Newport News, Va., and Scott R. Campbell, Sanford, Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 168,065, Mar. 14, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 366,205

Int. Cl.[4] G02B *7/18, 27/64*

U.S. Cl. 350—287 **4 Claims**



1. A thermally compensating mount for an alignment sensitive component comprising:

a cylindrical extension integrally formed to the alignment sensitive component and having the same coefficient of thermal expansion as the component;

a mounting structure;

a cylindrical receptacle in said mounting structure which has a diameter d_r determined by the following equation:

$$d_r = d_c \cdot \sqrt{\left(\frac{t_{cc} - t_{ca}}{t_{cm} - t_{cc}}\right)}$$

where d_c is the diameter of said cylindrical extension and t_{cc}, t_{ca} and t_{cm} are the respective coefficients of thermal expansion for said cylindrical extension, a means for adhering, and said mounting structure; and

a means for placing said means for adhering between said cylindrical extension and said cylindrical receptacle.

4,895,431

METHOD OF PROCESSING ENDOSCOPIC IMAGES

Junpei Tsujiuchi; Nagaaki Ohyama, both of Kawasaki; Toshio Honda, Yokohama; Eric Badique, Tokyo, and Susumu Kikuchi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 119,784

Claims priority, application Japan, Nov. 13, 1986, 61-270038; Jul. 8, 1987, 62-168791

Int. Cl.[4] G02B *27/00, 27/46*

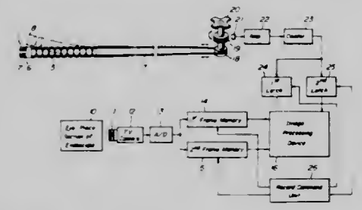
U.S. Cl. 350—320 **34 Claims**

1. A method of processing endoscope images taken by an endoscope having an insertion section, a bending section provided at a distal end of the insertion section and an operation section for controlling a movement of the bending section, comprising the steps of:

entering a first endoscopic image of an object taken by the endoscope situated in a first position;

entering a second endoscopic image of the object taken by the endoscope situated in a second position; said second

endoscopic image being at least partially overlapped with said first endoscopic image; and



detecting a positional relation between said first and second positions of the endoscope.

4,895,432

DISPLAY DEVICE HAVING ANTI-REFLECTIVE ELECTRODES AND/OR INSULATING FILM

Yukihiro Iwashita; Koji Sumi; Koichi Kamijo, and Hideaki Okumura, all of Nagano, Japan, assignors to Seiko Epson Corporation, a Japanese Corporation, Tokyo, Japan

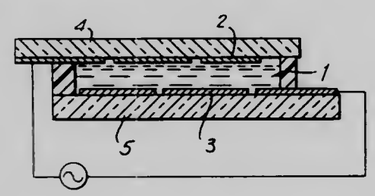
Continuation-in-part of Ser. No. 824,028, Jan. 30, 1986, Pat. No. 4,737,018. This application Apr. 8, 1988, Ser. No. 179,457

Claims priority, application Japan, Jan. 30, 1985, 60-15848; Jan. 30, 1985, 60-15849; Jul. 12, 1985, 60-153691

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 R **33 Claims**



1. A display device comprising:

a pair of opposed spaced apart substrates at least one of which is transparent;

an electrode disposed on the interior surface of each of the substrates, the electrode on the transparent substrate being itself transparent;

a display material enclosed between the substrates; and

wherein the transparent electrode is about ((5500×N)/(2×n))Å thick, wherein N is a natural number and n is the refractive index of the transparent electrode.

4,895,433

VISUAL FIELD CONVERTING OPTICAL SYSTEM

Susumu Takahashi, Hachioji; Minoru Okabe, Musashino; Akira Hasegawa, and Kimihiko Nishioka, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 15,360, Feb. 17, 1987, abandoned. This application Jan. 31, 1989, Ser. No. 303,980

Claims priority, application Japan, Feb. 17, 1986, 61-30980

Int. Cl.[4] G02B *1/00, 23/24, 5/04*

U.S. Cl. 350—413 **19 Claims**

1. An image forming optical system for forming an object image on a predetermined image forming position, comprising:

an image forming lens; and

a gradient refractive index optical element, said optical element having a refractive index distribution in which the refractive index is linearly changed in a direction crossing



an optical axis of said image forming lens at the region including a center part of said optical element which is located on said optical axis.

4,895,434

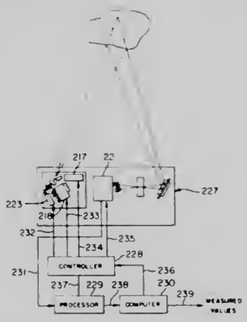
APPARATUS AND METHOD FOR 3-D MEASUREMENT USING HOLOGRAPHIC SCANNING

Howard K. Stern, Greenlawn; Joel Hecker, Port Jefferson Station; Peter Calabrese, Richmond Hill, and Richard Schmidt, Huntington, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Division of Ser. No. 884,494, Jul. 31, 1986, Pat. No. 4,758,093. This application Mar. 24, 1988, Ser. No. 172,472

Int. Cl.[4] G02B *26/00*

U.S. Cl. 350—484 **4 Claims**



1. A method of offsetting the path of a radiant energy beam to multiple paths with a relatively few glass plates comprising: inserting a first glass plate at a predetermined angle into said radiant energy beam, to offset said beam to a first offset path; removing said first glass plate and inserting a second glass plate at said predetermined angle into said beam to offset said beam to a second offset path, said second glass plate being twice as thick as said first glass plate; and inserting said first glass plate with said second glass plate at said predetermined angle into said beam to offset said beam to a third offset path.

4,895,435

APPARATUS FOR IMPROVING A DRIVER'S REARWARD FIELD OF VISION IN A MOTOR VEHICLE

George D. Shomper, 2501 Ambler Ct., Baltimore, Md. 21222

Filed Dec. 16, 1988, Ser. No. 285,061

Int. Cl.[4] B60R *1/04, 1/08;* B60J *3/00;* G02B *7/18*

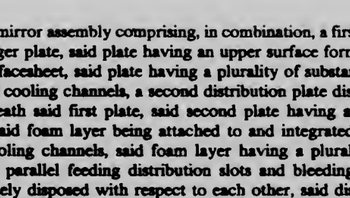
U.S. Cl. 350—606 **9 Claims**

1. An apparatus mounted on an elongated edge of a pivoted substantially horizontal sunshield visor disposed near the roof of the interior of a motor vehicle comprising:

a mirror encompassed by a frame;

a clasp pivotally attached to the frame for mounting the frame and mirror by a frictional engagement on the sunshield visor so that the mirror may be adjusted laterally on the elongated edge of the sunshield visor as desired by a particular driver;

a resilient means connecting the clasp to the frame to reduce vibration of the mirror; and



a manually manipulatable means to adjustably pivot the frame along a horizontal axis about the pivotal attachment to the clasp as desired by a particular driver for improving the field of vision simultaneously to the rear and to the driver's side of the vehicle.

4,895,436

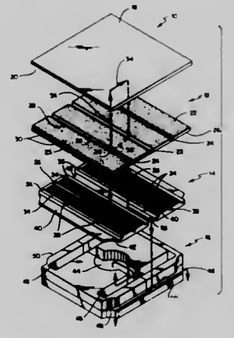
MIRROR ASSEMBLY

Gon-Yen Shen, Brookfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 19, 1988, Ser. No. 233,792

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—610 **13 Claims**



7. A mirror assembly comprising, in combination, a first heat exchanger plate, said plate having an upper surface forming a mirror faceabeet, said plate having a plurality of substantially parallel cooling channels, a second distribution plate disposed underneath said first plate, said second plate having a foam layer, said foam layer being attached to and integrated with said cooling channels, said foam layer having a plurality of spaced, parallel feeding distribution slots and bleeding slots alternately disposed with respect to each other, said distribution slots being substantially adjacent to and in fluid flow relationship with said cooling channels, said second plate having a support layer underneath said foam layer, said support layer having a plurality of rows of spaced feeding holes for feeding said feeding distribution slots, said support layer having a plurality of rows of spaced bleeding holes for bleeding said bleeding distribution slots, a third manifold plate disposed underneath said second plate, said third plate having a plurality of elongated inlet passages, a parallel outlet passage interposed between each set of two inlet passages, means for interconnecting said inlet passages with said feeding holes in fluid flow communication, and means for interconnecting said outlet passages with said bleeding holes in fluid flow communication.

4,895,437

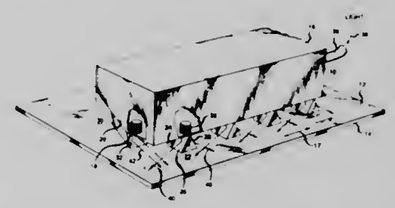
ILLUMINATION METHOD AND APPARATUS

Israel Amir, Ewing, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 27, 1989, Ser. No. 316,003

Int. Cl.[4] G02B *5/08;* F21V *7/00*

U.S. Cl. 350—612 **7 Claims**



5. Apparatus for illuminating at least a portion of a major surface of a substrate with light directed at the substrate at a grazing angle, comprising:

an elongated body spaced above the substrate so as to be parallel to an axis running along its surface;

a plurality of first light-reflective members depending from the body in spaced relation along the axis, each member shaped to split a beam of light directed thereat into two beams and to reflect each of the two, in a downward direction opposite the other beam, so each beam strikes the substrate at a grazing angle in a direction generally along the first axis;

means for directing light at each of the first light-reflective bodies; and

means for directing light towards the substrate at a grazing angle in a direction generally perpendicular to the first axis so the light strikes the substrate at a grazing angle.

4,895,438

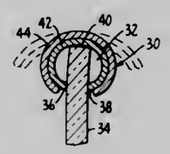
EYEGLASS FRAME INCLUDING SHAPE-MEMORY ELEMENTS

Robert B. Zider, Portola Valley, and John F. Krumme, Woodside, both of Calif., assignors to CVI/Beta Ventures, Inc., Menlo Park, Calif.

Continuation of Ser. No. 876,077, Jun. 19, 1986, Pat. No. 4,772,112, which is a continuation-in-part of Ser. No. 676,823, Nov. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 558,604, Dec. 6, 1983, abandoned. This application Jan. 1, 1988, Ser. No. 200,831

Int. Cl.[4] G02C *1/00, 5/16*

U.S. Cl. 351—41 **7 Claims**

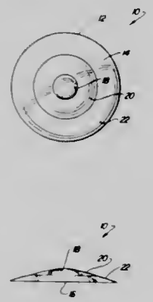


1. An eyeglass frame having at least one frame component, said frame component having a generally U- or C-shaped cross-section, said frame component made of shape-memory alloy with a martensite transformation temperature below ambient temperature, said alloy having an austenite transformation temperature above which the alloy transforms to its austenite state to change the U- or C-shaped opening within

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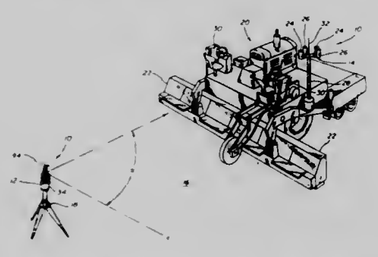
said cross-section with respect to a substrate that may be inserted therein.

4,895,439
ASPHERIC SPECTACLE LENS
Raymond Stoller, 5603 NW. 159th St., Hialeah, Fla. 33014
Filed Jul. 13, 1988, Ser. No. 218,647
Int. Cl.[4] G02C *7/02*; G02B *3/02*
U.S. Cl. 351—167 **3 Claims**



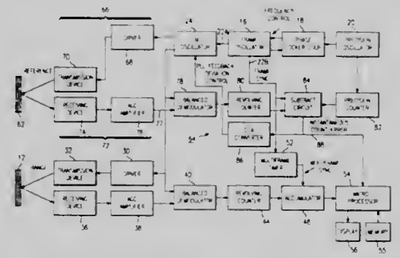
1. A spectacle lens consisting of:
a substantially circular optic having an aspheric front surface and a rear surface,
said front surface of said optic having a central optical zone and between two and three annular optical zones surrounding said central zone,
wherein said central zone has a predetermined diopter refraction,
wherein each annular optical zone has a predetermined diopter refraction which is substantially one doopter less than the diopter refraction of the optical zone immediately adjacent its interior, and
wherein said rear surface is substantially planar.

4,895,440
LASER-BASED MEASUREMENT SYSTEM
Gary L. Cain, New Carlisle; Mark D. Sobottke, Kettering, both of Ohio, and Joseph F. Rando, Los Altos Hills, Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.
Filed Aug. 22, 1988, Ser. No. 234,565
Int. Cl.[4] G01C *3/08*; G01B *11/26*
U.S. Cl. 356—5 **19 Claims**



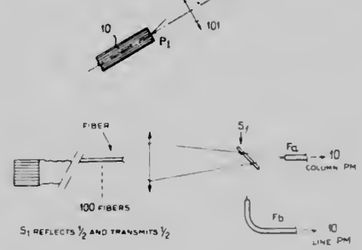
1. A laser beam measurement system, comprising:
a transmitter at one position which produces a laser reference plane by sweeping a laser beam about the transmitter;
a receiver located at a position remote from said transmitter which receiver intercepts the laser reference plane;
reflector means at said receiver for reflecting said laser beam back to said transmitter when the laser beam sweeps past said receiver;
first means at said transmitter for sensing said laser beam reflected back to said transmitter from said receiver;
azimuth means at said transmitter, responsive to said first means, for providing electrical angle signals indicative of the angle at which said receiver is positioned with respect to a reference axis that extends from said transmitter;
second means at said transmitter, responsive to said first means, for causing said transmitter to modulate said beam in response to sensing of said laser beam reflected back to said transmitter by said reflector means; and
third means at said transmitter, responsive to said first means and said second means, for producing an electrical signal indicative of the period of time between said modulation and the sensing by said first means of such modulation of said laser beam reflected back to said transmitter, said time period being indicative of the range of said receiver from said transmitter.

4,895,441
METHOD AND APPARATUS FOR PRECISION RANGING
C. Cameron Allen, Jr., Richardson, Tex., assignor to Fandel Instruments, Inc., a Texas corporation, Grand Prairie, Tex.
Filed Mar. 19, 1987, Ser. No. 27,642
Int. Cl.[4] G01C *3/08*; G01S *9/68*
U.S. Cl. 356—5 **6 Claims**



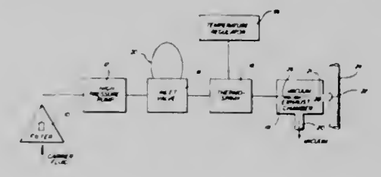
1. A precision optical ranging apparatus for measuring absolute distance to a target, comprising:
means for generating a sinusoidally-varying modulating signal having a predetermined first frequency, the first frequency inversely proportional to a period;
a signal source having a long coherent length compared to the distance to be measured and having a predetermined second frequency substantially greater than the predetermined first frequency, the signal source having an input for receiving the modulating signal and in response thereto generating a frequency-modulated signal;
means for converting the frequency-modulated signal into an optical waveform and for transmitting the frequency-modulated signal in its optical waveform to the target, the transmitted frequency-modulated signal maintaining spatial coherence as it travels to and from the target due to the long coherent length of the signal source;
a receiver for receiving from the target a reflected version of the transmitted frequency-modulated signal in its optical waveform and in response thereto generating a received frequency-modulated signal;
means for comparing the frequency-modulated signal and the received frequency-modulated signal to generate a beat frequency signal representing a number of 360° instantaneous phase differences between the frequency-modulated signal and the received frequency-modulated signal per period caused by the sinusoidally-varying modulating signal, wherein the beat frequency signal is proportional to the absolute distance to the target provided the absolute distance is smaller than the coherent length of the signal source;
means for processing the beat frequency signal to determine the absolute distance to the target;
a reference target;
a reference transmitter located a predetermined distance from the reference target and connected to the signal source, the reference transmitter for transmitting the frequency-modulated signal in its optical waveform to the reference target;
a reference receiver located a predetermined distance from the reference target for receiving from the reference target a reflected version of the transmitted frequency-modulated signal in its optical waveform and in response thereto generating a received reference frequency-modulated signal;
means for comparing the reference frequency-modulated signal and the received reference frequency-modulated signal to generate a reference beat frequency signal representing a number of 360° instantaneous phase differences between the reference frequency-modulated signal and the received reference frequency-modulated signal per period caused by the modulating signal; and
means for processing the reference beat frequency signal to maintain the frequency of the frequency-modulated signal output from the signal source within predetermined limits.

4,895,442
VELOCIMETER WITH AN OPTICAL FIBER MOSAIC
Alain Boutier, Bures, and LeFevre Jean, Fontenay-Aux Roses, both of France, assignors to Office National D'Etudes Et De Recherches Aerospatiales (O.N.E.R.A), Chatillon, France
Filed Jan. 27, 1988, Ser. No. 149,191
Claims priority, application France, Jan. 30, 1987, 87 01150
Int. Cl.[4] G01P *3/36*; G02B *6/32*
U.S. Cl. 356—28 **13 Claims**



1. A velocimeter comprising:
a measurement volume in a fluid flow containing microparticles;
means for illuminating said measurement volume so that microparticles in the volume illuminated by energy from the means for illuminating diffuse the light incident thereon;
means for deriving the velocity of said fluid flow from the light diffused by the illuminated particles;
an optical fiber mosaic having an input plane;
an optical system for projecting an object plane in the measurement volume onto the input plane of said mosaic; and
means for connecting outputs of the optical fiber mosaic to said velocity deriving means,
the mosaic optical fibers being arranged in a line and column matrix, the fibers having outputs optically split into two equal parts to first and second optical fibers collectively coupled to common line and column photodetectors.

4,895,443
METHOD AND APPARATUS FOR ELECTROTHERMAL ATOMIZATION OF SAMPLES
Margaretha T. C. de Loos-Vollebregt, Pynacker, and Leo de Galan, EM Schiedam, both of Netherlands, assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Jun. 20, 1988, Ser. No. 208,936
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720289
Int. Cl.[4] G01N *21/74*
U.S. Cl. 356—36 **10 Claims**



1. A method for electrothermal atomization of samples for analysis by atomic absorption spectrophotometry comprising the steps of:
(a) heating to a first, above-ambient temperature a furnace shaped to receive a sample and to accommodate transmission of a radiation beam of pre-selected wavelength;
(b) heating a liquid sample in a capillary tube to cause at least a major portion thereof to vaporize;
(c) intermittently inserting one end of the tube into said furnace and forming a jet of the vaporized sample injected into the furnace so as to impinge on an inner surface thereof;
(d) heating the furnace to a temperature higher than said first temperature and sufficient to atomize the sample;
(e) passing a beam of radiation through the atomized sample and measuring the degree of absorption thereof by the sample; and
(f) allowing the furnace to cool down to said first temperature.

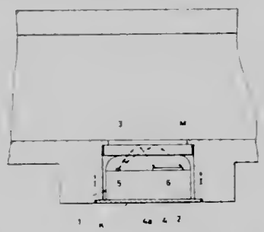
4,895,444
DETECTOR DEVICE FOR MIXING RATIO FOR GASOLINE AND ALCOHOL OR THE LIKE
Shigeru Miyata, and Yoshihiro Matsubara, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed Apr. 12, 1988, Ser. No. 180,490
Claims priority, application Japan, Apr. 17, 1987, 62-95962; Jun. 26, 1987, 62-160242
Int. Cl.[4] G01N *21/41*
U.S. Cl. 356—128 **7 Claims**

1. A detector device for mixing ratio of gasoline and alcohol or the like comprising:
an optically permeable plate, one side of which is placed to be in direct contact with mixing liquid of different kinds of components;
a light emitting diode located at other side of said optically permeable plate to be opposite to said mixing liquid, so that light beams emitted from said diode enter said optically permeable plate to be incident on a boundary between said plate and said mixing liquid, the light beams incident on said boundary at less than a critical angle being refracted toward said mixing liquid, while the light beams incident on said boundary at more than the critical angle being totally reflected, said critical angle depending on a degree of said mixing liquid;
a photo diode having a rectangular shape, and located in

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coplanar relationship with said light emitting diode to receive the light beams totally reflected from said boundary to generate an output in accordance with the light beams received; and

a distance between said photo diode and said light emitting diode, and width dimension of said photo diode along the



direction of said distance being determined such as to provide incident angles ranging from a minimum corresponding to the critical angle when said mixing liquid ratio is at a lower limit of the predetermined range to a maximum corresponding to the critical angle when said mixing liquid ratio is at upper limit of the predetermined range.

4,895,445

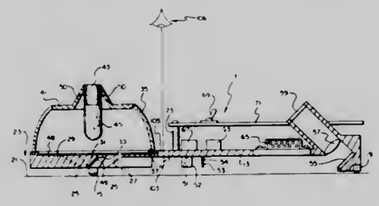
SPECTROPHOTOMETER

Edward M. Granger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 66,284, Jun. 25, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 270,728

Int. Cl.[4] G01J *3/18, 3/42*

U.S. Cl. 356—328 **34 Claims**



1. A spectrophotometer including:

means for illuminating a sample to be spectrally analyzed;

a plurality of detectors disposed in a linear array in a common plane, with said detectors being disposed on uniformly spaced centers;

light directing and diffracting means for directing and diffracting light from said sample onto said array of detectors;

said light directing and diffracting means including:

a collecting lens;

a diffraction grating;

an imaging lens; and

a flare stop, said flare stop being supported between said collecting lens and said diffraction grating;

means supporting said collecting lens between said sample and said flare stop with said sample and flare stop being at the conjugates of said collecting lens, whereby said collecting lens directs light from said sample as a non-collimated beam onto said diffraction grating through said flare stop;

means supporting said imaging lens between said diffraction grating and said array, with said flare stop and said array at the conjugates of said imaging lens;

said diffraction grating being angularly disposed relative to the light incident thereon and the plane of the array and the axis of said imaging lens being oriented, and the array and the imaging lens being disposed, to produce a substantially linear relationship between the predominant wavelength of the light incident at any particular point on the array and the distance of that point along the array.

4,895,446

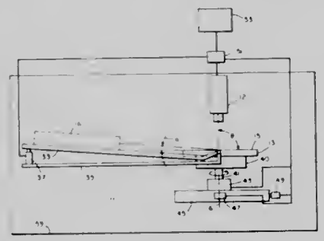
PARTICLE DETECTION METHOD AND APPARATUS

Mario A. Maldari, Stow, and Charly Allemand, Newton, both of Mass., assignors to Inspex Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 922,478, Oct. 23, 1986, Pat. No. 4,722,126. This application Sep. 19, 1988, Ser. No. 246,464

Int. Cl.[4] G01N *15/02*

U.S. Cl. 356—336 **6 Claims**



1. Apparatus for detecting particles on the front surface of a patterned semiconductor wafer comprising:

a. holder for holding said semiconductor wafer,

b. means for illuminating an area on said surface at grazing angle of incidence with a collimated beam of light,

c. a means for orienting the surface so that light diffracted from the surface and the pattern thereon can be reduced to a minimum,

d. light detector means disposed above said surface at an angle in the vicinity of ninety degrees to detect light scattered from the area on the surface by any particles thereon and not specularly reflected light and producing signals representative thereof,

e. a computer for processing signals received by the light detector means,

f. a display for displaying the processed signals, and

g. means for moving the holder translationally about two axes so that other areas can be examined.

4,895,447

PHASE-SENSITIVE INTERFEROMETRIC MASK-WAFER ALIGNMENT

Walter Järisch, Boeblingen, and Günter Makosch, Sindelfingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1988, Ser. No. 207,978

Claims priority, application European Pat. Off., Oct. 30, 1987, 87115965

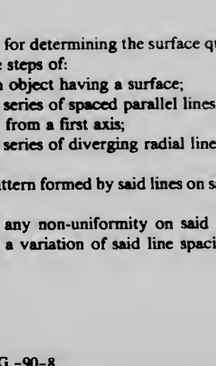
Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—356 **23 Claims**

1. Method for aligning two parallel objects (1,2) in different planes, each object carrying an optical grating to diffract light beams with symmetrical incidence into a direction normal to the surface of the objects, the phase of the diffracted beams being analyzed by electro-optic phase compensation, characterized in that the following steps are performed in a lithographic system of the proximity printing type:

determine the phase of the diffracted beams (5) for at least one alignment direction when the alignment grating (3*a*) of one object (2) is positioned over a smooth surface of the other object (1),

determine the phase of the diffracted beams (5) for each alignment direction after the grating (3*b*) of the second



object has been brought under the alignment grating (3*a*) of the first object with an alignment accuracy of better than g/4, g being the constant of the gratings,

apply the relative phase of the second measurement step as position control signal to displace one of the objects.

4,895,448

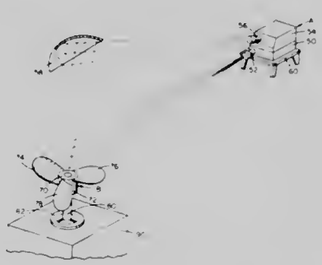
METHOD AND APPARATUS FOR DETERMINING THE SURFACE QUALITY OF AN OBJECT

Richard P. Laird, 3705 W. Carmel, Peoria, Ill. 61615

Filed Jan. 13, 1988, Ser. No. 143,512

Int. Cl.[4] G01B *11/24*

U.S. Cl. 356—376 **25 Claims**



1. A method for determining the surface quality of an object comprising the steps of:

providing an object having a surface;

projecting a series of spaced parallel lines on the surface of the object from a first axis;

projecting a series of diverging radial lines onto said object surface;

viewing a pattern formed by said lines on said object surface; and,

ascertaining any non-uniformity on said object surface by observing a variation of said line spacing on said object surface.

4,895,449

GAUGE FOR MEASURING ACROSS-SECTIONAL DIMENSION DENIATION ON AN ELONGATE OBJECT

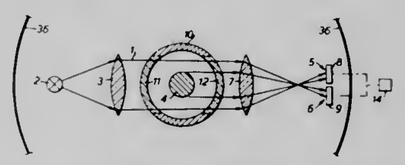
Joseph W. Marshall, East Knighton, England, assignor to British Steel plc, London, England

Continuation of Ser. No. 758,390, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 607,405, May 7, 1984, abandoned, which is a continuation of Ser. No. 17,462, Mar. 5, 1979, abandoned. This application Aug. 23, 1988, Ser. No. 235,167

Claims priority, application United Kingdom, Mar. 9, 1978, 938878

Int. Cl.[4] G01B *11/10*; G01N *21/88*

U.S. Cl. 356—386 **10 Claims**



1. A gauge for detecting or measuring a cross-sectional dimension or deviation from a predetermined shape or cross-sectional dimension of elongate objects moving relative to the gauge comprising a tubular housing, means for rotating the housign continuously about the intended path of objects to be gauged, a light source and collimating means mounted on the housing and positioned to direct a collimated beam of light towards and onto objects moving along the aforesaid path of travel, a photo diode array mounted on the housing at a location diametrically opposed to the light source and comprising a multiplicity of individual photo diodes which are sequentially scanned on rotation of the housing to produce a series of discrete electrical signals representative of the actual sizes and spatial positions of the real object images received by the array at particular moments in time, and signal processing means connected to receive the aforesaid electrical signalsl and to provide outputs corresponding to the aforesaid parameters to be detected or measured by the gauge.

4,895,450

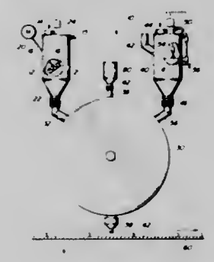
WEIGHING, MEASURING, AND MIXING APPARATUS FOR LIGHTWEIGHT CONCRETE

Karl Holik, 12858 Pasadena Ave., Litchfield Park, Ariz. 85340

Filed May 1, 1989, Ser. No. 345,786

Int. Cl.[4] B28C *7/04*

U.S. Cl. 366—18 **7 Claims**



1. Measuring and weighing apparatus comprising, in combination:

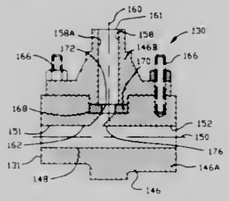
first hopper means for receiving first materials;

first weighing means for weighing the first materials in the first hopper means;

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first measuring means for measuring the volume of the first materials in the first hopper means;
second hopper means for receiving second materials;
second weighing means for weighing the second materials in the second hopper means; and
third hopper means for receiving and mixing the first materials from the first hopper means and the second materials from the second hopper means.

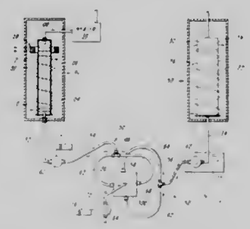
4,895,451
MIXING DEVICE
Wayne B. Hockett, Tampa, Fla., assignor to Continuous Hose Corporation, Tampa, Fla.
Filed Jul. 5, 1988, Ser. No. 215,001
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—150 **13 Claims**



1. An improved mixing device for mixing an abrasive with a flowing fluid, comprising:
a body member having a major internal channel defined therein:
said major internal channel extending between a major input and a major output of said major internal channel;
said body member having a minor internal channel defined therein;
said minor internal channel extending from a minor input to an internal end intersecting with a portion of said major internal channel located between said major input and said major output of said major internal channel;
means for directing the flowing fluid into said major input of said major internal channel;
means for directing the abrasive into said minor input of said minor internal channel for enabling the abrasive to mix with the flowing fluid with said major internal channel and to discharge from said major output; and
means establishing said minor internal channel at an acute angle relative to said major internal channel with said minor internal channel extending generally toward said major input of said major internal channel for enabling abrasive erosion of said body member to be distributed over a region of said body member during prolonged use of the mixing device.

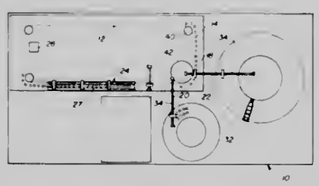
4,895,452
METHOD AND APPARATUS FOR PRODUCING LIPID VESICLES
Costas Yiourmas, Vineland, N.J., and Donald F. H. Wallach, Brookline, Mass., assignors to Micro-Pak, Inc., Wilmington, Del.
Filed Mar. 3, 1988, Ser. No. 163,806
Int. Cl.[4] B01F *3/08, 5/06, 15/02;* **B01J** *13/02*
U.S. Cl. 366—173 **4 Claims**

1. An apparatus for the production of multilamellar or paucilamellar lipid vesicles by shear mixing and rapid hydration of a lipophilic phase by a hydrophilic phase, said apparatus comprising:
a substantially hollow mixing chamber having an interior surface, an exterior surface, and a cross-section which is substantially cylindrical about a first axis, said mixing chamber further containing a first inlet orifice for inlet of said lipophilic phase, a second inlet orifice for inlet of said hydrophilic phase, and an outlet orifice, said first inlet orifice and said second inlet orifice being located substantially tangential to said inner surface of said mixing chamber and said first and second inlet orifices being directed in the same tangential direction, said outlet orifice being located substantially axial along said first axis, said outlet being free of any turbulence-creating barriers;
a first reservoir for holding said lipophilic phase;
a free delivery system for delivering said lipophilic phase from said first reservoir to said first inlet orifice, said first delivery system comprising a first pump, a first inlet feed line connecting said first pump to said first inlet orifice, and a first tubing connecting said first reservoir to said first pump;
a second reservoir for holding said hydrophilic phase; and



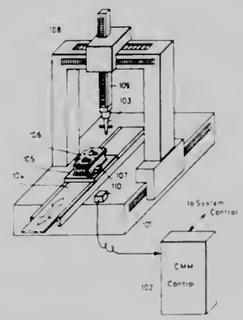
a second delivery system for delivering said hydrophilic phase from said second reservoir to said second said inlet orifice, said second delivery system comprising a second pump, a second inlet feed line connecting said second pump to said second inlet orifice, and a second tubing connecting said second reservoir to said second pump;
said first and second pumps, said first and second tubing, said first and second inlet feed lines, and said first and second inlet orifices being selected in size to provide shear mixing by introducing said lipophilic phase and said hydrophilic phase into said hollowing mixing chamber with sufficient velocities such that turbulent flow is created in said hollow mixing chamber, thereby providing shear mixing and hydration of said lipophilic phase by said hydrophilic phase in said hollow mixing chamber.

4,895,453
VORTEX MIXER DRIVE
William J. Devlin, Newark; Carl F. Morin, Brandywood, and Robert K. Wiedenmann, New Castle, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 24, 1988, Ser. No. 237,017
Int. Cl.[4] B01F *11/00*
U.S. Cl. 366—219 **14 Claims**



1. An automatic apparatus for establishing a vortex in liquid samples contained in reaction vessels disposed on a transport comprising:
a plurality of vessel carriers disposed on the transport, each adapted to hold the upper portion of a reaction vessel, the transport having a line of movement,
a rotatable coupling having an axis of rotation and located under the line of movement of the vessel carriers in a position to interdict a reaction vessel held by the transport,
the coupling defining a first recess positioned off of and opening radially outward from the axis of rotation;
means for rotating the coupling to a first position to engage the lower portion of a reaction vessel and to a second position to permit the reaction vessel and to pass, and
means to rotate the coupling rapidly, thereby to orbit the lower end of an engaged reaction vessel.

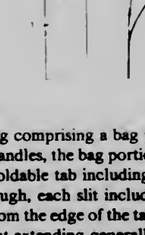
4,895,454
METHOD OF DETERMINING THE TEMPERATURE OF A WORKPIECE IN A FLEXIBLE MANUFACTURING SYSTEM
Bernd Kammleiter, and Karl Schepperle, both of Oberkochen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
Filed Sep. 6, 1988, Ser. No. 240,816
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729644
Int. Cl.[4] G01K *7/10;* **G01N** *25/00*
U.S. Cl. 374—163 **8 Claims**



1. A method for determining the temperature of a workpiece in a flexible manufacturing system such as for correcting of errors introduced by temperature when making length measurements on the workpiece, the method comprising the steps of:
installing a self-sufficient sensor assembly equipped with temperature sensing means on the workpiece, the sensor assembly including an encapsulated housing and remaining on the workpiece also during the material processing on the workpiece;
causing the sensor assembly to pass through the material flow together with the workpiece; and,
transmitting temperature values measured on the workpiece to appropriate remote stations.

4,895,455
COVER FOR WALL MOUNTED THERMOSTAT INCLUDING ILLUMINATION MEANS AND MAGNIFYING MEANS
David Horning, 105 Glen Haven La., Pittsburgh, Pa. 15238
Filed Mar. 6, 1989, Ser. No. 319,091
Int. Cl.[4] G01K *1/06;* **G01D** *11/28*
U.S. Cl. 374—208 **8 Claims**

1. A cover for use with a circular thermostat having a wall-mounted base and a rotatable sub-assembly, said rotatable sub-assembly having a central dial casing presenting temperature readings and/or settings;
said cover having a circular annular portion and a central transparent portion and having:
securing means for securing the cover to said rotatable sub-assembly of said thermostat;



illuminating means beneath said annular portion for illuminating the said central dial casing;
visual magnifying means comprising a transparent convex lens in said central transparent portion, said magnifying means being adapted to enlarge the view of said temperature readings and/or settings;
and means for activating said illuminating means.

4,895,456
SHOPPING BAGS
Shigenari Morita, Higashinariku, Japan, assignor to The Pack Kabushiki Kaisha, Higashinariku, Japan
Filed Jan. 6, 1989, Ser. No. 294,199
Int. Cl.[4] B65D *33/06*
U.S. Cl. 383—20 **4 Claims**



1. A shopping bag comprising a bag portion, a bottom portion, and a pair of handles, the bag portion including a foldable tab in its rim, the foldable tab including slits for allowing the handle to pass through, each slit including a first portion extending inwardly from the edge of the tab and a second portion continuous with, but extending generally transversely to, said first portion and being inwardly spaced from said rim of said bag portion and the opposite ends of each handle being bonded to a reinforcement strap attached to the bag portion, the foldable tab being folded over the reinforcement straps with the handles protruded through the second portions of the handle-receiving slits.

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RF-SEALABLE PACKAGING CONTAINERS

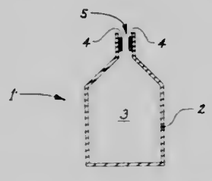
Gerald M. Lancaster, Freeport, and David C. Kelley, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 42,997, Apr. 27, 1987, Pat. No. 4,787,194, which is a division of Ser. No. 738,008, May 25, 1985, Pat. No. 4,660,354, which is a continuation-in-part of Ser. No. 645,990, Aug. 31, 1984, Pat. No. 4,601,948, which is a continuation-in-part of Ser. No. 531,110, Sep. 12, 1983, Pat. No. 4,600,614. This application Aug. 31, 1988, Ser. No. 239,486

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

Int. Cl.[4] B65D *33/22*

U.S. Cl. 383—94 **10 Claims**



1. A packaging container which is substantially closed except for a filling opening, said container comprising a multiwall construction and characterized by an inner lay of RF-sealable polymer on at least the inner walls of the filling-opening, said RF-sealable polymer comprising at least one MW-sealable carbon monoxide-containing olefin polymer.

4,895,458

BEARINGS FOR WIND GENERATOR ROTORS

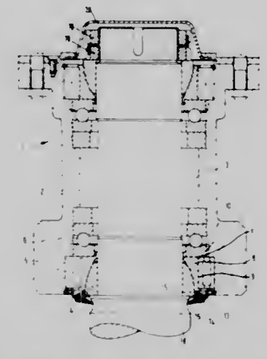
Josef Gerster, Gröbenzell, Fed. Rep. of Germany, assignor to MAN Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,915

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732730

Int. Cl.[4] F16C *21/00, 19/49*

U.S. Cl. 384—126 **6 Claims**



1. In a bearing for supporting the rotor blades of a wind power generator, said rotor having blades mounted on a bearer flange comprising thrust and radial bearing means supporting the flange on a stationary hub, the improvement wherein said bearing means comprises two axially spaced bearing combinations each including a first bearing in the form of a skew joing bearing including an outer ring, a second bearing with cylindrical rolling elements placed around the skew joint bearing and including an inner ring, and a third bearing including a thrust bearing arranged to the side of both the first bearing and the second bearing and a shaft ring, the outer ring of the first bearing, the inner ring of the second bearing and the shaft ring of the third bearing constituting a rotationless ring unit, said three rings contacting each other in two planes and being preloaded to hold the rings in engagement with each other.

4,895,459

FIXING ARRANGEMENT FOR A REVOLVING SHOE OF A ROLLING MEMBER GUIDE

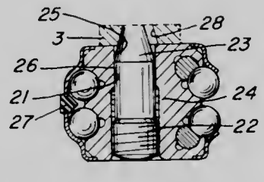
Jacob Werner, Brianring 29, D-6000 Frankfurt/Main 70, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 370,459

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824192

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—43 **11 Claims**



1. A fixing arrangement for fixing a revolving shoe of a rolling member guide to a supporting element with bolts for tensioning the revolving shoe and supporting element, and for fixing an adjusting position, comprising:

a revolving shoe (2) having a through-bore (5);

an externally cylindrical eccentric bush (6) arranged in the through-bore (5) and having a pin bore (7) arranged so as to be eccentric relative to the cylindrical outer face (8) of the eccentric bush (6);

a cylindrical pin (9) attached to the supporting element (3) so as to fit into the pin bore (7), the revolving shoe further having two threaded fixing bores (21) which are offset in a direction opposite to that of the through-bore (5);

fixing pins (22) which are insertable into each of the fixing bores (21) and have a tapered free end so as to run out in a cone (23) engageable with a conical bore (28) of the supporting element (3); and

at least one fixing bolt (29) associated with the revolving shoe (2).

4,895,460

SEALING FOR BEARING ASSEMBLIES

Anthony Grzina, Drummoyne, Australia, assignor to Warman International Limited, Artarmon, Australia

PCT No. PCT/AU86/00309, § 371 Date May 22, 1987, § 102(e) Date May 22, 1987, PCT Pub. No. WO87/02747, PCT Pub. Date May 7, 1987

PCT Filed Oct. 16, 1986, Ser. No. 86,147

Claims priority, application Australia, Oct. 22, 1985, PH3024

Int. Cl.[4] F16C *33/72, 33/80*

U.S. Cl. 384—132 **7 Claims**

1. In a bearing assembly for a rotating shaft assembly defining at least two grooves and an annular projection therebetween, a bearing seal comprising:

at least two piston rings, spaced apart from each other and supported on the bearing assembly, to form an inner sealing element, each said piston ring being adapted to be at least partially received in a respective one of the grooves of the rotating shaft assembly;

a labyrinth passage forming an outer sealing element;

a passageway extending externally of the bearing assembly into a space between at least two of said spaced apart piston rings; and

an automatic grease feeder connected to said passageway to discharge grease into the space,



whereby grease discharged from said automatic feeder flows under pressure over said piston rings to cause a layer of grease to lie between said piston rings and the rotating shaft assembly, and to flow through said labyrinth and through said inner sealing element to form a seal against the ingress of material past the bearing seal.

4,895,461

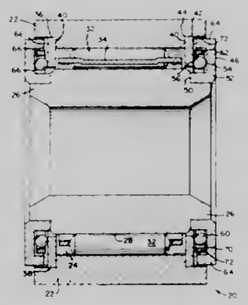
COMBINED RADIAL AND THRUST BEARING

Leo Stella, Bristol, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Jan. 3, 1989, Ser. No. 267,558

Int. Cl.[4] F16C *19/36, 19/49, 33/80*

U.S. Cl. 384—454 **6 Claims**



1. A combined radial and thrust bearing comprising:

a radial bearing outer race having a first, radial outer raceway;

a radial bearing inner race having a second, radial inner raceway that is concentric with and spaced from the radial outer raceway to form an outer raceway-inner raceway annulus for bearing rolling members of a radial bearing; and

an annular series of bearing rolling members in said annulus,

a first, radially disposed washer, the outer periphery of the inward face of which is located against an axiallyreceiving stop face on the outer race, the outward face of said washer comprising a third raceway,

a second, radially disposed washer, spaced from the first washer and having an inward facing fourth raceway that is opposed to and axially spaced from the third raceway, forming a third raceway-fourth raceway annulus for bearing rolling members of a thrust bearing,

an annular series of bearing rolling members in said third raceway-fourth raceway annulus,

said second washer including a first, axially oriented, inward projecting member, located radially outwardly from the thrust bearing rolling members,

said second washer including a second, axially oriented, inward projecting member, located radially inwardly from the thrust bearing rolling members; and retainer means in said third raceway-fourth raceway annulus for spacing apart the bearing rolling members located therein, said retainer means having a circumference and an annular surface in close proximity to said second washer, and an annular inner surface in close proximity to said first washer, for forming a seal.

4,895,462

BEARING ASSEMBLY

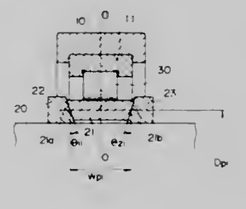
Hirotoshi Takata, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,203

Claims priority, application Japan, Aug. 17, 1987, 62-203915

Int. Cl.[4] F16C *19/52*

U.S. Cl. 384—493 **1 Claim**



1. In a bearing assembly comprising:

a bearing mounting member:

a bearing mounted to said bearing mounting member and including an inner raceway ring having first and second end surfaces, at least one of said inner and outer raceway rings having a linear expansion coefficient different from that of said bearing mounting member, and having an inclined surface formed on at least one of said end surfaces inclined with respect to a vertical bearing center line;

a distance piece abutting against said inclined end surface of said at least one raceway ring and secured to said bearing mounting member, said distance piece having a linear expansion coefficient substantially equivalent to that of said bearing mounting member; the improvement in which:

said at least one raceway ring, having a linear expansion coefficient different from that of said bearing mounting member, has inclined surfaces formed on both of said end surfaces, and angles of inclination, θ_1 and θ_2 of said inclined surfaces, with respect to the vertical bearing center line, are determined to satisfy the following relationship between an axial length Wp and a diameter Dp of said at least one raceway ring measured at the center of a thickness thereof: $\tan \theta_1 + \theta_2 = 2Wp/Dp$

said angles θ_1, θ_2 being assigned with a positive sign when the angle is extending outwardly with respect to the vertical bearing center line, and with a negative sign when the angle is extending inwardly; and

said at least one raceway ring mounted to said bearing mounting member with a predetermined fit in accordance with a relation in magnitude between the linear expansion coefficients of said at least one raceway ring and said bearing mounting member, and working temperature conditions of the bearing assembly, such that said inner raceway ring is loose fitted when the linear expansion coefficient of said inner raceway ring is smaller than that of said bearing mounting member and said bearing assem-

bly is used at a temperature higher than that during mounting and when the linear expansion coefficient of said inner raceway ring is larger that of said bearing mounting member and said bearing assembly is used at a temperature lower than that during mounting, and said inner raceway ring is interference fitted when the linear expansion coefficient of said inner raceway ring is smaller than that of said bearing mounting member and said bearing assembly is used at a temperature lower than that during mounting and when the linear expansion coefficient of said inner raceway ring is larger than that of said bearing mounting member and said bearing assembly is used at a temperature higher than that during mounting.

4,895,463

MATRIX PRINT HEAD

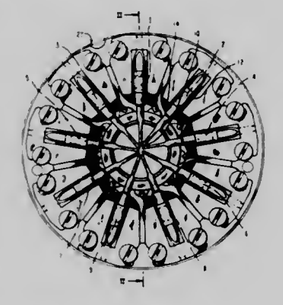
Hans J. Wyk, Villingen, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,437

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644185

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **23 Claims**



1. A matrix print head comprising

an individual pin print element;

an electromagnetic coil forming part of an electromagnetic circuit coordinated to the individual pin print element;

a coil core disposed in the electromagnetic coil;

a back plate;

a permanent magnet is furnished with a substantially lower magnetic flux as compared with the corresponding electromagnetic coil;

a yoke plate;

a springing armature, where the individual pin print element is attached to said springing armature, and where the springing armature is disposed opposite to the coil core of the electromagnetic coil and wherein the armature, the core of the coil, the back plate, the permanent magnet, and the yoke plate form a main-series magnetic circuit and where the springing armature rests in its rest position on the core of the coil;

a shunt ring forming part of a shunt magnetic circuit coordinated to the main series magnetic circuit, which shunt magnetic circuit is formed by the back plate, the permanent magnet, the yoke plate, and a shunt ring, and wherein the total extension of the shunt ring in a direction parallel to an axis of the coil is at least two times the extension of the permanent magnet in the same direction.

4,895,464

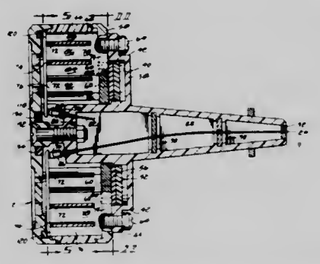
WIRE MATRIX PRINT HEAD ASSEMBLY

Bernard Rubinshtein, Spokane, Wash., assignor to Output Technology Corporation, Spokane, Wash.

Filed Jul. 14, 1988, Ser. No. 219,989

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **14 Claims**



1. A wire matrix print head assembly having a plurality of elongated wire members in which each wire member is movable from a retracted nonprint position to an extended print position when a force is applied to a drive end of the wire member, comprising:

a housing having a central axis;

a plurality of armature means mounted at angularly spaced radial locations about the central axis of said housing with each armature means in operative association with the drive end of a corresponding wire member for selectively applying a force to the drive end of the corresponding wire member to selectively move the wire member from the retracted nonprint position to the extended print position;

a plurality of electromagnetic means associated with corresponding armature means with each electromagnetic means selectively applying magnetic forces to a corresponding armature means to selectively activate the armature means to drive the corresponding wire member to its extended print position;

each of the electromagnetic means having (1) a center pole and (2) a radially spaced first outer pole and (3) a radially spaced first inner pole that are magnetically interconnected in which the poles of each electromagnetic means have pole ends facing the corresponding armature means; and

each of the electromagnetic means having an outer electrical coil surrounding the first outer pole and an inner electrical coil surrounding the first inner pole and separated by the center pole, in which the first inner and the outer coils are interconnected electrically with the same directional polarity to increase the force applied to the drive end of the wire member when the inner and outer coils are energized concurrently.

4,895,465

THERMAL TRANSFER RIBBON ESPECIALLY FOR IMPRESSIONS ON ROUGH PAPER

Norbert Mecke, Hanover, and Heinrich Krauter, Neustadtl, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 15, 1987, Ser. No. 109,489

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635141

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

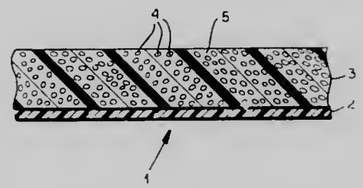
Int. Cl.⁴ B41J *31/00*

U.S. Cl. 400—241.2 **10 Claims**

1. A thermal-transfer ribbon, comprising:

a support strip; and

a thermally transferable image-transfer layer on said support strip comprising a solid continuous phase in which a pigment is dispersed, a pigment-containing discontinuous phase consisting of solid beads of a polymer meltable during the thermal-transfer process and distributed in said



continuous phase, said solid continuous phase being formed by at least in part a polymer different from and mutually incompatible with the polymer of said beads, and a wax substance selected from the group which consists of a wax and a waxlike material.

4,895,466

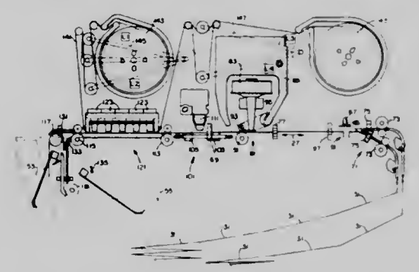
PROCESSOR FOR FORMS WITH MULTI-FORMAT DATA

G. William Hartman, Longwood; Robert L. Wohlers, Leesburg, and Thomas R. Routhieaux, Longwood, all of Fla., assignors to Datamax Corporation, Orlando, Fla.

Filed Jan. 20, 1988, Ser. No. 146,210

Int. Cl.⁴ B41J *15/18, 11/68*

U.S. Cl. 400—613.2 **10 Claims**



1. A multi-format document printer and processor, comprising:

a supervisory processor, transport processor and a further processor, all for receiving data to be transferred to and from a plurality of successive forms under the control of said supervisory processor;

means for feeding the forms along a transport path in either or two opposite directions under control by said transport processor;

write means operably responsive to the transport processor to write variable information on successive ones of said forms in a first format, the first format being a machine-readable format;

a read station including read means in communication with the further processor to read said variable information in said first format, the transport processor being operable to communicate with said further processor and to compare said variable information as read to variable information previously written;

a printer having a plurality of print heads disposed downstream of the write means and the read means along the transport path, the printer producing, under control by said transport processor, a visually readable record on the successive forms;

said means for feeding the forms including a reversible drive for the forms and at least one edge sensor, the forms being introduced at one or the other opposite end of the transport path and being bidirectionally moved along the path during read and write operations;

wherein the successive forms are fan-folded, form tickets introduced at said one end of the transport path, said printer and processor also operating on pre-processed tickets, the printer and processor further comprising means to introduce pre-processed tickets at the other end of the transport path, said pre-processed tickets being bidirectionally fed, first backwards along the transport path to a read station and then forwards past said read station and the further processor being operable to read data on said pre-processed tickets and to perform operations thereof;

a ticket storage bin for storing two selectable supplies of fan-folded tickets, sensors along the transport path for detecting an edge of a foremost one of said fan-folded tickets and a controllable burster operable to separate the foremost ticket from the supply, the burster having a striking member operated upon a trailing edge of the fan-folded ticket being detected at the sensor and the striking member and sensor being spaced by a distance equal to a length of the ticket along the transport path; and

means for loading a fan-folded ticket from either of said supplies, said means for loading maintaining a leading edge of a ticket from a previously selected form supply near said burster until said supervisory processor selects the other form supply at which time said means for loading retracts said previously selected form supply ticket and advances a ticket from said other form supply.

4,895,467

ROTARY KNOCK TYPE MECHANICAL PENCIL

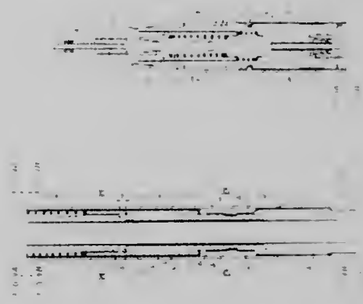
Hidehei Kageyama, Saitama, Japan, and Robert V. Lozeau, Cumberland, R.I., assignors to Kotobuki & Co., Ltd., Kawagoye, Japan and A. T. Cross Company, Lincoln, R.I.

Filed Nov. 20, 1987, Ser. No. 123,266

Claims priority, application Japan, Nov. 25, 1986, 61-180740; Jun. 15, 1987, 62-91654

Int. Cl.⁴ B43K *21/20*

U.S. Cl. 401—65 **8 Claims**

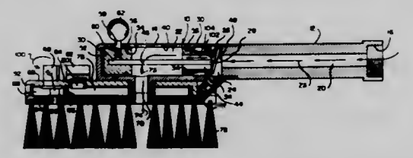


1. A mechanical pencil of the type having a lead feeding mechanism including a lead chuck fitted in a forward outer cylinder cooperatively operated to feed a lead responsive to rotation of a rearward outer cylinder rotatably and removably connected to the rear end of the forward outer cylinder a tip element at an end of the forward outer cylinder opposite the rearward outer cylinder slider means slidably mounted in the

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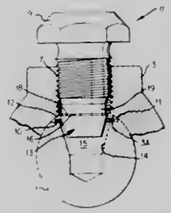
tip element for axial movement along the longitudinal axis thereof and a lead guide pipe in said slider means comprising:
cam engaging means connected at a rear end of the lead chuck of the lead feeding mechanism and movably inserted into the forward outer cylinder for axial movement together with the lead feeding mechanism, and
a cam cylinder connected to the rearward outer cylinder, the cam cylinder being rotatably and removably inserted into the rearward part of the forward outer cylinder and having cam surface means at the front end thereof, the cam surface means including:
(a) a large cam surface,
(b) a small cam surface, and
(c) an engaging part arranged in front of said small cam surface
the large cam surface being operatively engaged with said cam engaging means to axially slide said cam engaging means in a first direction responsive to a first substantially rotation of the rearward outer cylinder in a first rotary direction so that, sequentially, the chuck and lead guide pipe are moved forwardly through a chuck release position and the lead guide pipe is projected out of the tip element rotating the cam in the opposite direction past the large cam surface, the cam engaging means operatively engages said small cam surface, the small cam surface being for axially sliding said cam engaging means in said first direction response to rotation of the rearward outer cylinder in a second rotary direction opposite said first rotary direction so that said chuck is moved forwardly to a chuck release position, the engaging part being operative for locking said cam engaging means at a chuck releasing position; and wherein said lead guide pipe can be retracted and stored within the tip element at a chuck releasing position.

4,895,468
BRUSH WITH AUTOMATIC WATER SHUT-OFF
Gilmore H. Chappell, 6100 City Ave., Executive House, Apt. 1718, Philadelphia, Pa. 19131
Continuation of Ser. No. 45,323, May 4, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 263,958
Int. Cl.[4] A46B *11/00, 11/02, 11/06*
U.S. Cl. 401—270 **20 Claims**



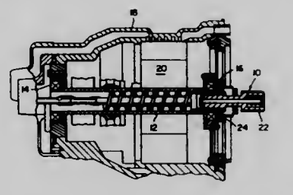
1. A brush with automatic shut-off comprising:
a handle portion having a rearward end and a forward end, the handle portion being adapted to be connected to a source of water under pressure,
the handle portion having a water conduit therethrough, the water conduit terminating at the forward end in a valve chamber, the valve chamber having a seat;
a nozzle projecting from the handle portion forwardly of the valve chamber and having a nozzle conduit therethrough adapted to communicate with said valve chamber;
a valve means positioned in the valve chamber to control water flow, the valve means being continuously biased toward the seat by the water under pressure;
the valve means being adapted to prevent the flow of water through the valve chamber when the valve means is in contact with the seat;
a body portion pivotally connected to the handle portion,
the body portion being provided with a fluid conduit partially defined by a conduit body section to receive water flow through the valve chamber and a discharge nozzle to direct the flow of water outwardly of the brush;
operating means positioned within the body portion and being movable between forward and rearward positions to optionally contact the valve means dependent upon the pivotal position of said body portion with respect to said handle portion,
the valve means being forced away from the seat when contacted by the operating means to cause water flow;
said nozzle including means for sealing that extends into and contacts said conduit body section, said means for sealing adapted to seal the water in the nozzle conduit and the fluid conduit in all pivotally moved positions of the body and handle portions; and,
a plurality of bristles secured in the body portion to facilitate cleaning when the brush is in use.

4,895,469
LOCKING FASTENER
Jacques R. Coueron, Saint Nazaire, France, assignor to Eaton Corporation, Cleveland, Ohio
Filed Mar. 6, 1989, Ser. No. 320,196
Claims priority, application United Kingdom, Mar. 11, 1988, 8805829
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—21 **5 Claims**



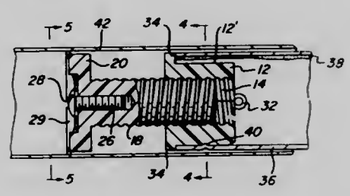
1. A self-locking assembly for fixing a first object (2 or 3) to a locating station on a second, elongated object (1) over which the first object can slide longitudinally, said station being defined by a conical receiving hole (15) and an annular recess (11) surrounding the mouth of the hole, said first object (2 or 3) having longitudinal bore (2A or 3A) to receive the second object (1), and having an internally threaded bore (6) extending generally radially of and intersecting its longitudinal bore (2A or 3A), said assembly comprising an externally threaded fastener (8) for threadable engagement in said internally threaded bore, said externally threaded fastener (8) comprising in axial order, a gripping portion (9), by which it may be rotated, a threaded shank portion (7) and a tapered down portion (13); said assembly characterized by said externally threaded fastener including a waist region (19), of reduced cross-section and axially intermediate the tapered portion (13) and the shank portion (7) and a circular spring clip (10) able when unexpanded to slide over a distal part only of the axial length of the tapered portion, and able when expanded to slide also over the entire length of the tapered portion (13).

4,895,470
DRIVE MECHANISM FOR GENERATOR SHAFTS
William M. Scherzinger, Brick, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Apr. 3, 1989, Ser. No. 332,184
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—25 **12 Claims**



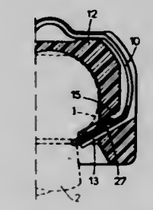
1. A drive mechanism for coupling a generator shaft having a shaped bore to a source of rotational power, comprising:
a drive shaft having an axial bore extending from an opening at a first end to an opening at a second end and a cavity at said opening at said first end, said first end adapted for interconnection with the source of rotational power and said second end of said drive shaft adapted to fit within the bore of the generator shaft so as to cause the generator shaft to rotate when said drive shaft rotates;
a rod adapted to fit within said bore in said drive shaft such that a portion of said rod extends from said second opening and having a head adapted to allow said rod to be rotated and depressed into said cavity;
a compression spring adapted to fit within said cavity at said first end about said rod and in contact with said head such that when said rod is depressed into said cavity said spring goes into compression and exerts a force against said head;
a bar securd to said portion of said rod extending from said second opening; and
retaining means secured within the bore of the generator shaft for receiving said bar when said rod is depressed and for retaining the drive mechanism within the generator shaft.

4,895,471
EXPANDER MECHANISM FOR TELESCOPING TUBES
Charles E. Geltz, Drexel Hill, and Fernando Guerrero, West Chester, both of Pa., assignors to Zenith Products Corporation, Aston, Pa.
Filed Mar. 18, 1988, Ser. No. 169,659
Int. Cl.[4] F16B *7/10*
U.S. Cl. 403—104 **8 Claims**



1. An expander mechanism for telescoping tubes comprising:
(a) first and second telescoping tubes, said second tube having an interior wall;
(b) a bushing having a threaded center opening, said bushing being comprised of two pieces hingedly attached together and being mounted on an end portion of the first tube;
(c) a bolt comprising a head and a threaded shaft adapted to be received by complementary threads of the opening in the bushing; and
(d) a lock washer attached to the head of the bolt and having a peripheral portion in engagement with said interior wall, said lock washer being resiliently deformable in only one direction to assume a generally concave configuration upon application of a force to the peripheral portion of said lock washer, said lock washer having a generally concave configuration when said peripheral portion is in engagement with said interior wall, said first tube being inserted into said second tube so as to be slidable therein and thus allowing the telescoping tubes to be expandable in one direction only.

4,895,472
DISASSEMBLABLE BALL AND SOCKET JOINT
Dominique Dony, Braillans, and Jacky Humblot, Besancon, both of France, assignors to Airax, France
Filed Mar. 18, 1988, Ser. No. 169,945
Claims priority, application France, Apr. 1, 1987, 87 04547
Int. Cl.[4] F16C *11/10, 11/06*
U.S. Cl. 403—133 **20 Claims**



1. A disassemblable ball and socket joint, comprising:
a spherical ball integral with a journal,
a cage body having a cavity adapted to receive the ball, a channel in said cage body connected to said cavity to permit the introduction of the ball into the cavity, and two slots one arranged on each side of said channel and leading thereinto, said cage body further being provided with means for fixing it to a support, and
a generally C-shaped resilient ring, surrounding said cage body, and positioned so that the ends of the resilient ring enter said two slots in the cage body and project inside the channel to retain the ball in the cavity;
said resilient ring, when the ball is absent, exerting on one hand upon the exterior of the cage body a compressive force approximately parallel to the axis of the channel at two points located on either side of the channel and spaced from said axis, and on the other hand exerting additional compressive forces upon the interior face of the slot by means of two protuberances formed on the interior face of the ring and outwardly convex towards the interior of the ring, or by a rib provided on the interior face of the slot;
said resilient ring being so shaped and positioned by the cage body that when the ball is in the cavity and the journal is coaxial with the channel, the resilient ring is not in contact either with the ball or with the journal and occupies the same position as when the ball is absent.

4,895,473
JOINT FOR RELEASABLY SECURING SUPPORT MEMBER IN MODULAR STRUCTURE
Donald C. Hennick, 9547 Wallingford North, Seattle, Wash. 98103
Filed Aug. 20, 1987, Ser. No. 87,691
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—191 **10 Claims**

1. For use in modular structures, such as furniture, grandstands, and the like, having a generally horizontal portion, a joint for securing a generally vertical member to said horizontal portion, said joint comprising:
a ring that defines a generally vertical opening shaped and

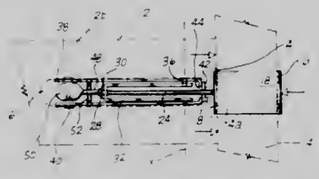
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dimensioned to slidably receive said vertical member therethrough;

an elongated member extending generally horizontally from the ring and through an opening in said horizontal portion; said elongated member having a first end attached to the ring, and a second opposite end;

vertical surface portions of said horizontal portion having a recess formed therein for receiving a part of the ring; said recess being defined by an inner generally vertical surface, a top surface, and a bottom surface; and

releasable fastening means for engaging said second end of the elongated member and pulling the elongated member to pull said part of the ring into the recess and urge said



vertical member into contact with said vertical surface portions above and below the recess, said fastening means being adjustable for adjusting the tension in the elongated member and the tightness of the joint;

said recess and said ring being dimensioned so that, when said part of the ring is received into the recess and said vertical member is urged against said vertical surface portions by the fastening means, the ring is spaced from the inner vertical surface, the top surface, and the bottom surface of the recess, to give the ring a free-floating action in the recess to automatically compensate for wearing and irregularities in said vertical member and said horizontal portion to thereby prevent wobbling of said vertical member.

4,895,474

COUPLING SYSTEM FOR ROTATIONAL AND AXIALLY STIFF COAXIAL COUPLING OF TWO SHAFT ELEMENTS

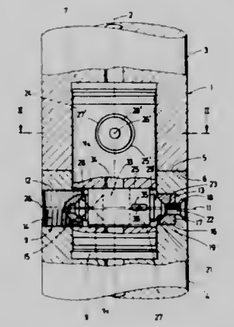
Otto Eckle, Löchgau, Fed. Rep. of Germany, assignor to Josef Paul Huser, Meggen, Switzerland

Filed Mar. 9, 1988, Ser. No. 165,777

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708746

Int. Cl.[4] F16B *2/14*

U.S. Cl. 403—292 18 Claims



1. Coupling system for rotational and axially stiff coaxial coupling of a first rotatable shaft element (3) to a second rotatable shaft element (4), defining a central axis of rotation (2), each of said shaft elements being formed with flat transverse matching frictionally engaged, abutting engagement surfaces (5, 6), comprising the combination of

a first cylindrical concentric engagement fit bore (7) formed in the first shaft element (3);

a second cylindrical concentric engagement fit bore (8) formed in the second shaft element (4);

a first cross bore (9') extending transversely through the first shaft element (3) and intersecting the first engagement fit bore (7), said first cross bore being subdivided by the first engagement fit bore (7) into two diametrically located first bore portions (12', 13'), and having an axis (11') intersecting the central axis (2) at a right angle;

a second cross bore (9) extending transversely through the second shaft element (4) and intersecting the second engagement fit bore (8), said second cross bore being subdivided by the second engagement fit bore (8) into two diametrically located second bore portions (12, 13), and having an axis (11) intersecting the central angle (2) at a right angle;

a coaxial engagement fit peg (24, 24', 31) located in both the first and second engagement fit bores (7, 8), fitting snugly therein and connecting said shaft elements together;

a first bolt cross bore (25') defining a first bolt cross bore axis (26') extending transversely through the engagement peg (24, 24', 31) at a level of the first cross bore (9') when the peg is positioned in the first engagement fit bore (7);

a second bolt cross bore (25) defining a second bolt cross bore axis (26) extending transversely through the engagement peg at a level of the second cross bore (9) when the peg (24, 24', 31) is positioned in the second engagement fit bore (8);

said first and second cross bores (9, 9') through the first and second shaft sections (3, 4) and the first and second bolt cross bores (25', 25) through said coaxial fit plug (24, 24', 31) being axially spaced from each other and from said frictionally engaged abutting engagement surfaces (5, 6);

a first longitudinally adjustable cross bolt engagement element (14') located in one (12') of said first cross bore portions;

a first cross bolt counter element (19') located in the other (13') of said first cross bore portions;

a second longitudinally adjustable cross bolt engagement element (14) located in one (12) of said second cross bore portions;

a second cross bolt counter element (19) located in the other (13) of said second cross bore portions;

a first connection bolt (27') located in the first cross bore (9') and having essentially frustoconically interfitting end portions (28', 29') engageable, respectively, with the first cross bolt engagement element (14') and the first cross bolt counter element (19');

a second connection bolt (27) located in the second cross bore (9) and having essentially frustoconically interfitting end portions (28, 29) engageable, respectively, with the second cross bolt engagement element (14) and the second cross bolt counter element (19); and

wherein, upon engagement of said engagement surfaces (5, 6), the spacing of the axes (11, 11') of the first and second cross bores (9, 9') is longer than the spacing of the axes (26, 26') of the first and second bolt cross bores (25, 25') extending through the coaxial engagement peg (24, 24', 31) and said engagement surfaces are frictionally engaged upon longitudinal adjustment of said first and second cross bolt engagement elements (14', 14).

4,895,475

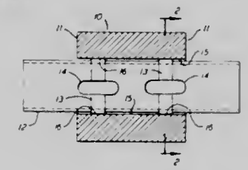
ASSEMBLY OF CYLINDER AND SHAFT WITH LOW STRESS COUPLING AND METHOD OF MAKING SAME

Donald L. Carter, 2316 Doana Dr., Vestal, N.Y. 13850

Filed Feb. 23, 1988, Ser. No. 159,355

Int. Cl.[4] B25G *3/00*; F16B *7/00*; F16D *1/00*; B21D *35/00*

U.S. Cl. 403—383 7 Claims



1. The method of assembling a cylinder and shaft with no strain transmission from the shaft to the cylinder comprising the steps of:

forming a right circular cylinder having a longitudinal center bore for receiving therein a shaft, said cylinder having been machined to precise final dimensions and end face perpendicularity and flatness;

forming a hollow shaft to fit within said bore and having a plurality of raised annular collars having predefined areas thereon for attachment to the surface of said bore with said collars each interrupted by one or more slots through the wall of said shaft to intersect and segment said collars such that no transverse right section of said shaft has a continuous circumferential attachment area; and

assembling said shaft within said bore by joining said attachment areas with said mating bore surface.

5. The assembly of a cylinder and shaft comprising:

a right circular metal cylinder having a central bore and parallel flat end faces perpendicular to the longitudinal axis of said cylinder, said cylinder having been machined to final dimensions;

a hollow shaft joined to said cylinder on the surface of said bore at predefined areas such that no no transverse right section taken across said shaft has a continuous circumferential attachment area to said bore surface, the wall of said shaft having at least one raised annular collar thereon providing a said attachment area on its periphery and being segmented by at least one longitudinal slot in said wall interrupting said collar.

4,895,476

BRUSHING DEVICE AND METHOD

Marc Vangaever, Markegem, Belgium, assignor to Procedes et Brevets Industriels, en Aberge "P.B.I." S.A., Luxembourg, Luxembourg

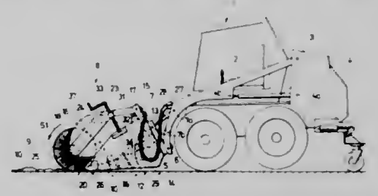
Filed Jan. 12, 1987, Ser. No. 2,243

Claims priority, application Belgium, Jan. 23, 1986, 216130

Int. Cl.[4] E01F *13/00*

U.S. Cl. 404—6 19 Claims

1. Brushing apparatus comprising: a motor vehicle; a tool-holder means carried by the motor vehicle; means for raising and lowering the tool-holder means relative to the motor vehicle; an assembly removably mounted on the tool-holder means and including container means pivotally mounted relative to the tool-holder means about a first horizontal axis and having an opening into which material to be brushed is deposited during a brushing operation and through which material within the container means is discharged when emptying the container means, brush means rotatable about a second horizontal axis, support means mounting the brush means on said container means for free swinging movement relative to the container about a third axis, and drive means for rotating the brush means; container operator means controlled from and carried by the motor vehicle for pivoting the container means about the first horizontal axis between a brushing position and a container-emptying position; said brush means having a center of gravity relative to the third axis such that the brush means lies adjacent to the container opening in the brushing position of the container means, and is spaced from the con-



tainer opening to expose the opening in the container-emptying position.

4,895,477

SCRAPING DEVICE FOR MAKING A SUBGRADE

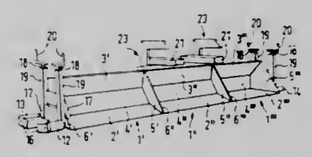
Martin Probst, Riedstrasse 37, 7141 Steinheim; Herbert Schaffarzyk, Ellerstrasse 62, 2870 Delmenhorst, and Walter Schaffarzyk, Herman Allmersweg 13, 2870 Delmenhorst, all of Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,210

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708249

Int. Cl.[4] E01C *19/22*

U.S. Cl. 404—119 14 Claims



1. Scraping device adapted to be towable over a subgrade to remove excess subgrade material from the surface thereof, said device comprising a lower wall (2) defining a scraping bar for removing excess subgrade material, opposed side walls (5,6), a top wall (3) and a rear wall (4) upstanding from said lower wall (2); said lower wall (2), said top wall (3), said side walls (5,6) and said rear wall (4) defining a bucket-shaped container for collecting the removed excess subgrade material, and attachment means (21,23) on the scraping device adapted for lifting and transporting the scraping device for emptying, wherein the container is assembled from individual bucket-shaped segments (1', 1", 1"') fastened together to one another laterally so that the lower walls (2', 2", 2"') are in a plane, wherein each edge segment (1', 1"') exhibits on its outer side a side wall (6', 5"') for assembly purposes, and wherein the walls facing one another (5', 6", 5", 6"') of neighboring segments (1', 1", 4"') define a passage (41) for connection of the segments adjacent the space.

4,895,478

ADJUSTABLE HANDLE CONSTRUCTION FOR A COMPACTION APPARATUS

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Slinger, Wis.

Filed Aug. 22, 1988, Ser. No. 234,889

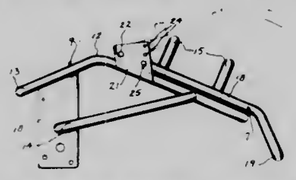
Int. Cl.[4] E01C *19/34*

U.S. Cl. 404—133 3 Claims

1. In a compaction apparatus, a soil compacting member, drive means operably connected to said soil compacting member for driving said soil compacting member in a vertical reciprocating path to compact said soil, guard means spaced and surrounding said drive means, a handle having an inner end and having an opposed distal end projecting outwardly beyond said guard means and positioned to be engaged by an

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operator, means for pivotally connecting the inner end of the handle to said guard means such that said distal end is movable between a position below the guard means to a position above the guard means, and adjustable locking means interconnecting the handle at a location between said ends to said guard means for locking the handle to said guard means at a plurality of different elevations between said above and below positions,



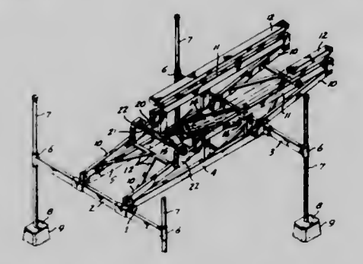
said guard means being generally rectangular in horizontal elevation and including a pair of parallel spaced side members, said handle being generally U-shaped and having a pair of generally parallel arms, said guard means including a forward end portion and a rear end portion disposed at a downwardly inclinded angle with respect to said forward portion, said arms being pivotally connected to the rear end portions of said side members.

4,895,479

LIFT FOR WATERCRAFT

Christopher J. Michaelsen, and Jack Uchida, both of Seattle, Wash., assignors to Nyman Pile Driving, Inc., Issaquah, Wash.

Filed Dec. 16, 1987, Ser. No. 133,762
Int. Cl.[4] B63C *3/06*
U.S. Cl. 405—3 **4 Claims**



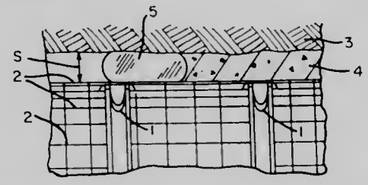
1. In a lift having an elongated stationary base frame including front and rear cross members and transversely spaced, longitudinally extending beams connected between said cross members, swingable parallel arms pivotally mounted toward the front and rear ends of the base frame, respectively, an elongated lifting member pivotally connected to the ends of the arms remote from their ends connected to the base frame and extending generally parallel to the base frame, such frame, arms and member forming an approximate parallelogram, and fluid pressure jack means extending generally diagonally of such parallelogram and including a fluid pressure cylinder component and a plunger component movable in such cylinder component for swinging the parallel arms relative to the base frame so as to translate the lifting member, the improvement comprising one of the jack means components being connected to the central portion of the rear cross member approximately midway between the beams, and including two elongated braces having rear end portions connected to the central portion of the rear cross member between the beams at opposite sides of the point of connection of such one jack means component, respectively, each of said braces extending from its point of connection to the rear cross member forward and outward toward the beam at the same side of the base frame, said braces having front end portions connected to the beams, and a compression bar extending between the beams closely adjacent to the front end portions of said braces, whereby force applied to the central portion of the rear cross member by the fluid pressure jack means tending to bow the rear cross member is transmitted as tension of said braces to their connections to the beams and inward bowing of said beams in the area of the front end portions of said braces is resisted by said compression bar.

4,895,480

METHOD AND APPARATUS FOR FORMATION OF A TUNNEL LINING

Gert Jackel, Bottrop; Karl Kohler, Rees-Esserden, and Friedrich Schoter, Oberhausen, all of Fed. Rep. of Germany, assignors to Signode Corporation, Glenview, Ill.

Filed Sep. 9, 1988, Ser. No. 242,409
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730574
Int. Cl.[4] E21D *9/06, 11/00*
U.S. Cl. 405—147 **32 Claims**



1. A method for sealing a gap space defined between a tunnel support frame and the ground during the formation of a tunnel, comprising the steps of:

introducing backfill concrete into said gap space defined between said tunnel support frame and said ground so as to form a portion of said tunnel;

introducing inflatable bag means into said gap space defined between said tunnel support frame and said ground at an axial position along said tunnel which is adjacent to said backfill concrete such that said inflatable bag means is disposed in contact with said backfill concrete; and

inflating said inflatable bag means to a predetermined pressure value such that said gap space defined between said tunnel support frame and said ground is sealing closed and said inflatable bag means exerts axial pressure upon said backfill concrete disposed adjacent to said inflatable bag means such that proper and complete backfilling of said gap space defined between said tunnel support frame and said ground, and within which said backfill concrete is disposed, is able to be achieved.

4,895,481

NON-RIGID MARINE PLATFORM WITH SURFACE WELLHEADS

Jean F. M. Pepin-Lehalleur, and Lo c M. J. Danguy des Deserts, both of Paris, France, assignors to Doris Engineering, Paris, France

Filed Jan. 20, 1988, Ser. No. 146,177
Claims priority, application France, Jan. 29, 1987, 87 01056
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—224 **10 Claims**

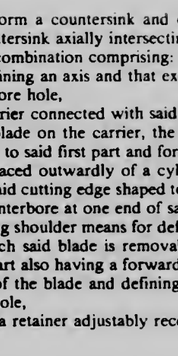
1. A non-rigid marine platform for use in deep water applications which comprises:

a base which is positioned on a seabed,

a rigid structure, the rigid structure including a plurality of floats located below a surface of the water, a lattice structure which extends upwardly from the floats and above the surface of the water, and a deck with production wellheads mounted on the lattice structure so as to be positioned above the surface of the water,

a plurality of conducting tubes which extend from the seabed upwardly to the rigid structure to connect with the production wellheads,

a plurality of flexible, tubular piles which extend upwardly from the base to the rigid structure, the tubular piles being held under a total tension force exerted thereon by the



floats of the rigid structure which is greater than the total compression force on the conducting tubes, and

a plurality of guide frames at spaced apart locations along the plurality of tubular piles between the base and the rigid structure and through which the plurality of tubular piles and the plurality of conductors pass.

4,895,482

COUNTERSINK FORMING TOOLING

John A. Aurentz, Fallbrook, Calif., assignor to Briles Rivet Corporation, Oceanside, Calif.

Continuation of Ser. No. 5,101, Jan. 20, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 239,708
Int. Cl.[4] B23B *51/10*
U.S. Cl. 408—225 **6 Claims**



1. In tooling to form a countersink and counterbore in a workpiece, the countersink axially intersecting a bore hole in the workpiece, the combination comprising:

(a) a first part defining an axis and that extends axially forwardly in the bore hole,

(b) a rotatable carrier connected with said first part,

(c) and a cutter blade on the carrier, the blade projecting radially relative to said first part and forming at least one cutting edge spaced outwardly of a cylinder defined by said first part, said cutting edge shaped to form said countersink and counterbore at one end of said bore hole,

(d) said part having shoulder means for defining a rectangular hole in which said blade is removably received and held and said part also having a forward portion projecting forwardly of the blade and defining a surface to engage the bore hole,

(e) and including a retainer adjustably received in said carrier and positioned to effect holding of the blade in engagement with a location edge defined by one of said part and carrier,

(f) said carrier comprising a sleeve receiving and carrying said part, and including a tubular body interfitting said sleeve and blocked by said retainer against rotation and axial displacement relative thereto, there being means to hold the blade in the sleeve.

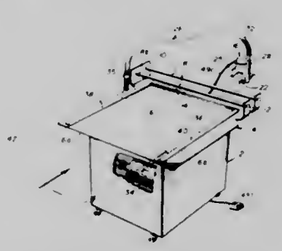
(g) said first part comprising a drill adapted to rotatably drill said bore hole.

4,895,483

CEILING PANEL REVEALER DEVICES AND METHODS

Carl E. Anderson, 4680 NE. Indian River Dr., Jensen Beach, Fla. 33457

Filed May 9, 1985, Ser. No. 732,282
Int. Cl.[4] B23C *3/28*
U.S. Cl. 409—132 **11 Claims**



1. A device for resizing ceiling panels with simultaneous creation of a new reveal edge which comprises:

a table unit having a quadrilateral, flat top work surface,

a pair of spaced apart, parallel tubular guide members supported on said table unit above said work surface in a plane parallel thereto,

an elongated slot in said work surface extending longitudinally between said guide members,

a motor driven cutter unit comprising

a depending rotary cutter element,

a pair of lateral slide parts contoured to rest upon and slide longitudinally along said guide members supporting said cutter unit between said guide members with a portion of said cutter element extending into said slot,

a straightedge connected to the top of said work surface normal to said guide members and said slot, and

suction means to remove debris created by operation of said cutter unit, said suction means including

a conduit with an inlet carried by said cutter unit juxtaposed to said cutter element and above said work surface.

11. A method of resizing a ceiling panel and simultaneously creating a new reveal edge thereon which comprises:

supporting a ceiling panel to be resized on a horizontal, flat work surface above which a pair of spaced apart, parallel tubular guide members are positioned in a plane parallel thereto, there being a longitudinal slot in said work surface extending substantially parallel to and between said guide members,

positioning said panel on said work surface so a edge thereof that is to be severed in resizing of the panel is aligned with said slot,

supporting a motor driven cutter unit comprising a depending rotary cutter element between and upon said guide members via a pair of Lateral slide parts contoured to rest upon and slide longitudinally along said guide members with a portion of said cutter element extending into said slot,

passing said cutter element along said slot by moving said cutter unit longitudinally along said guide members so the

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cutter element severs said panel along a path defined by said slot, and

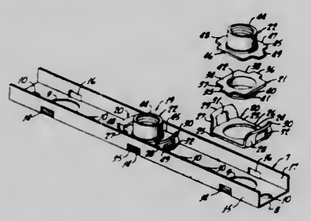
removing cuttings as created by operation of said cutter unit via suction means that includes a conduit with an inlet carried by said cutter unit juxtaposed to said cutter element and above said work surface.

4,895,484

FASTENER WITH FLOATING NUT FOR USE WITH COMPOSITE STRUCTURE

James G. Wilcox, Rancho Palos Verdes, Calif., assignor to Deutsch Fastener Corp., Lakewood, Calif.

Filed Oct. 25, 1988, Ser. No. 262,423
Int. Cl.[4] F16B *27/00*
U.S. Cl. 411—85 **11 Claims**



1. A fastener unit comprising

a nut member,

a retainer,

said nut member and said retainer including cooperative means for releasably holding said nut member to said retainer, whereby said nut member can be removed from and replaced in said retainer,

a channel of composite nonmetallic material adapted to be connected to a supporting structure,

and means for permitting limited lateral floating movement of said nut member relative to said channel,

said channel having a central web having an opening therethrough adjacent said nut member for permitting access to said nut member and side flanges joined by said central web at least one of which has an opening therethrough, said retainer including a first member seated on said central web of said channel and having an opening therethrough, and a second member seated on said first member, said second member of said retainer including means extending into said opening in said side flange for securing said retainer to said channel.

4,895,485

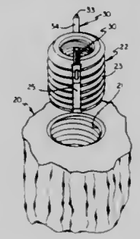
LOCKING KEY FOR THREADED INSERT

Belen A. Guevara, Escondido, and Robin W. Elcock, Torrance, both of Calif., assignors to Rexnord Holdings Inc., Torrance, Calif.

Filed Oct. 5, 1988, Ser. No. 253,998
Int. Cl.[4] F16B *39/06*
U.S. Cl. 411—322 **11 Claims**

1. A locking key for use with an insert installed in a threaded opening in a carrier material, said key having an upper locking portion and a lower tang portion, the insert having a cylindrical body portion, an exterior thread on said body complementary to and for engagement with the thread of the opening, and a slot in the body portion longitudinally interrupting the insert exterior thread, said key being constructed for positioning in the slot for installation therein, wherein the improvement comprises:

said locking key tang portion having a centrally-located aperture defining a flexure area and further having a pair



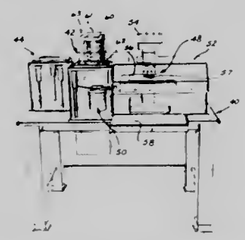
of protrusions located in opposing relation along said aperture, for retaining said key in the insert slot.

4,895,486

WAFER MONITORING DEVICE

Gregory G. Baker, and Edward F. Boyle, both of Gig Harbor, Wash., assignors to Roboptek, Inc., Gig Harbor, Wash.

Filed May 15, 1987, Ser. No. 50,952
Int. Cl.[4] G01P *13/00*
U.S. Cl. 414—331 **9 Claims**



1. A monitoring device for determining the presence or absence of wafer-like objects in a carrier having a plurality of shelves, each shelf being constructed to support one such object in an orientation normal to a carrier axis, the device comprising:

a first detector including means for detecting the presence of a body moving with the carrier along the carrier axis transversely past the first detector and means for generating a first detection signal corresponding to the detection of the presence of said body;

a translation member physically coupled to said carrier such that movement of the translation member results in movement of the carrier;

an object handler including means for removing objects from the shelves;

movement means for moving the translation member such that the carrier and any objects supported on the carrier move along the carrier axis past the first detector;

means for generating a position signal during motion of the translation member such that the position signal encodes the position of the translation member; and,

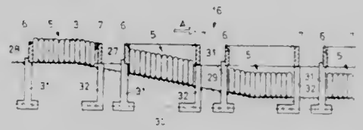
processing means for processing the first detection signal and the position signal to determine the presence or absence of an object on each shelf and to enable proper handling of the objects by indexing the object handler so that it does not attempt removal of objects from shelves on which an object is absent.

4,895,487

CONVEYOR APPARATUS FOR ADVANCING GROUPS OF FLAT ARTICLES, PARTICULARLY BAKED CONFECTIONERY ITEMS

René Fluck, Schleitheim, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 23, 1988, Ser. No. 172,321
Claims priority, applicatioo Switzerland, Mar. 23, 1987, 1089/87
Int. Cl.[4] B65B *35/44*
U.S. Cl. 414—403 **7 Claims**



1. A conveying system having an input end receiving flat, generally disc-shaped articles in a flat-lying orientation and arranged in at least one column of indefinite length and an output end discharging the articles in consecutive article groups wherein each group being formed of a number of face-to-face stacked articles, comprising

(a) a plurality of separate, individual pallets including means for receiving and supporting therein said article groups; each pallet being open at a pallet face;

(b) a stacking device arranged for forming said groups and charging the pallets therewith;

(c) an article removal device arranged for emptying the pallets and discharging, through said output end, the article groups removed from the pallets; said article removal device comprising

(1) two parallel-spaced support faces supporting each pallet at opposite marginal zones at said pallet face;

(2) means for moving the pallets on said support faces in an advancing direction;

(3) a ramp situated between said support faces and extending in said advancing direction; said ramp being arranged for engaging said articles projecting through the pallets; said ramp having a downward slope in said advancing direction, whereby the articles move out gradually from the pallets upon movement thereof in said direction of advance; and

(4) article supporting means moving in synchronism with said means for moving the pallets; said article supporting means being arranged for supporting, at opposite leading and trailing end faces, each article group as it moves out on the ramp from the respective said pallet;

(d) first conveyor means for advancing charged pallets from said stacking device to said article removal device;

(e) second conveyor means for returning empty pallets from said article removal device to said stacking device; and

(f) lateral guiding means extending along at least said first conveyor means for guiding and retaining said pallets on said first conveyor means.

4,895,488

MANIPULATOR MOUNTED TRANSFER PLATFORM

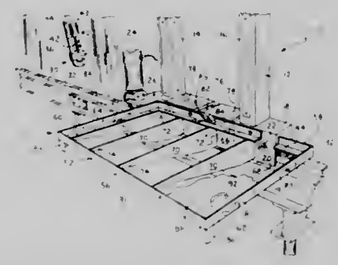
James C. Dobbins; Mark A. Hoover; Kay W. May, all of Idaho Falls, and Maurice J. Ross, Pocatello, all of Id., assignors to United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1988, Ser. No. 256,431
Int. Cl.[4] B65G *63/00*
U.S. Cl. 414—749 **16 Claims**

1. In a manipulator system for use in hazardous environments including a manipulator adapted for reciprocal movement upon a guide device, a transfer platform comprising:

a bed frame defining a generally horizontal bed projecting outwardly from the manipulator; and

frame mounting means securing the bed frame to the manipulator in a generally cantilevered fashion, thereby essen-



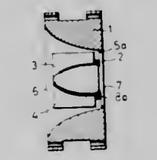
tially minimizing the structure necessary to support the platform outwardly of the manipulator while enhancing operator visibility of the platform and the manipulator during use of the manipulator system.

4,895,489

AXIAL FLOW FAN

Yasuaki Kohama, Katahira 2-1-1; Hideo Hirama, 30-1 Nishitaga 5-chome; Takuzo Kanno, 30-1, Nishitaga 5-chome, and Takashi Ishida, 30-1, Nishitaga 5-chome, all of Sendai, Miyagi, Japan

Filed Oct. 22, 1987, Ser. No. 111,774
Claims priority, application Japan, Nov. 14, 1986, 61-271424
Int. Cl.[4] F04D *19/00*
U.S. Cl. 415—218.1 **6 Claims**



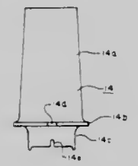
1. An axial flow fan comprising: means defining a casing having spaced apart air inlet and outlet ports and having means therein defining an air flow passage communicating the inlet and outlet ports, the air flow passage having its maximum diameter at the air inlet port and its minimum diameter at the air outlet port; a rotationally driven hub rotatably disposed within the casing along the air flow passage and carrying a plurality of fan blades which extend radially outwardly from the hub; supporting means rotatably supporting the hub to undergo rotation within the casing whereby rotation of the hub causes air to flow through the air inlet port and along the air flow passage and out through the air outlet port accompanied by the formation of air swirls in the region of the air outlet port; and means disposed on at least one of the casing and hub in the region of the air outlet port for dividing the air swirls into smaller size swirls, the means for dividing the air swirls comprising a projection on the casing, the projection extending circumferentially around the air flow passage and radially inwardly into the air flow passage.

4,895,490

INTERNAL BLADE RETENTION SYSTEM FOR ROTARY ENGINES

Donald J. Kasperski, Jupiter, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 28, 1988, Ser. No. 276,721
Int. Cl.[4] F01D *5/32*
U.S. Cl. 416—221 **2 Claims**



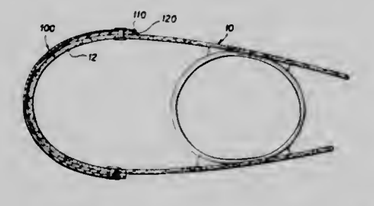
1. Blade retention system for a rotary engine having an axis of rotation comprising:
a disk positioned for rotation within said rotary engine, said disk having a first circumferential groove positioned centrally on its circumferential edge, and extending perpendicular to said axis of rotation;
a preloaded circular snap ring positioned in said first groove, said snap ring being mechanically biased to extend radially outwardly from said first groove; and
multiple blades for installation in said disc, each of the said blades having a base with a second, centrally located, fully enclosed groove, extending perpendicular to said axis of rotation and aligned with said first groove for engagement with said snap ring which locks said blades into blade slots in said disk when bases of said blades are slid into corresponding blade slots; and
wherein said blades are further characterized by dovetail bases for sliding engagement with corresponding blade slots on said disk.

4,895,491

FAN BLADE PROTECTION SYSTEM

Steven R. Cross, Catonsville; Stuart J. Pass, and Robert G. Huntington, both of Owings Mills, all of Md., assignors to Environmental Elements Corp., Baltimore, Md.

Filed Jun. 17, 1988, Ser. No. 208,098
Int. Cl.[4] F04D *29/38*
U.S. Cl. 416—224 **20 Claims**



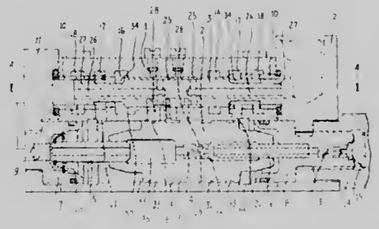
1. A fan blade protection system secured to a fan blade formed from resinous matrix material for substantially preventing erosion by particulate impingement on said fan blade, comprising:
a composite laminate structure bonded to at least a portion of an external surface of said fan blade having an aerodynamic contour devoid of recesses having an erosion resistant metallic outer layer bonded to an elastomeric energy dissipative layer, said composite laminate structure being riveted to said fan blade in addition to said bonding, said metallic outer layer being of predetermined yield strength and having a predetermined thickness to (1) elastically deform responsive to said impingement by said particulates, and (2) by manually formable about a leading edge of said fan blade where said elastomeric layer being of predetermined spring rate and having a predetermined thickness for substantially preventing said metallic outer layer from contacting said fan blade external surface during said elastic deformation of said metallic outer layer responsive to said impingement by said particulates.

4,895,492

DOUBLE ACTING AND AUTOMATICALLY REVERSING PRESSURE INTENSIFIER

Karl Bittel, and Rudi Bardoux, both of Leipzig, German Democratic Rep., assignors to VEB Kombinat ORSTA-Hydraulik, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 534,158, Sep. 21, 1983, abandoned, and Ser. No. 742,620, Jun. 7, 1985, Pat. No. 4,735,051. This application Dec. 16, 1985, Ser. No. 809,284
Claims priority, application German Democratic Rep., Sep. 27, 1982, 2435027
Int. Cl.[4] F15B *3/00*
U.S. Cl. 417—225 **14 Claims**



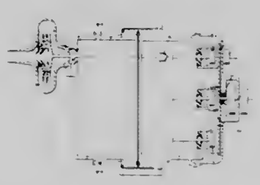
14. A double acting and at the limiting positions automatic reversing pressure intensifier comprising
a case having a first and a second bore hole, a discharge bore and a feed bore;
a pressure intensifier piston sliding in the first bore hole;
a stationary piston engaging the pressure intensifier piston to generate a higher pressure in the fluid;
fluid channel means disposed at the pressure intensifier piston to provide two different flow connections corresponding to the two limiting positions of the pressure intensifier piston;
a control slider disposed in the second bore hole of the case;
two control bores, disposed at a distance from the control bore connecting to the feed bore, connecting the discharge bore to the first bore for the pressure intensifier piston;
hydraulic means connected to the fluid channel means disposed at the pressure intensifier piston to provide two different flow connections for moving the control slider from one limiting position into the opposite limiting position when the pressure intensifier reaches each of its limiting positions;
hydraulic valve means associated with the control slider to supply pressure fluid to move the pressure intensifier piston while the control slider is in a limiting position;
a control bore connecting the middle of the first bore for the pressure intensifier piston to the feed bore;
two control bores, disposed at a distance from the control bore connecting to the feed bore, connecting the discharge bore to the first bore for the pressure intensifier piston;
where the pressure intensifier piston is provided with flat control grooves of which the ones disposed toward the middle are wider than the outer control grooves and which control grooves are disposed such that in a limit position of the pressure intensifier piston on the right (left) side the outer left (right) flat control groove connects at least one of the two closely spaced left (right) control bore to the control bore on the left (right) side connected to the discharge bore, while the inner left (right) flat control groove connects the control bore connected to the feed bore to the two closely spaced right (left) control bores.

4,895,493

ROTARY PUMP

Harold D. Kletschka, 1925 Noble Dr., Minneapolis, Minn. 55422

Division of Ser. No. 62,137, Jun. 12, 1987, Pat. No. 4,844,707. This application Aug. 18, 1988, Ser. No. 217,653
Int. Cl.[4] F04B *39/14*
U.S. Cl. 417—238 **14 Claims**



1. A rotary pump comprising:
a coupling section comprising:
a coupling housing;
a rotating disk rotatably mounted within said coupling housing;
at least one rotary unit mounted to said rotating disk for rotation about an axis spaced from the axis of said rotating disk and for revolution about the axis of said disk;
an impeller attached to said rotary unit by a releasable connection means such that rotation of said rotary unit causes rotation of said impeller;
means for rotating said rotating disk so as to revolve said rotary unit and align said rotary unit with said releasable connection of said impeller; and
drive means connected, by operation of a force, to said rotary unit for causing rotation of said rotary unit.

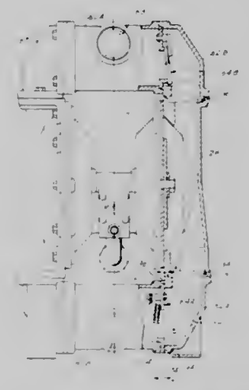
4,895,494

INTERCHANGEABLE MANIFOLDS FOR DIAPHRAGM PUMPS

Richard K. Gardner, Montpelier, Ohio, assignor to The ARO Corporation, Bryan, Ohio

Continuation of Ser. No. 61,733, Jun. 15, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 219,188
Int. Cl.[4] F04B *19/00, 39/10*
U.S. Cl. 417—239 **3 Claims**

1. In a double acting diaphragm pump of the type including (i) a pump body, (ii) a first and a second pressurized chamber in the body, (iii) a first diaphragm in the first chamber linked to a second diaphragm in the second chamber, (iv) first and second fluid flow passages to each chamber, and (v) pumping means to reciprocally displace the linked diaphragms in their respective chambers for pumping action in the chambers and their associated first and second fluid flow passages, the improvement comprising in combination:
(a) said first and second fluid flow passages each being adapted to (i) removably retain a check valve and (ii) sealingly engage a manifold providing means for directing fluid flow to or from the check valve;
(b) at least four reversible flap check valves, each including (i) a planar support plate having a peripheral seal on its opposing planar surfaces, (ii) a plate fluid passage for fluid flow through the plate, (iii) a generally planar flap member adapted to cover the plate fluid passage on one side of the plate, and (iv) hinge means along one side of the flap member for attaching the flap member to the plate and maintaining the flap member in a cooperative relationship with the plate whereby fluid pressure on one side of the flap member pivots the flap member about the hinge to open the flap check valve and fluid pressure on the opposite side pivots the flap member into sealing engagement with the plate; and
(c) at least a first manifold and second manifold, each of said manifolds including (i) manifold sealing channels for sealing and removable engagement with the fluid flow passages, and (ii) two opposting planar plate sealing surfaces, each defining means for removable sealing cooperation with the opposing sides of the planar support plate of an



associated flap check valve; said reversible flap check valves of one of said first and second manifold being reversible with respect to said reversible flap check valves of the other of said first and second manifold to reverse the direction of permitted fluid flow as determined by the orientation of the flap check valves in the associated manifold, whereby the housings, passages, and manifolds of the pump are retained in an identical configuration regardless of the direction of fluid flow through the pumping chambers, the peripheral seal on the opposite sides of the manifold plate having an identical non-circular shape and oriented in opposite directions on the opposite sides of the plate, the manifold sealing channel cooperative with the peripheral seal to orient the flap check valve with the hinge means vertically above the flap member regardless of the direction of fluid flow through the valve.

4,895,495

ELECTROMAGNETIC PUMP WITH PROJECTIONS FORMED ON THE COIL BOBBIN

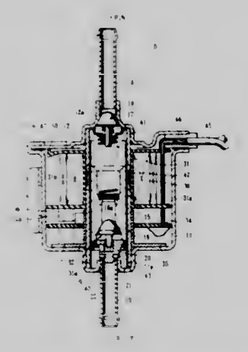
Takatoshi Arai, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,911
Claims priority, application Japan, Dec. 25, 1987, 62-196007
Int. Cl.[4] F04B *17/04*
U.S. Cl. 417—360 **1 Claim**

1. An electromagnetic pump comprising:
a cylindrical member including a magnetic cylindrical member for slidably housing a plunger;
a resin coil bobbin arranged outside said cylindrical member and having an excitation coil wound therearound;
a printed circuit board arranged outside said cylindrical member at a distance from one side surface of said resin coil bobbin;

a holder arranged outside said cylindrical member at a distance from the other side surface of said resin coil bobbin with respect to said printed circuit board; and

a pump housing constituted by a cup-like housing body for accommodating the electromagnetic pump components and a lid mounted thereon so as to close an opening end of said housing body,



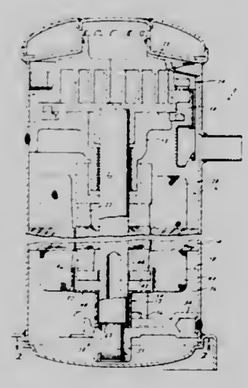
wherein an engaging projection is formed on a peripheral portion of the surface of said coil bobbin, which opposes said lid, and the electromagnetic pump components are held while said components are biased in an axial direction of said cylindrical member by utilizing said engaging projections.

4,895,496

REFRIGERATION COMPRESSOR

John P. Elson, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Jun. 8, 1988, Ser. No. 204,091
Int. Cl.[4] F04B *39/02*
U.S. Cl. 417—372 **22 Claims**



1. A refrigeration compressor comprising:

an outer shell;

a sump disposed in the bottom of said shell containing a supply of lubricant;

a compressor within said shell;

a motor disposed within said shell for driving said compressor, said motor including a stator and a rotor secured to a shaft drivingly connected to said compressor, the lower end of said rotor being rotatable and extending below the normal upper nonoperating level of said lubricant in said sump, said shaft extending downwardly from the lower end of said rotor; and

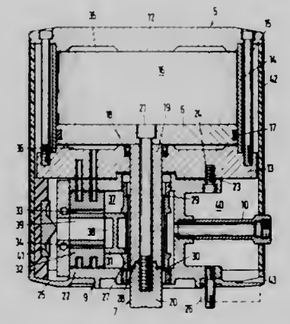
shield means extending above said normal upper level of lubricant, said shield means including a first portion extending between said rotor and stator and surrounding said lower portion of said rotor and a second portion operative to position said first portion, said shield means being operative to restrict oil flow to the rotating lower end of said rotor whereby power consumption of said motor is reduced.

4,895,497

DOUBLE ACTING PNEUMATIC DRIVEN PUMP WITH REGULATING VALVE

Wilfried Schlinkheider, Bielefeld, Fed. Rep. of Germany, assignor to Kopperschmidt-Mueller GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,225
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706351
Int. Cl.[4] F04B *9/12*
U.S. Cl. 417—403 **14 Claims**



1. A fluid flow machine comprising a pump having a first reciprocable piston; a fluid-operated motor having a second reciprocable piston coaxial with said first piston; means for coupling said first piston to said second piston, including a reciprocable piston rod; means for regulating the operation of said motor, said regulating means being adjacent said coupling means intermediate said motor and said pump; a liquid-containing chamber disposed intermediate said regulating means and said pump at a level beneath said regulating means, said piston rod extending through said chamber and being in contact with the liquid in said chamber, said regulating means being disposed radially outwardly of said piston rod and having means for supplying moisture-containing gaseous fluid to and for receiving moisture-containing gaseous fluid from said motor so that condensate is likely to gather in said regulating means; and means for collecting condensate intermediate said regulating means and said chamber.

4,895,498

CRANK CASE CHAMBER

Narcizo O. Basseggio, Av. FChui, 376/401-Cristal CEP 90650 Porte Alegre, R.S., Brazil

Division of Ser. No. 44,363, Apr. 14, 1987, Pat. No.
Claims priority, application Brazil, Jun. 14, 1985, 8502912
Int. Cl.[4] F01M *11/06*; F04B *39/02*
U.S. Cl. 417—426 **11 Claims**

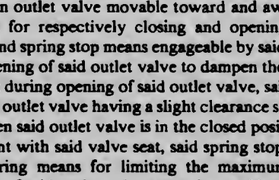
1. A system of parallel compressors for compressing fluids miscible with oil, comprising:

a plurality of compressors connected in parallel;

means for internally separating each compressor into a discharge chamber, a suction chamber, and a crankcase chamber, the chambers of each compressor being independent of one another;

one or more horizontal tubes connected between the crankcase chambers and positioned at a level such that oil occupies a lower portion of each tube and gas occupies the remaining portion of each tube;

a suction manifold connected to the suction chambers;



a capillary tube connecting each crankcase chamber in gas flow communication with the suction manifold, the capillary tube including a calibrating hole;

a discharge manifold connected to the discharge chambers;

means connected to the discharge manifold for separating oil from compressed fluids leaving the discharge chambers; and

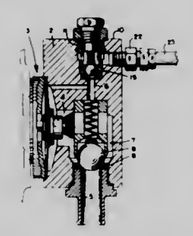
a conduit connecting the oil separating means to at least one of the horizontal tubes for returning oil to the crankcase chambers, the conduit including a calibrating hole.

4,895,499

OUTLET VALVE ASSEMBLY FOR PAINT SPRAYER

Eugene F. Gargas, Wellington, Ohio, assignor to The Wooster Brush Company, Wooster, Ohio

Filed Sep. 22, 1986, Ser. No. 909,675
Int. Cl.[4] F04B *21/02, 39/10*
U.S. Cl. 417—506 **19 Claims**



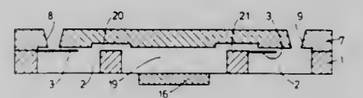
1. An outlet valve assembly for a paint sprayer or the like having a pumping chamber and inlet and outlet openings through which fluid is respectively drawn into the pumping chamber and discharged therefrom, said outlet valve assembly comprising a valve seat adapted to be received in said outlet opening, an outlet valve movable toward and away from said valve seat for respectively closing and opening said outlet opening, and spring stop means engageable by said outlet valve during opening of said outlet valve to dampen the outlet valve movement during opening of said outlet valve, said spring stop means and outlet valve having a slight clearance space therebetween when said outlet valve is in the closed position in seated engagement with said valve seat, said spring stop means comprising spring means for limiting the maximum amount of movement of said outlet valve away from said valve seat during opening of said outlet valve to its fully position during full operating conditions.

4,895,500

MICROMECHANICAL NON-REVERSE VALVE

Bertil Hök, Sportfiskaregatan 53, Västerås, Sweden (S-723 48); Lars Tenerz, Ringgatan 20C, Uppsala, Sweden (S-752 27), and Jonas Tirén, Geijersgatan 13C, Uppsala, Sweden (S-752 26)

Filed Apr. 7, 1989, Ser. No. 334,578
Claims priority, application Sweden, Apr. 8, 1988, 8801299
Int. Cl.[4] F16K *15/16*
U.S. Cl. 417—566 **20 Claims**



1. A silicon micromechanical non-reverse valve comprising

a first silicon wafer having a cavity in one of its main surface and provided with a cantilever beam integral with the top portion of said first wafer, extending over said cavity and being arranged at a distance above the bottom wall of the cavity,

and a second wafer made of a material selected from the group which consists of silicon and glass, said second wafer being provided over the first wafer and covering the cavity thereof in order to form a chamber, said second wafer being provided with two openings one of which is situated within the outline of the beam and the other being situated outside said outline, said first opening acting as an inlet and said second opening acting as an outlet for the valve.

20. A membrane pump comprising a membrane adapted to be vibrated, a fluid duct a portion of which is formed by said membrane and at least one non-reverse valve provided in said fluid duct in order to direct the fluid pumped by the membrane vibrations generally in one flow direction along the fluid duct, said non-reverse valve being of the type indicated in claim 1 and said membrane being the bottom wall of the cavity.

4,895,501

ROTARY COMPRESSOR WITH VANE POSITIONED TO REDUCE NOISE

Bharat S. Bagepalli, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,669
Int. Cl.[4] F01C *1/02*; F04C *2/04*
U.S. Cl. 418—63 **14 Claims**



1. A rotary compressor comprising:

a cylindrical wall;

a compression chamber within said cylindrical

a roller mounted for eccentric rotation about a rotation axis with said cylindrical wall; and

a vane slideably mounted in a slot in said cylindrical wall, said vane moving along a vane center line; said vane center line being disposed at a tilt angle relative to a most direct radius extending from the rotation axis to said vane

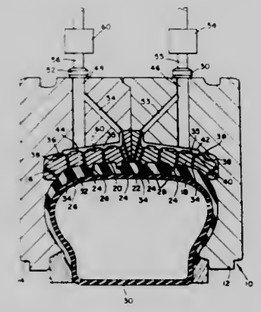
VOL 1110 ISS 4 JA 23 1990 UMI

such that the vane center line is tilted toward said compression chamber, said tilt angle being less than or equal to the arctan E/(R+V) where E is the eccentricity of the compressor, R is the outer radius of the roller, and V is the vane nose radius.

4,895,502
TREAD RING VENTING AND PRESSURIZATION SYSTEM

Richard C. Beard, Massillon, and Carl W. Crispin, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 132,038, Dec. 14, 1987, Pat. No. 4,812,281, Division of Ser. No. 759,668, Jul. 29, 1985. This application Nov. 18, 1988, Ser. No. 273,958
Int. Cl.[4] B29C *35/02*; B28B *7/12, 17/00*
U.S. Cl. 425—29 **7 Claims**



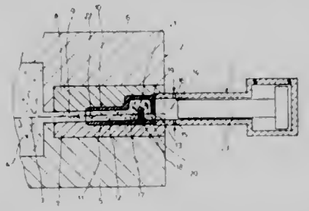
1. A tire mold having at least two pieces and comprising a mold body, a tread ring, a plurality of vent holes located at spaced positions in a molding surface of the tread ring, a sealed cavity between said mold body and said tread ring, said cavity including fluid passages extending around said mold body in communication with said vent holes, ports in said mold in communication with said passages and in communication with a source of fluid pressure and control means for regulating said fluid pressure and interval of time said fluid pressure is communicated to said vent holes.

4,895,503
DEVICE TO PRODUCE MOLDED PLASTIC PARTS FROM A FLOWABLE REACTION MIXTURE

Ferdinand Proska, Leverkusen; Hans M. Sulzbach, Koenigswinter; Ferdinand Althausen, Neunkirchen, and Reiner Raffel, Seigburg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1988, Ser. No. 259,370
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736022
Int. Cl.[4] B29C *45/27*
U.S. Cl. 425—127 **5 Claims**

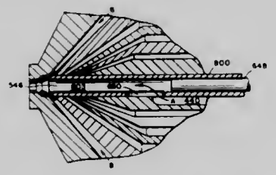
1. An apparatus to produce molded plastic parts from a flowable reaction mixture comprising:
(i) a molding tool having a mold cavity and being connected to a mixing device for mixing reactive components to form said flowable reaction mixture, said mixing device having inlets for said components and an outlet for said flowable mixture,
(ii) a sprue runner leading from said outlet to said cavity and allowing said mixture to flow from said outlet to said cavity, the walls of said runner being made at least partially of an insertable preformed lining which can be removed along with the molded part, wherein said lining is attached directly to said outlet.



4,895,504
APPARATUS FOR INJECTION MOLDING AND INJECTION BLOW MOLDING MULTI-LAYER ARTICLES

Frederick G. Kudert, Niles; Maurice G. Latreille, Batavia; Robert J. McHenry, St. Charles; George F. Nahill, Crystal Lake, all of Ill.; Henry Pfutzenreuter, III, Alta Loma, Calif.; William A. Tennant, Schaumburg, Ill.; Thomas T. Tung, Hoffman Estates, Ill., and John Vella, Jr., Aurora, Ill., assignors to American National Can Company, Chicago, Ill.

Division of Ser. No. 484,707, Apr. 13, 1983, Pat. No. 4,712,990. This application Sep. 19, 1986, Ser. No. 909,282
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—133.1 **41 Claims**

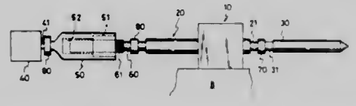


1. An injection nozzle assembly having a central channel with an open end, for co-injecting at least three streams of melt materials to form a multi-layer article from said melt material streams,
said nozzle comprising at least two interfitting shells each having inner and outer surfaces, and a nozzle cap having an inner surface enclosing at least a portion of the outer surface of the outermost one of said interfitting shells,
at least one shell containing a feed flow control channel for flow of melt material therethrough,
said feed flow channel leading to an associated annular flow passageway,
said annular flow passageway being bounded on one side by a portion of the outer surface of the shell containing said flow channel and being bounded on the other side by a portion of the inner surface of an adjacent one of the interfitting shells or of the nozzle cap,
a portion of the outer surface of the shell containing said flow channel having a symmetrical, frustoconical shape,
a portion of the inner surface of said adjacent shell or nozzle cap having a symmetrical, frustoconical shape,
said outer and inner symmetrical, frustoconical surface portions being adapted and cooperating to form a fixed tapered, symmetrical frustoconical portion of said annular passageway which terminates at a fixed, annular orifice whose dimension is substantially invariable for flow of melt material therethrough, into the central channel of the nozzle assembly.

4,895,505
ELECTRICALLY OPERATED INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki, and Masatoyo Sogabe, Hachioji, both of Japan, assignors to Fanuc Ltd, Oshino, Japan

PCT No. PCT/JP87/00650, § 371 Date Apr. 13, 1988, § 102(e) Date Apr. 13, 1988, PCT Pub. No. WO88/01562, PCT Pub. Date Mar. 10, 1988
PCT Filed Sep. 1, 1987, Ser. No. 184,488
Claims priority, application Japan, Sep. 2, 1986, 61-205041
Int. Cl.[4] B29C *45/77, 45/80*
U.S. Cl. 425—145 **20 Claims**

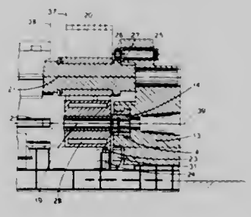


1. An injection molding machine having an injection mechanism, a mold clamping mechanism, an ejector, and a nozzle touch mechanism, each including a linear motion member which is linearly movable, comprising:
at least one linear motion electric motor having a stationary section and a movable section which is linearly movable relative to said stationary section; and
means for operatively coupling each said movable section of said at least one linear motion electric motor to a corresponding one of said linear motion members of the injection mechanism, the mold clamping mechanism, the ejector, and the nozzle touch mechanism, so as to be movable in unison with said corresponding linear motion member.

4,895,506
EXTRUSION PRESS

Geremia Nonini, Buttrio, and Giampietro Benedetti, Campoformido, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Mar. 3, 1988, Ser. No. 168,884
Claims priority, application Italy, Dec. 2, 1987, 83505 A/87
Int. Cl.[4] B29C *47/54*
U.S. Cl. 425—184 **5 Claims**

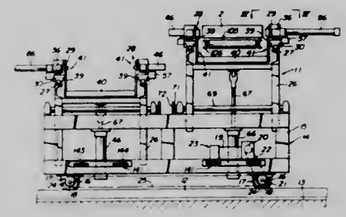


1. A press device for carrying out extrusion of a metal billet, said press device comprising:
a container, said container having a plurality of chambers formed therein for holding billets, each of said chambers having a central longitudinal axis:
an extrusion ram;
a die secured to a die holder, said die and said container being axially movable with respect to each other;
a shears to shear a heel of the billet, said shears being secured to the die holder and disposed between the die and said container;
wherein said chambers are rotatable about an axis parallel to and equidistant from the central longitudinal axes of said chambers in order to present each of said chambers sequentially to said extrusion ram and die so that while an active chamber is undergoing the extrusion step, the other chamber or chambers can be presented to other operating positions, said die and die holder forming an exit aperture for the extruded billet, and wherein the shears shear the heel of an extruded metal billet as the active chamber container the most recently extruded billet is moved from one position to another.

4,895,507
DIE ASSEMBLY EXCHANGING APPARATUS FOR EXTRUDER

Eiji Yano, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,216
Claims priority, application Japan, Nov. 12, 1987, 62-285967
Int. Cl.[4] B29C *47/12*
U.S. Cl. 425—192 R **9 Claims**



1. An apparatus for exchanging die assemblies for an extruder, comprising a carriage arranged on an extruding side of the extruder, first moving means for moving said carriage along a first axis perpendicular to an extruding direction of the extruder and in parallel with a horizontal, two grasping units supported by said carriage and spaced from each other along the first axis, second moving means for moving said grasping units along a second axis parallel with said extruding direction, respectively, third moving means for moving said grasping units along a third axis perpendicular to said first and second axes, respectively, and a plurality of storing stands arranged spaced apart each other along the first axis beside a moving passage of said carriage for storing various kinds of die assemblies, respectively, and each of said grasping units extending along said third axis and having a pair of arms provided with grasping means for grasping the die assembly.

4,895,508
APPARATUS FOR PRODUCING PROCESSED WOOD MATERIAL PANELS

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Division of Ser. No. 120,355, Nov. 13, 1987, Pat. No. 4,802,837. This application Feb. 6, 1989, Ser. No. 307,094
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639061
Int. Cl.[4] B29C *43/48*
U.S. Cl. 425—371 **3 Claims**

1. Apparatus for continuous production of plastic material webs at increased temperature, said apparatus comprising a double band press, said double band press comprising a first press band and a second press band, drums arranged to support each of said press bands with said press bands travelling over said drums, each of said press bands comprising an inner band in contact with said drum and an outer band spaced outwardly from said inner band and arranged to contact the plastics material web, said outer bands disposed in spaced relation and forming a passageway extending in a direction of travel of said press bands over said drums and having an inlet end and an outlet end and said passageway forming a reaction zone extending between the inlet end and outlet end, means for supply-

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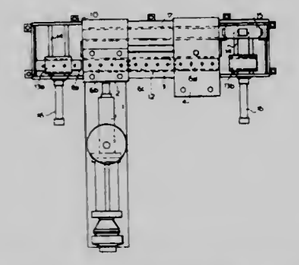
ing heat to said press bands for forming the plastics material web, means spacing each said inner band and outer band apart, said spacing means comprising spacers extending transversely of the travel direction of said press bands and in contact with said inner band and said outer band, said spacers spaced apart in the travel direction and forming therebetween channels extending transversely of the travel direction of said press bands, thermal insulation means located within said channels, said means for supplying heat to said press bands arranged to heat the outer bands before their entry into the reaction zone to an increased temperature required for the plastics material web to be formed and said thermal insulation means arranged to maintain said inner band at a lower temperature.

4,895,509

COMPACT APPARATUS FOR MOLDING HOLLOW CONTAINERS IN MOLECULARLY ORIENTATABLE PLASTIC MATERIAL

Ferruccio Giacobbe, Via Don Orione 21, Milan, Italy

Filed Jul. 12, 1988, Ser. No. 217,961
Claims priority, application Italy, Jul. 20, 1987, 21342 A/87
Int. Cl.[4] B29C *69/00*
U.S. Cl. 425—383 **1 Claim**



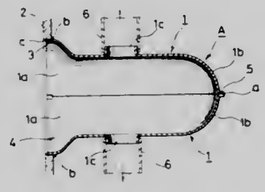
1. A compact apparatus for molding hollow containers of a molecularly orientable plastic material, comprising:
a support frame having a perimeter;
a molding line operatively connected with said support frame, said line including a plurality of contiguous molding units aligned in a row having respective zones of action for forming the containers and a discharging unit spaced from said molding units;
a conveyor device linking said units and including:
two mutually parallel elongated linear sections spaced apart and two spaced apart and mutually parallel transverse sections bridging said linear sections, each of said sections being provided with respective rectilinear guides forming a closed path along said perimeter of said frame, one of said elongated sections linking said aligned units of said molding line,
a plurality of carriages sliding along said guides and having respective support jaws for the containers along said one of elongated sections, said carriages being of uniform length and being in end-to-end relationship along said one of elongated sections,
a first actuating means provided with a pusher arm for acting upon a first of said carriages along the guide of said one of the elongated sections, said first actuating means producing a stroke equal to said uniformed length of each of the carriages, so that said units with the respective zones of action spaced at the distance equal to said uniformed length of said carriages are continuously in correspondence with at least some of said carriages along said one of the elongated sections,
second actuating means for advancing the carriages along the respective guide of the other elongated section between said transversal sections by a single stroke produced by said second actuating means,
a respective slide provided with a respective support guide for carrying one of said carriages along each of said transverse sections of said path between said parallel elongated sections of said path, each of the slides being formed with a respective actuator for transferring said carriages between positions where each of the support guides of the respective slide is in alignment with the respective guiding means of said elongated sections of said path, said units of said molding line extending along said line with a length equal to said uniform length of said carriages, said discharging unit being above said elongated section of said path parallel to said one elongated section linking said units of the molding line.

4,895,510

COMBUSTION CHAMBER OF A PULSATING COMBUSTOR

Nobuyoshi Yokoyama, Toyoake, Japan, assignor to Paloma Kogyo Kabushiki Kaisha, Japan

Filed Jan. 23, 1989, Ser. No. 299,386
Claims priority, application Japan, Aug. 24, 1988, 63-110881
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 **4 Claims**



1. A vessel assembly defining a combustion chamber in a pulsating combustor, which comprises
a pair of generally convex half-shells made by plastic deformation,
each of half-shells having (i) a substantially semi-oval cross section, (ii) a side opening, (iii) a rear opening which is perpendicular to the side opening, (iii) a substantially one-fourth-spheroidal front end portion, (iv) a radially enlarged rear end portion which defines the rear opening, (v) a substantially central exhaust port which is located on a side opposed to the side opening,
the half-shells being joined to each other at substantially U-shaped side edges thereof defining the side openings thereof to form an integral assembly which is totally closed except for the exhaust ports and the rear openings,
the rear openings of the half-shells providing together an inlet for admitting a mixture of fuel and air into the vessel assembly, and
the rear end portions of the half-shells being connected to an edge of a hole made through a wall of a vessel for holding liquid to be heated, so as to connect the entire vessel assembly to the wall.

4,895,511

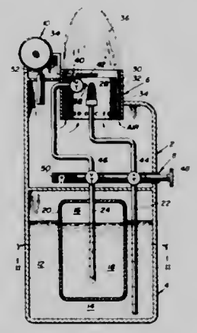
COLOR OR SCENT MODIFIED FLAME POCKET LIGHTERS

Ronald W. Schmid, S. 29th St., Virginia Park #96, Ft. Pierce, Fla. 33450

Filed Oct. 24, 1988, Ser. No. 261,121
Int. Cl.[4] F23Q *2/32*
U.S. Cl. 431—126 **6 Claims**

1. A pocket lighter capable of providing a colored flame visible in daylight which comprises:
a fluid containment portion, a fuel combustion portion, valve means and igniter means,
said fluid containment portion comprising:

a first compartment containing pressurized fuel,
a second compartment containing flame coloration liquid,
a first tubular member for conducting fuel from said first compartment to said fuel combustion portion via said valve means,
a second tubular member for conducting coloration liquid from said second compartment to said fuel combustion portion via said valve means,
said fuel combustion portion comprising:
a burner unit connected to said first tubular member,
a nozzle connected to said second tubular member positioned to dispense coloration liquid into a flame emitted by said burner unit,



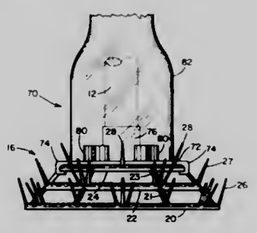
a heat activated valve associated with said nozzle to control the dispensing of said coloration liquid therefrom,
said valve means comprising:
a first valve that controls flow of fuel through said first tubular member and
a second valve that controls flow of liquid through said second tubular member,
said first and second valves being arranged to simultaneously open and close,
said igniter means being positioned in said fuel combustion portion to ignite fuel delivered to said burner unit upon the opening of said first valve.

4,895,512

TAPER CANDLE/CHIMNEY GLASS BAR

Marian D. Sullivan, and Elaine A. Tschetter, both of Sioux Falls, S. Dak., assignors to Sullivan, Inc., Sioux Falls, S. Dak.

Continuation-in-part of Ser. No. 102,037, Sep. 29, 1987, Pat. No. 4,815,967. This application Mar. 22, 1989, Ser. No. 327,338
Int. Cl.[4] F23D *3/16*
U.S. Cl. 431—295 **9 Claims**



1. An adapter for use with a candle ring, comprising:
a generally flat plate spanning the candle ring;
a generally cylindrical candle holder mounted in symmetrical position on said plate;
said candle holder including opposite pairs of internal gussets therein for engaging a taper candle at its lower end;
a chimney-glass holder mounted on said plate in surrounding relationship with said candle holder;
a pair of fixed, spaced-apart clips associated with said plate for snap-releasable engagement with the candle ring to secure the adapter thereto; and
said plate, candle holder and internal gussets, chimney glass holder, and clips being constructed of integral molded plastic.

4,895,513

HEAT RESISTANT COMBUSTION ELEMENT

Bodh R. Subherwal, Huntington Beach, Calif., assignor to BR Laboratories, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 82,162, Aug. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 907,929, Sep. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 803,183, Dec. 2, 1985, abandoned. This application Aug. 5, 1988, Ser. No. 229,048
Int. Cl.[4] F23D *14/12*
U.S. Cl. 431—328 **9 Claims**



1. A method for producing a combustion element through which an air-fuel mixture may flow and across the surface of which substantially flameless combustion may take place as the mixture flows out from the element, comprising the steps of:
providing a body of felted carbon fibers having a structure of interconnected, multidimensional randomly disposed strands;
heating said body in an atmosphere of an inert gas to a temperature of between 1500 degrees and 2100 degrees F.;
maintaining said body of fibers at said temperature;
passing a gas including a heat decomposable source of silicon atoms through said body of heated fibers for a period of time sufficient to in situ convert substantially all of said fibers to silicon carbide and silicon; and
cooling said converted body of fibers.

4,895,514

GAS BURNER FOR HEATING OF AN AIR OR OTHER COMBUSTION SUPPORTING GAS STREAM

Pierre Cantryn, St Germain-en-Laye, and Maurice Idoux, Versailles, both of France, assignors to Mecanique Generale Foyers-Turbine, Sevres, France

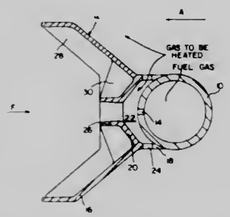
Filed Oct. 11, 1988, Ser. No. 256,777
Claims priority, application France, Oct. 23, 1987, 87 14686
Int. Cl.[4] F23D *14/46*
U.S. Cl. 431—350 **9 Claims**

1. A burner for heating a stream of a combustion supporting gas flowing at high speed in one direction, which comprises
(a) a pipe fed with a fuel gas and extending across the flow direction of the combustion supporting gas stream, the pipe defining
(1) holes generating fuel gas jets directed in the direction of the combustion supporting gas stream flow,
(b) a flame stabilizer arranged downstream of the pipe in this direction, the flame stabilizer including
(1) two divergent combustion supporting gas stream deflector wings delimiting a downstream zone shielded from said gas stream and an upstream zone, and

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(c) a respective convergent-divergent nozzle arranged in the downstream zone downstream of each one of said holes and coaxially thereto,

(1) the nozzles having inlets facing the holes and the gas jets generated from said holes creating a negative pressure at the nozzle inlets, and



(2) the nozzle inlets communicating with the upstream zone through openings formed in the flame stabilizer and so arranged as to eliminate the influence of the dynamic pressure of the gas stream on the flow rate of gas drawn in by the nozzles through the openings.

4,895,515

DENTAL INSTRUMENTS

Per A. T. Axelsson, Hammarö , Sweden, assignor to Ingrid Margareta Axelsson et al., Sweden

Filed Nov. 14, 1988, Ser. No. 270,052
Claims priority, application Sweden, Nov. 13, 1987, 8704435
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—166 **12 Claims**



1. A dental instrument for planing tooth surfaces to remove calculus and plaque comprising:

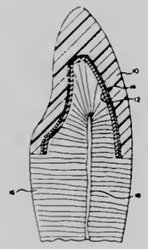
a shaft, one end of which is adapted to be attached to an driven by a driving means, and a working part formed at the other end of said shaft and adapted to work upon tooth surfaces in the mouth of a patient, said working part including at least a pair of axially spaced, substantially flat surface parts separated by a recessed area, said area defined in part by opposed surfaces which intersect said axially spaced surface parts at substantially 90° to form opposed cutting edges on opposite sides of said recessed area, said axially spaced, substantially flat surface parts substantially preventing removal of tooth material, including root cementum and dentine, once the tooth surfaces have been planed smooth.

4,895,516

INTERMEDIATE CERAMIC BONDING LAYER FOR BONDING OF A RESIN TO AN ALLOY STRUCTURE OR SUBSTRUCTURE

Johan O. Hultén, 100 E. Bellevue #25D, Chicago, Ill. 60611

Filed Oct. 14, 1987, Ser. No. 108,178
Int. Cl.[4] A61K *6/08*
U.S. Cl. 433—201.1 **57 Claims**



1. A method of manufacturing a polymerizable resin or composite resin, alloy substructure reinforced dental restoration, comprising:

(a) coating a crown and bridge alloy substructure with a vitrifiable ceramic, said alloy and said ceramic having generally similar coefficients of expansion;

(b) vitrifying said ceramic to fuse said ceramic to said substructure, thereby forming a generally thin ceramic bonding layer on said substructure;

(c) forming a microporous surface on said ceramic bonding layer with an etching acid to obtain a microporous ceramic bonding layer;

(d) applying a silane coupling agent to said microporous ceramic bonding layer;

(e) overlaying said silane coupling agent with a polymerizable resin or composite resin material; and

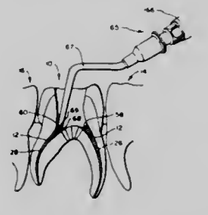
(f) polymerizing said resin or composite resin material.

4,895,517

METHODS FOR PERFORMING VITAL DENTAL PULPOTOMY

Dan E. Fischer, Sandy, Utah, assignor to Ultradent Products, Inc., Salt Lake City, Utah

Filed Apr. 14, 1987, Ser. No. 38,198
Int. Cl.[4] A61C *5/02*
U.S. Cl. 433—224 **51 Claims**



1. A method for repairing a tooth comprising the steps of:

(a) accessing the pulp chamber of the tooth;

(b) amputating the dental pulp in the pulp chamber to the orifices of the pulp canals;

(c) arresting hemorrhaging from the exposed cut ends of the pulpal tissue in the pulp canals;

(d) fixing the exposed cut ends of the pulpal tissue by applying thereto a composition containing ferric ions to create barrier regions of fixed tissue between the pulp chamber and vital pulpal tissue in the pulp canals; and

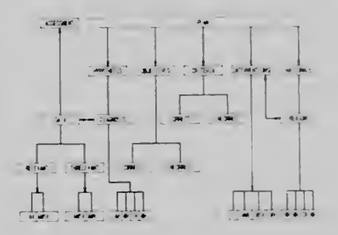
(e) sealing the barrier regions of fixed tissue from the pulp chamber using a cement base.

4,895,518

COMPUTERIZED DIAGNOSTIC REASONING EVALUATION SYSTEM

Jean M. Arnold, Parsippany, and William H. Greenhalgh, Neshanic Station, both of N.J., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Nov. 2, 1987, Ser. No. 115,720
Int. Cl.[4] G09B *19/00, 7/00*
U.S. Cl. 434—118 **5 Claims**



1. A method of operating a computing machine to assess the reasoning ability of an examinee to be evaluated, the method comprising the steps of:

first storing in a test memory area situation data corresponding to respective situation phrases in a test situation description which describes a predetermined test situation, said test situation description being substantially narrative and formed of a plurality of said situation phrases, each situation phrase having associated therewith a respective phrase identification symbol;

second storing in a problem identification memory area problem data corresponding to a plurality of predetermined problems each having a respective degree of pertinence to said test situation;

third storing in a problem selection memory area a problem selection response by the examinee, said problem selection response specifying a selection by the examinee of at least one of said predetermined problems as being considered by the examinee to have a significant degree of pertinence to said test situation;

fourth storing in a problem selection support memory area data corresponding to a problem selection support response by the examinee, and specifying a selection by the examinee of ones of said situation phrases which support said problem selection response;

fifth storing in an objectives identification memory area objectives data corresponding to a plurality of predetermined objectives;

sixth storing in an objectives selection memory area data corresponding to an objective selection response specifying one of said predetermined objectives as being considered by the examinee to be a correction to the predetermined problem selected in said step of third storing;

seventh storing in a criteria identification memory area data corresponding to a plurality of predetermined criteria;

eighth storing in a criteria selection memory area data corresponding to a criteria selection response specifying at least one of said predetermined criteria as being considered by the examinee as supporting said predetermined objective selected in said step of sixth storing;

ninth storing in an intervention identification memory area data corresponding to a plurality of predetermined interventions;

tenth storing in an intervention selection memory area data corresponding to at least one of said predetermined interventions selected by the examinee to resolve a problem identified in said step of third storing;

eleventh storing in a rationale identification memory area data corresponding to a plurality of predetermined rationales; and

twelfth storing in a rationale selection memory area data corresponding to at least one of said predetermined rationales considered by the examinee as supporting said predetermined intervention selected in said step of tenth storing, including at least a selected one of said phrase symbols for supporting said predetermined intervention.

4,895,519

AUDIO-FREQUENCY CONVERTER APPARATUS, INSTALLATION INCLUDING SAID APPARATUS FOR TREATING SUBJECTS SUFFERING FROM AUDIO-PHONATORY AND AUDITIVE-VERBAL DISORDERS, AND A METHOD OF USING SUCH AN INSTALLATION

Isi Beller, 51, rue Saint-André-des-Arts, 75006 Paris, and Boris Fradin, Noisy a/Ecole, both of France, assignors to I. Beller, Paris, France

Continuation of Ser. No. 756,231, Jul. 18, 1985, Pat. No. 4,708,657. This application Nov. 23, 1987, Ser. No. 125,757
Claims priority, application France, Jul. 27, 1984, 84 12019
The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.
Int. Cl.[4] H04R *3/12*
U.S. Cl. 434—185 **9 Claims**



1. A device for treating auditory disorders, comprising a parametric converter for converting from an audio signal supplied to said parametric converter at an input thereof to a parametric signal corresponding to said audio signal, said parametric signal being output from said parametric converter at an output thereof, said parametric converter comprising

first and second threshold detector means, each operatively connected to said input of said parametric converter, each for rectifying said audio signal with respect to a respective threshold and polarity of said audio signal, and each providing a respective output with a respective time constant, said time constant of said output of said second threshold detector means being greater than said time constant of said output of said first threshold detector means,

a voltage controlled oscillator receiving as an input said output of said first threshold detector means and providing an oscillating output having frequency that decreases with increase in said output of said first threshold means,

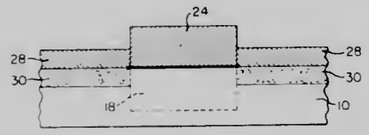
modulator means for receiving as a first input a signal corresponding to said oscillating output of said voltage controlled oscillator and as a second input said output of said second threshold detector means, and for outputting as said output of said parametric converter said parametric signal oscillating with said frequency of said first input to said modulator means with an envelope amplitude that increases with increase in said second input to said modulator means.

4,895,520

METHOD OF FABRICATING A SUBMICRON SILICON GATE MOSFETG21 WHICH HAS A SELF-ALIGNED THRESHOLD IMPLANT

John E. Berg, New York, N.Y., assignor to Standard Microsystems Corporation, Hauppange, N.Y.

Filed Feb. 2, 1989, Ser. No. 305,959
Int. Cl.[4] H01L *21/265, 21/283, 21/316*
U.S. Cl. 437—45 **14 Claims**



1. A process for fabricating an integrated circuit comprising the steps of providing a silicon substrate, forming an insulating layer on said substrate, forming at least one trench in said insulating layer which extends to the insulating/silicon interface, forming a gate oxide layer at the bottom of said trench on the exposed surface of said substrate, implanting impurities through said gate oxide layer to the upper surface of said substrate but not into regions beneath said remaining portion of said insulating layer, thereby to establish a threshold adjust implant beneath said gate oxide layer, depositing a conductive layer over said insulating layer and into said trench, etching said conductive layer to the top surface of said insulating layer, thereby to form a gate electrode in said trench over said oxide layer and surrounded by said insulating layer, removing at least a portion of said insulating layer without removing said gate electrode, and implanting a dopant into said substrate in areas previously covered by said insulating layer but not in the area underneath said gate electrode, thereby to form source and drain regions, whereby the edges of said threshold adjust implant are aligned with the edges of said source and drain regions and said gate electrode.

4,895,521

MULTI-PORT COAXIAL CONNECTOR ASSEMBLY

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 13, 1989, Ser. No. 297,636
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—63 **11 Claims**



1. A coaxial connector assembly (26) for use with a printed circuit board (30), said printed circuit board (30) having a dielectric substrate (40), a conductive signal pad (46) on a first surface (28) of said substrate, and a conductive ground pad (48) on said first surface (28) adjacent to and spaced from said signal pad (46), said connector assembly (26) comprising:

a monolithic contact element (52) including a support portion (58), an elongated signal pin portion (60) extending from a first side of said support portion (58), and a spring contact portion (62) extending from a second side of said support portion (58) opposite said first side;

a dielectric support element (54) adapted to secure therein said support portion (58) of said contact element (52) with said signal pin portion (60) extending outwardly from a first end (74) of said support element (54) and said spring contact portion (62) being exposed at a second end (70) of said support element (54) opposite said first end (74);

a conductive sleeve element (56) having a first portion (78) and a second portion (80), said first sleeve portion (78) surrounding said support element (54) and said second sleeve portion (80) surrounding said signal pin portion (60) and including means for retaining said support element (54) within said first sleeve portion (78);

a housing block (36) having a bore (38) therethrough internally configured as complemental to the exterior of said sleeve element (56); and

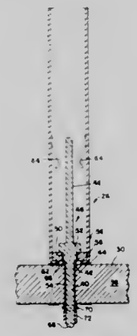
means (32) for mounting said housing block (36) to said substrate first surface (28) so that with said contact element (52), said support element (54) and said sleeve element (56) assembled and within said bore (38), said spring contact portion (62) is in touching contact with said signal pad (46) and said first sleeve portion (78) is in touching contact with said ground pad (48).

4,895,522

PRINTED CIRCUIT BOARD COAXIAL CONNECTOR

Dimitry G. Grabbe, Middletown, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 18, 1989, Ser. No. 298,376
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—63 **7 Claims**



1. A coaxial connector (28) for mounting on a printed circuit board (26), said printed circuit board having a dielectric substrate (38) of a defined thickness, a conductively plated aperture (40) through said substrate, a conductive signal (42) pad on a first surface (30) of said substrate adjacent to said aperture and in electrical contact with the plating in said aperture, and a conductive ground pad (44) on said first surface adjacent to and spaced from said signal pad, said connector comprising:

a central conductive contact element (46) including a signal pin portion (48) and an elongated support portion (54), the cross-sectional dimension of said support portion (54) being such that said support portion (54) fits freely into said aperture (40) with minimum clearance therebetween and the length of said support portion (54) being greater than said defined thickness;

an insulated annular disc member (56) surrounding said contact element (46);

a conductive outer sleeve element (58) surrounding said contact element (46) and said disc member (56), the internal dimension of said sleeve element (58) being slightly greater than the outer diameter of said disc member (56), said sleeve element (58) being formed with an inwardly directed end (62) adapted to lie between said disc member (56) and said substrate (38) in electrical contact with said ground pad (44) and spaced from said signal pad (42); and

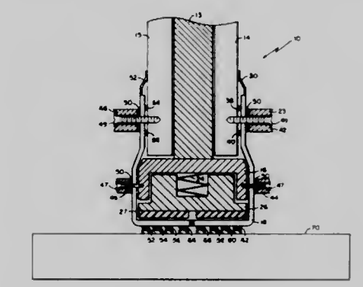
securing means (70, 72) mounted on said support portion (54) for exerting a force thereon to maintain said inwardly directed end (62) of said sleeve element (58) in compression between said disc member (56) and said substrate (38).

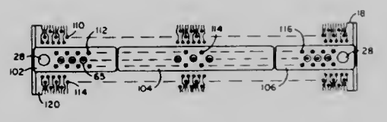
4,895,523

CONTROLLED IMPEDANCE CONNECTOR

Brian D. Morrison, Hopkinton, and Jack J. Rosenberg, Acton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 7, 1988, Ser. No. 268,146
Int. Cl.[4] H01R *23/68*
U.S. Cl. 439—67 **17 Claims**





1. A high density controlled impedance connector comprising:

means for providing a housing for said connector, said housing means provides for attaching said connector to a component board means and for securing said connector to a mating means;

pressure bar means inserted into an end of said housing means for distributing load forces over a surface of a mating end of said connector;

spring means disposed between an inside surface of said housing means and said pressure bar means for providing said load forces; and

flexible circuit means attached to said housing means and said component board means for making a plurality of power, ground and I/O signal electrical contacts between said component board means and said mating means; and

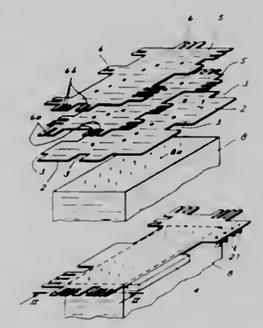
said flexible circuit means comprises a first layer of a plurality of power and ground conductive planes in parallel for providing a low inductance current path between said component board means and said mating means and a second layer of conductive strips for said I/O signals with a dielectric material means separating said first layer and said second layer.

4,895,524

INTERFACE DEVICE HAVING RIGID PLANAR ELEMENTS AND FLEXIBLE PRINTED CIRCUITS

Claude Thepault, Milan, Italy, assignor to CROUZET S.P.A., Baranzate Di Bollate, Italy

Filed Mar. 21, 1988, Ser. No. 171,474
Claims priority, application Italy, Mar. 23, 1987, 19807 A/87
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—74 **9 Claims**



1. An electrical interface connector for a washing machine or the like, comprising:

an electromechanical programmer for said washing machine having a surface and pins projecting from said surface for electrical connection to the programmer;

a rigid planar element lying flat against said surface, traversed by said pins and affixed to said programmer by soldering to said pins, said rigid planar element having generally a rectangular configuration formed with notches along edges thereof defining respective rectangular projections asymmetric with respect to one another;

a flexible printed circuit lying flat against said rigid planar element and traversed by at least some of said pins and soldered thereto, said flexible printed circuit having groups of contact strips overlying respective ones of said rectangular projections with ends of said contact strips being coterminous with ends of the respective projections; and

respective electrical connector members each dimensioned to receive a respective one of said projections and the group of contact strips overlying same, whereby asymmetry of said projections prevents incorrect attachment of said connector members to said connector.

4,895,525

CABLE SHIELD GROUNDING CLAMP CONNECTOR

Ignazio E. Leonardo, Union, N.J., assignor to A K Stamping Co. Inc., Mountainside, N.J.

Filed Jan. 31, 1989, Ser. No. 304,753
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—99 **9 Claims**

1. In a cable shield grounding clamp connector for establishing an electrical connection with the shield of an electrical cable having an inner core of insulated conductors, an outer insulating jacket with an outer diameter, and a shield between the inner core and the outer jacket, the shield having an inner surface and including a metallic sheath and a corrosion inhibiting coating on the metallic sheath at least along the inner surface of the shield, an improvement for effecting the electrical connection and maintaining the electrical connection con-

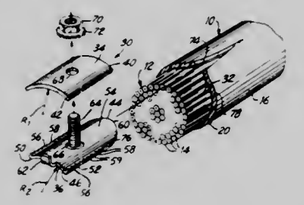
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tinuously during service in the field, the improvement comprising:

an outer plate extending longitudinally between opposite ends thereof and having a transverse cross-sectional configuration curved circumferentially along an arc of a first radius to conform essentially to the outer diameter of the jacket;

an inner plate extending longitudinally between opposite ends thereof and laterally between opposite edges thereof, the inner plate including a web portion curved circumferentially between the laterally opposite edges along an arc of a second radius;

clamping means for urging the outer plate and the inner plate toward one another; and



scraping means located along the laterally opposite edges of the inner plate for projecting toward the outer plate when the inner plate and the outer plate are juxtaposed with one another, with the jacket and the shield interposed between the juxtaposed outer plate and inner plate;

the second radius being related to the first radius such that upon urging the outer plate and the inner plate toward one another, the inner plate will be resiliently deflected toward conformance with the curved configuration of the outer plate and the scraping means will be displaced concomitantly circumferentially along the shield to scrape away portions of the coating and make electrical contact with corresponding portions of the metallic sheath without piercing the metallic sheath, and will be biased continuously toward the metallic sheath to maintain the electrical contact continuously during service in the field.

4,895,526

CONNECTING TERMINAL BLOCK FOR ELECTRICAL APPARATUS

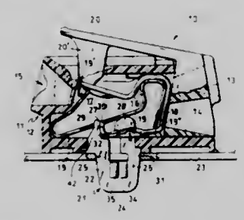
Dieter Hearici, and Erwin Lingemann, both of Arnsberg, Fed. Rep. of Germany, assignors to Firma Brokelmann, Jaeger & Busse GmbH & Co., Arnsberg, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 296,260

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 8801623[U]

Int. Cl.[4] H01R *4/66, 13/73*

U.S. Cl. 439—108 **6 Claims**



1. A connecting terminal block for an electric apparatus having a wall adapted to receive said terminal block, said terminal block comprising:

an insulating body formed with a chamber and at least one inlet opening into said chamber and adapted to receive a conductor to be connected by said terminal block and at least one slot opening from said chamber toward said wall;

conductor means including at least one conductive element received in said chamber, engageable with said conductor and formed with a pair of spaced-apart first openings for making electrical contact with said conductor; and

a two-shank generally U-shaped plug constituted from thin flat sheet metal and having a bight and a pair of shanks unitarily connected to said bight and coplanar with said bight, said shanks each extending unitarily into a connecting shank part at a respective free end of the respective shank, said plug being received in said slot with said bight projecting from said slot into locking engagement in an opening in said wall and said connecting shank parts engaging said conductive element in respective second openings thereof, the opening in said wall having a clear width which is at least slightly smaller than the largest distance between outer edges of said shanks.

4,895,527

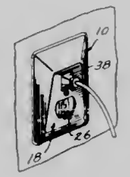
SAFETY COVER

Martin C. Brown, 7216 Balmoral Dr., Columbia, S.C. 29209, and Peter M. Brown, 107 Birch Trail, Greenwood, S.C. 29649

Filed May 22, 1989, Ser. No. 354,790

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—147 **13 Claims**



1. For use in conjunction with a wall-mounted electrical receptacle with dual outlets for the selective reception of electrical plugs conventionally formed to present an oblong shape with the longer dimension thereof alignable with the outlets for engagement of the plugs therewith; a one-piece, rigid safety cover, said cover including a peripheral base edge defining a base plane and being engageable with the wall about the electrical receptacle and means for mounting said cover to said receptacle, said cover inward of said base edge being laterally offset from the plane of said edge and defining a chamber adapted to receive a outlet-engaged plug, said cover including an opening defined therethrough and into said chamber for alignment with a first receptacle outlet upon a mounting of the cover to the receptacle, said opening being oblong and complementary to a conventional oblong-configured plug for free passage of the plug therethrough and into said chamber upon alignment of the plug and opening, and for precluding withdrawal of said plug from said chamber upon rotation of said plug out of alignment with said opening, said oblong opening, upon a mounting of the cover to the receptacle, having the longer dimension thereof extending transverse of the aligned first outlet whereby rotation of said plug subsequent to pass·ge of the plug through the opening and into chamber will be required prior to engagement of the plug in the aligned outlet and will preclude withdrawal of said plug out of said chamber through said opening, said chamber being of a depth outward of said aligned first outlet to receive and return at least a portion of the plug between the cover and the aligned outlet.

4,895,528

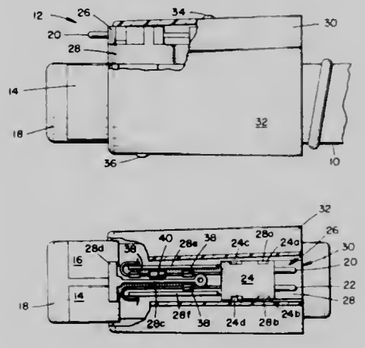
UNIVERSAL HIGH/LOW VOLTAGE HOSE-TO-WALL FITTING FOR CURRENT-CARRYING FLEXIBLE HOSE

Alcide W. Cholaniere, and George T. Dunn, Jr., both of Abbeville, S.C., assignors to Automation Industries, Inc., Greenwood, S.C.

Filed Dec. 13, 1988, Ser. No. 283,565

Int. Cl.[4] H01R *4/60*

U.S. Cl. 439—191 **20 Claims**



1. A universal hose-to-wall fitting for a current-carrying flexible hose, comprising:

(a) a generally cylindrical portion for mechanical attachment to one end of a current-carrying flexible hose; and

(b) a male end fitting including a first pair of electrical contacts for connection to high-voltage current-carrying elements of a current-carrying flexible hose, and means for rigidly and detachably affixing said male end fitting to said cylindrical portion for orientation of said first pair of electrical contacts:

(i) either toward the wall end of said hose-to-wall fitting so that said first pair of electrical contacts will engage a corresponding pair of high-voltage contacts in a wall fitting virtually simultaneously with the engagement of said cylindrical portion with a source of vacuum;

(ii) or toward the hose end of said hose-to-wall fitting to enable connection of said first pair of electrical contacts to a plug attached to one end of an electrical cord for supplying high-voltage power therethrough.

4,895,529

ENVIRONMENTALLY SEALED CONNECTOR

Anil C. Thakrar, Camp Hill; John P. Redmond, Mechanicsburg; Paul C. Schubert, Jr., Harrisburg, and Clair W. Snyder, Jr., York, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 453,327, Dec. 27, 1982, abandoned. This application May 13, 1986, Ser. No. 862,902

Int. Cl.[4] H01R *13/40*

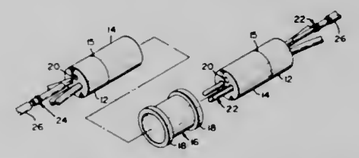
U.S. Cl. 439—281 **19 Claims**

1. A connector housing, comprising:

a rigid section formed of plastic material having first passageway means extending therethrough in which terminal means will be secured;

a flexible section formed of plastic material having second passgeway means extending therethrough from an end face and in communication with said first passageway means and along which conductor means terminated to the terminal means will extend, said second passageway means being sized for sealingly engaging the conductor means;

said rigid section and said flexible section are integrally molded and are secured together at an interface therebetween by forming a chemical affinity therebetween, the shape of the interface between said rigid and flexible sections being essentially the same as the shape of the end face of the flexible section; and



at least one sealing member formed of flexible plastic material at a front end of said rigid section integrally molded thereon and secured thereon by a chemical affinity therebetween, the shape of the interface between said rigid section and flexible sealing member being essentially the same as the shape of the end face of the flexible sealing member, said sealing member being sealingly engageable with a sealing surface of a complementary connector housing.

4,895,530

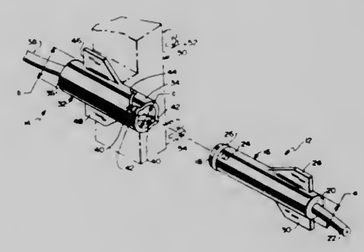
QUICK DISCONNECT AUTOMOTIVE BATTERY CONNECTOR

Robert J. Gugelmeyer, Aurora, and Lawrence E. Geib, Bartlett, both of Ill., assignors to Molex Incorporated, Del.

Filed Feb. 24, 1989, Ser. No. 314,991

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—311 **23 Claims**



1. A pair of quickly connectable and disconnectable electrical connectors comprising:

a first connector including

a first terminal having a mating end and a wire mounting end, the mating end comprising a pair of outwardly deflectable longitudinally extending contacts, the wire mounting end being securely mounted to a wire;

a first housing molded from a nonconductive material having a terminal receiving recess formed therein open at one end for receiving said first terminal therein, said first housing comprising a forward mating end with cam means for facilitating connection and disconnection of the first connector; and

a second connector including

a second terminal having a mating end and a wire mounting end, the mating end of said second terminal being receivable between the outwardly deflectable contacts of the first terminal, the wire mounting end of said second terminal being securely mounted to a wire;

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a second housing molded from a nonconductive material having a terminal receiving recess formed therein open at one end for receiving said first terminal therein, said second housing comprising a mating end with a cam means for engaging the cam means of said first housing and guiding said first and second housings helically into a fully mated condition in which the first and second terminals are helically wiped and mated with one another.

4,895,531
ELECTRICAL CONTACT MEMBER

Guido Vignoli, Alta, Italy, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 25, 1988, Ser. No. 223,837
Claims priority, application United Kingdom, Nov. 16, 1987, 8726806
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—398 **3 Claims**



1. An improved electrical contact member comprising a conductor connecting end constituted by a pair of interconnected parallel plates joined by a pair of transverse straps to define a wire receiving mouth conveying to a pair of aligned wire receiving slots and in respective plates, and a tab receiving end constituted by extensions of said parallel plates with the end most portions thereof split to define two legs and having a tab receiving slot, where each said leg is provided with means for engaging an insert, a U-shaped insert fabricated from a sheet of spring steel and located between said parallel plates in a position perpendicular to the planes of said parallel plates, and seated in said means, where one end of said insert engages corresponding legs of each said plate, and the opposite end of said insert engages the other legs of each said plate, whereby the split legs of each said plate define a common slot with said insert for receiving a tab therein.

4,895,532
MODULAR CONNECTOR COUPLER WITH SELECTIVE COMMONING SYSTEM

Stephen B. Bogese, II, Roanoke, Va., assignor to Virginia Patent Development Corporation, Roanoke, Va.

Continuation of Ser. No. 858,837, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 652,653, Sep. 20, 1984, abandoned. This application Sep. 11, 1987, Ser. No. 97,342
Int. Cl.[4] H01R *31/08*
U.S. Cl. 439—507 **14 Claims**

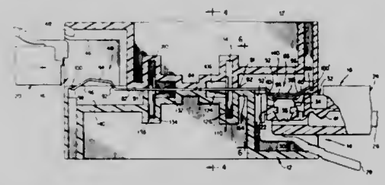
1. A modular jack for receiving a modular plug of the type which includes a dielectric housing having a free end for insertion into the modular jack, a cord input end having a cavity for receiving a multi-conductor cord, a resilient latching arm integrally connected by a flexible hinge to the free end of the dielectric housing and extending obliquely rearwardly therefrom, a terminal-receiving side having partitions which define side-by-side slots in communication with the cavity, electrically conductive contact terminals positioned within the slots and extending into the cavity for making electrical engagement with associated conductors of the cord, the contact terminals including insulation-piercing tangs at the lower portion thereof and an outer edge surface, the modular jack comprising:

(a) an insulating housing having a front end and a rear end;

(b) plug-receiving cavity means for receiving the modular plug extending into said front end of said insulating housing and having a plurality of internal walls including a rear wall;

(c) a wall member extending adjacent said rear wall of said plug-receiving cavity means and having conductor-receiving means formed therein;

(d) a plurality of electrical conductors in side-by-side spaced-apart relationship in said insulating housing, each of said conductors comprising:



(i) a first portion positioned in said conductor receiving means of said supporting wall; and

(ii) a spring contact portion extending from said front end toward said rear end of said housing from said first portion into said plug-receiving cavity means;

(e) commoning bar assembly means positioned adjacent said conductor-receiving means of said wall member and including means for maintaining continuous electrical contact between at least two conductors which may be preselected from said plurality of electrical conductor; said commoning bar assembly means maintaining continuous electrical contact between said conductors when a plug is inserted into said plug receiving cavity means;

(f) said spring contact portions of said conductors engaging the contact terminals of the modular plugs after insertion of the plug into said plug-receiving cavity means; and

(g) said plug-receiving cavity means further having recess means formed therein for receiving and releasably retaining the latching arm of the modular plug.

4,895,533
WATERPROOF PLUG FOR A CONNECTOR

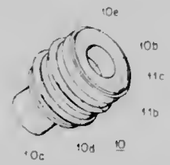
Sakai Yagi; Kazuto Ohtaka, and Hisashi Tsukamoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 310,169
Claims priority, application Japan, Feb. 12, 1988, 63-16348[U]; Feb. 12, 1988, 63-16349[U]
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—587 **4 Claims**

1. A waterproof plug for a connector comprising:

a rubber plug having an outer tube portion capable of fitting to an inner wall of a connector housing formed in the outer periphery of one side of a tubular portion which provides an electric wire inserting hole therein;

a stabilizing tube having rigidity mounted between said tubular portion and said outer tube portion of said rubber plug, characterized in that said rubber plug is integrally molded with said stabilizing tube and at least an end surface of an electric wire pulling side of said stabilizing tube

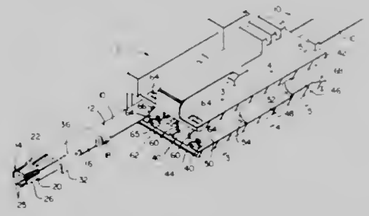


is covered with a collar portion of said rubber plug formed as a continuation of said tubular portion.

4,895,534
PULL TO SEAT CONNECTOR

Thomas M. Klunk, Dover, Pa., and Allen F. VanDerStuyf, Kernersville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 130,761, Dec. 9, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,847
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—599 **21 Claims**



1. An electrical connector comprising a rigid insulative housing, having a plurality of cavities, and a plurality of stamped and formed terminals, one terminal being received in each cavity, each terminal having a crimping section for engaging a wire adjacent a first terminal end and a noncircular receptacle contact section for engaging a complementary terminal adjacent a second terminal end, wherein:

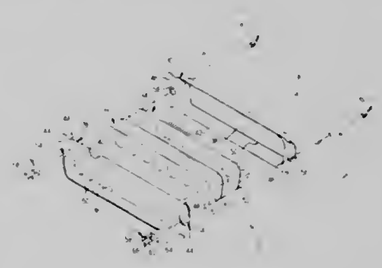
each housing cavity has a wire enclosing portion adjacent a wire receiving end of the housing, and a receptacle contact enclosing portion adjacent an opposite contact receiving end of the housing, the receptacle contact enclosing portion of each cavity being wider than the wire enclosing portion, a shoulder, facing the contact receiving end, being defined intermediate the wire enclosing portion and the receptacle contact enclosing portion; and

each terminal has stop means and a diverging camming segment, the stop means being between the crimping section and the second terminal end, the stop means conforming to the interior contour of the receptacle contact enclosing portion and engaging the shoulder, the camming segment being between the crimping section and the stop means, the camming segment comprising means for engaging the housing adjacent the contact receiving end to orient the stop means to conform to the interior contour of the receptacle contact enclosing portion, whereby a wire can be inserted through each cavity from the wire receiving end beyond the contact receiving end so that each terminal can then be crimped to each wire and each terminal can be pulled into the housing from the contact receiving end, the camming segment engaging the housing to orient the terminal to conform to the contour of each cavity as the terminal is pulled into the cavity.

4,895,535
KEYED MOUNTABLE ELECTRICAL CONNECTORS

Atahusain Emadi, Carlisle, and Daniel J. Migaogas, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 7, 1989, Ser. No. 362,736
Int. Cl.[4] H01R *13/645*
U.S. Cl. 439—681 **6 Claims**



1. An improved electrical connector of the type having forward and rearward metal shells surrounding and retaining therewithin a terminal housing means and exposing a mating face of the housing means for mating with a matable connector and a rearward face adapted to provide for electrical connection of the connector terminals with respective conductive means, the shells being securable together and having abutting apertured lateral flanges, the improvement comprising:

a pair of key members adapted to be secured along the front surfaces of said lateral flanges of said forward metal shell, each key member having a threaded aperture therethrough to be threadably engaged by a corresponding threaded shank of said mounting means, and each key member having a body section having a cross-sectional shape of a selected regular polygon and defining a rear mounting face, and each key member further having a keying projection extending forwardly from said body section around approximately one half of the circumference about said threaded aperture to a front face;

each aperture through said lateral flanges of said forward metal shell having a cross-sectional shape corresponding to said selected regular polygon comprising the cross-sectional shape of said key member body section enabling said key member body section to be inserted therewithin, and each aperture through said lateral flanges of said rearward metal shell being smaller than and centered with respect to the corresponding said forward metal shell aperture, so that the periphery of said rearward metal shell aperture defines a seating surface against which said rearward face of a said key member will be held by said mounting means;

the shank portion of each said mounting means adapted to extend through a corresponding said rearward metal shell aperture, and through a corresponding said forward metal shell aperture to be threaded into a corresponding said threaded key member aperture and having a length at least less than the length of said keying projection, after said corresponding key member has been seated within said forward metal shell aperture to have the desired angular orientation,

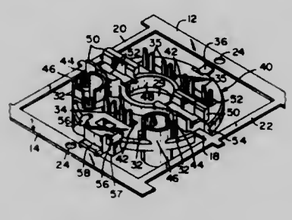
whereby a keyed connector is defined matable with a mating matchingly keyed connector when said mounting means extend through said corresponding rearward and forward metal shell apertures and said corresponding threaded key member aperture.

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4,895,536
LEAD FRAME ASSEMBLY HAVING SEVERABLE ELECTRICAL CIRCUIT SECTIONS

David J. Gingerich, Swatara; Richard F. Granitz, Harrisburg; William H. Rose, Harrisburg, and David T. Shaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 934,883, Nov. 25, 1986, Pat. No. 4,783,906, which is a division of Ser. No. 807,775, Nov. 12, 1985, Pat. No. 4,673,837, which is a continuation of Ser. No. 609,166, May 11, 1984, abandoned. This application Jul. 19, 1988, Ser. No. 221,481
Int. Cl.[4] H01R 9/24
U.S. Cl. 439—885 14 Claims



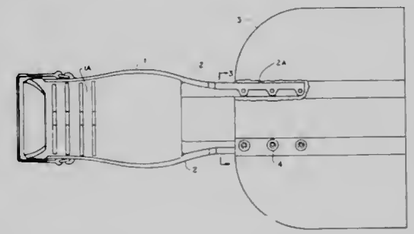
1. A lead frame assembly comprising:
a lead frame formed as an integral member from metal sufficiently thick to withstand handling after forming, said lead frame having a general outer periphery having a plurality of openings located inwardly from said general outer periphery defining integrally joined metal sections, said lead frame including a plurality of electrical engagement sections each of which is adapted to be electrically engaged by a respective electrical conductor means, and said lead frame further including a sufficient number of severable sections located at selected locations inwardly from said general outer periphery and remote from said electrical engagement sections so that severing thereof would separate said integral member into separate metal members at least two of which each include at least two said electrical engagement sections and define electrical circuit paths;
dielectric covering means secured onto said lead frame and extending at least outwardly to said general outer periphery thereof and around substantial portions of said metal sections exposing at least said electrical engagement sections for electrical engagement with respective electrical connector means and including a general outer surface disposed outwardly from said severable sections, whereby a lead frame assembly is fully defined, portions of said dielectric covering means adjacent said severable sections of said lead frame being adapted to at least not interfere with assured severing of said severable sections; and
means for locating said severable locations, whereby said integrally joined metal sections are separable into separate electrical circuits after said covering means is secured thereto, by locating and severing at least an appropriate one of said severable sections, and a fully fabricated lead frame assembly is capable of being customized after fabrication thereof by selective severing at said severable locations.

4,895,537
SWIM FIN

Stephen S. Ciccotelli, P.O. Box 1414, Deming, N. Mex. 88031

Filed Jan. 27, 1989, Ser. No. 302,614
Int. Cl.[4] A63B 31/08
U.S. Cl. 441—64 4 Claims

1. In a swim fin: (a) a foot pocket; (b) two flexible beams molded to the sides of the foot pocket and projecting forwardly and inwardly for a short distance so that the flexible beams are behind the foot pocket as the swiin fin moves through the water during swimming: (c) a rigid blade spaced

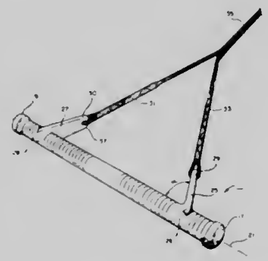


from the foot pocket;and (d) means to secure the rigid blade to the end portions of the flexible beams.

4,895,538
SKI ROPE HANDLE AND METHOD OF ASSEMBLY

Roo Marks, 7 Hafey, Kenthurst, New South Wales 2154, Australia

Filed Jun. 20, 1988, Ser. No. 208,454
Int. Cl.[4] A63C 15/06
U.S. Cl. 441—69 4 Claims

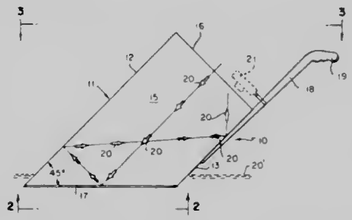


1. An improved ski rope handle, comprising:
an elongate bar having a central axis and opposing ends;
an attachment bracket mounted adjacent each end of said bar, each attachment bracket having a near end connected to said bar and a distant end which projects outwardly away from said bar, the attachment brackets being inclined toward one another so that each of the attachment brackets forms an acute angle with the central axis of the elongate bar, each distant end being provided with an opening for receiving a ski rope, whereby the ski rope can be connected to each of said brackets at a point remote from said elongate bar and without passing through said bar, thereby providing a rope assembly point remote from the elongate bar itself; and
whereby the elongate bar is of tubular construction having an open interior and wherein the attachment brackets are wire carriers having free ends, the elongate bar being provided with a hole adjacent each opposing end thereof for receiving the free ends of its respective attachment bracket.

4,895,539
UNDERWATER VIEWING DEVICE

Terry E. Bender, 9337 Bellewood St., Palm Beach Gardens, Fla. 33410

Filed Aug. 23, 1988, Ser. No. 235,278
Int. Cl.[4] B63C 11/00
U.S. Cl. 441—135 11 Claims

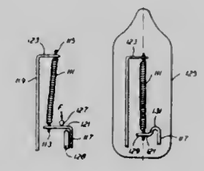


1. An underwater viewing device comprising horizontal transparent viewing means; a viewing tube operatively connected to and extending upwardly from said horizontal transparent viewing means, said viewing tube having a plurality of opaque sides forming a viewing opening at the uppermost ends thereof, said viewing opening being perpendicular to said plurality of opaque sides and also being of lesser area than said horizontal transparent viewing means; each of said opaque sides securely attached to each other and provided with sealant means at the junction points of said opaque sides with each other and also with said horizontal transparent viewing means; said opaque sides forming said viewing tube having an angle of less than ninety degrees with said horizontal transparent viewing means; support means securely fastened to at least one of said plurality of opaque sides to provide support for said underwater viewing device whereby said horizontal transparent viewing means can be immersed in water permitting one or more viewers to look into said viewing opening and see clear, undistorted images of what lies below said horizontal transparent viewing means without the requirement for the viewer to place his head into contact with said viewing tube at the open end thereof.

4,895,540
FILAMENT SUPPORT STRUCTURE MOUNTING METHOD

Gustaaf Sisens; Thomas Clouse, IV, both of Richmond, Ky., and G. George Balog, Cleveland, Ohio, assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 923,258, Oct. 27, 1956, abandoned. This application Mar. 30, 1988, Ser. No. 180,664
Int. Cl.[4] H01K 3/08, 1/18
U.S. Cl. 445—32 4 Claims



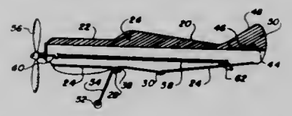
1. A method of manufacturing a filament structure including connecting each end of a coiled filament having a longitudinal axis and a prescribed number of turns to a separate leg of a wire support, stretching said filament until a desired turns per inch specification is achieved, said stretching forming a U-shaped section in one of said legs, wherein before said filament is stretched its axis is disposed non-perpendicularly to each said leg and after stretching it is substantially perpendicular to at least a portion of both legs.

4,895,541
FLYING MODEL AIRPLANE

William H. Miller, 636 S. River Dr., Tempe, Ariz. 85281

PCT No. PCT/US87/03137, § 371 Date Aug. 1, 1988, § 102(e) Date Aug. 1, 1988, PCT Pub. No. WO89/04707, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 25, 1987, Ser. No. 303,555
Int. Cl.[4] A63H 27/18, 27/22, 27/24
U.S. Cl. 446—57 6 Claims





1. A disassemblable flying model airplane comprising:
(a) a fuselage in the shape of an isoceles triangle, in cross-section taken transversely to the length of the fuselage, having equal angles at the bottom when said fuselage is oriented at a normal orientation, a projecting tendon hook on each side, a wing attaching eye on the bottom and tail attaching inverted dovetail fastener at the trailing end;
(b) an aerodynamic wing having a pair of tendon supporting hooks equally spaced on a top surface and an attaching interlocking medial member on the mid-position of the wing, the wing disposed beneath the fuselage interfacing through the medial member forming an interlocking union therebetween, the wing creating the necessary aerodynamic lift allowing the model airplane to fly;
(c) a pair of wing supporting tendons each having a yoke on each end, each tendon attached on one end to the projecting tendon hook and on the other end to the wing tendon supporting hook defining a brace transmitting loads imposed on the wing to the projecting tendon hooks on the fuselage giving support and stability to the wing;
(d) an elevator having a tail attaching plate with openings for receiving said attaching inverted dovetail juxtapositioned transversely onto said trailing end of the fusalage providing the vertical stability for the model airplane in flight;
(e) a vertical stabilizer having a projecting finger, connected to the top of the fuselage at the trailing end with the projecting finger interlocking into said tail attaching inverted dovetail and said elevator tail attaching plate therebetween creating an interrelated structural joint joining the trailing end, elevator and vertical stabilizer together in a disassemblable manner, said stabilizer providing the dynamic lateral stability required for flight;
(f) landing gear having wheels rotatably attached to an inverted "V" shaped wire strut with said apex of the strut inserted into said wing attaching eye with said wing interlocking medial member therebetween forming a removable attachment of said wing and landing gear to the

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fuselage, the landing gear sufficiently resilient to absorb loads imposed thereupon during landing of the model airplane and the wheels providing the rotation for mobility on the ground;

(g) a propeller rotatably abutting the front of said fuselage having an airscrew pulling the airplane forward through the air when revolved providing the dynamic motivation; and,

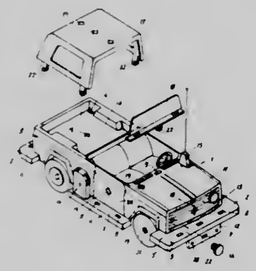
(h) means to rotate the propeller contained within the fuselage creating the applied force to the propeller sustaining sufficient rotational endurance to allow free flight of the model airplane.

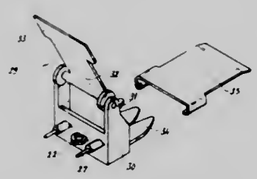
4,895,542

TOY AUTOMOBILE WITH ATTACHMENTS

Marc F. de Blanitza, 5, rue Coste, F-69300 Caluire, France

Filed Nov. 9, 1988, Ser. No. 269,153
Claims priority, application France, Nov. 10, 1987, 87 16295
Int. Cl.[4] A63H *17/26*
U.S. Cl. 446—94 **20 Claims**





1. A toy automobile, comprising:

an elongated body having a shape generally of an automotive vehicle with a driver's compartment having doors;

front and rear bumper members affixed to said body at a front and a rear, thereof, respectively and having upper generally horizontal surfaces extending substantially beyond said body in a front and a rear direction respectively;

running-board members affixed to said body along opposite sides thereof beneath said doors and extending from said body with substantially equal widths, said running-board members having generally horizontal upper surfaces, said body being formed with additional outer surfaces including both substantially vertical and substantially horizontal surfaces;

at least one rapid-connection formation provided on each of said surfaces, all of said rapid-connection formations being functionally identical;

a set of automobile accessories each having a rapid-connection formation detachably matingly engageable with substantially any of said rapid-connection formations of said surfaces for selective positioning of said accessories removably on said surfaces; and

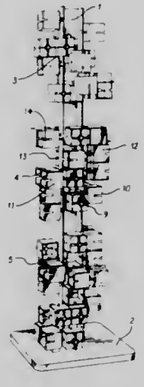
at least one removable body element having at least one rapid-connection formation detachably matingly engageable with at least certain of said rapid-connection formations of said surfaces of said body for removable attachment of said element to said body.

4,895,543

ASSEMBLY TREE FOR PHYSICAL THERAPY AND EXERCISE

John E. Vermette, Baltimore, Md., assignor to Baltimore Therapeutic Equipment Co., Hanover, Md.

Filed Apr. 20, 1988, Ser. No. 184,105
Int. Cl.[4] A63H *13/02*
U.S. Cl. 446—105 **15 Claims**



1. A device for exercise and physical evaluation and therapy, said device having a specific predetermined configuration when fully assembled and comprising a vertical standard with one or more arrays removably attached thereto, each of said arrays having a specific, predetermined configuration consisting of a plurality of preassembled modules each consisting of one or more interlocking units of specified weight and shape, at least one module in each array consisting of more than one unit and each module having its own specific configuration, disposition and orientation within its array on said standard and being attached to said standard in a specific location and sequence to achieve said specific predetermined configuration when fully assembled and to permit proper attachment of the other modules in the array, said standard being provided with means for said attachment of modules disposed in a predetermined pattern such that said attachment of said modules results in the fully assembled device having said specific predetermined configuration.

4,895,544

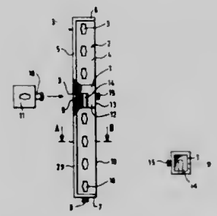
TOY CONSTRUCTION KIT

Arthur Fischer, Waldachtal/Tumlingen, Fed. Rep. of Germany, assignor to fischerwerke Arthur Fischer GmbH & Co., KG., Waldachtal/Tumlingen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,060
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1988, 3802858
Int. Cl.[4] A63H *33/12*
U.S. Cl. 446—122 **8 Claims**

1. A toy construction kit, comprising an angled profiled member having two arms having identical width and arranged at a right angle relative to one another, each of said arms being provided with a plurality of apertures for engaging with locking pegs of adjoining components; a substantially block-shaped adapter arranged inside said angled profiled member between said arms and fixable to said angled profiled member, said

adapter having a square cross-section so as to complete said angled profiled member to form a joint square cross-section, said adapter having free external sides provided with connecting means selected from a projection and a slot for connecting



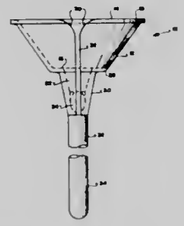
further components thereto, at least one side of said adapter being open; and means for fixing said adapter to said angled profiled member and including a locking peg which engages through a respective one of said apertures of said angled profiled member.

4,895,545

BALLOON CUP HOLDER AND STICK

David C. Nelson, 1585 S. Cleveland-Massillon Rd., Copley, Ohio 44321

Filed Jun. 27, 1988, Ser. No. 211,911
Int. Cl.[4] A63H *3/06*
U.S. Cl. 446—220 **11 Claims**



1. A balloon holder, comprising:

a shaft;

a cup maintained at a first end of said shaft, said cup having a slot therein passing through a sidewall of said cup from an open first end of said cup to an apertured second end thereof; and

a neck located below said second end of said cup, said neck having a bottom surface which is oblique to a central axis of said shaft, said slot terminating at a point on said bottom surface which is furthest from said open first end of said cup.

4,895,546

INFLATABLE TOY WITH INDEPENDENTLY MOVABLE LIMBS

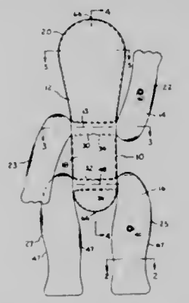
Zoran Rakonjac, 214 N. Mayers, Burbank, Calif. 91506

Filed Dec. 6, 1988, Ser. No. 280,336
Int. Cl.[4] A63H *3/06*
U.S. Cl. 446—221 **2 Claims**

1. An inflatable three dimensional figure comprising:

a main hollow balloon body formed by two individual flat flexible sheets, each sheet having a longitudinal direction and a transverse direction;

each sheet comprising two longitudinally-extending major sheet sections spaced apart in the transverse direction, and at least one connector strip extending transversely between the spaced-apart sections; each sheet section having a first curved longitudinal edge and second curved longitudinal edge; said sheets being aligned so that the first longitudinal edges of the major sheet sections on different sheets are joined together to form a flanged seam, each said flanged seam being continued along side edges of the associated connector strips so that the connector strips form a tubular wall; the sheet sections in each of the sheets being turned inside out so that the associated flanged seam



is within the space encompassed by the sheets; the second longitudinal edges of aligned sheet sections being joined together to form two longitudinal flanged seams; and at least one hollow limb body;

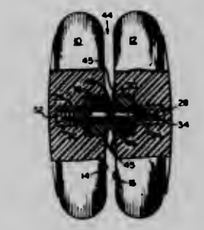
each hollow limb body including a hollow flexible pipe frictionally fitting within the aforementioned tubular wall, and a hollow bulging limb extending angularly from each end of the flexible pipe, to thereby enable each building limb to assume different angulations relative to the tube axis.

4,895,547

SUPERIOR PERFORMANCE YO-YO

Leonard R. Amaral, 26 Harcourt St., Swansea, Mass. 02777

Filed Jan. 27, 1989, Ser. No. 303,648
Int. Cl.[4] A63H *1/30*
U.S. Cl. 446—250 **6 Claims**



1. A superior performance yo-yo comprising:

a pair of yo-yo halves;

an axle defined by a cylindrical shaft having connecting means securely connected to each of the halves at the axis of rotation of the yo-yo;

a spool rotatably mounted in contact with the axle between the yo-yo halves, the spool being freely rotatable on the axle and having a limited amount of axial play, the axial play being no greater than about 0.018";

the halves being spaced with respect to each other, adjacent the spool, between about 0.075" to about 0.090".

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4,895,548

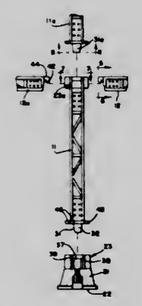
COLLAPSIBLE CONSTRUCTION SET

Andrew M. Holland; Dan B. Young, both of Cincinnati; James J. Wright, Loveland, all of Ohio; Timothy M. Sullivan, Erlanger, Ky.; Hampton Woodhouse, Cincinnati, Ohio; John F. Mayer, Ft. Thomas, Ky., and Michael A. Katauskas, Cincinnati, Ohio, assignors to Tonka Corporation, Kenner Division, Minnetonka, Minn.

Filed Dec. 5, 1988, Ser. No. 280,233

Int. Cl.[4] A63H *3/52, 33/00;* **E04C** *3/30;* **B25G** *3/00*

U.S. Cl. 446—476 **2 Claims**



1. A toy construction set comprising first, second and third parts, said first part including a receptacle connector formed by receptacle walls, said receptacle walls forming an open receptacle therebetween, said first part further including a stabilizing pin in said open receptacle and generally parallel with said receptacle walls, and at least one ledge on said receptacle connector adjacent and outside of said receptacle walls, said second part including an end connector formed by an end which is insertable into said receptacle, said end having a hole therein for receiving said stabilizing pin, said end connector further including at least one flange which extends generally laterally of said end and is operable to overlie said ledge when said receptacle and end connectors are assembled, and said third part including a hook connector formed by a generally right angle hook, said hook being engageable with said ledge, and said hook extending between said ledge and said flange when said receptacle, end and hook connectors are assembled, said third part having a hook connector and an end connector at ends thereof.

4,895,549

UNIVERSAL JOINT FOR A HIGHLY STRESSED CARDAN SHAFT

Hans Lindenthal, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,372

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644204

Int. Cl.[4] F16D *3/41*

U.S. Cl. 464—136 **10 Claims**

1. Universal joint for a cardan shaft suitable for transmitting high torques, having two joint yokes, each of which is connected to two trunnions of a trunnion cross, having the following features:

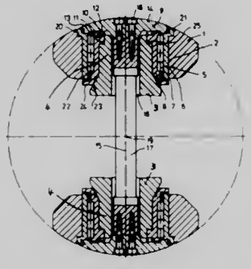
(a) each joint yoke comprises a single part, wherein one joint yoke hub and two yoke eyes together form an integral component;

(b) each trunnion of the trunnion cross is mounted by means of a radial roller bearing and by means of an axial roller bearing separate therefrom in a corresponding bearing hole in a respective yoke eye, and a bearing cover covers said bearings and said bearing hole;

(c) each axial bearing is located between the end face of the trunnion and the bearing cover, which is supported at least in part by a supporting surface of the yoke eye facing away from the axis of rotation of the cardan shaft;

(d) a central longitudinal hole extends along the axes of the trunnions through the trunnion cross;

(e) a tie-rod, which connects two mutually opposed bearing covers to one another, extends through the central longitudinal hole;



(f) an outer ring is assigned to each radial bearing, and each bearing cover is supported via the outer ring on the assigned yoke eye in the direction of the axis of rotation of the cardan shaft; and

(f) each bearing cover is secured against twisting relative to the joint yoke and is radially mobile.

4,895,550

BLOW-MOLDED CONVOLUTED BOOT

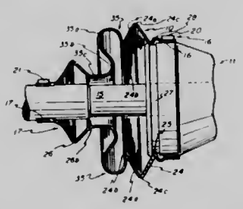
W. Howard Baker, Hartsville, Tenn., assignor to Wynn's-Precision, Inc., Lebanon, Tenn.

Continuation-in-part of Ser. No. 48,182, May 11, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 224,630

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[4] F16D *3/84*

U.S. Cl. 464—175 **1 Claim**



1. A blow-molded annular convoluted boot formed of thermoplastic elastomer material and having a large end terminating in a large diameter axial clamping extension adapted to be secured to the annular body of a constant velocity joint and having a small end terminating in a small diameter axial clamping extension adapted to be secured to a shaft extending from said joint, and in which said joint body is formed with an outwardly opening annular recess, the improvement comprising:

a plurality of annular convolutions each defined by a boot wall having axially spaced radially inner ends extending to a common radially outer peak, including a first convolution positioned axially adjacent to said boot large end, said first convolution having means thereon forming an annular retention convolution portion adapted to be received on an outwardly opening recess in said joint body, said retention portion being connected to said large diameter clamping extension,

a second convolution adjacent to said boot small end having one end thereof connected to said small diameter clamping extension, and

an integral non-convoluted rolling diaphragm portion in said boot wall intermediate said first and second convolutions, said rolling diaphrgm portion including a first outwardly-curved section joining with said first convolution at the inner end thereof remote from said large end, said rolling diaphragm portion further having a second section extending radially inwardly and axially from said first section toward said larger end in the released state and turning toward said smaller boot end, said rolling diaphragm portion further having a third generally axially extending section joining said second section and extending to a radially inner end of said second convolution, said rolling diaphragm portion providing for angular deflection of said boot ends without inducing excessive tensile strain on the boot wall.

4,895,551

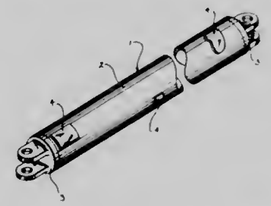
DYNAMICALLY BALANCED DRIVE SHAFT

Peter J. Fritz, Mequon, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Sep. 24, 1987, Ser. No. 100,545

Int. Cl.[4] F16C *3/02;* **F16F** *15/32*

U.S. Cl. 464—180 **10 Claims**



1. A balanced shaft assembly, comprising a shaft, and at least one patch applied to said shaft, said patch comprising a matrix of resin bonded to the shaft and extending only a portion of the circumference and axial length of said shaft, said patch having a thickness less than 1/16 inch, said particles comprising from 25% to 75% by weight of said patch, said patch having a relatively large surface area in comparison with said thickness whereby stress concentrations around the patch are minimized.

4,895,552

CONTROL SYSTEM FOR TRANSMISSION

Keiju Abo, Yokosuka, and Toshikazu Oshideri, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 31, 1989, Ser. No. 330,918

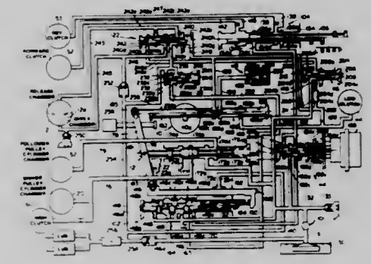
Claims priority, application Japan, Mar. 31, 1988, 63-75973

Int. Cl.[4] F16H *11/02*

U.S. Cl. 474—28 **3 Claims**

1. A control system for a transmission, the transmission including a gearing mechanism combined with a V-belt type continuously variable transmission mechanism, the transmission also including a low clutch and a high clutch, wherein when the low clutch is engaged, torque is transmitted by the gearing mechanism, while when the high clutch is engaged, torque is transmitted by the V-belt type continuously variable transmission mechanism, the V-belt type continuously variable transmission mechanism including a driver pulley with a driver pulley cylinder chamber, a follower pulley with a follower pulley cylinder chamber, and a V-belt drivingly interconnecting the driver and follower pulleys, the control system, comprising:

means for supplying a predetermined hydraulic fluid pressure to the driver pulley cylinder chamber; and



means for admitting said predetermined hydraulic pressure to the high clutch.

4,895,553

DERAILLEUR FOR A BICYCLE

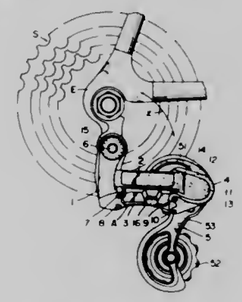
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jan. 25, 1988, Ser. No. 147,513

Claims priority, application Japan, Jan. 28, 1987, 62-17798

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—80 **6 Claims**



1. A derailleur for a bicycle for shifting a drive chain from one sprocket to another of a multistage sprocket assembly of said bicycle, said derailleur comprising:

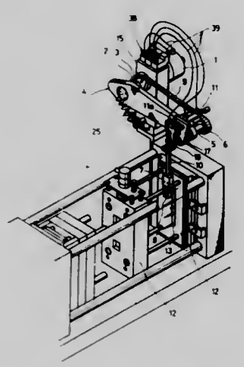
(a) a deformable linkage mechanism comprising a base member, two linkage members interconnecting said base member and a movable member, said linkage members comprising a forcible movement mechanism for moving said movable member, responsive to deformation of said linkage mechanism, axially of said multistage sprocket assembly and radially of said multistage sprocket assembly in a plane adapted to be oriented perpendicular to an axis of said multistage sprocket assembly when said derailleur is mounted on said bicycle, and a mounting shaft for mounting said base member rotatably to said bicycle frame;

(b) a chain guide including a guide pulley, for guiding said chain to and from each sprocket of said multistage sprocket assembly, and a tension pulley;

(c) support means for supporting and interconnecting said chain guide and said movable member and comprising a support member pivotally supported at a first pivot axis to said movable member and supported at a second axis to

said chain guide, said second axis being spaced apart from said first axis;
(d) position adjusting means for adjustably fixing an angular position of said chain guide relative to said support member at said second axis; and
(e) a tension spring interposed between said support member and said movable member for biasing said support member in a direction of applying chain tension to said chain.

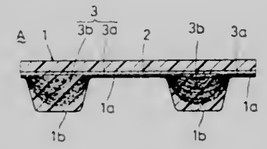
4,895,554
MECHANISM FOR MOVING GRIPPER AND ADJUSTING LOCI OF ITS MOTIONS IN WORK TAKEOUT DEVICE
Tadokoro Isamu, Moriyama, Japan, assignor to Shinsei Kagaku Co., Ltd., Osaka, Japan
Filed Apr. 14, 1989, Ser. No. 339,196
Int. Cl.[4] F16H *55/36*
U.S. Cl. 474—141 **2 Claims**



1. A mechanism for moving a gripper and adjusting the loci of its motions in a work takeout device comprising
a noncircular pulley 3 mounted on the machine body and loosely fitted around a rotary shaft 2 of an actuator 1, a part near one end of a turnover arm 4 is fitted thereon on the outside of the noncircular pulley 3;
the noncircular pulley 3 is fixed on the machine body 15 in such a way as to be held in a definite direction without being affected by the rotary shaft 2's motion; the turnover arm 4 is fixed on the rotary shaft 2; in the other end of said rotary arm 4, a shaft rod 5 is rotatably inserted; on the shaft rod 5 projecting to both sides from the turnover arm 4, a circular pulley 6 is provided on the side corresponding to the noncircular pulley 3, and a gripper 7 having open - closable nails 8 at its tip on the other side; and
a belt 9 is spanned between the aforementioned noncircular pulley 3 and circular pulley 6, to be turned therearound.

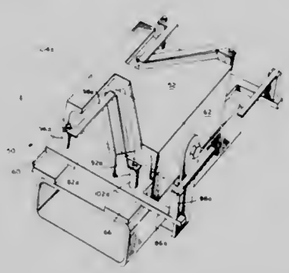
4,895,555
POWER TRANSMISSION BELT AND METHOD OF MANUFACTURE
Katuki Watanabe, and Mamoru Minamimure, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan
Filed Mar. 25, 1988, Ser. No. 173,639
Claims priority, application Japan, Mar. 31, 1987, 62-80351
Int. Cl.[4] F16G *1/10*
U.S. Cl. 474—260 **4 Claims**

1. A power transmission belt, comprising:
an endless belt body made of an elastomer matrix and having an inner circumference;
said endless belt body having a plurality of elastomer tooth portions and a plurality of elastomer tooth bottoms spaced along said inner circumference, each said tooth bottom separating two adjacent tooth protions of said plurality of tooth portions, and each said elastomer tooth portion having a free and uncovered elastomer surface along said inner circumference of said endless belt body;
a plurality of tensile cords embedded in said endless belt body at a predetermined depth from the surface of said tooth bottoms; and



a continuous nonwoven fabric made of high strength fiber embedded in said belt body between said tensile cords and the surfaces of said tooth bottoms and tooth portions, said fabric evenly distributed along the circumferential extent of said endless belt body such that said fabric is evenly diffused in said tooth portions and compressed in said tooth bottoms, said compressed fabric in said tooth bottoms providing a thin compressed layer protecting said tensile cords embedded in said endless belt body.

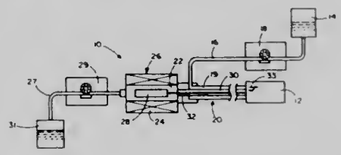
4,895,556
SEALING ELEMENT FOR ANGLE SEALS AND T-SHIRT BAGS
Harold A. Jensen, Brockton, Mass., assignor to Katana Corp., Somerville, Mass.
Continuation-in-part of Ser. No. 34,898, Apr. 3, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 184,077
Int. Cl.[4] B31B *1/64, 35/64*
U.S. Cl. 493—209 **7 Claims**



1. An angular gussett sealer for use with a converter which converter seals, slits and otherwise forms side-by-side side-gussetted tubular webs, which comprises:
a track adapted to be secured to the converter to extend thereacross, in a direction substantially transverse to the longitudinal axis of the moving webs;
a pair of sealing shoes secured to the track, each of the shoes biased to an open position;
means to position the shoes on the track in a direction transverse to the longitudinal axis of the webs;
a crossmember adapted to be secured to the converter to extend thereacross, the crossmember parallel to and spaced apart from the track;
a sealing assembly secured to the crossmember for adjustment relative thereto, the assembly having:

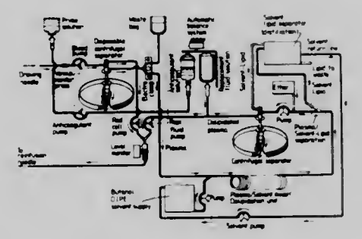
a pair of electromagnets secured to the assembly in a moveable manner;
a pair of sealing wires secured to the assembly in a moveable manner between the sealing shoes and the electromagnets; the pairs of shoes, sealing wires and electromagnets being in register with one another;
means to heat the sealing wires; and
means to energize the electromagnets to move the shoes from their biased open position to a closed position with the electromagnets, whereby gussetts lying between the sealing wires and the shoes and lying between the sealing wires and the electromagnets are sealed.

4,895,557
DRIVE MECHANISM FOR POWERING INTRAVASCULAR BLOOD PUMPS
John C. Moise, Carmichael; John W. Carriker, Gold River, both of Calif., and Reginald R. Baxter, Barrington, Ill., assignors to Nimbus Medical, Inc., Rancho Cordova, Calif.
Filed Dec. 7, 1987, Ser. No. 129,714
Int. Cl.[4] A61F *1/24*
U.S. Cl. 600—16 **15 Claims**



1. A cable drive for an intravascular blood pump, comprising:
(a) a motor having a stator surrounding a hollow space; and
(b) a cable drive unit removably insertable into said hollow space, said cable drive unit including:
(i) fluid-tight housing means having a fluid inlet and a fluid outlet, and a fluid passage connecting the same;
(ii) rotor means disposed within said housing means, said rotor means being arranged to be rotated when said housing means is inserted into said stator and said stator is energized; and
(iii) means on said rotor means for receiving a drive cable extending though said fluid outlet.

4,895,558
AUTOLOGOUS PLASMA DELIPIDATION USING A CONTINUOUS FLOW SYSTEM
Bill E. Cham, Upper Brookfield, Australia, assignor to University of Queensland, St. Lucia, Australia
Filed Jan. 20, 1988, Ser. No. 146,029
Int. Cl.[4] A61M *1/03*
U.S. Cl. 604—4 **8 Claims**



1. A method for the clinical removal of cholesterol and triglycerides from plasma of a living animal using a continuous flow system, comprising the steps of:
(a) drawing whole blood from a living animal;
(b) separating plasma from red blood cells of said blood;
(c) treating said plasma with a liquid lipid solvent, said solvent comprised of about 60% peroxide-free DIPE and about 40% butanol by volume, said treatment comprising
(i) mixing, for a period of less than 30 minutes, said lipid solvent with said plasma to produce a mixture;
(ii) allowing said mixture to settle into an organic solvent-lipid phase and an aqueous plasma phase; and
(iii) separating said aqueous plasma phase from said organic phase;
(d) removing residual organic solvent from said aqueous plasma phase with ether to produce modified plasma;
(e) remixing said modified plasma with red blood cells of said animal to produce a blood product; and
(f) reintroducing said blood product into said animal,
whereby said blood product is not characterized by protein denaturation or adverse effects on hematological and biochemical constituents thereof, including phospholipids and clotting factors, and has a lower content of cholesterol and triglycerides than said whole blood.

4,895,559
NASAL PACK SYRINGE
Ronald D. Shippert, 4975 S. Albion St., Littleton, Colo. 80121
Continuation of Ser. No. 81,658, Aug. 4, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 255,461
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—15 **4 Claims**



1. A nasal pack syringe, comprising:
packing material having an end surface for insertion into a nasal cavity and being of a first size to facilitate insertion into said nasal cavity, said packing material being capable of absorbing fluid and expanding to a second size upon contact with said fluid in order to apply pressure to ruptured blood vessels in order to reduce the flow of blood in the nasal cavity, said packing material being single piece and rigid and having a cross-section wherein said cross-section substantially throughout the length of said packing material has a larger dimension in a first direction than the largest dimension of said cross-section in a direction substantially perpendicular to said first direction, said packing material maintaining said rigid single piece first size configuration until completely inserted into said nasal cavity wherein only upon contact with said fluid does expansion to said second size occur;
barrel means having a bore for containing said packing material of said first size and having an inlet end and an outlet end, said packing material exiting said outlet end when being inserted into the nasal cavity and wherein said outlet end has a cross-sectional area substantially corresponding to said cross-sectional area of said packing material substantially throughout the length of said packing material;
plunger means disposed in said barrel means and movable relative thereto, said plunger means being received in said

inlet end of said barrel means and being movable to force said packing material from said outlet end for insertion into the nasal cavity, said plunger means including a shaft having an end surface, said packing material end surface being positioned forward of said plunger means shaft end surface in said barrel means, said plunger means shaft end surface contacting and terminating at said packing material end surface wherein said plunger means shaft end surface does not extend past and into said packing material when said packing material is being moved relative to said barrel means;

attaching means connected adjacent to said end surface of said packing material for use in removing said packing material from the nasal cavity, said attaching means having substantial portions located exteriorly of said shaft of said plunger means when said plunger means is disposed in said barrel means; and

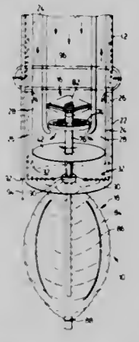
wherein, when said packing material is being placed in the nasal cavity, said larger dimension in cross-section of said packing material is positioned in a substantially vertical direction for receipt by the nasal cavity.

4,895,560

ANGIOPLASTY APPARATUS

Apostolos C. Papantonakos, 10, Korizi Str. - Kalamki, Athens, Greece

Filed Mar. 31, 1988, Ser. No. 176,365
Int. Cl.[4] A61B *17/32*
U.S. Cl. 604—22 **16 Claims**



1. An angioplasty apparatus for removing abnormal deposits such as atheromatic plaque from the interior walls of blood vessels and the like comprising:

a hollow elongate flexible member having one end for insertion into a vessel;

a driving member coupled to said elongate flexible member and extending forwardly of the one end of said flexible member;

milling means connected to said driving member exterior to said elongate member;

drive means in communication with said driving member for actuating said driving member , said driving member rotating said milling means alternately in opposite directions to engage and mill said deposits upon actuation thereof by said drive means;

suction means in communication with said elongate flexible member for withdrawing milled particles of said deposit from said vessel and into said elongate flexible member; and

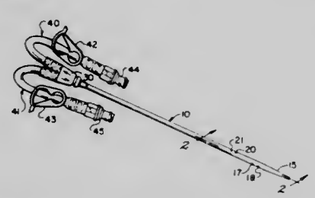
sensing means located on said elongate flexible member for effecting electrical coupling between said vessel and said milling means, said sensing means sensing when said milling means has removed said deposit from the interior walls of said vessel.

4,895,561

DUAL-LUMEN CATHETER-CONNECTING SYSTEM

Sakharam D. Mahurkar, 6171 N. Sheridan Rd., Suite 1112, Chicago, Ill. 60660

Filed May 16, 1988, Ser. No. 194,143
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—43 **53 Claims**



1. A dual-lumen catheter assembly comprising:

a dual-lumen catheter having a distal end and a proximal end,

flow diversion means having one end fastened to the proximal end of said catheter, and

a pair of flexible extension tubes each having one end fastened to the opposite end of said flow diversion means from said catheter, each of said extension tubes being bent back toward the distal end of said catheter to form a bend having a predetermined shape, each bend being adapted to flex and deform from said predetermined shape in response to an external force and being adapted to return to said predetermined shape in response to removal of said external force.

4,895,562

SYSTEM FOR ADMINISTERING MEDICATION NASALLY TO A PATIENT

George A. Lopez, Orange County, Calif., assignor to ICU Medical, Inc., Mission Viejo, Calif.

Continuation of Ser. No. 872,050, Jun. 6, 1986, Pat. No. 4,790,832. This application Dec. 5, 1988, Ser. No. 279,534
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—48 **5 Claims**



1. In administering medication to a patient,

(1) inserting through a nostril of a patient a tube that has a first end extending into the stomach of the patient and a second end extending from the nostril,

(2) inserting into the second end a connector including,

(a) a port for receiving medication from a gastric syringe, and

(b) a manually operable valve which controls the flow of medication introduced by the syringe into the port, so that when the valve is open medication flow through the tube into the stomach of the patient, and

(3) with the valve open, inserting a gastric syringe containing medication into the port and feeding the medication from the syringe into the port, through the open valve and tube into the stomach of the patient.

4,895,563

FINGER MOUNTED SURGICAL NEEDLE GUIDE/NEEDLE PROTECTOR

James H. Gilbaugh, 2902 SW. Canterbury La., Portland, Oreg. 97201

Filed Jul. 13, 1988, Ser. No. 218,229
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—117 **4 Claims**



1. A finger-mount guide for a surgical needle comprising

an elongate, finger-mountable, body having proximal and distal ends with an open lumen extending between said ends for receiving, freely and slidably, such a needle, and

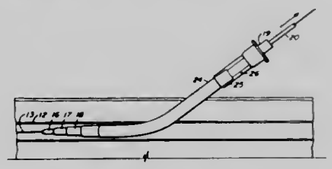
an elongate, flexible, touch-sensitive, glance-protective attaching ribbon joined to said body adjacent, and extendible from, the latter's said distal end adjacent one side of the distal end of said lumen, adapted for folding longitudinally smoothly around the end of the user's finger with the guide in place on the finger, thus to promote, for the user, touch sensitivity, and finger/needle protectivity, during a guided surgical procedure.

4,895,564

PERCUTANEOUS FEMORAL BYPASS SYSTEM

Edward M. Farrell, 66 Dolan Dr., Nepean, Ontario, Canada (K2J 1Z1)

Filed Jun. 8, 1988, Ser. No. 204,043
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—164 **4 Claims**



1. A percutaneous dilator system comprising:

(i) a first dilator tube having a tapered leading end and inwardly directed shoulder means spaced from the trailing end defining a gripping section between the shoulder and the trailing end;

(ii) a bore through the tube dimensioned to receive a guide wire; and

(iii) a second dilator tube having a bore corresponding to the outside diameter of the first tube, a tapered leading end, and an inwardly directed flange at the trailing end dimensioned to note with the shoulder means to limit relative axial mating movement of the first and second tubes while exposing the gripping section;

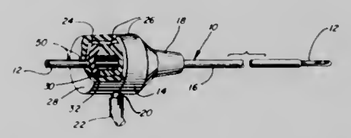
whereby a puncture through tissue containing a guide wire of predetermined gauge may be enlarged without substantial tissue damage by placing the first tube over the guide wire through the puncture, then sliding the second dilator tube over the wire and first dilator tube until its flange means engages the shoulder means to enlarge the puncture further, the dilator tubes being subsequently removable as a unit by pulling on the gripping section.

4,895,565

MEDICAL INSTRUMENT VALVE

Richard A. Hillstead, Hollywood, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Continuation-in-part of Ser. No. 99,139, Sep. 21, 1987, Pat. No. 4,798,594. This application May 16, 1988, Ser. No. 194,539
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—167 **21 Claims**



1. A valve which comprises an elastomeric partition member having a first face and a second, opposed face and adapted for securement in a housing, and a slit extending through said valve between the first and second faces, the improvement comprising, in combination:

at least one of said faces defining a concave surface to reduce the central thickness of said partition member, said slit extending through said concave surface, said slit further defining a first line on said first face and a second line on said second face, said first line and said second line having a similar configuration but being in non-alignment with each other, with a generally helical slit section extending between said first line and said second line through said partition member.

4,895,566

COATING MEDICAL DEVICES WITH CATIONIC ANTIBIOTICS

Clarence C. Lee, Covington, Ga., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 889,251, Jul. 25, 1986, abandoned. This application Jun. 15, 1988, Ser. No. 208,868
Int. Cl.[4] A61M *5/325*
U.S. Cl. 604—266 **6 Claims**

1. A medical device having long-lasting bactericidal properties comprising,

a substrate,

heparin molecules ionically bound to said substrate via anchor molecules, said anchor molecules attached directly to said substrate and interposed between said heparin molecules and said substrate, said anchor molecules selected from the group consisting of BZK and TDMAC, and

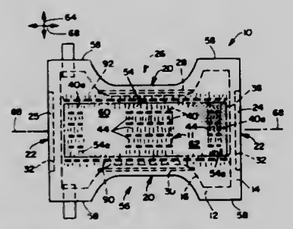
cationic antibiotic molecules ionically bound to said heparin molecules.

VOL 1110 ISS 4 JA 23 1990 UMI

4,895,567
WETNESS INDICATING HOT-MELT ADHESIVES
Herman Colon, Mossey, N.Y., and Albert Maletsky, Franklin Lakes, N.J., assignors to The International Group, Inc., Lyndhurst, N.J.
Continuation-in-part of Ser. No. 178,662, Apr. 7, 1988, abandoned, which is a continuation of Ser. No. 70,206, Jul. 14, 1987, Pat. No. 4,743,238, Continuation-in-part of Ser. No. 839,943, Mar. 17, 1986, Pat. No. 4,681,576. This application Jun. 20, 1988, Ser. No. 209,404
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] A61F *13/16, 13/18, 13/20*; C08J *23/00*
U.S. Cl. 604—361 8 Claims

1. A wetness indicating hot-melt adhesive composition substantially free of vinyl pyrrolidone homopolymer and vinyl pyrrolidone/vinyl acetate copolymer and consisting essentially of
(A) 20 to 70% by weight of at least one polymer selected from the group consisting of ethylene/vinyl acetate copolymer and ethylene/acrylic acid copolymer;
(B) 25 to 60% by weight of an acidic material selected from the group consisting of
(a) at least one free monobasic saturated or unsaturated fatty acid having an acid number above 137,
(b) at least one rosin acid having an acid number above 130, and
(c) a combination of said free monobasic saturated or unsaturated fatty acid and said rosin acid;
(C) 0 to 40 wt. % of water soluble wax;
(D) 0 to 60 wt. % of glycerol monostearate;
(E) 0 to 55 wt. % of hydogenated castor oil;
(F) 0 to 15 wt. % of polyalkylene wax;
(G) 0 to 60 wt. % of compatible plasticizer; and
(H) particles of a dyestuff insoluble in the composition but soluble in water, the color of the dyestuff particles being substantially invisible in the composition, whereby when the composition is wet with water the dyestuff particles dissolve in the water and permeate the composition.

4,895,568
DIAPER LINER WITH SELECTIVELY ELASTICIZED PORTIONS
Kenneth M. Enloe, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 18, 1988, Ser. No. 234,786
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.2 15 Claims



1. An absorbent article, comprising:
a backsheet layer;
a substantially liquid-permeable liner layer;
an absorbent body located between said backsheet and liner layers; and
a plurality of longitudinally extending elastic members which are connected to said liner layer and transversely distributed in a substantially adjacently-spaced relation over a medial section of said article, said elastic members having a total, active longitudinal extent of not more than about 50 percent of the total length of said absorbent article, said elastic members operably gathering said liner layer to form therein one or more ruffled panel regions which include a plurality of transversely aligned ridges extending generally perpendicularly from said liner layer and positioned at a predetermined portion of said absorbent article, and said elastic members arranged to operably shorten said liner layer to reduce the occurrence of transversely aligned wrinkling and folding thereof at a designated region of said absorbent article.

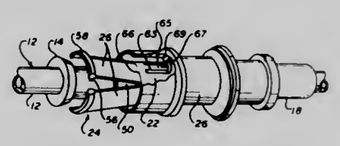
4,895,569
FASTENING SYSTEM FOR A DISPOSABLE ABSORBENT GARMENT HAVING A TAILORED SEAM
John C. Wilson; Gregory J. Rajala; Leona G. Boland, all of Neenah, and Georgia L. Zehner, Larsen, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Continuation-in-part of Ser. No. 902,830, Sep. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 947,941, Dec. 31, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,647
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] A61F *13/02*
U.S. Cl. 604—386 23 Claims



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:
a breathable elastomeric outer cover, including front and rear waistband portions defining a waist opening, a pair of leg openings delimited along marginal sides of said outer cover, an intermediate crotch section delimited between said leg openings, front and rear panels separated by said crotch section and front and rear ear portions delimited along said marginal sides between said leg openings and said waistband of said outer cover;
an absorbent insert structure substantially superposable on said front said rear panels and said crotch section, including a liquid permeable bodyside liner as a liquid impermeable baffle with an absorbent core disposed therebetween;
attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof; and
full-length fastening means for securing said garment about a wearer while providing full-length closures between said leg openings and said waist opening, comprising a pair of front fastener members attached to said front ear portions and releasably engageable with a cooperating pair of rear fastener members attached to said rear ear portions, said cooperating fastener members including inner and outer peripheral edges, cooperating primary closure means spaced from one another for forming primary load-bearing closures adjacent said waist and leg openings of said full-length closures and abutment means presenting cooperating secondary closure means for forming secondary load-bearing closures between said spaced primary closure means and maintaining the dimensional integrity of said full-length closures wherein said means have an effective modulus of elasticity sufficient to allow fastening

while also preventing inadvertent disengagement thereof when said garment is worn; and
hinging means for hingedly attaching said outer peripheral edges of one of said pair of front and rear fastener members to an associated pair of said ear portions, rendering said hinged fastener members bendable laterally outwardly to engage said outer peripheral edges thereof with outermost marginal side edges of the other of said ear portions when said cooperating fastener members are releasably engaged with one another, thereby forming spliced, tailored seams.

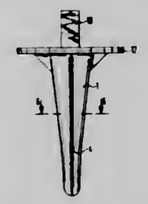
4,895,570
LOCKING PORT SHROUD FOR PERITONEAL DIALYSIS TUBING CONNECTOR
Mark E. Larkin, Lindenhurst, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Continuation-in-part of Ser. No. 58,452, Jun. 5, 1987, abandoned. This application May 13, 1988, Ser. No. 189,640
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—411 17 Claims



1. A connection for medical tubing, comprising:
a first tube having a flange and a pierceable diaphragm;
a second tube having a piercing pin extending therefrom for piercing said diaphragm and an exterior annular flange rearward of said piercing pin;
a tubular collet, having a splayed end, slideable along said second tube and said pin, further including a cored-out slot defining a flexible finger, said finger having a detent means on an exterior surface; and
a tubular locking ring, slideable on said collet from a first position to a second position, including an annular cam on an interior surface;
said annular cam being adapted to engage said detent means on said collet in said first position without forcing said flexible finger radially inwardly, depress said detent means radially inwardly to a position within the diameter and forward of said second tube annular flange while said locking ring slides intermediate from said first to said second position, and release said detent means in said second position while forcing said flexible finger radially inwardly.

4,895,571
STEM FOR TIBIA PART OF A KNEE JOINT ENDOPROSTHESIS
Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants GmbH, Lubeck, Fed. Rep. of Germany
Filed Aug. 31, 1988, Ser. No. 239,077
Int. Cl.[4] A61F *2/38*
U.S. Cl. 623—20 1 Claim

1. A knee joint endoprosthesis which comprises a elongated shaft for introduction into a prepared medullary cavity, said shaft extending out of one side of a plate, and a stem extending out of the other side of said plate in alignment with a longitudinal axis passing through said shaft, wherein, when the prosthesis is implanted, it is inserted in a space prepared in the medullary bone cavity in the tibia, wherein the cross-sections along the length portions of the stems of both left and right tibias of a patient comprise posterior rounded configurations and planar anterior surfaces terminating in apices pointed in a common direction, the improvement consisting in that the cross-section along the length of said stem is substantially anatomically matched to the cross-sectional shape of the medullary cavity of both left and right tibias, said stem having over its entire length, a posterior surface having a substantially semicircular cross-sectional configuration to match said posterior rounded configuration of said tibias, and an anterior surface having an



angular configuration defined by a pair of planar surfaces extending from said posterior surface and angled toward each other to define a continuous medial ridge, said medial ridge being receivable in either of said apices in the right and left tibias.

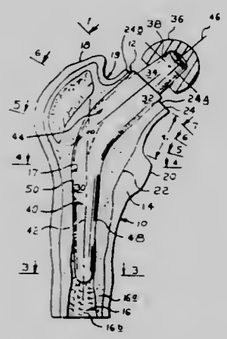
4,895,572
INTERLOCKING FEMORAL PROSTHESIS DEVICE
Ira Chernoff, 515 E. 72nd St., Apt. 19A, New York, N.Y. 10021
Filed Nov. 25, 1988, Ser. No. 276,124
Int. Cl.[4] A61F *2/32, 5/04*
U.S. Cl. 623—23 3 Claims



1. An interlocking femoral prosthesis capable of implanting within the human body, wherein said interlocking femoral prosthesis comprises:
(a) a spherical shaped member structurally affixed to an arched cylindrical neck member, said arched cylindrical neck member being structurally affixed to a blunted shaft member, there being formed through said arched cylindrical neck member a singular circular opening, the axis of said circular opening passing through the center axis of said arched cylindrical shaft member there being formed through the lower portion of said blunted shaft member a first elliptical opening spaced from a second elliptical opening, said elliptical openings having the axis of each of said elliptical openings being parallel to each other and perpendicular to the axis of said circular opening;
(b) a first screw member capable of insertion through said singular circular opening;
(c) a second screw member capable of insertion through said first elliptical opening; and
(d) a third screw member capable of insertion through said second elliptical opening.

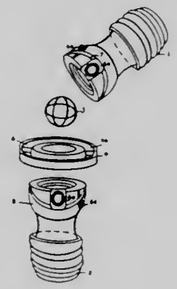
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4,895,573
FEMORAL-JOINT PROSTHETIC DEVICE
James B. Koeneman, Mesa; Joseph A. Longo, Phoenix; Roger H. Johnson, Phoenix; Thomas M. Hansen, Phoenix; Allan M. Weinstein, Paradise Valley, and Thomas P. Murray, Scottsdale, all of Ariz., assignors to Harrington Arthritis Research Center, Phoenix, Ariz.
Division of Ser. No. 753,711, Jul. 10, 1985, Pat. No. 4,738,681. This application Mar. 23, 1988, Ser. No. 172,026
Int. Cl.[4] A61F *2/36, 2/32*
U.S. Cl. 623—23 **4 Claims**



1. A method of replacing the hip joint in a femur, comprising:
cutting the femur to remove the head portion thereof,
removing relatively soft cancellous bone material below the cut to form an elongate intramedullary cavity defined substantially by a wall of densified cancellous bone contained within the cortical shell in the proximal end of a femur whose surface has 15°–30° twist in a proximal end region on progressing toward the proximal femur end, said wall covering the greater and lesser trochanters from within and including the calcar femorale,
providing a femoral hip-joint prosthetic device having a stem which substantially conforms in shape and dimensions to such cavity, and
inserting the stem into the cavity, with a twist-in motion, until the stem is received by press fit in the cavity.

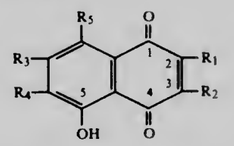
4,895,574
PIEZOELECTRIC MOTIVATOR FOR PROSTHETIC DEVICES
Larry Rosenberg, 3440 Caroline Ave., Culver City, Calif. 90230
Filed Jun. 6, 1984, Ser. No. 617,715
Int. Cl.[4] A61F *1/24*
U.S. Cl. 623—24 **16 Claims**



1. A synthetic muscle adapted to power a prosthetic limb, comprising:
a flexible tri-layer element, said tri-layer element including a central element which is flexible in at least two dimensions;
a pair of opposed contractile elements carried by said central element and responsive to the application of electrical potentials thereto to change a physical characteristic thereof; and,
means for selectively applying electrical potentials to each of said contractile elements and, wherein at least one of said opposed contractile elements includes a piezoelectric material embedded in a gelatinous material.

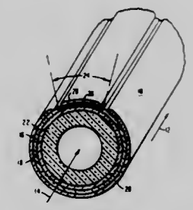
4,895,575
USE OF 5-HYDROXYNAPHTHOQUINONES FOR DYEING HUMAN KERATIN FIBRES
Michel Hocquaux, Paris; Jean Cotteret, Limay, and Georges Rosenbaum, Asnieres, all of France, assignors to L'Oreal, Paris, France
Continuation of Ser. No. 557,963, Dec. 5, 1983, abandoned. This application Jun. 23, 1988, Ser. No. 210,506
Claims priority, application Luxembourg, Dec. 8, 1982, 84.511
Int. Cl.[4] A61K *7/13*
U.S. Cl. 8—424 **11 Claims**

1. A composition for dyeing human hair comprising in a carrier suitable for application to said human hair a naphthoquinone of the formula



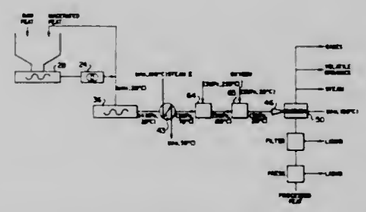
wherein
R_1 and R_2 each independently represent hydrogen, methyl, methoxy, nitro or halogen,
R_3 and R_4 each independently represent hydrogen, methyl or methoxy and
R_5 represents hydrogen, methyl or methoxy, with the proviso that at least one of R_1 and R_2 is other than hydrogen when R_3, R_4 and R_5 are simultaneously hydrogen, said naphthoquinone being present in an amount effective to dye said hair, said composition also containing at least one of an anionic, cationic, nonionic, or amphoteric surface active agent or polymer, or a solid powdered medium selected from the group consisting of silica, a plant other than a plant containing said naphthoquinone, clay, flour, a starchy or mucilagenous substance, and a plant powdered after solvent extraction of the active substance.

4,895,576
METHOD OF DOPING INTERCONNECTIONS FOR ELECTROCHEMICAL CELLS
Uday B. Pal, Monroeville; Subhash C. Singhal, Murrysville; David M. Moon, Pittsburgh, and George R. Folser, Lower Burrell, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 15, 1988, Ser. No. 182,277
Int. Cl.[4] H01M *6/00*; B05D *5/12*; C23C *16/00*
U.S. Cl. 29—623.5 **17 Claims**



1. A method of bonding a dense, electronically conductive interconnection layer on a porous, electronically conductive, electrode structure, comprising the steps:
(A) forming a layer of metal oxide particles, where the metal is selected from the group consisting of Ca, Sr, Co, Ba, Mg, and mixtures thereof on a portion of a first surface of a porous, electronically conductive, electrode structure;
(B) heating the electrode structure;
(C) applying metal halide vapor comprising lanthanum halide and chromium halide to said first surface of the porous electrode structure and applying a source of oxygen to a second, opposite surface of the porous electrode structure, so that oxygen contacts the metal halide vapor at said first surface of the electrode, to cause a reaction of the oxygen with the metal halide vapor and cause a dense, lanthanum-chromium oxide structure to grow from the first electrode surface, between and around the metal oxide particles, where metal ions in the metal oxide particles start to diffuse into the lanthanum-chromium oxide structure as it grows thicker with time; and
(D) heat annealing the electrode-lanthanum-chromium oxide structure in air, at a temperature and for a time effective to further cause the metal ions in the metal oxide particles to diffuse throughout the bulk of the lanthanum-chromium oxide structure; to provide a dense, top, electronically conductive interconnection layer on the porous electrode structure, with complete disappearance of the metal oxide particles.

4,895,577
LOW SEVERITY PEAT DEWATERING PROCESS
Esteban Chornet, Sherbrooke, and Ralph P. Overend, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limitee, Ottawa, Canada
Filed Nov. 21, 1988, Ser. No. 274,423
Claims priority, application Canada, Nov. 23, 1987, 552494
Int. Cl.[4] C10F *5/00*; E21C *49/00*
U.S. Cl. 44—33 **7 Claims**



1. A continuous process for dewatering peat comprising the steps of flowing a slurry of peat through a reactor directly heated by the addition of live steam to heat the slurry to a temperature of between 160° C. to 200° C., subjecting the heated slurry to intense mechanical shear and mixing, and then, after a period of between 1 to 3 minutes, quenching the product.
3. A process according to claim 1 comprising the further step of subjecting the peat product after quenching to mechanical pressing to produce peat of a moisture content of 50% to 60%.

4,895,578
HYDROCARBON FUEL DETERGENT
George R. Meyer, Missouri City, and Walter R. Lyons, Jr., Rosenberg, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.
Division of Ser. No. 43,736, Apr. 29, 1987, Pat. No. 4,863,487. This application Sep. 8, 1988, Ser. No. 241,879
Int. Cl.[4] C10L *1/18, 1/22*
U.S. Cl. 44—63 **9 Claims**

1. A hydrocarbon fuel composition comprising:
a hydrocarbon fuel; and
a detergent amount of a detergent comprising
an alkenylsuccinimide prepared by reacting an alkenylsuccinic acid or anhydride with a mixture of amines,
wherein at least 90 weight percent of the alkenyl substituent

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is derived from an olefin having a carbon chain of from 10 to 30 carbons or mixtures thereof,
and wherein said mixture of amines is comprised of:

Amine	Percentage by Weight
aminoethylethanolamine	5 to 70
aminoethylpiperazine	5 to 30
triethylenetetramine	0 to 25
hydroxyethylpiperazine	0 to 20
diethylenetriamine	0 to 10
higher oligomers of the above amines	10 to 85

and wherein said alkenylsuccinic acid or anhydride is reacted with said mixture of amines at a mole ratio of 0.8 to 1.5 moles of said amines per mole of said alkenylsuccinic acid or anhydride.

4,895,579

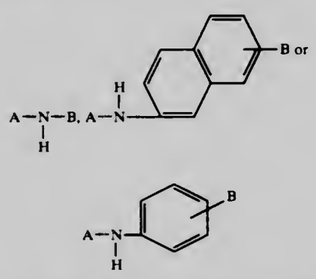
REACTION PRODUCTS OF ALKENYLSUCCINIC COMPOUNDS WITH AROMATIC AMINES AND HINDERED ALCOHOLS AND LUBRICANT AND FUEL COMPOSITIONS THEREOF

Harry J. Andress, Wenonah, and Henry Ashjian, E. Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 702,989, Feb. 19, 1985, Pat. No. 4,803,004.
This application Jan. 17, 1989, Ser. No. 297,150
Int. Cl.[4] C10L *1/22, 1/18*
U.S. Cl. 44—75 **12 Claims**

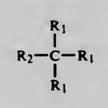
1. A fuel composition comprising a major proportion of a liquid hydrocarbon fuel and a minor effective dispersant or antioxidant amount of a product of reaction made by

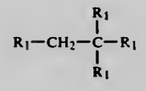
(a) reacting a polyalkenylsuccinic compound selected from the group consisting of an alkenyl succinic acid and the ester and the anhydride thereof, with an aromatic amine of the formula:



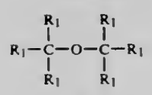
wherein A and B may be the same or a different aromatic group and where one or both of said aromatic groups contain an alkyl substituent having from about 4 to about 18 carbon atoms; and wherein said aromatic groups have from 6 to about 50 carbon atoms; and thereafter with

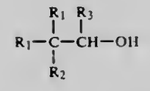
(b) a hindered alcohol selected from the group having the following general formulae:


(1)


(2)

-continued


(3)


(4)

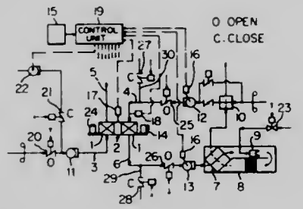
wherein R_1 and R_2 are each separately selected from CH_2OH and CH_3 with the proviso that at least one of R_1 or R_2 is CH_2OH and R_3 is selected from hydrogen or alkyl of from about 4 to about 22 carbon atoms and wherein reaction (a) is carried out at temperatures of from about 100° to about 200° C. and reaction (b) is carried out at temperatures of from about 100° to about 300° C. with the reactants being present in a molar ratio of succinic compound to aromatic amine to hindered alcohol of about 1:0.1–1:0.5–0.75.

4,895,580

GAS TREATING APPARATUS

Koji Morioka; Hiromasa Ogata, and Susumu Ohmori, all of Tokyo, Japan, assignors to Toya Boseki Kabushiki Kaisha Tajkisha Ltd, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 314,641
Claims priority, application Japan, Sep. 26, 1988, 63-240096
Int. Cl.[4] B01D *53/06*
U.S. Cl. 55—160 **12 Claims**



1. A gas treating apparatus comprising:

an adsorptive member 1 having a material capable of adsorbing a solvent contained in the object gas and capable also of desorbing the adsorbed solvent through a high-temperature recycling air;

a conveying device for holding said adsorptive member 1 and conveying the same from an adsorbing section A where the treatment-object gas is introduced to a desorbing section B;

a recycling gas supplying device 12, 13 for supplying the high-temperature recycling air for solvent desorption to said adsorptive member 1 currently positioned to said desorbing section B;

trouble detecting means for detecting an abnormality in the gas treating apparatus; and

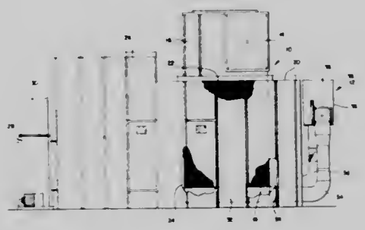
safety means for evacuating a portion of said adsorptive member 1 currently located within and adjacent said desorbing section B and having solvent content thereof yet un-desorbed from a high-temperature-zero-air-flow condition based on a detection of said detecting means.

4,895,581

TWO STAGE AIR FILTRATION SYSTEM

Bobby L. Starling, Charlotte, N.C., assignor to Pneumafil Corporation, Charlotte, N.C.

Filed Apr. 12, 1989, Ser. No. 336,883
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—283 **9 Claims**



1. A filter system for removing textile waste materials and the like entrained in a fluid flow, such system comprising:

(a) first stage air separator means for initially separating large particles of said waste material from said air flow, comprising

(i) first filter means having a predetermined permeability for preventing the passage therethrough of said large particles;

(ii) air inlet means for receiving said fluid flow and directing it through said first filter means;

(iii) collection means located at the upstream side of said first filter means for collecting said large particles; and

(iv) air outlet means located downstream of said first filter means for exhausting said air flow after it has passed through said first filter means;

(b) second stage air filtering means additionally separating said large particles of waste materials, comprising:

(i) a housing means having a generally flat second filter means extending thereacross to divide said housing means into an inlet portion below said second filter means and an outlet portion above said second filter means;

(ii) first conduit means interconnecting said collection means and said inlet portion of said housing;

(iii) second conduit means interconnecting said outlet portion of said housing and said air outlet means of said first stage separator means; and

(iv) blower means for causing a predetermined small portion of said air flow and said collected particles of waste to flow from said collection means, through said first conduit means and said second filter means for separating said waste materials from said small portion of said air flow, and for causing said small portion of said air flow to flow from said outlet portion of said housing and back into the air outlet means of said first stage air separator means to be combined with said flow that has passed through said first filter means; and

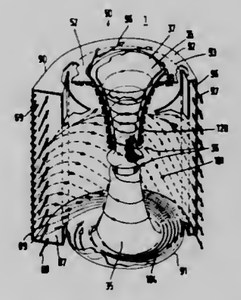
(c) waste removal means associated with said second stage air filtering means for permitting said large waste particles to be periodically removed from said inlet portion of said housing means.

4,895,582

VORTEX CHAMBER SEPARATOR

Ernst-August Bielefeldt, Kiefern Grund 20, DE-2114 Hollenstedt, Fed. Rep. of Germany

Division of Ser. No. 258,766, Oct. 17, 1988, Pat. No. 4,848,991, Division of Ser. No. 47,002, May 7, 1987, Pat. No. 4,801,310.
This application Apr. 11, 1989, Ser. No. 336,350
Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615747
Int. Cl.[4] B03B *5/32*; B07B *7/086*; B04C *7/00*; B01D *21/26*
U.S. Cl. 55—337 **14 Claims**



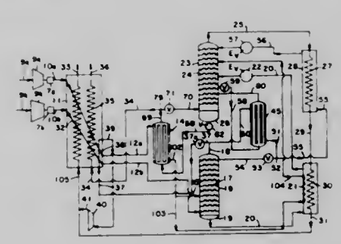
1. In a vortex chamber separator for separating and/or precipitating of solid and/or liquid particles (disperse phase) from gaseous and/or liquid media (continuous phase) as well as for separating mixed gases (gas-gas-separation) and/or mixed fluids (fluid-fluid-separation) as well as for screening and/or classifying by means of centrifugal force comprising at least one vortex chamber with a sharp flow edge and a pair of coaxially arranged suction tubes disposed within the vortex chamber and extending from end walls of the vortex chamber toward each other and connected with a clean gas outlet, the improvement wherein the vortex chamber is provided with a casing having a means for maximixing flow while compensating for the influence of casing friction retardation, including peripheral wall that is spirally curved.

4,895,583

APPARATUS AND METHOD FOR SEPARATING AIR

Scott Flanagan, Houston, Tex.; Robert A. Mostello, Somerville, and Anne P. Ko, Woodcliff Lake, both of N.J., assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Jan. 12, 1989, Ser. No. 296,543
Int. Cl.[4] F25S *3/02*
U.S. Cl. 62—24 **14 Claims**



1. A process for the production of oxygen by the separation of air comprising:

(a) separating air which has been compressed and cooled into first and second portions;

(b) liquefying substantially all of the first portion and intro-

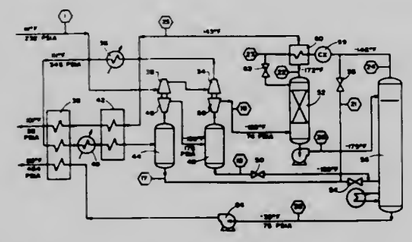
ducing a first part thereof and the second portion into a high pressure fractionating means to obtain a crude liquid oxygen stream and substantially pure gaseous nitrogen;
(c) introducing the second part of the first portion of liquid air formed in step (b) into a low pressure fractionating means to obtain a substantially pure gaseous nitrogen product and a substantially pure liquid oxygen stream, wherein the crude liquid oxygen stream produced in step (b) is introduced into the low pressure fractionating means at an intermediate stage;
(d) condensing the substantially pure gaseous nitrogen formed in step (b) in heat exchange with a boiling liquid withdrawn from an intermediate stage in the low pressure fractionating means, introducing a portion of the resulting liquid nitrogen to each of the high and low pressure fractionating means as reflux and returning the resulting vapor to the low pressure fractionating means;
(e) forming substantially pure gaseous oxygen from the liquid stream formed in step (d) by heat exchange with the first portion of cooled, compressed air being liquefied in step (b); and
(f) withdrawing said substantially pure oxygen gas as product, wherein the ratio of the liquid air introduced into the high pressure fractionating means to the liquid air introduced into the low pressure fractionating means is from about 1:9 to 1:1.

4,895,584

PROCESS FOR C_2 RECOVERY

Loren L. Back, Tulsa, and Ronald D. Key, Broken Arrow, both of Okla., assignors to Pro-Quip Corporation, Ponca City, Okla.

Filed Jan. 12, 1989, Ser. No. 296,432
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—29 **16 Claims**



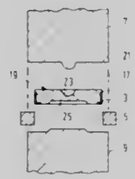
1. An improved process for separating a hydrocarbon bearing feed gas containing ethane and C_2 (ethylene and/or ethane) components into a fraction containing predominantly methane and lighter components and a fraction containing a predominant portion of the C_2 and heavier components, comprising the steps of:
(a) cooling and partially condensing the feed gas and delivering it to a separator to provide thereby a first residue vapor and a C_2-containing liquid, which liquid also contains lighter hydrocarbons including appreciable methane;
(b) directing at least part of the C_2-containing liquid into a heavy ends fractionation column wherein said liquid is separated into a second hydrocarbon bearing residue vapor containing predominantly methane and a C_2-containing product;
(c) passing the second residue through a heat exchanger to condense at least a major portion of the methane content thereof;
(d) contacting at least part of said first residue vapors with at least part of the partially condensed second residue in a light ends fractionation column to thereby obtain third residue vapors and liquids;
(e) supplying the liquids thereby recovered from the light ends fractionating column to the heavy end fractionation column as a liquid feed thereto; and
(f) directing at least part of the C_2-containing liquid from step (a) into intimate contact with the second residue prior to step (d), which liquid provides additional liquefied methane which acts with said partially condensed second residue as a direct contact refrigerant to thereby condense C_2 and heavier components while the methane itself is evaporated in the light ends fractionation column.

4,895,585

METHOD OF MANUFACTURING LENS ELEMENTS

Johannes H. Angenent, Paris, France; Nicodemus Hattu, Eindhoven, Netherlands; Petrus Heller, Eindhoven, Netherlands; Petrus A. Lemmens, Eindhoven, Netherlands; Cornelis J. T. Potters, Eindhoven, Netherlands, and Johan C. Wijn, Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 8, 1988, Ser. No. 241,636
Claims priority, application Netherlands, Sep. 16, 1987, 8702201
Int. Cl.[4] C03B *11/08*
U.S. Cl. 65—39 **6 Claims**



1. A method of manufacturing lens elements having a glass lens and a metal holder comprising the steps:
a. positioning a glass preform in a holder, said holder being a ring dimensioned to laterally surround said glass preform and having a height slightly less than the thickness of said preform;
b. heating said glass preform and said holder to a predetermined temperature suitable for moulding of said glass;
c. positioning said heated preform and holder between the dies of a mould, said dies being heated and having respective profiles corresponding to the profile of the glass lens to be formed;
d. moving said two dies relative to each other, closing the distance therebetween;
e. compressing said heated glass preform between said dies and forming said die profiles into said glass preform to form said lens said ring laterally expanding by the pressure created in said glass preform caused by said compression and being limited in lateral expansion by a surrounding ring;
f. terminating said die motion at a predetermined position whereby a small gap remains between at least one of said dies and said holder, a quasi-closed moulding cavity having said small gap existing at completion of said die motion, a quantity of glass from said preform being pressed away through said gap during said moulding operation without loss of pressure in said moulding cavity; and
g. cooling the obtained composite lens element comprising a glass lens and holder.

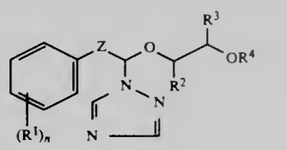
4,895,586

TRIAZOLYL GLYCOL ETHERS, FUNGICIDES AND BIOREGULATORS

Ernst Buschmann, Ludwigshafen; Linhard Sproesser, Bad Duerkheim; Bernd Zeeh, Limburgerhof; Johann Jung, Limburgerhof; Wilhelm Rademacher, Limburgerhof; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

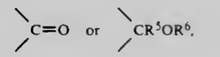
Filed Nov. 19, 1986, Ser. No. 932,338
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541156
Int. Cl.[4] A01N *43/653*; C07D *249/08*
U.S. Cl. 71—76 **5 Claims**

1. An α-triazolyl glycol ether of the formula I



(I)

where
R^1 is C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or phenyl,
R^2 and R^3 are each hydrogen or C_1–C_4-alkyl,
R^4 is C_1–C_4-alkyl
Z is



n is 0, 1, 2 or 3
R^5 is hydrogen, C_1–C_4-alkyl, vinyl, allyl, prop-1-en-1-yl ethynyl, prop-1-yn-1-yl, but-1-yn-1-yl and
R^6 is hydrogen, C_1–C_4-alkyl, allyl, crotyl, benzyl, halogenbenzyl, 4-methylbenzyl, 4tert-butylbenzyl, 4-methoxybenzyl, 2-methoxybenzyl or 4-isopropoxybenzyl.

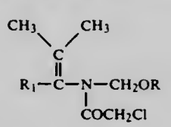
4,895,587

HALOACETAMIDE COMPOUNDS, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF AS HERBICIDE

Shozo Kato, Fujisawa; Tetsuo Takematsu, Utsunomiya; Hidenori Okamoto, Fujisawa, and Masaru Ogasawara, Utsunomiya, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Jun. 18, 1986, Ser. No. 875,686
Claims priority, application Japan, Jun. 21, 1985, 60-134387
Int. Cl.[4] A01N *37/18, 43/02*; C07C *103/34, 103/37*
U.S. Cl. 71—90 **5 Claims**

1. A haloacetamide compound of the formula (I)'



(I)'

wherein
R_1 represents a substituted or unsubstituted phenyl group or a substituted or unsubstituted thienyl group, and
R represents a C_1–C_6 alkyl group; and
wherein the substituent of the substituted phenyl or thienyl group represented by R_1 is a member selected from the group consisting of C_1–C_6 alkyl groups, halogen atoms and C_1–C_6 alkoxy groups.

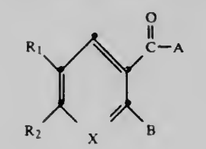
4,895,588

SUBSTITUTED IMIDAZOLONES HAVING HERBICIDAL ACTIVITY

John G. Dingwall, Nuglar, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

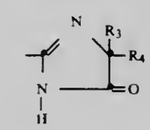
Filed Jun. 21, 1988, Ser. No. 209,470
Claims priority, application Switzerland, Jul. 1, 1987, 2480/87
Int. Cl.[4] A01N *43/50*; C07D *401/04*
U.S. Cl. 71—92 **7 Claims**

I. A compound of formula (I)



(I)

in which
X is a nitrogen atom,
and R_2 independently of one another are hydrogen or C_1–C_4alkyl,
A is —OH; $—O^{\ominus}\ M^{\oplus}$; or C_1–C_4alkoxy,
$M^{\oplus}$ is the cation equivalent of an alkali metal or alkaline earth metal or of a nitrogen-containing base; and
B is a 2-imidazol-4-one radical of the formula



in which
R_3 is C_1–C_4alkyl and
R_4 is methyl or ethyl substituted by 1 to 5 fluorine atoms, or a salt thereof with an acid, base or complex-former.
5. A method of controlling undesired plant growth, wherein a herbicidally effective amount of a compound of formula I according to claim 1 is allowed to act on the locus of the plant to be controlled.

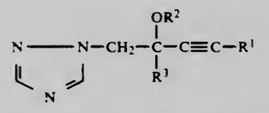
4,895,589

HETEROCYCLIC COMPOUNDS

Raymond Elliott, Nr. Reading, and John Dalziel, Binfield, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 4, 1986, Ser. No. 892,364
Claims priority, application United Kingdom, Aug. 7, 1985, 8519836
Int. Cl.[4] A01N *43/653*; C07D *249/08*
U.S. Cl. 71—92 **8 Claims**

1. A triazole derivative having the formula (I):



and stereoisomers thereof, wherein R^1 is an alkyl group containing from 3 to 6 carbon atoms, or a haloalkyl group containing from 2 to 5 carbon atoms, or a group $—CH_2—Z$ wherein Z is a cycloalkyl group containing from 3 to 5 carbon atoms,

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R^1 containing primary or secondary carbon atoms only; R^2 is hydrogen or an alkyl group containing from 1 to 4 carbon atoms; and R^3 is a tertiary butyl group optionally substituted by halogen; and salts acid addition acetate or benzoate, esters and metal complexes of the compound of formula (I) wherein R^2 is hydrogen.

4,895,590

HERBICIDAL PYRAZOLESULFONAMIDES

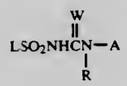
Stephen L. Hartzell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 85,026, Aug. 13, 1987, Pat. No. 4,762,550, which is a division of Ser. No. 760,713, Aug. 1, 1985, Pat. No. 4,705,558, which is a continuation-in-part of Ser. No. 662,789, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 651,082, Sep. 17, 1984, abandoned. This application Apr. 29, 1988, Ser. No. 188,543

Int. Cl.[4] C07D *403/14*; A01N *43/66, 43/68, 43/70*

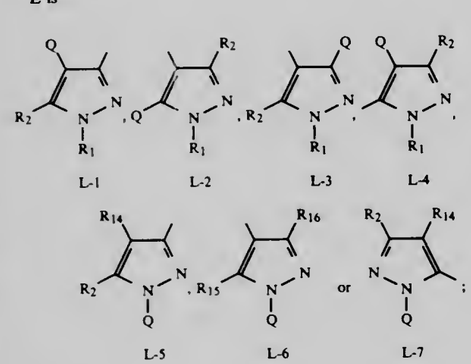
U.S. Cl. 71—93 **30 Claims**

1. A compound of the formula:



wherein

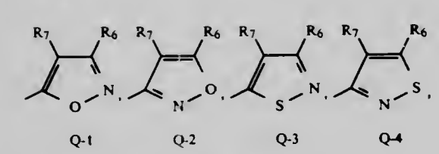
L is



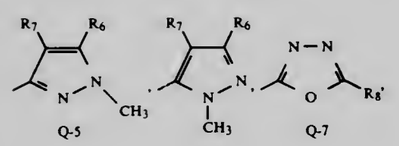
L-1 L-2 L-3 L-4

L-5 L-6 L-7

Q is

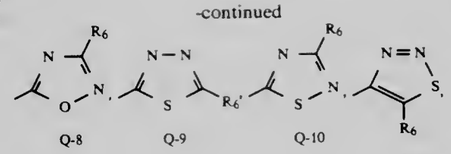


Q-1 Q-2 Q-3 Q-4

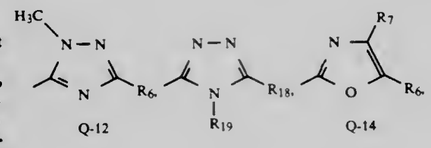


Q-5 Q-6 Q-7

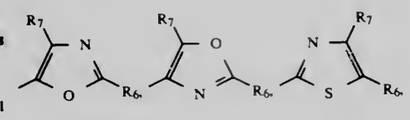
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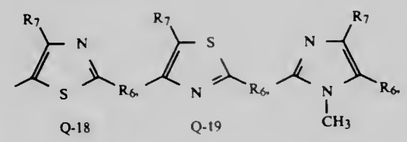
Q-8 Q-9 Q-10 Q-11



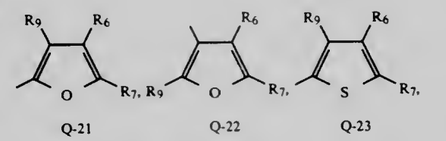
Q-12 Q-13 Q-14



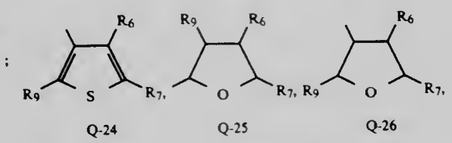
Q-15 Q-16 Q-17



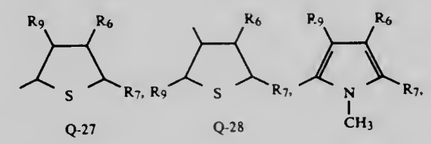
Q-18 Q-19 Q-20



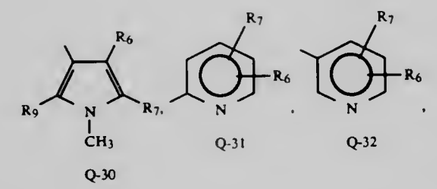
Q-21 Q-22 Q-23



Q-24 Q-25 Q-26

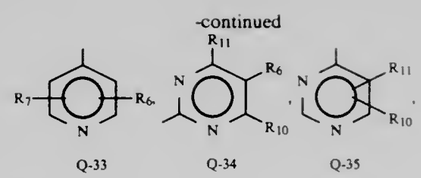


Q-27 Q-28 Q-29

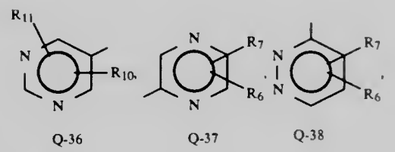


Q-30 Q-31 Q-32

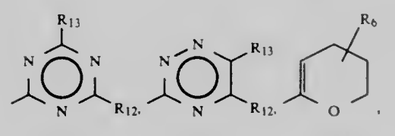
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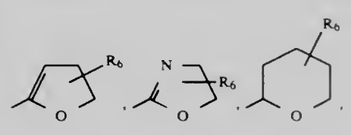
Q-33 Q-34 Q-35



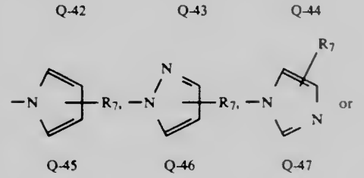
Q-36 Q-37 Q-38



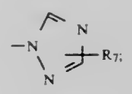
Q-39 Q-40 Q-41



Q-42 Q-43 Q-44



Q-45 Q-46 Q-47 or



Q-48

R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{18} or R_{19} are independently selected from C_1–C_4 alkyl, C_1–C_4 haloalkyl, mercapto, benzylthio, halogen, C_1–C_4 alkoxy, C_1–C_6 alkylthio, C_3–C_4 alkenyl, C_3–C_4 alkenylthio, C_3–C_4 alkynylthio, C_3–C_4 haloalkenylthio, C_3–C_4 alkenyloxy, C_1–C_2 haloalkoxy, C_1–C_2 haloalkylthio, C_2–C_4 cyanoalkylthio, C_3–C_6 alkoxycarbonylalkylthio, C_2–C_5 alkoxyalkylthio or C_3–C_5 acetylalkylthio;

W is O or S;

R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl or phenyl optionally substituted by Cl, NO_2, CH_3 or OCH_3;

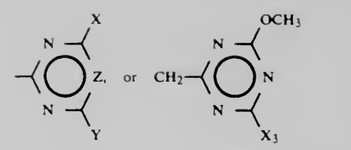
R_2 is H, Cl or CH_3;

R_{14} is H, C_1–C_4 alkyl, F, Cl, Br, NO_2, C_1–C_3 haloalkylthio, C_3–C_4 alkenyl, C_3–C_4 alkynyl, CO_2R_{17}, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl or $SO_2NR^IR^{II}$;

R_{15} and R_{16} are independently H, C_1–C_4 alkyl, C_2–C_4 alkoxyalkyl, C_1–C_3 haloalkylthio, C_1–C_3 haloalkoxy, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfonyl, F, Cl, Br, CO_2R_{17} or $SO_2NR^IR^{II}$;

R^I and R^{II} are independently C_1–C_3 alkyl;

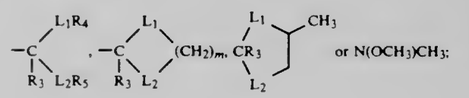
R_{17} is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2C{\equiv}CH$, CH_2CH_2Cl or $CH_2CH_2OCH_3$;



A-1 A-6

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, $C(O)R_3$,



or $N(OCH_3)CH_3$;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_3 is H or CH_3;

R_4 and R_5 are independently C_1–C_2 alkyl;

Z is N; and

X_3 is CH_3 or OCH_3;

and their agriculturally suitable salts; provided that

(1) X and/or Y are other than OCF_2H;

(2) when W is S, then R is H, A is A-1, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



(3) when the total number of carbon atoms of X and Y is greater than four, then the total number of carbon atoms of Q and R_2, R_{14}, R_{15} or R_{16} is less than or equal to ten; and

(4) when L is L-5, L-6 or L-7, then Q must be bonded to the pyrazole ring nitrogen through a carbon atom.

21. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,895,591

HERBICIDAL SULFONAMIDES

James V. Hay, Newark; Barry A. Wexler, Wilmington, both of Del., and Donna F. Zimmerman, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

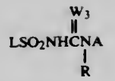
Division of Ser. No. 111,670, Oct. 23, 1987, Pat. No. 4,786,313, Division of Ser. No. 917,930, Oct. 10, 1986, Pat. No. 4,721,521, Division of Ser. No. 768,158, Aug. 26, 1985, abandoned, Continuation-in-part of Ser. No. 680,549, Dec. 11, 1984, abandoned. This application Aug. 30, 1988, Ser. No. 238,102

Int. Cl.[4] C07D *251/20*; A01N *43/66*

U.S. Cl. 71—93 **21 Claims**

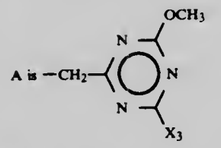
1. A compound of the formula

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I

R is H or CH_3;
W_3 is O or S;
n is 0 or 1;
R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro. CH_2CN, CH_2OCH_3, CH_2SCH_3, CN, C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl or CO_2R^{III};
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;
R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or
R^I and R^{II} may be taken together as $-(CH_2)_3-$. $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$;
R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_4 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;
W is W_1;
W_1 is C_2–C_8 alkenyl substituted with 1–3 atoms of F, Cl or Br;



A-6

A is $-CH_2-$

X_3 is CH_3 or OCH_3;
and their agriculturally suitable salts.

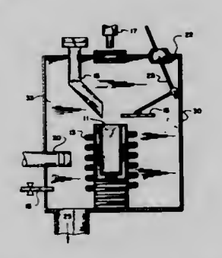
15. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,895,592

HIGH PURITY SPUTTERING TARGET MATERIAL AND METHOD FOR PREPARING HIGH PURITY SPUTTERING TARGET MATERIALS

Tukaram K. Hatwar, and Paul D. Ashins, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 14, 1987, Ser. No. 133,599
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.14 **14 Claims**



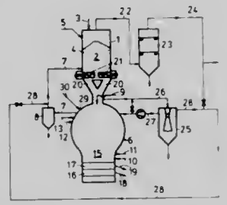
1. A method for producing rare earth-transition metal sputtering target materials which comprises introducing the components of a rare earth-transition metal alloy into the inner section of a crucible assembly having an inner and outer section separated by thermally insulating material, melting the components in an inert atmosphere to form an alloy melt, controlling the cooling of the melt in the crucible assembly, and solidifying the alloy to form the target.

4,895,593

PROCESS OF RECOVERING MOLTEN PIG IRON OR STEEL PRE-PRODUCTS FROM LUMPY IRON-OXIDE AND SCRAP USING A FLUIDIZED BED

Horst Sulzbacher, Leoben, Austria, and Markus Hubig, Aachen, Fed. Rep. of Germany, assignors to Korf Engineering GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,876
Claims priority, application Austria, Jul. 30, 1987, 1933/87
Int. Cl.[4] C22B *1/10*
U.S. Cl. 75—26 **14 Claims**



1. In a process of recovering molten pig iron or steel pre-products from lumpy iron-oxide containing charging substances by providing a direct reduction zone for reducing said charging substances so as to obtain sponge iron, providing a meltdown gasifying zone for smelting said sponge iron, under supply of carbon carriers and oxygen-containing gas forming a coal fluidized bed, and producing a CO and H_2 containing reduction gas to be injected into said direct reduction zone and reacted there so as to form top gas, the improvement comprising:

charging scrap containing organic impurities and/or one or more non-ferrous metallic elements and having an apparent weight amounting to between 300 and 1000 kg/m^3 and sponge iron into said meltdown gasifying zone,

maintaining a temperature of said coal fluidized bed between about 1,500° to 1,700° C.,

carbonizing and smelting said scrap in said coal fluidized bed while maintaining reducing conditions in said fluidized bed, and

pyrolyzing organic impurities present in said scrap.

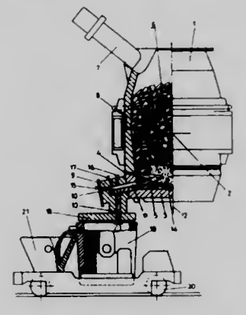
4,895,594

PROCESS FOR CONTINUOUSLY MELTING SCRAP

Ludwig von Bogdandy, Linz; Gerhard Mitter, Traun; Otto Köller, and Lucian Pochmarski, both of Leoben, all of Austria, assignors to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H., Leoben-Donawitz, Austria

Filed Dec. 1, 1988, Ser. No. 278,543
Claims priority, application Austria, Dec. 17, 1987, 3341/87
Int. Cl.[4] C22B *11/00*
U.S. Cl. 75—43 **1 Claim**

1. A process for continuously melting scarp and/or pig iron within a converter, comprising the steps of: applying heat to a bottom interior portion of the converter by means of substoichiometric burners arranged substantially in a plane so as to direct flames radially inwardly towards the bottom of the converter; supplying oxygen to the interior of the converter above the plane of the burners to complete combustion; and selectively discharging molten material from the converter to a mobile ladle through a taphole in the converter and a tapping means secured to the converter and positioned between the taphole and the ladle, said selective discharging being accomplished by swiveling the converter about a substantially horizontal axis between positions at which the level of the molten material within the converter is below and above the taphole.

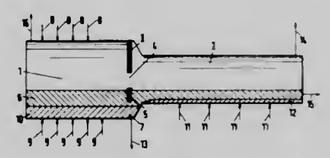


4,895,595

DIRECT SMELTING PROCESS FOR NON-FERROUS METAL SULFIDE ORES

Peter Fischer, Bad Vilbel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 146,768
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701846
Int. Cl.[4] C22B *13/00*
U.S. Cl. 75—62 **7 Claims**



1. A continuous process of directly smelting a material which contains a non-ferrous metal sulfide, comprising

(a) smelting in a reactor having a wall separating it into spaced oxidizing and reducing zones each with a slag bath, the reactor further having a gas space and suction lines connected to said oxidizing and reducing zones,

(b) the slag baths of the two zones communicating with each other,

(c) charging material containing a non-ferrous metal sulfide to be smelted into the slag bath in the oxidizing zone and blowing an oxygen-containing gas into the slag bath in the oxidizing zone,

(d) passing a slag rich in an oxide of the non-ferrous metal of the non-ferrous metal sulfide from the oxidizing zone into the reducing zone,

(e) blowing a reducing agent and oxygen-containing gas into the slag in the reducing zone at such respective rates that the non-ferrous metal oxides are substantially completely reduced and a phase that is rich in non-ferrous metal is formed,

(f) tapping a slag which is poor in non-ferrous metal from the reducing zone,

(g) separately sucking from the oxidizing and reducing zones gases generated therein through said suction lines, and

(h) controlling the pressures in the suction lines connected to the oxidizing and reducing zones so that a zero differential pressure is obtained adjacent to the space between the oxidizing and reducing zones, the gas space in the reactor having a cross-section which forms a constriction between the oxidizing and reducing zones, and a flow area of the constriction being disposed closely over a surface of the slag bath, a lower part of the constriction reaching into the slag bath but leaving open a passage for slag.

4,895,596

METHOD OF RECOVERING PALLADIUM CATALYST

Katsuo Imatani; Akira Ishikawa, and Masaki Kashibe, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jun. 17, 1988, Ser. No. 208,751
Claims priority, application Japan, Jun. 19, 1987, 62-152545
Int. Cl.[4] C22B *11/04*; B01J *23/96*; C07C *67/343*
U.S. Cl. 75—108 **10 Claims**

1. A method of recovering a palladium catalyst from a liquid reaction mixture having been produced by oxidative coupling reaction of an aromatic compound in the presence of a catalyst containing palladium (II) salt and a basic bidentate ligand, which comprises heating the liquid reaction mixture under stirring at a temperature of 180° to 220° C. in an atmosphere containing hydrogen gas at a partial pressure of 20 to 60 kg/cm^2 to reduce the catalyst in the reaction mixture to precipitate a metallic palladium from the reaction mixture.

4,895,597

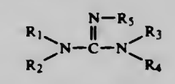
RECOVERY OF PRECIOUS METALS

Wilson L. Lin, Plymouth; Phillip L. Mattison, New Brighton, and Michael J. Virnig, Fridley, all of Minn., assignors to Henkel Corporation, Ambler, Pa.

Division of Ser. No. 819,778, Jan. 16, 1986, Pat. No. 4,814,007.
This application Jan. 23, 1989, Ser. No. 300,525
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 R **14 Claims**

1. A process for the recovery of a precious metal from an aqueous alkaline cyanide solution containing said precious metal comprising:

(1) contacting said aqueous solution containing said precious metal with an ion exchange resin having a functionality consisting essentially of guanidine functionality wherein said precious metal value is extracted from said aqueous solution, wherein said ion exchange resin containing said quanidine functionality has a pKa at 25° C. greater than 12 and has the formula:



where one of the R groups R_1 through R_5 is an ion exchange resin backbone and the remaining R groups are selected from the group consisting of H and aromatic and aliphatic hydrocarbon groups having up to 25 carbon atoms;

(2) separating said aqueous solution, now metal barren, from said ion exchange resin having said guanidine functionality; and

(3) recovering the precious metal value from said ion exchange resin by stripping said precious metal value from said ion exchange resin by contacting said ion exchange resin with an aqueous alkaline solution.

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4,895,598

STABILIZATION OF EXTREMELY LIGHTWEIGHT AGGREGATE CONCRETE

Bengt Hedberg, Dr Heymans Gata 5, S-413 22 Göteborg, and Leif Berntsson, Tågalistaregatan 10, 416 52 Göteborg, both of Sweden

Continuation of Ser. No. 18,773, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 740,059, May 28, 1985, abandoned. This application May 18, 1988, Ser. No. 198,722
Claims priority, application Sweden, Oct. 5, 1983, 8305474
Int. Cl.[4] C04B *14/02, 24/24, 24/36*
U.S. Cl. 106—86 **8 Claims**

1. Method of producing a monolithic lightweight aggregate concrete of a density of 700–1200 Kg/m^3 in fully dried condition composed of lightweight cement mortar including hydraulic cement, sand, fine and extremely lightweight particles, air bubbles and water mixed together with coarse lightweight aggregate,

characterized by the fact that

the low density of the cement mortar of the lightweight aggregate concrete is constituted by replacing sand at least partly by an equivalent volume of small air bubbles with a diameter in the range of approximately from 20 to 500 micrometers so that the volume of air bubbles is in the range of 5 to 30% of the volume of cement mortar and expanded organic and inorganic aggregate of particle density less than 200 Kg/m^3 and of a size approximately from 0.2 to 2 mm and a volume from 5–20% of the volume of cement mortar in such a way that the total particle volume of the cement mortar constitutes nearly a continuous size distribution, the stability is increased and the homogenity is maintained of the fresh cement mortar and concrete by adding polymer microparticles and equivalent organic microparticles in the amount of 0.1–5.0% of the cement weight,

said polymer microparticles consisting of a mixture of at least two different types,

a first type consisting of synthetic polymer particles having a diameter of 0.1–1.0 micrometers on the surface of which an anionic or a combination of anionic-nonionic calcium stable surfactants have been adsorbed to an amount of 0.1–5.0% by weight of the synthetic polymer, and

a second type consisting of natural or synthetic polymer microparticles having a diameter of 0.5–10 micrometers on the surface of which an anionic or anionic-nonionic calcium destabilizable combination of surfactants have been adsorbed to an amount of 0.1–5.0% by weight of the natural or synthetic polymer, wherein the weight ratio between the second type microparticles and the first type microparticles is in the range from 1:3 to 1:6.

4,895,599

COATING FOR VDT SCREENS

Paul Wallace, 1198 Davenport Road, Toronto, Ontario, Canada (M6C 2G8)

Filed Aug. 9, 1988, Ser. No. 229,952
Int. Cl.[4] C08L *1/08*
U.S. Cl. 106—189 **10 Claims**

1. A liquid composition for application as a coating to screens of video display terminals, the composition comprising a mixture of:

(a) pure silica as a flattening agent;

(b) a surface active copolymer to minimize the build-up of static electricity on the surface of the screen selected from the group consisting essentially of dimethyl silicone polymers containing pendant polyether groups;

(c) hydroxyethyl cellulose polymer as a thickener; and

(d) a carrier comprising one of glycerol, ethylene glycol or propylene glycol;

these ingredients being present in relative concentrations so as to be effective for their intended purpose in the final mixture.

4,895,600

ASPHALT COMPOSITIONS CONTAINING ANTI-STRIPPING ADDITIVES PREPARED FROM AMINES OR POLYAMINES AND PHOSPHONATES

Dane Chang, Houston, and Druce K. Crump, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 94,982, Sep. 9, 1987, Pat. No. 4,786,329. This application Jul. 28, 1988, Ser. No. 225,322
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—284.1 **9 Claims**

1. A composition which comprises a blend comprising:

(A) bituminous material and

(B) the product resulting from reacting at conditions sufficient to complete the reaction of

(1) phosphorous acid;

(2) at least one organic polyamine represented by the following formula IV

$$Z((-O-CH_2-CHR^6)_y-NHR^3)_{y'} \qquad \text{FORMULA IV}$$

wherein each R^3 is independently hydrogen or a hydrocarbyl group or hydroxyl substituted hydrocarbyl group or amine substituted hydrocarbyl group having from about 1 to about 36, carbon atoms; each R^6 is independently hydrogen or an alkyl or haloalkyl group having from 1 to about 4 carbon atoms; Z is a polyvalent hydrocarbyl group having from 2 to about 8 carbon atoms; y has a value from 1 to about 20; and y' has a value from about 2 to about 8; and

(3) at least one carbonyl-containing compound which will react with the phosphorus-containing compound;

wherein components (1), (2) and (3) are employed in quantities which provide a ratio of carbonyl groups:phosphorus atoms:amine hydrogen atoms of from about 0.1:0.1:1 to about 2:1.5:1; and

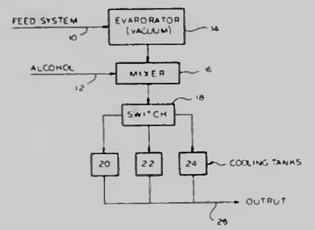
wherein components (A) and (B) are employed in quantities which provide from about 0.05 to about 10 percent by weight of component (B) based upon the weight of component (A).

4,895,601

AQUEOUS-ALCOHOL FRUCTOSE CRYSTALLIZATION

Thomas P. Binder, Clinton, and Robert M. Logan, Clinton, both of Iowa, assignors to Archer Daniels Midland Company, Decatur, Ill.

Filed Dec. 12, 1988, Ser. No. 283,188
Int. Cl.[4] C13F *1/02, 1/04*
U.S. Cl. 127—58 **17 Claims**



1. A continuous process for crystallizing fructose comprising the steps of:

(a) supplying an incoming aqueous fructose feed stream at a temperature in the order of about 130°–180° F.;

(b) placing said feed stream in an evaporator having an internal temperature in the range of about 105°–130° F.;

(c) continuing an evaporation within said evaporator until there is a crystallization of about 5–40% w/w of the total dry solids of fructose in said feed stream;

(d) discharging the partially crystallized magma content of said evaporator into a mixer and adding alcohol to said mixer with a mixture ratio in the range of from about 3 to 1 by weight to about 1 to 3 by weight of alcohol to said partially crystallized fructose feed stream;

(e) discharging the mixture from said mixer into at least one holding tank;

(f) linearly cooling said mixture in said holding tank over a period of approximately 10–24 hours to a final temperature in the range of about 60°–80° F.; and

(g) removing and drying the contents of said holding tank.

4,895,602

PIPE CLEANING METHOD

Shizuo Sagawa, 12-8, Minami Kugahara 1-chome, Ota-ku, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,303
Claims priority, application Japan, Aug. 1, 1987, 62-191525
Int. Cl.[4] B08B *9/02*
U.S. Cl. 134—6 **2 Claims**



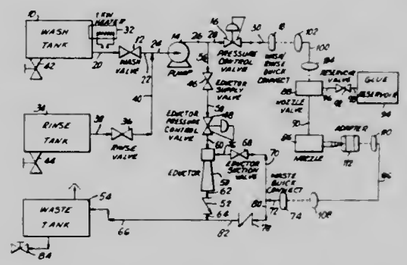
1. A method for cleaning the interior of a stationary pipe comprising introducing a plurality of small spheres as a group into one end of the interior of the pipe to be cleaned, each sphere having a diameter less than 1/10 of the diameter of the pipe to be cleaned and having a plurality of rectangular-shaped heads projecting from its surface and applying hydraulic pressure to the plurality of spheres from one side of the group thereof to propel them through the pipe as a single mass that adapts to any changes in the diameter of the pipe.

4,895,603

APPARATUS AND METHOD FOR IN-PLACE CLEANING AND PRIMING OF A NOZZLE ASSEMBLY

Bernard A. Seup; Bernard C. Kiernan; David L. Biluaas, and Michael L. Watkins, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,354
Int. Cl.[4] B08B *3/08, 5/04*
U.S. Cl. 134—21 **2 Claims**



1. A method for in-place cleaning and priming of an in-place nozzle assembly which in normal operation receives from a reservoir and discharges to a work place a fluid material which tends to leave behind an accumulation of undesired residue, comprising the steps of:

(a) delivering an effective quantity of a fluid cleaning substance from a fluid cleaning source to said nozzle to remove from the interior of said nozzle any of said fluid material and said undesired residue present therein; then

(b) delivering an effective quantity of a fluid rinsing substance from a fluid rinsing source to said nozzle to remove from the interior of said nozzle any residue of said cleaning substance present therein; then

(c) channeling a quantity of said rinsing substance through priming means to create a suction and applying said suction to said reservoir through said nozzle to draw a quantity of said fluid material from said reservoir and through said nozzle to displace the remainder of said rinsing substance therefrom and effectively to prime said nozzle with said fluid material; and

(d) conveying to a waste receiving facility all of said fluid material, said undesired residue, said cleaning substance and said rinsing substance flowing from said nozzle and all of said rinsing substance channeled through said priming means during the conduct of steps (a), (b) and (c) hereof.

4,895,604

METHOD AND APPARATUS FOR RINSING MATERIALS OR ARTICLES

Noriyuki Hayashi, Hikone, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Continuation of Ser. No. 880,124, Jun. 30, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 269,496
Claims priority, application Japan, Jul. 15, 1985, 60-154339; Apr. 25, 1986, 61-94652; Apr. 25, 1986, 61-94653
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—31 **7 Claims**

1. A method of vapor-rinsing semiconductor wafers comprising the steps of:

superheating and evaporating a rinsing solvent located in a rinsing chamber so as to fill an inside of said rinsing chamber with a steam of said rinsing solvent, said steam rinsing from a bottom of said chamber toward a top of said chamber;

disposing said wafers at a first level inside said rinsing chamber above said rinsing solvent between said bottom and said top of said chamber, said rinsing chamber constantly being filled with said steam at said first level;

forming condensates of said rinsing solvent on surfaces of said wafers thereby rinsing said wafers;

measuring the vapor temperature at said first level inside said rinsing chamber;

measuring the vapor temperature at a second level inside said rinsing chamber near said top of said chamber, said vapor temperature at said second level temporarily dropping below a reference value after said wafers are initially disposed inside said chamber at said first level indicating said steam has dropped below said second level within said chamber;

detecting when said vapor temperature at said second level recovers to said reference value which signifies completion of rinsing of said articles; and removing said wafers from said chamber.

4,895,605

METHOD FOR THE MANUFACTURE OF HARDENED RAILROAD RAILS

Robert J. Ackert, and Murray A. Nott, both of Sault Ste. Marie, Canada, assignors to Algoma Steel Corporation, Sault Ste. Marie, Canada

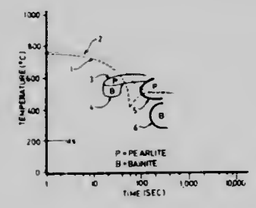
Filed Aug. 19, 1988, Ser. No. 234,400
Int. Cl.[4] C21D *9/04*
U.S. Cl. 148—12.1 **22 Claims**

1. A method for manufacturing and treating a railroad rail, comprising the steps of:

(a) forming hot a railroad rail from an alloy steel of preselected chemical composition;

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(b) force cooling at least the rail head of the rail from a preselected cooling start temperature above about the austenite-to-ferrite transformation temperature such that the surface of the rail head is maintained above the martensite start temperature;
(c) terminating the forced cooling when the temperature of the rail head reaches a preselected cooling stop temperature, and before a substantial volume fraction of the austenite in the rail head has transformed to pearlite; and



(d) holding the rail head under substantially isothermal conditions until the austenite-to-pearlite transformation is complete;
(e) wherein the chemical composition of the alloy steel is selected such that the austenite-to-pearlite reaction occurs earlier in time than the austenite-to-bainite reaction under said substantially isothermal conditions.

4,895,606

FORMULATIONS FOR SOLDERING FLUX

Ashraf Jafri, 4 Fairview Avenue, Richmond Hill, Ontario, Canada (L4C 6L2)

Filed Feb. 23, 1989, Ser. No. 314,414
Int. Cl.[4] B23K *35/34*
U.S. Cl. 148—25 **12 Claims**

1. A soldering flux composition comprising a water-soluble oil-in-water emulsion paste in turn comprising:
(a) an oil type material
(b) an emulsifier,
(c) water, and
(d) a fluxing agent comprising an inorganic or organic halogen compound capable of removing oxide from a metal surface to be soldered.

4,895,607

IRON-NEODYMIUM-BORON PERMANENT MAGNET ALLOYS PREPARED BY CONSOLIDATION OF AMORPHOUS POWDERS

Choong-Jin Yang, Lowell, and Ranjan Ray, Andover, both of Mass., assignors to Kabota, Ltd., Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,625
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—104 **3 Claims**

1. A method for preparing a fine grained iron-neodymium-boron bulk-shaped alloy comprising the steps of:
forming an alloy melt having the following composition: $Fe_aCo_bNd_cR_dM_eB_f$ wherein Fe, Co, Nd and B are iron, cobalt, neodymium and boron respectively, and R is an element selected from the group consisting of lanthanum, yttrium, cerium, dysprosium, terbium, gadolinium, and praseodymium and mixtures thereof, and M is an element selected from the group consisting of aluminum, silicon, germanium, niobium and gallium and mixtures thereof, wherein a=65–84, b=0–25, c=5–20, d=0–10, e=0–5 and f=3–10 respectively with the proviso that the sum (a+b+c+d+e+f)=100,
adding 0.3 to 3 weight percent of at least one diboride selected from the group consisting of zirconium diboride, titanium diboride and tantalum diboride, to said melt of alloy,
depositing said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range of approximately between 10^5 to 10^{7*} C./second and form a rapidly solidified filament, ribbon or particulate of said alloy characterized predominantly by a single amorphous structure,
comminuting said ribbon, filament or particulate into a powder, said powder having an average particle size of less than 60 mesh and consisting of platelets having a thickness of less than 0.1 millimeter, each platelet being defined by an irregularly shaped outline resulting from fracture, and
consolidating said powder into a bulk shape consisting of fine grained crystalline phases using hot extrusion.

4,895,608

CORROSION RESISTANT ALUMINUM COATING COMPOSITION

John W. Bibber, Batavia, Ill., assignor to Sanchem, Inc., Chicago, Ill.

Filed Apr. 29, 1988, Ser. No. 187,828
Int. Cl.[4] C23C *22/07*
U.S. Cl. 428—427.2 **11 Claims**

1. An aluminum or aluminum alloy article having been coated with an intermedaite coating composition having as essential ingredients phosphate ions, aluminum ions, and nitrate ions wherein the aluminum ions are present in at least 900 ppm, the phosphate ions are present in at least 3170 ppm and the nitrate ions are present in at least 6200 ppm and said phosphate composition has a pH of less than 1.5.

4,895,609

ACTIVATED METAL AND METHOD OF PREPARING

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 182,718, Apr. 18, 1988, and a continuation-in-part of Ser. No. 96,368, Sep. 11, 1987, and a continuation-in-part of Ser. No. 830,767, Feb. 19, 1986, Pat. No. 4,799,979, and a continuation-in-part of Ser. No. 685,910, Dec. 27, 1984, Pat. No. 4,820,362, and a continuation-in-part of Ser. No. 538,541, Oct. 3, 1983, Pat. No. 4,830,931, which is a continuation-in-part of Ser. No. 531,444, Sep. 12, 1983, abandoned, and a continuation-in-part of Ser. No. 507,174, Jun. 23, 1983, Pat. No. 4,694,036, and a continuation-in-part of Ser. No. 417,214, Sep. 13, 1982, abandoned, and a continuation-in-part of Ser. No. 359,212, Mar. 18, 1982, Pat. No. 4,443,557, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, and a continuation-in-part of Ser. No. 172,671, Jul. 28, 1980, Pat. No. 4,435,481, said Ser. No. 685,910, is a continuation-in-part of Ser. No. 507,174, , and a continuation-in-part of Ser. No. 281,405, , and a continuation-in-part of Ser. No. 531,444, , said Ser. No. 830,767, is a continuation-in-part of Ser. No. 507,174, , and a continuation-in-part of Ser. No. 281,405, , said Ser. No. 96,368, is a continuation-in-part of Ser. No. 281,405,. This application Jun. 10, 1988, Ser. No. 205,387
Int. Cl.[4] C06B *45/30*
U.S. Cl. 149—5 **16 Claims**

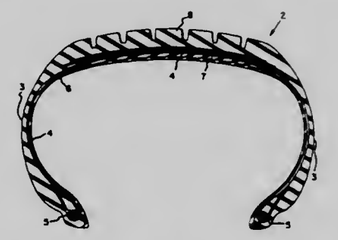
1. In the process of preparing a continuous length of pyrophoric metal, the steps of providing a continuous length of a carrier web not over about ¾ millimeter thick, applying to the web a layer at least about 1/50 millimeter thick of a mixture of aluminum powder and nickel, iron or cobalt powder, the powders being in the proportion of a Raney alloy, and the powder particles being sufficiently small to essentially completely interact when heated, and heating the layer-carrying web to cause the powder particles to essentially completely interact and adhere to the web, the web being sufficiently heat resistant so that it is not disintegrated by the process.

4,895,610

SELF-SEALING PNEUMATIC TIRE AND METHOD OF MANUFACTURING THE SAME

William E. Egan, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 905,362, Sep. 9, 1986, abandoned, which is a continuation of Ser. No. 690,920, Jan. 11, 1985, abandoned, which is a continuation of Ser. No. 523,495, Aug. 15, 1983, abandoned. This application Jun. 3, 1988, Ser. No. 202,171
Int. Cl.[4] B60C *21/08*; B32B *31/00*
U.S. Cl. 156—115 **7 Claims**



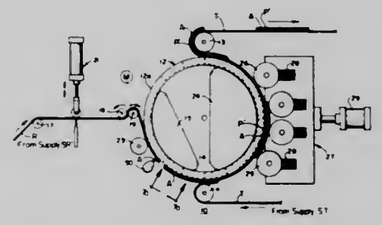
1. A method of preparing a pneumatic rubber tire having a puncture sealing feature which comprises:
(a) building an unvulcanized tire comprised of a circumferential rubber tread, a supporting carcass therefor, two spaced beads, two rubber sidewalls connecting said beads, an inner liner and a layer of polymer composition disposed inwardly from said supporting carcass and outwardly from said inner liner wherein said polymer composition consists of based on its polymer content, 100 parts by weight butyl rubber having a number average molecular weight of 200,000 to 500,000, and a Mooney vicosity ranging from about 40 to 58, about 10 to 40 parts by weight of carbon black, about 5 to 35 parts by weight of polyisobutylene having a number average molecular weight of about 7,500 to 15,000, about 5 to 35 parts by weight of an oil extender, about 0 to 1 parts by weight sulfur, and about 1.0 to 8 parts by weight of a perioxide vulcanizing agent; and
(b) shaping and vulcanizing said tire under conditions of heat and pressure and simultaneously forming in situ a puncture sealant layer in said tire by both crosslinking and partially depolymerizing said butyl rubber in said polymer composition.

4,895,611

METHOD AND APPARATUS FOR MAKING NON-ROPING THERMOPLASTIC DRAW TAPE FOR THERMPLASTIC BAGS

David A. Bryniarski, Rochester, and Edward G. Grosz, Sodus Point, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 157,751, Feb. 19, 1988, Pat. No. 4,822,437. This application Feb. 21, 1989, Ser. No. 312,281
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] B32B *31/18, 31/20, 35/00*
U.S. Cl. 156—252 **6 Claims**



1. In a system for the manufacture of thermoplastic draw tape bags, apparatus for the continuous application of reinforcing patches of predetermined length to thermoplastic draw tape of predetermined length to produce non-roping draw tape for the bags comprising:
(a) a cylindrical drum supported for rotation at a predetermined speed adjacent a sealing station in the system, said cylindrical drum having a plurality of chambers extending around the circumference thereof, the cylindrical peripheral surface of said drum having perforations therein;
(b) a vacuum manifold communicating with a fractional number of said chambers to supply a vacuum to the perforations in said peripheral surface at a vacuum station spaced from the sealing station in the system,
(c) means for supplying thermoplastic draw tape from a supply roll to the cylindrical surface of said drum at the sealing station for rotation therewith at the predetermined speed;
(d) means for supplying reinforcing patch material from a supply roll;
(e) nip roll means for unwinding the reinforcing patch material from the supply roll at a predetermined speed slower than the draw tape speed on the surface of said drum by the direct ratio of the reinforcing patch length to the draw tape length;
(f) means positioned between the supply roll of reinforcing patch material and said nip roll means for perforating the reinforcing patch material, once per bag, at predetermined locations corresponding to the predetermined length of the reinforcing patches;
(g) separator nip roll means at the vacuum station for forcing the perforated reinforcing patch material against the peripheral surface of said drum for rotation therewith at draw tape speed to separate a patch from the roll of reinforcing patch material at the perforations;
(h) means for applying an adhesive coating to the patch material on the peripheral surface of said drum;
(i) means for directing the draw tape over the adhesive coated patches on the peripheral surface of said drum between the vacuum station and the sealing station;
(j) compression applying means at the sealing station for applying pressure against the draw tape to force the draw tape against the adhesive coated reinforcing patches and the reinforcing patches against the drum to cause the

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reinforcing patches to adhere to the draw tape as each reinforcing patch passes the sealing station; and

(k) means for directing the draw tape with sealed reinforcing patches away from the sealing station for subsequent assembly of the reinforced draw tape with a thermoplastic bag.

4,895,612

METHOD FOR WELDING AND LAMINATING POLYAMIDES

Nadka V. Avramova; Stoyko C. Fakirov, both of Sofia, Bulgaria, and Jerold M. Schultz, Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Jun. 23, 1988, Ser. No. 210,259

Claims priority, application Bulgaria, Sep. 29, 1987, 81312

Int. Cl.[4] C09J *3/00, 5/02;* B32B *27/34*

U.S. Cl. 156—326 **3 Claims**

1. A process for welding and laminating polyamides which comprises:

wetting separate polyamide bodies with a solution of paraformaldehyde in paraformaldehyde methanol containing traces of an alkali metal hydroxide and a catalytic amount of anhydrous oxalic acid, and subsequently

pressing the wetted polyamide bodies at a pressure of about 0.05 to 5 MPa at a temperature of from 5° to 40° C. for a time sufficient to create methylene bridges between nitrogen atoms of the separate methylene bodies.

4,895,613

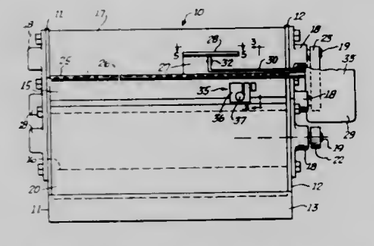
FILM LINEAR STRIPPER

Kenneth Carrico, 1201 Gulf Stream Way, Singer Island, Fla. 33404

Filed Jun. 16, 1988, Ser. No. 207,455

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—344 **15 Claims**



15. A method of simultaneously cutting and stripping the backing film from solar radiation reducing film, said method comprising the following steps:

(a) providing a roller support means for a roll of solar radiation reducing film;

(b) providing horizontal measuring and cutting means on said roller support means wherein said horizontal measuring means is connected to said horizontal cutting means;

(c) providing adjustable vertical cutting means on said roller support means;

(d) providing a pair of stripping rollers for stripping the backing film from said solar radiation reducing film;

(e) operably connecting said roller support means and said pair of stripping rollers;

(f) manually feeding said backing film between said stripping rollers; whereby further pulling of said solar radiation reducing film from said roll automatically strips said backing film therefrom and actuation of said horizontal measuring and cutting means provides a horizontal cut to said solar radiation reducing film and said backing film.

4,895,614

APPARATUS FOR LABEL TRANSFER

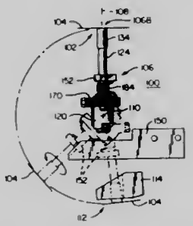
Lee E. Trouteaud, and Fritz F. Treiber, both of Dayton, Ohio, assignors to Hobart Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 2,597, Jan. 12, 1987, Pat. No. 4,787,953. This application Sep. 12, 1988, Ser. No. 246,592

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] B65C *9/08*

U.S. Cl. 156—542 **6 Claims**



1. Label transfer apparatus comprising an axle having a fixed axis, a transfer arm rotatable about said fixed axis between a label pickup position and a label delivery position and label grasping means for enabling said transfer arm to grasp a label at said label pickup position and release said label at said label delivery position, characterized in that said transfer arm comprises:

a socket body rotatably connected to said axle and having a central axis generally perpendicular to said fixed axis,

a nozzle carried by said socket body and rotatable about said central axis

an eccentric collar mounted fast on said nozzle,

spring means interconnecting said socket body and said nozzle for urging relative rotation therebetween about said central axis,

stop means for adjustably stopping said relative rotation at any one of a plurality of stop points,

angle selection means connected to said spring means and to said stop means for selecting one of said stop points, and

guide means for contacting said collar and causing rotation of said nozzle against the action of said spring means during a portion of the rotation of said transfer arm about said fixed axis.

4,895,615

MONOLITHIC FABRICATION TECHNIQUES FOR FRONT FACE OPTOELECTRONIC COUPLERS AND/OR OPTICAL COMPONENTS INCLUDING RIDGE STRUCTURED WAVEGUIDES

Markus Muschke, Braunthal, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

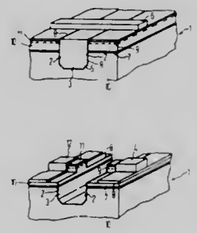
Filed Mar. 3, 1989, Ser. No. 319,010

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 3807777

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 **16 Claims**

1. A method for the monolithic fabrication of front face coupling of one of a group of components consisting of optoelectronic and optical components including a ridge waveguide structure in which the light-coupling edges of the component via a mask in the desired structure are etched out of a wafer of suitable material, which has been provided by at least one of a group processes consisting of an epitaxy-process, a diffusion-process and an implantation process with a sequence of layers depending on the component, the method comprising the steps of: covering etching grooves formed by either wet chemical or dry etching techniques having substantially perpendicular side walls serving as light-coupling edges of the component with suitable first layer of organic material; phototechnically removing the first layer of organic material in the region outside of the etched groove by incineration or by chemical exposure so that a remaining portion of the first layer



at least substantially fills the etched groove; applying a second layer of organic material over the first layer; structuring the second layer of organic material to form a ridge waveguide etching mask, and etching the ridge waveguide structures using the mask out of the wafer.

4,895,616

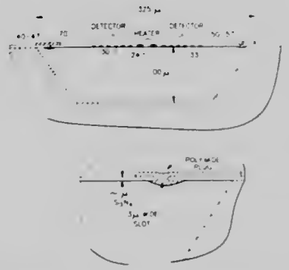
METHOD FOR MAKING THIN FILM ORTHOGONAL MICROSENSOR FOR AIR FLOW

Robert E. Higashi, Shorewood; James O. Holmen, Minnetonka; Steven D. James, Edina; Robert G. Johnson, Minnetonka, and Jeffrey A. Ridley, Burnsville, all of Minn., assignors to Honeywell Inc, Minneapolis, Minn.

Division of Ser. No. 129,204, Dec. 7, 1987. This application Apr. 24, 1989, Ser. No. 342,010

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—647 **12 Claims**



1. A process for fabricating a thin film microsensor for air flow comprising the steps of:

providing a single crystal (100) silicon wafer having a planar surface, and having a 110 direction;

depositing and delineating a rectangular area of a thin film layer of sacrificial selectively etchable material on the silicon surface;

depositing a thin film of silicon nitride on the selectively etchable material and the rest of the silicon surface, the film being thicker than the thickness of the sacrificial material;

depositing and delineating a thin film of electrically resistive material on the silicon nitride to form desired circuit elements such as detector resistors, circuit resistors and a heater resistor, said heater resistor and detector resistors being located over said sacrificial material area;

depositing a thin film of silicon nitride over the resistive material and the previous silicon nitride;

cutting narrow slots through the silicon nitride to the sacrificial material layer, the slots being near the sacrificial material layer edges;

introducing selective etch through the slots to etch out the sacrificial material layer leaving a thin cavity in its place;

introducing an anisotropic etch through the slots and cavity to anisotropically etch a thermal isolation pit in the silicon wafer; and

applying and delineating polyimide film over slots to close off the slots.

4,895,617

ETCHANT SOLUTION FOR PHOTORESIST-PATTERNED METAL LAYERS

Thomas S. Roche, and Maureen F. Preuss, both of Cheshire, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed May 4, 1989, Ser. No. 347,128

Int. Cl.[4] C23F *1/00, 1/02;* B44C *1/22;* C03C *15/00*

U.S. Cl. 156—665 **10 Claims**

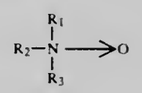
9. A process for etching a metal substrate which comprises immersing the substrate in an aqueous etchant solution comprised of water and:

(a) about 65% to 75% by weight phosphoric acid;

(b) about 1% to 5% by weight nitric acid;

(c) about 0% to 15% by weight acetic acid; and

(d) about 0.005% to about 5% of an amine oxide surfactant having the formula (I):



(I)

wherein R_1 *and* R_2 are each independently selected from the group consisting of lower alkyl group having 1–4 carbon atoms and lower alkoxy groups having 1–4 carbon atoms and R_3 is a higher alkyl group having about 8 to 18 carbon atoms or mixture thereof.

4,895,618

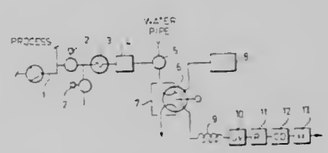
METHOD OF CONTROLLING ALKALINE PULPING PROCESS

Panu Tikka, and Nils-Erik Virkola, both of Helsinki, Finland, assignors to Afora OY, Helsinki, Finland

Continuation of Ser. No. 136,507, Dec. 28, 1987, abandoned, which is a continuation of Ser. No. 825,089, Jan. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 794,178, Nov. 1, 1985, abandoned. This application Mar. 23, 1989, Ser. No. 330,954

Int. Cl.[4] D21C *7/12*

U.S. Cl. 162—49 **1 Claim**



1. A method of sampling process liquor from an alkaline pulping process wherein said process liquor contains components including reaction product components and residual cooking chemicals flowing through a process pipeline of a digester, comprising the steps of:

(a) first, taking a sample of the process liquor from said process pipeline to a sample line;

(b) second, passing said sample along said sample line through a filter;

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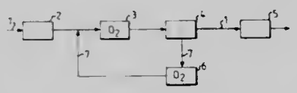
(c) third, isolating from said sample which has passed through the filter a smaller sample of a selected volume;
(d) fourth, diluting said smaller volume of sample with a flowing liquid to produce a diluted sample;
(e) fifth, passing said diluted sample including diluting flowing liquid through a capillary tube to produce mixing by diffusion;
(f) sixth, flowing said mixed diluted sample through measuring devices for measuring reaction product compounds and residual cooking chemicals to produce a signals indicative of selected properties of said sample; and
(g) seventh, washing said sample line and said filter by passing a washing medium through the sample line and filter in a direction opposite the direction in which said sample passes therethrough.

4,895,619

METHOD OF DELIGNIFICATION OF CELLULOSIC FIBER MATERIAL

Björn Ahs, and Rune Hillström, both of Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden

Filed Jan. 30, 1989, Ser. No. 302,962
Claims priority, application Sweden, Mar. 17, 1988, 8800964
Int. Cl.[4] D21C *9/10*
U.S. Cl. 162—55 **16 Claims**



1. A method of delignifying cellulosic fiber material comprising the steps of:
(a) feeding the material in a first path in a downstream direction;
(b) effecting oxygen delignification of the material as it passes in the first path at a first position;
(c) effecting screening of the material in the first path to form accepts fraction which continues to pass in the first path, and a rejects fraction which is fed into a second path;
(d) effecting treatment of the material in the second path consisting of the step of oxygen delignification of the material in the second path; and
(e) returning the treated material from the second path to the first path upstream of said first position.

4,895,620

ELECTRICALLY CONDUCTIVE CARBON-COATED FIBERS

Kenneth K. Ko; Nowaf Halout, and Ronald S. Lenox, all of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 830,278, Feb. 18, 1986, abandoned. This application May 15, 1987, Ser. No. 49,822
Int. Cl.[4] D21H *3/78*
U.S. Cl. 162—138 **31 Claims**

1. A composition having a low electrical resistivity comprising:
(a) fiber having (b) a carbon powder coating and (c) a binder which holds the fiber with the carbon powder coating wherein (a), (b) and (c) are characterized as follows in Lewis acid-base activity: the fiber is basic, the carbon powder is acidic and the binder is either neutral or acidic.

4,895,621

WATER SOLUBLE THERMOSETTING RESIN, PROCESS FOR ITS PRODUCTION, PAPER SIZING COMPOSITION AND PAPER SIZING PROCESS

Thord G. Hassler, Helsingborg, Sweden, assignor to W. R. Grace AB, Helsingborg, Sweden

Filed Nov. 18, 1986, Ser. No. 932,117
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1985, 3541511
Int. Cl.[4] D21H *3/36*
U.S. Cl. 162—164.3 **12 Claims**

1. A water soluble thermosetting resin comprising the reaction product of polyallylamine and (i) from about 0.1 to about 3 moles of epihalohydrin per mole of amine nitrogen in said polyallylamine, or (ii) formaldehyde in an amount sufficient to produce a reaction product having a viscosity of at least 15 mPas.; or (iii) mixtures of (i) and (ii).

4,895,622

PRESS FELT CONDITIONER FOR NEUTRAL AND ALKALINE PAPERMAKING SYSTEMS

Daniel J. Barnett; Abdul Q. Khan, and Patricia R. Keen, all of Jacksonville, Fla., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Nov. 9, 1988, Ser. No. 269,218
Int. Cl.[4] D21F *1/32*
U.S. Cl. 162—199 **15 Claims**

1. A process for inhibiting polymeric retention aid flocculated particulate deposition in felts of a papermaking system which comprises applying to said felts an effective inhibiting amount of a felt conditioner consisting essentially of:
a. A relatively low molecular weight organic, anionic polymer selected from the group consisting of: homopolymers of acrylic acid; copolymers of methacrylic acid and polyethylene glycol allyl ether; homopolymers of methacrylic acid; copolymers of acrylic acid and polyethylene glycol allyl ether; copolymers of acrylic acid and 1-allyloxy-2-hydroxypropane sulfonic acid; and
b. At least one hydrophilic, nonionic or anionic surfactant selected from the group consisting of: octyl phenol ethoxylate, nonyl phenol ethoxylate dodecyl phenol ethoxylate, secondary alcohol ethoxylate, ethoxylated polyoxypropylene glycol, dialkyl phenol ethoxylate, alkyl polyglycoside, dodecylbenzene sulfonic acid, and polyoxyethylene sorbitan monoester.

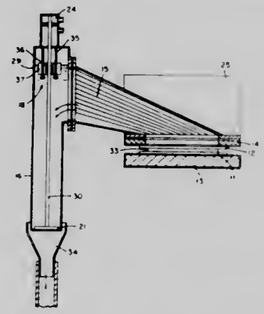
4,895,623

METHOD TO DE-WATER PULP FOR PAPER USING A SIPHON WITH SIMULTANEOUS FORMATION OF SHEET IN A TWO-WIRE SYSTEM, AND APPARATUS WHICH EMPLOYS SUCH METHOD

Glauco Corbellini, Udine, Italy, assignor to A.W.E. Anti Wear Engineering Srl, Udine, Italy

Filed Aug. 26, 1987, Ser. No. 90,769
Claims priority, application Italy, Sep. 5, 1986, 83401 A/86
Int. Cl.[4] D21F *11/00, 1/48*
U.S. Cl. 162—203 **9 Claims**

1. A method to simultaneously form and siphon water from a sheet of pulp comprising:
providing upper and lower continuously moving wire meshes, said meshes being spaced apart to define an area for receiving the pulp,
supplying said pulp between said meshes, and
simultaneously progressively mechanically compressing the pulp a predetermined amount and siphoning water, and essentially only water, from the pulp, using a siphon having a siphon mouth in contact with an upper surface of the upper wire mesh, wherein an upper end of the siphon is kept in contact with the atmosphere via a negative pressure source which raises water in the siphon to a predetermined height above the meshes conducting the siphoning of water at a constant value by preventing a meniscus from forming on said meshes,
wherein said meshes are located at a level and extend essentially horizontally, and the meniscus is prevented



from forming by the siphoning of water to a level above the level of said meshes, and wherein said negative pressure source keeps the siphon full of water for a start-up of the siphon.

4,895,625

METHOD FOR PRODUCING A GALVANICALLY DEPOSITED PROTECTION LAYER AGAINST HOT GAS CORROSION

Martin Thoma; Monika Bindl; Paul Baenger, all of Munich, and Josef Linska, Grafing, all of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,211
Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815976
Int. Cl.[4] C25D *5/50*
U.S. Cl. 204—16 **11 Claims**

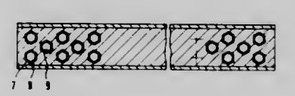
1. A method for producing a protective coating on structural components intended for exposure to hot gas, comprising the following steps:
(a) preparing an electrolyte in which a matrix material of cobalt and/or nickel is contained,
(b) preparing a metal alloy powder of aluminum and/or chromium having powder particles of spherical configuration,
(c) passivating the surface of said spherical powder particles,
(d) suspending said spherical powder particles in said electrolyte until a particle suspension concentration is reached within the range of 40 g/l to 100 g/l in the electrolyte,
(e) immersing said structural component in an electrolytic bath prepared with said electrolyte, and performing a galvanic deposition until a coating having the desired thickness is obtained, and
(f) removing the coated component from said electrolytic bath and subjecting the coated component to a heat treatment until an alloyed coating is formed.

4,895,624

TURBULENCE GENERATOR MADE OF PLASTIC WITH CERAMIC COATED FLOW DUCTS IN THE HEAD BOX OF A PAPER MACHINE

Lasse Koivisto, Varkaus, and Heikki Laitinen, Poitsila, both of Finland, assignors to Valmet-Ahlstrom Oy, Finland

PCT No. PCT/FI87/00063, § 371 Date May 27, 1988, § 102(e) Date May 27, 1988, PCT Pub. No. WO87/06964, PCT Pub. Date Nov. 19, 1987
PCT Filed May 12, 1987, Ser. No. 199,256
Claims priority, application Finland, May 12, 1986, 861977
Int. Cl.[4] D21F *1/02*
U.S. Cl. 162—343 **4 Claims**



1. In a headbox of a paper machine, a turbulence generator comprising
at least one perforated or apertured plastic beam having a plurality of flow ducts through which pulp suspension is to be passed,
said beam comprising surfaces defining said ducts passing therethrough and having a ceramic coating thereon,
wherein said ceramic surface coating and at least a part of a body of said plastic beam are chemically bonded to one another, to constitute a united entity.

4,895,626

PROCESS FOR REFINING AND PURIFYING GOLD

Peter S. Shor, 230 E. 15th St., New York, N.Y. 10003

Filed Apr. 14, 1989, Ser. No. 338,788
Int. Cl.[4] C25C *1/20*
U.S. Cl. 204—111 **10 Claims**

1. A method for electrorefining gold which comprises the steps of preparing an electrolytic cell including an anode, a cathode and an electrolyte.;
forming the anode from the gold-containing metal to be refined;
encasing said anode in a permeable anode bag to form an anode assembly;
filling the cell with an aqueous solution of electroconductive salts, at least one of said salts being a source of ammonium ions, said ammonium ions maintained in said electrolyte in concentrations sufficient to form soluble complexes with any silver in said gold-containing metal under the electrolytic conditions in said cell;
said electrolyte maintained at a pH sufficiently low to prevent precipitation of any non-gold hydroxides;
imposing a voltage potential between the anode and cathode of said cell sufficient to solubilize substantially all the non-gold components of said anode and remove same from said anode bag and to subdivide the insoluble gold content of said gold-containing metal into pure particulate gold; and

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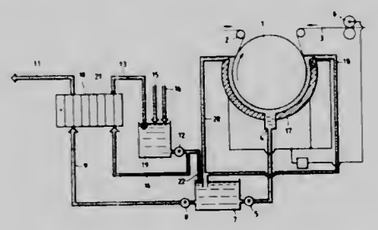
collecting the pure insoluble gold particles accummulated within the anode bag.

4,895,627

METHOD OF ELECTROLYTIC SURFACE TREATMENT OF ALUMINUM SUPPORTS FOR PLANOGRAPHIC PRINTING PLATES

Akio Uesugi, and Tsutomu Kakei, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1989, Ser. No. 305,597
Claims priority, application Japan, Feb. 5, 1988, 63-2402288
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.75 **5 Claims**



1. A method of electrolytic surface treatment of aluminum supports for planographic printing plates, comprising the steps of:

separating aluminum ions in an electrolyte for the surface treatment to the outside of a system using an ion-exchange membrane; and

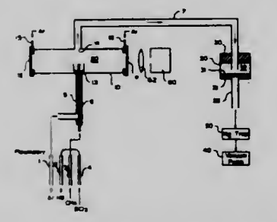
mixing the electrolyte after separation with a used electrolyte having high aluminum concentration, thereby to keep the aluminum ion concentration constant in the electrolyte before use.

4,895,628

PROCESS FOR THE PREPARATION OF SUBMICRON-SIZED BORON CARBIDE POWDERS

Arne K. Knudsen, and Charles A. Langhoff, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 700,841, Feb. 12, 1985. This application Jul. 28, 1986, Ser. No. 889,665
Int. Cl.[4] C01B *35/00*
U.S. Cl. 204—157.41 **14 Claims**



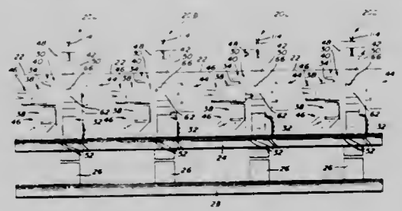
1. An endothermic process for the preparation of ultrafine high purity boron carbide powder, which comprises subjecting a continuous stream of a reactant gas mixture consisting essentially of; (1) volatile boron chloride source and; (2) up to a stoichimetric amount, calculated on the boron in the boron chloride source, of a volatile carbon source; (3) at least a stoichimetric amount, calculated on the boron in the boron chloride source, of a source of hydrogen, at an absolute pressure of at least about 300 Torr, to an amount of CO_2 laser radiation effective to convert at least a portion of the volatile boron chloride source to B_4C.

4,895,629

SPEED ELECTROCOAGULATION PRINTING METHOD AND APPARATUS

Adrien Castegnier, Outremont; Guy Castegnier, Ile Bizard; Francoise Castegnier, Outremont, and Gilles Gadbois, Rawndon, all of Canada, assignors to Elcorsy Inc., Montreal, Canada

Filed Apr. 24, 1989, Ser. No. 342,101
Int. Cl.[4] C25D *13/04*
U.S. Cl. 204—180.9 **65 Claims**



1. A method of reproducing an image and transferring same onto a substrate, which comprises the steps of:

(a) providing a positive cylindrical electrode having a central longitudinal axis and rotating at substantially constant speed about said longitudinal axis, said positive electrode being formed of an electrolytically inert metal and having a passivated surface defining a positive electrode active surface, and a plurality of negative electrolytically inert electrodes electrically insulated from one another and arranged in negative electrode active surfaces disposed in a plane parallel to the longitudinal axis of said positive electrode and spaced from the positive electrode active surface by a constant predetermined gap, said negative electrodes being spaced from one another by a distance at least equal to said electrode gap to prevent edge corrosion of said negative electrodes;

(b) coating the positive electrode active surface with an olefinic substance and a metal oxide to form on said surface micro-droplets of olefinic substance containing said metal oxide in an amount to prevent corrosion of said positive electrode;

(c) filling said electrode gap with a substantially liquid colloidal dispersion containing an electrolytically coagulable colloid, a liquid dispersing medium, a soluble electrolyte and a coloring agent, and having a substantially constant temperature;

(d) electrically energizing selected ones of said negative electrodes to cause point-by-point selective coagulation and adherence of the colloid onto the olefin and metal oxide-coated positive electrode active surface opposite the electrode active surfaces of said energized negative electrodes while said positive electrode is rotating, thereby forming a series of corresponding dots of colored, coagulated colloid representative of a desired image;

(e) removing any remaining non-coagulated colloid from said positive electrode active surface; and

(f) contacting the dots of colored, coagulated colloid with a substrate at a transfer position to cause transfer of the colored, coagulated colloid onto said substrate and thereby imprint said substrate with said image.

4,895,630

RAPIDLY REMOVABLE UNDERCOATING FOR VACUUM DEPOSITION OF PATTERNED LAYERS ONTO SUBSTRATES

Brian E. Aufderheide, Cedarburg, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Division of Ser. No. 770,338, Aug. 28, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,853
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192.11 **5 Claims**



1. A method for producing a patterned layer of a material on a substrate including the steps of:

(1) applying an undercoating on a surface of the substrate in a pattern including one or more first portions covered by the undercoating and one or more second portions of the surface free of the undercoating,

the undercoating comprising, in combination, (a) a water soluble film-forming polymer consisting of a polymer having a Water Solubility Rate, measured as defined in the specification, in the range of 1 to 10 hours; (b) a solubility accelerator consisting of a compound compatible with the film-forming polymer and having a Water Solubility Rate, measured as defined in the specification, of 30 minutes or less; and (c) a solid particulate material insoluble in the film-forming polymer and providing a rough surface topology to a dried layer of the undercoating;

(2) vacuum depositing a material over each first portion and each second portion of the surface of the substrate;

(3) removing the undercoating and vacuum deposited material adhering thereto from each first portion of the surface of the substrate by washing with water for one minute or less,

thereby providing the substrate with vacuum deposited material adhering to each second portion of the surface thereof.

4,895,631

PROCESS AND APPARATUS FOR CONTROLLING THE REACTIVE DEPOSIT OF COATINGS ON SUBSTRATES BY MEANS OF MAGNETRON CATHODES

Peter Wirz, Walderabach, and Friedrich-Werner Thomas, Gelnhausen, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau I, Fed. Rep. of Germany

Continuation of Ser. No. 59,559, Jun. 8, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,404
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709177
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.13 **10 Claims**

1. Process for controlling the reactive deposit of a coating on a substrate using a magnetron cathode operated at constant power and having a target with an electrically conductive component of the coating material, said method comprising the steps of

introducing said substrate into a coating zone adjacent to said target,

admitting a reaction gas in the immediate vicinity of the target,

generating a plasma between said target and said substrate, said plasma containing material from said target, said material producing at least one spectral line,

measuring the intensity of said spectral line,

automatically sensing a property of the finished coating after said substrate leaves said coating zone and producing a sliding reference value which is continuously and automatically adjusted in relation to said property as sensed,

regulating the admission of said reaction gas during the build-up of the coating according to the intensity of said spectral line and said sliding reference value so that a pre-established property of the finished coating is kept substantially constant, the time constant which represents the time lag between the measurement of the intensity and the admission of the reaction gas being kept to a minimum by the admission of the reaction gas in the immediate vicinity of the target.

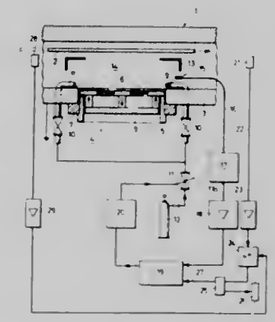
9. Apparatus for controlling the reactive deposit of a coating on a substrate comprising

a magnetron cathode having a target with an electrically conductive component of the coating material,

a coating zone into which said substrate is introduced, said coating zone being adjacent to said target, said target and said substrate defining therebetween a reaction zone in which a plasma is generated,

a gas distributing system comprising means for admitting a reaction gas in the immediate vicinity of said target, a source of reaction gas, and a control valve between said source and said admitting means,

a first control circuit comprising a spectral photometer



system having an optical sensor aimed at said reaction zone along a beam path parallel to said target, an amplifier connected to the output of said spectral photometer system, a controller, and an actuator for said control valve, said first control circuit having a relatively short time constant which represents the time lag between the measurement of the intensity and the admission of the gas,

a second control circuit comprising a second sensor which automatically senses a property of the finished coating after the substrate leaves the coating zone, a second amplifier connected to said second sensor, and a reference value generator which produces a sliding reference value which is automatically adjusted in relation to the property of the finished coating sensed, said generator being connected to said controller, said second control circuit having a relatively long time constant which represents the time lag between the sensing of the property of the finished coating and the admission of the gas, the optical sensor and the second sensor producing signals which are combined by the controller to regulate said control valve so that a pre-established property of the finished coating is kept substantially constant.

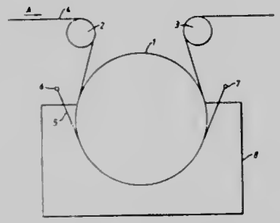
VOL 1110 ISS 4 JA 23 1990 UMI

4,895,632

DEVICE FOR PROVIDING A STRIPE SHAPED COATING ON AN ELONGATED CONDUCTIVE STRIP BY AN ELECTROLYTIC PROCESS

Willem Hoyer, Hertogenbosch, Netherlands, assignor to MECO Equipment Engineers B.V., Hertogenbosch, Netherlands

Filed Jan. 31, 1998, Ser. No. 304,548
Claims priority, application Netherlands, Feb. 10, 1988, 8800317
Int. Cl.[4] C25D *17/00*
U.S. Cl. 204—206 10 Claims



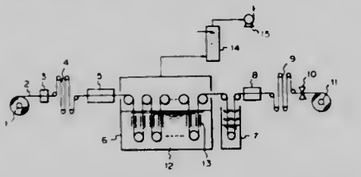
1. Device for providing, by an electrolytic process, a stripe shaped coating on an elongated conductive strip, said strip being guided along a rotatable wheel and provided with means for moving the strip in its longitudinal direction, in such a way that over part of the path the strip travels against at least part of the outer circumference of the wheel, whilst at the side of the strip remote from the wheel a stationary masking strip is provided, which covers at least part of the part of the strip which is in contact with the wheel and which is provided with holes, so that via the holes an electrolyte can be brought into contact with the part of the strip which moves along the holes during operation, characterized in that a groove, extending in the longitudinal direction of the masking strip, is provided in the side of the masking strip directed towards the strip, the width of said groove being equal to the width of the coating to be provided on the strip, whilst the holes debouch into said groove.

4,895,633

METHOD AND APPARATUS FOR MOLTEN SALT ELECTROPLATING OF STEEL

Hirohisa Seto; Atsuyoshi Shibuya; Junichi Uchida; Toshio Nakamori, all of Amagasaki; Hirotaka Nakabayashi, Osaka; Kenichi Yanagi, Hiroshima; Yukio Kanda, Hiroshima; Junkichi Yoneda, Hiroshima; Katsufusa Hidaka, Hiroshima; Yoshio Shimozato, Hiroshima; Yuuji Furuzawa, Hiroshima; Hajime Shimasaki, Hiroshima, and Toshio Taguchi, Hiroshima, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 3, 1988, Ser. No. 202,048
Int. Cl.[4] C25D *17/00*
U.S. Cl. 204—207 10 Claims



1. A molten salt electroplating apparatus comprising:
means for drying and preheating a previously cleaned steel member;
anodic treatment means for activating the surface of said steel member after it has been preheated;
iron ion removing means connected to said anodic treatment means and containing a packed layer of metal particles having a greater tendency to ionize than iron;
and electroplating means including an electroplating zone defined by an unimmersed anode and said steel member and further including a means for introducing a molten salt into said electroplating zone wherein said steel member is electroplated in said electroplating zone after its surface has been activated.

4,895,634

POROUS SEPARATORY MEMBER ENTIRELY MADE OF POLYPHENYLENE SULFIDE FOR THE ELECTROLYSIS OF WATER

Luigi Giuffré; Giovanni Modica; Alberto Pagani, all of Milan, Italy, and Giancarlo Imarisio, Brussels, Belgium, assignors to Fratelli Testori S.p.A., Milan, Italy

Filed Jun. 14, 1988, Ser. No. 207,334
Claims priority, application Italy, Jun. 22, 1987, 20989 A/87
Int. Cl.[4] C25B *13/08*
U.S. Cl. 204—296 4 Claims

1. A porous separatory member to be placed between anode and cathode of electrolytic cells for producing hydrogen and oxygen by water electrolysis, said member consisting of a fabric or felt entirely made of polyphenylene sulfide; said polyphenylene sulfide carrying on said polyphenylene sulfide's polymeric chain polar groups which make the separator ionically active.

4,895,635

NOVEL CAUSTIC-CHLORINE ELECTROCHEMICAL CELL MONITORING APPARATUS AND METHOD

Stephen A. Noding, Brusly, and John P. McGraw, Denham Springs, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 964,404, Dec. 23, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 142,610
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—435 13 Claims



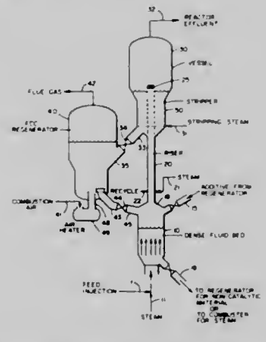
1. A continuous monitor reference electrode assembly for a caustic-chlorine electrolyzer having one or more electrochemical cells, each cell having electrode chamber walls, electrode screens, and including a selected electrochemical cell or a site thereon to be monitored, which assembly comprises
(a) a voltmeter,
(b) a standard calomel reference electrode connected to said voltmeter and in contact with the cell bath of a selected electrochemical cell which is to be monitored by said reference electrode and which cell is also connected to said voltmeter through a cell electrode;
(c) a continuous hollow flexible conduit having one end passing through said aperture of said conduit support body and being proximate said body and open to an electrode of said selected electrochemical cell, but spaced apart therefrom and the other end associated with said reference electrode and providing fluid contact for said cell bath with said reference electrode;
(d) a conduit support body which is free from structural integration with said electrolyzer and non-attachable to the electrode screen and having an aperture therein, said body is seated between said walls adjacent said selected electrochemical cell and located at a predetermined site thereon so that said conduit is supported at a predetermined location between said walls of said electrolyzer and adjacent said selected electrochemical cell, wherein said body is seated between said walls and prevents said conduit from being pinched or dislocated during the pressing together of said walls of said electrolyzer during set up operation prior to start up and operation thereof;
whereby said cell bath from said selected electrochemical cell flows to said reference electrode and performance of said selected electrochemical cell can be determined from said voltmeter.

4,895,636

FCC PROCESS WITH CATALYST SEPARATION

Nai Y. Chen, Titusville; Billy K. Huh, Lawrenceville, both of N.J., and Thomas F. Degnan, yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 10, 1988, Ser. No. 206,240
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—113 12 Claims



1. In a fluidized catalytic cracking (FCC) process for converting of heavy, metals laden crude oil feed to lighter products wherein the feed contacts a zeolite containing FCC catalyst in a catalytic riser reactor, catalyst and cracked products are separated at the cracking reactor outlet, the catalyst is stripped to remove strippable hydrocarbons therefrom and the stripped catalyst is charged to a conventional regenerator and regenerated with an oxygen containing gas and recycled to the reactor to recontact feed, the improvement which comprises
(a) contacting the feed with a mixture of FCC catalyst and a metals scavenging getter material which is separable from the FCC catalyst by physical means wherein the getter material is coarser than the catalyst, and the mixture contacts the feed at the base of an upflow riser reactor, the base of which has a settling zone which segregates getter from catalyst;
(b) removing a majority of the metals in the FCC feed by depositing them on the getter material; and
(c) segregating the FCC catalyst from the getter material before the FCC catalyst enters the FCC regenerator.

4,895,637

RESID CRACKING PROCESS AND APPARATUS

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 18, 1988, Ser. No. 259,561
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—113 10 Claims

1. A fluidized catalytic cracking process wherein a heavy, metals laden feed contacts hot regenerated catalytic cracking catalyst in a riser reactor, the feed is cracked to lighter products and the cracking catalyst is coked, catalyst is separated from cracked products in a separation means, coked catalyst is stripped of strippable hydrocarbons with a stripping gas, the stripped catalyst is regenerated with an oxygen-containing gas in a regeneration zone, and the regenerated catalyst is recycled to the riser to contact more heavy feed characterized by:
(a) cracking heavy feed in a riser reactor with an elutriable mixture of fluidizable catalytic cracking catalyst having a settling velocity and an additive material having a higher settling velocity than the cracking catalyst;
(b) segregating and regenerating said elutriable mixture by charging it to a regenerator comprising a single dense phase fluidized bed wherein the additive material and cracking catalyst segregate and form an additive rich lower dense phase bed and a cracking catalyst rich upper dense phase bed and adding a primary oxygen-containing gas to the upper dense bed and regenerating the cracking catalyst in the upper dense bed; and adding a secondary oxygen-containing gas to the additive rich lower dense bed to at least partially decoke the additive;
(c) removing the at least partially decoked additive from the additive rich lower dense bed and recycling the additive to the riser reactor for contact with the feed;
(d) separately removing the regenerated cracking catalyst from the upper dense bed and recycling the removed catalyst to the riser reactor.

4,895,638

CATALYTIC CRACKING PROCESS

Breat A. Anfdembrink, Wilmington, Del.; Thomas F. Degnan, Yardley, and Charles T. Kresge, West Chester, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 139,520, Dec. 30, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 339,284
Int. Cl.[4] C10G *11/04*
U.S. Cl. 208—118 25 Claims

1. A process for catalytically cracking a petroleum fraction to lighter hydrocarbons, the process comprising providing a feedstock containing a petroleum fraction and then contacting said feedstock with a catalyst under catalytic cracking conditions, the catalyst composition including a titanometallate layered metal oxide material comprising a layered metal oxide material comprising a layered metal oxide and pillars of a chalcogenide of at least one element selected from Groups IB, IIB, IIIA, IIIB, IVB, VA, VB, VIA, VIIA and VIIIA of the Periodic Table of the Elements separating the layers of the metal oxide, wherein each layer of the metal oxide has the general formula

$$[M_x[]_yZ_{2-(x+y)}O^4]^{q-}$$

wherein M is at least one metal of valence n wherein n is an integer between 0 and 7, [] represents a vacancy site, Z is titanium, and wherein

$$q=4y-x(n-4)$$

$$O<x+y<2$$

so as to produce lighter hydrocarbons.

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4,895,639

SUPPRESSING SEDIMENT FORMATION IN AN EBULLATED BED PROCESS

Michael P. Bellinger, and Scott M. Sayles, both of Baton Rouge, La., assignors to Texaco, Inc., White Plains, N.Y.

Filed Mar. 9, 1989, Ser. No. 321,112
Int. Cl.[4] C10G *13/02*
U.S. Cl. 208—149 10 Claims

1. An improved continuous process for treating a fluid hydrocarbon feedstock with a hydrogen-containing gas at elevated catalytic reaction temperatures and pressures in the presence of a bed of hydrocracking catalyst, said process comprising introducing the hydrogen-containing gas and feedstock into the lower end of a generally vertical catalyst containing reaction vessel wherein the catalyst is placed in random motion within the fluid hydrocarbon whereby the catalyst bed is expanded to a volume greater than its static volume, wherein the mixture of feedstock, gas and catalyst constitutes a turbulent zone from which zone aged, carbon containing catalyst is removed and fresh hydrocracking catalyst reduced in carbon is added, the upper portion of which turbulent zone is defined by an interface with a substantially catalyst depleted zone from which zone hydrocracked product is removed, wherein the improvement comprises:

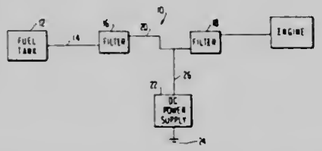
adding fluid catalytic cracking catalyst fines of a size of 40 microns or less to the bed of hydrocracking catalyst in an amount of up to 25 wt % of total catalyst, and recovering a hydrocracked product reduced in sediment.

4,895,640

METHOD FOR REMOVING IMPURITIES AND RESIDUAL MOISTURE FROM PETROLEUM FUELS

Herman R. Jackson, 1550 Selva Marina Dr., Atlantic Beach, Fla. 32233

Filed Feb. 10, 1989, Ser. No. 308,591
Int. Cl.[4] C10G *33/04*
U.S. Cl. 208—188 8 Claims



1. A method for removing impurities and residual moisture from a petroleum fuel comprising:

(a) circulating said fuel through a first filter apparatus made up of a cellulosic material containing a solid organic acid and a chromate compound: and

(b) circulating said fuel from step (a) through a second filter apparatus containing a cellulosic material containing water: and

(c) during (a) and (b) maintaining an electric grounding of said first filter apparatus via a DC power supply placed in between said first and second filters.

4,895,641

METHOD OF DESALTING CRUDE OIL

Maria I. Briceno, Caricuao, Sector CC-2, Bloque 4, Apt. 03-01; Maria L. Chirinos, Ur. Santa Paula, Calle Pluton Qta., both of Caracas, Venezuela; Alistair S. Taylor, 11 Stockbridge Way, Yateley, Camberley, Surrey, GU17 7BS, and Spencer E. Taylor, 32 Martindale Avenue, Heatherside, Camberley, Surrey, GU15 1BD, both of England

Continuation of Ser. No. 804,189, Dec. 3, 1985, abandoned. This application Jul. 31, 1989, Ser. No. 387,417
Claims priority, application United Kingdom, Dec. 7, 1984, 8431013
Int. Cl.[4] C10G *19/00*
U.S. Cl. 208—286 6 Claims

1. A method for reducing the salt content of a heavy crude oil which method comprises the steps of

(a) mixing 70 to 98% by volume of a heavy crude oil having a viscosity in the range 200 to 25,000 mPa.s at the mixing temperature with 30 to 2% by volume of an aqueous solution of an emulsifying surfactant or an alkali, percentages being expressed as percentages by volume of the total mixture; mixing being effected under low shear conditions in the range 10 to 1,000 reciprocal seconds, in such manner that an HIPR emulsion is formed comprising distorted oil droplets having mean droplet diameters in the range 2 to 50 microns separated by aqueous films,

(b) breaking the resulting emulsion, and

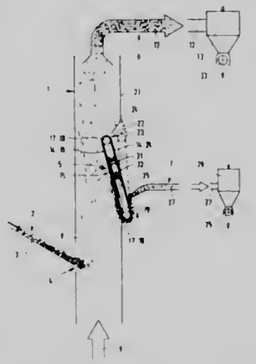
(c) separating the resulting mixture into a layer of relatively salt-free oil and a layer of relatively salt-enhanced water.

4,895,642

PROCESS FOR SEPARATING PARTICLES OF ELECTRICALLY NON-CONDUCTIVE MATERIAL, IN PARTICULAR PLASTICS MATERIAL AND/OR PAPER, FROM WASTE, AND A DEVICE FOR CARRYING OUT THE PROCESS

Josef Frei, Oberehrendingen, Switzerland, assignor to Organ-Faser Technology BV, Haarlem, Netherlands

Filed Feb. 17, 1988, Ser. No. 157,494
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3705004
Int. Cl.[4] B03C *3/01, 3/38, 3/88*
U.S. Cl. 209—127.3 9 Claims



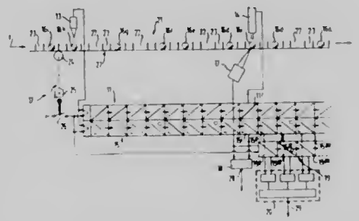
1. A device for separating particles of electrically non-conductive material such as plastics and paper from waste, having a feed device for feeding a stream of fractionated waste material into said shaft, comprising a first station provided with a device for electrostatically charging the particles of electrically non-conductive material in the stream of material and a subsequent second station provided with a receiving device of an opposite electrostatic charge, wherein said receiving device comprises a rotating conveying element which projects into or laterally borders the shaft or the stream of material, said conveying element further comprising a conveyor belt which is displaceable such as by pivoting, transverse to the shaft or to the stream of material.

4,895,643

MACHINE WITH AUTOMATIC TRANSPORT OF ARTICLES

Heinrich Hippenmeyer, Freiamt, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

Continuation of Ser. No. 747,287, Jun. 21, 1985, Pat. No. 4,707,250. This application Aug. 28, 1987, Ser. No. 90,528
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423538
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—552 5 Claims



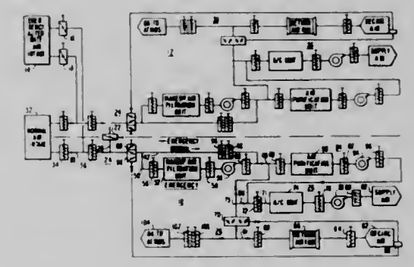
1. An automatic article transport machine, wherein individual like compartments are moved on a conveyor along a conveyor path subdivided into unit lengths, which are each associated with one compartment, past processing stations, single articles respectively being present in some of said compartments and the other ones of said compartments being empty, said articles having one of two characteristics, either a characteristic corresponding to a certain norm or a characteristic differing from the certain norm; said machine comprising: a characteristic shift register associated with said conveyor path and having a plurality of storage units and an input; a clock associated with the conveyor, which transmits a clock signal to said characteristic shift register on advance of the conveyor by one unit length, and thereby shifts information contained in the characteristic shift register on by one storage unit; a characteristic detection apparatus which is provided in the vicinity of the start of the conveyor path and is connected to said input of said characteristic shift register, said characteristic detection apparatus detecting the characteristic which the article moving past said apparatus possesses, and transmits a corresponding electrical characteristic signal which is input into a storage unit of the characteristic shift register; an article sorting apparatus arranged at a downstream position of the conveyor path, the article sorting apparatus being connected to the characteristic shift register and, at the instant an article moves past, receiving the associated characteristic signal from the associated storage unit of the characteristic shift register and correspondingly sorting the respective article; a presence shift register, said presence shift register being controlled by said clock, being provided in parallel with said characteristic shift register and having one storage unit for each compartment; means for generating one of a presence signal and an absence signal depending on whether an article is present in a compartment of said conveyor moving past said characteristic detection apparatus and for inputting the respective signal into a storage unit of said presence shift register; and an article presence detection apparatus arranged along the conveyor path at the location of the article sorting apparatus and connected to a logic circuit which transmits a fault signal when a determination made by the presence detection apparatus differs from the content of the associated storage unit of the presence shift register.

4,895,644

FLUID SUPPLY AND RECIRCULATION SYSTEM

Thaddeus T. Poremski, Jacksonville, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 841,677, Mar. 19, 1986, Pat. No. 4,775,397, which is a continuation of Ser. No. 604,300, Apr. 26, 1984, abandoned. This application Jul. 1, 1988, Ser. No. 214,072
Int. Cl.[4] B01D *46/00*
U.S. Cl. 210—97 16 Claims



1. A fluid supply system for supplying a fluid to a working system comprising:

a first fluid-intake conduit for drawing fluid into the supply system;

means for controlling the rate of fluid transported by said first fluid-intake conduit;

a fluid transport conduit communicably coupling with said first fluid-intake conduit downstream of said transported-fluid rate-control means;

a fluid output terminal communicably coupling with said fluid transport conduit at a location where the fluid is available for supply to the working system;

a first conditioning conduit through which the fluid is conditioned, communicably coupling downstream of said transported-fluid rate-control means, with said first fluid-intake conduit at one end, and with said fluid output terminal at the other end, said first conditioning conduit being connected in a parallel flow path with said fluid-transport conduit;

pumping means, connected to said conditioning conduit, for drawing fluid through said first conditioning conduit, in a direction from said fluid-intake conduit to said fluid output terminal, said pumping means being sized in capacity with reference to the capacity of said transported-fluid control means to pump fluid at a higher rate than its passage through the transported-fluid control means whereby fluid is pumped by said pumping means at a given rate through said first conditioning conduit which is larger than the rate of fluid being supplied through said transported-fluid control means, to establish a flow of fluid within said transport conduit in a direction from the fluid-output terminal toward said transported-fluid control means when said first conditioning conduit is in operation whereby the fluid from said first fluid-intake conduit whose rate is controlled by said transported-fluid control means is prevented from bypassing said first conditioning conduit.

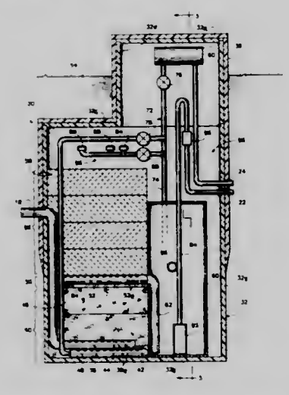
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4,895,645

ANAEROBIC/AEROBIC FILTER PLANT

Nicholas F. Zorich, Jr., One Third St., No. 101, P.O. Box 754, Astoria, Oreg. 97103

Filed Dec. 9, 1987, Ser. No. 131,989
Int. Cl.[4] C02F 3/30
U.S. Cl. 210—98 **23 Claims**



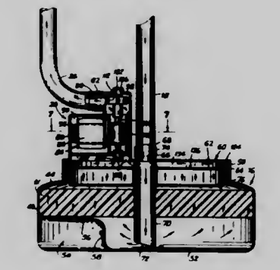
1. A biological filter for use between a septic tank and a drain field comprising:
- a filter tank, including an influent line from the septic tank, said filter tank having an anaerobic treatment means for treating, anaerobically, septic tank effluent and aerobic treatment means for treating, aerobically, septic tank effluent;
- a holding well for receiving fluid from said filter tank including connection means for providing fluid outflow from said holding well when the fluid reaches a predetermined level in said holding well; and
- a circulation well for receiving fluid from said connection means, including a circulation pump means for pumping the fluid selectively into said anaerobic treatment means, said aerobic treatment means, and the drain field.

4,895,646

EXTERNAL AQUARIUM FILTER

Allan H. Willinger, Oakland, N.J., assignor to Willinger Brothers, Inc., Oakland, N.J.

Filed Jun. 20, 1988, Ser. No. 209,412
Int. Cl.[4] A01K 63/04
U.S. Cl. 210—169 **9 Claims**



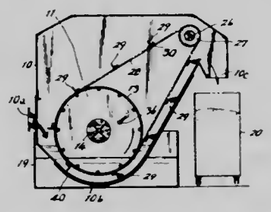
1. An external aquarium filter, comprising an open-top filter container, said open top being sufficiently wide to insert therein a layer of filtering material, a removable cover for said open top, an inlet fluid flow port and an outlet fluid flow port, both in said cover, said inlet flow port being substantially central of said cover, support means in said container for supporting the layer of filtering material across said filter container defining a clean water chamber above said filtering material and a contaminated water chamber below said filtering material, an inlet tube depending from said inlet fluid flow port for passing through a hole in the filtering material and in flow communication with said contaminated water chamber, and wherein the outlet fluid flow port is in flow communication with said clean water chamber, said filter container being formed as a substantially flat can of a circular cross-section and having an upwardly extending externally threaded neck portion, said cover comprising a screw-on cover top cooperating with said neck portion to close said can, said circular shape providing substantially even flow of the water from the substantially center inlet tube and upward therearound through the filtering material and into the contaminated water chamber, said support means comprising a plurality of raised knees inwardly projecting from the outer periphery of the container and along its lower part to define a shelf upon which the filtering material sits, said layer comprising a circular sheet of porous flexible foam filter material having an outer diameter approximating the inner diameter of said filter container and a central aperture for snugly receiving said depending tube, wherein said neck portion has a diameter less than the diameter of said container, and said container comprising a shoulder portion leading to said neck portion, said shoulder portion providing an upper stop for said filtering material, the thickness of said filtering material approximating the spacing between said support means and said shoulder.

4,895,647

FILTERING APPARATUS

Tadao Uchiyama, 5-24-3 Matsugaoka, Funabashi-shi, Chiba-ken, Japan

Filed Aug. 1, 1988, Ser. No. 226,845
Claims priority, application Japan, Aug. 12, 1987, 62-201154; Nov. 25, 1987, 62-296896
Int. Cl.[4] E03B 11/00; B01D 35/06
U.S. Cl. 210—171 **7 Claims**



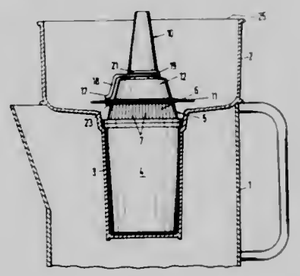
1. A filtering apparatus for filtering cutting oil containing metal chips, said apparatus comprising:
- an oil reservoir having a rectangular cross section, opposed end walls one of which end walls defines an oil inlet through which cutting oil is introduced into the reservoir and the other of which end walls defines a chip discharge area at which area metal chips are discharged out of the reservoir, opposed side walls extending between said end walls and one of which side walls has an oil discharge opening extending therethrough, and a bottom defined by an arcuate bottom wall extending between said end walls;
- a permanent magnet disposed outside said reservoir on said bottom wall for attracting metal chips in cutting oil in said reservoir toward the bottom wall thereof;
- a filtering drum rotatably mounted within said reservoir, said drum having a filtering screen extending about the periphery thereof for filtering cutting oil containing metal chips;
- an annular rotary member secured to said drum so as to rotate therewith and journalled in said oil discharge opening extending through said one of the side walls;
- a rotary shaft journalled in the other of said side walls and rotatably supporting said drum; and
- chip discharge means disposed in said reservoir for discharging metal chips disposed at said bottom of said reservoir from said reservoir at said discharge area, said chip discharge means operatively connected to said drum so as to rotate said drum when said chip discharge means operates.

4,895,648

FILTER COVER FOR A PURIFICATION INSERT IN A WATER TREATMENT DEVICE WITH A HOLLOW TUBE

Heinz Hankammer, Taunusstein, Fed. Rep. of Germany, assignor to Brita Wasser-Filter-Systeme GmbH, Taunusstein, Fed. Rep. of Germany

Filed Feb. 28, 1989, Ser. No. 316,871
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3814683
Int. Cl.[4] B01D 19/00, 35/00
U.S. Cl. 210—188 **7 Claims**



1. A filter cover for a purification insert (4) in a water treatment device, wherein the filter cover (5) has filter slots (7) on a conical surface portion (6) and at least one vent opening (9) in the middle of a raised connecting portion (8), and can be connected to a hollow tube (10) with a disc (11), characterised in that the filter slots (7) are substantially straight and are arranged in a ring-like configuration on the frustoconical surface portion (6) which occupies about $\frac{1}{3}$ to $\frac{1}{4}$ of the height of the filter cover (5) and that provided on the upper outer annular surface of the disc (11) are markings (15, 16) with which there is associated an adjustable pointer (17) mounted on an arresting ring (19) which is arranged non-detachably and rotatably on the hollow tube (10).

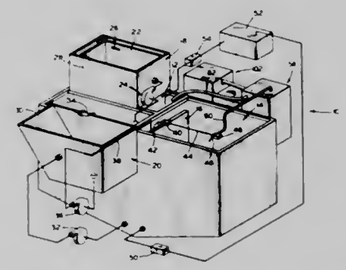
4,895,649

APPARATUS FOR PROCESSING COOLANT

Robert H. Brandt, Pemberville, and Merlin P. Hoodlebrink, Bradner, both of Ohio, assignors to Brandt & Associates, Inc., Pemberville, Ohio

Filed Dec. 5, 1988, Ser. No. 279,763
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—195.2 **9 Claims**

1. A coolant processing system comprising a clean coolant tank, a dirty coolant tank, a coalescing unit for separating free oil from the coolant, means for supplying coolant from said dirty coolant tank to said coalescing unit, means for supplying coolant from said coalescing unit to said dirty coolant tank, a filtering unit for separating particles from the coolant, means for supplying filtered coolant from said filtering unit to said dirty coolant tank and, alternately, toward said clean coolant tank, said filtered coolant supplying means comprising a pump, an inlet line connecting said filtering unit to an inlet of said pump, an outlet line connected to an outlet of said pump, a first three-way valve in said outlet line, a first branch line connected to said three-way valve for supplying liquid from said outlet line to said firty coolant tank, a second branche line communicating with said three-way valve, a second three-way valve in said second branch line, said second three-way valve having a third branch line for supplying coolant to said clean coolant tank, a fourth branch line connect4d to said second three-way valve, an ultrafitration tank communicating with said fourth branch line for receiving coolant, a first overflow line communicating with an upper portion of said ultrafiltration tank and said dirty coolant tank, for supplying excess coolant from said ultrafiltration tank to said dirty coolant tank, a reverse osmosis tank, a second overflow line communicating with an upper portion of said reverse osmosis tank and said ultrafiltration tank for supplying excess coolant from said reverse osmosis tank to said ultrafiltration tank, ultrafiltration means for filtering coolant from said ultrafiltration tank, means for circulating liquid from ultrafiltration tank to said ultrafiltration means, reverse osmosis means, means for circulating liquid from said reverse osmosis tank to said reverse osmosis means, and means for supplying coolant from said ultrafiltration means to said reverse osmosis tank.

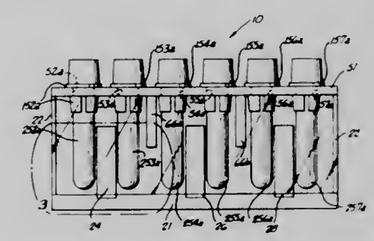


4,895,650

MAGNETIC SEPARATION RACK FOR DIAGNOSTIC ASSAYS

Robert Wang, San Diego, Calif., assignor to Gen-Probe Incorporated, San Diego, Calif.

Filed Feb. 25, 1988, Ser. No. 160,551
Int. Cl.[4] B03C 1/02
U.S. Cl. 210—222 **4 Claims**

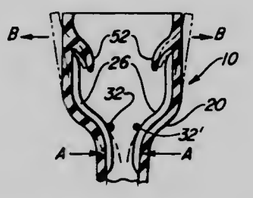


1. A magnetic separation rack for holding a plurality of containers, said rack comprising:
- a base;
- a top surface parallel to said base and having a plurality of apertures therethrough, said apertures arranged in rows and configured to accept and hold a top portion of the containers, the apertures holding each container in a posi-

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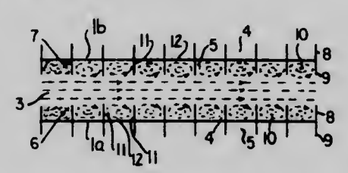
tion perpendicular to said top surface with a bottom portion of each container near said base; and
a series of magnets positioned immediately adjacent to one side of the position for each container without extending to said base,
wherein the position for each container has only one magnet immediately adjacent thereto,
wherein said magnets are arranged between every other row of the apertures.

4,895,651
PERSONAL, PORTABLE, DISPOSABLE TAP WATER FILTER
Glen H. Niddleton, 2641 Meldrum Road, Windsor, Ontario, Canada (N8W4G8)
Division of Ser. No. 150,978, Feb. 1, 1988, Pat. No. 4,824,565. This application Mar. 13, 1989, Ser. No. 322,645
Int. Cl.[4] B01D *00/00*
U.S. Cl. 210—266 **4 Claims**



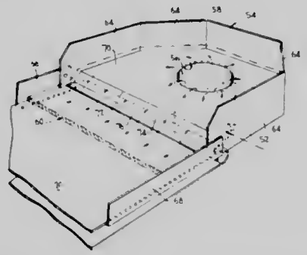
1. A method for mounting a fluid connector to a cylindrical member wherein said fluid connector has a resilient annular lip radially expandable in response to squeezing said fluid connector at a predetermined location displaced from said resilient annular lip, said method comprising the steps of:
radially squeezing said fluid connector at said predetermined location to radially expand said resilient annular lip;
inserting said radially expanded resilient annular lip over said cylindrical member; and
terminating the squeezing of said fluid connector to allow said resilient annular lip to radially contract compressably sealing said fluid connector on said cylindrical member.

4,895,652
CROSS-FLOW SEPARATOR
Jan Cornelissen, Hague, Netherlands, assignor to Pielkenrood-Vinitex B.V., Netherlands
Continuation-in-part of Ser. No. 551,374, Nov. 10, 1983, abandoned. This application Aug. 21, 1985, Ser. No. 768,031
Claims priority, application Netherlands, Nov. 12, 1982, 8204412
Int. Cl.[4] B01D *21/00*
U.S. Cl. 210—320 **4 Claims**



1. In a gravity cross-flow separator of the type comprising mutually parallel spaced-apart plates defining a substantially horizontal liquid flow path between each pair of adjacent plates for passing a liquid to be treated by gravity separation, said plates being inclined relative to a horizontal place and defining upper and lower gutters extending substantially in the direction of greatest inclination of said plates and transversely to the direction of liquid flow for collecting components separated from the treated liquid disposed above and below said flow path, respectively, wherein the improvement comprises that said gutters have substantially trapezoidal or rectangular cross section so as to substantially contain separated material in said gutters against entrainment with said horizontal liquid flow, the upper gutters of each flow path being in phase alignment with the lower gutters of the same flow path.

4,895,653
FLOODED BOTTOM DISTRIBUTION SYSTEM
John Cherochak, Hackettstown, N.J., assignor to Komline-Sanderson Engineering Corporation, Peapack, N.J.
Filed Jan. 29, 1988, Ser. No. 149,738
Int. Cl.[4] B01D *33/38*
U.S. Cl. 210—400 **11 Claims**

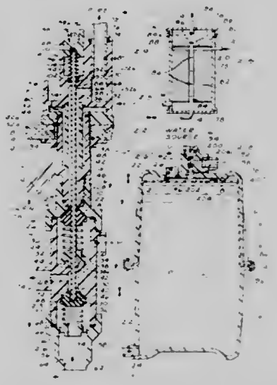


1. In combination with apparatus for dewatering a suspension of material in a liquid medium, a hopper for containing a pool of the suspension and having a substantially flat bottom, and side and end walls defining a pan having an opening at one end such that the suspension exits at said open end after a relatively short period of retention in the hopper, said bottom having an orifice formed therein through which the suspension is introduced into the hopper from below the hopper, and means independent of said dewatering apparatus for tilting said hopper and its substantially flat bottom toward and away from the open, exit end of the hopper and causing such suspension to gently overflow the open end of said hopper and be discharged therefrom.

4,895,654
PURIFIED WATER DISPENSING AND REJECT WATER CONTROL VALVE ASSEMBLY
Bruce D. Burrows, 25,145 W. Ave. Stanford, Valencia, Calif. 91355
Continuation of Ser. No. 848,360, Apr. 4, 1986, abandoned, which is a continuation of Ser. No. 573,155, May 1, 1984, Pat. No. 4,585,554, which is a continuation-in-part of Ser. No. 457,763, Jan. 13, 1983, abandoned, which is a continuation of Ser. No. 295,696, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 4,652, Jan. 19, 1979, abandoned, which is a continuation of Ser. No. 867,363, Jan. 6, 1978, abandoned. This application Nov. 25, 1987, Ser. No. 125,777
The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.
Int. Cl.[4] B01D *13/00, 35/02*
U.S. Cl. 210—110 **14 Claims**

1. A purified water dispensing and reject water control valve assembly, said control valve assembly being for use in a water purification system including a reverse osmosis unit having a purified water outlet and a reject water outlet and further including a reservoir tank having a purified water chamber for receiving and storing purified water produced by

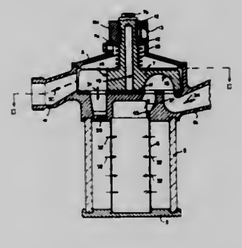
said reverse osmosis unit, said control valve assembly comprising:
an intermediate assembly including means defining a first reject water passage, a purified water passage, and a second reject water passage disposed generally in concentric relation to each other;
a lower assembly mounted generally at a lower end of said intermediate assembly, said lower assembly including a purified water inlet coupled to a first end of said purified water passage, a reject water inlet coupled to a first end of said first reject water passage, and a drain coupled to a first end of said second reject water passage;
an upper assembly mounted generally at an upper end of said intermediate assembly, said upper assembly including means forming a vented air gap to provide vented flow communication between second ends of said first and second reject water passage and a discharge spout coupled to a second end of said purified water passage;
a valve stem extending between said upper and lower assemblies and through said intermediate assembly, said valve stem carrying a first valve member for controlling purified water flow from said purified water inlet to said purified water passage, and a second valve member for controlling reject water flow from said reject water inlet to said first reject water passage; and



a valve actuator mounted on said upper assembly in operative relation with said valve stem for displacing said valve stem to move said first and second valve members together between substantially closed positions and open positions for controlling water flow into said purified water passage and said first reject water passage, respectively.

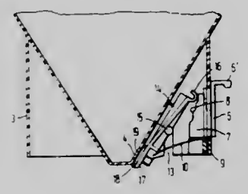
8. A purified water dispensing valve and reject water control valve assembly, said control valve assembly being for use in a water purification system including a reverse osmosis unit for converting feed water into a supply of purified water and a supply of reject water, said control valve assembly comprising:
a valve body having an intermediate portion, said intermediate portion including means defining a first reject water passage, a purified water passage, and a second reject water passage, said passages being disposed in generally concentric relation;
said valve body further including a lower portion defining a purified water inlet in communication with a lower end of said purified water passage, a reject water inlet in communication with said first reject water passage, and drain means in communication with a lower end of said second reject water passage;
said valve body further including an upper portion including means defining a vented flow passage coupled between the upper ends of said first and second reject water passages;
valve means for controlling flow of purified water into said purified water passage and for controlling reject water flow into said first reject water passage;
a valve actuator mounted on said valve body upper portion for operating said valve means; and
a discharge spout on said upper portion in communication with the upper end of said purified water passage.

4,895,655
FILTRATION APPARATUS
Robert H. Schindler, Bellmund, Switzerland, assignor to Liquitech Holding S.A., Luxembourg, Luxembourg
Filed Apr. 19, 1988, Ser. No. 183,583
Claims priority, application Luxembourg, Apr. 27, 1987, 86857
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210—411 **1 Claim**



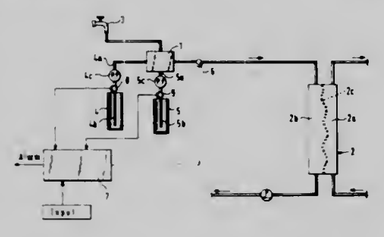
1. Filtration apparatus comprising a vessel, a filter which divides said vessel into two chambers, an inlet in said vessel for admitting liquid to be filtered, an outlet in said vessel for exhausting filtered liquid, a movable distributor device in said vessel actuable from externally of said vessel and movable between a filtration position in which it directs the liquid to be filtered into the first chamber which the liquid leaves by passing through the filter to pass into the second chamber which it leaves in the filtered condition through the outlet and a rinsing position in which it directs entering liquid into the said second chamber which the liquid leaves by passing through the filter in the reverse direction to the first chamber which it leaves charged with the impurities to be eliminated by an escape passage located in the vessel, wherein said distributor device includes passage means for interconnecting said escape passage and the first chamber when the distributor device is in the rinsing position, said distributor device disconnects said escape passage and said first chamber when the distributor device is in said filtration position, a cover for said vessel, a generally cylindrical wall, wherein said filter has a cylindrical shape and is mounted in said vessel coaxially with said wall, wherein said distributor device has a generally disc like shape, lies coaxial with the said vessel and is rotatably mounted in said vessel, said disc has a cylindrical extension which passes through an opening defined in the closure cover of said vessel and wherein the extremity of said cylindrical extension has section means for enabling it to be turned to actuate the distributor device, and a fixed vane situated in the passage between the inlet and the said first chamber for imparting a helical motion to the liquid engaging it.

4,895,656
ADJUSTABLE COFFEE FILTER
Gerard C. Smit, Amerongen, Netherlands, assignor to Smitdesign B.V., Netherlands
Filed Jan. 27, 1989, Ser. No. 303,565
Claims priority, application Netherlands, Feb. 3, 1988, 8800257
Int. Cl.[4] B01D *23/20, 23/28*
U.S. Cl. 210—481 16 Claims



1. A coffee filter for a coffee making apparatus comprising a holder for receiving a suitable filter element, said holder having at least at a lower end thereof a wall portion inclined relatively to a vertical axis of said holder and there being provided near the lower end a coffee outflow opening having a disc-shaped valve made from resilient material which, controlled by an operating member that is accessible from outside the holder, is adapted to be brought into different positions relative to the coffee outflow opening through cooperation of a spring and a cam-and-follower assembly, characterized in that the outflow opening is provided in the inclined holder wall portion, that at least opposite the coffee outflow opening and at an interspace outside said inclined holder wall portion there is provided a substantially vertical outer wall having a slide-receiving slit wherein a slide is mounted for axial adjustment therein, said slide carrying on the inside of the substantially vertical wall the cam having a curved surface, said valve being attached to one end of a lever whose other end functions as the follower, and with a leaf spring extending substantially across the interspace between the substantially vertical outer wall and the inclined holder wall portion and biasing the lever so as to close the outflow opening through the valve.

4,895,657
APPARATUS FOR HEMODIALYSIS
Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany
Filed Oct. 5, 1988, Ser. No. 253,814
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734880
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—647 9 Claims



9. In a method for hemodialysis using a hemodialysis apparatus which comprises a mixing system for supplying dialysis solution to a dialyzer and a protective system independent of the mixing system for preventing the dialyzer from receiving dialysis solution which is dangerous to a patient, wherein said mixing system includes at least one source container for dialysis concentrate, at least one intake conduit, a source of water, and a mixing means, and wherein said protective system includes a first conductivity cell for sensing conductivity of dialysis solution and a monitoring stage for monitoring conductivity of dialysis solution through said first conductivity cell, said method including the steps of mixing dialysis concentrate from said source container with water from said source of water to produce the dialysis solution, monitoring the conductivity of the dialysis solution through said first conductivity cell and preventing dialysis solution having a composition dangerous to the patient from reaching the dialyzer, the improvement comprising:
- providing at least one second conductivity cell in said intake conduit;
- monitoring conductivity of the dialysis concentrate through said second conductivity cell;
- applying an output signal from said second conductivity cell to a monitoring stage of a second protective system where correct connection of the dialysis concentrate container exists and conductivity measured by said second conductivity cell is within a preset range; and
- emitting an alarm or control signal from said second protective system where measured conductivity deviates from said preset range.

4,895,658
MEMBRANE CLEANING COMPOSITIONS CONTAINING ACRYLIC POLYMER
Zahid Amjad, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Jun. 15, 1987, Ser. No. 61,921
Int. Cl.[4] C02F *5/14;* C11D *3/37*
U.S. Cl. 210—636 11 Claims

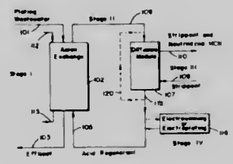
1. A composition for cleaning a semipermeable membrane comprising 20 to 80% by weight, based on the weight of total composition, of a weak organic acid and 20 to 80% by weight, based on the weight of total composition of an acrylic polymer selected from the group consisting essentially of copolymers of acrylic acid or its salt with 5 to 50% by weight of a copolymerizable comonomer or a mixture of such comonomers, weight average molecular weight of said acrylic polymer is in the range of 500 to 100,000.

7. In a process for cleaning a membrane used in a water purification system wherein water under pressure is passed through said membrane comprising the step of contacting said membrane with a cleaner composition in water comprising 20 to 80% by weight, based on the weight of total composition of an acrylic polymer and 20 to 80% be weight, based on the weight of total composition of a weak organic acid or a mixture thereof; said acrylic polymer is selected from copolymers of acrylic acid or its salt with 5 to 50% by weight of one or more copolymerizable comonomers, weight average molecular weight (M_w) of said acrylic polymer is in the range of 500 to 100,000.

4,895,659
METHOD FOR METAL AND CYANIDE RECOVERY FROM PLATING BATHS AND RINSE WATERS
Michael J. Semmens, Minneapolis, and Edward L. Cussler, Jr., Edina, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Apr. 30, 1987, Ser. No. 44,306
Int. Cl.[4] B01D *13/01;* C02F *9/00*
U.S. Cl. 210—638 35 Claims

28. A method for removing HCN from an acidic aqueous solution having heavy metal ions therein; said method including the steps of:

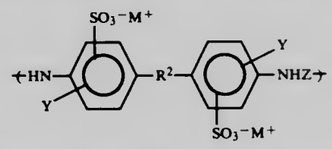
(a) substantially continuously passing said acidic aqueous solution through a microporous membrane module including at least one microporous membrane; and



(b) diffusing the HCN across the microporous membrane, leaving said heavy metal ions behind.

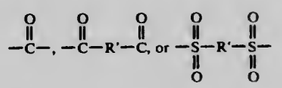
4,895,660
WATER-SOLUBLE AROMATIC POLYAMIDES AND POLYUREAS
Larry D. Kershner; Charles E. Reinecke, both of Midland, Mich.; Nitis Sarkar, Lake Jackson, Tex., and Larry R. Wilson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 885,357, Jul. 14, 1986, Pat. No. 4,824,916, which is a continuation-in-part of Ser. No. 708,608, Mar. 15, 1985, abandoned. This application Apr. 5, 1989, Ser. No. 333,375
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—640 7 Claims

1. A membrane comprising having properties for pervaporization of aqueous feeds derived from a discriminating layer consisting essentially of a polymer containing at least 90 weight percent of recurring units of Formula I:



(I)

wherein Y, at each occurrence, is independently a compatible substituent, M^+, at each occurrence, is a compatible cation, R^2 at each occurrence is a covalent bond, hydrocarbylene or inertly substituted hydrocarbylene; and Z at each occurrence is independently

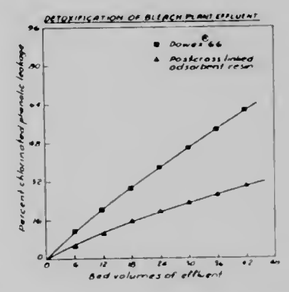


and R' at each occurrence is independently hydrocarbylene or an inertly substituted hydrocarbylene.

4,895,661
ALKALI RESISTANT HYPERFILTRATION MEMBRANE
John E. Cadotte, Minnetonka, Minn., assignor to Filmtec Corporation, Minneapolis, Minn.
Division of Ser. No. 1,488, Jan. 8, 1987, Pat. No. 4,834,886. This application Apr. 14, 1989, Ser. No. 339,331
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 7 Claims

1. A process for separating alkali metal salts of a C_1 to C_4 carboxylic acid from salts of a chelating agent comprising:
(a) contacting the discriminating layer of a membrane with an aqueous solution containing salts of the carboxylic acid and the chelating agent;
(b) effecting a chemical potential difference across the membrane so that salts of the carboxylic acid selectively permeate through the membrane;
(c) recovering the aqueous solution of carboxylic acids salts from the second surface of the membrane, wherein the membrane comprises a porous support layer and affixed to the support layer, a discriminating layer having a plurality of micropores in a normally water-compatible polymer matrix which bears a plurality of groups reactive with aldehyde, said polymer being crosslinked via reaction of a difunctional or polyfunctional aldehyde to render the polymer normally water-insoluble and wherein the membrane exhibit:
(i) a water flux of at least about 15 gfd and a rejection of at least about 60 percent when tested with an aqueous solution of 0.2 weight percent of a first compound or salt having a molecular weight in the range from about 300 to about 1,000 at 200 psi and 25° C., with the sum of the water flux in gfd and rejection of the first compound or salt in percent equal to at least about 90; and
(ii) a NaCl rejection of less than about 30 percent when tested with an aqueous solution of 0.2 weight percent NaCl at 200 psi and 25° C.

4,895,662
PURIFICATION OF EFFLUENT FROM WOOD PULP BLEACH PLANT
Rex R. Stevens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of Ser. No. 323,242, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 200,337, May 31, 1988, abandoned. This application May 15, 1989, Ser. No. 351,342
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—692 22 Claims



1. A process for purifying a waste effluent from the bleaching of wood pulp comprising the step of contacting a waste effluent with an adsorbent resin so as to adsorb color bodies or chlorinated organic compounds onto said adsorbent resin, wherein said adsorbent resin is derived from a macroporous copolymer of a monovinyl aromatic monomer and a crosslink-

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ing monomer, were the macroporous copolymer has been post-crosslinked in the swollen state in the presence of a Friedel-Crafts catalyst and functionalized with hydrophilic groups.

4,895,663

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

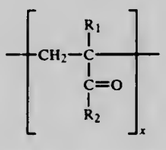
Filed Jul. 18, 1988, Ser. No. 220,194

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

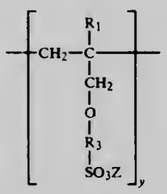
Int. Cl.[4] C02F 5/10

U.S. Cl. 210—701 **6 Claims**

1. A method of controlling the deposition of calcium phosphate on the structural parts of a system exposed to an aqueous medium containing said calcium and phosphate ions under deposit forming conditions, said method comprising adding to said aqueous medium an effective amount for the purpose of a water soluble polymer comprising repeat unit moieties (a) and (b) wherein said repeat unit (a) comprises the structure



and wherein said repeat unit (b) comprises the structure



wherein each R_1 is independently H or lower alkyl (C_1–C_3); R_2 is OH or OM; M is a water soluble cation; R_3 is 2,hydroxypropylidene; and Z is H or a water soluble cation or cations which together counterbalance the valence of SO_3; and said polymer has a molar ratio x:y of about 4:1 to 3:1 and a number average molecular weight of about 1,500 to 14,000, or said polymer has a molar ratio x:y of about 6:1 and a molecular weight of about 8,000 to 14,000.

4,895,664

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

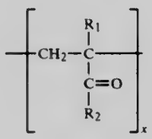
Continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Jul. 18, 1988, Ser. No. 220,195

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

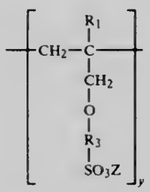
Int. Cl.[4] C02F 5/10

U.S. Cl. 210—701 **13 Claims**

1. A method of controlling the deposition of calcium phosphate on the structural parts of a system exposed to an aqueous medium containing said calcium and phosphate ions under deposit forming conditions, said method comprising adding to said aqueous medium an effective amount for the purpose of a water soluble polymer comprising repeat unit moieties (a) and (b) wherein said repeat unit (a) comprises the structure



and wherein said repeat unit (b) comprises the structure



wherein each R_1 is independently H or lower alkyl (C_1–C_3); R_2 is OH, or OM; M is a water soluble cation; R_3 is 2-hydroxypropylidene or a water soluble cation or cations which together counterbalance the valence of SO_3; and the molar ratio x:y of said polymer being between about 4:1 to 1:5.

4,895,665

METHOD FOR TREATING AND RECLAIMING OIL AND GAS WELL WORKING FLUIDS AND DRILLING PITS

Cam C. Colelli, 417 Hillcrest Dr., New Philadelphia, Ohio 44663, and David I. Mansberry, 10092 Hickory Ridge Dr., Brecksville, Ohio 44141, assignors to George D. Smith; John J. Smith, both of Canton; Gregory New, Beloit; Cam C. Colelli, New Philadelphia and David I. Mansberry, Brecksville, all of, Ohio

Filed Apr. 26, 1989, Ser. No. 344,001

Int. Cl.[4] B01D 21/01

U.S. Cl. 210—710 **22 Claims**

1. A method of clarifying an industrial working fluid containing soluble and insoluble contaminants retained within a pit means for collecting at the bottom thereof a layer of sludge comprising precipitates of said soluble contaminants and separated insoluble contaminants together with entrapped fluid including the steps of:

(a) adding a solid particulate treating agent comprising an alkaline earth metal oxide to said fluid in an amount exceeding its solubility therein to cause at least some of the soluble contaminants in the fluid to form a precipitate;

(b) causing said precipitate and insoluble contaminants to settle and form said layer of sludge and said excess treating agent to form a layer of treating agent substantially covering said layer of sludge at the bottom of said pit means; said treating agent having a density greater than that of said sludge and compressing the layer of sludge under the force of gravity to cause a portion of the entrapped fluid to be expelled therefrom; and

(c) withdrawing fluid above said layer of treating agent to provide clarified fluid in an amount greater than that possible in the absence of said layer of treating agent.

4,895,666

CENTRIFUGE WITH TWO WITHDRAWAL CHAMBERS

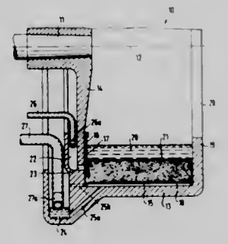
Paul Franzen, Grevenbroich, and Gunther Hultsch, Oberschleissheim, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Münich, Fed. Rep. of Germany

Continuation of Ser. No. 80,273, Jul. 31, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,145

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626314

Int. Cl.[4] B01D 21/26

U.S. Cl. 210—741 **37 Claims**



22. A process for the centrifugal separation of solids from a feed suspension, said process comprising:

feeding said suspension to a centrifuge basket having an axis of rotation, a radial filter, and a lateral filter;

filtering said suspension through said radial filter and forming a filter cake comprising solids from said suspension, said filter cake forming on a radial filtration side of said radial filter;

collecting radial-filtrate in a radial-filtrate collection space after passage through said radial filter;

collecting lateral-filtrate in a lateral-filtrate collection space after passage through said lateral filter;

lateral transferring said radial-filtrate from said radial-filtrate collection space to a radial-filtrate withdrawal chamber;

laterally transferring said lateral-filtrate from said lateral-filtrate collection space to a lateral-filtrate withdrawal chamber which is separate from said radial-filtrate withdrawal chamber and without admixture of said radial-filtrate and said lateral-filtrate; and

independently withdrawing at least one of said lateral-filtrate and said radial-filtrate from their respective withdrawal chambers.

4,895,667

FABRIC TREATING COMPOSITIONS

Priscilla S. Fox, Phoenix, and Barbara J. Felthouse, Scottsdale, both of Ariz., assignors to The Dial Corporation, Phoenix, Ariz.

Filed May 24, 1988, Ser. No. 198,181

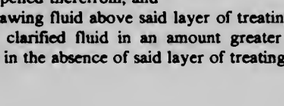
Int. Cl.[4] D06M 13/46

U.S. Cl. 252—8.8 **14 Claims**

1. A composition capable of imparting softness and antistatic properties to fabrics treated therewith in the wash cycle of a laundering process comprising:

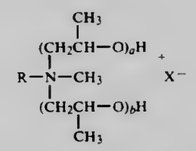
(1) an aliphatic cationic compound selected from the group consisting of:

(a) an ethoxylated quaternary ammonium compound characterized by the structure:



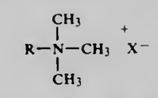
wherein R represents alkyl or alkenyl of 8–18 carbon atoms, each of a and b are at least 1 and the sum of a plus b is from 2 to 50 and X is Cl^- or $CH_3SO_4^-$,

(b) a propoxylated quaternary ammonium compound characterized by the structure:



wherein R represents alkyl or alkenyl of 8–18 carbon atoms, each of a and b are at least 1 and the sum of a plus b is from 2 to 50 and X is Cl^- or $CH_3SO_4^-$, and mixtures of (a) and (b), and

(2) a cationic mono long chain alkyl quaternary ammonium compound characterized by the structure:



wherein R represents alkyl or alkenyl of 8 to 18 carbon atoms and X is Cl^- or $CH_3SO_4^-$, and

wherein the ratio on a weight basis of said ethoxylated compound, said propoxylated compound and mixtures thereof to said mono long chain compound is from about 85:1 to about 15:1 and wherein said composition is formulated to deliver at least about 0.60% of said cationic compounds based on the weight of the fabrics being washed.

4,895,668

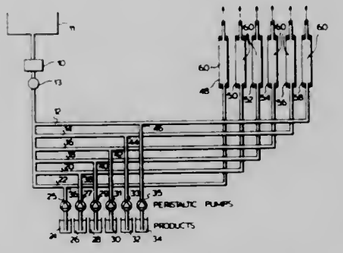
CARBOXYLATED SURFACTANT-CONTAINING LUBRICANTS, PRODUCTION AND USE

Manjit Singh, Kimberley, and Jeffrey Deaton, Sheffield, both of England, assignors to Diversey Corporation, Mississauga, Canada

Continuation of Ser. No. 15,978, Feb. 18, 1987, abandoned. This application Jan. 4, 1989, Ser. No. 293,346

Int. Cl.[4] C10M 129/40, 129/16

U.S. Cl. 252—34 **15 Claims**



1. An aqueous soap-based lubricant concentrate comprising:

(i) a soap lubricant;

(ii) a carboxylated surfactant of the formula selected from the following:

$$(a)R—(OC_mH_{2m})_nOR'COOX \quad (I)$$

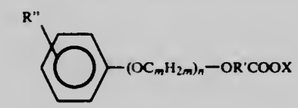
wherein:

R represents a fatty group;

R' represents an alkylene group;

X represents a cationic moiety;

m represents an integer of from 2 to 4; and
n represents an integer of from 1 to 20;



(II)

wherein
R'; X; m and n are as defined in (a); and
R" represents a C_6–C_{20} alkyl group, and
(c) mixtures thereof;
(iii) a non-carboxylated surfactant; and
(iv) an aqueous diluent.

4,895,669
AQUEOUS BASED ACIDIC HARD SURFACE CLEANER
Clement K. Choy, Walnut Creek, Calif., and Ellen E. Valachovic, Greenwood Lake, N.Y., assignors to The Clorox Company, Oakland, Calif.
Continuation of Ser. No. 926,448, Nov. 3, 1986, Pat. No. 4,804,491. This application Oct. 26, 1988, Ser. No. 262,972
Int. Cl.[4] C11D *3/39*
U.S. Cl. 252—95 **13 Claims**

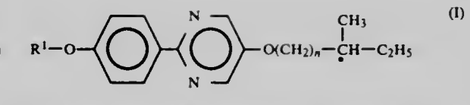
1. A phase-stable hard surface cleaner comprising:
an acidic aqueous phase having a pH of less than about 2, said aqueous phase consisting essentially of linear alkyl aryl sulfonic acid and alkali metal peroxymonosulfate, said linear alkyl aryl sulfonic acid and said alkali metal peroxymonosulfate being dissolved in said aqueous phase in amounts effective in together providing non-Newtonian rheology for said aqueous phase.

4,895,670
ADDITION OF SEVERELY-HINDERED AMINOACIDS TO SEVERELY-HINDERED AMINES FOR THE ABSORPTION OF H_2S
Guido Sartori, and W. S. Winston Ho, both of Annandale, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Oct. 13, 1987, Ser. No. 106,795
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—189 **4 Claims**

1. A composition comprising: (1) at least one severely hindered amino compound having a cumulative -E_s value (Taft's steric hindrance constant) greater than 1.75 wherein said severely hindered amino compound is selected from the group consisting of a secondary amino ether alcohol, a di-secondary amino ether, and mixtures thereof, and (2) an aminoacid, said aminoacid being a severely hindered amino compound having a cumulative -E_s value greater than 1.75, wherein said aminoacid is selected from the group consisting of N-tertiarybutylalanine, N-tertiarybutylglycine, and mixtures thereof, said aminoacid and said severely hindered amino compound being present in said absorbent composition in a mole ratio of said aminoacid to said severely hindered amino compound of about 0.01:1 to 4:1.

4,895,671
OPTICALLY ACTIVE PHENYLPYRIMIDINE COMPOUND AND A LIQUID CRYSTAL COMPOSITION
Makoto Ushioda; Kouji Ohno, and Shinichi Saito, all of Kanagawa, Japan, assignors to Chisso Corporation, Obsaka, Japan
Filed Oct. 21, 1988, Ser. No. 260,986
Claims priority, application Japan, Oct. 21, 1987, 62-265933
Int. Cl.[4] G02F *1/13*; C09K *19/34*; C07D *239/02*
U.S. Cl. 252—299.61 **13 Claims**

1. An optically active phenylpyrimidine compound expressed by the formula

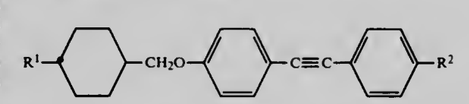


(I)

wherein n represents an integer of 3 to 7; when n is 3, R^1 represents alkyl of 8 to 12 carbon atoms; when n is 4, R^1 represents alkyl of 6 to 12 carbon atoms; when n is 5 to 7, R^1 represents alkyl of 5 to 12 carbon atoms; and the symbol • indicates an asymmetric carbon atom.

4,895,672
TOLAN COMPOUND AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME
Yasuyuki Goto, and Toshiharu Suzuki, both of Ichiharashi, Japan, assignors to Chisso Corporation, Japan
Filed Aug. 17, 1988, Ser. No. 233,048
Claims priority, application Japan, Sep. 25, 1987, 62-240499
Int. Cl.[4] C09K *19/30*; C07C *43/21, 43/215, 43/225*
U.S. Cl. 252—299.63 **5 Claims**

1. A 4-(trans-4-alkylcyclohexylmethyloxy)-4'-substituted-tolan expressed by the formula



wherein R^1 represents an alkyl group of 1 to 10 carbon atoms and R^2 represents an alkyl group of 1 to 10 carbon atoms or a halogen atom of F or Cl.

4,895,673
EMULSIONS FOR ELECTRODEPOSITING POLYMERIC ALLOYS AND COPOLYMERS
William M. Alviso, Penn Hills Township, Allegheny County, and Ram S. Raghava, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 12, 1985, Ser. No. 755,135
Int. Cl.[4] B01J *13/00*; C08J *3/08*; C09K *3/00*
U.S. Cl. 252—308 **15 Claims**

1. A method of making an emulsion from which an interpenetrating polymeric network can be electrodeposited comprising:
(A) forming at least two separate solutions in organic solvents, each of said solutions containing at least one compound that is structurally different from a compound dissolved in another of said solutions, said compounds being selected from the group consisting of organic solvent-soluble polymers, oligomers, and monomers;
(B) mixing each of said solutions separately with a non-solvent for said compounds to form at least two separate emulsions; and
(C) mixing together said separate emulsions to form a single emulsion without reacting said compounds.

3. An emulsion having a discontinuous phase which comprises at least two compounds of different structural formula selected from the group consisting of organic solvent-soluble polymers, oligomers, and monomers, dissolved in an organic solvent, where said compounds are non-reactive with each other in said emulsion, and a continuous phase which comprises an organic non-solvent for said compounds.

4,895,674
THERMALLY STABLE SULFONATE COMPOSITIONS
Lawrence V. Gallacher, Norwalk, Conn.; Alfen J. Gustavsen, Ballwin, Mo., and Robert L. Kugel, Norwalk, Conn., assignors to King Industries, Inc., Norwalk, Conn.
Filed Mar. 16, 1987, Ser. No. 26,077
Int. Cl.[4] C23F *11/10, 11/00*
U.S. Cl. 252—389.52 **14 Claims**

1. A homogeneous concentrate composition adapted for use as a rust- and corrosion-inhibitor in a petroleum or synthetic base medium and capable of retaining greater than about 90% of its sulfonate content at a temperature of 200° C. for 21 hours said concentrate comprising:
(a) a blend of:
(i) an oil soluble metal sulfonate; and
(ii) an alkali or alkaline earth metal or zinc soap of an alkyl or alkenyl succinic acid, a partially esterfied alkyl or alkenyl succinic acid or a mixture of any of the foregoing; and
(b) a carrier for said composition.

4,895,675
NEUTRAL PH WHEEL CLEANER
Ray E. Smith, Orlando, Fla., assignor to Pro-Max Performance, Inc., Longwood, Fla.
Filed Dec. 21, 1988, Ser. No. 287,120
Int. Cl.[4] C11D *3/065*
U.S. Cl. 252—539 **10 Claims**

1. A wheel cleaner for alloy and coated metal vehicle wheels comprising:
water in an amount of 54.5%±5% by weight;
a builder dissolved therein, said builder selected from the group consisting of tetrapotassium phosphate, tetrasodium pyrophosphate, trisodium phosphate, sodium tripolyphosphate, potassium tripolyphosphate, and trisodium phosphate;
sodium salt of sulfonate oleic acid added to said solution in an amount of 25%±10% by weight to adjust the pH of said solution to 7.5±0.5 by weight; and
an anionic surfactant selected from the group consisting of sodium salts of sulfonated dodecylbenzene and potassium salts of sulfonated dodecylbenzene in an amount of 10%±3% by weight.

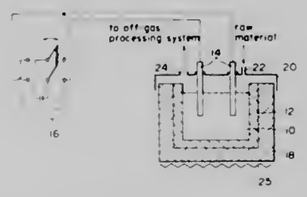
4,895,676
METHOD OF TREATING CONTACT LENSES
Mauro De Gregorio, Rome, Italy, assignor to Azienda Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Rome, Italy
Continuation of Ser. No. 77,620, Jul. 24, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,275
Claims priority, application Italy, Aug. 1, 1986, 21384 A/86
Int. Cl.[4] A61K *31/415*
U.S. Cl. 252—542 **12 Claims**

1. A method of inhibiting protein sedimentation from Lacrimal fluid on a contact lens and neutralizing irritative effect of existing protein sediments without substantially affecting mucus secretion by mucous membranes of the contact leans wearer wherein said lens is contacted with an effective amount of a composition comprising bendazac, 5-hydroxy-bendazac, or a salt thereof with an inorganic or organic physiologically acceptable base, and a physiologically acceptable carrier said contact occurring prior to insertion into the eye.

4,895,677
LIGHT-POLARIZING FILM
Takuzo Okumura, Tokyo; Toyokazu Okada, and Hitoshi Kikui, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Division of Ser. No. 910,220, Sep. 8, 1986, Pat. No. 4,803,014. This application Oct. 25, 1988, Ser. No. 262,571
Claims priority, application Japan, Feb. 26, 1985, 60-36855
Int. Cl.[4] F21V *9/14*; G02B *5/30*
U.S. Cl. 252—585 **1 Claim**

1. A light-polarizing film exhibiting a neutral gray produced by absorbing in and orienting at least one coloring matter selected from the group consisting of (1) (A) and (B), (2) (A) and (C), and (3) (A) and (B) and (C), as a dichroic coloring matter in a polymer film; wherein
(A) is iodine,
(B) is a dichroic dye having absorption characteristics and polarization characteristics in the wavelength region of 400~500 nm in the wavelength range of visible light,
(C) is a dichroic dye having absorption characteristics and polarization characteristics in the wavelength region of 600~700 nm in the wavelength range of visible light, wherein a high density polyethylene film or polypropylene film which has been uniaxially stretched is laminated as a protective film onto at least one side of the light-polarizing film.

4,895,678
METHOD FOR THERMAL DECOMPOSITION TREATMENT OF RADIOACTIVE WASTE
Katsuyuki Ohtsuka, Mito; Jin Ohuchi, Ibaraki, and Hideaki Tamai, Saitama, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan
Continuation of Ser. No. 233,280, Aug. 17, 1988, abandoned. This application Jan. 8, 1989, Ser. No. 363,305
Claims priority, application Japan, Sep. 16, 1987, 62-231857
Int. Cl.[4] C21F *9/08, 9/14*; C03B *5/027, 3/00*
U.S. Cl. 252—632 **5 Claims**



1. A method of thermal decomposition treatment of radioactive liquid waste containing sodium compound, which method comprises the steps of:
heating the radioactive liquid waste to evaporate a liquid component therein and to form a radioactive dried matter containing tbe sodium compound;
introducing the radioactive dried matter into a container which has a heating device for melting said sodium compound in said radioactive dried matter within said container, a pair of electrodes and a power source for applying voltage between said electrodes;
heating said radioactive dried matter by using said heating device to melt said sodium compound in said radioactive dried matter;
applying electric current to said electrodes while changing the polarity of the voltage every several tens of seconds to directly heat said molten sodium compound by Joule heat, thereby decomposing, vaporizing and removing said sodium compound to form a stabilized radioactive solid as a residue in the container; and
taking out said stabilized radioactive solid from said container.

VOL 1110 ISS 4 JA 23 1990 UMI

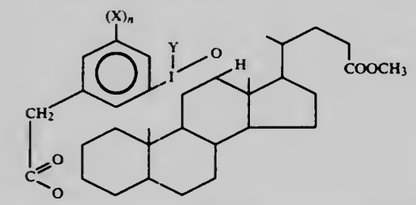
4,895,679

PROCESS FOR PRODUCTION OF CHENODEOXYCHOLIC ACID AND NOVEL INTERMEDIATES USEFUL FOR THE PROCESS

Seo H. Yoo, Wyckoff, N.J., assignor to Prime Chemicals Technology Corporation, Wyckoff, N.J.

Filed Feb. 17, 1989, Ser. No. 331,975
Int. Cl.[4] C07J *1/00*
U.S. Cl. 260—397.1 13 Claims

1. A compound of the formula:



wherein —X is an electron withdrawing group, n is an integer equal to zero or one, and —Y is a halogen.

4,895,680

HYDROCARBON OXIDATIONS CATALYZED BY NITRIDE-ACTIVATED METAL COORDINATION COMPLEXES

Paul E. Ellis, Jr., Downingtown; James E. Lyons, Wallingford, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Jan. 2, 1987, Ser. No. 247
Int. Cl.[4] C07C *67/00, 27/12, 45/32, 45/33*
U.S. Cl. 260—410.9 R 20 Claims

1. In a process in which an alkane is selectively oxidized by contact with air or oxygen in the presence of a catalyst comprising a Group IV(*a*) to VIII transition metal coordination complex, the improvement which comprises activiting said catalyst with nitride.

4,895,681

FATTY ACID ESTERS OF POLYGLYCEROL POLYGLYCOL ETHERS, THEIR PRODUCTION AND USE

Klaus Herrmann, Monheim, and Leonhard Wittich, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 111,386, Oct. 21, 1987, abandoned.
This application Dec. 20, 1988, Ser. No. 287,686
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636086
Int. Cl.[4] C07C *67/76*
U.S. Cl. 260—410.6 8 Claims

1. A foam inhibitor for aqueous systems comprising a fatty acid ester of polyglycerol polyglycol ether obtained by first reacting a polyglycerol with from about 2 to about 60 moles of ethylene oxide and from about 10 to about 60 moles of propylene oxide, and then esterifying the resulting alkylene oxide adduct with a C_8–C_{22} fatty acid using from about at least 1 to about 3 moles of fatty acid per mole of hydroxyl groups in said polyglycerol.

4,895,682

HYDROCARBON OXIDATIONS CATALYZED BY AZIDE-ACTIVATED METAL COORDINATION COMPLEXES

Paul E. Ellis, Jr., Downingtown; James E. Lyons, Wallingford, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Copany, Philadelphia, Pa.

Filed Jan. 2, 1987, Ser. No. 246
Int. Cl.[4] C07C *67/00, 27/12, 45/32*
U.S. Cl. 260—410.9 R 9 Claims

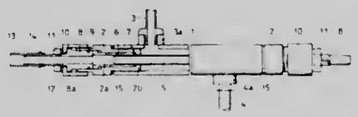
1. In a process in which an alkane is selectively oxidized by contact with air or oxygen in the presence of a catalyst comprising a Group IV(*a*) to VIII transition metal coordination complex, the improvement which comprises activating said catalyst with an azide ion bonded to the transition metal.

4,895,683

APPARATUS FOR MASS TRANSFERRING BETWEEN PHASES DIFFERENT FROM EACH OTHER

Yoshihiko Iwasaki, Miyazaki, Japan, assignor to Kiyomoto Tekko Kabushiki Kaisha, Miyazaki, Japan

Division of Ser. No. 43,221, Apr. 27, 1987, Pat. No. 4,818,447.
This application Jan. 24, 1989, Ser. No. 301,237
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—104 2 Claims



1. An apparatus for contact between phases different from each other, comprising:

an outer tubular column formed at side wall portions thereof with a nozzle for feeding fluid and a nozzle for discharging fluid, and formed at opposite ends thereof with openings, on the inner surfaces of which are formed threads:

two fixing flange tubes each having a first end portion formed on an outer wall surface thereof with threads and at inside of an inner wall surface with an annularly raised stepped portion, a second end portion formed thinner in wall thickness than the first end portion and formed on an outer wall surface thereof with threads, and a central portion formed with a stepped portion, said threads on the outer surface of the first end portion being detachably, threadably coupled to said threads on the inner surface of either one of the openings of said outer tubular column;

a box nut-shaped cap 10 detachably, threadably coupled to the threads on the outer wall surface of the second end portion of said fixing flange tube;

a porous tube whose opposite end portions are inserted into openings of the first end portions of said fixing flange tube;

an annular elastic member provided at the stepped portion in the first end portion of said fixing flange tube and deformable under pressure;

a collar having one end portion being in contact with said annular elastic member in the first end portion of said fixing flange tube and the other end portion formed on the outer periphery thereof with a flange portion which is located at a position closer to the second end portion than the central stepped portion of said fixing flange tube;

a nozzle 8 having a first end portion capable of being in contact with the flange portion of said collar in the inner side of the second end portion of said fixing flange tube, a second end portion formed into a nozzle shape smaller in outside diameter than the first end portion, an intermediate portion formed on the outer periphery thereof with a flange portion engageable with the inner side of said cap, and a portion closer to the second end portion than said flange portion, being formed on the outer periphery thereof with threads; and

a nut detachably, threadably coupled to the threads on the outer periphery of said nozzle; wherein, in a state where said cap is threadably coupled to the threads of said fixing flange tube, through said nozzle and said collar, said annular elastic member is deformed to thereby contact and hold said porous tube.

4,895,684

CURING OF ARTICLES IN A DOME PRESS AFTER EARLY SHUT-OFF OF STEAM

William F. Mattson, Hinckley, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Continuation-in-part of Ser. No. 102,956, Sep. 30, 1987, Pat. No. 4,816,198, which is a continuation-in-part of Ser. No. 704,850, Feb. 25, 1985, abandoned. This application Dec. 10, 1988, Ser. No. 285,690
Int. Cl.[4] B29C *35/02*
U.S. Cl. 264—40.6 3 Claims

1. In a process for shaping and curing a green article in a dome press using high pressure external steam to heat a mold in the press, by flowing said steam externally over said mold, placing said green article in a cavity defined by upper and lower halves of said mold, heating said article internally with an internal beating medium flowed through a bladder, and externally with steam flowed over said mold, so that, when the press is opened, the point of least cure has received the required number of cure equivalents to complete curing said article, the improvement comprising,

(a) flowing said external steam for long enough to maintain the external surface of said mold at above about 270° F,

(b) shutting off the flow of said steam early, before said point of least cure has received one-half of said required number of cure equivalents, early shut-off occurring after about 25%, and before about 75%, of a normal external steam-on cycle time is over, during which cycle the external steam flow would have continuously been maintained; said early shut-off also occurring at a time such that a temperature swing of 10° F at a location within said mold near an interface of said article and an article surface-forming portion of said mold is not exceeded; yet,

(c) delivering substantially the same required number of cure equivalents to said point of least cure as delivered during a normal external steam-on cycle without extending the press-close to press-open time which would have been required for a normal external steam-on cycle, and without monitoring the temperature at any point within said article; whereby the amount of steam saved by said early shut-off is correlatable to the time during which said steam is shut-off early.

4,895,685

CROSSLINKED COMPOSITE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Zenjiro Honda; Hajime Komada, and Hiroki Karakane, all of Himeji, Japan, assignors to General Director of the Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 6,151, Jan. 23, 1987, Pat. No. 4,824,573.
This application Feb. 10, 1989, Ser. No. 308,785
Claims priority, application Japan, Jan. 23, 1986, 61-11088; Jan. 23, 1986, 61-11089
Int. Cl.[4] B01D *13/04*
U.S. Cl. 264—45.5 12 Claims

1. A process comprising producing a crosslinked composite membrane by the steps of:

applying a crosslinking solution containing reactants which comprise a water-soluble polysaccharide having a sulfonate group and/or a sulfonic acid group and a polyfunctional melamine compound to a porous base;

effecting the drying of the crosslinking solution and the crosslinking of the reactants simultaneously to form a skin layer having a crosslinked structure formed by covalent bonds on the porous base; and
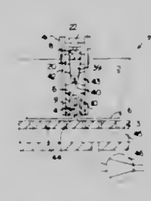
repeating said process steps.

4,895,686

PROCESS FOR THE PRODUCTION OF CUSHIONS MADE OF FOAM WHICH ARE PROVIDED WITH TEXTILE COVERS

Volker Onnenberg, Drabenderhoehe; Ralf Busch, Cologne, both of Fed. Rep. of Germany, and John Lindsey, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 65,793, Jun. 24, 1987. This application Dec. 1, 1988, Ser. No. 278,624
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3622951
Int. Cl.[4] B29C *67/22, 51/10*
U.S. Cl. 264—46.6 4 Claims



1. A process for the production of foam cushions having textile covers which comprises inserting a textile cover into a mold cavity having gates which project into said mold cavity, initially preforming said textile cover by applying a vacuum through holes in said mold cavity such that said textile cover conforms to the contour on both sides of each of said gates, clamping said textile cover against said gates, further positioning said textile cover such that it conforms to the contours of both said gates and said mold cavity, releasing said clamps and subsequently introducing a foam-forming reaction mixture into said mold cavity and against said textile cover.

4,895,687

PROCESS FOR CONVERTING DUSTY OR STICKY PARTICULATE MATERIALS

David Farrar, and Peter Flesher, both of West Yorkshire, England, assignors to Allied Colloids Ltd., United Kingdom

Filed Oct. 26, 1988, Ser. No. 262,619
Claims priority, application United Kingdom, Oct. 27, 1987, 8725096
Int. Cl.[4] B29B *9/00*
U.S. Cl. 264—118 10 Claims

1. A process of converting a dusty or sticky particulate mass into an apparently dry, substantially non-dusty, granular material, the process comprising distributing a polymerisable material in aqueous solution substantially uniformly throughout the particulate mass, causing polymerisation of the polymerisable material to proceed to a stage at which the mass is substantially non-sticky, converting the mass to granular form while in this state and completing the polymerisation and, optionally, breaking any aggregates of granules after polymerization completion.

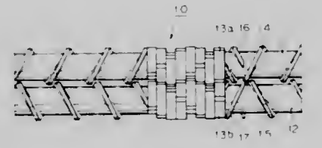
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4,895,688

METHOD OF PRODUCING A SUPPORT FOR PHOTOGRAPHIC PAPER

Tsunehisa Shigetani; Masahiro Kamiya; Tatsuo Miyakoda, all of Tokyo; Katsuhiko Sakata, Nichinan; Toshio Inada, and Tatsumi Okada, both of Tokyo, all of Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,310
Int. Cl.[4] B29C *47/06, 47/40;* **B32B** *27/10, 31/30*
U.S. Cl. 264—171 **8 Claims**



1. A method of producing a support for photographic paper, comprising the steps of:

preparing a resinous melt from a resinous material comprising a water proof thermoplastic polymer and a pigment and continuously coating at least one surface of a substrate sheet with the resinous melt by a melt-extrude-coating procedure; and

solidifying the resultant coating layer of the resinous melt on the substrate sheet,

wherein the resinous melt to be coated on the surface of the substrate sheet contains at least a portion thereof to which at least one melt-kneading procedure is applied in a melt extruder having a pair of biaxial screws engaged with each other, satisfying the relationship (I):

$$L \geqq 20D \quad (I)$$

wherein L represents a length of each screw and D represents a diameter of each screw, and provided with at least one pair of kneading disks located in at least a portion of the biaxial screws.

4,895,689

PROCESS FOR PREPARING HEAT TREATED SOLUTION CAST POLYKETONE-BASED BARRIER POLYMER MATERIALS

Leonard E. Gerlowski, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 128,967
Int. Cl.[4] B29C *39/00, 71/02*
U.S. Cl. 264—216 **6 Claims**

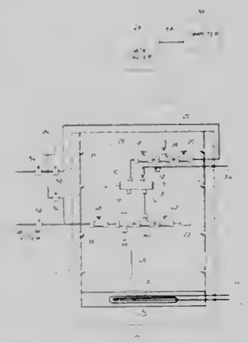
1. A process for preparing a polymer material having improved oxygen and carbon dioxide barrier properties comprising the steps of:

blending together hexafluoroisopropanol and a member selected from the group consisting of methanol, ethanol, isopropyl alcohol, butanol, and mixtures thereof, in a ratio of vol% ranging from 99:1 to 60:40;

adding a quantity of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon to form up to a 17wt% solution of said polymer;

casting said solution forming a solution cast film;

heating said solution cast film to a temperature in the range from about 20° C. to below to about 0° C. below the melting point of the polymer; and



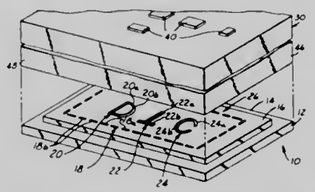
cooling said heated solution cast film at from about 6° C. to about 10° C. per minute.

4,895,690

METHOD FOR CASTING COLORED DETAILS

Wayne D. LaRoche, Farmington, and John D. Gray, New Durham, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 77,435, Jul. 24, 1987. This application Feb. 22, 1989, Ser. No. 313,522
Int. Cl.[4] B29B *17/00;* **B29C** *39/12*
U.S. Cl. 264—245 **7 Claims**



4. In a process for forming a desired decorative feature in situ in a base layer of thermoplastic material in a shell made from thermoplastic material having a fuse temperature cast against a heated tool having a mold surface thereon the method comprising:

forming recesses in a reference mold surface with the recesses defining the desired decorative feature therein to receive and retain cast material for subsequent bonding to the base layer of thermoplastic material that is cast to cover the reference mold surface so as to produce a raised, color contrasting, decorative feature on the base layer;

providing a masking construction having a plurality of foot portions with peripheral edges corresponding to peripheral edges of the recesses for covering all portions of the reference mold surface except for the recesses formed therein when the masking construction is connected to the heated tool;

providing separate sources of the thermoplastic material between each of the foot portions;

heating the reference mold surface of the tool to a temperature lower than the fuse temperature of the thermoplastic material;

connecting the masking construction to the tool to align the peripheral edges of the foot portions with the peripheral edges of the recesses of the reference mold surface to expose only the recesses to the separate sources of thermoplastic material;

inverting the connected masking construction and tool for depositing a first layer of the thermoplastic material into the recesses of the reference mold surface;

reinverting the connected masking construction and tool for recycling unused thermoplastic material to the separate sources of the thermoplastic material;

removing the masking construction from the tool;

heating the reference mold surface of the tool to a temperature to melt and fuse the first layer of thermoplastic material; and

casting a base layer of thermoplastic material against the reference mold surface and the first layer of thermoplastic material to bond and fuse the first layer of thermoplastic material to the base layer, and then cooling the reference mold surface of the tool and stripping the bonded base layer and first layer of thermoplastic material from the reference mold surface thereby forming the color contrasting, raised, decorative feature on the base layer.

4,895,691

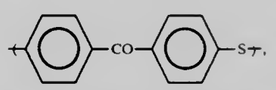
POLY(ARYLENE THIOETHER-KETONE) FIBERS AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake; Yu Iizuka, both of Iwaki; Hiroyuki Endo, Ibaraki; Toshitaka Kouyama, Iwaki; Takayuki Katto, and Zenya Shiiki, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Division of Ser. No. 194,014, May 12, 1988. This application May 19, 1989, Ser. No. 354,321
Claims priority, application Japan, May 15, 1987, 62-118620; Jul. 21, 1987, 62-181970; May 7, 1988, 63-109920
Int. Cl.[4] B29C *55/00;* **C08F** *283/00*
U.S. Cl. 264—288.4 **6 Claims**

1. A process for the production of poly(arylene thioether-ketone) fibers, which comprises melt-extruding a thermoplastic material, which comprises:

(A) 100 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO—and —S—are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, Tm being 310–380° C.;

(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc (420° C./10 min) being at least 210° C., wherein ΔHmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min, after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.3–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 percent by weight sulfuric acid; and optionally,

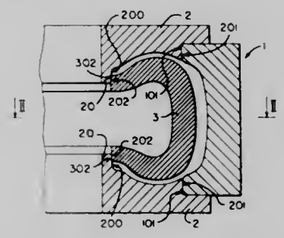
(B) up to 50 parts by weight of at least one of thermoplastic resins at an extrusion temperature of 320–430° C. through a spinneret, stretching the resultant fibers to a draw ratio of from 1.2:1 to 8:1 within a temperature range of 120–200° C., and then heat setting the thus-stretched fibers at 130–370° C. for 0.1–1,000 seconds.

4,895,692

MOLD FOR THE MOLDING AND VULCANIZING OF A RUBBER TIRE

Daniel Laurent, Meylan, and Marc Sebe, Clermont-Ferrand, both of France, assignors to Compagnie Generale Des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 40,353, Apr. 20, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 265,326
Claims priority, application France, Apr. 25, 1986, 86 06158
Int. Cl.[4] B29C *35/00*
U.S. Cl. 264—326 **9 Claims**



9. A process for manufacturing a rubber tire in a rigid mold which imparts the final shape and dimensions to the tire, said rigid mold including a removable rigid core assembled from rigid segments for molding the interior surface of the tire, two side parts for molding the exterior sidewalls of the tire and a peripheral ring divided into a plurality of segments having transverse surfaces for molding the exterior tread, said process comprising the steps of building the blank of the tire to be molded on the assembled rigid core segments and thereafter closing the two side parts and peripheral ring segments of the mold while moving the transverse surfaces of adjacent segments of the ring in flush sliding engagement and while moving the contact surfaces between the ring and the side parts in flush sliding engagement.

4,895,693

HEADLIGHT OF MOTOR VEHICLE

Takanori Suzuki; Hideshi Mori; Kenji Miyazawa; Kazutami Ohishi, and Masahito Naganawa, all of Kitawaki, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,482
Claims priority, application Japan, Sep. 30, 1987, 62-151191[U]; Jul. 29, 1988, 63-190906
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—61 **12 Claims**



1. A headlight of double beam type, comprising:

a lamp body having one end closed and the other end open;

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means defining in a given part of the closed end of said lamp body an aperture;

a lens covering the open end of the lamp body;

an upper beam projecting unit including a first concave light reflector integrally formed on a part of the inner surface of said closed end of the lamp body, and a first light source installed at a center portion of said first concave light reflector; and

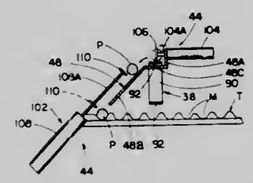
a lower beam projecting unit including a condensing lens installed inside said lamp body at a position facing said aperture, a second concave light reflector disposed outside said lamp body and detachably connected to the outside of said lamp body in a manner to face said aperture, and a second light source installed at a center portion of said second concave light reflector.

4,895,694

APPARATUS FOR ALIGNING NUCLEAR FUEL PELLETS

Bango Yokoyama, Ibaraki, Japan, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 17, 1988, Ser. No. 276,170
Claims priority, application Japan, Aug. 12, 1987, 62-123530
Int. Cl.[4] G21C *21/02*
U.S. Cl. 376—261 **15 Claims**



10. An apparatus for aligning nuclear fuel pellets, comprising:

(a) endless means for advancing nuclear fuel pellets along a generally linear path in a direction generally coincident with their axes;

(b) means disposed in said linear path for stopping advancement of the pellets along said linear path for assembling a row of the pellets along said linear path;

(c) means disposed along said linear path for sensing when advancement of a prescribed number of the pellets in a row have been stopped by said advancement stopping means;

(d) means for successively feeding pellet holding trays one at a time to a pellet receiving position located lower than said linear path;

(e) a panel defining an inclined path extending from said linear path to one of said trays disposed at said receiving position; and

(f) means disposed along said linear path and being responsive to said sensing means for transferring the pellets in the row thereof from said linear path along said inclined path to a groove defined in the one of said trays disposed at said receiving position;

(g) said pellet transferring means including

(i) an ejector mechanism positioned along one side of said advancing means and being operable in response to said sensing means for pushing the row of pellets sidewise from said linear path to initiate movement of the row of pellets down said inclined path, and

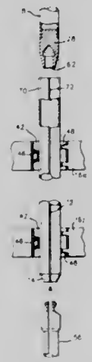
(ii) a guide mechanism positioned along an opposite side of said advancing means and being operable in response to said sensing means for supporting and guiding the row of pellets as they move down said inclined path to said tray.

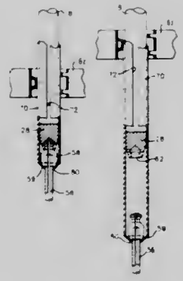
4,895,695

METHOD FOR LOADING FUEL RODS INTO GRIDS OF NUCLEAR FUEL ASSEMBLIES

John M. Shallenberger, Fox Chapel Borough, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 46,475, May 6, 1987, Pat. No. 4,800,061.
This application Nov. 9, 1988, Ser. No. 268,920
Int. Cl.[4] G21C *21/00*
U.S. Cl. 376—261 **11 Claims**





5. A method of inserting a fuel rod into cells of a plurality of support grids forming part of a nuclear fuel assembly and having detents for resiliently engaging and laterally supporting fuel rods inserted into the cells, comprising the steps of:

(a) providing a thin-walled metallic tubular member which has a substantially uniform wall thickness of not more than about 0.008 inch, an as-formed inner diameter substantially corresponding to the outer diameter of said fuel rod, a length sufficient for the tubular member to extend at least through a majority of said plurality of the support grids, and a longitudinal slit formed in the wall of the tubular member throughout the length thereof so as to render said wall resiliently deflectable in a diameter-reducing sense, said longitudinal slit having a width sufficient to preclude overlapping of the edges of said wall along the slit, and insufficient to receive any of said detents;

(b) mounting said tubular member in position for protectively enveloping said fuel rod during insertion thereof; and

(c) in one substantially continuous operation, inserting the fuel rod, with said tubular member in position to envelope it, into said cells of the support grids and axially withdrawing the tubular member from the inserted fuel rod while restraining the latter against further movement thereof.

4,895,696

STEAM TURBINE PRESERVATIVE AND METHOD OF PRESERVING STEAM TURBINE COMPONENTS

James C. Bellows, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1987, Ser. No. 124,302
Int. Cl.[4] G21C *1/01*; C23F *11/00*
U.S. Cl. 376—305 **20 Claims**

1. A method of preserving steam turbine components, comprising the steps of:

producing an amine polymer from substantially synthesized compounds; and

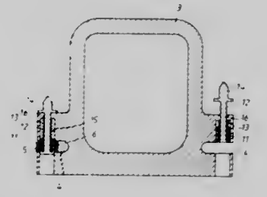
applying said amine polymer product in selected amounts as a non-aqueous layer upon the surfaces of the components.

4,895,697

TOP SUPPORT LOCK

Patrik Andersson, Västerfärnebo, and Anders Wallander, Västeras, both of Sweden, assignors to ABB Atom AB, Västeras, Sweden

Filed Sep. 26, 1988, Ser. No. 248,931
Claims priority, application Sweden, Sep. 28, 1987, 8703719
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—434 **1 Claim**



1. In a nuclear assembly having a lifting handle, said assembly comprising:

a fuel channel having an upper end section which surrounds a lifting plate;

a top support which is substantially angluar and arranged with openings at angle-piece ends to connect said ends to the lifting handle, the lifting handle being provided with openings for receiving the angle-piece ends of the top support and openings perpendicular to said lifting handle openings; and

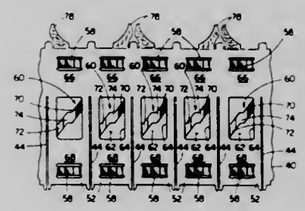
means for positioning and locking the top support, said means comprising a movable, spring-loaded cylindrical portion arranged to fit corresponding openings in the angle-piece ends of the top support, said cylindrical portion having one open and one closed end, the latter being joined to a shaft, said shaft being partially surrounded by a compression spring, said spring acting between the cylindrical portion and an end wall of the handle, said shaft passing for guidance through a hole in the lifting handle and being provided outside the handle with a stop means.

4,895,698

NUCLEAR FUEL ROD GRIP WITH MODIFIED DIAGONAL SPRING STRUCTURES

Edmund E. DeMario, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1988, Ser. No. 168,060
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—442 **15 Claims**



1. In a nuclear fuel rod grid including a plurality of inner and outer straps being interleaved with one another to form a matrix of hollow cells, each cell for receiving one fuel rod and being defined by pairs of opposing wall sections of said straps which wall sections are shared with adjacent cells, each cell having a central longitudinal axis, a fuel rod engaging spring structure of resiliently yieldable material being integrally formed on each wall section of said inner straps, said spring structure comprising:

(a) a pair of spaced apart opposite outer portions being integrally attached at their outer ends to said respective wall section, said portions extending in alignment with one another and in generally diagonal relation to the direction of said central longitudinal axis of said one cell; and

(b) a middle portion disposed between and integrally connected at its outer ends with respective inner ends of said outer portions, said middle portion extending in generally transverse relation to the direction of said central longitudinal axis of said one cell;

(c) said upper and lower outer portions having respective pairs of spaced lateral edges which extend in diagonal relation to said cell axis and are offset from one another in the direction of said cell axis;

(d) said middle portion having a pair of spaced lateral edges which extend in transverse relation to said cell axis and interconnect said offset pairs of edges of said upper and lower outer portions.

4,895,699

METHOD OF MAKING A CATHODE FROM TUNGSTEN AND IRIDIUM POWDERS USING A REACTION PRODUCT FROM REACTING BARIUM PEROXIDE WITH AN EXCESS OF TUNGSTEN AS THE IMPREGNANT

Louis E. Branovich, Howell; Gerard L. Freeman, Freehold; Bernard Smith, Ocean, and Donald W. Eckart, Wall, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1989, Ser. No. 401,202
Int. Cl.[4] B22F *3/26*
U.S. Cl. 419—27 **6 Claims**

1. Method of making a cathode for operation in microwave devices from tungsten and iridium powders using a reaction product formed from reacting barium peroxide with an excess of tungsten as an impregnant, said method including the steps of:

(A) mixing the tungsten and iridium powders,

(B) adding about 2 percent by weight of an activator to the mixture,

(C) ball milling the mixture for about 8 hours,

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(D) pressing the ball milled mixture into a billet at about 48,000 p.s.i. in a die,
(E) sintering the billet at about 1800° C. for about thirty minutes in dry hydrogen of less than −100 dewpoint,
(F) backfilling the billet with copper in dry hydrogen at about 1500° C.,
(G) machining the billet to the desired geometry,
(H) removing the copper by etching in nitric acid,
(I) thoroughly rinsing in deionized water, methanol and then drying,
(J) firing the billet in dry hydrogen at about 140° C. for about 15 minutes,
(K) impregnating the billet with reaction product formed from reacting barium peroxide with an excess of tungsten by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,
(L) removing the billet from the furnace after the furnace is cooled, and
(M) removing any loose pieces of impregnant from the billet.

4,895,700

LOW GRADE MATERIAL AXLE SHAFT

Kent E. Davison, Columbia City, and Ervin M. Rickert, Fort Wayne, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Division of Ser. No. 166,178, Mar. 10, 1988, Pat. No. 4,820,357. This application Sep. 6, 1988, Ser. No. 240,629
Int. Cl.[4] C22C *38/04, 38/06*
U.S. Cl. 420—8 **5 Claims**

1. An axle shaft with a rated capacity between 30,000 and 44,000 pounds and a body diameter between 1.70 and 2.05" having been made by forging and machining the ends thereof and induction hardening with no intermediate heat treating between forging and hardening, said composition consisting essentially of 0.40–0.48% carbon, 1.35–1.61% manganese, 0–0.23% silicon, 0–0.23% chromium, 0–0.15% copper, 0–0.20% nickel, 0–0.15% molybdenum, 0.020–0.45% sulfur, 0.025–0.050% aluminum and 0.035% maximum phosphorus, with the balance being iron, and said shaft having a critical diameter of 2.1–2.6".

4,895,701

GOLD COLORED ALLOY COMPOSITION WITH ZERO PERCENT GOLD

Daniel Davitz, 921 Harlem, Glenview, Ill. 60025

Filed Jan. 9, 1989, Ser. No. 294,774
Int. Cl.[4] C27C *30/02*
U.S. Cl. 420—587 **9 Claims**

1. A gold color, highly tarnish and corrosion resistant alloy which consists essentially of, by weight, 19 to 22 percent indium, 24 to 27 percent palladium, 5 to 30 percent copper, and the balance consisting essentially of silver, and wherein said alloy is gold free.

4,895,702

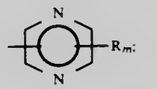
CORROSION INHIBITOR COMPOSITIONS CONTAINING INHIBITOR PREPARED FROM AMINO SUBSTITUTED PYRAZINES AND EPOXY COMPOUNDS

Gordon C. Fischer, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 787,559, Oct. 15, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 131,979
Int. Cl.[4] C23F *11/00*
U.S. Cl. 422—7 **15 Claims**

1. A method for reducing or preventing the corrosion of a metal composition subject to corrosion in corrosive liquid or gaseous atmospheres which method comprises contacting the surface of said metal while in contact with a corrosive liquid or gaseous atmosphere with a corrosion inhibiting amount of a corrosion inhibitor composition comprising the product resulting from reacting

(A) at least one pyrazine compound having at least one substituent —NHR' group wherein R' is hydrogen, a hydrocarbyl group having from 1 to about 8 carbon atoms or a pyrazinyl group represented by the formula



wherein each R is independently hydrogen, a hydrocarbyl group having from 1 to about 20 carbon atoms, —OH, —OR, —SH, or —SR; m has a value from 1 to 3; and

(B) at least one epoxide compound selected from the group consisting of

(1) monoglycidyl ethers of aliphatic and aromatic monohydroxyl-containing compounds, and

(2) polyglycidyl ethers of aliphatic and aromatic compounds having two or more hydroxyl groups per molecule;

wherein components (A) and (B) are present in quantities which provide a ratio of epoxy groups to $—NH_2$ groups of from about 0.25:1 to about 2:1.

4,895,703

TRIHYDROXYBENZENE BOILER CORROSION INHIBITOR COMPOSITIONS AND METHOD

John D. Zupanovich, Pittsburgh; Lois J. Neil, Sewickley, and Dennis J. Sepelak, McMurray, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 92,342, Sep. 3, 1987, abandoned, which is a continuation of Ser. No. 2,836, Jan. 13, 1987, abandoned, which is a continuation of Ser. No. 776,935, Sep. 17, 1985, abandoned. This application Aug. 15, 1988, Ser. No. 232,354
Int. Cl.[4] C23F *11/00*
U.S. Cl. 422—14 **2 Claims**

1. A method of inhibiting corrosion in boilers comprising adding to boiler feedwater containing oxygen an effective amount of a hydrazine-free composition comprising: a) pyrogallol and b) hydroquinone; wherein the weight ratio of a):b) ranges from about 99.1 to 1:99.

4,895,704

INTEGRAL MULTILAYER ANALYTICAL ELEMENT

Fumisori Arai, and Takeshi Igarashi, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 854,346, Apr. 21, 1986, abandoned. This application Oct. 27, 1987, Ser. No. 117,355
Claims priority, application Japan, Apr. 23, 1985, 60-853336
Int. Cl.[4] G01N *31/22*
U.S. Cl. 422—57 **15 Claims**

1. In an integral multilayer analytical element which comprises a water-impermeable light-transmissive support, a hydrophilic layer containing a water-absorptive hydrophilic polymer binder and a spreading layer superposed in this order, and containing at least one reagent capable of reacting with a component of a sample to produce a detectable species capable of detection by light, the improvement which comprises said hydrophilic layer containing light-scattering particulates in an amount to make light transmittance in the range from 10 to 2.5%.

14. In a method for the detection of a blood component wherein a blood sample is placed on an integral multilayer analytical element and analyzed the improvement wherein said analytical element comprises a superposed in this order, a water-permeable light-transmissive support, a hydrophilic layer containing a water-absorptive hydrophilic polymer binder, and a spreading layer, and which further contains at least one reagent capable of reacting with a component of the sample to produce a detectable species capable of detection by light, and wherein said hydrophilic layer contains light scattering particulates in an amount to make the light transmittance in the range from 10 to 2.5%.

4,895,705

MOLECULE-BASED MICROELECTRONIC DEVICES

Mark S. Wrighton, Winchester; Henry S. White, Jr., Somerville, and Gregg P. Kittlesen, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 674,410, Nov. 23, 1984, Pat. No. 4,721,601. This application May 13, 1987, Ser. No. 49,341
Int. Cl.[4] G01N *27/00*
U.S. Cl. 422—68 **5 Claims**

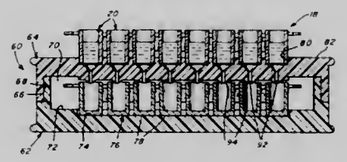
1. A device comprising two closely spaced electrically conductive electrodes on an insulating substrate wherein the first electrode is overlaid with a first redox polymer and the second electrode is overlaid with a second redox polymer, wherein the redox potential of said second polymer is different from the redox potential of the first redox polymer.

4,895,706

MULTI-WELL FILTER STRIP AND COMPOSITE ASSEMBLIES

David Root, Lexington, Mass., and George Lyman, Kennebunk, Me., assignors to Costar Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 923,906, Oct. 28, 1986. This application Apr. 28, 1988, Ser. No. 187,083
Int. Cl.[4] B01L *3/00*; G01N *1/18*
U.S. Cl. 422—102 **15 Claims**



1. A filter assembly comprising
a vacuum manifold having a base and removable cover,
a chamber in the vacuum manifold,
a passage in the manifold communicating with the chamber for applying a reduced pressure to the chamber,
a multi-well filter strip having a plurality of wells, each of the wells having side walls and open top and bottom ends, each of the wells further having a separate filter membrane attached to a bottom surface of the side walls and closing the open bottom end of each well of the strip,
means provided on the outside of the cover for supporting the strip and for supporting each membrane adjacent the bottom ends of the respective wells to maintain the membrane attachment to the well when a vacuum is applied to the chamber, and
means defining openings in the cover for placing each membrane in communication with the chamber whereby a reduced pressure applied to the chamber will draw liquid in the wells through the membranes into the chamber.

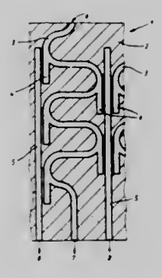
4,895,707

SOOT BURN-OFF FILTER FOR DIESEL ENGINES

Michael Kühn, Filderstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 310,909
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806324
Int. Cl.[4] F01N *3/10, 3/02*; B01D *39/20*
U.S. Cl. 422—177 **20 Claims**

1. A soot burn-off filter for diesel engines, comprising a porous ceramic filter material with exhaust gas ducts which pass through the latter in meander shape from an inflow side connected to the engine to an outflow side;
the exhaust gas ducts opening into branching blind ducts at outer bends of their meander shapes;



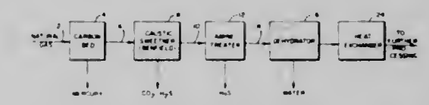
and adjacent discharge ducts in said porous ceramic filter material open towards the outflow side and associated with said blind ducts.

4,895,708

REMOVAL OF MERCURY FROM NATURAL GAS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 905,990, Sep. 10, 1986, abandoned. This application Apr. 27, 1988, Ser. No. 188,088
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—210 **3 Claims**



1. In a process for treating raw natural gas containing mercury wherein said natural gas is contacted with an aqueous solution of an alkali carbonate and/or an amine to remove carbon dioxide and hydrogen sulfide, the improvement comprising contacting the natural gas with free elemental sulfur on a support, and, independently of said natural gas, contacting the natural gas with said aqueous solution of alkali carbonate and/or amine, to which 10 to 10,000 ppm of free, reactive elemental sulfur in dissolved or colloidal form has been added.

4,895,709

METHOD OF PREPARING METAL CARBIDES, NITRIDES, AND THE LIKE

Richard M. Laine, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 119,303, Nov. 6, 1987, Pat. No. 4,789,534, which is a continuation of Ser. No. 900,592, Aug. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 727,524, Apr. 26, 1985, abandoned. This application Dec. 5, 1988, Ser. No. 279,599
Int. Cl.[4] C01B *33/06*
U.S. Cl. 423—344 **5 Claims**

1. A method of producing a product M_aX_b wherein M represents one or more metals selected from the group consisting of transition metals and tin, X represents silicon, and a and b represent the atomic proportions of M and X, comprising the steps of, in sequence:

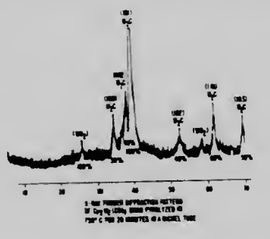
(a) providing a precursor to M_aX_b that is non-volatile upon pyrolysis and which comprises an organometallic complex, said complex including one or more metal atoms M which

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may be the same or different, and wherein each of said metal atoms M is bound to an organic ligand, said organometallic complex further containing the element X either directly bound to one or more of said metal atoms M or contained within said ligands or both;

(b) optionally either:

(i) dissolving said precursor in an organic solvent to give a precursor solution, the solvent selected such that the



precursor can be dissolved to a concentration at which the precursor solution has a viscosity sufficient to allow extrusion into a desired form; or

(ii) melting said precursor;

(c) shaping said precursor into a desired form; and

(d) pyrolyzing said shaped precursor, at a temperature in the range of 500° C. to 950° C., to give M_aX_b as a residue substantially free of organic materials.

4,895,710

NITROGEN INJECTION

Gotfred Hartmann, Bekkestua, and Helge G. Gran, P.O. Box 5555, N-4602 Kristiansand S, both of Norway, assignors to Helge G. Gran, Norway

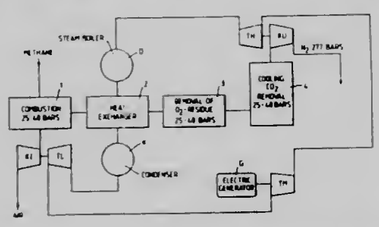
PCT No. PCT/NO87/00009, § 371 Date Oct. 9, 1987, § 102(e) Date Oct. 9, 1987, PCT Pub. No. WO87/04420, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 23, 1987, Ser. No. 104,056

Claims priority, application Norway, Jan. 23, 1986, 860239

Int. Cl.⁴ B01D *50/00;* **C01B** *21/00;* **E21B** *43/16*

U.S. Cl. 423—351 **9 Claims**



1. In a method for the production of pressurized nitrogen for injection application at high pressure, said method being of the type which comprises combusting natural gas in air, which is compressed prior to the combustion, whereby said combustion forms a flue gas containing nitrogen and carbon dioxide and said combustion binds the oxygen content of the air in the carbon dioxide; removing the carbon dioxide from the flue gas by absorption, and then pressurizing the remaining nitrogen to a high pressure required for said injection application, wherein the improvement comprises compressing the combustion air prior to the combustion to an intermediate pressure between said high pressure and atmospheric pressure, the heat energy developed by the combustion being heat exchanged at the intermediate pressure with water for production of steam, which subsequently is utilized for mechanical work for compression to the intermediate pressure and maintenance of said high pressure.

4,895,711

PREPARATION OF HYDROXYLAMMONIUM SALTS

Werner Biffar, Frankenthal; Werner Steigleiter, Limburgerhof, and Franz-Josef Weiss, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 326,989

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809554

Int. Cl.⁴ C01B *21/20*

U.S. Cl. 423—387 **4 Claims**

1. In a process for preparing a hydroxylammonium salt by the catalytic reduction of nitrogen monoxide with hydrogen at an elevated temperature in a dilute aqueous mineral acid, the improvement which comprises: preparing a support platinum catalyst by precipitating metallic platinum from an aqueous solution of a platinum salt onto a carrier suspended in the solution by means of a reducing agent in the presence of one or more water-soluble substituted or unsubstituted thioureas, and carrying out said reduction in the presence of said supported platinum catalyst suspended in the dilute aqueous mineral acid.

4,895,712

PROCESS FOR PRODUCING CARBON FIBER AND GRAPHITE FIBER

Kikuji Komine, Tokorozawa; Hisao Kato, Hachioji; Tsutomu Naito, Iruma; Takashi Hino, Tokorozawa, and Hiroyuki Kuroda, Oomiya, all of Japan, assignors to Toa Nenryo Kogyo K.K., Japan

Filed Apr. 22, 1988, Ser. No. 185,110

Claims priority, application Japan, Apr. 23, 1987, 62-98524

Int. Cl.⁴ D01F *9/12*

U.S. Cl. 423—447.4 **4 Claims**

1. In the process for producing carbon fiber and graphite fiber comprising the steps of infusibilizing by thermosetting a pitch fiber obtained by spinning carbonaceous pitch, then carbonizing or graphitizing said infusibilized fiber, the improvement comprising the steps of: doubling said spun pitch fiber in bundles; adding a heat resistant doubling treatment oil of non-aqueous type during or after said doubling step wherein the heat resistant doubling treatment oil is selected from the group consisting of alkylphenylpolysiloxane containing 5 to 80 mole % of phenyl group, and dimethylpolysiloxane containing antioxidant which are both of the non-aqueous type and have less than 1,000 cst viscosity at 25° C. when 0.5 g of the oil is taken into a 50 ml beaker and heated by an increase in temperature of 0.5° C./min. from 100° to 330° C. under an air atmosphere; passing the doubled fiber bundles continuously and linearly as a thread line by applying 0.001 to 0.2 g tension per filament through a thermosetting furnace containing an oxygen rich gas with at least 30% oxygen content; and infusibilizing by thermosetting said fiber bundles at a temperature of less than about 350° C.

4,895,713

INTERCALATION OF GRAPHITE

Ronald A. Greinke, Medina; Robert A. Mercuri, Seven Hills, and Edgar J. Beck, Fairview Park, all of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 91,195, Aug. 31, 1987, abandoned. This application Mar. 16, 1989, Ser. No. 323,214

Int. Cl.⁴ C01B *31/04*

U.S. Cl. 423—448 **18 Claims**

1. A method for intercalating graphite flakes which comprises;

(a) adding liquid intercalation solution to graphite flakes in an amount of between 10 and 35 parts by weight of solution per 100 parts by weight of graphite flakes, the liquid intercalation solution comprising one or more members selected from the group consisting of nitric acid, sulfuric acid, potassium chlorate, chromic acid, potassium permangante, potassium chromate, potassium dichromate, perchloric acid, hydrogen peroxide, iodic acids, periodic acids, ferric chloride, and halides, and

(d) dispersing the intercalation solution through the graphite flakes to produce intercalated graphite flakes, the intercalated graphite flakes having an exfoliation volume greater than about 100 cm^3/g when passed directly to exfoliation.

4,895,714

RADIOIODINATED APOTRANSFERRIN FOR USE IN TUMOR DIAGNOSIS, IMAGING, LOCALIZATION OR TREATMENT

Ward P. Faulk, 4414 Edinburgh Point, Indianapolis, Ind. 46208

PCT No. PCT/GB86/00464, § 371 Date Apr. 1, 1987, § 102(e) Date Apr. 1, 1987, PCT Pub. No. WO87/00756, PCT Pub. Date Feb. 12, 1987

PCT Filed Aug. 1, 1986, Ser. No. 64,939

Claims priority, application United Kingdom, Aug. 2, 1985, 8519457

Int. Cl.⁴ A61K *49/02, 37/04, 35/14;* **C07K** *15/14*

U.S. Cl. 424—1.1 **13 Claims**

1. Conjugates of apotransferrin with a radioactive isotope of iodine for use in tumour diagnosis, imaging or localization.

4,895,715

METHOD OF TREATING GYNECOMASTIA

Rudolph Neri, Hawthorne, and Robert J. Spiegel, Westfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 181,286, Apr. 14, 1988, abandoned. This application May 9, 1989, Ser. No. 351,261

Int. Cl.⁴ A61K *31/56, 45/06, 31/135, 31/16*

U.S. Cl. 424—10 **10 Claims**

1. A method of treating gynecomastia in patients being treating with a non-steroidal antiandrogen who are in need of such treating which comprises admnistering to such patients a therapeutically effective amount of an antiestrogen or 4-hydroxyandrostenedione.

4,895,716

STABILIZED FORMULATIONS OF GAMMA INTERFERONS

Joel D. Goldstein, Brighton, and David R. Thatcher, Groton, both of Mass., assignors to Biogen, Inc., Cambridge, Mass.

Filed Jun. 9, 1987, Ser. No. 59,723

Int. Cl.⁴ A61K *45/02*

U.S. Cl. 424—85.5 **14 Claims**

1. A composition which comprises IFN-γ, lactobionic acid and an acetate/glycine buffer.

4,895,717

REVERTANT SEROTYPE 1 MAREK'S DISEASE VACCINE

Richard L. Witter, Okemos, Mich., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 10, 1987, Ser. No. 71,948

Int. Cl.⁴ A61K *39/12, 37/00;* **C12N** *15/00, 7/08;* **C12R** *1/91*

U.S. Cl. 424—89 **4 Claims**

1. A vaccine comprising: (1) in an effective immunization dosage a viral agent wherein said viral agent is a cloned revertant virus having the essential identifying characteristics of Md11/75C/R2 produced by backpassaging attenuated strain Md11/75C and is characterized by significantly improved protectivity against Marek's disease as compared to said attenuated strain, and (2) a pharmaceutically acceptable carrier or diluent.

4,895,718

SEROTYPE 2 MAREK'S DISEASE VACCINE

Richard L. Witter, Okemos, Mich., assignor to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 10, 1987, Ser. No. 71,949

Int. Cl.⁴ A61K *39/12, 37/00;* **C12N** *15/00, 7/08;* **C12R** *1/91*

U.S. Cl. 424—89 **6 Claims**

1. A vaccine comprising: (1) in an effective immunization dosage a viral agent, wherein said viral agent is a cloned virus having the essential identifying characteristics of 301B/1, and (2) a pharmaceutically acceptable carrier or diluent.

4,895,719

METHOD AND APPARATUS FOR ADMINISTERING DEHYDRATED LIPOSOMES BY INHALATION

Ramachandran Radhakrishnan; Paul J. Mihalko, both of Fremont, and Robert M. Abra, San Francisco, all of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 737,221, May 22, 1985, abandoned, and Ser. No. 860,528, May 7, 1986, abandoned, and Ser. No. 937,609, Dec. 3, 1986. This application Mar. 6, 1987, Ser. No. 22,937

Int. Cl.⁴ A61K *31/35, 9/14, 9/48, 9/68*

U.S. Cl. 424—45 **18 Claims**

1. Apparatus for administering a water-soluble drug, at a selected dose, via the respiratory tract comprising

dehydrated liposome particles formed by the steps of (a) producing a liposome suspension having at least about 50% liposome-encapsulated drug, and (b) dehydrating the suspension, and

a device for producing an airborne suspension of the liposome particles containing such selected dose of the drug.

4,895,720

COMPOSITIONS AND METHODS FOR CLEANING THE GUMS

Athanasios S. Ladas, Parsippany; Debbie L. Barnett-Davis, Stirling, both of N.J.; Ronald J. Sharpe, East Longmeadow, Mass., and Suzanne H. Ispentchian, Piscataway, N.J., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 28, 1988, Ser. No. 173,833

Int. Cl.⁴ A61K *7/16*

U.S. Cl. 424—49 **7 Claims**

1. A method of cleaning the gums of a denture wearer comprising applying to the gums after the dentures have been removed, periodically, a gum cleaner composition comprising silica in a cellulose gum gel, water and a detergent, said composition having an RDA of less than 20, said composition being not significantly more abrasive to dentin than water.

4,895,721

PEROXIDE GEL DENTIFRICE COMPOSITIONS

Jacob Dracker, Holmdel, N.J., assignor to Carter-Wallace Inc., New York, N.Y.

Filed Jan. 22, 1988, Ser. No. 146,902

Int. Cl.⁴ A61K *7/20, 33/40*

U.S. Cl. 424—53 **5 Claims**

1. Stable, aqueous, non-relaxing peroxide gel compositions consisting essentially of from about 35% to about 95% by weight of a complexing agent selected from the group consisting of ethylene polymers of the formula $HOCH_2(CH_2OCH_2)_n$-$CHOH$ wherein n has a value of 3to 1000 and mixtures thereof, from about 0.75% to about 5.00% by weight of a gelling agent selected from the group consisting of carboxypolymethylene polymers comprising a major portion of an alpha, beta-olefinically unsaturated carboxylic acid and a minor portion of a polyalkenyl polyether or a polyol and carboxy vinyl polymers, from about 0.05% to about 1.00% by weight of a peroxide stabilizer selected from the group comprising butylated hydroxyanisole, butylated hydroxy toluene, propyl gallate, sodium 2,2'-dihydroxy-4,4'-dimethoxy-5-sulphobenzone, lauryl

dibutylamine oxide and the like and up to about 15.00% by weight of hydrogen peroxide.

4,895,722

HAIR TREATMENTS

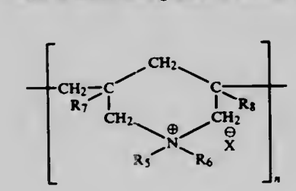
Yoshiaki Abe, Tokyo; Rikio Tsushima, Wakayama, and Hiroshi Watanabe, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 352,463, Feb. 25, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,532
Claims priority, application Japan, Mar. 3, 1981, 56-30275
Int. Cl.[4] A61K *7/06, 7/09, 7/11*
U.S. Cl. 424—71 **5 Claims**

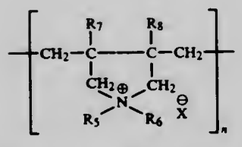
1. A hair treatment composition comprising the following three ingredients (A), (B) and (C):

(A) 0.05 to 10 wt. % of at least one decomposition derivative of keratin having a molecular weight in the range of 30,000–100,000 and being selected from the group consisting of (1) decomposition products obtained by oxidation of keratin, and (2) derivatives at the thiol groups of decomposition products obtained by reduction of keratin, said keratin being obtained from animal hairs, human hairs, features, nails, horns, hooves or scales;

(B) 0.05 to 10 wt. % of a cationic polymer having an average molecular weight of 500–5,000,000 and being selected from the group consisting of quaternize derivatives of cellulose ethers, allyl quaternary ammonium homopolymers of the recurring units of formulas (I) and (II):

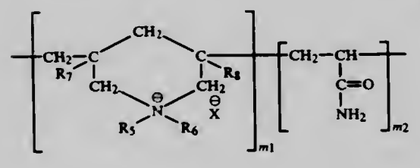


(I)



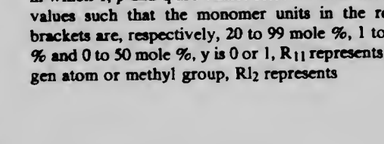
(II)

in which R_5 and R_6 are the same or different and represent hydrogen or an alkyl group having 1 to 18 carbon atoms, R_7 and R_8 are the same or different and independently represent hydrogen, an alkyl group having 1 to 3 carbon atoms, or phenyl group, X^- represents chloride or bromide, sulfate, nitrate, methyl sulfate and hydroxycarbonate and n has a value sufficient to give a molecular weight of 10,000–1,000,000; polymers of the recurring units of the formulas (III) and (IV):



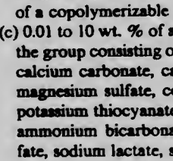
(III)

-continued



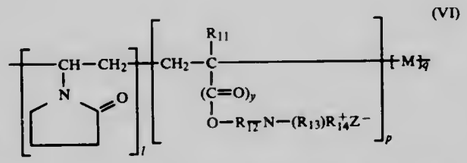
(IV)

in which m_1 and m_2 are values sufficient to give a molecular weight of 10,000–1,000,000, and R_5, R_6, R_7, R_8 and X^- have the same meanings as defined above; polymers of the formula (V):



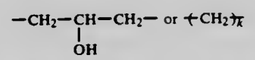
(V)

in which R_9 and R_{10} are the same or different and independently represent hydrogen, an alkyl group having 1 to 6 carbon atoms, or a phenyl group, and n and X have the same meanings as defined hereinbefore, and quaternized derivatives of copolymers of N-vinylpyrrolidone/vinyl monomer of the formula (VI):



(VI)

in which l, p and q are values selected from the group of values such that the monomer units in the respective brackets are, respectively, 20 to 99 mole %, 1 to 80 mole % and 0 to 50 mole %, y is 0 or 1, R_{11} represents a hydrogen atom or methyl group, Rl_2 represents



wherein k is a value of 2 to 18, R_{13} represents an alkyl group having 1 to 4 carbon atoms, RI_4 represents methyl, ethyl, or benzyl, Z represents chloride, bromide, iodide, SO_4, HSO_4 or CH_3SO_3, and M represents a monomer unit of a copolymerizable vinyl monomer; and

(c) 0.01 to 10 wt. % of at least one compound selected from the group consisting of aluminum sulfate, barium chloride, calcium carbonate, calcium chloride, magnesium nitrate, magnesium sulfate, copper sulfate, potassium phosphate, potassium thiocyanate, sodium chloride, lithium chloride, ammonium bicarbonate, ammonium nitrate, sodium sulfate, sodium lactate, sodium benzoate, sodium citrate and urea.

4,895,723

CHOLESTYRAMINE COMPOSITIONS AND METHOD FOR PREPARATION THEREOF

Moh. S. Amer, Fairfield County, Conn., and Jack C. Gray, Suffolk County, N.Y., assignors to Amer and Company, Carpenteria, Calif.

Filed Sep. 8, 1986, Ser. No. 904,920
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—79 **19 Claims**

1. In a method of making orally ingestible cholestyramine-containing composition devoid of fishy odor for reducing the cholesterol level in human blood, the improvement comprising the step of blending a cholesterol-reducing agent consisting essentially of cholestyramine, which agent is capable of forming an insoluble complex with bile acids, with, approximately by weight, an amount of an aqueous syrup containing at least 65% of water-soluble sugar carbohydrate within a cholestyramine:syrup ratio ranging from 1:1 to 1:4.5 sufficient to initially form a paste or dough.

4,895,724

CHITOSAN COMPOSITIONS FOR CONTROLLED AND PROLONGED RELEASE OF MACROMOLECULES

John R. Cardinal; William J. Curatolo, both of Old Lyme, Coan., and Charles D. Ebert, Brewster, N.Y., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 7, 1985, Ser. No. 742,500
Int. Cl.[4] A61K *9/62, 9/52, 37/00*
U.S. Cl. 424—418 **20 Claims**

1. A composition for controlled and prolonged release of at least one macromoleculor compound which composition comprises a porous mix of chitosan having dispersed therein said macromolecular compound, and which composition has been contacted with at least one of an organic solvent or a base.

4,895,725

MICROENCAPSULATION OF FISH OIL

Martin L. Kantor, Mamaroneck; Solomon S. Steiner, Mt. Kisco, and Howard M. Pack, Scarsdale, all of N.Y., assignors to Clinical Technologies Associates, Inc., Elmsford, N.Y.

Continuation-in-part of Ser. No. 88,651, Aug. 24, 1987. This application Apr. 4, 1988, Ser. No. 177,498
Int. Cl.[4] A61K *9/66*
U.S. Cl. 424—455 **21 Claims**

1. Palatable microcapsules comprising a biologically active material and an oxidizable oil having a strong odor and taste encapsulated within a non-oil soluble enteric coating to form microcapsules having no taste or smell derived from the oil, said coating formed by preparing an emulsion of an oil-based biologically active compound and a non-oil soluble enteric coating in a basic solution, atomizing the emulsion into an acidic aqueous solution, and separating the precipitated microcapsules from the acidic aqueous solution.

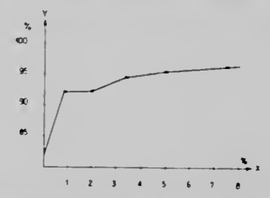
4,895,726

NOVEL DOSAGE FORM OF FENOFIBRATE

Bernard Curtet, Marsanny la Cote; Eric Teilland, Talant, and Philippe Reginault, Fontaine les Dijon, all of France, assignors to Fournier Innovation et Synergie, Paris, France

Filed Jan. 19, 1989, Ser. No. 299,073
Claims priority, application France, Feb. 26, 1988, 88 02359
Int. Cl.[4] A61K *9/64*
U.S. Cl. 424—456 **12 Claims**

1. A therapeutic composition, which is presented in the form of gelatin capsules and which is useful especially in the oral treatment of hyperlipidemia and hypercholesterolemia, said composition containing a co-micronized mixture of particles of



fenofibrate and a solid surfactant, wherein the mean particle size of said co-micronized mixture is less than 15 μm.

4,895,727

PHARMACEUTICAL VEHICLES FOR EXHANCING PENETRATION AND RETENTION IN THE SKIN

Larry M. Allen, Denver, Colo., assignor to Chemex Pharmaceuticals, Inc., Denver, Colo.

Filed May 3, 1985, Ser. No. 730,682
Int. Cl.[4] A61K *33/32, 31/315, 31/56, 31/05*
U.S. Cl. 424—642 **30 Claims**

1. A method of enhancing penetration of the skin and mucous membrane by a pharmacologically active agent and retention of said pharmacologically active agent therein comprising the application to the skin of a composition comprising said pharmacologically active agent and an effective penetrating and retaining amount of a water-soluble zinc-containing compound which acts to reduce the transdermal flux through the skin and mucous membrane of the pharmacologically active agent.

4,895,728

METHOD OF LIMITING CONSUMPTION OF ANIMAL FEEDS AND A SELF LIMITING FEED PRODUCT

David C. Weakley, St. Louis, Mo.; Kent J. Lanter, Millstadt, Ill., and Danny L. Williams, Manchester, Mo., assignors to Purina Mills, Inc., St. Louis, Mo.

Filed Sep. 4, 1987, Ser. No. 93,316
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 **8 Claims**

1. A method of self feeding ruminant animals comprising administering a feed composition comprising a nutrient containing basal composition with an intake limiting composition, the intake limiting composition consisting essentially of sodium hydroxide, the sodium hydroxide being present in an amount effective to limit intake of the animal feed to a desired consumption level.

4,895,729

PRESERVATION OF CUT AND SEGMENTED FRESH FRUIT PIECES

William D. Powrie, North Vancouver; Chia R. Hui Wu, Vancouver, and Brenton J. Skura, Richmond, all of Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Sep. 11, 1987, Ser. No. 96,114
Claims priority, application Canada, Mar. 31, 1987, 533437
Int. Cl.[4] A23B *7/00;* **B65D** *81/28*
U.S. Cl. 426—316 **11 Claims**

1. A method of preparing and preserving fresh fruit for storage which comprises:

(a) separating edible parenchyma tissue from inedible tissue of the fruit;

(b) cutting and/or segmenting the edible tissue of the fruit into pieces;

(c) packing the fruit pieces in a gas impermeable container;

(d) flushing the container with an oxygen containing gas mixture;

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(e) sealing the container from ambient outside atmosphere; and

(f) refrigerating the container with the fruit pieces at a temperature between about −1° C. to about 6° C. to quickly cool the fruit pieces in the container.

4,895,730

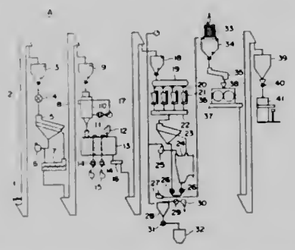
METHOD FOR MANUFACTURING A FOODSTUFF SUITABLE FOR SOYBEAN MILK PRODUCTION

Shigeru Chikarashi, Sapporo, Japan, assignor to Nichii Co., Ltd., Osaka, Japan

Division of Ser. No. 107,510, Oct. 9, 1987, Pat. No. 4,817,516. This application Oct. 28, 1988, Ser. No. 264,435

Int. Cl.⁴ A23L *1/20*

U.S. Cl. 426—634 **1 Claim**



1. A method for manufacturing a foodstuff suitable for soybean milk production, which comprises removing earth matter and earth-born germs depositing on soybean material by brushing, drying said soybean material with a first dryer so as to remove water content without deteriorating any water soluble proteins contained therein for easy separation of a flesh portion and a skin portion of said soybean material, adjusting the water content of said soybean material with a second dryer so as to facilitate separation of said skin portion from said flesh portion, separating said soybean material into skin and flesh portions and simultaneously diving said flesh portion of each piece of said soybean material into four to eight parts thereby producing granular masses and powdery masses, separating the resulting powdery masses from the granular masses, and converting the granular masses into uniformly distributed flaky masses by flat pressing rollers.

4,895,731

CANNED MEAT AND GRAVY PET FOOD AND PROCESS

Gerald J. Baker, Wheaton; Arun K. Bansal, Barrington; John L. Kosleczka, Chicago, and David A. Kuntz, Glen Ellyn, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

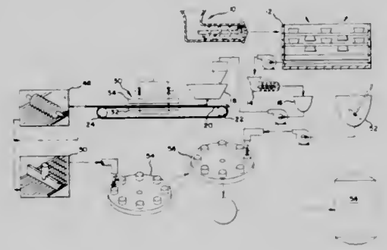
Division of Ser. No. 33,347, Mar. 31, 1987. This application Sep. 13, 1988, Ser. No. 243,953

Int. Cl.⁴ A23K *1/04*; A23L *1/31*

U.S. Cl. 426—641 **8 Claims**

1. A nutritionally-balanced, highly-palatable and visually appealing canned pet food comprising:

(a) meaty pieces having a sliced appearance, a fat content of greater than 2%, at least 75% meat-derived ingredients, and at least 10% liver, at least 3% defatted soybean flour and at least 2% blood plasma to provide resilience and bind the fat; and



(b) a transparent, free flowing gravy which is substantially free of visible fat and imparts a high sheen to the meaty pieces.

4,895,732

CHOCOLATE

Nobuyuki Suwa, Sagamihara, and Akifumi Yuki, Tokorozawa, both of Japan, assignors to Mitsubishi Kasei Corporation, Japan

Filed Aug. 3, 1988, Ser. No. 227,760

Claims priority, application Japan, Aug. 5, 1987, 62-196097

Int. Cl.⁴ A23G *3/00*

U.S. Cl. 426—660 **6 Claims**

1. A chocolate consisting essentially of a hard butter and at least 0.1% by weight of a sucrose fatty acid ester, wherein said hard butter is a nontempering type and said sucrose fatty acid ester consisting essentially of capric acid, lauric acid or myristic acid as a constituting fatty acid and has an average degree of substitution of the fatty acid on the sucrose of 4 to 7, said sucrose fatty acid ester having an HLB of not more than 2.

4,895,733

METHOD AND SYSTEM FOR AGGLOMERATING PARTICLES AND/OR FOR COATING PARTICLES

Georgios Imanidis, Serres, Greece; Hans Leuenberger, Pfeffingen, Switzerland; Reinhard Nowak, Binzen, Fed. Rep. of Germany; Jürg M. Studer, Muri, and Stefan Winzap, Reinach, both of Switzerland, assignors to Pharmatronic AG, Pratteln, Switzerland

PCT No. PCT/CH87/00114, § 371 Date May 5, 1988, § 102(e) Date May 5, 1988, PCT Pub. No. WO88/01904, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 8, 1987, Ser. No. 194,988

Claims priority, application Switzerland, Sep. 9, 1986, 3610/86

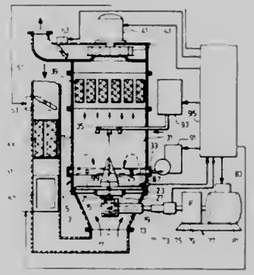
Int. Cl.⁴ B05D *17/00, 7/00*; B05C *5/00, 11/00*

U.S. Cl. 427—8 **29 Claims**

1. Method for agglomerating particles and/or coating particles with other particles, wherein particles are introduced into a processing space of a vessel, there processing space being limited at its lower end by a rotor disc rotatable around a vertical axis,

wherein in an agglomeration and/or coating operation the rotor disc is rotated and gas is passed in an upward direction through the processing space so that particles to be agglomerated and/or coated are moved in such a way that they are alternately rolled over the rotating rotor disc and lifted up by the gas and wherein a liquid is sprayed at least intermittently onto the moved particles,

wherein a variable related to the torque required for rotating the rotor disc is measured at least during the agglomeration and/or coating operation and wherein the spraying of liquid is terminated at a time at which said variable reaches a preset threshold value,



and wherein the particles—after the spraying of liquid has been terminated—are dried in the processing space.

4,895,734

PROCESS FOR FORMING INSULATING FILM USED IN THIN FILM ELECTROLUMINESCENT DEVICE

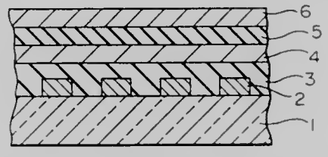
Takeshi Yoshida, and Masahiko Itabashi, both of Tsukuba, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,317

Claims priority, application Japan, Mar. 31, 1987, 62-78099; Mar. 31, 1987, 62-78100

Int. Cl.⁴ B05D *3/06*

U.S. Cl. 427—38 **12 Claims**



1. A process for forming an insulating film which comprises vapor the depositing a thin film of at least one member selected from a group consisting of silicon nitride, silicon oxide and silicon oxynitride on a transparent electroconductive film formed on a transparent substrate by a plasma chemical vapor deposition method with heating the transparent substrate to a substrate temperature of 350 to 550° C.; said transparent electroconductive film being formed of a material selected from the group consisting of $IN_2O_3(Sn)$, $SnO_2(Sb)$, $Sn_2O(P)$, $SnO_2(Te)$, $SnO_2(W)$, $SnO_2(Ce)$, $SnO_2(F)$, Cd_2SnO_4, Cd_2SnO_2, CdO, Au, Ag, Cu, Pd, Pt, Ae, Cr, and Rh and said transparent substrate comprising a glass substrate.

4,895,735

RADIATION INDUCED PATTERN DEPOSITION

Eliot V. Cook, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 1, 1988, Ser. No. 162,722

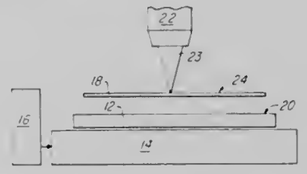
Int. Cl.⁴ B05D *3/06*

U.S. Cl. 427—43.1 **44 Claims**

1. A method for forming a pattern of material on a deposition surface comprising the steps of:

placing a layer, comprising a substrate having first and second sides and a sublayer of patterning material, next to the surface with the sublayer of patterning material positioned between the second side of the substrate and the deposition surface;

introducing radiant or thermal energy to the layer from the first side of the substrate; and



vaporizing a portion of the sublayer to deposit patterning material on the surface, said vaporization effected by thermally conducting said energy through the substrate.

4,895,736

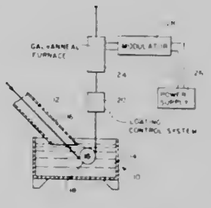
METHOD FOR ALLOYING OF COATINGS

Richard A. Sommer, Warren; George Havas, Youngstown, and Mario Tama, Cortland, all of Ohio, assignors to Ajax Magnethermic Corp., Warren, Ohio

Filed Feb. 24, 1989, Ser. No. 248,243

Int. Cl.⁴ B05D *3/02*

U.S. Cl. 427—45.1 **6 Claims**



1. A method of applying a molten metal coating to a metallic strip comprising the steps of:

passing a strip through a bath of molten metal;

heating the strip by magnetic induction at a preselected operating frequency for heating the coating and strip; and,

modulating the induction heating frequency whereby transverse flexural resonance in the coated strip is avoided.

4,895,737

METAL-ORGANIC CHEMICAL VAPOR DEPOSITION

Richard J. M. Griffiths, and Rodney R. Bradley, both of Duston, England, assignors to Plessey Overseas Limited, Ilford, England

Filed Jun. 12, 1986, Ser. No. 873,562

Claims priority, application United Kingdom, Jun. 26, 1985, 8516140; Jul. 20, 1985, 8518351

Int. Cl.⁴ B05D *3/14*; C23C *16/00*

U.S. Cl. 427—50 **8 Claims**

1. A method of metal-organic chemical vapour deposition of compound semiconductor film, this method comprising:

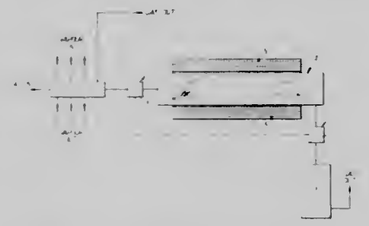
supporting a multiplicity of spaced and stacked wafer substrates by means of an inert mounting and retaining same within a reaction vessel;

applying heat by external means, to the wall of the reaction vessel to raise the substrates to an appropriate reaction temperature; and,

admitting as a single gaseous stream, at one end of the reaction vessel, a carrier gas together with appropriate vapour-phase reagents (at least one of which reagents is metal organic), and extracting same at the other end

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thereof, whilst maintaining said reagents at a reduced pressure in the range 10^{-2} millibars to 10 millibars, approximately, to ensure uniform diffusion thereof, thereby to deposit a compound semiconductor film upon the exposed surface of each substrate.



4,895,738

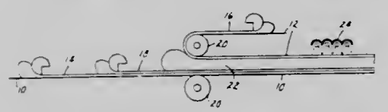
METHOD OF MAKING A UNIFIED PRESSURE-SENSITIVE ADHESIVE TAPE

Patrick G. Zimmerman, St. Paul; Gordon G. Johnson, Lake Elmo; Susan L. Korpela, St. Paul, and Caroline L. Vernon, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 84,781, Aug. 17, 1987, Pat. No. 4,818,610, which is a continuation-in-part of Ser. No. 900,372, Aug. 29, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 332,886

Int. Cl.[4] B05D *5/10*

U.S. Cl. 427—208.8 **1 Claim**



1. A process for making a pressure-sensitive adhesive tape comprising a plurality of superimposed layers, at least one outer layer being a pressure-sensitive adhesive layer, contiguous layers defining an interface therebetween, each of said layers comprising a photopolymerized matrix of polymeric chains; said polymeric chains extending from the matrix of one of said layers through said interface into the matrix of a contiguous layer; said polymeric chains comprising polymerized monomers having migrated from the matrix of each contiguous layer prior to polymerization, said process comprising the steps of:

(1) preparing a plurality of coatable compositions, each of said coatable compositions comprising at least one photopolymerizable monomer; at least one of said coatable compositions being curable to a pressure-sensitive adhesive state, monomers of each of said coatable compositions being copolymerizable when blended and subjected to photopolymerization conditions;

(2) sequentially coating said coatable compositions to provide a plurality of superimposed layers with contiguous layers defining an interface therebetween, with one composition which is curable to a pressure-sensitive adhesive state being coated as a first or last layer;

(3) permitting migration of photopolymerizable monomers through said interface between contiguous layers, and

(4) subjecting said superimposed layers to irradiation to simultaneously photopolymerize said monomers in each layer, and to provide polymeric chains comprised of copolymers of photopolymerizable monomers originating from contiguous layers extending through said interface therebetween thereby to produce a tape having layers which cannot be delaminated.

4,895,739

PRETREATMENT FOR ELECTROPLATING PROCESS

John J. Bladon, Wayland, Mass., assignor to Shipley Company Inc., Newton, Mass.

Division of Ser. No. 153,357, Feb. 8, 1988, which is a continuation-in-part of Ser. No. 71,865, Jul. 10, 1987, abandoned. This application Sep. 15, 1988, Ser. No. 244,788

Int. Cl.[4] C25D *5/54, 5/56*

U.S. Cl. 427—304 **6 Claims**

1. A method for formation of a catalytic metal sulfide conversion coating over the surface of a nonconductor, said method comprising the steps of:

a. treating the surface of said nonconductor with an acid colloidal solution of a tin-noble metal electroless metal plating catalyst; and

b. treating the surface of the nonconductor with a solution containing a dissolved sulfide capable of reacting with the metal plating catalyst to form a sulfide of said catalytic noble metal.

4,895,740

PROCESS FOR MANUFACTURING COLORED STAINLESS STEEL WIRE

Masahiro Hiromori, and Toshimi Nakahara, both of Itami, Japan, assignors to Sumitomo Electric Industries Ltd., Itumi, Japan

Division of Ser. No. 853,014, Apr. 17, 1986, Pat. No. 4,791,025. This application Aug. 24, 1987, Ser. No. 88,892

Int. Cl.[4] B05B *3/02, 3/12*

U.S. Cl. 427—358 **4 Claims**

1. A process for manufacturing a stainless steel wire comprising the steps of applying a colored resinous paint to a thickness of 1 to 500 microns on a stainless steel wire, drying and baking said paint so as to form a coating having a pencil hardness of 6H or less, and cold drawing the coated wire.

4,895,741

DECORATIVE BOW STORABLE IN A FLAT CONFIGURATION

Gerald C. Coffman, 1835 NE. Second St., Bend, Oreg. 97701

Continuation-in-part of Ser. No. 82,077, Aug. 4, 1987, Pat. No. 4,780,343. This application Jul. 19, 1988, Ser. No. 219,719

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] D04D *7/10*

U.S. Cl. 428—5 **25 Claims**



1. A decorative bow assembly, comprising:

(a) a base member including indicia defining a plurality of loop locations arranged in a predetermined pattern about a central point; and

(b) a plurality of loop members, each comprising an elongate piece of flexible sheet material having a pair of opposite longitudinal edges, a pair of end edges extending between the longitudinal edges, and respective opposite end portions proximate the end edges, each piece of flexible sheet material being bent into the form of an arcuate loop, and each of said plurality of loop members being attached to said base member at a respective one of said loop locations with both the end portions of said elongate piece of flexible sheet material being located proximate each other.

4,895,742

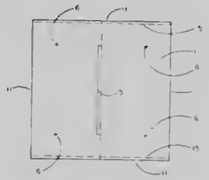
CONVERTIBLE RECEPTACLE

Clemens B. Schaub, 400 W. Romana St., Pensacola, Fla. 32595, and Susan S. Raisch, 53 Cloister Pl., Staten Island, N.Y. 10306

Filed Jul. 22, 1988, Ser. No. 223,192

Int. Cl.[4] B65D *30/10, 33/06*

U.S. Cl. 428—35.5 **7 Claims**



1. A convertible receptacle comprising

an upper and a lower layer of sheet material, said layers having peripheries and being attached to each other at respective peripheries, such that said upper and lower layer may lie adjacent each other on a flat surface;

said upper layer being provided with a centrally located opening; and

lifting means, said lifting means attached to said upper layer encompassing said opening and being located between said opening and said periphery;

such that, upon lifting said lifting means said upper layer is lifted from said lower layer and a receptacle is formed, said receptacle being accessible by way of said central opening;

whereby objects residing on said upper layer are caused to fall into said opening and then into said receptacle.

4,895,743

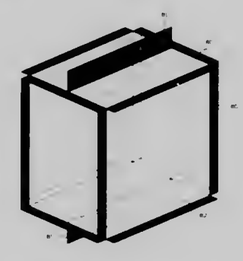
BLOW MOLDED ARTICLE

Donald L. Peters, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 931,480, Nov. 11, 1986, Pat. No. 4,761,130, which is a division of Ser. No. 728,912, Apr. 30, 1985, Pat. No. 4,650,627. This application Mar. 31, 1988, Ser. No. 175,560

Int. Cl.[4] B65D *1/00*

U.S. Cl. 428—35.7 **9 Claims**



3. A one piece blow molded plastic article having six sides forming an enclosure, with at least one pair of the sides opposing, each of said sides having an enclosure surface, and an outer surface, said article further having 12 angular edges and a flash along each edge, and said article further having a flash on at least one of the two outer surfaces of one pair of opposing sides formed by the top and bottom of the mold.

4,895,744

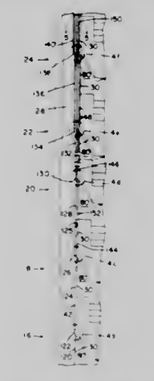
METHOD OF MAKING A MULTI-LAYER PARISON

Milton Briggs, York, Pa., and Erich O. Teutsch, Marietta, Ga., assignors to General Electric Company, Pittsfield, Mass. and Graham Engineering Corporation, York, Pa.

Division of Ser. No. 922,198, Oct. 23, 1986, Pat. No. 4,798,526, and a continuation of Ser. No. 886,734, Jul. 17, 1986, abandoned, and a continuation of Ser. No. 878,701, Jun. 26, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 221,598

Int. Cl.[4] B29C *47/06;* **B32B** *27/08, 31/30*

U.S. Cl. 428—35.7 **16 Claims**



1. A method of fabricating a multi-layered, thermoplastic parison having adjacent layers of synthetic polymeric resins having incompatible melt flow temperatures which comprises the steps of:

providing a first synthetic polymeric resin in a heat-softened, shapeable state requiring a melt flow temperature within a first given temperature range;

providing a second synthetic polymeric resin in a heat-softened, shapeable state requiring a melt flow temperature within a second given temperature range;

said first resin being degradable by exposure to a temperature within the second given temperature range;

shaping the first resin provided into an annular stream;

shaping the second resin provided into an annular stream;

applying one of the first and second resin streams onto a mandrel at a uniform, constant flow rate to form a continuous tubular substrate while substantially maintaining the melt flow temperature of the provided resin;

adhering the other of the first and second resin streams to the tubular substrate, at a constant, uniform flow rate to form a covered substrate and moving the covered substrate along the mandrel, while substantially maintaining the melt flow temperatures of the provided first and second resins; and

extruding the covered substrate to form a parison.

4,895,745

DARK ACRYLIC PRESSURE-SENSITIVE ADHESIVE

George F. Vesley, Hudson, Wis., and Jürgen Klingen, Schwalmtal, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 241, Jan. 2, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,227

Int. Cl.[4] A61F *13/02*

U.S. Cl. 428—40 **16 Claims**

1. A colored acrylic pressure-sensitive adhesive tape com-

VOL 1110 ISS 4 JA 23 1990 UMI

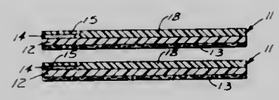
prising a flexible carrier supporting a pressure-sensitive adhesive layer in which is dispersed a pigment or dye plus hydrophobic silica having a surface area of at least 10 m^2/g and in an amount comprising by weight from about 2 phr to about 15 phr, wherein said tape has a more intense color than an identical tape in which the adhesive contains no hydrophobic silica.

4,895,746

STACK OF PRESSURE SENSITIVE ADHESIVE COATED SHEETS

Timothy A. Mertens, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 1, 1989, Ser. No. 317,649
Int. Cl.[4] B32B *7/06*
U.S. Cl. 428—40 **11 Claims**



1. A stack of aligned sheets, each of which sheets includes
a backing having a plurality of edges providing a peripheral edge for the sheet, and upper and lower surfaces,
a coating of pressure sensitive adhesive on said lower surface by which the sheet is adhered to the sheet beneath it in the stack, said coating extending along and within at least 12.5 mm of all of said edges,
release means providing a first adhesion zone between adjacent sheets in the stack and adjacent one of said edges for providing a sufficiently low release force between said adhesive coating and the upper surface of the adjacent sheet in the stack to afford, when the sheet is the uppermost or lowermost sheet in the stack, easy initiation of peeling of the sheet from the adjacent sheet in the stack along the first adhesion zone, and
attachment means providing a second adhesion zone between adjacent sheets in the stack for providing a sufficiently high release force that is higher than said low release force in the first adhesion zone to firmly adhere adjacent sheets in the stack together and thereby hold the stack of sheets together during handling, while affording continued peeling away of the sheet in the stack after initiating of such peeling along the first adhesion zone.

4,895,747

PRESSURE SENSITIVE ADHESIVE LABEL

Ronald B. Birkholz, White Bear Lake, and Richard R. Riter, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 22, 1988, Ser. No. 223,278
Int. Cl.[4] B32B *7/06, 7/12*
U.S. Cl. 428—42 **13 Claims**



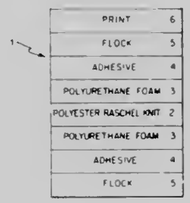
1. A label for use with a support surface, comprising:
(a) a sheet member having first and second opposing major surfaces;
(b) a layer of moisture dissipative material applied to said second major surface of said sheet member; and
(c) a pressure sensitive adhesive applied to said moisture dissipative layer opposite said second major surface of said sheet member for adhering said sheet member to the support surface;
(d) so that said sheet member may be removed without damage from the support surface by dissipating said layer of moisture dissipative layer.

4,895,748

FLOCKED FOAM FABRIC WITH FLATTENED FIBERS WHICH ARE COLOR PRINTED

William J. Squires, 26 E. Hunting Ridge Rd., Stamford, Conn. 06903

Filed Apr. 3, 1989, Ser. No. 332,543
Int. Cl.[4] B32B *33/00*
U.S. Cl. 428—88 **19 Claims**



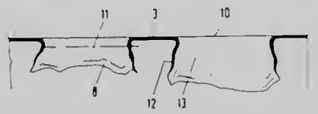
1. A flocked foam fabric, comprising:
a foamed polyurethane element having an outer surface;
flock fibers; and
means for adhering the flock fibers onto said outer surface, said flock fibers having an end imbedded into said adhering means and a portion projecting out of said adhering means, said portion being thermally set into a flattened and entangled state along said outer surface of said foamed element so as to provide a substantially flat surface with entangled flock fibers.

4,895,749

LIQUID PERMEABLE THERMOPLASTIC FILMS

Dieter Rose, Grunwald, Fed. Rep. of Germany, assignor to AOE Plastic GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1988, Ser. No. 215,732
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723404
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—132 **7 Claims**



1. Liquid-permeable film made from a thermoplastic material suitable for use as a covering film for absorbent material having openings therein shaped as projections which terminate in a free edge on one side only of the film, the narrowest cross-section of the opening being on a different plane from that of the opposite smooth side of the film, and characterised by the fact that the plane of the narrowest cross-section of the opening is spaced from the plane of said opposite smooth side of the film in the direction from said opposite smooth side toward said one side of said film by a distance greater than the thickness of said film in its undeformed state and that the cross-section of the opening increases in size in an axial direction from the point of the narrowest cross-section (11) to the free edge of the projection (12).

4,895,750

HIGH-TEMPERATURE TENSILE TEST SPECIMEN AND METHODS OF FABRICATION

Wilson N. Pratt, Anaheim, Calif., assignor to General Dynamics Corp., Pomona Division, Pomona, Calif.

Filed Mar. 28, 1988, Ser. No. 173,787
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—137 **7 Claims**



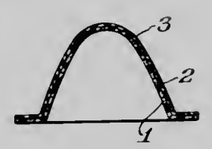
1. A specimen bar of carbon composite material suitable for high-temperature testing in a tensile test apparatus without breaking in the gripping jaws of said apparatus, comprising:
a first end portion having a plurality of holes therethrough, said first end portion and the circumferential walls of said holes being plated with a layer of nickel;
a second end portion having a plurality of holes therethrough, said second end portion and the circumferential walls of said holes being plated with a layer of nickel; and
a tensile test portion between said first and second end portions and contiguous therewith.

4,895,751

WATERPROOF, WATER-VAPOR-PERMEABLE FABRIC CONSTRUCTION

Tatsu Kato, 3-15-18, Sakura, Setagayaku, Tokyo 156, and Takashi Imai, 831-2 Kinugasa, Wake-cho, Wake-gun, Okayamaken 709-04, both of Japan

Filed Oct. 6, 1987, Ser. No. 105,093
Claims priority, application Japan, Oct. 8, 1986, 61-153701[U]
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—245 **9 Claims**



1. A waterproof, water-vapor-permeable fabric construction comprising a three-dimensional laminate of a water-permeable material bonded to a waterproof, water-vapor-permeable film, at least a part of said laminate being molded so that it has a permanent three-dimensional curved shape.

4,895,752

LOW DIELECTRIC CONSTANT LAMINATE OF FLUOROPOLYMER AND POLYARAMID

Craig S. McEwen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 134,712, Dec. 18, 1987, abandoned. This application Jun. 6, 1989, Ser. No. 363,350
Int. Cl.[4] B32B *9/04, 15/08*
U.S. Cl. 428—245 **9 Claims**

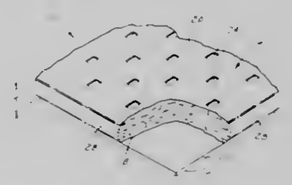
1. A laminate comprising in order (1) a layer of copper, (2) a layer of fluoropolymer selected from the group consisting of polytetrafluoroethylene, a copolymer of tetrafluoroethylene and hexafluoropropylene, a copolymer of tetrafluoroethylene and perfluoro (propyl vinyl ether), a terpolymer of tetrafluoroethylene, hexafluoropropylene, and perfluoro (propyl vinyl ether) and a terpolymer of tetrafluoroethylene, hexafluoropropylene, and perfluoro (ethyl vinyl ether) which is reinforced with a woven or nonwoven fabric of polyaramid fiber, such that the volume percent of polyaramid on the basis of the total of the polyaramid plus fluoropolymer is less than about 40, and (3) a second layer of copper with the proviso:
(a) a layer of copper oxide, zinc or brass is intermediate and contacts both layers (1) and (2), or
(b) a layer of copper oxide contacts layer (1) and a layer of zinc or brass is intermediate and contacts both the layer of copper oxide and layer (2) or
(c) layer (1) contacts layer (2) and with the further proviso:
(d) a layer of copper oxide, zinc or brass is intermediate and contacts both layers (2) and (3), or
(e) a layer of copper oxide contacts layer (3) and a layer of zinc or brass is intermediate and contacts both the layer of copper oxide and layer (2), or
(f) layer (2) contacts layer (3).

4,895,753

FENDER COVER

Thomas J. Etter, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 13, 1989, Ser. No. 337,398
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—286 **15 Claims**



1. A flexible fender cover adapted for covering a fender of an automobile or the like while a mechanic works on the automobile, the cover comprising:
an absorbent layer of a generally oleophilic blown microfiber material and having opposite major side surfaces, the absorbent layer being bonded at spaced locations to prevent separation or linting thereof; and
a non-slip layer on one major surface of the absorbent layer formed of generally non-slip and non-abrasive elastomeric material having a generally high coefficient of friction in a shear mode relative to the fender to grip the fender, with generally low adhesion when peeled or lifted from the fender.

4,895,754

OIL TREATED MINERAL FILLER FOR ASPHALT

Joseph Graham, Plymouth, Minn., and Billy L. George, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 24, 1989, Ser. No. 301,163
Int. Cl.[4] D04H *1/58*
U.S. Cl. 428—289 **8 Claims**

6. Fabric mat which is coated or impregnated with the composition of claim 1.

4,895,755

HALOGENATED ADVANCED EPOXY RESINS

Jody R. Berman; Chun S. Wang, both of Lake Jackson; Louis L. Walker, Clute, all of Tex., and Abel Mendoza, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

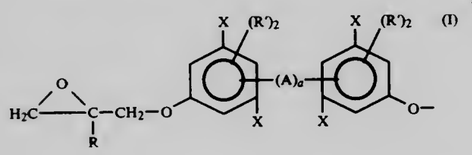
Continuation of Ser. No. 126,398, Nov. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 907,706, Sep. 15, 1986, Pat. No. 4,727,119. This application Oct. 14, 1988, Ser. No. 259,449

Int. Cl.[4] C08G 59/02

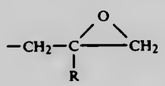
U.S. Cl. 428—290 75 Claims

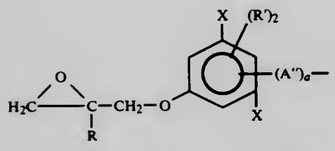
1. A halogen-containing advanced epoxy resin which results from reacting

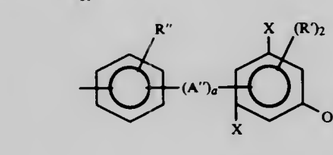
(A) at least one epoxy resin represented by the following formulas I, II, III, IV, V, VI, VII, VIII, IX or X; and



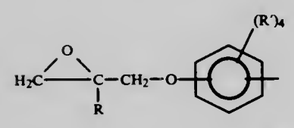
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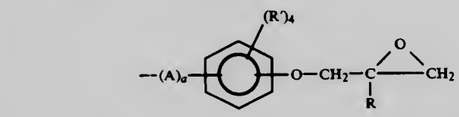


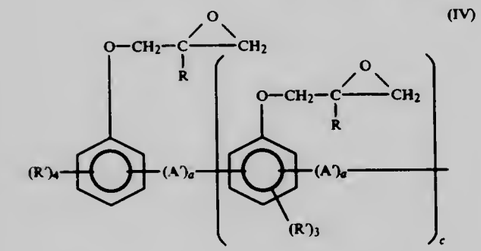




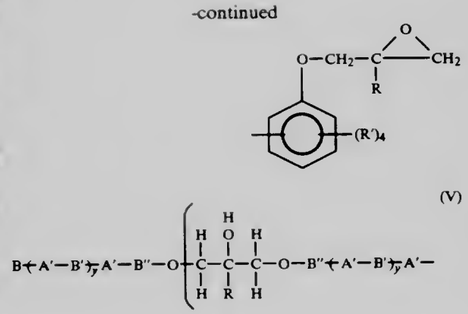
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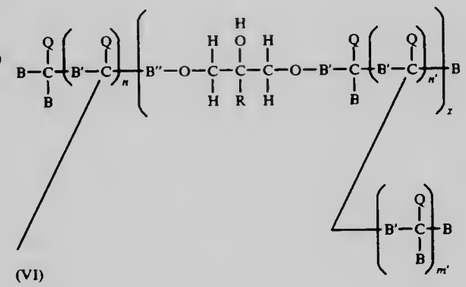




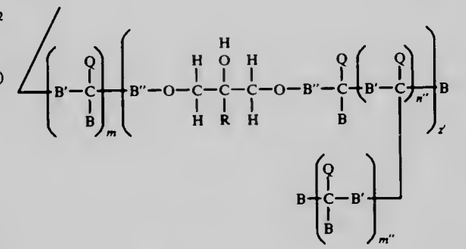
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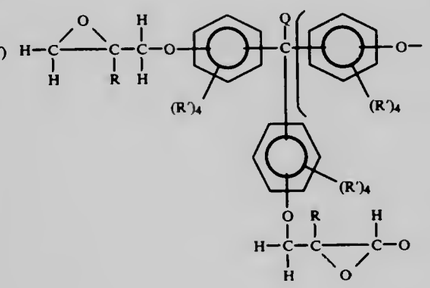
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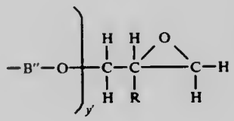


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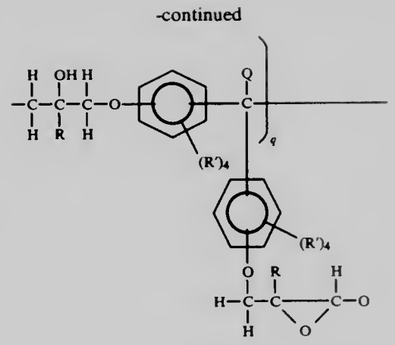


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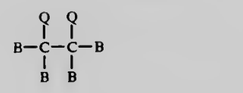
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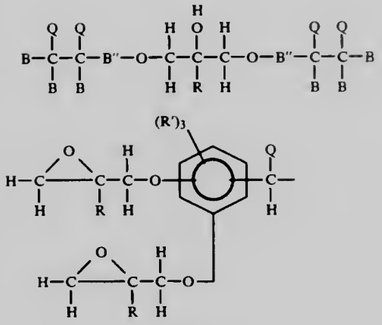
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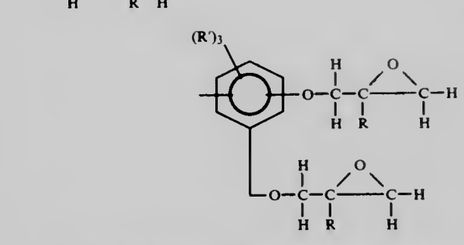
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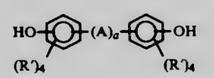
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(X)

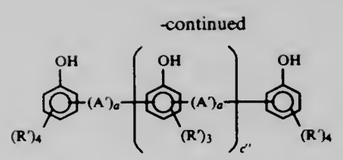


(B) at least one polyhydric phenolic compound represented by the following formulas XI, XII, XIII, XIV, XV, XVI or XVII

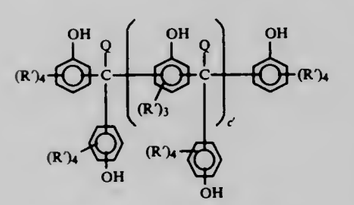


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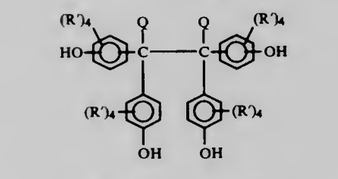
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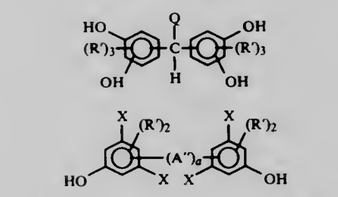
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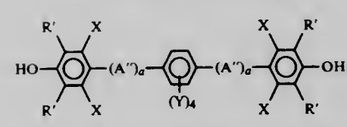
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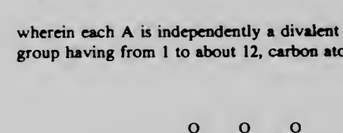
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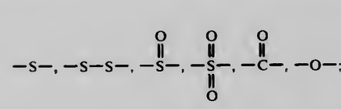


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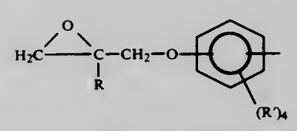


(XVII)

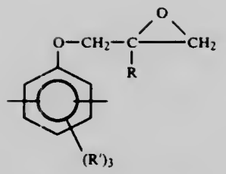
wherein each A is independently a divalent hydrocarbyl group having from 1 to about 12, carbon atoms,



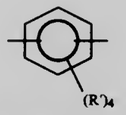
each A' is independently a divalent hydro-carbyl group having from 1 to about 12 carbon atoms; each A" independently is a divalent hydrocarbyl group having from 1 to about 4 carbon atoms; each B is independently represented by the formula



each B' is independently represented by the formula



each B'' is represented by the formula



each Q is independently hydrogen or a hydro-carbyl group having from 1 to about 10 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each R' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms or a halogen atom; a has a value of zero or 1; each R'' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from about 1 to about 10 carbon atoms, a halogen atom or a glycidyl ether group; each X is independently hydrogen or a halogen atom; each Y independently is hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, a halogen atom or a hydroxyl group; each c, c', c'' independently has a value from about zero to about 10; m has a value of n−1; m' has a value of n'−1; m'' has a value of n''−1; each n, n' and n'' independently has a value from zero to about 3; q has a value from zero to about 4; each y independently has an average value from 1 to about 5; y' has an average value of from zero to about 3, each z and z' independently has a value from zero to about 3; and wherein

(i) at least one of components (A) and (B) contains at least one halogen atom which is in the meta position with respect to an oxygen atom attached to the ring for each two aromatic rings;

(ii) when the average epoxide functionality of component (A) is not greater than 2 and the average hydroxyl functionality of component (B) is not greater than 2, components (A) and (B) are present in quantities which provide a hydroxyl to epoxide ratio of from about 0.1:1 to about 0.9:1;

(iii) when one of components (A) and (B) has an average functionality of greater than 2 and the other has an average functionality of not greater than 2, components (A) and (B) are present in quantities which provide a hydroxyl to epoxide ratio of from about 0.01:1 to about 0.4:1; and when both components (A) and (B) have an average functionality of greater than 2, components (A) and (B) are present in quantities which provide a hydroxyl to epoxide ratio of from about 0.01:1 to about 0.3:1.

4,895,756

PRINTED CIRCUIT SUBSTRATE

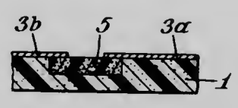
Hirosuke Suzuki, Saitama, Japan, assignor to Junkosha Co., Ltd., Japan

Filed Sep. 23, 1988, Ser. No. 248,158

Claims priority, application Japan, Nov. 20, 1987, 62-177167[U]

Int. Cl.[4] B32B *5/22*

U.S. Cl. 428—317.9 10 Claims



1. A printed circuit comprising electrically conductive material which forms circuit elements contained within the pores of a porous dielectric substrate.

4,895,757

PHOTOGRAPHIC PAPER SUPPORT MANUFACTURE

Wolfram Wyak, Belm; Bernd Scholz, and Ralf-Burckhard Dethlefs, both of Osnabrück, all of Fed. Rep. of Germany, assignors to Felix Schoeller, Jr. GmbH & Co. K.G., Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 72,406

Claims priority, application European Pat. Off., Jul. 22, 1986, 86110061

Int. Cl.[4] B32B *5/16, 27/10;* G03C *1/78*

U.S. Cl. 428—323 20 Claims

1. A photographic support material comprising a photographic base paper coated with at least one layer of a polyolefin pigmented mixture containing white pigment and having a surface receptive to the application of a light sensitive photographic coating thereon positioned on at least one side of the paper, said polyolefin layer mixture also containing a polyalkylene glycol therein in a quantity of between about 40 ppm and 15 by weight relative to the total quantity of the polyolefin.

4,895,758

MAGNETIC RECORDING MEDIUM

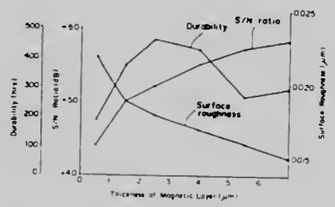
Akito Sakemoto; Hideo Fujiwara; Kunio Mizushima, all of Ibaraki, and Akira Miyake, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Sep. 17, 1985, Ser. No. 777,017

Claims priority, application Japan, Sep. 19, 1984, 59-194866; Sep. 19, 1984, 59-194867; Sep. 19, 1984, 59-196150

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—323 7 Claims



1. A magnetic disc comprising a non-magnetic substrate having first and second surfaces and a magnetic layer formed on each of said first and second surfaces, said magnetic layer comprising a non-magnetic binder having dispersed therein a ferromagnetic powder having a particle size of from 0.1 to 1.0 μm, said magnetic layer having a coercive force (Hc) of from 1180 to 2,000 oersteds, a residual magnetic flux density (Br) of from 1110 to 2,000 gausses and a thickness of at least 0.5 μm, wherein said ferromagnetic powder is present in said magnetic layer in an amount of from 65–85% by weight based on total weight of powder and binder, has a specific surface area of not larger than 60 m^2/g and a saturation magnetization of from 100 to 130 emu/g.

4,895,759

SATURATING GRADE PAPER

Roger A. Crawford, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 169,653, Mar. 18, 1988, abandoned. This application Mar. 2, 1989, Ser. No. 315,981

Int. Cl.[4] B32B *29/00*

U.S. Cl. 428—331 22 Claims

1. A resin saturable paper sheet containing titanium dioxide as the principal filler and from about 5 to about 40 weight percent, basis the titanium dioxide, of amorphous precipitated silica having a BET surface area of between about 25 and 200 square meters per gram, a pH of between about 6 and 9.5 and a median agglomerate particle size of less than about 30 micrometers, said silica containing less than about 1 weight percent of calcium (calculated as calcium oxide).

4,895,760

FILM COATING FOR RIGID, SMOOTH SURFACES

Dennis D. Berger, Midlothian, Va., assignor to Tredegar Industries, Inc., Richmond, Va.

Filed Oct. 9, 1987, Ser. No. 107,132

Int. Cl.[4] B32B *27/36, 27/08*

U.S. Cl. 428—332 10 Claims

1. An article comprised of a substrate having a rigid or hard, smooth surface and having affixed thereto a thermoplastic film having on one side thereof an embossed matte finish and on the other side thereof a smooth surface ranging in smoothness from about 0.25 to about 10 Ra, the smooth surface of the film being affixed to the smooth surface of the substrate whereby said film adheres tightly to said surface due solely to the intimate contact between said smooth surface of said substrate and said smooth surface of said film.

4,895,761

SHEETS WITH SILICONE-BASED SURFACE-RELEASE FILM

Megumi Kashida, and Yasuaki Hara, both of Gunma, Japan, assignors to Shin Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 239,496

Claims priority, application Japan, Sep. 2, 1987, 62-219748

Int. Cl.[4] B32B *9/06*

U.S. Cl. 428—336 12 Claims

1. A surface-release sheet which comprises, in successive layers:

(i) a substrate sheet;

(ii) an undercoating layer of a thickness of about 0.3 to 3 μm of a cured organopolysiloxane composition produced by curing a curable organopolysiloxane composition comprising:

(a) an organopolysiloxane having, in a molecule, at least three aliphatically unsaturated hydrocarbon groups bonded to the silicon atoms,

(b) an organohydrogenpolysiloxane having, in a molecule, at least three hydrogen atoms directly bonded to the silicon atoms, and

(c) a platinum compound; and

(iii) an overcoating layer containing from 0.01 g to 5 g per square meter of substrate surface area of an organotin compound of the general formula R_pSnA_{4-p} in which R is a monovalent hydrocarbon group free from aliphatic unsaturation, the subscript p is the integer 1, 2, or 3, and A is an acyloxy group.

4,895,762

MAGNETIC RECORDING MATERIAL

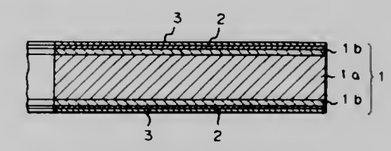
Tadao Tokushima; Makoto Shiraki; Yoshifumi Suzuki, and Yukio Wakui, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Dec. 15, 1987, Ser. No. 132,929

Claims priority, application Japan, Jan. 27, 1986, 61-313399

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—336 8 Claims



1. An improved magnetic recording material comprising an Al or Al alloy substrate, and including an anodic oxide layer formed on the surface of said substrate, a primary layer comprising an Al or Al alloy of 0.1 to 2 micron thickness formed on the surface of said anodic oxide layer, an anodic oxide surface layer provided with a plurality of pores and formed on the surface of said primary layer, and a ferromagnetic substance within said plurality of pores in said anodic oxide surface layer.

4,895,763

MAGNETIC RECORDING MEDIUM AND NON-AQUEOUS SUSPENSION OF INORGANIC SOLID PARTICLES FOR USE IN THE PRODUCTION OF THE SAME

Shigeo Aoyama, Kyoto; Kenji Sumiya, Saita, and Yoshiharu Katsuta, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 30, 1987, Ser. No. 114,847

Claims priority, application Japan, Oct. 31, 1986, 61-261701; Oct. 31, 1986, 61-261702; Oct. 31, 1986, 61-261703

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—405 7 Claims

1. A magnetic recording medium comprising a substrate, a magnetic layer and optionally a back coat layer formed thereon, wherein at least one of the magnetic layer and the back coat layer contains non-magnetic solid particles the surfaces of which are treated with an organosilazane compound having alkyleneoxy units in an amount of from 0.1 to 20 parts by weight of said organosilazane compound per 100 parts by weight of said non-magnetic solid particles.

4,895,764

MAGNETIC RECORDING MEDIA

August Lehner, Roedersheim-Gronau; Albert Kohl, Lautersheim; Michael Bobrich, Bobl-Iggelheim; Hermann Roller, Ludwigshafen; Peter Richter, Frankenthal; Werner Lenz, Bad Durkheim; Ludwig Kreitner, Heppenheim, and Peter Rudolf, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 161,048

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707440

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—425.9 6 Claims

1. A magnetic recording medium consisting of a nonmagnetic base and, firmly applied to this, at least one magnetic layer based on a magnetic material finely dispersed in a binder consisting of not less than 50% by weight of a thermoplastic polyurethane, wherein the thermoplastic polyurethane used is a branched polyurethane which is soluble in tetrahydrofuran and free of isocyanate groups, possesses OH-containing urea

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groups at the chain ends and has a molecular weight of from 40,000 to 200,000, and which is prepared from

A. 1 mole of a polydiol having a molecular weight of from 400 to 4,000,

B. from 0.3 to 10 moles of a straight-chain aliphatic diol of 2 to 10 carbon atoms,

C. from 0.05 to 0.5 mole of a tri- or polyol of 3 to 10 carbon atoms,

D. from 1.3 to 13 moles of a diisocyanate of 6 to 30 carbon atoms and

E. from 0.09to 2 moles of an aminoalcohol of 2 to 16 carbon atoms,

with the proviso that the ratio of the OH groups of components A to C to the NCO groups of component D to the amine groups of component E is 1:1.03–1.3:0.03–0.3.

4,895,765

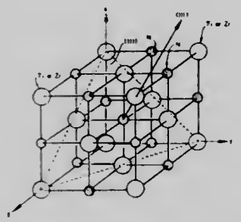
TITANIUM NITRIDE AND ZIRCONIUM NITRIDE COATING COMPOSITIONS, COATED ARTICLES AND METHODS OF MANUFACTURE

Jiinjen A. Sue, Indianapolis, and Harden H. Troue, Plainfield, both of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 781,459, Sep. 30, 1985, abandoned. This application Sep. 10, 1986, Ser. No. 905,510

Int. Cl.[4] B32B *15/18;* **C23C** *15/00*

U.S. Cl. 428—627 **29 Claims**



1. A polycrystalline zirconium nitride coating composition having a highly oriented crystallographic structure consisting of an I(111)/I(200) x-ray diffraction intensity ratio of at least about 15.

4. A polycrystalline titanium nitride coating composition having a highly oriented crystallographic structure consisting of an I(111)/I(200) x-ray diffraction intensity ratio of at least about 75.

16. A method of forming a highly oriented polycrystalline titanium nitride or zirconium nitride coating upon a substrate with the TiN or ZrN coating having a high I(111)/I(200) x-ray diffraction intensity ratio comprising the steps of:

(a) providing within a vacuum chamber cathode comprising a source material of titanium or zirconium upon an evaporable end surface, and an anode spaced apart from the cathode;

(b) generating an electric arc between the evaporable end surface of the cathode and the anode to form a plasma of material from the source material;

(c) surrounding the cathode with an elongated member positioned between and spaced from the cathode and the anode, wherein the elongated member is electrically insulated from the cathode and the anode and has an open end extending a distance x beyond the evaporable end surface of the cathode to form a cathode chamber containing the plasma;

(d) directing a flow of nitrogen gas through the plasma in the cathode chamber and into the vacuum chamber such that the gas envelops the electric arc over at least the distance x before entering the vacuum chamber;

(e) withdrawing gas from the vacuum chamber to maintain a predetermined pressure within the vacuum chamber; and

(f) depositing a coating of material from the plasma upon the object.

4,895,766

BAKEWARE COATING

William T. Saad, Burnt Hills, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Mar. 23, 1988, Ser. No. 171,978

Int. Cl.[4] B32B *9/04;* **C08G** *77/04*

U.S. Cl. 428—447 **46 Claims**

23. A coating composition for bakeware consisting essentially of:

(a) 100 parts by weight of at least one base silicone resin having alkoxy or acyloxy functional groups and a viscosity of from 10 to about 200,000 centipoise at 25° C.;

(b) from about 50 to about 2,000 parts by weight of at least one base polydiorganosiloxane fluid different from component (a) having a viscosity between about 5 and 5,000 centipoise at 25° C. and having functional groups selected from the group consisting of silanol, alkoxy, and acyloxy;

(c) from about 1 to about 30% by weight based on (a) and (b) a hydroxy functional polyphenylsiloxane resin containing $C_6H_5SiO_{3/2}$ units, $(C_6H_5)_2SiO_{2/2}$ units, or $(C_6H_5)CH_3SiO_{2/2}$ units;

(d) from about 0.5 to about 5% by weight based on (a) and (b) a nonthermosettable polydiorganosiloxane fluid; and

(e) an effective amount of condensation catalyst to cure the composition.

4,895,767

TRANSPARENT ARTICLE AND PROCESS FOR PREPARATION THEREOF

Kaoru Mori, Shiga; Naoki Shimoyama, Otsu, and Takashi Taniguchi, Shiga, all of Japan, assignors to Toray Industries, Inc., Japan

Continuation of Ser. No. 819,152, Jan. 14, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 208,845

Claims priority, application Japan, Mar. 22, 1985, 60-56114

Int. Cl.[4] B32B *9/04, 27/36, 17/06;* **G02B** *5/28*

U.S. Cl. 428—447 **18 Claims**

1. A transparent article comprising on the surface of a transparent substrate a cured transparent coating film composed of a composition comprising 100 parts by weight of an organic silicon compound represented by the following general formula (I) and/or a hydrolysis product thereof:

$$R^1_aR^2_bSi(OR^3)_{4-a-b} \quad (I)$$

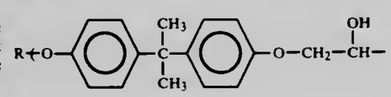
wherein

R^1 and R^2 each stand for an alkyl group, an alkenyl group, an aryl group or a hydrocarbon group having a halogen group, an epoxy group, a glycidoxy group, an amino group, a mercapto group, a methacrylate group or a cyano group,

R^3 stands for an alkyl group having 1 to 8 carbon atoms, an alkoxyalkyl group, an acyl group or a phenyl group, and

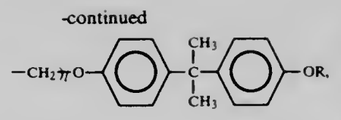
a and b are 0 or 1,

10 to 300 parts by weight of a polyfunctinal epoxy resin having an aromatic ring and/or an aliphatic ring, said epoxy resin being selected from the group consisting of:

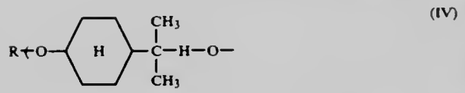


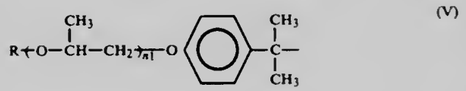
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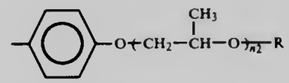


(IV)





(V)



wherein

R stands for a glycidyl group and l, m, n_1 and n_2 are integers of from 0 to 15 and 25 to 800 parts by weight of antimony oxide fine particles having an average particle size of 1 to 200 mμ.

4,895,768

NON-YELLOWING CLEAR COATINGS

Chaucer C. Tang, Bloomfield Hills, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 286,786, Dec. 20, 1988, which is a division of Ser. No. 137,095, Dec. 23, 1987, abandoned. This application May 16, 1989, Ser. No. 352,504

Int. Cl.[4] C08L *37/00*

U.S. Cl. 428—461 **8 Claims**

1. A substrate coated with a layer of a dried and cured composition which before drying and curing comprises about 20–80% by weight of a binder and 0–20% by weight solvent for the binder, wherein the binder consists essentially of about 60–80% weight, based on the weight of the binder, of an acrylic polymer of polymerized monomers of alkyl methacrylate, alkyl acrylate or mixtures thereof and the polymer having pendent aminoester or hydroxy aminoester groups and 20–60% by weight based on the weight of the binder, of a glycidyl acrylic crosslinking polymer of polymerized monomers of glycidyl methacrylate or glycidyl acrylate and an alkyl methacrylate or acrylate or mixtures thereof; wherein

the coating composition contains about 0.5–10% be weight, based on the weight of the binder, of catalyst consisting of the alkyl ester of para hydroxy benzoic acid having 1–4 carbon atoms in the alkyl group.

4,895,769

METHOD FOR PREPARING LIGHT POLARIZER

Edwin H. Land, Cambridge; Anthony J. DiRocco, Billerica, and Leonard Polizzotto, Stow, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 9, 1988, Ser. No. 230,468

Int. Cl.[4] B29C *55/10;* **B32B** *27/08*

U.S. Cl. 428—483 **22 Claims**

1. A method for preparing a stainable polymeric sheet article adapted to the production of a light polarizer therefrom, the method comprising the steps of:

providing a support sheet of amorphous polymeric material;

uniaxially stretching the amorphous polymeric support sheet in a first direction and at a temperature at or above the glass transition temperature of the polymeric support sheet material, to partially orient the molecules of the polymeric support sheet material along said first direction;

applying a coating of an aqueous polyvinyl alcohol-containing composition to the surface of the uniaxially stretched polymeric support sheet; and

stretching the polyvinyl alcohol-coated uniaxially stretched polymeric support sheet at a temperature at or above the glass transition temperature of the polymeric support sheet material and in a second direction of stretch;

said second direction of stretch being at an angle within about ±60 degrees from a normal to said first direction of stretch;

the amount of stretch along said first direction being sufficient to impart to the polymeric support sheet, resistance to stress-induced fracture along said first direction, and the amount of stretch along said second direction being sufficient to simultaneously orient the molecules of said polyvinyl alcohol layer to thereby adapt the layer to incorporation of visible dichroism, and to impart to the support layer, resistance to stress-induced fracture along said second direction.



16. A stainable polymeric sheet article adapted to the production of a light polarizer therefrom, said polymeric sheet article comprising:

a biaxially oriented polymeric support sheet carrying a coated layer of polyvinyl alcohol;

said biaxially oriented polymeric support sheet having biaxial orientation resulting, in part, from the uniaxial stretching of an amorphous polymeric support sheet prior to the application of said coated polyvinyl alcohol layer thereon, said uniaxial stretching being along a first direction, and, in part, as an incident to the subsequent stretching and orientation, along a second direction, of said coated polyvinyl alcohol layer carried on said uniaxially stretched polymeric support sheet;

said stretching of said coated polyvinyl alcohol layer along said second direction being at an angle within about ±60 degrees from a normal to said stretching along said first direction;

the amount of stretch along said first direction being sufficient to impart to the polymeric support sheet, resistance to stress-induced fracture along said first direction, and the amount of stretch along said second direction being sufficient to simultaneously orient the molecules of said polyvinyl alcohol layer and thereby adapt the layer to incorporation of visible dichroism, and to impart to the support layer, resistance to stress-induced fracture along said second direction.

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4,895,770
PROCESS FOR THE MANUFACTURE OF MULTI-LAYERED, COATED HARDMETAL PARTS
Wilfried Schintlmeister, Muhl/Reutte, and Wolfgang Wallgram, Breitenwang, both of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.
Filed Aug. 30, 1988, Ser. No. 238,835
Claims priority, application Austria, Aug. 31, 1987, 2173/87
Int. Cl.[4] G22F *3/00*
U.S. Cl. 428—552 21 Claims

1. A coated hardmetal part comprised of:
(a) a WC-Co or WC-Ni hardmetal substrate;
(b) an intermediate coating on said substrate comprised of TiC and/or TiCN, so as to provide a diffusion barrier to prevent the formation of brittle tungsten cobalt boron or tungsten nickel boron phases in the external zone of the hardmetal part; and
(c) a metal-boronitride coating on said intermediate layer wherein the boron concentration in said metal-boronitride layer is maintained so as to prevent formation of diboride phase.

4,895,771
ELECTRICAL CONTACT SURFACE COATING
John W. Souter, Autumn, and Michael C. Nottingham, Westbrook, both of United Kingdom, assignors to AB Electronic Components Limited, Great Britain
Filed Jun. 14, 1988, Ser. No. 206,564
Int. Cl.[4] C25D *5/12*; H01R *13/03*
U.S. Cl. 428—670 7 Claims

1. A process for providing an electrically conductive surface coating on an electrical contact body comprising the steps of depositing upon the surface of said body in sequence, (a) a nickel layer, (b) a first soft, pure gold layer, (c) a palladium/-nickel alloy layer containing nickel up to a proportion of 50% by weight, and (d) a second gold layer.

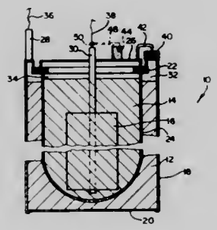
4,895,772
PHOSPHOR, AND RADIATION IMAGE STORAGE PANEL
Kenji Takahashi; Takashi Nakamura, and Yuichi Hosoi, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 47,595, May 11, 1987, abandoned, which is a continuation of Ser. No. 727,974, Apr. 26, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 147,573
Claims priority, application Japan, Apr. 26, 1984, 59-84356; Apr. 26, 1984, 59-84357
Int. Cl.[4] C09K *11/61*
U.S. Cl. 428—691 12 Claims

1. A divalent europium activated alkaline earth metal halide phosphor which is coactivated with boron and has the formula (I):

$$M^{II}X_2 \cdot aM^{II}X'_2 : xEu^{2+}, yB \quad (I)$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I, and $X \neq X'$; and a, x and y are numbers satisfying the conditions of $0.1 \leq a \leq 10.0$, $0 < x \leq 0.2$ and $2 \times 10^{-4} \leq y \leq 2 \times 10^{-1}$, respectively.

4,895,773
ELECTROCHEMICAL CELL
Roger J. Bones, Abingdon, and James L. Sudworth, Burton-on-Trent, both of England, assignors to Lilliwyte Societe Anonyme, Luxembourg
Filed Oct. 4, 1988, Ser. No. 253,267
Claims priority, application United Kingdom, Oct. 6, 1987, 8723407
Int. Cl.[4] H07M *2/00*
U.S. Cl. 429—7 10 Claims

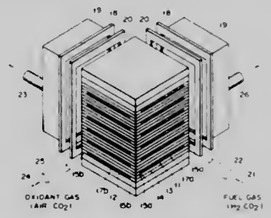


1. A rechargeable electrochemical power storage cell which comprises
an anode compartment containing active anode material which is liquid at the operating temperature of the cell;
a cathode compartment containing an electrolyte which is liquid at the operating temperature of the cell and an active cathode material; and
a separator which separates said compartments from each other and through which separator active anode material passes from the anode compartment to the cathode compartment during discharging of the cell, to enter the cathode compartment in ionic form, and through which separator the active anode material passes from the cathode compartment to the anode compartment during charging of the cell, at least one of said compartments being selected and being provided with switch means, the switch means being operative in response to an excursion, past a threshold value, of pressure in the sealed compartment arising from movement of active anode material through the separator during operation of the cell while it is connected to an external circuit, thereby to prevent further operation of the cell while said pressure remains past said threshold value.

4,895,774
MOLTEN CARBONATE FUEL CELL
Hideyuki Ohzu; Yoshihiro Akasaka, both of Tokyo; Hiroshi Tateishi, Zushi, and Takashi Ogawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 14, 1989, Ser. No. 310,309
Claims priority, application Japan, Feb. 17, 1988, 63-32632; Mar. 17, 1988, 63-64043; Mar. 17, 1988, 63-64044; Mar. 25, 1988, 63-69782
Int. Cl.[4] H07M *8/08*
U.S. Cl. 429—35 11 Claims

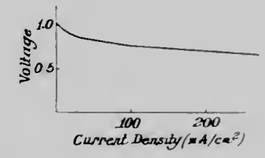
1. A molten carbonate fuel cell comprising:
a pair of conductive electrodes;
an electrolyte body sandwiched between said pair of conductive electrodes and consisting essentially of an electrolyte of an alkali carbonate mixture, more than 5 mol % to 15 mol % of magnesium carbonate with respect to said alkali carbonate mixture, and an electrolyte retaining material;

fuel supplying means for supplying a fuel gas to one of said pair of conductive electrodes; and



oxidant supplying means for supplying an oxidant gas to the other of said pair of conductive electrodes.

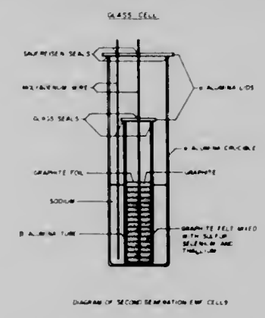
4,895,775
INTEGRAL FUEL CELL ELECTRODE AND MATRIX AND A METHOD FOR MANUFACTURING SAME
Hiroshi Kato, and Ichiro Komada, both of Oksyama City 703, Japan
Filed Jan. 27, 1988, Ser. No. 148,979
Claims priority, application Japan, Jan. 29, 1987, 62-17229
Int. Cl.[4] H07M *4/86*
U.S. Cl. 429—41 14 Claims



1. An integrally molded fuel cell electrode and matrix comprising:
(a) a matrix layer containing 3 to 20 weight percent PTFE and 80 to 97 weight percent inorganic powder integrally formed on one side of
(b) an electrode layer of PTFE containing a catalyst, wherein said matrix layer contains carbon fine powder and has integrally formed, on its side opposite said electrode layer, a layer of PTFE containing a second inorganic powder which possesses electrical insulating properties.

4,895,776
ELECTROCHEMICAL CELL UTILIZING SELENIUM AS AN ELECTRODE-REACTANT
Anil V. Virkar, Salt Lake City, Utah; Gerald R. Miller, East Amherst, N.Y., and James R. Rasmussen, Salt Lake City, Utah, assignors to Ceramatec, Inc., Salt Lake City, Utah
Continuation of Ser. No. 25,109, Mar. 12, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 267,690
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—102 7 Claims

1. An electrochemical cell comprising:
an anolyte containing substantially a molten alkali metal;
a solid beta"-alumina electrolyte possessing mobile alkali metal ions of the same alkali metal as is present in the anolyte; and
a catholyte comprising a mixture of molten selenium and molten sulfur in a molar ration of about 3:1 to about 30:1 selenium to sulfur, wherein at least a portion of said selenium and sulfur is present in elemental form.



4,895,777
SODIUM-SULFUR STORAGE BATTERY
Hiroshi Kagawa, Takatsuki, Japan, assignor to Yuasa Battery Co., Ltd., Osaka, Japan
Filed Aug. 14, 1986, Ser. No. 896,196
Claims priority, application Japan, Aug. 14, 1985, 60-179088
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—104 5 Claims



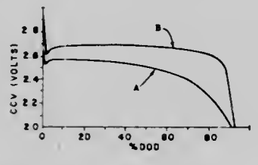
1. A sodium-sulfur storage battery comprising:
a battery housing which functions as a positive current terminal collector;
a solid electrolyte tube which is permeable to sodium ions and is disposed in the battery housing; and
a positive electroconductive material, impregnated with a positive reactant, disposed in a positive chamber between said solid electrolyte tube and said battery housing, said positive electroconductive material having an rough interior surface part circumferentially composed of longitudinally extending circumferentially alternating concave and convex portions, which are formed by compression during arcuate molding of the electroconductive material.

4,895,778
METHOD OF PURIFYING ELECTROLYTES OF ALKALI METAL BATTERIES
David Nalewajek, West Seneca, N.Y., assignor to Allied-Signal Inc., Morristown, N.J.
Continuation of Ser. No. 756,857, Jul. 18, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,697
Int. Cl.[4] H01M *6/04*; C02F *5/42*
U.S. Cl. 429—188 20 Claims

1. A method of purifying an organic electrolyte for use in alkali batteries, said electrolyte containing at least one contami-

nant metal selected from copper, nickel and iron solute and and at least one alkali metal salt solute contained in a least one organic solvent, comprising the steps of:

(a) contacting the electrolyte with a chelating resin for said contaminant metal solute which is insoluble in a stable to



said organic solvent to allow sorption by coordination of the copper, nickel and/or iron solute from said solvent without allowing sorption of the alkali metal salt solute from said solvent; and p1 (b) isolating the purified electrolyte from the resin.

4,895,779

METHOD OF FORMING A T SHAPED CONTROL ELECTRODE THROUGH AN X-RAY MASK

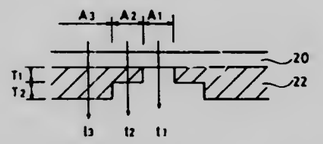
Nobuyuki Yoshioka, and Noriaki Ishio, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 99,000, Sep. 21, 1987, Pat. No. 4,865,952. This application Aug. 11, 1988, Ser. No. 231,065

Claims priority, application Japan, Sep. 20, 1986, 61-223369; Sep. 20, 1986, 61-223370

Int. Cl.[4] G03F *1/02*

U.S. Cl. 430—5 **11 Claims**



1. A method of manufacturing an X-ray mask for forming a T-shaped control electrode having a section of a T shape, said method further comprising:

a step of preparing a substrate for transmitting X-rays;

a step of forming a first absorber not transmitting X-rays on said substrate;

a step of forming a first resin film corresponding to the width of a lower portion of said T shape on said first absorber;

a step of forming a second absorber not transmitting X-rays on said first absorber by utilizing said first resin film as a model;

a step of forming a second resin film corresponding to the width of an upper portion of said T shape on parts of said first resin film and said second absorber;

a step of forming a third absorber not transmitting X-rays on said second absorber by utilizing said second resin film as a model; and

a step of removing said first and second resin films.

4,895,780

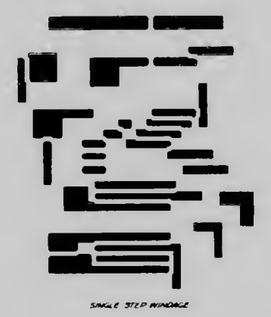
ADJUSTABLE WINDAGE METHOD AND MASK FOR CORRECTION OF PROXIMITY EFFECT IN SUBMICRON PHOTOLITHOGRAPHY

Yoav Nissan-Cohen, Schenectady; Paul A. Frank, Albany; Joseph M. Pimbley; Dale M. Brown, both of Schenectady; Ernest W. Balch, Ballston Spa, and Kenneth J. Polasko, Latham, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 49,744, May 13, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 265,285

Int. Cl.[4] G03F *1/00*

U.S. Cl. 430—5 **11 Claims**



1. A mask for use in the manufacture of integrated circuit devices, said mask comprising:

a transparent substrate having a plurality of base patterns disposed thereon, said patterns being opaque to at least one form of radiation, said base patterns having similarly opaque variable windage patterns disposed adjacent thereto and continuous therewith, said windage patterns being of greater width along the sides of each of said base patterns where the space between adjacent base patterns is greater than a threshold M than they are where the space between adjacent base patterns is less than said threshold value M.

4,895,781

LAYERED ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER CONTAINING SUBSTITUTED POLYCYCLO TRISAZO COMPOUNDS

Hideyuki Takai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

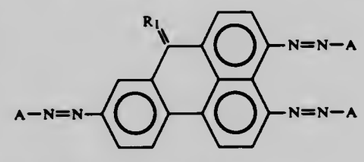
Filed Mar. 21, 1989, Ser. No. 326,735

Claims priority, application Japan, Mar. 23, 1988, 63-67281

Int. Cl.[4] G03G *5/14, 5/06*

U.S. Cl. 430—58 **13 Claims**

1. An electrophotographic photosensitive member having a photosensitive layer on an electroconductive support, wherein said photosensitive layer contains a trisazo pigment represented by the formula (1) shown below:



(1)

wherein R_1 represents oxygen atom or



and A represents a coupler residue having phenolic hydroxyl group.

4,895,782

PROCESS FOR PREPARING DISPERSION LIQUID CONTAINING ORGANIC, PHOTOCONDUCTIVE AZO PIGMENT AND PROCESS FOR PREPARING ELECTROPHOTOGRAPHIC, PHOTOSENSITIVE MEMBER

Takashi Koyama; Hajime Miyazaki, and Hideki Anayama, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

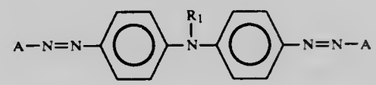
Filed Jun. 1, 1988, Ser. No. 200,851

Claims priority, application Japan, Jun. 2, 1987, 62-139308

Int. Cl.[4] G03G *5/10*

U.S. Cl. 430—58 **12 Claims**

1. In a process for preparing an electrophotographic, photosensitive member, which comprises (a) a step of forming a charge generation layer by applying and drying a dispersion liquid containing an organic photoconductive azo pigment represented by the following general formula:



wherein R_1 represents a hydrogen atom of a substituted or unsubstituted alkyl group and A represents a coupler residue having a phenolic hydroxyl group, and (b) a step of forming a charge transport layer by applying and drying a solution of a charge-transporting substance, said charge transport layer being formed on an electroconductive support either before or after formation of said charge generation layer, the improvement which comprises subjecting said organic photoconductive azo pigment to a heating pretreatment step in a ketone-type solvent prior to forming said dispersion liquid.

4,895,783

OVERCOATED ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINS METAL ACETYL ACETONATE IN POLYMER LAYER

Lieng-Huang Lee, Webster, and Christine J. Tarnawskyj, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 293,025

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—66 **13 Claims**

1. An electrophotographic imaging member comprising a supporting substrate, at least one photoconductive layer and an overcoating layer having one side contiguous with said electrophotographic imaging layer and the other side exposed to the ambient atmosphere, said overcoating layer comprising a solid solution or molecular dispersion of a metal acetyl acetonate in an insulating film forming polymer.

4,895,784

PHOTOCONDUCTIVE MEMBER

Shigeru Shirai, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 196,842, May 24, 1988, abandoned, which is a continuation of Ser. No. 102,231, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 946,619, Dec. 29, 1986, abandoned, which is a continuation of Ser. No. 859,222, May 5, 1986, abandoned, which is a continuation of Ser. No. 627,523, Jul. 3, 1984, abandoned. This application Mar. 13, 1989, Ser. No. 323,223

Claims priority, application Japan, Jul. 15, 1983, 58-129047

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—69 **12 Claims**



1. A photoconductive member which comprises a drum-shaped substrate and a photoconductive layer provided thereon, said photoconductive layer comprising an amorphous material comprising silicon atoms as a matrix and at least one of hydrogen atoms and halogen atoms and said drum-shaped substrate having a ratio of the minimum thickness at the end portions to the maximum thickness at the central portion of 0.2 or higher, wherein the end portions of the drum-shaped substrate have a thickness less than the thickness of the central portion and are adapted for attachment to a support.

4,895,785

SPHERICAL TONER PARTICLE

Yoshiaki Torimoto, and Yoshitsugu Shirasaki, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Division of Ser. No. 73,086, Jul. 14, 1987, abandoned. This application Jan. 3, 1989, Ser. No. 293,067

Claims priority, application Japan, Jul. 14, 1986, 61-165305

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—137 **3 Claims**

1. A method of preparing a spherical toner particle which comprises dispersing carbon black, a polymerization initiator, a charge control agent, a hydrophobic dispersant and/or a thickening agent in a monomer having a polymerizable unsaturation producing an oily phase dispersion, adding said oily phase dispersion into water containing a dispersion stabilizer producing a polymerization dispersion, and polymerizing said monomer from said polymerization dispersion to produce a toner particle substantially spherical in form characterized in that the ratio of the area of the surface of the toner particle covered with carbon black to the whole surface area of the toner is not greater than 25 percent.

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4,895,786

PROCESS FOR STABILIZING PHOTOSENSITIVE MATERIALS TO REPLACE EXHAUSTIVE WASHING

Masayuki Kurematsu, Hino, and Shigeharu Koboshi, Sagamihara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 258,067, Oct. 14, 1988, abandoned, which is a continuation of Ser. No. 147,082, Jan. 20, 1988, abandoned, which is a continuation of Ser. No. 820,673, Jan. 21, 1986, abandoned. This application May 11, 1989, Ser. No. 351,268

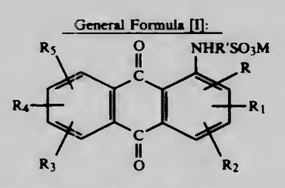
Claims priority, application Japan, Jan. 24, 1985, 60-12198

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—139 **18 Claims**

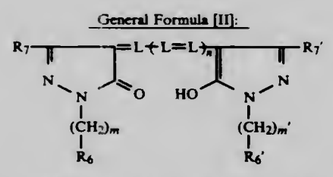
1. In a processing method for silver halide color photosensitive material in which silver halide color photosensitive material is treated to produce a color dye image with a processing solution that has a fixing ability, and subsequently is not washed but treated with a washless stabilizing solution, the improvement comprising treating said silver halide color photosensitive material with a washless stabilizing solution that contains a triazinylstilbene optical brightening agent in the presence of an amount sufficient to stabilize the dye image and reduce staining of the photosensitive material of at least one compound represented by General Formula (I), (II), (II') or (II''):

General Formula [I]:

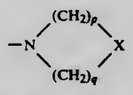


where each of R, R_1, R_2, R_3, R_4 and R_5 is a hydrogen or halogen atom, or a hydroxy, alkyl, alkoxy, sulfo or —NHR-'SO_3M group; R' is an alkylene group; and M is a cationic group;

General Formula [II]:

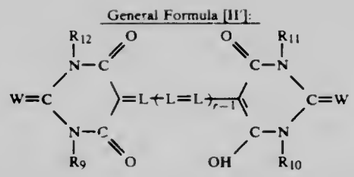


where each of R_6 and R_6' is a hydrogen atom, or an alkyl, aryl or heterocyclic group; each of R_7 and R_7' is a hydroxy, alkoxy, cyano, trifluoromethyl, —$COOR_8$, —$CONHR_8$, —$NHCOR_8$, ureido, imino or amino group, a C_{1-4}-alkyl-substituted amino group, or a cyclic amino group represented by



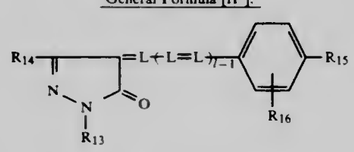
where each of p and q is the integer 1 or 2; X is an oxygen or sulfur atom, or a —CH_2—$_{group;}$ R_8 is a hydrogen atom, or an alkyl or aryl group; L is a methine group; n is the integer 0, 1 or 2; each of m and m' is the integer 0 or 1;

General Formula [II']:

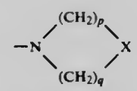


where r is the integer 1, 2 or 3; W is an oxygen or sulfur atom; L is a methine group; each of R_9 to R_{12} is a hydrogen atom, or an alkyl, aryl, aralkyl or heterocyclic group; and at least one of R_9 to R_{12} is a substituent group other than a hydrogen atom;

General Formula [II'']:



where l is the integer 1 or 2; L is a methine group; R_{13} is an alkyl, aryl or heterocyclic group; each of R_{14} and R_{15} is a hydroxy, alkyl, alkoxy, cyano, trifluoromethyl, —$COOR_8$, —$CONHR_8$, —$NHCOR_8$, ureido, imino, amino, or a C_{1-4}-alkyl-substituted amino group, or a cyclic amino group; represented by



where each of p and q is the integer 1 or 2; X is an oxygen or sulfur atom, or a —CH_2-group); R_8 is a hydrogen atom, or an alkyl or aryl group; and R_{16} is a hydrogen or chlorine atom, or an alkyl or alkoxy group.

4,895,787

PHOTOPOLYMERIZABLE POSITIVE WORKING, PEEL DEVELOPABLE, SINGLE SHEET COLOR PROOFING SYSTEM

Stephan J. W. Platzer, Califon, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 18, 1988, Ser. No. 220,479

Int. Cl.[4] G03G *7/00*; G03C *5/08*

U.S. Cl. 430—253 **28 Claims**

1. A method for forming a colored image which comprises, in order:

(A) providing a photosensitive element which comprises, in order:

(i) a transparent support; and

(ii) a single photosensitive composition layer on one surface of said support, which photosensitive layer comprises an organic binding resin, a colorant, a photoinitiator, and a free radical polymerizable acrylate or methacrylate component having at least two ethylenically unsaturated groups, wherein said binding resin is present in sufficient amount to bind the composition components into a uniform film, and wherein said colorant is present in sufficient amount to uniformly color the composition, and wherein said photoinitiator is present in sufficient amount to initiate the free radical polymerization of said polymerizable component upon exposure to sufficient actinic radiation, and wherein said polymerizable component is present in sufficient amount to provide image differentiation when the composition is image-wise exposed to actinic radiation; and

(iii) an adhesive layer directly adhered to said colored, photosensitive layer, which adhesive layer comprises a thermoplastic resin which has a T_g in the range of from about 25° C. to about 100° C.; and

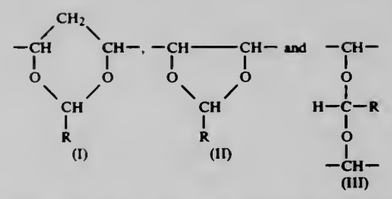
(B) either

(i) providing a receiver base to which said adhesive layer is laminated at elevated temperature and pressure; and then image-wise exposing said photosensitive composition through the transparent support to actinic radiation; or

(ii) image-wise exposing said photosensitive composition to actinic radiation; and then providing a receiver base to which said adhesive layer is laminated at elevated temperature and pressure; and

(C) peeling apart said support and said receiver base, thereby transferring the adhesive layer and the image-wise nonexposed portions of the colored, photosensitive composition to the receiver base while the image-wise exposed portions remain on the surface of the support; and

(D) optionally repeating steps (A) through (C) at least once with another photosensitive element having at least one different colorant transferred to the adhesive layer and image-wise nonexposed portions of the previously processed photosensitive element on said receiver base.



where R is methyl or ethyl, and wherein said group I is present in component C from about 75% to about 85%, group II is present in component C from about 3% to about 5%; and group III is present in component C from about 10% to about 22%;

(b) 2-stilbenyl-4,6-di(trichloromethyl)triazine;

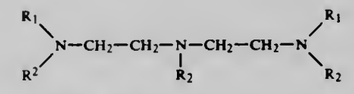
(c) a photopolymerizable mixture of

(1) a polyethoxylate diacrylated monomer having the formula

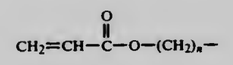


and

(2) an oligomeric amine diacrylate having the formula



wherein R_1 is

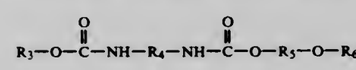


where n=0–4;

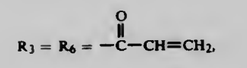
and R_2 is hydrogen, hydroxyl or —$(CH_2)_m$ OH where m=1–4; and

(3) trimethylolpropane ethoxylate triacrylate; and

(4) an oligomeric urethane acrylate having the formula



wherein



R_4=R_5=$C_6H_3R_7$ where R_7=—CH_3 or —H; and

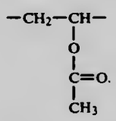
(d) 2-isopropyl-9-H-thioxanthen-9-one.

3. A process for the production of a photographic element comprising combining in admixture

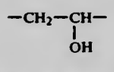
(a) a binder resin having the general formula

-A-B-C-

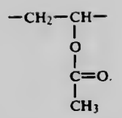
wherein a plurality of each of components A, B and C occur in ordered or random sequence in the resin and wherein A is present in said resin at about 5% to about 20% by weight and comprises groups of the formula



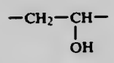
B is present in said resin at about 4% to about 30% by weight and comprises groups of the formula



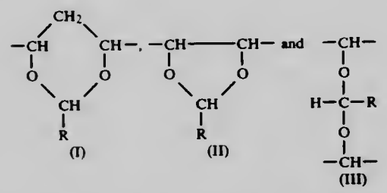
and C is present in said resin at about 50% to about 91% by weight and comprises acetal groups consisting of groups of the formulae



B is present in said resin at about 4% to about 30% by weight and comprises groups of the formula



and C is present in said resin at about 50% to about 91% by weight and comprises acetal groups consisting of groups of the formulae



where R is lower alkyl or hydrogen, and wherein said group I is present in component C from about 75% to about 85%, group II is present in component C from about 3% to about 5%, and group III is present in component C from about 10% to about 22%;

(i) said binder resin prepared by dissolving a polyvinyl alcohol/polyvinyl acetate copolymer having from about 75% to about 80% hydrolization by weight in a solvent mixture of water and a hydroxyl-group containing solvent to form a reaction solution; and

(ii) heating said reaction solution at a temperature of from about 50° C. to the boiling point of the solution; and adding a catalytic amount of an acid selected from the group consisting of organic sulfonic acids and inorganic mineral acids in said reaction solution; and

(iii) titrating an aliphatic aldehyde having the formula R—CHO, wherein R is hydrogen or lower alkyl, into said reaction solution in an amount sufficient to produce a degree of acetal formation of from about 50% to about 91% by weight while titrating a sufficient additional amount of said hydroxyl group containing solvent into said reaction mixture simultaneously with said aldehyde to prevent unwanted precipitation; the foregoing steps being conducted while vigorously mixing said reaction mixture throughout; and

b. a photoinitiator; and

c. a photopolymerizable mixture of

(i) a polyethoxylate diacrylated monomer; and

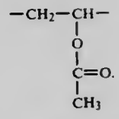
(ii) an oligomeric amine diacrylate coating said mixture on a suitable substrate; and drying said mixture.

7. A process for using a photographic element comprising combining in admixture

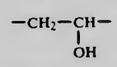
(a) a binder resin having the general formula

-A-B-C-

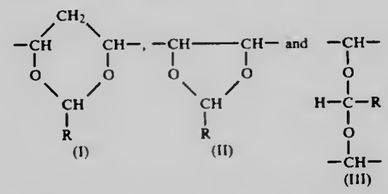
wherein a plurality of each of components A, B and C occur in ordered or random sequence in the resin and wherein A is present in said resin at about 5% to about 20% by weight and comprises groups of the formula



B is present in said resin at about 4% to about 30% by weight and comprises groups of the formula



and C is present in said resin at about 50% to about 91% by weight and comprises acetal groups consisting of groups of the formulae



where R is lower alkyl or hydrogen, and wherein said group I is present in component C from about 75% to about 85, group II is present in component C from about 3% to about 5%; and group III is present in component C from about 10% to about 22%;

(b) a photoinitiator;

(c) a photopolymerizable mixture of

(1) a polyethoxylate diacrylated monomer; and

(2) an oligomeric amine diacrylate

the process further comprising coating the composition formed by the mixture on a suitable substrate to form a photographic element; drying said composition; imagewise exposing said element to actinic light and developing said element with a suitable aqueous developer which is free of organic solvents..

4,895,789

METHOD OF MANUFACTURING NON-LINEAR RESISTIVE ELEMENT ARRAY

Shunichi Motte, and Mitsuya Suzuki, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,833
Int. Cl.[4] G03C 5/00
U.S. Cl. 430—316 **17 Claims**

1. A method for manufacturing a non-linear resistive element array on a substrate, comprising:

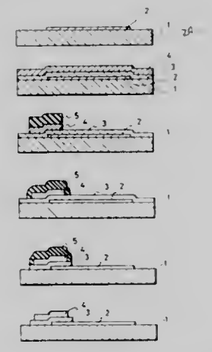
depositing a first conductive layer on the substrate and selectively forming the layer in a desired pattern;

the first depositing a non-linear resistive layer on conductive layer;

depositing a second conductive layer on the non-linear resistive layer;

forming the second conductive layer in a desired pattern by photo-etching using a patterned resist layer;

heat-treating the patterned resist layer on the patterned second conductive layer to extend the resist layer to cover the outer sides of the end portions of the second conductive layer; and



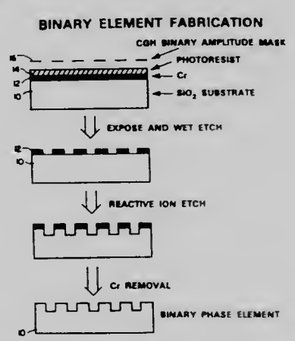
forming the non-linear resistive layer in a desired pattern using the heat-treated resist layer as a mask.

4,895,790

HIGH-EFFICIENCY, MULTILEVEL, DIFFRACTIVE OPTICAL ELEMENTS

Gary J. Swanson, and Wilfrid B. Veldkamp, both of Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 21, 1987, Ser. No. 99,307
Int. Cl.[4] G03C 5/00; B29D 11/00
U.S. Cl. 430—321 **14 Claims**



1. Method for making high efficiency multilevel, diffractive, optical elements comprising:

generating a plurality of binary amplitude masks including the multilevel information, the masks being configured to provide 2^N levels where N is the number of masks; and

utilizing the masks' information serially for serial etching of 2^N levels into the optical element, the etching depths for the masks being related by a fixed ratio.

14. Method for making high efficiency multilevel, diffractive, optical elements comprising:

generating a plurality of binary amplitude masks including the multilevel information by lithographic pattern generation, the masks configured to provide 2^N levels where N is the number of masks;

aligning a first one of the masks with respect to the optical element;

coating the optical element with photoresist;

exposing the photoresist through the aligned mask;

developing the photoresist;

etching the optical element;

aligning the next one of the masks with respect to the pattern etched with the first of the masks; and

repeating the coating, exposing, developing, etching, and aligning steps for each of the masks to produce 2^N levels into the optical element.

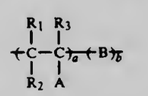
4,895,791

SILVER HALIDE PHOTOGRAPHIC ELEMENT CONTAINING A POLYMER LATEX

Yasuo Makuuoki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 21, 1987, Ser. No. 87,841
Claims priority, application Japan, Aug. 21, 1986, 61-195788
Int. Cl.[4] G03C 1/76
U.S. Cl. 430—523 **8 Claims**

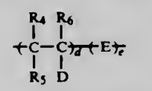
1. A silver halide photographic element comprising a support having thereon at least one silver halide emulsion layer, wherein said at least one silver halide emulsion layer or at least one other hydrophilic colloid layer contains in addition to a binder, as component (A), a polymer latex having repeating units represented by the following general formula (I):



(I)

wherein A represents a group having a dissociating group which has a pKa of about 4 or lower, said pKa being measured at 25° C. in water; R_1, R_2, and R_3, which may be the same or different, each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group having alkenyl group having 1 to 30 carbon atoms, a substituted or unsubstituted aryl group having 1 to 30 carbon atoms, a carboxyl group, an alkyloxycarbonyl group, or an alkycarboyloxy group; B represents a unit derived from a monomer copolymerizable with a monomer containing A; and a and b represent numbers a repeating units with a molar ratio of a to b being about 1.5/98.5 to about 50/50; and wherein said polymer latex is admixed with, an component (B), a compound selected from the group consisting of

(a) a polymer having the following general formula (II):



(II)

wherein D represents a hydroxy group or a substituted or unsubstituted polyoxyalkylene group; R_4, R_5 and R_6 have the same meaning as defined above for R_1, R_2, and R_3 in formula (I); E represents a unit derived from a monomer copolymerizable with a monomer containing D and has the same meaning as defined above for B in formula (I); and d and e represent numbers of repeating units with the molar ratio of d to e being about 100/0 to about 5/95,

(b) a water insoluble compound having a molecular weight of 300 to 5,000 and having the following general formula (III):

F—G (III)

wherein R represents a substituted or unsubstituted alkyl, alkenyl or aryl group having 14 or more carbon atoms; and G represents a hydroxy group, or a substituted or unsubstituted polyoxyalkylene group,

(c) a cellulose derivative selected from the group consisting of methyl cellulose, ethyl cellulose, carboxymethylcellulose, sulfated cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, and alginic acid, or

(d) a starch derivative selected from the group consisting of corn starch, cane starch, rice starch, carboxyl starch, methylated starch and dextrin,

and mixtures of (a)–(d),

wherein said component (B) is present in an amount of about 1.5 wt % or more based on the solid weight of the polymer latex, and wherein the average particle diameter of said polymer latex is about 0.01 to about 1 μm and the polymer latex added to said at least one silver halide emulsion layer or other hydrophilic colloid layer in an amount of about 2 to about 150 wt % based on the weight of a binder in the emulsion layer or other hydrophilic colloid layer, respectively.

4,895,792

PHOTOGRAPHIC LIGHT-SENSITIVE SILVER HALIDE ELEMENT WITH ANTISTATIC BACKING LAYER

Yasuhiro Aizawa, and Toru Noda, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation of Ser. No. 25,590, Mar. 13, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,156

Claims priority, application Japan, Mar. 17, 1986, 61-59779

Int. Cl.[4] G03C *1/82*

U.S. Cl. 430—530 **5 Claims**

1. A photographic light-sensitive element having improved antistatic properties consisting essentially of

a hydrophobic support,

a photographic light-sensitive silver halide emulsion layer on one side of the support, and

an antistatic layer on the other side of the support, wherein the antistatic layer comprises a binder and a cation modified colloidal silica having an average particle diameter of 7–30 millimicrons, the surface of the colloidal silica being coated with a cation modifier chosen from finely divided hydrous metallic oxide selected from aluminum, zirconium, and tin in an amount of 0.5%–30% weight in terms of metal oxide based on the weight of the colloidal silica, and further wherein the coating amount (solid content) of cation modified colloidal silica applied to the support to form the antistatic layer is 30–200 mg/m^2.

4,895,793

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Nobuo Seto, and Masakazu Morigaki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 15, 1987, Ser. No. 38,669

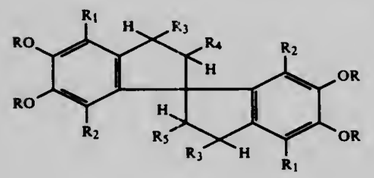
Claims priority, application Japan, Apr. 16, 1986, 61-87803

Int. Cl.[4] G03C *7/32, 7/38*

U.S. Cl. 430—548 **19 Claims**

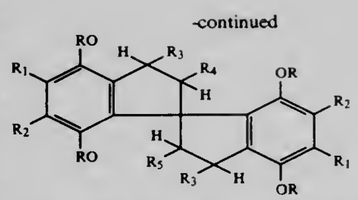
1. A silver halide color photographic material, comprising at least one of the compounds represented by formula (I) or (II):

formula (I)



-continued

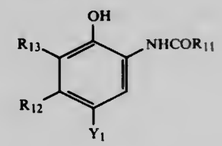
formula (II)



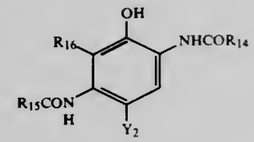
wherein each R represents a hydrogen atom, an alkyl group, alkenyl group, aryl group, heterocyclic ring group, R_6CO— group, R_7SO_2— group, or R_8NHCO— group in which R_6, R_7 and R_8 each represents an alkyl group, alkenyl group, aryl group or heterocyclic ring group; R_1 and R_2 each represents a hydrogen atom, halogen atom, alkyl group, alkenyl group, alkoxy group, alkenoxy group, aryloxy group, alkylthio group, alkenylthio group, arylthio group, alkoxycarbonyl group, alkylcarbonyl group, hydroxy group, alkylcarbonyloxy group, carbamoyl group or acylamino group; R_3 represents a hydrogen atom, alkyl group, alkenyl group or aryl group; R_4 and R_5 each represents a hydrogen atom, alkyl group, alkenyl group, alkoxy group, alkenoxy group, aryloxy group, alkylthio group, alkenylthio group or arylthio group; each R, R_1, R_2 and R_3 in two compounds or in one compound represented by formula (I) and/or (II) may be the same or different; and in R, R_1 and R_2, adjacent groups may be joined to form a 5-membered or a 6-membered ring.

7. The silver halide color photographic material as claimed in claim 1, further comprising at least one coupler represented by formula [III], [IV], [V], [VI] or [VII]

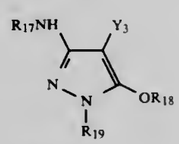
General formula (III)



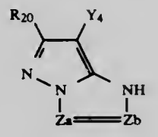
General formula (IV)



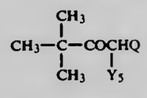
General formula (V)



General formula (VI)



General formula (VII)



wherein R_{11}, R_{14} and R_{15} each represents an aliphatic group, aromatic group, heterocyclic group, aromatic amino group, or heterocyclic amino group; R_{12} represents an aliphatic group;

R_{13} and R_{16} each represents a hydrogen atom, halogen atom, aliphatic group, aliphatic oxy group or acylamino group; R_{17} and R_{19} each represents a substituted or unsubstituted phenyl group; R_{18} represents a hydrogen atom, aliphatic or aromatic acyl group, or aliphatic or aromatic sulfonyl group; R_{20} represents a hydrogen atom or a substituent; Q represents a substituted or unsubstituted N-phenylcarbamoyl group; Za and Zb each represents a methine group, substituted methine group or =N—; Y_1, Y_2, Y_3, Y_4 and Y_5 each represents a group capable of splitting off at the time of coupling reaction with the oxidation product of a developing agent; and R_{12} and R_{13}, and R_{15} and R_{16} respectively may form a 5-membered, 6-membered or 7-membered ring.

17. The silver halide color photographic material as claimed in claim 7, wherein dimers or higher polymers may be formed through R_{11}, R_{12}, R_{13} or Y_1; R_{14}, R_{15}, R_{16} or Y_2; R_{17}, R_{18}, R_{19} or Y_3; R_{20}, Z_a, Z_b or Y_4; and Q or Y_5.

4,895,794

SILVER HALIDE EMULSIONS HAVING HOST CRYSTALS WITH GUEST CRYSTALS FORMED IN PROJECTION THEREON AND PHOTOGRAPHIC MATERIALS CONTAINING SUCH EMULSIONS

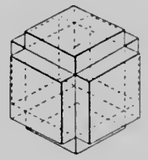
Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1987, Ser. No. 82,252

Claims priority, application Japan, Aug. 5, 1986, 61-183918

Int. Cl.[4] G03C *1/02, 1/28, 7/32*

U.S. Cl. 430—567 **15 Claims**



1. A silver halide emulsion comprising silver halide crystal grains containing silver chloride, wherein on at least one of six (100) surfaces of a cubic or rectangular parallelepiped host crystals surrounded mainly by (100) surfaces and containing 30 mol % or more silver chloride at said (100) surfaces of the host crystal, a guest silver halide crystal containing substantially the same halide composition as said (100) surfaces is formed in projection so that the bottom surface of the guest crystal is a part of said (100) surfaces of the host crystal and so that the intersections of the surfaces of the host crystal and the guest crystal form re-entrant angle parallel to the edges of the (100) surfaces of the host crystal.

4,895,795

DETECTION AND DIFFERENTIATION OF COXIELLA BURNETII IN BIOLOGICAL FLUIDS

Marvin E. Frazier, Richland, Wash.; Louis P. Mallavia, Moscow, Id.; James E. Samuel, Pullman, Wash., and Oswald G. Baca, Albuquerque, N. Mex., assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 795,207, Nov. 5, 1985. This application Nov. 5, 1986, Ser. No. 927,779

Int. Cl.[4] C12Q *1/68, 1/04*

U.S. Cl. 435—6 **6 Claims**

1. A method for differentiating strains of *C. burnetii* that are capable of causing acute disease from those strains capable of causing chronic disease, comprising:

treating cells contained within a biological sample and suspected of containing *C. burnetii* to expose cellular DNA;

hybridizing a first aliquot of the cellular DNA with a DNA probe which specifically hybridizes with *C. burnetii* DNA;

hybridizing a second aliquot of the cellular DNA with a labeled DNA probe derived from the Xba-Eco RI portion of fragment E of plasmid QpRS and containing DNA sequences that specifically hybridize with *C. burnetii*



DAN of strains associated with the capacity of cause chronic disease; and

detecting the hybridized, labeled DNA probes, and therefrom differentiating the strain of *C. burnetii*.

4,895,796

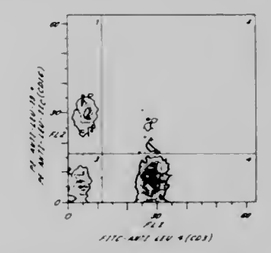
IDENTIFICATION OF NK CELLS AND CYTOTOXIC T LYMPHOCYTES

Lewis L. Lanier, Los Altos; Joseph H. Phillips, San Mateo, and Anne L. Jackson, Sunnyvale, all of Calif., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 6, 1988, Ser. No. 141,626

Int. Cl.[4] G01N *33/569, 33/577*

U.S. Cl. 435—7 **17 Claims**



1. A method for distinguishing between substantially all NK cells and all T lymphocytes, which comprises:

contacting a sample containing lymphocytes with a first reagent comprising anti-CD3 and a first detectable label and a second reagent comprising a mixture of anti-CD16 and anti-GP160 both labeled with a second detectable label; and

identifying cells that react with said reagents wherein cells that react with said first reagent are identified as all of the population of T lymphoctyes, and cells that react with said second reagent but not with said first reagent are identified as substantially all of the population of NK cells.

VOL 1110 ISS 4 JA 23 1990 UMI

4,895,797
SULFATE REDUCING BACTERIA DETERMINATION AND CONTROL
Lea J. Gawel, Ponca City, Okla.; Thomas Ng, Chadds Ford, Pa., and James M. Odom, Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.
Filed Dec. 23, 1986, Ser. No. 946,547
Int. Cl.[4] G01N *33/50, 33/53;* C12Q *1/68*
U.S. Cl. 435—7 8 Claims

5. A method for detecting the presence of sulfate-reducing bacteria in a sample comprising:
(a) preparing a lysate of said sample to release into said lysate adenosine 5'-phosphosulfate reductase (APS reductase) contained in said sulfate-reducing bacteria,
(b) contacting at least a portion of the lysate with a first antibody specific for the APS reductase to form a first complex, and
(c) detecting the first complex as an indication of the presence of sulfate-reducing bacteria.

4,895,798
TEST DEVICES FOR DETERMINATION OF OCCULT BLOOD
Steven C. Charlton; Robert P. Hatch, and Paul R. Hemmes, all of Elkhart, Ind., assignors to Miles, Inc., Elkhart, Ind.
Filed Nov. 13, 1987, Ser. No. 119,977
Int. Cl.[4] C12Q *1/54;* G01N *21/78, 33/66, 33/72*
U.S. Cl. 435—14 6 Claims

1. A test device useful for the determination of occult blood comprising:
a single layer carrier matrix;
a test composition incorporated into said carrier matrix, said composition comprising a glucose derivative that upon addition of water produces glucose, glucose oxidase, and an indicator system that upon oxidation produces a dectable optical response.

4,895,799
PROCESS AND REAGENT FOR THE DETERMINATION OF TOTAL BILIRUBIN
Cornelia Kruse-Müller, Tutzing; Joachim Siedel, Bernried, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed Feb. 24, 1987, Ser. No. 17,662
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608453
Int. Cl.[4] C12Q *1/34, 1/26, 1/36*
U.S. Cl. 435—18 10 Claims

1. Process for determining total bilirubin content in a body fluid sample comprising incubating said body fluid sample with both subtilisin under conditions favoring complete liberatin of bilirubin bound to albumin from said albumin and with bilirubin oxidase and colorimetrically detecting the products quantitatively formed from bilirubin as a result of bilirubin oxidase activity as a measurement of total bilirubin content in said body fluid sample.

4,895,800
YEAST PRODUCTION OF HEPATITIS B SURFACE ANTIGEN
Juerg F. Tschopp; Michael M. Harpold; James M. Cregg, and Richard G. Buckholz, all of San Diego, Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 26, 1985, Ser. No. 801,713
Int. Cl.[4] C12P *21/00, 21/02;* C12N *15/00, 5/00*
U.S. Cl. 435—69.3 31 Claims

1. An essentially pure culture of a yeast capable of growth on methanol as carbon and energy source wherein said yeast is of the genus Pichia transformed with an expression cassette comprising
(a) a regulatory region isolated from *Pichia pastoris* and selected from the group consisting of AOX1, p40, and DAS operably linked to
(b) a polypeptide coding region coding for a hepatitis B surface antigen operably linked to
(c) a Pichia transcription termination fragment.

4,895,801
METHOD FOR PRODUCING OLIGOSACCHARIDES
Tatsuhiko Kan; Tsuneo Terashima, and Yoichi Kobayashi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan
Filed Oct. 1, 1987, Ser. No. 103,416
Claims priority, application Japan, Oct. 7, 1986, 61-237075
Int. Cl.[4] C12P *19/04;* C12R *1/69*
U.S. Cl. 435—101 3 Claims

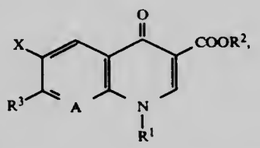
1. A method for producing oligosaccharides which are represented by the general formula Gal-(Gal)$_n$-Glc, where Gal is a galactose residue, Glc is a glucose residue, and n is an integer of from 1 to 4, characterized in that lactose or a lactose-containing substance is treated with at least two kinds of beta-galactosidases produced by different microorganisms.

4,895,802
DNA STRAND CODING FOR α-ACETOLACTATE DECARBOXYLASE AND YEAST TRANSFORMED WITH THE DNA STRAND
Hidetaka Sone; Junichi Tanaka, and Takashi Inoue, all of Takasaki, Japan, assignors to Kirin Beer Kabushiki Kaisha, Shibuya, Japan
Filed Dec. 11, 1986, Ser. No. 940,596
Claims priority, application Japan, Dec. 13, 1985, 60-280289
Int. Cl.[4] C12N *15/00, 7/00;* C07H *13/12*
U.S. Cl. 435—172.3 14 Claims

1. An isolated DNA sequence which has a nucleotide sequence coding for a polypeptide having α-acetolactate decarboxylase activity, of which amino acid sequence is substantially from A to B of the amino acid sequence shown in FIG. 1.

4,895,803
METHOD FOR DECONTAMINATION OF MYCOPLASMA-INFECTED CELL CULTURES
Günter E. Hübner, Wuppertal; Helmut Brunner, Langenfeld, and Hans-Joachim Zeller, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Oct. 22, 1986, Ser. No. 921,995
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539393; May 27, 1986, 3617803
Int. Cl.[4] C12N *5/00, 5/02*
U.S. Cl. 435—240.1 16 Claims

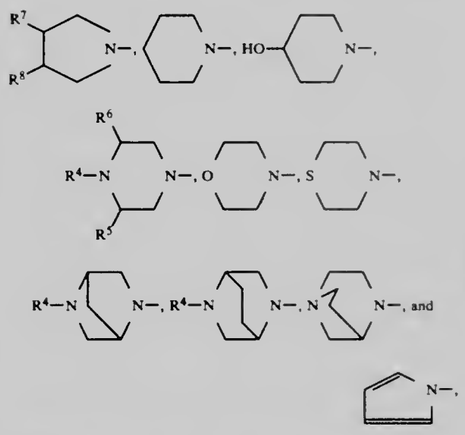
1. A method for decontaminating mycoplasma-infected cell cultures comprising contacting said cell cultures with an effective decontaminating amount of a active compound comprising quinolone- or 1,8-naphtyridonecarboxylic acid of the formula (I)



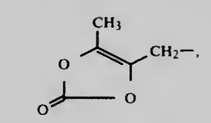
(I)

in which
R^1 represents methyl, ethyl, propyl, isopropyl, cyclopropyl, vinyl, 2-hydroxyethyl, 2-fluoroethyl, methoxy, amino, methylamino, dimethylamino, ethylamino, phenyl, 4-fluorophenyl or 2,4-difluorophenyl,

R^2 represents hydrogen, alkyl having 1 to 4 carbon atoms, or (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl,
R^3 represents methyl or a cyclic amino group selected from the group consisting of



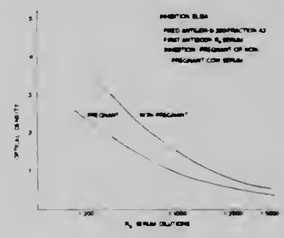
in which
R^4 represents hydrogen, alkyl having 1 to 4 carbon atoms, 2-hydroxyethyl, allyl, propargyl, 2-oxopropyl, 3-oxobutyl, phenacyl, formyl, $CFCl_2$—S—, $CFCl_2$—SO_2—, CH_3O—CO—S—, benzyl, 4-aminobenzyl or



R^5 represents hydrogen or methyl,
R^6 represents hydrogen, alkyl having 1 to 4 carbon atoms, phenyl or benzyloxomethyl,
R^7 represents hydrogen, amino, methylamino, ethylamino, aminomethyl, methylaminomethyl, ethylaminomethyl, dimethylaminomethyl, hydroxyl or hydroxymethyl,
R^8 represents hydrogen, methyl, ethyl or chlorine,
X represents fluorine, chlorine or nitro and
A represents N or C—R^9, in which
R^9 represents hydrogen, halogen, methyl or nitro, or R^9 together with R^1 forms a bridge of a structure selected from the group consisting of —O—CH_2—CH—CH_3, —S—CH_2—CH—CH_3 and —CH_2—CH_2—CH—CH_3, said method not requiring cloning to achieve permanent decontamination.

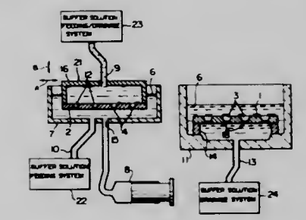
4,895,804
BOVINE ANTIGEN GLYCOPROTEIN, RELATED ANTIBODY, AND USE IN DETECTION OF PREGNANCY IN CATTLE
Eileen F. Bostwick, St. Paul, and Alan G. Hunter, Roseville, both of Minn., assignors to University of Minnesota, St. Paul, Minn.
Continuation-in-part of Ser. No. 628,571, Jul. 6, 1984, Pat. No. 4,755,460, and a continuation-in-part of Ser. No. 752,510, Jul. 8, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 88,346
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] G01N *33/577*
U.S. Cl. 435—240.27 4 Claims

1. An isolated, substantially pure bovine pregnancy antigen for detecting and determining pregnancy in cattle consisting of a glycoprotein obtained from a pregnant bovine animal which is character ized by having a specific immunological reaction



with a monoclonal antibody directed specifically against said glycoprotein wherein said monoclonal antibody is produced from hybridoma ATCC HB 8846.

4,895,805
CELL MANIPULATING APPARATUS
Kazuo Sato, Tokyo; Shinji Tanaka, Akishima; Yoshio Kawamura, Kokubunji; Hiroyuki Kohida, Fuchu; Yoshihisa Hosoe, and Masatoshi Sakurano, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 24, 1988, Ser. No. 235,485
Claims priority, application Japan, Aug. 31, 1987, 62-215288
Int. Cl.[4] C12M *3/02*
U.S. Cl. 435—286 10 Claims



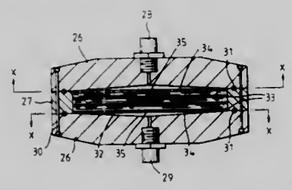
1. A cell manipulating apparatus for conveying cells to a plurality of chambers provided in a chamber plate, comprising:
a taking-up device including a carrier plate having taking-up portions placed in positions corresponding to those of said chambers in said chamber plate, each of said taking-up portions being adapted to provide means for taking up a single cell and
a moving device adapted to move, relative with respect to the chamber plate, said taking-up device to a position above said chamber plate to set said taking-up portions in close proximity with respect to said chambers to allow transfer of a plurality of said single cells from said taking-up device to said chamber plate at one time.

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4,895,806
DEVICE FOR LIQUID CHROMATOGRAPHY OR IMMOBILIZED ENZYME REACTION

Minh S. Le, Gateshead, and James A. Sanderson, Wallsend, both of England, assignors to Millipore Ireland B.V., Roterdam, Netherlands

Continuation of Ser. No. 156,290, Feb. 16, 1988, abandoned. This application Jan. 13, 1989, Ser. No. 366,312
Claims priority, application United Kingdom, Feb. 14, 1987, 8703471; Apr. 27, 1987, 8709907
Int. Cl.[4] C12M *1/40*
U.S. Cl. 435—288 15 Claims

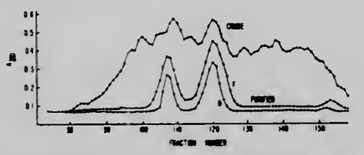


1. A device for the separation of molecular components from liquids containing the same, comprising a housing, a multi-layer microporous membrane assembly within the housing wherein a plurality of membrane layers are disposed in face-to-face relation with edges of each membrane within the assembly lying adjacent to a barrier, means for substantially preventing flow between the membrane edges and the barrier, inlet means for directing incoming liquid on to a first surface of the membrane assembly, and outlet means for gathering and directing outgoing liquid from a second surface of the membrane assembly, wherein the flow of liquid is successively through the plurality of membrane layers, the membrane material of the assembly having bound thereto a ligand or an immobilised enzyme.

4,895,807
MEMBRANE CHANNEL PROTEIN AND RELATED THERAPEUTIC COMPOUNDS

Bruce D. Cherksey, 608 Garden St., Hoboken, N.J. 07030

Filed Dec. 31, 1986, Ser. No. 948,262
Int. Cl.[4] G01N *33/483*; C07K *3/02, 3/20, 15/00*
U.S. Cl. 436—63 12 Claims



1. A purified K^+/Cl^- channel protein capable of binding both furosemide and quinine.

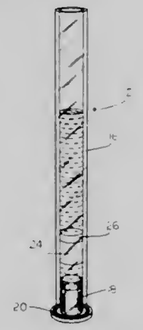
6. A method of screening a chemical entity for activity in modulating membrane transport, cellular volume or cellular pressure, said method including the step of measuring the ability of said chemical entity to bind to the channel protein of claim 1.

9. A method of extracting a K^+/Cl^- channel protein from cell membrane material comprising the step of extracting with an affinity gel, said affinity gel comprising a channel protein binding compound covalently bonded to a polysaccharide or monosaccharide support material.

4,895,808
METHOD AND APPARATUS FOR ADSORPTION DETECTION

Thomas R. Romer, Washington, Mo., assignor to Romer Labs, Inc., Washington, Mo.

Filed Jul. 26, 1988, Ser. No. 224,159
Int. Cl.[4] G01N *30/14*
U.S. Cl. 436—178 22 Claims



1. A method for purification of analytes in a solution which comprises placing said solution in a test tube, inserting a pressure exerting adsorption column having a resilient seal closely engaging an inner wall of said test tube to force said solution into said column through a bottom opening in said column past a filter member and past an adsorbent packing material to adsorb interference material to provide semi-purified solution in which solid and soluble interferences are removed, withdrawing said semi-purified solution and subjecting said solution to a selective detection procedure for further analysis of analytes therein.

4,895,809
IMMOBILIZED ANTIGEN-ANTIBODY DISPLACEMENT PROCESS

Timothy D. Schlabach, Pittsburg, Calif., and Fred E. Regnier, West Lafayette, Ind., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 9, 1984, Ser. No. 569,361
Int. Cl.[4] G01N *33/543, 33/558, 22/538, 30/02*
U.S. Cl. 436—518 10 Claims

1. A method for quantitatively determining the amount of a plurality of antigens in a biological sample, comprising the steps of:

(a) segregating the sample antigens into a plurality of distinct zones by high performance or other liquid chromatographic techniques; and

(b) allowing said segregated antigen zones to pass through a post-segregation detection system including a competitive binding component and a detector, said competitive binding component including

(i) immobilized antibodies of a plurality of distinct species effective to specifically and reversibly couple to particular sample antigens, and

(ii) fluorescently labeled antigens corresponding to the sample antigens that have specifically and reversibly coupled to the corresponding immobilized antibodies,

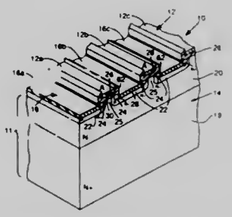
such that as said antigen zones pass through said detection system, said labeled antigens are competitively displaced by corresponding sample antigens and enter said detector

(c) detecting the amount of displaced fluorescence-labeled antigen, said detected amount corresponding quantitatively to a given sample antigen zone.

4,895,810
TOPOGRAPHIC PATTERN DELINEATED POWER MOSFET WITH PROFILE TAILORED RECESSED SOURCE

Theodore O. Meyer; John W. Mosier, II; Douglas A. Pike, Jr., all of Bend, and Theodore G. Hollinger, Redmond, all of Oreg., assignors to Advanced Power Technology, Inc., Bend, Oreg.

Continuation-in-part of Ser. No. 842,771, Mar. 21, 1986, Pat. No. 4,748,103. This application May 17, 1988, Ser. No. 194,874
Int. Cl.[4] H01L *21/467*
U.S. Cl. 431—41 48 Claims



1. A method employing no more than one independent mask of producing a plural-functional-region MOS semiconductor device in a substrate structure including a gate oxide layer on an upper surface of a semiconductor substrate, said method comprising:

forming over the oxide layer a dopant protective layer,

creating a mask-surrogate pattern-definer having a defined outline characteristic in such protective layer,

exposing a portion of the upper surface of the substrate within a range bounded by the defined outline characteristic,

performing first and second doping steps in the exposed portion of the upper surface of the substrate to form a first diffusion of a first dopant type extending to a first depth within said region and to a first lateral width determined by the defined outline characteristic and to form a second diffusion of a second dopant type of polarity opposite the first dopant type and extending to a second depth within said region and a second lateral width determined by the defined outline characteristic,

the second depth and width being less than the first depth and width, respectively, so that the second diffusion is contained within the first diffusion,

forming a trench in the exposed upper surface portion of the substrate, the trench having a base and sidewalls in which a lower substrate surface is exposed,

the trench being formed to a trench depth less than the first diffusion depth and greater than the second diffusion depth and a trench width less than the second lateral width, so as to form separate source regions of the second diffusion along opposed sidewalls of the trench and to space the lower substrate surface of the base of the trench below the upper surface of the substrate,

forming a gate conductive layer on the oxide layer and a source conductive layer on the base of the trench in contact with the lower substrate surface,

the gate and source conductive layers each conforming to the defined outline characteristic and being spaced vertically apart by the spacing of the lower substrate surface on which the source conductive layer is deposited below the upper substrate surface portion on which the oxide layer is deposited, and

the source conductive layer and trench sidewalls being mutually formed so that the source conductive layer electrically contacts the source regions along said sidewalls.

4,895,811
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Kazuhiko Inoue, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 4, 1988, Ser. No. 253,171
Claims priority, application Japan, Oct. 8, 1987, 62-254146
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—41 1 Claim

1. A method of manufacturing a semiconductor device comprising:

implanting ions of an impurity in a compound semiconductor substrate and forming a first ion-implanting layer of a first conductivity type on a major surface layer of said substrate;

forming a first insulating film on the major surface of said substrate;

forming a second insulating film having an opening portion on said first insulating film;

forming an opening portion in said first insulating film by selective etching using said second insulating film as a mask;

implanting ions of an impurity in said first ion-implantation layer through said opening portion of said second insulating film and forming a second ion-implantation layer of a second conductivity type in a surface layer thereof;

forming, on the major surface of said structure, while said second insulating film remains, conductor layers in which at least a layer thereof contacting said semiconductor substrate is either a refractory metal layer or a layer containing a refractory metal;

removing said second insulating film to remove said conductor layer portion formed thereon, thereby forming an electrode so that only said conductor layer portion exposed in said opening portion of said second insulating film and formed on said substrate remains;

implanting impurity ions of the second conductivity type in said first ion-implantation layer using said electrode and said first insulating film as masks; and

annealing said structure to activate said first and second ion-implantation layers.

4,895,812
METHOD OF MAKING OHMIC CONTACT TO FERROELECTRIC SEMICONDUCTORS

Da Y. Wang, Lexington; Daniel T. Kennedy, Burlington, both of Mass., and Burton W. MacAllister, Jr., Hudson, N.H., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 14, 1988, Ser. No. 284,037
Int. Cl.[4] H01L *21/44*
U.S. Cl. 437—180 16 Claims

1. A method of fabricating an ohmic contact to a semiconducting ferroelectric material comprising the steps of:

providing a semiconducting ferroelectric material having a permanent polarization below the Curie temperature of the ferroelectric material;

depositing a layer of chemically compatible electrically conductive material to a surface of said ferroelectric material;

heating the ferroelectric material and layer of electrically conductive material to a temperature about the Curie temperature of the ferroelectric material and lower then what would cause chemical reactions or physical degradation of the materials; and

allowing said ferroelectric material and layer of conductive material to cool below the Curie temperature of said ferroelectric material.

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4,895,813

METHOD FOR FABRICATING DEVICES INCLUDING MULTICOMPONENT METAL HALIDE GLASSES AND THE RESULTING DEVICES

Jerry R. Bautista, Basking Ridge; Matthijs M. Broer, Lebanon; Allan J. Bruce; James W. Fleming, both of Westfield, and Kenneth L. Walker, New Providence, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1987, Ser. No. 103,229

Int. Cl.[4] C03C *13/04*

U.S. Cl. 501—37 **7 Claims**

1. A method for fabricating a device, comprising the steps of:

forming a melt having a composition which includes three or more metal halides;

converting at least a part of said melt into a solid glass body having at least one cross-sectional dimension greater than or equal to about 1 centimeter; and

completing the fabrication of said device, said completing step including the step of incorporating at least a portion of the material of said glass body into said device, Characterized In That

said converting step includes the step of cooling essentially every portion of said part at a rate which is both greater than about 10 Kelvins per second and chosen to substantially preclude the formation of crystallites in said glass body.

4,895,814

PROCESS FOR PRODUCING ALUMINA SILICA SINTERED CERAMICS HAVING IMPROVED HIGH-TEMPERATURE STRENGTH

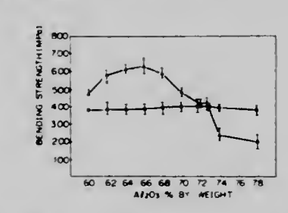
Shuzo Kanzaki; Hideyo Tabata; Osami Abe; Obta Shigetoshi, all of Aichi; Yamagishi Chitake, Tokyo, and Mitachi Senshu, Kanagawa, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo; Mino Yogyo Co., Ltd., Gifu; Nihon Cement Co., Ltd. and Hokko Chemical Industry Co., Ltd., both of Tokyo, all of, Japan

Continuation-in-part of Ser. No. 868,810, May 29, 1986, abandoned. This application Jun. 24, 1987, Ser. No. 66,697

Claims priority, application Japan, May 30, 1985, 60-117646

Int. Cl.[4] C04B *35/18*

U.S. Cl. 501—128 **22 Claims**



1. A process for producing an alumina silica sintered ceramic having improved strength comprising the steps of:

(A) synthesizing a starting powder mixture from a homogeneous mixed solution of aluminum and silica sources that is conditioned to provide a chemical composition wherein the ratio of Al_2O_3 content to the sum of Al_2O_3 and SiO_2 contents in the synthesized powder mixture is adjusted to the range of 62–73% by weight and the total content of Na_2O and K_2O as impurities in said powder is adjusted to no more than 1,000 ppm;

(B) calcining said starting powder at a temperature of from about 950° to about 1,200° C.;

(C) grinding said calcined product into particles and compressing the particles into a compact; and

(D) sintering the compact at a temperature of from about 1,500 to about 1,700° C. and at atmospheric pressure so as to make the sintered ceramic having a room-temperature strength of at least 300 MPa and a hot (1,300° C.) strength of at least 400 MPa.

4,895,815

SINTERED FORM BODY

Hans Olapinski, Aichwald; Wolfgang Burger, Wernau, and Ulf Dworak, Baltmannsweiler, all of Fed. Rep. of Germany, assignors to Feldmuehle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,043

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706209

Int. Cl.[4] C04B *35/46, 35/10*

U.S. Cl. 501—134 **10 Claims**

1. A mixture for producing a sintered body on a basis of aluminum titanate, the mixture consisting essentially of:

more than 46 wt.-% TiO_2;

up to 49.5 wt.-% Al_2O_3;

3 to 5 wt.-% quartz (SiO_2);

less than 0.2 wt.-% impurities, the Al_2O_3 and TiO_2 being present in a weight ratio of 1:0.95 to 1:1.05, and all weight parts together make up 100 weight-percent.

4,895,816

SUPPORT MATERIAL CONTAINING CATALYST FOR FIXED HYDROFINING BEDS

Lloyd E. Gardner, 1340 SE. Hampden Sq., Bartlesville, Okla. 74006, and Simon G. Kukes, 569 Braemer Ave., Naperville, Ill. 60540

Division of Ser. No. 11,989, Feb. 6, 1987, Pat. No. 4,828,683. This application Jan. 9, 1989, Ser. No. 296,163

Int. Cl.[4] B01J *21/04, 23/88, 35/08*

U.S. Cl. 502—10 **23 Claims**

1. A fixed catalyst bed comprising

(a) at least one layer of substantially spherical alumina-containing particles resistant to the detrimental effect of water during hydrotreating, and

(b) at least one layer of hydrotreating catalyst particles comprising a refractory inorganic carrier material and at least one hydrogenation promoter selected from the group consisting of transition metals belonging to the Groups IIIB, IVB, VB, VIB, VIIB, VIII, IB, and IIB of the Periodic Table and compounds of said transition metals;

wherein said substantially spherical alumina-containing particles in layer (a) resistant to the detrimental effect of water during hydrotreating have been prepared by a process comprising the step of heating a starting material of substantially spherical alumina-containing particles having an initial average particle size in the range of from about 0.05 to about 1.5 inches, an initial surface area, determined by the BET method employing nitrogen, of at least about 20 m^2/g, an initial pore volume, determined by mercury intrusion porosimetry at a pressure ranging from 0 to 50,000 psig, of at least about 0.1 cc/g, an initial normalized crush strength of at least 150 lb. per inch diameter per particle, an initial content of Na of less than about 2.0 weight-%, and an initial content of Al_2O_3 of at least about 80 weight-%,

wherein said heating of said starting material has been carried out at a temperature in the range of from about 500° to about 900° C. for a period of time of at least 10 minutes, under such heating conditions as to increase the portion of the pore volume in pores having a diameter in the range of from about 40 to about 200 Angstroms and to increase the retention of crush strength, measured after exposure for about 100 hours to a liquid hydrocarbon-containing stream which contains at least about 0.5 weight-% sulfur, under hydrotreating conditions at about 2250 psig total pressure, about 110 psig partial pressure of steam and about 700° F.;

wherein a layer (a) of said substantially spherical alumina-containing particles is placed as support layer below at least one layer (b) of said hydrotreating catalyst particles;

wherein said substantially spherical alumina-containing particles in said support layer (a) are promoted with at least one compound of at least one element selected from the group consisting of Y, La, Ce, Ti, Zr, Hf, Cr, Mo, W, Mn, Re, Ni, Co, Cu, Zn and P at a level of from about 0.1 to about 2.0 weight percent of said at least one element;

and wherein said hydrotreating catalyst particles contain said at least one hydrogenation promoter at a level which is effective for lowering the concentration of sulfur and metals present in a hydrocarbon-containing feed stream under effective hydrotreating conditions.

4,895,817

POLYCONDENSATION CATALYST

Naoya Ogata, Tokyo, Japan, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 45,497, May 4, 1987, Pat. No. 4,778,873, which is a continuation-in-part of Ser. No. 861,374, May 9, 1986, Pat. No. 4,668,762. This application Jun. 16, 1988, Ser. No. 207,465

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[4] B01J *31/02, 31/06*

U.S. Cl. 502—158 **16 Claims**

1. A catalyst system which is particularly useful for the synthesis of condensation polymers which is comprised of (1) at least one silicon-phosphorous compound which contains at least one divalent oxygen atom which is bonded directly to a tetravalent silicon atom and a trivalent or pentavalent phosphorus atom; (2) pyridine as an acid acceptor; and (3) at least one halogenated hydrocarbon which contains at least one carbon atom which has at least two halogen atoms bonded directly to it.

4,895,818

PHOSPHONITE-AND PHOSPHINITE-PROMOTED RUTHENIUM - COBALT CATALYSTS FOR THE DEALKOXYHYDROXYMETHYLATION OF ACETALS TO FORM GLYCOL ETHERS

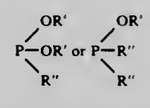
D. Michael Duggan, Drexel Hill; James E. Lyons, Wallingford; Harry K. Myers, Cochranville, all of Pa., and Robert E. Ledley, Hockessin, Del., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Division of Ser. No. 871,351, Jun. 6, 1986. This application Aug. 31, 1988, Ser. No. 238,435

Int. Cl.[4] B01J *31/20*

U.S. Cl. 502—161 **6 Claims**

1. In a catalyst useful in dealkoxyhydroxymethylation of acetals and which contains a metal selected from the group consisting of cobalt and both ruthenium and cobalt, the improvement wherein said catalyst additionally contains a promoter of the formula



or mixtures thereof, wherein R' and R'', each of which may be the same or different, are hydrogen, alkyl, cycloalkyl, or aryl; and wherein the R' groups, when other than hydrogen, may, when taken together, form a cyclic compound.

4,895,819

ALKALI METAL CARBONATE SUPPORTS AND ELEMENTAL ALKALI CATALYSIS THEREOF FOR OLEFIN DIMERIZATION

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 18, 1988, Ser. No. 220,639

Int. Cl.[4] B01J *27/232, 23/04*

U.S. Cl. 502—174 **17 Claims**

1. A process for the preparation of a catalyst support comprising:

(a) preparing a thick paste comprising about 65 to about 75 weight percent of an alkali metal carbonate, about 11 to about 19 weight percent of water, and about 9 to about 19 weight percent of a water soluble ketone;

(b) forming a particulate product from said paste; and

(c) calcining said particulate product.

4,895,820

CATALYTIC PROCESS FOR THE PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES USING A TITANIA-SUPPORTED PHOSPHAMINE CATALYST FOR THE PREPARATION OF LINEAR POLYETHYLENE POLYAMINES

Neal J. Grice, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,556

Int. Cl.[4] B01J *27/10, 27/135, 27/14, 27/24*

U.S. Cl. 502—200 **15 Claims**

1. A new composition of matter prepared by treating titania with a solvent solution of phosphonitrillic chloride and an acid scavenging agent under conditions to form titania containing an intermediate reaction product of said phosphonitrillic chloride with a portion of said titania,

next treating said intermediate reaction product with a solvent solution of a diamine chelating agent and an acid scavenging agent under conditions to form a final reaction product,

and calcining said final reaction product to catalytically activate said final reaction product,

said solvent solution of said phosphonitrillic chloride containing about 2 to about 25 wt. % of said phosphonitrillic chloride, based on the weight of the titania and a molar excess of said acid scavenging agent, based on the moles of chloride in said phosphonitrillic chloride, and

said solvent solution of said diamine chelating agent containing about 1.1 to about 4 mole equivalents of diamine chelating agent per mole equivalent of chloride originally present in said phosphonitrillic acid and a molar excess of said acid scavenging agent, based on the moles of chloride originally present in said phosphonitrillic chloride.

4,895,821

PROCESS FOR THE MANUFACTURE OF CATALYTIC ELEMENTS AND CATALYTIC ELEMENTS SO PRODUCED

Hartmut Kainer, Wiesbaden; Eugen Bühler, Königstein; Daniel Grimm, Bad Schwalbach; Wilfried Schenelle, Wiesbaden; Claus Flockenhaus, Essen; Karl-Heinrich Lane, Hattingen, and Klaus Merkel, Essen, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden and Didier Engineering GmbH, Essen, both of, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,716

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727119

Int. Cl.[4] B01J *23/34, 23/74, 23/86*

U.S. Cl. 502—204 **24 Claims**

1. A process for the manufacture of catalytic elements, said process comprising the steps of:

(a) providing a primary catalytic material, said primary catalytic material being a member selected from the group consisting essentially of iron oxide, a mixture of iron oxide

and chromium oxide, a mixture of iron oxide and manganese oxide, and a mixture of iron oxide, chromium oxide and manganese oxide and combinations of members of the group;

(b) mixing a binder means with said primary catalytic material for binding said primary catalytic material;

(c) molding said mixed primary catalytic material and binder means produced in said step (b) to produce green catalytic elements;

(d) subjecting said green catalytic elements to a first temperature treatment of 100° C. to 250° C. to set said binder means:

(e) treating said catalytic elements obtained from said step (d) with a mixture of sulfuric acid and phosphoric acid; and

(f) subjecting said catalytic elements obtained from said step (e) to a second temperature treatment in the range between about 100° C. and about 600° C. to temper said catalytic elements.

4,895,822

HYDROCRACKING CATALYSTS

Hajime Okazaki, Kawasaki; Michiaki Adachi, and Masaru Ushio, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1988, Ser. No. 185,835

Claims priority, application Japan, Apr. 24, 1987, 62-101307

Int. Cl.[4] B01J *27/12, 27/128, 27/132*

U.S. Cl. 502—206 **6 Claims**

1. A catalyst for use in hydrocracking mineral oils which comprises:

(a) a carrier resulting from solid-phase modification of at least one porous inorganic oxide with at least one fluorine compound, said inorganic oxide being selected from the group consisting of silica, boria, zirconia, silica-alumina, silica-magnesia, alumina-magnesia, alumina-titania, silica-titania, alumina-boria and alumina-zirconia, said inorganic oxide and said fluorine compound being present in an amount of 10 to 90 percent and in an amount of 2.5 to 85 percent, respectively, by weight of the total catalyst; and

(b) at least one metal component selected from the group consisting of a Group VI metal, a Group VIII metal and a combination thereof, said metal component being present in an amount of 5 to 50 percent by weight of the total catalyst.

4,895,823

COMPOSITION OF MATTER FOR OXIDATIVE CONVERSION OF ORGANIC COMPOUNDS

John H. Kolts, Ochelata, and Jack P. Guillory, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 713,674, Mar. 19, 1985, Pat. No. 4,672,145. This application Jul. 31, 1986, Ser. No. 891,009

Int. Cl.[4] B01J *23/02, 27/10, 27/135, 27/138*

U.S. Cl. 502—226 **4 Claims**

1. A solid composition of matter consisting essentially of: (a) a component comprising lithium, and (b) a component comprising magnesium and (c) a component comprising (1) at least one material selected from the group consisting of tin and compounds containing tin and (2), optionally, at least one material selected form the group consisting of chloride ions and compounds containing said chloride ions.

4,895,824

ADD-ON HYDROGEN SULFIDE TRAP

Gwan Kim, Olney, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 96,562

Int. Cl.[4] B01J *23/00, 35/04*

U.S. Cl. 502—300 **16 Claims**

1. An assembly consisting essentially of a three way exhaust gas catalyst over which is passed an automobile exhaust gas to be treated and an H_2S trap over which is passed the treated exhaust gas consisting essentially of a support, which is a metal monolith or a ceramic monolith, having distended thereover as the active H_2S gettering component an H_2S-getter metal oxide (MO)

(a) which traps the H_2S by the following reaction:

$$MO + H_2S \rightarrow MS + H_2O$$

(b) which self-regenerates via the following reaction:

$$MS + 3/2\ O_2 \xrightarrow[(air)]{} MO + SO_2 \text{ and}$$

(c) which has little tendency to form sulfates at a temperature greater than approximately 500° C.;

said trap device in said automobile engine exhaust system being capable of self regeneration with oxygen under a lean exhaust gas condition; and

said trap device having the sole function of adsorbing H_2S and not containing any additional exhaust gas catalysts.

4,895,825

HIGH-POROSITY SILICOCALCAREOUS MASS FOR STORING OF GAS, AND PRODUCTION PROCESS

Philippe Deck, Montreuil; Georges Delode, Champigny-sur-Marne; Gerard Vagnard, Bagnolet, all of France, and Bartolomeo Colturri, Milan, Italy, assignors to L'Air Liquide, Paris, France

Continuation-in-part of Ser. No. 66,350, Jun. 25, 1987, abandoned. This application Jan. 12, 1988, Ser. No. 143,065

Claims priority, application France, Sep. 18, 1986, 86 13060

Int. Cl.[4] B01J *20/10*; B05D *7/22*

U.S. Cl. 502—407 **7 Claims**

1. A process for lining a bottle with a silicocalcareous mass of good strength and uniformity in order to provide a gas storage bottle, said process comprising:

slaking quickline with hot water at a temperature of about 40°–85° C. to form a first mixture;

adding additional water to said first mixture and homogenizing the suspension formed by stirring at a slow speed to provide a second mixture;

dispersing a reinforcing agent in said second mixture to form a third mixture, said reinforcing agent comprising about 3–30% by weight, based on the final dry weight of the lining, of cellulose fibers selected from the group consisting of cellulose fibers which are partially mechanically delignified, partially chemically delignified, and partially chemically delignified and mechanically refined;

introducing with stirring into the third mixture, a mixture of natural silica and a member selected from the group consisting of about 8–20% by weight of calcium silicate and about 2–5% by weight of amorphous ultrafine synthetic silica having a specific surface area between about 150 and 300 m^2 per gram, said amounts being based on the final dry weight of the lining, so as to form a fourth mixture;

dispersing into the fourth mixture a second mineral suspending agent selected from the group consisting of about 0.5–5% by weight of glass fibers, and purified clay in an amount of about 0.1–2% by weight, these quantities being based on the final dry weight of the lining, and thereby forming a paste;

transferring said paste under partial vacuum into a bottle to be lined;

maintaining said bottle containing said paste in autoclave under saturation steam pressure of about 1 MPa for about twenty hours; and

drying said bottle in furnace for about seven days at a temperature no greater than 170° C.

7. A gas storage bottle for storing gases therein, said gas storage bottle being filled with a dried homogeneous silicocalcareous mass having a high porosity of 88–90.5% and having a density between 0.240 kg/l and 0.280 kg/l and a compressive strength between 1.5 MPa to 3.5 MPa and constituting

a dried product of an aqueous paste consisting essentially of and formed by mixing in order

quicklime slaked with hot water at a temperature of about 40°–85° C.; water; 3–30% by weight based on solids of reinforcing cellulose fibers selected from the group consisting of cellulose fibers which are partially mechanically delignified, partially chemically delignified, and partially chemically delignified and mechanically refined, a mixtured of natural finely ground silica and a member selected from the group consisting of 8–20% based on solids of calcium silicate and 2–5% based on solids of amorphous ultrafine synthetic silica having a specific surface area between about 150 and 300 m^2 per gram, the total quantity of silica being such as to provide a weight ratio of lime to silica of between 0.7 and 1.1; a mineral suspending agent selected from the group consisting of 0.5–5% by weight based on solids of glass fibers and 0.1–2% by weight based on solids of purified clay; the water being present in an amount of at least 3 times greater than the amount of solids.

4,895,826

HEAT-SENSITIVE RECORDING MATERIAL WITH DIAZONIUM SALT AND COUPLER PRECURSOR WITH ESTER OR URETHANE GROUP

Katsuhiko Watanabe; Takayuki Hayashi; Hiroshi Kamikawa; Masato Satomura, and Takekatsu Sugiyama, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1988, Ser. No. 185,230

Claims priority, application Japan, Apr. 24, 1987, 62-101456

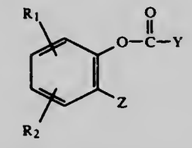
Int. Cl.[4] B41M *5/18*; G03C *1/58*

U.S. Cl. 503—202 **11 Claims**

1. A heat-sensitive recording material, comprising:

a support having provided thereon a heat-sensitive recording layer comprising a diazonium salt which is heat-sensitive and light-decomposable, and a coupler precursor compound, wherein said diazonium salt and said coupler precursor compound are provided in a single layer or a multi-layer such that they are in heat reactive association to enable color formation by coupling,

wherein said diazonium salt is present in an amount of from 0.05 to 5.0 g/m^2, and said coupler precursor compound is present in an amount of from 0.1 to 10 parts by weight per part by weight of said diazonium salt and is represented by formula (I):



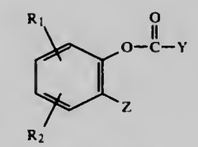
(I)

wherein X represents an oxygen atom; Y represents an alkoxy group, a substituted amino group, an alkylthio group or an alkyl group; Z represents an mono-substituted carbamoyl group or a morpholinocarbonyl group; and R_1 and R_2 each represents a hydrogen atom, a halogen atom, a hydroxyl group, a substituted amino group, an alkyl group or an aryl group, or R_1 and R_2 may be bonded to form a ring.

7. A heat-sensitive recording material, comprising:

a support having provided thereon a heat-sensitive recording layer formed by a microencapsulation method comprising a diazonium salt which is heat-sensitive and light-decomposable, and a coupler precursor compound, said coupler precursor compound and said diazonium salt are provided in a single layer or a multi-layer such that they are in heat reactive association to enable color formation by coupling,

wherein said diazonium salt and said coupler precursor compound are contained in either a core of the microcapsules or in a heat sensitive layer outside the microcapsules, and said diazonium salt is present in an amount of from 0.05 to 5.0 g/m^2, and said coupler precursor compound is present in an amount of from 0.1 to 10 parts by weight per part by weight of said diazonium salt and is represented by formula (I):



(I)

wherein X represents an oxygen atom; Y represents an alkoxy group, a substituted amino group, an alkylthio group or an alkyl group; Z represents an mono-substituted carbamoyl group or a morpholinocarbonyl group; and R_1 and R_2 each represents a hydrogen atom, a halogen atom, a hydroxyl group, a substituted amino group, an alkyl group or an aryl group, or R_1 and R_2 may be bonded to form a ring.

4,895,827

THERMALLY-RESPONSIVE RECORD MATERIAL

Steven L. Vervacke, and Kenneth D. Glanz, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 128,857, Dec. 4, 1987, Pat. No. 4,820,683. This application Jan. 17, 1989, Ser. No. 298,447

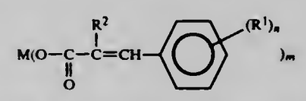
Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—210 **32 Claims**

1. A non-reversible thermally-responsive record material comprising a support member bearing a thermally-sensitive color-forming composition consisting essentially of

a chromogenic material and an acidic developer material in contiguous relationship, whereby the melting, softening or sublimation of either material produces a change in color by reaction between the two,

a metal salt of a compound of the formula



(I)

wherein M is a metal selected from Zn, Ca, Sn, Ni, Cu, Al, Co, and Mg;

wherein m corresponds to the valency of M;

wherein n is 1 to 3;

wherein R^1 is selected from hydrogen, halogen, alkyl, oxyalkyl, or NO_2, with the proviso that the alkyl group is of 1 to 5 carbons;

wherein R^2 is selected from hydrogen, alkyl, or aryl, with the proviso that the alkyl group is of 1–5 carbon; and

a suitable binder therefor.

4,895,828

THERMOSENSITIVE RECORDING MATERIAL

Hiroshi Yaguchi, and Hisashi Sakai, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 11, 1989, Ser. No. 350,203

Claims priority, application Japan, May 19, 1988, 63-122273

Int. Cl.[4] B41M *5/18, 5/20*

U.S. Cl. 503—226 **18 Claims**

1. A thermosensitive recording material comprising a sup-

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port, an intermediate layer comprising an expanded plastic filler, formed on said support, and a thermosensitive coloring layer formed on said intermediate layer, with an electroconductive agent being contained in an effective amount in at least said intermediate layer.

4,895,829

HEAT-SENSITIVE RECORDING MEDIUM

Kazuyuki Hanada, Washinomiya, and Susumu Nakamura, Kawagoe, both of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 86,783

The portion of the term of this patent subsequent to Sep. 19, 1988, has been disclaimed.

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **3 Claims**

1. In a heat-sensitive recording medium composed of a base sheet, a heat-sensitive recording layer provided on one side of the base sheet and a heat-resistant layer provided on the other side of the base sheet, the improvement wherein the heat-resistant layer is made of a film-forming resin modified with a modifier which is a reaction product of a silicone, wherein said silicone compound (a) contains at least one organic functional group reactive with an isocyanate group and is reacted with an organic polyisocyanate.

4,895,830

SUBLIMATION TYPE THERMAL INK TRANSFER PRINTING MATERIAL

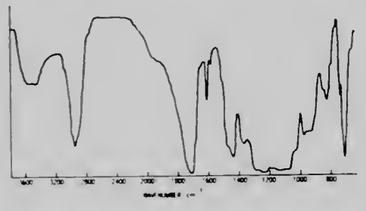
Naohiro Takeda, Yokohama; Yuzo Otani, Tokyo; Nariaki Okajima; Yoshihiko Ito, both of Yokohama, and Shin-ichi Kinoshita, Yokohama, all of Japan, assignors to Diafoil Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,148

Claims priority, application Japan, Dec. 28, 1988, 62-334960

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **3 Claims**



1. A sublimation type thermal ink transfer printing material comprising a biaxially drawn film substrate consisting of a polyester base film and an applied primer layer of a reaction product of a polymerizable compound having carbon-carbon unsaturated bonds and a polyester, said substrate being drawn after a liquid containing said reaction product is applied on the polyester film; a layer of sublimation type ink formed on said applied layer; and a slippery layer formed on the side opposite to said ink layer.

4,895,831

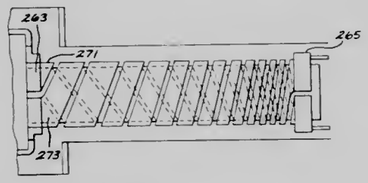
CERAMIC SUPERCONDUCTOR CRYOGENIC CURRENT LEAD

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,113

Int. Cl.[4] H01F *5/00*

U.S. Cl. 505—1 **2 Claims**



1. Apparatus comprising:

a two stage cryocooler sleeve having a second stage heat exchanger station capable of achieving lower temperatures than the first stage heat exchanger; and

a current lead comprising a ceramic superconductor having a critical temperature greater than the operating temperature of the first stage of said cryocooler, said ceramic superconductor being tapered with the broader end thermally coupled to said first stage heat exchanger and the narrow end coupled to said second stage heat exchanger, said tapered ceramic lead reducing heat conduction from said first heat exchanger to said second heat exchanger station.

4,895,832

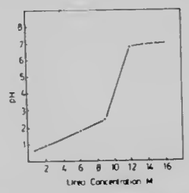
COPRECIPITATION METHOD FOR PRODUCING SUPERCONDUCTING OXIDES OF HIGH HOMOGENEITY

Chau-Ting Chang, and Ru-Shi Liu, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Nov. 3, 1988, Ser. No. 266,786

Int. Cl.[4] C01F *11/02, 17/00;* **C01G** *3/02*

U.S. Cl. 505—1 **4 Claims**



1. A coprecipitation method for producing homogeneous coprecipitates of superconducting oxides comprising:

(a) preparing an aqueous mixture containing Y, Ba and Cu salts with a molar ratio of 1:2:3;

(b) adding 5–10 mole of oxalic acid per mole of Y and 20–250 mole of urea per mole of Y into the aqueous mixture;

(c) heating the aqueous mixture to a temperature range of 80 to 100 degrees C in order to decompose the urea into CO_2 and NH_3 based on the following hydrolysis equation:

$$CO(NH_2)_2 + H_2O \rightarrow 2NH_3 + CO_2,$$

such that a pH value of the aqueous mixture will be elevated by the NH_3 evoluted from the urea hydrolysis;

(d) cooling the temperature of the aqueous mixture to room temperature; and

(e) recovering the homogenous coprecipitates of the superconducting oxides.

4,895,833

LIVER LACTOGENIC FACTOR

L. Stephen Frawley, Charleston, S.C., assignor to The Medical University of South Carolina, Charleston, S.C.

Filed Mar. 6, 1987, Ser. No. 22,893

Int. Cl.[4] A61K *37/02, 35/14, 35/407;* **C07K** *15/06*

U.S. Cl. 514—2 **7 Claims**

1. Liver lactogenic factor having a molecular weight of approximately 8–10 kd and lactogenic peptide fragments thereof in substantially pure form.

4,895,834

RENIN INHIBITORS III

James P. Hudspeth, Malibu, Calif.; James S. Kaltenbronn, Ann Arbor, Mich.; Joseph T. Repine, Ann Arbor, Mich.; William H. Roark, Ann Arbor, Mich., and Michael A. Stier, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 941,966, Jan. 15, 1986, Pat. No. 4,735,933. This application Nov. 2, 1987, Ser. No. 113,277

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

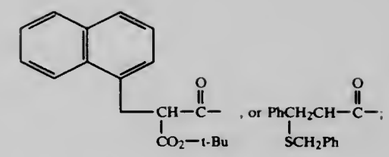
Int. Cl.[4] H61K *37/02;* **C07K** *5/06, 5/08*

U.S. Cl. 514—18 **10 Claims**

1. A peptide of the formula

ACYL—X—Y—W—U (I)

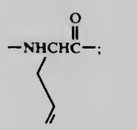
and the pharmaceutically acceptable acid addition salts thereof, wherein ACYL is DNMA,



, or

;

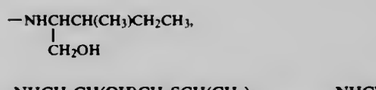
X is HIS, HOMOHIS, PHE, HOMOPHE, ILE, LEU, NLE, N-MeHIS, N-MeLEU, or



Y is STA, CYSTA, or PHSTA;

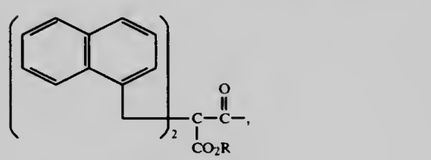
W is LEU, ILE, N-MeLEU, N-MeILE, VAL or absent with the proviso that, when ACYL is DNMA, W is present; and

U is $-NHCH_2CH(CH_3)CH_2CH_3$, $-NHCH_2Ph$,

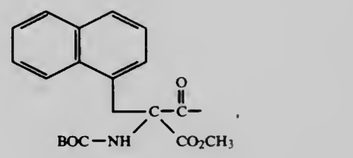


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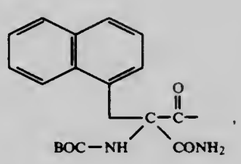
$-NHCH_2CH(OH)CH_2SCH(CH_3)_2$, $-NHCH_2CH(OH)CH_2SOCH(CH_3)_2$, $-NHCH_2CH(OH)CH_2SO_2CH(CH_3)_2$,



,

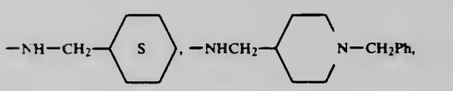


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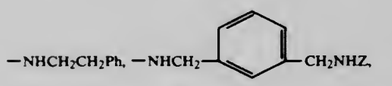


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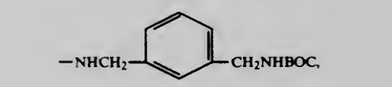
wherein R is hydrogen or a straight or branched lower alkyl of from one to six carbon atoms,



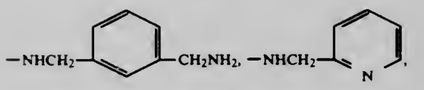
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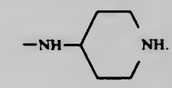


,



,

$-NH_2$, $-NHCH_2CH{=}CH_2$, $-OC_2H_5$, $-OCH_3$, or



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VOL 1110 ISS 4 JA 23 1990 UMI

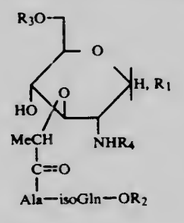
4,895,835

MURAMYL PEPTIDE DERIVATIVES AND USE THEREOF

Akira Hasegawa, Gifu, Japan, assignor to Nisshin Oil Mills, Ltd., Tokyo, Japan

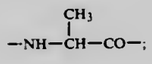
Filed Nov. 17, 1988, Ser. No. 272,496
Claims priority, application Japan, Nov. 20, 1987, 62-293281
Int. Cl.[4] A61K *37/02;* **C07K** *9/00*
U.S. Cl. 514—8 **17 Claims**

1. A muramyl peptide derivative having the formula (I):

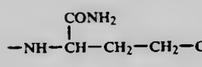


(I)

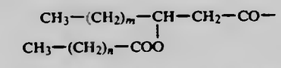
in which "Ala" is



"iso-Gln" is



R_1 is hydrogen atom, hydroxy group, mercapto group, a C_{2-20}alkanoyloxy group, a C_{2-20}alkanoylthio group, R_3O— or R_3S—; R_2 is hydrogen atom or a C_{1-20}alkyl group, R_3 is a group the sub-formula:



(n is an integer of 10–14 and m is an integer of 8–12); and R_4 is a C_{2-4}alkanoyl group.

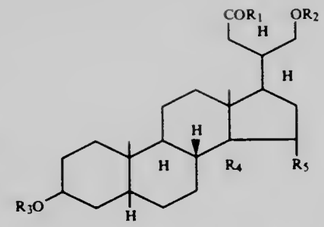
4,895,836

NOR-CHOLANIC ACID DERIVATIVES, A PROCESS FOR THEIR PREPARATION, THEIR USE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Laura Chiodini, Busto Arsizio; Mauro Gobbini, Sesto Calende; Sergio Mantegani, Milan; Daniel Ruggieri, Milan; Aldemio Temperilli, Milan; Gabriella Traquandi, Corsate d'Adda, and Patrizia Ferrari, Varese, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

PCT No. PCT/EP87/00006, § 371 Date Oct. 29, 1987, § 102(e) Date Oct. 29, 1987, PCT Pub. No. WO87/04166, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 7, 1987, Ser. No. 133,043
Claims priority, application United Kingdom, Jan. 9, 1986, 8600491
Int. Cl.[4] C07J *00/00;* **C07H** *15/24;* **A61K** *31/58*
U.S. Cl. 514—26 **6 Claims**

1. A compound having the general formula I



I

wherein either R_1 represents a hydroxy group or an alkoxy group having from 1 to 4 carbon atoms and R_2 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, or R_1 and R_2 taken together represent a chemical bond; R_3 represents an aminodeoxy or aminodideoxy or aminotrideoxy sugar residue of the D or L series; and either R_4 represents a hydroxy group and R_5 represents a hydrogen atom; or Rand R_5 taken together represent a chemical bond; or a pharmaceutically acceptable salt thereof.

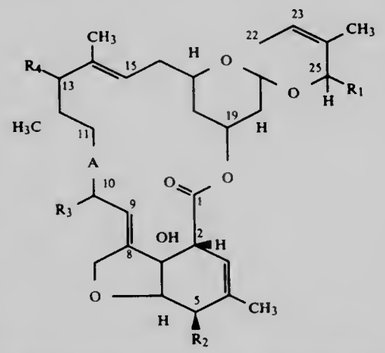
4,895,837

AVERMECTIN DERIVATIVES

Helmut Mrozik, Matawan, and Frank S. Waksmunski, South River, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 150,186, Jan. 29, 1988, abandoned. This application Jan. 13, 1989, Ser. No. 296,172
Int. Cl.[4] A61K *31/70;* **C07H** *17/04;* **C07P** *313/06*
U.S. Cl. 514—30 **15 Claims**

1. A compound having the formula:

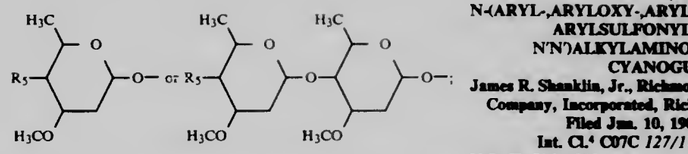


wherein A represents a single bond or a double bond; R_1 is iso-propyl or sec-butyl;

R_2 is hydroxy, oxo, loweralkoxy, or triloweralkylsilyl substituted hydroxy;

R_3 is hydrogen, hydroxy, halogen, or oxo or triloweralkylsilyl substituted hydroxy, however R_3 is present only when A represent a single bond;

R_4 is hydrogen, hydroxy, halogen, triloweralkylsilyl substituted hydroxy,



R_5 is hydroxy, triloweralkylsilyl substituted hydroxy, oxo, $-NR_6R_7$ or



R_6 and R_7 are independently hydrogen, loweralkyl, or loweralkanoyl.

12. A method for the treatment of parasitic infections of animals which comprises administering to an animal infected with parasites an effective amount of a compound of claim 1.

4,895,838

METHOD FOR PROVOKING ANGIOGENESIS BY ADMINISTRATION OF ANGIOGENICALLY ACTIVE OLIGOSACCHARIDES

Robert McCluer, Acton; Nicholas Catsimpoolas, Newton Center; Michael Klibanov, Brookline; Ann Griffith, Newton Center, all of Mass., and Robert Sinn, New York, N.Y., assignors to Trustees of Boston University, Boston, Mass. and Angio-Medical Corporation, N.Y.

Filed Mar. 9, 1988, Ser. No. 165,809
Int. Cl.[4] A01N *43/04;* **C07K** *13/00, 3/06;* **A61K** *31/715*
U.S. Cl. 514—54 **22 Claims**

1. Method for causing or enhancing angiogenesis in a subject in need thereof, comprising administering to said subject an angiogenically effective amount of at least one angiogenically active oligosaccharide.

4,895,839

PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING COMPLEXES OF FLAVANOLIGNANS WITH PHOSPHOLIPIDS

Ezio Bombardelli, Milan, Italy, assignor to INDENZA S.p.A., Milan, Italy

Filed Jul. 7, 1988, Ser. No. 216,039
Claims priority, application Italy, Jul. 10, 1987, 21253 A/87
Int. Cl.[4] A61K *31/335, 31/685*
U.S. Cl. 514—78 **1 Claim**

1. The method of treating edema in a host in need of such a treatment which consists of topically applying to the edema an effective amount of a composition which contains as the active ingredient 1–10% by weight of a flavannolignan complex, selected from the group consisting of silymarin, silybin, silydianin and silychristin, with a phospholipid, which is a synthetic mixture of phosphatidylcholine, phosphatidylserine and phosphatidylethanolamine, wherein the acyl residues are derived from palmitic, stearic, oleic and linoleic acids or a natural phospholipid in admixture with excipients.

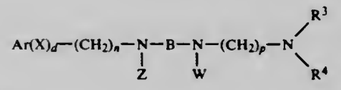
4,895,840

N-(ARYL-,ARYLOXY-,ARYLTHIO-ARYLSULFINYL-AND ARYLSULFONYL-)ALKYL-N,N'-(OR N'N')ALKYLAMINOALKYL UREAS AND CYANOGUANIDINES

James R. Shanklin, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Jan. 10, 1987, Ser. No. 60,266
Int. Cl.[4] C07C *127/17, 157/07;* **A61K** *31/17*
U.S. Cl. 514—212 **63 Claims**

1. A compound comprising the structure:



wherein;

Ar is 1- and 2-naphthyl, 2,3-dihydro-1H-inden-4(or5)-yl, 2-furanylmethyl, 2-pyridinyl, phenyl and phenyl substituted by one to three radicals, the same or different, selected from the group consisting of loweralkyl, loweralkoxy, diloweralkylamino, cyano, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, acyl, acylamino, aminocarbonyl, diloweralkylaminoloweralkoxy, trifluoromethyl, nitro and halogen;

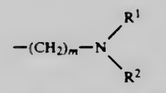
X is thio, sulfinyl, sulfonyl, or oxygen;

d is zero or one;

B is carbonyl, thioxomethyl;

n, m and p are selected from 2–6 inclusive and may be the same or different;

Z and W are each R or



with the proviso that when Z is R, W is $-(CH_2)_m-NR^1R^2$ and when Z is $-(CH_2)_m-NR^1R^2$, W is R;

R, R^1, R^2, R^3 and R^4 may be the same or different and are selected from the group consisting of hydrogen, loweralkyl, cycloalkyl, phenyl and phenylloweralkyl wherein phenyl may be substituted by one to three radicals, the same or different, said radicals being selected from the group consisting of loweralkyl, loweralkoxy, cyano, trifluoromethyl, nitro and halogen, and

each of R^1 and R^2, and R^3 and R^4 may, together with the adjacent nitrogen form the heterocyclic ring structure 1-homopiperidinyl, 1-piperidinyl, 4-morpholinyl, 1-pyrrolidinyl, 1-piperazinyl, or piperazine substituted in the 4-position by a radical selected from loweralkyl, phenyl, phenyl substituted by 1–2 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl, nitro, and cyano and pyridyl;

with the further proviso that when B is thioxomethyl, then R^1, R^2, R^3 and R^4 are not hydrogen or with the adjacent nitrogen from the heterocyclic ring structure 1-piperazinyl; and

with a still further proviso that when B is carbonyl and $(X)_d$ is thio or sulfinyl or Ar is phenyl substituted by loweralkylthio or loweralkylsulfinyl, then R^1, R^2, R^3 and R^4 are not hydrogen or with the adjacent nitrogen form the heterocyclic ring structure 1-piperazinyl;

and the pharmaceutically acceptable salts thereof.

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4,895,841

CYCLIC AMINE COMPOUNDS WITH ACTIVITY AGAINST ACETYLCHOLINESTERASE

Hachiro Sugimoto, Ushiku, Japan; Yutaka Tsuchiya, Fort Lee, N.J.; Kunizou Higurashi, Tokyo, Japan; Norio Karibe, Tsukuba, Japan; Yoichi Iimura, Tsukuba, Japan; Atsushi Sasaki, Tsukuba, Japan; Yoshiharu Yamanishi, Ryugasaki, Japan; Hiroo Ogura, Tsuchiura, Japan; Shin Araki, Tsukuba, Japan; Takashi Kosasa, Tsukuba, Japan; Atsuhiko Kubota, Tsukuba, Japan; Michiko Kosasa, Tsukuba, Japan, and Kiyomi Yamatsu, Kamakura, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

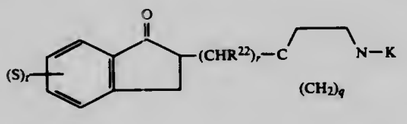
Filed Jan. 20, 1988, Ser. No. 209,339

Claims priority, application Japan, Jun. 22, 1987, 62-155058

Int. Cl.[4] A61K *31/55;* **C07D** *405/06*

U.S. Cl. 514—212 **13 Claims**

1. A cyclic amine compound having the formula



wherein

r is an integer of 1 to 10, R^{22} is hydrogen or methyl, and the R^{22} radicals can be the same or different when r is from 2 to 10;

K is phenylalkyl or phenylalkyl having a substituent on the phenyl ring;

S is hydrogen or a substituent on the phenyl ring, and

t is an integer of 1 to 4, with the proviso that $(S)_t$ can be a methylenedioxy group or an ethylenedioxy group joined to two adjacent carbon atoms of the phenyl ring; and

q is an integer of 1 to 3,

or a pharmacologically acceptable salt thereof.

11. A method for treating a disease caused by acetylcholinesterase activity which comprises administering to a human patient having the disease, an effective amount of the cyclic amine compound as defined in claim 1, or a pharmacologically acceptable salt thereof.

4,895,842

PHENYLALANINE DERIVATIVE AND PROTEINASE INHIBITOR

Shosuke Okamoto, Kobe; Yoshio Okada, Akashi; Akiko Okuno-miya, Kobe; Taketoshi Naito, Tokyo; Yoshio Kimura, Tokyo; Meribiko Yamada, Tokyo; Norio Ohno, Tokyo; Yasuhiro Katsura, Tokyo, and Yumi Seki, Tokyo, all of Japan, assignors to Shosuke Okamoto, Hyogo and Showa Denko Kabushiki Kaisha, Tokyo, both of, Japan

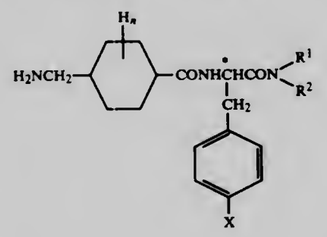
Filed Sep. 29, 1986, Ser. No. 912,480

Claims priority, application Japan, Sep. 27, 1985, 60-212240; Mar. 4, 1986, 61-45348

Int. Cl.[4] A61K *31/165;* **C07C** *103/28*

U.S. Cl. 514—227.5 **4 Claims**

1. A phenylalanine derivative having the formula (I):



(I)

where

R^1 and R^2 are, independently, hydrogen provided that both R^1 and R^2 are not hydrogen at the same time;

C_1–C_8 alkyl which may be substituted with hydroxy, hydroxycarbonyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylmercapto, C_1–C_4 alkoxy, carbamoyl, sulfamoyl, pyridyl, or phenyl which may further be substituted with nitro, C_1–C_4 alkoxy, or halogen;

C_6–C_8 cycloalkyl which may be substituted with hydroxy, C_1–C_4 alkoxy, hydroxylcarbonyl, C_1–C_4 alkoxycarbonyl, or C_1–C_4 alkyl;

phenyl which may be substituted with halogen, nitro, trifluoromethyl, C_1–C_4 alkoxy, C_1–C_4 alkylmercapto, C_1–C_4 alkylcarbonyl, phenylcarbonyl, hydroxycarbonyl, C_1–C_4 alkoxycarbonyl, carbamoyl, sulfamoyl, amidino, pyridylcarbonyl, or C_1–C_6 alkyl which may further be substituted with C_1–C_4 alkylcarbonyl, hydroxycarbonyl, or C_1–C_4 alkoxycarbonyl;

pyridyl which may be substituted with halogen or C_1–C_4 alkoxy;

pyrimidyl;

N-benzylazacyclohexyl; and

R^1 and R^2 may form with the nitrogen atom attached thereto a ring structure selected from the group consisting of morpholino; thiomorpholino; piperazino which may be substituted with phenylcarbonyl, benzyl, or C_1–C_4 alkyl; pyrrolidyl which may be substituted with hydroxycarbonyl or C_1–C_4 alkoxycarbonyl; and

piperidino substituted with C_1–C_4 alkyl, phenyl C_1–C_4 alkyl, phenylcarbonyl, or C_1–C_4 alkoxycarbonyl;

X is hydrogen; nitro; amino; or —OZ wherein Z is hydrogen; C_1–C_4 alkyl; C_2–C_4 alkenyl; benzyl which may be substituted with halogen, C_1–C_4 alkyl, nitro, trifluoromethyl, hydroxycarbonyl, C_1–C_4 alkoxycarbonyl, or cyano; phenylcarbonylmethyl; pyridylmethyl; phenyl which may be substituted with nitro or halogen; pyridyl or pyrimidyl which may be substituted with nitro; phenylsulfonyl which may be substituted with C_1–C_4 alkyl; or benzyloxycarbonyl which may be substituted with halogen;

n is 4 to 10; and

the mark * indicates that the configuration of the carbon may be either one of D-configuration, L-configuration and DL-configuration or a pharmaceutically acceptable salt thereof.

4,895,843

USE OF 3-(4-BROMO-2-FLUOROBENZYL)-4-OXO-3H-PHTHALAZIN-1-YLACETIC ACID AS A HYPOURICAEMIC AGENT

Per T. Thyrum, Wilmington, Del., assignor to ICI Americas, Inc., Wilmington, Del.

Filed Feb. 9, 1988, Ser. No. 154,019

Claims priority, application United Kingdom, Feb. 26, 1987, 8704569

Int. Cl.[4] C07D *237/32;* **A61K** *31/50*

U.S. Cl. 514—248 **3 Claims**

1. A method for the production of a hypouricaemic effect in a warm blooded animal requiring such treatment which comprises administering to said animal a hypouricaemically effective amount of 3-(4-bromo-2-fluorobenzyl)-4-oxo-3H-phthalazin-1-ylacetic acid or of a pharmaceutically acceptable salt thereof.

4,895,844

INDOLE ALKALOID COMPOSITIONS AND THEIR METHODS OF USE

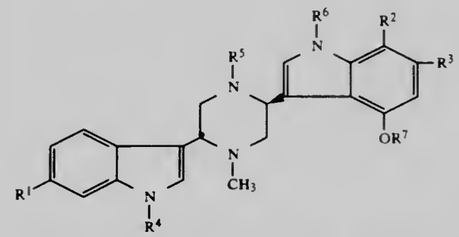
Shigeo Komoto, and Oliver J. McConnell, both of Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Continuation of Ser. No. 30,670, Mar. 25, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 313,281

Int. Cl.[4] A61K *31/495;* **C07D** *403/14*

U.S. Cl. 514—254 **8 Claims**

1. A substantially pure compound according to the formula:



wherein R^{1-3} are the same and are hydrogen or halogen, R^{4-7} are the same and are —H, —R or —COR, and R is lower alkyl.

4,895,845

METHOD OF ASSISTING WEIGHT LOSS

John C. Seed, 763 Kingston Rd., Princeton, N.J. 08540

Filed Sep. 15, 1986, Ser. No. 907,837

Int. Cl.[4] A61K *31/50, 31/495, 31/44, 31/135*

U.S. Cl. 514—252 **10 Claims**

1. A method of assisting weight loss in a human in need thereof which comprises administering to said human, over a sustained period of time, both a rauwolfia alkaloid in the form of reserpine, and at least one antidepressant selected from the group consisting of trazodone, bupropion and fluoxetine in an administration regimen sufficient to supply effective daily dosages thereof for assisting weight loss.

4,895,846

PHARMACEUTICALLY USEFUL DIHYDROPYRIDINYLDICARBOXYLATE AMIDES AND ESTERS INCORPORATING ARYLPIPERAZINYLALKYL MOIETIES

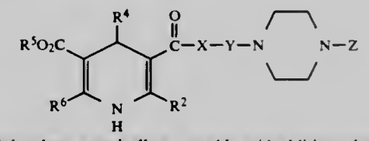
Graham S. Poindexter, and Davis L. Temple, Jr., both of Evansville, Ind., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 693,426, Jan. 22, 1985, Pat. No. 4,755,512, which is a continuation-in-part of Ser. No. 599,097, Apr. 11, 1984, abandoned. This application Dec. 18, 1987, Ser. No. 134,715

Int. Cl.[4] A61K *31/495;* **C02D** *401/12*

U.S. Cl. 514—252 **19 Claims**

1. A compound of Formula XXI"



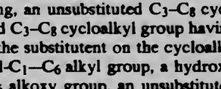
XXI"

and the pharmaceutically acceptable acid addition salts thereof wherein

R^2 and R^6 are independently selected from lower alkyl, hydroxy-lower-alkyl, lower-alkoxy-lower-alkyl, lower-alkylamino-lower-alkyl, or di-lower alkylamino-lower-alkyl;

R^4 is cycloalkyl of 5–7 carbons, bicycloalkenyl of 7–9 carbon atoms, furanyl, indolyl, methylthiopyridyl, thienyl, benzoxadiazolyl, and benzothiadiazolyl; phenyl, naphthyl, or substituted phenyl, with a substituent selected from the group consisting of acetamino, lower alkyl, lower alkoxy, cyano, halogen, hydroxyl, nitro, trifluoromethyl, trifluoromethylsulfonyl, and methylsulfonyl;

R^5 is R^2 or



X is O;

Y is a C_2 to C_5 alkylene chain, alkyleneoxyalkylene, alkylenethioalkylene, or alkyleneaminoalkylene chain wherein each alkylene moiety has 2–5 carbon atoms with the proviso that when R^5 is R^2, Y cannot be C_2 to C_5 alkylene chain; and

Z is phenyl, pyridinyl, or pyrimidinyl, either unsubstituted or substituted with a group selected from among lower alkyl, lower alkoxy, cyano, halo, and trifluoromethyl.

14. The method of exerting a vasodilating effect in a mammalian host which comprises administering to a mammal having a condition in which therapeutic benefit is derived from vasodilation, a non-toxic effective vasodilating dose of a compound as claimed in claim 1.

4,895,847

2,3-DIHYDRO-1H-INDENE DERIVATIVES

Yasuo Oshiro; Hiraki Ueda, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

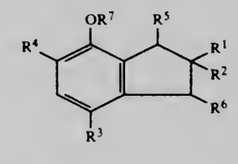
Division of Ser. No. 770,677, Aug. 29, 1985, Pat. No. 4,788,130. This application Sep. 21, 1988, Ser. No. 247,401

Claims priority, application Japan, Aug. 31, 1984, 59-183514; Aug. 14, 1985, 60-179191

Int. Cl.[4] A61K *31/495, 31/44, 31/445;* **C07D** *295/12, 295/14, 295/18, 213/74, 233/61, 207/16;* **C07C** *91/28, 103/38, 131/02*

U.S. Cl. 514—255 **10 Claims**

1. A 2,3-Dihydro-1H-indene compound or salt thereof represented by the formula (1)



(1)

wherein

R^1 and R^2 are each a hydrogen atom, a C_1–C_6 alkyl group, an unsubstituted phenyl group, a substituted phenyl group having 1 to 3 substituents selected from the group consisting of a halogen atom and a C_1–C_6 alkyl group on the phenyl ring, an unsubstituted C_3–C_8 cycloalkyl group, a substituted C_3–C_8 cycloalkyl group having 1 to 3 halogen atoms as the substitutent on the cycloalkyl ring, a C_3–C_8 cycloalkyl-C_1—C_6 alkyl group, a hydroxyl group, a phenyl-C_1–C_6 alkoxy group, an unsubstituted phenyl-C_1–C_6 alkyl group, a substituted phenyl-C_1–C_6 alkyl group having 1 to 3 substituents selected from the group consisting of a halogen atom and a C_1–C_6 alkoxy group on the phenyl ring or a substituted phenyl-C_1–C_6 alkyl group having a C_1–C_4 alkylenedioxy group on the phenyl ring;

R^3 is a halogen atom or a C_1–C_6 alkyl group;

R^4 is a hydrogen atom, a halogen atom, a phenyl-C_1–C_6 alkyl

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group, a C_3–C_8 cycloalkyl-C_1–C_6 alkyl group, a piperidinyl-C_1–C_6 alkanoylamino-C_1–C_6 alkyl group, a pyridinium-C_2–C_6 alkanoylamino-C_1–C_6 alkyl group, a C_1–C_6 alkyl group, a 1-phenyl-2-propenyl group, a 1-methyl-2-propenyl group, or a 2 chlorobenzoyl group;

R^5 is a group of the formula —NH—A—B, wherein A is a C_1–C_6 alkylene group which may have at least one hydroxy group as the substituent, a group of the formula —CO—(D)$_l$— or a group of the formula —D—CO—, wherein D is a C_1–C_6 alkylene group and l is an integer of 0 or 1 and B is a 1-piperazinyl group which may have at least one substitutent selected from the group consisting of a C_1–C_6 alkyl group which may have at least one hydroxy group as the substitutent, an oxo group, a carboxy group, a C_1–C_6 alkoxycarbonyl group, a pyridyl group, a phthalimido group, a pyrrolidinylcarbonyl- C_1–C_6 alkyl group, an unsubstituted phenyl group, a substituted phenyl group having 1 to 3 substituents selected from the group consisting of a halogen atom, a C_1–C_6 alkyl group which may have 1 to 3 halogen atoms as subsitutents, a C_1–C_6 alkoxy group and a nitro group on the phenyl ring, a phenyl-C_1–C_6 alkyl group and a benzoyl group which may have 1 to 3 C_1–C_6 alkoxy groups as the substituents on the phenyl ring;

R^6 is a hydrogen atom or a phenyl group; and

R^7 is a hydrogen atom or a C_1–C_6 alkyl group.

8. 2,3-Dihydro-1-[4-(3-methoxyphenyl)-1-piperzinyl-]acetylamino-2,2,4,6-tetramethyl-7-hydroxy-1H-indene.

4,895,848

TREATMENT OF ALCOHOLISM USING 2-PYRIMIDINYL-1-PIPERAZINE DERIVATIVE

Jörg Traber, Lohmar, and Klaus Opitz, Muenster, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co. KG., Cologne, Fed. Rep. of Germany

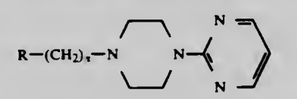
Filed Aug. 3, 1988, Ser. No. 227,962

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727879

Int. Cl.[4] A61K *31/495*

U.S. Cl. 514—255 **5 Claims**

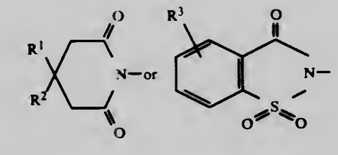
1. A method of treating alcoholism comprising administering to a patient who is an alcoholic an effective amount of a 2-pyrimidinyl-1-piperazine derivative of the formula



in which

n represents one of the numbers 2, 3, 4, 5 or 6, and

R represents



in which

R^1, R^2 and R^3 each independently denote hydrogen or lower alkyl, and/or the salts thereof.

4,895,849

ARALKYLAMINOPYRIMIDINE COMPOUNDS WHICH ARE USEFUL AS FOR PRODUCING THEREOF AND INSECTICIDES

Hirosuke Yoshioka, Wako; Tokio Obata, Ube; Katsutoshi Fujii, Ube; Kiyoshi Tsutsumiuchi, Ube, and Haruo Yoshiya, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

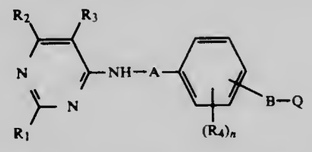
Filed Oct. 5, 1987, Ser. No. 105,403

Claims priority, application Japan, Oct. 8, 1986, 61-237878; May 6, 1987, 62-108899; Sep. 10, 1987, 62-225180

Int. Cl.[4] C07D *239/42*

U.S. Cl. 514—241 **32 Claims**

4. An insecticide comprising a carrier and an effective amount of an active ingredient compound represented by the formula:



(I)

wherein R_1 represents a hydrogen atom or a lower alkyl group which is unsubstituted or substituted with a halogen atom; R_2 and R_3 each independently represents a halogen atom or a lower alkyl group which is unsubstituted or substituted with a halogen atom, a lower alkoxy group or a lower alkylthio group; R_4 represents a hydrogen atom, a halogen atom or a lower alkyl group; n represents an integer of 1 or 2; Q represents a phenyl group or a heterocyclic group selected from the group consisting of a furyl group, a thienyl group, a pyrrolyl group, an oxazolyl group, an isooxazolyl group, a thiazolyl group, an isothiazolyl group, an imidazolyl group, a pyrazolyl group, an oxadiazolyl group and a tetrazolyl group, a pyranyl group, a pyridyl group, a pyridazinyl group, a pyrimidinyl group, a pyrazinyl group and a symmetrical triazinyl group, a benzothiazolyl group, a benzoxazolyl group, a benzoimidazolyl group, a quinazolinyl group, a quinolyl group and a quinoxalinyl group each of which phenyl and beterocyclic group being unsubstituted or substituted with at least one selected from the group consisting of a halogen atom, a nitro group, a lower alkoxy group, a lower alkylthio group, a lower alkyl group which is unsubstituted or substituted with a halogen atom or a lower alkoxy group, a phenyl group which is unsubstituted or substituted with a lower alkoxy group and a phenoxy group which is unsubstituted or substituted with a halogen atom or an unsubstituted or halogen atom-substituted lower alkyl group; said beterocyclic group may be substituted with an oxo group; an alkyl group having 5 to 10 carbon atoms; an allyl group; a geranyl group; a farnesyl group; a lower alkyl group substituted with 1 to 4 halogen atoms; a cycloalkylmethyl group having 3 to 6 carbon atoms; an ethyl group substituted with a lower alkoxy group, a lower alkoxyalkyl group, a lower alkylthio group, a lower alkylsulfonyl group or a phenoxy group which may be substituted with one or two lower alkyl groups; a glycidyl group; an acetonyl group; a dioxoranyl group substituted with a phenoxymethyl group which may be substituted with a chlorine atom; a 2,2-diethoxyethyl group, a 1-ethoxycarbonylethyl group, a trimethylsilylmethyl group, a 1-pyridylethyl group, a lower alkyl group substituted with a benzylimino group which may be substituted with a lower alkoxyimino group or a lower alkyl group; A represents a lower alkylene group which is unsubstituted or substituted with one or two substituents selected from the group consisting of a cycloalkyl group having 3 to 5 carbon atoms, a lower alkynyl group, a lower alkyl group substituted with a halogen atom, a lower alkoxy group or a lower alkylthio group; and B represents a direct bond, an oxygen atom, a sulfur atom, a straight or branched lower alkylene group or a lower alkyleneoxy group; or an acid addition salt thereof.

4,895,850

INSECTICIDAL 1,2,3,4-TETRAHYDRO-5-NITRO-PYRIMIDINE DERIVATIVES

Ernst Gesing, Erkrath-Hochdahl; Hilmar Wolf, Langenfeld; Benedikt Becker, Mettmann, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

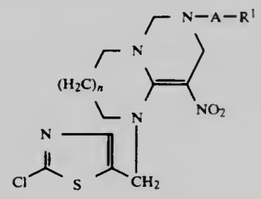
Filed Nov. 15, 1988, Ser. No. 271,555

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1987, 3739264

Int. Cl.[4] C07D *487/04*; A01N *43/90*

U.S. Cl. 514—258 **10 Claims**

1. A 1,2,3,4-tetrahydro-5-nitropyrimidine derivative of the formula



(I)

in which

n is 0 or 1,

A is a direct bond, $—(CH_2)_m—$ or $—(CH_2)_x—Y—(CH_2)_z$

m is a number from 1 to 4,

x and z each independently is 0, 1 or 2,

Y is oxygen, sulphur, —NH— or



R^2 is optionally alkoxycarbonyl-substituted C_1–C_4-alkyl, or cyano, hydroxyl or phenyl, and

R^1 halogeno-C_1–C_4-alkyl or an optionally substituted radical from the group consisting of phenyl, naphthyl, anthryl, phenanthryl, pyridyl, furyl, thienyl, piperidyl and 1,3-benzodioxolyl each of which is optionally substituted by identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, n- or i-propyl, tert.-butyl, trifluoromethyl, methoxy, ethoxy, trifluoromethylthio, hydroxyl, diethylamino, carboxyl and phenyl,

or an acid addition salt thereof.

4,895,851

USE OF OXOQUINAZOLINE DERIVATIVES IN THE TREATMENT OF HYPERURICAEMIA

Gerhard Raaber, Ingelheim am Rhein, and Roland Stechert, Bingen am Rhein, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim Zentrale GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

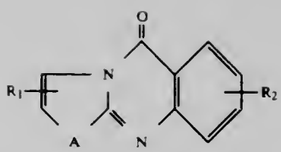
Division of Ser. No. 152,190, Feb. 4, 1988, Pat. No. 4,861,784. This application Mar. 14, 1989, Ser. No. 323,511

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704203

Int. Cl.[4] A61K *31/505*

U.S. Cl. 514—267 **1 Claim**

1. A method for treating hyperuricaemia or a disease state caused thereby, which method comprises orally administering to a host suffering from hyperuricaemia or a disease state caused thereby, a therapeutic amount of a compound of formula



wherein

A represents —CH=CH

R_1 represents (a) hydrogen, a lower alkly or alkoxy group or a condensed-on benzene ring or (b) a cyano, tetrazol-5-yl or —COR_3 group,

R_2 represents a cyano, tetrazol-5-yl or —COR_4 group or, if R_1 has one of the meanings given in (b), R_2 may also represent hydrogen, a lower alkyl or alkoxy group or a condensed-on benzene ring,

R_3 represents a lower alkoxy group, an amino, hydroxylamino or tetrazol-5-yl amino group or, if R_2 does not represent hydrogen, R_3 may also represent a hydroxy group and

R_4 represents a lower alkoxy group, a hydroxy, amino, hydroxylamino or tetrazol-5-yl amino group, or a pharmaceutically acceptable salt thereof.

4,895,852

ANTITUMOR ALKALOIDS

Tatsuo Higa, Okinawa, Japan; Ryuichi Sakai, Champaign, Ill., and Toshio Ichiba, Nagasaki, Japan, assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

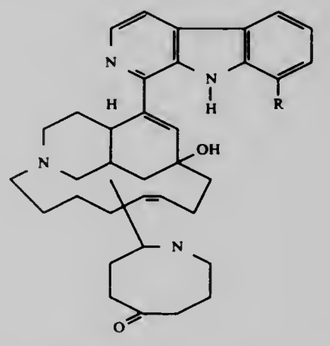
Filed Nov. 24, 1987, Ser. No. 124,672

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[4] A61K *31/475*; C07D *519/00*

U.S. Cl. 514—281 **8 Claims**

1. A substantially pure compound according to the formula:



wherein

R is —H, —OH, —OCOA, or halogen and

A is C1–C5 alkyl,

the dihydro and tetrahydro derivatives and mineral and organic acid salts thereof.

7. A pharmaceutical composition comprising, as an active ingredient, an effective pharmaceutical amount of a compound of claim 1 and a non-toxic pharmaceutically acceptable carrier or diluent.

4,895,853

ANTITUMOR ALKALOIDS

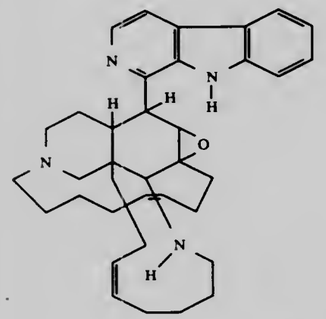
Tatsuo Higa, Naha, Japan; Ryuichi Sakai; Shigeo Kohmoto, both of Vero Beach, and May S. Lui, Sebastian, all of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Filed Dec. 18, 1986, Ser. No. 943,609

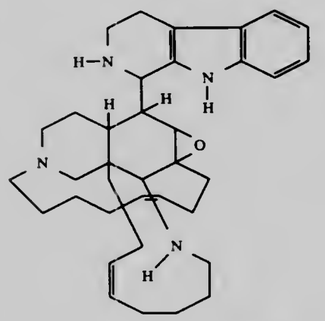
Int. Cl.[4] A61K *31/475*; C07D *519/00*, *471/04*

U.S. Cl. 514—281 **10 Claims**

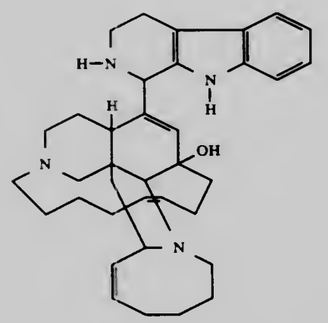
1. A substantially pure compound according to any one of the following formulae I, II, III or IV:



I



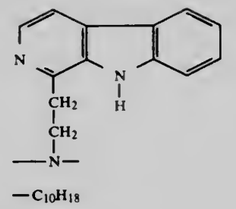
II



III

-continued

IV



and acid salts thereof.

6. A pharmaceutical composition comprising, as an active ingredient, in an amount effective to provide a dosage of between about 0.01 and 100 micrograms of one or more of compounds of claim 1 and a non-toxic pharmaceutically acceptable carrier or diluent.

4,895,854

ANTITUMOR ALKALOIDS

Tatsuo Higa, Okinawa, Japan, and Ryuichi Sakai, Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

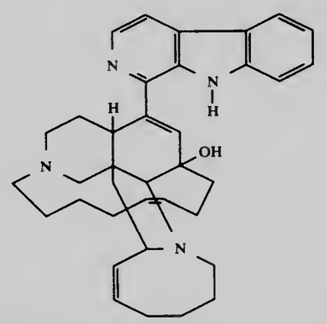
Continuation of Ser. No. 879,094, Jun. 26, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 228,868

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[4] A61K *31/475*; C07D *519/00*

U.S. Cl. 514—281 **3 Claims**

1. A substantially pure compound of the formula:



and the dihydro, tetrahydro and hexahydro derivatives thereof.

3. A pharmaceutical composition comprising, as an active ingredient, an amount effective to provide a dosage of between about 0.01 and 100 micrograms of one or more of the compounds of claim 1 and a non-toxic, pharmaceutically acceptable carrier or diluent.

4,895,855

MIXTURE OF DIFFERENT DIHYDROPYRIDINES

Siegfried Goldmann, Wuppertal; Horst Böshagen, Haan; Friedrich Bossert, Wuppertal; Gerhard Franckowiak, Wuppertal; Horst Meyer, Wuppertal; Jürgen Stoltefuss, Haan; Rainer Gross, Wuppertal; Matthias Schramm, Cologne, and Günter Thomas, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,160

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447170

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—302 **2 Claims**

1. A vasodilating composition comprising (A) ethyl 2-methyl-4-(4-oxo-2-phenyl-4H-thiochromen-8-yl)-5-oxo-1,4,5,7-tetrahydrofuro(3,4-b)pyridine-3-carboxylic ethylester and (B) at least one member selected from the group consisting of nitrendipine, nicardipine, nisoldipine and nifedipine, there being present 50 to 200 nmols of (B) per mol of (A).

4,895,856

DERIVATIVES OF 5-PENTYLAMINO-5-OXOPENTANOIC AND 4-PENTYLAMINO-4-OXOBUTANOIC ACIDS WITH ANTAGONISTIC ACTIVITY TOWARDS CHOLECYSTOKININ

Francesco Makovec; Rolando Chisté, both of Monza; Walter Peris, Milan, and Luigi Rovati, Monza, all of Italy, assignors to Rotta Research Laboratorium S.p.A., Milan, Italy

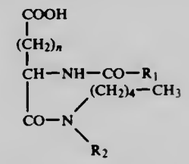
Division of Ser. No. 133,844, Dec. 16, 1987, Pat. No. 4,826,878. This application Dec. 7, 1988, Ser. No. 280,857

Claims priority, application Italy, Dec. 16, 1986, 67937 A/86

Int. Cl.[4] C07D *215/54*; A61K *31/47*

U.S. Cl. 514—311 **6 Claims**

1. Pharmaceutically active compounds of 5-pentylamino-5-oxopentanoic and 4-pentylamino-4-oxobutanoic acids having the formula:



(I)

in which n is selected from 1 and 2, R_1 or is 2-quinolinyl 3-quinolinyl, and R_2 is selected from the pentyl group and alkoxyalkyl groups having 4 or 5 carbon atoms, or a pharmaceutically-acceptable salt thereof.

6. A method for the treatment of spastic conditions, pancreatitis, pathological conditions of the CNS linked to deficiencies in the physiological neuron levels of cholecystokinin or other bio-active polypeptides in the human or animal body, the method comprising administering to said body an effective amount of a compound of claim 1.

4,895,857

ANTI-INFECTIVE METHODS AND COMPOSITIONS

Steven T. Blackman, New York, N.Y., assignor to Thames Pharmacal Co., Inc., Roslyn Heights, N.Y.

Division of Ser. No. 218,956, Jul. 14, 1988, Pat. No. 4,873,265. This application Aug. 7, 1989, Ser. No. 389,963

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—352 **15 Claims**

1. A method of providing local antibacterial treatment to a human or animal tissue area in need thereof, comprising applying to said tissue area an effective antibacterial amount of a composition comprising (a) from about 0.5 to about 5.0% by weight of an ethylenediamine derivative agent or pharmaceutically acceptable salts thereof, and (b) a pharmaceutically acceptable topical vehicle

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4,895,858

FUNGICIDAL PYRIDYL CYCLOPROPANE CARBOXAMIDES

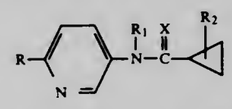
Don R. Baker, Orinda, and Keith H. Brownell, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 193,621, May 13, 1988, Pat. No. 4,808,603, which is a division of Ser. No. 36,542, Apr. 15, 1987, Pat. No. 4,766,134, which is a continuation-in-part of Ser. No. 29,116, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 859,152, May 2, 1986, abandoned. This application Sep. 23, 1988, Ser. No. 248,504

Int. Cl.[4] A01N *43/40*; C07D *213/75*, *213/64*

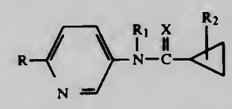
U.S. Cl. 514—352 **11 Claims**

1. A compound having the structural formula



in which R is selected from the group consisting of halogen, C_1–C_3 alkoxy and C_1–C_3 haloalkoxy, R_1 is —H; and R_2 is selected from the group consisting of —H, 1—CH_3 and 2—CH_3; X is O or S: or a fungicidally acceptable organic or inorganic salt thereof.

7. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



in which R is selected from the group consisting of halogen, C_1–C_3 alkoxy and C_1–C_3 haloalkoxy, R_1 is —H; and R_2 is selected from the group consisting of —H, 1—CH_3 and 2—CH_3; X is O or S: or a fungicidally acceptable organic or inorganic salt thereof.

4,895,859

ANTI-INFECTIVE METHODS AND COMPOSITIONS

Steven T. Blackman, New York, N.Y., assignor to Thames Pharmacal Co., Inc., Roslyn Heights, N.Y.

Division of Ser. No. 218,956, Jul. 14, 1988, Pat. No. 4,873,265. This application Aug. 7, 1989, Ser. No. 389,961

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—352 **15 Claims**

1. A method of providing local antimycotic treatment to a human or animal tissue area in need thereof, comprising applying to said tissue area an effective antimycotic amount of a composition comprising from about 0.5 to about 5.0% by weight of an ethylenediamine anthihistaminic derivative agent or pharmaceutically acceptable salts thereof, and (b) a pharmaceutically acceptable topical vehicle.

VOL 1110 ISS 4 JA 23 1990 UMI

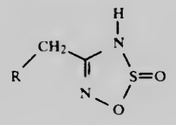
4,895,860

NOVEL SUBSTITUTED 3H-1,2,3,5-OXATHIADIAZOLE 2-OXIDES USEFUL AS ANTIHYPERGLYCEMIC AGENTS

Thomas R. Alessi, Monmouth Junction, and John W. Ellingboe, Princeton, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 21, 1989, Ser. No. 341,514
Int. Cl.[4] C07D *291/04;* A61K *31/41*
U.S. Cl. 514—360 **23 Claims**

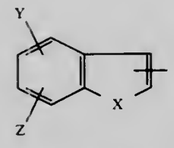
1. A compound of formula (I)



(I)

wherein R is

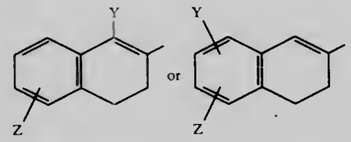
(a)



and X is NH, O, or S, and Y and Z are independently hydrogen, lower alkyl containing 1 to 6 carbon atoms, or halogen;

or R is

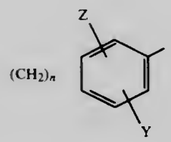
(b)



and Y and Z are as defined above;

or R is

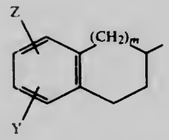
(c)



and n is 3 or 4, and Y and Z are as defined above;

or R is

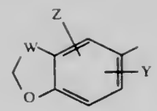
(d)



and m is 0 or 1, and Y and Z are as defined above;

or R is;

(e)



and W is CH_2 or O, and Y and Z are as defined above or R is cyclohexyl; or the pharmaceutically acceptable salts thereof.

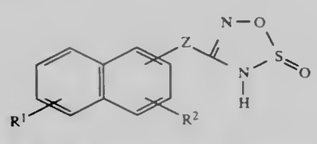
4,895,861

NOVEL NAPHTHALENYL-3H-1,2,3,5-OXATHIADIAZOLE 2-OXIDES USEFUL AS ANTIHYPERGLYCEMIC AGENTS

Louis J. Lombardo, South Plainfield, and Thomas R. Alessi, Monmouth Junction, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

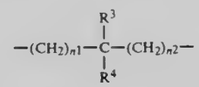
Filed Apr. 21, 1989, Ser. No. 341,609
Int. Cl.[4] C07D *291/04;* A61K *31/41*
U.S. Cl. 514—360 **16 Claims**

1. A compound of structural formula (I)



(I)

wherein R^1 and R^2 are independently hydrogen, lower alkyl containing 1 to 6 carbon atoms, alkoxy containing 1 to 6 carbon atoms, ethynyl, methylthio, nitro or halogen; Z is



wherein R^3 is hydrogen, lower alkyl containing 1 to 3 carbon atoms, alkoxy containing 1 to 2 carbon atoms, or benzyl; R^4 is lower alkyl containing 1 to 3 carbon atoms, alkoxy containing 1 to 2 carbon atoms, or benzyl; n^1 is 0, 1, or 2; n^2 is 0, 1, or 2; or Z is —S—CH_2—, —SO_2—CH_2-, or —OCH_2—; or Z is —$C(R^5)$=$C(R^6)$—, wherein R^5 and R^6 are independently hydrogen or lower alkyl containing 1 to 3 carbon atoms, or the pharmaceutically acceptable salts thereof.

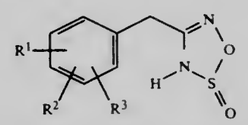
4,895,862

NOVEL BENZYL-3H-1,2,3,5-OXATHIADIAZOLE 2-OXIDES USEFUL AS ANTIHYPERGLYCEMIC AGENTS

Thomas R. Alessi, Monmouth Junction, N.J., and Terence M. Dolak, Canadaigua, N.Y., assignors to American Home Products Corp., New York, N.Y.

Filed Apr. 21, 1989, Ser. No. 341,407
Int. Cl.[4] C07D *291/04;* A01K *31/41*
U.S. Cl. 514—360 **17 Claims**

1. The compounds of structural formula (I)



(I)

wherein R^1, R^2 and R^3 are independently selected from the

group consisting of hydrogen, lower alkyl or alkoxy containing 1 to 6 carbon atoms, halogen, trifluoromethyl, nitro, vinyl, ethynyl, alkylthio wherein alkyl contains 1 to 4 carbon atoms, nitrile, phenyl, phenyl- or halogen substituted phenylalkoxy wherein alkoxy contains 1 to 4 carbon atoms or the pharmaceutically acceptable salts thereof.

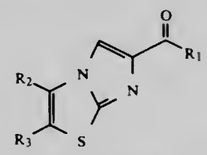
4,895,863

NOVEL IMIDAZO[2,1-B]BENZOTHIAZOLES

Charles J. R. Hedgecock, Wootton Bassett, and David P. Kay, Swindon, both of Great Britain, assignors to Roussel Uclaf, Paris, France

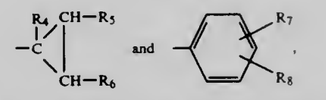
Filed Oct. 18, 1988, Ser. No. 259,285
Claims priority, application United Kingdom, Oct. 20, 1987, 8724566
Int. Cl.[4] C07D *513/04;* A61K *31/425*
U.S. Cl. 514—366 **22 Claims**

1. A compound selected from the group consisting of a compound of the formula

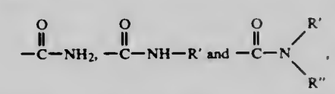


I

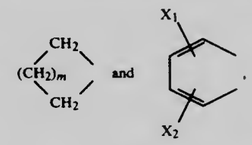
wherein R_1 is selected from the group consisting of



R_4, R_5, R_7 and R_8 are individually selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_6 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, phenyl, halogen, alkoxycarbonyl of 2 to 5 carbon atom, cyano,



R′ and R″ are individually alkyl of 1 to 5 carbon atoms, R_2 and R_3 together form a member of the group consisting of



m is 1, 2 or 3, X_1 and X_2 are individually selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, benzyloxy, phenethoxy, thienyloxy phenoxy and naphthoxy halogen, azido and nitro or taken together form methylenedioxy and their non-toxic, pharmaceutically acceptable acid addition salts.

4,895,864

ANTIBIOTIC TAN-950A, ITS PRODUCTION AND USE

Takashi Iwasa, Kyoto; Shigetoshi Tsubotani, and Setsuo Harada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 184,824
Claims priority, application Japan, Apr. 30, 1987, 62-107999
Int. Cl.[4] A61K *31/42;* C07D *261/12;* C12P *17/14*
U.S. Cl. 514—380 **2 Claims**

1. Antibiotic TAN-950A or a salt thereof, whereof the monosodium salt has the following physico-chemical properties:

(1) Appearance: White solid

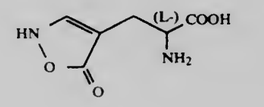
(2) Molecular formula: $C_6H_7N_2O_4Na$

(3) Ultraviolet (UV) absorption spectrum: in water λmax 253±3 nm ($E_{1\ cm}^{1\%}$=380±50)

(4) Infrared (IR) absorption spectrum: in KBr Main absorption wavenumbers (cm^{-1}) 3430, 1640, 1500, 1410, 1350, 1180, 1070, 930, 870, 810, 750, 610, 530

(5) ^{1}H-nuclear magnetic resonance (NMR) spectrum: 400 MHz, in deuterium oxide The following signals are observed (δ_{ppm} $J_{(Hz)}$) 2.70 (1H, dd, J=7.3, 15.6), 2.80 (1H, dd, J=4.4, 15.6), 3.86 (1H, dd, J=4.4, 7.3), 7.98 (1H, s)

(6) ^{13}C-NMR spectrum: 100 MHz, in deuterium oxide The following signals are observed (δ_{ppm}) 180.6 (s), 177.1 (s), 158.5 (s), 82.9 (s), 58.5 (d), 26.5 (t) and having this structural formula:



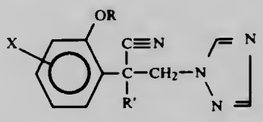
4,895,865

ALPHA-(2-ALKOXYPHENYL)-ALPHA-ALKYL-1H-1,2,4-TRIAZOLE-1-PROPANENITRILES AND DERIVATIVES

Steven H. Shaber, Horsham, and Ted T. Fujimoto, Churchville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 817,636, Jan. 10, 1986, abandoned. This application Dec. 9, 1986, Ser. No. 936,782
Int. Cl.[4] A01N *43/653;* C07D *249/08*
U.S. Cl. 514—383 **31 Claims**

1. A compound of the formula



wherein X is a hydrogen, fluorine, chlorine or bromine, R is hydrogen, (C_1–C_6)alkyl or (C_2–C_5)alkenyl, and R′ is unsubstituted or substituted (C_3–C_8)alkyl, unsubstituted or substituted (C_2–C_6)alkenyl, (C_3–C_6)cycloalkyl or (C_1–C_3)alkyl(C3-C6)cycloalkyl wherein the alkyl and alkenyl substituents are one to three halogens and the agronomically acceptable enantiomorphs, acid addition and metal salt complexes thereof.

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4,895,866

ANTI-INFLAMMATORY IMIDAZOLE COMPOUNDS

Dankwart C. Fenske, Weybridge; Elizabeth A. Kuo, Swindon, and Wilfred R. Tully, Cirencester, all of United Kingdom, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 80,407, Jul. 31, 1987, Pat. No. 4,810,828. This application Nov. 15, 1988, Ser. No. 271,732

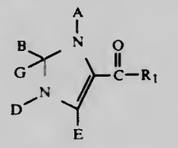
Claims priority, application United Kingdom, Aug. 18, 1986, 86-20060

Int. Cl.[4] A61K *31/415;* **C07D** *233/70, 233/84*

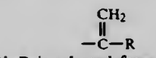
U.S. Cl. 514—392 **6 Claims**

1. A compound selected from the group consisting of compounds of the formula

I



wherein R_1 is selected from the group consisting of



and —C≡C—R', R is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R' is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl of 1 to 5 carbon atoms, and aryl of 6 to 10 carbon atoms unsubstituted or substituted with at least one member of the group consisting of halogen, —OH, —COOH, —CF_3 and alkyl and alkoxy of 1 to 5 carbon atoms, A is alkyl of 1 to 5 carbon atoms, B and G together with the carbon atom to which they are attached are carbonyl or thiocarbonyl and D is selected from the group consisting of alkyl of 1 to 5 carbon atoms and phenyl unsubstituted or substituted with at least one member of the group consisting of halogen, —OH, —COOH, —CF_3 and alkyl and alkoxy of 1 to 5 carbon atoms and E is hydrogen or halogen and its non-toxic, pharmaceutically acceptable acid addition salts.

5. A method of relieving inflammation in warm-blooded animals comprising administering to warm-blooded animals an anti-inflammatorily effective amount of at least one compound of claim 1.

4,895,867

2-(5-PHENYL-2-FURANYL)IMIDAZOLES USEFUL AS CARDIOTONIC AGENTS

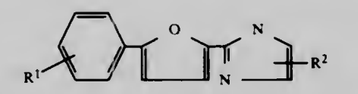
Chan-Ting Huang; Stanford S. Pelosi, Jr., and Ralph L. White, Jr., all of Norwich, N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Continuation-in-part of Ser. No. 878,910, Jun. 26, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 145,073

Int. Cl.[4] C07D *405/54;* **A61K** *31/415*

U.S. Cl. 514—397 **7 Claims**

1. A method for enhancing the contractile force of cardiac muscle of a mammal which comprises systemically administering to said mammal an effective amount of a composition comprising a compound conforming to the following chemical structure:



wherein R^1 is mono- or di- substituents selected from the group consisting of hydrogen, halo, nitro, trifluoromethyl, straight and branched chain C_1–C_5 alkyl, acetyl, propionyl, methoxy and ethoxy; and R^2 is mono- or di- substituents selected from the group consisting of hydrogen, methyl and ethyl;

or a pharmaceutically acceptable salt or hydrate thereof.

4,895,868

THIOCHROMAN ESTERS OF PHENOLS AND TEREPHTHALLATES HAVING RETINOID-LIKE ACTIVITY

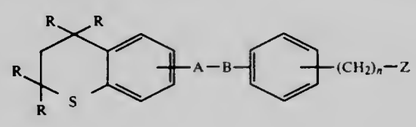
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Jun. 29, 1988, Ser. No. 212,855

Int. Cl.[4] A61K *31/38;* **C07D** *335/06*

U.S. Cl. 514—432 **15 Claims**

1. A compound of the formula:



in which:

the R groups are independently hydrogen or lower alkyl;

one of A and B is O or S and the other is —C(O)—, A being attached to the thiochroman ring at the 6 or 7-position;

n is 0–5; and

Z is H, or Z is —COD where D is —OH, or —OM wherein M is a pharmaceutically acceptable cation, or D is —OR_1 is a lower alkyl group, or D is —$N(R_2)_2$ where R_2 is hydrogen or a lower alkyl group, or Z is —OE where E is hydrogen or a C_{1-20} aliphatic, cycloaliphatic, or aliphatic-phenyl ether-forming group or a C_{1-10} aliphatic or cycloaliphatic carboxylic acid ester forming group or a phenyl or lower alkyl phenyl carboxylic acid ester forming group, or Z is —CHO or a lower alkyl acetal thereof, or Z is —COR_3 where R_3 is —$(CH_2)_mCH_3$ where m is 0–4 and the sum of n and m does not exceed 4 or a lower alkyl ketal derivative thereof.

15. A method for treating psoriasis in a mammal which method comprises administering, alone or with a pharmaceutically acceptable excipient, a therapeutically effective amount of a compound of claim 1.

4,895,869

PHENYLENE, FURYL, AND THIENYL LEUKOTRIENE B_4 ANALOGUES

Stevan W. Djuric, Glenview; Richard A. Haack, Chicago, and Julie M. Miyashiro, Evanston, all of Ill., assignors to C. D. Searle & Co., Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,279

Int. Cl.[4] A61K *3/38;* **C07D** *333/22*

U.S. Cl. 514—438 **3 Claims**

1. A compound comprising 5-hydroxy-7-[5-(1-hydroxy-3-nonenyl)-2-thienyl]-6-heptenoic acid.

4,895,870

TREATING CHLAMYDIA INFECTIONS USING SPECTINOMYCIN ANALOGS

Gary E. Zurenko, Alamo Township, Kalamazoo County; James J. Vavra, Portage; David R. White, Kalamazoo, and Richard C. Thomas, Oshtemo Township, Kalamazoo County, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

PCT No. PCT/US86/00620, § 371 Date Nov. 10, 1986, § 102(e) Date Nov. 10, 1986, PCT Pub. No. WO86/05686, PCT Pub. Date Oct. 9, 1986

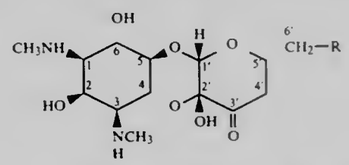
PCT Filed Mar. 26, 1986, Ser. No. 933,641

Int. Cl.[4] A61K *31/335*

U.S. Cl. 514—452 **12 Claims**

1. A method of treating chlamydial infection comprising administering an anti-chlamydial effective amount of spectinomycin analog selected from the group consisting of

I



wherein R is a straight, branched or cyclic alkyl from 1 to 4 carbon atoms and isomeric forms thereof, and pharmaceutically acceptable salts and hydrates thereof to a host in need of said treatment.

4,895,871

BENZOHETEROCYCLYL KETONE HYDRAZONE INSECTICIDES

Kathryn A. Lutomski, Hightstown; Angelina J. Duggan, Lawrenceville, both of N.J., and John F. Engel, Washington Crossing, Pa., assignors to FMC Corporation, Philadelphia, Pa.

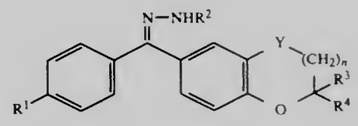
Filed Jul. 28, 1988, Ser. No. 225,519

Int. Cl.[4] A01N *43/08;* **C07D** *307/87*

U.S. Cl. 514—469 **9 Claims**

1. A benzoheterocyclyl ketone hydrazone compound of the formula

I



in which:

A. Y is methylene, n is 0, R^3 and R^4 are methyl; R^1 is chloro, fluoro, methylsulfonyloxy, or trifluoromethylsulfonyloxy; and R^2 is selected form hydrogen, C_1-C_3 alkylcarbonyl, phenylcarbonyl, halophenylcarbonyl, ethoxycarbonyl, 4-chlorophenylaminocarbonyl, phenylsulfonyl, phenoxycarbonyl, 4-methylphenylcarbonyl, formyl, and trifluoromethylcarbonyl; or

B. Y is difluoromethylene, n is 0, R^1 is methylsulfonyloxy or trifluoromethylsulfonyloxy, R^3 and R^4 are fluoro, and R^2 is C_1-C_3 alkylcarbonyl or formyl.

4,895,872

IMMUNOSUPRESSIVE ANALOGUES AND DERIVATIVES OF SUCCINYLACETONE

Danute E. Nitecki; Margaret Moreland, both of Berkeley; Lois Aldwin, San Mateo; Corey H. Levenson, Oakland; Irwin Braude, Danville; David F. Mark, Danville, and Henry Rapaport, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Mar. 15, 1989, Ser. No. 324,360

Int. Cl.[4] A61K *31/22, 31/19, 31/12*

U.S. Cl. 514—546 **15 Claims**

1. A method of treating disease comprising suppressing the effectiveness of a patients immune system comprising administering to a patient a therapeutically effective amount of an analogue or derivative of succinylacetone.

4,895,873

CALCIUM SALT OF VALPROIC ACID

Helmut Schäfer, Kayhude, Fed. Rep. of Germany, assignor to Desitin Arzeneimittel GmbH, Hamburg, Fed. Rep. of Germany

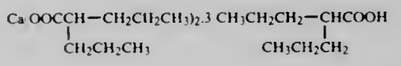
Filed Mar. 16, 1988, Ser. No. 169,058

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709230

Int. Cl.[4] A61K *31/19;* **C07C** *53/128*

U.S. Cl. 514—557 **5 Claims**

1. A calcium salt of valproic acid containing 3 moles of free valproic acid coordinated with calcium valproate and represented by the formula:



4,895,874

TUMOR TREATMENT PROCESS AND COMPOSITION

David Rubin, 3 Rav Zair, and Ely J. Rubin, c/o Israel Medical Research Foundation, P.O. Box 3592, both of Jerusalem, Israel, assignors to David Rubin; Ely J. Rubin, both of San Diego, Calif.; Adolf W. Schwimmer, Savyon, Israel; Irwin S. Schwartz, Toronto, Canada and Century Laboratories, Inc., Port Washington, N.Y.

Continuation of Ser. No. 320,087, Nov. 10, 1981, abandoned. This application Mar. 1, 1984, Ser. No. 583,798

Int. Cl.[4] A61K *31/20*

U.S. Cl. 514—558 **19 Claims**

1. A method for the treatment of a carcinoma neoplasm comprising administering to a patient having such a carcinoma neoplasm, an amount effective to cause the death of at least some of the cells of said neoplasm of a saturated straight chain aliphatic dicarboxylic acid, or a pharmaceutically acceptable salt thereof, having a total number of carbon atoms which is divisible by four, said total number of carbon atoms being a number such that said dicarboxylic acid or salt is effective and at least 12, wherein said carcinoma neoplasm is one against which said dicarboxylic acid is toxic when a cell suspension thereof is treated with said compound in vitro.

4,895,875

STABILIZED PEROXIDE SOLUTIONS

Anthony E. Winston, East Brunswick, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jan. 13, 1988, Ser. No. 206,180

Int. Cl.[4] A61K *31/17*

U.S. Cl. 514—588 **9 Claims**

1. A method for stabilizing a pharmaceutical solution for generating hydrogen peroxide, said solution consisting essentially of from 1 to 12% urea peroxide in glycerine, and containing no more than 1% water, which comprises:

(a) dissolving succinic anhydride in at least a portion of the glycerine solvent, in an amount equivalent to from 0.01 to 3% of the total solution;

(b) admixing any remaining portion of the glycerine to make-up said solution;

(c) mixing the solution;

(d) adding urea peroxide to the thus treated solution; and

(e) blending the resulting mixture to form the desired stabilized solution.

4,895,876

CONCENTRATED STABLE FLUOROCHEMICAL AQUEOUS EMULSIONS CONTAINING TRIGLYCERIDES

Frank K. Schweighardt, Allentown, and Charles R. Kaybert, Alburtis, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 20, 1987, Ser. No. 28,521
Int. Cl.[4] A61K *31/35, 31/334, 31/445, 31/535*
U.S. Cl. 514—747 20 Claims

1. A stable aqueous emulsion of a perfluorochemical comprising approximately 60 weight/volume percent or greater of a perfluorochemical, approximately 0.5 up to 7 weight % of a phospholipid which emulsifies said perfluorochemical, approximately 5–30 weight % of a triglyceride of fatty acids, and the remainder of an aqueous medium.

4,895,877

MICROBIOCIDAL COMPOSITIONS COMPRISING AN ARYL ALKANOL AND A MICROBIOCIDAL COMPOUND DISSOLVED THEREIN

Nuno M. Rei, Boxford, and Ronald C. Wilson, Wenham, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 87,540, Aug. 20, 1987, abandoned, which is a division of Ser. No. 17,382, Feb. 20, 1987, Pat. No. 4,711,914, which is a continuation of Ser. No. 724,463, Apr. 22, 1985, Pat. No. 4,683,088, which is a continuation-in-part of Ser. No. 619,092, Jun. 11, 1984, Pat. No. 4,663,877. This application Mar. 1, 1989, Ser. No. 317,133
Int. Cl.[4] A01N *9/00*
U.S. Cl. 514—970 5 Claims

1. A composition comprising a polymer processing aid, and from about 5% to about 20% by weight, based on the total weight of the composition, of a microbiocidal compound selected from the group consisting of maleimides, isoindole dicarboximides having a sulfur atom bonded to the nitrogen atom of the dicarboxamide group and isothiazolinone compounds, said microbiocidal compound being present as the solute in an aryl alkanol solvent, and the aryl alkanol solvent being present in an amount such that the weight ratio of the aryl alkanol solvent to microbiocidal compound is from about 3/1 to about 5/1.

4,895,878

FLEXIBLE POLYURETHANE FOAM HAVING A HIGH FIRE RESISTANCE

Lucien Jourquin, Wetteren, and Eddie Du Prez, Sint-Maria-Oudenhove, both of Belgium, assignors to Recticel, Brussells, Belgium

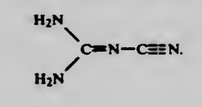
Filed Sep. 19, 1988, Ser. No. 246,395
Claims priority, application Belgium, Sep. 18, 1987, 8701053
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—103 25 Claims

1. A flexible highly elastical polyurethane foam having a density ranging between 25 and 150 kg/m^3 and a relatively high fire resistance obtained by a reaction of an isocyanate and/or a chemically modified derivate thereof with a high molecular weight reactive polyol in the presence of a catalytic agent, a cross-linker, and/or an extender, of water as a blowing agent and a fire retardant, characterized in that said fire retardant comprises at least one of the following components:

(1) linear urea-formol oligomer mixture having the general formula NH_2-CO-NH-(CH_2-NH-CO-NH)$_n$-CH_2-NH-CO-NH_2, wherein n can have the value from 0 to 50;

(2) urea in powdered form of which the particles are at least partially covered by a film of less soluble material;

(3) dicyandiamide having the general formula:



4,895,879

INTERNAL MOLD RELEASE COMPOSITIONS

Donald L. Nelson, Lake Jackson, Tex.; Roney J. Matijega, Midland, Mich., and Dennis P. Miller, deceased, late of Midland, Mich. (by Marilyn M. Miller, Administrator), assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 856,724, Apr. 25, 1986, abandoned, which is a continuation of Ser. No. 641,883, Aug. 17, 1984, Pat. No. 4,585,803. This application Apr. 20, 1987, Ser. No. 40,463
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—105 9 Claims

1. A process for the production of optionally cellular, polyurethane elastomer molding by reacting a reaction mixture comprising

(I) a polyisocyanate,

(II) an isocyanate-reactive polymer,

(III) a chain extender comprising a sterically hindered aromatic diamine and

(IV) an internal mold release agent mixture comprising

(a) about 0.25 to 10% by weight, based on the weight of components (II) and (III) of a zinc carboxylate and

(b) a compatibilizer comprising a member selected from the group consisting of isocyanate-reactive, acyclic compounds containing at least one tertiary nitrogen atom and isocyanate-reactive polymers containing at least one tertiary nitrogen atom in an amount sufficient to solubilize the zinc carboxylate so that when the internal mold release agent mixture is in admixture with components (II) and (III), the zinc carboxylate possesses improved resistance to precipitation, said reaction mixture being processed as a one-shot system by the RIM process.

4,895,880

PHOTOCURABLE COMPOSITIONS CONTAINING PHOTOBLEACHABLE IONIC DYE COMPLEXES

Peter Gottschalk, Centerville; Douglas C. Neckers, Perrysburg, and Gary B. Schuster, Champaign, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 944,305, Dec. 18, 1986, Pat. No. 4,772,530, which is a continuation-in-part of Ser. No. 860,367, May 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 800,014, Nov. 20, 1985, abandoned. This application Sep. 18, 1987, Ser. No. 98,358
Int. Cl.[4] C08F *8/00*
U.S. Cl. 522—31 19 Claims

1. A visible-light sensitive photohardenable composition comprising a free radical addition polymerizable or crosslinkable material and a photobleachable ionic dye-counter ion compound, said compound being capable of absorbing visible light and producing free radicals which initiate polymerization or crosslinking of said material.

4,895,881

COATING COMPOSITION

Christian Bigner, Lidingö, Sweden, assignor to Extensor AB, Angered, Sweden

Continuation of Ser. No. 701,132, Feb. 13, 1985, abandoned, which is a continuation of Ser. No. 515,307, Aug. 18, 1983, abandoned, which is a continuation of Ser. No. 413,476, Aug. 31, 1982, abandoned, which is a continuation of Ser. No. 249,631, Mar. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 96,551, Nov. 21, 1979, abandoned, which is a continuation of Ser. No. 964,069, Nov. 27, 1978, which is a continuation of Ser. No. 854,742, Nov. 25, 1977. This application May 20, 1987, Ser. No. 52,532
Claims priority, application Sweden, Nov. 25, 1976, 7613245-5
Int. Cl.[4] C08J *7/04*
U.S. Cl. 523—122 9 Claims

1. An anti-fouling composition for coating on a surface intended to be submerged in water comprising a binder, form 1 to 50% of polytetrafluoroethylene particles, based on the dry weight of the composition, and from 5 to 95%, based on the dry weight of the composition, of an antifouling agent selected from the group consisting of copper metal and copper and zinc compounds, and also comprising a liquid dispersion medium, including at least one halogenated hydrocarbon, the polytetrafluoroethylene particles being dispersed in said liquid dispersion medium.

4,895,882

FRICTION MATERIAL COMPOSITE

Hiroshi Asano, and Kouichi Iwata, both of Hyogo, Japan, assignors to Nippondenso Co., Ltd., Kariya and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Dec. 2, 1987, Ser. No. 128,405
Claims priority, application Japan, Dec. 4, 1986, 62-289590; Jul. 6, 1987, 62-168488
Int. Cl.[4] C08J *5/14*; B22C *11/22*
U.S. Cl. 523—145 7 Claims

1. A friction material composite comprising the following components, a reinforcing fiber material, an organic filler, a friction and abrasion conditioner, and a thermosetting resin binder bonding said components together, wherein said reinforcing fiber material comprises 25 to 35 percent by volume of staple cellulose pulp of not more than 150 μm in fiber length, wherein said organic filler comprises 30 to 40 percent by volume of an organic filler of not more than 840 μm in maximum grain size, wherein said friction and abrasion conditioner comprises 0.5 to 5 percent by volume of aluminum oxide and/or magnesium oxide of not more than 250 μm in maximum grain size, said friction material composite further having a porosity of 15 to 30 percent by volume.

4,895,883

POLYURETHANE UREAS

Joseph Pedain, Cologne; Karl H. Pisaric, Pulheim; Walter Schröer, Leverkusen; Wilhelm Thoma, Leverkusen; Harro Träubel, Leverkusen, and Karl-Arnold Weber, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 280,091
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741538
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 10 Claims

1. A polyurethane urea obtained by reacting

(a) a hydrophilic NCO prepolymer prepared from a polyhydroxy component containing about 9 to 100% by weight of a polyether, said polyether having an ethylene oxide content of about 30 to 100% by weight with

(b) an aldimine- or ketimine-containing hardener mixture in the presence of water and organic solvents, said hardener being used in an amount sufficient to provide about 30 to 70% of the amino groups, either in free or blocked form, needed to react with the NCO groups of component (a), the remainder of the NCO groups reacting with water.

4,895,884

RUBBER CONTAINING MICROENCAPSULATED ANTIDEGRADANTS

David A. Benko, Munroe Falls; Larry R. Evans, Seville; James G. Gillick, Akron; Walter H. Waddell, Fairlawn; Barbara A. Metz, Baltimore; Benjamin F. Benton, Centerburg; Gordon E. Pickett, Reynoldsburg, and William R. Krumm, Reynoldsburg, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 6, 1987, Ser. No. 104,893
Int. Cl.[4] C08K *5/34, 5/13*
U.S. Cl. 523—207 9 Claims

1. A composition comprising a diene containing polymer and a microencapsulated antidegradant; wherein the walls of the microcapsule are formed of a polymer selected from the group comprising cellulose acetate and chlorinated rubber; and wherein said microencapsulated antidegradant has a diameter of 50 microns or less and a wall to core ratio of from 1:1 to 4:1 by weight.

4,895,885

POLYMER COMPOSITIONS STABILIZED WITH POLYSILOXANES CONTAINING STERICALLY HINDERED HETEROCYCLIC MOIETY

George N. Foster, Bloomsbury, N.J.; Herbert E. Petty, Bethel, Conn., and Roswell E. King, III, Pleasantville, N.Y., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 6, 1988, Ser. No. 240,739
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—99 47 Claims

1. An olefin polymer composition comprising an olefin polymer and a stabilizing amount, sufficient to stabilize said olefin polymer against light degradation, of a polysiloxane stabilizer of the formula:

$$M^*_aD_xD^*_yT_zQ_wM^*_b$$

wherein: M* represents a member of the group, M, M', or M'' in which

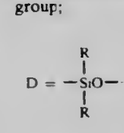
$M = R^u_3SiO-$,

$M' = R^u_3Si-$; and

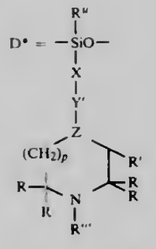
$M'' = R''O_1-$;

R^u is an alkyl group having 1 to 8 carbon atoms, phenyl, or phenethyl;

R'' is an alkyl group having 2 to 20 carbon atoms or a phenyl group;



R is phenyl or an alkyl group having 1 to 3 carbon atoms;

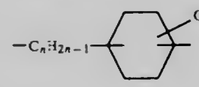


R' is hydrogen, an alkyl groups having 1 to 3 carbon atoms, or a keto oxygen;

X is a single bond or

$-C_n-H_{2n}-$,

$-C_nH_{2n}OC_mH_{2m}-$


, or

-continued
$-C_nH_{2n}OC_mH_{2m-1}(OH)-$;

R''' is hydrogen or an alkyl group having 1 to 12 carbon atoms;
Y' is —O—, —COO—, $-C_nH_{2n}O-$, or —NH—;
Z is CH or nitrogen with the proviso that when Z is nitrogen, Y' is $-C_nH_{2n}O-$;
y has a value of 1 to about 100;
n has a value of zero to about 10;
m has a value of zero to about 10;
p has a value of zero or one;

$T = -SiO_{3/2}-$;

$Q = -SiO_{4/2}-$;

v has a value of one;
x has a value of zero to about 200;
y has a value of about 1 to about 100;
z has a value of zero to about 5;
w has a value of zero to about 5.

4,895,886
STATIC DISSIPATIVE COMPOSITION
Richard E. Felter, Lancaster, and Deborah L. Musser, Columbia, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Nov. 9, 1988, Ser. No. 269,056
Int. Cl.[4] C08K *3/36*
U.S. Cl. 524—247 **9 Claims**

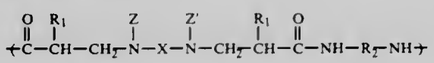
1. A method for preparing a non-aqueous antistatic coating composition to provide a composition that can be packaged as an aerosol spray, the said non-aqueous coating composition comprising (1) 1–1.5 parts of a choline antistat, (2) 1.6–2.4 parts of one or more long chain quarternary ammonium antistat, (3) 70–90 parts of a solvent vehicle, (4) a polymer binder, and (5) an inorganic particulate, with the parts by weight of (1)–(5) totalling to an amount in the range of from 87.1 to 123.9; comprising the steps:
(a) dissolving the said choline antistat and the said long chain quarternary ammonium antistat in an alcohol to form a solution, and
(b) blending the solution formed in (a) and a mixture of an organic solvent, the said polymer binder dissolved in the organic solvent, and the said inorganic particulate, to form a storage stable composition wherein the 70–90 parts of the said solvent vehicle are provided by the alcohol and the organic solvent.

4,895,887
COATING COMPOSITION AND WHEEL COATED WITH THE SAME FOR VEHICLES
Yasuo Daimon, Tondabayashi; Takashi Ban, Yamatotakada; Akio Fujisaka, Kakegawa, and Kimio Ochiai, Ogasa, all of Japan, assignors to Osaka Yuki Kagaku Kogyo Kabushiki Kaisha, Osaka and Asahi Malleable Iron Co., Ltd., Shizuoka, both of, Japan
Filed Aug. 4, 1988, Ser. No. 228,145
Claims priority, application Japan, Sep. 9, 1987, 62-225839
Int. Cl.[4] C08K *5/24*
U.S. Cl. 524—265 **7 Claims**

1. A wheel for mounting tires of a vehicle coated with a coating composition, wherein the coating composition comprises, on the basis of the total weight of the solid components of the composition,
(a) 20 to 60% by weight of a colloidal silica,
(b) 20 to 60% by weight of a partial condensate of organoalkoxysilane hydrolyzate,
(c) 5 to 40% by weight of a polymer or a copolymer of unsaturated ethylenic monomers,
(d) 0.1 to 5.0% by weight of a surface active agent and derivative as an indispensable component.
(e) 150 to 550% by weight of a solvent containing a glycol derivative as an indispensable component.

4,895,888
LAMINATING INK COMPOSITION CONTAINING POLYAMIDE RESINS
William P. Keaveney, Pompton Plains, N.J., assignor to BASF Corporation, Clifton, N.J.
Filed Nov. 9, 1988, Ser. No. 268,923
Int. Cl.[4] C08K *5/05*
U.S. Cl. 524—391 **10 Claims**

1. In a fluid ink composition comprising a resin, alcohol solvent, and a pigment, the improvement wherein the resin comprises an alcohol soluble polyamide resin having ecurring units of the formula:



wherein R_1 is either hydrogen or methyl, R_2 is either a carbocyclic, aralkyl, or linear or branched aliphatic group, x is an alkylene group and Z and Z' each represent an alkyl group which may be the same or different or together form an alkylene group.

4,895,889
PRECERAMIC COMPOSITIONS
John Semen, and John J. Rogers, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.
Filed May 12, 1988, Ser. No. 193,105
Int. Cl.[4] C08K *3/34*
U.S. Cl. 524—443 **9 Claims**

1. A preceramic composition having a particle size not larger than about 105 micrometers and comprising an intimate mixture of (A) about 50–85% by weight of silicon nitride powder and (B) about 15–50% by weight of a preceramic polysilazane binder consisting essentially of at least one polysilazane prepared by reacting an organodihalosilane with ammonia, treating the ammonolysis product with a basic catalyst which is capable of deprotonating an NH group that is adjacent to an SiH group, and quenching the resultant product with an electrophilic quenching reagent.

4,895,890
CALCIUM SILICATE SHAPED PRODUCT
Takeo Sawanobori, Kawasaki; Mitsuru Swata, Kodaira; Noriyuki Ariyama, Hino, and Yuji Noguchi, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Continuation of Ser. No. 105,284, Oct. 7, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 332,380
Claims priority, application Japan, Oct. 14, 1986, 61-243722; Oct. 14, 1986, 61-243724
Int. Cl.[4] C08K *7/06, 3/34*
U.S. Cl. 524—456 **8 Claims**

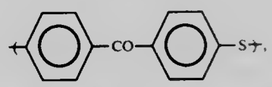
1. A calcium silicate shaped product consisting essentially of a calcium silicate hydrate, a carboxyl group-containing copolymer latex, a coupling agent and a carbon fiber having a tensile strength of at least 150 kg/mm^2 and a tensile modulus of elasticity of at least 5 ton/mm^2.

4,895,891
MAT, ELASTIC-THERMOPLASTIC MOULDING COMPOUNDS
Werner Schumann, Pulheim; Werner Tischer; Wolfgang Liedtke, both of Dormagen, and Klaus Richter, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany
Filed Jun. 6, 1988, Ser. No. 202,369
Claims priority, application Fed. Rep. of Germany, Jun. 17, 1987, 3720210
Int. Cl.[4] C08K *3/36*; C08J *5/18*; C08L *51/04, 9/02*
U.S. Cl. 524—493 **6 Claims**

1. An elastic-thermoplastic moulding coposition which is an ABS or similar material including graft polymers with rubbers other than polybutadiene as graft basis and graft monomers other than styrene and acrylonitrile as well as mixtures of such graft polymers with free copolymers of the graft monomers, which comprises one or more polymers of resin-forming monomers grafted on rubbers and optionally one or more other thermoplastic synthetic resins and from 0.1 to 5%, by weight, based on the composition, of a hydrophobicised silica.

4,895,892
MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) COMPOSITIONS
Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yo Iizaka; Toshitaka Kouyama; Takayuki Katto, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan
Filed May 12, 1988, Ser. No. 194,013
Claims priority, application Japan, May 15, 1987, 62-118619; Jun. 22, 1987, 62-154801; May 7, 1988, 63-109917
Int. Cl.[4] C08L *31/00*
U.S. Cl. 524—520 **10 Claims**

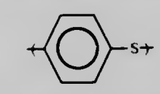
1. A melt-stable poly(arylene thioether-ketone) composition comprising:
(A) 100 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



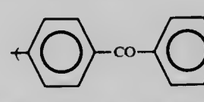
wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):
(a) melting point, Tm being 310–380° C.;
(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc (420° C./10 min) being at least 210° C., wherein ΔHmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min after the poly(arylene thioether-ketone) is held at pv 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C;
(c) reduced viscosity being 0.2–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 percent by weight sulfuric acid;
(B) 0–400 parts by weight of at least one thermoplastic resin; and
(C) at least one filler selected from fibrous fillers and inorganic fillers in a proportion of 0–400 parts by weight per 100 parts by weight of the sum of said components (A) and (B);
at least one of said components (B) and (C) being contained in a proportion of at least 0.1 part by weight per 100 parts by weight of said component (A).

4,895,893
HEAT-RESISTANT RESIN COMPOSITIONS, AND HEAT-RESISTANT MOLDED OR FORMED ARTICLES AND PRODUCTION PROCESS THEREOF
Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yukio Ichikawa; Yo Iizaka, all of Iwaki; Makoto Fukuda, Kusukabe; Toshio Enoki, Iwaki; Takayuki Katto, Iwaki; Yasuo Sakaguchi, Iwaki, and Zenya Shiiki, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan
Filed May 12, 1988, Ser. No. 194,016
Claims priority, application Japan, May 15, 1987, 62-118619
Int. Cl.[4] C08F *283/00*
U.S. Cl. 524—592 **10 Claims**

1. A resin composition comprising:
(A) 100 parts by weight of a poly(arylene sulfide) of a substantially linear structure containing 50% by weight or higher of recurring units of the formula:



having a logarithmic viscosity number of 0.1 to 1.0 dl/g in a 1-chloronaphthalene solution at a polymer solution of 0.4 g/dl and a temperature of 208° C.;
(B) from 0.01 to less than 25 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula:



wherein the —CO— and —S— are in the para position to each other; and having the following physical properties (a)–(c):
(a) melting point, Tm being 310°–380° C.;
(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc (420° C./10 min) being at least 210° C., wherein Δ Hmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min, and then held at 420° C. for 10 minutes; and
(c) reduced viscosity being 0.2 to 2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 wt. % sulfuric acid; and
(C) at least one filler selected from fibrous fillers and inorganic fillers in a proportion of 0 to 400 parts by weight per 100 parts by weight of the resin component comprising said poly(arylene sulfide) and said poly(arylene thioether-ketone).

4,895,894
MODULUS MODIFICATION OF WATER BORNE POLYURETHANE-UREAS
Sven H. Rusetman, Walnut Creek, and Joginder N. Anand, Clayton, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 31, 1988, Ser. No. 200,287
Int. Cl.[4] C08L *75/12, 75/08*
U.S. Cl. 524—840 **12 Claims**

1. A stable aqueous dispersion of an ionic polyurethane-polyurea prepared by the reaction of:
A. an aqueous dispersion of an isocyanate terminated ionic prepolymer prepared in the absence of solvent from:

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(i) an aliphatic or cycloaliphatic diisocyanate;
(ii) a polyol mixture comprising:
(a) from about 50 to about 95 equivalent percent of a polyalkyleneoxy diol having a molecular weight of from about 500 to about 6,000; and
(b) from about 50 to about 5 equivalent percent of a polyalkyleneoxy triol having a molecular weight of from about 500 to about 3,000; and
(iii) a carboxylic acid containing diol wherein said acid is neutralized with a tertiary amine after said prepolymer formation to form said ionic function prior to forming said aqueous dispersion,
wherein said (iii) is present in sufficient proportions to provide about 10 to about 150 milliequivalents of said ionic groups per 100 grams of said prepolymer and further, wherein the proportions of said (i), (ii), and (iii) are such that the ratio of isocyanate equivalents to the total isocyanate-reactive equivalents falls in a range of from about 1.1 to about 3; and
B. an alkylene diamine wherein the proportions of said (A) and (B) are such that the ratio of equivalents of isocyanate in (A) to amine equivalents in (B) falls in a range of from about 1.25 to about 0.90.

4,895,895

THICKENED MOULDING COMPOSITIONS

Trevor R. Osborne, and Stephen J. Thompson, both or Wellingborough, England, assignors to Scott Bader Company Limited, Wellingborough, England

Filed Jun. 17, 1987, Ser. No. 63,211
Claims priority, application United Kingdom, Dec. 15, 1986, 8629895
Int. Cl.[4] C08L *67/06, 63/10, 75/04*
U.S. Cl. 525—28 **10 Claims**

1. A moulding composition comprising:
fibrous reinforcement;
an additive selected from low profile and low shrink additives;
an ethylenically unsaturated, essentially amorphous polymer selected from the group consisting of unsaturated polyester, vinyl ester and urethane acrylate polymers;
a monomer copolymerisable therewith, and
a thickener being a crystalline unsaturated polyester having a glycol component derived from at least two symmetrical glycols and having a molecular weight per double bond of no more than about 210, the crystalline unsaturated polyester being present in the composition in an amount of from about 10 to about 50% by weight of the total weight of the ethylenically unsaturated amorphous polymer, the monomer copolymerisable therewith and the crystalline unsaturated polyester, whereby the effectiveness of the said additive is retained.

4,895,896

CONTACT LENS HAVING IMPROVED EYE COMPATIBILITY

Wolfgang Müller-Lierheim, Lichtweg 5, D-8032 Grafelfing, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,487
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 3627937; European Pat. Off., Jul. 23, 1987, 87110671.2
Int. Cl.[4] G02C *7/04;* **G02B** *1/04*
U.S. Cl. 525—54.1 **12 Claims**

1. Contact lens comprising a lens body with a surface having monoclonal antibodies or fragments of antibodies immobilized thereon, the N-terminal ends of said immobilized antibodies or antibody fragments being directed against mucous substances which are secreted by the epithelium of the conjunctiva of a human eye so that a mucous layer is formed on the surface of the lens body when the contact lens is worn on the human eye.

4,895,897

AROMATIC CARBONATE COMPOSITIONS MODIFIED WITH OXAZOLINE FUNCTIONALIZED POLYSTYRENE REACTED WITH AN ETHYLENE ELASTOMER CONTAINING REACTIVE POLAR GROUPS

Lawrence G. Kaufman, Somerville, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 231,691, Aug. 12, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 322,592
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 **20 Claims**

1. An aromatic carbonate composition comprised of:
(a) at least one aromatic carbonate resin; and
(b) a functionalized elastomeric polymer comprising the reaction product of (i) an ethylene elastomer having at least one reactive polar group and (ii) an oxazoline functionalized polystyrene.

4,895,898

THERMOPLASTIC MOULDING MATERIALS OF IMPROVED PROCESSABILITY

Hans-Jürgen Kress, Krefeld; Herbert Eichenauer, Dormagen; Horst Peters, Leverkusen; Jochen Schoeps, Krefeld, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 886,810, Jul. 16, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 159,481
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526552
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 **4 Claims**

1. Thermoplastic moulding materials containing
(A) 20–80 parts by weight of a thermoplastic polycarbonate,
(B) 10–60 parts by weight of one or more graft polymers composed of
(B.1) 5–90 parts by weight of a mixture of
50–95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methylmethacrylate or mixtures thereof, and as a different monomer
(B.1.2) 50–5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, grafted on to
B.2) 95–10 parts by weight of a rubber having a glass temperature TG≦10° C. and
(C) 10–70 parts by weight of a thermoplastic copolymer having an intrinsic viscosity of 20 to 110 ml/g (measured in dimethylformamide at 25° C.) and formed from
(C.1) 50–95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, or mixtures thereof, and
(C.2) 50–5% by weight of (meth)acrylonitrile, the total of the parts by weight (A)+(B)+(C) amounting in each case to 100 parts by weight, and
0.5 to 7.5 parts by weight relative to 100 parts by weight of (A)+(B)+(C), of a copolymer formed from
(D.1) 0–90% by weight of styrene, α-methylstyrene, nuclear-substituted styrene or mixtures thereof, and
(D.2) 100–10% by weight of (meth)acrylonitrile characterized in that the component (D) has an intrinsic viscosity of 2 to 10 ml/g (measured in dimethylformamide at 25° C.), the chain length of the copolymer (D) being regulated by means of C_1–C_{18}-alkyl mercaptans.

4,895,899

IMPACT RESISTANT POLYETHYLENE TEREPHTHALATE/POLYCARBONATE/POLYETHYLENE GRAFT COPOLYMER BLENDS

John M. Wefer, Newtown, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Dec. 23, 1987, Ser. No. 137,039
Int. Cl.[4] C08L *69/00, 51/00*
U.S. Cl. 525—67 **4 Claims**

1. A blend comprising
(a) polyethylene terephthalate regrind;
(b) polyethylene regrind;
(c) polycarbonate resin; and
(d) graft copolymer of styrene-acrylonitrile resin on an ethylene-propylene-non-conjugated diene rubber spine, said styrene-acrylonitrile resin being present in an amount of about 5–75% by weight of the graft copolymer: and
wherein the proportions of (a), (b), (c) and (d) expressed in parts by weight per 100 parts of (a), (b), (c) and (d) are as follows:
(a) 20–80;
(b) 1–30;
(c) 15–50; and
(d) 15–30.

4,895,900

COATING COMPOSITION

Hajime Sakejima, Hiratsuka; Hiroshi Iwai, Atsugi, and Kozi Matsumoto, Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Division of Ser. No. 23,352, Mar. 9, 1987, abandoned. This application Dec. 7, 1987, Ser. No. 131,240
Claims priority, application Japan, Mar. 12, 1986, 61-54358; Jan. 23, 1987, 62-14626
Int. Cl.[4] C08L *33/02, 33/14, 33/26*
U.S. Cl. 525—108 **4 Claims**

1. A coating composition comprising a first acrylic resin, a second acrylic resin, a polyepoxy compound and a phosphorus-containing compound,
said first acrylic resin being a basic tertiary amino group-containing acrylic resin, said second acrylic resin being a carboxyl group-containing acrylic resin obtained by copolymerizing 0.5 to 20% by weight of a C_3–C_6 unsaturated aliphatic monobasic or dibasic acid with 99.5 to 80% by weight of at least one copolymerizable other vinyl monomer selected from the group consisting of C_1–C_{24} alkyl or cycloalkyl esters of acrylic or methacrylic acid, hydroxy-C_1–C_{24} alkyl esters of acrylic or methacrylic acid, aromatic vinyl compound, vinyl acetate, acrylonitrile and methacrylonitrile, said phosphorus-containing compound being selected from the group consisting of phosphorus-containing inorganic acids, orthophosphoric acid esters, phosphorus acid esters, phosphonic acid esters, acid phosphoric acid esters and polyphosphoric acid compounds,
the relative amounts of said first acrylic resin and said polyepoxy compound being such that the proportion of epoxy groups in the polyepoxy compound is about 0.5 to about 2 equivalents per equivalent of the combined amount of carboxyl and tertiary amino group in the first acrylic resin, the amount of the second acrylic resin being about 2 to 40 parts by weight calculated as nonvolatile matter per 100 parts by weight of the first acrylic resin calculated as nonvolatile matter, and the amount of the phosphorus-containing compound being about 1 to about 10 parts by weight per 100 parts by weight of the first acrylic resin calculated as nonvolatile matter.

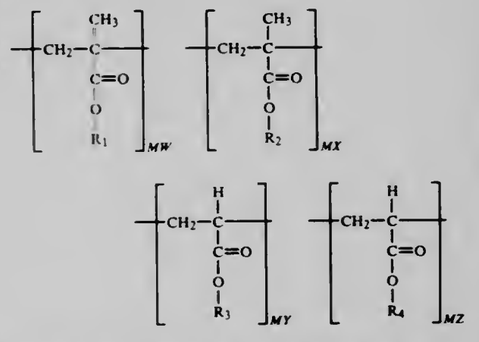
4,895,901

POLYMETIC HINDERED AMINE LIGHT STABILIZERS

Chester E. Ramey, Chagrina Falls; Ronald E. Thompson, Parma, and Charles J. Rostek, Jr., Chagrin Falls, all of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 55,180, May 28, 1987, Pat. No. 4,804,717. This application Nov. 23, 1988, Ser. No. 276,218
Int. Cl.[4] C08L *23/10, 33/08, 75/04, 67/00*
U.S. Cl. 525—127 **20 Claims**

1. An organic composition subject to thermal oxidative or actinic light deterioration, having incorporated therein a stabilizing amount of a piperidine modified acrylate-methacrylate copolymer stabilizer comprisng monomer units (I), (II), (III), and (IV) corresponding to the formula:



wherein R_1 and R_4 may be the same or different, and each is a lower alkyl radical; R_2 and R_3 may be the same or different, and each is a substituted piperidine radical; M is equal to the total number of monomer units in the polymer chain, and is of a magnitude sufficient to provide a polymer having molecular weight of at least 500; W is equal to at least 0.5; X is equal to at least 0.1 but not greater than 0.2, Y is equal to at least 0.1, Z is equal to at least 0.05 but not greater than 0.2, and W plus X plus Y pluz Z is equal to 1.

4,895,902

HINDERED TERTIARY AMINE AMINOALKYL METHACRYLATE STABILIZER FOR SPANDEX

Gary A. Lodoen, fishersville, and Arnoldus J. Ultee, Afton, both of Va., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Jul. 28, 1988, Ser. No. 228,805
Int. Cl.[4] C08L *75/06, 75/08, 75/12*
U.S. Cl. 525—128 **7 Claims**

1. In an improved spandex composition which contains a hindered tertiary amine copolymer additive formed from diisopropylaminoethyl methacrylate and a comonomer, the improvement comprising the comonomer being hydroxybutyl acrylate or ethyl acrylate.

4,895,903

THERMOPLASTIC ELASTOMER COMPOSITIONS

Seizo Kobayashi; Katsumi Usui, and Takashi Mitsue, all of Yokohama, Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Apr. 22, 1988, Ser. No. 185,109
Claims priority, application Japan, Apr. 24, 1987, 62-99952
Int. Cl.[4] C08L *23/16, 23/18, 23/12, 23/26*
U.S. Cl. 525—133 **8 Claims**

1. A thermoplastic elastomer composition prepared by crosslinking a composition comprising the following components (A), (B) and (C) by using a phenolic curing agent:
(A) 30–70 parts by weight of an ethylene/α-olefin copoly-

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mer prepared by copolymerizing ethylene and an α-olefin having 3 to 12 carbon atoms in the presence of a catalyst comprising a solid component and an organoaluminum compound which solid component contains at least magnesium and titanium, said ethylene/α-olefin copolymer having the following properties (I) to (IV):

(I)	Melt index	0.01–100 g/10 min
(II)	Density	0.870–0.905 g/cm^3
(III)	Maximum peak temperature as measured according to a differential scanning calorimetry (DSC)	not lower than 100° C.
(IV)	Insolubles in boiling n-hexane	not less than 10 wt. %

(B) 70–30 parts by weight of a propylene polymer; and

(C) 70–150 parts by weight, based on 100 parts by weight of the component (A) and (B), of an ethylene/α-olefin/non-conjugated diene copolymer rubber.

4,895,904

PLASTIC SHEETING FOR GREENHOUSE AND THE LIKE

Yael Allingham, P.O. Box 14, Benyamina, Israel

Continuation of Ser. No. 942,512, Dec. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 774,312, Sep. 10, 1985, abandoned. This application Oct. 26, 1987, Ser. No. 115,597

Claims priority, application Israel, Jun. 9, 1984, 72879

Int. Cl.[4] C08K *3/22, 3/08*

U.S. Cl. 523—135 **11 Claims**

1. A plastic sheet for use as a cover in greenhouses, in a tunnel used in agriculture and for similar agricultural uses, which comprises a polymer incorporating a UV radiation stabilizer and an absorber or reflector in the near infra-red (NIR) region of about 0.7 μ m to about 2.0 μ m, said absorber of reflector being a metal or metal oxide powder having a fine particle size in the submicron to few micron range, being selected from the group consisting of black iron oxide, blue cobalt oxide and coated copper powder, and being incorporated in the polymer in amounts such that the sheet transmits at least 70 percent of the photo-synthetic active radiation (PAR) having wavelengths in the 0.4 to 0.7 micron range and reflects or absorbs at least 10 percent of the energy in the near infra-red (NIR) range.

4,895,905

GEL-TYPE CHELATING RESINS AND A PROCESS FOR REMOVAL OF MULTI-VALENT, ALKALINE EARTH OR HEAVY METAL CATIONS FROM SOLUTIONS

Hans P. Schneider, Stade, and Ulrich Wallbaum, Dollern, both of Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1988, Ser. No. 153,688

Int. Cl.[4] C08F *257/02, 112/08, 8/40*

U.S. Cl. 525—154 **3 Claims**

1. A gel chelating resin comprising beads of a cross-linked polymer resin having chelating functional groups, characterized in that the beads (i) have a decreased level of cross-linkages in the shell area as compared to the core area, (ii) are prepared by (a) forming a suspension of a plurality of cross-linked polymer matrixes containing polymerization-initiating free radicals, (b) contacting said matrixes with a monomer feed which is at least partially imbibed by said matrixes and polymerizing said monomer, (iii) have alkylaminophosphonic, isothiouronium, mercaptomethyl and/or dithiocarbamate functional groups, and (iv) have a resistance to osmotic shock such that when the beads are contacted with 50 cycles of alternating 4M HCl and 4M NaOH, greater than 90 percent of the beads remain unbroken.

4,895,906

POLYCHLOROPRENE MIXTURES

Peter Wendling, Leverkusen; Werner Obrecht, Moers; Wilhelm Göbel, Leverkusen; Rüdiger Musch, Bergisch Gladbach; Rudolf Casper, Leverkusen, and Eberhard Müller, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 19, 1988, Ser. No. 221,430

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725042

Int. Cl.[4] C08L *11/00, 11/02*

U.S. Cl. 525—194 **10 Claims**

1. A polychloroprene rubber composition produced by mixing sulfur-modified polychloroprene with xanthogene-disulfide-regulated polychloroprene in a ratio of 95:5 to 5:95, characterized in that the rubbers are mixed in the form of their latices, co-peptized and isolated from the latex mixture.

4,895,907

POLYMERIZATION PROCESS USING BISQUINONE PEROXIDE CATALYST

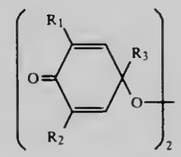
Duane B. Priddy, Midland, Mich., and Mehmet Demirors, Terneuzen, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1988, Ser. No. 232,187

Int. Cl.[4] C08F *4/34, 279/02, 291/02*

U.S. Cl. 525—257 **8 Claims**

1. A process for preparing graft polymers comprising polymerizing a graft forming polymerizable mixture in the presence of a rubbery spine polymer and a graft promoting amount of a bisquinone peroxide corresponding to the formula:



wherein R_1, R_2 and R_3 independently each occurrence are noninterfering chemical substituents, and wherein the bisquinone peroxide cleaves at the carbon-oxygen bond.

4,895,908

CYCLOPENTADIENYLETHANOL AND BIS(2-HYDROXYETHYL)DICYCLOPENTADIENE ESTERS AND GRAFTS THEREOF ON CARBOXYL MODIFIED POLYOLEFINS

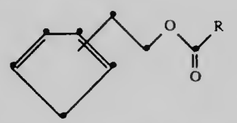
Jerome L. Stavinoha, and Anthony W. McCollum, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 101,474, Sep. 28, 1987, Pat. No. 4,812,509. This application Dec. 30, 1988, Ser. No. 292,070

Int. Cl.[4] C07C *69/78, 69/03;* **C08F** *265/04, 265/02*

U.S. Cl. 525—290 **7 Claims**

1. A compound of the formula:



wherein R represents an aliphatic or aromatic, branched or unbranched hydrocarbon of 1 to 20 carbon atoms.

5. A process for preparing a cross-linked, high molecular weight compound which comprises reacting:

(a) a polyolefin having a functional group selected from the group consisting of esters, acids and anhydrides; and

(b) a compound selected from the group consisting of cyclopentadienylethanol, bis(2-hydroxyethyl)dicyclopentadiene, and mixtures thereof.

4,895,909

IMBIBER POLYMERS ALKYLATED AFTER POLYMERIZATION

George C. Sypniewski, Marinette, Wis., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 194,645, May 16, 1988, Pat. No. 4,835,222, which is a continuation of Ser. No. 16,438, Feb. 19, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 322,313

Int. Cl.[4] C08F *00/00*

U.S. Cl. 525—309 **15 Claims**

1. A method of preparing organic fluid-insoluble, organic fluid-swellable polymer particles comprising (a) swelling lightly crosslinked vinyl aromatic polymer particles in an admixture of organic swelling medium and at least one Friedel Crafts catalyst; (b) exposing the swollen vinyl aromatic polymer particles to at least one alkyl halide under alkylating conditions, thereby preparing alkylated vinyl aromatic polymer particles which are organic fluid-insoluble and organic fluid-swellable; (c) removing at least a portion of the organic swelling medium from the alkylated vinyl aromatic polymer particles; (d) swelling the alkylated vinyl aromatic polymer particles with at least one monomer selected from the group consisting of the esters of unsaturated acids with C_{10} to C_{18} alcohols; and a step (e) polymerizing the monomer, said step (e) following step (d).

4,895,910

RESIN COMPOSITION CURABLE AT LOW TEMPERATURE

Osamu Isozaki, Yokohama, and Noboru Nakai, Hiratsuka, both of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Feb. 29, 1988, Ser. No. 161,822

Claims priority, application Japan, Mar. 9, 1987, 62-53662

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

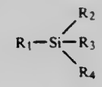
Int. Cl.[4] C08F *24/00*

U.S. Cl. 525—326.5 **14 Claims**

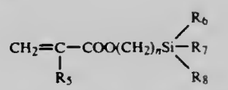
1. A resin composition curable at a low temperature and characterized in that the composition comprises:

(a) a copolymer prepared by copolymerizing ethylenically unsaturated groups of a polysiloxane macromonomer and an epoxy-containing monomer containing at least one ethylenically unsaturated group,

the polysiloxane macromonomer being prepared by reacting 70 to 99.999 mole % of a compound (A) represented by the formula


(I)

wherein R_1 is an aliphatic hydrocarbon group having 1 to 8 carbon atoms or phenyl, and R_2, R_3 and R_4 are each alkoxyl having 1 to 4 carbon atoms or hydroxyl, with 30 to 0.001 mole % of a compound (B) represented by the formula


(II)

wherein R_5 is a hydrogen atom or methyl, R_6, R_7 and R_8 are each hydroxyl, alkoxyl having 1 to 4 carbon atoms or an aliphatic hydrocarbon group having 1 to 8 carbon atoms, at least one of R_6, R_7 and R_8 being hydroxyl or alkoxyl, and n is an integer of 1 to 6 the polysiloxane macromonomer having per molecule at least two functional groups selected from hydroxyl and the alkoxyl and being 400 to 100,000 in number average molecular weight,

the epoxy-containing monomer having at its terminal end the group


(Z)

wherein (Z) forms an alicyclic group along with the C—C bond of the epoxy group, said epoxy-containing monomer containing at least one epoxy group, at least one α, β-unsaturated bond and at least one carbonyl group, and

(b) at least one member selected from the group consisting of a 6- coordinate organoaluminum chelate compound with neither hydroxyl or alkoxyl attached directly to the aluminum atom thereof and an 8-coordinate organozirconium chelate compound with neither hydroxyl or alkoxyl attached directly to the zirconium atom thereof.

4,895,911

TALL OIL FATTY ACID MIXTURE IN RUBBER

Syed K. Mowdood, Akron, and Bharat K. Kansupada, Mogadore, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 254,055, Oct. 6, 1988, Pat. No. 4,870,135. This application Aug. 18, 1989, Ser. No. 395,697

Int. Cl.[4] C08C *19/20*

U.S. Cl. 525—346 **7 Claims**

1. A method of enhancing the cure of a sulfur vulcanizable elastomer selected from the group consisting of natural rubber, synthetic rubber or mixture thereof which comprises adding to a sulfur vulcanizable elastomer a mixture of tall oil fatty acids wherein said tall oil fatty acid mixture comprises at least (a) from about 28% to about 55% by weight of oleic acid, (b) from about 25% to about 40% by weight of linoleic acid, (c) from about 4% to about 20% conjugated linoleic acid and (d) from about 0% to about 8% rosin acids.

4,895,912

STRETCHED POLY(ARYLENE THIOETHER-KETONE) FILMS AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake; Yo Iizuka; Toshitaka Kouyama; Takayuki Katto; Zenya Shiiki, all of Iwaki, and Toshiya Mizuno, Tsuchiura, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed May 12, 1988, Ser. No. 194,015

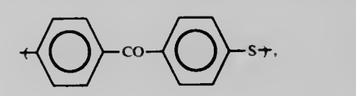
Claims priority, application Japan, May 15, 1987, 62-118620; Jul. 21, 1987, 62-181970; May 7, 1988, 63-109918

Int. Cl.[4] C08F *283/00*

U.S. Cl. 525—471 **12 Claims**

1. A stretched poly(arylene thioether-ketone) film made of a thermoplastic material which comprises:

(A) 100 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, Tm being 310–380° C.;

(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc 420° C./10 min) being at least 210° C., wherein ΔHmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min, after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.3–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 percent by weight sulfuric acid; and optionally,

(B) at least one component selected from up to 100 parts by weight of at least one thermoplastic resin and up to 15 parts by weight of at least one filler.

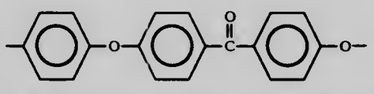
4,895,913

WIRE COATING RESIN COMPOSITION

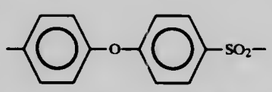
Teruo Saito, Kanatsu; Kunioki Asai, Tondabayashi, and Yasuroo Suzuki, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 70,506, Jul. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 878,228, Jun. 25, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 219,822
Claims priority, application Japan, Jul. 5, 1985, 60-148988
Int. Cl.⁴ C08G *16/00*
U.S. Cl. 525—471 **4 Claims**

1. A wire coating resin composition comprising 25–95% by weight of a polyetherketone consisting essentially of the following repeating unit:



and 75–5% by weight of an aromatic polysulfone consisting essentially of the following repeating unit:



which is characterized by the intrinsic viscosity of the polyetherketone satisfying the following inequality:

$$0.83 \leqq y \leqq 0.01x + 0.65,$$

wherein x represents the weight percentage of the polyetherketone in the wire coating resin composition and y represents the intrinsic viscosity of the polyetherketone.

4,895,914

SURFACE TREATED POLYMETHYLSILSESQUIOXANE POWDER

Kenji Saitoh, and Hiroshi Kimura, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Nov. 8, 1988, Ser. No. 268,409
Claims priority, application Japan, Jan. 18, 1988, 63-7018
Int. Cl.⁴ C08F *283/00*
U.S. Cl. 525—478 **4 Claims**

1. A polymethylsilsesquioxane powder characterized by being surface treated with an organic silicon compound represented by the following general formula:

$$(R_3Si)_aZ$$

wherein R represents a non-substituted monovalent hydrocarbon group, a represents a numeral of 1 or 2, and Z represents a hydrogen atom, a halogen atom, a hydroxyl group, —OR', —NR'X, —ONR'$_2$ or —OOCR' when a is 1, while —O—, —N(X) or —S— when a is 2, wherein R' represents an alkyl group having 1 to 4 carbon atoms, and X a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

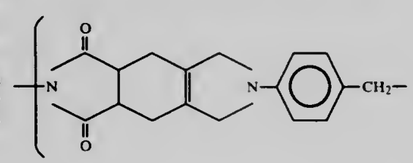
4,895,915

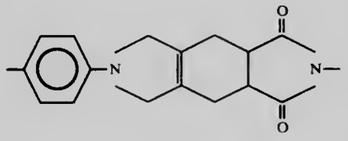
BIS[4-(3,4-DIMETHYLENE-PYRROLIDYL)PHENYL] METHANE

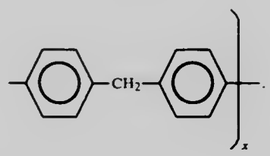
Raphael M. Ottenbrite, Midlothian, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 221,386, Jul. 19, 1988, Pat. No. 4,851,544. This application Feb. 16, 1989, Ser. No. 311,551
Int. Cl.⁴ C08G *73/10*
U.S. Cl. 526—262 **2 Claims**

1. A polyimide composition consisting essentially of recurring units having the following structural formula:







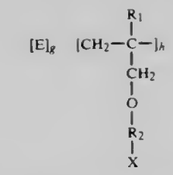
4,895,916

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, and William S. Carey, Ridley Park, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Jul. 5, 1988, Ser. No. 215,105
Int. Cl.⁴ C08F *20/42*
U.S. Cl. 526—298 **9 Claims**

1. Composition of a water soluble polymer comprising substantially repeat units having the structure:



wherein E in the above formula is the repeat unit obtained after polymerization of an ethylenically unsaturated compound or compounds; wherein R_1 is hydrogen or lower alkyl (C_1–C_3); R_2 is a hydroxy substituted lower alkylene group having from 1 to 6 carbon atoms or a non-substituted lower alkylene group having from 1 to 6 carbon atoms; X is selected from the group consisting of CN, $CONR_3R_4$, and COOM; wherein R_3 and R_4 is independently hydrogen or lower alkyl (C_1–C_3); M is hydrogen, any water soluble cation, or a lower alkyl (C_1–C_3); the molar ration g:h of said polymer being between about 30:1 to 1:20.

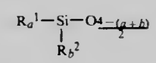
4,895,917

ORGANOPOLYSILOXANES WITH BUNTE SALT GROUPS

Burghard Grüning, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 29, 1988, Ser. No. 251,185
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735086
Int. Cl.⁴ C08G *77/00*
U.S. Cl. 528—10 **8 Claims**

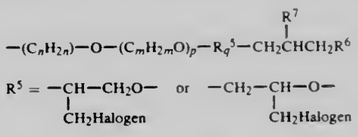
1. An organopolysiloxane with Bunte salt groups linked over carbon atoms of the general formula



wherein

R^1 is methyl or phenyl, with the proviso that at least 90% of R^1 is methyl;

R^2 is selected from the group consisting of (i) R^3 and (ii) R^4, in which R^3 is



one of the two groups R^6, R^7 being —OH, while the other is $—S_2O_3Me$, in which

Me is alkali metal, ammonium or substituted ammonium,

n=3 to 6,

m=2 to 3,

p=0 to 100,

q=0 to 5, and

(ii) R^4 is $—(C_xH_{2x})—O—(C_yH_{2y}O)_zR^8$, in which

R^8 is alkyl or acyl with 1 to 4 carbon atoms or hydrogen,

x=3 to 6,

y=2 to 3, and

z=1 to 100,

with the proviso that, in the average molecule, at least one R^2 group has the meaning of R^3 and, when p=0 in R^3, at least one R^4 group is present,

a=1 to 2.33

b=0.02 to 1 and

$2 \leqq a+b \leqq 3$.

4,895,918

ALKOXY-FUNCTIONAL ONE-COMPONENT RTV SILICONE RUBBER COMPOSITIONS

Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 26,241, Mar. 16, 1987, Pat. No. 4,755,578, which is a division of Ser. No. 832,505, Feb. 21, 1986, Pat. No. 4,670,532, which is a division of Ser. No. 755,954, Jul. 16, 1985, Pat. No. 4,593,085, which is a continuation of Ser. No. 449,105, Dec. 13, 1982, abandoned. This application May 2, 1988, Ser. No. 168,299
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.
Int. Cl.⁴ C08G *77/06*
U.S. Cl. 528—18 **16 Claims**

1. A one component RTV silicone rubber composition comprising a base diorganopolysiloxane polymer having a viscosity in the range of 100 to 1,000,000 centipoise at 25° C. having one alkoxy group on each terminal silicon atom in the polymer chain and having at least one hydrolyzable leaving group on each terminal silicon atom in the polymer chain wherein the hydrolyzable leaving group is selected from the group consisting of silazy, cyclic amido, amido, amino, carbamato, enoxy, imidato, isocyanato, oximato, thioisocyanato and ureido radicals and the organo groups are C_{1-13} monovalent hydrocarbon radicals; and an effective amount of a condensation catalyst.

4,895,919

SPIROBIINDANE COPOLYSILOXANECARBONATES AND METHOD FOR THEIR PREPARATION

Gary R. Faler, Scotia; David M. Dardaris, Clifton Park, and Donald G. LeGrand, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

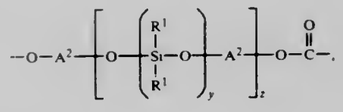
Filed Oct. 7, 1988, Ser. No. 254,742
Int. Cl.⁴ C08G *77/04*
U.S. Cl. 528—26 **20 Claims**

1. A copolysiloxanecarbonate composition comprising structural units of the formulas



(I)

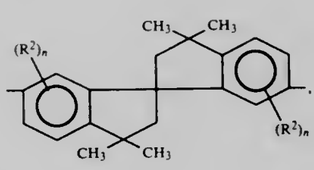
and



(II)

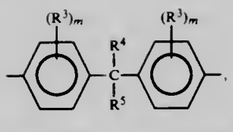
wherein:

A^1 is



(III)

A^2 is



(IV)

R^1 is a hydrocarbon radical, each of R^2 and R^3 is independently C_{1-4} alkyl or halo, each of R^4 and R^5 is independently C_{1-4} alkyl or phenyl, m is 0–4, n is 0–3, each of x and y has an average value of about 0–200 and the average value of x+y is at least about 5, w is 0 when x is 0 and at least 1 when x is greater than 0, and z is 0 when y is 0 and at least 1 when y is greater than 0; at least one of w and z being 1.

4,895,920

PROCESS FOR THE PREPARATION OF POLYURETHANES WITH LIQUID CRYSTAL PROPERTIES AND DIISOCYANATES SUITABLE FOR CARRYING OUT THE PROCESS

Werner Mormann, Kreuztal; Barbara Brahm, and Martin Brahm, both of Siegen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,445

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3730985

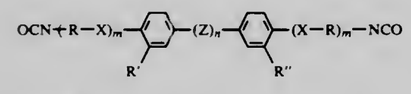
Int. Cl.[4] C08G *18/48*

U.S. Cl. 528—76 **4 Claims**

1. A process for the preparation of polyurethanes having liquid crystal properties comprising reacting, in proportions corresponding to an NCO/OH equivalent ratio of from about 0.9:1 to 1.1:1,

(a) an alkane polyol having a molecular weight range of from 62 to 250; with

(b) an organic diisocyanate having the formula

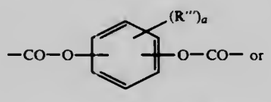


wherein

R is an alkylene group of 2 to 11 carbon atoms;

X is CO—O or O—CO;

Z is N=N, CH=CH, CO—O,



R', R'', and R''' are independently hydrogen, Cl, Br, NO_2, C_1–C_{20} alkyl,

a is 1, 2, or 3;

each m is identically 1; and

n is 0 or 1.

4,895,921

WATER SOLUBLE OR DISPERSIBLE BLOCKED POLYISOCYANATES AND A PROCESS FOR THEIR PREPARATION AND USE

Walter Schäfer, Leichlingen; Hanns P. Müller, Bergisch Gladbach, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Oct. 4, 1988, Ser. No. 253,179

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735198

Int. Cl.[4] C08G *18/80*

U.S. Cl. 528—45 **8 Claims**

1. A process for the production of a coated substrate which comprises coating said substrate with a mixture comprising

(I) a water soluble or dispersible blocked polyissocyanate which comprises

(a) a statistical average per molecule of at least one structural nit corresponding to the formula

B—CO—NH—

wherein B stands for a group obtainable by removal of the acidic hydrogen atom from a monofunctional blocking agent for organic isocyanates and

(b) a structural unit corresponding to the formula



in a quantity sufficient to ensure the solubility or dispersibility of said blocked polyisocyanate in water, said blocked polyisocyanate containing a statistical average of at least two structural units corresponding to the formulas shown under (a) and (b) per molecule, and

(II) an aqueous solution or dispersion of an organic compound containing least two isocyanate-reactive groups and subsuquently curing the coating by heat .

4,895,922

LOW TEMPERATURE SYNTHESIS OF POLYESTERAMIDES

Naoya Ogata, Tokyo, Japan, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 5, 1988, Ser. No. 190,426

Int. Cl.[4] C08G *69/44*

U.S. Cl. 528—179 **20 Claims**

1. A process for the synthesis of a polyesteramide which comprises polymerizing at least one diamine, at least one diol, and at least one dicarboxylic acid in the presence of (1) at least one acid acceptor; (2) at least one halogenated organic compound which contains at least one carbon atom which has at least three halogen atoms bonded directly to it; and (3) triphenylphospine oxide.

4,895,923

POLYCARBONATE OF CYCLOHEXYLHYDROQUINONE

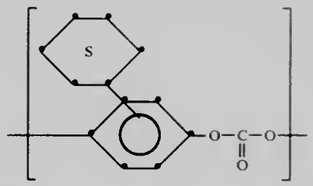
W. Ronald Darnell, Weber City, Va., and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,168

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—196 **2 Claims**

1. A polycarbonate comprising the recurring units



and having an inherent viscosity of at least about 0.3 as measured at 25° C. and 0.1 g/100 mL in a 40/25/35 w/w/w mixture of o-chlorophenol/phenol/sym-tetrachloroethane.

4,895,924

POLY(ARYLENE THIOETHER-KETONE) FIBERS AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake; Yo Iizuka, both of Iwaki; Hiroyuki Endo, Shinbayashi; Toshitaka Konyama, Iwaki; Takayuki Katto, Iwaki, and Zenya Shiiki, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo K. K., Tokyo, Japan

Filed May 12, 1988, Ser. No. 194,014

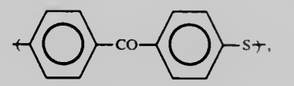
Claims priority, application Japan, May 15, 1987, 62-118620; Jul. 21, 1987, 62-181970; May 7, 1988, 63-109920

Int. Cl.[4] C08G *2/00*

U.S. Cl. 528—226 **9 Claims**

1. Poly(arylene thioether-ketone) fibers obtained by melt-spinning a thermoplastic material which comprises:

(A) 100 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, Tm being 310°–380° C.;

(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc (420° C./10 min) being at least 210° C., wherein ΔHmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min, after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.3–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 percent by weight sulfuric acid; and optionally,

(B) up to 50 parts by weight of at least one of thermoplastic resins.

4,895,925

MELT-STABLE POLY(ARYLENE THIOETHER-KETONE) AND PRODUCTION PROCESS THEREOF

Yoshikatsu Satake; Takashi Kaneko; Yutaka Kobayashi; Yo Iizuka; Takayuki Katto, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

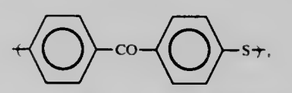
Filed May 12, 1988, Ser. No. 194,012

Claims priority, application Japan, May 15, 1987, 62-118619; May 7, 1988, 63-109916

Int. Cl.[4] C08G *2/00*

U.S. Cl. 528—226 **4 Claims**

1. A melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, Tm being 310°–380° C.;

(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc (420° C./10 min) being at least 210° C., wherein ΔHmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min, after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.2–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/d in 98 percent by weight sulfuric acid.

4,895,926

HYDROXYETHYLNORBORNENE COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

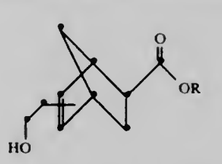
Jerome L. Stavinoha, and Anthony W. McCollum, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 245,110, Sep. 16, 1988, Pat. No. 4,855,395, which is a division of Ser. No. 101,472, Sep. 25, 1987, Pat. No. 4,789,602. This application Apr. 3, 1989, Ser. No. 332,123

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 **14 Claims**

1. A process for preparing the compound of the formula:



wherein R represents an aliphatic or aromatic, branched or unbranched hydrocarbon of 1 to 25 carbon atoms, which comprises reacting a cyclopentadienylethanol of the formula:



with an acrylate ester.

VOL 1110 ISS 4 JA 23 1990 UMI

4,895,927

WATER SOLUBLE, SELF-CROSSLINKING, POLYMERIC CONDENSATION PRODUCT OF AMINO (METH) ACRYLATE AND PHOSPONIC ACID ESTER

Simpert Lidemann, Bobingen, and Michael Bernheim, Aystetten, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

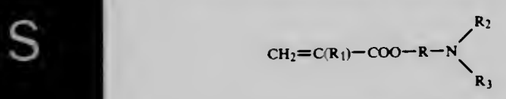
Filed Mar. 25, 1988, Ser. No. 172,878

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711092

Int. Cl.[4] C08G *83/00*

U.S. Cl. 528—321 **27 Claims**

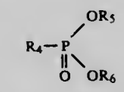
1. Process for the manufacture of an aqueous solution of a water-soluble, self-crosslinking condensation product which comprises reacting 1 mole of a compound of the formula (I)



(I)

or the hydrolysis products thereof, in which R is alkylene with 2 to 4 C-atoms, R_1 is hydrogen or ethyl, and R_2 and R_3 are independently of each other an alkyl residue with 1 to 4 C-atoms,

with 0.3 to 1.5 mole of a compound of the formula (II)



(II)

in which R_4, R_5 and R_6 are independently of each other an alkyl residue with 1 to 3 C-atoms, by heating in the presence of water as reaction medium, wherein the viscosity is increased until nearly all the olefins double bonds have disappeared.

4,895,928

MELT-PROCESSABLE POLYMERIC MATERIALS BASED ON 5-T-BUTYLISOPHTHALIC

David J. Fenoglio; Edward E. Paschke, both of Wheaton, and James R. Stephens, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 904,907, Sep. 8, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 208,398

Int. Cl.[4] C08G *69/46, 69/32*

U.S. Cl. 528—348 **24 Claims**

1. Melt processing an amorphous polyaramide having an intrinsic viscosity measured on a 0.4 wt.% solution in N,N'-dimethylacetamide at 30° C. larger than about 0.5 made from at least one wholly aromatic diamine and a diacyl compound-containing compoocnt containing at least twenty mol (20) percent of a compound containing the 5-t-butylisophthaloyl moiety.

4,895,929

PROCESS FOR PRODUCING POLYPHENYLENE ETHER, DISPERSING POLYETHER IN AQUEOUS MEDIUM AND HEATING DISPERSION

Katsuhiro Abe; Kazunori Yano; Ryuhei Matsui; Shigeki Kiriyama, all of Mie; Yoshiharu Tatsukami, and Kenji Nagaoka, both of Osaka, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo and Sumitomo Chemical Company, Ltd., Osaka, both of, Japan

Filed Jun. 25, 1987, Ser. No. 66,295

Claims priority, application Japan, Jun. 25, 1986, 61-148700

Int. Cl.[4] C08G *65/46*

U.S. Cl. 528—487 **22 Claims**

1. A process for producing a polyphenylene ether having improved powder properties and containing a reduced amount of a catalyst residue comprising oxidatively polymerizing a phenol in an organic solvent in the presence of a catalyst for oxidative polymerization, finely dispersing resulting polyphenylene ether solid particles containing the organic solvent in an amount of from 50 to 150 parts by weight based on the weight of the polyphenylene ether in an aqueous dispersion medium containing an inorganic phosphoric acid or a salt thereof, and heating the aqueous dispersion to remove the solvent from the polyphenylene ether and extract the catalyst component present in the polyphenylene ether into the aqueous phase.

4,895,930

PROCESS FOR ISOLATING POLYARYLENE SULPHIDES

Franz Alfes; Wolfgang Alewelt, both of Krefeld; Wolfgang Eisermann, Duesseldorf, and Erhard Tresper, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 214,010

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723071

Int. Cl.[4] C08J *3/00;* C08G *75/02*

U.S. Cl. 528—499 **1 Claim**

1. Process for purifying polyarylene sulphides, characterised in that the reaction solution obtained from the polymerisation reaction for producing polyarylene sulphides, is cooled to a temperature between 30° and 70° C. having a cooling rate of 1° to 5° C. per second, in that the cooled product is ground, and in that it is then treated with water or an organic solvent or both.

4,895,931

PHOSPHOLIPASE A_2-INHIBITING PEPTIDES

Kei Okazaki; Akiko Saito, and Moriyuki Sato, all of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1989, Ser. No. 301,477

Claims priority, application Japan, Feb. 4, 1988, 63-24572

Int. Cl.[4] C07K *7/08*

U.S. Cl. 530—326 **1 Claim**

1. A peptide selected from the group consisting of peptides having the amino acid sequences represented by the following formulae (I) to (XII):

H—Val—Asp—Glu—Ala—Thr—Ile—Ile—Asp—Ile—Leu—Thr—Lys—Arg—Asn—Asn—OH (I)

H—Thr—Lys—Arg—Asn—Asn—Ala—Gln—Arg—Gln—Gln—Ile—Lys—Ala—Ala—Tyr—OH (II)

H—Ile—Lys—Ala—Ala—Tyr—Leu—Gln—Glu—Thr—Gly—Lys—Pro—Leu—Asp—Glu—Thr—Leu—Lys—Lys—Ala—Leu—Thr—Gly—His—Leu—Glu—OH (III)

H—Lys—Pro—Leu—Asp—Glu—Thr—Leu—Lys—Lys—Ala—Leu—Thr—Gly—His—Leu—Glu—OH (IV)

H—Ile—Glu—Ile—Leu—Ala—Ser—Arg—Thr—Asn—Lys—Glu—Ile—Arg—Asp—Ile—OH (V)

H—Thr—Thr—Arg—Ser—Tyr—Pro—Gln—Leu—Arg—Arg—Val—Phe—Gln—Lys—Tyr—Thr—OH (VI)

H—Lys—Gly—Asp—Ile—Glu—Lys—Cys—Leu—Thr—Ala—Ile—Val—Lys—Cys—Ala—OH (VII)

H—Lys—Cys—Leu—Thr—Ala—Ile—Val—Lys—Cys— (VIII)

-continued

Ala—Thr—Ser—Lys—Pro—Ala—OH

H—Ile—Val—Lys—Cys—Ala—Thr—Ser—Lys—Pro— (IX)

Ala—Phe—Phe—Ala—Glu—Lys—OH

H—Gly—Val—Gly—Thr—Arg—His—Lys—Ala—Leu— (X)

Ile—Arg—Ile—Met—Val—Ser—Arg—OH

H—Val—Ser—Arg—Ser—Glu—Ile—Asp—Met—Asn— (XI)

Asp—Ile—Lys—Ala—Phe—Tyr—OH

and

H—Ile—Lys—Ala—Phe—Tyr—Gln—Lys—Met—Tyr— (XII)

Gly—Ile—Ser—Leu—Cys—Gln—Ala—OH

4,895,932

METHOD FOR DETERMINING CARDIODILATIN AND FRAGMENTS THEREOF AND ANTIBODIES USEFUL IN DETERMINATION OF CARDIODILATIN AND ITS FRAGMENTS

Wolf-Georg Forssmann, Heidelberg, Fed. Rep. of Germany, assignor to Organogen Medizinisch-Molekularbiologische Forschungsgesellschaft m.b.H., Heidelberg, Fed. Rep. of Germany

Division of Ser. No. 140,736, Dec. 31, 1987, Pat. No. 4,782,044, which is a division of Ser. No. 769,627, Aug. 20, 1985, Pat. No. 4,751,284. This application Aug. 8, 1988, Ser. No. 229,706

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346953

Int. Cl.[4] C07K *7/10;* A61K *37/02, 49/00;* G01N *33/53*

U.S. Cl. 530—387 **12 Claims**

1. Method for determining cardiodilatin or a fragment thereof comprising contacting a body fluid sample with an antibody produced in response to immunization of a host with cardiodilatin or a fragment thereof which antibody specifically binds to cardiodilatin or a fragment thereof and determining binding between said antibody and cardiodilatin or fragment thereof as indicating presence of cardiodilatin or said fragment.

4,895,933

NEW ANTITUMOR AGENT OBTAINED BY MICROBIAL STEREOSELECTIVE REDUCTION OF 4'-DEOXY-4'-IODODOXORUBICIN

Giuseppe Cassinelli, Voghera; Teresa Bordoni, Milan; Sergio Merli, Bernareggio, and Giovanni Rivola, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

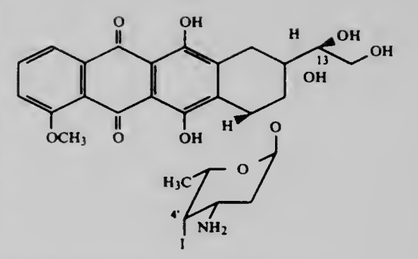
Filed Jan. 19, 1988, Ser. No. 145,282

Claims priority, application United Kingdom, Jan. 22, 1987, 8701381

Int. Cl.[4] C07H *15/24*

U.S. Cl. 536—6.4 **2 Claims**

1. 4'-Deoxy-13(S)-dihydro-4'-iododoxorubicin having the formula (II)



(II)

and pharmaceutically acceptable salts thereof.

4,895,934

PROCESS FOR THE PREPARATION OF CLINDAMYCIN PHOSPHATE

William L. Matier, Hockessin, Del.; Chi Woo, and Ying-Chi Lee, both of Libertyville, Ill., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 234,717, Aug. 22, 1988, Pat. No. 4,849,515. This application Mar. 27, 1989, Ser. No. 328,884

Int. Cl.[4] C07H *15/16*

U.S. Cl. 536—16.5 **5 Claims**

5. A process for the preparation of clindamycin phosphate, said process comprising:

treating protected clindamycin hydrochloride with phosphorous oxychloride in a suitable solvent to obtain a reaction mixture;

adding benzyl alcohol to the reaction mixture and subsequently adding water to complete the reaction and thereby obtaining protected clindamycin benzylate, hydrochloride;

heating the protected clindamycin benzylate hydrochloride in the presence of an acid to obtain deprotected clindamycin hydrochloride;

isolating the deprotected clindamycin benzylate hydrochloride;

treating the deprotected clindamycin benzylate hydrochloride with a suitable base to obtain clindamycin benzylate free base;

isolating the clindamycin benzylate free base; and

treating the clindamycin free base with hydrogen gas in the presence of Pd/C catalyst in a suitable solvent to thereby obtain clindamycin phosphate.

4,895,935

PLATINUM PHARMACEUTICALS

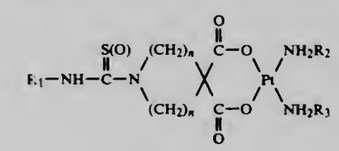
Abdolhossein Talebian, Herndon; Dianna C. Green, Falls Church, both of Va.; Charles F. Hammer, Washington, D.C., and Philip S. Schein, Bryn Mawr, Pa., assignors to Georgetown University, Washington, D.C.

Continuation-in-part of Ser. No. 74,825, Jul. 17, 1987, abandoned. This application Jan. 14, 1988, Ser. No. 143,762

Int. Cl.[4] C07H *15/00, 23/00*

U.S. Cl. 536—17.1 **18 Claims**

1. A compound of the formula:



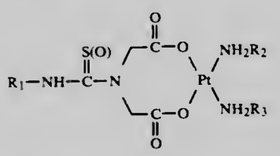
wherein

n is 1 or 2; R_1 is a mono or disaccaride which has a five or

six membered ring component selected from the group consisting of pyranosyl, furanosyl, sugar alcohols, deoxysugars, glyconic acids, glycuronic acids and glycosides, which can be substituted by acetyl, amino or N-acetylamino; each of R_2 and R_3 is independently selected from the group consisting of hydrogen of C_{1-4} alkyl, or R_2 and R_3 together are linked to adjacent carbon atoms on a five or six membered ring structure

or a pharmaceutically acceptable salt thereof.

5. A compound of the formula:

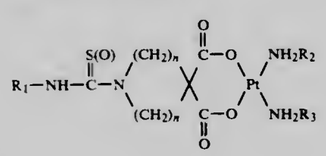


wherein

R_1 is a mono or disaccharide which has a five or six membered ring component selected from the group consisting of pyranosyl, furanosyl, sugar alcohols, deoxysugars, glyconic acids, glycuronic acids and glycosides, which can be substituted by acetyl, amino or N-acetylamino, R_2 and R_3 are selected from the group consisting of hydrogen, C_{1-4} alkyl or R_2 and R_3 or R_2 and R_3 together are linked to adjacent carbon atoms on a five or six membered ring structure

or a pharmaceutically acceptable salt thereof.

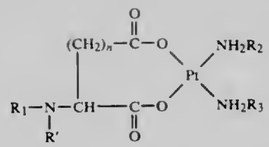
16. A compound of the formula:



wherein

n is 1 or 2; R_1 is a mono or disaccharide which has a five or six membered ring component selected from the group consisting of pyranosyl, furanosyl, sugar alcohols, deoxysugars, glyconic acids, glycuronic acids and glycosides, which can be substituted by acetyl, amino or N-acetylamino; each of R_2 and R_3 is independently selected from the group consisting of hydrogen or C_{1-4} alkyl, or R_2 and R_3 together are linked to adjacent carbon atoms on a five or six membered ring structure

or a pharmaceutically acceptable salt thereof.



wherein n is 0 or 1; R_1 is selected from the group consisting of hydrogen, a mono or disaccharide which has a five or six membered ring component selected from the group consisting of pyranosyl, furanosyl, sugar alcohols, deoxysugars, glyconic acids, glycuronic acids and glycosides, which can be substituted by acetyl, amino or N-acetylamino linked to the nitrogen atom by a —NHCO— amide moiety, and —NHCS— thioamide moiety or a —CO— carbonylmoiety, R′ is selected from the group consisting of hydrogen, C_{1-4} alkyl or R_2 and R_3 or R_2 and R_3 together are linked to adjacent carbon atoms on a four, five or six membered ring structure, or R_2 and R_3 together form a fused or bicyclic ring with adjacent carbon atoms; with the proviso that R′ and R_1 cannot both be hydrogen when n=0,

or a pharmaceutically acceptable salt thereof.

4,895,937

5-IOSO-2-PYRIMIDINONE NUCLEOSIDE

Thomas J. Bardos, Snyder, N.Y.; Yung-Chi Cheng, Chapel Hill, N.C.; Alan C. Schroeder, Silver Springs, Md., and Simon M. N. Efange, Plymouth, Minn., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 641,770, Aug. 19, 1984, Pat. No. 4,782,142, which is a continuation-in-part of Ser. No. 337,297, Jan. 5, 1982, Pat. No. 4,468,384. This application Oct. 27, 1988, Ser. No. 263,183

Int. Cl.[4] **C07H** *19/067*

U.S. Cl. 536—23 **1 Claim**

1. 1-(2-Deoxy-β-D-ribofuranosyl)-5-(iodo)-2-pyrimidinone.

4,895,938

PROCESS FOR SEPARATING POLYSACCHARIDES FROM TAMARIND SEEDS

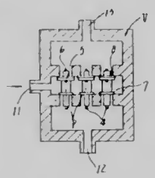
Takashi Teraoka, Kishiwada; Akira Iriguchi; Kenji Ebie, both of Kawanishi, and Namio Mizuhashi, Takarazuka, all of Japan, assignors to Shikibo Limited, Osaka, Japan

Filed Jun. 20, 1988, Ser. No. 208,623

Claims priority, application Japan, Jul. 16, 1987, 62-178122

Int. Cl.[4] **C08G** *8/02*

U.S. Cl. 536—128 **8 Claims**



5. A process for recovering from tamarind seeds a dispersions which is rich in particles rich in polysaccharides, said process consisting essentially of the steps of:

(1) pulverizing tamarind seeds to form particles of less than 80 microns in size but not less than 5 microns in size;

(2) dispersing the obtained particles in an aqueous medium consisting essentially of water and 5–60% by weight of at least one water soluble organic solvent to form a dispersion which contains particles rich in polysaccharides and particles rich in other components of the tamarind seeds, said particles rich in polysaccharides being larger than said particles rich in other components;

(3) classifying said dispersion in at least one hydrocyclone, whereby the particles rich in polysaccharides descend to the bottom of the hydrocyclone and the particles rich in other components rise to the top of the hydrocyclone; and

(4) withdrawing from the bottom of the hydrocyclone a dispersion which is rich in the particles rich in polysaccharides, and withdrawing from the top of the hydrocyclone a dispersion which is rich in the particles rich in other components.

4,895,936

PLATINUM PHARMACEUTICALS

Abdolhossen Talebian, Herndon; Dianna C. Green, Falls Church, both of Va., and Philip S. Schein, Bryn Mawr, Pa., assignors to Georgetown University, Washington, D.C.

Continuation-in-part of Ser. No. 74,825, Jul. 17, 1987, abandoned. This application Jan. 14, 1988, Ser. No. 143,761

Int. Cl.[4] **C07H** *15/00, 23/00*

U.S. Cl. 536—17.1 **13 Claims**

1. A compound of the formula:

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4,895,939

HIGH PERCENTAGE β-YIELD SYNTHESIS OF CARBAPENEM INTERMEDIATES

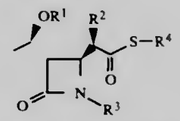
Alain Martel, Deisos; Jean-Paul Daris, St-Hubert, and Jacques Corbeil, Montreal, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 832,191, Feb. 24, 1986, Pat. No. 4,772,683. This application Jun. 14, 1988, Ser. No. 206,383

Int. Cl.[4] **C07D** *205/08, 401/12, 403/12;* **C07F** *7/18*

U.S. Cl. 540—200 **4 Claims**

1. A compound of the formula



wherein R^1 is hydrogen or a conventional hydroxy-protecting group, R^2 is lower alkyl having from 1–6 carbon atoms, R^3 is hydrogen, trimethylsilyl, triisopropylsilyl, triethylsilyl, t-butyldiphenylsilyl, t-butyldimethylsilyl, or 2,4,6-tri(t-butylphenoxy)dimethylsilyl, and R^4 is a group selected from pyrid-2-ylmethyl, 3-methylpyrid-2-ylmethyl, isothiazol-2-ylmethyl; and 1-methylimidazol-2-yl-methyl.

4,895,940

PROCESS FOR THE PREPARATION OF PENEMS

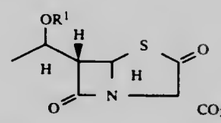
Brian T. O'Neill, Westbrook, and Douglas Phillips, Ledyard, both, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 19, 1988, Ser. No. 260,141

Int. Cl.[4] **C07D** *499/04;* **A61K** *31/425*

U.S. Cl. 540—310 **28 Claims**

1. A process for the preparation of a compound of the formula



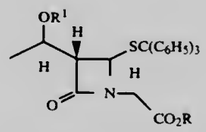
(4)

wherein R is $—CH_2CX=CH_2$, $—CH_2CH_2Si(CH_3)_3$, p-nitrobenzyl, or a conventional radical forming an ester which is hydrolyzed under physiological conditions;

X is H or Cl; and

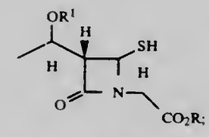
R^1 is a conventional silyl protecting group; which comprises

(a) reaction of a compound of the formula



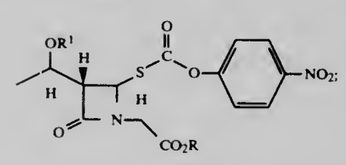
(1)

with a molar excess of $AgNO_3$ in the presence of a molar excess of pyridine in a reaction-inert solvent at a temperature in the range of about −25° to 25° C., followed by treatment with H_2S, to form a compound of the formula



(2)

(b) acylation of said compound of the formula (2) with substantially one molar equivalent of p-nitrophenyl chloroformate in the presence of substantially one molar equivalent of 4-(dimethylamino)pyridine in a reaction-inert solvent at a temperature in the range of about −25° to 25° C. to form a solution of a compound of the formula



(3)

and

(c) reaction of said solution of the compound of the formula (3) with a molar excess of lithium hexamethyldisilylamide at a temperature in the range of about −50° to −100° C. to form said compound of the formula (4).

4,895,941

PROCESS FOR PREPARING 2α-METHYL-2β-(1,2,3-TRIAZOL-1-YL)METHYLPENAM-3α-CARBOXYLIC ACID DERIVATIVES

Sigeru Torii; Hideo Tanaka; Motoaki Tanaka, all of Okayama; Shozo Yamada, Honjyo, and Akira Nakai, Okayama, all of Japan, assignors to Taiho Pharmaceutical Co., Ltd., Tokyo and Otsuka Kagaku Kabushiki Kaisha, Osaka, both of, Japan

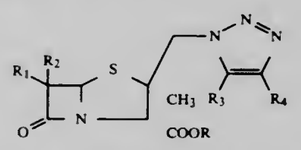
Filed Feb. 28, 1989, Ser. No. 316,631

Claims priority, application Japan, Mar. 1, 1988, 63-49039

Int. Cl.[4] **C07D** *499/00;* **A61K** *31/425*

U.S. Cl. 540—310 **12 Claims**

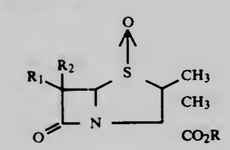
1. A process for preparing a 2α-methyl-2β-(1,2,3-triazol-1-yl)methylpenam-3α-carboxylic acid derivative represented by the formula



(I)

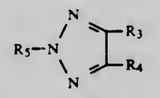
wherein R is a penicillin carboxyl protecting group, R_1 is hydrogen atom or halogen atom, R_2 is hydrogen atom, lower alkyl group, lower alkoxy group, halogen atom, azido group, lower alkylthio group, phthalimido group or $—NHR_6$ group, wherein R_6 is hydrogen atom or acyl group derived from a carboxylic acid, R_3 and R_4 are the same or different and each represent hydrogen atom, trialkylsilyl group, lower alkyl group, lower alkoxy group, phenyl group, phenyl group which has 1 to 5 substituents selected from the group consisting of halogen atom, lower alkyl group, lower alkoxy group and nitro group, C_2–C_6 aliphatic acyl group, trifluoromethyl group, carbamoyl group, lower alkyl-substituted carbamoyl

group, lower alkoxy-substituted lower alkyl group, hydroxyl group, nitro group, amino group, cyano group, formyl group, halogen atom, a group of the formula $—S(O)_nR_7$, wherein R_7 is lower alkyl, n is 0, 1 or 2, a group of the formula $—COOR_8$, wherein R_8 is hydrogen atom, benzyl group, benzyl group which has 1 to 5 substituents selected from the group consisting of halogen atom, lower alkyl group, lower alkoxy group and nitro group, alkali metal atom, alkyl group having 1 to 18 carbon atoms, lower alkenyl or lower alkynyl group, or lower alkyl group substituted with 1 to 3 phenyl groups, which comprises heating a penicillanic acid sulfoxide derivative represented by the formula



(III)

wherein R, R_1 and R_2 are as defined above, with about 1-10 moles of a triazole derivative represented by the formula



(IV)

wherein R_3 and R_4 are as defined above and R_5 is hydrogen atom or silyl group substituted with 3 groups selected from the group consisting of lower alkyl group, benzyl group and phenyl group.

4,895,942

NOVEL EPOXY COMPOUNDS

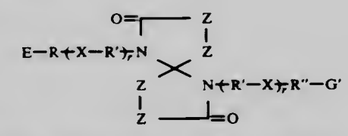
Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 172,054, Mar. 23, 1988, abandoned. This application Sep. 16, 1988, Ser. No. 245,434

Int. Cl.[4] C07D *291/04, 419/04*

U.S. Cl. 540—489 **15 Claims**

1. The epoxyalkoxy-containing spirodilactam represented by the formula



wherein Z independently is $=C(Z')_2$ in which Z' independently is hydrogen, lower alkyl or halogen, or Z is such that two adjacent Z moieties form a ring system Z" of from 5 to 7 ring atoms up to two of which are nitrogen, oxygen or sulfur with the remainder of the Z" ring atoms being carbon atoms, there being up to 15 carbon atoms inclusive in Z", two of which connect a carbonyl carbon atom with the spiro carbon atom, R is aromatic of up to 15 carbon atoms and up to two aromatic rings inclusive, R' or R" independently are R or aliphatic of up to 10 carbon atoms inclusive, r independently is 0 or 1, X is a direct valence bond, alkylene of up to 8 carbon atoms inclusive, oxo, thio, sulfonyl, carbonyl, dioxyphenylene, 2,2-di(oxyphenyl)propane or dioxydiphenylene, E is 1-(2,3-epoxy)alkoxy of up to 8 carbon atoms inclusive and G' is hydrogen or E with the proviso that when G' is E then R" is R.

4,895,943

PREPARATION OF 1,4-DIAZABICYCLO(3.2.2)NONANE

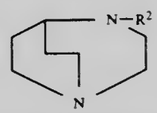
Robert C. Friedmann, Old Saybrook; John W. Lackey, Mystic, and Brian T. O'Neill, Westbrook, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,542

Int. Cl.[4] C07D *51/70*

U.S. Cl. 540—556 **2 Claims**

1. A compound of the formula



wherein R^2 is naphthoyl, substituted naphthoyl, benzyl, substituted benzyl, benzoyl or substituted benzoyl, wherein each of said substituted naphthoyl, substituted benzyl, and substituted benzoyl is substituted with one to three substituents selected from the group consisting of halo, C_1-C_4 alkoxy and C_1-C_4 alkyl.

4,895,944

BENZOXAZINE INTERMEDIATES

Isao Hayakawa, and Shohgo Atarashi, both of Tokyo, Japan, assignors to Dalichi Seiyaku Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,117

Claims priority, application Japan, Dec. 25, 1986, 61-314095

Int. Cl.[4] C07D *265/36*

U.S. Cl. 544—105 **3 Claims**

1. A 2H-benzoxazine compound represented by the formula (II)

(II)

wherein X^1 represents a hydrogen atom or a halogen atom, X^2 and X^3 each represents a halogen atom, and R^1 represents an alkyl group having 1 to 6 carbon atoms, and the salts thereof.

4,895,945

EPOXIDIZED CHLOROTRIAZINE COMPOUNDS

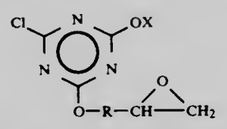
Sterling B. Brown, Schenectady, and Richard C. Lowry, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 19, 1988, Ser. No. 144,901

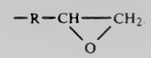
Int. Cl.[4] C07D *251/26*

U.S. Cl. 544—218 **6 Claims**

1. A compound having the formula



wherein R is an alkylene, cycloalkylene, aromatic hydrocarbon-substituted alkylene or divalent aromatic hydrocarbon radical having from 1 to about 18 carbon atoms and X is selected from the group consisting of alkyl, aromatic hydrocarbon and aromatic hydrocarbon-substituted alkyl radicals having from 1 to about 18 carbon atoms and



4,895,946

PROCESS FOR THE PREPARATION OF FUSED PYRIDINE COMPOUNDS

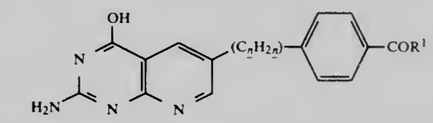
Edward C. Taylor, Princeton, N.J., and Philip M. Harrington, Plainwell, Mich., assignors to The Trustees of Princeton University, Princeton, N.J.

Continuation-in-part of Ser. No. 114,030, Oct. 26, 1987, abandoned. This application Apr. 25, 1988, Ser. No. 186,015

Int. Cl.[4] C07D *471/04*

U.S. Cl. 544—279 **8 Claims**

1. A process for the preparation of a compound of the formula:

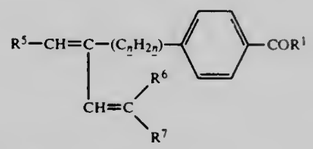


wherein:

R^1 is $—NHCH(COOR^2)CH_2CH_2COOR^3$, or OR^2 in which each of R^2 and R^3 is hydrogen or a carboxylic acid protecting group; and

n has a value of from 1 to 3;

which comprises allowing 2,4-diamino-6[1H]-pyrimidinone to react in an inert organic solvent with a compound of the formula:



in which R^1 and n are as herein defined;

R^5 is $—OR^8$ or



each of R^6 and R^7, independently of the other, is a strong electron withdrawing group; and

each of R^8 and R^9, independently of the other, is hydrogen or alkyl of 1 to 6 carbon atoms, or R^8 and R^9, together with the nitrogen atom to which they are attached, are pyrrolidino, morpholino, or piperidino.

4,895,947

PROCESS FOR PRODUCING 1-ACYL-2-PYRAZOLINE DERIVATIVE

Hiroyuki Yamashita, Fukuoka; Kunio Okumura, Kanagawa; Hajime Iizuka, Kanagawa, and Norio Ohto, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

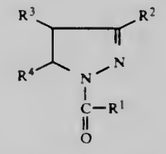
Filed Dec. 9, 1988, Ser. No. 281,748

Claims priority, application Japan, Dec. 17, 1987, 62-317446

Int. Cl.[4] C07D *403/12, 401/12, 231/06*

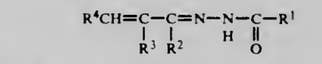
U.S. Cl. 544—405 **16 Claims**

1. A process for producing a 1-acyl-2-pyrazoline derivative represented by the formula (II)



(II)

where R^1 denotes a hydrogen atom, pyridyl group, pyrazinyl group, alkyl group, aryl group, or alkoxy group; and R^2, R^3, and R^4 independently denote a hydrogen atom, furyl group, pyridyl group, alkyl group, or aryl group, said process comprising cyclizing by heating an acylhydrazone derivative represented by the formula (I)



(I)

where R^1, R^2, R^3, and R^4 are defined as above.

4,895,948

PROCESS FOR PREPARATION OF OPAQUE QUINACRIDONES

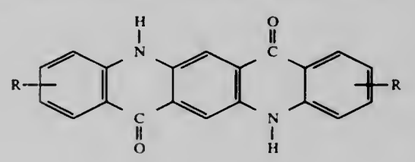
Edward E. Jaffe, and Johannes Pfeninger, both of Wilmington, Del., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,255

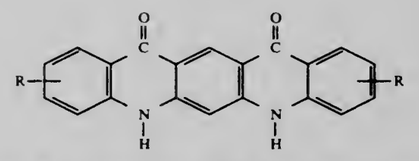
Int. Cl.[4] C09B *48/00*

U.S. Cl. 546—56 **10 Claims**

1. A process for the preparation of opaque disubstituted quinacridone compounds corresponding to the formulae



and



where R are independently F, Cl, Br, lower alkyl, or lower alkoxy, which consists essentially of milling the crude or subpigmentary form of the quinacridone compound in the presence of an amount 5-25 times the weight of said quinacridone compound of a low boiling alkanol or glycol and 0.5-10.0%, by weight of said alkanol or glycol, of an alkali metal hydrox-

ide or a quaternary ammonium hydroxide, and isolating the resulting opaque compound.

4,895,949

PROCESS FOR PREPARATION OF QUINACRIDONE SOLID SOLUTIONS

Edward E. Jaffe, and Johannes Pfenninger, both of Wilmington, Del., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,260
Int. Cl.[4] C09B 48/00
U.S. Cl. 546—56 **17 Claims**

1. A process for making a solid solution of at least two quinacridone compounds which consists essentially of milling the crude or subpigmentary quinacridone compounds at a temperature of 20°–40° C. in the presence of an amount 5–25 times the weight of the quinacridone compounds of a low boiling alkanol or glycol and 0.5–10.0%, by weight of said alkanol or glycol, of an alkali metal hydroxide or quaternary ammonium hydroxide, and isolating the resulting solid solution.

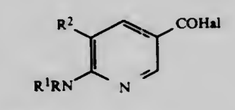
4,895,950

5-HALOGENO-6-AMINO-NICOTINIC ACID HALIDES

Hans Lindel, Leverkusen, and Werner Hallenbach, Langenfeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,047
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723069
Int. Cl.[4] C07D 213/72, 213/75, 213/78, 213/81
U.S. Cl. 546—309 **7 Claims**

1. A 5-halogeno-6-amino-nicotinic acid halide of the formula



(I)

in which
R represents hydrogen or alkyl,
R^1 represents hydrogen, alkyl or acyl,
R^2 represents halogen and
Hal represents halogen.

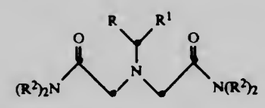
4,895,951

HETEROCYCLIC DIAMIDES AND METHOD FOR IMPROVING FEED UTILIZATION AND LACTATION IN RUMINANT ANIMALS

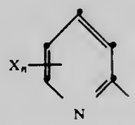
Alan W. White, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 81,048, Aug. 3, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,898
Int. Cl.[4] C07D 213/56, 215/16, 217.22, 221.12
U.S. Cl. 546—336 **7 Claims**

1. A compound of the formula:

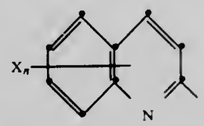


wherein R represents



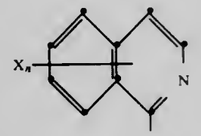
(a)

wherein n is an integer of 0 to 2, and each X, independently, represents lower alkyl, lower alkoxy, chloro, acetyl, nitro, bromo or carboalkoxy;



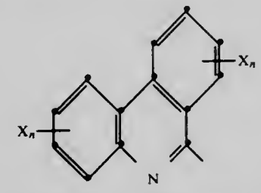
(b)

wherein n and each X, independently, have the same meaning as previously defined;



(c)

wherein n and each X, independently, have the same meanings as previously defined; or



(d)

wherein each n, independently, and each X, independently, have the same meaning as previously defined;
R^1 represents hydrogen, methyl or ethyl, and each R^2, independently, represents a straight or branched chain alkyl of 1 to 6 carbon atoms,
or the physiologically acceptable salts thereof.

4,895,952

POLYFLUOROALKYLTHIOMETHYL COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND USE THEREOF

Frederique Marty, Nice; Emile Rouvier, Tourrette-Le-Vens, and Aime Cambon, Nice, all of France, assignors to Atochem, Paris, France

Filed Dec. 29, 1986, Ser. No. 946,822
Claims priority, application France, Jan. 7, 1986, 86 00135
Int. Cl.[4] C07D 213/32
U.S. Cl. 546—339 **9 Claims**

1. A polyfluoroalkylthiomethyl compound of the formula:

$$R_F(CH_2)_m—S—CH_2—A$$

in which R_F is a straight-chain or branched perfluoroalkyl radical containing from 2 to 16 carbon atoms, m is an integer from 1 to 4, and A is an ammonium group derived from a secondary or tertiary amine, a phosphonium group, or an ionic or nonionic group —Q—$(CH_2)_n$—Z, in which Q is an oxygen or sulphur atom, n the number 0, 1 or 2, and Z an unsubstituted alkyl, aryl or alkylaryl radical.

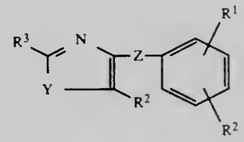
4,895,953

2-ARYL SUBSTITUTED HETEROCYCLIC COMPOUNDS AS ANTIALLERGIC AND ANTIINFLAMMATORY AGENTS

John H. Musser, Malvern; Reinhold H. W. Bender, Valley Forge, and Anthony F. Kreft, III, Trooper, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 103,224, Sep. 30, 1987, Pat. No. 4,826,990.
This application Feb. 15, 1989, Ser. No. 311,011
Int. Cl.[4] C07D 277/30, 233/26, 263/32
U.S. Cl. 548—204 **2 Claims**

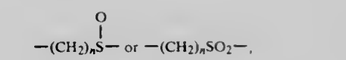
1. A compound having the formula



wherein

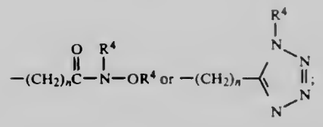
Y is —O—, —S— or —N(R⁴)—;

Z is $—(CH_2)_nO—$, $—(CH_2)_nS—$, $—(CH_2)_nN(R^4)—$, $—C(=O)—N(R^4)—$,



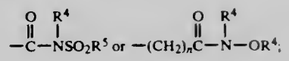
$—(CH_2)_nS(=O)—$ or $—(CH_2)_nSO_2—$,

R^1 is $—(CH_2)_n—C(=O)—NSO_2R^5$, $—(CH_2)_nC(=O)—OR^4$,

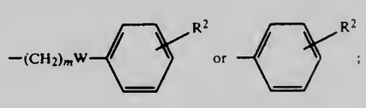


$—(CH_2)_nC(=O)—N(R^4)—OR^4$ or $—(CH_2)_n$—(triazole);

with the proviso that when Y is —S—, R^1 is $—(CH_2)_n$



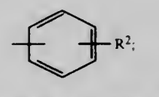
n is 0–5;
R^2 is hydrogen, loweralkyl, loweralkoxy, lower alkoxycarbonyl, trifluoromethyl, nitro, cyano or halo;
R^3 is $—(CH_2)_m$



W represents a bond or —O—, —S— or



m is 1–15;
R^4 is hydrogen or loweralkyl;
R^5 is lower alkyl, monofluoroloweralkyl, difluoroloweralkyl, polyfluoroloweralkyl, perfluoroloweralkyl or



and the pharmaceutically acceptable salts thereof.

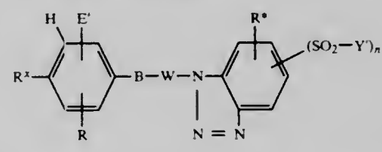
4,895,954

PRECURSORS FOR SYNTHESIS OF TRIPHENDIOXAZINE DYESTUFFS

Günther Schwaiger, Frankfurt am Main; Hartmut Springer, Königstein/Taunus, and Walter Helmling, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 76,927, Jul. 23, 1987, Pat. No. 4,816,574.
This application Oct. 28, 1988, Ser. No. 263,733
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3625346
Int. Cl.[4] C07D 249/18
U.S. Cl. 548—260 **19 Claims**

1. A compound of the formula



in which:
R^x denotes $H_2N—$ or $O_2N—$;
Y' denotes the vinyl group, the β-hydroxyethyl group or an ethyl group containing, in the β-position, a substituent which can be eliminated by means of an alkali;
B is an oxygen or sulfur atom or an amino group of the formula —NH— or —N(R')—
in which R' is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, phosphono, acetyloxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo;
E' denotes hydrogen, a sulfo or carboxy group or a group of the formula $—SO_2—Y'$, or E' is a sulfonamide group of the formula $—SO_2—NR^1R^2$,
in which R^1 is a hydrogen or an alkylene of 2 to 6 carbon atoms substituted by sulfo or sulfato, or is an alkylene of 2 to 6 carbon atoms substituted by sulfo or sulfato and interrupted by 1 or 2 hetero groups selected from the groups of the formulae —O—, —S—, —NH— and —N(R')— in which R' has one of the meanings given above, or R^1 is an alkylene of 2 to 6 carbon atoms substituted by carboxy or phosphato, or is an alkylene of 1 to 3 carbon atoms substituted by phosphono, or is naphthyl or phenyl or naphthyl or phenyl substituted by substituents which are selected from the group consisting of methyl, methoxy, ethoxy, chlorine, carboxy and

sulfo, and R^2 is hydrogen or is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of hydroxy, sulfato, carboxy, sulfo and methoxy, or E' is a sulfonamide group of the formula $—SO_2—NH—SO_2—R^3$ in which R^3 is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, phosphono, acetyloxy, sulfo, carboxy and phenyl, or R^3 is phenyl unsubstituted or substituted by 1 or 2 sulfo groups;

W is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from groups of the formulae —O—, —S—, $—SO_2—$, —CO—, —1,4-piperidino, —NH— and $—N(R^o)—$ in which R^o has one of the meanings of R' or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, phosphono, acetyloxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

W is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, phosphono, acetyloxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamoyl, carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or benzyl, or

W is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl or 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro, amino and amino mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, or

W is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moieties of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms;

R is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 5 carbon atoms, halogen, carboxy or sulfo;

n denotes the number 0 or 1, but n is only zero if E' is a group $—SO_2Y'$; in which Y' is β-sulfatoethyl; and

R^o denotes a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a halogen atom or a carboxy or sulfo group.

4,895,955

NON-RADIOACTIVE CARBODIIMIDE PRECURSOR TO NUCLEIC ACID PROBES

John P. Ford, Uradilla, N.Y.; Charles W. Blewett, Fort Mitchell, Ky.; Michael D. Soblett, Cincinnati, Ohio; Bernard F. Erlanger, Whitestone, N.Y., and Alan F. Cook, Cedar Grove, N.J., assignors to Lifecodes Corporation, Valhalla; Quantum Chemical Corporation and Trustees of Columbia University, both of New York, all of, N.Y.

Filed May 27, 1988, Ser. No. 199,570
Int. Cl.[4] C07D *495/04*
U.S. Cl. 548—303 **4 Claims**

1. A carbodiimide compound of the Formula I:

$$Z—L—W—N=C=N—R_1$$

wherein Z is a biotin group; L is a divalent linking group; W is an alkylene group of up to 24 carbon atoms which can be substituted with or interrupted by a water solubility enhancing group or cleavable S—S group; R_1 is alkyl or substituted alkyl of up to 18 carbon atoms.

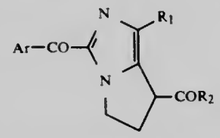
4,895,956

3-AROYL-6,7-DIHYDRO-5H-PYRROLO(1,2-C)IMIDAZOLE-7-CARBOXYLIC ACID DERIVATIVES

Masayoshi Tsuji, Tosu; Hisataka Inoue, Kurume; Yoshihiro Tanoue, Fukuoka; Kouichi Beppu, Tosu; Masaru Saita, Saga; Yasuaki Taniguchi, Tosu; Kenichi Furuta, Chikushino; Yoshiki Deguchi, Tosu, and Kanji Noda, Chikushino, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Ltd., Tosu, Japan

Filed Sep. 8, 1988, Ser. No. 242,331
Claims priority, application Japan, Sep. 10, 1987, 62-227702
Int. Cl.[4] C07D *487/04*
U.S. Cl. 548—324 **1 Claim**

1. A 3-aroyl-6,7-dihydro-5H-pyrrolo imidazole-7-carboxylic acid derivative of formula



wherein R_1 is hydrogen or halogen; Ar is unsubstituted phenyl or phenyl substituted by 1 to 5 halogen atoms, alkyl groups or alkoxy groups; and R_2 is hydroxy, alkoxy or $—NH—CH_2—COOH$.

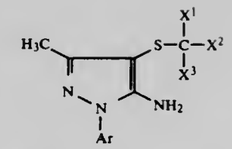
4,895,957

PROCESS FOR THE PREPARATION OF 4-SUBSTITUTED 3-METHYL-1-ARYL-5-AMINO-PYRAZOLES

Hauke Firstenwerth, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,698
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742612
Int. Cl.[4] C07D *231/44*
U.S. Cl. 548—362 **20 Claims**

1. A process for the preparation of a 4-substituted 3-methyl-1-aryl-5-amino-pyrazole compound of the formula



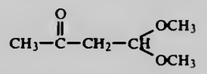
(I)

in which

X^1, X^2 and X^3 independently of one another each stand for halogen and

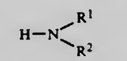
Ar stands for unsubstituted or substituted phenyl, comprising

(a) reacting a 3-ketobutyraldehyde dimethyl acetal of the formula (II)



(II)

with an amine of the formula (III)

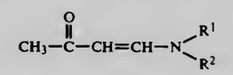


(III)

in which

R^1 and R^2 independently of one another each stand for hydrogen, alkyl, cycloalkyl or for in each case unsubstituted or substituted aralkyl, aryl or heteroaryl, or together with the nitrogen atom to which they are bonded stand for an unsubstituted or substituted heterocyclic ring which contains or does not contain one or more further hetero atoms,

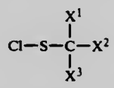
(b) reacting the resultant reaction mixture directly without isolation of an intermediate of the formula (IV)



(IV)

in which

R^1 and R^2 have the abovementioned meanings, with a trihalogenomethanesulphenyl chloride of the formula (V)

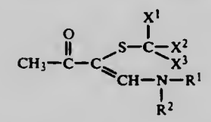


(V)

in which

X^1, X^2 and X^3 have the abovementioned meanings,

(c) reacting the resultant reaction mixture directly, without isolation of an intermediate of the formula (VI)



(VI)

in which

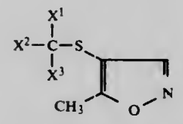
R^1, R^2, X^1, X_2 and X^3 have the abovementioned meanings, with hydroxylamine hydrochloride in the presence of an acid-binding agent and

(d) reacting the resultant reaction mixture directly with an arylhydrazine of the formula (IX)

$$Ar—NH—NH_2 \quad (IX)$$

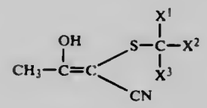
in which

Ar has the abovementioned meaning, without isolation of an intermediate of the formula (VII)



(VII)

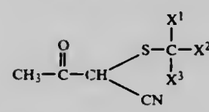
which, under the given reaction conditions, immediately react further to give an open-chain tautomer of the formula (VIIIa)



(VIIIa)

in which

X^1, X^2 and X^3 have the abovementioned meanings, and an open-chain tautomer of the formula (VIIIb)



(VIIIb)

in which

X^1, X^2 and X^3 have the abovementioned meanings.

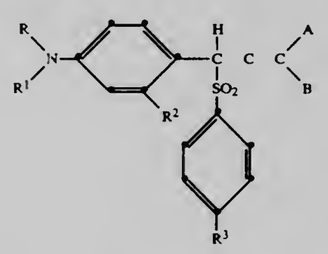
4,895,958

3-AMINOPHENYL-3-(PHENYLSULFONYL)-1,1-BIS-(AMINOPHENYL/INDOL-3-YL) PROPENES

William M. Hung, Cincinnati, Ohio, and James E. Kaemer, Maplewood, N.J., assignors to Hilton Davis Co., Cincinnati, Ohio

Division of Ser. No. 56,169, Jun. 1, 1987, Pat. No. 4,795,738. This application Jan. 3, 1989, Ser. No. 292,709
Int. Cl.[4] C07C *147/12*; C07D *209/10*
U.S. Cl. 548—455 **7 Claims**

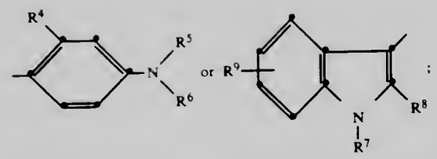
1. A 1-A-1-B-3-(2-R^2-4-N-R-N-R-N-R^1-aminophenyl)-3-(4-R^3-phenylsulfonyl)prop-1-ene having the formula



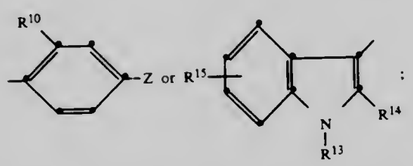
wherein:

A represents a moiety selected from the group consisting of

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B represents a moiety selected from the group consisting of



in which:

Z, represents-$NR^{11}R^{12}$; R, R^5 and R^{11} independently represent hydrogen; non-tertiary C_1 to C_{16} alkyl; phenyl; phenyl substituted by one or two of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro or halo; benzyl; or benzyl substituted in the benzene ring by one or two of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro or halo;

R^1, R^6 and R^{12} independently represent non-tertiary C_1 to C_{16} alkyl;

R^2, R^4 and R^{10} independently represent hydrogen, non-tertiary C_1 to C_{16} alkyl, non-tertiary C_1 to C_8 alkoxy, nitro or halo;

R^3 represents hydrogen, non-tertiary C_1 to C_{16} alkyl, non-tertiary C_1 to C_4 alkoxy, nitro or halo;

R^7 and R^{13} independently represent hydrogen; or non-tertiary C_1 to C_{16} alkyl unsubstituted or substituted by non-tertiary C_1 to C_{16} alkoxy, phenoxy, phenyl, phenyl substituted by one or two of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro or halo;

R^8 and R^{14} independently represent hydrogen, non-tertiary C_1 to C_4 alkyl or phenyl; and

R^9 and R^{15} independently represent one or two of hydrogen, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro or halo, and wherein R and R^1 together with the nitrogen can represent piperdinyl or pyrrolidinyl.

4,895,959

PURIFICATION OF N-METHYL-2-PYRROLIDONE

Toshikazu Kato; Hiroshi Inoue, and Kensuke Ogawara, all of Mie, Japan, assignors to Tosoh Corporation, Amagachi and Toso Steel Co., Ltd., Tokyo, both of, Japan

Filed Jun. 9, 1989, Ser. No. 363,692

Claims priority, application Japan, Jun. 10, 1988, 63-141613

Int. Cl.[4] C07D *207/267*

U.S. Cl. 548—555 **5 Claims**

1. A method of purifying N-methyl-2-pyrrolidone containing thiophenol and/or diphenyl disulfide which comprises adding a polyhalogenated aromatic compound and an alkali metal hydroxide and/or an alkali metal carbonate to the N-methyl-2-pyrrolidone containing thiophenol and/or diphenyl disulfide, heat-treating the mixture, and subjecting the mixture to separation by distillation.

4,895,960

CYCLO SUBSTITUTED PROPYLENEAMINE OXIME AND ITS USE AS A BRAIN IMAGING AGENT

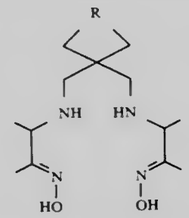
Edward A. Deutsch, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Filed Jan. 23, 1989, Ser. No. 300,617

Int. Cl.[4] A61K *49/02*; **C07D** *205/00, 305/00*; **C07C** *131/00*

U.S. Cl. 548—950 **2 Claims**

1. A chemical compound which is the d,l isomer of the following:



wherein R represents a bivalent radical completing a four or five member ring, and wherein R is selected from the group consisting of methylene, ethylene, —O—, —S—, a secondary amine and a C_1–C_{12} alkyl substituted tertiary amine.

4,895,961

PREPARATION OF ESTERIFIED RHODAMINE DYES

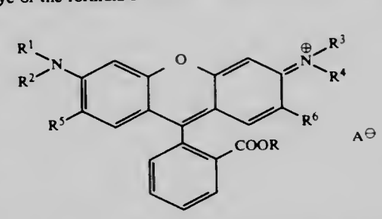
Karl Schmeidl, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,114

Int. Cl.[4] C07D *311/88*

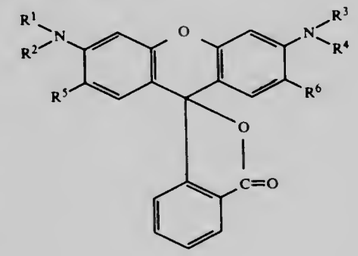
U.S. Cl. 549—227 **26 Claims**

1. A process for preparing a completely esterified rhodamine dye of the formula I



(I)

where R, R^2 and R^4 are identical or different and each is independently of the others methyl or ethyl, R^1 and R^3 are identical or different and each is independently of the other hydrogen, methyl or ethyl, R^5 and R^6 are identical or different and each is independently of the other hydrogen or methyl, and $A^\ominus$ is an anion, from a compound of the formula II



(II)

or from a corresponding water addition product by esterification with a dialkyl sulfate in a solvent, which comprises using γ-butyrolactone, alkylene carbonate, dialkyl carbonate, methoxypropyl acetate or a dialkyl phthalate as solvent and working in the presence of a molar excess of a base, based on the dialkyl sulfate.

4,895,962

2,4-DIPHENYL-1,3-DIOXANES

Andrew G. Brewster, Macclesfield; George R. Brown, Wilmslow, and Michael J. Smithers, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries plc, London, United Kingdom

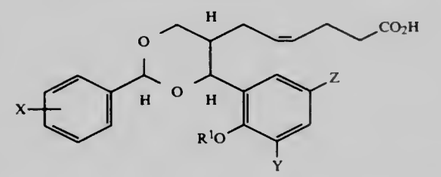
Division of Ser. No. 861,329, May 9, 1986, Pat. No. 4,775,685. This application Jul. 13, 1988, Ser. No. 218,251

Claims priority, application United Kingdom, May 10, 1985, 8511890

Int. Cl.[4] C07D *319/06*

U.S. Cl. 549—373 **1 Claim**

1. A compound of the formula IV



IV

wherein X is selected from fluoro, chloro, bromo, trifluoromethyl, cyano, methoxy, and nitro; and one of Y and Z is hydrogen or fluoro, and the other is hydrogen; and wherein the groups at positions 2, 4 and 5 of the dioxane ring have cis-relative stereochemistry and R^1 is (1–6C)alkyl; or a salt thereof.

4,895,963

1,3-DIOXAN-5-YL-HEXENOIC ACIDS

Andrew G. Brewster, and Michael J. Smithers, both of Macclesfield, United Kingdom, assignors to Imperial Chemical Industries plc, London, England

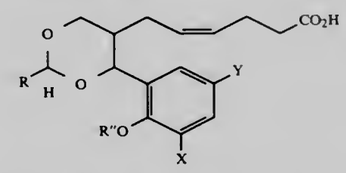
Division of Ser. No. 861,330, May 9, 1986, Pat. No. 4,772,625. This application Jul. 12, 1988, Ser. No. 217,851

Claims priority, application United Kingdom, May 10, 1985, 8511891

Int. Cl.[4] C07D *319/06*

U.S. Cl. 549—375 **1 Claim**

1. A compound of the formula II



II

wherein R is isopropyl, sec-butyl, isobutyl, or t-butyl; R'' is (1–6C)alkyl; and X and Y are hydrogen; and wherein the groups at positions 2, 4 and 5 of the dioxane ring have cis-relative stereochemistry; or a salt thereof.

4,895,964

QUARTERNARY AMMONIUM PENDANT SILOXANE COPOLYMERS

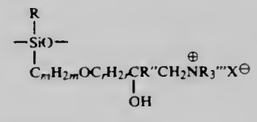
Anthony J. Margida, Marietta, Ohio, assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jul. 1, 1988, Ser. No. 214,512

Int. Cl.[4] C07F *7/10*

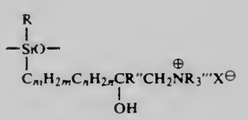
U.S. Cl. 556—425 **12 Claims**

1. A process for producing a quarternary ammonium pendant siloxane copolymer containing in the copolymer backbone the quarternary ammonium pendant siloxy unit of the structure:



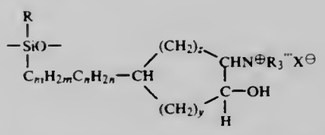
(D*)

or the siloxy unit:



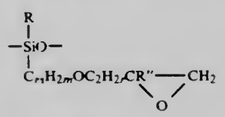
(E*)

or the siloxy unit:



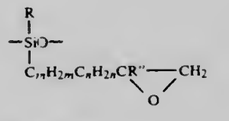
(E')

which comprises reacting an epoxy pendant siloxane copolymer containing in the copolymer backbone the epoxy pendant siloxy unit of the structure:



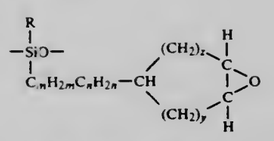
(D'')

or the siloxy unit:



(E'')

or the siloxy unit:



(E)

with a tertiary amine acid salt of the general formula $R_3'''N{\cdot}HX$ in contact with a catalytic amount of free tertiary amine catalyst of the general formula $R_3'''N$, said catalytic

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amount being at a ratio of from about 0.0005:1 to about 0.05:1 free tertiary amine equivalent to tertiary amine acid salt equivalent, wherein

R is an alkyl group having from 1 to 3 carbon atoms;

R'' is hydrogen or methyl;

R''' is a hydrocarbyl group having from 1 to about 20 carbon atoms;

X represents the charged anion of the inorganic or organic acid of the acid component used in preparation of the tertiary amine acid salt;

r has a value of from 1 to about 10;

m has a value of from 2 to about 4;

n has a value of from 0 to about 10;

y has a value of 1 or 2; and

z has a value of 1 to 3.

4,895,965

METHOD FOR MAKING CARBOXY ARYL TERMINATED ORGANOSILOXANES

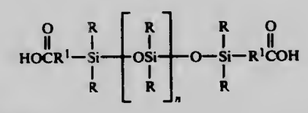
Matthew E. Langer, Guilderland, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1989, Ser. No. 344,789

Int. Cl.[4] C07F 7/08

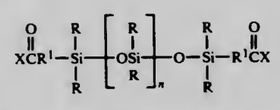
U.S. Cl. 556—439 **5 Claims**

1. A method for making carboxy aryl terminated organosiloxanes having the formula,



which comprises,

(1)hydrolyzing a haloacyl aryl terminated organosiloxane of the formula,



in the presence of an aqueous insert organic solvent mixture at a temperature in the range of from 25° C. to 100° C., and,

(2) recovering the resulting carboxyaryl terminated organosiloxane from the mixture of (1), where R is selected from the same or different $C_{(1-13)}$ monovalent hydrocarbon radicals and $C_{(1-13)}$ monovalent hydrocarbon radicals substituted with radicals inert during equilibration or condensation, R^1 is selected from the same or different divalent $C_{(6-13)}$ aromatic hydrocarbon radicals and divalent $C_{(6-13)}$ aromatic hydrocarbon radicals substituted with radicals inert during equilibration and condensation, n is a whole number equal to 0 to 10 inclusive and X is a halogen radical.

4,895,966

POLYMERIZABLE ORGANOSILANE COMPOUND

Toru Kubota; Toshinobu Ishihara, and Mikio Endo, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,923

Claims priority, application Japan, Aug. 2, 1988, 63-193011

Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—448 **7 Claims**

1. An organosilane compound represented by the general formula

$$ClFC{=}CF{-}O{-}(R^1{-}O{-})_m{-}(-^2{-})_n{-}CH{-}R^3{-}CH_2{-}SiR_3,$$

in which each R^1 is, independently from the others, an alkylene group having 1 to 10 carbon atoms, each R^2 is, independently from the others, an alkylene group having 1 to 10 carbon atoms, R^3 is a hydrogen atom or an alkyl group, each R is, independently from the others, a monovalent hydrocarbon group, alkoxy group or triorganosiloxy group, the subscript m is zero, 1, 2 or 3 and the subscript n is zero or 1.

4,895,967

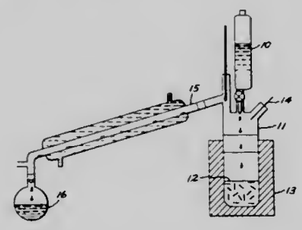
METHOD FOR MAKING CYCLIC POLY(SILOXANE)S

James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1988, Ser. No. 248,658

Int. Cl.[4] C07F 7/08

U.S. Cl. 556—451 **10 Claims**



1. A method for making cyclic poly(siloxane) which comprises,

(1) incrementally contacting substantially linear poly(organosiloxane) to a fixed catalyst bed at a temperature in the range of 200° C. to 800° C. and a pressure of from 760 to 0.01 torr in an oxygen-free atmosphere to produce volatile cyclic poly(siloxane), and

(2) condensing and thereafter recovering the volatile cyclic poly(siloxane) from (1), where the substantially linear poly(organosiloxane) consists essentially of from 3 to 20, chemically combined organosiloxy units selected from the class consisting of diorganosiloxy units, organohydrogen siloxy units and a mixture thereof.

4,895,968

ACID EQUILIBRATION METHOD FOR ORGANCPOLYSILOXANES HAVING CARBON-SILICON-BONDED AROMATIC ORGANIC RADICALS

Mark A. Buese, Upper Darby, Pa., and Sandra A. Swint, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,450

Int. Cl.[4] C07F 7/08, 7/10

U.S. Cl. 556—462 **9 Claims**

1. A method for equilibrating poly(aliphatic organicsiloxane) with organicpolysiloxane having aromatic organic radicals attached to silicon by carbon-silicon bonds, whereby the tendency of the aromatic organic radicals attached to silicon by carbon-silicon bonds to cleave is substantially reduced, which comprises:

(1) heating with agitation, a mixture comprising poly(aliphatic organicsiloxane) and an effective amount of acidic equilibration catalyst until the equilibration catalyst is uniformly dispersed throughout the resulting mixture and

(2) adding the organicpolysiloxane having aromatic organic radicals attached to silicon by carbon-silicon bonds to (1) and heating the resulting mixture with agitation until equilibration is effected.

4,895,969

PROCESS FOR THE PRODUCTION OF ORGANOSILANES

Kurt Feldner, Leverkusen; Bruno Degen, Much; Gebhard Wagner, Odenthal, and Manfred Schulze, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 370,353

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1988, 3823308

Int. Cl.[4] C07F 7/16

U.S. Cl. 556—472 **3 Claims**

1. In the production of an organochlorosilane by reaction of silicon or a silicon alloy with an alkyl or aryl chloride in the presence of a copper catalyst, the improvement which comprises employing the silicon or alloy in atomized form.

4,895,970

POLY(ALKYLENE CARBONATE) MONOAHLS AND POLYAHLS USEFUL AS SURFACTANTS

Robert F. Harris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 885,118, Jul. 14, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 223,462

Int. Cl.[4] C07C 154/00

U.S. Cl. 558—248 **12 Claims**

1. A modified poly(alkylene carbonate) polyahl containing at least one thiocarbonate moiety which is the reaction product of a poly(alkylene carbonate) polyahl represented by the formula

$$R^1[X(C(R^2)_2C(R^2)_2O)_y{-}(C(R^2)_2C(R^2)_2OCQ)_x(R^1(XA)_{n-1})_z{-}H]_n \quad (1)$$

wherein

R^1 is separately in each occurrence an n-valent hydrocarbon radical or hydrocarbon radical which contains one or more heteroatoms of the group consisting of O, N and S;

R^2 is separately in each occurrence hydrogen, halogen, nitro, cyano, C_{1-20} hydrocarbyl substituted with hydrogen or one or more of the group consisting of halo, cyano, nitro, thioalkyl, tert-amino, C_{1-20} alkoxy, C_{6-20} aryloxy, C_{7-24} aralkoxy, carbonyl-dioxy (C_{1-20}) alkyl, carbonyldioxy(C_{6-24}) aryl, carbonyldioxy(C_{7-20}) alkyl, C_{1-24} alkoxycarbonyl, C_{6-24} aryloxycarbonyl, C_{7-24} aralkoxycarbonyl, C_{1-20} alkylcarbonyl, C_{6-24} arylcarbonyl, C_{7-24} aralkylcarbonyl, C_{1-20} alkylsulfinyl, C_{6-24} arylsulfinyl, C_{7-24} aralkylsulfinyl, C_{1-24} alkylsulfonyl, C_{6-24} arylsulfonyl and C_{7-24} aralkylsulfonyl;

X is separately in each occurrence S, O, NH,

$$R^1[X(C(R^2)_2C(R^2)_2O)_y{-}(C(R^2)_2C(R^2)_2OCQ)_x(R^1(XA)_{n-1})_z{-}H]_n \quad (I)$$

A is separately in each occurrence

$$+C(R^2)_2C(R^2)_2{-}OCQ\frac{}{x},\ +C(R^2)_2C(R^2)_2{-}O\frac{}{y},$$

combinations thereof, or a covalent bond;

Q is separately in each occurrence O, S or NH provided that all carbonate moieties are not terminal:

n is separately in each occurrence an integer of from 1 to 25;

x is separately in each occurrence an integer of from 1 to 40;

y is separately in each occurrence an integer of from 1 to 120; and

z is separately in each occurrence an integer of from 0 to 5; and one or more C_{1-20} aliphatic monomercaptans, C_{5-20} cycloaliphatic monomercaptans, C_{6-24} arylmonomercaptans, alkylene dimercaptans having 5–24 carbon atoms, arylene dimercaptans having 6–24 carbon atoms, aralkylene dimercaptans having 7 to 24 carbon atoms, mercaptoalcohols having from about 8 to about 20 carbon atoms, mercaptoacids having from about 8 to 20 carbon atoms or mercaptoamines having from about 8 to about 20 carbon atoms.

4,895,971

PROCESS FOR THE PRODUCTION OF IMINODIACETONITRILE

Jow-Lih Su, Silver Spring, and Martin B. Sherwin, Potomac, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,413

Int. Cl.[4] C07C 120/00

U.S. Cl. 558—346 **28 Claims**

1. An improved process for the production of iminodiacetonitrile prepared by

(a) contacting under reaction conditions in a reactive absorber

(1) hydrogen cyanide

(2) formaldehyde

(3) ammonia

(b) scrubbing the reaction products from (a) supra with an aqueous scrubbing solution,

(c) recovering the product,

wherein the improvement comprises: using as a source of hydrogen cyanide in step

(a) the direct unpurified reactor product gases of a hydrogen cyanide production process comprising a gaseous mixture of hydrogen cyanide and ammonia,

using as a source of formaldehyde in step (a) the direct unpurified reactor product gases of a formaldehyde production process comprising a gaseous mixture of formaldehyde and water.

4,895,972

PROCESS FOR LOWERING THE DIELECTRIC CONSTANT OF POLYIMIDES USING DIAMIC ACID ADDITIVES

Diane M. Stoakley, and Anne K. St. Clair, both of Poquoson, Va., assignors to The United States of American as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 1, 1988, Ser. No. 239,259

Int. Cl.[4] C08G 69/26

U.S. Cl. 528—353 **9 Claims**

1. A method for producing high temperature linear aromatic polyimide films and coatings having low dielectric constants comprising:

forming a polyamic acid solution by chemically reacting equimolar quantities of an aromatic diamine and an aromatic dianhydride in a solvent medium;

adding a diamic acid additive to the polyamic acid solution so that the concentration of the diamic acid additive is about 1–20 percent by weight based on the percent solids in the polyamic acid resin, the diamic acid additive being selected from the group consisting of:

2,2-bis(3,4-dicarboxyphenyl)hexafluoropropane dianhydride-aniline diamic acid;

3,3,'-diaminodiphenylsulfone-phthalic anhydride diamic acid;

4,4,'-oxydiphthalic anhydride-aniline diamic acid;

2,2-bis[4(4-aminophenoxy)phenyl]hexafluoropropane-phthalic anhydride diamic acid;

2,2-bis[4(3-aminophenoxy)phenyl]hexafluoropropane-phthalic anhydride diamic acid; and

4,4'-oxydianiline-phthalic anhydride diamic acid;

applying onto a surface a desired thickness film layer of the polyamic acid solution containing the diamic acid additive; and

thermally curing the applied film in the temperature range of

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250° C. to 300° C. for at least one hour to yield a low dielectric polyimide film layer.

4,895,973

SUBSTITUTED GLUTARIC ACID LACTONES IN THE TREATMENT OF HYPERLIPIDEMIA

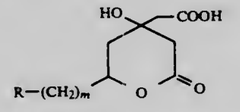
John S. Baran, Winnetka; Thomas J. Lindberg, Wheaton, and Harman S. Lowrie, Northbrook, all of Ill., assignors to G. D. Searle & Company, Chicago, Ill.

Continuation of Ser. No. 896,493, Aug. 14, 1986. This application Dec. 21, 1988, Ser. No. 287,820

Int. Cl.[4] C07C *69/76, 69/74, 69/66*

U.S. Cl. 560—060 **1 Claim**

1. An intermediate for the synthesis of a compound of the formula:



wherein R represents cycloalkyl, aryl, methyl or a group of the formula:



wherein R^1 represents cycloalkyl or phenyl; and m is an integer of from 9 to 13 inclusive; said intermediate comprising a compound of the formula:

$$R(CH_2)_mCHOHCH_2CO_2C_2H_5$$

wherein R and m are as defined above, with the proviso that when R is methyl, then m cannot equal 11.

4,895,974

FUNGICIDES

Patrick J. Crowley, Crowthorne, England, assignor to Imperial Chemical Industries PLC, London, England

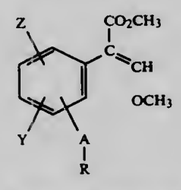
Filed May 16, 1988, Ser. No. 194,692

Claims priority, application United Kingdom, May 15, 1987, 8711538

Int. Cl.[4] C07C *69/76*

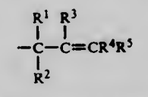
U.S. Cl. 560—060 **8 Claims**

1. A compound of the formula (I):



(I)

and stereoisomers thereof, in which A is oxygen or sulphur; Z and Y are independently hydrogen, halogen, optionally substituted alkyl, nitro or cyano; and R, is the group



in which R^1 and R^2 are independently hydrogen or alkyl; and R^3, R^4 and R^5 are independently hydrogen, halogen, alkyl, haloalkyl or alkoxy provided at least one of R^4 and R^5 is halogen.

4,895,975

DIACETYLENE COMPOUND AND PROCESS FOR PRODUCTION OF POLYMER CONTAINING DIACETYLENE GROUPS FROM THE DIACETYLENE COMPOUND

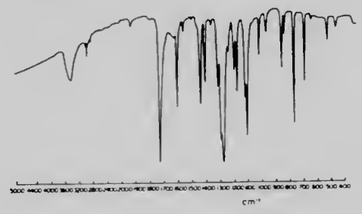
Eisuke Fujiwara, Ami, Japan, assignor to Kozo Iizuka, Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,906

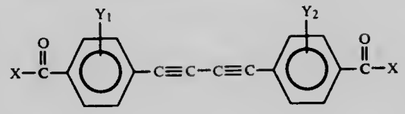
Claims priority, application Japan, May 6, 1987, 62-108974

Int. Cl.[4] C07C *63/24*

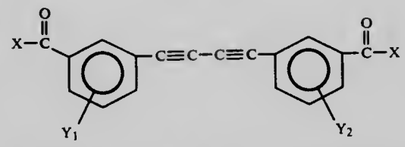
U.S. Cl. 560—083 **9 Claims**



1. A diacetylene compound of the formula:



or



wherein X is hydroxyl, halogen, alkoxy, a monavalent hydrocarbon having from 1 to 20 carbon atoms or a —OM group wherein M is an alkali metal, and each of Y_1 and Y_2 which are the same or different, is hydrogen, a monavalent organic group having from 1 to 20 carbon atoms or halogen.

4,895,976

PREPARATION OF 4-PENTANOATES BY ISOMERIZATION

Patrick M. Burke; Norman Herron, both of Wilmington, and Stephan J. McLain, Hockessin, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 23, 1988, Ser. No. 197,221

Int. Cl.[4] C07C *67/30*

U.S. Cl. 560—211 **5 Claims**

2. A process for the isomerization of a compound having the formula: $CH_3—CH=CH—CH_2—CO_2R$ where R is alkyl of 1 to 8 carbon atoms, which comprises contacting said compound with a nickel hydride complex of the formula $HNi(PYZ)_n+X—$ where P is phosphorus, Z is selected from the class consisting of R' and OR' wherein R' is selected from the class consisting of hydrocarbyl radicals of up to 18 carbon atoms and hydrocarbyl radicals of up to 18 carbon atoms substituted with groups selected from the class consisting of

and hydrocarbyl radicals of up to 18 carbon atoms two Z's and the groups of the formula —R"— consisting and —O—R'—O— wherein —R"— is a hydrocarbylene radical of from 2 to 12 carbon atoms and wherein n is an integer, namely 3 or 4, and X— is an anion of a strong homogeneous acid or a heterogeneous acid, at a temperature in the range of 80 to 200 degrees C. for a time up to about one hour at a pressure in the range of about 15 to 200 psig, and recovering a compound having the formula $CH_2=CH_2—CH_2—CH_2—CO_2—R$.

4,895,977

PURIFICATION OF ALKANESULFONIC ACIDS USING OZONE

Martin Nosowitz, Easttown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 12, 1988, Ser. No. 283,112

Int. Cl.[4] C07C *139/00*

U.S. Cl. 562—124 **9 Claims**

1. A process for removing oxidizable organic impurities, which include an alkyl alkanethiolsulfonate, from an alkanesulfonic acid comprising contacting said alkanesulfonic acid with an ozone-containing gas at a temperature of from about 20° C. to 100° C.

4,895,978

OXIDATION OF PSEUDOCUMENE TO TRIMELLITIC ACID ENHANCED BY LOW GRAM ATOM RATIOS OF ZIRCONIUM TO TRANSITION METAL IN OXIDATION CATALYST SYSTEM

John K. Daris, and Alan G. Bemis, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 383,267, May 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 242,551, Mar. 11, 1981, abandoned. This application May 19, 1986, Ser. No. 864,813

Int. Cl.[4] C07C *51/16*

U.S. Cl. 562—416 **3 Claims**

1. The method of oxidation of liquid pseudocumene in the presence of acetic acid in the weight ratio to pseudocumene of from 0.6:1.0 up to 3.5:1.0 at a temperature of from 175° C. up to 225° C. in the presence of a system of catalysis based on one gram mole of pseudocumene of from 2.25 up to 5.1 milligram atoms of bromine, a total of from 2.5 up to 5.5 milligram atoms of transition metals cobalt, manganese and cerium and from 0.005 up to 0.075 milligram atoms of zirconium per milligram atom of total transition metal.

4,895,979

PROCESS FOR PREPARING CARNITINE

Ryoji Noyori; Masato Kitamura, both of Aichi; Takeshi Ohkuma, Gumma, and Hidenori Kumobayashi, Kanagawa, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

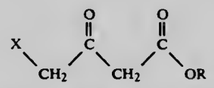
Filed Feb. 21, 1989, Ser. No. 313,007

Claims priority, application Japan, Feb. 19, 1988, 63-37032

Int. Cl.[4] C07C *51/09, 53/124*

U.S. Cl. 562—567 **2 Claims**

1. A process for preparing carnitine which comprises asymmetrically hydrogenating a γ-halogeno-β-keto ester represented by formula (I):



(I)

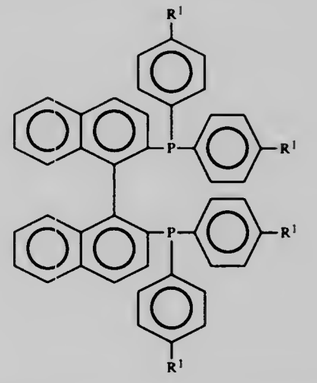
wherein X represents a chlorine atom or a bromine atom; and R represents a lower alkyl group, in the presence of a ruthenium-optically active phosphine complex represented by formula (II), (III) or (IV):

$$Ru_2Cl_4(L)_2(C_2H_5)_3N \quad \text{(II)}$$

$$Ru(OCOR^2)_2(L) \quad \text{(IV)}$$

$$RuX_2(L) \quad \text{(V)}$$

wherein L represents 2,2'-bis(di-p-R^1-phenylphosphino)-1,1'-binaphthyl of formula (III):



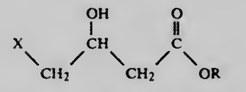
(III)

wherein

R^1 represents a hydrogen atom, a methyl group, or a t-butyl group;

R^2 represents a lower alkyl group or a trifluoromethyl group; and X is as defined above,

as a catalyst at a temperature of from 70° to 150° C. to obtain an optically active alcohol represented by formula (VI):



(VI)

wherein X and R are as defined above, and then reacting the optically active alcohol as obtained with trimethylamine without isolation.

4,895,980

METHOD OF MANUFACTURING MAGNESIUM POTASSIUM CITRATE

Neill B. Waisdorf, San Antonio, Tex., assignor to Mission Pharmacal Company, Inc., San Antonio, Tex.

Division of Ser. No. 140,818, Jan. 5, 1988. This application Jan. 27, 1989, Ser. No. 303,537

Int. Cl.[4] C07C *51/43*

U.S. Cl. 562—584 **9 Claims**

1. A method for producing a magnesium potassium citrate composition comprising the steps of:

Mixing citric acid and water with uninterrupted agitation;

While still agitating, gradually adding a magnesium compound and a potassium compound thereto in such proportions that the mixture thus formed comprises magnesium ions, potassium ions and citrate ions in a ratio of about 1:4:2, and the moisture content of the mixture ranges between about 10 weight percent and about 20 weight percent;

Blending the resultant composition to a granular mass; and thereafter

Milling and drying the granular mass to form a magnesium potassium citrate composition having the desired particle size and moisture content.

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4,895,981

PROCESS FOR IMPROVING THE PHOTOCHEMICAL STABILITY OF DYEINGS ON POLYESTER FIBRE MATERIALS

Gerhard Reinert, Allschwil, and Kurt Burdeska, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

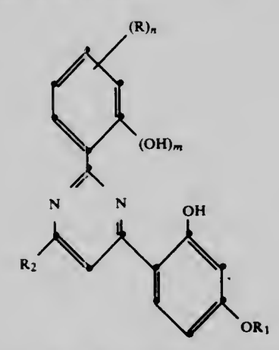
Continuation of Ser. No. 156,771, Feb. 17, 1988. This application Mar. 24, 1989, Ser. No. 331,071

Claims priority, application Switzerland, Feb. 27, 1987, 751/87; Oct. 1, 1987, 3820/87

Int. Cl.[4] C09B *67/10*; C07D *239/70*

U.S. Cl. 8—565 **10 Claims**

1. A process for improving the photochemical stability of dyeings on polyester fibers which process comprises applying on said fibers from an aqueous liquor by the exhaustion process a compound of the formula



(I)

in which R is alkyl, alkoxy, halogen or hydroxyl, R_1 is alkyl, R_2 is hydrogen, halogen, alkyl, alkylamino, hydroxyalkylamino, aralkylamino, alkoxyalkylamino, alkenyl, alkoxy, alkoxy which is substituted by hydroxyl, carboxyl or C_2-C_5alkoxycarbonyl, aklenyloxy, phenyl or phenyl which is substituted by halogen, alkyl, hydroxy-C_1–C_4alkyl, alkenyloxy, alkoxy, hydroxyl or carboxy-C_1–C_4alkoxy, m is 0 to 1 and n is 0, 1 or 2.

4,895,982

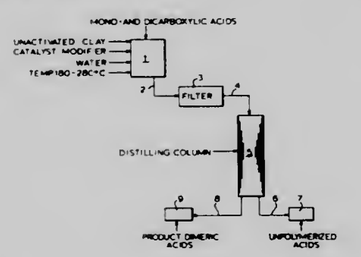
TRICARBOXYLIC ACIDS

Mark S. Pavlin, Lawrenceville, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Jun. 20, 1986, Ser. No. 876,451

Int. Cl.[4] C07C *57/02*

U.S. Cl. 562—595 **10 Claims**



1. Tricarboxylic acids having 34, 35, 36, 38 or 40 carbon atoms prepared by:

providing a mixture of acids which comprises an unsaturated dicarboxylic acid selected from the group consisting of unsaturated dicarboxylic acids having 16, 17, 18, 20 or 22 carbon atoms and an unsaturated monocarboxylic acid having 18 carbon atoms;

heating the acid mixture to a temperature of from 180° C. to 280° C. in the presence of a catalytic proportion of an unactivated clay, from 0.5 to 6 milliequivalent per gram of clay catalyst of a compound selected from the group consisting of an alkali or alkaline earth metal salt, and 0.05 to 5 percent by weight of acid of water.

4,895,983

PROCESS FOR PRODUCING METHYLOL UREA SOLUTION AND PROCESS FOR PRODUCING SLOW-RELEASING NITROGENOUS FERTILIZER USING THE SAME

Kiyoshi Nakayama, Yamato; Hiroshi Aoki, Kawasaki, and Hisato Saitoh, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

Continuation of Ser. No. 932,653, Nov. 19, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 338,444

Claims priority, application Japan, Nov. 21, 1985, 60-261880

Int. Cl.[4] C07B *41/02*; C07C *127/15*

U.S. Cl. 564—60 **20 Claims**

1. A process for producing a methylol urea solution which comprises an addition reaction between urea and formaldehyde in the presence of water and at least one alikali selected from the group consisting of alkali metal salts of pyrophosphoric acid and tripolyphosphoric acid, wherein the addition reaction is carried out at a temperature in the range of room temperature to 100° C. and at a pH of from 7 to 10, using 0.4 to 3moles of the urea to 1 mole of the formaldehyde in the presence of 0.5 to 9%, by weight based on the formaldehyde, of said alkali.

4,895,984

ACYLATION OF AROMATICS

Manfred Eggersdorfer, Frankenthal; Hardo Siegel, Speyer; Alfred Schuhmacher, Ludwigshafen; Walter Groech, Edingen-Neckarhausen, and Jochem Henkelmann, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 54,574, May 27, 1987, abandoned. This application May 25, 1988, Ser. No. 198,676

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619169; Dec. 11, 1986, 3642329

Int. Cl.[4] C07C *45/46*

U.S. Cl. 568—319 **15 Claims**

1. In a process for the acylation of benzene substituted by a branched-chain amyl group, using a Friedel-Crafts catalyst selected from the group consisting of $FeCl_3$, BF_3, $ZnCl_2$, $TiCl_4$, aluminum bromide and aluminum chloride, to produce the corresponding amyl-substituted phenyl ketone, the improvement which comprises carrying out the acylation in the presence of an organometallic compound which is a metalalkyl or metalalkyl halide of a metal selected from the group consisting of aluminum, magnesium, boron, tin, zinc and titanium as a cocatalyst.

4,895,985

PREPARATION OF CYCLOPENTANONE

Martin Decker, Ludwigshafen; Harro Wache, Fussgoenheim, and Wolfgang Franziechka, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,210

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730185

Int. Cl.[4] C07C *45/45*

U.S. Cl. 568—355 **6 Claims**

1. A process for the preparation of cyclopentanone from adipic acid wherein adipic acid vapor in an inert gas at a temperature of from 250° C. to 450° C., possibly accompanied by water vapor, is passed over an oxygenous acidic catalyst, which comprises silica mixed with phosphoric acid or a hydrogen phosphate or a basic catalyst, which comprises alumina mixed with elements of subgroups 1A or 2A of the periodic table.

4,895,986

2,2'-DIFLUORO-4-ALKOXY-4'-HYDROXYDIPHENYLS AND THEIR DERIVATIVES, THEIR PRODUCTION PROCESS AND THEIR USE IN LIQUID CRYSTAL DISPLAY DEVICES

Claude Vauchier, Goncelin, and Francoise Vinet, Grenoble, both of France, assignors to Commissariat a l'Energie, Paris, France

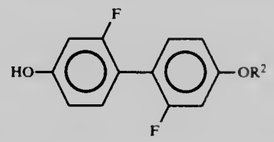
Division of Ser. No. 19,058, Feb. 26, 1987, Pat. No. 4,795,579. This application Sep. 15, 1988, Ser. No. 244,908

Claims priority, application France, Feb. 28, 1986, 86 02858

Int. Cl.[4] C07C *43/23*; C09K *19/12*

U.S. Cl. 568—643 **2 Claims**

1. A 2,2'-difluoro-4-alkoxy-4'-hydroxydiphenyl according to formula:



(II)

in which R^2 represents a straight or branched alkyl radical with 1 to 12 carbon atoms.

4,895,987

PHOSPHONITE-AND PHOSPHONITE-PROMOTED RUTHENIUM - COBALT CATALYSTS FOR THE DEALKOXYHYDROXYMETHYLATION OF ACETALS TO FORM GLYCOL ETHERS

D. Michael Duggan, Drexel Hill; James E. Lyons, Wallingford; Harry K. Myers, Cochranville, all of Pa., and Robert E. Ledley, Hockessin, Del., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Jun. 6, 1986, Ser. No. 871,351

Int. Cl.[4] C07C *41/28, 43/20*

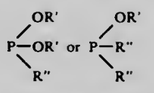
U.S. Cl. 568—648 **22 Claims**

1. Process for the dealkoxyhydroxymethylation of an aldehyde acetal of the formula



wherein R is hydrogen, alkyl, cycloalkyl, or aryl; R^1 and R^2, which may be same or different, are alkyl, cycloalkyl, aryl and wherein when R^1 and R^2 are alkyl, they may be joined together to form a cyclic acetal, to form the corresponding glycol monoether, which comprises reacting said acetal, which has been formed separately or in situ, with syngas in the presence of a catalytically effective amount of a catalyst system comprising:

(a) a promoter of the formula



or mixtures thereof, wherein R' and R'', each of which may be the same or different, are hydrogen,, alkyl, cycloalkyl, or aryl; and wherein when the R' groups are alkyl, they may be joined together to form a cyclic compound; and

(b) a ruthenium-cobalt metal cluster compound; or

(c) a mixture of cobalt-containing compounds and ruthenium-containing compounds; or

(d) cobalt-containing compounds.

4,895,988

PROCESS FOR THE MUTUAL CONDENSATION OF AROMATIC AND CARBONYLIC COMPOUNDS

Mario G. Clerici, Milan, and Giuseppe Bellussi, Piacenza, both of Italy, assignors to Eniricerche S.p.A., Milan; Enichem Sythesis S.p.A., Palermo and Snamprogetti S.p.A., Milan, all of, Italy

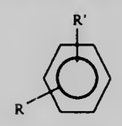
Filed Oct. 20, 1987, Ser. No. 110,329

Claims priority, application Italy, Oct. 22, 1986, 22073 A/86

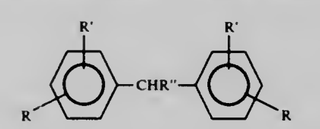
Int. Cl.[4] C07C *37/20, 39/12*

U.S. Cl. 568—727 **20 Claims**

1. A process for producing aromatic condensation products comprising: condensing an aromatic compound having the following general formula:



with a carbonyl compound of the general formula R''CHO to produce a diaryl-alkane of the general formula:



wherein:

R, R' are independently selected from the group consisting of hydrogen, hydroxyl, alkoxy, and halogen; and

R'' is selected from the group consisting of hydrogen and substituted or non-substituted alkyl or aryl, wherein the reaction temperature is from about room temperature to about 200° C., and wherein the reaction is conducted in the presence of a catalyst comprising a zeolite having a pore size not greater than about 6Å in diameter.

4,895,989

PROCESS FOR PRODUCING ALKALI METAL ALCOHOLATES

Ulrich Sander, Friedrichsdorf; Pavel Soukup, Hammersbach; Harald Heinrich, Frankfurt am Main, and Wilfried Weiss, Oberursel, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,759

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723193

Int. Cl.[4] B01D *13/00*; C07C *31/30*

U.S. Cl. 568—851 **9 Claims**

1. A process for producing an alkali metal alcoholate, comprising the steps of:

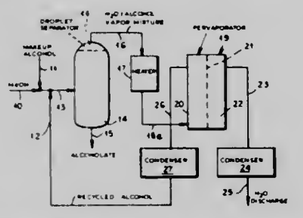
(a) mixing an alkali metal hydroxide with an alcohol capable of reacting therewith to form an alcoholate and reacting the resulting mixture at a temperature of 50° to 110° C. under a pressure of 0.3 to 1.2 bar to produce an alkali metal alcoholate and a vapor-phase alcohol-water mixture

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and separating the alkali metal alcoholate from the vapor phase alcohol-water mixture;

(a_1) heating said vapor-phase alcohol-water mixture to a temperature above the reaction temperature in step (a) but less than 120° C. prior to separation of the vapor-phase alcohol-water mixture;

(b) separating the components of said vapor-phase alcohol-water mixture by pervaporation through at least one membrane with one of said components permeating said



membrane while the other component is retained thereby to recover alcohol vapor and water vapor from said vapor-phase alcohol-water mixture;

(c) separately condensing the recovered alcohol and water vapors of step (b);

(d) recycling condensed alcohol from step (c) to step (a) for reaction with alkali metal hydroxide; and

(e) recovering the alkali metal alcoholate produced in step (a).

4,895,990

FLUORINATED POLYCYCLIC COMPOUNDS

Colin R. Sargent, and David E. Wotton, both of Bristol, Great Britain, assignors to I.S.C. Chemicals Limited, London, England

Filed Jun. 24, 1987, Ser. No. 66,709

Claims priority, application United Kingdom, Jun. 24, 1986, 8615400

Int. Cl.⁴ C07C *19/08*

U.S. Cl. 570—130 **3 Claims**

1. A fully fluorinated and fully saturated perfluorocarbon, consisting of a diarylmethane derivative containing at least two saturated six-membered rings, condensed or non-condensed, seventeen carbon atoms and from 28–32, inclusive, fluorine atoms, and having a boiling point from 250 degrees C. to 265 degrees C.

4,895,991

METHOD OF PREPARATION OF TRIFLUOROMETHYL COPPER AND TRIFLUOROMETHYL AROMATICS

Donald J. Burton, Iowa City; Denise M. Wiemers, West Branch, and Jerome C. Easdon, Iowa City, all of Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Continuation of Ser. No. 4,035, Jan. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 809,291, Dec. 16, 1985, Pat. No. 4,650,887, which is a division of Ser. No. 651,163, Sep. 17, 1984, Pat. No. 4,582,921. This application Jan. 25, 1989, Ser. No. 302,587

Int. Cl.⁴ C07C *17/26, 17/28, 17/24*

U.S. Cl. 570—144 **4 Claims**

1. The method of preparation of trifluoromethyl aromatics of the formula $Ar(CF_2)_nCF_3$ from a difluorodihalomethane of the formula CF_2XY, comprising:

reacting an aromatic halide with a difluorodihalomethane of the formula CF_2XY wherein X and Y are halogens but are not fluorine, with copper metal in the presence of a small but chain extension suppression effective amount of fluoride ion to provide a perfluoroalkyl aromatic of the formula $Ar(CF_2)_nCF_3$, wherein n is from 0 to 20.

4,895,992

PROCESS FOR PREPARING IODINATED AROMATIC COMPOUNDS AND THE REGENERATION OF CATALYSTS USED THEREIN

Mark Rule; Gerald C. Tustin, both of Kingsport; Donald L. Carver, Church Hill, and Jerry S. Fanver, Blountville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 70,249, Jul. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 29,898, Mar. 25, 1987, Pat. No. 4,792,642. This application Sep. 19, 1988, Ser. No. 246,154

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.⁴ C07C *17/15, 21/24*; B01J *29/38, 21/20*

U.S. Cl. 570—203 **16 Claims**

1. A process for oxyiodinating a hydrocarbon aromatic compound, comprising:

reacting a hydrocarbon aromatic compound with iodine in the presence of oxygen over a combined catalyst, said combined catalyst comprising an iodination catalyst selected from the group consisting of zeolites, acidic silica-aluminas and alumina, silica, silica-alumina and titania inert supports containing alkali or alkaline earth cations, and containing less than about 1 wt. % of an oxidation catalyst selected from the group consisting of Rh, Cr, Ru cations and mixtures thereof, to produce an iodoaromatic compound, wherein said reacting is continued until said combined catalyst is at least partially deactivated by carbon deposits;

separating said hydrocarbon aromatic compound and iodine from said deactivated combined catalyst; and

heating said deactivated catalyst in the presence of an amount of oxygen, at a temperature and for a time sufficient to remove the carbon deposits by combustion to produce a regenerated combined catalyst.

4,895,993

PROMOTERS FOR HALOALKENE ISOMERIZATION

H. Wayne Mark, Summerville, S.C.; Richard C. Doss, and Clarence R. Bresson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1988, Ser. No. 244,342

Int. Cl.⁴ C07C *17/24, 17/00*

U.S. Cl. 570—236 **15 Claims**

1. A process for isomerizing a haloalkene of the general formula R—CH(Y)—CH=CH—CH_2(X) that is either a cis- or trans-isomer where R is H, an alkyl or aryl group, X is Cl, Br, or I and Y is H, Cl, Br or I, comprising the steps of:

heating the haloalkene; and

adding a catalyst comprised of a mixture of a copper compound and a dithiocarbonic or trithiocarbonic acid derivative.

4,895,994

SHAPED CATALYSTS AND PROCESSES

Wu-Cheng Cheng, Columbia; Christian B. Landsager, Ashton, and Robert M. Spotnitz, Baltimore, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 181,357, Apr. 14, 1988, Pat. No. 4,826,799. This application Oct. 18, 1988, Ser. No. 245,494

Int. Cl.⁴ C07C *5/02*

U.S. Cl. 585—270 **8 Claims**

1. In a catalytic process for using a catalyst made by the Raney process, the improvement comprising using as the catalyst made by the Raney process a catalyst selected from the group consisting of:

I. shaped catalyst made by the Raney process compositions comprising an intimate mixture of:

(a) particles of Raney process metal, present in an amount of about 15–50 parts by weight;

(b) high molecular weight polymer, present in an amount of about 1–30 parts by weight; and

(c) homogeneous voids within the mixture, present in an amount of about 0.1–90 volume % of the total mixture; said composition having a BET surface area of about 20–80 m^2/g, a macroporosity of about 0.1–70% of total porosity, a shaped density of about 0.8–2.0 g/cc, and a packed shape density of about 0.5–1.4 g/cc; and

II. shaped catalyst made by the Raney process composition comprising:

Raney process metal, cemented together with alpha-alumina, said shaped catalyst composition comprising 15–50 parts by weight of Raney process metal, 1–42 parts by weight of alumina, 0.1–90 volume % voids, having a density of about 1–1.7 g/cc, a packed density of about 0.6–1.3 g/cc, a BET surface area of about 20–80 m^2/g, and a macroporosity from about 0.1–70% of the total porosity.

4,895,995

PROCESS FOR THE SIMULTANEOUS HYDROCONVERSION OF A FIRST FEEDSTOCK COMPRISING UNSATURATED, HALOGENATED ORGANIC COMPOUNDS AND A SECOND FEEDSTOCK COMPRISING SATURATED, HALOGENATED ORGANIC COMPOUNDS

Robert B. James, Jr., Northbrook, and Tom N. Kalnes, La Grange, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 2, 1988, Ser. No. 278,991

Int. Cl.⁴ C10C *1/00*

U.S. Cl. 585—310 **19 Claims**

1. A process for the simultaneous hydrodehalogenation of a first feedback comprising unsaturated, halogenated organic compounds and a second feedstock comprising saturated, halogenated organic compounds which process comprises:

(a) contacting said first feedstock comprising unsaturated, halogenated organic compounds with hydrogen in a first hydrogenation reaction zone operated at hydrogenation conditions selected to minimize the polymerization of unsaturated organic compounds and to produce a first hydrogenated stream comprising hydrocarbonaceous compounds;

(b) contacting at least a portion of said first hydrogenated stream and said second feedstock comprising saturated, halogenated organic compounds with hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce a second hydrogenated stream comprising hydrogenated hydrocarbonaceous compounds and residual trace quantities of halogenated organic compounds and to generate at least one water-soluble hydrogen halide compounds;

(c) contacting the resulting effluent from said second hydrogenation zone comprising hydrogenated hydrocarbonaceous compounds, said residual trace quantities of halogenated organic compounds, a hydrogen-rich gas and at least one water-soluble hydrogen halide compound with a halide-lean absorber solution in an absorption zone;

(d) withdrawing a halide-rich absorber solution containing at least a portion of said water-soluble hydrogen halide compound from said absorption zone;

(e) withdrawing a stream comprising hydrogenated hydrocarbonaceous compounds, said residual trace quantities of halogenated organic compounds and a hydrogen-rich gas from said absorption zone;

(f) introducing said stream recovered in step (e) into a third hydrogenation reaction zone operated at hydrogenation conditions selected to hydrogenate essentially all of said residual trace quantities of halogenated organic compounds to produce a third hydrogenated stream comprising hydrocarbonaceous compounds and at least one water-soluble inorganic halide compound;

(g) contacting said third hydrogenated stream with a halide-lean aqueous scrubbing solution; and

(h) introducing a resulting admixture from step (g) into a separation zone to provide a hydrogen-rich gaseous stream, a fourth hydrogenated stream comprising hydrocarbonaceous compounds and essentially free from halogenated organic compounds and a halide-rich aqueous scrubbing solution containing at least a portion of said water-soluble inorganic halide compound produced in step (f).

4,895,996

SYNTHESIS OF ALKENES FROM ENAMINES VIA HYDROBORATION

Christian T. Goralski, Midland, Mich.; Bakthan Singaram, and Herbert C. Brown, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind. and The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1988, Ser. No. 258,744

Int. Cl.⁴ C07C *1/32*

U.S. Cl. 585—328 **19 Claims**

1. A process for preparing alkenes consisting essentially of two essential steps of

(1) reacting an enamine wherein the enamine has an alkene portion which corresponds to an alkene selected from the group comprising cyclic alkenes, heterocyclic alkenes, acyclic alkenes, terminal alkenes and dienes with a hydroborating agent selected from the group consisting of borinane and compounds corresponding to the formula

R^1R^2BH

wherein R^1 and R^2 are separately in each occurrence C_{5-20} hydrocarbyl under reaction conditions sufficient to form an intermediate organoborane; and

(2) subjecting the organoborane formed in step (1) to an elimination reaction under reaction conditions sufficient to form the alkene corresponding to the alkene portion of the starting enamine.

4,895,997

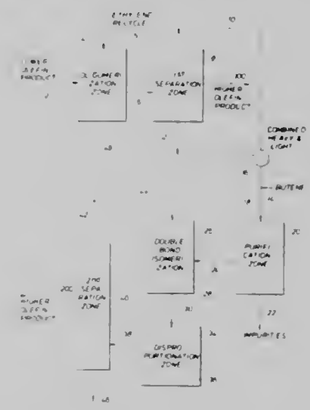
OLEFIN ISOMERIZATION PROCESS

David M. Hamilton, Jr., Houston, and Richard A. Kemp, Stafford, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1988, Ser. No. 238,389

Int. Cl.⁴ C07C *2/02, 5/23*

U.S. Cl. 585—329 **32 Claims**



1. A double bond isomerization process for the conversion of an alpha olefin feedstock to a mixture of internal olefins, which process comprises contacting said olefin having an alpha double bond therein at isomerization conditions with a catalyst having a surface area of at least about 275 m^2/g and at least

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about 40% of its pore volume in pores having diameters less than about 50 Å prepared by incorporating palladium into an alumina hydrogel.

10. A process for the increased production of higher olefins having alpha double bonds from ethylene which comprises:

(a) oligomerization of a feed material predominantly comprising ethylene in an ethylene oligomerization zone, at oligomerization conditions, in the presence of an oligomerization catalyst to form higher olefinic molecules having even carbon number of C_4 to C_{100};

(b) separating said produced even numbered olefins in a first separation zone, at first separation zone conditions, to form a first olefin product stream having alpha double bonds and having from C_{12} to C_{18} and first separation zone effluent streams having: (1) unreacted ethylene, (2) light alpha olefins from C_4 to C_{10} and (3) heavy alpha olefins having from C_{20} to C_{100};

(c) combining said light and heavy alpha olefins and passing said combined stream to purification-isomerization-disproportionation steps and balancing therewith a quantity of C_4 olefins to average the carbon number in said combined stream to approximately C_{12};

(d) purifying said combined alpha olefin stream in the presence of a purification absorbent bed, at purification conditions, to remove from said combined stream impurities comprising oxygenates, metals, water and inorganics;

(e) double bond isomerizing, in an isomerization step, said purified alpha olefins of step (d), at isomerization conditions, in the presence of a hydrogel-derived palladium catalyst having a surface area of at least about 275 m^2/g and at least about 40% of its pore volume in pores having diameters less than about 50 Å to thereby diminish the amount of dimerization during isomerization, wherein said isomerization produces an isomerization effluent stream having internal double bonds and being substantially free of alpha-situated double bonds;

(f) disproportionating said isomerization olefin stream produced in step (e) in a disproportionation step in the presence of a disproportionation catalyst maintained at disproportionation conditions, to form an effluent stream containing C_{12}–C_{18} olefins and olefins lighter and heavier than C_{12} and C_{18}; and

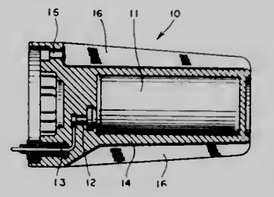
(g) separating said disproportionation effluent stream of step (f) in a second separation zone maintained at second separation conditions to form a second olefin product stream having from C_{10}–C_{18} carbon atoms and a light and heavy olefin fraction.

4,895,998

ENCAPSULATED ELECTRICAL COMPONENT AND METHOD OF MAKING SAME

Jack T. Bevington, Ashland, Ohio, assignor to McNeil (Ohio) Corporation, St. Paul, Minn.

Filed Aug. 15, 1988, Ser. No. 232,103
Int. Cl.[4] H01G *1/03*
U.S. Cl. 174—52.2 **8 Claims**



1. An encapsulated capacitor assembly for mounting onto the housing of an electric motor, comprising:

a capacitor having a casing and conductor terminal means extending from one end of said casing;

unitary housing means fully encapsulating said casing of said capacitor and defining an outer surface;

means for electrically communicating said conductor terminal means with said outer surface on one end of said housing means;

heat dissipation means integrally depending from said outer surface; and

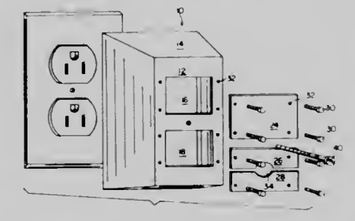
mounting means for mounting the assembly to the electric motor, said mounting means being proximate to said means for electrically communicating.

4,895,999

PROTECTIVE SAFETY ENCLOSURE FOR ELECTRICAL OUTLETS

Bill R. Calderon, 1211 Ebener St., Redwood City, Calif. 94061

Filed Sep. 19, 1988, Ser. No. 245,586
Int. Cl.[4] H01R *13/447*
U.S. Cl. 174—67 **3 Claims**



1. A protective safety enclosure for an electrical outlet assembly having at least one plug receiving socket, comprising:

a hollow three-dimensional structure having a relatively flat front panel, at least one side wall extending completely around the perimeter of said front panel, said side wall extending rearwardly from said front panel, wherein said sidewall has an integral edges defining a perimeter shape somewhat larger than said outlet assembly to be enclosed, and an open face opposite said front panel and defined by said edge;

said enclosure having a depth defined by said side wall dimensioned to snugly enclose a male plug received in one of said sockets;

said front panel having one aperture for each socket within said electrical outlet assembly, each said aperture being in registration with one of said sockets and being dimensioned to permit the passage therethrough of a male plug with line cord attached;

first shield means for detachably covering and uncovering each of said apertures on said front panel when said corresponding socket is not in use;

said first shield means comprising a thin planar cover dimensioned to fit over each of said apertures in said front panel, said cover being slightly larger in size than said apertures; and means to removably attach said cover to said front panel such that when said cover is attached to said front panel, it is supported by said front panel, thereby preventing any access to a socket within said enclosure;

second shield means for detachably covering each of said apertures on said front panel when a plug connected to one end of a line cord in received in said corresponding socket;

said second shield means comprising a thin planar cover divided into two equal-sized cooperating members, said cooperating members together being dimensioned to fit over each of said apertures in said front panel;

a centrally disposed aperture in said two-member panel, such that one half of said aperture is cut out from each of said members and said complementary halves are positioned opposite each other to form a single aperture equal in size to the cross-section of a line cord; and

means to removably attach each member of said second shield sequentially to said front panel such that when said two members are attached to said front panel, said second shield is supported by said front panel and said two members are enabled to grip a line cord passing through said aperture in said second shield;

a plurality of small holes disposed around the periphery of each aperture in said front panel;

a plurality of tapered prongs disposed about the periphery of said first shield and each member of said second shield at positions complementary to said holes around the periphery of each of said front panel apertures such that said tapered prongs of said shield may be force fitted into said holes about said aperture to cover said aperture; and

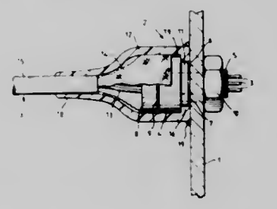
means to secure said enclosure to an electrical outlet assembly.

4,896,000

ARRANGEMENT FOR TERMINATING AN ELECTRICAL CABLE SCREEN

Brian T. Procter, Stroud, and Derek R. Chambers, Swindon, both of England, assignors to Raychem Limited, England

Filed Sep. 30, 1988, Ser. No. 251,598
Claims priority, application United Kingdom, Oct. 2, 1987, 8723213
Int. Cl.[4] H02G *15/02*
U.S. Cl. 174—74 R **11 Claims**



1. An arrangement for terminating the screen of a cable having one or more electrical wires and an electrical screen, which comprises:

(a) a termination piece for the screen which has a hollow, electrically conductive, cable entry portion that can be positioned around the wire or wires of the cable, the cable entry portion having an outer surface that can be posi-

tioned inside part of the cable screen and the outer surface of the cable entry portion being provided with a gripping member for the cable screen, and

(b) a dimensionally recoverable hollow article of a polymeric material which can be positioned over at least the cable entry portion and the proximal part of a cable extending therefrom, and which can be dimensionally recovered onto the cable entry portion and cable so as to retain the cable screen against the gripping member;

the termination piece and the hollow article having an annular lip and a cooperating groove which can engage one another when the article is dimensionally recovered, so as to inhibit removal of the article from the termination piece.

4,896,001

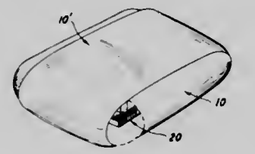
ANTI-ELECTRIC PROTECTION

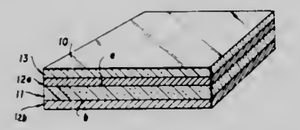
Warren R. Pitts, Needham; Richard G. Miekka, Sudbury, and Daniel J. White, Framingham, all of Mass., assignors to Denison Manufacturing Company, Framingham, Mass.

Filed Jan. 27, 1986, Ser. No. 822,496

Int. Cl.[4] H05K *9/00;* **H04B** *3/28;* **C23F** *1/00*

U.S. Cl. 174—35 MS **9 Claims**





1. The method of protecting an object against adverse electric effects which comprises:

applying a continuous multiplicity of layers of a light weight protective continuous wrapper which is metallized on opposite sides and wider than said object, thereby to control the extent of the anti-electric protection.

4,896,002

METHOD AND APPARATUS FOR DISPLAYING RAW TABLET LOCATION DATA

Thomas E. Papsin, Huntington, Conn., assignor to Summgraphics Corporation

Filed Jun. 19, 1989, Ser. No. 368,287

Int. Cl.[4] G08C *21/00*

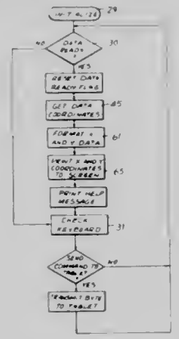
U.S. Cl. 178—18 **13 Claims**

1. A method for displaying raw tablet location data, comprising:

a. getting data which includes a representation of the X and Y coordinates of the location of a pointing device on or over the tablet surface,

b. separating the X and Y coordinate information from the data,

c. converting the X and Y coordinate information into its display equivalent,



d. displaying on a monitor screen first the display equivalent of the X coordinate and then the display equivalent of the Y coordinate.

4,896,003

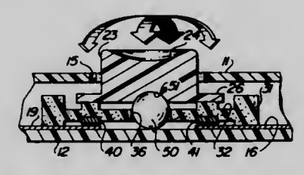
MULTI-POSITION ELECTRICAL SWITCH

Man-Ching Hsieh, 5th Floor #34, Alley 73, Tung Yuan Street, Shuang Yuan District, Taipei, Taiwan

Filed Jun. 30, 1989, Ser. No. 374,054

Int. Cl.[4] H01H *25/00, 13/70*

U.S. Cl. 200—6 A **25 Claims**



1. A multi-position electrical switch including in combination:

a housing having a bottom and a top, said top having an opening therethrough;

at least two pairs of spaced-apart conductors located adjacent the bottom of said housing, each pair of conductors located at a predetermine distance from a point on said bottom;

an actuating member extending through an opening in said top, said actuating member having a flange on the lower end thereof, said flange extending radially outwardly from a central axis through said actuating member, said opening in said top being aligned with said point on said bottom, and said flange being of a greater diameter than the width of said opening;

a deformable resilient support member having a circular opening in the center thereof and having at least a portion thereof in contact with the lower surface of said flange;

spherical bearing means located in the opening in said support member, said bearing means engaging said point on the bottom of said housing and a point at the center of the bottom of said flange of said actuating member;

at least two conductive contact means located on the bottom of said deformable support member and positioned for bridging corresponding ones of said pairs of spaced-apart conductors, whereupon when said actuating member is tilted downwardly about said spherical bearing means toward a selected one of said pairs of spaced-apart conductors, a corresponding one of said contact means is pressed into contact to bridge the space between such selected one of said pairs of conductors to complete an electrical circuit therethrough so long as said actuating member remains tilted downwardly, release of said actuating member allowing said deforable resilient support member to return said actuating member to a rest position where none of said conductive contact means are in electrical contact with any of said spaced-apart pairs of conductors.

4,896,004

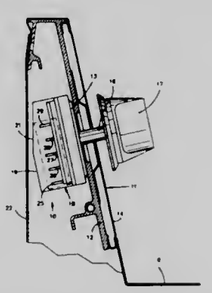
LOW-PROFILE RANGE CONTROL SWITCH

Mousa Aframian, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Mansfield, Ohio

Continuation-in-part of Ser. No. 107,333, Oct. 9, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 240,098

Int. Cl.[4] H01H *19/08, 21/17*

U.S. Cl. 200—6 B **9 Claims**



5. A thermal cycling switch having a housing of insulating material having an end wall, a plurality of side walls extending from said end wall and defining a face, at least one of said side walls being planar and terminating in an edge a spaced distance from said face, a cover extending over said face and secured to said housing, said housing and said cover defining a cavity, a rotatable operating cam mounted centrally in said housing, first and second switches in said cavity, said first switch being positioned between said cam and said planar side wall, said second switch being positioned between said cam and the side wall opposite said planar side wall, said planar wall having a plurality of slots extending from said edge toward said end wall, each of said switches including at least two terminals with each terminal extending through one of said slots from said cavity to the exterior of said housing, each of said terminals being staked to said planar wall to hold said terminal and the connected portion of the switch in position in said cavity, and a locking bar secured in said housing generally in alignment with said planar wall and extending between said edge and said face to clamp said terminals in said slots.

4,896,005

METHOD AND APPARATUS FOR THE CONTINUOUS HEATING, PASTEURIZATION OR STERILIZATION OF FOODSTUFFS OR THE LIKE BY MICROWAVE ENERGY

Rolf Skubich, Langehagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,836

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811063

Int. Cl.[4] H05B *6/78, 6/72*

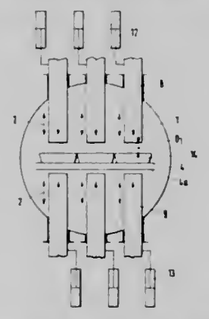
U.S. Cl. 219—10.55 A **13 Claims**

1. Apparatus for the continuous, uniform and rapid heating, pasteurization and sterilization of packaged foods by microwave energy, comprising:

(a) an elongated microwave treatment chamber having a longitudinal axis;

(b) an endless conveyor belt adapted to travel longitudinally through said chamber, with said belt supporting packaged foods of various sizes and shapes to be treated by microwave energy;

(c) elongated microwave feed ducts with microwave generators extending toward a horizontal plane through the horizontal axis of said chamber, from the exterior of said chamber to the interior thereof both above and below said



packaged foods, with the inner ends of said ducts being in selectively variable proximity to said packaged foods; and

(d) means positioned exteriorly of said chamber for adjusting said ducts toward or away from said packaged foods comprising fluid cylinders arranged outside said treatment chamber and operably secured to said feed ducts for effecting movement thereof in response to actuation of the cylinders;

whereby packaged foods of various sizes can be continuously optimally treated by microwave energy without access to said treatment chamber and without disruption to the continuous treatment process.

4,896,006

ROTARY SWITCH ACTUATING MECHANISM FOR ACTUATING AT LEAST TWO PLUNGER CONTROL ELEMENTS

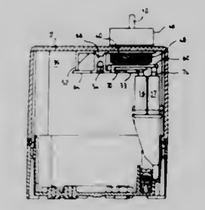
Pierre Dard, Le Pecq, and Fabrice Maës, Ermont, both of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 144,976, Jan. 19, 1988, abandoned. This application Jan. 17, 1989, Ser. No. 298,803

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 8713156

Int. Cl.[4] H01H *3/20*

U.S. Cl. 200—17 R **3 Claims**



3. In an apparatus comprising, housed in a case having a lid provided with at least one aperture and having inner and outer surface portions, switching electric apparatus including at least

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first and second movable plunger control elements, a rotary actuating mechanism comprising:

(i) a control knob having a first axis of rotation and first and second angular locations about said first axis, said control knob projecting out of the case through said aperture from said outer surface portion and being pivotally mounted in a socket located out of the case, said socket having a cylindrical extension which projects through said aperture internally of the case, said cylindrical extension having an external threaded portion and a nut being screwed on said threaded portion, while a clamping ring is inserted between said nut and said inner surface portion;

(ii) at least one cam formed on a further socket which is pivotally mounted in said cylindrical extension and rigidly connected to the control knob, said cam engaging the first plunger control element when the knob is in said first angular location;

(iii) a rockable transmission lever mounted for rocking about a second axis substantially normal to said first axis including a sleeve portion at least partially surrounding the further socket, said sleeve portion engaging the second plunger element when the knob is in said second angular location, said transmission lever further including an end lug and a middle portion linking said sleeve portion to said lug, said middle portion having a projecting extension with which the cam cooperates for rocking the transmission lever wherein said middle portion is hinged on said bar between said free end and said clamping ring; and

(iv) a bar integrally formed with the clamping ring and radially extending the clamping ring, said bar having a free end which is bent at right angles to form a stop, said stop cooperating with said lug for limiting the rocking motion of the transmission lever.

4,896,007

SWITCHING APPARATUS WITH AN ELECTRICALLY CONDUCTIVE OPERATING BAR

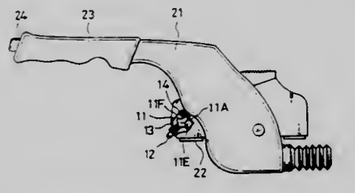
Hiroshi Yamazaki, Yokohama, Japan, assignor to Ohi Seisakusho, Co., Ltd., Kanagawa, Japan

Filed Aug. 2, 1988, Ser. No. 227,257

Claims priority, application Japan, Sep. 22, 1987, 62-143799[U]

Int. Cl.⁴ H01H *9/06*

U.S. Cl. 200—61.87 **5 Claims**



1. In a combination of a switching apparatus with a rotatable actuating lever, the apparatus comprising:

electrically conductive base means including opposing rising walls having slots opposing each other;

electrically conductive operating bar means extending through said slots of said rising walls and being slidably supported by the rising walls, said operating bar means having a laterally projecting portion;

seal bracket means made of resin and forming an electrical insulator and attached to one of the rising walls of the base means;

terminal means integrally formed with the seal bracket means and fixed to said one of the rising walls of the base means by said seal bracket means;

said operating bar means having an end portion; and

spring means disposed around said operating bar means between said rising walls and being engaged with said laterally projecting portion to cause said end portion of the operating bar means to project outside of said one of the rising walls to cooperate with said lever, said spring means biasing the operating bar means so that said laterally projecting portion of the operating bar means comes into contact with the terminal means, whereby, upon rotation of said lever by an external force, said lever acts on said end portion so as to selectively hold said operating bar means in a pressed position, in which said laterally projecting portion is prevented from contact with said terminal means, and a released position, in which said laterally projecting portion comes into and remains in contact with said terminal means.

4,896,008

VACUUM DISCHARGE DEVICE

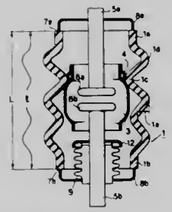
Shinichi Aoki, and Kiyoshi Matsuyama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,836

Claims priority, application Japan, Sep. 29, 1987, 62-246570; Oct. 20, 1987, 62-262893; Dec. 7, 1987, 62-307697; Jun. 29, 1988, 63-159525

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **19 Claims**



1. A vacuum discharge device comprising:

an insulating envelop provided with metallic layers respectively at the opposite ends thereof;

a pair of electrodes disposed opposite to each other within the insulating envelop; and

sealing members brazed respectively to the metallic layers formed in the opposite ends of the insulating envelop and maintained at the same potential as that of the electrodes;

characterized in that the insulating envelop is a hollow, generally cylindrical ceramic member having an internally and externally corrugated wall, and the outer creeping length and inner creeping length of the insulating envelop are greater than the distance between the sealing members or between the metallic layers.

4,896,009

GAS PERMEABLE MICROWAVE REACTIVE PACKAGE

Thomas D. Pawlowski, Neenah, Wis., assignor to James River Corporation, Norwalk, Conn.

Filed Jul. 11, 1988, Ser. No. 217,534

Int. Cl.⁴ H05B *6/04*

U.S. Cl. 219—10.55 E **8 Claims**

1. In a microwave browning and crisping arrangement of the type including a substrate having a substantially planar support surface on which is laminated a browning and crisping layer forming a microwave interactive means for converting microwave energy to heat in an amount sufficient to brown and crisp food; and a food item having a bottom surface resting in contact with the browning and crisping layer on said planar support surface; the improvement, as a means for producing improved browning and crisping of said bottom surface of the food item by maintaining said contact between the bottom surface of the food item and the browning and crisping layer, comprising at least one aperture being provided through said substrate, said at least one aperture being confined to a central



area of said support surface and the remaining surface area of the support surface being free of apertures, said remaining surface area being greater than said central surface area.

4,896,010

MICROWAVE DRYING & SANITIZING OF FABRIC

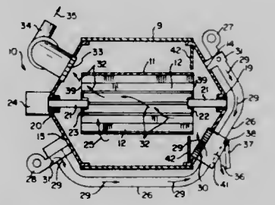
Mary E. O'Connor; Michel J. Cloutier; Robert D. Strattan, and James R. Sorem, Jr., all of Tulsa, Okla., assignors to Micro Dry, Incorporated, Tulsa, Okla.

Division of Ser. No. 129,161, Dec. 7, 1987, Pat. No. 4,829,679.

This application Dec. 15, 1988, Ser. No. 284,704

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 M **1 Claim**



1. A method of sanitizing articles by microwave irradiation, comprising the steps of:

(a) heating articles by microwaves in a sealed heating chamber containing heated water vapor below the boiling point; and

(b) causing said heated water vapor to accumulate and become further heated below the boiling point within said sealed chamber, whereby said articles will be sanitized by the combination of the microwave field effect and said heated water vapor.

4,896,011

MICROWAVE POTATO BAKING STAND AND METHOD FOR BAKING POTATOES

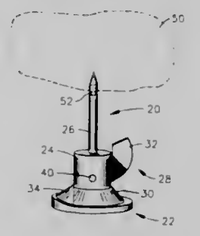
Joe Trucks, 143 Twin River Rd., P.O. Box 321, Eureka, Mo. 63025

Filed Mar. 24, 1989, Ser. No. 328,184

Int. Cl.⁴ H05B *6/80*

U.S. Cl. 219—10.55 E **9 Claims**

1. A device for baking potatoes in an oven, comprising a base and a spike, said spike being attached at one end to said base, an other end of said spike rising vertically from said base, and said other end of said spike being pointed whereupon a potato may be impaled, and said spike having an annular mark substantially near said other end of said spike to provide a guideline for the placement of said potato upon impalement, whereby as baking



proceeds said potato may slide down said spike by its own weight when said potato has reached the desired consistency.

4,896,012

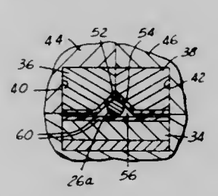
LOW FRICTION WIRE GUIDE FOR ELECTRICAL DISCHARGE MACHINE

George Barbulescu, Ann Arbor, Mich., assignor to Raycon Corporation, Ann Arbor, Mich.

Filed Apr. 3, 1989, Ser. No. 331,867

Int. Cl.⁴ B23H *7/10, 9/14*

U.S. Cl. 219—69.12 **8 Claims**



1. In an EDM apparatus having servo drive means for providing a spark gap between the tip of a movable electrode and a workpiece and means for directing dielectric fluid across the gap to remove erosion products from the spark gap the improvement comprising:

an electrode wire having an outer surface and a wire tip thereon which is locatable with respect to a workpiece for forming the spark gap;

movable carriage means for supporting said wire electrode during movement of said wire electrode with respect to the workpiece;

a length of said electrode wire extending outwardly of said carriage means in the direction of movement of said carriage means;

servo-drive means for driving said carriage means and said wire electrode with respect to the workpiece during a machining cycle;

wire guide means for contacting said outer surface of said electrode so as to guide the tip of the electrode with respect to the workpiece as it is driven into spark gap relationship therewith; and

means for reducing sliding friction between said wire guide means and said outer surface of said electrode to reduce the amplitude of the operational vibration modes of said electrode tip with respect to said wire guide means during the machining operation.

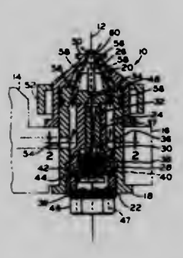
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4,896,013

HYPERBOLOID CURRENT PICK-UP FOR AN ELECTRICAL DISCHARGE WIRE CUTTING MACHINE

William R. Fricke, Bloomingdale, and Thomas J. Truty, Streamwood, both of Ill., assignors to T-Star Industrial Electronics Corporation, Wheeling, Ill.

Filed Apr. 7, 1988, Ser. No. 178,560
Int. Cl.[4] B23H *7/10, 7/04*
U.S. Cl. 219—69.12 **8 Claims**



1. A cartridge assembly for an electrical discharge wire cutting machine, comprising:
- a cartridge barrel defining a housing for said cartridge assembly; said cartridge barrel having a first open end and a second open end;
- a wire guide mounted in said first open end of said cartridge barrel for guiding a wire electrode of an electrical discharge wire cutting machine;
- a current pick-up holder mounted in said second open end of said cartridge barrel;
- a current pick-up for delivering current to said wire electrode, said current pick-up mounted in said pick-up holder, said current pick-up including a longitudinal bore with a first end and a second end, said bore being of a continuous, curvilinear cross-section sufficient to minimize the engagement of said wire electrode with said first end and said second end of said bore; and

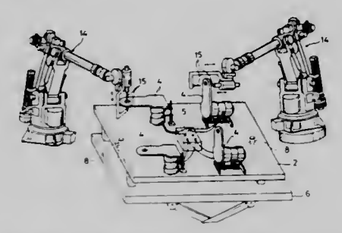
wherein said cross section of said bore of said current pick-up is a hyperboloid with a center line offset from a longitudinal midline of said current pick-up.

4,896,014

METHOD OF AUTOMATICALLY GRINDING AN ELECTRODE FOR SPOT WELDING USE AND APPARATUS FOR EFFECTING SAID METHOD

Hisatoshi Sakai, and Takashi Shirasaki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 27, 1988, Ser. No. 250,137
Claims priority, application Japan, Oct. 13, 1987, 62-258738
Int. Cl.[4] B23K *11/36*
U.S. Cl. 219—91.2 **12 Claims**



1. A method of automatically grinding an electrode for spot welding using, said method comprising the steps of:

transporting, with the use of a work transport means of a welding line, a stand having thereon at least one automatic dresser which is capable of grinding a welding electrode of a spot welding machine; and

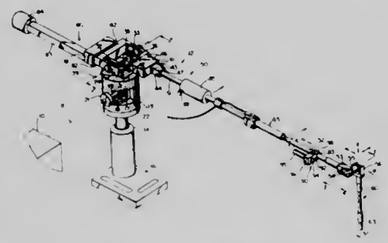
automatically grinding said electrode by said automatic dresser when said stand has reached a work station which is provided with at least one of a plurality of spot welding machines installed along said welding line.

4,896,015

LASER DELIVERY SYSTEM

John Taboada, and Robert H. Poirier, both of San Antonio, Tex., assignors to Refractive Laser Research & Development Program, Ltd., San Antonio, Tex.

Filed Jul. 29, 1988, Ser. No. 226,287
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.78 **43 Claims**



1. A laser delivery system comprising:
- (a) a hollow base comprising an opening for receiving a beam,
- (b) a boom support adjacent said base,
- (c) means for mounting said boom support for rotation on a first axis extending through said base, and for rotation on a second axis transverse to said first axis comprising:
  - i. a pair of spaced bearings in said based,
  - ii. a shaft journalled in said bearings,
  - iii. a fork carried by said shaft, and
  - iv. bearing means for journalling said boom support on said fork,
- (d) a hollow linear boom having a proximal end and a distal end,
- (e) means for attaching the proximal end of said boom to said boom support,
- (f) said boom comprising boom bearing means permitting axial and rotational movement of said distal end relative to said proximal end,
- (g) a handpiece,
- (h) means for connecting said handpiece to said boom distal end for rotation about an axis transverse of the boom axis, and
- (i) means for conducting a beam from said opening into and through said boom and into said handpiece in all positions of said boom and handpiece.

4,896,016

PLASMA ARC METAL CUTTING APPARATUS WITH ACTUATION SPRING

Daniel M. Broberg, Edina, and Terry A. Prentice, Bloomington, both of Minn., assignors to Century Mfg. Co., Minneapolis, Minn.

Filed Apr. 24, 1989, Ser. No. 341,838
Int. Cl.[4] B23K *9/06*
U.S. Cl. 219—121.5 **8 Claims**

1. A metal cutting apparatus comprising a plasma arc cutting torch, having in combination,

a torch housing,

an electrically conductive nozzle carried by said housing, an orifice at an outlet end of said nozzle,

an electrode in said torch engaging said nozzle,

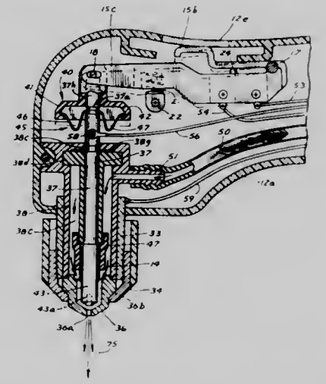
an electrical circuit including said electrode and nozzle,

a spring assembly in connection with said electrode,

said spring assembly normally urging said electrode into electrical contact with said nozzle,

a switch, energizing said electrode and said nozzle,

an operating engagement between said switch and said spring assembly,



a lever operating said switch causing said spring assembly to be urged into an over center position,

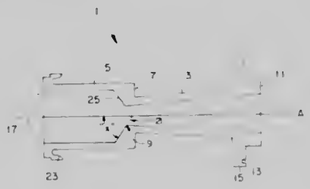
whereby said spring assembly is caused to separate said electrode from engagement with said nozzle upon said electrode becoming energized and causing an arc to be created therebetween.

4,896,017

ANODE FOR A PLASMA ARC TORCH

Lewis M. Koppel, Amherst; Jonathan J. Kim, Williamsville, and Viswanathan Venkateswaran, Amherst, all of N.Y., assignors to The Carborundum Company, Cleveland, Ohio

Filed Nov. 7, 1988, Ser. No. 268,119
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.52 **4 Claims**



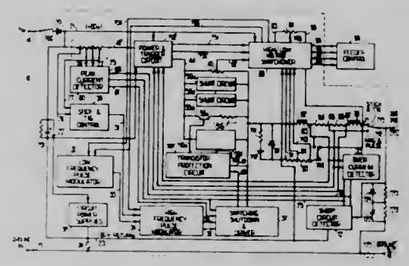
1. An anode which functions as a nozzle and produces a directable flow of thermal plasma for a plasma arc torch that operates at a high thermal efficiency, comprising a generally cylindrical shape having an axial bore with two consecutively aligned sections, aligned along a major axis of the cylinder, including:
- a base means hollowed along the major axis for joining the anode to the plasma arc torch and to a gas source and;
- a primary section, having an inside surface which is aligned along said axis and conically shaped with the end having the larger inside diameter being attached to the base and an opposite end having a smaller inside diameter;
- a transition zone at the end of the primary section having a smaller inside diameter comprising a conically shaped inside surface, which surface is at an angle of between about 55 degrees to about 65 degrees relative to said major axis, and wherein the end of the transition zone having a smaller diameter is attached to the end of the primary section having a smaller diameter and wherein the point where the primary section and transition zone are joined is rounded and convex toward the axis of the anode and the end of the transition zone having a larger diameter is attached to one end of the secondary section; and
- a secondary section, having an inside surface which is cylindrically shaped and aligned along the axis, and wherein the secondary section is attached at one end to the transition zone.

4,896,018

METHOD AND APPARATUS FOR PROTECTING A POWER TRANSISTOR FROM EXCESSIVE CURRENT FLOW

Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067

Continuation-in-part of Ser. No. 791,224, Oct. 25, 1985, Pat. No. 4,716,274. This application Jan. 12, 1987, Ser. No. 62,543
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—137 PS **63 Claims**



1. In a welding station comprising an output stage and a driver stage for providing drive power to said output stage, said output stage comprising at least one transistor, said transistor having a drive input terminal, a power supply input terminal, an output point, and a bonding wire connecting said output point to an output terminal, a method of reducing the probability of said bonding wire detaching or burning through due to an instantaneous current flow through said transistor, comprising the steps of:
- (a) connecting a load to said output terminal;
- (b) adjusting said load to cause a predetermined output current to flow through said output stage;
- (c) adjusting said drive power to cause a predetermined voltage to be present between said power supply input terminal and said output terminal; and
- (d) repeating steps (b) and (c) as necessary to simultaneously obtain said predetermined output current and said predetermined voltage;

wherein said transistor operates slightly in an active mode at said predetermined output current so that, for loads tending to cause said output current to exceed said predetermined output current, said drive power is insufficient to support said output current and said bonding wire is protected.

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4,896,019

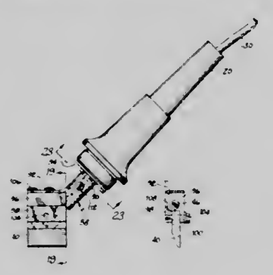
ELECTRIC SOLDERING IRON FOR SIMULTANEOUSLY SOLDERING OR DESOLDERING A ROW OF INTEGRATED CIRCUIT LEADS

Kim T. Hyun, 1640 #5 Maple Dr., Chu Lavista, Calif. 92011

Continuation-in-part of Ser. No. 95,637, Sep. 14, 1987, Pat. No. 4,771,932, which is a continuation of Ser. No. 806,643, Dec. 9, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 142,011

Int. Cl.[4] **H05B** *1/00;* **B23K** *3/00, 31/02*

U.S. Cl. 219—228 **1 Claim**



1. A soldering iron comprising:

(a) a handle;

(b) a heating block mounted to said handle and having a pair of opposed tangs defining a channel therebetween;

(c) a soldering blade removably mounted in said channel and having an elongated operative soldering edge and a shank portion opposite said edge; and,

(d) an elongated heating element mounted in said heating block and in close heat exchange relationship with said blade and substantially parallel to said operative soldering edge;

(e) one of said tangs being removable, and said blade being mounted by a blot that passes through one of said tangs, through said blade and threadedly engages the other of said tangs; and,

(f) said removable tang having an upper surface that pressesagainst a corresponding surface of the rest of said heating block, and said upper surface having a sloped portion and a shoulder portion to seat easily against said corresponding surface and to cause the lower edge of said removable tang to exert compressive pressure on the soldering blade as said bolt is tightened.

4,896,020

PORTABLE ELECTRIC HAIR DRYER

Hans-Dieter Poweleit, Haan, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany

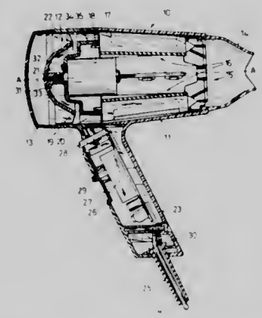
Filed Jan. 24, 1989, Ser. No. 301,541

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802638

Int. Cl.[4] **H05B** *3/02;* **F24H** *3/04;* **A45D** *20/08*

U.S. Cl. 219—370 **15 Claims**

1. An electric hair dryer, particularly a portable hair dryer, comprising a hollow housing having an air-admitting inlet and an air-discharging outlet spaced apart from said inlet; means for inducing a flow of air through said housing from said inlet to said outlet, including a rotor in said housing and an electric motor for said rotor; an electric heater for the flow of air in said housing; a first insulating carrier; electric contacts for said motor provided on said first carrier; a second insulating carrier; contacts for said heater provided on said second carrier; and means for separably coupling said carriers with each other



so that the contacts for said motor engage the contacts for said heater.

4,896,021

PORTABLE ELECTRIC HAIR DRYER

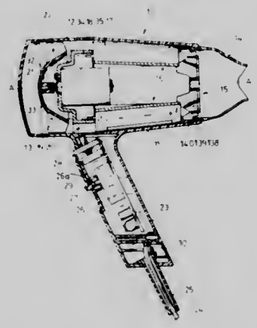
Hans-Dieter Poweleit, Haan, and Heinrich Komesker, Wuppertal, both of Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 234,795

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729774

Int. Cl.[4] **H05B** *1/02*

U.S. Cl. 219—370 **13 Claims**



1. An electric appliance, such as a portable hair dryer, comprising a hollow housing having an air-admitting inlet and an air-discharging outlet; an electric motor disposed in said housing and having at least one component which is heated when connected with a source of electrical energy; impeller means connected with said motor and arranged to induce the flow of air through said housing from said inlet to said outlet; diffuser means provided in the housing in the path of air flow from said inlet to said outlet; and electric air heating means provided in said housing between said diffuser means and said outlet, said at least one component being disposed in said housing in the path of air flowing through said diffuser toward said heating means.

4,896,022

COFFEE POT HAVING A TEMPERATURE REGULATING BASE

Alfred A. Schroeder, 2711 Whisper Fawn, San Antonio, Tex. 78230, and Lenord G. Ewing, 2305 Brittany Grace, New Braunfels, Tex. 78130

Filed Sep. 20, 1988, Ser. No. 246,630

Int. Cl.[4] **F24C** *15/10*

U.S. Cl. 219—433 **13 Claims**



1. An article for regulating the temperature of a container which is positionable above a heated surface, comprising:

a first portion for restricting communication of heated fluid from a first space adjacent a heated surface to a second space adjacent a lower surface of a container positioned above said heated surface, said first portion having a plurality of holes therethrough;

a second portion for defining a fluid passage to enable direct fluid communication between an atmosphere and said first space when said container is at rest above said heated surface, said second portion being integral with said first portion and said atmosphere being cooler than said heated surface; and

means for mounting said first and second portions to a container in a manner which provides a second fluid passage for enabling direct fluid communication between said second space and said atmosphere, thereby enabling circulatory flow between said second space and said atmosphere.

4,896,023

DRY AND WET HEATER

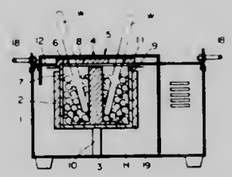
Goro Uchiyama, 832-10, Oaza-Sana, Kawagoe-Shi, Saitama-Ken, Japan

Filed May 26, 1988, Ser. No. 199,251

Claims priority, application Japan, Dec. 21, 1987, 62-193886[U]

Int. Cl.[4] **H05B** *1/00*

U.S. Cl. 219—521 **3 Claims**



1. A heater for heating articles by conduction with a liquid or solid heating medium, the heater comprising a housing, a heating vessel with an open top supported in the housing, the vessel having a base wall and a peripheral wall defining a heating chamber for containing the heating medium, a rod-like heating element extending upwardly into the chamber from the base wall, a cap covering the open top of the vessel, the cap having apertures for inserting articles to be heated into the heating chamber at locations surrounding the heating element, a perforated spacer plate surrounding the top of the vessel, and a protector supported on said plated of inhibiting user contact with the cap, the protector having an upper wall spaced above the cap and providing a central opening for obtaining access to said apertures, the perforated plated interrupting heat transfer from the vessel to the protector.

4,896,024

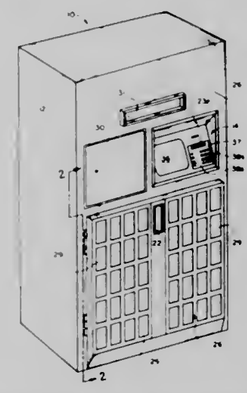
APPARATUS FOR DISPENSING AND ACCEPTING RETURN OF REUSABLE ARTICLES

Herbert Morello; F. Michael Theriault, both of Canton, and Michael H. Wellman, Canal Fulton, all of Ohio, assignors to Diebold, Incorporated, North Canton, Ohio

Filed Oct. 19, 1987, Ser. No. 110,014

Int. Cl.[4] **G06K** *5/00*

U.S. Cl. 235—381 **20 Claims**



1. An apparatus for dispensing and returning reusable articles, comprising:

means defining a pair of planar arrays, each having a plurality of locations for holding a reusable articles therein, each location identifiable with its own particular location code and each article identifiable with its own particular article code;

memory means adapted to store details of said location codes and said article codes;

input data means operatively connected to said memory means for receiving informational data from a patron;

receptacle means accessible to a patron for receiving articles;

transfer means operable for placing an article into a location in said arrays or removing an article therefrom, said transfer means including:

platform means disposed between said arrays and being movable along guides through a plane parallel to said arrays,

platen means mounted on said platform means for reciprocal movement between said planar arrays along an axis perpendicular to said arrays, said platen means defining an article receiving opening therebetween and being movable between a first position wherein said platen means are in a central position on said platform means and second positions wherein said platen means are shifted to a side of said platform means toward a location in one of said arrays, and

conveyor means for conveying an article into or out of said receiving opening when said platen means is in said second position, and being movable relative to said arrays between operative engagement with an article in any of said locations and said receptacle means;

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article code sensing means adapted to sense the article code of an article carried by said transfer means; and,

control means having means for receiving control information and for generating output instructional information and control signals, said control means being responsive to input data from said patron to initiate the transfer of a selected article from a location in said arrays to said access opening by said transfer means, or to return an article received by said patron from said access opening to an empty location in said arrays.

4,896,025

INFORMATION REPRODUCING APPARATUS FOR INFORMATION RECORDING MEDIUM HAVING A PLURALITY OF INFORMATION TRACKS

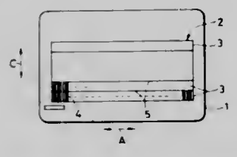
Kōyō Hasegawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,925, Feb. 18, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 331,014

Claims priority, application Japan, Feb. 20, 1986, 61-33779; Feb. 20, 1986, 61-33780

Int. Cl.[4] G06K *19/00*

U.S. Cl. 235—437 **11 Claims**



1. An information reproducing apparatus for reproducing information recorded on an information recording medium having a plurality of information tracks arranged in a predetermined direction, said information reproducing apparatus comprising:

read out means for reading out the plurality of information tracks along the predetermined direction thereof during a period of time and for reproducing the information of each of the plurality of information tracks;

counting means for counting the period of time of said reading out means; and

track identifying means for identifying the plurality of information tracks read out by said read out means in accordance with a result of counting performed by said counting means.

4,896,026

LASER DIODE SCANNER WITH IMPROVED SHOCK MOUNTING

Mark Krichever, Hauppauge; Yuri Gofman, Brooklyn, and Howard M. Shepard, Great River, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,548

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—472 **9 Claims**

1. In a laser scanning system for reading indicia having portions of different light reflectivity, said system being of the type including

(A) a hand-held head normally supportable by a user in an intended position of use;

(B) an optical assembly located in the head, having a center of mass, and including

(i) laser diode for emitting a laser beam with concomitant generation of heat,

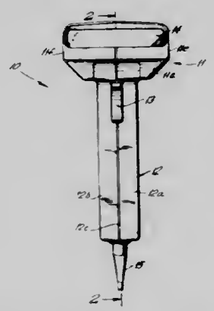
(ii) a heat sink for conducting the heat away from the diode,

(iii) optic means for optically forming and modifying the laser beam to have a predetermined beam cross-section at a reference plane in the vicinity of which indicia to be read are located and impinged by the laser beam, thereby reflecting off the indicia reflected laser light, at least a returning portion of which travels away from the indicia back toward the head, and

(iv) sensor means for detecting the returning portion of the reflected laser light, and for generating an electrical signal indicative of the indicia being read; and

(C) a scanning assembly located in the head, having a center of mass, and including

(i) a reciprocally oscillatable scanning motor having a drive shaft on which a mirror is mounted for joint repetitive and cyclical oscillating movement a plurality of times per second, said mirror directing the laser beam toward the reference plane and to and across the indicia



to be read for scanning the same, said mirror also collecting the returning portion of the reflected laser light and directing the same to the sensor means,

the improvement which comprises:

(a) means for shock mounting the assemblies relative to the head, including

(i) a first pair of shock mounts within the head and aligned along a first axis which extends generally through the center of the mass of the scaning assembly, and

(ii) a second pair of shock mounts within the head and aligned along a second axis which extends generally through the center of mass of the optical assembly; and

(b) a printed circuit board supported by, and extending between, the assemblies for maintaining the assemblies in optical alignment.

4,896,027

PORTABLE DETACHABLE DATA RECORD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation of Ser. No. 31,715, Mar. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 692,788, Jan. 17, 1985, Pat. No. 4,665,004. This application Feb. 14, 1989, Ser. No. 311,442

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—488 **24 Claims**



1. A data record for accompanying another record, each of said records being unassociated with regard to operable use of the other, but associated by information content, comprising,

a data card having opposed front and back planar surfaces, the card capable of storing at least one quarter megabyte of machine readable data, said card being a first data record, and

detachable adhesion means mounted on the back surface of the card for repeatable attachment and detachment of said card to and from a support surface associated with a second record, said card being machine readable when detached from said support surface.

4,896,028

SURGE ABSORPTION APPARATUS

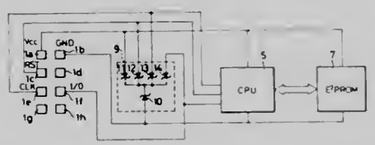
Hidekiyo Kushima, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 60,387, Jun. 10, 1987, Pat. No. 4,825,060. This application Feb. 23, 1989, Ser. No. 314,127

Claims priority, application Japan, Jun. 11, 1986, 61-133767

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—492 **9 Claims**



1. A surge absorption apparatus comprising:

a common constant voltage element having a first terminal and a second terminal; and

a plurality of independent constant voltage elements each having a first terminal and a second terminal, the second terminals of the independent constant voltage elements being commonly connected to said second terminal of said common constant voltage element.

4,896,029

POLYGONAL INFORMATION ENCODING ARTICLE, PROCESS AND SYSTEM

Donald G. Chandler; Eric P. Batterman, both of Princeton, and Govind Shah, Princeton Junction, all of N.J., assignors to United Parcel Service of America, Inc., Greenwich, Conn.

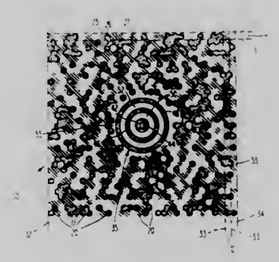
Continuation-in-part of Ser. No. 178,600, Apr. 8, 1988, Pat. No. 4,874,936. This application Mar. 31, 1989, Ser. No. 330,111

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—494 **89 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 80 Pages)



1. An optically readable label for storing encoded information comprising a multiplicity of information-encoded polygons having at least five sides, said polyygons arranged with the geometric centers of adjacent polygons lying at the vertices of a two-dimensional hexogonal array, said polygons having one of at least two different optical properties.

4,896,030

LIGHT-REFLECTIVITY CONTROLLER FOR USE WITH AUTOMOTIVE REARVIEW MIRROR USING ELECTROCHROMIC ELEMENT

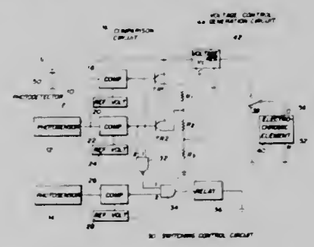
Mitsuo Miyaji, Kuki, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,482

Claims priority, application Japan, Feb. 27, 1987, 62-27438[U]; Jan. 22, 1988, 63-5968[U]

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **4 Claims**



1. A light reflectivity controller for use with an automotive rearview mirror having an electrochromic element on each of the reflective surfaces thereof, comprising:

a first photosensor for detecting the brightness of the surroundings including the front of a car in which the inside rearview mirror is equipped, to provide a signal corresponding to the detected brightness;

a second photosensor for detecting the brightness of the surroundings including the rear of the car to provide a signal corresponding to the detected brightness;

first means for comparing the output signal delivered from said first photosensor with at least a reference value predetermined correspondingly to the brightness of the surroundings of the car to provide at least a first control signal formed based on the result of the comparison;

second means for comparing the output signal delivered from said second photosensor with at least a reference value predetermined correspondingly to the brightness of the surroundings of the car to provide a second control signal formed based on the result of the comparison;

the reference values in said first and second comparing means corresponding to different brightnesses of said surroundings of the car;

a control voltage generating means for generating different voltages for application to said electrochromic elements on said reflective surfaces;

a first switching means for delivering to said control voltage generating means a third control signal in accordance with one of said different voltages to be delivered based on said plural control signals received from said first and second comparing means;

a second switching means for connecting said electrochromic elements selectively between said control voltage generating means and the ground potential based on said plural control signals delivered from said first and second comparing means, whereby the voltages applied to said electrochromic elements are controlled automatically and stepwisely based on the brightness of the surroundings of the car; and

a timer circuit adapted so as to recognize, from the change of the control signal delivered from said second comparing means, that the voltage delivered from said control voltage generating means should be changed from the predetermined voltage to any other lower voltage, and to act on

said second switching means to let the latter connect said electrochromic elements to the ground potential for a predetermined short time and thereafter to said control voltage generating means.

4,896,031

PROXIMITY FUSE OPTICAL RADIATION RECEIVER HAVING WEDGE-SHAPED DAMPING FILTER POSITIONED ADJACENT PHOTOCELL

Erland Pettersson, Göteborg; Bengt Witt, Karlskoga, and Ola Kantz, Leksand, all of Sweden, assignors to Aktiebolag Bofors, Bofors, Sweden

Filed Jun. 10, 1968, Ser. No. 205,255
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—203 R **24 Claims**



1. In a proximity fuse for a launchable unit, an apparatus including a transmitter which transmits optical radiation reflectable against a target surface and a receiver provided with a detector device for generating an electric signal on receipt of the radiation reflected from the target surface and impinging upon the receiver/detector at different angles of incidence depending upon the distance of the target surface from the unit, wherein the receiver comprises:

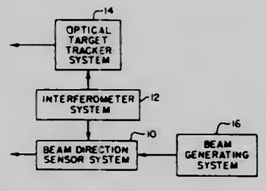
a fixed mechanical/optical arrangement including a radiation damping filter, collimator lens, mirror and gap for distributing the received radiation to the surface of the detector device to render the sensitivity of the apparatus to depend upon angles of incidence in such a manner that the electric signal emitted by the detector device will be substantially independent of said distance within the entire scanning region of the proximity fuse.

4,896,032

ACTIVE BORESIGHT DRIFT MEASUREMENT AND CALIBRATION APPARATUS

James M. Ball, Huntington Beach, and Isaac Richman, Newport Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 26, 1989, Ser. No. 303,418
Int. Cl.[4] H05H *3/00*; G01B *11/27*
U.S. Cl. 250—251 **8 Claims**



1. An active boresight drift measurement and calibration apparatus comprising in combination:

means for generating a beam,

means for tracking a target, said target tracking means tracking a target and establishing a tracker boresight,

means for sensing a beam direction, said beam direction sensing means operatively interacting with a generated beam and establishing a beam boresight for said generated beam, and,

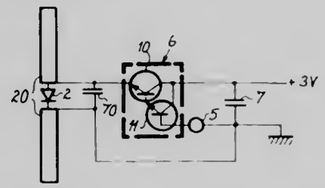
means for measuring distance, said distance measuring means operatively connected to said target tracking means and said beam direction sensing means, said distance measuring means making a predetermined number of distance measurements between said target tracking means and said beam direction sensing means, said distance measurements establishing the alignment of said tracker boresight with said beam boresight, an initial calibration state being established when the boresight alignment angle is substantially zero, said distance measuring means providing periodic distance measurements to establish changes in boresight alignment angle, said changes in boresight alignment angle are utilized as boresight alignment drift correction angles which may be utilized to correct the boresight differences between said target tracking means and said beam generating means.

4,896,033

ARRAY OF OPTICALLY-CONTROLLED ELEMENTS FOR THE DIFFUSION OF ELECTROMAGNETIC ENERGY

Francois Gautier, Germain En Laye, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 39,690, Apr. 20, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,268
Claims priority, application France, Apr. 22, 1986, 86 05803
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—215 **9 Claims**



1. A network for the controlled diffusion of electromagnetic energy, said network receiving a radioelectric wave of frequency f_o from a first outside source and receiving a modulated light ray from a second outside source, said network comprising:

photodetector means for receiving said light ray and converting said light ray to an electrical signal of frequency f_m;

a dipole;

a variable capacity diode connected between the two respective parts of said dipole;

means for controlling the polarization of the variable capacity diode; and

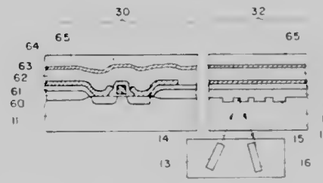
wherein said dipole receives said radioelectric wave of frequency of and said electric signal of frequency f_m such that a modulated signal of frequency $f=f_o+Kf_m$ is diffused from said dipole and said variable capacity diode omnidirectionally.

4,896,034

METHOD OF IDENTIFYING A SEMICONDUCTOR WAFER UTILIZING A LIGHT SOURCE AND A DETECTOR

Tadashi Kiriseko, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 6, 1988, Ser. No. 254,100
Claims priority, application Japan, Oct. 9, 1987, 62-255242
Int. Cl.[4] G06K *7/10*
U.S. Cl. 250—271 **18 Claims**



1. A method of identifying a semiconductor wafer having a front surface, a rear surface, and a rear side, in which a light source transmits an incident light and a light detector having an optical axis receives a reflected light, said method comprising the steps of:

(a) forming a code pattern on the front surface of said wafer, said code pattern having first and second regions, each having a reflected light intensity different from each other;

(b) irradiating light from said light source including infrared light rays onto the rear surface of the wafer from the rear side of said wafer, said light penetrating through said wafer onto the code pattern and reflecting therefrom;

(c) receiving the light reflected from the code pattern with said detector on the rear side of the wafer; and

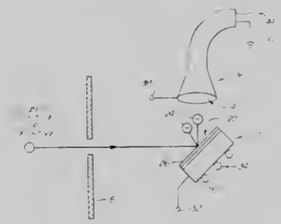
(d) identifying the wafer by decoding the received signal.

4,896,035

HIGH MASS ION DETECTION SYSTEM AND METHOD

John F. Mahoney, South Pasadena, and Julius Perel, Altadena, both of Calif., assignors to Phrasor Scientific, Inc., Duarte, Calif.

Continuation-in-part of Ser. No. 82,785, Aug. 6, 1987, Pat. No. 4,835,383. This application Apr. 15, 1988, Ser. No. 181,816
Int. Cl.[4] H01J *43/00*
U.S. Cl. 250—309 **20 Claims**



1. An ion detection system, comprising:

means for providing a beam of ions;

target means for intercepting said ions and ejecting secondary negatively charged particles, comprising:

a target substrate having a first major surface oriented so as to intercept said ion beam;

means, coupled to said target substrate, for maintaining said target substrate at a first bias potential; and

a layer of photoemissive material substantially coating the first major surface of said target substrate, said photoemissive material having a band gap energy in the range of from 1-2 eV and an electron affinity of less than 1 eV; and

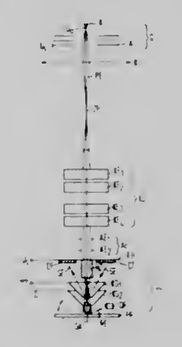
detection means, configured with respect to said target so as to receive the secondary negatively charged particles ejected from said target means, for detecting said secondary negatively charged particles and for providing an electrical signal corresponding to said detected secondary particles.

4,896,036

DETECTOR OBJECTIVE FOR SCANNING MICROSCOPES

Harald Rose, and Joachim Zach, both of Darmstadt, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,245
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3703029
Int. Cl.[4] H01J *37/244*
U.S. Cl. 250—310 **21 Claims**



1 An electrostatic detector objective for focusing a primary particle beam guided along a beam axis onto a specimen, comprising:

an immersion lens including a middle electrode and a detector, said middle electrode and said detector being disposed within said immersion lens and concentric relative to the beam axis for documenting secondary and/or backscattered particles;

a source side electrode included in said immersion lens;

means for providing a first positive potential at said source side electrode; and

means for providing a second positive potential at said middle electrode, said second potential being higher than said first potential.

4,896,037

HIGH-SPEED IMAGE RECORDING APPARATUS FOR ENERGY SUBTRACTION PROCESSING

Kazuo Shimura; Nobuyoshi Nakajima, and Masamitsu Ishida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 726755, Apr. 24, 1985. This application Sep. 25, 1986, Ser. No. 912,208
Claims priority, application Japan, Apr. 24, 1984, 59-82350
Int. Cl.[4] G21K *3/00*; G01T *1/16*
U.S. Cl. 250—327.2 **7 Claims**

1. A high-speed image recording apparatus for energy subtraction processing, which comprises:

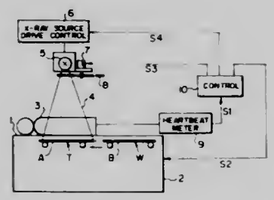
(i) sheet change means for removing a stimulable phosphor sheet positioned at a predetermined image recording posi-

tion from said image recording position and loading a different stimulable phosphor sheet to said image recording position;

(ii) a radiation source for emitting a radiation to said stimulable phosphor sheet positioned at said image recording position;

(iii) radiation source drive controlling means for controlling drive of said radiation source;

(iv) filter change-over means for changing over a different radiation filter on a radiation passage between said radiation source and said stimulable phosphor sheet at each image recording step, and



(v) a controller for sending signals to said sheet change means, said filter change-over means and said radiation source drive controlling means for loading said stimulable phosphor sheet to said image recording position by said sheet change means, changing over said radiation filter by said filter change-over means, and then driving said radiation source by said radiation source drive controlling means to emit said radiation, wherein said controller sends a signal to said radiation source drive controlling means in synchronization with consecutive heartbeats of an object.

4,896,038

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

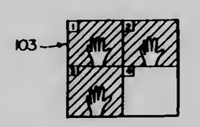
Nobuyoshi Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 27, 1988, Ser. No. 148,832

Claims priority, application Japan, Jan. 27, 1987, 62-17041

Int. Cl.⁴ G03B *42/02*

U.S. Cl. 250—327.2 **9 Claims**



1. A radiation image read-out method in which final read-out is carried out for obtaining image signals for use in reproduction of a visible image from a recording medium carrying a radiation image of an object recorded thereon, image processing conditions for use in processing of the final read-out image signals obtained by the final read-out are adjusted, and image processing of the final read-out image signals is carried out by use of the image processing conditions,

wherein the improvement comprises the steps of, in the case where subdivision image recording is carried out by exposing each of a plurality of subdivisions on said recording medium to radiation in the course of the radiation image recording:

(i) removing image signals at a subdivision, which has not been exposed to the radiation, from said final read-out image signals obtained by said final read-out on the basis of information on said subdivision image recording, and

(ii) adjusting said image processing conditions on the basis of the remainder of said final read-out image signals,

wherein, in the case irradiation fields of the radiation at a plurality of said subdivisions are limited in the course of subdivision image recording said irradiation fields are detected on the basis of said remainder of said final read-out image signals, the image signals inside of said irradiation fields are extracted from said remainder of said final read-out image signals, and said image processing conditions are adjusted on the basis of said extracted image signals inside of said irradiation fields; and

wherein said image processing conditions are gradation processing conditions, and said gradation processing conditions are adjusted by:

(a) creating a histogram of said extracted image signals inside of said irradiation fields,

(b) calculating the maximum image signal level Pmax and the minimum image signal level Pmin of a desired image signal range from said histogram, and

(c) adjusting said gradation processing conditions so that the maximum image signal level Pmax and the minimum image signal level Pmin correspond respectively to the maximum signal level Rmax and the minimum signal level Rmin of a desired input signal range in an image reproduction means which are determined by the maximum density Dmax and the minimum density Dmin of a correct density range in a reproduced visible image.

4,896,039

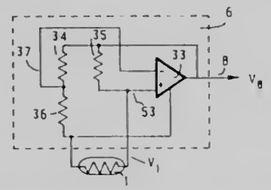
ACTIVE INFRARED MOTION DETECTOR AND METHOD FOR DETECTING MOVEMENT

Jacob Fraden, 72 Hampton Rd., Hamden, Conn. 06518

Filed Dec. 31, 1987, Ser. No. 140,090

Int. Cl.⁴ G01J *5/24*

U.S. Cl. 250—342 **21 Claims**



1. An active infrared radiation motion detector for detecting a moving object, said detector comprising:

a support body;

a first temperature sensitive self-heating resistive means capable of emitting thermal radiation in response to electric power through said resistive means, mounted on said support body for emitting said thermal radiation for radiating on a region which may include said object;

a first electronic control circuit connected to said resistive means for maintaining the resistance of said resistive means at a predetermined value by adjusting electrical power through said resistive means, and for providing a signal indicative of change in said power, said change being indicative of modulation by movement of said object.

4,896,040

METHOD OF INSPECTING FLOPPY DISK CASING

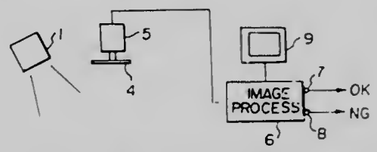
Tomohiro Nakata, and Toshihiro Matsushita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1987, Ser. No. 140,271

Claims priority, application Japan, Jan. 9, 1987, 62-2898

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—372 **7 Claims**



1. A method of inspecting a floppy disk casing comprising the steps of projecting a light beam containing at least ultraviolet light in a predetermined wave range onto a portion of an inner surface of the casing applied with a liner;

receiving ultraviolet light in the predetermined wave range contained in reflected light from each point on a portion of the casing or the liner;

subjecting the intensity of the received ultraviolet light, corresponding to each point on the portion of the casing or the liner, to a threshold processing; and

differentiating the intensity of the received ultraviolet light corresponding to the casing from the intensity of the received ultraviolet light corresponding to the liner to determine whether the liner is applied to the inner surface of the casing in a satisfactory state on the basis of a result of the threshold processing.

4,896,041

DOSIMETER FOR IONIZING RADIATION
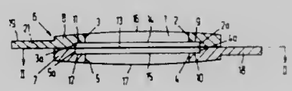
Hugo Vlasbloem, Maasland, and Simon Duinker, Bloemendaal, both of Netherlands, assignors to B.V. Optische Industrie 'De Oude Delft', Delft, Netherlands

Filed Nov. 14, 1986, Ser. No. 931,538

Claims priority, application Netherlands, Nov. 15, 1985, 8503152

Int. Cl.⁴ G01T *1/205*

U.S. Cl. 250—385.1 **30 Claims**



1. A dosimeter for ionizing radiation comprising a casing defining a gas-filled measuring chamber in which there is provided a plurality of anode wires and at least one cathode element and wherein said casing is provided with at least one entry window for ionizing radiation, characterized in that said casing is comprised of essentially rectangularly shaped-frames of insulating material defining an oblong measuring chamber, said frames of insulating material mounted to each other in gas-tight manner and essentially transparent to ionizing radiation, an innermost long edge of each frame of insulating material being provided with a shoulder extending parallel to said plane of said anode wires, each shoulder of said frame supporting a flat cathode element at a distance from said anode wires, said cathode element extending essentially over a length of said oblong measuring chamber and being essentially flat, said cathode element being mounted in at least one of said frames and parallel to a plane of said anode wires, said anode wires are disposed parallelly to one another in said chamber in a plane of separation between said frame over essentially a length of said oblong measuring chamber essentially transverse to said oblong measuring chamber.

4,896,042

DUAL MODE GERMICIDAL APPARATUS

Wesley G. Humphreys, Huntingdon Valley, Pa., assignor to Dora DiCamillo 1988 Trust, Newtown, Pa.

Filed Sep. 6, 1988, Ser. No. 240,608

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.⁴ A61L *2/10*

U.S. Cl. 250—435 **11 Claims**



1. In a lightweight portable ultraviolet germicidal lamp for killing both airborne and surface carried bacteria comprising a housing structure having side walls, a top wall and an open lower end; a grid spanning, lengthwise and widthwise, the open lower end of said housing; support means at the lower end of said side walls to support the housing and permit easy movement thereof over a surface with the grid closely adjacent to said surface; a reflector closely spaced from and facing said grid, said reflector carried by said housing and spanning between opposite side walls thereof; a plurality of ultraviolet germicidal lamps intermediate said reflector and grid extending lengthwise of said housing and parallel to said lengthwise grid; and handle means on said housing to permit the same to be readily moved by a user; the improvement comprising,

a detachable base section having a lower wall and upwardly projecting front, rear and side walls to removably engage said housing structure and support the same with said grid spaced from the lower wall of said base section;

openings in said front and rear walls to allow air to be drawn into a space between said grid and said lower wall; and

a fan carried by said rear wall to draw air through the space between said grid and said lower wall whereby any bacteria carried by the air is exposed to said ultraviolet lamps.

4,896,043

RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa, Minami-ashigara; Yuichi Hosoi, Chigasaki, and Kenji Takahashi, Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Continuation of Ser. No. 5,642, Jan. 21, 1987, abandoned. This application May 13, 1988, Ser. No. 195,379

Claims priority, application Japan, Jan. 21, 1986, 61-11297; Dec. 27, 1986, 61-309758

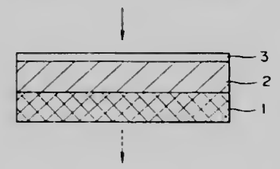
Int. Cl.⁴ G03B *42/08*

U.S. Cl. 250—484.1 **15 Claims**

1. A radiation image storage panel comprising a phosphor layer containing a stimulable phosphor and a multi-layer optical filter which has a reflectance of not less than 60% at a

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stimulation wavelength of said stimulable phosphor when the stimulating ray is perpendicular to the surface of the phosphor



and a transmittance of not less than 60% at a wavelength of a stimulated emission of the stimulable phosphor.

4,896,044

SCANNING TUNNELING MICROSCOPE NANOETCHING METHOD

Yun-Zhong Li; Ronald G. Reifenberger, and Ronald P. Andres, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Feb. 17, 1989, Ser. No. 312,768
Int. Cl.[4] H01J *37/305*
U.S. Cl. 250—492.3 **9 Claims**



1. A method for creating topographic depressions on a conducting substrate by localized vaporization of the substrate surface on a nanometer scale comprising the steps of:

positioning a tunneling tip over said surface so that a tunneling current is detectable in said tunneling tip upon application of a predetermined bias voltage; and

transiently increasing the tunneling current to create a power density sufficient to cause localized evaporation of the substrate surface.

4,896,045

ELECTRON BEAM HEAD AND PATTERNING APPARATUS INCLUDING DETECTION OF SECONDARY OR REFLECTED ELECTRONS

Masahiko Okunuki, Tokyo, and Mitsuaki Seki, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,966
Claims priority, application Japan, Apr. 28, 1987, 62-103025
Int. Cl.[4] G21K *5/10*
U.S. Cl. 250—492.2 **11 Claims**

1. An electron beam head for projecting an electron beam toward an article, comprising:

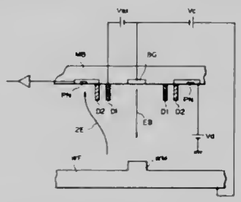
a base member;

electron beam producing means provided on said base member, for producing a beam of electrons;

detecting means provided on said base member, for detecting electrons from the article as the article is irradiated with the electron beam from said electron beam producing means;

a first electrode provided on said base member, for providing a first electric field having a first potential for introducing the electrons from the article to said detecting means; and

a second electrode provided on said base member and disposed between said electron beam producing means and



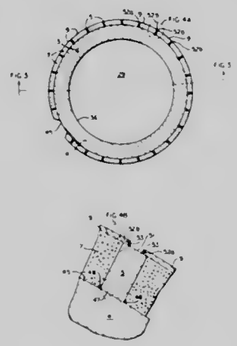
said first electrode, for providing a second electric field having a potential higher than that of the first potential.

4,896,046

FUEL ROD SHIPPING CASK HAVING PERIPHERAL FINS

Larry E. Efferding, Pensacola, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1988, Ser. No. 189,208
Int. Cl.[4] G21F *5/00*
U.S. Cl. 250—507.1 **25 Claims**



11. A shipping cask for transporting radioactive material, comprising:

a. an inner vessel having an open end, a closed end and a heat conducting wall formed from an alloy containing iron;

b. a plurality of substantially flat, heat conductive and mutually parallel ribs formed from an alloy containing iron, each of which has an inside and an outside edge, wherein the inside edge is welded to the outside surface of the heat conducting wall of the inner vessel by welds on either side of said inside edge, and wherein each rib is oriented substantially orthogonally with respect to said outside surface;

c. a layer of neutron absorbing, cementitious material disposed over the outside wall of the inner vessel and between the mutually parallel ribs, and

d. a plurality of flat fin members formed from an alloy containing iron, each of which has two opposing and mutually parallel edges that are connected to the outer edges of two adjacent ribs for both dissipating heat conducted by the ribs, for supporting and protecting the layer of cementitious material and creating a watertight barrier between the cask exterior and the cementitious material,

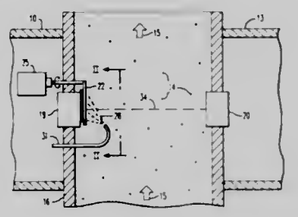
wherein the substantially orthogonal orientation of the ribs that support each fin member reinforces said fin member against mechanical shock applied to the cask.

4,896,047

METHOD AND APPARATUS OF PERIODICALLY OBTAINING ACCURATE OPACITY MONITOR READINGS OF AN EXHAUST GAS STREAM

Karen L. Weaver, Oviedo, and James C. Bellows, Maitland, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1988, Ser. No. 179,683
Int. Cl.[4] G01N *15/06*
U.S. Cl. 250—573 **17 Claims**



1. In an opacity monitor associated with an exhaust stack, said monitor having a transmitter and a receiver which cooperate to measure a quantity of particulate matter in an exhaust gas stream, a method of periodically obtaining opacity monitor readings comprising the steps of:

(a) shielding the monitor from the exhaust gas stream by placing two windows adjacent to the monitor, a first window being placed between said transmitter and said exhaust gas stream and a second window being placed between said receiver and said exhaust gas stream;

(b) cleaning at least one of said windows for a first predetermined time period by spraying a volatile nonflammable cleaning solvent onto said window by means of a sprayer intermittently operable during the first predetermined time period while wiping said window with a reciprocating wiper arm in resilient engagement therewith, said wiper arm continuously operable during the first predetermined time period;

(c) then obtaining an opacity monitor reading by directing a light beam across the exhaust stack from the transmitter via the first window through the exhaust gas stream to the receiver via the second window during a second predetermined time period; and

(d) alternately repeating the step of cleaning said window for the first predetermined time period with the step of obtaining an opacity monitor reading during the second predetermined time period.

4,896,048

SCATTERING-TYPE PARTICLE DETECTION DEVICE FOR USE IN HIGH TEMPERATURE PROCESS CHAMBERS

Peter G. Borden, Palo Alto, Calif., assignor to High Yield Technology, Mountain View, Calif.

Filed May 27, 1988, Ser. No. 199,546
Int. Cl.[4] G01N *15/07, 21/00*
U.S. Cl. 250—574 **36 Claims**

1. A particle detector for use in a high temperature environment comprising:

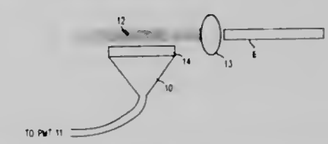
a light source for providing short wavelength radiation;

an optical fiber means for receiving and conducting said radiation;

means for focusing said radiation from said light source onto said optical fiber means;

a process chamber to which said optical fiber means is directed;

optical lens means for collimating or focusing the radiation passing through said optical fiber;



an optical fiber pickup adjacent to said lens means for receiving light scattered by particles within said process chamber; and

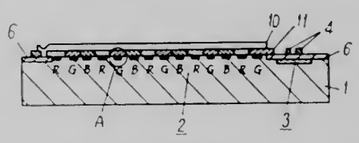
photosensing means to detect such scattered light and for producing pulse signals indicative of the number of particles that are present in said process chamber.

4,896,049

COLOR IMAGE SENSOR OBTAINED FROM VISUAL PHOTOSENSITIVE MATERIALS DERIVED FROM BIOLOGICAL SUBSTANCES

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 26, 1988, Ser. No. 198,829
Claims priority, application Japan, May 29, 1987, 62-135013
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 250—578 **2 Claims**



1. An image sensor having a plurality of visual substance films composed of biological substances producing optical current or optically induced electric power, depending on the intensity of light by responding to light of a specific wavelength, said usual substance films arranged in mosaic or stripe form on a picture element region containing a charge accumulation region of a solid image pickup device and a charge transfer region, being formed between a contact electrode and a transparent electrode which are connected to said charge accumulation region, and

wherein said plurality of visual substance films are violet films of varied sensory wavelength produced by isolating bacteriorhodopsin from halophils and denaturing retinal in an opsin protein thereof.

4,896,050

REMOTE CONTROL TYPE OF AUTOMATIC CONTROL DEVICE FOR THE AUTOMOBILE DOOR

Chen Shin-Chung, No. 11-11 Nei Tso Tsun, Lachu-Taoyuan, Taiwan

Filed Jul. 18, 1988, Ser. No. 220,306
Int. Cl.[4] H02J *3/14*
U.S. Cl. 307—10.2 **10 Claims**

1. An automatic remote control locking and unlocking devices for automobile doors and the like, comprising in combination:

a plurality of interconnected circuits including

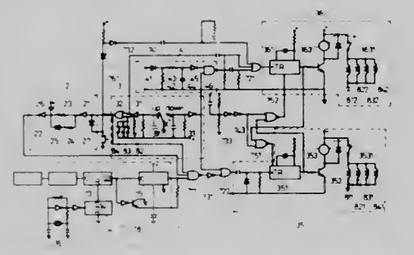
(I) a receiving circuit;

(II) a control circuit;

(III) a switch circuit;

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(IV) a delayed locking circuit connected to said switch circuit;
(V) a car-speed detecting circuit;
(VI) a first locking circuit;
(VII) a second locking circuit;
(VIII) a first unlocking circuit; and
(IX) a second unlocking circuit;
said receiving circuit at least including:
(a) a trigger having input and output terminals;
(b) two NAND gates, each having at least first and second input terminals;
(c) two negative triggering mono-stable circuits;
(d) an input transistor;
(e) an output transistor;
(f) a micro-switch, having unlocking and locking contacts and a center contact, operatively connected to a respective main car door, with the center contact of said microswitch being grounded;
wherein
an input terminal of said trigger is connected to said input transistor, and upon receipt of a respective signal an output terminal of said trigger is emitting a signal;
the first input terminal of each of said two NAND gates is respectively connected to the output terminal of said trigger;
the second input terminal of each of said two NAND gates is respectively connected to the unlocking and locking contacts of said micro-switch;
the output terminals of said NAND gates are respectively connected with said locking contacts of said microswitch;



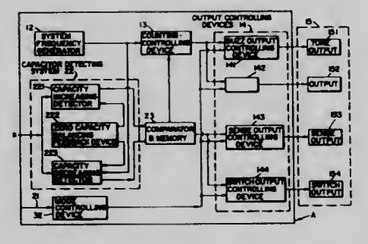
said locking contact of said micro-switch being connected respectively with the input terminals of said negative triggering mono-stable circuits for respectively effecting unlocking or locking; and
the output terminals of said negative triggering mono-stable circuits being connected to the base of said output transistor;
(g) a relay connected with the collector of said output transistor; and
(h) an indicating lamp operable by way of said relay;
said control circuit including said first recited microswitch and associated micro-switches for the locking devices of car doors, and said control circuit further including said switch circuit;
(i) an AND gate connected to the output terminals of said first locking circuit, said switch circuit and said car-speed detecting circuit, and the output of said AND gate controlling said second locking circuit;
(j) locking coils in respective of said locking and unlocking circuits, for the car-door locking device, with said locking coils being connected in parallel at the output terminal of said delayed locking circuit, and with said locking devices on the car doors being locked up automatically upon at least three circuits having an "H" output terminal of the second unlocking circuit connected with respective unlocking coils of the locking devices of the car doors;
(k) at least one OR gate for controlling of the respective unlocking circuit being controlled by said OR gate;
(l) an unlocking control switch of which one terminal is grounded, with the other terminal being connected through a first inverter with the input terminal of said OR gate; and
(m) the first inverter as aforesaid, connected to said second unlocking circuit and with another input terminal of said OR gate, with either pressing of said unlocking control switch and the car being stopped, said unlocking control switch starting to operate, and said OR gate generating an output signal to drive said respective unlocking circuit to substantially automatically release the car's locking devices.

4,896,051

MULTI-PURPOSE SENSE CONTROLLER

Line Chiang-Piao, 4F., No. 330, Sec. 4, Chung Yang N. Rd., Pei Tou District Taipei, and Tsai Wen-Pin, 3F., No. 4, Lane 9, Ning an Street, Taipei, both of Taiwan

Filed May 10, 1988, Ser. No. 192,150
Int. Cl.[4] H01H *35/00*
U.S. Cl. 307—117 **1 Claim**



1. A multi-purpose sense controller comprising:
a system frequency generator producing a steady frequency for timing and synchronism;
a capacity detecting system including a capacity decreasing detector and a zero capacity balance detector for detecting and determining input capacity change and sending out corresponding signals;
a mode control input for setting the selected mode and controlling time period;
a timing controller for calculating time;
a comparator memory for comparatively determining the variation of the induced condition so as to send out signal to actuate the controller;
a timing output controller for providing timing switch, delay switch, and delay timing switch through the selection of the mode controller;
a sense output controller which all determine the output condition through the selection of the mode controller;
a switch output controller controlled by the selection of the controller so that it will be actuated by a first sense and stopped by a second sense; and
a conducting plate connected to the input of the controller.

4,896,052

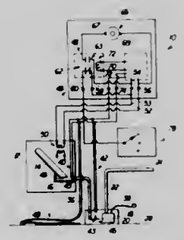
OVERFLOW AND LEAKAGE DETECTION SYSTEM FOR AN AIR CONDITIONING UNIT

Daniel R. Morrison; William C. Pickell, both of Key Biscayne, Fla., and William S. Massey, Silver Spring, Md., assignors to Liquid Management Systems, Inc., Key Biscayne, Fla.

Continuation-in-part of Ser. No. 912,574, Sep. 29, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 173,480
Int. Cl.[4] F25B *1/00, 49/00*
U.S. Cl. 307—118 **12 Claims**

1. An air conditioning assembly including an overflow detector system for the sensing of leaks from the air conditioning assembly, said air conditioning assembly comprising, in combination,

(a) an air conditioning unit having collection means for the collection of overflow condensation therein,
(b) a sensor mechanism connected to an electrical power source and including at least one probe extending outwardly therefrom into operative relation to said collection means,
(c) said one probe positioned at a predetermined overflow level on said collection means, said predetermined overflow level defined by water contact with said one probe prior to overflow from said collection means,
(d) control means electrically connected to said sensor mechanism and said power supply and structured for regulating current flow from said power supply to said sensor mechanism and for further regulating activation and deactivation of the air conditioning unit,
(e) at least one supplementary probe extending outwardly



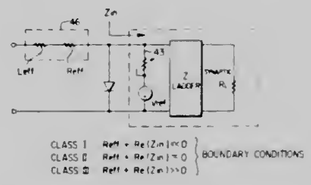
from said sensor mechanism and positioned in liquid sensing relation on a supporting surface for said air conditioning unit in receiving relation to overflow condensation from said collection means or plumbing components associated therewith,
(f) said one supplementary probe comprising an elongated configuration and including two spaced apart conductors extending the length thereof and interconnected to one another and partially covered at spaced apart locations along the length of said supplementary probe by insulating material, said one supplementary probe disposed on the supporting surface and configured to sense liquid collected thereon,
(g) said control means including switching means electrically interconnected to said one probe and to said electrical power source for regulating activating current to the air conditioning unit.

4,896,053

SOLITARY WAVE CIRCUIT FOR NEURAL NETWORK EMULATION

Robert L. Kesselring, 422 Rustic Cir., Richardson, Tex. 75080

Filed Jul. 29, 1988, Ser. No. 226,034
Int. Cl.[4] H03K *19/08, 19/12, 19/20*
U.S. Cl. 307—201 **14 Claims**



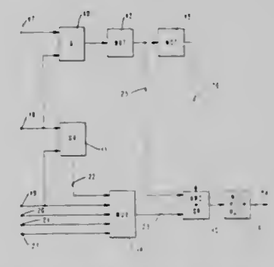
1. A circuit for emulating action potential propagation through a portion of a neuron, comprising:
a plurality of series-connected "L" stages, each of the "L" stages comprising:
a first shunt branch having a variable capacitor;
a second shunt branch having a conductance and a d.c. bias means connected in series; and
a third branch connected in series to the first and second branches, the third branch having an inductance means including one or more operational amplifier means adapted to form an inductor, wherein the inductor and the variable capacitor cooperate to generate a solitary wave output representing an action potential through the portion of the neuron.

4,896,054

OPTIONAL SINGLE OR DOUBLE CLOCKED LATCH

Donald B. Kiley, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 519,338, Aug. 1, 1983. This application Nov. 29, 1985, Ser. No. 802,923
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—272.1 **29 Claims**



1. A programmable latching circuit comprising:
a double-ended cross coupled circuit having input means and output means,
said double-ended cross coupled circuit having first and second programmable legs and a third non-programmable leg,
said first programmable leg being coupled to said output means and cross coupled to said third non-programmable leg and comprising a first programming transistor and a first gating transistor,
said second programmable leg being coupled to said input means and said output means and switchably cross coupled to said third non-programmable leg and comprising a second programming transistor and a second gating transistor, and
each of said programming transistors and said gating transistors having a respective control electrode,
said third non-programmable leg comprising a transistor having a control electrode coupled to said first and second programming transistors.

4,896,055

SEMICONDUCTOR INTEGRATED CIRCUIT TECHNOLOGY FOR ELIMINATING CIRCUITS OR ARRAYS HAVING ABNORMAL OPERATING CHARACTERISTICS

Syuso Fujii, Kawasaki, and Shozo Saito, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

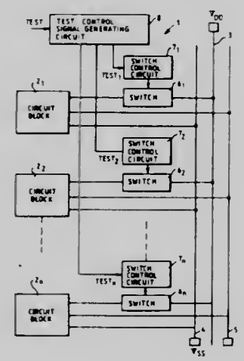
Filed Mar. 4, 1988, Ser. No. 164,407
Claims priority, application Japan, Mar. 6, 1987, 62-51362
Int. Cl.[4] G06F *15/60;* **G11C** *7/00;* **G01R** *31/28;* **H03K** *19/007*
U.S. Cl. 307—442 **26 Claims**

1. A semiconductor integrated circuit having power lines, the circuit comprising:

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a plurality of circuit blocks each having equivalent functions;

first switch means corresponding to each circuit block for coupling power from said power lines to the corresponding circuit block; and



switch control means corresponding to each first switch means for selectively controlling the activation of the corresponding first switch means.

4,896,056

SEMICONDUCTOR IC INCLUDING CIRCUIT FOR PREVENTING ERRONEOUS OPERATION CAUSED BY POWER SOURCE NOISE

Mitsuyuki Kamioda, Kawasaki, and Tadahiro Fujii, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

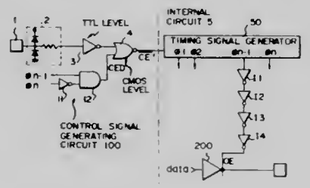
Filed Oct. 5, 1988, Ser. No. 253,658
Claims priority, application Japan, Oct. 9, 1987, 62-254993
Int. Cl.[4] H03K *17/16, 5/00*
U.S. Cl. 307—443 **14 Claims**

1. A semiconductor integrated circuit comprising:

a first logic circuit, having a first threshold voltage, for outputting a logic signal corresponding to a level of an input signal which is externally supplied thereto;

a second logic circuit for outputting a logic signal of a predetermined level regardless of an output from said first logic circuit while a control signal is being generated, said second logic circuit having a second threshold voltage higher than the first threshold voltage, one input terminal for receiving an output signal of said first logic circuit, and another input terminal for receiving a control signal;

an internal circuit for receiving the logic signal from said second logic circuit and executing a predetermined operation; and



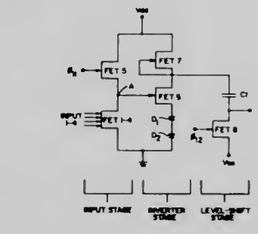
control signal generating means for generating the control signal while power source noise caused by the operation of said internal circuit is being generated.

4,896,057

HIGH-SPEED DYNAMIC DOMINO CIRCUIT IMPLEMENTED WITH GAAS MESFETS

Long Yang, Edison, N.J., and Stephen I. Long, Santa Barbara, Calif., assignors to United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 14, 1988, Ser. No. 244,761
Int. Cl.[4] H03K *19/096*
U.S. Cl. 307—448 **7 Claims**



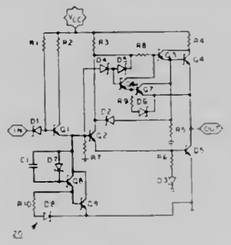
1. A dynamic logic gate comprised of a plurality of metal-semiconductor field-effect transistors each having a source terminal, a drain terminal, and a gate terminal for control of current flow from said source to said drain terminal, said logic gate having a first transistor connected in series for current conduction with one or more data input transistors between a source of bias potential and circuit ground, said first transistor having its gate connected to a clock pulse source for precharging an internal node between said first transistor and said one or more data input transistors by turning said first transistor on during the presence of a clock pulse, following which data inputs applied to gates of said one or more data input transistors may discharge said internal node depending on the logic level of said data inputs, and two output metal-semiconductor field-effect transistors connected as an inverter having the input gate of said inverter connected to said internal node.

4,896,058

TTL CIRCUIT HAVING RAMPED CURRENT OUTPUT

Robert J. Murray, Mapleton, Utah, assignor to North American Philips Corp., New York, N.Y.

Filed Apr. 26, 1988, Ser. No. 186,502
Int. Cl.[4] H03K *19/088, 17/16, 19/092*
U.S. Cl. 307—456 **5 Claims**



1. A logic buffer circuit having an input terminal and an output terminal, which comprises:

control circuit means connected to said input terminal;

output pull-up driver means coupled during operation to a supply voltage and having an input coupled to said control circuit means and an output coupled to said output terminal;

output pull-down driver means coupled during operation to a reference voltage and having an input coupled to said control circuit means and an output coupled to said output terminal; and

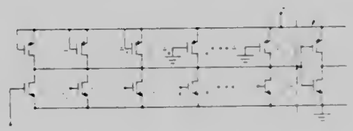
means for generating a ramped current output at said output terminal for both high-to-low and low-to-high output level transitions during operation and comprising a first current amplifier means coupled between said control circuit means and said reference voltage, and second current amplifier means coupled to said control circuit means and having an output connected to said output terminal.

4,896,059

CIRCUIT TO PERFORM VARIABLE THRESHOLD LOGIC

Scott Goodwin-Johansson, Pittsboro, N.C., assignor to Microelectronics Center of North Carolina, Research Triangle Park, N.C.

Filed Jul. 26, 1988, Ser. No. 224,334
Int. Cl.[4] H03K *17/30*
U.S. Cl. 307—464 **13 Claims**



1. A high speed logic gate circuit for detecting input signals and having variable threshold capabilities comprising:

a. a source of reference voltage;

b. at least one first transistor means of a first gate conductivity type having the transistor source connected to reference voltage and the transistor drain connected to a common circuit point and the gate of the transistor means connected to said reference voltage or ground with at least one gate connected to said reference voltage if the first gate conductivity type is NMOS and at least one gate connected to the ground if the first gate conductivity type is PMOS to establish a predetermined circuit operating point;

c. an array of parallel transistors of a second gate conductivity type, complementary to said first transistor means and having the array transistor drains connected to the common circuit point and the array transistor sources connected to the ground and gates of selected array transistors coupled for receiving signals to be monitored; and

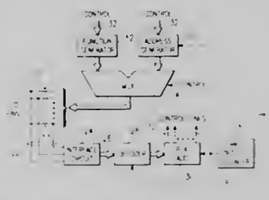
d. bi-stable inverter means having its input connected to said common circuit point so that its output changes state when the voltage at said common point exceeds a predetermined level.

4,896,060

DIALER WITH INTERNAL OPTION SELECT CIRCUIT PROGRAMMED WITH EXTERNALLY HARDWIRED ADDRESS

Herman Ma, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Oct. 31, 1988, Ser. No. 264,902
Int. Cl.[4] H03K *19/01, 3/26*
U.S. Cl. 307—482.1 **15 Claims**



1. A programmable control circuit, comprising:

a plurality of input/output pins;

an address generator for generating a separate and predetermined serial address for each of said input/output pins;

a function generator for interfacing with said input/output pins to perform a predetermined function;

a multiplexer circuit for selecting said function generator when in a normal mode of operation or said address generator when in a set-up mode of operation to interface with said input/output pins;

a plurality of address input pins having a number less than that of said plurality of input/output pins;

interface means for interfacing select ones of said input/output pins with select ones of said address input pins;

decode means for decoding and latching said addresses received on said address input pins during said set-up operation;

an addressable control signal generator for outputting a separate and predetermined control signal for each decodable address, said predetermined control signals utilized by said function generator; and

control means for generating a set-up signal to control said multiplexer to select said address generator and to control said decode means for decoding and latching said received addresses on said input address pins.

4,896,061

GAAS ANALOG SWITCH CELL WITH WIDE LINEAR DYNAMIC RANGE FROM DC TO GHZ

Syed M. Ahmed, Flemington, N.J., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,679
Int. Cl.[4] H03K *17/687, 3/353*
U.S. Cl. 307—575 **20 Claims**

1. A series switching cell (FIG. 5) for selectively switching an RF signal at an input to an output, comprising:

a first FET (40) having a gate electrode adapted to receive said RF signal and having a drain electrode adapted to

receive an operating potential (V_{DD}) and a source electrode;

a second FET (49) having a source to drain path in series with the gate electrode of said first FET for receiving said RF signal;

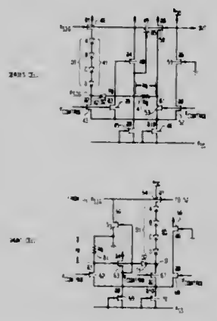
a third FET (43) having a gate electrode adapted to receive a first control signal (V_{CONT}) for turning said third FET ON or OFF;

a diode clamping means (41) coupled between the source electrode of said first FET and a drain electrode of said third FET;

a fourth FET (39) having a gate electrode coupled to the gate electrode of said third FET (43) and having a source electrode coupled to a source electrode of said third FET and having a drain electrode coupled to said drain electrode of said third FET (43) via a diode (42);

a fifth FET (48) having a gate electrode coupled to the drain electrode of said fourth FET (39) and having a source electrode coupled to a gate electrode of said second FET (49), with the source electrode of said fifth FET (48) coupled to a point of reference potential via a first current source (45);

a sixth FET (50) having a drain electrode adapted to receive said operating potential (V_{dd}) and having a gate electrode coupled in series with said source to drain path of said second FET (49) to provide an output, and having a source electrode coupled to said drain electrode of said fourth FET (39) via a resistor (47);



a seventh FET (53) having a drain electrode coupled to said source electrode of said sixth FET (50) and having a source electrode coupled to the source electrodes of said third and fourth FETs (43, 39) and coupled to a second current source (46);

an eighth FET (52) having a gate electrode coupled to the gate electrode of said seventh FET (53) and a source electrode coupled to the source electrode of said seventh FET (53) with the gate electrode of said seventh and eight FETs (52,53) adapted to receive a control signal (V_{CONT}) of opposite polarity to said first control signal for turning said seventh and eight FETs ON or OFF;

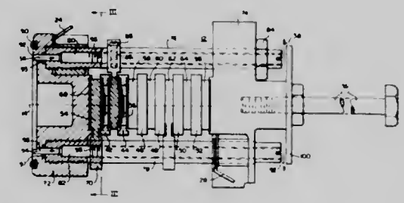
a ninth FET (51) having a grounded gate electrode, a drain electrode adapted to receive said operating potential and source electrode coupled to the drain electrode of said eighth FET (52) wherein said RF input signal at the gate electrodes of said first FET (40) propagates to said output of said sixth FET (50) when a first level of said first control signal is applied to said gate electrodes of said seventh and eighth FET (52 and 53) and to prevent said RF input signal from propagating when a second opposite level control signal is applied to said gate electrodes of said seventh and eighth FETs while a first level control signal is applied to said gate electrodes of said third and fourth FETs (39, 43), wherein said RF signal is selectively switched from said input to output linearly for a wide range of input RF signals.

4,896,062

ROTATING RECTIFIER ASSEMBLY

David D. Pollard, Amanda Township, Lima County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1988, Ser. No. 201,716
Int. Cl.[4] H02K *11/00, 9/19;* **H01L** *23/32*
U.S. Cl. 310—68 D **8 Claims**



1. A rectifier assembly for use in the rotor of an electric generator, said assembly comprising:

a plurality of generally disk-shaped diode packages arranged in a stack on a common axis;

a plurality of radial bus bars, formed of electrically and thermally conductive material, each of said radial bus bars having a first portion positioned adjacent to at least one of said diode packages along said axis and a second portion extending radially outward from said stack;

first and second end members positioned at opposite ends of said stack;

a plurality of electrically and thermally conductive through bolts extending between said first and second end members;

each of said through bolts including a longitudinal opening for receiving cooling fluid;

means for placing selected ones of said through bolts in tension between said first and second end members, thereby axially compressing said stack;

means for electrically connecting each of said radial bus bars to one of said through bolts; and

means for electrically connecting each of said through bolts to an external circuit.

4,896,063

ELECTROMAGNETIC INDUCTION DEVICES WITH MULTI-FORM WINDING AND REFLECTED MAGNETIZING IMPEDANCE

Gary D. Roberts, Riverton, Utah, assignor to S.P.C. Holding Co., Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 315,800, Feb. 27, 1989, which is a continuation of Ser. No. 83,137, Aug. 12, 1987, Pat. No. 4,808,868, which is a continuation-in-part of Ser. No. 900,700, Aug. 27, 1986. This application Mar. 9, 1989, Ser. No. 321,234
Int. Cl.[4] H02P *1/44;* **H02K** *11/00*
U.S. Cl. 310—68 R **8 Claims**

1. A polyphase induction machine adapted to be supplied with polyphase power at a plurality of input terminals, said machine comprising:

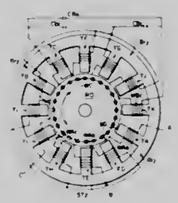
a rotatable rotor carrying a plurality of interconnected rotor windings;

a stator operatively associated with said rotor;

a plurality of primary stator windings disposed in said stator for each phase of said polyphase power and receiving, via one of said input terminals, a different phase of said polyphase power and adapted to be magnetically coupled to said rotor windings, each of said primary stator windings being in the form of an insulated form coil;

first means for electrically connecting said primary stator windings in a first configuration;

a plurality of secondary stator windings disposed in said stator such that said secondary stator windings are not electrically connected to said input terminals, are not electrically connected to said primary stator windings, and are adapted to be magnetically coupled to said primary windings and magnetically coupled to said rotor windings when said machine is operating, each of said secondary stator windings exhibiting an inductive reactance, and being in the form of a random coil;



second means for electrically connecting said secondary stator windings in a second configuration; and

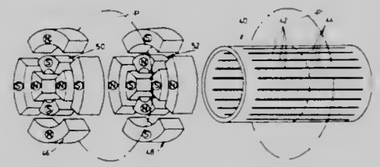
a capacitor exhibiting a capacitive reactance and being provided for each secoodary stator winding wherein said capacitor is electrically connected across at least one of said secondary stator windings and is of such a size as to form a parallel floating resonant circuit with said at least one of said secondary stator windings where said capacitive and inductive reactances will be equal at a predetermined resonant frequency.

4,896,064

LOW LOSS MAGNETIC DRIVE SYSTEM

Patrick M. Taiani, Bedford, Canada, assignor to Nova Scotia Research Foundation Corp., Nova Scotia, Canada

Filed Jan. 3, 1989, Ser. No. 293,106
Int. Cl.[4] H02K *49/10*
U.S. Cl. 310—104 **11 Claims**



1. A low loss synchronous magnetic drive system comprising:

(a) a drive motor;

(b) a cup-shaped carrier member coupled to said drive motor for rotation on a longitudinal axis, said member mounting therein at least two axially spaced apart sets of drive magnets, circumferentially adjacent magnets of each set being of opposite polarity and each magnet of one set being longitudinally aligned with a magnet of opposite polarity within the axially adjacent set;

(c) a driven shaft rotatable on said axis, said shaft carrying thereon at least two axially spaced apart sets of driven magnets, each set being axially aligned with a corresponding set of said drive magnets, circumferentially adjacent driven magnets of each set being of opposite polarity, each driven magnet of one set being longitudinally aligned with a driven magnet of opposite polarity within the axially adjacent set;

(d) tension cylinder means circumferentially interposed between said sets of drive and driven magnets, said cylinder means including a plurality of narrow, circumferentially equally spaced slots extending radially though the wall of said cylinder means over at least the combined length of said sets of driven magnets, said cylinder means having a closed wall at one end between said shaft and said carrier means and means at the other end for hermetically mounting said cylinder means to a housing containing apparatus to be driven by said shaft; and

(e) a plurality of axially adjacent annular laminations electrically insulated from each other and positioned within said cylinder means so as to encircle said driven magnets over the length thereof;

at least said driven shaft, said cylinder means and said laminations being constructed of non-magnetic materials having high tensile strength and high electrical volume resistivity.

4,896,065

MINIATURE MOTOR

Kenji Tsuyama, Chiba, Japan, assignor to Mabuchi Motor Co., Ltd., Chiba, Japan

Filed Jan. 8, 1987, Ser. No. 1,371
Claims priority, application Japan, Sep. 1, 1986, 61-1271[U]
Int. Cl.[4] H02K *21/26*
U.S. Cl. 310—154 **10 Claims**



1. A miniature motor comprising: a motor case; a permanent magnet stator supported on an inner surface of said motor case; first and second bearings supported by said motor case; a rotor shaft supported by said first and second bearings; a commutator supported on said rotor shaft; a rotor supported on said rotor shaft; an electrical contact supported by said housing; and, a contact brush connected to said electrical contact and positioned so as to be in electrical contact with said commutator; and magnetic rotor shaft biasing means for urging the rotor shaft in a predetermined direction within the bearings, said rotor shaft biasing means includes a thick C-shaped stator segment at one side of said rotor and a thin C-shaped stator segment at an opposite side from said thick C-shaped stator segment, said rotor being acted on by a magnetic field form said thick C-shaped stator segment so as to urge said rotor in a direction and urge said rotor shaft in a direction within said bearings.

4,896,066

LAMINATED ROTOR SLOT CLOSER

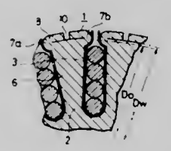
Toshio Tomite, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,270
Claims priority, application Japan, Jun. 3, 1987, 62-138080
Int. Cl.[4] H02K *15/09, 1/24*
U.S. Cl. 310—214 **2 Claims**

1. An armature of a rotary machine comprising a laminated core having a plurality of slots formed therein, windings wound in the slots of the laminated core, and projecting portions formed by deforming partly open portions of the slots of the laminated core so as to prevent a slipping-out of the windings from the slots, each of the projecting portions having a

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curved outer peripheral surface provided in a vicinity of a slot open side of a tooth portion between the slots of the laminated core, an insulating paper provided on a surface of each slot and on the curved projecting portions, an insulating material provided between the insulating paper and the windings in each slot and between adjacent projecting portions of a respective



slot having the insulating paper provided thereon, the adjacent curved projecting portions of a respective slot being spaced from one another so as to delimit a cut-open portion having a width smaller than the width of a respective slot, the adjacent curved projecting portions being spaced from the windings of the slot so that the curved projecting portions cause substantially no damage to a surface of the windings.

4,896,067

ELECTRICAL MACHINE, ESPECIALLY ELECTRIC MOTOR

Bernd Walther, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

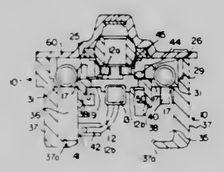
PCT No. PCT/EP87/00431, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/01802, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 7, 1987, Ser. No. 192,743

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629634

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—239 **3 Claims**



1. A brush mounting device for mounting the elongate brush holders, at least one first generally cylindrical circuit component and at least one generally cuboid second circuit component of an electric motor, said device comprising a one piece member of an electrically non conductive material including a generally flat disc like plate portion having a front face, a rear face and a central opening extending through said plate portion along an axis perpendicular to said front and rear faces, first means on said plate portion for fixedly mounting a pair of elongate brush holders upon said rear face at diametrically opposite sides of said central opening with the longitudinal axes of said holders in alignment with each other, said means integral with said plate portion for mounting a pair of first generally cylindrical circuit components upon the front face of said plate portion at diametrically opposite sides of said central opening with the longitudinal axes of said first components extending parallel to each other, and third means integral with said plate portion for mounting said at least one generally second circuit cuboid component on said plate portion upon the rear face of said plate portion directly opposite one of said first generally cylindrical circuit components.

4,896,068

ACTIVITY SENSOR FOR A HEART PACEMAKER

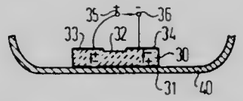
Keath Nilsson, Akersberga, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 97,139, Sep. 16, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,342

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633255

Int. Cl.⁴ H01L *41/08;* **A61N** *1/00*

U.S. Cl. 310—329 **5 Claims**



1. An activity sensor for use in a heart pacemaker having a housing with at least one flat wall, said activity sensor comprising:

a flexural type piezoelement having oppositely polarized ceramic parts, each having first and second sides and contacted at both sides with electrodes, said ceramic parts being arranged side-by-side with said first sides facing said flat wall of said housing;

means for electrically connecting said electrodes on said first sides of said ceramic parts to one another;

means for securing said first sides in force-transmitting contact over entire area with said flat wall of said housing; and

said electrodes on said second sides electrically connected to at least first and second terminals so that said piezoelement generates an electrical voltage across said terminals as a measure of activity acting upon the piezoelement through said wall of said housing.

4,896,069

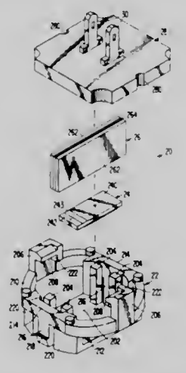
PIEZOELECTRIC SWITCH

Armand Rosenberg, Rehovot, and Menashe Yeheskel, Yavne, both of Israel, assignors to Makash - Advanced Piezo Technology, Israel

Filed May 27, 1988, Ser. No. 199,701

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—339 **8 Claims**



1. A piezoelectric switch comprising:

casing means for receiving an external mechanical force;

piezoelectric means for sensing the external mechanical force received by said casing means and converting said force to an electrical signal, said piezoelectric means having one side connected to said casing means and another side having a positive pole and a negative pole;

anisotropic elastomeric connector means disposed adjacent to and in contact with said piezoelectric means for conducting the electrical signal; and

circuit means disposed adjacent to and in contact with said conductive means for receiving and processing the conducted electrical signal received from said piezoelectric means and for preventing any electrical signals from passing from said circuit means through said conductive means to said piezoelectric means.

4,896,070

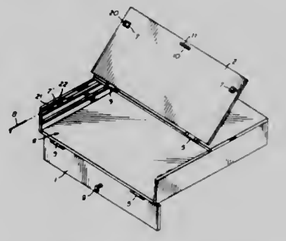
VCR CABINET

Dwight K. Reid, P.O. Box 16680, Houston, Tex. 77222, and Glen T. Balusek, 3330 Lake Ridge Bend, Spring, Tex. 77380

Continuation-in-part of Ser. No. 54,225, May 26, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 211,432

Int. Cl.⁴ A47B *81/00*

U.S. Cl. 312—290 **6 Claims**



1. A video containment apparatus comprising a rectangular prism having:

a top,

two sides,

a top door slidably mounted in the top by means of a pair of tracks extending from the front and under a fixed portion of said top,

a front comprising a moveable front door contiguous to said top door and hingedly mounted to one of said sides and

a bottom and additionally comprising a key activated lock mounted in said front door, said lock having an arm for engaging a portion of said top door whereby both doors are held in place when both are fully closed and said lock activated.

4,896,071

METHOD AND DEVICE FOR SETTING THE STATIC CONVERGENCE AND/OR PURITY OF A COLOR TELEVISION TUBE

Claude Pons, Rome, Italy, assignor to Videocolor, Montrouge, France

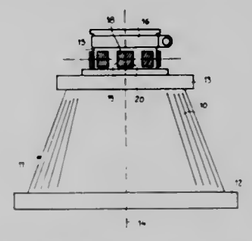
Filed Nov. 12, 1987, Ser. No. 119,445

Claims priority, application France, Nov. 12, 1986, 86 15672

Int. Cl.⁴ H01J *29/70*

U.S. Cl. 313—428 **17 Claims**

1. A method for the setting of static convergence of a color television tube using permanent magnets, wherein magnetizable elements are fixed around the tube, the said elements being evenly distributed around the axis of the tube and wherein, to correct static convergence errors, each element is magnetized by means of a corresponding coil, the position and dimensions



of which are such that each element is subjected only to the field inside the turns of the corresponding coil.

4,896,072

FLASHBULB WITH A HEAT SHIELD

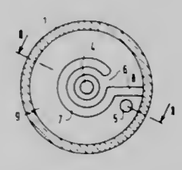
Ingo Duenisch, Taunusstein, and Dieter Eierle-Tachirner, Wiesbaden, both of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,752

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703690

Int. Cl.⁴ H01J *61/30, 61/80, 61/90*

U.S. Cl. 313—610 **6 Claims**



1. A flashbulb comprising a cylindrical housing (**1, 2, 3, 23, 24**) having outside walls (**2, 3, 23, 24**) and inside walls (**7, 8, 12, 12*a*, 21, 22, 27**) in which two electrodes (**4, 5, 10, 11, 16, 17, 25, 26**) are fused, and said two electrodes project into a discharge space (**9, 14, 20', 28**) characterized in that the discharge space (**9, 14, 20', 28**) extends circumferentially around the cylindrical housing substantially in the same plane between said two electrodes (**4, 5, 10, 11, 16, 17, 25, 26**); and said outside walls (**2, 3, 23, 24**) are composed of glass and the inside walls (**7, 8, 12, 12*a*, 13, 20, 22, 27**) are formed of white ceramic material which is hermetically fused to said glass of said outside walls.

4,896,073

DISCHARGE TUBES

Arthur Maitland, St. Andrews, Scotland, and Hugh Menown, Writtle, United Kingdom, assignors to English Electric Valve Company Limited, Chelmsford, United Kingdom

Filed Aug. 21, 1987, Ser. No. 87,922

Claims priority, application United Kingdom, Aug. 30, 1986, 8621023

Int. Cl.⁴ H01J *17/16*

U.S. Cl. 313—634 **8 Claims**

1. A discharge tube capable of being coupled to a second discharge tube of substantially the same configuration to provide increased current conducting capability, comprising

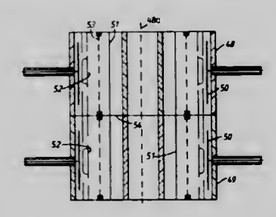
a cylindrical member having a longitudinal axis;

a first electrode having a first surface area extending along said axis, said first electrode being surrounded by said cylindrical member;

a second electrode having a second surface area extending

along said axis, said second electrode being interposed between said cylindrical member and said first electrode, said second electrode being coaxial with said first electrode; and

first and second end pieces extending substantially transverse to said longitudinal axis, said end pieces being connected to said cylindrical member to form an envelope

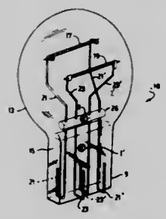


containing said first and second electrodes, at least one of said end pieces being removable to permit said discharge tube to be joined to at least one other discharge tube, thereby providing a combined discharge tube having electrodes of increased surface area and a current carrying capacity greater than that of either of said first or second discharge tubes.

4,896,074
PROCESS FOR MARKING A GLASS OBJECT AND ARTICLE

Debra L. Williams, Hillsboro; David S. Holmes, Stoddard, and Daniel D. Devir, Sutton, all of N.H., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 27, 1988, Ser. No. 289,843
Int. Cl.[4] H01J *9/24*; H01K *1/28*
U.S. Cl. 313—635 **18 Claims**



1. A method of manufacturing a glass article having a discrete marking located thereon comprising the steps of:

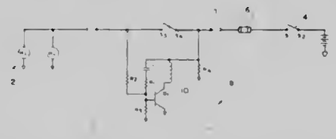
providing a blank of a lead-containing glass material to be formed into the article by heating;

subjecting the blank to at least one heating step in which the heating is produced by a flame that includes a gaseous mixture of a combustible gas and oxygen, said flame being applied to a surface of the glass blank, the oxygen content of said gaseous flame being in non-stoichiometric proportions relative to the combustible gas in a distinct portion of the flame to produce an indicia on the blank in the form of a black translucent surface of a lead oxide deficient in oxygen.

4,896,075
AUTOMATIC HEADLIGHT AND PARKING LIGHT SWITCHING

John L. Earle, P.O. Box 185, Forest Grove, Oreg. 97116

Continuation of Ser. No. 826,093, Feb. 6, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 169,173
Int. Cl.[4] H01K *7/00*; B60Q *1/26, 1/02*
U.S. Cl. 315—82 **29 Claims**

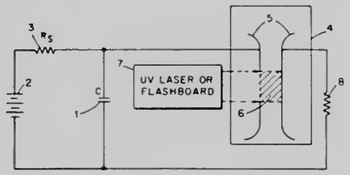


1. An automatic headlight switching apparatus comprising normally open contacts which are in series between a headlight and existing switch on a switched side of a headlight switch, energizing means for closing the normally open contacts by the operator's actuation of the headlight switch to an "on" condition from an "off" condition, means to maintain the "on" condition, disabling means electrically connected to the energizing means for disabling the energizing means and controlling means for controlling the disabling means.

4,896,076
BINARY AND TERNARY GAS MIXTURES FOR USE IN GLOW DISCHARGE CLOSING SWITCHES

Scott R. Hunter, and Loucas G. Christophorou, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 27, 1988, Ser. No. 186,856
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—150 **7 Claims**



7. A capacitive energy storage system comprising:

a diffuse-discharge switch;

a gas mixture in said diffuse-discharge switch comprising a mixture of He, Ne and Ar in combination with a second compound selected from the group consisting of $(CF_3)_2O$, CF_4, BF_3, GeF_4, WF_6, SiF_4, in combination with a compound selected from the group consisting of TMPD, TMBI, TMAE, TMAB, triethylamine, methylaniline, diethylamine, aniline, Co-ocene, Ch-ocene, Ni-ocene and Fe-ocene; and

means for selectively activating said gas mixture to an electrical conductive state.

4,896,077
IGNITOR DISABLER

Peter G. Dodd, Scarborough, and Lister Young, Weston, both of Canada, assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 62,914, Jun. 16, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 363,425
Int. Cl.[4] H05B *41/14*
U.S. Cl. 315—289 **21 Claims**



1. In a circuit for igniting a high intensity discharge lamp, with a characteristic voltage that varies during phases of lamp operation, said circuit including portion, an ignitor disabler comprising:

means for disabling the igniting portion during abnormal lamp operation;

means for triggering said means for disabling the igniting portion after passage of a predetermined amount of time, said means for triggering having a timing component for measuring the predetermined amount of time, which timing component begins time measuring operation only under certain, predetermined conditions;

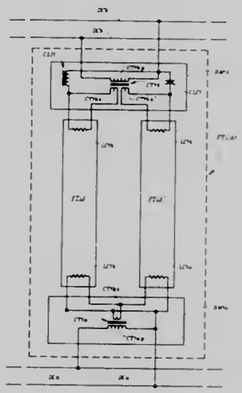
means for resetting the timing component of said means for triggering upon lamp ignition; and

means for establishing a threshold voltage which threshold voltage is higher than the characteristic voltage of the lamp under normal operating conditions.

4,896,078
DISTRIBUTED BALLASTING SYSTEM FOR SUN TANNING APPARATUS

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed May 6, 1985, Ser. No. 730,599
Int. Cl.[4] H05B *41/29*
U.S. Cl. 315—312 **10 Claims**



1. Distributed ballasting system particularly suitable for a sun tanning apparatus and operable to power a plurality of fluorescent lamps, each fluorescent lamp having a first and a second cathode, the fluorescent lamps being positioned substantially in parallel with one another and in such manner that all the first cathodes are aligned along a first path and all the second cathodes are aligned along a second path, said ballasting system comprising:

rectifier and filter means adapted to connect with an ordinary electric utility power line and, when so connected, operative to provide a substantially non-current-limited and constant-magnitude DC voltage at a first set of DC terminals;

inductor means connected between said first set of DC terminals and a second set of DC terminals, thereby providing at said second set of DC terminals a unidirectional voltage from a substantially constant-magnitude source having an inductive internal impedance;

inverter means connected with said second set of DC terminals and operable to provide at a set of central output terminals a substantially non-current-limited AC voltage having an essentially sinusoidal waveshape and a frequency significantly higher than that of the voltage on said power line, said inverter means having an L-C parallel-circuit connected in circuit with said central output terminals, said L-C parallel-circuit being resonant at or near the frequency of said AC voltage;

a first pair of distribution conductors: (i) connected with said central output terminals, (ii) disposed substantially along said first path, and (iii) connected with each of said first cathodes by way of current-limiting means; and

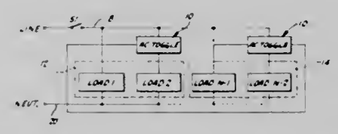
a second pair of distribution conductors: (i) connected with said central output terminals, (ii) disposed substantially along said second path, and (iii) connected with each of said second cathodes;

whereby said plurality of fluorescent lamps is powered from the AC voltage provided from said set of central output terminals by way of said two pairs of distribution conductors.

4,896,079
BI-LEVEL SWITCH

Jim Tabor, Dallas, Tex., assignor to Prescolite, Inc., San Leandro, Calif.

Filed May 20, 1988, Ser. No. 197,027
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—313 **12 Claims**



1. A control mechanism for use with one fluorescent lighting unit having at least first and second lamps and a line switch to regulate electrical power from a source to the first and second lamps, comprising:

a. means for alternately interrupting and connecting electrical power from the source to the second lamp, only, responsive to the successive opening and closing of the line switch; and

b. reset means for overriding said means for alternately interrupting and connecting power from the source to the second lamp by connecting power from the source to the second lamp, responsive to the operation of the line switch.

4,896,080

FLAT PICTURE-REPRODUCING DEVICE

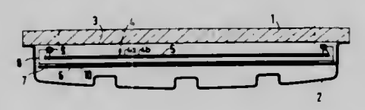
Kurt M. Tischer, Wendlingen, and Uwe Mayer, Kirchheim/-Teck, both of Fed. Rep. of Germany, assignors to Nokia Unterhaltungselektronik, Pforzheim, Fed. Rep. of Germany

Continuation of Ser. No. 64,229, Jun. 18, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 291,316

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622259

Int. Cl.[4] H01J *29/70*

U.S. Cl. 315—366 **15 Claims**



1. A flat, vacuum-enclosed device for reproducing a picture by displaying a plurality of parallel lines each comprising a plurality of picture elements, said lines and elements each having a desired brightness, said device comprising:

a phosphor-coated glas faceplate for displaying said lines and elements;

a shallow tray-shaped rear housing attached to the faceplate forming an evacuated enclosure;

a cathode consisting of a periodic array of oxide-coated heating wires arranged parallel to the lines to be displayed on the faceplate and disposed in said enclosure in a plane parallel to the faceplate;

a counterelectrode disposed between said cathode and the rear housing, said counterelectrode comprising individual electrically isolated segments arranged perpendicular to the oxide-coated heating wires of the cathode;

a control arrangement disposed between the cathode and the faceplate;

a perforated anode mounted between the cathode and the control arrangement;

means for applying an electrical potential to the anode;

means for applying selected electrical potentials to the segments of the counterelectrode;

means for selectively applying a first or a second electrical potential to selected ones of said oxide-coated heating wires, so that one of said first and second electrical potentials functions to heat the wires to which it is applied and the other electrical potential allows the wires to emit electrons which are attracted towards the anode to a degree depending upon the electrical potential applied to an adjacent segment of the counterelectrode;

means for applying electrical potentials to the segments of the counterelectrode to provide brightness modulation; and

means for applying electrical correction potentials to the segments of the counterelectrode on a line-by-line basis for balancing the brightness of adjacent lines displayed on the faceplate.

4,896,081

AUTO CONVERGENCE CIRCUIT

Hiroshi Ichigaya; Yoshirou Ishikawa, and Hiromu Hosokawa, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 31, 1988, Ser. No. 265,247

Claims priority, application Japan, Oct. 31, 1987, 62-276787

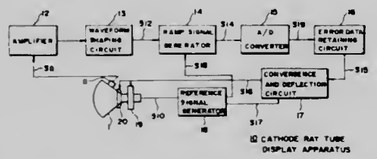
Int. Cl.[4] H01J *29/70*; **H04N** *17/02*

U.S. Cl. 315—368 **10 Claims**

1. An automatic convergence correcting circuit for use with a color cathode ray tube formed with a shadow mask, at least one index pattern disposed at a predetermined position on the shadow mask, means for generating an electron beam for scanning the index pattern in a plurality of traverses, and means for detecting light reflected upon scanning of the index pattern by the beam and generating a detected signal that corresponds to the reflected light and is representative of the scanning position of the electron beam; said correcting circuit comprising:

a waveform-shaping circuit for converting the detected signal into a two-level signal;

a ramp signal generator receiving the two-level signal as a timing signal for raising an integral controlling signal to a first level and receiving a reference signal as a timing signal for lowering the integral controlling signal to a second level, said ramp signal generator performing effective integration only during time periods when the integral controlling signal is at a selected one of the first and second levels and producing a ramp signal having an integrated value corresponding to the sum total of the integration periods;



10 CATHODE RAY TUBE DISPLAY APPARATUS

means responsive to the ramp signal output from said ramp signal generator for generating a signal representing convergence error information for controlling the convergence of the electron beam;

whereby the effect of noise included in the detected signal is reduced and convergence correction with increased accuracy is obtained.

4,896,082

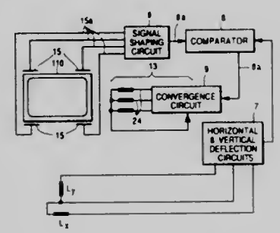
RASTER DISTORTION CORRECTION CIRCUIT

Erich Geiger, Unterkirnach, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,542

Int. Cl.[4] H01J *29/70, 29/76*

U.S. Cl. 315—368 **14 Claims**



1. A cathode ray tube for displaying an image therein, comprising:

an evacuated enclosure containing therein an electron beam gun;

a perforated, first electrode disposed inside said enclosure and responsive to said electron beam for generating a first index signal that varies when said electron beam passes through the perforations in said first electrode such that said index signal is indicative of a position of said electron beam; and

a second electrode disposed outside said enclosure and capacitively coupled through said enclosure to said first electrode for developing in said second electrode a second index signal that varies in accordance with said first index signal and that is indicative of said position of said electron beam.

4,896,083

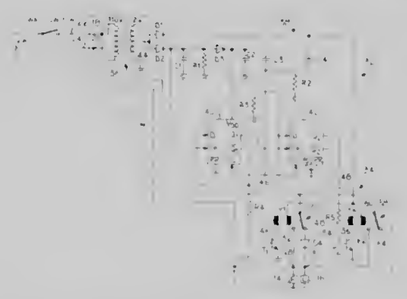
SUCCESSIBLE SWITCH ACTIVATED CONTROL CIRCUIT

Walt W. Kopala, Lenexa, Kans., and Benny Lee, Taipei, Taiwan, assignors to Transworld Products, Inc., Shawnee, Kans.

Filed May 4, 1988, Ser. No. 190,257

Int. Cl.[4] H02P *7/36*

U.S. Cl. 318—268 **18 Claims**



1. A control circuit for selectively activating a plurality of output devices in response to successive applications of input power to said circuit from a source thereof, said control circuit comprising:

input means for coupling with the source of input power;

a plurality of outputs for coupling with the output devices and for activating the devices in response to activation of said outputs; and

operating circuit means coupled with said input means and said outputs and including sensing circuit means for sensing successive applications of input power from the source, and

activating circuit means coupled with said sensing circuit means and responsive thereto for selectively activating certain of said outputs for producing a plurality of predetermined combinations of activated outputs in a predetermined sequence upon said successive applications of input power,

said control circuit including reducing structure for producing one of said combinations in which a certain one of said outputs is activated at a first output level and for producing another of said combinations at which said certain one of said outputs is activated at a second, reduced output level,

said reducing structure including a diode and relay means for selectively activating said certain ones of said outputs through said diode for reducing the power flow therethrough in order to produce said second reduced output level.

11. A circuit for receiving operating power from a switched source thereof having a switch for selective successive applications of operating power to said circuit and, in response thereto, for selectively energizing a fan and at least one lamp, said circuit comprising:

input means for coupling with the switched source;

a fan output for coupling with the fan and for energizing the fan when coupled therewith upon activation of said fan output;

a lamp output for coupling with the lamp and for energizing the lamp when coupled therewith upon activation of said lamp output; and

control circuit means coupled with said input means and with said fan and lamp outputs and including

sensing means for sensing successive applications of operating power to said input means, and

activating means coupled with said sensing means and responsive thereto for selectively activating said outputs for producing a plurality of predetermined combinations of activated outputs in a predetermined sequence upon successive applications of operating power,

said combinations including a combination in which only one of said fan and lamp outputs are activated and including another combination in which both of said outputs are activated,

said activating means including an output reduction unit and switch means coupled therewith, said output reduction unit also being coupled with said input means for receiving operating power therefrom and with said lamp output, said switch means being selectively actuatable between a first position for supplying operating power to and thereby activating said lamp output at a first output level and a second position for supplying operating power to said lamp output through said output reduction unit thereby activating said lamp output at a second reduced output level in order to energize said lamp coupled to said lamp output at a dimmer illumination level output in said second position than in said first position.

4,896,084

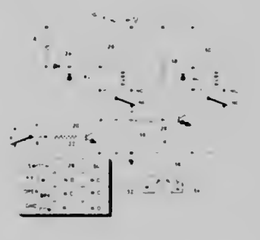
SINGLE INPUT, SINGLE SUPPLY THREE-STATE CONTROLLER

H. Winston Maue, Farmington Hills, and Timothy S. Roddy, Canton, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed May 22, 1989, Ser. No. 355,254

Int. Cl.[4] H02P *1/22, 3/12*

U.S. Cl. 318—280 **15 Claims**



1. A circuit for controlling electric current flow to a plurality of terminals of a load in order to effect a plurality of modes of operation of said load, said circuit comprising:

a first conductor carrying a direct current potential with respect to a reference potential applied on a second conductor;

a single input control line;

input switching means selectively operable to alternatively connect said input control line to a first condition, a second condition or a third condition, respectively;

first switching means, responsive to said input switching means and having a movable contact, a first contact and a second contact, for normally providing electrical continuity between said movable contact of said first switching means and alternatively said first contact of said first switching means or said second contact of said first switching means;

second switching means responsive to said input switching means and having a movable contact, a first contact and a second contact, for normally providing electrical continuity between said movable contact of said second switching means and alternatively said first contact of said second

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switching means or said second contact of said second switching means; and

electronic means operative in response to said input control line being connected by said input switching means to alternatively, said first condition, or said second condition or said third condition, said electronic means being determinative of electrical continuity between said movable contact of said first switching means and alternatively said first contact of said first switching means or said second contact of said first switching means, said electronic means further being determinative of electrical continuity between said movable contact of said second switching means and alternatively said first contact of said second switching means or said second contact of said second switching means

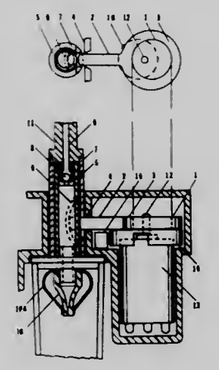
whereby the condition on said input control line provided by said input switching means establishes, in conjunction with said electronic means, the state of said first and second switching means which effect a particular mode of operation of said load.

4,896,085

IMPULSE ACTUATOR SYSTEM

J. Paul Jones, Chester Springs, Pa., assignor to Patent Research and Development Corp., Exton, Pa.

Filed Jul. 15, 1988, Ser. No. 219,436
Int. Cl.[4] H02P *3/08*
U.S. Cl. 318—560 **2 Claims**



1. An impulse actuator system with a three pole D.C. motor which has an added brush that is electrically switched to provide a silent magnetic braking to a stop position at the end of a single rotation comprising:

a shaft;

a round cam having a peripheral surface connected to said shaft for rotation therewith, the connection between the cam and the shaft being off-set from the center of the cam to establish the limits of lateral motion of said peripheral surface through 180 degrees of said shaft rotation;

a cam follower slideably connected with said peripheral surface, the connection providing for said cam and cam follower, while engaged, to slide relative to one another in a plane normal to the axis of said shaft;

the cam follower having a cam follower arm extending radially outward and normal to the axis of said shaft;

means connected to said housing slideably engaging said cam follower arm and providing, when said shaft is rotating, for the cam follower and its cam follower arm to have a reciprocating motion in a plane normal to the axis of said shaft; and

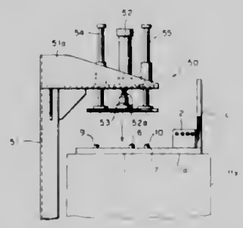
means operatively connected to said shaft to sense the rotary position of the shaft and cam surface at between substantially 270 and 300 degrees.

4,896,086

METHOD AND APPARATUS FOR POSITIONING WORKPIECE TO PALLET IN WORKING LINE

Masakazu Miyahara, Hiroshima; Kazuo Oda, Higashihiroshima, and Tomoyuki Nozaki, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 29, 1988, Ser. No. 225,789
Claims priority, application Japan, Jul. 31, 1987, 62-193518
Int. Cl.[4] G05B *19/18*
U.S. Cl. 318—568.1 **11 Claims**



1. A method for positioning a plurality of different workpieces to successive pallets for transport along a working line, each pallet having an upper workpiece set surface, the method comprising the steps of:

(a) providing plural positioning pins at discrete locations on each of a plurality of pallets, each positioning pin is having a set position whereupon it protrudes above the workpiece set surface of the pallet and a reset position whereupon it is retracted not to protrude above the workpiece set surface of the pallet;

(b) resetting all the plural positioning pins of the pallet to the reset position;

(c) setting at least one selected positioning pin to the set position ready to coact with one of the plurality of different workpiece;

(d) and positioning a one of the plurality of different workpieces on the pallet by fitting the selected protruded positioning pin into a predetermined positioning hole defined by the one of the plurality of the workpieces.

4,896,087

ROBOTIC WORKCELL CONTROL SYSTEM HAVING IMPROVED INPUT/OUTPUT INTERFACING FOR BETTER WORKCELL OPERATION

Elmer M. Onaga, Blawnox, Pa.; Richard J. Casler, Jr., Newtown, Conn.; James A. Hart, Virginia Beach, Va.; Kim N. Trinh, Danbury, Conn., and Kenneth E. Daggett, Murrysville, Pa., assignors to Staubli International AG., Switzerland

Filed Jan. 31, 1989, Ser. No. 304,972
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.2 **6 Claims**

1. A control system for a workcell having at least one electric robot and a plurality of workcell equipment items in turn having a plurality of control and sensor devices associated therewith, said system comprising:

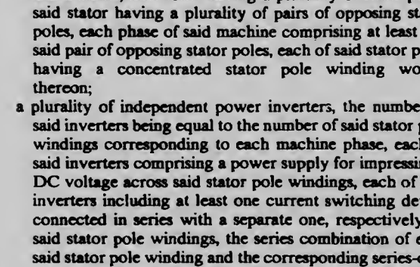
a first electronic robot controller disposed at a first workcell location to operate said robot as a part of the workcell process;

means for loading program data into said robot controller;

a first input/output control module disposed at a second workcell location and having connected thereto as inputs a first group of said sensor devices and as outputs a first group of said control devices;

at least a second input/output control module disposed at a third workcell location and having connected thereto as inputs at least a second group of said sensor devices and as outputs at least a second group of said control devices;

a serial local area network connecting said robot controller and said input/output modules to provide for program and process data communication; and



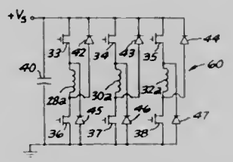
each of said input/output modules having computing means including a microprocessor for operating the module in accordance with a module operating program downloadable from said robot controller to the module and for processing inputs and outputs in accordance with a user process program downloadable from said robot controller to the module.

4,896,088

FAULT-TOLERANT SWITCHED RELUCTANCE MACHINE

Thomas M. Jahns, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1989, Ser. No. 331,197
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **20 Claims**



1. A fault-tolerant switched reluctance machine drive, comprising:

a multiphase switched reluctance machine including a rotor and a stator, said rotor having a plurality of rotor poles, said stator having a plurality of pairs of opposing stator poles, each phase of said machine comprising at least one said pair of opposing stator poles, each of said stator poles having a concentrated stator pole winding wound thereon;

a plurality of independent power inverters, the number of said inverters being equal to the number of said stator pole windings corresponding to each machine phase, each of said inverters comprising a power supply for impressing a DC voltage across said stator pole windings, each of said inverters including at least one current switching device connected in series with a separate one, respectively, of said stator pole windings, the series combination of each said stator pole winding and the corresponding series-connected switching device comprising a separate respective phase leg of the corresponding inverter; and

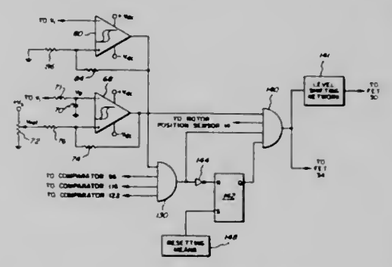
gate drive means coupled to each respective current switching device for exciting the corresponding stator pole winding connected in series therewith, the stator pole windings of said inverters corresponding to the same machine phase having substantially the same conduction interval, the conduction intervals for the different machine phases being mutually time-shifted.

4,896,089

FAULT MANAGEMENT SYSTEM FOR A SWITCHED RELUCTANCE MOTOR

Gerald B. Kliman; Stephen R. MacMinn, both of Schenectady, and Charles M. Stephens, Pattersonville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,159
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—701 **36 Claims**



1. A fault management system for detecting faults in a multiphase switched reluctance motor employing unidirectional current excitation from a DC source, each phase of said motor comprising two stator poles and a phase winding having two motor leads for connecting the phase winding in series with at least one respective semiconductor switch, said system further isolating any detected faults so that the faulted motor phases are deactivated and motor operation is continued through the remaining phases, said system comprising:

a plurality of phase control circuits, said phase control circuits each comprising a respective AND gate coupled to a separate respective semiconductor switch, each AND gate generating a low logic level output signal when a fault is detected in the corresponding motor phase, whereby each motor phase exhibiting a fault is deactivated;

a plurality of current sensor means, each respective one of said current sensor means coupled to a separate respective semiconductor switch to sense the instantaneous current in the respective motor phase winding, the output of each of said current sensor means, respectively, coupled to an input of the AND gate of the corresponding phase control circuit, each respective one of said current sensor means generating a low logic level output signal to the AND gate of the corresponding phase control circuit whenever the respective instantaneous phase current exceeds a regulated current limit; and

a plurality of current differential sensor means, each respective one of said current differential sensor means coupled to a separate respective motor phase winding for detecting any difference in current flow between the two leads of each respective phase winding of the corresponding phase, the output of each of said current differential sensor means, respectively, coupled to an input of the AND gate of the corresponding phase control circuit, each respective one of said current differential sensor means generating a low logic level signal output to the AND gate of the corresponding phase control circuit when any difference in current flow between the two leads of each respective phase winding of the corresponding phase is detected.

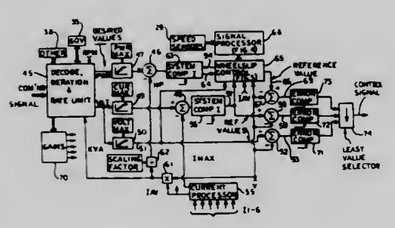
VOL 1110 ISS 4 JA 23 1990 UMI

4,896,090

LOCOMOTIVE WHEELSLIP CONTROL SYSTEM

Edgar T. Balch, Erie; Harold S. Hostettler, Jr., Edinboro, both of Pa., and David J. Konko, Dunkirk, N.Y., assignors to General Electric Company, Erie, Pa.

Filed Oct. 31, 1988, Ser. No. 265,377
Int. Cl.[4] B61C *15/08*
U.S. Cl. 318—52 91 Claims



1. For inclusion in a propulsion system of a traction vehicle having a plurality of wheels that are subject to slipping with respect to the surface on which the vehicle travels, the system comprising a plurality of adjustable speed electric motors mechanically coupled in driving relationship to separate wheels of the vehicle, a controllable source of electric power the output of which is electrically coupled in energizing relationship to the respective motors, means associated with the source of power for varying the magnitude of its output current or voltage in accordance with a variable control signal, means for deriving a feedback signal representative of the actual current or voltage magnitude, and a plurality of means for respectively sensing the rotational speeds of the separately driven wheels, said control signal being provided by a controller to which the speed sensing means are coupled and which is operative to vary the control signal as necessary to minimize any difference between the feedback signal and a reference signal the value of which normally depends on the value of a variable command signal, improved wheelslip control means comprising:

a. first means for comparing the rotational speeds of the separately driven wheels of the vehicle and for detecting the highest and lowest speeds, respectively;

b. second means associated with said first means for providing a reference speed value indicative of the rotational speed of a vehicle wheel that is not slipping;

c. third means for determining a normally desired maximum difference between the reference speed indicated by said second means and a predetermined one of the speeds detected by said first means;

d. summing means associated with said first, second and third means for deriving a speed error value representative of the algebraic sum of said predetermined one speed, said reference speed and said maximum difference, said speed error value being zero whenever said one speed has a desired value;

e. multiplying means for deriving a voltage error value related to said speed error value by a variable gain that is a predetermined function of said reference speed value;

f. integrating means operative when the actual value of said one speed differs from the desired value in a predetermined direction for obtaining a wheelslip correction value that increases at an average rate that varies with said voltage error value; and

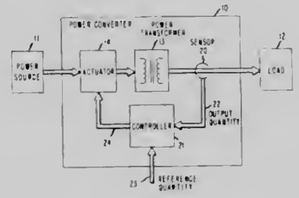
g. means associated with said integrating means for reducing the value of said reference signal by an amount corresponding to said correction value.

4,896,091

ELECTRIC POWER CONVERTER

André Kislovski, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

PCT No. PCT/CH86/00124, § 371 Date Jul. 7, 1987, § 102(e) Date Jul. 7, 1987, PCT Pub. No. WO87/01834, PCT Pub. Date Mar. 26, 1987
Continuation-in-part of Ser. No. 53,367, Jun. 29, 1987, Pat. No. 4,853,611. This PCT application Sep. 2, 1986, Ser. No. 86,633
Claims priority, application Switzerland, Sep. 13, 1985, 3964/85
Int. Cl.[4] G05F *1/32*
U.S. Cl. 323—253 13 Claims



1. An electrical power converter,

comprising a power transformer which separates galvanically a power source at its primary side from a load at its secondary side,

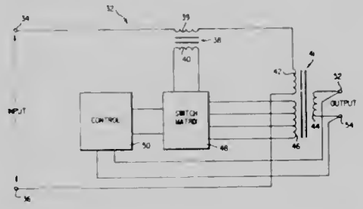
and comprising a final control element, the regulating actuator unit of which is a variable linear inductor and which regulating actuator operates linearly relative to an electrical voltage applied or relative to an electrical current applied to the regulating actuator, which regulating actuator has a finite inductance value which value can be measured at the input of the regulating actuator where the reactance of the regulating actuator is controllable by varying the value of the inductance; where the ratio of the minimum of said inductance and the maximum of said inductance is settable relative to said electrical voltage applied or relative to said electrical current applied to the regulating actuator over values having a ratio of at least 1:100 by varying a control current.

4,896,092

VOLTAGE REGULATOR FOR AC SINGLE PHASE AND THREE PHASE SYSTEMS

Gordon E. Flynn, Richmond, Va., assignor to Power Distribution, Inc., Richmond, Va.

Filed Oct. 12, 1988, Ser. No. 256,459
Int. Cl.[4] G05F *1/16*
U.S. Cl. 323—258 3 Claims



1. A voltage regulator for alternating current single phase and three phase systems which comprises

a. an input terminal,

b. a series injection transformer having primary and secondary windings with said secondary winding being in series with said input terminal,

c. an output transformer with tertiary windings which include

i. a primary winding in series with said secondary winding of said series injetion transformer,

ii. a system output AC voltage winding,

iii. and a multi-tap winding,

d. a switch matrix which receives its source voltage from said multi-tap winding,

e. and control means including a microprocessor for receiving the output voltage from said system output AC voltage winding and for driving said switch matrix,

i. said control means includes a peak and hold circuit which stores the peak voltage every half cycle,

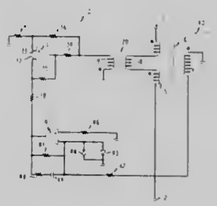
f. said switch matrix applying the proper voltage level and phase to the primary of said series injection transformer to effect voltage regulation.

4,896,093

ELECTRONIC INDUCTOR

Dewayne A. Spires, Plaistow, N.H., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1988, Ser. No. 234,662
Int. Cl.[4] G05F *1/24*
U.S. Cl. 323—259 6 Claims



1. An electronic inductor comprising:

an inductance transformer (20) having a primary inductance winding (18) and a secondary inductance winding (19);

current sensing means (16) for sensing the current in the primary inductance winding;

a bidirectional current source (20) connected to said secondary inductance winding; and

control means (41) reponsive to said current sensing means and connected to said bidirectional current source for controlling the current in said secondary inductance winding to substantially increase the inductance effect of said primary inductance winding.

4,896,094

BANDGAP REFERENCE CIRCUIT WITH IMPROVED OUTPUT REFERENCE VOLTAGE

Carlos A. Greaves, and Mathew A. Rybicki, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1989, Ser. No. 375,098
Int. Cl.[4] G05F *3/28*
U.S. Cl. 323—314 8 Claims

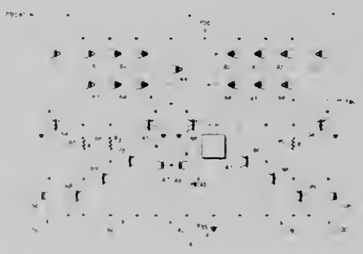
1. A bandgap reference circuit, for continuously providing an output reference voltage, comprising:

an operational amplifier, having a first input terminal, a second input terminal, and an output terminal;

a first circuit portion, coupled to a first power supply voltage terminal, to a second power supply voltage terminal, to the output terminal of the operational amplifier, and to the positive terminal of the operational amplifier, for providing a first feedback signal to the first input terminal of said operational amplifier, and for providing the output reference voltage;

a second circuit portion, coupled to the first power supply voltage terminal, to the second power supply voltage terminal, to the output terminal of the operational amplifier, and to the second input terminal of the operational amplifier, for providing a second feedback signal to the second input terminal of said operational amplifier;

first compensation means, coupled to the first power supply voltage terminal, to the second power supply voltage terminal, and to the first circuit portion, for providing a



current in the first circuit portion proportional to a current conducted at the first input terminal of said operational amplifier; and

second compensation means, coupled to the first power supply voltage terminal, to the second power supply voltage terminal, and to the second circuit portion, for providing a second current in the second circuit portion proportional to a current conducted at the second input terminal of said operational amplifier,

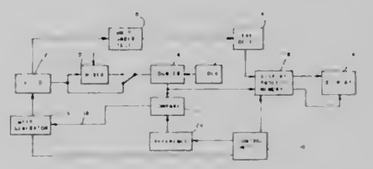
wherein the first feedback signal and the second feedback signal each has a magnitude proportional to a voltage on the output terminal of the operational amplifier.

4,896,095

APPARATUS AND METHOD FOR DETERMINING FREQUENCY RESPONSE OF A SYSTEM UNDER TEST

Johann Schutz, Munich, Fed. Rep. of Germany, assignor to Schlumberger Messgerate GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,373
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638458
Int. Cl.[4] G01R *27/00*
U.S. Cl. 324—617 8 Claims



1. A circuit for determining the frequency response of a unit under test, the circuit comprising a variable frequency oscillator for outputting a variable frequency test signal for application to the unit under test, a control signal generator for generating a control signal to vary the frequency of the oscillator, a processing circuit for determining a parameter of the unit under test from measured values of an output signal produced by the unit under test in response to the test signal, a counter connected to receive (a) a reference frequency signal and (b) a

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signal derived from the test signal and arranged to count one of (a) and (b) during a time interval defined by the other one of (a) and (b) in order to produce a count accurately representative of either the frequency or the period of the test signal, respectively, and a control unit for controlling said processing circuit to associate each measured value of the output signal from the unit under test with the respective count obtained simultaneously therewith, to thereby determine the frequency response of said unit.

4,896,096

REFLECTED SIGNAL MEASUREMENT BLANKING CIRCUIT

Glenn R. Ewart, San Jose, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Mar. 31, 1988, Ser. No. 176,099
Int. Cl.[4] G01N *22/00*
U.S. Cl. 324—642 **12 Claims**



1. A reflected signal measurement blanking circuit for use in a network analyzer comprising:
- first means, including means for coupling said first means to a first port of a device under test, for measuring the magnitude of a signal reflected from said device under test in said network analyzer;
- second means, including means for coupling said second means to a second port of said device under test, for measuring the magnitude of a signal transmitted through said device under test in said network analyzer; and
- means coupled between said first means and said second means which is responsive to said second means for blanking said reflected signal measurement when said magnitude of said transmitted signal falls below a predetermined magnitude.

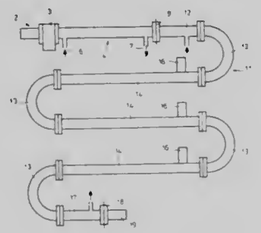
4,896,097

APPARATUS FOR THE EXAMINATION OF MEASURING GASES BY MEANS OF MICROWAVES

Lutz Berger, Eggenstein; Gunther Krieg, Karlsruhe; Johann Pappert, Weingarten, and Gerhard Schmitt, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,655
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3622956
Int. Cl.[4] G01N *22/00*
U.S. Cl. 324—639 **28 Claims**

1. In an apparatus for the analysis of gaseous media comprising a microwave transmitter; a microwave receiver; a measuring cell disposed between said transmitter and said receiver, composed of at least one Stark chamber, and having a gas inlet and a gas outlet; and at least one Stark electrode disposed in, and electrically insulated from, said chamber; the improvement comprising a plurality of mutually spaced holders, formed of insulating material, disposed within said chamber and holding



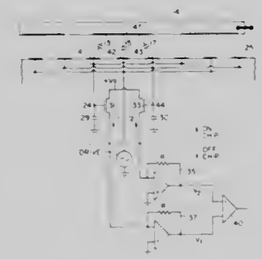
and positioning said electrode in a predetermined position in said chapter.

4,896,098

TURBULENT SHEAR FORCE MICROSENSOR

Joseph H. Haritonidis, Cambridge; Roger T. Howe, Belmont; Martin A. Schmidt, Brookline, and Stephen D. Senturia, Boston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 1,824, Jan. 8, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,106
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—663 **54 Claims**



1. A wall shear stress microsensor comprising:
- a microndiminsioned shear-sensitive plate;
- a plurality of supporting arms which suspend the plate above a substrate and define a cavity between the plate and the substrate, the cavity being so small that it dampens movement of the plate normal to the plane of the plate through viscous forces generated within the cavity; and
- readout means for providing an indication of the deflection of the plate and thereby a measurement of the shear stress of interest.

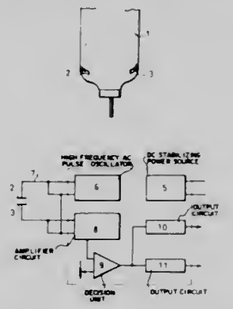
4,896,099

METHOD OF ANNOUNCING LOW LEVEL OF REMAINING LIQUID IN DROPPER

Takeo Suzuki, Kawasaki, Japan, assignor to Tobo Plastic Co., Ltd., Kawasaki, Japan

Filed Dec. 14, 1988, Ser. No. 284,040
Claims priority, application Japan, Feb. 10, 1988, 63-30591
Int. Cl.[4] G08B *21/00*; **G01F** *23/00*
U.S. Cl. 324—667 **2 Claims**

1. A method of announcing a low level of the remaining liquid in a dropper, comprising the steps of:
- applying a pulse of a stable level to at least one of detecting electrodes attached to an outer surface of a lower portion of a liquid-containing dropper;
- comparing a level of said pulse passed through an interior of said dropper with a reference pulse level, said reference pulse level being between a level of said pulse passed through said interior of said dropper when said liquid exists therein for defining an electrostatic capacity between said detecting electrodes and that of said pulse passed through said interior of said dropper when a remaining quantity of said liquid in said dropper decreases to such an extent that a significantly reduced electrostatic capacity is defined between said detecting electrodes; and
- automatically actuating an annunciator when a judgement signal representative of unfavorable results derived from said step of comparing with said reference pulse level.

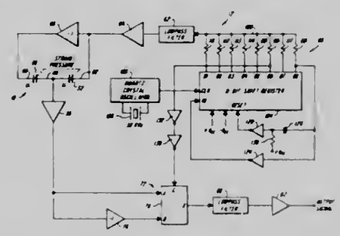


4,896,100

SIGNAL CONDITIONER FOR CAPACITIVE TRANSDUCER

Iwar H. Back, Franklin, Mass., assignor to Hitec Products, Inc., Ayer, Mass.

Filed Aug. 30, 1988, Ser. No. 238,541
Int. Cl.[4] G01R *27/26, 11/52*
U.S. Cl. 324—678 **14 Claims**



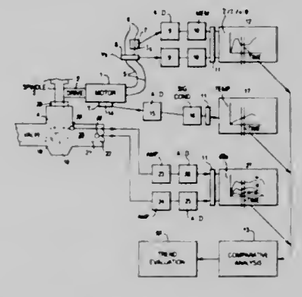
1. Signal conditioning apparatus for operation of a capacitive transducer, comprising:
- a digital waveform generator for generating a waveform that approximates a sine wave and for generating a binary signal synchronized to said waveform, said waveform having more than two voltage levels;
- filter means responsive to said waveform for providing a first sinusoidal excitation signal;
- inverting means responsive to said first sinusoidal excitation signal for providing a second sinusoidal excitation signal that is 180° out of phase with said first excitation signal;
- means for applying said first and second excitation signals to said transducer so as to produce an output signal from said transducer; and
- demodulating means responsive to said binary signal for synchronously detecting the output signal from said transducer.

4,896,101

METHOD FOR MONITORING, RECORDING, AND EVALUATING VALVE OPERATING TRENDS

Harold R. W. Cobb, P.O. Box 078811, West Palm Beach, Fla. 33407

Continuation-in-part of Ser. No. 937,402, Dec. 3, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,261
Int. Cl.[4] G01R *31/02*; **G01M** *13/02, 19/00*
U.S. Cl. 324—73.1 **7 Claims**



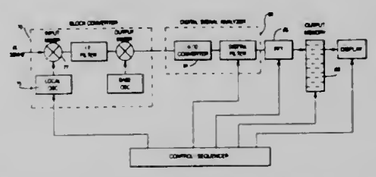
1. A method for analyzing changes in the performance of a valve operated in a single stroke by a driver comprising the steps of:
- obtaining a first parameter indicative of the electrical current delivered to the driver during the single stroke;
- obtaining a second parameter indicative of the temperature of said driver during the single stroke;
- obtaining a third parameter indicative of the noise generated by said valve during said single stroke;
- modifying said first parameter with said second parameter in accordance with a predetermined formula to obtain a corrected power parameter;
- obtaining a synchronized record of said corrected power parameter and said third parameter for a predetermined period during a full stroke opening or closing action of said valve to permit qualitative assessment of said single stroke.

4,896,102

SPECTRUM ANALYZER

Carl E. DuBois, San Diego, Calif., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jun. 13, 1988, Ser. No. 205,915
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B **14 Claims**



1. A spectrum analyzer for analyzing an input spectrum of signals in a predetermined frequency range, said spectrum analyzer comprising:
- block converter means for converting selected frequency

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blocks the input spectrum to a corresponding predetermined output band of frequencies, said block converter means including stepping means for sequentially selecting frequency blocks of the input spectrum for conversion by said block converter means;

A/D converter means coupled to said block converter means for converting the output of said block converter means into digital data signals;

digital filter means coupled to said A/D converter means for selecting a predetermined frequency band from the output band of frequencies of said block converter means;

processing means for processing data contained within the predetermined frequency band;

storage means for sequentially storing the output from said processing means;

display means for displaying the output stored in said storage means; and

control means for controlling at least said block converter means, said processing emans, and said display means such that said block converter means, said processing means, and said display means respectively and concurrently operate on sequential frequency blocks of the input spectrum.

4,896,103

CURRENT MEASURING MAGNETIC FIELD SENSOR HAVING MAGNETOOPTIC ELEMENT WITH ITS EASY AXIS OF MAGNETIZATION AT RIGHT ANGLES TO THE MAGNETIC FIELD GENERATED BY THE CURRENT

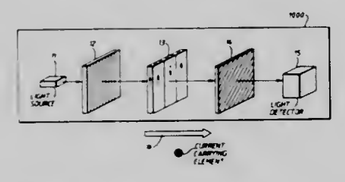
Senji Shimanuki, Atsugi; Susumu Hashimoto, Tokyo; Shunji Nomura, Yokohama, and Tomohisa Yamashita, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 878,796, Jun. 26, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 183,302

Claims priority, application Japan, Jun. 29, 1985, 60-143732; Jul. 31, 1985, 60-168944; Nov. 27, 1985, 60-266948

Int. Cl.[4] G01R *33/032, 19/00;* **G02F** *1/09*

U.S. Cl. 324—96 **24 Claims**



1. A magnetic field sensor for measuring the current flowing in a current conducting element comprising:

a light source;

a light detector;

a magneto-optic element which has easy axis of magnetization and which is disposed between said light source and said light detector,

means for positioning said magneto-optic element with respect to said current carrying element such that the easy axis of magnetization of said magneto-optic element is at substantially right angles to the direction of the magnetic field generated by current flowing in said current conducting element;

first polarizing elements interposed between said light source and said magneto-optic element;

second polarizing element interposed between said magneto-optic element and said light detection; and

wherein said light detector produces a signal based upon a light from said light source which has passed through said polarizing elements and said magneto-optic element which is a function of the magnetic field produced by the current flowing in said current conducting element.

4,896,104

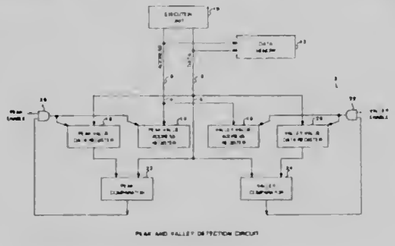
DIGITAL PEAK AND VALLEY DETECTOR

Chandravadan N. Patel, Los Altos; Richard Wm. Blasco, Auburn, both of Calif.; Atsushi Kiuchi, and Hiromitsu Inada, both of Tokyo, Japan, assignors to Hitachi Micro Systems, Inc., San Jose, Calif.

Filed Feb. 15, 1989, Ser. No. 311,161

Int. Cl.[4] G01R *19/16;* **H03K** *5/153*

U.S. Cl. 324—103 P **4 Claims**



1. A digital peak and valley detector for receiving digital data which includes both address data and value data, said detector comprising:

a peak value address register to which is applied said address data for storing an address of a detected peak value;

a valley value address register to which is applied said address data for storing an address of a detected valley value;

a peak value data register to which is applied said value data for storing a peak value;

a valley value data register to which is applied said valley data for storing a valley value;

a peak comparator to which is applied the value data and a value of a peak value stored in said peak value data register for comparing said peak value stored in said peak value data register with successive value data and for generating a first enable signal when a value in said successive value data exceeds a value of said peak value stored in said peak value data register;

a first means for latching address and value data into said peak value address register and said peak value data register respectively in response to said first enable signal;

a value comparator to which is applied said value data and a value of a valley value stored in said valley value data register for comparing said valley value stored in said valley value data register with successive value data and for generating a second enable signal when a value in said successive valley data is less than a value of said valley value stored in said valley value data register; and

a second means for latching address and value data into said valley value address register and said valley value data register respectively in response to said second enable signal.

4,896,105

AC ELECTRIC ENERGY METER HAVING DRIVE CIRCUIT INCLUDING STEPPER MOTOR FOR DRIVING MECHANICAL REGISTER

Joseph C. Engel, Moaroeville Boro, and Robert T. Elms, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1988, Ser. No. 173,499

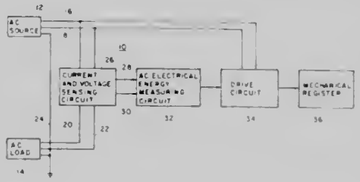
Int. Cl.[4] G01R *11/16*

U.S. Cl. 324—142 **27 Claims**

20. Apparatus for driving a register of an AC electric meter based on a pulse signal representative of an amount of AC electrical energy consumed by an AC electric load, said apparatus being coupled to an AC electrical energy source and comprising:

a two-pole single phase stepper motor coupled to the source of AC electrical energy and having a rotatable output shaft; and

means for controlling the current flow from the AC electrical energy source through said stepper motor to rotate the



output shaft of said stepper motor in a unidirectional manner based on the pulse signal representative of the amount of AC electrical energy consumed by the AC electric load, the rotation of the output shaft of said stepper motor causing the output shaft of said stepper motor to increment the register.

4,896,106

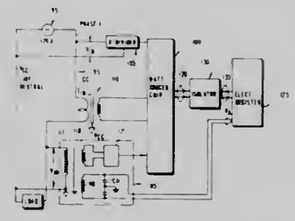
WATTHOUR METER FOR WYE CONNECTED SYSTEMS

John T. Voisine, Lafayette, Ind., and Robby F. Hausegger, Hausen, Switzerland, assignors to Landis & Gyr Metering, Inc., Lafayette, Ind.

Filed Sep. 21, 1987, Ser. No. 99,120

Int. Cl.[4] G01R *21/06, 31/00*

U.S. Cl. 324—142 **7 Claims**



1. A watthour meter for registering AC electrical energy consumption by a load connected to an AC source of AC load current and AC line voltage, comprising:

current sensing means for producing a first signal in relation to the AC load current through the load;

a resistive voltage divider network electrically connected at its input to the AC source and producing at its output a second signal in relation to the AC line voltage across the load;

a measuring circuit, accepting at its input said first signal and said second signal; and producing at its output a third signal corresponding to the AC electrical energy consumption;

register means for receiving said third signal; and

communication means between said measuring circuit and said register means for transmittinq said third signal from said measuring circuit to said register means and for electrically isolating said register means from said measuring circuit and from the input of said resistive voltage divider network.

4,896,107

TEST PIN FOR AN ADAPTER FOR CONNECTING TEST CONTACTS ON THE GRID OF A PRINTED CIRCUIT BOARD TESTING DEVICE WITH TEST POINTS OF A TEST-PIECE ON AND/OR OFF THE GRID

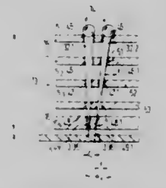
Martin Maelzer, Hagenburger Str. 26, D-3050 Wunstorf; Rüdiger Dehmel, Wunstorf; Hans-Hermann Higgen, Stadthagen, and Andreas Gülzow, Springe, all of Fed. Rep. of Germany, assignors to Erich Luther and Martin Maelzer, both of Wunstorf, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,063

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639360

Int. Cl.[4] G01R *1/00, 1/04*

U.S. Cl. 324—158 P **17 Claims**



1. A test pin for an adapter for connecting test contacts of a printed circuit board testing device that are located on a grid with test points of a testpiece such as a printed circuit board located on and/or off the grid, wherein in order to connect associated test contacts and test points the test pin can be inserted into guide holes at different inclinations in the adapter, said test pin comprising a pointed contact section that is directed towards the respective contact point of the circuit board and that projects from the adapter, and an adjacent guidance section that is guided in an associated guide hole of the adapter, the cross-section of the guidance section being greater than that of the contact section and being reduced along its length to that of the contact section whereby the pointed contact sections of neighboring test pins of converging inclination can contact closely positioned test points of a printed circuit board.

4,896,108

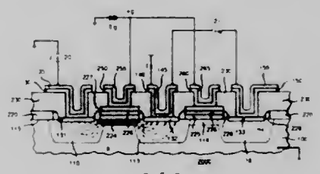
TEST CIRCUIT FOR MEASURING SPECIFIC CONTACT RESISTIVITY OF SELF-ALIGNED CONTACTS IN INTEGRATED CIRCUITS

William T. Lynch, Summit, and Kwok K. Ng, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 25, 1988, Ser. No. 224,512

Int. Cl.[4] G01R *31/26, 27/14*

U.S. Cl. 324—158 T **19 Claims**

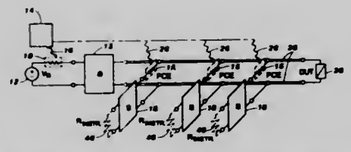


1. A semiconductor integrated circuit wafer including chip circuits and a test circuit located at a major surface of the semiconductor wafer, the test circuit comprising:

(a) first, second, and third contact electrodes contacting the major surface of the wafer at first, second, and third mutually spaced-apart areas thereof;

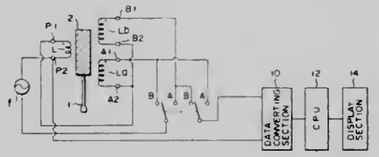
(b) first, second, and third mutually spaced-apart diffused regions of the wafer contacted by the first, second, and third contact electrodes, respectively;
(c) first and second control electrodes overlying first and second channel regions, respectively, of the major surface, the first channel region situated in the space between the first and second spaced-apart areas, and the second channel region situated in the space between the second and third spaced-apart areas;
(d) voltage source means, connected to the first and second control electrodes, for causing first and second inversion layers, respectively, to form at the major surface of the wafer in the first and second channel regions, respectively;
(e) current source means, connected to the first or the second contact electrode, for causing a flow of current through the first diffused region, the first inversion layer, and the second diffused region;
(f) voltage measuring means, connected across the second and third contact electrodes, for measuring the voltage developed across the second and third contact electrodes in response to the flow of current.

4,896,109
PHOTOCONDUCTIVE CIRCUIT ELEMENT REFLECTOMETER
Christen Rauscher, Alexandria, Va., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.
Filed Dec. 7, 1987, Ser. No. 129,210
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 R **12 Claims**



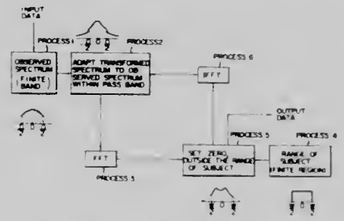
1. A photoconductive reflectometer for characterizing a high-frequency semiconductor device by generating a slowed-motion image of a signal reflected from the device, comprising:
pulse means for generating extremely short electrical pulses for reflection by said device;
a plurality of photoconductive circuit elements intermediate said pulse means and said device at locations effective to admit samples of electrical signals between said pulse means and said device;
a plurality of filter means connected to said plurality of photoconductive circuit elements for electronically filtering out high-frequency components from said samples and for outputting filtered samples in the form of slowed-motion images of said signals between said pulse means and said device; and
optical excitation means for sequentially exciting said plurality of photoconductive circuit elements for extremely short periods and at intervals effective for said admissions.

4,896,110
DIFFERENTIAL TRANSFORMER FOR DETECTING THE DISPLACEMENT OF A PROBE USING THE COMBINED OUTPUT OF TWO MODES OF OPERATION
Giichiro Shimizu; Toshiharu Okuyama, and Yoshio Wakatsuki, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan
Filed Jul. 25, 1988, Ser. No. 223,930
Claims priority, application Japan, Aug. 5, 1987, 62-120099[U]
Int. Cl.[4] G01B *7/14*; G08C *19/06, 19/12*
U.S. Cl. 324—208 **10 Claims**



1. A length measuring apparatus comprising: current supplying means for supplying an AC current; voltage transformer means including first, second and third coils, a core and a probe, said first coil having first and second terminals, said second coil having third and fourth terminals, said third coil having fifth and sixth terminals, said first, second and third coils being arranged in a predetermined order, said third terminal being connected to said second and sixth terminals, and said probe being arranged at a distal end of said core on a first coil side thereof and being brought into contact with an object to be measured, thereby causing said core to move from said first coil toward said third coil;
data converting means connected to said voltage transformer means for converting a secondary voltage output from said voltage transformer means into digital data;
display means for displaying input moving amount data;
switching means, connected to said voltage transformer means to said current supplying means, for connecting said current supplying means between said first terminal of said first coil and said fourth terminal of said second coil to apply said secondary voltage output appearing between said third terminal of said second coil and said fifth terminal of said third coil to said data converting means in a first mode, and for connecting said current supplying means between said fifth terminal of said third coil and said fourth terminal of said second coil to apply said secondary voltage appearing between said fourth terminal of said second coil and said fifth terminal of said third coil to said data converting means in a second mode; and
control means, connected to said switching means, for setting said switching means in the first mode, for receiving the digital data output from said data converting means as first mode data in the first mode, for setting said switching means in the second mode, for setting said switching means in the second mode, for receiving the digital data output from said data converting means as second mode data in the second mode, and for calculating the moving amount data from the first and second mode data to output the calculated moving amount data to said display means.

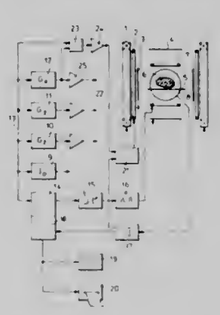
4,896,111
METHOD AND SYSTEM FOR IMPROVING RESOLUTION OF IMAGES IN MAGNETIC RESONANCE IMAGING
Yoshio Machida, and Kyojiro Nanbu, both of Tochigi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 1, 1988, Ser. No. 278,453
Claims priority, application Japan, Dec. 2, 1987, 62-305286
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **5 Claims**



1. A system for acquiring a magnetic resonance image by estimating components in a magnetic resonance signal outside a range, the range corresponding to a region of a subject, the system comprising:
static field generating means for generating a static field;
gradient field generating means for generating gradient fields;
transmitting and receiving means for transmitting an excitation pulse to the subject and for receiving a magnetic resonance signal generated in the subject;
control means for controlling the static field generating means, the gradient field generating means, and the transmitting and receiving means in accordance with a predetermined sequence;
setting means for setting a set region of the subject in accordance with the predetermined sequence; and
estimating means for estimating the magnetic resonance signal received by the transmitting and receiving means in accordance with the set region;
wherein the estimating means includes;
first transforming means for Fourier-transforming the magnetic resonance signal;
zero-setting means for setting components outside the range in a magnetic resonance signal transformed by the first transforming means to zero;
second transforming means for Inverse Fourier-transforming a magnetic resonance signal zero-set by the zero-setting means; and
fitting means for fitting a magnetic resonance signal transformed by the second transforming means to the magnetic resonance signal received by the transmitting and receiving means within the range.

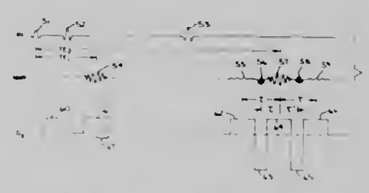
4,896,112
METHOD FOR GENERATING SPIN ECHO PULSE SEQUENCES IN A NUCLEAR SPIN TOMOGRAPH, AND NUCLEAR SPIN TOMOGRAPH ADAPTED FOR CARRYING OUT SUCH METHOD
Dieter Ratzel, Rheinstetten, and Norbert Schuff, Heidelberg, both of Fed. Rep. of Germany, assignors to Bruker Medizintechnik GmbH, Rheinstetten, Fed. Rep. of Germany
Filed Sep. 7, 1988, Ser. No. 241,440
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730148
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **16 Claims**

1. A method for generating spin echo pulse sequences in a nuclear spin tomograph, comprising a magnet for generating a homogeneous static magnetic field, at least one auxiliary coil to which a compensation current is applied for correction of the static magnetic field, at least one gradient coil for generating a gradient field varying in space and directed in the same direction as the static magnetic field, which gradient coil can be subjected to currents varying over time, and at least one rf coil arrangement to which rf pulses can be supplied for exciting nuclear spins of a body located in the homogeneous static magnetic field and permitting resonance signals generated by the excited nuclear spins to be received, said method comprising the steps of exciting the nuclear spins by means of a sequence of rf pulses comprising a first excitation pulse and a subsequent sequence of rf pulses serving for exciting spin echoes, a first rf pulse of the subsequent pulse sequence being spaced from the excitation pulse by a first time interval and the



rf pulses of the subsequent pulse sequence being spaced from each other by second time intervals, and applying further current pulses to the at least one gradient coil in the intervals between successive rf pulses, and compensating in addition the influence of eddy currents and other field effects produced by generation of the gradient fields, characterized in that a current pulse is applied to the auxiliary coil, at least in one of the time intervals comprising the first and the second time intervals, between the excitation pulse and the next following rf pulse which current pulse effects a variation of the static magnetic field limited in time so as to compensate a dephasing effect on the excited nuclear spins resulting from a variation to which the static magnetic field is subjected by the insertion of one or more gradient fields.

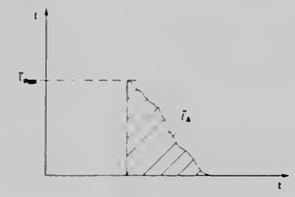
4,896,113
USE OF REPEATED GRADIENT ECHOES FOR NOISE REDUCTION AND IMPROVED NMR IMAGING
Norbert J. Pelc, Waunatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.
Continuation of Ser. No. 276,054, Nov. 25, 1988, abandoned. This application Jun. 16, 1989, Ser. No. 368,145
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **20 Claims**



1. A method for producing a spin echo and a gradient echo signal to produce an image, the steps comprising:
(a) applying a polarity magnetic field to the object to be imaged;

(b) exciting the nuclei in the object with an RF excitation pulse;
(c) applying a spin echo producing RF pulse to produce a spin echo signal at a first time T;
(d) acquiring the spin echo signal at the first time T during the application of a first read out gradient; and
(e) acquiring a gradient echo signal at at least one time $T+\tau$ and $T-\tau$ during the application of a second read out gradient.

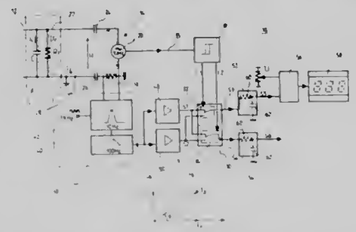
4,896,114
CABLE FAULT DETECTOR
Marcus Donner, Helsinki, Finland, assignor to Oy Elecid Ab, Helsinki, Finland
PCT No. PCT/FI86/00156, § 371 Date Aug. 25, 1988, § 102(e) Date Aug. 25, 1988, PCT Pub. No. WO88/05171, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 29, 1986, Ser. No. 235,899
Int. Cl.[4] G01R *31/08*
U.S. Cl. 324—522 **9 Claims**



1. Method for detecting a fault, e.g. a short circuit, break or leakage in an electric cable or conductor, whereby two conductor pairs (1,2 and 4,5), one of which comprises the faulty conductor (1), are connected in such a way as to form a a pair of closed loops (1,5 and 2,4), a voltage pulse being applied to one (2,4) of the closed loops to locate the fault (X), wherein the pulse is applied to the intact (2,4) loop of the pair of closed loops, the pulse voltage being adjusted according to the nature of the fault to a level sufficient to produce a malfunction, e.g. sparking, in the defective loop (1,5), whereupon the current pulses produced at the ends of this loop are detected and the ratio of these current values (I_{max}; I_A) is measured and translated into a distance of the fault from the detector.

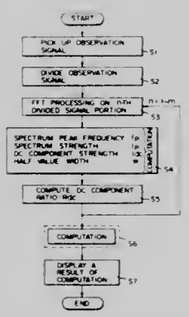
4,896,115
ELECTRICAL NETWORK INSULATION MONITORING AND MEASURING DEVICE
Philippe LeMaitre; Philippe Schuster, and Christian Pellegrin, all of Grenoble, France, assignors to Merlin Gerin, France
Filed Jun. 1, 1988, Ser. No. 201,014
Claims priority, application France, Jun. 4, 1987, 87 07871
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—551 **5 Claims**

1. A monitoring and measuring device of the insulation of an electrical network with respect to earth, comprising:
an input circuit comprising a generator capable of applying a reference AC signal of a first frequency to the network to be monitored, the network being of a second frequency higher than said first frequency;
an electronic detection circuit designed to supply a measurement signal representative of the insulation status of the network in response to the sending of said reference AC signal, said measurement signal being proportional to the ground fault impedance formed by a leakage resistance, and by a leakage capacitance whose value depends on the characteristics of the network;
means for discriminating the components of said measurement signal, a first component being a function of the current flowing through the leakage resistance, and a second component being a function of the current flowing through the leakage capacitance;
a synchronous detection device having a pair of first and second static invertors processing the first and second components of the measurement signal, said measurement signal being applied to the input of each invertor via a filtering circuit designed to deliver a filtered signal at the first frequency of the reference AC signal;
a converter electrically connected to the generator, said converter delivering two quadrature control signals to



respectively control the first and second inverters, the first control signal being in phase with said reference AC signal;
an integrating circuit connected to the output of each of the first and second inverters for extracting the mean value of the first and second components of the measurement signal;
and computation and display means connected to the outputs of each integrating circuit for indicating the values of the leakage resistance, and/or of the leakage capacitance.

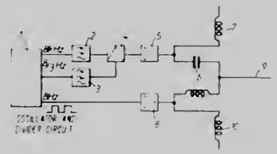
4,896,116
PULSE RADAR METHOD AND APPARATUS FOR DETECTING AN OBJECT
Yuji Nagashima, Tokorozawa; Yoshikazu Sudo, Iruma; Junichi Masuda, Tokyo; Yuzo Matsudaira, Higashiyamato; Kishio Arita, Kunitachi, and Eiji Nagai, Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan
PCT No. PCT/JP87/00838, § 371 Date May 23, 1988, § 102(e) Date May 23, 1988, PCT Pub. No. WO88/03276, PCT Pub. Date May 5, 1988
PCT Filed Oct. 30, 1987, Ser. No. 207,280
Claims priority, application Japan, Oct. 30, 1986, 61-256764; Oct. 12, 1987, 62-254738; Oct. 28, 1987, 62-272133
Int. Cl.[4] G01V *3/12, 3/38;* **G01R** *23/16;* **G01S** *13/04*
U.S. Cl. 324—329 **17 Claims**



1. A method for detecting an object by a pulse radar method, comprising:

receiving as an observation signal an electromagnetic wave which is an echo wave returned back from an object;
dividing said observation signal into separate divided signal portions for a predetermined time interval;
transforming each divided signal portion into a frequency region by Fast Fourier Transformation to find a spectral distribution;
reading from the spectral distribution at least two of the following parameter values, a spectral peak frequency value f_p, a DC component ratio value R_{dc} and a half value width value W as one combination;
extracting only each wave returned back from an object being detected, by eliminating as a spurious echo wave from said spectral distribution parameter values divided signal portions having a value other than that of the spectral peak frequency f_p falling within a predetermined frequency range, that of the DC component ratio R_{dc} falling within a predetermined DC component ratio, or that of the half value width W falling within a predetermined half value width; and
displaying a cross-sectional image of the object from said extracted respective wave.

4,896,117
METHOD OF AND APPARATUS FOR TRACING FAULTS IN ELECTRICAL CONDUCTORS
Peter M. Floweredew, Bristol, and Andrzej Z. Regini, Eastington, both of England, assignors to Radiodetection Limited, Bristol, England
Filed Oct. 24, 1988, Ser. No. 267,162
Claims priority, application United Kingdom, Oct. 24, 1987, 8724960
Int. Cl.[4] G01R *31/08*
U.S. Cl. 324—520 **13 Claims**



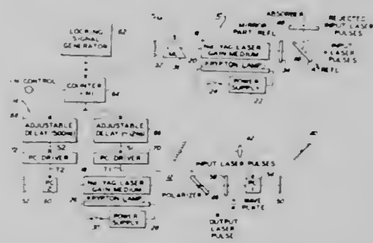
1. A method of tracing faults in an at least partially hidden or inaccessible electrical conductor, whose path is known or which can be assumed, comprising generating first and second low frequency phase coherent electromagnetic signals and a high frequency electromagnetic signal, modulating the high frequency signal by the second low frequency signal, additively coupling the modulated high frequency signal and the first low frequency signal to the conductor, traversing an electromagnetic signal receiver over the assumed or known path of the conductor, separately detecting from the receiver the low and high frequencies, deriving from the received high frequencies the second low frequency modulation of the high frequency signal and deriving from the received low frequencies a first low frequency gradient signal, comparing the second low frequency with the gradient signal and repeating such comparison at different positions of the traverse, substantial changes in result indicating the location of a fault.

4,896,118
VARIABLE GAIN CURRENT-TO-VOLTAGE AMPLIFIER WITH GAIN INDEPENDENT TEST MODE OPERATION
Richard A. Johnson, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 26, 1988, Ser. No. 262,846
Int. Cl.[4] G01R *19/00*
U.S. Cl. 330—2 **18 Claims**



1. A precision current-to-voltage amplifier having a normal amplification mode wherein an input current is amplified by an adjustable gain to produce an output voltage corresponding thereto and also having a test mode wherein the output voltage is independent of the normal amplification gain comprising:
(a) an active component;
(b) a first switch means connected between the input current and the active component;
(c) a first adjustable amplification means connected in an amplifier configuration to the active component;
(d) a test input divider connected to the output voltage such that the adjustable amplification means is connected to the output voltage through a portion of the test input divider; and
(e) a second switch means connected between a test input and the test input divider, the second switch means and the first switch means not both being closed at the same time.

4,896,119
CW PUMPER CW PUMPED VARIABLE REPETITION RATE REGENERATIVE LASER AMPLIFIER SYSTEM
Steven L. Williamson; Girard Mourou; Irl N. Duling, III; Philippe Bado, all of Rochester, and Carl H. Petras, Cameron, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.
Filed Jun. 7, 1984, Ser. No. 618,274
Int. Cl.[4] H01S *3/00*
U.S. Cl. 330—4.3 **27 Claims**



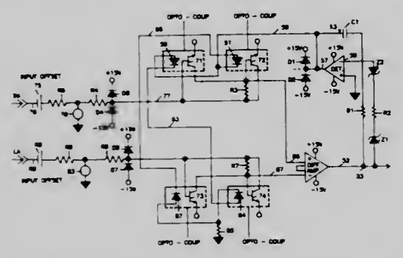
1. Regenerative laser apparatus comprising an optical cavity, a gain medium in said cavity, means for CW pumping said gain medium, means for injecting laser pulses into said cavity and providing multiple traversals of said cavity and medium thereby amplifying said pulses, and means for controlling the rate at which said pulses are injected into said cavity and said amplified pulses are outputted from said cavity.

4,896,120

INSTRUMENTATION AMPLIFIER ARRANGEMENT

Zvi Kamil, 14 David Hamelech St., Tel Aviv, Israel

Filed Mar. 24, 1987, Ser. No. 29,538
Claims priority, application Israel, Mar. 24, 1986, 78244
Int. Cl.[4] H03F *17/00*
U.S. Cl. 330—59 **5 Claims**



2. A high input impedance, high gain instrumentation amplifier arrangement for use with electrocardiagraph (EOG) systems, said arrangement comprising:

(a) a differential amplifier having a positive input port and a negative input port,

(b) first means including a first sensor means and first offset voltage means for supplying voltage to said positive input port,

(c) second means including a second sensor means and a second offset voltage means for supplying voltage to said negative input port,

(d) a feedback arrangement operated responsive to average DC output voltages at the output of said differential amplifier for supplying input voltages to the input ports of said differential amplifier to cancel non-zero average DC output voltages, said feedback arrangement comprising:

(1) detecting means for detecting and averaging DC output voltages,

(2) voltage developing means coupled to said input ports and operated responsive to the average DC output voltages for developing input voltages to cancel said non-zero average DC output voltages, and

(3) non-galvanic coupling means for coupling said average DC output voltages from said detecting means to said voltage developing means without adversely affecting the high gain of the instrumentation amplifier arrangement.

4,896,121

CURRENT MIRROR FOR DEPLETION-MODE FIELD EFFECT TRANSISTOR TECHNOLOGY

Lawrence Larson, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 31, 1988, Ser. No. 264,410
Int. Cl.[4] H03F *3/16*
U.S. Cl. 330—288 **13 Claims**

1. A current mirror, comprising:

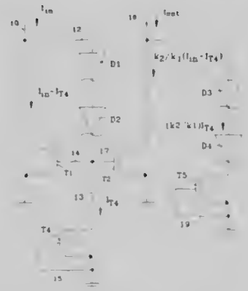
input circuit means for accepting input current;

a first depletion-mode field effect transistor (FET) connected in circuit with the input circuit means;

a second depletion-mode FET whose gate is connected in circuit and the gate of the first FET;

an output circuit means connected in circuit with the second FET for outputting current which mirrors the input current;

a level-shifting circuit that maintains the first depletion-mode FEt in its active or linear mode, said level-shifting circuit also drawing current wherein the level-shifting circuit is connected in circuit with both the drain and the gate of the second FET to maintain the gate voltage of the second FET below its drain voltage, and wherein the drain and the gate of the second FET are connected in circuit with the drain and the gate respectively of the first FET such that the drain voltage and the gate voltage of



the second FET are reflected to equal the drain voltage and the gate voltage respectively of the first FET; and

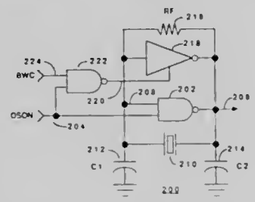
a current compensation circuit that provides current that is proportional to the current drawn by the level-shifting circuit.

4,896,122

MULTIPLE BANDWIDTH CRYSTAL CONTROLLED OSCILLATOR

Omid Tabernia, Coconut Creek; Barry W. Herold, Boca Raton, both of Fla., and Kenneth R. Burch, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 14, 1989, Ser. No. 380,047
Int. Cl.[4] H03B *5/32*
U.S. Cl. 331—158 **11 Claims**



1. A dual bandwidth crystal oscillator, comprising:

an oscillator crystal;

a first transconductance amplifier, having an input and an output coupled to said oscillator crystal, and having a first gain sufficient to maintain oscillation with said oscillator crystal at a first current level; and

a second transconductance amplifier, having an input coupled to said input of said first transconductance amplifier, and an output coupled to said output of said first transconductance amplifier, and having a second gain for augmenting the gain of said first transconductance amplifier to maintain oscillation with said oscillator crystal at a second current drain,

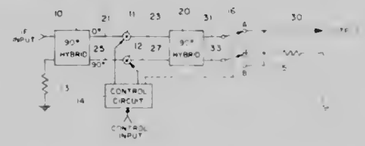
said second transconductance amplifier further having isolation means, responsive to a first bandwidth control signal for isolating said second transconductance amplifier from said first transconductance amplifier, thereby effecting oscillation at the first current drain, and further responsive to a second bandwidth control signal for effecting the coupling of said second transconductance amplifier to said first transconductance amplifier, thereby effecting oscillation at the second current drain.

4,896,123

QUADRAPHASE MODULATOR

Dov Taub, 1238 E. 26 St., Brooklyn, N.Y. 11210

Filed Feb. 17, 1989, Ser. No. 311,962
Int. Cl.[4] H04L *27/20*
U.S. Cl. 332—103 **11 Claims**



1. A quadraphase modulator for receiving a radio frequency input signal and selectively producing one of four output signals having relative phases in quadrature, comprising:

a first 90° hybrid having a first pair of input ports and a first pair of output ports, one of said first input ports connected to receive said input signal;

a second 90° hybrid having a second pair of input ports and a second pair of output ports;

a first phase reversal switch connected between one of said first output ports and one of said second input ports;

a second phase reversal switch connected between the other of said first output ports and the other of said second input ports;

a selector switch for connecting an output line to one of said second output ports; and

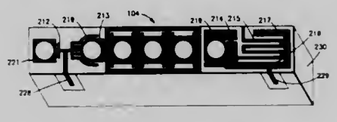
switch operation means for selectively operating said first and second phase reversal switches and said selector switch for producing a selected one of four possible output signals on said output line, the selected output signal being determined by the positions of the reversal and selector switches and the output signals having a relative phase relationship with respect to one another of 0°, 90°, 180°, or 270°.

4,896,124

CERAMIC FILTER HAVING INTEGRAL PHASE SHIFTING NETWORK

Dale G. Schwent, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1988, Ser. No. 264,659
Int. Cl.[4] H01P *1/18, 1/202, 1/213*
U.S. Cl. 333—206 **9 Claims**



1. A filter for filtering radio signals, comprising:

dielectric means comprised of a dielectric filter having top, bottom and side surfaces, said bottom and side surfaces being substantially covered with a conductive material, a plurality of holes each having surfaces substantially covered by a conductive material and extending from the top surface toward the second surface;

input coupling means coupled to a first hole of said plurality of holes;

first electrode means disposed on the top surface of said dielectric means and coupled to the conductive material of a second of said plurality of holes;

second electrode means disposed on the top surface of said dielectric means at a predetermined distance from said first electrode means for capacitively coupling thereto;

first transmission line means disposed on the top surface of said dielectric means and having a first end coupled to said second electrode means and having a second end coupled to the conductive material of one of said side surfaces, for producing a predetermined inductive impedance;

second transmission line means disposed on the top surface of said dielectric means and having a first end coupled to said second electrode means and having a second end disposed at a predetermined distance from the conductive material of one of said sides, for producing a predetermined capacitive impedance; and

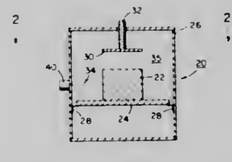
output coupling means coupled to the first end of said second transmission line means.

4,896,125

DIELECTRIC NOTCH RESONATOR

William D. Blair, Jr., Lanoka Harbor; Salvatore Beativenga, Manalapan, and Gregory J. Lamont, Englishtown, all of N.J., assignors to Alcatel N.A., Inc., Claremont, N.C.

Filed Dec. 14, 1988, Ser. No. 284,341
Int. Cl.[4] H01P *7/10*
U.S. Cl. 333—219.1 **38 Claims**



1. A dielectric notch resonator comprising:

(A) a dielectric resonator formed from a high dielectric constant material;

(B) a housing positioned about the dielectric resonator;

(C) means for positioning the dielectric resonator within the volume defined by the housing so as to generate a resonate reactive impedance about a center frequency; and

(D) a coupling reactance mechanism comprising:

(1) an inductive coupling wire,

(2) a capacitive element connected to the coupling wire at one end and forming therewith a reactive element having an imaginary impedance component of approximately the same magnitude as the imaginary impedance component of the resonator at the center frequency of the dielectric resonator, with the imaginary component of the coupling mechanism reactance approximately 90 degrees out of phase with that of the dielectric resonator so as to effectively cancel the imaginary reactive component of the resonator reactance at the center frequency and frequencies thereabouts, and

(3) means, connected at the second end of the coupling wire, for providing interconnection of the dielectric notch resonator with an external component.

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4,896,126

COIL FOR AN ELECTROMAGNETIC RELAY HAVING DELAYED SWITCHING

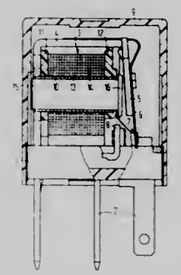
Richard Siepmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,058

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 8802045[U]

Int. Cl.⁴ H01F *7/10*

U.S. Cl. 335—244 **11 Claims**



1. A coil for an electromagnetic relay having a delayed response, comprising:
a coil member having:
a core;
a coil tube immediately over said core, a carrying part of said coil tube being a short-circuit tube of a material of good electrical conductivity;
two flanges being at least partly of an insulating material connected at ends of said coil tube;
only a thin insulating layer provided over said short-circuit tube in a region between said two flanges; and
a winding applied over said thin insulating layer on said short-circuit tube between said two flanges.

4,896,127

LAGGED TYPE SOLENOID

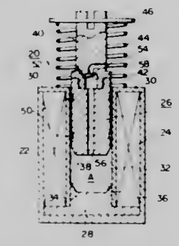
Etsushi Hida, Shizuoka, Japan, assignor to Kabushiki Kaisha Nippon Automation, Japan

Filed Nov. 4, 1988, Ser. No. 267,522

Claims priority, application Japan, Dec. 21, 1987, 62-321570; Dec. 21, 1987, 62-321571

Int. Cl.⁴ H01H *7/18*

U.S. Cl. 335—239 **24 Claims**



1. A lagged type solenoid comprising:
a frame formed into a substantially cylindrical shape and opened at one end thereof;
a coil bobbin formed into a substantially cylindrical shape and provided therein with an axially extending through-hole, said coil bobbin having a magnetic coil wound on its outer periphery and being arranged on an inner peripheral surface of said frame;
a core arranged in a bottom of said frame to define a plunger moving space in cooperation with said through-hole of said coil bobbin;
a plunger fitted in said plunger moving space so as to be reciprocated in an axial direction thereof and advanced in said plunger moving space due to excitation of said magnetic coil; and
a plunger lagging mechanism for carrying out one of the plunger advancing operation and plunger retreating operation at a low speed in said plunger moving space,
said plunger lagging mechanism comprising:
at least one air discharge passage for discharging air in said plunger moving space from said space therethrough to an ambient atmosphere;
at least one air supply passage for supplying air from the ambient atmosphere therethrough to said plunger moving space;
one of said air discharge passage and air supply passage being formed into a sectional area larger than that of the other of said air discharge passage and air supply passage;
the sectional area of said one of said air discharge passage and air supply passage being small sufficiently to flow air between said plunger moving space and the ambient atmosphere little by little; and
selective shut-off means for closing the other of said air discharge passage and air supply passage during one of said plunger advancing operation and plunger retreating operation.

4,896,128

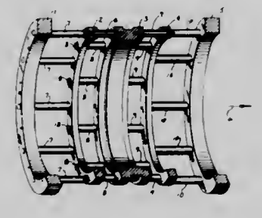
SUPPORT STRUCTURE FOR HIGH FIELD MAGNET COILS

John J. Wollan; Raghavan Jayakumar, both of Florence, S.C.; Vincent Abruzzo, Utica, N.Y., and James Lee, Jr., Lake City, S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 30, 1988, Ser. No. 278,124

Int. Cl.⁴ H01F *5/00*

U.S. Cl. 335—299 **16 Claims**



1. A magnet support structure for a set of magnet coils of a solenoid magnet comprising:
a set of at least two magnet support rings spaced apart along the length of a magnet bore axis of the solenoid magnet, each ring being disposed coaxially with the bore axis of the solenoid magnet;
means for mounting at least one magnet coil of said set in each of said magnet support rings with said coil coaxial with the magnet bore axis;
a set of at least three struts extending between and rigidly connecting successive magnet support rings, each strut being parallel to the magnet bore axis and disposed around the magnet bore axis, said struts being sized and positioned to resist axial forces to which said spaced magnet support rings are subjected as a result of the magnetic forces produced by the set of magnet coils;

wherein the means for mounting the magnet coil to a magnet support ring includes:
a radially inward extending lip formed around the inner surface of the magnet support ring, said lip defining a land to bear the axial force of the coil; and
clamping means mounted around the circumference of the magnet support ring opposite from the land to sandwich the magnet coil between the land and the clamping means to restrain the magnet coil against movement along the magnet bore axis.

4,896,129

MAGNETIC FIELD COILS

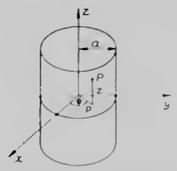
Robert Turner, Bramcote; Peter Mansfield, and Barry L. W. Chapman, both of Beeston, all of England, assignors to National Research Development Corporation, London, England

Filed Jun. 25, 1987, Ser. No. 66,201

Claims priority, application United Kingdom, Jun. 28, 1986, 8615854

Int. Cl.⁴ H01F *5/00*

U.S. Cl. 335—299 **17 Claims**



1. A magnetic coil including a plurality of conductors positioned on a surface of the magnetic coil, the positions of the conductors being determined by a calculation of a continuous current density required on that surface to generate a specified magnetic field and by calculation of conductor positions on the surface of the magnetic coil which correspond to the current density.

4,896,130

MAGNETIC SYSTEM

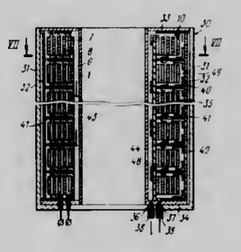
Igor V. Ermilov, ulitsa Sovetskaya, 31, kv. 24, Reutov, Moskovskaya oblast; Lev V. Kozlov, Marxistskaya ulitsa, 1, korpus 1, kv. 199, Moscow; Vladimir F. Martynov, ulitsa Volkovskaya, 5a, kv. 3, Ljubertsy, Moskovskaya oblast; Vladimir I. Perevodchikov, ulitsa Krzhizhanovskogo, 4, korpus 2, kv. 32, and Evgeny I. Stepanenko, ulitsa Kntuzova, 9, kv. 33, both of Moscow, all of U.S.S.R.

Filed Nov. 15, 1988, Ser. No. 271,602

Claims priority, application U.S.S.R., Nov. 16, 1987, 4328105

Int. Cl.⁴ H01F *5/00*

U.S. Cl. 335—300 **22 Claims**



1. A magnetic system comprising:
a frame;
at least one coil providing for setting-up of a magnetic field and having end surfaces, an inner lateral surface, and an outer lateral surface;
coil formers of each of said coils arranged coaxially on said frame;
conducting and insulating tapes wound in layers on said coil former;
a serving of each said coils encompassing an outer surface of each coil;
circulating means for circulating coolant, arranged in close proximity to end surfaces of said coils with a gap between said end surface of each coil and said circulating means;
said end surfaces of the coils being formed substantially by extremities of said conducting and insulating tapes; and
a cooling system.

4,896,131

STUD FINDER WITH ONE-PIECE MAGNET ASSEMBLY

Daniel B. Podlesny, New Brunswick, and Ralph Lopez, Cliffwood Beach, both of N.J., assignors to Red Devil, Inc., Union, N.J.

Filed Apr. 10, 1989, Ser. No. 335,748

Int. Cl.⁴ H01F *7/02*

U.S. Cl. 335—302 **4 Claims**



1. A magnetic detection device comprising:
a housing;
a magnet assembly pivotable in said housing;
said magnet assembly including a one-piece molded body;
said one-piece molded body including first and second integrally molded pivot bosses at opposed sides of said one-piece molded body and centrally disposed along a length thereof; and
said magnet assembly being capable of being magnetized along a desired axis.

4,896,132

FINGERPRINT DISPLAY APPARATUS

Larry D. Land, 1946 Edgerton, St. Paul, Minn. 55117

Filed Sep. 6, 1988, Ser. No. 245,047

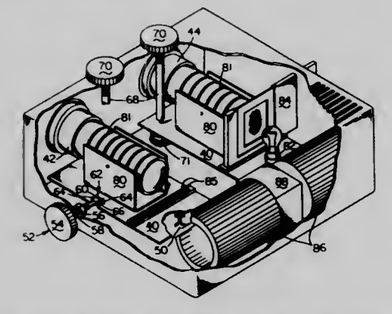
Int. Cl.⁴ G03B *21/26*

U.S. Cl. 353—94 **9 Claims**

1. Fingerprint display apparatus comprising:
(a) first and second projection lenses respectively mounted to first and second separate support platforms and wherein each platform is supported from at least one pivot member interiorly of an enclosure;
(b) means extending from said enclosure and coupled to each of said first and second platforms for horizontally rotating each platform relative to each platform pivot member; and
(c) means extending from said enclosure and contacting each of said first and second platforms for vertically tilting each platform relative to each platform pivot member and relative to spring means for counter-biasing each of said first and second platforms;
(d) first and second means for removeably supporting individual transparent carriers having a fingerprint pattern

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printed thereon in coaxial relation to said respective first and second lenses; and



(e) means for back lighting each of said first and second lenses and said first and second fingerprint support means.

4,896,133

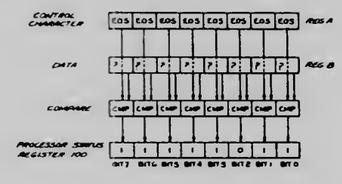
PARALLEL STRING PROCESSOR AND METHOD FOR A MINICOMPUTER

David H. Methvin, Boulder, Colo.; Angus McLagan, Newport Beach, Calif.; Gei-Jon Pao, Garden Grove, Calif., and Chong S. Un, Anaheim, Calif., assignors to Davin Computer Corporation, Irvine, Calif.

Continuation of Ser. No. 88,421, Aug. 20, 1987, abandoned, Continuation-in-part of Ser. No. 12,834, Feb. 10, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 262,225

Int. Cl.[4] G05B *1/00*; G06F *7/02*

U.S. Cl. 340—146.2 **23 Claims**



1. A parallel byte processing system for locating a control character in a data word comprising a predetermined number of bytes, said system comprising:

a first register to receive said bytes of said data word, said first register having a byte position for each of said predetermined number of bytes;

a second register to store copies of a predetermined control character, said copies being equal in number to said predetermined number of said bytes of said data word in said first register, said second register having a byte position for each of said copies; and

comparison means which simultaneously compares each byte of said data word in said first register with the copy of said control character in the same byte position in said second register, and generates a control bit for each said byte position of said first register, a control bit for a byte position being in a first control bit state if said byte of said data word in said byte position of said first register is equal to said copy of said control character in the same byte position of said second register, and in a second control bit state when said byte of said data word in said byte position in said first register is not equal to said copy of said control character in the same byte position in said second register.

4,896,134

ARMORED SELF-CONTAINED OUTDOOR/INDOOR SIREN ASSEMBLY

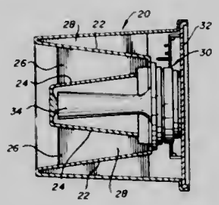
Takatoshi Hayashi, Saitama, Japan, assignor to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed May 2, 1988, Ser. No. 188,959

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] G08B *3/00*

U.S. Cl. 340—384 E **5 Claims**



1. A weatherproof and tamperproof alarm unit comprising: a cover member of strong and rigid armor material forming a housing having an open front end and an open rear end; a first horn of like strong rigid armor material having an open front end and an open rear end, said first horn being integrally connected to said cover member at the front open end of said housing and converging toward the rear end of said housing; a second horn of like strong rigid armor material having a closed front end and an open rear end and converging from its rear open end to its closed front end; means supporting said second horn coaxially within said first horn in radially spaced relationship therewith with the closed front end of said second horn positioned adjacent to the open front end of said housing and of said front horn to close the open front end of said housing; a base removably mounted on the open rear of said housing and forming an enclosure therefor; and an electrically activated sound generating unit mounted on said base and including a third horn extending coaxially into said second horn and diverging toward the closed end of said second horn in radially space relationship therewith.

4,896,135

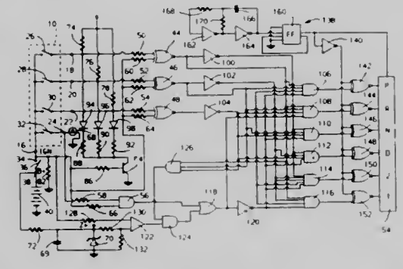
ELECTRONIC RANGE INDICATOR FOR A MOTOR VEHICLE

Lisa D. Deeds, and Dennis M. Lombardo, both of Haslett, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1989, Ser. No. 303,380

Int. Cl.[4] B60Q *1/00*; H01H *3/16*

U.S. Cl. 340—456 **5 Claims**



1. In a motor vehicle having a selector mechanism adapted to be positioned by a vehicle operator for selecting a desired transmission range, and position detecting means including at least one limit switch having input and output terminals which are electrically connected or disconnected depending on the position of said selector mechanism, apparatus for providing a continuous electronic indication of the selector mechanism position, comprising:

on state means operative during on periods of the vehicle to connect said input terminal to a relatively high potential system voltage, while biasing said output terminal toward a lower voltage which is overridden by said high potential system voltage when said input and output terminals are connected;

off state means operative during off periods of the vehicle to connect said input terminal to said lower voltage, while biasing said output terminal toward a higher voltage which is overridden by said lower voltage when said input and output terminals are connected, thereby to logically invert the output terminal voltage as compared with that established during on periods of the vehicle; and

decoding means for driving an electronic display (1) in accordance with the voltage at the output terminal of said limit switch during on periods of the vehicle, and (2) in accordance with the logical inverse of the voltage at the output terminal of said limit switch during off periods of the vehicle, thereby to provide an indication of the selector mechanism position during both on and off periods of the vehicle without requiring the supply of said high potential system voltage to the input terminal of said limit switch during the off periods of said vehicle.

4,896,136

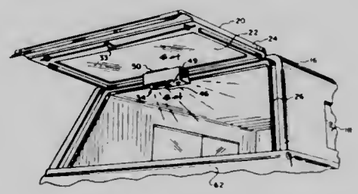
COMBINATION BRAKE LIGHT AND INTERIOR LIGHT FOR MOUNTING ON THE DOOR OF A TRUCK CAP

Robert Hotovy, New Buffalo, Mich., assignor to Creation Windows, Inc., Elkhart, Ind.

Filed Dec. 14, 1987, Ser. No. 132,470

Int. Cl.[4] B60Q *1/26, 1/44*

U.S. Cl. 340—468 **12 Claims**



1. A combination brake light and interior light for use on a truck cap covering the load-carrying portion of a pickup truck having brakes, the truck cap having a rear door adapted to be opened and closed, the rear door including a rear window, the combination brake light and interior light comprising:

a housing mounted to the rear door, said housing having at least first and second portions;

a brake light lens disposed on a first portion of said housing, facing the rear window and being substantially vertically disposed when the rear door is closed;

a brake light bulb disposed within said housing proximate to said brake light lens, such that light from said brake light bulb is transmitted through said brake light lens and the rear window;

means for energizing said brake light bulb when the truck brakes are applied;

a first interior light lens disposed on a second portion of said housing;

an interior light bulb disposed within said housing proximate to said first interior light lens, such that light from said interior light bulb is transmitted through said first interior light lens; and

means for selectively energizing said interior light bulb.

4,896,137

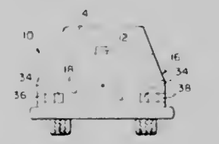
REAR WINDOW STOP-N-TURN SIGNAL INDICATOR LIGHT CIRCUIT

Robert Lee, III, P.O. Box 476, Clayton, La. 71326, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Aug. 11, 1988, Ser. No. 231,254

Int. Cl.[4] B60Q *1/46*

U.S. Cl. 340—479 **4 Claims**



3. A stop and turn signal system for an auxiliary lamp mounted inside a rear window of a motor vehicle, said system comprising a means for converting the auxiliary lamp from a stop light to a stop and turn signal light for preventing accidents, wherein said converting means comprises a logic circuit being an OR GATE having three diodes with their cathode leads all tied together and connected to the auxiliary lamp, said diodes anode leads are each connected separately to a brake signal switch, a left turn signal switch and a right turn signal switch, whereby when the brake signal switch, the left turn signal switch or the right turn signal switch is activated, it will energize its respective bulb and forward bias said respective diode in which current will flow through the auxiliary lamp from a battery, making the auxiliary lamp light up, further comprising a means for indicating on the auxiliary lamp a left turn signal or a right turn signal when the auxiliary lamp is flashing.

4,896,138

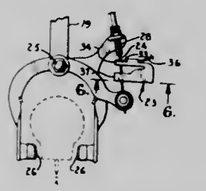
BICYCLE BRAKING INDICATOR LIGHT ASSEMBLY

Paul G. Nickols, P.O. Box 411182, Kansas City, Mo. 64141

Filed Jul. 15, 1988, Ser. No. 220,005

Int. Cl.[4] B60Q *1/44*

U.S. Cl. 340—479 **5 Claims**



4. A brake indicator light actuator for mounting on the control cable of a caliper brake mechanism, said actuator comprising

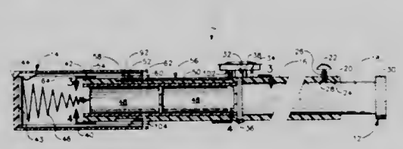
(a) a body configured to provide a pair of parallel legs separated from one another, said legs defined as a base leg and an electric contact carrying leg, each said leg having an open end slot in which the cable is received

(b) means for cooperating with said slot to anchor said base leg to said cable, said cable being loosely received in the slot in said contact carrying leg to permit movement of said cable relative to said leg; and

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(c) electric contact means on said contact carrying leg.

4,896,139
SELF-CONTAINED BURGLAR ALARM DEVICE FOR SLIDING WINDOWS, DOORS AND THE LIKE
Alan E. Eldridge, 4830 S. Bahama Way, Aurora, Colo. 80015
Filed May 11, 1988, Ser. No. 193,111
Int. Cl.[4] G08B *13/08*
U.S. Cl. 340—546 **35 Claims**



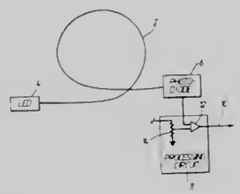
1. An alarm device for closures such as windows, sliding doors, and the like, said device comprising:
an elongated housing having first and second ends;
an alarm responsive to an electrical signal;
switch means for controlling said electrical signal and including contact means for activating said alarm in each of two activation modes corresponding to extension and compression of said housing;
means disposed at said housing first end for adjusting the length of said housing; and
means disposed proximate said housing second end for enabling movement of said contact means to initiate said two activation modes from an inactive alarm mode in cooperation with said housing length adjustment means.

4,896,140
DISPLAY TABLE SECURITY SYSTEM
Dale E. Biever, 54 Douglass St., Boyertown, Pa. 19512, and Lee M. Frank, Sr., 6337 Evelyn, Rotherford Heights, Harrisburg, Pa. 17111
Filed Jan. 9, 1989, Ser. No. 294,753
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—568 **6 Claims**



1. A security system for individual articles on display comprising a sensor detector engaged by an article on display and responsive to a predetermined movement of said article or to a predetermined condition of the sensor detector itself, an indicator sub-system having an alarm annunciator, means for connecting said sensor detector to said indicator sub-system and comprising a continuity circuit and a floating circuit, said indicator sub-system comprising a first indicator circuit connected to said continuity circuit and responsive to interruption of said continuity circuit and a second indicator circuit connected to said floating circuit and responsive to an interruption of said floating circuit, said alarm annunciator being connected to said first and second indicator circuits and actuated by either one or both of said indicator circuits.

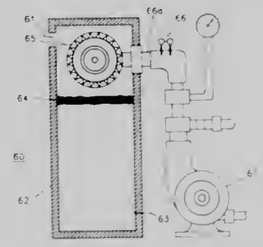
4,896,141
FIRE AND OVERHEAT DETECTION
Robert L. Farquhar, Reading, and Brian D. Powell, Maidenhead, both of United Kingdom, assignors to Graviner Limited, Billericay, England
Filed Apr. 15, 1988, Ser. No. 182,106
Claims priority, application United Kingdom, Apr. 16, 1987, 8709287
Int. Cl.[4] G08B *17/02;* **H01J** *5/16*
U.S. Cl. 340—590 **11 Claims**



1. An overheat detector, comprising:
an optical fibre, the light conducting part of which melts at a predetermined temperature,
means for launching light into one end of the fibre, and means for monitoring the power level of light received at the other end, in order to output an alarm signal in dependence on variations in the monitored level indicative of interruption of the light conducting part of the optical fibre due to melting of the light conducting part,
the monitoring means including discriminating means for discriminating against the production of a said alarm signal in response to abrupt mechanical interruption of the light conducting part,
wherein the discriminating means comprises another optical fibre similar to the first mentioned optical fibre, both optical fibres being mounted in a single cable, and means for permitting the output of a said alarm signal only if the monitored power level of the light received from both fibres is below a predetermined threshold.

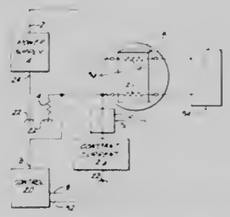
4,896,142
MOISTURE DETECTION SYSTEM FOR CARPET CLEANING APPARATUS
Dale G. Aycox, Rte. 3, Box 335, Space 11, Gainesville, Tex. 76240, and Kenneth Aycox, R.R. 1, Box 3940, Rogers, Ark. 72756
Filed Apr. 16, 1987, Ser. No. 40,376
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—604 **3 Claims**

1. A water extraction system including means for detecting moisture, foam or water flowing into a vacuum water pump, comprising a water vacuum pump, moisture recovery tank, a moisture sensor for detecting at least one of moisture, foam or water, a control unit and means for removing power from the vacuum pump when moisture, foam or water is detected flowing into the vacuum pump, aid water vacuum pump drawing water and moisture into said moisture recovery tank, said sensor being located between said water recovery tank and the vacuum pump, said sensor including two parallel conducting elements closely spaced so that the moisture, foam or water content between or across the two elements affects the conductance between the two conducting elements, the control unit including a detector circuit for detecting a change of conductance between the two sensor conducting elements, the control unit also including two indicating lights, one of which is on when there is no conductance between parallel conducting elements and the other indicating light is on when the is conductance between the parallel conducting elements, the



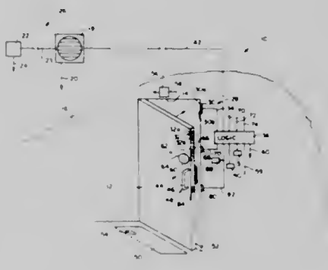
control unit also including a time delay circuit to prevent premature removal of power from the vacuum pump and a lock loop to ensure that the power is not reapplied to the vacuum pump once power is removed.

4,896,143
GAS CONCENTRATION SENSOR WITH DOSE MONITORING
Earl M. Dolnick, Encinitas, and Terry G. Anderson, San Diego, both of Calif., assignors to Quantum Group, Inc., San Diego, Calif.
Filed Apr. 24, 1987, Ser. No. 42,264
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—634 **10 Claims**



4. A gas concentration sensor system comprising:
a conductive metal oxide gas sensor having resistance which is variable in response to gas concentration, including concentration of a target gas;
means connected to the gas sensor for measuring a first resistance of the gas sensor at a lower temperature;
means connected to the gas sensor for intermittently heating the gas sensor from the lower temperature to a higher temperature;
means connected to the gas sensor for measuring a second resistance of the gas sensor at the higher temperature;
means connected to the measuring means for determining target gas concentration as a function of both the first and second resistances;
register means for accumulating values of target gas concentration from the determining means;
means for adding values to the register means when target gas concentration exceeds a selected value; and
means for subtracting values from the register means when target gas concentration is less than the selected value.

4,896,144
HAND WASHING ALERT
Naomi C. Bogstad, 1124 Virgilina Ave., Norfolk, Va. 23503
Filed Sep. 29, 1988, Ser. No. 250,536
Int. Cl.[4] G08B *7/00*
U.S. Cl. 340—691 **13 Claims**



1. A warning means for use in a facility and which is adapted to remind people to wash their hands prior to leaving the facility, comprising:
a frame-mounted switch mounted on a door frame of an ingress/egress door of a facility which includes a hand-washing means;
a switch activating means mounted on the ingress/egress door in a position to actuate said frame-mounted switch;
a recorded message playing means;
a recorded message on said recorded message playing means that is adapted to remind someone to wash their hands;
a speaker means connected to said recorded message playing means and located in the facility for broadcasting said recorded message in the facility;
an egress switch means mounted to be activated by a person prior to such person exiting the facility;
a control unit connecting said frame-mounted switch and said egress switch to said recorded message playing means and activating said playing means after said frame-mounted switch has been actuated by said door being opened to permit someone to enter the facility and after said egress switch has been activated prior to said door being opened to permit someone to exit the facility;
power means connected to said frame-mounted switch, to said egress switch means, to said control unit, to said recorded message playing means and to said speaker means;
a visible alarm mounted in the facility adjacent to said door and connected to said control unit to be activated when said recorded message playing means is activated, said visible alarm containing a message adapted to remind someone to wash their hands, and means connected to said visible alarm to de-activate said visible alarm after a person has exited the facility, said visible alarm being connected to said power means; and
a lock on said door and a lock control means connected to said door lock and to said control unit to prevent said door from being opened to permit egress from the facility until said facility hand washing means has been activated, said lock and said lock control means being connected to said power means.

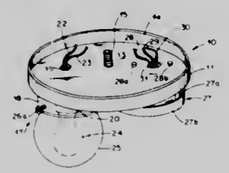
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4,896,145

FIXTURE FOR MOUNTING A LAMPHOLDER AND FIRE DETECTOR

Mike Lewkowicz, Wayside, N.J., assignor to Life Light, Inc., Oakhurst, N.J.

Continuation-in-part of Ser. No. 840,146, Oct. 6, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 202,050
Int. Cl.[4] G08B *23/00*; H02J *7/00*; F21V *33/00*
U.S. Cl. 340—693 **14 Claims**



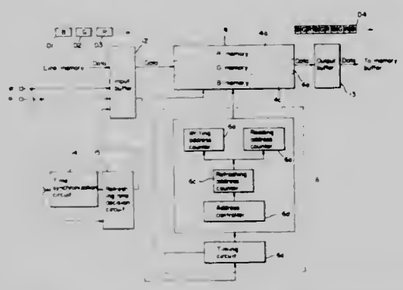
1. In combination, a light and fire detector fixture comprising:
(a) a housing having an exterior and interior, and including mounting means for mounting said housing to an electrical outlet box;
(b) lamp holding means connected to said housing and including a lamp receptacle and lamp conductor means for coupling said lamp receptacle to a power source associated with said electrical outlet box; and
(c) fire detecting means connected to said exterior of said housing at a location displaced along said exterior of said housing with respect to said lamp holding means, said fire detecting means including alarm means, detecting means to trigger said alarm means upon detection of a predetermined indicia of fire and fire detector conductor means for coupling said fire detecting means to said power source associated with said electrical outlet box.

4,896,146

COLOR IMAGE PROCESSOR

Masao Narumiya, Shiki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 42,017, Apr. 24, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 320,895
Claims priority, application Japan, Apr. 30, 1986, 61-101646
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—701 **9 Claims**



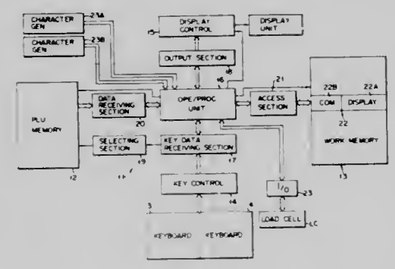
1. A color image processor for synchronously writing color data into a frame memory and reading said color data from said frame memory comprising:
color scanning means for sequentially scanning a plurality of lines of color data from a color document;
timing control means for developing a data timing signal in response to an external write signal and an external read signal;
writing address controlling means for writing each line of said plurality of lines of color data from said color scanning means, in synchronism with said data timing signal, at a plurality of addresses in said frame memory by generating said plurality of addresses for each line of said plurality of lines; and
reading address controlling means for generating said plurality of addresses for reading said plurality of lines of color data from said frame memory in synchronism with said data timing signal in response to a predetermined number of lines of said plurality of lines being written into said frame memory.

4,896,147

DISPLAY DEVICE FOR DISPLAYING CHARACTERS OF DIFFERENT CHARACTER SIZES

Takashi Futakata, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 90,031
Claims priority, application Japan, Sep. 10, 1986, 61-213565
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—731 **5 Claims**



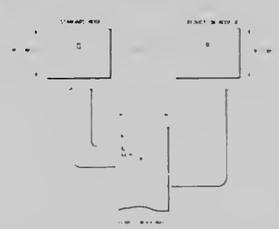
1. A display device comprising:
memory means for storing article name data;
a first character generator for generating character data of a normal size;
a second character generator for generating character data of a small size relative to said normal size, the height of which is less than half of that of the character data of said normal size, and the width of which is less than that of the character data of said normal size; and
control means for causing said display means to display character data, said control means including means for checking the arrangement of characters of the article name data stored in said memory means and the number of characters of said article name data; means for selecting one of said first and second character generators, wherein said first character generator is selected when it is detected that the number of characters of said article name data lies within a predetermined range, and said second character generator is selected when it is detected that the number of characters of said article name data exceeds said predetermined range or when it is detected that the arrangement of said article name data is in two-line form; and means for causing the selected character generator to generate items of character data according to the characters of said article name data for causing the display means to display the generated character data.

4,896,148

DISPLAY APPARATUS

Kikuo Kurita, Hirakata, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1987, Ser. No. 94,143
Claims priority, application Japan, Sep. 8, 1986, 61-211197
Int. Cl.[4] G06F *3/153*
U.S. Cl. 340—731 **6 Claims**



1. A display apparatus for displaying characters in a plurality of display modes, comprising:
storing means for storing text including a plurality of the characters therein;
a display device having a two-dimensional screen for displaying the characters;
character data generating means for generating character data corresponding to the characters in said storing means to be displayed on the screen of said display device;
display mode judging means for judging a display mode to display the characters on the screen wherein the number of character lines displayed on said screen in one of said plurality of display modes is different than the number of character lines displayed in another of said plurality of display modes;
operating means for locating a display start address of said storing means in the display mode judged by said judging means on the basis of the address of the character positioned at a cursor position on the screen, wherein a start character is stored at said display start address; and
display device drive means for causing the characters to be displayed from said start character stored in said start address of the storing means which is located by said operating means in the selected display mode on the screen in response to the character data generated by said character data generating means and the display start address located by the operating means.

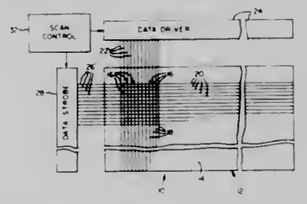
4,896,149

ADDRESSING STRUCTURE USING IONIZABLE GASEOUS MEDIUM

Thomas S. Buzak, Beaverton; Paul C. Martin, Portland; H. Wayne Olmstead, Beaverton, and John J. Horn, Hillsboro, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 19, 1988, Ser. No. 145,062
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—794 **22 Claims**

1. An addressing structure for a data element, comprising:
an ionizable gaseous medium in communication with a data element and an electrical reference;
ionizing means providing a data strobe signal for selectively effecting ionization of the ionizable gaseous medium to provide an interruptible electrical connection between the data element and the electrical reference, thereby to selectively address the data element; and



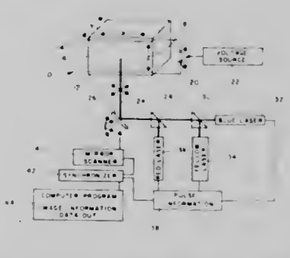
sensing means for sensing a datum stored by the data element, the datum having a value that is independent of the magnitude of the data strobe signal.

4,896,150

THREE-DIMENSIONAL IMAGING SYSTEM

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed Apr. 18, 1988, Ser. No. 182,920
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—795 **7 Claims**



1. A three-dimensional television system comprising:
a viewing chamber having a top and bottom, said viewing chamber also having a length, a depth and a height;
first and second electrode plates positioned at the top and bottom of said viewing chamber;
means to rapidly alternate a charge's direction between said first and second electrode plates;
a plurality of minute particles formed in a narrow plane along the length and depth of said viewing chamber, said plane of particles moved by said alternating charge causing said particles to move rapidly in a plane between said first and second electrode plates; and
means to illuminate selected of said particles at a desired position in said viewing chamber.

4,896,151

SIMULTANEOUS COMMUNICATION METHOD AND SYSTEM

Shoubu Kuranami, Hadano, and Masahiro Sakata, Kanagawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,212
Claims priority, application Japan, Oct. 28, 1986, 61-254604
Int. Cl.[4] H04L *1/00*; G06F *15/16*
U.S. Cl. 340—825.520 **11 Claims**

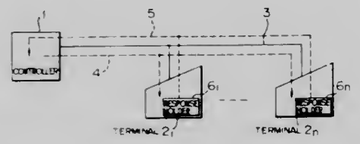
1. A simultaneous communication method of transmitting data, inclusive of a plurality of data blocks, in a local network in which the frequency of occurrence of transmission error is low, from a controller to a plurality of terminals all at once, comprising the steps of:
(a) transmitting the data blocks of said data in sequence from

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said controller simultaneously to all of said plurality of terminals;

(b) holding in each of said terminals a respective acknowledgement response for each data block; and

(c) successively sending a single acknowledgement response from each of said terminals to said controller only upon termination of transmission of all of the data blocks of said data, said single acknowledgement response from each



terminal indicating whether any data block in the data received by said terminal is erroneous data;

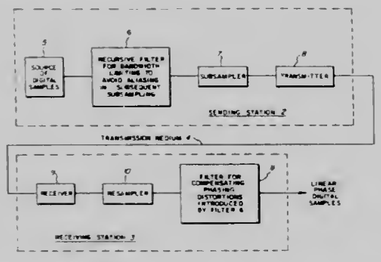
wherein said controller retransmits all of the data on the basis of the acknowledgement response received from said terminals at least to ones of said terminals indicating a need for data retransmission, and said terminals which receive said retransmission send an acknowledgement response after each retransmission of one data block.

4,896,152

TELEMETRY SYSTEM WITH A SENDING STATION USING RECURSIVE FILTER FOR BANDWIDTH LIMITING

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1989, Ser. No. 318,097
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 340—853 **8 Claims**



1. A telemetry sending station for generating information concerning the nature of a subsampled filtered digital electric signal to be received by a telemetry receiving station comprising a receiver for receiving from a medium said information generated by said telemetry sending station to recover a replica of said subsampled filtered digital signal and a finite-impulse-response filter of a type having a system function with zeroes for compensating phase distortion and further zeroes for limiting bandwidth on a linear-phase basis, said sending telemetry station comprising:

a source of samples of a digital signal response to a measured parameter;

a recursive filter having a transfer function having poles in the Z transform domain where the transfer function of said finite-impulse-filter has its zeroes for compensating phase distortion, said recursive filter for bandwidth limiting said digital signal to obtain a filtered digital signal;

means for subsampling the response of said recursive filter without substantial aliasing to obtain said subsampled filtered digital signal; and a transmitter for transmitting via said medium said information concerning the nature of a filtered digital signal as supplied from said means for subsampling.

4,896,153

SYSTEM TO CONTROL AND TEMPORARILY ADAPT SEMAPHORIC REGULATION

Giuseppe Pastorino, Genoa, Italy, assignor to CO.FI.GE. Compagnia Fiduciaria Genovese S.P.A., Genoa, Italy

Filed Aug. 3, 1987, Ser. No. 81,299
Claims priority, application Italy, Aug. 6, 1986, 48365 A86
Int. Cl.⁴ G08G *1/07*
U.S. Cl. 340—906 **12 Claims**



1. A system to control and temporarily adapt a node's semaphoric system, which system includes semaphoric signals, the components of the system provided in a number suitable for crossings requirements which comprises:

first receiving radioelectric equipment means, equipped with an aerial, to receive and decode signals on a given frequency;

first transmitting radioelectric equipment means equipped with an aerial, suitable for decoding, reencoding and retransmitting said reencoded signals, and coupled to said first receiving radioelectric equipment means so as to form transit monitoring decentralized sites;

one main transmitter connected to an aerial means, provided on a rescue vehicle; one onboard secondary transmitter, sending signals to said transit monitoring sites;

at least one traffic monitoring site comprising second receiving radioelectric equipment means, provided near a switching exchange of semaphoric signals, able to decode the signals sent on a given frequency, from the main transmitter and to transmit the decoded signals to an interface; and

the interface acting on the node's semaphoric system, the interface able to receive and to decode the signals coming from said traffic monitoring sites so as to suitably switch the semaphoric signals, on the basis of the decoded signals from the traffic monitoring site.

4,896,154

MAP DISPLAY SYSTEM FOR VEHICLE NAVIGATION

Richard C. Factor, Kinnelon; Terry L. Pearsall, Wayne; John A. Strowe, Irvington, and Laura A. Nass, Piscataway, all of N.J., assignors to Eventide Inc., Little Ferry, N.J.

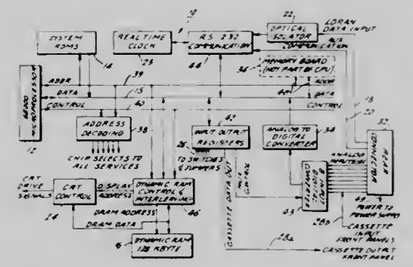
Filed Oct. 28, 1987, Ser. No. 114,300
Int. Cl.⁴ G08G *1/12*
U.S. Cl. 340—995 **6 Claims**

1. Map display system for navigation of a vehicle showing selected map features in true size and orientation in relation to background map data, the system comprising:

memory means to store map data of an area in which the vehicle may travel; such data including background map data in a first memory location; reference location points of selected map features in a second memory location, and true size and orientation data of such selected map features in a third memory location;

first means to selectively collect background map data from the memory means and to compose a first image component of such data;

second means to selectively collect from the memory means reference location points of one or more individual features from the selected map features and true size and orientation data of the one or more selected features



within the range of the first image component and to compose a second image component of the one or more selected map features aligned with and in true size proportion to the first image component; and

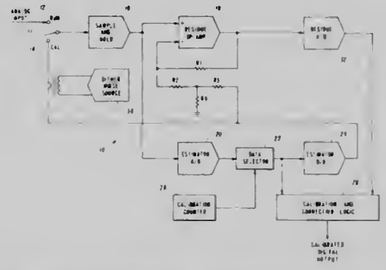
display means to collectively display the first and second image components.

4,896,155

METHOD AND APPARATUS FOR SELF-CALIBRATION OF SUBRANGING A/D CONVERTER

Robert L. Craiglow, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 22, 1988, Ser. No. 210,046
Int. Cl.⁴ H03M *1/10*
U.S. Cl. 341—120 **12 Claims**



6. Self-calibration apparatus for a subranging analog-to-digital (A/D) converter having an estimator A/D converter and a residue A/D converter, comprising:

means for switching between a run mode and a calibration mode, said switching means providing an analog input to a residue operational amplifier and to the estimator A/D converter;

a calibration counter for generating digital calibration signals in incremental steps;

a data selector for selectively transferring, to an estimator digital-to-analog (D/A) converter and a calibration logic circuit, an output of the estimator A/D converter in said run mode and said calibration signal in said calibration mode;

said residue operational amplifier receiving a signal from said estimator D/A converter as a second analog input;

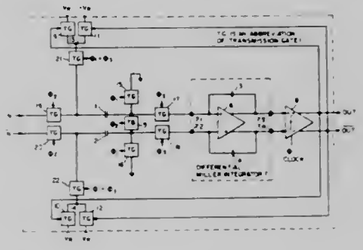
the residue A/D converter receiving an output from said residue operational amplifier and providing an input to said calibration logic circuit; said calibration logic circuit computing and storing a calibration table of correction factors for each of said calibration signal steps in said calibration mode and providing a corrected digital output in said run mode.

4,896,156

SWITCHED-CAPACITANCE COUPLING NETWORKS FOR DIFFERENTIAL-INPUT AMPLIFIERS, NOT REQUIRING BALANCED INPUT SIGNALS

Steven L. Garverick, Galway, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,484
Int. Cl.⁴ H03M *3/02*
U.S. Cl. 341—143 **18 Claims**



1. A switched-capacitance coupling network responsive to the difference between voltages appearing respectively at first and second nodes for applying that difference between first and second input connections of a differential amplifier, said switched capacitor apparatus comprising:

a third node for receiving a common-mode voltage;

fourth and fifth nodes for receiving respective voltages, one of which is positive in a given amount respective to said common-mode voltage and the other of which is negative in said given amount respective to said common-mode voltage, at any given time;

a first capacitor having respective first and second plates;

a second capacitor having respective first and second plates;

means for generating in staggered phase relationship a first train of pulses, a second train of pulses and a third train of pulses, pulses of which trains occur cyclically in order of their train number and do not overlap;

means for selectively connecting the first plates of said first and second capacitors to said third node only during each pulse of said first train;

means for selectively connecting the second plates of said first and second capacitors to separate ones of said first and second nodes only during each pulse of said second train;

means for selectively connecting the first plates of said first and second capacitors to separate ones of said first and second input connections of said differential amplifier, only during each pulse of said third train;

means for selectively connecting the second plates of said first and second capacitors to separate ones of said fourth and fifth nodes only during intervals between pulses in said second train including times when pulses appear in said first train and times when pulses appear in said third train; and

means for selectively connecting the first plates of said first and second capacitors solely to each other during each pulse of said second train and disconnecting them from each other at least at times their second plates are connected to said fourth and fifth nodes, respectively.

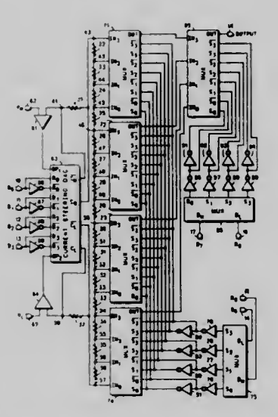
VOL 1110 ISS 4 JA 23 1990 UMI

4,896,157

DIGITAL TO ANALOG CONVERTER HAVING SINGLE RESISTIVE STRING WITH SHIFTABLE VOLTAGE THEREACROSS

Dejan Mijuskovic, Tempe, Ariz., assignor to Motorola, Inc.

Filed Jan. 17, 1989, Ser. No. 297,014
Int. Cl.[4] H03M *1/66*
U.S. Cl. 341—144 **8 Claims**



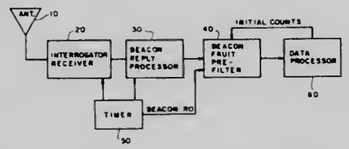
1. A resistive string digital to analog converter comprising:
a plurality of resistors coupled in series, having first and second nodes at the respective ends of said plurality of resistors coupled in series and a plurality of nodes, one each between each of said plurality of resistors;
first means coupled to said first and second nodes and said plurality of nodes, for selecting a voltage on one of said plurality of nodes in response to a first portion of a digital input signal and providing the result as an analog output signal; and
second means coupled to said first and second nodes for adjusting the voltage level at both said first and second nodes in response to a second portion of said digital input signal, wherein the voltage difference between said first and second nodes remains substantially the same and the current through said plurality resistors remains substantially the same;
wherein said second means includes,
a. a first resistor;
b. a second resistor;
c. a current steering digital to analog converter coupled to receive said second portion of said digital input signal and having a first output coupld to said first node, a second output coupled to said first output by said first resistor, a third output coupled to said second node, and a fourth output coupled to said third output of said current steering digital to analog converter by said second resistor;
d. a first amplifier having a first input coupled to received a first reference voltage, a second input coupled to said second output of said current steering digital to analog converter, and an output coupled to a first input of said current steering digital to analog converter; and
e. a second amplifier having a firstinput coupled to receive a second reference voltage, a second input coupled to said fourth output of said current steering digital to analog converter, and an output coupled to a second input of said current steering digital to analog converter.

4,896,158

BEACON FRUIT FILTER

Elbert L. Cole, Jr., Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1988, Ser. No. 266,813
Int. Cl.[4] G01S *13/78*
U.S. Cl. 342—40 **9 Claims**



1. A pre-filter for removing fruit replies from decoded reply data prior to being output for processing in a radar system, comprising:
detecting means for detecting reply signals occurring in a plurality of time periods;
counting means for counting a number of related reply signals occurring in a first predetermined number of said time periods and for counting a number of related reply signals occurring in a second predetermined number of said time periods, said second predetermined number being greater than said first predetermined number;
memory means for storing the reply signals detected by said detecting means;
comparing means for comparing the number of related reply signals occurring in said first predetermined number of said time periods with a first threshold value and for comparing the number of related reply signals occurring in said second predetermined number of said time periods with a second threshold value; and
control means for discarding a reply signal stored in said memory means when a number of related replies occurring in said first predetermined number of time periods is below said first threshold value, for outputting from said pre-filter related reply signals stored in said memory means when a number of related reply signals occurring in said first predetermined number of time periods is equal to or greater than said first threshold value, for discarding related replies stored in said memory means when a number of related replies occurring in said second predetermined number of time periods is below a second threshold value, and for outputting from said pre-filter related replies stored in said memory means when a number of related replies occurring in said second predetermined number of time periods is equal to or greater than said second threshold value.

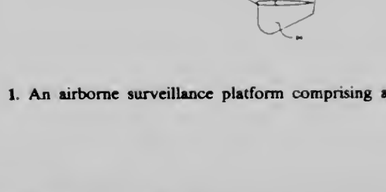
4,896,159

RADAR SYSTEM WITH PULSE-TO-PULSE FREQUENCY AGILITY AND MULTIPLE-TIME-AROUND ECHO RESOLUTION

Sergio Sabatini, Rome; Artenio Russo, Tora E Piccilli; Giuseppe Rodriguez, Rome; Giancarlo Camertoni, Rome, and Piero Pratesi, Rome, all of Italy, assignors to Selenia, Industrie Elettroniche Associate, S.P.A., Rome, Italy

Filed May 25, 1988, Ser. No. 198,427
Claims priority, application Italy, May 26, 1987, 47986 A/87
Int. Cl.[4] G01S *13/08*
U.S. Cl. 342—131 **10 Claims**

1. A method of operating a radar system with pulse-to-pulse frequency agility, comprising the steps of:
(a) transmitting to a target for searching or tracking a sequence of pulses and receiving from said target first-time-around, second-time-around and multiple-time-around echoes during each of a multiplicity of sweep;
(b) changing the frequency of each transmitted pulse from sweep to sweep with pulse-to-pulse frequency agility, whereby the first-time-around echoes each have a frequency corresponding to that of the transmitted pulse of the respective sweep each second-time-around echo has a frequency corresponding to that of the transmitted pulse of an immediately prior sweep, and said multiple-time-around echoes each have a frequency corresponding to that of a transmitted pulse of a still-earlier sweep;
(c) tuning a plurality of receivers equal in number to the highest order multiple-time-around echo to be detected to respective frequencies equal to the transmitted pulse frequencies resulting in said first-time-around, said second-time-around and each of said multiple-time-around echoes up to said highest order multiple-time-around echo;
(d) detecting the echoes received from said target and channeling said echoes to said receivers whereby each receiver



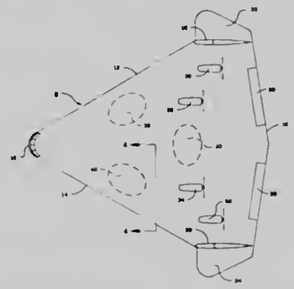
responds to echoes of a frequency to which that receiver has been tuned in step (c), thereby resolving said echoes and establishing a location of said target in a nonambiguous range of the radar system; and changing the frequencies to which said receivers are tuned in step (c) in accordance with the frequency-agility alteration of the frequencies of said transmitted pulses, said radar system being a monopulse system having a Σ channel and a plurality of channels each having a respective receiver, said method further comprising, in a monopulse mode, transmitting a transmitted pulse through said Σ channel and receiving an addition signal through said Σ channel while receiving difference signals through said Δ channels in said monopulse mode, and switching over from said monopulse mode to pulse-to-pulse frequency agility mode whereupon said receivers are tuned in step (c) to frequencies of said transmitted pulses.

4,896,160

AIRBORNE SURVEILLANCE PLATFORM

William M. Miller, Jr., Princeton, N.J., assignor to Aereon Corporation, Princeton, N.J.

Filed Feb. 19, 1988, Ser. No. 157,694
Int. Cl.[4] H01Q *3/22, 1/28*
U.S. Cl. 342—368 **11 Claims**



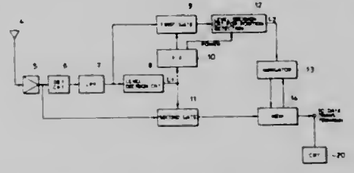
1. An airborne surveillance platform comprising a radar-transparent hollow airfoil enclosing an interior space, said airfoil having a delta-shaped planform with a narrow nose at one corner, leading edges extending from the nose to the opposite corners, and a trailing edge extending betweeen said opposite corners, the planform being substantially symmetrical about a plane of symmetry extending from said narrow nose to the midpoint of the trailing edge, ellipse-like cross-sections transverse to said plane through substantially all of the length of the airfoil, a maximum height dimension in said plane perpendicular to the chord in said plane at a location spaced from said trailing edge and from said nose, said ellipse-like cross-sections progressively decreasing in height, measured in said plane, throughout substantially the entire distance from the cross-section at the point of maximum height toward said trailing edge, and a phased array antenna physically stationary relative to the airfoil, said antenna being arranged to scan horizontally, while the airfoil is in level flight, in a substantially continuous pattern in all azimuthal directions and being fixed in a position substantially entirely within said interior space so that substantially all radiant energy received by said antenna passes through said airfoil.

4,896,161

ROADSIDE BEACON SYSTEM

Yoshizo Shibano, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 18, 1987, Ser. No. 63,383
Claims priority, application Japan, Jun. 18, 1986, 61-141793
Int. Cl.[4] G01S *3/02, 1/08;* G08G *1/12*
U.S. Cl. 342—457 **5 Claims**



1. A roadside beacon system for allowing vehicle navigation systems to be accurately calibrated to a current position, said roadside beacon system comprising:
at least one roadside antenna means including a split beam antenna installed along a road, said roadside antenna means for emitting navigational data signals in the form of a radiation pattern across a road portion adjacent to said roadside antenna means, said antenna means having a directional pattern such that a field strength of signals radiated therefrom is abruptly lowered along a radiation pattern axis which intersects said road; and
navigation means installed on a vehicle, said navigation means including:
means for receiving said navigational data signals; and
position discriminating means for detecting when a field strength of received said navigational data signals becomes less than a first predetermined level and to thereupon output a position signal; and
calibrating means for calibrating said navigation means to a current position according to said position signal and position data included in said navigational data signals.

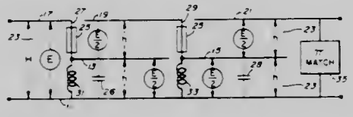
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4,896,162

CAPACITANCE LOADED MONOPOLE ANTENNA

O. D. Parham, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 16, 1987, Ser. No. 26,338
Int. Cl.[4] H01Q *1/36, 9/36*
U.S. Cl. 343—749 **26 Claims**



1. An antenna for receiving an electromagnetic signal, comprising:

means for providing a reference plate;

means for providing a plurality of capacitor plates disposed with respect to said means for providing a reference plate to form a plurality of capacitors for receiving said electromagnetic signal, and thereby developing an E field across each of said capacitors; wherein:

a first capacitor of said plurality of capacitors is formed by said means for providing a reference plate and a first capacitor plate of said means for providing a plurality of capacitor plates;

a second capacitor of said plurality of capacitors is formed by a second capacitor plate of said means for providing a plurality of capacitor plates disposed above said means for providing a reference plate and disposed laterally from and not overlying said first capacitor plate;

a third capacitor of said plurality of capacitors is formed by a third capacitor plate of said means for providing a plurality of capacitor plates disposed above said second capacitor plate and disposed laterally from and not overlying said first capacitor plate; and

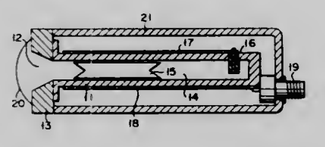
means for serially coupling selected ones of said plurality of capacitors together such that the E fields of said plurality of capacitors are additively coupled, said means comprising a serial connection between said first capacitor plate and said second capacitor plate, and inductive means coupled between said second capacitor plate and said means for providing a reference plate.

4,896,163

MICROWAVE RECEIVING DEVICE

Toshio Shibata, and Kenji Matsumoto, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 5, 1988, Ser. No. 215,390
Claims priority, application Japan, Jul. 6, 1987, 62-102787[U]; Sep. 30, 1987, 62-148441[U]
Int. Cl.[4] H01Q *13/02*
U.S. Cl. 343—786 **19 Claims**



1. A microwave receiving device for receiving a microwave transmitted as a circularly polarized wave, comprising:

chassis means having an opening at one end thereof, the opening having a shape for providing predetermined directivity characteristics;

waveguide means having a circular cross section and formed inside said chassis means from said opening of said chassis means along substantially the entire length of said chassis means;

circularly polarized wave-to-linearly polarized wave converting means, arranged inside said waveguide means, for converting a circularly polarized wave propagating through said waveguide means into a predetermined linearly polarized wave;

probe means, extending into said waveguide means through said chassis means, for receiving the predetermined linearly polarized wave, converting the wave into an electrical signal, and outputting the electrical signal outside said chassis means;

microwave circuit board means mounted on said chassis means so as to surround at least part of said waveguide means and connected to said probe means, said microwave circuit board means being provided with a microwave circuit for performing predetermined signal processing of the electrical signal output from said probe means; and

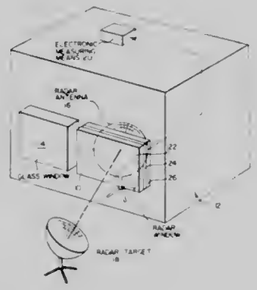
connector means, connected to said microwave circuit board means, for externally outputting the electrical signal processed by said microwave circuit.

4,896,164

RADAR TRANSPARENT WINDOW FOR COMMERCIAL BUILDINGS

Charles Burke, Melbourne; Joao F. I. Falcao, Palm Bay, both of Fla.; Albert R. Sarraffe, Bayshore, and Michael T. Curtin, Bellerose, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 30, 1988, Ser. No. 238,080
Int. Cl.[4] H01Q *1/42*
U.S. Cl. 343—872 **2 Claims**



1. A building structure comprising:

a plurality of structural walls;

an opening formed in at least one of the walls;

multi-layered panel means mounted in the opening for permitting transparent radar transmission therethrough while optically obscuring the interior space behind the panel, the panel means comprising:

an inner layer of polyester resin/E-glass laminate;

an outer layer of polymide resin/E-glass laminate having a light reflective exterior surface resembling window pane glass; and

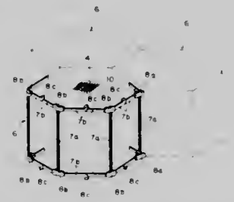
at least one core layer of rigid polyimide foam.

4,896,165

MODULE FOR EXPANDABLE STRUCTURE AND EXPANDABLE STRUCTURE EMPLOYING SAID MODULE

Takayuki Koizumi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,928
Claims priority, application Japan, Sep. 24, 1987, 62-239370
Int. Cl.[4] H01Q *15/20*
U.S. Cl. 343—881 **27 Claims**



1. A foldable, self-expanding module for supporting a planar structure comprising:

a plurality of rigid frame members, disposed perpendicularly to the plane of said planar structure;

a plurality of hinged frame members, each of said hinged frame members being divided into a first frame piece and a second frame piece, said first frame piece and said second frame piece having folded and unfolded positions;

a first hinge for interconnecting said first and second frame pieces;

said first and second frame pieces in their unfolded position extending along a first substantially linear axis, said first hinge having a pivot axis that is spacedly offset from said frame piece axis;

second hinges for connecting each of said hinged frame members between two of said rigid frame members;

said first and second hinges being arranged so that, in the folded state, said first frame piece and said second frame piece are disposed perpendicularly to the plane of said planar structure.

4,896,166

REPLACEABLE THERMAL PRINT HEAD ASSEMBLY

Robert A. Barker; Jonathan J. Burnard, both of Brookline; Thomas A. Davis, Nashua; Danny J. Prats, and Melanie L. Seat, both of Milford, all of N.H., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Mar. 30, 1988, Ser. No. 175,401
Int. Cl.[4] G01D *5/10*
U.S. Cl. 346—76 PH **13 Claims**

2. A printing system for printing documents, comprising:

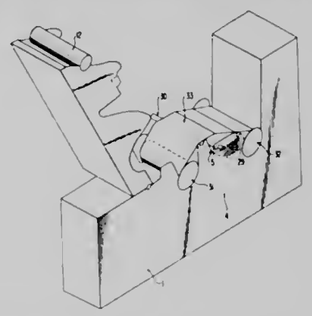
a printing station having a slot formed on each of two sides thereof;

a replaceable print head having a pin protruding from each of two sides thereof adapted to slide into said slots;

alignment means, engageable with said pins when slid into said slots, for aligning said print head with respect to the printing station and the documents to be printed;

a movable member, movable between a first and a second position;

wherein said alignment means is engaged with said pins when said movable member is moved to said first position,



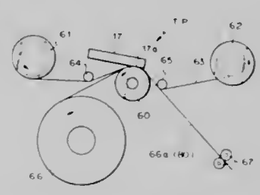
and is disengaged when said movable member is moved to said second position.

4,896,167

IMAGE RECORDING APPARATUS

Naoji Hayakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,898
Claims priority, application Japan, Mar. 30, 1987, 62-77096
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **11 Claims**



1. An image recording apparatus for effecting image recording on a recording medium, having:

recording means for effecting image recording conforming to image information on the recording medium;

an ink sheet mounting portion for removably mounting thereon an ink sheet having ink;

a recording medium mounting portion for removably mounting the recording medium thereon;

ink sheet conveying means for conveying the ink sheet mounted on said ink sheet mounting portion;

recording medium conveying means for conveying the recording medium mounted on said recording medium mounting portion;

a drive source for providing a drive force;

drive force transmitting means for transmitting the drive force of said drive source to said recording medium conveying means;

drive force transmitting means for transmitting the drive force of said drive source to said ink sheet conveying means;

designating means for designating the drive torque of said drive source; and

control means for controlling electric power applied to said drive source in conformity with the drive torque designated by said designating means.

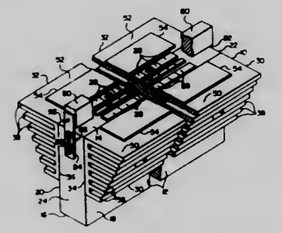
VOL 1110 ISS 4 JA 23 1990 UMI

4,896,168

LIGHT EMITTING DIODE PRINTHEAD

David A. Newman; William B. Scott, Jr.; Thomas E. Przybylowicz; Bryan A. Beaman, and Wesley H. Bacon, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1988, Ser. No. 238,646
Int. Cl.[4] G01D *9/42;* **H01L** *23/02*
U.S. Cl. 346—107 R **7 Claims**



1. In a LED array printhead of the type comprising a row of LED array chips located end-to-end to provide a row of uniformly spaced light emitting sites, the improvement comprising:

an elongate support bar of generally rectangular configuration having a pair of opposite relatively narrow elongate flat faces between a pair of opposite relatively wide elongate flat faces;

means mounting said row of LED array chips on said support bar in end-to-end relation along the center region of one of said relatively narrow faces of said support bar; and

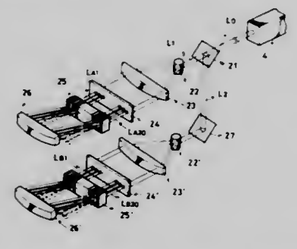
heat dissipating means in heat transferring relation to both of said relatively wide faces of said support bar for dissipating heat from those surfaces.

4,896,169

LASER SCAN RECORDING APPARATUS USING APERTURE PLATES TO FORM SHIFTED ROWS OF BEAMS WHICH ARE MODULATED AND CONVERGED ON PHOTOSENSITIVE MATERIAL

Akira Kuwabara, and Yasufumi Koyama, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 23, 1988, Ser. No. 210,227
Claims priority, application Japan, Jun. 23, 1987, 62-156257
Int. Cl.[4] G01D *9/42, 15/14*
U.S. Cl. 346—108 **12 Claims**



1. An apparatus for recording a binary image on photosensitive material, said apparatus comprising:

(a) means for providing a light beam which has a uniform intensity across its width;

(b) converging means for reducing the diameter of said light beam on said photosensitive material so that said light beam covers an area corresponding to at least four adjacent pixels in a matrix;

(c) modulating means for modulating said light beam; and

(d) controlling means for controlling said modulating means on the basis of image data, said controlling means including:

(i) two line memories for storing said image data;

(ii) a selector and a latch means connected to said selector for synchronously outputting pixel data; and

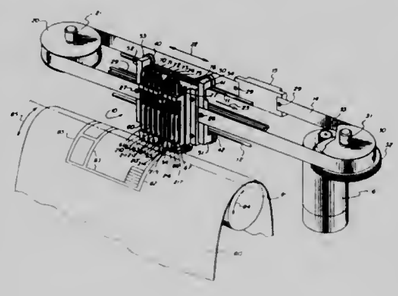
(iii) an AND gate and an OR gate connected to said latch means for outputting control signals for controlling said modulating means.

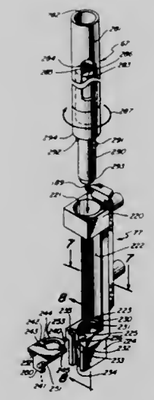
4,896,170

LOCKING PEN SUPPORT MEANS FOR GRAPHIC RECORDER

Robert H. Niemeyer, III, Beaverton, Oreg., assignor to AM International Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 75,533, Jul. 19, 1987, Pat. No. 4,763,140. This application Jun. 16, 1988, Ser. No. 206,708
Int. Cl.[4] G01D *9/30, 11/00, 11/02*
U.S. Cl. 346—139 R **14 Claims**





7. In a graphic recorder having a moveable pen carriage, a plurality of pen shuttles movably supported thereon, and a plurality of recording pens; recording pen locking and support means comprising:

male and female bayonet mounting means defined in each of said recording pens and pen shuttles respectively for removably securing each of said recording pens to a respective one of said pen shuttles in a twist-locking attachment,

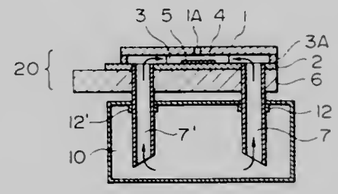
said male bayonet mounting means each including a generally cylindrical extension having a pair of outwardly extending pins having tapered end portions and said female bayonet mounting means each including a generally cylindrical passage defining an inwardly tapered seat configured to receive said tapered end portion of said generally cylindrical extension and lock means for captivating said outwardly extending pins.

4,896,171

LIQUID EJECTION RECORDING HEAD REMOVABLY MOUNTED ON A STORAGE TANK

Susumu Ito, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 57,739, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 715,414, Mar. 25, 1985, abandoned. This application Mar. 6, 1989, Ser. No. 319,846
Claims priority, application Japan, Mar. 31, 1984, 59-64109
Int. Cl.[4] G01D *15/6;* **B41J** *3/04*
U.S. Cl. 346—140 R **8 Claims**



1. A liquid ejection recording head removably mountable on a storage tank for storing liquid therein, the head comprising:

means defining an orifice for discharging the liquid therethrough;

a liquid chamber communicating with said orifice;

an energy generating member for generating energy for forming droplets of the liquid;

a base plate having a first portion on which said liquid chamber and said energy generating member are provided; and

needle-type liquid supply pipes for insertion into the storage tank, said liquid supply pipes being arranged at opposite sides of said energy generating member such that said energy generating member is disposed generally between said liquid supply pipes and thus can be fed liquid from opposite sides thereby, wherein said liquid supply pipes project away from another portion of said base plate opposite said liquid chamber to supply the liquid from the storage tank to said liquid chamber and said energy generating member, and wherein said recording head discharges droplets in a direction transverse to that of liquid conveyance to said energy generating member from said liquid supply pipes.

4,896,172

LIQUID INJECTION RECORDING APPARATUS INCLUDING RECORDING LIQUID CIRCULATION CONTROL

Minoru Nozawa, Machida; Yutaka Koizumi, Tokyo; Toshihiro Mori, Kawasaki, and Atsushi Saito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,645
Claims priority, application Japan, Nov. 20, 1987, 62-291963; Nov. 20, 1987, 62-291967
Int. Cl.[4] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **15 Claims**

1. A liquid injection recording apparatus comprising

a recording head having discharge ports for discharging recording liquid therethrough, a liquid path communicating with said discharge ports, a liquid chamber communicating with said liquid path and energy generating elements utilized for discharging said recording liquid;

a temperature sensor for detecting the temperature of said recording head and/or said recording liquid in said recording head;

a storing tank for storing said recording liquid to be supplied to said recording head;

a communicating path for switchably communicating between a supply system for supplying said recording liquid from said storing tank to said liquid chamber and a circulation system for circulating said recording liquid between said storing tank and said liquid chamber;

switching means for switching said communicating path to either of said supply system or said circulation system in accordance with temperature information from said temperature sensor; and

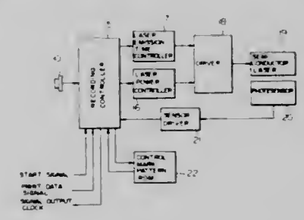
a control circuit for controlling said switching means.

4,896,173

DATA PRINTER

Akira Shimada, and Tetsuro Akasaki, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,368
Claims priority, application Japan, Apr. 8, 1988, 63-85105
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—154 **10 Claims**



1. A data printer comprising:

data printing means for printing data on a recording medium in accordance with print data;

control mark forming means for generating dot data on a control mark pattern to cause the data printing means to form on the recording medium a control mark the print state of which is sensed;

print density sensing means for sensing the print density of the control mark formed on the recording medium; and

print condition control means for controlling the print density brought about by the data printing means in accordance with the print density of the control mark sensed by the print density sensing means;

wherein the control mark forming means includes first control mark pattern generating means for generating a first control mark pattern extending continuously in a scan direction in which print data is written and cut in pieces in the direction perpendicular to the scan direction and second control mark

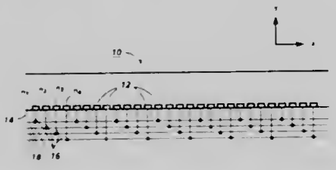
pattern generating means for generating a second control mark pattern either cut in pieces in the scan direction and extending continuously in the direction perpendicular to the scan direction or cut in pieces both in the scan direction and in the direction perpendicular to the scan direction and the print condition control means includes print density control means for controlling the print density of the first control mark pattern in accordance with the result of sensing the print density of the first control mark pattern; and print width control means for controlling the width of a print line in accordance with the result of sensing the print density of the second control mark pattern.

4,896,174

TRANSPORT OF SUSPENDED CHARGED PARTICLES USING TRAVELING ELECTROSTATIC SURFACE WAVES

Richard G. Stearns, Mountain View, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 20, 1989, Ser. No. 326,135
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—459 **6 Claims**



1. A method for transporting electrically charged particles suspended in a fluid, through said fluid, in a transport direction, comprising the steps of

providing an array of electrically conductive transport electrodes disposed upon a dielectric surface adjacent said fluid, said array including a plurality of substantially parallel electrodes extending transversely to said transport direction,

applying a sinusoidally varying electrical potential to each of said electrodes with each adjacent electrode being phase displaced from its neighboring electrodes, so as to create a traveling electrostatic wave propagating in said transport direction,

controlling the electrical potential so as to move said charged particles through said fluid under the influence of said traveling electrostatic wave without contacting said transport electrodes or said dielectric surface.

4,896,175

PHOTOGRAPHY BOOTH AND METHOD

Donald O. Thayer, Jr., 153 Lincoln St., Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 932,365, Nov. 19, 1986, Pat. No. 4,804,983. This application Oct. 5, 1988, Ser. No. 253,652
Int. Cl.[4] G03B *1/12, 29/00*
U.S. Cl. 354—76 **20 Claims**

1. Self-photography booth, comprising:

(a) a booth having a first end portion for a person to be photographed and a spaced and aligned opposite second end portion;

(b) camera means operably associated with said second end portion and including a selectively operable film advance system for advancing a length of film having a plurality of frames through said camera means in a sequential manner and means for selectively exposing a frame of the film with an image of the person;

(c) video camera means operably associated with said second end portion and with said camera means for receiving the image of the person perceived by said camera means;

(d) video display means operably associated with said video camera means and with said second end portion for displaying the perceived image;

(e) means operably associated with said camera means for causing exposure of a frame of the film with the perceived image; and,



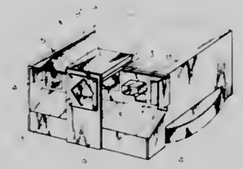
(f) means operably associated with said camera means for selectively causing or preventing operation of said film advance system after operation of said exposure means so that multiple exposures may be made by preventing operation of the film advance system and thereby preventing the film from advancing, and operation of said film advance system causes the film to advance to the next frame.

4,896,176

CAMERA FOR MAKING COLLAGE PHOTOGRAPHS

Edwin M. Barrett, College Park, Ga., assignor to Robert A. Tates, College Park, Ga., a part interest

Filed Aug. 26, 1988, Ser. No. 240,070
Int. Cl.[4] G03B *1/00*
U.S. Cl. 354—122 **14 Claims**



1. A camera comprising:

a lens having a field of view;

means for positioning film for exposure substantially along a focal plane of said lens;

a screen positioned to block a portion of the field of view of said lens; and

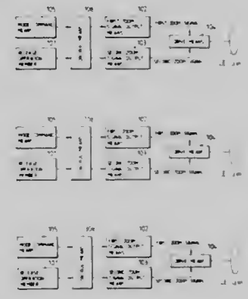
means for illuminating said screen during film exposure whereby light from the field of view may be directed by the lens to one portion of film positioned along the focal plane and light from the screen directed to a second portion of the film.

4,896,177

CONTROLLER FOR CAMERA

Kazuyuki Kazami; Toshiyuki Nakamura, both of Tokyo; Koichi Daitoku, Sagamihara; Hidemori Miyamoto, Kawasaki, and Hiroshi Wakabayashi, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,050
Claims priority, application Japan, Jan. 27, 1988, 63-18459; May 24, 1988, 63-127681; Oct. 24, 1988, 63-268702; Nov. 4, 1988, 63-280065
Int. Cl.[4] G03B *5/00, 15/05, 17/38*
U.S. Cl. 354—145.1 **12 Claims**



1. A zooming controller for a camera provided with:

first zoom signal output means operatively associated with the half depressing operation of a release operation member and outputting a first zoom signal for directing a photographing lens to a focal length preset on the camera side;

second zoom signal output means outputting a second zoom signal for arbitrarily varying the focal length of said photographing lens by a manual operation;

drive means responsive to said first or second zoom signal to electrically drive said photographing lens and effect zooming;

mode command means for commanding the setting and release of an auto focal length mode in which the focal length of said photographing lens is changed with said first zoom signal, by a manual operation; and

control means for operating said first zoom signal output means by the first half depressing operation of the release operation member when said auto focal length mode is set, and releasing said auto focal length mode when said second zoom signal is output during the time from after said half depressing operation is released until the next shutter release, and thereafter inhibiting the operation of said first zoom signal output means until said shutter release is effected even if said half depressing operation is done.

4,896,178

LENS-FITTED PHOTOGRAPHIC FILM UNIT

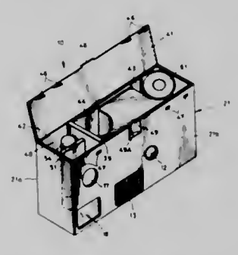
Hiroshi Ohmura; Takaaki Kotani; Tokuji Sato, and Tsutomu Tanaka, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1988, Ser. No. 253,545
Claims priority, application Japan, Oct. 5, 1987, 62-152637; Oct. 5, 1987, 62-251263
Int. Cl.[4] G03B *15/05, 17/02*
U.S. Cl. 354—145.1 **16 Claims**

1. A lens-fitted film unit having a roll of film, a taking lens having an optical axis, exposure means and an electronic flash, said lens-fitted film unit comprising:

a film unit housing which is provided with a film container receiving chamber containing a film container into which said roll of film is wound after exposure and a battery receiving chamber containing a battery for said electronic flash, said film container having an axis perpendicular to said axis of said taking lens;

a container cover member covering said film container receiving chamber which is opened to remove said film container from said film container receiving chamber; and



a battery cover member covering said battery receiving chamber which is so arranged so as to be opened by opening of said film container cover member;

said cover members being mounted on said unit for opening and closing movement about an axis perpendicular to said lens and container axes.

4,896,179

LENS DRIVE APPARATUS FOR CAMERA

Youji Watanabe, Sagamihara, and Junichi Itoh, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1989, Ser. No. 295,822
Claims priority, application Japan, Jan. 14, 1988, 63-005746
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—195.1 **18 Claims**



1. A lens drive apparatus for driving the taking lens of a camera comprising:

a manual operating member;

a pulse generator for producing a pulse as the operating member is moved;

means for detecting a speed of movement of the operating member on the basis of pulses produced by the pulse generator;

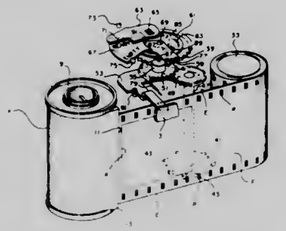
a motor for driving a taking lens;

output control means for delivering a drive signal to the motor in accordance with the speed of movement detected by the detecting means;

and level preset means for modifying a relationship between a speed of movement and output drive signal delivered from the output control means, thereby allowing a level of the output drive signal to the motor which corresponds to a speed of movement of the operating member to be selectively chosen.

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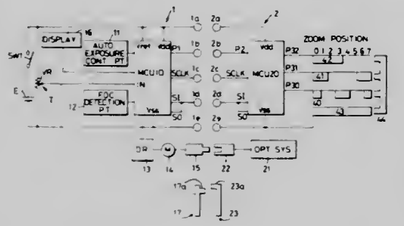
4,896,180
FILM INITIALIZATION REASSURING MECHANISM
Joel S. Lawther, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 8, 1989, Ser. No. 363,556
Int. Cl.[4] G03B *17/36*
U.S. Cl. 354—217 **9 Claims**



1. An improved photographic camera wherein (a) a frame counter is adapted to be changed to successive numbered settings corresponding to respective frames of a filmstrip, (b) a motion-transmitting element completes a cycle of movement each time the next available frame is positioned for exposure, to change said frame counter to a new numbered setting corresponding to that frame, and (c) a film confirmation indicator is changed to a ready setting substantially simultaneously with said motion-transmitting member changing said frame counter to a first numbered setting corresponding to the first available frame to be positioned for exposure, to provide a reassuring indication that said camera is ready to take a picture, and wherein the improvement comprises:

said motion-transmitting element and said film confirmation indicator include respective cooperating means for changing the film confirmation indicator to its ready setting in response to the motion-transmitting element completing a cycle of movement concomitant with the first available frame being positioned for exposure.

4,896,181
CAMERA SYSTEM
Takashi Saegusa, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 31,050, Mar. 27, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 302,069
Claims priority, application Japan, Mar. 31, 1986, 61-73272; Mar. 31, 1986, 61-73914
Int. Cl.[4] G03B *17/00*
U.S. Cl. 354—286 **22 Claims**



1. A camera system comprising:

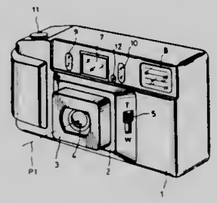
memory means storing data indicating a maximum stopped-down-aperture value difference of a photographing lens;

means for detecting a preset stopped-down-aperture value difference and creating a stopped-down-aperture value difference signal;

means for reading out the data from said memory means, detecting that the stopped-down-aperture value difference indicated by the stopped-down-aperture value difference signal is smaller than the maximum stopped-down-aperture value difference, and generating a detection signal; and

means, responsive to said detection signal, for displaying that a preset aperture ring is not set at a maximum aperture value.

4,896,182
CAMERA WITH CHANGEABLE FOCAL LENGTH
Kazuhiro Akiyama, Saitama; Kazuo Kamata, Tokyo, and Hidemi Saito, Yamanashi, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Nihon Seimitsu Kogyo Kabushikia Kaisha, both of Kanagawa, Japan
Filed Jan. 9, 1989, Ser. No. 294,810
Claims priority, application Japan, Jan. 8, 1988, 63-863[U]
Int. Cl.[4] G03B *7/099, 7/12*
U.S. Cl. 354—481 **10 Claims**



1. A camera having a taking lens system changeable in focal length between relatively long and relatively short focal lengths, said camera comprising:

photoelectric means for receiving light and providing an electric output to control exposure;

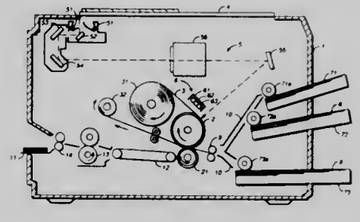
a masking member disposed in front of said photoelectric means and formed with first and second opening means for allowing light passing therethrough to fall on said photoelectric means at different incident angles; and

light stop means movable to cover or uncover said second opening means upon changing said taking lens system between said relatively long and relatively short focal lengths.

4,896,183
IMAGE FORMATION APPARATUS WITH SUPPLEMENTAL LIGHT SOURCE
Kunio Ohashi; Syoichi Nagata, and Yoshiharu Tsujimoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 27, 1988, Ser. No. 224,927
Claims priority, application Japan, Aug. 7, 1987, 62-198745
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **8 Claims**

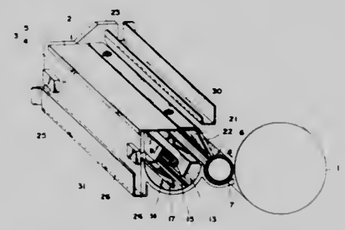
1. In an image formation apparatus which forms a visible image by exposing to image-forming light a light-accepting sheet coated with microcapsules encapsulating a substance which hardens by light and a colorless dye to selectively harden said microcapsules by exposure of said substance to light and to thereby form an invisible image on said light-accepting sheet, superposing thereon an image transfer sheet coated with a developer material having chromogenic effects on said colorless dye, and pressing said light-accepting sheet and said image transfer sheet together by a pressure applying device to cause unhardened ones of said microcapsules to rupture and to thereby cause said colorless dyes encapsulated

in said ruptured microcapsules to chromogenically react with said developer material, the improvement wherein said apparatus comprises a supplemental light source unit including arrays of lamps emitting light of different colors, said supplemental



light source unit serving to selectably expose non-image-forming areas of said light-accepting sheet to thereby harden microcapsules in said non-image-forming areas, and said supplemental light source unit serving also to correct photosensitivity characteristics of said microcapsules.

4,896,184
IMAGE FORMING APPARATUS WITH A DEVELOPING DEVICE
Manabu Kamitamari, and Yoshiaki Takano, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jul. 28, 1988, Ser. No. 227,541
Claims priority, application Japan, Jul. 28, 1987, 62-189863
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—206 **6 Claims**



1. An image forming apparatus comprising:

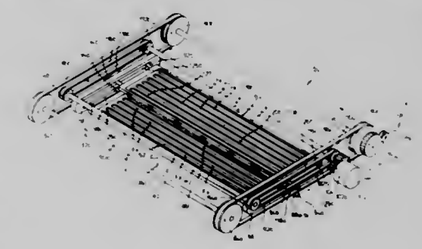
a developing device containing developer powder for developing an image;

a first detecting means for detecting the developer at one end of the developing device;

a second detecting means for detecting the developer at other end opposite to the one end of the developing device; and

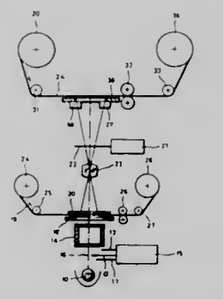
control means for determining whether the substantial amount of the developer is detected by both of said first and second detecting means and permitting image formation when both of said detecting means detect the substantial amount of the developer.

4,896,185
FILTER DRIVING MECHANISM FOR IMAGE RECORDING DEVICE
Tugio Okuzawa, Ashigarakami, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 18, 1988, Ser. No. 169,700
Claims priority, application Japan, Mar. 19, 1987, 62-64842
Int. Cl.[4] G03B *27/72, 27/76*
U.S. Cl. 355—35 **7 Claims**



1. A filter driving mechanism in an image recording device for applying light including image information from an original through a focusing optical system to a photosensitive member to record the image information on the photosensitive member, said filter driving mechanism comprising at least two filter groups each including a plurality of equally spaced filters extending in a main scanning direction, said filter groups being disposed in a plurality of stages between said focusing optical system and said photosensitive member, and moving means for moving said filter groups back and forth in a direction substantially normal to said main scanning direction, wherein said filter groups include respective substantially planar filter holders each having a plurality of equally spaced slots defined therein and extending in said main scanning direction, said filter being disposed in said slots.

4,896,186
LETTER IMAGE PRINTING METHOD AND APPARATUS
Kanji Tokuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 29, 1988, Ser. No. 237,206
Claims priority, application Japan, Aug. 28, 1987, 62-214662
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—40 **13 Claims**



6. A photographic printer for printing images from a negative film onto a print, and for printing information from an information print head onto the print in the same posture as the posture of the printed image, the printer comprising:

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a plurality of information printing heads disposed in the photographic printer, each of said plurality of information printing heads being operable for printing information on a print in a different posture;

means for selectively actuating one of said plurality of information print heads so that the posture of the image to be printed on the print and the posture of the information to be printed on the print are the same.

4,896,187

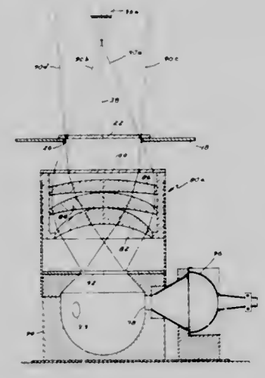
HIGH-EFFICIENCY ILLUMINATING SYSTEM AND METHOD FOR MULTI-IMAGE PRINTERS

Roy A. Clapp, 2505 S. Kiwanis Ave., Sioux Falls, S. Dak. 57105

Filed Aug. 19, 1988, Ser. No. 233,725

Int. Cl.[4] G03B *27/54, 27/44*

U.S. Cl. 355—71 **10 Claims**



9. A negative illuminating system in combination with a multi-image photographic printer equipped with a plurality of lens arrays, each lens array including at least one objective lens, and a negative holder with an aperture therein, the illuminating system comprising a light source of limited area, an optical system for enlarging the light from said limited area light source in the vicinity of said negative holder to provide a stream of uniform light, said optical system transmitting its energy in the form of said uniform light stream substantially restricted to the operating field of the various objective lenses contained in said plurality of lens arrays.

4,896,188

PHOTOTOOL HAVING A STRUT FOR HOLDING HINGED MEMBERS IN AN OPENED POSITION

Thomas L. Byers, 5840 Stewart Dr., Mustang, Okla. 73064

Filed Sep. 28, 1988, Ser. No. 250,303

Int. Cl.[4] G03B *27/58*

U.S. Cl. 355—72 **18 Claims**

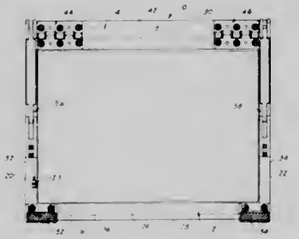
1. A phototool, comprising:

a first member having an upper surface, lower surface, a first side, a second side, a first end and a second end;

a second member having an upper surface, a lower surface, a first side, a second side, a first end and a second end, the second side of the second member being hingedly connected to the second side of the first member for moving the second member from a closed position wherein the lower surface of the first member is disposed generally near the upper surface of the second member to an opened position wherein the first member is disposed at an angle with respect to the second member;

a strut having a first end and second end, the first end of the strut being pivotally connected to the upper surface of the second member and the second end being connected to the upper surface of the first member, a portion of the strut being movable for varying a length of the strut generally between the first end and the second end as the first member is moved from the opened position to the closed position and from the closed position to the opened position, the strut comprising:

a first arm having a first end and a second end, the first end of the first arm being pivotally connected to the upper



surface of the second member and forming the first end of the strut; and

a second arm having a first end and a second end the second arm being rigidly connected to the upper surface of the first member and the second end of the second arm forming the second end of the strut, the second end of the first arm being pivotally and movably connected to the second arm for varying the length of the strut.

4,896,189

LID OPENING AND CLOSING DEVICE FOR IMAGE INPUT APPARATUS

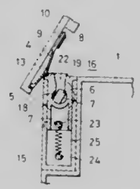
Yoshihide Akuzawa, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,660

Claims priority, application Japan, Dec. 15, 1987, 62-190449[U]

Int. Cl.[4] G03B *27/62*

U.S. Cl. 355—75 **4 Claims**



1. A lid opening and closing device for an image input apparatus comprising:

a housing incorporating an optical reading unit therein and having a transparent original table provided on the top face thereof;

a flat lid located over the top face of said original table;

fulcrum pins arranged on a common axis and fixedly provided at least at both sides of the base of said lid;

a lid pivot, with a shaft hole made therein for allowing said fulcrum pin to fit therein for rotation, adapted to fit in said housing at its one end for vertical movement while being urged downward;

flat portions provided at portions of the periphery of said fulcrum pin virtually in parallel with the plane of said lid;

therebeing a cut made in said lid pivot communicating with said shaft hole, with an opening at its upper end, and having a width smaller than the diameter of said shaft hole

for guiding said flat portions of said fulcrum pin therethrough;

a plate spring provided with an engagement portion attached to said lid on its inner face close to said fulcrum pin; and

an engagement portion for engaging with the engagement portion on said plate spring when said lid is held opened at a desired angle with said original table.

4,896,190

IMAGE FORMING APPARATUS WITH BATTERY

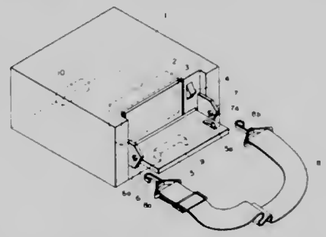
Haruo Uchida; Kazumi Umezawa, both of Yokohama, and Shinichi Sasaki, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 156,810

Claims priority, application Japan, Feb. 27, 1987, 62-044927; Mar. 2, 1987, 62-030144

Int. Cl.[4] G03G *21/00;* **G03B** *27/52;* **H01H** *3/16, 9/06*

U.S. Cl. 355—202 **14 Claims**



1. A portable image forming apparatus, comprising:

a photosensitive member;

means for forming an image on a recording medium using said photosensitive member;

a battery for supplying power to drive said image forming means;

a guiding member for guiding the recording member, said guiding member being swingably mounted to a frame of said apparatus adjacent an end thereof and being movable between a guiding position wherein the opposite end of the guiding member is away from the frame and an accommodating position wherein the opposite end is close to the frame; and

a battery accommodating portion for accommodating said battery, said accommodating portion being provided with an openable cover, wherein said guiding member is overlaid to the cover when it takes the accommodating position.

4,896,191

SHEET TRANSFERRING MECHANISM IN AN ELECTROPHOTOGRAPHIC RECORDING APPARATUS

Keiji Ohyabu; Youji Houki, both of Tokyo; Shinichi Watarai, Yokohama, and Tomohiro Nonomura, Takasago, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 7, 1988, Ser. No. 241,245

Claims priority, application Japan, Sep. 10, 1987, 62-233728; Mar. 19, 1988, 63-57003

Int. Cl.[4] G03G *15/14, 21/00*

U.S. Cl. 355—309 **6 Claims**

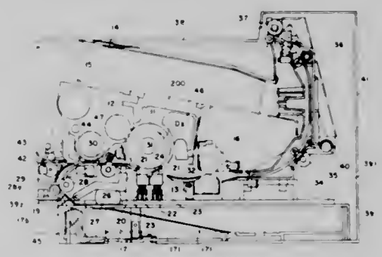
1. A recording apparatus for transcribing images onto recording sheets by using toner, said recording apparatus comprising:

a base frame;

a photoconductive drum for producing a toner image on a cylindrical surface thereof, rotated around a first axis fixed to said base frame;

image transcribing means for transcribing the toner image on the cylindrical surface onto the recording sheet;

first positioning means for positioning said image transcribing means to the cylindrical surface so that an image transcribing space produced between the cylindrical surface and said image transcribing means is kept to a predetermined value with a designated tolerance when said photoconductive drum is rotated, the recording sheet being contacted to the cylindrical surface and the toner image on the cylindrical surface being transcribed on the



contacted recording sheet during the recording sheet is passed through the image transcribing space with the cylindrical surface rotated;

sheet intruding means for guiding the recording sheet to the image transcribing space; and

second positioning means for keeping a gap between the cylindrical surface and said sheet intruding means to a predetermined value with a designated tolerance by positioning said sheet intruding means together with said image transcribing means positioned by said first positioning means.

4,896,192

IMAGE FORMING APPARATUS

Naoyoshi Kinoshita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1987, Ser. No. 127,435

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—315 **19 Claims**



16. An image forming apparatus comprising:

a photosensitive member having photosensitive layer thereon;

means for charging said photosensitive member and forming thereon electrostatic latent images;

developing means for developing said electrostatic latent images formed on said photosensitive member into visible images;

a transfer charger for transferring onto a paper said visible images formed on said photosensitive member;

a separation charger for separating said paper from said photosensitive member;

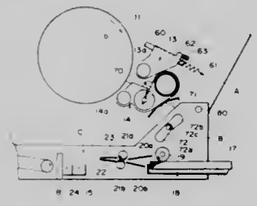
a first voltage applying means for applying AC voltage to said separation charger;
paper detection means which outputs a signal corresponding to whether or not said paper exists between said separation charger and said photosensitive member;
a second voltage applying means for applying DC voltage to said separation charger, said DC voltage being of reverse polarity to the polarity of the electrostatic latent image on said photosensitive member; and
a first control means for controlling the second voltage applying means so as to apply DC voltage to said separation charger when said paper detection means outputs a signal indicating that no paper exists between said separation charger and said photosensitive member and to apply smaller DC voltage when said paper detection means outputs a signal indicating that paper exists between said separation charger and said photosensitive member;
a third voltage applying means for applying DC voltage to said transfer charger, said DC voltage being of the same polarity to the polarity of the electrostatic latent image on said photosensitive member; and
a second control means for controlling the third voltage applying means so as to apply DC voltage to said separation charger when said paper detection means outputs the signal indicating that paper exists between said separation charger and said photosensitive member and to apply smaller DC voltage when said paper detection means outputs the signal indicating that no paper exists between said separation charger and said photosensitive member.

4,896,193

MULTICOLORED IMAGE FORMING APPARATUS SEPARABLE FOR EASE OF MAINTENANCE

Kazuo Kagiura, Tokyo; Noriyuki Yokoo, Hiratsuka; Mototada Toriumi, Tokyo; Hiroyoshi Maruyama; Hidetoshi Tanaka, both of Yokohama, and Yoichi Ishii, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 928,419, Nov. 10, 1986, abandoned.
This application Apr. 3, 1989, Ser. No. 332,383
Claims priority, application Japan, Nov. 15, 1985, 60-255000; Jun. 9, 1986, 61-133189
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—326 **29 Claims**



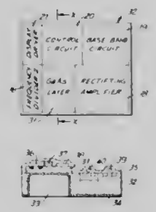
1. An image forming apparatus including a first body and a second body which is openable from and closable to said first body, said image forming apparatus comprising in said first or second body:
a movable image bearing member;
means for forming a latent image on said image bearing member in accordance with image information;
at least first and second developing means for developing the latent image formed on said image bearing member by said latent image forming means, each of said first and second developing means being movable between a developing position for developing the latent image on said image bearing member and a retracted position where it is retracted from the developing position and disposed away from said image bearing member;
first moving means for moving said first developing means between its developing position and its retracted position when the second body is closed, wherein said second developing means is movable between its developing position and its retracted position when the second body is closed and inversely to said first developing means, in response to said first moving means moving said first developing means between its retracted position and its developing position; and
second moving means for moving away from said image bearing member at least the developing means in its developing position when the second body is closed without moving the developing means that is at its retracted position to its developing position, in response to an opening operation of the second body.

4,896,194

SEMICONDUCTOR DEVICE HAVING AN INTEGRATED CIRCUIT FORMED ON A COMPOUND SEMICONDUCTOR LAYER

Katumi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,746
Claims priority, application Japan, Jul. 8, 1987, 62-171535
Int. Cl.[4] H01L *29/267, 29/06*
U.S. Cl. 357—16 **10 Claims**



1. A semiconductor device comprising:
a silicon substrate;
a compound semiconductor layer selectively formed on a main surface of said silicon substrate;
a hole formed in a portion of said silicon substrate on which said compound semiconductor layer is formed so as to expose the bottom surface of said compound semiconductor layer;
at least one circuit element formed on the upper surface of said compound semiconductor layer; and
a metal layer formed on the bottom surface of said silicon substrate, said metal layer extending through said hole to cover the exposed bottom surface of said compound semiconductor layer.

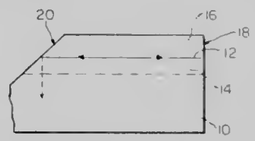
4,896,195

SUPERLUMINESCENT DIODE

Michael Jansen, Los Angeles; Moshe Sergant, Culver City; Szutsun S. Ou, Manhattan; Jaroslava Z. Wilcox; Jane J. Yang, both of Los Angeles, and Larry R. Eaton, Huntington Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 14, 1988, Ser. No. 168,067
Int. Cl.[4] H01L *33/00;* **H01S** *3/19*
U.S. Cl. 357—17 **13 Claims**

1. A superluminescent diode, comprising:
a semiconductor diode structure including a light-absorbing substrate, an active region, means for connecting an electrical power source across the active region to produce spontaneous emission of light, and means for laterally guiding emitted light in the structure, such that the emitted light substantially follows a longitudinal direction; and
at least one end facet that is inclined to a plane perpendicular to the longitudinal direction, to reflect light impinging on it into the substrate;



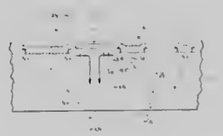
wherein spontaneously emitted light makes only one pass through the active region and is either emitted or reflected into the substrate and absorbed.

4,896,196

VERTICAL DMOS POWER TRANSISTOR WITH AN INTEGRAL OPERATING CONDITION SENSOR

Richard A. Blanchard, Los Altos, and David Cooper, Saratoga, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 929,961, Nov. 12, 1986, abandoned.
This application Sep. 8, 1988, Ser. No. 243,166
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 **8 Claims**



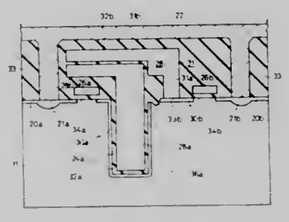
1. In a vertical DMOS semiconductor structure in which a drain of said vertical DMOS structure is formed in a semiconductor substrate, a body region of said vertical DMOS semiconductor structure having a conductivity type opposite the conductivity type of said drain is formed within said drain, and a source of said vertical DMOS semiconductor structure having a conductivity type opposite said conductivity type of said body region is formed within said body region a structure for sensing temperature comprising:
an operating condition sensor region within said drain of said vertical DMOS semiconductor structure comprising:
a sensor body region having the same conductivity type as said body region of said vertical DMOS semiconductor structure, said sensor body region being joined with said body region of said vertical DMOS structure;
a sensor source region having a conductivity type opposite that of said sensor body region; and
a contact attached to said sensor source region for forward biasing said sensor source region with respect to said sensor body region,
wherein, when said contact is biasing said sensor source region, said operating condition sensor region conducts a current related to a temperature of said vertical DMOS structure.

4,896,197

SEMICONDUCTOR MEMORY DEVICE HAVING TRENCH AND STACKED POLYSILICON STORAGE CAPACITORS

Koichiro Mashiko, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 132,645
Claims priority, application Japan, Dec. 10, 1986, 61-293733
Int. Cl.[4] H01L *29/78, 29/06, 27/02*
U.S. Cl. 357—23.6 **13 Claims**



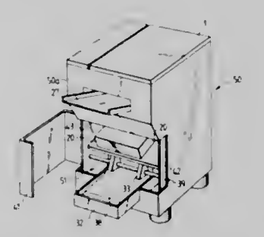
1. In a semiconductor memory comprising an array of transistors formed on a semiconductor substrate of a first conductivity type, wherein each of said transistors has source and drain impurity regions of an opposite conductivity type formed in said substrate and a gate between and insulated from said source and drain impurity regions:
a first, trench-type capacitor coupled to a first one of said transistors, said first trench-type capacitor comprising a first impurity region on the sidewall of a trench formed in said substrate and a first conductive material in said trench separated from said first impurity region by an insulating layer, said first impurity region and said first conductive material forming plates of said trench-type capacitor; and
a second, stacked capacitor coupled to a second one of said transistors adjacent said first transistor, said second, stacked capacitor comprising a second conductive material insulated from said first conductive material and disposed vertically to and entirely outside said trench, said first and second conductive materials forming plates of said second, stacked capacitor.

4,896,198

IMAGE RECORDING APPARATUS HAVING WINDOW FOR MAINTENANCE PURPOSE

Tosbio Sugiura, Nagoya; Osamu Nagata, Aichikamo; Makoto Yamada, Gifu, and Tsuyoshi Suzuki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 15, 1988, Ser. No. 284,692
Claims priority, application Japan, Dec. 15, 1987, 62-191006[U]
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **5 Claims**



1. An image recording apparatus for recording an image of

VOL 1110 ISS 4 JA 23 1990 UMI

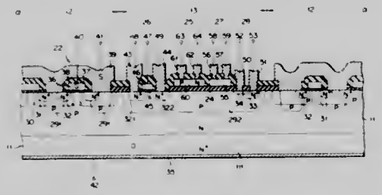
an original on an image recording medium, said apparatus comprising:
- a pair of support plates disposed in spaced-apart relation and in parallel with each other;
- rollers rotatably bridged between said pair of support plates for conveying the recording medium, each of said rollers having its own axis about which said roller rotates and said axis extending in a direction orthogonal to said pair of support plates;
- a casing for accommodating said pair of support plates, said casing having a wall in parallel with said axis and said wall having a window.

4,896,199

SEMICONDUCTOR DEVICE WITH PROTECTIVE MEANS AGAINST OVERHEATING

Yukio Tsuzuki, Aichi, and Masami Yamaoka, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 935,718, Nov. 28, 1986, Pat. No. 4,760,434. This application Mar. 16, 1988, Ser. No. 169,001
Claims priority, application Japan, Nov. 29, 1985, 60-270141
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[4] H01L *23/56*
U.S. Cl. 357—28 7 Claims



1. A semiconductor device comprising:
- a semiconductor body;
- heat generating means, including an active semiconductor element;
- an insulation film formed on a surface of said semiconductor body;
- a heat-sensitive element including at least one diode element formed by a PN junction being formed in a polycrystalline silicon semiconductor layer on said insulation film in such a manner that said heat-sensitive element is separated from said semiconductor body, said heat-sensitive element detecting the temperature of said semiconductor body varying due to the heat generated by said heat generating means; and
- means, electrically connected to said heat-sensitive element, for deriving, as a temperature detection signal, the level of a forward voltage drop generate din said at least one diode element.

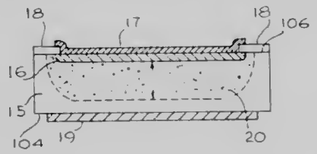
4,896,200

NOVEL SEMICONDUCTOR-BASED RADIATION DETECTOR

Yasukazu Seki; Noritada Sato, both of Yokosuka, and Masaya Yabe, Kanagawa, all of Japan, assignors to Fujl Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 803,115, Nov. 29, 1985, abandoned. This application Feb. 1, 1988, Ser. No. 153,520
Claims priority, application Japan, Nov. 30, 1984, 59-253684
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 6 Claims

1. A semiconductor-based, non-solar radiation detector, including:
- a single-crystal substrate;
- an undoped amorphous silicon layer with high specific electrical resistance carried on at least one surface of said substrate to form a heterojunction therebetween;
- a first aluminum electrode carried on said amorphous silicon layer, said first aluminum electrode having a plurality of thin, closely and uniformly spaced, conductive straps of substantially constant width distributed substantially uniformly over the surface of said amorphous silicon layer and connected to a common central conductive element;



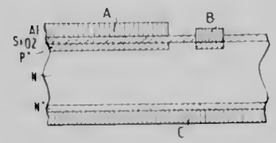
- a second electrode carried on a surface of said substrate opposite to a surface thereof carrying said undoped amorphous silicon layer; and,
- means, including said first and second electrodes, for applying a reverse bias to said heterojunction, whereby a depletion layer is produced in said substrate, which depletion layer produces electrical carrier when exposed to nonsolar radiation.

4,896,201

SEMICONDUCTOR DETECTOR HAVING INTEGRATED COUPLING CAPACITORS AND INTERGRATED DC BIASING STRUCTURES

Josef Kemmer, Haimhausen; Gerhard Lutz, c/o Max Planck Institut für Physik und Astrophysik Föhringer Ring 6, 8000 Munich 80; Peter Holl, c/o MBB GmbH, P.O. Box 80 11 09, 8000 Munich 80, and Lothar Strueder, c/o MPT fur Physik und Astrophysik Föhringer Ring 6, 8000 Munich 40, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH; Gerhard Lutz, both of Munich; Peter Holl, Grafing and Lothar Strueder, Munich, all of, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,619
Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715674
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 13 Claims



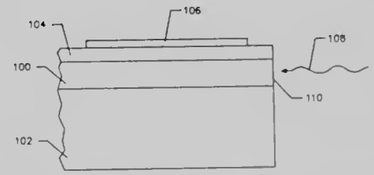
1. A semiconductor detector comprising an at least partially depleted base region having a first conductivity, means for applying a bias voltage to said base region, output or read-out electrode means arranged on at least one major surface of said detector at which an output signal is produced by charge carriers generated by radiation incident on said detector, said output or read-out electrode means comprising a highly doped zone having a second conductivity, an insulating layer applied on said highly doped zone, and a conducting electrode layer applied on said insulating layer. whereby said output signal is readable at said conducting electrode layer, said detector further comprising at least one voltage supply electrode means having said second conductivity and being connected to said highly doped zone in a high impedance manner through said base region of said detector for supplying a voltage to said highly doped zone.

4,896,202

SHORT WAVELENGTH IMPURITY BAND CONDUCTION DETECTORS

Ramasesha Bharat, Orange, and Michael D. Petroff, Fullerton, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 20, 1988, Ser. No. 209,244
Int. Cl.[4] N01L *29/12*; G01J *1/00*; G01T *1/22*
U.S. Cl. 357—30 19 Claims



1. An edge illuminated impurity band conduction detector for operation under an applied electric field to detect short wavelength infrared electromagnetic energy, comprising:
- an extrinsic semiconducting IR-active layer having a thickness less than the absorption length of the electromagnetic energy and with a first conductivity type impurity concentration which is high enough to create an impurity energy band;
- an intrinsic semiconducting blocking layer with first and second conductivity type impurity concentrations which are low enough that substantially no charge transport occurs by an impurity conduction mechanism; and
- first and second electrical contacts,
- the IR-active and blocking layers being positioned between the contacts such that an electrical potential applied to the contacts creates an electric field across the layers, with the detector oriented such that the electromagnetic energy impinges on an edge of the IR-active layer and propagates in the IR-active layer in a direction substantially orthogonal to the applied electric field, the IR-active layer extending in the orthogonal direction for at least the absorption length of the electromagnetic energy.

4,896,203

HETEROJUNCTION BIPOLAR TRANSISTOR

Yasutomo Kajikawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 97,165, Sep. 16, 1987. This application Aug. 23, 1988, Ser. No. 235,277
Claims priority, application Japan, Sep. 25, 1986, 61-228724
Int. Cl.[4] H01L *29/72, 29/205*
U.S. Cl. 357—34 5 Claims



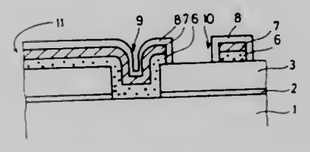
1. A heterojunction bipolar transistor comprising:
- a semi-insulative substrate;
- a first conductivity type collector layer formed on the upper part of said semi-insulative substrate;
- a semi-insulation layer formed on said collector layer;
- a second conductivity type external base layer formed on said semi-insulation layer;
- an insulation film formed on said external base layer and provided with an opening in a required position;
- a cavity obtained by mesa etching regions of said external base layer, said semi-insulating layer and said collector layer corresponding to said opening of said insulation film being utilized as a mask;
- a second conductivity type internal base layer formed only on exposed said regions of said external base layer, said semi-insulation layer and said collector layer only in said cavity;
- a first conductivity type emitter layer formed on said internal base layer in said cavity; and
- an emitter electrode formed in a self-alignment manner through said opening of said insulation film to be electrically connected with said emitter layer.

4,896,204

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THEREOF

Yoshihiro Hirata; Reiji Tamaki; Takeshi Noguchi; Junichi Arima; Kenji Saitoh, and Shigeru Harada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 914,879, Oct. 3, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 224,172
Claims priority, application Japan, Oct. 8, 1985, 60-224284
Int. Cl.[4] H01L *25/54, 21/441*
U.S. Cl. 357—67 4 Claims



1. A semiconductor device having an electrode and interconnection film covering an opening region for interconnection, wherein
- said electrode and interconnection film comprises a first metal layer comprising aluminum, a second metal layer comprising aluminum alloy formed on said first metal layer, the hardness of said second metal layer being of a higher value than that of said first metal layer, and a layer consisting essentially of a mixture of aluminum hydrate and aluminum oxide formed on said second metal layer.

4,896,205

COMPACT REDUCED PARASITIC RESONANT FREQUENCY PULSED POWER SOURCE AT MICROWAVE FREQUENCIES

Robert J. Weber, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 73,044, Jul. 14, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 317,146
Int. Cl.[4] H01L *23/02, 23/32, 27/66*
U.S. Cl. 357—81 5 Claims

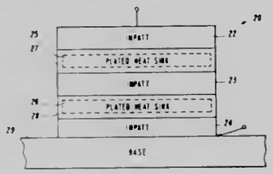
5. A microwave frequency power source comprising:
- a. a plurality of cylindrical IMPATT diodes, each having a diameter dimension connected in an electrical series, for increasing the power output of said plurality with respect to the power of the individual IMPATT diodes within said plurality;
- b. at least one cylindrical intermediate heat sink having a diameter dimension interposed between said plurality of IMPATT diodes;
- c. wherein said plurality of IMPATT diodes and said at least

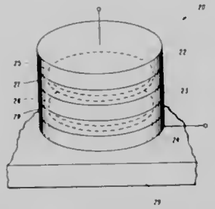
VOL 1110 ISS 4 JA 23 1990 UMI

one heat sink being arranged in a stack with said stack having an end;

d. wherein said IMPATT diode and said at least one heat sink have equal diameter dimensions;

e. a buffer heat sink, positioned in a stacked configuration at the end of said stack; and





f. a base heat sink positioned in a stacked configuration with said stack and said buffer heat sink, wherein the thermal conductivity characteristic and thermal capacity characteristic of said at least one heat sink is matched to the thermal conductivity characteristic and thermal capacity characteristic of said buffer heat sink and base heat sink combination.

4,896,206

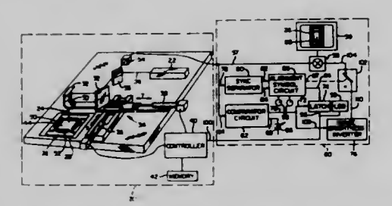
VIDEO DETECTION SYSTEM

Munroe Denham, Aloha, Oreg., assignor to Electro Science Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 132,874, Dec. 14, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 313,651

Int. Cl.[4] H04N *7/18, 5/57*

U.S. Cl. 358—101 **24 Claims**



1. A video detection system for detecting the common edge line of adjacent first and second portions of an article in a predetermined orientation, comprising:

video means for generating a video signal corresponding to a video image of the article, the video signal including a brightness level of changing magnitude in response to differences in a brightness of the image of the first and second portions of the article;

comparison means in communication with the video means for comparing a reference brightness magnitude with the magnitude of the video signal brightness level and for providing a brightness status signal that assumes first and second states whenever the magnitude of the video signal brightness level is, respectively, greater than and less than the reference brightness magnitude; and

detection point means for establishing within the video image a detection point at a selectable position that is independent of the orientation of the common edge line, the detection point means cooperating with the video means so that the detection point is movable from one of the first and second portions to the common edge line,

whereby the state of the brightness status signal changes whenever the detection point moves from one of the first and second portions to the common edge line and the change in the state of the brightness status signal represents detection of the common edge line.

4,896,207

COLOR IMAGING APPARATUS EMPLOYING A HORIZONTAL STRIPE COLOR FILTER TO REDUCE RISE-TIME ARTIFACTS

Kenneth A. Parulski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1988, Ser. No. 208,302

Int. Cl.[4] H04N *9/04*

U.S. Cl. 358—44 **9 Claims**

1. Imaging apparatus for generating a color video representation of an object, said apparatus comprising:

an area image sensor having a high speed horizontal scan and a relatively lower speed vertical scan, said sensor having a plurality of light-sensitive areas arranged two-dimensionally in parallel lines each oriented lengthwise in the horizontal high speed scanning direction;

a color filter array having parallel horizontal lines of colored filter elements overlying respective lines of light-sensitive areas, said color filter array having a vertically repetitive pattern comprising at least three adjacent lines of same-color filter elements oriented in the horizontal scanning direction and a line of filter elements including at least one other color oriented in the horizontal scanning direction; and

means for horizontally and vertically scanning said image sensor and for generating an output signal, said output signal comprising a repetitive color video sequence of at least three lines of the same color and one line including said other color.

4,896,208

APPARATUS AND METHOD FOR READING AND DIGITALLY EDITING MULTIPLE IMAGES

Shigeru Moriya, and Masamichi Kishi, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1987, Ser. No. 127,068

Claims priority, application Japan, Dec. 2, 1986, 61-289461; Dec. 2, 1986, 61-289462

Int. Cl.[4] H04N *1/387, 1/21, 1/46*

U.S. Cl. 358—78 **16 Claims**

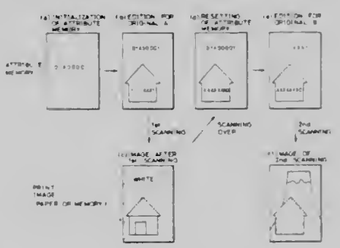
1. An image reading and editing apparatus, comprising:

image reading means for reading an image on an original and generating image data;

attribute data storing means for storing attribute data representing how the image data is to be processed, said attribute data being set for each of a plurality of small sections into which the entire region of the original containing said image is divided, said attribute data including a prohibition attribute;

attribute data input means for designating an area equal to or larger than one of said small sections in the entire region of the original, setting attribute data for the designated area, and storing the attribute data in the attribute data storing means;

means for instructing that a composite image is to be formed



from two or more image portions on areas designated in different originals by the attribute data input means; and

image data output means for processing the image data generated by said image reading means based on the attribute data stored in said attribute data storing means and outputting the processed image data to an external apparatus so that null data is output with respect to small sections for which the prohibition attribute is set when said instructing means instructs that a composite image is to be formed.

4,896,209

PASSENGER VEHICLE POLLING SYSTEM HAVING A CENTRAL UNIT FOR POLLING PASSENGER SEAT TERMINAL UNITS

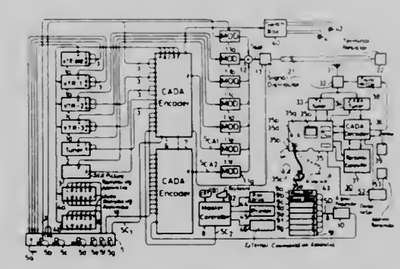
Atsushi Matsuzaki, Kanagawa; Koichi Tagawa, Tokyo; Masami Yamashita, Kanagawa, and Yoshiyuki Kondo, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,590

Claims priority, application Japan, Feb. 10, 1987, 62-29353; Mar. 4, 1987, 62-49818

Int. Cl.[4] H04N *7/00*

U.S. Cl. 358—86 **23 Claims**



1. A passenger vehicle polling system, including:

a head end apparatus comprising means for generating a polling command signal and means for centralizing polling answer signals generated in response to the polling command signal, each one of said polling answer signals including a status signal and an address signal identifying one of the passenger seats;

a plurality of terminal units each provided at a different one of the passenger seats, each of said terminal units comprising a means for decoding said polling command signal, and a means for generating said each polling answer signal; and

a means for transmitting the polling command signal from the head end apparatus to the terminal units, and a means for transmitting said each polling answer signal from said one of the terminal units at which it is generated to the head end apparatus.

4,896,210

STEREOSCOPIC GRAPHICS DISPLAY TERMINAL WITH IMAGE DATA PROCESSING

Daniel A. Brokenshire, 200 S. W. Greenridge Dr., Apt. 802, Lake Oswego, Oreg. 97035, and Peter W. Hildebrandt, 3280 S. W. 170th, Apt. 1405, Beaverton, Oreg. 97006

Filed Nov. 16, 1987, Ser. No. 121,188

Int. Cl.[4] H04N *13/00*

U.S. Cl. 358—88 **17 Claims**



1. A stereoscopic graphics display terminal for processing three-dimensional image data representative of a three-dimensional object and displaying a stereoscopic image of the object, comprising:

processor means coupled to receive three-dimensional image data as modeling space coordinates from an information source for transforming the modeling space coordinates into viewing space coordinates, and for transforming viewing space coordinates into stereoscopic image data, the modeling space coordinates representing a three-dimensional image of a three-dimensional object, the viewing space coordinates representing a preselected view of the object, and the stereoscopic image data representing a right-eye view and a left-eye view of the preselected view of the object; and

display means coupled to the processor means and responsive to the stereoscopic image data for displaying the right- and left-eye views of the object, presenting to an observer a stereoscopic image of the object; wherein said processor means and said display means are resident in said stereoscopic graphics display terminal.

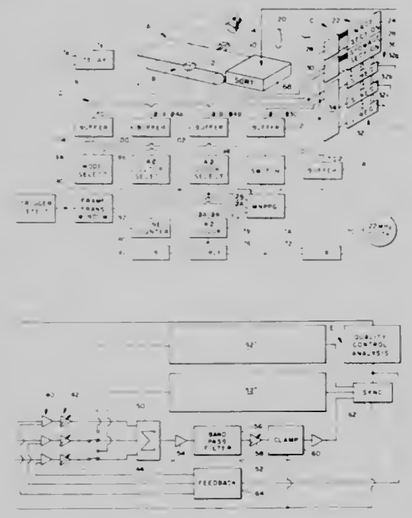
VOL 1110 ISS 4 JA 23 1990 UMI

4,896,211

ASYNCHRONOUSLY TRIGGERED SINGLE FIELD TRANSFER VIDEO CAMERA

Robert P. Hunt, Palto Alto, and Martin Shih, San Jose, both of Calif., assignors to Picker International, Inc., Highland Heights, Ohio

Filed Apr. 26, 1988, Ser. No. 186,446
Int. Cl.[4] H04N 3/14, 7/18
U.S. Cl. 358—106 **16 Claims**



1. A method of quality control comprising:
(a) focusing video camera on an examination region;
(b) moving an object to be examined through the examination region under relatively subdued light;
(c) flushing accumulated charge from a light sensor of the video camera;
(d) as the object moves through the examination region, illuminating the object with high intensity light from a high intensity flash;
(e) on the light sensor, integrating both the subdued light and the high intensity light from the examination region;
(f) subsequent to the high intensity flash, reading integrated light values from the light sensor to produce a video signal representing a single field of a video image;
(g) determining at least one characteristic of the object from the single field video signal.

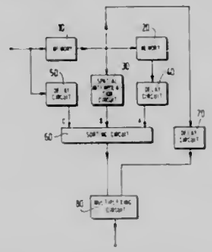
4,896,212

METHOD OF PROCESSING VIDEO SIGNALS WHICH ARE SAMPLED ACCORDING TO A SAMPLING PATTERN HAVING AT LEAST ONE OMITTED ELEMENT WHICH DIFFERS FROM PICTURE FRAME TO PICTURE FRAME AND A VIDEO SIGNAL CONVERTER FOR PUTTING THIS METHOD INTO EFFECT

Olivier Chantelou, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1988, Ser. No. 197,366
Claims priority, application France, Jun. 4, 1987, 87 07794
Int. Cl.[4] H04N 7/12, 7/01
U.S. Cl. 358—138 **9 Claims**

1. A method of processing input video signals which are sampled according to a sampling pattern having at least one omitted element which differs from picture frame to picture frame, said method including the steps:
intra-picture spatially filtering video signals of a current picture frame for obtaining spatially filtered video signals of said current picture frame;
median filtering said spatially filtered video signals of said current picture frame, video signals of a picture frame



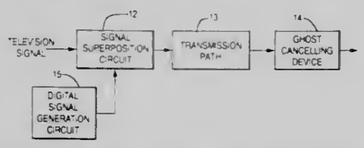
preceding said current picture frame, and video signals of a picture frame subsequent to said current picture frame for obtaining median filtered video signals; and
multiplexing said median filtered video signals and said video signals of said current picture frame for obtaining video signals which are sampled according to said sampling pattern having all elements present for all picture frames.

4,896,213

GHOST CANCELLING REFERENCE SIGNAL TRANSMISSION/RECEPTION SYSTEM

Kazuo Kobo, Neyagawa; Kiyotake Fukui, Settsu; Toshiro Nozoe, Ibaraki, and Noriaki Morotomi, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 15, 1986, Ser. No. 885,825
Claims priority, application Japan, Jul. 16, 1985, 60-156458; Nov. 11, 1985, 60-252152
Int. Cl.[4] H04N 7/087
U.S. Cl. 358—147 **6 Claims**



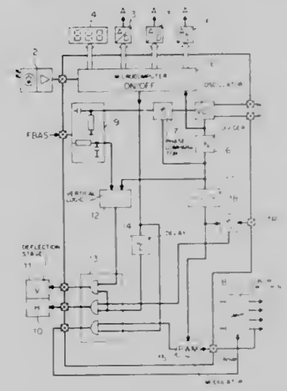
1. A ghost cancelling reference signal transmission/reception system comprising:
a means for generating a digital signal composed of frame synchronizing signals, clock synchronizing signals, and data signals;
a means for superposing said digital signal on a television signal in a vertical blanking interval of the television signal;
a transmission means for transmitting said television signal containing said superposed digital signal; and
a ghost cancelling means that receives the transmitted television signal and executes a correlative operation of the transmitted television signal to eliminate group-delay distortion, frequency-amplitude characteristic distortion and ghost generated in said transmission means from the transmitted television signal, said ghost cancelling means using said digital signal superposed on said television signal as a reference signal.

4,896,214

TELEVISION RECEIVER WITH A MICRO-COMPUTER CONTROLLED OPERATING PART AND A SWITCHING NETWORK PART

Franz Dieterle; Erich Geiger, both of Unterkirnach; Uwe Hartmann, Villingen-Schwenningen, and Udo Mai, VS-Villingen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

PCT No. PCT/EP87/00741, § 371 Date Oct. 17, 1988, § 102(e) Date Oct. 17, 1988, PCT Pub. No. WO88/04504, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 28, 1987, Ser. No. 250,719
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641303
Int. Cl.[4] H04N 5/04, 9/74
U.S. Cl. 358—148 **9 Claims**



1. A television receiver comprising: a micro-computer controlled operating part; a switching network part; deflection stages; said television receiver receiving a television signal with synchronization pulses; a micro-computer for controlling said operating part; a clock generator for said micro-computer and synchronized by said synchronization pulses; said clock generator also comprising a control generator for said switching network part and for said deflection stages; a pulse-width modulator for dividing and processing a signal from said clock generator and emitting a control signal for controlling said switching network part.

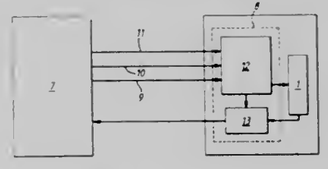
4,896,215

IMAGING APPARATUS WITH FLEXIBLE INTERFACE FOR CONTROLLING DIFFERENT IMAGE SENSOR TYPES

Christopher J. Morcom, Maldon, England, assignor to English Electric Valve Company Limited, Essex, England

Filed Sep. 15, 1988, Ser. No. 245,111
Claims priority, application United Kingdom, Sep. 18, 1987, 8721977
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—210 **14 Claims**

1. Imaging apparatus comprising an image sensor, a device arranged to receive an output from the image sensor and an interface between them, said interface operating to apply a plurality of signals to the image sensor to produce the output, the sequence in which said signals are applied to said image sensor being determined by control signals applied to the
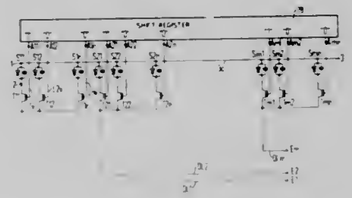


interface, thereby enabling said interface to operate with more than one type of image sensor.

4,896,216

INTEGRATED CIRCUIT FOR READING OUT SIGNALS FROM AN OPTOELECTRONIC IMAGE SENSOR

Gerhard Brunst, and Klaus Rohleder, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,230
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727943
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.29 **13 Claims**



1. An integrated circuit for reading out signals of a linear opto-electronic image sensor, comprising:
m groups of n sensor elements positioned next to one another in a line, ones of said sensor elements in said groups corresponding to ordering numbers in respective ones of said groups, each of said sensor elements having first and second terminals, said first terminals being connectable to a substantially constant voltage;
switching transistors connected in series with said second terminals of said sensor elements for connecting n sensor elements of every group in individual succession to common group-associated data lines;
common control lines connected to drive said switching transistors connected to said sensor elements of identical ordering numbers in different ones of said groups; and
a read-out circuit having inputs connected via m ones of said common group associated data lines and said switching transistors to said second terminals of said sensor elements, said inputs of said read-out circuit being supplied simultaneously with a signal group of m sensor signals of all of said sensor elements having the same ordering numbers, said inputs of said read-out circuit being supplied with corresponding signal groups of different ordering numbers in n successive time segments.

6. An integrated circuit as claimed in claim 1, wherein a shift register has outputs connected to said control lines, each of said shift register outputs being individually allocated to ones of said sensor elements.

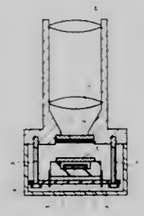
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4,896,217

SOLID-STATE IMAGING DEVICE INCLUDING A TRANSPARENT CONDUCTOR BETWEEN AN OPTICAL LOW-PASS FILTER AND AN IMAGING SENSOR

Toshio Miyazawa, Chiba; Kouzou Yasuda, Mobara; Hiroichi Soukei, Mobara, and Iwao Takemoto, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1988, Ser. No. 204,737
Claims priority, application Japan, Jun. 10, 1987, 62-144916
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.11 **13 Claims**



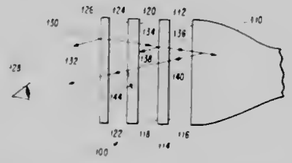
6. A solid-state imaging device comprising:
a solid-state imaging chip;
means for providing optical signals to said solid-state imaging chip along a predetermined optical signal path;
an optical low-pass filter provided on said optical signal path for reducing a Moire effect in said solid-state imaging device; and
means provided on said optical signal path for preventing the generation of electromagnetic waves between said solid-state imaging chip and said optical low-pass filter by preventing electrical signals generated in said solid-state imaging chip from impinging on said optical low-pass filter, wherein said means comprises a shielding member formed on said optical path between said solid-state imaging chip and said optical low-pass filter.

4,896,218

CIRCULARLY POLARIZED MULTI-BANDPASS INTERFERENCE CONTRAST ENHANCEMENT FILTER

Gerald L. Vick, Mount Vernon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 4, 1987, Ser. No. 93,844
Int. Cl.[4] H04N *5/72*
U.S. Cl. 358—253 **5 Claims**



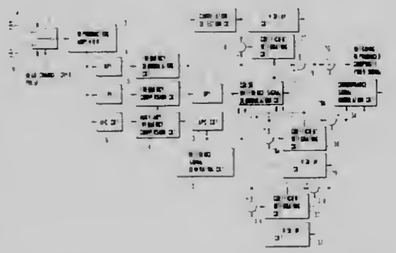
1. A display device comprising:
a. a cathode ray tube for generating an emissive display in response to some input signal;
b. a face plate disposed upon said cathode ray tube through which the emissive display is viewed;
c. a multiple bandpass optical interference filter disposed outwardly of said face plate for selectively passing only certain wavelengths of light;
d. a polarizer disposed outwardly of said multiple bandpass filter for selectively passing only light with predetermined electric field properties;
e. an anti-reflective coating disposed outwardly of said polarizer for decreasing ambient light from reflecting off said polarizer; whereby, ambient light approaching the cathode ray tube first encounters the anti-reflective coating and then is polarized by said polarizer and further is filtered by said multiple bandpass filter allowing only certain predetermined wavelengths of light to pass on to said face plate of said cathode ray tube where portion of the remaining light will be reflected back toward said polarizer and a smaller portion of said light will be transmitted through to the anti-reflective coating and away from the cathode ray tube.

4,896,219

COLOR VIDEO SIGNAL REPRODUCING APPARATUS

Hiroto Yasumura; Masahide Hirasawa; Minoru Noji, all of Kanagawa; Susumu Kozuki, Tokyo; Koji Takahashi, and Katsuji Yoshimura, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 39,085
Claims priority, application Japan, Apr. 23, 1986, 61-093978; Apr. 23, 1986, 61-093979; May 12, 1986, 61-107983; May 12, 1986, 61-107984; May 12, 1986, 61-107986
Int. Cl.[4] H04N *9/79*
U.S. Cl. 358—327 **19 Claims**



1. A video signal reproducing apparatus for reproducing a composite video signal from a record bearing medium on which the composite video signal is recorded, said composite video signal being formed, from a color video signal including at least a luminance signal and a chrominance signal, by frequency-modulating said luminance signal, frequency-converting said chrominance signal into a signal having a lower frequency band than its original frequency band and then frequency-multiplexing the both signals, comprising:
(a) reproducing means for reproducing said composite video signal from said record bearing medium;
(b) separating means for separating the frequency-modulated luminance signal and the frequency-converted chrominance signal from said composite video signal reproduced by said reproducing means and outputting the separated signals, respectively; and
(c) demodulating means for demodulating the frequency-converted chrominance signal outputted from said separating means into a plurality of different base-band signals and for outputting these signals, respectively.

4,896,220

MAGNETIC RECORDING METHOD AND MAGNETIC RECORDING HEAD USED THEREFOR

Masamichi Sato; Takashi Matsumoto; Kazukiyo Tamada, and Hiroichi Naito, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 28, 1987, Ser. No. 78,623
Claims priority, application Japan, Jul. 28, 1986, 61-175707; Jul. 28, 1986, 61-175709; Jul. 28, 1986, 61-175711; Jul. 28, 1986, 61-175714; Aug. 22, 1986, 61-195668; Apr. 10, 1987, 62-87151
Int. Cl.[4] H04N *9/79*
U.S. Cl. 358—328 **6 Claims**



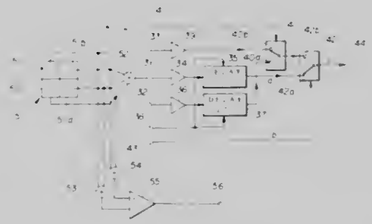
1. A magnetic recording method comprising the steps of:
forming a first track on a magnetic recording medium by magnetically recording a first information signal thereon:
forming a second track on said recording medium by magnetically recording a second information signal thereon;
said second information signal having a predetermined azimuth angle to said first information signal and said second track crossing said first track at a predetermined non-zero crossing angle θ.

4,896,221

OPTICAL DISC REPRODUCING APPARATUS HAVING SPEED-CHANGE REPRODUCTION MODE

Akira Mashimo, Tokorozawa, Japan, assignor to TEAC Corporation, Japan

Filed Jun. 20, 1988, Ser. No. 208,879
Claims priority, application Japan, Jun. 23, 1987, 62-156254
Int. Cl.[4] G11B *7/00*
U.S. Cl. 358—342 **11 Claims**



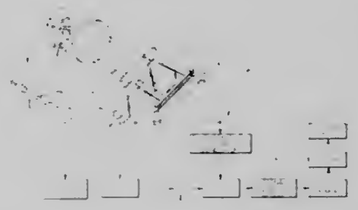
1. An optical disc reproducing apparatus for reproducing a pre-recorded signal from an intended track of an optical disc by detecting reflected light beams of a main light beam and sub light beams reflected from the optical disc, said main light beam being irradiated as a main beam spot on the track while said sub light beams are irradiated as sub beam spots at intermediate portions between two successive tracks one of which is said intended track, said optical disc reproducing apparatus having a speed-change reproduction mode in which the main beam spot jumps from said intended track to an adjacent track at a predetermined rate while maintaining a relative positional relationship of the main beam spot and the sub beam spots, said optical disc reproducing apparatus comprising:
first input terminal means for receiving a first reproduced signal detected from the reflected light beam of said main light beam reflected from the optical disc;
second input terminal means for receiving at least a second reproduced signal detected from the reflected light beam of one of said sub light beams reflected from the optical disc;
delay means for matching timings of the first and second reproduced signals by delaying at least one of the first and second reproduced signals; and
selecting means supplied with the first and second reproduced signals from said delay means for selectively outputting the first reproduced signal during a time when no jump is made and for selectively outputting the second reproduced signal for a predetermined time after a jump starts.

4,896,222

METHOD OF AND APPARATUS FOR CORRECTING IMAGE SIGNAL

Nobutaka Fukai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 7, 1988, Ser. No. 241,180
Claims priority, application Japan, Sep. 7, 1987, 62-224846
Int. Cl.[4] H04N *1/00, 1/40*
U.S. Cl. 358—446 **6 Claims**



3. An apparatus for correcting an image signal, comprising:
a light beam source for emitting a light beam;
scanner means for scanning an object on which image information is recorded, with said light beam;
photoelectric converter means for photoelectrically detecting light bearing the image information from the object to produce an image signal representing the image information;
means for reading the image information based on said image signal;
monitor means for monitoring the intensity of the light beam emitted from said light beam source;
signal correcting means for dividing an output signal from said monitor means into a high-frequency component and a low-frequency component and for producing a corrective signal by multiplying a ratio of said high-frequency component to said low-frequency component by a constant; and
processing means for processing said image signal produced by said photoelectric converter means with said corrective signal produced by said signal correcting means.

4,896,223

DISPLAY AND INPUT DEVICE

Tuyoshi Todome, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

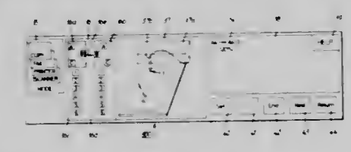
Filed Mar. 18, 1988, Ser. No. 170,254
Claims priority, application Japan, Mar. 19, 1987, 62-66967
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—468 **4 Claims**

1. A display and input device incorporating a plurality of equipment having independent functions, comprising:

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a memory including a memory portion defining the appearance of a plurality of operation modes;

a display unit for displaying a picture image of ones of the plurality of operation modes according to said plurality of equipment having independent functions, said display unit having a plurality of display modes that vary according to input operations of said equipment and, when a display mode has been changed to a new display mode, the operation information inputted prior to the change in the display mode is simultaneously displayed by said display unit during the new display mode;



an input unit having a plane surface and superimposed over the display unit, said input unit for generating electrical signals corresponding to x- and y- coordinates of any portion of said display unit which is touched, the surface input area portions corresponding to one of said picture images of an operation mode; and

a controller for loading the control programs from an instruction listing stored in the memory, for setting said input areas of said input unit for various modes, for receiving said electrical signals of the input unit at the same time and for executing the various displays of said display unit.

4,896,224

VIDEO AND AUDIO SIGNAL RECORDING APPARATUS PROVIDING FOR RECORDATION OF CONTROL DATA WITH AUDIO SIGNALS

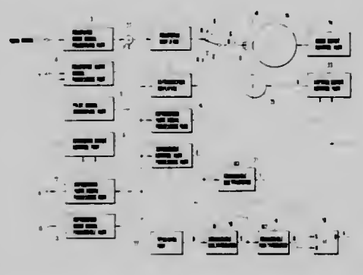
Kazumitsu Tobe, Chiba, and Isao Harigaya, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,441

Claims priority, application Japan, Dec. 8, 1986, 61-290333

Int. Cl.⁴ H04N *7/00*

U.S. Cl. 360—19.1 **12 Claims**



1. A video signal recording apparatus comprising:

(a) recording means for recording an analog video signal by obliquely forming recording tracks on a tape shaped recording medium within a first area which extends in the longitudinal direction of the medium and for recording a digital audio signal by obliquely forming recording tracks in a second area which extends in parallel to said first area;

(b) first control means for generating an instruction signal for causing said recording means to stop recording said video and audio signals;

(c) second control means for causing, in response to said instruction signal, said recording means to record, in said second area, control data indicative of a stop made in recording;

(d) reproducing means for reproducing said control data from said second area; and

(e) third control means for causing said recording means to start recording said video and audio signals on the basis of said control data reproduced by said reproducing means.

4,896,225

TAPE RECORDING AND/OR REPRODUCING APPARATUS

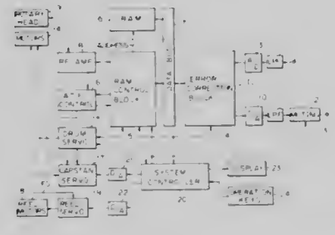
Takashi Nakatsuyama, Chiba, and Fumihiko Kato, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 236,801

Claims priority, application Japan, Sep. 14, 1987, 62-230276

Int. Cl.⁴ G11B *15/46, 15/48*

U.S. Cl. 360—73.06 **11 Claims**



1. A tape recorder capable of operating at an ordinary reproducing speed and in a forward or reverse direction and comprising:

a magnetic head for scanning a magnetic tape;

operating mode means for running the magnetic tape at a speed higher than said ordinary reproducing speed in a state in which said magnetic head is in contact with the magnetic tape;

operating means controllable by a user of the tape recorder for making said operating mode means operative;

first speed control means for controlling the operating mode means so as to run the magnetic tape at a first speed higher than said ordinary reproducing speed;

second speed control means for controlling the operating mode means so as to run the magnetic tape at a second speed higher than said first speed; and

automatic switching control means responsive to said operating means for making said first speed control means operative for a predetermined period of time after said operating means is operated and for making said second speed control means operative when the operating means is continuously operated after an elapse of said predetermined period of time.

4,896,226

MULTI-MOTOR ELECTRONIC STILL CAMERA HAVING RECORDING DISK, FOCAL PLANE SHUTTER, AND OPTICAL FILTERS

Yoshitaka Araki, Tokyo; Yoshio Nara, Kawasaki; Tadashi Ohta, Tokyo, and Yasuaki Ishiguro, Ohi, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 867,007, May 20, 1986, abandoned, which is a continuation of Ser. No. 541,972, Oct. 14, 1983, abandoned. This application Dec. 18, 1987, Ser. No. 135,538

Claims priority, application Japan, Oct. 19, 1982, 57-183086

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—35.1 **9 Claims**

1. An electronic still camera for recording a still image of an object on a recording disk comprising:

(a) image pick-up means having a light-receiving surface;

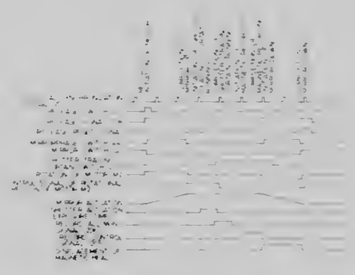
(b) an optical system for forming an image of the object on said light-receiving surface, said image pick-up means converting said image on said light-receiving surface into an electrical signal;

(c) shutter means disposed between said optical system and said image pick-up means, said shutter means assuming a shielding state for shielding said image pick-up means from light passed through said optical system and a non-shielding state for allowing said light to reach said image pick-up means to permit the image-to-electrical signal conversion thereof;

(d) a view finder;

(e) a reflecting member disposed between said optical system and said shutter means, said reflecting member being movable between an observation position for directing light passed through said optical system toward said view finder and a photographing position for directing light passed through said optical system toward said shutter means;

(f) moving means for moving said reflecting member from said observation position to said photographing position



prior to the change of said shutter means from said shielding state to said non-shielding state and for moving said reflecting member from said photographing position to said observation position after the change of said shutter means from said non-shielding state to said shielding state;

(g) an electric motor;

(h) rotation means operatively associated with said motor to rotate said recording disk;

(i) recording means for recording said electric signal on said recording disk rotated by said rotation means;

(j) timing means for generating a first timing signal after the change of said shutter means from said non-shielding state to said shielding state, and generating a second timing signal before the completion of the movement of the reflecting member from said photographing position to said observation position; and

(k) control means for causing said recording means to start recording said electrical signal on said recording disk in response to said first timing signal, and causing said recording means to terminate recording said electrical signal on said recording disk in response to said second timing signal.

4,896,227

METHOD OF LOCATING AND INSPECTING DROPOUTS ON A MAGNETIC DISC

Frank S. Fountain, Wilmington, Del., and Donald K. Pusey, West Grove, Pa., assignors to E. I. DuPont De Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 84,011, Aug. 11, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 333,836

Int. Cl.⁴ G11B *27/36*

U.S. Cl. 360—31 **13 Claims**

1. A method of selectively inspecting a magnetic disc in those locations where dropouts in the form of loss of magnetic signal intensity of information recorded thereon have been detected comprising the steps of:

detecting dropouts on the disc by:

rotating the disc at a substantially constant angular velocity while recording a magnetic signal of constant intensity along predefined concentric circular tracks

rotating the disc at the same substantially constant angular velocity while reading the recorded magnetic signal along said predefined tracks

comparing the intensity of the read signal with a predefined threshold to detect a level of loss of magnetic signal intensity

rotating the disc at the same substantially constant angular velocity while reading the recorded magnetic signal along said predefined tracks

comparing the intensity of the read signal with a different predefined threshold to detect another level of loss of magnetic signal intensity

determining the angular position of detected losses of signal intensity by:

measuring a first time interval between passage of a synchronizing signal on the disc and each detected loss of magnetic signal intensity

measuring a second time interval between passage of said synchronizing signal and subsequent second passage of said synchronizing signal and

dividing the first time interval by the second time interval and multiplyinq the resulting quotient by 360 to precisely define the angular position of each dropout in degrees

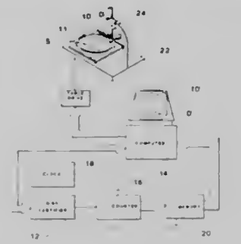
storing information as to such detected losses of magnetic signal intensity in a computer,

generating a map of the disc with the levels of losses of magnetic signal intensity color coded

displaying said map on a color CRT display device and

moving the disc into operative relationship with a disc inspecting instrument, and controlling the position of the disc with respect to such instrument on the basis of said detected signal loss location information stored in the computer,

so that specific dropouts may be selected for inspection by positioning a cursor over the color coded symbol representing the detected magnetic signal losses and subsequently inspected by the disc inspection instrument.



4,896,228

MAGNETIC DISC APPARATUS HAVING IMPROVED HEAD POSITION CONTROL

Shuji Amakasu, Hanamaki, and Munehisa Goto, Yokohama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1987, Ser. No. 59,259

Claims priority, application Japan, Jun. 6, 1986, 61-132356

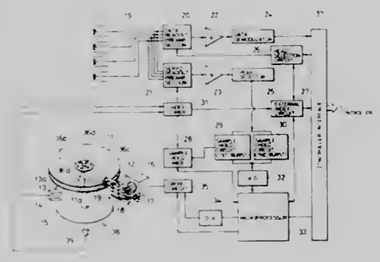
Int. Cl.⁴ G11B *5/596, 21/10*

U.S. Cl. 360—77.08 **3 Claims**

1. A magnetic disc apparatus comprising:

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a plurality of magnetic recording surfaces formed coaxially on respective ones of a plurality of recording discs;
disc drive means for rotating said recording discs;
a plurality of movably mounted electromagnetic transducers respectively disposed for readout of recorded data from corresponding ones of said magnetic recording surfaces;
head drive means for moving said transducers;
data readout circuit means for processing readout signals from said transducers to reproduce said recorded data;
a single servo sector formed in each of said recording surfaces, said servo sectors being disposed at respective mutually different angular positions and each said servo sector having track centerline servo data recorded therein;
servo data readout circuit means coupled to receive readout signals from each of said transducers; and
servo control means including index signal generating means coupled to said disc drive means for generating index signals to respectively designating timings for readout of servo data from each of said servo sectors, said servo control means responsive to (a) said servo data successively readout from each of said servo sectors by said



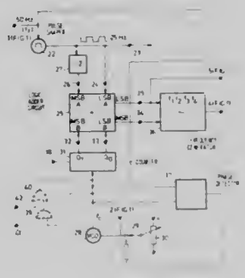
transducers during each rotation of said recording discs, to (b) said index signals produced from said index signal generating means, and to (c) externally supplied command data, for controlling said head drive means to apply track centerline servo control to a currently selected one of said transducers to maintain said transducer aligned with a track centerline position of a corresponding one of said recording surfaces, and in which said servo control means derives rotational eccentricity data of said plurality of recording discs responsive to servo data obtained from all of said servo sectors, and executes said track centerline servo control in response to said rotational eccentricity data to compensate for said rotational eccentricity;
in which said servo control means comprises data processing means which functions at a time of a changeover from selection of one of said transducers to selection of another one thereof to predict an optimum rack centerline position for servo control of said another transducer at said time of change over, based on said data obtained from all of said servo sectors, and in which said servo control means functions to rapidly move said another transducer to said optimum centerline position upon said change over.

4,896,229

APPARATUS FOR REPRODUCING VIDEO SIGNALS AT A SPEED WHICH DEVIATES FROM A NOMINAL SPEED

Richard C. Spiero, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 854,065, Apr. 17, 1986, abandoned, which is a continuation of Ser. No. 437,582, Oct. 29, 1982, abandoned. This application Jun. 8, 1988, Ser. No. 206,950
Claims priority, application Netherlands, Apr. 19, 1982, 8207614
Int. Cl.[4] G11B *5/58*
U.S. Cl. 360—77.14 **4 Claims**



1. An apparatus for reproducing video signals recorded on a record carrier in mutually parallel tracks which are inclined relative to the longitudinal axis of the record carrier, at a speed which deviates from a nominal speed, said carrier including means for identifying individual consecutive tracks within a cycle of at least three tracks, said cycles repeating in succession along said axis, said apparatus comprising:
a tape transport for moving said record carrier along the longitudinal axis thereof;
a read head for reading the video signals in said parallel tracks;
means for repeatedly moving said read head in one direction, at a constant speed, along a path which is inclined relative to said longitudinal axis of said record carrier, wherein said path is substantially parallel to said parallel tracks when said tape transport moves said record carrier at a nominal speed;
tracking-error detection means for generating a tracking-error signal which is a measure of the deviation of the read head relative to the center of a track being followed;
a tape transport control loop for receiving said tracking-error signal for controlling the direction and speed of said tape transport;
a reference signal generator coupled to said tracking-error detection means for generating, at a predetermined rate, a sequence of reference signals therefor corresponding to said means for identifying consecutive tracks on said record carrier;
characterized in that said reference signal generator comprises means for advancing said reference signals to the next reference signal of the sequence at a succession of equally spaced instants of time, and means selectively causing the reference signal to advance to the next reference signal or to return to the immediately preceding reference signal at instants of time different from said succession of equally spaced instants of time, thereby forming a modified sequence of reference signals corresponding to those tracks to be followed by said read head when the path thereof is inclined relative to said tracks and wherein said succession of equally spaced instants corresponds to a first frequency, and said means for selectively causing operates at a selectively adjustable second frequency, said first frequency corresponding to the number of tracks scanned per second at the nominal playing

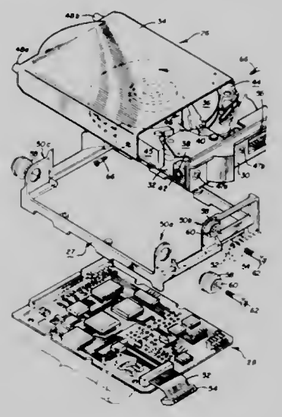
speed, switching with a second frequency being effected in a backward sense compared with the direction in which switching is affected with said first frequency and switching means comprising means for providing a signal of said first frequency, means for converting said first frequency signal into a first counting signal, a variable frquency oscillator for generating a signal of said second frequency, a counter coupled to said variable frequency oscillator for converting said second frequency signal into a second counting signal, an adder for adding together said first and second counting signals, and a frequency generator coupled to an output of said adder for generating each of said reference signals in dependence on the sum of said counting signals.

4,896,230

DISK DRIVE ARCHITECTURE

Frederick M. Stefansky, and Glade N. Bagnell, both of Longmont, Colo., assignors to Conner Peripherals, Inc., San Jose, Calif.

Filed May 29, 1987, Ser. No. 56,584
Int. Cl.[4] G11B *5/012, 5/00*
U.S. Cl. 360—97.02 **24 Claims**



1. A hard disk drive assembly, comprising:
an end plate;
a base plate mounted on said end plate so that said end plate and said base plate are orthogonally related;
a casing attached to said end plate and encompassing said base plate in a controlled environment established by said end plate and said casing;
a spin motor mounted on said base plate;
a disk mounted on said spin motor;
transducer means for interacting with said disk; and
actuator means, mounted on said base plate, for positioning said transducer means with respect to said disk.

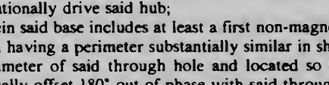
4,896,231

BACKBONE GASKET FOR DISC DRIVES

Robert F. Hoppe, Santa Cruz, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 18, 1988, Ser. No. 220,509
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97.02 **1 Claim**

1. In a disc drive system having a recording media within a sealed housing having top and bottom casing members, a read/write head for transferring information between the recording media and an external system and a head positioner assembly for locating the head relative to the recording media, the improvement comprising a backbone gasket for sealing a connection between the top and bottom casing members, the backbone gasket including:
a stiffener layer having opposing top and bottom sides; and



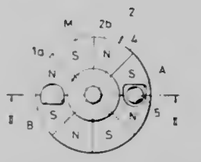
a pair of elastomeric layers adhered to the top and bottom opposing sides of the stiffener layer respectively, thereby sandwiching the stiffening layer; and
wherein the stiffener layer has a substantially lower modulus of elasticity than the elastomeric layers.

4,896,232

CHUCKING MECHANISM FOR FLOPPY DISK DRIVE

Katsuyuki Sugawara, Shiraishi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,457
Claims priority, application Japan, Aug. 27, 1987, 62-130464[U]
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—99.04 **2 Claims**



1. A chucking mechanism for a magnetic disk cartridge comprising:
a turntable including a magnetic disk mounted on a base, said base being provided with plural magnetic pole sections of reversed polarity for magnetically attracting a hub of the magnetic disk cartridge;
a rotary driving shaft fixed to said base;
a driving pin installed at an end of a leaf spring fixed to a lower surface of said magnetic disk, said driving pin projecting upwardly out of a through hole defined by said base and said magnetic disk, so as to chuck said hub and rotationally drive said hub;
wherein said base includes at least a first non-magnetic portion having a perimeter substantially similar in shape to a perimeter of said through hole and located so as to be radially offset 180° out of phase with said through hole.

4,896,233

HEAD SUPPORTING MECHANISM FOR A MAGNETIC DISK APPARATUS IN WHICH A HEAD SLIDER IS INCLINED WITH RESPECT TO A GIMBAL SPRING

Tadaharu Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

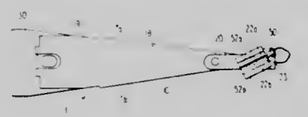
Filed Feb. 12, 1988, Ser. No. 155,418
Claims priority, application Japan, Feb. 12, 1987, 62-30923
Int. Cl.[4] G11B *5/48*
U.S. Cl. 360—104 **8 Claims**

1. A head slider supporting mechanism for supporting a head slider so as to float on a surface of a magnetic disk when said magnetic disk is rotating, comprising:
a rigid arm block;
a suspension element secured to said rigid arm block at its fixed end, said suspension element including a resilient spring section adjacent to said fixed end and a rigid load

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beam section adjacent to a free end of said suspension element so as to apply a loading force at said free end; and

a gimbal spring symmetric with respect to a symmetric axis, said gimbal spring being secured to said free end of said suspension element such that one end portion of said gimbal spring including one end of said symmetric axis is secured to said free end of said suspension element, said gimbal spring mounting said head slider so as to enable said head slider to move in rolling and pitching directions;



said head slider being formed with rails parallel to each other on a surface facing said magnetic disk, said head slider having a longitudinal axis parallel to an extending direction of said rails and being mounted on said gimbal spring such that said longitudinal axis is inclined relative to said symmetric axis of said gimbal spring by an angle ranging from greater than 10 degrees to smaller than 80 degrees.

4,896,234

MODE-CHANGE MECHANISM FOR TAPE RECORDING AND/OR REPRODUCING APPARATUS

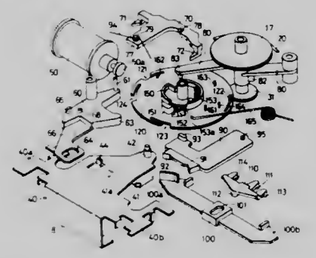
Hisanori Watanabe, Kanagawa, and Kenji Ohara, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,182

Claims priority, application Japan, Jun. 30, 1987, 62-163353

Int. Cl.[4] G11B *21/22*

U.S. Cl. 360—105 **26 Claims**



1. A mode-change mechanism for an auto-reverse recording and/or reproducing apparatus comprising:

a driving gear driven by a power source;

a partially toothless gear having cams formed on a flat surface thereof and being intermittently driven by said driving gear only in one direction, and having at least four toothless peripheral portions, a first toothless portion located in opposed relation to said driving gear at a time of forward recording/reproducing mode and reverse recording/reproducing mode, a third toothless portion located in opposed relation to said driving gear at a time of one of a fast forward mode and a rewind mode, and a fourth toothless portion located in opposed relation to said driving gear at a time of the other of a fast forward mode and rewind mode, said cams being arranged for driving respective predetermined members, whereby said modes are provided;

biasing means for providing an initial torque to said partially toothless gear;

locking means for locking and unlocking said partially toothless gear in respective positions whereat each toothless portion is located in opposed relation to said driving gear;

solenoid means for regulating operation of said locking device;

selection means for selecting said modes when each toothless portion is located in opposed relation to said driving gear; and

selection control means for regulating said solenoid means to control said selection means while said partially toothless gear is rotated.

4,896,235

MAGNETIC TRANSDUCER HEAD UTILIZING MAGNETORESISTANCE EFFECT

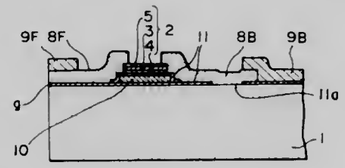
Hiroshi Takino, Kanagawa, Japan; Shigeyoshi Imakoshi, deceased, late of Kanagawa, Japan (by Yuko Imakoshi, heir); Nobuhiro Terada, Miyagi, Japan; Norio Saito, Miyagi, Japan; Hideo Suyama, Miyagi, Japan, and Kenichiro Tsunewaki, Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 927,133, Nov. 5, 1986, abandoned. This application Jan. 17, 1989, Ser. No. 298,299

Claims priority, application Japan, Nov. 5, 1985, 60-247752

Int. Cl.[4] G11B *5/30*

U.S. Cl. 360—113 **13 Claims**



1. A magnetic transducer head utilizing magnetoresistance effect comprising;

first and second sensing elements arranged parallel to each other and each subject to a common signal magnetic field,

each of said first and second sensing elements being composed of first and second soft magnetic layers which are superimposed and a nonmagnetic layer mounted between said first and second soft magnetic layers and forming a track width (TW),

at least one of said first and second soft magnetic layers having a magnetoresistance effect and said first and second soft magnetic layers magnetostatically coupled through said nonmagnetic layer,

a pair of electrodes connected to each of said first and second sensing elements at first and second end portions of each of said first and second sensing elements and said first and second sensing elements connected in series, a sense current flows through said first and second sensing elements in opposite directions,

said first and second sensing elements receiving a signal magnetic field which is parallel to said sense current, and said first and second soft magnetic layers having an easy axis of magnetization which is substantially perpendicular to said sense current, at least one slit formed in said first and second sensing elements in a direction perpendicular to said track width and a coupling layer **29** extending between said first and second sense elements in a direction parallel to said track width.

4,896,236

TAPE STABILIZER UNIT FOR STABILIZING A MOVING TAPE IN A TAPE RECORDING AND/OR REPRODUCING APPARATUS

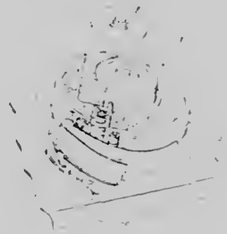
Hayao Usui, and Satoshi Mogi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 13, 1988, Ser. No. 218,226

Claims priority, application Japan, Jul. 15, 1987, 62-176586

Int. Cl.[4] G11B *15/61, 15/66, 15/60*

U.S. Cl. 360—130.23 **28 Claims**



1. A tape stabilizer unit for stabilizing a moving tape in a tape recording and/or reproducing apparatus comprising:

a roller arranged so as to be in contact with a surface of the tape, said roller being rotatable by engagement with the moving tape;

a circular weight having a diameter larger than that of said roller; and

means for detachably connecting said weight to said roller so that rotation of said roller causes rotation of said weight.

4,896,237

MAGNETIC TAPE CARTRIDGE COMPATIBLE WITH DISK DRIVE AND TAPE DRIVE MECHANISM THEREFOR

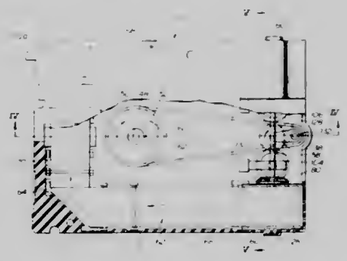
Toshiro Obta, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,884

Claims priority, application Japan, Aug. 30, 1985, 60-189887; Aug. 30, 1985, 60-131692[U]

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 **26 Claims**



1. A magnetic tape cartridge for use with a disk drive for transferring data between a magnetic tape within said cartridge and a disk drive head, comprising:

means for defining a tape run path for passing across said disk drive head for transferring data between said magnetic tape and said disk drive head;

first and second reels arranged within said cartridge at respective ends of said tape run path and having said magnetic tape wound therearound, said first and second reels being rotatably mounted for feeding said magnetic tape from one reel to the other reel;

mean arranged within said cartridge for selectively driving one of said first and second tape reels for winding said magnetic tape thereon from the other reel, said means for driving including a first gear mounted for rotation with said first reel, a second gear mounted for rotation with said second reel and a third gear connected for rotation by a drive mechanism of said disk drive and selectively cooperating with one of said first and second gears in response to a selected driving direction of said drive mechanism.

4,896,238

TAPE CASSETTE WITH PRESSABLE CAP FOR FIXING REEL ON REEL BASE

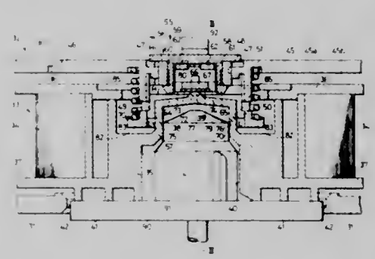
Takashi Oogi; Tadao Igarashi, both of Miyagi, and Haruyuki Karibe, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,387

Claims priority, application Japan, Dec. 5, 1986, 61-187519[U]

Int. Cl.[4] G11B *23/08*

U.S. Cl. 360—132 **7 Claims**



1. A tape cassette comprising:

a reel on which a tape is wound;

a cassette casing having an upper half with a hole and a lower half, said upper half and said lower half being formed so as to rotatably accommodate said reel therebetween; and

a reel pressing means fitted into said hole in said upper half, said reel pressing means having:

(a) a holder including a reel bearing for bearing said reel by way of a projection provided in alignment with the axis of rotation of said reel;

(b) a cap formed with an upper surface that is continuous and pressable by a reel pressing member provided in a cassette mounting device, said cap being engageable with said holder so that said cap and said holder are disposed on opposite sides of said upper half; and

(c) spring means interposed between said upper half and said holder so as to urge said reel toward said lower half;

said continuous surface being flat so as to facilitate engagement with said pressing member over an extended area and so as to impose substantially no restriction on the configuration and construction of said real pressing member.

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4,896,239

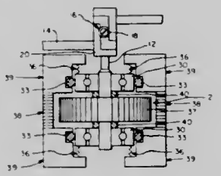
BI-COMPLIANT ROTOR STEPPER MOTOR FOR AN ACTUATOR IN A DISC DRIVE

Sanjoy Ghose, Santa Cruz County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 31,904, Mar. 30, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 259,457

Int. Cl.[4] G11B *5/012;* **F16C** *1/02*

U.S. Cl. 360—106 **4 Claims**



1. A stepper motor especially adapted for use in an actuator in a disc drive comprising a motor housing, a stator within the housing, a rotor movable relative to the stator and fixed to a motor shaft and responsive to pulses applied to said motor to drive said motor shaft, axially spaced ball bearings rotatably supporting said shaft, means fixedly supporting said ball bearings against radial direction comprising a ring of hardened elastomer surrounding said ball bearings and filling the radial spacing between the motor housing and the bearings outer race, and means resiliently supporting said bearings against axial deflection comprising preloaded spring means which are axially spaced and thus resiliently support the spaced ball bearings, thereby permitting small non-critical axial deflection of said motor shaft but restraining said shaft against deflection in the critical, radial direction.

4,896,240

MAGNETIC DISK HAVING AN INDEX AREA AND A LIMITED NUMBER OF RADIALLY EXTENDING SERVO SECTIONS

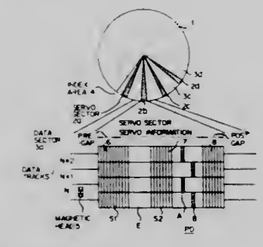
Kazunori Moriya, Yokohama; Nobuyuki Takagi; Toshihiro Sugaya, both of Tokyo, and Norio Nakamura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 911,120, Sep. 24, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,429

Claims priority, application Japan, Sep. 24, 1985, 60-210424

Int. Cl.[4] G11B *5/82*

U.S. Cl. 360—135 **3 Claims**



1. A magnetic disk comprising:

an inde area provided in part of said magnetic disk, an index signal being recorded in said index area; and

a limited number of radially extending servo sections formed only in a partial area spanning only a limited angular region of said magnetic disk and each intervening between selected data sectors positioned subsequent to said index area, each of said servo sections having a servo information area in which a servo information pattern signal is formed, said number of servo sections being 3 or 4, wherein an angular distance traversing each servo section from a first to a last servo section is smaller than an angular distance from the first to the last servo section when measured in an opposite direction not traversing said plural servo sections.

4,896,241

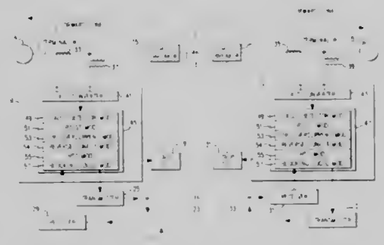
DIRECTIONAL COMPARISON BLOCKING PROTECTIVE RELAY SYSTEM

Hung J. Li, Coral Springs, Fla., and Deborah K. Mort, Wilkins Twp., Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1989, Ser. No. 317,163

Int. Cl.[4] H02H *3/30*

U.S. Cl. 361—66 **15 Claims**



1. A directional comparison blocking relay system protecting an electrical power transmission path segment of a predetermined length against faults, said transmission path segment including circuit breakers at each end thereof for interrupting current in response to a trip signal, said system including a terminal unit associated with each end of said transmission path segment for selectively generating the trip signal for the circuit breaker at the associated transmission path end, and a communications channel between said terminal units for carrying signals between the terminal units, each said terminal unit including:

means monitoring currents and voltages at the associated end of the transmission path segment and generating incremental change signals in response to predetermined incremental changes in said currents and voltages indicative of a fault condition;

forward looking pilot relay means responsive to currents at the associated end of the transmission path segment and having a forward zone extending beyond the length of said transmission path segment in a direction toward the other terminal unit, and operative to generate a forward fault signal in response to currents indicative of a fault in said forward zone, said forward looking relay responding to said fault more slowly than said monitoring means;

transmitter means for transmitting signals over said communications channel to said other terminal;

receiver means for receiving signals over said communications channel from the other terminal; and

logic means comprising blocking signal generating means generating a local blocking signal in response to said incremental change signals, said transmitter means transmitting said local blocking signal to the other terminal unit over said communications channel, said receiver means receiving a local blocking signal transmitted by the other terminal as a remote blocking signal, trip signal generating means generating a trip signal in response to a forward fault signal, trip blocking means blocking said trip signal generating means from generating a trip signal in response to either a local blocking signal or a remote blocking signal, and blocking signal stop means canceling said blocking signal generating means from generating said local blocking signal, and hence, the remote blocking signal received at the other terminal, in response to said forward fault signal, whereby said trip signals are generated at each terminal only for internal faults between said terminals and are generated substantially simultaneously at each terminal.

4,896,242

DIRECT AC-DC CONVERTER FAULT PROTECTION SYSTEM

Charles L. Neft, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1988, Ser. No. 220,705

Int. Cl.[4] H02H *7/10*

U.S. Cl. 361—87 **9 Claims**



1. In a direct AC to AC converter having a plurality of bilateral switches (BSW) associated in groups between input lines and output lines of the converter, the BSW's of a group being operatively connected each between a corresponding input line and an output line from such group; and control switching means for controlling said BSW's according to a switching pattern wherein said BSW's are concurrently controlled for conduction in groups pertaining to the different input lines and a corresponding common output line; the combination of:

one current sensor operative concurrently in relation to at least the several converter input lines for one group of BSW's whereby a fault current occurring with one BSW will pass to another BSW and said one current sensor will see twice said fault current; and

another current sensor operative in relation to the output line from said one group;

means being provided for comparing the outputs of said one and another current sensors for detecting a fault current within said one group.

4,896,243

EFFICIENT ESD INPUT PROTECTION SCHEME

Amitava Chatterjee, Richardson, and Charvaka Duvvury, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1988, Ser. No. 287,427

Int. Cl.[4] H02H *9/04*

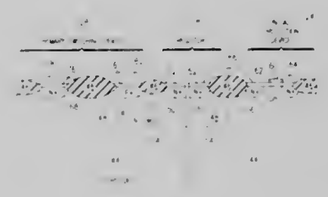
U.S. Cl. 362—91 **12 Claims**

1. A circuit for dissipating an electrostatic voltage at the pin of an integrated circuit formed on a semiconductor layer of a first conductivity type, comprising:

a resistor having a first node connected to said pin and a second node connected to said integrated circuit such that the current is drawn therethrough in response to an electrostatic voltage at the pin, said resistor comprising a first doped region of a second conductivity type;

a first switching device disposed between said first node of said resistor and a reference voltage, said first switching device operable to conduct electricity from the pin to said reference voltage responsive to a voltage at a first value across said first switching device;

a second switching device disposed between said second node of said resistor and said reference voltage for drawing current through said resistor to said reference voltage in response to a voltage at the pin of the integrated circuit at a value less than said first voltage value; and



a second doped region of second conductivity type disposed between said first doped region and the semiconductor layer, said second doped region being less heavily doped than said first doped region, the breakdown voltage between said second doped region and the semiconductor layer being equal to or greater than the first voltage value.

4,896,244

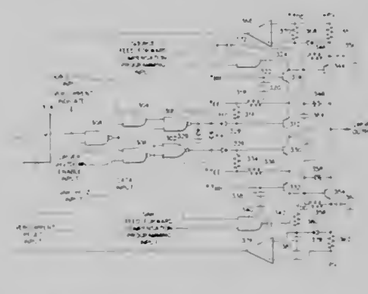
FEED FORWARD COMPENSATION CIRCUITRY AND SWITCHING LOGIC DRIVER WITH OVERCURRENT PROTECTION INCORPORATING SAME

Roger J. Kalina, San Diego, Calif., assignor to General Dynamics Electronics Division, San Diego, Calif.

Continuation-in-part of Ser. No. 28,729, Mar. 23, 1987, Pat. No. 4,783,714. This application Jun. 14, 1988, Ser. No. 206,524

Int. Cl.[4] H02H *3/087*

U.S. Cl. 361—98 **33 Claims**



1. A logic driver comprising:

control means for receiving input power and an input bistate data bit and responsive to first and second states of said input bistate data bit for providing output power at corresponding first and second predetermined voltage levels, said control means having feed forward compensation means for modifying the response time of said control means for providing output power in response to said input bistate data bit;

sense means coupled to said control means for detecting the level of current in said input power and providing a corresponding current level indication; and

overcurrent means, responsive to said current level indication, for generating an overcurrent command when said input power current level exceeds a predetermined level,

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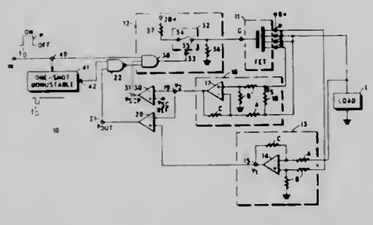
said control means responsive to said overcurrent command for disabling the output of power at the corresponding predetermined voltage level at said output.

4,896,245

FET OVERTEMPERATURE PROTECTION CIRCUIT

John Qualich, Wheeling, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 13, 1989, Ser. No. 322,015
Int. Cl.[4] H02H *3/26*
U.S. Cl. 61—103 **21 Claims**



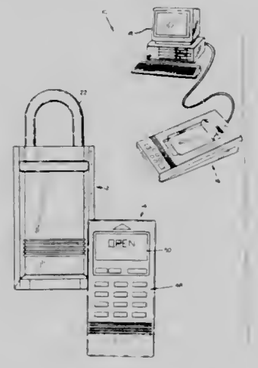
1. A FET overtemperature protection circuit comprising:
a FET having at least gate, source and drain electrodes, one of the drain and source electrodes intended for connection to a load so that the FET can selectively control current supplied to the load;
drive excitation circuit means for providing excitation to the FET to selectively control conduction of the FET in accordance with received control signals;
first circuit means coupled to the FET for developing a first signal indicative of and varying in accordance with the voltage between the FET drain and source electrodes;
second circuit means coupled to the FET for developing a second signal indicative of and varying in accordance with current flowing through one of said FET drain and source electrodes when said FET is on;
combining circuit means coupled to the first and second circuit means for receiving the first and second signals and combining them to provide an output signal in response thereto when a predetermined relationship exists between the first and second signals indicative of FET drain to source on resistance exceeding a predetermined value; and
coupling means for providing said output signal as at least one of the control input signals received by said drive excitation circuit means, said drive excitation means including means for responding to said output signal by reducing said FET current when said predetermined relationship exsits.

4,896,246

ELECTRONIC LOCK WITH ENERGY CONSERVATION FEATURES

Walter G. Henderson, Corvallis; John Q. Archer, II, Salem; Gerald R. Daum, Salem; George A. Ellson, Salem; John E. Gray, Salem; Wayne F. Larson, Salem; Rockne M. Olds, Salem; Jerry P. Scansen, Portland; John W. Sherman, Corvallis, and Edgar J. Unrein, Newberg, all of Oreg., assignors to Supra Products, Inc., Salem, Oreg.

Continuation-in-part of Ser. No. 192,831, May 11, 1988, which is a division of Ser. No. 15,864, Feb. 17, 1987, Pat. No. 4,766,646, which is a continuation-in-part of Ser. No. 831,601, Feb. 21, 1986, Pat. No. 4,727,368, which is a continuation-in-part of Ser. No. 814,364, Dec. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 788,072, Oct. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 788,072, Oct. 16, 1985, abandoned. This application May 2, 1989, Ser. No. 348,082
Int. Cl.[4] H01H *47/00*
U.S. Cl. 361—171 **4 Claims**



1. In a lock system in which a movable member is latched in place by the plunger of an unenergized electrical solenoid and in which the movable member can be manually moved for a distance despite its being latched in place, the system further including a solenoid drive circuit through which energy is selectively applied to the solenoid from a battery, an improvement for conserving battery energy comprising: switch means operatively coupled to the movable member and connected to the drive circuit so that energy is not applied to the solenoid through the drive circuit until said movable member is manually moved.

4,896,247

ROBOT VISION COOLING/PROTECTION SYSTEM

Calmon S. Cozer, 141-43 71st Ave., Flushing, N.Y. 11367

Filed Jul. 25, 1988, Ser. No. 223,517
Int. Cl.[4] B23K *9/12*
U.S. Cl. 361—385 **9 Claims**

5. A housing having an inner chamber wherein opto-electronic circuitry is contained and an optical interface between said inner chamber and the outside environment, said housing comprising;
a double walled, cylindrically shaped heat sink attached to said housing and having means forming a plurality of spirally shaped, independent cooling passages within its walls, each spiral passage having an inlet for receiving a cooling fluid and an outlet, said heat sink drawing heat from said housing and transmitting it to said cooling fluid;
means for directing said cooling fluid from a source to said inlet of each of said spiral passages; and
means for directing said fluid from said outlet of each spiral passage so that it flows across at least one face of said optical interface in a spiral motion, said spiral fluid flow



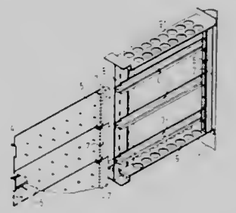
cooling said optical interface and preventing particle contamination thereof.

4,896,248

MODULE FRAME FOR RECEIVING INSERTABLE ELECTRICAL PRINTED CIRCUIT BOARDS

Karl Zell, Niederpoecking; Egon Jaeger, Munich; Peter Stoerk, Eurasburg, and Guenther Steiner, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 191,068, May 6, 1988, abandoned. This application Jun. 16, 1989, Ser. No. 368,169
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723395
Int. Cl.[4] H05K *07/14*
U.S. Cl. 361—415 **4 Claims**



1. A module frame receiving insertable electrical printed circuit boards equipped with components, which circuit boards are plugged into a motherboard in parallel planes and are connected to one another in their inserted condition with plug connectors by way of said motherboard, comprising:
a plurality of horizontally-extending guides arranged in a plurality of sets, each set having a plurality of guides arranged under one another within the module frame, the guides in each set defining a vertical plane, the guides in each set being spaced at intervals parallel to the planes of the printed circuit boards; and
corresponding to at least one set of guides, at least one printed circuit board including at least one guide frame attached along a back surface of the circuit board operatively engaging one of the horizontally-extending guides; whereby said circuit board is connectible independently to the motherboard by way of at least one of the plug connects.

4,896,249

ELECTRIC DOUBLE LAYER CAPACITOR

Masanori Endo, and Kouichi Watanabe, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 8, 1989, Ser. No. 308,307
Claims priority, application Japan, Feb. 9, 1988, 63-028126
Int. Cl.[4] H01G *9/00*
U.S. Cl. 361—502 **4 Claims**



1. An electric double layer capacitor, comprising:
first and second polarizable electrodes,
a separator disposed between said first and second polarizable electrodes, and
first and second current collectors respectively in contact with said first and second polarizable electrodes, and
each of said first and second polarizable electrodes comprising an activated carbon electrode made of polyacrylonitrile based activated carbon having a nitrogen content of not more than 7 wt % and electrolyte with which said activated carbon electrode is impregnated, said polyacrylonitrile based activated carbon being activated such that is has a greater affinity for said electrolyte without deterioration of voltage retaining characteristics of said electrodes.

4,896,250

SOLVENT-PROCESSIBLE ELECTRICALLY CONDUCTIVE COATINGS

Mary Sullivan, Marlboro, Mass., assignor to Emerson & Cuming, Inc., Lexington, Mass.

Filed Feb. 12, 1988, Ser. No. 155,188
Int. Cl.[4] H01G *9/00*; H01B *1/02*
U.S. Cl. 361—523 **9 Claims**

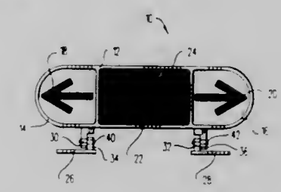
1. An article comprising a substrate and a layer thereon, said layer comprising (1) a coating comprising conductive particle filled polysulfone, and (2) solder on said conductive particle filled polysulfone of said coating.

4,896,251

AUXILIARY TURN SIGNAL ATTACHMENT

Albert J. Fasel, 97 W. Silver Lake Road N., Traverse City, Mich. 49684

Filed Dec. 6, 1988, Ser. No. 280,505
Int. Cl.[4] B60Q *1/38*
U.S. Cl. 362—80.1 **5 Claims**

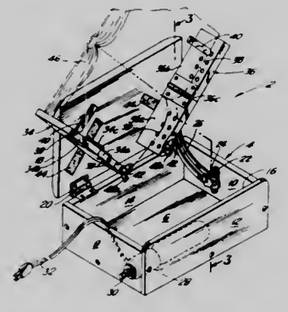


1. A auxiliary turn signal attachment, comprising:
a housing;
a pair of indicator light compartments at opposite ends of said housing;

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said indicator light compartments separated by a central section;
an indicator light in each of said compartments;
adjustable mounting means for mounting said housing adjacent a rear window of a vehicle and for adjusting the height and inclination of said housing with respect to an intended mounting surface;
said adjustable mounting means including a pair of second brackets each having a plurality of apertures for reception of threaded fasteners;
a pair of elongated rods pivotally mounted to said brackets and extending through a floor portion of said housing;
a pair of mounting tabs within said housing, each of said mounting tabs having a cylindrical bore slidably receiving one of said rods; and
a pair of set screws in said mounting tabs for clamping said rods in an adjusted position.

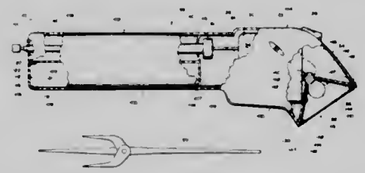
4,896,252
BOOKHOLDER
Richard M. Stewart, 236 Central Rd., Middlebury, Conn. 06762
Filed Aug. 1, 1988, Ser. No. 226,598
Int. Cl.[4] A47B *19/00*
U.S. Cl. 362—98 **9 Claims**



1. An improved bookholder comprising;
a box having a base and defining a top opening,
a lid for said box adapted to be pivotable thereon from a first position extending in a substantially vertical direction from said base to a second position in which said lid covers said top opening, said lid having a flat inside surface directed toward said top opening,
a pair of movable arms defining ledges thereon, said arms being attached to said flat inside surface of said lid and adapted to support a book on said ledges when the lid is in said first position,
means for holding said book on the ledges and against said lid,
said arms being arranged for pivoting movement in a plane parallel to said lid to a non-interfering location where they will enter the top opening of said box as the lid is pivoted to said second position, wherein said arms are pivotably connected by pivot pins normal to said lid, and further including means for fixing said arms when they are pivoted to a selected location on said lid.

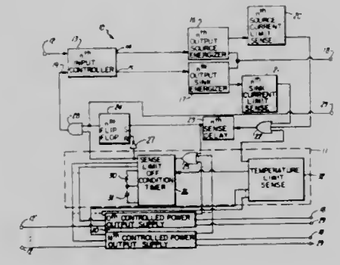
4,896,253
FLASHLIGHT SKEWER
Grant L. Southworth, 618 E. 640 North, Orem, Utah 84057
Continuation-in-part of Ser. No. 190,869, May 6, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 303,875
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—109 **16 Claims**

1. A hand-held combination skewer/flashlight assembly devoid of a surface-engaging support comprising:
cantilevered elongated linear rod means having sufficient structural integrity so as to remain substantially linear when a wiener or the like is supported adjacent the distal end of the rod means;
a food impaling tip at the distal end of the rod means;
the skewer/flashlight assembly further comprising power means associated with the proximal end of the rod means so that when the power means are activated the rod means are rotated;



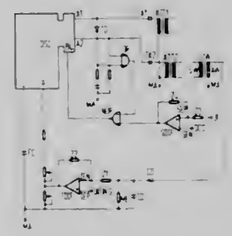
the skewer/flashlight assembly also comprising housing means comprising (a) means which carry and solely support (1) the cantilevered rod means and (2) the power means and (b) manual handle means by which the entire assembly is hand-held;
the housing means comprising flashlight means;
the housing means, the rod means and the power means of the skewer/flashlight assembly being free from surface-engaging support structure.

4,896,254
PROTECTIVE POWER CONTROLLER
Robert M. Bennett, Canton, Mich., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 28, 1989, Ser. No. 345,143
Int. Cl.[4] H02H *7/10*
U.S. Cl. 363—50 **26 Claims**



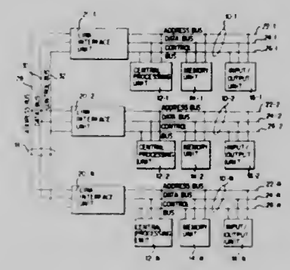
1. A protective multiple output power controller for supplying ranges of currents within selected limits at those of a plurality of outputs thereof to which corresponding loads are electrically connected to result in selected voltages occurring thereacross, said power controller comprising:
a plurality of input controllers each having a first output region and each having a control input region and a cessation input region, said plurality of input controllers each being capable of having its said first output region in a first state for a first control state occurring at its said control input region and a first cessation signal value on its said cessation input region, and having its said first output region in a second state for a second control state occurring at its said control input region with said first cessation signal value on its said cessation input region, and of having its said first output region in said second state if a second cessation signal value occurs on its said cessation input region;
a first plurality of output energization means each having first and second current pass regions and having a control region therein by which it is capable of being directed, through electrical energization thereof, to effectively provide a conductive path between its said first and second current pass regions, said control region of each of said first plurality of output energization means being electrically connected to a said first output region of a corresponding one of said plurality of input controllers, said first and second current pass regions of each of said first plurality of output energization means having a selected one thereof serving as one of said power controller outputs and with that one thereof remaining being electrically connected to a first terminal means adapted for electrical connection to a first supply of electrical energization;
a first plurality of current sensing means each having an output region and each being capable of sensing currents flowing through at least one of said first and second current pass regions of a corresponding one of said first plurality of output energization means, and of providing a selected logic state on said output region thereof if a current being sensed thereby is beyond a selected threshold value;
a plurality of resettable memory means each having an output region and both a setting input region and a resetting input region such that one logic state occurs on its said output region if a selected logic state occurs on its said setting input region but that an opposite logic state occurs on its said output region if a selected logic state occurs on its said resetting input region, said setting input region of each of said plurality of memory means being electrically connected to a said output region of a corresponding one of said first plurality of sensing means;
a power removal timer means having an initiation input region and an output region, said power removal timer means being capable of having a selected signal occur on its said output region at a selected time duration after a selected signal occurs on said power removal timer means initiation input region, said power removal timer means output region being electrically connected to said resetting input region of each of said plurality of resettable memory means;
a first coupling means having an output region and a plurality of input regions, said first coupling means being capable of having a selected signal occur on its output region after a selected signal occurs on any one of its said plurality of input regions, said first coupling means output region being electrically connected to said power removal timer means initiation input region and said first coupling means plurality of input regions each being electrically connected to a said output region of a corresponding one of said first plurality of sensing means; and
a plurality of second coupling means each having an output region and a pair of input regions, said plurality of said coupling means each being capable of having a signal occur on its said output region after selected signals occur concurrently on both of its said, pair of input regions, said plurality of second coupling means each having its output region electrically connected to a said cessation input region of a corresponding one of said plurality of input controllers, said plurality of second coupling means each having one of its said pair of input regions electrically connected to a said output region of a corresponding one of said plurality of resettable memory means and having that input region thereof remaining electrically connected to said output region of said power removal timer means.

4,896,255
POWER PACK COMPRISING RESONANT CONVERTER
Manfred Schlenk, Augsburg; Edwin Hielscher, Oberursel/Stierstadt, and Werner Loges, Maintal, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 147,724, Jan. 25, 1988, abandoned. This application Jun. 21, 1989, Ser. No. 368,890
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718960
Int. Cl.[4] H02M *7/539*
U.S. Cl. 363—97 **12 Claims**



4. A circuit for controlling a resonant circuit which is successively charged and discharged and which forms the primary circuit of a transformer in a power pack, comprising, a transformer (Ü), a capacitor (C) connected in the primary circuit of said transformer, switch means closing the primary circuit through or bypassing a DC voltage source (DCI), a by-stable flip-flop with its input connected to an output of a current zero value generator associated to the primary circuit and to an output of a frequency generator which depends on an output voltage (DCO) at the secondary side of said transformer (Ü); and the output of said by-stable flip-flop is connected to the switch means through a coupling means.

4,896,256
LINKING INTERFACE SYSTEM USING PLURAL CONTROLLABLE BIDIRECTIONAL BUS PORTS FOR INTERCOMMUNICATION AMOUNG SPLIT-BUS INTRACOMMUNICATION SUBSYSTEMS
Barry R. Roberts, Lindenhurst, Ill., assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed May 14, 1986, Ser. No. 863,060
Int. Cl.[4] G06F *13/36, 13/40, 13/42, 15/46*
U.S. Cl. 364—200 **3 Claims**



1. A data processing system comprising:
a plurality of intracommunication bus systems, each having an address bus, a data bus, and a control bus, each address bus being assigned a unique set of addresses;
a plurality of data processor components, at least one of said

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plurality of data processor components being connected to each of said plurality of intracommunication bus systems, having means for generating address signals over said address buses for requesting communication with any other one of said plurality of intracommunication bus systems, each of said generated address signals corresponding to one of said unique sets of addresses corresponding to a respective one of the other of the plurality of intracommunication bus systems;

an intercommunication bus system having an address bus, a data bus, and a control bus, common to said plurality of intracommunication bus systems; and

each of said plurality of intracommunication bus systems including a link interface means having first, second, and third bidirectional ports, each port having forward conduction, reverse conduction and non-conduction states, said ports connected respectively to corresponding data, address and control buses of said intercommunication and intracommunication bus systems to which said link interface means is connected,

each said link interface means including:

master control means having first controller means for selectively operating said first, second and third ports to pass address signals, data signals, and control signals through said first, second and third ports, respectively, for electrically connecting a selected one of the plurality of intracommunication bus systems to said intercommunication system in response to receipt of said address signals, said master control means including address decoder means for issuing a command signal in response to a received address signal which does not correspond to an address assigned to said corresponding intracommunication bus system from which said address signal was received, said command signal being indicative of said received address signal said first controller means including means for selecting the direction of operation of said first and third ports in response to generation of said command signal by said address decoder of the same link interface means, and means for selecting the direction of operation of said second port in response to control signals received from said control bus of said corresponding intracommunication bus system; and

slave control means having second controller means for selectively operating said first, second and third ports to pass said address signals, data signals, and control signals through said first, second and third ports, respectively, for electrically connecting a selected one of the plurality of intracommunication bus systems to said intercommunication system in response to a received command signal from another link interface means when said received command signal is indicative of an address included in the unique set of addresses assigned to the intracommunication bus system associated with said link interface means.

4,896,257

COMPUTER SYSTEM HAVING VIRTUAL MEMORY CONFIGURATION WITH SECOND COMPUTER FOR VIRTUAL ADDRESSING WITH TRANSLATION ERROR PROCESSING

Kazuhiko Ikeda, Yokohama, and Naoki Koizumi, Kanagawa, all of Japan, assignors to Panafacom Limited, Yamato, Japan

Continuation of Ser. No. 819,785, Jan. 17, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,598

Claims priority, application Japan, Jan. 19, 1985, 60-8077

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **19 Claims**

1. A computer system comprising:

a first computer means for processing tasks;

a second computer means independently operable from said first computer means for processing virtual address control;

a main memory means, operatively connected to said first and second computer means, for storing an address conversion table converting a virtual memory address into an actual memory address;

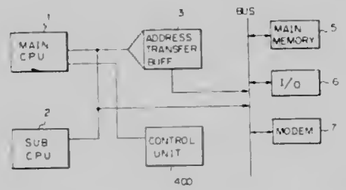
a buffer memory means, operatively connected to said first and second computer means, for storing pairs of virtual memory addresses and corresponding actual memory addresses; and

control means for controlling operations of said first and second computer means, said main memory means, and said buffer memory means, including first and second latch means,

wherein, when said first computer means outputs a virtual memory address to said buffer memory means to obtain a corresponding actual memory address, said buffer memory means outputting said actual memory address, corresponding to said output virtual memory address, within said address pairs transferred from said main memory means,

when said corresponding actual memory address output from said buffer memory means is determined to be invalid by said control means, said first latch means being set in order to halt said first computer means from outputting other virtual memory addresses, said control means outputting an interruption signal for activating said second computer means, and said second computer means accessing said address conversion table in said main memory means to find a pair of virtual and actual addresses corresponding to said output virtual memory address in response to said interruption signal, said second computer means reading said found pair of virtual and actual addresses from said address conversion table and storing said found pair of said virtual and actual addresses in said buffer memory means in order to output a corresponding actual memory address from said buffer memory means to said first computer means, said second computer means resetting said first latch means to enable said first computer means to output other virtual memory addresses,

when said second computer means detects that said output virtual memory address is erroneous after searching said address conversion table in said main memory means and not finding said output virtual memory address, said second computer means setting said second latch means to terminate access for said output virtual memory address and resetting said first latch means to remove said halt for said first computer means.



4,896,258

DATA PROCESSOR PROVIDED WITH INSTRUCTIONS WHICH REFER TO BOTH TAGGED AND TAGLESS DATA

Shinichiro Yamaguchi; Hidekazu Matsumoto, both of Hitachi; Tadaaki Bandoh, Naka; Hiroaki Nakanishi, Hitachi; Kenzi Hirose, Hitachi; Takao Kobayashi, Hitachi, and Yoshihiro Miyazaki, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,407

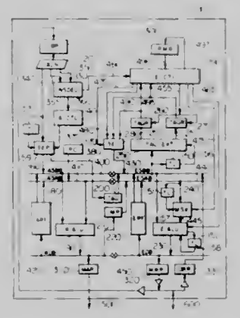
Claims priority, application Japan, Jul. 4, 1985, 60-145831; Jul. 8, 1985, 60-148301

Int. Cl.[4] G06F *9/34*

U.S. Cl. 364—200 **21 Claims**

1. A data processor for reading an instruction out of a memory unit storing basic data and instructions to execute the instruction, wherein said basic data is of a first data type comprised of only data and a second data comprised of a tag part which identifies a data type and a data part and wherein said first data type consists of data n bits ($n \geqq 16$) and said second data type includes a first sub-data type consisting of a tag of k bits ($k < n$) and a data part of ($n-k$) bits excluding the tag and a second sub-data type consisting of a tag of l bits ($l < n$, $l \leqq K$ and a data part of ($n-l$) bits excluding the tag, said data processor comprising:

first decoder means for detecting whether the instruction read out of said memory unit is an instruction having the first data type as an operand or an instruction having the second data type as an operand;



second decoder means, responsive to said first decoder means indicating that an operand of an instruction having the second data type as an operand is contained in an instruction word, for detecting whether the operand contained in the instruction word has the first sub-data type or the second sub-data type;

means for separating the tag and the data part when the second sub-data type is detected by said second decoder means;

tag storing means for storing the separated tag; and

address computing means for using the data of the second sub-data type part for address computation.

4,896,259

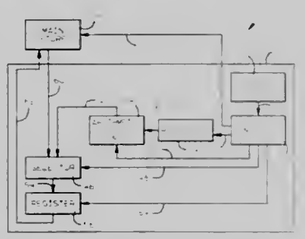
APPARATUS FOR STORING MODIFYING DATA PRIOR TO SELECTIVELY STORING DATA TO BE MODIFIED INTO A REGISTER

Michael N. Jacobs; David O. Lewis, both of Rochester, and Dale J. Thomforde, Pine Island, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 648,851, Sep. 7, 1984, abandoned. This application Nov. 30, 1987, Ser. No. 125,725

Int. Cl.[4] G06F *3/05, 9/00, 9/32*

U.S. Cl. 364—200 **21 Claims**



19. A data read/modify/write mechanism for performing read/modify/write operations in a computer system comprising:

a control store containing a plurality of control words for controlling the read/modify/write operations;

a controller coupled to the control store for decoding the control words and routing the decoded control words;

at least one register containing modifying data;

an ALU coupled to the controller for receiving decoded control words, and coupled to the at least one register for receiving modifying data as controlled by the decoded control words;

a main storage containing data to be modified;

a main storage controller coupled between the controller and the main storage for receiving decoded control words from the controller and retrieving data to be modified as controlled by the decoded control words;

register means coupled between the ALU and the main storage, and coupled to the controller for storing data to be modified from the main storage, and modifying data from the ALU; and

selector means coupled between the register means and the main storage and ALU, and coupled to the controller for receiving control words which set the selector means to select the modifying data and data to be modified for storage in the register means as controlled by the control means, wherein the register means is in turn coupled to the ALU to supply the ALU with modifying data prior to the modified data in the register means being written back to main storage.

4,896,260

DATA PROCESSOR HAVING INTEGRATED CIRCUIT MEMORY REFRESH

Gilbert P. Hyatt, 7841 Jennifer Cir., La Palma, Calif. 90623

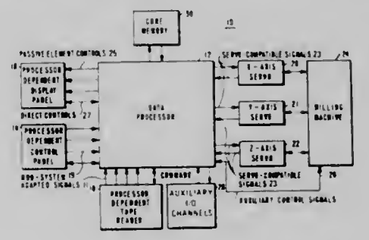
Continuation of Ser. No. 402,520, Oct. 1, 1973, Pat. No. 4,825,364, which is a division of Ser. No. 101,881, Dec. 28, 1970, abandoned. This application Apr. 24, 1989, Ser. No. 343,112

Claims priority, application United Kingdom, Dec. 17, 1971, 58814/71; Canada, Dec. 23, 1971, 130959; Fed. Rep. of Germany, Dec. 23, 1971, 2164190; Japan, Dec. 28, 1971, 3974/1972; St. Helena, Dec. 28, 1971, 19086/71

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—200 **82 Claims**



1. An integrated circuit digital processing system comprising:

an integrated circuit dynamic memory storing digital data;

an integrated circuit digital processor coupled to the integrated circuit dynamic memory and processing the digital data stored by said integrated circuit dynamic memory;

an integrated circuit control circuit periodically generating a refresh signal to command refresh of the digital data stored by said integrated circuit dynamic memory; and

an integrated circuit refresh circuit coupled to said integrated circuit dynamic memory and coupled to said integrated circuit control circuit and refreshing the digital

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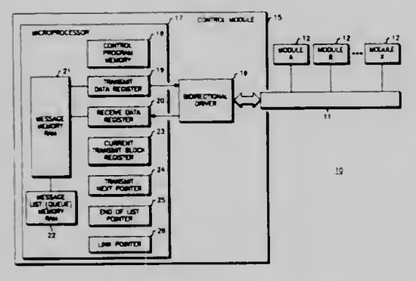
data stored by said integrated circuit dynamic memory in response to the refresh signal without conflict with the processing of the digital data by said integrated circuit digital processor.

4,896,261

SYSTEM FOR SCHEDULING SERIAL MESSAGE TRANSMISSION ON A BUS WHICH IS ADOPTABLE FOR RESCHEDULING PRIORITIZED MESSAGES USING A DOUBLY-LINKED LIST

Michael P. Nolan, Elk Grove, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 24, 1986, Ser. No. 934,057
Int. Cl.[4] G06F *13/42, 11/14*
U.S. Cl. 364—200 **15 Claims**



1. System for scheduling serial message transmission on a single bus, comprising:

means for storing in a memory a plurality of messages to be sent, each message being stored in sequential address locations in said memory between a corresponding message start address and a corresponding message end address;

means for storing in a memory a list (queue) of said messages, said list comprising a plurality of message pointer blocks each corresponding to, and thereby identifying, one of said messages, each pointer block including at least the following information, the message start address of the message corresponding to the pointer block, the address of the pointer block corresponding to the next message scheduled to be sent, and the address of the pointer block corresponding to the previous message to be sent;

message transmission means, coupled to said message storing means and said message list storing means, for sequentially serially transmitting said messages on a bus in accordance with the next message transmission order specified in said list; and

means, coupled to said message list storing means, for adding a new message to be transmitted by said transmission means by adding a corresponding new message block, which identifies the new message, to said list and altering two of said pointer blocks previously on said message list to refer to the address of said new block, said new block including at least the following information, the message start address of the new message corresponding to the new block, the address of the pointer block corresponding to the next message scheduled to be sent and the address of the pointer block corresponding to the previous message to be sent,

said system including means for rescheduling, in response to reception of a repeat request, a previously-sent message for retransmission, wherein rescheduling occurs by utilization of said message list to identify the message pointer block corresponding to the message to be resent, and effectively adding said identified message pointer block to said list as a new block corresponding to a message to be sent,

wherein said rescheduling means includes means for, after identifying the message pointer block in said list corresponding to the message to be resent, increasing priority date corresponding to said identified pointer block, such increased priority data being compared to priority data corresponding other pointer blocks on said list when adding said identified block to said list as a new block of a message to be sent to determine where on said list said new block should effectively be added.

4,896,262

EMULATION DEVICE FOR CONVERTING MAGNETIC DISC MEMORY MODE SIGNAL FROM COMPUTER INTO SEMICONDUCTOR MEMORY ACCESS MODE SIGNAL FOR SEMICONDUCTOR MEMORY

Yukio Wayama, Numazu; Naoto Miyajima, Shizuoka; Michio Shinozaki, and Kazunari Yashima, both of Numazu, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 22, 1985, Ser. No. 704,520
Claims priority, application Japan, Feb. 24, 1984, 59-33798; Feb. 24, 1984, 59-33801; Feb. 24, 1984, 59-33802
Int. Cl.[4] G06F *3/05, 5/00, 13/00*
U.S. Cl. 364—200 **12 Claims**



3. An apparatus for auxiliary storing data transferred from a computer via a computer bus, comprising:

(a) first means including a semiconductor memory and a storage bus; and

(b) second means interposed between the computer bus and the storage bus for converting an access mode signal from the computer into a second access mode signal for the semiconductor memory and controlling data transfer between a central processing unit (CPU) of the computer and the first means in response to the converted access mode signal, wherein said second means comprises:

(c) computer bus driver/receiver means connected to the computer bus for receiving from said CPU said data access control command signals, address data and information data prepared in magnetic disc access mode and transmitting to said CPU control signals of direct memory access, interrupt signals, data access control command signals, address data and information data prepared in said magnetic disc access mode;

(d) storage bus driver/receiver means connected to the storage bus for receiving information data read from said semiconductor memory and transmitting to said semiconductor memory data access control command signals of READ, WRITE, WRITE CHECK, and address data necessary for semiconductor memory access and information data to be written in said semiconductor memory;

(e) a condition code multiplexer means connected to said computer bus driver/receiver means for poll-scanning said computer bus driver/receiver means to check sequentially whether the computer is accessing said semiconductor memory and for outputting said data access control command signals;

(f) microprogram sequencer means connected to said condition code multiplexer means for generating microprogram address designation signals in sequence in response to the data access control command signals and clock pulse signals generated by a system clock;

(g) read only memory means connected to said microprogram sequencer for outputting microprogram instructions in response to the microprogram address designation signals;

(h) register means connected to said read only memory means, said microprogram sequencer means and said condition code multiplexer means for inputting the microprogram from said read only memory there into as microinstructions in response to said clock pulse signals and for outputting succeeding sequencer addresses and instruction signals to said microprogram sequencer means and a multiplexer control signal to said condition code multiplexer means;

(i) random access memory means connected to said computer bus receiver/driver means, said storage bus receiver/driver means and said register means for temporarily storing addresses, data, information data, data access control command signals, etc.; and

(j) microprocessor means connected to said computer bus receiver/driver means, said storage bus receiver/driver means, said random access memory means, and said register means for writing/reading information data in or out of said semiconductor memory in response to command signals received through said computer bus driver/-receiver means in accordance with the microprogram instructions transferred from said read-only memory means to said register means, said microprocessor means including means for analyzing said data access control command signals, omitting data access control command signals peculiar to said magnetic disc access mode, means for selecting data access control command signals of READ, WRITE, READ HEADER and WRITE CHECK necessary for transferring information data between the computer and said semiconductor memory, means for reading information data from said semiconductor memory, means for preparing a magnetic disc header in accordance with the microprogram instructions and converting address data peculiar to the semiconductor memory access mode into address data necessary for the magnetic disc access mode in accordance with the microprogram, and means for writing information data in said semiconductor memory, and converting said address data peculiar to the magnetic disc access mode to address data necessary for the semiconductor memory access mode in accordance with the microprogram instructions, so that information data may be transferred between the computer and said semiconductor memory.

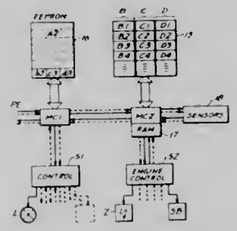
4,896,263

MULTI-MICROCOMPUTER SYSTEM

Jurgen Brauninger, Stuttgart, and Albrecht Sieber, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 941,285, Dec. 12, 1986, abandoned. This application May 26, 1988, Ser. No. 201,343
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3543996
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **2 Claims**

1. Multi-microcomputer system, comprising first and second microcomputers each having a central processor and a read-write memory and means for connecting said microcomputers with each other by at least a two-way serial data line, said first microcomputer further having, connected directly thereto, a nonvolatile programmable read-only memory, and second microcomputer having connected directly thereto a nonvolatile fixed read-only memory which is its only nonvolatile memory, said fixed read-only memory containing several varieties of a set of elements of stored data, all said varieties having corresponding elements differing from each other in the value of at least one element of said set of stored data, each said variety of stored data being stored for read-out responsive to a different designation, said programmable read-only memory of said first microcomputer being programmable during the initialization of said multi-microcomputer system to transmit only a predetermined one of said different designations for selecting a corresponding one of said varieties of said set of elements of data stored in the read-only memory of said second microcomputer, means being provided in said first microcomputer for causing said predetermined designation to be written, at initialization of said multi-microcomputer system, into said read-write memory of said second microcomputer and means being provided in said second microcomputer for writing said predetermined designation when ever received, into said read-write memory of said second computer and for selecting, in response thereto, said corresponding variety of the set of elements of data stored in the read-only memory of said second microcomputer, for use during the remainder of a period of continuous operation, after said initialization, of said multi-microcomputer system, to the exclusion during said period of all other said varieties of said set of elements of data stored in said read-only memory of said second microcomputer.

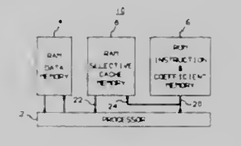


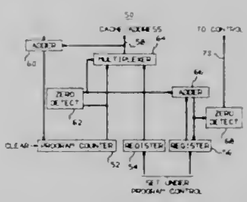
4,896,264

MICROPROCESS WITH SELECTIVE CACHE MEMORY

James R. Boddie, Hazlet, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 8, 1986, Ser. No. 904,544
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **2 Claims**





1. A circuit for data processing with at least one primary memory for storing both instructions and coefficients in the form of data, wherein the improvement comprises:

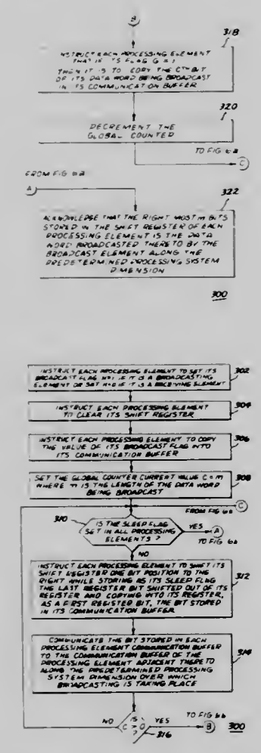
means for retrieving a set of data, including first and second subsets of data, from said primary memory;
means for selecting said first subset of data from said set of data;
a secondary memory for storing said first subset of data;
means for retrieving concurrently said first subset from said secondary memory and said second subset from said primary memory, and
control means for selectively executing said first stored subset of data with said second subset of data.

4,896,265

PARALLEL BROADCASTING METHOD AND APPARATUS

Charles M. Fiduccia, and Richard E. Stearns, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 28, 1988, Ser. No. 173,913
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 26 Claims



1. In a parallel processing system comprising a plurality of processing elements (PEs) arrayed in n-dimensions, a method for broadcasting an m-bit data word along a predetermined one of said n dimensions from each of selected ones of said PEs, all said selected PEs broadcasting their respective m-bit data words in a like predetermined direction along said predetermined dimension, said processing system being of the single instruction multiple data type in which each successive instruction is applied to all said PEs in said processing system, each said PE having a communication buffer coupled to serially communicate data bits at least to the communication buffer of the PE adjacent thereto in said predetermined direction along said predetermined dimension, each said PE having a p-bit shift register where p is greater than or equal to m, said processing system including a global counter, each said PE having a sleep flag which when set results in that PE ignoring instructions applied thereto, the communication of data bits between PEs being unaffected by the value of said sleep flag until each sleep flag in each PE is set and until the global counter is of a predetermined value, said method comprising the steps of:

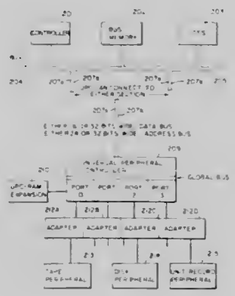
(a) instructing each said PE to set a broadcast flag to a first or a second value respectively in accordance with whether said PE is or is not one of said selected PEs;
(b) instructing each said PE to clear its respective shift register;
(c) instructing each said PE to copy the value of said broadcast flag to said communication buffer,
(d) setting a current value C of said global counter to m;
(e) determining whether said sleep flag is set in all said PEs and, if so, proceeding to step (l) and, if not, proceeding to step (f);
(f) instructing each PE not having its sleep flag set to shift its shift register one bit position in a first shifting direction while storing as said sleep flag a last register bit shifted out of said shift register and copying into said shift register as a first register bit the bit stored in said communication buffer;
(g) communicating the bit stored in each said PE communication buffer to the communication buffer of the PE adjacent thereto in said predetermined direction along said predetermined dimension;
(h) determining if said global counter has the value 0 and, if so, returning to step (e) and, if not, proceeding to step (i);
(i) instructing each said PE to store the Cth bit of said data word into said communication buffer only if said broadcast flag is set;
(j) decrementing said global counter,
(k) returning to step (e); and
(l) determining that the m bits stored in said shift register and justified to one end thereof along said first shifting direction constitute said data word.

4,896,266

BUS ACTIVITY SEQUENCE CONTROLLER

John A. Klashka, North Andover; Sidney L. Kaufman, Stoughton; Krzysztof A. Kowal, Framingham, all of Mass.; Richard P. Lewis, Sandown, N.H., and John L. McNamara, Jr., Tweksbury, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Jun. 3, 1987, Ser. No. 57,460
Int. Cl.[4] G06F *13/32*
U.S. Cl. 364—200 13 Claims



1. In a data processing system comprising a main memory and a CPU coupled to a system bus, and a peripheral sequence controller for accessing adapters coupled to respective peripheral devices, the peripheral sequence controller being coupled to the system bus and comprising:

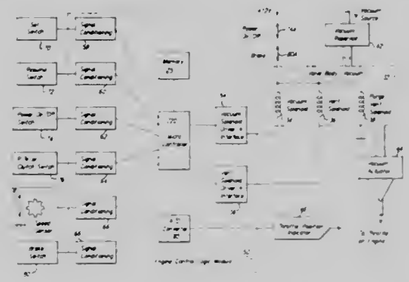
a microprocessor;
a plurality of adapter ports, each for communicating with an adapter;
logic means for polling each adapter port to determine if an adapter having peripheral devices is connected to the adapter port;
a plurality of direct memory access means each for controlling a respective direct memory access to and from said main memory and to and from one of said peripheral devices through one of the adapter ports; and
a sequencer means for sequentially enabling selected direct memory access means to have access to respective adapter ports for DMA data transfers between main memory and peripheral devices coupled to the adapter ports and for enabling the microprocessor access to the adapter ports to service interrupts after each direct memory access.

4,896,267

ELECTRONIC SPEED CONTROL SYSTEM FOR VEHICLES, A METHOD OF DETERMINING THE CONDITION OF A MANUAL TRANSMISSION CLUTCH AND OF A PARK/NEUTRAL GEAR IN AN AUTOMATIC TRANSMISSION

Douglas C. Frantz, Lake Orion; William R. Kissel, Milford, and James L. Vincent, Pontiac, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 6, 1987, Ser. No. 23,164
Int. Cl.[4] G05D *13/62*; G06F *15/20*
U.S. Cl. 364—426.04 9 Claims



1. In a method for use in an electronic speed control a method of determining the condition of a manual transmission clutch and of a park/neutral gear in an automatic transmission for a vehicle with an internal combustion engine with a throttle, a throttle position indicator, and a vacuum source where the electronic speed control system includes: a vacuum actuator, a vacuum reservoir and a valve body with a vacuum solenoid, a vent solenoid and a purge vent solenoid to work with a voltage source and switches and sensors including a set switch, resume switch, power on/off switch, park/neutral or clutch switch, a speed sensor, and a brake switch; signal conditioning; a memory for storing data including point slope curves and look-up tables representing predetermined limits of the ratio of engine speed to vehicle speed; an A/D converter; a vacuum solenoid driver and interface; a vent solenoid driver and interface and a microcontroller with input/output ports hereafter called vac/vent ports, to communicate with the valve body, where one of the uses for the microcontroller is for processing signals generated by the voltage source and switches and sensors which represent various speed control conditions as selected by the operator of the vehicle;

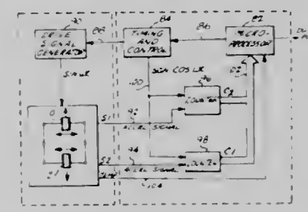
a method of determining the condition of a manual transmission clutch and of a park/neutral gear in an automatic transmission electronic speed control system comprising:
monitoring and storing engine speed;
monitoring and storing the vehicle speed;
computing and storing the ratio of engine speed to vehicle speed;
comparing the ratio of engine speed to vehicle speed to predetermined limits for the ratio of engine speed to vehicle speed;
disengaging the electronic speed control if the limits are exceeded.

4,896,268

APPARATUS AND METHOD FOR PROCESSING THE OUTPUT SIGNALS OF A CORIOLIS RATE SENSOR

Douglas C. MacGugan, Issaquah, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Nov. 25, 1987, Ser. No. 125,114
Int. Cl.[4] G01P *9/04*
U.S. Cl. 364—453 25 Claims



1. Apparatus for processing signals produced by an angular rate and linear acceleration sensor to determine an angular rate of rotation and a linear acceleration of a body, said sensor including a pair of accelerometers having their sensitive axes aligned in parallel with each other and orthogonal to a rate axis about which the angular rate of rotation of the body is sensed by periodically moving the pair of accelerometers in a direction orthogonal to both the sensitive axes of the accelerometers and to the rate axis as a function of a periodic movement signal, whereby a Coriolis acceleration proportional to the angular rate of rotation about the rate axis and aligned in the direction of the sensitive axes results, said accelerometers each producing an output signal proportional to the combined linear and Coriolis accelerations to which they are subjected along their sensitive axes, said apparatus comprising:

(a) summing means for determining a sum and a difference of the output signals produced by the pair of accelerometers during a fractional portion of a complete period of the movement signal;
(b) processing means for determining as a function of said sum and difference:
(i) an incremental change in velocity of the body along a sensitive axis of the body that is aligned with the sensitive axes of the accelerometers; and
(ii) an incremental change in angular position of the body about the rate axis; with
(c) said processing means including means for correcting said incremental change in angular position for cross-coupling of an error component of the incremental change in velocity, and means for determining the angular rate of rotation of the body about the rate axis and the linear acceleration of the body along the sensitive axis, as a function of:
(i) the corrected incremental change in angular position,
(ii) the incremental change in velocity, and
(iii) a duration of said fractional portion of the period of the movement signal.

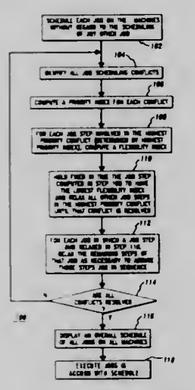
VOL 1110 ISS 4 JA 23 1990 UMI

4,896,269

JOB SHOP SCHEDULING AND PRODUCTION METHOD AND APPARATUS

David W. Toog, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,513
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—468 **16 Claims**



1. A method for performing a first plurality of production jobs on a second plurality of machines, each said job comprising a sequence of job steps to be respectively performed in a predetermined sequence on said machines, each said job step having a predetermined performance duration, each said job having a total processing time that is the sum of the performance durations of its respective steps and a due time measured relative to an arbitrary schedule start time, said method comprising the steps of:

(a) initially scheduling each said job for performance on said machines without regard to the scheduling of any other ones of said jobs, the initial scheduling for each said job being the tightest possible schedule for that job;

(b) identifying all job scheduling conflicts, each said conflict being the scheduling of more than one said job step on the same machine at the same time;

(c) computing a priority index for each said conflict in accordance with the equation:

$$PI = PRP \times MDF \times PSL$$

where:

PI = conflict priority index;

PRP = product of the job process time/job due time ratios of the jobs in said conflict;

MDF = demand factor of the machine on which said conflict occurs;

PSL = sum of the performance durations of the job steps constituting said conflict;

(d) selecting a highest priority conflict having the largest computed priority index;

(e) computing, for each job step constituting said highest priority conflict, a flexibility index in accordance with the equation:

$$FI = ST - SF$$

where:

FI = job step flexibility index;

ST = job slack time;

SF = job shift factor;

(f) holding fixed in time in said schedule within said highest priority conflict the job step having the lowest computed flexibility index while relaxing in time each remaining job step in said highest priority conflict until that conflict is resolved;

(g) relaxing, for each said job a step of which was relaxed to resolve said highest priority conflict, the steps succeeding the relaxed step only to the extent necessary to assure the steps of said job remain in said predetermined sequence;

(h) returning to step (b) if there remain any scheduling conflicts;

(i) providing a final, conflict free schedule for the performance of said first plurality of jobs on said second plurality of machines; and

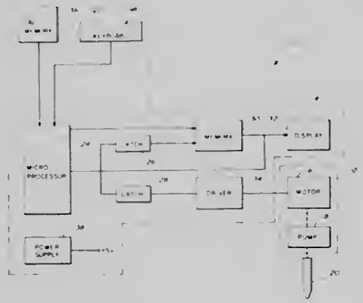
(j) performing said first plurality of production jobs on said second plurality of machines based on said final, conflict free schedule.

4,896,270

COMPUTER CONTROLLED PIPETTING SYSTEM

George P. Kalmakis, Reading; R. Laurence Keene, Brookline, both of Mass.; Gary E. Nelson, Nashua, N.H., and Victor A. Torti, Groton, Mass., assignors to Matrix Technologies Corporation, Lowell, Mass.

Filed Mar. 21, 1986, Ser. No. 842,629
Int. Cl.[4] G06F *15/42*; G01N *1/14*
U.S. Cl. 364—479 **2 Claims**



1. A pipetting system comprising:

(a) a hand held pipettor having pipette receptacle means and pump means;

(b) pipette means including a calibration pipette and a laboratory pipette, said pipette means received in said pipette receptacle means;

(c) drive means connected to said pump means, said drive means having first and second states, said pump means aspirating a liquid into said pipette means when said drive means is in said first state and dispensing a liquid from said pipette means when said drive means is in said second state;

(d) means for generating a reference signal defining a selected quantity of liquid aspirated into said pump means;

(e) memory means communicating with said generating means for storing said reference signal;

(f) control means for energizing said drive means and actuating said pump means accordingly to said stored reference signal for aspirating a quantity of liquid into said laboratory pipette which is equal to said selected quantity;

(g) pump means wherein said pump includes a piston which is constrained for reciprocating movement;

(h) sensor means communicating with said pump means for sensing the position of said piston relative to a home position of said piston, the distance between said positions defining a quantity of liquid aspirated and dispensed by said pump means when in said first and second states;

(i) display means communicating with said memory means for indicating the status of the pipetting system mode of operation;

(j) indicator means mounted on said pipette, said indicator means communicating with said drive means for indicating the state of said drive means;

(k) control means wherein said control means is separate from said pipettor, a cable connecting said control means and said pipettor; and

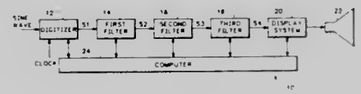
(l) pipetting system wherein said indicator means is a pair of light emitting diode, said display means mounted on said control means.

4,896,271

METHOD AND APPARATUS FOR MEASURING JITTER IN A PERIODIC SIGNAL

Yih-Chyun Jenq, Lake Oswego, and Philip S. Crosby, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 81,943, Aug. 5, 1987, Pat. No. 4,858,142. This application Jan. 14, 1988, Ser. No. 144,829
Int. Cl.[4] G01R *29/02*
U.S. Cl. 364—487 **10 Claims**



1. A method for measuring jitter in a clock signal comprising the steps of:

digitizing a periodic signal on each of a plurality of occurrences of a repetitive event in the clock signal to produce a first data sequence of data elements, the first data sequence representing a magnitude of the periodic signal as a function of time;

evaluating the first data sequence to provide a second data sequence of data elements representing phase angles associated with elements of the first data sequence;

evaluating the second data sequence to determine expected phase angles that elements of the second data sequence would represent if the clock signal and the periodic signal had constant frequencies; and

evaluating differences between phase angles represented by elements of the second data sequence and the expected phase angles.

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COMPUTER-CONTROLLED AUTOMATIC LOGIC DESIGN SYSTEM FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Yuichi Kurosawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

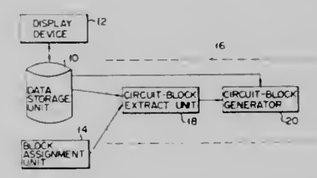
Filed Mar. 30, 1988, Ser. No. 175,288
Claims priority, application Japan, Mar. 31, 1987, 62-76204
Int. Cl.[4] G06F *15/60, 15/20*
U.S. Cl. 364—491 **9 Claims**

1. A computer-controlled automatic logic design method comprising the steps of:

(a) storing in a data storage unit a logic circuit which is automatically synthesized based on a hardware description language by using standard logic elements which have been stored as a library;

(b) at least partially displaying the logic circuit on a display device to permit an operator to assign; among logic elements constituting the logic circuit, those which are necessary to be grouped together as a circuit block in order to satisfy actual design conditions including restrictions for placement and wiring;

(c) combining, when said logic elements to be grouped together are selected by an operator, these selected logic elements as a circuit block, before said logic circuit stored in said data storage unit is subjected to automatic layout optimization processing to thereby generate a circuit section having a fixed integral circuit arrangement which is prevented from being modified; and



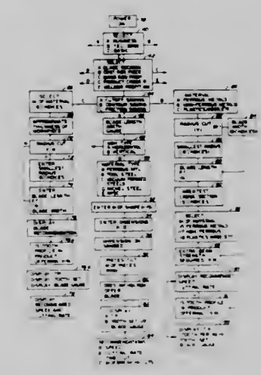
(d) rearranging said logic circuit stored in said data storage unit including said circuit block in such a manner that the internal circuit arrangement of said circuit block is kept continuously unchanged, whereby said circuit block is prohibited from being divided into several portions in the automatic layout optimization processing.

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METHOD AND APPARATUS FOR SELECTION OF COMPLEX PARTS, INCLUDING BLADES FOR BAND SAWS

Bill V. Moore, 304 Pinecroft Dr., Raleigh, N.C. 27609, and John A. Jackson, 1289 Belfast St., Greenville, Miss. 38701

Filed Jul. 29, 1987, Ser. No. 79,062
Int. Cl.[4] G06F *15/46*; G05B *19/18*
U.S. Cl. 364—505 **20 Claims**



1. A method of selecting a blade for a material cutting machine such as a motor driven band saw, the method comprising:

storing in a ROM descriptive data about blades, saws, and workpieces;

entering into a microprocessor that is coupled to the ROM identifying parameters about a particular band saw and a particular workpiece;

selecting data identifying an optimum blade for the particular band saw and the particular workpiece according to the identifying parameters; and

displaying information identifying the optimum blade.

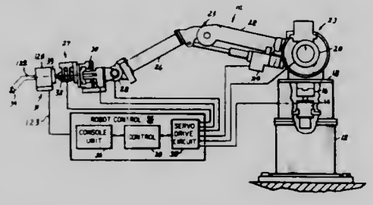
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4,896,274

VELOCITY PROPORTIONAL DAC FOR USE WITH A PROGRAM CONTROLLED MANIPULATOR

Richard E. Hohn; Gregory Webb; John C. Lauchnor, all of Cincinnati, Ohio, and Charles C. Teach, Bloomfield Hills, Mich., assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 14, 1986, Ser. No. 818,650
Int. Cl.[4] B05D *1/02;* **G06F** *15/42*
U.S. Cl. 364—513 **10 Claims**



1. In an apparatus for effecting motion of a workpoint associated with a function element, the apparatus including a programmable manipulator including an arm having a moveable member carrying the function element, an actuator for effecting motion of the moveable member, and a control system including:

(a) memory means for storing input signals representing information defining motion of the workpoint and operation of the function element;

(b) a servo mechanism circuit responsive to the input signals defining motion and connected to the actuator to control motion of the moveable member; and

(c) a digital to analogue converter responsive to the input signals defining operation of the function element for producing an analogue control signal for controlling the operation of the function element;

the improvement in combination therewith comprising:

(a) a teaching means for storing in the memory operator entered input signals representing values for;

(i) a final control signal magnitude (VF) assigned to a limiting velocity of the workpoint;

(ii) an initial control signal magnitude (VI) assigned to zero velocity of the workpoint; and

(iii) the limiting velocity (MAXVEL) of the workpoint; and

(b) a processor means for executing the steps of:

(i) producing a digital velocity signal (CV) representing the instantaneous velocity of the workpoint;

(ii) producing a control signal in response to the velocity signal in accordance with the following relationship:

$$V_O=[(VF-VI)/MAXVEL]CV+VI$$

where V_0 is the control signal; and

(iii) applying the control signal to the digital to analogue convertor to effect operation of the function element in proportion to the velocity of the workpoint.

4,896,275

FULL PAGE GRAPHICS IMAGE DISPLAY DATA REDUCTION

Brian H. Jackson, Litchfield, N.H., assignor to Bull HN Information Systems Inc., Billerica, Mass.

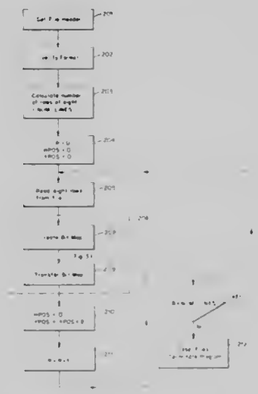
Filed Jul. 10, 1987, Ser. No. 72,210
Int. Cl.[4] G06F *15/66*
U.S. Cl. 364—519 **17 Claims**

1. A method of transferring a binary graphics or picture image stored in a random access memory (RAM) to an output device having less than a page of buffer memory, said image including a plurality of scan lines of dots or pixels, said method comprising the steps of:

(a) scanning a row segment of said binary image at a time starting from a predetermined reference point in said memory, said row segment consisting of a predetermined plurality of scan lines of dots;

(b) analyzing a predetermined increment of said row segment at a time in said memory for the presence of dot patterns containing essential data so as to divide said row segment into a number of increment long cell matrices;

(c) generating position information signals for bit map repre-



sentations containing said essential data patterns defined in step (b), each of said bit map representations having a vertical or height dimension equal to said predetermined plurality of scan lines and a horizontal or length dimension equal to a number of consecutive cell matrices detected as containing said essential data;

(d) successively transferring to said output device, said position information signals followed by each of said bit map representations in said memory containing areas of said image to be reproduced; and,

(e) repeating steps (a) through (d) for each row segment until said image has been processed.

4,896,276

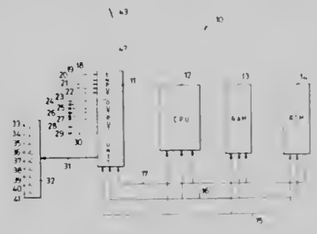
SELF-DIAGNOSIS DEVICE AND PROCESS FOR A MICRO-COMPUTER CONTROL SYSTEM FOR A MOTOR-VEHICLE INTERNAL COMBUSTION ENGINE

Renato Saglimbeni, Bollate, and Daniele Casagrande, Cesano Boscone, both of Italy, assignors to Alfo Romeo Anto S.p.A., Naples, Italy

Filed Apr. 21, 1986, Ser. No. 853,959
Claims priority, application Italy, May 14, 1985, 20681 A/85
Int. Cl.[4] G06F *15/20, 11/00;* **G01M** *15/00*
U.S. Cl. 364—550 **7 Claims**

1. Self-diagnosis device for verifying the functionality of a control system with programmed micro-computer for controlling preselected operative parameters of an i.c. engine, said micro-computer being operatively connected to sensors of determined engine parameters and to actuators of determined operative parameters of the same engine, said self-diagnosis device comprising indicator means for indicating the functional state of said micro-computer, of said sensors and of said actuators, connection means operatively connectable to said micro-computer and in turn connected to said sensors and actuators, said micro-computer being also programmed to execute on command a preestablished sequence of operations to check the functional state of components of said micro-computer and of said sensors and actuators and to display their state through said indicator means, said microcomputer being

further programmed to execute on command a preestablished sequence of operations to check the functional state of said



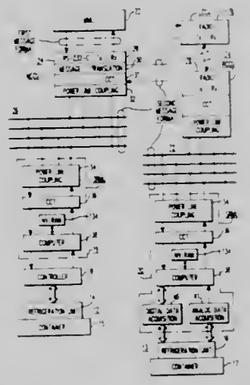
sensors and said actuators by using operation simulating signals.

4,896,277

METHOD OF MAPPING REFRIGERATED CONTAINERS IN A POWER LINE CARRIER BASED MONITORING SYSTEM

Leonard C. Vercellotti, Oakmont, and Arthur A. Andersoo, Irwin, both of Pa., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 3, 1988, Ser. No. 189,896
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—551.01 **20 Claims**



1. A method of mapping addresses of a plurality of refrigerated containers having uniquely addressable remote monitoring units (RMUs) connected to a power line carrier based monitoring system which includes a master monitoring unit (MMU), wherein the MMU includes computer based means for mapping the RMUs with predetermined mapping commands, and the RMUs include computer based means for responding to the mapping commands, including means for generating a random number and means for preparing mapping response messages, comprising the steps of:

mapping the RMUs of the refrigerated containers by the MMU with a predetermined first mapping command applied to the power line,

responding to the first mapping command by the RMUs connected to the power line communication system,

said mapping step including the steps of:

selecting a modulo having a range determined by the number of containers expected to be mapped,

and inserting the selected modulo into the first mapping command,

said responding step including the steps of:

generating a random number within the range of the modulo in the first mapping command,

inserting the container's address into a mapping response message,

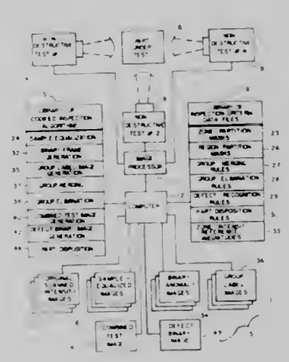
and applying the mapping response message to the power line at a time responsive to the magnitude of the random number.

4,896,278

AUTOMATED DEFECT RECOGNITION SYSTEM

R. Curtis Grove, San Pedro, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jul. 11, 1988, Ser. No. 217,587
Int. Cl.[4] G06F *15/46;* **G01N** *29/04*
U.S. Cl. 364—552 **4 Claims**



1. A method for defect recognition of a part tested by a plurality of nondestructive scanning image tests, comprising the steps of:

selecting a plurality of tests to be performed,

employing a digital computer employing digital words of bit length equal to or greater than said plurality of tests,

recording which one of said tests is used,

recording the number of tests to be performed,

assigning each test a unique test number,

defining a test surface on said part,

recording a scan aperture area for each test,

scanning said part under each test with constant energy transmitted from an energy emitter into successive discrete areas on said test surface of said part,

recovering successive portions of said constant energy transmitted into said successive discrete areas on said test surface with an energy receiver,

forming an intensity-modulated frame image comprising a two-dimensional projection of received portions of said constant energy from said test surface, one intensity-modulated frame image obtained from each of said set of tests and containing digital picture elements, each digital picture element corresponding in location on said frame image to locations of discrete areas on said test surface on which said part, each said digital picture element having an intensity value proportional to said portion of said constant energy received by said energy receiver from said discrete area,

determining which subset of said set of intensity-modulated frame images has the largest quantity of digital picture elements,

identifying one of said subsets as a highest density frame image,

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identifying which of said tests that produces a highest density frame image as a highest density test,
identifying all of said frame images except the highest density frame image as lesser density frame images,
processing each of the sets of intensity-modulated frame images other than the highest density frame image to form a set of corrected frame images, each of said sets of corrected frame images having said largest quantity of digital picture elements, whereby corresponding picture elements in each of said sets of said corrected frame images, will correspond in location on said processed frame image to locations of discrete areas scanned by the highest density test on said test surface on said part,
partitioning each of the sets of corrected frame images and the highest density frame images into test-specific zones, wherein a test-specific zone is defined as a test-specific bounded area on a test-specific frame image, corresponding to a test-specific bounded area on said test surface of said part,
storing zone-specific intensity reference magnitudes, said intensity reference magnitudes to be used for comparison with intensity values of frame image picture elements,
processing each of the sets of corrected frame images and the highest density frame image to form a set of binary anomaly images, wherein each binary anomaly image picture element is defined to correspond spatially to a corrected or highest density frame image picture element if their location on their respective images correspond, each of said sets of binary anomaly images containing picture elements of an upper binary state that correspond spatially to recorded intensity magnitudes on the corrected or highest density frame images that exceed zone-specific intensity reference magnitudes, and containing picture elements of a lower binary state that correspond spatially to recorded intensity magnitudes on the corrected or highest density frame images that do not exceed zone-specific intensity reference magnitudes,
processing each of the sets of binary anomaly images to form a set of group label images, wherein each group label image picture element is defined to correspond spatially to a binary anomaly image picture element if their locations on their respective images correspond, said group label picture element either being labeled or unlabeled, said labeled picture element being assigned a label from a label set, each label in said label set being ordered, wherein any two labels of said label set are ordered with respect to each other as lower ordered label and higher ordered label, said group label picture element being unlabeled if the corresponding binary frame image picture element has a lower binary state, and being labeled if said corresponding binary frame image picture element has an upper binary state, said label being identical to that of an adjacent group label picture element if both group label picture elements have spatially corresponding binary anomaly image picture elements of upper binary state, and said label being unique if no binary anomaly image picture elements spatially corresponding to adjacent group label picture elements have an upper binary state,
designating all labeled group label picture elements having identical labels as a group,
partitioning each of the group label images into regions, said partitioning being identical in each of said group label images, said regions being bounded areas comprising two-dimensional projections of specific bounded areas on said test surface of said part,
storing test-specific and region-specific group merging rules, said rules to be used to automatically decide if two groups in a specific group label image will be merged into one labeled group in the group label image, and to decide which lower state picture elements separating said two groups will be assigned to said merged labeled group,
applying test-specific and region-specific group merging rules to all groups in the set of group label images in order to merge groups in the set of group label images, wherein the merging of two groups is accomplished by reassigning unlabeled picture elements separating the two groups to the lower ordered label of said two groups and reassigning all labeled picture elements of the higher ordered label of said two groups to that of the lower ordered label of said two groups,
storing test-specific and region-specific group elimination rules, said rules to be used for automatically deciding if a group in a specific group label image will be eliminated,
applying test-specific and region-specific group elimination rules to all groups in the set of group label images to decide which of said groups will be eliminated, wherein the elimination of a group is accomplished by changing the label of each picture element in that group from a labeled to an unlabeled state,
processing the set of group label images to form a combined test image containing digital picture element words of bit length greater than or equal to the quantity of tests in said set of tests, wherein each combined test image picture element is defined to correspond spatially to a group label image picture element if their locations on their respective images correspond, and wherein each bit position of each of said digital picture element words is assigned to the unique test number equal to said bit position, and the bit position will be in an upper state if the corresponding group label image picture element is labeled, and the bit position will be in the lower state if the corresponding group label image picture element is unlabeled,
partitioning the combined test image into regions, said partitioning being identical to that performed on the set of group label images,
storing region-specific defect recognition rules, said rules to be applied to the combined test image and to be used to categorize digital picture elements as either defective or non-defective, and
applying region-specific defect recognition rules to all regions of the combined test image to generate a defect binary image, wherein each defect binary image picture element is defined to correspond spatially to a combined test image picture element if their locations on their respective images correspond, wherein said defect recognition rules are applied to each picture element of each region of the combined test image, and each picture element of the defect binary image will be placed in a lower binary state if said defect recognition rules applied to the spatially corresponding picture element in the combined test image categorize said picture element as defective, and said each picture element of said defect binary image will be placed in an upper binary state if said defect recognition rules categorize said spatially corresponding picture element in said combined test image as non-defective.

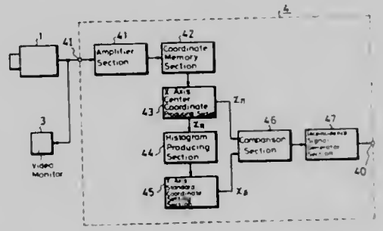
4,896,279

METHOD AND AN APPARATUS FOR INSPECTING AN EXTERNAL SHAPE OF AN OBJECT HAVING A SYMMETRY

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 923,126
Claims priority, application Japan, Oct. 31, 1985, 60-244583
Int. Cl.[4] H04N *7/18*; G06K *9/48*
U.S. Cl. 364—559 **10 Claims**

8. Apparatus for inspecting the external shape of an object having an axis of symmetry comprising:
first means having a photoelectric conversion screen expressed in an XY coordinate grid for sensing the shape of said object and displaying said shape such that the symmetrical axis of said object is parallel to one axis of the XY coordinate and for producing a video signal thereof,
second means responsive to said video signal for determining the coordinates of the grid at a plurality of right and left points with respect to the other axis of the XY coordinate at which an external contour of said object intersects each of a plurality of straight lines perpendicular to said symmetrical axis;
third means for determining the midpoint between each of said right and left points in each of said lines perpendicular to said symmetrical axis;
fourth means for determining the frequency of identical midpoints for all of said perpendicular lines and for creating a standard center coordinate having the maximum number of identical midpoint;



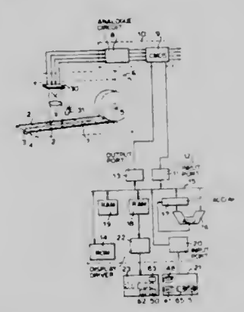
fifth means for determining the midpoint first distance between said standard center coordinate and each of said left points in each of the lines perpendicular to said symmetrical axis;
sixth means for determining the second distance between said standard center coordinate and the right point in each of the lines perpendicular to said symmetrical axis; and
seventh for comparing said first and second distances and detecting the symmetry of said object in response to the incidence of said distance.

4,896,280

ELECTRONIC TAPE RULE

Gareth S. Phillips, Cambridgeshire, United Kingdom, assignor to The Stanley Works, New Britain, Conn.

PCT No. PCT/US87/00667, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/05995, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 24, 1987, Ser. No. 138,909
Claims priority, application United Kingdom, Mar. 27, 1986, 8607746
Int. Cl.[4] G01B *3/08*
U.S. Cl. 364—562 **10 Claims**



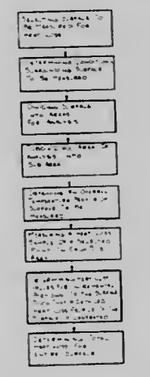
1. A tape rule comprising a housing, a tape that may be extended from the housing and which carries a position track therealong, reading means in the housing past which the position track travels during movement of the tape, first processor means electrically connected to the reading means for receiving electrical signals therefrom and generating an output indicating the extent of extension of the tape, visual readout means for providing a visual display indicative of the extent of tape extension, second processor means electrically connected to the visual readout means and to the first processor means, and selection means for specifying a choice of alternative preprogrammed calculations, said second processor means being operative in a first operative state to pass a signal indicating the extent of real tape extension to the visual readout means and responsive to said selector means to operate in a second operative state in which subsequent signals indicative of the extent of current tape extensions are processed using an earlier extension value stored in memory and a continuously processed result is passed to the visual readout means.

4,896,281

METHOD FOR HEAT LOSS SURVEY

Russel T. Mack, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 739,598, May 31, 1985, abandoned. This application Aug. 31, 1988, Ser. No. 239,485
Int. Cl.[4] G01K *17/00*
U.S. Cl. 364—557 **20 Claims**



1. A method for surveys for quantifying immediate heat loss from surfaces, comprising:
(a) evaluating conditions surrounding the surface for variations in exposure to air flows, sunlight, and other radiant heat sources/sinks and dividing the surface into areas for analysis such that within each area, no significant spatial variation in convective or radiative exposures exists;
(b) evaluating said areas and further subdividing said areas into sub-areas having unique surface emissivities with no significant inhomogenietys.
(c) obtaining an overall temperature profile of the surface;
(d) obtaining a directly measured reference heat loss sample at a selected point on each heat loss sub-area;
(e) correlating said directly measured heat loss of said reference heat loss sample with said selected point on the surface appearing in said overall temperature profile for development of a detailed heat loss profile of the surface; and
(f) determining incremental and then total heat loss of the surface.

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4,896,282

FLOW COMPUTER CALIBRATION TECHNIQUE

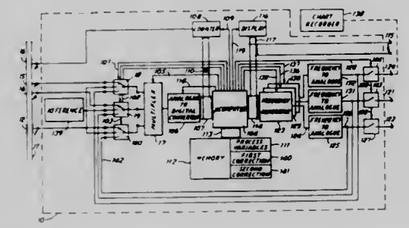
Cavan Orwell, Basingstoke, England, assignor to Schlumberger Electronics (U.K.) Limited, Farnborough, England

Filed Jan. 7, 1988, Ser. No. 141,773

Claims priority, application United Kingdom, Jan. 8, 1987, 8700403

Int. Cl.⁴ H03M *1/10*

U.S. Cl. 364—571.05 **12 Claims**



1. A method for converter calibration in a process computer having at least one analogue input, an analogue to digital converter, computer means operative upon converted values and having a digital output, and a digital to analogue converter for providing an analogue output from the digital output, including the steps of:

applying an input signal to one of said converters to establish an output signal therefrom;

establishing one of the signals as a reference;

calculating and storing a calibrating correction value for said one converter based upon the difference between an actual value of one of the signals and an expected value thereof;

connecting the analogue output of the digital to analogue converter to said least one analogue input;

controlling the computer means to provide a digital output;

converting the analogue output signal into a digital representation thereof using the analogue to digital converter to give a digital conversion;

applying the calibrating correction value to the conversion effected by said one converter; and

calculating and storing a calibrating correction value for the other converter based upon the difference between said digital output and said digital conversion;

whereby the stored calibrating correction values are applied in process use by the computer means to respectively correct signals received from the analogue to digital converter and signals output to the digital to analogue converter.

4,896,283

ITERATIVE REAL-TIME XY RASTER PATH GENERATOR FOR BOUNDED AREAS

Harry F. Hunt, Nashua, N.H., and Bruce Schurmann, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 7, 1986, Ser. No. 837,487

Int. Cl.⁴ G06F *15/66;* **H04N** *7/01*

U.S. Cl. 364—577 **13 Claims**

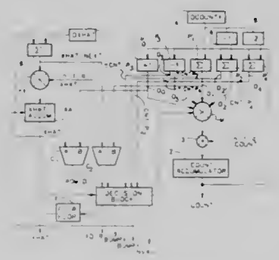
1. Apparatus for calculating the next pixel in a path through pixels located at intersections of first and second sets of coordinates that lie between first and second boundaries.

means responsive to a first signal representing the distance of an initial pixel in the path from said first boundary as measured along the coordinate of said first set on which said initial pixel is located for providing second signals respectively representing the distances of given test pixels of a pattern of test pixels from said first boundary as measured from said first boundary along coordinates of said first set on which they are located, said test pixels of said pattern having given coordinate positions with respect to said initial pixel,

means for providing a third signal indicating the direction of said path along said coordinate at said initial pixel,

means responsive to said second signals for respectively providing first indications as to the side of said first boundary at least some of said given test pixels are on,

means responsive to a fourth signal representing the distance between said boundaries as measured along one of said first set of coordinates on which a test pixel is located for providing fifth signals respectively representing the distances between said first and second boundaries as measured along other coordinates of said first set on which other test pixels of said pattern are located,



means responsive to said second and fifth signals for respectively providing second indications as to the side of said second boundary other test pixels of said pattern are on, and

path selection means responsive to said first and second indications and to said third signal for providing signals for indicating steps along said coordinates required to reach the test pixel of said pattern that is the next pixel in the path and a sixth signal indicating the direction of approach of the path to said next pixel along the coordinate of said first set on which said next pixel is located.

4,896,284

SEMICONDUCTOR INTEGRATED CIRCUIT FOR MULTIPLYING ANALOG AND DIGITAL VALUES

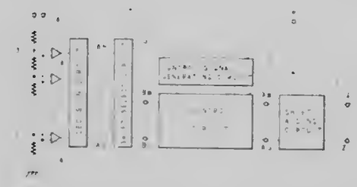
Sumitaka Takeuchi; Keisuke Okada, and Masatoshi Kimura, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 1, 1988, Ser. No. 226,636

Claims priority, application Japan, Aug. 31, 1987, 62-218508

Int. Cl.⁴ G06F *7/52;* **G06J** *1/00*

U.S. Cl. 364—606 **4 Claims**



1. A semiconductor integrated circuit for outputting a multiplication result with respect to an analog value and a digital value input as objects for multiplication, comprising:

a plurality of comparators for outputting comparator output signals dependent upon the result of a comparison between the voltage corresponding to a level of the analog value and reference voltages set for each of the comparators;

decision means for outputting a plurality of decision signals dependent upon the level of the comparator output signals;

multiplication signal generating means for generating predetermined selection signals for multiplication on the basis of said decision signals and generating shift signals for shifting the digital value to a higher position of a set of specified bits;

control signal generation means for generating a control signal according to the digital value;

control means for controlling said selection signals generated by said multiplication signal generating means according to said control signal and outputting the multiplication result with respect to the digital value and said selection signals; and

shift addition means including a transmission means for transmitting a digital value to the higher position of the set of specified bits according to said shift signal and an adding means for adding the digital value to the multiplication result.

4,896,285

CALCULATION OF FILTER FACTORS FOR DIGITAL FILTER

Seiichi Ishikawa; Masaharu Matsumoto; Katsuaki Satoh, and Akihisa Kawamura, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 15, 1988, Ser. No. 144,477

Claims priority, application Japan, Mar. 23, 1987, 62-68411; Mar. 30, 1987, 62-76937; Mar. 30, 1987, 62-76939; Apr. 2, 1987, 62-81979; Apr. 2, 1987, 62-81980; May 8, 1987, 62-113050

Int. Cl.⁴ G06F *15/31*

U.S. Cl. 364—724.01 **31 Claims**



1. A filter-factor calculating apparatus for a transversal filter, comprising:

inputting means for inputting a signal representing desirable frequency characteristics to obtain filter factors;

division means coupled to said inputting means for dividing the inputted frequency characteristic into a plurality of frequency bands; and

calculating means coupled to said division means for obtaining filter factors for realizing a frequency characteristic of each of the divided frequency bands.

4,896,286

FLOATING-POINT ARITHMETIC APPARATUS

Katsuhiko Ueda, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1987, Ser. No. 137,924

Claims priority, application Japan, Dec. 29, 1986, 61-311024

Int. Cl.⁴ G06F *7/38*

U.S. Cl. 364—748 **6 Claims**



1. A floating-point arithmetic apparatus for first and second floating point data each having an exponent section, a mantissa section expressed in an absolute value, and a sign section representing a sign of the mantissa section, the apparatus comprising:

first means for calculating the difference between the exponent sections of the first and second floating point data, determining which of the exponent sections of the first and second floating point data is greater, and selecting the greater exponent section of the first and second floating point data;

second means responsive to an output from the first means for selecting the mantissa section of one of the first and second floating point data which has the smaller exponent section, and shifting rightward the selected mantissa section by a bit number corresponding to the difference between the exponent sections;

third means responsive to the output from the first means for selecting the mantissa section of one of the first and second floating point data which has the greater exponent section;

an arithmetic means for performing addition and subtraction between outputs from the second and third means;

fourth means for normalizing a mantissa section which is an output from said arithmetic means, and correcting the greater exponent section of the first and second floating point data in correspondence with the normalizing;

fifth means for rounding off a mantissa section of an output from the fourth means;

sixth means for calculating an absolute value of the mantissa section of the output from the fourth means;

seventh means for generating a signal representative of a final arithmetic mode on the basis of the sign sections of the first and second floating point data, a result of the determination by the first means about which of the exponent sections of the first and second floating data is greater, and an arithmetic mode designation signal, for outputting the final arithmetic mode signal to said arithmetic means, and for, in cases where the final arithmetic mode corresponds to subtraction and the output from the first means indicates that there is a difference in exponent between the first and second floating point data, instructing said arithmetic means to subtract the output of the second means from the output of the third means;

eighth means for, in cases where the output from the first

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means represents that there is a difference in exponent between the first and second floating point data, enabling the fifth means to execute its function, for in cases where the output from the first means represents that there is no difference in exponent between the first and second floating point data and the final arithmetic mode corresponds to addition, enabling the fifth means to execute its function, and for, in cases where the output from the first means represents that there is no difference in exponent between the first and second floating point data and the final arithmetic mode corresponds to subtraction, enabling the sixth means to execute its function; and

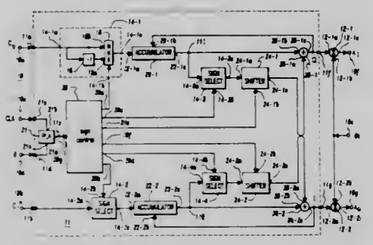
ninth means for determining a sign of a final arithmetic result on the basis of the sign sections of the first and second floating point data, the result of the determination by the first means about which of the exponent sections of the first and second floating point data is greater, the arithmetic mode designation signal, and a sign bit of the output from said arithmetic means.

4,896,287

CORDIC COMPLEX MULTIPLIER

Matthew O'Donnell, and William E. Engeler, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 31, 1988, Ser. No. 200,491
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—754 **20 Claims**



1. A recursive CORDIC rotator, comprising:

means for receiving digital data words representing each of the real C_R part and the imaginary C_I part of a first complex number C;

a first portion including means for rotating each one of the first complex number real C_R part and imaginary C_I part by a first angular increment α_1 of a selected one of $+90°$ and $-90°$ to form an associated one of digital data words I and Q;

a recursion portion including means for rotationally modifying each of the I and Q digital data words, received from the first portion, recursively through each selected one of positive and negative incremental angles α_1, for $2 \leqq i \leqq N$, where N is a positive integer greater than 2, and each incremental angle α_i not only less than angle α_1 but also greater than a next incremental angle α_{i+1};

means for receiving a digital data word representing an angular rotation ϕ portion of a second complex number B, expressed in amplitude/rotation angle form, and for controlling the signs of the angle α_1 in the first portion and all of the incremental angles α_1 in the recursion portion to successively approximate the second complex number rotation angle ϕ; and

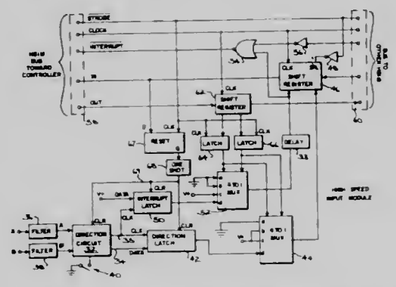
means for providing the first and second parts, after rotational modification through all N angles, respectively as a rotated imaginary-part output digital data word A_I substantially equal to $(B_R C_I - B_I C_R)$, where B_R and B_I are respective real and imaginary parts of the second complex number B, and a rotated real-part output digital data word A_R substantially equal to $(B_R C_R + B_I C_I)$.

4,896,288

PROGRAMMABLE CONTROLLER INPUT MODULE

Roger Gonnering, Glendale, and Anthony G. Gibart, Milwaukee, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Continuation of Ser. No. 12,566, Feb. 9, 1987, abandoned. This application May 31, 1989, Ser. No. 361,740
Int. Cl.[4] G06F *3/00, 3/02*
U.S. Cl. 364—900 **14 Claims**



I. An input module for a programmable controller which has an interrupt input, a clock output, a serial data input and a serial data output, said input module comprising:

a first input terminal for receiving a signal indicating the occurrence of an event to count;

a second input terminal for receiving a signal indicating whether the count is to be incremented or decremented;

first and second output terminals, said first output terminal for transmitting a signal to the interrupt input of the controller and said second output terminal for transmitting data to the serial input of the controller;

means for connecting the first input terminal to the first output terminal, and having means for receiving a first signal from another input module and coupling the first signal to said first output terminal;

means coupled to said second input terminal for storing the indication of whether the count is to be incremented or decremented; and

means for transmitting the indication from said means for storing to the second output terminal in response to a signal from the clock output of the controller, and having means for receiving a second signal from another input module and coupling the second signal to said second output terminal.

4,896,289

EXPANSION INTERFACE BOARD SYSTEM FOR CONNECTING SEVERAL PERSONAL COMPUTERS TO AN ELECTRONIC TYPESETTER CONNECTED TO A HOST PERSONAL COMPUTER

John M. Svinicki, Manchester, and Steven Phillips, Tecumseh, both of Mich., assignors to Xitron, Inc., Ann Arbor, Mich.

Filed Jul. 29, 1987, Ser. No. 79,794
Int. Cl.[4] G06F *3/00, 3/09, 3/12, 3/13*
U.S. Cl. 364—900 **2 Claims**

1. A personal computer/electronic typesetter interface for a personal computer having at least one expansion slot for accommodating additional circuit boards in an electronic typesetting network including a plurality of such interconnected personal computers, each personal computer including a main circuit board having a microprocessor, memory, a data input device and logic for preparing text files in a first coded format, and at least one electronic typesetting machine connected to one of the personal computers, said electronic typesetting machine including logic for typesetting text from text files in a second coded format, the personal computer/electronic typesetter interface including:

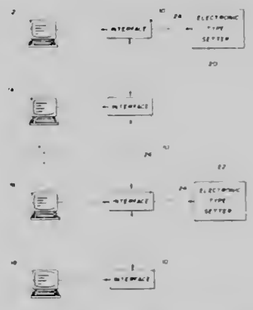
an expansion board including means for insertion in an expansion slot on each personal computer and means for electronic interconnection to the main circuit board, said expansion board including,

a microprocessor;

a first input for receiving text files transmitted over the network to the personal computer in which the expansion board is inserted,

a first output for transmitting text files from this personal computer to another selected personal computer in the network,

a second output for transmitting text files received from other personal computers in the network or from this



personal computer for output to the electronic typesetter connected to this personal computer,

memory for storing text files to be transmitted via the first output in a first queue,

memory for storing the files to be transmitted via the second output in a second queue;

logic for continuously monitoring the status of the files in each of the first and second queues;

logic for interrupting the operation of the microprocessor on the main circuit board of the personal computer and displaying the first and second queues of text files upon receipt of a preselected command by the data input device; and

logic for converting the data contained in a text file from the the first coded format to the second coded format accepted by the typesetter connected to the personal computer to which the file is directed for output.

4,896,290

METHOD FOR ROUTING EVENTS FROM KEY STROKES IN A MULTI-PROCESSING COMPUTER SYSTEMS

Deborah A. Rhodes, Waltham, Mass.; Eric Rustici, and Kelly H. Carter, both of Londonderry, N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 24, 1987, Ser. No. 88,936
Int. Cl.[4] G06F *3/23, 9/46*
U.S. Cl. 364—900 **8 Claims**

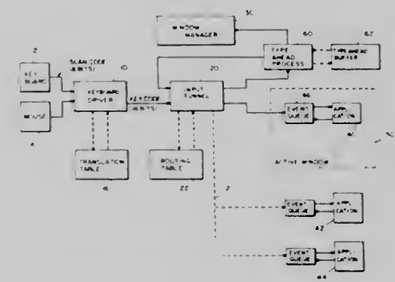
5. A method of routing user input in a computer system which concurrently runs a plurality of processes, including steps of:

generating keycodes representative of keys typed by a user;

distinguishing generated keycodes by looking up each keycode in a routing table which assigns each possible keycode to an individual assigned process of said plurality of processes, one of which processes being a supervisory process;

then, sending each keycode to its assigned process until a keycode assigned to the supervisory process is received;

sending keycodes received subsequent to the keycode assigned to the supervisory process to a buffer;



next, providing additional keycodes to the supervisory process from the buffer until the supervisory process has completed operation; and

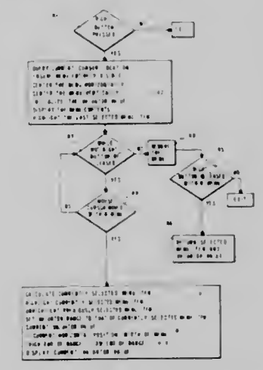
sending keycodes stored in the buffer to processes assigned therewith after the supervisory process has completed operation.

4,896,291

VALUATOR MENU FOR USE AS A GRAPHICAL USER INTERFACE TOOL

Stephen B. Gest, and Farrell W. Wymore, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1988, Ser. No. 196,922
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—900 **19 Claims**



1. A user interface for a data processing system, comprising:

means for displaying a list having a plurality of user actions; and means, coupled to said means for displaying, for simultaneously selecting one of said actions and a value within a range of values of said action.

4,896,292

APPARATUS FOR THE REVERSIBLE, OPTICAL STORAGE OF DATA

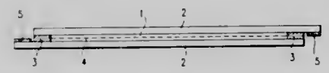
Manfred Eich, Frankfurt, and Joachim Wendorff, Naubeim, both of Fed. Rep. of Germany, assignors to Rohm GMBH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 10,488, Feb. 3, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 262,031

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1986, 3603267

Int. Cl.[4] G11C *13/02, 13/04*

U.S. Cl. 365—108 **32 Claims**



1. An apparatus for reversible optical data storage, comprising:

(i) a substrate; and

(ii) a macroscopically oriented film of a liquid crystal polymer in contact with said substrate,

wherein said polymer is in the solid, shape retaining condition at a first temperature below the glass temperature of said polymer,

wherein said polymer is in the isotropic liquid condition at a second temperature above the glass temperature of said polymer, and

wherein said glass temperature is greater than room temperature,

whereby data is stored by modulated local heating of said polymer at said first temperature to said second temperature wherein said polymer is in the isotropic liquid condition and whereby the data is fixed in the glass condition of said polymer when the heating is stopped.

4,896,293

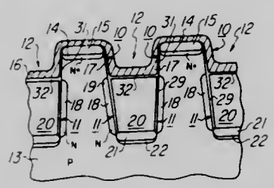
DYNAMIC RAM CELL WITH ISOLATED TRENCH CAPACITORS

David J. McElroy, Rosenberg, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 9, 1988, Ser. No. 204,337

Int. Cl.[4] G11C *11/24, 11/34;* **H01L** *29/78;* **G03B** *27/52*

U.S. Cl. 365—149 **9 Claims**



1. A dynamic random-access memory cell of the type having at least one storage capacitor and at least one access transistor formed at a face of a semiconductor body, comprising:

a pair of parallel trenches extending into said face of the semiconductor body on opposite sides of a semiconductor region formed by said parallel trenches,

a heavily-doped transistor drain region formed in the upper portion of said semiconductor region between said parallel trenches,

a conductive material filling a lower portion of said trenches and insulated by a capacitor dielectric from the sidewalls of said semiconductor region between said parallel trenches,

a pair of separate capacitor regions each formed in a lower portion of each sidewall of said semiconductor region between said parallel trenches, the capacitor regions doped with impurity different from the doping of said body, each said capacitor region being spaced from said drain region by a channel area in said sidewall, and each capacitor region being electrically isolated along said face from other capacitor regions of other cells, and

a gate separated from each said channel area by a transistor gate oxide,

wherein said storage capacitor is formed by said conductive material, said capacitor dielectric and at least one of said capacitor regions formed in said sidewall.

4,896,294

SEMICONDUCTOR MEMORY DEVICE WITH ROW AND COLUMN WORD LINES AND ROW AND COLUMN BIT LINES

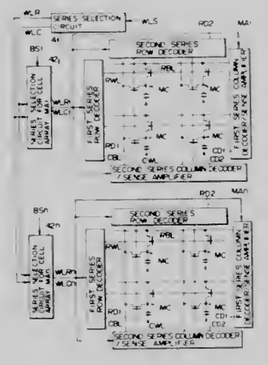
Mitsuru Shimizu, Sakura, and Nobuyuki Ikumi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1988, Ser. No. 261,866

Claims priority, application Japan, Dec. 9, 1987, 62-311177

Int. Cl.[4] G11C *7/00, 11/40, 8/00*

U.S. Cl. 365—149 **5 Claims**



1. A semiconductor memory device comprising:

a memory cell array including a plurality of memory cells arrayed in a matrix fashion, each of said memory cells including a first MOS transistor, a second MOS transistor, and a capacitor, which are connected at the first ends to one another;

a word line for a first cell series, connected to the gates of first MOS transistors in the memory cells arrayed a row;

a word line for a second cell series, connected to the gates of second MOS transistors arrayed in a column;

a bit line for the fist cell series, connected to the second ends of the first MOS transistors in said row;

a bit line for the second cell series, connected to the second ends of the second MOS transistors in said column; and

a cell series selection circuit for selecting one of the first cell series and the second cell series, according to the external input signal for cell series selection.

4,896,295

EPROM MEMORY CELL WITH TWO SYMMETRICAL HALF-CELLS AND SEPARATE FLOATING GATES

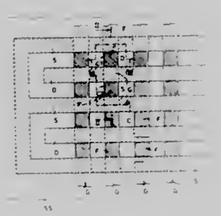
Giuseppe Corda, Saronno, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Milan, Italy

Filed Mar. 14, 1988, Ser. No. 167,986

Claims priority, application Italy, Mar. 12, 1987, 19656 A/87

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—185 **2 Claims**



1. An EPROM memory cell matrix comprising a silicon substrate; a plurality of parallel drain lines formed on said substrate; a plurality of parallel source lines formed on said substrate and alternating with said drain lines; floating gate areas spanning said drain lines and source lines; a plurality of parallel control gate lines arranged perpendicularly to said drain and source lines and superimposed on and self-aligned with said floating gate areas; and oxide areas electrically separating said drain lines, said source lines, said floating gate areas, and said control gate lines; wherein all of said source lines are electrically connected together so that each cell of said matrix comprises two symmetrical half-cells having a drain and a control gate in common, with respective sources being separated physically but connected electrically and respective floating gates being separated physically and electrically.

4,896,296

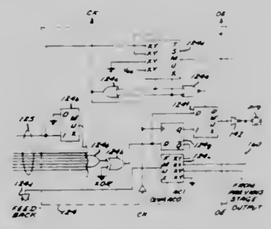
PROGRAMMABLE LOGIC DEVICE CONFIGURABLE INPUT/OUTPUT CELL

John E. Turner; David L. Rutledge, both of Beaverton, and Roy D. Darling, Forest Grove, all of Oreg., assignors to Lattice Semiconductor Corporation, Beaverton, Oreg.

Division of Ser. No. 862,815, May 13, 1986, Pat. No. 4,879,688, which is a continuation-in-part of Ser. No. 707,662, Mar. 4, 1985, Pat. No. 4,761,768. This application Dec. 23, 1988, Ser. No. 288,945

Int. Cl.[4] G11C *7/00;* **H03K** *19/173*

U.S. Cl. 365—189.08 **14 Claims**



1. An integrated programmable logic device comprising:

a programmable array including a plurality of input lines and a plurality of product term lines;

a device terminal;

a three-state output driver having an input coupled to a subset of the product term lines and an output coupled to the device terminal, the output driver responsive to a control logic signal for operating in one of a first mode in which the output driver provides an output logic signal to the device terminal and a second mode in which the output driver presents a high impedance to the device terminal for configuring the logic device to receive data externally applied at the device terminal;

a multiplexer having at least two input terminals, including a first input terminal coupled to a predetermined one of the product term lines to receive a product term signal and a second input terminal coupled to receive a predetermined logic signal, and having an output terminal coupled to provide the control logic signal to the output driver; and

means for controlling the multiplexer to selectively provide one of the product term signal and the predetermined logic signal to the output driver as the control logic signal.

4,896,297

CIRCUIT FOR GENERATING A BOOSTED SIGNAL FOR A WORD LINE

Hideshi Miyatake; Kazuyasu Fujishima; Masaki Kumanoya; Hideto Hidaka; Katsumi Dosaka, and Yasuhiro Konishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 112,034

Int. Cl.[4] G11C *7/00;* **H03K** *17/687*

U.S. Cl. 365—189.11 **21 Claims**



21. An apparatus which includes at least a first power supply for supplying a voltage of predetermined first level, a second power supply for supplying a voltage of predetermined second level higher than said first level and a circuit for generating a boosted signal for a word line, comprising:

control signal generating means responsive to an external synchronous signal for generating a precharge start signal having a predetermined period, a boosting trigger signal delayed from said precharge start signal, a floating signal delayed from said boosting trigger signal and a boost signal delayed from said floating signal;

control means coupled to a word line driving signal line for transmitting a voltage signal to a word line and to said first power supply and responsive to said precharge start signal and said boosting trigger signal for bringing said word line driving signal line to the voltage of the first level and responsive to said floating signal for rendering said word line driving signal line in an electrically floating state;

first boost means coupled to said word line driving signal line and responsive to said boost signal for boosting said word line and responsive to said boost signal for boosting said word line driving signal line; and

compensating voltage supply circuit means coupled to said word line driving signal line and to said second power supply and responsive to at least said precharge start signal for supplying a compensating voltage to said word line driving signal line to compensate for decrease in voltage of said word line driving signal line when said decrease occurs.

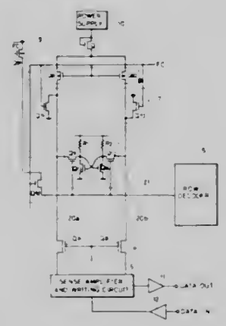
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4,896,298
READ CIRCUIT FOR MEMORY
Jacek Kowalski, Trets, France, assignor to SGS-Thomson Microelectronics SA, Paris, France
Filed Jan. 25, 1988, Ser. No. 147,902
Claims priority, application France, Jan. 27, 1987, 87 00931
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.01 **8 Claims**



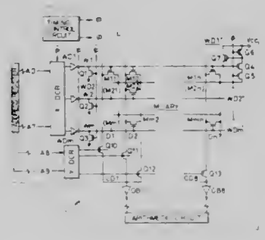
1. A reading circuit for a matrix of memory cells, said cells being arranged in rows and columns, the cells belonging to a common column being connected to a common corresponding bit line, said circuit comprising:
a precharge circuit for precharging said bit line to a precharge voltage prior to a reading operation; and
a detection circuit connected to said bit line and activated by a reading signal, said detection circuit detecting the discharge of said precharge bit line during a read operation and said discharge being dependant upon the logical state of an addressed cell of said memory cells which addressed cell is connected to said bit line and said reading circuit further comprising means for systematically discharging said bit line after the read operation whether or not said bit line has been discharged during the read operation.

4,896,299
STATIC SEMICONDUCTOR MEMORY DEVICE HAVING FUNCTION OF RESETTING STORED DATA
Tomohisa Wada, and Toshihiko Hirose, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 26, 1987, Ser. No. 114,245
Claims priority, applicatioo Japan, Oct. 24, 1986, 61-254482
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.01 **15 Claims**



1. In a static semiconductor memory device comprising a two dimensional memory cell array formed by static memory cells connected to a plurality of complementary bit line pairs and to a plurality of word lines, row decoder means for selecting a specific one of said word lines from among said plurality of word lines, a plurality of bit line load circuit means connected between said plurality of bit lines pairs and a power supply source, and an output terminal connected to said bit line pairs for outputting data from said memory cells, said static semiconductor memory device comprising:
word line driving means for simultaneously activating ones of said plurality of word lines connected to predetermined ones of said memory cells;
cutoff circuit means connected between said bit line load circuit and ones of said plurality of bit line pairs connected to said predetermined ones of said memory cells for interrupting a current flow in said bit line load circuits connected to said predetermined ones of said memory cells; and
potential fixing circuit means for setting said bit line pairs connected to said predetermined ones of said memory cells to a common state.

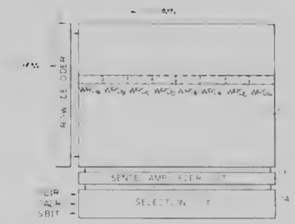
4,896,300
MICROPROCESSOR INCLUDING A MICROPROGRAM ROM HAVING A DYNAMIC LEVEL DETECTING MEANS FOR DETECTING A LEVEL OF A WORD LINE
Yutaka Shinagawa, Koganei, and Shigeru Shimada, Hoya, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., Tokyo, Japan
Division of Ser. No. 852,316, Apr. 15, 1986, Pat. No. 4,719,603.
This application Nov. 25, 1987, Ser. No. 126,258
Claims priority, application Japan, Apr. 15, 1985, 60-78364
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
In:. Cl.[4] G11C *7/00, 11/40, 8/00*
U.S. Cl. 365—204 **9 Claims**



1. A microprocessor comprising a microprogram ROM, wherein said microprogram ROM comprises:
a memory array which has a plurality of memory cells and a plurality of selection lines coupled to said memory cells;
a driver circuit whose output terminal is coupled to one end of each selection line for selecting predetermined memory cells by providing an output signal to a predetermined selection line;
a voltage detector circuit constructed of a first MOSFET whose gate receives an output signal of said driver circuit through said predetermined selection line, an output node coupled in series with the source-drain path of the first MOSFET, a second MOSFET which is on/off-controlled by a timing signal, wherein said first and second MOSFETs are connected in series between the output node and one terminal of a power source, and a third MOSFET which is on/off-controlled complementarily to said second MOSFET and which is connected between another terminal of the power source and the output node; and
a fourth MOSFET which is interposed between said another terminal of the power source and the gate of said first MOSFET, and which is brought into an "on" state by an output of the output node at a predetermined time when said second MOSFET has been brought into an "on" state and when a gate potential of said first MOSFET has exceeded a predetermined level,

wherein said microprogram ROM is formed on a single semiconductor substrate with other elements of said microprocessor, including registers, an arithmetic circuit and a timing control circuit.

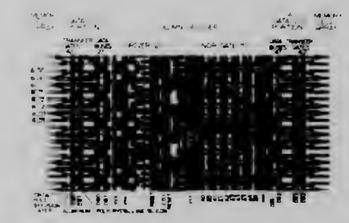
4,896,301
SEMICONDUCTOR MEMORY DEVICE CAPABLE OF MULTIDIRECTION DATA SELECTION AND HAVING ADDRESS SCRAMBLE MEANS
Junji Ogawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 13, 1988, Ser. No. 143,477
Claims priority, application Japan, Jan. 19, 1987, 62-009494
Int. Cl.[4] G11C *7/00, 8/00;* **G06F** *1/00*
U.S. Cl. 365—230.03 **9 Claims**



1. A semiconductor memory device, comprising:
a plurality of word lines;
a plurality of bit lines;
a memory cell array means having a plurality of memory cells operatively connected to said word lines and said bit lines for forming a logical space;
a row decoder means operatively connected to said word lines for selecting one word line in response to an internal row address;
multidirection data selection means operatively connected to said bit lines for simultaneously receiving a data set including a plurality of data from said memory cells, and for selecting desired data from said received data set in response to an internal directional address; and
address scramble means, operatively connected to said row decoder and said multidirection selection signal from outside of said semiconductor memory device, wherein said external address having an addressing linearity regardless of a selection made at said multidirection data selection means, and wherein said address scramble means is for further converting, due to activation by said direction selection signal, said received external address to said internal directional address.

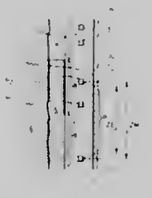
4,896,302
SEMICONDUCTOR MEMORY DEVICE HAVING COMMON DRIVER CIRCUITS FOR PLURAL MEMORY CELL ARRAYS
Kimiaki Sato; Yoshihiro Takemae, both of Tokyo; Masao Nakano, and Nobumi Kodama, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 844,377, Mar. 26, 1986, abandoned.
This application Nov. 22, 1988, Ser. No. 277,392
Claims priority, application Japan, Mar. 30, 1985, 60-68247
Int. Cl.[4] G11C *5/02, 7/00, 8/00;* **H03K** *19/094*
U.S. Cl. 365—230.06 **4 Claims**

1. A semiconductor memory device, comprising:
a first memory cell array and a first data input/output portion having transfer gates and data buses;
a second memory cell array and a second data input/output portion having transfer gates and data buses;
wirings connecting a sequence of driver circuits to said second data input/output portion; and
a column decoder circuit disposed between said first and second data input/output portions, said wirings traversing said column decoder circuit, said column decoder circuit, comprising:
address lines having address signals thereon;
a sequence of logic gate circuits, coupled to said address lines and said second data input/output portion of said second memory cell array, for receiving address signals and producing selection signals; and



said sequence of driver circuits, respectively coupled between and disposed in parallel with said sequence of logic gate circuits and the first data input/output portion of said first memory cell array, for receiving the selection signals and producing drive signals, said sequence of driver circuits being provided as driver circuits common to said first and second memory cell arrays, each of said driver circuits having an output terminal directly connected to said first data input/output portion and connected to said second data input-/output portion through said wirings traversing said sequence of said logic gate circuits.

4,896,303
METHOD FOR CEMENTATION EVALUATION USING ACOUSTICAL COUPLING AND ATTENUATION
David Leslie; Jacques A. E. de Selliers de Moranville, and Dennis J. Pittman, all of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Continuation of Ser. No. 913,820, Sep. 30, 1986, abandoned. This application Nov. 17, 1988, Ser. No. 273,120
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—35 **17 Claims**



1. A method of determining the properties of a material disposed behind a casing in a wellbore, comprising:
using a transmitter means adapted to be disposed in the wellbore within said casing, transmitting acoustic signals into said wellbore;
using a receiver means adapted to be disposed in the wellbore within said casing, receiving at least two of said acoustic signals in said wellbore, each of said signals corresponding to different spacings between a transmitter of

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said transmitter means and a receiver of said receiver means;

combining said acoustic signals and deriving from each of the acoustic signals a compensated attenuation rate signal representative of an attenuation of the received acoustic signal produced while propagating axially along said casing and a coupling signal representative of an attenuation of the received acoustic signal produced while propagating between the transmitter and said casing and between the receiver and said casing; and

determining the properties of the material behind the casing from both the attenuation rate signal and the coupling signal associated with each of the received acoustic signals.

4,896,304

OBJECT DETECTING SYSTEM USING ULTRASONIC WAVES

Hiroshi Tanigawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

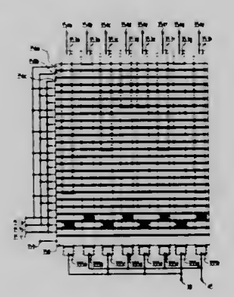
Continuation of Ser. No. 143,289, Jan. 7, 1988, which is a continuation of Ser. No. 15,523, Feb. 13, 1987, abandoned, which is a continuation of Ser. No. 699,200, Feb. 7, 1985, abandoned.

This application May 31, 1989, Ser. No. 359,341

Claims priority, application Japan, Feb. 7, 1984, 59-20290; Feb. 7, 1984, 59-20291; Feb. 7, 1984, 59-20292; Feb. 7, 1984, 59-20295; Feb. 7, 1984, 59-20296; Feb. 7, 1984, 59-20297

Int. Cl.[4] G01S *15/06*

U.S. Cl. 367—103 **5 Claims**



1. An object detecting system comprising:

an ultrasonic transducer element array comprising first to N-th ultrasonic transducer elements;

a first means for intermittently supplying burst driving pulses to said ultrasonic transducer elements at different times in each of successive intermittent periods; and

a second means coupled between each of said first to N-th ultrasonic transducer elements and said first means for applying said burst driving pulses to said first to N-th ultrasonic transducer elements, successively, said second means comprising first to N-th delay circuits which delay applying said burst driving pulses to said ultrasonic transducer elements, said first to N-th delay circuits giving different delay time periods, respectively, so that said delay time periods are successively longer in the order from said first delay circuit to said N-th delay circuit, and each of said ultrasonic transducer elements being supplied with the burst driving pulse through two kinds of said delay circuits connected in parallel in such a manner that M-th number of said ultrasonic transducer elements is coupled with M-th and (N−M+1)-th delay circuits, with M being a number from one to N.

4,896,305

ANIMAL LURING DEVICE

Eric A. Gimbal, 427 Houston Rd., Ambler, Pa. 19002

Filed May 2, 1989, Ser. No. 346,593

Int. Cl.[4] H04B *1/02*

U.S. Cl. 367—139 **6 Claims**



1. An animal luring device for selective recording and playback of animal audible sounds comprising,

a base member including a rechargeable battery and in electrical communication with a microphone and loudspeakers, and

a recorder/playback member mounted to said base is operably associated with said loudspeakers and said battery and is operative to enable selective recording and playback of audible animal sounds to direct such sounds through the loud speakers, and

the microphone in selective electrical communication with the recorder/playback member to selectively record animal sounds, and

frequency controller to select a predetermined frequency for filtering undesirable audible sounds during recording, and

a photovoltaic cell positioned within a housing cover selectively associated with the base member to recharge the battery for extended and remote use of the device.

4,896,306

ELECTRONIC SCHEDULER CAPABLE OF SEARCHING SCHEDULE DATA BASED ON TIME

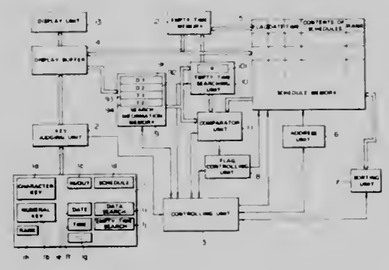
Masao Sanbongi, Kunitachi, and Minoru Tagi, Fussa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,860

Claims priority, application Japan, Jul. 17, 1987, 62-109668[U]; Jun. 1, 1988, 62-71758[U]

Int. Cl.[4] G04B *19/24, 45/00*

U.S. Cl. 368—29 **8 Claims**



1. An electronic scheduler, comprising:

memory means for storing plural schedule data, including means for combining at least time range data defined by first time data and second time data with corresponding schedule information;

means for entering time data as searching information into the electronic scheduler;

means for judging whether or not the time data entered by said entering means is present between the first time data and the second time data of the schedule data stored in said memory means; and

means for displaying schedule data with time range data defined by said first and said second time data when said judging means judges that the entered time data corresponds to a time between the first time data and the second time data.

4,896,307

MICROCOMPUTER-CONTROLLED PROGRAMMABLE TIME SWITCH

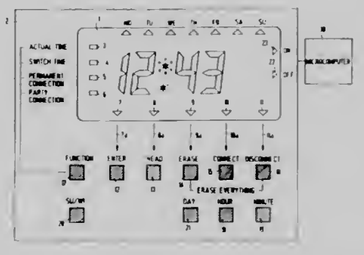
Juergen Marx, Nuremberg, and Manfred Baumgaertner, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,764

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1988, 3813921

Int. Cl.[4] G04B *19/30;* **G04C** *19/00*

U.S. Cl. 368—70 **6 Claims**



1. A microcomputer controlled programmable time switch for connecting and disconnecting an electrically controllable device, comprising:

a set of selection keys that select which data from data groups is to be set;

a set of setting keys that have individual functions to set said selected data;

a display that displays said data groups;

indicator lights on said display that are associated with said setting keys, said indicator lights for said data groups having corresponding legends that are clearly associated with said indicator lights;

a microcomputer, coupled to said selection keys and said setting keys, having data and shift registers coupled to said setting keys to receive input of said individual functions, with said selection keys providing cyclical selection of particular data from said data groups, said microcomputer having means for storing said data;

wherein a first of said data groups is a function selection, a second of said data groups is the days of the week, and a third of said data groups is the time;

wherein said data includes input, readout, erasing, and connecting and disconnecting of said device;

wherein said microcomputer includes means for guiding data input by flashing said indicator lights, with unguided data inputs being enterable in any sequence; and

wherein said microcomputer automatically stores data required for a complete data input after all such data has been selected.

4,896,308

DIGITAL CLOCK FOR GIVING ACOUSTIC TIME-INDICATING SIGNALS AT PREDETERMINED MOMENTS

Huoy J. Hwang, No. 53, Chi Shan I St., 23 Lin, Hsiang Lu Tsun, Ta Li Hsiang, Taichung Hsien, Taiwan

Filed Jun. 15, 1989, Ser. No. 366,454

Int. Cl.[4] G04B *21/02, 19/16*

U.S. Cl. 368—75 **3 Claims**



1. A digital clock for giving acoustic time-indicating signals at predetermined moments comprising an oscillator, a time integrated circuit driven by said oscillator, a first display means connected to said time integrated circuit to show hour and minute and a second display means connected to said time integrated circuit to show a day among a week,

two minute and hour decoders connected to said first display means to convert signals therefrom into a digital form,

a memory unit for receiving said signals from said minute and hour decoders, and having a plurality of inputs and outputs and a control pin,

a setting circuit comprising a plurality of flip-flops and a control switches connected to said inputs of said memory unit to pre-set said moments when said acoustic time-indicating signals are given;

an acoustic generator and a driving interface connected to respective outputs of said memory unit and driven by said memory unit to output said time-indicating signals,

a switching circuit to respectively connect with an output of said second display means and a control pin of said memory unit to disable said memory unit on a day shown on said second display means, and

a plurality of time-setting switches connected to said time integrated circuit to manually adjust time shown on said first and second display means.

4,896,309

OPTICAL DISC PLAYER WITH PHASE SHIFT DEPENDENT ON DISK ROTATION DIRECTION

Akio Yamakawa, Kanagawa; Noriyuki Yamashita, Tokyo, and Masaaki Arai, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 2, 1988, Ser. No. 201,197

Claims priority, application Japan, Jun. 11, 1987, 62-146066

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **12 Claims**

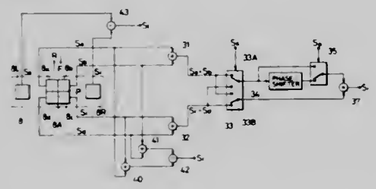
1. A signal reproducing system for use in an optical disc player using a light beam incident upon an optical record disc on which an information signal is recorded in a record track to read the information signal from the optical record disc, comprising:

disc driving means for rotating the optical record disc including the record track in a predetermined direction,

optical head means including an optical system for causing the light beam to impinge upon the optical record disc rotated by said disc driving means and receiving a reflected light beam from the optical record disc and at least first and second photodetecting elements so that a light beam spot is formed on the first and second photodetect-

ing elements by the reflected light beam received by the optical system and the photodetecting elements are aligned along a direction of movement of a diffraction pattern appearing in the beam spot in accordance with the movement of the record track,

phase shifting means for varying a phase of at least one of first and second output signals respectively based on detection outputs of said first and second photodetecting element,



switching means for causing the first and second outputs signals selectively to pass through said phase shifting means in response to the direction of movement of the record track relative to the light beam incident upon the optical record disc, and

mixing mean operative to add one of the said first and second output signals derived from said phase shift means to the other of said first and second output signals so as to produced a reproduced information signal.

4,896,310

LIGHT BEAM CONTROL ARRANGEMENTS FOR OPTICAL DISC APPARATUS

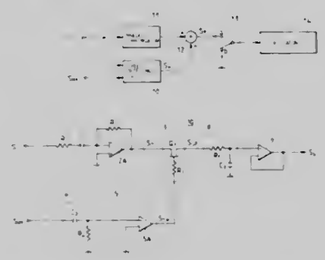
Shigeaki Wachi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,654

Claims priority, application Japan, Jul. 31, 1987, 62-118460[U]; Jan. 29, 1988, 63-16837

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **9 Claims**



1. A light beam control arrangement for an optical disc apparatus in which a tracking servo control for a light beam projected from an optical head device onto an optical disc is performed for keeping the light beam to trace a record track formed in the optical disc in accordance with a tracking error signal and a reproduced information signal is obtained from the record track upon which the light beam impinges, the arrangement comprising:

differentiation means for differentiating one of the tracking error signal and the reproduced information signal to produce a differentiation output signal,

phase detection means for phase-detecting said differentiation output signal with the other of the tracking error signal and the reproduced information signal to produce a detection output signal,

low pass filter means for producing a DC output signal having a level varying in response to an amplitude of said detection output signal, and

signal mixing means for mixing said DC output signal with the tracking error signal so that said DC output signal is used, in addition to the tracking error signal, for the tracking servo control.

4,896,311

DISK APPARATUS

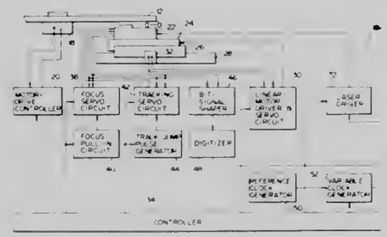
Atsushi Ishihara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

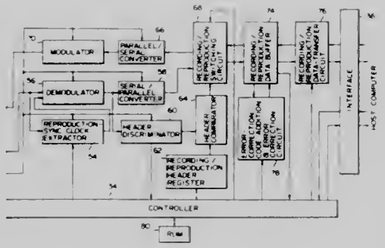
Filed Oct. 2, 1986, Ser. No. 914,623

Claims priority, application Japan, Oct. 3, 1985, 60-220579

Int. Cl.[4] G11B *21/08*

U.S. Cl. 369—47 **32 Claims**





1. A disk apparatus for reproducing data from both a first type disk and a second type disk, said first type disk recording data at a constant first frequency irrespective of a radial location of said data on said first type disk, said second type disk recording data at a frequency modified as a function of a radial location of said data on said second type disk, said first type disk and said second type disk having identification data for identifying the type of the disk, said disk apparatus comprising:

means for rotating a disk;

first reproducing means for reproducing said identification data recorded on said rotated disk and for determining whether said rotated disk is a first type disk or a second type disk; and

second reproducing means for reproducing data recorded on said rotated disk at said constant first frequency irrespective of the radial location of the data on said rotated disk when said first reproducing means determines that said rotated disk is said first type disk, and for reproducing data recorded on said rotated disk at said frequency modified as a function of the radial location of said data when said first reproducing means determines that said rotated disk is said second type disk, said modified frequency being a gradually increasing stepwise function of the location of the recorded data measured radially from the inside of said second type disk to the outside thereof.

4,896,312

CARTRIDGE LOADING APPARATUS

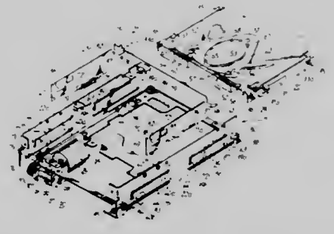
Kazuharu Odawara, Yokohama, and Ryoji Yamaguchi, Yutaka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 3, 1987, Ser. No. 56,902

Claims priority, application Japan, Jun. 13, 1986, 61-137481

Int. Cl.[4] G11B *17/04, 23/02*

U.S. Cl. 369—77.2 **12 Claims**



1. An apparatus for loading a disc-containing cartridge into a reproducing device having a head, the cartridge including a window for exposing a portion of the disc, and a movable shutter for covering the window when the cartridge is removed from the apparatus, comprising:

a main body having a port for receiving and discharging the cartridge therethrough;

means for moving the cartridge inserted into the port to a prescribed position within the main body adjacent to the head, including means for opening the shutter; and

at least one projection positioned in the main body for insertion into said window when said shutter is open to expose the disc, and for abutting said shutter to prevent the cartridge from moving to said prescribed position when said shutter is not fully opened.

4,896,313

OPTICAL INFORMATION RECORDING MEDIUM UTILIZING PITS HAVING A SHARP FRONT FACE AND METHOD OF MANUFACTURING THE SAME

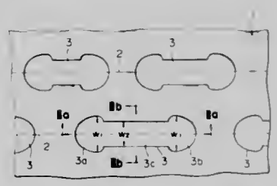
Atsuki Hirose, Ibaraki, and Tamotu Iida, Tsuchiura, both of Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Filed Jul. 9, 1987, Ser. No. 71,349

Claims priority, application Japan, Jul. 10, 1986, 61-160712

Int. Cl.[4] G11B *7/24*

U.S. Cl. 369—275 **25 Claims**



1. An optical information recording medium having on one side of a substrate a series of pits corresponding to a record signal, wherein the angle between a front face of each pit of said series of pits and a pit forming plane of said substrate, and the angle between a back face of each pit and said pit forming plane are made larger than the angle between a side face at an intermediate portion between said front and back faces along the entire length of said pit and said pit forming plane.

4,896,314

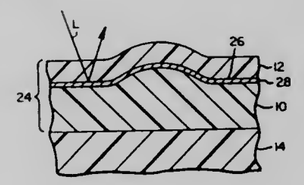
BUMP-FORMING MEDIA INCLUDING THIN INTERMEDIATE REFLECTIVE LAYER AND METHODS FOR WRITING, READING, AND ERASING SAME

W. Eugene Skiens, Wilsonville; Michael A. Lind; John S. Hartman, both of Durham; John W. Swanson, Portland, and Nancy E. Iwamoto, Portland, all of Oreg., assignors to Optical Data, Inc., Beaverton, Oreg.

Filed Apr. 19, 1988, Ser. No. 183,719

Int. Cl.[4] G11B *7/24*

U.S. Cl. 369—284 **22 Claims**



1. An optical recording medium including a triple layer recording structure, comprising:

(a) a first layer of a first material;

(b) a second layer of a second material;

(c) a third layer of a third material interposed between said first and second layers;

(d) said first, second and third layers cooperating as a medium for forming therein an optically detectable deformation by thermal expansion of said first material deforming said second and third layers without liquefaction or gasification of said first, second, or third materials when said first material is locally heated with light radiation of a first preselected wavelength L_1;

(e) said first, second, and third materials being sufficiently bonded together so as to enable said second layer, through said third layer bonded thereto, to hold said first material in expanded configuration upon cessation of said L_1 and cooling of said first material, retaining said optically detectable deformation, said second layer being sufficiently strong and rigid to hold said first material in expanded condition, said third layer including reflective means for enhancing the optical reflectance of said optically detectable deformation;

(f) said first, second and third layers further cooperating as an erasable optical recording medium for relaxing said optically detectable deformation without liquefaction or gasification of said first, second, or third materials when said second material is locally heated with light of a second preselected wavelength L_2, said third layer being sufficiently bonded to said first and second layers to enable said first layer, through said third layer bonded thereto, to pull said second layer flat; and

(g) said second layer adapted to substantially transmit said L_1 and substantially absorb said L_2 and said third layer adapted to partially transmit and partially reflect L_1.

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4,896,315

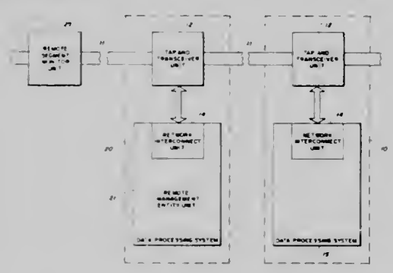
APPARATUS AND METHOD FOR DETERMINING NETWORK COMPONENT LOCATIONS ON A LOCAL AREA NETWORK SYSTEM CABLE SEGMENT

Michael A. Felker, Rio Rancho, N. Mex.; Chang J. Wang, Nashua, N.H.; Angelo N. Viverito, Albuquerque, N. Mex.; John W. Gilstrap, Albuquerque, N. Mex., and Jesus J. Martos, Tijeras, N. Mex., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 76,724, Jul. 23, 1987, Pat. No. 4,799,211. This application Nov. 23, 1987, Ser. No. 123,890

Int. Cl.[4] H04J *1/16*

U.S. Cl. 370—17 **18 Claims**



1. Apparatus for determining a location on a local area network cable segment of a device applying signals thereto, said apparatus comprising:

first means located at a first position of said cable segment for measuring and storing signal strengths on said cable segment and associating an issuing device identification with each set of signals;

second means located at a second position of said cable segment for measuring and storing signal strengths on said cable segment and associating an issuing device identification with each set of signals; and

processing means coupled to said local area network for receiving said stored signal strengths and associated issuing device identifications from said first and said second means applied to said segment cable in response to a signal group from said processing means, said processing means including:

a first procedure for determining an attenuation constant for said cable segment from said first and said second means stored signal strengths and said associated issuing device identifications; and

a second procedure for comparing attenuated signal strengths in relationship in said attenuation constant for sets of transaction signals issued from a selected device, said comparison providing a location of said selected device.

4,896,316

METHOD AND SYSTEM OF CONTROL OF FLOW OF DATA PACKETS

Albert Lespagnol, Perros-Guirec, and Jacques Y. Kerberenes, Lannion, both of France, assignors to L'etat Francais, Represente par le Ministre des PTT Centre National d'Etudes des Telecommunications (CNET), France

Filed Apr. 18, 1988, Ser. No. 182,940

Claims priority, application France, May 26, 1987, 87 07556

Int. Cl.[4] H04J *3/26*

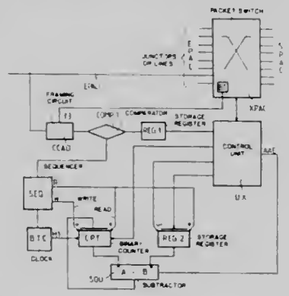
U.S. Cl. 370—60 **7 Claims**

1. A process for controlling the flow of data packets carried on a plurality of virtual circuits from a plurality of multiple demands, said process comprising the steps of:

(a) identifying each of said data packets in response to each request for an authorization to transmit, each data packet being identified by a label included in said packet and by an identification of a multiplex channel carrying the data packet;

(b) measuring the flow of data packets flowing on each of said virtual circuits and comparing said measured flow with an average rate to determine whether the measured flow is positive, negative, or null with respect to said average rate;

(c) if the flow compared in step (b) indicates that the measured flow of data packets is positive with respect to the average flow rate, giving an authorization to transmit and translating into rights to transmit which are proportional



to the time which has elapsed since the last previous request for a transmission authorization, the rights to transmit being accumulated;

(d) if the flow compared in step (b) indicates that the measured flow of data packets is negative with respect to the average flow rate, and if the accumulated rights to transmit are positive, giving an authorization to transmit and decrementing said accumulated rights; and

(e) if the flow compared in step (b) indicates that the measured flow of data packets is negative with respect to the average flow rate and if the accumulated right are nil, denying an authorization to transmit.

4,896,317

SUPERVISORY SYSTEM FOR A PRIMARY GROUP DIGITAL TRANSMISSION LINE

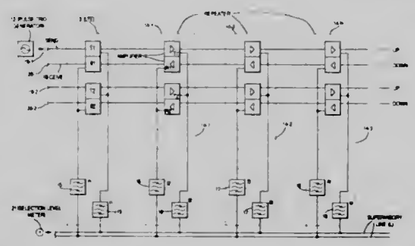
Noboru Nakama, Fussa; Hideyuki Motoori, Yokohama; Atsushi Suzuki, Yokosuka; Eiji Sogawara, Yokohama, and Naoyuki Kato, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 11, 1988, Ser. No. 155,139

Claims priority, application Japan, Feb. 20, 1987, 62-038916; May 15, 1987, 62-118134

Int. Cl.[4] H04B *17/00*

U.S. Cl. 370—13.1 **4 Claims**



1. A supervisory system for a primary group digital transmission line comprising:

terminal repeater means for receiving and transmitting multiplexed signals, for transmitting address information and for receiving and storing conditional information; and

a plurality of intermediate repeater means, having a normal, in-service condition, for receiving and transmitting said multiplexed signals, for receiving said address information and for providing, in response to said address information, said conditional information to said terminal repeater means while in said normal in-service condition, said terminal repeater means and said plurality of intermediate repeater means each include:

a plurality of amplifier means for receiving, amplifying and transmitting said multiplexed signals, and for providing a monitor output signal;

switching means for providing a monitor output signal of a designated one of said plurality of said amplifier means in accordance with said address information; and

error monitor means, for receiving said monitor output signal and for providing a coded output representing an error rate of said monitor output signal provided by said switching means.

4,896,318

METHOD FOR CANCELLING ECHO IN A TRANSMITTER AND AN APPARATUS THEREFOR

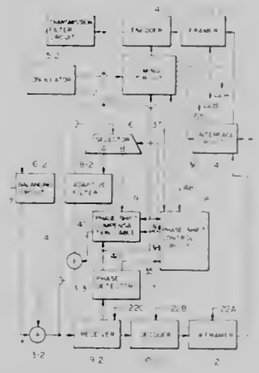
Masaru Kokubo, Fuchu; Tatsuko Shinotsuka, Stuffgart; Tatsuya Kameyama, Hachioji; Motohiro Kokumai, Yokohama, and Hirotaka Hara, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16. 1988, Ser. No. 271,673

Claims priority, application Japan, Nov. 18, 1987, 62-289320; Jun. 24, 1988, 63-154692

Int. Cl.[4] H04B *3/23*

U.S. Cl. 370—32.1 **25 Claims**



7. An echo canceller in a network termination (NT) of a transmission system comprising:

(a) means for transmitting a signal from the NT to a line termination (LT) and sampling an echo of the transmitted signal to set tap coefficients of an adaptive filter in the NT;

(b) means for requesting a down-going signal from the LT after the tap coefficients of the adaptive filter have been set;

(c) means for shifting a phase of the receiving clock with respect to the down-going signal from the LT for synchronization;

(d) means for detecting an end of transmission of a specific data train in an up-going signal from the NT when the phase of the receiving clock is to be shifted for synchronization during the transmission of the up-going signal from the NT;

(e) means for shifting the phase of the receiving clock when the end of transmission is detected;

(f) means for sampling a residual echo signal of the echo of the specific data train not cancelled by the adaptive filter to determine a correction value for the output of the adaptive filter and store the correction value;

(g) means for synchronizing by the means (d) and (e) when the phase of the receiving clock is to be shifted for synchronization after the correction value has been stored;

(h) means for adding a sign corresponding to the direction of phase shift to the correction value; and

(i) means for adding the correction value having the sign added thereto to the output of the adaptive filter after the phase shift by the means (g) to cancel the echo of the specific data train.

4,896,319

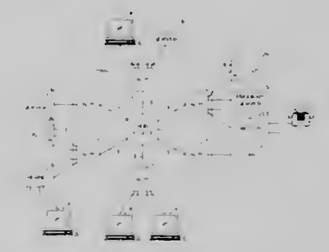
IDENTIFICATION AND AUTHENTICATION OF END USER SYSTEMS FOR PACKET COMMUNICATIONS NETWORK SERVICES

William P. Lidinsky, Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville; Ronald C. Weddige, Western Springs, and Bruce R. Zelle, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,544

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **12 Claims**



1. In a data network, a method of obtaining security in packet transmission from an input port to an output port, comprising the steps of:

including in each data packet an identity of said input port and an identity of a user of said input port transmitting said each data packet; and

in said network, prior to transmitting to said output port, for said each data packet, checking whether said user, identified by said user identity, has been previously authorized to transmit from said input port identified by said port identity if network transmission capacity is available.

4,896,320

FILTER BANK FOR FREQUENCY DEMULTIPLEXING IN MULTIPLE CHANNELS

Heinz Göckler, Elbinger Strasse 52, D-7150 Backnang, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 193,782

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716018

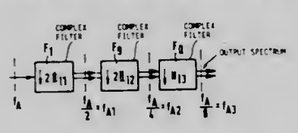
Int. Cl.[4] H04J *1/08*

U.S. Cl. 370—123 **14 Claims**

1. A filter bank for frequency demultiplexing of a number of channel signals, comprising a plurality of first nonrecursive filters, one for each channel, having complex value coefficients, each of said first nonrecursive filters having means for providing complex value output signals from real value input signals, such that the sampling rate at the output is reduced from that at the input by a given factor greater than 1, which can be designated as M; at least one of said first nonrecursive

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filters comprising a composite filter formed of a cascade of Q second nonrecursive filters including an input nonrecursive filter, Q being a positive integer greater than 1, each of said



second nonrecursive filters having a complex value coefficient and successive ones of said second nonrecursive filters having means for reducing the sampling rate by respective factors of $M_q > 1$, q=1 to Q, wherein

$$\prod_{q=1}^{Q} M_q = M.$$

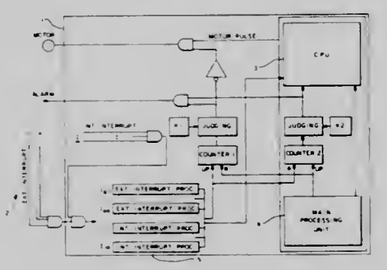
said input nonrecursive filter having means for receiving a real value input signal and outputting a complex value output signal, all of said second nonrecursive filters except said input nonrecursive filter having means for receiving a complex value input signal and outputting a complex value output signal.

4,896,321

SELF-MONITORING SYSTEM

Masafumi Kawahara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1988, Ser. No. 148,964
Claims priority, application Japan, Jan. 28, 1987, 62-11681
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—16.1 **5 Claims**



1. A self-monitoring computer-controlled system comprising

a main processing part which controls overall operations of said system by normally repeating a process at a regular frequency,

an interrupt processing part including an interrupt processing unit which is activated by an interrupt signal, and an alarm,

said main processing part further including a main counter for counting the processing time by said main processing part,

said interrupt processing unit including an interrupt counter for counting the processing time by said interrupt processing unit,

said main processing part normally serving to reset said interrupt counter and update the content of said main counter,

said interrupt processing unit normally serving to reset said main counter and update the content of said interrupt counter,

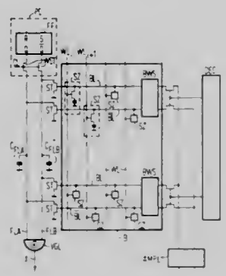
said alarm being activated if the content of said main counter exceeds a preset first number or if the content of said interrupt counter exceeds a preset second number.

4,896,322

CIRCUIT CONFIGURATION AND A METHOD FOR THE TESTING OF STORAGE CELLS

Rainer Kraus, Munich; Oskar Kowarik, Grafing; Kurt Hoffmann, Taufkirchen, and Manfred Paul, Unterfoehring, all of Fed. Rep. of Germany, assignors to Siemens Atkiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,676
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708489
Int. Cl.[4] G11K *29/00*
U.S. Cl. 371—21.2 **12 Claims**



1. Circuit configuration for testing storage cells disposed in a matrix in a semiconductor memory including word and bit lines for driving the storage cells, and evaluator circuits each being assigned to a respective bit line and each dividing the respective bit line into two identical first and second bit line halves, comprising:

a pair of first and second fault lines, a precharging device connected to said pair of fault lines, a comparator circuit having inputs connected to said pair of fault lines and an outlet issuing an output signal indicating the occurrence of faults in test operation, first and second switching transistors having sources, drains and gates, the gates of said first switching transistors each being connected to a respective one of said first bit line halves of said bit lines, and the gates of said second switching transistors each being connected to a respective one of said second bit line halves of said bit lines, the sources of all of said switching transistors being commonly connected to a potential corresponding to one of two mutually-complementary logic levels carried by said pair of fault lines in test operation, the drains of said second switching transistors being connected to said first fault line, and the drains of said first switching transistors being connected to said second fault line.

4,896,323

PARITY-CHECKED CLOCK GENERATOR SYSTEM

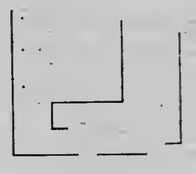
Stefan Körner, Leinfelden; Klaus D. Müller, Stuttgart; Peter Rudolph, Schoenaich; Dietmar Schmunkamp, Ehningen, and Halim S. Tandjung, Böblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,283
Claims priority, application European Pat. Off., Jun. 11, 1987, 87108414.1
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—61 **8 Claims**

1. A clock generator system comprising

a plurality of clock generators each containing a feedback shift register having a plurality of stages for generating clock pulses, and

cross-checking means for calculating a first parity bit over the output signals of said clock generators and a second



parity bit over the content from each of the stages of each of said shift registers, said means including compare means for comparing the calculated parity bits to stored expected parity bits.

4,896,324

METHOD AND APPARATUS FOR OPTIMIZING COUPLED LASER RESONATOR PERFORMANCE

Gary A. Ball, Newington, and Michael C. Fowler, Farmington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,301
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—18 **3 Claims**



1. An apparatus for use with first and second laser resonators each having a gain medium in a cavity and a displaceable mirror for selecting a resonator cavity length, said resonators providing output beams at an electromagnetic frequency having a beam power with a relative value of phase and coherence, said apparatus comprising;

a means for adjusting the cavity length of said resonators so that the electromagnetic frequency of said resonator beams are equal to a value $v - v0$;

a means for sampling each resonator beam with a means for providing signals indicative of the power of said resonator beams;

a means for electromagnetically coupling said beams, thereby ensuring that the frequencies of the laser resonator output beams are locked at a frequency $v = v0$;

a spectrophone means for sampling each beam for providing signals indicative of the electromagnetic frequency of said beams independent of the coherence and phase thereof, said spectrophone means having an operating range of frequencies with a maximum spectrophone means signal amplitude at an electromagnetic frequency v0;

a controller for receiving said resonator beam power signals and said spectrophone means signals and, for each resonator, said controller for

normalizing said spectrophone means signals with respect to said resonator beam power signals, thereby ensuring said spectrophone means signals are a function of only said resonator beam frequency;

generating, for each resonator, from said spectrophone means signals mirror control signals for positioning said mirror at a cavity length such that said spectrophone means signal value is equal to the value thereof at said frequency $v = v0$.

4,896,325

MULTI-SECTION TUNABLE LASER WITH DIFFERING MULTI-ELEMENT MIRRORS

Larry A. Coldren, Santa Barbara, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 23, 1988, Ser. No. 235,307
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—20 **27 Claims**



1. In a diode laser having an active section for creating a light beam by spontaneous emission over a bandwidth around some center frequency and for guiding and reflecting the light beam between a pair of mirrors bounding the active section on respective ends thereof to create an emitted beam of laser light, the improvement to allow selective tuning of the emitted beam comprising:

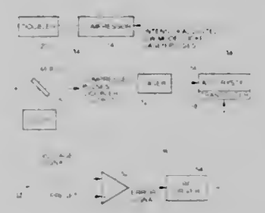
the mirrors each having spaced reflective maxima points providing a maximum reflection of an associated wavelength with the spacing of said reflective maxima points of the respective mirrors being different whereby only one said reflective maxima of each of the mirrors can be in correspondence with a wavelength of the created lightbeam and thereby provide a low loss window at any time.

4,896,326

PEAK POWER FLUCTUATIONS IN OPTICAL PULSE COMPRESSION

James D. Kafka, and Thomas M. Baer, both of Mountain View, Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 3, 1988, Ser. No. 152,171
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—31 **14 Claims**



1. Apparatus for stabilizing the frequency doubled output of a frequency doubler optically connected to a pulse compressor which is optically connected to and driven by a cw mode locked laser source producing laser pulses which are passed through the compressor and from the compressor through the frequency doubler, comprising:

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intensity measurement means following the frequency doubler for measuring the intensity of the frequency doubled output and producing an intensity measurement signal related thereto;

controller means connected to the intensity measurement means for producing a drive signal in response to the intensity measurement signal;

intensity adjustment means connected to the controller means and to the laser source for adjusting the intensity of the laser pulses from the laser source in response to the drive signal.

4,896,327

METHOD FOR FREQUENCY STABILIZATION OF A SEMICONDUCTOR LASER COMPRISING A COUPLED EXTERNAL RING RESONATOR

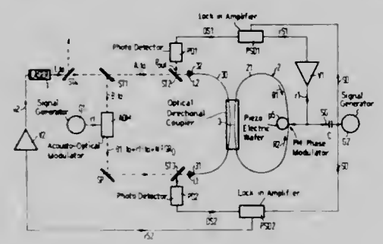
Alfred Ebberg, Bochum, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,062

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728349

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—32 **14 Claims**



1. A method for stabilizing an emission frequency of a semiconductor laser with an external ring resonator, said laser having an output coupled to said external ring resonator having resonant frequencies, means for stabilizing the resonant frequencies of the ring resonator including a phase modulator, said output of the laser being a wave of a frequency approximately of one of the resonant frequencies, said method including splitting the wave into a first portion and a second portion; stabilizing a free spectral range of the resonator to stabilize the resonant frequencies by passing the first portion of the wave through means for shifting the frequency of the wave by a reference frequency corresponding to a whole multiple of a rated value of the free spectral range to create a frequency shifted wave, coupling the frequency-shifted wave into the ring resonator to propagate in one direction and to excite a resonance of the resonator, when non-excitation of the resonant frequency occurs, using a decoupled portion of the first wave to control the modulator to shift the resonant frequencies of the resonator and continuously control the value of the free spectral range; and stabilizing the frequency of the laser by coupling the second portion into the ring resonator to travel in a direction opposite to the shifted wave to excite a resonance in the resonator, given a non-excitation of a resonance by the second portion, taking the uncoupled second portion and utilizing it to control the frequency of the laser.

4,896,328

RIDGE WAVEGUIDE-TYPE SEMICONDUCTOR LASER HAVING A CURRENT RECOMBINATION LAYER AND AN OPTICAL WAVEGUIDE LAYER

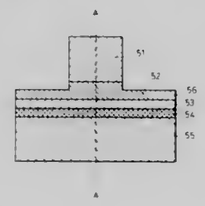
Yoshinobu Sekiguchi, Yamato, and Sotomitsu Ikeda, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,602

Claims priority, application Japan, Dec. 28, 1987, 62-335729

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—45 **22 Claims**



1. In a semiconductor laser, an operative structure comprising:

a substrate;

a current recombination layer formed on said substrate, said recombination layer generating light by recombining injected current;

an optical waveguide layer formed on said recombination layer across a width of said recombination layer and having a layer thickness, the light generated at said recombination layer being coupled to said optical waveguide layer, and at least a part of said optical waveguide layer being removed by etching in the direction of the layer thickness, at two opposing side regions up to a central region in the direction of the width of the recombination layer, in order to form a belt-like projection;

a separation layer which is provided between said recombination layer and said optical waveguide layer, and which has a lower refractive index than refractive indices of said recombination layer and said optical waveguide layer; and

a pair of electrodes for providing current to said combination layer, said electrodes being mounted to respective surfaces of the laser.

4,896,329

LASER DYE LIQUIDS, LASER DYE INSTRUMENTS AND METHODS

Lawrence E. Knaak, Dayton, Ohio, assignor to Exciton Incorporated, Dayton, Ohio

Filed Jun. 1, 1989, Ser. No. 360,082

Int. Cl.⁴ H01S *3/20*

U.S. Cl. 372—53 **16 Claims**

1. A laser dye liquid for emitting coherent laser radiation when excited by a pumping light source, said laser dye liquid comprising a laser dye mixed with a glycol ether solvent.

4,896,330

GAS LASER

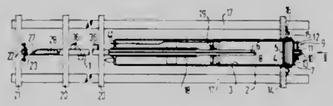
Hans Krueger, Munich; Wolfgang Welsch, Baldham, and Hans Golser, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,995

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719745

Int. Cl.⁴ H01S *3/63*

U.S. Cl. 372—65 **22 Claims**



1. A gas laser, comprising:

a housing tube having first and second opposite end faces;

a capillary being longer than said housing tube and projecting into said housing tube from said first end face, said capillary forming a discharge channel for said gas laser, said capillary being connected vacuum-tight to said first end face of said housing tube and having a first end lying outside said housing tube and a second end lying inside said housing tube, said second end being free of optical elements;

an optical element connected as a vacuum-tight termination at said first end of said capillary lying outside said housing tube;

a hollow cathode mounted in said housing tube;

a flexible support retaining said capillary in a radial position relative to said housing tube;

a first mirror positioned on an axis of said capillary beyond said second end of said capillary and connected vacuum-tight to said housing tube;

an optical bench;

a housing mount fixing said housing tube in an axial position relative to said optical bench;

means for aligning said capillary relative to said optical bench in a plane perpendicular to said capillary at least at two axially spaced locations, said means for aligning being fastened to said capillary outside said housing tube;

a second mirror being secured to said optical bench and lying on an axis of said capillary opposite said first mirror; and

mean for adjusting said second mirror relative to said first mirror such that said capillary is adjustable by said aligning means to align said capillary relative to said first and second mirrors to avoid output power loss.

4,896,331

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

Shoji Hirata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,768

Claims priority, application Japan, Mar. 30, 1987, 62-78763

Int. Cl.⁴ H01S *3/08*

U.S. Cl. 372—96 **6 Claims**

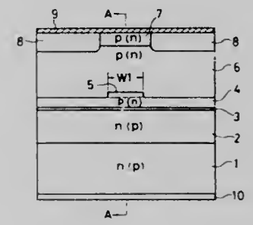
1. In a distributed feed back semiconductor laser of the refractive index guiding type, having a layered structure with two electrodes, the combination comprising:

(a) a first cladding layer formed on a substrate;

(b) an active layer formed thereon;

(c) a guide layer having formed thereon a diffraction grating with a plurality of serially connected regions extending in a longitudinal direction, said regions having a constant width normal to said longitudinal direction which is less than the width of said guide layer; and

(d) a second cladding layer having a strip-shaped waveguide, with the thickness of said guide layer in a direction normal to said layers being different in one of said regions to change the phase of light propagating through the waveguide, whereby there is a change in the transverse



mode distribution in one direction without a substantial change in the transverse mode distribution in the direction perpendicular to said one direction.

4,896,332

MONOCRYSTAL REFLECTORS FOR LASER APPLICATIONS

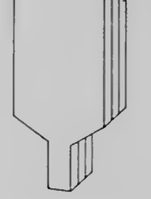
Jürgen Wisotzki, Weserstrasse 7a, 6074 Rödermark-Urberach, Fed. Rep. of Germany

Division of Ser. No. 830,025, Jan. 11, 1985. This application Mar. 10, 1988, Ser. No. 172,306

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400774

Int. Cl.⁴ H01S *3/08*

U.S. Cl. 372—99 **2 Claims**



1. A reflector of copper, silver or gold used for laser applications, produced from a monocrystal using a crucible having at least one surface polished to optical quality which is in contact with a reflecting surface of the reflector during the production of the reflector, said reflecting surface being of optical quality and having an unworked monocrystal structure.

4,896,333

CIRCUIT FOR GENERATING A TRAPEZOIDAL CURRENT WAVEFORM WITH MATCHED RISE AND FALL TIMES

Sümer Can, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Aug. 4, 1987, Ser. No. 81,409

Int. Cl.⁴ H04B *1/38;* **H04L** *5/16*

U.S. Cl. 375—7 **15 Claims**

11. A transceiver device comprising a receiver section and a transmitter circuit for transmitting data from a local data terminal to a computer network, said transmitter circuit comprising:

(a) an input means for receiving a differential input signal from said data terminal having an arbitrary high and low

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voltage level and a given pulse width, and converting said differential input signal into a single-ended voltage signal having internally well-defined high and low voltage levels;

(b) an integrator means comprising

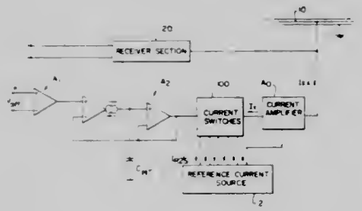
differential means having a first and second differential input, an integrator tail current source with a constant current value 2I, and a single-ended output, said first differential input being connected for receiving said single-ended voltage signal;

current source means having a constant current value I, said current source means being connected to said single-ended output;

a capacitor means also being connected to said differential means and having a predetermined capacitive value C;

negative feedback means for connecting said single-ended output to said second differential input,

in response to said single-ended voltage signal on said first differential input with respect to said second differential input, said differential means and current source means combining to control current flow charging or discharging said capacitor means at a constant value of I/C or −I/C respectively, to produce an integrated voltage voltage signal on said second differential input proportional to said single-ended voltage signal with respect to



said given pulse width, said integrated voltage signal having a particular voltage waveform; and

(c) current switching means comprising:

voltage threshold means having a plurality of voltage threshold taps, each of said voltage threshold taps having a separate voltage level;

current differential means having a plurality of first and second differential switcher inputs, a current switching differential output, and a corresponding plurality of switcher tail current sources each having a constant current value, each of said plurality of second differential switcher inputs being connected to an associated one of said voltage threshold taps, each of said plurality of first differential switcher inputs being connected to said single-ended output of said integrator means for receiving said integrated voltage signal;

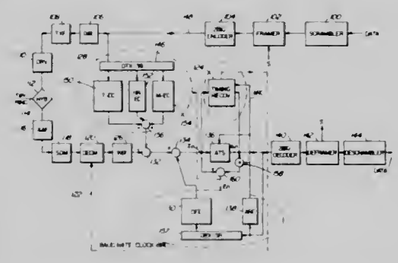
in response to comparison of said integrated voltage signal with respect to each of said separate voltage levels of said plurality of voltage threshold taps, said differential means controlling the current flow through said current switching differential output by each of said plurality of switcher tail current sources to produce a current signal having a current waveform shaped substantially similar to said particular voltage waveform of said integrated voltage signal.

4,896,334

METHOD AND APPARATUS FOR TIMING RECOVERY

Babak Sayar, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 24, 1988, Ser. No. 261,134
Int. Cl.[4] H04L *25/49*
U.S. Cl. 375—20 **22 Claims**



1. A receiver suitable for a loop interface circuit for a digital data transmission system, said receiver comprising:

sampling means for sampling a received four-level substantially randomized digital signal;

multilevel decision or slicing means for comparing samples of such received signal selectively with a plurality of thresholds to extract its four symbols;

timing recovery means for determining a sampling instant as a function of a precursor sample and a main pulse sample one baud apart, according to the timing function:

$$f(t)=(1/r)h(t)-h(t-T)$$

where 1/T is the baud rate, h(t) and h(t−T) denote the main pulse sample and precursor sample, respectively, r is the ratio between the main pulse sample and the precursor pulse sample, and t is the sampling instant;

said timing recovery means including a timing estimator responsive to baud rate samples (x_n and a_n) of the received signal before and after slicing, respectively, by said slicing means for deriving a precursor estimate (z_n) of the difference between an actual sampling instant and a desired sampling instant with reference to the ratio between the main sample pulse and said precursor sample one baud earlier, and means for generating a baud rate clock signal variable in dependence upon said estimate (z_n) the index n denoting the current baud interval;

said sampling means being responsive to said baud rate clock to vary said sampling instant;

wherein said timing estimator derives said precursor timing estimate z_n in accordance with the expression:

$$z_n=(-1)^m\cdot(a_{n-1}x_n-a_nx_{n-1})$$

where m represents the magnitude bit of the 2B1Q symbol (n=0 for magnitude 1, m=1 for magnitude 3).

4,896,335

DIGITAL 2B1Q TRANSMITTER WITH HIGH PRECISION AND LINEARITY TIME DOMAIN RESPONSE

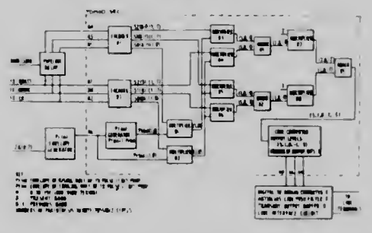
Hee Wong, San Jose, and Jesus A. Guinea, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 3, 1988, Ser. No. 202,125
Int. Cl.[4] H04L *27/18*
U.S. Cl. 375—59 **5 Claims**

1. A digital transmitter that receives a dibit input and generates a 2B1Q coded output signal which is in compliance with predefined characteristics, the digital transmitter comprising:

(a) dual modulator means including first and second modulator means responsive to the dibit input for generating first and second binary modulated vectors, respectively;

(b) means for summing the first and second binary modulated vectors according to a weighting ratio to provide a 2B1Q coded output signal; and



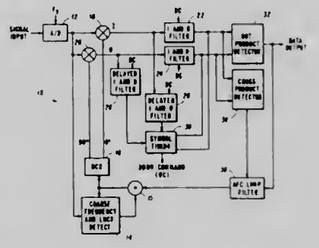
(c) envelope generator means for providing a modulation envelope for the 2B1Q coded output signal in a pulse density modulation format such that the 2B1Q coded input signal is in compliance with the predefined characteristics.

4,896,336

DIFFERENTIAL PHASE-SHIFT KEYING DEMODULATOR

Steven J. Henely, and Mark D. Walby, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 29, 1988, Ser. No. 237,912
Int. Cl.[4] H03D *3/18;* H03K *9/04;* H04L *27/22*
U.S. Cl. 375—80 **14 Claims**



14. A digital modem for processing a data signal, comprising:

means for estimating the data signal frequency;

means for receiving said frequency estimate and said data signal and generating in-phase and quadrature signals;

means for integrating and dumping said in-phase and quadrature signals, comprising a pair of non-delayed integrate and dump filters and a second pair of delayed integrate and dump filters;

means for determining a dump time of said integrate and dump means; and

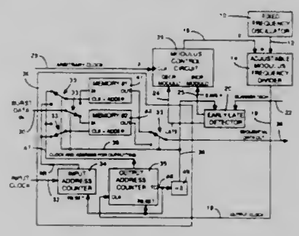
means for receiving said integrated and dumped signals and generating a data output, comprising a dot product detector that determines a value of a data bit by differential detection of the output of said integrate and dump filters.

4,896,337

ADJUSTABLE FREQUENCY SIGNAL GENERATOR SYSTEM WITH INCREMENTAL CONTROL

Edwin S. Bushy, Jr., Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1988, Ser. No. 179,097
Int. Cl.[4] H04L *25/36;* H03D *3/04;* G11B *5/09*
U.S. Cl. 375—118 **5 Claims**



1. A system receiving and storing data at an input clock frequency, and applying the stored data at an adjustable output clock frequency, comprising:

first and second memory means for receiving said data at said input clock, storing said data, and applying said data therefrom at said output clock;

switch means for transmitting said data at said input clock for storage in one of said first and second memory means, while transmitting stored data from the other one of said first and second memory means at said output clock;

means coupled to said first and second memory means, respectively, to indicate when a predetermined amount of said stored data has been applied therefrom, and to provide responsively a memory switching signal;

said switch means being further coupled to receive said memory switching signal and to responsively switch between said first and second memory means;

stable oscillator means providing an oscillating signal having a selected fixed frequency;

frequency divider means having an adjustable dividing ration, for receiving said oscillating signal, and for providing a frequency divided output signal, corresponding to said output clock;

means for detecting said output clock frequency with respect to a reference signal, and for providing a first control signal when said detected frequency is higher than a predetermined multiple of said reference signal frequency, and a second control signal when said detected frequency is lower; and

dividing ratio adjustment means for receiving said first and second control signal and for adjusting responsively said dividing ratio of said frequency dividing means to change the frequency of said output clock to substantially correspond to said predetermined multiple of said reference signal frequency.

4,896,338

METHOD AND DEVICE FOR THE DIGITAL SYNTHESIS OF A CLOCK SIGNAL

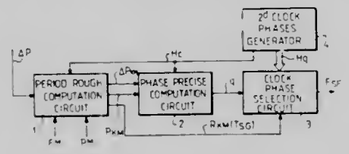
Andre Rouillet, Domont, and Lac Dartois, Colombes, both of France, assignors to Thomson-CSF, Paris, France

Filed Jun. 27, 1988, Ser. No. 212,355
Claims priority, application France, Jun. 26, 1987, 87 09029
Int. Cl.[4] H03D *3/24*
U.S. Cl. 375—119 **12 Claims**

1. A method for the digital synthesis of a clock signal, of the type wherein the clock signal to be synthesized is obtained from a phase increment datum ΔP representing the frequency to be synthesized, comprising the steps of performing, at each period T_c of a computation clock signal, a binary number M

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modulo addition of each phase increment with the modulo M sum of the phase increments already totalized inside a phase accumulating device with a capacity equal to the binary number M; reading, after each overflow of the capacity of the accumulator device, the remaining residual phase error P_K contained in the accumulating device; generating 2^Q clock



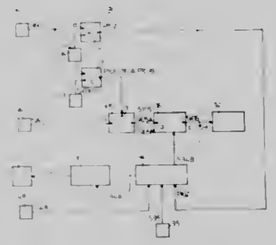
signals with a period T_c, phase-shifted with respect to each other by $T_c/2^Q$; computing, after each overflow, the temporal error Δt_K by calculating the ratio $^PK/\Delta P$ between the residual phase error P_K and the phase increment ΔP per clock period T_c; and selecting that clock signal for which the phase shift with respect to the computation clock signal is closest to the computed residual phase.

4,896,339

MATERIAL TESTING MACHINE

Mitoshi Fukumoto, Tokyo, Japan, assignor to Matsuzawa Seiki Kabushikikaisha, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,396
Claims priority, application Japan, Mar. 19, 1987, 62-65210; Mar. 19, 1987, 62-65211; Mar. 19, 1987, 62-65212
Int. Cl.[4] G01N *3/42*
U.S. Cl. 377—19 **6 Claims**



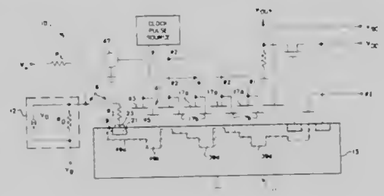
1. A material testing machine comprising:
a specimen table for holding a specimen;
an indenter for impression into the specimen to make therein an indentation;
an indenter pressing member for pressing the indenter into the specimen;
indenter pressing force detecting means for detecting the pressure on the specimen applied by the indenter;
amount of penetration detecting means for detecting the amount of penetration of the indenter into the specimen; and
an indenter pressing force transmitting member disposed between the indenter pressing member and the indenter;
wherein the indenter pressing force transmitting member is made of an elastic material; and
wherein the indenter pressing force detecting means comprises: (a) an indenter pressing force detecting displacement detector provided with a stator fixed to either one of the indenter and the indenter pressing member and a movable element having its free end held in contact with the other one of them; (b) pulse gererating means which generates a pulse when the output of the indenter pressing force detecting displacement detector has reached a predetermined value during the movement of the indenter pressing member; and
wherein the amount of penetration detecting means comprises: (a) a contacting member for contact with the surface of the specimen; (b) an amount of penetration detecting displacement detector provided with a stator fixed to either one of the indenter and the contactor and a movable element having its free end held in contact with the other one of them; and (c) means for latching the output of the amount of penetration detecting displacement detector, as a detected output, by the pulse from the pulse generating means.

4,896,340

PARTIAL DIRECT INJECTION FOR SIGNAL PROCESSING SYSTEM

David B. Caro, deceased, late of Redondo Beach, Calif. (by Marilyn C. Kaminski, legal representative), assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 1, 1985, Ser. No. 793,926
Int. Cl.[4] H01L *29/78*; G11C *19/28*
U.S. Cl. 377—60 **7 Claims**



1. A signal processing system comprising:
a signal source having an output for providing a time-varying current having a DC component and a time-varying component;
a signal processor having an input for receiving a time varying current; and
an interface circuit connected between said signal source and signal processor input and including an injection path and an impedance means series connected between said signal processor input and said signal source output, for delivering a first part of said time-varying current to said signal processor input, and dc bias means shunt connected between said impedance means and said signal source output for diminishing said DC component relative to said time-varying component at said input of said signal processor.

4,896,341

LONG LIFE X-RAY SOURCE TARGET

James M. Forsyth, Pittsford, and Robert D. Frankel, Rochester, both of N.Y., assignors to Hampshire Instruments, Inc., Rochester, N.Y.

Division of Ser. No. 669,441, Nov. 8, 1984, Pat. No. 4,700,371.
This application Oct. 13, 1987, Ser. No. 107,961
The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.
Int. Cl.[4] G21K *5/00*
U.S. Cl. 378—34 **7 Claims**

1. In an X-ray lithography system including means for providing an excitation beam pulse along a path toward a target to cause an X-ray emitting plasma to be formed and means for moving an X-ray resist coated object to be irradiated by said emitted X-rays, the improvement comprising:
target means, including a feeding reel, a take-up reel and a target material tape therebetween and positioned in the path of said beam; and
means for moving said target tape from said feeding reel towards said take-up reel between the provisions of selected pulses;
said tape having at least one cavity thereon and said beam intersecting said cavity, said beam being of sufficient power to cause an x-ray emitting plasma to be created at least partially within said cavity; and



said object to be irradiated by said emitted x-rays being positioned within a certain angle of said path, said certain angle being that angle with respect to said path within which the intensity of the provided x-rays is greater than the intensity of the x-rays provided if a part of said tape, other than said cavity, was positioned to intersect said beam.

4,896,342

X-RAY APPARATUS

Geoffrey Harding, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1988, Ser. No. 173,693
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710936
Int. Cl.[4] G01N *23/201*
U.S. Cl. 378—87 **6 Claims**



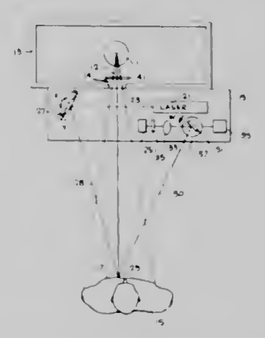
1. In an X-ray apparatus of the type comprising: a radiation source (1) which irradiates a cross-section of an examination zone (4) by means of a primary beam of substantially monochromatic radiation wherein said primary beam interacts with said cross section of said examination zone to produce elastically scattered X-ray quanta from the examination zone, said primary beam having a small cross-section,
first position-sensitive detector means (D1) which measure X-ray quanta elastically scattered in the primary beam within the examination zone, and means (6, 7) for reconstructing an image of the irradiated cross-section of the examination zone, wherein, as an improvement the first position-sensitive detector means (D1) measures the energy loss of the X-ray quanta which occurs in said first position-sensitive detector means due to Compton scattering, and further comprising second position-sensitive detector means (D2), and coincidence means (5) which determine the coincidence of signals from the first and second position-sensitive detector means (D1, D2), the reconstruction means (6, 7) functioning so that, in the case of said coincidence of detector means output signals, a path (r) of an X-ray quantum causing said signals is determined, and from said determination of the path and the energy loss (dE) measured in the first detector means, the position (zo) of a scatter point on the primary beam (3) is determined.

4,896,343

RADIATION APPARATUS WITH DISTANCE MAPPER FOR DOSE CONTROL

Allan M. Saunders, 2285 Bunker Hill Dr., San Mateo, Calif. 94402

Filed May 2, 1988, Ser. No. 189,143
Int. Cl.[4] H05G *1/10*
U.S. Cl. 378—95 **15 Claims**



1. Apparatus for delivering a radiation dose comprising,
radiation source means for producing a beam of ionizing gamma ray or x-ray radiation directed so as to deliver a dose of said radiation to an area of a target surface,
a light source emitting a light beam in a direction transverse to the direction of the ionizing radiation beam,
a photodetector, positioned to receive light scattered from the target surface,
means for scanning the light beam over the area of the target surface,
means for forming a three-dimensional surface profile map of said area of the target surface without movement of the radiation source means or of the light source, and
means responsive to said surface profile map for adjusting said dose of radiation from said radiation source over the area of the target surface,
so that the radiation source means and the light source may be operated simultaneously.

4,896,344

X-RAY VIDEO SYSTEM

John K. Grady, 111 Slough Rd., Harvard, Mass. 01451, and Richard E. Rice, 243 Lowell St., Arlington, Mass. 02174

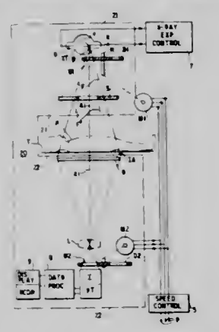
Filed Oct. 15, 1984, Ser. No. 661,146
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 **22 Claims**

1. An X-ray system for radiological examination of a subject comprising:
an X-ray source directing radiation on a path through a subject position;
an X-ray scintillation screen on the path beyond the subject position responsive to X-radiation to produce a secondary, planar light image;
optical means projecting the secondary image from the scintillation screen on a light path; and

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a light image intensifier tube beyond the optical means for amplifying the intensity of the light image; wherein

the intensifier tube has a planar input face receiving a planar



projected light image, and the system includes a movable light mask between the scintillation screen and intensifier tube with an image scanning aperture substantially at the plane of the projected light image.

4,896,345

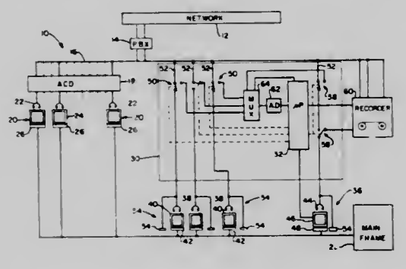
CALL HANDLING SYSTEM

Donald J. Thorne, 858 Westgrove Rd., Akron, Ohio 44303

Filed Feb. 16, 1989, Ser. No. 311,469

Int. Cl.[4] H04M *3/50*

U.S. Cl. 379—67 **10 Claims**



1. A telephone call handling system for interconnection with a telephone network, comprising:

a first plurality of operator stations operatively connected to the telephone network for receiving incoming calls therefrom;

a second plurality of operator stations operatively connected gto the telephone network for receiving incoming calls therefrom, and placing outgoing calls thereon;

first switch means interconnected between said second plurality of operator stations and the telephone network for selectively enabling said second plurality of operator stations to receive incoming calls and place outgoing calls;

control means operatively connected to said switch means for selectively actuating said first switch means;

call distribution means interposed between the telephone network and said first and second plurality of operator stations for selectively distributing said incoming calls to various of said first and second plurality of operator stations, said call distribution means distributing calls first to operator stations of said first plurality and thence to operator stations of said second plurality in the event that all operator stations in said first plurality are in receipt of an incoming call; and

recording means interconnected with said call distribution means, said recording means receiving nd recording information from incoming calls when all operator stations of said first and second plurality are connected to calls.

4,896,346

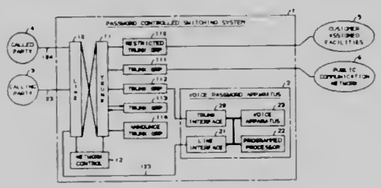
PASSWORD CONTROLLED SWITCHING SYSTEM

William R. Belfield, Westerville; William J. Erwin, Gahanna; Thomas J. Geers, Jr.; Roy V. Grubbe, both of Columbus; Stephen W. Handy, Reynoldsburg, and Robert J. Perdue, Pickerington, all of Ohio, assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 21, 1988, Ser. No. 274,151

Int. Cl.[4] H04M *3/50;* **H04Q** *3/04*

U.S. Cl. 379—88 **22 Claims**



16. A method of controlling a switching system terminating lines and trunks and arranged to interconnect the lines and the lines with the trunks comprising the steps of

enrolling and storing passwords identifying ones of the lines and trunks having access restricted thereto,

recognizing voice commands spoken by a calling party coupled with one of the lines and trunks and matching said spoken voice commands with said stored passwords, and

controlling said switching system upon matching said spoken voice commands with ones of said stored passwords to selectively interconnect said one calling party line and trunk with one of said restricted access lines and trunks identified by said matched stored password.

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INTERACTIVE VIDEO COMMUNICATIONS SYSTEM

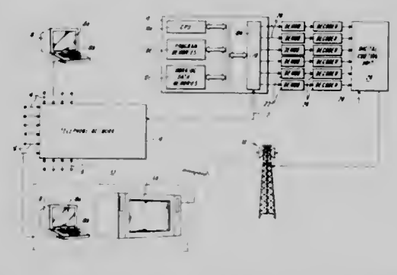
Oliver Auber, 4, Passage Saint-Avoye, 75003 Paris, France

Filed Sep. 22, 1988, Ser. No. 247,770

Claims priority, application France, Sep. 23, 1987, 87 13140

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—96 **4 Claims**



1. An interactive video communications system, comprising a server center connected to a telephone network, means for storing videotex-type graphics information in the server center, said information relating to at least one image, and terminals connected to the telephone network and provided with

screens on which at least a portion of the image may be displayed, wherein:

the server center includes means for chaning the stored graphics information in response to instructions transmitted by users from the terminals; and

means connected to the server center for converting the graphics information stored in the server center into television-type video signals, thereby enabling a television image to be displayed, to the users on one or more television receiver screens or televisions image projectors other than the screens of the terminals, with at least a portion of the displayed television image corresponding to the image represented by the graphics information stored at any moment in the server center.

4,896,348

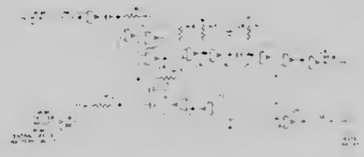
PAYSTATION MONITOR CIRCUIT TO PREVENT FRAUDULENT USE

Gary Grantland, Hartselle, and Attle D. Johnson, Somerville, both of Ala., assignors to Palco Telecom Inc., Nashville, Tenn.

Filed Jul. 1, 1988, Ser. No. 214,476

Int. Cl.[4] H04M *17/02*

U.S. Cl. 379—145 **7 Claims**



1. An off-hook reset circuit for use in a telephone paystation, said paystation including, a calling device, connections to a telephone central office, a rate relay, a totalizer circuit, a hookswich circuit and a central office battery circuit;

said reset circuit comprising:

a latch circuit;

a first gate circuit connected between said hookswitch circuit and said latch circuit operated to reset said latch circuit in response to a signal from said hookswitch circuit;

an oscillator circuit connected to said latch, enabled to generate a train of reset pulses in response to said latch being reset;

second gating means connected between said oscillator and said rate relay operated to gate a reset pulse to said rate relay;

whereby said totalizer circuit is reset and said calling device is disabled.

4,896,349

COMMUNICATION CONTROLLER IN A HOME BUS SYSTEM

Seiichi Kubo, Hirakata, and Naofumi Nakatani, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 843,621, Mar. 25, 1986, abandoned.

This application Mar. 25, 1988, Ser. No. 175,669

Claims priority, application Japan, Mar. 26, 1985, 60-61144

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—107 **7 Claims**

1. A bus system comprising:

a pulse transformer including a primary winding and plural secondary windings being wound on a common core, said plural secondary windings being wound bifilarily for obtaining good coupling,

plural kinds of information transmission medium connected, respectively, to said plural secondary windings of said pulse transformer, said plural kinds of information transmission medium including a coaxial cable and a pair of wires,

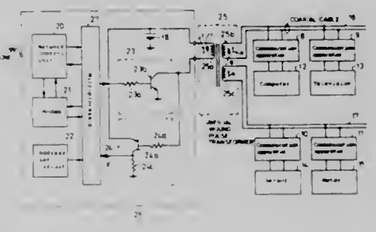
plural communication apparatuses connected to said plural kinds of information transmission medium,

electric domestic devices respectively connected to different ones of said plural communication apparatuses, and

control means connected to a primary winding of said pulse transformer for monitoring said plural kinds of information transmission medium, said control means facilitating sending and receiving operations of communication packets between said plural communication apparatuses, respectively connected to different ones of said coaxial cable and pair of wires, through said secondary windings.

5. A bus system comprising:

a pulse transformer comprising a primary winding and two



secondary windings being wound on a common core, said two secondary windings being wound bifilarly for obtaining good coupling,

a coaxial cable connected to one of said two secondary windings,

a pair of wires connected to the other one of said two secondary windings,

control means connected to a primary winding of said pulse transformer and to a subscriber telephone line for monitoring said coaxial cable and said pair of wires and for carrying out receiving and sending operations of communication packets between communication apparatuses,

a picture display apparatus connected to said coaxial cable through a communication apparatus, and

a sensor and a meter each connected to said pair of wires through a corresponding communication apparatus.

4,896,350

ARRANGEMENT FOR PROVIDING A CALL-CONNECTION SERVICE

Rainie M. Bicknell, Westminster, Colo.; Barbara J. Kittredge, Jackson, N.J.; Craig F. Palmer, Thornton, Colo., and Robert L. Young, Califon, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.; AT&T Information Systems Inc., Morristown and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Mar. 29, 1989, Ser. No. 329,918

Int. Cl.[4] H04M *7/14*

U.S. Cl. 379—220 **10 Claims**

1. Apparatus for providing a call-connection service to a customer of the service in a network of communication nodes, the apparatus comprising:

means in a first one of the nodes for responding to a request from the customer for establishment of a call path between second and third ones of the nodes, by obtaining from a fourth one of the nodes call-routing information pertaining to the second and third ones of the nodes, the first one of the nodes being under control of the service provider, and the second, third, and fourth ones of the nodes being under control of the customer; and

means in the first one of the nodes for interconnecting, in response to the obtained call-routing information, (a) a call path extending between the first one of the nodes and

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the second one of the nodes and (b) a call path extending between the first one of the nodes and the third one of the



nodes to form a call path between the second and third ones of the nodes which bypasses the fourth one of the nodes.

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APPARATUS FOR SEPARATING DC CURRENT AND AC CURRENT COMPONENTS OF A COMPOSITE SIGNAL

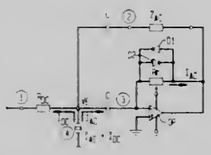
Harald Stader, and Hans W. Rudolf, both of Munich, Fed. Rep. of Germany, assignors to Siemens AG, Berlin and Manich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 872,063, Jun. 9, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 61,379

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3623045; Jul. 31, 1986, 3625872

Int. Cl.[4] H03H *11/04;* **H03G** *11/02*

U.S. Cl. 379—399 **1 Claim**



1. An apparatus for separating dc current and ac current components of a composite signal, comprising:

(a) a main current path for carrying the composite signal, said current path having a node where it branches out into:

(b) a first current path including a resistor for receiving the dc current components;

(c) a second current path including an impedance for tapping the ac current components and a first dc blocking filter for preventing the dc current components from flowing through the impedance;

(d) a third current path, coupled in parallel with the second current path, which includes an inverting amplifier formed by an operational amplifier, and an ohmic negative feedback resistor, wherein

(d1) the output of the operational amplifier is connected with its inverting input via the ohmic negative feedback resistor;

(d2) the output signal of the operational amplifier is superposed on the voltage drop in the second current path and is set in such a manner that it compensates for the voltage drop in at least a specific frequency range of interest, so that the node acts as a virtual ground for the ac current components in said frequency range; and

(d3) the negative feedback resistor is shunted by two oppositely poled diodes having threshold values selected to prevent overdriving of the operational amplifier.

4,896,352

TELEPHONE SET CIRCUIT INCLUDING AN OVERVOLTAGE PROTECTION

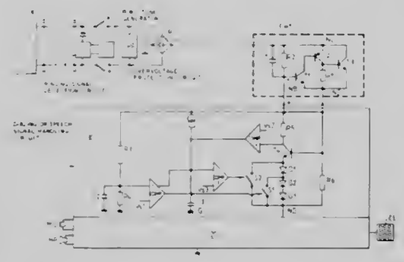
Emmanuel Dabin, Voiron, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jun. 1, 1988, Ser. No. 200,776

Claims priority, application France, Jun. 5, 1987, 8707946

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—412 **1 Claim**



1. A protection circuit for telephone sets, for the protection of an integrated circuit (CI) fed by a telephone line through a high-voltage stage (EHT), comprising:

a first capacitor (C2) and first charging means (R3) for said first capacitor, said first charging means being connected with the output of the high-voltage stage for charging the capacitor from the occurrence of a voltage at the output of the high-voltage stage;

a first threshold comparator (COMP1) connected with the first capacitor (C2) for establishing a first control signal after a first time period following said occurrence of a feeding voltage at the output of the high-voltage stage;

a second threshold comparator (COMP2) for detecting the occurrence of an overvoltage through the terminals of the high-voltage stage and for then supplying a second control signal;

a second capacitor (C3) and second charging means (SC1) for charging said second capacitor, said second charging means being inoperable to charge the second capacitor without receiving one of the first control signal and the second control signal;

a third threshold comparator (COMP3) connected with the second capacitor for establishing a third control signal after a second time period following the beginning of the charging of the second capacitor;

means (T4, D1, D2, D3, R6, S1, S2) for limiting the output current of the high-voltage stage, by receiving the first and third control signal and adapted to limit the current to a first value during reception of the first control signal and to a second value lower than the first one during reception of the third control signal.

4,896,353

APPARATUS FOR FAST DECODING OF A NON-LINEAR CODE

Ayyoob A. Dehgani, Salt Lake City, and Craig K. Rushforth, Kaysville, both of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Sep. 23, 1988, Ser. No. 248,866

Int. Cl.[4] H04L *9/00;* **H03M** *7/50*

U.S. Cl. 380—6 **11 Claims**

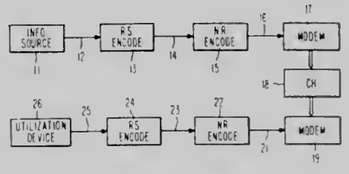
1. A high-speed decoder for decoding Nordstrom-Robinson encoded information comprising:

a source of encoded signals in the form of multi-dimensional vectors (r) to be decoded,

a plurality of computing elements coupled to said source of encoded signals,

each said computing element having means for modifying said multi-dimensional vectors (r) and for producing subcode values (S_K),

a plurality of subcode decoders coupled to said computing elements for producing an intermediate inner product (ip) value and an associated information bit value indicative of



said intermediate inner product value, and a plurality of comparators each being coupled to the output of one of said subcode decoders for comparing said intermediate inner product values and for determining the maximum intermediate inner product and the information bits indicative of the maximum inner product, and

output means coupled to said comparators for producing said information bits as a digital output indicative of the best mathematical estimate of the encoded signal being decoded.

4,896,354

IMAGE RECEPTION SYSTEM

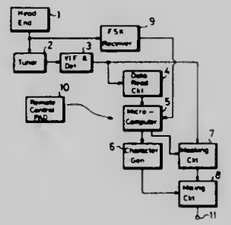
Isamu Inagaki, and Haruo Aoki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,802

Claims priority, application Japan, Oct. 12, 1984, 59-213645

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—7 **4 Claims**



1. An image reception system comprising:

tuner means for selecting one of a plurality of broadcast channels;

video detector means connected to said tuner means for deriving output signals corresponding to video signals and command data of the selected channel;

data fetch means connected to said video detector means for producing signals representative of command data and character data for on-screen display in response to said video output signals from sand video detector means;

command analyzing and display control means connected to said data fetch means for controlling video outputs to be displayed on a display screen;

key pad means for supplying a control command to said display control means;

said display control means including character generator means for generating character signals to be displayed on said display screen,

masking means connected to said video detector means and to said command analyzing and display control means for selectively superimposing masking signals on said video signals for blanking said video signals, in accordance with command data, and

character generator means connected to said command analyzing and display control means for generating character signals indicating types of reception blocking operations in accordance with said command data, said character signals being superimposed on said masked video signals.

4,896,355

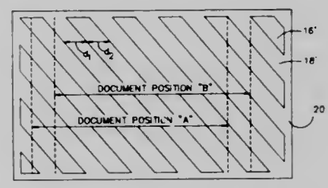
PATTERNING DEVICE FOR SECURITY FACSIMILE SYSTEMS

Jerry R. Iggulden, 21600 Cleardale St., Santa Clarita, Calif. 91321, and Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, assignors to Donald A. Streck, Ojai and Jerry R. Iggulden, Santa Clarita, both of, Calif., a part interest

Continuation-in-part of Ser. No. 312,700, Feb. 21, 1989, Continuation-in-part of Ser. No. 175,947, Mar. 31, 1988. This application Mar. 20, 1989, Ser. No. 325,400

Int. Cl.[4] G03B *27/00;* **H04N** *1/44;* **G09C** *5/00*

U.S. Cl. 380—54 **28 Claims**



1. A device for photocopying a document employing a standard photocopy machine having a cover glass upon which documents to be copied are placed to produce two partial documents each containing portions of the document which are complementary and mutually exclusive, said device comprising:

(a) a transparent sheet sized to be placed on the cover glass and having a pattern thereon of white and transparent portions which are complementary along longitudinally equal shift distances;

(b) holder means for holding a document over said pattern and disposed on said transparent sheet; and,

(c) moving means for moving said holder means between a first position and a second position located longitudinally at said equal shift distance from said first position.

4,896,356

SUB-BAND CODERS, DECODERS AND FILTERS

Paul C. Millar, Felixstowe, England, assignor to British Telecommunications public limited company, United Kingdom

Filed Nov. 16, 1984, Ser. No. 672,234

Claims priority, application United Kingdom, Nov. 25, 1983, 8331512; Feb. 27, 1984, 8405090

Int. Cl.[4] H04B *1/66*

U.S. Cl. 381—29 **13 Claims**

1. A sub-band coder comprising:

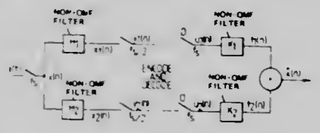
(a) an input means for receiving signal samples;

(b) first filter means, supplied from said input means, for passing frequencies above a transition frequency;

(c) second filter means, supplied from said input means, for passing frequencies below said transition frequency;

(d) first downsampling means for downsampling the output of said first filter means; and

(e) second downsampling means for downsampling the output of said second filter means; wherein:
(f) the amplitude response of said first filter means is a mirror image, about said transition frequency, of the amplitude response of said second filter means;



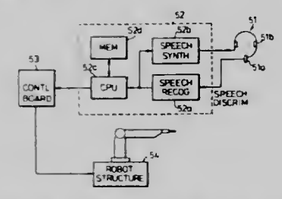
(g) the delay response of said first filter means is a mirror image, about said transition frequency, of the delay response of said second filter means;
(h) said first and second filter means are not quadrature filters; and
(i) the delay response of each filter means with respect to frequency is non-constant.

4,896,357

INDUSTRIAL PLAYBACK ROBOT HAVING A TEACHING MODE IN WHICH TEACHING DATA ARE GIVEN BY SPEECH

Yasakichi Hatano; Yoshimasa Itoh; Yoshiyuki Hirose, all of Yokohama; Kazuyuki Miyazaki, and Yuichi Ishikawa, both of Kawasaki, all of Japan, assignors to Tokico Ltd., Japan

Continuation-in-part of Ser. No. 28,760, Mar. 23, 1987, abandoned. This application Jul. 14, 1987, Ser. No. 72,884
Claims priority, application Japan, Apr. 9, 1986, 61-81857; Jul. 16, 1986, 61-167143; Jul. 18, 1986, 61-169397
Int. Cl.[4] G10L *7/08*; B25J *9/00*
U.S. Cl. 381—43 **7 Claims**



1. An industrial playback robot having a teaching mode and a playback mode and comprising:
mode selecting means for putting said industrial playback robot in one of said teaching mode and said playback mode;
a robot structure for carrying out one or more operations, and having a movable part;
driving means for driving said movable part;
position detecting means for detecting a position of said movable part and for producing positional information indicative of the position of said movable part;
speech input means for receiving a speech input indicative of an instruction, said instruction being a positioning instruction or an operating instruction corresponding to one of of said one or more operations;
first memory means for pre-storing speech patterns corresponding to said positioning instruction and to said operating instruction;
speech recognition means for analyzing the speech input supplied via said speech input means to obtain a certain speech pattern from the speech input, and for comparing said certain speech pattern with the pre-stored speech patterns in said first memory means to recognize said instruction corresponding to said speech input;
speech synthesis part coupled to said speech recognition means for generating a speech signal representative of a speech having said certain speech pattern;
speech output means supplied with said speech signal for sounding said speech having said certain speech pattern so as to confirm the instruction recognized by said speech recognition means;
second memory means for storing teaching data, said teaching data comprising a position datum indicative of a position which is to be assumed by said movable part in said playback mode and an operation datum indicative of an operation which is to be carried out by said robot structure in said playback mode; and
control means coupled to said position detecting means, said speech recognition means and said second memory means,
said control means in said teaching mode controlling said second memory means so that said positional information detected by the position detecting means is stored in said second memory means as the position datum when said speech input means receives said positioning instruction and that both of said operating instruction and said positional information detected by the position detecting means are respectively stored in said second memory means as the operation datum and the position datum when said speech input means receives said operating instruction,
said control means in said playback mode reading out teaching data previously stored in said second memory means during said teaching mode, and controlling said robot structure and said driving means so that said movable part assumes a position corresponding to said position datum and said robot structure carries out an operation corresponding to said operation datum depending on the teaching data read out from said second memory means.

4,896,358

METHOD AND APPARATUS OF REJECTING FALSE HYPOTHESES IN AUTOMATIC SPEECH RECOGNIZER SYSTEMS

Lawrence G. Bahler, and Alan L. Higgins, both of San Diego, Calif., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 17, 1987, Ser. No. 26,585
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—43 **2 Claims**



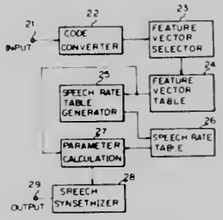
1. A method of improving the reliability of keyword identification by a speech recognition system for continuously spoken speech in a given language comprising the steps of:
providing a set of keyword templates each of which represents a respective keyword for recognition by said system;
providing a set of filler templates each of which is representative of an arbitrary sound or utterance that is a component of spoken speech including words in said given language;
generating a set of signals indicative of said spoken speech in a given time interval;
providing parallel operations of:
(a) comparing said set of signals with said keyword templates and selecting the keyword template having the greatest statistical similarity to said set of signals in said given time interval; and generating a keyword match score indicative of the statistical distance of said selected keyword template from said set of signals; and
(b) separately comparing said set of signals with said filler templates and selecting a concatenation of filler templates having the greatest statistical similarity to said set of signals in the same given time interval; and generating a filler concatenation match score indicative of the statistical distance of said conctenation of filler templates from said set of signals; and
comparing the keyword match score to the filler concatenation match score to determine, according to a pre-established threshold, whether said keyword match score is sufficiently better than said filler concatenation match score to confirm keyword identification.

4,896,359

SPEECH SYNTHESIS SYSTEM BY RULE USING PHONEMES AS SYSTHESIS UNITS

Seiichi Yamamoto; Norio Higuchi, both of Saitama, and Toru Shimizu, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa, Co., Ltd., Tokyo, Japan

Filed May 17, 1988, Ser. No. 196,169
Claims priority, application Japan, May 18, 1987, 62-119122
Int. Cl.[4] G10L *5/02*
U.S. Cl. 381—52 **4 Claims**



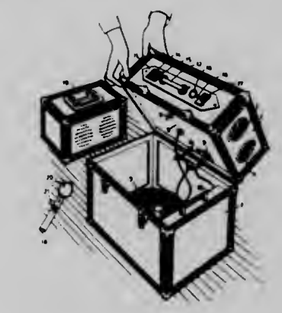
1. A speech synthesis system comprising:
code converter means (22) for accepting at an input terminal (21) text code comprising spelling, accent code and intonation code of a word, and producing therefrom a phonetic symbol for pronunciation (phoneme of speech) including a text string and aprosodic string for each phoneme of speech;
a feature vector table (24) including means for storing feature vector information comprising speech parameters for each phoneme, including a time duration period, pitch frequency pattern, formant frequency, formant bandwidth, strength of a voice source, and speech rate,
wherein each of said speech parameters is defined by two target points (r_1 and r_2) during said time duration period, a value at each of the target points, and a connection curve between said two target point values,
and wherein said said speech rate is defined for each phoneme by parameters of a speech rate adjustment curve including a start point (d_1), an end point (d_2) and a ratio of adjustment, stored in said feature vector table (24);
feature vector selection means (23) for selecting an address of said feature vector table (24) in accordance with each phonetic symbol input thereto from said code converter means (22);
a speech rate table generator means (25) for calculating, in response to speech rate parameters stored in said address selected from said feature vector table (24) by said selection means (23), a relationship between relative time which defines a speech parameter and absolute time, according to said speech rate adjustment curve;
a speech rate table (26) for storing the output of said speech rate table generator means (25) for successive short increments of time defined by said generator means (25);
speech synthesizing parameter calculation means (27) for calculating, from feature vector information stored in said feature vector table (24) and speech rate information stored in said speech rate table (26), an instant value of a speech parameter at each increment of time defined in said speech rate table (26);
speech synthesizer means (28) including voice sources and filters for generating a synthesized voice output by actuating voice source and filter combinations according to said speech parameter values calculated by said speech synthesizer parameter calculation means (27); and
an output terminal (29) coupled with an output of said speech synthesizer means (28) for providing said synthesized speech.

4,896,360

PUBLIC ADDRESS AMPLIFIER

Robert S. Knight, 47 High Street, Musselburgh, Midlothian EH21 7AD, Scotland, Great Britain.

Filed May 27, 1988, Ser. No. 199,415
Claims priority, application United Kingdom, May 27, 1987, 8712469
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—82 **8 Claims**



1. A public address amplifier comprising a housing; an output amplifier located in said housing, said output amplifier having an input for receiving pre-amplified signals, an output for supplying amplified signals to at least one loudspeaker, and a power input for receiving power from a power source; a cable for extending from said housing, one end of said cable being coupled to said power input so that power can be carried by said cable, and said one end of said cable being coupled to said input for receiving pre-amplified signals also carried by said cable; and a terminal on said housing coupled to said power input so that power can be supplied from said terminal, said terminal also being coupled to said input for receiving said pre-amplified signals so that said pre-amplified signals can be supplied from said terminal; a connector connected to the other end of said cable; whereby at least one further public address amplifier having the same configuration as said public address amplifier can be coupled serially with said public address amplifier by connecting a corresponding connector of the further public address amplifier into said terminal of said public address amplifier, whereby each of said public address amplifier and said further public address amplifier can receive said pre-amplified signals from a single pre-amplifier which can be connected to said connector of the public address amplifier, and whereby each public address amplifier and the pre-amplifier can receive power from any one of said public address amplifiers.

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4,896,361

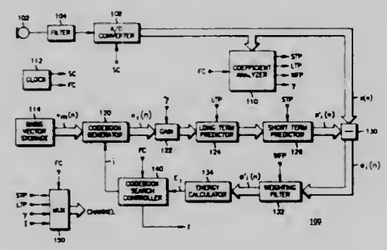
DIGITAL SPEECH CODER HAVING IMPROVED VECTOR EXCITATION SOURCE

Ira A. Gerson, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 141,446, Jan. 7, 1988, Pat. No. 4,817,157. This application Jan. 6, 1989, Ser. No. 294,098

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—40 **12 Claims**



1. A means for providing a set of 2^M codebook vectors for a vector quantizer, said codebook vector providing means comprising:

memory means for storing said set of codebook vectors, said set of stored codebook vectors formed by:

converting a set of selector codewords into a plurality of interim data signals; inputting a set of M basis vectors;

multiplying said set of basis vectors by said plurality of interim data signals to produce a plurality of interim vectors; and

summing said plurality of interim vectors to produce said set of codebook vectors;

means for addressing said memory means with a particular codeword; and

means for outputting a particular codebook vector from said memory means when addressed with said particular codeword.

4,896,362

SYSTEM FOR SUBBAND CODING OF A DIGITAL AUDIO SIGNAL

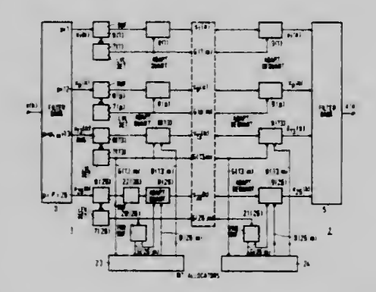
Raymond N. J. Veldhuis; Robbert G. van der Waal, and Marcel Breeuwer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1988, Ser. No. 184,746

Claims priority, application Netherlands, Apr. 27, 1987, 8700985

Int. Cl.[4] G10L *7/04, 9/18*

U.S. Cl. 381—30 **4 Claims**



1. A digital system including a coder and a decoder for subband coding of a digital audio music signal having a given sampling rate 1/T, the coder comprising:

analysis filter means responsive to the audio music signal for generating a number of P subband signals, the analysis filter means dividing the audio music signal band according to the quadrature mirror filter technique, with sampling rate reduction into successive subbands of band numbers p ($i \leqq p \leqq P$) increasing with the frequency, the bandwidth and the sampling rate for each subband being an integral submultiple of 1/(2T) and 1/T, respectively, and the bandwidths of the subbands approximately corresponding with the critical bandwidths of the human auditory system in the respective frequency ranges,

means responsive to each of the subband signals for determining a characteristic parameter G(p;m) which is representative of the signal level in a block having a same number of M signal samples for each subband, m being the number of the block,

means for adaptively quantizing the blocks of the respective subband signals in response to the respective characteristic parameters G(p;m);

and the decoder comprising:

means for adaptively dequantizing the blocks of quantized subband signals in response to the respective characteristic parameters G(p;m),

synthesis filter responsive to the dequantized subband signals means for constructing a replica of the digital audio music signal, these synthesis filter means merging the subbands to the audio music signal band according to the quadrature mirror filter technique, with the sampling rate increase,

characterized in that

the respective quantizing means in the coder and the respective dequantizing means in the decoder for each of the subbands having a band number p smaller than p_{im} are arranged for the respective quantizing and dequantizing of the subband signals with a fixed number of B(p) bits, the subband having band number p_{im} being situated in the portion of the audio music signal band with the lowest thresholds for masking noise in critical bands of the human auditory system by single music tones in the centre of the respective critical bands,

the coder and the decoder each further include bit allocation means responsive to the respective characteristic parameter G(p;m) of the subbands having a band number p not smaller than p_{im} within an allocation window having a duration equal to the block length for the subband having the band number p_{im}, for allocating a number of B(p;m) bits from a predetermined fixed total number of B bits for the allocation window to the respective quantizing means in the coder and the respective dequantizing means in the decoder for the signal block having block number m of the subband having band number p, the bit allocation means each comprising:

comparator means for comparing within each allocation window the characteristic parameters G(p;m) to respective thresholds T(p) for the subbands having band number p and for generating respective binary comparator signals C(p;m) having a first value C(p;m)="1" for a parameter G(p;m) not smaller than the threshold T(p) and a second value C(p;m)="0" in the opposite case, these thresholds T(p) being related to the thresholds of the human auditory system for just perceiving single music tones,

means for storing a predetermined allocation pattern {B(p)} of numbers of B(p) quantizing bits for subbands having respective band numbers p, these numbers B(p) being related to the thresholds for masking noise in the critical bands of the human auditory system by single music tones in the centre of the respective critical bands,

means for determining an allocation pattern {B(p;m)} of respective numbers of B(p;m) quantizing bits for the signal block having the block number m of the subband having band number p, in response to the allocation pattern stored {B(p)} and the respective characteristic parameters G(p;m) and comparator signals C(p;m), the allocation pattern {B(p;m)} being equal to the allocation pattern stored {B(p)} if all comparator signals C(p;m) within an allocation window have the said first value C(p;m)="1" and, in the opposite case, the allocation pattern {B(p;m)} being formed by not allocating quantizing bits to blocks within an allocation window having a comparator signal of the said second value C(p;m)="0" and by allocating the sum S of the numbers of B(p) quantizing bits available within an allocation window for the latter blocks in the allocation pattern stored {B(p)} to the blocks within an allocation window having a comparator signal of the said first value C(p;m)="1" and having the largest values of the characteristic parameter G(p;m) for obtaining numbers of B(p;m) quantizing bits which are greater than the corresponding numbers of B(p) quantizing bits in the allocation pattern stored {B(p)},

means for supplying the allocation pattern {B(p;m)} determined thus to the respective quantizing means in the coder and the respective dequantizing means in the decoder.

4,896,363

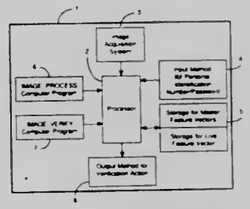
APPARATUS AND METHOD FOR MATCHING IMAGE CHARACTERISTICS SUCH AS FINGERPRINT MINUTIAE

Kenneth E. Taylor, and Jeff B. Glickman, both of Champaign, Ill., assignors to ThumbScan, Inc., Lombard, Ill.

Continuation of Ser. No. 55,145, May 28, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 342,666

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—5 **11 Claims**



1. A method of matching a live image and a master image having any random or nonrandom distribution of characteristic features throughout an image, comprising the steps of:

generating a set of points representative of the characteristic features of the live image;

generating a set of points representative of the characteristic features of the master image; and

evaluating the match between the live characteristic points and the master characteristic points, said step of evaluating consisting essentially of the further steps of:

deriving the distances between a plurality of pairs of the live characteristic points;

deriving the distances between a plurality of pairs of the master characteristic points; and

comparing the live distances with the master distances to determine whether of not the live image matches the master image;

wherein the steps of deriving the distances between pairs of the live characteristic points and deriving the distances between pairs of the master characteristic points comprise for each such step the step of forming, for each point in the set of points, a spectrum of values representing the distances between the point and each other point in the set of points.

4,896,364

METHOD OF DETECTING BOUNDARY STRUCTURES IN A VIDEO SIGNAL

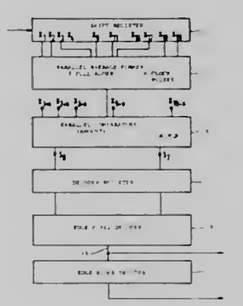
Herbert Lohscheller, Aspach, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,247

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542484

Int. Cl.[4] G06K *9/48*

U.S. Cl. 382—22 **10 Claims**



1. A method of detecting the edges in a video signal, with a decision criterion being derived from the environment of a pixel so as to effect image coding with the least number of bits, said method comprising steps of:

subdividing the entire image into partial image regions (blocks) which are non-overlapping and fixed sized and each individually coded as to intensity (luminance or chrominance) components;

from each of these partial image regions, forming a plurality of windows within a block each composed of one image pixel and its immediately adjacent environment pixels;

storing the intensity values of the pixels in a shift register wherein the sequence of said storing is effected linewise from top to bottom within each block;

for each window, reading out only the immediately adjacent environment pixels of an image pixel from the shift register in parallel and calculating an average intensity value from the read out values;

for each said window, individually comparing the respectively determined average value with the associated adjacent environment pixels taken from the shift register for each image pixel and providing a respective output signal having one of three different digital values depending on whether the intensity value of an environment pixel lies above, within, or below a given tolerance range around the average valve;

intermediately storing the three valued individual output signals;

and utilizing the three valued output signals to detect an edge and the orientation of such detected edge with the number of the respective values of the output signals and their sequence in a fixed direction around the associated image pixel defining the orientation of the detected edge.

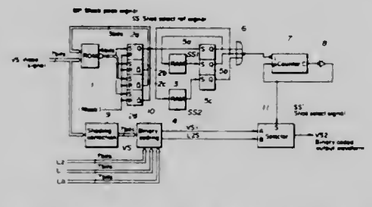
VOL 1110 ISS 4 JA 23 1990 UMI

4,896,365

VIDEO SIGNAL BINARY-CODING APPARATUS AND METHOD

Minoru Oota, Odawara, and Toshihiro Hanazoi, Ninomiyamachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 922,336, Oct. 23, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,611
Claims priority, application Japan, Oct. 24, 1985, 60-236345
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—53 **1 Claim**



1. A video signal binary-coding apparatus for converting a video signal corresponding to a predetermined bit width of information into binary-coded signals corresponding to white levels and black levels, comprising:

first means for producing a black peak signal in accordance with the black peak level of said video signal itself, and determining, in response to both said black peak signal and said video signal, whether or not said video signal is rich in the black component, and outputting a binary slice select reference signal indicative of the result determined, wherein said first means includes a ROM and a plurality of bistable circuits each responsive to an output of said ROM for generating at the output of a first of said bistable circuits a 1-bit slice select reference signal and at the respective outputs of the remaining bistable circuits respective bits of a 3-bit black peak signal which represents the preceding bit scan of said video signal to which the video signal of a subsequent bit scan is compared with by said ROM;

second means, coupled to the output of said first bistable circuit, for consecutively storing a plurality of slice select reference signals produced by a predetermined number of successive scans and outputting said stored plurality of slice select reference signals corresponding to a predetermined range of said video signal which is to be binary-coded, wherein said second means includes a first bistable memory circuit having an input coupled to the output of said first bistable circuit and an output coupled to an input of a first RAM, a second bistable memory circuit having an input coupled to an output of said first RAM and an output coupled to an input of a second RAM, and a third bistable memory circuit having an input coupled to an output of said second RAM and an output, wherein each one of said plurality of slice select reference signals, corresponding to successive scans, is stored in respective ones of said bistable memory circuits; and

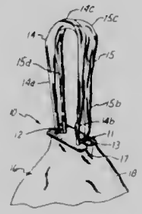
third means, coupled to said second means, for effecting delivery as a binary-coded output signal, corresponding to the predetermined bit width of said video signal, a binary-coded waveform produced by slicing said video signal at a predetermined slice level when it is determined that a slice select reference signal is present indicating that many black components exist in accordance with the plurality of slice select reference signals delivered from said second means, wherein said third means is comprised of a NOR logic gate having a plurality of inputs and an output and a bit counter, said NOR logic gate inputs being respectively coupled so as to receive slice select reference signals from the outputs of said first, second and third bistable memory circuits, and wherein said bit counter has an input coupled to the output of said NOR logic gate and an output for providing a slice select signal in response to at least one slice select reference signal from said second means to effect in slicing of said video signal corresponding to a threshold level indicative of the presence of many black components.

4,896,366

T-SHIRT BAG CLOSURE

Jack Oxman, Newport Beach, Calif., assignor to World Manufacturing, Inc., Costa Mesa, Calif.

Filed Nov. 18, 1988, Ser. No. 273,411
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—71 **12 Claims**



1. A container, comprising:

a T-shirt bag having first and second handles

a sheet of material;

the sheet of material defining first and second openings in which to place the first and second handles of the T-shirt bag in order to restrain the handles for purposes of retaining the T-shirt bag at least partially closed;

the first and second openings having substantially identical sizes and shapes;

the first opening being dimensioned and arranged to receive a first portion of the first handle and a first portion of the second handle and the second opening being dimensioned and arranged to receive a second portion of the first handle and a second portion of the second handle;

the first opening including a first access opening portion and a first interior portion,

the second opening including a second access opening portion and a second interior portion, the second access opening portion being dimensioned and arranged to enable a user to pass the second portion of the first handle and the second portion of the second handle through the second access portion into the second interior portion;

the sheet of material including a peripheral edge;

the first access opening portion extending to a first location at the peripheral edge of the sheet of material;

the second access opening portion extending to a second location at the peripheral edge;

the first access opening portion including an inward end at the first interior portion; and

the first interior portion including first and second channel portions, each of the first and second channel portions extending on an opposite side of the first access opening portion from the inward end of the first access opening portion back toward the peripheral edge.

4,896,367

ANTI-CORROSIVE STUFFING BOX ASSEMBLY

Hille Newton, and Ron Belanger, both of Bonnyville, Canada, assignors to H & R Valve, Ltd., Bonnyville, Canada

Filed Oct. 24, 1988, Ser. No. 261,748
Int. Cl.[4] F16C *33/72*; E21B *33/00*
U.S. Cl. 384—16 **13 Claims**

1. In well pumping apparatus wherein a stuffing box is mounted at the upper end of a wellhead and a polished rod is reciprocal along a vertical path through said stuffing box, the improvement comprising:

a bearing assembly disposed in an annular cavity in said stuffing box, said bearing assembly having bearing sections at opposite ends thereof, packing coils in said stuffing box interposed between said bearing sections, said stuffing box including means exerting a compressive force on said packing coils, said bearing assembly being of annular configuration and each bearing section including a first portion composed of an inert material and a second portion having an anodic surface portion on its inner peripheral surface in surrounding relation to said polished rod, said first and second portions disposed in end-to-end relation to one another and in surrounding relation to said polished rod.

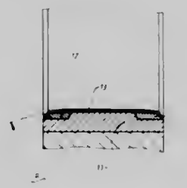


4,896,368

THREE COMPONENT SLIDE BEARING

Karl Just, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,910
Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816404
Int. Cl.[4] F16C *33/06*
U.S. Cl. 384—276 **2 Claims**



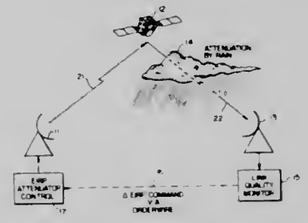
1. A three-component slide bearing having a steel-backed supporting part, an intermediate layer consisting of a harder bearing metal, and a thin slide layer consisting of a softer bearing metal, wherein the intermediate layer consisting of a harder bearing metal is disposed in the axial edge areas of the bearing which are endangered by a compression across the edges and arranged in surrounding recesses of the steel backed supporting part, while, in the center area of the bearing, the thin slide layer is applied directly onto the steel-backed supporting part.

4,896,369

OPTIMAL SATELLITE TWT POWER ALLOCATION PROCESS FOR ACHIEVING REQUESTED AVAILABILITY AND MAINTAINING STABILITY IN ALPC-TYPE NETWORKS

William C. Adams, Jr., Indialantic; Charles R. Patisaul, Melbourne, and Gerald S. Duggan, Indialantic, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Dec. 28, 1984, Ser. No. 687,269
Int. Cl.[4] H04B *7/185, 1/60*
U.S. Cl. 455—12 **15 Claims**



1. For use in an adaptive link power control (ALPC) satellite communications network wherein signals conveyed between transmitting and receiving terminals are amplified and relayed by a satellite amplifier device the power availability from which is controlled to meet the demands of the links of the network, a method of configuring said network to accommodate a maximum number of requesting-to-be-participant links while maintaining network stability of said satellite amplifier device at a prescribed availability, comprising the steps of:

(a incorporating into the satellite network an individual one of said requesting-to-be-participant links of which the network is to be configured;

(b) determining the power output probability density function of said satellite amplifier device as a result of the incorporation of said individual one of said links into said network and integrating the resulting probability density function to obtain a cumulative distribution function for said amplifier device;

(c) establishing a rain margin power to be made available by said amplifier device in accordance with the cumulative distribution function obtained in step (b);

(d) setting the ALPC network stability margin equal to the rain margin established in step (c);

(e) defining a stability operating point of said amplifier device relative to a prescribed operational point of said amplifier device (d); and

(f) selectively retaining in said network said individual one of said links that has been incorporated into said network in step (a), in accordance with whether or not the actual peak operating point of said amplifier device for the total number of links of said network including said incorporated link exceeds said stability operating point of said amplifier device.

4,896,370

CONTROL SYSTEM FOR MICROPROCESSOR AND SOFTWARE ENHANCED COMMUNICATIONS EQUIPMENT

Kaspar A. Kasparian, Raleigh, and Aaron S. Rogers, Knightsdale, both of N.C., assignors to Teletec Corporation, Raleigh, N.C.

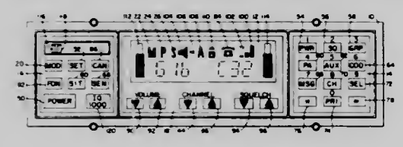
Filed Mar. 27, 1987, Ser. No. 31,004
Int. Cl.[4] H04B *1/40*
U.S. Cl. 455—77 **40 Claims**

1. A control system for land based and mobile radio communications equipment comprising:

(a) a face control panel having a display portion, a command

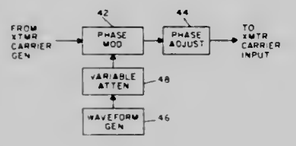
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portion and a keypad portion, said keypad portion having keypad values from '1' to '0';
(b) a plurality of keypad control buttons or switches activated by heat, light, pressure or a combination thereof disposed in said keypad portion of said face control panel corresponding to said keypad values from '1' to '0' and at least one of said control buttons or switches having a control function, said control buttons or switches having control functions when in a control mode and value functions which correspond to said keypad values when in a value mode;
(c) a command button or switch activated by heat, light, pressure or a combination thereof disposed in said command portion of said face control panel for accessing said control functions provided by said keypad control buttons



or switches and for then changing values or stati of a selected control function by allowing the access of said function to said keypad in a value mode;
(d) an alphanumeric display, said display being programmably operable in either a wraparound or scrolling fashion and disposed in said display portion of said face control panel to display symbols and alphanumeric characters to represent a selected operating mode and confirmation of other operating or programming related information and numbers to represent stati and information related to operation and programming; and
(e) software for accessing and subsequent resetting of the values or stati of said keypad control buttons or switches, said command button or switch and said alphanumeric display.

4,896,371
SYNCHRONOUS AM TRANSMISSION SYSTEM HAVING REDUCED SELF INTERFERENCE EFFECTS
Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016
Filed Nov. 20, 1987, Ser. No. 123,508
Int. Cl.[4] H04B *1/02*
U.S. Cl. 455—105 **7 Claims**



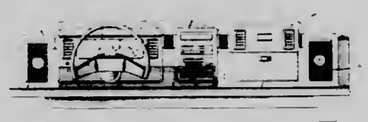
1. An improved synchronous AM transmission system, comprising:
first and second AM transmitters, each having program and carrier signal inputs;
means for supplying a program signal to the program signal input of each of said transmitters;
first means for supplying a first carrier signal of predetermined frequency to the carrier signal input of a selected one of said transmitters; and
second means for supplying to the carrier signal input of the other of said transmitters a second carrier signal of substantially the same frequency as that of said first carrier signal and having a relative phase with respect thereto which is varied in accordance with a selected phase modulation function.

4,896,372
PULSE WIDTH MODULATOR FOR AM-RF TRANSMITTER
Bryan A. Weaver, Dallas, Tex., assignor to Varian Associates, Inc., Palo Alto, Calif.
Filed Feb. 25, 1986, Ser. No. 832,630
Int. Cl.[4] H03F *3/38*
U.S. Cl. 455—108 **35 Claims**



7. An AM radio transmitter for transmitting an RF carrier amplitude modulated by an information signal having variable amplitude and frequency characteristics comprising a pulse width modulator responsive to the information signal for deriving a pulse width modulated signal having pulses with widths representing the instantaneous amplitude of the information signal and a variable frequency that is a function of at least one of said characteristics of the information signal, said modulator including a variable frequency oscillator for deriving an output wave having a constantly changing amplitude, means responsive to the information signal for supplying a DC signal having a magnitude that changes as a function of at least one of said characteristics of the information signal to the oscillator to control the frequency of the output wave, the pulse width modulated signal being a bilevel signal, the modulator including means for controlling transitions of the bilevel signal so that each transition in said bilevel signal occurs in synchronism with each change in the relative polarity of the information signal and the oscillator output wave, and means responsive to a smoothed replica of the pulse width modulated bilevel signal for deriving the RF amplitude modulated carrier.

4,896,373
DESK WITH DASHBOARD FACING
Paul M. Blake, 7 Colonial La., Canton, Mass. 02021
Filed Sep. 25, 1987, Ser. No. 101,867
Int. Cl.[4] H04B *1/06*
U.S. Cl. 455—344 **11 Claims**



1. An improved desk comprising:

(a) a substantially planar surface provided with a writing surface thereon;
(b) support means for supporting said planar surface at a predetermined distance above an adjacent floor surface; and
(c) said planar surface having a front portion and a rear portion having a rear edge with the rear edge having extending in adjacency upwardly therefrom a vertical facing made to resemble the dashboard of a vehicle facing toward said front portion and including the visualization of a vehicle instrument panel, said writing surface extending from said front portion to said facing and comprising a majority of said planar surface.

4,896,374
BROADBAND MONOLITHIC BALANCED MIXER APPARATUS
Raymond M. Waugh, Philipsburg; Tzu-Hung Chen, East Brunswick, and Mahesh Kumar, Lawrenceville, all of N.J., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 9, 1988, Ser. No. 282,083
Int. Cl.[4] H04B *1/26*
U.S. Cl. 455—326 **20 Claims**

1. A broadband monolithic balanced mixer apparatus for use within the microwave frequency ranges, comprising:
an active hybrid means having one input adapted to receive an RF signal and another input adapted to receive a local oscillator (LO) signal to provide at first and second outputs a combined LO and RF signal, said active hybrid means having a first active signal splitter having an input coupled to said one input for receiving said RF signal and having first and second outputs, a second active signal splitter having an input coupled to said another input for receiving said LO signal, said second splitter having first and second outputs,
a first active signal combiner having a first input coupled to said first output of said first signal splitter and having a second input and an output,
a second active signal combiner having a first input coupled to said second output of said first splitter and having a second input and an output,
a first all pass network having an input and an output terminal, with said input coupled to said first output of said second splitter and with said output coupled to said second input of said first combiner,



a second all pass network having an input and an output, with the input of said second all pass network coupled to said second output of said second splitter and with the output of said second all pass network coupled to the second input of said second combiner, wherein the output of said first and second combiners each provide an RF/LO signal of a different phase with respect to one another, and
mixing means coupled to said outputs of said first and second combiners to provide at an output an IF signal being of a frequency equal to the difference between said RF and LO signal frequencies and substantially free of said RF and LO signals.

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DESIGN PATENTS

GRANTED JAN. 23, 1990

ERRATA

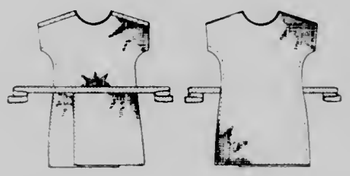
For CLASS	See PATENT NO.
D34-040	305,618

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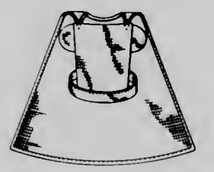
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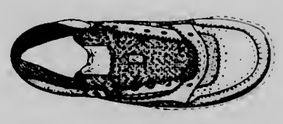
305,575
DIGNITY GOWN
David G. Gordon, 113 Laredo Ave., New Lebanon, Ohio 45345, and Carol A. Winkler, 8722 Dayton-Oxford, Franklin, Ohio 45005
Filed Jun. 14, 1989, Ser. No. 367,091
Term of patent 14 years
U.S. Cl. D2—17



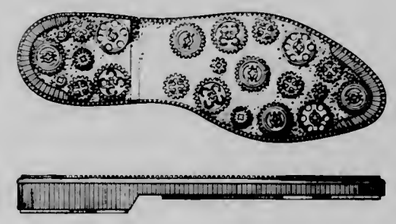
305,576
COMBINED CHILD'S CAPE AND BREASTPLATE
Leonard M. Petersen, Jr., Bloomington, Ind., assignor to Timeless Beginnings, Inc., Bloomington, Ind.
Filed Feb. 20, 1987, Ser. No. 17,194
Term of patent 14 years
U.S. Cl. D2—180



305,577
SHOE UPPER
Craig L. Feller, Tigard; David Cousin, Tualatin, and Mona McCrea, Portland, all of Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 1, 1989, Ser. No. 304,832
Term of patent 14 years
U.S. Cl. D2—314

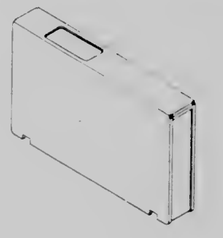


305,578
SHOE SOLE
Albert Charette, Bedford, N.H.; Paul E. Duchesnia, Haverhill, Mass., and John F. Lane, Rochester, N.H., assignors to Encore Shoe Corporation, Rochester, N.H.
Filed Nov. 9, 1987, Ser. No. 188,810
Term of patent 14 years
U.S. Cl. D2—321



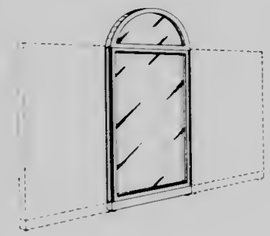
305,579
SUN PROTECTION SLEEVE
Catherine Cato, 3311 W. Turney, Phoenix, Ariz. 85017
Filed Aug. 15, 1986, Ser. No. 896,834
Term of patent 14 years
U.S. Cl. D2—610

305,580
CASE FOR VIDEO TAPE CASSETTE
Tatsuya Nozaki, Tokyo, Japan, assignor to Credix Corporation, Tokyo, Japan
Filed Sep. 23, 1986, Ser. No. 910,749
Term of patent 14 years
U.S. Cl. D3—35



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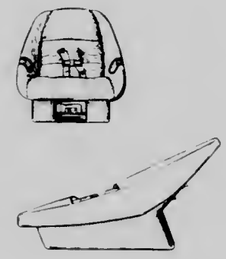
305,581
SPACE-DIVIDER PANEL FOR USE PRIMARILY IN AN OFFICE
Jane L. Jones, Park Township, Ottawa County, and Douglas J. Maat, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Oct. 7, 1986, Ser. No. 916,444
Term of patent 14 years
U.S. Cl. D6—332



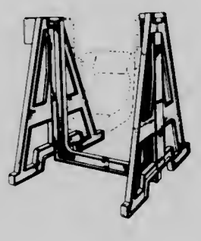
305,582
DIVIDER PANEL FOR A WORK STATION OR THE LIKE
Otto Zapf, Konigstein, Fed. Rep. of Germany, assignor to Allsteel Inc., Aurora, Ill.
Division of Ser. No. 901,162, Aug. 26, 1986. This application Oct. 18, 1988, Ser. No. 259,091
Term of patent 14 years
U.S. Cl. D6—332



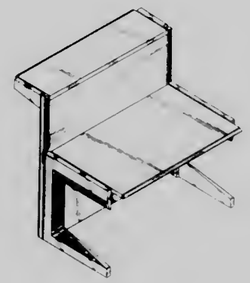
305,583
CHILD CAR SEAT
Dennis M. Turner, and Donald L. Gerken, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.
Filed Dec. 15, 1986, Ser. No. 942,005
Term of patent 14 years
U.S. Cl. D6—333



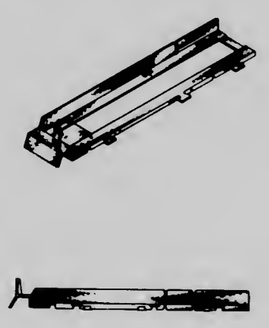
305,584
CHILD SWING FRAME
Raymond Spilman, Darien; Jacob Krapowicz, Ridgefield, both of Conn., and Alvin Fowler, Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.
Filed Nov. 25, 1986, Ser. No. 934,937
Term of patent 14 years
U.S. Cl. D6—344



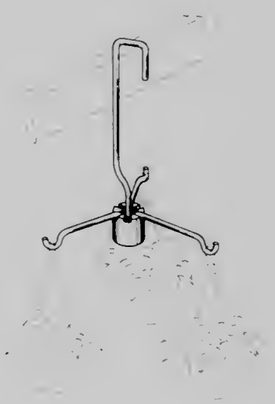
305,585
DESK
David Wright, Droitwitch, England, assignor to Remisystem (UK) Ltd., Worchestershire, England
Filed Feb. 13, 1987, Ser. No. 14,493
Claims priority, application South Africa, Aug. 14, 1986, 86/0678
Term of patent 14 years
U.S. Cl. D6—426



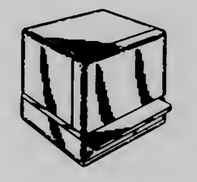
305,586
MERCHANDISE DISPLAY SHELF INSERT
Ulrich Wombacher, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Oct. 31, 1986, Ser. No. 926,471
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 5504
Term of patent 14 years
U.S. Cl. D6—512



305,587
POTTED PLANT HANGER
Louis Possemato, 1909 Margie La., Anaheim, Calif. 92802
Filed Oct. 9, 1987, Ser. No. 107,527
Term of patent 14 years
U.S. Cl. D6—513

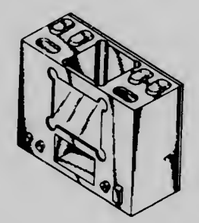


305,588
DISPENSER FOR PACKAGED BANDAGES AND THE LIKE
John W. Behringer, 143 Main St., North Kingstown, R.I. 02852
Filed Jan. 11, 1988, Ser. No. 141,898
Term of patent 14 years
U.S. Cl. D6—517

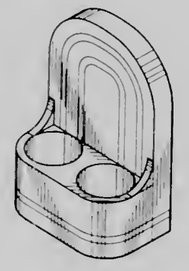


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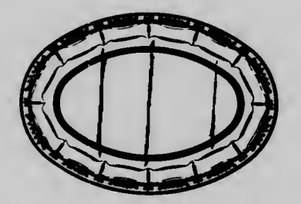
305,589
COMBINED SOAP DISPENSING AND ARTICLE STORAGE RACK FOR USE IN A SHOWER
Christopher Timmons, Rte. 1, Wheeling, Mo. 64688
Filed Feb. 19, 1988, Ser. No. 157,501
Term of patent 14 years
U.S. Cl. D6—524



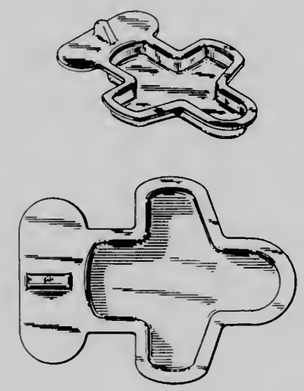
305,590
TUBULAR TOOTHPASTE CADDY
Ernest M. Vance, 702 Cedar Springs Rd., Lot 49, Weaver, Ala. 36277
Filed Nov. 30, 1987, Ser. No. 126,942
Term of patent 14 years
U.S. Cl. D6—534



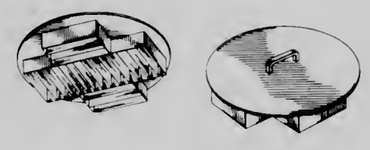
305,591
PLATE
Eiji Natori, Konosu, Japan, assignor to Chuo Kagaku Kabushiki Kaisha, Konosu, Japan
Filed Dec. 16, 1986, Ser. No. 942,579
Claims priority, application Japan, Oct. 7, 1986, 61-39777
Term of patent 14 years
U.S. Cl. D7—1



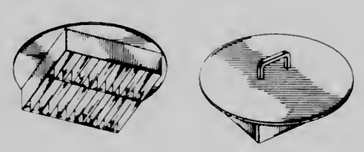
305,592
FOOD BOWL OR SIMILAR ARTICLE
Daniel L. Harris, Minneapolis, and Mark W. Bergman, Minnetonka, both of Minn., assignors to Harber, Inc., Eden Prairie, Minn.
Filed Jul. 13, 1987, Ser. No. 72,601
Term of patent 14 years
U.S. Cl. D7—5



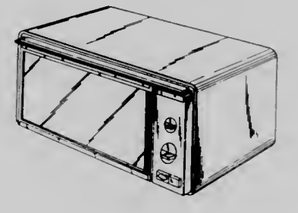
305,593
CUTTER FOR FORMING BREAD STICKS
Sleiman D. Saliba, 1400 Hancock Blvd., Apt. 111, Daytona Beach, Fla. 32014
Filed Oct. 30, 1986, Ser. No. 925,144
Term of patent 14 years
U.S. Cl. D7—43



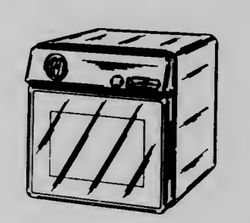
305,594
CUTTER FOR FORMING BREAD STICKS
Sleiman D. Saliba, 1400 Hancock Blvd., Apt. 111, Daytona Beach, Fla. 32014
Filed Oct. 30, 1986, Ser. No. 925,143
Term of patent 14 years
U.S. Cl. D7—43



305,595
MICROWAVE OVEN
Seung H. Yoo, Buchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 18, 1987, Ser. No. 16,181
Claims priority, application Rep. of Korea, Aug. 28, 1986, Des. 86-12272
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351

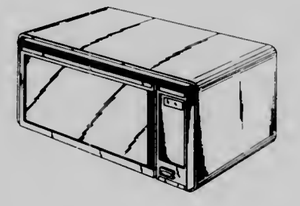


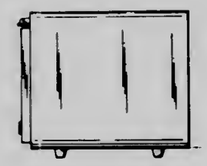
305,596
MICROWAVE OVEN
Hiroshi Nishibori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 9, 1987, Ser. No. 94,544
Claims priority, application Japan, Mar. 19, 1987, 62-10325
Term of patent 14 years
U.S. Cl. D7—351



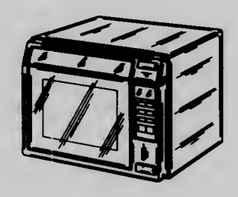
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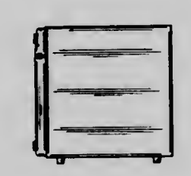
305,597
MICROWAVE OVEN
Seung H. Yoo, Buchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 18, 1987, Ser. No. 16,176
Claims priority, application Rep. of Korea, Aug. 28, 1986, Des. 86-12273
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



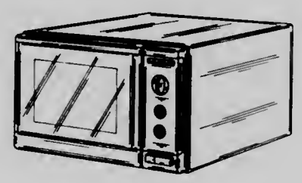


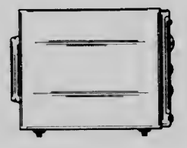
305,598
MICROWAVE OVEN WITH TOASTER
Junichi Saito, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 23, 1987, Ser. No. 137,011
Claims priority, application Japan, Jun. 23, 1987, 62-25756
Term of patent 14 years
U.S. Cl. D7—351



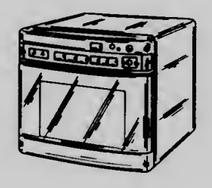


305,599
MICROWAVE OVEN
Hiromiti Yamada; Junichi Sakamoto, and Hiroshi Nishibori, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 27, 1987, Ser. No. 78,469
Claims priority, application Japan, Feb. 6, 1987, 62-4519
Term of patent 14 years
U.S. Cl. D7—351



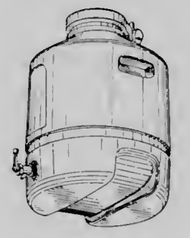


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MICROWAVE OVEN
Wataru Iwakashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 9, 1987, Ser. No. 130,733
Claims priority, application Japan, Jun. 9, 1987, 62-23711
Term of patent 14 years
U.S. Cl. D7—351





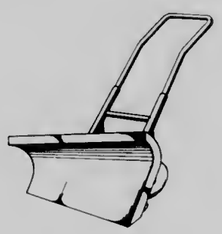
305,601
FERMENTATION VESSEL
C. Bruce Hewson, West Vancouver, Canada, assignor to Brewmaster Systems, Ltd., West Vancouver, Canada
Filed Apr. 28, 1986, Ser. No. 858,251
Claims priority, application Canada, Oct. 31, 1985, 31-10-85-5
Term of patent 14 years
U.S. Cl. D7—368



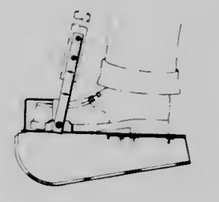
305,602
ICE SHAVER
Shinji Inomata, Shizuoka, Japan, assignor to Ai Kogyo Kabushiki Kaisha, Japan
Filed Jun. 29, 1987, Ser. No. 68,046
Claims priority, application Japan, Dec. 27, 1986, 61-52492
Term of patent 14 years
U.S. Cl. D7—374



305,603
SNOW MOVER
Donald Nelson, and Carol Nelson, both of 617 Starlight Dr., Salina, Kans. 67401
Filed Aug. 20, 1987, Ser. No. 87,625
Term of patent 14 years
U.S. Cl. D8—1

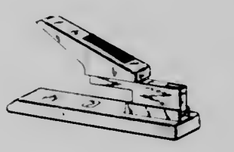


305,604
LAWN EDGER
Robert Keblbek, 1610 Pacific Bldg., Seattle, Wash. 98104
Filed Jul. 15, 1988, Ser. No. 219,162
Term of patent 14 years
U.S. Cl. D8—7



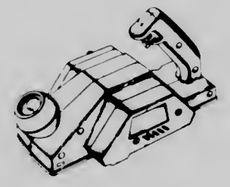


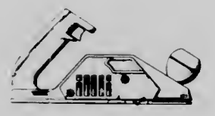
305,605
STAPLER
Yoshiyuki Ebihara, 25-18, Kamiogi 4-chome, Suginami-ku, Tokyo, Japan
Filed Nov. 24, 1986, Ser. No. 934,147
Term of patent 14 years
U.S. Cl. D8—50



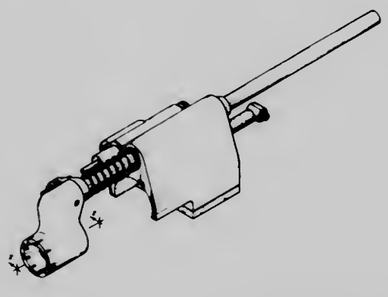
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305,606
POWER PLANER
Robert P. Cavedo, Easley, S.C., assignor to Ryobi Motor Products Corp., Pickens, S.C.
Filed Apr. 30, 1987, Ser. No. 44,279
Term of patent 14 years
U.S. Cl. D8—61

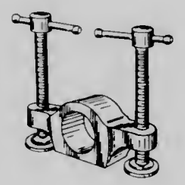




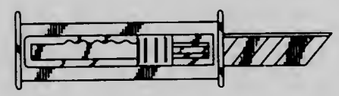
305,607
CHIP-COLLECTING ATTACHMENT FOR A HAND-HELD AIR DRILL
George G. Andrews, 1115 N. Cooper St., Arlington, Tex. 76011
Filed Apr. 9, 1986, Ser. No. 850,929
Term of patent 14 years
U.S. Cl. D8—70



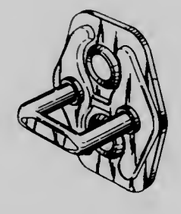
305,608
VENEER PIPE CLAMP
Ronald R. Hahn, Barrington, Ill., assignor to Hahn Manufacturing Company, Franklin Park, Ill.
Filed Feb. 18, 1987, Ser. No. 16,052
Term of patent 14 years
U.S. Cl. D8—72



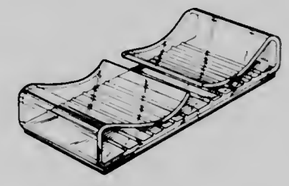
305,609
RETRACTABLE BLADE KNIFE
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,513
Term of patent 14 years
U.S. Cl. D8—99



305,610
STRIKER PLATE FOR AN AUTOMOBILE DOOR LOCK
Hitoshi Nakamura; Haruo Mochida, and Yoshio Watanuki, all of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd. and Nissan Motor Co., Ltd., both of Kanagawa, Japan
Filed Aug. 3, 1988, Ser. No. 227,741
Term of patent 14 years
U.S. Cl. D8—345



305,611
ADHESIVE CORD CLIP
Richard Herzog, Des Plaines, and Robert DeBiase, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Dec. 28, 1987, Ser. No. 138,015
Term of patent 14 years
U.S. Cl. D8—395



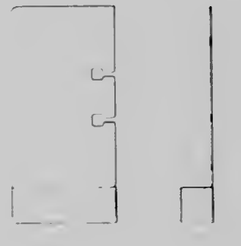
305,612
COMBINED CONTAINER AND SPRAY NOZZLE
Brian D. Haworth, Farnborough, England, assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Feb. 2, 1987, Ser. No. 9,438
Claims priority, application United Kingdom, Aug. 1, 1986, 1035797
Term of patent 14 years
U.S. Cl. D9—300



305,613
BOTTLE
Richard Friedman, Coral Springs, Fla., assignor to My Enterprises, Inc., Boca Raton, Fla.
Filed Jun. 4, 1987, Ser. No. 57,862
Term of patent 14 years
U.S. Cl. D9—314

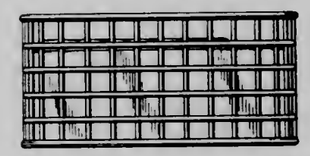


305,614
COMBINED PRODUCT CONTAINER AND DETACHABLE BUSINESS CARD
Georges Gotlib, 317 West 83rd St., New York, N.Y. 10024
Filed Sep. 16, 1986, Ser. No. 908,151
Term of patent 14 years
U.S. Cl. D9—337



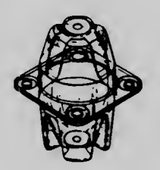
305,615
GIFT PACKAGE
Suzanne Cassano, Norwalk, and Wendy Banks, Roxbury, both of Conn., assignors to Liz Claiborne, Inc., New York, N.Y.
Filed Dec. 2, 1987, Ser. No. 127,670
Term of patent 14 years
U.S. Cl. D9—341





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305,616
EGG PACKAGING CONTAINER
William N. H. Johnson, London, England, assignor to Scientific Applied Research (SAR) plc, London, Great Britain
Filed Apr. 4, 1986, Ser. No. 850,359
Claims priority, application United Kingdom, Oct. 9, 1985, 1029723; Oct. 9, 1985, 1029724; Oct. 9, 1985, 1029725; Mar. 27, 1986, 1033124; Mar. 27, 1986, 1033125
Term of patent 14 years
U.S. Cl. D9—345



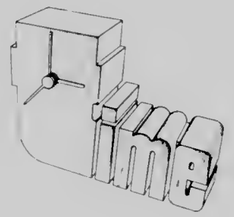
305,617
BOTTLE
Fred J. Hayman, Beverly Hills; Allan B. Johnson, Tarzana, and Keith L. Poulson, Canyon Country, all of Calif., assignors to Fred Hayman Beverly Hills, Inc., Beverly Hills, Calif.
Filed Jun. 16, 1988, Ser. No. 208,276
Term of patent 14 years
U.S. Cl. D9—377



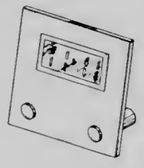
305,618
DISPLAY TRAY FOR FRUIT OR THE LIKE
Dean B. Blaser, Bryan, Ohio, assignor to Potter, Inc., Bryan, Ohio
Filed Mar. 6, 1986, Ser. No. 842,001
Term of patent 14 years
U.S. Cl. D34—40



305,619
CLOCK
Andreas Diehl, Marienburger Str. 3, D-8950 Kaufbeuren, Fed. Rep. of Germany
Filed Nov. 21, 1986, Ser. No. 934,089
Claims priority, application Fed. Rep. of Germany, May 22, 1986, MR 9683
Term of patent 14 years
U.S. Cl. D10—6



305,620
CLOCK
David C. H. Leung, Quarry Bay, Hong Kong, assignor to Langfield Electronics Co., Inc., Quarry Bay, Hong Kong
Filed Oct. 10. 1986, Ser. No. 918,868
Claims priority, application United Kingdom, Apr. 11, 1986, 1033399
Term of patent 14 years
U.S. Cl. D10—15



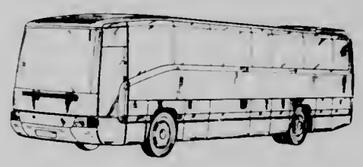
305,621
BATHROOM SCALE BODY
Stephen A. Francis, Milford, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Dec. 17, 1986, Ser. No. 943,285
Term of patent 14 years
U.S. Cl. D10—94



305,622
STRAP FOR A WRISTWATCH
Masamichi Wakamatsu, Fussa, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan
Division of Ser. No. 70,517, Jul. 7, 1987. This application May 9, 1989, Ser. No. 350,021
Term of patent 14 years
U.S. Cl. D11—5



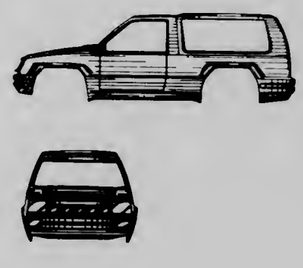
305,623
BUS
Joseph Gallitzendoerfer; Bruno Sacco, both of Sindelfingen; Peter Pfeiffer, Boeblingen, and Gerhard Steinle, Gechingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany
Filed Dec. 1, 1986, Ser. No. 936,266
Claims priority, application Fed. Rep. of Germany, May 30, 1986, MR 6090
Term of patent 14 years
U.S. Cl. D12—84



305,624
AUTOMOBILE
David P. Doyle, Mission Viejo, Calif., and Tokuo Fukuichi, Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Dec. 24, 1987, Ser. No. 138,012
Term of patent 14 years
U.S. Cl. D12—90

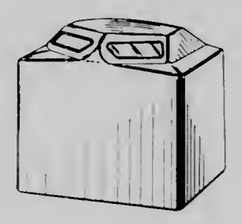


305,625
VEHICLE BODY
Nicholas D. R. Loubser, Plot 29, Pomona, Kempton Park, South Africa
Filed Apr. 27, 1987, Ser. No. 43,242
Claims priority, application South Africa, Oct. 30, 1986, 86/0932
Term of patent 14 years
U.S. Cl. D12—91

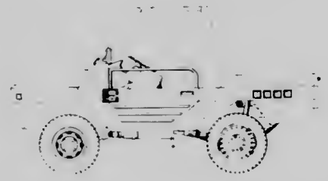


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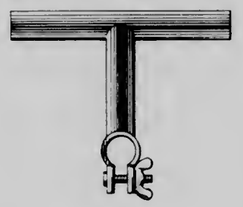
305,626
TRUCK SLEEPER CAB UNIT
Eugene V. Moffatt, 831 Douglas Dr.; Raymond H. Moffatt, 3448 Ellwood Rd., both of New Castle, Pa. 16101; Vivian S. Jones, R.D. #2 Frampton Rd., West Middlesex, Pa. 16159, and David A. Jones, 2060 Clayfurnace Rd., Sharpsville, Pa. 16150
Filed Jul. 6, 1987, Ser. No. 69,629
Term of patent 14 years
U.S. Cl. D12—96



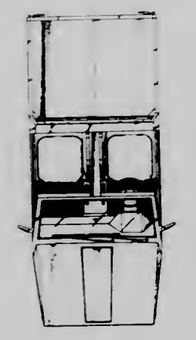
305,627
CARRYING VEHICLE
Sotoshi Takagi, Izumisano, and Akio Fukata, Izumi, both of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Sep. 23, 1987, Ser. No. 100,135
Claims priority, application Japan, Jul. 20, 1987, 62-29433
Term of patent 14 years
U.S. Cl. D12—98

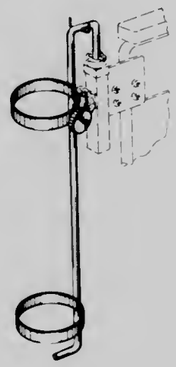


305,628
MOUNTING BAR FOR ATTACHMENT TO A BICYCLE STEM FOR SUPPORTING ACCESSORY ITEMS
Raymond G. Mannier, 4166 White Oak Dr., Dayton, Ohio 45432
Filed Aug. 14, 1987, Ser. No. 708,560
Term of patent 14 years
U.S. Cl. D12—114

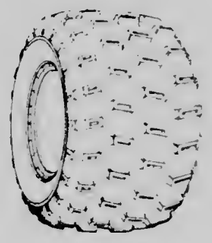


305,629
WHEELCHAIR-MOUNTED OXYGEN BOTTLE BRACKET
Charles F. Wood, 8341 W. Foothill Dr., Peoria, Ariz. 85354
Filed Nov. 17, 1987, Ser. No. 121,736
Term of patent 14 years
U.S. Cl. D12—133





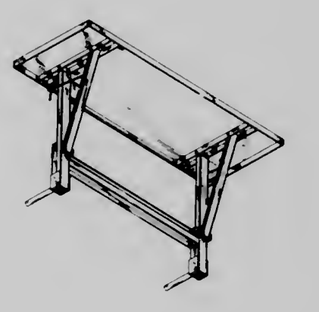
305,630
VEHICLE TIRE
Yuzi Shimamoto, Osaka, and Kotaro Tsutsumi, Tokyo, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed May 6, 1987, Ser. No. 46,495
Claims priority, application Japan, Dec. 17, 1986, 61-50168
Term of patent 14 years
U.S. Cl. D12—140



305,631
ANTI-SKID RUBBER CHAIN FOR TIRES
Hidehiko Hino, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 27, 1987, Ser. No. 42,691
Claims priority, applicatioa Japan, Oct. 27, 1986, 61-42777
Term of patent 14 years
U.S. Cl. D12—154



305,632
VEHICLE BUMPER-MOUNTED FOLDABLE TABLE
Kenneth L. Kraklio, Wellman, Iowa, assignor to K-Rak Products, Inc., Oxford, Iowa
Filed Feb. 4, 1987, Ser. No. 10,630
Term of patent 14 years
U.S. Cl. D12—155



305,633
EXTERIOR EXTENSION FOR A TRUCK CAB
Richard J. Kingsley, N. Bonneville, Wash., assignor to Saturn Corporation, Tacoma, Wash.
Filed Oct. 3, 1986, Ser. No. 915,325
Term of patent 14 years
U.S. Cl. D12—156



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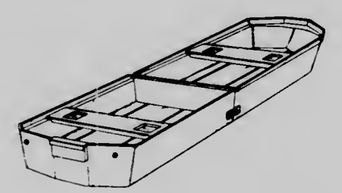
305,634
FRONT FACE OF A VEHICLE WHEEL
Boyke Boyer, Seefeld, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Jan. 20, 1987, Ser. No. 5,571
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, MR16761
Term of patent 14 years
U.S. Cl. D12—209



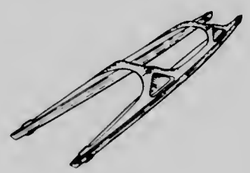
305,635
SHIELD FOR PROTECTING A WHEEL OR HUBCAP WHILE CLEANING AN AUTOMOBILE TIRE
Charles H. Pope, P.O. Box 171, Hopewell, Va. 23860
Filed Aug. 13, 1987, Ser. No. 84,733
Term of patent 14 years
U.S. Cl. D12—213



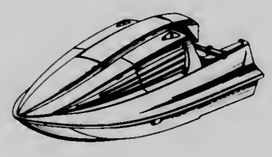
305,636
COMBINED BOAT AND LUGGAGE CARRIER
Loren C. Kienlen, 4471 Doyle St., Eugene, Oreg. 97404
Filed Jan. 4, 1988, Ser. No. 140,375
Term of patent 14 years
U.S. Cl. D12—300



305,637
ROW BOAT HULL
David Emmer, Los Gatos, Calif., assignor to Emmer Enterprises, Los Gatos, Calif.
Filed Jul. 7, 1987, Ser. No. 70,523
Term of patent 14 years
U.S. Cl. D12—304



305,638
JET SKI
Albert A. Mardikian, Corona Del Mar, Calif., assignor to American Hydro Ski, Inc., Huntington Beach, Calif.
Filed Mar. 10, 1988, Ser. No. 166,174
Term of patent 14 years
U.S. Cl. D12—307

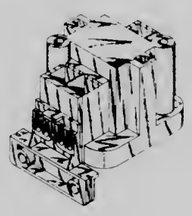




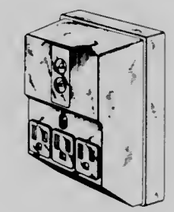
305,639
BATTERY PACK
Tsuguo Miki, Machida, and Kaoru Sumita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 3, 1988, Ser. No. 251,865
Term of patent 14 years
U.S. Cl. D13—8



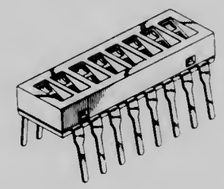
305,640
LAMP SOCKET
Dieter Henrici, Arnsberg, Fed. Rep. of Germany, assignor to Brokelmann, Jaeger & Busse GmbH & Co., Arnsberg, Fed. Rep. of Germany
Filed Sep. 30, 1987, Ser. No. 103,551
Term of patent 14 years
U.S. Cl. D13—25



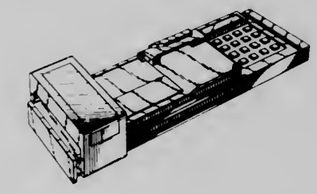
305,641
AC SURGE PROTECTOR
Paul V. DeLuca, Plandome, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Feb. 12, 1987, Ser. No. 14,526
Term of patent 14 years
U.S. Cl. D13—30



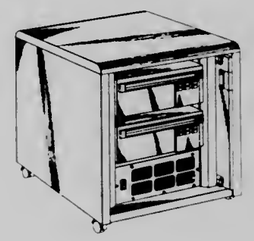
305,642
ELECTRICAL SWITCH ASSEMBLY
Masataka Kawashima, and Hiroji Fujimoto, both of Yokohama, Japan, assignors to Satori Switch Industry Co., Ltd., Kanagawa, Japan
Filed Oct. 6, 1986, Ser. No. 915,794
Term of patent 14 years
U.S. Cl. D13—37



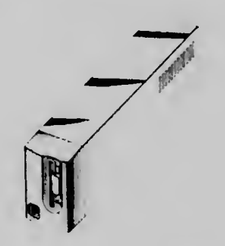
305,643
COMBINED CREDIT CARD AUTHORIZATION TERMINAL AND FLATBED CREDIT CARD IMPRINTER
David A. Stark, Apple Valley, Minn., and Laurance F. Plaskan, West Bend, Wis., assignors to Data Card Corporation, Minneapolis, Minn.
Filed Feb. 26, 1986, Ser. No. 832,163
Term of patent 14 years
U.S. Cl. D14—105



305,644
OPTICAL DISK DRIVE MODULE
Roberto Rivera, and Angelo Labarbera, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 27, 1987, Ser. No. 20,254
Term of patent 14 years
U.S. Cl. D14—107

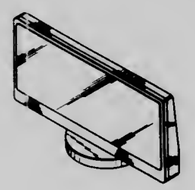


305,645
DISK DRIVE
Akira Tsukada, and Maki Tomoike, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 9, 1987, Ser. No. 1,502
Claims priority, application Japan, Jul. 10, 1986, 61-27218
Term of patent 14 years
U.S. Cl. D14—109

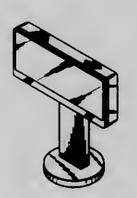


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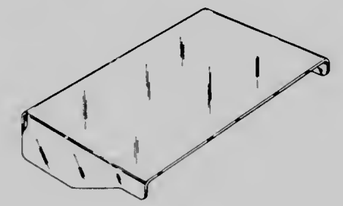
305,646
OPERATOR DISPLAY OR SIMILAR ARTICLE
Shuzo Kato; Yasushi Nakamura, both of Hiratsuka, and Junosuke Takeda, Ninomiya, all of Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 27, 1987, Ser. No. 101,341
Claims priority, application Japan, Mar. 30, 1987, 62-11684
Term of patent 14 years
U.S. Cl. D14—113



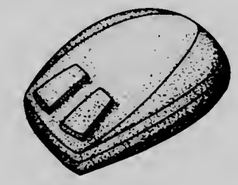
305,647
CUSTOMER DISPLAY OR SIMILAR ARTICLE
Shuzo Kato; Yasushi Nakamura, both of Hiratsuka, and Junosuke Takeda, Ninomiya, all of Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 25, 1987, Ser. No. 101,343
Claims priority, application Japan, Mar. 30, 1987, 62-11683
Term of patent 14 years
U.S. Cl. D14—113



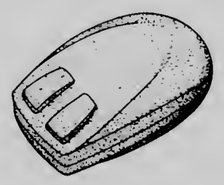
305,648
ANTI-GLARE VISOR FOR COMPUTER TERMINAL
Roy Edington, 56345 Strathmore Dr., Elkhart, Ind. 46516
Filed Feb. 27, 1987, Ser. No. 19,609
Term of patent 14 years
U.S. Cl. D14—114



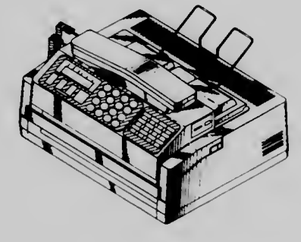
305,649
MOUSE
Stevens Lin, Taipei, Taiwan, assignor to Multitech Industrial Corporation, Taipei, Taiwan
Filed Jul. 27, 1987, Ser. No. 78,472
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



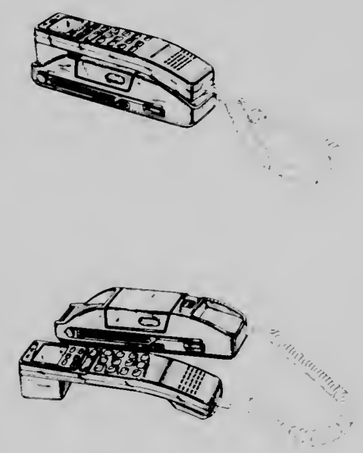
305,650
MOUSE
Stevens Lin, Taipei, Taiwan, assignor to Multitech Industrial Corporation, Taipei, Taiwan
Filed Aug. 12, 1987, Ser. No. 84,508
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



305,651
FACSIMILE MACHINE
Shinsaku Hino, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jul. 27, 1987, Ser. No. 78,471
Claims priority, application Japan, Feb. 2, 1987, 62-3959; Feb. 6, 1987, 62-4523
Term of patent 14 years
U.S. Cl. D14—118



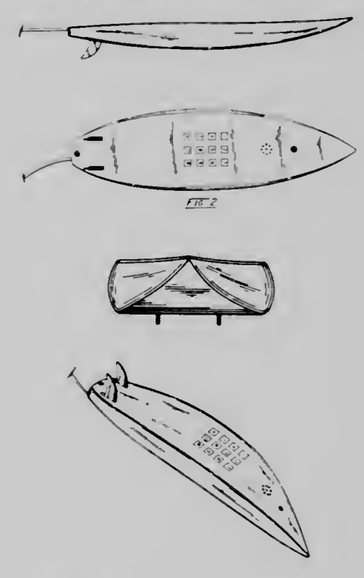
305,652
PORTABLE RADIOTELEPHONE
Keisuke Tejima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 29, 1988, Ser. No. 213,978
Claims priority, application Japan, Dec. 29, 1987, 62-53785
Term of patent 14 years
U.S. Cl. D14—138



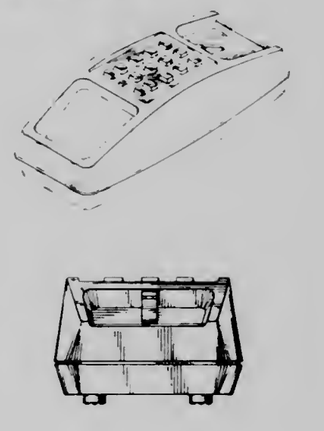
305,653
CASH AND CREDIT PUBLIC PAY TELEPHONE STAND
Martin S. Rose, Sudbury, England, assignor to GEC Plessey Telecommunications Ltd., Coventry, England
Filed Jun. 14, 1988, Ser. No. 206,631
Claims priority, application United Kingdom, Dec. 16, 1987, 1407134
Term of patent 14 years
U.S. Cl. D14—142



305,654
TELEPHONE
Allan W. Ferdi, 2207 Zollinger Rd., Columbus, Ohio 43221, and Douglas P. Fairchild, 7938 Prairie View Dr., Columbus, Ohio 43235
Filed Oct. 27, 1988, Ser. No. 263,130
Term of patent 14 years
U.S. Cl. D14—143



305,655
TELEPHONE BASE
James M. Sharp, Jr., Corinth, Miss., assignor to Alcatel Business Systems, Inc., Corinth, Miss.
Filed Mar. 3, 1989, Ser. No. 318,370
Term of patent 14 years
U.S. Cl. D14—150

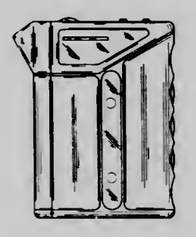


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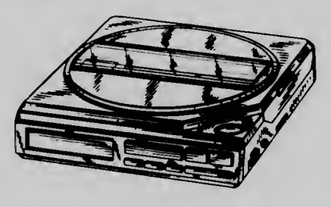
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COMBINED TAPE RECORDER AND RADIO
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
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Claims priority, application Japan, Feb. 17, 1987, 62-5929
Term of patent 14 years
U.S. Cl. D14—163



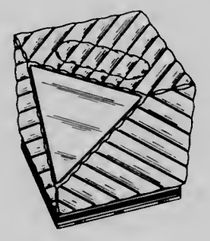
305,657
COMBINED TAPE PLAYER AND RADIO
Hirokazu Shibata, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,725
Claims priority, application Japan, May 22, 1987, 62-20234
Term of patent 14 years
U.S. Cl. D14—163



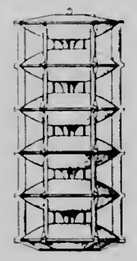
305,658
COMBINED RECORD PLAYER AND RADIO RECEIVER
Norio Hosaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 6, 1986, Ser. No. 893,738
Claims priority, application Japan, Feb. 17, 1986, 61-5229
Term of patent 14 years
U.S. Cl. D14—169



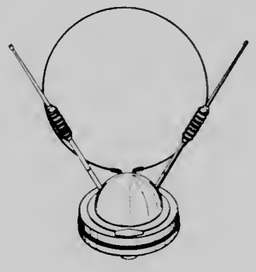
305,659
CLOCK RADIO
Mitsutaka Fuke, and Kazuo Tsujimoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 31, 1987, Ser. No. 81,432
Claims priority, application Japan, Feb. 6, 1987, 62-4518
Term of patent 14 years
U.S. Cl. D14—171



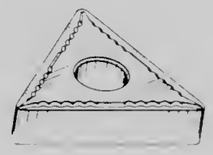
305,660
LOUDSPEAKER
Bruce W. Howze, Springfield, Pa., assignor to Whelen Technologies, Inc., Chester, Conn.
Filed Jul. 1, 1987, Ser. No. 69,032
Term of patent 14 years
U.S. Cl. D14—212



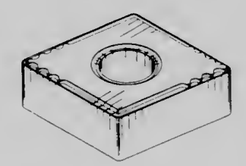
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INDOOR ANTENNA
Guo-Bang Tai, Taipei, Taiwan, assignor to King Feng Co. Ltd., Taipei, Taiwan
Filed Sep. 19, 1986, Ser. No. 909,454
Claims priority, application Taiwan, Aug. 5, 1986, 75304071
Term of patent 14 years
U.S. Cl. D14—235



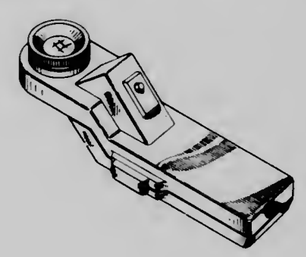
305,662
CUTTING TOOL INSERT
Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jan. 22, 1988, Ser. No. 147,007
Term of patent 14 years
U.S. Cl. D15—139



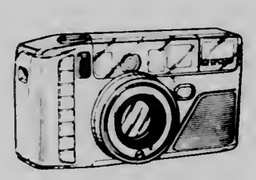
305,663
CUTTING TOOL INSERT
Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jan. 22, 1988, Ser. No. 147,006
Term of patent 14 years
U.S. Cl. D15—139



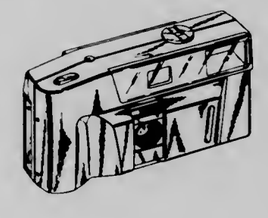
305,664
ILLUMINATED MAGNIFIER
Edwin A. Speaker, Brockport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 6, 1987, Ser. No. 34,185
Term of patent 14 years
U.S. Cl. D16—135



305,665
35 MM CAMERA
Hitoshi Suyama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Jan. 8, 1987, Ser. No. 1,555
Claims priority, application Japan, Jul. 22, 1986, 61-28623
Term of patent 14 years
U.S. Cl. D16—209

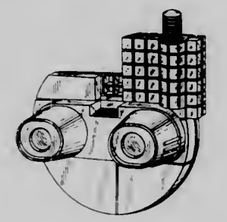


305,666
STILL CAMERA
Bruce A. Leonard, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 12, 1987, Ser. No. 2,461
Term of patent 14 years
U.S. Cl. D16—209



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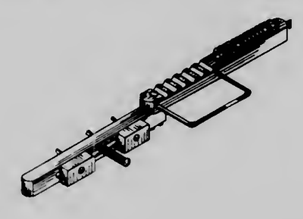
305,667
STEREOSCOPIC VIEWER
Martin Thaler, and David M. Gresham, both of Chicago, Ill., assignors to View-Master Ideal Group, Inc., New York, N.Y.
Filed May 30, 1986, Ser. No. 869,067
Term of patent 14 years
U.S. Cl. D16—222



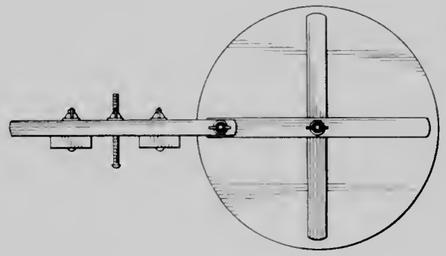
305,668
ELECTRONIC CALCULATOR WITH PRINTER
Hiroshi Sakaguchi, and Masaki Kawamura, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 13, 1987, Ser. No. 85,062
Claims priority, application Japan, Mar. 5, 1987, 62-8435
Term of patent 14 years
U.S. Cl. D18—7



305,669
COMBINED ADJUSTABLE BRUSH HOLDER AND BRACKET FOR ATTACHMENT TO AN EASEL
Frank H. Deusinger, 10 Lemon St. BHR, Okeechobee, Fla. 34974, assignor to Frank H. Deusinger, Okeechobee, Fla.
Filed May 30, 1986, Ser. No. 869,054
Term of patent 14 years
U.S. Cl. D19—35



305,670
COMBINED PALETTE AND BRACKET FOR ATTACHMENT TO AN EASEL
Frank H. Deusinger, 10 Lemon St. BHR, Okeechobee, Fla. 33472, assignor to Frank H. Deusinger, Okeechobee, Fla.
Filed May 30, 1986, Ser. No. 869,064
Term of patent 14 years
U.S. Cl. D19—35



305,671
HOLDER FOR RETAINING SMALL METALLIC OBJECTS MAGNETICALLY
Feather W. King, 165 Reiten Dr., Ashland, Oreg. 97520
Continuation-in-part of Ser. No. 806,546, Nov. 26, 1985. This application Jun. 23, 1986, Ser. No. 877,289
The portion of the term of this patent subsequent to Nov. 16, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75



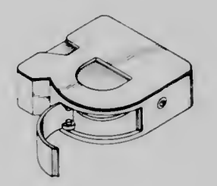
305,672
ADVERTISING DISPLAY UNIT FOR MERCHANDISING COOLER
Paul H. Corden, and Robert A. Johnson, both of Spartanburg, S.C., assignors to Specialty Equipment Company, Inc., Berkeley, Ill.
Filed Nov. 10, 1986, Ser. No. 929,656
Term of patent 14 years
U.S. Cl. D20—19



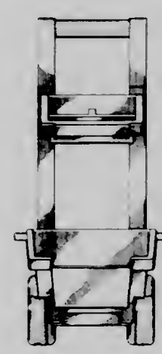
305,673
EMERGENCY VEHICLE WARNING SIGN
Paul J. Davidson, Woodland Hills, and Michael R. Smith, Thousand Oaks, both of Calif., assignors to E-Lite Limited, Woodland Hills, Calif.
Filed Jul. 10, 1987, Ser. No. 73,118
Term of patent 14 years
U.S. Cl. D20—42

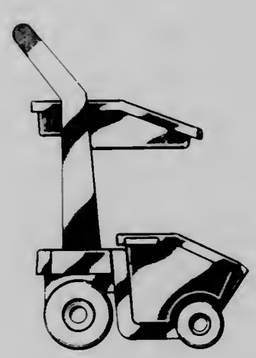


305,674
SIMULATIVE TOY BOX
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 132,055
Term of patent 14 years
U.S. Cl. D21—59



305,675
TOY CART
Miriam Kolker, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Apr. 5, 1988, Ser. No. 177,645
Term of patent 14 years
U.S. Cl. D21—134



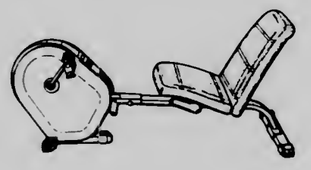


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305,676
JUMP FOR A TOY RACETRACK
Mun H. Ngai, Hong Kong, Hong Kong, assignor to Artin Industrial Co., Ltd., Sanpokong-Kowloon, Hong Kong
Filed Jan. 29, 1987, Ser. No. 8,581
Claims priority, application United Kingdom, Nov. 12, 1986, 1038001
Term of patent 14 years
U.S. Cl. D21—143



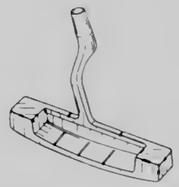
305,677
PEDALLING EXERCISER
Jose L. Beistegui, Vitoria Alava, Spain, assignor to 501 B.H. Holdings, Limited, St. Helier, Channel Islands
Filed Nov. 23, 1987, Ser. No. 123,992
Claims priority, application Spain, May 26, 1987, 113153
Term of patent 14 years
U.S. Cl. 21—194



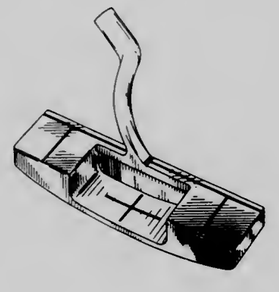
305,678
PHYSICAL EXERCISER
Ando Kunio, Kita 3-Chome, Kunitachi-Shi, Japan
Continuation-in-part of Ser. No. 930,377, Nov. 12, 1986, Pat. No. Des. 300,338. This application Nov. 13, 1987, Ser. No. 120,792
Term of patent 14 years
U.S. Cl. D21—198



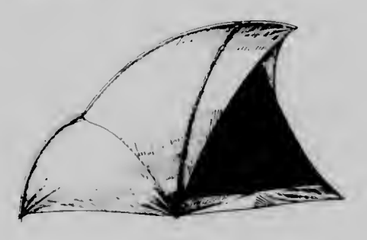
305,679
GOLF PUTTER HEAD
Raymon W. Cook, 13615 Pebble Way, San Antonio, Tex. 78231
Filed Oct. 27, 1986, Ser. No. 923,746
Term of patent 14 years
U.S. Cl. D21—219



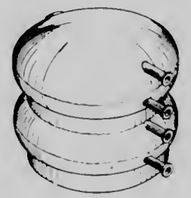
305,680
GOLF PUTTER MALLET-BLADE HEAD
Raymon W. Cook, 13615 Pebble Way, San Antonio, Tex. 78231
Filed Dec. 22, 1986, Ser. No. 945,464
Term of patent 14 years
U.S. Cl. D21—219



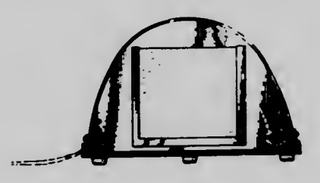
305,681
TENT
C. William Moss, Portland, Me., assignor to Moss, Inc., Camden, Me.
Filed Jul. 23, 1987, Ser. No. 76,922
Term of patent 14 years
U.S. Cl. D21—253

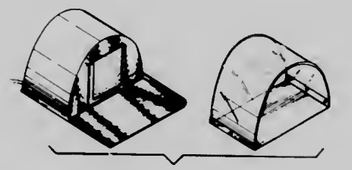


305,682
FILTER TANK FOR SWIMMING POOLS OR THE LIKE
Wallace M. Stromberg, 1913 Ohio, Wichita, Kans. 67214
Filed May 19, 1987, Ser. No. 51,306
Term of patent 14 years
U.S. Cl. D23—209

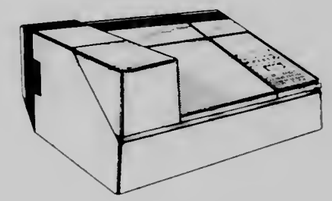


305,683
TABLE TOP AIR FILTER UNIT FOR REMOVING HAZARDOUS FUMES
Max Klein, 64 Euclid Ave., Pittsfield, Mass. 01201
Filed Apr. 23, 1987, Ser. No. 41,750
Term of patent 14 years
U.S. Cl. D23—365

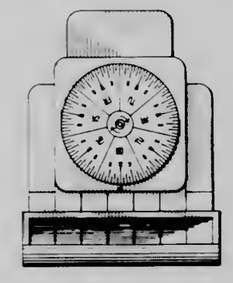


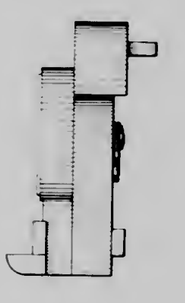


305,684
AUTOMATED DIAGNOSTIC ANALYZER OR THE LIKE
William J. Kanewske, III; Cassandra H. Stern, both of Dallas, and Brian W. Renoe, Collyville, all of Tex., assignors to Abbott Laboratories, North Chicago, Ill.
Filed May 8, 1987, Ser. No. 48,448
Term of patent 14 years
U.S. Cl. D24—1.1



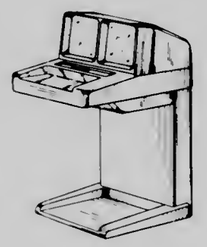
305,685
TIMED MEDICATION DISPENSER
Marian Lohman, A-5101-136th Ave., Hamilton, Mich. 49419
Filed Sep. 14, 1987, Ser. No. 96,327
Term of patent 14 years
U.S. Cl. D24—8



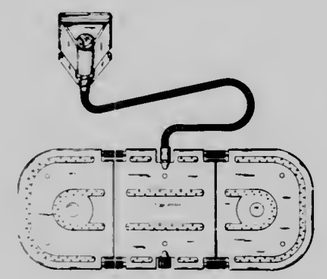


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305,686
EYEWEAR TECHNICIAN'S WORKSTATION
Richard Fischer, Offenbach-Bürgel, Fed. Rep. of Germany, assignor to Eyemetrics-Systems AG, Chur, Switzerland
Filed Nov. 18, 1986, Ser. No. 932,485
Claims priority, application Fed. Rep. of Germany, May 28, 1986, URA717/86
Term of patent 14 years
U.S. Cl. D24—17

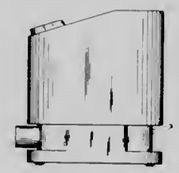


305,687
COMBINED CONTROL UNIT AND AIR BUBBLING BATH MAT
Stanley T. Walczak, Brookfield; Samuel F. Peterson, Chicago; Luc Heiligenstein, Chicago; Francois Geneve, Chicago, and Stephen Melamed, Chicago, all of Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Jun. 26, 1987, Ser. No. 67,141
Term of patent 14 years
U.S. Cl. D24—38

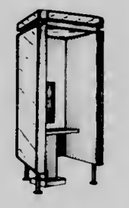


305,688
CONTROL UNIT FOR A BUBBLING BATH DEVICE
Luc Heiligenstein; Francois Geneve, and Stephen Melamed, all of Chicago, Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Jun. 26, 1987, Ser. No. 67,471
Term of patent 14 years
U.S. Cl. D24—38

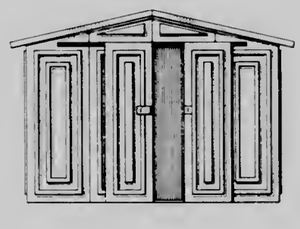




305,689
COMBINED TELEPHONE ENCLOSURE AND ADVERTISING UNIT
James W. Lerch, 1301 Hidden Springs La., Glendora, Calif. 91740
Filed Aug. 12, 1987, Ser. No. 84,110
Term of patent 14 years
U.S. Cl. D25—16



305,690
FIBERGLASS SHED
Jan H. Paul, and William E. Paul, both of P.O. Box 133, Marathon, Fla. 33050
Filed Nov. 30, 1987, Ser. No. 126,671
Term of patent 14 years
U.S. Cl. D25—22



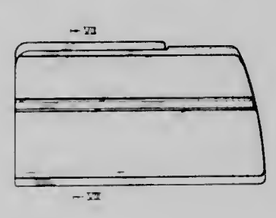
305,691
PASS THROUGH WALL PANEL
James O. Kelley, Spring Lake, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed May 28, 1987, Ser. No. 55,763
Term of patent 14 years
U.S. Cl. D25—152



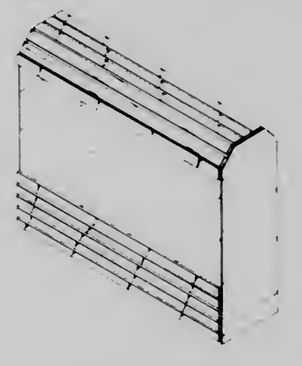
305,692
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Kiyotaka Yoshida, Yokosuka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,323
Term of patent 14 years
U.S. Cl. D26—35



305,693
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Yoshihiro Hamaoaki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,091
Term of patent 14 years
U.S. Cl. D26—35



305,694
LIGHTING FIXTURE
Tobias Brown, Oak Park, Ill., assignor to Alkco Manufacturing Company, Franklin Park, Ill.
Filed Jul. 28, 1986, Ser. No. 890,839
Term of patent 14 years
U.S. Cl. D26—85

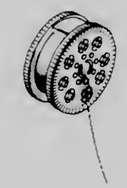


305,695
LIGHTING FIXTURE
William Segill, Newton; Mark E. Segill, Framingham, and Michael Dangelo, Seekonk, all of Mass., assignors to American Lighting Fixture Corp., Taunton, Mass.
Filed May 20, 1988, Ser. No. 196,962
Term of patent 14 years
U.S. Cl. D26—86

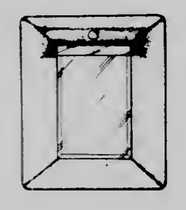


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305,696
DENTAL FLOSS CONTAINER
Kathleen C. Woodman, El Dorado Hills, Calif., assignor to Dentolife, Inc., El Dorado Hills, Calif.
Filed Aug. 17, 1987, Ser. No. 86,035
Term of patent 14 years
U.S. Cl. D28—64



305,697
LIGHTED TRANSPORTABLE COMPACT MIRROR
Kenneth A. Tarlow, Playa del Rey, Calif., and Lurline Moore, 12420 Woodgreen St., Apt. 204, Los Angeles, Calif. 90066, assignors to Lurline Moore, Los Angeles, Calif.
Filed Mar. 27, 1989, Ser. No. 329,067
Term of patent 14 years
U.S. Cl. D28—64.3



305,698
LIPSTICK CASE OR SIMILAR ARTICLE
Fo-Chun Chen, Chang-Hua, Taiwan, assignor to Chuan Hsiang Tang Chemical Co., Ltd., Chang-Hua, Taiwan
Filed Mar. 28, 1988, Ser. No. 174,526
Term of patent 14 years
U.S. Cl. D28—87



305,699
TOTE BOX
Charles R. Hubbard, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 28, 1987, Ser. No. 138,521
Term of patent 14 years
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF JANUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Shanklin, James R., Jr., 4,895,840, Cl. 514-212.000.
A K Stamping Co. Inc.: *See*—
Leonardo, Ignazio E., 4,895,525, Cl. 439-99.000.
A. L. Hansen Manufacturing Company: *See*—
Hansen, Randall C.; and Krahn, Gilbert H., 4,895,332, Cl. 248-251.000.
A. & M. Cousin Etablissements Cousin Freres: *See*—
Pipon, Yves; and Droulon, Georges, 4,895,038, Cl. 74-434.000.
A. O. Smith Corporation: *See*—
Fritz, Peter J., 4,895,551, Cl. 464-180.000.
Schoof, Walter W.; and Wessel, James L., 4,895,350, Cl. 267-52.000.
A. Stucki Company: *See*—
Wiebe, Donald, 4,895,408, Cl. 295-34.000.
A. T. Cross Company: *See*—
Kageyama, Hidehei; and Lozeau, Robert V., 4,895,467, Cl. 401-65.000.
A.W.E. Anti Wear Engineering Srl: *See*—
Corbellini, Glauco, 4,895,623, Cl. 162-203.000.
AB Electronic Components Limited: *See*—
Souter, John W.; and Nottingham, Michael C., 4,895,771, Cl. 428-670.000.
AB Tetra Pak: *See*—
Andersson, Kjell, 4,895,382, Cl. 280-33.991.
ABB Atom AB: *See*—
Andersson, Patrik; and Wallander, Anders, 4,895,697, Cl. 376-434.000.
Abbey, Harold G. Fluid servo system for fuel injection and other applications. 4,895,184, Cl. 137-625.290.
Abbott Laboratories: *See*—
Larkin, Mark E., 4,895,570, Cl. 604-411.000.
Abe, Katsuhiro; Yano, Kazunori; Matsui, Ryuhei; Kiriyama, Shigeki; Tatsukami, Yoshiharu; and Nagaoka, Kenji, to Mitsubishi Petrochemical Co., Ltd.; and Sumitomo Chemical Company, Ltd. Process for producing polyphenylene ether, dispersing polyether in aqueous medium and heating dispersion. 4,895,929, Cl. 528-487.000.
Abe, Masaru; Kawamoto, Yoshimichi; and Kohata, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for controlling camber of rear wheels of four-wheel-steerable vehicle. 4,895,383, Cl. 280-91.000.
Abe, Osami: *See*—
Kanzaki, Shuzo; Tabata, Hideyo; Abe, Osami; Shigetoshi, Ohta; Chitake, Yamagishi; and Senshu, Mitachi, 4,895,814, Cl. 301-128.000.
Abe, Yoshiaki; Tsushima, Rikio; and Watanabe, Hiroshi, to Kao Soap Co., Ltd. Hair treatments. 4,895,722, Cl. 424-71.000.
Abert Spa Dei Fratelli Bertoli fu Antonio: *See*—
Bertoli, Luigi, 4,895,258, Cl. 206-541.000.
Abo, Keiju; and Oshidari, Toshikazu, to Nissan Motor Co., Ltd. Control system for transmission. 4,895,552, Cl. 474-28.000.
Abra, Robert M.: *See*—
Radhakrishnan, Ramachandran; Mihalko, Paul J.; and Abra, Robert M., 4,895,719, Cl. 424-45.000.
Abraham, Jean-Luc; Chavand, Jean-Luc; and Jeziorowski, Frederic, to Leybold Aktiengesellschaft. Method for monitoring oil flow in an oil-lubricated vacuum pump. 4,895,220, Cl. 184-6.400.
Abruzzo, Vincent: *See*—
Wollan, John J.; Jayakumar, Raghavan; Abruzzo, Vincent; and Lee, James, Jr., 4,896,128, Cl. 335-299.000.
Ackert, Robert J.; and Nott, Murray A., to Algoma Steel Corporation. Method for the manufacture of hardened railroad rails. 4,895,605, Cl. 148-12.100.
Acushnet Company: *See*—
Brown, Robert A., 4,895,293, Cl. 228-182.000.
Adachi, Michiaki: *See*—
Okazaki, Hajime; Adachi, Michiaki; and Ushio, Masaru, 4,895,822, Cl. 502-206.000.
Adams, Charles S.: *See*—
Fielding, Douglas; and Adams, Charles S., 4,895,134, Cl. 126-243.000.
Adams, Kenneth D., to SSMC Inc. Stepper driven work feed patterning for sewing machines. 4,895,089, Cl. 112-316.000.
Adams, Kenneth D.; and Blackwood, John, to SSMC Inc. Lost motion compensation for sewing machine needle vibrating gate. 4,895,090, Cl. 112-443.000.
Adams, William C., Jr.; Patisaul, Charles R.; and Duggan, Gerald S., to Harris Corporation. Optimal satellite TWT power allocation process for achieving requested availability and maintaining stability in ALPC-type networks. 4,896,369, Cl. 455-12.000.
Adshead, Alan: *See*—
Doyle, James; Hopwood, Anthony I.; and Adshead, Alan, 4,895,419, Cl. 350-3.690.
Advance Designs and Concepts: *See*—
LoCascio, Thomas, 4,895,110, Cl. 119-106.000.
Advanced Power Technology, Inc.: *See*—
Meyer, Theodore O.; Mosier, John W., II; Pike, Douglas A., Jr.; and Hollinger, Theodore G., 4,895,810, Cl. 431-41.000.
Aereon Corporation: *See*—
Miller, William M., Jr., 4,896,160, Cl. 342-368.000.
Aero Toys, Incorporated: *See*—
Ekins, David L., 4,895,044, Cl. 74-551.900.
Afora OY: *See*—
Tikka, Panu; and Virkola, Nils-Erik, 4,895,618, Cl. 162-49.000.
Aframian, Mousa, to White Consolidated Industries, Inc. Low-profile range control switch. 4,896,004, Cl. 200-6.00B.
AG-Tech Packaging, Inc.: *See*—
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Agency of Industrial Science and Technology: *See*—
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Bajek, Thomas R.; and Chap, John P., to Selfix, Inc. Wall-mountable caddy. 4,895,334, Cl. 248-302.000.

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Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, to Sumitomo Chemical Company, Limited. Light-polarizing film. 4,895,677, Cl. 252-585.000.

Okunami, Hideo. Mail box with signalling device. 4,895,299, Cl. 232-35.000.

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Olds, Rockne M.: *See—*
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Onaga, Eimei M.; Casler, Richard J., Jr.; Hart, James A.; Trinh, Kim N.; and Daggett, Kenneth E., to Staubli International AG. Robotic workcell control system having improved input/output interfacing for better workcell operation. 4,896,087, Cl. 318-568.200.

O'Neill, Brian T.; and Phillips, Douglas, to Pfizer Inc. Process for the preparation of penems. 4,895,940, Cl. 540-310.000.

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Sugimoto, Hachiro; Tsuchiya, Yutaka; Higurashi, Kunizou; Karibe, Norio; Iimura, Youichi; Sasaki, Atsushi; Yamanishi, Yoshiharu; Ogura, Hiroo; Araki, Shin; Kosasa, Takashi; Kubota, Atsuhiko; Kosasa, Michiko; and Yamatsu, Kiyomi, to Eisai Co., Ltd. Cyclic amine compounds with activity against acetylcholinesterase. 4,895,841, Cl. 514-212.000.

Sugita, Etsuji: *See*—
Iwano, Shinichi; Sugita, Etsuji; Nagase, Ryo; Kanayama, Kazunori; Nakano, Kenichi; and Ando, Yasuhiro, 4,895,425, Cl. 350-96.200.

Sugiura, Toshio; Nagata, Osamu; Yamada, Makoto; and Suzuki, Tsuyoshi, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus having window for maintenance purpose. 4,896,198, Cl. 355-27.000.

Sugiyama, Takekatsu: *See*—
Watanabe, Katsuhiko; Hayashi, Takayuki; Kamikawa, Hiroshi; Satomura, Masato; and Sugiyama, Takekatsu, 4,895,826, Cl. 503-202.000.

Suhr, Robert N. Dipstick guide. 4,894,926, Cl. 33-726.000.

Sukejima, Hajime; Iwai, Hiroshi; and Matsumoto, Kozi, to Kansai Paint Company, Limited. Coating composition. 4,895,900, Cl. 525-108.000.

Sullivan, Inc.: *See*—
Sullivan, Marian D.; and Tschetter, Elaine A., 4,895,512, Cl. 431-295.000.

Sullivan, James P.: *See*—
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Sullivan, Marian D.; and Tschetter, Elaine A., to Sullivan, Inc. Taper candle/chimney glass bar. 4,895,512, Cl. 431-295.000.

Sullivan, Mary, to Emerson & Cuming, Inc. Solvent-processible electrically conductive coatings. 4,896,250, Cl. 361-523.000.

Sullivan, Timothy M.: *See*—
Holland, Andrew M.; Young, Dan B.; Wright, James J.; Sullivan, Timothy M.; Woodhouse, Hampton; Mayer, John F.; and Katauskas, Michael A., 4,895,548, Cl. 446-476.000.

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Sulzbacher, Horst; and Hubig, Markus, to Korf Engineering GmbH. Process of recovering molten pig iron or steel pre-products from lumpy iron-oxide and scrap using a fluidized bed. 4,895,593, Cl. 75-26.000.

Sumi, Koji: *See*—
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Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, 4,895,677, Cl. 252-585.000.
Saito, Teruo; Asai, Kuniaki; and Suzuki, Yasurou, 4,895,913, Cl. 525-471.000.

Sumitomo Electric Industries, Ltd.: *See*—
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Hiromori, Masahiro; and Nakahara, Toshimi, 4,895,740, Cl. 427-358.000.
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Sumitomo Heavy Industries, Ltd.: *See*—
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Sumitomo Metal Industries, Ltd.: *See*—
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Sumitomo Rubber Industries, Ltd.: *See*—
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Sumiya, Kenji: *See*—
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Duggan, D. Michael; Lyons, James E.; Myers, Harry K.; and Ledley, Robert E., 4,895,818, Cl. 502-161.000.
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Svinicki, John M.; and Phillips, Steven, to Xitron, Inc. Expansion interface board system for connecting several personal computers to an electronic typesetter connected to a host personal computer. 4,896,289, Cl. 364-900.000.

Swanson, Gary J.; and Veldkamp, Wilfrid B., to Massachusetts Institute of Technology. High-efficiency, multilevel, diffractive optical elements. 4,895,790, Cl. 430-321.000.

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Talebian, Abdolhossen; Green, Dianna C.; and Schein, Philip S., to Georgetown University. Platinum pharmaceuticals. 4,895,936, Cl. 536-17.100.

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Tanaka, Toshinori; and Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Method of forming armature core of electric rotating machine. 4,894,905, Cl. 29-598.000.

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Zimmerman, Patrick G.; Johnson, Gordon G.; Korpela, Susan L.; and Vernon, Caroline L., to Minnesota Mining and Manufacturing Company. Method of making a unified pressure-sensitive adhesive tape. 4,895,738, Cl. 427-208.800.
Zorich, Nicholas F., Jr. Anaerobic/aerobic filter plant. 4,895,645, Cl. 210-98.000.
Zupanovich, John D.; Neil, Lois J.; and Sepelak, Dennis J., to Calgon Corporation. Trihydroxybenzene boiler corrosion inhibitor compositions and method. 4,895,703, Cl. 422-14.000.
Zurenko, Gary E.; Vavra, James J.; White, David R.; and Thomas, Richard C., to Upjohn Company, The. Treating chlamydia infections using spectinomycin analogs. 4,895,870, Cl. 514-452.000.

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PATENTS WERE ISSUED ON THE 23RD DAY OF JANUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adler, Robert, to Zenith Electronics Corporation. Touch control system for controllable apparatus. Re. 33,151, Cl. 340-712.000.

Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger W.; Hollyday, Robert D.; and Kling, John P., to AMP Incorporated. Solderless mounted filtered connector. Re. 33,153, Cl. 439-608.000.

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Atlas, David. Radar detection of hazardous small scale weather disturbances. Re. 33,152, Cl. 342-26.000.

Beamenderfer, Robert E.: *See—*
Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger W.; Hollyday, Robert D.; and Kling, John P., Re. 33,153, Cl. 439-608.000.

Boyd, Harper, to Boyd's Bit Service Inc. Borehole drill pipe continuous side entry or exit apparatus and method. Re. 33,150, Cl. 166-242.000.

Boyd's Bit Service Inc.: *See—*
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Hollyday, Robert D.: *See—*
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Kling, John P.: *See—*
Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger W.; Hollyday, Robert D.; and Kling, John P., Re. 33,153, Cl. 439-608.000.

Zenith Electronics Corporation: *See—*
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Aubard, Gilbert G.: *See—*
Torossian, Dieran R.; Roux, Claude P.; and Aubard, Gilbert G., B1 4,301,163, Cl. 514-357.000.

Dotolo, Vincent. Pesticides containing D-limonene. B1 4,379,168, 1-23-90, Cl. 514-763.000.

Giglia, Robert D., to American Cyanamid Company. Filter paper. B1 4,495,030, 1-23-90, Cl. 162-145.000.

Hatch, Bruce O.; and Spaulding, Richard A., to Thermal Dynamics Corporation. Plasma torch with common gas source for the plasma and for the secondary gas flows. B1 4,581,516, 1-23-90, Cl. 219-121.480.

Nosker, Richard W., to RCA Corporation. Arrangement to minimize reflected ambient light in a display. B1 4,660,936, 1-23-90, Cl. 350-339.00D.

RCA Corporation: *See—*
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CLASS 29
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33 P 4,894,896
149.5 NM 4,894,897
155 R 4,894,898
252 4,894,899
256 4,894,900
428 4,894,901
437 4,894,902
448 4,894,903
598 4,894,904
4,894,905
599 4,894,906
602.1 4,894,907
623.5 4,895,576
711 4,894,908
719 4,894,909
764 4,894,910
842 4,894,911

CLASS 30
43.6 4,894,912
134 4,894,913
276 4,894,914
4,894,915
296 A 4,894,916
346 4,894,917

CLASS 33
17 R 4,894,918
4,894,919
203.11 4,894,920
265 4,894,921
272 4,894,922
304 4,894,923
367 4,894,924
374 4,894,925
726 4,894,926

CLASS 34
32 4,894,927
60 4,894,928
117 4,894,929
136 4,894,930

CLASS 36
2 6 4,894,931
3 R 4,894,932
28 4,894,933
037 4,894,934

CLASS 38
137 4,894,935

CLASS 40
414 4,894,936
606 4,894,937

CLASS 42
1.01 4,894,938
66 4,894,939
103 4,894,940
4,894,941

CLASS 43
4 4,894,942
6.5 4,894,943
7 4,894,944
42.5 4,894,945
43 13 4,894,946
131 4,894,947

CLASS 44
33 4,895,577
63 4,895,578
75 4,895,579

CLASS 47
1.5 4,894,948
40.5 4,894,949
42 4,894,950
45 4,894,951

CLASS 49
25 4,894,952
440 4,894,953
479 4,894,954
504 4,894,955

CLASS 51
5 B 4,894,956
131 1 4,894,957
289 R 4,894,958
429 4,894,959

CLASS 52
28 4,894,960
69 4,894,961
86 4,894,962
90 4,894,963
4,894,964
167 DF 4,894,965
309 12 4,894,969
317 4,894,966
334 4,894,967
400 4,894,968
410 4,894,970
514 4,894,971
716 4,894,972
732 4,894,973
785 4,894,974

CLASS 53
412 4,894,975
435 4,894,976
453 4,894,977
560 4,894,978

CLASS 55
160 4,895,580
283 4,895,581
337 4,895,582

CLASS 56
305 4,894,979
320.1 4,894,980

CLASS 57
10 4,894,981
58 36 4,894,982
408 4,894,983

CLASS 60
39 17 4,894,984
226.2 4,894,985
258 4,894,986
299 4,894,987
418 4,894,988
517 4,894,989
602 4,894,990
608 4,894,991
624 4,894,992
641 8 4,894,993
671 4,894,994
712 4,894,995

CLASS 61
103 4,896,245

CLASS 62
6 4,894,996
24 4,895,583
29 4,895,584
78 4,894,997
148 4,894,998
158 4,894,999
176 3 4,895,000
326 4,895,001
408 4,895,002
476 4,895,003
506 4,895,004
4,895,005

CLASS 65
39 4,895,585

CLASS 66
203 4,895,006

CLASS 70
54 4,895,007
86 4,895,008
264 4,895,009
284 4,895,036
314 4,895,010

CLASS 71
76 4,895,586
90 4,895,587
92 4,895,588
4,895,589
93 4,895,590
4,895,591

CLASS 72
49 4,895,011
361 4,895,012
405 4,895,013
481 4,895,014

CLASS 73
9 4,895,015
23 4,895,017
40.5 R 4,895,018
63 4,895,019
116 4,895,016
118 1 4,895,021
118.2 4,895,020
171 4,895,022
188 4,895,023
517 R 4,895,024
587 4,895,025
721 4,895,026
799 4,895,027
827 4,895,028
4,895,029
861 38 4,895,030
4,895,031
864 86 4,895,032
864 91 4,895,033
865.5 4,895,034

CLASS 74
7 A 4,895,035
422 4,895,037
434 4,895,038
471 XY 4,895,039
491 4,895,040
502 4 4,895,041
519 4,895,042
527 4,895,043
551.9 4,895,044
568 R 4,895,045
569 4,895,046
574 4,895,047
625 4,895,048
687 4,895,049
4,895,050
711 4,895,051
720.5 4,895,052
850 4,895,053
877 4,895,054

CLASS 75
10 14 4,895,592
26 4,895,593
43 4,895,594
62 4,895,595
108 4,895,596
118 R 4,895,597

CLASS 81
53 2 4,895,055
57.17 4,895,056

CLASS 82
165 4,895,058

CLASS 83
106 4,895,057
468 7 4,895,059

CLASS 84
616 4,895,060

CLASS 89
1.818 4,895,061
7 4,895,062
36 02 4,895,063
196 4,895,064

CLASS 98
2.14 4,895,065
42 22 4,895,066

CLASS 99
325 4,895,067
357 4,895,068
574 4,895,069

CLASS 101
148 4,895,070
169 4,895,071
376 4,895,072
409 4,895,073

CLASS 102
206 4,895,074
214 4,895,075
439 4,895,076
517 4,895,077

CLASS 104
8 4,895,078
174 4,895,079

CLASS 106
86 4,895,598
189 4,895,599
284 1 4,895,600

CLASS 108
56.1 4,895,080

CLASS 110
101 CC 4,895,081
186 4,895,082
235 4,895,083
255 4,895,084
346 4,895,085

CLASS 111
134 4,895,086

CLASS 112
80 18 4,895,087
130 4,895,088
316 4,895,089
443 4,895,090

CLASS 114
103 4,895,091
104 4,895,092
163 4,895,093
218 4,895,094
343 4,895,095
381 4,895,096

CLASS 116
34 R 4,895,097

CLASS 118
56 4,895,098
58 4,895,099
326 4,895,100
425 4,895,101
620 4,895,102
652 4,895,103
653 4,895,104
658 4,895,105
684 4,895,106
722 4,895,107
728 4,895,108

CLASS 119
51.5 4,895,109
106 4,895,110

CLASS 123
41 35 4,895,111
52 MV 4,895,112
90 17 4,895,113
179 G 4,895,114
195 A 4,895,115
198 D 4,895,116
222 4,895,117
339 4,895,118
376 4,895,119
417 4,895,120
425 4,895,121
489 4,895,122
4,895,123
510 4,895,124
568 4,895,125
585 4,895,126
643 4,895,127

CLASS 124
22 4,895,128
87 4,895,129

CLASS 126
25 R 4,895,130
41 R 4,895,131
48 4,895,132
204 4,895,133
243 4,895,134
263 4,895,135
355 4,895,136
391 4,895,137

CLASS 127
58 4,895,601

CLASS 128
6 4,895,138
79 4,895,139
4,895,140
94 4,895,142
206 29 4,895,143
419 PG 4,895,151
4,895,152
419 R 4,895,149
4,895,150
421 4,895,153
4,895,154
633 4,895,155
634 4,895,156
653 A 4,895,157
662.06 4,895,158
665 4,895,159
671 4,895,160
710 4,895,161
721 4,895,162
734 4,895,163
736 4,895,164
738 4,895,165
751 4,895,166
760 4,895,167
772 4,895,168
798 4,895,169
832 4,895,170
846 4,895,171
863 4,895,172
870 4,895,173

CLASS 131
110 4,895,174
297 4,895,175

CLASS 134
6 4,895,602
21 4,895,603
31 4,895,604
107 4,895,176
140 4,895,177
167 C 4,895,178
172 4,895,179

CLASS 137
117 4,895,180
375 4,895,181
596.12 4,895,182
614.21 4,895,183
625.29 4,895,184

CLASS 138
109 4,895,185

CLASS 139
1 C 4,895,186
145 4,895,187
439 4,895,188

CLASS 140
147 4,895,189

CLASS 141
1 4,895,190
4,895,191
5 4,895,192
9 4,895,193
198 4,895,194
258 4,895,195

CLASS 144
2 Z 4,895,196
369 4,895,197

CLASS 148
12 1 4,895,605
25 4,895,606
104 4,895,607

CLASS 149
5 4,895,609

CLASS 150
138 4,895,198

CLASS 152
415 4,895,199
451 4,895,200

CLASS 156
115 4,895,610
252 4,895,611
326 4,895,612
344 4,895,613
542 4,895,614
643 4,895,615
647 4,895,616
665 4,895,617

CLASS 162
49 4,895,618
55 4,895,619
138 4,895,620
145 B1 4,495,030
164.3 4,895,621
199 4,895,622
203 4,895,623
343 4,895,624

CLASS 164
56.1 4,895,201
430 4,895,202

CLASS 165
41 4,895,203
162 4,895,204

CLASS 166
90 4,895,205
242 Re.33,150
260 4,895,206
276 4,895,207

CLASS 169
54 4,895,208

CLASS 171
18 4,895,209

CLASS 172
256 4,895,210
271 4,895,211

CLASS 173
48 4,895,212
119 4,895,213

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CLASS 174

35 MS 4,896,001
52.2 4,895,998
67 4,895,999
74 R 4,896,000

CLASS 175

38 4,895,214
371 4,895,215

CLASS 178

18 4,896,002

CLASS 180

79.1 4,895,216
233 4,895,217

CLASS 181

116 4,895,218

CLASS 184

6.4 4,895,219
4,895,220
15.1 4,895,221
103.1 4,895,222

CLASS 187

125 4,895,223

CLASS 188

24.14 4,895,224
32 4,895,225
79.55 4,895,226
173 4,895,227
202 4,895,228
282 4,895,229

CLASS 190

107 4,895,230
115 4,895,231

CLASS 192

3.3 4,895,232
21.5 4,895,233
42 4,895,234
70.3 4,895,235
84 R 4,895,236
106.2 4,895,237

CLASS 194

319 4,895,238

CLASS 198

328 4,895,239
331 4,895,240
358 4,895,241
365 4,895,242
392 4,895,243
394 4,895,244
458 4,895,245
463.4 4,895,246
790 4,895,247
852 4,895,248

CLASS 200

6 A 4,896,003
6 B 4,896,004
17 R 4,896,006
61.87 4,896,007
144 B 4,896,008

CLASS 204

16 4,895,625
111 4,895,626
129.75 4,895,627
157.41 4,895,628
180.9 4,895,629
192.11 4,895,630
192.13 4,895,631
206 4,895,632
207 4,895,633
296 4,895,634
435 4,895,635

CLASS 206

3 4,895,249
223 4,895,250
273 4,895,251
310 4,895,252
387 4,895,253
423 4,895,254
497 4,895,255
501 4,895,256
534 4,895,257
541 4,895,258
565 4,895,259

CLASS 208

113 4,895,636
4,895,637
118 4,895,638
149 4,895,639
188 4,895,640
286 4,895,641

CLASS 209

127.3 4,895,642
552 4,895,643

CLASS 210

97 4,895,644
98 4,895,645
110 4,895,654
169 4,895,646
171 4,895,647
188 4,895,648
4,895,649
222 4,895,650
266 4,895,651
320 4,895,652
400 4,895,653
411 4,895,655
481 4,895,656
636 4,895,658
638 4,895,659
640 4,895,660
647 4,895,657
651 4,895,661
692 4,895,662
701 4,895,663
4,895,664
710 4,895,665
741 4,895,666

CLASS 211

77 4,895,260
196 4,895,261

CLASS 212

154 4,895,262
185 4,895,263

CLASS 215

11.1 4,895,264
31 4,895,265
230 4,895,266

CLASS 219

10.55 A 4,896,005
10.55 E 4,896,009
4,896,011
10.55 M 4,896,010
69.12 4,896,012
4,896,013
91.2 4,896,014
121.48 B1 4,581,516
121.5 4,896,016
121.52 4,896,017
121.78 4,896,015
137 PS 4,896,018
228 4,896,019
370 4,896,020
4,896,021
433 4,896,022
521 4,896,023

CLASS 220

4 F 4,895,267
85 R 4,895,268
85 S 4,895,272
90 4,895,269
257 4,895,270
335 4,895,271

CLASS 223

3 4,895,273
63 4,895,274
81 4,895,275
144.5 4,895,276
166 4,895,277
288 4,895,278
321 4,895,279
402.13 4,895,280
465.1 4,895,281
482 4,895,282

CLASS 223

94 4,895,283

CLASS 224

32 R 4,895,284
149 4,895,285
265 4,895,286

CLASS 226

76 4,895,287
109 4,895,288

CLASS 227

19 4,895,289

CLASS 228

116 4,895,290
121 4,895,291
122 4,895,292
182 4,895,293
222 4,895,294

CLASS 229

9 4,895,295
40 4,895,296
69 4,895,297
125.01 4,895,298

CLASS 232

35 4,895,299
45 4,895,300

CLASS 235

381 4,896,024
437 4,896,025
472 4,896,026
488 4,896,027
492 4,896,028
494 4,896,029

CLASS 236

34.5 4,895,301

CLASS 238

298 4,895,302

CLASS 239

61 4,895,303
150 4,895,304
239 4,895,305
263 4,895,307
288 4,895,306

CLASS 241

65 4,895,308
186 R 4,895,309
200 4,895,310
207 4,895,311

CLASS 242

35.5 A 4,895,313
35.5 R 4,895,312
58.6 4,895,314
66 4,895,315
71.8 4,895,316
107.4 R 4,895,317
195 4,895,318

CLASS 244

115 4,895,319
118.2 4,895,321
118.5 4,895,320
134 R 4,895,322
214 4,895,323

CLASS 246

170 4,895,324
473.1 4,895,325

CLASS 248

27.1 4,895,326
102 4,895,327
124 4,895,328
229 4,895,329
4,895,330
245 4,895,331
251 4,895,332
289.1 4,895,333
302 4,895,334
354.3 4,895,335
487 4,895,337
503.1 4,895,338
522 4,895,339
690 4,895,336

CLASS 250

201 4,896,030
203 R 4,896,031
215 4,896,033
251 4,896,032
271 4,896,034
309 4,896,035
310 4,896,036
327.2 4,896,037
4,896,038
342 4,896,039
372 4,896,040
385.1 4,896,041
435 4,896,042
484.1 4,896,043
492.2 4,896,045
492.3 4,896,044
507.1 4,896,046
573 4,896,047
574 4,896,048
578 4,896,049

CLASS 251

6 4,895,340
8 4,895,341
120 4,895,342
129.03 4,895,343
129.11 4,895,344
144 4,895,345
149.1 4,895,346

CLASS 252

8.8 4,895,667
34 4,895,668
95 4,895,669
189 4,895,670
299.61 4,895,671
299.63 4,895,672
308 4,895,673
389.52 4,895,674
539 4,895,675
542 4,895,676
585 4,895,677
632 4,895,678

CLASS 254

88 4,895,347
391 4,895,348

CLASS 260

397.1 4,895,679
410.6 4,895,681
410.9 R 4,895,680
4,895,682

CLASS 261

104 4,895,683

CLASS 264

40.6 4,895,684
45.5 4,895,685
46.6 4,895,686
118 4,895,687
171 4,895,688
216 4,895,689
245 4,895,690
288.4 4,895,691
326 4,895,692

CLASS 266

45 4,895,349

CLASS 267

52 4,895,350
69 4,895,351
80 4,895,352
140.1 4,895,353
141.1 4,895,354
257 4,895,355

CLASS 270

49 4,895,356

CLASS 271

8.1 4,895,357
121 4,895,358
125 4,895,359
202 4,895,360
253 4,895,361

CLASS 272

73 4,895,362
93 4,895,363

CLASS 273

1 GE 4,895,364
1.5 R 4,895,365
29 B 4,895,366
77 A 4,895,367
80.1 4,895,368
129 V 4,895,369
144 B 4,895,370
164 4,895,371
183 B 4,895,372
4,895,373
249 4,895,374
258 4,895,375
313 4,895,376
327 4,895,377

CLASS 277

12 4,895,378

CLASS 280

7.1 4,895,379
32.6 4,895,380
33.991 4,895,382
33.997 4,895,381
91 4,895,383
206 4,895,384
259 4,895,385
287 4,895,386
414.1 4,895,387
609 4,895,388
732 4,895,389
777 4,895,390
779 4,895,391
808 4,895,392

CLASS 281

15.1 4,895,393

CLASS 285

18 4,895,394
39 4,895,395
93 4,895,396
419 4,895,397

CLASS 292

83 4,895,398
92 4,895,399
145 4,895,400
254 4,895,401
307 R 4,895,402
336.3 4,895,403
337 4,895,404

CLASS 293

102 4,895,405
4,895,406

CLASS 294

19.1 4,895,407

CLASS 295

34 4,895,408

CLASS 296

107 4,895,409
214 4,895,410

CLASS 297

88 4,895,411
284 4,895,412

CLASS 299

81 4,895,413

CLASS 301

37 PB 4,895,414
37 S 4,895,415

CLASS 303

92 4,895,416

CLASS 307

10.2 4,896,050
117 4,896,051
118 4,896,052
201 4,896,053
272.1 4,896,054
442 4,896,055
443 4,896,056
448 4,896,057
456 4,896,058
464 4,896,059
482.1 4,896,060
575 4,896,061

CLASS 310

68 D 4,896,062
68 R 4,896,063
104 4,896,064
154 4,896,065
214 4,896,066
239 4,896,067
329 4,896,068
339 4,896,069

CLASS 312

234.5 4,895,417
252 4,895,418
290 4,896,070

CLASS 313

428 4,896,071
610 4,896,072
634 4,896,073
635 4,896,074

CLASS 315

82 4,896,075
150 4,896,076
289 4,896,077
312 4,896,078
313 4,896,079
366 4,896,080
368 4,896,081
4,896,082

CLASS 318

52 4,896,090
268 4,896,083
280 4,896,084
560 4,896,085
568.1 4,896,086
568.2 4,896,087
696 4,896,088
701 4,896,089

CLASS 323

253 4,896,091
258 4,896,092
259 4,896,093
314 4,896,094

CLASS 324

73.1 4,896,101
77 B 4,896,102
96 4,896,103
103 P 4,896,104
142 4,896,105
4,896,106
158 P 4,896,107
158 R 4,896,109
158 T 4,896,108
208 4,896,110
309 4,896,111
4,896,112
4,896,113
329 4,896,116
520 4,896,117
522 4,896,114
551 4,896,115
617 4,896,095
639 4,896,097
642 4,896,096
663 4,896,098
667 4,896,099
678 4,896,100

CLASS 330

2 4,896,118
4.3 4,896,119
59 4,896,120
288 4,896,121

CLASS 331

158 4,896,122

CLASS 332

103 4,896,123

CLASS 333

206 4,896,124
219.1 4,896,125

CLASS 335

239 4,896,127
244 4,896,126
299 4,896,128
4,896,129
300 4,896,130
302 4,896,131

CLASS 340

146.2 4,896,133
384 E 4,896,134
456 4,896,135
468 4,896,136
479 4,896,137
4,896,138
546 4,896,139
568 4,896,140
590 4,896,141
604 4,896,142
634 4,896,143
691 4,896,144
693 4,896,145
701 4,896,146
712 Re.33,151
731 4,896,147
4,896,148
794 4,896,149
795 4,896,150
825.520 4,896,151
853 4,896,152
906 4,896,153
995 4,896,154

CLASS 341

120 4,896,155
143 4,896,156
144 4,896,157

CLASS 342

26 Re.33,152
40 4,896,158
131 4,896,159
368 4,896,160
457 4,896,161

CLASS 343

749 4,896,162
786 4,896,163
872 4,896,164
881 4,896,165

CLASS 346

76 PH 4,896,166
4,896,167
107 R 4,896,168
108 4,896,169
139 R 4,896,170
140 R 4,896,171
4,896,172
154 4,896,173
459 4,896,174

CLASS 350

3.69 4,895,419
96.10 4,895,420
96.15 4,895,421
4,895,422
4,895,423
96.20 4,895,424
4,895,425
96.23 4,895,426
4,895,427
103 4,895,428
124 4,895,429
287 4,895,430
320 4,895,431
339 D B1 4,660,936
339 R 4,895,432
413 4,895,433
484 4,895,434
606 4,895,435
610 4,895,436
612 4,895,437

CLASS 351

41 4,895,438
167 4,895,439

CLASS 353

94 4,896,132

CLASS 354

76 4,896,175
122 4,896,176
145.1 4,896,177
4,896,178
195.1 4,896,179
217 4,896,180
286 4,896,181
481 4,896,182

CLASS 355

27 4,896,183
4,896,198
35 4,896,185
40 4,896,186
71 4,896,187
72 4,896,188
75 4,896,189
202 4,896,190
206 4,896,184
309 4,896,191
315 4,896,192
326 4,896,193

CLASS 356

5 4,895,440
4,895,441
28 4,895,442
36 4,895,443
128 4,895,444
328 4,895,445
336 4,895,446
356 4,895,447
376 4,895,448
386 4,895,449

CLASS 357

16 4,896,194
17 4,896,195
23.4 4,896,196
23.6 4,896,197
28 4,896,199
30 4,896,200
4,896,201
4,896,202
34 4,896,203
67 4,896,204
81 4,896,205

CLASS 358

44 4,896,207
78 4,896,208
86 4,896,209
88 4,896,210
101 4,896,206
106 4,896,211
138 4,896,212
147 4,896,213
148 4,896,214
210 4,896,215
213.11 4,896,217
213.29 4,896,216
253 4,896,218
327 4,896,219
328 4,896,220
342 4,896,221
446 4,896,222
468 4,896,223

CLASS 360

19.1 4,896,224
31 4,896,227
35.1 4,896,226
73.06 4,896,225
77.08 4,896,228
77.14 4,896,229
97.02 4,896,230
4,896,231
99.04 4,896,232
104 4,896,233
105 4,896,234
106 4,896,239
113 4,896,235
130.23 4,896,236
132 4,896,237
4,896,238
135 4,896,240

CLASS 361

66 4,896,241
87 4,896,242
98 4,896,244
171 4,896,246
385 4,896,247
415 4,896,248
502 4,896,249
523 4,896,250

CLASS 362

61 4,895,693
80.1 4,896,251
91 4,896,243
98 4,896,252
109 4,896,253

CLASS 363

50 4,896,254
97 4,896,255

CLASS 364

200 4,896,256
4,896,257
4,896,258
4,896,259
4,896,260
4,896,261
4,896,262
4,896,263
4,896,264
4,896,265
4,896,266
426.04 4,896,267
453 4,896,268
468 4,896,269
479 4,896,270
487 4,896,271
491 4,896,272
505 4,896,273
513 4,896,274
519 4,896,275
550 4,896,276
551.01 4,896,277
552 4,896,278
557 4,896,281
559 4,896,279
562 4,896,280
571.05 4,896,282
577 4,896,283
606 4,896,284
724.01 4,896,285
748 4,896,286
754 4,896,287
900 4,896,288
4,896,289
4,896,290
4,896,291

CLASS 365

108 4,896,292
149 4,896,293
4,896,294
185 4,896,295
189.01 4,896,298
4,896,299
189.08 4,896,296
189.11 4,896,297
204 4,896,300
230.03 4,896,301
230.06 4,896,302

CLASS 366

18 4,895,450
150 4,895,451
173 4,895,452
219 4,895,453

CLASS 367

35 4,896,303
103 4,896,304
139 4,896,305

CLASS 368

29 4,896,306
70 4,896,307
75 4,896,308

CLASS 369

44 4,896,309
4,896,310
47 4,896,311
77.2 4,896,312
275 4,896,313
284 4,896,314

CLASS 370

13.1 4,896,317
17 4,896,315
32.1 4,896,318
60 4,896,316
4,896,319
123 4,896,320

CLASS 371

16.1 4,896,321
21.2 4,896,322
61 4,896,323

CLASS 372

18 4,896,324
20 4,896,325
31 4,896,326
32 4,896,327
45 4,896,328
53 4,896,329
65 4,896,330
96 4,896,331
99 4,896,332

CLASS 374

163 4,895,454
208 4,895,455

CLASS 375

7 4,896,333
20 4,896,334
59 4,896,335
80 4,896,336
118 4,896,337
119 4,896,338

CLASS 376

261 4,895,694
4,895,695
305 4,895,696
434 4,895,697
442 4,895,698

CLASS 377

19 4,896,339
60 4,896,340

CLASS 378

34 4,896,341
87 4,896,342
95 4,896,343
99 4,896,344

CLASS 379

67 4,896,345
88 4,896,346
96 4,896,347
107 4,896,349
145 4,896,348
220 4,896,350
399 4,896,351
412 4,896,352

CLASS 380

6 4,896,353
7 4,896,354
54 4,896,355

CLASS 381

29 4,896,356
30 4,896,362
40 4,896,361
43 4,896,357
4,896,358
52 4,896,359
82 4,896,360

CLASS 382

5 4,896,363
22 4,896,364
53 4,896,365

CLASS 383

20 4,895,456
71 4,896,366
94 4,895,457

CLASS 384

16 4,896,367
43 4,895,459
126 4,895,458
132 4,895,460
276 4,896,368
454 4,895,461
493 4,895,462

CLASS 400

124 4,895,463
4,895,464
241.2 4,895,465
613.2 4,895,466

CLASS 401

65 4,895,467
270 4,895,468

CLASS 403

21 4,895,469
25 4,895,470
104 4,895,471
133 4,895,472
191 4,895,473
292 4,895,474
383 4,895,475

CLASS 404

6 4,895,476
119 4,895,477
133 4,895,478

CLASS 405

3 4,895,479
147 4,895,480
224 4,895,481

CLASS 408

225 4,895,482

CLASS 409

132 4,895,483

CLASS 411

85 4,895,484
322 4,895,485

CLASS 414

331 4,895,486
403 4,895,487
749 4,895,488

CLASS 415

218.1 4,895,489

CLASS 416

221 4,895,490
224 4,895,491

CLASS 417

225 4,895,492
238 4,895,493
239 4,895,494
360 4,895,495
372 4,895,496
403 4,895,497
426 4,895,498
506 4,895,499
566 4,895,500

CLASS 418

63 4,895,501

CLASS 419

27 4,895,699

CLASS 420

8 4,895,700
587 4,895,701

CLASS 422

7 4,895,702
14 4,895,703
57 4,895,704
68 4,895,705
102 4,895,706
177 4,895,707

CLASS 423

210 4,895,708
344 4,895,709
351 4,895,710
387 4,895,711
447.4 4,895,712
448 4,895,713

CLASS 424

1.1 4,895,714
10 4,895,715
45 4,895,719
49 4,895,720
53 4,895,721
71 4,895,722
79 4,895,723
85.5 4,895,716
89 4,895,717
4,895,718
418 4,895,724
455 4,895,725
456 4,895,726
642 4,895,727

CLASS 425

29 4,895,502
127 4,895,503
133.1 4,895,504
145 4,895,505
184 4,895,506
192 R 4,895,507
371 4,895,508
383 4,895,509

CLASS 426

2 4,895,728
316 4,895,729
634 4,895,730
641 4,895,731
660 4,895,732

CLASS 427

8 4,895,733
38 4,895,734
43.1 4,895,735
45.1 4,895,736
50 4,895,737
208.8 4,895,738
304 4,895,739
358 4,895,740

CLASS 428

5 4,895,741
35.5 4,895,742
35.7 4,895,743
4,895,744
40 4,895,745
4,895,746
42 4,895,747
88 4,895,748
132 4,895,749
137 4,895,750
245 4,895,751
4,895,752
286 4,895,753
289 4,895,754
290 4,895,755
317.9 4,895,756
323 4,895,757
4,895,758
331 4,895,759
332 4,895,760
336 4,895,761
4,895,762
405 4,895,763
425.9 4,895,764
427.2 4,895,608
447 4,895,766
4,895,767
461 4,895,768
483 4,895,769
552 4,895,770
627 4,895,765
670 4,895,771
691 4,895,772

CLASS 429

7 4,895,773
35 4,895,774
41 4,895,775
102 4,895,776
104 4,895,777
188 4,895,778

CLASS 430

5 4,895,779
4,895,780
58 4,895,781
4,895,782
66 4,895,783
69 4,895,784
137 4,895,785
139 4,895,786
253 4,895,787
278 4,895,788
316 4,895,789
321 4,895,790
523 4,895,791
530 4,895,792
548 4,895,793
567 4,895,794

CLASS 431

1 4,895,510
41 4,895,810
126 4,895,511
295 4,895,512
328 4,895,513
350 4,895,514

CLASS 433

166 4,895,515
201.1 4,895,516
224 4,895,517

CLASS 434

118 4,895,518
185 4,895,519

CLASS 435

6 4,895,795
7 4,895,796
4,895,797
14 4,895,798
18 4,895,799
69.3 4,895,800
101 4,895,801
172.3 4,895,802
240.1 4,895,803
240.27 4,895,804
286 4,895,805
288 4,895,806

CLASS 436

63 4,895,807
178 4,895,808
518 4,895,809

CLASS 437

41 4,895,811
45 4,895,520
180 4,895,812

CLASS 439

63 4,895,521
4,895,522
67 4,895,523
74 4,895,524
99 4,895,525
108 4,895,526
147 4,895,527
191 4,895,528
281 4,895,529
311 4,895,530
398 4,895,531
507 4,895,532
587 4,895,533
599 4,895,534
608 Re.33,153
681 4,895,535
885 4,895,536

CLASS 441

64 4,895,537
69 4,895,538
135 4,895,539

CLASS 445

32 4,895,540

CLASS 446

57 4,895,541
94 4,895,542
105 4,895,543
122 4,895,544
220 4,895,545
221 4,895,546
250 4,895,547
476 4,895,548

CLASS 455

12 4,896,369
77 4,896,370
105 4,896,371
108 4,896,372
326 4,896,374
344 4,896,373

CLASS 464

136 4,895,549
175 4,895,550
180 4,895,551

CLASS 474

28 4,895,552
80 4,895,553
141 4,895,554
260 4,895,555

CLASS 493

209 4,895,556

CLASS 501

37 4,895,813
128 4,895,814
134 4,895,815

CLASS 502

10 4,895,816
158 4,895,817
161 4,895,818
174 4,895,819
200 4,895,820
204 4,895,821
206 4,895,822
226 4,895,823
300 4,895,824
407 4,895,825

CLASS 503

202 4,895,826
210 4,895,827
226 4,895,828
227 4,895,829
4,895,830

CLASS 505

1 4,895,831
4,895,832

CLASS 514

2 4,895,833
8 4,895,835
18 4,895,834
26 4,895,836
30 4,895,837
54 4,895,838
78 4,895,839
212 4,895,840
4,895,841
227.5 4,895,842
241 4,895,849
248 4,895,843
252 4,895,845
4,895,846
254 4,895,844
255 4,895,847
4,895,848
258 4,895,850
267 4,895,851
281 4,895,852
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302 4,895,855
311 4,895,856
352 4,895,857
4,895,858
4,895,859
357 B1 4,301,163
360 4,895,860
4,895,861
4,895,862
366 4,895,863
380 4,895,864
383 4,895,865
392 4,895,866
397 4,895,867
432 4,895,868
438 4,895,869
452 4,895,870
469 4,895,871

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CLASSIFICATION OF PATENTS

546	4,895,872		CLASS 525	226	4,895,924		CLASS 546	346	4,895,971	310	4,895,995
557	4,895,873				4,895,925	56	4,895,948		CLASS 560	328	4,895,996
558	4,895,874	28	4,895,895	272	4,895,926		4,895,949	060	4,895,973	329	4,895,997
588	4,895,875	54.1	4,895,896	321	4,895,927	309	4,895,950		4,895,974		CLASS 600
747	4,895,876	67	4,895,897	348	4,895,928	336	4,895,951	083	4,895,975	16	4,895,557
763	B1 4,379,168		4,895,898	353	4,895,972	339	4,895,952	211	4,895,976		CLASS 604
970	4,895,877		4,895,899	487	4,895,929		CLASS 548		CLASS 562	4	4,895,558
	CLASS 521	108	4,895,900	499	4,895,930	204	4,895,953	124	4,895,977	15	4,895,559
103	4,895,878	127	4,895,901		CLASS 530	260	4,895,954	416	4,895,978	22	4,895,560
105	4,895,879	128	4,895,902	326	4,895,931	303	4,895,955	567	4,895,979	43	4,895,561
159	4,895,883	133	4,895,903	387	4,895,932	324	4,895,956	584	4,895,980	48	4,895,562
	CLASS 522	154	4,895,905		CLASS 536	362	4,895,957	595	4,895,982	117	4,895,563
31	4,895,880	194	4,895,906	6.4	4,895,933	455	4,895,958		CLASS 566	164	4,895,564
	CLASS 523	257	4,895,907	16.5	4,895,934	555	4,895,959	60	4,895,983	167	4,895,565
122	4,895,881	290	4,895,908	17.1	4,895,935	950	4,895,960		CLASS 568	266	4,895,566
135	4,895,904	309	4,895,909		4,895,936		CLASS 549	319	4,895,984	361	4,895,567
145	4,895,882	326.5	4,895,910	23	4,895,937	227	4,895,961	355	4,895,985	385.2	4,895,568
207	4,895,884	346	4,895,911	128	4,895,938	373	4,895,962	643	4,895,986	386	4,895,569
	CLASS 524	471	4,895,912		CLASS 540	375	4,895,963	648	4,895,987	411	4,895,570
99	4,895,885	478	4,895,913	200	4,895,939		CLASS 556	727	4,895,988		CLASS 606
247	4,895,886		4,895,914	310	4,895,940	425	4,895,964	851	4,895,989	2	4,895,144
265	4,895,887		CLASS 526		4,895,941	439	4,895,965		CLASS 570	11	4,895,145
391	4,895,888	10	4,895,917	489	4,895,942	448	4,895,966	130	4,895,990	54	4,895,141
443	4,895,889	18	4,895,918	556	4,895,943	451	4,895,967	144	4,895,991	79	4,895,146
456	4,895,890	26	4,895,919		CLASS 544	462	4,895,968	203	4,895,992	182	4,895,147
493	4,895,891	45	4,895,921	105	4,895,944	472	4,895,969	236	4,895,993	213	4,895,148
520	4,895,892	76	4,895,920	218	4,895,945		CLASS 558		CLASS 585		CLASS 623
592	4,895,893	179	4,895,922	279	4,895,946	248	4,895,970	270	4,895,994	20	4,895,571
840	4,895,894	196	4,895,923	405	4,895,947					23	4,895,572
											4,895,573
										24	4,895,574

CLASSIFICATION OF DESIGNS

D2—	17	305,575			305,596		377	305,617		307	305,638		171	305,659		253	305,681
	180	305,576			305,597	21—	194	305,677	D13—	8	305,639		212	305,660	D23—	209	305,682
	314	305,577			305,598	D10—	6	305,619		25	305,640		235	305,661		365	305,683
	321	305,578			305,599		15	305,620		30	305,641	D15—	139	305,662	D24—	1.1	305,684
	610	305,579			305,600		94	305,621		37	305,642			305,663		8	305,685
D3—	35	305,580		368	305,601	D11—	5	305,622	D14—	105	305,643	D16—	135	305,664		17	305,686
D6—	332	305,581		374	305,602	D12—	84	305,623		107	305,644		209	305,665		38	305,687
		305,582	D8—	1	305,603		90	305,624		109	305,645			305,666			305,688
	333	305,583		7	305,604		91	305,625		113	305,646		222	305,667	D25—	16	305,689
	344	305,584		50	305,605		96	305,626			305,647	D18—	7	305,668		22	305,690
	426	305,585		61	305,606		98	305,627		114	305,648	D19—	35	305,669		152	305,691
	512	305,586		70	305,607		114	305,628			305,649			305,670	D26—	35	305,692
	513	305,587		72	305,608		133	305,629			305,650		75	305,671			305,693
	517	305,588		99	305,609		140	305,630		118	305,651	D20—	19	305,672		85	305,694
	524	305,589		345	305,610		154	305,631		138	305,652		42	305,673		86	305,695
	534	305,590		395	305,611		155	305,632		142	305,653	D21—	59	305,674	D28—	64	305,696
D7—	1	305,591	D9—	300	305,612		156	305,633		143	305,654		134	305,675		64.3	305,697
	5	305,592		314	305,613		209	305,634		150	305,655		143	305,676		87	305,698
	43	305,593		337	305,614		213	305,635		163	305,656		198	305,678	D34—	40	305,618
		305,594		341	305,615		300	305,636			305,657		219	305,679			305,699
	351	305,595		345	305,616		304	305,637		169	305,658			305,680			

CLASSIFICATION OF PLANTS

P—	1	7,116	34	7,118	51	7,120		7,122			
		7,117	38	7,119	68	7,121	70	7,123	71	7,124	73	7,125

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,895,076	4,895,398	4,896,337	12	4,896,227	16 :	4,895,131	4,895,047
	4,895,252	4,895,418	4,896,340		4,894,867		4,895,277	4,895,162
	4,895,426	4,895,421	4,896,343		4,894,940		4,895,488	4,895,243
	4,896,348	4,895,428	4,896,355		4,894,984	17	Re.33,151	4,895,338
04 :	4,894,896	4,895,438	4,896,358		4,895,007		4,894,873	4,895,349
	4,895,141	4,895,482	4,896,366		4,895,039		4,894,874	4,895,400
	4,895,286	4,895,484	08	4,894,939		4,895,091		4,894,881	4,895,700
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	4,895,541	4,895,513	4,895,154		4,895,136		4,894,988	4,895,765
	4,895,573	4,895,546	4,895,230		4,895,148		4,895,014	4,895,798
	4,895,667	4,895,557	4,895,371		4,895,152		4,895,068	4,895,846
	4,896,157	4,895,562	4,895,559		4,895,159		4,895,110	4,896,044
05 :	4,894,887	4,895,574	4,895,727		4,895,161		4,895,121	4,896,106
	4,895,238	4,895,650	4,896,133		4,895,184		4,895,169	19 :	4,894,866
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	4,894,878	4,895,669	4,896,230		4,895,242		4,895,219		4,895,601
	4,894,899	4,895,709	4,896,350		4,895,253		4,895,226		4,895,991
	4,894,942	4,895,719	09	4,894,897		4,895,256		4,895,266		4,896,155
	4,894,943	4,895,750	4,894,900		4,895,362		4,895,275		4,896,205
	4,894,944	4,895,796	4,894,907		4,895,366		4,895,297		4,896,218
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	4,895,046	4,895,894	4,895,279		4,895,511		4,895,369		4,896,083
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	4,895,066	4,896,019	4,895,287		4,895,565		4,895,448		4,895,540
	4,895,080	4,896,027	4,895,436		4,895,613		4,895,504	22 :	Re.33,150
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International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

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—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations :	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

Nov. 7, 1989. JEFFREY M. SAMUELS,
Acting Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of December 29. 1989

Chemical Discipline -	June 2, 1989
Mechanical Discipline -	July 5, 1988
Electrical Discipline -	July 21, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of December 29, 1989.

Chemical -	December 21, 1987
Electrical -	January 28, 1988
Mechanical -	October 1, 1987

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of December 1989.

Affirmed	120
Affirmed-in-Part	36
Reversed	115
Total Decided	271

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 27, 1987, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,638,509 through 4,639,943
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 25, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,369,526 through 4,370,753
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant..... $495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))..... $245.00
By other than a small entity..... $490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f))..... $495.00
By other than a small enttity..... $990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982..... $120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f))..... $60.00
By other than a small entity..... $120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable ..... $550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 12, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,299,351	06/217,801	11/10/81
4,299,779	06/216,491	11/10/81
4,299,806	06/220,882	11/10/81
4,551,858	06/574,993	11/12/85
4,551,863	06/698,272	11/12/85
4,551,865	06/672,268	11/12/85
4,551,866	06/646,366	11/12/85
4,551,867	06/549,207	11/12/85
4,551,871	06/710,885	11/12/85
4,551,879	06/661,128	11/12/85
4,551,880	06/543,629	11/12/85
4,551,891	06/578,123	11/12/85
4,551,892	06/717,591	11/12/85
4,551,929	06/466,972	11/12/85
4,551,931	06/574,051	11/12/85
4/551,939	06/534,969	11/12/85
4,551,940	06/605,128	11/12/85
4,551,943	06/635,663	11/12/85
4,551,951	06/603,275	11/12/85
4,551,955	06/540,844	11/12/85
4,551,965	06/597,165	11/12/85
4,551,970	06/620,151	11/12/85
4,551,971	06/607,236	11/12/85
4,551,977	06/544,637	11/12/85
4,551,978	06/404,449	11/12/85
4,552,008	06/524,331	11/12/85
4,552,017	06/610,832	11/12/85
4,552,019	06/612,502	11/12/85
4,552,022	06/376,170	11/12/85
4,552,024	06/598,753	11/12/85
4,552,029	06/581,563	11/12/85
4,552,035	06/507,730	11/12/85
4,552,040	06/663,305	11/12/85
4,552,050	06/578,762	11/12/85
4,552,054	06/575,621	11/12/85
4,552,055	06/501,638	11/12/85
4,552,087	06/573,484	11/12/85
4,552,101	06/464,197	11/12/85
4,552,103	06/649,160	11/12/85
4,552,107	06/564,010	11/12/85
4,552,119	06/680,537	11/12/85
4,552,120	06/431,817	11/12/85
4,552,137	06/523,422	11/12/85
4,552,140	06/490,034	11/12/85
4,552,144	06/619,568	11/12/85
4,552,146	06/567,263	11/12/85
4,552,156	06/507,392	11/12/85
4,552,159	06/506,441	11/12/85
4,552,164	06/288,747	11/12/85
4,552,168	06/610,894	11/12/85
4,552,170	06/650,822	11/12/85
4,552,173	06/565,204	11/12/85
4,552,174	06/656,120	11/12/85
4,552,176	06/556,183	11/12/85
4,552,183	06/624,775	11/12/85
4,552,188	06/594,871	11/12/85
4,552,194	06/619,665	11/12/85
4,552,202	06/433,132	11/12/85
4,552,212	06/570,851	11/12/85
4,552,224	06/590,735	11/12/85
4,552,238	06/535,793	11/12/85
4,552,242	06/543,453	11/12/85

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Patent Number	Serial Number	Issue Date
4,552,257	06/544,253	11/12/85
4,552,263	06/504,306	11/12/85
4,552,271	06/593,897	11/12/85
4,552,275	06/553,264	11/12/85
4,552,276	06/586,357	11/12/85
4,552,279	06/650,490	11/12/85
4,552,285	06/581,564	11/12/85
4,552,294	06/556,086	11/12/85
4,552,304	06/592,073	11/12/85
4,552,320	06/482,037	11/12/85
4,552,321	06/577,490	11/12/85
4,552,322	06/638,227	11/12/85
4,552,323	06/659,640	11/12/85
4,552,325	06/422,934	11/12/85
4,552,332	06/624,865	11/12/85
4,552,338	06/509,968	11/12/85
4,552,342	06/583,354	11/12/85
4,552,344	06/530,939	11/12/85
4,552,345	06/574,034	11/12/85
4,552,348	06/455,836	11/12/85
4,552,352	06/482,872	11/12/85
4,552,354	06/463,056	11/12/85
4,552,357	06/646,020	11/12/85
4,552,358	06/564,290	11/12/85
4,552,360	06/579,709	11/12/85
4,552,362	06/577,254	11/12/85
4,552,363	06/550,967	11/12/85
4,552,365	06/570,959	11/12/85
4,552,370	06/483,658	11/12/85
4,552,371	06/495,985	11/12/85
4,522,374	06/530,863	11/12/85
4,552,381	06/579,689	11/12/85
4,552,384	06/475,848	11/12/85
4,552,403	06/537,340	11/12/85
4,552,416	06/594,129	11/12/85
4,552,428	06/384,433	11/12/85
4,552,430	06/429,534	11/12/85
4,552,439	06/544,132	11/12/85
4,552,444	06/677,062	11/12/85
4,552,468	06/349,617	11/12/85
4,552,474	06/550,291	11/12/85
4,552,476	06/587,360	11/12/85
4,552,479	06/568,618	11/12/85
4,552,481	06/633,485	11/12/85
4,552,484	06/568,701	11/12/85
4,552,485	06/436,039	11/12/85
4,552,493	06/488,601	11/12/85
4,552,494	06/610,151	11/12/85
4,552,499	06/452,262	11/12/85
4,552,507	06/588,226	11/12/85
4,552,508	06/504,463	11/12/85
4,552,522	06/604,303	11/12/85
4,552,533	06/515,053	11/12/85
4,552,542	06/668,971	11/12/85
4,552,546	06/507,636	11/12/85
4,552,569	06/693,446	11/12/85
4,552,572	06/517,895	11/12/85
4,552,573	06/556,312	11/12/85
4,552,586	06/553,001	11/12/85
4,552,589	06/574,667	11/12/85
4,552,611	06/526,791	11/12/85
4,552,624	06/521,350	11/12/85
4,552,625	06/566,576	11/12/85
4,552,636	06/616,681	11/12/85
4,552,641	06/566,478	11/12/85
4,552,655	06/309,094	11/12/85
4,552,664	06/608,428	11/12/85
4,552,687	06/512,286	11/12/85
4,552,695	06/600,405	11/12/85
4,552,706	06/539,201	11/12/85
4,552,722	06/502,553	11/12/85
4,552,744	06/635,626	11/12/85
4,552,751	06/312,458	11/12/85
4,552,761	06/599,534	11/12/85
4,552,766	06/396,116	11/12/85
4,552,770	06/698,843	11/12/85
4,552,796	06/664,533	11/12/85
4,552,817	06/574,028	11/12/85
4,552,845	06/439,408	11/12/85
4,552,847	06/536,602	11/12/85
4,552,855	06/556,002	11/12/85
4,552,863	06/588,254	11/12/85
4,552,869	06/621,131	11/12/85
4,552,871	06/598,132	11/12/85
4,552,874	06/462,864	11/12/85
4,552,890	06/578,232	11/12/85
4,552,894	06/573,472	11/12/85
4,552,905	06/623,707	11/12/85
4,552,920	06/570,587	11/12/85
4,552,928	06/651,059	11/12/85
4,552,932	06/605,514	11/12/85
4,552,953	06/450,191	11/12/85
4,552,962	06/459,796	11/12/85
4,552,983	06/652,484	11/12/85
4,552,993	06/599,719	11/12/85
4,552,995	06/515,250	11/12/85
4,553,026	06/514,126	11/12/85
4,553,055	06/621,644	11/12/85
4,553,071	06/514,725	11/12/85
4,553,072	06/579,668	11/12/85
4,553,076	06/657,990	11/12/85
4,553,085	06/494,377	11/12/85
4,553,122	06/578,510	11/12/85
4,553,138	06/360,907	11/12/85
4,553,144	06/443,935	11/12/85
4,553,148	06/505,399	11/12/85
4,553,151	06/421,931	11/12/85
4,553,164	06/417,592	11/12/85
4,553,168	06/558,506	11/12/85
4,553,178	06/458,965	11/12/85
4,553,183	06/392,505	11/12/85
4,553,194	06/681,204	11/12/85
4,553,205	06/420,730	11/12/85
4,553,215	06/296,179	11/12/85
4,553,231	06/608,879	11/12/85
4,553,249	06/538,965	11/12/85
4,553,250	06/440,891	11/12/85
4,553,253	06/704,131	11/12/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,218,351, Re. S. N. 07/443,047, Filed Nov. 27, 1989, Cl. 260/018, IMPACT RESISTANT THERMOPLASTIC POLYAMITES, Gerald K. Rasmussen, Owner of Record: *Inventor*, Attorney or Agent: Robert H. Jordan, Ex. Gp.: 155

4,508,429, Re. S. N. 07/442,663, Filed Nov. 29, 1989, Cl. 350/350, MEHTOD FOR DRIVING LIQUID CRYSTAL ELEMENT EMPLOYING FERROELECTRIC LIQUID CRYSTAL, Yoshiharu Nagae, Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Melvin Kraus, Ex. Gp.: 254

4,697,566, Re. S. N. 07/417,900, Filed Oct. 6, 1989, Cl. 123/479, METHOD OF CONTROLLING ELECTRONIC FUEL INJECTION TO INTERNAL COMBUSTION ENGINE, Mikihiko Ohnari, Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Carl I. Brundidge, Ex. Gp.: 342

4,700,887, Re. S. N. 07/427,259, Filed Oct. 12, 1989, Cl. 236/49, ENVIRONMENTAL CONTROL SYSTEM FOR POULTRY HOUSES, Michael B. Timmons, Owner of Record: *Cornell Research, Ithaca, N.Y.*, Attorney or Agent: George M. Cooper, Ex. Gp.: 344

4,711,269, Re. S. N. 07/477,003, Filed Dec. 6, 1989, Cl. 137/625.5, SOLENOID VALVE, Akos Sule, Owner of Record: *Inventor*, Attorney or Agent: Bernard Malina, Ex. Gp. 347

4,718,660, Re. S. N. 07/450,923, Filed Dec. 13, 1989, Cl. 271/305, ANTI-JAMMING MEANS FOR A POCKET OF A MAIL SORT MACHINE, Henry A. Daboub, Owner of Record: *Inventor*, Attorney or Agent: Drude Faulconer, Ex. Gp.: 311

4,724,982, Re. S. N. 07/448,809, Filed Dec. 11, 1989, Cl. 222/94, ASYMMETRICAL STRESS CONCENTRATOR FOR A DISPENSER PACKAGE, Sanford Redmond, Owner of Record: *Inventor*, Attorney or Agent: Robert E. Paulson, Ex. Gp.: 311

4,727,362, Re. S. N. 07/443,187, Filed Nov. 30, 1989, Cl. 340/703, DIGITAL DISPLAY SYSTEM, Jesus Andres Saenz, Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Richard A. Tomlin, Ex. Gp.: 266

4,784,880, Re. S. N. 07/450,365, Filed Dec. 13, 1989, Cl. 427/245, METHOD FOR MODIFYING ASYMMETRIC MEMBRANES BY ENDO-TREATING, Myron J. Coplan, Owner of Record: *Albany International Corp., Menands, N.Y.*, Attorney or Agent: Joseph C. Sullivan, Ex. Gp.: 139

4,789,575, Re. S. N. 07/434,636, Filed Nov. 13, 1989, Cl. 428/034, NON-FOIL COMPOSITE STRUCTURES FOR PACKAGING JUICE, Charles E. Gobbons, Owner of Record: *International Paper Company, New York, N.Y.*, Attorney or Agent: Stewart L. Gitler, Ex. Gp.: 154

4,790,431, Re. S. N. 07/447,516, Filed Dec. 7, 1989, Cl. 206/305, CARRYING CASE FOR STORING A COMPUTER AND A PRINTER OPERATIVELY CONNECTED THERETO, James W. Reel, Owner of Record: *International Computer Marketing Corp., Norcross, Ga.*, Attorney or Agent: Michael Stone, Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,488,477, Reexam. No. 90/001,910, Requested Dec. 18, 1989, Cl. 92/85, RODLESS CYLINDER, Michikazu Miyamoto, Owner of Record: *Shoketesu Kinzoku Kogyo KK, Tokyo, Japan*, Attorney or Agent: Oblon, Fisher, Spivak, et al., Ex. Gp.: 340, Requester: Barry Bretschneider, Washington, D.C.

4,806,579, Reexam. No. 90/001,908, Requested Dec. 7, 1989, Cl. 524/99, POLYMER COMPOSITES, Paul D. Calvert, Owner of Record: *British Petroleum Co., London, England*, Attorney or Agent: Brooks, Haidt, Hoffner & Delahunty, Ex. Gp.: 150, Requester: Owner

4,845,350, Reexam. No. 90/001,909, Requested Dec. 14, 1989, Cl. 235/472, NARROW-BODIED SINGLE-AND TWIN-WINDOWED PORTABLE LASER SCANNING HEAD FOR READING BAR CODE SYMBOLS, Howard M. Shepperd, et al., Owner of Record: *Symbol Technologies Inc., Bohemia, N.Y.*, Attorney or Agent: Kirshstein, Ottinger, Israel, et al., Ex. Gp.: 230, Requester: Owner

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Pasco Scientific, San Leandro, Calif, Reg. No. 994,669, for the mark "PASCO SCIENTIFIC," Canc. No. 18,249.

Nostalgia Rent-A-Car, Inc., West Palm Beach, Fla., Reg. No. 1,497,105, for the mark "NOSTALGIA CLASSIC CAR RENTALS," Canc. No. 18,253.

ERMA S. BROWN
Administrator of the Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline

v.

WESLEY TURNER,
Respondent.

Proceeding No. D89-6

NOTICE BY PUBLICATION

Notice is hereby given to the above named respondent that proceedings under 35 U.S.C. § 32 have been instituted against him. A copy of the COMPLAINT AND NOTICE OF PROCEEDINGS UNDER 35 U.S.C. 32, including the charges against respondent, was twice mailed to respondent's residence address of record and business address of record. The COMPLAINT AND NOTICE was twice returned from respondent's residence and business addresses of record by the U.S. Postal Service.

Respondent may obtain a copy of the above-mentioned COMPLAINT AND NOTICE from:

John H. Raubitschek
Associate Solicitor
U.S. Patent and Trademark Office
Office of Enrollment and Discipline
P.O. Box 15667
Arlington, Va. 22215

This notice will appear in the *Official Gazette* for four (4) consecutive weeks beginning with the issue of January 30, 1990.

Respondent has thirty (30) days from the date of the last publication of this notice to file and answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR § 10.136(d).

CAMERON WEIFFENBACH, *Director*
January 4, 1990 *Office of Enrollment and Discipline*

Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated December 19, 1989

Copies of the Trademark Official Gazette dated Dec. 19, 1989 were not mailed until Dec. 28, 1989. Therefore, for marks published in the Trademark Official Gazette dated Dec. 19, 1989, Notices of Opposition filed by Jan. 29, 1990 will be considered timely.

JEFFERY M. SAMUELS
Jan. 3, 1990 *Assistant Commissioner for Trademarks*

Errata

All reference to Patent No. 4,885,050 to Joseph A. Maher et al of Hamilton Mass, for "QUAD PROCESSOR" appearing

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in the Official Gazette of December 5, 1989 should be deleted since no patent was granted.

All reference to Patent No. 4,886,949 to Benjamin J. Bellas et al., Calif. for "METHOD AND APPARATUS FOR PULSE HEATING AND COOKING FOOD PRODUCTS" appearing in the Official Gazette of December 12, 1989 should be deleted since no patent was granted.

Removal From Register

Pursuant to the provisions of 37 CFR § 10.11 (b), a letter was directed on November 18, 1988 to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding had expired.

Accordingly, the names of the following person have been removed from the Register of Patent Attorneys and Agents.

CAMERON WEIFFENBACH
Director,
Office of Enrollment & Discipline
November 30, 1989

Casey P. August, 7 Hauteview Court, Don Mills, Ont., Canada M3A 2Z8
John Y. Clowney, 319 Overwood Rd., Akron, Ohio 44313
George M. Cole, 1254 Bank of Calif. Center, Seattle, Wash 98164
Jack Darrell, 7505 Fanin, Suite 214, Houston, Tex. 77054
George G. Dower, 3016 Lindberg Ave., Allentown, Pa. 18103
Douglas J. Drummond, 309 N. 6th St., Flagler Beach, Fla. 32036
Hill, William S., 955 Alton Rd., Port Charlotte, Fla. 33952
Jeffrey M. Kaden, Blum, Kaplan, Friedman Silverman & Beran, 1120 Ave. of the Americas, New York, N.Y. 10036
Konrad H. Kaeding, Willian, Brinks, Olds, Hofer, Gilson & Lione,One IBM Plaza, Suite 4100, Chicago, Ill. 60611
Evans Kahn, 105 Shore Rd., Greenwich, Conn. 06870
Robert L. Kahn, 189 West Madison St., Suite 1200, Chicago, Ill. 60602
Thomas A. Kahrl, Connecticut National Bank, 777 Main St., Hartford, Conn. 06115
Wallace M. Kain, AT&T Co., Box 25000, Greensboro, N.C. 27420
Lee H. Kaiser, Allis Chalmers Corp., Box 512, Milwaukee, Wis. 53201
Vernon F. Kalb, Prutzman, Kalb, Chilton & Alix, 750 Main St., Hartford, Conn. 06103
James M. Kanagy, Syntex (U.S.A.) Inc., 3401 Hillview Ave.,P.O. Box 10850, Palo Alto, Calif.94303
David S. Kane, Kane, Dalsimer, Kane, Sullivan & Kurucz, 420 Lexington Ave., New York, N.Y. 10170
Samuel Kane, 2 Spring Court, Cherry Hill, N.J. 08003
Alexander T. Kardos, 1557 Ashbrook Dr., Scotch Plains, N.J. 07076
Geoffrey M. Karny, Finnegan, Henderson, Farabow, Garrett & Dunner, 1775 K Street N.W., Washington, D.C. 20006
Horst M. Kasper, 13 Forest Drive, Warren, N.J. 07060
Koichiro Kato, Westinghouse Elec. Corp., 1310 Beulah Road Churchill, Pittsburgh, Pa. 15235
Neil F. Katz, Hill International, Inc., Suite 1072, 6809 Mayfield Rd., Mayfield Heights, Ohio 44124
Robert D. Katz, Hume, Clement, Brinks, Willian & Olds, Ltd., One IBM Plaza, Suite 4100, Chicago, Ill. 60611
Walter Katz, Congoleum Corp., 195 Belgrove Dr., Kearny, N.J. 07032
Howard Katzoff, 520 C Lombard St., Philadelphia, Pa. 19147
William Kaufman, 74 Kimberly Pl., New Canaan, Conn. 06840
Donald A. Kaul, Brownstein, Zeidman & Schomer, 1025 Connecticut Ave., N.W., Washington, DC 20036
Richard A. Kay, Schmidt, Howlett, Van't Hof, Shell & Van, 700 Frey Bldg., Grand Rapids, Mich. 49502
Leonard Kean, Johnson & Johnson, One Johnson & Johnson Plaza, New Brunswick, N.J. 08933,
Francis A. Keegan, Ward, Lalos, Leeds, Keegan & Lett, 1200 17th St., N.W., Washington, DC 20036
Richard J. Keegan, 4312 Hamilton St., Hyattsville, Md. 20781
Walter C. Kehm, Dweck & Sladkus, 666 Fifth Ave., New York, N.Y. 10103
Howard T. Keiser, 2525 Ranchvale Dr., Cincinnati, Ohio 45230
Deane E. Keith, Gulf Oil Corp., 715 Gulf Bldg., P.O. Box 1166 Pittsburgh, Pa. 15230
Henry B. Kellog, 511 Verdi Street, Venice, Fla. 33595
David B. Kellom, The Dow Chemical Co., Patent Dept., 1776 Bldg., Midland, Mich. 48640
Fred L. Kelly, 11325 Canterbury Rd., Chester, Va. 23831
William F. Kelly, Jr., 6 Village Rd., Florham Park, N.J. 07932
John T. Kelton, Darby & Darby, 405 Lexington Ave., New York, N.Y. 10174
Sherman J. Kemmer, Diamond Point Int'l Inc., 15300 Pearl Rd., Cleveland, Ohio 44136
Joseph D. Kennedy, Monsanto Co., G4ND 800 N. Lindbergh Blvd., St. Louis, Mo. 63167
William B. Kerkam, Jr., Kirkam, Stowell, Kondrack & Clarke P.C., Crystal Gateway 1, Suite 411, 1235 S. Jefferson Davis Hwy., Arlington, Va. 22202
Don M. Kerr, E.I. DuPont De Nemours & Co., 1007 Market Street, Wilmington, Del. 19898
Gordon W. Kerr, 321 Sawmill Rd., Bricktown, N.J. 08723
Paul A. Kerstein, Conlon & Kerstein, 205 West Randolph Street, Suite 1220, Chicago, Ill. 60606
Kenneth S. Kessler, 543 Broadway, Tacoma, Wash 98402
Casimir R. Kiczek, 27109 Kingswood Drive, Dearborn Hgts, Mich. 48127
Billy C. Killough, 14 N. Adgers Wharf, Charleston, S.C. 29401
Barnwell R. King, 73-40 188 St., Flushing, N.Y. 11366
Paul N. King, 623 Fuji Bldg., 2-3, Marunouchi 3-chome, Chiyoda-Ku, Tokyo 100, Japan
William H. King, Nasa, Langley Research Center, Hampton, Va. 23665
William E. Kinnear, 1810 Washington Blvd., Beaumont, Tex. 77705
Harold J. Kinney, Kinney, Lange, Braddock, Westman & Fairbairn, P.A., Suite 1500, 635 Fourth Ave., Minneapolis, Minn 55415
Samuel W. Kipnis, 100 Sands Point Rd., Apt. 105, Longboat Key, Fla. 33548
Nelson E. Kimmelman, Edelson, Udell, Kimmelman & Farrell, 1328 Land Title Bldg., Philadelphia, Pa. 19110
Michael E. Kiteck, Jr., 5050 Excelsior Blvd., Minneapolis, Minn 55416
Edmund T. Kittleman, French & Doescher, P.O. Box 2443, Bartlesville, Okla. 74005
Felix Klass, Celanese Corp., 1211 Avenue of the Americas, New York, N.Y. 10036
David Klein, 11418 Monterrey Dr., Silver Spring, Md. 20902
Ronald C. Klett, Post Office Box 232, Greendale, Wis. 53129
Larry H. Kline, 18 Broad St., Suite 805, Charleston, S.C. 29401
Michael J. Kline, 209 N. Dithridge Ave., Pittsburgh, Pa. 15213
Richard G. Kline, Beveridge, DeGrandi & Kline, 1819 H Street, N.W., Washington, D.C. 20006
Dale O. Kluck, 201 W. St. Andrews, Midland, Mich. 48640
Carl E. Kneuertz, 1204 Washington St., Suite 114, Alexandria, Va. 22314
Stuart W. Knight, Suite 201, 13522 Newport Avenue, Tustin, Calif. 92680
Eugene C. Knoblock, OltS.C.h, Knoblock & Hall, 625 JMS Bldg., South Bend, Ind. 46601
Frederick L. Knop, Jr., 100 N.E. Adams St., Peoria, Ill. 61629
Leonard S. Knox, 2300 Lincoln Park West, Suite 707, Chicago, Ill. 60616
Robert Knox, Jr., Texaco Development Corp., 2000 West Chester Ave., White Plains, N.Y. 10650
Herbert D. Knudsen, Standard Oil Co., Patent & License Division, Midland Bldg., - 928 TT, Cleveland, Ohio 44115
John M. Koch, 23108 Village 23, Camarillo, Calif. 93010
Steven P. Koda, Seed & Berry, 6300 Columbia Center, 701 Fifth Ave., Seattle, Wash 98104
George H. Kohlmann, Cipher Data Products, Inc., 9715 Businesspark Ave., P.O. Box 85170, San Diego, Calif. 92138
Waino M. Kolehmainen, 1218 Oak St. Winnetka, Ill. 60093

Phillip D. Koontz, 1472 N. 5th St., P.O. Box 820, Laramie, Wyo 82070
Glenn H. Korfhage, Dow Chemical Co., P.O. Box 1965, Midland, Mich. 48640
Richard Kornutik, Nabisco Brands, Inc., 15 River Rd., Wilton, Conn. 06897
Joseph C. Kotarski, Conoco Inc., P.O. Box 1267, Patent & Liscensing Division, 1000 South Pine, Ponca City, Okkla 74603
Howard K. Kothe, One Beekman Pl., New York, N.Y. 10022
Earl F. Kotts, 9114 W. Linden Rd., Watsonville, Calif. 95076
John G. Kovalich, 11 Carteret Rd., Livingston, N.J. 07039
Charles L. Kraft II, P.O. Box 18122, Baltimore, Md. 21220
Jill H. Krafte, Leydig, Voit, Osann, Mayer & Holt, Ltd., One IBM Plaza, Suite 4600, Chicago, Ill. 60611
Bernard L. Kramer, 21 Kristin Drive - #414, Schaumburg, Ill. 60195
Charles Krassov, 220 McEwan Ave., Windsor, Ont., Canada, N9B 2E4
John H. Kraus, 3040 Larkin Rd., Pebble Beach, Calif. 93953
Otto R. Krause, Hill, VanSanten, Steadman, Chiara & Simpson, 7000 Sears Tower, Chicago, Ill. 60606
Cyril A. Krenzer, Moran & Krenzer, P.C., 18 Lake St., P.O. Box 161, Owego, N.Y. 13827
Gerald H. Kreske, Hoover Co., 101 E. Maple Street, North Canton, Ohio 44720
Bernard Kriegel, 953 North Highland Ave., Los Angeles, Calif. 90038
John A. Krieger, American Can Technical Center, 433 N. Northwest Highway, Barrington, Ill. 60021
Robert D. Krohn, Los Alamos National Lab., Box 1663 MS 674, Los Alamos, N. Mex. 87545
John Krout, Gipple & Hale, Suite 905, 1925 North Lynn Street, Rosslyn, Va. 22209
Frederick J. Krubel, International Harvester Co., 401 North Michigan Ave., Chicago, Ill. 60611
Cedric H. Kuhn, 5605 Equestrian Dr., N.W., Albuquerque, N. Mex 87120
Carol K. Lackenbach, 507 Maguire Avenue, Staten Island, N. Y., 10309
Armand E. Lackenbach, Lackenbach, Siegel, Marzullo, Presta & Aronson, One Chase Rd., Scarsdale, N.Y. 10583
Elliot A. Lackenbach, 311HH Gates Rd., Somerset, N.J. 08873
Edwin V. Ladd, Jr., 184 Maxine Rd., Bristol, Conn. 06010
Frank R. LaFontaine, Shell Dev. Co., Pats. & Licensing P.O. Box 4248, Modesto, Calif. 95352
Robert I. Lainof, 1413 King Street, Alexandria, Va. 22314
Peter N. Lalos, Lalos, Leeds, Keegan, Lett & Marsh 1200 Seventeenth St., N.W., Washington, D.C. 20036
Michael A. Lamanna, General Electric Co., Bldg. 500-Rm 218, 1 River Road, Schenectady, N.Y. 12345
Frank J. Lamattina, HQ U.S. Air Force, Bldg. 104,424 Trapelo Rd., Waltham, Mass 02154
Wayne H. Lang, 60 Lee Place, Wellsville, N.Y. 14895
Lewis H. Lanman, Emery Industries, 1300 Carew Tower, Cincinnati, Ohio 45202
Roberts B. Larson, Larson & Taylor, 727 - 23rd Street, South, Arlington, Va. 22202
Roy W. Latham, 6812 Jarvis Ave., Newark, Calif. 94560
Lynn H. Latta, 431 Indio Drive, Pismo Beach, Calif. 93449
Bradford Laughlin, 15410 Artesian, Detroit, Mich. 48223
Don C. Lawrence, Poms, Smith, Lande & Rose, 1888 Century Park East, Suite 1000, Los Angeles, Calif. 90067
James W. Lawrence, 10237 Brigade Dr., Fairfax, Va. 22030
Peter E. Lawrence, 223 Edgemont Drive, Winnipeg, Manitoba, Canada R2J 3H5
Stanton T. Lawrence, Jr., Pennie & Edmonds, 330 Madison Ave., New York, N.Y. 10017
William R. Lawton, 1436 S.E. 12th Ave., Deerfield Beach, Fla. 33441
John M. Leach, Box 544, Walpole, N.H. 03608
Nicholas N. Leach, Morris, Nichols, Arsht & Tunnel, 12th & Market Sts. (P.O. Box 1347) Wilmington, Del. 19899
Michael V. Leahy, Klarman-Leahy Associates, Inc., 9 Boulevard Ave., Greenlawn, N.Y. 11740
James E. Ledbetter, Sandler & Greenblum, 701 S. 23rd St., Arlington, Va. 22202
George F. Lee, Emrich, Lee, Brown & Hill, 150 North Wacker Drive, Chicago, Ill. 60606
Newton H. Lee, Jr., Gradco Systems, Inc., 7 Morgan, Irvine, Calif. 92718
Simon K. Lee, IBM Corporation, Intellectual Property Law, Dept. 951/029, 5600 Cottle Rd., San Jose, Calif. 95193
Susan Lee, Pennie & Edmonds, 1155 Avenue of the Americas, New York, N.Y. 10036
Kleon M. Le Fever, North American Philips Corp., 100 East 42nd Street, New York, N.Y. 10017
Joseph A Legris, 21 Aylesbury Rd., Islington, Ontario Canada M9A 2M3
Edwin C. Lehner, 1224 Hillview Rd., Homewood, Ill. 60430
Michael R. Leibowitz, 125 East 18th Street, Brooklyn, N.Y. 11226
Bernard H. Lemlein, 173 Mason Ter., Brookline, Mass 02146
Lewis J. Lenny, 1301 - 20th St., N.W., Apt. 704, Washington, D.C. 20036
Glenn H. Lenzen, Jr., Cambridge Systems Group, 24275 Elise, Los Altos Hills, Calif. 94022
Henry K. Leonard, 2132 Burroughs Drive, Toledo, Ohio 43614
John E. Leonarz, P.O. Box 12011, Research Triangle Park, N.C. 27709
David H. Leroy, 70 Yuwpo Avenue, Oakland, N.J. 07436
Norton Lesser, Square D. CompaN.Y., 1415 S. Roselle Rd., Palatine, Ill. 60067
Herbert Levine, 522 Hayes Bldg., 2361 Jefferson Davis Hwy., Arlington, Va. 22202
Donald Levy, 1849 B Bough Ave. Clearwater, Fla. 33520
Edward F. Levy, 136 LaSalle Drive, Yonkers, N.Y. 10710
Harry M. Levy, Dithmar, Stotland, Stratman & Levy, Suite 1200, 189 West Madison St., Suite 1200, Chicago, Ill. 60602
Maurice W. Levy, 102 Morningside Rd., Verona, N.J. 07044
Sidney Levy, 4433 Dawn Avenue, La Verne, Calif. 91750
Fred O. Lewis, U.S. Department of Energy, Federal Office Bldg., P.O. Box E, Oak Ridge, Tenn. 37830
Irwin M. Lewis, 1800 N. Alanton Dr., Virginia Beach, Va. 23454
Jon M. Lewis, 205 Coulter Bldg., Greensburg, Pa. 15601
Walter Lewis, 12 Wakefield Rd., Scarsdale, N.Y. 10583
Basil J. Lewris, Finnegan, Henderson, Farabow, Garrett & Dunner, 1775 K Street N.W., Washington, D.C. 20006
John S. Lieb, 4251 N. Brown Ave., Suite A-1, Scottsdale, Ariz. 85251
Bette M. Light, 1191 East 3075 North, North Ogden, Utah 84404
Donald S. Lilly, United States Postal Service, 475 L'Enfant Plaza SW, Washington, D.C. 20260
Merton B. Lilly, 4601 Bristol Ct., Midland, Mich. 48640
Maria C.H. Lin, Celanese Corp., 1211 Avenue of the Americas, New York, N.Y. 10036
Theodore D. Lindgren, GTE Service Corp., One Stamford Forum, Stamford Conn. 06904
Charles M. Lindrooth, Hill, Van Santen, Steadman Chiara & Simpson, 333 N. Wacker Drive, Chicago, Ill. 60606
Roland A. Linger, 6912 Fisk Avenue, San Diego, Calif. 92122
John W. Linkhauer, 1425 Porter Bldg., Pittsburgh, Pa. 15219
Thomas D. Linton, Atrium Bldg., Suite 600, 16530 Ventura Boulevard, Encino Calif. 91436
John J. Lipari, Lipari, Mulken, Keefe & Champi 6 North Avenue, Cranford, N.J. 07016
Carl R. Lippert, 513 Guyasuta Rd., Pittsburgh, Pa. 15215
Joseph H. LipS.C.hutz, 440 E 79, New York, N.Y. 10021
Nelson Littell, Jr., Hammond & Littell, Weissenberger & Muserlian, 420 Lexington Ave., New York, N.Y. 10170
Katherine Lloyd, 34 Chabot Terrace, San Francisco, Calif. 94118
Leslie K. Loehr, 530 Georgine Rd., Fallbrook, Calif. 92028
Hugh L. Logan, 50 Fern Place, Berkeley Heights, N.J. 07922
Morris B. Lore, 851 Seminole Lane, Vero Beach, Fla. 32960
David W. Lotterer, P.O. Box 3175, Gaithersburg, Md. 20878
Regina A. Loughran, Stiefel, Gross & Kurland, 551 Fifth Avenue, New York, N.Y. 10176
Katherine P. Lovingood, 2242 Knollcrest Lane, Knoxville, Tenn. 37920
Frank C. Lowe, Klaas & Law, 738 Pearl Street, Denver, Colo. 80203
Harry R. Lubcke, 2443 Creston Way, Hollywood, Calif. 90068
Louis V. Lucia, 5200 N. Ocean Blvd., Ft. Lauderdale, Fla. 33308
Lawrence M. Lunn, Wick, White & Lunn, 6125 U.S. Highway 31 South, Indianapolis, Ind. 46227
Charles L. Lunsford, 8410 S. Quebec, Tulsa, Okla. 74136
Kenneth G. Lupo, 4407 Vintage Way, Garland, Tex. 75042

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Paul F. Lynch, 240 Commercial St., Boston Mass. 02109
Robert D. Lyon, Lyon & Lyon, 611 W. Sixth St., 34th Floor, Los Angeles, Calif. 90017
Gary F. Lyons, 3M Center, P.O. Box 33428, St. Paul, Minn 55133
Thomas F. Lysaught, Jr., GTE Directories Corp., 1865 Miner St., Des Plaines, Ill. 60016
William N. Mace, 69 Kenilworth Avenue, Ottawa, K1Y 375, Canada
Terrence MacLaren, Siemens Corporate Research & Support, Inc. 767 Fifth Avenue, New York, N.Y. 10153
Thomas R. Madden, Reichhold Chemicals, Inc., 525 North Broadway, White Plains, N.Y. 10603
Joseph M. Maguire, St. Regis Paper Company., Technical Center, West Nyack Rd., West Nyack, N.Y. 10994
Frank M. Mahon, Merck & Co., Inc., P.O. Box 2000, Rahway, N.J. 07065
Eugene J. Mahoney, Porter, Wright Norris & Arthur, Suite 1100 37 W. Broad St., Columbus, Ohio 43215
Raymond T. Majesko, Dresser Industries, Inc., 1505 Elm, Dallas Tex. 75201
Frank Makara, 29 Orange Drive, Jericho, N.Y. 11753
Stephen P. Malak, Spring-Mornne, Inc., 2040 W. WiS.C.onsin, Milwaukee, WiS.C.c 53233
Donald Malcolm, 40 East 17th St., Brooklyn, N.Y. 11226
Vincent A. Mallare, Hydrocarbon Research, Inc., 134 Franklin Corner Rd., P.O. Box 6047, Lawrenceville, N.J. 08648
Sara Lynn Mandel, Lyon & Lyon, 611 West Sixth Street, 34th Flr., Los Angeles, Calif. 90017
Debra A. Mangus, 5326 Pocusset Street, #24, Pittsburgh, Pa. 15217
Karl Michel Manheim, 2321 Zeno Place, Venice, Calif. 90291
Jacob A Manian, 39 Acorn Cir. Apt. 202, Towson, Md. 21204
John P. Mann, Dresser Industries Inc., Jeffery Minn. Mach. Div., 274 E. First Ave., Columbus, Ohio 43201
Ralph F. Manning, Allied Corporation, Trumbull Industrial Park, Trumbull, Conn. 06609
Arthur A. March, Rogers, Hoge & Hills, 5350 South DTC Parkway, Englewood, Colo. 80111
James G. Markey, Doyle and Roth Mfg. Co. Inc., 26 Broadway, New York, N.Y. 10004
Frank H. Marks, 4940 East End Avenue, Chicago, Ill. 60615
Thomas M. Marshall, IT&T Corp., 320 Park Ave., New York, N.Y. 10022
Arthur J. Martin, Boone, Knudsen & Martin, P.C., 862 Folsom Street, San Francisco, Calif. 94107
Charles F. Martin, Jr., 928 So. Forrest Dr., Birmingham, Ala. 35209
John T. Marvin, 3 Blythewood Rd., Doylestown, Pa. 18901
Julius Marx, 68 Wooleys Lane, Great Neck, N.Y. 11023
Leonhard F. Marx, 386 Hartshorn Dr., Short Hills, N.J. 07078
Nicholas J. Masington, Jr., Exide Electronics, 2 Penn Center Plaza, Philadelphia, Pa. 19102
Gregory J. Mason, Long Island Rail Road, Jamaica Station, Jamaica, N.Y. 11435
Clinton L. Mathis, 360 Central Building, Seattle, Wash 98102
John J. May, 790 Lucerne Dr., Sunnyvale, Calif. 94086
William E. Maycock, Corning Glass Works, Sullivan Park FR-212 Corning, N.Y. 14831
Eugene D. Mays, Ethyl Corp., 451 Florida Street, Baton Rouge, La 70801
Joseph M. Mazzarese, Kenyon & Kenyon, One Broadway, New York, N.Y. 10004
Shelton B. McAnelly, 1340 Monterrey Blvd., Baton Rouge, La 70815
Roe D. McBurnett, 12970 Ballad Drive, Sun City West, Ariz. 85375
Edward T. McCabe, Swift & Company, 115 Vest Jackson Blvd., Chicago, Ill. 60604
John W. McCaffrey, 1200 Greenwood Avenue, Wilmette, Ill. 60091
Hal H. McCaghren, 120 South Olive Avenue, Suite 555, West Palm Beach, Fla. 33402
James W. McClain, Brown, Martin, Haller & Meador, 110 West "C" Street, 13th Floor, San Diego, Calif. 92101
William T. McClain, Standard Oil Co., 200 East Randolph Dr., Chicago, Ill. 60601
John W. McClenahan, McFadden, Fincham & Co., 251 Bank Street, Suite 503, Ottawa, Ontario, Canada K1P 1X3
Kenneth F. McClure, 306 Lawton St., Falls Church, Va. 22046
John B. McCord, 20 N. Wacker Dr., Rm. 2200, Chicago, Ill. 60606
Michael D. McCoy, Neuman, Williams, Anderson & Olson, 77 West Washington St., Chicago, Ill. 60602
Charles A. McCrae, One Riverside Plaza, P.O. Box 332, Greenup, Ky. 41144
Neil McDermid, Fetherstonhaugh & Co., Montreal Dorval Airport, P.O. Box 248, Dorval, H4Y 1A8 Canada
James V. McDonald, Apt. 312, 2345 N. Craycroft Road, Tucson, Ariz. 85712
Barbara A. McDowell, IBM Corp., Suite 605, 1755 So. Jefferson Davis Hwy., Ste. 605, Arlington, Va. 22202
Ronald K. McFadden, McFadden, Fincham & Co., 251 Bank Street, Ottawa, Ontario K2P 1X3, Canada
Hansel L. McGee, New York City Civil Court, 851 Grand Concourse, New York, N.Y. 10451
Andrew M. McGinnis, 489 Common Street, Belmont, Mass 02178
Clement L. McHale, Westinghouse Electric Corp., 1310 Beulah Road, Pittsburgh, Pa. 15235
Arthur McIlroy, 3425 South Zunis, Tulsa, Okla. 74105
Robert McKay, Pennie & Edmonds, 1155 Avenue of the Americas, New York, N.Y. 10036
James J. McKeever, 20 Flower Lane, Greenwich, Conn. 06830
David D. McKenney, ITT Grinnell Corporation, 260 West Exchange Street, Providence, R.I. 02901
Robert M. McKinney, 52 Ridge Road, Westiminster, Md. 21157
James T. McMillan, McDonnell Douglas Finance Corp., 100 Oceangate, Ste. 900, Long Beach, Calif. 90802
Gary L. McMinimee, Wunschel, Eich & McMiniinee, P.C., 805 North Main, Carroll, Iowa 51401
Robert J. McNair, Jr., 2920 Blue Haven Terrace, Cincinnati, Ohio 45238
Warren D. McPhee, Mason, Kolehmainen, Rathburn & Wyss, 20 North Wacker Dr., Chicago, Ill. 60606
Paul F. McQuade, Finnegan, Henderson, Farabow, Garrett & Dunner, 1775 K Street N.W., Washington, D.C. 20006
John T. Meaney, 184 Summer Street, Framingham, Mass 01701
Nina L. Medlock, Baker, Miller, Mills & Murray, 1000 Pacific Place, 1910 Pacific Ave., Dallas, Tex. 75201
Donald W. Meeker, P.O. Box 8 Prudential Center Station, Boston, Mass 02199
Fred L. Mehlhoff, Beckman Instruments Inc., 2500 Harbor Blvd., Fullerton, Calif. 92634
Maureen C. Meinert, Peterson, Ross, S.C.hloerb & Seidel, 200 East Randloph Dr., Ste. 7300, Chicago, Ill. 60601
Angelo J. Mele, 4007 N. 27th St., Arlington, Va. 22209
Thomas P. Melia, Raytheon Missile Systems Division, Hartwell Road, Bedford, Mass 01730
John H. Merchant, 9115 Grant Ave., Manassas, Va. 22110
Kenneth E. Merklen, Gulf & Western Industries, Inc., One Gulf & Western Plaza, New York, N.Y. 10023
Charles F. Meroni, Sr., Hill, Van Santen, Steadman, Chiara & Simpson, 70th Floor Sears Tower, Chicago, Ill. 60606
Henriette Mertz, 5425 East View Park, Chicago, Ill. 60615
John G. Mesaros, 540 N. Golden Circle Drive., Ste. 210, Santa Ana, Calif. 92705
Raymond E. Metter, The Boeing Co., M/S 20-75 P.O. Box 3707, Seattle, Wash 98124
Harold S. Meyer, 1154 Jefferson Ave., Akron, Ohio 44313
Thomas V. Michaelis, 104 Seale Ave., Palo Alto, Calif. 94301
Charles Mikulka, Polaroid Corp., 549 Technology Square, Cambridge, Mass 02139
Calvin H. Milans, Jones, Tullar & Cooper, 2001 Jefferson Davis Hwy., Arlington, Va. 22202
Bennett G. Miller, P.O. Box 155, Cobb Island, Md. 20625
Carl Miller, 3612 Woolworth Bldg., 233 Broadway, New York, N.Y., 10007
Byron D. Miller, Banner, Birch, McKie & Beckett, Sixth Flr., One Thomas Circle, N.W., Washington, D.C. 20005
David B. Miller, Arthur, Dry & Kalish P.C., 1230 Avenue of the Americas, New York, N.Y. 10020
Jeffrey J. Miller, Seed & Berry, 6300 Columbia Center, Seattle, Wash 98104
Robert P. Miller, Western Electric Co., Inc., 2600 Warrenville, Rd., Lisle, Ill. 60532
Roy Miller, 2801 C Ocean Front Walk, San Diego, Calif. 92109
Wm. V. Miller, 145 N. High St., Columbus, Ohio 43215

Allen F. Millikan, 800 West Virginia Ave., Parkersburg, W. Va. 26101
Martha F. Mims, Cox & Smith Inc., 600 NBC Bldg., San Antonio, Tex. 78205
George J. Minish, 614 Eagle Rock Ave., P.O. Box 236, West Orange, N.J. 07052
Cyrus G. Minkler, Harness, Dickey & Pierce, 1500 N. Woodward, Ste. 300, Bloomfield Hills, Mich. 48013
Anthony J. Mirabito, Cesari & McKenna, 312 Union Wharf East, Boston, Mass 02109
George H. Mitchell, Jr., 304 Crystal Plaza One, 2001 Jefferson Davis Hwy., Arlington, Va. 22202
Maurice A. Moffat, Moffat & Co., Ste. 505, 350 Sparks St., P.O. Box 2088 Station "D", Ottawa, Ont., Canada KIP 5W3
Mark Mohler, Townsend & Townsend, Steuart Street Tower, 20th Flr., One Market Plaza, San FranciS.C.o, Calif. 94105
Franklin Mohr, 145 N. Halifax Ave., Apt. 711, Daytona Beach, Fla. 32018
Donald D. Mondul, Illinois Tool Works, Inc., 8501 West Higgins Road., Chicago, Ill. 60631
James H. Monroe, Pfizer, Inc., 235 E. 42nd St., New York, N.Y. 10017
Ralph G. Monsees, 450 B Street, Suite 1490, San Diego, Calif. 92101
Robert J. Mooney, 736 Second Street Pike, Southampton, Pa. 18966
Philemon J. Moore, Valley Stream Apts., Q-101, Lansdale, Pa. 19446
Davis T. Moorhead, 4 Holiday East, Clemson, S.C. 29631
Marie F. Morency, Rogers, Bereskin & Parr, P.O. Box 313, Commerce Court Postal Station, Toronto, Ont., Canada M5L 1G1
Ethel L. Morgan, Appleby Drive, Bedford, N.Y. 10506
Dennis M. Morganstein, Rose Morgenstern, Schmidt, Dixon & Hasley, Suite 900, Oliver Bldg., Pittsburgh, Pa. 15222
Armand G. Morin, 197 Giddings Ct., San Jose, Calif. 95139
Walter C. Morrison, Route 4, Meadowyck Lane 28, Vincentown, N.J. 08088
Darrell K. Morse, Morse, Clinton & O'Gorman, 7200 - 80th Street South, Cottage Grove, Minn 55016
Jonathan W. Morse, Dow Chemical Co., 1776 Washington, Midland, Mich. 48640
Shirley K. Morse, Krumkill Rd., Slingerlands, N.Y. 12159
David L. Moseley, Arnold, White & Durkee, 750 Bering Drive, Suite 400, Houston, Tex. 77057
Serle I. Mosoff, 22000 Halburton Rd., Beachwood, Ohio 44122
Richard J. Mossburg, Lord Motor Credit Co., P.O. Box 1732, Dearborn, Mich. 48128
Charles J. Moxley, Roe, Fowler & Moxley, 340 East Fourth South, Salt Lake, Utah 84111
George F. Mueller, 701 Knox Road, Villanova, Pa. 19085
Herman S. Muir, 2217 Cambridge Place, Lynchburg, Va. 24503
Edwin C. Mulcahy, Pharmaceutical Mfg. Ass., 1100 15th St.,N.W., Washington, DC 20005
Richard T. Muller, 5 Wall St., Bethlehem, Pa. 18018
Ronald V. Muller, 10736 Blue Ridge Blvd., Kansas City, Mo. 64134
Frederick F. Mumm, Walter, Finestone, Richter & Kane, 10920 Wilshire Blvd., #1400, Los Angeles, Calif. 90024
John S. Munday, 386 Conestoga Rd., Malvern, Pa. 19355
Francis X. Murphy, Pfizer Inc., 235 E. 32nd St., New York, N.Y. 10017
Gerard E. Murphy, AT&T, One Oak Way, Berkeley Heights, N.J. 07922
Peter J. Murphy, 3000 Southland Center, Dallas, Tex. 75291
Allan J. Murray, 3120 Lindenwood Dr., Dearborn, Mich. 48120
Kittie A. Murray, Felfe & Lynch, 805 Third Ave., 25th Flr., New York, N.Y. 10022
Michael M. Murray, Banner, Birch, McKie & Beckett, One Thomas Circle, N.W., Washington, D.C. 20005
Andrea G. Nace, 6208 Garnett Drive, Chevy Chase, Md. 20815
Joseph Nachay, 1975 Bathgate Ave., (2H), Bronx, N Y 10457
John C. Nahrwold, American Bar Association, 1155 E. 60th Street, Chicago, Ill. 60637
Roger Nash, 5123 Cavanagh Road, Los Angeles, Calif. 90032
James R. Naughten, 17485 Almond Rd., Castro Valley, Calif. 94546
William J. Navin, 81 Ivy Way, Port Washington, N.Y. 11050
James L. Neal, Thermo Electron Corp., 101 First Avenue, P.O. Box 459, Waltham, Mass 02254
Charles S. Neave, One Aberystwyth Pl., Binghamton, N.Y. 13905
David L. Neer, 7329 Keeler, Lincolnwood, Ill. 60646
Meyer Neishtoss, 1010 Summer Place, Pittsburgh, Pa. 15243
Arthur L. Nelson, Allis-Chalmers Corp., P.O. Box 512, Milwaukee, WiS.C. 53201
Francis D. Neruda, Baeder Neruda Interests, Inc., 1300 Post Oak Blvd., Suite 765, Houston, Tex. 77056
John R. Nesbitt, Purdue Nat'l Bank Bldg., Suite 1014, Lafayette, Ind. 47906
Bruce E. Newell, Enserch Engineers & Constructors, 10375 Richmond Ave., Houston, Tex. 77042
Alan L. Newman, Friedman Homes Inc., 4455 Rowland Ave., Elmonte, Calif. 91731
E. Robert Newman, Henderson & Sturm, 990 Woodmen Tower, Omaha, Neb 68102
Pauline Newman, FMC Corp., 2000 Market Street, Philadelphia, Pa. 19103
Simon M. Newman, 1411 Hopkins St., N.W., Washington, DC. 20036
Theron H. Nichols, 8723 Nairn St., Houston, Tex. 77074
Olaf Nielsen, 1427 Hillandale Dr., Bath, Ohio 49210
Mitchell B. Nisonoff, Mudge Rose Guthrie & Alexander, 20 Broad St., New York, N.Y. 10005
William E. Nobbe, 375 Colony Rd., Rossford, Ohio 43460
William R. Nolte, 191 Baldwin, Birmingham, Mich. 48009
William F. Norris, P.O. Box 470012, Tulsa, Okla. 74147
Richard E. Norton, 300 Central Avenue S.W., Suite 2500-W, Albuquerque, NM 87102
Andrew J. Nugent, 403 Colonial Road, Ridgewood, N.J. 07450
Casmir A. Nunberg, RR#1 Box 167, Rixeyville, Va. 22737
Leslie G. Nunn, Jr., Diamond Shamrock Chemicals Co., 350 Mt. Kemble Avenue, CN 1931, Morristown, N.J. 07960-1931
Neal K. Nydegger, 1332 Sun Valley Rd., Solana Beach, Calif. 92075
Abraham J. Nydick, Stoney Ford Rd., 1008 Morton Towers, 1500 Bay Road, Miami Beach, Fla. 33139
Gerald Richard O'Brien, Jr., Union Carbide Corporation, Old Ridgebury Rd., Danbury, Conn. 06817
Edward F. O'Connor, 121 Witney Ave., New Haven Conn. 06510
James R. O'Connor, TRW Assemblies and Fasteners Group, 31 Burlington Mall Rd., Burlington, Mass 01803
Harry B. O'Donnell, III, Suite 606B Portland Federal Building, 200 W. Broadway, Louisville, Ky. 40202
John A. Odozynski, GTE Services, Inc. 100 Endicott St. Danvers, Mass 01923
Thomas P. O'Hara, Morgan & Finnegan, 345 Park Avenue, New York, N.Y. 10154
Franz O. Ohlson, Aerospace Industries Association of America, Inc., 1725 Desales Street N.W., Washington, D.C. 20036
Robert L. Oldham, 1250 Weathervane Lane, Akron, Ohio 44313
James E. Olds, 7401 Metro Blvd., Suite 445, Edina, Minn 55435
Donald S. Olexa, Brunswick, Corp., One Brunswick Plaza, Skokie, Ill. 60077
Finn G. Olsen, Manchester, 15820 Sharon Valley Rd., Manchester, Mich. 48158
Henry T. Olsen, 6514 N. 85th Pl., Scottsdale, Ariz. 85253
James D. Olsen, Sun Exploration and Production Co., P.O. Box 2880, Dallas, Tex. 75221
Spencer E. Olson, CBS Inc., 227 High Ridge Rd., Stamford, Conn. 06905
Elliot M. Olstein, Carella, Byrne, Bain & Gilfillan, 6 Becker Farm Rd., Roseland, N.J. 07068
John R. O'Malley, University of Florida, Larsen Hall, Gainesville, Fla. 32611
Norman J. O'Malley, 163 Fox Fun Road, New Canaan, Conn. 06840
Thomas R. O'Malley, 4018 Bloomfield Ave., Drexel Hill, Pa. 19026
Herschell C. Omohundro, Sr., 5631 East Windsor Ave., Scottsdale, Ariz. 85257
Harold W. Ordway, Pfizer Inc.,235 East 42nd St., New York, N.Y. 10017
David O'Reilly, 23603 Park Sorrento, Suite 103, Calabasas, Calif. 91302

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Gerald J. Orman, 51 Town & Country Business Plaza, 1111 Town & Country Rd., Orange, Calif. 92668
Charles F. Osgood, 508 Gurney Rd., Franklin, Pa. 16323
Milton Osheroff, 1316 Fenwick Lane, Silver Spring, Md. 20910
William E. Otto, Westinghouse Electric Corp., 1310 Beulah Road, Churchill, Pittsburgh, Pa. 15235
Robert P. Outerbridge, Spraco, Inc., 2 East Spit Brook Road, Nashua, N.H. 03060
Bernard Ouziel, 430 Park Avenue, New York, N.Y. 10022
James W. Ove Jr., 50 West 57th Street, Westmonut, Ill. 60559
John L. Palmer, Sr., Eastman Kodak Co., 6300 Cedar Springs Rd., Dallas, Tex. 75235
Warley L. Parrott, P.O. Box 594, Camden, S.C. 29020
David J. Pasz, Kraig, DeWolfe & Pasz, 33 Public Square, Suite 1117, Cleveland, Ohio 44113
Mark G. Paulson, Nabisco Brands Inc., 15 River Rd. Wilton, Conn. 06897
John W. Pease, 1730 Winchester Dr., Winter Park, Fla. 32789
Donald Penprase, 11355 Orrs Ct., Cypress, Calif. 90630
Robert G. Pierce, 2910 S. Glebe Rd., Suite 209, Arlington, Va. 22206
Lloyd E.K. Pohl, 56020 Santa Fe Trail, Suite 0, Yucca Valley, Calif. 92284
Roy M. Porter, Jr., Box 426, 444 E. Main St., Chester, N.J. 07930
William O. Quesenberry, P.O. Box 117, Merry Point, Va. 22513
Joseph J.C. Ranalli, Pennie & Edmonds, 330 Madison Ave., New York, N.Y. 10017
John D. Randolph, 7100 Baltimore Ave., College Park, Md. 20740
Robert C. Rasche, 2437 Federal Ave., Los Angeles, Calif. 90064
David G. Rasmussen, Burroughs Corp., 1235 Jeff. Davis Hwy., Suite 1304, Arlington, Va. 22202
Robert N. Richards, 1130 Lookout Drive., Oxnard, Calif. 93033
Robert J. Rickett, 3304 Skycroft Dr., Minneapolis, Minn 55418
Theodore B. Roessel, 2933 Clover St., Pittsford, N.Y. 14534
Arne Ros, c/o Loichot Army Navy Dr., Arlington, Va. 22202
Sidney N. Rosenfeld, Borg-Warner Corp., Air Conditioning Gp., P.O. Box 1592, York, Pa. 17405
Martha L. Ross, 3540 Van Ness St., N.W., Washington, DC 20008
Edgar E. Ruff, 2809 Wales Rd., Columbia, S.C. 29206
Joseph E. Ryan, 4449 Fondell Dr., Edina, Minn 55435
Kenneth B. Salomon, 1652 Balboa Way, Burlingame, Calif. 94010
Richard I. Samuel, Patlex Corp., 533 S. Avenue W., Westfield, N.J. 07090
Daniel M. Schaeffer, 6 Frederick Dr., Shoreham, N.Y. 11786
George E. Schmitkons, 4511 Simmons Lane, Temple Hill, Md. 20784
Elliot N. Schubert, 10585 Porto Court, San Diego, Calif. 92124
James S. Shannon, 410 Delaware Ave., Dayton, Ohio 45405
Cheryl L. Shavers, 2026 Klamath Ave., #1, Santa Clara, Calif. 95051
William F. Simpson, P.O. Box 1255, New York, N.Y. 10008
Robert G. Slick, 22780 E. Cliff Dr., Santa Cruz, Calif. 95062
Jack L. Slobodin, Cartwright, Sucherman & Slobodin, Inc., 160 Sansome St., Suite 900, San Francisco, Calif. 94104
James J. Smolen, 5959 W. Loop South, Suite 500, Bellaire, Tex. 77401
Edward J. Stachura, 5709 18th Rd., N., Arlington, Va. 22205
John Stan, U.S. Dept. of Navy, Naval Ocean Sys. Ctr., San Diego, Calif. 92152
Frank A. Steinhilper, Stonehedge, Lincoln, Mass 01773
Alan R. Stempel, Hoffmann-La Roche, Inc., Kingsland St., Nutley, N.J. 07110
J. Bruce Synnott, Jr., 4960 Edmondson Pike, #S-4, Nashville, Tenn. 37211
Frederick A. Tecce, 216 W. Pomfret St., Carlisle, Pa. 17013
Charles H. Thieman, Kremblas, Foster, Millard & Watkins, 50 W. Broad St., Suite 3400, Columbus, Ohio 43215
Harry B. Thornton, 1829 Upshur St., N.W., Washington, DC 20011
Peter J. Van Bergen, Schwartz, Jeffery, Schwaab, Mack, Blumenthal & Evans, 111 N. Alfred St., Alexandria, Va. 22314
Robert Velgos, 1211 S. Osage, Barlesville, Okla. 74003
Donald L. Waller, 801 Ironwood Drive, #250, Rochester, Mich. 48063
Dennis J. Williamson, McDougall, Hersh & Scott, 135 S. La Salle St., Chicago, Ill. 60603
Henry O. Wright, 769 Entrada Dr. S., Ft. Myers, Fla. 33907

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Service Item	FY 1990 Goal (Calendar Days [1])	Monthly Average (Calendar Days [1])
Filing Receipts:		
Patents	22	16
Trademarks	30	27*
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	17 Hours
Window Coupons	5	2
Mail Coupons	12	6
Letter Orders	16	18
Electronic Ordering Service (EOS)	11	3
Certified Copies:		
Trademark Registrations	21	35
Applications-As-Filed	17	11**
File-Wrapper/Contents	N/A	14
Walk-up Certification	1	1
Patent Application Expedited	5	4**
Trademark Search Library:		
Filing Pending Marks	21	36***
Filing Reg. Certificates	Issue Date+2 Days	+2Day
Filing Temp. Drawings	6	21***
Assignments:		
Recording Patent-New Applications	43	43****
Recording Patents-Mail Room Recpts.	20	61****
Receipt Date of Bulk Pat. Docs. Returned by End of Month		July 11-July25, 1989
Recording Trademarks	20	41
Receipt Date of Bulk Trademark Documents Returned by End of Month		Sept. 18-Sept. 25, 1989
Avg. Days from Issue Fee Payment to Issue Date	90-100	96
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	+18 Days*****
Patent Copies Available	95% on Issue Date	+66 Days*****
Trademark Copies Available	95% on Issue Date	99% on Issue Date

[1] Unless otherwise noted.
* Increase due to large numbers of applications filed under Trademark Law Revision Act.
** The 5% of orders for which fiche are not on site are not included in calculations.
*** Large volume of pending marks has resulted in delays in receipt of drawings in the Trademark Search Library
**** There was a reduction of 7 days in patents-new applications and a reduction of 40 days in patents-Mail Room receipts since last month.
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Jan. 4, 1990

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PATENT NOTICES

Certificates of Correction For Week of January 30, 1990

PP. 06,654	4,814,653	4,825,613	4,830,023
PP. 06,829	4,817,089	4,825,938	4,830,497
4,680,241	4,817,404	4,826,424	4,830,536
4,689,026	4,818,213	4,826,518	4,830,571
4,724,794	4,818,248	4,826,701	4,830,687
4,740,402	4,818,358	4,826,752	4,830,935
4,761,284	4,818,580	4,826,787	4,831,258
4,766,404	4,819,089	4,827,010	4,831,291
4,786,695	4,819,647	4,827,166	4,831,298
4,786,923	4,820,586	4,827,290	4,831,300
4,789,874	4,820,731	4,827,767	4,832,284
4,789,915	4,820,957	4,827,801	4,832,364
4,793,690	4,821,333	4,828,004	4,832,410
4,797,253	4,821,675	4,828,017	4,832,830
4,798,007	4,822,265	4,828,054	4,833,269
4,799,054	4,822,335	4,828,069	4,833,758
4,799,167	4,822,665	4,828,294	4,834,256
4,801,445	4,822,687	4,828,465	4,835,417
4,805,991	4,822,943	4,828,999	4,835,571
4,806,532	4,823,098	4,829,149	4,835,916
4,806,699	4,823,207	4,829,205	4,836,184
4,807,412	4,823,255	4,829,458	4,836,427
4,809,987	4,823,691	4,829,564	4,841,037
4,812,186	4,823,860	4,829,593	4,850,443
4,813,114	4,824,303	4,829,723	4,850,645
4,813,223	4,824,319	4,829,811	4,852,917
4,813,736	4,824,623	4,829,888	
4,813,844	4,825,311	4,830,018	

Disclaimers

3,680,420.—*Josef Blum*, Norwalk, Conn. CRYOGENIC MICROTOME APPARATUS. Patent dated Aug. 1, 1972. Disclaimer filed Apr. 3, 1989, by the assignee RMC, Inc.

Hereby enters this disclaimer to claims 12, 13 and 14 of said patent.

3,915,335.—*Donald J. Shanklin*, Granada Hills; *George E. Robson*, Torrance, both of Calif. LOCKING GAS CAP. Patent dated Oct. 28, 1975. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Company.

Hereby enters this disclaimer to the entire term of said patent.

4,447,091.—*Liem Nguyen*, Garden Grove; *William J. Segal*, Van Nuys; *Kent Friend*, Santa Ana, all of Calif. CONVERTIBLE WIRE WHEEL HUB COVER. Patent dated May 8, 1984. Disclaimer filed Mar. 29, 1989, by the assignee Mr. Gasket Company.

Hereby enters this disclaimer to the entire term of said patent.

4,496,853.—*Ronald W. Streiber*, Smithtown, N.Y. STATIC LOAD FOR HIGH VOLTAGE DRIVER. Patent dated Jan. 29, 1985. Disclaimer filed Nov. 29, 1989, by the assignee, General Instrument Corporation.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 6, 7, 8, 10 and 11 of said patent.

4,739,795.—*Michael E. Ewbank; Steven A. Heitz*, both of Rockford, Ill. FLOW CONTROL VALVE. Patent dated Apr. 26, 1988. Disclaimer filed Nov. 6, 1989, by the assignee, Sundstrand Corporation.

The term of this patent subsequent to July 6, 1989, has been disclaimed

4,762,252.—*Frank S. Hyer*, Duxbury; *Paul M. Kitner*, Pembroke, both of Mass. ADAPTATION TO MAJOR OR SPORADIC DISTURBANCE ERROR IN WEIGH FEEDING APPARATUS. Patent dated Aug. 9, 1988. Disclaimer filed Nov. 13, 1989, by the assignee, Hyer Industries, Inc.

Hereby enters this disclaimer to claims 10, 11, 12, 14, and 17 of said patent.

4,773,106.—*Victor Toso*, Minneapolis, Minn.; *Stuart H. Spector*, Miami, Fla. BACK SUPPORT. Patent dated Sept. 27, 1988. Disclaimer filed Aug. 1, 1989, by the inventors.

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 6 of said patent.

4,816,422.—*Alexander J. Yerman*, Scotia; *Constantine A. Neugebauer*, Schenectady, both of N.Y. FABRICATION OF LARGE POWER SEMICONDUCTOR COMPOSITE BY WAFER INTERCONNECTION OF INDIVIDUAL DEVICES. Patent dated Mar. 28, 1989. Disclaimer filed Oct. 30, 1989, by the assignee, General Electric Company.

Hereby enters this disclaimer to claims 2 - 12 and 14 - 21 of said patent.

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ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
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DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-15-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REEXAMINATIONS

JANUARY 30, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 4,052,353 (1198th)
DISPERSIONS OF WATER SOLUBLE POLYMERS IN OIL

Clyde S. Scanley, 330 Speedwell Ave., Morristown, N.J. 07960
Reexamination Request No. 90/001,380, Nov. 18, 1987.
Reexamination Certificate for Patent No. 4,052,353, issued Oct. 4, 1977, Ser. No. 613,231, Sep. 15, 1975.
Continuation-in-part of Ser. No. 429,548, Jan. 2, 1974, abandoned. This application Nov. 18, 1987, Ser. No. 613,231
Int. Cl.[4] C08F *2/32;* **C08J** *3/04;* **C08L** *2/32*
U.S. Cl. 524—801

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** to **8** is confirmed.

New claims **9** to **14** are added and determined to be patentable.

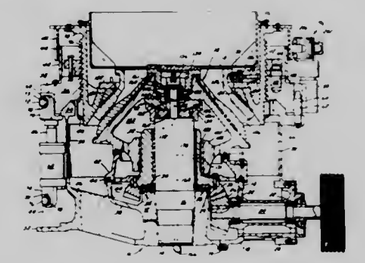
1. A self water dissolving composition of a water soluble polymer dispersed in oil which is stable to polymer coagulation and agglomeration, comprising:

a water soluble polymer dispersed in oil, said polymer having a water content at which the polymer remains finely divided and dispersed in the oil, said water content being less than 40%, by weight, based on polymer and water, said water soluble polymer dispersed in oil having been prepared from a water in oil emulsion of said water soluble polymer by reduction of the water content thereof; and

a water soluble surfactant, having an HLB number of above 8 in an amount effective to render the water soluble polymer self dissolving in water.

B1 4,478,373 (1199th)
CONICAL CRUSHER

John A. Gieschen, West Allis, Wis., assignor to Nordberg Inc.
Reexamination Request No. 90/001,781, Jun. 6, 1989.
Reexamination Certificate for Patent No. 4,478,373, issued Oct. 23, 1984, Ser. No. 196,509, Oct. 14, 1980.
Filed Jun. 6, 1989, Ser. No. 196,509
Int. Cl.[4] B02C *2/04*
U.S. Cl. 241—208



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentablity of claims **8–27** is confirmed.

Claim **1** is determined to be patentable as amended.

Claims **2–7**, dependent on an amended claim, are determined to be patentable.

1. An apparatus for crushing materials, comprising:

(a) a frame structure including a hub member having a vertical bore;

(b) a stationary support member having a central longitudinal axis, and having an upper portion and a lower portion, said lower portion being positioned within said bore and secured to said hub;

(c) a cylindrical eccentric mounted around said stationary support member for eccentric rotation therearound, said eccentric having an axis which intersects said longitudinal axis;

(d) means for rotating said eccentric about said support member;

(e) a head assembly having a cylindrical eccentric follower mounted on said eccentric for eccentric rotational movement about said support member, and including a lower crusher surface, and an upper spherical bearing member fixed to the underside of said head assembly;

(f) a bowl assembly mounted for adjustable movement relative to said frame, said bowl assembly having an upper crusher surface spaced an adjustable predetermined distance from said lower surface under static conditions; and

(g) a spherical bearing seat supported by *and* rigidly fixed to said upper portion of said support member, and holding and supporting said upper spherical bearing member, said spherical bearing seat having a center of curvature which substantially coincides with said intersection of said eccentric axis and said longitudinal axis.

B1 4,559,382 (1200th)
PROCESSABLE RADIATION CURABLE POLY(VINYL CHLORIDE) RESIN COMPOSITIONS

John A. Martens, and Brian H. Williams, both of White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Reexamination Request No. 90/001,651, Nov. 28, 1988.
Reexamination Certificate for Patent No. 4,559,382, issued Dec. 17, 1985, Ser. No. 501,270, Jun. 6, 1983.
Filed Nov. 28, 1988, Ser. No. 501,270
Int. Cl.[4] C08L *27/06;* **C08J** *3/28*
U.S. Cl. 524—535

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is cancelled.

Claims **2–8** are determined to be patentable as amended.

7. A composition comprising a poly(vinyl chloride) resin and a vinyl chloride resin-compatible compound having (a) two to six terminal or pendant ethylenically-unsaturated groups, (b) two or more groups selected from divalent carbonylamino groups, divalent thiocarbonylamino groups, or both, and (c) polyvalent aliphatic group, which is the residue remaining after the removal of hydroxyl or amino groups from an oligomeric nucleophilic compound, provided that there is at least one divalent carbonylamino or thiocarbonylamino group per ethylenically-unsaturated group, the amount of said vinyl chloride resin-compatible compound being sufficient so that upon exposure of the composition to actinic radiation, a gel is formed, said vinyl chloride resin-compatible compounds being characterized such that a film of a poly(vinyl chloride) resin

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and about 10 percent by weight of said vinyl chloride resin-compatible compound remains transparent when pressed at elevated temperatures near the fusing point of the composition of poly(vinyl chloride) resin and said vinyl chloride resin-compatible compound, said vinyl chloride resin-compatible compound having the following formula:



wherein:

Z represents the polyvalent residue remaining after the removal of hydroxyl or amino group from an oligomeric nucleophilic compound, $Z(XH)_n$, Z containing carbon and hydrogen atoms, and optionally oxygen atoms, and having a molecular weight of 500 to 5000;

X represents —O— or



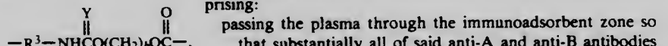
in which R^2 is hydrogen or lower alkyl group;

Y represents O or S;

R represents a divalent radical selected from the group consisting of $—CH_2)_a$,



, and



in which a is an integer from 1 to 6, b is an integer from 2 to 6, R^3 is an alkylene group[,] *or* a divalent carbocyclic aliphatic group with 5 or 6 ring members, [or arylene group,] Y is O or S;

R^1 represents hydrogen or methyl; and

n is an integer having a value of 2 to 6.

B1 4,664,913 (1201st)

METHOD FOR TREATING PLASMA FOR TRANSFUSION

C. Harold Mielke, San Rafael; Patrick J. Scannon, Davis; Paul R. Sohmer, Los Angeles, and John C. Klock, Mill Valley, all of Calif., assignors to Xoma Corporation, San Francisco, Calif.

Reexamination Request No. 90/001,722, Feb. 27, 1989.

Reexamination Certificate for Patent No. 4,664,913, issued May 12, 1987, Ser. No. 632 756, Jul. 19, 1984.

Continuation-in-part of Ser. No. 381,499, May 24, 1982, abandoned. This application Feb. 27, 1989, Ser. No. 632,756

Int. Cl.[4] A61K *35/16*

U.S. Cl. 424—101

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-8 is confirmed.

1. A method for treating human blood plasma from a donor prior to transfusion to a recipient to prevent ABH blood group incompatibility, regardless of the recipient's blood type, said method employing an immunoadsorbent zone including receptors consisting essentially of receptors specific for both anti-A and anti-B antibodies immobilized therein, said method comprising:

passing the plasma through the immunoadsorbent zone so that substantially all of said anti-A and anti-B antibodies are specifically removed from the plasma without reducing the concentrations of blood factors below levels necessary for blood clotting in the transfusion recipient.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,154

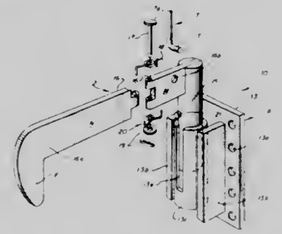
VEHICLE RESTRAINT

Norbert Hahn, South Milwaukee, Wis., and Arthur A. Olson, Jr., Glenview, Ill., assignors to Abon Corporation, Naples, Fla.

Original No. 4,605,353, dated Aug. 12, 1986, Ser. No. 526,090, Aug. 24, 1983. Application for reissue Aug. 12, 1988, Ser. No. 231,872

Int. Cl.[4] B65G *67/02*

U.S. Cl. 414—401 **6 Claims**



6. A restraint with means for releasably securing a parked vehicle with a depending portion against an adjacent structure and preventing accidental transverse movement of the vehicle away from the structure, said restraint comprising first means fixedly mountable on said structure and defining a channel having vertical guides and a vertical passageway therebetween, second means slidably mounted in said first means for vertical movement relative thereto, said second means having a vertical portion slidable longitudinally but restrained against transverse movement relative to said vertical guides, said second means having transverse arm means extending from said channel through said vertical passageway, said transverse arm means supporting hinge means at a distal portion thereof, and hook means having horizontal arm means extending outwardly from said transverse arm means, complemental hinge means connected to the hinge means of transverse arm means and forming a vertical hinge axis, and a vertical hook portion spaced from said complemental hinge means extending downwardly from said horizontal arm means whereby said hook means is movable vertically relative to said first means and rotatably movable about said vertical hinge axis relative to said second means between an operative position wherein the hook portion engages the depending portion and an inoperative position.

Re. 33,155

AQUEOUS INK FOR INK JET PRINTING

Eiichi Akutsu, Ichikawa; Kakuji Murakami, Shizuoka, and Tamotsu Aruga, Numazu, all of Japan, assignors to Ricoh Company, Limited, Tokyo, Japan

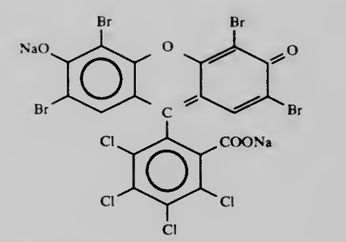
Original No. 4,581,071, dated Apr. 8, 1986, Ser. No. 708,651, Mar. 6, 1985. Application for reissue Apr. 5, 1988, Ser. No. 179,408

Claims priority, application Japan, Mar. 22, 1984, 59-53554

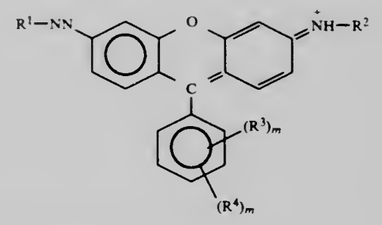
Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—22 **6 Claims**

1. In an aqueous ink comprising a water-soluble organic solvent having a boiling point of 100° C., or higher, water and a preservative and an anti-mold agent, the improvement comprising a first magenta dye having the formula (I) and a second magenta dye having the formula (II):

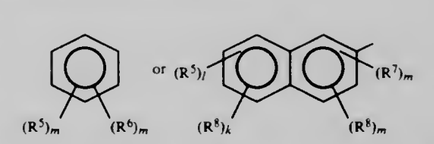


(I)



(II)

wherein R^1 and R^2 each represent



(in which R^5, R^6, R^7 and R^8 each represent a lower alkyl group, an amino group, a sulfonic acid group in the form of an alkali metal salt or a carboxyl group in the form of an alkali metal salt); R^3 and R^4 each represent a lower alkyl group, an amino group, a sulfonic acid group in the form of an alkali metal salt, or a carboxyl group in the form of an alkali metal salt; and k, l, m and n each represent an integer of 0, 1 or 2.

Re. 33,156

ALKALI SOLUBLE LATEX THICKENERS

Gregory D. Shay, Oak Forest; Emmojean Eldridge, Chicago, and James E. Kail, Arlington Heights, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Original No. 45,145,521, dated Apr. 30, 1985, Ser. No. 643,370, Aug. 23, 1984. Application for reissue May 29, 1987, Ser. No. 55,508

Int. Cl.[4] C08F *220/34*

U.S. Cl. 526—301 **18 Claims**

1. An alkali soluble thickener which is an aqueous emulsion copolymer of:

(A) about 20–70 weight percent of an alpha, beta-monoethylenically unsaturated carboxylic acid,

(B) about 20–80 weight percent of a monoethylenically unsaturated monomer lacking surfactant capacity;

(C) about 0.5–60 weight percent of a non-ionic urethane monomer which is the urethane reaction product of a nonohydric nonionic surfactant with a monoethylenically unsaturated monoisocyanate; and

(D) from 0 up to about 2 weight percent of a polyethylenically unsaturated monomer.

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Re. 33,157

NULL INITIATED METHOD AND SYSTEM FOR MONITORING A PRIORITY CHANNEL

Joseph P. Heck, Fort Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Original No. 4,573,210, dated Feb. 25, 1986, Ser. No. 565,948, Dec. 27, 1983. Application for reissue Feb. 24, 1988, Ser. No. 160,216

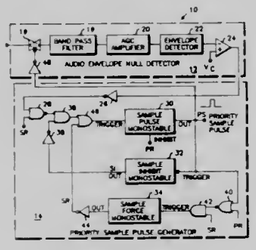
Int. Cl.[4] H04B *11/16*

U.S. Cl. 455—166 **34 Claims**

1. A method of monitoring one or more priority channels with minimal signal loss on nonpriority channels in a multichannel radio receiver, comprising:

receiving a demodulated audio signal on a nonpriority channel;

detecting nulls in said received demodulated audio signal; and



sampling the priority channel for a priority sampling period for a received signal during each of said null to avoid disruption in said nonpriority received signal.

PLANT PATENTS

GRANTED JANUARY 30, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,126
ROSE PLANT NAMED CONANGEL

Henry A. Conklin, P.O. Box 365, McFarland, Calif. 93250

Filed Feb. 9, 1989, Ser. No. 308,003

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—2 **1 Claim**

1. A new and distinct variety of rose plant of the climbing floribunda class, substantially as shown and described, which is a sport of the variety "Angel Face" (U.S. Plant Pat. No. 2,792) characterized particularly by its climbing habit of growth.

7,127
ROSE PLANT JACYIM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 14, 1988, Ser. No. 284,132

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class substantially as herein shown and described, characterized particularly as to novelty by the stable yellow flower color, rich glossy green foliage, outstanding globular habit, abundance of flowers and disease resistance.

7,128
MINIATURE ROSE PLANT NAMED 'MORCARLET'

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Jan. 23, 1989, Ser. No. 300,592

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded to upright, much branched habit, substantially as illustrated and described, characterized by byds and flowers of a dark red color which may be modified by darker shading or veining; the bud and flower resembling the variety Sheri Anne (U.S. Plant Pat. No. 3,826) in form, the sepals of each bud being covered with numerous moss like appendages; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semiglossy to glossy foliage and an abundance of flowers borne singly and in loose clusters of 3 to 5 or more.

7,129
ROSE PLANT JACSHINE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 14, 1988, Ser. No. 284,135

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by a clear coral pink flower, disease resistance, smooth dark green foliage, and vigorous growth producing good quantities of flowers.

7,130
IMPATIENS PLANT 'DAPPER DAN'

Daniel Simchock, 870 Broadway, Brentwood, N.J. 11717

Filed Nov. 4, 1988, Ser. No. 268,936

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A mew and distinct variety of Impatiens plant characterized particularly as to novelty by the foliage wherein the borders of the leaves are of yellowish white coloration to thus provide variegation, the borders being of relatively thin width varying from leaf to leaf, thereby providing a unique contrast with the double deep red flowers which have the color of the deep red impatiens "Duet".

7,131
AFRICAN VIOLET PLANT NAMED IMPROVED VIRGINIA

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,373

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Virginia, as described and illustrated, and particularly characterized by its single violet-shaped, bright pink flowers with frilled edges and darker center; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green oval to heart-shaped, slightly serrated leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,132
AFRICAN VIOLET PLANT NAMED IMPROVED IOWA

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,375

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Iowa, as described and illustrated, and particularly characterized by its single violet-shaped, intensive blue flowers; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green, oval to heart-shaped leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,133
AFRICAN VIOLET PLANT NAMED LITTLE CRYSTAL

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,758

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Little Crystal, as described and illustrated, and particularly characterized by its miniature growth habit; single, plain white flowers with elongated petals; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; medium green, spear to heart-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

7,134
AFRICAN VIOLET PLANT NAMED NICOLE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,395

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Nicole, as described and illustrated, and particularly characterized by its single intensive purplish-red flowers; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green, oval to round leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting and its long lasting and non-dropping flowers.

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7,135
AFRICAN VIOLET PLANT ANAMED IMPROVED DELAWARE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,865
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Delaware, as described and illustrated, and particularly characterized by its large, single violet-shaped, purplish red flowers with wavy edges; occasional white trace on a petal, strong, upright, flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green oval, slightly serrated leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

PATENTS

GRANTED JAN. 30, 1990

ERRATA

For CLASS	See PATENT NO.
606-086	4,896,661
606-094	4,896,662
606-079	4,896,663
606-074	4,896,668
266-200	4,896,810
514-938	4,897,259
331-107	4,897,621
330-004	4,897,622
370-085	4,897,841

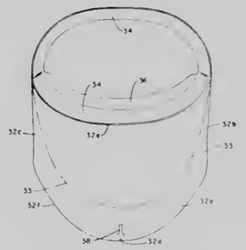
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PATENTS

GRANTED JANUARY 30, 1990

GENERAL AND MECHANICAL

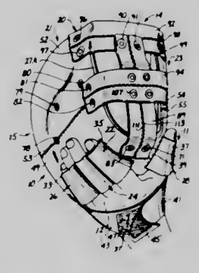
4,896,375
GOLF HAT OR CAP HAVING VISOR WITH MARKING MEANS
Donald E. Colucci, 4924 Cleveland Ave., NW., Canton, Ohio 44709
Continuation-in-part of Ser. No. 113,625, Oct. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 864,259, May 5, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 333,724
Int. Cl.[4] A63B *69/36*
U.S. Cl. 2—12 12 Claims



1. A golf cap for aiding a golfer in addressing a ball and in keeping his eyes on the ball during a golf swing, said cap comprising means including a headband for encircling the head of a wearer and a visor permanently attached thereto, said visor having an upper edge and a lower edge and being joined along its upper edge to said means, said visor being elongated and sloping downwardly and generally forwardly from the upper edge to the lower edge thereof, the length of said visor, measured along the centerline thereof, being at least about 4 inches, said upper edge being adapted to engage the wearer's head, at least a portion of said lower edge being below eye level when said cap is worn normally, said visor including marking means which is imprinted or stitched on the inside thereof so as to be immovable with respect to the visor, said marking means being invisible upon viewing the outside of the visor, said marking means including at least one mark for indicating whether or not the wearer's eyes are directed straight forward toward the ball, said mark serving as a point of reference indicating head movement during a golf swing.

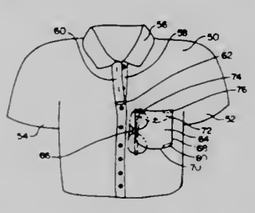
4,896,376
SPORT GLOVE CONSTRUCTION AND METHOD OF MAKING SAME
Monte A. Miner, 150 13th Street, Del Mar, Calif. 92014
Filed Jan. 25, 1988, Ser. No. 147,688
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—19 22 Claims

1. A sport glove construction, comprising:
front and rear pliable plastic sheets being disposed in overlying, opposed relationship and forming a front ball receiving side and a rear hand receiving side, said ball receiving side having a cup-shaped pocket therein for receiving a ball therein;
hand securing means securing to the outer surface of said rear sheet for receiving the hand of the user and for holding it in position on said outer surface of said rear sheet;
said front and rear sides each having a right and left portion;
web means interconnecting said right and left portions to help define said pocket;
right and left elongated pad means extending in a generally U-shaped configuration at the rim of said pocket, said pad means being composed of resilient impact absorbing material;
said pad means diverging away from one another at the lower portion of said sheet means toward said web means; and



a plurality individually spaced apart rigid fastening devices being arranged in a spaced apart manner within said pocket adjacent to said pad means and securing together said front and rear sheets for helping rigidify the flexibility of said glove construction.

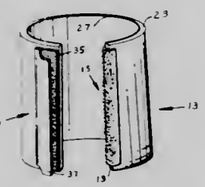
4,896,377
GARMENT HAVING AN INTEGRAL HANGER FOR EYEGLASSES
Allan W. Ferdi, 2207 Zollinger Rd., Columbus, Ohio 43221
Filed Sep. 22, 1988, Ser. No. 247,653
Int. Cl.[4] A41D *27/08;* **A41B** *1/08*
U.S. Cl. 2—115 8 Claims



1. A fabric garment adapted to be worn upon the upper body portion of a person having a pocket on the front of said garment having top, bottom and side edges, wherein said pocket is stitched to said garment along its side and bottom edges and wherein said pocket includes a horizontally extending top access opening which comprises:
an integral horizontally extending strip of fabric permanently fastened at both ends to an outer face of said pocket, and cooperative with said pocket to define a temple receiving opening for a pair of glasses, wherein said eyeglass hanger strip has a length slightly greater than one-half the perimeter of a pair of glasses taken at the greatest cross-sectional area of a temple to thereby enable said person to insert a single temple of said glasses into the temple receiving opening when said temple is at an acute angle with respect to the bridge portion of the glasses and wherein said eyeglass hanger strip permits said glasses to pivot at the joint between the temple and the bridge as a unit about said eyeglass hanger strip.

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4,896,378
PROTECTIVE WRIST BAND
Donald R. Campana, P.O. Box 476, Commerce City, Colo. 80037
Filed Sep. 26, 1988, Ser. No. 249,583
Int. Cl.[4] A41D *13/08*
U.S. Cl. 2—170 1 Claim



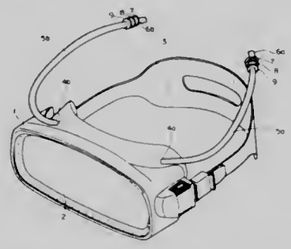
1. Device for protecting a wearer's wrist, comprising a flexible, resilient open-ended band that has a composite structure including an inner layer of a porous, absorbent fibrous fabric material, and a substantially thicker outer layer of a resilient, liquid-impervious closed-cell rubber-like material; a first connector element being affixed to one end of said band and a complementary second connector element affixed to the opposite ned of said band, said first and second connectors being releasably fastenable to each other so as to secure said band around the user's wrist; and wherein said first connector element comprises a strip of hook type fasteners that extends around the edge of the first end of said band so as to provide portions on the inside and outside of said first end, and said second connector element comprises a first strip of loop type fasteners secured to said opposite band end and a second strip of loop type fasteners that are hingedly secured adjacent said first strip, whereby connection of said first and second elements brings said inside portions of said hook type strip into engagement with said first strip of loop type fasteners and brings said outside portions into engagement with said second loop type strip.

4,896,379
DROP DOWN CUFF ARRANGEMENT FOR PANT LEGS OR SLEEVES
Sandra Kape, 86 Alta Vista, Kirkland, Quebec, Canada
Filed Sep. 6, 1988, Ser. No. 240,208
Int. Cl.[4] A41D *27/24*
U.S. Cl. 2—269 2 Claims



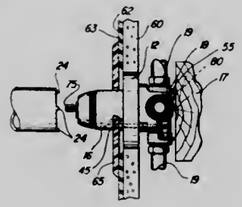
1. A drop down cuff arrangement for a pant leg sleeve or the like comprising:
- a pant leg or sleeve having a high position wherein a first portion of the leg or sleeve includes a finished hem at the end to form a high position hemline;
- cuff strip stitched to the outside of the leg or sleeve above the high position hemline folded upwards away from the high position hemline, held in place to the outside of the leg or sleeve by a removable attachment means, and
- the pant leg or sleeve having a low position wherein the cuff strip is released from the removable attachment means and folded down over the high position hemline.

4,896,380
FACE MASK EQUIPPED WITH EARPLUGS
Shigeki Kamitani, 8-1-933, Nakahara 1-chome, Isogo-ku, Yokohama-shi, Kanagawa-ken, Japan (235)
Filed Jan. 13, 1989, Ser. No. 296,780
Claims priority, application Japan, Jul. 22, 1988, 63-97002
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—428 2 Claims



1. Face mask which is designed to be used underwater comprising:
- a mask body configured to closely fit a face so as to cover at least the eyes and nose, and a piece of glass or transparent plate,
- first and second tubes extending from the mask body and in free flowing fluid communication with a closed space defined between the mask body and the face, each said tube having an open end remote from the mask body which is sized and shaped so as to be insertable into an ear canal, said remote end of each tube having a plurality of annular flanges disposed longitudinally thereof and integrally with said tube.

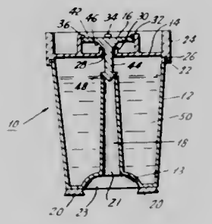
4,896,381
COMBINATION PLASTER GUARD AND MOUNTING BRACKET FOR MIXING VALVE
Joe D. Hutto, Fort Myers, Fla., assignor to Masco Corporation of Indiana, Taylor, Mich.
Filed Mar. 7, 1988, Ser. No. 164,753
Int. Cl.[4] E03C *1/00*
U.S. Cl. 4—191 10 Claims

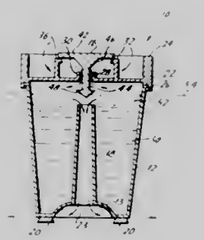


1. A combination plaster guard and mounting bracket assembly for a wall mounted faucet valve characterized by:
- a rear mounting bracket section having mounting means for mounting onto a faucet valve assembly;
- said mounting bracket section having an opening therethrough for receiving a faucet valve housing and constructed to allow the faucet valve housing to extend forwardly therefrom;
- a removable tubular plaster guard member extending from said mounting bracket section and generally coaligned with said opening and sized to receive said faucet valve housing therein;

connecting means for releasably connecting said tubular member to said mounting bracket section so that said tubular member must be disconnected from said mounting bracket section and removed from about said faucet valve before installation of an escutcheon plate and a valve handle onto said valve housing.

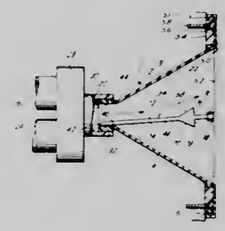
4,896,382
AUTOMATIC TOILET BOWL CLEANER WITH A METERED DISPENSING OF CLEANING COMPOSITION
John E. Sokol, Spring Lake Heights, and Peter J. Mackinson, Basking Ridge, both of N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.
Filed Dec. 5, 1988, Ser. No. 279,919
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—228 7 Claims





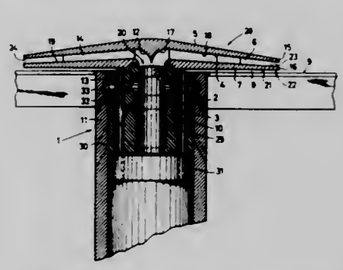
1. A bottom-of-the-tank toilet bowl cleaning device, comprising:
- a container for holding cleaning composition, said container having a substantially vertically oriented tube for dispensing said cleaning composition;
- a cover which fits over said container, said cover having a vent aperture; and,
- a float which cooperates with said tube of said container and said vent aperture of said cover, said float being disposed in a first position in which it closes both said vent aperture and tube for storage of said device, said float being movable when said device is in use between a second position in which it closes said vent aperture and prevents air from entering said container, and a third position in which said float opens said vent aperture to allow air to enter said container and displace a mixture of cleaning composition and water above said tube, thereby dispensing said mixture of water and cleaning composition through said tube into the toilet tank.

4,896,383
WATER TANK JET
Dean W. Morgan, 115 Woodland Trail, Leander, Tex. 78641; Walter R. Morgan, and Cindy S. Heller, both of 1737 Berwin La., Eugene, Oreg. 97407
Filed Mar. 31, 1988, Ser. No. 176,383
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 9 Claims



1. An apparatus for discharging a fluid stream into a spa tank or the like for subjecting a user's body to the massaging action of a moving fluid stream, said apparatus comprising:
- a housing having an inlet for receiving said fluid stream and an outlet for discharging said stream;
- supply means for providing the fluid stream to the inlet of the housing; and
- a substantially rigid guide means having one end pivotally mounted to the housing and its free, opposed end positioned adjacent the inlet of said housing, said guide means being adapted for reciprocating between first and second positions in response to said fluid stream to redirect the fluid stream within the housing.

4,896,384
DISCHARGE NOZZLE FOR THE DISCHARGE VALVE OF A WHIRLPOOL TUB
Okko K. Dijkhuizen, WE Roden, Netherlands, assignor to Ucosan B.V., Roden, Netherlands
Filed Nov. 17, 1987, Ser. No. 122,238
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3440497
Int. Cl.[4] A61H *33/06*
U.S. Cl. 4—542 23 Claims



1. A discharge nozzle of an outlet valve of a whirlpool tub, said nozzle comprising:
- a valve body having a water duct and an air duct defined therein;
- a solid disk-shaped distribution element extending over said valve body.
- said disk-shaped distribution element having an inner surface facing said valve body and between which inner surface

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and valve body a circular discharge duct and a circular intervening space are defined,

said circular intervening space defined radially outwardly of said circular discharge duct, the water duct of said valve body open to said circular discharge duct in a manner in which water is radially discharged from said discharge duct, and the air duct of said valve open to said circular intervening space;

a piston confronting said disk-shaped distribution element, located concentrically with respect to the water duct of said valve body and slidably mounted in the nozzle so as to be slidable in the nozzle relative to said valve body toward and away from said disk-shaped distribution element,

said piston having an outer surface facing the inner surface of said disk-shaped distribution element,

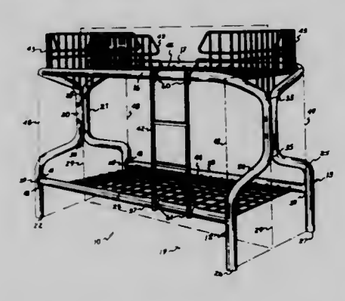
of said circular intervening space and said circular discharge duct, at least said circular discharge duct defined between the outer surface of said piston and the inner surface of said disk-shaped distribution element, and

said piston being movable to a closed position at which said piston contacts said disk-shaped distribution element and, of said water duct nd said air duct, at least said water duct being sealed by the contact between said piston and said disk-shaped distribution element.

4,896,385
BUNK BED FRAME

Rafael T. Bastos, Alpharetta, Ga., assignor to Leggett & Platt, Inc., Carthage, Mo.

Filed Aug. 25, 1988, Ser. No. 236,655
Int. Cl.[4] A47C *19/20*
U.S. Cl. 5—9 R **14 Claims**



1. A bunk bed frame comprising:

a pair of rigid members having spaced, horizontally disposed midportions and first and second end portions, said first and second end portions extending from opposite ends of said respective midportions, said first end portions converging to a first point of convergence on a mid plane between said midportions, said first end portions extending vertically in juxtaposition to a second point of convergence below said first point, said first end portions diverging from said second point of convergence and then extending vertically to contact a support surface, said first end portions being secured in juxtaposition between said first point and said second point;

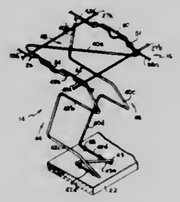
said second end portions being mirror images of their respective first end portions with respect to said mid plane and a center plane extending transversely of the bed; and

a pair of horizontally extending supports connecting said first end portions to said respective second end portions below said second points of convergence.

4,896,386
BEDDING FOUNDATION HAVING SNAP-IN PLACE FORMED WIRE SPRINGS

Steven E. Ogle, and Richard D. Seneker, both of Carthage, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 14, 1988, Ser. No. 167,387
Int. Cl.[4] A47C *23/04*
U.S. Cl. 5—247 **13 Claims**



2. A bedding foundation assembly comprising,

a bottom, substantially rectangular, horizontal base frame having side and end members and slats extending between said side members,

a substantially planar, horizontal, rectangular top wire grid, said grid comprising a border wire and first and second sets of wires, said border wire being of rectangular configuration and surrounding said first and second sets of wires, said first set of wires comprising a plurality of longitudinally extending, spaced, parallel wires and said second set of wires comprising a plurality of transversely extending, spaced, parallel wires, said first and second sets of wires intersecting one another and being fixedly connected to said border wires, pairs of said longitudinally extending wires and pairs of said transversely extending wires defining rectangular pockets for the reception of formed wire springs,

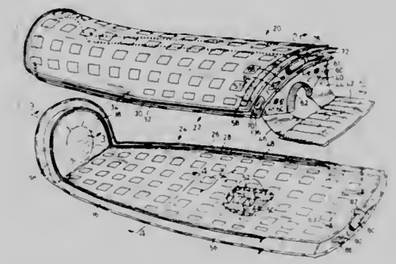
a plurality of formed wire springs interconnecting said base frame and said wire grid, each of said formed wire springs comprising a single length of wire of a first diameter, said length of wire being formed into a pair of substantially vertical resilient legs interconnected by a flat, horizontal, Z-shaped section, said flat, horizontal, Z-shaped section of each of said formed wire springs being secured within one of said pockets of said wire grid and the ends of said vertical legs of each of said formed springs remote from said flat, horizontal, Z-shaped section being fixedly secured to said base frame, and

said flat, horizontal, Z-shaped section of each of said formed wire springs including a pair of parallel torsion bars each connected at one end to opposite ends of a diagonal connector bar and each connected at the opposite end to one of said vertical legs, said flat, horizontal, Z-shaped section being connected to said top wire grid by snap-fit connector means, said snap-fit connector means comprising opposite end portions of said diagonal connector bar of said Z-shaped section being located over opposed wires of one of said first and second sets of wires of said grid and portions of each torsion bar of said pair of torsion bars of said flat, horizontal, Z-shaped section being located beneath an upwardly offset section of one wire of the other of said first and second sets of wires of said grid, said upwardly offset section of said one wire having a downwardly extending depression formed therein for locking said flat, horizontal, Z-shaped section of said formed wire spring within said pocket.

4,896,387
INSULATED SLEEPING BAG

Richard E. Malcolm, and Charles G. Shepherd, both of Oakville, Canada, assignors to Sleeping Bag Limited Partnership, Ontario, Canada

Filed Mar. 28, 1988, Ser. No. 174,305
Claims priority, application Canada, Mar. 27, 1987, 533230
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—413 **10 Claims**



1. An inflatable sleeping bag comprising:

an inflatable upper component having inner and outer skins and means limiting the separation of the skins when inflated, the upper compartment having a natural curved configuration when inflated to cover a user without support by the user;

a lower component coupled to the upper component to define a sleeping envelope and an opening for entry where the user's head and shoulder's will be positioned;

a shoulder cover dependent from the upper component and defining a neck collar and two flaps, one to each side of the user's neck;

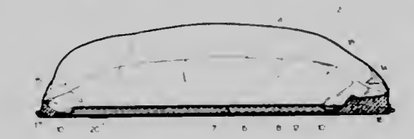
an inflatable pillow support on said flaps; and

means locating the flaps on the lower component to substantially seal the envelope when the user is inside and the neck collar is about the user's neck.

4,896,388
WATER PILLOW

Maurice R. Bard, 38 Hirondelle Place, Don Mills, Ontario, Canada (M3A 1V8)

Continuation-in-part of Ser. No. 192,783, May 10, 1988, Pat. No. 4,847,931. This applicatioo Sep. 30, 1988, Ser. No. 251,240
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—441 **41 Claims**

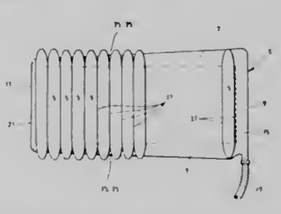


1. A pillow casing comprising a first surface and a connected second surface which cooperate to define an enclosure for receiving a compressible filler therein, said pillow casing further including a thin envelope layer intermediate said surfaces and attached to said second surface at sufficient points such that the envelope is secured to and essentially immediately above the second surface to maintain said envelope layer and said second surface in overlapping relationship, said envelope layer being adapted to sealably receive a fluid-like material therein to form a thin fluid-like layer remote and isolated from said first surface when said compressible filler is received in said enclosure, said filler when received in said enclosure being supoorted by said envelope layer to effectively float such received compressible filler on such fluid-like material received in said envelope.

4,896,389
INFLATABLE AIR MATTRESS

Paul Chamberland, Pointe Claire, Canada, assignor to S.S.I. Medical Services of Canada Inc., Pointe Claire, Canada

Filed Jun. 10, 1988, Ser. No. 204,732
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—453 **8 Claims**



1. An inflatable air mattress formed from a one piece elongated body having an air inlet end and a terminal end comprising:

a substantially planar lower portion having a longitudinal air distribution channel along each longitudinal side;

an upper portion comprising a plurality of straight elongated pillow-like air tunnels;

said air tunnels disposed transverse of said body adjacent to and parallel with each other;

said air tunnels being sealed from said lower portion along substantially all their length;

each of said air tunnels having an opening at each end thereof to be in fluid communication with said distribution channels;

each of said air tunnels being integrally formed with a small air pocket at each end, each said pocket extending over and covering the adjacent distribution channel, thereby to increase the width of the mattress;

an open transverse plenum conduit at an inlet end of said body, said conduit opening into said distribution channels, where by said channels, said air tunnels and said plenum conduit communicates with each other; and

air pressure source means operatively connected to said transverse plenum conduit for supplying said conduit, said channels and said tunnels with pressurized inflation air.

4,896,390
LIQUID MIXING PADDLE HAVING DISPOSABLE SLEEVE

Will G. Durant, 248 Quincy, Long Beach, Calif. 90803

Filed Jan. 9, 1989, Ser. No. 294,238
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—105 **40 Claims**

1. A tool comprising:

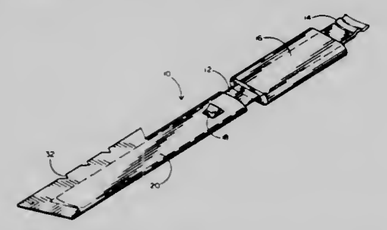
a blade portion having a handle region and an elongated member extending from said handle region;

a sleeve portion having a pocket for receiving said elongated member in surrounding engagement therewith;

means for removeably affixing said blade portion to said

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sleeve portion for removal and replacement of said sleeve portion:



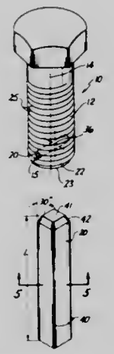
said sleeve portion comprising a flat border along at least one edge of said pocket, said border having a rigid tapered corner for use as a tool element.

4,896,391

METHOD OF FORMING A SELF-LOCKING FASTENER

Terry J. Rowley, Fairfield, Ohio, assignor to Long-Lok Fasteners Corporation, Lancaster, Tex.

Division of Ser. No. 629,200, Jul. 9, 1984, abandoned. This application Mar. 31, 1989, Ser. No. 331,512
Int. Cl.[4] B21K *1/44, 1/56*
U.S. Cl. 10—10 P **1 Claim**



1. A method of fabricating a self-locking fastener of the type described having a temperature stability of up to about 550 degrees F., comprising:

providing a pre-threaded externally threaded fastener element which includes at least a portion of the outer surface which is threaded and which includes crests with adjacent flanks and valleys therebetween,

providing a circular aperture through said externally threaded fastener element which is off-center with respect to the center axis of said fastener element and which extends from one side thereof to the other,

providing a non-circular locking element of a polyimide plastic material having a temperature stability of up to about 550 degrees F. and being proportioned to be received and locked into said aperture, said locking element being provided with a pair of opposed end faces, at least one of said end faces being tapered to facilitate insertion of said locking element into said aperture, and wherein the length of the locking element is greater than the major diameter of the fastener element,

assembling said locking element into the aperture of said fastener element by inserting said locking element into said aperture in a manner wherein said tapered end face is first positioned therein, continuing to forcibly insert said locking element into said aperture and press fitting the same completely into said aperture such that said end faces of said locking element are positioned radially beyond said valleys and said crests and are spaced from each other and form an angle therebetween of between 130 and 170 degrees as measured along the threaded periphery of said fastener, said locking element being retained in said aperture by said press fit, and

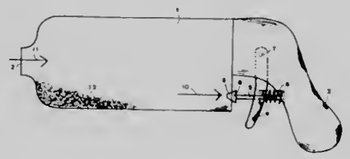
thereafter finishing said end faces of said locking element such that said end faces are positioned radially beyond said valleys but not more than a predetermined distance of about 0.003 of an inch beyond the crests of said threads.

4,896,392

CLEANING DEVICE

Harold L. Hull, 401 Canyon Way, Sp. 43, Sparks, Nev. 89431, and Charles Partee, P.O. Box 331, Janesville, Calif. 96114

Filed Mar. 28, 1988, Ser. No. 173,866
Int. Cl.[4] E04H *3/20*; F04F *10/00*
U.S. Cl. 15—1.7 **7 Claims**



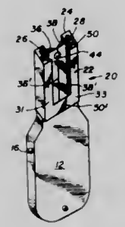
1. A cleaning device comprising a cylinder with an opening at a first end, said opening being substantially smaller than said cylinder, a debris retaining chamber in said cylinder, a handle mounted at a second end of said cylinder, a vent opening in said cylinder adjacent said handle, a valve means mounted on said handle positioned to open and close said vent opening, and means on said handle to move said valve means, to open and close said vent opening.

4,896,393

DIP-STICK WIPER WITH BUILT-IN OIL DETAINER

Hector M. Avila, Jr., 234 E. Empire St., San Jose, Calif. 95112

Filed Nov. 25, 1988, Ser. No. 275,950
Int. Cl.[4] A47L *25/00*
U.S. Cl. 15—210 B **18 Claims**



1. A oil-dip stick wiper for use in wiping used oil from a dip stick, comprising:

a main body portion which a hand may grip;

a dip-stick wiper-section extending from said main body portion, said wiper-section comprising a frame, a pair of oppositely-disposed wiper-blades mounted on said frame, each of said pair of wiper-blades having an elongated wiping blade edge-surface, said wiping blade edge-surfaces lying parallel and in at least close proximity to each other, whereby an oil-dip stick inserted therebetween, may be pulled therebetween to thereby wipe off the oil adhered to a lower section thereof;

said frame comprising at least one elongated channel juxtapositioned adjacently to at least one of said pair of wiper-blades, whereby said at least one channel catches the wiped-off oil from said blade edge-surfaces to detain the wiped-off oil therein until subsequent draining thereof;

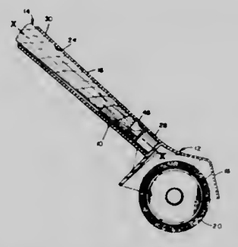
said at least one channel being a horizontal channel extending substantially along the width of both of said pair of wiper-blades, each said wiper-blade defining a lowermost section, said horizontal channel being juxtapositioned opposite said lowermost section of each said wiper-blade.

4,896,394

TOOL WITH EXTENSIBLE HANDLE

Richard A. Lian, Minneapolis, and Scott R. Parizek, Fridley, both of Minn., assignors to Padco, Inc., Minneapolis, Minn.

Filed Jun. 9, 1988, Ser. No. 204,500
Int. Cl.[4] B05C *17/02*; F16B *7/18*
U.S. Cl. 15—230.11 **12 Claims**



1. An insert for a tool having a handle extending from a first end to a free second end, said handle having a hollow bore extending therethrough with an axis of said bore generally aligned with an axis of said handle and having a reduced diameter portion generally near said first end, said bore extending through said free end and exposed to an exterior of said handle, said insert comprising:

an insert body having a longitudinal axis, said body sized to be inserted within said bore at said free end and moved through said bore to an inserted position adjacent said first end, said longitudinal axis disposed generally parallel to said bore axis when said body is in said inserted position;

affixing means for fixing said body in said inserted position, said affixing means including a disc connected to said body disposed generally perpendicular to said longitudinal axis, said disc having a diameter greater than said reduced diameter bore portion but said disc being slightly flexible to permit said disc to move past said reduced diameter portion as said body is moved into said inserted position.

4,896,395

REARVIEW MIRROR WIPER ATTACHMENT

Kendall G. Bissell, 8698 Caselman Rd., Sacramento, Calif. 95828

Filed Nov. 3, 1988, Ser. No. 266,889
Int. Cl.[4] B60S *1/10*
U.S. Cl. 15—250 B **14 Claims**

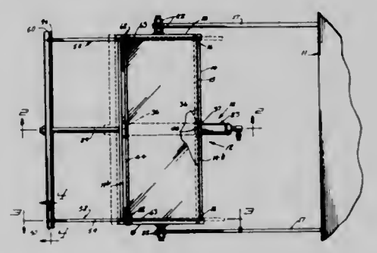
1. A wiper attachment mountable to a conventional vehicle rearview mirror having a mirror surface mounted to a mirror frame, the attachment being adapted to mount a wiper blade for wiping movement across the mirror surface, the wiper attachment comprising:

a single elongated double acting fluid powered cylinder having a piston rod therein with an outward end movable responsive to fluid pressure within the cylinder along a piston rod axis through an extension stroke wherein the piston rod end is moved outward of the cylinder to an extended position spaced from the cylinder and a retraction stroke wherein the piston rod end is moved along the piston rod axis to a retracted position adjacent to the cylinder;

control means adapted to connect the cylinder to a source of fluid under pressure and operable to alternatively direct fluid under pressure into the cylinder to thereby cause the piston rod to move through the extension or retraction stroke;

a mount adapted to secure the cylinder to the mirror frame;

an elongated yoke attached at its approximate center along the length thereof to the piston rod for movement therewith;



"L"-shaped links each having a first leg thereof mounted to the yoke at a position along the yoke spaced from the piston rod and having a second leg joined to the first leg and extending to an end overlapping the piston rod;

link adjusting means on the yoke for selectively adjusting the distance from the yoke to the second legs of the "L"-shaped links;

a wiper blade mount adapted to releasably receive a wiper blade; and

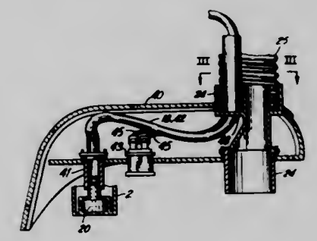
wiper blade mount adjusting means, mounting the wiper blade mount to the second legs of the "L"-shaped links for selectively positioning the wiper blade mount along the second link legs toward or away from the first legs thereof.

4,896,396

ELECTRICAL HOUSEHOLD APPLIANCE FOR STEAM CLEANING

Giuseppe Giannelli, Olginate Comasco, Italy, assignor to MICROMAX S.p.A., Como, Italy

Filed Oct. 25, 1988, Ser. No. 262,490
Claims priority, application Italy, Nov. 16, 1987, 22649 A/87
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—321 **9 Claims**



1. An electrical household appliance for steam cleaning having a monocoque body comprising;

a steam generator in said body including a boiler and a steam delivery conduit extending from the boiler;

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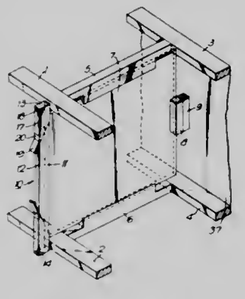
an electrical aspirator in said body for drawing fluid and matter suspended therein;
a container in said body for collecting matter from said drawn fluid in communication with said aspirator; and
a tubular suction conduit extending from said container, and comprising a sleeve associated with an inner wall of said suction conduit, wherein a portion of said steam delivery conduit extending from said steam generator lies within said sleeve, said electrical aspirator drawing fluids and suspended matter through said suction conduit.

4,896,397

PRINTED CIRCUIT BOARD HANDLING DEVICE

Kenneth F. Elliott, Ferring, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1989, Ser. No. 355,125
Claims priority, application United Kingdom, Jun. 9, 1987, 8713459
Int. Cl.[4] B25G *3/38*
U.S. Cl. 16—114 R **8 Claims**



1. A handling device suitable for manually inserting and removing a printed circuit board into and from a rack, said device comprising a rigid elongate member adapted to be attached to a printed circuit board at one end thereof substantially in the plane of the board, and further comprising two ejector levers pivotably attached to the elongate member respectively, one at each end thereof, each lever being manually rotatable in the plane of the board about a respective pivot from an inoperative position to an operative position in which, when the board is mounted in the rack and the levers are pivoted from their inoperative positions to their operative positions, each lever engages the rack for exerting a moment on the device tending to withdraw the board from the rack, wherein the device comprises two resiliently deformable elements each adapted to urge a respective one of the levers towards said inoperative position, in which position neither lever engages said rack.

4,896,398

DEVICE FOR INCREASING THE RESISTANCE OF MECHANISMS CONTROLLING THE POSITIONS OF A VEHICLE SEAT

Yves Pipon, and Bernard Chales, both of Orne, France, assignors to A. & M. Cousin Etablissements Cousin Freres, Orne, France

Continuation of Ser. No. 076,330, Jul. 22, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,774
Claims priority, application France, Jul. 26, 1986, 86 10606
Int. Cl.[4] B60N *1/00*
U.S. Cl. 16—337 **3 Claims**

1. In a device for increasing the resistance and durability of an articulation mechanism used to control the tilting angle of the back portion of a seat, or the height of the seat, in order to control the position of the seating portion, such articulation mechanism including a fixed first flange rigidly connected with a fixed member of the seat, and a movable second flange rigidly connected with another movable part of the seat, said first and second flanges being rotatable relative to one another via a continuous or discontinuous mechanical assembly having a temporary locking of said movable part with respect to the fixed part, comprising the improvement in combination therewith wherein:
said fixed first flange has a peripheral portion, in the vicinity of which is provided a first fine continuous circular toothing, and said second movable flange has a peripheral circular element that is provided with a second fine continuous circular toothing, with said first and second fine continuous circular toothings facing each other along all peripheries thereof although not contacting one another



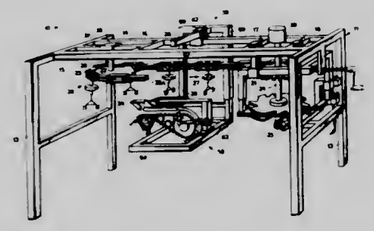
during normal operation of said articulation mechanism and no matter the position of the movable flange with respect to the fixed flange, but rather being adapted to contact one another in meshing relationship particularly along a given length in said position of the movable second flange with respect to the fixed first flange, when said articulation mechanism is temporarily distorted resiliently as a consequence of a sudden shock, in order to increase the resistance and durability so that said first and second fine continuous circular toothings under a small torque reactivate said fixed first flange and said movable second flange to avoid deformations and ruptures that could bring about destruction of said mechanism,
means via which cylindrical or circular articulation is controlled by a reversible-irreversible mechanism which is an epicyclic train.

4,896,399

ADJUSTABLE POULTRY CARCASS SEPARATOR

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands

Filed Jan. 31, 1989, Ser. No. 304,542
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 **11 Claims**



1. A poultry processing apparatus of the type used to separate parts of poultry carcasses as the carcasses are suspended

invertedly by their legs and conveyed in series along a processing path, comprising
a rotary guide wheel rotatable about an approximately upright axis, with the periphery of the guide wheel to be positioned in the path of the carcasses, said guide wheel including a series of generally radially extending protrusions with poultry part receiving recesses formed between said protrusions with the recesses sized and shaped to receive and guide the portions of the carcass to be separated,
cutting means positioned adjacent the peripheral portion of said guide wheel arranged for cutting the poultry parts guided by said guide wheel,
a recess size adjustment member including an edge portion located adjacent the bases of the recesses as the recesses move adjacent said cutting means, with said size adjustment member and said guide wheel being positioned in relative overlying relationship, and
means for changing the position of said recess size adjustment member to move the edge portion of said recess size adjustment member outwardly of the guide wheel to effectively cover an increased portion of the recesses of the guide wheel or to move the edge portion of said size adjustment member inwardly of the guide wheel to effectively cover less of the recesses of the guide wheel.

4,896,400

METHOD AND APPARATUS FOR PROCESSING TEXTILE FIBERS IN PARTICULAR COTTON FIBERS IN PRESSED BALES FOR REMOVING THEREFROM ADHERING ORGANIC WASTE RELEASED BY INSECTS

Edoardo Polli, via Petrarca, 20—20123 Milano, Italy

Filed Jul. 19, 1988, Ser. No. 221,317
Claims priority, application Italy, Jul. 21, 1987, 21377 A/87
Int. Cl.[4] D01B *1/48*
U.S. Cl. 19—0.27 **7 Claims**



1. A method for processing textile fibers, in particular pressed cotton bales for removing from said textile fibers insect excrements wherein said method comprises the steps of:
supplying, in a substantially continuous way, a plurality of pressed cotton bales to a processing tunnel,
irradiating said pressed cotton bales in said tunnel by microwaves having set frequency and power, said microwaves being adapted to dry said excrements, and
removing from said tunnel the thus processed cotton bales.

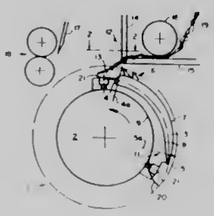
4,896,401

COMBING CYLINDER FOR A COMBING MACHINE

Hermann Ganser, Frauenfeld, Switzerland, assignor to Galipag, Frauenfeld, Switzerland

Filed Apr. 14, 1988, Ser. No. 181,488
Claims priority, application Switzerland, Apr. 15, 1987, 466/87
Int. Cl.[4] D01G *19/04*
U.S. Cl. 19—233 **9 Claims**

1. A combing cylinder in combination with a combing machine, said combing cylinder comprising:
a body having an outer curved surface; and
a wing-shaped combing segment secured to said body at a predetermined distance radially outward of said outer curved surface thereof, said wing-shaped combing segment having a front end and a rear end and also an outer surface and an inner surface, the latter of which, together



with a portion of said outer curved surface of said body defines an air flow passageway therebetween.

4,896,402

CABLE TIE

George A. Jansen, Denver, and Hans R. Hinnen, Lakewood, both of Colo., assignors to Band-It-IDEX, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 152,909, Feb. 5, 1988, abandoned. This application Dec. 2, 1988, Ser. No. 279,576
Int. Cl.[4] B65D *63/02*
U.S. Cl. 24—20 R **10 Claims**



1. A clamping device for reducing the size of any gap between the object constrained and band portions adjacent the object, comprising:
a band section for wrapping around an object, said band section having a first free end and extending in a first plane; and
a buckle section integrally formed with said band section, said buckle section including a first portion operatively connected to said band section and extending substantially in said first plane, said buckle section further including a second portion having a second free end, said second free end being located on the opposite end of said buckle section from which said band section extends, substantially all portions of said second portion being longitudinally offset from said first portion and extending in a second plane different from said first plane, said buckle section further including a slot intermediate said first portion and said second portion for receiving said first free end;
wherein said second portion including said second free end thereof is positioned in non-contacting relation with the object being constrained during the tightening of said band section about the object and in which substantially all of said first portion of said buckle section contacts the object after the object has been constrained and with said first free end of said band section being located outwardly of portions of said band section to which it is adjacent after said clamping device is tightened and locked.

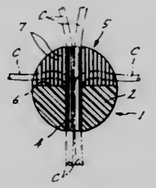
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,403

DOUBLE CORD CLINCH

Gregory C. Vouros, 2120 8th Ave. W., Seattle, Wash. 98119

Filed Jun. 15, 1988, Ser. No. 207,074
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—130 2 Claims



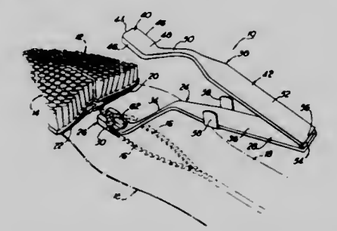
1. A clinch for a double cord comprising a body having a passage therethrough for snug reception therein of a double cord and a flaring mouth in communication with said passage and disposed generally coplanar with said passage and extending to a margin of said body, said flaring mouth having an inner extremity extending on a line perpendicular to and on both sides of said passage and opposite friction sides flaring from said inner extremity for gripping the cords of the double cord when the cords are spread apart, said opposite friction sides having teeth parallel to and at opposite side of said passage extending substantially from said inner extremity of said flaring mouth to the margin of said body.

4,896,404

CLOSURE DEVICE FOR ARTIFICIAL TURF SECTIONS

Bernard L. Garner, St. Louis, Mo., assignor to Astroturf Industries, Inc., Dalton, Ga.

Filed Feb. 27, 1989, Ser. No. 316,508
Int. Cl.[4] A44B *19/26*
U.S. Cl. 24—415 9 Claims



1. A device for joining juxtaposed sections of artificial turf having rows of interlockable elements disposed along opposed edges of said turf sections, comprising:

(a) a first body member comprising a first head portion and a first handle connected about one of its ends to said first head portion;

(b) a second body member comprising a second head portion and a second handle connected about one of its ends to said second head portion, said first and second head portions being selectively movable into and out of spaced apart overlying relationship by means of manipulating said handles; and

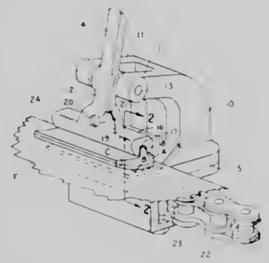
(c) guide means provided on at least one of said first and second head portions for guiding said interlockable elements into engaged and disengaged relationship when said first and second head portions are in overlying relationship.

4,896,405

TENTER CLIP

Robert S. Simmons, Warwick, R.I., and James P. Unger, Mansfield, Mass., assignors to Marshall and Williams Company, Greenville, S.C.

Continuation of Ser. No. 147,120, Jan. 21, 1988, abandoned, which is a continuation of Ser. No. 25,658, Mar. 13, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 220,402
Int. Cl.[4] D06C *3/04*
U.S. Cl. 26—93 1 Claim



1. In a tenter clip having a movable jaw carrying a longitudinal gripping member opposite a horizontal base member for clamping an edge of sheet material of any thickness within a range defined by clip size, said sheet material being carried in open width, said longitudinal gripping member comprising:

a rigid horizontal plate having a partially cylindrical convex lower surface extending longitudinally along a lower portion of said jaw opposite said base member;

said partially cylindrical convex lower surface being a portion of a cylinder of greater dimension than said clip size;

means securing said plate to said jaw;

a shoe constructed of a thickened layer of deformable rubbery material extending longitudinally and being attached to said partially cylindrical convex lower surface of said plate;

a partially cylindrical convex gripping surface in said thickened layer of deformable rubbery material clamping said edge of sheet material against said base member; and

said gripping surface being dformable and of sufficient thickness so that when the thickened layer is attached to the partially cylindrical convex lower surface of said rigid horizontal plate a large flat gripping surface area of compressed rubbery material is in engagement with said edge of sheet material against said base member confining the sheet material between the base member and the gripping surface to exert a gripping force across an extended flat area of said shoe;

said partially cylindrical convex lower surface of said rigid plate presenting an identical curved surface to every thickness of sheet material within the range of the clip size and thereby presenting a uniform flat gripping surface area to every thickness of sheet material within the range of the clip size;

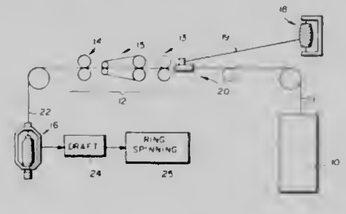
whereby said large flat gripping-surface decreases required clamping pressure.

4,896,406

METHOD FOR PRODUCING SHEETING PRODUCTS FROM YARN HAVING SHEATH AND CORE CONSTRUCTION

Joo Weingarten; Richard M. Altman, both of Weston, Conn.; Maura T. Buckley, Hoboken, N.J., and Kim L. Leipham, New York, N.Y., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 191,764, May 3, 1988, abandoned, which is a continuation of Ser. No. 872,853, Jun. 11, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 328,782
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.
Int. Cl.[4] D02G *3/00*; D01H *5/28*
U.S. Cl. 28—166 9 Claims



1. A method of producing a sheeting product comprising the steps of:

(a) providing a yarn having a sheath and core configuration with the sheath completely covering the core and comprising between about 68–83 percent of the yarn, the sheath fibers comprising cotton and the core fibers comprising staple polyester fibers;

said yarn formed by utilizing a drafting apparatus comprising front and back rollers, with an apron therebetween, and by:

(i) feeding a sliver of sheath fibers, and a roving of core fibers, to the drafting apparatus so that the roving of core fibers is at the center line of, and on top of, the sliver of sheath fibers, wherein the roving of core fibers is a roving having a twist multiple of about 0.25–0.8 turns per inch;

(ii) passing the roving and sliver together through the rear rolls, apron, and front rolls of the drafting apparatus to produce a drafted composite sliver; and

(iii) mechanically imparting a twist to the drafted composite sliver to produce a composite roving having a core and a sheath covering the core;

(iv) drafting and spinning the composite roving to produce the yarn;

(b) circular knitting the yarn into a fabric; and

(c) forming the fabric into a sheeting product.

4,896,407

AIR PRESSURE CONTROL FOR YARN TEXTURING PROCESSES

Olin D. Haynes, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 3, 1989, Ser. No. 318,252
Int. Cl.[4] D02G *1/00*; D02J *1/00*
U.S. Cl. 28—248 4 Claims

4. Apparatus to texture continuous filament synthetic yarn comprising: a yarn texturing system using an air jet, conduit means supplying air under pressure to said air jet, a first means operably associated with said conduit means measuring pressure of the air in said conduit means, automatically controlled valve means upstream of said first means to control the pressure of air in said conduit means and a pressure controller means operably connected to said valve means receiving a signal from said first means and the actual speed of the yarn



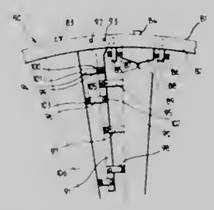
texturing machine to control the opening and closing of said valve means.

4,896,408

METHOD OF REPAIRING TURBINE BLADES

Michael J. Fraser, Broughton Hackett, England, assignor to Refurbished Turbine Components Limited, Droitwich, England

Filed Aug. 5, 1988, Ser. No. 229,141
Claims priority, application United Kingdom, Aug. 8, 1987, 8718837
Int. Cl.[4] B21K *3/04*
U.S. Cl. 29—156.8 B 13 Claims



1. A method of repairing a turbine blade of the type present in a turbine blade array in which a plurality of such blades are attached to a circumferential shroud, each blade having at least one tennon which extends into an aperture such that each blade is secured to the shroud, said method of repair comprising the steps of:

(a) forming a new part which comprises a new tennon and at least an end part of a turbine blade;

(b) removing the shroud from the end of the blade to be repaired and from at least one adjacent blade;

(c) removing the old tennon and in addition a part of the turbine blade;

(d) providing location means adapted to:

(i) locate on said new tennon and blade part;

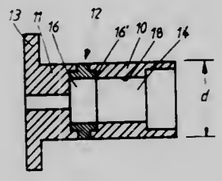
(ii) locate with at least one adjacent blade in said array;

(e) locating said locating means on the new tennon and blade part and on at least one adjacent blade to accurately locate said new tennon and blade part in a predetermined desired position;

(f) securing said new tennon and blade part to the turbine blade being repaired while the new tennon and blade part is being located by said location means.

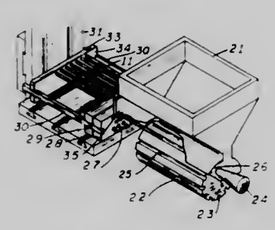
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,409
METHOD OF PRODUCING A ROTATIONALLY-SYMMETRICAL HOUSING, IN PARTICULAR A VALVE HOUSING
Arne Rösch, Haldenwang, and Horst Stade, Blaichach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Nov. 21, 1985, Ser. No. 800,500
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502287
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.1 R **4 Claims**



1. A method of producing a hollow cylindrical body having two magnetizable body parts separated by a non-magnetic material from a piece of magnetizable stock comprising the steps of: machining said chylindrical body to produce a cylindrical outer wall of uniform diameter with a flange at one end thereof, forming an axial through bore in said body, said through bore having successively different diameters, machining an annular recess in said through bore in one of said diameters, heating said cylindrical body in an area of said annular recess while rotating the same, introducing a fluid filler of non-magnetizable material into said annular recess while continuing to rotate said body, cooling said body, and turning said outer wall of said cylindrical body to expose said non-magnetic filler material, thereby producing axially spaced magnetizable cylindrical body portions secured by a non-magnetizable cylindrical body portion of filler material having the same radial thickness as said axially spaced body portions secured to said filler material.

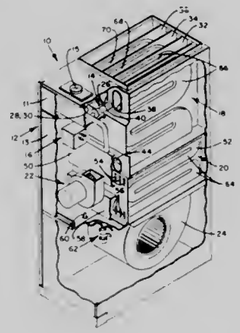
4,896,410
METHOD OF ASSEMBLING TUBE ARRAYS
J. B. Spitzmesser; R. J. Cameron; F. D. Doty, all of Columbia, and Brian L. Miller, Elgin, all of S.C., assignors to Doty Scientific Inc., Columbia, S.C.
Continuation-in-part of Ser. No. 226,042, Jul. 29, 1988, abandoned. This application May 24, 1989, Ser. No. 356,116
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.3 C **22 Claims**



1. A method for the automated assembly of arrays of microtubes, each of which has previously been finished to the required length, into parallel, planar rows and pressing header tubestrips, each of which has holes to receive the microtubes, said holes sized to permit interference fit, onto opposite ends of said microtubes, comprising the steps of:

(1) inserting the tubes into parallel, precision, non-sacrificial spacer forms, similar in hole pattern to the header tubestrips but with precision, slip-fit countersunk holes; (2) sliding the spacer forms apart to near opposite ends of the tubes; (3) securing caps over the ends of the tubes to secure the tube ends; (4) placing the tube-spacer-cap fixture assembly in a suitable mold; (5) pouring a molten, fusible alloy into the heated mold; (6) cooling the mold below the solidus temperature of the fusible alloy; (7) removing the encapsulated assembly from the mold; (8) sliding off the securing caps and spacer forms, thereby exposing the tube ends; (9) loading the assembly into a fixture which holds the encapsulated assembly, and which holds header tube strips in alignment with the tube ends of the encapsulated assembly at the two opposite ends of the tubes; (10) pressing the header tubestrips onto opposite ends of the tubes; and (11) melting the fusible alloy and cleaning it from the assembly.

4,896,411
METHOD OF MAKING A MULTIPLE CELL CONDENSING HEAT EXCHANGER
Daniel J. Dempsey, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.
Division of Ser. No. 729,765, May 2, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,989
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—157.3 D **4 Claims**



1. A method of manufacturing a condensing heat exchanger having a high velocity multiple-pass flow passage with an inlet and an outlet from a single flat sheet metal blank, comprising the steps of:

providing a single flat sheet metal blank,

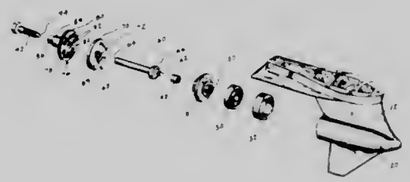
designing a prefolded high velocity flow passage pattern with a cross section of alternate planar and convex portions of selected dimensions and shape,

forming the designed prefolded high velocity flow passage pattern into a section of the flat sheet metal blank with said planar portion being in the plane of the flat sheet metal blank,

folding said formed sheet so that said planar portions abut against similar other planar portions and said concave portions register with similar other concave portions to collectively form the entirety of a high velocity multiple-pass flow passage having an inlet and an outlet, and

sealing selected edge portions of the folded sheet.

4,896,412
ASSEMBLY TOOL FOR MARINE DRIVE LOWER GEARCASE
Randall R. Meisner, Berlin, and Gary C. Ploeske, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Feb. 27, 1989, Ser. No. 316,093
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—263 **9 Claims**



1. In a marine drive having a lower gearcase with a vertical driveshaft having a lower pinion gear driving a driven gear at the front of a torpedo housing, said driven gear driving a horizontal propeller shaft extending rearwardly out of said torpedo housing, said torpedo housing having a rearwardly opening bore which is threaded at a rear portion and which has a front reduced diameter portion for receiving and retaining said driven gear which is press-fit forwardly into said front portion of said bore, a tool for installing said driven gear in said bore in said torpedo housing and press-fitting said driven gear into said front portion of said bore without impacting said gear with hammer blows or the like, comprising:

an axial shaft with front and rear ends and an annular shoulder proximate said front end, said front end being insertable into said driven gear with said annular shoulder engaging said driven gear;

a shaft aligner comprising an annular disc having an outer circumference externally threaded to mate with said threaded rear portion of said bore of said torpedo housing;

means cooperating with said axial shaft and said shaft aligner and rotatable about the axis of said axial shaft to apply axial force against said axial shaft to push said axial shaft forwardly such that said annular shoulder of said axial shaft pushes said driven gear forwardly and press-fits said driven gear into said reduced diameter front portion of said bore in said torpedo housing.

4,896,413
METHOD OF REMOVING A COAL MILL ROLL BEARING RACE
Charles M. Wisner, 4407 Cogbill Rd., Richmond, Va. 23234
Division of Ser. No. 929,772, Nov. 13, 1986, Pat. No. 4,807,346. This application Sep. 26, 1988, Ser. No. 248,938
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—426.5 **6 Claims**

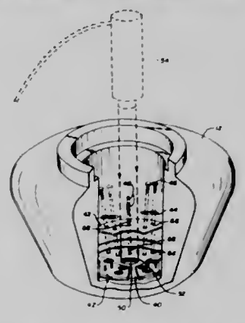
1. A method of removing a bearing race from the lower journal housing of a coal mill comprising:

removing a journal bearing from a journal housing;

inserting a main body member, having first and second longitudinal ends and a cross-section having a maximum diameter less than an internal diameter of race to be removed, into the lower journal housing so that said main body member is disposed below a bearing race to be removed and said first and second longitudinal ends are parallel with a base of the lower journal housing;

fixedly mounting at least first and second plate elements to said main body member so that an edge of each of said plate elements extends beyond a peripheral edge of said main body member so as to define an assembled structure of symmetrical configuration, having a maximum cross-sectional dimension greater than an inner diameter of a race to be removed, and having a central aperture defined at least partially therethrough, the walls of said central aperture having coupling means defined thereon;

coupling removing means to said coupling means defined in said central aperture of said assembled structure, said



removing means including means for moving said assembled structure relative to said journal housing so as to lift said assembled structure from below the race to be removed and so that the plate elements engage and lift the race from the cylindrical bore of the housing; and actuating said removing means to remove said bearing race from said housing.

4,896,414
WATERPROOF CUT AND DISPLACE JOINT AND METHOD FOR MAKING SAME
Otto P. Hafner, 1321 Paddock Way, Cherry Hill, N.J. 08034
Filed Jan. 20, 1988, Ser. No. 145,910
Int. Cl.[4] B21D *39/00*; **B23P** *11/00*
U.S. Cl. 29—432.1 **4 Claims**



1. In a method of mechanically joining together deformable sheets to form a waterproof sealed joint, the steps comprising:

positioning said sheets with surfaces facing each other;

deforming a portion of a first one of said sheets into the other sheet such that opposed, spaced-apart portions of said first sheet are severed and intervening portions are not severed;

causing an adjacent and corresponding portion of the second sheet to deform without being severed in response to deformation of said first sheet, and

compressing said deformed unsevered portion of said second sheet against said first sheet while maintaining resistance against said deformed portion of said first sheet, thereby at least partially flattening both of said deformed portions and causing them to expand outwardly along said sheets, said outward expansion of said deformed portion of said first sheet causing its severed edges to extend outwardly beyond said deformed but unsevered edges of said second sheet, thereby locking said sheets together while maintaining said second sheet deformed but not severed to produce a waterproof sealed joint.

VOL 1110 ISS 5 JA 30 1990 UMI

4,896,415

METHODS FOR FORMING CONTAINERS

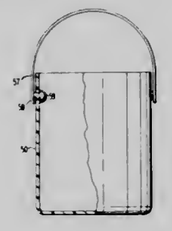
Erik Bock, Ejby Strandvej 3, DK-4070 Kr. Hyllinge, Denmark

Continuation of Ser. No. 879,990, Jun. 27, 1986, abandoned. This application May 31, 1988, Ser. No. 201,099

Claims priority, application United Kingdom, Jun. 29, 1985, 8516541; Feb. 25, 1986, 8604661

Int. Cl.[4] B29C *43/02, 65/00;* **B65D** *25/28, 25/32*

U.S. Cl. 29—453 **6 Claims**



1. A method of applying a handle-like member to a preformed container body of flexible, resilient plastics material having opposite side walls, comprising

positioning a pair of dies having bores therein internally of said container at substantially diametrically opposite positions on said side walls, and a pair of pistons outside said side walls in alignment with said bores of said dies,

displacing said plastics material of said side walls into said bores by subjecting said side walls to cold-forming by applying pressure thereto by moving said pistons against said side walls and into said bores, forming oppositely disposed inwardly extending hollow recesses, adapted to receive projections on substantially opposite ends of a handle-like member, and said projections adapted to be forced into said hollow recesses causing said hollow recesses to assume the contour of said projections,

forming said handle-like member having said projections on said substantially opposite ends, and forcing said projections into said hollow recesses causing said hollow recesses to assume the contour of said projections, and causing said handle-like member to become attached to said preformed container body.

4,896,416

ANCHORING METHOD

Ernest Cranko, P.O. Box 3850, Alrode, Transvaal 1451, South Africa, and Roger K. Moore, 18 Chandlers Close, Crabbs Cross, Redditch B97 5HU, England

Division of Ser. No. 7,685, Jan. 28, 1987. This application Dec. 16, 1988, Ser. No. 285,573

Claims priority, application United Kingdom, Jan. 31, 1986, 8602471; May 3, 1986, 8610924; May 3, 1986, 8610925; Oct. 17, 1986, 8624882

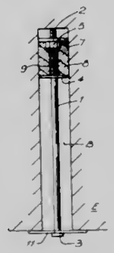
Int. Cl.[4] B21D *39/00;* **B23P** *11/02*

U.S. Cl. 29—522.1 **8 Claims**

1. A method of point anchoring an anchor element in a blind borehole in a substrate, the method comprising the steps of:

(i) providing an anchor element comprising an elongate bolt, the bolt having a threaded end portion, a threaded nut being in engagement with the threaded end portion, the nut including a head of an outer diameter substantially equal to that of the borehole to engage the wall of the borehole, a plate of an outer diameter substantially equal to the borehole and being fixedly mounted on the bolt towards the threaded portion thereof, a generally cylindrical body being mounted on the bolt and extending between the plate and the nut, the body comprising particles of a particulate material having a high resistance to crushing, the particles being held together by a weak bonding force;

(ii) then locating said anchor element in the borehole with the nut on the threaded end portion of the bolt and the plate fixed to the bolt being in the blind end of the borehole;



(iii) thereafter rotating the bolt to draw the nut towards the plate and thereby to subject the body to axial compression until the weak bonding force is overcome and the body loses its integrity and the particles of the body are moved closer together and expands to form a load bearing annulus between the wall of the borehole and the bolt.

4,896,417

METHOD OF PRODUCING A THIN FILM MAGNETIC HEAD

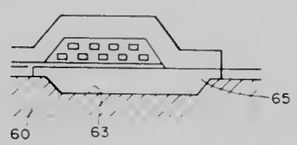
Shuichi Sawada, and Atsushi Toyoda, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 17, 1989, Ser. No. 311,843

Claims priority, application Japan, Feb. 19, 1988, 63-36648

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. A method of producing a thin film magnetic head comprising:

(a) a first process step of covering a portion other than a portion at which a recess is to be formed on a substrate by a patterned resist;

(b) a second process step of heating said substrate thereby partially flowing said resist so that an average inclination angle at a side edge portion of patterned resist will become equal to or smaller than 70 degrees;

(c) a third process step of forming said recess of said substrate by an ion beam etching; and

(d) a fourth process step of removing remaining resist from said substrate.

4,896,418

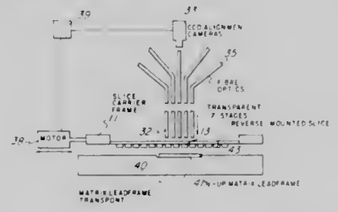
DIRECT MOUNTING METHOD FOR SEMICONDUCTORS

Gerald A. Yearsley, Singapore, Singapore, assignor to Texas Instrument Incorporated, Dallas, Tex.

Filed Aug. 7, 1987, Ser. No. 83,759

Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—827 **27 Claims**



1. A method for directly mounting a semiconductor bar upon a mounting area of a leadframe, comprising the steps:

(a) adhering semiconductor bars to a film;

(b) viewing the mounting area through a transparent "Z" stage; and

(c) using the "Z" stage to apply a force to the semiconductor bar to bring the semiconductor bar into contact with the mounting area.

4,896,419

APPARATUS AND PROCESS FOR FASTENING CONTACT PIECES TO ELECTRICAL LEADS

Bernard Jürgenhake, Im Brok 45, 4782 Erwitte-Völlinghausen, Fed. Rep. of Germany; Bruno Scholz, Soest, and Peter Ettl, Kinding, both of Fed. Rep. of Germany, assignors to Bernhard Jürgenhake, Erwitte-Völlinghausen, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 322,846

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808986; Mar. 17, 1988, 8803655[U]

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—861 **34 Claims**

1. A process for crimping a contact piece on an electrical lead in which an end section of an electrical lead extending into a crimping machine is guided between upwardly extending U-formed crimping claws of a contact piece held in a base frame of the crimping machine and is crimped therein by a plunger acting in combination with a crimping base-frame anvil, said process comprising the steps of:

bringing the end section of the electrical lead to a position over the crimping claws;

moving the plunger toward the electrical lead and the crimping claws;

centering and gripping the end section of the electrical lead with two jaws which are enclosed by contact with said plunger and driving the end section of the electrical lead downwardly with the plunger and the closed jaws to position the lead between shanks of the crimping claws;

crimping the crimping claws on the end section of the electrical lead with members mounted on the plunger.

13. Apparatus for fastening individual contact pieces from band formed series connected contact pieces to electrical leads comprising:

a base frame for holding the band-formed series connected contact pieces as they are moved along;

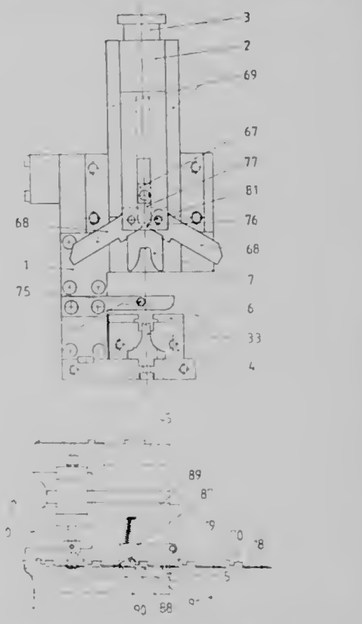
a transporting assembly mounted on the base frame including a first finger for engaging the band-formed series connected contact pieces and shoving them in a forwardly direction, step fashion;

a holding means mounted on the base frame for holding the band-formed, series-connected, contact pieces in their forwardly shoved positions;

a plunger on which an impact press is mounted;

the transporting assembly including an activating mechanism coupled to the plunger;

the first finger of said transporting assembly moving into an opening in the contact pieces in a direction perpendicular



to the forward direction in which the contact pieces are shoved and thereafter moving in the forward direction, the finger being shaped and sized in cross section to fit into the opening in the contact piece such that it engages a forward edge of the opening of the contact piece.

4,896,420

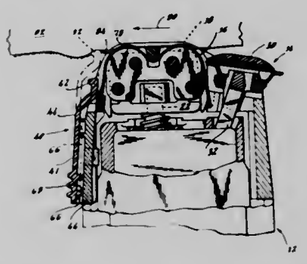
ELECTRIC SHAVER

David R. Locke, Bridgeport, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.

Filed Oct. 7, 1987, Ser. No. 105,876

Int. Cl.[4] B26B *19/42*

U.S. Cl. 30—34.2 **6 Claims**



1. An improved, electric dry shaver, comprising:

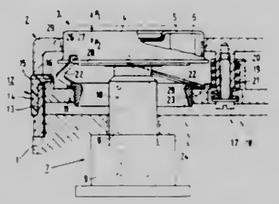
(a) a hand held housing;

(b) a cutter head mounted to said housing;

(c) said cutter head including a demountable hair pocket

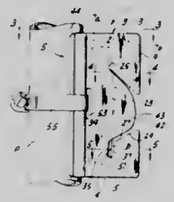
having a side wall thereof, said side wall having an exterior surface thereof;
(d) said cutter head having an elongated, longitudinally extending hair cutter assembly including a first stationary, apertured cutter member, and, a second reciprocating cutter member positioned in shearing engagement with said first member;
(e) said cutter head assembly adapted to shear body hair which extends through said first cutter member apertures when said cutter head is positioned by a user for engaging body hair;
(f) an electrically energized actuating means mounted in said housing and mechanically coupled to said reciprocating cutter member for imparting reciprocating motion to said second cutter member upon electrical energization of said actuating means;
(g) an elongated, longitudinally extending skin stretcher means laterally spaced from and extending generally parallel with hair cutter assembly;
(h) said skin stretcher means including a slide body mounted to said hair pocket side wall in sliding engagement with said exterior surface; and,
(i) means for selectively positioning said skin stretcher slide body at a first extended position in engagement with said exterior wall surface at which said slide body engages a user's skin and causes tensioning of the skin over an area which includes the location at which said cutter head assembly engages body hair, and, for positioning said skin stretcher slide body at a second retracted position in engagement with said exterior wall surface at which position said slide body is positioned substantially out of engagement with the user's skin and does not cause tensioning thereof in the area at which said cutter head assembly engages the user's body.

4,896,421
SHAVING APPARATUS
Geert Geertsma; Hendrik Poel, and Andreas F. J. Weeraink, all of Drachten, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jan. 19, 1989, Ser. No. 300,458
Claims priority, application Netherlands, Feb. 18, 1988, 8800405
Int. Cl.[4] B26B *19/14*
U.S. Cl. 30—43.6 **4 Claims**



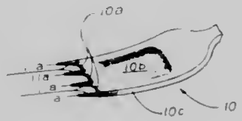
1. A shaving apparatus comprising a housing provided with a holder for at least one shaving unit, which shaving unit comprises an external shaving member with hair-entry apertures and an internal shaving member which is rotatable relative to the external shaving member, which internal shaving member is coupled to a drive mechanism by means of a drive shaft comprising at least two portions which are axially movable relative to each other, the holder being provided with a mounting plate for the shaving unit, which holder and mounting plate are movable relative to one another in axially inward and outward directions, characterized in that the external shaving member is secured to the mounting plate by means of at least one resilient element, so that the external shaving member with the mounting plate is also movable relative to the holder in both axial directions.

4,896,422
FISHING LINE CUTTER
Larry A. Sheehan, Springfield, and John R. James, Cassville, both of Mo., assignors to Bo-James Co., Inc., Cassville, Mo.
Filed Apr. 7, 1988, Ser. No. 178,484
Int. Cl.[4] A01K *91/00*
U.S. Cl. 30—290 **7 Claims**



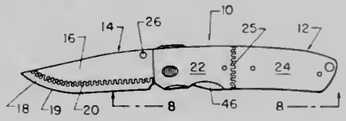
1. A cutter for cutting fishing line attached to a lure by means of a knot, comprising a plate-like member having two generally parallel and substantially planar faces spaced apart a distance corresponding to the thickness of said member, an outer peripheral edge, a first slot in said member extending inwardly from said peripheral edge and having a width slightly greater than the cross sectional dimension of the fishing line to permit entry of the fishing line into the slot but less than the cross sectional dimension of the knot to prevent entry of the knot into the slot, and a first blade associated with said plate-like member having a cutting edge positioned at the inner end of the slot whereby fishing line may be entered into the slot and, with the knot bearing against one of said planar faces, pulled against the cutting edge of the first blade to cut the line adjacent the knot, and wherein said plate-like member has a second slot therein extending inwardly from said peripheral edge and having a width slightly greater than the cross sectional dimension of the knot to permit entry of the knot into the slot but less than the cross sectional dimension of the lure to prevent entry of the lure into the slot, a second blade associated with said plate-like member having a cutting edge positioned at the inner edge of the second slot whereby the knot on a fishing line may be entered into the slot and, with the lure bearing against one of said planar faces, pulled against the cutting edge of the second blade to cut the knot and thereby detach the lure from the line.

4,896,423
EATING FORK
Walter J. Kinsey, 246 Mermaids Bite, Naples, Fla. 33940
Filed Jul. 13, 1988, Ser. No. 218,281
Int. Cl.[4] A47J *43/28*
U.S. Cl. 30—322 **8 Claims**



1. An eating fork comprising a handle, and extended flat body portion, and a plurality of short conical tines each having a small smoothly rounded end,
said tines projecting along parallel axes from the forward end of the flat body portion,
said body portion having a width slightly greater than the distance across the bases of the plurality of tines,
said flat body portion having in its upper surface a generally rectangular shallow depression having a depth of about 25% or less of the body thickness,
said tines having a length about one fifth the length of the extended flat body portion,
the fork surface including the surfaces joining the tines to the flat body portion and the shallow depression being smoothly curved and all surfaces of the fork being polished during manufacture.

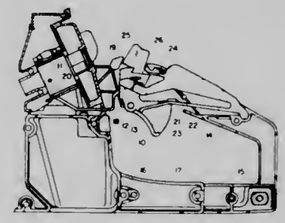
4,896,424
COMPOSITE CUTTING BLADE AND METHOD OF MAKING THE BLADE
Michael L. Walker, 2343 Tros Rd., Taos, N. Mex. 87571
Filed Jan. 13, 1989, Ser. No. 299,549
Int. Cl.[4] B26B *9/00, 3/06;* B21K *11/00*
U.S. Cl. 30—349 **5 Claims**



1. A composite cutting blade for a folding blade knife comprising:
an elongated body means composed of a strong tough material which forms the load bearing member of said cutting blade, said body means having a smooth upper edge and a lower edge;
a dovetail formed in the lower edge of said elongated body means;
an elongated cutting edge means made of a hard wear resistant material for forming the cutting edge of said cutting blade, said cutting edge means having an upper edge and a lower cutting edge;
a dovetail formed in the upper edge of said cutting edge means that matches the dovetail in said elongated body means and is sized so as to be an interference fit with the dovetail in the lower edge of said elongated body means;
said elongated body means and said elongated cutting edge means being permanently joined together by press fitting the dovetailed edges together and peening the formed dovetail joint.

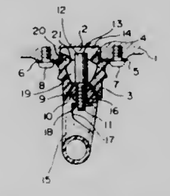
4,896,425
ARRANGEMENT OF A THROTTLE CONTROL ON A MOTOR SAW
Sören N. Henriksson, Kållered, Sweden, assignor to Aktiebolaget Electroleux, Stockholm, Sweden
Filed Sep. 19, 1988, Ser. No. 230,191
Claims priority, application Sweden, Aug. 11, 1987, 8703124
Int. Cl.[4] B27B *17/00*
U.S. Cl. 30—381 **4 Claims**

1. Arrangement of a throttle control on a motor saw having an engine and at least a rear handle fitted to the saw body by means of vibration-damping elements (15, 16), comprising a throttle control (10), a link and lever system (18, 19) and pivotable throttle on a pivot shaft in the engine, wherein the bearing of the throttle control in said rear handle is made with play in the longitudinal direction of the saw which allows movement of the throttle control in said direction through a distance



equal to the maximum amplitude of the vibrations absorbed by said vibration-damping elements.

4,896,426
VIBRATION-ISOLATING ATTACHMENT MEANS FOR HANDLE OF CHAIN-SAW
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Mar. 10, 1988, Ser. No. 166,535
Claims priority, application Japan, Mar. 18, 1987, 62-39704[U]
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—383 **11 Claims**



1. Vibration-isolating attachment means for a handle of a chain-saw characterized in that a circular recess is formed on the main body of the chain-saw, one end portion of a cylindrical hollow vibration isolating rubber is fitted around the periphery of said recess while the other end portion of said vibration isolating rubber is connected to the handle, and in that a stopper whose distal end is disposed within said recess is provided extending from the inner side of a cavity within said vibration isolating rubber toward the handle and said hollow vibration isolating rubber is formed with opposite annular convex portions adjacent to the distal end of said stopper.

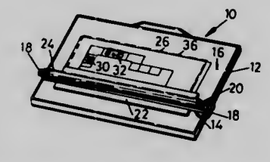
4,896,427
DRAUGHTING APPARATUS
Joseph W. K. Smith, Glenview, 12 Lady Brae, Gorebridge, Midlothian, EH23 4HT, Scotland, and Kevin F. Bannister, 12 Lilac Grove, Pitcorthie, Dunfermline, Scotland, both of Scotland
Continuation of Ser. No. 90,161, Aug. 27, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 316,543
Claims priority, application United Kingdom, Aug. 28, 1986, 8620769
Int. Cl.[4] G01B *5/00*
U.S. Cl. 33—1 G **12 Claims**

1. A draughting apparatus comprising a plurality of substantially planar right way round symbols elements having raised outlines for depicting predetermined symbols in their true non-reversed form, a support panel means for supporting the symbols elements in a general planar layout, said symbols

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elements being provided with symbol element locating means, and symbol transfer means comprising a self-duplicating set of sheets of draughting material having at least two sheets and a pressure transfer means, said at least two sheets being disposable between said raised outlines of said symbols elements and said pressure transfer means so that pressure applied by said pressure transfer means causes the outline of said symbols to be transferred to at least one of said two sheets to create an image of said symbols outlines thereon,

wherein said symbols support means comprises a sheet of magnetic or magnetizable material and at least part of said



symbols elements are, of a magnetizable or magnetic, respectively, material so that they are attracted to the sheet, said at least part of said symbols elements and said sheet together comprising said symbol element locating means,

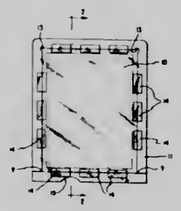
wherein said self-duplicating set of sheets comprises at least one further sheet, which further sheet is disposable between said symbol support means and said symbols elements with said symbols elements held in position on said further sheet means by said symbol element locating means, which further sheet is usable to display symbol element position indicator means.

4,896,428

CARD GAGE

John R. Peterson, Sioux Falls, S. Dak., assignor to Mint Finder Inc., Sioux Falls, S. Dak.

Filed Jan. 13, 1989, Ser. No. 296,706
Int. Cl.[4] G01B *3/14*
U.S. Cl. 33—1 B **10 Claims**



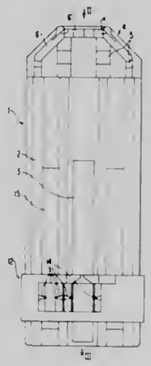
1. A gage for checking the uniformity of margins on collector's cards comprising a front having a transparent area at least as large as the card to be checked, rims on said front arranged to provide a hollow of a size to match the dimension of said card being checked, and gage markers on said front at regularly spaced intervals adapted to be compared with said margins.

4,896,429

SOLE MEASURING DEVICE

Roger Neiley, 11 Pond Crest, Danbury, Conn. 06811; Joseph Campisi, 18 Cobbler La., New Milford, Conn. 06776, and Douglas Hammond, 32A Carriage House Dr., Danbury, Conn. 06810

Filed Aug. 30, 1988, Ser. No. 238,214
Int. Cl.[4] A43D *1/08; A63C 11/00*
U.S. Cl. 33—3 B **6 Claims**



1. A sole measuring device comprising:

a rail (2) attached to a first stop (4);

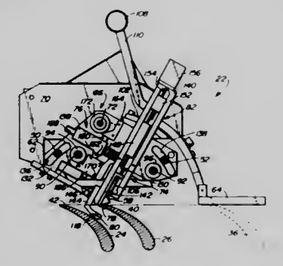
a slide slidably mounted on said rail and provided with a second stop, said first and second stops (4, 20) each having marks corresponding to a minimum distance of an upper edge of a sole (10) from a bearing face of the sole and to a maximum distance of the lower edge of the sole (10) from said bearing face.

4,896,430

SCANNING METHOD AND APPARATUS FOR MEASURING OPEN FLOW AREA

Clark R. Burton, Los Altos, Calif., assignor to Compair, Inc., Burlingame, Calif.

Filed Oct. 27, 1988, Ser. No. 263,550
Int. Cl.[4] G01B *3/38, 5/20*
U.S. Cl. 33—552 **35 Claims**



1. A scanning gauge for measuring the effective open area of a throat formed between vanes secured together at their end by buttress means, comprising

an elongated guide assembly,

locators mounted on the elongated guide assembly for engaging the vanes forming the throat, and

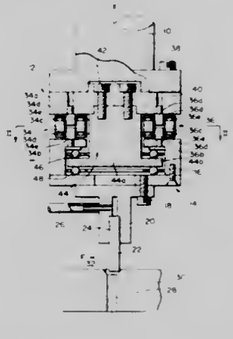
a scan element arranged for traversing the elongated guide assembly in longitudinal movement along the radial length of the throat for assessing its radial length, a sensor head arranged on the scan element for sweeping movement about an axis generally parallel to the vanes for assessing a minimum dimensional opening between a trailing edge of one vane and a convex surface of an adjacent vane along the length of the throat, longitudinal movement along the radial length of the throat and the minimum dimensional opening along the length of the throat providing values for determining the open area of the throat between the vanes.

4,896,431

ALIGNMENT APPARATUS

Shojiro Danmoto, Ushiku; Hachiro Sato, Abiko, and Fumio Kanno, Tsuchiura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,071
Claims priority, application Japan, Nov. 6, 1987, 62-279347; Nov. 6, 1987, 62-279348; Nov. 6, 1987, 62-169088; Oct. 6, 1988, 63-130460
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—644 **8 Claims**



1. An alignment apparatus interposed between a machine body and a terminal body attached along a central axis to the machine body and performs alignment therebetween, comprising:

a mounting body to be connected to the machine body, said mounting body having a surface opposing the terminal body;

a first shaft member extending from said opposing surface of said mounting body;

a second shaft member to be connected to a surface of the terminal body facing said mounting body, said second shaft member being coaxial with said first shaft member;

a plurality of pin members disposed around said first and second shaft members to surround said first and second shaft members; and

compression means for applying a tightening force to said plurality of pin members.

4,896,432

STATURE MEASURING APPARATUS

Doug M. Kang, Seoul, Rep. of Korea, assignor to Korea Measurers Co., Ltd., Busan, Rep. of Korea

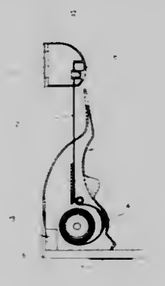
Filed Oct. 20, 1988, Ser. No. 260,441
Claims priority, application Rep. of Korea, Dec. 4, 1987, 21433/1987
Int. Cl.[4] G01B *3/08*
U.S. Cl. 33—768 **8 Claims**

1. A stature measuring apparatus for measuring stature, comprising:

a fixing and holding plate adapted to be fixed on a wall;

a measuring tape head, a measuring tape having an end secured to said measuring tape head, means for releasably securing said measuring tape head to said fixing and holding plate; and

a measuring tape body housing having a rectangular measuring plate fixed thereto, said measuring tape body housing containing means for rolling up said measuring tape and a window through which said measuring tape can be viewed, at least one light emitting diode and an audible melody mechanism, said measuring plate including a recess formed in a bottom surface thereof, said recess having



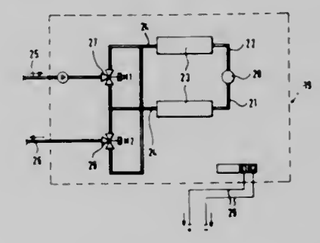
an internal switch mounted therein, a switching button plate covering said recess, power supply means for driving said light emitting diode and said audible melody mechanism, said switch being operable to operably connect said power supply means to said light emitting diode and said audible melody mechanism, said switch button plate being coupled with said switch so that, when said switch button plate is pressed, said switch is operated and said light emitting diode is lit and said audible melody mechanism is operated simultaneously, said lit diode and said audible melody mechanism indicating that said measuring plate is firmly engaged with an object the stature of which is being measured.

4,896,433

APPARATUS FOR HIGH-FREQUENCY DRYING OF COMBUSTIBLE GOODS, WITH FIRE SUPPRESSION SYSTEM

Kurt Friedrichs, Gutenbergstrabe, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,805
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809615
Int. Cl.[4] F26B *3/34*
U.S. Cl. 34—1 **4 Claims**



1. In a high-frequency dielectric drying apparatus for textile

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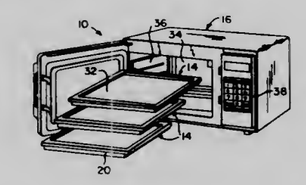
rolls and the like comprising a horizontally directed drying tunnel, horizontal belt means adapted to advance through said tunnel, horizontally arranged opposed electrode means above and below said belt means for generating a dielectric drying field and ventilator means for maintaining an air flow through said tunnel in a direction from an entrance to an exit end of said tunnel the improvement which comprises a transversely directed intake pipe adjacent said exit end, said pipe including spaced intake openings, conduit means in communication with said pipe for conducting increments of gases from said tunnel, a sensor assembly for receiving said increments said sensor assembly including first and second regeneratable filter members, automatic valve means for sequentially guiding said increment through one and then the other of said filter members, and CO sensor means connected to said filter members for activating a fire control system responsive to CO concentrations emerging from said filter members in excess of a predetermined value detected by said sensor means.

4,896,434

APPARATUS AND METHOD FOR DRYING GEL

Joseph Fanelli, 2300 Saddleback Dr., Danville, Calif. 94526

Filed Nov. 10, 1988, Ser. No. 269,693
Int. Cl.[4] F26B *3/34*
U.S. Cl. 34—1 **4 Claims**



1. An improved apparatus for drying gel which comprises:
(a) a tray assembly having a surface on which the gel is disposed, said tray assembly including a tray having a groove around its perimeter, a support plate having a plurality of holes around its perimeter, said support plate disposed within said tray so that said holes of said support plate are aligned with said groove in said tray for collecting the water vapor draining through said holes during drying of the gel, a piece of water soaked filter paper disposed over said support plate so that the gel can be placed onto said filter paper, a polyethylene sheet disposed over said filter paper, and a rubber sheet disposed over said polyethylene sheet for forming a vacuum seal;
(b) a microwave oven for applying microwave energy to the gel in said tray assembly to uniformly dry the gel in said tray assembly, and
(c) means for applying a vacuum to said tray assembly for removing moisture evaporated from the gel during the drying of the gel by said microwaves, said microwave oven being fully closable for directing the microwaves generated by said microwave oven.

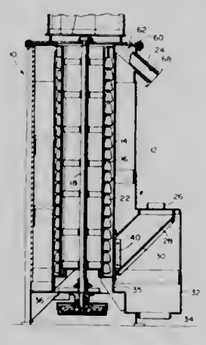
4,896,435

REPLACEABLE WEAR PARTS FOR CENTRIFUGAL PELLET DRYERS

Melvin B. Spangler, Jr., Clifton Forge, Va., assignor to Gala Industries Inc., Eagle Rock, Va.

Filed May 10, 1988, Ser. No. 192,127
Int. Cl.[4] F26B *17/30*
U.S. Cl. 34—58 **2 Claims**

1. In a centrifugal pellet dryer including an outer housing, a rotatable drum with spiral blades mounted exteriorly thereof and an inner housing of foraminous material enclosing the rotatable drum, said drum and inner housing being mounted within said outer housing, a feed chute for a slurry of water and pellets at the lower end of the outer housing for feeding pellets between the drum and foraminous inner housing, a discharge chute at the upper end of the outer housing communicating with the space between the rotatable drum and foraminous inner housing for discharge of dry pellets, said feed chute being downwardly inclined and including a foraminous inclined bottom wall and a pair of vertical side walls perpendicular to the bottom wall with the side walls being subject to erosion by movement of abrasive pellets down the feed chute, a narrow wear strip mounted vertically on the inner surface of each side wall of the feed chute adjacent the lower end thereof and means removably securing the wear strips on the side walls



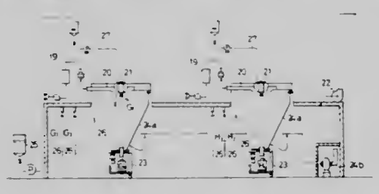
of the feed chute to prevent erosion of the side walls of the feed chute and enable replacement of the wear strips when they become worn, said discharge chute including a liner completely covering the interior surface of said discharge chute to protect the discharge chute from erosion when dried abrasive pellets are discharged from the discharge chute, means removably mounting said liner in operative position, said outer housing including a base section positioned to be impinged by pellets discharged from the feed chute to protect the outer housing from erosion by abrasive pellets, means removably securing said base section in operative position, on the bottom end portion of the outer housing to enable replacement thereof.

4,896,436

SPRAY DRYING PROCESS AND APPARATUS THEREFOR

Shoichi Iwaya; Hitoshi Masumura; Hiroki Takahashi, all of Tokyo; Masaaki Ohkawara, Yokohama; Katsumi Kobayashi, Yokohama, and Takashi Ito, Yokohama, all of Japan, assignors to TDK Corporation, Tokyo and Ohkawara Kakohki Co., Ltd., Yokohama, both of, Japan

Division of Ser. No. 947,245, Dec. 29, 1985, Pat. No. 4,809,442.
This application Apr. 18, 1988, Ser. No. 182,604
Claims priority, application Japan, Dec. 27, 1985, 60-292557; Aug. 28, 1986, 61-200004
Int. Cl.[4] F26B *19/00*; B01D *1/22*
U.S. Cl. 34—60 **3 Claims**



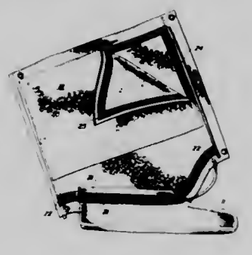
1. A spray drying apparatus, comprising: a housing having upper and lower rooms wherein the upper room comprises at least one unit for generation of hot gas, at least one unit for distribution of hot gas, at least one unit for atomization of feed liquid and at least one unit for discharge gas being arranged, wherein the lower room comprises at least one unit for recovery of produced powder being movably arranged, wherein said upper room has at least one spray drying chamber formed by a heat-resistant porous membrane means for allowing said hot gas to pass through said porous membrane means from an inside portion to an outside portion of said spray drying chamber to thereby permit adherence of said powder thereto, wherein said porous membrane means is removable from said spray drying chamber for recovery of said powder which has adhered thereto, and wherein the spray drying chamber is in between each feed liquid atomization unit in the upper room and each corresponding produced powder recovery unit in the lower room.

4,896,437

INSULATED BOOT AND GAITER COMBINATION

David R. Johnson, 1680 Ponderosa, Murphy's, Calif. 95247

Filed Oct. 7, 1985, Ser. No. 785,242
Int. Cl.[4] A41D *17/00*
U.S. Cl. 36—1.5 **6 Claims**



1. A detachable bootie and gaiter combination comprising:
(a) a bootie having an opening for receiving a foot, said bootie containing an upward extension defining said opening;
(b) a gaiter for placement about the calf of a user, said gaiter having an inner surface including a lower edge positioned adjacent said bootie;
(c) an insulating panel removably affixed to a substantial portion of the inner surface of said gaiter, said panel being spaced from the lower edge of said inner surface;
(d) first fastening means located along a longitudinal seam of said gaiter for effecting removal thereof from the user, said insulating panel being affixed to the inner surface of said gaiter adjacent said first fastening means whereby said panel is adapted to extend around the calf of the user;
(e) protective means extending along and overlying said first fastening means; and
(f) securing means affixed to said lower edge of the gaiter for removably attaching said gaiter to the upward extension of said bootie, said bootie and gaiter thereby forming a unitary structure for the protection of the user.

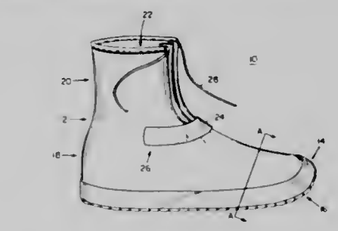
4,896,438

WATER-RESISTANT BOOT FOR ATHLETIC FOOTWEAR

Catherine DeBease, 14 N. Park St., Watertown, Mass. 02172

Continuation-in-part of Ser. No. 740,383, Oct. 7, 1985, abandoned. This application Aug. 31, 1988, Ser. No. 238,569
Int. Cl.[4] A43B *3/16*
U.S. Cl. 36—7.1 R **16 Claims**

15. A water-resistant boot for protecting an athletic shoe, comprising:
thin, flexible, water-resistant shell having a lower, body portion for closely surrounding and cradling the athletic shoe and an upper, sleeve portion for surrounding the ankle of a user, the sleeve portion having an opening through which the athletic shoe is inserted;
a water-resistant base attached to the body portion for engaging the sole of the athletic shoe, the base including deforming means for conforming to a tread pattern of the athletic shoe to enhance transfer of the effect of the tread pattern through the base;



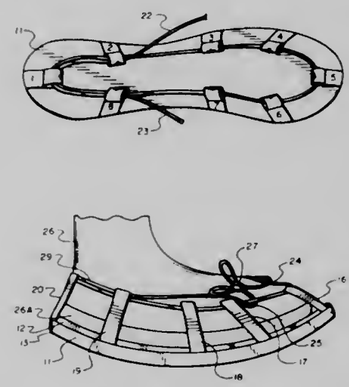
retainer means, formed of an elastic material and disposed about the lower periphery of the body portion of the shell, for forcing the shell against the athletic shoe to firmly grip the athletic shoe to minimize slippage between the boot and the shoe; and
means for securing the sleeve portion about the ankle of the user to enhance holding of the sleeve portion to the ankle and to minimize entrance of water through the opening.

4,896,439

SOUND PROOF COVER FOR SOLES OF SPORTSMEN'S SHOES AND METHOD FOR USE

Clyde S. Morgan, 305 N. 600 E., Mapleton, Utah 84663

Continuation-in-part of Ser. No. 88,713, Aug. 24, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 242,547
Int. Cl.[4] A43B *5/18, 3/12*
U.S. Cl. 36—7.5 **6 Claims**



1. A sound proof and slip proof cover for soles of sportsmen's shoes comprising in combination (a) a resilient sole a little larger than the sole of the sportsmen's shoe to be covered, which resilient sole has a laminated composition comprising a plurality of layers of foamed material attached together, the bottom layer being made up of a soft foamed material of thickness of at least ¼ inch, and the top layer being made up of a tougher foamed material than the bottom layer and having a thickness of at least ¼ inch, (b) attaching means to assist in holding the sole to the bottom of the sportmen's shoe compris-

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ing at least 4 short vertical straps attached along the outside edge of the resilient sole with at least three of the straps being attached to the back and back sides of the sole and at least one of the straps being attached at the front end of the sole, the end of the straps not attached to the sole possessing loops to permit passage of a cord there through, and (c) cord adapted to being passed through the loops at the end of the straps and being pulled tight to hold the sole on the sportsmen's shoes.

4,896,440

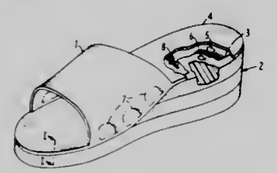
COMPOSITE POLYMERIC LEISURE SHOE AND METHOD OF MANUFACTURE THEREOF

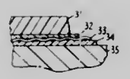
Francisco A. Salaverria, P.O. Box 685, Suisun City, Calif. 94585

Continuation of Ser. No. 41,681, Apr. 23, 1987, abandoned, which is a continuation of Ser. No. 763,380, Aug. 6, 1985, abandoned. This application Apr. 29, 1988, Ser. No. 188,730

Int. Cl.[4] A43B *3/12, 13/32*

U.S. Cl. 36—115 **10 Claims**





1. A composite leisure shoe comprising:

a synthetic polymeric shoe upper-insole having a generally flat lower surface,

a synthetic polymeric lower shoe sole of a synthetic foam polymeric material having a generally flat top surface wherein the synthetic foam polymeric material is different from the material comprising the shoe upper insole, and

a flexible interlayer therebetween forming a combined sole with the upper insole and the lower shoe sole,

the combined sole of the composite leisure shoe has at least one layer of a synthetic polymeric material bonded to a synthetic foam polymeric material different from the synthetic polymeric material of said at least one layer, such that the bonding between the top flat surface of the synthetic foam polymeric lower shoe sole and the lower flat surface of the synthetic polymeric shoe upper-insole of the composite leisure shoe includes a first adhesive and said interlayer of a loosely woven fabric is adhered between the lower surface of the upper-insole and the top surface of the synthetic foam polymeric lower shoe sole wherein the interlayer is smaller than the lower surface of the shoe upper-insole and is between about 0.3 and 3.0 millimeters of the lower peripheral edge of the shoe upper insole, and a second adhesive adheres the interlayer to the lower shoe sole, whereby the synthetic polymeric shoe upper-insole remains integrally adhered to the synthetic foam polymeric lower shoe sole during use.

4,896,441

REMOVABLE INNERSOLE FOR FOOTWEAR

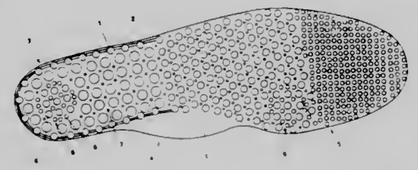
Riccardo Galasso, Via Toscanini, 11-Cadoneghe (Padova), Italy

Filed May 16, 1988, Ser. No. 194,304

Claims priority, application Italy, May 22, 1987, 47973 A/87

Int. Cl.[4] A43B *13/38, 13/40*

U.S. Cl. 36—43 **4 Claims**



1. A removable inner sole for footwear of the shape of the internal part of the shoe within which it is intended to be inserted, said inner sole having on the surface to be arranged at the bottom a plurality of solid elements (1), said elements protruding vertically towards the exterior and wherein in the area corresponding to the heel of the foot said elements (1) are arranged to form a circular structure (6) formed by a plurality of elements (6') of greater transversal dimensions disposed along the lateral borders and in the interior of a square structure, and a plurality of elements (6'') of smaller transversal dimensions are interposed between said elements (6') and said elements (6'') surround said elements (6'), and wherein said elements (1) are grouped in at least three groups of different hardness, said groups being arranged respectively according to the degree of hardness corresponding to the rear zone (3), corresponding to the intermediate zone (4) and corresponding to the front zone (5).

4,896,442

TRENCHER APPARATUS

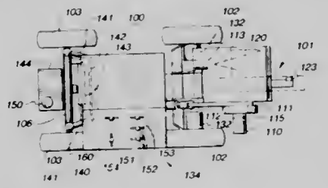
Rodney A. Stiff, and James R. Warren, both of Bundaberg, Australia, assignors to Austoft Industries Limited, Queensland, Australia

Filed Mar. 24, 1987, Ser. No. 29,745

Claims priority, application Australia, Mar. 25, 1986, PH5198

Int. Cl.[4] E02F *5/06*

U.S. Cl. 37—86 **5 Claims**



1. A trencher apparatus comprising:

a. a frame,

b. a forward pair of steerable wheels connected to said frame and steerable about a vertical axis,

c. a rearward pair of driving wheels, each of said driving wheels being independently driven by a hydraulic motor,

d. a digging apparatus extending downwardly from a position adjacent to said driving wheels, said digging apparatus having an earth outlet extending downwardly from a position adjacent to said drive wheels, said earth outlet being located substantially close to one of said driving wheels so as to discharge earth outwardly of said driving wheels, a portion of said earth being discharged to contact one of said driving wheels,

e. a steering means to pivot said steerable wheels about said vertical axis, including means rendering said steering means self-locking as against ground forces only while providing uninterrupted capability for angular incremental adjustment to said steerable wheels as a result of steering forces, and

f. a locking apparatus to lock said forward pair of wheels against rotation.

4,896,443

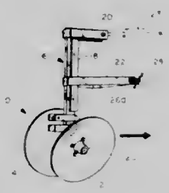
DITCH FORMING APPARATUS

Paul Klingler; Kenneth Klingler, and David Klingler, all of Rte. 2, Noble, Ill. 62868

Filed Jan. 19, 1989, Ser. No. 298,908

Int. Cl.[4] A01B *13/02;* **E02F** *5/02*

U.S. Cl. 37—98 **22 Claims**



1. Apparatus for forming a ditch comprising:

a frame adapted for coupling to and displacement by a traction vehicle, said frame including a generally upright member and a three-point hitch for coupling to said traction vehicle; and

first and second discs rotationally mounted to respective opposed, lateral portions of said generally upright member and oriented at respective angles to the direction of displacement of said frame, wherein forward portions of said discs are arranged in an overlapping manner along the direction of displacement, with each disc including a respective circular peripheral edge and opposed concave and convex sides, wherein the convex sides of said discs are oriented in facing relation and inwardly toward said frame and wherein said second disc is positioned lower than and aft of said first disc and said second disc is oriented outward at a greater angle relative to the direction of displacement of the frame than said first disc to compensate for the increased drag on said first disc to allow for straight tracking of the apparatus as said discs are moved through the soil.

4,896,444

EXCAVATION BUCKET

Karl G. Sieber, 8627 Beverly La., Dublin, Calif. 94568, and Kurt G. Sieber, 720 Terrace View Dr., Greensburg, Pa. 15601

Continuation of Ser. No. 96,065, Sep. 14, 1987, abandoned, which is a division of Ser. No. 740,811, Jun. 3, 1985, Pat. No. 4,719,711. This application Jul. 28, 1988, Ser. No. 226,531

Int. Cl.[4] E02F *3/40*

U.S. Cl. 37—118 R **7 Claims**

1. An excavating bucket for digging an excavation comprising a trench therein,

said bucket comprising:

means for providing an excavation, said excavation having a bottom portion and two flared edges leading from said bottom portion;

said flared edges comprising a plurality of substantially planar sloping surfaces;

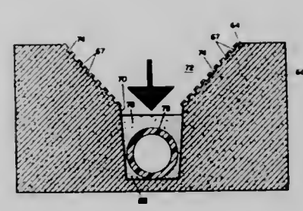
said means for providing an excavation comprising;

a first portion means for forming said bottom; and

a second, outwardly flared V-shaped, portion means contiguous to said first portion means for forming said two flared edges;

said second, outwardly flared V-shaped, portion means having cutting edges, said cutting edges having a plurality of teeth comprising means for producing a plurality of notches on said substantially sloping surfaces of the flared edges of said excavation for producing indentations for catching at least crumbling soil on said notched flared





edges of said excavation, with a substantial number of said notches having a substantially planar flat portion, with most of said flat portions being substantially parallel to said planar sloping surfaces of said flared edges.

4,896,445

METHOD FOR REDUCING COSTS AND ENVIRONMENTAL IMPACT OF DREDGING

Troy M. Deal, 277 Trismen Ter., Winter Park, Fla. 32789

Continuation of Ser. No. 579,805, Feb. 17, 1984, abandoned, which is a continuation of Ser. No. 221,219, Dec. 30, 1980, abandoned. This application Dec. 12, 1984, Ser. No. 681,071

Int. Cl.[4] E02F *5/28, 3/88*

U.S. Cl. 37—195 **5 Claims**



1. A method of transferring the dredging spoils of waterways, channels, ditches and the like with minimum environmental impact on the adjacent land and/or water comprising the steps of cutting a swath of solid spoils with a dredging head, forming a slurry having in the order of 5–10% solids by weight from the water within the swath, directing the slurry into the intake of a pump, reducing the size of the solids to form a sprayable slurry as the slurry passes through the pump while pressurizing the slurry, and passing the sprayable slurry from the pump to restricting nozzle means to accelerate the flow to spray the slurry relative to the swath in the order of 5 to 10 times the width of the swath with a projectile and spray pattern to dispose the spoils in a wide, thin, environmentally acceptable layer remote from the swath.

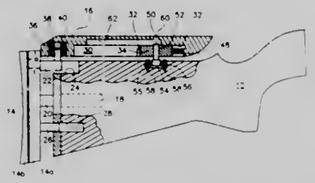
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,446

BUTTPLATE AND COMB ASSEMBLY FOR SHOULDER FIREARMS

Glenn D. Gregory, San Diego, Calif., assignor to G. Squared, Inc., Solana Beach, Calif.

Filed Jul. 10, 1989, Ser. No. 377,478
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—73 **9 Claims**



1. An adjustable comb and buttplate assembly for shoulder firearms having a stock and including recoil reduction means at the butt end of the stock for yieldably resisting recoil movement of the stock rearwardly toward the shooter when the firearm is fired, comprising

a buttplate at the rear of the stock in engagement with the recoil reduction means and normally urged thereby rearwardly away from the butt end of the stock,

an anchor extending forwardly from the buttplate adjacent the upper surface of the stock,

a comb slidable over the stock for movement forwardly and rearwardly relative to the stock,

a slide carried by the stock forwardly of the butt end thereof, said slide slidably engaging said comb for retaining said comb on the stock and for guiding said comb for sliding movement forwardly and rearwardly relative to the stock,

a threaded stud mounted on one of the stock and said slide and extending generally vertically toward and engaging the other of the stock and said slide substantially normal to the axis of sliding movement of said comb,

threaded follower means on one of the stock and slide in threaded engagement with said stud,

one of said stud and follower means being mounted for rotation and being rotatable to cause said comb to move vertically relative to the stock thereby to adjust the vertical elevation of the comb relative to the stock, said one of said stud and follower means being accessible from the exterior of the stock and comb for facilitating precise threaded adjustment of the elevation of the comb without disassembly of the stock and comb,

said slide and comb including abutment means limiting rearward movement of said comb relative to the stock,

said comb extending rearwardly to said anchor and being detachably engage with said anchor, said comb thereby retaining said buttplate on the stock and said abutment means normally preventing disassociation of said buttplate from the stock, said comb and buttplate thereby being interengaged for conjoint movement forwardly and rearwardly relative to the stock for accomodating rearward recoil movement of the stock relative to said comb and buttplate while the comb and buttplate remain stationary relative to the shooter when the firearm is fired.

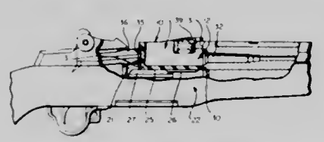
4,896,447

SAFETY MAINTENANCE IMPLEMENT FOR FIREARMS

Paul A. Badoni, 5724 Gainsborough Place, Oak Forest, Ill. 60452

Filed Dec. 30, 1988, Ser. No. 292,360
Int. Cl.[4] F41C *31/00*
U.S. Cl. 42—95 **11 Claims**

1. A safety maintenance implement for semi-automatic action firearms having an elongated receiver cavity in which a firearm bolt is reciprocally supported and normally biased forwardly toward an opening of a barrel breech of the firearm comprising a trough-shaped body adapted to engage and seal the interior of the receiver cavity against dirt and debris with



said body trough opening laterally outwardly of the receiver substantially along the entire length of said body.

4,896,448

BIRD DECOY WITH MOTOR DRIVE WINGS

Larry L. Jackson, Rt. 3, Sterling, Colo. 80751

Filed Dec. 20, 1988, Ser. No. 288,034
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **5 Claims**



1. A bird decoy comprising in combination:

a body having a hollow interior;

flapping means for transferring rotary motion into reciprocal motion mounted to the interior of said body;

motor means for imparting rotary motion to said flapping means connected to said body; and

a pair of arms slideably connected to said flapping means and pivotally connected to said body, said arms projecting through said body to connect to wings.

4,896,449

AUTOMATIC FISHHOOK BAITING SYSTEM

James H. Hopper, One Commerce Park Ave., Box 245, South Chatham, Mass. 02659

Filed Jul. 25, 1989, Ser. No. 385,011
Int. Cl.[4] A01K *79/00, 83/00*
U.S. Cl. 43—4 **22 Claims**



1. A system for baiting fishhooks which are attached to a fishing line, said system comprising:

A. means for storing a fishing line having a plurality of fishhooks attached thereto at spaced intervals; and

B. means for baiting fishhooks including a bait hopper having an inlet and an outlet, said hopper for holding a mixture of a liquid and a plurality of baits,

1. said hopper including an inlet bearing disposed in proximity to said inlet, an outlet bearing disposed in proximity to said outlet, and at least one intermediate bearing disposed between said inlet bearing and said outlet bearing,

2. said hopper further including means for varying substantially continuously a path which said fishing line follows through said mixture,

whereby as said fishing line is drawn from said means for storing and through said hopper, at least one of said baits is attached to substantially each one of said fishhooks.

4,896,450

SPEAR GUN TIP ASSEMBLY

William H. Rogers, Jacksonville, Fla., assignor to Sea Search, Inc., South Jacksonville, Fla.

Continuation-in-part of Ser. No. 72,297, Jul. 13, 1987, abandoned, and Ser. No. 171,018, Mar. 21, 1988, Pat. No. 4,839,979. This application Jun. 27, 1988, Ser. No. 211,759
Int. Cl.[4] A01K *81/00*
U.S. Cl. 43—6 **20 Claims**



1. A spear assembly for an underwater spear gun comprising an elongated shaft adapted to be fired from a spear gun and having a long axis, a forward end portion, and a rearward end portion, and a sharpened tip threadedly attached to said forward end portion, an elongated extension tip member having a sharp forward end and a rearward end including a rearwardly facing recess, said tip member being slideably and removably attachable to said sharpened tip by mating with said rearwardly facing recess in said extension tip member, an elongated flexible cable with a forward end attached to said extension tip member and a rearward end, and manually releasable clamping means slidable on the shaft for detachably securing thereto said cable.

4,896,451

ELECTRIC FISHING DEVICE FOR FISHING FROM A SHIP

Lien-Wei K'o, 2F, No. 531, Ching-Ping Rd., Chung-Ho City, Taipei Hsien, Taiwan

Filed Jan. 30, 1989, Ser. No. 304,855
Int. Cl.[4] A01K *89/017*
U.S. Cl. 43—26.1 **2 Claims**

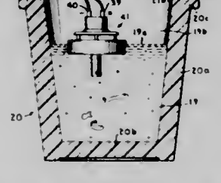
1. An electric fishing device for attachment to bulwarks or other suitable position on a ship when fishing from on board a ship comprising:

a fixed clamp seat and a clamping member forming a substantially U shape and with a clamp screw for driving said clamping member for attachment to the bulwarks or other suitable position on a ship;

a pivotable seat board pivotably connected on one end of said seat board to said fixed clamp seat and a tube socket substantially near the opposite end of said seat board for fixing a fishing rod thereto;

a contrtol rod standing vertically and attached at said one end of said seat board, said control rod being a hollow pipe, having a handle at the top portion of said rod with a push switch on said handle;

a socket at a lower end of said control rod adapted for connection to a shipboard D.C. power source;



a D.C. motor connected to said socket for using the shipboard D.C power source and wired to said push switch for control of actuation of said D.C. motor;

a reduction drive having a worm being the output of said motor connected to a worm wheel;

a reel and an output shaft being a pivot of said reel and extending within said reel and with said output shaft connected to said reduction drive;

clutch means having ratchet face and connected to said output shaft and having a ratchet pawl under spring tension making said pawl press against said ratchet face of said clutch means

whereby driving of said motor allows rewinding of said reel using the driving of said motor to rotate said reel

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4,896,452

SOLAR POWERED BAIT BOX

Harry D. Smith, 15645 W. Gardner Rd., Gardner, Kans. 66030, and Fletcher D. Sapp, 7714 Garnett, Lenexa, Kans. 66214

Filed Jun. 12, 1989, Ser. No. 364,644
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—57 **2 Claims**

1. A live fishing bait bucket or container having a normally substantially vertical side wall with a normally substantially horizontal bottom wall, said container adapted to receive therewithin a body of water to receive and maintain live fishing bait such as minnows therewithin, the upper surface of the

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body of water being positioned below the top end of the container,

said closure having an openable and closeable top cover or lid therewith,

an electric motor powered aerator device within said container operable to aerate a body of water received in said container,

a solar cell panel mounted on the upper surface of the container cover or lid having positive and negative electrical current terminals associated therewith so that current may be drawn from the solar panel,

a pair of insulated electric wires communicating through said container top or lid from the solar panel electrical terminals to the electrical terminals associated with said aerator electrical motor,

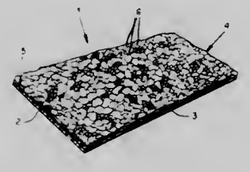
one upper end of said wires removably connected to the current outlet terminals of the solar panel and the other ends of said wires connectible to the power terminals of the aerator electric motor.

4,896,453

GROWTH-PREVENTING WEB FOR GROUND COVERING

Christian Jacob, Strasbourg, France, assignor to Sotralentz S.A., Dralingen, France

Filed Aug. 15, 1988, Ser. No. 232,608
Claims priority, application France, Aug. 17, 1987, 87 11703
Int. Cl.[4] A01G 7/00
U.S. Cl. 47—9 **11 Claims**



1. A vegetation-growth-preventing web, comprising:

a synthetic-resin foil layer of polyurethane or polyethylene having an upper surface;

a bituminous protective layer covering said upper surface and protecting said synthetic-resin foil layer against degradation by sunlight while forming an adhesive; and

a weighting layer of pieces of a relatively heavy bulk material on and substantially covering said upper surface in an amount of 5 kg/m^2 and bonded by said bituminous layer to said foil for holding said web on the ground and preventing wind-lifting thereof;

a coloring layer on said weighting layer of pieces of relatively heavy bulk material, and

a covering of glass beads on said coloring layer.

4,896,454

APPARATUS AND METHOD FOR TREATING TREES

Duane Crosenwett, 748 Hummingbird Way, North Palm Beach, Fla. 33408, and Robert W. Gottfried, 748 Hi Mount Rd., Palm Beach, Fla. 33480

Filed May 27, 1988, Ser. No. 199,791
Int. Cl.[4] A01G 7/06
U.S. Cl. 47—57.5 **21 Claims**

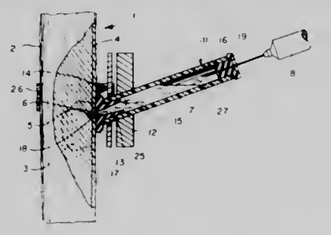
1. A method for treating a tree with a liquid, such that the liquid is continuously gravity-fed to the tree, said tree having a trunk and a cambrium layer, said method, in combination, comprising:

forming a hole in the trunk extending into the cambrium layer thereof;

fastening a bracket about the trunk of the tree;

providing an upstanding inclined tube including an inner open end and an outer end, a resilient bushing positioned in the inner end of the tube and extending therefrom, the bushing having an aperture formed therein of a size being substantially identical to the hole in the trunk of the tree, and a self-sealing bushing positioned in the outer end of the tube, whereby the outer end of the tube is sealed;

pressing the resilient bushing positioned in the tube against the trunk of the tree at an angle oblique relative to the trunk of the tree with the aperture formed in the resilient bushing being positioned substantially coincident with the hole formed in the trunk, such that liquid communication is provided between the tube and the hole in the trunk, and



further such that the resilient bushing is obliquely deformed to provide a substantially liquid-tight seal between the resilient bushing and the trunk of the tree;

securing the inclined tube to the bracket on the tree with the tube positioned extending outwardly at an oblique angle relative to the trunk of the tree;

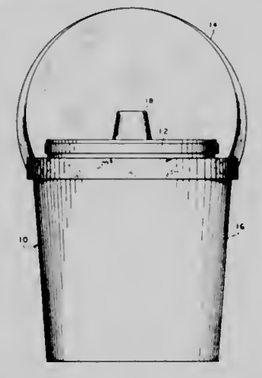
injecting a liquid into the obliquely inclined tube through the sealed end thereof, so that the liquid is continuously gravity-fed to the tree passing from the tube through the aperture formed in the resilient bushing and into the hole in the trunk, wherein the liquid is absorbed by the tree, thereby treating the tree.

4,896,455

PLANT STARTER APPARATUS

Eugene J. Kuban, R.D. #1, Box 588, Eight Four, Pa. 15330

Filed Oct. 11, 1988, Ser. No. 255,376
Int. Cl.[4] A01G 9/02
U.S. Cl. 47—66 **14 Claims**



1. Plant starter apparatus for starting a plant from seed wherein the plant, upon germination, receives light from a multiplicity of directions to allow vertical growth of the plant, said apparatus including:

soil holding means for holding a desired amount of soil, the soil held by the soil holding means forming a surface suitable for planting; and

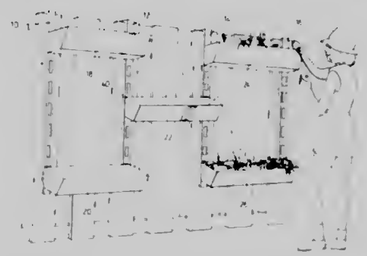
reflector means having a reflective surface capable of focusing reflected incident sunlight extending about a peripheral segment of said soil holding means, and above the soil holding means to a height which is sufficient for continuous reflecting of incident light proximate to foliage of a plant during upward growth thereof after emerging from the surface of the soil held in the soil holding means.

4,896,456

PLANT SUPPORTING SYSTEM

Douglas Grant, 700 Harmony Road, Suite 37, Oshawa, Ontario, Canada L1K 1S2

Filed Nov. 8, 1988, Ser. No. 268,874
Int. Cl.[4] A01G 9/02
U.S. Cl. 47—67 **8 Claims**



1. A modular, horizontally-adjustable plant growing system adapted for use against a vertical wall having an upper horizontal wall portion, the plant growing system comprising:

individually movable supports arranged in a plurality of horizontally adjacent pairs, each support comprising a hook portion fitted removably about the upper horizontal wall portion thereby suspending the support in a generally vertical orientation and comprising an elongate support portion having a multiplicity of vertically spaced-apart connector portions;

a plurality of receptacles, each receptacle having a bottom, a sidewall and an open top which are shaped to receive and retain soil, each receptacle having at least one pair of horizontally spaced-apart complementary connector portions, each complementary connector portion being shaped to mate with any one of the connector portions associated with the supports to releasably secure the associated receptacle at various selectable vertically spaced-apart positions relative to the supports; and,

each adjacent pair of supports being connected by at least one of the receptacles such that all the supports are joined together by the receptacles, the spacing between each adjacent pair of supports being fixed solely by securing the receptacles to the supports.

4,896,457

WATERING APPARATUS

Laurence S. Pitcher, 5160 Park Vista Blvd., Colorado Springs, Colo. 80918

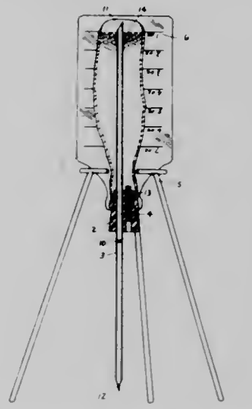
Filed Aug. 12, 1988, Ser. No. 232,115
Int. Cl.[4] A01G 25/00
U.S. Cl. 47—82 **11 Claims**

1. A watering apparatus for automatically delivering a timed rush quantity of water to a plant comprising:

a continuous walled, cylindrical, inverted reservoir bottle narrowing to form a circumferential shoulder and an elongated neck having an orifice therethrough;

a rubber stopper means of sufficient diameter to create a frictional, hermetic seal with the neck orifice comprising a circular rubber stopper having two through channels;

a means to allow the timed rush escape of water from the bottle and contained within one of said channels;



a vacuum breaking means extending through the second of said channels into the interior of the inserted reservoir bottle; and

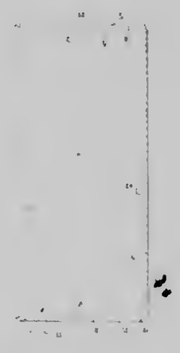
a support means to engage and hold the watering appartus proximal to and above a plant to be watered.

4,896,458

DOOR SYSTEM WITH INTERLOCKING PANELS

H. Smith McKann, and Wendel W. Haney, both of Fredericksburg, Va., assignors to General Products Company, Inc., Fredericksburg, Va.

Continuation of Ser. No. 197,956, May 24, 1988, Pat. No. 4,819,383. This application Apr. 10, 1989, Ser. No. 336,596
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[4] E06B 3/00
U.S. Cl. 49—501 **15 Claims**



1. A door, comprising:

first and second panels, each of said panels being substantially identical and formed of a unitary piece of material and including

a rectangular face member with opposite side and end edges,

a side flange extending substantially perpendicularly from

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said face member along one of said side edges, said side flange having a width substantially equal to a thickness of the door,

a first coupling means formed along a free lateral edge of said side flange remote from said face member, and

a second coupling means formed along the other side edge of said face member; and

said first and second coupling means of said first panel engaging said second and first coupling means, respectively, of said second panel to secure said panels and form the door, said coupling means being located at diametrically opposite corners of the door.

4,896,459

APPARATUS FOR MANUFACTURING THIN WAFERS OF HARD, NON-METALLIC MATERIAL SUCH AS FOR USE AS SEMICONDUCTOR SUBSTRATES

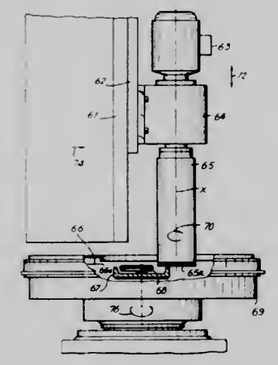
Georg Brandt, Erlangen, Fed. Rep. of Germany, assignor to GMN Georg Muller Nurnberg A.G., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 39,666, Apr. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 112,541, Oct. 26, 1987, abandoned. This application May 9, 1988, Ser. No. 191,682

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613132

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 C **7 Claims**



1. Apparatus for manufacturing thin wafers of hard, non-metallic material, such as monocrystalline or polycrystalline material for use as semiconductor substrates, from a bar of such material, said wafers having at least one precisely planar surface, said bar having an end face and a substantially central longitudinal axis, comprising:

an internal hole saw including a saw head and a cutting blade mounted for rotation around a slicing axis of rotation, said saw blade having a substantially circular internal cutting edge;

a cup-shaped grinding wheel having an annular grinding region, said grinding wheel being mounted in said saw head for rotation, and means for rotating said grind wheel around a grinding axis of rotation;

means for rotating said bar around said substantially central longitudinal axis thereof;

axial feed means for advancing at least one of said grinding wheel and said bar towards each other in an axial direction substantially parallel to one of said grinding axis and said bar axis with both said grinding wheel and bar rotating until said grinding region of said rotating grinding wheel engages and planes said end face of said bar during rotation thereof to a substantially precisely planar condition; and

radial feed means for advancing said bar, after said end face thereof is planed, in a radial direction with respect to said cutting edge of said saw blade and into engagement with said cutting edge until a wafer including said planed end face is sliced from said bar.

4,896,460

RAIL GRINDING MACHINE

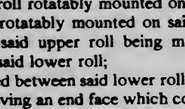
Josef Theurer, Vienna, and Herbert Wörgötter, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 8, 1988, Ser. No. 165,513

Claims priority, application Austria, May 12, 1987, 1200/87

Int. Cl.[4] E01B *31/17*

U.S. Cl. 51—178 **13 Claims**



1. A rail grinding unit for grinding surface irregularities on a rail head of at least one rail of a railroad track having two rails, which comprises

(a) a support frame having opposite ends,

(b) an undercarriage having flanged wheels supporting each support frame end on the rails for mobility along the railroad track,

(c) a carrier frame vertically adjustable mounted on the support frame,

(d) an endless grinding band mounted on the carrier frame and being vertically adjustable with respect to the support frame, the grinding band being trained about guide rollers under tension for rotation thereabout, a lower one of the guide rollers constituting a pressure roll for pressing the endless grinding band into grinding contact with the surface,

(e) a vertical adjustment device connected to the support frame for adjusting the depth of the grinding contact of the endless grinding band with the pressure roll in relation to the surface, the vertical adjustment device including a remote-controlled motor drive for operating the vertical adjustment device,

(f) vertical guides mounting on the support frame at respective sides of the carrier frame and guide sleeves on the carrier frame for vertically displaceably mounting the carrier frame on the vertical guides, and

(g) a set screw mounted on the support frame for engaging the carrier frame to delimit the vertical displacement thereof.

4,896,461

INTERNAL GRINDING MACHINE

Hideki Enoeawa, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Apr. 11, 1988, Ser. No. 180,214

Claims priority, application Japan, Apr. 10, 1987, 62-88094

Int. Cl.[4] B24B *47/22*

U.S. Cl. 51—103 WH **9 Claims**

1. An internal grinding machine comprising:

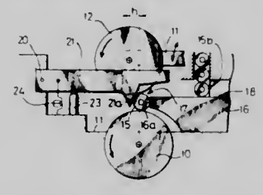
a fixed lower roll rotatably mounted on a frame;

an upper roll rotatably mounted on said frame above said lower roll, said upper roll being movable toward and away from said lower roll;

a shoe provided between said lower roll and said upper roll, said shoe having an end face which contacts and supports a workpiece in a support space between said upper and lower rolls;

means for feeding said workpiece toward said support space; and

means for guiding said workpiece into and out of said support space, said guiding means being pivotally mounted at one end and having a contoured projection of substantially V-shape biased toward said workpiece, said projection having at least a pair of cam surfaces, one of which guides said workpiece into said support space before grinding and another of which separates said workpiece from said support space after grinding.



4,896,462

MECHANISM FOR BELT SANDERS

Joseph G. Farmerie, New Berlin, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Jun. 27, 1988, Ser. No. 211,867

Int. Cl.[4] B24B *21/00*

U.S. Cl. 51—135 BT **2 Claims**



1. A belt sander comprising,

a base,

a drive roller mounted on one end of said base,

a vertical pivot pin mounted on said base,

a generally horizontally disposed yoke having a longitudinally oriented slot therein at one end mounted over said pin to enable the yoke to slide and pivot axially relative to said pin,

said yoke including spaced, generally vertical support arms at the other end of said yoke,

an idler roller rotatably mounted between said arms, said idler roller being longitudinally spaced from said drive roller,

an endless belt mounted on said drive roller and said idler roller,

a housing fixed relative to said base and including a generally vertical side wall,

a generally longitudinally disposed slot in one of said arms,

a threaded, heated pin slideably but non-rotatably mounted in said slot in said one arm and having its threaded end projecting outwardly through said side wall,

a knob threaded on said pin outside said housing, and

a spring compressed between said side wall and said one arm to bias said one arm against the head of said pin and to hold said knob against the outside of said housing so turning said knob adjusts said yoke about said pivot pin to angularly align said belt.

4,896,463

DISPOSABLE FINISHING ARTICLE HAVING AN INTEGRAL MOUNTING HUB INCLUDING PRESSURE CAP SECURED BY ROTATION

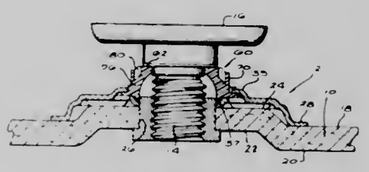
Joseph H. MacKay, Jr., 17551 Cabela Dr., San Diego, Calif. 92127

Continuation-in-part of Ser. No. 113,937, Oct. 27, 1987, Pat. No. 4,754,577, which is a continuation-in-part of Ser. No. 5,813, Jan. 21, 1987, Pat. No. 4,754,578, which is a continuation of Ser. No. 847,793, Apr. 3, 1986, Pat. No. 4,694,615. This application Apr. 15, 1988, Ser. No. 181,773

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] B24B *45/00*

U.S. Cl. 51—168 **14 Claims**



1. A finishing device having a disposable drive member non-removably affixed thereto for mounting on a threaded rotatable spindle of a power tool comprising:

a finishing article having a face and a back and having a first centrally disposed aperture therethrough;

a backing flange having an inner and outer surface and a diameter smaller than the diameter of said finishing article, said backing flange defining a second centrally disposed aperture therethrough, and a plurality of fingers extending radially inwardly from said outer surface thereof and defining a space therebeneath, said first and second apertures being aligned;

a retaining nut having a hollow internally threaded body having first and second ends and a first radially outwardly extending flange extending from said first end of said body, said body extending through said first and second apertures with said radial flange seated against one of said face and back;

means protruding outwardly from said second end of said body to non-removably secure said retaining nut and said backing flange together on said wheel without the use of adhesives; and

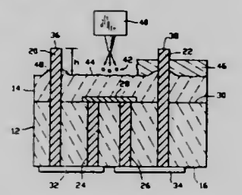
pressure cap means defining a centrally disposed opening therethrough secured to said fingers extending radially inwardly from said backing flange to apply force to said backing flange when said finishing article is secured on said spindle to cause said backing flange and said retaining nut to move toward each other to compress said finishing article therebetween as operative loads are applied to said article during use on said power tool, said pressure cap including a molded plastic member having a plurality of radially outwardly extending tangs, each of said tangs having a wedge shaped portion adapted to be received under one of said fingers for securing said cap to said backing flange.

4,896,464

FORMATION OF METALLIC INTERCONNECTS BY GRIT BLASTING

Jungihl Kim, Peekskill; Joseph C. Logue, Poughkeepsie; John J. Ritsko, Mount Kisco; Robert R. Shaw, Poughkeepsie, and George F. Walker, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1988, Ser. No. 207,085
Int. Cl.[4] B24C 1/04
U.S. Cl. 51—319 18 Claims



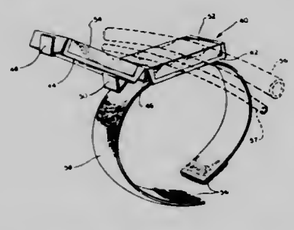
1. A method of forming upstanding conductive terminals upon a surface of a ceramic structure, comprising the steps of:
providing a ceramic structure having at least one electrically conductive member contained within the structure, the member having a terminal portion proximally disposed to a surface of the ceramic structure;
directing a stream of abrasive particles at the surface of the ceramic structure; and
abrading with the stream of abrasive particles the surface of the ceramic structure to remove ceramic material therefrom such that at least the terminal portion of the conductive member is left protruding from the abraded surface.

4,896,465

RETAINER APPARATUS

Robert Rhodes, 309 W. 550 North Cir., St. George, Utah 84770, and Dennis R. Hauze, 910 Millstream, Bountiful, Utah 84010

Division of Ser. No. 89,866, Aug. 27, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,194
Int. Cl.[4] A61B 17/12
U.S. Cl. 51—391 24 Claims



1. A retainer comprising:
a first support member;
a first resilient member mounted to said first support member said first support member including an abrasive member;
a second support member;
a second resilient member; mounted to said second support member; and
a base for supporting said first support member in a spaced relationship to said second support member with said first resilient member in juxtaposition with said second resilient member.

4,896,466

CONSTRUCTION METHOD AND APPARATUS

Wade H. Blazley, Orange, Australia, assignor to Blazley Designs Pty. Ltd., Miami, Australia

Continuation-in-part of Ser. No. 83,909, Aug. 6, 1987, Pat. No. 4,759,159, which is a continuation of Ser. No. 845,139, Feb. 28, 1986, abandoned. This application Apr. 21, 1988, Ser. No. 184,144
Int. Cl.[4] E04B 1/32
U.S. Cl. 52—7 9 Claims



1. A method for on-site construction of a self-supporting building utilizing interlocking panel members with each panel member having a male rib and a female rib along respective longitudinal edges thereof, said male rib being engageable within said female rib, for forming a continuous joint comprising the steps of:
(a) erecting a first panel member,
(b) positioning a second panel member adjacent to the first panel member with a respective female rib of one of said panel members overlying a respective male rib of the other of said panel members,
(c) engaging the female rib with a first contact member being substantially contiguous thereto,
(d) simultaneously engaging the male rib with a second contact member, said second contact member defining a recessed surface area and a perimetral projection, said perimetral projection being contiguous to the male rib during engagement for reducing frictional resistance during relative movement therebetween,
(e) applying opposed forces to said first and second contact members for urging the male and female ribs into interlocking engagement, and
(f) traversing the longitudinal length of the panel members with the engaged first and second contact members to develop a continuous joint between the respective panel members.

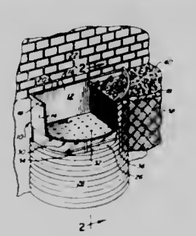
4,896,467

WINDOW WELL COVER

Daniel McGinnis, 7921 W. Dooner, Tinley Park, Ill. 60477

Filed Jul. 21, 1989, Ser. No. 383,046
Int. Cl.[4] B24B 5/00
U.S. Cl. 52—107 10 Claims

1. A one-piece plastic window well cover, which comprises a side wall having upper and lower edges, and a bottom wall integrally connected to said side wall adjacent said lower edge, whereby said window well cover defines a container, the upper edge of said side wall defining an outwardly-extending section which is proportioned to engage the upper edge of said window well, whereby said bottom wall and at least the majority of said side wall resides within said window well.

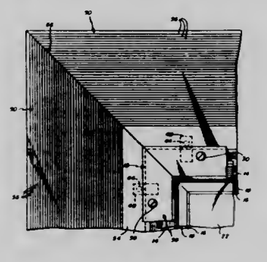


4,896,468

SKYLIGHT SEALING

Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Continuation of Ser. No. 857,940, Apr. 30, 1986, Pat. No. 4,702,049, which is a continuation-in-part of Ser. No. 839,419, Mar. 14, 1986, Pat. No. 4,703,592, which is a continuation-in-part of Ser. No. 749,947, Jun. 17, 1985, Pat. No. 4,589,238. This application Sep. 10, 1987, Ser. No. 94,870
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] E04B 7/18
U.S. Cl. 52—200 56 Claims



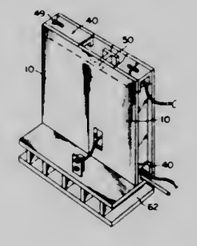
1. In a skylight for covering an opening in a building comprising, a curb frame extending about the opening, means for securing the curb frame in place about the opening, translucent or transparent means covering the opening and extending at its edges to the curb frame, means for retaining the covering means on the curb frame, said curb frame being constructed of a rigid thermoplastic material having co-extruded and integral therewith at least one gasket of flexible thermoplastic material for providing a seal between the curb frame and covering means and furthermore having co-extruded and integral therewith a flashing flange extending from the base of the curb frame about the periphery of the curb frame and of a flexible thermoplastic material, said rigid thermoplastic material forming the curb frame as well as the co-extruded flexible gasket and co-extruded flexible flashing flange all being commonly sealed to join the curb frame mitres and also simultaneously secure the gasket and flashing flange at the curb frame mitres to provide a continuous seal about the curb frame.

4,896,469

PREFABRICATED BUILDING PANEL ASSEMBLY

John T. Wright, 331 Groffs Mill Rd., E64, Harleysville, Pa. 19440

Continuation of Ser. No. 88,724, Aug. 19, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 282,899
Int. Cl.[4] E04F 17/08; E04B 2/00
U.S. Cl. 52—221 8 Claims



1. A prefabricated building panel assembly for facilitating placement of utility lines, said assembly comprising:
a pair of rectangular outer panels disposed in spaced parallel relationship, said panels each having peripheral edges including opposed parallel horizontal edges and opposed parallel vertical edges;
a plurality of generally parallel spaced apart studs connected to and extending between said panels aligned vertically and generally parallel to said vertical edges and including side studs which are spaced inwardly by a predetermined spacing from the respective vertical edges of said outer panels, said studs having a vertical length between its opposed ends such that the ends thereof are aligned in parallel and spaced inwardly by a predetermined spacing from the respective horizontal edges of said outer panels; and
a plurality of connecting members, each said connecting member comprising a pair of spaced apart substantially parallel flanges and a web connected to and extending between said flanges so as to form a hollow channel defined between said flanges spaced apart by said web, each said connecting member being slidably inserted between the opposed peripheral edges of said outer panels of said prefabricated panel assembly and being dimensioned in correspondence to said predetermined spacings of said studs from the horizontal and vertical edges of said outer panels such that the flanges thereof are in face to face contact with the respective outer panels and are in abutting contact with said studs, including horizontal connecting members being positioned horizontally with respect to said studs with said flanges in abutting contact with the ends of said studs, and vertical connecting members having a vertical length substantially equal to the vertical length of said studs and being positioned vertically in parallel to said studs,
wherein said horizontal and vertical connecting members are disposed such that the webs thereof are spaced from said studs with the respective channels thereof communicating into each other for directing utility lines between said outer panels in directions both parallel and orthogonal to the studs along the horizontal and vertical edges of said panel assembly, and wherein the vertical length of said second connecting member being substantially equal to that of said studs allows the channel of the horizontal connecting members to communicate into other horizontal connecting members of an adjacent panel assembly.

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4,896,470

TENDON TENSIONING ANCHOR

Felix L. Sorkin, Houston, Tex., assignor to Varitech Industries, Inc., Stafford, Tex.

Filed Apr. 21, 1988, Ser. No. 184,535
Int. Cl.[4] E04C *5/12, 3/26*
U.S. Cl. 52—230 **12 Claims**



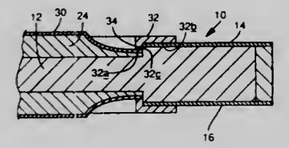
1. A tendon tensioning anchor comprising:
a base member having a tubular section extending therefrom, said tubular section having a sloping annular interior wall for receiving the end of a tendon; and
a plastic encapsulation means in generally air-tight juxtaposition with the exterior of said base member and the exterior of said tubular section, said plastic encapsulation means comprising a plastic material of high density polyethylene in injection-molded relationship to said base member and said tubular section, said plastic encapsulation means being of unitary construction, said base member and said sloping annular interior wall of said tubular section being in with said tendon extending therethrough electrolytic contact.

4,896,471

FIRE ROOF PANEL DOOR

Terry A. Turner, Princeville, Oreg., assignor to Truline Manufacturing Inc., Redmond, Oreg.

Filed Jan. 23, 1989, Ser. No. 299,347
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—455 **4 Claims**



1. A fire-resistant raised panel door comprising:
a support panel,
one or more rectangular panel-simulating regions formed on each of opposite sides of the support panel, with each panelsimulating region on one side of the support panel being opposite and aligned with an opposed panel-simulating region on the opposite side of the support panel, the support panel on each side having face regions extending about and disposed laterally outwardly of each panel-simulating region, a face overlay secured to the face regions of the support panel on each side of the support panel,
each panel-simulating region including a channel extending in a rectangular course forming the perimeter of the region, the channel being bottomed by bottom surfaces recessed inwardly from the face regions of the support panel and the channel encompassing a rectangular raised expanse,
an overlay for each panel-simulating region covering the rectangular raised expanse of the panel-simulating region and further covering the bottom surfaces of the channel that encompasses the raised expanse of the region, and
molding strips extending in the course of each channel, the molding strips, when viewed in cross section, each having on the interior thereof a lower level surface and an upper level surface and a body of the molding strip providing a bridge spanning the two levels of the molding strip, the molding strips being mounted with their lower level surfaces against the overlays which cover the bottom surfaces of the channel and with their upper level surfaces affixed against the face overlays.

4,896,472

BUILDING BLOCK AND SYSTEM

Terance J. Hunt, 2016 Fairmeadow Dr., Richardson, Tex. 75080
Continuation of Ser. No. 11,078, Feb. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 766,125, Aug. 15, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 300,203
Int. Cl.[4] E04C *1/10*
U.S. Cl. 52—593 **12 Claims**

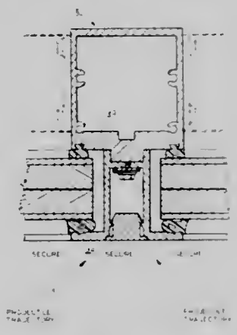
1. A building system comprising a set of three types of interlocking blocks, whereby construction of structures therewith does not require mortar, said three types of blocks of said set comprising:
a. a full block of rectangular configuration comprising: two spaced, parallel end walls and two spaced, parallel side walls extending longitudinally of said block between said end walls, said end and side walls having respective external faces, said block having top and bottom faces, and an open-ended internal cavity extending between said top and bottom faces of said block; two middle webs extending transversely of said block and parallel to said end walls between internal faces of said side walls for separating said open-ended internal cavity into two end cavities of substantially equal size and a central cavity, each said end cavity being defined by an internal face of one said end wall, one internal face of one said middle web, and the intervening internal faces of said side walls; an ear on a central portion of each said middle web, said ears being confined to and protruding from said central portions and being essentially the only protrusions from said top face, each said ear being of substantially the same dimensions, and each said ear having a transversely extending surface delimiting the extent of said ear toward said central cavity and oppositely disposed, longitudinally extending surfaces, each delimiting the extent of said ear toward the proximal said side wall; and a groove in said internal face of said end wall and each of said side walls of each said end cavity, said grooves in the internal faces of the end and side walls of each said end cavity being non-contiguous, each said groove extending from said bottom face toward said top face at least as far as said ears projects

form said top face, each said groove in said internal face of said end and side walls being defined by a groove face and adjacent opposite side edges, said side edges of said groove in each said end wall each being spaced from said external face of the proximal side wall a distance substantially the same as the distance from said longitudinally extending surfaces of said ears to the external faces of the proximal side walls and each said transversely extending surface of each said ear being spaced from said external face of the proximal end wall a distance substantially one-half the external length of a side wall minus the distance of said face of said groove in the proximal end wall to said external face f said end wall; and said side edge proximal said end wall of each said groove in from said external face of said proximal end wall as the distance of each said longitudinally extending surface of each said ear to said external face of said proximal side wall, whereby an ear and groove of adjacent blocks can be male-female interlocked one external face of one block flush with an external face of the other block;
b. a half block of rectangular configuration comprising four walls, each wall having an external face and an internal face, said internal faces defining an open-ended internal cavity, two of said external faces of said half block at opposite ends of said half block each having the same configuration as said external faces of said end walls of said fullblock, but being spaces by the other two said walls of said half block half the distance between the end walls of said full block, and at least one groove in one said internal face of said half block extending from one open end of said open ended cavity for male-female fitting with one said ear of said full block in a construction of a structure; and
c. a knock-out block having walls with the same external end face, side face and groove configurations as said full block, and further comprising removable means for knock-out portions of said walls which, when removed, permit insertion of reinforcement bars and the like across and between more than one of said knock-out blocks.

4,896,473

METHOD OF CONVERTING TO A SECURITY GLAZING SYSTEM

Richard E. Liebetrau, 237 Petrie Rd., Cadillac, Mich. 49601
Continuation of Ser. No. 166,691, Mar. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 938,320, Dec. 5, 1986, abandoned. This application Apr. 10, 1989, Ser. No. 335,440
Int. Cl.[4] E06B *5/10*
U.S. Cl. 52—747 **4 Claims**



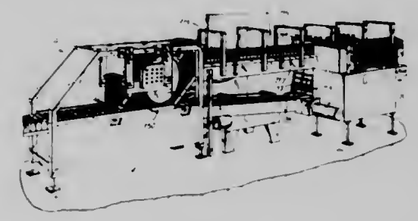
1. In a storefront structure including glazing frames having horizontal and vertical components for supporting glazing assemblies, said glazing assemblies defining a first secure assembly having a thickness dimension T_1 and a second non-secure assembly having a thickness dimension T_2, wherein T_2 is less than T_1, said glazing frames having glazing clips for retaining said glazing assemblies, said glazing clips including a thin-walled cover means and fastening means for securing the clips to one of said components, wherein the storefront structure supports, initially, a non-secure glazing assembly plus a filler element, said filler element being operable to adjust dimension T_2 to the value of dimension T_1,
a method of converting a non-secure glazing assembly to a secure glazing assembly wherein all steps are performed on the exterior or weatherside of the storefront structure comprising the sequential steps of:
removing the cover means to gain access to the fastening means,
removing the fastening means to free the glazing clip,
removing the glazing clip,
removing the non-secure glazing assembly including the filler element,
installing a secure glazing assembly replacing said glazing clip and said fastening means, and,
substituting a new cover means in the form of a length of solid bar stock to render the cover means secure.

4,896,474

SPACER-TRAY LOADING MACHINE

John F. Osteen; Bernard R. Marks, and Frederick J. Szeliga, all of Lynchburg, Va., assignors to International Container Systems, Inc., Tampa, Fla.

Filed Oct. 6, 1987, Ser. No. 105,780
Int. Cl.[4] B65B *21/08, 35/26, 5/10*
U.S. Cl. 53—48 **27 Claims**

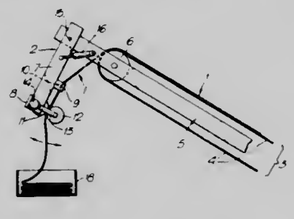


8. A tray loading machine for loading containers into trays comprising:
(a) a rotatable metering wheel for inserting said containers into said trays;
(b) tray input queue means for providing said metering wheel with a supply of trays;
(c) a tray supply line for supplying stacked trays to said metering wheel;
(d) tray feeding means for individually selecting a most downstream tray from said stacked tray supply line and transferring said most downstream tray to said tray input queue, said tray feeding means having:
(i) a retainer frame through which said trays pass one at a time from said tray supply line;
(ii) a plurality of retainer blades to mate with and selectively engage retainer cutouts located in said trays;
(iii) a pivotally mounted pull-and-drop arm pivotable between a tray-contact orientation in which a most downstream tray of said stacked trays is contacted and retained, and a tray-drop orientation in which said contacted anD retained tray may be dropped;
(iv) a plurality of pull-and-drop suckers mounted to said pull-and-drop arm, said pull-and-drop suckers having surfaces to mate with said contacted and retained tray so as to firmly hold said contacted and retained tray while said pull-and-drop arm pivots from said tray-contact orientation to said tray-drop orientation; and

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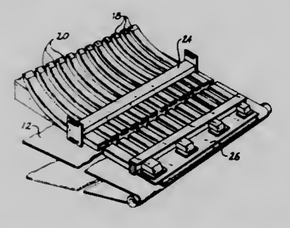
(v) orientation means to selectively urge and orient said spacer tray into said input queue;
(e) container input queue means for providing said metering wheel with a supply of containers;
(f) wherein said rotatable metering wheel urges containers from said container input queue means against said trays from said tray input queue means so as to insert said containers into said trays.

4,896,475
ROCKER FRAME
Dennis M. McAvinew, Mogadore, Ohio, assignor to Polysar Financial Services S.A., Fribourg, Switzerland
Filed Feb. 21, 1989, Ser. No. 312,922
Int. Cl.[4] B65B *25/14*
U.S. Cl. 53—117 **10 Claims**



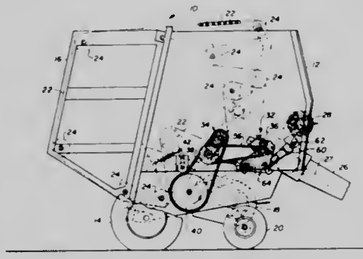
1. A cooperating rocker frame and conveyor adapted to transport and package one or more continuous strips of narrow gauge web material in a compartmentalized package comprising a belt conveyor having at its terminal end a depending rocker frame joined to each side of said conveyor frame by a pivot means, said rocker frame comprising at least two substantially equilength side members, spaced apart approximately the width of said conveyor, an end member joining said side members, two rubber rollers adjacent said end member held in contact by a pneumatic cylinder and piston means, one of said rollers being driven by a variable speed motor, a guide member parallel to and adjacent said end member and joining said side members, said guide member adapted to receive and bearing divider pins, and a rocker drive means, one end of which is attached to the frame for said conveyor and the other end of which is attached to said rocker frame.

4,896,476
APPARATUS FOR PACKAGING INSULATION MATERIAL
Ronald R. Harris, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Sep. 16, 1988, Ser. No. 245,246
Int. Cl.[4] B65B *1/24, 13/20*; B30B *5/04*
U.S. Cl. 53—118 **4 Claims**



4. An apparatus for packaging compressible mineral fiber insulation material comprising, in combination: means for transporting such insulation material; means for packaging such insulation material; and means for compressing such insulation material prior to such material entering said packaging means, said compression means including a plurality of curvilinear finger members extending in the machine direction, said finger members defining a plurality of voids extending in the machine direction, wherein such insulation material is progressively compressed by said finger members to a first thickness and such insulation material progressively compresses in such voids to a second thickness, slightly greater than such first thickness, such difference in insulation material thickness providing for self-guided orientation; and a flat press member positioned adjacent said finger members between said finger members and said packaging means, said press member providing a final smoothing compression to such insulation material as such insulation material is received by said packaging means.

4,896,477
NET WRAPPING APPARATUS
Robert A. Wagstaff, Lancaster, and John H. Merritt, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Mar. 13, 1989, Ser. No. 322,261
Int. Cl.[4] B65B *11/56, 21/12, 41/6*
U.S. Cl. 53—118 **11 Claims**



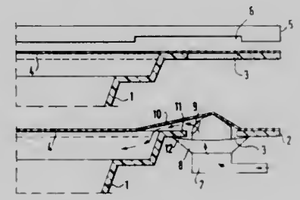
1. In a round baler for making cylindrical bales of crop material having apparatus for wrapping said bales with netting material, said apparatus including a knife and a feed roller which may be selectively driven to dispense netting material from a supply roll into said round baler, said apparatus having a home position and a cutting position wherein said feed roller is latched and said knife is actuated, said apparatus also having a feeding position wherein said feed roller is driven, said apparatus comprising:
a lever mounted for rotation about the axis of said feed roller, said lever having first means on one end thereof for effecting the driving of said feed roller and having second means on the other end thereof for effecting the latching of said feed roller.

4,896,478
METHOD AND APPARATUS FOR STERILIZING PACKAGING MATERIAL, IN PARTICULAR PACKAGING CONTAINERS
Michael Reiter, Cologne, Fed. Rep. of Germany, assignor to PKL Verpackungssysteme GmbH, Duesseldorf, Fed. Rep. of Germany
Filed Nov. 12, 1986, Ser. No. 929,949
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540161
Int. Cl.[4] B65B *55/10*; A61L *2/20*
U.S. Cl. 53—426 **14 Claims**

1. In the sterilising of packaging material such as packaging containers by means of a liquid sterilising agent, comprising atomizing the sterilising agent and mixing it with compressed air, vaporizing the resulting mixture, and blowing the mixture of vapor, air and sterilising agent onto the surface of the packing material, the vapor condensing on the packaging material, the improvement which comprises imparting to the mixture, prior to blowing onto the packaging material, a rotary movement along a central axis, and then positively guiding a boundary layer of the mixture liquid produced by the centrifugal action of the rotary flow at least partially in the opposite direction to the main flow direction of the mixture.

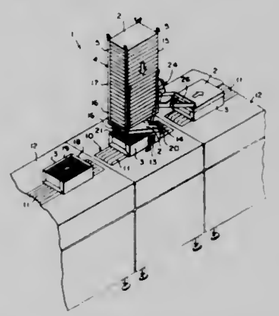


4,896,479
PACKAGING PROCESS
Raymond Gasson, Farnborough, United Kingdom, assignor to E.G.I. Projects Limited, Euston Square, United Kingdom
Continuation of Ser. No. 150,999, Feb. 1, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 372,215
Claims priority, application United Kingdom, Jan. 31, 1987, 8702206
Int. Cl.[4] B65B *7/28, 31/02, 31/04, 51/10*
U.S. Cl. 53—432 **8 Claims**



1. A process of packaging goods, which comprises
placing the goods in a container (1) made of flexible thermoplastic sheet material and having a flange (2) provided with an aperture (3),
partly closing the container by sealing a deformable sheet material (4) of thermoplastic material to the flange so as to leave unsealed together a part of the flange and the sheet material between the aperture and the interior of the container,
inserting a conduit member (7) into the aperture so as to separate the unsealed part of the flange and the sheet material thereby and so as to form an air-tight sealing engagement connection between the conduit member and the flange at the aperture for flow communicating the conduit member with the interior of the container through the unsealed part of the flange and the sheet material,
modifying the atmosphere in the container by withdrawing a part of the air in the container and introducing a preserving gas into the container via the conduit member so as to exchange the air in the container by the preserving gas,
removing the conduit member, and
sealing together the unsealed part of the sheet material and the flange whereby communication between the aperture (3) and the interior of the container is prevented.

4,896,480
METHOD AND APPARATUS FOR PLACING A COVER ON A BOX
Martin Blümle, Horhausen, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany
Filed Jan. 25, 1989, Ser. No. 301,807
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1988, 3806512
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—485 **7 Claims**



1. A method of placing a cover on a moving box having an opening, comprising:
(a) lowering the cover so that it is inclined with the edge thereof trailing in the direction of the box movement remaining supported by seizing the cover on one side while in a cover magazine and moving the cover downwardly with said side leading so that the cover is in an inclined position;
(b) gripping the edge of the cover leading in the direction of box movement over the leading edge of the box opening by running the box into the cover simultaneously with moving the cover downwardly;
(c) moving the box in the direction of box movement so that the box pulls the cover from the magazine supporting the trailing edge thereof, whereby the cover is placed on the opening of the box; and
(d) applying pressure to the cover from above so as to completely force the cover over the edges of the box opening.

4,896,481
COIN RECEIVING AND WRAPPING MACHINE
Hideshi Sentoku, Tokyo, and Takayoshi Asaoka, Tokyo, both of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1988, Ser. No. 212,598
Claims priority, application Japan, Jul. 2, 1987, 62-166025; Jul. 21, 1987, 62-181430
The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.
Int. Cl.[4] B65B *11/04, 57/20*
U.S. Cl. 53—501 **5 Claims**

1. A coin receiving and wrapping machine comprising:
upper hopper means for receiving coins to be processed,
first passage means for transporting received coins,
discriminating means provided in said first passage means for discriminating denominations and genuineness of received coins and counting the value of genuine received coins,
first coin excluding means provided in the vicinity of one

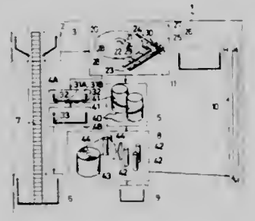
end of the first passage means for excluding coins having a larger diameter than that of a predetermined denomination of coins and feeding the coins of the predetermined denomination and those having a smaller diameter than that of the predetermined denomination of coins to second passage means for transporting received coins,

second coin excluding means provided in the second passage means for excluding coins having a smaller diameter than that of the predetermined denomination of coins,

accumulating means for receiving said predetermined denomination of coins to accumulate them,

wrapping means provided downward of said accumulating means for wrapping said predetermined denomination of coins in the form of a coin stack,

holding means removably mounted on said machine for temporarily holding the coins excluded by said first and second coin excluding means,



selecting box means removably mounted on said machine and positioned downward of said holding means for receiving the coins from the holding means and for discharging the coins introduced from the holding means,

lower hopper means located at the lower portion of the machine for receiving said coins discharged from the selecting box means and coins which are introduced through opening means opened to the outside of the machine, the selecting box means being provided with inlet means adapted to be communicated with the holding means when the selecting means is mounted on the machine and provided with outlet means which can be opened by applying a key from the outside of the machine, and

transporting means for transporting the coins introduced into said lower hopper means from the lower means to the upper hopper means.

4,896,482

BUNDLING MACHINE AND A METHOD OF BUNDLING MATERIAL

Michael Bohl, Schillerplatz 8, and Karlheinz Brieden, Furweg 5, both of 5609 Hueckeswagen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,301
Int. Cl.[4] B65B *13/24*
U.S. Cl. 53—588 7 Claims

1. A bundling machine comprising:

a supply roll for bundling material;

a driven ring, said supply roll be carried by said driven ring;

a gripper device for grabbing and separating the bundling material, said gripper device comprising a moveable support;

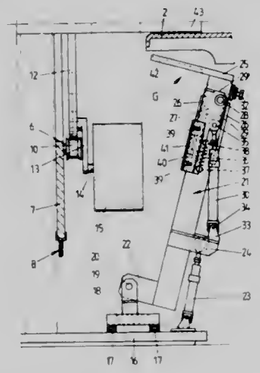
a carriage, said carriage being mounted upon said moveable support for movement transverse to the direction of motion of said support;

first and second beams for clamping and cutting said bundling material;

means for pivoting said first beam relative to said second beam, said second beam being rigidly mounted upon said support adjacent to one end thereof;

means guiding said carriage for movement along said support;

spring means urging said carriage in a direction away from said second beam; said first beam being mounted upon said carriage;



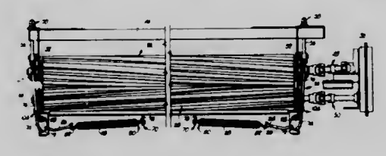
stop means carried by said support for limiting pivotal movement of said first beam to a position in which said first beam is parallel to said second beam.

4,896,483

HAY CONDITIONER ROLL TENSIONING MECHANISM

Michael L. O'Halloran, and Martin E. Pruitt, both of Hesston, Kans., assignors to Hay & Forage Industries, Hesston, Kans.

Filed Jan. 17, 1989, Ser. No. 297,945
Int. Cl.[4] A01D *82/00*
U.S. Cl. 56—1 14 Claims



1. In a crop conditioner having a frame and first and second rolls each rotatable about an axis of rotation, a mounting assembly for the first roll including a sub-assembly at each end of the first roll, each sub-assembly comprising:

a mounting plate rotatably supporting one end of the first roll and being supported on the frame for pivotal movement about a pivot axis which is generally parallel to and displaced from the axis of rotation of the first roll such that the axis of rotation of the first roll is movable relative to the axis of rotation of the second roll between a first position, a second position and a third position, the second and third positions of the first roll being progressively farther away from the axis of rotation of the second roll than the first position;

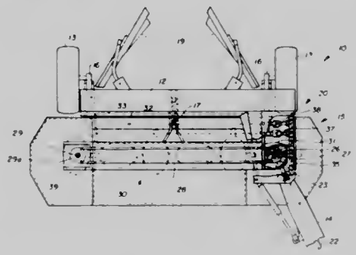
biasing means for exerting a biasing force on the mounting plate and the first roll which acts in a direction generally toward the second roll, the biasing force having a magnitude which is less when the first roll is located between the second and third positions than when the first roll is located between the first and second positions.

4,896,484

SPLIT CUTTERBAR DRIVE MECHANISM

Richard E. Jennings, Manheim, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Sep. 2, 1988, Ser. No. 240,854
Int. Cl.[4] A01D *34/66, 34/76*
U.S. Cl. 56—6 8 Claims



1. In a mower-conditioner having a frame; a header supported from said frame for generally vertical movement relative thereto, said header having a transverse cutterbar requiring rotational power at the transversely opposing ends thereof for proper operation to sever standing crop material; a conditioning mechanism to receive and condition severed crop material therefrom; and a drive mechanism providing operational power to the transversely opposing ends of said cutterbar and to said conditioning mechanism, an improved drive mechanism comprising:

a power input shaft adapted for connection to a prime mover to deliver rotational power to a gearbox, said gearbox being positioned above an adjacent end of said cutterbar and having a detachable lid, said power input shaft having a main drive gear affixed thereto for rotation therewith inside said gearbox;

a first output shaft rotatably supported from said gearbox and having a first pinion affixed thereto and positioned in intermeshing engagement with said main drive gear to provide rotational power to an adjacent end of said cutterbar, said first output shaft being rotatable in a first direction of rotation;

a second output shaft rotatably supported by said detachable lid and being removable from said gearbox with said detachable lid, said second output shaft having a second pinion affixed thereto and positioned in intermeshing engagement with said main drive gear to provide rotational power for a remote end of said cutterbar, said detachable lid supporting bearings positioned on opposite sides of said second pinion for the rotational support of said second pinion, said second output shaft being rotatable in a second direction of rotation opposite to said first direction of rotation; and

a power transfer mechanism to transfer rotational power from said second output shaft to said remote end of said cutterbar.

4,896,485

LAWN MOWER ASSEMBLY

Donald G. Gordy, Rte. 1, Box 213, Lawrence, Miss. 39336

Continuation-in-part of Ser. No. 220,041, Jul. 14, 1988. This application Feb. 3, 1989, Ser. No. 305,592
Int. Cl.[4] A01D *75/30*
U.S. Cl. 56—6 3 Claims

1. In a lawn mower towing assembly including a lead towing vehicle and a plurality of trailing rotary-type lawn mowers movable along a supporting surface, a hitch assembly comprising

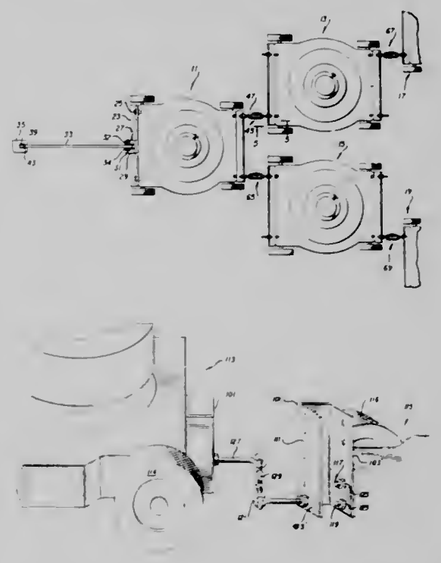
a substantially rigid bar adapted to be pivotally attached between said towing vehicle and the front of the first of said trailing lawn mowers, the point of attachment of said bar to said towing vehicle being of a substantially greater height above said supporting surface than the point of attachment to said first of said trailing lawn mowers;

first and second angular plates each having at least two sides with a plurality of spaced boreholes in each of said sides;

means for securing one of said sides of said first plate to the rear of said first of said trailing lawn mowers;

a second trailing lawn mower;

means for securing one of said sides of said second plate to the front of said second trailing lawn mower;





first and second removable eyebolts secured in a preselected borehole in the other of said sides of said first and second plates, said first eyebolt in the first of said angular plates being at a greater height above said supporting surface than said second eyebolt in said second of said angular plates; and

removable rigid link connecting said first eyebolt to said second eyebolt;

whereby forward movement of said first of said trailing lawn mowers provides a towing force on said second trailing lawn mower, said towing force having horizontal and vertical components.

4,896,486

CROP HARVESTER HAVING HEIGHT CONTROL

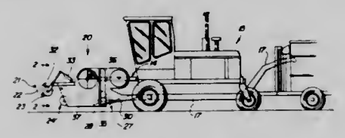
E. Cordeli Lundahl, Providence, and Laurel H. Jensen, Hyrum, both of Utah, assignors to Lundahl Research, Inc., Logan, Utah

Filed Jun. 7, 1988, Ser. No. 203,778
Int. Cl.[4] A01D *75/28*
U.S. Cl. 56—10.2 43 Claims

1. A grain harvester comprising a wheeled frame adapted to be advanced in a field in a predetermined direction; a header mounted to said wheeled frame; a first drum mounted on said header for rotation about a horizontal axis transverse to said direction of travel; said drum including means for stripping the grain including the heads from the stalks; means for rotating said first drum as said harvester advances; means for varying the rotational speed of said first drum; a second drum rotatably

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mounted on said frame for rotation about the horizontal axis transverse to the direction of travel; means for rotating said second drum; shield means surrounding a portion of said first drum to generate air flow between the inner surface of said shield means and said first drum when said first drum is rotated; at least one sensor means for sensing a first point at the top of the grain to measure the distance said first drum is above the crop stalks to be harvested; a second sensor means for sensing the distance from said first sensor means to a second point on said crop stalks; means for adjusting said harvesting means to maintain predetermined differential between the distances measured by the first and second sensors; a separation chamber receiving on one side the air flow generated by the rotation of the first drum means and the loose grain removed from said stalk by the action of said first and second drum means; means for generating a suction on a second side of said



separation chamber; means for creating said suction comprising a fan means having its input side connected to said chamber means; a third rotating drum surrounding said fan means; means for adjusting the amount of each of said air flows on said third drum; discharge means for discharging the material other than grain after removal from the third rotating drum by the pressure of the fan; collection means for collecting and holding the grain after separation; means for moving the grain collected in said collection means to the center of said means; means at the center of the chamber and said collection means for expelling the grain from the collection area; a second means for separating the grain from the heads connected to said collection means, said second separating means including a plurality of rotating brushes; means for independently driving the brushes at variable speeds resulting variable differential peripheral velocities; means for carrying the grain from said second separation means to a receptacle.

4,896,487

DRIVE SYSTEM FOR WALKING MOWERS

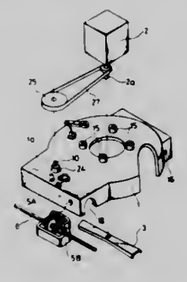
Keisaku Hikishima, Kobe; Hironobu Horie, Amagasaki, and Kosaku Watanabe, Nishinomiya, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

Filed May 16, 1988, Ser. No. 194,328

Claims priority, application Japan, Jan. 10, 1987, 62-89419[U]

Int. Cl.[4] A01D *69/06, 69/08*

U.S. Cl. 56—11.8 **1 Claim**



1. In self-propelled walking mower having a deck, en engine arranged at an upper side of said deck and fixedly supported by the deck, a mowing cutter arranged at a lower side of said deck and rotatably supported by the deck, and left and right front wheels rotatably supported by said deck, a drive system comprising:

a transmission casing arranged at a lower side of a rear end portion of said deck and having upper and lower casing halves which are secured together, said upper casing half having a peripheral wall which is formed integrally with said deck and is projected downwardly from a top wall of the deck so as to form said upper casing half in cooperation with said top wall;

a wheel axle and drive shaft each extending leftwards and rightwards within said transmission casing and embraced at axially spaced two portions thereof rotatably between and by said upper and lower casing halves, said wheel axle extending outwardly from said transmission casing and having left and right rear wheels associated thereto for co-rotation,

a transmission mechanism disposed within said transmission casing for transmitting power from said drive shaft to said wheel axle; and

a vertical input shaft extending upwardly from said upper casing half and supported rotatably by said top wall, said input shaft being drivenly connected to said engine through a belt and drivingly connected to said drive shaft through meshing bevel gears disposed within said transmission casing.

4,896,488

TRIMMING ATTACHMENT FOR A LAWN MOWER ETC.

Larry A. Duncan, 1343 Sophie Blvd., Orlando, Fla. 32828, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Dec. 29, 1988, Ser. No. 291,575

Int. Cl.[4] A01D *50/02*

U.S. Cl. 56—13.7 **3 Claims**



1. A grass trimming attachment for a power lawn mower having a housing with a downwardly extending skirt, an engine with a drive shaft extending into the housing and supporting cutter blades located within the skirt, said attachment comprising:

(a) a protective casing mounted to an underside of the housing and extending through one side of the skirt;

(b) a bearing mounted to an underside of said casing extending outside the housing;

(c) a first pulley rotatably carried on an underside of said bearing;

(d) a vertical shaft extending from said first pulley below the skirt;

(e) a trimmer hub mounted on a bottom portion of said vertical shaft;

(f) a flail member connected to said trimmer hub, operative for trimming grass adjacent to the skirt when said shaft and said hub are rotated;

(g) a second pulley affixed onto the drive shaft of the engine;

(h) a drive belt extending around said pulleys so that operation of said engine will cause said first pulley, said vertical shaft and said trimmer hub to rotate allowing said flail member to trim the grass;

(i) said protective casing having a portion that extends through one side of the skirt being a protective cover hinged to the rest of said protective casing, so that said protective cover can flip up to disengage said grass trimming attachment out of its normal operation position when said drive belt is removed from said first pulley; and

(j) means for holding said protective cover out of the normal operating position.

4,896,489

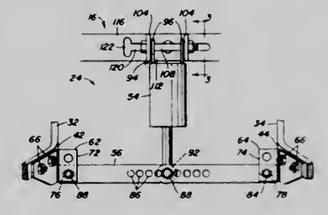
IMPLEMENT LIFT AND FLOTATION SYSTEM WITH A SINGLE TRANSVERSELY ADJUSTABLE CYLINDER

Lloyd A. Wykhuis, Mayville, Wis., assignor to Deere & Company, Moline, Ill.

Filed Mar. 22, 1989, Ser. No. 327,280

Int. Cl.[4] A01D *34/04, 63/108*

U.S. Cl. 56—15.9 **20 Claims**



1. In a vehicle having a frame and first and second transversely spaced lift arms pivotally connected to the frame and extending outwardly to distal connections with an implement, the weight of which is distributed in whole or part to the lift arms, a lift system comprising:

an elongated lift member connected between the arms outwardly of the pivotal connections with the frame;

a single hydraulic cylinder connected to the lift member and to the vehicle frame for providing a preselected vertical force to move the lift member vertically and to thereby raise and lower the lift arms; and

means for adjusting the cylinder longitudinally relative to the lift member to distribute the preselected vertical force to the individual arms in proportion to the weight distribution of the implement on the lift arms.

4,896,490

METHOD OF MANUFACTURING A CUT-UP MOWN-MATERIAL CARPET AND ROLLER-BASED PROCESSING MACHINE FOR CARRYING OUT THE METHOD

Hans Greuzebach, Gemünden, Fed. Rep. of Germany, assignor to Friedrich Mörtl Schleppergerätebau GmbH & Co. KG, Gemünden, Fed. Rep. of Germany

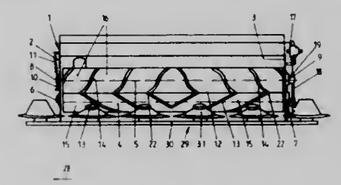
Filed Jul. 5, 1988, Ser. No. 214,954

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1987, 3724039

Int. Cl.[4] A01D *61/00*

U.S. Cl. 56—16.4 **12 Claims**

1. A method of producing a cut-up mown-material carpet, comprising the steps: providing two powered rollers with surfaces having matching strip-shaped elevations and depressions; moving said carpet through at least one processing nip between said two powered rollers; rotating said two-rollers in opposite directions for buckling said carpet; and advancing said carpet through said processing nip at different speeds on each side of the cross-section of the carpet; said rollers having peripheral speeds differing from each other at a constant ratio so that an elevation on one roller always cooperates with a depression on the other roller, said matching elevations and depressions being mutually engaging, each pair of matching elevations and depressions producing a nip for processing said carpet therein; rotating said strip-shaped and mutually engaging elevations and depressions at different peripheral speeds, the carpet center being reached through the cooperative action



of said elevation and depression, the nip location between one elevation on one roller and a depression on the other roller changing from nip to nip, an elevation having a greater peripheral speed than a cooperating depression at one moment has a lower speed than a cooperating depression at another moment so that the peripheral speeds applied against two carpet surfaces change always alternatively.

4,896,491

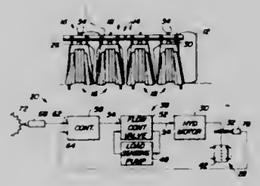
HYDRAULIC ROW UNIT DRIVE FOR A COTTON HARVESTER

Gary L. Warnsholz, Des Moines; Wendell D. Reece, Ankeny, both of Iowa, and Kevin D. McKee, Lexington, Ky., assignors to Deere & Company, Moline, Ill.

Filed Feb. 3, 1989, Ser. No. 305,572

Int. Cl.[4] A01D *46/10*

U.S. Cl. 56—28 **15 Claims**



1. A row unit drive assembly for a cotton harvester having a frame supported for forward movement over the ground at varying ground speeds, the frame supporting a plurality of transversely adjustable row units each having drivable cotton harvesting structure, the row unit drive structure assembly comprising:

a source of hydraulic fluid located on the harvester;

each row unit including a hydraulic motor drivingly connected to the corresponding cotton harvesting structure;

flexible conduit means connected to each hydraulic motor for supplying fluid from the source to the motor to drive the harvesting structure and facilitating transverse adjustment of the row units without disassembly of the drive structure assembly;

a sensor for providing a signal dependent on the ground speed of the harvester; and

flow-control means located between the source and the hydraulic motor and responsive to the ground speed signal for causing the motor to drive the harvesting structure at a speed dependent on the ground speed of the harvester.

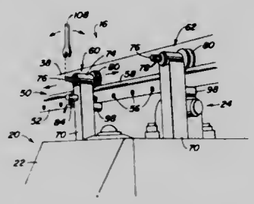
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,492

ROW UNIT SUPPORT MECHANISM FOR TRANSVERSE MOVEMENT

Steven A. Junge, Johnston, and Timothy A. Deutsch, Newton, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 23, 1988, Ser. No. 248,505
Int. Cl.[4] A01D *46/08*
U.S. Cl. 56—28 **17 Claims**



1. Unit support structure for mounting a row unit for transverse movement on the forward end of an agricultural harvester, comprising:

a transversely extending row unit support frame including a horizontal rail having an upwardly projecting portion;

hanger structure connected to and projecting upwardly from the row unit; and

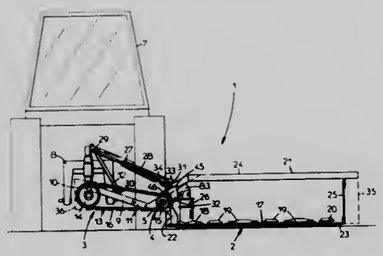
first and second transversely spaced rollers connected to the hanger structure for rotation about fore-and-aft extending axes and supported on the upwardly projecting portion of the rail for transverse movement thereon, said rollers including groove means receiving the upwardly projecting portion therein for preventing fore-and-aft movement of the row unit relative to the support frame and holding the unit squarely on the rail.

4,896,493

PIVOTAL MOWING GROUP FOR A TRACTOR

Horst Neuerburg, Saverne, France, assignor to Kuhn S.A., Saverne, France

Filed Mar. 15, 1989, Ser. No. 323,831
Claims priority, application France, Mar. 15, 1988, 88 03491
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—255 **29 Claims**



1. A mower to be moved by a tractor, during work in a direction of work, comprising:

a frame for hitching said mower to the tractor during the work;

a mowing group having a first end connected to said frame by a joint, said joint having an axis which is directed substantially in said work direction, said mowing group being positionable, during the work, in a work position in which it extends substantially close to the ground, said mowing group including:

(a) at least one cutting element;

(b) at least one rotor arranged close to the first end of said mowing group, said rotor extending at least partially above a part of said at least one cutting element and rotating around an upwardly directed rotational axis;

(c) drive elements of said at least one cutting element and said rotor which receive the movement of a driving source, said drive elements comprising:

(i) a drive shaft made up by at least one part, and extending into said rotor and having at least approximately the same rotational axis as said rotor;

(ii) a first bevel gear pair arranged at an upper end of said drive shaft and being in meshing engagement, said first bevel gear pair defining a point where rotational axes of the bevel gears of said first bevel gear pair intersect;

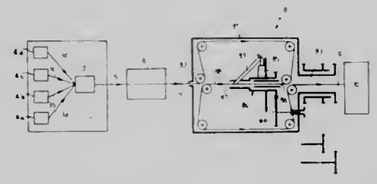
a control element for bringing the mowing gear from said work position to a transport position in which the mowing group is disposed in an upwardly directed direction, by pivoting said mowing group around said joint having an axis substantially directed in said direction of work, said axis of said joint connecting the mowing group to the frame being disposed in a vertically lower position than the point of intersection of the axes of the bevel gears of the first bevel gear pair.

4,896,494

WIRING AND TAPING LINE INSTALLATION

Christophe Cholley, 42ter Grande Avenue, 60260 Lamorlaye, France

Filed Nov. 23, 1988, Ser. No. 276,372
Claims priority, application France, Aug. 31, 1988, 88 11396
Int. Cl.[4] D07B *3/12, 3/10;* **H01B** *13/02, 13/08*
U.S. Cl. 57—6 **15 Claims**



1. A wiring installation comprising a taping head which serves to encircle with a tape a stranded cable formed of a plurality of constituent strands, the stranded cable being rotatable about its longitudinal axis and being fed into the taping head along a rotational axis which defines a general unwinding direction in the installation, said taping head comprising:

an exterior assembly adapted to rotate about said rotational axis and which comprises guiding means for guiding a cable both before and after taping thereof in said taping head, said exterior assembly including an exterior input and an exterior output for a cable, said exterior input and output operatively arranged relative to said general unwinding direction;

an interior assembly which rotates about said rotational axis, independently of said exterior assembly, and comprising a taping means, said interior assembly including an interior input and an interior output for a cable, said interior input and output operatively arranged in the opposite direction of said general unwinding direction, a taping path located between said interior input and said interior output and operatively arranged relative to said rotational axis but, said taping path oriented in the opposite direction to said general unwinding direction;

guiding means for guiding the cable from said exterior input towards said interior input and for taking up the cable at the interior output to cause the cable to circulate in the interior assembly in a direction which is opposite to said general unwinding direction;

a monitoring and control means for connecting said interior assembly to said exterior assembly; and

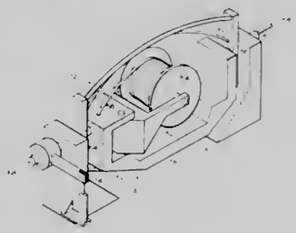
means for transmitting control and supply signal from said monitoring and control means to said taping means.

4,896,495

WIRE TWISTING MACHINE

Eckhard U. Sperling, Toronto, and Louis J. Kalmar, Richmond Hill, both of Canada, assignors to Cabletrade Industries Inc., Concord, Canada

Filed Jan. 6, 1989, Ser. No. 294,003
Claims priority, application Canada, Jan. 8, 1988, 556143
Int. Cl.[4] D07B *7/06, 7/00*
U.S. Cl. 57—127.5 **16 Claims**



1. A strand twisting machine having a polar axis;

strand guide means mounted for rotation about the machine polar axis, to describe an orbit thereabout;

a reel for transfer of strand product in relation thereto;

reel support frame means releasably securing the reel in rotational relation therein;

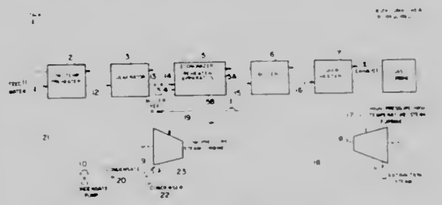
frame support means supporting the reel support frame means in relatively movable relation thereto, the reel support frame mean being movable with the machine at standstill from a first, retracted position located within the orbit of the strand guide means to a second, reel transfer position located out-board of the machine, for transfer of the reel.

4,896,496

SINGLE PRESSURE STEAM BOTTOMING CYCLE FOR GAS TURBINES COMBINED CYCLE

Nicholas Zervos, Norfolk, Mass., assignor to Stone & Webster Engineering Corp., Boston, Mass.

Filed Jul. 25, 1988, Ser. No. 223,564
Int. Cl.[4] F02C *6/18*
U.S. Cl. 60—39.02 **13 Claims**



1. A process for recapturing waste heat from the exhaust of a gas turbine to drive a high pressure-high temperature steam turbine and a low pressure steam turbine comprising the steps of:

(a) delivering the exhaust of the gas turbine to the hot side of an economizer-reheater apparatus;

(b) delivering a heated stream of feedwater and recycled condensate through the cold side of the economizer-reheater apparatus in an indirect heat exchange relationship with the gas turbine exhaust on the hot side of the economizer-reheater apparatus to elevate the temperature of the feedwater and recycled condensate to a temperature below the pinch point of the boiler;

(c) delivering the discharge from the high pressure-high temperature steam turbine through the economizer-reheater apparatus in an indirect heat exchange relationship with the gas turbine exhaust on the hot side of the economizer-reheater apparatus;

(d) driving the high pressure-high temperature steam turbine with the discharged stream of feedwater and recycled condensate which is heated to a temperature below the pinch point of the boiler by the economizer-reheater apparatus; and

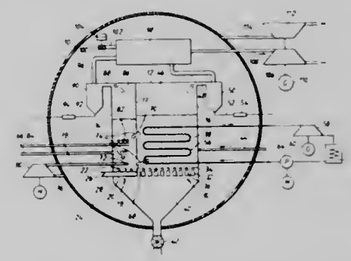
(e) driving the low pressure steam turbine with the discharged stream of the high pressure-high temperature steam turbine reheated below the pinch point of the boiler by the economizer-reheater apparatus.

4,896,497

PFBC POWER PLANT

Krishna K. Pillai, Finspong, Sweden, assignor to Abb Stal AB, Sweden

Filed Oct. 12, 1988, Ser. No. 256,434
Claims priority, application Sweden, Oct. 20, 1987, 8704075
Int. Cl.[4] F02C *3/28*
U.S. Cl. 60—39.12 **10 Claims**



1. A power plant burning fuel, primarily coal, in a fluidized bed of particulate material, at a pressure exceeding the atmospheric pressure, a so-called PFBC power plant, comprising

a bed vessel (**12**) with a bottom (**18, 30**) with nozzles (**22, 34**) for supplying the bed vessel (**12**) with air for fluidization of the bed (**38**) of the particulate material and combustion of the fuel supplied to the bed (**38**),

a gas turbine (**106**) driven by combustion gas from the bed vessel (**12**), and

a compressor (**112**), suitably driven by said turbine (**106**), compressing fluidization air and combustion air, characterized in that

the bed vessel (**12**) is divided into a first section (**14**) and a second section (**16**) by a vertical partition (**17**) reaching up to the upper wall of the bed vessel (**12**) so that freeboards (**86** and **46**, respectively) separated from each other are formed in said first section (**14**) and said second section (**16**),

said first section (**14**) of the bed bessel (**12**) forms a gas generator in which a burnable gas is generated,

the lower part of the partition (**17**) is provided with at least one opening (**68**) for transferring bed material from said first section (**14**) of the bed vessel (**12**) to said second section (**16**),

the plant comprises a secondary combustion chamber (**98**) for combustion of the burnable gas generated in the gas generator, and

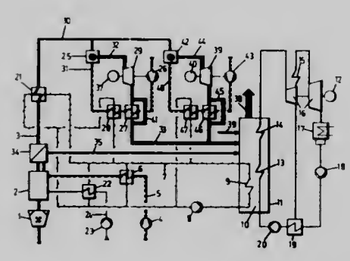
the plant comprises a device for mixing the combustion gases generated in said secondary combustion chamber (**98**) and in said second section (**16**) before the gases are supplied to the turbine (**106**).

4,896,498

PROCESS FOR CONTROLLING THE POWER OUTPUT OF A COMBINATION COAL-FIRED UNIT WITH INTEGRATED COAL GASIFICATION AND A COAL POWER STATION OPERATING ACCORDING TO THE PROCESS

Klaus Kaizia, Blumenweg 17, 5804 Herdecke, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,036
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1987, 37316273
Int. Cl.[4] F02C *3/28*
U.S. Cl. 60—39.03 **11 Claims**



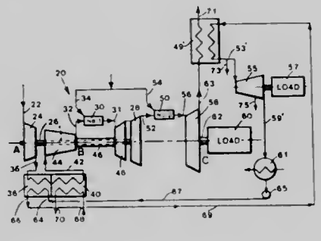
1. A process for controlling the power output of a coal power plant operated using the combined gas turbine-steam turbine process by means of a gas turbine plant and a steam power plant comprising a steam generator with a furnace and a steam turbine, in which coal is partly gasified in a coal gasification installation, the fuel gas produced is supplied to the gas turbine and the residual coke to the furnace of the steam generator, wherein the proportion of the total power output of the power station provided by the gas turbine plant and the degree of gasification in the coal gasification installation are controlled so as to increase from full load to part load, the amount of fuel gas produced being adjusted according to the power requirement of the gas turbine and the proportion of residual coke being reduced according to the power requirements of the steam turbine, while decreasing the amount of coal supplied overall.

4,896,499

COMPRESSION INTERCOOLED GAS TURBINE COMBINED CYCLE

Ivan G. Rice, P.O. Box 233, Spring, Tex. 77383

Continuation of Ser. No. 818,472, Jan. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, Ser. No. 416,171, Sep. 9, 1982, abandoned, Ser. No. 416,172, Sep. 9, 1982, abandoned, Ser. No. 416,173, Sep. 9, 1982, Pat. No. 4,550,562, Ser. No. 416,275, Sep. 9, 1982, Pat. No. 4,507,914, Ser. No. 486,334, Apr. 19, 1983, Pat. No. 4,545,197, Ser. No. 486,336, Apr. 19, 1983, Pat. No. 4,565,490, and Ser. No. 486,495, Apr. 19, 1983, Pat. No. 4,543,781, said Ser. No. 224,496, is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953, said Ser. No. 274,660, is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, said Ser. No. 416,171, Ser. No. 416,172, Ser. No. 416,173, Ser. No. 416,275, Ser. No. 486,334, Ser. No. 486,336, and Ser. No. 486,495, each is a continuation-in-part of Ser. No. 47,571, , Ser. No. 224,496, , Ser. No. 954,832, , and Ser. No. 274,660, , said Ser. No. 486,334, Ser. No. 486,336, and Ser. No. 486,495, each is a continuation-in-part of Ser. No. 416,171, , Ser. No. 416,172, , Ser. No. 416,173,. This application Sep. 28, 1988, Ser. No. 251,076
Int. Cl.[4] F02C *3/10, 7/143*
U.S. Cl. 60—39.161 **8 Claims**



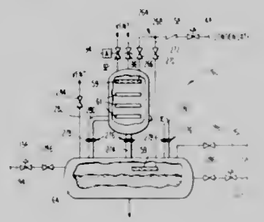
1. In a power producing system comprising a twin spool gas generator and a power turbine, said gas generator having a low pressure compressor driven by a low pressure turbine, a high pressure compressor driven by a high pressure turbine, a combustor positioned between said high pressure compressor and said high pressure turbine, said power turbine positioned downstream from said low pressure turbine, the improvement being characterized in that: said high and low pressure turbines being axially positioned and independently rotatable for driving said high and low pressure compressors respectively by means of concentric coaxial outer and inner shafting respectively said gas generator including at least one externally mounted intercooler positioned between said low pressure compressor and said high pressure compressor, at least one compressor outlet duct from said low pressure compressor communicating with said intercooler and at least one return duct from said intercooler communicating with said high pressure compressor, wherein said compressor outlet and return ducts and connections between said compressors and said intercooler are provided between said axially positioned low and high pressure compressors for air flow to and from said intercooler in counterflow with coolant, said outlet duct being configured to radially expand said air flow to a low velocity and said return duct being configured for low radial flow return velocity to said high pressure compressor.

4,896,500

METHOD AND APPARATUS FOR OPERATING A COMBINED CYCLE POWER PLANT HAVING A DEFECTIVE DEAERATOR

James Pavel, Lake Mary; Bennie L. Richardson, Winter Park, and Gerald A. Myers, Longwood, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1989, Ser. No. 352,599
Int. Cl.[4] F01K *7/00*
U.S. Cl. 60—39.182 **23 Claims**



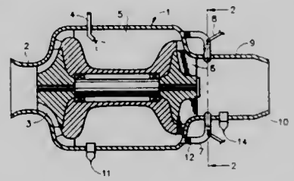
1. A combined cycle power plant, comprising:
a deaerator having primary and secondary functions, said primary function to degasify feedwater for use in the combined cycle power plant;
means for normally coupling said deaerator to the combined cycle power plant as a normally functioning part thereof;
means for isolating said deaerator from the combined cycle power plant during operations thereof; and
alternate means for performing said primary and secondary functions when said deaerator is isolated from the combined cycle power plant, during operations thereof, by said isolating means.

4,896,501

TURBOJET ENGINE WITH SONIC INJECTION AFTERBURNER

Robie L. Faulkner, 4138 Udall St., San Diego, Calif. 92107

Filed Oct. 22, 1987, Ser. No. 111,305
Int. Cl.[4] F02K *3/10*
U.S. Cl. 60—261 **12 Claims**



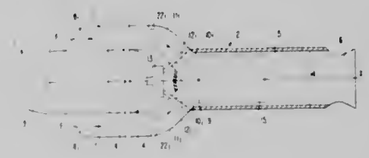
1. A turbojet engine including:
a compressor for supplying compressed gas to a combustion chamber;
a turbine mechanically coupled to said compressor for receiving hot combustion chamber gases from a combustion chamber and for discharging turbine discharge gas to an afterburner duct;
a combustion chamber interconnecting the output of said compressor and the input of said turbine;
combustion chamber fuel supplying means for supplying fuel to said combustion chamber such that the fuel is mixed with the compressed gas;
means for igniting the fuel/compressed gas mixture in said combustion chamber such that hot combustion chamber gases are formed;
an afterburner duct connected to the output of said turbine for receiving turbine discharge gas;
a turbine bypass duct connecting said combustion chamber with said afterburner duct for receiving hot combustion chamber gases from said combustion chamber and for injecting them as a gas jet into said afterburner duct;
turbine bypass duct fuel supplying means for supplying fuel to the hot combustion chamber gases passing through said turbine bypass duct; and
means for igniting the combined fuel/hot combustion chamber gases passing through said turbine bypass duct for combustion in said afterburner duct.

4,896,502

RAMJET ENGINE EQUIPPED WITH A PLURALITY OF CARBURATED AIR SUPPLY NOZZLES AND A MISSILE EQUIPPED WITH SUCH A RAMJET ENGINE

Maurice Ravel, Jouy-en-Josas, and Jean Viala, Charenton-le-Pont, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Sep. 17, 1986, Ser. No. 911,016
Claims priority, application France, Sep. 17, 1985, 85 13736
Int. Cl.[4] F02K *7/10*
U.S. Cl. 60—270.1 **10 Claims**



1. A ramjet engine comprising:
a combustion chamber having a longitudinal axis;
a plurality n of air ducts communicating with one end of the combustion chamber and being distributed about the longitudinal axis of the combustion chamber, n being an integer greater than one;
a plurality n of injector devices, one of the plurality of injector devices being located in a respective one of the plurality of air ducts;
a fuel tank;
means for supplying the plurality of injector devices with fuel from the fuel tank so as to provide a total fuel flow of quantity D to the plurality of injector devices; and
means for distributing the total fuel flow D among the plurality n of injector devices so that at least one of the plurality of injector devices is provided with an individual fuel flow different from D/n for enabling reduction in vibration.

4,896,503

MUFFLING AND PURIFYING DEVICE FOR COMBUSTION GASES OF GENERAL APPLICATION

Alex B. Furlan, Buenos Aires, Argentina, assignor to Alexandrex, Inc., Chicago, Ill.

Filed Nov. 16, 1988, Ser. No. 272,093
Claims priority, application Argentina, Nov. 19, 1987, 309344
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—311 **4 Claims**

1. A muffler and purifying device for combustion gases, of general application, of a type which includes an expanded external casing with two end intakes, anterior and posterior, equipped with nozzles, one connected to the exhaust pipe and the other for the discharge of gases to the outside, respectively, between which there is included a unit of elements for retaining impurities and purifying the gases, the improvement com-

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prising said elements being connected in the form of a cartridge which is removable from the casing through an aperture located at said posterior end, said aperture being closable by means of a removable cover said cartridge having a tubular wall with its own anterior end intake which has an aperture defining an internal nozzle for connection with the exhaust pipe which extends through said anterior end nozzle, said cartridge further comprising a first chamber for expansion and distribution of gases on a first filtering partition including perforated caps and a packet of spread metallic disks, a second chamber for the concentration and acceleration of gases, in which is located an annular blocking screen projecting in the direction of said first partition and defining a sub-chamber for the expansion and distribution of gases on a second filtering



partition, formed by a ceramic piece with narrow longitudinal perforations, which provide a restricting passage for gases which discharge into an acceleration chamber of a "Venturi" piping, said "Venturi" piping also having a high velocity section into which ends a suction nozzle which communicates with the outside air, said "Venturi" piping ending in a chamber for expansion and distribution of gases on a third filtering partition, likewise formed by a ceramic piece with narrow longitudinal perforations, which cause a restricting passage for the gases and discharge said gases into a predischarge chamber of said external casing, formed between said third filtering partition which is incorporated in the cartridge as an end posterior rear part of its tubular wall, and said removable cover which seals the posterior end of the casing.

4,896,504

EXHAUST GAS CONTROL DEVICE FOR ENGINES

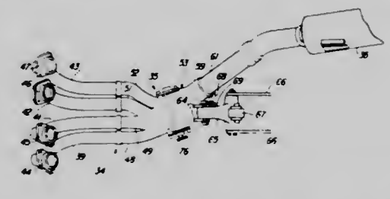
Sachio Matsui, Iwata, Japan, assignor to Yamaha Matsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 30, 1987, Ser. No. 126,839

Claims priority, application Japan, Dec. 3, 1986, 61-288480; Dec. 3, 1986, 61-288481; Dec. 3, 1986, 61-288482; Mar. 2, 1987, 62-45292

Int. Cl.[4] F02B *27/02*

U.S. Cl. 60—313 **60 Claims**



1. In an exhaust system for an internal combustion engine having an exhaust port, said exhaust system comprising an expansion chamber, an exhaust pipe for conveying exhaust gases from said exhaust port to said expansion chamber, and valve means for controlling the communication of said exhaust pipe with said expansion chamber, the improvement comprising said valve means comprising a valve member movable between a closed position wherein said valve member obstructs at least a portion of the flow area of said exhaust pipe where said exhaust pipe communicates with said expansion chamber and an opened position wherein said valve member does not obstruct any flow area of said exhaust pipe.

4,896,505

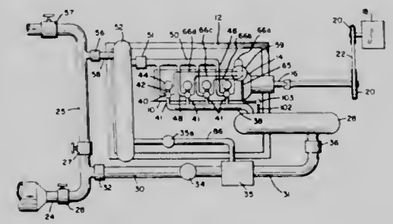
PRESSURIZED-FLUID-OPERATED ENGINE

John E. Holleyman, 3402 Polk St., Monroe, La. 71202

Filed Jan. 3, 1989, Ser. No. 293,183

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—370 **8 Claims**



1. A pressurized-fluid-operated reciprocating engine for providing output power by use of a pressurized gas that expands within the engine without combustion, said engine comprising:

a. an engine block having a plurality of cylinders within which respective pistons are reciprocatable to provide a rotary power output;

b. gas inlet means connected with the engine block for introducing a pressurized gas into the respective cylinders in a predetermined, timed relationship to provide a smooth power output from the engine;

c. gas outlet means connected with the engine block for conveying exhaust gas from the respective cylinders after the gas has expanded to move the pistons within the cylinders; and

d. recirculation means extending between the inlet means and the outlet means for recirculating a predetermined quantity of exhaust gas, the recirculation means including ejector means for drawing exhaust gas into the recirculation means, first expansion chamber means downstream of the ejector means for mixing inlet and exhaust gas, and second expansion chamber means downstream of the first expansion chamber means for additional mixing and partial expansion of the gas mixture for introduction into the respective cylinders.

4,896,506

TRANSMISSION WITH INTEGRATED GEAR REDUCTION

Charles C. Shivvers; Steven D. Shivvers, both of Corydon; Richard A. Arnold, Humeston, and Edward A. Ryks, Corydon, all of Iowa, assignors to Shivvers, Inc., Corydon, Iowa

Filed Nov. 18, 1987, Ser. No. 122,333

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—487 **2 Claims**

1. A unified hydraulic transmission comprising:

(a) an input shaft for being rotated by an external engine;

(b) a pump head; said pump head including a plurality of axially aligned pistons; said pump head being operatively rotated by said input shaft when said input shaft is rotating and having a neutral configuration wherein no fluid is pumped by said pump head and a plurality of non-neutral positions wherein varying amounts of hydraulic fluid flow from said pump head;

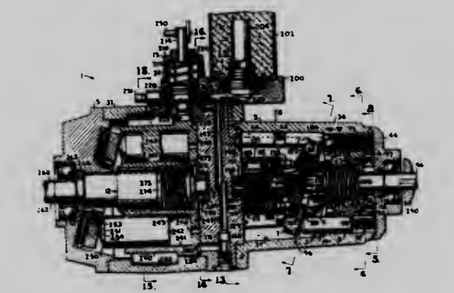
(c) a swash plate operably engaging the pistons of said pump head; said swash plate being manipulative to vary the angle of a surface of said swash plate actively engaging said pistons such that said pistons reciprocate within receivers associated therewith in accordance with an operative position of the swash plate so as to vary the fluid output of said pistons;

(d) a manifold effectively fluid flow communicating with the receivers of said pistons;

(e) a motor head fluid flow communicating with said manifold so as to receive fluid from said pump head and be rotated by fluid flow from said pump head; rotation of said motor head being caused by said fluid acting upon a plurality of axially reciprocating pistons within said motor head;

(f) an output shaft attached to said motor head;

(g) hydrostatic gear reduction means internal to said transmission and effectively reducing the rotational speed of



said motor head relative to said pump head even when said swash plate is positioned to provide for maximum fluid output from said pump head;

(h) said swash plate having a neutral orientation thereof wherein there is substantially no fluid output of said pump head and a plurality of non-neutral orientations thereof wherein there is a fluid output from said pump head; and including:

(i) positive neutral means requiring an operator to exert greater energy in moving from the neutral orientation of said swash plate to a non-neutral orientation thereof as compared to a similar differential movement between two non-neutral orientations of said swash plate.

4,896,507

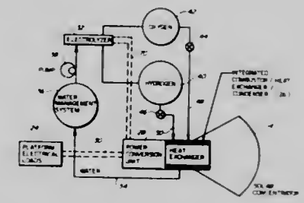
SOLAR POWER SYSTEM

Gregory S. Hosford, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 28, 1988, Ser. No. 276,579

Int. Cl.[4] F03G *7/02*

U.S. Cl. 60—641.8 **16 Claims**



1. A solar power system, comprising:

solar concentrator means;

power conversion means for converting solar energy from the solar concentrator means to electrical energy, through the medium of a working fluid, to power appropriate loads;

integrated combustor/heat exchanger means coupled to the power conversion means for heating said working fluid during periods of solar eclipse and giving off a water combustion product;

electrolyzer means for receiving the water combustion product from the integrated combustor/heat exchanger means and regenerating the water combustion product to gaseous hydrogen and oxygen, the electrolyzer means being coupled to the power conversion means as to be powered thereby during periods of excess electrical energy; and

means for supplying the hydrogen and oxygen for combustion in the integrated combustor/heat exchanger during said periods of solar eclipse.

4,896,508

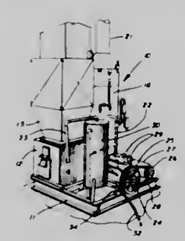
ENERGY CONVERTER

Karl L. Reinke, Jr., Dundee, Ill., assignor to K. Reinke, Jr. & Company, Dundee, Ill.

Filed Oct. 19, 1988, Ser. No. 259,710

Int. Cl.[4] F01K *27/00*

U.S. Cl. 60—648 **11 Claims**



1. A self-contained energy converter for providing a plurality of different outputs, said converter comprising:

a base;

means mounted to said base defining a combustion chamber for combustion of fuel therein;

boiler means mounted to said base for receiving products of combustion from said combustion chamber and heating liquid water to form steam, wherein said boiler means includes an exhaust flue for exhausting to an enclosed environmental space the products of combustion delivered thereto from said combustion chamber as hot air for convectively heating said space;

means associated with said boiler means for controlledly providing process steam from said boiler means;

a steam engine mounted to said base and having a rotatable output shaft;

means for controlledly providing work steam from said boiler means to said steam engine for operating said steam engine to drive said output shaft;

an electric generator mounted to said base and having a rotatable input shaft;

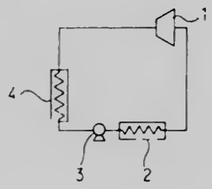
coupling means coupling said output shaft of the steam engine to said input shaft of the generator for causing said generator to produce an electrical energy output;

a water heater mounted to said base and having a serially connected cold water inlet, a heat exchanger, and a heated water outlet;

means for conducting exhaust steam from said steam engine to said water heater heat exchanger for heating cold water therein to be delivered from said outlet as heated water; and

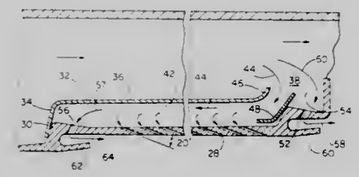
means for conducting steam condensate from said heat exchanger to said boiler means for regenerating steam therefrom to said boiler means.

4,896,509
WORKING FLUID FOR RANKINE CYCLE
Kohji Tamura, Kawanishi; Hiroshi Kashiwagi, Settsu, and Masahiro Noguchi, Osaka, all of Japan, assignors to Daikin Industries. Ltd., Osaka, Japan
Filed Nov. 3, 1988, Ser. No. 266,562
Claims priority, application Japan, Nov. 6, 1987, 62-281389
Int. Cl.[4] F01K *25/10*
U.S. Cl. 60—671 **1 Claim**



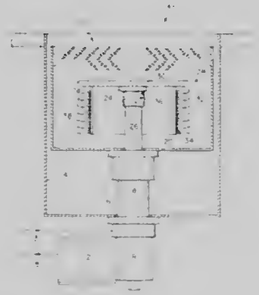
1. A process for converting thermal energy into mechanical energy in the Rankine cycle in which a cycle is repeated comprising the steps of vaporizing a working fluid comprising 1,2-dichloro-1,1,2-trifluoroethane with a hot heat source, expanding the resultant vapor in an expansion device, cooling it with a cold heat source to condense and compressing it by a pump.

4,896,510
COMBUSTOR LINER COOLING ARRANGEMENT
Howard L. Foltz, Westchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Continuation of Ser. No. 11,818, Feb. 6, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,560
Int. Cl.[4] F23R *3/54*
U.S. Cl. 60—757 **10 Claims**



1. A gas turbine engine combustor aft of the gas turbine compressor section, said combustor comprising:
(a) a liner disposed inwardly of a combustor outer wall and in the compressor discharge airflow, wherein the compressor discharge airflow is used for combustor cooling air and said liner is positioned for flow of cooling air past the exterior of said liner;
(b) a plurality of small film cooling holes in said liner, said film cooling holes being inclined toward the aft end of the combustor to direct cooling air along the interior surface of said liner;
(c) first means on said liner for blocking direct flow of air to said small film cooling holes and providing a path for reverse flow of air between said first means and the exterior surface of said liner;
(d) second means disposed aft of said first means for diverting a portion of said air and providing reverse flow of the diverted air into said path; and
(e) a first plurality of larger holes in said liner at the point of reversal of flow of said air for passing dirt particles therethrough.

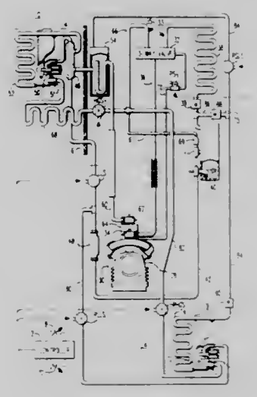
4,896,511
OPTIMALLY STAGED CRYOPUMP
Philip A. Lessard, 73 Cobleigh Rd., Boxboro, Mass. 01719, and Thomas Duoo, 420 W. Main St., Avon, Mass. 02322
Continuation of Ser. No. 206,952, Jun. 8, 1988, abandoned, which is a continuation of Ser. No. 7,370, Jan. 27, 1987, abandoned. This application May 15, 1989, Ser. No. 355,048
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **17 Claims**



1. A cryopump comprising.
a two-stage cold finger refrigerator having a first stage and a second stage;
a first temperature stage having a first extended cryopanel pumping surface for condensing gases which are cooled by the first stage of the refrigerator;
a second temperature stage having a second extended cryopanel pumping surface which is cooled to a lower temperature than the first temperature stage by the second stage of the refrigerator for pumping gases not pumped by the first pumping surface; and
a third temperature stage having a third pumping surface which is cooled to a lower temperature than the second temperature stage by the second stage of the refrigerator for pumping gases not pumped by the second pumping surface.

4,896,512
COMPARTMENTALIZED TRANSPORT REFRIGERATION SYSTEM
Leland L. Howland, Belle Plaine, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.
Filed Jan. 25, 1989, Ser. No. 301,408
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—117 **8 Claims**

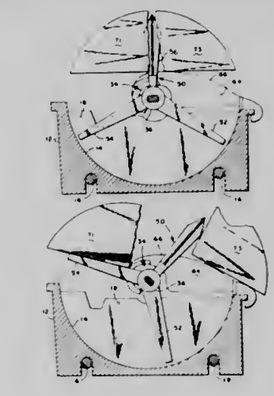
1. In a compartmentalized transport refrigeration system having a first refrigerant circuit which includes a compressor, a hot gas line, a condenser, a check valve, a receiver, a liquid line, an expansion valve, a host evaporator, and a suction line; a second refrigerant circuit which includes the compressor, the hot gas line, the host evaporator, and the suction line; refrigerant circuit selector valve means in the hot gas line having mutually exclusive cooling and heating mode positions which respectively connect the compressor to the first and second refrigerant circuits; a remote evaporator connected to the liquid, hot gas and suction lines via remote liquid, hot gas and suction lines, respectively, and a trailer having first and second compartments respectively served by the host and remote evaporators, the improvement comprising:
controllable valve means having open and close positions disposed in the liquid line of the first refrigerant circuit, in the hot gas line of the second refrigerant circuit, and in each of the remote liquid, hot gas and suction lines,
refrigerant conduit means connecting the remote suction line to the receiver, with the connection point to the remote suction line being disposed between the remote evaporator and the controllable valve means in the remote suction line,
said remote suction line including a check valve oriented to block refrigerant flow into the remote evaporator, with the connection point of the refrigerant conduit means to the remote suction line being disposed between said check valve and the controllable valve means in the remote suction line,
and control means selecting the second refrigerant circuit via the heating mode position of the refrigerant selector valve means when the remote evaporator requires a heating mode,



said control means closing the valve in the remote suction line when the host evaporator requires a heating mode,
said control means closing the valve in the remote suction line when the host evaporator requires a cooling mode while the remote evaporator is in a heating mode, to return refrigerant from the remote evaporator to the compressor via the host evaporator, causing the remote evaporator to function as a condenser for the host evaporator and providing a cooling mode for the host evaporator, notwithstanding the refrigerant circuit selector valve means being in the heating mode position.

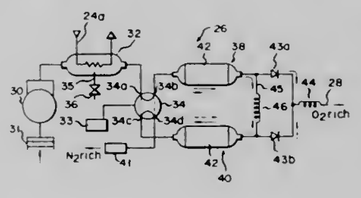
4,896,513
MAKING ICE IN A REFRIGERATOR
David W. Trosciuski, Woodridge, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 14, 1988, Ser. No. 270,563
Int. Cl.[4] F25C *5/08*
U.S. Cl. 62—351 **7 Claims**

1. A melt-out icemaker for use in a refrigerator and of the type having tray means with a plurality of curved-bottom ice molding cavities disposed in closely spaced aligned relationship;
electrically operated valve means for providing a measured flow of water to said cavities for forming crescent ice therein;
heating means operable upon electrical energization for heating said tray means for effecting melting of said ice at the surface of said cavities;
harvesting means including an ejector arms embedded in the formed ice in each cavity and rotatable for sweeping ice from said cavities and operable to break said formed ice from each of said cavities into plural segments upon radial stripping of formed ice from the arms wherein the improvement comprises:
said ejector arms each having wedge shaped surfaces provided thereon operative to facilitate said breaking of said



formed crescent ice into plural segments upon said radial stripping of said ice from said ejector arm.

4,896,514
AIR-CONDITIONING APPARATUS
Akihiko Sugiyama, and Takashi Matsuzaka, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 31, 1988, Ser. No. 264,875
Claims priority, application Japan, Oct. 31, 1987, 62-167300[U]; Dec. 3, 1987, 62-183745[U]; Jan. 28, 1988, 63-18258; Mar. 30, 1988, 63-41036
Int. Cl.[4] F24F *3/16*
U.S. Cl. 62—404 **17 Claims**



17. An air-conditioning apparatus comprising:
an air-conditioner including
an indoor unit having an indoor heat exchanger and arranged in a room to be air-conditioned;
an outdoor unit having an outdoor heat exchanger and arranged outdoors; and
a coolant pipe for connecting said indoor and outdoor heat exchangers;
an oxygen ratio increasing device including:
an oxygen ration increasing mechanism, arranged in said outdoor unit, for producing oxygen-ratio increased air having a high oxygen concentration; and
supplying means for supplying the produced oxygen-ratio increased air to the room; and
wherein said oxygen ratio increasing mechanism includes:
an adsorbing material for adsorbing nitrogen from air when said adsorbing material is compressed to a pressure more than a predetermined value and for eliminating the adsorbed nitrogen when said adsorbing material is pressure-reduced to a pressure less than the predetermined value,

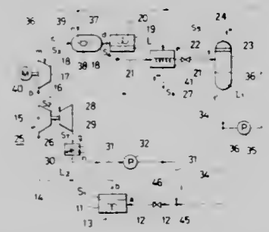
an air compressor for supplying air to said supplying means through said adsorbing material,
first and second tanks connected, in parallel to each other, between the delivery side of the air compressor and the supply means and each containing the adsorbing material therein,
switching means for causing outlet sides of the tanks to alternately connect to the supplying means and an outer atmosphere so as to allow the adsorbing material in the tanks to alternately perform an adsorption operation and a regeneration operation,
a first restrictor arranged between the supplying means and the first and second tanks,
check valves respectively arranged between the first tank and the first restrictor and between the second tank and the first restrictor,
a bypass which communicates with a path between the first tank and the check valve and a path between the second tank and the check valve, and
a second restrictor arranged in the bypass and having a larger restriction resistance than that of the first restrictor.

4,896,515

HEAT PUMP, ENERGY RECOVERY METHOD AND METHOD OF CURTAILING POWER FOR DRIVING COMPRESSOR IN THE HEAT PUMP

Hajime Endou, Tama, Japan, assignor to Mitsui Engineering & Shipbuilding Co., Tokyo, Japan

Continuation of Ser. No. 916,768, Oct. 8, 1986, abandoned. This application Dec. 4, 1987, Ser. No. 129,876
Claims priority, application Japan, Mar. 25, 1986, 61-64750; May 31, 1986, 61-12482
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—498 **8 Claims**



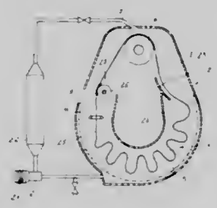
1. A heat pump for delivering heat to a heat sink at elevated temperatures, comprising:
an evaporator including a heat source for changing liquid from a working fluid into a low pressure vapor by utilizing the heat from said heat source,
a compressor means for converting said low pressure vapor to high pressure vapor,
a condenser, including said heat sink, for receiving said high pressure vapor from said compressor means and supplying to said heat sink heat generated by condensing said high pressure vapor into a high pressure liquid,
an expansion valve for incompletely expanding said high pressure liquid and generating medium pressure vapor and liquid of the working fluid,
a vapor-liquid separator for separating said vapor and liquid received from said expansion valve, and
an expansion turbine connected to said vapor liquid separator to be driven by the vapor separated therein, said vapor being expanded in said turbine,
said expansion turbine partially powering said compressor means.

4,896,516

DYEING MACHINE WITH DEBLOCKING MECHANISM

Armand Bene, Saint-Priest, France, assignor to MADINOX S.A., Saint Priest Mi Plaine, France

Filed Jul. 14, 1988, Ser. No. 219,283
Claims priority, application France, Jul. 15, 1987, 87 10494
Int. Cl.[4] D06B *3/24*
U.S. Cl. 68—13 R **14 Claims**



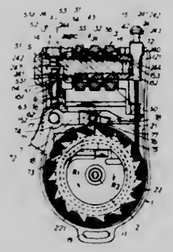
1. A dyeing apparatus provided with a mechanism for automatic deblocking of the movement of dyed goods therein, said apparatus comprising:
a vessel containing a dyeing liquid; means in said vessel for circulating a fabric web to be dyed along a path through said dyeing liquid in said vessel and defining a storage zone in said vessel along said path in which said web collects, a stretch of said web path leading toward said zone, and a stretch of said web path leading away from said zone;
control means in said vessel disposed along said stretch of said web path leading away from said zone and monitoring a strand of said web leaving said zone for monitoring advance of said web along said path; and
tractive means in said vessel operatively responsive and connected to said control means and disposed along said stretch of said web path leading away from said zone and engageable with said strand for exerting a tractive force thereon in a direction tending to advance said web along said path upon detection by said control means of a halting of said web.

4,896,517

WIRE LOCK HAVING SELF-RETRACTABLE WIRE

Choong-Kuan Ling, c/o Sinox Co., Ltd., P.O. Box 53-58, Taipei, Taiwan

Filed Jul. 14, 1989, Ser. No. 379,922
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—18 **12 Claims**



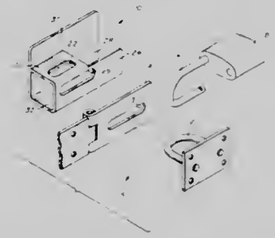
1. A wire lock comprising:
a casing composed of two side walls having a left vertical hole and a right vertical hole formed in two upper sides of said casing;
a wire means including a wire rope normally resiliently wound on a reel pivotally secured in said casing, a locking head formed on an outermost end of said wire rope operatively inserted in said left vertical hole for locking said wire rope in said casing and retractably held in said right vertical hole when opening the wire lock;
a plurality of dials respectively coupled with a plurality of sleeves rotatably mounted on a push-button latch formed on an upper portion of said casing;
said push-button latch having a push button formed on its left portion normally protruding leftwardly beyond said casing and having a cylindrical rod formed on a right portion of the latch for rotatably securing said sleeves and dials thereon, having a locking extension formed on a left portion of said latch operatively engageable with said locking head of said wire means for locking the wire lock;
a resilient impinger generally formed as a vertical rod resiliently protruding upwardly to operatively urge said locking head upwardly outwardly beyond said casing when opening the wire lock;
and a wire clutch means controlling a rewinding of said wire rope on said reel of said wire means or a releasing of said wire rope unwound from said reel.

4,896,518

ACCESS PREVENTION DEVICE AND METHOD OF MANUFACTURE

Donald W. Appelgren, 523 South 16th St., LaPorte, Tex. 77571

Filed Sep. 14, 1988, Ser. No. 244,039
Int. Cl.[4] E05B *67/38*
U.S. Cl. 70—54 **4 Claims**



1. A metal access prevention device, comprising:
(a) a first wall member having a hasp staple loop opening through its sidewalls;
(b) a second wall member having a loop shackle loop formed by a shackle opening through its sidewalls and by the lower edge of said second wall member;
(c) a third wall member and a fourth wall member joined together and joined to said first wall member and said second wall member to form a rectangular shape;
(d) said hasp staple loop opening and said lock shackle opening being disposed and arranged to permit a shape staple loop to be extended through said hasp staple loop opening and the shackle of a lock to be extended through said hasp staple loop and through said lock shackle loop before locking said shackle to said lock; and
(e) whereby said hasp staple loop, said shackle, and said lock shackle loop are interlinked and locked together.

4,896,519

SURFBOARD LOCKING APPARATUS AND METHOD

Steven K. Pitts, 1508 Cameo Dr., San jose, Calif. 95129

Filed May 12, 1989, Ser. No. 350,858
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—58 **14 Claims**

1. A method for securing a surfboard to a vehicle with a surfboard locking apparatus utilizing a U-shaped band with cable and releasable locking means, said method comprising:
(a) inverting and affixing said surfboard horizontally to a carrier on said vehicle adjacent any openable and lockable doors accessing said vehicle;
(b) placing said U-shaped band transversely over a rear section of said inverted surfboard with an upper leg of said U in front of a rear fin on said inverted surfboard and a lower leg of said U along a downwardly faced side of said inverted surfboard;
(c) attaching said upper leg and said lower leg of said U



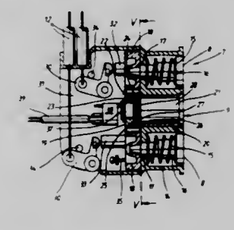
together at an open end using apertures in said legs and affixing therethrough said releasable locking means simultaneously attaching a looped end of a length of at least one said cable to said U-shaped locking apparatus by said releasable locking means; said length of cable used having looped terminal ends;
(d) inserting a free said terminal looped end of said length of said cable inside of said vehicle along the edge of one of said doors opened;
(e) closing and locking said doors with said length of said cable wedged in said edge of said one of said doors and any windows therein up in closed position.

4,896,520

LOCKABLE GLOVE COMPARTMENT COVER ARRANGEMENT FOR VEHICLES

Ulrich Bruhnke, Ehningen; Helmut Fischer; Matthias Schwarz, both of Böblingen; Erwin Uecker, Ratingen, and Reinhard Wittwer, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,383
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728960
Int. Cl.[4] B65D *55/14*
U.S. Cl. 70—159 **22 Claims**



1. Lockable glove compartment cover arrangement for motor vehicles comprising:
a first compartment cover for covering a first storage compartment in a vehicle dashboard or the like,
first latch means for latching the first cover in a closed position,
first actuating element means for actuating the first latch means to an open position, and

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securing means for controlling the security condition of the first actuating element means between a secured position preventing actuation of the first latch means to an open position and an unsecured position permitting actuation of the first latch means to an open position,

wherein said first actuating element means includes a first spur gear element operatively connected to a first push button to move axially therewith, said first spur gear element including an eccentrically offset first abutment stud which is operable in response to axial movement of the first push button to effect actuation of the first latch means to an open position when in an unsecured rotative position and which is inoperable to effect actuation of the first latch means to an open position when in a secured rotative position,

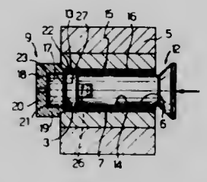
and wherein the securing means includes a toothed wheel gear in meshing driving engagement with said first spur gear element to move the first spur gear element between its respective unsecured and secured positions in response to rotation of the toothed wheel gear.

4,896,521

PROCESS FOR MANUFACTURING A TUBULAR SEMIFINISHED COPPER ALLOY PART

Armando Sbrana, Tirrenia, Italy, assignor to Europa Metalli-LMI S.P.A., Fireuze Borgo Pinti, Italy

Filed Oct. 3, 1988, Ser. No. 252,854
Claims priority, application Italy, Oct. 1, 1987, 67836 A/87
Int. Cl.[4] B21C *35/04*
U.S. Cl. 72—255 **5 Claims**



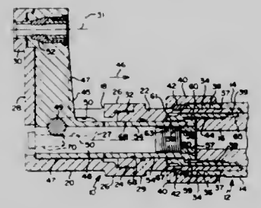
1. A process for manufacturing a tubular, semifinished copper alloy part, particularly suitable for producing ingot molds for the continuous casting of steel, characterized by the fact that it comprises at least a first stage wherein an ingot of said alloy is placed against the end wall of a cavity in a mold, the lateral surface of said cavity being substantially the same as that of said semifinished part, and said ingot presenting a lateral surface matching a portion of said lateral surface of said cavity, and a height equal to a fraction of the height of said lateral surface; and at least a second stage wherein a pressure member, designed to move along the longitudinal axis of said cavity and having a lateral surface substantially identical to the inner surface of said semifinished part, exerts sufficient pressure on said ingot to permanently deform and spread the material of the same inside said cavity and in the opposite direction to movement of said pressure member, so as to form an intermediate semifinished part having a lateral wall whose outer and inner surfaces respectively match the inner surface of said cavity and the outer surface of said pressure member, and an end wall joined to said lateral surface; a third stage for removing said end wall of said mold cavity and replacing the same with an annular cutting die having an inner surface substantially matching the outer surface of said pressure member; said cutting die acting as a support for the end of said semifinished part; a fourth stage wherein said pressure member exerts sufficient pressure on said end wall of said semifinished part to sever said end wall on said intermediate semifinished part from the lateral wall of the same, and so form said tubular semifinished part; and in said first and second stages, said end wall of said mold cavity if formed via closing means held against one end of said cavity for the purpose of closing the same; said closing means comprising a cup-shaping body having a lateral wall and end wall, and a plug designed to fit inside said cup-shaped body; said lateral wall of said cup-shaped body constituting said cutting die, and said lateral wall of said cup-shaped body and said plug defining the end surface of said mold cavity; said closing means being removed from said mold in said third stage, for removing said plug from said cup-shaped body, which is fitted back on to said mold for forming said cutting die.

4,896,522

ROTATABLE COUPLING FOR FASTENER INSTALLATION TOOL

Hendrik E. Rosier, Kingston, N.Y., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Mar. 21, 1989, Ser. No. 326,717
Int. Cl.[4] B21J *15/20*
U.S. Cl. 72—391 **7 Claims**



1. An adaptor mechanism installable between a piston driven fastener installation tool and an offset nose assembly for enabling the nose assembly to be rotatably adjustable within a socket formed in the tool, said adaptor mechanism comprising:

a tubular adaptor element having a threaded end section attachable to the nose assembly, and a smooth-surfaced sleeve section insertable into the socket in the installation tool;

a shaft having a close sliding fit within said tubular adaptor element, said shaft having internal threads for connection of the shaft to the nose assembly, and a first engagement means for connecting the shaft to the installation tool; and

a retaining nut connectable to said piston and having second engagement means axially aligned with said first engagement means such that said nut acts as a force-transmitting connection between the shaft and the piston via said first and second engagement means.

4,896,523

FINGER OPENING MECHANISM FOR TRANSFER PRESS

David W. Knight, Stratford, Conn., assignor to The U.S. Baird Corporation, Stratford, Conn.

Filed Sep. 2, 1988, Ser. No. 240,097
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—405 **39 Claims**

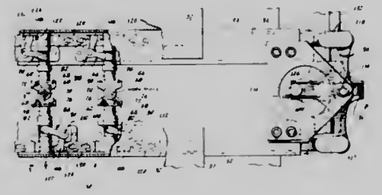
1. A finger operating mechanism for a multiple station metal forming press of the type having a press frame, a press bed and ram tooled for performing sequential work operations on work pieces at a plurality of longitudinally spaced work stations along a longitudinal axis, power driven shaft means for reciprocating the ram and for driving a transfer mechanism and other press elements, the transfer mechanism including spaced-apart transfer rails deployed for reciprocal longitudinal sliding movement flanking the work station, fingers extending inwardly from the rails toward the work stations, the fingers being deployed in opposed pairs spaced apart by the distance between the work stations, the fingers being spring biased to an operative position holding work pieces retractable to release

the work pieces, and cam means driving the transfer rails in reciprocal longitudinal motion so that the fingers are positioned alternately at adjacent work stations, the finger operating mechanism being adapted for retracting at least one pair of opposed fingers independently of the motion of the transfer rails and comprising:

(A) an actuating rod for each transfer rail, each actuating rod being mounted for sliding longitudinal movement along its respective transfer rail adjacent the finger station thereon;

(B) a finger pull-back lever for each finger operated by the finger operating mechanism, each finger pull-back lever being pivotally mounted to its respective transfer rail and having one arm engaged with the finger;

(C) means engaging the actuating rod with the finger pull-back lever such that sliding movement of the actuating rod retracts the finger;



(D) an actuating lever pivotally mounted to the transfer rails and connected to the actuating rods such that pivoting the actuating lever effects mechanical retraction of the fingers, the actuating lever including a follower;

(E) a roll slot member mounted for lateral sliding movement with respect to said longitudinal axis on the press frame, the roll slot member defining a longitudinal roll slot receiving the follower of the actuating lever and accommodating the longitudinal motion of the follower as the transfer rails reciprocate; and

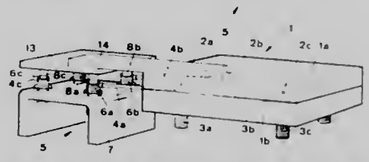
(F) cam drive means for driving the roll slot member in lateral movement to retract the fingers, the cam drive means including a profiled cam assembly driven by the power driven shaft means of the press profile and the cam assembly determining the time and duration of finger retraction.

4,896,524

DEVICE FOR THE EJECTION OF PRESSINGS OUT OF A PRESS TOOL

Jan A. K. Gustafsson, and Per-Göran Larsson, both of Tranås, Sweden, assignors to Stromsholmens Mekaniska Verkstad AB, Tranas, Sweden

PCT No. PCT/SE87/00048, § 371 Date Sep. 28, 1988, § 102(e) Date Sep. 28, 1988, PCT Pub. No. WO87/06165, PCT Pub. Date Oct. 22, 1987
PCT Filed Feb. 3, 1987, Ser. No. 252,275
Int. Cl.[4] B21D *45/04*
U.S. Cl. 72—427 **6 Claims**



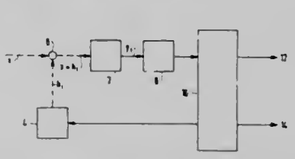
1. An assembly for the ejection of a pressed component from a press tool in a predetermined direction after completion of a pressing operation, said press tool including a moving section and a second section, said moving section and second section adapted to separate at a press surface, said assembly comprising a plurality of ejection pins located within said second section and distributed over said press surface each of said ejection pins having an end thereof located no higher than said press surface during a pressing operation of said press tool, each said ejection pin end adapted to eject a component from said press tool after completion of a pressing operation, characterized in that each ejection pin is operatively connected with an ejection piston rod to a hydraulic ejection piston, said hydraulic ejection piston axially movably disposed in a hydraulic ejection cylinder having an ejection cylinder wall, said ejection cylinder including an ejection space defined by said ejection piston and said ejection cylinder wall, said ejection space filled with an incompressible fluid, said ejection space being in open communication with a duct and a drive means for driving said ejection pins, said drive means comprising a plurality of mechanically inter-connected hydraulic drive cylinders including associated drive pistons and drive piston rods corresponding to said plurality of ejection pins, said drive piston rods adapted to move in synchronism with the moving section of the press tool, and a resilient means for urging said drive pistons and ejection pistons into said predetermined direction.

4,896,525

METHOD FOR A SELF-MONITORING TRANSDUCER

Fritz Breimesser, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 159,316, Feb. 23, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 300,704
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705900
Int. Cl.[4] G01L *27/00*
U.S. Cl. 73—1 R **4 Claims**



4. A method for self-monitoring a transducer to measure a true value x_o of a physical variable with the transducer, comprising the steps of:

(a) modulating said physical variable by predetermined quantities h_i, at least one of the quantities h_i being nonzero;

(b) generating measuring signals y_i from said modulated physical variable; and

(c) determining the true value x_o for said physical variable from said measuring signals y_i.

4,896,526

CONTINUOUS MONITORING OF A GAS MIXTURE

Werner Ratfisch, Martin-Luther-Strasse 1, 8000 München, Fed. Rep. of Germany

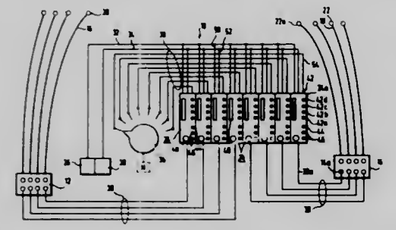
Filed Jun. 2, 1988, Ser. No. 201,558
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1987, 3719231
Int. Cl.[4] G01N *31/00*
U.S. Cl. 73—1 G **8 Claims**

1. A method for the continuous monitoring of a gas mixture, such as a gas mixture of hydrocarbon and air in a plant, comprising the steps of:

withdrawing test samples of the gas mixture from a plurality of spaced withdrawal points of the plant and supplying the test samples to an associated flame ionization detector for analyzing the gas mixture, with each withdrawal point being operatively connected to such a flame ionization detector; and

testing the operativeness of the flame ionization detectors by

selectively connecting each flame ionization detector with a readjusting unit for allowing selective and separate



testing of the operativeness of each flame ionization detector.

4,896,527

SOLVENT LEAK DETECTING SENSOR

Juji Akiba, Saitama, Japan, assignor to Junkosha Co., Ltd., Japan

Filed Jul. 14, 1989, Ser. No. 380,087
Claims priority, application Japan, Aug. 11, 1988, 63-105379
Int. Cl.[4] G01M *3/16*
U.S. Cl. 73—40.5 R **4 Claims**



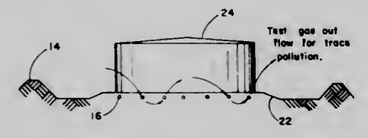
1. A solvent leak detecting sensor comprising: (a) a first electrical conductor and a second electrical conductor installed on an electrically insulating substrate in the form of a detection circuit network, the conductors being exposed and separated from each other, (b) the exposed portions of said first conductor and second conductor being covered by a mask layer of an electrically insulating material which is both water-repellent and which is dissolvable by the solvent that is to be detected, and (c) a top layer covering said layer in "b", this top layer being both porous and electrically conductive.

4,896,528

TANK BOTTOM LEAK TESTING AND APPARATUS

Donald E. Lewis, 7714 Moritz Lake Dr., Corpus Christi, Tex. 78413

Filed Nov. 16, 1987, Ser. No. 121,662
Int. Cl.[4] G01M *3/20, 3/32*
U.S. Cl. 73—40.7 **13 Claims**



1. A grid network system for testing for leaks in the bottom of a tank which sits on a layer of soil which comprises:
- a plurality of perforated horizontal test conduits buried under said tank in said layer,
- means to provide an isolated area relative to at least one of said perforations in at least one of said test conduits; and
- means to measure any inflow and/or outflow of fluids to or from said isolated area.

4,896,529

PERFLUORO-2,3,4-TRIMETHYLPENTHANE AND PROCESS FOR THE PREPARATION THEREOF

Claudio Tonelli, and Vito Tortelli, both of Milan, Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Apr. 5, 1988, Ser. No. 178,011
Claims priority, application Italy, Apr. 10, 1987, 20060 A/87
Int. Cl.[4] G01M *3/20*
U.S. Cl. 73—40.7 **1 Claim**

1. Process for carrying out the Gross leak test according to *MIL-STD 883C Rules, Condition F*, in which perfluoro-2,3,4-trimethylpentane is used as an indicator fluid.

4,896,530

METHOD OF LEAK TESTING, LEAK TESTING DEVICE, AND TEMPERATURE MEASURING DEVICE AS WELL AS A METHOD FOR MEASURING A TEMPERATURE VALUE

Martin Lehmann, Obere Farnbühlstrasse 1, 5610 Wohlen, Switzerland

PCT No. PCT/CH86/00043, § 371 Date Feb. 6, 1987, § 102(e) Date Feb. 6, 1987, PCT Pub. No. WO86/06166, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 9, 1986, Ser. No. 6,554
Claims priority, application Switzerland, Apr. 12, 1985, 1577/85
Int. Cl.[4] G01M *3/32*
U.S. Cl. 73—49.2 **22 Claims**

1. A method for leak testing containers, comprising the steps of:
- bringing a container into a pressure measuring unit;
- measuring a pressure value inside said container;
- brining said container out of said pressure measuring unit; and
- comparing said pressure value with a predetermined limit pressure value to determine whether said container is to be considered tight or leaky;
- wherein a temperature difference between a temperature of the determination of the limit pressure value and a temperature at the measurement of said pressure value, is taken into account, comprising the further steps of:
  - measuring heat radiation of said container at least one of before and after it is brought into said pressure measuring unit;
  - determining a time-span between a time at said measuring of said heat radiation and a time at said measuring of said pressure value;
  - determining said temperature at the measuring of said pressure value from values of said measuring of said heat radiation, said determination of said time-span, and a heat radiation characteristic of said container versus time;
  - comparing said pressure value and said limit pressure value;

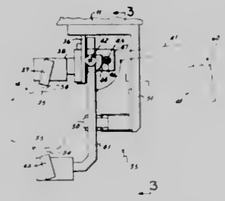
- correcting one of said pressure value, said limit pressure value and a comparison of said pressure value and said limit pressure value from a temperature-relative value corresponding to the determined temperature and a temperature according to said heat radiation measured.

4,896,531

SIDEWALL APPEARANCE MONITOR

Richard H. Hayes, Talmadge, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Oct. 11, 1988, Ser. No. 255,394
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 **4 Claims**



4. A sidewall appearance monitor comprising:
- a frame,
- a fixed upper chuck and a vertically-movable lower chuck for supporting a tire on said frame, means for inflating said tire, means for rotating said tire when inflated,
- a tread probe and support therefor depending vertically from said frame,
- an upper probe mounted on said frame adjacent the upper sidewall of a tire,
- a lower probe normally adjacent the lower sidewall of a tire,
- a pair of normally vertical support arms horizontally-spaced from each other and straddling said tread probe and support therefor, said lower probe being mounted between the lower ends of said support arms,
- means for mounting the upper ends of said support arms to swing said support arms between a vertical operative position and a horizontal inoperative position above the level of said tire,
- whereby said lower chuck may move downwardly to release the tire and the tire may be moved laterally away from said chucks without interference from said lower probe.

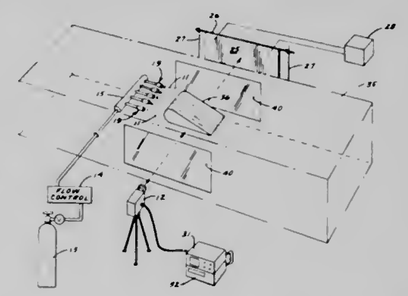
4,896,532

METHOD OF DETECTING TURBULENCE IN LAMINAR AIR FLOW

Henry H. Schmalz, Rockford, Ill., assignor to Thermal Surveys, Inc., Rockford, Ill.

Filed Nov. 9, 1988, Ser. No. 269,195
Int. Cl.[4] G01M *9/00*
U.S. Cl. 73—147 **11 Claims**

1. A method of visualizing turbulence in laminar air flow, the method comprising the steps of, creating a laminar stream of a first gas flowing at a predetermined velocity, creating a laminar stream of a predetermined tracer gas flowing within and in the same direction as the stream of the first gas and at a velocity substantially equal to the velocity of the first gas, the tracer gas having a vibrational absorption frequency in the infrared range, providing a thermally uniform background on one side of said streams, placing a camera on the opposite side of said streams with the camera directed toward said background, said camera being operable to detect radiation in the infrared range and to provide an output in the visual range, said camera being equipped with a band pass filter capable of transmitting infrared radiation to a narrow frequency band that substantially



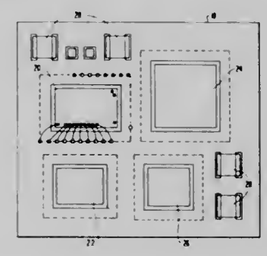
matches the vibrational frequency of the tracer gas, and taking photographic images of said streams with said camera.

4,896,533

MINIATURIZATION OF FLIGHT DEFLECTION MEASUREMENT SYSTEM

Robert Fodale, Massapequa, and Herbert R. Hampton, Hauppauge, both of N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1988, Ser. No. 251,438
Int. Cl.[4] G01M *9/00*
U.S. Cl. 73—147 **3 Claims**



1. A flight deflection measurement system including a hybrid microchip, comprising:
- a decoder;
- miniaturized radio controlled receiver means having said decoder mounted piggyback thereon, said receiver means and said decoder forming an integral unit and
- targets;
- said decoder receiving a pulse train and comprising:
- one-shot multivibrator means for detecting a missing pulse in the pulse train;
- counter means, operatively connected to said one-shot multivibrator means, being reset by said one-shot multivibrator means;
- decoder means, operatively connected to said counter means, for turning on the targets; and
- line driver means, operatively connected to said decoder means, for flashing the targets one at time in sequence.

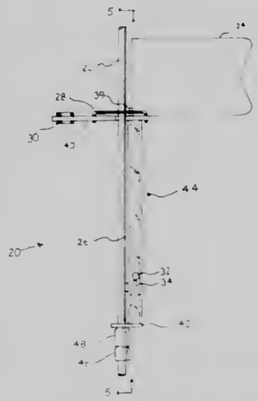
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,534

FLOAT-TYPE FLOWMETER

Daniel C. Daly, 38 Lindsay St., Dorchester, Mass. 02124

Filed Nov. 21, 1988, Ser. No. 274,200
Int. Cl.[4] G01N *1/02*
U.S. Cl. 73—189 13 Claims



1. A float-type flowmeter for measuring the rate of a given flow of fluid, said meter being of the type having:
- a float chamber extending between a first end and a second end, the cross-sectional area of which chamber in the plane perpendicular to the path between said first and said second ends increases as that path advances toward said second end;
- an inlet opening for receiving a sampled portion of said flow of fluid, so that when said inlet opening is faced into said flow, the rate of flow in said sampled portion increases with increases in the rate of flow of said fluid;
- means for channeling said sampled portion of said flow into said first end of said float chamber;
- an outlet opening for releasing at least a part of said sampled portion of flow from said second end of said chamber;
- a float, located in said float chamber, shaped to move between said first and second ends of said chamber, said float being pulled by gravity toward the first end of the chamber when the second end is placed above the first end, and being pushed toward said second end by said sampled portion of said flow, so that said float will tend to reach an equilibrium position when the force of gravity pushing the float down toward the first end equals the force of the net pressure of the sampled flow pushing the float up toward the second end, which net pressure tends to decrease as the cross-sectional area of said chamber increases;
- flow rate indicating means, which associate each of a plurality of positions between the first and second ends of said float chamber with the corresponding rate of flow of said fluid required for said float to reach a sustained equilibrium at said position when said inlet opening is faced into said flow;

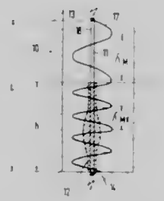
the improvement which comprises:
- means for rotatably mounting said inlet opening so that it can be rotated to face into said flow;
- a rotatably mounted deflection surface, mounted so it can be deflected by said flow so as to minimize its resistance to said flow; and
- means for mechanically linking said deflection surface and said inlet opening so that when said deflecting surface is rotated so as to minimize its resistance to said flow, said inlet opening faces into said flow.

4,896,535

TANK LEVEL METER

Anton Duckart, Wörth; Peter Hauler, Ettlingen, and Erich Zabler, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,649
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738515
Int. Cl.[4] G01F *23/28*
U.S. Cl. 73—290 V 7 Claims



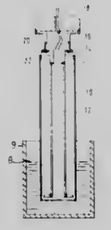
1. A tank level meter, particularly for measuring contents of a fuel tank of a motor vehicle and having a bottom and a top, said tank level meter comprising a sound conducting member extending from the bottom of the tank to the top of the tank; a sound generator coupled to one end of said sound conducting member to generate bending waves thereon; a sound receiver coupled to an opposite end of said sound conducting member, the material of said sound conducting member having an acoustic impedance which differs from that of a measured medium in said tank, said sound receiver detecting a measuring signal which depends on variations of velocity of sound waves propagating at an interface of said sound conducting member and surrounding media present in the tank; a coating at least partially surrounding said sound conducting member and having an acoustic impedance which differs from the acoustic impedance of said sound conducting member and is selected such that the sound waves arrive at said sound receiver with a phase shift which is substantially equal to a full cycle (2π radians) of said sound waves to thereby achieve an unambiguous reading of the measured signal.

4,896,536

OSCILLATION UNIT FOR FILLING LEVEL VIBRATION LIMIT SWITCH

Karl Benz, Schiltach, Fed. Rep. of Germany, assignor to Vega Grieshaber GmbH & Co., Wolfach, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,020
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 3740598
Int. Cl.[4] G01F *23/28*
U.S. Cl. 73—290 V 7 Claims



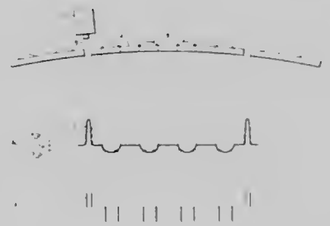
1. Device for determining a certain filling level of a filling material in a container including an oscillation probe, said probe having two oscillation elements, an inner and outer oscillating element (10, 12), both which oscillate with a same resonance frequency and in opposite directions of rotation, said inner and outer oscillation elements being in coaxially spaced relation with said outer oscillation element (10) at least partially enveloping said inner oscillation element (12) whereby oscillations of the oscillation probe are damped with touching of the filling material with said outer oscillation element (10), and electromechanical transformers in the form of piezo-electrical means are provided to drive the oscillation probe and detect an oscillation amplitude; the improvement comprising a ring membrane (14) common to said outer oscillation element (10) and said inner oscillation element (12), said outer and inner oscillation elements being fixed to said common ring membrane (14) so oscillation of said inner and outer oscillation elements deflects said common ring membrane and defines an oscillation node therein, and a fixture ring on said common ring membrane (14) for connection, preferably via a screw-in part (18), with the container, said fixture ring engaging said common ring membrane at said oscillation node of said common ring membrane (14); and
- a neutralizing membrane connected to said fixture ring for elastically connecting the container and preventing flow of oscillation energy to the container.

4,896,537

SHROUDED TURBINE BLADE VIBRATION MONITOR

Robert L. Osborne, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1988, Ser. No. 201,225
Int. Cl.[4] G01H *11/00*
U.S. Cl. 73—660 20 Claims



1. A system for monitoring the vibration of a plurality of turbine blades configured in a row, comprising:
- a sensor for sensing a profile of the turbine blade row under dynamic conditions;
- means for storing an expected profile of the turbine blade row;
- means for comparing said sensed profile to said expected profile to detect displacement of the turbine blades due to vibration;
- means for determining the existence of vibration from said detected displacements; and
- output means responsive to said means for determining.

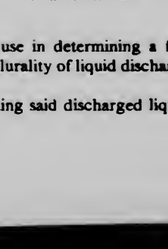
4,896,538

CONVERTIBLE SOCKET FOR PRESSURE GAUGE

Robert D. Bissell, Orange, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 7, 1988, Ser. No. 255,124
Int. Cl.[4] G01L *7/04*
U.S. Cl. 73—741 8 Claims

1. A pressure gauge having a case in which is disposed a Bourdon tube and a base socket connected to the Bourdon tube for placing said tube in pressure communication with a fluid pressure source, said base socket having a rearward face and a bottom face with respect to said gauge adjacent openings defined through said case and an internal passage communicating with said tube and means for connecting a source of fluid pressure to said socket selectively through one of said case openings to said bottom face or said rearward face and comprising:
- a first threaded aperture in the bottom face of said socket extending into communication with said internal passage;
- a second threaded aperture similar to said first threaded aperture in the rearward face of said socket extending into communication with said internal passage;
- said first and second apertures each defining a threaded portion and a concentric counterbore arranged with their respective axes intersecting at a predetermined angle;
- threaded plug means having socket engaging threads;



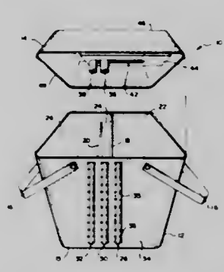
- a first seal disposed on said plug means whereby said plug can be threadedly inserted and sealingly plugged in one of said apertures;
- an adaptor assembly attachable to said socket through said one case opening and comprising a body having an axial passage extending therethrough and open on both ends, a first end of said body terminating in socket-engaging threads for threadedly connecting to the other of said socket apertures and a second end disposed outward of said case and defining connector threads for attaching to a threaded circuit defining a source of fluid pressure; and
- a second seal member disposed on said adaptor for sealing the threaded engagement with the other of said apertures.

4,896,539

SPRAY CALIBRATION DEVICE AND METHOD

Masoud Salyani, Winter Haven, and Joseph W. Serdynski, Lakeland, both of Fla., assignors to University of Florida, Gainesville, Fla.

Filed Oct. 13, 1988, Ser. No. 257,446
Int. Cl.[4] G01F *13/00, 25/00*
U.S. Cl. 73—861 15 Claims



1. A device for use in determining a flow rate of liquid discharged from a plurality of liquid discharge means comprising:
- means for collecting said discharged liquid, said collecting

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means comprising a plurality of connectors adapted to engage each of said plurality of liquid discharge means in a substantially fluid-tight manner, and a manifold having a plurality of inlet lines and a single outlet line, each of said inlet lines having one of said connectors attached thereto,

a receptacle having at least a first and a second compartment, each of said first and second compartments having a predetermined fixed volume adapted to hold said liquid, each of said compartments further having means for indicating a volume associated with at least one liquid level in each of said compartments;

means for connecting said outlet line of said manifold to said receptacle; and

means for selectively directing said liquid from said outlet line into each of said compartments.

4,896,540

AEROACOUSTIC FLOWMETER

Parthasarathy Shakkottai, 2622 Gardi St., Duarte, Calif. 91010, and Eug Y. Kwack, 20946 E. Canyon Ridge Rd., Walnut, Calif. 91789

Filed Apr. 8, 1988, Ser. No. 179,076
Int. Cl.[4] G01F *1/86, 15/04*
U.S. Cl. 73—861.02 **11 Claims**



2. A system for processing signals and deriving mass flow and temperature for the case of gas flows and additionally, steam quality for the case of wet steam flow in pipes of arbitrary sizes, the arrangement comprising:

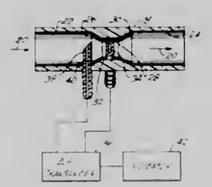
A non-obstructing aeroacoustic ring source containing a sharp edge and a ring cavity producing harmonic sound waves in the pipe flow of wavelength of the order of two pipe diameters; two sensing points in the form of pressure taps of narrow bore located on the pipe wall with a separation in the flow direction equal to an internal multiple of a half wavelength of said harmonic sound wave; two sound detecting means enclosed to enable sound from said pressure taps to be detected uninfluenced by high mean pressures and surges in said flow; lead-in tubes of narrow bore to prevent high temperatures from reaching said sound detectors from said pressure taps, but which convey sound with adequate damping to minimize phase variations with frequency, said lead-in tubes also providing additional surge protection; for steam flows, means for providing a small purge gas flow through said narrow-bore lead-in tubing to prevent condensation of steam; means for controlling a subsidiary flow derived from an upstream location to energize said ring source, if measurements are required to nearly zero flow; electronic amplifying means to amplify the sinusoidal signals produced by said sound detectors; phase-lock loop amplifying means to remove noise and to generate two square wave signals accurately preserving the phase difference between said sinusoidal signals; detector means for measuring said phase difference and frequency of one of said signals; means for measuring mean pressure and temperature of said flow in said pipe; output means for calculating and displaying temperature, mass flow and quality of said flow in said pipe.

4,896,541

VORTEX GENERATING MASS FLOWMETER

Nathaniel Hughes, Palm Springs, Calif., assignor to Vortran Corporation, Culver City, Calif.

Continuation of Ser. No. 570,162, Jan. 12, 1984, Pat. No. 4,730,500, and a continuation-in-part of Ser. No. 213,843, Dec. 8, 1980, Pat. No. 4,453,542, which is a continuation-in-part of Ser. No. 40,557, May 21, 1979, Pat. No. 4,240,293, and Ser. No. 109,839, Jan. 7, 1980, Pat. No. 4,372,169. This application Jan. 28, 1988, Ser. No. 149,475
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] G01F *1/32, 1/44*
U.S. Cl. 73—861.22 **28 Claims**



1. A vortex generating flowmeter comprising:

a first port;

a second port;

a flow measurement passage between the ports;

a restriction formed in the flow passage between the first and second ports, the restriction comprising a converging-diverging nozzle;

a rod producing drag in the passage between the restriction and the second port; and

means for sensing fluid pressure in the vicinity of the rod.

4,896,542

PORTABLE WASTEWATER FLOW METER

Robert M. Hunter, 320 S. Wilson Ave., Bozeman, Mont. 59715

Continuation-in-part of Ser. No. 51,325, May 19, 1987, Pat. No. 4,799,388. This application Dec. 20, 1988, Ser. No. 286,695
Int. Cl.[4] G01F *1/44*
U.S. Cl. 73—861.63 **6 Claims**



1. In the process of metering the flow of liquid which is flowing by gravity in an elongated pipe that is open to atmosphere, wherein:

tubular venturi metering device is installed in the pipe, which has an open-ended bore therethrough having an axis extending end-to-end thereof,

arranging the device in the pipe so that the axis of the bore is disposed substantially parallel to the longitudinal axis of the pipe and the bore thus has an end which is normally oriented upstream of the liquid flow in the pipe and an end which is normally oriented downstream of the liquid flow in the pipe,

the bore having an axially inwardly tapered entrance section adjacent the upstream end thereof which converges toward the axis of the bore in vertical planes paralleling the axis of the bore relatively toward the downstream end of the bore but terminates short of the axis of the bore so that a throat is formed in the bore which opens to the downstream end thereof,

forming a liquid seal between the device and the pipe at the outer periphery of the device so that the liquid in that section of the pipe disposed upstream from the upstream end of the bore of the device, is constrained to flow through the bore of the device, relatively toward the downstream end thereof,

determining the static pressure head in the liquid in the aforesaid upstream section of the pipe when the liquid is flowing in the pipe at a depth less than that adapted to fill the upstream pipe, to meter the flow in the pipe for the less than full condition thereof,

configuring the cross-sectional area of the throat, relative to that of the pipe, transverse the respective axes thereof, so that the throat will fill with liquid substantially simultaneously with the upstream section of the pipe, when the liquid depth rises therein, and

providing means whereby the static pressure head of the liquid in the throat of the device and the upstream section of the pipe can be determined when both the upstream section of the pipe and the throat are filled, so that the difference between the latter two pressure heads can be determined to meter the flow in the pipe for the full condition thereof, and thereby enable the flow in the pipe to be metered for the full condition thereof as well as the less than full condition thereof and the transition therebetween,

the improvement wherein:

arranging the device in the pipe with its axis and the top of its throat horizontal thus leveling the device,

the bore having an axially outwardly tapered exit section adjacent the downstream end thereof which diverges from the axis of the bore in vertical planes paralleling the axis of the bore relatively toward the end of the bore that is normally downstream,

providing means whereby the static pressure head of the liquid in the throat of the device and in both the entrance section and the exit section can be determined, so that the difference between the static pressure heads in the entrance section and in the exit section can be used to determine the direction of flow and, hence, the actual upstream end of the device, and, during the less than full condition, an appropriate correction factor for metering the flow rate, and so that the difference between the throat pressure head and the actual upstream pressure head can be determined to meter the flow in the pipe for the full condition thereof.

4,896,543

THREE-AXIS FORCE MEASUREMENT STYLUS

Larry S. Gullman, Redwood City, Calif., assignor to SRI International, Inc., Menlo Park, Calif.

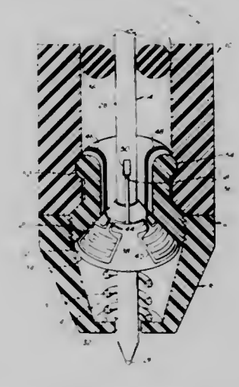
Filed Nov. 15, 1988, Ser. No. 271,254
Int. Cl.[4] G01L *5/16;* **G06K** *9/00*
U.S. Cl. 73—862.04 **16 Claims**

9. An apparatus for generating signals representing direction and magnitude of force on a shaft in a stylus comprising:

a housing, wherein said housing comprises a first pressure means;

a pickup, wherein said pickup comprises a second pressure means; and

a sensing means disposed between said housing and said pickup and abutting said housing and said pickup at an interface wherein said first and second pressure means exert pressure on said sensing means for sensing pressure of said pickup abutting said housing in a plurality of directions, wherein said first pressure means comprises a funnel portion and wherein said second pressure means comprises a cone portion, said cone portion abutting said funnel portion in a complementary relationship forming said interface, and wherein said sensing means comprises planar pads which are disposed at said interface between said funnel portion and said cone portion and which are



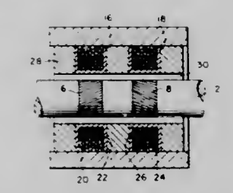
distributed around a central axis through said cone portion for sensing directionality of force.

4,896,544

MAGNETOELASTIC TORQUE TRANSDUCER

Ivan J. Garshelis, Pittsfield, Mass., assignor to Mag Dev Inc., Pittsfield, Mass.

Continuation-in-part of Ser. No. 938,404, Dec. 5, 1986, Pat. No. 4,760,745, and Ser. No. 95,774, Sep. 14, 1987. This application Nov. 17, 1987, Ser. No. 119,531
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.36 **50 Claims**



11 A magnetoelastic torque transducer for providing an electrical signal indicative of the torque applied to a member, said member having a ferromagnetic and magnetostrictive region, said transducer comprising:

a pair of axially spaced-apart annular bands defined within a thermally hardened portion of said region, said bands having respectively symmetrical right and left hand helically directed residual stress created magnetic anisotropy instilled therein subsequent to thermal hardening of sufficiently large magnitude compared with the random magnetic anisotropy in said member that the contribution to total magnetic anisotropy of any random anisotropy is negligible, each said band having at least one circumferential region which is free of residually unstressed areas over at least 50% of its circumferential length;

means for applying a cyclically time varying magnetic field to said bands;

means for sensing the change in permeability of said bands caused by said applied torque; and

means for converting said sensed change in permeability to an electrical signal indicative of the magnitude of the torque applied to said member.

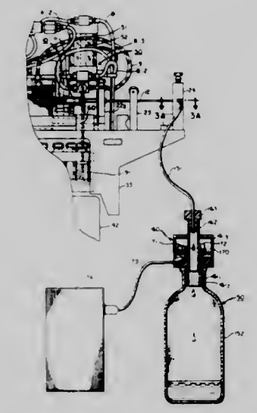
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4,896,545

AUTOMATIC FLUID INJECTOR

Julius P. Averette, Baker, La., assignor to Dynatech Precision Sampling Corporation, Baton Rouge, La.

Filed Apr. 22, 1988, Ser. No. 184,797
Int. Cl.[4] G01N *35/06*
U.S. Cl. 73—863.01 **10 Claims**



1. In an apparatus combination useful for the injection of a small accurately measured quantity of a fluid specimen into an inlet of an analytical instrument, said apparatus being characterized as one which includes means for the pickup of fluid specimen from a supply source, a calibrated chamber wherein at least a portion of the fluid specimen is charged to fill the chamber and overflow a portion of the fluid specimen as droplets from the chamber, closure means for closing the calibrated chamber to trap an accurately measured quantity of the fluid specimen therein, and means for injection of the measured quantity of fluid specimen into the inlet of said analytical instrument,

the improvement comprising

drop counting means for monitoring and counting a preselected number of the drops of the fluid specimen overflowing said chamber, and

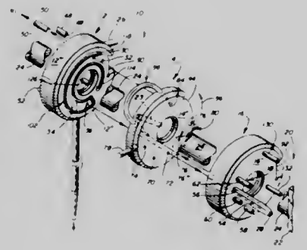
means responsive to said drop counting means for interrupting the flow of fluid specimen from said supply source to trap said fluid specimen within said calibrated chamber prior to injection of the measured quantity of the fluid specimen into the inlet of said analytical instrument.

4,896,546

LIQUID METERING AND TRANSFER VALVE ASSEMBLY

Pedro P. Cabrera, and Daniel A. Estoque, both of Miami, Fla., assignors to Coulter Electronics, Inc.

Continuation of Ser. No. 113,297, Oct. 26, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,905
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—863.73 **12 Claims**



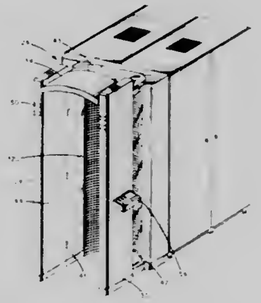
1. A liquid metering and transfer valve assembly for use in a diluting system for providing at least three segmented, precise liquid samples from a single liquid sample source, at least two of said segmented liquid samples being of different volume, said valve assembly being operable between a loading condition and a delivery condition and including means for defining first, second and third segmenting portions in series communication with each other during the loading condition for receiving a continuous body of liquid sample from said source; said first, second and third segmenting portions being constructed and arranged to be isolated with the contents thereof one from the other; and there being means for combining each of said first, second and third isolated contents with a precise volume of diluent from a source of diluent and delivering said isolated contents with their associated amount of diluent to respectively different exterior locations; one of said segmenting portions being formed as first internal passageway means of precise internal volume, another of said segmenting portions formed as a first externally disposed hollow loop having a precise internal volume different from the internal volume of said first internal passageway means, and a second external hollow loop having a precise internal volume defining said third segmenting portion; second internal passageway means formed in said valve assembly and capable of establishing series communication with said first hollow loop and said first internal passageway means during the loading condition of said valve assembly and additional internal passageway means capable of being coupled to a source of diluent during the delivery condition of said valve assembly, said second external hollow loop being capable of isolating a precise volume of liquid sample therein and being disposed in communicating relationship with said additional internal passageway means during said delivery condition of said valve assembly for delivering its isolated volume of liquid sample with an associated amount of diluent to a preselected exterior location; whereby three precisely measured liquid sample volumes are measured and delivered to exterior locations along with respective precise volumes of diluent employing a single loading operation, said metering and transfer valve assembly being formed of a pair of spaced outer valve elements and an inner movable valve element sandwiched between said outer valve elements and coaxially aligned therewith, the valve elements having outer circumferential surfaces, each valve element having opposite faces and the opposite faces of the inner, movable valve element are sealingly frictionally engaged with the adjacent faces of the outer valve elements; the inner movable valve element carrying said first internal segmenting passageway means, one outer valve element carrying the first external hollow loop, and an aspirator probe secured to the other outer valve element being coupled to the liquid sample source; said additional internal passageway means for coupling said segmenting portions to the source of diluent being formed in both said outer valve elements; a pair of angular passageways formed in said inner valve element, said pair of angular passageways leading from angularly spaced apart locations along the outer circumferential surface of said inner valve element and opening to each face; said second external loop having opposite ends respectively secured to said outer circumferential surface of said inner valve element within respective ones of said angular passageways at said locations and extending outwardly of said outer circumferential surface.

4,896,547

AIR-SAMPLING APPARATUS WITH EASY WALK-IN ACCESS

Michel D. Arney, Rosliodale; Gianfranco Zaccai, Boston; Eugene K. Achter, Lexington; Edward J. Burke, Waltham; Gabor Miskolczy, Carlisle, and Ain A. Sonin, Lexington, all of Mass., assignors to Thermedics Inc., Woburn, Mass.

Filed Nov. 18, 1988, Ser. No. 272,951
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—863.81 **3 Claims**



1. Apparatus for producing an air sample containing vapors of selected compounds carried by a person comprising:

a booth sized to permit walk-in entry of a person and walk-out exit therefrom, said booth including a top, a pair of opposed generally vertical side walls, and a generally vertical end wall connected to said side walls and having at least one air passage therethrough;

said booth having an open end opposite said end wall for walk-in entry of a person;

portions of said side walls near the end wall of said booth being formed of light-transmissive materials and portions of said side walls and said top near the open end being opaque; and

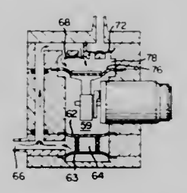
means for withdrawing air from within said booth through the air passage in said end wall, said air withdrawal means operable to cause air to flow from said open end over essentially the entire body of a person positioned within said booth and to produce an air sample containing vapors of said selected compounds removed from the person.

4,896,548

FLUID SAMPLER WITH MINIATURE SINGLE-ACTING PUMP ASSEMBLY

Hill S. Lalin, Wayne, and William T. Fleming, Glen Gardner, both of N.J., assignors to Gilian Instrument Corp., Wayne, N.J.

Filed Dec. 27, 1988, Ser. No. 290,580
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—864.34 **10 Claims**



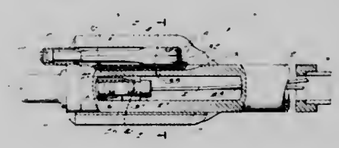
1. A fluid sampler for sampling air flow through a load comprising a single-acting pump assembly having a housing, an inlet port and an outlet port, a valve unit including a single inlet valve and a single outlet valve, a control diaphragm mounted in said housing to form a pumping chamber in communication with said inlet valve and said outlet valve, a piston for reciprocating said control diaphragm, a motor for driving said piston with said piston being located in a substantially enclosed cavity separated from said pumping chamber by said control diaphragm and damping means integrated in said pump housing for providing a highly damped fluid flow through said pump, said damping means comprising a first and second flexible diaphragm and a coil spring disposed between said diaphragms for forming a damping chamber with said first diaphragm disposed in common between said damping chamber and said substantially enclosed cavity.

4,896,549

MOLTEN METAL SAMPLER

Richard A. Falk, 122 Nurmi Dr., Fort Lauderdale, Fla. 33301

Filed Jun. 10, 1988, Ser. No. 205,464
Int. Cl.[4] G01N *1/12*; G01K *1/12*
U.S. Cl. 73—864.53 **7 Claims**



1. Apparatus for measuring properties of molten metal comprising:

an elongated tube adapted to be connected to a handle for manipulation thereof,

a first molten metal measurement device supported by said tube,

a second molten metal measurement device,

a pod for receiving said second measurement device in embracing contact laterally along side said tube and first molten metal measuring device, and said pod having wall means defining a tube sleeve portion which interfits with said tube to support the pod on said tube, the pod wall means defining a pouch to receive said second measurement device, and means for securing said second molten metal measurement device in said pouch, said pod having common wall means surrounding and forming said pouch and said tube sleeve portion.

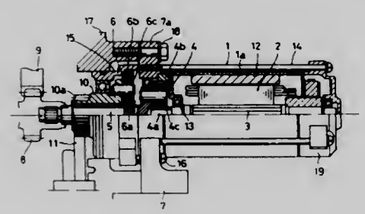
6. Apparatus for measuring properties of molten metal comprising handle means for supporting a thermocouple having a cold junction, an insulative pod adapted to be connected to the handle means for manipulation thereby in a molten metal bath and said pod including wall means defining a common chamber having a curved portion for receiving the handle means and an offset pouch, said pouch being dimensioned to receive and support in offset relationship from the handle means and the thermocouple a molten metal sampler having a mold, and insulative means between the thermocouple and the pouch to insulate said cold junction of the thermocouple from heat in the molten metal sampler in the pouch.

4,896,550

CONSTRUCTION OF STARTER MOTOR FOR TAKING OFF POWER TO OUTSIDE

Koichi Hikichi, Higashi-Kurume, and Hideyuki Minami, Kiryu, both of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gunma and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 11, 1988, Ser. No. 166,888
Claims priority, application Japan, Apr. 13, 1987, 62-90127
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] F02N *15/02*
U.S. Cl. 74—6 **7 Claims**



1. A construction of a starter motor for taking off power to an outside, wherein;

said motor comprises a first reduction mechanism having a motor shaft as an input shaft, a first output shaft coaxial with said input shaft, a pinion gear provided on said first output shaft which is engageable directly or indirectly with a ring gear of an engine, the pinion gear being located on a side of the motor defined as a first side, and first gear means in the first reduction mechanism for transmitting power from said input shaft to the first output shaft, and a second reduction mechanism having said first output shaft as an input shaft, a second output shaft and second gear means in the second reduction mechanism for transmitting power from the first output shaft to the second output shaft,

said second output shaft is hollow to be coaxially fitted onto said first output shaft to permit relative rotation between said first output shaft and said second output shaft, so that the power can be taken off on the first side of said motor at said pinion gear, and;

first and second brackets within which said first and second reduction mechanisms are axially arranged.

4,896,551

STARTER MOTOR AND PROCESS OF FORMING PINION SHAFT USED IN THE STARTER MOTOR

Hideyuki Minami, Kiryu; Tomoo Matsumura, Ohmama; Takashi Yokosuka, Tsuruta; Katsuo Takahara, Ohta, and Shigeru Okajima, Isesaki, all of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Mar. 11, 1988, Ser. No. 166,885
Claims priority, application Japan, Apr. 15, 1987, 62-92793; Apr. 15, 1987, 62-57078; Apr. 15, 1987, 62-57079; May 8, 1987, 62-111887
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] F02N *15/02*
U.S. Cl. 74—6 **7 Claims**

1. A starter motor comprising:

a motor shaft,

a first output shaft having a pinion gear provided thereon to engage a ring gear of an engine, the pinion gear being located on a side of the motor defined as a first side,

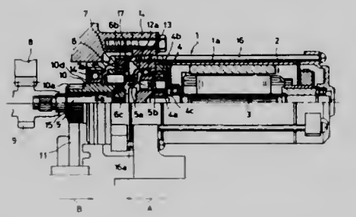
a first reduction mechanism for outputting power from said motor shaft through said first output shaft,

a second output shaft,

a second reduction mechanism for outputting power from said first output shaft through said second output shaft, wherein

said second output shaft is rotatably coupled onto said first output shaft and made coaxial therewith such that power can be taken out on the first side of said motor shaft at said pinion gear,

said first output shaft having a first bearing, a first case bracket having one side, said first case bracket being engaged with said first bearing so as to be able to bear a thrust at the one side of the first case bracket in a first axial direction,



said second output shaft having a second case bracket having an other side, said second case bracket being engaged with said second bearing so as to be able to bear a thrust at the other side of the second case bracket in a second axial direction opposite said first axial direction,

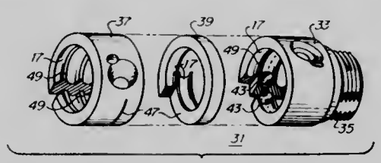
a stop member cooperable with said first and second output shafts for controlling relative displacements of the first and second output shafts in the first and second axial directions so that a thrust in the second axial direction on the first output shaft and a thrust in the first axial direction on said second output shaft can be borne by each of said first and second output shafts.

4,896,552

BALLSCREW FOLLOWER AND METHOD OF MAKING AND OPERATING THE SAME

Joseph P. Virga, Morgan Hill, Calif., assignor to Ballscrews & Actuators Co., Inc.

Filed Jan. 19, 1988, Ser. No. 145,383
Int. Cl.[4] F16H *13/08*
U.S. Cl. 74—89.15 **4 Claims**



1. Apparatus for operating with a leadscrew having a helical groove therein at a selected pitch along the length thereof; the apparatus comprising:

follower apparatus for relative rotational and translational motion with respect to the leadscrew, the follower apparatus having a head end and a tail end coupled by at least one convolute section therebetween that is axially spaced therefrom with the tail end resiliently coupled to the head end substantially only by the convolute section, and having a helical groove in a portion of the head end and in a portion of the tail end and in said convolute section at said selected pitch for forming with the groove in the leadscrew a course in which balls may rotate in contact with the grooves in said leadscrew and in said follower apparatus;

a plurality of balls disposed within said course to alter position along said course in response to relative rotation of the leadscrew and follower apparatus, the diameter of said balls being selected relative to the dimensions of said course to maintain said convolute section in a resilient torsionally expanded condition between said head end and said tail end; and

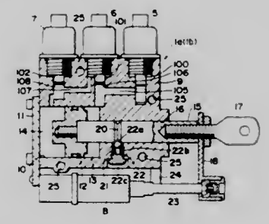
return means coupled to said course at the head end and at the tail end for circulating said balls therein during relative rotation of the leadscrew and follower apparatus.

4,896,553

AUTOMATIC TRANSMISSION

Yuji Sato; Hiromi Kono; Akifumi Tanoue, and Yoshiyuki Kimura, all of Higashi-matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 26, 1988, Ser. No. 198,825
Claims priority, application Japan, May 30, 1987, 62-137316
Int. Cl.[4] B60K *20/10*
U.S. Cl. 74—335 **3 Claims**



1. An automatic transmission comprising:

(a) a first fluid-pressure differential cylinder for select operation of said automatic transmission;

(b) a second fluid-pressure differential cylinder for shift operation of said automatic transmission;

(c) each of said first and second fluid-pressure differential cylinders including a first chamber and a second chamber having a larger pressure receiving area than said first chamber, said first chamber being connected through a first connecting passage to a hydraulic power supply, said second chamber being connected through a second connecting passage to a tank, said first and second chambers being connected together by a third connecting passage;

(d) a first solenoid-operated valve disposed in said first connecting passage for making and blocking a fluid communication between said first chamber and said hydraulic power supply;

(e) a second solenoid-operated valve disposed in said third connecting passage for opening and closing said third connecting passage;

(f) a third solenoid-operated valve disposed in said second connecting passage for opening and closing said third connecting passage;

(g) a pulse generator connected with said second and third solenoid-operated valves for issuing them a high frequency pulse signal having a pulse repetition period shorter than an on-off response time of each of said second and third solenoid-operated valves, said pulse signal having a duty factor which is variable;

(h) a shift-lever actuator device connected with said first and second fluid-pressure differential cylinders respectively through first and second transmission means for receiving mechanical positional outputs of the respective cylinders to select a gear position corresponding to the thus-receiving mechanical positional outputs;

(i) a first block containing said first fluid-pressure differential cylinder and having a fluid intake hole and a fluid discharge hole, said intake and discharge holes opening to a face of said first block respectively through a pair of fluid passages defined in said first block;

(j) a second block containing and said second fluid-pressure differential cylinder and having a fluid intake hole and a fluid discharge hole; and

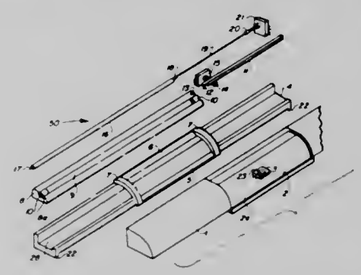
(k) connecting means for joining said first and second blocks together such that said first and second blocks are in facewise contact with each other with said openings at said face held in communication with said intake and discharge holes in said second block.

4,896,554

MULTIFUNCTION TACTILE MANIPULATABLE CONTROL

Craig F. Culver, 201 Ware Rd., Woodside, Calif. 94086

Continuation of Ser. No. 116,105, Nov. 3, 1987, Pat. No. 4,823,364. This application Apr. 24, 1989, Ser. No. 342,416
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[4] G05G *9/02*; G09G *1/00*
U.S. Cl. 74—471 XY **8 Claims**



1. A device for generating control signals, comprising:

a support having a recess extending longitudinally along said support;

an elongated bar movable longitudinally in said recess;

an elongated cylindrical element rotatively mounted in said bar so as to move rotatively with respect to the bar and connected to the bar to move with said bar in said recess;

means, operable by longitudinal movement of said bar, for producing a first signal; and

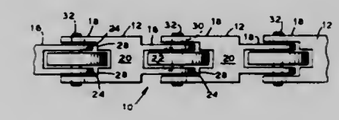
means, operable by rotational movement of said cylindrical element independent of and relative to said bar, for producing a second signal.

4,896,555

SERPENTINE TUBE INSPECTION POSITIONING SPINE

William E. Bailey; John H. Flora, both of Lynchburg, and Robert E. Womack, Forest, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 21, 1988, Ser. No. 260,161
Int. Cl.[4] F16C *1/20*
U.S. Cl. 74—502.5 **6 Claims**



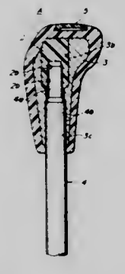
1. A positioning spine, comprising:

a. a plurality of identical links;

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b. each link having a longitudinal axis and first and second bifurcated ends spaced along the axis;
c. said second bifurcated end having a substantially oval bore therethrough perpendicular to the longitudinal axis;
e. a pivot pin accepted in said bores of said first and second bifurcated ends of adjacent links for mating adjacent links together;
d. said first bifurcated end being sized to fit within said second bifurcated end of an adjacent link for mating therewith and having a bore therethrough perpendicular to the longitudinal axis;
f. means for maintaining rigid straightness of said mated links when under longitudinal compressive forces comprising flat inner alignment faces on said second bifurcated end and corresponding flat end alignment faces on said first bifurcated end; and
g. means for allowing pivoting of one link relative to an adjacent link.

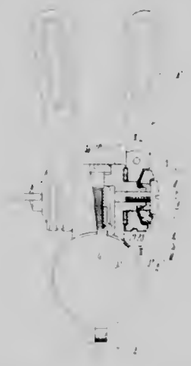
4,896,556
SHIFT LEVER KNOB
Toshiaki Takada, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Japan
Filed May 9, 1988, Ser. No. 191,995
Claims priority, application Japan, May 8, 1987, 62-68715[U]
Int. Cl.⁴ G05G *1/04, 1/10*
U.S. Cl. 74—523 **8 Claims**



1. A shift lever knob comprising:
a surface layer made of a synthetic resinous material;
an insert disposed inside said surface layer and made of a synthetic resinous material and having a threaded portion for attachment to a shift lever; and
a metal filling disposed inside said surface layer between said surface layer and said insert
for adjusting the total weight of said knob to a predetermined value.

4,896,557
SPEED-CHANGE LEVER DEVICE FOR A BICYCLE
Masashi Nagano, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Feb. 7, 1984, Ser. No. 577,894
Claims priority, application Japan, Feb. 15, 1983, 58-21398[U]; Jun. 14, 1983, 58-91344[U]
Int. Cl.⁴ G05G *5/06*
U.S. Cl. 74—531 **6 Claims**

1. A speed-change lever device for a bicycle, comprising:
(a) a lever shaft having a round portion and a not-round portion, said lever shaft having a screw thread at an axial end thereof;
(b) an operating lever supported rotatably on said round portion of said lever shaft, said operating lever including a boss;
(c) an elastically deformable friction plate supported on said not-round portion of said lever shaft for providing resistance against rotation of said lever;
(d) an urging member having a not-round through bore through which said urging member is fitted onto said not-round portion of said lever shaft for urging said friction plate against said operating lever and said lever shaft; and
(e) a screw member screwable with said screw thread of said lever shaft, whereby said screw member can be screwed forwardly or backwardly to adjust a rotational resistance provided against said lever by said friction plate, said urging member having an urging portion for contacting said friction plate as a result of a forward screw-movement of said screw member during assembly of said lever

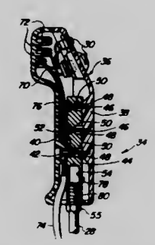


device to thereby elastically deform said friction plate to urge said friction plate toward said boss of said operating lever, said friction plate including at least one engaging segment which, when urged by said urging portion of said urging member during assembly of said lever device, is elastically deformed to engage with said not-round portion of said lever shaft leaving substantially no gap therebeween to thereby make said friction plate not-rotatable, said engaging segment being inclined relative to an axial dimension of said lever shaft and deformed elastically along said axial dimension as a result of urging of said friction plate by said urging member toward said boss, an utmost end portion of said engaging segment being in contact with an outer face of said not-round portion of said lever shaft.

4,896,558
CONTROL HANDLE FOR A WORK VEHICLE
Lynn A. Meier, East Dubuque, Ill.; Steven H. Johnson, and Mark A. Litka, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Jun. 1, 1988, Ser. No. 200,825
Int. Cl.⁴ G05G *1/10*
U.S. Cl. 74—543 **16 Claims**

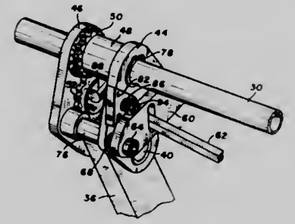
1. A control handle, the handle comprising:
a housing being formed from a back plate and a switch plate, the back plate and the switch plate both having internal and external surfaces;
releasable securing means for releasably securing the back plate to the switch plate;
at least one electrical switch mounted in the switch plate, the switch having an operator contact assembly that extends from the switch outwardly from the external surface of the switch plate;
a terminal post integrally formed with the back plate and extending inwardly from the internal surface of the back plate;

switch wires coupling the switch to the terminal post; and communication wires coupled to the terminal post and extending therefrom for connection to a work assembly,



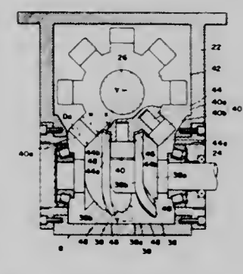
whereby when the releasably securing means in released, the back plate can be removed from the switch plate and the terminal post and switch can be readily accessed for servicing.

4,896,559
POSITION ADJUSTABLE VEHICLE STEERING CONTROL
Gregory J. Marier, Brooklyn Park, Minn., and Tommy O. Moats, Frederic, Wis., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed May 26, 1988, Ser. No. 198,856
Int. Cl.⁴ G05G *1/14*
U.S. Cl. 74—551.4 **16 Claims**



1. An adjustable steering control apparatus for vehicles, including:
a first elongate steering member disposed for rotation on a longitudinal axis;
a second steering member mounted with respect to one end of said first steering member for pivoting relative to said first steering member about a transverse first axis;
a third steering member rotatably mounted with respect to said second steering member about a transverse second axis parallel to said first axis relatively remote from said first steering member whereby said third steering member revolves about said first axis as said second steering member so pivots; and
an indexing means for joining said first steering member and said third steering member in a manner to rotate said third steering member relative to the second steering member responsive to said pivoting of said second steering member, in a direction opposite to the direction of said pivoting and in an amount predetermined to maintain said third steering member in a selected orientation with respect to said first steering member as the third steering member revolves about the first axis; and
a locking means, mounted to reciprocate with respect to said steering members in the direction of said transverse axes, for releasably securing said first, second and third steering members against movement relative to one another.

4,896,560
INDEXING DEVICE
Heizaburou Kato, Ogasa, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Nov. 14, 1988, Ser. No. 270,035
Claims priority, application Japan, Jun. 1, 1988, 63-132594; Jun. 1, 1988, 63-71748[U]
Int. Cl.⁴ F16H *53/06*
U.S. Cl. 74—569 **9 Claims**



1. An indexing device comprising:
a rotatably driven input shaft;
a globoidal cam provided on the input shaft and having, for the purpose of outputting intermittently the rotation of the input shaft, a taper rib defining a cam face which has a disk-shaped end face gradually yielding to a helical face about the input shaft;
an output shaft to which the rotation of the input shaft is transmitted so that the output shaft may rotate intermittently;
an indexing disk provided on the output shaft and having supports protruding radially outwardly at intervals along the circumference of the indexing disk, the taper rib having a ridge fitting between the adjoining supports;
cam followers each disposed at the end of each support on the indexing disk and brought into engagement with the taper rib so as to be intermittently driven along the cam face; and
gaps provided between the ridge of the taper rib and the supports opposite this, the gap being filled up by the elastic deformation of the cam follower so that the ridge of the taper rib may come into contact with the support.

4,896,561
LUBRICATING OIL SUPPLY DEVICE FOR TRANSMISSION MECHANISM
Yuichi Hayakawa, Toyoake; Tamotu Kobetake, Anjo; Kagenori Fukumura, Toyota, and Seiichi Nishikawa, Toyokawa, all of Japan, assignors to Aisin-Warner Limited and Toyota Jidosha Kabushiki, both of, Japan
Filed Jan. 21, 1986, Ser. No. 820,666
Claims priority, application Japan, Jan. 19, 1985, 60-7785
Int. Cl.⁴ F16H *57/02*
U.S. Cl. 74—606 R **4 Claims**

1. A power transmission for an engine, comprising:
a transmission mechanism, having: an input shaft, an output shaft disposed parallel to said input shaft, a first rotary body disposed on said input shaft, a second rotary body disposed on said output shaft, and a transmission member for interlocking said first rotary body with said second rotary body;
a transmission mechanism case forming a transmission mechanism chamber for housing said transmission mechanism,

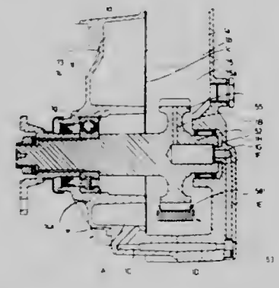
the transmission member being lubricated by a lubricating oil in said chamber; and,

a lubricating oil supply mechanism, comprising:

a partition wall assembly disposed in said transmission mechanism chamber and defining an oil chamber to contain lubricating oil, said partition wall assembly having an opening to receive lubricating oil scattered therethrough by operation of said transmission mechanism; and,

lubricating oil supply passages for lubricating said transmission member, including a first oil passage connected between said oil chamber and said output shaft, a second oil passage in said output shaft communicating with said first oil passage and a radial oil passage in said second rotary body communicating with said second oil passage,

whereby lubricating oil scattered by operation of said transmission mechanism is collected in said oil chamber through said opening and lubricating oil in said oil chamber is supplied to said transmission member through said lubricating oil supply passages.



4,896,562

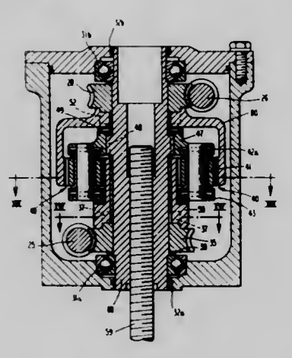
VALVE ACTUATOR DIFFERENTIAL WORM PLANETARY GEAR DRIVE

Ivan E. Wilkinson, Lynchburg; Charles L. Hylton, Madison Heights, and R. Gregory Pence, Forest, all of Va., assignors to Limitorque Corporation, Lynchburg, Va.

Filed Mar. 24, 1988, Ser. No. 173,195

Int. Cl.[4] F16H *37/06, 31/05*

U.S. Cl. 74—626 **1 Claim**



1. A valve actuator for controlling reciprocating motion of an elongated stem connected to the valve, comprising:

an elongated stem having helically-wound screw threads thereabout;

a tubular-shaped drive sleeve having an internal bore therethrough with helically-wound threads engaging the threads of said stem;

first and second, bi-directional, drive force input means to transmit an input force adjacent a said drive sleeve;

first and second worms operatively connected to said first and second input means to receive rotational forces therefrom and transmit rotational forces;

first and second axially spaced cylindrical gears, each have a bore therethrough, concentrically and rotationally mounted on said sleeve adjacent each said first and second worms and connected to receive a force transmitted from said first and second worms, respectively;

a tubular-shaped sun gear of a first pre-determined diameter concentrically rotating with said first cylindrical gear about said drive sleeve;

a tubular-shaped ring gear of a second, larger, predetermined diameter, adjacent said sun gear and concentrically rotating with said second cylindrical gear about said drive sleeve; and

a plurality of right cylindrically-shaped planet gears operationally connected between said sun gear and said ring gear, each said planet gear fixedly held by a carrier arm connected to said drive sleeve whereby a rotational force transmitted by said first input device is transmitted to said ring gear and through said planet gears and then to said drive sleeve which moves said stem, and a rotational force transmitted by said second input device is transmitted to said sun gear and through said planet gears and then to said drive sleeve which moves said stem.

4,896,563

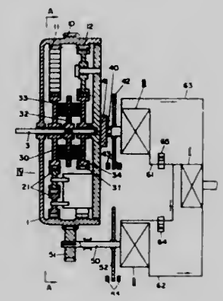
HYDRAULIC MECHANICAL POWER DRIVE FOR HEAVY VEHICLES

Gedalyahu Manor, and Dan Wolf, both of Haifa, Israel, assignors to Technion Research & Development Foundation Limited, Haifa, Israel

Filed Nov. 28, 1988, Ser. No. 277,635

Int. Cl.[4] F16H *47/04, 48/08*

U.S. Cl. 74—677 **3 Claims**



1. A hydraulic-mechanical power transmission for heavy vehicles comprising:

a hydraulic, variable-displacement pump (I) driven by an internal combustion engine,

a first (II) and a second (III) hydraulic, variable-displacement motor both supplied fluid under pressure by said hydraulic pump (I) and controlled by valve means (64), (65),

a planetary gear unit consisting of a cylindrical casing (1) containing an internal ring gear (11) and an external ring gear (10), a sun gear (31) mounted on an output shaft (3), planetary gear wheels (20) mounted on a planet-carrier (2) in mesh with said internal ring gear and with said sun gear, and a clutch (33) serving, in engaged state, to prevent relative motion of said casing and said planet carrier to effect said unit to rotate as a rigid unit,

the power transmission being characterized by said first motor (II) serving to rotate said casing (1), by means of a pinion (51) in mesh with said external ring gear (10), by said second (III) motor serving to rotate said planet-carrier, whereby three different speeds are available: a low speed, by said planetary gear unit being rotated as a rigid unit by said two motors simultaneously; a medium speed by said first motor rotating said casing with said clutch released and said second motor being at standstill; and a high speed, by said second motor rotating said planet carrier and said first motor being at standstill.

4,896,564

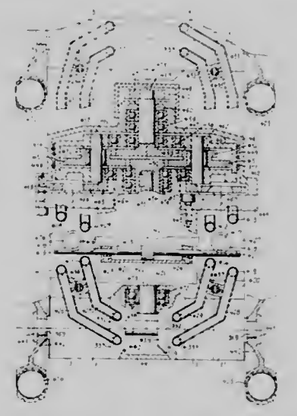
AXIAL PISTON MOTOR OR PUMP WITH AN ARRANGEMENT TO THRUST THE ROTOR AGAINST A SHOULDER OF THE SHAFT

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 678,540, Dec. 5, 1984, Pat. No. 4,664,018, and a continuation-in-part of Ser. No. 387,567, Jun. 11, 1982, abandoned, and a continuation-in-part of Ser. No. 521,874, Aug. 10, 1983, abandoned, said Ser. No. 387,567, Continuation of Ser. No. 954,555, and a continuation of Ser. No. 122,914, and a continuation of Ser. No. 282,990, said Ser. No. 521,874, Continuation of Ser. No. 64,248. This application Jan. 16, 1987, Ser. No. 4,018

Int. Cl.[4] F16H *37/06, 47/04;* **F01B** *1/00;* **B60K** *17/356*

U.S. Cl. 74—682 **6 Claims**



1. An axial piston device, comprising, in combination, a rotor revolvably borne in a housing with cylinders provided axially in said rotor to contain in the cylinders reciprocable pistons, inlet ports and outlet ports for flow of fluid into and out of said cylinders, a piston stroke guide means to guide said pistons in reciprocating piston strokes in said cylinders and an improvement.

wherein said improvement comprises, in combination,

an axial thrust bearing provided on a shaft in said housing, said rotor radially borne on said shaft,

a shoulder provided on said shaft and a front seat provided on

said rotor to axially bear on said shoulder of said shaft,

a rear end face provided on said rotor and a thrust member provided in a housing portion and subjected to high pressure fluid in a thrust chamber on the rear of said thrust member while said thrust member has a front face,

whereby said high pressure fluid in said thrust chamber presses said thrust member towards

said rotor to engage with said front face against said rear end face

and said front seat against said shoulder while said shaft is pressed by the load on said shoulder onto said axial thrust bearing,

wherein said shaft extends axially through said device,

wherein a bore is concentrically provided in said shaft to extend through

said shaft, and, wherein an independent shaft is extended through said bore in said

shaft with the ability to move independently of said shaft with said bore.

4,896,565

PROCESS FOR THE GEAR CHANGE OF THE AUTOMATIC TRANSMISSION OF MOTOR VEHICLES CONTROLLED WITH AN ELECTROHYDRAULIC VALVE SYSTEM

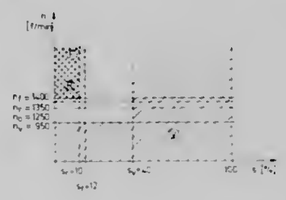
Sándor Simonyi, Petöfi u. 59, H-31-2 Salgotarján; László Töröcsik, Kakukk u. 10/b, H-1126 Budapest; István Tóth, Kistarján u. 8., H-3100 Salgotarján, and György Válóczi, Budapesti u. 40, H-3104 Salgotarján, all of Hungary

Filed Apr. 28, 1988, Ser. No. 187,497

Claims priority, application Hungary, May 15, 1987, 2176/87

Int. Cl.[4] B60K *41/22;* **F16H** *45/02;* **F16D** *47/02*

U.S. Cl. 74—731 **8 Claims**



1. The process of controlling an automatic transmission for a motor vehicle, wherein the transmission includes a hydrodynamic torque converter and a shiftable mechanism providing a plurality of input-output gear ratios, and a clutch for by-passing said torque converter, which comprises

(a) sensing the output speed of the transmission and generating an output speed signal corresponding thereto,

(b) sensing the drive input speed of the transmission and generating an input speed signal corresponding thereto,

(c) comparing said input speed signal and said output speed signal, in relation to the gear ratio of said transmission, and generating therefrom a slip signal representing the slippage within said transmission under momentary load,

(d) comparing said slip signal with predetermined upper and lower slip limit values,

(e) comparing at least one of the output speed signal and the input speed signal with predetermined upper and lower speed limit values,

(f) executing a downshift from a higher gear ratio when said slip exceeds the predetermined upper slip limit value and/or when the compared speed signal is below the lower speed limit value,

(g) executing an upshift from a lower gear ratio when said upper speed limit value is exceeded by the compared speed signal simultaneously with said slip being below said lower slip limit value,

(h) at least one of said input speed or output speed signals being selected to be compared to predetermined upper and lower clutch control speed signals, and said slip signal being compared to a clutch control slip signal, said upper

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clutch control speed signal representing a speed below the upper speed limit value,

(i) engaging said clutch to by-pass said torque converter when the speed indicated by the selected speed signal exceeds the speed represented by said upper clutch control speed signal and said slip signal indicates less slip than represented by said clutch control slip signal, and

(j) disengaging said clutch in response to said selected speed signal indicating less speed than the speed represented by said lower clutch control speed signal.

4. The process of controlling an automatic transmission for a motor vehicle, wherein the transmission includes a hydrodynamic torque converter and a shiftable mechanism providing a plurality of input-output gear ratios, which comprises

(a) sensing the output speed of the transmission and generating an output speed signal corresponding thereto,

(b) sensing the drive input speed of the transmission and generating an input speed signal corresponding thereto,

(c) comparing said input speed signal and said output speed signal, in relation to the momentary gear ratio of said transmission, and generating therefrom a slip signal representing the slippage within said transmission under momentary load,

(d) comparing said slip signal with predetermined upper and lower slip limit values,

(e) executing a downshift from a higher gear ratio when said slip exceeds the predetermined upper slip limit value,

(f) comparing at least one of the output speed signal and input speed signal with predetermined upper and lower speed limit values,

(g) executing an upshift from a lower gear ratio when said upper speed limit value is exceeded simultaneously with said slip being below said lower slip limit value,

(h) executing a downshift from a higher gear ratio when the compared speed signal is below the lower speed limit value,

(i) upon execution of a downshift, analyzing the conditions of operation relating to slip at the moment of downshift and deriving a comparative slip signal which is a function of said conditions of operation,

(j) comparing said comparative slip signal to the slip signal generated by operation of the vehicle, and

(k) causing a following upshift to be executed subject to a correspondence of said slip signal with said derived comparative slip signal.

4,896,566

MOTION TRANSFORMING DEVICE, AND IN PARTICULAR A SPEED REDUCTION GEAR

Christian Salesse, 30, rue Jules Auffret, F 93330 Neuilly sur Marne, France

Filed Nov. 16, 1987, Ser. No. 121,231

Claims priority, application France, Nov. 24, 1986, 86 16328; Jan. 23, 1987, 87 00792; Mar. 16, 1987, 87 03574; Apr. 10, 1987, 87 05155

Int. Cl.⁴ F16H *13/06, 15/00*

U.S. Cl. 74—798 **11 Claims**

1. A device for transforming motion and, in particular, a speed-reducing device comprising:

a housing;

a high speed input means to a first stage, said input means being supported by said housing;

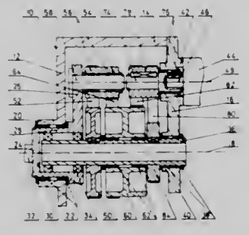
said first stage comprising two members;

at least one of said two first stage members being operationally coupled to said input means for generating a first rotary motion;

the other of said two first stage members either having a relative motion in opposite direction with respect to said one first stage member or the speed of said other first stage member being zero with respect to said housing;

a second stage comprising a double pulley means rotating together and operationally coupled to each of said two first-stage members with strands that travel at two different linear speeds relative to said housing;

a movable support supported by said housing and mounting said double pulley means so that said double pulley means is free to rotate relative to said movable support and to move in an imposed trajectory, the movement of said



double pulley means along said imposed trajectory generating a low speed output through said movable support;

said strands running such between said first stage and said second stage that they generate rotary couples on said movable support which are in the same direction to cause movement of said movable support.

4,896,567

PLANETARY TRANSMISSION MECHANISM AND DEVICE OF INVOLUTE GEARS WITH COMPLEX MINOR TOOTH DIFFERENCE

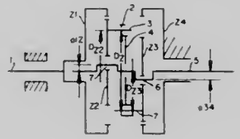
Ganxo Zhou, Hunan, China, assignor to Hunan Research Inst. of Machinery, Hunan, China

Filed Oct. 9, 1987, Ser. No. 107,359

Claims priority, application China, Jul. 18, 1987, 87102061

Int. Cl.⁴ F16H *1/28*

U.S. Cl. 74—804 **11 Claims**



1. A planetary transmission mechanism of involute gears with compound small tooth-difference, comprising an eccentric shaft with first and second eccentric axles, first and second internal gear drives, an output shaft coaxial with said eccentric shaft, and a rotational delivery mechanism, wherein each of said internal gear drives comprises an internal gear and a planetary gear, said planetary gears of said first and second internal gear drives being rotatably sleeved on said first and second eccentric axles respectively and coupled to each other by said rotational delivery mechanism, and the internal gear of said first internal gear drive being stationary, while the internal gear of said second internal gear drive is fixed to said output shaft, wherein said rotational delivery mechanism is a planetary rotational delivery mechanism, a crank rotational delivery mechanism, a drive disk rotational delivery mechanism, or a pin and pin hole rotational delivery mechanism.

4,896,568

ELECTRIC-HYDRAULIC CONTROL

Georg Gierer, Kressbronn, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

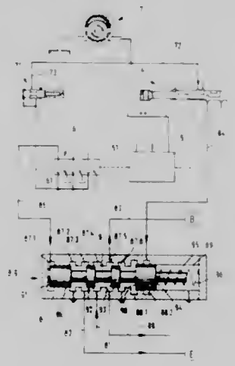
PCT No. PCT/EP87/00219, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO87/06669, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 23, 1987, Ser. No. 272,835

Claims priority, application Luxembourg, May 2, 1986, PCT/EP86/00262

Int. Cl.⁴ B60K *41/16*

U.S. Cl. 74—861 **3 Claims**



1. An electro-hydraulic control for an automatic transmission comprising:

a hydrodynamic unit having a turbine;

a driving unit having a driving shaft and delivering a driving output;

a first and second primary shaft, said shafts being respectively connected to said turbine and to said driving shaft;

a stepped-down planetary coupling gear receiving said driving output, said received output dependent upon a means selected from the group consisting of separate gear speeds and power-split gear speeds;

a selecting slide for choosing a neutral gear position, a drive gear position and a reverse gear position;

an electronic device communicating with said selecting slide with a plurality of solenoid valves kept in a zero position by a spring means communicating with said electronic device;

a hydraulic pressure means including a pressure source, pressure-and switch valves, and dampers for actuating speed shift couplings and brakes;

an emergency valve designed as a stop valve capable of operating in mutual relationship said solenoid valves and shift couplings controlling a highest speed gear and reverse gear; and

whereupon a current failure while the transmission is in drive gear causes activation of said shift coupling for said highest speed gear by hydraulic pressure to allow purely mechanical transmission through said second shaft to continue drive operation, and a change in position of said selecting slide into said neutral gear position and again back into said drive gear position causes a repositioning of said emergency valve so that through a drive coupling it becomes possible to drive over said hydrodynamic unit, over the first primary shaft and also to start.

4,896,569

ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION AND METHOD OF CONTROLLING THE SAME

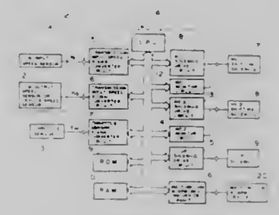
Yasunobu Ito, Okazaki, and Yasuo Mizuno, Chiryu, both of Japan, assignors to Aisin AW Kabushiki Kaisha, Japan

Filed Jun. 16, 1988, Ser. No. 207,701

Claims priority, application Japan, Jun. 26, 1987, 62-157559

Int. Cl.⁴ B60K *41/18*

U.S. Cl. 74—866 **11 Claims**



1. A method of electronically controlling an automatic transmission in which the transmission gear stage and engaging or disengaging operations of a lock-up clutch in a torque converter are determined on the basis of the number of transmission output revolutions and the throttle opening and in which a shifting solenoid and a lock-up solenoid incorporated in said transmission are controlled, said method comprising the steps of:

(a) comparing the number of transmission input revolutions and the number of transmission output revolutions with each other;

(b) determining whether or not the number of transmission output revolutions is abnormal on the basis of the result of said comparison; and

(c) detecting existence of an internal mechanical failure of said transmission by comparing the number of revolutions output from a transmission output sensor with the number of transmission output revolutions calculated from the number of transmission input revolutions and the gear ratio, if no abnormality is determined to exist.

4,896,570
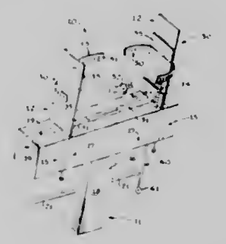
OIL FILTER WRENCH APPARATUS

Vernon S. Bourgeois, 248 Bluebird Dr., Slidell, La. 70458

Filed Feb. 27, 1989, Ser. No. 315,640

Int. Cl.⁴ B25B *13/48, 13/10*

U.S. Cl. 81—64 **7 Claims**



1. An oil filter wrench apparatus for use in combination with an oil filter wherein the apparatus comprises:

a torque unit including a stem and a pair of arms;

an inner clamp unit operatively associated with the arms of

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the torque unit and comprising a pair of clamp members having an inboard face and an outboard face wherein each of the inboard faces of the clamp members are provided with at least one friction pad element; and,

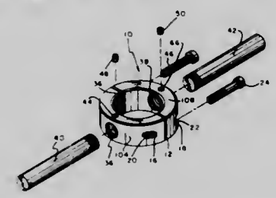
means for contacting the outboard faces of said pair of clamp members to bring the inboard faces of the clamp members into engagement with the sides of an oil filter.

4,896,571

PLUMBING TOOL

Harold Perry, 6406 E. 11th, Wichita, Kans. 67206

Filed Jul. 7, 1988, Ser. No. 217,753
Int. Cl.[4] B25B *13/04*
U.S. Cl. 81—120 1 Claim



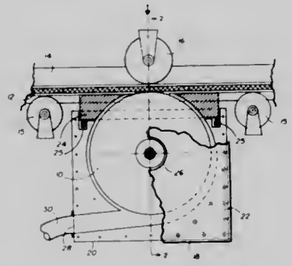
1. A plumbing tool comprising a ring means divided into a first semi-circular section and into a second semi-circular section, said first semi-circular section having a pair of first ends and a pair of first threaded apertures with one first threaded aperture extending through one of the first ends and the other first threaded aperture extending through the other first end, each of said first threaded apertures terminate in a first recess disposed within the first semi-circular section and communicating with the respective first threaded aperture; said second semi-circular section having a pair of second ends and a pair of second threaded apertures with one second threaded aperture extending through one of the second ends and the other second threaded aperture extending through the other second end; each of said second threaded apertures terminate in a second recess disposed within the second semi-circular section and communicating with the respective second threaded aperture; a first threaded bolt means threadably engaging one of the first threaded apertures and one of the second threaded apertures and extending through one of said first recesses and one of said second recesses; a second threaded bolt means threadably engaging the other first threaded aperture with the other second threaded aperture and extending through the other of said first recesses and the other of said second recesses; said first semi-circular section having a structure defining a first central threaded aperture and a first top threaded aperture communicating with said first central threaded aperture and said second semi-circular section having a structure defining a second central threaded aperture and a second top threaded aperture communicating with said second central threaded aperture; and a pair of threaded handles, with one threaded handle threadably secured within said first central threaded aperture and with the other threaded handle threadably secured within said second central threaded aperture; a pair of handle-engaging threaded bolt means threadably engaged within said first and second top threaded apertures respectively for lodging against the pair of threaded handles; said first semi-circular section has a structure defining a first plurality of teeth on an interior surface of said first semi-circular section, and said second semi-circular section has a structure defining a second plurality of teeth on an interior surface of said second semi-circular section has been added after teeth.

4,896,572

SAW CHIP COLLECTOR

Laurence C. Smyth, Beaconsfield, and Edouardo Del Rincon, Pierrefonds, both of Canada, assignors to Norandex Inc., Cleveland, Ohio

Filed Nov. 15, 1988, Ser. No. 271,272
Int. Cl.[4] B26D *7/08*
U.S. Cl. 83—100 7 Claims



1. A saw chip collector for use in cutting slots in a work, comprising:

(a) an enclosure surrounding a saw blade except for an opening at a position in which the blade cuts the work, said enclosure having a cavity for housing the saw blade which has a width about twice the width of the blade;

(b) a floating block mounted on the enclosure at the blade cutting position and spring biased against the work for sealing the top of the enclosure against the bottom of the work;

(c) an opening in the enclosure at the hub of the saw blade for drawing air into the enclosure;

(d) an output port in the enclosure for flushing out the sawn chips; and

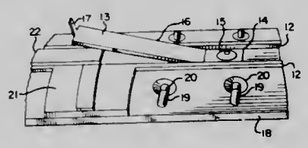
(e) a radial clearance provided in the cavity of the enclosure which is shaped as an increasing spiral channel to direct the sawn chips circumferentially out of the enclosure through said output under centrifugal action of the blade.

4,896,573

APPARATUS FOR REMOVING SCRAP FROM A DIE CYLINDER

Paul G. Kapolnek, Chicago, Ill., assignor to Western Printing Machinery Company, Schiller Park, Ill.

Filed Jan. 27, 1988, Ser. No. 212,338
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—117 12 Claims



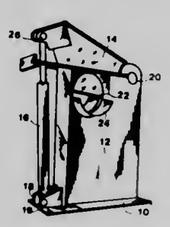
1. Apparatus for stripping scrap from a web, comprising: a pair of rolls rotatable in opposite directions about parallel axes in contact with opposite sides of the web; one roll carrying one or more flexible pointed fingers for impaling scrap; and the other roll having a resilient material directly opposed the flexible pointed fingers for impaling scrap onto the flexible pointed fingers.

4,896,574

SELF SHARPENING WOOD LOG SLICER

Harold L. Hull, 401 Canyon Way, Sp. 43; Carroll T. Tostenson, and Drusilla M. Tostenson, both of 973 Holman Way, all of Sparks, Nev. 89431

Filed Sep. 26, 1988, Ser. No. 248,726
Int. Cl.[4] B23D *35/00*
U.S. Cl. 83—675 7 Claims



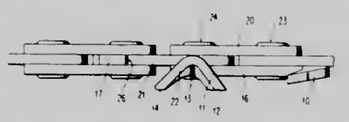
1. A log slicer comprising; a substantially rectangular base plate structure, a slicing blade, said slicing blade having at least one sharpened edge, said slicing blade containing a mountable bearing, said bearing defining a pivot point of said blade, said bearing and said pivot point being located on a vertical line drawn substantially from one end of said sharpened edge, said vertical line defining multiple points at which said bearing and said pivot point may be mounted, said multiple points determining the amount of slicing action of said slicing blade, means connecting said base plate and said slicing blade at said bearing, means to reciprocate said slicing blade in a general direction toward and away from said base plate and means to hold object to be sliced in relation to said slicing blade to allow said sharpened edge to penetrate and sever said object to be sliced.

4,896,575

SAWCHAIN

Erik Sandström, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed May 25, 1989, Ser. No. 357,900
Int. Cl.[4] B27B *33/14*
U.S. Cl. 83—833 5 Claims



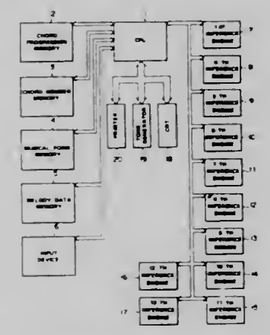
1. Sawchain comprising drivelinks, sidelinks and cutter links, with cutter links on both the left and right side of the sawchain, and where each cutter link consists of a flat lower part, from which one depth gauge and one cutter rise, both of which are designed for automatic resharpening by an abrasive tool mounted on the motor unit powering the sawchain, characterized by the front border of the cutter with the side edge and the rear border of the cutter being located on the same side farther away from the central plane of the sawchain than the outer surface of the lower flat part of the cutter link, and by having a fold intermediate between the front border of the cutter with the side edge and the rear border, where the middle part of the cutter adjacent to said fold lies closer to the central plane of the sawchain than said surface of the lower flat part of the cutter link.

4,896,576

ACCOMPANIMENT LINE PRINCIPAL TONE DETERMINATION SYSTEM

Mayumi Iso, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,120
Claims priority, application Japan, Jul. 30, 1987, 62-188913; Jul. 30, 1987, 62-188914; Jul. 30, 1987, 62-188915; Jul. 30, 1987, 62-188916; Jul. 30, 1987, 62-188917; Jul. 30, 1987, 62-188918
Int. Cl.[4] G10H *1/22, 1/38*
U.S. Cl. 84—634 27 Claims



16. A system for determining a principal tone on a non-real-time basis for each of a plurality of segments of an accompaniment line, comprising:

hierarchic structure means for defining a hierarchic structure of segments of music; and

principal tone inference means for generating an output signal based on inferring a principal tone for a segment of interest in accordance with said hierarchic structure defined by said hierarchic structure means, whereby a principal tone is determined for each of said plurality of segments of the accompaniment line.

4,896,577

ACTION FOR UPRIGHT PIANO

Chris A. Trivelas, P.O. Box 725, North Bend, Wash. 98045, and Darrell G. Fandrich, 16611 NE. 20th, Bellevue, Wash. 98008

Filed Oct. 2, 1987, Ser. No. 104,277
Int. Cl.[4] G10C *3/18*
U.S. Cl. 84—240 4 Claims



1. An action for an upright piano, said piano having a basic structure, said action comprising a plurality of key-hammer mechanisms and having an at rest position, said key-hammer mechanisms individually comprising:

a key having a playing end, a working end, a first fulcrum attached to said basic structure and supporting said key between said playing end and said working end, at least one weight installed between said playing end and said

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first fulcrum, and a second fulcrum attached to said key between said working end and said first fulcrum,

a wippen having a wippen center, a jack center, a jack having a toe and an engaging end, said jack being pivoted at said jack center, a backcheck wire, a backcheck block attached to said wippen by said backcheck wire, said wippen being pivoted to said basic structure at said wippen center and supported by said second fulcrum,

a hammer assembly having a hammer butt, a backstop assembly, a hammer shank and a hammer head, said hammer butt being pivoted to said basic structure at a hammer center,

said piano having at least one string attached to said basic structure and positioned to be struck by said hammer head,

a regulating button attached to said basic structure,

a hammer return spring, supported between said basic structure and said hammer assembly, producing a first force and engaging said hammer assembly at a lever arm distance from said hammer center such that said first force produces a first torque on said hammer assembly in a direction to urge said hammer head away from said at least one string,

said first torque being in the range of 25% to 150% of the torque which the force of gravity would produce on said hammer assembly about said hammer center with said hammer shank essentially horizontal,

said at least one weight producing a second force due to the force of gravity on said weight, said second force being applied to said hammer assembly by said engaging end of said jack, via said wippen and said first fulcrum, at a lever arm distance from said hammer center such that said second force produces a second torque on said hammer assembly opposing said first torque,

a repetition spring having first and second ends and producing a third force, said ends being supported between a first point on said hammer assembly and a second point on said jack, said first and second points having an arrangement, said arrangement determining the line of action of said third force, said line of action oriented to urge engagement of said engaging end of said jack with said hammer butt, said line of action also oriented to provide a lever arm distance for said third force about said hammer center such that said third force produces a third torque on said hammer assembly, said third torque also opposing said first torque,

said hammer butt having a shape such that engagement of said engaging end of said jack with said hammer butt has a camming action which produces a fourth force on said hammer butt at a lever arm distance from said hammer center such that said fourth force produces a fourth torque on said hammer assembly, said fourth torque also opposing said first torque,

said second force being such that, with said engaging end of said jack being engaged with said hammer butt, the sum of said second, third and fourth torques is less than said first torque such that said first torque, via said hammer butt, said wippen and said first fulcrum, produces a net return force urging return of said playing end of said key toward said at-rest position,

said arrangement and said shape being such that, with said engaging end of said jack being disengaged from said hammer butt, said sum of said second, third and fourth torques is greater than said first torque such that re-engagement of said engaging end of said jack with said hammer butt occurs before said hammer head reaches said at-rest position and such that said hammer assembly rests on said jack in said at-rest position,

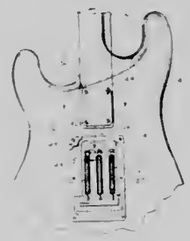
whereby, when said playing end of said key is released after play, said backcheck block begins to move away from said backstop assembly allowing return movement of said head toward said at-rest position, whereupon, said first, second, third and fourth torques act upon said hammer assembly such that re-engagement of said jack with said hammer butt occurs before said hammer head reaches said at-rest position, said re-engagement enabling replay, if said playing end of said key is again depressed, said re-engagement also reducing said third and fourth torques to enable said second torque to urge contact between said engaging end of said jack and said hammer butt and to enable said first torque to put said action in said at-rest position due to said net return force, and said re-engagement also assuring that said hammer assembly rests on said jack.

4,896,578

NECK AND BODY ASSEMBLY FOR A STRINGED INSTRUMENT

P. J. Marx, 4931 S. Jonathan La., New Berlin, Wis. 53151

Continuation of Ser. No. 132,402. This application Jun. 6, 1989, Ser. No. 363,435
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—313 **5 Claims**



1. An assembly for joining the neck and body of a stringed instrument comprising:

an elongated neck having a front surface along which the strings are disposed and a rear surface configured so as to accommodate the hand ofthe user, the base end of said neck having a first thickness measured from said front surface to said rear surface and having a connecting flange extending therefrom with said connecting flange having a second thickness smaller than said first thickness,

a body having a front surface along which the strings are disposed and a rear surface facing the user, said body having an upper connecting portion adapted to mate with said connecting flange in such a manner that said connecting portion overlaps and abuts said connecting flange and defines a combined thickness of said upper connecting portion and connecting flange which is substantially the same as said first thickness of said base end, said body further including a rearwardly opening cavity in which is disposed a tremolo block assembly and further comprising fastener means for connecting said block assembly to said connecting flange, said fastener means consisting of screw means connecting said block assembly to said connecting flange, and

fastening means extending through said connecting flange and into said connecting portion to secure said upper body connecting portion to said connecting flange.

4,896,579

FLUTE HEADJOINT

Jack P. Goosman, P.O. Box 13, Pickering, Ontario, L1V 2R2, Canada

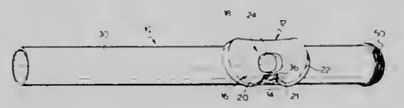
Filed Jun. 12, 1989, Ser. No. 366,004
Int. Cl.[4] G10D *7/02*
U.S. Cl. 84—384 **28 Claims**

1. A flute headjoint, comprising:

(a) a tubular body and a lip aperture in the side wall thereof;

(b) lip positioning means located in front of the lip aperture for positioning a flute player's lips;

(c) air splitting means for splitting the stream of air from a flute player's lips into a first air stream which travels through the lip aperture into the tubular body and a second air stream which travels past the lip aperture; and



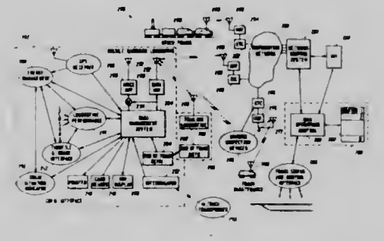
(d) air channelling means located behind the lip aperture shaped for channelling the second air stream downwardly into a channel located behind the lip aperture.

4,896,580

RAILROAD MISSILE GARRISON SYSTEM

Ron Rudnicki, Lisbon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1988, Ser. No. 287,938
Int. Cl.[4] F41H *13/00*
U.S. Cl. 89—1.815 **1 Claim**



1. An improved railroad missile garrison system, that launches ICBMs from rail cars operated over an expansive geographic region, on a rail network that also carries nonmilitary trains; the missile garrison system comprising:

at least one railroad missile launch car for transporting and launching said ICBM's, from remote locations;

at least one locomotive having a geographic position, coupled with said at least one railroad missile launch car for providing motive force necessary for travel about the rail network;

means on-board said locomotive, for generating locomotive position signals in response to the geographic position of said locomotive;

a communication system, on-board said locomotive, for communicating said locomotive position signal to various users about the rail network;

said communication system further receiving track information signals, from sources off-board the locomotive, relating to a status of tracks in the rail network; and

means for automatically causing said locomotive to stop, in response to a predetermined track information signal;

means for automatically causing the locomotive to change throttle position, in response to a second predetermined track information signal,

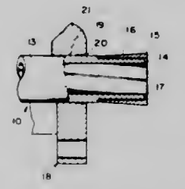
WHEREBY, the missile launch car, with ICBM thereon, can be automatically stopped and accelerated at remote locations about the rail network so that collisions can be avoided, derailments reduced and threats from sabotage, vandalism and terrorism minimized.

4,896,581

ACCURIZER

Richard Cole, P.O. Box 197, S. Harpswell, Me. 04079

Filed Dec. 30, 1988, Ser. No. 292,452
Int. Cl.[4] F41F *17/12;* **F41D** *10/08*
U.S. Cl. 89—196 **3 Claims**



1. A handgun comprising a barrel, a slide, sight means constructed and arranged on said slide to help align said barrel with a target and including an accurizer for said handgun to lessen a tendency for said barrel to become misaligned with said target when said handgun fires a projectile from said barrel, said accurizer comprising, in combination,

(a) a muzzle end portion of said barrel having a short length of lesser outside diameter than a given diameter of a portion of said barrel extending rearward of said muzzle end portion, said muzzle end portion having an outside surface that is threaded,

(b) a tapered bushing having an internal bore threaded to mate with said threaded outside surface of said muzzle end portion, a rear end portion having an outside diameter equal to that of said rearward extending portion of said barrel and tapering in an axially forward direction to a larger outside diameter than that of said rearward extending portion of said barrel, and

(c) a slide having an inside surface with a diameter at least equal to said given diameter so that said slide can make a sliding fit with said rearward extending portion of said barrel arranged in circumferential relation to said barrel, said inner surface of said slide having a forward end portion constructed and arranged to provide a taper essentially identical to the taper of the outside surface of said tapered bushing; whereby said forward tapered end portion of said inside surface of said slide tightly engages said tapered outside surface of said tapered bushing when said handgun is fired.

4,896,582

METHOD FOR REDUCING THE PISTON SPEED, ESPECIALLY IN THE PISTON AND CYLINDER ASSEMBLIES OF AN EXCAVATING MACHINE, AND DEVICE FOR CARRYING OUT THE METHOD

Lars Ö. Tordenmalm, Södra Sandby, and Ingvar Bruhn, Höör, both of Sweden, assignors to Akermans Verkstad AB, Eslöv, Sweden

PCT No. PCT/SE86/00003, § 371 Date Sep. 8, 1988, § 102(e) Date Sep. 8, 1988, PCT Pub. No. WO87/04220, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 8, 1986, Ser. No. 216,542
Claims priority, application Sweden, Jan. 7, 1985, 8500048
Int. Cl.[4] F15B *13/16*
U.S. Cl. 91—361 **11 Claims**

6. Device for reducing speed of a piston in a piston and cylinder assembly as the piston approaches end positions of the cylinder, the device comprising:

a signal transducer adapted to sense when the piston passes a predetermined position adjacent ends of the cylinder;

control means for generating a positive or negative control signal for respectively extending and retracting the piston and cylinder assembly;

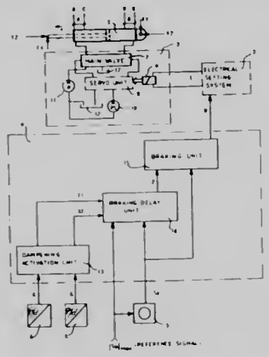
a pressure medium system;

a setting system operatively connected to the pressure me-

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dium system for controlling the pressure medium system and supply of pressure medium to the piston and cylinder assembly;

a delay unit for receiving a position signal generated when the piston passes the predetermined position and receiving a reference signal and a control lever signal, said delay unit being activated by the position signal to compare the



control lever signal with the reference signal and to generate a comparison signal after a delay time period; and

a braking unit for receiving and processing the comparison signal and the control lever signal to generate an output signal, said output signal together with a direction signal indicating a direction of piston travel being applied to the setting system to control the supply of pressure medium to the piston and cylinder assembly.

4,896,583

SADDLE BEARING SUPPORT FOR AXIAL PISTON PUMPS AND MOTORS

Gregory D. Lemke, Union Grove, Wis., assignor to Racine Fluid Power Inc., Broadview, Ill.

Filed Feb. 19, 1988, Ser. No. 159,864

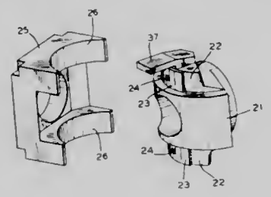
Int. Cl.[4] F04B *1/30*

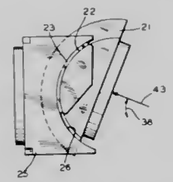
U.S. Cl. 91—505 **8 Claims**

1. A thrust bearing support for an axial piston pump having a support saddle comprising:

a swash block having at least one arcuate bearing seat;

an arcuate bearing shell attached to said bearing seat of said swash block and having an arcuate length of a bearing surface less than a length of an associated bearing surface of a support saddle; and





means for retaining said bearing shell on said bearing seat of said swash block.

4,896,584

PISTON-CYLINDER ASSEMBLY

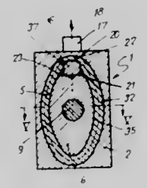
Kurt Stoll, Lenzhalde 72, and Gerhard Hihn, Schurwaldstr. 7, both of 7300 Esslingen, Fed. Rep. of Germany

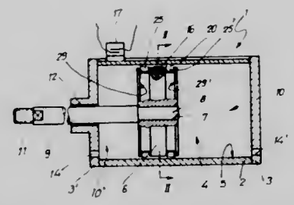
Filed Oct. 21, 1987, Ser. No. 111,997

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635893

Int. Cl.[4] F01B *25/26, 31/12*

U.S. Cl. 92—5 R **12 Claims**





1. A piston-cylinder assembly, comprising: 'an elongated cylinder housing made of nonmagnetic material and including means defining an inner cylinder chamber extending in an axial direction thereof, said inner cylinder chamber having noncircular cross section while an external surface thereof is of a nonconforming shape in cross section so as to define at least

one region on said cylinder housing wherein a wall thickness dimension is thinner than at other locations, said region being located on a radial axis of said cylinder housing;

a piston made of nonmagnetic material and conformed in shape to and non-rotatably received in said inner cylinder chamber, said piston being movable in axial direction in said inner cylinder chamber and guided by a noncircular guide surface formed by a side wall of said inner cylinder chamber;

means defining a recess in an outer peripheral surface of said piston, said recess being located generally on an axis radially aligned with said radial axis of said cylinder housing;

at least one magnet received in said recess;

said inner cylindrical chamber and said piston being both oval in cross-sectional shape, said recess in said piston being located on a major axis of said oval, and said region whereat said wall thickness is thinnest being located on said major axis of said oval;

at least one switch mounted on an exterior surface on said cylinder housing and arranged within range of the magnetic field of said magnet when said cylinder housing and said switch are generally radially aligned, said switch being operable when present in a magnetic field, whereby said switch is operated by said magnetic field of said magnet when said piston and said switch are generally radially aligned, said noncircular and conforming cross-sectional shapes of said inner cylinder chamber and said piston thereby defining a means for preventing said piston and said cylinder housing moving angularly with respect to each other to maintain a fixed radial alignment relation of said magnet and said switch.

4,896,585

ADJUSTABLE AXIAL PISTON MACHINE

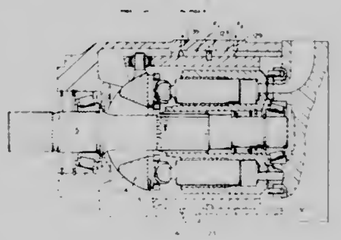
Franz Forster, Muhlbach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,388

Claims priority, application Fed. Rep. of Germany, May 5, 1987, 3714888

Int. Cl.[4] F01B *3/00/13/04*

U.S. Cl. 92—12.2 **4 Claims**



1. An adjustable axial piston machine having a housing, a rotating cylinder drum and an operating cylinder-servo piston unit capable of being acted upon by control pressure of low pressure, said cylinder-servo piston unit having a non-rotatable movable part being connected with a control of the axial piston machine having an annular configuration and being located around the cylinder drum.

4,896,586

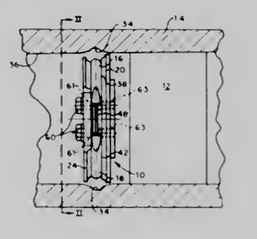
PISTON STOP ASSEMBLY

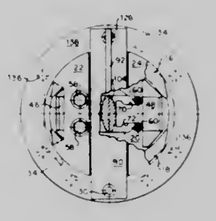
Robert J. Purcell, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 21, 1988, Ser. No. 222,674

Int. Cl.[4] F15B *15/26*

U.S. Cl. 92—21 MR **13 Claims**





11. A stop assembly for retaining a floating piston within a cylinder, said cylinder having a channel in the internal wall, comprising:

a plurality of ring segments, each segment being positioned within said channel;

a plurality of retainer plates in contact with said ring segments;

a plurality of actuating means, each having a surface in contact with one of said ring segments, at least one of said actuating means being positioned between said first and second retainer plates; and

first means for securing said retainer plates together and for clamping said ring segments between said retainer plates.

4,896,587

CYLINDER-PISTON DEVICE

Rolf Mintgen, Thür, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,567

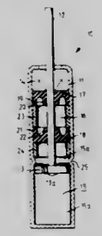
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724370

Int. Cl.[4] F16J *15/18*

U.S. Cl. 92—165 R **13 Claims**

1. A cylinder-piston device comprising a cylindrical container (11) having an axis and two ends and defining a cavity (15, 16) therein, piston rod guiding means (14) provided adjacent to at least a first one of said two ends, a piston rod member (12) guided by said piston rod guiding means (14) inwards and outwards of said container (11) along said axis of said container (11), sealing means (17, 18) adjacent to said piston rod guiding means (14), said sealing means (17, 18) comprising an axially outer sealing unit (17) and an axially inner sealing unit (18), a sealing chamber (16) being defined axially between said axially outer (17) and said axially inner (18) sealing units, both said axially outer (17) and said axially inner (18) sealing units comprising a respective sealing ring member (17, 18), said sealing ring members (17, 18) being in sealing engagement with both

an internal circumferential face of said container (11) and an external circumferential face of said piston rod member (12), a working chamber (15) being defined axially between said axially inner sealing unit (18) and the second end of said container (11), said working chamber (15) containing a volume of pressurized fluid, each of said sealing ring members (17, 18) having a radially outer, axially pointing sealing lip (19, 21) sealingly engaging said internal circumferential face and a radially inner, axially pointing sealing lip (20, 22) sealingly engaging said external circumferential face, respective sealing lips (19, 20, 21,



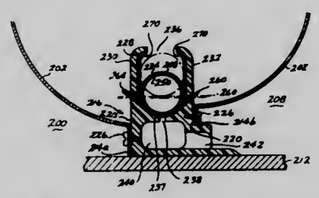
22) of said sealing ring members (17, 18) extending in opposite axial directions towards said sealing chamber (16), said sealing chamber (16) receiving a volume of pressurized gas, the pressure of said volume of pressurized gas within said sealing chamber (16) exceeding the pressure of said pressurized fluid within said working chamber (15), said pressure within the sealing chamber being exerted on the sealing ring lips causing the sealing ring to exert pressure on the outer surface of the piston rod member and inner wall of the cylindrical container thereby sealing said volume of pressurized gas within said sealing chamber.

4,896,588

SELF-CLEANING CABIN AIRFLOW REGULATING DEVICE

Damian G. Mosda, Seattle, Wash., and Douglas E. Peash, Cheboygan, Mich., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 26, 1988, Ser. No. 148,765
Int. Cl.[4] F24F *13/072*
U.S. Cl. 98—1 **39 Claims**



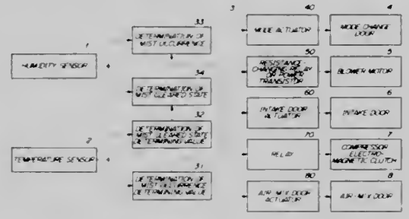
1. A self-cleaning airflow regulator, comprising:
(a) a housing including:
a first chamber having a pair of spaced-apart sidewalls;
an air inlet in airflow communication with the first chamber; and
an air outlet in airflow communication with the first chamber at a location spaced from the air inlet;
(b) a close fitting, partially pervious poppet cylinder within the first chamber at a location between the sidewalls thereof to occupy substantially the entire width separating the sidewalls, the poppet cylinder adapted to move transversely of its length along the sidewalls toward and away from the air inlet in response to the level of airflow through the first chamber;
(c) means for biasing the poppet cylinder in the direction towards the air inlet to shift the poppet cylinder towards the air inlet when no air is flowing into the first chamber through the air inlet; and,
(d) reactive contact means associated with the sidewalls of the housing which engage the poppet cylinder to cause the poppet cylinder to rotate about its longitudinal axis as the poppet cylinder moves along the housing sidewalls toward and away from the air inlet.

4,896,589

AIR CONDITIONING CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

Tadahiro Takahashi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,545
Claims priority, application Japan, Jun. 8, 1988, 63-140944
Int. Cl.[4] B60H *1/00*
U.S. Cl. 98—2.01 **5 Claims**



1. In an air conditioning control system for an automotive vehicle equipped with windowpanes, the system having a humidity sensor for sensing humidity on an inner surface of at least one of said windowpanes, a temperature sensor for sensing temperature of the inner surface of said at least one of said windowpanes, and demisting control means for determining that the inner surface of said least one of said windowpanes is in a state immediately before a mist occurs, and effecting demisting control for demisting the inner surface of said at least one of said windowpanes when the sensed humidity thereon is higher than a first predetermined value corresponding to the sensed temperature of the inner surface of said at least one of said windowpanes, said first predetermined value being assumed when the inner surface of said at least one of said windowpanes is in said state,
the improvement wherein:
said demisting control means comprises first determining means for determining a second predetermined value lower than said first predetermined value by a predetermined amount after the start of said demisting control, and second determining means for determining that said mist has been cleared away, and stopping said demisting control when the sensed latest value of the humidity on the inner surface of said at least one of said windowpanes becomes lower than said second predetermined value determined by said first determining means.

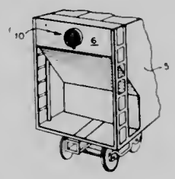
4,896,590

RAILROAD HOPPER CAR VENT

William J. Groos, Tinley Park, Ill., assignor to Pullman Leasing Company, Chicago, Ill.

Filed Mar. 22, 1989, Ser. No. 327,048
Int. Cl.[4] B60H *3/06*
U.S. Cl. 98—6 **20 Claims**

1. A venting device for admitting air into an enclosed container through an opening in a wall therein during discharge of material from said container, said device comprising:
mounting means adapted to be positioned in said opening,
retainer means for holding said mounting means on said container, a replaceable filter member adapted to admit air into said container,
means for releasably mounting said filter member to said retainer means, and



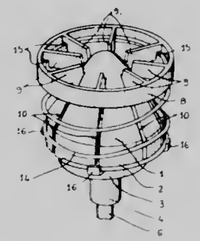
shake proof means for securing said retainer means to said mounting means comprising interengaging teeth means on said retainer means and mounting means, and said teeth means on the retainer means being deflectable away from the teeth means on the mounting means for releasing the same.

4,896,591

CITRUS FRUIT SQUEEZER

Michel Bertrand, La Lombardière, Luzinay, France (38200)

Filed Nov. 21, 1988, Ser. No. 273,970
Int. Cl.[4] A23N *1/00*
U.S. Cl. 99—507 **3 Claims**



1. In a device for mechanically squeezing citrous fruits of the type which includes a fixed body in a generally ogive form, a squeezer axially moveable with respect to the longitudinal axis of the body, a retractable ejector axially moveable with respect to the body and elastic return means which enable the ejector to retract under the effect of pressure exerted by the squeezer as the squeezer urges a half of fruit to be squeezed toward the body and which elastic return means returns the squeezer and ejects the skin of the fruit half after the fruit has been squeezed the improvement comprising, a plurality of spaced slots formed in the body so as to extend generally longitudinally with respect to the longitudinal axis of the body, said body having a base portion and an uppermost portion and inner and outer surfaces, the ejector including a generally circular grille having a plurality of spaced arms which extend radially outwardly so as to be oriented radially with respect to the axis of the body, said radial arms of the ejector being slideably received within said spaced slots in the body, and the elastic return means being disposed intermediate the ejector and said base of the body whereby the ejector will be positively guided between adjacent said uppermost portion of the body toward the base portin thereof by said radial arms being guidingly received within said slots in the body.

4,896,592

GRAIN POLISHING MACHINE

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 311,620
Claims priority, application Japan, Mar. 31, 1988, 63-81669
Int. Cl.[4] B02B *3/04, 3/06*
U.S. Cl. 99—519 **7 Claims**



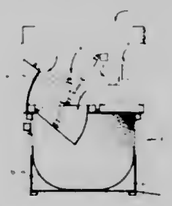
1. A grains polishing machine of vertical friction type in which a main shaft is rotatably arranged within a vertical perforated bran-removing polishing cylinder, the main shaft has thereon a spiral rotor and a polishing rotor, said polishing rotor having a vertical axis and agitating projections, and a polishing chamber defined between said perforated bran-removing polishing cylinder and the polishing rotor which communicates at one end of said chamber with a grain feed section and at the other end of said chamber with a grain discharge section, wherein said polishing cylinder is axially divided into at least two sections different in diameter from each other so as to have a step part therebetween and said polishing rotor is also axially divided into at least two sections different in diameter from each other so as to have a step part therebetween, whereby said polishing chamber is axially divided into at least two sections so as to have a corresponding connection passage therebetween which communicates such chamber sections with each other, said connection passage being defined between the respective step parts of said perforated bran-removing polishing cylinder and said polishing rotor, and said connection passage being provided with a resistance adjusting means for adjusting the cross-sectional area of said connection passage.

4,896,593

VERTICAL TRASH COMPACTOR

Boyd C. Slusser, Jenison, Mich., assignor to Sebright Products, Incorporated, Hopkins, Mich.

Filed Mar. 28, 1988, Ser. No. 174,002
Int. Cl.[4] B30B *15/06, 15/16*
U.S. Cl. 100—53 **18 Claims**



1. In a compactor for waste material comprising a base adapted to receive an open-top container, said open-top container being adapted to receive waste material therein, a housing mounted on said base, ram means mounted in said housing and adapted for compacting waste material in said open-top

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container, and power means operably connected to said ram means to move said ram means, the improvement in said ram means comprising:

a first platen pivotably connected to one of said base and said housing for swinging movement about a first axis between a retracted loading position and a normal position relative to said base, and

a second platen pivotably connected to and carried by said first platen for swinging movement about a second axis between a retracted position relative to said first platen and generally parallel to said first platen and an extended position relative to said first platen.

4,896,594

DRAWING INSTALLATION FOR A PRESS

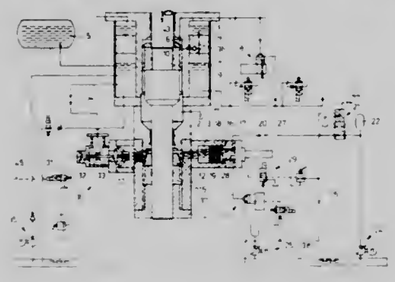
Siegfried Baur; Rudi Brandstetter, both of Goeppingen, and Gerhard Roos, Ebersbach-Bünwangen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Nov. 27, 1987, Ser. No. 125,925

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640788

Int. Cl.[4] B30B *1/32*; B21D *22/00*

U.S. Cl. 100—269 R **8 Claims**



1. A drawing installation for a press, comprising a mechanically actuated drawing ram means, a sheet metal holder means producing a holding force acting on a sheet metal member opposite a drawing direction by way of a pressure medium-actuated piston rod means in a fixed pressure cylinder means, the piston rod means being operatively connected with a pressure piton means having operating surface means acted upon in the drawing direction, said pressure cylinder means forming a pressure space around the operating surface means of the pressure piston means, control means operating in dependence on ram travel and operable to pre-accelerate the sheet metal holder means in the drawing direction by the piston pressure means prior to contact of the drawing ram means on the sheet metal holder means by connecting the operating surface means of the pressure piston means with hydraulic liquid, said control means including a pre-acceleration cylinder means having pressure quantity space means, a pressure space means and a pressure piston separating the pressure quantity space means from the pressure space means, a follow-up control means, hydraulic fluid reservoir, the pressure space of said pressure cylinder means being in hydraulic fluid-communication with the pressure quantity space means and being operable to be brought into hydraulic fluid communication with the reservoir of hydraulic fluid by a follow-up control means upon termination of the pre-acceleration of the sheet metal holder means by the pressure piston means.

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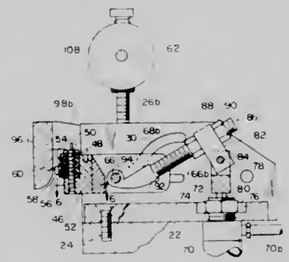
PRINT HEAD AND BACKER PLATE ASSEMBLY FOR CARTON MARKER

Thomas A. Beckett, Jr., Merchantville, N.J., assignor to Adco-Applied Development Co. Inc., Manahawkin, N.J.

Continuation-in-part of Ser. No. 122,032, is a continuation-in-part of Ser. No. 930,865, Nov. 14, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 322,179

Int. Cl.[4] B41F *17/24*

U.S. Cl. 101—44 **24 Claims**



1. A marking machine for imprinting indicia on a carton surface comprising;

a base including upstanding side plates disposed in spaced parallel relation,

a print head disposed between said side plates, guide elements extending from said print head and cooperatively engaging guide means on said side plates to define a linear and rotational path of movement of said print head with respect to said base, a demountable type holder secured to said print head for holding a type element thereon,

an ink roll supported above said side plates for engagement with the type element carried by said type holder in the raised position of said print head,

a backer plate assembly including a backer plate pivotally mounted on said base for movement between a raised standby position and a lowered carton backing position,

and selectively actuatable drive means including a common connection with said print head and backer plate assembly for cyclically moving said print head from a raised standby position with the type holder adjacent said ink roll to a printing position with the type holder extending beyond the side plates into engagement with a carton surface, said drive means moving said backer plate assembly into its lowered carton backing position so as to provide rigid support to the carton surface at the time of engagement of the carton by the inked type element carried by said print head type holder, said drive means serving to return said print head and said backer plate assembly to their raised standby positions.

4,896,596

LUBRICATION SYSTEM FOR PRINT HAMMER MECHANISMS

Edward F. Helinski, Johnson City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,047

Int. Cl.[4] B41J *7/22, 9/00*

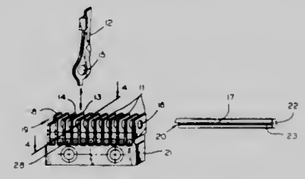
U.S. Cl. 101—93.48 **20 Claims**

16. A passive lubrication system for use in a mechanism having at least one element of a predetermined length supported to be pivoted at high speed over a very small angle, comprising:

elongated pivot pin means to support said one element and having a predetermined length;

at least two means having means to define an opening to receive said elongated pivot pin means, one of said means located on each side of said one element, and having means to define at least one channel extending along said predetermined length;

porous means located within said channel and extending out therefrom to be in communication with said two means; and



reservoir means for containing a supply of a predetermined lubricant and including means forming a path for lubricant flow from said reservoir means to said two means;

whereby lubricant flow by capillary action occurs readily from said reservoir means, through said two means, and through said porous means to lubricate an area of support between said elongated pivot pin means and said one element.

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SCREEN PRINTING APPARATUS

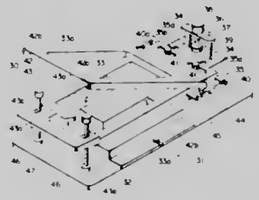
Shoji Hayata, Ibaragi, and Tadao Watanabe, Ichikawa, both of Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 158,175

Claims priority, application Japan, Feb. 20, 1987, 62-22687[U]; Feb. 20, 1987, 62-22688[U]

Int. Cl.[4] B41F *15/14*

U.S. Cl. 101—126 **11 Claims**



1. A screen printing apparatus for a printing plate having an inner frame with a central opening and a screen master mounted over the inner frame, comprising:

a base having a central portion where an object on which a print is to be made is to be received,

a lower outer frame pivotally mounted on said base for supporting said printing plate on a side of the inner frame, said lower outer frame having a central opening larger than the central opening for said inner frame, and

an upper outer frame pivotally mounted on said base for pressing said printing plate against said lower outer frame so as to clamp said inner frame of the printing plate between said upper and lower outer frames, said upper outer frame having a downwardly bent inner peripheral edge adapted to be disposed inwardly of at least said inner peripheral edge of said inner frame so that when said printing plate is held between said upper and lower outer frames, said inner peripheral edge of said upper outer frame pushes said screen master from its screen side at portions near and along said inner frame downwardly toward said lower outer frame to stretch said screen master at an appropriate degree of tension.

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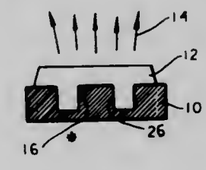
PAD PRINTING PROCESS USING THIXOTROPIC INK

Charles S. Leech, Jr., Glendale, Ariz., assignor to Automated Industrial Systems, Erie, Pa.

Filed Feb. 27, 1989, Ser. No. 316,480

Int. Cl.[4] B41F *17/00*

U.S. Cl. 101—170 **11 Claims**



1. A process for printing an image on the surface of an article comprising:

a. providing a printing plate having a recess that is a facsimile of a desired image and a thixotropic ink,

said ink comprising a pigment and a catalyst,

b. filling said recess with said ink including an excess of said ink,

c. doctoring said excess ink from said plate by passing a doctoring blade over said plate to remove said excess ink from said plate whereby the viscosity of said thixotropic ink in said recess is severely reduced by the mechanical stress of the passage of said doctor blade over said image in said plate and ink flow into said recess in said plate is completed.

d. allowing said image to return to its cohesive nature which provides the required adhesive properties to facilitate the transfer of said image from said recess in said plate to an elastomer print pad,

e. engaging said ink in said recess with said pad and lifting said pad whereby a substantial part of said image is lifted from said plate,

f. substantially immedistely transferring said image from said pad to said article,

g. lifting said pad from said article thereby leaving said ink that was lifted from said recess on said article, thereby providing said image on said article.

4,896,599

SWING-AWAY COLORHEAD FOR OFFSET DUPLICATOR

James J. Keller, Dallas, Tex., assignor to Dahlgren Duplicator Sales, Inc., Marietta, Ga.

Continuation of Ser. No. 873,711, Jun. 12, 1986, abandoned. This application Jul. 28, 1988, Ser. No. 225,553

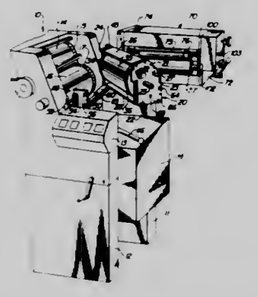
Int. Cl.[4] B41F *5/18*

U.S. Cl. 101—175 **22 Claims**

1. A printing press having a blanket cylinder and a first plate cylinder rotatably secured between a pair of press side frames, the improvement comprising: a second plate cylinder; a movable carrier for said second plate cylinder; means movably securing said movable carrier for pivotal movement about a substantially vertical axis to one of the press side frames; means rotatably securing said second plate cylinder to said movable carrier; plate cylinder lock-up means to detachably secure said movable carrier to maintain said second plate cylinder in engagement with said blanket cylinder; inker form rollers; an inker carrier, means rotatably mounting said inker form rollers in said inker carrier; means movably securing said inker carrier for pivotal movement about said substantially vertical axis

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relative to said movable cylinder carrier; and inker lock-up means detachable securing said inker carrier to said movable



carrier to maintain said form rollers in engagement with said second plate cylinder.

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PRINTING MACHINE

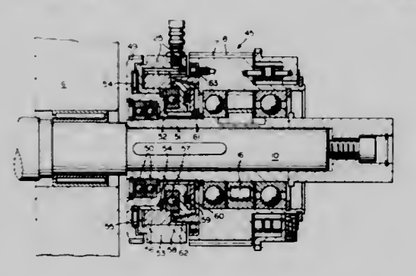
Dieter Rogge, Lengerich; Robert Blom, Tecklenburg, and Wolfgang Knapheide, Lienen, all of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,242

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742129

Int. Cl.[4] B41E *5/16*

U.S. Cl. 101—182 **14 Claims**



1. A printing machine comprising a plurality of inking units, a plurality of plate cylinders, at least one impression cylinder, a central gear for driving the impression cylinder during a printing operation by meshing with plate cylinder gears associated with the respective plate cylinders, the plate cylinders being mounted on plate cylinder carriages on tracks included in a frame of the machine and which extend in approximately tangential to radial directions relative to the central gear, the plate cylinders being movable into engagement with the impression **10** cylinder for the printing operation and away from said impression cylinder after printing, wherein the inking units comprise halftone ink rollers with ink roller shafts which carry halftone ink roller gears to mesh with the plate cylinder gears, and said halftone rollers being movable by inking unit carriages on tracks of the plate cylinder carriages, the machine further comprising means for **16** aligning respective teeth of the central gear with teeth of the plate cylinder gears when the plate cylinder gears are moved to pushed-in positions, datum marks provided on the plate cylinder gears, feelers secured to respective ones of the carriages to cooperate with said marks in such a manner that the plate cylinders can be angularly aligned for printing in register, and a servomotor for angularly moving a respective plate cylinder gear, through drive gear means, to a position in which the feeler can sense the datum mark.

4,896,601

INKING UNIT FOR ROTARY PRINTING PRESSES

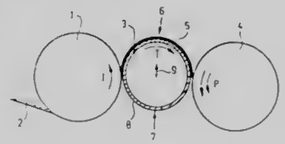
Willi Jeschke, Bad Herrenalb, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,534

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739893

Int. Cl.[4] B41F *31/10;* **B41L** *27/08*

U.S. Cl. 101—350 **17 Claims**



1. An inking unit for a rotary printing press having ink roller means for providing ink to a printing plate of a plate cylinder comprising:

an ink fountain;

an ink fountain roller rotatably mounted and rotatably driven for receiving a supply of the ink thereon from said ink fountain;

a first distributor roller rotatably mounted and rotatably driven for transferring the ink thereon to the ink roller means;

at least one transfer roller which is rotatably mounted and rotatable about a central axis and disposed between said ink fountain roller and said first distributor roller for transferring at least some of the ink from said ink fountain roller to said first distributor roller;

said at least one said transfer roller being generally cylindrical and including a surface which has a circumference which includes at least one raised area and at least one recessed area;

said at least one said transfer roller being mounted for at least one said raised area to be in contact with said ink fountain roller to receive the some of said ink therefrom when said at least one of said recesssed areas is adjacent said first distributor roller;

said one said transfer roller being mounted for at least one said raised area to be in contact with said first distributor roller to supply said some of the ink thereto when said at least one of said recessed areas is adjacent said ink fountain roller;

said ink fountain roller supplying rotational power to said at least one said transfer roller when said at least one said raised area of said transfer roller is in contact with said ink fountain roller; and

said first distributor roller supplying rotational power to said at least one said transfer roller when said at least one said raised area of said transfer roller is in contact with said first distributor roller.

4,896,602

METHOD OF AND A CIRCUIT FOR METERING INK IN PRINTING MACHINES

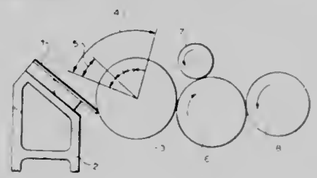
Arndt Jentzsch; Wolfgang Mueller, both of Coswig; Falko Missbach, Meissen, and Volker Eichler, Weinboehla, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jun. 30, 1988, Ser. No. 213,618

Claims priority, application German Democratic Rep., Jul. 1, 1987, 304412

Int. Cl.[4] B41F *31/06;* **B41L** *27/08*

U.S. Cl. 101—350 **6 Claims**



1. A circuit arrangement for controlling the ink metering in a printing machine operating in cycles and having an inking mechanism including an ink fountain, a doctor roller in engagement with the fountain, an electric stepper drive for driving the doctor roller at a relatively low speed in discrete angular increments of a uniform magnitude to withdraw from the fountain a layer of ink, comprising, an increment voltage generator coupled to the printing machine for generating a series of pulses related to the rotary speed of the machine, a first AND gate having an input connected to the output of said increment voltage generator and an output connected to said stepper drive, rate selection means including a time preselection unit having an output connected to a setting input of a binary store, the output of said binary store being connected to a second input of said first AND gate, the output of said increment voltage generator being connected to an input of a second AND gate and the output of said time preselection unit being connected to the a second input of said second AND gate and an output of said second AND gate being connected to a means for selecting the magnitude of a metering step, said magnitude selecting means predetermined number of pulses is delivered by said increment voltage generator.

4,896,603

APPARATUS FOR CLOSING THE GAP BETWEEN THE ENDS OF A GRAVURE PRINTING PLATE CLAMPED ON A PLATE CYLINDER

Joachim Dorow, Hassloch, and Gerhard Bleckmann, Lampertheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,276

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727115

Int. Cl.[4] B41F *27/12*

U.S. Cl. 101—375 **1 Claim**

1. Apparatus for closing the gap between the ends of a gravure printing plate clamped on a plate cylinder having a shaft and having formed below said gap a gap cavity into which plastic and curable material is introduced, said apparatus comprising:

a gap-covering plate,

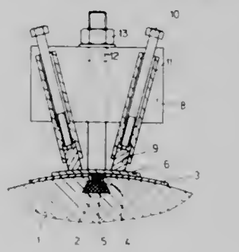
two support members respectively mounted on the shaft ends of the plate cylinder,

a mounting structure interconnecting said support members, and

a pair of pressure bars, one on each side of the gap, which extend along the length of the cylinder;

wherein said mounting structure includes guide members which hold said pressure bars for displacement in the direction of the cylinder, and

wherein a plurality of pressure screws distributed over the entire length of the pressure bars are mounted in said guide members in alignment with said pressure bars for engagement of the upper end of said bars,



so that, upon the tightening of said screws said pressure bars urge said gap-covering plate against said printing plate over the entire length of the cylinder on both sides of said gap, thereby effectively counteracting the outflow of said plastic material, during its introduction, between said gap covering plate and said printing plate.

4,896,604

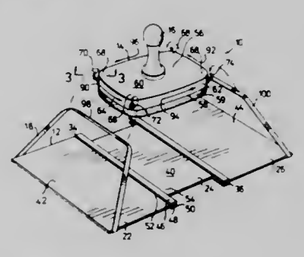
STAMP WITH REPLACEABLE DIE PLATE ATTACHED TO SUPPORT MEMBER BY AN ELASTOMERICALLY EXTENSIBLE CONNECTION

Walter Urbanowicz, 531 3rd Ave. East, Owen Sound, Ontario, Canada

Continuation of Ser. No. 840,032, Mar. 17, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 145,318

Int. Cl.[4] B41K *1/02*

U.S. Cl. 101—379 **7 Claims**



1. A stamp comprising:

a rigid planar die plate having a front face bearings dies, a rear face, and first and second opposing side edge portions;

a die plate mounting member distinct from the die plate and positioned against the rear face of the die plate;

a handle rigidly fixed to and extending rearwardly from the die plate mounting member;

first elastomeric retaining means for forming an elastomerically extensible connection between the first die plate side edge portion and the die plate mounting member, the first elastomeric retaining means including first releasable securing means for releasably securing the first elastomeric retaining means to the first die plate side edge portion;

second elastomeric retaining means for forming an elastomerically extensible connection between the second die plate side edge portion and the die plate mounting mem-

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ber, the second elastomeric retaining means including second releasable securing means for releasably securing the second elastomeric retaining means to the second die plate side edge portion;

the first and second elastomeric retaining means being in tension and so positioned relative to the die plate side edge portions and the die plate mounting member that the tension normally keeps the die plate in contact with the die plate mounting member and that the die plate mounting member can be rocked relative to the rear face of the die plate by means of the handle to apply pressure to different portions of the rear face of the die plate, the die plate being maintained in contact with the die plate mounting member solely by the first and second elastomeric retaining means.

4,896,605

METHOD OF CUT POSITION DETERMINATION FOR PRINTING MACHINES

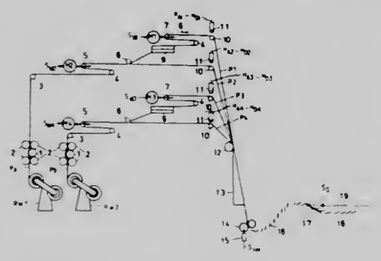
Thomas Schröder, Zürich, Switzerland, assignor to Asea Brown Boveri Ltd, Baden, Switzerland

Filed Feb. 8, 1989, Ser. No. 307,753

Claims priority, application Switzerland, Feb. 19, 1988, 622/88

Int. Cl.[4] B41L *3/02*

U.S. Cl. 101—486 **9 Claims**



1. A method of cut position determination for printing machines, having at least one, to be synchronously guided, printed paper web (P1–P4), identical printed product pages following directly or at periodic intervals one after the other on each paper web, wherein,

(a) print-dependent brightness signals (H_{A1}–H_{D4}) are derived by at least 2 photodetectors, which are arranged for each paper web (P1–P4) next to each other with respect to the direction of transport of the latter,

(b) at least a 1st oscillation signal of definable frequency (f1) is derived as a function of each of these brightness signals, provided these brightness signals are not constant,

(c) the amplitude (a_{A1}–a_{D1}) is determined as a function of each of these 1st oscillation signals,

(d) of the 1st oscillation signals, the one with the greatest amplitude is selected,

(e) from this selected 1st oscillation signal, the current phase position (ϕ_x,ϕ_{A1}–ϕ_{D1}) with respect to a predeterminable synchronizing signal (S_{syn}) is determined and stored as reference phase position (ϕ_{ref}),

(f) the phase difference ($\Delta\phi n$) between the current phase position (ϕ_x) and the reference phase position (ϕ_{ref}) is determined at an interval of at least one printed product page, and

(g) at least one register of the printing machine is controlled as a function of this phase difference ($\Delta\phi n$) such that the phase difference becomes at least approximately =0.

4,896,606

OPTICAL PROXIMITY FUZE

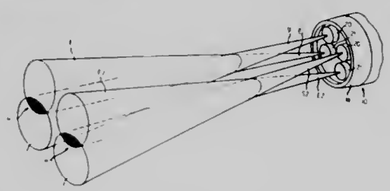
Beat De Coi, Landquart, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Mar. 20, 1989, Ser. No. 325,958

Claims priority, application Switzerland, Mar. 31, 1988, 01 226

Int. Cl.[4] F42C *13/02*

U.S. Cl. 102—213 **3 Claims**



1. An optical proximity fuze for detonating a projectile or the like at a predetermined distance from a target, comprising:

at least two optical transmitters each of which emits an associated beam towards a target;

at least two optical receivers each of which is arranged in cooperating relationship with an associated one of the at least two optical transmitters;

each optical receiver receiving at least part of the beam emitted by the associated optical transmitter and reflected at the target;

each of said at least two optical receivers delivering a signal to detonate the projectile upon reception of said beam reflected at said target;

said two optical receivers measuring target distance in several chronological measurements; and

means for detonating the projectile only when said two optical receivers simultaneously respond.

4,896,607

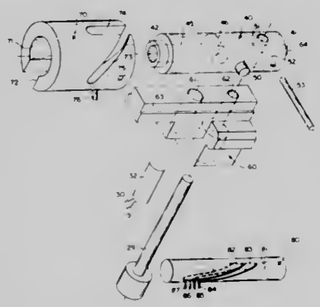
BOOSTED KINETIC ENERGY PENETRATOR FUZE

James C. Hall, Rte. 6, Box 324, Buffalo, Minn. 55313, and Peter H. Van Sloun, 207-18th Ave. N., Hopkins, Minn. 55343

Continuation of Ser. No. 254,146, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 930,991, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 521,878, Aug. 10, 1983, abandoned. This application Mar. 3, 1989, Ser. No. 319,853

Int. Cl.[4] F42C *15/24*; F42B *15/24*

U.S. Cl. 102—247 **10 Claims**



1. In a fuze, in combination:

a cylindrical rotor having an axis, ends, an axial bore at one end of said axis, said axial bore having an open end, a transverse bore communicating with said axial bore, said bores containing explosive leads, and a radially extending caming pin;

means supporting the ends of said rotor for rotation about said axis;

an inertia weight bored to receive said rotor and having a helical groove to receive said caming pin, so that displacement of said weight along said rotor between first and second positions causes rotation of said rotor between first and second rotated positions thereof;

and a detonator block engaging said weight to enable axial movement and to prevent rotation of said weight about said axis, said block including a radial detonator bore which is aligned with said transverse bore of said rotor in said second rotated position thereof.

4,896,608

Patent Not Issued For This Number

4,896,609

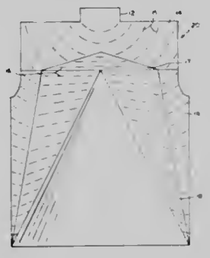
PLANAR SHOCK WAVE GENERATOR AND ENHANCER DEVICE

Robert E. Betts, Huntsville; Lawrence B. Thorn, Madison, and William F. Meagher, Huntsville, all of Ala., assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1989, Ser. No. 348,753

Int. Cl.[4] F42B *1/02*

U.S. Cl. 102—309 **4 Claims**



1. A planar shock wave generator and detonator enhancer device which permits a reduction in weight, length, and diameter of a shape charge to achieve the same effect with which said device functions, said planar shock wave generator and detonator enhancer device comprising:

(i) a planar wave shaper which transforms radial shock waves generated from a first initiated explosive to planar waves and directs said planar waves toward a shape charge, said planar wave shaper comprising:

(a) a conically shaped planar charge having a predetermined diameter at the base and slant heights terminating at an apex;

(b) a cylindrically shaped fast detonating charge positoned above said conically shaped planar charge and intersecting along said slant heights of said conically shaped planar charge; and,

(c) a detonator positioned on the surface of said cylindrically shaped fast detonating charge to provide initiation point on surface which generates radial shock waves which are acted upon by said conically shaped planar charge to transform said radial waves to planar shock waves;

(ii) a slower cone shaped detonating shape charge intersecting along the base of said conically shaped planar charge for receiving said planar shock waves as transformed by said conically planar charge, said planar shock waves traveling down said slower cone shaped detonating shape charge to achieve detonation and to give amplified explosive force on the jet towards the cone center resulting from said detonation, said amplified explosive force resulting from said planar wave shaper transformation permitting a reduction in weight, length, and diameter of said shape charge to achieve the same effect.

4,896,610

FLUID CUSHION DEVICE

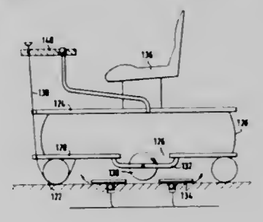
Phillip M. R. Deane, Northbourne, England, assignor to Super X Limited, Southampton, Great Britain

Filed Jul. 10, 1987, Ser. No. 71,848

Claims priority, application United Kingdom, Jul. 11, 1986, 8616897

Int. Cl.[4] B60V *1/16*; B61D *15/00*

U.S. Cl. 104—23.2 **5 Claims**



1. A cushion system comprising:

floor means defining an outer surface and including internal fluid passageways and a matrix of valve chambers communicating with said passageways, said valve chambers having openings to said outer surface of said floor means,

valve elements moveably mounted in said valve chambers, a tubular nipple having one end centered inside said valve chamber for supporting an associated valve element in a valve open position, said valve elements being spherical and said valve chambers being cylindrical for loosely receiving said spherical valve elements, each said valve opening defined by an annular seating surface adjacent an end of said valve chamber opposite said end of said valve chamber fitted with said nipple, each said valve element including a portion projecting through said valve opening beyond said floor outer surface when said valve element is in its closed position, said projecting spherical surface portion providing a low friction contact,

platform means including a flexible inflatable torus shaped skirt, said torus defining internal cavity, said platform means further defining a plenum chamber inside said torus in cooperation with a region of said floor outer surface, and said region including at least one valve chamber opening,

a plate suspended inside said platform defined plenum chamber, and means normally biasing said plate toward said floor outer surface for engaging at least one valve element projecting portion in order to move the valve element toward an open position so that fluid from the valve chamber passes into the plenum chamber, said plate biasing means exerting a form on said valve element sufficient to overcome said fluid pressure on said valve element, said toroidial shaped internal cavity containing fluid at substantially the same fluid pressure as that provided to said plenum chamber from said valve chambers,

said platform comprising at least individual disc shaped elements connected to one another by a frame such that three discs are provided adjacent the vertices of said triangular frame,

and drive wheels adapted to contact said floor outer surface.

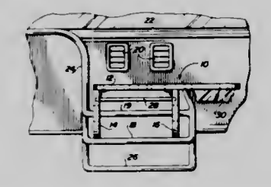
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4,896,611

DRINK HOLDER FOR AUTOMOTIVE MINI-VANS

James W. Loreazini, 6497 E. Via Algardi, Tucson, Ariz. 85715

Filed Nov. 3, 1988, Ser. No. 266,874
Int. Cl.[4] A47B *23/00*
U.S. Cl. 108—45 **13 Claims**



1. A removable drink holder for installation in a motor vehicle utilizing for installation a compartment having an interior provided in the front console and dashboard assembly of the motor vehicle, and not requiring fixed physical attachment to the motor vehicle, the drink holder comprising:

a tray with a plurality of openings therethrough adapted to receive various sized drink containers, said tray having a top flat surface and a bottom flat surface; and

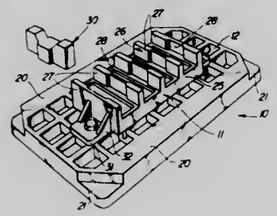
a pair of legs operably attached to said tray, said legs having means to frictionally engage a compartment interior provided in the front console and dashboard assembly of the motor vehicle, said legs having an elongated portion and an oppositely situated short portion, said short portion mounted to the bottom flat surface, said elongated portion shape defined by a width and length, which conforms to the compartment interior, said width decreasing relative to said length, said shape defining said means to frictionally engage interiorly the compartment provided in the motor vehicle front console and dashboard assembly whereby the tray is held in a fixed position in the motor vehicle for the convenience of the driver and passengers.

4,896,612

MOLDED PLASTIC PALLET SYSTEM

James S. Salloum, Oxford, Mich., assignor to Creative Techniques, Inc., Auburn Hills, Mich.

Continuation of Ser. No. 63,028, Jun. 17, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 247,404
Int. Cl.[4] B65D *19/18*
U.S. Cl. 108—55.3 **9 Claims**



1. A pallet for supporting and conveying articles, comprising:

a normally horizontally arranged, integrally molded plastic grid formed of spaced apart elongated, longitudinal strips and transverse strips that intersect and are integral at their junctions to form regularly spaced apart, substantially identically size grid openings;

each of said strips being of a substantially uniform, generally rectangular cross-section whose vertical height is substantially greater than its horizontal width;

with the upper edges of the strips being substantially coplanar and defining an upper carrying surface, and with the lower edges of at least some of the longitudinal strips being coplanar to form parallel, elongated, skid-like suppots arranged to provide a flat, planar, lower pallet support surface;

said transverse strips being arranged at right angle to the longitudinal strips and being of a lesser height than the longitudinal strips which form the side-like supports so that the lower edges of the transverse strips are arranged a distance above the lower pallet support surface and are generally coplanar to form fastener engaging surfaces that are upwardly recessed relative to the lower pallet support surface;

a removable article holding member having an upper portion shaped to receive and hold an article, and a lower surface shaped to rest upon the pallet upper carrying surface in contact with the upper edges of a number of the longitudinal and transverse strips;

releasable fastening means mechanically securing the holding member to the pallet, with said fastening means including a portion arranged to engage upwardly against a transverse strip lower edge fastener engaging surface portion and being recessed above the lower pallet support surface, and said fastening means including a portion extending through its adjacent grid opening and connected to the holding member;

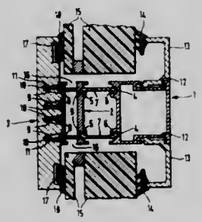
whereby articles may be placed upon the holding member for holding and conveying the articles upon the pallet, and the holding member may be selectively replaced with different holding member for holding different shaped articles.

4,896,613

COMPOSITE BOMBARDMENT INHIBITING SECTION FOR FRAME MEMBERS

Elke Salzer, Weidenhauser Str. 36, 3550 Marburg, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,166
Int. Cl.[4] E05G *3/00*; E06B *5/12, 9/00*; E04H *9/00*
U.S. Cl. 109—27 **12 Claims**



1. A composite section for forming blast resistant panel frames comprising a base section, an intermediate section having a first side secured to said base section and an opposite side remote from said first side, a plurality of projections extending from said opposite side in a direction away from said base section said projections being integrally formed with said intermediate section, length wisely co-extensive therewith, and being elastically pivotable with respect thereto, said projections including nose portions directed laterally to one side of said projections, a rigid generally planar cover section of thickness in excess of the length of said projections and including grooves recessed into the body thereof and opening toward said intermediate section, said grooves being spaced to receive said projections, said grooves being defined by side walls, a bottom and a mouth facing said intermediate sections, said side walls flaring progressively outwardly in the direction of said mouth to define a cam configuration, said grooves being of substantially greater cross-sectional extent than said projections and including laterally off set enlargements adapted to receive said nose portions of said projections, said projections and grooves being arranged in pairs, said nose portions and grooves of each said pair being oriented in mirror symmetry.

4,896,614

METHOD AND APPARATUS FOR TREATMENT OF HAZARDOUS WASTE IN ABSENCE OF OXYGEN

Prabhakar Kulkarni, 12027 Circle Dr. E., Houston, Tex. 77071

Filed Sep. 15, 1988, Ser. No. 244,318
Int. Cl.[4] F23G *7/00*
U.S. Cl. 110—346 **6 Claims**



1. A method of converting hazardous waste material into useful by-products, comprising the steps of:

(a) introducing the waste material into a plasma arc generated by a plasma gun and converting the waste material into a gaseous outflow;

(b) collecting said gaseous outflow in a reactor chamber in the absence of oxygen for preventing the recombination of said gaseous outflow with oxygen;

(c) directing said gaseous outflow through cooling apparatus for reducing the temperature of said gaseous outflow;

(d) passing said gaseous outflow through molecular sieve apparatus permitting selected constituents of said gaseous outflow to pass through said molecular sieve apparatus; and

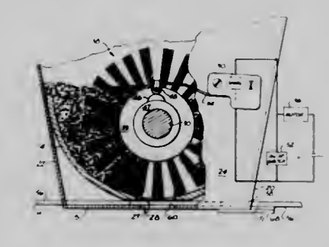
(e) collecting said selected constituents in storage vessels.

4,896,615

HOPPER FOR DISPENSING SEED, GRAIN AND THE LIKE

Clarence E. Hood, Jr., Clemson; Thomas R. Garrett, Six Mile, and Charles R. DuBose, Central, all of S.C., assignors to Clemson University, Clemson, S.C.

Continuation of Ser. No. 787,684, Oct. 15, 1985, abandoned. This application Aug. 26, 1987, Ser. No. 91,289
Int. Cl.[4] A01C *19/02*; B65D *88/26, 88/68*
U.S. Cl. 111—177 **14 Claims**



1. A hopper for dispensing seed, grain and the like, the hopper comprising:

a housing having a lower portion and at least one dispensing opening in said lower portion;

a rotatable shaft located within said housing;

means for rotating said shaft;

flexible metering means mounted on said shaft above each said dispensing opening for agitating seed, grain and the like and for translocating same to said dispensing opening during rotation of said shaft;

means for selectively stopping rotation of said shaft, whereby when rotation of said shaft is stopped by said selective shaft rotation stopping means, seeds, grain and the like are blocked from access to said dispensing opening; and

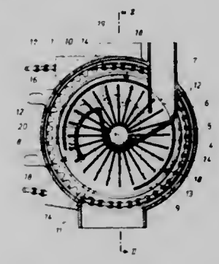
said selective shaft rotation stopping means comprises a cam mounted on said shaft, a cam follower mounted to engage said cam, and switch means connected to said follower whereby said switch means is activated when said follower engages a preselected point of said cam.

4,896,616

SEED PLANTER

Johann Wintersteiger, Gonetsreith 35, A-4910 Ried im Innkreis, and Franz Spiesberger, Gunzing 51, A-4923 Lohnsburg, both of Austria

Continuation of Ser. No. 129,866, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 442,144, Nov. 16, 1982, abandoned, which is a continuation of Ser. No. 236,684, Feb. 23, 1981, abandoned. This application Jun. 8, 1989, Ser. No. 363,636
Claims priority, application Austria, Mar. 7, 1980, 1266/80
Int. Cl.[4] A01C *7/04, 7/20*; B23Q *7/04*; B65H *3/08*
U.S. Cl. 111—185 **6 Claims**



1. A device for separating individual seed grains from a multiplicity of seed grains exclusively by suction and sowing the individual seed grains spaced from each other, comprising

(a) a seed box adapted to contain the multiplicity of seed grains, the seed box having an interior defined by

(1) a bottom extending from an inlet for feeding a supply of seed grains into the seed box interior to a discharge passage for discharging the individual seed grains, and

(2) a rear wall constituted by a discharge disc consisting of a first part and a second part, the first part being a disc body having a planar contact surface and the second part being a planar disc blade in contact with the disc body contact surface, one of the parts being stationary and the other part being mounted for rotation about an axis extending perpendicularly to the planar disc body contact surface, the stationary disc part defining a seed guide slot extending from a point near the bottom of the seed box upwardly and eccentrically about the axis over a sector thereof and through the discharge passage, and the rotatably mounted part defining peripherally spaced entraining slots intersecting the guide slot, spaced suction openings being formed at substantially radial intersections between the guide and entraining slots, and the widths of the guide and entraining slots being smaller than a maximal diameter of the seed grains so as to permit penetration of only a single one of the seed grains through the disc blade to contact both the guide and entraining slots,

(b) suction means communicating through the suction openings with the interior of the seed box whereby a respective one of the single seed grains is sucked therefrom into the suction openings, and

(c) drive means for rotating the rotatably mounted disc part, the combination of the rotating disc part and the contact of the seed grain by the guide and entraining slots causing each single seed grain sucked into the respective suction opening to be rotated radially outward by friction and to be sucked deeper into the respective suction opening than adjacent seed grains, causing adjacent seed grains to fall back into the seed box, and the entraining slots in the rotating disc part carrying the individual spaced seed grains held by suction in the spaced suction openings in a discharge path through the discharge passage.

4,896,617

BLIND STITCH SEWING MACHINE

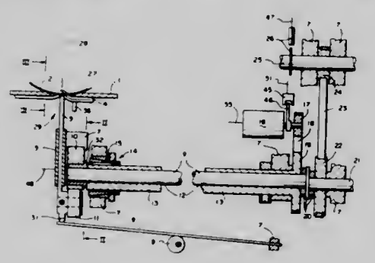
Georg Hauser, Münich, and Rolf Höggenstaller, Wessling, both of Fed. Rep. of Germany, assignors to J. Strobel & Sohne GmbH & Co., Munich, Fed. Rep. of Germany

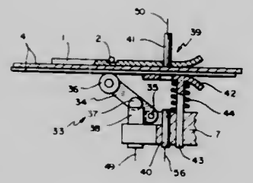
Filed May 31, 1989, Ser. No. 359,327

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3819017

Int. Cl.[4] D05B *1/24*

U.S. Cl. 112—176 **24 Claims**





1. A blind stitch sewing machine having an arc needle with a tip, main drive means to oscillate the needle along an arcuate path and a fabric deflector movable in a plane of motion intersecting the arcuate path to bear against a material being sewn comprising:

(a) means to oscillate the fabric deflector in its plane of motion to contact the fabric being sewn to deflect the fabric into the arcuate path of the arc needle, the means including a stepping motor for adjusting the fabric deflector oscillation with respect to the arcuate path;

(b) a sewing material sensor generating an output signal depending upon the thickness of the fabric;

(c) a contact pickup to generate an electrical signal upon contact between the arc needle and the fabric deflector;

(d) measurement window pickup means operatively associated with the drive means to generate a measurement window signal for each stitch commencing shortly before the tip of the arc needle reaches the plane of motion of the fabric deflector and ending with the onset of the motion of the fabric deflector away from the arcuate path of the arc needle; and,

(e) control circuit means operatively connected to the stepping motor, the contact pickup, the sewing fabric sensor and the measurement window pickup means such that the stepping motor places the fabric deflector in a starting position displaced away from the arcuate path of the arc needle and, in the course of a subsequent sewing operation, moves the fabric deflector closer to the arcuate path until the contact pickup generates its signal during the measurement window signal and such that, at the end of the measurement window signal, the stepping motor moves in the opposite direction a predetermined number of steps dependent upon the output signal from the sewing fabric sensor to provide a minimum spacing for the fabric deflector.

4,896,618

HANDLING OF LIMP FABRIC

Robert C. Blake, Horsham; Shane A. Bone, Chirnside Park; David Lau, Templestowe, all of Australia; Yoshinobu Fukuyama, Yamatotakada, Japan; Hiroji Maegawa, Kashihara, Japan; Hisayoshi Morimoto, Kashikara, Japan, and Hiroshi Ogita, Nara, Japan, assignors to Pacific Dunlop Limited, Australia

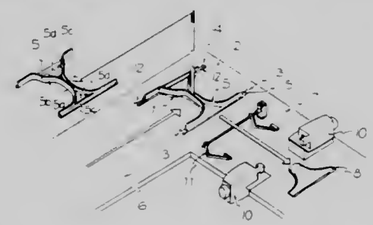
PCT No. PCT/AU87/00447, § 371 Date Aug. 29, 1988, § 102(e) Date Aug. 29, 1988, PCT Pub. No. WO88/05021, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 30, 1987, Ser. No. 271,860

Claims priority, application Australia, Dec. 30, 1986, PH09700

Int. Cl.[4] D05B *35/00, 27/00*

U.S. Cl. 112—262.3 **12 Claims**



1. A method of stretching and folding a limp fabric piece having a plurality of opposed elastic bands extending therefrom comprising locating and holding said fabric piece in an extended condition on a platform having a foldable segment such that one half of said fabric piece is located on said foldable segment and in a position to enable subsequent folding of fabric piece to obtain the shape of the desired garment, applying suction to said elastic bands in an axial direction thereto by suction means, gripping said elastic bands relative to the suction means, releasing the suction, stretching said fabric piece by axially moving the suction means with the gripped elastic bands away from said fabric piece, gripping the fabric piece adjacent the elastic bands, associated with said foldable segment, relative to the segment in the correct position to form the garment with overlapping elastic bands when folded, releasing the gripping hold on said elastic bands associated with said foldable segment, folding said segment to form said garment with said elastic bands overlapping, pressing and holding said garment adjacent said overlapping elastic bands, releasing the grip on the elastic bands associated with said platform and said foldable segment respectively, and returning said foldable segment.

3. Apparatus for stretching and folding a limp fabric piece having a plurality of opposed elastic bands extending therefrom comprising

a platform having a foldable segment,

means for folding said foldable segment relative to the platform,

a limp fabric piece feeding plate for feeding said limp fabric piece to said platform and holding said fabric piece thereon in an extended condition and in a pre-determined position to enable eventual folding of the fabric piece to produce a garment,

means for moving said plate member horizontally or vertically,

suction means located adjacent said platform for applying suction to the elastic bands extending from the fabric piece,

elastic band gripper means associated with the suction means for gripping and holding the sucked-in elastic bands, relative to said suction means,

means for moving said suction means relative to said platform to stretch said fabric piece,

garment gripper means associated with said foldable segment for gripping and holding the stretched fabric piece at the correct position for folding said piece and

garment pressing means associated with said platform for pressing and holding the folded garment adjacent the overlapping elastic bands of said fabric piece.

4,896,619

HEMMER SEAMER ASSEMBLY

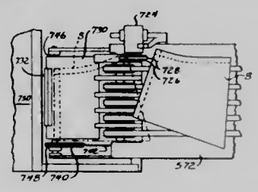
Maximilian Adamski, Palatine; Robert L. Kosrow, Hoffman Estates, and Stephen Ruderman, Oak Park, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 162,919, Mar. 2, 1988, Pat. No. 4,800,830.

This application Oct. 11, 1988, Ser. No. 256,781

Int. Cl.[4] D05B *27/04*

U.S. Cl. 112—306 **8 Claims**



1. A device for manipulating a sewn fabric, comprising;

means for sewing the fabric resulting in placement of the fabric at a turned configuration;

means for moving the fabric away from the sewing means; and

means for turning the sewn fabric into a desired configuration.

4,896,620

MARINE BUOY

Harry E. Jones, 9408 NE. 188th St., Bothell, Wash. 98011

Filed Feb. 1, 1989, Ser. No. 305,159

Int. Cl.[4] B63B *45/00*

U.S. Cl. 114—253 **19 Claims**

1. A towable buoy comprising:

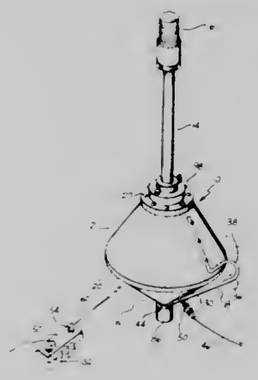
a float body having an upper end and a lower end and including a generally conical upper portion having a small upper end and a large lower end, and a generally conical lower portion having a large upper end and a small lower end, said lower end of said upper portion being joined to the upper end of said lower portion, providing the float body with a maximum diameter where the upper and lower portions join;

a control line guide bar connected to said buoy, said guide bar having a lower end adjacent the lower end of said flat body, and an upper end, and said guide bar sloping upwardly and outwardly from its lower end to its upper end;

a tow bar connected to the upper end of the guide bar and presenting a bight spaced radially outwardly from the maximum diameter of the float body;

a ballast weight providing the buoy with a center of gravity located below said maximum diameter of said flat body; and

a control line having a buoy end slidably connected to said guide bar, for sliding in position along said guide bar, said



control line having a first position wherein said buoy end of the control line is at the lower end of said guide bar, and a second position in which said towing line is in tension and said buoy end engages said bight of said tow bar;

wherein when a towing force is first applied to the tow line the buoy end of the tow line will slide in position upwardly along the guide bar into a position of engagement with the bight of said tow bar, and then when the tow line is pulled upon an additional amount it will exert a towing force acting on said buoy substantially at the maximum diameter of the float body.

4,896,621

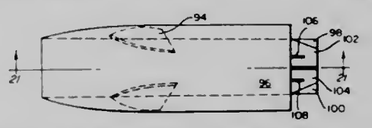
METHOD OF MODIFYING A BOAT HULL TO OBTAIN ENHANCED LIFT AND ROUGH WATER STABILITY

Charles P. Coles, P.O. Box 244, South Hamilton, Mass. 01982

Filed Jul. 29, 1988, Ser. No. 225,998

Int. Cl.[4] B63B *1/38*

U.S. Cl. 114—274 **6 Claims**



1. Method of modifying a powered boat hull to obtain enhanced lift and rough water stability, comprising:

(a) defining at least one axial tunnel extending from the bow to the transom of the boat hull;

(b) positioning a pair of flexible foils on each side of the bow and beneath the water line and boat hull so as to obstruct and create turbulence of dense spray in the forward end of the tunnel, while cushioning shock and lifting the bow; and

(c) simultaneously peripherally enclosing the transom end of the tunnel with a foil forming a skirt extending substan-

VOL 1110 ISS 5 JA 30 1990 UMI

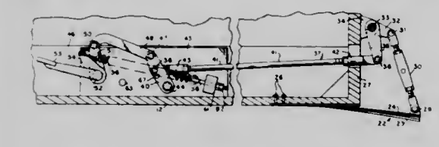
tially across said tunnel, so as to prevent air escaping and to compress said turbulence and thereby lift said transom.

4,896,622

ATTITUDE CONTROL APPARATUS FOR SPEEDBOATS

William E. Thomas, 7184 Teak Way, Alta Loma, Calif. 91701

Filed Mar. 15, 1989, Ser. No. 323,678
Int. Cl.[4] B63B *1/22*
U.S. Cl. 114—285 **10 Claims**



1. Apparatus for controlling the fore-and-aft attitude of a speedboat having a cavitation plate mounted thereon for swinging movement relative to the bottom of said boat, comprising:

a manually operable first control device;

first pivot means pivotally supporting said first control device;

control mechanism including a second control device for swinging said cavitation plate between an upper position and a lower position;

second pivot means pivotally supporting said second control device;

a link;

a first pivot connection between said link and said first control device;

a second pivot connection between said link and said second control device;

spring means urging said first control device to hold said cavitation plate in said upper position and to maintain said first pivot connection on one side of a plane passing through said first pivot means and said second pivot connection; and

said first control device being manually movable to move said first pivot connection to the opposite side of said plane and said cavitation plate to said lower position.

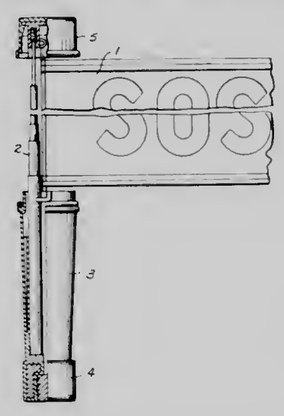
4,896,623

SIGNAL FLAG

Peter Seibert, and Kurt Schulzke, both of Hamburg, Fed. Rep. of Germany, assignors to Alboran Warenvertriebsgesellschaft mbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 117,870
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638697
Int. Cl.[4] G09F *17/00*
U.S. Cl. 116—173 **6 Claims**

1. A signal device comprising a staff having a signalling means carried thereon and a receiving case for the staff and signalling means, said staff being connected to said receiving case and being collapsible to a size for fitting in said receiving case with said signalling means carried on said staff, said signalling means including a visually significant means, said case having a foot portion with said foot portion having fastening means for affixing said foot to a support, said case having an opening at one end thereof and being conically shaped so as to taper from said one end toward said foot, said staff having telescoping sections with a base section connected to said foot of said case, said case having a central axis and said staff being disposed in said case eccentrically with respect to said central axis, said case including a cap and said staff having one end



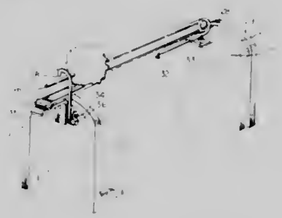
attached adjacent the foot of said case and an opposite end attached to said cap.

4,896,624

MAIL BOX SIGNAL APPARATUS

James R. Carnwath, 12024 86th Ave. N.W., Kirkland, Wash. 98034

Filed Mar. 22, 1989, Ser. No. 326,974
Int. Cl.[4] G09F *17/00*; B65D *91/00*
U.S. Cl. 116—303 **1 Claim**



1. Signal apparatus for use on a mailbox, said mailbox having a longitudinal axis, a top, an open end and a door at said open end, said door having a bottom edge and a top end and being hinged to said mailbox at said bottom edge so that when said door is opened said top end moves away from said top of said mailbox, said apparatus comprising:

a one piece spring having a base segment, a coil segment and an arm segment, said arm segment having a free end and a free position and an engaged position, said engaged position being essentially parallel to said top and said free position being at an angle to said top,

a hook having an eye segment, a shank segment and a hook segment,

a clip,

a first fastener,

a second fastener and

signal material, said signal material being attached to said arm segment near said free end,

said base segment of said spring being attached to said top of said mail box with said clip and said first fastener with said arm segment in a plane parallel to said longitudinal axis and said free end extending past said top end of said door,

said hook being attached to said door with said second fastener and located so that said hook segment can engage said free end of said arm segment,

whereby when said door is closed said free end of said arm segment can be engaged by said hook segment to hold said arm segment in said engaged position and when said door is opened said hook segment disengages from said free end and said arm segment moves to said free position.

4,896,625

DEVELOPING DEVICE

Koji Sakamoto; Toshio Kaneko, both of Tokyo; Wataru Yasuda, and Fuchio Kanno, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 39,686, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 906,396, Sep. 12, 1986, Pat. No. 4,674,439, which is a division of Ser. No. 466,928, Feb. 16, 1983, Pat. No. 4,625,676. This application May 31, 1988, Ser. No. 206,928
Claims priority, application Japan, Feb. 17, 1982, 57-19925; Jun. 3, 1982, 57-94051; Jun. 4, 1982, 57-94778; Jun. 16, 1982, 57-101965; Jun. 24, 1982, 57-93678
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—657 **10 Claims**



1. A developing device for developing an electrostatic latent image formed on an image bearing member using toner particles, comprising:

toner carrier means for carrying said toner particles along a predetermined path, a part of which defines a developing section where said electrostatic latent image is developed by said toner particles;

supplying means for supplying said toner particles to said toner carrier means;

pressure means disposed between said supplying means and said developing section in pressure contact with said toner carrier means for forming a thin film of toner particles which are charged to a predetermined polarity; and

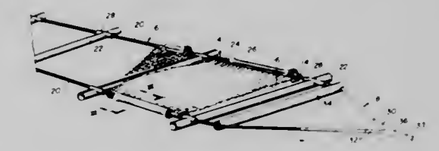
discharging means disposed downstream of said developing section but upstream of said supplying means for removing any excess remaining charge from those portions of said toner carrier means where said toner particles have been transferred to said image bearing member as a result of development at said developing section while keeping those toner particles which have not been used at said developing section carried on said toner carrier means, said discharging means being disposed at a position where said toner particles to be supplied to said toner carrier means is absent and in contact with said toner carrier means after development.

4,896,626

SHELLFISH CULTURE METHODS AND APPARATUS

John K. Holt; David E. Vaughan, and Roger L. Creswell, all of Ft. Pierce, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Filed Aug. 24, 1988, Ser. No. 235,516
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—4 **13 Claims**



1. Apparatus for the subtidal, cultchless cultivation of marine bivalve mollusks that comprises:

a plurality of individual quadrilateral, compartments connected together in the form of a continuous belt, each compartment formed by an upper and a lower section of mesh fabric defined by substantially parallel longitudinal edges and substantially parallel transverse edges,

said sections being releasably held together at said longitudinal edges and permanently at said transverse edges thereof leaving the remainder of said sections unconnected defining therebetween a mollusk culture chamber,

said belt including:

a pair of longitudinal cords, and

a plurality of tubular members spaced apart along and normal to the longitudinal axes of said cords holding said cords spaced apart and substantially parallel to each other,

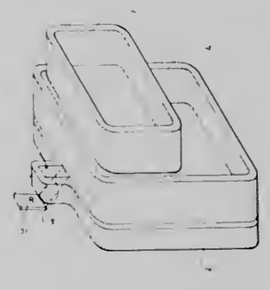
said sections of mesh fabric being releasably closed and clamped at their said longitudinal edges to said cords.

4,896,627

ANT PROOF PET DISH

Douglas C. Riddell, Harvey, La.

Filed Mar. 8, 1989, Ser. No. 320,393
Int. Cl.[4] A01K *39/04*
U.S. Cl. 119—51.5 **3 Claims**



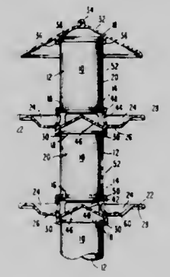
1. An ant proof pet dish, comprising:

a base receptacle having vertical sidewalls for retaining an insect inhibiting fluid, said base receptacle having an open top and forming an insect inhibiting moat;

an intermediate receptacle having vertical sidewalls and in open top for storing a quantity of drinking water for an animal, said intermediate receptacle overlying and supported in spaced relation slightly above said base recepta-

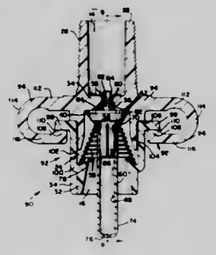
cle with said vertical sidewalls of said base receptacle and said intermediate receptacle disposed in alignment;
at least one upstanding post and cooperating socket securing said base receptacle and said intermediate receptacle in said overlying relation;
said intermediate receptacle covering an entire open top of said base receptacle to prevent pets from accessing fluid in said base receptacle;
an upper receptacle for retaining a quantity of food for an animal, said upper receptacle supported slightly above said intermediate receptacle; and
at least one upstanding post and cooperating socket securing said upper receptacle to said intermediate receptacle.

4,896,628
ANIMAL FEEDING DEVICE
Leo Kadunce, Langhorne, Pa., assignor to Self Seal Container Corp., Bridgeport, Pa.
Filed Apr. 27, 1988, Ser. No. 186,850
Int. Cl.[4] A01K *39/014*
U.S. Cl. 119—52.2 **18 Claims**



1. An animal feeding device being particularly usable as a bird feeder comprising:
(a) a food container defining a food reservoir therein and a food delivery opening adapted to release food downwardly from said food reservoir, said food container including a lower rim edge means and an upper rim edge means extending outwardly therefrom;
(b) a base member positioned below said food container and including a food trough for holding food therein for removal by feeding animals;
(c) a top member being engageable with respect to said upper rim edge means of said food container to facilitate protection thereof from undesirable environmental conditions;
(d) a food distribution coupling attached with respect to said base member, said food distribution coupling being adapted to be detachable with respect to said lower rim edge means of said food container for movably retaining same with respect to said base member to facilitate selective distribution of food from said food reservoir thereof into said feed trough, said food distribution coupling including:
(1) a food distribution chamber positioned below said food delivery opening of said food container being retained by said food distribution coupling, said food distribution chamber adapted to receive food from said food reservoir and supply same to move into said feed trough;
(2) food distribution port means in communication with said food distribution chamber and adapted to receive food therefrom for guiding movement of same into said food trough defined in said base member;
(3) a retaining ring means attached with respect to said base member and including a base retaining lip means being detachably engageable with respect to said lower rim edge means of said food container to secure same movably with respect to said retaining ring means, said base retaining lip means including two vertically adjacent inwardly extending engaging lip members to facilitate retainment of said lower rim edge means therein, said food container being specifically movable with respect to said base retaining ring means between a food retaining position extending across and closing said food distribution port means and a food supplying position for releasing of food downwardly through said food delivery opening into said food distribution chamber therebelow to allow movement of food through said food distribution port means into said food trough.

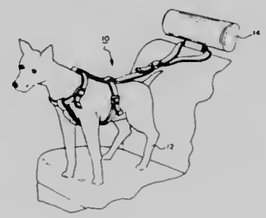
4,896,629
POULTRY WATERING VALVE
Dwight N. Johnson, Carlsbad, Calif., assignor to Aqua Drop Corporation, Carlsbad, Calif.
Filed Aug. 30, 1988, Ser. No. 238,538
Int. Cl.[4] A01K *7/06*
U.S. Cl. 119—72.5 **22 Claims**



1. A poultry watering valve comprising:
a housing including an inlet, an outlet and a flow path extending between said inlet and said outlet;
a valve seat surrounding said flow path;
an inlet bore extending upstream from said valve seat toward said inlet;
a valve member engageable with said valve seat to control flow in said flow path;
biasing means operatively engaged with said valve member for urging said valve member toward a closed position in engagement with said valve seat; and
a valve stem operatively engaged with said valve member for moving said valve member away from said valve seat to an open position;
the poultry watering valve being characterized by:
an elastomeric seal member captured in said housing between said valve seat and said outlet;
said valve member being defined on said seal member; and
said seal member including a restrictor pin portion extending upstream from said valve member through said inlet bore.

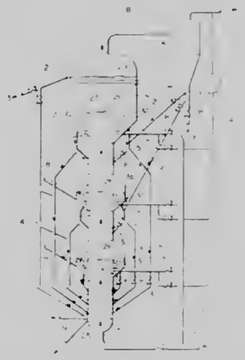
4,896,630
ANIMAL SAFETY SEAT BELT
Therese G. Luce, 311 Garden Ter., Pottawattomie Park, Michigan City, Ind. 46360, assignor to Therese G. Luce, Michigan City, Ind.
Filed Jun. 3, 1988, Ser. No. 202,781
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—96 **20 Claims**

1. An animal safety seat belt comprising:
an upper restraint of predetermined length having at least three upper attachment means for slidably attaching straps, said upper restraint adapted to be disposed adjacent the spine of the animal;
a lower restraint of predetermined length having at least three lower attachment means for slidably attaching straps, said lower restraint adapted to be disposed adjacent the stomach and chest of the animal;
a front strap including adjustable loop means for adjusting the circumference of a front loop, said front loop slidably attached to the most forward of said upper and said lower attachment means;
a rear strap including adjustable loop means for adjusting the circumference of a rear loop, said rear loop slidably attached to a rearward attachment means of said upper



restraint and a corresponding attachment means of said lower restraint;
securement means affixed to the rear of a restraint rearward of said rear strap for securing said restraint to a structural member of vehicle and for maintaining a relatively fixed distance between said front and rear straps when force is applied to said restraining means;
said restraints secured to the animal by said straps, whereby the animal is secured to structural member of said vehicle.

4,896,631
FLUIDIZED BED REACTOR
Ejler L. Holm, Gistrup, and Jens C. Clausen, Storvorde, both of Denmark, assignors to Aalborg Vaerft A/S, Aalborg, Denmark
Division of Ser. No. 870,977, Jun. 5, 1986, Pat. No. 4,788,919.
This application Jul. 12, 1988, Ser. No. 217,848
Claims priority, application Denmark, Jun. 13, 1985, 2688/85; May 23, 1986, 2425/86
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **15 Claims**



1. In a circulating fluidized bed reactor comprising:
a vertical reactor chamber,
a first inlet in a lower part of the reactor chamber for introduction of solid particle material and a second inlet in the lower part of the reactor chamber for introduction of fluidization gas,
an outlet conduit in an upper part of the reactor chamber for removal of reactor material, and
at least one further outlet conduit located between said first inlet and said outlet conduit for recirculation of solid particle material by continuous gravitational fall back to said lower part of the reactor chamber as at least one further inlet for solid particle material,
heat exchange means being provided in a space peripheral to the reactor and located above said lower part of the reactor chamber, said space having confinements forming an integral part of the reactor, said heat exchange means being arranged to provide for heat-exchanging contact with said recirculated solid particle material prior to said continuous gravitational fall of solid particle material to said lower part of said reactor chamber,
said at least one further outlet conduit interconnecting said space and said lower part of the reactor chamber for leading particle material directly without impediment from said space to said lower part of the reactor.

4,896,632
UNSYMMETRICAL FREE PISTON ENGINE
Anton Braun, 6421 Warren Ave., S., Minneapolis, Minn. 55435
Filed Oct. 10, 1985, Ser. No. 786,067
Int. Cl.[4] F02B *71/00*
U.S. Cl. 123—46 R **10 Claims**



1. A compact and substantially vibration free engine of the unsymmetrical free piston type for driving a compressor or other energy absorbing device comprising: a cylinder, support means for supportingo ne end only of said cylinder, first and second pistons in said cylinder with a combustion chamber therebetween, the first piston having a first rod extending through a first end of said cylinder, the second piston having a second rod extending through a second end of said cylinder and having a double rack thereon beyond said second cylinder end, a pair of spaced pinion gears beyond said second end with one each engaging one side each of said double rack, a pair of spaced and rigidly connected racks having one each of the connected racks engaging one each of said pinion gears, a drive shaft extending from one of said first or second rods for driving an energy absorbing device, and drive means located along the side of the cylinder and extending from said spaced racks to the rod beyond the opposite cylinder end so that as said pistons move apart each will exert a force on said drive shaft in the same direction.

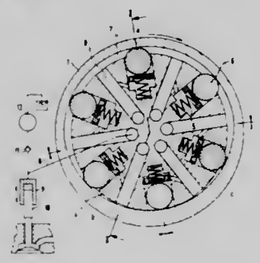
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4,896,633

VALVE CONTROL OF INTERNAL COMBUSTION ENGINES BY MEANS OF A ROTARY PISTON PUMP WITH UNEQUAL PUMPING OUTPUT

Ewald Junghans, Bergisch Gladbach, and Gabriel Tittizer, Roesrath, both of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 237,226
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728510
Int. Cl.[4] F04C *2/344*; F01L *9/02*
U.S. Cl. 123—90.12 **6 Claims**



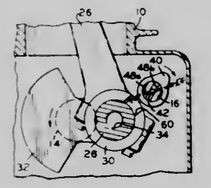
1. Rotary piston pump assembly, comprising a rotary piston pump having a housing with first, second and third sectors, a pump body with a plurality of radially displaceable pistons successively passing through said first, said second and said third sectors during one rotation, each two of said pistons enclosing a space therebetween forming an independent pumping chamber, and inlet and outlet means communicating with said pumping chambers, each of said pumping chambers having a pump output equal to zero during passage of said enclosing pistons through said first sector.

4,896,634

PHASE TIMED CAMSHAFT SPRAY LUBRICATION SYSTEM

Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jun. 5, 1989, Ser. No. 361,565
Int. Cl.[4] F01M *1/06*
U.S. Cl. 123—90.34 **21 Claims**



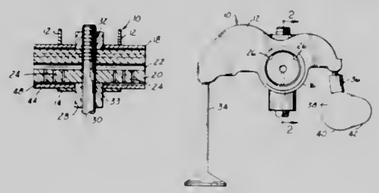
1. An internal combustion engine comprising:
a crankcase;
a crankshaft rotatably disposed within said crankcase;
a connecting rod having a bearing portion connected to a journal portion of said crankshaft, said bearing portion having a lubrication feed opening allowing oil to lubricate journal bearing surfaces of said crankshaft and said connecting rod;
a lubricating shaft rotatably disposed within said crankcase, said lubricating shaft having an axial bore and a spray means connected to said bore for spraying oil on said crankshaft; and
an oil pump means in communication with said bore for supplying pressurized lubricating oil to said bore;
said shafts configured such that during a portion of the rotation of said crankshaft when said shafts are closest in position, said spray means of said lubricating shaft is positioned facing said feed opening and oil is sprayed into said feed opening to lubricate the journal bearing surfaces.

4,896,635

FRICTION REDUCING ROCKER ARM CONSTRUCTION

Pierre A. Willermet, Livonia, and John M. Pieprzak, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 290,114
Int. Cl.[4] F01M *1/06, 9/10*
U.S. Cl. 123—90.36 **9 Claims**



1. A friction reducing engine rocker arm construction comprising a rocker arm having a longitudinally extending body, the body having an opening therein at least partially circular in shape and defined by an annular wall portion of the body, a fulcrum having a mating portion at least partially circular in shape, the fulcrum being rotatably mounted in the opening with a slight radial clearance space between the wall and fulcrum, cam means having a no-load base circle portion and a load contoured portion, the cam means being engageable with the body to pivot the same about the fulcrum, the cam means is under no-load condition when contact between the cam means and body is made on the base circle portion of the cam means, the cam means loads the body into contact with and against one side of the fulcrum, and lubricant inlet means to supply lubricant under pressure to the clearance space at a pressure level greater than the no-load force of the body against the fulcrum whereby the body is essentially continuously floated upon the fulcrum by means of a film of lubricant therebetween, a vent for the lubricant circumferentially spaced from the inlet means whereby loading of the body by movement of the cam means to a position providing contact between the cam means and body on the contoured portion of the cam means effects a squeezing of a portion of the lubricant from the clearance space while retaining a thin film of lubricant therein to reduce frictional resistance to rotation between the parts.

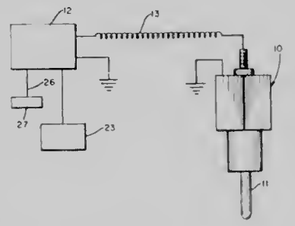
4,896,636

METHOD OF OPERATING I. C. ENGINES AND APPARATUS THEREOF

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Filed Feb. 17, 1989, Ser. No. 311,848
Int. Cl.[4] F02P *19/00, 23/02*
U.S. Cl. 123—145 A **19 Claims**

1. A method of operating an unthrottled internal combustion engine, said engine having a combustion chamber provided with an electrically heated catalytic glow plug, which method comprises:
(a) electrically heating an ignition catalyst comprising at least a major portion of the ignition surface of said glow plug to a temperature effective for vaporization of fuel drops and ignition of vaporized fuel;
(b) subsequently controlling said electrical heating to maintain said catalyst at operating temperature during operation of said engine, said operating temperature being at least about 75 degrees Kelvin below that value required for ignition with a noncatalytic glow plug of the same size and configuration as said catalytic plug; and



(c) igniting gas phase combustion of an admixture of fuel and air by contact of said admixture with said heated catalyst, said combustion resulting in a combustion wave in the immediate vicinity of top dead center.

4,896,637

POWER SUPPLY DEVICE FOR ELECTRICAL EQUIPMENT OF AN AUTOMOTIVE VEHICLE

Kyobei Yamamoto, Himeji City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1988, Ser. No. 280,464
Claims priority, application Japan, Dec. 15, 1987, 62-191053[U]
Int. Cl.[4] F02N *11/08*
U.S. Cl. 123—179 B **9 Claims**

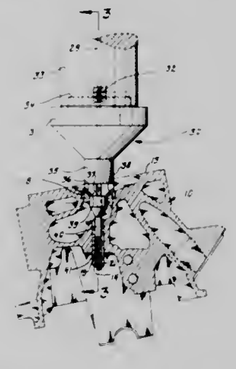
1. A power supply device for an electric device of an automobile having switching means for making and breaking an electric current supplied thereto, comprising:
a battery coupled across said electric device of an automobile having said switching means to supply a DC voltage thereto;
voltage raising circuit means, having an input terminal coupled to a terminal of said battery through a starting switch in series circuit relationship with the voltage raising circuit means, for outputting a DC voltage higher than said DC voltage of said battery;
a diode coupled in parallel circuit relationship with a series circuit of said starting switch and said voltage raising circuit means, a forward direction of said diode coinciding with a forward direction of said voltage raising circuit means;
constant voltage source means having an input terminal coupled to an output of said voltage raising circuit means for outputting a constant DC voltage;
control circuit means coupled to an output of said constant voltage source means to be supplied with said constant DC voltage for outputting a signal controlling a making and breaking of said switching means of said electric device of an automobile.

4,896,638

FABRICATING INTERNAL COMBUSTION ENGINE CYLINDER HEADS WITH CLOSE TOLERANCE INTERNAL SURFACES

Barry E. Shepley, Windsor, Canada, assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1988, Ser. No. 280,797
Int. Cl.[4] F01L *3/08*
U.S. Cl. 123—188 GC **14 Claims**



1. A method of fabricating a cylinder head for an internal combustion engine, comprising:
(a) forming a cast cylinder head with a passage having implanted in the walls of such passage a valve stem guide sleeve insert and a valve seat insert, said inserts being formed of fused powder metal and each having an internal cylindrical surface prepared to near net shape no longer requiring macroscale sizing; and
(b) microsizing both of said internal cylindrical surfaces by a single pass of a common rotary abrasive tool inflexible along its axis and supported for accurate alignment independent of said guide sleeve.

4,896,639

METHOD AND APPARATUS FOR ENGINE CONTROL AND COMBUSTION QUALITY DETECTION

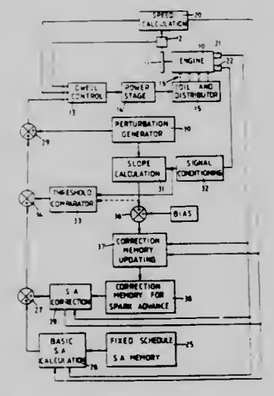
Michael Holmes, Solihull, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Dec. 9, 1987, Ser. No. 130,620
Claims priority, application United Kingdom, Dec. 9, 1986, 8629346
Int. Cl.[4] F02P *5/15*; F02D *41/26*
U.S. Cl. 123—419 **40 Claims**

1. An engine control and combustion quality detection system for an internal combustion engine having at least one control input, said system comprising:
means for establishing a base value for a first one of said at least one control input;
perturbations means for periodically perturbing said first control input about said base value;
a sensor for sensing an engine parameter representing combustion quality and providing an output representing said engine parameter; and
slope calculation means, receiving said output from said sensor when said perturbation means perturbs said first

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control input about said base value, for determining a slope of said output from said sensor with respect to perturbations in said first control input indicating combustion quality of said engine.



4,896,640

LOAD SETTING DEVICE

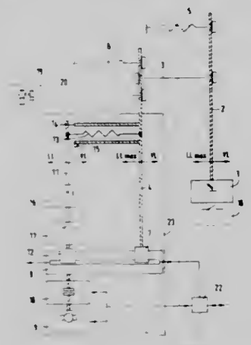
Manfred Pfalzgraf, Frankfurt am Main, and Gerd Hickmann, Kirchen, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,989

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724338; May 7, 1988, 3815734

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—399 **17 Claims**



1. A load setting device for an internal combustion engine of a vehicle, the engine having a setting member which establishes the power of the engine, the device comprising

a control element for acting on the setting member;

a driver, an accelerator pedal, an electric actuator, an electronic control device, and a desired-value detection element, the control element being connected to the driver coupled to the accelerator pedal and being furthermore movable by means of the electric actuator; and wherein

the desired-value detection element is operative with said driver, the setting device including an acutal-value detection element which cooperates with said desired-value detection element and acts on the electric actuator, the actuator being controllable as a function of signal values detected by the electronic control device; and wherein said device further comprises:

a stop located on the driver;

a coupling spring which interconnects the driver and the control element;

means for biasing the control element in a direction towards said stop of the driver;

a coupling spring; and wherein

the driver, the coupling spring, the control element, the desired-value detection element and the actual-value detection element form a single structural unit.

4,896,641

IGNITION TIMING CONTROL DEVICE OF INTERNAL COMBUSTION ENGINE

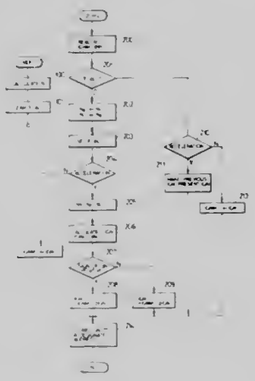
Masami Nagano; Takeshi Atago; Junji Miyake, and Masahide Sakamoto, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1988, Ser. No. 207,540

Claims priority, application Japan, Jun. 17, 1987, 62-149226

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—422 **8 Claims**



1. An ignition timing control device for an internal combustion engine having first means for calculating an ignition timing correction amount on the basis of a variation amount of a rotational speed of an engine and second means for effecting a modification of a basic ignition timing on the basis of the ignition timing correction amount calculated by said first means during a period after an engine is subjected to acceleration control,

wherein said first means includes control means for executing a detection processing of said rotational speed of said engine and a calculation processing of said ignition timing correction amount, independently of each other, in such a manner that the detection processing is executed periodically in synchronization with revolution of said engine, while the calculation processing is executed periodically at a predetermined fixed rate independent of said rotational speed of said engine, and so that said ignition timing correction amount calculated in each calculation processing period is used by said second means until a next detection processing of the rotational speed of said engine is performed.

4,896,642

CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

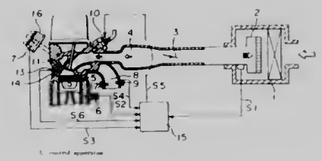
Shoichi Washino, and Satoru Ohkubo, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,211

Claims priority, application Japan, Sep. 29, 1987, 62-246559; Sep. 29, 1987, 62-246560

Int. Cl.[4] F02P *5/04*

U.S. Cl. 123—435 **13 Claims**



1. A control apparatus for a spark ignition type integral combustion engine adapted to measure an intake air quantity and an engine revolution number, to calculate a basic fuel injection quantity by taking account of the intake air quantity and the engine revolution number and to inject fuel on the basis of a signal of the basic fuel injection quantity, which comprises:

a pressure detecting means to detect an inner pressure of at least one cylinder P,

a crank angle detecting means to detect a crank angle θ of the engine, and

a control device having means for receiving the output signals of said pressure detecting means and said crank angle detecting means for determining the maximum inner pressure of said cylinder P_{max} in a single ignition cycle and the crank angle at the time of the maximum inner pressure θP_{max} taking place, means for calculating a temperature of a cylinder T as a function of the maximum inner pressure P_{max} and the crank angle θP_{max} at said pressure P_{max}, means for outputting a control signal for controlling fuel on the basis of the calculated temperature T at the pressure P_{max}, and means for operating an engine control variable depending on said control signal.

4,896,643

METHOD AND ARRANGEMENT FOR CONTROLLING THE FUEL/AIR RATIO OF AN INTERNAL COMBUSTION ENGINE

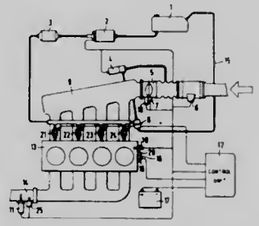
Thomas Blümel, Schnitten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,679

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740268

Int. Cl.[4] F02D *41/14, 41/26*

U.S. Cl. 123—489 **11 Claims**



1. A method for controlling the fuel/air ratio of an internal combustion engine with an oxygen measurement probe located in the exhaust pipe of the internal combustion engine, wherein an output voltage of the probe is employed for controlling the fuel/air ratio, the method including steps of

comparing the output voltage of the probe to threshold values of probe voltage;

controlling the threshold values as a function of extreme values of the probe output voltage;

determining data of extreme values of the probe output voltage;

storing the threshold values in a nonvolatile memory; and

feeding data which has been obtained by a determination of the extreme values of the output voltage to the nonvolatile memory as addresses for a reading of stored threshold values.

4,896,644

SYSTEM AND METHOD FOR CONTROLLING A FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE

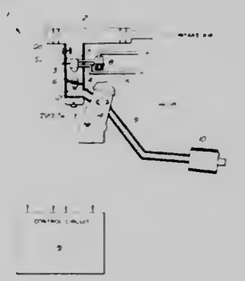
Hirohisa Kato, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jan. 29, 1988, Ser. No. 150,258

Claims priority, application Japan, Jan. 30, 1987, 62-21365

Int. Cl.[4] F02D *41/10*

U.S. Cl. 123—492 **19 Claims**



1. A system for controlling a fuel supply to an internal combustion engine, comprising:

(a) first means for monitoring engine operating conditions;

(b) second means for determining whether the engine presently falls in a predetermined deceleration condition on the basis of the engine operating conditions monitored by the first means and cutting the fuel supply off when it is determined that the engine presently falls in the predetermined deceleration condition;

(c) third means for calculating a basic fuel quantity to be supplied to the engine on the basis of the engine operating conditions detected by the first means and correcting the basic fuel quantity according to a fuel recovery increment quantity when the fuel supply recovery is started after the fuel supply cut-off is carried out by the second means so as to derive a final fuel quantity supplied to the engine;

(d) fourth means for deriving an engine load immediately before the fuel supply cut-off is carried out from the engine operating conditions detected by the first means;

(e) fifth means for counting a first duration of time during which the fuel supply cut-off is carried out;

(f) sixth means for deriving a residual quantity of the supplied fuel remaining on a wall of an intake air passage of the engine at a time immediately before the fuel supply cut-off is started on the basis of the engine load immediately before the engine fuel cut-off is carried out derived by the fourth means;

(g) seventh means for deriving and setting the the fuel recovery increment quantity on the basis of the residual fuel

quantity and the first duration of time counted by the fifth means; and

(g) eighth means for supplying the final fuel quantity derived by the third means to the engine.

4,896,645

FUEL PUMPING APPARATUS

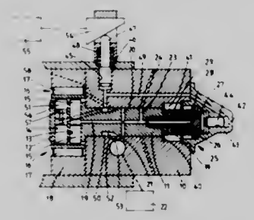
James C. Potter, London, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Aug. 4, 1989, Ser. No. 389,487

Claims priority, application United Kingdom, Oct. 11, 1988, 8823846

Int. Cl.[4] F02M *39/00*; F02B *19/02*

U.S. Cl. 123—506 **8 Claims**



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine, comprising a plunger mounted in a bore, a cam for imparting inward movement to the plunger, an outlet through which fuel can flow during inward movement of the plunger, the outlet being connected in use to a fuel injection nozzle, means for feeding fuel to the bore to effect outward movement of the plunger and a spill valve operable to spill fuel from the bore during inward movement of the plunger to determine the amount of fuel supplied through said outlet characterised in that said spill valve includes a spill valve member which is biased to the closed position, a first piston slidable within a first cylinder, the first piston being operatively connected to said spill valve member whereby when the pressure in the first cylinder attains a predetermined value the spill valve member will be moved to the open position, a second piston slidable in a second cylinder, the first and second cylinders being in communication with each other, spring means biasing said second piston against the action of fluid pressure in said cylinders, adjustable stop means for limiting the movement of said second piston against the action of the spring means, and a further plunger operable in synchronism with said first mentioned plunger a further bore in which said further plunger is mounted, the further bore communicating with said cylinders whereby during inward movement of said plungers the first mentioned plunger will deliver fuel to the outlet and the further plunger will deliver fluid to said cylinders, the fluid displaced by said further plunger being initially absorbed by movement of said second piston until its movement is halted by said stop means whereupon the fluid pressure in said first cylinder increases to at least said predetermined value and the spill valve member is moved to the open position to terminate delivery of fuel through said outlet.

4,896,646

AUTOMATED FEEDER FOR A BALL PROPELLING MACHINE

Edward W. Kabelin, and Thomas C. Kabelin, both of 3921 Kitten Cir., Hamilton Beach, Calif. 92649

Filed Nov. 18, 1988, Ser. No. 272,827

Int. Cl.[4] F41B *15/00*

U.S. Cl. 124—51 R **13 Claims**

1. An automated feeder for connection between a source of balls and a ball propelling machine including:

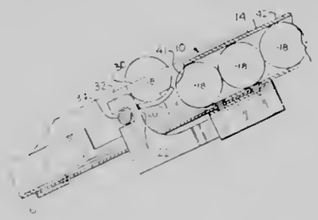
a chute for guiding balls from the source of balls to the ball propelling machine having:

an upper end for connection to the source of balls; and

a lower end for connection to the ball propelling machine;

a blocker positioned in said chute to obstruct movement of balls through said chute; and

means to lift a ball being obstructed by said blocker over said blocker so that the ball can continue through said chute out said lower end to the ball propelling machine, said blocker including:



an upstanding linear abutment surface positioned to engage a ball moving through said chute;

a radius surface connected to said upstanding linear abutment surface; and

an upper surface connected to said radius surface, said means to lift a ball being obstructed by said blocker over said blocker lifting the ball up said upstanding linear abutment surface, along said radius surface, and along said upper surface before release out said lower end to the ball propelling machine.

4,896,647

CUTTING TOOL SYSTEM FOR CUTTING STONE AND METHOD OF CUTTING SAME

Frank Valva, Saxon on the Bay, Bay Shore, N.Y. 11706, and Gene Kirshak, 106 Oleeta Rd., Mt. Sinai, N.Y. 11766

Filed Mar. 22, 1989, Ser. No. 326,985

Int. Cl.[4] B28D *1/04*

U.S. Cl. 125—14 **13 Claims**



1. A cutting system for cutting a heavy slab comprising:

a substantially flat member, having a plurality of apertures;

means for supporting said flat member in a fixed and substantially horizontal position;

a plurality of rollers extending in an upward direction and extending through said plurality of apertures of said substantially flat member in order to protrude therefrom and be able to support the slab above said substantially flat member so as to permit manipulations of said slab above said member; and,

means for supporting said plurality of rollers in a fixed relationship relative to said plurality of apertures of said substantially flat horizontal member, said support means comprising a hinged support structure such that said rollers are disposed upon the support structure and are elevated by means of raising and lowering the hinged support structure so as to protrude through the apertures.

4,896,648

GUIDE RAIL AND LINK CHAIN FOR CHAIN SAW

Willi Boller, Agasul-Illnau, Switzerland, assignor to Gamma Stawag AG, Rumlang, Switzerland

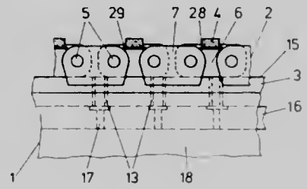
PCT No. PCT/CH87/00144, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/04602, PCT Pub. Date Jun. 30, 1988

PCT Filed Oct. 20, 1987, Ser. No. 257,307

Claims priority, application Switzerland, Dec. 23, 1987, 05208/86

Int. Cl.[4] B28D *1/08*

U.S. Cl. 125—21 **7 Claims**



1. Guide rail and link chain for a chain saw for the finishing of concrete, stone and masonry, wherein coolant channels extend through the guide rail and cutting plates are connected with chain members of the link chain, with the distinction that the guide rail (1) includes plastic slide rails (3) on both lengthwise sides, the chain (2) is guided by and contacts these plastic slide rails (3) only, the chain (2) includes pairs of side guide members (7, 8), and each of the side guide members (7, 8) overlaps and lies against a respective outer side surface (11, 12) of the slide rail (3), each pair of side guide members (7, 8) is interconnected through a link (5) and by metal slide elements (6), a sliding surface (9) of each slide element (6) is supported by the outer surface (15) of the slide rail (3) and the cutting plates (4) are located on a side (10) of the slide element (6) opposite from the guide rail (1).

4,896,649

DEVICE FOR BREAKING OFF TIPS OF AMPULES

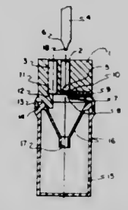
Horst Rabenecker, Stockelsdorf, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellscaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,378

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727782

Int. Cl.[4] B28D *1/32*

U.S. Cl. 125—23 R **16 Claims**



1. A device for opening breakable tubular ampules having a closed end which may be removed after being scored, comprising:

ampule receiver means for receiving the ampule closed end;

a scoring tool associated with said ampule receiver;

stop means associated with said ampule receiver for engaging the ampule adjacent the ampule closed end and for positioning the ampule closed end relative to the scoring tool to prevent advancement of said ampule in said ampule receiver and to allow rotation of said ampule to allow scoring of said ampule by said scoring tool; and

scored ampule receiving means for receiving a scored ampule end being inserted into said scored ampule receiving means in a first axial direction,

scored ampule breaking means positioned adjacent said scored ampule, said second ampule breaking means for breaking the scored ampule end upon movement of said scored ampule end into said scored ampule receiving portion a predetermined distance in said first axial direction, whereby the ampule with an open end is removable from said scored ampule receiving end in a second axial direction.

4,896,650

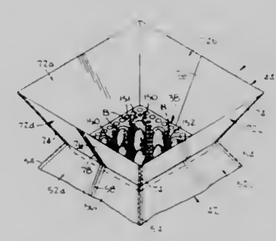
COOKING UNIT WITH IMPROVED FIRE GRATE

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Redmond, Oreg.

Continuation of Ser. No. 143,618, Nov. 13, 1988, Pat. No. 4,829,975. This application Jan. 9, 1989, Ser. No. 294,367

Int. Cl.[4] F24C *1/16*

U.S. Cl. 126—9 R **6 Claims**



1. A fire grate for cooking unit using a briquette having a narrow edge and a vertical orientation comprising a planar member having an enclosed opening surrounded by an endless wall formed to receive said narrow edge of the briquette and to support said briquette in vertical orientation, said member comprising at least one opening for exposing the briquette to combustion air or gas.

4,896,651

PORTABLE, COLLAPSIBLE COOKING GRILL

Mel H. Kott, Jr., 421 E. Harrison, Harlingen, Tex. 78550

Filed May 3, 1989, Ser. No. 347,513

Int. Cl.[4] F24B *3/00*

U.S. Cl. 126—30 **13 Claims**

1. A portable, collapsible grill assembly comprising:

a detachable grill;

a grill support post comprising:

means for supporting the detachable grill; and

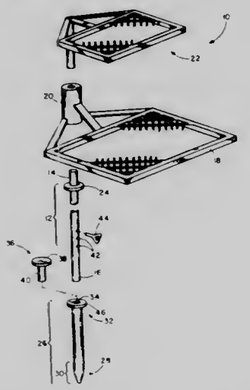
means for engaging and being supported by an elongated spud supporting comprising:

a first end having a tapered portion to be driven into the ground; and

a second end having companion means for engaging and supporting the grill support post, where the second end additionally comprises a flange oriented normal to and encircling the elongated spud support; and

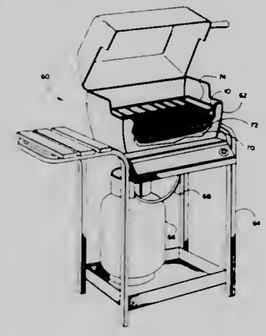
a driver tool comprising:

means for temporarily engaging the elongated spud support at the second end; and



an impact head to be struck when the tool has engaged the elongated spud support to drive the elongated spud support into the ground by the first end thereof.

4,896,652
CELLULAR BASE FOR A GRILL
Robert A. Geiter, Lawrenceville, Ga., assignor to Applied Ceramics, Inc., Doraville, Ga.
Continuation of Ser. No. 886,302, Jul. 16, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 271,417
Int. Cl.[4] A47J *37/00*; F24C *3/00*
U.S. Cl. 126—41 R **14 Claims**



1. A cellular base for use in a heating apparatus including a heat source and a surface to be heated, comprising:
a base member formed of a ceramic material defining a plurality of adjacent openings in a honeycomb-like fashion to permit the passage of air through said base member, the density of said openings ranging from 16 openings per square inch to less than 100 openings per square inch; and
means for mounting said base member intermediate of said heat source and said surface to be heated whereby heated air is drafted from said heat source across the surface of the base member to radiate an even distributioo of heat to said surface to be heated.

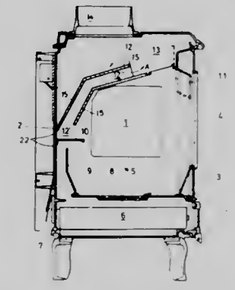
4,896,653
COOKING FUEL CAN CLOSURE
Alan Eke, Menomonie; Brent English, Eau Claire; Marc Kurger, Wausau, and Charles E. Yost, Menomonie, all of Wis., assignors to Manufacturing Laboratory, Menomonie, Wis.
Filed Feb. 8, 1989, Ser. No. 307,751
Int. Cl.[4] F23D *3/24*
U.S. Cl. 126—45 **9 Claims**



1. A cooking fuel can comprising:
a bottom wall, a side wall, and a top wall closure defining therebetween a cooking fuel receiving chamber, said top wall closure having a central aperture and a plurality of peripheral apertures defined therethrough, said central aperture and said peripheral apertures communicating with said cooking fuel receiving chamber;
a cooking fuel disposed within said cooking fuel receiving chamber; and
a peelable sheet-like seal secured to the upper surface of said top wall closure, peripherally of said central aperture so as to define a fluid tight closure for said central aperture.

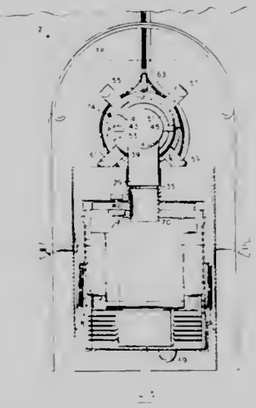
4,896,654
POLLUTION NEUTRALIZING WOODBURNING STOVE
Claude Berlaimont, Couvin, Belgium, assignor to Fonderies Du Lion S.A., Frasnes-lez-Couvin, Belgium
Filed Feb. 8, 1988, Ser. No. 153,378
Claims priority, application Belgium, Mar. 3, 1987, 08700199
Int. Cl.[4] F24C *1/16*; F23B *5/00*
U.S. Cl. 126—58 **6 Claims**

1. A solid fuel stove, capable of neutralizing polluting elements of burnt gases which comprises, a combustion space delimited by essentially vertical walls, including two lateral walls, a front wall and a rear wall, and a top wall and a bottom wall; a grate on the bottom wall; and a postcombustion chamber in the combustion space that extends obliquely forward and upwardly from a region of the rear wall substantially midway between said top and bottom walls over the burning fuel and through the combustion space, said postcombustion chamber having an inlet located within said region, and further including an inwardly facing horizontal deflector projecting into the combustion space from the rear wall adjacent said inlet to the postcombustion chamber, the deflector being positioned to direct heated burnt gases up the postcombustion chamber and to circulate cooler gases in the combustion space below the deflector, said postcombustion chamber defining a compulsory passage so that burnt gases are heated to a high temperature



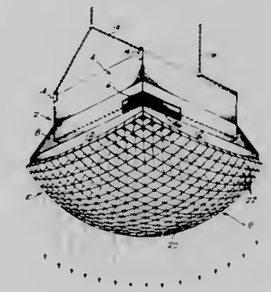
level by the burning fuel, said burnt gases circulating in said combustion space from the bottom wall to the top wall thereof and between the two lateral walls of the combustion space.

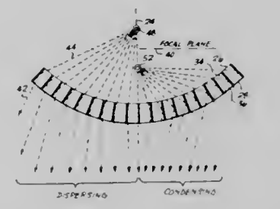
4,896,655
VERSATILE HEATER FOR UNDER-BLANKET HEATING, TENT HEATING, AND FOOD HEATING
Charles L. Urso, 215 Newton St., Waltham, Mass. 02154
Filed May 17, 1988, Ser. No. 194,837
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—59 **7 Claims**



1. A portable heater comprising:
a heat source;
a hollow exhaust guide connected in gaseous communication with the heat source, the guide having an outer end portion which includes an opening, the guide being positioned relative to the heat source for passing the guide through a tent wall opening such that the outer end portion is outside of the tent while the heat source is inside of the tent;
a weather flange having front and rear surfaces which at least partially surround the exhaust guide so that the flange surfaces can be positioned adjacent the wall opening to inhibit the passage of ambient air through the wall opening; and
a bipod positioned adjacent the flange front surface for standing the bipod outside of the tent to support the exhaust guide and flange wherein the flange protects the wall opening against outside weather.

4,896,656
LENS-LIKE RADIANT ENERGY TRANSMISSION CONTROL MEANS
Roger N. Johnson, Mercer Island, Wash., assignor to Radiant Optics, Inc., Seattle, Wash.
Continuation of Ser. No. 943, Jul. 14, 1986, Pat. No. 4,841,947, which is a continuation of Ser. No. 755,760, Jul. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,134, Aug. 31, 1984, abandoned. This application Jun. 5, 1989, Ser. No. 349,162
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—92 B **30 Claims**





1. In combinatin, a source of radiant energy, and control means interposed on a source axis of transmission between the radiant energy source and an area to be irradiated, to control the transmission of the radiant energy in the manner of a lens, said control means comprising an array of radiant energy transmissive cells that are arranged about the source axis of transmission, with a first face of the array facing toward the radiant energy source and a second face of the array facing toward the area to be irradiated, each cell having four reflective, generally planar, interior sidewall surfaces, each sidewall surface being arranged generally orthogonal to each of the adjacent sidewall surfaces about a cell axis of transmission, the sidewall surfaces defining a pair of opposed radiant energy transmissive ends aligned along the cell axis of transmission, with one cell end at the first arary ace and the other cell end at the second array face, each of the cells having its axis of transmission angularly oriented relative to the source axis of transmission by an amount varying from one side to an opposite side of the array so that the radiant energy received in the cell from the radiant energy source through the radiant energy transmissive end at the first array face is reflected off the cell sidewall surfaces and out the radiant energy transmissive end at the second array face at a desired prefetermined angle relative to the source axis of transmission to produce a desired predetermined radiant energy distribution pattern on the area to be

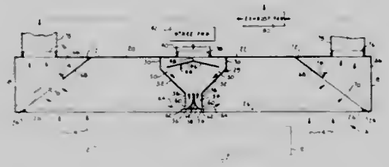
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irradiated, the array producing a focal point on the source axis of transmission spaced from the first array face such that when the source of radiant energy is shifted along the surce axis of transmission to one side or the other of the focal point, the radiant energy distribution pattern imaged on the area to be irradiated is changed to a more or less intensified pattern thatn the radiant energy source alone would provide by direct transmission to the area.

4,896,657
EXHAUST HOOD SYSTEM AND METHOD FOR PIZZA OVENS

Joseph T. Glassman, 303 W. 38th St., Hays, Kans. 67601

Filed May 25, 1989, Ser. No. 356,765
Int. Cl.[4] F24C *15/20*
U.S. Cl. 126—299 D **20 Claims**

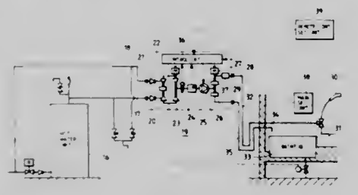


1. An exhaust system for a pizza oven, comprising:
an overhead hood mounted above the pizza oven, said hood having opposite sides;
an air intake plenum in said hood at a location between said opposite sides of the hood, said intake plenum presenting a pair of elongated slots oriented to direct air from said plenum toward the respective opposite sides of the hood;
a pair of exhaust openings in said hood for discharging air therefrom, said openings being located adjacent the respective opposite sides of the hood;
exhaust fan means for drawing air through said exhaust openings; and
intake fan means for forcing outside air into said intake plenum and through said slots in a pair of air streams traveling at a relatively high velocity to induce heat and vapor from the oven into the air streams and out through said exhaust openings.

4,896,658
HOT WATER SUPPLY SYSTEM

Hiroaki Yonekubo, Kyoto; Yasuo Kidouchi, Yamatokoriyama; Yasukiyo Ueda, Nara, and Munehiko Tokumoto, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1988, Ser. No. 202,576
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—362 **10 Claims**

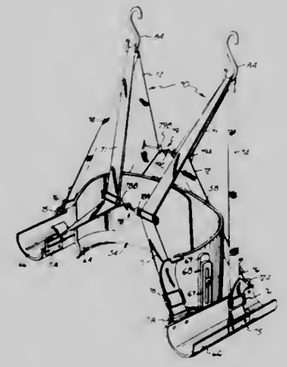


1. A hot water supply system comprising:
(a) means for adjusting a temperature of water supplied to the temperature adjusting means from a hot water line and a cold water line, wherein the temperature adjusting means includes a mixing valve mixing hot water and cold water supplied thereto at an adjustable ratio;
(b) a plurality of outlets receiving water from the temperature adjusting means and connected to water supplied objects;
(c) a change-over valve means interposed between the temperature adjusting means and the outlets for selecting one of the outlets and supplying the water to a selected target outlet;
(d) an outlet setting unit means connected to the changeover valve means for determining the target outlet selected from the outlets;
(e) a temperature setting unit means connected to the mixing valve for determining a target temperature; and
(f) a control unit means for controlling the change-over valve means and the temperature adjusting means in accordance with the selected target outlet to attain the target temperature, wherein the control unit controls the temperature adjusting means and thereby controls the temperature of water in accordance with which of the outlets is selected by the change-over valve means, wherein the control unit means includes means for predetermining different target temperatures corresponding to the respective target outlets, the target temperatures being in present individual ranges of the temperature of the water, and means for controlling the temperature adjusting means on the basis of the target temperature which corresponds to the selected outlet and which is in the preset individual range of the temperature of the water such that the target temperature at each location of said selected outlet cannot of exceeded by the actual temperature be water supplied to that outlet.

4,896,659
GRAVITY LUMBAR TRACTION DEVICE

Gary D. Goldish, Golden Valley, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 922,665, Oct. 24, 1986, abandoned. This application Sep. 1, 1987, Ser. No. 91,845
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—75 **16 Claims**



1. A gravity lumbar traction device including a vest for supporting a user, which vest engages the thorax of the user for supporting the user, a pair of arm supports supported on the vest in position for a user to partially support weight on forearms supported on the arm supports, and a plurality of straps adapted to be supported at an external support and attached to the vest through the arm supports only and arranged such that at least one strap supports edges of each of the arm supports spaced from the user to react loads on the vest caused by supporting a user in direction to tend to prevent lower edges of the vest from pressing inward against the user when the user is supported.

4,896,660
ARM ELEVATOR SUPPORT DEVICE

James W. Scott, P.O. Box 7630, Tifton, Ga. 31794

Filed Sep. 16, 1988, Ser. No. 245,344
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—77 **21 Claims**

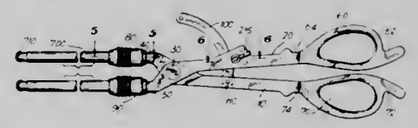


1. An arm elevation support device for recuperative support following rotator cuff surgery, humeral head or shaft fracture correction, or the like comprising:
a generally monolithic humerus support having,
a first proximal surface operable to abut against a patient's side,
a second surface operable for underlying and supporting the humeral portion of a patient's recuperative arm, and
a third distal surface substantially parallel in operation to said first proximal surface and extending at approximately a forty-five degree angle with respect to said second surface;
a contoured well shoulder anchor having,
a contoured sleeve portion operable to be worn around the acromial region of a patient's well arm and shoulder and extend in supporting contact about the deltoideus and deltoid regions of a patient's well arm and shoulder,
a first step connected to an anterior segment of said contoured well shoulder anchor, and
extending across a patient's upper torso and being releasably connected to an anterior portion of said monolithic humerus support, and
a second trap connected to a posterior segment of said contoured well shoulder anchor and extending across a back portion of a patient's torso and being releasably connected to a posterior portion of said monolithic humerus support wherein the shoulder region of a patient's opposing well arm operably provides support for said generally monolithic humerous support positioned on an opposite side of a patient's body for underlying and supporting the patient's recuperative arm; and
a radius and ulna support releasably connected to said third distal surface of said monolithic humerus support for recuperatively supporting a hand and foreman of a patient.

4,896,661
MULTI PURPOSE ORTHOPEDIC RATCHETING FORCEPS

Roy Bogert, Lincoln Park, N.J.; Michael W. Chapman, Sacramento, Calif.; Charles C. Edwards, Baltimore, Md., and Dana C. Mears, Pittsburgh, Pa., assignors to Pfizer, Inc., New York, N.Y.

Filed Feb. 5, 1988, Ser. No. 152,455
Int. Cl.[4] A61B *17/18, 17/28*
U.S. Cl. 606—86 **3 Claims**



1. A forceps device comprising:
(a) a first elongate arm having a hand grip portion at a proximal end;
(b) a second elongate arm having a hand grip portion at a proximal end;
(c) said first and second arms being joined at a pivot point to form opposing co-planar jaw portions at their distal ends;
(d) said jaw portions being adapted to removably secure interchangeable tip portions;
(e) said first arm having a ratchet toothed member secured thereto intermediate said pivot point and said hand grip portion;
(f) said second arm having a multiposition pawl mechanism positioned to engage said ratchet toothed member such that in one position of said pawl, said arms pivot to ratchet open said jaw portions, in a second position of said pawl, said arms pivot to ratchet closed said jaw portions and in a third position, said pawl is disengaged from said ratchet toothed member, whereby suitable tip portions are ratcheted to compress or distract a work piece.

4,896,662
SEALING DEVICE FOR INTRODUCING CEMENT INTO A BONE CANAL

Philip C. Noble, Houston, Tex., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,451
Int. Cl.[4] A61B *17/56*
U.S. Cl. 606—94 **24 Claims**



1. Apparatus for introducing cement into a bone canal through an opening in the bone, comprising:
(a) body member having a passageway of predetermined cross-section extending therethrough for passage of cement;
(b) generally annular wall member extending from said body member and defining an outer surface at least a portion of which is elastically expandable and is configured and

dimensionec so as to be capable of extending into the bone canal, said outer surface adapted to provide a contacting seal along a length of the inner walls of the bone canal; and

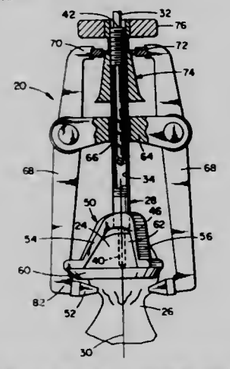
(c) chamber defined by said annular wall emmber, said chamber having a cross-section greater than said predetermined cross-section of said passageway and communicating with said passageway and relatively stationary with said bone canal such that cement, upon its introudction into said bone canal, will also fill said chamber and cause said elastically expandable portion of said annular wall to expand so as to aid in maintaining said seal.

4,896,663

SELF CENTERING FEMORAL DRILL JIG

Mark V. Vandewalls, Pierceton, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Oct. 14, 1988, Ser. No. 258,018
Int. Cl.[4] A61B *17/56*
U.S. Cl. 606—79 **5 Claims**



1. A hand-held drill jig for locating and maintaining a central axis through a head and an associated neck of a femur enabling a drill hole to be formed in the femoral head oriented to said central axis comprising:

guide means having a bore with a longitudinal axis for guiding movement from a superior position of a drill bit oriented to said central axis toward and into cutting engagement with the femoral head; and

positioning means engageable with the femur at spaced locations for rendering said guide means immobile relative to the femur and for aligning the longitudinal axis of said guide means relative to said central axis, said positioning means including:

head positioning means mounted on said guide means engageable at spaced locations with the outer peripheral surface of the femoral head; and

neck positioning means mounted on said guide means engageable at spaced locations with the outer peripheral surface of the femoral neck;

said head and said neck positioning means jointly causing said longitudinal axis to be oriented with said central axis when said head positioning means is engaged with the outer peripheral surface of the femoral head and when said neck positioning means is engaged with the outer peripheral surface of the femoral neck.

4,896,664

SNORKEL

Chiharu Harayama, Atsugi, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

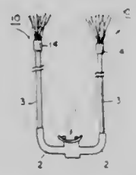
Filed Apr. 4, 1989, Ser. No. 333,522
Claims priority, application Japan, Apr. 7, 1988, 63-47063
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—200.25 **6 Claims**

1. A snorkel comprising:

(a) a mouthpiece portion, including a check valve;

(b) a breathing tube extending outwardly from said mouthpiece portion; and

(c) capping the outward end of said breathing tube a multiplicity of porous tubes which are impermeable to water but permeable to gases, said tubes being sealed at one end and gathered together at the other end of each tube to



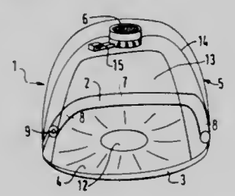
form an integral unit, said unit being inserted in or affixed to said breathing tube in an airtight manner.

4,896,665

RESPIRATORY PROTECTION HOOD AND SAFETY EQUIPMENT FOR AIRCRAFT

Pierre P. Gervais, Seyssins, France, assignor to l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 3, 1988, Ser. No. 252,137
Claims priority, application France, Oct. 2, 1987, 87 13610
Int. Cl.[4] A62B *7/10, 17/04, 18/00*
U.S. Cl. 128—201.25 **16 Claims**



15. A hood for respiratory protection comprising a fluidtight flexible cover for covering the head of a user and having a base provided with a shape-maintaining device which is closed onto itself for being placed, in service, around the neck of the user, a reserve of oxygen under pressure, means for putting the interior of the reserve in communication with the interior of the cover, and flexible sealing means for connecting the hood to the neck of the user, at least a part of said shape-maintaining device comprising a deformable means which is capable of assuming selectively a convex shape and a concave shape, said shape-maintaining device further comprising a substantially C-shaped tube constituting said reserve of oxygen, the tube having two end portions which are interconnected by said deformable means, said deformable means, in said concave shape, being withdrawn within the confines of the C-shaped tube.

4,896,666

FACE MASK ASSEMBLY AND PACIFIER

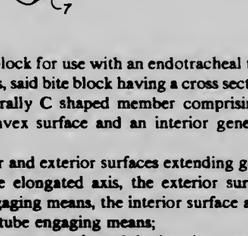
Allen J. Hinkle, Hardy Hill Rd., Lebanon, N.H. 03766

Continuation of Ser. No. 688,611, Jan. 3, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,563
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—202.13 **16 Claims**

1. An assembly for use in inducing anesthetic gas, said assembly comprising, in combination:

face mask means for extending over at least the nose and mouth of a wearer of said face mask so as to (a) tightly contact the face of the wearer in order to define a confined air space between said face mask means and the face of the wearer, (b) prevent the accumulation in said confined air space of an unacceptably large quantity of air exhaled by the wearer, and (c) permit the anesthetic gas to be introduced into the confined air space, said face mask means including an opening adapted to receive the gas;

an elongated, integrally-formed pacifier element including an orifice at one end thereof, a hole at the other end thereof and a passageway extending through said element from said orifice to said hole, and means for selectively attaching said pacifier element to said face mask means, so



that said pacifier element is adapted to be inserted into the mouth of the wearer so as to occupy a substantial portion of the anatomical space of the oropharynx and depress the tongue of the wearer, and adapted to transmit gas received at said opening of said face mask means through said orifice, and into said passageway; and

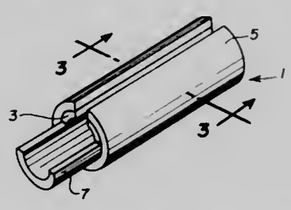
fragrance means, incorporated in said face mask means, for providing a predetermined fragrance.

4,896,667

ENDOTRACHEAL TUBE BITE BLOCK

Linda M. Magnuson, 2357 N. 193rd St., Seattle, Wash. 98155, and Dwight W. Roxburg, 3615 Greenwood Rd., Sedalia, Colo. 80135

Filed Nov. 2, 1988, Ser. No. 265,899
Int. Cl.[4] A61B *24/00*; A61M *25/00, 16/00*
U.S. Cl. 128—207.14 **19 Claims**



12. A bite block for use with an endotracheal tube having an elongated axis, said bite block having a cross section defined by a single generally C shaped member comprising an exterior generally convex surface and an interior generally concave surface;

said interior and exterior surfaces extending generally parallel to the elongated axis, the exterior surface acting as teeth-engaging means, the interior surface acting as endotracheal tube engaging means;

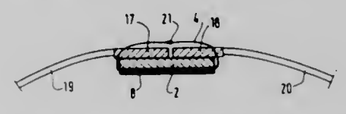
wherein the cross section of the interior concave surface is such that the length of a line segment across the mouth of the concave surface is greater than the length of any other line segment parallel to the first line segment and having end points on the concave surface.

4,896,668

PLATE SET FOR OSTEAL FIXATION, EQUIPPED WITH SUTURE STRANDS

Georges Popoff, Paris, and Georges Schwarz, Goussainville, both of France, assignors to Peters, Aubervilliers, France

Filed Apr. 9, 1987, Ser. No. 36,305
Claims priority, application France, Apr. 10, 1986, 86 05146
Int. Cl.[4] A61B *17/08*; A61F *5/04*
U.S. Cl. 606—74 **8 Claims**



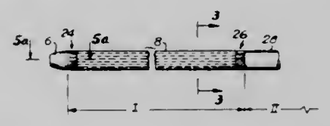
1. A sternum plate set for securing a patient's ribcage following surgery and for protecting internal organs during subsequent surgical procedures, comprising a plate of biocompatible material intended to be implanted into a patient's body during a surgical operation behind the sternum and to remain in contact with or as a substitute for the sternum, said plate having a slightly convex shape on a side facing said sternum, said plate being provided with at least one transverse channel having a suture strand passing therethrough, said suture strand having free ends intended to be passed through the sternum and joined together to secure the plate behind the sternum and resting against the sternum such that the plate permanently remains inside the patient's body between the sternum and internal organs.

4,896,669

DILATATION CATHETER

Anandkumar Bhate, North Bergen, and David Catlin, Middletown, both of N.J., assignors to Meadox Medicals, Inc., Oakland, N.J.

Filed Aug. 31, 1988, Ser. No. 239,081
Int. Cl.[4] A61M *29/02*
U.S. Cl. 606—194 **33 Claims**



1. A dilatation catheter, comprising:

a length of a tubular shaft of flexible material having a longitudinal axis;

an inner tubular flexible member coaxially disposed in the shaft and having a distal portion projecting therefrom;

a balloon portion formed at the distal end of the flexible shaft, the balloon portion being capable of expanding radially to a predetermined diameter with minor axial movement when subjected to internal pressure to provide a balloon, the balloon portion fixed to the distal end of the tubular flexible shaft and the distal end of the inner tubular flexible member; and

a transition portion at each end of the balloon portion for coupling the balloon portion to the distal end of the inner tubular flexible member and the distal portion of the tubular flexible shaft, the transition portion being capable of longitudinal extension in response to a minor longitudinal contraction at the two ends of the balloon portion to reduce the axial movement when the balloon portion is inflated.

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4,896,670
KISSING BALLOON CATHETER
James F. Crittenden, Hollis, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed Apr. 19, 1988, Ser. No. 183,673
Int. Cl.[4] A61M *29/02*
U.S. Cl. 606—194 **6 Claims**



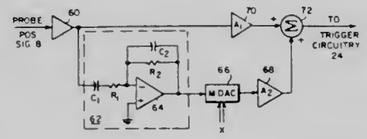
1. A balloon dilatation catheter comprising:
an elongate shaft having proximal and distal ends and having a lumen extending therethrough;
a fitting on the proximal end of the shaft for connection with a source of fluid under pressure;
a dilatation balloon adapted to be inflated to a predetermined size and mounted to the distal end of the shaft, the interior of the balloon being in communication with the lumen whereby the balloon may be inflated and deflated;
the balloon being of unitary construction and having a proximal portion and a distal portion, the proximal portion of the balloon having a smaller inflated diameter than the distal portion of the balloon, each of said proximal and distal portions having a length, when inflated, at least twice that of its diameter, when inflated.

4,896,671
CATHETER WITH CONTOURED ABLATION ELECTRODE
A. David Cunningham, London, England; Paul M. Leah, Schroon Lake, and Harvey W. Collins, Gansevoort, both of N.Y., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed Aug. 1, 1988, Ser. No. 226,780
Int. Cl.[4] A61B *5/04*; A61N *1/05*
U.S. Cl. 128—642 **35 Claims**



1. A catheter which can be advanced through a body vessel to an internal organ for high voltage electroshock ablation of a desired portion of the internal organ without arcing, said catheter comprising:
an electrode for conducting electrical energy to the desired portion of the internal organ, said electrode having a smoothly curved surface free of sharp edges;
an elongated conductor coupled to said electrode, said conductor having a proximal end for coupling to an external source of electrical energy;
electrical insulation surrounding said elongated conductor, said conductor and said insulation defining an electrical lead having a central axis, said electrical lead having suitable diameter and flexibility to be advanced through the body vessel to the internal organ, said electrical lead having a cross-sectional dimension at the junction with said electrode that is less than the maximum cross-sectional dimension of said electrode; and
a flexible, insulating sheath surrounding a major portion of said electrical lead, said insulating sheath having a diameter approximately equal to the maximum cross-sectional dimension of said electrode, said insulating sheath being tapered from full diameter at a first point on said central axis to the diameter of said electrical lead at a second point on said central axis adjacent to said electrode.

4,896,672
HARDWARE CORECTION SCHEME FOR INTER-FRAME IMAGE JITTER IN A SCANNING PROBE ULTRASOUND IMAGING SYSTEM
Robert K. O'Toole, Sandown, N.H., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 28, 1988, Ser. No. 173,759
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.09 **4 Claims**

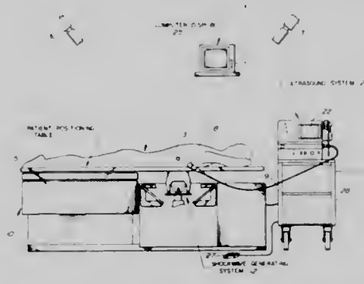


1. In an acoustic imaging system having a moving transducer for transmitting and receiving a series of acoustic signals along a plurality of acoustic paths covering an area to be scanned to provide imaging data representative of the density of the scanned area, transducer positioning and driving circuitry, comprising:
transducer driving means, responsive to a trigger signal applied thereto, for applying signals to the transducer to cause an acoustic signal to be transmitted thereby;
means for moving the transducer with a cyclical motion so that acoustic signals transmitted by the transducer cover a scanned area;
means, coupled to the transducer, for providing a position signal representative of the transducer position;
trigger means, responsive to first and second signals for applying a trigger signal to the transducer driving means when the first and second signals are equal, the second signal being representative of the transducer position at which the next acoustic signal is to be transmitted;
compensation means, responsive to the position signal, for generating said first signal, including:
means, responsive to the position signal, for providing a scaled position signal proportional to the position signal;
means, responsive to the position signal, for generating a correction signal representative of the rate of change of the position signal; and
means for adding the scaled position signal and the correction signal to provide said first signal.

4,896,673
METHOD AND APPARATUS FOR STONE LOCALIZATION USING ULTRASOUND IMAGING
Freeman H. Rose, Del Mar; Charles D. McGregor, Laguna Beach, and Prabodh Mathur, El Toro, all of Calif., assignors to Medstone International, Inc., Costa Mesa, Calif.
Filed Jul. 15, 1988, Ser. No. 219,208
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.03 **14 Claims**

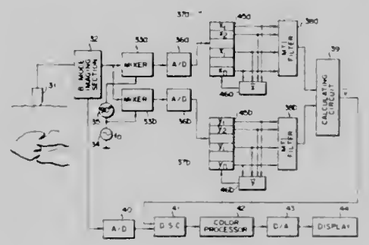
1. A method for gallstone localization using ultrasound imaging for enabling a gallstone to be positioned with respect to a focal point of a shock wave system comprising the steps of
providing an ultrasound image of a gallstone in a patient using an ultrasound transducer by moving the ultrasound transducer adjacent the patient,
detecting the position of the ultrasound transducer by imaging the transducer means by first and second cameras, said cameras means being calibrated with respect to a reference,
storing images of the transducer picked up by the cameras means and processing said images,
capturing said ultrasound image of the gallstone, and

calculating the relationship of the gallstone with respect to the ultrasound transducer using said ultrasound image of said gallstone and calculating the distance of the stone



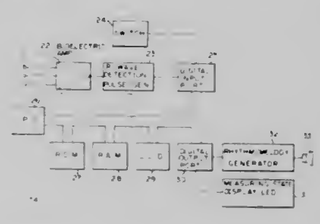
from the reference using said calculated relationship of the gallstone with respect to the transducer and the detected position of the transducer.

4,896,674
ULTRASONIC DIAGNOSING SYSTEM
Yasutsugu Seo, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 856,960, Apr. 29, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 259,458
Claims priority, application Japan, Apr. 30, 1985, 60-90923
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—661.09 **11 Claims**



1. An ultrasound diagnosing system comprising:
ultrasound transmitting/receiving means for emitting ultrasound pulse beams into a living subject and receiving echo signals from the subject;
cross-sectional imaging means for controlling transmission timings of the pulse beams and at least one of a beam position and a beam direction of the pulse beams from the ultrasound transmitting/receiving means, so as to perform ultrasound scanning for emitting and receiving the ultrasound beam a predetermined number of times at an identical beam position, and for obtaining cross-sectional image information on the living subject from the echo signals received at the ultrasound transmitting/receiving means;
phase detecting means for performing quadrature detection of the echo signals to obtain two sets of echo components corresponding to phase shift data at each position of the cross-sectional information, the echo components being adapted to consist of samples corresponding to the number of times of transmission/reception at the identical beam position for each position in the cross-sectional image data;
correction means including averaging means for calculating an average value on the basis of each set of the echo components supplied from the phase detecting means, and subtracting means for subtracting said average value from each set of the echo components;
filter means for eliminating low-frequency clutter components along a time base, in accordance with the two sets of echo components, as provided by said correction means, corresponding to the positions of the cross-sectional image and generated by the phase detecting means;
calculating means for calculating an average blood flow speed in the living subject for each position of the cross-sectional image information by autocorrelation; and
display means for superposing average blood flow speed two-dimensional distribution information from the calculating means on the cross-sectional image information from the cross-sectional imaging means, and for displaying a superposed image.

4,896,675
APPARATUS FOR MONITORING DEGREE OF MENTAL TENSION
Mieko Ohsuga, and Futomi Shimono, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 16, 1989, Ser. No. 311,708
Claims priority, application Japan, Jun. 10, 1988, 63-144360
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—671 **3 Claims**



1. An apparatus for monitoring mental tension, comprising:
first measuring means for measuring a periodic wave related to a contraction activity of the heart of a person to be monitored;
detecting means for detecting special waves which periodically appear in said periodic wave measured by said first measuring means;
second measuring means for measuring an interval at which said special waves are generated;
first processing means for providing as tension index values, a mean value of an interval train of said special waves and magnitude of a respiration component of fluctuation of said interval train; and
display means for displaying said tension index values.

4,896,676
BLOOD PRESSURE MEASURING UNIT
Kitoh Sasaki, Tokyo, Japan, assignor to Signal Technology Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 32,534, Apr. 1, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 263,989
Claims priority, application Japan, Jun. 11, 1986, 61-135606
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—681 **8 Claims**

1. A blood pressure measuring unit of the type which can be worn about the wrist of a user, comprising:
a display device including a digital time displaying watch device;
wrist band means for fitting about the wrist of a user;

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casing means secured to said wrist band means for holding at least said display device;
an air pressure chamber secured to said casing means for holding air at a pressure that is greater than atmospheric pressure;
means for supplying compressed air to said pressure chamber;
cuff means for contacting the wrist of a user, formed of resilient material and in communication with said air pressure chamber, said cuff means having a first substan-



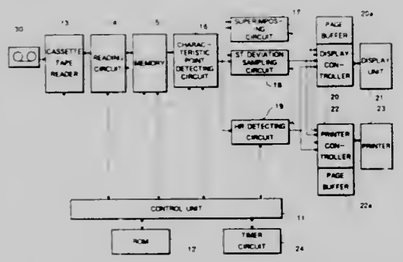
tially flat outer surface in contact with an inside surface of said wrist band means, and an inner surface adapted to contact the wrist of a user;
means for sensing the pressure within said air pressure chamber by using an electrostatic variable capacitor formed of flat sheets of capacitive material; and
means responsive to said pressure sensing means for calculating the blood pressure of a user, and for supplying such information to said display means so that it may be displayed.

4,896,677

ELECTROCARDIOGRAPHIC WAVEFORM DISPLAY APPARATUS, AND METHOD OF EXPRESSING ELECTROCARDIOGRAPHIC WAVEFORMS

Mutsuo Kaneko; Isamu Suzuki, both of Tokyo; Chuichi Sato, Chofu; Noriko Igarashi, and Yumi Nishimura, both of Tokyo, all of Japan, assignors to Kukuda Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,759
Claims priority, application Japan, Dec. 26, 1987, 62-330933; Jul. 25, 1988, 63-183585
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 **18 Claims**



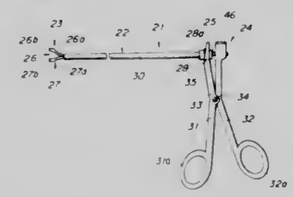
1. A method of expressing an electrocardiographic waveform, comprising:
determining a predetermined characteristic point in a first waveform of said ECG waveform for synchronization of a number of waveforms comprising ECG waveforms to said characteristic point in said first waveform;
determining a setable predetermined fixed amount of display time during which said ECG waveforms are to be superimposed related in time to said characteristic point; and
setting a cycle time axis interval which is to occur before the start of said settable fixed amount of time during which said ECG waveforms are to be displayed in superimposition,
superimposing said number of said superimposed waveforms at expressed positions in visual relationship to an expression of said first waveform and synchronized to said predetermined characteristic point of said first waveform for said predetermined fixed amount of displayed superimposition time to mark a point from which said cycle time axis interval is to be measured;
said ECG waveforms which are superimposed being selectable from said number of ECG waveforms such that any deviation in the electrocardiographic waveform may be discerned by inspection of the superimposed visual relationship expressed by the displayed superimposition of waveforms.

4,896,678

ENDOSCOPIC TREATING TOOL

Mototsugu Ogawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,490
Claims priority, application Japan, Dec. 12, 1986, 61-296233
Int. Cl.[4] A61B *10/06*
U.S. Cl. 128—751 **16 Claims**



1. An endoscopic treating tool for use with an endoscope comprising:
an elongated insertable part having a distal part insertable through the endoscope, and an opposite proximal part remaining outside the endoscope;
a treating means requiring an operation force to be applied thereto for treating a patient, provided adjacent the distal part of said insertable part;
an operating means provided on the proximal part of said insertable part to which force is applied for operating the treating means;
a force transmitting means connecting said operating means and said treating means with each other so as to make said treating means operable by operation of said operating means; and
an operation force releasing means for completely releasing the transmission of force to said treating means from said operating means when the operating force for said operating means becomes larger than a predetermined force.

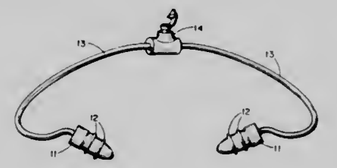
4,896,679

METHOD AND APPARATUS FOR THE EXCLUSION OF SOUND AND WATER FROM THE AUDITORY CANAL

Carol L. St. Pierre, 3325 E. Jasper St., Tulsa, Okla. 74115

Filed May 22, 1989, Ser. No. 355,640
Int. Cl.[4] A61F *11/00*
U.S. Cl. 128—865 **9 Claims**

1. An earplug for providing protection to a person's auditory canal comprising:
at least one hollow expandable ear insert of a fixed shape and made of an elastomeric material and having a closed end and a side wall adapted to be inserted into a user's auditory canal, and an open end, said ear insert being sufficiently small in its unexpanded state such that the ear insert may be inserted into the user's auditory canal without abrasion to the user's auditory meatus; and
a hollow tube having opposed open ends, an air inlet at one of said ends and an air outlet at said other end, said air



outlet being attached to said open end of the ear insert, said air inlet attached to a mouthpiece adapted to be positioned at the user's mouth for allowing the user to inflate the ear insert by blowing into the air inlet.

4,896,680

METHOD OF EXTENDING A FLAP OF SKIN

Bernard Hirshowitz, 55 Margalit Street, Mount Carmel, Haifa, Israel

Filed Feb. 1, 1988, Ser. No. 150,673
Claims priority, application United Kingdom, Feb. 10, 1987, 8702983
Int. Cl.[4] A61B *17/04*
U.S. Cl. 606—218 **2 Claims**



1. A method of applying incremental traction to skin to extend a flap of skin comprising the steps of: (a) pushing first and second hooked retaining means into different respective regions of the skin to puncture said different respective regions of the skin; (b) pulling an elongate member that is attached to one of the retaining means through locking means that is attached to the other of said retaining means so as to shorten the length of the elongate member between the two retaining means and thereby apply tension to the skin; (c) allowing the skin to creep and extend in length; (d) thereafter shortening the length of the elongate member between the two retaining means to reapply tension to the skin; (e) withdrawing said hooked retaining means from said different respective regions of the skin a period of time following initiation of step (d); and (f) thereafter placing the extended skin over a defect and suturing it in position to conceal the defect.

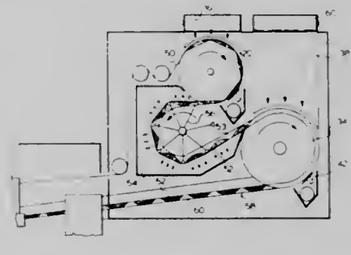
4,896,681

TOBACCO BLEND FORMATION

Warren A. Brackmann, Mississauga; Takeshi Nehyo, Willowdale; Michael H. Sheahan, Toronto, and Stanislav M. Snaidr, Mississauga, all of Canada, assignors to Rothmans, Benson & Hedges Inc., North York, Canada and Rothmans International Services Limited, Bucks, United Kingdom

Filed Aug. 11, 1988, Ser. No. 230,885
Claims priority, application United Kingdom, Aug. 11, 1987, 8718949
Int. Cl.[4] A24C *5/18*
U.S. Cl. 13—84.3 **41 Claims**

1. A method of forming a tobacco filler rod, which comprises:
rotating about a horizontal axis a vacuum wheel having a tobacco-conveying surface defined by a plurality of rectilinear chords of a circle having its centre coinciding with said axis and arranged about a periphery of said vacuum wheel,
forming on said tobacco-conveying surface a plurality of bunches of a first blend of tobacco particles having a flat surface adjacent said tobacco-conveying surface and a curved surface spaced from said tobacco-conveying surface and which curves outwardly from both its ends to a location of maximum thickness and defining a space between the bunches from said tobacco conveying surface outwardly to a thickness corresponding to said maximum thickness, and



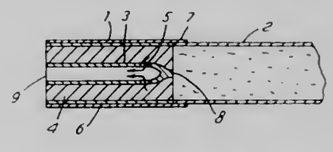
providing a second blend of tobacco particles different in smoking characteristics from the first blend filling the space between each of the adjacent bunches to said thickness corresponding to said maximum thickness of said bunches.

4,896,682

CIGARETTE FILTER RODS AND CIGARETTES INCORPORATING SUCH FILTER RODS

Tow Pin Liew, Westcliff-on-Sea, England, assignor to Rothmans International Tobacco (UK) Limited, England

Filed Sep. 8, 1988, Ser. No. 241,663
Claims priority, application United Kingdom, Sep. 17, 1987, 8721876
Int. Cl.[4] A24D *3/00, 3/04*
U.S. Cl. 131—339 **18 Claims**



1. A cigarette filter rod comprising a filter element having an outer wall which surrounds a longitudinally extending tube member to provide an annular space therebetween, said annular space containing fibrous material, the fibrous material having fibres which extend longitudinally between a first end of the filter element which is adapted for attachment to a tobacco rod and a second end thereof, one end of said tube member being closed and located at the first end of the filter element and the other end of which is open and extends to the second end of the filter element, the wall of the tube member being provided with at least one radially extending aperture adjacent to said closed end and opening into said annular space to promote radial flow through the fibres of the filter element adjacent said at least one aperture, and said at least one aperture being dimensioned so that it remains open to allow flow communication through the wall of the tube member into said annular space throughout the period that a cigarette provided with the tobacco rod is smoked.

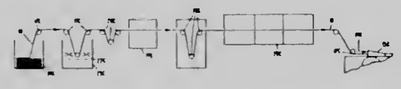
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4,896,683

SELECTIVE DELIVERY AND RETENTION OF NICOTINE BY-PRODUCT FROM CIGARETTE SMOKE

Richmond R. Cohen, Hockessin, Del., and David J. Gibboni, Drexel Hill, Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 17, 1988, Ser. No. 258,366
Int. Cl.[4] A24D *3/06, 3/08, 3/16*
U.S. Cl. 131—342 22 Claims



1. A method for controlling nicotine filter retention and pass through characteristics of a cigarette filter element comprising one or a combination of cellulose acetate- or thermoplastic synthetic- substrate, comprising,

A. treating one or more fiber of film substrate forming said filter element or plug component, thereof with an aqueous solution or suspension having a pH within a range of about pH 8 to about pH 12 and containing an effective amount of a non-toxic water soluble salt of a weak acid as an active modifier; or

B. treating one or more fiber or film substrate forming said filter element or plug component thereof with an aqueous solution or suspension containing an effective amount of a non-toxic water soluble inorganic salt of a strong acid as an active modifier; and

C. completing fabrication of the desired filter element;

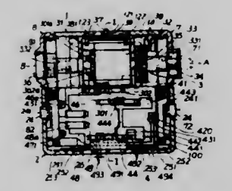
whereby (1) treatment of said substrate or plug component of the filter element with the salt of a weak acid increases filter pass through of nicotine smoke component relative to total particulate pass through concentration, and (2) treatment of said substrate or plug component of the filter element with the salt of a strong acid decreases filter pass through of nicotine smoke component relative to total particulate pass through concentration.

4,896,684

BI-DIRECTIONAL NAIL TRIMMER

Fargo Chou, P.O. Box 10160, Taipei, Taiwan

Filed Apr. 3, 1989, Ser. No. 331,745
Int. Cl.[4] A45D *29/05*
U.S. Cl. 132—73.6 10 Claims



1. A bi-directional nail trimmer comprising:

a basic body having a front groove transversely formed across a width of said basic body;

an upper cover secured on an upper side of said basic body;

a motor means slidably engageable with said front groove of said basic body having a motor shaft protruding rightwardly and leftwardly on two opposite sides of a motor;

a primary polisher detachably mounted on a right side portion of said motor shaft for polygonally manicuring an user's nail, a secondary polisher detachably mounted on a left side portion of said motor shaft for planarly manicuring a user's nail;

a switch means for controlling a running speed of said motor; and

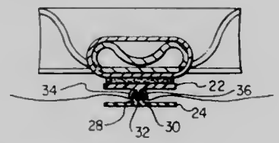
a power source powering said motor and controlled by said switch means; both said primary polisher and said secondary polisher normally retracted in said body and said upper cover, said motor means having a front botton protruding frontwardly beyond said upper cover and operatively moved either rightwardly to protrude said primary polisher for primarily manicuring a user's nail or moved leftwardly to protrude said secondary polisher for further trimming the user's nail.

4,896,685

BABY BOW HAIR FASTENER

Gary D. Lawrence, Ft. Worth, Tex., assignor to Globestar, Incorporated, Fort Worth, Tex.

Filed Jun. 28, 1988, Ser. No. 212,602
Int. Cl.[4] A45D *8/22*
U.S. Cl. 132—278 2 Claims



1. A decorative baby hair piece comprising:

a decorative adornment means for beautifying a baby's hair;

a hair locking means attached to the decorative adornment means for securing the decorative adornment means to the baby's hair;

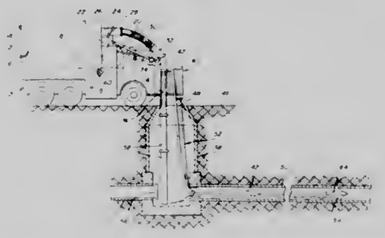
said hair locking means including: first and second elongated strips of flexible material, the strips having first and second opposing ends, the first ends being interconnected for forming first and second opposing surfaces, the second ends remaining open for positioning baby hair between the first and second strips; and strip locking means for locking the strips together, said strip locking means including elongated male and female elements of flexible material formed on opposing surfaces of the strips, said male and female elements extending substantially the length of the strips and having interlocking surfaces which coact when pressed together with the baby's hair inbetween to lock the corresponding surfaces and hair together for securing the decorative baby hair piece to the baby's hair, wherein the male element has oppositely disposed convex walls and the female element has concave walls corresponding to the convex walls of the male element for producing a lock when pressed together with a baby's hair inbetween for locking baby hair and the first and second strips together, and wherein the female element has convex shaped outer walls forming first and second parts of a second male element, and the male element has opposing members having concave surfaces forming first and second parts of a second female element, said first and second parts of the second male element corresponding to the first and second parts of the second female element for forming a second lock when pressed together.

4,896,686

PIVOTING HOSE STORAGE REEL AND MOUNTING THEREOF

Ronald L. Schmidt, Jr., 930 Vernon Ave., Glencoe, Ill. 60022, and Timothy G. Mayer, 810 Woodland Knolls Rd., R.R. 2, Metamora, Ill. 61548

Filed Oct. 31, 1988, Ser. No. 264,834
Int. Cl.[4] B08B *9/06*
U.S. Cl. 134—167 C 46 Claims



6. Apparatus for supporting a portable discharge hose storage reel from a vehicle, comprising:

means for supporting a discharge hose storage reel adjacent the frame of said vehicle, with said hose storage reel having an associated lateral positioner positioned below the frame of said vehicle, and said hose storage reel having rotational freedom of movement about the axis of said hose reel and along a pivotal axis substantially transverse to and substantially intersecting said hose reel axis between the ends of said hose reel; and

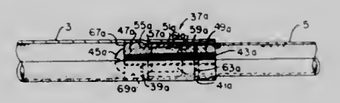
means for mounting said hose reel pivotal axis in a laterally displaceable position relative to said vehicular support platform.

4,896,687

COLLAPSIBLE CANE

Barry M. Segal, and Charles Foxman, both of St. Louis, Mo., assignors to Americane, Inc., Maryland Heights, Mo.

Filed Oct. 31, 1988, Ser. No. 264,863
Int. Cl.[4] A45B *9/00*
U.S. Cl. 135—75 17 Claims



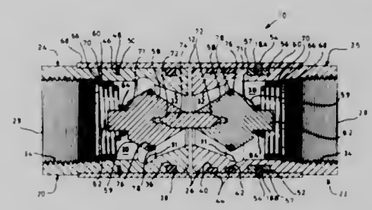
1. A collapsible cane having a series of innerfitting smaller and larger telescoping sections which are interlocked against collapse when extended, each said smaller innerfitting telescoping section carrying internal expansion means activated by relative rotary movement between adjacent larger and smaller innerfitting telescoping sections for engagement with an inner wall of said larger innerfitting telescoping section, said internal expansion means including wedge elements threadably engaged by a common threaded member on opposite sides of a longitudinally slit locking cylinder to provide radial expansion and engagement with the inner wall of said larger innerfitting telescoping section, each said larger innerfitting telescoping section including circumferential depression means against which said internal expansion means operates to expand against an internal wall of said larger innerfitting telescoping section during the relative rotary movement between said sections, at least one of said larger telescoping sections also including a second circumferential depression means longitudinally spaced from said first circumferential depression means and positioned immediately adjacent an outer free end of each said larger telescoping sections, and each said second circumferential depression means in at least one of said larger telescoping sections being slidably engaged by an outer wall of an adjacent smaller telescoping innerfitting section to provide guiding and centering for said adjacent innerfitting smaller and larger telescoping sections during extension and collapse thereof.

4,896,688

BREAKAWAY HOSE COUPLING DEVICE

Alton Richards, Roane County, and Leonard R. Nitzberg, Knox County, both of Tenn., assignors to Richards Industries, Inc., Rockwood, Tenn.

Continuation-in-part of Ser. No. 766,834, Aug. 16, 1985, Pat. No. 4,674,525. This application Jun. 17, 1987, Ser. No. 63,505
Int. Cl.[4] F16L *29/00, 37/28*
U.S. Cl. 137—68.1 6 Claims



1. An improved breakaway hose coupling device for releasably joining the hose ends of two fluid communicating hoses and for selectively disengaging such hose ends in response to a disengaging force of a preselected value being exerted on such hoses and/or said coupling device, while being resistant to disengaging in response to transient fluid pressure surges in the flow of fluid through said coupling, said coupling device comprising:

a coupling sleeve, said coupling sleeve defining first and second oppositely disposed openings, and further defining at least one shear pin hole;

first and second valve assemblies for being releasably secured on such hose ends, each said valve assembly comprising a valve housing having a forward end portion for being received in said first and second openings of said sleeve member and a rearward end portion provided with means for releasably engaging one such hose end, said valve housing being provided with a passageway therethrough communicating with such hose end, said passageway defining a forwardly disposed valve seat, each said first and second valve assembly further comprising a poppet valve mounted within said passageway of said valve housing, said poppet valve being provided with means for biasing said poppet valve toward said valve seat, one said valve housing being provided with a first exterior annular recess registering with said shear pin hole as said valve housing is received in said coupling sleeve; and

a shear pin closely received in said shear pin hole and said first annular recess thereby limiting axial movement of said valve housing in said sleeve in the absence of such disengaging force in excess of said preselected value without limiting rotation of said valve assembly relative to said sleeve, said shear pin being fabricated with Kevlar arimid fibers dispersed in a plastic matrix, whereby said shear pin is predictably frangible, yet is not susceptible to being weakened by said transient surges.

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CYLINDER PRESSURE RELIEF VALVE

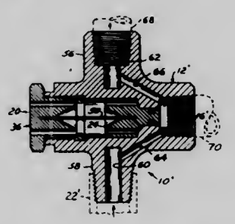
Julian S. Taylor, 8502-A SW. 8, Oklahoma City, Okla. 73128

Continuation-in-part of Ser. No. 131,592, Dec. 11, 1987, Pat. No. 4,787,409, and a continuation-in-part of Ser. No. 246,831, Sep. 20, 1988, Pat. No. 4,896,690. This application Nov. 14, 1988, Ser. No. 270,315

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[4] F16K *17/14*

U.S. Cl. 137—70 **10 Claims**



1. A pressure relief valve, comprising:

a valve body having a through bore forming an inlet port at one end of the bore;

valve means in the bore for opening and closing the inlet port;

plug means in the other end portion of the bore; and,

collapsible means including an elongated rigid member axially interposed between the valve means and the plug means for normally maintaining the inlet port closed.

4,896,690

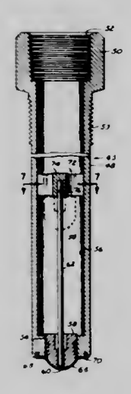
PRESSURE AND THERMAL RELIEF VALVE

Julian S. Taylor, 8502-A SW. 8, Oklahoma City, Okla. 73128

Continuation-in-part of Ser. No. 131,592, Dec. 11, 1987, Pat. No. 4,787,409. This application Sep. 20, 1988, Ser. No. 246,831

Int. Cl.[4] F16K *17/00*

U.S. Cl. 137—73 **1 Claim**



1. A thermal responsive relief valve, comprising:

a valve body having an axial passageway therethrough;

an elongated strut having opposing ends axially disposed in said body;

means securing one end portion of said strut to the valve body within the body passageway;

means closing the valve body passageway including thermally released means normally surrounding the end portion opposite said one end portion of said strut and projecting beyond the body in a manner permitting longitudinal sliding movement of the closing means toward the said one end of the valve body in a passageway opening action in response to a predetermined temperature or pressure adjacent the thermally released means,

said passageway closing means further including a piston having an axial through bore adjacent and projecting at one end portion beyond one end of the body; and,

an impermeable flexible sheath sealing said piston one end portion with said body one end.

4,896,691

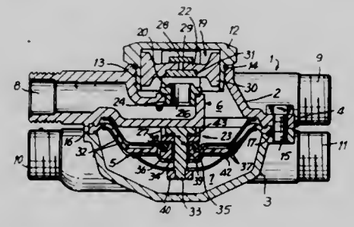
PRESSURE COMPENSATING DEVICE

John W. Green, and Ian Moran, both of Hamilton, New Zealand, assignors to Greens Industries Limited, Hamilton, New Zealand

Filed Feb. 26, 1988, Ser. No. 162,208

Int. Cl.[4] G05D *11/03*

U.S. Cl. 137—100 **2 Claims**



1. A pressure compensating apparatus comprising a vessel body defining two chambers separated by a diaphragm, an inlet an outlet for each of the two chambers, the first of said chambers including valving means for controlling the entry of fluid into the chamber the second chamber allowing the free passage of fluid therethrough, the inlet to said first chamber incorporating a valve opening which is aligned with a removable cap providing access to the valve opening and incorporating a valve seat, a floating valve head positioned over said valve seat said floating valve head being constrained by a bridge which straddles the inlet to the first chamber and which is connected to said diaphragm, movement of the diaphragm controlling the closure of the valve head on the valve seat and the flow of fluid through said first chamber such movement occurring when a pressure differential exists between the first and second chambers.

4,896,692

PILOT OPERATED CONTROL VALVE

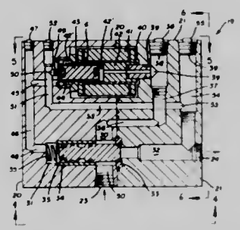
Daniel Raun, 696 McClurg Rd., Youngstown, Ohio 44512

Filed Apr. 13, 1989, Ser. No. 337,348

Int. Cl.[4] F16K *31/42, 13/00*

U.S. Cl. 137—269 **1 Claim**

1. A pilot operated control valve having first and second mating body members, each of which has a plurality of bores extending thereinto, a first pair of said bores in said mating body members positioned for registry with one another to define a poppet valve chamber and an axial extension thereof, a second pair of said bores in said mating body members positioned for registry with one another to define a solenoid chamber, a poppet valve element movably positioned in said poppet valve chamber, a solenoid coil enclosed in said solenoid chamber and defining a pilot valve chamber, a pilot valve element positioned in said pilot valve chamber for movement by said solenoid coil, a third one of said bores in said first mating body member defining an inlet communicating with said poppet valve chamber and extending inwardly thereof at a right angle to said poppet valve chamber, a third one of said bores in said second mating body member communicating with said axial extension, said axial extension defining an outlet port, a valve seat in said axial extension between said inlet bore and said third one of said bores in said second mating body member for engagement with said poppet valve element when the same is moved thereagainst, a third pair of said bores in said mating bodies positioned for registry with one another and in communication with said inlet bore and a fourth one of said bores in said second mating body member, a fifth one of said bores in said second mating body member communicating with said fourth bore therein and with said pilot valve chamber, a fourth one of said bores in said first mating body member communicating with said pilot valve chamber and with a fifth one of said bores in said first mating body member, said fifth one of said bores and said first mating body member communicating



with said poppet valve chamber, said pilot valve element having sealing members on its opposite ends, a sixth one of said bores in said first mating body member communicating with said pilot valve chamber in line with one of said sealing members and with a seventh one of said bores in said first mating body member, a fourth pair of registering bores in said mating body members communicating with said seventh one of said bores in said first mating body member and said third one of said bores in said second mating body member, plugs removably positioned in said fifth and seventh bores in said first mating body member at the ends thereof in the surface of said first mating body member and plugs removably positioned in said third and fourth bores in said second mating body member at the ends thereof in the surface of said second mating body member and fasteners joining said first and second mating body members to one another.

4,896,693

UPPER PORTION OR CARTRIDGE OF A TAP

Jean-Jacques Rodriguez, Douvaine, France, assignor to Kugler, Fonderie Et Robinetterie S.A., Geneva, Switzerland

Filed Aug. 25, 1988, Ser. No. 236,372

Claims priority, application Switzerland, Sep. 11, 1987, 03525/87

Int. Cl.[4] F16K *11/08*

U.S. Cl. 137—454.5 **2 Claims**

1. In a tap cartridge comprising two plates one of which is fixed on the cartridge and the other rotatable by means of a control shaft between an open position and a closed position corresponding to the opening or closing of the tap, the improvement wherein said tap cartridge comprises

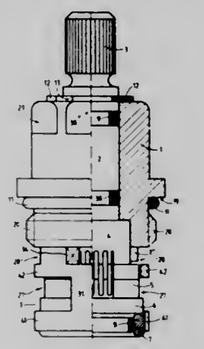
a control shaft including driving means at a lower end thereof positioned within said cartridge,

a sleeve having internal bores of differing diameter, the diameter of said internal bores diminishing from a lower open end of said cartridge to an opposing upper end of said cartridge,

abutment lugs for limiting the angular rotation of said control shaft within said cartridge by means of direct cooperative engagement with portions of said control shaft, and positioning lugs for retaining said fixed plate in position within said cartridge,

two pairs of opposed water outlets in side portions thereof, lateral edges of said opposed water outlets in said side portions of said cartridge forming said positioning lugs and abutment lugs,

two spaced apart annular rings, a lower one of said annular rings positioned adjacent said lower open end, said annular rings connected together by means of two diametrically opposed wall portions, the inside diameter of said



lower annular ring being greater than the distance between said wall portions, and the distance between said wall portions being greater than the inside diameter of the second annular ring, and said diametrically opposed wall portions forming said positioning lugs for retaining said fixed plate in position within said cartridge.

4,896,694

PRESSURE-LIMITING VALVE

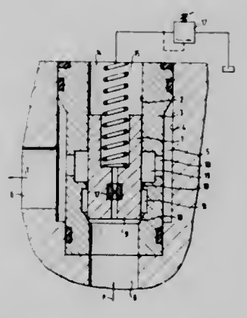
Georg Rausch, Lohr/Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,565

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808962

Int. Cl.[4] F16K *31/122*

U.S. Cl. 137—491 **7 Claims**



1. A pressure-limiting valve comprising:

a valve housing,

a valve body within said valve housing, said body pressed by a valve force against fluid pressure onto a valve seat and movable from engagement with said valve seat to permit fluid flow across said valve seat when fluid pressure exceeds the valve force,

a fluid passageway formed between said valve body and said valve housing downstream of said valve seat, said passage-

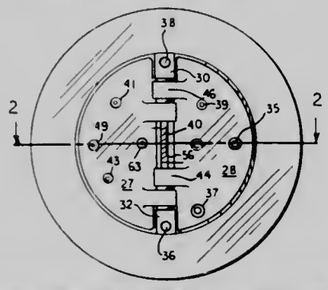
way comprising a first recess in said valve housing proximal said valve seat defining a first annular space between said valve body and housing, a second recess in said valve housing distal said valve seat defining a second annular space between said valve body and housing, and a throttle point between said first and second recesses, defining a third annular space between said valve body and housing wherein said second annular space has a volume greater than said first annular space, and said first annular space has a volume substantially greater than said third annular space.

4,896,695

CHECK VALVE

Wasyl A. Pysh, 620 W. Sixth St., Erie, Pa. 16507

Filed May 1, 1989, Ser. No. 331,224
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—512.1 **1 Claim**



1. A check valve comprising a hollow body, said hollow body having an inner periphery defining a flow passage therethrough,

said body having an inlet end, an outlet end and an intermediate part,

a ledge integrally attached to the inner periphery of said intermediate part,

said ledge having a first valve seat formed on it,

a laterally extending bar having ends extending across said flow passage and said ends of said bar being integrally attached to said ledge at its said ends,

a second valve seat formed on said bar,

said second valve seat being disposed substantially in a common plane with first valve seat,

valve members,

said valve members comprising valve plates

sealing means on said valve plates engaging said first valve seat and said second valve seat when said valve members are in closed position, providing a seal,

said valve members being adapted move to a position away from said first valve seat and said second valve seat when said valve members are in an open position,

a first lug and a second lug,

each said lug having a flat bottom surface resting on said first valve seat,

a first set screw extending through said first lug and threadably engaging said ledge, rigidly clamping said first lug to said first valve seat,

a second set screw extending through said second lug, rigidly clamping said second lug to said valve seat,

an axle,

said axle having a first end and a second end,

a first laterally extending hole in said first lug receiving said first end of said axle,

a second laterally extending hole in said second lug receiving said second end of said axle,

said first end and said second end of said axle terminating inside said hollow body,

each said valve member comprising a semi-circular valve plate,

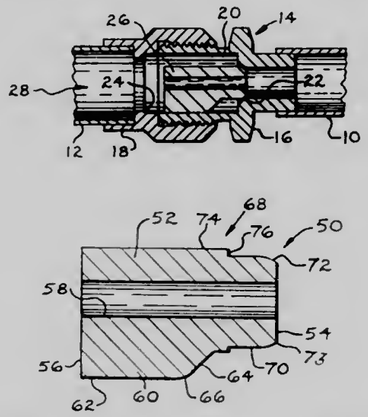
said first set screw and said second set screw being adapted to be removed from said ledge whereby said lugs, said axle and said valve members can be removed from said flow passage.

4,896,696

FLOW CONTROL RESTRICTOR

Andrew H. Bradley, Van Wert, Ohio; Steven M. Knowles, Leslie, and Frederick J. Pilon, Stockbridge, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 3, 1989, Ser. No. 374,850
Int. Cl.[4] F16K *21/02*
U.S. Cl. 137—513.3 **8 Claims**



1. A flow control restrictor characterized by its low operational noise level comprising , in combination, an elongated body having a longitudinal axis, a first end surface, a nose region adjacent said first end surface, a peripheral spider region having a radius, a second end surface and an axial bore intersecting said first and second end surfaces, said first end surface being substantially planar and substantially perpendicular to said axis, said nose region including a cylindrical nose surface having a radius and a convex transition surface constituting the intersection of said first end surface and said nose surface having a radius, said transition surface comprising a segment of a sphere having its center upon said longitudinal axis and a radius greater than the radius of said nose surface.

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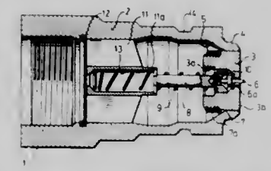
COUPLING FOR CONNECTING LIQUID CONDUITS

Leif Strömdahl, Klackjärnsliden 3, Karlstad, Sweden (S-654 81)

PCT No. PCT/SE87/00481, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO88/03243, PCT Pub. Date May 5, 1988
PCT Filed Oct. 20, 1987, Ser. No. 326,546
Claims priority, application Sweden, Oct. 22, 1986, 8604489
Int. Cl.[4] F16L *29/00*
U.S. Cl. 137—614.03 **9 Claims**

1. A coupling for connecting liquid conduits, comprising an insert nipple (1) and a receiving nipple (15), said nipples being axially movable in relation to each other for connection and disconnection, said insert nipple (1) comprising a stationary sleeve (2) with a sealing valve body (3) spring-biased and inwardly axially movable therein, said receiving nipple (15) having an outer sleeve (16), an inner spring-biased and inwardly axially movable sealing sleeve (17) and a stationary valve central stay (28) which in disconnected condition sealingly cooperates with the sealing sleeve (17), characterised in that the sealing sleeve (17) is provided at its outer end portion with an inner wedge seal (21) arranged to sealingly cooperate

with a wedge-forming conical outer surface (4) on the front end portion of the outer sleeve (2) and comprising a conical support ring (21*b*); that an inner seal (26) is arranged in a groove (26*a*) in the outer sleeve (16) for radial sealing cooperation with the sealing sleeve (17) which is free from sealing grooves; that the distance between circumferentially located locking balls (19) in the outer sleeve (16) and said inner seal (26) is greater than the distance within which the sealing sleeve (17) is axially movable inside the outer sleeve (16); that the



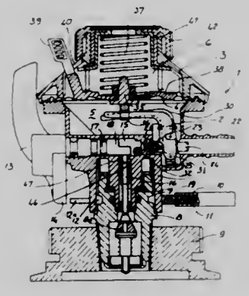
sealing sleeve (17) is provided on its inner side with a seal (22) which in disconnected condition is arranged to seal against a substantially cylindrical sealing surface (28*a*) of a sealing valve body (28*c*) of the valve central stay (28) and which comprises a sealing ring (22*a*) and a seal holder (23); and that the sealing sleeve (17) and outer sleeve (16) are provided with cooperating support means (17*a*, 16*a*; 33, 33*a*, 16*a*) permitting the sealing sleeve (17) to take up liquid pressure in disconnected condition in order to relieve the valve central stay (28).

4,896,698

PRESSURE ADJUSTING DEVICE FOR CONTROLLING LIQUID GAS FLOW RATE

Mario Limiroli, Via Medici del Vascello, 26, 20138 Milano, Italy

Filed May 5, 1988, Ser. No. 190,507
Claims priority, application Italy, Mar. 22, 1988, 19890 A/88
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614 **3 Claims**



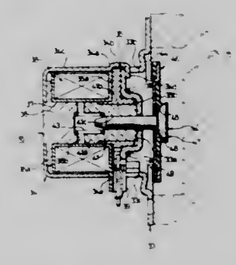
1. A pressure adjusting-coupling device for controlling the flow rate of liquid gases, comprising a body consisting of a bottom half shell and a top half shell, coupled to one another through a resilient membrane, said resilient membrane defining with said top half shell and bottom half shell respectively a gas control chamber and a gas pressure reducing and delivery chamber, communicating with a gas delivery outlet, said bottom half shell defining with a gas control valve of a gas holding pressure vessel a coupling end piece, quick coupling means being moreover provided operating between said coupling end piece and said gas control valve, operatively engaging with a handle for operating valve means of the pressure adjusting device so as to prevent said preasure adjusting device from improperly engaging with and/or disengaging from said pressure vessel as said valve means are in their open position, said quick coupling means consisting of a resilient biassed slide member movable transversely of said coupling end piece, said slide member being provided with openings having edges removably engaging in an annular groove formed on said coupling end piece, one end of said slide member abutting against a lug of said operating handle with said operating handle in its open position, wherein said pressure adjusting-coupling device further comprises, in said delivery chamber, a first and a second lever pivoted to a support member for guiding a piston member controlling a gas delivery nozzle, said levers including each a long arm engaging with a bracket rigid with a middle portion of said resilient membrane and a plate provided with a side driving arm projecting from said chamber, said first and second levers, as they are operated, causing said piston member to slide in opposite directions with respect to said resilient membrane.

4,896,699

SOLENOID VALVE

Morihiko Shimamura, and Hitoshi Takaku, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed May 16, 1989, Ser. No. 352,486
Claims priority, application Japan, May 31, 1988, 63-72349[U]
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—630 **8 Claims**



1. A solenoid valve comprising a first casing having a valve seat formed thereon on which valve means may be seated, a second casing in the form of a cylinder having a closed bottom and connected to the first casing, a solenoid disposed on a cylindrical spool and contained within the second casing, an annular spacer interposed between the solenoid and the first casing and defining a magnetic path for the solenoid together with the second casing, and a plunger slidably fitted in the spool and connected to the valve means;

wherein the spacer includes an axial portion which is formed with a sleeve-shaped guide, which is fitted into the spool and in which the plunger is slidably fitted.

4,896,700

VALVE ARRAY

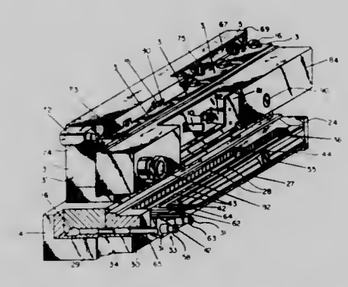
Kurt Stoll, Esslingen, Fed. Rep. of Germany, assignor to Festo KG, Esslingen, Fed. Rep. of Germany

Continuation of Ser. No. 124,380, Nov. 24, 1987, abandoned, which is a continuation of Ser. No. 885,942, Jul. 15, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 316,469
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525857
Int. Cl.[4] F16K *11/00*
U.S. Cl. 137—884 **6 Claims**

1. A valve assembly comprising a plurality of substantially rectangular block-shaped valve bodies each of said plurality of bodies having a planar venting side at one end and a planar connection side at an opposite end, each of said plurality of valve bodies having a planar operating side between said vent-

VOL 1110 ISS 5 JA 30 1990 UMI

ing side and said connection side, at least one feed duct, at least one vent duct and at least one control fluid duct in said valve bodies extending between adjacent said venting side and adjacent said connection side; a connection member having a planar mounting surface connected to each of said valve bodies connection side and positioning said valve bodies with their operating sides all oriented in the same direction along a substantially common plane, said connection member having a planar assembly side at substantially right angles to said mounting surface; a plurality of load ducts in said connection member, each of said plurality of load ducts being connected to a



respective one of said control fluid ducts and each of said plurality of load ducts having a duct section extending to said assembly side; a supply duct in said connecting member communicating with each of said feed ducts and opening into said assembly side; a manifold body having a planar manifold base mounted on said assembly side; a plurality of distributor ducts each extending substantially parallel to said assembly side in said manifold body and each being connected to a corresponding one of said duct sections, said manifold body having a plurality of consumer orifices connected to said distributor ducts and projecting out of said manifold and having port openings defining plug connections.

4,896,701

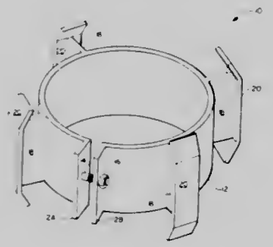
UNDERGROUND PIPE SUPPORT AND SPACER

Donald W. Young, P.O. Box 15947, Durham, N.C. 27704

Filed Aug. 25, 1988, Ser. No. 236,506

Int. Cl.[4] F16L *3/10*

U.S. Cl. 138—108 **6 Claims**



1. A metal device for supporting an underground pipe or cable within the encasement sleeve of a laterally bored underground hole comprising an annular collar having two adjacent ends resiliently spaced-apart and adapted to be urged together so as to secure said collar around the underground pipe or cable, a plurality of support legs equidistantly spaced apart and extending radially outwardly from said collar, said support legs each having means attached to the end thereof to facilitate placement of the pipe or cable into the encasement sleeve of the laterally bored hole, said means comprising an elongate foot at the outer end thereof which is substantially longer than the longitudinal length of said collar, and wherein a medial portion of said foot is flat and the opposing ends of said foot are bent inwardly from the longitudinal axis of said foot toward said collar and out of the plane of the medial portion of said foot.

4,896,702

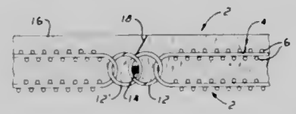
SEAM CONSTRUCTION FOR PAPERMAKING FABRICS

Robert L. Crook, Starkville, Miss., assignor to Niagara Lockport Industries Inc., Quincy, Fla.

Filed Dec. 1, 1988, Ser. No. 279,040

Int. Cl.[4] D03D *23/00*

U.S. Cl. 139—383 A **18 Claims**



1. A seamed papermaking fabric having a multilayer base fabric and comprising

an endless woven fabric forming a tubular belt having a sidewall of

predetermined width measured between opposed axial edges of said tubular belt,

predetermined length measured circumferentially around said tubular belt,

predetermined weave, and

predetermined thickness;

said tubular belt being flattened to form a base fabric of substantially twice said predetermined thickness with opposing portions of said tubular belt sidewall adjacent one another and having a flattened length between lengthwise extremities of said base fabric of about half said predetermined circumferential length;

at least one helical coil seaming member inserted between said opposing sidewall portions at each respective lengthwise extremity of said base fabric, with the helical axis of said seaming member extending transverse to the lengthwise direction of said fabric, and the coils of said seaming member extending through spaces between adjacent machine direction yarns and supportably engaging said machine direction yarns to support said seaming member against force applied outwardly of said respective lengthwise extremity of said base fabric;

said opposed lengthwise extremities of said base fabric being joined together by interengagement of said coils of the respective said seaming members and insertion of a pintle member axially through said interengaged coils to form a seamed endless fabric of substantially twice said predetermined thickness.

4,896,703

DEVICE FOR FORMING HANGWIRES

Vincent M. Testa, Jr., P.O. Box 501, Beverly, Mass. 01915

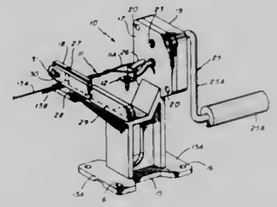
Filed Sep. 15, 1988, Ser. No. 244,353

Int. Cl.[4] B21F *1/06*

U.S. Cl. 140—104 **5 Claims**

1. A device for forming a hangwire by twisting together a portion of the shorter arm and the corresponding portion of the longer arm of a J-shaped wire preform having a fastener freely held by the wire in the bend of the preform, said device including a mount provided with first and second parallel vertical walls, the first wall including a housing, a rate reducing gear train within the housing having a first gear and a last gear, the shaft of the first gear extending outwardly with respect to the first wall and provided with a crank and the shaft of the last gear extending inwardly towards the second wall

and provided with a hook for receiving and holding the loop established by the bend in the wire of the preform, said second wall having an upwardly opening slot in alignment with the axis of the last gear and dimensioned to accommodate both arms of the preform held by the hook and a transverse ledge underlying the closed end of the slot, said first and second



walls spaced apart for the wanted twist length, a hold down arm, and a pivotal connection between one end of the arm and the second wall adjacent one end of the ledge and holding the arm in a position to be swung from an inoperative position in which the slot in the second wall is exposed into an operative position, overlying and against the arm ends within the slot.

4,896,704

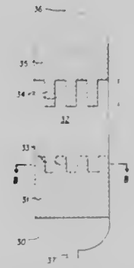
LOADING TECHNIQUES FOR DOWNFLOW REACTORS

Fouad A. Aly, Newtown, and Paul W. Snyder, Washington Crossing, both of Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jan. 27, 1988, Ser. No. 148,746

Int. Cl.[4] B65B *1/00, 1/04*

U.S. Cl. 141—9 **9 Claims**



1. A method for loading catalyst in superimposed fixed beds in a reactor vessel comprising the steps of:

a. loading a portion of a first catalyst into a reactor vessel thereby forming a bed of first catalyst;

b. positioning a loading form comprising a plurality of open-ended compartments defined by vertically extensive walls onto the bed of said first catalyst;

c. loading said first catalyst into some of said open-ended compartments;

d. loading a second catalyst into the remaining open-ended compartments to form a vertically extensive transition zone comprising vertically extensive columnar sections of said first catalyst and vertically extensive columnar sections of said second catalyst;

e. loading said second catalyst onto said transition zone to form a bed of said second catalyst.

4,896,705

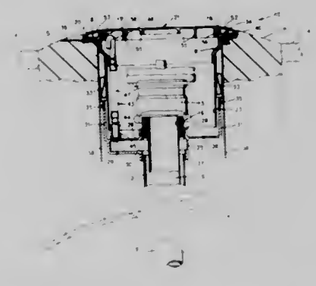
CONTAINMENT MANHOLE

Alexander R. Podgers, Lake City, and Eric J. Batterfield, Fairview, both of Pa., assignors to Emco Wheaton, Inc., Raleigh, N.C.

Continuation of Ser. No. 166,992, Mar. 10, 1988, abandoned, Division of Ser. No. 17,531, Feb. 24, 1987, Pat. No. 4,763,806. This application Jun. 30, 1989, Ser. No. 374,605

Int. Cl.[4] B65B *3/06;* **B67D** *5/00*

U.S. Cl. 141—86 **12 Claims**



1. A manhole comprising:

a manhole body having an upper rim forming the upper perimeter of the manhole, the rim having an upstanding flange and a ledge extending outwardly from the flange, the body also having an outer lip extending upwardly from the outer edge of the ledge, the body also having a trough extending radially outwardly through the lip to channel liquid on the ledge outwardly pass the lip and to reduce the accumulation of liquid on the ledge; and

a lid on top of the manhole supported on the flange of the rim and covering the flange, the lid having a downwardly sloped skirt at its outer periphery, the skirt extending over the ledge to direct liquid on top of the lid downwardly toward the ledge, the skirt being vertically spaced from the ledge to minimize the contact area between the rim and the lid and to facilitate the insertion of a tool or fingers between the skirt and the ledge to remove the lid.

4,896,706

BAG FOR TRANSPORTING DRY GRANULAR POWDERS

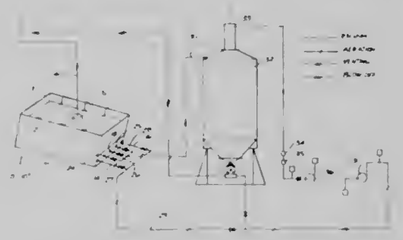
William J. Tanner, Glenhaven, and Pawell Baltyn, Ermington, both of Australia, assignors to Amatek Limited, Australia

Filed Oct. 27, 1988, Ser. No. 263,785

Claims priority, application Australia, Nov. 3, 1987, PI5217; Jun. 20, 1988, PI8866

Int. Cl.[4] B65D *1/32*

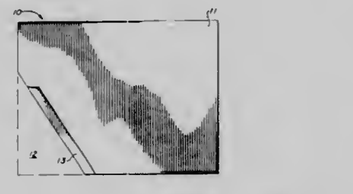
U.S. Cl. 141—114 **17 Claims**



1. A container for the transport of dry granular powdered materials including,

a generally flexible and collapsible bag having a skin for holding a volume of dry granular powdered material, said skin having top, side and base portions,
a fluidizing means in said base portion for providing aeration of the powdered material,
input means connecting to said fluidizing means in said base portion for providing pressurizing gas to aerate the powdered material,
output means connecting to said base portion for withdrawing the powdered material from said bag,
means for filling the bag, and
means for supporting the bag during filling and during transport thereof when in a filled or a partially filled state, said skin including said base portion so that when empty said base portion is foldable to a compact form.

4,896,707
ADJUSTABLE, DISPOSIBLE FUNNEL
Stanley P. Cowles, 2128 E. Woodman Dr., Tempe, Ariz. 85283
Filed Dec. 21, 1987, Ser. No. 135,673
Int. Cl.[4] B67C *11/00*; B65B *39/02*
U.S. Cl. 141—337 **7 Claims**

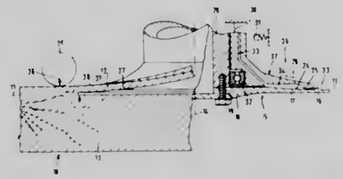




1. In a disposable funnel comprised of a generally rectangular, flexible, planar material formable by a user into a funnel shape and having adhesive affixed to said material for making adhering contact to a selected, relatively broad porton of said material to maintain said material in a user-selected funnel shape, the improvement for efficiently reducing the amount of adhesive necessary to maintain said user-selected funnel shape, said improvement comprising:
said adhesive being a relatively narrow adhesive strip, coupled obliquely to said material so as to lie in a generally straight line on a surface of a user-selected funnel shape, rather than forming a spiral line about the surface of said funnel shape, thereby efficiently reducing the amount of adhesive required to maintain said material in said user-selected funnel shape.

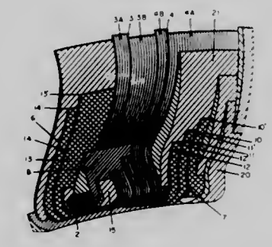
4,896,708
METHOD AND DEVICE FOR CUTTING OR SLOTTING RIGID MATERIAL, IN PARTICULAR WOOD
Hans Dietz, Ammerbuch-Pfäffingen, Fed. Rep. of Germany, assignor to Wurster u. Dietz GmbH u. Co., Tubingen-Derendingen, Fed. Rep. of Germany
PCT No. PCT/DE87/00466, § 371 Date Jun. 10, 1988, § 102(e) Date Jun. 10, 1988, PCT Pub. No. WO88/02683, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 14, 1987, Ser. No. 221,257
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635318; Jun. 20, 1987, 3720500
Int. Cl.[4] B27G *19/08*; B26D *7/08*; B27B *5/28, 1/00*
U.S. Cl. 144—363 **18 Claims**

3. An apparatus for cutting elongate pieces of wood, said pieces of wood having a modulus of elasticity between 50,000 and 400,000 kg/cm^2, comprising:
a circular saw blade having a plurality of spaced peripheral cutting teeth;
drive means for rotating said saw blade about an axis at a cutting speed of said teeth exceeding 40 m/s; and
stationary bending means arranged on a broad side of said circular saw blade and having an edge adjoining said



cutting teeth, said bending means having a radially profiled surface with a thickness increasing towards said axis and decreasing toward said cutting teeth to extend tangentially towards said teeth, whereby said saw blade can be used to cut a slot into said pieces of wood dividing each piece into a piece of wood having a first and second section and whereby said first section is lifted from said saw blade immediately after the formation of said slot.

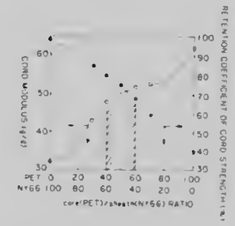
4,896,709
PNEUMATIC TIRE INCLUDING SQUARE WOVEN BEAD REINFORCING LAYERS
Jean-Claude Alie, Bastogne, Belgium; Romain Geisen, Strassen, Luxembourg; André Lamock, Fauvillers, Belgium, and William J. Villamizar, Cruchten, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation-in-part of Ser. No. 56,073, Jun. 1, 1987, Pat. No. 4,726,408. This application Feb. 19, 1988, Ser. No. 157,561
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—543 **15 Claims**



1. A pneumatic tire for beavy duty use comprising:
two bead regions, each reinforced by a bead core:
a radial carcass having two sets of at least two textile plies each, anchored around the bead core, the plies of the first set being wrapped around the bead core from the inside towards the outside of the tire and the plies of the second set being wrapped around the bead core from the outside towards the inside of the tire;
each bead region comprising a rubber apex strip of a substantially triangular cross-section extending radially outwardly from the bead core and an axially inner and an axially outer textile reinforcing layer comprising a square woven fabric having textile cords oriented at an angle with respect to the mid-circumferential plane in the range

of 30 degrees to 60 degrees, and the axially inner and axially outer textile reinforcing layers being respectfully disposed axially inside and outside of the first and second sets of carcass plies along the radial extent of the rubber apex strip, said first and second sets of carcass plies being separated from one another only below a separation point at the apex of the rubber apex strip; wherein
the rubber apex strip has a radially outermost end having a height h_1 between 0.15 and 0.2 times the height h_0 of the tire cross-section; wherein
the first set of plies have ply endings located at a height which is lower than the height of the radially outermost end of the rubber apex strip; wherein
the axially outer textile reinforcing layer has a radially outermost edge having a height h_3 located between 0.2 and 0.35 times the height h_0 of the tire cross-section; and wherein the axially inner textile reinforcing layer has a radially outermost edge having a height h_2 which is higher than h_3 and between 0.25 and 0.45 times the height h_0.

4,896,710
PNEUMATIC RADIAL TIRES FOR HEAVY VEHICLES
Kietsu Maeda, Toyonaka, Japan, assignor to Toyo Tire & Rubber Co., Ltd., Osaka, Japan
Filed Dec. 27, 1988, Ser. No. 290,193
Claims priority, application Japan, Dec. 28, 1987, 62-334632
Int. Cl.[4] B60C *9/02*; D02G *3/48*
U.S. Cl. 152—556 **1 Claim**

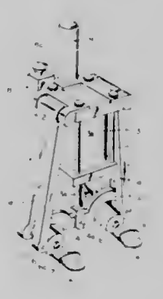


1. A pneumatic radial tire comprising:
an outer covering including a tread portion extending along the outer circumference of the tire, a respective sidewall portion extending from each side of said tread portion, and a respective bead portion extending radially inwardly from each said sidewall portion; and
a carcass comprising carcass plies and belt cord layers disposed beneath said outer covering and reinforcing the same, said carcass plies including carcass ply cords extending radially in the tire, and said belt cord layers interposed between said tread portion and said carcass plies,
each of said carcass ply cords comprising a twisted composite filament having a core-sheath structure in which a core is surrounded by a sheath,
said core comprising polyester, and said sheath comprising polyamide and accounting for 40–60 wt % of the entire said core-sheath structure,
each of said carcass ply cords that comprises the twisted composite filament having a coefficient of twist K defined by

$$K = T\sqrt{\frac{D}{\rho}} \times 10^{-3}$$

wherein T is the number of twists per 10 cm of cord length,
D is the denier of the cord, and
p is the specific gravity of the cord and the coefficient of twist K being within the range of
$1.22 < K < 2.24$, and
each of said carcass ply cords having an initial modulus Md (g/d) based on the load required to elongate the cord 2% at room temperature satisfying the condition
$Md > 45.0$.

4,896,711
APPARATUS FOR MOUNTING AND DISMOUNTING OF TIRES
Ejnar Pedersen, Bryndumvej 205, Esbjerg, Deamark (6715)
Filed Sep. 22, 1988, Ser. No. 247,862
Claims priority, application Deamark, Oct. 5, 1987, 5204/87
Int. Cl.[4] B60C *25/07, 25/10*
U.S. Cl. 157—1.22 **14 Claims**

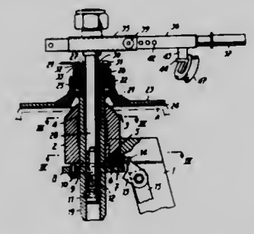


1. An apparatus for mounting and dismounting a tire having circumferential beads from a wheel having circumferential rims against which the beads engage respectively in use comprising:
a main actuator means;
first and second gripper means for clamping onto a rim and mounted on said main actuator means for movement relative to each other;
a tire lever means on each of said gripper means for engagement with a tire adjacent a bead thereof; and
control means for operating said main actuator means and said gripper means in sequence so that said first gripper means is actuated to clamp onto the rim, said main actuator means is actuated to move said second gripper means relative to said first gripper means in a first direction, said second gripper means is actuated to clamp onto the rim, said first gripper means is deactuated to release the rim therefrom, said main actuator means is actuated to move said first gripper means in said first direction, said first gripper means is actuated to clamp onto the rim, and said second gripper means is deactuated to release the rim therefrom, said sequence being repeated as desired.

4,896,712
APPARATUS FOR FITTING TIRES ON THE WHEELS OF MOTOR VEHICLES
Francis du Quesne, Kleistraat 138, 2630 Aartselaar, Belgium
Filed Apr. 20, 1989, Ser. No. 340,643
Claims priority, application Belgium, Apr. 20, 1988, 8800453; Mar. 30, 1989, 8900353
Int. Cl.[4] B60C *25/06*
U.S. Cl. 157—1.24 **12 Claims**

1. Apparatus for fitting the tires of motor vehicle wheels, comprising a stand, a head with a central opening and fixed on the stand and on which the wheel to be fitted is placed, a movable disc for exerting pressure on the wheel and part of which is formed by a sleeve provided with an axial opening and which is adjusted in the opening of the head, a locking means under the head for drawing and gripping the sleeve and for locking the disc against the wheel, a rod mechanism and

pedal on the stand for controlling the locking means, a movable pivot axle which is adjusted in the opening of the sleeve and can turn there, a second locking means mounted so that it can rotate on the disc and serving to fasten the pivot axle, a



lever mounted on the pivot axle, at least one fitting roller mounted on the lever the rolling surface of which is provided with a groove which serves to roll the tire bead over the flange of the wheel rim, and a retaining means forming part of the pivot axle meant for holding the tire in position during fitting.

4,896,713

DRIVE UNIT FOR A VERTICAL BLIND OR THE LIKE AND VERTICAL BLIND UTILIZING SAME

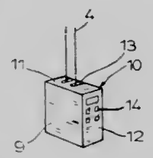
Wilhelm Rademacher, Buschkamp 7, 4292 Rhede, Fed. Rep. of Germany

Filed Jun. 14, 1988, Ser. No. 206,320

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722631; European Pat. Off., May 5, 1988, 88107197.1

Int. Cl.[4] E06B *9/30*

U.S. Cl. 160—168.1 **21 Claims**



1. A drive unit, for a vertical blind or the like having a plurality of slats that are movable by an endless pull element, of the type comprising a drive motor, said drive motor being coupled to a drive pinion that is constructed for drivingly engaging the pull element, and switch control means for operating the drive motor, the improvement comprising a housing enclosing said drive motor and drive pinion, and having means for enabling said drive unit to be installed onto a portion of the pull element, without separation and rejoining thereof, in each of two orientations of the housing that are offset 180° relative to each other about an axis extending normal to the plane of a rear wall of the housing so as to be inverted; wherein said means for enabling comprises a side wall at each of top and bottom sides of said housing being provided with opening means for providing access to said drive pinion and for enabling said portion of the pull element to pass into the housing to the drive pinion and to pass out of the housing therefrom, and the switch control means being integrated into a removable end face wall that is fastenable to the housing in each of two positions which are offset 180° relative to each other about an axis extending normal to the plane of the end face wall so as to be inverted.

4,896,714

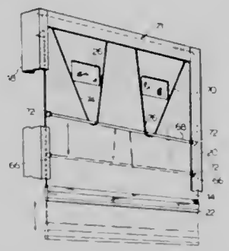
ROLL DOOR

Arthur S. Ellis, Brampton, Canada, assignor to Hy-Roll Manufacturing, Inc., Ontario, Canada

Filed Mar. 24, 1987, Ser. No. 30,034

Int. Cl.[4] E06B *9/08*

U.S. Cl. 160—311 **4 Claims**



1. A roll door assembly, comprising:

a frame comprising a pair of side frame members in spaced apart relationship, defining a door space therebetween said frame having an upper end and a lower end,

rotatable support means for a flexible roll door mounted in said frame,

a flexible roll door rollingly supported as a door winding on said support means,

said support means being rotatably mounted in said upper end and said roll door being rollingly supported on said support means between an open door position in which said roll door is in a substantially rolled configuration having a minimum hanging weight of flexible door and a closed door position in which said roll door is in an unrolled configuration having a maximum hanging weight of flexible door extending vertically downwardly from said upper end to said lower end with an outer end of said roll door adjacent said lower end,

a counterweight means housed in each of said frame members and adapted to retain said flexible roll door taut, said counterweight means being mounted for vertical counterbalancing movement responsive to rolling movement of said door, each said counterweight means comprising:

(i) a counterweight member, a first fixed pulley adjacent said upper end, a second fixed pulley adjacent said lower end, and a movable pulley mounted to said counterweight member between said first and second fixed pulley,

(ii) spool means mounted for rotation with said support means, and

(iii) a belt fixed at a first end to said spool means and wound thereon as a belt winding, and fixed at a second end to said outer end of said roll door,

said belt being entrained from said spool means about said movable pulley, thence about said first fixed pulley and thence about said second fixed pulley to said outer end of said roll door,

said belt winding on said spool means increasing in diameter responsive to decrease in diameter of said door winding on said support means as said roll door unwinds to the closed configuration and said hanging weight of flexible door increases, and said belt winding on said spool means decreasing in diameter responsive to increase in diameter of said door winding on said support means as said roll door is wound to the open configuration and said hanging weight of flexible door decreases, such that a uniform counter-balancing of said roll door is achieved throughout travel between said open and closed configurations by the balancing moment created by each said counterweight member and belt winding and by the hanging weight of flexible door and door winding,

drive means to rotate said support and spool means, and

further including opposed vertical channels in said side frame members, a wind bar extending between said channels for movement therein and support strand means entrained about said wind bar and mounted between said frame and said support means, said support strand means being rollingly supported on said support means.

4,896,715

APPARATUS FOR AND PROCESS OF DIRECT CASTING OF METAL STRIP

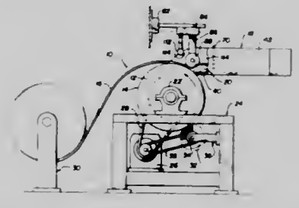
LeRoy Honeycutt, Salisbury, N.C., assignor to National Aluminum Corporation, Pittsburgh, Pa.

PCT No. PCT/US88/04641, § 371 Date Mar. 29, 1989, § 102(e) Date Mar. 29, 1989

Continuation-in-part of Ser. No. 152,486, Feb. 5, 1988, abandoned. This PCT application Dec. 29, 1988, Ser. No. 344,288

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—479 **28 Claims**



1. In a melt drag metal strip casting apparatus wherein molten metal is delivered from a supply of the molten metal into contact with a chill surface at a casting station and the chill surface is driven for movement in a path past the casting station at a predetermined linear rate to quench and withdraw a continuous strip of metal from the molten metal supply, the strip having a bottom surface adhering to the chill surface and an unsolidified top surface as it is withdrawn from the molten metal supply, the improvement comprising,

a top roll,

mounting means supporting the top roll above the chill surface and spaced therefrom by a distance substantially equal to the thickness of the strip desired, and in contact with the unsolidified top surface of the strip,

means independent of the molten metal for applying heat to the top roll to maintain the top roll temperature at a level which will not solidify the top surface of the strip as a result of contact with the top roll, and

means withdrawing the solidified layer as a continuous metal strip.

15. In a melt drag strip casting apparatus wherein molten metal is delivered from a supply of the molten metal into contact with a chill surface at a casting station and the chill surface is driven for movement in a path passed the casting station at a predetermined linear rate to quench and withdraw a continuous strip of metal from the molten metal supply, the strip having a bottom surface adhering to the chill surface and an unsolidified top surface as it is withdrawn from the molten metal supply, and a top roll mounted above the chill surface and spaced therefrom a distance substantially equal to the thickness of the strip desired for contact with the unsolidified top surface of the strip, the improvement wherein said top roll comprises an elongated cylindrical graphite body having a smooth outer surface for engaging the unsolidified metal on the top surface of a metal strip emerging from the supply of molten metal, and means supporting said graphite body for rotation about a horizontal axis parallel to and spaced from the top surface of the metal strip.

17. A process for direct casting of metal strip comprising

withdrawing molten metal from an open tundish on a moving chill surface and progressively solidifying the metal from the moving chill surface upward to form a solid continuous strip,

providing an uncooled top roll having an outer surface in contact with molten metal moving with the moving chill surface and having its axis spaced from the chill surface to define a gap between the top roll outer surface and the chill surface corresponding to the thickness of the strip to be formed, and

rotating the top roll about its axis in contact with the molten metal.

4,896,716

HEAT PIPE TYPE HEAT-EXCHANGER FOR THE VENTILATION

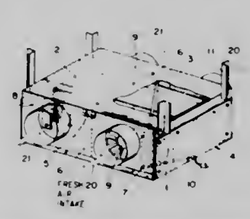
Junji Sotani, and Chiyoshi Sasaki, both of Yokohama, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 148,537, Jan. 26, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 309,970

Claims priority, application Japan, Jan. 27, 1987, 62-10493[U]

Int. Cl.[4] F24H *3/02*; F28D *15/00*

U.S. Cl. 165—54 **3 Claims**



1. A heat pipe type heat-exchanger ventilation unit for a humid environment comprising:

a generally box-like case having sides forming a substantially enclosed space;

a plurality of heat pipes affixed with fins provided internaly of said case, said heat pipes extending horizontally and being fixedly positioned vertically one above another extending across said enclosed space;

a partition plate within said case extending transversely across said heat pipes so as to divide the enclosed space into two side-by-side closed chambers;

an air inlet and an air outlet formed in each of said chambers, in opposite sides of said case, each side having an inlet to one chamber and an outlet from the other chamber; and

a pair of fans affixed in said case, including a fan affixed in each of said inlets, for circulation of air through the respective chambers; said unit further including an external power source wire extending into one of said chambers used to intake air of low humidity, power connections of said fans to said external power source wire beng made in said one of said chambers.

4,896,717

FLUIDIZED BED REACTOR HAVING AN INTEGRATED RECYCLE HEAT EXCHANGER

Walter R. Campbell, Jr., 1659 Porter Rd., Union, N.J. 07083; Michael G. Allinson, 24 Field La., Denville, N.J. 07834, and Benjamin H. Sinson, 267 Powder Horn Dr., Phillipsburg, N.J. 08865

Filed Sep. 24, 1987, Ser. No. 100,509

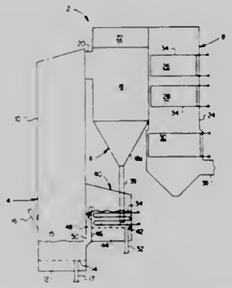
Int. Cl.[4] F28D *19/02*; F28C *3/16*

U.S. Cl. 165—104.18 **2 Claims**

1. A fluidized bed combustion system including a furnace, a fluidized bed of combustible particulate material disposed in

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the furnace, a recycle heat exchanger disposed adjacent said furnace and sharing a common wall with said furnace separating means for receiving a mixture of flue gases and entrained particulate material from a fluidized bed in said furnace and separating said particulate material from said flue gases, means for passing said separated flue gases to a heat recovery area, means for passing said separated particulate material to said heat exchanger, and a vertical partition disposed in said heat exchanger for dividing said heat exchanger into a chamber for receiving said separated particulate material and a vertically extending passage located between said common wall and said



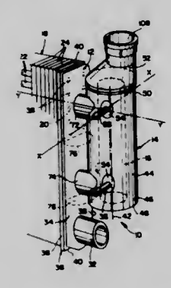
chamber for receiving said particulate material from said chamber, means for distributing air through said material in said chamber to fluidize said latter material, heat exchange means disposed in said chamber for passing fluid through said material in said chamber to control the temperature of said material, said common wall having an opening extending therethrough and registering with the lower end of said passage for passing said material from said passage to said fluidized bed in said furnace, the height of particulate material in said passage being sufficient to seal against backflow of said flue gases from said furnace through said heat exchanger and to said separating means.

4,896,718

WATER RESERVOIR DEVICE CONTAINING AN OIL EXCHANGER, FOR AN AUTOMOBILE RADIATOR

Pierre Tria, Elancourt, France, assignor to Valeo, Paris, France

Filed May 5, 1988, Ser. No. 190,453
Claims priority, application France, May 6, 1987, 87 06416
Int. Cl.[4] F28D *7/10*
U.S. Cl. 165—141 **17 Claims**



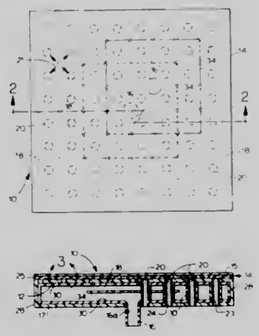
1. A water reservoir device for an automobile radiator with a tube body, said device comprising a water reservoir (12), an appended receptacle (14) exterior of and in communication with the water reservoir (12), said receptacle including completely encircling peripheral wall means, and an oil exchanger (16) received within said receptacle, said oil exchanger including inlet and discharge pipes (58) passing in a sealed manner through the wall means of the appended receptacle (14), for communication with an oil circuit, and means on said pipes for mounting the oil exchanger (16) in the appended receptacle (14), said water reservoir (12) and the appended receptacle (14) comprising an integral molded assembly of plastic material.

4,896,719

ISOTHERMAL PANEL AND PLENUM

Richard F. O'Neill, Carlsbad, Calif., and Robert B. Whitesides, Murrysville, Pa., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 11, 1988, Ser. No. 192,610
Int. Cl.[4] F28F *3/12*
U.S. Cl. 165—170 **8 Claims**



1. A heat exchanger that controls the temperature of an extended heat exchange surface, comprising:
- a panel having a plurality of discharge orifices defining passages closely spaced apart throughout the area of the panel for receiving a flow of heat exchange medium,
- a plurality of exhaust openings provided in the panel and located in a manner that each discharge orifice is surrounded by a plurality of exhaust openings located in close proximity to each discharge orifice,
- an extended area heat exchange panel providing the extended heat exchange surface, said heat exchange panel comprising a porous material bonded to a metal sheet, said porous material being located adjacent to the orifice panel, wherein said passages defined by said discharge orifices do not penetrate said porous material, and
- a plenum disposed adjacent the orifice panel to provide a constant supply of heat exchange medium to the discharge orifices.

4,896,720

METHOD AND SYSTEM FOR CLEANING WELL CASING

Mark W. DeRouen, Carencro, La., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 20, 1988, Ser. No. 286,915
Int. Cl.[4] E21B *37/04*
U.S. Cl. 166—170 **4 Claims**

1. Apparatus for cleaning the interior wall of a well casing string and the like comprising:
- an elongated generally cylindrical body member formed of a resilient plastic material;
- a plurality of elongated helical wraps of wire bristles disposed on the exterior surface of said body member and projecting generally radially outwardly with respect to a longitudinal central axis of said body member, said wire bristles having a free radial height with respect to said longitudinal central axis of said body member of about 0.25 inches and the outer diameter of said wraps of said wire bristles being at least about 3% greater than the diameter of the inside wall of said casing;
- elongated rod means extending completely through said body member, said rod means including thread means



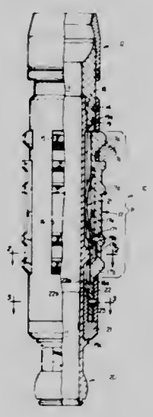
thereon for connecting said body member to a plug member; and
- a plug member formed of deformable rubberlike material having read means therein for connection to said thread means of the rod means of said body member and having plural cylindrical flanges engageable with said wall of said casing and forming a generally fluid tight seal therewith.

4,896,721

LOCATOR SHIFTER TOOL

William R. Welch, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 14, 1989, Ser. No. 322,906
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—214 **10 Claims**



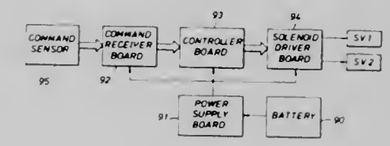
1. An improved locator shifter tool comprising:
(a) an inner mandrel having upper and lower expander surfaces;
(b) an outer key mandrel around said inner mandrel, said outer key mandrel having a plurality of openings, a slot above each opening, each said opening and slot having a camming surface along a lower surface thereof;
(c) a key having profiled grooving thereon mounted for radial movement in each opening and slot thereabove, each said key having an upper camming surface engageable with said slot camming surface and a lower camming surface engageable with said opening camming surface;
(d) biasing means for biasing said keys toward expanded position;
(e) a locking means comprising said inner mandrel upper and lower expander surfaces engageable with the inside surface of each key for locking said keys in expanded position; and
(f) releasable positioning means for positioning said keys in radially moveable position; said positioning means releaseable on upwardly movement of said inner mandrel relative to said outer mandrel for engaging said key and outer mandrel camming surfaces and moving said keys to retracted position.

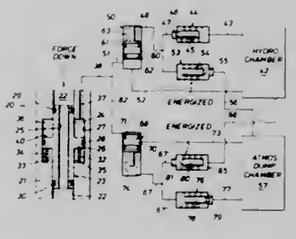
4,896,722

MULTIPLE WELL TOOL CONTROL SYSTEMS IN A MULTI-VALVE WELL TESTING SYSTEM HAVING AUTOMATIC CONTROL MODES

James M. Upchurch, Sugarland, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 295,614, Jan. 10, 1989, which is a continuation-in-part of Ser. No. 243,565, Sep. 12, 1988, Pat. No. 4,856,595, which is a division of Ser. No. 198,968, May 26, 1988, Pat. No. 4,796,699. This application Jan. 11, 1989, Ser. No. 295,874
Int. Cl.[4] E21B *34/08, 49/08, 47/06*
U.S. Cl. 166—250 **13 Claims**





1. A well testing system adapted to be disposed in a borehole, comprising:
- stimulus generating means for generating an initial kickoff stimulus;
- a plurality of valves;
- a plurality of control system means connected respectively to the plurality of valves for operating said valves; and
- control means interconnected between said plurality of control systems means and said stimulus generating means for automatically controlling the operation of one or more of said plurality of control system means and thereby one or more of said plurality of valves in a predetermined manner in response to said initial kickoff stimulus.

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4. A method of automatically controlling a plurality of valves disposed in a multi-valve well testing system when said system is disposed in a borehole, comprising:
generating an initial kickoff stimulus signal;
receiving said initial kickoff stimulus signal in a processor means disposed in said system;
executing in said processor means a set of instructions stored in a memory disposed in said system in response to said initial kickoff stimulus signal; and
automatically controlling one or more of said plurality of valves during the execution of said set of instructions.

4,896,723

CROSS-LINKED POLYVINYL ALCOHOLS AND OIL RESERVOIR PERMEABILITY CONTROL THEREWITH

Dennis H. Hoskin, Lawrenceville, and Paul Shu, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 21, 1989, Ser. No. 369,180
Int. Cl.[4] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—272 **24 Claims**

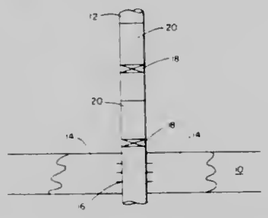
1. In a method of recovering oil under steam flooding conditions from an oil-bearing subterranean formation penetrated by an injection well and a production well, in which an aqueous fluid is injected into the formation through the injection well to displace oil to the production well, the improvement comprising employing, in at least a portion of the aqueous fluid injected into the formation, a cross-linked polymer obtained by cross-linking polyvinyl alcohol with a cross-linking agent which is a mixture of a phenolic component and an aldehyde or a mixture of a naphtholic component and an aldehyde.

4,896,724

METHOD FOR SUSPENDING WELLS

Randy D. Hazlett, Dallas; Alfred R. Jennings, Jr., Plano, both of Tex., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 890,679, Jul. 30, 1986, Pat. No. 4,817,719. This application Apr. 25, 1988, Ser. No. 185,666
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—285 **33 Claims**



1. A method for shutting in a well which minimizes formation damage comprising:
(a) placing into said formation a solution containing water and a chemical blowing agent;
(b) causing said chemical blowing agent to decompose thereby liberating a gas which forces formation fluids away from a wellbore into said formation;
(c) pumping a solidifiable gel mixture into the productive interval of the formation via a wellbore where said mixture comprises
(i) water,
(ii) 0.2 to 5.0 wt. percent of a cross linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group, and
(iii) 0.02 to 50.0 wt. percent of a partially methylated aminoplast resin which cross links with said polymer;
(d) causing said gel mixture to become a solid thereby forming a gel plug within said wellbore and a formation gel within said formation sufficient to withstand environmental formation conditions and pressures which cause hydrocarbonaceous fluids to flow into said wellbore from the formation areas near said wellbore;
(e) placing in said wellbore on top of said plug an amount of cement sufficient to isolate said productive interval when said cement hardens while being supported by said plug; and
(f) allowing said cement to set which set cement in combination with said gel plug is competent to exclude production fluids from said wellbore.

4,896,725

IN-WELL HEAT EXCHANGE METHOD FOR IMPROVED RECOVERY OF SUBTERRANEAN FLUIDS WITH POOR FLOWABILITY

Marvin T. Parker, 11506 Spring Glenn Dr., Houston, Tex. 77070, and Peter J. Noonan, 24099 Shooting Star Dr., Golden, Colo. 80401

Continuation-in-part of Ser. No. 934,696, Nov. 25, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 206,135
Int. Cl.[4] E21B *43/24, 43/40*
U.S. Cl. 166—267 **19 Claims**



10. A method for producing fluid from a subterranean formation through a well in fluid communication therewith, comprising the steps of:
conducting fluid from the subterranean formation into the well;
heating and compressing a lift gas;
admixing the heated lift gas with the fluid at one or more gas lift valves positioned in the well near or above the producing formation at an effective depth beneath the surface to lift the fluid thereto;
placing the admixture in heat exchange relationship with the heated lift gas prior to said admixture of the lift gas, the lift gas being at a higher temperature than the admixture;
producing the admixture at the surface;
recovering wet gas from the admixture; and
recycling at least a portion of the recovered wet gas for use as said lift gas to the heating and compressing step.

14. An artificial lift system for producing oil from a subterranean formation, comprising:
a well in fluid communication with the formation;
means for conducting crude oil from the formation into the well;
means for injecting lift gas into the crude oil in the well at a depth, rate, temperature and pressure effective to lift the crude oil to the surface;

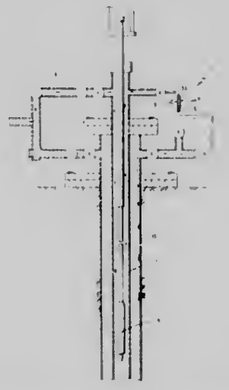
means for heating the lift gas to a temperature in excess of that of the fluid produced at the surface;
means for placing the heated lift gas in heat exchange relationship in the well with the fluid being lifted to the surface;
separator means for recovering wet gas from the oil produced at the surface; and
means for recycling at least a portion of the recovered wet gas for use as said lift gas to the heat exchange means.

4,896,726

SLIP STREAM DEVICE

Robert N. Ayres, 7009 Meadowview Loop W., Lake Charles, La. 70605

Continuation-in-part of Ser. No. 71,020, Jul. 7, 1987, Pat. No. 4,796,697. This application Jan. 10, 1989, Ser. No. 295,850
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[4] E21B *37/08*
U.S. Cl. 166—312 **13 Claims**



1. A device for continuously adding chemicals to a production oil and gas well including a casing extending into the ground with a substantially coaxially disposed tubing therein wherein a down hole pump pumps crude oil upwardly through the tubing and gas flows upwardly through the casing, said device comprising:
an above ground mixing chamber having an inlet and an outlet;
first means communicating between said tubing and inlet for diverting a flow of production oil into the inlet;
pressure responsive valve means communicating with the inlet for closing the inlet when pressure within the chamber exceeds a predetermined value;
second means communicating with said chamber for admitting a predetermined flow of liquid chemical into said chamber; and
means carried by said device for permitting only a predetermined flow rate of liquid through said chamber,
conduit means communicating between the outlet and said casing for conveying the flow through the outlet into the casing;
whereby said liquid contents flush downwardly through said casing through the well to be pumped upwardly through the tubing.

8. Method for continuously adding chemicals to a production oil and gas well having a casing extending into the ground with a substantially coaxially disposed tubing therein wherein a down hole pump pumps crude oil upwardly through the tubing and gas flows upwardly through the casing comprising the steps of:
providing an above ground mixing chamber having an inlet and an outlet;
diverting a predetermining flow of production oil from said tubing into the inlet to said chamber;
adding a predetermined flow of chemicals to said diverted flow of oil in said chamber while maintaining the pressure within said chamber within a predetermined range;
conveying the mixture of chemicals and oil from said chamber through the outlet therein and into said casing.

4,896,727

MEDIUM AND METHOD FOR FILLING THE HORN WALL OF A HORSE'S HOOF

Wilhelmus G. H. M. Busser, Julianalaan 42, 3871 VK Hoevelaken, Netherlands

Filed Jun. 15, 1988, Ser. No. 206,840
Claims priority, application Netherlands, Jun. 18, 1987, 8701417
Int. Cl.[4] A01L *5/00*
U.S. Cl. 168—4 **11 Claims**



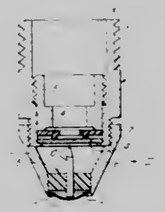
1. Medium for filling or replacing portions of the horn wall or horny parts of the hoof of an animal, particularly a horse, wherein the medium consists of a mixture of a plurality of components, of which one is a synthetic resin and another consists of filler particles which remain resilient and comprise wood, rubber, cork or a combination of filler particles, said mixture being adapted to be cured by the addition of a hardening catalyst and optionally an accelerator.

4,896,728

FIRE SPRINKLERS WITH FRANGIBLE BODY CLOSING A FLOW PASSAGE AND SEPARATE MEANS FOR SHATTERING SAME

Heinz S. Wolff, London, and David W. Hawes, Cuckfield, both of England, assignors to Thomas Bolton & Johnson Limited, Staffordshire, England

Filed Sep. 26, 1988, Ser. No. 249,129
Claims priority, application United Kingdom, Oct. 2, 1987, 8723226
Int. Cl.[4] A62C *37/08*
U.S. Cl. 169—37 **9 Claims**



1. A fire sprinkler comprising a flow passage extending from an inlet to an outlet, a fluid distributor positioned beyond the outlet, a frangible body closing the flow passage, separate means actuated by a temperature-responsive element of a shape-memory alloy for shattering the frangible body to allow

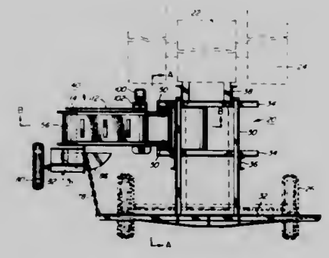
passage of fluid on detection of predetermined temperature-rise conditions, said element itself generating the force required to shatter said frangible body.

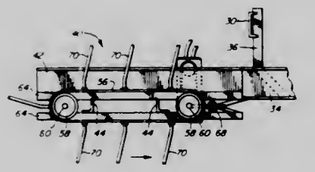
4,896,729

APPARATUS FOR COLLECTING POTATOES AND OTHER ROOT VEGETABLES

Maurice Fex, 2746 Dominion Drive, Blezard Valley, Ontario, Canada (P0M 1E0)

Filed Jun. 20, 1988, Ser. No. 209,068
Claims priority, application Canada, Jun. 18, 1987, 540066
Int. Cl.[4] A01D *13/00*
U.S. Cl. 171—84 10 Claims





1. Apparatus for gathering vegetable such as potatoes and other root vegetables from a plurality of rows into a central region for subsequent harvesting, comprising:

a support frame structure adapted to be secured to a tractor;

a pair of wings secured to said frame and adapted to extend, in use, laterally outwardly relative to the foward direction of travel of the tractor;

each of said wings having an endless flexible tine carrier mounted thereto for travel in an endless path of travel, said path of travel including an upper run and a lower run;

a plurality of permanently aligned tines secured to and projecting outwardly from the flexible tine carrier for movement along said path of travel such that, when in use, the tines located along said lower rung of the path of travel are capable of engaging the vegetables lying on or in the earth; and

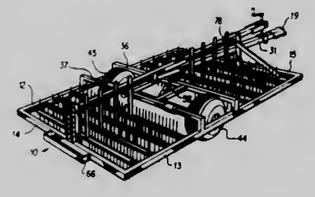
drive means connected to said endless tine carriers for moving the latter along their respective paths of travel in opposed directions such that the vegetables while still in the ground in which they were grown as well as vegetables on the ground are engaged by said tines and gathered together toward a region between said wings for subsequent harvesting.

4,896,730

APPARATUS FOR CULTIVATING RICE AND OTHER CROPS

James D. Jarrett, and Lynn S. Murray, both of Williams, Calif., assignors to Pure-Harvest Corporation, Napa, Calif.

Continuation-in-part of Ser. No. 176,059, Mar. 31, 1988, abandoned. This application Jan. 10, 1989, Ser. No. 295,352
Int. Cl.[4] A01B *49/02, 23/02, 23/04*
U.S. Cl. 172—40 33 Claims



1. An apparatus for cultivating rice and any crop which is planted three-fourths inch or deeper into the soil, comprising:

a framework;

a plurality of longitudinally spaced elongated bars extending across said framework;

a plurality of resilient elongated downwardly extending substantially linear through their length tine members disposed at uniformly spaced locations along each of said bars capable of vibrating in all directions (360°) while contacting the soil, said tine members being offset in each successive bar from the tine members of any other bar and capable of working substantially 100 percent of the soil surface;

means on each of said bars for securing a straight portion of the tine to the bar; and

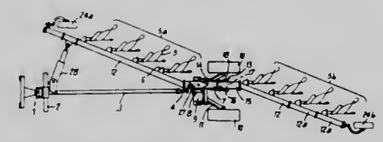
wheel means engaging said framework for moving said framework in a rolling motion across a surface.

4,896,731

REVERSIBLE SEMI-MOUNTED PLOW WITH A LOCKABLE ARTICULATION

Alphonse Besson, Montigne Sur Moine, France, assignor to S.A.R.L. Ets Gregoire-Besson Et Cie, Montigne Sur Moine, France

Filed Jun. 24, 1988, Ser. No. 210,783
Claims priority, application France, Jun. 29, 1987, 87 09124
Int. Cl.[4] A01B *3/16*
U.S. Cl. 172—225 4 Claims



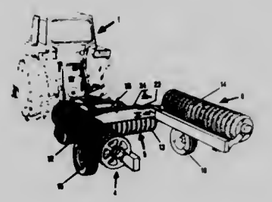
1. A multifurrow reversible semi-mounted plough comprising a large number of plough-bodies fixed on a beam, the beam being constituted by at least two elements interconnected via an articulation about an axis which is horizontal in a working position of the plough, and means for selectively locking and unlocking said articulation, said means for selectively locking and unlocking said articulation comprising a mobile pin member carried by one of the articulated beam elements, engaging in a generally V-shaped notch formed in the other beam element, and means for remotely selectively moving said pin member into and out of said notch.

4,896,732

FOLDABLE FRAME FOR AGRICULTURAL ROLLERS

Crister K. G. Stark, Axtavägen, S-59600 Skänninge, Sweden

PCT No. PCT/SE87/00547, § 371 Date Apr. 19, 1989, § 102(e) Date Apr. 19, 1989, PCT Pub. No. WO88/04134, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 20, 1987, Ser. No. 346,927
Claims priority, application Sweden, Dec. 5, 1986, 8605233
Int. Cl.[4] A01B *73/06, 29/00*
U.S. Cl. 172—311 7 Claims



1. An agricultural roller equipped with wheels and intended for soil cultivation, and including a plurality of frame sections pivotably connected to each other and arranged side by side, said frame sections comprising a central frame section having a towing bar pivotally connected thereto for transport and towing behind a tractor, and side frame sections pivotally connected on both sides of the central frame section, each of said frame sections having attached thereto a rotatable roller means for working the soil, characterized;

in that all wheels are attached to the side frame sections and are intended for transport only and are settable between an inactive position above the ground in the work position of the roller and a lowered position where the wheels carry the roller with the roller means lifted from the ground, said wheels including two transport wheels (15,16) connected one to each of the side frame sections in close proximity to the central frame section (8),

in that said pivotal connections between adjacent frame sections (4,5,6) include pivoting joints (17, 18) having only one pivoting axis and formed and oriented such that the frame sections of the roller are free to swing vertically relative to each other while in the work position for the purpose of allowing the frame sections to adjust themselves to irregularities in the ground, and the side frame sections are allowed to swing inwardly while in the transport position so that a decreased transport width is obtained,

in that a power means is arranged between the towing bar (5) of the roller and the central frame section (8) so that the central frame section and the side frame sections connected thereto are, by the action of the power means (21), commonly pivotable approximately 90 degrees about a pivoting axis transverse to the travelling direction of the roller between its work position and an intermediate position in which all the frame sections are situated generally parallel to each other and substantially in a vertical plane transverse to the travelling direction, while the transport wheels (15,16) are adapted such as to be simultaneously pivoted between their inactive position and a position engaging the ground for supporting the roller with the roller means elevated above the ground, and

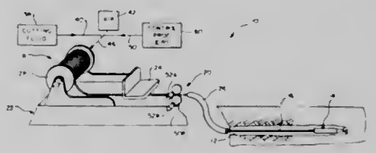
in that with the frame sections retracted into the intermediate position the pivoting joints allow the side frame sections (4, 6) to swing between the intermediate position and the transport position when the roller is moved forwards or backwards in the working direction thereof.

4,896,733

TECHNIQUE FOR PROVIDING AN UNDERGROUND TUNNEL UTILIZING A POWERED BORING DEVICE

Glen Baker, Kent; Albert W. Chau, Redmond; James A. Fikse, Kirkland, and John E. Mercer, Kent, all of Wash., assignors to FlowMole Corporation, Kent, Wash.

Continuation of Ser. No. 866,240, May 22, 1986, Pat. No. 4,821,815, This application Oct. 21, 1988, Ser. No. 260,792
Int. Cl.[4] E21B *7/18, 44/00*
U.S. Cl. 175—26 8 Claims



2. An apparatus for providing a continuous underground tunnel between first and second spaced-apart points, comprising:

(a) a boring device including high pressure fluid jets of substantially constant pressure for boring through soil of the type which varies in hardness to bore through; and

(b) means for driving said boring device through said last-mentioned soil from said first point to said second point as the device bores through said soil whereby to form a tunnel between said points, said driving means including means for automatically varying the speed of said device as it bores through the soil depending upon the hardness of the soil so as to provide a tunnel of substantially uniform diameter regardless of the degree of hardness of the soil being bored through by the device.

4,896,734

SUPERCHARGED MOTOR VEHICLE

Kenji Horiuchi, and Toru Ichinose, both of Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 839,682, Mar. 14, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 314,240
Claims priority, application Japan, Mar. 27, 1985, 60-60800
Int. Cl.[4] B60K *13/02*
U.S. Cl. 180—68.3 29 Claims



1. In a motor vehicle having an engine compartment, an air inlet to said engine compartment for delivering cooling air thereto, an engine disposed in said engine compartment with its output shaft rotating about an axis extending generally perpendicular to the direction of air flow into said engine compartment from said air inlet and the ends of said engine being contiguous to the ends of said output shaft, and a supercharger for delivering air under pressure to an induction system of said engine, the improvement comprising said supercharger lying outside of the area defined by a pair of parallel planes extending in the direction of air flow and each containing a respective end of said engine and disposed in a path of air flow from said

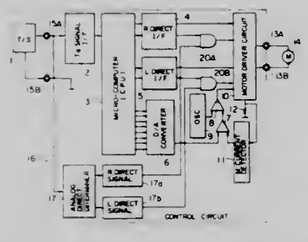
air inlet not obstructed by said engine and so that air flowing around the outer periphery of said supercharger does not intersect said engine.

4,896,735

ELECTRIC MOTOR ASSISTED POWER STEERING DEVICE

Mitsuharu Morishita; Kosaku Uota, and Takeshi Yasukawa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,006
Claims priority, application Japan, Apr. 6, 1988, 63-86120; Apr. 6, 1988, 63-86123
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **6 Claims**



1. An electric motor assisted power steering device for an automotive vehicle which includes a steering wheel operated by an operator of the vehicle, at least one steered wheel, and a steering shaft operatively coupling the steering wheel to the steered wheel, said power steering device comprising:

an electric motor capable of being turned in a first and a second direction by a supply of a current in a first and a second direction, respectively, said electric motor being operatively coupled to the steering shaft to provide an auxiliary torque to a right and a left direction by rotating in said first and second direction, respectively;

torque sensor means for detecting a steering torque of the steering shaft applied by the operator of the vehicle via the steering wheel;

computation means, including a microcomputer coupled to an output of said torque sensor, for determining a direction of said auxiliary torque corresponding to said steering torque of the steering shaft applied by the operator, and for determining an amount of the auxiliary torque provided by said electric motor to the steering shaft, wherein said computation means outputs a first right direction signal when said steering torque applied by the operator is to the right direction and a first left direction signal when said steering torque is to the left direction;

direction determiner circuit means, coupled to an output of said torque sensor means, for determining a direction of said auxiliary torque corresponding to said steering torque of the steering shaft applied by the operator, wherein said direction determiner circuit means outputs a second right direction signal when said steering torque is to the right direction and a second left direction signal when said steering torque is to the left direction;

first logical product means, having a first and a second input coupled to an output of said computation means and an output of said direction determiner circuit means, respectively, for computing and outputting a logical product of said first and second right direction signals;

second logical product means, having a first and a second input coupled to an output of said computation means and an output of said direction determiner circuit means, respectively, for computing and outputting a logical product of said first and second left direction signals; and

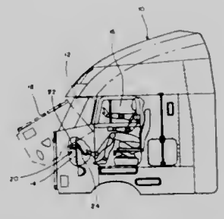
motor current control means, coupled to outputs of said first and second logical product means and an output of said computation means, for controlling a current supplied to said electric motor to an amount corresponding to said amount of auxiliary torque determined by said computation means, wherein said motor current control means controls a direction of current supplied to said electric motor to said first direction in response to an output from said first logical product means and to said second direction in response to an output from said second logical product means.

4,896,736

FIREWALL MOUNTED FOOT VALVE AND BRAKE PEDAL ASSEMBLY

Jason Smith, Newark, Calif., assignor to Paccar Inc., Bellevue, Wash.

Filed Sep. 15, 1988, Ser. No. 245,140
Int. Cl.[4] B62D *33/06*
U.S. Cl. 180—89.16 **6 Claims**



1. In a truck of the cab-over engine type including a cab which is located over the truck's engine andwhich has a front windshield, a front vertical firewall located below said windshield and defining the forwardmost extent of the cab's lower interior near the driver's feet, and a nose hood mounted for pivotal movement between a closed position in front of said firewall for preventing external access to the firewall and an opened position for gaining access to said firewall externally of said cab, the improvement comprising:

(a) a foot valve and brake pedal assembly including a foot valve, a brake pedal and means including a support plate for disengageably connecting the foot valve and brake pedal together in an operating condition, such that said foot valve is manually disengeable from said support plate and said brake pedal, and

(b) means disengagabely connecting said support plate to said firewall such that

(i) said brake pedal is located on the interior side of said firewall within the cab,

(ii) said foot valve is located on the exterior side of said firewall behind the nose hood when the latter is in its closed position, but easily accessible from outside the cab when the hood is in its opened position, and

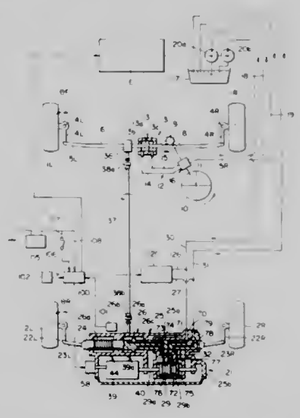
(iii) said assembly including said foot valve, support plate and brake pedal are manually disconnectable and removable from said cab when said nose hood is in its opened position, whereby said foot valve is manually separable from said support plate after the entire brake assembly has been disconnected from the firewall.

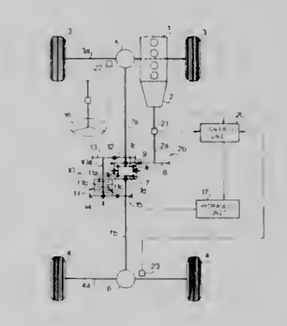
4,896,737

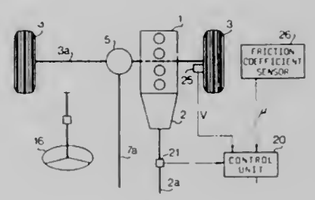
FOUR-WHEEL STEERING APPARATUS FOR VEHICLE

Hirotaka Kanazawa, Hiroshima; Koushun Note, Higashhiroshima; Yasuhiro Nakashima, and Takeshi Murai, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 22, 1988, Ser. No. 184,982
Claims priority, application Japan, Apr. 22, 1987, 62-100866
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—140 **11 Claims**







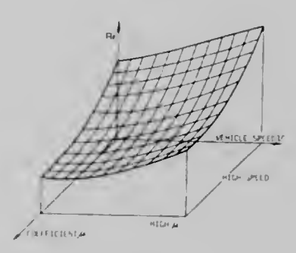
9. In a four-wheel steering apparatus for a vehicle including rear wheel power steering means for turning rear wheels, a hydraulic system for supplying oil under pressure to the rear wheel power steering means, and valve means for draining oil from the rear wheel power steering means, the improvement comprising: engine stop means for outputting a signal to stop the vehicle engine, control means for actuating said valve means for draining oil at a predetermined time after said engine stop means outputs a signal for stopping the vehicle engine when a signal is received from said engine stop means, said control means including delay means for keeping said valve means in a closed position when a signal is received from said control means, said delay means delaying actuation of said valve means during said predetermined time.

4,896,738

POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Yukio Kodama, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 63,173
Claims priority, application Japan, Jun. 20, 1986, 61-144477; Jun. 20, 1986, 61-144476; Jun. 20, 1986, 61-144475; Jun. 20, 1986, 61-144478; Jun. 20, 1986, 61-144479
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.
Int. Cl.[4] B60K *17/34, 23/08*
U.S. Cl. 180—233 **6 Claims**



3. In a power transmitting system for a four-wheel drive vehicle having an engine, a transmission operatively connected with said engine for transmitting a torque of the engine to main drive wheels and auxiliary drive wheels of the vehicle through a central differential means and defining torque distribution ratio of the main drive wheels to the auxiliary drive wheels, said central differential means enabling different wheel speeds between said main and auxiliary drive wheels, the improvement in the system which comprises

hydraulic actuating means comprising input and output members respectively connected to outputs of said central differential means operatively bypassing said central differential means for changing the torque transmitted to said main drive wheels and auxiliary drive wheels, and

reduction gear means connected to at least one of said input and output members of said hydraulic actuating means and a corresponding of said outputs of said central differential means for producing different rotary speeds between said input and output members of said hydraulic actuating means,

detecting means for detecting driving conditions of the vehicle and for producing an output signal upon occurrence of the driving conditions, and

control means responsive to the output signal for supplying hydraulic pressure between said input and output members of the hydraulic actuating means to change the rotary speeds of said input and output members, so as to change the torque distribution ratio of the main drive wheels to the auxiliary drive wheels in accordance with the driving conditions of the vehicle.

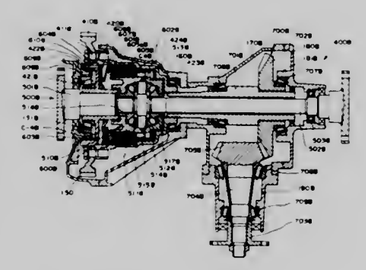
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4,896,739

FOUR-WHEEL DRIVE VEHICLE

Masakatsu Miura, Kariya; Tatsuya Iwatsuki, Okazaki, and Seitoku Kubo, Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 810,381, Dec. 18, 1985, Pat. No. 4,763,748.
This application Aug. 11, 1988, Ser. No. 231,009
Claims priority, application Japan, Dec. 19, 1984, 59-267784
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—248 1 Claim



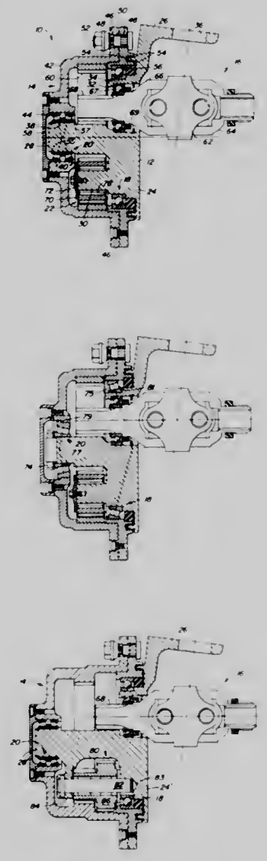
1. A four-wheel drive vehicle comprising:
a front wheel side having a front wheel set,
a rear wheel side having a rear wheel set,
an engine having an output shaft extending in a transverse direction of a vehicular body,
a transmission having an input shaft connected to the output shaft of the engine and an output shaft connected through a transmission mechanism to the input shaft such as to extend in a transverse direction of the vehicular body,
a rotating member connected to the output shaft of the transmission,
a front differential gear,
a first output member connected between the rotating member and one of the wheel sets for transmitting power to one of the wheel sets through said front differential gear,
a second output member coaxial with the first output member, connected to the rotating member,
a rear wheel propeller mechanism between the second output member and the other wheel set, and operative to convert the rotation of the second output member into rotation about an axis perpendicular to the axis of rotation of the second output member for driving the other wheel set,
a front differential gear case having an inner periphery and an annular hole,
an outer periphery on said second output member, and
a hydraulic friction clutch provided coaxially with the first and second output members to selectively connect the rotating member and the first output member, said hydraulic friction clutch comprising
a plurality of clutch plates splined on the inner periphery of the front differential gear case and the outer periphery of the second output member,
a piston slidably fitted in the annular hole of the front differential gear case,
a hydraulic chamber provided in said annular hole of the front differential gear case, and
a return spring provided between the piston and the front differential gear case to bias the piston toward the chamber.

4,896,740

WHEEL BEARING SUPPORT

Volker Hueckler, Radolfzell, and Ulrich Eckhardt, Altrip, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Dec. 18, 1987, Ser. No. 134,633
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644143
Int. Cl.[4] B60B *27/04;* B60K *17/22, 17/30*
U.S. Cl. 180—255 17 Claims



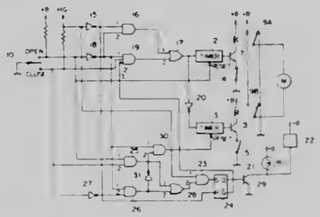
1. A wheel bearing support and driving mechanism for a driven wheel, comprising:
a wheel bearing support carrier having a plate with a first side having pivot means thereon for pivotally mounting a support carrier to pivot about a pivot axis and a second side opposite said first side having a wheel hub support journal extending therefrom;
a wheel hub rotatably mounted on said plate by an input side bearing arrangement and on said support journal by an output side bearing arrangement for rotation about a wheel hub rotation axis co-axial with said support journal;
a drive shaft rotatable about an axis eccentric to the wheel hub rotational axis, said drive shaft extending through said plate and said input side bearing arrangement and having a universal joint therein having a center co-axial with the pivot axis of said pivot means of said support carrier; and
an internal gear rigidly connected to said wheel hub, said internal gear being driven by said drive shaft.

4,896,741

PASSIVE SEAT BELT SYSTEM

Osamu Kawai, and Shunzi Mizumura, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 91,986, Sep. 1, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,427
Claims priority, application Japan, Sep. 2, 1986, 61-205115; Sep. 1, 1987, 62-216379
Int. Cl.[4] B60R *21/00, 22/00*
U.S. Cl. 180—268 11 Claims



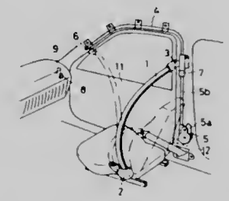
1. A passive seat belt system comprising:
drive means for reciprocating a seat belt;
first detection means responsive to opening and closing of a door for generating sets of door-state indicating detection output signals, with different sets of said signals confirming different states of the door;
second detection means activated when a slider of the seat belt is at a predetermined position;
first control means for controlling said drive means in accordance with detection outputs of said first and second detection means; and
second control means for causing said first control means to drive said seat belt backward when said first detection means produces a set of detection output signals which disagree as to the state of the door at a given time.

4,896,742

CONTROL METHOD FOR AUTOMATIC SEAT BELT OF AUTOMOBILE

Kazuaki Shitanoki; Masashi Kusumi; Hidetaka Shinozaki, and Takahiro Higuchi, all of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,333
Claims priority, application Japan, Oct. 14, 1987, 62-257373
Int. Cl.[4] B60R *21/00*
U.S. Cl. 180—270 1 Claim



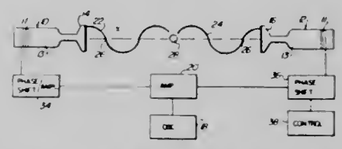
1. A control method for an automatic seat belt of an automobile comprising:
attaching an anchor to one end of a seat belt in such a manner that the seat belt may be movable along a guide rail attached to a side wall of a cabin of the automobile;
interlocking the seat belt to operate with opening and closing of a door so that the seat belt is automatically turned to a tightened condition, in which the anchor is located in a rear end portion of the guide rail, when the door is closed and the seat belt is automatically turned to a loosened condition, in which the anchor is located in a front end portion of the guide rail, when the door is opened; and
automatically turning the seat belt from the tightened condition to the loosened condition, even if the door remains closed, when an ignition key is removed from an ignition switch.

4,896,743

METHOD AND APPARATUS FOR ACOUSTIC LEVITATION

Thomas J. Danley, Highland Park; Dennis R. Merkley, Wauconda, and Charles A. Rey, Naperville, all of Ill., assignors to Intersonics Incorporated, Northbrook, Ill.

Filed Mar. 24, 1986, Ser. No. 843,022
Int. Cl.[4] G10K *11/00*
U.S. Cl. 181—0.5 26 Claims



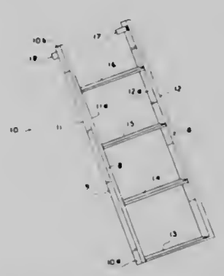
1. Method for acoustically levitating an object along a first axis in a sound transmitting medium comprising the steps of providing a pair of independent opposed, spaced sound sources along said first axis, operating the sound sources at substantially the same frequency such that the sound waves from the respective sources interfere without use of reflective surfaces and creation of standing waves to create at least one well of acoustic energy between the interfering sound waves, and disposing the object into said one well to acoustically levitate the object.

4,896,744

BOAT LADDER AND CARRIER ASSEMBLY

John R. Crose, P.O. Box 244, Heber Springs, Ark. 72543

Filed Oct. 11, 1988, Ser. No. 256,311
Int. Cl.[4] B63B *27/00*
U.S. Cl. 182—88 3 Claims



1. A ladder assembly for attachment beneath the deck of a boat comprising;
a carrier including two side elements having opposite forward and rear ends, an end element fixedly spanning said

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side element rear ends, means mounting said carrier beneath the deck of a boat,

a support assembly mounted beneath the boat deck adjacent said carrier forward ends and including transversely disposed top and bottom rods having opposite ends and spaced from one another to provide a ladder receiving clearance therebetween, said top rod disposed in a vertical plane substantially laterally offset forwardly from the vertical plane of said bottom rod,

a ladder having two elongated siderails joined by a plurality of steps spaced from one another along the extent of said ladder siderails, said siderails each including a planar top and bottom surface joined to an inner face and provided with opposite front and rear ends, stop means on said ladder siderails adjacent said rear ends, said stop means including a stop member on each said siderail inner face and projecting downwardly beyond said bottom surface, said ladder siderails disposed within said clearance between said support member top and bottom rods, and

said ladder shiftable in a substantially horizontal direction from a stowed position atop said carrier with said stop members abutting said carrier end element, to an extended use position inclined downwardly from said support assembly with said ladder stop members abutting said support member bottom rod and said ladder siderail rear end top surfaces abutting said support member top rod.

4,896,745

ADJUSTABLE BASE FOR LADDERS AND LIKE OBJECTS

Johnny Wärnelöv, Södergatan 39, S-573 00 Tranås, Sweden

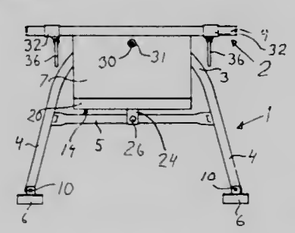
PCT No. PCT/SE87/00331, § 371 Date Jan. 19, 1989, § 102(e) Date Jan. 19, 1989, PCT Pub. No. WO88/00669, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 10, 1987, Ser. No. 303,728

Claims priority, application Sweden, Jul. 22, 1986, 8603182

Int. Cl.[4] F16M *11/00*; E06C *7/44*

U.S. Cl. 182—200 **8 Claims**



1. An adjustable base assembly for supporting a ladder or like object (21) for compensating for an uneven foundation surface and/or to enable the ladder or like object to be inclined at a desired angle, the assembly comprising an arcuate bottom structure (1) which includes footplate devices (6) which can be brought into contact with said foundation surface, and a part-circular, upper arcuate part (3) whose ends are mutually connected by a cross-strut (5, 5'), and further comprising an attachment structure (2) which is pivotally mounted to the bottom structure and which is intended to support the ladder or like object at a distance from the foundation surface, a spacer means (7) is pivotally mounted on said strut (5, 5') in the centre (28) of curvature of the arcuate part (3),

characterized in that the attachment structure includes an upper, transversely extending bar (9) which carries holder means (36) for embracing and securing sidepieces (40) of the ladder, said bar (9) being firmly connected via said spacer means (7) with a lower, transversely extending and upwardly open channel section (14) which is intended to receive a ladder rung (22); and in that said spacer means (7) presents an upper, transversely extending U-shaped strut (8) which embraces the arcuate part,

said U-shaped strut (8) extends across the arcuate part (3) in a chordal manner; and in that said U-shaped strut is clamped with a friction-locking action against said arcuate part (3) with the aid of a clamping device which extends centrally through the U-shaped strut and which can be screwed into said spacer means (7).

4,896,746

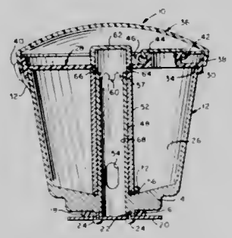
COVERED STORAGE FUNNEL

Warren Desjardins, 128 Engelke St., Patchogue, N.Y. 11772

Filed Aug. 26, 1988, Ser. No. 237,281

Int. Cl.[4] F16N *11/00, 33/00*; F01M *11/04*

U.S. Cl. 184—92 **2 Claims**



1. A covered storage funnel, comprising, a housing, for being received in a filler port of an engine and serving as reservoir means for fuel or oil for dispensing said fuel or oil, a first cover pivotally secured to said housing, for covering said reservoir means and serving as a tray for parts and other articles, and means for removably securing said covered storage funnel to said filler port, wherein a second cover is pivotally secured to said housing, for covering said parts and other articles, wherein a bottom wall is integrally attached to said housing and is provided with a neck portion that receives a rubber washer and a plate that secures said housing in said filler neck, and said first cover includes a flexible first hinge fixedly secured to an outer periphery of a flange on an open portion of said first cover, and said first hinge is also fixedly secured to an outer peripheral surface of said housing, and the neck portion extends upward and is integrally attached to said first cover and includes a closure cap for filling a compartment in said housing that serves as said reservoir means, and said closure cap when open serves as vent means for said compartment, when dispensing said fuel or oil from said funnel, wherein said second cover includes a flexible second hinge that is fixedly secured to one side of said second cover and is fixedly secured to said first hinge, and a rotatable valve includes a first sleeve integrally attached to and extending upward from said bottom wall of said housing, and a bore of said first sleeve provides passageway means for fluid flow out of said compartment through an opening provided in said bottom wall, wherein said rotatable valve includes an outer second sleeve rotatably received on said first sleeve, and an opening through said first sleeve and said outer second sleeve are provided for alignment with each other for entrance of said fluid from said compartment into said rotatable valve, and said fluid passes out of said rotatable valve and said bottom wall of said housing, and said second sleeve includes a rubber O-ring in an annular groove provided on a bottom of said second sleeve, and said O-ring engages with a bottom surface of said bottom wall and provides sealing means against leakage of said fluid out of said compartment, wherein said second sleeve includes a plurality of spaced teeth that engage with similar teeth provided on a bottom of a valve cap received on said second sleeve, and said valve cap extends above said first cover, provides finger grip rotation means for said rotatable valve to open and close said rotatable valve, and an annular groove in a wall of said valve cap receives an edge of an opening through said first wall and provides sealing means in a top of said compartment of said housing.

4,896,747

MODULAR ELEVATOR SYSTEM

John Inglis, Killara, Australia, assignor to Otis Elevator Company, Farmington, Conn.

Filed Jul. 28, 1988, Ser. No. 225,501

Int. Cl.[4] B66B *9/00*

U.S. Cl. 187—1 R **3 Claims**



1. An elevator system for mounting in an elevator shaft having a pluraltiy of door landings therein, said system comprising:

(a) a car module having a pair of opposed permanent walls and a pair of opposed intervening mounting ports extending between corresponding ends of said permanent walls;

(b) a modular door assembly removably affixed to and closing one of said mounting ports;

(c) a modular wall assembly removably affixed to and closing the other of said mounting ports;

(d) a car control module mounted on an outside surface of one of said car module permanent walls, said car control module carrying car wiring, and also carrying floor selection and control means as well as floor display means, said floor selection, control and display means being visible and accessible from the interior of said car module via openings in said one car module permanent wall;

(e) shaft modules for mounting in an elevator shaft proximate to each landing therein, said shaft modules comprising tripping switch means, magnetic switch means, and magnetic switch vane means carried on mounting means adapted to be secured in place in the elevator shaft; and

(f) proximity sensing means mounted on said car control module externally of said car module, said proximity sensing means including: tripping means for cooperating with said shaft module tripping switch means for decelerating the car module in the shaft; magnetic switch means for cooperating with said shaft module magnetic switch vane means for sensing car module position and controlling car door operation; and magnetic switch vane means for cooperating with said shaft module magnetic switch means for sensing car module position and car leveling.

4,896,748

FULL FREE LIFT MAST ASSEMBLY

Jan Mikkelsen, Borre, and Kjell Sorlie, Tonsberg, both of Norway, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed May 27, 1988, Ser. No. 199,543

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 E **9 Claims**

1. A full free lift mast assembly, comprising:

a first pair of spaced apart fixed uprights;

a second pair of spaced uprights movably mounted on said first pair of uprights;

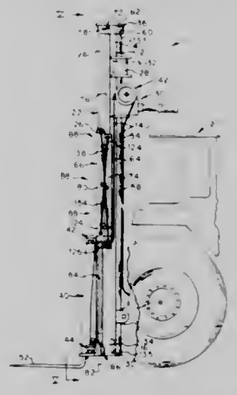
a carriage movably mounted on said second pair of uprights;

a first mast lift jack having a cylinder and a rod connected to and extensibly movable relative to said cylinder, said rod being connected to one of said first pair of fixed and said second pair of movable uprights and said cylinder being connected to the other of said first pair of fixed and said second pair of movable uprights;

a first carriage lift jack having a longitudinal axis, a cylinder, and a rod connected to and extensibly movable along said first carriage lift jack longitudinal axis and relative to said first carriage lift jack cylinder, said first carriage lift jack rod being pivotally connected to one of said carriage and said second pair of uprights;

a second carriage lift jack having a cylinder, a longitudinal axis, and a rod connected to and extensibly movable relative to the second carriage lift jack cylinder along the second carriage lift jack longitudinal axis, said second lift jack rod being pivotally connected to the other of said carriage and second uprights; and

first connecting means for connecting said first carriage lift jack cylinder to the second carriage lift jack cylinder, for



maintaining said first and second carriage lift jack cylinders from movement relative to each other and in a preselected overlapping relationship relative to each other, and for maintaining the longitudinal axis of said first and second carriage lift jacks substantially parallel to each other, said first connecting means including:

a plurality of first tab members connected to said first carriage lift jack cylinder at preselected longitudinally aligned spaced apart locations along the first carriage lift jack cylinder;

a plurality of second tab members connected to the second carriage lift jack cylinder at preselected longitudinally aligned spaced apart locations along the second carriage lift jack cylinder, said first and second tab members being in sequential and adjacent abutting contact with each other, and

first fastening means for releasably fastening each one of the plurality of first tab members to an adjacent abutted one of the second tab members.

4,896,749

EMERGENCY VEHICLE BRAKING SYSTEM AND METHOD FOR USING SAME

Frank H. Walker, 7271 Green Valley Dr., Grand Blanc, Mich. 48439

Filed Jan. 26, 1988, Ser. No. 148,675

Int. Cl.[4] B 1T *1/14*; B60B *15/00*

U.S. Cl. 188—5 **17 Claims**

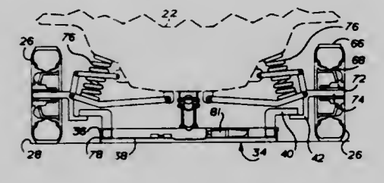
1. An emergency braking device for a vehicle to be driven on a roadway, said vehicle having a sprung mass including a

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body, an unsprung mass including at least one rear wheel provided with a wheel brake mechanism, and a spring suspending the body upon the unsprung mass said emergency braking device comprising:

a vacuum shroud attached to the vehicle sprung mass adjacent the rear wheel, said vacuum shroud having a generally-planar opening formed therein;

shift means to move the vacuum shroud between an inoperative position carried by the sprung mass clear of the roadway and an operative position in which the vacuum shroud is carried by the unsprung mass, and the vacuum



shroud opening cooperates with the roadway moving relative thereto to define a substantially enclosed cavity;

pump means to evacuate the air from within the enclosed cavity to cause the vacuum shroud to be urged toward the roadway; and

attachment means to couple the vacuum shroud in the operative position to the vehicle unsprung mass causing the normal force of the wheel to be increased without increasing the load on the spring, thereby enabling the wheel brake mechanism to decelerate the vehicle at an increased rate.

4,896,750

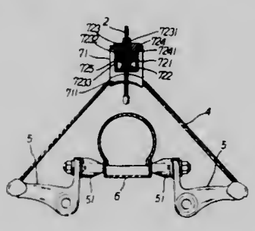
BICYCLE BRAKE CABLE TENSION ADJUSTMENT

Shih-Ming Tseng, No. 18-12, Lane 503, Chung Chen Rd. Sec. 2,, Changhua City, Taiwan

Filed Nov. 29, 1988, Ser. No. 277,665

Int. Cl.[4] B62L *1/14*

U.S. Cl. 188—24.19 **2 Claims**



1. A bicycle brake cable tension adjustment device comprising:

a suspension member having a horizontal wall with a through hole disposed thereon, and a vertical wall the bottom end of which is reversely bended upward toward said horizontal wall to form a groove;

an adjustment assembly which comprises:

a tubular casing having threads disposed on the inner wall thereof, the bottom end of which is disposed a reduced through hole with the periphery of said hole forming a flange portion;

a coil spring located in said tubular casing and on said flange portion at the bottom thereof;

a bolt-like member having a flanged head and external threads which engage with the inner threads of said tubular casing to join the two together, a through hole being disposed along the axial direction of said bolt-like member with the inner wall thereof defined in tapered form, and the diameter of said through hole increasing from the top to the bottom;

a guiding tube having a conic bottom end being located within said through hole of said bolt-like member and on top of said coil spring with the conic bottom end in operative abutment with said tapered inner wall of said through hole, two or more through bores disposed on said conic bottom end and in communication with said guiding tube for receiving two or more steel balls therein; said tubular casing and said bolt-like member being screwed together and disposed through said hole on the horizontal wall of said suspension member with the flanged head of said bolt-like member in supporting relation with the periphery of said hole; a brake actuating cable being guided through said adjustment assembly and also through said guiding tube; said steel balls being in contact with said actuating cable, once the cable is being pulled upward said guiding tube will be brought along to move upward, making said conic bottom end in tight abutment with said tapered wall of said bolt-like member, thus pushing the steel balls radially inward to tightly hold said cable in place; by pushing down said guiding tube to release said conic bottom end from engagement with said tapered inner wall, permitting said steel balls to release said cable, thereby the cable can be pulled in either direction for adjustment.

4,896,751

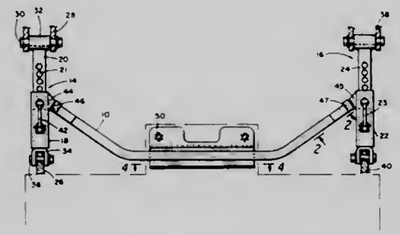
SELF-LINE BRAKE ADJUSTER

Wayne A. Rhodes, Luray, and James W. Johnson, Jackson, both of Tenn., assignors to Touchstone Railway Supply & Mfg. Co., Jackson, Tenn.

Filed Dec. 13, 1988, Ser. No. 283,964

Int. Cl.[4] F16D *65/52, 65/14*

U.S. Cl. 188—197 **2 Claims**



1. A braking apparatus for use with a locomotive truck having a motor nose cushion support, comprising:

a left wheel adjuster assembly;

a right wheel adjuster assembly;

a first bracket affixed to said left wheel adjuster assembly and extending generally horizontally therefrom;

a second bracket affixed to said right wheel adjuster assembly extending generally horizontally therefrom, said first and second brackets each having a vertical opening therethrough;

a rigid tie bar extending between said left and right wheel adjuster assemblies;

a first vertical pin member pivotally connecting one end of said tie bar to said first bracket, and a second vertical pin member pivotally connecting the other end of said tie bar to said second bracket such that the adjuster assemblies are held a fixed distance apart; and

means to slideably support said tie bar relative to said motor nose cushion.

4,896,752

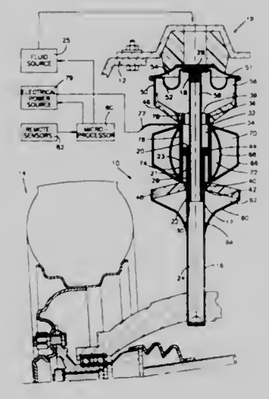
VEHICLE STRUT

Emil M. Shtarkman, Southfield, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Feb. 12, 1988, Ser. No. 155,620

Int. Cl.[4] F16F *13/00*

U.S. Cl. 188—299 **23 Claims**



1. An apparatus for damping relative movement between parts, said apparatus comprising:

an elastomeric spring assembly acting to resist relative movement between the parts;

said elastomeric spring assembly comprising an elastomeric spring member defining at least partially a first fluid chamber for receiving electrorheological fluid;

means defining a fluid storage chamber in fluid communication with said first fluid chamber;

means for controlling fluid flow from said first fluid chamber to said fluid storage chamber to thereby control the spring rate of said elastomeric spring assembly, said controlling means comprising means for applying an electric field to a portion of said electrorheological fluid to control the viscosity thereof;

sensor means for controlling said means for controlling fluid flow from said first fluid chamber to said fluid storage chamber;

a cylinder connected with one of the parts and defining a working fluid chamber;

a piston dividing said working fluid chamber into first and second chamber portions;

a piston rod connected with said piston and with the other of the parts, said piston and piston rod being movable relative to said cylinder in compression and extension strokes, said elastomeric spring assembly acting to resist relative movement between said piston and said cylinder;

means for communicating said first fluid chamber with said first chamber portion, means for communicating said first and second chamber portions, and means for communicating said second chamber portion with said fluid storage chamber;

a second elastomeric spring assembly defining a second fluid chamber;

means for connecting said first and second elastomeric springs to act in series; and

means for communicating with second fluid chamber of said second elastomeric spring assembly with one of said first and second chamber portions.

4,896,753

BICYCLE BRAKE

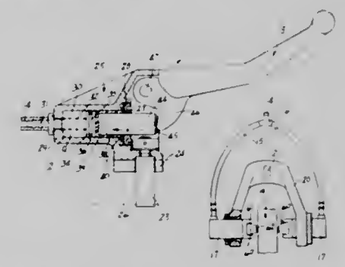
Sandor Sule, Hattenlebenweg 42, CH-8240 Thayngen, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,531

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711477; Apr. 15, 1987, 3712734

Int. Cl.[4] B60T *11/16*

U.S. Cl. 188—344 **14 Claims**



1. A bicycle brake system which comprises: at least one master cylinder; a hand lever connected to said master cylinder; at least one wheel cylinder connected to said master cylinder; a hydraulic brake line connecting said wheel cylinder to said master cylinder; a space of variable volume opening out from both ends of said brake line adjacent the master cylinder and the wheel cylinder, respectively; a piston and spring means supported thereby operatively associated with the variable volume space of the master cylinder, with said piston in sliding engagement with the master cylinder, wherein said piston is configured as a disk piston with an annular groove for an O-ring; an O-ring in said annular groove in sliding engagement with said master cylinder; a push rod operated by said hand lever; an elastic plastic thimble having an interior space and secured in the master cylinder and closed at one end by a closed face, wherein the interior space accommodates said push rod and wherein said closed face abuts said piston and wherein said piston and push rod are on opposite sides of said closed face; whereby said hand lever, push rod, thimble, piston and spring means cooperate to reduce the volume of the variable volume space of the master cylinder; an elastic plastic thimble secured to the space of variable volume of the wheel cylinder, said wheel cylinder thimble having an interior space connected to the brake line and closed at one end by a closed face, brake pads operatively associated with said closed face, whereby the closed face applies a braking force on the brake pads.

4,896,754

ELECTRORHEOLOGICAL FLUID FORCE TRANSMISSION AND CONVERSION DEVICE

J. David Carlson, Cary, and Theodore G. Duclos, Raleigh, both of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Aug. 25, 1988, Ser. No. 236,433

Int. Cl.[4] F16D *27/00*

U.S. Cl. 192—21.5 **25 Claims**

1. Apparatus for transmission and conversion of torque responsive to selective and variable application of an electric field to an electrorheological fluid, comprising:

an enclosed chamber containing the electrorheological fluid;

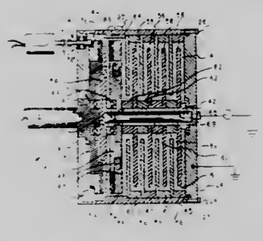
a first member structurally isolated within said enclosed chamber and movable relative to said enclosed chamber, through which torque may be transmitted by the electrorheological fluid responsive to the particular yield strength thereof determined by the magnitude of the electric field;

a second member positioned externally from said enclosed chamber in close proximity to a surface of said enclosed chamber; and,

drive magnet means and output magnet means associated

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respectively with each of said first member and said second member for operatively coupling said first member to



said second member through said surface of said enclosed chamber such that said first member and said second member rotate together.

4,896,755

OVERLOAD CLUTCH

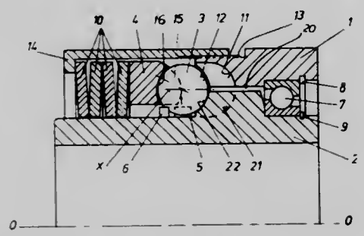
Sobby L. Girgais, Magdalenenstrasse 19, 5210 Troisdorf 14, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 93,465

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 8623878[U]

Int. Cl.⁴ F16D 7/06

U.S. Cl. 192—56 R **26 Claims**



1. An overload clutch comprising:

a pair of clutch members relatively rotatable about an axis and each formed with an axially forwardly facing circumferentially directed track and with a plurality of angularly spaced seats opening into the track, the seats being alignable to form axially forwardly open pockets in at least one relative angular position of the members;

means including a bearing supporting the members relative to each other for relative rotation about the clutch axis;

respectively angularly spaced rolling elements engageable in the pockets and angularly displaceable in the tracks, whereby when the rolling elements are in the pockets the two members are rotationally coupled such that one can drive the other and, when the rolling elements are in the tracks, the members are relatively rotatable;

a ring member engaging the rolling elements;

means including a spring for pressing the ring member backward relative to the clutch members against the rolling elements and thereby urging the rolling elements into the pockets, the flank angle of the seats being such that rolling elements in the pockets are pressed forward against the ring member with a force component largely dependent on torque transmitted between the two clutch members; and

cage means holding the rolling elements at their angularly spaced positions; and

stop means including an abutment on one of the members operatively engageable with the rolling elements to limit their angular travel in the tracks relative to the one member and constructed and arranged so that the number of abutments forming said stop means is less than the number of rolling elements in said tracks.

4,896,756

APPARATUS FOR PREVENTING HEAT DAMAGE IN AN ELECTROMAGNETIC CLUTCH

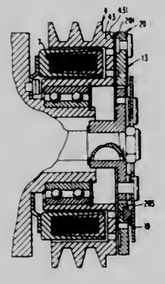
Takashi Matsushita, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Division of Ser. No. 10,466, Feb. 3, 1987, Pat. No. 4,799,578. This application Sep. 9, 1988, Ser. No. 242,307

Claims priority, application Japan, Feb. 3, 1986, 61-14356; Feb. 28, 1986, 61-29875

Int. Cl.⁴ F16D 27/10

U.S. Cl. 192—84 C **1 Claim**



1. In an electromagnetic clutch including a first rotatable member having an axial end plate of magnetic material, a second rotatable member, an annular armature plate of magnetic material connected to said second rotatable member so that said annular armature plate is capable of limited axial movement, said annular armature plate facing said axial end plate of said first rotatable member with an axial air gap therebetween and an electromagnetic device associated with said first rotatable member and operable to attract said armature plate into contact with said axial lend plate such that the rotation of said first rotatable member can be transmitted to said second rotatable member through said armature plate when said electromagnetic means is activated, the improvement comprising said armature being formed of materials with a predetermined Curie point and wherein one or more meltable elements are disposed on an axial end surface of said armature plate, wherein an increase in temperature of said clutch beyond said predetermined point, causes a decrease in the magnetic property of said armature, whereby the attractive force between said first rotable member and said armature will be decreased to thereby render said electromagnetic clutch inoperable.

4,896,757

BOLT ON ELECTROMAGNETIC FAN CLUTCH

Kenneth F. Seager, Sr., Big Flats, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Sep. 6, 1988, Ser. No. 242,287

Int. Cl.⁴ F16D 27/10

U.S. Cl. 192—84 C **12 Claims**

1. An electromagnetic fan clutch assembly for mounting to the fan mounting hub of an internal combustion engine, said fan clutch assembly comprising:

a drive means having a radial flange disposed at one end thereof, said radial flange being adapted to be connected to said engine's fan mounting hub, said radial flange having a hub portion, said drive means further comprising a shaft member having an external spline at one end thereof;

and an internal spline on said hub portion, said internal spline of said hub portion being adapted to engage said external spline of said shaft member;

an inner fan hub rotatably attached to said shaft member adjacent to said radial flange, said inner fan hub having means for attaching a fan member thereto;

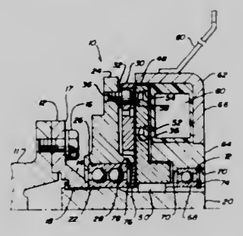
a magnetically permeable annular armature disposed adjacent to said inner fan hub;

spring means for connecting said armature to said inner fan hub for rotation therewith, said spring means producing an axial force urging said armature in an axial direction towards said inner fan hub;

a magnetically permeable annular stator disposed adjacent to said armature and spaced a predetermined distance therefrom, said stator being mounted to said drive means and rotatable therewith;

a magnetically permeable coil housing rotatably connected to said drive means, adjacent to said stator, said coil housing having an annular cavity circumscribing said drive means, said annular cavity being open on the side facing said stator;

a first low friction bearing rotatably connecting said inner fan hub to said shaft member;



a second low friction bearing rotatably connecting said coil housing to said shaft member;

said shaft member further having a first snap ring groove disposed adjacent to said one end and a second snap ring groove disposed at an opposite end;

a first snap ring disposed in said first snap ring groove to prevent the displacement of said hub portion off of said one end of said shaft member;

a second snap ring disposed in said second snap ring groove to prevent the displacement of said second low friction bearing off of said opposite end of said shaft member;

a resilient washer disposed between said first low friction bearing and said stator producing a resilient axial force urging said hub portion against said first snap ring and said second low friction bearing against said second snap ring;

a solenoid coil disposed in said annular cavity for generating a magnetic field producing a magnetic force axially displacing said armature into engagement with said stator and clamping it thereto so that said armature and said inner fan hub will rotate with said stator; and

means connected between said coil housing and a stationary object to prohibit the rotation of said coil housing with the rotation of said drive means.

4,896,758

INSERT FOR A BOAT TRAILER ROLLER

Andrew K. Hoszowski, Greenville, Miss., assignor to Moeller Mfg. Co., Greenville, Miss.

Filed Nov. 15, 1988, Ser. No. 271,277

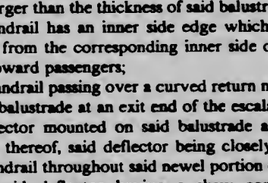
Int. Cl.⁴ B65O 13/00

U.S. Cl. 193—37 **9 Claims**

1. An insert for a hollow resilient roller for supporting a boat on a boat trailer comprising:

elongated sleeve means for surrounding a shaft for supporting said hol ow roller; and

a plurality of spaced-apart longitudinal ridge means for embedding in an inner diameter of the roller extending outward from the sleeve means along the length thereof forming a plurality of channel means for circulating air extending between said ridge means, said sleeve means and an interior surface of said hollow roller;



whereby the force of the boat on the hollow resilient roller causes the ridge means to be further embedded in said roller, providing enhanced support for the boat.

4,896,759

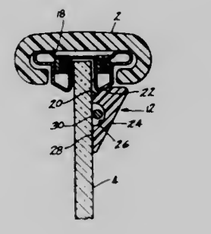
HANDRAIL MOUNT DEFLECTOR FOR STREAMLINED ESCALATOR NEWELS

Hella Badstuebner, and Walter Tietze, both of Stadthagen, Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 12, 1989, Ser. No. 337,192

Int. Cl.⁴ B66B 29/08

U.S. Cl. 198—324 **8 Claims**



1. An escalator or the like comprising:

(a) a moving treadway;

(b) a thin balustrade flanking said threadway;

(c) a handrail guide rail mounted on a peripheral edge of said balustrade;

(d) a moving handrail mounted on said handrail guide rail for use by passengers standing on said treadway, said handrail having a transverse dimension which is substantially larger than the thickness of said balustrade whereby said handrail has an inner side edge which projects inwardly from the corresponding inner side of said balustrade toward passengers;

(e) said handrail passing over a curved return newel portion of said balustrade at an exit end of the escalator; and

(f) a deflector mounted on said balustrade at said newel portion thereof, said deflector being closely adjacent to said handrail throughout said newel portion of said balustrade; said deflector having a skew contact surface thereon which extends from a line on the threadway side of said balustrade below said handrail, to a line immediately below the treadway side edge of said handrail whereby said contact surface gradually deflects objects which encounter it away from said balustrade and around said handrail; and

a means for internally illuminating said deflector.

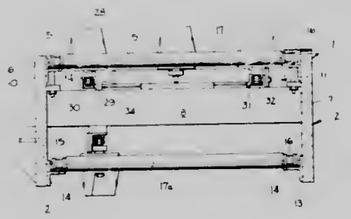
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4,896,760

PUSHER ELEMENTS AND CROSS TUBES FOR A SORTATION CONVEYOR FOR PRODUCTS WITH HIGH-FRICTION SURFACES

George M. Triantafiloe; Thomas C. Yu, and Robert R. Babel, all of Cincinnati, Ohio, assignors to The Buschman Company, Cincinnati, Ohio

Filed Jan. 18, 1989, Ser. No. 298,521
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 **24 Claims**



1. In a sortation conveyor for packages and products, said conveyor comprising a frame defining a main line of the conveyor and at least one branch outlet extending laterally therefrom, an endless conveying apron supported for movement on said frame along said main line and having a top run moveable in the conveying direction and a bottom run moveable in a return direction, said apron comprising a pair of endless chains joined together by a plurality of cross tubes affixed to said chains and extending transversely of said frame in parallel spaced relationship, a plurality of pusher elements, each pusher element being slidably mounted on and between adjacent pairs of cross tubes throughout the length of said apron, said pusher elements being moveable with and by said apron in said conveying direction, and means for shifting a desired number of said pusher elements transversely of said apron along those cross tubes to which they are mounted to divert a desired package or product onto said branch outlet, the improvement comprising a low-friction layer on each of said cross tubes and a package or product contacting cap on each of said pusher elements having at least one package or product contacting surface sloping upwardly and inwardly of said cap to impart to said package or product a lifting force as well as a horizontal force such that the weight of the package or product on said cross tubes and thus the sliding friction forces are reduced whereby said sortation conveyor can accommodate products with high-friction surfaces.

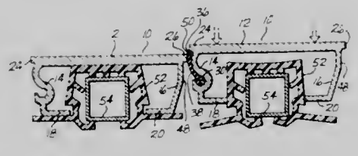
4,896,761

RECIPROCATING CONVEYOR FLOOR MEMBERS AND SEALS

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Continuation-in-part of Ser. No. 346,784, May 3, 1989, which is a continuation-in-part of Ser. No. 185,840, Apr. 25, 1988, Pat. No. 4,858,748, which is a division of Ser. No. 59,376, Jun. 4, 1987, Pat. No. 4,785,929, and a continuation-in-part of Ser. No. 680,069, Dec. 10, 1984, Pat. No. 4,679,686, which is a continuation-in-part of Ser. No. 346,865, Feb. 8, 1982, Pat. No. 4,492,303. This application May 25, 1989, Ser. No. 357,084
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—750 **13 Claims**

1. A reciprocating floor conveyor, comprising:
first and second floor members which, when installed, extend side by side, each floor member having a top and first and second downwardly depending opposite sides, with the first side of a first floor member closely confronting the second side of a second floor member when the floor members are installed;
said top of each of said first and second floor members including a side lip overhanging one of said first and second sides;
said lip being contiguous with the closely confronted side of the other floor member when the floor members are installed to form a narrow material-excluding gap between the lip of one floor member and the closely confronted side of the other floor member;
said first side of said first floor member including a longitudinal seal-retaining groove spaced downwardly from said top;



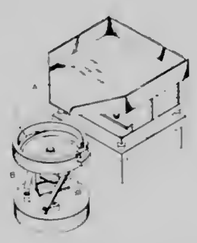
said second side of said second floor member including a side surface laterally spaced from the first side of the first floor member when the floor members are installed;
an elongated seal strip having an inboard base portion received in and retained by the retaining groove, and an outboard portion projecting from said base portion outwardly from said groove to a free edge; and
said outboard portion of the seal strip being positioned substantially below said lip and having sufficient resilient stiffness that said free edge is biased into contact with said second side surface of the second floor member.

4,896,762

VIBRATING SEPARATOR FOR AGGREGATED ENTANGLED PIECES

Yu-Ting Chang, No. 53, Lane 46, Chung Shan E. Road, Foog-Shan City, Kaohsiung Hsieu, Taiwan

Filed Oct. 13, 1988, Ser. No. 257,284
Int. Cl.[4] B65G *27/10*
U.S. Cl. 198—761 **2 Claims**
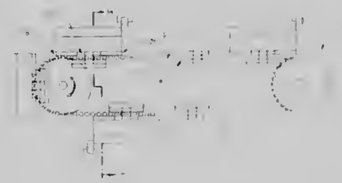


1. A vibrating separator for small aggregated and entangled pieces comprising:
(a) a platform having a front portion and a rear portion;
(b) a substantially horizontal tray for holding small aggregated pieces having a front portion with a delivery outlet and a rear portion;
(c) a rigid support mounted on said rear portion of said platform below said rear portion of said tray;
(d) a flexible cantilever member having one end rigidly fixed to said rigid support and another end rigidly fixed to a bottom side of said rear portion of said tray at a location displaced towards said front portion of said tray, whereby said flexible cantilever generally runs in a direction parallel to said tray;
(e) a flexible support member mounted on said front portion of said platform and connected to the bottom side of said front portion of said tray; and
(f) a vibrator mounted on said front portion of said platform and connected to said bottom side of said front portion of said tray;
whereby said tray can be vibrated to move small entangled pieces at a faster speed at said front portion thereof than at said rear portion thereof, thereby separating and forwarding the small pieces to said delivery outlet.

4,896,763

TRANSPORT SYSTEM

Jan Hordyk, Beamsville; Karel A. Grande, Hamilton, and Douglas M. Pickard, St. Catherines, all of Canada, assignors to RMT Engineering Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 198,334, May 25, 1988, abandoned. This application Feb. 22, 1989, Ser. No. 134,317
Int. Cl.[4] B65G *17/00*
U.S. Cl. 198—803.2 **3 Claims**



1. A carrier for use on an accumulating conveyor of the type having a pair of sprocket means, a continuous multiple strand roller chain with a first strand entrained on said sprocket means and a second strand supported by said first strand and laterally clear of said sprocket means,
said carrier comprising an inner engagement member and an outer engagement member; means maintaining said inner and said outer engagement members at a fixed distance from one another to form a passage therebetween;
said inner engagement member having an inner planar face facing said passage to engage one side of said second strand; said inner engagement member having a pair of end faces which are substantially perpendicular to said inner planar face to form therewith a pair of inner corner portions;
said outer engagement member having a pair of incline portions with a gap therebetween, each of said portions having an outer planar face substantially parallel with said inner planar face and an end face adjacent said gap, said outer planar faces together with said end faces on said portions forming a pair of outer corner portions;
said inner and said outer engagement members and said passage being dimensioned to cause said inner and said outer corner portions to extend between the rollers of said second strand when that segment of said first strand adjacent said corner engages one of said sprocket means.

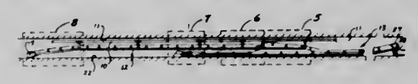
4,896,764

MONORAIL ADVANCED SYSTEM FOR CONVEYORS IN A MINING APPARATUS

Michael G. Neunzert, Mountain View, Wyo., assignor to Tg Soda Ash, Inc., Granger, Wyo.

Filed Aug. 8, 1988, Ser. No. 229,620
Int. Cl.[4] B65G *21/14*
U.S. Cl. 198—812 **15 Claims**

1. A conveyor apparatus for being advanced and retracted in a mine, and which eliminates the need for separate storage of unused conveyor material, and which can be either advanced or retracted at will while loaded or unloaded and while operating or stationary, said apparatus comprising:
rail means for extending along and being fixed to the roof of a mining tunnel;
an elongate truss assembly movably suspended from said rail means for traveling along said rail means above the floor of a mining tunnel;
a stationary support assembly for being positioned on the floor of a mining tunnel;
an endless conveyor belt, portions of which are carried by said truss assembly and extend along substantially the entire length of said truss assembly for being moved with said truss assembly along said rail means and other portions of which are carried by said stationary support assembly; and



vertically adjustable conveyor loading means carried by said moveable truss assembly at the loading end of said conveyor, wherein at least portions of said conveyor loading means can be supported by the floor of a mining tunnel for being loaded thereat;
wherein said rail means defines the path of travel for said elongate truss assembly and the position of said conveyor can be advanced and retracted within a mining tunnel by advancing or retracting said suspended truss assembly along said rail means.

4,896,765

METHOD FOR PRODUCING A DRIVING OR CONVEYOR BELT

Gerhard Loose, Hanau, Fed. Rep. of Germany, assignor to Peter-BTR Gummiwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 25, 1988, Ser. No. 161,187
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706404
Int. Cl.[4] B65G *15/34*
U.S. Cl. 198—847 **18 Claims**

1. A method for producing a driving or conveyor belt made or rubber or a rubberlike covering layer and a reinforcing member consisting of one or more plies of textile fabric comprising the step of forming each of said textile fabric plies having a plurality of interwoven warp and woof threads of a synthetic material, said synthetic material selected from the group consisting of polyester, polyamide and/or aramid or a combination thereof, wherein at least one of said plurality of interwoven warp threads or one of said plurality of interwoven woof threads are covered entirely or partially by a coating covering of rubber or rubberlike material prior to being interwoven into said textile fabric.

4,896,766

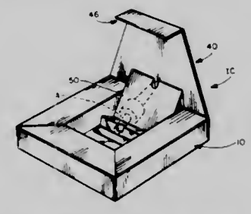
DISPLAY CARTON

Sandra D. Paley, Mayfield Heights, Ohio, assignor to Container Corporation of America, Clayton, Mo.

Filed May 8, 1989, Ser. No. 348,393
Int. Cl.[4] B65D *5/50*
U.S. Cl. 206—45.15 **16 Claims**
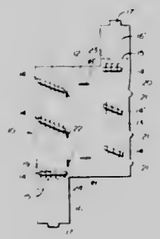
1. A blank of foldable sheet material for use in forming a carton for holding and displaying an article, said blank being cut and scored to provide:
(a) a generally rectangular bottom wall panel having opposed front and rear end edges and opposed side edges;
(b) side wall outer panels foldably joined to respective side edges of said bottom wall panel;
(c) side wall upper panels foldably joined to outboard edges of respective side wall outer panels;
(d) side wall inner panels foldably joined to outboard edges of respective side wall upper panels;

(e) front and rear end wall outer panels foldably joined to respective front and rear end edges of said bottom wall panel;
(f) a front end wall upper panel foldably joined to an outboard edge of said front end wall outer panel;
(g) a rear wall inner panel foldably joined to an outboard edge of said front end wall upper panel;



(h) a front end wall inner panel cut from material of said front end wall upper panel and foldably joined to an edge thereof;
(i) a cover foldably joined to an outboard edge of said rear end wall panel and including at least one cover panel;
(j) an article holding member at least partly formed from material cut from said cover and foldably joined to an edge of the cover that is spaced inboardly from the outboard extremity of the cover.

4,896,767
SUTURE PACKAGE
Ricardo L. M. Pinheiro, Sao Paulo, Brazil, assignor to Ethicon, Inc., Somerville, N.J.
Filed Feb. 9, 1989, Ser. No. 327,857
Claims priority, application Brazil, Feb. 9, 1988, 8800527
Int. Cl.[4] A61L *15/00*
U.S. Cl. 206—63.3 **6 Claims**



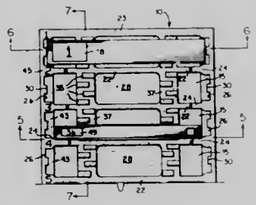
1. A suture package of the folded type suitable for holding a plurality of sutures with a needle affixed to at least one end of the suture, characterized by comprising;
a first suture mounting panel (11) having a first supporting and holding element (14) attached thereto adjacent one end of said mounting panel (11) and adapted to hold a suture (23) at a position immediately adjacent to the needle (24);
a second suture mounting panel (13) having a second supporting and holding element (14) attached thereto adjacent to one end of said second mounting panel (13) and adapted to hold a suture (13) at a position immediately adjacent to the needle (24);
an interconnecting panel (12) connecting said first (11) and second (13) mounting panels;
said first holding element (14) attached to said first suture mounting panel (11) at the opposite end of the package from said second holding element (14) on said second suture mounting panel (13);
each suture mounting panel (11,13) possessing at least one additional supporting and holding element (14') and adapted to fix a suture thread along said suture mounting panel;
each suture mounting panel (11, 13) being formed with a cover flap (16,16') adapted to fold over and enclose the needles (23) when the loaded package is folded to enclose the suture threads.

4,896,768
ANTI-BACTERIAL AND ANTI-VIRAL PRESATURATED WIPE PRODUCT
Leslie B. Anderson, Easton, Pa., assignor to Lab Products, Inc., Maywood, N.J.
Filed Oct. 6, 1986, Ser. No. 916,074
Int. Cl.[4] B65D *81/24;* **B65B** *55/02*
U.S. Cl. 206—210 **13 Claims**



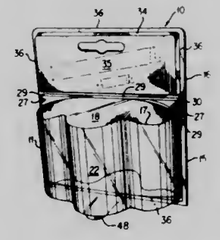
1. A presaturated wipe product for applying an active disinfectant solution to a work surface comprising:
a first layer of packaging material;
a second layer of packaging material;
a pad secured to said second layer;
a dilute glutaraldehyde solution impregnated in the pad for providing disinfecting activity to the pad;
wherein the first layer and the second layer are heat sealed to each other so as to form a sealed envelope for maintaining the presaturated pad therein; and
further wherein the presaturated pad has been γ-irradiated after the first and second layers are heat sealed so that said envelope maintains disinfecting activity for the glutaraldehyde over an extended period of time.
12. A presaturated wipe for applying an active disinfectant solution to a work surface prepared by the process comprising:
securing a pad to a first layer of packaging material;
impregnating said pad with a dilute glutaraldehyde solution for providing disinfecting activity to the pad;
heat sealing the first layer to a second layer of packaging material to form a sealed envelope for maintaining the presaturated pad therein; and
subjecting the sealed enveloped to γ-irradiation in order to prevent microbial growth inside the envelope and to maintain the effectiveness of the dilute glutaraldehyde solution over an extended period of time.

4,896,769
CODED STORAGE DISPLAY TRAY
Richard Merzon, 85 N. 3rd St., Brooklyn, N.Y. 11211
Division of Ser. No. 805,874, Dec. 6, 1985, Pat. No. 4,744,463.
This application May 17, 1988, Ser. No. 194,829
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—232 **4 Claims**



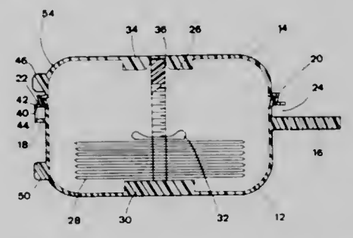
1. A coded storage display system for boxed and unboxed cassettes, said system comprising:
a tray having compartments for boxed and unboxed cassettes;
compartment identifying indicia formed on the tray adjacent to each compartment;
a relatively large label for each boxed cassette to be retained in the tray compartments bearing indicia corresponding to said compartment identifying indicia for the compartment in which the boxed cassette is to be positioned; and
a relatively small label for each unboxed cassette to be retained bearing indicia corresponding to said identifying indicia for the compartment in which the unboxed cassette is to be positioned, whereby each compartment and compartment section may be identified as intended for receipt of a particular boxed or unboxed cassette.

4,896,770
BATTERY DISPLAY PACKAGE
Victor A. Calcerano, Carmel, N.Y., and David F. O'Brien, North Woodstock, Conn., assignors to Duracell Inc., Bethel, Conn.
Filed Mar. 16, 1989, Ser. No. 324,286
Int. Cl.[4] B65D *85/62*
U.S. Cl. 206—333 **14 Claims**



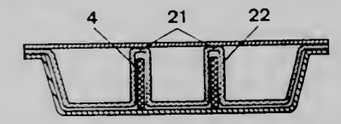
1. A package for the sale and display of articles comprising a housing formed by a front blister and a rear blister, said housing being shaped for closely holding the articles therein, an upwardly extending panel portion attached to the housing by which the package can be hung from a display rack, engagement means attached to the rear blister portion whereby a plurality of packages hung from a display rack are aligned by the interaction between adjacent packages of the engagement means on one package with the front blister portion of the package immediately behind; whereby said housing, panel, and engagement means are all integrally related.

4,896,771
CIRCULAR SAW BLADE CASE
Louie M. Edwards, 10207 Morgan Territory Rd., Livermore, Calif. 94550
Filed Jul. 31, 1989, Ser. No. 387,865
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—349 **8 Claims**



1. A hinged, one-piece, generally square case for circular saw blades integrally formed from synthetic plastic material and comprising:
a bottom section having a central spindle and means to receive a cover section;
a spindle having threads on the upper end and means of support in said bottom section at the lower end;
a handle integrally molded into said bottom section;
a cover section having a central cylindrical boss with an aperture for receiving said spindle and means to accept said bottom section to form a watertight case.

4,896,772
COMPOSITE CONTAINER FOR FOOD AND PROCESS FOR ITS PRODUCTION
Juris Walter, Schaffhausen; Heinz Oster, Feuerthalen, and Harald Severus, Schaffhausen, all of Switzerland, assignors to Swiss Aluminium, Ltd., Chippis, Switzerland
Filed May 11, 1988, Ser. No. 192,826
Claims priority, application Switzerland, May 12, 1987, 01807/87
Int. Cl.[4] B65D *85/72*
U.S. Cl. 206—484.2 **14 Claims**



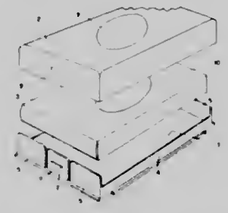
1. A sterilizable composite container comprising:
(a) a trough formed from a flexible plastic/aluminum/plastic laminate, said trough having a base portion, a sidewall portion extending from said base portion and a lip portion extending from said sidewall portion wherein said base portion and said sidewall portion define a compartment;
(b) a tray formed from a plastic material located in said compartment wherein said tray has a base portion, sidewall portion and lip portion defining a storage compartment wherein the lip portion of said tray rests on the lip portion of said trough; and
(c) a lid formed from a flexible plastic/aluminum/plastic laminate which rests at least on said lip portion of said tray wherein said lid is heat sealed to said tray and said tray is heat sealed to said trough wherein said lid is flush with the lip portion of the tray and is provided with a part protruding beyond the lip portion of the tray as a tear-open tab.

4,896,773

PLASTIC BOX CONTAINING BAGS MADE OF POLYETHYLENE FOR HYGIENIC USE GROUPED TOGETHER WITH A DOUBLE FOLD

Tiziano Zillo, Via Stefano Carli, 3/B, 36027 Rosa (Vicenza), Italy

Filed Oct. 28, 1988, Ser. No. 264,157
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—494 **3 Claims**



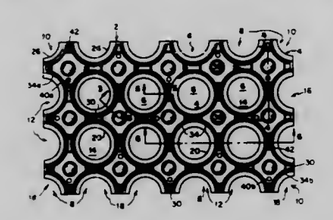
1. A box made of plastic material which contains an assembly of bags made of polyethylene for hygienic use which comprises bottom (1) in the shape of a rectangular basin to be fixed onto a wall, cover (2) having rounded corners and a central opening (9), said cover being snap applied onto said bottom, and a box-like assembly of cardboard (3) insertable in the interior of the box and easily replaceable, said assembly containing a plurality of bags made of polyethylene for hygienic use, said bags being grouped together with a double fold, wherein said double fold is "S" shaped with intercalated superimposition of the extremities of said bags (13), said bags constituting the replaceable assembly whereby it is manually possible to remove said bags (13) through said central opening (9) of the cover one at a time without disturbing the assembly of bags (13), each of said bags presenting the border of the successive bag (13) in front of said opening (9) after each extraction.

4,896,774

SPACER TRAY FOR PACKAGING CONTAINERS

Roy Hammett, Tampa, Fla., and Edward L. Passarelli, Bensonville, Ill., assignors to International Container Systems, Tampa, Fla.

Filed May 11, 1987, Ser. No. 48,437
Int. Cl.[4] B65D *21/00*
U.S. Cl. 206—516 **23 Claims**



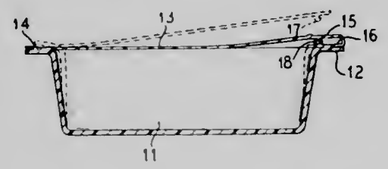
1. A spacer tray for containers, the spacer tray being formed of a moldable sheet material, the spacer tray being shaped to provide a plurality of container-bottom receptacles, the container-bottom receptacles being disposed in a row-column array, each container-bottom receptacle being shaped to receive at least a part of a bottom portion of a container, a container-spacer wall being located between each pair of adjacent container-bottom receptacles to maintain the bottom portions of containers seated in the pair of adjacent container-bottom receptacles in a spaced-apart relationship, the spacer tray having a height less than half the height of the containers the spacer tray is adapted to seat, the spacer tray having a number of container-loading-guide-pin caps projecting generally upwardly from an upper surface of the spacer tray, each container-loading-guide-pin cap being shaped, dimensioned, and located to receive an end portion of a container-loading-guide pin within an interior of the cap for locating the spacer tray during loading and shaped for guiding bottom portions of containers into container-bottom receptacles during loading of the spacer tray.

4,896,775

ZIPPERED THERMAL FORM TRAY SYSTEM

Hugo Boeckmann, Arlington Heights, Ill., and Steven Ausnit, New York, N.Y., assignors to Zip-Pak Incorporated, Northbrook, Ill.

Filed Jun. 29, 1988, Ser. No. 213,161
Int. Cl.[4] B65D *1/34*
U.S. Cl. 206—557 **25 Claims**



1. A reclosable sealed tray for foodstuffs and the like comprising in combination:
a semi-rigid rectangular tray having a recess for contents surrounded by a flange at the top edge extending continuously along the ends and sides of the tray;
a flexible plastic cover over the tray sealed to the tray rim for moisture and air-tight integrity of the tray contents;
an elongate continuous interlockable zipper having separable rib and groove profiles closing an elongate opening in said cover and extending generally parallel to the tray sides; and
the lateral dimension of the tray and cover being such that with outward movement of the tray sides caused by forcing the ends inwardly the elongate opening in the cover will separate to afford access to the tray contents.

4,896,776

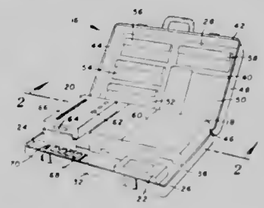
PROTECTIVE CARRYING CASE FOR DATA PROCESSING EQUIPMENT

Bradley J. Kabanuk, Minneapolis, and Gale L. Jacobsen, Northfield, both of Minn., assignors to Gemini Incorporated, Cannon Falls, Minn.

Filed Nov. 3, 1988, Ser. No. 266,516
Int. Cl.[4] B61D *85/38*
U.S. Cl. 206—576 **16 Claims**

1. A protective case for carrying data processing equipment, comprising:
a substantially rigid bottom shell having a substantially flat bottom wall and a first wall means extended upwardly from the perimeter of said bottom wall;
a substantially rigid top shell having a substantially flat top wall and a second side wall means extended normal to said top wall from the perimeter thereof, said top and bottom shells adapted to releasably engage one another along their respective side wall means to form an enclosure;
a first mounting means integral with said bottom shell for supporting a computer in spaced apart relation to said bottom wall at a first selected vertical distance from the bottom wall, and in a select orientation relative to said bottom shell to facilitate use of the computer while it is so supported; and

a second mounting means integral with said bottom shell for releasably and integrally supporting a printer in spaced apart relation to the bottom wall and in a select vertical distance from the bottom wall and in a select printer orientation to facilitate use of printer while it is so



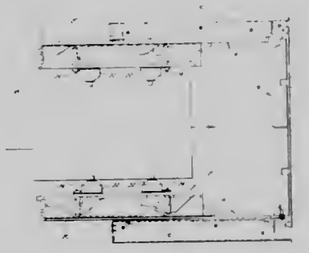
supported, said second mounting means defining a first compartment under said printer for storage of computer printout paper beneath the printer, said compartment open to permit the direct feeding of the paper from the first compartment to the printer.

4,896,777

LOCK AND SHOCK MOUNTED DEVICE FOR COMPUTER DISK DRIVE

Jeffrey M. Lewis, Maynard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 6, 1988, Ser. No. 178,295
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—41 **24 Claims**



1. A mounting system for a delicate shock-mounted device, comprising a support for the device, a locking assembly associated with the support and movable towards said device to lock said device against movement with respect to the support, a cam assembly laterally displaceable with respect to said locking assembly from a first inoperative position to a second operative position where the cam assembly activates said locking assembly, and a control mechanism for selectively holding said cam assembly in its operative or its inoperative position.

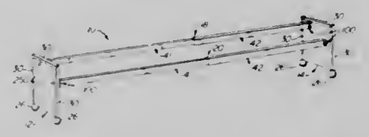
4,896,778

ELONGATE MEMBER CONNECTION TO AN END PLATE

Mark Ferdinand, Glencoe; Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Dec. 21, 1988, Ser. No. 287,832
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—175 **10 Claims**

1. A set of components for being assembled into a rack, said set of components comprising:
at least one end plate defining an aperture;
a fastener having a threaded shank adapted for extending through said aperture and having a head for engaging said end plate;
at least one elongate member for extending from said end plate and defining at least a first slot; and
a retaining member for being positioned in said elongate



member through said first slot, said retaining member having two oppositely extending end portions for each projecting laterally beyond said elongate member and for engaging said elongate member, said retaining member defining a threaded bore for threadingly receiving the threaded shank of said fastener.

4,896,779

DISPLAY SHELF ORGANIZER

Mitchell Jureckson, Edgewater, N.J., assignor to L'Oreal, S.A., Paris, France

Filed Aug. 14, 1987, Ser. No. 86,108
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—184 **5 Claims**



1. A display shelf organizer comprising, in combination,
at least two flat, elongated shelf divider elements having like length and width dimensions, each individually securable at one end thereof to the forward edge portion of the upper surface of a shelf with its width dimension disposed perpendicular to said upper surface to extend perpendicularly from the forward edge of the shelf toward the rearward edge thereof in spaced parallel relationship with at least one other divider element and with the upper surface of the shelf defining a compartment for articles to be displayed;
a slider element attached to said one end of each shelf divider element, each said slider element including a thin, flat, rectangularly-shaped member which when the shelf divider is secured to a shelf as aforesaid is disposed above the surface of the shelf and is inclined downwardly and forwardly with respect to the forward edge of the shelf with its length dimension disposed parallel to the forward edge of the shelf;
an elongated channel member formed from an elongated rectangular sheet of flexible material comprising rectangularly-shaped front and rear members each having front and back surfaces, said front and rear members being defined by a longitudinally extending line of reduced thickness which forms a longitudinally extending hinge along which said front member is folded forwardly so that its back surface overlies the front surface of said rear member, said rear member having a first longitudinally extending track formed on its back surface by a pair of integral, in-turned, parallel flanges spaced apart by a distance substantially equal to the width dimension of said

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slider elements so as to receive said slider elements for detachably securing said channel member forwardly of the forward edge of the shelf, said front member having a pair of in-turned, parallel longitudinally extending flanges integrally formed on its front surface defining a second, forwardly-facing track; and

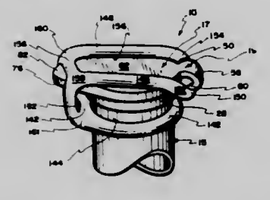
at least one carrier member having a slider element dimensioned to be received in and to be moveable along said second track so as to be positionable as desired with respect to a compartment.

4,896,780

FAIL SAFE RELEASIBLE LOCKS FOR CAPPED DISPOSABLE CENTRIFUGE CONTAINERS

Paul M. Jessop, and David H. Jeffs, both of Salt Lake City, Utah, assignors to Multi-Technology Inc., Salt Lake City, Utah

Division of Ser. No. 191,518, May 9, 1988, Pat. No. 4,830,209. This application Nov. 14, 1988, Ser. No. 271,141
Int. Cl.[4] B65D *45/00*
U.S. Cl. 215—291 **4 Claims**



1. A releasible lock for holding a capped liquid specimen container in a leak-free closed state during centrifuging, boiling and like processing in a specimen testing laboratory, the releasible lock being formed as one piece of synthetic resinous material with memory and comprising (a) first means to restrainingly engage a closed cap to prevent cap movement in a direction away from a liquid specimen container having an opening at one end which is closed by the cap, (b) second means to restrainingly engage the container adjacent said opening and (c) third means integrally interconnecting the first means to the second means in such a way that the memory of the third means retains the aforesaid engagements prohibiting loss of any portion of the liquid specimen through the opening and across the cap during boiling and centrifuging and whereby the releasible lock can be manually force into the leak-free closed state or removed by the user as desired, the first and second means comprising spaced elongated cross members and the third means comprise parallel spaced longitudinal members.

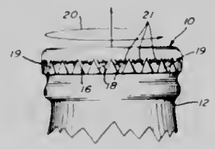
4,896,781

TWIST-TO-REMOVE CROWN CAP WITH A FINGER PROTECTIVE GRIPPING SURFACE

Laval Simard, 893 des Rochers, St-Félicien, Quebec, Canada (G8K 1N6)

Filed Sep. 23, 1988, Ser. No. 249,458
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—328 **5 Claims**

1. A twist-to-remove crown cap for closing a container having a threaded neck, the crown cap comprising a top wall; a depending skirt, said skirt comprising a plurality of each of said serrations extending in a substantially circumferential direction of said crown cap and including a relatively flat flank surface, the flank surfaces of the serrations constituting a relatively smooth finger gripping surface for the removal of said crown cap; and thread means adapted for engagement with the threaded neck of the container.

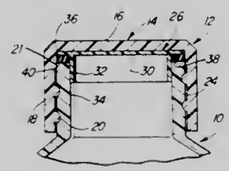


4,896,782

CLOSURE WITH INSERT FOR ENHANCED SEALING

H. Gene Hawkins; Randall K. Julian, and Gary V. Montgomery, all of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Feb. 13, 1989, Ser. No. 309,175
Int. Cl.[4] B65D *41/28*
U.S. Cl. 215—329 **24 Claims**



1. A closure particularly adapted to maintain a sealing relationship with the lip of a container neck, comprising:

a cap having a top and an annular skirt depending from the periphery of said top having internal threads for engaging external threads on said container neck;

a preformed insert having a top and a depending plug dimensioned for an interference fit with said container neck; and

an elastic sealing member dimensioned to engage said container neck lip and the top of said insert and to be compressed therebetween;

whereby a seal is established and maintained between said closure and said container neck by the preformed insert being held in position relative to said container neck by said plug, a rigid structure is maintained on both sides of the container neck lip by said insert plug and the cap skirt, and said elastic sealing member being compressed between said insert top and container neck lip sustaining a hermetic seal even during distortion that takes place in an elevated temperature environment.

4,896,783

CONTAINER AND CAP ASSEMBLY

Richard A. Leoncavallo, Pittsford; Peter K. Baird, Honeoye Falls; Ravinder C. Mehra, Fairport, and Sharad Rajguru, Rochester, all of N.Y., assignors to Manufacturers Hanover Trust Company, New York, N.Y.

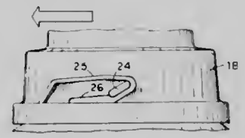
Division of Ser. No. 780,928, Sep. 27, 1985, Pat. No. 4,689,147. This application Jul. 16, 1987, Ser. No. 75,257
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—330 **4 Claims**

1. A container and cap assembly comprising:

a receiving container having an upper end, said upper end having a substantially cylindrical wall;

a cap having a lower end, said lower end having a substantially cylindrical outer wall;

means for providing quick assembly or disassembly and a positive locking of said cap and receiving container comprising means defining at least two recesses in said cylindrical outer wall of said lower end of said cap, each of said recesses having a first receiving portion and a locking portion, and a locking pin on said cylindrical wall of said upper end of said receiving container for placement in each of said recesses, said locking portion having means



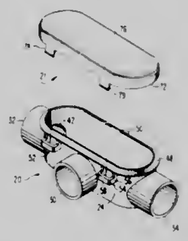
defining a ramp having an initial contact engaging end, a ramp surface, and indentation for receiving and locking in position said locking pin, said ramp surface being disposed at an angle in the range of about 3° to 8°, said locking pin having a substantially elongated outer configuration and an engaging surface inclined with respect to the longitudinal axis of said receiving container in the range of about 40° to 80°.

4,896,784

FITTING FOR INTERCONNECTING NON-METALLIC CONDUIT

Kenneth A. Heath, Manchester, Mo., assignor to Hubbell Incorporated, Orange, Conn.

Filed May 17, 1989, Ser. No. 352,945
Int. Cl.[4] H02G *3/08*
U.S. Cl. 220—3.2 **12 Claims**



1. A wiring housing for interconnecting non-metallic electrical conduit comprising the combination of

a main portion including a back wall and a substantially continuous side wall forming a box with an open front, said side wall having a front edge lying in a single plane;

at least two round tubular projections extending substantially perpendicularly in different directions from said walls, each said tubular projection being dimensioned internally to receive an end of a piece of non-metallic conduit;

means in said walls defining generally circular openings through said walls concentric with each of said tubular projections, said openings being smaller than the internal dimensions of said projections to define a stop shoulder at the inner end of each said tubular projection;

means forming an outwardly sloping surface adjacent said front edge, said surface being textured to encourage beading of moisture thereon;

a cover comprising

wall means defining a generally U-shaped channel, said channel following a path shaped to match the contour of said front edge of said side wall with said U-shaped channel opening in a direction opposite the open side of said box, and

a substantially continuous body within said path followed by said channel for closing said open side of said box when said channel is placed over said outwardly sloping surface, said channel and said outwardly sloping surface forming a substantially water-excluding closure;

a plurality of latch members protruding from said cover outwardly of said channel; and

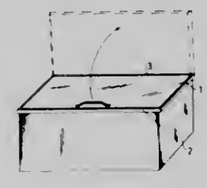
a plurality of latch sockets shaped to receive said latch members formed on said wall outwardly of said outwardly sloping surface to retain said cover on said housing.

4,896,785

COMBINATION CHEST FREEZER AND GLASS COVER

Sven-Erik Södervall, Edsne, Sweden, assignor to Termofrost AB, Stockholm, Sweden

Division of Ser. No. 17,618, Feb. 24, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 243,137
Claims priority, application Sweden, Feb. 27, 1986, 8600891
Int. Cl.[4] H05B *3/06*
U.S. Cl. 220—82 R **4 Claims**



1. The combination of a chest freezer and a glass cover, the freezer being of the kind in which the goods contained in the chest are intended to be viewed through the glass cover, said chest freezer being void of devices for forcibly circulating air within the chest when the cover is closed, and said glass cover (1) being hinged to the chest (2) along one of the edges of said cover so that the cover is raised, to swing about the axis of the hinge, to be opened, characterized in that: said glass cover (1) is horizontal when in its closed position; said glass cover (1) consists solely of one glass pane (4), which is void of an electrically conductive coating for electric heating of the panel, and, on the side of the glass pane which faces the interior of the chest, the surface of the pane is provided with an infrared radiation reflecting layer (8) having an emissivity value not greater than 0.2 whereby a substantially stationary non-circulating cushion of air is generated in said chest immediately beneath the closed, horizontal glass cover.

4,896,786

SHIPPING CONTAINER FOR EDUCATIONAL MATERIALS AND THE LIKE

Jay M. Schupack, Bellevue, Wash., and Alan Biggs, Victoria, Canada, assignors to Comprehensive Health Education Foundation, Seattle, Wash.

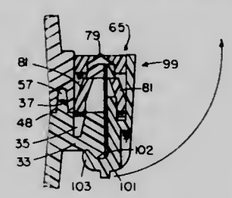
Division of Ser. No. 102,880, Sep. 30, 1987. This application Aug. 1, 1988, Ser. No. 226,463
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—338 **3 Claims**

1. A hinge, which is useful with a container having a body portion and a lid portion, the lid portion forming a top for the body portion, comprising:

a hinging element comprising two rigid clip-like portions joined by a narrow, central, flexible web-like portion, such that the clip-like portions are rotatable about said web-like portion;

hinge mounting elements located on abutting sections of said

lid and body portions of the container, the hinge mounting elements including interior cavities configured so as to open onto edges of the respective hinge mounting elements which are immediately adjacent to each other when the lid and body portions are abutting, thereby defining abutting edge openings, each interior cavity including a clip retaining portion, wherein the clip-like portions of the



hinging element are configured so as to be insertable into the interior cavities of the lid and body hinge mounting elements, respectively, through the edge openings thereof, and wherein the free end of each clip-like portion includes an end section which abuts the clip-retaining portion in the hinge mounting elements so as to tend to prevent removal of the clip-like portions from the hinge mounting elements.

4,896,787

ARTICLE WITH RESILIENT HINGES BECOMING RIGID UNDER TENSION

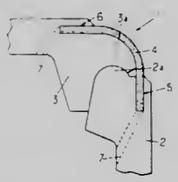
Dominique Delamour, Les Mesnuls, and Olivier Rodi, Neauphle le Chateau, both of France, assignors to Genus International, France, a part interest

Filed Aug. 15, 1988, Ser. No. 232,454

Claims priority, application France, Aug. 14, 1987, 87 11592; Nov. 13, 1987, 87 15706

Int. Cl.⁴ B65D *6/18*

U.S. Cl. 220—339 **16 Claims**



1. Article comprising at least two rigid generally planar elements, hinging means for hinging these two elements together for pivoting between a first position in which these two elements form a first angle therebetween and a second position in abutment one against the other in which these two elements form a second angle therebetween and means for locking these two elements with respect to each other in the second position, said hinge means comprising a resilient part having resilient properties connecting said elements together, said hinge means being shaped such that said resilient part occupies a relaxed position when the two elements occupy their first position and a tensioned position when the two elements are locked with respect to each other in their second position, the resilient part, under tension in the second position, comprising a means for providing substantial rigidity to the hinge between the two elements when the locking means is locked.

4,896,788

PACKAGING MEANS HAVING TAB SEALING MEANS ATTACHED WITH SOLVENT-FREE HOT MELT ADHESIVE, HOT MELT ADHESIVE THEREFOR AND METHOD OF ADHESIVE BONDING USING SAID ADHESIVE

Georg Bolte, Vechelde; Dieter Heinecke; Gunter Hexel, both of Braunschweig, and Rudolf Hinterwaldner, Moosach-Altenburg, all of Fed. Rep. of Germany, assignors to 501 Schmalbach Lubeca AG, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,645

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710157

Int. Cl.⁴ B65D *17/50, 41/02*

U.S. Cl. 220—359 **14 Claims**

1. A packaging means adapted to be filled with a liquid or solid fill material having an opening in a wall thereof sealed by a removable sealing means, said sealing means being attached to said wall of said packaging means in a manner effective to seal said opening by means of a solvent-free thermoplastic hot melt adhesive, said solvent-free thermoplastic hot melt adhesive being comprised of at least one polymer of the general formula:

$$HO\text{+}A\text{+}_{n+1}\text{+}B\text{+}_{m}H$$

wherein A is selected from the group consisting of

$$-\overset{\overset{O}{\|}}{C}-PA;\quad -\overset{\overset{O}{\|}}{C}-PI;\quad -\overset{\overset{O}{\|}}{C}-PE-O-;\quad -\overset{\overset{O}{\|}}{C}-PES-O-;$$

$$PA/PI;\ \left[\overset{\overset{O}{\|}}{C}-PA-\overset{\overset{O}{\|}}{C}-O-PE-O\right],$$

$$\left[\overset{\overset{O}{\|}}{C}-PA-\overset{\overset{O}{\|}}{C}-O-PES-O\right];$$

$$\left[\overset{\overset{O}{\|}}{C}-PI-\overset{\overset{O}{\|}}{C}-O-PE-O\right];\ \text{and}$$

$$\left[\overset{\overset{O}{\|}}{C}-PI-\overset{\overset{O}{\|}}{C}-O-PES-O\right];$$

and wherein B is selected from the group consisting of PA, PI, PE, PES, a block segment of A, and only one of PA, PI, Pe or PES plus a block segment of, with the proviso that one of A or B contains segments of PA or PI while the other contains segments of PE or PES, n=an integer of 0 to 50, m=an integer of 0 to 50, the ratio of PA and/or PI to PE and/or PES in the block segments may range from 1:10 to 10:1 and the ratio A:B ranges from 1:20 to 20:1, wherein PA=polyamide/copolyamide, PA/PI=copolyamide imide, PI=polyimide, PE=-polyether and PES=polyester/copolyester blocks.

4,896,789

ANTI-LEAK FUEL CAP LINER

Mark E. Federspiel, West Bend, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Feb. 17, 1989, Ser. No. 312,891

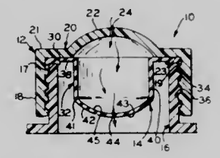
Int. Cl.⁴ B65D *51/00*

U.S. Cl. 220—367 **24 Claims**

1. A vented cap assembly for a fuel reservoir of the type having a filler neck and a fuel-receiving opening in the neck, said cap assembly comprising:

a cap member including means for removably attaching the cap member to the filler neck of a fuel tank;

a liner element engaging an underside of said cap member and adapted to be disposed in the fuel-receiving opening when said cap assembly is attached to a filler neck, said liner element including a flexible generally dome-shaped diaphragm portion having a convex surface facing axially



away from said underside of said cap member and a concave surface facing said underside of said cap member, said dome-shaped portion having a slit extending therethrough from the convex surface to the concave surface; and

means associated with said cap member for venting gases to and from the underside of said cap member.

4,896,790

THERMAL BOX FOR THE TRANSPORTATION OF FRESH GOODS AND A METHOD OF PRODUCING A MOULDING THEREFOR

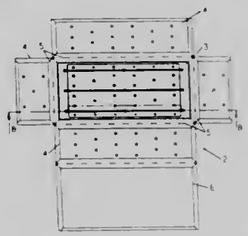
Oddbjorn Gronnevik, Nesbru, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed Jun. 30, 1988, Ser. No. 213,619

Claims priority, application Norway, Jun. 30, 1987, 872726

Int. Cl.⁴ B65D *5/00*

U.S. Cl. 220—416 **20 Claims**



1. A moulding for forming a thermo box, said moulding comprising:

a unitary, doubled-walled, hollow thermoplastic body, said body comprising:

a base portion for forming a base of a thermo box, said base portion having a drainage means for draining fluid from the thermo box;

a plurality of sidewall portions for forming sidewalls of the thermo box; and

means for connecting said plurality of sidewall portions to said base portion, said means for connecting comprising weakened portions enabling said sidewall portions to be folded relative to said base portion so as to enable the thermo box to be formed.

4,896,791

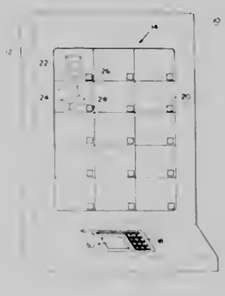
COUPON DISPENSING SYSTEM

William C. Smith, Providence, R.I., assignor to The Savings Spot, Ltd., Providence, R.I.

Continuation of Ser. No. 5,202, Jan. 20, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 273,161

Int. Cl.⁴ G07F *11/00*

U.S. Cl. 221—7 **15 Claims**



1. A consumer selectable coupon dispensing system, comprising:

one or more image areas, each image area including means for displaying a representation of a product to be promoted for which a single coupon is selectable;

each image area further including an associated selection device to be manipulated by a consumer to select a coupon for said product;

switch means associated with each selection device to register the current coupon selection;

input means for receiving an access code identifying the consumer;

means, within the system and responsive to said input means, for identifying coupons previously issued to said consumer;

means, responsive to said means for identifying, for establishing a coupon quota for said consumer;

means, responsive to said means for establishing a coupon quota and said means for registering the current coupon selection, for comparing said current coupon selection made by the consumer with the consumer's coupon quota, and for preventing issuance of the selected coupon if the consumer's established quota has been exceeded;

means, responsive to said means for comparing, for printing the selected coupon;

means, responsive to said means for comparing, for updating said means for identifying coupon selections made by the consumer, to include the current selected and printed coupon; and

means for recording and storing within the system, said consumer's updated coupon selections.

4,896,792

AUTOMATIC DISPENSING DEVICE FOR PRODUCTS AND CENTRAL WAREHOUSE OR STORE CONSTRUCTED WITH SUCH DEVICES

Michel Marchand, 130, Route de Genval, B-1328 Lasne, Belgium

Continuation-in-part of Ser. No. 102,271, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 819,905, Dec. 17, 1985, abandoned. This application Jul. 26, 1988, Ser. No. 224,569

Int. Cl.⁴ G07F *11/12*

U.S. Cl. 221—11 **10 Claims**

1. An automatic dispensing device for products, comprising: a warehouse having opposite side walls, a back guide, a front guide, and at least one movable guide between the front

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and back guide, said guides being substantially vertically oriented so as to define substantially vertical product chutes arranged one behind another, each chute having a lower outlet end being adapted to hold products stacked one upon another;

an inclined ramp at the lower end of the product chutes for receiving products from the chutes;

said movable guide being movable between a lowered position, wherein communication is prevented between the



ramp and the chute behind the movable guide, and a raised position wherein communication is provided between the ramp and the chute behind the movable guide such that products are released on to the chute;

control means on the ramp for automatically releasing one product at a time from the ramp; and

power means for selectively moving the movable guide between said lowered and raised positions such that only one chute is in communication with the ramp at any time.

4,896,793

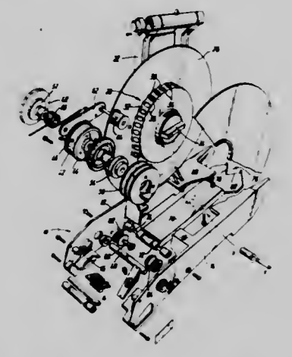
LABELLING MACHINES

Peter D. S. Briggs, Taverham; Richard J. Hirst, Fakenham, and Alan Constantine, Norwich, all of England, assignors to Sinclair International Limited, Norwich, England

Filed Dec. 4, 1987, Ser. No. 128,943

Int. Cl.[4] B65C *9/18*; B65H *5/28*

U.S. Cl. 221—73 **7 Claims**



1. A labelling machine comprising cassette means for storing a reel of label strip, said label strip comprising: a label carrier strip having a line of longitudinal weakening permitting separation of the carrier strip into two strips; labels disposed at intervals on the carrier strip, said labels spanning the longitudinal weakening, said label strip having a profiled edge; a stripper plate for separating individual labels from the carrier strip; feed roller means for advancing the labels strip over the stripper plate, said feed roller means having a profiled surface which engages the profiled edge of the label strip for advancement in a first direction of advancement of the label strip relative to the stripper plate around the edge of the stripper plate for separation of individual labels from the carrier strip and for separation of the carrier into two carrier strips along the longitudinal weakening thereof and for advancing the separated carrier strips relative to the stripper plate in a second direction, said second direction being opposite to the first direction, said feed roller means being located upstream of the stripper plate; a first take-up roller for receiving one separated carrier strip; a second take-up roller for receiving the other separated carrier strip; free wheel hubs supporting said first and second take-up rollers permitting overrun when taking up the separated carrier strips whereby tension is maintained in said label strip passing over the stripper plate; drive means for the feed roller means and the first and second take-up rollers, said drive means being separably connected to the feed roller means and the first and second take-up rollers whereby the disposition of the feed roller means can be adjusted relative to the drive means.

4,896,794

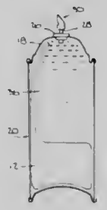
METHOD FOR PREPRESSURIZING DISPENSING CONTAINER AND FOR FILLING PRESSURIZED CONTAINER WITH FLOWABLE PRODUCT

Gordon L. Banks, Antwerp; Michael Moran, Kapellen, both of Belgium, and Gerhard Obrist, Kaiseraugst, Switzerland, assignors to Enviro-Spray Systems, Inc., Hoboken, N.J.

Continuation of Ser. No. 96,165, Sep. 11, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,030

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—1 **36 Claims**



1. A method for prepressurizing a product dispensing container, comprising the steps of:

providing a pouch having a first compartment containing a first chemical reactant and a second compartment having a second reactant, said pouch being provided with releasable sealing means for releasably sealing said first compartment and said second compartment and for separating said first compartment and said second compartment from one another to prevent mixing of said first chemical reactant and said second chemical reactant, at least a portion of said pouch containing a predetermined quantity of a first gas;

inserting said pouch into said container;

closing said container; and

generating, before introducing any product into the container, at least a partial vacuum in said container to release said sealing means and expand said pouch under pressure from said gas, thereby enabling mixing of said first chemical reactant and said second chemical reactant to generate a predetermined quantity of a second gas for further expansion of said pouch and pressurization thereof to a predetermined pressure.

4,896,795

GRAIN MOISTURE SENSOR

Randall J. Ediger, 132 N. 3rd St., Hampton, Nebr. 68843, and Richard Boelts, 320 Elk Creek Rd., Malcolm, Nebr. 68402

Filed Jan. 15, 1988, Ser. No. 144,187

Int. Cl.[4] F26B *13/12*

U.S. Cl. 222—63 **18 Claims**



1. A grain moisture sensor for measuring the moisture content of grain within a grain dryer bin adjacent the bottom wall thereof, which dryer includes a peripheral wall for containing and supporting grain within the bin, means for input of relatively high moisture grain into the top of the dryer and discharge means operative to remove a generally uniform layer of grain from the bottom of the dryer, said grain moisture sensor comprising,

at least one capacitor including at least a pair of capacitor plates,

a support means,

said capacitor plates being supported on said support means such that, upon mounting of said support means on the dryer, said capacitor plates are positioned within the dryer adjacent to bottom wall and in spaced relation from the peripheral wall,

said capacitor plates being supported in uniformly spaced apart substantially vertical relation whereby, upon mounting of said support means in said dryer, grain in the dryer fills the space between the plates and passes downwardly between the plates in response to operation of the discharge means, and

an electrical circuit including measuring means for measuring the capacitance of said capacitor, control logic means electrically connected to said measuring means and operative to calculate the percentage moisture content of grain between said capacitor plates as a function of the capacitance of said capacitor, and means for electrically connecting said control logic means to said discharge means for activating said discharge means to remove a layer of grain from the bottom of the bin in response to the percentage moisture content of grain between said capacitor plates being lowered to a selected amount.

4,896,796

STRIPING DISPENSER PACKAGE FOR VISCOUS PRODUCTS

Kurt N. Harris, Haskins, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Nov. 18, 1988, Ser. No. 272,972

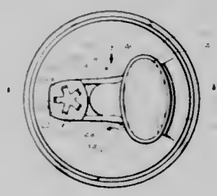
Int. Cl.[4] B67D *5/56*; B65D *25/40*

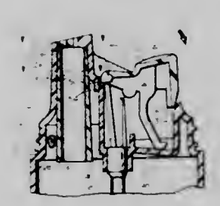
U.S. Cl. 222—145 **22 Claims**

1. A dispensing package for containing and dispensing a composite product comprising a first viscous product and a second viscous product, said composite product having a bead of the first viscous product with the second viscous product being applied to the exterior of the bead in at least one longitudinally extending strip, said dispensing package comprising:

a container having a body portion with an inside, a first end and a second end, said first end serving as a dispensing end, said container further having wall means extending across said dispensing end of said container, said wall means forming an elongate, annular dispensing spout, said elongate dispensing spout having an outer, terminal portion and an inner portion, said outer terminal portion having an inside with a first configuration;

an annular insert positioned in said elongate dispensing spout, said annular insert defining an elongate interior passage and comprising an imperforate wall defining an outer portion having an outside with a second configuration positioned snugly within said outer portion of said elongate spout and an inner portion, said second configuration being different than said first configuration, said outer portion of said annular insert and said outer portion of said elongate spout defining at least one longitudinally extending passage, said inner portion of said annular insert forming a recess with said inner portion of said annular





dispensing spout, said recess being adapted to receive the second viscous product, said inner portion of said annular insert having a free end which is adapted to be in fluid communication with the first viscous product; and

means for pressurizing the first viscous product and the second viscous product to cause the first viscous product to flow from said portion through said annular dispensing spout in a bead by way of said elongate interior passage of said annular insert and to cause the second viscous product to flow from said recess through said annular dispensing spout entirely on the outside of said annular insert in a strip on the outside of the bead of the first viscous product by way of said at least one longitudinally extending passage.

4,896,797

SEED STICK

Bruce A. Tumlin, Route One, Box 289C, Hayden, Ala. 35079

Filed Jan. 17, 1989, Ser. No. 299,555

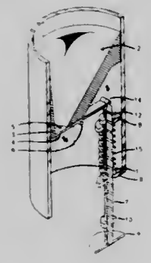
Int. Cl.[4] B65D *5/42*

U.S. Cl. 222—175 **5 Claims**

1. A manually operable seeder device or the like comprising:

an elongated, tubular storage hopper including a funneling member fixedly mounted off center within the lower end thereof, and having a lower opening, a swing check valve assembly affixed within the lower portion of said hopper and directly beneath said funneling member, said swing check valve including a flat plate member being in communication with said funneling member, said plate member having a first portion on one side of a fulcrum pin and covering said lower opening, and a second portion on the other side of the fulcrum pin, said plate member being pivotally secured to the hopper by the fulcrum pin, which extends diametrically across the chamber of said hopper,

said second portion of said plate member being hinged at its extreme edge opposite said fulcrum pin to the end of a threaded push-rod, said push-rod being parallel to the interior wall of lowest portion of said hopper and perpendicular to the plane of said plate, said push-rod being slidably connected to said interior wall by fixedly mounted guides, said swing check valve further including



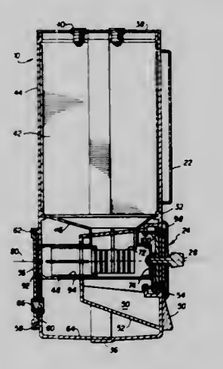
a single coil spring means surrounding said push-rod, said spring means operable to bias said push-rod wherein said plate covers and seals said funnel member lower opening to retain said valve closed, said push-rod further extending beyond the lower end of said hopper, and said check valve opens by said first portion of the plate member swinging downwardly and away from said lower opening when the threaded rod moves relative to the storage hopper.

4,896,798

PAN CANDY AND NUT MEAT PRODUCT VENDING MACHINE APPARATUS

Edward L. Milton, Idaho Falls, Id., assignor to Innovative Design and Marketing, Inc., Idaho Falls, Id.

Filed Oct. 15, 1986, Ser. No. 919,889
Int. Cl.[4] B65D *88/54*; G01F *11/06*
U.S. Cl. 222—307 **2 Claims**



1. A coin-operated product vending apparatus with a coin-operated product dispensing mechanism, said dispensing mechanism including:

a housing having a lockable back plate for providing controlled access to the product dispensing mechanism;

a hollow cylindrical tumbler means having a cylindrical wall rotatably disposed within a hollow cylindrical product receiving and dispensing container, said tumbler means having a product receiving and dispensing aperture disposed in the cylindrical wall thereof; and

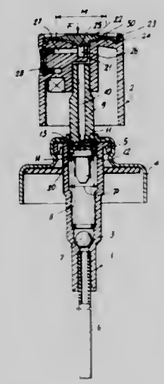
a plunger slideably mounted within said tumbler means for regulating the amount of product to be dispensed, said plunger being accessible through said lockable back plate when opened and being adjustable from the exterior of the housing without having to remove said tumbler from the product receiving and dispensing container.

4,896,799

DEVICE WITH BUTTON INCORPORATING A SHUT-OFF MEANS, FOR DELIVERING LIQUIDS IN ATOMIZED FORM

Giancarlo Giuffredi, Milan, Italy, assignor to Coster-Tecnologie Speciali S.p.A., Italy

Filed Jun. 8, 1988, Ser. No. 204,209
Claims priority, application Italy, Jun. 19, 1987, 20976 A/87
Int. Cl.[4] B65D *1/32*; G01I *11/00*; B67D *5/40*
U.S. Cl. 222—321 **6 Claims**



1. A device for atomized delivery of liquids such as perfumes and medicaments from containers, comprising

a pump having a plunger mobile in a cylinder against action of a spring, and

a delivery button connected to the plunger for manually operating the same,

wherein a delivery duct or hole is provided in the button and which can be shut off by a valving member carried by a flexible diaphragm fixed peripherally into a seat in the button,

said diaphragm comprises a central tubular projection, and the valving member is situated at a center of the tubular projection.

4,896,800

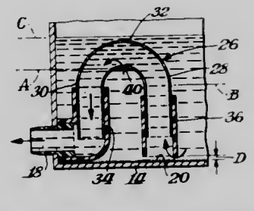
SIPHON PURGE SYSTEM

Michael D. Corey, Worthington, Minn., assignor to Crystal Tips, Inc., Spirit Lake, Iowa

Filed Jul. 27, 1988, Ser. No. 224,942
Int. Cl.[4] F04F *10/00*
U.S. Cl. 222—416 **5 Claims**

1. A siphon purge system for removing water and accumulated sediment from an ice making machine comprising a water reservoir having a bottom wall and an upwardly surrounding side wall, drain opening means in the reservoir, an inverted U-shaped tube mounted in the reservoir having an inlet leg portion, an opposed outlet leg portion and an interconnecting bight portion, means connecting the outlet leg portion of the inverted U-shaped tube to the drain opening means including an adjustable outlet tube connected between the outlet leg portion, and the drain opening means, the inlet leg portion having an open entrance end positioned in close proximity to the bottom wall of the reservoir, and a siphon breaker opening

in the bight portion of the inverted U-shaped tube at the inside surface of the U-shape whereby water drains through the inverted U-shaped tube when the water level of the reservoir rises to the level of the bight portion and continues to drain as the water level reaches the full height of the bight portion at



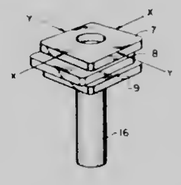
which time water and accumulated sediment are siphoned from the bottom wall of the reservoir through the inverted U-shaped tube until the water level of the reservoir drops to below the siphon breaker opening at which time the siphon action is broken, and an adjustable inlet tube at the end of the inlet leg portion of the inverted U-shaped tube.

4,896,801

METHOD FOR CONTROLLING THE DISCHARGE CHANNEL OF A CASTING CONTAINER (TUNDISH) FOR METALLIC MELTINGS, AND A DEVICE FOR CARRYING OUT THE METHOD

Josef Lothmann, Langerwehe; Friedhelm Paulus, Hurtgenwald, and Ludwig Walther, Duren/Niederau, all of Fed. Rep. of Germany, assignors to Flo-Con Systems, Inc., Champaign, Ill.

Filed May 13, 1987, Ser. No. 49,703
Claims priority, application Fed. Rep. of Germany, May 13, 1986, 161152
Int. Cl.[4] B22D *37/00*
U.S. Cl. 222—590 **11 Claims**



1. A method of controlling the pouring spout of a molten metal tundish, said tundish having a sliding valve mounted thereunder, said sliding valve comprising a valve plate for opening, closing and partial opening movement between a head plate and a discharge member, said head plate being mounted on the underside of said tundish comprising the steps of:

moving said valve plate in two directions perpendicular to each other in a plane perpendicular to the longitudinal axis of said pouring spout

moving the head plate in two directions perpendicular to each other in a plane perpendicular to the longitudinal axis of the pouring spout

oscillatingly moving said plate in said direction perpendicular to the longitudinal axis of the pouring spout, the directions of oscillation extending at a phase angle of 90° to each other and the oscillating movements being matched with each other such that a relative movement resulting between the valve plate and the head plate is generated along a closed curve path concentric with the longitudinal axis of the pouring spout.

4,896,802

MACHINE FOR PRODUCING BUNDLED PLASTIC TAPE PRODUCTS SUCH AS POMPONS

Hiroo Nanami, Shizuoka, Japan, assignor to Kabushikigaisha Nanami, Shizuoka, Japan

Filed Jun. 28, 1988, Ser. No. 212,635
Claims priority, application Japan, Jun. 30, 1987, 62-163817
Int. Cl.[4] D04D *7/06*; A41H *43/00*
U.S. Cl. 223—46 **9 Claims**



1. A machine for producing bundled plastic tape products such as pompons, comprising: a roll supporting shaft (7) for rotatably supporting a tape roll (11) comprising a plastic tape (9) wound about a core, a ripping device (4) for ripping said tape into strips, and a reel (5) for winding said strips thereabout mounted on a common framework (1), said ripping device having a plurality of cutters (34) disposed thereon in an equally spaced relationship in the transverse direction of said tape whereby as said plastic tape is payed out of said tape roll, the tape is ripped in the longitudinal direction of the tape into strips of a constant width, and said reel being provided on an outer periphery thereof with a first recess (48) adapted to pass a string for bundling said strips wound about said reel, and a second recess adapted to pass a knife or scissors for cutting said bundled strips for removing the bundled strips from said reel, wherein said ripping device includes:

(a) a ripping anvil (23) fixedly mounted to said framework and common to said plurality of cutters such that said plastic tape is passed through a space between said anvil and said cutters and automatically ripped as the tape is payed out of said tape roll by the rotation of said reel,

(b) a cutter holder (31) mounted to a cover portion (22) of said framework for pivotable and sliding movement relative to said anvil, said holder mounting said cutters, and said anvil defining a plurality of grooves (25) cooperable with and for receiving said cutters,

(c) hook means (37) mounted to said cutter holder for engagement with retainer means (24) common to said anvil,

(d) an operating lever (36) mounted to said cutter holder for moving said holder between a first position whereat said cutters are removed from said grooves, and a second position whereat said cutters are disposed in said grooves and said hook means are engaged with said retainer means, and

(e) spring means (33) for biasing said holder in both said first and second positions.

4,896,803

PULLING ON AID FOR COMPRESSION STOCKINGS

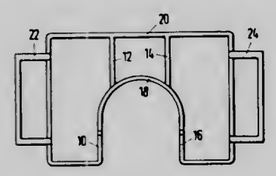
Claus-Dieter Wilkens, Nauheimer Strasse 35, D-2800 Bremen 44, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,394
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808557; Mar. 25, 1988, 3810047
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—112 **6 Claims**

1. Putting on aid for putting on stockings, particularly compression stockings, comprising a frame-like construction with at least four substantially equidistantly spaced, parallel-extend-

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ing support rods (10,12,14,16) whereof first ends are interconnected by means of a first clip (18) and whereof the second ends are interconnected by means of a second clip (20), the first



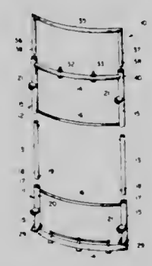
clip (18) being substantially semicircular with a diameter corresponding to the stocking width and the second clip (20) being substantially U-shaped with a significantly greater width being interconnected with the first clip.

4,896,804

CONVERTIBLE PACK FRAME

James C. Dearborn, and Ronald R. King, both of 4496 Industrial St., Simi Valley, Calif. 93063

Filed Mar. 28, 1988, Ser. No. 176,620
Int. Cl.[4] A45F *4/02*; F16M *11/20*; B27B *21/00*
U.S. Cl. 224—153 **2 Claims**



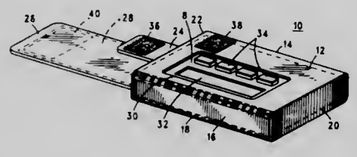
1. In a portable take-apart pack frame convertible between a back pack configuration and a monopod configuration, the combination comprising:
a first unit of rigid rectangular structure;
a second unit of rigid rectangular structure;
said first and said second units being similarly constructed as U-shaped members having a pair of parallel spaced-apart side members joined at one end by an arcuate cross element and at their opposite ends by an arcuate cross brace;
said side members having ends;
each of said side member ends adjacent to said cross brace terminating in an open socket having a central axis along the longitudinal axis of each of said respective side members;
each of said side members further having an open socket having a transverse axis normal to the longitudinal axis of said side member;
a pair of linear elongated rods having opposite ends insertably and selectively receivable into said open sockets having said transverse axis normal to the longitudinal axis of said side member to define said monopod configuration and insertably and selectively receivable into said open sockets having a central axis along the longitudinal axis of said side member to define said back pack configuration; and
said open sockets having a central axis along the side member longitudinal axis occupied by said rod ends to constitute said back pack configuration and said open sockets having a transverse axis normal to said side member longitudinal axis occupied by said rod ends to constitute said monopod configuration;
said pair of rods are coupled end-to-end insertably supported in a selected one of said open sockets to project vertically supported from a single one of said units when said monopod configuration is defined;
a "U"-shaped extension having free ends selectively and detachably coupled to said first unit; and
a saw blade detachably coupled to said free ends of said "U"-shaped extension when not coupled to said first unit so as to constitute a complete hand saw.

4,896,805

CERTAIN IMPROVEMENTS TO A PAGER CARRYING CASE

Lynne D. Klaczak, Boynton Beach, and Marilyn S. Burger, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1988, Ser. No. 227,042
Int. Cl.[4] A45F *5/02*
U.S. Cl. 224—236 **5 Claims**



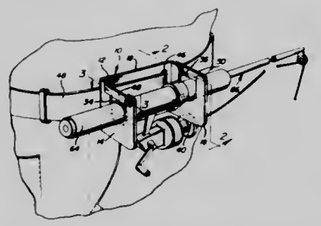
4. The improvement of claim 3 wherein the stiff flexible material is plastic.

4,896,806

BELT MOUNTED ROD HOLDER

Pete Sanchez, Jr., P.O. Box 8125, Albuquerque, N. Mex. 87108

Filed Jul. 24, 1985, Ser. No. 758,398
Int. Cl.[4] A01K *97/10*
U.S. Cl. 224—242 **3 Claims**



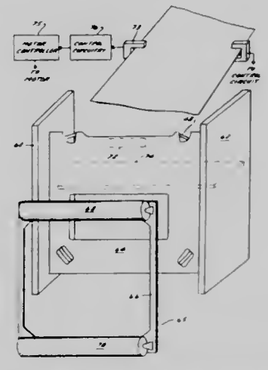
1. A belt mounted rod holder including a generally horizontally disposed U-shaped holder including a pair of laterally registered and spaced apart generally horizontal and parallel arms interconnected at the pair of corresponding ends by a bight portion extending therebetween, said bight portion including means for support from a waist encircling belt with said arms spaced along and projecting horizontally outwardly from said belt, said arms including registered upwardly opening notches formed therein for cradling longitudinally spaced portions of a fishing rod handle therein, said arms each including retaining means operative to releasably retain the corresponding fishing rod handle portion therein against upward displacement from the corresponding notch, said bight portion including a pair of belt receiving openings formed therein and spaced apart along said bight portion between said arms, said retaining means each including resilient means extending at least substantially entirely across the upper extremity of the corresponding notch to define a resilient closure therefor and defining an unobstructed major height portion of the corresponding notch therebelow in which to receive a fishing rod handle cross sectional area, said resilient means each including a generally resilient U-shaped body provided with an outer peripheral groove in which the portions of the corresponding arms defining the upwardly opening notch therein are seated, the open end of said U-shaped body including opposite inwardly directed resilient arm portions for releasably closing the open end of said U-shaped body.

4,896,807

WEB GUIDE APPARATUS

David L. Mundschau, Waukesha, Wis., assignor to Quad/Tech, Inc., Pewaukee, Wis.

Filed Apr. 15, 1988, Ser. No. 181,980
Int. Cl.[4] B65H *23/038*
U.S. Cl. 226—21 **31 Claims**



1. A web guide apparatus of the type comprising: a frame support; a carriage, including at least one idler roller; means for movably mounting said carriage to said frame support; and means for controllably moving said carriage to vary the lateral position of said web relative to said roller, said web guide having a predetermined response bandwidth with respect to the frequency of variations in said lateral position, and a natural resonance frequency, said web guide improved wherein:
said response bandwidth is greater than 1 Hz; and
said natural resonance frequency is outside of said bandwidth.

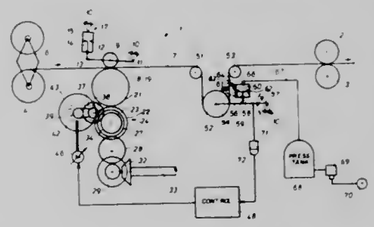
4,896,808

DEVICE FOR THE CONTROLLED INFEED OF A WEB TO A PRINTING MACHINE, METHOD FOR REGULATING A CORRESPONDING CONTROL SIGNAL, AND DEVICE FOR PERFORMING THE METHOD

Johannes G. Schaede, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 242,897
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731214
Int. Cl.[4] B65H *23/185*
U.S. Cl. 226—42 **7 Claims**

1. A device for the controlled infeed of continuous web material (7) to a printing machine having a motorized web drive formed by rollers (8, 9), with a tensioning roller (52) in the form of a compensating roller disposed downstream of the web drive, with a control device (48) based on the actual and nominal value signals (U_ϕ) of the web tension for the compensating drive of the traction roller (8) and with a differential drive (24) placed upstream of the traction roller (8) and having



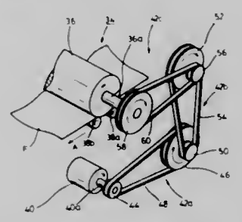
at least a drive component, a power take-off component and a control component (26, 23, 34), characterized in that the control component (34) can be driven by the main drive (33) of the printing machine by means of an adjustable drive (39).

4,896,809

FEED DEVICE

Yoshihiro Koyanagi, Ashigarakami, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1988, Ser. No. 254,056
Claims priority, application Japan, Oct. 6, 1987, 62-253211
Int. Cl.[4] B65H *20/00*; F16H *7/00*
U.S. Cl. 226—188 **9 Claims**



1. A feed device for feeding an image recording medium, comprising:
a drive drum having a belt operatively engaged therewith and at least one nip roller for gripping and feeding an image recording medium therebetween;
a rotative drive source; and
at least two speed reducer means operatively coupled between said drive drum and said rotative drive source, each comprising respective pairs of pulleys of different diameters and respective belts each trained around one of said respective pairs of pulleys, wherein said belt operatively engaged with said drive drum is one of said respective belts and is of higher rigidity than at least one other of said respective belts.

4,896,810

APPARATUS FOR MELTING SCRAP

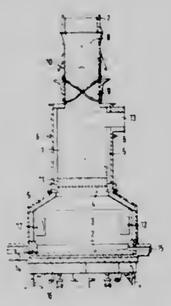
Walter Maschlanka, Gaggenau, and markus Hubig, Aachen, both of Fed. Rep. of Germany, assignors to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 282,440

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1987, 3742349

Int. Cl.[4] F27B *1/24*

U.S. Cl. 266—200 **11 Claims**



1. A furnace for melting metal scrap comprising: a shaft-like upper portion having a vertical longitudinal axis for containing metal scrap to be melted, a cooled grate at a lower end of the upper portion for retaining the metal scrap in the upper portion until melted, and a lower portion joined coaxially to the upper portion below the cooled grate, the lower portion comprising:

(a) a radially outwardly and downwardly inclined portion having a lower end, and having an upper end joined to the lower end of the upper portion, the inclined portion defining a radiating surface,

(b) a vertically walled portion having an upper end joined to the lower end of the inclined portion, substantially vertical walls defining the perimeter of the vertically walled portion, and a lower end closed by a bottom to define a hearth for containing a volume of molten metal, the volume having an upper surface, and

(c) burner means situated in the vertically walled portion for issuing heat into the furnace substantially at right angles to the longitudinal axis and above the upper surface of the volume, the upper surface being situated at an average of between 1.5 and 3.5 meters below said radiating surface, the area of the radiating surface being between about 1.8 and 3.5 m^2/ton of molten metal.

4,896,811

MACHINE FOR BONDING LEADS TO NON-COPLANAR SUBSTRATES

Gerald R. Dunn, Carlsbad; Dean R. Haagenson, Vista, both of Calif., and Michael J. Pirozzoli, Pine Springs, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed May 16, 1989, Ser. No. 353,377

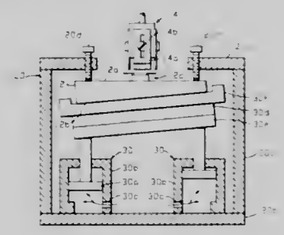
Int. Cl.[4] H01L *21/603*

U.S. Cl. 228—5.5 **11 Claims**

1. A machine for bonding leads to a substrate having top and bottom surfaces that are non-coplanar; wherein said machine is comprised of:

a carrier for said substrate which includes a frame having a set of stops that terminate in a single plane and which are arranged in a pattern with a central opening;

a forcing means, in said carrier, for pinning said top surface of said substrate directly against all of said stops simultaneously, such that a portion of said top surface is exposed through said opening and is aligned with said single plane, by pushing on said bottom surface; and,



a bonding module having blades which lie parallel to said single plane and which move through said opening and bond leads to the exposed portion of said top surface.

4,896,812

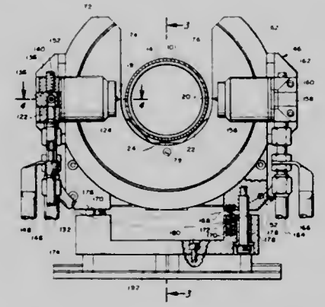
DOUBLE DOWNHILL PIPE WELDER

Gasparas Kazlauskas, 1134 Tower Rd., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 261,140, Oct. 24, 1988, abandoned. This application Mar. 6, 1989, Ser. No. 319,061

Int. Cl.[4] B23K *9/02, 9/06, 9/225*

U.S. Cl. 228—32 **5 Claims**



1. A pipe welding apparatus comprising:

a mounting base adapted to be mounted onto a fixed structure;

a welding head housing mounted on said mounting base, said welding head housing having a central enlarged recess with access into said central enlarged recess being from above said welding head housing, pipe support means mounted within said central enlarged recess, said pipe support means adapted to support a pipe to be welded with the pipe resting on said pipe support means; and

a pair of welding electrodes mounted on said welding head housing, said welding electrodes being oriented diametrically opposite each other relative to the pipe to be welded, said welding electrodes being mounted on a ring gear, said welding electrodes to move in unison, said ring gear being movable relative to said welding head housing, each said welding electrode to be operated to weld only during movement from an upper position to a lower position, said upper position being one hundred eighty degrees spaced from said lower position relative to the diameter of the pipe, both said upper position and said lower position being located on a single vertical plane extending through the center of the pipe to be welded.

4,896,813

METHOD AND APPARATUS FOR COLD ROLLING CLAD SHEET

Kinji Saijo, Kudamatsu; Tsukasa Fujimura, Yamaguchi, and Kazuo Yoshida, Hikari, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,834

Int. Cl.[4] B23K *20/04, 20/14, 20/24*

U.S. Cl. 228—116 **10 Claims**

1. A method of cladding one of a variety of metals with another dissimilar metal, comprising the following steps:

(a) holding the metals to be bonded against grounded metal holding electrodes, said electrodes acting as cathodes;

(b) providing an anode for cooperation with each cathode, each anode being insulated from ground and having a surface area over three times larger than the surface area of the cathode which is exposed to said anode;

(c) exposing the metals to be bonded to an inert gas at a pressure of from 1×10^{-4} to 1×10^{-1} Torr between said anodes and said cathodes;

(d) sputter etching the metals by glow discharge plasma by supplying RF power with a frequency from 1 to 50 MHz to the cathodes and the respective anodes, thereby substantially removing the oxides from the surface of the metals to be bonded;

(e) bringing the cleaned surfaces into contact with one another;

(f) maintaining a vacuum of from 1×10^{-6} to 1×10^{-3} Torr where said surfaces are brought into contact;

(g) maintaining a temperature from room temperature to 300° C. where said surfaces are brought into contact; and

(h) urging the surfaces together at a pressure sufficient to effect a reduction in thickness of from 0.1 to 30%.

3. Apparatus for cladding a strip of one of a variety of metals with a dissimilar cladding metal, said apparatus comprising a sputter etching unit comprising

an etching chamber electrically connected to an anode therein, and

a grounded metal holding electrode which acts as a cathode, said electrode being in the form of a roller which receives a strip of metal thereabout and passes said strip adjacent to said anode;

skirts between said chamber and said metal holding electrode, said skirts extending very close to said roller to maintain a pressure differential in said chamber, said skirts electrically insulating said anode from said cathode.

4,896,814

METHOD OF WELDING INSIDE A GROOVE MACHINED IN A SOLID STEEL PART, AND UTILIZATION OF THE METHOD FOR REPAIRING A CRACKED ROTOR

Gilles Allain, Paris, and Max Nougaret, Pierrefitte, both of France, assignors to Societe anonyme dite: ALSTHOM, Paris, France

Filed Jul. 28, 1988, Ser. No. 225,429

Claims priority, application France, Jul. 28, 1987, 87 10689

Int. Cl.[4] B23K *9/02, 9/04, 9/225, 37/06*

U.S. Cl. 228—119 **8 Claims**

1. A method of welding in a groove machined in a solid alloyed steel part, wherein bottom passes are performed and then each wall of the groove is faced with low alloy steel filler material, heat treatment is then performed so as to eliminate the stresses in the zones of the part adjacent to the walls of the groove faced with low alloy steel filler material, and after heat treatment, the empty space between the two facing layers is filled with low alloy steel filler materials, said operation of facing the wall being performed by placing a deformable steel plate having a very low elastic limit in the groove at a certain distance from said wall, by filling the space between the deformable plate and the wall with weld layers of low alloy steel



having a carbon content lying in the range of 0.08% to 0.12%, with the plate deforming in a direction towards the weld layers of low alloy steel filler material to follow contraction of the low alloy steel during cooling, thereby reducing the overall risk of cracking of the low alloy steel of the filler material, and by getting rid of the steel plate and optionally a portion of the filler material so as to leave only a layer on the wall and wherein the bottom passes are performed using a non-alloyed low carbon steel as the filler material.

4,896,815

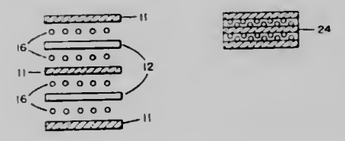
METHOD FOR FORMING TITANIUM ALUMINIDE-DUCTILE TITANIUM ALUMINUM ALLOY MATRIX COMPOSITES

Dan G. Rosenthal, Huntington, and Joseph A. Goebel, Hamden, both of Conn., assignors to Avco Lycoming, Stratford, Conn.

Division of Ser. No. 55,415, May 29, 1987, Pat. No. 4,816,347. This application Aug. 4, 1988, Ser. No. 228,257

Int. Cl.[4] B23K *20/00, 20/22*

U.S. Cl. 228—120 **11 Claims**



1. A method for forming a hybrid titanium metal composite having good strength at temperatures up to about 1500° F. and good ductility comprising the steps of superposing at least one layer of a high temperature-resistant titanium aluminide and at least one layer of a ductile titanium aluminum alloy, and metallurgically bonding said layers together under high isostatic pressure at a temperature of between about 1700° and 1800° F. to form a composite article having substantially higher yield strength, ultimate tensile strength and % elongation ductility than said layer of titanium aluminide at both room temperature and at 1200° F., and having substantially higher yield strength and ultimate tensile strength at 1200° F., than said layer of ductile titanium aluminum alloy has at 1000° F.

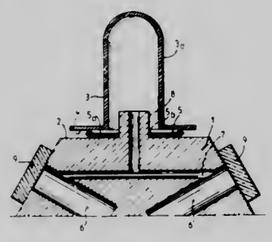
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,816

METHOD FOR PRODUCING A FLUIDTIGHT AND HEAT CURABLE SEAL BETWEEN METAL OBJECTS AND A BODY OF VITROCERAMIC MATERIAL

Guy Lancar, Vigneux sur Seine, and Jean-Jacques Roland, Sceaux, both of France, assignors to Quantel S.A., Les Ulis Orsay Cedex and Societe Francaise d'Equipements Pour la Navigation Arienne-S.F.E.N.A., Velizy Villacoublay Cedex, both of, France

Continuation of Ser. No. 702,031, Feb. 15, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 119,253
Claims priority, application France, Feb. 15, 1984, 84 02302
Int. Cl.[4] B23K *20/00*; C21D *1/00*; H01J *9/00*
U.S. Cl. 228—122 **6 Claims**



1. A method for producing a fluidtight seal between a body of vitroceramic material formed of an amorphous phase and a quartzic crystalline phase β and a metal element intended to form part of the construction of a gas laser, and in particular a laser gyrometer, said method comprising the steps of:

interposing between surfaces to be sealed of said body of said vitroceramic material formed of an amorphous phase and a quartzic crystalline phase β and said metal element an annular joining member of aluminum capable of diffusing into said vitroceramic material; and

subjecting the assembly thus formed to a thermo-compression operation comprising a preliminary step of heating the assembly to a temperature required to provide diffusion at the interface between said vitroceramic material and said aluminum annular joining member, said preliminary heating step being followed by a step of compression of the assembly in order to provide a plastic deformation of the joining member, so as to cause a superficial diffusion of the aluminum material of said annular joining member into the facing surfaces of said body of vitroceramic material and said metal element.

4,896,817

FLUX COMPOSITION AND METHOD OF DECREASING TIN CONTENT IN LEAD/TIN SOLDER JOINTS

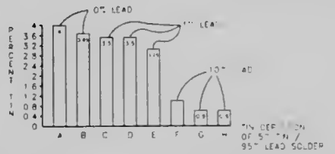
Randy W. Sayder, Vestal, and James Spalik, Kirkwood, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,524
Int. Cl.[4] B23K *35/363*
U.S. Cl. 228—123 **14 Claims**

1. A process for reducing the amount of tin in a lead/tin solder comprising the steps of:

providing a flux having a metal compound dissolved in said flux to a degree such as to provide at least a stoichiometric amount of lead in the flux equal to the amount of tin to be removed from the solder; and wherein said metal is more electronegative than tin;

applying said flux to a given amount of solid solder heating said solder and said flux above the melting point of said solder to cause the metal compound in the flux to react with the free tin and reduce the metal compound to free



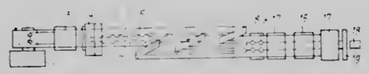
metal and oxidize the tin to the corresponding tin compound.

4,896,818

METHOD OF FABRICATING LIGHT-WEIGHT SECTIONS

Lev Z. Shteinbok; Igor L. Shteinbok; Alexandr V. Sagirov, and Leonid S. Davydov, all of Moscow, U.S.S.R., assignors to Opytnoe Proizvodsyvenno- Tekhnicheskoe Predpriyatie "Energotekhprom", Moscow, U.S.S.R.

PCT No. PCT/SU88/00003, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO88/05350, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 7, 1988, Ser. No. 271,959
Claims priority, application U.S.S.R., Jan. 23, 1987, 4206339
Int. Cl.[4] B23K *20/04, 31/08*; B21D *5/06*; K04C *3/08*
U.S. Cl. 228—170 **6 Claims**



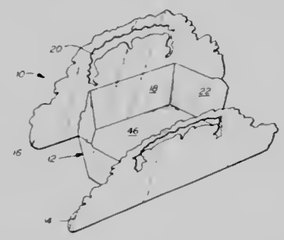
1. A method of fabricating a metal sheet material unit from an elongate metal strip having a longitudinal axis which comprises dividing the strip longitudinally into at least two narrower strips having adjacent zigzag edges, relatively displacing the narrower strips lengthwise and widthwise relative to one another by winding at least one of the narrower strips spirally into a helix having an axis perpendicular to the longitudinal axis, reengaging the zigzag edges of the narrower strips in a longitudinally displaced position and welding the narrower strips together with the zigzag edges in engagement.

4,896,819

FOLDABLE GIFT BASKET

John W. Grossman, 20 Park Dr., San Anselmo, Calif. 94960

Filed Jan. 10, 1989, Ser. No. 295,652
Int. Cl.[4] B65D *5/36, 5/46*
U.S. Cl. 229—8 **7 Claims**



1. A decorative, foldable cardboard basket for carrying and displaying selected items, comprising:

a central receptacle having connected side walls, end walls and a bottom section, said receptacle having linear fold lines in its end walls and bottom section to enable the receptacle to assume an essentially flattened configuration, and means for holding said receptacle in its opened, erect configuration; and

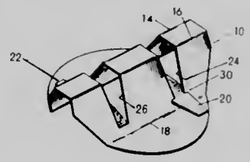
a pair of side panels of flexible sheet material and having decorative printing on their outer surfaces, each said panel having an inner surface attached to and extending above the outer surface of one side wall and having an opening within an upper panel portion that forms a handle for said basket when said upper panel portions are bent together.

4,896,820

HOLDER FOR TACOS OR THE LIKE

Max G. Harrington, Fairoaks, Calif., assignor to Idea Resources Corporation, Woodland, Calif.

Filed Mar. 16, 1989, Ser. No. 324,450
Int. Cl.[4] B65D *5/00*; A47J *43/00*
U.S. Cl. 229—100 **5 Claims**



1. A holder for tacos or the like comprising:

a blank formed from a sheet of paperboard material;

said blank having end edges and a pair of opposing side edges;

a first pair of parallel fold lines across said blank parallel to said side edges and near the mid-portion of said blank to enable side portions of said blank to be folded toward each other to encompass a taco or the like;

a first continuous line forming a polygon extending across said first pair of parallel fold lines and into said side portions;

one line of said first polygon parallel to said first pair of fold lines being a fold line and the other lines being perforated so that the area within said first polygon is partially removable to form a pocket when said side portions are folded toward each other, adapted to receive a taco or the like; and

a second pair of parallel fold lines, each of said second pair of fold lines being along and parallel to one of said side edges to enable side edge portions to be folded away from each other to form generally horizontal bases for said folded form.

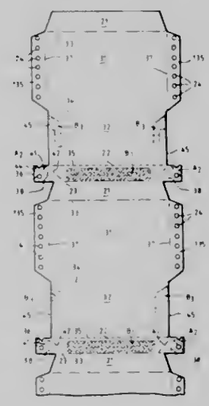
4,896,821

ENVELOPES

Laurence J. Bell, Victoria, Australia, assignor to Envelopments Pty. Ltd., Melbourne, Australia

Filed Jun. 26, 1987, Ser. No. 57,544
Int. Cl.[4] B65D *27/10*
U.S. Cl. 229—69 **46 Claims**

1. An article of stationery comprising a continuous length of paper or other material suitable for envelope formation folded to define a plurality of envelopes wherein each envelope, excepting that one at one end of the length, partly overlaps and is attached, per the continuity of said length, to a first adjacent envelope and, excepting that one at the other end of the length, is partly overlapped by and is attached, per the continuity of said length, to another, second, adjacent envelope and wherein each envelope comprises a face and a back wherein at least substantially the whole of the face of each envelope is not overlapped by an adjacent envelope, wherein said article of stationery is, at least substantially throughout the whole of its length and, at least substantially inboard of side edges of each envelope and notwithstanding such overlap, not more than 3 layers thick of said paper or other material suitable for envelope formation, wherein the envelopes have back side edges extending from the sides of the backs of the envelopes and integral therewith which are folded inwardly and secured to the inside of the front whereby to close the sides of the envelopes, the envelopes further have front side edges integral with the fronts of the envelopes and extending laterally outwardly of the envelopes and provided with sprocket holes for use with sprocket feed printers, wherein said front side edges are attached to the envelopes via a line of perferential tearing whereby said front side edges may be stripped from the envelope, and wherein said line of perferential tearing is located laterally outboard of the sides of the back of the envelopes.

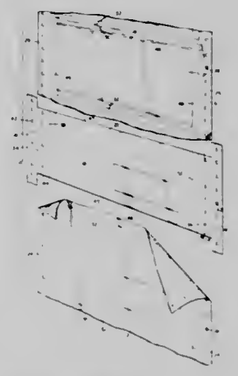


4,896,822

APPARATUS AND METHODS FOR FORMING MAILERS WITH INSERTS

Robert E. Ashby, Quakertown, Pa., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 5, 1989, Ser. No. 333,235
Int. Cl.[4] B65D *27/10*
U.S. Cl. 229—69 **14 Claims**



1. A mailer product, comprising:

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a pair of panels each having opposite end portions, each said end portion including a marginal feed strip with longitudinally extending spaced perforations therealong;
an insert having first and second marginal feed strips each with longitudinally extending spaced perforations therealong, said first and second feed strips lying adjacent each of opposite end portions of said insert;
said insert being disposed between said panels with the first feed strip at each end of said insert in registry with the feed strips of said panels at the corresponding end of the mailer, each said second feed strips extending outwardly of the corresponding end of said panels.

4,896,823

MAILER WITH RETURN ENVELOPE

James C. Taylor, Columbia, S.C., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Aug. 9, 1988, Ser. No. 230,032
Int. Cl.[4] B65D *27/06*
U.S. Cl. 229—73 **28 Claims**



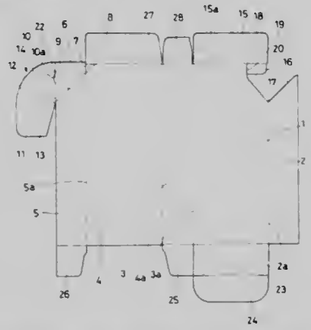
1. A mailer with integral return envelope comprising:
an elongated sheet having first, second and third panels longitudinally spaced one from the other along said sheet and connected one to the other along first and second laterally extending, longitudinally spaced, fold lines, respectively;
on one face only of said sheet, adhesive applied to lateral margins of said first panel, lateral margins of one of said second and third panels, a distal end margin of said first panel, and an end margin of one of said second and third panels immediately adjacent said second foldline;
straight lines of perforations extending longitudinally along the entire length of said sheet along opposite sides thereof, the adhesive on said lateral margins of said first panel being disposed laterally outwardly of the longitudinally extending lines of perforations in said first panel and the of adhesive on said lateral margins of one of said second and third panels straddling the longitudinally extending lines of perforations in the corresponding panel;
first, second and third straight lines of perforations extending laterally respectively in said first, second and third panels, said first perforation line being inset from the distal end margin of adhesive in said first panel, said second perforation line extending in said second panel adjacent to and spaced longitudinally from said second foldline a distance less than the distance between said second perforation line and said first foldline and defining an end margin adjacent said second foldline, said third perforation line in said third panel being spaced longitudinally from said second foldline substantially the same distance that said second perforation line in said second panel is spaced from said second foldline and defining another end margin adjacent said second foldline, the end margin of adhesive on said one of said second and third panels straddling one of said second and third laterally extending lines of perforations therein;
said second and third panels being relatively foldable about said second foldline to register said second and third panels in opposition one to the other and to adhesively secure and register (a) the lateral margins of said second and third panels one to the other and (b) the end margins adjacent said second foldline of said second and third panels one to the other, said first panel being foldable about said first foldline to register said first panel the said third panel in face to face opposition one to the other and to adhesively secure the lateral and distal end margins of said first panel to the lateral and end margins of said third panel to form a mailer and such that said first, second and third straight lines of perforations lie in registration each with the other and said longitudinally extending lines of perforations lie in registration each with the other whereby the lateral margins defined by the registering straight lines of perforations extending longitudinally along said first, second and third panels and one end margin of the mailer defined by the registering first, second and third straight lines of perforations may be removed along the respective registering lines of perforations to form a return envelope defined by said second and third panels;
means carried by said first panel including at least one line of perforations defining a portion of said first panel removable from said first panel and receivable in said return envelope without folding thereof; and
said second panel having a window formed therein such that address information on the face of the third panel may be displayed through the window when the panels are folded and adhesively secured to form the mailer.

4,896,824

POUR SPOUT CONTAINER

Yoshiharu Aoki, Tokyo, Japan, assignor to Sigma Shigyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 22, 1989, Ser. No. 313,607
Claims priority, application Japan, Aug. 5, 1988, 63-103901
Int. Cl.[4] B65D *5/74*
U.S. Cl. 229—125.42 **1 Claim**



1. A container for granular substances, comprising:
a pasting piece;
a rear piece connected to said pasting piece along a first fold line;
a right side piece connected to said rear piece along a second fold line;
a front piece connected to said right side piece along a third fold line;

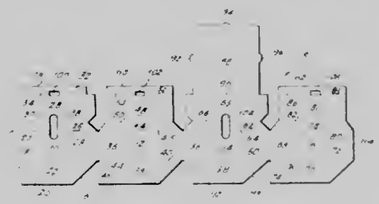
a left side piece connected to said front piece along a fourth fold line, and an inner surface of said left side piece connected to a portion of an outer surface of said pasting piece;
bottom piece means connected to a bottom edge of each of said rear piece, said right side piece, said front piece and at least one of said pasting piece and said left side piece;
a first cut extending a distance down said pasting piece from a top edge thereof along said first fold line, said top edge extending above the top edge of each of said rear piece, said right side piece and said front piece;
a fifth fold line extending from a bottom of said first cut across said pasting piece to a free edge of said pasting piece, and the area of said pasting piece below said first fold line includes said portion of an outer surface;
a second cut extending from said fourth fold line near the intersection of said fifth fold line and said free edge of said pasting piece to a point on said top edge of said front piece, said point being spaced from said fourth fold line;
top piece means connected to said top edge of said rear piece and said right side piece and connected along a front edge thereof to said top edge of said front piece from said point to said third fold line;
a tongue piece connected to said front edge of said top piece means from said point to at least near said free edge of said pasting piece; and
a sliding board connected along a sixth fold line to said free edge of said pasting piece from the intersection of said fifth fold line and said free edge of said pasting piece to said top edge of said pasting piece, at least a portion of a top edge of said sliding board extending above said top edge of said front board, said sliding board being in sliding contact with an outer surface of said tongue piece and an inner surface of said front piece.

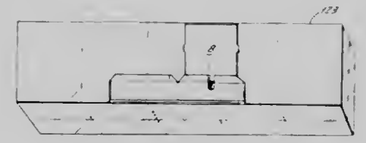
4,896,825

FOLDABLE ASHTRAY

Robert E. Moeller, New Milford, N.J., assignor to Alford Industries Inc., Ridgefield Park, N.J.

Filed Jan. 18, 1989, Ser. No. 299,454
Int. Cl.[4] B65D *73/00*
U.S. Cl. 229—167 **14 Claims**





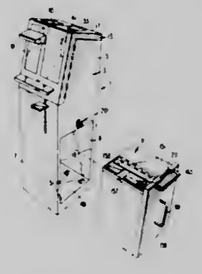
1. A blank for forming an ashtray with a bottom, said blank comprising:
a first side panel for forming a first side of said ashtray;
a first bottom flap for forming a first portion of said bottom of said ashtray, said first bottom flap being connected to said first side panel by a first fold line;
a second side panel for forming a second side of said ashtray, said second side panel being connected to said first side panel by a second fold line;
a second bottom flap for forming a second portion of said bottom of said ashtray, said second bottom flap being connected to said second side panel by a third fold line;
a third side panel for forming a third side of said ashtray, said third side panel being connected to said second side panel by a fourth fold line;
a third bottom flap for forming a third portion of said bottom of said ashtray, said third bottom flap being connected to said third side panel by a fifth fold line;
a fourth side panel for forming a fourth side of said ashtray, said fourth side panel being connected to said third side panel by a sixth fold line and adapted to be affixed to said first side panel to form said ashtray;
a fourth bottom flap for forming a fourth portion of said bottom of said ashtray, said fourth bottom flap being connected to said fourth side panel by a seventh fold line; and
a bottom panel and enabling means for enabling said bottom panel to be positioned over said bottom flaps to complete said bottom of said ashtray, said bottom panel being connected to said enabling means, said enabling means being connected to one of said side panels by an eighth fold line;
wherein at least one of said side panels other than said one to which said bottom panel is connected includes a first tab receiving slot, said bottom panel including a first tab which is receivable in said first tab receiving slot to secure said bottom panel in position over said bottom flaps to complete said bottom of said ashtray.

4,896,826

TAMPER-DETERRENT FEE COLLECTING BOX FOR BUSES

Denis Bernier, 28 de l'Epée, Suite 102, Outremont, Quebec, H2V 3S9, Canada

Filed Sep. 29, 1988, Ser. No. 250,716
Int. Cl.[4] G07B *15/00*
U.S. Cl. 232—7 **18 Claims**



1. A tamper-deterrent box for collecting travel fees on board of a bus, said box comprising:
a hollow case having an upper part and a lower part and including a top wall, a bottom wall, front, back and side walls; said lower part defining a housing having an opening;
a fee-collecting receptacle removably received in said housing through said opening;
means defining a first slot through said top wall for sliding paper money therethrough;
means defining a second slot through said top wall for dropping coins therethrough;
a first gathering container, beneath said first slot for receiving paper money from said first slot, said first container comprising:
a first guide slide for receiving paper money; said first

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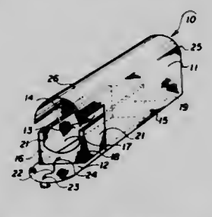
slide having a free edge and being pivotally mounted for said free edge to be brought against said front wall, and
a first viewing window, as part of said front wall for visioning paper money in said first container;
a second gathering container beneath said second slot for receiving coins from said second slot, said second container comprising:
a second guide slide for receiving coins; said second slide having an edge band at one end and being pivotable mounted for said edge band to face said front wall;
a second viewing window as part of said front wall;
spacer means on said edge band;
resilient means pressing said spacer means against said viewing window, constructed so that said spacer means create a space between said edge band and said second window allowing said coins to be received, in said space, only flatly and in edge-abutting relation so as to be counted through said second window, and
means operable from outside said case for simultaneously pivoting said first slide away from said front wall and said second slide away from said front wall against said resilient means to free said paper money and said coins from said gathering containers to fall toward said fee-collecting receptacle.

4,896,827

MAILBOX SYSTEM

George Economou, 419 Valley Dr., Pittsburgh, Pa. 15215

Filed Jan. 27, 1989, Ser. No. 303,457
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—17 3 Claims



1. A mailbox, said mailbox comprising;
(a) a housing, said housing adapted to receive mail therein, said housing having an outwardly opening door therein, which door covers an access opening to said housing;
(b) a tray means slidably disposed within said housing, said tray means having a front stop means for assisting in containing said mail within said tray means and being adapted to contain mail therein, said tray means further adapted to slide automatically outwardly through said opening in said housing when said door is opened, by means of a connector means between said door and said front stop of said tray;
(c) an overhanging roof portion extending from said housing, said roof portion having a rounded profile and adapted to extend over at least a portion of said tray means when said tray means slides outwardly through said opening in said housing.

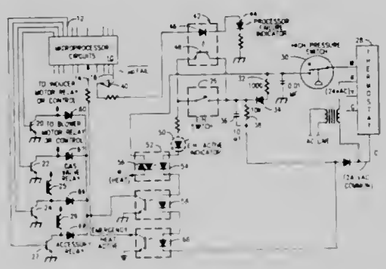
4,896,828

SOLID STATE EMERGENCY HEAT CIRCUIT

Robert W. Peltz, Jr., Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 23, 1989, Ser. No. 370,780
Int. Cl.[4] G05D *23/00*; G05B *9/02*
U.S. Cl. 236—10 6 Claims

1. An emergency heat circuit for a microprocessorcontrolled furnace of the type in which a microprocessor controller for the furnace has a plurality of logic inputs and outputs including an input to receive a thermostat indication, an emergency-heat-active thermostat indication, an emergency-heat-active input for inducing a suitable emergency heat algorithm, an output to control a gas valve to the furnace, an output to control at least one blower motor, and a microprocessor failure output which provides a particular level when the microprocessor is functioning properly and another complementary level when the microprocessor is malfunctioning; and which includes a thermostat having an R conductor to which AC thermostat power is applied, a C conductor which serves as a common conductor for said AC thermostat power, and a W conductor which supplies AC power from the R conductor when the thermostat senses a low ambient temperature condition; the emergency heat circuit comprising:
a rectifier circuit having an input connected to said W conductor and an output that provides a DC voltage when said AC voltage appears on said W conductor;



a manually actuable emergency heat switch having one terminal connected to the rectifier circuit output and another terminal connected to means responsive to the switch for actuating the emergency-heat-active input of the microprocessor;
first photo-optical switch means having an optical actuator connected to said microprocessor failure output and a switched element having terminals connected in parallel to the manually actuable emergency heat switch; and
second optical switch means having an optical actuator connected between said emergency heat switch and said C conductor and a photo-optically switched element for switching on one or more of said gas valve and said one or more blower motors.

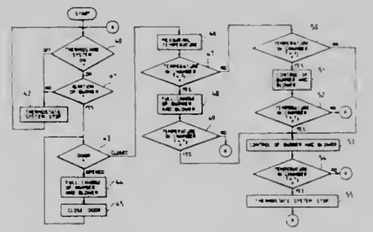
4,896,829

AIR CIRCULATION SYSTEM FOR THERMOSTATIC CHAMBER

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,280
Claims priority, application Japan, Dec. 30, 1987, 62-335970
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A 9 Claims

1. An air circulation system for thermostatic chamber, comprising:
a thermostatic chamber mounted on a vehicle, the thermostatic chamber having a door, a plurality of circulation ports provided to opposing walls of the chamber near the door and opening in the chamber, and an intake port provided to a wall of the chamber opposite to the door;
a door sensor installed in the thermostatic chamber to detect the closed or open state of the door;
a temperature sensor installed in the thermostatic chamber to detect the temperature in the chamber;
a burner installed on the vehicle;
a heat exchanger mounted on the vehicle and having an inlet port and an outlet port, the heat exchanger being adapted to heat the air drawn in from the inlet port by using the hot burned gas produced by the burner and deliver the heated air from the outlet port;
a first air duct to communicate the outlet port of the heat exchanger with the circulation ports provided on the wall of the thermostatic chamber on one side;
a second air duct to communicate the outlet port of the heat exchanger with the circulation ports provided on the wall of the thermostatic chamber on the other side; and a first air shutter installed in the second air duct, the first air shutter being adapted to open the second air duct in response to a door-closed signal from the door sensor and close the second air duct in response to a door-open signal from the door sensor;
a third air duct to communicate the second air duct with the inlet port of the heat exchanger; and a second air shutter



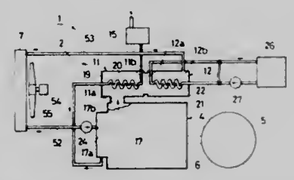
installed in the third air duct, the second air shutter being adapted to close the third air duct in response to a door-closed signal from the door sensor and open the third air duct in response to a door-open signal from the door sensor;
a fourth air duct to communicate the intake port of the thermostatic chamber with the inlet port of the heat exchanger; and a third air shutter installed in the fourth air duct, the third air shutter being adapted to open the fourth air duct in response to a door-closed signal from the door sensor and close the fourth air duct in response to a door-open signal from the door sensor; and
a blower to circulate the hot air heated by the heat exchanger through the first, second, third and fourth air ducts into the thermostatic chamber.

4,896,830

WASTE HEAT RECOVERY SYSTEM FOR HORIZONTAL LIQUID-COOLED INTERNAL COMBUSTION ENGINE

Yoshimichi Takamatsu, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Sep. 29, 1988, Ser. No. 255,162
Claims priority, application Japan, Sep. 30, 1987, 62-248264; Sep. 30, 1987, 62-248265
Int. Cl.[4] B60H *1/04*
U.S. Cl. 237—12.1 6 Claims



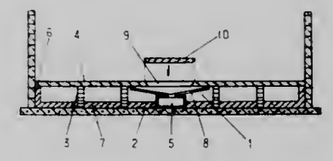
1. In a waste heat recovery system for a horizontal liquid-cooled internal combustion engine;
said horizontal liquid-cooled internal combustion engine being equipped with a heat exchanger for heat absorption from the exhaust gas (a first heat exchanger) and a heat exchanger for waste heat recovery (a second heat exchanger),
a water jacket within an engine body of said internal combustion engine, the first heat exchanger and the second heat exchanger being connected in series so that the engine cooling liquid will circulate in order through the water jacket, the first heat exchanger and the second heat exchanger,
waste heat generated from the internal combustion engine being adapted to be absorbed in the water jacket and in the first heat exchanger and to be recovered in the second heat exchanger through the engine cooling liquid,
the first heat exchanger and the second heat exchanger being located on the upper side of the engine body, and
the engine cooling liquid inlet of the first heat exchanger being communicated directly with the enging cooling liquid outlet of the water jacket, the engine cooling liquid inlet of the second heat exchanger being communicated directly with the engine cooling liquid outlet of the first heat exchanger, and the engine cooling liquid outlet of the second heat exchanger being communicated with the engine cooling inlet of the water jacket.

4,896,831

UNDERFLOOR HEATING SYSTEM AND METHOD FOR HEATING THE SAME

Young T. Choi, 292-52, Imoon-Dong, Tongdaemoon-Ku, Seoul, Rep. of Korea

Filed Jul. 15, 1988, Ser. No. 220,001
Claims priority, application Rep. of Korea, Aug. 12, 1987, 8846/87[U]
Int. Cl.[4] F28F *7/00*
U.S. Cl. 237—69 6 Claims



1. An underflooring heating system structure, comprising:
bottom support means defining a bottom support surface, an upstanding wall means, a concrete panel spaced a finite distance above said bottom support surface and being supported on at least one of said bottom support means and said wall means to define a sealed airtight cavity between said concrete panel a nd said bottom support surface, said concrete panel forming a top wall of said cavity, said also forming an underfloor of a room, interior surfaces of aid wall means having an insulating layer thereon, said concrete panel having an opening therethrough with a cover member fixed therein;
a noncombustible heat source for generating hot air in said cavity being arranged on said support surface in said cavity and having a heat diffusion means mounted thereon for diffusing the hot air generated by said heat source to uniformly heat said concrete panel, said heat source being located in said cavity such that said heat diffusion means is under said opening in said concrete panel and covered by said cover, said heat source being connected to an electric energy source, whereby said concrete panel is heated by convection and radiant heat by said heat source within said cavity under said underfloor.

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4,896,832

DISPENSING APPARATUS FOR METERED QUANTITIES OF PRESSURISED FLUID

David J. Huwlett, Grimston, United Kingdom, assignor to Bespak PLC, King's Lynn, United Kingdom

Filed Aug. 25, 1988, Ser. No. 236,397

Claims priority, application United Kingdom, Sep. 9, 1987, 8720976; Aug. 1, 1988, 8818285

Int. Cl.[4] B05B *11/02*

U.S. Cl. 239—322 **20 Claims**



16. A pressurized dispensing container having a tubular body defining a chamber, the container having a collapsible chamber metering valve located at a first end of the body for dispensing metered quantities of fluid and actuated by axial depression of a valve stem defining a dispensing flowpath, the container having piston means dividing the chamber into a product fluid reservoir communicating with the valve and a propellant fluid reservoir, the piston means being movable such that propellant pressure is applied to the product fluid without mixing of the respective fluids, the piston means including a free piston axially slidable within the chamber and dividing the chamber into a first portion constituting the product fluid reservoir located forward of the piston and a second portion constituting the propellant fluid reservoir located rearward of the piston, wherein the piston includes a forward portion of a first material selected to be substantially chemically non-reactive with the product fluid and a rearward portion of a second material selected to be substantially impermeable to the propellant fluid, the piston portions being composited such that the product and propellant fluids respectively do not contact the second and first materials of the piston respectively.

17. Dispensing apparatus for dispensing metered quantities of a pressurized fluid comprising a pressurized dispensing container, a housing for the container defining a bore, the container having a body which is axially slidable in the bore, the container having a collapsible chamber metering valve located at a first end of the body for dispensing metered quantities of fluid and actuated by axial depression of a valve stem defining a dispensing flowpath, a valve actuator fixedly connected to the housing at a corresponding first end thereof and defining a further dispensing flowpath for product fluid dispensed through the stem, and trigger means operable to urge the container body axially towards the first end of the housing such that the valve stem is depressed by relative movement together of the valve and actuator and thereby dispensing a metered quantity of fluid, wherein the container body defines a chamber and the container includes a flexible bag dividing the chamber into a product fluid reservoir communicating with the valve and a propellant fluid reservoir, the bag being movable such that propellant pressure is applied to the product fluid without mixing of the respective fluids, and wherein the interior of the bag defines the product reservoir, the bag including a mouth portion including a thickened annular flange secured in sealing contact with a cooperating flange of the valve and a thickened neck portion formed integrally with the flange and depending rigidly therefrom so as to define an annular space between the neck and the valve.

19. Dispensing apparatus for dispensing metered quantities of a pressurized fluid comprising a pressurized dispensing container, a housing for the container defining a bore, the container having a body which is axially slidable in the bore, the container having a collapsible chamber metering valve located at a first end of the body for dispensing metered quantities of fluid and actuated by axial depression of a valve stem defining a dispensing flowpath, a valve actuator fixedly connected to the housing at a corresponding first end thereof and defining a further dispensing flowpath for product fluid dispensed through the stem, and trigger means operable to urge the container body axially towards the first end of the housing such that the valve stem is depressed by relative movement together of the valve and actuator and thereby dispensing a metered quantity of fluid, wherein the container body defines a chamber and the container includes means dividing the chamber into a product fluid reservoir communicating with the valve and a propellant fluid reservoir, the dividing means being movable such that propellant pressure is applied to the product fluid without mixing of the respective fluids, and wherein the actuator includes inner and outer nested components, the actuator including a break-up nozzle for atomizing dispensed fluid, which nozzle includes swirl inducing ducts defined by groove formations formed in one or other abutting surfaces of the inner and outer nested components of the actuator respectively, which inner nested component includes a first tubular portion defining a bore fitting onto the valve stem, the outer nested component including a second tubular portion fitting onto the first tubular portion, the first tubular portion being provided with an axially extending groove cooperating with the outer component to define a passageway communicating with the nozzle and a radial port communicating between the bore and the passageway.

4,896,833

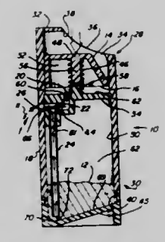
PARTICLE SPRAYER

David E. Brody, 2800 S. University Boulevard, No. 128, Denver, Colo. 80210

Filed Jul. 29, 1988, Ser. No. 226,399

Int. Cl.[4] B05B *7/30*

U.S. Cl. 239—654 **12 Claims**



1. A sprayer for particulate material, comprising in combination:

an elongated tubular main body separated into at least one air compartment and at least one storage compartment for the particulate material;

means for moving air mounted in the air compartment;

an air passageway providing air flow communication between the air compartment and the exterior of the main body; and

a discharge tube mounted within the main body extending into the storage compartment, said discharge tube having one end insertable within the particulate material in the storage compartment and a second end having an outlet orifice extending partially across and in air flow communication with said air passageway, a venturi opening in the air passageway located adjacent to said second end defined by an upstream edge of said outlet orifice, said outlet orifice having a downstream edge lying substantially on said air passageway, whereby movement of the means for moving air within said air compartment creates air pressure in the air compartment and air flow from the air compartment to the exterior of the main body along the air passageway, which air flow passes the venturi opening at an increased velocity creating a low pressure area at said second opening of said discharge tube to withdraw particulate material from the one end of said discharge tube and into the air passageway and then to the exterior of the main body, and said outlet orifice prevents backflow of the particulate material into the air compartment.

4,896,834

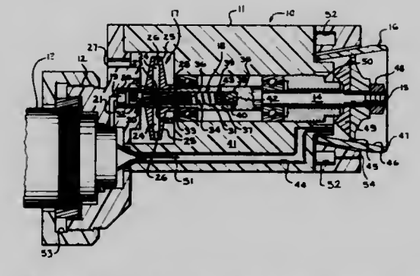
ROTARY ATOMIZER APPARATUS

Kenneth J. Coeling, Temperance, Mich., and Richard Weinstein, Toledo, Ohio, assignors to The DeVilbiss Company, Toledo, Ohio

Filed Aug. 30, 1984, Ser. No. 645,560

Int. Cl.[4] B05B *5/04*

U.S. Cl. 239—691 **5 Claims**



1. A high speed rotary painting assembly, including a high voltage power supply, for supplying a voltage between 40 kv. and 100 kv., and air supply means and a paint supply means, said rotary painting assembly comprising, in combination, a non-conductive body, a longitudinally extending non-conductive shaft mounted within said body, a non-conductive rotary air turbine mounted adjacent said shaft, said non-conductive rotary air turbine having rotational velocities in excess of 10,000 revolutions per minute, a non-conductive high speed rotary atomizing bell operating connected to said non-conductive rotary air turbine and mounted adjacent one end of said non-conductive body, means for feeding paint to said non-conductive rotary atomizing bell, sealing means adjacent said atomizing bell for preventing paint from flowing back down said shaft, said sealing means including a resin seal surrounding said shaft and engaging a non-rotatable insert mounted by said body and surrounding said shaft means in communication with said high voltage power supply for charging paint flowing to said non-conductive rotary atomizing bell and air means for shaping the paint emitted from said painting apparatus.

4,896,835

SCREENING MACHINE

Harley D. Fahrenholz, Box 278, Clarissa, Minn. 56440

Continuation of Ser. No. 217,060, Jul. 11, 1988, abandoned, which is a continuation of Ser. No. 859,612, May 5, 1986, abandoned. This application Jun. 30, 1989, Ser. No. 374,603

Int. Cl.[4] B02C *13/00*; B07B *9/00*

U.S. Cl. 241—74 **12 Claims**

1. A screening machine for earth materials comprising:

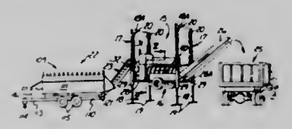
a frame member;

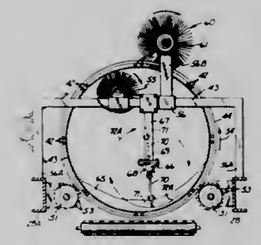
a screening drum mounted on said frame member and rotatable about a longitudinal axis; said screening drum having a screen peripheral wall with openings therethrough to separate the materials being screened as to size;

means to support said drum for rotation about the longitudinal central axis with ends of the drum open to receive and discharge material to be screened;

a first rotary brush having an axis parallel to the longitudinal axis and mounted on the interior of the screening drum and having bristles engaging the screen peripheral wall;

a second rotary brush having an axis parallel to the longitudinal axis and mounted on the exterior of the screening drum and having bristles engaging said screen wall, the second brush being offset along the circumference of the screen peripheral wall from the first brush;





beater means mounted for rotation on a central shaft within said screening drum and having a plurality of spaced beater flaps thereon, each comprising a flexible material flap fixed to the shaft and hammer means fixed to outer ends of the flap to engage material being screened; and

means for rotating said beater means independently of rotation of the drum at a speed to cause the beater flaps to extend radially under centrifugal force to break up clods of the earth material, and the beater flaps being of size and mounted to move in a path adjacent to but clear of said screen peripheral wall of the screening drum and clear of the first brush as the beater means is rotated.

4,896,836

ROTARY FEEDER WTH METAL REMOVING MEANS

Wayne R. Mitchell, Muncy, Pa., assignor to Sprout-Bauer, Inc., Muncy, Pa.

Filed Dec. 30, 1988, Ser. No. 292,326

Int. Cl.[4] B02L *13/26*

U.S. Cl. 241—81 **19 Claims**

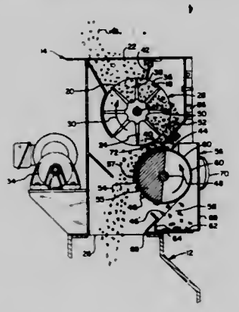
1. A metering type feeder for a material processing apparatus comprising:

a vertically oriented housing having upper and lower portions, the upper portion including an inlet for receiving feed stock material containing tramp metal, and the lower portion including an outlet adapted to discharge feed material into the apparatus;

a feeder member mounted for continuous rotation about a first horizontal axis in the upper portion of the housing such that feed material from the inlet enters the feeder member and is poured in metered quantities into the lower portion of the housing;

a magnetized drum mounted for continuous rotation about a second axis in the lower portion of the housing, said second axis being substantially parallel to the first axis, the

drum having an outer surface at least part of which is disposed in the path of the feed material that is poured from the feeder member whereby the tramp metal from the feed material is magnetically attached to the drum and not discharged to the apparatus;



first means within the housing for continuously separating the tramp metal from said outer surface at a rotational position outside the path of the feed material, while the drum rotates; and

means accessible through the housing while the drum is rotating for continuously accumulating the separated tramp metal within the housing.

4,896,837

ROLLER MILL

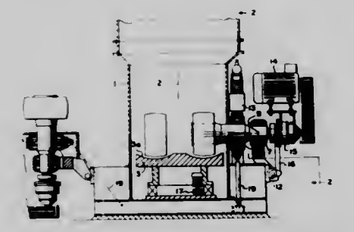
Otto Heinemann, Eanigerloh, and Norbert Bredenhöller, Oelde, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 281,660

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801728

Int. Cl.⁴ B02C *15/04, 15/10*

U.S. Cl. 241—121 **10 Claims**



1. A roller mill comprising a housing, a grinding plate in said housing, drive means for rotating said grinding plate, a grinding roller overlying said grinding plate for cooperative grinding action therewith, a rotatable shaft forming a part of said roller and having an end portion projecting therefrom, first bearing means engaging said shaft end portion and establishing an axis of rotation which is fixed vertically relative to said grinding plate, second bearing means engaging said shaft end portion, and adjusting means engaging said second bearing means for permitting vertical movement thereof relative to said grinding plate, whereby said second bearing means functions as a floating bearing, each of said first and second bearing means being self-aligning bearings.

4,896,838

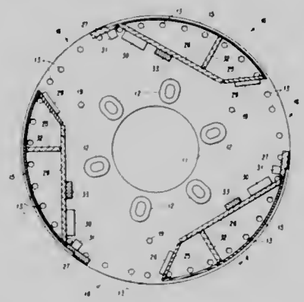
ROTOR FOR VERTICAL SHAFT IMPACT CRUSHERS

John C. Vendelin, and Frederick J. Winegar, both of Springfield, Oreg., assignors to Cedarapids, Inc., Cedar Rapids, Iowa

Filed Oct. 31, 1988, Ser. No. 264,983

Int. Cl.⁴ B02C *19/00*

U.S. Cl. 241—275 **17 Claims**



1. In a rotor for a vertical shaft impact crusher, the rotor having a generally annular side wall disposed between a pair of generally circular plates defining axially spaced upper and lower end walls of the rotor when in operation, the upper rotor end wall including a central aperture therein for receipt into the interior of the rotor of material to be crushed, the side wall of the rotor including a plurality of material exit portals from the interior of the rotor uniformly spaced about its periphery, each exit portal having leading and trailing edges with respect to the direction of operative rotation of the rotor and extending between the rotor upper and lower end walls, the improvement comprising: an exit portal protector of wear resistant material constituting both the radially outermost portion of the trailing edge of each exit portal between the upper and lower rotor end walls as well as a portion of the periphery of the rotor in a trailing direction from the trailing edge of the portal, each portal protector having a leading nose disposed radially inwards of the periphery of the rotor and a channel disposed generally parallel to the rotor upper and lower end walls, the channel extending from said nose outwards in a trailing direction with respect to the operative rotation of the rotor to the periphery of the rotor and thence in the trailing direction generally along the periphery of the rotor.

4,896,839

APPARATUS AND METHOD FOR WINDING A STRIP OF MATERIAL INTO AN ARCUATE ELONGATE PASSAGE

Joe E. Curtis, Jr., Lexington, Ky.; Clair E. Piatt, Bronson, Mich.; John L. Fisher, Lexington, and John E. Cloyd, Versailles, both of Ky., assignors to Kuhlman Corporation, Birmingham, Mich.

Division of Ser. No. 11,454, Feb. 6, 1987, Pat. No. 4,741,484, which is a continuation of Ser. No. 662,330, Oct. 17, 1984, abandoned. This application Apr. 11, 1988, Ser. No. 146,881

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 242—7.02 **29 Claims**

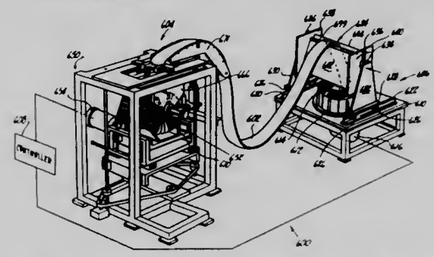
1. An apparatus for winding a strip of material into an arcuate elongated passage defined within a first element, the first element defining a circumferentially extending gap opening into the arcuate elongated passage, said apparatus comprising:

a bobbin rotatably disposed within the arcuate elongated passage and operable for receiving the strip of material;

supply means for supplying the strip of material to said bobbin through the circumferentially extending gap;

bobbin drive means coupled to said bobbin through the circumferentially extending gap for rotating said bobbin to wind the strip of material into a coil on said bobbin; and

drag belt means for slidably frictionally engaging the strip of material along a portion of the periphery of said coil to



create a frictional drag force on said strip of material for tightening the windings of said coil as said bobbin rotates.

4,896,840

COMMAND AND CONTROL DEVICE FOR THE MEMBERS OF RESTORATION OF THE THREAD CONTINUITY ON CONER MACHINES

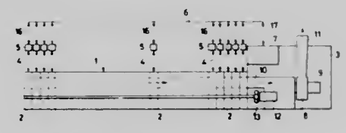
Luigi Colli; Roberto Badiali, and Nereo Marangone, all of Pordenone, Italy, assignors to Savio S.p.A., Pordenone, Italy

Filed Feb. 5, 1988, Ser. No. 152,659

Claims priority, application Italy, Feb. 6, 1987, 19275 A/87

Int. Cl.⁴ B65H *54/20, 54/22*

U.S. Cl. 242—35.5 R **5 Claims**



1. A command and control device for members of restoration of thread continunity under coning on coner machines having more than one coning position, each coning position having one or more feelers used to detect faults in thread and request intervention to restore thread and members which perform said intervention, capable of gradually carrying out thread restoration interventions and maintaining the number of contemporaneous interventions within a preset limit, comprising:

a. an interface device on each coning position of the coner machine, having at least one microprocessor, placed between the feelers used to detect faults in thread and request intervention to restore and the members which perform said intervention;

b. a central control unit, having at least one microprocessor; and

c. a memory unit containing two or more memory registers, at least the first of which records the requests for intervention in the form of a waiting list, and the second of which contains a number of positions equal to the maximum number of allowed contemporaneous interventions, which are filled by characters representing interventions taking place,

wherein the interface devices at the coning positions requesting intervention through at least one microprocessor send signals along signal lines to at least one microprocessor in the control unit, which records the intervention requests in the first register of the memory unit and monitors the second register of the memory unit to determine whether there are available positions in the second register and when an available position exists in the second register the control unit sends a concensus to intervene along said signal lines to the interface device corresponding to the intervention request taken from the first register and fills the empty position in the second register with a character indicating an intervention taking place, and further wherein upon completion of the intervention at the coning head the interface device signals the control unit along said signal lines that the intervention has ended and the control unit causes the deletion of a character from the second register thereby allowing another concensus to intervene to be sent to another position having requested interventions as recorded on the first register.

4,896,841

METHOD AND APPARATUS FOR LOCATING AND LOOSENING A RESERVE YARN WINDING ON A TEXTILE SPINNING COP OR THE LIKE

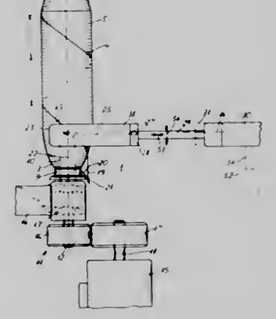
Heinz-Lorenz Topsett, Moenchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 310,331

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804373

Int. Cl.⁴ B65H *54/22, 67/08*

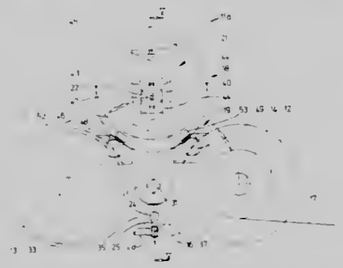
U.S. Cl. 242—35.6 E **14 Claims**



1. A method for locating and loosening a reserve yarn winding on a textile spinning cop or a like textile yarn bobbin of the type wherein the reserve yarn winding is wound with a relatively large rise from a nose end of the cop to a foot end of the cop, said method comprising the steps of rotating the cop around its longitudinal axis; providing a locating implement having a hook formed with a reversely directed rounded tip; during the rotation of the cop, positioning the tip of the hook in contact with the outer periphery of the cop and facing oppositely of the direction of cop rotation for catching the reserve yarn winding with the hook; providing a guide member for guiding the hook during said positioning of the hook; positioning said guide member in engagement with the outer periphery of the cop during said positioning of the hook; and thereafter withdrawing the hook generally tangentially from the cop for pulling the reverse yarn winding to loosen it from the cop.

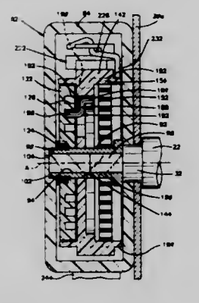
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,842
PACKAGING MACHINE, ESPECIALLY FOR CIGARETTES
Focke Heinz, Verden, and Wach Jürgen, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany
Filed Jun. 23, 1988, Ser. No. 210,431
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721091
Int. Cl.[4] B65H *19/12*
U.S. Cl. 242—58.6 **14 Claims**



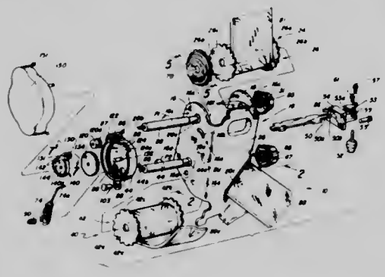
1. Packaging machine for producing cigarette packs from web-like packaging material which is drawn from a working reel on one of a plurality of working journals, a new "full" reel being extracted from a reel stock by means of a transport journal, conveyed in axial alignment in front of an empty one of said working journals and transferred to said empty working journal as a result of axial shifting, characterized in that said transport journal (22) is disposed on a transport arm (21) which is mounted pivotably between said working journals (13, 14), and which conveys said "full" reel (11*a*) along an arc of a circle alternatively in front of an empty one of said working journals (13, 14).

4,896,843
COMFORT MECHANISM WITH SLACK LIMIT
Mark Gray, Newmarket, and Ken Forget, La Fontaine, both of Canada, assignors to TRW Vehicle Safety Systems Ltd., Toronto, Canada
Filed Aug. 31, 1988, Ser. No. 238,856
Int. Cl.[4] B60R *22/34*
U.S. Cl. 242—107.7 **18 Claims**



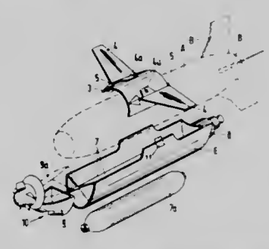
1. An apparatus comprising:
a spindle having belt webbing wound thereon, said spindle being supported for rotation in belt retraction and belt withdrawal directions;
means for biasing said spindle to rotate in the belt retraction direction;
a first member fixed to said spindle for rotation with said spindle;
a rotatable second member located adjacent said first member and rotatable with said spindle in the belt withdrawal direction; and
actuatable means which, after actuation, stops rotation of said second member in the belt withdrawal direction at a predetermined angular position to limit the amount of slack which can be established in the belt and for thereafter blocking rotation of said second member in the belt withdrawal and belt retraction directions and enabling rotation of said spindle and first member in the belt withdrawal direction relative to said second member from said angular position;
said actuatable means including a third member attached to said second member and engageable with a stop portion of said first member to prevent rotation of said first member and said spindle in the belt retraction direction past said angular position when said second member is blocked from rotating by said actuatable means.

4,896,844
DUAL SPOOL RETRACTOR WITH COMFORT LIMITING MECHANISM
James A. Gavagan, Centerline, and William E. Brennan, Rochester Hills, both of Mich., assignors to Irvin Industries, Inc., Auburn Hills, Mich.
Continuation-in-part of Ser. No. 110,207, Oct. 19, 1987, abandoned. This applicatioo Dec. 2, 1988, Ser. No. 278,823
Int. Cl.[4] B60R *22/34*
U.S. Cl. 242—107.7 **29 Claims**



1. A dual spool retractor having a first rotatable spool means and second rotatable spool means for storing a respective first belt and second belt, means for biasing the first spool means and second spool means in a direction to retract the respective first belt and second belt, comfort means operatively associated with the first spool means for actuation by limited protraction of the first belt relative to the second belt to provide a predetermined amount of slack in said first belt, comfort limiting means actuated by a drive train drivingly coupled between the first spool means and second spool means for disengaging the comfort means and allowing retraction of said first belt in response to rotation of said first spool means relative to the second spool means caused by protraction of the first belt relative to the second belt to an extent exceeding said limited protraction to prevent slack in said first belt greater than said predetermined amount.

4,896,845
AIR SUPPORTED STRUCTURE EQUIPMENT PARTICULARLY SUITABLE FOR BALLISTIC TYPE MUNITIONS SUPPLY CONTAINER
Claudio Peretti, and Guglielmo Rebuffatti, both of Lombardore Turin, Italy, assignors to A.R.I.S.S.p.A., Turin, Italy
Filed Aug. 5, 1988, Ser. No. 228,974
Int. Cl.[4] F42B *15/033*
U.S. Cl. 244—3.1 **6 Claims**



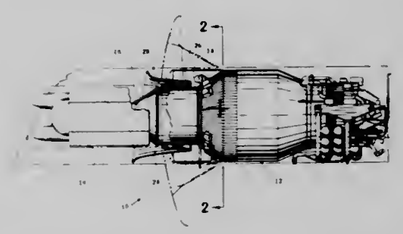
1. Air carrying equipment, particularly being added onto ballistic type munitions having a body, comprising:
two complementary parts mutually coupled together to form a bivalve device, comprising a saddle having a cylindrical sector mounted to straddle the munition, and equipped with a pair of symmetrically opposite foldable wings having hinges close to respective edges of the cylindrical sector, and
a cradle for carrying fuel tanks and propulsion elements, and mounted in opposite radial position with respect to said saddle,
wherein the two parts hold the body of the munition between them.

4,896,846
SUPERAGILE TACTICAL FIGHTER AIRCRAFT AND METHOD OF FLYING IT IN SUPERNORMAL FLIGHT
Thomas H. Strom, Newport News, Va., assignor to Dynamic Engineering, Inc., Newport News, Va.
Continuation-in-part of Ser. No. 721,664, Apr. 9, 1985, abandoned. This application Sep. 15, 1987, Ser. No. 194,734
Int. Cl.[4] B64C *9/00, 15/00*
U.S. Cl. 244—75 R **9 Claims**



1. A superagile tactical fighter aircraft comprising:
a fuselage having a nose, a midsection, an aft section and at least one vertical tail, said fuselage adapted to house a human pilot, a payload, fuel, automatic flight control systems, a navigation system, and a life support system to assist and sustain the pilot;
fixed wings mounted on the aft section of the fuselage, behind a center-of-gravity of the aircraft;
a high thrust-to-weight propulsion system being mounted to the wings;
fully articulating air inlets at a front end of the propulsion system, said air inlets being deflectable so as to face into a local air stream so as to provide minimally distorted air flow to the propulsion system throughout a complete flight regime but particularly at very high angles of attack and low air speeds;
fully articulating exhaust nozzles at a rear end of the propulsion system, said exhaust nozzles being rapidly deflectable so as to allow the pilot the capability to vector and direct gross thrust produced by the propulsion system; and
rotatable canard surface means, mounted on the midsection on the fuselage in front of the center-of-gravity and separate from the wings, for fully and rapidly deflecting air flow thereacross in an angle-of-attack range with trailing edge about 90° up to trailing edge about 45° down, said canard surface means being located so as to provide pitch control forces and moments and to cause the aircraft to be longitudinally unstable and capable of trimming at very high angles of attack approaching the range from 70° to 90°.

4,896,847
AERODYNAMIC BRAKING SYSTEM FOR RECOVERING A SPACE VEHICLE
Paul R. Gertsch, San Diego, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.
Filed Nov. 2, 1988, Ser. No. 265,990
Int. Cl.[4] B64G *1/22*
U.S. Cl. 244—158 R **14 Claims**



1. An aerobrake for an orbital transit vehicle that includes a central adapter connected at one end of the vehicle and a payload adapter ring that couples the adapter to a payload, the payload adapter ring being decoupled from the central adapter after the payload has been deployed, the aerobrake comprising:
a flexible thermal blanket means that is adapted to be folded longitudinally against itself in an annular folded shape to surround the central adapter and payload adapter ring when the aerobrake is in a stowed position;
hinged panel means connected to the thermal blanket and arranged to support the thermal blanket in its inwardly folded position when the aerobrake is stowed; and
power hinge means carried by the orbital transfer vehicle and adapted to selectively drive the hinged panel means to an extended deployed position and to support the thermal blanket means in an annular bowl like configuration whereby after the payload has been deployed in a desired geo-synchronous earth orbit the launch vehicle may be slowed for reentry to a low earth orbit for return to earth for recovery and reuse of the orbital transfer vehicle and the aerobrake.

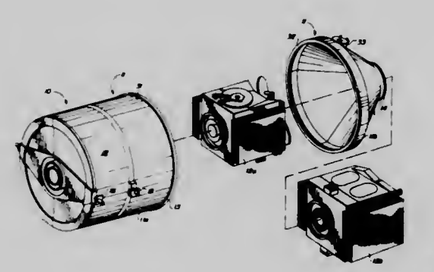
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,848

SATELITE TRANSFER VEHICLE

David Ballard, Seabrook, Tex., and Denis Lofts, Albans, England, assignors to Scott Science and Technology, Palmdale, Calif.

PCT No. PCT/US85/01648, § 371 Date Jun. 27, 1986, § 102(e) Date Jun. 27, 1986
Continuation-in-part of Ser. No. 645,911, Aug. 29, 1984, Pat. No. 4,664,343. This PCT application Aug. 28, 1985, Ser. No. 865,731
Int. Cl.[4] B64G *1/40*
U.S. Cl. 244—158 R 1 Claim



1. In a system for transferring a payload from an earth-launch vehicle in one space trajectory to another trajectory, said system including

an earth-launch vehicle, having

fuselage means including a cargo bay defining a mass-distribution envelope therein, and primary propulsion and guidance systems for launching said earth-launching vehicle from earth for injection into a low-earth transfer trajectory;

a transfer vehicle carrying said payload, stowed in said cargo bay during earth-launch and insertion of said earth-launch vehicle into said low-earth transfer trajectory; and

means for un-stowing said transfer vehicle/payload combination from said cargo bay preparatory to operation of said transfer vehicle to transfer said payload to said other trajectory;

the improved transfer vehicle characterized in that the improved transfer vehicle has multiple stages, including, in combination:

(A) at least two rocket-powered propulsion stages arranged and releasably secured together in tandem relationship, each said stage including

(1) a support frame,

(2) at least one rocket engine mounted in said frame; and

(3) the fuel supply for said engine;

(B) means for releasably mounting a payload on the upper end of said tandem propulsion stages;

(C) avionics and post-deployment support systems for said vehicle carried in the support frame of the upper propulsion stage; and

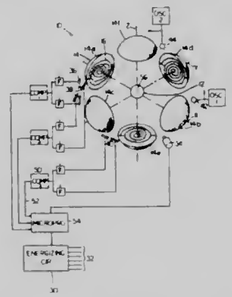
(D) trunnion-cheek means formed integrally with the support frame of at least one of said propulsion stages and said fuselage means to directly, releasably support and position said vehicle and attached payload within the dimensional and mass-distribution envelopes of said cargo bay.

4,896,849

SAMPLE LEVITATION AND MELT IN MICROGRAVITY

Philip I. Moynihan, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 26, 1987, Ser. No. 66,450
Int. Cl.[4] B64G *1/22*
U.S. Cl. 244—158 R 7 Claims



1. Apparatus useful in a microgravity outer space environment for levitating an object relative to a space vehicle, and establishing the object at an elevated temperature comprising:

a plurality of electromagnetic radiation sources on said space vehicle, said source spaced about said object and oriented to emit electromagnetic radiation toward said object, each of said sources being adjustable to vary the amount of electromagnetic radiation output it emits towards said object;

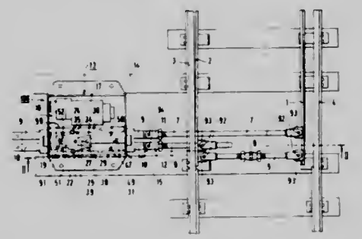
means for controlling the electromagnetic radiation output of each source in a pattern which produces net electromagnetic radiation pressure from said sources in a predetermined direction and with a force sufficient to maintain said object at a substantially constant position relative to said space vehicle while applying a controlled total amount of heat to said object to substantially melt it, with at least one of said sources emitting electromagnetic radiation in a direction not substantially along said predetermined direction.

4,896,850

RAILROAD SWITCH MOTOR SYSTEM

Francis Carmes, Voisins le Bretonneux, France, assignor to Societe Anonyme dite: ALSTHOM, Cedex, France

Filed Nov. 16, 1988, Ser. No. 271,787
Claims priority, application France, Nov. 23, 1987, 87 16189
Int. Cl.[4] B61L *5/10, 11/02*
U.S. Cl. 246—476 10 Claims



1. A motor system for a railroad switch constituted by two moving blades: a right point blade and a left point blade, said two blades being interconnected in the vicinity of their tips by a spacer bar, the right point blade being connected in the vicinity of its tip to a right operating rod, the left point blade being connected in the vicinity of its tip to a left operating rod, wherein the system includes motor means for longitudinally driving a right control bar and a left control bar which are respectively connected to and in line with the right operating rod and the left operating rod, said motor means and said control bars being disposed in a housing disposed in a fixed position, the system including, inside said housing, moving equipment including a central body lying between a right longitudinal slide and a left longitudinal slide, the two slides meshing with a common gear wheel mounted to rotate freely in said central body, the strokes of the two slides relative to said central body being limited by abutments, said motor means acting on said central body of the moving equipment, which body is movable in parallel between a right locking plate and a left locking plate which are fixed and which are parallel to each other and to the axes of said control bars, the right control bar being situated between the right locking plate and said moving equipment by being at least partially received in said right longitudinal slide, the left control bar being situated between the left locking plate and said moving equipment by being at least partially received in said left longitudinal slide, each control bar being provided with two drive and locking pegs, which pegs are cylindrical, and disposed vertically in a floating mount, each being received between a locking plate and a slide in a notch provided in a corresponding one of the control bars, each locking plate including two vertical locking grooves having sloping side walls which flare apart going from the plate towards the bar, and having a depth of not more than one half the diameter ½D of one of said floating pegs, wherein the width of said moving equipment constituted by the distance between the outer flanks of the two sides, between the two locking plates is staged over three distinct widths comprising, at each end, a first stage of width no greater than the distance L between the two locking plates less twice the diameter D of a floating peg, followed on each side of said moving equipment going towards the middle of the moving equipment by a second stage of width lying between L - 2D and L - D, and finally a central stage of width less than L and greater than the width of said second stage, with the transition from the first stage to the second stage being formed by a sloping wall, the distance between the two notches of a control bar being not less than the length of the central stage plus twice the width of one of second stages, and being less than the length of the central stage plus the length of one of the second stages plus the length of one of the first stages, and wherein said common gear wheel is connected to detector means which co-operate with an electrical contact for checking anomalous operation causing said gear wheel to rotate, thereby indicating a fault.

4,896,851

MOUNTING ATTACHMENT FOR STRUCTURAL STRINGERS

Lawrence M. Shaull, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 10, 1988, Ser. No. 205,080
Int. Cl.[4] F16L *3/24*
U.S. Cl. 248—72 7 Claims

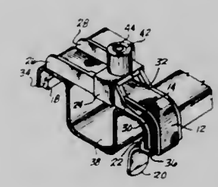
1. A mounting assembly attachable to a stringer of a type having spaced apart flanges each with edges, comprising:

a strap having a first end portion including a hook engageable over the edge of a first flange of the stringer, said strap being of a length to extend laterally across the stringer, an inner surface, and a second end portion;

a mounting member having a base positionable against the stringer, said base including a hook engageable on the edge of the second flange of the stringer, a guide avenue for the strap, and an outer surface adjacent its hook;

a plurality of upstanding hook elements on one of said inner surface of the strap and said outer surface of the mounting member, and a plurality of upstanding loop elements on the other of said surfaces; and

said strap being of sufficient length, and said hook and loop elements being so positioned to permit the strap to be hooked onto a first flange of the stringer, the mounting member to be hooked onto a second flange of the stringer,



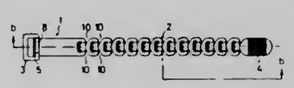
the strap to be placed within the guide avenue of the mounting member and then pulled upon, to put the strap in tension, and then the second end portion of the strap to be drawn against the outer surface of the mounting member, to bring the hook and loop elements into connecting engagement.

4,896,852

BUNDLING BAND

Tsuyoshi Akema, Tokyo, Japan, assignor to Emhart Industries, Inc., Hartford, Conn.

Filed Nov. 17, 1986, Ser. No. 931,510
Claims priority, application Japan, Nov. 21, 1985, 60-179566
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.3 5 Claims



1. A bundling band having a strip-like band portion and a holder portion provided at one end of the band portion in order to bind elongated articles such as electric wires or wire harnesses, said holder portion being formed with a hole through which a free end of the band portion passes so that a loop is formed by the band portion passing through the hole to bundle the elongated articles, the holder portion being provided with means to engage with the band portion for preventing the loop from loosening after bundling, characterized in that the side edges of the band portion are provided with cutouts having a depth aufficient to be cut off by twisting the band portion, said cutouts being formed symmetrically on both side edges of the band portion, and a plurality of cutouts in pairs are formed from one end of the band portion toward the other end with predetermined spaces between them.

4,896,853

TRASH BAG HOLDER

Richard C. Nyzen, 620 Merriman Rd., Akron, Ohio 44303

Continuation of Ser. No. 95,664, Sep. 14, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 302,778
Int. Cl.[4] B65B *67/12*
U.S. Cl. 248—97 17 Claims

1. Apparatus for supporting bags or the like comprising: stand means, a first arm carried at one end by said stand means, a second arm pivotally attached to one side of said first arm, means carried on said first and second arms for attaching a bag thereto so that when said second arm is swung away from said one side of aid first arm the bag is open and when said second arm is adjacent to said one side of said first arm the bag is closed, and biasing means having one end mounted to an other

side of said first opposite said one side between said one end of said first arm and a point of pivotal attachment of said second arm to said first arm, the other end of said biasing means being attached to said second arm, said biasing means maintaining



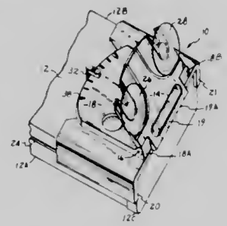
said second arm swung away said one side of said first arm to keep the bag in the open position and maintaining said second arm adjacent to said one side of said first arm to keep the bag in the closed position.

4,896,854
BOW HOLDER
Louis S. St. Laurent, 2948 Earl, Warren, Mich. 48092
Filed Dec. 15, 1988, Ser. No. 285,545
Int. Cl.[4] A47F *3/44*
U.S. Cl. 248—156 **15 Claims**



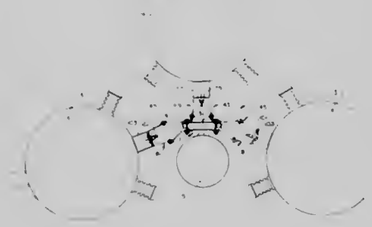
1. A bow holder having an interior side and an exterior side, the bow holder comprising:
- a support member having an upper section, a middle section, and a lower section;
- means for engaging the lower section for selectively mounting the holder; and
- an upper bow receptacle being angularly disposed to the upper section, and a lower bow receptacle being essentially U-shaped and having a closed bottom, a wall opposite the middle section, and a slot formed in the wall, the lower bow receptacle being angularly disposed to the middle section, both receptacles facing the interior side, the upper section being joined to the middle section at an interior obtuse angle less than 180°, the middle support member section being joined to the lower section at an exterior obtuse angle less than 180°;
- whereby a bow is supported, in an upright position, at the bow's end by the lower bow receptacle and, at a medial position on the bow, by the upper bow receptacle.

4,896,855
PIVOTAL WINDSHIELD MOUNT
Gregory Furnish, Cincinnati, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio
Filed Nov. 21, 1988, Ser. No. 274,002
Int. Cl.[4] F16B *47/00*
U.S. Cl. 248—206.3 **22 Claims**



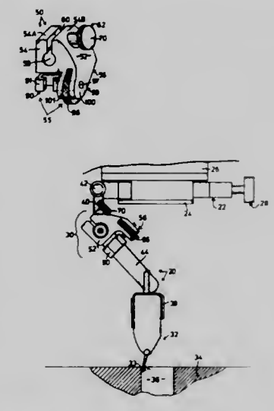
1. A pivotal windshield mount for supporting a radar receiver at a desired angle of inclination to the horizontal upon the inside of a vehicle windshield comprising:
- a windshield mounting member having secured thereto at least one forwardly facing suction cup, said windshield mounting member being attachable to said windshield by said suction cup;
- receiver supporting member hingedly connected at one edge thereof to said windshield mounting member so as to rotate about a horizontal axis thereon; said receiver supporting member being securable to said receiver;
- a bracing surface on one of said members spaced from said horizontal axis; and
- an eccentric cam attached to the other of said members and rotatable about a cam pivot axis on said member, said cam rotatably mounted in abutting engagement with said bracing surface for rotation into selected different angular positions for maintaining the distance between said cam pivot axis and said bracing surface at selected different distances to maintain said receiver supporting member at selected different angles to support said receiver thereon at said desired angle over a range of windshield angles.

4,896,856
ELECTRICAL EQUIPMENT CLUSTER MOUNT
Marion R. Farmer, Germantown, and Randall L. Hook, Memphis, both of Tenn., assignors to Aluma-Form, Inc., Memphis, Tenn.
Filed Sep. 29, 1988, Ser. No. 251,125
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—219.4 **30 Claims**



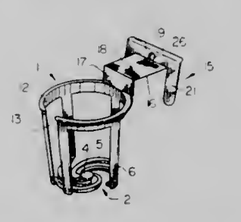
1. An electrical equipment cluster mount for use upon a utility pole or the like comprising:
- an elongated bearing plate adapted to be mounted to the utility pole;
- a hollow polygonal structural member having a plurality of sides and being attached to said elongated bearing plate along one side thereof; and
- individual electrical equipment holding bracket means mounted to said hollow structural member and extending from other sides of said hollow polygonal structural member and contiguously interlocked with at least one other adjacent electrical equipment holding bracket means on said hollow polygonal structural member for mounting electrical equipment in a predetermined clustered array relative to said utility pole.

4,896,857
VERNIER ADJUSTMENT SYSTEM FOR DIAL INDICATOR HOLDER
Harry McCullough, Rte. 1, Box 110-17C, Jacksonville, Ark. 72076
Filed Jan. 17, 1989, Ser. No. 296,944
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—279 **8 Claims**



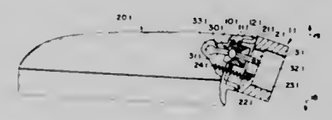
1. In a dial indicator holder of the type comprising a fastener adapted to be coupled to a machining spindle or quill, an articulated arm projecting from said fastener and adapted to support a gauge and comprising at least a first link and a second link pivotally coupled together, the improvement comprising a device for enabling subsequent vernier adjustments to the holder, said device comprising:
- rigid body means adapted to be secured to said first link means for operationally mounting said device upon said dial indicator holder;
- saddle means adapted to be coupled to said second link means for restraining same;
- wherein the pivotal relationship between said first link means and said second link means is preserved after installation of said device; and,
- control means for at least slightly moving said saddle means relative to said body means to pivot said second link relative to said first link to produce vernier adjustments of said holder which will be indicated upon said gauge.

4,896,858
FLEXIBLE MUG HOLDER
Robert Sokolski, and John Downey, both of Warren, Pa., assignors to Whirley Industries, Inc., Warren, Pa.
Filed May 27, 1988, Ser. No. 199,534
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 **19 Claims**



1. An expandable hinge comprising: a plurality of curved arms lying in a plane, each arm comprising a flexible first portion and a rigid second portion, and a hub connected to one end of each of the arms, the arms extending outwardly from the hub and being attached to a plurality of members which define a periphery of the hinge such that an outwardly radial force on the members causes the hinge to expand, increasing its periphery.

4,896,859
HOLDING DEVICE FOR A TILTABLE MIRROR FOR VEHICLES
Herwig Polzer, Untere Steige Weg 13; Richard Seubert, Meister-Hermann-Strasse 8, both of D-8760 Miltenberg, and Hans J. Fuchs, Gartenstrasse 12, D-6981 Dorfprozelten, all of Fed. Rep. of Germany
Filed Sep. 1, 1988, Ser. No. 239,384
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 8711959
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—549 **12 Claims**



1. An outside mirror for a vehicle, said outside mirror comprising:
- a mirror base,
- a mirror housing tiltably mounted on said mirror base for forward and backward movement relative to said mirror base and out of a normal use position to a tilted end position,
- spring means for retaining said mirror housing in the normal use position at the mirror base and for biasing said mirror housing from the tilted end position in a direction toward the normal use position,
- an edge of said mirror housing bearing against an edge of said mirror base,
- a catch member for holding said mirror housing in the tilted end position, and said catch member including overcomable stop means for securing said mirror housing at a safety position between the tilted end position and the normal use position, and
- a catch element gripping said catch member at least in the tilted end position and the safety position, said catch element being fixed to said mirror housing in a patch of said catch member wherein the spring means biases the mirror

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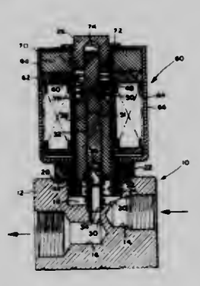
housing, when released from the tilted end position, to move the mirror housing to the safety position.

4,896,860

ELECTRICALLY OPERATED REFRIGERANT VALVE

Peter J. Malone, Elk Grove, and Robert J. Torrence, Addison, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 8, 1989, Ser. No. 348,368
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.05 **9 Claims**



1. An electrically operated refrigerant valve assembly comprising:

(a) a valve body means defining an inlet adapted for connection to a pressurized source of liquid refrigerant, an outlet adapted for connection to an evaporator and a valving chamber including a passage connecting said inlet and outlet;

(b) casing means having a generally tubular configuration closed at one end with the other end attached to said body means and sealed thereon for closing said valving chamber;

(c) guide post means having an end portion thereof attached to said body and defining a hollow thereon communicating with said passage and having at least one valving port for communicating said hollow with the exterior thereof;

(d) armature means having ferromagnetic properties disposed for sliding movement thereon, said armature means having a pair of longitudinally spaced guide means thereon, said guide means providing the sole sliding contact surfaces between said post means and said armature means, with one of said guide means configured to close said at least one port when slidably disposed thereover; and,

(e) electromagnetic coil means disposed over said casing means and attached to said body means, said coil means operative upon flow of electrical current therethrough to provide a magnetomotive force for moving said armature means from a position closing said at least one port to any of a plurality of positions at least partially opening said port for permitting controlled flow from said inlet to said outlet.

4,896,861

FLUID CONTROL SOLENOID VALVE

Takao Kojima, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP88/00230, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO88/06692, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 1, 1988, Ser. No. 265,675
Claims priority, application Japan, Mar. 2, 1987, 62-30067[U]
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.15 **4 Claims**

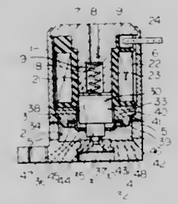
1. A fluid control solenoid valve comprising:

a housing having a fluid passage including an inlet port and an outlet port;

a valve seat disposed in said fluid passage, said valve seat having a valve port for allowing the passage of the fluid;

a plunger having a valve body, said plunger being movable between a closed position in which said valve body closes said valve port and an open position in which said valve port is not closed by said valve body;

a plunger guide which is disposed around said plunger and which has a contact region which is in sliding contact with said plunger and which guides said plunger between said open position and said closed position;



biasing means for biasing said valve body toward one of said open and closed positions;

a solenoid coil for magnetically driving said plunger from said closed position against the action of said biasing means when energized; and

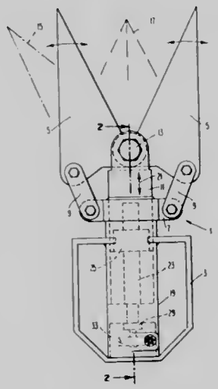
a nonmagnetic cover which substantially separates said contact region from said fluid passage and which has a hole formed therein through which said plunger passes without contacting the edges of the hole, said contact region being in fluid communication with the hole, whereby said contact region is protected against ingress of foreign matter entrained in the fluid.

4,896,862

METHOD OF OPERATING A SCREW-PROPELLED RESCUE TOOL

Robert F. Ganley, 615 Mallard Rd., Wayne, Pa. 19087

Division of Ser. No. 185,401, Apr. 22, 1988, abandoned. This application Mar. 6, 1989, Ser. No. 319,794
Int. Cl.[4] B66F *3/10*
U.S. Cl. 254—1 **6 Claims**



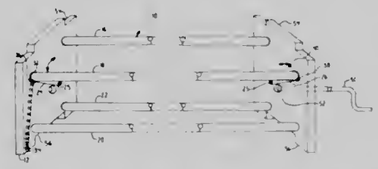
1. A method of operating a rescue tool, for extricating an accident victim from the wreckage of an accident, the rescue tool having a pair of arms which are pivotably connected together, and a piston means connected to the arms, such that movement of the piston means causes the arms to separate and come together, the method comprising the step of turning a threaded member, the member being threadedly engaged with the piston such that rotation of the threaded member causes the piston means to move, by direct mechanical coupling and without the intervention of a fluid medium, and thereby to move the arms, the turning step being performed until the arms have moved to a desired position, wherein the turning step comprises the steps of bringing a power source to the vicinity of the threaded member, the power source being entirely distinct from the rescue tool, such that the power source is capable of turning the threaded member, and activating the power source so as to turn the threaded member.

4,896,863

SYSTEM HAVING MATERIAL DISPENSING AND WIND UP DEVICE WITH GUIDE

Tim Riplinger, 35912 Helendale, Ingleside, Ill. 60041

Filed May 26, 1988, Ser. No. 199,312
Int. Cl.[4] G01M *19/00*
U.S. Cl. 254—134.3 FT **32 Claims**



1. A system for dispensing material into a conduit attached to a terminal box for supporting at least one means for bolding material having at least first and second end sections comprising:

at least one material supply and wind up device having at least first and second end portions and at least three means for rolling rotatably secured between said first and second end portions, said three means for rolling releasably holding said first and second end sections of said means for holding, thereby dispensing said material in at least one of substantially 360°;

at least one substantially frictionless collar having an aperture through which the material slides, said aperture having a predetermined cross-sectional configuration for guiding said material through said terminal box and in said conduit; and

at least one of said means for rolling having at least a pair of lockable means for spacing slideable on said one of said means for rolling for retaining said means for holding in a predetermined axial position.

4,896,864

SAFETY BARRIER

Arthur Nusbaum, Fort Lee, N.J., assignor to Robert Nusbaum; Howard Nusbaum, both of New York, N.Y. and Barbara Selick, Teaneck, N.J.

Filed May 20, 1988, Ser. No. 197,101
Int. Cl.[4] A01G *17/06*
U.S. Cl. 256—23 **26 Claims**

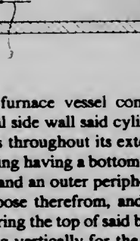
1. A safety barrier assembly for a floor of a building under construction, which comprises

cable support means;

upper and lower cables supported substantially horizontally by said cable support means along at least a portion of the outer perimeter of the building floor, said lower cable being only a few inches above the building floor; and

elongated sheet means having opposed longitudinally extending first and second edges, a main body portion extending from said first edge toward said second edge and a stiff longitudinally extending bottom portion extending from said main body portion toward and terminating in said second edge;

said sheet means being supported vertically by said cables with said main body portion being secured to said upper cable and said stiff bottom portion being secured to said lower cable;



said stiff bottom portion lying on but being unsecured to said building floor with said second edge positioned inwardly of said lower cable; and

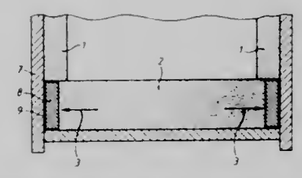
said assembly having a strength sufficient to withstand a load of 200 pounds applied in any direction with a minimum of deflection.

4,896,865

FORCE-ABSORBING MEANS IN A FURNACE

Hans Persson, Helsingborg, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 23, 1987, Ser. No. 41,715
Claims priority, application Sweden, May 2, 1986, 8602040
Int. Cl.[4] C21B *9/10*
U.S. Cl. 266—285 **3 Claims**



1. A cylindrical furnace vessel comprising a metal shell forming a cylindrical side wall said cylindrical side wall being of uniform thickness throughout its extent and a bottom wall, a metal cylindrical ring having a bottom end loosely positioned on the bottom wall and an outer periphery at least adjacent to the side wall and loose therefrom, and a layer of refractory lining material covering the top of said bottom wall and having a thickness extending vertically for the height of the ring, the lining material when heated expanding radially and contacting and applying radial force to the ring, the ring receiving and restraining the force and preventing it from acting on the side wall.

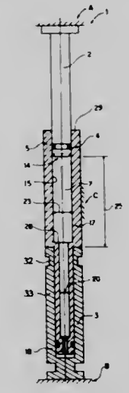
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4,896,866

DOUBLE-ACTING SHOCK ABSORBER

Jean-Claude Legrand, Reding, and Gérard Prevot, Willerwald, both of France, assignors to Ferco International, Sarrebourg, France

Filed Jun. 3, 1988, Ser. No. 201,873
Claims priority, application France, Jun. 11, 1987, 87 08317
Int. Cl.[4] F16F *5/00, 9/18*
U.S. Cl. 267—64.26 **29 Claims**



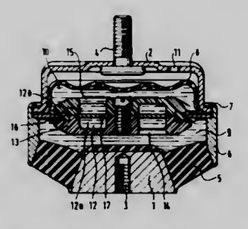
1. A double-acting shock absorber comprising:
(a) a piston to be fixed to a first part;
(b) a cylinder being always axially spaced from said fixed piston, said cylinder to be fixed to a second part; and
(c) a movable member in axial alignment with and functionally engaged with both said fixed piston and said fixed cylinder, said movable member comprising:
(i) a first portion having a substantially cylindrical cavity within which said fixed piston is slidably engaged; and
(ii) a second portion functionally configured as a piston slidably engaged within said fixed cylinder.

4,896,867

HYDRAULICALLY DAMPING ELASTIC BEARING

Georg Schyboll, Sinzig-Westum, and Heinz Breuner, Neuenahr, both of Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,231
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703820
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—140.1 **19 Claims**



1. A resilient mounting device having hydraulic damping for vibrationally damping a motor vehicle engine, said mounting device having a longitudinal axis along which damping is prevalent, said mounting device comprising:
opposite first and second rigid end portions with mounting means thereat, said end portions being disposed along said longitudinal axis at either end of said mounting device;
a resilient connecting element resiliently connecting said first and second end portions and forming with them a cavity for two chambers in controllable fluid communication, each with the other, said two chambers for containing damping fluid, and being disposed one adjacent the other along said longitudinal axis;
a first of said two chambers being a compression chamber for permitting a build-up of pressures substantially above and below ambient pressure about said mounting device;
said two chambers being separated by partition means, said partition means having a rigid inner portion and a flexible portion engaging said rigid inner portion, each of said rigid inner portion and said flexible portion being disposed in a plane substantially perpendicular to said longitudinal axis;
said rigid inner portion having a channel connecting said first and said second chambers, said channel following a circular route and having a predetermined length, said circular route being at least partially radially displaced from and about said longitudinal axis in said rigid inner portion, said rigid inner portion being formed in two pieces and including a means for securing a first of said two pieces to a second of said two pieces;
dividing means for dividing said channel into a divided channel having at least a first segment portion and a second segment portion, along at least a portion of the length of said channel, said dividing means having an opening to permit flow of fluid between said first segment portion and said second segment portion, said dividing means and said opening therein being disposed within an inner portion of said rigid portion of said partition means to permit flow of fluid substantially along a substantial portion of each of said first segment portion and said second segment portion when flowing from one chamber to the other, to substantially increase a path of flow of said fluid over the length of said channel when undivided, and providing means for adjusting an adjusted length of said divided channel during manufacture by angularly moving said dividing means disposed in said divided channel during manufacture to tune said divided channel such that said divided channel thus provides damping in a given type of pressure difference between said two chambers in a given frequency range;
said opening in said dividing means being substantially completely open at a continuity of angular locations during any angular movement during manufacture along said circular route of said channel and;
said divided channel having a substantially constant cross section throughout said adjusted length thereof such that a flow rate, of said flow of fluid through said adjusted length of said divided channel through which fluid flows, remains substantially the same.

4,896,868

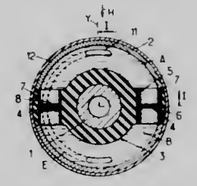
HYDRAULIC ANTIVIBRATORY SUPPORT SLEEVE

Jean Thelamon, 23, rue des Patis, Douy, and Alain Vidal, 13, Impasse de Valcivieres, 63000 Clermont Ferrand, both of France

Filed Jan. 26, 1989, Ser. No. 301,698
Claims priority, application France, Jan. 28, 1988, 88 00978
Int. Cl.[4] F16F *13/00*; B60G *15/06*; B60K *5/12*
U.S. Cl. 267—140.1 **8 Claims**

1. Hydraulic antivibratory support sleeve comprising two rigid tubular frames (1, 2), one surrounding the other and joined together by an elastomer body (3) sealingly connected thereto and shaped so as to form therewith at least two sealed chambers (A, B) diametrically opposite in a direction Y separated from each other by sections of a central dividing wall (6) and communicating together through a narrow channel (E), the assembly of said chambers and said channel being filled with a liquid, characterized in that one at least of the sections

of said central dividing wall (6) connecting the two frames (1 and 2) together is formed with a wide well (5) extending in direction Y, independent of the narrow channel (E) and sufficiently wide to cause the two chambers (A and B) to communi-



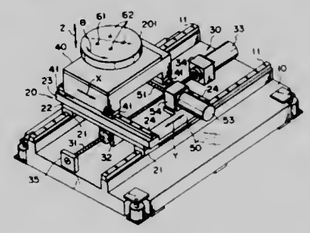
cate freely with each other, which well is closed by a deflectable valve (4; 15) of relatively large transverse area associated with means for limiting the amplitude of the deflections of said valve.

4,896,869

MOVING TABLE APPARATUS

Kiyoshi Takekoshi, Yamanashi, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,273
Claims priority, application Japan, Oct. 30, 1987, 62-275075
Int. Cl.[4] B23Q *3/18*
U.S. Cl. 269—60 **18 Claims**



1. A moving table apparatus comprising:
a base;
a first moving support moving on the base, in a first direction, said first moving support having a main member and a support member rotatably connected to said main member;
a second moving support moving on said support member of said first moving support in a second direction, different from said first direction; and
adjusting means for moving said main member and support member relative to each other, thereby adjusting, to a predetermined value, an angle between two lines extending in said first and second directions.

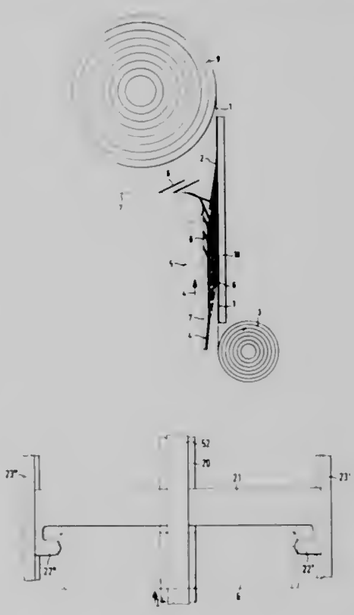
4,896,870

COMPACT TRANSPORT AND STORAGE SYSTEM FOR FOLDED OR CONNECTED SHEET PRODUCTS

Ingo Kobler, Anhausen, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 132,989, Dec. 15, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,472
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643026
Int. Cl.[4] B65H *39/08*
U.S. Cl. 270—60 **18 Claims**

1. Compact transportation system to transport folded or connected sheets defining a connecting back along a transport surface, or transport plane,
said system comprising
a storage position defining a storage surface or plane;
transport means including an elongated flexible transport element (1) of finite length,
said transport element (1) being positionable at the storage position;
flat, elastic sheet holder means (2, 21, 22) on said transport means and arranged to engage laterally into and between



the sheets between the connecting back with the flat surface of said bolder means being located parallel to and against portions of the flat sides of the sheets; and
guide means (10, 11) positioning said transport element (1) at the transport surface or plane;
said elongated transport element retaining the sheets thereon with the sheet surfaces which face the transport surface being positioned directly or indirectly adjacent the transport surface or plane when the transport element is at said storage position.

4,896,871

SHEET FEEDER FOR AN IMAGE RECORDING APPARATUS

Hiroyuki Idesawa, Hiratsuka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

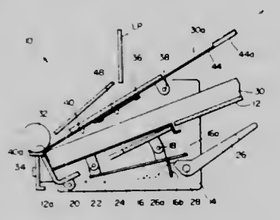
Filed Dec. 9, 1988, Ser. No. 282,070
Claims priority, application Japan, Dec. 11, 1987, 62-188629[U]
Int. Cl.[4] B65H *3/06, 3/44*
U.S. Cl. 271—9 **3 Claims**

1. A sheet feeder for an image recording apparatus having an automatic sheet feeding function for automatically feeding paper sheets one by one from sheet loading means and a manual sheet feeding function for feeding paper sheets which are manually inserted one at a time, comprising:
a feed roller member for feeding the paper sheets one by one from said sheet loading means;

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a friction pad member pressed against said feed roller member when said feed roller feeds the paper sheet so as to separate the paper sheets one by one;

a manual feed guide member located above said sheet loading means for guiding the paper sheet when the manual sheet feeding function is effected; and



a presser member mounted on said manual feed guide member to be movable between an operative position where one end portion of said presser member intervenes between said feed roller member and said friction pad member and an inoperative position where said one end portion does not intervene between said feed roller member and said friction pad member.

4,896,872

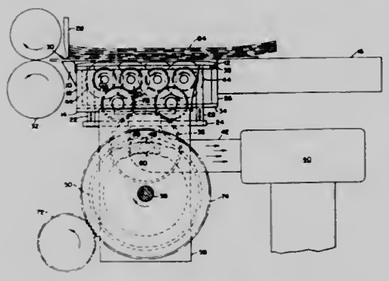
INTERMITTENTLY PROTRUDING FEEDER FOR PAPERBOARD BLANKS

Louis M. Sardella, Towson, Md., assignor to Wm. C. Staley Machinery Corporation, Hunt Valley, Md.

Continuation of Ser. No. 73,285, Jul. 14, 1987, Pat. No. 4,828,244, which is a continuation of Ser. No. 877,582, Jun. 23, 1986, Pat. No. 4,681,311, which is a continuation of Ser. No. 550,285, Nov. 9, 1983, Pat. No. 4,614,335, which is a continuation of Ser. No. 144,129, Apr. 28, 1980, abandoned. This application Mar. 10, 1989, Ser. No. 321,402

Int. Cl.[4] B65H *3/64*

U.S. Cl. 271—11 **2 Claims**



1. Apparatus for feeding corrugated blanks one by one from the bottom of a stack of blanks essentially without slippage so that the leading edge of the blank being fed always enters the nip of nip rolls at the same point in the machine cycle with precision suitable for printing and slotting, said apparatus comprising

a. nip rolls adapted to be operated with a surface velocity;

b. stack supporting structure including a forward portion;

c. transport means supported under said forward portion of stack supporting structure, said transport means comprising a continuous high coefficient of friction surface adapted to be circulated; .

d. means for changing the relative vertical relationship of said high coefficient of friction surface and said forward portion of said stack supporting structure so as to alternately provide an active position where said high coefficient of friction surface extends above the top of said stack supporting structure forward portion and a passive position where said high coefficient of friction surface does not extend above the top of said stack supporting structure forward portion;

e. suction means for urging a blank downwardly into engagement with said high coefficient of friction surface in the active position;

f. transmission means comprising input shaft means which is adapted to be rotated and output shaft means which is adapted to be rotated;

g. means operatively connecting the output shaft means of the transmission means and the transport means so that during a portion of the operation of the apparatus said high coefficient of friction surface is circulated in a feed direction and undergoes controlled acceleration to essentially said nip rolls' surface velocity;

the apparatus being such that the active position is effected at a time before said high coefficient of friction surface undergoes said controlled acceleration and the passive position is effected when said friction surface is at essentially said nip rolls' surface velocity; whereby said high coefficient of friction surface of said transport means initiates feeding the lowermost blank in the feed direction by static friction and moves and accelerates that blank to the nip rolls essentially without slippage occurring and so that each blank enters the nip rolls at essentially said surface velocity and in register.

4,896,873

DEVICE FOR ISOLATING STACKED BLANKS

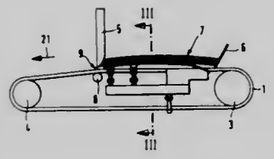
Karl Saro, Ratingen, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,352

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703845

Int. Cl.[4] B65H *3/04*

U.S. Cl. 271—35 **6 Claims**



1. In an apparatus for isolating stacked blanks and including a conveyor belt, a stop for stopping the blanks at a predetermined location on the belt and means for holding the blanks to the belt, the improvement which comprises several auxiliary suction components positioned adjacent the belt and acting upon the undermost blank to pull such blank against the belt, said components being distributed along the direction of travel and secured together by a stationary slideover tongue on a common support.

4,896,874

METHOD AND APPARATUS FOR TURNING CONTINUOUSLY CONVEYED FLAT STRUCTURES, ESPECIALLY ARRIVING IMBRICATED PRINTED PRODUCTS SUCH AS TO RETAIN THEIR ORIGINAL IMBRICATED FORMATION

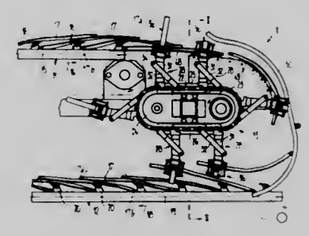
Erwin Müller, Oberdürnten, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Apr. 13, 1987, Ser. No. 37,960

Claims priority, application Switzerland, Apr. 18, 1986, 1579/86

Int. Cl.[4] B65H *29/00*

U.S. Cl. 271—186 **18 Claims**



17. An apparatus for turning infed substantially flat flexible structures, especially printed products, arriving in a predetermined formation, comprising:

means for infeeding the substantially flat flexible structures in an imbricated formation;

means for outfeeding the substantially flat flexible structures;

deflection means arranged between the infeed means and the outfeed means for the substantially flat flexible structures;

said deflection means comprising at least one endless revolvingly driven element;

said deflection means further comprising a deflection wheel;

said at least one endless revolvingly driven element comprising two runs;

said at least one endless revolvingly driven element being guided between said two runs about said deflection wheel;

a plurality of carrier elements carrying a plurality of grippers and arranged in mutually spaced relationship from one another on said at least one endless revolving driven element;

said carrier elements protruding outwardly from said at least one endless revolving driven element;

each said carrier element having an outer end;

a respective one of said plurality of grippers being mounted at the outer end of each said carrier element; and

each said gripper serving for individually laterally engaging with a substantially flat flexible structure for grippingly turning the substantially flat flexible structures.

4,896,875

COPY SHEET PULL GUIDE MECHANISM

Robert P. Gotschewski, Schaumburg, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Dec. 21, 1988, Ser. No. 287,771

Int. Cl.[4] B65H *9/00*

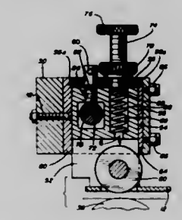
U.S. Cl. 271—236 **20 Claims**

1. A pull guide mechanism for moving a copy sheet over a conveyor board into proper registration in a printing, duplicating or like machine, comprising:

drive wheel means in the conveyor board and pressure wheel means above the conveyor board for sandwiching a copy sheet therebetween and pulling the sheet into said proper registration in response to driven rotation of the drive wheel means;

carriage means mounted on the machine for reciprocal movement toward and away from the conveyor board and the drive wheel;

spring biased piston means mounted on the carriage means for limited yielding movement relative thereto, the pressure wheel means being rotatably mounted on the piston means for movement with the carriage means toward and away from the drive wheel means and for gripping a copy sheet between the wheel means against the spring bias;



first adjusting means for adjusting the position of the piston means relative to the carriage means and thereby adjusting the dwell time that the wheel means grip the copy sheet; and

second adjusting means for adjusting the biasing pressure of the spring.

4,896,876

DOCUMENT FEEDING APPARATUS

Yasushi Yamada; Masaru Ushio; Yoshikazu Maekawa, and Tsugio Hirabayashi, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,848

Claims priority, application Japan, Jun. 22, 1987, 62-154639

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—265 **6 Claims**



1. A document feeding apparatus comprising:

document stacking means for receiving a stack of documents, each document having a leading edge and a trailing edge;

copying means for copying the documents;

first document feeding means for feeding documents from the document stacker along a desired path;

second document feeding means disposed along the desired path between the first document feeding means and the copying means for feeding the documents to the copying means;

first sensing means disposed along the desired path between the first document feeding means and the second document feeding means for detecting the leading edge of a document and generating a first document signal in response thereto;

second sensing means disposed along the path between the second document feeding means and the copying means for detecting the leading edge of a document and generating a second document signal in response thereto; and

control means for stopping the movement of the document along the desired path for a first predetermined period of time in response to the first document detection signal from the first sensing means before the leading edge of the document fed from the second document feeding means

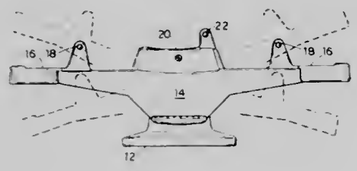
reaches the second sensing means and energizing the second document feeding means after a predetermined period of time to feed the document to the copying means and for energizing the copying means in response to the second document detection signal after a second predetermined period of time.

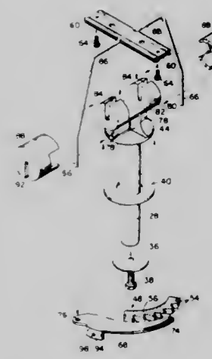
4,896,877

INCREMENTALLY ROTATABLE TEETER-TOTTER

David E. Moomaw, East Aurora; Wade A. F. Maple, Elma, and Robert J. Bogga, East Aurora, all of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 232,489, Aug. 15, 1988, abandoned. This application Jan. 28, 1989, Ser. No. 373,043
Int. Cl.[4] A63G *1/32*
U.S. Cl. 272—30 **21 Claims**





1. A teeter-totter that simultaneously incrementally rotates as it pivots up-and-down comprising:
a base;
a support member rotatably mounted on the base;
a beam mounted on the support member for rotatable movement therewith and for pivotal movement in up-and-down directions;
spring means secured to the beam: and
means on the base coupling the spring means to the base for simultaneously incrementally rotating the beam upon movement of the beam in at least one of the up-and-down directions and for biasing the beam to a neutral position.

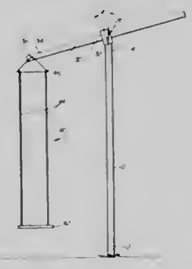
4,896,878

RECREATIONAL DEVICE

Marvin H. Greenwood, 3444 Wickersham, Houston, Tex. 77027

Filed Oct. 11, 1988, Ser. No. 255,344
Int. Cl.[4] A63G *9/00*
U.S. Cl. 272—85 **26 Claims**

1. A rider propelled recreational device comprising:
a central support associated at its proximal end with a horizontal plane of reference and having mounted at its distal end a bearing device, said central support having its longitudinal axis positioned perpendicularly to said horizontal plane of reference, and said bearing device being fixedly attached to said distal end of said central support with the longitudinal axis of said bearing device inclined relative to said horizontal plane of reference and intersecting the longitudinal axis of said central support to define an acute angle therebetween;
at least one radially outwardly extending cross member mounted at its proximal end to said bearing device for rotation about the longitudinal axis of said bearing device, said cross member being rotatable about said longitudinal axis of said bearing device to describe a circle defining a second plane which second plane is positioned in non-parallel relationship with said horizontal plane of reference; and



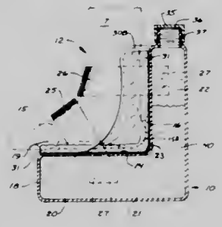
a swing suspended for omnidirectional and translational movement, from the distal end of said cross member, said swing comprising at least two flexible supporting members operatively connected at their respective proximal ends to a single point located on the distal end portion of said cross member and at their respective distal ends to a seat suspended by said supporting members, at least a portion of said supporting members being arranged substantially parallel one with another with a spreader of selected length placed intermediately of said seat and said cross member to position in said substantially parallel fashion said portion of each of said supporting members occurring between said seat and said spreader.

4,896,879

ADJUSTABLE WEIGHT DEVICE FOR HUMAN JOINT OR MUSCLE EXERCISE

Ronald J. Klawitter, 321 Fifth St., West, Hector, Minn. 55342

Filed Jan. 28, 1988, Ser. No. 212,564
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 **5 Claims**



1. A foot and lower leg mounted exercise device for exercising a human knee under external weight comprising:

a substantially rigid L-shaped container having a base section and an upright section joined together and at least one compartment defined on the interior thereof, and an access opening to the compartment at an upper portion of the upright section;
foot and lower leg support surface means formed on such container defining a first surface on an upper side of the base section and adapted to engage the bottom of the foot of a user and support such foot along the instep region, and a second surface joining the first surface and formed on the upright section extending upwardly and substantially at right angles to the first surface to be adjacent and in contact with the calf of the leg of a user when a foot of a user is supported on the first surface, the compartment including a first compartment portion below the first surface and a second compartment portion to the rear of the second surface, the second compartment portion extending upwardly along substantially the entire upright section;
a first adjustable strap fastener mounted on the first section and adapted to be positioned over an instep of a user above the first surface; and
a second adjustable strap fastener mounted on the upright section and positioned for engaging and encircling a lower leg of a user and extending outwardly from the second surface, whereby the container can be filled with a variable amount of liquid including the compartment portion extending upwardly along the upright section of the container for adjusting the total weight carried for exercise, and wherein the ankle of a user is retained in substantially one position for such exercise when the container is in place on a user with the fastener means fastened to support such foot and lower leg.

4,896,880

EXERCISE DEVICES

Scott Caruthers, Glen Burnie, Md., assignor to Dar Products Corporation, Baltimore, Md.

Continuation-in-part of Ser. No. 94,794, Sep. 14, 1987, Pat. No. 4,813,669. This application Sep. 9, 1988, Ser. No. 241,297
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 **30 Claims**



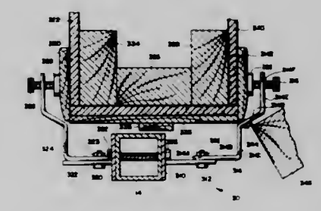
13. An exercise device, comprising a substantially spherical housing having an opening through which the user's hand may be inserted, the housing having a pair of complementary hemispherical shells joining together along their respective circumferential edges about a common midplane, a weight disposed between the complementary hemispherical shells and disposed substantially transversely of the common midplane between the shells, the weight having a pair of end portions, respectively, and means for securing each shell to a respective end portion of the weight.

4,896,881

MULTIPLE PURPOSE EXERCISE APPARATUS SUITABLE FOR HOME USE

Girair Djerdjerian, 239 Boulevard Deguire, Apt. 406, Ville St. Laurent, Quebec, Canada (H4N 1P2)

Filed Mar. 28, 1988, Ser. No. 174,114
Int. Cl.[4] A63B *17/00*
U.S. Cl. 272—900 **1 Claim**

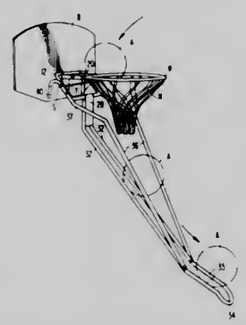


1. A supporting frame, which may be used for an exercise machine, for use in a doorway having first and second sides and having a door mounted on the first side, said supporting frame comprising:
a first vertical support member;
a second vertical support member;
a transverse member, coupled between said first and second vertical support members for positioning said first and second vertical supports members adjacent to the respective first and second sides of the doorway;
first and second clamping means, coupled to said first and second vertical support members, respectively, and to said doorway for holding said respective first and second vertical support members in an upright position inside said doorway by means of a compressive force exerted against respectively different casing sections of said doorway; and
wherein said doorway has first and second jambs on said first and second sides, respectively, each of said jambs have a stop member mounted thereon, and said casing sections of said doorway having respective molding sections, wherein, a portion of said first and second clamping means are configured to pass between said door and said doorway to allow said clamping means to hold said exercise supporting frame in an upright position in close proximity to said stop members, inside said doorway by means of said compressive force exerted against the molding sections of said respectively different casing sections of said doorway; and
wherein said clamping means include a first member, coupled at a first end to said first vertical support member and at a second to one of the casing sections of said doorway;
wherein said first member includes a first segment configured to be parallel to said one casing segment; a second segment, having an oblique angle with respect to the first segment, for allowing said first member to pass through an opening formed between said one casing section of said doorway and said door, attached to said doorway, when said door is in an open position; and a third segment, having an angle with said second segment that is substantially equal to the angle formed at the junction of said first and second segments; wherein said first segment includes means for coupling said first member to said one casing section of said doorway and said third segment includes means for coupling said first member to said further casing section of the doorway; and
wherein the clamping means further includes a second member, coupled at a first end to said first member and a second end to a further casing section opposite said one casing section, wherein said first member exerts a compressive force against said one casing section and said second member exerts a compressive force against said further casing section; and

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wherein said transverse member includes means for coupling exercise apparatus to said supporting frame.

4,896,882
GOAL-SUPPORTED BASKETBALL RETURN DEVICE
Brian L. Coleman, Oxford, Miss., assignor to Auburn Research Foundation, Auburn Univ., Auburn, Ala.
Filed Dec. 23, 1987, Ser. No. 137,326
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—1.5 A **25 Claims**



18. A combination of a basketball return apparatus and a basketball goal elevated above a playing surface, said goal having a vertical backboard, a horizontal circular rim and rim support means including a rim bracket supporting said rim on the front of said backboard, said basketball return apparatus comprising:

a frame at the upper end thereof removably engaging said backboard;

a pair of inclined rails attached at their upper ends to said frame and extending forwardly of and obliquely downwardly from said goal, beneath said rim, to lower ends at a point above the playing surface, said rails being spaced apart along their length a distance less than the diameter of a basketball and interconnected at their lower ends;

a pair of support struts above and flanking said rails for supporting said rails and deflecting a basketball onto said rails, said support struts attached to said frame at their upper ends and each support strut attached at its lower end to a lower portion of a respective adjacnet rail;

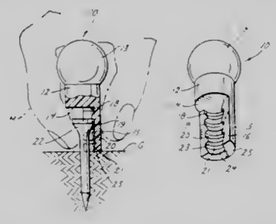
a vertical kickplate at the upper ends of said rails, positioned behind and below said rim, for deflecting a basketball forwardly of said goal;

a flat horizontal bracket centrally attached to said frame and overlying said rim bracket, said flat horizontal bracket fitting between said backboard and said rim and having side flanges flanking said rim bracket; and

a pair of abutments attached to said frame on opposite sides of and below said horizontal bracket and abutting said backboard and preventing downward pivotal movement of said apparatus about said rim bracket to keep the lower ends of said rails substantially at the point above the playing surface.

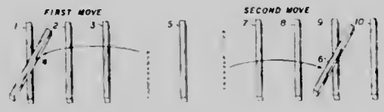
4,896,883
DEVICE FOR SETTING A GOLF TEE
Alfred E. Wagenknecht, 11971 Brookington, Bridgeton, Mo. 63044
Filed Dec. 14, 1988, Ser. No. 284,432
Int. Cl.[4] A63B *57/00*
U.S. Cl. 273—32.5 **7 Claims**

1. A device for setting a golf tee comprising a unitary body member having a side wall with a tee-facing surface and a permanently open side opposite said surface, a plurality of step recess sections in the tee-facing surface of the side wall vertically spaced from one another, each step recess section having a downwardly facing horizontal wall section for engaging the top of a golf tee, whereby when a golf tee is pressed against said tee-facing surface its upper side will be engaged by a selected one of said downwardly facing wall upon the application of downward pressure on said body, said body having a



lower end with the downwardly facing walls being of different distances from said lower end, said step recess sections cooperating with said open side to enable a user to hold a tee inserted into a step section stationary in the device by placing one finger of a hand on the tee and a second finger of said hand on a side of the device opposite the tee and to enable the user to change the position of the tee to a different downwardly facing wall using only said hand.

4,896,884
STICK PUZZLE
Sal S. Mirvic, 1760 Bush St., Apt. 7/12, San Francisco, Calif. 94109
Filed May 15, 1989, Ser. No. 351,543
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 J **7 Claims**



1. A method of playing a game, comprising:

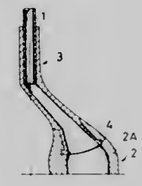
providing ten individual, separate, gamepieces, each of said gamepieces comprising an elongated wooden stick having a square cross-section,

arranging said ten gamepieces in a straight line,

executing a first move by taking a first, in-play gamepiece, carrying it over a pair gamepieces, designated second and third gamepieces, where said second gamepiece is adjacent said first gamepiece and said third gamepiece is adjacent said second gamepiece, and placing said first gamepiece over a fourth, mating gamepiece which is adjacent said third gamepiece, thereby to form an X with said first and fourth gamepieces and also to form a completed pair with said first and said fourth gamepieces,

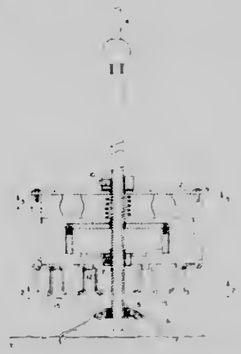
executing subsequent moves in the same manner as said first move with in-play gamepieces, other than gamepieces which have been used to form completed pairs, until all gamepieces have been used to form completed pairs, thereby completing said game successfully, or until additional gamepieces are playable, but cannot be used to form completed pairs, thereby failing to complete said game successfully.

4,896,885
GOLF CLUB
Ryota Kajita, Chiba, and Hidekimi Inoue, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 6, 1988, Ser. No. 203,225
Claims priority, application Japan, Jun. 5, 1987, 62-140943
Int. Cl.[4] A63B *53/04, 53/02*
U.S. Cl. 273—167 H **5 Claims**



1. A golf club of the wood type, comprising a club head and a shaft, the club head comprising a hollow neck and a body having a sole and having a golf ball striking face including a golf ball hitting spot H, the bollow neck fixedly receiving the shaft, the shaft being straight, and the neck having an end portion remote from the body of the head which end portion is straight and coaxial with the shaft for receiving the shaft and a hollow portion closer to the body of the head which is inclined to such extent that, unde the assumption that the relation between the axis X of the shaft and the hitting spot H both in vertical planes squarely facing a golfer using the golf club is negative when the hitting spot H is before the axis X in the direction of flight of the golf ball and positive when the hitting spot H is after the axis X in that direction, the horizontal distance y between the axis X and hitting spot H, which distance Y is perpendicular to said planes, is greater than −3 mm.

4,896,886
PORTABLE GOLF PUTTING APPARATUS
Russell H. Colley, 7446 Dublin Dr., Boca Raton, Fla. 33433
Filed Jan. 31, 1989, Ser. No. 304,219
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—184 A **20 Claims**



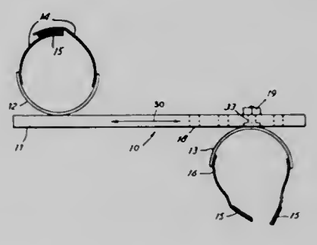
1. A golf putting apparatus with a simulated grass surface that can be compactly packaged for transport and storage and readily assembled for play with cup devices that simulate the holes or cups on a golf green that receive and retain a golf ball, the apparatus comprising:

(a) a carpet means simulating the smooth grass surface of a golf green with flat seam joining means;

(b) at least one cup device including retaining means for retaining said ball when it enters a particular area at said device, said cup device extending above the surface of said carpet means and said retaining means suspended from said cup device; and

(c) attaching means connected to said cup device, said attaching means removably attaching said cup device to said carpet means.

4,896,887
GOLFING AID
Alan R. Cable, 16 Widecombe Road, Mottingham, London SE9, United Kingdom
Filed Dec. 21, 1988, Ser. No. 287,112
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—189 R **10 Claims**



1. A golfing aid for attachment to a user's arms comprising: an elongate rigid yoke having a longitudinal axis; and two means for attaching the yoke to the user's arms, said attachment means being spaced apart on and carried by said yoke, the attachment means each having an arm-engaging portion, said arm-engaging portions being positioned at different positions in a direction transverse to said longitudinal axis, whereby when the aid is attached to the user's arms, the arms are positioned at different positions relative to said longitudinal axis so that one arm is further from the user's body than the other.

4,896,888
OCEAN YACHT RACING GAME
Philip L. Owen, 50 Palmer Street, Balmain, New South Wales 2041, Australia
Filed Jun. 11, 1987, Ser. No. 60,472
Claims priority, application Australia, Jun. 12, 1986, PH6435
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—240 **21 Claims**

1. A game for at least one player having game turns comprising:

a plurality of markers representing boats, each boat having an assigned class;

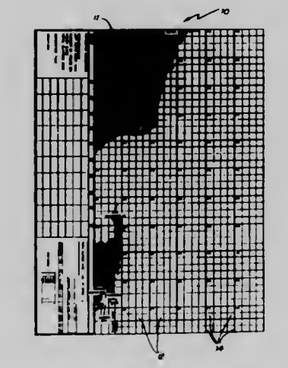
a map providing a mapped region, said markers cooperating with said map to indicate changing boat positions on the mapped region, the map region subdivided into weather areas;

a random number generator operated at each game turn to provide a first distance indicia for the turn;

a plurality of weather information units, separate from the map, each said unit providing a discrete set of weather conditions which correspond and pertain to a particular weather area of the map;

a plurality of situation cards, each said card bearing a means for obtaining a second distance indicia from the assigned boat class and weather condition; and

wherein a boat position at each turn is determined by the first and second distance indicia, the number generated at



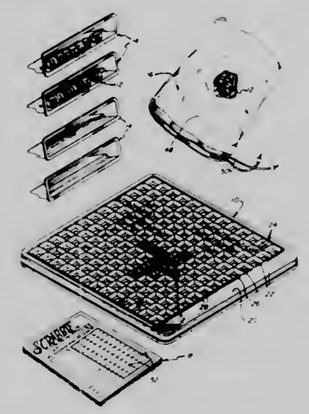
the turn, and the prevailing set of weather conditions for that turn.

4,896,889

WORD GAME WITH BOARD AND PLAYING PIECES ROTATABLY SUPPORTED THEREIN

James O. Kuhn, 140 Nassau St., New York, N.Y. 10038, and Michael W. Thompson, 1410 Girard NE., Albuquerque, N. Mex. 87106

Filed May 8, 1989, Ser. No. 348,881
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—272 **17 Claims**



1. A board game comprising:

(a) a playing board having a playing surface with a rectangular grid formed by multiple rows and columns of recesses; and

(b) a multiplicity of playing pieces having a body portion and dimensioned to be removably seated within said recesses of said playing board, each of said playing pieces bearing repetitions of an indicium about the periphery of said body portion, each of said repetitions being in a distinct color,

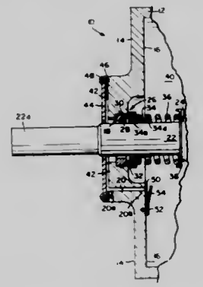
whereby a first player may place a multiplicity of said playing pieces in aligned recesses to construct a cognizable linear array of indicia each displaying a preselected color associated with that player, and a second player may place at least one playing piece on the board in an empty recess adjacent one of said recesses utilized by the linear array of the first player to create a new cognizable linear array incorporating at least the indicium of said at least one recess, said at least one playing piece added by the second player being seated in said adjacent recess displaying the repetition of the indicium in a color associated with the second player and said playing piece of the first player in said one recess being rotatable to display the repetition of the indicium of the color associated with the second player.

4,896,890

OIL SCAVENGE CHECK VALVE APPARATUS

C. Richard Mauney, Mooresville, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 10, 1989, Ser. No. 377,224
Int. Cl.[4] F16J *15/16*
U.S. Cl. 277—3 **15 Claims**



1. An oil seal, scavenge check valve apparatus comprising:

a seal housing having a first side, a second side, a shaft opening formed therethrough and a fluid opening formed therethrough;

a shaft sealingly mounted in the shaft opening, the shaft having a first portion outside the housing and a second portion inside the housing;

a first end of the fluid opening being in fluid communication with the first side;

a second end of the fluid opening being in fluid communication with the second side; and

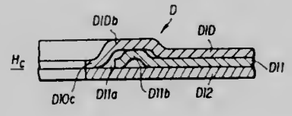
seal means for sealing the second end of the fluid opening the seal means normally closing the second end and being responsive to pressure differences between the first and second sides for moving between a normally closed position and an open position.

4,896,891

STEEL LAMINATE GASKET WITH ASSOCIATED BEADS

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,376
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—235 B **11 Claims**



1. A steel laminate gasket for an internal combustion engine having at least one hole therein, comprising:

a first plate having at least one first hole corresponding to the hole of the engine, and at least one first bead situated around the first hole, said first bead having a flat top portion and a width greater than height thereof,

a second plate situated under the first plate and having at least one second hole surrounding the hole of the engine, and

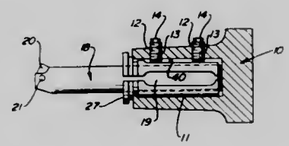
support means integrally formed with the second plate, said support means including at least one second bead having a size smaller than that of the first bead and being situated beneath the first bead so that when the gasket is tightened, the support means abuts against and supports the first bead.

4,896,892

TOOL HOLDER BUSHING

Edward A. Andrews, 379 Executive Dr., Troy, Mich. 48083

Filed Dec. 30, 1988, Ser. No. 292,328
Int. Cl.[4] B23B *31/04*
U.S. Cl. 279—1 A **8 Claims**



1. A tool holder bushing for clamping an elongated tool shank coaxially within an elongated socket bore formed within a tool holder, turret and the like machine tool element, comprising:

an elongated, cylindrically shaped tube, whose length is a number of times greater than its diameter, having an outer end and an inner end;

channel means formed in said tube adjacent said outer end of said tube;

an elongated, narrow slot of substantially uniform width formed in the tube wall and extending substantially the full length of the tube from the outer end to the inner end;

a narrow slit formed in the tube wall at each end of the tube and extending from its respective end to the slot, with the slits being a number of times narrower than the slot and being substantially aligned with the central axis of the slot;

a narrow, flat band formed in the exterior surface of the tube wall and extending substantially the full length of the tube parallel to the axis of the tube and radially offset relative to the slot;

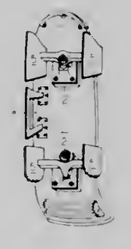
whereby the bushing tube may be inserted in the socket, and a tool shank may be inserted within the bushing and the shank and the bushing may be clamped within the socket bore by screws mounted in the wall defining the socket and extending transversely of the socket, so that the screws either engage the flat band to resiliently compress the bushing tube or extend through the slot to directly engage the tool shank, and the slot may receive screws which are spaced apart from each other different distances from one socket to another so that the bushing may be used in differing sockets.

4,896,893

ICE SKATEBOARDS

Adam A. Shumays; Sami A. Shumays, and Ibrahim K. Abu-Shumays, all of 1248 Varner Rd., Pittsburgh, Pa. 15227

Division of Ser. No. 290,372, Dec. 29, 1988, abandoned. This application Jul. 21, 1989, Ser. No. 383,257
Int. Cl.[4] A63C *1/36*
U.S. Cl. 280—14.2 **1 Claim**



1. A skateboard for skating on an ice surface comprising:

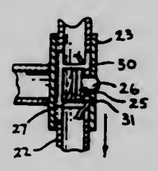
an elongated body portion having an upper surface and a lower surface,

a pair of trucks affixed to the lower surface of said body portion, said trucks having forward and rearward horizontal axles and forward and rearward pivoting mounts positioned in tandem to each other to enable pivotal steering movement of the axles upon tilting of said body portion,

first and second pairs of runner blades attached to the outer ends of respective forward and rearward axles to define forward and rearward pairs of longitudinally spaced runner blades arranged in tandem along each side of said body portion, and

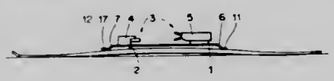
a pair of auxiliary blade assemblies attached to said lower surface along each side of said body portion between respective forward and rearward runner blades and arranged in tandem therewith, each of said auxiliary blade assemblies comprising a blade having a runner portion with leg portions extending from opposite ends of said runner portion, the lower edge of said runner portion being spaced closer to the lower surface of said body portion than the lower edges of said first and second pairs of runner blades, a first pair of longitudinally spaced mounting plates attached to said lower surface, each of said first pair of mounting plates having a pair of longitudinally spaced bolts affixed thereto and extending perpendicularly therefrom, a second pair of mounting plates attached to respective free ends of said leg portions, one of said second pair of mounting plates having a circular opening and an arc-shaped opening longitudinally spaced from said circular opening, the other of said second pair of mounting plates having a pair of longitudinally spaced arc-shaped openings, each of said arc-shaped openings in said second pair of mounting plates having a radius of curvature equal to the distance between said circular opening and a respective one of said arc-shaped openings, and wing nuts threadedly engageable with said bolts for securing said second pair of mounting plates to said first pair of mounting plates while permitting pivotal movement of said auxiliary blade relative to the longitudinal axis of said elongated body portion.

4,896,894
STROLLER CARSEAT APPARATUS
David L. Singletary, 3759 Glenayre La., Oshkosh, Wis. 54904
Filed Jan. 9, 1989, Ser. No. 295,132
Int. Cl.[4] B62B 7/12
U.S. Cl. 280—30 8 Claims



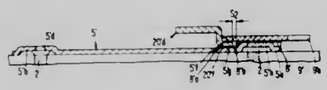
1. An infant seat stroller apparatus comprising,
an infant seat fixedly secured to a first bottom framework,
a second bottom framework reciprocatably mounted relative to said first bottom framework and underlying said first bottom framework with a scissor frame mounted within said first and second bottom framework to effect positioning of said second bottom framework relative to said first bottom framework,
a rear framework including a handle mounted rearwardly of said infant seat,
a plurality of spaced wheel units rotatably mounted to said second bottom framework and rotatable from a retracted first position to a lowered ground engaging second position relative to said second bottom framework,
each wheel unit including a rotatable member selectively securable in said first or second positions with a plurality of apertures engageable with a wheel latch button mounted within said second bottom framework and a switch adapted to be in a closed position when the wheel unit is rotated to the lowered second position, and,
visual indicator means mounted in said handle operatively associated with the switch of each wheel unit for providing a visual indication only when all of said wheel units are positioned in said lowered second position.

4,896,895
SHOCK-ABSORBING ELEMENT FOR SKIS
Broni Bettosini, Brunnenwiesenstrasse 28, 8610 Uster, Switzerland
Continuation-in-part of Ser. No. 915,910, Oct. 7, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 223,331
Claims priority, application Switzerland, Mar. 25, 1982, 1850/82
Int. Cl.[4] A63C 5/00
U.S. Cl. 280—607 11 Claims



11. A shock-absorbing element for a ski, said ski having longitudinal and lateral directions, said shock-absorbing element comprising:
a shock-absorbing zone disposed between an upper surface of said ski and a ski binding mounted thereon, wherein said zone includes at least one layer of an elastomer material and at least one layer of metal, said elastomer layer and said metal layer each having a rearward end and a front end, relative to the direction of travel, said elastomer layer being in direct contact with the upper surface of said ski and said metal layer being in direct contact with said elastomer layer, said metal layer sandwiching said elastomer layer between said metal layer and said upper surface of said ski;
means for rigidly fastening said rearward end of said elastomer layer and of said metal layer in the longitudinal, vertical and lateral directions during use to said ski; and
at least one guiding and fastening cap including means for mounting during use said front end of said metal layer shock-absorbingly and movable longitudinally, and rigidly vertically and laterally, to said ski.

4,896,896
SAFETY SKI BINDING
Andreas Riegler; Karl Stritzl, both of Vienna, and Hurbert Würthner, Hainburg, all of Austria, assignors to TMC Corporation, Switzerland
Filed Jul. 15, 1987, Ser. No. 73,682
Claims priority, application Austria, Jul. 15, 1986, 1915/86
Int. Cl.[4] A63C 9/081
U.S. Cl. 280—618 8 Claims

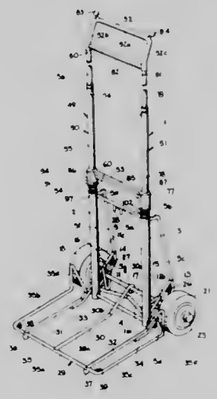


1. A ski binding, comprising:
a base plate;
a mounting plate spaced from said base plate along a longitudinal axis;
a foot plate extending between and at least partially above said base plate and said mounting plate;
pivot means disposed on said mounting plate for swivelling said foot plate about an first bearing point and for supporting said foot plate;
a guide plate positioned above said mounting plate and secured thereto, said guide plate having a rearward edge defining a cam surface;
a slide plate made from a low friction material and positioned between said mounting plate and said guide plate;
a guide element having one end extending between said mounting plate and said guide plate and an opposite end spaced above said mounting plate;
a front jaw member securely mounted on said foot plate and biased to limit movement in a substantially perpendicular direction away from said foot plate;
a heel holder adapted to be mounted on said foot plate; and
locking means adapted to be mounted on said foot plate for urging a roller mounted on said heel holder into engagement with said cam surface and for controlling the swivelling movement of said foot plate.

4,896,897
ARTICLE CARRYING CART
Paul K. Wilhelm, c/o Clipper Products, P.O. Box 30388, Cincinnati, Ohio 45230
Filed Nov. 1, 1988, Ser. No. 265,493
Int. Cl.[4] B62B 1/08
U.S. Cl. 280—655 14 Claims

1. A lightweight, portable, article carrying cart comprising a main frame supported by a pair of wheels, said main frame comprising a pair of upright tubular members maintained in parallel spaced relationship by a first transverse rod-like brace passing through coaxial perforations near the lower ends of said main frame tubular members and releasably affixed thereto, a second rod-like brace having a central portion welded to the rear surfaces of said main frame tubular members near the upper ends thereof, and a third M-shaped rod-like brace having a central V-shaped portion terminating in rearwardly extending legs, the junctures of said legs and said V-

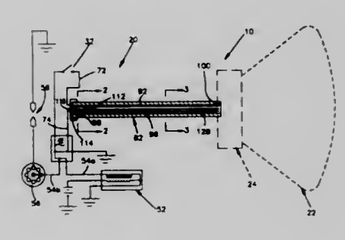
shaped portion being welded to the rear surfaces of said main frame tubular members near the lower ends thereof and above said first brace, said second brace central portion terminating at each end in extensions comprising first rearwardly extending portions followed by second downwardly and rearwardly extending portions followed by third downwardly and forwardly extending portions terminating in free ends each welded to one of said main framed tubular members, said extensions comprising stair and curb skids, each of said legs of said third brace being welded to said downwardly and rearwardly extending portion of the adjacent one of said skids, each of said legs of said third brace being parallel and substan-

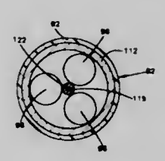


tially coplanar with said downwardly and forwardly extending portion of the adjacent one of said skids, a nut-like member welded to each of said third brace legs and the adjacent downwardly and forwardly extending skid portion, a rod-like shaft extending between said nut-like members and welded thereto with end portions extending through said nut-like members, said shaft comprising an axel with a wheel rotatively mounted on each of its end portions, said cart main frame supporting a telescoping handle assembly shiftable between retracted and extended conditions, and said main frame supporting a load carrying lower platform shiftable thereon between a load carrying position and a stowed position.

4,896,898
IGNITER FOR AN INFLATABLE OCCUPANT RESTRAINT
Reiner Leazen, Almont, and Leo S. Knowlden, Romeo, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed Sep. 13, 1988, Ser. No. 243,618
Int. Cl.[4] B60R 21/32
U.S. Cl. 280—735 7 Claims

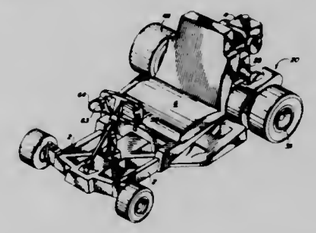
1. An apparatus for igniting material, said apparatus comprising:
a pyrotechnic transmission line having one end located adjacent the material, said pyrotechnic transmission line including a housing and a plurality of pyrotechnic cords located in said housing and extending for substantially the length of said housing, said plurality of pyrotechnic cords igniting upon the application of heat thereto;
a pair of electrically conductive members located at a position spaced from said one end of said pyrotechnic transmission line, each of said members having a portion located within said housing, said portions of said members being spaced apart and said plurality of pyrotechnic cords being located between said members; and
means for generating a spark between said pair of members to heat and thereby ignite said plurality of pyrotechnic cords,
said means for generating a spark including an actuatable electric switch and a power source operatively connected





with said pair of members to generate the spark between said pair of members in response to actuation of said switch, said power source comprising a coil of a spark ignition system for an internal combustion engine.

4,896,899
GO-CART VEHICLE
Don R. Lawrence, Tempe, Ariz., assignor to Action Products, Inc., Tempe, Ariz.
Filed Mar. 29, 1988, Ser. No. 174,699
Int. Cl.[4] B62D 1/18
U.S. Cl. 280—775 17 Claims



1. A driver operated motor vehicle of the go-cart type comprising:
a. a chassis having a top surface and front, rear and mid portions;
b. a pair of steerable front wheels and a pair of back wheels comprising at least one drive wheel and supporting said chassis;
c. a tilt wheel steering assembly comprising:
(1) a tie rod operatively connected to said front wheels;
(2) a steering wheel;
(3) a steering shaft connecting said steering wheel and said tie rod;
(4) Universal joint means articulating said steering shaft in two segments near the bottom thereof;

(5) a bracket pivotally mounted on the surface of said chassis and comprising:

(a) a bushing pivotally disposed in the upper end of said bracket for partial rotation about a horizontal axis transverse said chassis and having an aperture sized to slidably receive said steering shaft; and

(b) catch means having a plurality of catch positions and attached to said chassis;

(c) detent means carried by said bracket;

whereby said bracket may be rotated to a selected position of said catch means to adjust the degree of tilt of said steering shaft to suit the convenience of the driver;

d. said wheels comprising a tire and a hub assembly comprising a substantially flat rim surface and at least one flange ultrasonically welded to said rim surface for engaging a bead of said tire;

e. an engine mounted on a rear portion of said chassis;

f. transmission means adapted to transfer the output of said engine to said said drive wheels;

g. driver operable means for regulating the speed of said engine; and

h. seat means for supporting a driver of said vehicle.

4,896,900

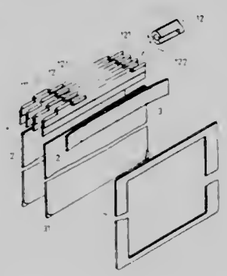
LOOSE-LEAF PHOTO ALBUM

Wu-Hsin Hong, Tainan, Taiwan, assignor to Hsin Yu Album Enterprise Co., Ltd., Tainan, Taiwan

Filed Oct. 13, 1988, Ser. No. 257,325

Int. Cl.[4] B42D *5/00*; G09F *19/00*; B05D *11/00*

U.S. Cl. 281—15.1 **9 Claims**



1. A loose-leaf binder having a plurality of pages neatly piled together, every abutting two of which are detachably and rotatably connected with each other by a plurality of axially aligned hinge members alternately formed along a pair of corresponding edges of said pages; wherein the improvement is characterized in that every neighboring two of the axially aligned hinge members are detachably and rotatably engaged with each other by an axially concave knuckle and an axially protruded pillar which are respectively formed at the adjacent axial ends, said axially concave knuckle having an outer wall formed by one of said adjacent ends and defining a concave portion, said wall having a longitudinal slit extending from the free end of said concave knuckle, tranversely passing through said wall and connecting with said knuckles' concave portion, and said axially protruded pillar being formed to be inserted into said concave knuckle via said longitudinal slit.

4,896,901

FLEXIBLE SHEET OR WEB MATERIALS

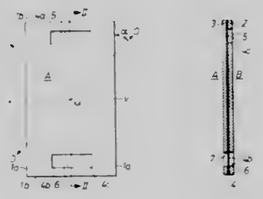
Peter Ekelund, Tunbridge Wells, England, assignor to Svecia Antiqua S.A., Fribourg, Switzerland

Filed May 6, 1988, Ser. No. 191,117

Claims priority, application United Kingdom, May 15, 1987, 8711568; Dec. 4, 1987, 8728437

Int. Cl.[4] B42D *15/00*; B42F *5/00*; G02B *27/28*

U.S. Cl. 283—90 **18 Claims**



1. A document security article comprising:

a flexible sheet element having opposite faces; and

a light polarizing element positioned within said sheet element between said opposite faces, said sheet element including two material layers with said light polarizing element being located between said material layers, a first one of the material layers having at least two apertures therein exposing portions of the light polarizing element towards one face of the sheet element and a second one of the material layers having at least one aperture therein exposing a portion of the light polarizing element towards the other face of the sheet element, the at least one aperture in the second material layer being at least partially coincident with one of the apertures in said first material layer, and the light polarizing element being so arranged that the portions thereof which are exposed through said two apertures in said first material layer have axes of polarization which are at substantially right angles with respect to each other when the flexible sheet element is folded so as to bring together the two apertures in said first material layer.

4,896,902

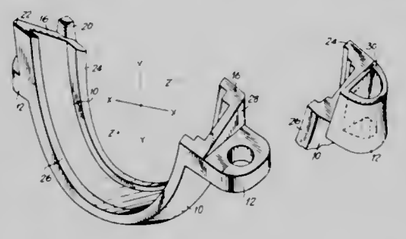
SEGMENTED TRANSITION COUPLING

Richard R. Weston, Nazareth, Pa., assignor to Victaulic Company of America, Easton, Pa.

Filed Sep. 29, 1988, Ser. No. 251,590

Int. Cl.[4] F16L *17/00*

U.S. Cl. 285—93 **4 Claims**



1. A coupling segment for use in conjunction with an identical coupling segment to provide a transitional segmented pipe coupling;

said coupling segment having end faces respectively inclined oppositely relative to an X-Z plane of said coupling segment; and,

means at one end only of said coupling segment prohibiting assembly of said one end of said coupling segment to a said one end of an identical coupling segment; said means comprising an abutment integral with said one end of said coupling segment and positioned adjacent one axial side of said coupling segment, and a projection integral with said one end of said coupling segment and positioned adjacent an opposite axial side of said coupling segment;

said abutment and said projection each being positioned radially outwardly of the associated said end face;

said projection extending perpendicularly above the adjacent surface of said end face in a direction tangential to said coupling segment;

said projection being freely moveable relative to an opposite end of an identical said coupling segment to permit both axial movement of said one end in the direction of the X-X axis of said coupling segment, and also to permit rotational movement of said coupling segment about the Y-Y axis of said coupling segment.

4,896,903

SEGMENTED PIPE JOINT RETAINER GLANDS

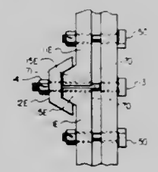
Dennis D. Shumard, Eastland, Tex., assignor to EBAA Iron Inc., Eastland, Tex.

Division of Ser. No. 13,358, Feb. 11, 1987, Pat. No. 4,779,900.

This application Aug. 8, 1988, Ser. No. 229,828

Int. Cl.[4] F16L *17/06*

U.S. Cl. 285—337 **8 Claims**



1. A segmented retainer gland assembly comprising:

a plurality of circular arc segments sized to form a complete circle when fitted together in end-to-end array;

each of said segments having opposite end flanges projecting axially outwardly from a first axial outer face of each segment in an axial direction substantially perpendicular to said face, the end faces of each of said end flanges of adjacent end flanges being coengageable when said gland segments are assembled in circular array;

a clamping bracket for each pair of adjacent end flanges, said clamping bracket having an inside recess opening through a face thereof sized and shaped to receive a pair of said end flanges when said clamping bracket is attached to said first axial outer face of said gland segments over said end flanges; and

single bolt means for securing each of said clamping brackets to each pair of adjacent joining gland segment end flanges whereby said segments are secured together by said clamping brackets to form said circular array.

4,896,904

HEAT SHRINKABLE DEVICE WITH ADHESIVE BARRIER FOR CONNECTING ELONGATE OBJECTS

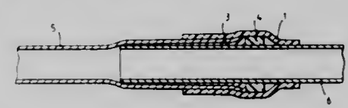
John A. Gededen, Swindon, and David E. Barnwell, Highworth, both of United Kingdom, assignors to Raychem Limited, Swindon, England

Continuation of Ser. No. 668,605, Nov. 6, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 73,394

Claims priority, application United Kingdom, Nov. 8, 1983, 8329787; Feb. 13, 1984, 8403696; Feb. 15, 1984, 8403927; May 22, 1984, 8413050; Sep. 17, 1984, 8423428

Int. Cl.[4] F16L *47/02*

U.S. Cl. 285—381 **39 Claims**



1. A connection between a plurality of fluid-conveying pipes comprising a first fluid-conveying pipe and a second fluid-conveying pipe, an end region of the second pipe being inserted into an end of the first pipe to form an overlap region of the pipes, a hollow open-ended polymeric tube which is located, and has been dimensionally recovered by the application of heat thereto, over at least part of the overlap region so that it encloses the end of the first pipe and part of the second pipe, at least one bonding insert formed from a thermosetting adhesive located inside the tube, and at least one barrier insert located inside the tube adjacent to the bonding insert and supported by and in contact with the tube such that, when the device was heated, the barrier insert restricted the flow of fused thermosetting adhesive of the bonding insert away from the overlap region so that the adhesive flowed into the overlap region via the end of the first pipe to form a permanent bond between the fluid-conveying pipes.

4,896,905

THREE-POINT LATCH FOR SWITCH CABINET

Lothar Lehr, Burbach, and Manfred Wetzel, Ewersbach, both of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf LOH GmBH & Co. KG, Herborn, Fed. Rep. of Germany

Filed Mar. 29, 1988, Ser. No. 174,646

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 37105639

Int. Cl.[4] F03C *5/00*

U.S. Cl. 292—5 **20 Claims**



1. In a switch cabinet latch of the type having a cabinet body and a door hinged thereto which may be held in closed position by a door-mounted push-rod lock along a closing edge, the lock having push rods extending therefrom and an actuating

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element which when rotated moves the push rods axially, the push rods having closing ends which in the closed position reach behind closing faces mounted on the cabinet body and in the open position are away from the closing faces, the improvement comprising:

rollers rotatably mounted on the closing ends on the push rods;

lock blocks mounted on the cabinet body, each block having one of said closing faces substantially parallel to the door and facing away therefrom and a transition surface at an acute angle to the direction of push-rod movement facing away from the cabinet door, such that turning of the actuating element moves the rollers from the open position first against the transition surfaces to impart a closing movement to the door and then onto the door-parallel closing faces;

the closing ends having lock surfaces inclined toward the door in position to cooperate with the closing-block transition surfaces to clamp the door against the cabinet body;

a holding block mounted on the cabinet body; and

a hasp on the actuating element with a locking nose extending radially therefrom positioned such that further turning of the actuating element, with said rollers already on said door-parallel closing faces, moves the locking nose behind the holding block to clamp the door to the cabinet body in the area of the push-rod lock.

4,896,906

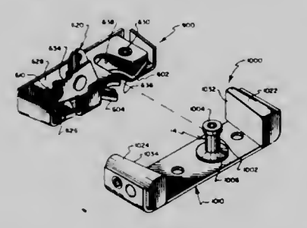
VEHICLE DOOR LOCK SYSTEM

Lee S. Weinerman, Medina, and Joel T. Vargus, Middleburg Heights, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 106,934, Oct. 5, 1987, abandoned, and a continuation-in-part of Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned, said Ser. No. 106,934, is a continuation of Ser. No. 830,709,. This application Oct. 16, 1987, Ser. No. 109,479

Int. Cl.[4] E05C *3/26*

U.S. Cl. 292—48 **43 Claims**



1. A rotary latch assembly, comprising:

(a) striker means including a U-shaped bracket having an elongate central portion that interconnects a pair of opposed, overlying end formations and that has a generally cylindrical stud that is connected to the central portion and extends in cantilevered fashion therefrom to project between the overlying end formations at spaced distances therefrom;

(b) rotary latch means including elongate latch housing means for defining a protective enclosure for latch operating components, and for defining a pair of opposed end regions;

(c) rotary latch bolt means including a pair of pivotal latch bolts mounted by the latch housing means for rotation in unison between latched and unlatched positions, and being operative, when in their latched positions, to securely grasp the stud that is carried by the U-shaped bracket of the striker means to releasably retain the rotary latch means in engagement with the striker means;

(d) wedge block means including a pair of wedge block members rigidly secured to the end formations of the U-shaped bracket of the striker means for defining a pair of opposed inclined surfaces that face toward said stud;

(e) inclined surface means defined by opposed end regions of the latch housing means for engaging the opposed inclined surfaces of the wedge block means when the rotary latch means is brought into latching engagement with the striker means to guide the rotary latch means into proper alignment with the striker means during latching and to retain the rotary latch means in proper alignment with the striker means while latched.

4,896,907

LOCKING DEVICE FOR A VEHICLE

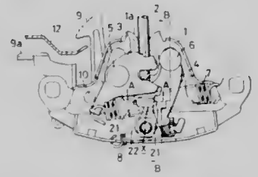
Hatsuo Hayakawa, and Mikio Honma, both of Yokohama, Japan, assignors to Ohi Seisakusbo Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 121,610, Nov. 17, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,657

Claims priority, application Japan, Nov. 18, 1986, 61-272819

Int. Cl.[4] E05C *3/26*

U.S. Cl. 292—216 **11 Claims**



1. A locking device for a vehicle having a body, a door or hood pivotally connected to the body for opening and closing movement, and a striker on the door or hood, the device comprising:

a base plate securable to a body of a vehicle;

a latch lever and a locking lever pivotally mounted on the base plate;

said latch lever being rotatable in mesh with a striker as the door or hood of a vehicle closes;

said locking lever being engagable with said latch lever to block rotation of the latch lever;

an engaging means provided on said base plate for engaging with the side of said locking lever or latch lever opposite to said base plate and thereby blocking the movement of said lever away from the surface of said base plate; and

wherein the distance from said engaging means to the pivotal connection of the engaged lever is larger than the distance between said pivotal connection and the point of engagement between said latch lever and said locking lever.

4,896,908

ELASTOMER-CLAD MOTOR-VEHICLE DOOR LATCH

Frank Kleefeldt, Heiligenhaus, Fed. Rep. of Germany, assignor to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,704

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 68715925

Int. Cl.[4] E05C *3/26*

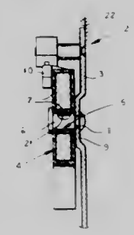
U.S. Cl. 292—216 **6 Claims**

1. A motor-vehicle latch assembly comprising:

a locking bolt secured to a doorpost;

a mounting plate secured to a door and provided with a pivot and formed therearound with a bearing surface;

a locking fork formed with a pivot hole fitted over the pivot, having a side directly confronting the bearing surface, and engageable with the bolt on closing of the door; and



an elastomeric cladding covering the fork including the interior of the hole in contact with the bolt and the side of the bolt in contact with the bearing surface, the cladding engaging the bearing surface.

4,896,909

OPENER

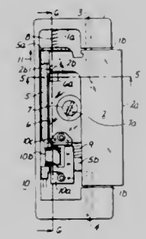
Güenter Mauer, Heiligenhaus, Fed. Rep. of Germany, assignor to Mauer GmbH, Heiligenhaus, Fed. Rep. of Germany

Filed Feb. 9, 1988, Ser. No. 153,966

Claims priority, applicatioo Fed. Rep. of Germany, Feb. 9, 1987, 3703909

Int. Cl.[4] E05B *15/02*

U.S. Cl. 292—341.16 **5 Claims**



1. Door opener including a pivotably mounted locking plate, further including electromagnetic means including an yoke and an armature, comprising:

a tangentially effective wedge element mounted to the locking plate;

an axially adjustable and movable drive slide operatively connected to said wedge element;

a control slide resiliently mounted on said drive slide;

a blocking pin mounted on the control slide; and

said armature being pivotally mounted on said control slide.

4,896,910

COMBINATION BUMPER AND TIRE STORAGE COMPARTMENT

Bernie R. Carter, 7123 Thrush View #30, San Antonio, Tex. 78209

Filed Sep. 30, 1988, Ser. No. 251,307

Int. Cl.[4] B62D *43/00*

U.S. Cl. 293—117 **4 Claims**

1. A combination vehicle bumper and tire storage compartment comprising:

(a) a rack comprising:

(i) a U-shaped cross bar attached to main frame members of a vehicle near the rear of said vehicle;

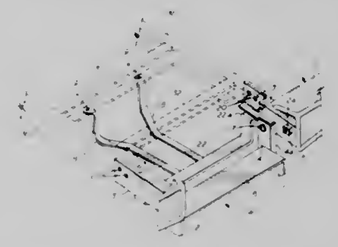
(ii) at least two straps attached by one end to said cross bar and attached at the other end to a cross frame member of said vehicle, said straps having a shape that conforms to the shape of a tire;

(b) a step bumper attached to said main frame members of said vehicle by means of a pair of opposed extensions extending from an inside of said step bumper, each of said extensions having first pin apertures for receiving hinge pins;

(c) a closure mounted on said step bumper comprising:

(i) a rectangular box like structure open at rear and top sides, and having two opposed side members, a bottom member forming a step of said bumper and a front member forming a door which forms a sole access to said rack;

(ii) a hinge member extending from each of said side members and aligned with an inside surface of said



extensions, said hinge members having second pin apertures for receiving said hinge pins; and

(iii) said hinge pins passed through said first and second pin apertures to rotatably secure said closure to said extension, said closure being arranged for rotation rearward and downward about said hinge pins, said first and second apertures being positioned to allow access to said rack when said closure is rotated downwardly; and

(d) means for latching and securing comprising a hole in each said side member aligned with an internally threaded hole in each said adjacent extension and a releasable bolt extending through said hole, engaged in said internally threaded hole and including a portion of said bold positioned in said rectangular box like structure for operating said bolt.

4,896,911

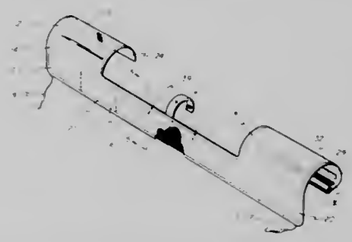
AUTOMOBILE SIDE PROTECTOR

Vincent M. Duke, 1452 Candlewood Dr., Worthington, Ohio 43085

Filed Oct. 3, 1988, Ser. No. 252,304

Int. Cl.[4] B60R *19/42*; B65D *65/08, 65/14*

U.S. Cl. 293—128 **19 Claims**

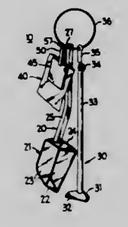


1. An automobile side protector for protecting the paint of an automobile from scratches comprising a flexible sheet form member which is foldable, a portion of said sheet form member in the operative position of said side protector being retained in

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the interior of said automobile, said sheet form member having a front portion, said front portion having a top edge with a relatively rigid strip form member means positioned therealong for insertion into the hood seam while the hood is closed for retaining said strip form member means therein.

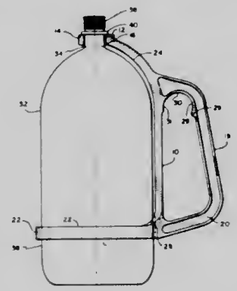
4,896,912
SANITARY METHOD AND APPARATUS FOR WASTE COLLECTION AND DISPOSAL
Vernon A. Parnell, 5208 W. North Ave., Chicago, Ill. 60639
Filed Oct. 3, 1988, Ser. No. 252,597
Int. Cl.[4] A01K *29/00*
U.S. Cl. 294—1.3 **2 Claims**



1. Apparatus for sanitary collection and disposal of waste material comprising: a scoop having a receptacle portion and an elongate handle portion, a scraper having a blade portion and an elongate handle portion, first flexible disposal bag means adapted to be fitted over said receptacle portion of said scoop for completely enclosing said receptacle portion in a covering configuration, second flexible disposal bag means adapted to be fitted over said blade portion of said scraper for completely enclosing said blade portion in a covering configuration, means for releasably securing said first and second bag means in the covering configuration thereof respectively to said scoop and said scraper, a coupling ring, and means securing said scoop and said scraper to said coupling ring so that at least one of said scoop and said scraper is releasable from said coupling ring, said coupling ring being received through a complementary opening in said handle portion of said scoop, said securing means including clip means carried by said handle portion of said scraper adapted to be releasably coupled to said coupling member.

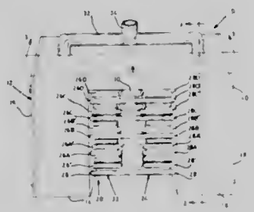
4,896,913
RELEASABLE SELF LOCKING HANDLE FOR WIDE BODY, NARROW NECK CONTAINERS
Steve J. Kennedy, P.O. Box 24, Cassville, Mo. 65625
Continuation-in-part of Ser. No. 246,153, Sep. 19, 1988. This application Nov. 14, 1988, Ser. No. 270,675
Int. Cl.[4] B65D *23/10*; B67B *7/44*
U.S. Cl. 294—31.2 **4 Claims**

1. A one piece self-locking carrier handle for a wide body, narrow neck container comprising a one piece body frame member including a closed ring support strap disposed at one end of the frame member for encircling the wide body portion of a container to be carried by the carrier, releasable locking means disposed at another end of said frame member for lockingly gripping the narrow neck portion of the container, and web support means connecting said support strap and said locking means, said releasable locking means comprising a C-shaped flexible snap ring having an open section and extending from one end of the web support means, said snap ring including a flexible tip adapted to be flexed upon outward pressure to enlarge the open section and thereby permit unlocking of the ring from the neck of the container, and said web support means including a vertical support web and a hand grip web spaced therefrom and attached at opposite ends to said vertical support web and cap removing means disposed at the juncture of said hand grip web and said vertical support web, said cap removing means comprising connecting portions of inner surfaces of the hand grip web and the vertical support web and adapted to permit the cap to be opened to be gripped



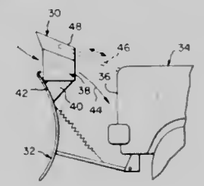
along a substantial portion of a peripheral surface of the cap, said inner surfaces including a toothed bearing surface, an abutment disposed diametrically opposite the toothed bearing surface and a smooth surface portion between the toothed surface and the abutment.

4,896,914
ROBOTIC HAND WITH SHAPE DETERMINATION CAPABILITIES
S. Scott Stevens, Rte. 1, Box 302A, Harriman, Tenn. 37748
Filed Aug. 3, 1987, Ser. No. 80,616
Int. Cl.[4] B25J *9/14*
U.S. Cl. 294—88 **36 Claims**



1. A device for engaging an object having a surface, said device providing signal information related to the shape of said surface of said object, which comprises:
- a housing for placement proximate said surface of said object;
- a plurality of finger units carried by said housing, said finger units each having a first end for engaging said surface, and a further end positioned within said housing, said plurality of finger units being sufficient in number to support said object when said object is engaged by said first ends of said finger units;
- guide means for each of said finger units, said guide means providing for movement of said finger units along fixed paths relative to said housing;
- movement means associated with each said finger units for selective movement of said finger units along their individual axes in said fixed paths from a reference first position stored within said housing to a second position to engage said surface of said object with said first ends, and for selective movement to return to said reference first position and release said surface of said object;
- a distance measurement means associated with each of said finger units whereby an electrical signal is generated that is related to distance traveled by said first end of each said finger units along said fixed paths from said reference first position to said second position for effecting said engaging of said surface of said object by said first ends of said finger units, said electrical signal generated by said distance measurement means being uniquely related to said shape of said surface.

4,896,915
WIND DEFLECTOR PLATE FOR SNOW PLOW
J. Eric Morandi, 2218 Saw Mill River Rd., Elmsford, N.Y. 10523, and George Spector, 233 Broadway, Room 3615, New York, N.Y. 10007
Filed Jun. 5, 1986, Ser. No. 870,831
Int. Cl.[4] B60K *11/00*
U.S. Cl. 296—180.1 **5 Claims**



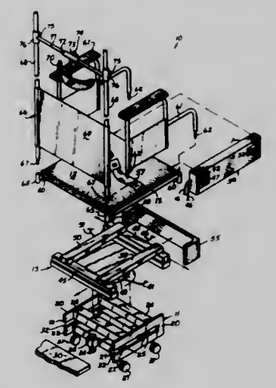
1. A wind deflector for a snow plow on a motor vehicle having a plow pump bar and a radiator, said deflector comprising:
(a) a deflecting plate mounted on said pump bar;
(b) a pair of spaced apart mounting brackets extending downwardly from said deflecting plate; and
(c) means for securing said brackets of said deflecting plate to said plow pump bar so that when said plow is in position said deflecting plate will deflect air from above said plow down behind said plow and into said radiator of said motor vehicle to prevent overheating.

4,896,916
CHAIR FOR CUTTING CHILDREN'S HAIR
Michael Marter, Bismarck, N. Dak., assignor to Kaemark, Inc., Giddings, Tex.
Continuation of Ser. No. 229,747, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 944,571, Dec. 22, 1986, abandoned. This application Jul. 13, 1989, Ser. No. 380,693
Int. Cl.[4] A63G *9/10*
U.S. Cl. 297—181 **3 Claims**



1. A children's barber chair comprising:
- a base adapted to rest on a supporting surface;
- a hydraulic cylinder attached to said base and extending upwardly therefrom;
- a piston mounted within said cylinder for reciprocating movement in a vertical direction within said cylinder, said piston having a rod connected thereto and extending vertically upwardly to terminate in an upper rod end;
- platform means connected to said upper rod end of said piston rod for movement in unison therewith, said platform means comprising a first flat circular horizontal surface;
- a body member rigidly connected to said platform means and extending upwardly therefrom, said body member comprising a saddle shaped seat positioned in spaced relation above said first horizontal circular surface of said platform means, said saddle shaped seat having a forward end, a rearward end, and opposite lateral sides, and handle means positioned above and forwardly of said saddle shaped seat;
- said first circular horizontal surface of said platform having an outer circumferential edge which is sufficiently large to protrude laterally beyond said lateral sides of said saddle shaped seat and to protrude forwardly and rearwardly beyond said forward and rearward ends of said saddle shaped seat so as to form first and second foot rests positioned below and on opposite sides of said saddle shaped seat whereby a child sitting astride said saddle shaped seat can rest its feet on said first and second foot rests, said circular shape of said circular horizontal surface permitting said child to move its feet forwardly and rearwardly while resting on said first and second foot rests;
- said platform means further comprising a second flat horizontal surface having a circular outer perimeter spaced below, concentric with, and spaced radially outwardly from said outer perimeter of said first circular horizontal surface, a circular vertical wall extending downwardly, from said first horizontal surface to said second horizontal surface whereby said first horizontal surface, said circular vertical wall, and said second horizontal surface form a top hat shaped configuration.

4,896,917
CHAIR FOR X-RAY TABLE
Eldon D. Enevoldson, Dayton, Ohio, assignor to Rehab Tech., Inc., Dayton, Ohio
Filed Oct. 7, 1988, Ser. No. 254,884
Int. Cl.[4] A47C *3/18*; A61G *7/10*
U.S. Cl. 297—217 **4 Claims**



1. Apparatus comprising:
- a X-ray table having a flat surface,
- a foot plate projecting perpendicularly to said table,
- a chassis removably clamped to said foot plate,
- a chair having a backrest and having a seat parallel to said foot plate,

means mounting said chair on said chassis for fore and aft,

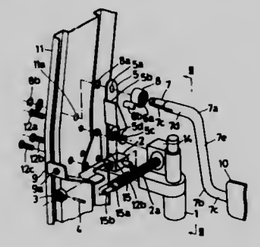
lateral and rotational movements to shift a patient, while seated on the chair, between positions in which the patient's back is adjacent said table flat surface and said patient's side in adjacent said table first surface, said shifting including pulling a patient and seat away from said table, rotating the patient and seat 90° and returning said patient and seat to a position adjacent said table.

4,896,918

LUMBAR SUPPORT REGULATING APPARATUS

Naoaki Hoshihara, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 20, 1988, Ser. No. 260,414
Claims priority, application Japan, Oct. 20, 1987, 62-160098
Int. Cl.[4] A47C *7/46*
U.S. Cl. 297—284 **3 Claims**



1. A lumbar support regulating apparatus comprising:
pressing means rotatably supported on a seat back frame by means of rotatable shaft portions at opposite ends of an offset central portion having a pressing plate secured thereto for forward and rearward movement relative to said seat back frame upon rotation of said pressing means,
a spiral spring member connected at a first end to and surrounding one of said rotatable shaft portions,
link means pivotally mounted on said seat back frame disposed in engagement with a second end of said spiral spring member; and
drive means mounted on said seat back frame for rotating said link means to rotate said pressing means through said spring member, said drive means including movable means connected to said link means and limit means on said drive means for limiting movement of said movable means for regulating the limit of forward and rearward movement of said pressing member.

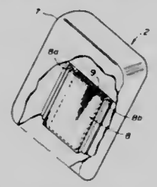
4,896,919

SEATBACK OF AUTOMOTIVE SEAT

Masakazu Murakibi, Isehara, and Ichiro Matsuura, Kanagawa, both of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Oct. 20, 1988, Ser. No. 260,422
Claims priority, application Japan, Oct. 28, 1987, 62-164775
Int. Cl.[4] A47C *7/26*
U.S. Cl. 297—452 **4 Claims**

1. A seatback of an automotive seat, comprising:
a structural base including a rectangularly extending frame having opposed side portions, and a plurality of springs extending between said opposed side portions;
a pad material covering said structural base except at a given rear part of said structural base;
a flexible trimmed cover covering said pad material, said trimmed cover having a rear part by which said given rear part of said structural base is entirely covered;
a rectangular bag member having side flange portions secured at its side flange portions to an inner surface of said rear part of said trimmed cover in a manner to define at an upper portion of said bag member an entrance into the interior of said bag member; and
a rectangular hardboard member slidably insertable into the bag member through said entrance to allow said rear part



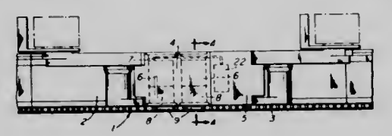
of the trimmed cover to have considerable durability against pressure applied thereto from the outside, said hardboard being constructed of a light paper board impregnated with plastics.

4,896,920

DRUM-CUTTER MINING MACHINE

Karl-Heinz Weber, Witten-Heven, and Siegfried Reike, Bochum, both of Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik u.EisengieBerei mgH, Bochum, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 193,773
Claims priority, application Fed. Rep. of Germany, May 19, 1987, 371668
Int. Cl.[4] E21C *29/02*
U.S. Cl. 299—42 **15 Claims**



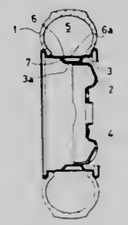
1. A drum-cutter mining machine for use in longwall mining operations, said mining machine being translatable along a longwall conveyor having a conveyance means extending therealong, said mining machine comprising:
a machine body;
a capstan housing mounted upon the machine body, said capstan housing containing at least one bore extending therethrough;
drive motor means having a rotating shaft means, said drive motor means and said shaft means being positioned in said at least one bore to extend perpendicular to the direction of translational movement of the mining machine along said longwall conveyor;
gear means rotatably coupled to the rotating shaft means; and
drive wheel means connected with said gear means, said drive wheel means being engageable with said conveyor means to cause translation of the mining machine along said longwall conveyor, said drive motor means being removably and operational in either of reversible positions in said at least one bore.

4,896,921

WHEEL FOR VEHICLE

Chiharu Sato, Utsunomiya; Yoichi Kamiyama, Kawachimachi, and Hiroyuki Ikegami, Utsunomiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1988, Ser. No. 239,229
Claims priority, application Japan, Sep. 4, 1987, 62-134498[U]
Int. Cl.[4] B60C *23/18*
U.S. Cl. 301—5 R **3 Claims**



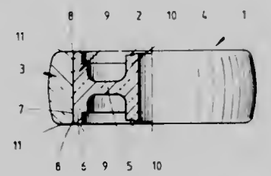
1. A wheel for vehicles, having a tubeless tire, said wheel comprising:
a wheel body, a rim of said wheel body is provided thereabout with an annular hollow member which comprises two semiannular hollow parts joined to each other via a hinge so that said hollow member can be opened and closed at said hinge; and
a silencing chamber formed around said wheel body and communicating with an air chamber in said tire via a communication port, said silencing chamber being formed in said hollow member, said communication port being made in a wall of said hollow member.

4,896,922

PLASTIC WHEEL ASSEMBLY

Friedrich W. Güthe, Wermelskirchen, Fed. Rep. of Germany, assignor to Teute Rollen Gesellschaft mit beschrankter Haftung & Co., Wermelskirchen, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,447
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732505
Int. Cl.[4] B60B *5/02*
U.S. Cl. 301—63 PW **6 Claims**



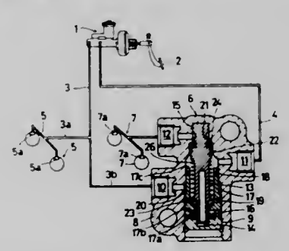
1. A wheel assembly comprising:
a rim body made from injection-moldable plastic consisting of a halogen-free polypropylene copolymer;
a tire made of thermoplastic rubber applied to said rim body consisting of polypropylene vulcanized cross-linked with an EPDM rubber .

4,896,923

DUAL HYDRAULIC BRAKE SYSTEM

Takashi Nagashima, Koda, and Eiji Miura, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

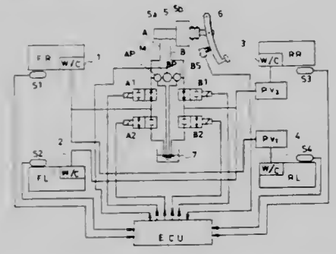
Filed Sep. 28, 1988, Ser. No. 250,330
Claims priority, application Japan, Sep. 30, 1987, 62-149792[U]
Int. Cl.[4] B60T *8/26*
U.S. Cl. 303—9.63 **3 Claims**



1. A dual hydraulic system for controlling actuation of brake assemblies for wheeled vehicles comprising:
a brake master cylinder for supplying hydraulic pressure separately to a first fluid circuit and a second fluid circuit;
two front wheels;
two front wheel cylinders, each one of said front wheel cylinders being connected to one of the front wheels and being in fluid communication with said brake master cylinder through said second fluid circuit;
two rear wheels;
two rear wheel cylinders, each one of said rear wheel cylinders being connected to one of the rear wheels and being in fluid communication with said brake master cylinder through said first fluid circuit;
proportioning valve means connected between said first circuit and said rear wheel for proportionally reducing the hydraulic pressure supplied to said rear wheels when the hydraulic pressure exceeds a set value; said valve means including:
a housing;
a bore formed in said housing;
an outlet port formed at one side of said bousing for establishing fluid communication between said bore and said rear wheel cylinders;
a first inlet port formed in said housing for establishing fluid communication between said bore and said first fluid circuit;
a piston having a valve head;
a valve seat opposed to said valve head;
a spring engaged at one end with an annular shoulder of said piston to move said valve head away from said valve seat;
sensing means for sensing fluid leakage in said second fluid circuit; and
a sleeve slidably mounted in said bore, said sleeve provided with a flange having an upper surface, said sleeve enclosing said spring and receiving an end of said spring opposite to said one end and in contact with said upper surface, said flange having a lower surface which transmits the hydraulic pressure to the sleeve, said upper surface and said lower surface being substantially adjacent to each other, said piston having an abutting portion located intermediate said annular shoulder and said upper surface said sleeve being movable towards said piston so as to cause said upper surface to abut said abutting portion to displace the valve head from the valve seat upon actuation of the sensing means.

VOL 1110 ISS 5 JA 30 1990 UMI

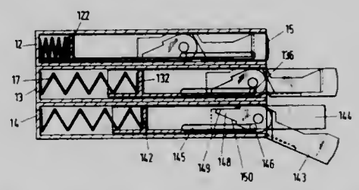
4,896,924
ANTISKID CONTROL DEVICE
Kazutaka Kuwana, Toyota; Tsuyoshi Yoshida, Obu; Shinsuke Sakane, Toyota, and Tetsuya Miyachi, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Continuation of Ser. No. 240,322, Sep. 2, 1988, abandoned. This application Apr. 19, 1989, Ser. No. 339,945
Claims priority, application Japan, Sep. 2, 1987, 62-219608
Int. Cl.[4] B60T *8/82*
U.S. Cl. 303—96 **19 Claims**



1. An antiskid control device for a vehicle having a plurality of wheels each with a hydraulic pressure-actuated brake, and a movable brake pedal for applying hydraulic pressure to the brakes, comprising:
start detecting means for detecting the initial movement of the brake pedal during braking;
means for detecting the rotational speed of each of the plurality of wheels, and generating at prescribed intervals a wheel speed signal corresponding to the rotational speed of each wheel;
presuming means responsive to the speed detecting means for generating at the prescribed intervals a standard vehicle speed signal corresponding to one of a predetermined speed and the highest speed of any of the plurality of wheels;
selecting means for generating at the prescribed intervals one of a low coefficient signal corresponding to the rotational speed of the one of the wheels having the lowest coefficient of friction with the driving surface and a low speed signal corresponding to the rotational speed of the one of the wheels having the lowest rotational speed; and
pressure control means responsive to the start detecting means for automatically controlling the hydraulic pressures applied to each of the brakes in response to the standard vehicle speed signal and the wheel speed signals when at least one of the wheel speed signals corresponds to a speed below than a specified level, and the standard vehicle speed signal and one of the low coefficient signal and the low speed signal when all of the wheel speed signals correspond to a speed below the specified level.

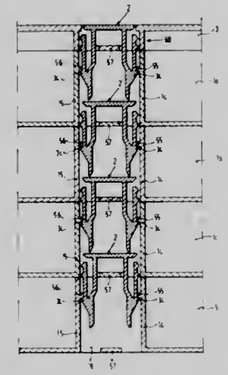
4,896,925
STORAGE CONTAINER FOR INFORMATION CARRIER
Wolfgang Nehl, Martinskirchle 22, 7244 Waldachta 3/Tumlingen, Fed. Rep. of Germany
Filed May 27, 1988, Ser. No. 201,116
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719797
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—12 **9 Claims**

1. A storage container for an information carrier, particularly for magnetic tape cassettes, comprising a hollow housing; a slider arranged to support an information carrier, said slider being movable in said housing in a direction of movement to a withdrawing position in which it partially extends outwardly of said housing, said slider having a main part and a front part which is connected pivotably relative to said main part about a pivot axis and is pivotal relative to said main part in said withdrawing position; and means for guiding said slider, said guiding means including a guide provided in said housing and a pin provided on said slider at a distance from said pivot axis and engageable in said guide, said guide in said housing being straight in the direction of movement of said slider, said front



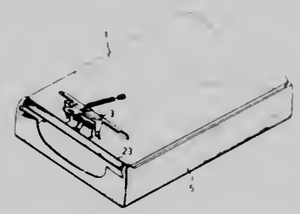
part being provided in the region of said pivot axis with at least one abutment element which limits the pivoting of said front part in said withdrawing position, said main part of said slider having a side wall and a recess formed in said side wall, said abutment element of said pivotable front part of said slider engaging in said recess of said main part.

4,896,926
STACKABLE DRAWER BOX
Johannes M. Verbolt, Ulft, Netherlands, assignor to Atlanta Hoogezand B.V., Hoogezand, Netherlands
Filed May 26, 1988, Ser. No. 198,900
Claims priority, application Netherlands, May 27, 1987, 8701263
Int. Cl.[4] F16B *12/00*
U.S. Cl. 312—111 **17 Claims**



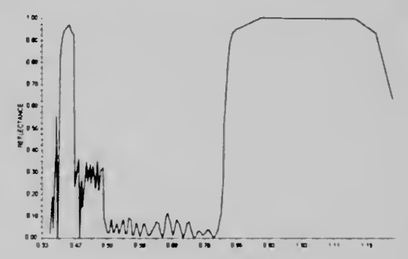
1. A stackable drawer box comprising:
a plurality of side walls, and
receiving means on at least two of said plurality of side walls for receipt of and retention of a coupling element which includes spaced parallel legs connected by a connecting portion and spaced parallel fingers extending substantially parallel to and from the spaced legs toward the connecting portion,
said receiving means including lug members for inwardly biasing the legs and the fingers of the coupling element as the coupling element is forced past said lug members and a stop for engaging the connecting portion of the coupling element so as to enable a displacement in a downward direction of the coupling element located in said receiving means from an inoperative position, in which the coupling element is substantially located within said receiving means of a first drawer box, into a coupling position, in which the coupling element coacts with a second drawer box located subjacent to the first drawer box of two stacked drawer boxes so that said lug members of the second drawer box engage the fingers of the coupling element after the legs and fingers of the coupling element have moved past the lug members of the first drawer box, and a continued displacement in the downward direction of the coupling element relative to both boxes is blocked by said stop of the first drawer box engaging the connecting portion of the coupling element and said lug members of the second drawer box prevent displacement in a direction opposite to the downward direction of the coupling element.

4,896,927
COMBINATION CLIP-BOARD AND CASE
David Liu, and Jane Keo, both of No. 95, Kung Cheng Rd., West District, Taichung, Taiwan
Filed Mar. 1, 1989, Ser. No. 317,432
Int. Cl.[4] A47B *63/00*
U.S. Cl. 312—190 **3 Claims**



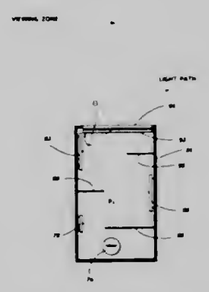
1. A combination clip-board and case, said combination comprising a clip-board (1) and a case (5) wherein:
said clip-board comprising a combination of a board (10) and a clip (3); said board (10) having two vertical slots (13) at a top portion thereof; said clip-board having a pivoting means (23) which has an axial slot (231) for receiving said board (10) through insertion of the top margin thereof into said axial slot (231); a pin (24) being employed at each end of said pivoting means (23) for rotatably hinging said board to said case;
an integral base (2) extending from said pivoting means (23) thereunder; said base having two first lugs (21) each having a respective first bore (211) therethrough, such that said lugs (21) are passable through said vertical slots (13) and attachable to said clip (3);
a clip (3) having two second lugs (32), said second lugs each having a respective second bore (322) therethrough; said first lugs (21) being respectively attachable to said second lugs (32) by means of a bolt (34) passing through said first bores (211) and second bores (322);
said case (5) having a cam cutout (51) formed on a side thereof; said cam output (51) providing an opening in said case through which the clip is passable; a sliding groove (52) being provided along the whole length of the sides which are perpendicular to said side where said cam cutout is formed;
a protrusion (53) being formed on the end of each said sliding groove (52) adjacent to said cam cutout (51); a hollow portion (54) being provided within said protrusion (53) for receiving said pivoting means (23); a slot (55) being defined directly below said hollow portion (54) allowing passage of said pins (14) from said protrusion (53) into said sliding groove (52); and
said pins (14) being slidable within said sliding groove (52).

4,896,928
CHROMATICALLY INVARIANT MULTILAYER DIELECTRIC THIN FILM COATING
Bruce E. Perilloux, and Stephen D. Vincent, both of Grass Valley, Calif., assignors to Coherent, Inc., Auburn, Calif.
Filed Aug. 29, 1988, Ser. No. 238,095
Int. Cl.[4] G02B *5/22, 5/28*
U.S. Cl. 350—1.6 **33 Claims**



1. A short-wave-pass optical filter, including:
a substrate having a surface; and
a coating supported by the surface of the substrate, said coating including a set of alternating layers formed of material having high refractive index and substantially quarter-wave optical thickness, and material having low refractive index and substantially quarter-wave optical thickness, where the thickness of each layer is selected so that the filter has a reflectance spectrum exhibiting a ripple over a first segment of the visible spectrum but exhibiting no significant ripple over a second segment of the visible spectrum, so that the reflectance of the first segment is sufficient to give the filter a desired aesthetic color, and so that the desired aesthetic color is substantially independent of incidence angle.

4,896,929
HOLOGRAPHIC DISPLAY MODULE FOR DISPLAYING MACHINE STATUS
Werner E. Haas, Webster; John R. Andrews, Fairport; Kirk A. Blakesley, Newark; John L. Havranek, Williamson; Leon E. Kawacz, Rochester; Raymond P. Mileski, Fairport; Michael D. Rainsdon, Walworth; Andrew P. Yesul, Jr., Penfield, and George A. Muller, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jul. 15, 1988, Ser. No. 219,120
Int. Cl.[4] G03H *1/22*
U.S. Cl. 350—3.85 **5 Claims**



1. In a machine having a plurality of operating subsystems, a holographic display system for providing a holographic visual

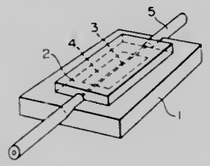
display relating to the status of various machine operations, said display system comprising, in combination:
- a holographic display plate having formed thereon a holographic representation of the machine,
- at least one display panel comprising a plurality of liquid crystal, individually addressable elements, said display panel positioned parallel with, and adjacent to said holographic display plate,
- an illumination source for providing a uniform level of illumination to the holographic display plate and the display panel, and
- control circuitry for detecting a particular machine operation status and for selectively energizing the liquid crystal elements associated with the particular operation status
- whereby a corresponding portion of said holographic display plate is illuminated presenting a visual display of the particular operation status.

4,896,930

OPTICAL FUNCTIONAL DEVICE OF AN OPTICAL WAVEGUIDE TYPE

Shigeki Tsuchitani, Mito, and Kazuji Yamada, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,706
Claims priority, application Japan, Mar. 19, 1987, 62-62555
Int. Cl.[4] G12B *6/10*
U.S. Cl. 350—96.12 **27 Claims**



1. In an optical functional device of a unit mode waveguide, wherein the improvement comprises an optical waveguide embedded into a main surface of a first substrate and which includes a channel formed as a slit in the main surface of said first substrate and which slit is of a predetermined length such that it is completely covered by a main surface of a second substrate completely sealing an exposed part of said slit which forms said channel thereby forming a hollow part which is filled with a charge of a nonlinear optical material, wherein there is formed a waveguide for allowing propagation of a unit mode signal.

4,896,931

FREQUENCY DOUBLING DEVICE

Jacob Khurgin, Ellicott City, Md., assignor to North American Philips Corp., New York, N.Y.

Filed Aug. 18, 1988, Ser. No. 233,688
Int. Cl.[4] G02B *6/10*; G02F *1/35*
U.S. Cl. 350—96.12 **9 Claims**



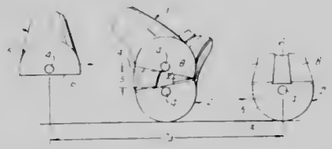
1. A frequency doubling device comprising:
(a) a non-linear optical substrate;
(b) a non-linear optical waveguide disposed on said substrate, said waveguide having a refractive index differing from that of said substrate;
(c) said non-linear waveguide having an inverted polarization interface disposed therein; and
(d) means for directing electromagnetic radiation across said waveguide in a direction parallel to said inverted polarization interface.

4,896,932

METHOD OF FORMING AN OPTICAL FIBRE JUNCTION

Stephen A. Cassidy, Ipswich, England, assignor to British Telecommunications Public Limited Company, England

PCT No. PCT/GB88/00259, § 371 Date Nov. 21, 1988, § 102(e) Date Nov. 21, 1988, PCT Pub. No. WO88/07690, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 31, 1988, Ser. No. 279,158
Claims priority, application United Kingdom, Apr. 2, 1987, 8707853
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **9 Claims**



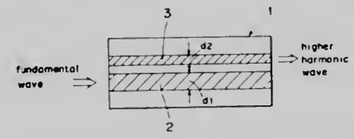
1. A method of preparing a junction between the cores of two D-optical fibres comprising bending a first fibre around a curved surface and causing its flat face to face outwards, superposing a second D-fibre on the first fibre, bending the second fibre around the curved surface causing its flat face to face towards the curved surface, and controlling the lateral position of the superposed fibres on the curved surface to provide a predetermined separation between the cores of the fibres.

4,896,933

HIGHER HARMONIC GENERATOR

Seiki Yano, Kashihara; Mitsuhiro Matsumoto, Tenri, and Toshiki Hijikata, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 875,735, Jun. 18, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 267,730
Claims priority, application Japan, Jun. 18, 1985, 60-133558
Int. Cl.[4] G02F *1/37*
U.S. Cl. 350—96.15 **9 Claims**



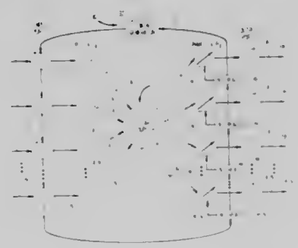
1. A higher harmonic wave generator for generating a higher harmonic wave from an incident fundamental wave, comprising:
- first optical waveguide means of a nonlinear optical material having a first width for obtaining an effective refractive index and positioned in a first direction for guiding the incident fundamental wave; and
- second optical waveguide means of said nonlinear optical material having a second width for obtaining said effective refractive index, being optically connected to said first optical waveguide means and positioned in a parallel direction to said first direction, for generating and guiding the higher harmonic wave of the incident fundamental wave;
- wherein said first and second widths of said first and second optical waveguide means are controlled for obtaining said effective refractive index for said first and second optical waveguide means.

4,896,934

BROADBAND OPTICAL MULTICAST SWITCH

Edward Arthurs, Summit; Matthew S. Goodman, Belle Meade; Chong K. Kim, Livingston, and Tony T. Lee, Bridgewater, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 3, 1989, Ser. No. 306,528
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 **16 Claims**



16. An optical switch with multicasting capability comprising
- a plurality of input ports and a plurality of output ports,
- each of said input ports including means for reserving one or more particular output ports for a packet by writing information into a control token during a first control phase of a packet transmission cycle,
- each of said output ports including means for reading a control token during a second control phase of a packet transmission cycle so that said particular output ports are able to receive packets from particular input ports, and
- an optical transmission network for routing said packets from said particular input ports to said particular output ports during a transmission phase of a packet transmission cycle.

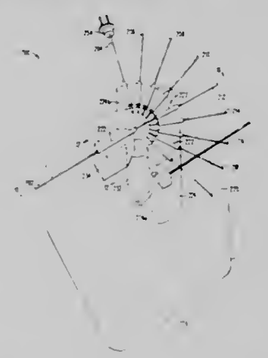
4,896,935

FIBER OPTIC SWITCH

Ho-Shang Lee, 1826 Curtis St., Berkeley, Calif. 94702

Continuation of Ser. No. 945,385, Dec. 22, 1986, Pat. No. 4,834,488, which is a continuation-in-part of Ser. No. 785,166, Oct. 7, 1985, abandoned. This application Nov. 7, 1988, Ser. No. 268,046
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **12 Claims**

1. An optical switching device comprising:
- n fixed optical fibers, n being an integer greater than 1, said n fibers located so that one end of each fiber is optically aligned with a center point and so that said ends of the fibers are substantially coplanar;
- an optical fiber rotatable about an axis through said point, said fiber being coplanar with the n fixed fibers;
- a stepping motor for rotating the rotatable fiber;
- a stepping motor control system for controlling the rotation of the stepping motor to align the rotatable fiber with any one of the n fixed fibers, so that the stepping motor rotates the movable fiber by one of n preset numbers of steps, each of said n numbers of steps corresponding to the position of a fixed fiber, so that when the rotatable fiber is rotated by a number of steps selected from said n numbers of steps, the movable fiber will be substantially optically aligned with the fixed fiber whose position corresponds to said selected number of steps;



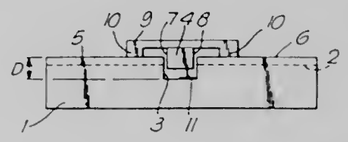
- wherein the fixed fibers are arranged so as to permit the rotatable fiber to rotate freely to align with the desired fixed fiber.

4,896,936

COMPONENT MOUNTED TO SUBSTRATE WITH OVERLYING BRIDGE-SHAPED SUPPORTE

Ian W. Stanley, Ipswich, England, assignor to British Telecommunications, Great Britain

Division of Ser. No. 80,564, Jun. 11, 1987, Pat. No. 4,846,930. This application Jan. 30, 1989, Ser. No. 303,275
Claims priority, application United Kingdom, Oct. 16, 1985, 8525458; Oct. 16, 1985, 8525459; Oct. 16, 1985, 8525460; Oct. 16, 1985, 8525461; Oct. 16, 1985, 8525462; Oct. 23, 1985, 8526189
Int. Cl.[4] G02B *6/36*; H01L *23/02*; H01S *3/08*
U.S. Cl. 350—96.20 **10 Claims**



1. In combination:
- a component secured to the lower side of a bridge-shaped support,
- at least one of the support and the substrate including locator means for locating the support in at least one direction relatively to the substrate,
- said support and component being secured to a substrate with the component located between the support and the substrate.

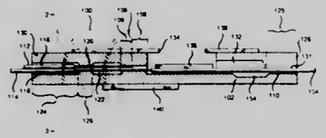
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,937

OPTICAL FIBER SWITCH

Richard T. Kraetsch, Berkeley Heights; Richard J. Pimpinella, Hampton; Leonard W. Schaper, and King L. Tai, both of Berkeley Heights, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 2, 1988, Ser. No. 227,220
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **17 Claims**



1. An optical fiber switch assembly comprising a fixed optical fiber (**114**), a switchable optical fiber (**104**), a base member (**102**) having an optical fiber groove extending longitudinally from one side of the base member to the opposite side and having a first section for supporting the fixed optical fiber and a second section for supporting the switchable optical fiber in optical alignment with the fixed fiber, being characterized in that

the first and second groove sections each contain a first portion (**124, 144**) for fixedly supporting a sheathed part of its respective fiber and a second portion (**108, 109**) of dimensions smaller than the first portion for supporting an unsheathed end part of its fiber and optically aligning the unsheathed end part with that of the other fiber, and

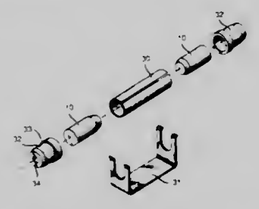
means (**100, 134, 136, 138**) for moving at least the unsheathed end part of the switchable fiber to a position of optical disconnection, with the fixed fiber.

4,896,938

OPTICAL FIBER CONNECTOR COMPRISING GLASS TUBES

Terry D. Mathis, Lilburn, and Calvin M. Miller, Roswell, both of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 527,341, Aug. 29, 1983, Pat. No. 4,850,670. This application Feb. 27, 1989, Ser. No. 315,984
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 **8 Claims**



1. A connector for end-to-end connecting at least one pair of optical fibers, the connector comprising

(a) a first and a second glass tube, each given glass tube having an end face and an outer cylinder surface and being of substantially uniform circular cross section over its whole length, but not excluding the optional presence of a chamfer or chamfers and/or a fiber entry cone, the bore of the given glass tube being substantially concentric with the outer cylinder surface of the tube and having a diameter that is larger than the diameter of the fiber to be received therein, the fiber to extend at least the length of the bore and to be maintained therein fixed with respect to the given glass tube by UV-curable adhesive means, whereby the fiber can be secured in the bore by exposure of the given glass tube with the fiber therein to ultraviolet radiation;

(b) alignment means comprising an alignment sleeve that contactingly at least partially surrounds both the first and the second glass tubes such that the outer cylinder surfaces of the respective glass tubes are maintained concentrically aligned, with the respective end faces facing each other; and

(c) means for maintaining the distance between the respective end faces substantially fixed.

4,896,939

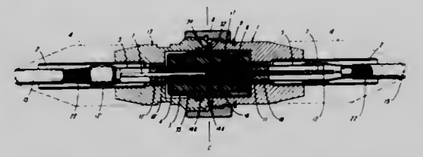
HYBRID FIBER OPTIC/ELECTRICAL CABLE AND CONNECTOR

Donald G. O'Brien, N. Hampton, N.H., assignor to D. G. O'Brien, Inc., Seabrook, N.H.

Filed Oct. 30, 1987, Ser. No. 115,258
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **9 Claims**







1. A signal communication cable having at least one optical fiber and further comprising first conductor means, including

A. a first tubular electrical conductor enclosing said optical fiber, for supporting said optical fiber,

B. a second tubular electrical conductor coaxially enclosing said first electrical conductor, and

C. dielectric support means seatingly disposed between said first and second electric conductors, said dielectric support means providing a substantially uniform dielectric layer having a uniform dielectric constant along said cable, for maintaining said first electric conductor at a selected relative location within said second electrical conductor, and for maintaining a selected electrical impedance between said first and second electrical conductors so that said first and second electrical conductors are substantially coaxial, and so that said first and second electrical conductors have a selected uniform electrical impedance therebetween.

8. Signal communication connection apparatus according to claim 7 further comprising

A. first pressure sealing means sealingly engaged between said secured-together plug and receptacle housing means, for sealing ambient fluid from the location of said aligned and precision-spaced support tube ends,

B. second pressure sealing means on said plug means sealingly engaged between said inner and outer electrical conductors of said plug means for blocking the transfer of fluid pressure axially between the location said aligned and precision-spaced support tube ends and locations in said plug means distal therefrom, and

C. third pressure sealing means on said receptacle means sealingly engaged between said inner and outer electrical conductors of said receptacle means for blocking fluid pressure axially between the location of said aligned and precision-spaced support tube ends and locations in said receptacle means distal therefrom.

4,896,941

IMAGE-TRANSMITTING FIBER

Shotaro Hayashi; Tsugio Sonobe; Kiyonori Ishii, all of Ibaraki; Kazuo Sanada; Sadao Chigira, both of Chiba; Takashi Tsumanuma, and Osamu Fukuda, both of Sakura, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan and Fujikura Ltd., both of Tokyo, Japan

Continuation of Ser. No. 201,385, May 31, 1988, abandoned, which is a continuation of Ser. No. 852,583, Apr. 16, 1986, abandoned. This application Mar. 2, 1989, Ser. No. 325,033
Claims priority, application Japan, Apr. 27, 1985, 60-93269
Int. Cl.[4] G02B 5/17
U.S. Cl. 350—96.25 **13 Claims**



1. In image-transmitting fiber for transmitting an image of an object from one end of the fiber to the other end, the fiber comprising at least one first fiber element for transmitting light power therethrough, and a plurality of second fiber elements disposed around and extending along said first fiber element, said second fiber elements cooperating with one another for transmitting the image of the object therethrough, and said first fiber element being greater in diameter than each of said second fiber elements.

4,896,940

OPTICAL FIBER CABLE FOR USE IN HIGH TEMPERATURE CONTAMINATING ENVIRONMENT

Krishnaswamy Kathiresan, Marietta; Parbhubhai D. Patel, Dunwoody, and Manuel R. Santana, Doraville, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 90,075, Aug. 27, 1987, abandoned. This application Feb. 10, 1989, Ser. No. 309,897
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **13 Claims**



1. A communications cable which comprises:

a core which includes at least one optical transmission medium;

an inner tubular member which comprises a material that allows the transmission media at least one transmission medium to continue to be effective notwithstanding exposure of the cable to temperatures in the range of at least about 500° F. for a period of time as long as about 30,000 hours and which encloses said core;

sealing means enclosing said inner tubular member for providing a sealed enclosure therefor along the length of said cable to prevent the ingress of contaminants and for providing the cable with flexibility; and

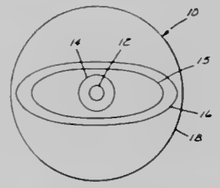
an outer tubular member which is made of a braided metallic material and which encloses said sealing means and which is capable of providing said cable with mechanical protection and tensile strength notwithstanding exposure to said temperatures for said period of time.

4,896,942

POLARIZATION-MAINTAINING OPTICAL FIBER

James R. Onstott; Michael J. Messerly; Raymond C. Mikkelson, and Lawrence J. Donalds, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 3, 1989, Ser. No. 306,822
Int. Cl.[4] G02B 6/22
U.S. Cl. 350—96.33 **17 Claims**



1. A single-mode, polarization-maintaining optical fiber comprising a core, a cladding which includes asymmetric stress-applying region or regions and an inner barrier between the core and the stress-applying region or regions, and a jacket surrounding the cladding, characterized by the feature that:

the cladding and any portion of the jacket that is within five times the radius of the mode-field in the core have a substantially uniform index of refraction that is at least 0.005 less than that of pure silica, and the index of refraction of the core is at least as great as that of pure silica.

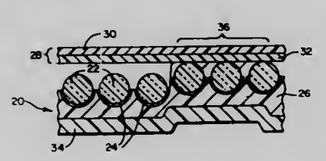
VOL 1110 ISS 5 JA 30 1990 UMI

4,896,943

ENCAPSULATED-LENS RETROREFLECTIVE SHEETING HAVING IMPROVED COVER FILM

Howard R. Tolliver, Woodbury; Roger R. Kult, Maplewood; Terry R. Bailey, Woodbury, and Arthur D. Dickson, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1987, Ser. No. 49,674
Int. Cl.[4] G02B *5/128*
U.S. Cl. 350—105 **25 Claims**



1. An encapsulated-lens retroreflective sheeting comprising a monolayer of lenses partially embedded in a binder layer, a specularly reflective layer underlying the lenses, and a cover film sealed to the binder layer along a network of interconnecting lines forming hermetically sealed cells within which the lenses are encapsulated and have an air interface, wherein:

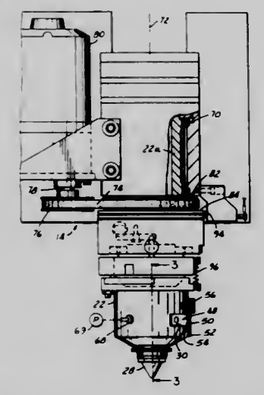
the cover film comprises polyethylene, or polypropylene; or a copolymer comprising a major portion by weight of at least one of ethylene or propylene and a minor portion by weight of at least one comonomer; blends of polyethylene, polypropylene, or copolymers.

4,896,944

METHOD AND APPARATUS FOR TREPANNING WORKPIECES

Timothy L. Irwin, 635 Hidden Valley Dr., Apt. 113, Ann Arbor, Mich. 148104, and William L. Clayton, Jr., 317 Grand River Ave., Fowlerville, Mich. 48834

Filed Jul. 25, 1988, Ser. No. 223,360
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—247 **10 Claims**



1. A beam delivery assembly for focusing a beam of collimated radiation from an energy source comprising:

a lens holder in said housing having a lens supported thereon in a first aligned position wherein the optical axis of said lens is congruent with a longitudinal axis;

means for supporting said lens holder for movement laterally within said housing in a plane generally perpendicular to the path of the beam;

means for supporting said housing for rotation about its vertical longitudinal axis to rotate the lens and lens holder; and

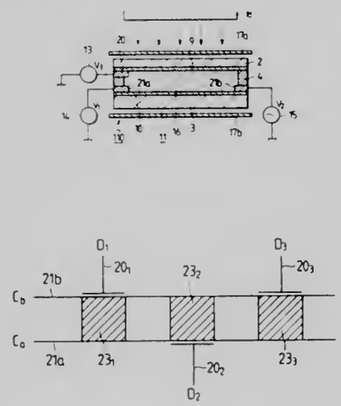
positioning means for adjusting the supported lens with respect to said longitudinal axis for producing a variable orbital path of the focused beam on a workpiece.

4,896,945

LIQUID CRYSTAL CELL ARRAY AND METHOD FOR DRIVING THE SAME

Yuji Ooba, Tokyo; Tadaaki Masumori, Kodaira, and Shigeo Sugihara, Kunitachi, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 280,925
Claims priority, application Japan, Dec. 14, 1987, 62-315709; Dec. 21, 1987, 62-321401; Sep. 20, 1988, 63-233578
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—332 **19 Claims**



1. A liquid crystal cell array comprising:

a first transparent substrate;

a second transparent substrate disposed in parallel and opposite to the first transport substrate;

a plurality of first transparent electrodes arranged on the inner surface of the first transparent substrate;

a plurality of individual cell drive lines formed on the inner surface of the first transparent substrate and each connected to one of the plurality of first transparent electrodes;

at least one second transparent electrode formed on the inner surface of the second transparent substrate in an opposed relation to the first transparent electrodes;

first and second common-side electrodes connected to both ends of the second transparent electrode;

a first common drive line formed on the inner surface of the second transparent substrate and connected to the first common-side electrode of the second transparent electrode;

a second drive line formed on the inner surface of the second transparent substrate and connected to the second common-side electrode of the second transparent electrode; and

liquid crystal sealed between the first and second transparent substrates, said liquid crystal being of a type which reverses its dielectric anisotropy when a driving frequency therefor changes from a frequency above to a frequency below a critical frequency and vice versa;

regions over which light is transmitted through the first transparent electrodes and the second transparent electrode defining a plurality of cell windows.

8. A method for driving a liquid crystal cell array which includes a first transparent substrate which has formed thereon a plurality of first transparent electrodes and a plurality of individual cell drive lines connected to the first transparent electrodes, respectively, a second transparent substrate which has formed thereon at least one second transparent electrode opposed to the first transparent electrodes, respectively, and having common-side electrodes on its both sides, a first common drive line connected to one of the common-side electrodes of the second transparent electrode, a second common drive line connected to the other common-side electrode of the second transparent electrode, and liquid crystal sealed between the first and second transparent substrates, the liquid crystal having dielectric anisotropy which reverses according to frequency, and in which regions over which light is transmitted through the first transparent electrodes and the second transparent electrode disposed opposite thereto define a plurality of cell windows;

wherein, in a close mode for closing all of the cell windows, a low-frequency voltage is applied across the first transparent electrodes and the second transparent electrode disposed opposite thereto; and

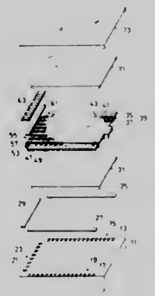
wherein, in a diaphragm mode for diaphragming at least one of the cell windows, low-frequency voltages corresponding to respective pixel signals are applied to the first transparent electrodes and two different high-frequency voltages are applied to the first and second common drive lines, respectively, forming a high-frequency gradient the second transparent electrode.

4,896,946

LIQUID CRYSTAL DISPLAY DEVICE

Takumi Suzaki, Tokyo; Kiyohiro Uehara, and Ryo Niitsuma, both of Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 857,191, Apr. 29, 1986, abandoned. This application Nov. 30, 1988, Ser. No. 277,500
Claims priority, application Japan, May 13, 1985, 60-069385[U]; May 14, 1985, 60-070116[U]; May 22, 1985, 60-108241; May 22, 1985, 60-108242
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—336 **1 Claim**



1. A liquid crystal display device comprising:

a circuit board having an outer electrode terminal section for a signal wire;

a liquid crystal display cell including a flexible film used as an upper substrate and a lower substrate and having an electrode terminal section for a signal wire; and

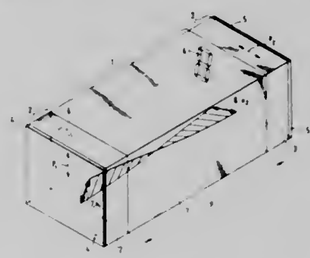
said upper substrate having projecting edges extending beyond corresponding edges of said lower substrate, and said electrode terminal section formed on the lower side of the upper substrate of the liquid crystal cell and said outer electrode terminal section of the circuit board being connected by a film connector of anisotropic conductivity and a flexible printed circuit substrate by applying heat and pressure thereto, so that said electrode terminal section and said outer electrode terminal section are interconnected and said liquid crystal cell is secured to said circuit board.

4,896,947

LIQUID CRYSTAL DISPLAY CELL

Franz Leenhouts, Kaiseraugst, Switzerland, assignor to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 246,026, Sep. 14, 1988, abandoned, which is a continuation of Ser. No. 106,696, Oct. 8, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,332
Claims priority, application Switzerland, Oct. 24, 1986, 4234/86
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—337 **9 Claims**



1. A liquid crystal display (LCD) cell, comprising a twisted nematic liquid crystal having a positive dielectric anisotropy, which is disposed between two plates having electrodes and surface orientations, and wherein the plates are disposed between two polarizers, and further including, in combination, a twist angle ϕ between the nematic directors of the liquid crystal at the respective plates of from about 10° to about 80°; an angle θ between the surface orientation direction and the polarization direction of the plate on the light incidence side of from about −30° to about 60°; an angle ψ between the polarization directions of the two polarizers of from about 80° to about 110°; and an optical path difference $\Delta n.d$ of from about 0.2 to about 0.7 μm.

4,896,948

SIMPLIFIED DOUBLE-CAVITY TUNABLE OPTICAL FILTER USING VOLTAGE-DEPENDENT REFRACTIVE INDEX

Nicholas R. Dono, Hopewell Junction; Paul E. Green, Jr., Mount Kisco, both of N.Y., and Philippe A. Perrier, Vivolay, France, assignors to International Business Machines Corporation, Armonk, N.Y.

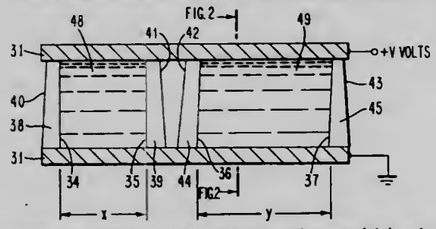
Filed Feb. 21, 1989, Ser. No. 312,285
Int. Cl.[4] G02F *1/01, 1/133;* G01B *9/02*
U.S. Cl. 350—355 **4 Claims**

1. A tunable optical filter, comprising:

a plurality of resonator cavities, each of said resonator cavities having reflective surfaces at each of two ends of said cavities with an electro-optic material inside said each resonator cavity;

a pair of electrodes at two opposite sides of said resonator cavities, with only a single control voltage being applied to one of said electrodes while the other of said electrodes is set at ground potential, the index of refraction of said electro-optic material in both of said cavities varying simultaneously with changes in said control voltage;

said cavities resonating at a selected wavelength when optical signals are passed through said cavities and when the index of refraction of said electro-optic material is adjusted to a predetermined value.

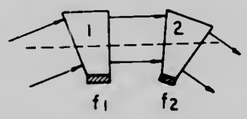


4,896,949

ACOUSTO-OPTIC TUNABLE BANDPASS FILTER WITH STRONG SIDEBAND SUPPRESSION

Nathan T. Melamed, Pittsburgh, and Richard A. Elco, Upper Allen Township, Cumberland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1988, Ser. No. 186,872
Int. Cl.[4] G02F *1/11*
U.S. Cl. 350—358 **6 Claims**



1. An acousto-optic tunable filter comprising:

optically birefringement crystal means, having a first part with an input face and a first optic axis and a second part with a second optic axis, for receiving light incident to the input face and for diffracting the light in said first part and in said second part; and

acoustic means for launching acoustic waves into said first part and into said second part so that said diffraction of said first part subjects the incident light to filtering of a first bandpass characteristic having a center optical wavelength and so that said diffraction of said second part subjects light from the first part to filtering of a second bandpass characteristic being different than said first bandpass characteristic having said center optical wavelength.

4,896,950

ZOOM LENS OF HIGH POWER VARYING RATIO

Hiroshi Endo, Kanagawa, and Sadatoshi Takahashi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

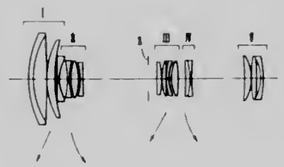
Filed Feb. 18, 1988, Ser. No. 157,241
Claims priority, application Japan, Feb. 20, 1987, 62-038547; Feb. 20, 1987, 62-038548; Apr. 24, 1987, 62-101571; Apr. 24, 1987, 62-101572; Jul. 2, 1987, 62-166217
Int. Cl.[4] G02B *15/14, 9/64*
U.S. Cl. 350—427 **14 Claims**

1. A zoom lens comprising, as counted from the object side of te lens, a first lens group having a positive refractive power, a second lens group having a negative refractive power, a third lens group having a positive refractive power, a fourth lens group having a negative refractive power and a fifth lens group having a positive refractive power, wherein, assuming that, when varying the magnifying power of said lens from a wide angle end to a telephoto end, an air space between an i-th lens unit and an i+1-th lens unit varies to a degree ΔDi, said i-th lens unit has a focal length fi, the focal length of the whole lens system as obtained at the telephoto end is FT, and a space between said first and second lens units varies to a degree ΔE1 between the wide angle end and the telephoto end, the following conditions are satisfied:

$\Delta D1>0$

$\Delta D2<0$

$\Delta D3>0$



$\Delta D4<0$

$0.046<|f2/FT|<0.093$

$0.22<|f1/FT|<0.6$

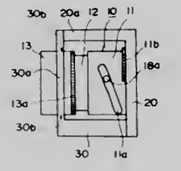
$2.1<|\Delta E1f2|<3.6$

4,896,951

LENS MOUNT ASSEMBLY

Toshikatsu Atsuta; Hirotaka Shiroshita; Naokiro Hisamoto; Takayuki Kuboderа; Kazuo Ishikawa; Masao Tsujimura, all of Tokyo, and Eiichi Mochizuki, Nagano, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jun. 29, 1988, Ser. No. 212,879
Claims priority, application Japan, Jul. 16, 1987, 62-109260[U]; Jul. 31, 1987, 62-116667
Int. Cl.[4] G02B *15/14, 7/04*
U.S. Cl. 350—429 **7 Claims**



1. A lens mount assembly for an optical instrument having a body, said assembly comprising:

a zooming mechanism comprising an optical system having a plurality of optical elements, a cam barrel, and a movable barrel movable along an optical axis in operative association with rotation of said cam barrel and thereby to change a relative position of respective optical elements of the optical system; said zooming mechanism further comprises a front optical assembly including a focussing mechanism having a rotatable barrel mounted on a front side of said movable barrel to displace the front optical assembly for focussing control; and

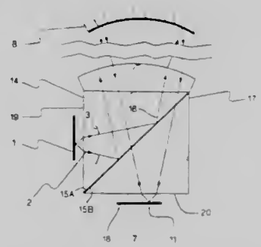
a barrel supporting mechanism comprising a support member secured directly to the body of the optical instrument so as to project forward from said body of the optical instrument, said support member having a receiving opening for slidably receiving the rotatable barrel of said lens mount assembly.

4,896,952

THIN FILM BEAMSPLITTER OPTICAL ELEMENT FOR USE IN AN IMAGE-FORMING LENS SYSTEM

Alan E. Rosenbluth, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1988, Ser. No. 185,187
Int. Cl.[4] G02B *17/00*
U.S. Cl. 350—445 **9 Claims**



1. A beamsplitter structure producing a division of wavefront in each of a plurality of beams of radiation propagating between object and image fields of an optical lens system, wherein said divided wavefronts propagate to the image field of said optical system substantially free of aberration, distortion, and apodization, said beamsplitter structure comprising:

first and second prisms disposed in an optical lens system, said first and second prisms composed of a material capable of supporting the propagation of

image-forming beams of radiation having divergence angles and wavelength employed by said optical system and including at least one plane surface prism face on each prism,

a plurality of thin-film coatings of dielectric materials layered on said plane surface of said first prism,

wherein said plurality of thin-film coatings on said first prism include

a first number of coating materials having selected composition and thicknesses to establish the approximate overall reflectivity of said beamsplitter, each of said coating materials having phase thickness less than one quarter of the minimum wavelength present in the central one of said image-forming beams; and

a second number of coating materials having selected composition and thicknesses for correcting any non-trivial phase aberration and any non-uniform amplitude reflectance and transmittance provided by the initial plurality of coatings with minimal added net reflectivity

said materials and having uniform thicknesses over said surface to produce a compensating phase distribution and a compensating amplitude distribution in the reflected and transmitted portions of said beams, when said beams are incident at said plane surface from outside said first prism or from inside said first prism;

said compensating phase and amplitude distributions being substantially the algebraic negatives of the phase aberrations and amplitude nonuniformities of the remainder of said optical lens system,

wherein said compensating phase distribution produced by said thin-film coatings, corresponds to the trivial aberrations of piston and field-independent image shift, and wherein said compensating amplitude distribution corresponds to substantially equal and uniform reflection and transmission of each of said beams over their full divergence,

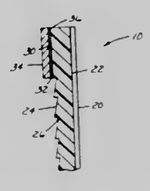
said at least one plane surface of said second prism being bonded to said thin film coatings on said first prism, on the opposite side of said thin film coatings from said first prism on which said thin film coatings are layered.

4,896,953

ANAMORPHIC WIDE ANGLE SAFETY LENS

Sanford Cobb, Jr., Saint Mary's Point, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 8, 1988, Ser. No. 229,653
Int. Cl.[4] G02B *3/08*
U.S. Cl. 350—452 **5 Claims**



1. A wide angle safety lens for use in a passenger side door of a motor vehicle, said lens having first and second major surfaces said first major surface being a structured surface having a plurality of linear prisms thereon, said linear prisms forming a Fresnel lens that acts like a cylindrical lens having a first negative focal length and said second major surface being a structured surface having a plurality linear prisms thereon, said linear prisms on said second major surface being perpendicular to said linear prisms on said first major surface and said linear prisms on said second major surface forming a Fresnel lens that acts like a cylindrical lens having a second negative focal length.

4,896,954

REARVIEW MIRROR

Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025

Filed May 25, 1989, Ser. No. 356,710
Int. Cl.[4] G02B *5/08*
U.S. Cl. 350—632 **10 Claims**



1. A rearview mirror especially adapted for aerodynamically streamlined automobiles having side walls curved into the plane of a downwardly sloped hood at the front end of the vehicle which comprises a frame having a base, an upstanding neck, and a mirror housing with an open rear end on the top of the neck, a mirror tiltably mounted in the mouth of the open rear end of the mirror housing, means releasably mounting said base on the side wall of the automobile adjacent the front end thereof to selectively position the mirror housing above the hood and laterally outward from the side wall to establish an elongated sight line between the eyes of the driver and the mirror for reducing the angle of incidence and the angle of reflection to a minimum for avoiding blind spots alongside the rear end of the vehicle, and means for permanently mounting said base on said side wall at the selected position.

4,896,955

EYEGLASS FRAME INCLUDING SHAPE-MEMORY ELEMENTS

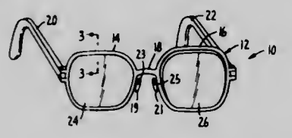
Robert B. Zider, Portola Valley, and John F. Krumme, Woodside, both of Calif., assignors to CVI/Beta Ventures, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 876,077, Jun. 19, 1986, Pat. No. 4,772,112, which is a continuation-in-part of Ser. No. 676,823, Nov. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 558,604, Dec. 6, 1983, abandoned. This application Dec. 5, 1988, Ser. No. 309,205

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] G02C *1/04*

U.S. Cl. 351—41 **8 Claims**



1. An eyeglass frame having at least a portion thereof fabricated from nickel-titanium based shape-memory alloy, said portion being in the work-hardened pseudoelastic metallurgical state, said portion having been subjected to work-hardening and having a low effective elastic modulus giving a soft, springy feel, said portion having greater than 3% elasticity over a temperature range from −20° C. to +40° C.

4,896,956

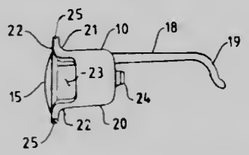
SPECTACLES WITH SINGLE PIVOT FOLDED REAR VISION ELEMENTS

Joseph J. Berke, 2063 Long Lake Shore, West Bloomfield, Mich. 48033, and A. Gil Spear, Jr., Vero Beach, Fla., assignors to Joseph J. Berke, West Bloomfield, Mich.

Filed Sep. 13, 1988, Ser. No. 243,871

Int. Cl.[4] G02C *11/02*

U.S. Cl. 351—50 **5 Claims**



1. A pair of spectacles for viewing objects behind a forward facing user of the kind having a pair of slender temples rotatably attached to the ends of a conventional eyeglass frame without side shields whereby the side vision of the user of the spectacles is unobstructed by the frame, comprising, in combination: an eyepiece, a conventional eyeglass frame without side shields, a pair of symmetrically opposite slender temples attached to the opposite outer end portions of the frame for rotation about a pair of spaced apart axes, a pair of lenses mounted in the frame, at least one folded rear vision element attached to the eyepiece at a position which is laterally intermediate to the ends of the frame, said rear vision element having a window bounded by a pair of spaced apart arms rotatably attached to the upper and lower intermediate portions of said frame to enable the user through the window between said arms to view objects at the side of the user without obstruction and an adjoining reflective portion at a fixed angular relationship to said arms to enable the user through said lenses to view objects behind the user, said element being selectively adjustable about a single axis to an operative position whereat said reflective portion is in confronting relationship to a user of said spectacles and to a non-operative position whereat said reflective portion is in side facing relationship to the user.

4,896,957

NOSE PAD FOR EYEGLASSES

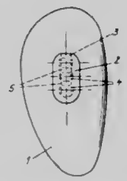
Herbert Speer, Weberstrasse 48 (BRD), D-7531 Eisingen, Fed. Rep. of Germany

Continuation of Ser. No. 69,381, Jul. 1, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,596

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1986, 3638311

Int. Cl.[4] G02C *5/12*

U.S. Cl. 351—137 **1 Claim**



1. In a nose pad assembly for eyeglasses, which assembly comprises

a plastic nose pad having a rear portion formed with a generally vertical socket hole, which is defined by a boundary surface and open at its top,

a mounting arm having a depending free end portion extending into said hole from above, and

detent means for resiliently and slidably interlocking said rear portion and said free end portion in a plurality of vertically spaced apart positions,

the improvement residing in that

said socket hole is provided with at least two spaced ball sockets, said ball sockets being spaced from each other by lands, each ball socket having a pair of flats facing each other and aligned along a transverse axis passing through said rear portion and said nose pad, said depending free end portion of said mounting arm terminating in a detent ball, said detent ball having a pair of opposed flats which are positioned to interengage any pair of the flats facing each other in said socket hole, said detent ball resiliently interfitting with any one of said ball sockets so that the nose pad is capable of a limited lateral pivotal movement about the vertical axis of the free end portion to adjustably conform to a wearer's nose.

4,896,958

FLEXIBLE CONTACT LENS FOR ENHANCED MOVEMENT ON THE EYE

Keith S. Ames, 102 Mayfair Dr., Rochester, N.Y. 14617; Steven G. Zantos, 53 Selborne Chase, Fairport, N.Y. 14450, and Henry A. Knoll, 19 Oak St., Apt. #4, Bath, Me. 04530

Filed Feb. 18, 1988, Ser. No. 157,014

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—160 R **5 Claims**

1. A flexible contact lens, including a convex-concave central portion, a peripheral flange portion, and a concave-convex transition portion joining said central portion and said peripheral flange portion whereby said flange portion is outwardly extending relative to said central portion;

the inner edge of said peripheral flange being thereby raised from the eye surface to facilitate movement of said lens over the limbal region of the eye; and



the extent of said peripheral flange forward from the eye surface being effective for eyelid contact to enhance movement of said lens on the eye.

4,896,959

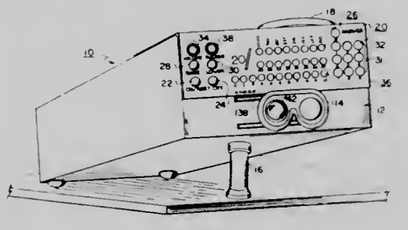
VISUAL ACUITY UNIT FOR TREATMENT OF AMBLYPIA

Richard W. O'Brien, Philadelphia, Pa., assignor to Visual Enhancement, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 36,205, May 4, 1979, Pat. No. 4,726,672, which is a continuation of Ser. No. 771,703, Sep. 3, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 120,877

Int. Cl.[4] G61B *3/00*

U.S. Cl. 351—203 **20 Claims**



1. In an ocular stimulator unit to improve a user's acuity having a solitary visual target presented without interference from other visual stimulus, means for randomly selecting and generating at least one of a number of various figures to be displayed on the target, a keyboard through which the user can respond to various figures seen on the visual target, means for comparing the displayed figure with responses from the keyboard, means to inform the user of the correctness or incorrectness of the response, and means to adjust the apparent size of the displayed figure to maintain the figure displayed at a level of minimal discernible size, the improvement which comprises

wherein the means to adjust the apparent size of the displayed figure comprises multiple lighted visual targets, each target available to serve as the solitary visual target presented individually during treatment and without interference from the other targets

wherein said multiple visual targets are placed in a darkened chamber;

means to maintain each of the visual targets at a different acuity demand level; and

means for the user to select electronically which of the multiple targets to view.

4,896,960

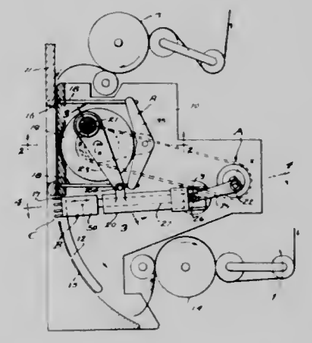
HIGH SPEED TRANSPORT FOR LARGE FILM FORMATS

Geoffry H. Williamson, 10994 Freemont St., Yucaipa, Calif. 92399

Filed Oct. 13, 1988, Ser. No. 257,099

Int. Cl.[4] G03B *1/22*

U.S. Cl. 352—193 **22 Claims**



1. A film transport for reducing acceleration and deceleration of claw pin engagement, especially in wide format motion picture cameras and projectors, and including;

a frame having an aperture plate with a plate opening and behind which there is a register plate with a film path therebetween, the aperture and register plates and film path therebetween having an arcuate portion below the plate opening and concentric with an oscillation axis spaced rearwardly therefrom,

a claw arm carried on said oscillation axis with an end thereof in spaced relation to the arcuate portion of the register plate to swing concentrically therewith and having a wrist pin at a fixed radius from the oscillation axis,

a drive axis spaced rearwardly from the register plate and above the oscillation axis, and above the wrist pin of the claw arm,

a first crank shaft on the drive axis and having a crank pin for oscillating the claw arm, there being a connecting rod from said crank pin to the wrist pin of the claw arm,

a claw pin carrier reciprocably carried at the end of the claw arm in spaced relation to the arcuate portion of the register plate and having at least one claw pin projecting therefrom to disengageably enter film perforations,

a control axis spaced rearward of the oscillation axis,

a second crank shaft on the control axis and having a crank pin for reciprocating the claw pin carrier, there being a connecting rod from said crank pin to a wrist pin of the claw pin carrier,

and a drive means for rotating the two crank shafts at the same rate of angular momentum.

4,896,961

PARTICLE ANALYZING APPARATUS

Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 106,025, Oct. 8, 1987, abandoned, which is a continuation of Ser. No. 811,462, Dec. 20, 1985, abandoned. This application Jan. 15, 1989, Ser. No. 368,151

Claims priority, application Japan, Dec. 26, 1984, 59-278154

Int. Cl.[4] G01N *21/64, 21/53*

U.S. Cl. 356—73 **9 Claims**

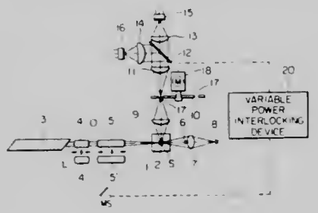
1. A particle analyzing apparatus, comprising:

an irradiating optical system for irradiating a particle to be examined flowing one by one with a laser light beam;

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a measuring optical system for measuring at least fluorescent light received from the particle;

a variable lens system for varying the form of the laser light beam provided in said irradiating optical system; and



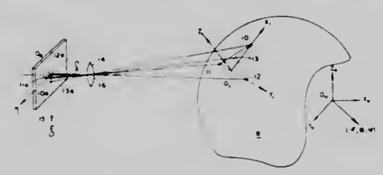
means for varying the form of a viewing field provided at a position in said measuring optical system optically conjugate with the position of the particle to be irradiated by the laser light beam and adapted to vary the form of the viewing field substantially simultaneously with a change in the form of the laser light beam.

4,896,962

SYSTEM FOR MEASURING THE ANGULAR DISPLACEMENT OF AN OBJECT

Anatoly Mess, and Joseph Krimerman, both of Haifa, Israel, assignors to El-Op Electro Optics Industries, Ltd., Rehovot, Israel

Filed May 26, 1988, Ser. No. 199,284
Claims priority, application Israel, Jun. 1, 1987, 82731
Int. Cl.[4] G01C *1/00*; G01J *1/20*
U.S. Cl. 356—152 **6 Claims**



1. A helmet line of sight measuring system for determining the spatial location of a helmet and the line of sight of an observer wearing said helmet, both relative to a coordinate reference frame, said system comprising:

a plurality of assemblies of light sources distributed on said helmet, each assembly comprising three light sources positioned at the vertices of a triangle and a fourth light source outside the plane of said triangle, there being a predetermined geometry associated with said light sources;

optical means fixed in space relative to said coordinate reference frame for imaging the light emitting by the light sources in at least one of said assemblies onto an area image sensor located a predetermined distance from said optical means producing two-dimensional image data of said light sources on said area image sensor; and

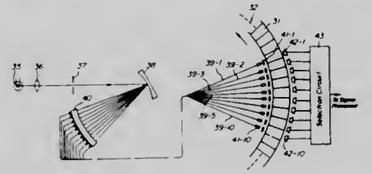
computing means coupled to said area image sensor and responsive to said predetermined geometry and said predetermined distance for determining the spatial coordinates of said helment from said image data.

4,896,963

AUTOMATIC ANALYZER

Yutaka Kato, Shizuoka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 275,417
Claims priority, application Japan, Dec. 2, 1987, 62-303207
Int. Cl.[4] G01J *3/36*; G01N *21/13*
U.S. Cl. 356—328 **8 Claims**



1. An automatic analyzer comprising

a reaction line;

means for transporting a number of reaction vessels arranged on the reaction line with a first pitch, said reaction vessels containing therein test liquids; and

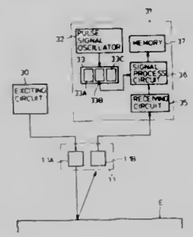
photometering means including a light source for emitting white light, means for dividing the white light into a plurality of light beams having different wavelengths, a plurality of light guides each having incident ends arranged to receive a respective one of said plurality of light beams and exit ends arranged along the reaction line with a second pitch which is different from said first pitch for projecting the light beams onto reaction vessels along measuring optical paths, and a plurality of light detectors each arranged on respective measuring optical paths to receive respective light beams emitted from the exit ends of respective light guides and transmitted through reaction vessels; whereby test liquids contained in a plurality of reaction vessels situating at the measuring optical paths are photometered with the aid of said plurality of light beams having different wavelengths in a time sequential manner, while the reaction vessels are moved along the reaction line over the first pitch.

4,896,964

SYSTEM FOR MEASURING IRREGULARITIES OF ROAD SURFACE

Masahiro Kitazume, Tokyo, Japan, assignor to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,286
Claims priority, application Japan, Oct. 10, 1986, 61-240245
Int. Cl.[4] G01B *11/30*
U.S. Cl. 356—376 **14 Claims**



1. A system for measuring irregularities of a road surface by the use of laser rays, comprising:

(a) a laser ray transmitting and receiving section positioned above said road surface;

(b) a body frame for holding said laser ray transmitting and receiving section at a predetermined height; and

(c) carrier means mounted on said body frame for moving said laser ray transmitting and receiving section along said body frame from one end to the other, said laser ray transmitting and receiving section being operatively connected to an exciting circuit section for energizing the continuous operation of said laser ray transmitting section, said laser ray transmitting and receiving section being operatively connected to a signal process circuit section for receiving reflected and diffused rays from said road surface, and detecting irregularities information, said signal process circuit section comprising:

(i) means for producing pulse signals at a predetermined timing;

(ii) a plurality of frequency dividers for receiving said pulse signals;

(iii) means for selecting one of said frequency dividers to obtain a desired output signal;

(iv) means for receiving a signal from said laser ray receiving section; and

(v) a signal process circuit for receiving a signal from said receiving means to determine distance information and irregularities information, said signal process circuit being actuated in synchronism with said output signals from said selected frequency divider;

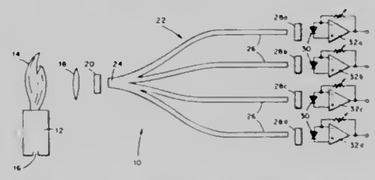
whereby the number of times of signal processing per unit time to received signals in said signal process circuit is changed in synchronism with a moving speed of said laser ray transmitting and receiving section on said body frame.

4,896,965

REAL-TIME ALKALI MONITORING SYSTEM

David R. Goff, Christiansburg, Va.; Robert R. Romanosky, Prosperity, Pa., and Peter Hessel, Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 14, 1988, Ser. No. 244,759
Int. Cl.[4] G01N *21/72*
U.S. Cl. 356—417 **21 Claims**



1. A real-time alkali monitoring system for detecting selected alkali emissions from a light source in the presence of interfering background radiation, comprising:

a bifurcated fiber optic cable having first and second branches attached to a common trunk and adapted at the common end to optically couple light from a light source to said cable;

a first bandpass optical filter having a passband centered about a selected emission line and a bandwidth at least as wide as the selected emission line and being disposed to intercept light passing from the end of said first branch of said cable;

a second bandpass optical filter having a passband centered about a wavelength identical to that of said first bandpass filter and a bandwidth substantially wider than the bandwidth of said first bandpass filter and being disposed to intercept light passing from the end of said second branch of said cable;

a first light detector means for generating a first signal having an amplitude proportional to the intensity of light transmitted through said first bandpass filter,

a second light detector means for generating a second signal having an amplitude proportional to the intensity of light transmitted through said second bandpass filter;

a means for scaling one of the output signals from said detectors; and,

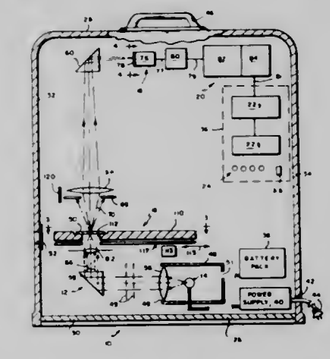
a means for calculating the difference between said scaled output signal and said other output signal to generate a third output signal having an amplitude proportional to the intensity of said emission line being monitored.

4,896,966

MOTILITY SCANNER AND METHOD

Paul Boisseau, Lexington; Diarmaid H. Douglas-Hamilton, Beverly, and Thomas P. Sosnowski, Wayland, all of Mass., assignors to Hamilton-Thorn Research, Wenham, Mass.

Filed Aug. 15, 1986, Ser. No. 897,036
Int. Cl.[4] G01N *21/00*; G06K *9/00*; C12M *1/34*
U.S. Cl. 356—442 **15 Claims**



1. A motility scanner for characterizing the motion of sperm, bacteria and particles in fluid, comprising:

(a) an optical system including an imaging lens;

(b) a source of illumination for said system;

(c) a heated specimen support disposed in the object plane of said imaging lens, said heated specimen support designed to accommodate a specimen holder;

(d) radiation sensing means coupled to said system at the imaging plane of said imaging lens;

(e) signal processing means for analyzing signals generated by said radiation sensing means; and

(f) display means coupled to said signal processing means for displaying information characteristic of said motion;

(g) wherein said imaging lens has a depth of field at its object plane of about 0.2 mm and wherein said optical system further comprises a pair of reflecting elements, a collimating lens interposed between said source of illumination and one of said pair of reflecting elements, a condensing lens mounted between said one of said pair of reflecting elements and said specimen support, optical filters to remove unwanted portions of the radiation emitted by said source, and an aperture mounted between said specimen support and said imaging lens, said motility detector further including an obscuring member disposed on said one of said pair of reflecting elements.

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4,896,967

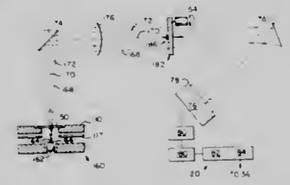
MOTILITY SCANNER AND METHOD

Diarmaid H. Douglas-Hamilton, Beverly, and Paul Boisseau, Waltham, both of Mass., assignors to Hamilton-Thorn Research, Danvers, Mass.

Continuation-in-part of Ser. No. 897,036, Aug. 15, 1986. This application Mar. 11, 1988, Ser. No. 167,682

Int. Cl.[4] G01N *21/59, 21/45, 33/487*

U.S. Cl. 356—442 **8 Claims**



1. In a motility scanner of the kind for characterizing the motion of sperm, bacteria, particles in flowing fluids and the like, and comprising:

(a) an optical system including an imaging lens;

(b) a source of illumination for said system;

(c) a specimen support including a specimen holder disposed in the object plane of said imaging lens;

(d) radiation sensing means coupled to said system at the imaging plane of said imaging lens;

(e) signal processing means for analyzing signals generated by said radiation sensing means; and

(f) display means coupled to said signal processing means for displaying information characteristic of said motion;

the improvement comprising said source of illumination including a single LED and a small source aperture designed to direct all of the illumination emanating from said source onto said specimen holder, and a movable plate designed to be swung into the beam of said imaging lens at a plane conjugate to the plane of said small source aperture, said plate provided with a centrally disposed retarding member and/or an attenuating member, with a part of said beam focussed by said imaging lens onto said retarding and/or attenuating member and with the remainder of said beam being focussed onto said plate surrounding said retarding and/or attenuating member, said single LED being one of high intensity, the improvement further including an electronic image reversal means forming a component part of said signal processing means, and switching means coupled to said electronic image reversal means for actuating the same.

4,896,968

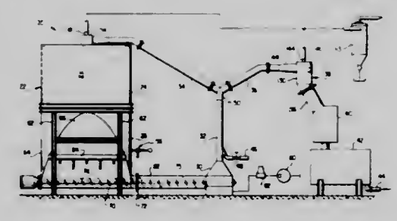
CEMENT STORAGE AND MIXING SYSTEM

Lloyd A. Baillie, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 38,693, Apr. 15, 1987, abandoned. This application Sep. 13, 1988, Ser. No. 244,588

Int. Cl.[4] B01F *13/02*; B28C *5/06*

U.S. Cl. 366—10 **8 Claims**



1. A system for storing and discharging dry blended cement material comprising a mixture of cement particles and at least one additive comprising dry particulates wherein said cement particles and said particulates are of at least one of different size and density, said system being adapted to minimize separation of said mixture by at least one of elutriation and percolation, said system comprising:

at least one storage bin including means forming a transverse top wall, a cylindrical sidewall and opposed wall portions converging toward each other and defining a material receiving chamber, and bottom trough means defining a discharge opening to provide for discharge of said mixture from said chamber;

material distribution means in communication with said chamber for distributing said material into said chamber in such a way as to minimize separation of relatively lighter weight particles from heavier particles in said mixture during discharge of said mixture into said bin;

a discharge conduit in communication with said bottom trough for conducting said mixture from said chamber; and

conveyor means extending substantially across said chamber, said conveyor means comprises a conveyor screw extending within said bottom trough and having a flight which tapers radially inwardly with respect to the axis of rotation of said conveyor screw from a point adjacent said discharge conduit toward an opposite end of said bottom trough for withdrawing said mixture from said chamber in such a way that the material disposed in said chamber is withdrawn from said chamber substantially uniformly across said chamber due to the progressively increasing swept volume of said flight so as to remix particles of said mixture of said at least one of said different size and density and which have separated in said chamber due to said at least one of elutriation and percolation.

4,896,969

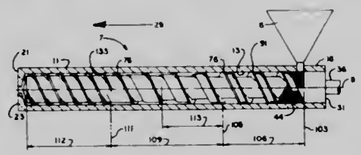
METHOD AND APPARATUS FOR MELTING AND CONVEYING PLASTICATED MATERIAL

Robert F. Dray, Box 273-M, Rte. 1, Hamilton, Tex. 76531

Continuation of Ser. No. 729,684, May 2, 1985, abandoned. This application Feb. 5, 1988, Ser. No. 149,962

Int. Cl.[4] B01F *7/08*; B29B *7/14*

U.S. Cl. 366—88 **15 Claims**



1. Apparatus for independently developing an initial melt film to convey plasticated material comprising:

(a) a barrel having a cylindrical bore therethrough;

(b) a shaft rotatable in said bore and having a substantially circular cross-section and an axis for rotation concentric with said bore, said shaft further having a helical first and a second flight formed thereabout, said first flight, said second flight and said shaft defining a helical first and a second channel means, said first and second flights having respective diameters which are less than the diameter of said bore, said barrel, said shaft and said first and second channel means defining a feed section, a metering section and a transition section therebetween;

(c) a plasticated material hopper communicatingly coupled by means of a single opening through said barrel into said bore to thereby deliver sequentially a plasticated material at a beginning of said feed section from said hopper through said single barrel opening into said first and second channel means;

(d) said first channel means having a constant depth in said feed section for conveying plasticated material through said feed section, said transition section and said metering section in a downstream direction upon rotation of said shaft; and

(e) said second channel means being shallower than said first channel means to thereby immediately subject plasticated material in said second channel means to high shear rates which thereby independently develops an initial melt film of said plasticated material in said second channel means in the immediate vicinity of a point of commencement of said feed section, said second channel means terminating at an end of said feed section, said initial melt film in said second channel means wetting said bore in the immediate vicinity of said point of commencement of said feed section thereby establishing a stable melt film through said feed section that permits efficient conveying of said plasticated material from said single barrel opening of said hopper through said feed section and into said transition section.

4,896,970

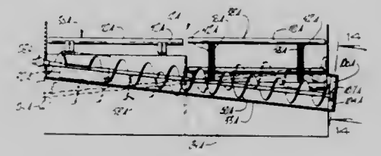
FEED MIXER

Dorland H. Schuler, Griswold, Iowa, assignor to Schuler Mfg. & Equip. Co., Inc., Griswold, Iowa

Continuation-in-part of Ser. No. 924,207, Oct. 28, 1986, Pat. No. 4,799,800. This application Aug. 1, 1988, Ser. No. 226,438

Int. Cl.[4] B01F *7/08*

U.S. Cl. 366—296 **25 Claims**



1. A feed mixing device, comprising:

a mixing chamber having forward and rearward end walls, a bottom wall and opposite side walls;

at least one rotatable mixing reel, including an axle and a plurality of elongated mixing bars operatively connected to the axle;

rotation means for rotating said reel for mixing feed within the chamber; and

first and second augers having shafts inclined in opposite directions on opposite sides of the reel and extending along respective side walls of the chamber and having opposite inlet and outlet ends, and the augers having flighting conveying feed in opposite directions within the chamber.

4,896,971

MIXING APPARATUS

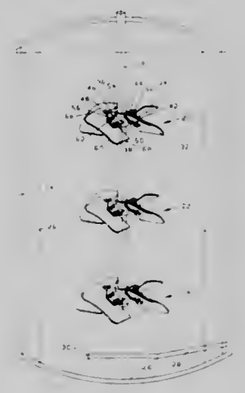
Ronald J. Weetman, and Richard A. Howk, both of Rochester, N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 26, 1987, Ser. No. 31,307

Int. Cl.[4] B01F *7/18*

U.S. Cl. 366—330 **21 Claims**

1. A mixer which is adopted to operate in non-uniform flow fields such as the flow field which tends to be influenced by the flow of a gas, which mixer comprises a shaft adapted to have means for its rotation, a hub on said shaft having an arm extending radially from said shaft, an impeller which provides flow which is predominantly in the direction axially of said shaft in such non-uniform flow fields, said impeller having blade means, including a blade of paddle-shaped planform with a tip end, a base end and leading and trailing edges, said blade in the vicinity of 90% of a radius from the axis of said shaft being of width at least 40% of the impeller's diameter, said blade having camber along a chord between its leading and trailing edges and having a flat section along a surface extending in a region along the diagonal between the tip and base ends, said diagonal extending between a point on the tip end closer to the trailing edge than to the midpoint of said tip



between the leading and trailing edges and another point on the base end closer to the leading edge than the midpoint between said leading and trailing edges, means for attaching said arm to said flat section to mount said blade on said hub, plate means providing to said arm an extension having a width greater than the width of said arm and extending beyond said arm, and said plate means being disposed along said flat surface of said blade at said base and along at least one side of said arm.

4,896,972

DELIVERY LANCE FOR THE HOMOGENEOUS MIXING OF WATER-SOLUBLE PRODUCTS SUCH AS AUTOMOBILE WAXES

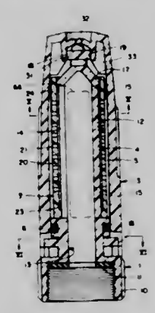
Loris Ferrari, Carpi, Italy, assignor to G.L.-S.r.l., Corregio Emilia, Italy

Filed Apr. 8, 1988, Ser. No. 179,436

Claims priority, application Italy, Apr. 30, 1987, 46839A/87

Int. Cl.[4] B01F *5/00*; B05B *1/34, 7/10*

U.S. Cl. 366—340 **5 Claims**



1. A delivery lance apparatus for the homogeneous mixing of a water-soluble material with water which comprises a first and second hollow cylindrical members (1), (3) having upper and lower end, said first hollow cylindrical member (1) having

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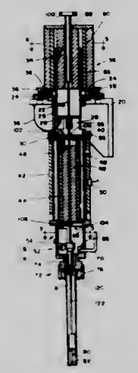
transverse slots therein and an inlet (10) for the water at its said lower end, said second hollow cylindrical member (3) being provided with an outlet (32) for the water, said first hollow cylindrical member (1) being inserted into said second hollow cylindrical member (3) to define a first annular chamber (4) surrounding the inner member (1), sealing means (6) between said first and second hollow cylindrical member, said first hollow cylindrical member (1) having a second innermost coaxial chamber (13) for containing a mass (66) of said soluble material and communicating with said first annular chamber (4) through said transverse slots (15); said second hollow cylindrical member (3) having an inwardly projecting cup-shaped element (31) at its said upper end, said cup-shaped element has a base, said discharge outlet mouth (32) being located in the base of said cup-shaped element, whereby water introduced through said inlet (10) follows a tortious path, homogeneous mixing of water occurs with said water-soluble material placed in said second coaxial chamber (13), and wherein said first bollow cylindrical member (1) is provided with an atomizing head (18) at its said upper end, said atomizing head has oblique grooves (19) and said atomizing head is located in said cup-shaped element.

4,896,973

THERMOMECHANICAL ANALYSIS APPARATUS

Harold I. Hill, Fairfield; Michael J. O'Neill, Wilton, and Thomas M. Murray, Trumbull, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 21, 1985, Ser. No. 704,353
Int. Cl.[4] G01N *25/16*
U.S. Cl. 374—56 **9 Claims**



1. In a thermomechanical analysis apparatus of the type which includes a support for positioning a sample in a programmable temperature environment, a probe mounted for vertical displacement without generation of mechanically counteractive restoring force positionable in contact with the sample surface, means supporting the probe for substantially offsetting the effect of the weight of the probe on the sample, and means for monitoring movement of the probe in response to changing physical characteristics of said sample, the improvement wherein said weight offsetting means is a linear motor comprising:

a substantially cylindrical magnet assembly mounted above and substantially coaxial with said probe and said monitoring means;

a linearly, vertically movable armature coaxial with said magnet assembly and including a coil energizable to generate a magnetic field operable with the field of said magnet assembly to exert a vertical axial force on said armature;

said armature being electrically conductive and forming a shorted secondary turn to said coil, and

means for controllably energizing said coil with a high impedance electrical current.

4,896,974

SPHERICAL SPACER OF A CROSSED ROLLER BEARING ASSEMBLY

Toshiaki Shimizu, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 289,870
Claims priority, application Japan, Dec. 23, 1987, 62-323815
Int. Cl.[4] F16C *19/40*
U.S. Cl. 384—47 **8 Claims**



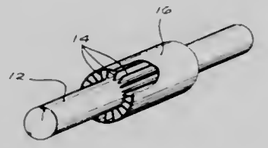
1. A spacer for use in a crossed roller bearing assembly including a plurality of rollers provided in a guide channel in a crossed arrangement, said spacer being located between any two adjacent ones of said plurality of rollers when used in said assembly, said spacer including a substantially spherical outer surface and a pair of recessed, arc-shaped guide surfaces which are located on opposite sides and which have generatrix lines extending perpendicular to each other.

4,896,975

CERAMIC AIR BEARING SHAFT

Frank A. Bescoby, Rancho Palos Verdes; David M. Kotchick, San Pedro, and Stanley C. Pollitt, Rancho Palos Verdes, all of Calif., assignors to Allied-Signal Inc., Morris Township, N.J.

Filed Dec. 13, 1988, Ser. No. 283,640
Int. Cl.[4] F16C *37/00*
U.S. Cl. 384—114 **13 Claims**



1. A machinery element comprising:

a ceramic shaft; and

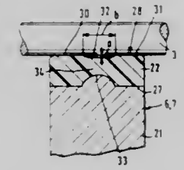
bearing surface means attached to said ceramic shaft for providing a cooled bearing support surface, said bearing surface means including fins extending radially outwardly from said shaft, said fins supporting an axially concentric bearing sleeve, said fins and said sleeve formed of a ceramic composite.

4,896,976

SUPPORTING DISK FOR A SUPPORTING DISK BEARING

Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stachlecker, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 200,855
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719445
Int. Cl.[4] F16C *19/50*
U.S. Cl. 384—549 **8 Claims**



1. Supporting disk apparatus for engagement with an open-end spinning rotor shaft such that the rotor shaft creates an elastic deformation of said supporting disk apparatus, said apparatus comprising:

supporting disk means for engaging the rotor shaft, said supporting disk means including an outer circumference area providing a running surface for the rotor shaft, said outer circumference area being constructed such that said outer circumference area is elastically deformed a given distance by the rotor shaft and;

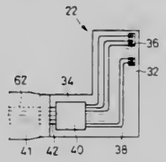
ring groove means provided around and extending into said supporting disk means outer circumference area, said ring groove means having a depth in a radial direction of said supporting disk means slightly larger than the given distance of elastic expected deformation of said outer circumference area in the radial direction of said supporting disk means caused by the rotor shaft during operation, wherein said ring groove means exhibits a width dimension in an axial direction of said supporting disk means which is substantially greater than the radial depth of said ring groove means.

4,896,977

THERMAL PRINTER HAVING A STRUCTURE FOR SUPPORTING A PRINT HEAD WITH A DRIVER ON ITS FRONT SURFACE

Kazuhiko Takagi, and Naohisa Kinoshita, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 9, 1988, Ser. No. 165,973
Claims priority, application Japan, Mar. 12, 1987, 62-36087[U]
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 **7 Claims**



1. A thermal printer wherein a printing operation is effected by a print head which is movable along a print line relative to a recording medium while the print head and the recording medium are held in contact with each other via a thermal print ribbon, comprising:

a platen having a bearing surface for supporting said recording medium, said bearing surface extending in a direction parallel to said print line;

said print head having a flat front surface which faces said recording medium supported by said platen, said flat front surface being a generally L-shaped surface including an upright portion having a length perpendicular to said print line, and a horizontal portion which extends horizontally from one of opposite ends of said upright portion, said length of said upright portion being greater than a width of said thermal print ribbon;

a plurality of printing elements which are arranged on said upright portion of said flat front surface of the print head, in a direction intersecting said print line;

head supporting means for supporting said print head movably between a printing position in which said printing elements contact said recording medium on said platen, and a retracted position in which said printing elements are spaced away from the recording medium, said head supporting means providing, at least in said printing position thereof, a wedgeshaped clearance between said flat front surface of said print head, and a plane tangent to said bearing surface of said platen, said wedge-shaped clearance increasing with a distance from said printing elements in said direction parallel to said print line; and

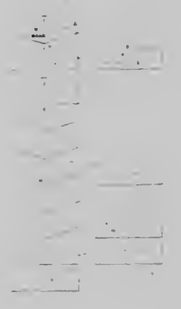
a head driver secured to said horizontal portion of said flat front surface of said print head such that said head driver is spaced from said printing elements in said direction parallel to said print line and thereby positioned within said wedge-shaped clearance, said head driver being electrically connected to said plurality of printing elements, for controlling energization of said printing elements.

4,896,978

METHOD FOR OPTIONAL CONTROL OF LINE SPACING IN ELECTRONIC TYPEWRITER

Bong Y. Shin, Sawon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Sawon, Rep. of Korea

Filed Jul. 7, 1988, Ser. No. 216,170
Claims priority, application Rep. of Korea, Jul. 14, 1987, 1987-7608[U]
Int. Cl.[4] B41J *19/96*
U.S. Cl. 400—555 **6 Claims**



1. A method for optionally controlling line spacing in an electronic typewriter, said method comprising the control procedure of:

(a) first stage for setting or clearing a variable line pitch mode;

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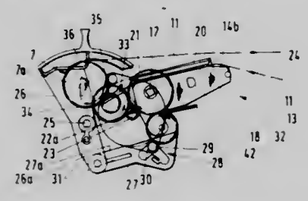
(b) second stage for checking key input following the first stage;
(c) third stage for judging whether the variable line pitch mode has been set, and if the variable line pitch mode not been set, performing a function according to the corresponding key, then returning to the first stage;
(d) fourth stage for judging whether or not the key input is a set key to set-up the line spacing with a specified length, and, when key input is the set key, setting the corresponding key data to be received by an amount of variable line pitch;
(e) fifth stage for judging whether or not the key input is a return key when key input is not the set key in the fourth stage, and, when key input is the return key, returning the carriage through feeding the line by the amount of the variable line pitch, then returning the control procedure to the first stage;
(f) sixth stage for judging whether or not the key input is an index key when key input is not the return key in the fifth stage, and, when key input is the index key, feeding the line by the amount of the variable line pitch, then returning the control procedure to the first stage;
(g) seventh stage for judging whether or not the key input is a reverse index key, when key input is not the index key in the sixth stage, and, when key input is not the reverse index key, performing the operation according to the corresponding key, then returning the control procedure to the first stage; and
(h) eighth stage for reversely feeding the line by the amount of the variable line pitch when the key input is the reverse index key in the seventh stage.

4,896,979

DEVICE FOR A PAPER TRANSPORT IN AN OFFICE MACHINE IN PARTICULAR IN A MATRIX PRINTER

Gerd Nolte, Sendan, and Erich Steppe, Ulm, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 159,710
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705856
Int. Cl.[4] B41J *11/50*
U.S. Cl. 400—605 **20 Claims**



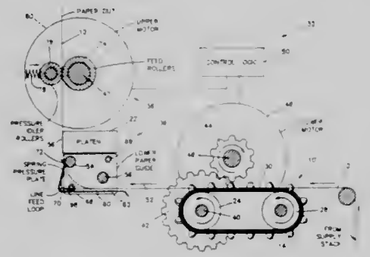
1. A device for paper transport in an office machine comprising
side plates;
a print support surface supported by the side plates,
a paper drive motor;
a tractor shaft supported by the side plates;
a tractor gear wheel fixed against rotation on the tractor shaft; transmission means associated with the paper drive motor for placing the tractor gear wheel into and out of a force-transmitting connection with the paper drive motor;
a tractor pair force-transmittingly connected to the tractor gear wheel;
a lever drive for tilting the tractor pair relative to the paper guide plane in each case into an about tangential direction relative to the circumferential upper side or relative to the circumferential lower side of the print support surface;
an idler wheel engaging the tractor wheel for reversal of the rotary direction of motion of the tractor wheel and moving together with the tractor wheel such as to allow alternation of engagement of a pinion between tractor wheel and idler wheel and to coordinate a simultaneous shift of the paper tangential output direction of the tractor entailed in the same motion for a change in paper supply without manual paper bin change.

4,896,980

PAPER ADVANCING SYSTEM FOR HIGH SPEED PRINTERS

Royden C. Sanders, Jr., P.O. Box 590, Hillsborough Mills/Elm St., Wilton, N.H. 03086, and John L. Forsyth, Greenfield, N.H., assignors to Royden C. Sanders, Jr., Wilton, N.H.

Filed Aug. 10, 1988, Ser. No. 230,457
Int. Cl.[4] B41J *15/16*
U.S. Cl. 400—618 **28 Claims**



1. In a printer for printing lines of text including a horizontal platen and a printing mechanism disposed adjacent the platen for printing lines of text during side to side motion thereof with an interval between the printing of successive lines during which the printing mechanism reverses direction, the improved paper advancing apparatus for intermittently moving paper on a line-by-line basis from a supply input between the platen and printing mechanism comprising:
(a) powered first drive means disposed before the platen and printing mechanism for receiving and gripping the paper from the supply input and for forming a supply loop containing an exact length of paper for exactly one or a multiple of one line feed distance between said powered first drive means and the platen and printing mechanism while a line is being printed by said printing mechanism.
(b) powered second drive means disposed after the platen and printing mechanism for gripping and rapidly moving the paper only the entire length of said supply loop between said powered first drive means and the platen and printing mechanism during a single said interval, said powered second drive means being inoperative to move said paper, while said printing mechanism is printing a line; and,
(c) control logic means operably connected to said powered first drive means and said powered second drive means for activating said first drive means, to receive only exactly the paper from the supply input required to form said supply loop, during the time the printing mechanism is printing a line and for activating said second drive means to move the paper said exact length of said supply loop when the printing mechanism has completed printing a line and requires the paper to be advanced said exact length in preparation for the printing of the next line.

4,896,981

AUTOMATIC PENCIL

Go-Sing Lin, Tainan, Taiwan, assignor to Mosu Pencil Corporation, Tainan, Taiwan

Filed Jul. 5, 1988, Ser. No. 215,348
Int. Cl.[4] B43K *21/02*
U.S. Cl. 401—57 **5 Claims**



1. A mechanical pencil comprising:
an elongate outer casing having a cylindrical inner wall terminating in an opening at one end, a continuous annular shoulder extending radially inwardly from the inner wall and terminating at an inner annular edge, the continuous annular shoulder disposed inwardly of the opening;
an inner tube disposed within said outer casing having an inner channel for storing a plurality of presharpened pencil leads and terminating in an enlarged end having at least a pair of cooperating slots to split the enlarged end into cooperating clamping members, and shoulder means extending outwardly of said inner tube disposed inwardly of the enlarged end;
helical spring means disposed within said outer casing and surrounding at least a portion of said inner tube, said helical spring means being operatively compressed to apply pressure between the continuous annular shoulder of said outer casing and the shoulder means of said inner tube; and
pencil lead pushing means in supporting contact with the continuous annular shoulder of said outer casing and encircling said inner tube, and seated on the continuous annular shoulder of said outer casing, said lead pushing means including support means encircling said inner tube, and an associated lead pushing member depending from the support means from a point inwardly from the inner annular edge of the continuous annular shoulder of said outer casing and extending downwardly and inwardly through one of the slots in said inner tube and terminating within the inner channel of said inner tube to selectively contact an end of one of the pencil leads.

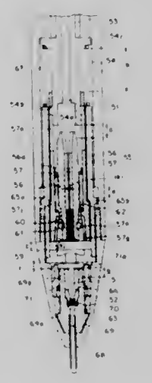
4,896,982

LEAD FEED MECHANISM FOR MECHANICAL PENCIL

Hidehei Kageyama, and Yoshihide Mitsuya, both of Kawagoe, Japan, assignors to Kotobuki & Co. Ltd., Kyoto, Japan

Continuation of Ser. No. 897,823, Aug. 19, 1986, abandoned.
This application Aug. 1, 1988, Ser. No. 226,522
Claims priority, application Japan, Aug. 20, 1985, 60-182711; Dec. 30, 1985, 60-298641; Mar. 14, 1986, 61-57491
Int. Cl.[4] B43K *21/16*
U.S. Cl. 401—65 **8 Claims**

5. A mechanical pencil comprising: an outer pipe having an interior chamber;
a lead chuck mounted in said interior chamber;
a lead pipe slidably disposed within said interior chamber;
a bottom bearer fixedly attached to a forward end of said lead pipe and having a radial projection;
a sleeve slidably mounted within said interior chamber surrounding said lead chuck and at least a forward end of said bottom bearer;
said sleeve having a longitudinally elongated groove formed in its circumferential wall;
said bottom bearer being reciprocable within said sleeve and having a close fit therein, and said radial projection extending into and being reciprocable within said elongated groove of said sleeve;
a bottom pipe disposed within said interior chamber forwardly of said sleeve;



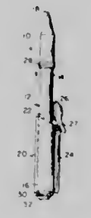
and means for causing said bottom bearer to move said sleeve forwardly upon forward movement of said bottom bearer, such that a forward face of said sleeve moves into abutment with said bottom pipe.

4,896,983

PROTECTING SLEEVE WITH COVER AND CLIP

Byung-Do Im, 17214 Horst Ave., Cerritos, Calif. 90701, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Sep. 23, 1987, Ser. No. 100,301
Int. Cl.[4] B43K *9/00*
U.S. Cl. 401—107 **3 Claims**



1. A writing instrument which comprises:
(a) an elongated casing with a first portion and an oppositely disposed second portion;
(b) a writing tip at remote end of the first portion of said casing;
(c) a slide cap having an opening at a distal end thereof being telescopically received over the first portion of the casing and moveable along said casing between (1) a retracted position in which said slide cap overlies the second portion, thus leaving said writing tip exposed and (2) an extended position in which said slide cap covers said writing tip, thus protecting said writing tip;
(d) means for releasably retaining said slide cap in each of the retracted and extended positions;
(e) a clip affixed to said slide cap for mounting onto a web of cloth material of the user;
(f) a cover movably mounted on said cap adjacent said opening when said cap is moved to said retracted position

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and (2) a closed position in which said cover conceals said opening when said slide cap is in said extended position; and

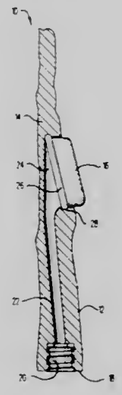
(g) means external of the cap on the clip for manually moving said cover to the open and closed position, wherein the cover is pivotally mounted on the clip and includes pivotal arms for movement from an open position spaced externally from said distal end to a closed position.

4,896,984

LOTION APPLICATOR

Laurie A. Evans, P.O. Box 372, Lawton, Mich. 49065

Filed Mar. 8, 1989, Ser. No. 320,517
Int. Cl.[4] A45D *34/00*
U.S. Cl. 401—140 **1 Claim**



1. A lotion applicator, comprising:

an elongated body formed from a resilient material;

a first portion of said body configured to simulate a human forearm;

a second portion of said body configured to simulate a human hand;

an internal passage extending through said first portion and terminating at a first end in an enlarged lateral opening in a central palm area of said second portion;

said internal passage terminating at a second end in a threaded coupling at an end of said first portion for engagement with a threaded neck of a lotion bottle;

a finger area disposed at an end of said elongated body opposite said threaded coupling;

an arcuate undercut groove formed within said palm area of said second portion, adjacent said lateral opening;

said undercut groove and said lateral opening forming a reduced thickness connection between said palm area and said finger area, said reduced thickness connection having a greater flexibility than remaining portions of said elongated body;

a perforated mounting plate having an arcuate peripheral edge portion removably received in said undercut groove; and

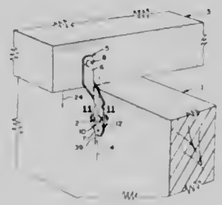
a sponge applicator secured on an outer surface of said mounting plate and having an outer portion exposed through said lateral opening, whereby said sponge applicator may be removed by flexing said finger area to release said mounting plate from said undercut groove.

4,896,985

SNUGGING CONNECTION AND METHOD

Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed May 1, 1989, Ser. No. 345,910
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—11 **8 Claims**





1. A snugging connection comprising:

a. a stationary structural member;

b. a movable structural member positioned adjacent to said stationary structural member and movable with respect to said stationary structural member;

c. generally rigid connector dimensioned for joining said stationary structural member and said movable structural member and having a connected end and a snugging end;

d. connection means affixing said connected end of said generally rigid connector to said movable structural member;

e. en elongated opening formed in said snugging end of said generally rigid connector elongated along a longitudinal axis;

f. snugging means formed in said snugging end of said generally rigid connector adjacent said elongated opening projecting at a selected angular position at an angle to said longitudinal axis from a proximal pivotal end to a distal end, with said snugging means rotatable about said proximal pivotal end from said first selected angular position to a second position generally parallel to said longitudinal axis; and

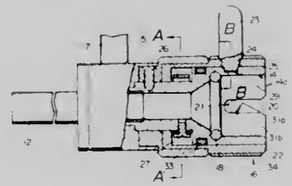
g. a fastener having a shank and a head attached thereto with said head having a shoulder projecting at a generally right angle thereto with said shank diameter being selected for receipt within said elongated opening and said shoulder dimensioned for snagging and rotating said distal end of said snugging means to said second position for moving said movable structural member relative to said stationary structural member in the general direction of said longitudinal axis as said fastener is driven into said stationary structural member.

4,896,986

ENDOSCOPE CONNECTING APPARATUS

Toshiki Teruyama, Koganei, Japan, assignor to Olympus Optical Co, Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 104,891
Claims priority, application Japan, Oct. 8, 1986, 61-240300
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—14 **8 Claims**



1. An endoscope connecting apparatus comprising:

a body part including a cylindrical housing part open at one end of said body part and adapted for housing a large diameter connecting part formed at the rear end of an insertable part of an endoscope, two fitting pins projecting from the outer periphery of said large diameter connecting part and a pair of guide grooves formed on the wall surface of said cylindrical housing part open at said one end of said body part with each guide groove adapted to engage one of said fitting pins;

a rotary ring rotatably fitted to a cylindrical outer peripheral surface of said cylindrical housing part;

a pair of groove parts formed in the part of said rotary ring facing the outside of each said guide groove, each of said groove parts including a first sloped groove wall forming an angle less than 90 degrees with the lengthwise direction of said guide groove and open at said one end of said body part and a second sloped groove wall connected to an end of said first sloped groove wall opposite from said open end and forming an angle less than 90 degrees with the lengthwise direction of said guide groove in a direction reverse to the slope of said first sloped groove wall, each said groove part having a width capable of housing one of said fitting pins; and

a rotary energizing means between opposed diametric surfaces of said body part and said rotary ring and biasing said rotary ring in one direction with respect to said body part so that said first and second sloped groove walls of each groove part close a part of respective ones of said guide grooves.

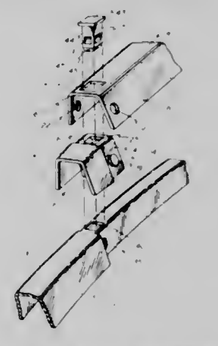
4,896,987

PIVOT JOINT

Peter C. Pethers, London, England, assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,476
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—24 **7 Claims**

1. A pivot joint for pivoting together first and second members, at least the first of which is of channel section at the joint and the second of which is adapted to seat within the first, the pivot joint comprising a joint body of generally channel section adapted to fit within the first member and to receive the second member therewithin, the joint body having first engagement means located on its exterior for engagement with the first member so as to secure it thereto and second engagement means movable between a first position in which it is adapted to cooperate with means on the second member and a second position in which it is free of the second member, and a plug member separate from said joint body and insertable into the channel of the joint body and acting on the second



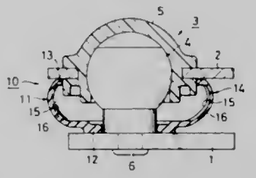
engagement means to force the second engagement means into its first position in which it engages the second member.

4,896,988

WATERPROOF DEVICE FOR JOINT SECTION

Yoichi Inoue, Kiryu, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Jan. 3, 1989, Ser. No. 292,779
Claims priority, application Japan, Jan. 11, 1988, 63-2330[U]
Int. Cl.[4] F16C *11/06*
U.S. Cl. 403—134 **3 Claims**



1. A waterproof device for a joint section rotatably connecting a pair of rods comprising, a seal member formed of an elastic material, said seal member having opposite ends, covering sections provided at both said opposite ends of said seal member to respectively cover the rods provided at both said opposite ends of said seal member, a displacement offsetting section provided between both said covering sections, and a plurality of strips of thin and thick portions formed on said displacement offsetting section in a manner to locate said thick or thin strips alternately and extend toward both said ends of said seal member, said joint section including a spherical shaft having an axis and wherein said thick and thin portions extend in essentially parallel relationship to said axis.

4,896,989

LOCKABLE, PIN-RETAINING COUPLING

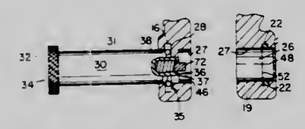
William E. Swager, P.O. Box 750, Fremont, Ind. 46737

Filed Jul. 2, 1987, Ser. No. 69,162
Int. Cl.[4] F16B *21/00*
U.S. Cl. 403—154 **2 Claims**

1. A coupling comprising a pin, a clevis, said clevis having first and second legs, each of said legs having a bore therethrough, said bores being coaxial and having cylindrical surfaces, said bores being adapted to slidably receive said pin, said pin having first and second ends and first and second stops at said respective ends, said pin having a cylindrical surface, said

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second leg having a latch, said latch holding said pin in position within said bores of said first and second legs when said latch is engaged with said pin, said pin being retractable from said bore of said second leg when said latch is not engaged with said pin, a brake, said brake restricting movement of said pin within said pin bores, said stops preventing said pin from being retractable from said bore of said first leg, wherein said latch comprises a latch body having outer and inner surfaces, upper and lower projecting tracks, and an overhang, said inner surface having a slot therein, said slot comprising an open, circular first end, an undercut longitudinal central portion, and an undercut disk-shaped second end, said overhang being defined by the region between said inner surface and the surface of said undercut portions of said slot, upper and lower transverse channel slots positioned within said second leg, said projecting tracks slidably positioned within said channel slots, said latch body being slidable within said second leg, said overhang engaging said second pin end when said latch body is in the latched position thereby preventing said pin from being retracted from said second end, said overhang disengaging said second pin end when said latch body is in the unlatched position thereby allowing said pin to be retracted from said second leg, wherein said second stop includes a groove, a ramp, and a head, wherein said ramp comprises a base and an incline, said head and groove define a shoulder, said shoulder plunges from said cylindrical pin surface to said base of said ramp, said incline angles away from said base and head and crests at said cylindrical surface of said pin, said base forms a neck about said pin, wherein said coupling has a retainer comprising said shoulder, a disk-shaped collar receptacle within said first leg bore, said collar receptacle having spaced walls and a face disposed between said walls, a toroidal-shaped collar is diametrically expandable in tension within said receptacle and pin groove, said pin shoulder and facing receptacle wall wedging said collar therebetween when said pin is retracted to the fully open position thereby retaining said pin within said first leg, and wherein said collar surrounds said base when said pin is in the fully retracted position, and said ramp stretches said collar outwardly to said cylindrical pin surface when said pin is urged in the direction of the closed position, said walls restrain said collar from movement relative to said first leg.



4,896,990

SUPPORT STRUCTURE OF A ROTATABLE LEVER

Hitoshi Nakamura, and Yasuaki Hori, both of c/o Ohi Seisakusho Co., Ltd., 14-7, Maruyama 1-chome, Isogo-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 17, 1988, Ser. No. 169,295

Claims priority, application Japan, May 15, 1987, 62-71652

Int. Cl.⁴ F16B *9/00*

U.S. Cl. 403—162 **7 Claims**

1. A support structure in combination with a rotatable lever, comprising:

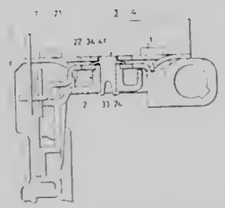
a support body including a cylindrical shaft portion integrally formed with said support body and extending therefrom in an axial direction, said cylindrical shaft portion having an opening;

a base member connected to said support body and having a shaft hole therein;

an auxiliary shaft member including a main shaft body extending in an axial direction of said shaft member and supported in said opening of said cylindrical shaft portion, and a projecting shaft disposed at one end of the auxiliary shaft member and inserted in said shaft hole so that said projecting shaft is supported by said base member,

said rotatable lever being pivotally positioned on said cylindrical shaft portion of said support body, said auxiliary shaft member supporting said rotatable lever on said cylindrical shaft portion for a pivotal movement thereon,

said auxiliary shaft member further including at another end thereof insertion means constructed so as to enable said main shaft body to pass through said opening but prevent



said cylindrical shaft portion of said support body from being disengaged from said auxiliary shaft member once said main shaft body has been inserted into said cylindrical shaft portion; and

elastic means disposed between said base member and said main shaft body for biasing said rotatable lever towards said cylindrical shaft portion, said rotatable lever being disposed between said cylindrical shaft portion and said elastic means, whereby said cylindrical shaft portion is supported at both opposite ends thereof.

4,896,991

JOINING STRUCTURE FOR FRAMES USED IN BICYCLES AND SIMILAR VEHICLES

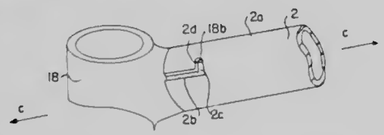
Masanori Yashuhara, Osaka, Japan, assignor to Kabushiki Kaisha Fukurotani Seisakusho, Osaka, Japan

Continuation-in-part of Ser. No. 176,082, Mar. 31, 1988, abandoned. This application Mar. 3, 1989, Ser. No. 319,815

Claims priority, application Japan, Apr. 1, 1987, 62-82145

Int. Cl.⁴ B25G *3/16*

U.S. Cl. 403—290 **5 Claims**



1. A joining structure for the lightweight frames of bicycles and similar vehicles formed by joining chemically and mechanically pipes and couplings, said joining structure comprising:

pipes and couplings and connecting extensions formed on at least one of said couplings made from a lightweight material selected from the group consisting of aluminum, magnesium, titanium, alloys or ceramic compositions of aluminum, magnesium or titanium, carbon fibers and composites thereof;

pipe ends formed at the extremities of said pipes made from a lightweight material selected from the group consisting of aluminum, magnesium, titanium, alloys or ceramic compositions of aluminum, magnesium or titanium, carbon fibers and composites thereof;

engaging projections formed on the external circumferential surfaces of at least one of said connection extensions or said pipe ends;

insertion cut-outs formed in at least one of the circumferential walls or internal circumferential surfaces of the mating connecting extensions or pipe ends into which said engaging projections are inserted, the insertion cut-outs guiding said engaging projections;

locking slots oriented in the circumferential direction formed as continuations of said insertion cut-outs, with said connection extensions and pipe ends securely joined to each other by inserting the engaging projection on each of one of said connecting extensions or pipe ends into the insertion cut-out formed in each of the other mating connecting extensions or pipe ends after coating bonding agents at the contact surface between said connecting extensions and pipe ends, and then rotating the mating connecting extension and pipe end relative to each other in the circumferential direction, so that the engaging projections are locked in place by the locking slots and slippage between said couplings and said pipes is prevented after bonding.

4,896,992

ADJUSTABLE MOUNTING FRAME ARRANGEMENT

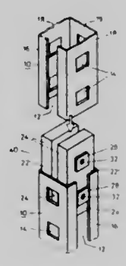
Erhard Muhlethaler, Schaluneu, Switzerland, assignor to Lanz Oensinger AG, Sedringstrasse, Switzerland

Filed Sep. 29, 1988, Ser. No. 251,118

Claims priority, application Switzerland, Sep. 29, 1987, 3780/87

Int. Cl.⁴ F16B *7/00;* **A47F** *5/00*

U.S. Cl. 403—297 **25 Claims**



1. An adjustable mounting frame arrangement comprising:

four-sided hollow profile sections having at least one longitudinal slit on one side of the sections, and locking means at least on the sides adjoining the side having the longitudinal slit, preventing longitudinal displacement;

disconnectable connectors for connecting two such profile sections together, wherein the connection is affectable by spreading action at the connectors;

said connectors having two pairs of legs provided with at least one spreading device, the width of the legs transverse to the spreading direction being adapted to the inside width of the profile;

detent devices located on the outside of the legs which come into engagement with said locking means upon spreading and substantially at the same time to effect form locking with the four inside walls of the hollow profile, wherein the height of the legs, including the detent devices, is less than the width of the at least one longitudinal slit, the legs each being individually insertable into the interior of one hollow profile section through the longitudinal slit.

4,896,993

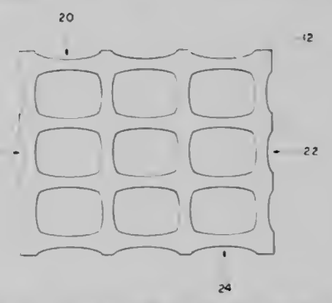
MAT FOR PROVIDING A STABILIZED SURFACE OVER SAND OR OTHER LOOSE SOIL AND METHOD OF FABRICATING THE SAME

William W. Bohnhoff, 12501 E. Amherst Cir., Aurora, Colo. 80014

Filed Oct. 20, 1987, Ser. No. 110,434

Int. Cl.⁴ E01C *5/20;* **E02B** *3/14*

U.S. Cl. 404—33 **22 Claims**



1. A mat for providing a stabilized surface over sand or other loose soil, said mat comprising

a first layer of fiber material;

a layer of skeletal material, said skeletal layer being substantially stiff and rigid when subjected to forces along directions within the plane of said skeletal layer but being bendable when subjected to forces in a direction substantially perpendicular to the plane of said skeletal layer such that said skeletal layer may be rolled, said skeletal layer being affixed in an overlapping relationship to said first fiber layer; and

means connected to first fiber layer and adapted to protrude into the loose soil for substantially preventing the lateral displacement of said mat along the surface of the loose soil.

4,896,994

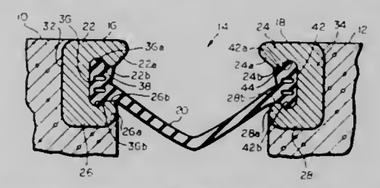
HIGHWAY EXPANSION JOINT STRIP SEAL

Howard R. Brown, Bowling Green, Ohio, assignor to The D. S. Brown Company, Inc., North Baltimore, Ohio

Filed Nov. 17, 1988, Ser. No. 275,291

Int. Cl.⁴ E01C *11/10*

U.S. Cl. 404—64 **21 Claims**



1. An elongate membrane for use in a strip seal between the spaced apart ends of adjacent sections of a highway, bridge, or the like, said membrane comprising;

a web portion having first and second opposed edges:

a first ear portion attached to the first of the opposed edges of the web portion;

a second ear portion attached to the second of the opposed edges of the web portion;

each of the first ear portion and the second ear portion extending generally normally to the web portion and having an enlarged end portion and a transitional portion attached to said enlarged end portion and positioned between said enlarged end portion and the edge of the web portion to which said each of the first ear portion and the second ear portion is attached;

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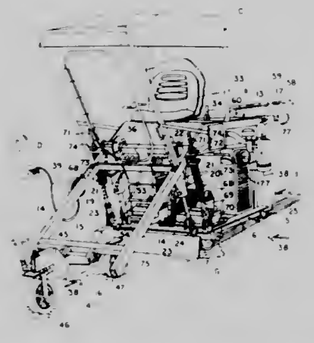
each transitional portion having an upper sealing surface and a lower sealing surface;
the upper sealing surface of each transitional portion being below an upper limit of the enlarged end portion to which said transitional portion is attached;
the lower sealing surface of each transitional portion being above a lower limit of the enlarged end portion to which said transitional portion is attached;
each transitional portion being attached to the edge of the web portion to which the ear portion incorporating said transitional portion is attached at a location on said transitional portion which is substantially closer to one of the upper sealing surface and the lower sealing surface thereof than to the other; and
elongate void means comprising upper and lower spaced apart voids within the enlarged end portion of each of the first ear portion and the second ear portion to facilitate the compressing of each said enlarged end portion in a direction transverse to its upper limit and its lower limit;
wherein the web portion, the first end portion and the second end portion are formed integrally in a single piece from an elastomeric material; and
wherein the upper void of each enlarged end portion is positioned a first distance below the upper limit of said enlarged end portion,
wherein the lower void of each enlarged end portion is positioned a second given distance above the lower limit of said enlarged end portion, said second given distance being slightly greater than said first distance, and
wherein the transitional portion of each ear portion is attached to the edge of the web portion to which the ear portion incorporating said transitional portion is attached at a location of said transitional portion which is approximately in alignment with the lower void of said enlarged end portion.

4,896,995

GRINDING APPARATUS

Joseph R. Simmons, 904 Cherry Hill, No. Little Rock, Ark. 72116

Continuation of Ser. No. 172,453, Mar. 24, 1988, abandoned. This application May 30, 1989, Ser. No. 357,951
Int. Cl.[4] E01C *23/08*
U.S. Cl. 404—90 **9 Claims**



1. A pavement grinding machine for removing high spots comprising:
a lower frame assembly comprising a substantially horizontally disposed frame having opposite front and rear portions joined by side frame elements,
drive wheels mounted adjacent said lower frame rear portion,
a grinding head assembly mounted adjacent said lower frame front portion between said side frame elements,
said grinding head assembly including a pair of laterally spaced apart grinding heads,
a main shaft supporting said pair of laterally spaced apart grinding heads,
said main shaft having two opposite ends,
mounting means on said side frame elements,
said main shaft opposite ends being respectively supported by said side frame element mounting means, said grinding heads each respectively having an outer face disposed contiguous with one said side frame element, wherein the juxtaposition of each said grinding head outer face contiguous with one said side frame element permits grinding of the surface of a pavement substantially close to an adjacent curb,
motive means mounted upon said lower frame assembly and operable respectively to drive said wheels and grinding head main shaft,
a drive pulley on said main shaft intermediate said laterally spaced apart grinding heads,
motion transmitting means connecting said motive means and said drive pulley,
an upper frame assembly spaced above said lower frame assembly and substantially above said motive means,
said upper frame assembly including a pair of laterally spaced apart rearmost substantially horizontal lateral frame members respectively rigidly affixed to a pair of laterally spaced apart co-joined forwardmost and downwardly inclined control arms terminating in forward distal portions,
said lateral frame members each having a rearmost portion provided with pivot means attached to a point substantially vertically disposed above and fixed relative said lower frame assembly rear portion,
a pavement engaging steerable wheel assembly attached to said control arms adjacent said distal portions substantially forward of said grinding head assembly,
a frame control mechanism including a pair of displaceable fluid cylinders each having opposite upper and lower ends, said upper ends respectively attached to said control arms adjacent said horizontal frame members and said lower ends respectively attached adjacent said lower frame assembly front portion, and
an operator's cab mounted atop said upper frame assembly and including a seat disposed substantially vertically above said grinding head assembly, whereby
actuation of said frame control mechanism pivots said lower frame assembly relative said upper frame assembly about said pivot means to vary the vertical spacing between said upper frame assembly and said lower frame assembly front portion to alter the elevation of said grinding head assembly relative a line extending between said drive wheels and pavement engaging wheel assembly.

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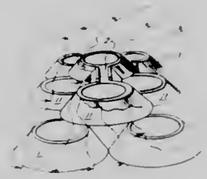
WAVE ACTUATED COASTAL EROSION REVERSAL SYSTEM FOR SHORELINES

William J. Mouton, P.O. Box 10515, New Orleans, La. 70181; Robert Grush, 3716 James Dr., Metairie, La. 70003, and Dolores B. Alton, 3827 Leila Pl., New Orleans, La. 70121

Filed Jan. 23, 1989, Ser. No. 300,793
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—21 **11 Claims**

1. A wave actuated erosion control, accretion collection system comprising:
(a) a matrix of generally circular rings, each having a truncated cone continuous thin sidewall with an outer surface and an inner surface defining a hollow interior for trapping sedimentary material, the ring having upper and lower respective circular edges defining respective upper smaller and lower larger open portions and the sidewall

inner and outer surfaces having a slope of between thirty and forty-five degrees (30°–45°);



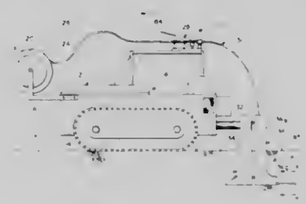
(b) a matrix of interstitial blocks defining connections between adjacent rings, each block having a pair of opposed concave portions that register respectively with the outer surface of a pair of adjacent rings.

4,896,997

CABLE SHEATHING AND BURYING METHOD

Wayne L. Gaylin, 2330 Athena Rd., West Linn, Oreg. 97068

Filed Sep. 27, 1985, Ser. No. 781,032
Int. Cl.[4] E02D *29/10*; F16L *1/02*
U.S. Cl. 405—156 **6 Claims**



1. A method of depositing subsurface a continuous length of sheath-enclosed fiber optical cable comprising:
opening a side of a hollow, plastimer sheath along the length thereof;
directing a fiber optical cable into the opening of the sheath thereby producing an elongate, continuous assembly of the sheath with the cable inside it;
permitting the wall of the plastimer sheath, through memory, to assume a non-joined, closed condition along a region of the sheath extending along a side thereof, said non-joined, closed condition being assumed with the wall of the sheath reaching a overlapped condition in said region, the sheath having an inner diameter substantially exceeding the outer diameter of the cable in the assembly;
forming a trench for receiving the assembly;
and after the closed condition is reached, subjecting the assembly to bending as it travels into the trench, said nonjoined closed condition accommodating distortion of the assembly during said bending; and
placing the assembly in said trench.

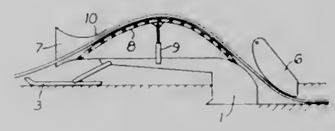
4,896,998

SUBMARINE CABLE PLOUGH

Alan R. Reece, Northumberland, England, assignor to Soil Machine Dynamics Ltd., Northumberland, England

Filed Feb. 4, 1988, Ser. No. 152,136
Claims priority, application United Kingdom, Feb. 11, 1987, 8703154
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—160 **6 Claims**

1. A plough for burying a submarine cable below the surface of the sea-bed, which plough comprises a plough blade for cutting a continuous channel in said sea-bed by movement of the plough along the sea-bed surface, guide means defining a cable pathway through said plough from a point forward of said plough blade to a point rearward of said plough blade, said pathway extending over an upwardly-facing generally convex surface and a downwardly-facing generally convex surface,



said upwardly-facing generally convex surface being articulated whereby to modify its curvature and further being mounted for pivotal movement relative to said downwardly-facing generally convex surface, monitoring means to monitor the tension in a cable passing through said pathway and hydraulic pathway varying means to automatically effect pivotal movement of said upwardly-facing generally convex member when said tension differs from a predetermined value.

4,896,999

SET OF CONCRETE BUILDING BLOCKS FOR CONSTRUCTING A DRY WALL

Willi Ruckstuhl, Augwilerstrasse 48, CH-8302 Kloten, Switzerland

Filed Dec. 1, 1988, Ser. No. 278,733
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740646
Int. Cl.[4] F02D *29/02*
U.S. Cl. 405—286 **13 Claims**

1. A set of interlocking concrete blocks for the construction of a mortarless wall, comprising: frontal blocks (1) of different widths, anchoring blocks (2) for effecting an anchoring of said front blocks (1) in an earth substrate, and connecting blocks (3) for effecting a close connection of opposed said front blocks (1); each said frontal block (1) having a structured front side (4) and on its rear side at least one frontal block dovetail projection (5) relative to a top view; each said anchoring block (2) in said top view having a rectangular cross section (6) with anchoring block dovetail projections (7) integrally formed on each longitudinal side; each said connecting block (3) comprising two dovetail halves (8) formed together at a narrow die of each said dovetail half (8); and said front block dovetail projections (5), said anchoring block dovetail projections (7) and said dovetail halves (8) each having same dimensions.

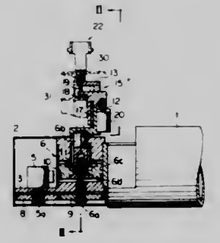
VOL 1110 ISS 5 JA 30 1990 UMI

4,897,000

CLAMPING MECHANISM FOR AN APPARATUS FOR DRILLING OR COUNTERSINKING HOLES IN A WORKPIECE

Takashi Suzuki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1989, Ser. No. 352,458
Claims priority, application Japan, May 18, 1988, 63-120848
Int. Cl.[4] B23B *41/00, 47/00*
U.S. Cl. 408—79 **7 Claims**



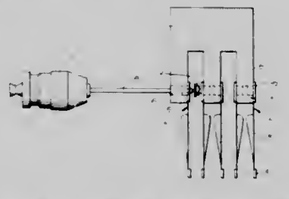
1. An apparatus for drilling and countersinking holes in a tubular work, comprising:
(a) a frame;
(b) a toolhead supported by the frame;
(c) a carrier arm mounted on the frame for insertion in the work;
(d) a linear actuator mounted on the carrier arm and including a movable member having an axis about which the movable member is rotatable relative to the carrier arm and along which the movable member is reciprocable relative to the carrier arm toward and away from the toolhead;
(e) offset anvil means coupled to the movable member of the linear actuator for pressing the work against the toolhead; and
(f) a rotary actuator mounted on the carrier arm and drivingly coupled t the movable member of the linear actuator for imparting rotation to the movable member.

4,897,001

DE-STAKING TOOL AND METHOD FOR REMOVAL OF HEAD GIMBALS FROM HEAD STACK ASSEMBLIES

Allen G. Rumpler, San Diego, Calif., assignor to Computer & Communications Technology Corp., San Diego, Calif.

Filed Feb. 25, 1988, Ser. No. 160,147
Int. Cl.[4] B23B *51/00*
U.S. Cl. 408—212 **2 Claims**



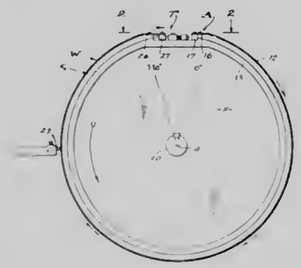
2. An apparatus for removing an interiorly mounted ball-staked head gimbal from a head stack assembly having a plurality of in-line head gimbals, each gimbal being of the type that has a tubular staking tub, comprising:
(a) a drill having a tool driver having a diameter less than the inside diameter of the tubular staking hubs, the tool driver being inserted through the tubular staking hubs to a selected interiorly mounted head gimbal to be removed from the head stack assembly;
(b) a cutting tool removably attachable to the tool driver and sized to fit between a pair of head gimbals, the cutting tool having a cutting face substantially the same diameter as the outside diameter of the tubular staking hubs; and
(c) means for positioning the cutting tool at the location of the selected head gimbal, wherein the cutting tool is there removably attached to the tool driver such that rotation of the tool driver rotates the cutting tool whereby the cutting action of the cutting tool removes the hub of the selected head gimbal thereby removing the selected head gimbal from the head stack assembly.

4,897,002

METHOD AND APPARATUS FOR MAKING IRREGULAR SECTIONS

Robert C. Keppeler, 8721 Rhodes Ct., Santee, Calif. 92071

Filed Jun. 6, 1988, Ser. No. 202,372
Int. Cl.[4] B23D *3/00*
U.S. Cl. 409—293 **36 Claims**



1. A method of machining fragile elongated sections of material into irregular cross sections, and including;
the first step of placing an elongated workpiece of said material over a convexely curved support,
the second step of anchoring opposite ends of the workpiece at opposite ends of the convexely curved support for its coextensive engagement upon the support between the opposite ends thereof,
the third step of tensioning the workpiece and removing slack between its opposite anchored ends,
and the fourth step of removing material from the workpiece by movement of a cutting tool away from an anchored end of the workpiece while maintaining tension in the workpiece by the third step and thereby preventing slack therein.

4,897,003

BLIND RIVET

William D. Bradley, and Michael Woodrow, both of Welwyn Garden City, England, assignors to Avdel Systems Limited, Hertfordshire, England

Filed Feb. 10, 1989, Ser. No. 308,447
Claims priority, application United Kingdom, Feb. 12, 1988, 8803284; May 27, 1988, 8812598
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—43 **14 Claims**

1. A blind rivet for anchoring in relatively soft material, which rivet comprises:
a tubular shell having a shank;
a preformed head at one end of the shank;
and a weakened expandible portion of the shank at the end thereof remote from the head;
the weakened portion of the shell having a thinner wall than a next adjacent part of the shell and a plurality of weakened zones spaced apart circumferentially around the thinner wall, said thinner wall extending from said end remote from said head towards said head by a distance not greater than one third of a shell length from said remote end to said head;
and a stem extending through the tubular shell, the stem having:
an expander head adjacent the expandible portion of the shell, the expander head having a maximum external diameter greater than the internal diameter of the thinner wall portion of the shell and having an underhead shape progressively increasing in diameter towards the maximum diameter of the head at least from a radius at which it meets the adjacent end of the shell;
and a breakneck on the stem;
wherein said weakened portion of the shell and said next adjacent part of the shell have strengths such that when the rivet is inserted into a bore in a body of relatively soft material so that the expandible portion of the shell is located in the bore spaced by a sufficient distance from the



surface of the material at an accessible end of the bore, and increasing tension is applied to the stem on the side of the breakneck remote from the stem head, with respect to the head of the shell,
firstly the stem head progressively enters the weakened portion of the shell, the progressively increasing diameter of the underhead shape causing the weakened portion to rupture along the weakened zones to split into a plurality of legs from said end remote from said head to said next adjacent part, said legs being forced outwardly into the body of relatively soft material to anchor the rivet therein,
and thereafter the stem breakneck fractures before the stem head can advance substantially further into the shell, and before splitting of said next adjacent part, thereby confining the splitting of the shell into radially expanded legs embedded in the material to the end portion of the shell spaced away from the surface of the material at the accessible end of the bore, with no substantial expansion of at least the major part of the remaining length of the shell shank.

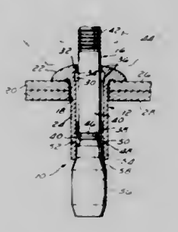
4,897,004

BLIND FASTENER WITH SELF-LOCKING COLLAR

Merle E. Norton, Anaheim, Calif., assignor to Textron, Inc., Providence, R.I.

Continuation of Ser. No. 878,613, Jun. 26, 1986, abandoned.
This application Jul. 20, 1988, Ser. No. 222,326
Int. Cl.[4] F16B *13/04, 13/06*
U.S. Cl. 411—43 **24 Claims**

1. A fastener comprising:
a sleeve with a bore extending through said sleeve;
an elongated stem adapted to extend through said sleeve;
an annular collar engaged within said bore, wherein said collar is integral with said sleeve, said stem passing through said collar, said collar being slidable within said bore from a first position to a second position, said collar being sized so that when said collar is in said first position, said stem may be inserted within said sleeve and through said collar; and



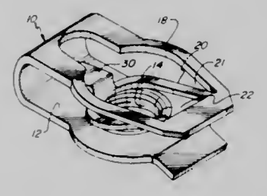
an upwardly facing shoulder on said stem, said shoulder being adapted to engage said collar as said stem is pulled through said sleeve, causing said collar to move from said first position to said second position, said collar being deformed in said second position so as to prevent said stem from sliding relative to said sleeve.

4,897,005

GUTTED U-NUT

Francis C. Peterson, Woodbury, and Michael G. Gagnon, Oakville, both of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

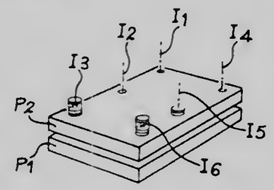
Continuation-in-part of Ser. No. 33,175, Apr. 1, 1987, Pat. No. 4,729,706. This application Dec. 3, 1987, Ser. No. 128,432
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] F16B *37/02*
U.S. Cl. 411—175 **8 Claims**



1. A fastener assembly, comprising:
a clip having first and second legs,
(a) said first leg having a substantially U-shaped elongated tongue for engaging a sheet material,
(i) said tongue having long uniform spring arms formed of substantially straight substantially uniform width metal strips connected to said first leg at the tips of said strips, said spring arms having a uniform spring action over their length,
(ii) a substantially elongated oblong aperture being provided in said tongue;
(iii) substantial clearance being provided between said tongue and said first leg; and
(b) said second leg having means for receiving a threaded fastener formed thereon;
said clip being mountable onto a sheet material having a thickness of about four millimeters with as little as about 8 pounds of force.

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4,897,006
DEVICE FOR EXERTING A PRESSURE DEVELOPING IN STAGES ON A PART
Michel Blin, La Ville du Bois, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Aug. 29, 1988, Ser. No. 237,746
Claims priority, application France, Sep. 4, 1987, 87 12293
Int. Cl.[4] F16B *33/00, 43/02*
U.S. Cl. 411—368 **8 Claims**



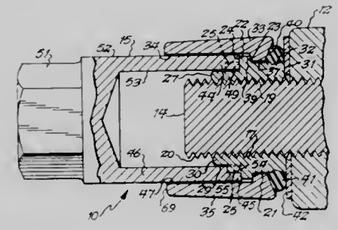
1. A device for applying pressure developing in stages to a part exposed to a predetermined temperature cycle, said device being characterized in that it comprises at least one stack of elementary washers mounted on a rod provided with abutments at its ends and transversing two pressure plates between which said part is placed, said stack having first and second spring washer means, said first spring washer means including a washer made from a shape memory alloy operable when passing a first predetermined temperature within said temperature cycle to pass from a planar or flat shape to a truncated shape, said second spring washer means including a washer made from a shaped memory alloy operable when passing through a second predetermined temperature different from said first predetermined temperature and within said temperature cycle to pass from a planar or flat shape to a truncated shape, said first and second spring washer means cooperating to apply a first predetermined force to said part upon passing said first predetermined temperature and to apply a second predetermined pressure different from said first predetermined pressure to said part upon passing said second predetermined temperature.

4,897,007
STEADY PUSH PIN
Haw-Renn Chen, and Feichu H. Chen, both of 4057 Little Hollow Pl., Moorpark, Calif. 93021
Filed Aug. 1, 1988, Ser. No. 227,677
Int. Cl.[4] F16B *23/00, 35/06*
U.S. Cl. 411—401 **3 Claims**



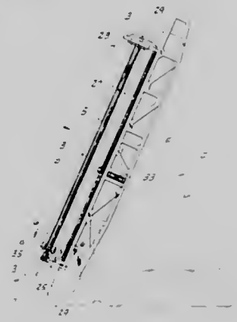
1. A steady push pin comprising a threaded stem with a pointed end and an elliptical cylinder head, which is formed with the cross sections transverse to said threaded stem being larger nearby both ends and smoothly getting smaller from said both ends inwards along the length such that the smallest cross section transverse to said threaded stem is at an optimal location somewhere in between said both ends, whereby said steady push pin can be tacked into a solid media and used as a means to hang or somewhat vertically hold an article on said solid media with both vertical and horizontal load holding capability.

4,897,008
ANTI-TAMPER NUT
Jeffery R. Parks, Elma, N.Y., assignor to McGard, Inc., Buffalo, N.Y.
Filed Oct. 17, 1988, Ser. No. 258,871
Int. Cl.[4] F16B *41/00*
U.S. Cl. 411—432 **14 Claims**



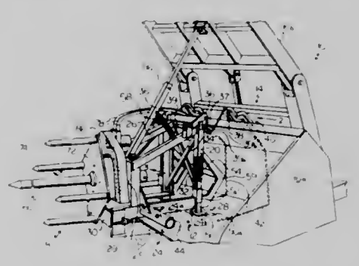
1. A locknut comprising an annular locknut body having an inner surface and an outer surface, means on said inner surface for engaging a lug in mounted relationship, an annular shroud having an inner surface and an outer surface, said annular shroud being rotatably mounted in substantially coaxial relationship on said annular locknut body with said inner surface of said annular shroud facing said outer surface of said annular locknut body, a first annular ridge on said outer surface of said locknut body, a second annular ridge on said inner surface of said annular shroud, a first shoulder on said first annular ridge, a second shoulder on said second annular ridge for engaging said first annular shoulder, said second annular shoulder having an inner diameter which is greater than the external diameter of said outer surface of said annular locknut body located in contiguous relationship thereto for permitting said rotatable mounting between said annular shroud and said annular locknut body, a first end on said locknut body, a second end on said shroud, said first end extending outwardly beyond said second end when said first and second shoulders are in engagement for permitting said first end to bear against a surface while permitting said second end to be spaced from said surface to thereby permit said shroud to be rotatably mounted on said locknut body, resilient seal means encircling said first end of said locknut body, a first portion on said seal means extending beyond said first end of said locknut body, a second portion on said seal means located on the opposite side thereof from said first portion for engagement by said second end of said shroud, to thereby cause said seal means to be positioned in sealing engagement between said second end of said shroud and said surface when said first end of said locknut body bears against said surface while said resilient characteristic of said seal means permits said relative rotation between said shroud and said locknut body and prevents vibration between said locknut body and said shroud, key-receiving lobe means on said outer surface of said annular locknut body extending both radially and axially of said locknut body, and a key-receiving opening in said annular shroud at the opposite end thereof from said second end of said shroud.

4,897,009
DRILL PIPE HANDLING APPARATUS
Michael S. Powell, Boonville, Ind., assignor to Peabody Coal Company, St. Louis, Mo.
Filed Jan. 5, 1989, Ser. No. 293,708
Int. Cl.[4] E21B *19/14*
U.S. Cl. 414—22.66 **14 Claims**



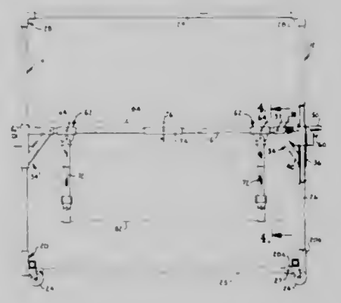
1. Drill pipe handling apparatus comprising:
a magazine for holding a plurality of lengths of drill pipe and delivering each pipe into position for its removal by drilling apparatus which is operable to drill the pipe into the ground at an angle off vertical,
said magazine comprising a center shaft and upper and lower heads on the shaft,
said heads having means for holding a plurality of pipes in position generally parallel to the center shaft with each pipe adapted to be removed from the magazine by the drilling apparatus,
means supporting the shaft for movement of the magazine relative to the drilling apparatus with the shaft at an angle off vertical between a retracted position relative to the drilling apparatus and a delivery position wherein a pipe is aligned with the drilling apparatus for removing the pipe therefrom, and for rotation of the magazine relative to the supporting means for successively bringing pipes held by the magazine into position for being removed from the magazine by the drilling apparatus,
and means for holding the shaft against rotation such as might otherwise occur when the magazine is in retracted position due to the shaft being at an angle off vertical, and the magazine thereby being unbalanced, said means comprising a brake for the shaft located below the lower head, said brake comprising two generally interiorly semicylindrical brake shoes pivotally interconnected for swinging movement relative to one another on an axis generally parallel to the shaft axis between an open position for application thereof around the shaft and removal thereof from the shaft and a closed position surrounding the shaft with the interior semicylindrical surfaces of said shoes in frictional engagement with the shaft for preventing rotation of the shaft such as might otherwise occur due to the shaft being at an angle off vertical and the magazine thereby being unbalanced, while enabling rotation of the magazine for successively bringing pipes held in the magazine into position for being removed from the magazine by the drilling apparatus, means for attachment of the shoes to the supporting means for the shaft below the lower head, and spring means for drawing the two shoes together when the shoes are applied around the shaft, said spring means being disengageable from the shoes for the opening of the shoes and engageable with the shoes following application of the shoes around the shaft.

4,897,010
HAY BALE HANDLING IMPLEMENT
James Golley, R.R. #1, Tees, Alberta, Canada
Filed May 5, 1988, Ser. No. 190,527
Int. Cl.[4] B65H *16/10;* **B66F** *09/18;* **E02F** *03/36*
U.S. Cl. 414—24.6 **16 Claims**



12. An implement adapted to be coupled to the loader bucket of a front-end loader, said loader bucket including a lower support platform, said implement comprising:
a support frame for resting on said support platform and having a front end and a rear end;
coupling means connected to said support frame and extending around said bucket to secure releasably said support frame to said bucket;
biasing means for biasing the rear end of said support frame towards said support platform upon tightening of said coupling means; and
engagement means extending forwardly from said front end, wherein said support frame is a generally upright structure having a pair of lower base members, said base members including a bifurcated front end for receiving said support platform, one end of said coupling means being connected to said base members beneath said support platform and wherein said rear end includes a pair of feet, said feet being biased towards said support platform via springs upon tightening of said coupling means.

4,897,011
MECHANICAL LIFT DEVICE
Rupard A. Brower, 3521 NW. Hermosa Dr., Kansas City, Mo. 64150
Filed Jul. 12, 1988, Ser. No. 218,584
Int. Cl.[4] B60B *29/00*
U.S. Cl. 414—459 **9 Claims**

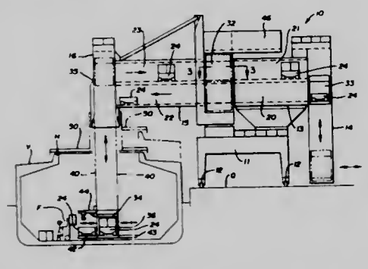


1. Apparatus for lifting and supporting heavy loads, said apparatus comprising:
first and second spaced apart frame sections each including

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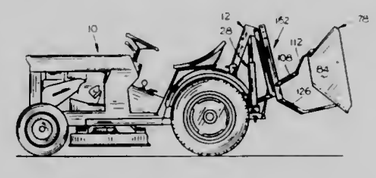
a pair of upright stanchions spaced apart from one another and a center upright located between said stanchions;
a substantially horizontal lifting frame having a pair of spaced apart load carrying bars and a pair of coupling bars extending between and connecting said load carrying bars;
a guide sleeve fitted on each upright stanchion for sliding movement up and down thereon, said sleeves being rigidly coupled with said lifting frame to guide the latter up and down on said frame sections;
a pair of mechanical jacks mounted on the respective center uprights and movable up and down thereon by jacking action, said jacks being rigidly coupled with the respective coupling bars of said lifting frame to raise and lower the lifting frame by jacking action upon operation of said jacks; and
means for coupling the load with said lifting frame.

4,897,012
CARGO HANDLING SYSTEM
Bruce L. Brewer, Alliance, Ohio, assignor to Custom Technologies, Inc., Beloit, Ohio
Filed Nov. 6, 1987, Ser. No. 117,545
Int. Cl.[4] B60P *1/00*; B65G *63/00*
U.S. Cl. 414—540 **18 Claims**



1. A system for transporting cargo between a storage area and a cargo carrier comprising:
bridge means spanning between the storage area and the cargo carrier said bridge means having a bridge structure, a boom structure pivotable about one end of said bridge structure in a substantially horizontal plane and platform means interposed between said bridge structure and said boom structure to present a rotatable interface therebetween;
first elevator means located at one end of said bridge structure proximate to the storage area;
second elevator means located at one end of said boom structure positionable relative to the cargo carrier;
cover means supported at said one end of said boom structure about said second elevator means, said cover means being movable elevationally relative to said boom structure, said cover means further being rotatable about said second elevator means;
trackway means along said bridge means interconnecting said first and second elevator means said trackway means including bridge trackway along said bridge structure and boom trackway along said boom structure; and
a plurality of independent car means for carrying the cargo, each said car means being movable selectively on said first and second elevator means, and further independently along said trackway means.

4,897,013
ELECTRICALLY OPERATED MATERIAL HANDLING ATTACHMENT FOR A GARDEN TRACTOR OR THE LIKE
Randal H. Thompson; Joseph W. Langenfeld, and Neal W. Westendorf, all of Onawa, Iowa, assignors to Westendorf Mfg. Co., Inc., Onawa, Iowa
Continuation of Ser. No. 935,822, Nov. 28, 1986, Pat. No. 4,770,595. This application Jun. 27, 1988, Ser. No. 212,239
Int. Cl.[4] B66F *9/00*
U.S. Cl. 414—703 **1 Claim**

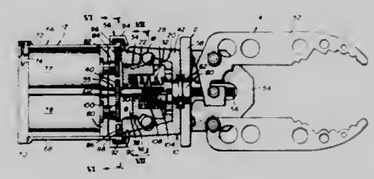


1. In combination,
a wheeled vehicle having rearward and forward ends, said vehicle including an electrical power source,
a support means mounted on one of said rearward and forward ends,
a vertically movable multiple-point hitch assembly secured to said support means, said assembly being movable between upper and lower positions,
a materials handling bucket pivotally mounted on said assembly and being movable between dumping and working positions,
an electrically operated ram means operatively connected to said assembly for raising and lower said assembly and said materials handling bucket,
linkage means operatively connecting said bucket and said assembly for pivoting said bucket, relative to said assembly, from said working position to said dumping position,
and a mechanical actuator means operatively connected to said linkage means for automatically power pivoting said bucket to said dumping position when said ram means has raised said assembly and said bucket to a predetermined height,
said actuator means comprising an elongated flexible member having one end operatively fixed against vertical movement, the other end of said flexible member being secured to said linkage means,
said flexible member having a length such that it will be slack when said bucket is in its working position and said assembly is in its said lower position, and such that it will become taut to cause said linkage means to pivot said bucket to its dumping position when said assembly has reached said predetermined height.

4,897,014
DEVICE FOR INTERCHANGE OF TOOLS
Richard C. Tietze, Ft. Pierce, Fla., assignor to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.
Filed Sep. 6, 1988, Ser. No. 240,706
Int. Cl.[4] B25J *17/00*
U.S. Cl. 414—729 **7 Claims**

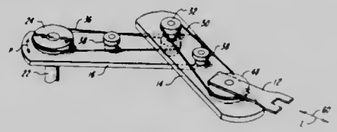
1. A device for interchanging tools on a mechanical manipulator arm which comprises:
a male locking cone unit, a female receptacle cone unit and a motor unit,
said male locking cone unit comprising:
a plurality of equal size balls captured in a male truncated conical cage within holes equidistantly spaced around and through its external surface in a common plane normal to the longitudinal axis of said cage, said holes

having portions of said balls extending through them beyond the outer surface of said cage, and
cam means to alternately force said balls into a fully extended position in said holes and relax said balls into a retracted position in said holes,
said female receptacle cone unit comprising:
a dished member having an internal conical surface mating with said external surface of said locking cone,
a groove in said conical surface contoured to embrace said portions of said balls positioned in a plane normal to the longitudinal axis of said dished member,



lands in said groove dividing it into eight sections of substantially equal length, said lands preventing said balls when in said groove from moving from one of said sections to another, and
a tool fixed thereto,
said motor unit comprising:
means to axially connect with said tool to operate it, and means mounting said motor unit to said male receptacle cone unit.

4,897,015
ROTARY TO LINEAR MOTION ROBOT ARM
Robert C. Abbe, Newton, and David G. Baker, North Grafton, both of Mass., assignors to ADE Corporation, Newton, Mass.
Filed May 15, 1987, Ser. No. 51,090
Int. Cl.[4] B25J *9/06*
U.S. Cl. 414—744.8 **11 Claims**



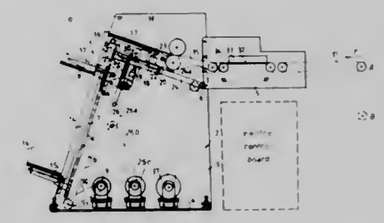
9. A robot arm comprising:
a first arm rotatable about a first pivot point with respect to a reference;
a second arm rotatable about a second pivot point on said first arm remote from said first pivot point;
and end effector rotatable about a third pivot point located on said second arm remote from said first pivot point;
first means for producing coordinated rotation of said end effector with respect to said second arm including a coupling between said end effector and said first arm at a 1:2 rotation ratio, said second arm with respect to said first arm and of said first arm about said first pivot point including a coupling between said second arm and said reference at a 2:1 rotation ratio whereby said end effector is caused to effect translational motion while maintaining a predetermined angular orientation of said effector relative to said reference in response to rotation of said first arm about said first pivot; and
second drive means for causing said end effector to rotate (θ motion) about said central pivot without experiencing radial motion (r motion) whereby said end effector can be independently driven in r and θ motions about said central pivot thereby to access points in a horizontal plane.

4,897,016
AUTOMATED PHASING DEVICE FOR PHASING WHEEL ATTACHMENT BOLTS AND METHODS UTILIZING SAME
Kou Namiki; Takaji Mukumoto, and Keiichiro Gunji, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 53,263, May 22, 1987, Pat. No. 4,841,632. This application Jan. 10, 1989, Ser. No. 295,366
Int. Cl.[4] B25J *5/02*; B65G *47/00*
U.S. Cl. 414—757 **3 Claims**



1. A phasing device for phasing wheel attachment bolts, comprising a pair of phasing fingers movable towards each other with wheel attachment bolts on a wheel attachment member therebetween, and a mechanism for releasing said wheel attachment bolts from dead points of said phasing fingers, said mechanism including a rotatable tube rotatable about a central portion of said phasing device, and engaging members held by said rotatable tube for engaging said wheel attachment bolts, said engaging members being rotatable with said rotatable tube and movable toward said wheel attachment member at respective speeds selected such that said engaging members traverse the dead points of the phasing fingers while the engaging members are positioned enough to said wheel attachment member so as to be able to engage said wheel attachment bolts.

4,897,017
VERTICAL SIGNATURE STACKER
Antonio Castiglioni, Varallo Pombia, Italy, assignor to Civiemme S.r.l., Bogogno, Italy
Filed Apr. 30, 1987, Ser. No. 44,441
Claims priority, application Italy, May 2, 1986, 20299 A/86
Int. Cl.[4] B65G *57/02*
U.S. Cl. 414—790.8 **10 Claims**



1. Apparatus for forming stacks of signatures comprising:
(a) a stacker framework;
(b) a belt driven conveyor for delivering signatures provided by a rotary press to a location interiorly of the framework;
(c) a separator plate disposed adjacent the conveyor for interrupting the flow of signatures on the conveyor and forming the initial part of each stack;

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(d) a slide frame disposed within the stacker framework and supporting the separator plate, the slide frame having a first drive unit and translation means associated therewith for raising and lowering the slide frame and separator plate and having an upper limit stop position wherein the separator plate is generally level with the head of an operator, the first drive unit and translation means comprising two channel sections housing a slidable cursor, the slidable cursor supporting the slide frame and being coupled to and driven by lateral chains that engage a gear coupled to a D.C. reversing electric motor, the slide frame having a second drive unit and translation means associated therewith the retracting and advancing the separator plate, and a third drive unit and translation means for tilting the slide frame and separator plate;

(e) a fork onto which signatures carried by the separator plate are placed, the fork having a fourth drive unit and translation means associated therewith for raising and lowering the fork, at least the first and fourth drive units being independently operable of each other; and

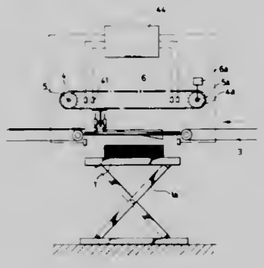
(f) a sliding wall disposed adjacent an exit end of the stacker framework for lowering the stacks, and a stack supporting wall disposerl adjacent the sliding wall, each wall comprising a plurality of rollers.

4,897,018

APPARATUS FOR STACKING VENEER SHEETS

Toshinori Nakaoda; Teruaki Aoto; Nagara Aoyama, and Tsuyoshi Nakamura, all of Obbu, Japan, assignors to Meinan Machinery Works, Inc., Japan

Filed May 6, 1988, Ser. No. 191,035
Claims priority, application Japan, May 7, 1987, 62-111609; Sep. 11, 1987, 62-229229
Int. Cl.[4] B65H *29/34*
U.S. Cl. 414—794.2 **6 Claims**



1. An apparatus for stacking veneer sheets, comprising

(a) a stack support upon which to stack veneer sheets;

(b) a first conveyor means for intermittently supplying veneer sheets toward the stack support, said conveyor means having one end in proximity to said stack support;

(c) a veneer detector means for detecting a veneer sheet when the veneer sheet on the conveyor has come to a predetermined discharge position;

(d) transport means for carrying the sheet from the discharge position to a predetermined drop position above the stack support, said transport means having

(I) a veneer carrier for holding at a first, starting position a substantial middle of a front end portion of the sheet conveyed to said discharge position by said conveyor, and carrying the sheet therefrom to said drop position, and

(II) a pair of spaced-apart support means, for selectively supporting opposed side portions of the sheet while allowing a substantial rear half of the sheet to curve downwardly, said support means being oriented in the direction of travel of the sheet, and being movable between operative positions to support the sheet and non-operative positions to not support the sheet;

(e) a first carrier detector means for detecting the veneer carrier when the veneer carrier has come to the first position;

(f) a second carrier detector means for detecting the veneer carrier when the veneer carrier has come to a second position where the veneer carrier has the sheet in the drop position;

(g) means for imparting a downward curvature to the front end portion of the sheet such that the entire sheet has a substantially uniform downward curvature before the sheet is dropped, the veneer carrier releasing its hold on the sheet once the entire sheet has achieved the substantially uniform downward curvature;

(h) actuating means for keeping the support means in the support positions from the time that the sheet begins to be carried to the drop position until the entire sheet has become uniformly curved downwardly, and moving the support means to the non-operative positions after the veneer carrier has started to be moved from the second position to a third position where the veneer carrier no longer supports the sheet;

(i) a third carrier detector means for detecting the veneer carrier when the veneer carrier has come to the third position,

(j) a drive mechanism for reciprocating the veneer carrier between the first and third positions; and

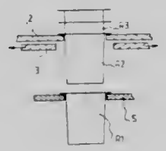
(k) a controller means responsive to the detection of the sheet by the veneer detector means for controlling the operation of the conveyor and responsive to the detection of the veneer carrier by the first, second and third carrier detector means for controlling the operations of the conveyor, of the drive mechanism, of the actuating means and of the curving means.

4,897,019

DEVICE FOR TAKING CONTAINERS OUT OF A PILE AND PROCESSING MACHINE EQUIPPED WITH THIS DEVICE

Didier Lemaire, Cherisy, and Jean-Marc Dronet, Putanges Pont Ecrepin, both of France, assignors to E. P. Remy & Cie., France

Filed Apr. 18, 1988, Ser. No. 182,982
Claims priority, application France, Apr. 24, 1987, 87 05847
Int. Cl.[4] B65G *59/06, 59/10*
U.S. Cl. 414—795.6 **5 Claims**



1. A device for taking containers such as cups out of at least one pile, comprising:

a supporting frame including openings through which said containers can pass;

a magazine comprising at least a first deformable parallelogram linkage hinged on and above said frame and including four hinged links hingedly connected to one another to conform to any shape and dimension of containers therebetween;

means for taking the containers one by one from the pile of containers in the magazine, comprising at least second and third superimposed deformable parallelogram linkages hinged on and underneath said frame, each of the second and third linkages including four hinged links hingedly connected to one another to conform to any shape and dimension of containers therebetween; and

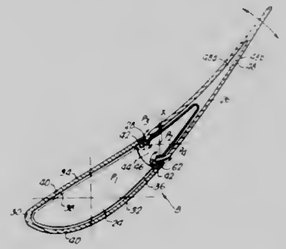
means for controlling the deformation of said first, second and third deformable parallelogram linkages simultaneously and independently from each other.

4,897,020

NOZZLE GUIDE VANE FOR A GAS TURBINE ENGINE

Robert C. Toaks, Bridgwater, England, assignor to Rolls-Royce plc, London, England

Filed May 8, 1989, Ser. No. 349,173
Claims priority, application United Kingdom, May 17, 1988, 8811657
Int. Cl.[4] F01D *5/08*
U.S. Cl. 415—115 **8 Claims**



1. A nozzle guide vane for a gas turbine engine comprising:

a fixed upstream portion, having an upstream and a downstream end;

a movable downstream portion, having an upstream end and a downstream end said upstream end confronting, and being spaced by a predetermined amount from, the downstream end of the upstream portion;

a passage, provided in the upstream portion for the passage of cooling air therethrough;

a second passageway, provided at the downstream end of the upstream portion for the passage of cooling air therethrough and for directing said cooling air onto the upstream end of the downstream portion;

a third passageway, provided at the upstream end of the downstream portion for receiving cooling air directed thereupon;

a sealing device, situated between the upstream portion and the downstream portion comprising a plurality of ridges situated on the confronting ends of the upstream and downstream portions, said ridges extending towards the other portion to reduce the gap therebetween.

4,897,021

STATOR VANE ASSSEMBLY FOR AN AXIAL FLOW ROTARY MACHINE

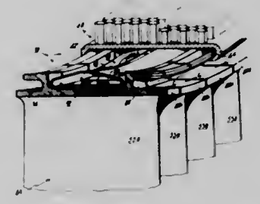
Gary F. Chaplin, Veron; John L. Pannone, Glastonbury, and Michael A. Weisse, Windsor Locks, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1988, Ser. No. 201,505
Int. Cl.[4] F01D *5/02*
U.S. Cl. 415—173.7 **9 Claims**

1. A stator assembly for an axial flow rotary machine having an axis of rotation, a case outwardly of a working medium flowpath and an array of stator vanes extending inward therefrom, which comprises:

a stator vane having a single airfoil which extends inwardly from the case, an inner end and a surface which is adapted to slidably engage a seal segment;

a seal segment which extends circumferentially with respect to the axis of rotation, which slidably engages the inner end of the stator vane in the circumferential direction and which axially overlaps the inner end of the stator vane and has a surface which is adapted to slidably engage the stator vane;



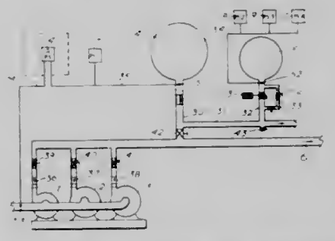
means for urging the seal segment in the radial direction such that the surface of the seal segment abuttingly engages the surface on the stator vane and is slidable thereon in a non-radial direction to provide frictional damping to the stator vane and to the inner air seal.

4,897,022

MULTI-TANK/MULTI-PUMP WATER PRESSURE BOOSTER SYSTEM

Carl E. Hudson, P.O. Box 506, Oroville, Calif. 95965-0506

Filed Jul. 25, 1988, Ser. No. 223,955
Int. Cl.[4] F04B *23/02*
U.S. Cl. 417—7 **1 Claim**



1. A multi-pressurized-reservoir multi-pressurizing means condition responsive pressure controlled pressure booster system comprising:

a. a plurality of pressurizing means, hereafter referred to as pumps 1, 2, and 3, connected to a common suction manifold providing inlet fluent service, said pumps plumbed in parallel having a check valve on the discharge side joined into a common main service line;

b. a primary presurized reservoir, hereafter referred to as a primary tank, connected to said service line with an inline restricted fill rate means hereafter referred to as an orificed check valve and pressure switch means, for control of said pump 1, with sensing point located at said primary tank discharge aperture and a secondary presurized reservoir, hereafter referred to as a secondary tank, joined to said service line by a connecting line equipped with an inline fluent egress flow control means, hereafter referred to as a solenoid valve, and fluent ingress restricted fill rate means hereafter referred to as a check valve bypass line to provide controlled refilling time of said secondary tank, and a plurality of pressure switches with a common service line connected to the sensing point adjacent to said secondary tank discharge aperture with said pressure

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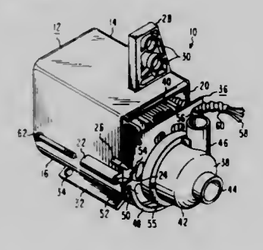
sensing switches individually preset to energize its respectively controlled pump as pressure demands whereby said system is capable of maintaining a narrow margin of pressure variation throughout design flow capacity and obtaining an improved degree of reliability, energy efficiency, diverse operational features, simplicity, and greatly reduced cost.

4,897,023

LIQUID PUMP ASSEMBLY

Douglas J. Bingler, Furlong, Pa., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Nov. 28, 1988, Ser. No. 277,019
Int. Cl.[4] F04D *29/40*
U.S. Cl. 417—423.15 **11 Claims**



1. An assembly of a pump and an electric motor in which the pump has inlet and outlet ports at one side and an operating shaft extending from an opposite side to which the motor is attached, the assembly comprising:

a one piece housing having a substantially flat top wall, a substantially U-shaped bottom wall with the arms of the bottom wall integral with and extending from opposite sides of the top wall, and a back wall extending across one end of the bottom and top walls with the other end of the housing being open;

the pump and motor assembly fitting into the housing with the motor being adjacent the back wall and the inlet and outlet ports of the pump projecting from the open end of the housing;

a mounting plate mounted on the pump between the pump and the motor; and

means securing the mounting plate against the open end of the housing.

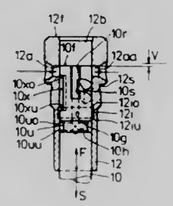
4,897,024

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Ernst Hatz; Hans A. Kochanowski, both of Ruhstorf, and Erich Abesser, Passau, all of Fed. Rep. of Germany, assignors to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 192,301
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731817
Int. Cl.[4] F02M *45/06*
U.S. Cl. 417—499 **20 Claims**

1. A fuel injection pump for internal combustion engines, comprising: a piston sleeve having means defining a bore therein at least one pump piston arranged movably in said bore of said piston sleeve, said piston having an end face, said piston end face being cooperable with said bore to a define a work chamber in said piston sleeve, means defining a suction chamber, injection means for drawing fuel from said suction chamber into said work chamber during a stroke of said piston in one direction and for, during a stroke of said piston in the other direction of travel, first isolating said work chamber from said suction chamber and then delivering fuel from said work chamber to an injection nozzle, means for opening a return path between said work chamber and said suction chamber, said opening means including a control groove formed on a peripheral surface of said piston and having a piston control edge which is inclined relative to a longitudinal axis of said piston, said injection means including control means operable during said stroke of said piston in said other direction for effecting a pre-injection of fuel into the injection nozzle and for thereafter effecting a main injection of fuel into the injection nozzle, said control means including cooperating grooves



provided respectively in said piston and said piston sleeve, said piston groove and said piston sleeve groove being axially limited by parallel edges and being located across said inclined piston control edge from said work chamber so as to be separated from said work chamber, said piston having a connecting bore extending therethrough and connecting said work chamber to said piston groove, said piston having an axially extending overflow groove formed on said peripheral surface thereof, said piston sleeve groove being connectable to said suction chamber through said overflow groove.

4,897,025

GEROTOR PUMP WITH EXTENDED INLET PORT

Ushiji Negishi, 934-2, Komagatacho, Maebashi-shi, Gunma, Japan

Filed Aug. 4, 1988, Ser. No. 228,244
Claims priority, application Japan, Aug. 6, 1987, 62-197753
Int. Cl.[4] F04C *2/10*
U.S. Cl. 418—171 **5 Claims**



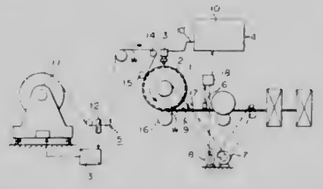
1. A trochoid pump comprising, an outer gear rotor having a first predetermined number of teeth and an inner gear rotor having a second predetermined number of teeth different in number from the first predetermined number of teeth, the inner gear rotor teeth being in contact with the outer gear rotor teeth, such that pressure chambers are defined by adjoining teeth of said outer and inner gear rotors, said pressure chambers having corresponding volumes that gradually increase and gradually decrease respective predetermined amounts in accordance with rotations of said outer and inner gear rotors in a predetermined direction, an intake opening communicating with selected ones of said pressure chambers having volumes that gradually increase during rotation of said outer and inner gear rotors in said predetermined direction, and an outlet opening communicating with a second selected amount of said pressure chambers having corresponding volumes that gradually decrease during rotation of said outer and inner gear rotors in said predetermined direction, one of said pressure chambers including a minimum volume pressure chamber having a minimum gap portion between the teeth of said outer and inner gear rotors at a minimum gap position of said inner and outer gear rotors, wherein said intake opening starts to be opened in the vicinity of the minimum gap portion between the teeth of said outer and inner rotors so as to communicate with the minimum volume pressure chamber at the minimum gap portion thereby preventing closing of pressure in the chambers which have passed the outlet opening, and wherein said intake opening is opened at a position closer to said outlet opening than the minimum gap position.

4,897,026

SEPARATOR MANUFACTURING APPARATUS

Hisao Yokoya, Nakatsugawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,365
Claims priority, application Japan, Oct. 1, 1987, 62-248414; Oct. 1, 1987, 62-248412; Oct. 26, 1987, 62-269775; Oct. 26, 1987, 62-269774; Oct. 26, 1987, 62-269773
Int. Cl.[4] B29C *31/04*
U.S. Cl. 425—115 **10 Claims**



1. A separator manufacturing apparatus which comprises:

(a) a transfer roller with a plurality of continuous annular shaping grooves each of which:

(i) has a predetermined shape in cross section

(ii) is formed in the outer circumferential surface of said transfer roller in its circumferential direction; and

(iii) extends completely around said transfer roller;

(b) a resin feeding device with a nozzle means to feed a hot-melt type resin to said annular shaping grooves of said transfer roller;

(c) a base paper feeding device to feed a continuous sheet of base paper at a predetermined speed to said outer circumferential surface of said transfer roller supplied with the resin to thereby form by transfer a plurality of ribs on a surface of the base paper; and

(d) a detecting device positioned adjacent to said transfer roller to detect the shape and/or dimension of the ribs formed by transfer.

4,897,027

APPARATUS FOR PRODUCING HIGH-VOLTAGE INSULATORS RESISTING DAMAGE BY BIRDS

Pál Szaplonczay, Budapest; Zsuzsanna Sényei, Solymár; Alajos Bognár, Budapest; Márton Téglás, Budapest, and László Csabai, Budapest, all of Hungary, assignors to Villamosipari Kutato Intezet, Hungary

Division of Ser. No. 859,638, May 5, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 177,862
Claims priority, application Hungary, May 17, 1985, 1856/85
Int. Cl.[4] B29C *54/14, 45/18*
U.S. Cl. 425—117 **5 Claims**

1. Apparatus for producing a silicone elastomer based insulating material and manufacturing from said material an outdoor insulator having a fiber-reinforced core and provided with sheds to increase the length of the electric creepage path, comprising:

(a) pumping means supplying the individual components to be combined in a predetermined ratio, said components including a vinyl-functional polysiloxane, an H-functional polysiloxane and 0.1 to 10 percent by weight of a sulfur containing feldspathoid aluminum silicate;

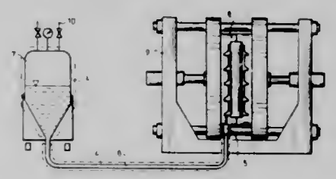
(b) first connecting means coupled to the outputs of said pumping means to convey said components;

(c) mixing means to which said components are conveyed via said connecting means;

(d) outlet means from said mixing means, allowing said components to leave said mixing means after forming a silicone elastomer mixture;

(e) second connecting means, including a detachable casting head for accommodating said silicone elastomer mixture leaving said mixing means;

(f) storage means for receiving said silicone elastomer mixture from said second connecting means said second connecting means being located in the bottom of said storage means and connectable with said mixing means and mold means;



(g) mold means having a generally vertical longitudinal axis for receiving a fiber core and molding an insulator about said fiber core and having bottom located means for receiving molding material from said storage means;

(h) pressure means, exerting 5 to 6 bar, for moving said silicone elastomer mixture, from said storage means through the second connecting means into said molding means through said casting head attached to a single input; and

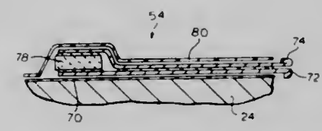
(i) heating means associated with said molding means for causing a cross-linked structure to be achieved in said silicone elastomer mixture in said molding means.

4,897,028

APPARATUS FOR THERMOPLASTICALLY PROCESSING SYNTHETIC POLYMERIC RESINS

Martin B. Barancik, Evansville, Ind., and Erich O. Teutsch, Marietta, Ga., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Mar. 20, 1987, Ser. No. 28,647
Int. Cl.[4] B29F *1/08*
U.S. Cl. 425—144 **8 Claims**



1. In an injection molding apparatus for injection molding of a thermoplastic resin, which comprises an interior mold surface, the improvement which comprises; a thin-film resistance heater disposed on the surface of the mold.

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4,897,029

DEVICE FOR PREPARING A VERY HOMOGENEOUS AND FINELY DIVIDED FINE-CERAMICS MASS

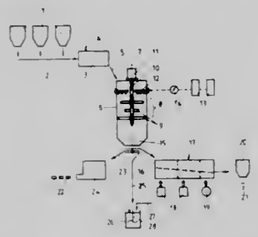
Dieter Seltmann, Schirnding, and Emil-Karl Köhler, Berchtesgaden-Oberau, both of Fed. Rep. of Germany, assignors to Porzellanfabrik Schirnding AG, Schirnding, Fed. Rep. of Germany

Division of Ser. No. 58,795, Jun. 5, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 179,563

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 3619272

Int. Cl.[4] B29C *67/02;* **B01J** *2/06*

U.S. Cl. 425—222 **11 Claims**



1. An arrangement for preparing a very homogeneous and finely-divided fine-ceramics mass from ceramic raw materials, liquids, aggregates, and similar materials, usable for dishes and articles in isostatic pressing comprising: means for finely grinding starting materials to form a granulate having processing properties for producing porcelain; means for adding liquid to the ground materials; an upright container with a feed for the ground starting materials entering through the top of the container; pipes on said container with nozzle-shaped openings from which the liquid emerges as a mist; a rapid-acting mixer with arms below said pipes; said starting materials being first allowed to fall freely through said upright container while being contacted with liquid injected under turbulence and then agglomerated into a granulate; and means for partly removing the liquid; said granulate having a predetermined kernel construction with individual splintering particles in form of a grape in which kernels are put together; said granulate containing air and being compressible, said air escaping from said granulate when said granulate is compressed.

4,897,030

APPARATUS FOR LENGTHWISE FOLDING THERMOPLASTIC STRIP MATERIAL

Thomas L. Vajtay, Somerset, N.J., assignor to SLM Manufacturing Corporation, Somerset, N.J.

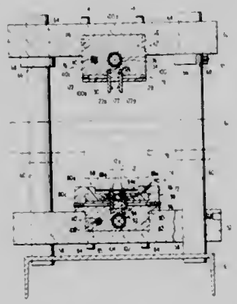
Division of Ser. No. 1,283, Jan. 8, 1987, Pat. No. 4,780,261. This application Aug. 22, 1988, Ser. No. 234,665

Int. Cl.[4] B29C *53/06, 59/02*

U.S. Cl. 425—384 **9 Claims**

1. In an apparatus for forming longitudinally folded thermoplastic material stock strip comprising a feed stand supporting a roll of thermoplastic material stock strip, a feed mechanism for gripping a free end of the thermoplastic material stock strip and continuously feeding it in the longitudinal direction of the strip, a heating assembly receiving said thermoplastic material stock strip and including a means for heating at least portions of said stock strip to a temperature sufficient to heat soften the thermoplastic material, a means downstream of said heating assembly for progressively folding said heat softened flat thermoplastic material stock strip into lengthwise folded form having at least one substantially sharp fold and means for maintaining the lengthwise folded thermoplastic material stock strip in folded condition by holding and pressing the stock strip while cooling the stock strip to set the fold, the improvement wherein;

said heating assembly comprises fixed upper and lower knife blades in longitudinal alignment with and respectively above and below said stock strip and sandwiching the stock strip therebetween with the opposed surfaces of the stock strip in light contact with respective knife blade edges, means for heating respective knife blades such that



said stock strip is heat softened along said narrow longitudinal areas on opposite sides of the stock strip to maximize the heat softened effect so as to permit the stock strip to be moved at relatively high speed through the heating assembly, and to thereby define a localized longitudinal fold line for said stock strip.

4,897,031

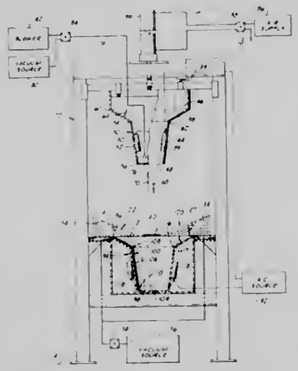
ARTICLE FORMING SYSTEM

Donald E. Weder; Erin H. Weder, both of Highland, Ill.; R. E. Jack Dunn, St. Louis, and Franklin J. Craig, Valley Park, both of Mo., assignors to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Jul. 13, 1988, Ser. No. 219,083

Int. Cl.[4] B29C *51/20*

U.S. Cl. 425—388 **41 Claims**



1. An apparatus for forming a sheet of material into an article, comprising:

a male die having an upper end, a lower end and an outer peripheral male die surface extending a distance generally between the lower end and the upper end of the male die;

a female die having an upper end, a lower end and an opening intersecting the upper end and extending a distance towards the lower end forming an inner peripheral female die surface, the opening being shaped to receive the portion of the male die having the male die surface formed thereon and the female die surface being mateable with the male die surface with a clearance therebetween in a forming position of the male die and the female die;

means for moving one of the male die and the female die to the forming position with the male die surface matingly disposed in the female die surface and for removing one of the male die and the female die from the forming position;

a platform having a support surface formed thereon and an opening extending through the support surface, the female die being disposed in the opening with the upper end of the female die being disposed generally near the support surface, the support surface being adapted to support at least portions of the sheet of material with a generally central portion of the sheet of material being disposed generally over the opening through the upper end of the female die; and

said means for holding being inclined portions of said support surface defining vacuum parts therein.

4,897,032

APPARATUS FOR MAKING A CLOSURE DEVICE COMPRISING A HINGED CAP FOR A CONTAINER

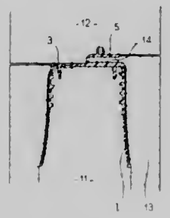
Pierre Corteggiani, Seyssins, France, assignor to Le Moulage Automatique, Chateau Thierry, France

Filed Nov. 30, 1988, Ser. No. 278,131

Claims priority, application France, Dec. 4, 1987, 87 16883

Int. Cl.[4] B29C *33/00*

U.S. Cl. 425—556 **1 Claim**



1. A mold for forming an aperture container cap having a hinged lid mold in an open position, comprising:

a core for defining a cap interior and about which a hinged cap can be molded; a female mold having plural relatively movable parts for forming a cap exterior and defining a generally cylindrical mold cavity, one of said movable parts having a blade portion projecting generally parallel to and spaced from an end of said core to define an end portion of the cap therebetween, a surface of said blade portion opposite a second surface thereof next adjacent said core defining a surface of said lid which will be an outer surface when the lid is closed in said cap and a further mold part movable to abut said movable parts to close said mold and in-part defining end portions of said cap and a portion of said lid which will be an inner surface when the lid is in a closed position in said cap, the cap being ejectable from the mold merely by relative axial movement of the mold parts.

4,897,033

LIGHTER WITH A CIGARETTE EXTINGUISHER

Bill Yang, Taipei, Taiwan, assignor to Cotron Corporation, Taipei, Taiwan

Filed Feb. 6, 1989, Ser. No. 306,702

Int. Cl.[4] F23Q *2/32;* **A24F** *13/20, 19/14*

U.S. Cl. 431—253 **3 Claims**

1. A lighter with a cigarette extinguisher, comprising:

a body having a fuel storage chamber;

fuel igniting means secured to said body;

first cutting means having a first end portion, a second end portion and a first blade formed on said first end portion;

second cutting means secured to said body, having a third end portion, a fourth end portion and a second blade formed on said third end portion;

pivoting means for pivotally connecting said second end portion and said fourth end portion so as to facilitate relative pivotal movement of said first blade and said second blade, said relative pivotal movement of said first blade and said second blade affecting cutting-off of a cigarette head inserted into a space between said first blade and said second blade;

biasing means, disposed between said first cutting means and said second cutting means, for biasing said two cutting means to move apart from each other; and

a tongue disposed between said first cutting means and said second cutting means, for cooperating with said first cutting means to crush said cut-off cigarette head.

4,897,034

TRUCKS FOR USE IN TUNNEL KILNS

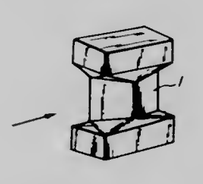
Keiji Yasuda, Aichi, and Kazuhiro Miyahara, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Feb. 9, 1988, Ser. No. 153,923

Claims priority, application Japan, Feb. 14, 1987, 62-19423[U]

Int. Cl.[4] F27D *3/12*

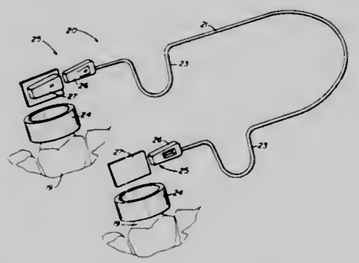
U.S. Cl. 432—241 **4 Claims**



1. A truck for use in a tunnel kiln for firing shaped bodies by heating said shaped bodies with a plurality of combustion burners provided on sides inside said tunnel kiln, comprising supports, each of which has an elliptical cross section with substantially parallel portions thereof arranged in parallel to a combustion stream emitted from said combustion burners, such that each of said supports has a maximum cross sectional area substantially normal to said combustion stream which is smaller than the maximum cross sectional area substantially parallel to said combustion stream.

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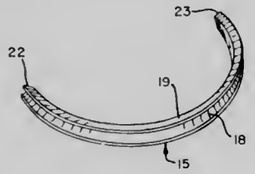
4,897,035
CONNECTOR APPLIANCE FOR ORTHODONTIC APPLIANCE SYSTEMS
William A. Green, 488 Beech St., San Bruno, Calif. 94096
Filed Aug. 29, 1988, Ser. No. 237,854
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—17 **13 Claims**



1. A connector appliance for orthodontic appliance systems, said connector appliance comprising:
- a male connector piece having generally a wedge shape with a large base end and a relatively narrow outer end, the base end being adapted to be rigidly attached to a force-supplying orthodontic appliance,
- the male connector piece including four substantially planar outer surfaces, comprising two outer side surfaces forming opposite sides of the connector piece, and an outer proximal surface and an outer distal surface that also form opposite sides of the connector piece, said opposite outer side surfaces, and said opposite proximal surface and distal surface lying in nonparallel planes that slope closer together towards the narrow outer end of the male connector piece so that the outer end is narrower between said opposing surfaces than the larger base end, and
- a female connector piece being adapted to be rigidly attached to a patient's tooth and having a generally wedge-shaped receptacle with a large front opening and a relatively narrower back opening, the receptacle shape substantially corresponding to the wedge shape of the male connector piece so that the male connector piece can be received in the receptacle in a connected position, the receptacle of the female connector piece including four surfaces corresponding to the four outer surfaces of the male connector pieces, two side surfaces that form opposite sides of the receptacle, and the proximal surface and a distal surface that also form opposite sides of the receptacle, said opposing surfaces of the receptacle lying in nonparallel planes that slope closer together towards the relatively narrow back opening of the receptacle, and each of the four surfaces of the receptacle being adapted to substantially abut the corresponding outer surface of said male connector piece when said male connector piece is received in the receptacle in the connected position, and
- locking means associated with the male connector piece and the female connector piece for locking said connector pieces together in the connected position.

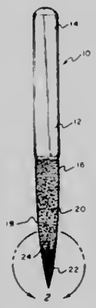
4,897,036
TORQUING AUXILIARY
Peter C. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.
Filed Sep. 1, 1988, Ser. No. 239,552
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—18 **18 Claims**

1. In combination with an orthodontic system for an arch of a person including a plurality of brackets mounted on the teeth of the arch and having generally aligned rectangular arch wire slots, a torquing auxiliary received in said archwire slots and attached to a plurality of said brackets on a curved segment of the arch for applying a torquing force to a tooth, a main archwire at least partially received in said archwire slots attached to all of said brackets, said auxiliary comprising a wire of highly resilient material such that it will not easily permanently deform when stressed from its passive or unstressed state and when stressed will tend to return to its passive state, said auxiliary wire being arcuate along its length in its passive or unstressed state and devoid of any loops and having a cross section therealong mating with the archwire slot against relative rotation where it is attached to at least one bracket and stressed when attached to adjacent brackets to apply torque to



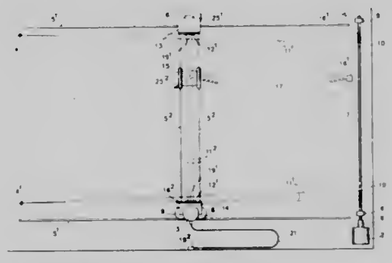
the tooth on which the bracket is mounted against rotation, said auxiliary wire having opposed generally parallel flat surfaces for engaging opposed parallel sides of the archwire slot and one of the other surfaces having a recess shaped to receive at least a portion of the main archwire so as to minimize protrusion from the bracket, whereby the auxiliary is passive in one position prior to mounting on the brackets and then turned about fifteen to ninety degrees from the passive state and stressed and arcuately formed on the curved segment of the arch in a different dimension than when in its passive state to then be attached to the brackets in the stressed state thereby activating the auxiliary to apply torque to the bracket or brackets to which it is mounted against relative rotation.

4,897,037
DENTAL BUR
David C. Appleby, 239 Chestnut St., Haddonfield, N.J. 08033
Filed Dec. 8, 1988, Ser. No. 281,168
Int. Cl.[4] A61C *3/06*
U.S. Cl. 433—166 **12 Claims**



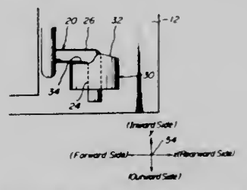
7. A dental bur comprising:
- a nonabrasive shank portion adapted to be held by a dental drill;
- an abrading portion connected to and extending downwardly from said shank portion;
- said abrading portion having substantially the same abrading properties throughout the length thereof but being divided into two distinct, axially separtate and differently shaded sections.

4,897,038
CARTOGRAPHIC DEVICE
Ingrid Fröhlich, and Andreas Pachler, both of Aufhofen 8, D-8195 Egling, Fed. Rep. of Germany
PCT No. PCT/DE87/00041, § 371 Date Oct. 2, 1987, § 102(e) Date Oct. 2, 1987, PCT Pub. No. WO87/04834, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 3, 1987, Ser. No. 113,818
Claims priority, application European Pat. Off., Feb. 3, 1986, 86101373.8; Fed. Rep. of Germany, Sep. 29, 1986, 3633051
Int. Cl.[4] G09B *29/10, 27/08*
U.S. Cl. 434—153 **14 Claims**



1. A cartographic device comprising:
- support means for supporting a map on which a plurality of locations are illustrated at respective positions,
- a place indicator that is movable relative to the support means for indicating locations on the map,
- at least one fixed reference element on the support means for defining the position of the place indicator,
- input means for receiving information relating to a location illustrated on the map,
- a microcomputer having permanently stored therein information defining the positions on the map at which selected locations are illustrated, and
- drive means responsive to the microcomputer to move the place indicator to the position at which a location is illustrated.

4,897,039
CONNECTOR LOCKING DEVICE
Kazuburo Uchida, and Tsunemi Eda, both of Mooka, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Japan
Filed Apr. 3, 1989, Ser. No. 332,703
Claims priority, application Japan, Apr. 8, 1988, 63-47660[U]
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—372 **7 Claims**



1. A locking device for a connector including latch supports in the form of a half-cylinder and latch springs, horizontally outwardly bent ends of each of the latch springs being rotatably supported in two latch supports, respectively, and base portions of each of the latch springs being always in elastic contact with end faces of two latch supports, wherein an end face of each of the latch supports comprises a flat face substantially perpendicular to rotating axes of the bent ends of the latch spring, a width differential face made of an inclined face continuous to the flat face and obliquely protruding in an axial direction of the bent ends of the latch spring away from the flat face, and a gently inclined face continuous to the width differential face on an opposite side of the flat face and obliquely depressing in an axial direction of the bent ends of the latch spring away from the width differential face, and said base portions of each of the latch springs are in contact with said flat faces, in contact with the width differential faces, and in contact with the gently inclined faces when the latch spring is in a vertical, a predetermined inclined and a horizontal position, respectively.

4,897,040
CUTTING AND CLAMP SLEEVE CONTACT AND METHOD OF CONNECTING INSULATED ELECTRICAL WIRE CONDUCTORS
Dieter Gerke, and Manfred Müller, both of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Berlin, Fed. Rep. of Germany
Filed Mar. 21, 1988, Ser. No. 170,881
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709376
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—401 **17 Claims**



1. An electrical connector for cutting and clamping electrical insulated wire conductors, comprising a substantially tubular member having open ends and an axially-extending through slot extending from one end to the other, first and second wall pieces located intermediate the length of said tubular member electrically connected to said tubular member and projecting into the interior of said tubular member and terminating in spaced-apart wall piece conductor edges defining a contact slot, the electrically insulated wire conductor being movable through the through-slot and between the conductor edges which are shaped to cut through the insulation of the wire and to make clamping electrical connection with said wall piece conductor edges, said tubular member defining said through slot being connected to said first and second wall pieces such that the widening of said through slot by an insulated wire conductor generates a proportional widening of said contact slot prior to the insulated wire engaging said conductor edges defining said contact slot.

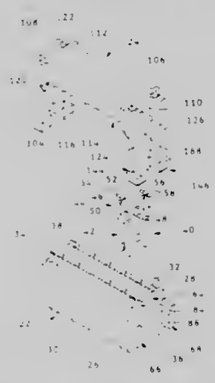
4,897,041
ELECTRICAL CONNECTOR HAVING A CABLE TERMINATING COVER RETENTION SYSTEM AND A STRAIN RELIEF THEREFOR
Francis M. Heiney, and Joseph W. Young, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 21, 1989, Ser. No. 326,999
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—404 **20 Claims**

1. An electrical connector for terminating multiconductor cable, comprising:

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a housing having a cable receiving face, opposed side walls and an end wall, said end wall having first, second and third protrusions extending therefrom, said first protrusion centrally located with respect to said side walls and proximate said cable receiving face, said first protrusion defining a latching surface facing in a direction substantially away from said cable receiving face, said second and third protrusions located proximate respective side walls, with said second and third protrusions each defining a sloped surface angled toward the other protrusion in a direction away from said cable receiving face and a latch shoulder facing away from said cable receiving face; and

a terminating cover having first and second spaced latch arms extending therefrom to distal ends which are deflectable toward one another, said terminating cover defining



an inner surface, said latch arms each having first and second latch means proximate said distal end and facing in a direction substantially towards said cable receiving face, the terminating cover capable of being secured to the housing in first and second positions, in said first position the first latch means on each latch arm engages said latching surface and each said distal end engages a respective said sloped surface such that the inner surface of the terminating cover is spaced from the cable receiving face to permit insertion and alignment of the cable for termination, the terminating cover movable from the first position toward the cable receiving face, the terminating cover securing the cable to the housing in a terminated condition at the second position, with the second latch means of each latch arm engaging a respective said latch shoulder.

4,897,042

MULTIPLE JUNCTION DEVICE

Youji Saka, Mie, and Takao Nozaki, Tsu, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Jun. 15, 1988, Ser. No. 207,316

Claims priority, application Japan, Jun. 16, 1987, 62-149832; Jun. 19, 1987, 62-154066

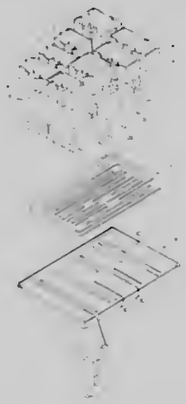
Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—404 **27 Claims**

1. A junction device comprising a first wiring board having at least one connection area thereon, at least one first electric wire to be connected, said first wire being beneath said first wiring board, and at least one first connection tab;

each said first connection tab comprising a first connecting end and a first wire contact remote therefrom, said connecting end being offset from said first wire contact in a direction longitudinal of said first wire;

said first connecting end being adapted to mate with a complementary portion of another connector, each said first tab extending from said wire connection area through said



first wiring board and being in electrical contact with one said first electric wire.

4,897,043

RESILIENT CONTACT PIN

Klaus Giringer, Herrenberg; Sven Hinnerwisch, Nufringen, and Gustav Krüger, Herrenberg, all of Fed. Rep. of Germany, assignors to Feinmetall GmbH, Herrenberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 64,868, Jun. 19, 1987, Pat. No. 4,787,861. This application Oct. 21, 1988, Ser. No. 261,365

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3620946; Dec. 29, 1986, 3644643; May 6, 1988, 8806066; May 6, 1988, 8806067; May 6, 1988, 8806065; May 6, 1988, 8806068

Int. Cl.[4] H01R *4/40*

U.S. Cl. 439—482 **13 Claims**



1. A resilient contact pin for contacting an electrical or electronic item, such as a circuit board, to be tested, the resilient contact pin being electrically conductive and mountable on a testing unit, said resilient contact pin comprising:

a straight cylindrical member stamped from sheet metal and bent to form a metal tube;

a contact member in said tube including a piston axially slidable in said tube and having a frontward end portion projecting out of said tube for engagement with said item;

spring means in said tube bearing upon said contact member and urging said piston in a frontward direction toward said item; and

at least one lug formed from a region of said cylindrical member, projecting into the interior of said tube, and forming an abutment for said piston limiting displacement of said contact member in said frontward direction, said lug having a configuration of a tonguelike barb reaching in the interior of said tube toward a rearward end thereof and having a free end portion extending rectilinearly parallel to a longitudinal axis of said tube, said contact member being formed with a shoulder generally transverse to said axis and abuttingly engaging said free end portion under force applied by said spring means to limit said displacement of said contact member.

4,897,044

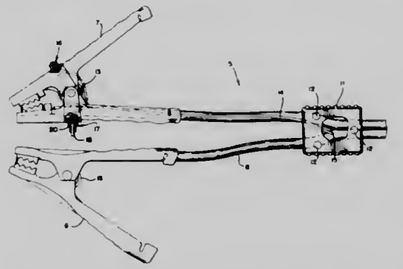
BATTERY JUMPER CABLE

Michael J. Rood, Hoffman Estates, Ill., assignor to Pi-Chen Hsu Chou, Taipei, Taiwan

Filed Jul. 20, 1987, Ser. No. 75,127

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—504 **5 Claims**



1. A battery jumper cable unit with integrated safety features for use in starting a first vehicle having a first battery requiring assistance from a second battery in a second vehicle providing assistance, comprising, in combination:

positive and negative insulated electrical cables long enough to reach between said first and second batteries and physically joined adjacent their opposite ends by clamping means;

a pair of positive terminal clamps attached in electrically conducting relationship to opposite ends of said positive insulated electrical cable for clamping onto the positive terminals of said first and second batteries;

a pair of negative terminal clamps attached in electrically conductive relationship to opposite ends of said negative insulated electrical calbe one of which is for clamping onto the engine block or other ground point on said second vehicle and the other of which is for clamping onto the engine block or other ground point on said first vehicle; and

an installer's warning circuit comprising, a test probe mounted in electrically insulated relationship on each said negative terminal clamp, an insulated test conductor electrically interconnecting each said test probe with said positive insulated electrical cable, and an electrically actuated attention-getting means, a diode and a resistor mounted in electrically insulated relationship on each said negative terminal clamp and interconnected in series circuit relationship with each other and with the said test probe mounted on the same one of said negative terminal clamps by means of the same one of said insulated test conductors, each of said negative terminal clamps comprising two jaws with one of said test probes mounted on one of said jaws and one of said attention-getting means mounted on the other of said jaws and with said one test probe and said one attention-getting means being exposed in opposite directions, whereby said attention-getting means is exposed to view when said test probe is hidden from view and each of said insulated test conductors being connected with said positive insulated electrical cable within the adjacent of said clamping means.

4,897,045

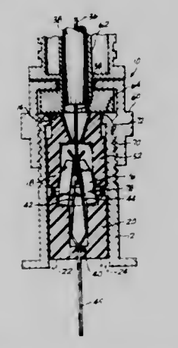
WIRE-SEIZING CONNECTOR FOR CO-AXIAL CABLE

Arthur Dyck, Box 455, Abbotsford, British Columbia, Canada (V2S 5Z5)

Continuation-in-part of Ser. No. 107,340, Oct. 13, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 207,705

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—578 **12 Claims**



1. An "F" port connector, for making an electrical connection for a co-axial cable, comprising:

an electrically conductive housing, a portion of which defines a generally cylindrically shaped cavity, and having a radially inwardly projecting flange positioned at one end of said housing, said flange having a flat, axially outwardly facing annular surface which surrounds and defines an axial end opening leading into said cavity, said end opening having a diameter that is less than the inside diameter of said cavity;

an axially movable cam member made of an electrically insulative dielectric material, and having an inner portion received within said cavity, said inner portion having a smooth outer surface which is cylindrically shaped for sliding movement along the inner wall of said cavity, and an end portion defining one axial end of said cam member, said end portion having a smooth cylindrically shaped outer surface that extends through said housing end opening and normally projects axially outward past said annular surface of said flange, the outer diameter of said outer surface of said cam member's end portion being less than the outer diameter of said cam member's inner portion, said end portion providing an outwardly facing thrusting surface for driving said cam member axially inwardly into said cavity, and wherein the outer diameter of said smooth outer surface of said cam member's inner portion is greater than the width of said end opening in a manner so that said cam member's inner portion cannot pass through said end opening, said housing's flange retaining said inner portion in said cavity, said inner portion further having a camming recess facing axially inwardly;

a wire-seizing body also received in said housing and having a seating portion, and a pair of seizing elements extending axially away from said seating portion, with each seizing element having an outer axial end, each element end having an angled outer lateral surface, said angled surfaces

converging symmetrically with respect to each other into said camming recess, and with said recess having at least a pair of divergent inner surfaces which drivingly contact said convergent angled surfaces as said cam member is driven axially into said cavity, said seizing elements being homogeneously joined to said seating portion in a manner such that said seating portion and said elements are formed from a single piece of material, and wherein said material is an electrically insulative dielectric material having sufficient elasticity to permit elastic lateral bending of said elements, said seizing elements being normally parallelly spaced from each other when in a nonwire-seizing condition along substantially their entire length from the location where they are joined to said seating portion to their outer axial ends, and further, each of said elements having a generally flat, rectangular inner surface, said inner surface of one element laterally facing said inner surface of one other; and

an electrically conductive spring contact member having first and second normally spaced elastically bendable metal leaves, one leaf each substantially extending along the length of one of said inner surface of said seizing elements, said leaves being spread apart in a manner so as to define an axial wire-receiving space inbetween said seizing elements and said leaves, and

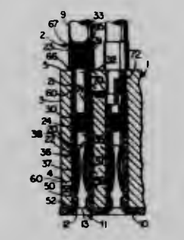
wherein said divergent inner surfaces of said cam member drivingly contact said convergent angled surfaces of said seizing element's outer axial ends as said cam member moves axially into said cavity, in a manner so as to elastically bend said seizing elements laterally inwardly toward each other along their length from their ends toward the location where they are joined to said seating portion, said inner surfaces of said elements correspondingly driving said leaves laterally inwardly along said wire-seizing space from said element ends toward said seating portion to close upon a length of wire in said space.

4,897,046

SHIELDED CONNECTOR SYSTEM FOR COAXIAL CABLES

John N. Teagler, Chico, Calif.; Alan L. Routh, and John T. Vesaleck, both of Madison, Ohio, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 3, 1986, Ser. No. 914,803
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—579 **3 Claims**



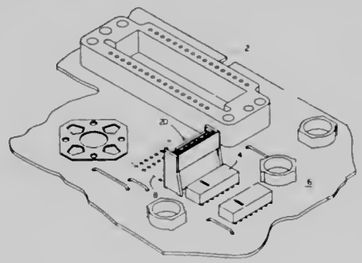
1. A coaxial cable termination system, comprising a coaxial cable terminator including a coaxial cable having signal and shield contact electrically connected to said signal conductors, an electrical contact electrically connected to said signal conductor, said electrical contact having a contacting portion for electrically connecting with an external member inserted to engagement with said contacting portion, a protective insulator means for covering at least part of said contacting portion, and a strain relief body molded directly to at least part of said coaxial cable, electrical contact and protective insulator means for holding the same in relatively fixed positions with respect to each other; and housing means for receiving therein said terminator to hold the same in position to make electrical connection with an external member inserted into said housing means to engage said electrical contact, and said protective insulator means comprising a hollow cylindrical tube portion and a split back end for cooperating with said strain relief to facilitate securing said insulator means and said strain relief body with respect to each other.

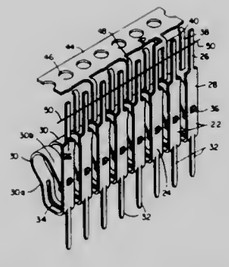
4,897,047

ELECTRICALLY AND MECHANICALLY PROGRAMMABLE ELECTRICAL APPARATUS

Alistair D. Connell, Greensboro; Donald W. K. Hughes, and Allen F. VanDerStayf, both of Kernersville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 10, 1988, Ser. No. 230,640
Int. Cl.[4] H01R *9/09*; H01H *85/02, 85/14*
U.S. Cl. 439—189 **30 Claims**





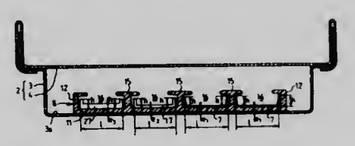
1. A programmable connector comprising: a plurality of terminals, each including fuse contact means; a plurality of ground members, at least one ground member disposed adjacent the fuse contact means of each terminal; a single filament having a current carrying capacity less than each said terminal and each said ground member initially extending between a plurality of said terminals and a plurality of said ground members; and a plurality of filament contact dummy legs disposed between otherwise adjacent terminals, portions of the single filament between selected terminals and a ground member and between each said filament contact dummy leg and adjacent ones of said terminals capable of being selectively severed by application of a current, between the selected terminals and an adjacent one of said ground members or between selected filament contact dummy legs and an adjacent one of said terminals, in excess of the current carrying capacity of the single filament, a ground connection being maintained between other terminals and at least one of said ground members.

4,897,048

PREFABRICATED ELECTRIC DUCTING ADAPTABLE FOR SEVERAL RATED CURRENTS

Daniel Liebon, Arc-sur-Tille; Jean-Yves Teinturier, Longvic, and Jean-Ouerre Thierry, Arc-sur-Tille, all of France, assignors to La Telemecanique Electrique, France

Filed Feb. 23, 1989, Ser. No. 313,789
Claims priority, application France, Feb. 25, 1988, 88 02285
Int. Cl.[4] H01R *25/16*
U.S. Cl. 439—211 **9 Claims**



1. A prefabricated electric ducting adaptable for several given rated currents and intended in particular for distributing low powers, said ducting comprising:

i. a metal protective casing in the form of a tubular conduit having a longitudinal axis and a substantially parallelepipedic section,

ii. a flat support which extends longitudinally inside the casing, said support being a shaped piece made by extruding an electrically insulating plastic material and comprising a base plate, two outer ribs mounted at right angles to said base plate and, at even spacings parallel to said outer ribs, a plurality of inner ribs, said outer and inner ribs extending longitudinally over the whole length of the base plate and being shaped so as to define therebetween and with the base plate a plurality of parallel longitudinal grooves having identical C sections with straight edges, a current conducting bar housed flat in each of said grooves, said support bars being applied by its base plate against the bottom of the casing,

iii. a plurality of taps spaced evenly apart over the length of the casing, each of said taps being provided with orifices situated opposite said conducting bars for the passage of removable current tapping members, each of said taps providing an electric contact with a corresponding conducting bar, wherein the conducting bars corresponding to said different rated currents of the ducting have the general form of a U having legs and base which have respectively identical outer heights and identical outer widths, whatever the rated current of the ducting, said U conducting bars having a thickness which varies as a function of the rated current of the ducting, the respective conducting bars being inscribed in the respective identical C shaped sections of said grooves.

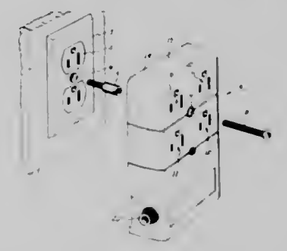
4,897,049

ELECTRICAL TAP WITH PERMANENT MOUNT

Edward B. Miller, Avon, Conn., and Robert J. Mellen, North Kingstown, R.I., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1988, Ser. No. 226,504
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—365 **7 Claims**

1. In combination, (i) a duplex wall receptacle mounted in a wall and a wall plate mounted over said wall and receptacle, (ii) an elongated mounting stud, one end of which comprises a machine screw thread portion which is screwed into and secured in corresponding threads in said receptacle and which secures said wall plate to said receptacle and the other end of which extends outward of said receptacle and comprises a blind hole having machine threads on the interior surface thereof, (iii) a plug-in power tap containing means for receiving at least one male plug wherein said tap is plugged into said receptacle over said wall plate and has cavity means to receive said blind hole portion of said mounting stud, said tap having a front and back portion wherein said back portion contains said cavity means for accepting said mounting stud along with at least one projecting male ground pin and blades for making electrical contact with electrical blade receiving members within said wall receptacle, and said front portion of said tap containing a mounting hole or cavity axially aligned with said mounting hole in said back portion and wherein a first hollow post or cylinder extends inwardly and perpendicularly from the inner surface of either of said back or front portion and which post contains a portion of reduced diameter on the inner surface thereof and where a second hollow post or cylinder



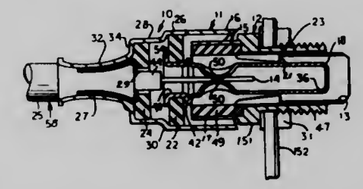
extends inwardly and perpendicularly from the inner surface of said respective front or back portion and which fits in mating engagement into said first post and wherein the end of said second post butts against said interior portion of reduced diameter in said first post and wherein said hollow portion of each of said posts are axially aligned and provide said cavity means for receiving a mounting screw with a portion of said post extending from said back portion containing said cavity means for receiving said portion of said mounting stud, and (iv) said mounting screw which is screwed into said mounting stud through said cavity means in said tap to secure said tap to said receptacle.

4,897,050

METHOD AND APPARATUS FOR MAKING COAXIAL COUPLINGS

Walter J. Randolph, Saegertown, Pa., assignor to NTT, Inc., Meadville, Pa.

Filed Mar. 30, 1989, Ser. No. 330,796
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—585 **20 Claims**



1. A plug for connecting a coaxial cable to a socket comprising:

a hollow cylindrical shell having a first open end, a second open end, a first part, a second part and a third part,

said second part being disposed between said first part and said third part,

a hollow cylindrical pin having an open end,

said hollow cylindrical pin being disposed in said hollow cylindrical shell and concentric thereto,

a first insulation washer in said first part,

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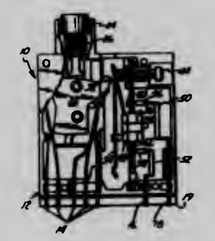
said coaxial cable having a first conductor, insulation over said first conductor and a wire shield over said insulation, flange means holding said pin in place on said first insulation washer and connecting said pin to said first conductor, said shell being adapted to receive said coaxial cable, said first conductor being adapted to extend into said pin, said third part of said shell being deformed into engagement with said wire shield forming electrical and mechanical connection with said wire shield.

4,897,051

FLEXIBLE ELECTRIC COMPONENT LEADS

Donald J. Kasprzyk, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 11, 1988, Ser. No. 167,050
Int. Cl.[4] H01R *13/70*
U.S. Cl. 439—620 **20 Claims**



1. Apparatus for mounting an electrical member in a housing so that it may be electrically connected to circuit means external to the housing and mechanically connected to the housing so as to be flexible generally along first, second and third axes, the electrical member having a first terminal comprising:

first electrical conductive compound spring means having first and second ends with first, second and third relatively thin flat portions therebetween, the first, second and third flat portions being bendable and twistable so as to permit flexibility generally along the first, second and third axes; and

connection means connecting the first end of the first spring means to the first terminal of the electrical member and connecting the second end of the fist spring means to the housing so as to extend from the interior to the exterior of the housing for connection to the circuit means.

4,897,052

INTERMEDIATE ELECTRICAL COMPONENT FOR A MOLDED PLUG

James D. Priest, and Douglas D. Duffield, both of New Paris, Ohio, assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 3, 1989, Ser. No. 306,518
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—652 **11 Claims**

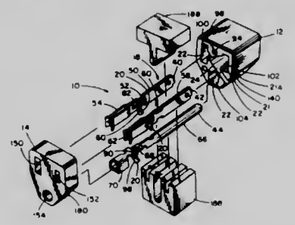
1. An intermediate electrical component for an electrical connector, comprising:

a plurality of terminal elements;

a stranded conductor connected to each of the terminal elements;

a first body portion having a plurality of parallel channels formed therein, and a terminal element loading face oriented transversely with respect to the parallel channels, each channel receiving one of the terminal elements; and

a second body portion closing the terminal element loading opening and having channels formed therein and aligned with corresponding channels of the first body portion for



receiving portions of the terminal elements extending from the first body portion.

4,897,053

CONTACT PIN

Robert J. Verhoeven, Sint Amands Aan de Schelde, and Danny L. C. Morlion, Gent, both of Belgium, assignors to Burndy Corporation, Norwalk, Conn.

Filed Apr. 11, 1989, Ser. No. 336,410
Claims priority, application European Pat. Off., Nov. 7, 1988, 88202482.1
Int. Cl.[4] H01R *13/428*
U.S. Cl. 439—751 **3 Claims**



1. Contact pin for a printed circuit board, comprising a compliant portion for mounting the contact pin in a hole in the printed circuit board, said compliant portion including two legs extending in the longitudinal direction of the contact pin and joining a solid contact pin portion at both ends, said legs being twisted into a position in which seen in cross section these legs extend obliquely outwardly before insertion of the contact pin in a hole, wherein said legs are separated from each other by a slot and in that each solid contact pin portion is provided with a positioning element projecting from the corresponding solid contact pin portion into said slot and being displaced outwardly with respect to the solid contact pin portions.

4,897,054

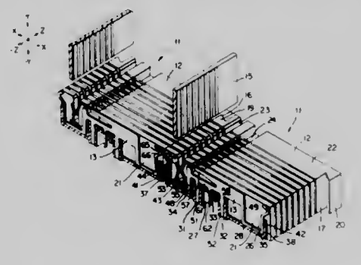
MODULAR CIRCUIT BOARD BUSSING CONNECTOR

Hermanus P. J. Gilissen, Each, and Lucas Soes, Roosmalen, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 134,630, Dec. 18, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,169
Claims priority, application United Kingdom, Dec. 19, 1986, 8630450
Int. Cl.[4] H01R *23/70*
U.S. Cl. 439—631 **20 Claims**

1. An electrical connector comprising an insulating module

having a printed circuit board receiving slot therein with a plurality of receptacle contacts disposed within the slot, the module having a series of bussing means extending between opposed parallel ends of the module and intersecting the circuit board receiving slot, the bussing means being selectively commoned to the receptacle contacts, the bussing means being defined with at least one resilient contact portion arranged to protrude beyond one of the opposed parallel ends of the housing, with the opposed parallel ends of the housing being



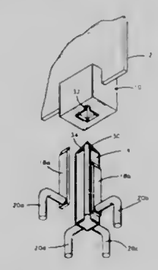
adapted to be assembled in edge-to-edge relation with another similar connector module to bring complementary conductive contact portions into electrical engagement to selectively interconnect receptacle contacts on similar modules, the receptacle contacts and the bussing means being formed by circuit traces disposed on a flexible substrate, the flexible substrate being applied to the module with the circuit traces extending between opposed parallel ends and extending into the circuit board receiving slot for electrical interconnection to the printed circuit board traces.

4,897,055

SEQUENTIAL CONNECTING DEVICE

Thomas M. Jurista, Vestal, and Osvaldo Mantilla, Endicott, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 28, 1988, Ser. No. 276,518
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—924 **6 Claims**



1. A socket and plug arrangement for sequentially making contact with a multiplicity of connections, comprising;

a plug member,

a socket member configured to slidingly receive said plug member,

a first set of a plurality of electrically conducting discrete contacts circumferentially disposed and insulated from each other in said socket member;

a second set of a plurality of electrically conducting discrete contacts circumferentially disposed and insulated from each other on said plug member and arranged to engage said first set of contacts when said plug member is inserted into said socket member, at least two of the contacts in one of the sets of said contacts being axially displaced with respect to each other;

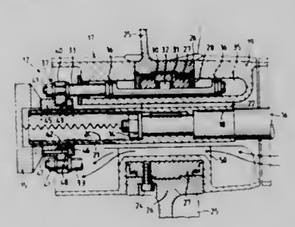
whereby when said plug member is inserted into said socket member contact between the contacts of the two sets are made sequentially in at least two steps.

4,897,056

PROPELLER FOR WATER VEHICLE

Peter Müller, Widmerstrasse 27, Zurich, Switzerland

Filed Jun. 28, 1988, Ser. No. 212,662
Claims priority, application European Pat. Off., Jul. 3, 1987, 87109600.4
Int. Cl.[4] B63H *3/02*
U.S. Cl. 440—50 **10 Claims**



1. Variable pitch propeller for watercraft, which is rotatably mounted on an outboard-supported, pivotable support body and is driven by an engine via a drive connection, the propeller comprising a drive shaft fixed to said drive connection; a propeller hub fixed to said drive shaft; a plurality of propeller blades rotatably mounted to said propeller hub; and adjusting means for adjusting said blades to different pitch angles, said adjusting means being constructed as a mechanism rotating with said propeller hub and being integrated into said hub, said adjusting means including an adjusting linkage operatively connected to said blades, and a manually operable handle arranged on an outflow side of the propeller and spaced from said adjusting linkage and adapted to set said adjusting linkage acting on roots of said propeller blades in accordance with a desired pitch of the propeller blades, said hub including an inner hub and an outer hub surrounding said inner hub and supporting said blades, said adjusting means further including a worm gear fixed to said inner hub which has a spindle portion, said worm gear including a spindle nut rotatable on said spindle portion and being operatively connected to said adjusting linkage by a synchronous flange to displace the same for adjusting said blades, said handle being coupled with said spindle nut in a non-rotary manner to be axially displaceable in respect thereto, and at least one removable locking pin axially extending in said spindle nut and said flange for preventing rotation of said spindle nut after said baldes have been adjusted, said pin being removed from said flange for permitting rotation of said handle.

4,897,057

MARINE PROPULSION UNIT UNIVERSAL DRIVE ASSEMBLY

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

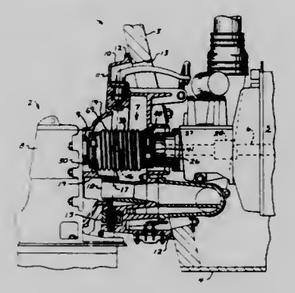
Filed Aug. 4, 1988, Ser. No. 228,320
Int. Cl.[4] B63H *21/32*
U.S. Cl. 440—57 **13 Claims**

1. A universal drive assembly (7) for connecting the rotary output (6) of an inboard marine engine (5) to a rearwardly disposed outboard mounted stern drive unit (2), comprising, in combination:

(a) a universal joint (20) rotatable about a drive axis and

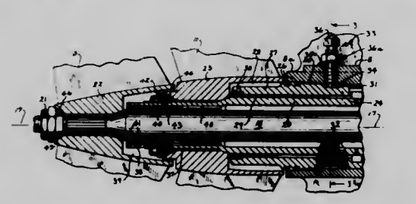
VOL 1110 ISS 5 JA 30 1990 UMI

adapted for respective connection to the engine and stern drive unit,
(b) axially spaced support means (35,44) mounted for rotation with said universal joint,
(c) a cylindrical bellows (33) surrounding said universal joint and forming a lubricant-containing bellows chamber (61),
(d) mounting means for fixedly securing said bellows to said support means so that said bellows rotates with said universal joint,
(e) bearing means (54) mounted to said universal joint within said chamber,
(f) means open to said chamber and defining a circulatory fluid flow path (62) through said bearing means,



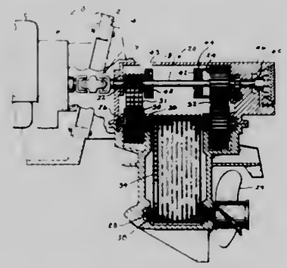
(g) the construction being such that rotation of said universal joint and said bellows causes lubricant in said chamber to circulate generally radially along said path and through said bearing means to lubricate the latter, and with centrifugal force causing the said lubricant to form a cylindrical mass at the inner surface of said bellows,
(h) and restraining means (69) for supporting said bellows against enlargement under the centrifugal force load of said cylindrical mass of lubricant,
(i) said bellows and said lubricant forming co-rotating means to dissipate heat from said chamber.

4,897,058
MARINE DEVICE WITH IMPROVED PROPELLER SHAFT BEARING CARRIER ARRANGEMENT
Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed May 23, 1988, Ser. No. 197,452
Int. Cl.[4] B63H *5/10*
U.S. Cl. 440—80 **1 Claim**



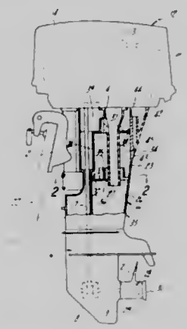
1. In a marine drive, the combination comprising:
(a) a generally vertical drive housing (6) terminating in a lower torpedo housing (9) forming part of a lower gear case (8),
(b) first and second propeller shafts (18,20) disposed within said torpedo housing and extending longitudinally rearwardly in a generally fore-to-aft direction, and with said shafts being concentric and coaxially disposed for rotation on a longitudinal drive axis (17),
(c) rearwardly and forwardly disposed propellers (10,11) disposed on the aft portions of said respective first and second shafts (18,20), and with said propellers having respective first and second hubs (22,23),
(d) said first and second hubs having respective forwardly facing first and second recesses (39,28) disposed therein,
(e) a first bearing carrier (37) mounted concentrically about said first propeller shaft (18) and with said first carrier having a first rearwardly extending nose portion (38) telescoped within said first recess (39),
(f) a second bearing carrier (24) mounted concentrically about said second propeller shaft (20) and with said second carrier having a first rearwardly extending nose portion (27) telescoped within said second recess (28),
(g) first bearing means (40) disposed between said first bearing carrier (37) and said first propeller shaft (18),
(h) second bearing means (29) disposed between said second bearing carrier (24) and said second propeller shaft (20),
(i) said first bearing means (40) being disposed within said first recess (39),
(j) said second bearing means (29) being disposed within said second recess (28),
(k) annular O-ring sealing means (26) disposed between said second bearing carrier (24) andd said gear case (8) adjacent a rearward portion of the latter,
(l) means (31,33) for preventing rotation of one of said bearing carriers (24) about said axis (17) during rotation of said propeller shafts,
(m) and said first bearing carrier (37) for said first propeller shaft (18) being formed by a reduced rearward end portion (37) of said second propeller shaft (20).

4,897,059
WATER PUMP FOR MARINE PROPULSION SYSTEM
Neil A. Newman, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Sep. 8, 1988, Ser. No. 241,614
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—88 **5 Claims**



1. A corrosion resistant coolant pump for placement in the cooling system of a marine drive, said marine drive including an engine and a rotatable shaft rotating when said engine is running, comprising:
a housing including a cavity in communication with said marine drive cooling system;
a corrosion resistant member mounted to and rotatable with said rotatable shaft mounted within said housing;
impeller means connected to said corrosion resistant member so as to be rotatable in response to rotation thereof for pumping coolant in said cooling system, said impeller means being disposed within said housing cavity;
seal means provided about said corrosion resistant member for sealing said housing cavity and preventing contact of coolant with said rotatable shaft, wherein said seal means comprises a pair of seals provided about said corrosion resistant member between a side of said housing cavity and said rotatable shaft, and including a first seal adjacent said housing cavity and a second seal spaced from said first seal so that a gap is formed between said first and second seals; and
drain means in communication with said gap formed between said first and second seals for draining coolant which leaks from said housing cavity through said first seal before said coolant reaches said second seal.

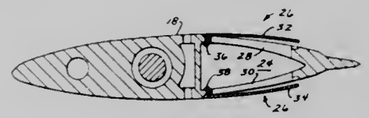
4,897,060
EXHAUST SYSTEM FOR OUTBOARD MOTORS
Masaki Okazaki, Shizuoka, Japan, assignor to Yamaha Hatsudoki and Sanshin Kogyo, both of Shizuoka, Japan
Continuation of Ser. No. 486,406, Apr. 19, 1983, abandoned.
This application Dec. 13, 1984, Ser. No. 681,705
Claims priority, application Japan, Apr. 24, 1982, 57-68908
Int. Cl.[4] B63H *21/32*
U.S. Cl. 440—89 **16 Claims**



1. In an exhaust system for an outboard motor having an engine with an exhaust outlet, an expansion chamber, means including an exhaust pipe for delivering exhaust gases from said exhaust outlet to said expansion chamber, an exhaust gas discharge normally disposed below the surface of the water when said motor is propelling a watercraft, and means for delivering exhaust gases from said expansion chamber to said exhaust gas discharge, the improvement comprising said exhaust pipe extending through a wall which divides said expansion chamber into two parts, said exhaust pipe extending though said first part and terminating in said second part, and an annular opening in said wall defined by an extending flange encircling said exhaust pipe and through which said exhaust pipe passes and which communicates said parts with each other and which forms a tuning neck.

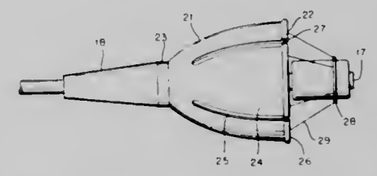
4,897,061
GEARCASE EXHAUST VENT FOR A MARINE PROPULSION SYSTEM
Roger E. Koepsel, and Ronald M. Steiner, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Aug. 4, 1988, Ser. No. 228,321
Int. Cl.[4] B63H *21/32*
U.S. Cl. 440—89 **7 Claims**

1. In a marine propulsion system in which engine exhaust is routed through an internal exhaust passage formed within a housing prior to discharge through an exhaust outlet, said exhaust passage including at least one area of restricted exhaust flow, the improvement comprising relief means comprising one or more openings in said housing disposed adjacent said area of restricted exhaust flow for relieving exhaust pressure adjacent said area of restricted exhaust flow by providing an alternate outlet for exhaust adjacent said area of restricted flow, and closure means responsive to the pressure of exhaust within said exhaust passage adjacent said area of restricted flow for selectively opening and closing said one or more openings, wherein said closure means comprises:
one or more plates adapted to cover said one or more openings, said one or more plates being movable between an open position in which exhaust is allowed to exit said



exhaust passage through said one or more openings, and a closed position for preventing the passage of exhaust through said one or more openings; and
bias means for biasing said one or more plates toward said closed position, said bias means yielding to a predetermined exhaust pressure within said exhaust passage so as to allow said one or more plates to move to their open positions.

4,897,062
WATER WALKER'S PROPULSION POLE
Benjamin H. Watson, 2601 NE. 4th St., Renton, Wash. 98056
Filed Oct. 24, 1988, Ser. No. 261,698
Int. Cl.[4] B63H *16/04*
U.S. Cl. 440—101 **6 Claims**



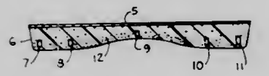
1. A water walker's propulsion pole for use over a body of water, said use comprising an at rest situation, a thrust stroke situation and a return stroke situation, said pole comprising:
a shaft having a first end and a second end and a longitudinal axis,
a hand grip,
a first float having a first buoyant force,
a second float having a second buoyant force and
a propulsion apparatus having a maximum diameter,
said hand grip being installed on said first end,
said first float being installed on said second end,
said propulsion apparatus being installed on said shaft adjacent to said first float,
said second float being installed on said shaft adjacent to said propulsion apparatus,
whereby with said propulsion apparatus installed between said first and second floats, said floats function to maintain said propulsion apparatus at desired distances of immersion in said body of water during use of said pole.

4,897,063

REACTION INJECTION MOLDED RECREATION BOARDS WITH SPACED RECTANGULAR REINFORCING RODS

Robert S. Scheurer, and Kendal Hancock, both of Wichita Falls, Tex., assignors to Wellington Leisure Products, Inc., Madison, Ga.

Filed Nov. 14, 1985, Ser. No. 798,066
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—68 **11 Claims**



1. Board apparatus for water skis, skateboards and recreational boards, comprising:

(a) an elongated flat plastic planar member having a greater length than width and having upper and lower surfaces for supporting at least a portion of a human, one of the upper and lower surfaces being an aluminum plate joined to the plastic member, and said plastic member being a body of polyurethane foam;

(b) rectangular reinforcing rods extending substantially through the length of said planar member wherein said rods have rectangular cross sections with greater heights than widths, and wherein said rods are oriented within the plastic member with the heights of said cross sections aligned generally transversely to the upper and lower surfaces; and,

(c) clips encapsulated in the polyurethane foam for holding the rods within the foam during manufacturing.

4,897,064

HEAD-FITTING SWIMMING APPARATUS

Shum H. Che, Kowloon, Hong Kong, assignor to Ever In Enterprises, Limited, Kowloon, Hong Kong

Continuation of Ser. No. 109,300, Oct. 16, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 284,758
Int. Cl.[4] B63C *9/12*
U.S. Cl. 441—124 **3 Claims**



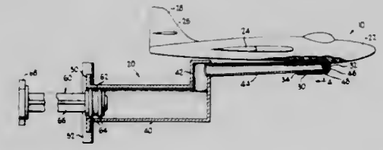
1. In a face mask for use on the head of a swimmer for covering a substantial portion of the head of the swimmer, a visor having at least a transparent portion, a visor holder carrying the visor and strap means secured to the visor holder for attaching the same to the head of the swimmer, so that water is substantially inhibited from entering between the visor holder and the head of the swimmer whereby the swimmer has relatively clear vision through the visor, said visor holder only enclosing the frontal portion of the heat of the swimmer, said visor being comprised of first and second spaced-apart transparent panels having outer margins and means for securing the outer margins of the panels to form a rigid unitary assembly and to provide a permanent water-tight compartment between the panels, said water-tight compartment being of sufficient size to provide a buoyancy sufficient to float the face mask in water when it is detached from the head of the swimmer.

4,897,065

TOY VEHICLE AND HANDHELD PNEUMATIC LAUNCHER

John K. Fertig, Mount Prospect; Thomas P. McQueeny, Chicago, and Howard J. Morrison, Riverwoods, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 30, 1989, Ser. No. 302,887
Int. Cl.[4] A63H *27/14, 3/31, 29/00;* **A63B** *71/00*
U.S. Cl. 446—63 **17 Claims**



1. A toy vehicle and a handheld pneumatic launcher comprises in combination:

a toy vehicle made predominantly of a lightweight plastic foam;

the toy vehicle including means for receiving a launching tube;

an elongated hollow cylinder having an axis and opposed ends;

one of the opposed ends of the cylinder being open and the other closed;

a flange extending outwardly from either side of the cylinder adjacent the open end of the cylinder for a user to manually grasp the cylinder;

the launching tube having an attached end and a free end;

the attached end of the launching tube being connected to the cylinder adjacent the closed end of the cylinder, in general alignment with the cylinder as opposed to generally transverse to the cylinder and in pneumatic communication with the cylinder;

an elongated piston having a forward end and a rearward end;

the piston having a head at the forward end that fits into the cylinder in gas tight relationship with the cylinder;

means adjacent the rearward end of the piston facilitating actuation of the piston; and

the flange for grasping the cylinder and the means for actuating the piston cooperating to permit a user to grasp the cylinder with the fingers of each of the user's hands while using the thumbs on the actuating means to help support and aim the launcher as well as to push the piston into the cylinder.

4,897,066

TOY ACTIVITY CENTER

Erik P. Tapdrup, Virum, and Flemming H. Olsen, Espergaerde, both of Denmark, assignors to Interlego A.G., Switzerland

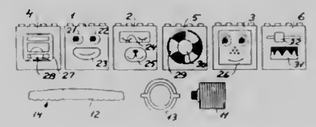
PCT No. PCT/DK87/00063, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO87/07171, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 153,824
Claims priority, application Denmark, May 29, 1987, 2516/86
Int. Cl.[4] A63H *3/16, 33/06, 33/08*
U.S. Cl. 446—97 **8 Claims**

1. A toy activity center comprising:

a base plate having a front side provided with means for receiving a plurality of removable activity units and a rear side,

each of said activity units including means for activation and audio or visual means responsive to said activation means and primary and secondary coupling means with a predetermined mutual modular spacing,

said coupling means being adapted to be connected with the corresponding coupling means of another activity unit; and,



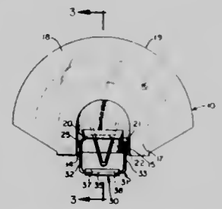
the predominant part of the base plate rear side is provided with at least one of said primary and secondary coupling means with said mutual modular spacing.

4,897,067

DIAPHRAGH-TYPE GAME CALLER WITH REMOVABLE SPACER

Frank Piper, Delmont, Pa., assignor to Penn's Woods Products, Inc., Delmont, Pa.

Filed Jan. 24, 1989, Ser. No. 300,918
Int. Cl.[4] A63H *5/00, 3/31*
U.S. Cl. 446—207 **15 Claims**



1. A game caller having components of a size and shape suitable for insertion into a user's mouth for support against the roof of the mouth comprising:

a support;

first and second generally flat, sheet-like diaphragms fixedly retained by the support in tension with surfaces of the diaphragms exposed from the support and with the diaphragms in a generally spaced-apart relationship with respect to one another with one of the diaphragms generally overlying the other so that the diaphragms have spaced-apart opposing surface areas free from the support, each diaphragm presenting an edge free of the support to vibrate by exhausted pulmonary air when the support and the diaphragms are inserted within the user's mouth generally against the roof of the mouth; and

a removable spacer insertable between the free edges of the diaphragms into position generally between the first and second diaphragms, the removable spacer having generally smooth exposed surfaces for insertion between the diaphragms to prevent tearing of the diaphragms and a configuration to completely retain the opposing surface areas of the first and second diaphragms out of contact with one another when the removable spacer is inserted between the diaphragms upon removal of the support and diaphragms from the mouth of the user.

4,897,068

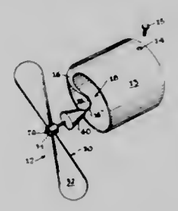
PROPELLER EQUIPPED APPARATUS FOR EXHAUST PIPES

Joseph S. Jackson, 3832 West 64th St., Inglewood, Calif. 90302

Filed Jan. 30, 1989, Ser. No. 303,194
Int. Cl.[4] A63H *33/40*
U.S. Cl. 446—217 **6 Claims**

1. A propeller equipped apparatus in combination with the outlet end of the exhaust tailpipe of a vehicle wherein the propeller equipped apparatus comprises:

a mounting assembly designed to engage and be operatively secured in a surrounding relationship relative to the external periphery of said outlet end of the exhaust tailpipe; wherein the mounting assembly is further provided with



an outwardly disposed armature shaft member having an inboard end and an outboard end;

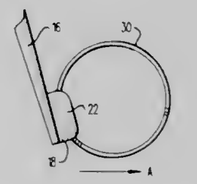
a propeller assembly comprising a propeller unit that is operatively connected to said armature shaft member; whereby, the propeller assembly is readily visible on the outside of the mounting assembly on the outlet end of the exhaust tailpipe.

4,897,069

TOY HOOP AND GUIDE STICK

Sterlin U. Overturf, 808 W. 32nd St., Baltimore, Md. 21211

Filed Mar. 8, 1989, Ser. No. 320,516
Int. Cl.[4] A63H *33/02*
U.S. Cl. 446—219 **1 Claim**





1. A toy hoop and guide stick, comprising:

a circular hoop having a predetermined width;

an elongated guide stick;

a rectangular channel member secured adjacent one end of said guide stick;

said channel member having two parallel side walls separated by an extent equal to about twice the width of said circular hoop;

said circular hoop formed from a transparent material and

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having a hollow interior portion forming a continuous circular track; and

a plurality of rolling members received in said track, said rolling members each having an elongated generally oval configuration, extending substantially entirely across the width of said hoop and including a phosphorescent material.

4,897,070

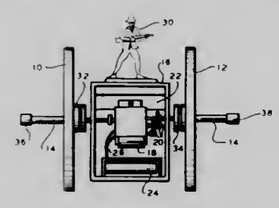
TWO-WHEELED MOTORIZED TOY

Ronald D. Wagstaff, 17 Myrtle Ave., Caldwell, N.J. 07006

Filed Apr. 14, 1989, Ser. No. 338,589

Int. Cl.[4] A63H *15/04, 13/18, 30/04;* **A63G** *25/00*

U.S. Cl. 446—273 **10 Claims**



1. A self-propelled toy comprising:

a pair of like wheels spaced apart along a common axis and having a given diameter;

axial shaft means connected to said wheels for rotation therewith and having ends extending outwardly therefrom along said axis;

a central housing freely supported on said shaft means between said wheels and extending a larger distance below said shaft means than above said shaft means, the height of said housing being smaller than the diameter of said wheels;

miniature electric motor means supported in said housing below said shaft means and including drive gear means;

means for coupling said drive gear means to said shaft means for driving said shaft means and wheels;

electrical energy supply means mounted at the bottom of said housing and coupled to said motor means; and

electrical control means mounted on said housing and connected to said energy supply means and to said motor means to actuate said motor means;

said energy supply means having a weight and position providing a low center of gravity for maintaining said housing in an upright position.

4,897,071

COMBINE HARVESTER CLEANING APPARATUS

Dirk J. Desmijder, Geut; Wilfried E. D. Geust, Koekelare; Willy C. Hollevoet, Torhout; Marc R. M. Jonckheere, Lichtervelde, and Francois Van Herpe, Houtem, all of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Oct. 20, 1988, Ser. No. 260,833

Int. Cl.[4] A01F *12/44, 19/00*

U.S. Cl. 460—10 **23 Claims**

1. A combine harvester comprising:

a mobile frame adapted for movement over a field, threshing and separating means supported on said frame to harvest crop material and produce a threshed and separated crop material;

a cleaning mechanism disposed on said frame to receive said threshed and separated crop material from said threshing and separating means, said cleaning mechanism including a grain pan reciprocated in a fore-and-aft direction and having movable divider means and being operable to receive said threshed and separated crop material, sieve means operable to receive said threshed and separated crop material from said grain pan, and fan means operable to blow cleaning air through said sieve means to clean unwanted debris therefrom;

inclination sensing means for sensing the lateral inclination of said frame and operable to produce an output indicative of said lateral inclination; and

position control means mounted on said grain pan for movement therewith and being operable to movably adjust said divider means in response to the output of said inclination sensing means, said position control means including a linear actuator positioned beneath the grain pan and pivotally coupled at one end to a mounting support on the grain pan and operatively connected at an opposing end thereof to the divider means, said position control means further including a shuttle member guided for back-and-forth movement in a transverse direction relative to the grain pan and coupled to the linear actuator, said divider means being selectively connectable to the shuttle member for permitting the linear actuator to control the position of said divider means through the intermediary of said shuttle member and to the grain pan for fixing said divider means in a fixed position relative to said grain pan.

4,897,072

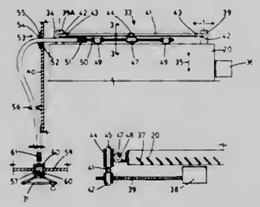
APPARATUS FOR ADJUSTING THE SIEVE OF A COMBINE HARVESTER

Harlan Bestland, Box 99, Brunkild, Manitoba, Canada (R0G 0E0)

Filed Jun. 17, 1988, Ser. No. 208,220

Int. Cl.[4] A01F *12/44, 17/00*

U.S. Cl. 460—99 **14 Claims**



1. A combine harvester comprising a cab for housing an operator, a header for picking up a crop to be harvested, straw separating means for extracting grain and chaff from straw of the crop, sieve means for receiving the grain and chaff and for extracting the grain from the chaff, fan means for generating an air flow through the sieve means, the sieve means including means defining a plurality of openings therethrough through which the grain can fall and through which air can pass and means for adjusting the openings to vary the grain and air flow conditions, and actuating means mounted in the cab for actuating said adjustment means for on the go variation of said conditions, said actuating means comprising a rod, manually operable means mounted at one end of the rod for rotating the rod about an longitudinal axis thereof, collar means for mounting the rod so as to project through the cab wall and so as to provide rotation thereof relative to the wall with the manually operable means inside the cab and an opposed end of the rod externally of said cab, bracket means arranged for attachment to the sieve means of the combine, a screw member carried in said bracket means for rotation thereto, means movable in response to rotation of said screw member to operate said adjusting means, elongate flexible coupling means having a first end connected to said rod and a second opposed end connected to said screw member such that rotation of said rod causes said flexible coupling means to drive said screw member, and guide means for confining said flexible coupling means to follow a path from said cab to said screw member through a wall of said combine.

4,897,073

SHAFT COUPLING FOR ROTATING ELEMENTS

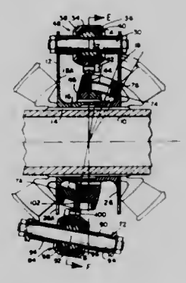
Ilie Chivari, Vellwigstrasse 51, D-4690 Herne 1, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,112

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1987, 3728970

Int. Cl.[4] F16D *3/16*

U.S. Cl. 464—70 **9 Claims**



1. A shaft coupling, which permits an angle between two coupled rotating elements, comprising

a first coupling half which is adapted to be connected to a first rotating element,

a second coupling half which is adapted to be connected to a second rotating element,

intermediate coupling members which are connected through resilient universally movable joints to the first coupling half and also to the second coupling half,

in which

each of the intermediate coupling members are half through a first pair of diametrically opposite resilient joints and are directly connected to the second coupling half through a second pair of diametrically opposite resilient joints angularly offset by 90° relative to the first said pair, and

the intermediate coupling members are arranged angularly offset to one another in such manner that the acceleration and deceleration forces arising as a result of any kinematic irregularity of the driven movement for each intermediate member in the resilient joints is substantially balanced out.

4,897,074

MECHANISM FOR JOINING A CARRIER TAPE COVER TO A BASE STIP

Richard K. Knight, Arlington, Tex., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 17, 1988, Ser. No. 194,938

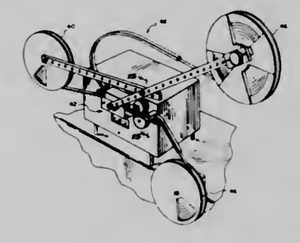
Int. Cl.[4] B65H *37/04, 37/00;* **B65B** *11/50*

U.S. Cl. 493—381 **16 Claims**

1. A mechanism for joining a carrier tape cover strip to a base strip having opposed first and second edges, said cover strip being of the type having a top surface with a longitudinally extending hump projecting upwardly therefrom and a pair of first and second sidewalls extending downwardly from said top surface in a parallel relationship to said hump, said first sidewall having a first inwardly extending hooked portion formed integrally therewith, said second sidewall having a second inwardly extending hooked portion formed integrally therewith, said mechanism comprising:

first guide means for receiving said base strip;

second guide means arranged in a position over said first guide means for receiving said cover strip above said base strip;



third guide means interposed between said first guide means and said second guide means for gradually guiding said first hooked portion of said cover strip over said first edge of said base strip;

holding means for retaining said first hooked portion and said first edge in place; and

pressure means for applying a downward force on said hump to cause said second sidewall and said second hooked portion to move laterally outwardly,

whereby when said pressure means is released said second hooked portion of said cover strip is snapped inwardly towards and over said second edge of said base strip.

4,897,075

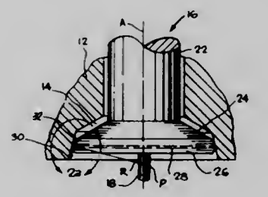
CENTRIFUGE DRIVE HUB

Thomas D. Sharples, Atherton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 11, 1989, Ser. No. 336,682

Int. Cl.[4] B04B *9/12*

U.S. Cl. 494—84 **14 Claims**



1. A centrifuge comprising:

a hub having a skirt with symmetry about a vertical drive shaft axis, the skirt defining a radially outward, rotor-engaging surface having a smooth, continuous curve profile in an axial plane,

drive means for rotating the hub about the vertical drive shaft axis, and

a rotor having an internal wall in frictional contact with the rotor-engaging surface for rotation therewith.

4,897,076

DETACHABLE AND REMOTE CONTROLLABLE AFTERLOADING DEVICE FOR RADIATION

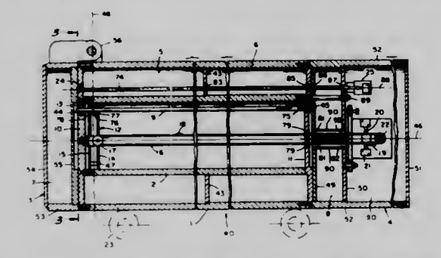
Ajmal A. Puthawala, 11859 Cresta Verde Dr., Whittier, Calif. 90601, and Anwer A. Puthawala, 46 Weiselstrasse, Erlangen Buckenhof, Fed. Rep. of Germany (8520)

Filed Nov. 25, 1985, Ser. No. 802,264

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442762?

Int. Cl.[4] G21F *5/02*; A61N *5/01*; A61M *37/04*

U.S. Cl. 600—7 **12 Claims**



1. An afterloading device for inserting a ribbon containing radioactive material into a thin, hollow conduit which has been placed within or adjacent to a tumor of a medical patient, wherein the ribbon has a first end composed of a non-ferromagnetic material and a second end comprising a ferromagnetic material and wherein the thin, hollow conduit has a first end placed within or adjacent to the tumor and an open second end which is accessible outside of the patient's body, the afterloading device comprising:

(a) a radiation-shielded container;

(b) at least one non-ferromagnetic tube within the container, the tube having a first end, an open second end, a longitudinal axis, an exterior surface and an interior surface;

(c) a magnet disposed within the container proximate to the exterior surface of the tube;

(d) means for moving the magnet proximate to and in parallel with the exterior surface of the tube between a first magnet position located proximate to the first end of the tube and a second magnet position located proximate to the second end of the tube; and

(e) connection means for connecting the second end of the thin, hollow conduit in communication with the second end of the tube;

so that when the ribbon is within the tube with the second end of the ribbon proximate to the first end of the tube and when the magnet is at the first magnet position and when the second end of the conduit is connected in communication with the open second end of the tube, the first end of the ribbon can be slid from the tube into the conduit by causing the magnet to slide from the second magnet position to the first magnet position.

4,897,077

METHOD OF INSERTING AN IAB DEVICE INTO THE BODY

Gerald J. Ciccia, Sudbury, Mass., and Edward J. Lombardi, Derry, N.H., assignors to Kontron Inc., Everett, Mass.

Continuation of Ser. No. 53,178, May 22, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,593

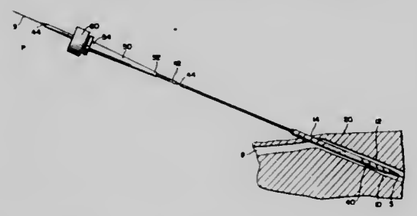
Int. Cl.[4] A61B *19/00*

U.S. Cl. 600—18 **21 Claims**

1. A method for inserting an intra-aortic balloon apparatus through a patient's skin and into the femoral artery, wherein said intra-aortic balloon apparatus includes a balloon catheter having a proximal end and a distal end, an inflatable and deflatable balloon bladder means sealidly attached at the distal end of the balloon catheter and a hollow stylette means passing through the length of the intra-aortic balloon, said intra-aortic balloon apparatus further including a hemostasis sheath slidably coupled with the balloon catheter between the balloon bladder means and the proximal end of the balloon catheter, said hemostasis sheath having a distal end adjacent to the balloon bladder means and a proximal end opposite from the balloon bladder means having a larger outside diameter than that at the distal end, said intra aortic balloon apparatus also including sealing means releaseably coupled to said hemostasis sheath, the method comprising the steps of:

(a) puncturing the patient's skin and femoral artery to create an opening in the skin and artery;

(b) inserting a guide wire into the opening in the artery and passing the guide wire up to the patient's aorta;



(c) dilating with dilating means the opening to achieve a diameter sufficient to permit insertion of the intra-aortic balloon bladder means in a wrapped configuration into the femoral artery;

(d) removing the dilating means;

(e) without the use of an insertion sheath, directly inserting the intra-aortic balloon bladder means in a wrapped configuration over the guide wire and through the opening and passing it up to the aorta; and

(f) sliding the hemostasis sheath along the balloon catheter, through the insertion site and into the femoral artery far enough to control bleeding from the puncture opening in the femoral artery, yet permit blood flow along the femoral artery.

4,897,078

Patent Not Issued For This Number

4,897,079

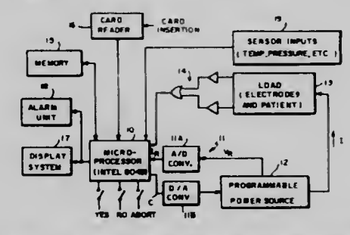
POLYMERIC SLEEVE FOR SURGICAL INSTRUMENTS

Edward R. Zaleski, Santa Ana; F. Richard Christ, Orange, and Jacob F. R. Louw, El Toro, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Jul. 22, 1988, Ser. No. 222,938

Int. Cl.[4] A61B *17/20*; A61M *7/00*

U.S. Cl. 604—22 **32 Claims**



1. A sleeve useful on a surgical instrument comprising: an elongated sleeve portion having a hollow interior space through which fluid is passed, and at least one fluid outlet at or near the distal end portion of said elongated sleeve portion to allow fluid to leave said interior space; and a hub secured to said elongated sleeve portion and adapted to receive at least a portion of said surgical instrument, said hub including one or more surfaces structured and adapted to contact said surgical instrument so as to substantially prevent fluid in said hub from passing out of said hub through the opening in said hub through which said surgical instrument enters said hub, said elongated sleeve portion and said hub each being made of one or more organic polymeric materials substantially free of silicon, and said elongated sleeve portion being harder than said hub.

4,897,080

FEED DEVICE FOR AN EPIDURAL NEEDLE

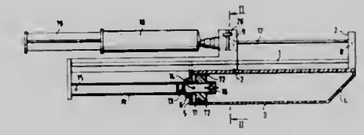
Lemar W. Hamidi, Thüringer Strasse 2, 5880 Lüdenscheid, German Democratic Rep.

Filed Aug. 22, 1988, Ser. No. 234,916

Claims priority, application German Democratic Rep., Oct. 6, 1987, 3733757

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—117 **16 Claims**



1. A feeding device for the introduction of a needle, having a needle point, into the epidural space of a person, comprising:

a guide rail;

a needle;

a needle holder for holding said needle;

a guide block having said needle holder, said guide block being slidably arranged on said guide rail;

a piston rod positioned on said guide block, said piston rod extending into a cylinder, through a passage, which is capable of being filled with a liquid; and,

a piston positioned on said piston rod, said piston having a series of flow passages for a limited flow of the liquid.

4,897,081

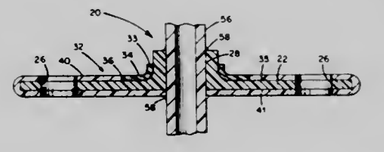
PERCUTANEOUS ACCESS DEVICE

Victor L. Poirier, Chelmsford; Warren C. Clay, Lynn, and Benedict D. T. Daly, Wellesley, all of Mass., assignors to Thermedics Inc., Woburn and TMCA Foundation Inc., Boston, both of, Mass.

Continuation of Ser. No. 613,931, May 25, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 15,588

Int. Cl.[4] A61M *25/02*; A61F *1/00*

U.S. Cl. 604—175 **3 Claims**



1. In a percutaneous access deice including a button having a skirt and a neck integral with and substantially normal to said skirt, said neck and skirt being formed of a semirigid biocompatible material and having a bore therethrough to accommodate a tube, and a porous bed overlying and attached to at least a portion of said button, the improvement wherein said porous bed comprises a first stage extending along a portion of said skirt adjacent to said neck and along at least the lower portion of said neck and a second stage formed essentially of a biocompatible material and having pores of a size in the range of about 400–800 microns, said first stage having a total length along said neck and said skirt of at least 0.25 inches and being fabricated of layers of filaments of a diameter in the range of about 0.0004 to 0.015 inches and of a polyurethane material which is the reaction product of dicyclohexyl methane diisocyanate, polytetramethylene ether glycol, and 1,4 butane diol, said layers being formed into a structure having pores of a size in the range of about 50–125 microns, said percutaneous access device, upon implantation of the skirt in subcutaneous tissue adjacent to the dermis, promoting formation of a stable, tight, infection-free biologic seal between said device and adjoining tissue through the downgrowth of epidermal cells through the first stage and the formation of mature collagen in said second stage.

4,897,082

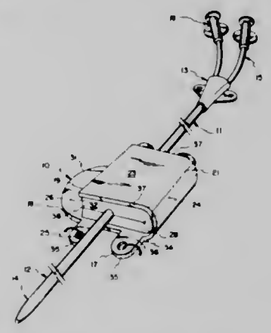
APPARATUS FOR PROVIDING A SUTURE TAB

Timothy J. Erskine, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 20, 1989, Ser. No. 325,610

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—180 **30 Claims**



1. A suture tab comprising:

a body with a first end and a second end and a first part on the first end and a second part on the second end, the body having an inside surface and an outside surface integral therewith, the first part extending from the first end to the second part and forming a fold line between the first and second parts, the second part extending from the fold line to the second end, the body having a plurality of openings in the first part each of the openings generally being through the body from the inside surface to the outside surface and located about the first part; and

adhesion means attached to a section of the inside surface of the body first and second parts for placement in juxtaposition when the first and second parts are folded along the fold line therebetween and wherein the plurality of openings is on another section apart from the adhesion means.

4,897,083

SYRINGE NEEDLE GUARD

Michael D. Martell, 6297 Sandoval Ave., Riverside, Calif. 92509

Filed May 9, 1988, Ser. No. 191,565

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—192 **15 Claims**

1. A protected needle assembly for a hypodermic syringe comprising:

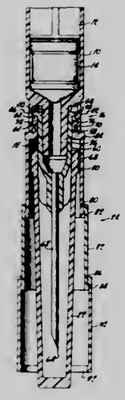
a standard needle assembly hub having upper and lower sections,

means on said hub for connecting the assembly to a syringe barrel,

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a cannula fixed to said lower section and having an insertion tip positioned outwardly of said lower section, and

a longitudinally extensible and collapsible protective sleeve having an inner end fixedly secured to and circumscribing said hub upper section and having an outer end radially outwardly spaced from said hub lower section and extending to said cannula insertion tip when said sleeve is longitudinally extended, said sleeve being longitudinally collapsible to a contracted position in which said sleeve outer end is positioned inwardly of said cannula tip to expose the cannula tip for use of the syringe.



4,897,084

DISPOSABLE LIQUID-ABSORBING ARTICLE

Ingela Ternström, Mölnlycke, and Evamarie Lundahl, Landvetter, both of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

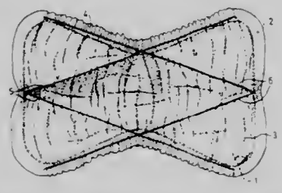
PCT No. PCT/SE87/00310, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO88/00010, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 30, 1987, Ser. No. 154,248

Claims priority, application Sweden, Jul. 2, 1986, 8602943

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385.2 **2 Claims**



1. A disposable liquid-absorbing article having an elongated absorbent body or pad (1) which is enclosed in a casing comprising a liquid-permeable outer layer (3) which is intended to face the wearer when the article is used, and a liquid-impervious outer layer (2) located on the opposite side of the absorbent pad, and in which the two outer layers extend beyond the absorbent pad and are joined together therearound, and which casing incorporates elastication in the form of one or more elastic tapes or threads (4) attached to the casing in a pre-stretched state, the elastic element or elements (4) incorporated in the elastication being secured to the inner surface of the liquid-permeable layer (3), parts of said elastic element or elements at least partially bridging the absorbent pad (1) and extending between the pad (1) and the liquid permeable layer (3), these bridging parts of the elastic element or elements being attached in at least a first V-shaped pattern (5) with the apex of the V located on the longitudinal center line of the article toward one end of the article, and in a second V-shaped pattern (6) with the apex of the V located on the longitudinal center line of the article toward the opposite end of the article, said apices being spaced a substantial distance from each other along the longitudinal center line of the article, the elastic elements incorporated in said patterns crossing one another, so as to impart to the article a basin-like shape within the region defined by the elastic elements between the apices of the patterns and the points of intersection of the elastic elements.

4,897,085

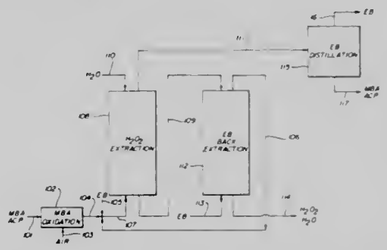
RECOVERY OF HYDROGEN PEROXIDE

Robert N. Cochran, West Chester, and Lawrence M. Candela, Philadelphia, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jan. 10, 1989, Ser. No. 295,411

Int. Cl.[4] B01D *12/00*; C01B *15/026*; C07C *45/00*

U.S. Cl. 23—293 R **2 Claims**



1. The process which comprises admixing a methyl benzyl alcohol oxidate mixture containing methyl benzyl alcohol, acetophenone and hydrogen peroxide with ethyl benzene extractive solvent, and separately recovering an inorganic hydrogen peroxide phase and an organic phase containing ethyl benzene solvent, methyl benzyl alcohol and acetophenone.

4,897,086

LUBRICANT AND FUEL COMPOSITIONS CONTAINING REACTION PRODUCTS OF POLYALKENYL SUCCINIMIDES, ALDEHYDES, AND TRIAZOLES

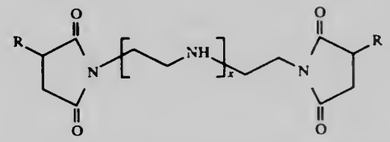
David A. Blain, Morrisville, Pa.; Angeline B. Cardis, Florence, N.J., and Sylvia S. McGonigle, Chadds Ford, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1988, Ser. No. 290,405

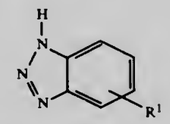
Int. Cl.[4] C10L *1/18, 1/22*

U.S. Cl. 44—53 **22 Claims**

1. The reaction product obtained by reacting a polyalkenyl-substituted succinimide having the structural formula:



where R is an alkyl or alkenyl group of 9 to 150 carbon atoms, and x is 1 to 4 with a triazole having the structural formula:



where R^1 is hydrogen or an alkyl, aryl, arylalkyl, or alkylaryl group of 1 to 12 arbon atoms and an aldehyde in a molar ratio of succinimide to aldehyde to triazole respectively of between about 1 to 0.1 to 0.1 and about 1 to 4 to 4 at a temperature of about 100° C. to about 200° C. at ambient pressure.

4,897,087

DIISOCYANATE DERIVATIVES AS ASHLESS FUEL DISPERSANTS AND DETERGENTS AND FUEL COMPOSITIONS CONTAINING SAME

David A. Blain, Morrisville, Pa.; Angeline B. Cardis, Florence, and Jeffrey C. Trewella, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 30, 1988, Ser. No. 277,738

Int. Cl.[4] C10L *1/18, 1/22*

U.S. Cl. 44—71 **18 Claims**

1. A fuel composition comprising a major amount of liquid fuel and a minor detergency/dispersancy amount of a diisocyanate bridged polyether-polyamine product of reaction prepared by connecting polyethers to polyamines with diisocyanates as generally shown below:

$$OCN-R-NCO \xrightarrow{\text{(Polyether)}}$$

$$\text{Polyether-O}-\overset{\overset{O}{\|}}{C}-NH-R-NCO \xrightarrow{\text{(Polyamine)}}$$

$$\text{Polyether-O}-\overset{\overset{O}{\|}}{C}-NH-R-NH-\overset{\overset{O}{\|}}{C}-N-\text{Polyamine}$$

where R is from about 1 to about 60 carbon atoms, and is selected from the group consisting of alkyl, aryl, alkaryl, or arylalkyl, and wherein the polyether is added to the diisocyanate in a 1:1 ratio and the resultant adduct is added to the polyamine in a 1:1 to X:1 ratio and wherein X is the number of nitrogens on the polyamine.

4,897,088

DISPERSING AGENT AND A SOLID FUEL SLURRY COMPOSITION CONTAINING THE SAME

Katuhiro Ishikawa, Chiba; Katsumi Ito, Sazaka, and Youji Shigeyoshi, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 236,729

Claims priority, application Japan, Aug. 28, 1987, 62-214275

Int. Cl.[4] C10L *5/00*; B01F *17/14*; C08C *19/20*

U.S. Cl. 44—90 **9 Claims**

1. A dispersing agent comprising as an essential component a salt of a sulfonation product of a polymer of an aliphatic diene or a copolymer of an aliphatic diene and an alkenyl monomer copolymerizable therewith.

7. A solid fuel slurry composition comprising (a) the dispersing agent of claim 1, (b) solid fuel powder and (c) water as essential components.

4,897,089

PARTIAL OXIDATION BURNER FOR PRODUCING SYNTHETIC GASES

Dang V. Quang, Neuilly sur Seine; Alain Feugier, Orgeval; Paul Gateau, Saint Nom La Breteche, and Bernard Poussin, Carrieres sur Seine, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jun. 28, 1988, Ser. No. 212,690

Claims priority, application France, Jun. 30, 1987, 87 09268

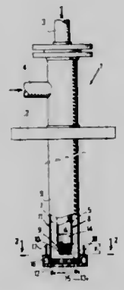
Int. Cl.[4] C01B *3/36*; C10J *3/50*

U.S. Cl. 48—86 R **14 Claims**

1. A burner for partial oxidation under pressure of a first fluid by a second fluid, the burner including two gas introduction tube means for respectively introducing one of said first and second fluids, one of said two gas introduction tube means being disposed internally of the other of said two gas introduction tube means such that said one of said gas introduction tube means forms an internal tube and said other of said gas introduction tube means forms an external tube, each of said gas introduction tube means comprises a plate mounted at one end thereof, each said plate includes a plurality of cylindrical

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through hole means for enabling a flow of the respective fluids from the two gas introduction tube means therethrough, and wherein the through hole means in the plate mounted at one



end of the external tube are disposed in opposition to the through holes means in the plate mounted on the end of the internal tube.

4,897,090

PROCESS FOR INHIBITION OF FLYSLAG DEPOSITS

Chih-hsiung F. Liu, and Charles V. Sternling, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 27, 1989, Ser. No. 373,312
Int. Cl.[4] C10J *3/46*
U.S. Cl. 48—210 **1 Claim**

1. A process for the gasification of coal comprising
(a) oxidizing particulate coal in a gasification zone under conditions to produce synthesis gas, and producing synthesis gas at a temperature of from about 1050° C. to about 1800° C., said synthesis gas containing molten flyslag particles;
(b) passing said synthesis gas from said gasification zone to and through a heat exchange zone having walls cooler than the melting point of said flyslag particles, the heat exchange zone comprising a quench section and a heat exchange section in flow through communication therewith, and quenching and cooling said synthesis gas and solidifying said flyslag particles in said heat exchange zone;
(c) introducing graphite into said synthesis gas which passes through said heat exchange zone in an amount effective to inhibit formation of strongly adhering deposits; and
(d) separating flyslag from the cooled gaseous stream, and recovering synthesis gas from said gaseous stream.

4,897,091

MEMBRANE PROCESS FOR SEPARATING GASES FROM GAS-LIQUID CHARGE STREAMS

Mordechai Pasternak, Spring Valley, N.Y., and Richard F. Benapre, Greenwich, Conn., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 4, 1988, Ser. No. 176,895
Int. Cl.[4] B01D *13/00*
U.S. Cl. 55—16 **17 Claims**

1. The process for separating a gas from a gas-liquid charge which comprises
maintaining, as a non-porous membrane separating layer, a membrane of the polymeric reaction product of (i) a poly oxyalkylene polyamine and (ii) a dissocyanate;
passing into contact with the charge side of said membrane a gas-liquid charge;
maintaining a pressure drop access said membrane whereby at least a portion of said gas of said gas-liquid charge passes through said membrane as permeate and said gas-liquid charge is converted to a lean liquid retentate containing less gas than is present in said gas-liquid charge;
recovering from the low pressure side of said non-porous membrane separating layer said permeate gas; and
recovering from the high pressure side of said non-porous membrane separating layer said lean liquid retentate containing less gas than is present in said gas-liquid charge.

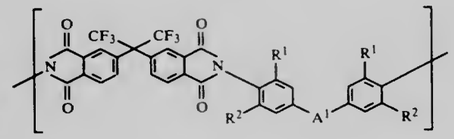
4,897,092

POLYIMIDE MEMBRANE HAVING IMPROVED FLUX

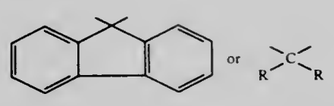
William F. Burgoyne, Jr., Emmaus, and Michael Langsam, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 27, 1989, Ser. No. 316,214
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **11 Claims**

1. A semi-permeable membrane formed of a polyimide containing polymerizable units of the formula:



where
each R^1 is independently H, C_1–C_6 alkyl, or 1-arylalkyl;
each R^2 is independently C_1–C_6 alkyl, aryl, perhaloalkyl, or 1-arylalkyl; and
A^1 is a single bond,



wherein
each R is independently, CF_3, CF_2Cl, C_1–C_6 alkyl, phenyl, substituted phenyl or a halogen.

6. A process for separating a component of a gas mixture containing at least one other component, said process comprising: bringing said gas mixture into contact with the membrane of claim 1 whereby one component selectively permeates through said membrane.

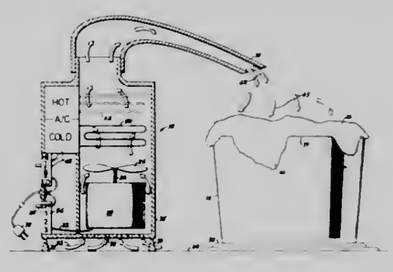
4,897,093

FOAM-DESTROYING PROCESS

Ramona Thelin, 5326 N. Bosart, Indianapolis, Ind. 46220

Filed Jun. 6, 1988, Ser. No. 202,301
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—87 **1 Claim**

1. A process for destroying foam or froth appearing as bubbles rising to the surface of liquid being heated in an open container, in which a substantial amount of foam or froth is produced and generally cover the surface of the liquid;
comprising blowing a stream of gas from a blower through an outlet thereof and thereby the gas impinging upon and sweeping over the region of the surface of the liquid being heated, the impingement of the stream of gas against the region of the surface of the liquid being operative to destroy the bubbles of foam or froth as they rise to the surface of the liquid, thus permitting rapid heating of the



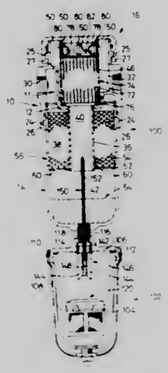
liquid by preventing the build-up of foam or froth on and above the surface of the liquid.

4,897,094

IN-LINE FILTER ASSEMBLY FOR COMPRESSED AIR

Sadao Maeda, Okazaki, Japan, assignor to Maeda Shell Service Co., Ltd. and J&M Co., Ltd., Aichi, Japan

Filed Mar. 31, 1989, Ser. No. 330,907
Claims priority, application Japan, Apr. 5, 1988, 63-46072[U]; May 13, 1988, 63-63478[U]
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—219 **8 Claims**



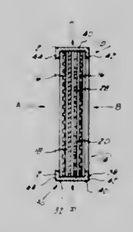
1. An in-line filter device including first filter means having a first packing adapted to coalesce vapor or liquid particles contained in compressed air passing therethrough, into droplets, trapping means for trapping the droplets and thereby separating the droplets from the compressed air, and second filter means having a second packing through which the compressed air which has passed said first filter means flows, the second packing being adapted to vaporize residual liquid particles remaining in the compressed air which has passed the first filter means, said inline filter device comprising:
an intermediate sleeve having an upper and a lower open end and an inner partition wall structure;
an upper cap having an inlet and an outlet closing said upper open end of said intermediate sleeve and cooperating with the intermediate sleeve to define an upper volume on one of opposite sides of said partition wall structure, said inlet communicating with the first packing and said outlet communicating with the second packing;
a lower cap closing said lower open end of said intermediate sleeve and cooperating with the intermediate sleeve to define a lower volume on the other side of said partition wall structure, said intermediate sleeve and said upper and lower caps constituting a housing assembly having said upper and lower volumes separated from each other by said partition wall structure;
an inner tube disposed in said lower volume so as to extend from said partition wall structure, and cooperating with said lower cap to define an inner space and an outer annular space which communicate with each other through a bottom space formed below said inner tube, said lower volume communicating with said upper volume through said inner space;
said intermediate sleeve having an inlet port which communicates with said outer annular space and which receives an incoming compressed air, and an outlet port which communicates with said upper volume and through which the compressed air is discharged from said housing assembly;
said outer annular space being filled with said first packing, to form said first filter means;
a porous structure accommodated within said bottom space, as said trapping means for trapping said droplets formed during passage of the compressed air through said first filter means;
draining means for discharging a mass of the droplets trapped by said porous structure, out of said housing assembly;
said second packing filling at least a portion of said upper volume and thereby forming said second filter means through which the compressed air which has passed through said inner space flows.

4,897,095

WATER ENTRAPMENT DEVICE

Ram D. Bedi, Birmingham, and Donald T. Benedyk, Brighton, both of Mich., assignors to 2V Industries, Inc., Wixom, Mich.

Filed Dec. 14, 1988, Ser. No. 284,302
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—279 **1 Claim**



1. A water entrapment device comprsing:
a housing having a closed top, bottom, and sides, the housing having a front opening and a back opening;
an entrapment portion disposed within the housing, the entrapment portion comprising;
a tin plated aluminum mesh screen covering the front opening;
a plurality of vertically spaced, co-planar arranged W-shaped entrapment members disposed behind the screen, the entrapment members having a plurality of apertures formed in the central point of the W shape, the apertures running from top to bottom of the entrapment member; and
an absorbent member disposed behind the entrapment members, the absorbent member containing solid biocide;
a water collecting tray disposed beneath the entrapment portion in the housing; and
a drain aperture formed in the bottom of the housing in fluid communication with the water collecting tray.

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SYSTEM FOR THE REGENERATION OF A PARTICULATE FILTER TRAP

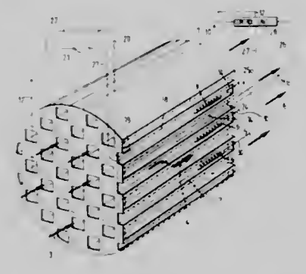
Franz Pischinger, Aachen, and Gerhard Lepperhoff, Eschweiler, both of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co. KG., Aachen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 25,738, Mar. 13, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 215,546

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608801

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—283 **3 Claims**



1. A system for the regeneration of a particulate filter trap provided for the exhaust gases of an internal combustion engine, the trap having an exhaust gas inflow side and a purified exhaust gas outflow side and a plurality of adjacent inlet and outlet channels extending between said sides and secondary energy means supplied to the trap for initiating the regeneration in dependence on the thermal resistance of the amount of particulates deposited in the trap, means at the inflow side extending into one of said inlet channels for controlled production of thermal energy at a predetermined first location therein, a sensor upstream of said inflow side for sensing the exhaust gas temperature, and temperature measuring means at the outflow side extending into one of the outlet channels to a predetermined second location separated from the first location by a layer of the deposited particulates, control means connected to said sensor for comparing and evaluating a reduced temperature gradient in the trap occasioned by the amount of the deposited particulates with the temperature of the exhaust gas before entering the trap, and said control means being connected to said measuring means for determining the temperature gradient and for controlling an increase in the supply of the secondary energy in dependence on said temperature gradient.

4,897,097

AIR CLEANER FOR INTERNAL COMBUSTION ENGINE

Kazuhiro Yamamura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 8, 1988, Ser. No. 203,887

Claims priority, application Japan, Jun. 9, 1987, 62-143495

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—419 **17 Claims**

1. An air cleaner comprising:

a casing including first and second receptacle portions which are symmetrically arranged with respect to a center portion of the casing, each receptacle portion including an air inlet opening and a holding portion, the holding portions being inclined to one another to form a generally V-shaped recessed portion of the casing;

first and second filter elements respectively held by the holding portions of said first and second receptacle portions, so that first and second dust side chambers are defined at one side of said first and second filter elements, respectively, in said casing to which the air inlet openings of said first and second receptacle portions are exposed respectively;

a cover having a protruding portion which overlies the filter elements and the V-shaped recessed portion of the casing and in which an air outlet opening is formed, said cover being sealingly disposed on said casing in such a manner



that a common clean side chamber is defined at the other sides of said first and second filter elements, to which said air outlet opening is exposed; and

structure means defining in said cover two substantially identical flow passages which extend from the respective filter elements to said air outlet opening of the cover.

4,897,098

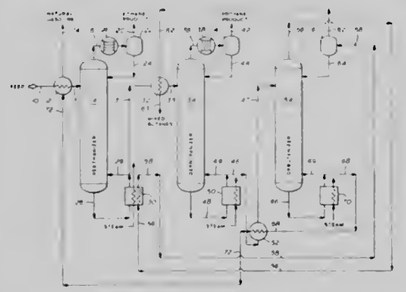
FRACTIONATION SYSTEM FOR STABILIZING NATURAL GASOLINE

Robin M. Pate, Houston; James O. Nye, Friendswood, and David R. Keck, Seabrook, all of Tex., assignors to Enterprise Products Company, Houston, Tex.

Continuation of Ser. No. 919,446, Oct. 16, 1986, abandoned. This application May 11, 1988, Ser. No. 196,764

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—31 **11 Claims**



1. A process for fractionating liquid hydrocarbons comprising:

(a) fractionating a hydrocarbon stream comprising ethane and mixed butanes in a deethanizing fractionation zone operated at a pressure to produce a first temperature in the bottoms of said deethanizing zone;

(b) separating said ethane as an overhead product and recovering the bottoms containing said mixed butanes from said deethanizing zone;

(c) fractionating said bottoms containing mixed butanes in a debutanizing fractionation zone operated at a pressure to produce a mixed butane overhead at a second temperature sufficiently higher than said first temperature, whereby indirect contact between the mixed butane overhead and said bottoms of said deethanizing zone will cause heat to be transferred from said mixed butanes overhead to said bottoms; and

(d) indirectly contacting said mixed butane overhead from said debutanizing zone with said bottoms from the deethanizing fractionation zone thereby substantially condensing said mixed butanes overhead.

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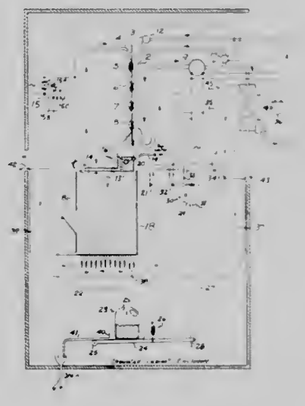
ICE MAKER AND WATER PURIFIER

John D. Ruff, 206 Birch St., Alexandria, Va. 22305

Filed Dec. 1, 1988, Ser. No. 278,447

Int. Cl.[4] C02F *1/22*

U.S. Cl. 62—532 **19 Claims**



1. A method for providing a supply of purified ice and a supply of purified liquid water from a source of unpurified liquid water, said method comprising the steps of:

(a) cooling selected areas of at least one ice-forming structure to a temperature below the freezing temperature of water;

(b) flowing unpurified liquid water over said selected areas to form ice at said selected areas while washing impurities away from the formed ice with said stream;

(c) increasing the temperature at said selected areas at various times to remove said ice from said ice-forming structure;

(d) collecting the ice removed in step (c) in a bin;

(e) warming a portion of said bin at selected times to melt some of the ice therein into purified liquid water;

(f) collecting in a container the purified liquid water derived in step (e);

wherein step (a) includes cooling said selected areas with an evaporator that is part of a vapor compression refrigeration system utilizing refrigerant fluid in a continuous flow path including a compressor, a condenser, a metering device and the evaporator;

wherein step (e) includes the steps of:

(e.1) heating a fluid medium with thermal energy rejected by said condenser; and

(e.2) flowing the heated fluid medium along the underside of said bin.

4,897,100

APPARATUS AND PROCESS FOR FIBERIZING FLUORIDE GLASSES USING A DOUBLE CRUCIBLE AND THE COMPOSITIONS PRODUCED THEREBY

Minor L. Nice, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 13, 1989, Ser. No. 296,564

Int. Cl.[4] C03B *37/023*

U.S. Cl. 65—3.13 **20 Claims**

1. An apparatus for producing a continuous glass fiber having a core fluoride-containing glass concentrically surrounded by a clad fluoride-containing glass, comprising:

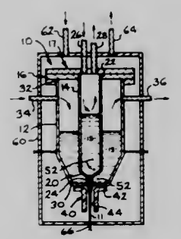
an outer crucible for melting the clad glass, the outer crucible comprising an upper end and an orifice plate defining an orifice for supplying a stream of molten clad glass;

an inner crucible for melting the core glass, the inner crucible positioned within the outer crucible, the inner crucible comprising an upper end and a bottom end, the bottom end comprising a tip defining at least one aperture for supplying a stream of molten core glass, the tip being oriented substantially concentric with the orifice in the orifice plate of the outer crucible; and,

a shield in a position to limit turbulent gas flow immediately adjacent the forming continuous glass fiber in a zone beneath the orifice plate of the outer crucible, the shield defining a passageway coaxial with the aperture in the tip of the inner crucible.

10. A process for producing a continuous glass fiber having a core fluoride-containing glass concentrically surrounded by a clad fluoride-containing glass comprising:

heating a supply of molten core glass in an inner crucible and heating a supply of molten clad glass in an outer crucible;



allowing the molten core glass and the molten clad glass to cure;

quenching the temperature of the molten core glass and molten clad glass;

raising the temperature of the molten core glass and the molten clad glass to a fiberizing temperature;

supplying a stream of molten core glass from the inner crubicle concentrically surrounded by a stream of molten clad glass from the outer crucible;

drawing the stream of molten core glass concentrically surrounded by the stream of molten clad glass into the continuous glass fiber through a shield in a position to limit turbulent gas flow in a zone beneath the outer crucible.

4,897,101

METHOD OF FORMING A PRECISION GLASS MOLD AND ARTICLE

Larry L. Carpenter; Robert J. Hagerty, both of Painted Post; Mark L. Morrell, Horseheads, and Peter A. Schrauth, Elmira, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Mar. 8, 1989, Ser. No. 320,754

Int. Cl.[4] C03B *11/08*

U.S. Cl. 65—64 **36 Claims**

1. A method of forming a mold assembly including a pair of glass molds defining first and second opposed optical molding surfaces comprising the steps of:

providing a first master defining a first m aster mold cavity having a first predetermined master optical surface adapted to form a first glass mold,

disposing a first quantity of preformed glass mold material within said first master mold cavity and heating said preform to a moldable temperature,

press molding a first glass mold within said first master mold cavity and impressing said first master optical surface into said first glass mold material to form a first glass molding surface which is adapted to form a first finished optical surface,

providing a second master defining a second master mold cavity having a second predetermined master optical surface adapted to form a second glass mold,

VOL 1110 ISS 5 JA 30 1990 UMI

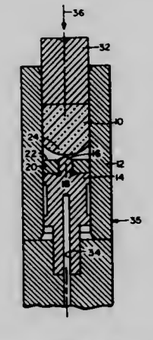
disposing a second quantity of preformed glass mold material within said second master mold cavity and heating said preform to a moldable temperature,

press molding a second glass mold within said second master mold cavity and impressing said second master optical surface into said second glass mold material to form a second glass molding surface which is adapted to form a second finished optical surface, and

said first and second glass molding surfaces when positioned in opposed operative relationship defining a glass mold cavity having a predetermined desired size, shape and volume.

19. A method of forming a glass mold defining an optical molding surface comprising the steps of:

providing a master defining a master mold cavity having a predetermined master optical surface formed therein adapted to form a glass mold,



disposing a quantity of preformed glass mold material within said master mold cavity and heating said preform to a moldable temperature,

press molding a glass mold within said master mold cavity and impressing said master optical surface into said moldable glass mold material to form a glass molding surface adapted to form a finished optical surface, and

said glass molding surface at least in part defining a glass mold cavity having a predetermined desired size, shape and volume when positioned in opposed operative relationship with a molding surface of a second mold.

36. The method of claim 19 further comprising the step of providing a second glass mold having a second glass molding surface adapted to form a second optical surface, said glass molding surface and said second glass molding surface in operative relationship defining a glass mold cavity having a predetermined desired size, shape and volume.

4,897,102

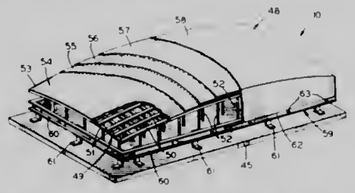
GLASS SHEET PRESS BENDING MOLD

William L. Modesitt; Floyd T. Hagedorn, both of Sherman, Tex., and Harold R. Hall, Whitehouse, Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Mar. 14, 1989, Ser. No. 323,356
Int. Cl.[4] C03B *23/023*
U.S. Cl. 65—287 **20 Claims**

1. A glass shaping mold for use in press bending a heated glass sheet, comprising a continuous shaping element having a surface configuration corresponding to the curvature to which said sheet is to be bent, said shaping element including a flexible framework, a resilient body covering said framework, and a plurality of layers of a fibrous, heat-resistant, normally pliable material disposed over said resilient body, at least one of said layers having applied thereto and cured a liquid rigidizer material for increasing the stiffness of said shaping element to a degree appropriate for press bending said hot glass sheet.

18. A method of forming a continuous-surface glass shaping mold for use in press bending a heated glass sheet, comprising forming a flexible framework to the curvature to which the sheet is to be bent, encapsulating said framework in a resilient body covering defining the design surface of said mold, covering said design surface of said resilient body with a plurality of



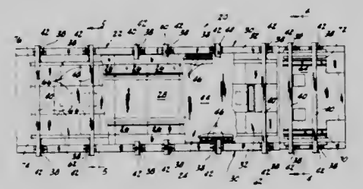
individdual layers of a fibrous, heat-resistant, normally pliable material, and applying to at least one of said layers a liquid rigidizer material and curing said material to impart a predetermined degree of stiffness to the composite covering suitable for press bending said sheet.

4,897,103

CONDUIT FOR MOLTEN GLASS

Roger P. Weilacher, Sapulpa, Okla., assignor to Liberty Glass Company, Sapulpa, Okla.

Filed Sep. 12, 1988, Ser. No. 242,773
Int. Cl.[4] C03B *5/16*
U.S. Cl. 65—346 **13 Claims**



1. A conduit for conducting molten glass in a glass making operation comprising:

an elongate superstructure having first and second opposing elongate sides;

an elongate carriage;

a plurality of refractory blocks assembled on the carriage to form a longitudinally extending channel on the carriage for conducting molten glass;

a plurality of rollers for supporting the carriage on the superstructure in an operative position in which the channel is in position to conduct molten glass and allowing the carriage to be slid out of the operative position and out of the superstructure;

a roof for the longitudinal channel on the carriage; and

means for clamping the roof to the superstructure to maintain the roof suspended in position for sliding the carriage out from under the roof and out from the superstructure.

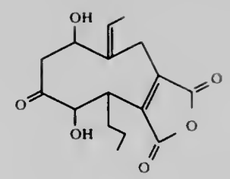
4,897,104

ANHYDRIDE HERBICIDES

Tatsuo Haneishi; Mutsuo Nakajima, both of Tokyo; Kiyoshi Koi, Shiga; Kohei Furuya, Tokyo; Seigo Iwado, Tokyo, and Sadao Sato, Tokyo, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,409
Claims priority, application Japan, Apr. 27, 1987, 62-103976
Int. Cl.[4] A01N *43/08*; C07D *307/93*
U.S. Cl. 71—88 **2 Claims**

1. A compound of formula (I):



(I)

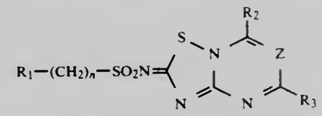
4,897,105

HERBICIDAL COMPOUNDS, THEIR PRODUCTION AND USE

Yoshiyuki Okada, Suita; Isao Aoki, Kawanishi; Nobuyuki Okajima, Osaka, and Takashi Kuragano, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

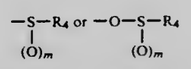
Filed Mar. 20, 1987, Ser. No. 28,692
Claims priority, application Japan, Mar. 25, 1986, 61-67821
Int. Cl.[4] A01N *43/90*; C07D *513/04*
U.S. Cl. 71—90 **15 Claims**

1. A compound of the formula



(I)

wherein R_1 is a phenyl group which is unsubstituted or substituted by one to five substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, aryl containing 6 to 14 carbon atoms, aryloxy containing 6 to 14 carbon atoms, aralkyl containing 7 to 9 carbon atoms, aralkyoxy containing 7 to 19 carbon atoms, an acyl group selected from the group consisting of lower alkylcarbonyl, lower alkenylcarbonyl, arylcarbonyl, aralkylcarbonyl, lower alkoxycarbonyl, aryloxycarbonyl, aralkyloxycarbonyl, lower alkoxycarbonyl-carbonyl, heterocyclic oxycarbonyl and heterocyclic carbonyl in which all of the aryl and aralkyl moieties have the same meanings as defined above and the heterocyclic moiety is thienyl, benzothienyl, pyrrolyl, oxazolyl, piperazinyl, thiazolyl, thiadiazolyl, pyrazolyl, tetrazolyl or oxazinyl, which acyl group is unsubstituted or substituted by one to three halogen atoms, acyloxy, in which acyl has the same meaning as defined above, acylamino in which acyl has the same meaning as defined above, carbamoyl, thiocarbamoyl, carbamoyloxy, sulfamoyl, sulfamoyloxy, halogen, carboxy, hydroxy, mercapto, lower alkylamino, arylamino in which aryl has the same meaning as defined above, aralkylamino in which aralkyl has the same meaning as defined above, nitro, cyano, and a group of the formula



wherein R_4 is lower alkyl, lower alkenyl, lower alkoxy, aryl containing 6 to 14 carbon atoms, aryloxy in which aryl has the same meaning as defined above, aralkyl containing 7 to 19 carbon atoms, aralkyloxy containing 7 to 19 carbon atoms, an acyl group selected from the group consisting of lower alkylcarbonyl, lower alkenylcarbonyl, arylcarbonyl, aralkylcarbonyl, lower alkoxycarbonyl, aryloxycarbonyl, aralkyloxycarbonyl, lower alkoxycarbonyl-carbonyl, heterocyclic oxycarbonyl and heterocyclic carbonyl in which all of the aryl and aralkyl moieties have the same meanings as defined above and the heterocyclic moiety is thienyl, benzothienyl, pyrrolyl, oxazolyl, piperazinyl, thiazolyl, thiadiazolyl, pyrazolyl, tetrazolyl or oxazinyl, which acyl group is unsubstituted or substituted by one to three halogen atoms, acyloxy in which acyl has the same meaning as defined above, acylamino in which acyl has the same meaning as defined above, lower alkylamino, arylamino in which aryl has the same meaning as defined above, aralkylamino in which aralkyl has the same meaning as defining above, thienyl, benzothienyl, pyrrolyl, oxazolyl, piperazinyl, thiazolyl, thiadiazolyl, pyrazolyl, tetrazolyl or oxazinyl, and m is 0, 1 or 2,

R_2 and R_3 respectively are a lower alkyl or lower alkoxy group,

Z is CH, and

n is 0 or 1,

or a salt thereof.

12. A method of killing weeds in a paddy field which comprises applying a herbicidally effective amount of the compound (I) as claimed in claim 1 wherein n is 1 or a salt thereof to the paddy field.

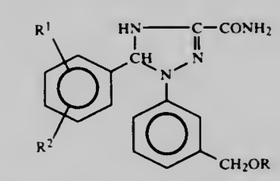
4,897,106

DERIVATIVE OF 4,5-DIHYDRO-1H-1,2,4-TRIAZOLE-3-CARBOXAMIDE, AND HERBICIDAL COMPOSITION CONTAINING THE DERIVATIVE

Takafumi Shida; Yoshikazu Kubota; Isao Ichinose; Shiro Yamazaki, and Hiroyasu Shiokawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,165
Claims priority, application Japan, Mar. 18, 1987, 62-63443; Mar. 18, 1987, 62-63444; Mar. 18, 1987, 62-63445; Mar. 18, 1987, 62-63446
Int. Cl.[4] A01N *43/653*; C07D *249/10*
U.S. Cl. 71—92 **25 Claims**

1. A derivative of 4,5-dihydro-1H-1,2,4-triazole-3-carboxamide represented by the formula (I):



(I)

wherein R^1 represents a hydrogen atom, a halogen atom, an alkyl group of 1 to 3 carbon atoms or an alkoxy group of 1 to 3 carbon atoms, R^2 represents a hydrogen atom or a halogen atom and R represents a straight-chain alkyl group of 1 to 8 carbon atoms, a branched-chain alkyl group of 3 to 8 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, a (cycloalkyl)alkyl group of 4 to 8 carbon atoms, an alkenyl group of 3 to 8 carbon atoms, an alkynyl group of 3 to 8 carbon atoms, an alkoxyalkyl group of 3 to 8 carbon atoms, a phenyl group, an aralkyl group of 7 to 9 carbon atoms, a phenyl group substituted by halogen atom(s) or an alkyl group of 2 to 8 carbon atoms which is substituted by fluorine atom(s).

4,897,107

1-HYDROXYETHYL-AZOLE COMPOUNDS AND AGRICULTURAL COMPOSITIONS

Graham Holmwood, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Berg-Gladbach; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

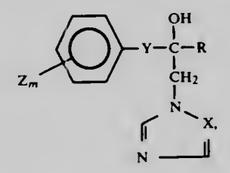
Continuation of Ser. No. 260,479, May 4, 1981, abandoned. This application Nov. 8, 1983, Ser. No. 549,867

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018866; Feb. 19, 1981, 3106076

Int. Cl.[4] A01N *43/653;* **C07D** *249/12*

U.S. Cl. 71—92 **54 Claims**

1. 1-Hydroxyethyl-azole compound of the formula



(I)

wherein

R is an alkyl radical with 1 to 4 carbon atoms; a cycloalkyl radical which has 3 to 7 carbon atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms or a phenyl radical which is optionally substituted by halogen, alkyl with 1 to 4 carbon atoms or haloalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms; or else is phenyl which is optionally mono- or di-substituted by identical or different substituents selected from halogen, methyl and trifluoromethyl

X is a nitrogen atom;

Y is a grouping $-OCH_2-$;

Z_m is a halogen atom, an alkyl radical with 1 to 4 carbon atoms, a cycloalkyl radical with 5 to 7 carbon atoms, an alkoxy radical with 1 to 4 carbon atoms, an alkylthio radical with 1 to 4 carbon atoms, a haloalkyl radical with 1 or 2 carbon atoms and 1 to 5 halogen atoms, a haloalkoxy radical with 1 or 2 carbon atoms and 1 to 5 halogen atoms, a haloalkylthio radical with 1 or 2 carbon atoms and 1 to 5 halogen atoms, a phenyl radical which is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms, a phenoxy radical which is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms, a phenylalkyl radical which has 1 or 2 carbon atoms in the alkyl part and is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms, or a phenylalkoxy radical which has 1 or 2 carbon atoms in the alkoxy part and is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms; and

m is 0, 1, 2 or 3

and physiologically acceptable acid addition salts thereof or metal salt complexes thereof.

4,897,108

HERBICIDAL SULFONAMIDES

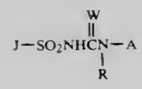
Donald J. Dumas, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 16,049, Feb. 18, 1987, Pat. No. 4,769,060, which is a division of Ser. No. 726,452, Apr. 29, 1985, Pat. No. 4,661,147, which is a continuation-in-part of Ser. No. 617,606, Jun. 5, 1984, abandoned. This application Jun. 24, 1988, Ser. No. 216,280

Int. Cl.[4] A01N *43/66;* **C07D** *251/16, 409/12*

U.S. Cl. 71—93 **29 Claims**

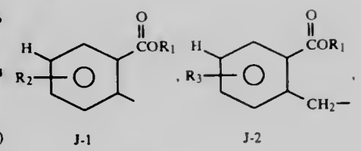
1. A compound of the formula



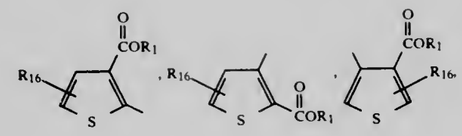
(I)

wherein

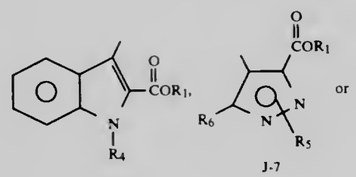
J is



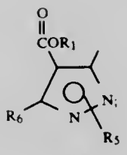
J-1 J-2



J-3 J-4 J-5



J-6 J-7

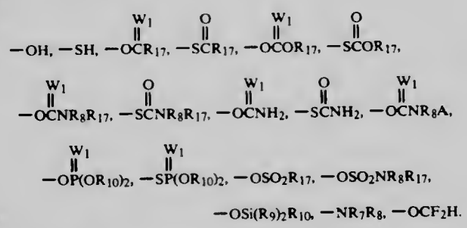


J-8

W is O or S;

R is H or CH_3;

R_1 is C_2–C_5 alkyl, C_4 alkenyl or C_4 alkynyl substituted with one or two substituents selected from:



provided that

(1) when R_1 is disubstituted, then the two substituents are identical and are not on the same carbon atom;

(2) when R_1 is C_2–C_3 alkyl and monosubstituted, then the substituent is other than $-SR_7$ or $-SO_2R_7$; and

(3) the carbon atom of R_1 adjacent to the ester oxygen does not carry any of the above substituents and must be substituted by at least one hydrogen atom;

W_1 is O or S;

n is 0, 1, or 2;

R_2 is H, Cl, F, Br, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, C_1–C_2 haloalkyl, or C_1–C_2 alkyl substituted with OCH_3 or SCH_3;

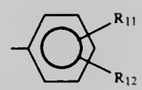
R_3 is H, F, Cl, CH_3 or OCH_3;

R_4 is H or CH_3;

R_5 is H, C_1–C_3 alkyl, $CH_2CH{=}CH_2$ or phenyl;

R_6 is H or C_1–C_3 alkyl;

R_7 is C_1–C_4 alkyl substituted with 0–3 atoms of F, Cl or Br, 0–2 methoxy groups or 0–1 cyano groups, C_3–C_4 alkenyl substituted with 0–3 atoms of F, Cl or Br, C_3–C_4 alkynyl or



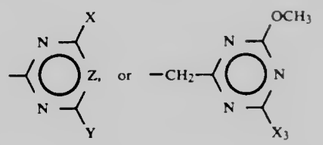
R_8 is H or C_1–C_2 alkyl;

R_9 is C_1–C_2 alkyl;

R_{10} is C_1–C_4 alkyl or C_6H_5;

R_{11} and R_{12} are independently H, F, Cl, Br, CH_3, OCH_3, SCH_3, SO_2CH_3, NO_2 or CF_3;

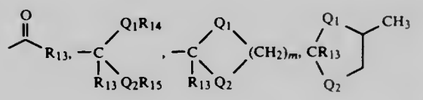
A is



A-1 A-6

X is CH_3, OCH_3, OCH_2CH_3, OCF_2H, CH_2F, OCH_2CH_2F, OCH_2CHF_2, OCH_2CF3 or CF3;

Y is H, CH_3, OCH_3, OC_2H_5, CH_2OCH_3, $NHCH_3$, $N(OCH_3)CH_3$, NH_2, $N(CH_3)_2$, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$,



OCF_2H, SCF_2H, $CH_2S(O)p(C_1$–C_4 alkyl), cyclopropyl or $CH_2OC_2H_5$;

m is 2 or 3;

p is 0, 1 or 2;

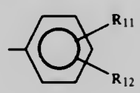
Q_1 and Q_2 are independently O or S;

R_{13} is H or CH_3;

R_{14} and R_{15} are independently C_1–C_2 alkyl;

R_{16} is H, F, Cl or CH_3;

R_{17} is C_1–C_{10} alkyl substituted with 0–3 atoms of F, Cl or Br, 0–2 methoxy groups or 0–1 cyano groups, C_3–C_{10} alkenyl substituted with 0–3 atoms of F, Cl or Br, C_3–C_{10} alkynyl substituted with 0–3 atoms of F, Cl or Br, or

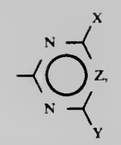


Z is N; and

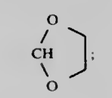
X_3 is CH_3 or OCH;

provided that

(a) when W is S, then R is H, A is



and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, OCH_2CF_3, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or $CH(OCH_3)_2$ or



and

(b) X or Y is other than OCF_2H, and their agriculturally suitable salts.

22. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,897,109

COMPOSITIONS FOR PROTECTING CULTURE PLANTS FROM THE PHYTOTOXIC ACTION OF HERBICIDALLY ACTIVE CHLORACETANILIDES

Henry Martin, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

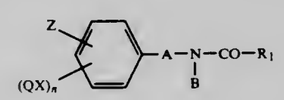
Continuation of Ser. No. 668,607, Nov. 6, 1984. This application Oct. 5, 1987, Ser. No. 106,985

Claims priority, application Switzerland, May 28, 1984, 2612/84

Int. Cl.[4] A01N *29/00, 29/10, 25/32*

U.S. Cl. 71—118 **13 Claims**

1. A composition for selectively controlling weeds in maize or sorghum which contains a herbicidally effective amount of metolachlor and for protecting the maize or sorghum from the phytotoxic action of the metolachlor a herbicidally antagonistically effective amount of an acylamide derivative of the formula



wherein

X is oxygen;

Q is C_1–C_6-alkyl, C_2–C_6-alkoxyalkyl or C_3–C_6-dialkoxyalkyl;

n is 1, 2 or 3;

Z is hydrogen;

A is C_1–C_6-alkylene which may be straight-chained or branched;

B is C_1–C_6-alkyl or C_2–C_6-alkenyl which is unsubstituted or substituted by C_1–C_4-alkoxy; and

R_1 is dichloromethyl, together with an inert agriculturally acceptable carrier and a surfactant.

2. The seed of sorghum which has been treated with a composition according to claim **1**.

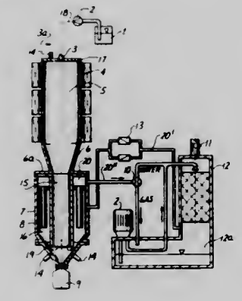
VOL 1110 ISS 5 JA 30 1990 UMI

4,897,110

PRODUCTION OF NOBLE METAL/NON-NOBLE METAL OXIDE POWDER

Wulf Kock, Markdorf, and Michael Laboureur, Constance, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Division of Ser. No. 67,470, Jun. 26, 1987, Pat. No. 4,804,167.
This application Sep. 20, 1988, Ser. No. 246,986
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622123
Int. Cl.[4] B22F *1/02, 9/24*
U.S. Cl. 75—0.5 A **9 Claims**



1. In a method for the production of powder being comprised of a noble metal and of a nonnoble metal oxide under atomization of salts of these metals in watery solution under further utilization of a hot reactor and a hot gas filter with sedimentation chamber, and a collection chamber underneath the improvement comprising:

atomizing the metal solution in the hot reactor;

moving a droplet containing gas flow inside the reactor by operation of a pressure differential produced by a water pump; the gas resulting at least in parts from reaction in the closed chamber reactor;

running the powder and the gas through the sedimentation chamber of the hot gas filter under support of gravity and separating the powder particles from reaction gases at a temperature above the dew point of the gas by deflecting the reaction gases and laterally into the hot gas filter while the powder is collected below in the collection chamber; and

scrubbing the gas extracted from the filter, in a scrubber following condensation of any water vapor.

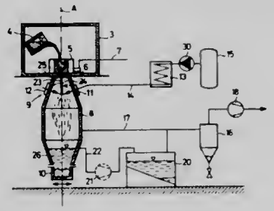
4,897,111

METHOD FOR THE MANUFACTURE OF POWDERS FROM MOLTEN MATERIALS

Sigurd Jönsson, Alzenau; Michael Hohmann, Hanau; Gerhard Gross, Krefeld, and Hans W. Bergmann, Echental, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 207,120
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1987, 3730147
Int. Cl.[4] B22F *9/06*
U.S. Cl. 75—0.5 C **9 Claims**

1. Method for the manufacture of powders from a melt of molten metal using a melting chamber, a tower below said chamber positioned to receive the melt so that the melt falls vertically downward in a stream, and an atomizing system for atomizing the melt, said method comprising injecting a low



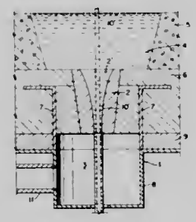
boiling liquefied gas under pressure through the atomizing system into the stream entering the tower.

4,897,112

METHOD FOR HEATING PRIMARILY NOZZLES, AND APPARATUS FOR CARRYING OUT THE METHOD

Sven Ekerot, Minervavägen 19,, S-191 50 Sollentuna, and Jan Svensebriak, Järfälla, both of Sweden, assignors to Sven Ekerot, Sollentuna, Sweden

PCT No. PCT/SE86/00588, § 371 Date Jun. 27, 1988, § 102(e) Date Jun. 27, 1988, PCT Pub. No. WO87/04100, PCT Pub. Date Jul. 16, 1987
PCT Filed Dec. 29, 1986, Ser. No. 213,612
Claims priority, application Sweden, Dec. 30, 1985, 8506160
Int. Cl.[4] C21C *5/42*; C22B *4/00*
U.S. Cl. 75—10.13 **24 Claims**



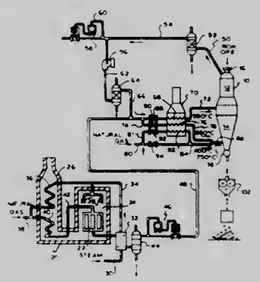
1. A method for heating so-calling nozzles through which steel in some form of liquid phase condition is intended to pass in a forming operation, comprising the step of heating, with the aid of microwaves, the nozzle (2, 12, 22, 27) combined with the step of constructing the nozzle with material that exhibits a high loss factor with regard to microwaves, said microwave heating being effected for the purpose of avoiding blockages from occurring in the nozzle as a result of a temperature decrease in the hot medium passing therethrough.

4,897,113

DIRECT REDUCTION PROCESS IN REACTOR WITH HOT DISCHARGE

Jorge-Octavio Becerra-Novoa, Apodaca; Ronald-Victor-Manuel Lopez-Gomez, San Nicolas de los Garza; Carlos Dominguez-Abedo, San Pedro Garza Garcia, and Leobardo Chapa-Martinez, San Nicolas de los Garza, all of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Continuation of Ser. No. 779,390, Sep. 23, 1985, Pat. No. 4,734,128. This application Mar. 25, 1988, Ser. No. 173,265
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] C21B *13/02*
U.S. Cl. 75—34 **17 Claims**



1. A process for the gaseous reduction of particulate iron ore in a vertically arranged, moving bed reactor to produce hot sponge iron with a given degree of carburization, said reactor having a reduction zone in the upper portion thereof through which a reducing gas is circulated and a modifying zone in the lower portion thereof for adjusting at least one of the properties of temperature and of carbon content of the sponge iron formed in said reduction zone, which process comprises:

supplying ore to be reduced to the upper portion of the moving bed in said reduction zone,

introducing hot reducing gas largely composed of carbon monoxide and hydrogen into the reduction zone to flow through and react with the moving bed of iron ore to give sponge iron and an off-gas containing C_2,

removing said off-gas from said reduction zone,

introducing into said modifying zone a blend of a hydrocarbon-containing gas and of a relatively hotter reducing gas largely composed of carbon monoxide and hydrogen which blend forms a hot carburizing gas mixture,

causing said mixture to flow through the modifying zone of the reactor,

adjusting the blend of said mixture and its temperature so as to be effective to modify to given values the carbon composition of the sponge iron passing therethrough to between 1% and 4% by weight and the temperature of the sponge iron to between 600° C. and 900° C.,

and removing modified hot sponge iron from the bottom of said reactor.

4,897,114

NITROGEN-CONTAINING ADDITIVE FOR STEEL MELTS

Bernd Neuer, Schnaitsee, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,749
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739156
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—53 **13 Claims**

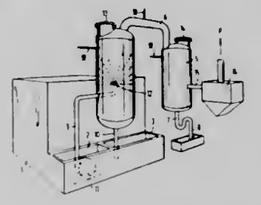
1. A device for nitriding molten steel, comprising a continuous, substantially cylindrical metallic sheath which is quickly soluble in molten steel, said metallic sheath defining a continuous hollow space therein, said space being filled with finely divided calcium cyanamide.

4,897,115

METHOD OF, PURIFYING A MELT, WHICH, BESIDES ONE OR MORE IMPURITIES, ESSENTIALLY CONTAINS A LIGHT METAL, IN PARTICULAR ALUMINUM

Gijsbert W. van Wijk, Baalder Esch 41, 7772 JX Hardenberg, Netherlands

Division of Ser. No. 44,928, May 1, 1987, Pat. No. 4,842,643. This application Nov. 21, 1988, Ser. No. 273,593
Claims priority, application Netherlands, May 6, 1986, 8601158
Int. Cl.[4] C22B *9/04*
U.S. Cl. 75—63 **9 Claims**



1. The method of removing volatizable metallic impurities from light metal comprising the steps of maintaining a molten bath of a light metal containing volatizable metallic impurities at a temperature in the range of from about 600° to 900° C., providing a vacuum processing vessel partially filled with metal from said bath, maintaining the pressure within said vessel at a subatmospheric level, forcing a continuous stream of molten metal from said bath under positive pressure into said vessel, causing said metal from said stream of metal to be interposed into said vessel at a level above said molten metal in said vessel through an atomizing device, thereby to cause the metal of said stream to be atomized and said impurities to be volatized while continuously drawing off said volatized impurities under vacuum through a conduit connected to said vessel at a level about said molten metal in said vessel and thereafter discharging said light metal from the molten metal in said processing vessel.

4,897,116

HIGH PURITY ZR AND HF METALS AND THEIR MANUFACTURE

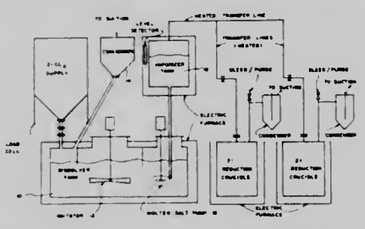
Randall L. Scheel, Albany, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed May 25, 1988, Ser. No. 198,577
Int. Cl.[4] C22G *34/10*
U.S. Cl. 75—84.5 **7 Claims**

1. The process for preparing metals selected from the group consisting of zirconium, hafnium, tantalum, vanadium, and niobium comprising providing in first vessel means a eutectic solution of a chloro, bromo or iodo salt of the selected metal in a molten thermal body of one or more alkali or alkaline earth metal halides at a non-vaporizing temperature, transferring said eutectic solution to second vessel means, maintaining said second vessel means at a temperature sufficient to vaporize said salt, transferring the salt vapor independently to a bank of separately fed reduction crucibles, the supply of said eutectic

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solution to said second vessel means being maintained such that said salt vapor can be supplied substantially continuously to



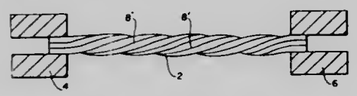
said crucibles in a selective manner dependent upon the operating status of each crucible.

4,897,117

HARDENED PENETRATORS

Thomas W. Pearice, Mt. Juliet, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 843,715, Mar. 25, 1986, abandoned. This application Sep. 13, 1988, Ser. No. 244,587
Int. Cl.[4] C22C *27/04*
U.S. Cl. 75—248 **6 Claims**



1. A column of material having a length to diameter above about 4:1 composed of a high density tungsten alloy having a hardness gradient from the outer surface to the core such that the surface hardness is harder than the core.

4,897,118

SELECTIVE METALLIZATION PROCESS, ADDITIVE METHOD FOR MANUFACTURING PRINTED CIRCUIT BOARDS, AND COMPOSITION FOR USE THEREIN

Donald R. Ferrier, Thomaston, and Gary B. Larson, Cheshire, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Division of Ser. No. 929,595, Nov. 10, 1986, Pat. No. 4,748,104. This application Nov. 10, 1987, Ser. No. 119,162
Int. Cl.[4] C25D *5/34*
U.S. Cl. 106—1.11 **2 Claims**

1. A composition for use in treating a substrate surface which has been masked in a predetermined pattern with an organic plating resist material such that upon subsequent treatment of the substrate surface with an activating solution and a metal plating solution, metal plating on unmasked surfaces is enhanced while metal plating on said resist is minimized, said composition consisting essentially of an aqueous solution containing (i) an organosilane conditioning agent, present in an amount of from about 0.1 to 8 g/l, and (ii) an adjuvant, selected from the group consisting of ethylenediamine, N,N,N',N'-tetramethyl-1,3-butanediamine, diethylene diamine, triethylene tetraamine, and mixtures thereof, in an amount of from about 5 to 15 g/l.

4,897,119

AQUEOUS DISPERSION OF GROUND SLAG

William J. Clarke, 162 Spencer Pl., Ridgewood, N.J. 07450, assignor to Geochemical Corporation and W. J. Clarke, both of Ridgewood, N.J.

Filed Jan. 11, 1988, Ser. No. 142,464
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] C04B *7/14*
U.S. Cl. 106—117 **22 Claims**

1. In a composition comprising water, a ground blast-furnace slag having a specific surface area greater than 3000 cm^2 per gm, and, to disperse the slag in the water, an effective amount of an addition polymer the improvement comprising the polymer being a polymer of (1) at least 70 percent acrylic acid and (2) the remaining up to 30 percent, by weight, selected from the group consisting of other carboxylic acid monomers and noncondensing monomers; the polymer having a molecular weight from about 1000 to about 20,000 and being unneutralized or the salt of an alkali metal or ammonia.

4,897,120

ACCELERATOR FOR PORTLAND CEMENT DERIVED FROM FERTILIZER

Michael F. Pistilli, Lombard, Ill., assignor to Gifford-Hill & Company, Inc., Dallas, Tex.

Filed Jan. 19, 1988, Ser. No. 145,556
Int. Cl.[4] C04B *24/00*
U.S. Cl. 106—315 **7 Claims**

1. A method of producing an additive suitable for use as a set accelerator in portland cement concrete and mortar mixes comprising the steps of reacting a calcium ammonium nitrate composition with a tri- or tetramethylolglycoluril compound under conditions to convert ammonia present in the composition into a non-reactive water-soluble hexamine and also produce water-soluble glycoluril derivatives.

4,897,121

REMOVAL PROCESS OF ASBESTOS-FILLED LININGS OR COATINGS

Torao Sasaki, Kita 1-5-17, Kuki, Japan, assignor to Torao Sasaki and Noshiro Mfg. Co., Ltd., both of Kuki, Japan, a part interest

Filed Apr. 19, 1988, Ser. No. 183,059
Claims priority, application Japan, Oct. 5, 1987, 62-249690; Feb. 3, 1988, 63-22091
Int. Cl.[4] B08B *1/00*
U.S. Cl. 134—22.18 **3 Claims**

1. A process for the removal of an asbestos-filled lining or coating applied on a surface of a building, which comprises:
jetting out water at a pressure of 50–200 atm against an area of the lining or coating and at the same time mechanically rubbing said area of the lining or coating, thereby separating the lining or coating as fragments from said area of said lining or coating;
drawing the fragments and water in said area of said lining or coating together with the surrounding air; and
collecting the thus-drawn fragments by means of a dust collector.

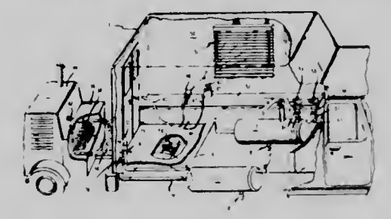
4,897,122

PROCESS, COMPOSITION AND APPARATUS FOR CLEANING VENETIAN BLINDS

A. Charles Schreiber, 114 Edgemont Rd., Watchung, N.J. 07060, and Robert W. Schreiber, 612 Orchard St., Cranford, N.J. 07076

Continuation of Ser. No. 895,500, Aug. 11, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 171,161
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—29 **13 Claims**

13. A process for cleaning dirty assembled venetian blinds having slats which are metal, plastic or baked enamel-coated metal slats in a mobile vehicle which mobile vehicle comprises:
a four-sided enclosed portion wherein the enclosed portion is substantially box shaped with three walls and a doorway wherein two of the walls are substantially parallel to and opposite each other and the third wall connects first perpendicular ends of the two substantially parallel walls and is opposite to and substantially parallel to the doorway which connects second ends of the two substantially parallel walls, a ceiling and a floor, wherein;
(1) the inside of one of said parallel walls is adapted to hold said venetian blinds as they are being washed and rinsed (the wash wall);
(2) a flexible pressure hose for dispensing the aqueous detergent solutions for washing or water for rinsing said venetian blinds, said hose having two ends, one end of which having an adjustable nozzle and the second end of which having means to draw either aqueous detergent wash solution from a detergent holding tank attached to the underside of the floor of the enclosed portion of the mobile vehicle or to draw rinse water from a rinse water holding tank attached to the underside of said floor;
(3) heating means intermediate the ends of said pressure hose for heating a solution passing through said hose;
(4) means at the inside on the ceiling or attached to said wash wall adapted to hold said venetian blinds;
(5) means at the bottom of said wash wall adapted for



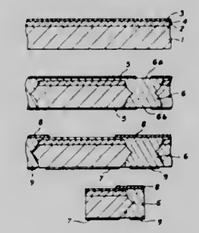
recycling the said aqueous detergent wash solution into said detergent holding tank;
(6) means at the bottom of said wash wall, separate from said recycling means, for draining used rinse water from said vehicle; and
(7) means to power said heating means and said pressure hose;
said process comprising the steps of
(a) spraying with the flexible pressure hose the surfaces of the venetian blinds with an aqueous non-ionic detergent solution from said detergent holding tank in an amount and at a temperature and pressure sufficient to transfer substantially all the dirt from said surfaces to the aqueous non-ionic detergent solution;
(b) rinsing with the flexible pressure hose the washed venetian blinds from step (a) with water from the rinse holding tank in an amount and at a pressure sufficient to remove substantially all the aqueous detergent solution from the surfaces of the venetian blinds;
(c) directing at the surfaces of the slats of said venetian blinds from step (b) an aqueous spray solution consisting essentially of an alkali metal (C_8–C_{18})alkylbenzene sulfonate and at least one ethoxylated nonylphenyl in an amount sufficient to remove the water droplets from the surfaces of the slats of said rinsed venetian blinds from step (b); and
(d) causing the washed and rinsed assembled venetian blinds to dry.

4,897,123

SOLAR CELLS AND METHOD FOR PRODUCING SOLAR CELLS

Kotaro Mitsui, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 29, 1988, Ser. No. 251,504
Claims priority, application Japan, Nov. 28, 1987, 62-300975
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—256 **50 Claims**



1. A solar cell comprising:
a compound semiconductor substrate of a first conductivity type having opposed front and rear surfaces including at least one separation region for receiving an interconnecting electrode, said separation region extending through said substrate from said front surface to said rear surface, said separation region having a second conductivity type different from the first conductivity type;
a first compound semiconductor layer of the first conductivity type disposed on the front surface of said substrate;
a second compound semiconductor layer of the second conductivity type disposed on said first layer opposite said substrate and forming a rectifying junction with said first layer, said second layer being in electrical communication with said separation region;
a first electrode disposed on the rear surface of said substrate and spaced from said separation region; and
an interconnecting electrode in electrical communication with said second layer at said front surface and extending to said rear surface over said separation region.

4,897,124

ALUMINUM-ALLOY ROLLED SHEET FOR FORMING AND PRODUCTION METHOD THEREFOR

Mamoru Matsuo, and Toshio Komatsubara, both of Fukaya, Japan, assignors to Sky Aluminium Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1988, Ser. No. 213,737
Claims priority, application Japan, Jul. 2, 1987, 62-163899; Jul. 2, 1987, 62-163900; Jul. 3, 1987, 62-165422
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—2 **13 Claims**

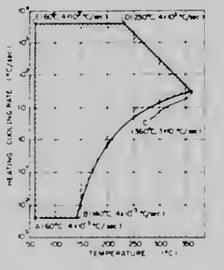
4. A production method for an Al-Si-Mg series aluminum-alloy rolled sheet for forming, having improved formability, corrosion-resistance, and weldability, comprising the steps of:
preparing melt consisting essentially of Si an Mg, whose contents are on and within the line connecting points A, B, C, D, E, and F of FIG. 1, except for the line FA, from 0.05 to 0.5% of Fe, and balance aluminum and unavoidable impurities, with the proviso of

	Si (%)	Mg (%)
A:	1.8	0.1
B:	2.5	0.1
C:	2.5	1.1
D:	1.2	1.1
E:	1.2	0.6

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-continued

	Si (%)	Mg (%)
F:	1.8	0.6



casting the melt by continuous or semi-continuous casting to form an ingot;

rolling the ingot to form a rolled sheet; and,

solution heat-treating the rolled sheet at a temperature ranging from 450° to 590° C., followed by cooling at a cooling rate of not less than 5° C./sec.

4,897,125

METHOD OF HEAT TREATMENT OF AL-BASED ALLOYS CONTAINING LI AND THE PRODUCT OBTAINED BY THE METHOD

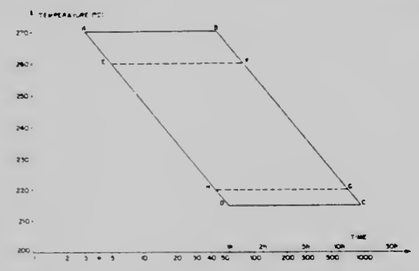
Bruno Dubost, 3, rue Casimir Brenier; Max Reboul, C6 Voie Fleurie, Rochepleine, both of 38120 Saint Egreve, and Pierre Sainfort, 31 Quai Claude Bernard, 38000 Grenoble, all of France

Continuation of Ser. No. 938,510, Dec. 5, 1986, Pat. No. 4,812,178. This application Oct. 20, 1988, Ser. No. 250,855

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—12.7 A **15 Claims**



1. In a method of heat treatment of Al alloys containing Li and at least one principal element selected from the group consisting of Cu, Mg and Zn as well as optional minor elements comprising Zr, Mn, Ni, Hf, Ti and Be and optional trace impurities comprising Fe and Si, the balance being Al, said method comprising a solution treatment and quenching operation, an optional plastic deformation and natural ageing operation followed by at least one tempering operation, the improvement wherein said at least one tempering operation includes a principal tempering operation carried out at a temperature at or above the solvus temperature of the δ' phase, and in an area defined by a parallelogram, on a temperature log-time diagram, whose corners have the following coordinates:

A	270° C. - 3 min
B	270° C. - 48 C. - 48 min
C	225° C. - 9 hr 30 min
D	225° C. - 35 min.

4,897,126

ALUMINUM-LITHIUM ALLOYS HAVING IMPROVED CORROSION RESISTANCE

Philip E. Bretz; Ralph R. Sawtell, both of Pittsburgh, and Warren H. Hunt, Jr., Monroeville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 685,731, Dec. 24, 1984, Pat. No. 4,797,165, which is a continuation-in-part of Ser. No. 594,344, Mar. 29, 1984, Pat. No. 4,648,913. This application Jun. 30, 1988, Ser. No. 213,722

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—12.7 A **43 Claims**



1. In a method of making aluminum base alloy products having combinations of improved strength and fracture toughness in the aged condition, the method comprising the steps of:

(a) providing a lithium-containing aluminum base alloy product in a condition suitable for aging;

(b) imparting to said product, prior to an aging step, a working effect equivalent to stretching said product greater than about 5% at room temperature;

(c) selecting said alloy to be responsive to said working effect and controlling said working effect to provide improved combinations of fracture toughness and strength in response to aging; and

(d) subjecting said product to an aging step.

4,897,127

RAPIDLY SOLIDIFIED AND HEAT-TREATED MANGANESE AND NIOBIUM-MODIFIED TITANIUM ALUMINUM ALLOYS

Shyh-Chin Huang, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

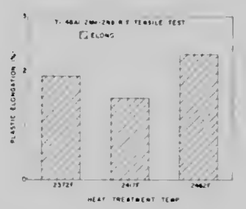
Filed Oct. 3, 1988, Ser. No. 253,659

Int. Cl.[4] C22F *1/18*; B32B *15/14*

U.S. Cl. 148—133 **6 Claims**

1. A niobium and manganese modified titanium aluminum alloy product consisting essentially of titanium, aluminum, niobium and manganese in the following approximate atomic ratio:

$$Ti_{52\text{-}42}Al_{46\text{-}50}Nb_{1\text{-}5}Mn_{1\text{-}3},$$



said alloy having been rapidly solidified and heat treated thereby giving a ductility of at least 2.0.

4,897,128

PROCESS OF DETERMINING THE ZINC CONTENT OF PHOSPHATING BATHS

Heinz Dosch; Dieter Hauffe, both of Frankfurt, and Horst Gehmecker, Oberwiesen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 6, 1988, Ser. No. 178,183

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3711931

Int. Cl.[4] C23F *7/08*

U.S. Cl. 148—241 **8 Claims**

1. A method of determining the zinc content of an acid aqueous phosphating bath comprising:

providing a bath sample with a pH value between 1.2 and 1.7 with an oxidation-reduction electrode immersed therein; and

titrating the bath sample in the presence of ethylenediaminetetraacetic acid, hexamethylenetetramine and alkalihexacyanoferrate(III) with an alkalihexacyanoferrate-(II) until the potential at the electrode reaches an inflection point.

8. A method of controlling the zinc content of an acid aqueous zinc phosphating bath comprising:

determining the zinc content of the bath by providing a bath sample with a pH value between 1.2 and 1.7 with an oxidation-reduction electrode immersed therein;

titrating the bath sample in the presence of ethylenediameinetetraacetic acid, hexamethylenetetramine and alkalihexacyanoferrate(III) with an alkalihexacyanoferrate(II) until the potential at the electrode reaches an inflection point;

determining the consumption of alkalihexacyanoferrate(II) based on the electrode voltage potential; and

supplying make-up concentrate by means of a metering device, which is controlled based on the consumption of alkalihexacyanoferrate(II).

4,897,129

CORROSION RESISTANT COATING

James N. Tuttle, Jr., Litchfield, and Olyn P. Jaboin, Wolcott, both of Conn., assignors to The LEA Manufacturing Company, Waterbury, Conn.

Division of Ser. No. 33,676, Apr. 3, 1987, Pat. No. 4,749,417, and Ser. No. 861,834, May 12, 1986, Pat. No. 4,673,445. This application May 16, 1989, Ser. No. 194,208

Int. Cl.[4] C23C *22/82*

U.S. Cl. 148—256 **8 Claims**

1. A process for improving the corrosion resistance of an iron or steel part, said process comprising the steps of first forming a phosphate conversion coating over said part by contact of the part with a phosphating solution, and then contacting the phosphate conversion coating with an aqueous treatment solution of nickel acetate.

4,897,130

MAGNETIC MATERIAL COMPRISING AN INTERMETALLIC COMPOUND OF THE RARE EARTH TRANSITION METAL TYPE

Kurt H. J. Buschow, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 57,722, Jun. 2, 1987, abandoned, which is a continuation of Ser. No. 824,992, Feb. 3, 1986, abandoned. This application Oct. 24, 1988, Ser. No. 262,569

Claims priority, application European Pat. Off., Feb. 21, 1986, 86200267.2

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—302 **4 Claims**



1. A sintered magnetic material consisting essentially of a rare-earth transition metal intermetallic compound having a composition defined by the formula

$$R_2(Co_{1-x}Fe_x)_{14}B$$

where $0 \leqq x \leqq 0.2$, and R is at least one element selected from the group consisting of Nd, Pr, and Tb, with or without one or more of a member of the group consisting of Y and other rare-earth metals, the maximum energy product of the magnetic material being about 30 megagauss-oersted.

4,897,131

GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING IMPROVED GLASS FILM PROPERTIES AND LOW WATT LOSS

Toshiya Wada; Osamu Tanaka; Toshihiko Takata; Kunihide Takashima, and Hiromichi Yasumoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 5, 1986, Ser. No. 938,648

Claims priority, application Japan, Dec. 6, 1985, 60-273421; Dec. 26, 1985, 60-292134; Dec. 26, 1985, 60-292135; Dec. 26, 1985, 60-292136; Dec. 27, 1985, 60-293281; Oct. 11, 1986, 61-240182; Oct. 11, 1986, 61-240183

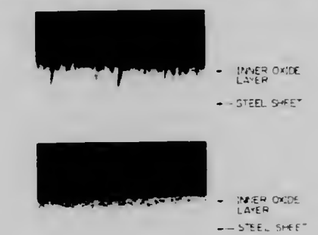
Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—308 **5 Claims**

1. A grain-oriented silicon steel sheet having areas of sharp and minute uneveness on at least one surface of the sheet, said areas having a depth of from 3 to 15 μm, said areas being separated from one another by less than 1 mm and said areas covering 50 percent to 90 percent of said surface of said sheet; an oxide layer disposed on said surface of said sheet and par-

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tially protruding into said areas of sharp and minute uneveness; and a glass film disposed over said oxide layer, said sheet



having a watt loss of less than 0.082 $W_{17/50}$ (W/Kg) and said glass film having a tension of at least 0.6 Kg/mm^2.

4,897,132

TURBINE CASING FORMED OF A HEAT RESISTANT AUSTENITIC CAST STEEL

Masao Yamamoto; Takashi Yebisuya, both of Tokyo; Osamu Watanabe, and Masayuki Yamada, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 933,366, Nov. 18, 1986, abandoned, which is a continuation of Ser. No. 720,271, Apr. 5, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 127,601
Claims priority, application Japan, Oct. 3, 1984, 59-206260
Int. Cl.[4] C22C *38/44*
U.S. Cl. 148—327 **9 Claims**



1. A turbine casing formed of a heat resistant austenitic cast steel consisting of 0.04 to 0.08% by weight of carbon, 2.0% by weight or less of silicon, 0.5–1.9% by weight of manganese, 0.1 to 0.30% by weight of nitrogen, 8.5 to 12% by weight of nickel, 15 to 19.5% by weight of chromium, 0.05 to 0.35 by weight of vanadium, 2 to 3% by weight of molybdenum, 0 to 0.5% by weight of niobium, 0 to 0.5% by weight of titanium and 0 to 0.01 by weight of boron, the balance being iron apart from incidental impurities, said cast steel having been subjected to a homogenizing heat treatment of the as cast steel.

4,897,133

METHOD FOR MANUFACTURING AN EMBOSSED PATTERN IN A PORTABLE MEDIUM

Yoshiaki Nemoto, Yokohama, and Hiroshi Ohba, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

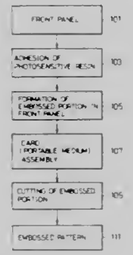
Filed Jan. 20, 1988, Ser. No. 146,073
Claims priority, application Japan, Jan. 20, 1987, 62-11043; Jan. 20, 1987, 62-11044; Jan. 20, 1987, 62-11046
Int. Cl.[4] B32B *31/18, 31/28*
U.S. Cl. 156—64 **10 Claims**

9. A method of manufacturing an embossed pattern on a card, the embossed pattern comprising linearly arranged symbols, the method comprising the steps of:

forming a medium on the card, the medium covering an area ot the card larger than the area of the embossing pattern;

cutting a part of the medium into an outer edge of the embossed pattern by cutting at least a portion of the prescribed outer edge of each symbol simultaneously with at least a portion of the outer edge of an adjacent symbol; and

cutting the remaining part of the medium into an inner edge of the embossed pattern.



10. The method of claim 9 wherein the outer edge cutting step comprises the steps of:

calculating the trajectories necessary to cut from the outer edge of one symbol to a common boundary between the symbol and the adjacent symbol;

calculating the trajectories necessary to cut from the outer edge of the adjacent symbol to the common boundary;

combining the trajectories; and

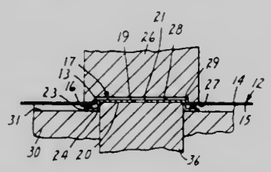
cutting along the combined trajectories to simultaneously cut the edge portions of both the symbol and the adjacent symbol.

4,897,134

ULTRASONIC WELDING HUBS TO MAGNETIC RECORDING DISKETTES

Arlin B. Doering, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 823,190, Jan. 27, 1986, Pat. No. 4,797,764. This application Oct. 14, 1988, Ser. No. 258,040
Int. Cl.[4] B29C *65/08*; G11B *5/82*
U.S. Cl. 156—73.1 **5 Claims**



1. A method for ultrasonically welding a magnetic medium disk to a hub with a thermoplastic adhesive said method comprising;

providing a hub including a center portion and a flange portion, said center portion having a planar drive surface;

placing a thermoplastic adhesive on said flange portion of said hub;

providing a magnetic medium disk having a central aperture and having a side zero and a side one;

placing the hub at the central aperture and resting said side one of said disk on said adhesive;

applying pressure and ultrasonic vibrations to said magnetic medium disk and adhesive;

maintaining said pressure and ultrasonic vibrations for a time necessary to melt said adhesive and achieve a desired axial distance, α, between said side zero of said disk and the plane of said drive surface, and

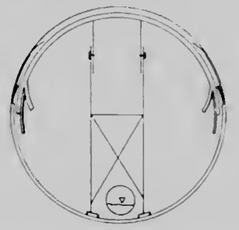
maintaining the position of the hub and magnetic medium disk until the adhesive is set.

4,897,135

METHOD OF RECONSTRUCTING PIPE SYSTEMS USING FIBERGLASS LAMINATES

Harry H. Aylor, Jr., and Boyd A. Hirtz, both of Chesterfield, Mo., assignors to Insituform Mid America, Inc., Chesterfield, Mo.

Filed Dec. 29, 1987, Ser. No. 139,817
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—94 **10 Claims**



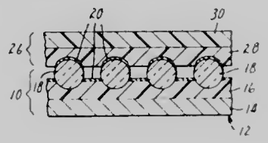
1. A method of reconstructing a large diameter fixed passageway by application of a fiberglass sandwich having a structural core layer comprising balsa wood sandwiched between fiberglass laminates to at least one 360 degree section of said passageway.

4,897,136

METHOD OF MAKING ENCAPSULATED-LENS RETROREFLECTIVE SHEETING

Terry R. Bailey, Woodbury; Roger R. Knit, Maplewood; Howard R. Tolliver, Woodbury, and Arthur D. Dickson, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 799,098, Nov. 18, 1985, abandoned. This application Aug. 26, 1987, Ser. No. 89,944
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[4] A63B *39/00*; B29B *1/16*; B32B *31/00*
U.S. Cl. 156—145 **21 Claims**



1. Method of making encapsulated-lens retroreflective sheeting which comprises the following steps:

(1) partially embed substantially a monolayer of lenses into a carrier web,

(2) deposit specularly reflecting material over the lens-bearing surface of the carrier web,

(3) under heat and pressure, contact with a HMW thermoplastic binder film portions of the specularly reflecting deposit which are on lenses without contacting any portion of the specularly reflecting deposit which is on the surface of the carrier web between lenses,

(4) strip off the carrier web to form exposed leases,

(5) lay a cover film over the exposed lenses, and

(6) apply heat and pressure along a network of interconnecting lines to soften and deform the binder material into contact with the cover film, thus forming hermetically sealed cells within which the lenses are encapsulated and have an air interface.

4,897,137

PRIMER FOR USE ON EPDM ROOFING MATERIALS

Dennis P. Miller, and Laurence G. Dammann, both of Columbus, Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Continuation-in-part of Ser. No. 887,594, Jul. 21, 1986, abandoned. This application Sep. 1, 1988, Ser. No. 239,719
Int. Cl.[4] B32B *25/18*; C08J *5/12*; C08L *15/02, 51/02*
U.S. Cl. 156—157 **12 Claims**

1. A primer composition for use on EPDM roofing materials in conjunction with polychloroprene based roofing adhesive comprising an admixture of:

100 parts styrene-ethylene-butylene-styrene thermoplastic block copolymer rubber, from 10 to 1000 parts brominated isobutylene-isoprene butyl rubber polymer,

from 10 to 1000 parts aromatic hydrocarbon reinforcing resin selected from the group consisting of

hydrogenated alicyclic hydrocarbons, linear homopolymers of styrene, and copolymers of styrene or alpha methyl styrene with vinyl toluene monomer or butadiene monomer, and mixtures thereof,

and sufficient solvent to achieve application viscosity.

7. A process for adhering EPDM roofing membrane materials comprising the steps of:

(a) cleaning edges of EPDM roofing membrane with solvent,

(b) coating said cleaned edges of EPDM roofing membrane with a primer comprising an admixture of 100 parts styrene-ethylene-butylene-styrene thermoplastic block copolymer rubber, from 10 to 1000 parts brominated isobutylene-isoprene butyl rubber polymer, from 10 to 1000 parts aromatic hydrocarbon reinforcing resin selected from the group consisting of hydrogenated alicyclic hydrocarbons, linear homopolymers of alpha methyl styrene, and copolymers of styrene or alpha methyl styrene with vinyl toluene monomer or butadiene monomer, and mixtures thereof, and sufficient solvent to achieve application viscosity,

(c) allowing said primer to dry,

(d) applying polychloroprene based contact cement,

(e) allowing said polychloroprene based contact cement to dry, and

(f) joining said primed, polychloroprene based contact cement coated edges.

4,897,138

SEALING OF PLASTIC TUBES

John B. Shaposka, and Dudley Spencer, both of Wilmington, Del., assignors to Deseo, Inc., Wilmington, Del.

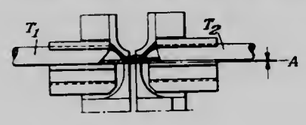
Continuation-in-part of Ser. No. 51,390, May 18, 1987, Pat. No. 4,793,880. This application Dec. 20, 1988, Ser. No. 287,461
Int. Cl.[4] B29C *57/10, 65/20*
U.S. Cl. 156—158 **15 Claims**

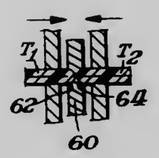
10. A method for sealing the end of a thermoplastic tube comprising the steps of placing the tube in pockets in a pair of spaced apart tube holders with the tube spanning the space between the tube holders, clamping the tube closed at two spaced locations with each location being at one of the tube holders, cutting through the tube at a location in the space between the tube holders and between the two clamped locations to form two tube sections severed from each other, heating the ends of the two tube sections to melt the ends, moving the tube holders and tube sections toward each other, locating

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the pockets out of alignment with each other before the tube ends are moved toward each other, and completely sealing closed at least one of the tube ends after the tube ends have been moved toward each other, wherein the tube pockets are initially aligned with each other and then moved out of alignment by a distance corresponding to about one-half the thickness of the wall of the tube, and the tube ends are brought into contact with each other in the misaligned position.

15. A device for sealing the ends of a thermoplastic tube comprising a pair of spaced apart tube holders having aligned tube receiving pockets whereby a single tube may be placed in said pockets spanning the space therebetween, clamping means on said tube holders for clamping the tube closed at a pair of spaced locations, cutting means relatively movable into the





space between said pockets to cut through the tube between said spaced locations to form two distinct tube sections, said cutting means being relatively movable out of said space between said pockets, means for melting the ends of the tube sections, a die block having cold die pockets in opposite surfaces of said die block with said cold die pockets being fixedly aligned relative to each other and with each cold die pocket being alignable with a respective one of the tube sections after the ends of the tube sections have been melted, said die block being relatively movable into and out of said space between said tube receiving pockets, and means for moving said tube holders toward said cold die pockets whereby the ends of the tube sections are completely sealed upon contacting said cold die pockets.

4,897,139

METHOD OF PRODUCING PROGRESSIVELY INFLATED PACKERS

Edward T. Wood, Houston, Tex., assignor to Completion Tool Company, Houston, Tex.

Division of Ser. No. 596,681, Apr. 4, 1984, Pat. No. 4,781,249. This application Jul. 18, 1988, Ser. No. 219,786

Int. Cl.[4] B29C *71/02*

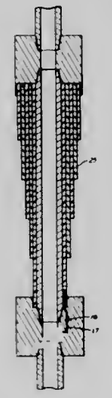
U.S. Cl. 156—188 **8 Claims**

1. A method of producing an elongated inflatable packer wherein an inflatable packer element is disposed over a tubular casing member and sealingly attached to the casing member at the ends of the packer element and wherein there are means for admitting fluid from the interior of the casing member to the interior of the packer element, the improvement comprising the steps of:

disposing a rubber release agent over a part of the length of the tubular casing member from the location for one of the ends of the packer element toward the center of the length of the packer element;

disposing an uncured rubber element over the tubular casing member and the release agent; and

curing said rubber element on said tubular casing member to provide the packer element so that upon inflation the



release agent permits the packer element to be progressively released from the casing member.

4,897,140

METHOD FOR MAKING A PIPE-SHAPED BODY OF WOOD

Peter Opsvik, Hogtunveien 12, Asker, Norway (1370)

Continuation-in-part of Ser. No. 865,188, May 19, 1986, abandoned. This application Jan. 13, 1988, Ser. No. 144,914

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—250 **12 Claims**

1. A method for manufacturing furniture products from a substantially annular pipe-shaped body made of a number of wood staves, comprising the steps of:

selecting a number of substantially straight wood staves having substantially parallel longitudinal edges, substantially parallel faces, and a predetermined length, width and thickness,

furnishing each said face with substantially parallel inner and outer surfaces each having a curvature transverse to said longitudinal edges, said curvatures corresponding to said number of wood staves and to the radius of said pipe-shaped body,

providing each said longitudinal edge with a complementary tongue and groove pattern adapted to mate with the tongue and groove pattern of an adjacent stave, said pattern having a series of mutually undulating grooves and oppositely slanting and radially projecting tongues,

coating said tongues and grooves with an adhesive,

assembling said staves in a cradle-like mounting means, wherein the tongues and grooves of each stave are brought into direct perpendicular engagement with the

tongues and grooves of an adjacent stave, the engagement of said staves together forming the pipe-shaped body, the final stave being brought into position by separating the second to last stave and its next adjacent stave until the space defined between them opens to receive the final stave and then firmly closes around said final stave, thereby completing the pipe-shaped body,

clamping said assembled staves to stabilize the pipe-shaped body and allow the adhesive to cure,

releasing said pipe-shaped body from clamping,

working the internal and external surfaces of the pipe-shaped body,

cutting at least one pair of cylindrical hollow bodies from the pipe-shaped body along a predetermined continuously arcuate and non-planar path to form at least one pair of furniture blanks, both blanks of said pair having a contoured edge of substantially the same shape in the vicinity of the cut, and finishing at least one of said blanks to provide a furniture product.

4,897,141

METHOD FOR PREPARING SEMICONDUCTOR WAFERS

Richard T. Girard, Covestryville, Pa., assignor to Valtech Corporation, Eagle, Pa.

Continuation-in-part of Ser. No. 946,396, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 678,724, Dec. 6, 1984, abandoned. This application Jun. 9, 1988, Ser. No. 204,339

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—250 **1 Claim**

1. The process of preparing semiconductor wafers from ingots by bonding said ingots to a cutting beam with an epoxy adhesive and slicing the ingot into wafers, said process comprising the steps of:

a. mixing hollow microspheres of an average diameter of 1 to 500 micrometers as the single additive that prevents or ameliorates thermally induced stress and the clogging problem during slicing with the resin part of an epoxy adhesive, wherein sufficient hollow microspheres are used to provide 2 to 35% (wt/wt) of the total adhesive, wherein the hollow microspheres are formed from silicate glass melts or from a homogeneous solution of alkali metal silicate and a polysalt selected from the group consisting of ammonium pentaborate, sodium pentaborate and sodium hexametaphosphate;

b. mixing a sufficient amount of a hardener for the epoxy adhesive with the mixture of step a. to provide a set time of 4 to 12 hours;

c. spreading the mixed adhesive system on said cutting beam and/or semiconductor liquid;

d. placing said cutting beam and silicon ingot in contact with each other;

e. allowing the adhesive to set;

f. slicing the ingot into wafers with an inside diameter diamond or wire saw that penetrates the ingot, adhesive and part of the cutting beam; and

g. recovering the wafers by breaking the adhesive bond between the semiconductor wafer and the cutting means.

4,897,142

PROCESS AND APPARATUS FOR THE CONTINUOUS LINE MANUFACTURE OF PENCILS

Jean-Bernard Chenal, Saint-Cergues, France, assignor to Caran d'Ache S.A., Thonex, Switzerland

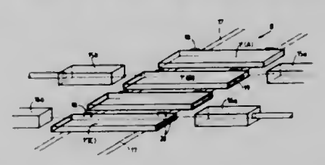
Filed Aug. 17, 1988, Ser. No. 233,077

Claims priority, application Switzerland, Sep. 4, 1987, 3415/87

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—257 **9 Claims**

1. A process for the continuous manufacture of pencils, comprising the steps of laying pencil leads between two half boards having longitudinal grooves, fixing the half boards together by pressing to form sandwich boards, trimming the transverse edges of these sandwich boards, applying a protective layer to the trimmed transverse edges thus formed and thereafter printing an identification mark on the protective



layer, wherein the application of the protective layer and the printing of the idenification mark are carried out by jet under pressure of drops of a protective liquid and a printing liquid, respectively.

4,897,143

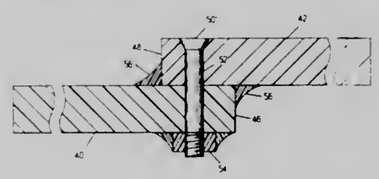
METHOD FOR CONDITIONING COMPOSITE STRUCTURES

James H. Covey, Snohomish, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 22, 1988, Ser. No. 171,753

Int. Cl.[4] B32B *31/08, 31/28;* H05F *3/00*

U.S. Cl. 156—273.9 **9 Claims**



1. A method for conditioning a composite structure by increasing a sparking current threshold of said structure from a first threshold to a second threshold, said structure including at least one joint between sheets made from composite materials, said sparking current threshold being a minimum current which causes sparking at at least one said joint, the method comprising the step of passing a first conditioning current through said joint for a first predetermined period of time, said first conditioning current level being less than said first threshold.

4,897,144

EPOXY-SUFONYLAZIDE AS BONDING AGENT

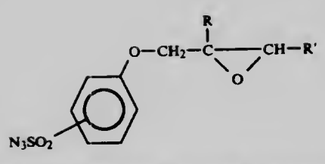
Anthony B. Clayton, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 99,868, Sep. 22, 1987, Pat. No. 4,772,733, which is a continuation-in-part of Ser. No. 806,477, Jul. 17, 1986, abandoned. This application May 2, 1988, Ser. No. 189,434

Int. Cl.[4] B05D *5/10;* C08C *19/22*

U.S. Cl. 156—307.3 **7 Claims**

1. A process for bonding a sulfonylazide-reactive polymer to an epoxy-reactive material selected from the group consisting of silaceous materials, metals, alloys of metals, and epoxy-reactive polymers, comprising heating the polymer and the material with an epoxy-sulfonylazide having the general formula:



wherein R is lower alkyl and R' is hydrogen or lower alkyl to a temperature sufficient to bond the polymer and the materials to the epoxy-sulfonylazide.

4,897,145

PIVOTED HAMMER/GATE BACK-UP ASSEMBLY FOR A BUCKLE CHUTE FOLDER EQUIPPED WITH A MOISTENING DEVICE

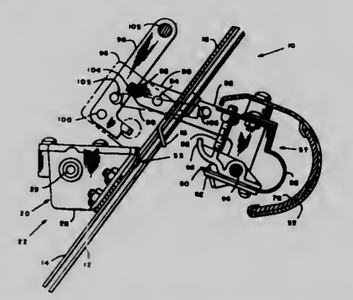
Joseph H. Marzullo, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 21, 1988, Ser. No. 222,490

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[4] B31F *1/00*

U.S. Cl. 156—442.1 **3 Claims**



1. Apparatus for applying moisture to a flexible document containing water-activated adhesive, comprising:

A. a buckle chute having

i. a pair of opposing plates defining a document path therebetween,

ii. a stopping bar situated between said opposing plates,

iii. an adjustable plate slidably mounted on one of said opposing plates;

B. a moistening assembly secured to said adjustable plate situated adjacent one of said buckle chute plates on one side of said document path, said moistening assembly including a reservoir and a wick secured to said reservoir and extending toward said document path; and

C. a hammer/gate unit pivotably mounted to said adjustable plate on the other side of said document path for engaging said wick and urging said document against said wick, said hammer/gate unit being pivotable between a position adjacent said moistening assembly for moistening operation and a non-moistening position remote from said moistening assembly.

4,897,146

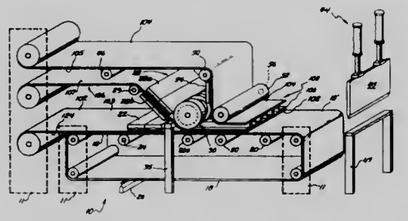
APPARATUS AND METHOD FOR FABRICATING STRUCTURAL PANELS HAVING CORRUGATED CORE STRUCTURES AND PANEL FORMED THEREWITH

Louis P. Iaziana, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,270

Int. Cl.[4] B32B *31/12, 31/20*

U.S. Cl. 156—462 **11 Claims**



1. Apparatus for fabricating a lightweight structural panel having a thermoplastic or thermoplastic-composite corrugated core sheet and at least a first thermoplastic or thermoplastic-composite skin sheet bonded thereto comprising:

conveyor means for advancing a first skin sheet in an axial machine direction;

core sheet advancing means for advancing a core sheet in said axial machine direction;

first heating means disposed along the path of advancement of said core sheet for heating said core sheet to a process temperature at which a surface of said core sheet to be brought into contact with a first skin sheet becomes tacky and at which said core sheet is plastically deformable;

second heating means disposed along the path of advancement of said first skin sheet and adjacent said first skin sheet for heating a first contact surface of said first skin sheet to a temperature below said process temperature of said core sheet; and

means for plastically deforming said core sheet and simultaneously bonding said core sheet to said first skin sheet, said means for deforming comprising a forming drum, said conveyor means and a plurality of forming mandrels, said forming mandrels comprising elongated members extending in the axial machine direction spaced apart from one another and spaced away from said conveyor means, permitting said first skin sheet to pass between said forming mandrels and said conveyor means, said drum having a plurality of annular channels, each of said channels partially encompassing a forming mandrel and cooperating therewith to form a plurality of axial extending corrugations, a portion of which extend between adjacent forming mandrels and are laminated to said first skin sheet during the forming of said corrugations in said core sheet.

4,897,147

PROCESS AND APPARATUS FOR BONDING TEXTILE SHEET-LIKE STRUCTURES

Jürgen Inselmann, Löhne, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 817,225, Jan. 8, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 151,723

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502608

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—498 **3 Claims**

1. An apparatus for bonding two superposed textile sheets at least one of which is coated with a heat-activatable bonding agent, said apparatus comprising:

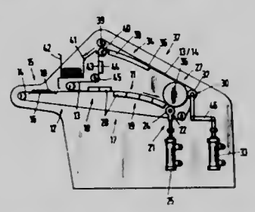
a pair of abutting conveyor belts for conveying the textile sheets in a conveying direction;

means for supplying the textile sheets between said conveyor belts in the conveying direction;

at least first and second heating plates, disposed on opposite sides of the conveyor belts, for activating the bonding agent, each of said heating plates comprising a curved platen such that said conveyor belts rest against their associated heating plates under tension;

a first linear-pressure device, disposed downstream from said heating plates in the conveying direction, for applying a directed linear pressure on the textile sheets, thereby anchoring the bonding agent in the textile sheets, said first linear-pressure device comprising a first pressure roller;

heated surface-pressure means for stabilizing the anchoring of the bonding agent in the textile sheets and for preventing the sheets from springing apart, said surface pressure



means comprising a rotating pressure cylinder which is in pressure contact with said first roller and against which a conveyor belt rests under tension along a part periphery of the pressure cylinder; the textile sheets lying between two conveying strands resting against the pressure cylinder and belonging the conveyor belts; said rotating pressure cylinder being followed by a second linear pressure device comprising a second pressure roller which is located at a distance from the first linear pressure device and which is pressable against said rotating pressure cylinder, said conveying strands passing in pressing contact between said pressure cylinder and said first and second pressure rollers; and

a cooling station, disposed downstream from said heated surface-pressure means in the conveying direction, for cooling the textile sheets.

4,897,148

APPARATUS FOR REMOVING ADHESIVE TAPE WRAPPED AROUND A PRINTED CIRCUIT BOARD

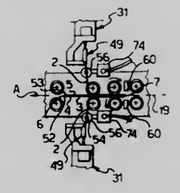
Ivano Orlandi, Turate, Italy, assignor to Orlandi Aldo e Orlandi Ivano S.d.f., Como, Italy

Filed Oct. 20, 1988, Ser. No. 260,050

Claims priority, application Italy, Oct. 27, 1987, 22415-A/87

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—584 **10 Claims**



1. An apparatus for removing an adhesive tape wrapped around a printed circuit board, characterized in that it comprises a table extending within a supporting structure, a runway having mutually spaced-apart parallel roller pairs and being mounted on said table to guide a taped board along a predetermined travel path, first and second cutter means carried on said structure at said travel path and movable away therefrom, two stations whereat said tape is pried up, clamped, and removed, said stations being supported on said structure downstream from said cutter means and arranged in mirror image relationship astride said travel path, each said station including a blade mounted on a slide movable transversely toward and away from said travel path, and gripper means mounted on said slide and associated with said blade.

4,897,149

METHOD OF FABRICATING SINGLE-CRYSTAL SUBSTRATES OF SILICON CARBIDE

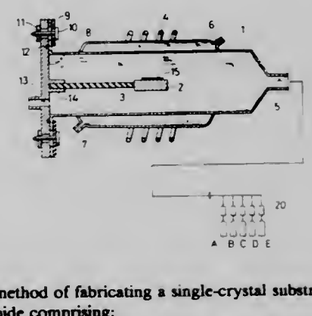
Akira Suzuki, Nara; Katsuki Furukawa, Sakai, and Mitsuhiro Shigeta, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 10, 1986, Ser. No. 872,604

Claims priority, application Japan, Jan. 19, 1985, 60-134721

Int. Cl.[4] C30B *25/20*

U.S. Cl. 156—610 **16 Claims**



1. A method of fabricating a single-crystal substrate of silicon carbide comprising:

(a) forming a crystal substrate base layer selected from the group consisting of:

(i) a single-crystal substrate ground layer of a nitride selected from the group consisting of AlN, GaN and $Al_xGa_{1-x}N$ wherein $0<x<1$, said single crystal substrate ground layer having a hexagonal crystal structure, and

(ii) a crystal layer of the same structure comprising a mixture of SiC and at least one of said nitrides present in an amount within the range of 0.1-10 mole % by total weight of said mixture on a single crystal substrate of a material selected from a group of materials not including alpha-SiC at a temperature from 1,200 to 1,600° C. by a CVD method; and

(b) growing a single crystal of alpha-SiC on said ground layer.

4,897,150

METHOD OF DIRECT WRITE DESPOSITION OF A CONDUCTOR ON A SEMICONDUCTOR

Daniel J. Dooley, Saratoga, and Arthur R. Elsea, Jr., Fremont, both of Calif., assignors to Laser Industries, Inc., San Jose, Calif.

Filed Jun. 29, 1988, Ser. No. 213,146

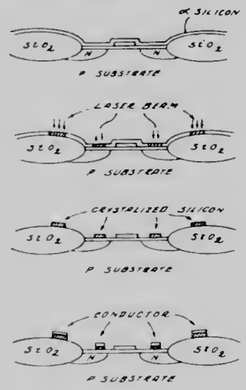
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—628 **17 Claims**

1. A method of forming a conductive pattern on a semiconductor element comprising the steps of:

depositing a catalytic layer on said semiconductor element;

activating selected regions of said catalytic layer to form a pattern of activated regions;



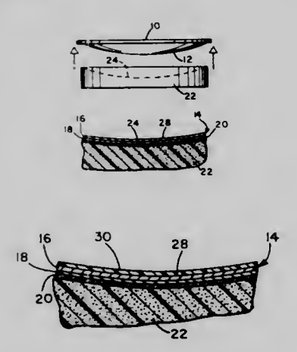
etching the areas of said catalytic layer not activated; and depositing a conductive material on said activated regions.

4,897,151

METHOD FOR FABRICATING A DICHROIC PARABOLIC LENS REFLECTOR

Henry T. Killackey, Covina; Joseph M. Gailliot, Jr., Alta Loma, and John T. Branigan, Claremont, all of Calif., assignors to General Dynamics Corp., Pomona Division, Pomona, Calif.

Filed Jul. 27, 1988, Ser. No. 224,617
Int. Cl.[4] C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—630 **17 Claims**



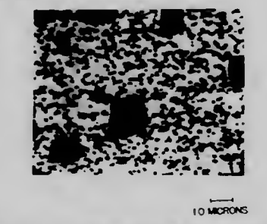
1. A method for forming a dichroic lens reflector comprising the steps of:
providing a substrate formed of a low dielectric constant material, said substrate having a pre-formed substantially parabolic support surface;
providing a mandrel having a work surface formed as a substantially reverse image of said support surface;
forming a conductive layer upon said work surface;
mounting said conductive layer upon said support surface;
removing said mandrel from said conductive layer; and
forming an array of dipoles in said conductive layer.

4,897,152

ETCHANT FOR REVEALING DISLOCATIONS IN II-VI COMPOUNDS

John-Sen Chen, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 27, 1989, Ser. No. 315,979
Int. Cl.[4] H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—637 **15 Claims**



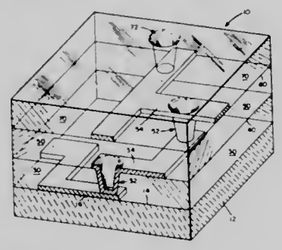
5. A method for revealing dislocations in group II–VI compounds comprising the steps of:
preparing an etchant of water, hydrochloric acid, and potassium dichromate;
exposing a surface of the compound to the etchant; and
removing the etchant from the surface of the compound.

4,897,153

METHOD OF PROCESSING SILOXANE-POLYIMIDES FOR ELECTRONIC PACKAGING APPLICATIONS

Herbert S. Cole, Scotia, and James E. Kohl, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,153
Int. Cl.[4] B44C 1/22; C03C 15/00; B29C 37/00; B32B 31/00
U.S. Cl. 156—643 **24 Claims**



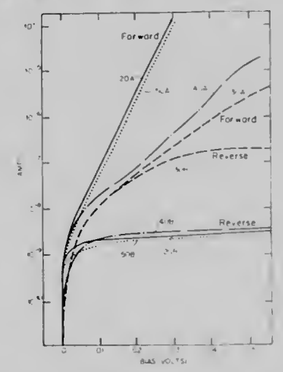
1. A process comprising the steps of:
forming a first copolymer layer;
treating said first copolymer layer under conditions which leave the exposed surface of said first copolymer layer enriched with some elements of the copolymer formula;
cleaning said exposed surface of said first copolymer layer with an etchant or solvent which substantially removes said enrichment to leave an exposed surface of said first copolymer layer which is substantially similar to that of an untreated surface of said copolymer; and
forming a second copolymer layer on said exposed surface of said first copolymer layer.

4,897,154

POST DRY-ETCH CLEANING METHOD FOR RESTORING WAFER PROPERTIES

Satya N. Chakravarti, Hopewell Junction, N.Y.; Stephen J. Fonash, and Xiao-Chun Mu, both of State College, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 3, 1986, Ser. No. 882,116
Int. Cl.[4] C23F 1/00; H01L 21/306
U.S. Cl. 156—643 **19 Claims**



1. A process for restoring a monocrystalline semiconductor wafer after sustaining crystallinity damage due to dry etching, said process comprising the steps of:
performing dry etching on selected portions of a semiconductor wafer with an etching gas mixture which causes crystallinity damage and the formation of a dry etch residue film on said selected portions of said semiconductor wafer;
removing said dry etch residue layer from the etched portions and actively forming by the application of energy a continuous oxide layer on said selected etched portions of said semiconductor wafer;
rapid thermal annealing said wafer by heating said wafer to a temperature of at least 700° C. for less than 30 seconds to drive said oxide layer down into said wafer a small amount, to obtain impurity gettering, and to restore crystallinity below said oxide layer; and
removing said oxide layer.

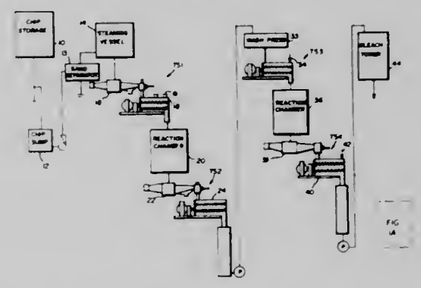
4,897,155

METHOD FOR PRODUCING LOW FINES CONTENT PULP BY SUBJECTING CELLULOSIC CHIPS TO LOW FREQUENCY COMPRESSION-RELAXATION CYCLES

Rudy J. Kotelec, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed May 27, 1987, Ser. No. 54,491
Int. Cl.[4] D21B 1/16; D21C 3/26, 9/10
U.S. Cl. 162—18 **13 Claims**

1. A method for producing a pulp having a low fines content of 10% or less comprising the steps of:
(a) subjecting cellulosic fibrous chips in a first treatment stage to compressive and shearing forces characterized by low frequency compression-relaxation cycles to convert the chips to fibers;
(b) impregnating the chips with a chemical while simultaneously subjecting the chips to said compressive and shearing forces;
(c) controlling the distribution of the fiber length by retaining the fibers resulting from step (b) in a reaction chamber for a predetermined time at a predetermined temperature to control the fiber length distribution;
(d) squeezing the fibers to reduce their moisture content;
(e) subjecting the fibers in a second treatment stage to compressive and shearing forces characterized by low frequency compression-relaxation cycles;
(f) impregnating the fibers with a chemical, while simultaneously subjecting the fibers to the compressive and shearing forces of step (e); and



(g) bleaching the fibers resulting from step (f), wherein the method steps produce a pulp having a low fines content of 10% or less.

4,897,156

PROCESS FOR ACTIVATING CELLULOSE PULP WITH NO AND/OR NO_2 AND OXYGEN IN THE PRESENCE OF NITRIC ACID AND THEN DELIGNIFYING BLEACHING THE ACTIVATED CELLULOSE PULP

Hans O. Samuelsson, Gothenburg, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Mar. 24, 1982, Ser. No. 361,289
Claims priority, application Sweden, Sep. 21, 1981, 8105552
Int. Cl.[4] D21C 3/16
U.S. Cl. 162—65 **18 Claims**

1. A process for activating chemical cellulose pulp and then delignifying bleaching the activated pulp, which comprises adding and treating the cellulose pulp in an activating stage with added nitrogen oxide selected from the group consisting of nitrogen dioxide, nitrogen monoxide, polymers thereof, and mixtures thereof, and with added oxygen-containing gas in the presence of nitric acid added in an amount within the range from about 0.1 to about 1 g mole per kg of water accompanying the cellulose pulp at a temperature within the range from about 50 ° to about 120° C., the nitrogen oxide, oxygen-containing gas and nitric acid all being present simultaneously, the treatment being under conditions minimizing formation of nitric acid and favoring a high concentration of nitrogen dioxide for an activating time selected according to activating temperature as follows:
(a) at an activating temperature of from 50° to 90° C. of from about 5 to about 120 minutes, and

VOL 1110 ISS 5 JA 30 1990 UMI

(b) at an activating temperature above 90° C. of from 1 to about 10 minutes;

washing the treated pulp and then subjecting the washed pulp to at least one delignifying stage in an aqueous alkaline medium.

4,897,157

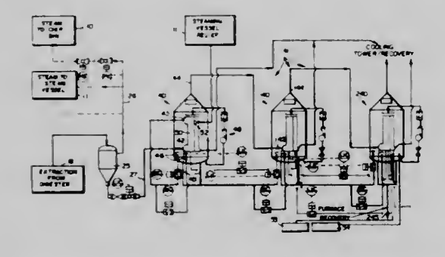
MAKE-UP LIQUOR AND BLACK LIQUOR EVAPORATING PROCESSING DURING PULP PRODUCTION

Carl L. Elmore; Mark A. Mullen, both of Glens Falls; George D. Emery, Fort Miller, and Timothy R. Carter, Lake George, all of N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Continuation of Ser. No. 883,315, Jul. 8, 1986, abandoned. This application Mar. 15, 1988, Ser. No. 170,077

Int. Cl.[4] B01D *1/26*; D21C *11/06*, *11/10*

U.S. Cl. 162—240 **11 Claims**



1. Apparatus for evaporating liquor during the production of paper pulp from fibrous comminuted cellulosic material, comprising:

a continuous digester having a black liquor extraction outlet;

a first discrete flash tank operatively connected to said black liquor extraction outlet, and having a steam outlet therefrom, and a concentrated black liquor outlet therefrom;

at least one discrete evaporator having a first inlet for the black liquor and a first outlet therefor, a first conduit for flowing black liquor from said first inlet to said first outlet, a vapor outlet, a second inlet for the black liquor and a second conduit for communicating the black liquor from said first outlet to said second inlet, a second outlet and a third conduit for communicating the black liquor from said second inlet to said second outlet; and

means in said evaporator for effecting heat exchange between the black liquor flowing in said first conduit from said first inlet to said first outlet and the black liquor flowing in said third conduit from said second inlet to said second outlet;

means for directly connecting said concentrated liquor outlet from said first flash tank without intervening heat exchange and said first inlet so that the heat content of the black liquor flowing in said first conduit from said first inlet to said first outlet in heat exchange relation with the black liquor flowing in said third conduit effects evaporation of the black liquor in said third conduit to produce vapor which is discharged from the vapor outlet of the evaporator.

4,897,158

HEADBOX APPARATUS FOR A PAPERMAKING MACHINE

Elmer Weisshuhn, Vogt; Alfred Bubik, Ravensburg; Hans Dahl, Ravensburg; Herbert Holik, Ravensburg; Rüdiger Kurtz, Immenstaad; Anton Zembrot, Aulendorf; Wolf-Gunter Stotz; Werner Seider, both of Ravensburg, and Robert Tröndle, Ravensburg, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

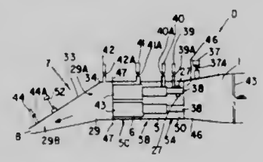
Continuation of Ser. No. 873,196, May 19, 1986. This application Nov. 17, 1988, Ser. No. 272,340

Claims priority, application Switzerland, Sep. 19, 1984, 04489/84; Feb. 28, 1985, 00915/85

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] D21F *1/06*

U.S. Cl. 162—259 **37 Claims**



1. A headbox apparatus for a papermaking machine defining a predetermined machine direction and a predetermined web width and for producing a paper web from an infed fiber stock suspension passed through the headbox apparatus, said headbox apparatus comprising:

a distribution box for distributing an infed fiber stock suspension across the predetermined web width;

a diffusor system following said distribution box and receiving the infed fiber stock suspension from said distribution box;

said diffusor system possessing a plurality of diffusor channels for throughpassing the infed fiber stock suspension through said diffusor system;

a nozzle chamber following and flow communicating with said diffusor system;

said nozzle chamber receiving said infed fiber stock suspension from said diffusor system and containing a delivery slice for throughpassing said infed fiber stock suspension;

said delivery slice distributing said infeed fiber stock suspension at substantially a predeterminate weight per unit area distribution across said predetermined web width;

said delivery slice having a preselectable opening width;

said infed fiber stock suspension, during operation of the headbox apparatus, flowing through said headbox apparatus at a predeterminate flow rate and in a flow direction defining substantially horizontal flow direction components;

flow control means for controlling said predeterminate weight per unit area distribution of said infed fiber stock suspension across said predetermined web width, said predeterminate flow rate of said infed fiber stock suspension across said predetermined web width, and the alignment of said substantially horizontal flow direction components of said flow direction of the infed fiber stock suspension with the predetermined machine direction across said predetermined web width;

said flow control means comprising:

adjusting means for adjusting said preselectable opening width of the delivery slice of said nozzle chamber in a manner such that there is obtained said predeterminate weight per unit area distribution across said predetermined web width;

control means for controlling said predeterminate flow rate of said infed fiber stock suspension across said predetermined web width and the alignment with said predetermined machine direction of said substantially horizontal flow direction components of the flow direction of said infed fiber stock suspension across said predetermined web width;

said control means including structure for controlling said predeterminate flow rate and the alignment with said predetermined machine direction of said substantially horizontal flow direction components of said infed fiber stock suspension substantially simultaneously with a change in the adjustment of said adjusting means for adjusting said preselectable opening width of the delivery slice of said nozzle chamber;

said distribution box having a predetermined geometrical configuration across said predetermined web width;

said nozzle chamber having a predetermined geometrical configuration across said predetermined web width;

said control means containing adjusting means effective across said predetermined web width for selectively locally individually adjusting said predeterminate geometrical configuration of either said distribution box or said nozzle chamber; and

said control means further including means for the selective infeed or outfeed of a fluid medium to at least one of said distribution box and said nozzle chamber.

4,897,159

APPARATUS FOR PULP CONTAMINANT REMOVAL

Randall L. Bose, Pisgah Forest; Albert P. Kriek, Asheville; Eric D. Myracle, and Don B. Rogers, both of Brevard, all of N.C., assignors to P. H. Glatfelter Company, Spring Grove, Pa.

Filed Mar. 7, 1988, Ser. No. 165,001

Int. Cl.[4] D21F *7/00*; D21G *9/00*

U.S. Cl. 162—260 **9 Claims**

1. Apparatus for removing contaminant particles from a moving pulp mat comprising:

a detection section having a light source adapted to transmit light to an entire width of said moving pulp mat,

means for detecting an intensity of light across said entire width of the mat, and

means for generating signals corresponding to positions on said mat where decreases are detected in said light intensity by said detecting means, said detected decreases corresponding to locations of contaminant particles in said moving pulp mat;

a removal section further comprising:

a plurality of nozzle spray means for discharging pressurized streams of fluid to cut sections from said mat, said spray means being adapted to produce substantially longitudinal slits as said pulp mat moves past said spray means and to produce substantially transverse cuts intersecting said longitudinal slits;

means for supplying pressurized fluid to said nozzle spray means;

control means for selectively discharging pressurized fluid from said spray means responsive to signals received from said signal generating means to produce longitudinal slits and transverse cuts in said pulp mat sufficient to separate sections from said mat corresponding to positions where said decreases in light intensity have been detected by said detecting means; and

wherein said nozzle spray means further comprises a first row and a second row of nozzles,

each nozzle of said first row having a small diameter circular orifice facing said pulp mat and being positioned to dispense a stream of pressurized fluid for producing a longitudinal slit in said pulp mat as said mat moves past said first row,

each nozzle of said second row having an elongated, transversely oriented slot orifice facing said pulp mat and being positioned to dispense a stream of pressurized fluid for producing a horizontal cut in said pulp mat,

each nozzle of said second row further being stationary and associated with a pair of adjacent nozzles of said first row and positioned and sized to produce a horizontal cut intersecting longitudinal slits produced by said associated pair of nozzles of said first row.

4,897,160

HEAD BOX FOR A PAPER MAKING MACHINE

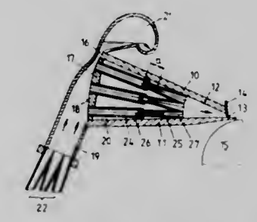
Karl Wolf, and Dieter Egelhof, both of Heidenheim-Schnaitheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 231,141, Aug. 10, 1988, which is a continuation of Ser. No. 148,059, Jan. 25, 1988, abandoned, which is a continuation of Ser. No. 24,852, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 434,262, Oct. 14, 1982, abandoned. This application Feb. 2, 1989, Ser. No. 305,557

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144066

Int. Cl.[4] D21F *1/06*

U.S. Cl. 162—343 **16 Claims**



1. A head box for a paper making machine, comprising:

a feed channel for feeding fiber pulp suspension; the feed channel extending over the width of the paper making machine; an outlet nozzle for the fiber pulp suspension, and the nozzle also extending over the width of the machine and being spaced away from the feed channel;

a plurality of circular tubular flow channels, each tubular flow channel extending from the feed channel to a respective downstream end toward the outlet nozzle, the channels being distributed over the width of the machine and over the height of the head box;

each tubular channel having inside it, more toward the downstream end thereof, a circular tubular channel piece with a reduced inside diameter, as compared with the inside diameter of the tubular channel upstream of the channel piece which is in the tubular flow channel, the channel piece having an entrance at its upstream end

which produces a step-like reduction in cross-section inside the tubular flow channel, and each tubular flow channel having, upstream of the location of the channel piece therein a substantially constant pulp flow cross-section.

4,897,161

SEPARATION OF VINYL ACETATE FROM ETHYL ACETATE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715, and Marc W. Paffhausen, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Mar. 20, 1989, Ser. No. 326,086
Int. Cl.[4] B01D *3/40*; C07C *67/54*
U.S. Cl. 203—51 **6 Claims**

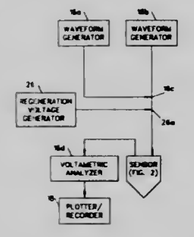
1. A method for recovering vinyl acetate from mixtures of vinyl acetate and ethyl acetate which comprises distilling a mixture of vinyl acetate and ethyl acetate in a rectification column in the presence of about one part of an extractive agent per part of vinyl acetate-ethyl acetate mixture, recovering vinyl acetate as overhead product and obtaining the ethyl acetate and the extractive agent from the stillpot, in which the extractive agent comprises diethylene glycol ethyl ether.

4,897,162

PULSE VOLTAMMETRY

Jan Lewandowski, South Euclid; Paul S. Malchesky, Painesville, and Yukihiko Nose', Cleveland, all of Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio

Continuation-in-part of Ser. No. 930,872, Nov. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 815,402, Dec. 31, 1985, abandoned. This application Feb. 2, 1988, Ser. No. 151,622
Int. Cl.[4] G01N *27/50*
U.S. Cl. 204—1 T **22 Claims**



1. A sensing apparatus for sensing chemical compositions comprising:

an electrocatalytic sensor having at least sensing and reference electrodes;

means for applying a first periodic signal to the sensor during a measurement time period;

means for generating a periodic reactivation signal differing from the first periodic signal by at least one of amplitude, frequency, and waveshape;

means for applying the periodic reactivation signal to the sensor during a reactivation time period after completion of the measurement time period; and

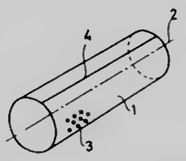
sensing means for sensing electrical current flow between the sensing and reference electrodes during the measurement time period.

4,897,163

METAL CYLINDRICAL SCREEN MADE OF SHEET MATERIAL, AND PROCESS FOR PRODUCING SUCH A SCREEN

Wilhelmus J. F. Verheesen, Horn, Netherlands, assignor to Stork X-Cel B.V., Netherlands

Filed Mar. 28, 1989, Ser. No. 329,652
Claims priority, application Netherlands, Apr. 5, 1988, 8800865
Int. Cl.[4] C25D *1/08*
U.S. Cl. 204—11 **13 Claims**



1. Metal screen in cylindrical form, comprising a sheet metal screen material, two ends of which are joined together, in which said sheet metal screen material used is a screen material formed in one or more stages, at least the first stage of which comprises electrodeposition of metal on a matrix and wherein said ends of said material are connected overlapping each other, and at the point of overlap the ready material has an overall thickness between 1.0 and 1.5 times the initial thickness of said sheet screen material.

4,897,164

PROCESS FOR PREPARING THE THROUGH HOLE WALLS OF A PRINTED WIRING BOARD FOR ELECTROPLATING

Anthony M. Piano, Lodi, and Randolfo Galvez, North Bergen, both of N.J., assignors to Olin Hunt Specialty Products Inc., Cheshire, Conn.

Filed Apr. 24, 1989, Ser. No. 342,492
Int. Cl.[4] C25D *5/02, 5/54*
U.S. Cl. 204—15 **15 Claims**

1. In the process for electroplating the walls of through holes in a laminated printed wiring board comprised of at least one non-conducting layer laminated to at least two separate conductive metal layers, which comprises the steps:

(a) contacting said printed wiring board having said through holes with a liquid dispersion of carbon black comprised of:

(1) carbon black particles having an average particle size of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) a liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) separating substantially all of the liquid dispersing medium from said applied dispersion, thereby depositing said carbon black particles in a substantially continuous layer on said non-conducting portions of said hole walls;

(c) microetching said metal layers of said printed wiring board to remove deposited carbon black therefrom; and

(d) later electroplating a substantially continuous metal layer over the deposited carbon black layer on said non-conducting portions of hole walls, thereby electrically connecting said metal layers of said printed wiring board;

wherein said improvement comprises:

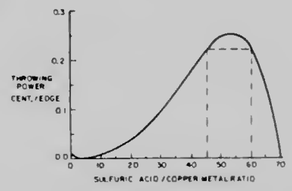
contacting said deposited carbon black particles after step (b) and before step (c) with aqueous alkaline solution of an alkal metal borate.

4,897,165

ELECTROPLATING COMPOSITION AND PROCESS FOR PLATING THROUGH HOLES IN PRINTED CIRCUIT BOARDS

Roger F. Bernards, Wellesley; Gordon Fisher, Sudbury, and Wade Sonnenberg, Foxboro, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Aug. 23, 1988, Ser. No. 235,051
Int. Cl.[4] C25D *3/38, 7/00*; G01N *27/46*
U.S. Cl. 204—24 **16 Claims**



1. An aqueous acid copper plating solution comprising one or more bath soluble copper salts in a concentration sufficient to provide a total copper ion content in an amount of from one to ten grams per liter of solution, an acid in an amount where the acid, expressed as sulfuric acid, to copper weight ratio, has an upper limit in accordance with the equation:

$$R=67-2.7\,[X]$$

and a lower limit in accordance with the equation:

$$R=35-1.3\,[X]$$

where, in each equation, R is the weight ratio of hydrogen ion to copper metal and X is the weight of dissolved copper metal in solution and a surfactant conforming to the formula:

$$R'—O—(CH_2(CH_2O)_nH$$

where R' is an aryl or alkyl group containing from about 2 to 20 carbon atoms and n is an integer whereby the molecular weight of the surfactant is at least 500,000.

10. A process for electrolytically depositing copper on the conductive walls of printed circuit board through holes, said process comprising the steps of providing a printed circuit board substrate having through holes with an aspect ratio of at least 10 to 1 and a length of at least 0.100 inches, electrolytically depositing copper onto the walls of said through holes from a copper plating solution comprising one or more bath soluble copper salts in a concentration sufficient to provide a total copper ion content in an amount of from one to ten grams per liter of solution, an acid in an amount where the acid, expressed as sulfuric acid, to copper weight ratio, has an upper limit in accordance with the equation:

$$R=67-2.7\,[X]$$

and a lower limit in accordance with the equation:

$$R=35-1.3\,[X]$$

where in each equation, R is the weight ratio of hydrogen ion to copper metal and X is the weight of dissolved copper metal in solution and a surfactant conforming to the formula:

$$R'-O-(CH_2CH_2O)_nH$$

where R' is an aryl or alkyl group containing from about 2 to 20 carbon atoms and n is an integer whereby the molecular weight of the surfactant is at least 500,000.

4,897,166

ANTIFOAMING ADDITIVE FOR ACID LIQUIDS

Detlef Melzer, Cologne; Erhardt Tabel, Leverkusen, and Hans-Peter Biermann, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 214,769
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723198
Int. Cl.[4] C25D *3/10*
U.S. Cl. 204—51 **13 Claims**

1. In an acidic liquid a surfactant and a foam inhibiting agent, the improvement comprises said foam inhibiting agent being perfluoroalkyl-containing esters of phosphoric acid.

7. An acidic liquid according to claim 1 which is an electrolyte solution for the production of galvanic chromium layers as hard or gloss chromium by electrolytic deposition of chromium, said electrolyte solution containing hexavalent chromium compounds and fluorinated surfactants.

10. A foam inhibiting composition which comprises a surfactant and a perfluoroalkyl-containing ester of phosphoric acid.

4,897,167

ELECTROCHEMICAL REDUCTION OF CO_2 TO CH_4 AND C_2H_4

Ronald L. Cook, Aurora; Robert C. MacDuff, and Anthony F. Sammells, both of Naperville, all of Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Aug. 19, 1988, Ser. No. 234,387
Int. Cl.[4] C25C *1/12*; C25B *3/04*
U.S. Cl. 204—52.1 **26 Claims**

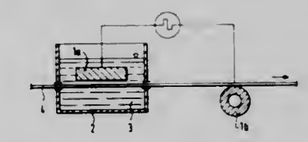
1. A process for electrochemical reduction of CO_2 to CH_4 and C_2H_4 at both high current densities and high Faradaic efficiencies in an electrochemical cell comprising an anode an a cathode in contact with an electrolyte, said process comprising: passing a current between said anode and said cathode; electrodepositing Cu ions form an electrolyte comprising an aqueous inorganic salt solution in which CO_2 is soluble and Cu ions forming deposited uniformly granular Cu on a highly polished cathode surface in situ; passing CO_2 through said electrolyte and contacting said cathode surface; reducing at least a portion of said CO_2 to CH_4 and C_2H_4 at said in situ deposited Cu cathode surface; removing gaseous products comprising CH_4 and C_2H_4 form said electrolyte.

4,897,168

PROCESS AND ARRANGEMENT FOR PRODUCTION OF PRINTING PLATE SUPPORT

Heinz Boergerding, Walluf, and Joachim Stroszynski, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,829
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715791
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.43 **7 Claims**



1. A process for the production of a roughened support material for printing plates, comprising aluminum or an alloy thereof, wherein said material further comprises equally distributed tubular depressions and has a bright surface, which comprises the steps of electrochemically roughening said ma-

terial, in at least two sequentially arranged acidic electrolyte baths using electrolytes of different compositions, by means of a pulsed direct current.

4,897,169

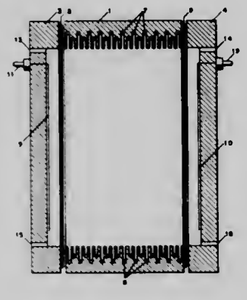
PROCESS AND APPARATUS FOR RECYCLING ISOELECTRIC FOCUSING AND ISOTACHOPHORESIS

Milan Bier, 5341 E. 7th St., Tucson, Ariz. 85711, and Garland E. Twitty, 8340 E. Lee St., Tucson, Ariz. 85715

Continuation of Ser. No. 897,748, Aug. 18, 1986. This application Apr. 3, 1989, Ser. No. 333,867

Int. Cl.[4] G01N *27/28, 27/26*

U.S. Cl. 204—183.2 **17 Claims**



1. A process for isoelectric focusing or isotachophoresis of fluids, comprising the steps of:

establishing a fluid flow within a chamber comprised of a top end with a plurality of parallel closely spaced ports, a bottom end with a plurality of parallel, closely spaced ports, said top and bottom ends being substantially parallel to each other, with the top end's and bottom end's ports being closely matched, a front wall and a rear wall, said walls being electrically non-conducting, substantially parallel to each other and separated by a distance of between about 0.025 and about 0.25 cm, and two side plates, said plates carrying electrodes

applying an electrical potential across said fluid flow in a direction substantially transverse to said fluid flow;

recycling the fluid between each of said top and bottom matched ports through external loop means

cooling the fluid while in said external loop means; and

maintaining the residence time of the fluid within said chamber at a value less than 90 seconds.

4,897,170

MANUFACTURE OF A SODERBERG ELECTRODE INCORPORATING A HIGH CARBON-CONTRIBUTING PHENOLIC SACRIFICIAL BINDER

Pitchaiya Chandramouli, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 814,468, Apr. 7, 1986, Pat. No. 4,775,455. This application Oct. 3, 1988, Ser. No. 252,122

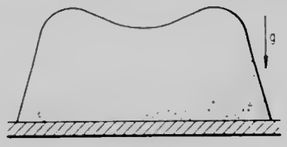
Int. Cl.[4] C25C *7/02*

U.S. Cl. 204—294 **53 Claims**

34. The process of claim 22 for making a Soderberg continuous carbon electrode, wherein the feedstock composition comprises

a mixture of particulate carbonaceous aggregate, phenolic resin binder, plasticizer and hexamethylenetetramine, wherein said plasticizer has a boiling point of above 200° C., wherein the weight amount of said plasticizer is greater than 0%–50% based on the combined weight of resin solids and plasticizer, and wherein the weight amount of said hexamethylenetetramine is 0% to no more than 5% based on phenolic resin solids,

said phenolic resin binder comprising phenolic novolac resin characterized by a minimum melt point of 100° C. and a



free phenol content of not more than 4% by weight as measured by gas chromatography analysis.

35. A Soderberg electrode made by the process of claim 34.

4,897,171

WAFER SUSCEPTOR

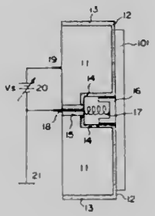
Tadahiro Ohmi, 2-1-17-301, Komegabukuro, Sendai-shi, Miyagi-ken, Japan

Continuation of Ser. No. 934,798, Nov. 25, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 251,935

Claims priority, application Japan, Nov. 26, 1985, 60-265912

Int. Cl.[4] B05C *11/14*; C23F *1/02*

U.S. Cl. 204—298 **8 Claims**



1. A wafer susceptor comprising:

a conductive susceptor body, having a recessed portion and a hole connecting said recessed portion with a rear surface, and being covered by an insulating film to form a wafer receiving surface,

a conductor body electrically insulated from said susceptor body and inserted into said recessed portion so as to be movable within said hole and so that it becomes flat and flush with said wafer receiving surface and in electrical contact with said wafer,

means for resiliently urging said conductor body towards said wafer,

a first lead wire electrically connected with said conductor body and said wafer through said hole,

a second lead wire electrically connected with said wafer susceptor body, and

a means to apply a specified voltage between said first lead wire and said second lead wire, whereby said wafer is adsorbed on the susceptor by electrostatic forces.

4,897,172

SPUTTERING CHAMBER STRUCTURE FOR HIGH-FREQUENCY BIAS SPUTTERING PROCESS

Toshihiko Katsura, and Masahiro Abe, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 24, 1988, Ser. No. 236,384

Claims priority, application Japan, Mar. 26, 1987, 62-211607

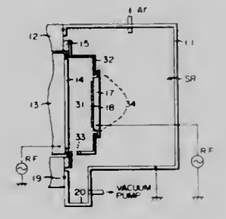
Int. Cl.[4] C23C *14/44*

U.S. Cl. 204—298 **8 Claims**

1. A sputtering chamber structure adapted to perform a high-frequency bias sputtering process for forming an insulation film on a semiconductor substrate by depositing thereon particles emitted from a target formed of insulative material, comprising:

first and second facing electrodes to which the target and semiconductor substrate are adapted to be attached, respectively;

a protection plate formed to surround said target and having a first opening facing the front surface of said target and at



least one second opening formed separately from said first opening to decentralize target power in the inner space defined by said protection plate when said high-frequency bias sputtering process is effected, said first opening being closed off by said second electrode; and

a vacuum chamber for receiving said first and second electrodes and said protection plate and adapted to be in a reduced-pressure condition during said high-frequency bias sputtering process.

4,897,173

BIOSENSOR AND METHOD FOR MAKING THE SAME

Shiro Nankai; Mariko Kawaguri, and Tashi Iijima, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

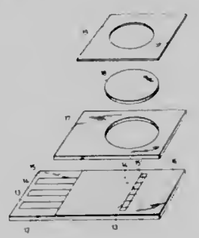
PCT No. PCT/JP86/00311, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO86/07632, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 19, 1986, Ser. No. 27,204

Claims priority, application Japan, Jun. 21, 1985, 60-136423; Nov. 7, 1985, 60-249203; Nov. 7, 1985, 60-249204; Dec. 11, 1985, 60-278202; Apr. 2, 1986, 61-75728

Int. Cl.[4] G01N *27/46, 27/54*

U.S. Cl. 204—403 **19 Claims**



1. A biosensor for electrochemically detecting concentration variations of a substrate in a liquid sample, comprising:

an insulating base;

an electrode system provided on said insulating base, said electrode system being primarily made of carbon and comprising, at least, a measuring electrode and a counter electrode; and a perforated body covering said electrode system, said perforated body comprising an oxidoreductase enzyme and an electron acceptor carried therein, said perforated body being an integral part of said electrode system and said base, said electron acceptor being a member selected from the group consisting of potassium ferricyanide, p-benzoquinone, 2,6-dichlorophenol, indophenol, methylene blue, phenazine methosulfate and potassium beta-naphthoquinone-4-sulfonate; whereby, when said biosensor is placed in contact with a liquid sample containing a substrate and said substrate chemically reacts with said oxidoreductase enzyme and said electron acceptor to produce a transfer of electrons, said biosensor detects the electron transfer which is proportional to the resulting variation in the concentration of said substrate in said liquid sample.

4,897,174

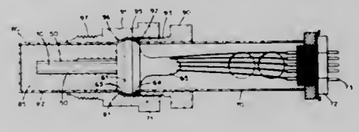
GAS SENSING APPARATUS

Da Y. Wang, Lexington; Daniel T. Kennedy, Burlington, both of Mass., and Burton W. MacAllister, Jr., Hudson, N.H., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 24, 1988, Ser. No. 198,028

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—425 **7 Claims**



1. Gas sensing apparatus comprising

a gas sensor element including a body of solid electrolyte material exhibiting ion conduction in the presence of a gas to be detected, said body being of generally elongated rectangular parallelepiped configuration with parallel first and second major surfaces, said gas sensor element having a gas pump adjacent to one end thereof with electrical leads connected to electrodes of the gas pump extending from the other end thereof;

a ceramic heater of generally elongated rectangular parallelepiped configuration with parallel first and second major surfaces and having a resistance heating element adjacent to one end thereof with electrical leads connected to the resistance heating element extending from the other end thereof;

a mounting collar of insulating material having a central opening therethrough from one side to the opposite side thereof;

said gas sensor element and said ceramic heater being mounted in the opening in said mounting collar with a major surface of the ceramic heater in close physical contact with said first major surface of said gas sensor element;

the one end of the gas sensor element having the gas pump and the one end of the ceramic heater having the resistance heating element being positioned on said one side of the mounting collar, and said other end of the gas sensor element and said other end of the ceramic heater having electrical leads extending therefrom lying on said opposite side of the mounting collar;

sealing means sealing the gas sensor element and ceramic heater in the opening in the mounting collar, said sealing means completely surrounding the portions of the gas sensor element and the ceramic heater lying on said opposite side of the mounting collar and adhering to the surface of the mounting collar to provide a gas-tight seal of the opening in the mounting collar;

a shield member encircling the portions of the gas sensor element and the ceramic heater positioned on said one side of the mounting collar and being in contact with the mounting collar at said one side thereof to form an enclosed test chamber;

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said shield member having at least one aperture therein to permit gas to be analyzed to enter the test chamber;

a housing member having one end in contact with said mounting collar at said opposite side thereof and having another end spaced therefrom;

an electrical connector mounted at said other end of said housing member and having contacts connected to the electrical leads from the gas sensors element and the ceramic heater and extending externally of the housing member; and

clamping means holding said shield member and said housing member in physical contact with said mounting collar at said one side and at said opposite side thereof, respectively, with said shield member forming a gas-tight seal with said mounting collar.

4,897,175

PROCESS FOR IMPROVING THE COLOR AND COLOR STABILITY OF A HYDROCARBON FRACTION

Jeffery C. Bricker, Buffalo Grove, Ill., assignor to UOP, Des Plaines, Ill.

Filed Aug. 29, 1988, Ser. No. 237,471
Int. Cl.[4] C10G *17/00, 45/00*
U.S. Cl. 208—12 **8 Claims**

1. A process for improving the color and color stability of a hydrocarbon fraction containing color bodies and color body precursors comprising contacting the hydrocarbon fraction with a selective hydrogenation catalyst in the presence of hydrogen, the hydrogen dissolved in the hydrocarbon fraction and present in a concentration of about 0.1 to about 3 mole percent based on the total hydrocarbon fraction, at a temperature of about 25° to about 250° C. and a pressure of about 1 to about 15 atmospheres to hydrogenate the color bodies and color body precursors without substantially hydrogenating any olefins and aromatic compounds contained in the hydrocarbon fraction, thereby providing a color stable hydrocarbon fraction.

4,897,176

METHOD OF PREPARING BASEOIL BLEND OF PREDETERMINED COKING TENDENCY

Ghazi B. Dickakian, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jun. 20, 1986, Ser. No. 876,460
Int. Cl.[4] C10G *71/00, 9/12, 9/16*
U.S. Cl. 208—48 R **16 Claims**

1. A process for preparing a blend comprising a plurality of baseoils and having a desired and determined coking tendency, said process comprising the steps of:

(a) measuring the amount of volatile fractions present in each of said baseoils to determine the onset and/or progression of asphaltene coke precursor formation in each of said baseoils so as to determine the coking tendency of each of said baseoils; and

(b) blending at least two of said baseoils in relative amounts effective to produce the blend having the desired and determined coking tendency.

4,897,177

PROCESS FOR REFORMING A HYDROCARBON FRACTION WITH A LIMITED C_9+ CONTENT

Murray Nadler, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

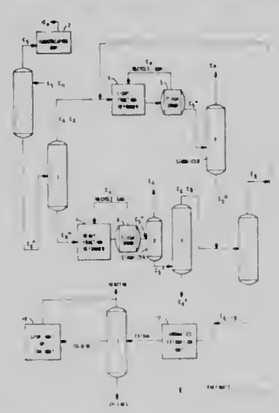
Filed Mar. 23, 1988, Ser. No. 171,993
Int. Cl.[4] C10G *35/095, 61/02, 63/06*
U.S. Cl. 208—79 **30 Claims**

9. A process for reforming a hydrocarbon feed comprising:

(a) separating a first fraction of said hydrocarbon feed into:

(i) a light fraction comprising an amount less than about 10% by volume C_9+ hydrocarbons, said light fraction being selected from the group consisting of a C_6 fraction, a C_7 fraction, C_8 fraction, a C_6–C_7 fraction, a C_7–C_8 fraction, a C_6–C_8 fraction, and a fraction consisting essentially of C_6 and C_8 hydrocarbon; and

(ii) a heavy fraction comprising a range of hydrocarbons wherein the lowest carbon number hydrocarbon is one



number higher than the highest carbon number hydrocarbon of the light fraction; and

(b) reforming said light fraction under reforming conditions in the presence of a monofunctional catalyst.

4,897,178

HYDROCRACKING CATALYST AND HYDROCRACKING PROCESS

Donald P. Best, Mahopac; Gary N. Long, Putnam Valley; Regis J. Pellet, Crouton-oz-Hudson; Jule A. Rabo, Armonk; Edward T. Wolynic, Scarsdale; Frank P. Gortsema, Pleasantville, and Albert R. Springer, Mt. Vernon, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 764,618, Aug. 12, 1985, Pat. No. 4,735,928, which is a continuation of Ser. No. 490,951, May 2, 1983, abandoned. This application Jan. 13, 1988, Ser. No. 143,473
Int. Cl.[4] C10G *47/20, 69/10*
U.S. Cl. 208—111 **54 Claims**

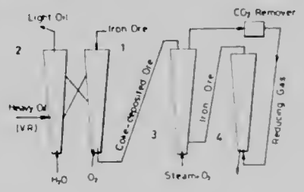
1. A process for hydrocarbon conversion if a hydrocarbon feedstock under conditions effective to cause hydrocracking of said feedstock and thereby to produce lower boiling hydrocarbons which comprises contacting said hyrocarbon feedstock in the presence of hydrogen with a catalyst comprising: (1) a zeolitic aluminosilicate which has an SiO_2/Al_2O_3 molar ratio of at least 6, said aluminosilicate having been treated by (i) thermal treatment at an effective temperature and for an effective time in the presence of steam, followed by (ii) ion-exchange with a solution containing ammonium ion; and (2) an effective amount of a hydrogenation component, said catalyst possessing ion exchange sites which are essentially free of rare earth cations.

4,897,179

METHOD OF PRODUCING REDUCED IRON AND LIGHT OIL FROM ION ORE AND HEAVY OIL

Kenji Mori; Katsuhiko Tsuzura, both of Kobe; Mamoru Onoda, Hyogo; Ryo Watanabe, Kobe; Takehiko Ashie, Kobe; Yoshifumi Kameoka, Kobe; Katsufumi Shinohara, Kobe, and Atsuhiko Nakanishi, Hyogo, all of Japan, assignors to Jyushitsuyu Taisaku Gijutsu Kenkyukumiai, Tokyo, Japan

Continuation of Ser. No. 760,579, Jul. 30, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 931,988
Claims priority, application Japan, Aug. 3, 1984, 59-163950
Int. Cl.[4] C10G *11/12, 11/18*
U.S. Cl. 208—127 **13 Claims**



1. A method of producing reduced iron and light oil from iron ore and heavy oil as raw materials which comprises:

(a) a thermal cracking step comprising:

feeding heavy oil into a thermal cracking column in which iron ore particles are retained in a fluidized state, subjecting said heavy oil to thermal cracking to produce light oil and depositing coke obtained as a by-product upon thermal cracking on the surface of the iron ore particles;

(b) a gasification step comprising:

introducing said coke-deposited iron ore, which is adjusted such that the residual amount of the coke is 3–6% of the coke-deposited iron ore, into a gasification furnace, and bringing said coke-deposited iron ore into contact with an oxidizing gas substantially containing steam and up to 15 volume %, based on the steam, of oxygen at 800°–1000° C., to react the coke with steam and oxygen, thereby, yielding a reducing gas containing a high-concentration of hydrogen gas; and

(c) a reduction step comprising:

transferring heated coke-deposited iron ore and the reducing gas obtained in step (b) to a reduction furnace and reducing the coke-deposited iron ore in a fluidized state at a temperature of at least 800° C. to produce reduced iron ultimately having a coke content of 1 to 3%.

4,897,180

CATALYTIC COMPOSITE AND PROCESS FOR MERCAPTAN SWEETENING

Jeffery C. Bricker, Buffalo Grove, and Robert R. Frame, Glenview, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 152,508, Feb. 5, 1988, Pat. No. 4,824,818. This application Jan. 30, 1989, Ser. No. 303,197
Int. Cl.[4] C10G *27/00*
U.S. Cl. 208—189 **15 Claims**

1. In a method for treating a sour petroleum distillate containing mercaptans comprising contacting the distillate in the presence of an oxidizing agent with a catalytic composite effective in oxidizing said mercaptans to disulfides, wherein the improvement comprises a catalytic composite comprising a metal chelate and an onium compound selected from the group consisting of phosphonium, arsonium, stibonium, oxonium and sulfonium compounds dispersed on an adsorbent support, the onium compound having the formula $[R'(R)_yM]^+X^-$ wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R' is a straight chain alkyl radical containing from about 5 to about 20 carbon atoms, M is phosphorous, arsenic, antimony, oxygen or sulfur, X is hydroxide or a halide selected from the group consisting of chlorine, bromine and iodine, y is 2 when M is oxygen or sulfur and y is 3 when M is phosphorous, arsenic or antimony.

4,897,181

HYDRODESULFURIZATION PRESSURE CONTROL

Thomas J. Houghton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1987, Ser. No. 31,962
Int. Cl.[4] C10G *45/00*
U.S. Cl. 208—209 **6 Claims**



1. A method for controlling the pressure of a source of hydrogen-rich gas in a reforming process wherein a source stream of hydrogen-rich gas supplied from said source of hydrogen-rich gas is combined with a hydrocarbon containing fluid stream to form a combined feed stream which is provided to a hydrodesulfurization reactor, and wherein excess hydrogen-rich gas in said hydrodesulfurization process and excess hydrogen-rich gas in said reforming process are vented through a first control valve and a second control valve respectively, said method comprising the steps of:

establishing a first signal representative of the actual pressure of said source of hydrogen;

establishing a second signal representative of a desired pressure for said source of hydrogen wherein said desired pressure for said source of hydrogen is compatible with a desired pressure for said reactor;

comparing said first signal and said second signal and establishing a third signal which is responsive to the difference between said first signal and said second signal;

modifying said first control valve and said second control valve so that said first control valve begins to open at a lower pressure signal than said second control valve begins to open, and

manipulating said first control valve and said second control valve in response to said third signal to thereby maintain said actual pressure for said source of hydrogen represented by said first signal substantially equal to said desired pressure represented by said second signal, wherein the manipulation of said first control valve and said second control valve in response to said third signal results in the venting of an ample amount of hydrogen-rich gas for operation of said reactor through a path including said reactor and said first control valve, before venting any hydrogen-rich gas through said second control valve, to thereby insure maximum utilization in said reactor of hydrogen-rich gas from said source of hydrogen-rich gas.

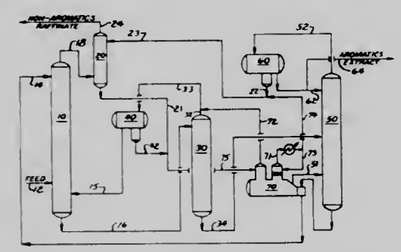
VOL 1110 ISS 5 JA 30 1990 UMI

4,897,182

AROMATIC EXTRACTION PROCESS HAVING IMPROVED WATER STRIPPER

William H. Maier, Hoffman Estates, and Martin F. Bentham, Chicago, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Oct. 3, 1988, Ser. No. 252,616
Int. Cl.[4] C10G *21/28*
U.S. Cl. 208—321 **3 Claims**



1. A process for the extraction of aromatics from a feed containing both aromatic and nonaromatic hydrocarbons comprising:
(a) contacting said feed with a solvent selective for aromatic hydrocarbons and separating a raffinate comprising substantially only nonaromatic hydrocarbons and an extract comprising substantially all of the aromatic hydrocarbons and a minor fraction of the nonaromatic hydrocarbons;
(b) washing the raffinate of (a) with a wash water stream;
(c) stripping the nonaromatic hydrocarbons from the extract of (a), condensing and returning said stripped nonaromatic hydrocarbons to the extraction of (a) and condensing and phase separating the steam containing stripped hydrocarbons of (g) below;
(d) recovering the aromatic hydrocarbons from the stripped extract from (c) by steam stripping and condensing and phase separating said stripped aromatics and steam;
(e) recycling said condensed steam of (d) as the wash water stream to (b);
(f) separating the wash water stream after contact with the raffinate in (b) and supplying said water stream as feed to a stripping steam generator in combination with the phase separated condensed steam of (c);
(g) stripping residual hydrocarbons from the stripping steam generator feed with steam at the entrance to the steam generator and combining said stripped hydrocarbons and steam with the stripped nonaromatic hydrocarbons of (c);
(h) generating steam in the steam generator of (f) and using a portion of said steam in (d);
(i) condensing a portion of the steam generated in (h) and returning a portioo of the condensate as reflux to purify the condensed water; and,
(j) sending the remaining portion of the condensate of (i) to the wash step of (b) in combination with the condensed steam of (e).

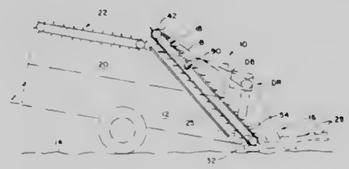
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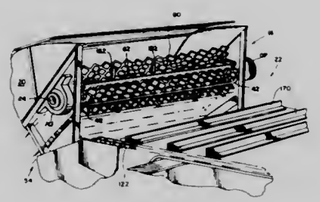
LITTER SCREENING AND SEPARATING APPARATUS

Robert L. Lewis, Jr., and Carl J. Thomas, both of Baxley, Ga., assignors to Lewis Bros. Mfg. Inc., Baxley, Ga.

Filed Jun. 10, 1987, Ser. No. 60,325
Int. Cl.[4] B07B *1/00, 1/10*
U.S. Cl. 209—235 **10 Claims**

1. In a litter screening and separating apparatus movable along the floor of a poultry house for engaging and lifting litter from the floor, wherein said apparatus has a scoop means on a front portion thereof for scooping up said litter, a storage compartment for receiving and storing litter scooped up by the scoop means, and an upwardly and rearwardly inclined conveyor means extending from a first end adjacent to the scoop means to a second end adjacent to the storage compartment for conveying litter from the scoop means to the storage compartment, the improvement comprising:
a plurality of replaceable individual panel means having opposite ends thereof removably attached to and carried by flexible chains of the conveyor means, and with said chains define said conveyor means, said panel means having a leading edge and a trailing edge and being attached at the leading edge to said chains, said panel means having a width and being attached to said chains in spaced relation to one another along said chains such that when the panel means are moving along flight of said conveyor





means the panel means lie flat and in substantially contiguous relationship with one another, defining an essentially continuous support surface for said litter, but when the panel means move around the second end of the conveyor means the trailing edge of the panel means flip upwardly, throwing litter carried thereby into said storage compartment, the trailing edge of said panel means having an upturned portion to enhance the throwing action and to assist in retaining litter on the panel means as they move up the inclined conveyor means, said panel means having opening means therethrough for enabling smaller particles of litter to pass therethrough while retaining larger particles of litter on the conveyor means.

4,897,184

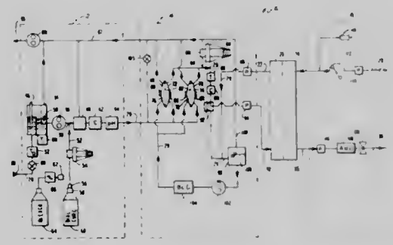
FLUID FLOW APPARATUS CONTROL AND MONITORING

David R. Shouldice, Lakewood; Daniel A. Powell, and Tom L. Brose, both of Littleton, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Oct. 31, 1986, Ser. No. 925,305
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—87 **14 Claims**

1. Dialysate preparation and supply apparatus comprising,
a dialyzer,
a blood flow line for flow of blood between a patient and said dialyzer,
a dialysate flow line for flow of dialysate to and from said dialyzer,
at least one fluid control mechanism means on a said line for control fluid conditions in said line,
at least one fluid condition control sensor means on a said line for sensing a condition of fluid in said line,

a plurality of fluid condition monitor sensors means for sensing conditions of fluid in a said line,
at least one fluid condition monitor sensor means on said line sensing the same said condition of fluid in said line as a said fluid condition control sensor,
at least one digital control processor means for receiving signals from said control sensor means and controlling a said fluid control mechanism means to achieve a desired fluid condition,



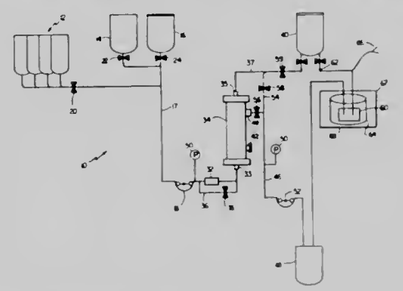
at least one digital monitor processor means for receiving signals directly from said monitor sensor means and verifying that said fluid condition sensed by said monitor sensor means meets a predetermined safety limit,
means for safeguarding said patient if said fluid condition sensed does not meet said predetermined safety limit,
a digital master control processor means for communicating with said at least one digital control processor means, and
a digital master monitor processor means for communicating with said at least one digital monitor processor means.

4,897,185

CELL PROCESSING APPARATUS AND METHOD

Robert J. Schuyler, Boulder, and Robert L. White, Kittredge, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Oct. 6, 1988, Ser. No. 254,392
Int. Cl.[4] B01D *13/00, 33/00*
U.S. Cl. 210—90 **10 Claims**



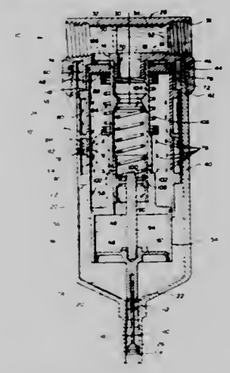
1. Apparatus for processing cells in a cell suspension comprising
a membrane separating device connected to receive said cell suspension, said device including a membrane, said membrane being configured to pass cell-free fluid but not said cells through said membrane, said device having an outlet for a concentrated cell suspension, and
means for receiving said concentrated cell suspension, said means including a centrifuge downstream of said separating device connected to receive said concentrated cell suspension from said outlet.

4,897,186

FLUID FILTER

Benedict R. Gerulis, Blaine, Minn., assignor to C.I.B., Inc., Minneapolis, Minn.

Continuation of Ser. No. 160,552, Feb. 26, 1988, Pat. No. 4,812,230. This application Mar. 13, 1989, Ser. No. 322,644
Int. Cl.[4] B01D *27/12*
U.S. Cl. 210—108 **31 Claims**



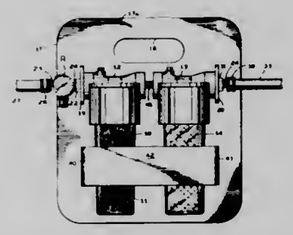
1. Self-cleaning filter including a filter medium between an inlet port for introducing fluid to be filtered and an outlet port for discharging filtered fluid, with the filter medium located in a housing defining a sump, comprising, in combination: means for purging fluid and particulate matter filtered by the filter medium from the sump upon reintroduction of fluid into the inlet port after the flow of fluid has been interrupted and for occluding fluid flow from the sump when the housing has been pressurized by the fluid introduced into the inlet port.

4,897,187

PORTABLE WATER FILTRATION APPARATUS

William J. Rice, 3201 State Rd. 84, Ft. Lauderdale, Fla. 33312

Filed Dec. 5, 1988, Ser. No. 279,826
Int. Cl.[4] B01O *21/34*
U.S. Cl. 210—137 **5 Claims**



1. A portable water filtration apparatus comprising:
a mounting base having a back plate and first and second parallel end plates extending perpendicularly forward from said back plate, each of said end plates having an opening therein;
a sediment filter unit having a head with a water inlet on one side and a water outlet on the opposite side, and a porous filter cartridge extending down from said head of the

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sediment filter unit and arranged to filter water between said water inlet and outlet;

a secondary filter unit having a head with a water inlet on one side and a water outlet on the opposite side, and a filter cartridge with activated charcoal therein extending down from said head of the secondary filter unit and arranged to filter water between said water inlet and outlet of said head of the secondary filter unit;

a pipe nipple connecting said water outlet of said head of the sediment filter unit to said water inlet of said head of the secondary filter unit;

said head of the sediment filter unit, said pipe nipple and said head of the secondary filter unit having a combined length substantially equal to the distance between the inside faces of said end plates on the mounting base;

a pressure regulator having a water inlet and a water outlet;

manually attachable and releasable means at said opening in said first end plate holding said one side of said head of the sediment filter unit against the inside of said first end plate and holding said pressure regulator on the outside of said first end plate with said water outlet of the pressure regulator registering with said water inlet of said head of the sediment filter unit at said opening in said first end plate;

and manually attachable and releasable means at said opening in said second end plate holding said opposite side of said head of said secondary filter unit against the inside of said second end plate with said water outlet of said head of the secondary filter unit registering with said opening in said second end plate.

4,897,188

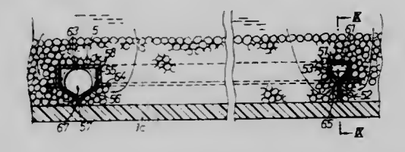
FILTERING DEVICE

Yonekichi Ogawa, Tokyo, Japan, assignor to Suisaku Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,448

Int. Cl.[4] A01K *63/04*

U.S. Cl. 210—169 **8 Claims**



1. A filtering device, comprising a water suction case which is buried in gravel spread over the bottom of a water basin so as to cause said gravel to exhibit a filtering function; and a pumping means connected to the water suction case for circulating water within a water flow passage arrangement defined in said water suction case toward an upper side in an interior portion of said water basin, said water suction case being provided with a plurality of water suction ports connected to said water flow passage arrangement, wherein said water suction case comprises a first linear suction portion, a plurality of second linear suction portions connected perpendicularly to said first suction portion at intervals therebetween in a longitudinal direction of said first suction portion, and a third suction portion extending parallel to said first auction portion and connected perpendicularly to said second suction portions, said water flow passage arrangement having a first flow passage defined within said first suction portion, second flow passages within said second suction portions and a third flow passage within said third suction portion, said third flow passage having a cross-sectional area larger than cross-sectional areas of said first and second flow passages, said first and second passages being communicated with said pumping means through said third passage, and wherein said first, second and third suction portions are provided with flanges which are laterally and integrally projected from opposite sides of said first, second and third suction portions, respectively, said water suction portions having water suction ports, and means for disposing said water suction ports above the bottom of the water basin and inwardly of the flanges with at least one said water suction port in at least an elevation below, above and the same as said flanges.

4,897,189

BLOOD PURIFICATION APPARATUS

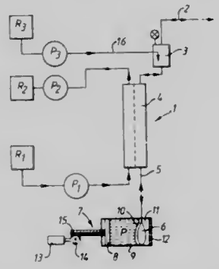
Roger N. Greenwood; Colin Aldridge; James E. Tattershall, all of London, and Rodney V. Barrett, Bristol, all of United Kingdom, assignors to Research Corporation Limited, London, England

Filed Jan. 15, 1988, Ser. No. 144,488

Claims priority, application United Kingdom, Oct. 23, 1987, 8724914

Int. Cl.[4] B01D *13/01, 29/42*

U.S. Cl. 210—195.2 **13 Claims**



1. Blood purification apparatus comprising means for withdrawing blood from a patient into a blood conduit, a blood purification module in fluid flow communication with said conduit, a blood reservoir for receiving blood from said module, pump means for withdrawing blood and returning blood from said reservoir to the patient via the blood purification module, said reservoir being flexible and having variable capacity and forming part of said pump means, the pump means comprising hydraulic fluid which can act on the exterior of said reservoir to control blood flow into and out of said blood purification module.

4,897,190

MEMBRANE FILTER PLATE

Werner Klinkau, Berg am Starnbergersee, and Reinmund Stanik, Marktoberdorf, both of Fed. Rep. of Germany, assignors to Klinkau Besitzges.mbH, Fed. Rep. of Germany

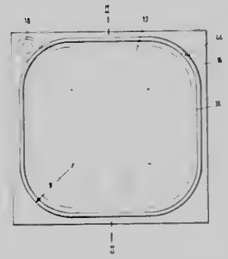
Division of Ser. No. 246,919, Sep. 16, 1988, Pat. No. 4,832,840, which is a continuation of Ser. No. 36,133, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 673,206, Nov. 19, 1984, abandoned, which is a continuation of Ser. No. 450,786, Dec. 17, 1982, abandoned. This application Mar. 29, 1989, Ser. No. 330,310

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221249; Nov. 20, 1982, 3242917

Int. Cl.[4] B01D *25/14, 25/15*

U.S. Cl. 210—228 **2 Claims**

1. In a membrane filter plate for a filter press comprising a carrier plate including a periphery and an outer surface, which includes a central recessed surface in the outer surface, both the outer surface and the central recessed surface being parallel to a central plane of the carrier plate, said central recessed surface being connected to said outer surface by an oblique surface, a membrane being carried on the outer surface of said carrier plate and being peripherally sealed to the outer surface of said carrier plate, and the membrane being loaded to flex toward the carrier plate and being loaded to flex away from the carrier plate, the improvements comprising a surface area of the carrier plate including the oblique surface and extending from the peripheral connection of the membrane to the carrier plate to the central recessed surface, said area including means



for avoiding defined flexure lines of the membrane when it is loaded towards and away from the central recessed surface of the carrier plate said means for avoiding including a continuously changing curvature.

4,897,192

ROTARY FILTRATION DEVICE

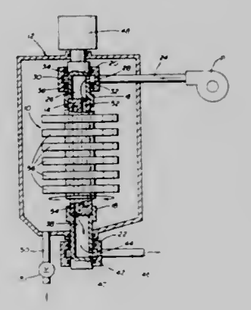
William J. Lawrence, 5 Harbor La., Kemah, Tex. 77565

Continuation-in-part of Ser. No. 220,154, Jul. 18, 1988, Pat. No. 4,818,401. This application Dec. 28, 1988, Ser. No. 291,050

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] B01D *33/22*

U.S. Cl. 210—330 **17 Claims**



4,897,191

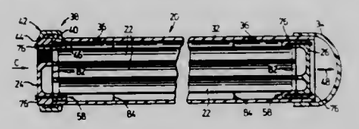
TUBULAR MEMBRANE MODULE WITH FLUID SHEAR PROTECTION

Robert W. Langerak, Brantford; Paul B. Koehler, Burlington; Fernando A. Tonelli, Dundas, and Radu Apostolache, Burlington, all of Canada, assignors to Zenon Environmental Inc., Burlington, Canada

Filed May 27, 1988, Ser. No. 199,823

Int. Cl.[4] B01D *13/01*

U.S. Cl. 210—321.81 **9 Claims**



1. A tubular membrane module, comprising:

a housing which includes a tubular shell having a closed first end, and a permeate outlet;

a fixed inlet header sealed to said shell at a second end thereof;

a second, floating return header disposed within said shell remote from said inlet header, said second header being sized to fit closely within said shell but being free to move longitudinally with respect to the shell when the module is in use; and,

a plurality of membrane tubes extending between and sealed to said headers, each tube comprising a porous pipe having an inner surface, and a permeable membrane on said surface;

the module having inlet and outlet ports for fluid to be treated and permitting flow of fluid from said inlet port through said tubes to said outlet port.

1. A filtration device for filtering fluid medium from matter in a fluid suspension in a vessel, which comprises:

a. a rotary shaft having a longitudinal axis, a longitudinal outflow bore, and journaled to rotate about said axis in the vessel,

b. means for imparting rotation to said rotary shaft,

c. a plurality of annular porous filtration members having inner and outer perimeters, secured coaxially to said shaft, each member comprising a porous inner support layer and a porous outer filtration layer confiningly overlaying the inner support layer, the pores in the outer layer being smaller than the pores in the inner layer, the pores of said layers being in fluidic communication so that upon immersion in a fluid suspension the fluid medium can pass from the outer layer to the inner layer,

d. fluid suspension distribution means in the vessel defining a plurality of fluid suspension outlets spaced apart longitudinally with respect to said shaft, each outlet opening into the vessel adjacent an outer layer of at least one filtration member at a portion thereof proximate said shaft radially inward from the outer perimeter of said member, for discharging fluid suspension to central zones within the vessel adjacent said radially inward portion of each filtration member outer layer,

e. filtrate delivery means in fluidic communication with the inner layer of each filtration member and the outflow bore for delivering filtrate from the inner layer of said filtration member into said outflow bore, and

f. means for passing a fluid suspension to be filtered into said distribution means and for passing filtrate from said filtration member outer layers through said filtrate delivery means out said outflow bore.

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4,897,193

DEVICE FOR MASS TRANSPORT AND SEPARATION THROUGH SELECTIVE BARRIERS

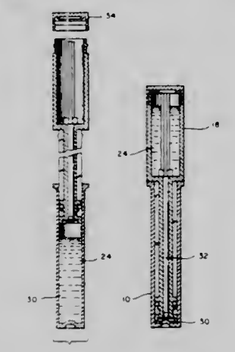
Michael Cais, and Moshe Shimoni, both of Haifa, Israel, assignors to Technion Research and Development Foundation, Ltd., Haifa, Israel

Division of Ser. No. 821,768, Dec. 27, 1985, Pat. No. 4,832,850, which is a continuation-in-part of Ser. No. 542,906, Oct. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 270,411, Jun. 4, 1981, abandoned. This application Jan. 31, 1989, Ser. No. 303,460

Claims priority, application Israel, Jul. 21, 1980, 60645

Int. Cl.[4] B01D *15/04*

U.S. Cl. 210—359 **24 Claims**



1. A device for carrying out mass transport and substantially quantitative physical separation of one or more components from one phase to another phase without the need for centrifugation, the phases being both liquid, or liquid-solid, or liquid-gas-liquid, or liquid-gas-solid, said mass transport and physical separation being substantially quantitative and carried out in the same device, which comprises:

a vertical mixing reservoir, having an inner diameter, an outer diameter, an inner wall, a bottom wall and an upper end for containing multiple phases including an upper liquid phase;

a mixer-separator snuggly fitted into said mixing reservoir for sliding movement therein and including means defining at least one channel passing axially through said mixer-separator, said mixer-separator including at its lower end a barrier which is selectively permeable to the upper liquid phase in said mixing reservoir and at its upper end a container which has a top and into which opens said at least one channel for accumulating separated liquid from said upper liquid phase from the mixing-reservoir forced through said barrier and said at least one channel in response to sliding movement of said mixer-separator into said mixing reservoir;

a sealing element surrounding said mixer-separator at a preselected distance above the lower end of said mixer-separator, said sealing element being positioned above said barrier; and

means, defining a space positioned in the axial direction within said mixing reservoir between said barrier and said sealing element, for creating and maintaining a gas cushion during the entire sliding movement of the mixer-separator into the mixing reservoir until all of the upper liquid phase is forced through said at least one barrier, said gas cushion decreasing the pressure exerted on said barrier in response to said sliding movement of said mixer-separator into said mixing reservoir, the configuration of said space and the gas cushion being selected so as to force back into said mixing reservoir any of the upper liquid phase which has crept up along the inner wall of the mixing reservoir above the low end of the mixer-separator, wherein said bottom wall of the mixing reservoir and said lower end of the mixer-separator have corresponding profiles such that substantially quantitative separation of the upper liquid phase can be accomplished.

4,897,194

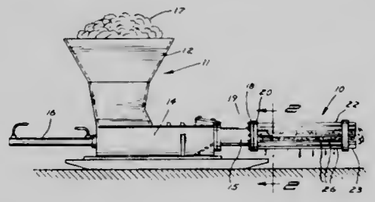
LIQUID SEPARATING APPARATUS

David A. Olson, 1708 Roberts Dr., Albert Lea, Minn. 56007

Filed Sep. 11, 1987, Ser. No. 95,162

Int. Cl.[4] B01D *33/00*; B30B *9/02, 9/12*

U.S. Cl. 210—359 **37 Claims**



1. A liquid separating apparatus for separating an amount of liquid from a subject mixture of discrete solid material entrained with liquid, comprising:

a housing having side wall means defining a longitudinal unobstructed liquid extraction chamber, said housing having an inlet at an upstream longitudinal end of the chamber for connection to a material moving apparatus, and an outlet at a longitudinal downstream end of the chamber;

said housing side wall means having a porosity generated by a plurality of elongate generally longitudinal openings that are open between the chamber and the outside;

portions of the side wall means toward the outlet end of the housing being movable relative to one another inward and outward of the chamber to vary the volume of the chamber;

elastic type bias means holding the side wall means and acting upon the side wall means to bias said movable side wall means portions toward a position inward of the chamber for exertion of a bias force in an inward direction upon outward deflection of the side wall means whereby when subject mixture is moved into the chamber under the influence of the material moving apparatus against the force of the bias means, the subject mixture is squeezed causing entrained liquid to be removed from the subject mixture.

4,897,195

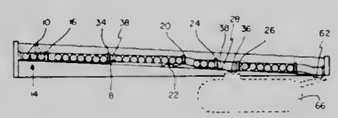
SYSTEM AND PROCESS FOR ANAEROBIC DIGESTION OF WASTE MATERIALS

Stewart E. Erickson, P.O. Box 4511, Ketchum, Id. 83340

Filed Apr. 11, 1989, Ser. No. 336,250

Int. Cl.[4] C02F *3/28*

U.S. Cl. 210—603 **10 Claims**



1. A system for digestion of an organic waste slurry, comprising:

a plurality of digestion modules, each having a waste inlet port, a gas discharge port, and means for agitating the waste contained within the digestion module in response to rotation of the module; means for filling the digestion modules with the organic waste slurry; rotation means for causing controlled rotation of the modules during the digestion process;

means for maintaining the temperature of the digestion modules within a selected range;

gas collection means operatively connected to each of the digestion modules for collecting gases produced in each of the digestion modules; and

means for emptying the slurry from each module upon completion of digestion therein;

10. A process for digestion of organic waste materials, comprising the steps of:

injecting the organic material into a tabular-shaped digestion module where the decomposition process occurs;

agitating the organic material contained within the module by rotating the module to promote the decomposition process;

monitoring the organic material contained in the module to determine chemical composition and progress of the decomposition process;

adding water, liquid effluent and other substances as necessary to the contents of the module to promote efficient decomposition;

extracting gases produced during decomposition from the module; and

removing the remaining slurry when the decomposition process has reached a selected stage.

4,897,196

TWO-STAGE BATCH WASTEWATER TREATMENT

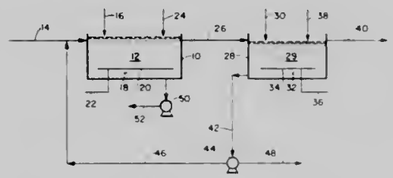
William M. Copa, Wausau, and Thomas J. Vollstedt, Schofield, both of Wis., assignors to Zimpro/Passavant Inc., Rothschild, Wis.

Filed Feb. 17, 1988, Ser. No. 157,456

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] C02F *3/12*

U.S. Cl. 210—616 **15 Claims**



1. A process for purifying wastewater containing organic and adsorbable pollutants comprising the steps of:

(a) introducing a predetermined quantity of the wastewater into a primary treatment zone including an aeration and settling zone;

(b) aerating the wastewater in said aeration and settling zone with an oxygen-containing gas in the presence of sufficient amounts of a powdered adsorbent and biologically active solids to reduce the BOD, COD and TOC to desired levels;

(c) terminating aeration and retaining said thus-treated wastewater in said aerating and settling zone a sufficient time for solids therein to settle by gravity and produce a first solids phase and a first aqueous phase containing a maximum predetermined amount of said solids;

(d) withdrawing a predetermined amount of said first aqueous phase from said aeration and settling zone and transferring same into a contact zone;

(e) agitating said first aqueous phase in said-contact zone in the presence of a powdered adsorbent for an agitation period sufficient to reduce the BOD, COD and TOC to desired levels;

(f) terminating agitation and allowing solids in said thus-treated first aqueous phase to settle by gravity for a settling period sufficient to produce a clarified, substantially solids-free, second aqueous phase and a second solids phase; and

(g) thereafter withdrawing a predetermined amount of said second aqueous phase from said contact zone.

4,897,197

USING LIQUID CHROMATOGRAPHY PACKING MATERIALS

Dwight E. Williams, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 63,147, Jun. 17, 1987, Pat. No. 4,773,994. This application Jun. 27, 1988, Ser. No. 212,192

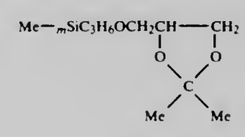
Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **6 Claims**

1. A method for analysis by reverse phase liquid chromatography, comprising:

(a) preparing an analyte containing biological fluid to be analyzed, and

(b) contacting said analyte with a liquid chromatography column packed with a packing material comprising a porous support having ketal blocked diol groups on the surfaces thereof, wherein said ketal blocked diol groups have the formula:



wherein m is 1-3.

4,897,198

SEPARATION AGENT COMPRISING 1,3-GLUCAN

Tohru Shibata; Hajime Namikoshi, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Division of Ser. No. 8,114, Jan. 23, 1987, Pat. No. 4,830,752, which is a continuation of Ser. No. 716,734, Mar. 27, 1985, abandoned. This application Feb. 28, 1989, Ser. No. 316,648

Claims priority, application Japan, Mar. 30, 1984, 59-62661

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **9 Claims**

1. A method of separating an optical isomer from a racemic modification thereof, which comprises contacting said racemic modification with a 1,3-glucan derivative, under chromatographic separation conditions effective to separate said optical isomer, said derivative being a compound in which at least 85% of the total hydroxyl groups of a 1,3-glucan has been replaced by a substituent which is bonded to said 1,3-glucan be an ether bond, said substituent being selected from the group consisting of aliphatic groups having 2 to 10 carbon atoms, alicyclic groups having 4 to 10 carbon atoms, aromatic groups having 6 to 20 carbon atoms and heteroaromatic groups having 4 to 20 carbon atoms; and recovering said optical isomer.

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4,897,199

ENVIRONMENTALLY SAFE METHOD FOR THE REMOVAL OF RESIDUAL WATER SOLUBLE POLYMERS FROM AQUEOUS WASTE STREAMS

Kavssery P. Ananthapadmanabhan, New Windsor, N.Y., and Errol D. Goddard, Haworth, N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jul. 5, 1989, Ser. No. 375,488
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—639 **16 Claims**

1. An environmentally safe method for the removal and disposal of residual water soluble polymers from aqueous waste streams, wherein said polymers have a molecular weight of greater than about 200 and are present in said aqueous waste stream in a concentration of less than about 1 percent, said method comprising the steps of:

(a) pretreating a bentonite adsorbent having a surface area of from about 500 to about 1000 square meters per gram by heating at a temperature of from about 650° C. to about 750° C.;

(b) contacting said aqueous waste stream with said bentonite adsorbent for a period of time of from about 1 to about 10 minutes;

(c) separating an aqueous waste stream essentially free of said polymers from said bentonite adsorbent;

(d) heating said bentonite adsorbent to a temperature of from about 650° C. to about 750° C. for a period of time sufficient to convert said polymers to carbon dioxide and water;

(e) treating said bentonite adsorbent after heating with at least one acid, alkali or neutral wash for a period of at least one hour to restore the interlayer spacing of said bentonite to at least about 10 angstroms, as determined by X-ray diffraction analysis; and

(f) contacting said bentonite adsorbent from step (e) with an additional water soluble polymer containing aqueous waste stream.

4,897,200

MACROMOLECULAR CARBONYL GROUPS CONTAINING MATERIAL SUITABLE FOR USE AS SORBENT FOR NITROGEN COMPOUNDS

Robert Smakman, Nigtevecht, Netherlands, assignor to Organon Teknika bv, Boxtel, Netherlands

Continuation of Ser. No. 586,375, Mar. 5, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 930,943
Claims priority, application Netherlands, Mar. 23, 1983, 8301035
Int. Cl.[4] B01D *15/04*
U.S. Cl. 210—692 **5 Claims**

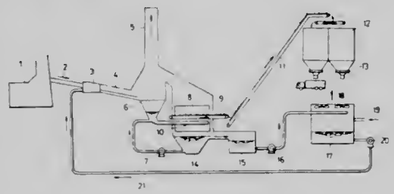
1. A method for the extracorporeal clinical removal of ammonia, urea, creatinine, or other waste products having one or more amino groups, from blood or blood serum, comprising contacting said blood or blood serum with a cross-linked copolymer of a monovinyl aromatic compounds and a polyvinyl aromatic compound, said cross-linked copolymer having groupings containing three vicinal carbonyl groups or a hydrate thereof, followed by removal of said blood or blood serum from contact with said material.

4,897,201

COMPOSITION AND A PROCESS FOR PROMOTING DEWATERING OF GRANULATED SLAG

Akira Yamamoto, Saita; Yasutaka Arimoto, Neyagawa, and Michio Konno, Oita, all of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka and Nippon Steel Corporation, Tokyo, both of, Japan

Continuation-in-part of Ser. No. 745,611, Jun. 17, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 66,948
Claims priority, application Japan, Jun. 23, 1984, 59-129644
Int. Cl.[4] B01D *21/00*
U.S. Cl. 210—729 **11 Claims**



6. A process for promoting dewatering of granulated slag, which comprises contacting wet granulated slag with a slag dewatering composition in an aqueous medium under a neutral or alkaline condition of a pH 7 or higher, the slag dewatering composition having a reduced tendency to foam and comprising an ionic surfactant component, said ionic surfactant component consisting essentially of

(a) one or more of anionic surfactants selected from the group consisting of those represented by the general formula

$$C_{12}H_{25}O-(CH_2CH_2O)_n-SO_3M \quad (I)$$

$$RCON(CH_2CH_2O)_n-SO_3M, \quad (II)$$

and

$$RCOOCH_2O-(CH_2CH_2O)_n-SO_3M \quad (III)$$

wherein R denotes a monovalent hydrocarbon radical of C_{11-30}, R' denotes a hydrogen atom or a monovalent hydrocarbon radical of C_{1-7}, M denotes an inorganic cation of H^+, Na^+, K^+, NH_4^+, $\frac{1}{2}$ Mg^{2+}or $\frac{1}{2}$ $Ca^{2+}$and the mean value of n is 3–20, provided that for formula (I) n is 3, and

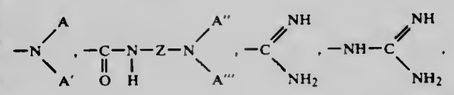
(b) one or more of cationic surfactants selected from the group consisting of free bases represented by the general formula

$$R-X \quad (IV)$$

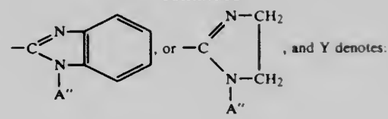
and their acid-addition salts, and compounds containing a quaternary nitrogen atom represented by the general formula

$$(R-Y)^+G^- \quad (V)$$

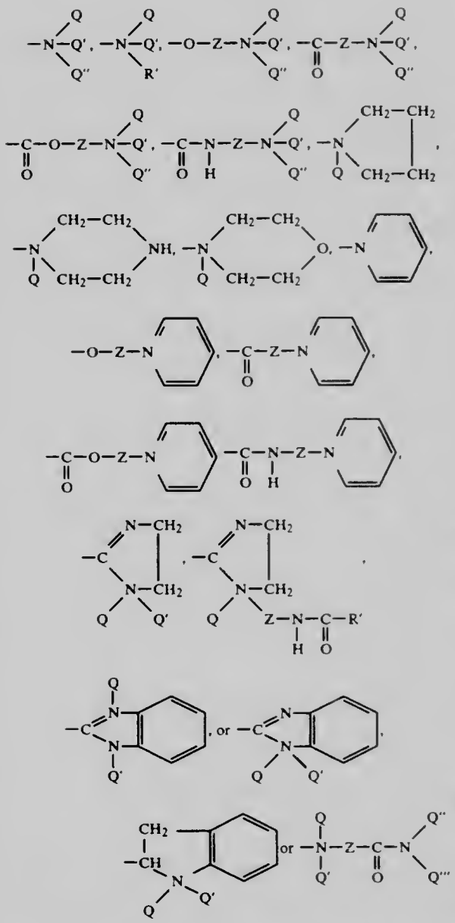
wherein R denotes a monovalent hydrocarbon radical of C_{11-30}, X denotes:



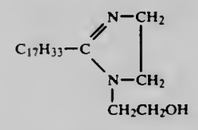
-continued



, and Y denotes:



wherein A and A' may be identical with or different from each other and each denotes a hydrogen atom or a hydroxyalkyl group of C_{1-4}, A" and A"' may be identical to or different from each other and each denotes a hydrogen atom, a monovalent hydrocarbon radical of C_{1-7}, or a hydroxyalkyl group of C_{1-4}, Q, Q', Q" and Q"' may be identical with one another or not and each denotes a monovalent hydrocarbon radical of C_{1-7} or a hydroxyalkyl group of C_{1-4}, R' denotes a monovalent hydrocarbon radical of C_{1-30} which may be identical with or different from R, Z and Z' each denotes a divalent hydrocarbon radical of C_{1-7} and may be identical with or different from each other, and G denotes a monovalent anion, said anionic surfactant(s) being compounded with said cationic surfactant(s) in a ratio of 79–50% by weight to 21–50% by weight, provide that when the formula (I) anionic surfactant is used the cationic surfactant is a salt of

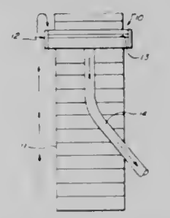


4,897,202

PROCESS AND APPARATUS FOR RECOVERY AND RECYCLING CONVEYOR LUBRICANTS

William J. King, Orange, Calif., assignor to Pure-Chem Products, Inc., Stanton, Calif.

Filed Jan. 25, 1988, Ser. No. 148,288
Int. Cl.[4] C02F *1/00*; B65G *45/00*
U.S. Cl. 210—754 **35 Claims**



1. A process for recovering and recycling a solution of water soluble conveyor lubricant or detergent from a moving conveyor, comprising the steps of:

(a) continuously recovering of the lubricant or detergent from the conveyor by suction means;

(b) treating the recovered lubricant or detergent which is to be reused so as to render the recovered lubricant or detergent suitable for reuse; and

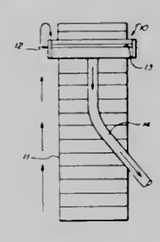
(c) recycling the treated lubricant or detergent to a conveyor lubricating system.

4,897,203

PROCESS AND APPARATUS FOR RECOVERY AND RECYCLING CONVEYOR LUBRICANTS

William J. King, Orange, Calif., assignor to Pure-Chem Products, Inc., Stanton, Calif.

Filed Feb. 26, 1988, Ser. No. 161,000
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[4] C02F *1/00*
U.S. Cl. 210—754 **14 Claims**



1. A process for recovering and recycling a solution of water soluble chain lubricant or detergent from a conveyor, comprising the steps of:

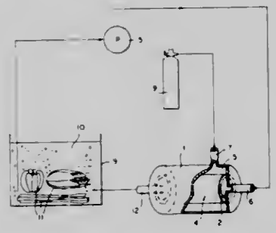
(a) continuously recovering the lubricant or detergent from the conveyor by suction means;
(b) treating the recovered lubricant or detergent by heat sterilization;
(c) recycling the treated lubricant or detergent to be reused to a conveyor lubricating system.

4,897,204

PROCESS AND APPARATUS FOR GAS DISSOLUTION

Yoshihisa Katoh, Toyota; Takashi Ogawa, Kariya; Masashi Fujimoto, Toyoake, and Mitsumasa Hasegawa, Kariya, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,779
Claims priority, application Japan, Oct. 1, 1987, 62-248956
Int. Cl.[4] C02F *1/72*
U.S. Cl. 210—758 **13 Claims**



1. A process for gas dissolution, comprising the steps of:
introducing liquid into a first chamber of a vessel;
setting the pressure of gas to be dissolved about two times higher than that of the liquid;
introducing the pressurized gas into a second chamber of the vessel;
making the gas penetrate a partition wall into the liquid, wherein the partition wall comprises a plurality of layers of a porous ceramic material, the first ceramic layer facing the first chamber and having a thickness of about 5 to 40 μm and the diameter of each pore of the first ceramic layer being about 0.8 μm or less; and
discharging the liquid from the first chamber of the vessel.

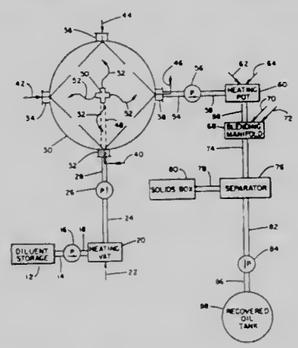
4,897,205

METHOD FOR TREATING WASTE MATERIAL

Kenneth C. Landry, Novato, Calif., assignor to Landry Service Co., Inc., League City, Tex.

Continuation-in-part of Ser. No. 99,076, Sep. 21, 1987, abandoned, which is a continuation of Ser. No. 882,412, Jul. 7, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 215,265
Int. Cl.[4] B01D *17/00*
U.S. Cl. 210—766 **15 Claims**

1. A method for removing waste material having solid and liquid phase components from a container and separating said components, comprising:
heating a diluent;
injecting a first quantity of steam and said diluent into said container in an amount sufficient to cause a portion of said solid phase to flow;
establishing a flow of a portion of said liquid phase and said portion of said solid phase of said waste material from said container;
injecting a second quantity of steam and said diluent into said flow of waste material in an amount sufficient to maintain said flow;
separating said liquid and said solid phases of said waste material from said flow of said waste material; and



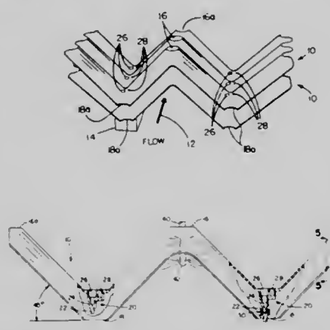
collecting volumes of said liquid and said solid phases of said waste material from said separated liquid and solid phases.

4,897,206

BIDIRECTIONALLY CORRUGATED PLATE SEPARATOR FOR FLUID MIXTURES

Joseph L. Castelli, Radnor, Pa., assignor to Facet Quantek, Inc., Tulsa, Okla.

Filed Nov. 30, 1988, Ser. No. 278,000
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—791 **21 Claims**



6. The coalescing plate of claim 5 wherein each of the spacers includes asymmetrically located multistep projections and asymmetrically located internal passages adapted for mating with a similar spacer, whereby a 180° rotation of the plate results in a different separation from a similar plate.

17. In apparatus for separating immiscible components of different densities in a horizontally flowing fluid comprising a plurality of horizontally disposed, spaced coalescing plates, each of the plates having bidirectional corrugations, running both laterally and longitudinally along the single plane of the plate, forming crests and valleys, the crests and valleys including bleed holes for passage of the immiscible components,
the method of cleaning the plates in situ comprising:
passing a nozzle sequentially through the bleed holes in the plate and into the space between adjacent plates; and
passing a pressurized fluid or gas through the nozzle.

4,897,207

MULTI-PURPOSE FORMULATIONS

Jay S. Greene, Accokeek, Md., assignor to Environmental Security Incorporated, Gloucester, Mass.

Filed Jan. 28, 1985, Ser. No. 695,349
Int. Cl.[4] A62D *1/00*; A62C *1/00, 3/00*
U.S. Cl. 252—2 **10 Claims**

1. A method of formulating a Class D firefighting agent which includes a detergent mixture comprising an alkylate sulfonate, non-ionic detergent and lauric superamide, comprising the steps of:
adding amounts of, vitamin B-6, sodium chloride and bicarbonate of soda effective when, in formulation, to put out a Class D fire, to a minimum amount of water sufficient to facilitate mixing of the components;
mixing the, vitamin B-6, sodium chloride, bicarbonate of soda, and water together so that substantially no lumps exist and a generally homogeneous slurry is provided; and then
mixing the slurry with the detergent mixture so as to provide a homogeneous Class D firefighting agent.

4,897,208

LIQUID FABRIC SOFTENER COLORED PINK

Errol H. Wahl, Cincinnati, and Aivars I. Vimba, Reading, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1988, Ser. No. 264,580
Int. Cl.[4] D06M *13/34*
U.S. Cl. 252—8.6 **11 Claims**

1. A fabric softening composition in the form of an aqueous dispersion comprising from about 3% to about 35% by weight of fabric softener and from about 1 ppm to about 1,000 ppm of a colorant system which comprises a dye selected from the group consisting of D&C Red #17; D&C Red #30; D&C Red #37, and mixtures thereof.

4,897,209

LUBRICANT COMPOSITIONS CONTAINING ARYLSULFONIC ACIDS, AND ORGANO PHOSPHITES AND REACTION PRODUCTS THEREOF

Derek A. Law, Yardley, and Shi-Ming Wu, Newtown, both of Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,800
Int. Cl.[4] C01M *135/10, 137/04*
U.S. Cl. 252—32.7 E **50 Claims**

1. A process for making a reaction product suitable for use as an additive in lubricating oils comprising reacting a metal dihydrocarbylaromatic sulfonate and a dihydrocarbyl or trihydrocarbyl phosphite in a mole ratio of sulfonate compound to phosphite compound of between about 10:1 and about 1:10 at a temperature between about 30° C. and about 250°.

4,897,210

LITHIUM COMPLEX GREASE THICKENER AND HIGH DROPPING POINT THICKENED GREASE

George P. Newsoroff, Woodlands, Tex., assignor to Pennzoil Products Company, Houston, Tex.

Filed Jul. 12, 1988, Ser. No. 217,897
Int. Cl.[4] C10M *105/38*
U.S. Cl. 252—41 **20 Claims**

1. A lithium complex grease thickener for increasing the dropping point of a lubricating grease, comprising as primary ingredients
a lithium salt of a first compound selected from the group consisting of 12-hydroxystearic acid and (C_1–C_{24}) alkyl esters thereof; and
a dilithium salt of a second compound consisting of di(C_1–C_{24}) alkyl esters of terephthalic acid; the lithium salts of said first and second compounds being present in a molar proportion of about 0.5:1 to 15:1.

10. A lithium complex thickened grease of high lubricating activity, shear stability, penetration and dropping point comprising
a major proportion of a lubricating oil; and
about 1 to 45 wt % of a lithium complex thickener with respect to the thickened grease; said thickener comprising a lithium salt of a first compound selected from the group consisting of 12-hydroxystearic acid and (C_1–C_{24})alkyl esters thereof, and a dilithium salt of a second compound consisting of di(C_1–C_{24})alkyl esters of terephthalic acid; the lithium salts of said first and second compounds being present in a molar proportion of about 0.5:1 to 15:1.

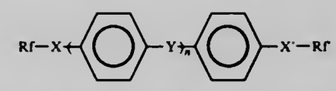
4,897,211

SYNTHETIC LUBRICANT FOR LUBRICATING THIN FILM AND MAGNETIC RECORDING MEDIUM

Takatera Dekura, Kanagawa, and Juro Endo, Saitama, both of Japan, assignors to Hitachi Metals, Ltd. and Maruwa Bussan K. K., both of Tokyo, Japan

Division of Ser. No. 136,392, Dec. 22, 1987. This application Jun. 12, 1989, Ser. No. 364,171
Claims priority, application Japan, Apr. 16, 1987, 62-94121
Int. Cl.[4] C10M *147/04*
U.S. Cl. 252—54 **7 Claims**

1. A magnetic recording medium having a substrate with at least a magnetic recording layer and a protective film layer for covering said magnetic recording layer formed thereon, said magnetic recording medium comprising a lubricant layer formed on said protective film layer by coating said protective film with a lubricant containing a compound represented by the following general formula (I):



(I)

wherein Rf and Rf' represent a fluorine-containing polyoxyalkylene group, X and X' a polar group Y of one or more selected from the group consisting of methylene, ethylene, propylene, oxygen, ketone, imino, sulfone and sulfur or no atom or group, and n an integer of 0 to 5, wherein the thickness of said lubricant layer of a compound represented by the general formula (I) is one to several molecular layers.

4,897,212

DETERGENT TABLETS FOR DISHWASHING MACHINES

Hans Kruse, Korschenbroich, and Jochen Jacobs, Wuppertal, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 107,829, Oct. 13, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,675
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1986, 3634813
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—99 **14 Claims**

1. A detergent tablet for a dishwashing machine wherein at least about 10% by weight of said tablet is dissolved in the prerinse cycle of said machine, said tablet consisting of from about 85 to about 96% by weight of a mixture of sodium metasilicate pentahydrate, anhydrous sodium metasilicate, and anhydrous pentaalkali metal tripolyphosphate wherein the ratio by weight of said anhydrous tripolyphosphate to said anhydrous sodium metasilicate is from about 1:2 to 2:1 and the ratio by weight of said anhydrous sodium metasilicate to said sodium metasilicate pentahydrate is from about 0:1 to 4:1, from about 0.5 to about 5.0% by weight of an active chlorine compound, and a tabletting aid consisting of a mixture of from about 1 to about 5% by weight of sodium acetate and from about 2 to about 6% by weight of spray-dried sodium zeolite NaA, based on the weight of said tablet.

4,897,213

GRANITE CLEANING AGENT AND PREPARATION THEREOF

Douglas F. Brink, 130 Tremont St., Barre, Vt. 05641

Filed Oct. 14, 1988, Ser. No. 257,539
Int. Cl.[4] C11D *7/08, 7/10, 7/50*
U.S. Cl. 252—143 2 Claims

1. A cleaning agent, for use in removing weathering, microorganisms and dirt from granite monuments, memorials, buildings and other granite products, consisting of:
a mixture of ammonium bifluoride and denatured alcohol;
an approximate proportion of 11.2 percent ammonium bifluoride;
an approximate proportion of 18.7 percent denatured alcohol or similar ethyl alcohol; and
the balance an approximate proportion of 70.1 percent water to complete the solution.

2. A method of cleaning granite monuments, memorials, buildings and other granite products, consisting of the steps of:
placing one pound of granular ammonium bifluoride in a container;
adding an amount of 1.67 pounds of denatured alcohol or a similar ethyl alcohol to said granular ammonium bifluoride;
mixing the above-identified mixture with sufficient water to form a total solution of one gallon;
coating the article to be cleaned with said solution by means of a brush or like means;
allowing said mixture to be in contact with said article for a period of time; and
rinsing said solution with plain water under a minimum amount of pressure.

4,897,214

SKIN CLEANING PREPARATIONS CONTAINING A HLB 10-19 NON-IONIC EMULSIFIER AND A THICKENING AGENT

Giovanni Gazzani, Appiano Gentile, Italy, assignor to Crinos Industria Farmacobiologica Spa., Como, Italy

Continuation of Ser. No. 740,293, May 31, 1985, Pat. No. 4,774,016, which is a continuation of Ser. No. 572,942, Jan. 23, 1984, abandoned. This application Feb. 25, 1988, Ser. No. 163,396
Claims priority, application Italy, Jan. 24, 1983, 19248 A/83
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] A61K *7/075, 7/50*; C11D *1/66, 3/37*
U.S. Cl. 252—170 7 Claims

1. In aqueous preparations for hygenic uses and, cleaning of skin, scalp and hair, selected from the group consisting of:
(a) about 5 to about 10% of an emulsifying agent, and having an HLB emulsifying power of between 10 and 19; and
(b) about 0.5 to about 5% of a thickening agent capable of forming gels and colloidal solutions in the presence of water, wherein the preparations provide a mild and delicate cleaning action, non-irritating to the skin, have a low tendency to remove fat and a reduced tendency for stimulation of sebum secretion, the improvement wherein said preparations are specifically selected from the group consisting of a milk having the composition:
(a) 1.0% carboxymethylcellulose,
(b) 9.0% polyoxyethylated ricinoleic glyceride 40;
(c) 1.5% polyoxyethylene cholesterol 24, and
(d) the remainder water;
a cream containing:
(a) 2.0% sodium alginate,
(b) 7.0% polyoxethylene laurylether,
(c) 1.5% cetyl alcohol,
(d) the remainder water; and a lotion containing:
(a) 1.5% arabic gum,
(b) 7.0% polyoxyethylene sorbitan monolaurate,
(c) 5.0% polyethyleneglycol 400,
(d) 10.0% ethyl alcohol, and
(e) the remainder water.

5. A method for cleaning human skin comprising the steps of:
applying to the skin, hair or scalp a substantially aqueous preparation in cream, gel, milk or lotion form containing preserving agents and consisting essentially of:
about 1.0% carboxymethylcellulose
about 9.0% polyoxyethylated ricinoleic glyceride;
about 1.5% polyoxyethylene cholesterol 24;
and the balance being water; and removing said preparation;
and wherein the thickening agent combines with the emulsifying agent to produce a synergistic action improving the solubilization of fatty substances, sebum other impurities present on said skin, hair and scalp.

4,897,215

DETERGENTS CONTAINING WATER-SOLUBLE COPOLYMERS CONTAINING AS COPOLYMERIZED UNITS MONOMERS HAVING TWO OR MORE ETHYLENICALLY UNSATURATED DOUBLE BONDS

Wolfgang Trieselt, Ludwigshafen; Richard Baur, Mutterstadt; Ekhard Winkler, Mutterstadt; Paul Diessel, Mutterstadt; Hans-Peter Seelmann-Eggebert, Schriesheim; Dieter Boeckh, and Heinrich Hartmann, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiegesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 191,898
Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716544
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.24 5 Claims

1. A surfactant-based detergent composition which contains from 0.5 to 25% by weight of a water-soluble copolymer which contains
(a) from 99.5 to 15 mol % of one or more monoethylenically unsaturated C_3- to C_6-monocarboxylic acids,
(b) from 0.5 to 20 mol % of one or more comonomers which contain two or more ethylenically unsaturated nonconjugated double bonds and which are derived from esters obtainable by esterification of
(b1) monoethylenically unsaturated C_3- to C_6-monocarboxylic acids with
(b2) polyhydric C_2- to C_6-alcohols, water-soluble or water-insoluble polyalkylene glycols having a molecular weight of up to about 400, water-soluble polyalkylene glycols having a molecular weight of from above about 400 to 10,000, polyglycerols having a molecular weight of up to 2,000, polyvinyl alcohol having a molecular weight of up to 10,000 and monohydric, monoethylenically unsaturated C_3- to C_6-alcohols,
(c) from 0 to 84.5 mol % of one or more monoethylenically unsaturated C_4- to C_6-dicarboxylic acids,
(d) from 0 to 20 mol % of one or more hydroxyalkyl esters of from 2 to 6 carbon atoms in the hydroxyalkyl group of monoethylenically unsaturated C_3- to C_6-carboxylic acids and
(e) from 0 to 30 mol % of other water-soluble, monoethylenically unsaturated monomers copolymerizable with (a), (b), (c) and (d)
as copolymerized units, with the proviso that the sum of the mol percentages (a) to (c) is always 100, and which has a K value of from 8 to 120 (determined on the sodium salt by the Fikentscher method on a 1% strength by weight aqueous solution at 25° C. and pH 7).

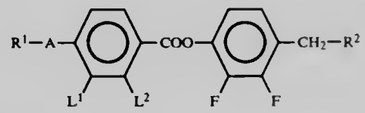
4,897,216

2,3-DIFLUOROPHENOL DERIVATIVES

Volker Reiffenrath, Rossdorf; Joachim Krause, Dieburg; Andreas Wächtler, Griesheim; Georg Weber, Erzhausen, and Thomas Geelhaar, Mainz, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,046
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807819
Int. Cl.[4] G02F *1/13*; C09K *19/30, 19/20*; C07C *69/773*
U.S. Cl. 252—299.63 17 Claims

1. A 2,3-difluorophenol derivative of the formula



wherein
R^1 and R^2, in each case independently of one another, are an alkyl group having 1–15 C atoms, wherein one or each CH_2 group of two nonadjacent CH_2 groups can be replaced by —O—, —CO—, —CH=CH— or —C≡C—;
A is 1,4-phenylene which is unsubstituted or substituted by one or two fluorines, or is trans-1,4-cyclohexylene or a single bond; and
L^1 and L^2, in each case independently of one another, are H or F.

4,897,217

METHOD FOR PRODUCING ALKALINE EARTH HALOPHOSPHATE STIR-IN PHOSPHORS

Douglas M. Jackson, Monroetos; John A. Arbie, Sr., and Richard G. W. Gingerich, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 13, 1989, Ser. No. 337,679
Int. Cl.[4] C09K *11/73*
U.S. Cl. 252—301.4 P 1 Claim

1. A method for producing alkaline earth halophosphate stir-in phosphors, said method comprising:
(a) forming a uniform mixture consisting essentially of in percent by weight from about 55 to about 75 calcium monohydrogen phosphate, from about 15 to about 35 calcium carbonate, from about 2 to about 20 ammonium chloride, from about 1 to about 15 manganese carbonate, from about 1 to about 15 antimony trioxide, and from about 2 to about 10 calcium fluoride, wherein the average particle size of said calcium monohydrogen phosphate as measured by Fisher subsieve size is from about 4.6 to about 6.8 micrometers in diameter and the 50% size as measured by Coulter Counter is from about 9.0 to about 11.5;
(b) firing said mixture in a non-reacting atmosphere at a temperature of from about 600° C. to about 1300° C. for a sufficient time to produce a fired material containing said phosphor;
(c) milling said fired material in an aqueous acid;
(d) wet screening the resulting milled material through a first screen of greater than about 300 mesh;
(e) removing said aqueous acid from the resulting screened milled material;
(f) suspending said screened milled material in water and screening the resulting suspension through a second screen of greater than about 350 mesh;
(g) adding to the resulting screened suspension an aqueous base to form a slurry having a pH of from about 7.0 to about 9.0;
(h) removing the liquid phase from resulting slurried phosphor material;
(i) drying said slurried material in air at a temperature of from about 400° C. to about 700° C.;
(j) transferring the resulting dried material by vacuum to holding means, and thereafter transferring said dried material by gravity from said holding means to a vibratory feeder;
(k) transferring said dried material from said vibratory feeder by gravity to a third screen having a size of greater than about 350 mesh; and
(l) passing said dried material through said third screen wherein vacuum pulls said dried material to and through said screen and at the same time a flow of air behind said third screen results in vibration of the particles of said dried material as they pass through said third screen, and thereafter passing the screened and vibrated particles under vacuum to collecting means.

4,897,218

METHODS FOR SUPPRESSING CEMENT CLINKER DUST EMISSIONS

Donald C. Roe, Southampton, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 24, 1987, Ser. No. 41,902
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[4] C04B *7/48*; C09K *3/22*
U.S. Cl. 252—313.1 20 Claims

1. A method of suppressing dust generation emanating from calcined cement clinker comprising:
foaming a solution comprising water and a low salt tolerant surfactant foaming agent, applying said foam solution to said cement clinker, grinding said clinker with gypsum to form cement, and slurrying said cement with water and inhibiting foam formation in said slurried cement by interaction of said low salt tolerant surfactant and dissolved salts in said slurried cement so as not to result in a significant increase in air entrapment in the final cement product.

4,897,219

VOLTAGE-DEPENDENT NON-LINEAR RESISTANCE CERAMIC COMPOSITION

Keiichi Noi, Tsuzuki; Akihiro Takami; Kazuhide Ebine, both of Katano, and Kimiko Kumazawa, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 21,588, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 668,383, Oct. 9, 1984, abandoned. This application Nov. 7, 1988, Ser. No. 268,618
Claims priority, application Japan, Feb. 10, 1983, 58-20657; Feb. 10, 1983, 58-20608; Feb. 10, 1983, 58-20609; Feb. 10, 1983, 58-20610; Feb. 10, 1983, 58-20653; Feb. 10, 1983, 58-20654; Feb. 10, 1983, 58-20655; Feb. 10, 1983, 58-20656; Feb. 15, 1983, 58-24029; Feb. 15, 1983, 58-24028; Apr. 28, 1983, 58-75749; Apr. 28, 1983, 58-75748; May 2, 1983, 58-77757; May 2, 1983, 58-77753; May 2, 1983, 58-77754; May 13, 1983, 58-84426; May 13, 1983, 58-84422; May 13, 1983, 58-84423; May 13, 1983, 58-84424; May 13, 1983, 58-84425; World Int. Prop. O., Feb. 9, 1984, PCT/JP84/00035
Int. Cl.[4] H01B *1/08*; C03C *35/46*
U.S. Cl. 252—520 2 Claims

2. A voltage-dependent non-linear resistance ceramic composition,
which comprises
79.800–99.989 mol % of $SrTiO_3$, 0.005–10.000 mol % of Dy_2O_3, 0.001–0.200 mol % of Nb_2O_5 and 0.005–10.000 mol % in the form of oxide(s) of one or more element selected from the group consisting of Ca, Cd, In, Ba, Cs, Zr, Sn, W, Ni, Fe, Pt, Tl, Si, Be, Li, Ir, Os, Hf and Ru.

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4,897,220

DETERGENTS CONTAINING WATER-SOLUBLE COPOLYMERS CONTAINING AS COPOLYMERIZED UNITS MONOMERS HAVING TWO OR MORE ETHYLENICALLY UNSATURATED DOUBLE BONDS

Wolfgang Trieselt, Ludwigshafen; Richard Baur, Mutterstadt; Ekkard Winkler, Mutterstadt; Paul Diessel, Mutterstadt; Hans-Peter Seelmann-Eggebert, Schriesheim; Dieter Boeckh, and Heinrich Hartmann, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 191,979

Int. Cl.[4] C11D *3/37*

U.S. Cl. 252—546 **5 Claims**

1. A surfactant-based detergent composition which contains from 0.5 to 25% by weight of a water soluble copolymer which contains

(a) from 99.5 to 15 mol % of one or more monoethylenically unsaturated C_3- to C_6-monocarboxylic acids,

(b) from 0.5 to 20 mol % of one or more comonomers which contain two or more ethylenically unsaturated nonconjugated double bonds and which have one or more —CO—OX groups where X is hydrogen, an alkali metal, one equivalent of an alkaline earth metal or ammonium,

(c) from 0 to 84.5 mol % of one or more monoethylenically unsaturated C_4- to C_6-dicarboxylic acids,

(d) from 0 to 20 mol % of one or more hydroxyalkyl esters of from 2 to 6 carbon atoms in the hydroxyalkyl group of monoethylenically unsaturated C_3- to C_6-carboxylic acids and

(e) from 0 to 30 mol % of other water-soluble, monoethylenically unsaturated monomers copolymerizable with (a), (b), (c) and (d) as copolymerized units, with the proviso that the sum of the mol percentages (a) to (e) is always 100, and which has a K value of from 8 to 120 (determined on the sodium salt by the Fikentscher method on a 1% strength by weight aqueous solution at 25° C. and pH 7).

4,897,221

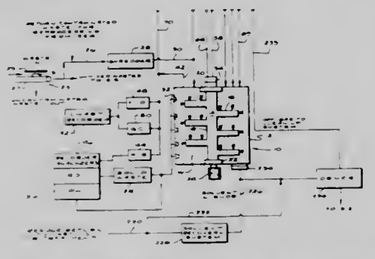
PROCESS AND APPARATUS FOR CLASSIFYING, SEGREGATING AND ISOLATING RADIOACTIVE WASTES

Frank Manchak, Jr., 11300 S. Norwalk Blvd., Santa Fe Springs, Calif. 90670

Filed Feb. 26, 1988, Ser. No. 160,814

Int. Cl.[4] G21F *9/12, 9/24;* B28B *1/02, 1/20*

U.S. Cl. 252—633 **9 Claims**



1. A process of classifying, segregating, and isolating radioactive wastes initially present in a mixture into component fractions, comprising the steps of:

(a) heat stripping volatile fractions from said mixture;

(b) measuring the radioactivity of that remaining portion of the mixture from which said volatile fractions have been stripped;

(c) separating said remaining mixture into separate fractions each having a different range of radioactivity levels and storing said separated fractions

(d) selecting at least one of a plurality of stored radiation shielding materials; and

(e) casting said selected radiation shielding material and casting a selected one of said radioactive fractions with said shielding materials into a rigid shape such that said radiation shielding material encapsulates said radioactive fraction to substantially prevent the escape of radiation therefrom.

4,897,222

TRANSPORTABLE PRESS FOR A HIGH CONDENSABILITY OF RADIOACTIVE WASTE MATERIAL OF NUCLEAR POWER STATIONS AND PROCESS FOR CONDENSING THE SAME

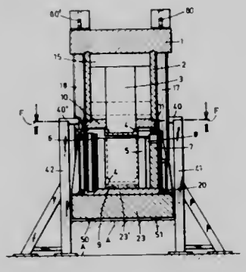
Wolfgang Müntzel, Barsbüttel, and Michael Szakala, Quickborn, both of Fed. Rep. of Germany, assignors to Firma Hansa Projekt Machinenbau GmbH, Hamburg, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 616,435

Claims priority, application Fed. Rep. of Germany, May 31, 1983, 3319698

Int. Cl.[4] G21F *9/12, 9/24;* B30B *15/30, 15/06*

U.S. Cl. 252—633 **13 Claims**



1. A transportable hydraulic press for condensing radioactive waste materials of high condensability, produced in nuclear power plants, the press comprising a matrix for receiving a container with waste material therein; a hydraulically operated stamp for pressing said container, said matrix including two cups pivotally connected to each other and pivotable between an open position in which said container is received in said matrix and a closed position in which said container is pressed upon; locking means for locking said cups in said closed position; two hydraulic setting cylinders each connected to a respective cup to pivot the same between the open and closed position, said press being movable from a vertical operative position to a horizontal transportable and inoperative position, said cups being vertically disposed in said operative position, said stamp being operated to press the waste material in said container together with said container into a package of a smaller height; means for radially loading containers containing said waste material onto said matrix; and means for radially removing said package from said matrix.

4,897,223

TRI-PHENYL METHYL COLOR-FORMING AGENTS

Udo Eckstein, Cologne; Hubertus Pauar, and Roderich Raue, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

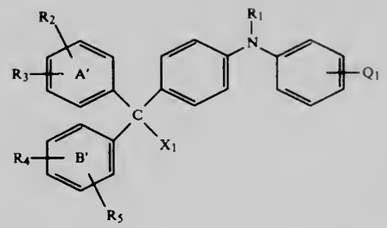
Filed Mar. 1, 1988, Ser. No. 162,531

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707548

Int. Cl.[4] C07C *121/80*

U.S. Cl. 544—73 **2 Claims**

1. Colour-forming agents, of the formula



wherein

X_1 denotes hydroxyl; C_1–C_{12}-alkoxy which is optionally substituted by chlorine or C_1–C_4-alkoxy; C_2–C_{12}-alkenyloxy; or benzyloxy or phenylethyloxy which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R_1 denotes C_1–C_{12}-alkyl or benzyl,

R_2 and R_4 independently of one another denote hydrogen, chlorine, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, phenoxy, benzyloxy or a radical of the formula



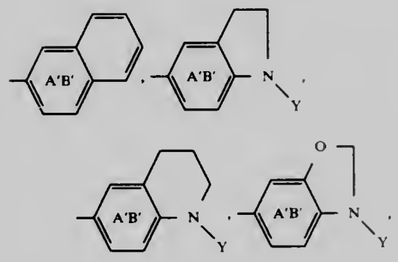
R_3 and R_5 independently of one another denote hydrogen; chlorine, C_1–C_{12}-alkyl; C_2–C_{12}-alkenyl; C_1–C_{12}-alkoxy; C_2–C_{12}-alkenyl-oxy; phenyl; benzyl; phenoxy or benzyloxy which is optionally substituted by chlorine, C_1–C_{12}-alkyl or C_1–C_{14}-alkoxy; cyclohexyloxy or cyclopentyloxy which is optionally substituted by C_1–C_{12}-alkyl; C_1–C_{12}-alkylmercapto or a radical of the formula



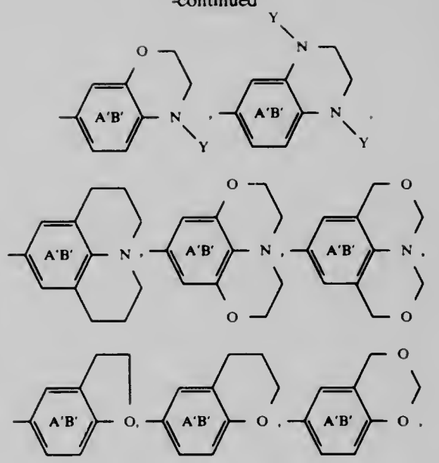
Y_1 and Y_2 independently of one another denote C_1–C_{12}-alkyl which is optionally substituted by chlorine, cyano, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy; or cyclohexyl, phenyl or benzyl, which can be substituted by chlorine, C_1–C_{12}-alkyl or C_1–C_{12}-alkoxy, or

R_2 and R_3 denote members which, together with ring A′ and/or

R_4 and R_5 denote members which, together with ring B′, are necessary to complete a ring system of the following formulae



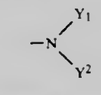
-continued



wherein

Y represents C_1–C_{12}-alkyl, which can be substituted by chlorine, cyano, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy; cyclohexyl, phenyl or benzyl, which can be substituted by chlorine, C_1–C_{12}-alkyl with C_1–C_{12}-alkoxy, and

the saturated ring component can carry up to 4 radical from the group comprising chlorine, C_1- to C_4-alkyl, C_1- to C_4-alkoxy and phenyl, or



denotes a pyrrolo, pyrrolidino, piperidino, pipecolino, morpholino, pyrazolo or pyrazolin radical which is optionally substituted by chlorine, C_1- to C_4-alkyl or phenyl.

VOL 1110 ISS 5 JA 30 1990 UMI

4,897,224

METHOD FOR PRODUCING FERULYL STANOL DERIVATIVES

Yoshikazu Kondo, Sendai; Shuetu Suzuki, and Morio Kobayama, both of Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 831,853

Claims priority, application Japan, Mar. 5, 1985, 60-41932; Mar. 7, 1985, 60-43725; Mar. 7, 1985, 60-43726; Mar. 9, 1985, 60-45732

Int. Cl.[4] C07J 9/00

U.S. Cl. 260—397.2 2 Claims

1. A method for producing a ferulyl stanol derivative, comprising:

(a) acetylating ferulic acid with a mixture of pyridine and acetic anhydride to prepare an acetylated ferulic acid,

(b) treating said acetylated ferulic acid with thionyl chloride to form an acid chloride,

(c) reacting said acid chloride with phytostanol in the presence of pyridine to form a phytostanol compound

(d) dissolving said phytosterol compound into a liquid mixture of methanol and chloroform to prepare a solution, and

(e) adding to said solution sodium borohydride, with stirring, to thereby deacetylate said phytosterol compound.

4,897,225

PROCESS FOR THE PREPARATION OF ROOM TEMPERATURE FLOWABLE DERIVATIVES OF NATURAL FATS AND OILS AND THEIR USE

Helmut Brehm; Helmut Klimmek, and Dolf Stockhausen, all of Krefeld, Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed May 22, 1987, Ser. No. 53,299

Claims priority, application Fed. Rep. of Germany, May 26, 1986, 3617657

Int. Cl.[4] C07C 143/90

U.S. Cl. 260—400 13 Claims

1. A process for the preparation of a derivative of a natural fat or oil which is liquid or free-flowing at room temperature, which comprises reacting a 1,2-epoxide at elevated temperature and in the presence of a basic catalyst with (a) a fat that is solid at room temperature, (b) a fat which contains solid fractions, or (c) with a mixture of at least one of (a) and (b) with a free fatty acid or with at least one of a mono- or di-glyceride, and sulphating the product of such reaction.

4,897,226

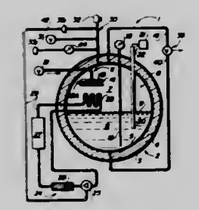
CARBON DIOXIDE STORAGE AND DISPENSING APPARATUS AND METHOD

Michael D. Hoyle, Arlington, Tex., and Charles V. Snyder, East Mobile, Ala., assignors to Carbonic Technologies, Inc., Arlington, Tex.

Filed Mar. 15, 1989, Ser. No. 323,897

Int. Cl.[4] B01F 3/04

U.S. Cl. 261—129 31 Claims



1. A carbon dioxide storage and dispensing apparatus comprising a vessel adapted to contain liquid and gaseous carbon dioxide; at least one fill line extending into said vessel, with the discharge end of said fill line terminating inside said vessel and the supply end of said fill line connected to a source of liquid carbon dioxide; and mixer means carried by said discharge end of said fill line, whereby impingement of liquid carbon dioxide against said mixing means dispenses said liquid carbon dioxide in said gaseous carbon dioxide in said vessel and effects rapid equilibrium between said liquid carbon dioxide and said gaseous carbon dioxide.

4,897,227

PROCESS FOR PRODUCING HIGH-TEMPERATURE RESISTANT POLYMERS IN POWDER FORM

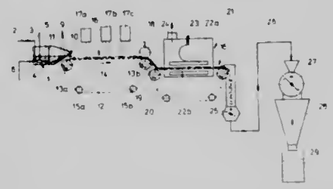
Erich Wanek, Vöcklabruck; Josef Baumgartinger, Ungenach; Manfred Schobesberger, Seewalchen; Rupert Stadlbauer, Lenzing, and Klaus Weinrotter, Vöcklabruck, all of Austria, assignors to Lenzing Aktiengesellschaft, Austria

Filed Feb. 12, 1988, Ser. No. 155,372

Claims priority, application Austria, Feb. 16, 1987, 322/87

Int. Cl.[4] B29B 9/04, 9/10

U.S. Cl. 264—6 11 Claims



1. A process for producing high-temperature resistant polymers in powder form, which process comprises the steps of

preparing a concentrated solution of a polymer in an aprotic polar solvent,

expressing said concentrated polymer solution continuously into the region of a twisting cone of hot aqueous precipitant thereby forming short irregular wormy formations,

uniting said formations to a fleece-like web,

washing said web with aqueous solvents and finally with water,

drying and comminuting said web.

4,897,228

METHOD FOR PRODUCING OPTICAL DISK BASE

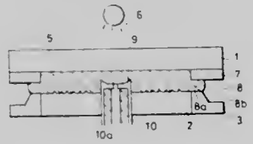
Hiroaki Miwa; Tetsuo Tajima, both of Fujisawa, and Ryoichi Sudo, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Maxell, Ltd., Ibaraki, both of, Japan

Filed Jul. 23, 1987, Ser. No. 76,766

Claims priority, application Japan, Jul. 30, 1986, 61-177561

Int. Cl.[4] B29C 45/07

U.S. Cl. 264—22 12 Claims



1. A method for producing an optical disk base having a center hole, which includes the steps of injecting a photo-curable resin into a cavity formed between a mold half having an information pattern and another mold half of flat plate which are placed opposite to each other, curing the photo-curable resin by irradiation with light, and demolding, wherein said photo-curable resin is injected into said cavity through an injection nozzle having an outside diameter which is substantially equal to the diameter of the center hole of the optical disk base, said injection nozzle having a forward end where the photo-curable resin exits the nozzle and having a horn-shaped opening at the forward end thereof; wherein the forward end of said nozzle is closed after injection; wherein said photo-curable resin is irradiated with light with said injection nozzle projected into said cavity so that said injection nozzle forms an unfilled well having a circular groove therein which facilitates the formation of the center hole; and wherein said center hole is punched out along said circular groove after said demolding.

4,897,229

PROCESS FOR PRODUCING A SHAPED SILICON CARBIDE-BASED CERAMIC ARTICLE

Toru Sawaki; Akio Nakaishi; Keizo Shimada, and Takashi Watanabe, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 5, 1988, Ser. No. 254,370

Int. Cl.[4] C04B 33/32, 35/52

U.S. Cl. 264—28 19 Claims

1. A process for producing a shaped silicon carbide-based ceramic article, comprising the steps of:

forming an organic silicon polymer into a predetermined shape;

doping the shaped organic silicon polymer with a doping material consisting of at least one member selected from the group consisting of chlorine, bromine and iodine, at a temperature of at least 10° C. below the softening point of the shaped organic silicon polymer, to an extent such that the doping material is in an amount of 0.01% to 150% based on the weight of the shaped organic silicon polymer, to render the shaped organic silicon polymer infusible; and

pyrolyzing the infusible shaped organic silicon polymer in an inert gas atmosphere at a temperature of 800° C. to 1400° C., to provide a shaped silicon carbide-based ceramic article.

4,897,230

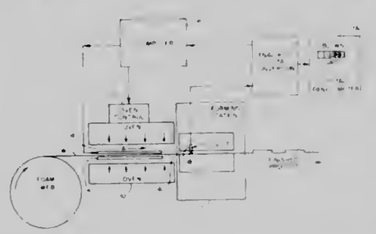
METHOD OF AND APPARATUS FOR MEASURING AND CONTROLLING BLOW-UP OF A FOAM SHEET IN A THERMOFORMER OVEN

Jonathan Gross, Canandaigua, N.Y., assignor to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 223,981, Jul. 25, 1988. This application Aug. 15, 1988, Ser. No. 232,148

Int. Cl.[4] B29C 51/42, 51/46, 67/20

U.S. Cl. 264—40.1 10 Claims



1. A method of measuring and controlling foam plastic sheet blow-up by regulating advancement rate of a continuous thermoformable foam plastic material sheet through a thermoformer oven responsive thickness measurements of said sheet of plastic material which is conveyed through said thermoformer oven towards a thermoforming installation; comprising:

(a) sensing the sheet thickness of thermoformable material at least at one location within a forming station of said thermoforming installation;

(b) and varying the rate of advance of said sheet material within said thermoformer oven so as to regulate dwelling time thereof in said oven in response to variations in the sheet thickness sensed in said forming station to thereby obtain a requisite blow-up of the material received in the forming station from said oven.

6. An apparatus for measuring and controlling foam plastic material blow-up to regulate advancement rate of a continuous thermoformable foam plastic material sheet through a thermoformer oven responsive a thickness measurements of said sheet of thermoformable plastic material which is conveyed through said thermoformer oven towards a thermoforming installation; comprising:

(a) thickness sensor means in a forming station of said thermoformer oven; said sensor means including an element extending towards said sheet and being adapted to measure the blow-up of said sheet;

(b) and means for varying the rate of advance of said sheet material within said thermoformer oven so as to control dwelling time thereof in said oven based on variations in the sheet blow-up measured in said forming station and to resulting control the extent of material blow-up of the sheet entering the forming station.

4,897,231

ANODIZED ALUMINUM COATING

Robert S. Scheurer, and Kendal Hancock, both of Wichita Falls, Tex., assignors to Wellington Leisure Products, Inc., Madison, Ga.

Continuation of Ser. No. 776,868, Sep. 17, 1985, abandoned. This application Feb. 13, 1989, Ser. No. 309,962

Int. Cl.[4] B29C 67/00

U.S. Cl. 264—46.7 7 Claims

1. The method of bonding a body of reaction injection molding material onto a metal substrate comprising the steps:

applying a coating of aqueous polymer dispersion material onto a surface of said substrate under ambient temperature conditions;

heating said coated substrate at an elevated temperature to yield a cured, solid residue which is set and non-tacky; and,

contacting the cured coating of said substrate with a body of reaction injection molding material in a mold under reaction injection molding pressure.

4,897,232

PREPARATION OF FIBRES FROM A LIQUID PRECURSOR

Harold G. Emblem, Southport; Kenneth Jones, Tyldesley, and Jonathon M. Boulton, Epsom, all of England, assignors to Clinotherm Limited, West Yorkshire, England

Filed Jun. 1, 1988, Ser. No. 201,013

Claims priority, application United Kingdom, Nov. 28, 1986, 8628537

The portion of the term of this patent subsequent to Jun. 7, 2006, has been disclaimed.

Int. Cl.[4] D01F 9/08

U.S. Cl. 264—56 2 Claims

1. A process for the preparation of a filament without the need for a filament-forming organic polymer or a coagulating bath, such process comprising forming a homogeneous clear solution by dissolving in a mixture of water and a C_1–C_4 alcohol an aluminium halohydrate organic complex obtained from an aluminium halohydrate and a polyol containing two to six carbon atoms and at least two hydroxy groups, incorporating in the solution a magnesium salt and an organic silicate containing at least one C_1–C_6 organic group, the magnesium, alumin-

ium and silicon being present in an oxide stoichiometry for cordierite, evaporating solvent to cause polymerisation and drawing from the concentrated solution a clear homogeneous filament, which on firing forms a ceramic cordierite fibre.

4,897,233

METHOD OF MAKING REINFORCED MATERIAL

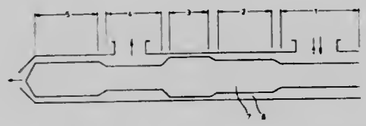
Peter Bier, Krefeld; Karl-dieter Loehr, Alpheu, and Dieter Titze, Airtrach, all of Fed. Rep. of Germany, assignors to Bayer AG, Fed. Rep. of Germany

Continuation of Ser. No. 945,388, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 708,497, Mar. 5, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,499

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408224

Int. Cl.[4] B29B *9/14*

U.S. Cl. 264—108 **5 Claims**



1. Process for the production of materials containing filling elements sensitive to shearing forces comprising the steps of adding the filling elements to an at least kneadable plastic in the first section of a screw machine, operating all subsequent screw sections of the machine with a high degree of filling ($\epsilon=1$) with a kinematic operating parameter Λ, which indicates the ratio of the quantity q conveyed through a filled screw section at a prevailing operating state to the maximum quantity q max to be conveyed through the screw at a back pressure of $\Delta p=0$, of greater than Λ max.

4,897,234

ARTICLES OF MANUFACTURE AND THEIR PRODUCTION

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove Village, Ill.

Filed Oct. 24, 1988, Ser. No. 261,125

Int. Cl.[4] B27N *3/00*

U.S. Cl. 264—109 **51 Claims**

1. A process which comprises compressing and heat curing a non-resilient, non-flexible recurable material formed by subjecting cured polyimide foam to the action of pressurized steam; the heat curing being performed in the absence of steam and at a temperature above 200° C. at which such recurable material is recured.

4,897,235

PROCESS FOR IMPARTING A SURFACE COATING TO FILMS

Heinrich Rosenthal, and Ingo Schinkel, both of Walsrode, Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

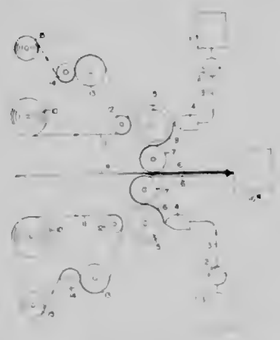
Continuation-in-part of Ser. No. 942,103, Dec. 16, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 203,979

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545591

Int. Cl.[4] B29C *47/02*

U.S. Cl. 264—134 **4 Claims**

1. A process for the production of a surface-coated thermoplastic film of propylene polymer, which comprises applying to the film a melt of the desired coating, and then stretching the film at least monoaxially about 3 to 20 fold without contacting the film surface during stretching, said process carried out by a slot doctoring system comprising a transfer and laminating roll, an application head, at least one applicator roll and a melting device whereby the coating material to be applied is transferred directly from the application head to the surface of the applicator roll, which is brought into contact with the transfer and laminating roll which, in turn, transfers the melt to a film and wherein by means of a change-over mechanism a



contact roll of a supporting film or paper guide system can be swung against the applicator roll to take off an applied layer over a cooling roll and a deflection roll to a wind-up station from which samples can be withdrawn and monitored.

4,897,236

METHOD AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF RUBBER OR POLYMER-BASED MIXTURES CONTAINING ADDITIVES

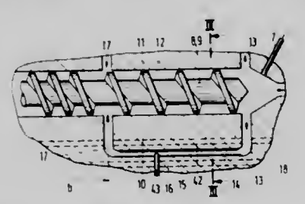
Norbert Rübiger, Lohmar, and Manfred Dienst, Burgdorf, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,598

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729237; Sep. 2, 1987, 3729236

Int. Cl.[4] B29B *7/48*; B29C *47/78*

U.S. Cl. 264—211.23 **19 Claims**



1. A method for the continuous production of a rubber-containing mixture in a twin-screw extrusion device comprising a housing, at least first and second feed apertures, and an outlet aperture adjacent the end of the extrusion device, comprising the steps of:

(a) feeding rubber into said extrusion device through said first feed aperture and masticating said rubber,

(b) metering additives to be admixed with said rubber through said second feed aperture, said second feed aperture being at a spacing from said first feed aperture of from about one to ten times the diameter of said screws,

(c) mixing said additives with said rubber,

(d) dividing said mixture of rubber and additives into first and second parts downstream of said second feed aperture at a spacing of up to about ten times the diameter of said screws,

(e) discharging said first part through said outlet aperture,

(f) feeding said second part, containing up to 20 times the quantity of said first part, into an annular chamber exteriorly of the extrusion chamber, said annular chamber having a length of at least about twice said screw diameter,

(g) cooling said mixture in said annular chamber, and

(h) returning said cooled second part into said extruder chamber utilizing the feed pressure of said extruder, said re-entry point of said cooled mixture lying upstream of said outlet aperture.

2. An apparatus for the continuous production of a rubber-containing mixture, comprising an extrusion device, said extrusion device comprising a housing; first and second intermeshing screws rotatable in said housing; first and second feed hopper means communicating with the interior of said housing; metering devices associated with each of said feed hopper means; said housing further defining an axial outlet means downstream of said feed hopper means, means for controlling said outlet means in dependence upon the pressure subsisting in said housing, and recycling means having first and second end regions communicating with said interior of said housing, said first end region of said recycling means lying in the region of, but upstream of, said outlet opening and said second end lying upstream of said first end, wherein said second hopper means is disposed downstream of said first hopper means at a longitudinal spacing of up to about ten times the diameter of said screws, wherein said recycling means comprises at least one outflow passage terminating in said first end region and extending radially from said housing, annular chamber means into which said outflow passage opens radially, said annular chamber comprising inner and radially outer wall surfaces, and extending co-axially with said housing and having a longitudinal length of at least twice said diameter of said screws, means for cooling said annular chamber, at least one inflow passage extending radially inwardly from said annular chamber and terminating in said second end region, and a cylindrical casing member including inner and outer wall surface, said inner wall surface of said casing forming said outer wall surface of said return chamber, said inner wall surface of said casing defining helical grooves therein, said helical grooves having a pitch for effecting the return of material in said chamber in an upstream direction.

4,897,237

METHOD OF FITTING EYEGLASSES

Peter Frey, Poststrasse 6, D-4250 Bottrop, and Hans-Jürgen Kellner, Dieselstrasse 6, D-4200 Oberhausen, both of Fed. Rep. of Germany

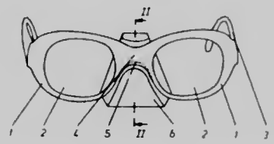
PCT No. PCT/EP83/00294, § 371 Date Jun. 11, 1984, § 102(e) Date Jun. 11, 1984, PCT Pub. No. WO84/02009, PCT Pub. Date May 24, 1984

PCT Filed Nov. 10, 1983, Ser. No. 624,673

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241455

Int. Cl.[4] B29C *33/38*

U.S. Cl. 264—222 **2 Claims**



1. Method of fitting eyeglasses to a wearer's nose, comprising the steps of: filling a hollow space between eyeglass bridge and bridge of the nose with a curing plastic impression material while the glasses are in place to produce an impression of the bridge of the wearer's nose; allowing the impression material to harden; removing the eyeglasses from the wearer's nose; removing lenses and temples from the eyeglasses; embedding the eyeglass bridge along with the cured impression material in molding material to obtain a model; removing the impression material from the eyeglasses; filling hollow space left between the eyeglass bridge and the model with a curing plastic that bonds to the material of the eyeglass frame; subjecting the eyeglasses together with the molded-on plastic to a heat treatment under elevated pressure while the lenses and temples are removed from the eyeglasses; and reassembling the eyeglasses.

4,897,238

STRETCHED POLY(ARYLENE THIOETHER-KETONE) FILMS AND PRODUCTION PROCESS THEREOF

Toshitaka Kosyama; Takayuki Katto; Zenya Shiiki; Yoshikatsu Satake, all of Iwaki; Toshiya Mizuno, Tsuchiura, and Yo Iizaka, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Division of Ser. No. 194,015, May 12, 1988. This application May 19, 1989, Ser. No. 354,323

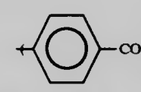
Claims priority, application Japan, May 15, 1987, 62-118620; Jul. 21, 1987, 62-181970

Int. Cl.[4] C08F *283/00*; B29C *55/00*; B29D *7/22*

U.S. Cl. 264—288.4 **4 Claims**

1. A process for the production of a stretched poly(arylene thioether-ketone) film which comprises processing a thermoplastic material into the stretched poly(arylene thioether-ketone) film, wherein said thermoplastic material comprising:

(A) 100 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, Tm being 310°–380° C.;

(b) residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, and melt crystallization temperature, Tmc (420° C./10 min) being at least 210° C., wherein ΔHmc (420° C./10 min) and Tmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min, after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.3–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dl in 98 percent by weight sulfuric acid; and optionally,

(B) up to 100 parts by weight of at least one of thermoplastic resins and/or up to 15 parts by weight of at least one of fillers,

wherein upon processing the thermoplastic material into the stretched poly(arylene thioether-ketone) film, the thermoplastic material is formed into an amorphous film, the amorphous film is stretched, as first-stage stretching, to a draw ratio of from 1.5:1 to 7:1 in one direction at 100°–180° C. to give a birefringence of 0.05–0.35, the resultant film is stretched, a optional second-stage stretching, to a draw ratio of from 1.5:1 to 7:1 in a direction perpendicular to said one direction at 100°–180° C., and the resulting film is then heat set at a temperature of from 200° C. to a temperature just below the melting point of the poly(arylene thioether-ketone).

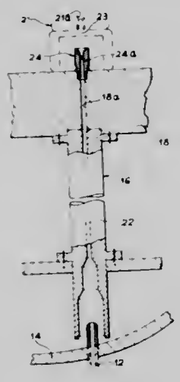
VOL 1110 ISS 5 JA 30 1990 UMI

4,897,239

INSTRUMENTATION COLUMN FOR THE CORE OF A PRESSURIZED WATER NUCLEAR REACTOR

Jacques Planchard, Fontenay-aux-Roses; Jean-Luc Godon, Paris, both of France; Daniel Gorman, Ottawa, Canada, and Gérard Gary, Saint Cheron, France, assignors to Electricite de France Service National, Paris, France

Filed Dec. 10, 1987, Ser. No. 131,207
Claims priority, application France, Dec. 12, 1986, 86 17419
Int. Cl.[4] G21C *17/10, 19/20*
U.S. Cl. 376—254 **2 Claims**



1. An instrumentation column for the core of a pressurized water nuclear reactor, which serves to house a glove finger tube (23) ensuring the guidance of a neutron flux measuring probe, with a clearance permitting the circulation of cooling water from the core (20), said column (16) successively having from bottom to top a vertical guide sleeve (22), whose upper end is fixed to a lower core plate (18), a vertical hole (18*a*) formed in said plate and a nozzle (124) fixed to said plate and projecting above the same, said nozzle having a vertical passage (124*a*) with a circular section and whose upper end issues on to a horizontal planar face (124*b*), characterized in that the passage (124*a*) formed in the nozzle has a constant diameter over most of its length and up to said planar horizontal face (124*b*), the upper end of the nozzle having slots (124*d*) issuing on to the planar horizontal face (124*b*) and oriented substantially radially with respect to said passage (124*a*).

4,897,240

NUCLEAR REACTOR

Kiyoshi Sako, Ibaraki, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

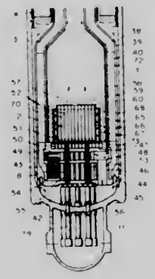
Continuation of Ser. No. 57,386, Jun. 2, 1987, abandoned. This application May 2, 1989, Ser. No. 348,097
Claims priority, application Japan, Jun. 2, 1986, 61-127782
Int. Cl.[4] G21C *7/22, 9/00*
U.S. Cl. 376—328 **5 Claims**

1. A nuclear reactor comprising:
- a reactor vessel;
- a reactor core disposed within said vessel and including fuel rods;
- a primary cooling system within said reactor vessel and including a steam generator and a pump for passing primary cooling water through said reactor core;
- a poison tank disposed within said reactor vessel and containing a boric acid solution of a concentration sufficient to shut down said reactor core, said poison tank including a lower portion surrounding said reactor core and a reduced size upper portion extending above said reactor core;

said steam generator surrounding said reduced size upper portion of said poison tank;

the top of said upper portion of said poison tank having means for blocking communication of said poison tank with primary cooling water in said reactor core during normal operation of said pump, and for, upon decreased operation of said pump, opening communication between said poison tank and said primary cooling water to thereby enable boric acid solution to be supplied to said reactor core and thus shut down said reactor core, said means comprising at least one valve having a valve member and operatively connected to said pump to urge said valve member to a closed position, blocking communication between said poison tank and said primary cooling water, by pressure generated by said pump during normal operation thereof, whereby upon removal of such pressure said valve member moves to an open position opening communication between said poison tank and said primary cooling water; and

means, between the lower end of said poison tank and said primary cooling water, for, upon said valve being opened, allowing boric acid solution to communicate with said primary cooling water and said reactor core.

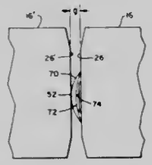


4,897,241

ANTI-BOW GRID FOR NUCLEAR FUEL ASSEMBLY

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 325,712, Nov. 30, 1981, abandoned. This application Feb. 3, 1986, Ser. No. 825,948
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—438 **10 Claims**



1. In the combination of two elongated nuclear fuel assemblies of the type having a plurality of longitudinally spaced apart grids supporting a regular array of elongated fuel rods, each grid including a plurality of substantially flat, rigid perimeter plates circumscribing the fuel rods and defining a polygonal assembly cross section, the assemblies further being supported in parallel side by side relationship such that an arbitrary first perimeter plate of one assembly is co-extensive and opposite an arbitrary second perimeter plate of another assembly whereby a predetermined nominal gap is provided therebetween, the improvement comprising:

said first and second perimeter plates each having a plurality of crowned anti-bowing springs integrally formed thereon and projecting outwardly therefrom, said anti-bowing springs being laterally separated in periodic alternation with substantially flat portions of the outer surface of the plate such that each spring on the first perimeter plate is opposite a flat surface on the second plate, and conversely, each spring on the second plate is opposite a flat surface on the first plate,

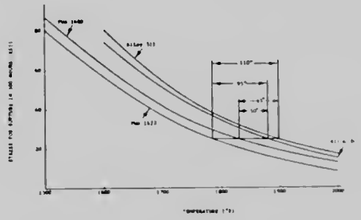
said plurality of crowned anti-bowing springs on each perimeter plate consisting of horizontally alternating primary and secondary springs, the primary springs having a greater projection and less stiffness than the secondary springs.

4,897,242

PROCESS FOR TREATING MOLTEN CAST IRON IN AN OPEN LADLE BY MEANS OF PURE MAGNESIUM

Karl Gut, Beaken, and Ivo Henych, Stetten, both of Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Filed May 10, 1989, Ser. No. 349,642
Claims priority, application Switzerland, May 10, 1988, 01773/88
Int. Cl.[4] C21C *7/02*
U.S. Cl. 420—23 **2 Claims**



1. A process for treating molten iron in an open ladle with magnesium comprising providing a volume of molten iron in an open ladle, providing a plurality of desired sized coated particles of metal selected from the group consisting of magnesium and magnesium alloys wherein the coating is a protective coating consisting of (1) a ceramic material selected from the group consisting of SiO_2, Cr_3O_3, SiC, ZrO_2, Al_2O_3, CaO, CaSi and mixtures thereof and (2) binders, introducing said plurality of coated particles into said volume of molten metal below the surface thereof wherein the size of said particles is selected such that the rise of said particles through the molten iron takes longer than the reaction time of said particles with the molten iron thereby insuring adequate dilution of the magnesium by the molten iron.

4,897,243

DUCTILE BRAZING ALLOY OF COPPER-NICKEL-SILICON-TITANIUM

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 7, 1988, Ser. No. 268,134
Int. Cl.[4] C22C *9/06*
U.S. Cl. 420—488 **8 Claims**

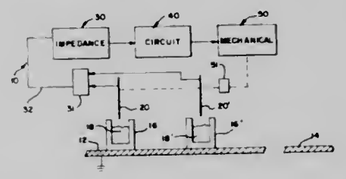
1. A brazing alloy consisting of, in weight percent; 0.3 to 5% Ti; 2 to 15% Ni; 0.25 to 4% Si; balance copper.

4,897,244

APPARATUS AND METHODS FOR ANALYZING FLUIDS

Patrick B. Wallace, Saginaw, and Larry W. Moore, Plano, both of Tex., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 620,147, Jun. 13, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 872,778
Int. Cl.[4] B01L *3/02*; G01N *35/06*
U.S. Cl. 422—100 **1 Claim**



1. Apparatus for sensing the top level of a fluid in a container, comprising the combination of:
- an open container made of nonconductive material for holding an ionized fluid whose top level in the container is to be sensed,
- a chassis having a flat conductive surface disposed below the container and supporting the container thereon,
- probe means having one end adapted to be moved into and out of the open top of the container under the control of mechanical means, said probe including means for transferring the fluid from said container to a testing station for analysis,
- electrical conductor means at said one end of the probe,
- the cross-sectional area of said one end of the probe being small relative to the area of said flat conductive surface on which the container is supported and small relative to said container,
- a source of a.c. signals,
- means for coupling said conductor means at said one end of the probe to receive a.c. signals from said source of a.c. signals,
- an electrical ground associated with said source of a.c. signals,
- means for connecting said conductive surface of the chassis to said electrical ground,
- said conductor means on the probe and said chassis defining a capacitor means and the magnitude of the capacitance changing from one value to a larger value when the probe end is first brought into contact with ionized fluid in the container,
- impedance means including said capacitor means adapted to undergo a threshold signal change when the conductor means on the probe contacts fluid in the container, and
- circuit means coupled to said impedance means for producing a control signal to said threshold signal change.

4,897,245

CATALYTIC REACTOR SYSTEM FOR CONVERSION OF LIGHT OLEFIN TO HEAVIER HYDROCARBONS WITH SORPTION RECOVERY OF UNREACTED OLEFIN VAPOR

Chang-Hueng Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 576,179, Feb. 1, 1984, Pat. No. 4,511,747. This application Dec. 6, 1984, Ser. No. 678,954
Int. Cl.[4] C07C *7/00*; C08F *4/00, 6/04*
U.S. Cl. 422—131 **9 Claims**

1. A continuous system for converting ethene-rich olefinic feedstock to heavier liquid hydrocarbons comprising

means for combining the feedstock stream with a liquid

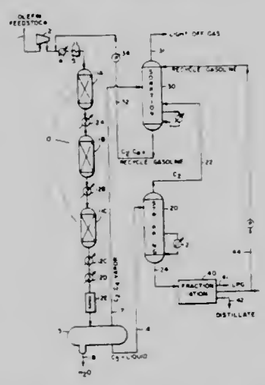
VOL 1110 ISS 5 JA 30 1990 UMI

hydrocarbon stream containing a major amount of gasoline range hydrocarbons including C_5^+ olefins;

reactor means for contacting the combined feedstock-gasoline stream at elevated temperature and pressure in a reaction zone with shape selective medium pore zeolite oligomerization catalyst to convert a portion of the olefinic components to heavier hydrocarbons;

heat exchange means for cooling oligomerization reaction effluent to condense at least a portion of said heavier hydrocarbons;

means for separating the cooled and partially condensed effluent stream into an ethene-rich vapor stream and condensed liquid hydrocarbon stream;



means for fractionating said condensed hydrocarbons to provide a gasoline stream, a distillate product stream and a light hydrocarbon vapor stream containing unreacted ethene;

sorption means for contacting the ethene-rich vapor from the separation step and the light hydrocarbon vapor stream under sorption pressure conditions with a cooled liquid portion of the gasoline hydrocarbon to sorb ethene into the liquid gasoline stream; and

means for recycling the sorbed ethene and gasoline stream for combining with an ethene-rich feedstock.

4,897,246

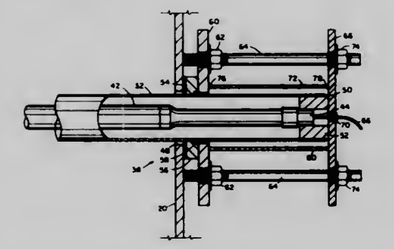
OXIDATION CHAMBER

Ronald L. Peterson, Tucson, Ariz., assignor to Peroxidation Systems, Inc., Tucson, Ariz.

Filed Sep. 13, 1988, Ser. No. 243,908

Int. Cl.[4] B01J *19/08, 19/12*

U.S. Cl. 422—186.3 **6 Claims**



1. Apparatus for mounting an elongated ultraviolet lamp having an end portion within a liquid-filled chamber in such a way that the end of the lamp extends out through an aperture in the chamber wall, said apparatus noteworthy for not requiring any machining of the chamber wall other than that required to produce said aperture, for electrically insulating the lamp from the chamber wall, for sealing the aperture in the chamber wall, for preventing the liquid from coming into direct contact with the lamp, and for permitting thermal expansion of said lamp, said apparatus comprising in combination:

a tube surrounding said lamp but spaced radially from it, one end of said tube extending through the aperture in the chamber wall to an end located outside the liquid-filled chamber;

a cylindrical plug having an outside diameter slightly less than the inside diameter of said tube to permit said cylindrical plug to slide freely within said tube, and having a central bore of suitable size and shape to accommodate the end portion of said lamp in a sliding fit, whereby said cylindrical plug serves to maintain the radial spacing between said lamp and said tube, while permitting said lamp to expand axially within said tube;

a gasket lying against the outside of the chamber wall and surrounding the aperture in the chamber wall;

an O-ring retainer encircling said tube and lying against the side of said gasket opposite the chamber wall, and including a groove for retaining an O-ring in sealing contact with said tube;

an O-ring lodged in the groove of said O-ring retainer and sealingly engaging said tube;

a compression plate oriented perpendicular to said tube and bearing against said O-ring retainer; and,

means interconnecting the chamber wall and said compression plate for drawing said compression plate against said O-ring retainer, whereby said gasket is compressed causing said gasket to sealingly engage both said O-ring retainer and the chamber wall.

4,897,247

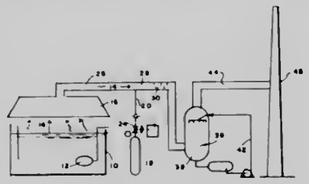
TREATMENT OF EXHAUST GASES TO REDUCE MULTI-VALENT HEAVY METALS

Donald R. Anderson, Los Alamitos, Calif., assignor to B. Richard Sacks, Van Nuys and Joseph L. Feeney, Vernon, both of, Calif.

Filed May 16, 1988, Ser. No. 194,294

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—210 **9 Claims**



1. A method for the treatment of exhaust gases containing detectible quantities of a multivalent heavy metal in a high oxidation state which comprises:

a. introducing sulfur dioxide into contact with the exhaust gases, the sulfur dioxide being introduced in amounts from 1 to 10 times the stoichiometric quantity necessary for reducing said multivalent heavy metal into a lower oxidation state;

b. maintaining the contact of said sulfur dioxide with said exhaust gases under acidic conditions to favor the reduction of said heavy metal into a lower oxidation state and produce a compound of sulfur in a higher oxidation state than in said sulfur dioxide;

c. treating the exhaust gases containing said heavy metal in a lower oxidation state and residual sulfur dioxide and compound of sulfur to remove said sulfur dioxide and compound of sulfur from said exhaust gases; and

d. passing said exhaust gases containing said heavy metal in a lower oxidation state into the atmosphere.

8. A method for the treatment of exhaust gases containing detectible quantities of a multivalent heavy metal in a high oxidation state which comprises:

a. introducing an alkali metal bisulfite which is dissolved in an aqueous solution into contact with the exhaust gases;

b. maintaining the contact of said alkali metal bisulfite with said exhaust gases under acidic conditions to favor the reduction of said heavy metal into a lower oxidation state and produce a compound of sulfur in a higher oxidation state than in said alkali metal bisulfite;

c. treating the exhaust gases containing said heavy metal in a lower oxidation state and residual alkali metal bisulfite and compound of sulfur to remove said alkali metal bisulfite and compound of sulfur from said exhaust gases; and

d. passing said exhaust gases containing said heavy metal in a lower oxidation state into the atmosphere.

4,897,248

METHOD FOR TREATING EXHAUST GAS

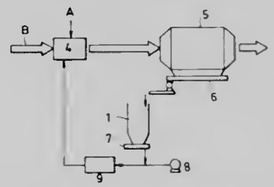
Mitsuhiro Horiguchi; Shigechika Tomisawa; Yukio Iida, and Joji Tonomura, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 759,410, Jul. 26, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 120,772

Claims priority, application Japan, Jul. 30, 1984, 59-157620; Feb. 12, 1985, 60-23568; Jul. 1, 1985, 60-142608; Jul. 1, 1985, 60-142609

Int. Cl.[4] B01D *53/34*

U.S. Cl. 423—240 **5 Claims**



1. A method for removing HCl gas component from an exhaust gas which is at a temperature above its dew point comprising, collecting used slaked lime powder, cooling the used slaked lime powder to below the dew point of said exhaust gas, and blowing said cooled powder into said exhaust gas in order to remove the HCl gas component from said exhaust gas.

4,897,249

BARIUM BORATE PREPARATION

Sidney D. Ross, Williamstown, and Manuel Finkelstein, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 3, 1989, Ser. No. 332,316

Int. Cl.[4] C01B *35/12, 15/12;* **C04B** *35/46, 35/48*

U.S. Cl. 423—280 **2 Claims**

1. A process for preparing barium borate, said process consisting essentially of obtaining a purified filtrate of soluble barium hydroxide by boiling barium hydroxide octahydrate in water and filtering off any insoluble material, reacting an aqueous solution of boric acid with said purified barium hydroxide compound in boiling water, precipitating the reaction product of hydrated γ-BaB_2O_4 having a barium to boron ratio of 1:2 from said water, converting the hydrated product to anhydrous γ-BaB_2O_4 at 300° to 400° C., and converting the anhydrous product to β-BaB_2O_4 at 600° to 800° C.

4,897,250

PROCESS FOR PRODUCING CALCIUM PHOSPHATE

Masaya Sumita, Tokyo, Japan, assignor to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 115,931, Nov. 2, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 301,411

Claims priority, application Japan, Oct. 31, 1986, 61-260196

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—308 **11 Claims**

1. A process for producing a calcium phosphate comprising the steps of

(a) dissolving at least one first member selected from the group consisting of calcium hydroxide and calcium oxide in water with at least one second member selected from the group consisting of a sugar, a sugar alcohol, and a polyhydric alcohol, said at least one second member present in a total concentration effective to increase the solubility of the calcium hydroxide or calcium oxide in water;

(b) and adding phosphoric acid to the solution obtained to precipitate a calcium phosphate.

4,897,251

CATALYTIC REMOVAL OF HYDROGEN SULPHIDE FROM LIQUID SULPHUR

Jacques Maurice, Pau; Romain Fouque, Poey de Lescar, and Jean-Louis Auriol, Pau, all of France, assignors to Societe Nationale Elf Aquitaine (production), Paris, France

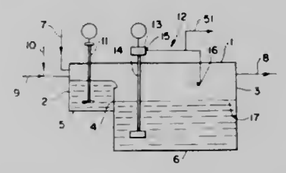
PCT No. PCT/FR87/00268, § 371 Date Mar. 9, 1988, § 102(e) Date Mar. 9, 1988, PCT Pub. No. WO88/00570, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 8, 1987, Ser. No. 171,878

Claims priority, application France, Jul. 10, 1986, 86 10063

Int. Cl.[4] C01B *17/02;* **B01J** *31/02*

U.S. Cl. 423—578 R **35 Claims**



1. In a process for the removal of H_2S present in liquid sulfur in a dissolved state or combined as hydrogen polysufides wherein a catalyst system comprising at least one basic compound is admixed with liquid sulfur and the H_2S is separated from the liquid sulfur, the improvement which comprises including in the catalyst system at least one surfactant compound which has substantially no basic properties.

4,897,252

PRODUCTION OF HYDROGEN PEROXIDE

Robert N. Cochran, West Chester, and Lawrence M. Candela, Philadelphia, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

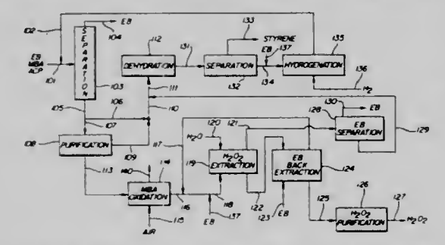
Filed Jan. 10, 1989, Ser. No. 295,409

Int. Cl.[4] C01B *15/026;* **C07C** *45/00*

U.S. Cl. 423—591 **3 Claims**

1. A process for the production of hydrogen peroxide which

comprises reacting methyl benzyl alcohol with molecular oxygen in the liquid phase, and maintaining the concentration



of water in the liquid phase below 4% by weight during the reaction.

4,897,253

CATALYTIC GENERATION OF HYDROGEN FROM HYDROCARBONS

John W. Jenkins, Reading, England, assignor to Johnson Matthey Public Limited Company, London, England

Filed Sep. 29, 1987, Ser. No. 102,470

Claims priority, application United Kingdom, Sep. 30, 1986, 8623482

Int. Cl.[4] C01B *3/38*

U.S. Cl. 423—651 **10 Claims**

1. A process for generating hydrogen by the partial oxidation of a hydrocarbon, which process does not require the application of external heat for the process to proceed, and which comprises injecting into at least one point amongst a mass of a catalyst consisting essentially of platinum and chromium oxide supported on a refractory solid catalyst support, a mixture comprising a hydrocarbon and oxygen, the point of injection having a local temperature of from 700° to 1000° C. the hydrocarbon reacting with the oxygen to generate said hydrogen.

4,897,254

RADIOACTIVE COMPOSITIONS FOR THE TREATMENT OF CALCIFIC TUMORS

Jaime Simon, Angleton, Tex.; Wynn A. Volkert, Columbia, Mo.; David A. Wilson, Richwood, Tex.; David E. Troutner, Columbia, Mo., and William F. Goeckeler, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 762,361, Aug. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 652,702, Sep. 21, 1984, abandoned. This application Mar. 3, 1987, Ser. No. 21,382

Int. Cl.[4] A61K *43/00*; C07F *11/00*

U.S. Cl. 424—1.1 **18 Claims**

1. A composition comprising a complex which comprises a chelant and a radionuclide wherein the chelant is hydroxyethylethylenediaminetriacetic acid or a physiologically acceptable salt thereof with a radionuclide selected from the group consisting of Sm-153, Gd-159 and Ho-166, wherein the molar ratio of chelant to radionuclide is about 50:1 or more, and a physiologically acceptable liquid carrier.

4,897,255

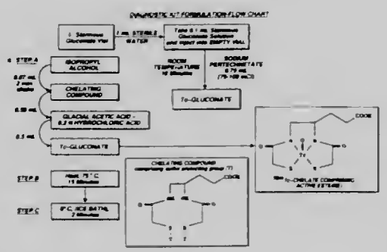
METAL RADIONUCLIDE LABELED PROTEINS FOR DIAGNOSIS AND THERAPY

Alan R. Fritzberg, Edmonds; Sadhakar Kasina; Ananthachari Srinivasan, both of Kirkland, and Daniel S. Wilbur, Edmonds, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 817,321, Jan. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 692,000, Jan. 14, 1985, abandoned. This application Jan. 19, 1987, Ser. No. 65,011

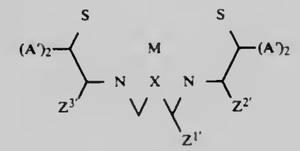
Int. Cl.[4] A61K *49/02, 39/395*

U.S. Cl. 424—1.1 **9 Claims**



1. A method for preparing a radiolabeled polypeptide which comprises:

combined in an aqueous medium, said polypeptide and said compound of the formula



wherein:

M is a metal or metal oxide radionuclide ion;

one of Z^1, Z^2, Z^3, or Z^4, is R'CW'(HNV')n'Y', and the others are H_2 or =O;

R' is an aliphatic divalent radical of from 1 to 6 carbon atoms and 0 to 2 heteroatoms;

V' is of the formula R'CW';

W' is H_2 or =NH or =0, with the proviso that the W' bonded to the carbon atom bonded to Y' is H_2 when Y' is -NH2;

X' is a bond, methylene or CHZ4;

A' is H or lower alkyl of from 1 to 6 carbon atoms;

n' is 0 to 1; and

Y' is the leaving group of an active ester, said ester reacting with said polypeptide to form an amide or amidine bond with said polypeptide; or NH_2; or $NHNH_2$, with the proviso that when Y' is NH_2 or $NHNH_2$, said polypeptide has an oxo-group as a result of glycol cleavage of a sugar bound to said polypeptide, and said combining is under reductive amination conditions;

wherein said compound forms a stable covalent bond to said polypeptide.

4,897,256

LHRH ANALOG FORMULATIONS

Akwete L. Adjei, Wadsworth; Edwin S. Johnson, Antioch, and James W. Kesterson, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 934,874, Nov. 25, 1986. This application Nov. 4, 1987, Ser. No. 114,359

Int. Cl.[4] A01N *25/02*

U.S. Cl. 424—43 **2 Claims**

1. An aerosol formulation comprising 0.01-5% w/w/ LHRH analog, 0.05-10% w/w/ surfactant, 0-55% w/w/ solvent and 30-99% w/w/ propellant.

4,897,257

METHOD FOR PRODUCING FOAMABLE COMPOSITION

Hirokazu Nishikawa, Minamikawachi; Junzou Yamashita, Toyonaka, and Hiroshi Kimura, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 822,226, Jan. 24, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 282,989

Claims priority, application PCT Int'l Appl., Feb. 7, 1985, PCT/JP85/00050; Nov. 8, 1985, PCT/JP85/00625

Int. Cl.[4] A61K *9/46, 9/20, 31/375*

U.S. Cl. 424—44 **10 Claims**

1. In a method for producing a foamable composition which comprises mixing Component-A which is a solid alkali or alkaline earth metal salt of carbonic acid, Component-B which is a solid aliphatic carboxylic acid, and Component-C which is vitamin C, the improvement which comprises mixing Component-C into Component-B, and mixing Component-A and the resultant Component-B together after separately moisturizing the Component-A and the resultant Component-B with approximately 0.5-5% (w/w) water, the ratio of Component-A to Component-B being approximately 1:1-1:2 and the ratio of Component-C to the total of Component-A and Component-B being approximately 60% or less by weight.

4,897,258

PERIODONTAL COMPOSITION AND METHOD

Jerome B. Rudy; Melvin Denholtz, both of Livingston; Jeffrey R. Denholtz, Stanhope, and Peter D. Bohm, Freehold, all of N.J., assignors to Peroxydent Group, Livingston, N.J.

Continuation-in-part of Ser. No. 2,177, Jan. 12, 1987, Pat. No. 4,837,008, and a continuation-in-part of Ser. No. 721,210, Apr. 9, 1985, and a continuation-in-part of Ser. No. 532,182, Sep. 14, 1983, abandoned. This application Jan. 28, 1988, Ser. No. 149,402

Int. Cl.[4] A61K *7/20, 33/40*

U.S. Cl. 424—53 **8 Claims**

1. A non-aqueous peridontal paste or gel dentifrice composition, comprising:

a water soluble, non-aqueous vehicle having dispersed therein sodium bicarbonate or potassium bicarbonate and calcium peroxide without barrier coatings as the essential active agents providing bactericidal active oxygen upon breakdown of the peroxide by tissue contact and by reaction with the bicarbonate in the oral cavity, effective to thereby inhibit the motility of harmful anaerobic gum disease-causing bacteria that live and thrive therein in the gum crevices and which cannot survive in an oxygenated environment; said composition being substantially completely anhydrous; the quantities and relative proportions of said peroxide and bicarbonate being sufficient to provide quantities of bactericidally active oxygen upon breakdown of said peroxide by reaction with said bicarbonate upon intermixing with water and use in the oral cavity, and to provide a neutral or basic pH upon dispersal of said composition in water; the bicarbonate being present in a weight ratio of sodium bicarbonate to said peroxide in the range of 4:1 to 8:1, (or equivalent potassium bicarbonate), said peroxide comprising at least about 1% to about 10% by weight of the composition, where said peroxide content is calculated on the basis of 60% CaO_2; said bicarbonate having an average particle size from about 100 to about 2,000 microns, the stability of the peroxide being increased by decreasing the surface area of the bicarbonate by increasing its particle size; said water soluble non-aqueous vehicle being essentially hydrophilic, water soluble and adapted to rapidly dissolve with water when used, and having an effective viscosity for use as a toothpaste or gel between about 2,000 to 200,000 cps.

4,897,259

HIGH OIL PHASE PHARMACEUTICAL VEHICLES AND SUNSCREEN COMPOSITIONS HAVING WATERPROOF SUN PROTECTION FACTORS

Terrence J. Murray, Buffalo; Bhiku G. Patel, Tonawanda, and Richard O. Muhlhauser, Grand Island, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 938,708, Dec. 4, 1986, Pat. No. 4,810,489. This application Nov. 7, 1988, Ser. No. 268,105

Int. Cl.[4] A61K *7/42, 7/44, 9/10*; B01J *13/00*

U.S. Cl. 514—938 **9 Claims**

1. A waterproof pharmaceutical vehicle in the form of an aqueous emulsion system having an oil phase content of from about 35% to about 65%, wherein the emulsion system comprises:

from about 1% to about 10% of an oil soluble polyvinylpyrrolidone and long alkyl chain olefin copolymer;

from about 2% to about 10% of an emulsifier; and

a solvent system comprising

from about 4% to about 20% of a C_4–C_{22} fatty acid, alcohol or ester thereof,

from about 4% to about 25% of a glycol ester or glycol diester, and

from 0% to about 13% of a branched chain ester of a C_4–C_{22} carboxylic acid.

4,897,260

COMPOSITIONS THAT AFFECT SUPPRESSION OF CUTANEOUS DELAYED HYPERSENSITIVITY AND PRODUCTS INCLUDING SAME

Peter M. Ross, New York, and H. Leon Bradlow, Holliswood, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 53,379, May 22, 1987, which is a continuation-in-part of Ser. No. 30,764, Mar. 25, 1987. This application Feb. 29, 1988, Ser. No. 161,743

Int. Cl.[4] A61K *7/40, 7/42, 7/44, 7/48*

U.S. Cl. 424—59 **2 Claims**

1. A method of treating individuals suffering from xeroderma pigmentosum which comprises administering topically to the affected area of an individual in need of such therapy an effective amount of a glucocorticoid carboxylic acid ester sufficient to prevent skin cancer after exposure to UV radiation.

4,897,261

FINGERNAIL COSMETIC COMPOSITION

Kazunori Yamazaki; Muneo Tanaka; Yutaka Okunuki; Yoshikazu Soyama, and Masaaki Ishiwatari, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,895

Int. Cl.[4] A61K *7/043*

U.S. Cl. 424—61 **6 Claims**

1. A fingernail cosmetic composition containing at least one resin, at least one organic solvent, 0.5 to 30% of water based on the total weight of the composition, and a water-incorporating compound having at least one hydrophilic moiety and at least one lipophilic moiety, the weight ratio of the water-incorporating compound to water ranging from 0.1 to 200:100, said water-incorporating compound being at least one member selected from the group consisting of water-soluble polymers having an average molecular weight of 1,000 to 2,000,000 and

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oil-soluble polymers having an average molecular weight of 1,000 to 2,000,000.

4,897,262

NON-AEROSOL HAIR SPRAY COMPOSITION

Arun Nandagiri, Rockaway; Paul S. Wallace, Glen Rock, and Beverly J. Lajoie, River Edge, all of N.J., assignors to Playtex Jhirmack, Inc., Stamford, Conn.

Filed Mar. 22, 1988, Ser. No. 171,635
Int. Cl.[4] A61K *7/11*
U.S. Cl. 424—71 **9 Claims**

1. A non-aerosol hair spray for styling and holding the hair consisting essentially by weight of about 5 to 10 percent of a partly neutralized alkyl ester of alkyl vinyl ether maleic acid copolymer, in which the alkyl ester consists of four carbons or less, about 10 to 15 percent water, about 73 to 85 percent aliphatic 2 to 3 carbon atom monohydric alcohol and about 0.1 to 2 percent adjuvant.

4,897,263

METHODS AND COMPOSITIONS FOR TREATMENT OF PATHOLOGICAL HYDROPHOBIC INTERACTIONS IN BIOLOGICAL FLUIDS

Robert L. Hunter, Tucker, Ga., assignor to Emory University, Atlanta, Ga.

Division of Ser. No. 291,925, Dec. 29, 1988, and a continuation-in-part of Ser. No. 45,459, May 7, 1987, Pat. No. 4,801,452, which is a continuation-in-part of Ser. No. 43,888, Apr. 29, 1987, which is a continuation of Ser. No. 863,582, May 15, 1986, abandoned. This application Jun. 1, 1989, Ser. No. 359,903
Int. Cl.[4] A61K *31/475*
U.S. Cl. 424—83 **5 Claims**

1. A method of protecting damaged cells and tissue from reperfusion injury in an animal or human comprising the step of injecting into the animal or human with the damaged tissue an effective amount of a surface active copolymer with the following general formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein a is an integer such that the hydrophobe represented by (C_3H_6O) has a molecular weight of approximately 950 to 4000, and b is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes approximately 50% to 95% by weight of the compound.

4,897,264

HUMAN GAMMA INTERFERON-SPECIFIC RECEPTOR PROTEIN, ANTIBODY AGAINST SAID PROTEIN, METHODS FOR OBTAINING SAID PROTEIN AND SAID ANTIBODY AND COMPOSITIONS CONTAINING SAID PROTEIN AND ANTIBODY

Daniela Novick; Patricia Orchansky; Dina Fischer, all of Rehovot, and Menachem Rubinstein, Givat Shmuel, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Mar. 27, 1987, Ser. No. 30,640
Claims priority, application Israel, Apr. 8, 1986, 78444
Int. Cl.[4] A61K *39/00, 45/02*
U.S. Cl. 424—85.5 **22 Claims**



1. A human gamma inteferon-specific receptor protein in a soluble and at least partially purified form, said protein not being an immunoglobulin.

4,897,265

METHOD FOR TREATING DISORDERS OF THE VASCULAR AND PULMONARY SYSTEMS

Ralph J. Stolle, Oregonia, Ohio, and Lee R. Beck, Birmingham, Ala., assignors to Stolle Research & Development Corporation, Cincinnati, Ohio

Division of Ser. No. 546,162, Oct. 27, 1983, Pat. No. 4,636,384, which is a continuation-in-part of Ser. No. 384,625, Jun. 3, 1982, abandoned. This application Jan. 9, 1987, Ser. No. 1,848
Int. Cl.[4] A61K *39/40, 35/20*
U.S. Cl. 424—87 **13 Claims**

1. A method for reducing particulate matter deposited in lungs wherein said particulate matter is associated with environmental particulates in smoke, in an animal which comprises:
administering to said animal milk collected from a bovid being maintained in a hyperimmune state, in an amount and for time sufficient to stimulate phagocytosis of said particulate matter present in said lungs.

4,897,266

NOVEL PHYSIOLOGICAL PRODUCT EXTRACTED FROM ALGAE AND PLANTS

Rene A. Herve, Plancoët, and Serge Percehais, Saint Malo, both of France, assignors to Laboratoires Goemar S.A., France

Continuation of Ser. No. 884,673, Jul. 16, 1986, abandoned, which is a continuation of Ser. No. 638,463, Jul. 31, 1984, abandoned. This application Apr. 18, 1988, Ser. No. 185,241
Claims priority, application France, Dec. 30, 1982, 82 22136; Dec. 30, 1982, 82 22137; Nov. 30, 1983, 83 19142
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **18 Claims**

1. A substantially sterile liquid physiological product obtained from a natural raw material selected from the group consisting of whole algae, whole plant, and parts thereof by cryocomminuting one of said algae and said plants to produce a pulp having a particle size of between about 100 to 10 microns; subjecting the pulp to molecular milling in a reciprocating piston-valve molecular-mill defining a space between said piston and said valve which causes bursting of vegetative cells and a release of large quantities of intracellular liquid; ultra-decanting the molecular milled pulp to obtain a liquid protoexoplasma and a paste and then ultra-filtering said protoexoplasma on a filter having a membrane with a power of cut off of less than 20,000 in a sterile atmosphere thereby obtaining said substantially sterile, liquid physiological product.

4,897,267

MICROPARTICLES COMPRISING A BIODEGRADABLE POLYMER CONTROLLING THE RELEASE OF AN ANTIMALARIA ACTIVE PRINCIPLE, PHARMACEUTICAL COMPOSITIONS COMPRISING IT AND PROCESS FOR ITS PREPARATION

José Bontemps, Xhendremael; Philippe Pirson, Wezembeek-Oppem; Jean-Bernard Falmagne, Wavre; Robert Jerome, Tilff; Philippe Teyssie, Condroz; Luc Delattre, Oupeye, and Brigitte Evrard, Verlaine, all of Belgium, assignors to Ire-Celltarg S.A., Fleurus, Belgium

Filed Jul. 28, 1988, Ser. No. 225,395
Claims priority, application France, Jul. 30, 1987, 87 10802
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—422 **20 Claims**

1. Microparticles consisting of microspheres constituted by a polylactide polymer matrix, within which is distributed an active principle which is primaquine, one of its derivatives of the formula

PQ—X

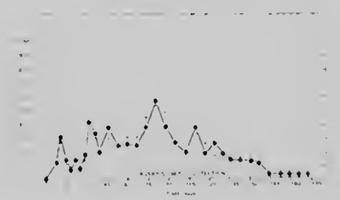
in which,
PQ represents primaquine,
X represents an amino acid or a peptide of 2 to 4 amino acids, the linkage PQ—X being a peptide covalent linkage between the free amine group of PQ and the carboxylic group of X, or conjugates of PQ or PQ—X with a hepatotropic vector, or one of their pharmaceutically acceptable salts.

4,897,268

DRUG DELIVERY SYSTEM AND METHOD OF MAKING THE SAME

Thomas R. Tice, and Richard M. Gilley, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Aug. 3, 1987, Ser. No. 81,289
Int. Cl.[4] A61F *5/46*
U.S. Cl. 424—422 **32 Claims**



1. A method of preparing a composition for delivering a an effective amount of a constant dose of an active ingredient to an animal over a preselected, prolonged period of time, comprising the steps of:
(a) encapsulating effective amounts of said ingredient in first and second separate biodegradable and biocompatible copolymer excipients having different monomers ratios to form first and second microcapsules, each of said microcapsules having of a different rate of release therefrom of said ingredient; and
(b) combining an effective amount of said first and second microcapsules to form said composition having a delivery profile wherein the release of said ingredient through said second microcapsule begins as the release of said ingredient through said first microcapsule declines.

4,897,269

ADMINISTRATION OF DRUGS WITH MULTIPHASE LIPOSOMAL DELIVERY SYSTEM

Michael Mezei, Halifax, Canada, assignor to Mezei Associates Limited, Nova Scotia, Canada

Division of Ser. No. 774,266, Sep. 10, 1985, Pat. No. 4,761,288, which is a continuation-in-part of Ser. No. 653,997, Sep. 24, 1984, abandoned. This application Jun. 27, 1988, Ser. No. 212,012
Int. Cl.[4] A61K *9/66, 37/22;* **B01J** *13/02*
U.S. Cl. 424—450 **6 Claims**

1. A method for administering a slightly water soluble biologically active compound comprising:
topically applying a pharmaceutical composition comprising:
(a) multilamellar lipid vesicles with a slightly water soluble biologically active compound captured therein;
(b) a saturated solution of the biologically active compound; and
(c) the biologically active compound in solid form.

4,897,270

PHARMACEUTICAL COMPOSITIONS

David S. Deutsch, London, and Jamshed Anwar, Ilford, both of United Kingdom, assignors to Glaxo Group Limited, GB2

Continuation of Ser. No. 71,163, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 913,267, Sep. 30, 1986, abandoned. This application Dec. 30, 1988, Ser. No. 291,364
Claims priority, application United Kingdom, Sep. 30, 1985, 8524001
Int. Cl.[4] A61K *9/28, 9/36, 31/71*
U.S. Cl. 424—465 **19 Claims**

1. A film coated pharmaceutical tablet for oral administration which comprises a tablet core containing an effective amount of cefuroxime axetil as active ingredient, an effective amount of a disintegrant to produce tablet core disintegration immediately following film coat rupture, and a film coat which serves to mask the bitter taste of cefuroxime axetil upon oral administration, the film coat having a rupture time of less than 40 seconds when measured by a rupture test wherein the tablet is placed in a beaker of still 0.07M hydrochloric acid at 37° C., the rupture time being measured as the time which elapses before the core of the tablet first becomes visible to the naked eye through the ruptured film coat; and the tablet core disintegrating immediately following rupture of the film coat in the said rupture test.

4,897,271

INHIBITION OF ENZYMATIC BROWNING IN SHRIMP

Petros S. Taoukis, Minneapolis; Theodore P. Labuza, Arden Hills; Shao-Wen Lin, St. Paul, and Janet H. Lillemo, Minneapolis, all of Minn., assignors to University of Minnesota, Minneapolis, Minn.

Filed May 20, 1988, Ser. No. 197,038
Int. Cl.[4] A23L *1/33*
U.S. Cl. 426—7 **2 Claims**

1. A process for inhibiting oxidative darkening in a shrimp comprising the step:
treating the shrimp with an amount of a purified protease, wherein the amount is effective to inhibit oxidative darkening of the shrimp.

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4,897,272

PROCESS FOR PRODUCING RICE VINEGAR

Terumasa Kubota, Toyohashi; Isao Itoh, Kashihara, and Shinji Tanijiri, Saita, all of Japan, assignors to Tamanoi Vinegar Corporation Limited, Osaka, Japan

Filed Nov. 20, 1987, Ser. No. 123,595
Int. Cl.[4] C12J *1/04*
U.S. Cl. 426—17 5 Claims

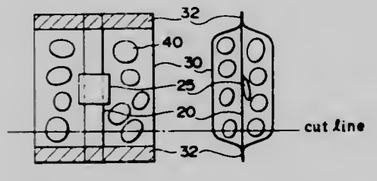
1. A process for producing rice vinegar, comprising:
subjecting rice to saccharification, whereby a saccharified liquid is obtained,
purifying the saccharified liquid with at least one nitrogen-removing treatment to control the amount of soluble nitrogen in the liquid, whereby a purified saccharified liquid is obtained,
subjecting the purified saccharified liquid to alcoholic fermentation, whereby an alcoholic fermentation product is obtained,
subjecting the alcoholic fermentation product to acetic acid fermentation using an acetic acid-producing microorganism, whereby an acetic acid fermentation product is obtained,
adding a gluconic acid fermentation liquid to the acetic acid fermentation product,
mixing the gluconic acid fermentation liquid with the acetic acid fermentation product to obtain a liquid mixture,
filtering the liquid mixture by passing the mixture through an ultrafiltration membrane having a pore size of less than 0.2 μm, whereby the acetic acid-producing microorganism is removed, and
recovering rice vinegar from the filtered liquid mixture.

4,897,273

PACKAGE WITH FRESHNESS KEEPING AGENT SACK

Kazutoshi Kotaki; Syuji Wakamatsu, both of Tokyo; Tadahiko Egawa, Mobara; Yoshikazu Morita, and Kou Iwata, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Japan

Filed Aug. 6, 1987, Ser. No. 82,146
Claims priority, application Japan, Aug. 8, 1986, 61-121003; Apr. 10, 1987, 62-86945
Int. Cl.[4] B65D *81/24*
U.S. Cl. 426—118 7 Claims



1. A package containing a product to be preserved and a sack of a freshness keeping agent, said sack and its contents being adapted to remove from the atmosphere in the package components that would diminish the product freshness, said package comprising opposed walls that are heat-sealed together at opposed ends of a first dimension of said package to define a product-containing space; and a sheet within the product-containing space extending between and integrally heat-sealed into, said opposed heat-sealed ends of the package but being otherwise unattached to the package walls, said sheet having a width that is less than the corresponding dimension of the package, and having the sack of freshness keeping agent attached thereto at a point remote from the heat-sealed ends of the sheet.

4,897,274

MULTI-LAYER HIGHLY MOISTURE AND GAS PERMEABLE PACKAGING FILM

Giovanni Candida, Via D'Annunzio, and Luigi Perazzo, Cuneo, both of Italy, assignors to W. R. Grace & Co., Duncan, S.C.

Filed Jul. 13, 1987, Ser. No. 72,497
Claims priority, application European Pat. Off., Oct. 29, 1986, 86115018.3
Int. Cl.[4] B32B *27/28;* B65D *75/00*
U.S. Cl. 426—127 5 Claims

1. A multilayer high permeability packaging film comprising:
(a) two layers comprising a polymeric resin selected from the group consisting of
(i) very low density polyethylene with a comonomer content of from 10% to 22% by weight of the very low density polyethylene, said comonomer selected from the group consisting of C_4—, C_6— and C_8-alpha-n-olefins,
(ii) polybutylene and copolymers thereof,
(iii) poly-4-methyl-pentene-1,
(iv) polyethylene terephthalate glycol,
(v) polyether,
(vi) polyurethanes, and
(vii) elastomeric copolyesters; and
(b) a third layer disposed between the two layers and comprising butadiene-styrene copolymer with a styrene content of from 60% to 80% by weight of the copolymer.

4,897,275

PROCESS FOR PREPARING FROZEN FRIED FOOD

Koji Nagai; Setsuko Aoki, and Masaru Furuta, all of Tokyo, Japan, assignors to Taiyo Fishery Co., Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,320
Claims priority, application Japan, Jun. 18, 1987, 62-151849
Int. Cl.[4] A23B *4/10*
U.S. Cl. 426—289 15 Claims

1. A process for preparing a frozen fried food which comprises coating a food material to be fried with a particle/powder mixture comprising porous particle and a hygroscopic powder at a ratio of weight of 1:10 to 10:1, and then freezing the same; and wherein said porous particles comprise particles obtained by adding water to a material selected from the group consisting of wheat flour, starch, gluten, soybean protein, corn meal, glutinous rice flour, rice flour, soybean meal, mashed potatoes, milk protein, fish meat, flesh meat, yolk and albumen, and thereafter frying the resulting mixture in hot oil.

4,897,276

PROCESS AND COMPOSITION FOR PROTECTING AND CUSHIONING

Ralph J. Locke, Boyne City, Mich., and David C. Netherton, Valparaiso, Ind., assignors to Plan B, Inc., Wauwautosa, Wis.

Filed Mar. 14, 1988, Ser. No. 167,404
Int. Cl.[4] B65B *25/00, 31/02*
U.S. Cl. 426—307 13 Claims

1. A process for packaging a food product having a bag puncturing surface of sufficient sharpness to puncture an outer wrapper when the bag is in overlying relationship thereto, the process comprising the steps of:
liquefying a polymeric composition consisting essentially of:
(a) a polymer selected from the group consisting of polyethylene, ethylene vinyl acetate and mixtures thereof, present in an amount between about 40% and about 90% by weight of said polymeric composition, the polymer having a molecular weight between about 1,800 and about 25,000 molecular weight units;
(b) a polyterpene resin, said polyterpene resin present in an amount sufficient to impart flexible resiliency to said polymeric composition, upon solidifying of said polymeric composition; and
(c) an antioxidant stabilizer present in amounts sufficient to prevent oxidation of said polymeric composition and surrounding food product;
admixing the liquefied polymeric composition with a gas, capable of producing foaming in said polymeric composition, to entrain said gas therein, said gas being present in an ratio of between about 1:1 and about 1:10, gas to composition, respectively;
selectively spraying said admixture of said polymeric composition and said gas directly onto the bag puncturing surface while simultaneously allowing said polymeric composition to foam, to selectively cover the bag puncturing surface, said admixture applied at a point-of-contact temperature of between about 80° F. and about 130° F.;
allowing the applied foamed material to solidify and adhere to the product in the form of a flexible resilient coating on said surface; and, then,
encasing the product in said outer wrapper to form a package such that the foamed flexible resilient coating is interposed between said bag puncturing surface and said wrapper in an amount sufficient to prevent puncture of said wrapper.

4,897,277

METHOD FOR PRODUCING CHEESE BY MEANS OF MICROFILTRATION

Bernard Dieu; Jean Cuq, both of Sebazac; Blas Tarodo de la Fuente; Michel Beanasar, both of Assas, and Jean-Marc Desroches, Les Costes Rouges, all of France, assignors to Valmont S.A., Montauban, France

PCT No. PCT/FR87/00496, § 371 Date Aug. 10, 1988, § 102(e) Date Aug. 10, 1988, PCT Pub. No. WO88/04141, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 11, 1987, Ser. No. 246,662
Claims priority, application France, Dec. 12, 1986, 86 17464
Int. Cl.[4] A23C *19/05*
U.S. Cl. 426—491 9 Claims

1. A process for producing cheese from milk, comprising the steps of:
(a) homogenizing raw milk;
(b) treating said raw milk to obtain a coagulum containing precipitated whey protein, curd and whey;
(c) transporting said coagulum through at least one microfiltration loop wherein said curd and said whey protein is separated from said whey; and
(d) removing said curd and whey protein from said microfiltration loop for further processing as cheese.

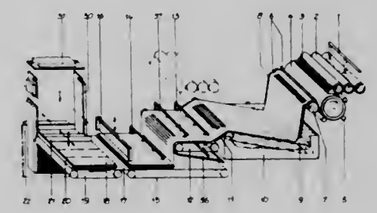
4,897,278

PROCESS FOR THE MANUFACTURE OF TEXTURED MEATS AND FISH PRODUCTS

Reinhard Schubring; Juergen Witt; Irene Harwardt; Sigrd Neumann, all of Rostock; Christoph Schneider, Kleinmachnow; Gerhard Mieth, Potsdam; Wolfgang Rase, Rostock, and Juergen Brueckner, Bergholz-Rehbruecke, all of Fed. Rep. of Germany, assignors to Institut fuer Hochseefischerei und Fischverarbeitung - Betrieb des VEB Fischkombinat Rostock, Rostock, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,068
Claims priority, application German Democratic Rep., Dec. 3, 1986, 2969866; Mar. 6, 1987, 3005127
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—577 11 Claims

1. A process for texturizing a mass containing proteins and including muscle flesh to produce a ready-to-cook texturized protein product, comprising comminuting a mass of muscle flesh to subcellular particles sizes of 10 to 200 microns, mixing the comminuted muscle flesh with 1 to 20%, based on the mass of the proteins, of pectins having a degree of esterification of 30 to 80%, shaping the mixture into sheets, heating the sheets to at least as high as 40° C. or cooling the sheets to at least as



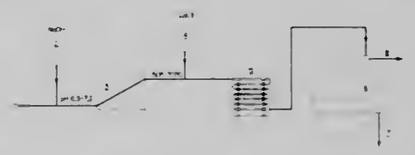
low as −15° C., and then freezing the sheets thereby to produce a ready-to-cook texturized protein product.

4,897,279

METHOD OF DEPHOSPHOLIPIDATING WHEY

Hanno Lehmann, and Ilol Wasen, both of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jan. 10, 1989, Ser. No. 295,420
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1988, 3800468
Int. Cl.[4] A23C *9/20;* A23L *1/29*
U.S. Cl. 426—583 7 Claims



1. A method of dephospholipidating whey comprising the steps of: aggregating lipoproteins by initially adjusting the pH of whey with continuously added sodium-hydroxide solution, heating the adjusted pH whey to at least 50° C., adding from 0.18 to 0.61 grams of calcium per liter of whey the heated whey, and keeping the whey hot for no longer than 3 minutes; and thereafter immediately centrifuging the hot whey to separate the lipoproteins.

4,897,280

PROCESSED SOYBEAN CURD FOOD HAVING A TEXTURE SIMILAR TO MEAT

Hideo Obtsu, Kawasaki, Japan, assignor to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,459
Claims priority, application Japan, Sep. 3, 1986, 61-208697
Int. Cl.[4] A23J *1/14*
U.S. Cl. 426—656 7 Claims

1. A processed soybean curd food having a texture similar to meat, comprising:
soybean curd; and
a fibrous soybean protein material prepared by using a single or twin screw extruder, and mixed together with the soybean curd to form the food with the texture similar to meat,
said soybean curd being obtained by coagulating soybean milk prepared from whole or defatted soybeans,
said protein material being obtained by heating and compressing a raw material containing 70 to 90 parts by weight of soybean protein, 10 to 30 parts by weight of starch, 0 to 5 parts by weight of an edible fat or oil, and 10 to 50 parts by weight of water and thereafter extruding the

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resulting substance, cutting the extruded substance into pieces each having a length of 10 to 30 mm, and swelling the cut pieces by adding water thereto.

4,897,281

PROCESS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM BY WAY OF MICROWAVE PLASMA CVD METHOD

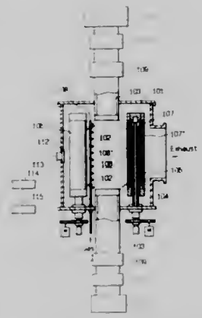
Takayoshi Arai; Shigehira Iida, both of Ueno; Keishi Saitoh, Nabari; Junichiro Hashizume, Ueno, and Tetsuya Takei, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,746

Claims priority, application Japan, May 26, 1987, 62-126885

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—8 8 Claims



1. In a microwave plasma chemical vapor deposition process for the formation of a functional deposited film on a plurality of cylindrical substrates by means of a microwave plasma chemical vapor deposition conducted in a substantially enclosed cylindrical film-forming chamber, said film-forming chamber comprising a circumferential wall having an end portion thereof hermetically provided with a microwave introducing window to which a waveguide extending from a microwave power source is connected, said film-forming chamber having a discharge space and a plurality of rotatable cylindrical substrate holders therein, each of said substrate holders being capable of having one of said cylindrical substrates positioned thereon, said substrate holders being concentrically arranged in said film-forming chamber so as to circumscribe said discharge space, said film-forming chamber being provided with means for supplying a film forming raw material gas into said discharge space and means for evacuating said film-forming chamber, wherein said process includes forming a functional deposited film on each of said cylindrical substrates by generating a plasma by microwave glow discharge in said film-forming raw material gas to form said functional deposited film while simultaneously rotating said cylindrical substrates, the improvement which comprises the steps of: (a) monitoring an effective power of microwaves to be introduced into said film-forming chamber, (b) generating an output signal indicative of the effective power of said microwaves corresponding to a given plasma intensity, and (c) controlling a match between (i) said effective power of said microwaves corresponding to a given plasma intensity in film-forming chamber and (ii) said microwaves to be introduced into said film-forming chamber in accordance with said output signal to thereby maintain the plasma intensity constant in said film-forming chamber irrespective of the time elapsed, whereby a functional deposited film exhibiting enhanced uniformity in thickness and in quality is formed on each of said cylindrical substrates at a high deposition rate.

4,897,282

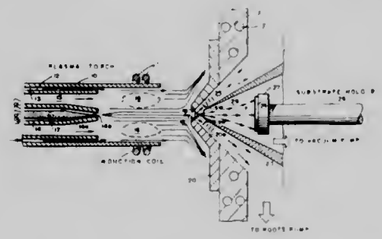
THIN FILM COATING PROCESS USING AN INDUCTIVELY COUPLED PLASMA

Richard N. Kniseley; Frederick A. Schmidt, and Brian D. Merkle, all of Ames, Iowa, assignors to Iowa State University Reserach Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 904,680, Sep. 8, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 199,286

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—34 10 Claims



7. The process for applying a coating of a normally solid material to a target substrate, comprising:

(a) within a zone at essentially atmospheric pressure generating an inductively coupled toroidal plasma from a monatomic gas, said generated plasma being in the form of an annulus with a plasma-free central portion;

(b) passing a carrier stream of said monatomic gas through the central portion of said plasma annulus;

(c) introducing a finely-divided, particulate solid coating material into said carrier gas upstream of said plasma annulus, the particles of said material having an average size of less than 50 microns;

(d) vaporizing the particles of said coating material by inductively coupled plasma heating as said stream passes through said plasma annulus;

(e) downstream of said annulus directing said stream containing said vaporized coating material through a first orifice which separates said atmospheric pressure zone from a first-vacuum zone, said orifice being of circular shape and having a diameter of from 0.125 to 2.5 millimeters, said first vacuum zone having a pressure maintained therein below 20 Torr, the diameter of said first orifice and the vacuum in said first zone being related so that said stream accelerates on passing through said first orifice to a velocity greater than Mach 1 within said first zone generating a shock wave along a front downstream of said first orifice, said shock wave providing a Mach disk at a predetermined distance from said first orifice and the vacuum being applied to said first-vacuum zone on the downstream side of said Mach disk;

(f) providing a second circular orifice having a diameter greater than the diameter of said first orifice in stream flow alignment therewith, said second orifice being provided in the tip of conical skimmer means extending downstream from said first orifice and separating said first vacuum zone from a second vacuum zone within said skimmer means which is maintained at a pressure below 10^{-4} Torr, said second orifice being located in relation to said first orifice so that said Mach disk is pierced by said skimmer means adjacent its orifice-providing tip;

(g) passing at least a portion of the coating material-containing stream through said second orifice; and

(h) supporting a target substrate within said second zone in alignment with said second orifice so that said stream portion impinges thereon, the coating material in the carrier stream being cooled below its melting temperature as it passes through said first and second vacuum zones and depositing in solid form on the target substrate.

4,897,283

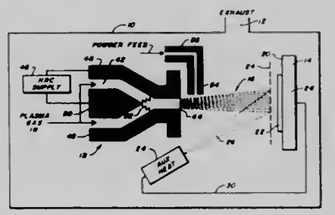
PROCESS OF PRODUCING ALIGNED PERMANENT MAGNETS

Kaplesh Kumar, Wellesley, and Dilip K. Das, Bedford, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 814,012, Dec. 20, 1985, abandoned, Continuation of Ser. No. 632,681, Jul. 20, 1984, abandoned, Division of Ser. No. 467,132, Feb. 16, 1983, abandoned. This application Jul. 6, 1987, Ser. No. 70,634

Int. Cl.[4] B05D *1/00, 5/12*

U.S. Cl. 427—34 11 Claims



1. A process for producing highly crystallographically aligned permanent magnet material comprising the steps of:

directing a spray of molten particulate rare earth-transition metal alloy toward the surface of a heated substrate;

depositing said molten particulate alloy on said surface; and

maintaining the temperature of said surface above approximately 966° but below the lower of the melting points of the substrate and the deposition material during the deposition so as to achieve a high degree of crystallographic alignment and corresponding high magnetic anisotropy in the deposition material.

4,897,284

PROCESS FOR FORMING A DEPOSITED FILM ON EACH OF A PLURALITY OF SUBSTRATES BY WAY OF MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION METHOD

Takayoshi Arai; Shigehira Iida; Junichiro Hashizume; Tetsuya Takei, all of Ueno, and Keishi Saitoh, Nabari, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,553

Claims priority, application Japan, Mar. 27, 1987, 62-073561

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—39 4 Claims

1. In a process for the formation of a functional deposited film on a plurality of cylindrical substrates by means of microwave plasma chemical vapor deposition using a microwave plasma chemical vapor deposition apparatus having a cylindrical deposition chamber comprising a circumferential wall having an end portion thereof provided with a microwave introducing window to which a waveguide extending from am microwave power source is connected, said cylindrical deposition chamber having a discharging space in which a plasma is formed, a non-discharging space in which a plasma is not formed and a plurality of rotatable cylindrical substrate holders disposed therein, each of said substrate holders capable of having one of said cylindrical substrates positioned thereon, said rotatable cylindrical substrate holders being concentrically arranged in said cylindrical deposition chamber so as to circumscribe said discharging space, said cylindrical deposition chamber being provided with means for supplying a film-forming raw material gas into said discharging space, said means for supplying said film-forming raw material gas including at least one gas liberation hole open to said discharging space and said cylindrical deposition chamber also provided with means for evacuating said cylindrical deposition chamber, said process including forming said deposited film on each of said cylindrical substrates by glow discharge of film-forming raw material gas in order to generate said plasma to effect the formation of said deposited film in said discharging space while rotating said cylindrical substrates, the improvement which comprises:

(a) disposing said means for supplying a film-forming raw material gas in a space between an adjacent pair of said circumscribed by said plurality of film-forming raw material gas-supplying means; and (b) regulating the thickness of said deposited film to 1000 Å or less formed on each of said cylindrical substrates for each cycle of rotation of said substrate passing through said discharging space.

4,897,285

METHOD AND APPARATUS FOR PCVD INTERNAL COATING A METALLIC PIPE BY MEANS OF A MICROWAVE PLASMA

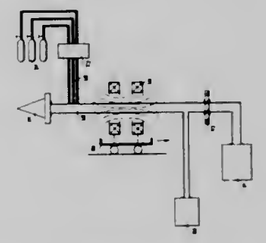
Rolf Wilhelm, Munich, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Jun. 13, 1989, Ser. No. 365,424

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820237

Int. Cl.[4] C23C *16/50*

U.S. Cl. 427—39 6 Claims



1. A microwave plasma method of depositing a coating of a prescribed material on a surface by means of a reaction of a vapor phase providing the prescribed material in which:

(a) adjacent the surface to be coated, an atmosphere containing said vapor phase is created at a pressure less than atmospheric pressure;

(b) in a region of the surface to be coated, a magnetic field is generated, and p1 (c) in the region of the surface to be coated, a high-frequency field is generated

and in which, pressure, field strength of the magnetic field and the frequency and power of the high-frequency field are all selected so that electron cyclotron resonance occurs in the region of the magnetic field, causing a low-pressure gas discharge to trigger the reaction furnishing the prescribed material, wherein for internally coating a pipe having at least its internal surface of metal, microwave energy is supplied into said pipe at a frequency which is propogated along said pipe and wherein said magnetic field is generated in a localized length of said pipe and transposed in the longitudinal direction of said pipe.

3. An apparatus for internally coating a pipe by means of a PCVD method, said apparatus comprising: p1 a microwave generator (**14**) coupled to one end of the pipe (**10**);

means (**22, 24**) connected to said pipe (**10**) for supplying the working gases;

vacuum pump means (**20**) connected to said pipe (**10**);

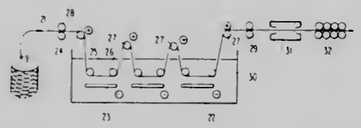
means (**28**) for generating a magnetic field adapted to be shifted along the length of said pipe (**10**).

4,897,286

METHOD FOR PRODUCING CARBON FIBER REINFORCED THERMOPLASTIC RESIN PRODUCT

Hiroyuki Kosuda; Yasuhisa Nagata, and Yoshikiro Endoh, all of Shizuoka, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 135,795, Dec. 21, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 291,362
Claims priority, application Japan, Dec. 20, 1986, 61-302779; May 1, 1987, 62-108442; Jun. 9, 1987, 62-143916
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **18 Claims**



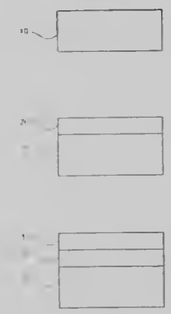
1. A process for producing a product of carbon fiber reinforced thermoplastic resin comprising immersing carbon fibers in a suspension of a powder of a thermoplastic resin in a liquid medium, which contains at least 20 wt% of an organic liquid which contains from 0 to 80 wt% water, to impregnate the thermoplastic resin among the carbon fibers, and heating the thermoplastic resin deposited on the fibers to melt and form a unitary assembly with carbon fibers.

4,897,287

METALLIZATION PROCESS FOR AN INTEGRATED CIRCUIT

Henry R. Berger, and Gretchen M. Adema, both of Durham, N.C., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Oct. 6, 1988, Ser. No. 254,252
Int. Cl.[4] B05D *5/12*; H01L *21/285*
U.S. Cl. 427—96 **15 Claims**



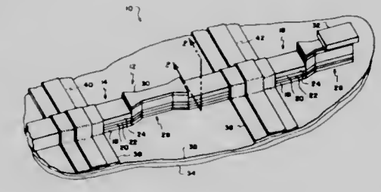
1. A metallization process for a silicon substrate comprising the steps of:
- codepositing a refractory metal and nitrogen on said substrate to form a first layer of refractory metal and nitrogen solid mixture on said substrate;
- depositing a refractory metal on said first layer, to form a second layer of refractory metal on said first layer; and
- heating to convert said first layer into refractory metal nitride and said second layer into refractory metal silicide.

4,897,288

VIALESS SHORTING BARS FOR MAGNETORESISTIVE DEVICES

Mark L. Jenson, Princeton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 8,211, Jan. 28, 1987, Pat. No. 3,754,431. This application Mar. 15, 1988, Ser. No. 168,293
Int. Cl.[4] G11C *11/15*
U.S. Cl. 427—123 **2 Claims**



1. A method of forming a magnetoresistive thin film device on a solid state material surface, comprising:
- forming a first layer of a ferromagnetic, magnetoresistive material on said surface;
- forming a second layer over said layer, wherein said second layer will serve to separate said first layer from subsequent layers;
- forming a third layer of a ferromagnetic magnetoresistive material over said second layer, wherein said second layer is comprised of a material which will prevent exchange coupling between said first and third layers;
- forming a fourth layer over said third layer, said fourth layer including tantalum and nitrogen;
- forming a fifth layer over said fourth layer, said fifth layer being comprised of a conductive material;
- removing portions of each of said five layers so that a strip including all of said five layers results;
- protecting selected, spaced portions of the upper surface of said fifth layer; and
- removing the part of said fifth layer which is unprotected.

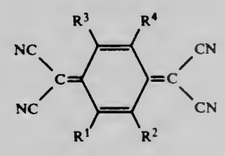
4,897,289

PRODUCTION OF AN ELECTRICALLY CONDUCTIVE SURFACE LAYER ON MOLDINGS CONSISTING OF PLASTICS

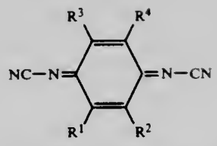
Alexander Aumueller, Ludwigshafen; Peter Neumann, Wiesloch; Gerd Blinne, Bobenheim, and Gerhard Lindenschmidt, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 56,705, Jun. 2, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,310
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619606
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—125 **15 Claims**

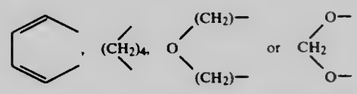
1. A process for making an electrically conductive surface layer on a molding, comprising:
- (i) coating a molding made of plastic which is soluble or swellable in organic solvents with a first solution of a tetracyanoquinonedimethane of the formula



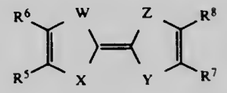
or of an N,N'-dicyanoquinonediimine of the formula



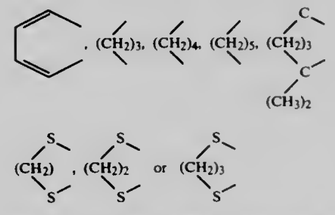
or a of a mixture of these compounds, where R^1, R^2, R^3 and R^4 independently of one another are each methyl, hydrogen, ethyl, propyl, isopropyl, methoxy, ethoxy, propoxy, butoxy, pentyloxy, methylthio, fluorine, chlorine, bromine or cyano, or one of the radicals R^1 and R^2 or one of the radicals R^3 and R^4 or one of the radicals R^1 and R^2 and one of the radicals R^3 and R^4 are phenyl or butyl, or R^1 and R^2 or R^3 and R^4 or R^1 and R^2 and R^3 and R^4 together form a radical of the formulae



where the fused aromatic rings are unsubstituted or monosubstituted or disubstituted by chlorine, bromine, methoxy or methyl, to obtain diffusion of said first solution only into the surface of said molding;
- (ii) drying the molding obtained in step (i);
- (iii) coating the molding obtained in step (ii) with a second solution of a tetrachalcogenafulvalene of the formula



where R^5, R^6, R^7 and R^8 independently of one another are each hydrogen, methyl, ethyl, phenyl, methylphenyl or methoxyphenyl, or R^5 and R^6 or R^7 and R^8 or R^5 and R^6 and R^7 and R^8 together form a radical of the formulae



and X, Y, W and Z are each selenium or sulfur, or a solution of an iodide of the formula

$$M^{m+}I_m^-$$

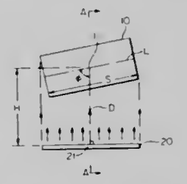
where M is an m-valent alkali metal, alkaline earth metal or transition metal, tin, lead, thallium, ammonium, phosphonium, arsonium or stibonium, copper, silver, pyridinium, N-methylpyridinium, quinolinium, N-methylquinolinium, phenazinium, N-methylphenazinium, tetramethylammonium, tetraethylammonium, tetrabenzylammonium, trimethylbenzylammonium or triethylbenzylammonium, and m is 1, 2 or 3, to obtain diffusion of said second solution only into the surface of said molding; and
- (iv) drying the molding obtained in step (iii) to obtain a molding having thereon an electrically conductive surface layer and in which the compositional integrity of the core of said molding has been unaffected by said steps (i) to (iv).

4,897,290

METHOD FOR MANUFACTURING THE SUBSTRATE FOR LIQUID CRYSTAL DISPLAY

Toru Terasaka, Hachioji; Kazuo Arai, Seki; Kazuo Asano, Hachioji, and Shinichi Nishi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 101,665, Sep. 28, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,157
Claims priority, application Japan, Sep. 26, 1986, 61-226184; Jun. 17, 1987, 62-148940
Int. Cl.[4] B05D *5/06*; C23C *16/00, 16/30*; G02F *1/13*
U.S. Cl. 427—162 **61 Claims**



1. A substrate including an alignment layer useful in a liquid crystal display device fabricated by the steps of:
- disposing a linear source in a vacuum chamber, said linear source having a linear dimension and a center point substantially half-way along said linear dimension;
- disposing at least one substrate having a centerline, a center and a first surface in said vacuum chamber in fixed space relation to said linear source so that said first surface faces and a centerline of the substrate and the linear source are coplanar with said linear source and said center of said substrate lies substantially along a line through said center of said linear source and perpendicular to said linear source, said substrate being rotated about said centerline to a desired angle θ, and the linear dimension of said linear source and a linear dimesion of said substrate projected onto said linear source being substantially equal;
- depositing material from said linear source onto said substrate.

4,897,291

WOOD SEALANT COMPOSITION

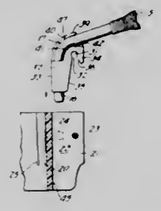
Moon Kim, Stone Mountain, Ga., assignor to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed Apr. 28, 1988, Ser. No. 187,419
Int. Cl.[4] B05D *3/02*; C08L *33/02*
U.S. Cl. 427—393 **25 Claims**

1. A sealant composition for application to a wood product to minimize moisture absorption by the wood product through a surface, comprising:
- (a) about 20 to 80 wt. % of an aqueous vehicle;
- (b) about 2 to 20 wt. % of first polymer solids having a glass transition temperature in the range of about −70° to 5° C.;
- (c) about 3 to 25 wt. % of a hydrophobic filler; and
- (d) about 0.03 to 1.5 wt. % of a water soluble methyl siliconate.

VOL 1110 ISS 5 JA 30 1990 UMI

4,897,292
BRANCH-HOLDER ASSEMBLY FOR ARTIFICIAL CHRISTMAS TREES
Joel I. Glickman, Huntingdon Valley, Pa., assignor to Magic Mold Corporation, Hatfield, Pa.
Filed Jan. 3, 1989, Ser. No. 292,816
Int. Cl.[4] A47G *33/06*
U.S. Cl. 428—8 **7 Claims**

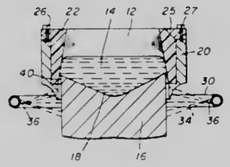


1. A pivotally foldable branch structure for an artificial Christmas tree or the like comprising
(a) a branch-mounting member provided with a plurality of radially oriented recesses each defined by spaced walls,
(b) pivot support means in said recesses,
(c) a plurality of bent wire branch elements having downwardly extending mounting portions and outwardly extending limb portions,
(d) pivotable adapter elements for said bent wire branch elements,
(e) said adapter elements each having a downwardly extending recess for the reception and containment of the mounting portions of said branch elements and an open-sided, outwardly extending recess, adjacent the top of said downwardly extending recess, for the reception of inner limb portions of said branch elements,
(f) said adapters being received in said recesses and supported by said pivot support means for pivoting movement about a horizontal axis to move said limb portions in an upward direction,
(g) the open-sided recesses of said adapters being effectively closed off by confronting surfaces of the spaced walls of said radially oriented recesses, whereby the limb portions of said branch elements are locked into said adapter elements when said adapter elements are mounted on said pivot means.

4,897,293
NOVEL ROOFING MEMBRANE AND METHOD OF MAKING
Charles Thessen, Franklin, Ky., assignor to Kendall Company, Lexington, Mass.
Filed Jul. 12, 1988, Ser. No. 217,810
Int. Cl.[4] D06N *7/00*; B29B *1/00*
U.S. Cl. 428—40 **10 Claims**

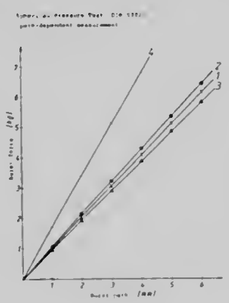
1. A method of making a skid-resistant ice and water protection roofing membrane comprising the steps of:
(1) applying a mass of linear low density polyethylene at the nip of two calender rolls wherein one of said rolls is heated above the melting point of said linear low density polyethylene and is rotating at a first relatively low speed, the other of said rolls being heated to a temperature below the melting point of said linear low density polyethylene and is rotating at a second substantially greater speed than said one roll, thereby forming a membrane characterized by having a substantially smooth surface adherent to said other roll and an opposed roughened or texturized surface;
(2) removing said membrane from said other roll; and
(3) thereafter applying a layer of adhesive to said smooth surface, thereby providing a roofing membrane characterized by having an adhesive layer on one surface thereof, the opposed surface being roughened or texturized.

4,897,294
INSULATING MATERIAL CONTAINING DELAMINATED VERMICULITE
Stephen C. Libby, Bowling Green, Ohio, and G. Edward Graddy, Jr., Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 123,336, Nov. 19, 1987, Pat. No. 4,773,470. This application Sep. 12, 1988, Ser. No. 242,499
Int. Cl.[4] B22C *1/18, 9/12*; B22D *7/10*; B28B *7/36*; B29C *33/38*
U.S. Cl. 428—34.1 **10 Claims**



10. An asbestos-free insulation material made by the steps of:
(a) mixing a dry mixture comprising about 15–25 wt % lime, about 15–25 wt % silica, about 12–20 wt % delaminated vermiculite, about 30–50 wt % wollastonite, and about 1–8 wt % organic fiber with water to form an aqueous slurry;
(b) molding the aqueous slurry into a wet shape;
(c) expelling water from the wet shape;
(d) heating the wet shape above about 100° C. in the presence of steam; and
(e) drying the wet shape to remove free water.

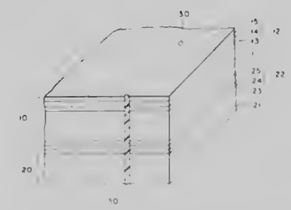
4,897,295
FOOD STUFFS CASING
Gayyur Erk, Gorxheimertal, and Joachim Kühn, Weinheim, both of Fed. Rep. of Germany, assignors to Naturin-Werk Becker & Co., Weinheim/Bergstrasse, Fed. Rep. of Germany
PCT No. PCT/EP86/00721, § 371 Date Aug. 6, 1987, § 102(e) Date Aug. 6, 1987, PCT Pub. No. WO87/03452, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 8, 1986, Ser. No. 110,748
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543739; Jul. 26, 1986, 3625409
Int. Cl.[4] B65B *25/00*; B65D *85/00, 75/04*
U.S. Cl. 428—34.8 **28 Claims**



1. A food stuff casing packed in a moisture-proof packing and formed at least in part of at least one polyamide having

absorbed at least 5% of its own weight in water and containing no tightening lubricating agent, and no moisture retaining agent, the food stuff casing having the following physical characteristics:
(a) ready for filling, tightened, and moistened, it has a minimum burst force of 8.0 kg and a corresponding minimum burst path of 8.5 mm, measured in accordance with DIN 53 325;
(b) the slope of the line of burst path over burst force determined by the spherical pressure test (DIN 53 325) amounts to 0.17–1.3 (kg/mm);
(c) the friction value determined according to DIN 53 375 of the food stuffs casing as opposed to a PUR-elastomer having a Shore-A hardness of 95 amounts to at least 30.
(d) the casing withstands a minimum of 800 strokes without rupture, when subject to the scrub test.

4,897,296
FABRIC FOR PROTECTIVE GARMENTS
Ben H. Marshall, Jr., Midlothian, Va., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Continuation of Ser. No. 57,441, Jun. 2, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,994
Int. Cl.[4] D04H *1/04*
U.S. Cl. 428—102 **7 Claims**

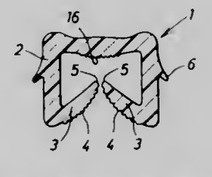


1. An improved fabric particularly suited for protective garments, the fabric having a composite of a spunbonded polyethylene film-fibril sheet laminated to a three-layered film of coextruded layers of low density polyethylene on both faces of a central film layer of a copolymer of vinyl chloride and vinylidine chloride, the improvement comprising the fabric consisting essentially of a first composite seamed to a second composite, the spunbonded sheet of the first composite being in contact and in face-to-face relationship throughout the fabric with the three-layered film of the second composite.

4,897,297
ELASTIC WET COMPRESS
Dimitri P. Zafiroglu, Wilmington, Del., assignor to E. I. DuPont De Nemours & Co., Wilmington, Del.
Filed May 17, 1988, Ser. No. 195,063
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—102 **7 Claims**

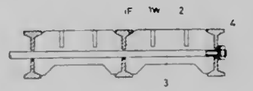
1. An article of manufacture particularly suited for use as a wet compress having an upper and a lower outer layer and containing between the layers a particulate filling material consisting essentially of 5 to 30 percent of super-absorbent polymer and 70 to 95 percent of diluent by total weight of the filling material, a least one of the layers being an elastic water-permeable fabric having a recoverable stretch of at least 50 percent in at least one direction.

4,897,298
LAMINATE AND MOLDED ARTICLE PREPARED THEREFROM
Yasuhiko Otawa; Kunihide Hiraoka; Toshiyuki Maeda, all of Ichihara; Katsuo Okamoto, Funabashi; Noboru Sakamaki, Ichihara, and Shizuo Shimizu, Houya, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Division of Ser. No. 114,594, Oct. 30, 1987. This application Sep. 26, 1988, Ser. No. 248,901
Claims priority, application Japan, Oct. 30, 1986, 61-256872; Dec. 11, 1986, 61-293482; Dec. 15, 1986, 61-296797
Int. Cl.[4] E06B *7/16*
U.S. Cl. 428—122 **18 Claims**



1. A glass run channel having in the cross-section thereof a grooved body portion and a tongue shaped strainer portion expanded from the vicinity of the top of the side wall of the grooved body portion toward the center, which is composed of an olefinic thermoplastic elastomer, wherein at least a part, falling in contact with glass, of the surface of the strainer portion is laminated with a lubricating resin layer through a modified olefin thermoplastic elastomer layer having repeated fine convexities and concavities on the surface thereof so that the repetition of the fine convexities and concavities is retained on the surface of the lubricating resin layer, wherein the modified olefin thermoplastic elastomer is (a) a partially cross-linked graft-modified polyolefin elastomer formed by dynamically heat-treating a blend comprising (i) 10 to 100 parts by weight of a peroxide-cross-linking olefin copolymer, (ii) 0 to 90 parts by weight of an olefinic plastic, the sum of the amounts of the components (i) and (ii) being 100 parts by weight, and (iii) 0.01 to 10 parts by weight of at least one monomer selected from the group consisting of (1) an unsaturated carboxylic acid and a derivative thereof, (2) an unsaturated epoxy monomer and (3) an unsaturated hydroxyl monomer, in the presence of an organic peroxide, and the lubricating resin is (b) a polyamide, polyurethane or polyester.

4,897,299
GRATING OF FIBER REINFORCED PLASTIC
Hidejl Kawachi; Fumiyoshi Yamada; Toshiyasu Fukuya, and Tetsuro Matsuo, all of Osaka, Japan, assignors to Kurimoto Plastics Co., Ltd., Osaka and Dainipponink & Chemicals, Inc., Tokyo, both of, Japan
Filed Jul. 26, 1988, Ser. No. 226,314
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—131 **4 Claims**



1. A grating of fiber reinforced plastic, comprising: a plurality of main beams having an I-shaped cross section which are

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made of fiber reinforced plastic and arranged in parallel to one another, each main beam having an upper flange defining an upper face and two lower back faces, a lower flange defining a bottom face and two upper back faces and a center web defining two side faces, with a bottom, lower back face of the upper flange and the top upper back face of the lower flange being inclined at a gradual slope to a side face of the center web, and a plurality of grid members which are also made of fiber reinforced plastic, each having a top face and each contacting one of said plurality of main beams at corresponding lower back, upper back and side faces to be integrally fixed thereto, such that the top face of each grid member lies in the same plane as the top face of the main beams.

4,897,300

SECURITY PAPER

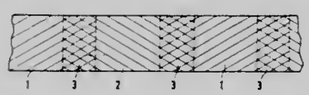
Michael Boehm, Heimstetten, Fed. Rep. of Germany, assignor to GAO Gesellschaft fuer Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,896

Claims priority, application European Pat. Off., Aug. 19, 1987, 87112042.4

Int. Cl.[4] B05D *3/02*

U.S. Cl. 428—195 **15 Claims**



1. A security paper, in particular a bank note, having embedded therein, running from edge to edge, a security thread that is printed with luminescent colors, wherein the luminescent colors are colorless and transparent or paper-colored in the unexcited state and wherein along the security thread there are successive and overlapping portions which, when the colors are excited, have a length recognizable to the naked eye and are each printed with a different luminescent color, so that a characteristic compound color results in the overlapping areas.

4,897,301

FLEXIBLE SHEET REINFORCED WITH POLY(AROMATIC AMIDE) NON-WOVEN FABRIC AND USE THEREOF

Keiichi Uno, Shiga; Yoshimi Ishinami, Iwakuni; Masaaki Nakamura, Otsu, and Tomohiko Nakao, Iwakuni, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jan. 22, 1986, Ser. No. 821,304

Claims priority, application Japan, Jan. 23, 1985, 60-11499; Feb. 4, 1985, 60-19480; Jun. 21, 1985, 60-136287

Int. Cl.[4] B32B *15/08, 27/02, 27/34;* **H05K** *1/03*

U.S. Cl. 428—209 **20 Claims**

1. A flexible sheet which comprises a non-woven fabric made predominantly from a poly(aromatic amide) component which is impregnated with a heat- and/or light-curable resin, w herein the non-woven fabric satisfies the following conditions:

$$5\ g/m^2 < \text{weight per unit area} < 35\ g/m^2, \text{ and}$$

$$0.15\ g/cm^3 \leqq \text{density} \leqq 0.8\ g/cm^3$$

said non-woven fabric made predominantly from a poly(aromatic amide) component being a poly(aromatic amide) non-woven fabric comprising chopped fibers consisting predominantly of an aromatic polyamide or copolyamide and binder, said chopped fibers of an aromatic polyamide or copolyamide being selected from the groups consisting of (a) chopped fibers of a polymer comprising predominantly an aromatic homopolyamide or copolyamide wherein the bonding chain extends from the aromatic ring in uniaxial or parallel axial direction, (b) chopped fibers of an aromatic homopolyamide or copolyamide other than the polymer of the chopped fibers (a) and mixtures thereof.

17. In a flexible printed circuit board wherein a flexible sheet is used as a base sheet and/or a covering layer, the improvement which comprises that the flexible sheet comprises a non-woven fabric made predominantly from a poly(aromatic amide) component which is impregnated with a heat- and/or light-curable resin, wherein the non-woven fabric satisfies the following conditions:

$$5\ g/m^2 < \text{weight per unit area} < 35\ g/m^2, \text{ and}$$

$$0.15\ g/cm^3 \leqq \text{density} \leqq 0.8\ g/cm^3;$$

said non-woven fabric made predominantly from a poly(aromatic amide) component being a poly(aromatic amide) non-woven fabric comprising chopped fibers consisting predominantly of an aromatic polyamide or copolyamide and binder, said chopped fibers of an aromatic polyamide or copolyamide being selected from the group consisting of (a) chopped fibers of a polymer comprising predominantly an aromatic homopolyamide or copolyamide wherein the bonding chain extends from the aromatic ring in uniaxial or parallel axial direction, (b) chopped fibers of an aromatic homopolyamide or copolyamide other than the polymer of the chopped fibers (a) and mixtures thereof.

4,897,302

SPORTING SURFACES

Paul F. Bull, Bellbowrie, Australia, assignor to A. V. Syntec Pty Ltd., Queensland, Australia

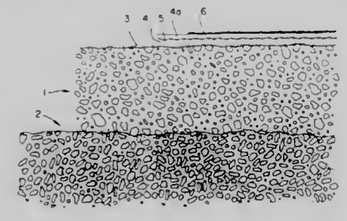
PCT No. PCT/AU88/00069, § 371 Date Nov. 17, 1988, § 102(e) Date Nov. 17, 1988, PCT Pub. No. WO88/06971, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 16, 1988, Ser. No. 283,450

Claims priority, application Australia, Mar. 18, 1987, PI0927

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—283 **13 Claims**



13. A synthetic sports surface comprising a laminate of:
a porous resilient base layer formed from a matrix of a polyurethane elastomer and resilient particulate material;
a polymeric sealant on an upper surface of said base layer;
a fibre-reinforced adhesive layer on an upper surface of said sealant; and,
a wear layer comprising an acrylic polymer on an upper surface of said sealant, said fibre-reinforced adhesive layer comprising an adhesive having reactive sites capable of bonding to said sealant and said wear layer.

4,897,303

BUOYANT COATED FIBERS

Francis P. McCullough, Jr., Lake Jackson, and R. Vernon Snelgrove, Damon, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1988, Ser. No. 164,605

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—284 **18 Claims**

1. A buoyant low density open-celled fibrous structure which can be used for floatation and/or insulation comprising a coated batting, felt or non-woven web of resilient shape reforming elongatable non-linear carbonaceous fibers, said fibers having a reversible deflection ratio of greater than 1.2:1, and an aspect ratio greater than 10:1, said coating comprising a water insoluble hydrophobic cured or set substance.

4,897,304

VIRUCIDAL COMPOSITION, THE METHOD OF USE AND THE PRODUCT THEREFOR

Shafi U. Hossain, and Kenneth R. Smith, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

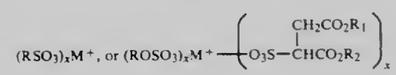
Continuation of Ser. No. 447,581, Dec. 13, 1982, Pat. No. 4,828,912, which is a continuation-in-part of Ser. No. 392,781, Jun. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 264,688, Jul. 20, 1981, abandoned. This application Nov. 12, 1986, Ser. No. 930,607

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—289 **6 Claims**

1. A virucidal and/or germicidal garment product comprising,
(a) a substrate selected from the group consisting of cellulosic webs and nonwoven webs,
(b) said substrate containing a virucidally or germicidally effective amount of a composition comprising:
(i) from about 0.05 to about 5 weight percent, based on the dry weight of the substrate, of an anionic surfactant selected from the group consisting of alkyl sulfonate salts, sulfuric acid ester salts and sulfosuccinic ester salts having a structure:



$$(RSO_3)_xM^+, \text{ or } (ROSO_3)_xM^+ \left(\begin{array}{c} CH_2CO_2R_1 \\ | \\ O_3S-CHCO_2R_2 \end{array} \right)_x$$

wherein M+ is a mon-, di- or trivalent metal cation or an ammonium or substituted ammonium ion, x is an integer, and R is an alkyl group, R_1 an R_2 are the same or different straight or branched chain aliphatic groups
(ii) at least about 2 percent, based on the dry weight of the substrate, of at least one acid having the structure:

R—COOH

wherein R is a radical selected from lower alkyl radicals, or substituted derivatives of such acids selected from the group consisting of citric, malic, succinic, benzoic, and substituted derivatives thereof, and mixtures of two or more of said acids.

4,897,305

PLASMA TREATMENT WITH ORGANIC VAPORS TO PROMOTE A MEAL ADHESION OF POLYPROPYLENE FILM

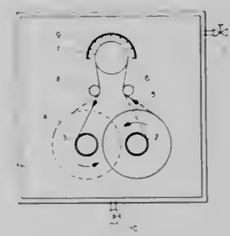
Floyd F.-L. Ho, West Chester, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 12, 1987, Ser. No. 25,122

Int. Cl.[4] B05D *3/04;* **B32B** *15/05, 27/16, 27/32*

U.S. Cl. 428—333 **7 Claims**

1. A metallized film comprising a polyolefin substrate and a metal coating on at least one surface thereof and a very thin, almost mono molecular layer of a low molecular weight hydrocarbon polymer in between the polyolefin substrate and the metal coating where the hydrocarbon polymer layer is formed by subjecting said substrate, prior to metallization, to a plasma treatment with organic vapors to promote metal adhesion, said



metal coating being selected from the class consisting of aluminum, chromium, gold, silver, and copper and said organic vapors being selected from the class consisting of saturated and unsaturated aliphatic hydrocarbons having up to 12 carbon atoms and mixtures thereof.

4,897,306

MEDIUM FOR ELECTROPHORESIS

Naohiko Sugimoto; Daijiro Nishio, and Elichi Hasegawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1987, Ser. No. 40,486

Claims priority, application Japan, Apr. 19, 1986, 61-90622; Apr. 19, 1986, 61-90623

Int. Cl.[4] B32B *27/08;* **C08L** *5/00, 5/12;* **G01N** *31/00*

U.S. Cl. 428—336 **8 Claims**

1. In a medium for electrophoresis which comprises a support of a plastic material selected from the group consisting of polyethylene terephthalate, the polycarbonate of Bisphenol A, polyvinyl chloride, vinylidene chloride-vinyl chloride copolymer, polymethyl methacrylate, polyethylene, polypropylene, cellulose acetates, and cellulose acetate propionate, and an aqueous polyacrylamide gel membrane formed by the crosslinking polymerization of an acrylamide compound and a crosslinking agent in the presence of water, the improvement which comprises a resin layer between the support and the aqueous polyacrylamide gel membrane comprising a resin having an oxygen permeability coefficient lower than that of the plastic material of the support, said coefficient being not more than 15 cc/m^2-atm-day when the resin is in the form of a film having a thickness of 20 μm.

4,897,307

PROCESS FOR THE SOLVENT-INDUCED CRYSTALLIZATION OF AMORPHOUS POLY(ETHERETHERKETONE)-TYPE POLYMERS AND THE ARTICLE FORMED THEREBY

Henry N. Beck, Walnut Creek, Calif., and Robert M. Nowak, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 11, 1987, Ser. No. 84,444

Int. Cl.[4] C08J *7/02;* **B01D** *39/16;* **B05D** *5/00;* **B32B** *7/02;* **C08F** *6/00*

U.S. Cl. 428—398 **20 Claims**

1. A process for the solvent-induced crystallization of amorphous poly(etheretherketone)-type polymers to produce an article comprising the solvent-induced crystalline poly(etheretherketone)-type polymer, which process comprises:
A. contacting a preformed article of a polymer comprising amorphous poly(etheretherketone-type polymer with an effective amount of at least one organic compound in its

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liquid state which organic compound consists essentially of atoms of carbon, hydrogen, oxygen, nitrogen sulfur, halogen or mixtures thereof having a molecular weight of between about 160 and 320 daltons at a temperature below the polymer glass transition temperature Tg wherein the temperature of contact is between about 85° C. and 145° C. for a time effective to first swell and plasticize the amorphous polymer in physical contact with the organic compound and subsequently crystallize the amorphous poly(etheretherketone)-type polymer, without destroying the physical form characteristic of the preformed article prior to contact with said organic compound,

B. removing the organic compound under conditions effective to maintain the solvent-induced crystalline polymer in the preformed article form, and

C. recovering the preformed article comprising solvent-induced crystalline poly(etheretherketone)-type polymer.

4,897,308

COMPOSITIONS COMPRISING AQUEOUS DISPERSIONS OF LIPID SPHERES

Guy Vanlerberghe, Montjay-La-Tour, and Rose-Marie Handjani née Villa, Paris, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 102,935, Dec. 12, 1979, Pat. No. 4,772,471, which is a continuation-in-part of Ser. No. 865,499, Dec. 29, 1977, Pat. No. 4,217,344, which is a continuation-in-part of Ser. No. 700,038, Jun. 25, 1976, abandoned. This application Jun. 8, 1988, Ser. No. 204,034

Claims priority, application France, Jun. 30, 1975, 75 20456; Belgium, Jun. 23, 1976, 0168219; France, Nov. 15, 1977, 77 34249

The portion of the term of this patent subsequent to Aug. 12, 1990, has been disclaimed.

Int. Cl.[4] A61K *9/62, 37/22;* **B01J** *13/02*

U.S. Cl. 428—402.2 **4 Claims**

1. A composition comprising a mixture of at least two aqueous dispersions of spherules, each dispersion of spherules comprising arranged molecular layers of a non-ionic lipid compound encapsulating an aqueous phase wherein the non-ionic lipid compound has a lipophile group-hydrophile group ratio such that the non-ionic lipid compound swells in the aqueous phase to be encapsulated therein so as to form a lamellar phase, the hydrophile group of said non-ionic compound being selected from the group consisting of polyoxyethylene groups, polyglycerol groups and other polyol groups, said spherules having a diameter between 1000 Å and 50,000 Å, the aqueous phase encapsulated in the spherules of one of said dispersions containing an active substance different from that contained in the aqueous phase encapsulated in the spherules of another of said dispersions.

4,897,309

CONSOLIDATION OF THE SURFACES OF PARTICULATE ADSORBENTS

Franz Haas, and Gerold Schreyer, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,633

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723687

Int. Cl.[4] B05D *7/00;* **B32B** *5/16*

U.S. Cl. 428—403 **8 Claims**

5. A particulate adsorbent obtained by a process for the consolidation of the surfaces of a particulate adsorbent by coating with an aqueous polymer dispersion, said process comprising:

(i) impregnating a dry particulate adsorbent with a cationic aqueous polymer solution;

(ii) removing excess polymer solution;

(iii) coating the impregnated adsorbent by treatment with an anionic aqueous dispersion of a polymer having a softening point of from 60° to 150° C.; and

(iv) drying the coated adsorbent.

4,897,310

INKING RIBBON FOR TRANSFERRING COLOR UNDER THE INFLUENCE OF HEAT

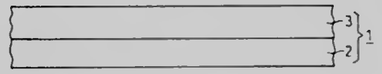
Wolfgang Beyer; Monika Kohla; Manuela Schneider, and Eduard Schuetz, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,818

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742924; May 20, 1988, 3817753

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—412 **14 Claims**



1. An inking ribbon for transferring color through the application of heat comprising:

a carrier layer;

an ink layer;

a decomposable component that promotes the color transfer given the application of heat, composed of cellulose nitrate whose decomposition temperature is set at between approximately 100° C. to about 150° C. with catalytic additives; and

the ink layer being heat-meltable and the cellulose nitrate being contained in the ink layer as a component thereof.

4,897,311

METAL-CERAMIC COMPOSITE BODIES

Isao Oda, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 867,441, May 28, 1986, abandoned. This application May 12, 1988, Ser. No. 195,447

Claims priority, applicatioo Japan, Jun. 28, 1985, 60-126295

Int. Cl.[4] C04B *35/48;* **B32B** *15/04*

U.S. Cl. 428—433 **5 Claims**

1. A metal-ceramic composite body comprising a metallic member having a depression or through-hole therein, and a ceramic member having a protrusion inserted into said depression or through-hole by interference fitting above room temperature, said metallic member comprising at least one metallic material selected from the group consisting of maraging steel, nickel-chromium-molybdenum steel, nickel steel, chromium steel, nickel-chromium steel and nickel-molybdenum steel, said metallic material inherently producing martensitic transformation upon cooling in ambient air from a high temperature to expand its volume, and having at least one non-martensitic structure selected from the group consisting of a tempered structure, a normalized structure and an age hardened structure.

4,897,312

POLYMER-BASED ELECTRICAL INSULATION AND ELECTRICAL CONDUCTOR INSULATED THEREWITH

Johann Wartusch, Vellmar; Werner Gölz, Mainz, and Holger Andreas, Riedstadt, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,628

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702209; European Pat. Off., Oct. 8, 1987, 87114730.2

Int. Cl.[4] B32B *9/06*

U.S. Cl. 428—450 **22 Claims**

I. Electrical insulation comprising:

a polyolefin as polymeric base material; and

a voltage stabilizer included in the polyolefin and comprised of at least one hydrolyzable alkoxy compound, which at least one hydrolyzable alkoxy compound is a liquid at a temperature ranging from about −25° C. to about 140° C. and has a formula:

$$(R^aO)_yR^b{}_{3-y}X{-}[R{-}X'(OR^c)_zR^d{}_{2-z}]_n{-}OR^e,$$

where R^a, R^c and R^e are hydrocarbon groups having 1 to 18 carbon atoms; R^b and R^d are saturated or unsaturated, aliphatic hydrocarbon groups or aromatic hydrocarbon groups having from 1 to 30 carbon atoms and having hydrogen and functional groups; R is a group having a carbon skeleton including at least one heteroatom Y; O is oxygen; X and X' are elements having a valence of four; n varies from 1 to 10, y varies from 0 to 3, z varies from 0 to 2, and where R, R^a, R^b, R^c and R^d appear independent from one another in a specific composition.

4,897,313

PRIMER/MEMBRANE WATERPROOFING SYSTEM

Robert A. Wiercinski, Somerville, Mass., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jul. 1, 1988, Ser. No. 214,707

Int. Cl.[4] B32B *11/04, 13/12*

U.S. Cl. 428—489 **7 Claims**

1. A package including a waterproofing membrane and primer composition comprising

a. a waterproofing membrane comprising a carrier sheet and a rubberized asphalt adhesive thereon, and

b. a primer composition, adapted to promote adhesion between a concrete construction surface and the waterproofing membrane, comprising a water-based emulsion of a polymeric component comprised of butyl acrylate 40 to 100 wt. %, styrene 0 to 60 wt. %, and acrylonitrile 0 to 10 wt wt. %.

4,897,314

PHENOL FORMALDEHYDE ADHESIVE FOR BONDING WOOD PIECES OF HIGH MOISTURE CONTENT AND COMPOSITE BOARD AND VENEERS BONDED WITH SUCH ADHESIVE

Michael R. Clarke, West Vancouver; Paul R. Steiner, North Vancouver, and Axel W. Anderson, Burnaby, all of Canada, assignors to Forintek Canada Corp., Vancouver, Canada

Division of Ser. No. 165,929, Mar. 9, 1988, Pat. No. 4,824,896. This application Feb. 13, 1989, Ser. No. 309,558

Int. Cl.[4] C09J *5/00, 3/16;* **B32B** *27/42, 21/08*

U.S. Cl. 428—529 **8 Claims**

1. A product formed of wood pieces having a moisture content greater than 8% bonded together with an adhesive composition comprising:

A. A highly advanced high molecular weight resin prepared by condensing phenol with an excess of formaldehyde in the presence of an alkaline hydroxide catalyst under reflux conditions;

B. A resin powder or aqueous dispersion which is a phenol formaldehyde (PF) condensation product partially cross-linked so that the particles swell when added to component A without dissolving;

C. A component selected from the group consisting of alkylene carbonates and phenol resorcinol formaldehyde (PRF) resins in an amount between about 1 and 4 weight percent based on the amount of solid resin in components A and B;

D. Optionally borax in the amount of 0 to 3 weight percent based on the amount of solid resin of components A and B, and component A has a molar ratio of formaldehyde to phenol ranging between about 1.8:1.0 to 2.2:1.0 and an alkalinity equivalent to the alkalinity produced by sodium hydroxide in an amount between about 5 and 10 weight percent based on the amount of solid resin in components A and B, and a number average molecular weight from 800 to 5,000.

5. A method of making a wood composite comprising providing wood pieces having a moisture content greater than 8% and hot press bonding said wood pieces using an adhesive composition comprising:

A. A highly advanced high molecular weight resin prepared by condensing phenol with an excess of formaldehyde in the presence of an alkaline hydroxide catalyst under reflux conditions;

B. A resin powder or aqueous dispersion which is a phenol formaldehyde (PF) condensation product partially cross-linked so that the particles swell when added to component A without dissolving;

C. A component selected from the group consisting of alkylene carbonates and phenol resorcinol formalhyde (FRF) resins in an amount between about 1 and 4 weight percent based on the amount of solid resin in components A and B;

D. Optionally borax in the amount of 0 to 3 weight percent based on the amount of solid resin of components A and B, and component A has a molar ratio of formaldehyde to phenol ranging between about 1.8:1.0 to 2.2:1.0 and an alkalinity equivalent to the alkalinity produced by sodium hydroxide in an amount between about 5 and 10 weight percent based on the amount of solid resin in components A and B, and a number average molecular weight from 800 to 5,000.

4,897,315

YTTRIUM ENRICHED ALUMINIDE COATING FOR SUPERALLOYS

Dinesh K. Gupta, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 787,570, Oct. 15, 1985, abandoned. This application Sep. 3, 1986, Ser. No. 903,831

Int. Cl.[4] B22F *3/00*

U.S. Cl. 428—552 **14 Claims**



1. An article having resistance to oxidation and thermal mechanical fatigue comprising a substrate selected from the group consisting of Ni and Co base superalloys, and an aluminide coating 0.001–0.004 inches thick diffused with the substrate, wherein the coating has an outer zone and a diffusion zone inward thereof, the outer zone consisting essentially of, by weight percent, 21–35 Al, 0.2–2 Y, 5–30 Cr, up to 40 Co, with the balance nickel, and the diffusion zone having a lesser

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concentration of Al than the outer zone and a greater concentration of Al than in the substrate.

4,897,316

PLATED STEEL SHEET FOR CANS

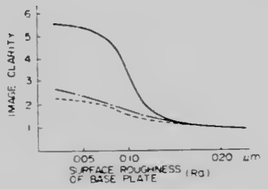
Hiroshi Kagechika; Tadahiko Mishima; Yoshinori Yomura; Hiroshi Ishikawa; Naoyuki Oniwa, and Yoshihiko Yasue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 281,032

Claims priority, application Japan, Dec. 29, 1987, 62-336859

Int. Cl.[4] B32B *15/01, 15/18*

U.S. Cl. 428—612 **3 Claims**



1. A plated steel sheet for cans, comprising:
a steel sheet having an average central surface roughness of not more that 0.10 μm; and
a vacuum-plated metal or metal alloy layer formed on the surface of said steel sheet.

4,897,317

CORROSION RESISTANT ZN-CR PLATED STEEL STRIP

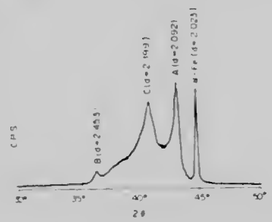
Tatsuya Kanamaru; Motohiro Nakayama; Katutoshi Arai; Shinichi Suzaki, and Ryoichi Naka, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,830

Claims priority, application Japan, Mar. 31, 1987, 62-79027; Aug. 6, 1987, 62-195343; Aug. 6, 1987, 62-195344; Aug. 26, 1987, 62-210253; Aug. 26, 1987, 62-210254; Sep. 22, 1987, 62-237765; Sep. 22, 1987, 62-237766; Dec. 17, 1987, 62-319830; Dec. 17, 1987, 62-319831; Jan. 8, 1988, 63-1187; Jan. 26, 1988, 63-15156; Jan. 28, 1988, 63-17626; Feb. 23, 1988, 63-40292; Feb. 23, 1988, 63-40293

Int. Cl.[4] B32B *15/18*

U.S. Cl. 428—629 **8 Claims**



1. A corrosion resistant plated steel strip comprising a substrate consisting of a steel strip; and at least one principal plating layer formed on at least one surface side of the steel strip substrate and comprising a co-deposited zinc-chromium based alloy comprising chromium in an amount of more than 5% by weight but no more than 20% by weight and the balance consisting of zinc, and at least one additional plating layer formed on the principal plating layer, and comprising at least one member selected from the group consisting of iron and iron-based alloys.

4,897,318

LAMINATED MAGNETIC MATERIALS

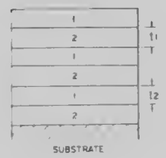
Hiroshi Sakakima, Hirakata; Koichi Osano, Neyagawa; Yuuji Omata, Ibaraki; Koichi Kugimiya, Toyonaka, and Satoru Mitani, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 4,582, Jan. 20, 1987, abandoned. This application Jan. 18, 1989, Ser. No. 298,788

Claims priority, application Japan, Jan. 21, 1986, 61-10820; May 22, 1986, 61-117875; Oct. 31, 1986, 61-261264; Oct. 31, 1986, 61-261265

Int. Cl.[4] G11B *5/127, 5/62*

U.S. Cl. 428—635 **18 Claims**



1. Laminated magnetic materials comprising first thin films having a magnetostrictive constant λ less than 1×10^{-5} consisting essentially of Fe and Si, and second thin films different from said first thin films, said second thin films being composed of an amorphous alloy or Fe-Si-Al alloy each of which alloys has a magnetostrictive constant λ less than 1×10^{-5} and excellent wear resistance, said first and second thin films being alternately laminated, the thickness (t_1) of said first films and the thickness (t_2) of said second films meeting the following conditions: both t_1 and $t_2<300$ Å; and $t_1<2t_2$ to simultaneously provide superior wear resistance and superior magnetic characteristics, both of which are necessary to produce a magnetic head of improved quality.

4,897,319

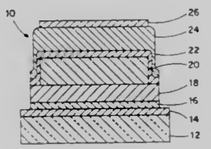
TFEL DEVICE HAVING MULTIPLE LAYER INSULATORS

Sey-Shing Sun, Beaverton, Oreg., assignor to Planar Systems, Inc., Beaverton, Oreg.

Filed Jul. 19, 1988, Ser. No. 221,440

Int. Cl.[4] H05B *33/12*

U.S. Cl. 428—690 **8 Claims**



1. A thin film electroluminescent laminate comprising:
(a) a thin film layer of electroluminescent material;
(b) a first insulator stack comprising a high capacitance insulator layer and a thin film layer of silicon oxynitride, the silicon oxynitride layer being placed in contact with a first side of the thin film layer of electroluminescent material; and
(c) a second insulator stack situated on a second side of the layer of thin film electroluminescent material opposite the first insulator stack and comprising a high capacitance insulator layer placed in contact with said second side of said thin film layer of electroluminescent material and a layer of silicon oxynitride.

4,897,320

MAGNETO-OPTICAL RECORDING MEDIUM

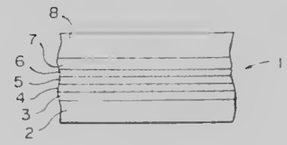
Masaaki Nomura; Takashi Yamada; Ryoichi Yamamoto, and Akira Nahara, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigari, Japan

Continuation-in-part of Ser. No. 27,877, Mar. 19, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,613

Claims priority, application Japan, Mar. 20, 1986, 61-63371

Int. Cl.[4] G11B *5/66, 11/00;* **G11C** *13/06*

U.S. Cl. 428—694 **6 Claims**



1. A magneto-optical recording medium comprising a transparent nonmagnetic substrate, a magneto-optical recording layer overlaid on said transparent nonmagnetic substrate, and a protective layer overlaid on said magneto-optical recording layer, wherein said protective layer is composed of a layer of a mixture of a rare earth metal with a dielectric material, the content of the rare earth metal in the mixture of the protective layer being within the range of 15–45 percent by volume;
whereby free oxygen given rise to in the course of sputtering or deposition of said protective layer is absorbed on the protective layer said before it can be absorbed on the recording layer.

4,897,321

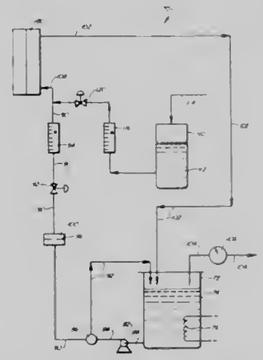
CONTROLLED ELECTROCHEMICAL POWER GENERATION

Nicholas Shuster, Madison, and Joseph A. Neff, Cleveland, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 29, 1986, Ser. No. 912,274

Int. Cl.[4] H01M *2/38*

U.S. Cl. 429—51 **25 Claims**



1. A method of power generation, said method comprising the steps of:
supplying an electrolyte to a flow channel defined between an alkali metal anode and a cathode initially spaced about 10–25 mils from said anode in an electrochemical cell having means adapted for providing a substantially uniform pattern of flow of said electrolyte through said flow channel, said electrolyte comprising an aqueous solution of the hydroxide of said alkali metal; and,
controlling the volumetric flow rate of said electrolyte through said flow channel in order to attain substantially uniform voltage from said cell.

4,897,322

METHOD FOR PREVENTING OVERHEATING OF HIGH-TEMPERATURE STORAGE BATTERIES

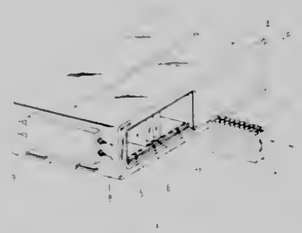
Jens-Christian Jessen, Eppelheim, Fed. Rep. of Germany, assignor to Asea Brown Bovery Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,888

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734221

Int. Cl.[4] H01M *10/50*

U.S. Cl. 429—62 **7 Claims**



1. Method for avoiding overheating of a high-temperature storage battery having a cooling system for maintaining a desired internal temperature, which comprises determining the maximum possible power delivered by the storage battery once by calculation for a desired first given temperature value after the storage battery has been manufactured, while taking the available cooling power of the cooling system and the thermal losses of the high-temperature storage battery into account, continuously measuring the internal temperature of the storage battery during operation, comparing the internal the temperature with the desired first given temperature value, switching on the cooling system for maintaining the desired first given temperature value if the internal temperature rises to a second given temperature value, reducing the power delivered to the storage battery if the internal temperature increases further to a third given temperature value in order to limit the internal temperature, and first removing the power reduction and then switching off the cooling system when the internal temperature drops to the desired first given value.

4,897,323

HIGH TEMPERATURE DISCHARGEABLE GALVANIC PRIMARY ELEMENT HAVING ALKALINE ELECTROLYTE

Rolf Hennrich, and Heinz-Werner Nientiedt, both of Ellwangen, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,221

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714654

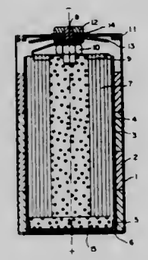
Int. Cl.[4] H01M *6/10*

U.S. Cl. 429—94 **18 Claims**

1. A primary element which is operable at substantially elevated temperatures without the generation of hydrogen gas and risk of hydrogen gas explosion comprising an alkaline electrolyte in a metallic annular cylindrical and hermetically sealed housing enclosing end inwardly directed concentric order:
(a) an outer positive electrode consisting essentially of silver oxide or manganese dioxide in the form of at least one pressed powder cylinder:
(b) an inner coiled negative electrode consisting essentially of cadmium, which electrode is fully enclosed concentri-

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cally within the confines of the positive electrode and not in contact with the positive electrode and



(c) a separator interposed between the positive and negative electrodes.

4,897,324

HERMETICALLY-SEALED ALKALINE BATTERY

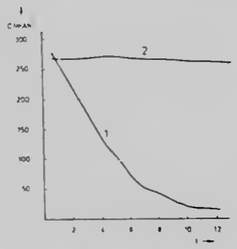
Helmut Glaser, Singapore, Singapore, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 211,987

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727766

Int. Cl.[4] H01M *4/32, 6/04*

U.S. Cl. 429—206 **10 Claims**



1. An improved sealed alkaline battery of the button cell type with a positive nickel hydroxide electrode and a negative cadmium electrode, each having the form of a pressed powder tablet in a metal wire gauze envelope, which cell is capable of long-term overloading and increased charge capacity and comprises a positive electrode of a powder material of a mixture of 45 wt.% to 55 wt.% of nickel hydroxide, 20 wt.% to 35 wt.% of nickel, 8 wt.% to 12 wt.% of cadmium hydroxide, 6 wt.% to 10 wt.% of cadmium, which mixture is free of conductive graphite, wherein in the positive electrode the cadmium/cadmium hydroxide has a capacity of 30 to 50% of the useful positive capacity and the negative electrode is electrically short-circuited with an auxiliary electrode to electrochemically reduce the oxygen pressure.

4,897,325

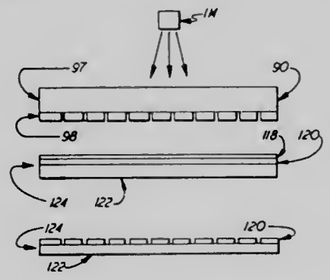
CONTACT LITHOGRAPHIC FABRICATION OF PATTERNS ON LARGE OPTICS

Prasad R. Akkapeddi, Norwalk, and Robert E. Hufnagel, Ridgefield, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 8,230, Jan. 29, 1987, Pat. No. 4,810,621, which is a division of Ser. No. 799,390, Nov. 18, 1985, Pat. No. 4,668,083. This application Nov. 23, 1988, Ser. No. 275,192

Int. Cl.[4] G03F *1/00*

U.S. Cl. 430—5 **9 Claims**



1. A method for the fabrication of a flexible mask used to form an optical element which comprises:

coating a substrate with an opaque layer;

forming a pattern into said opaque layer to produce a master grating;

forming a flexible mask blank composed of a flexible transmissive layer, an opaque layer, and a photoresist layer;

exposing said photoresist layer on said flexible mask blank to radiation which passes through said master grating;

developing the exposed portions of said photoresist layer;

etching the portions of said opaque layer underlying the exposed, developed portions of said photoresist layer;

removing the photoresist layer remaining after etching said opaque layer.

4,897,326

PROCESS TO MANUFACTURE PRINTED CIRCUIT BOARDS

Giuseppe Marengo, Milan, Italy, assignor to Telettra-Telefonia Electronica e Radio, S.p.A., Italy

Filed Mar. 3, 1986, Ser. No. 835,479

Claims priority, application Italy, Apr. 9, 1985, 20284 A/85

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—31 **12 Claims**

1. A process for manufacturing printed circuit boards including a rigid support carrying, on a first major side, circuit components distributed according to a desired design, and, on a second major side, soldered wires corresponding to the circuit components, wherein the process comprises the steps of:

producing on a photoconductive surface respective labile electrostatic images of the desired designs of said circuit components and of said soldered wires;

applying electrically conductive material on said labile images on said surface;

transferring the so-distributed conductive material from said surface onto respective insulating sheets by printing;

affixing the insulating sheets to opposite sides of said rigid support;

treating said insulating sheets to increase the thickness of said conductive material; and

processing the resulting structure to complete a printed circuit board suitable for supporting the circuit components and the soldered wires.

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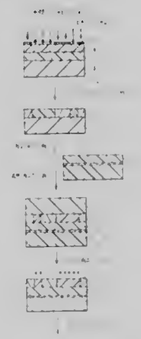
CORRECT-READING IMAGES FROM PHOTOPOLYMER ELECTROGRAPHIC MASTER

Alan S. Dubin, Greenville; Catharine E. Looney, Wilmington, and Steven P. Schmidt, Greenville, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1988, Ser. No. 199,445

Int. Cl.[4] G03G *5/026*

U.S. Cl. 430—45 **32 Claims**



1. Process for the preparation of a high resolution, correct reading image comprising

(A) exposing a photopolymerizable electrographic element comprising in order, a temporary support, a photopolymerizable layer, and a strippable cover sheet, imagewise to actinic radiation through the cover sheet;

(B) stripping the cover sheet from the exposed photopolymerizable layer;

(C) laminating the exposed surface of the photopolymerizable layer to a conductive substrate;

(D) peeling off the temporary support from the exposed photopolymerizable layer;

(E) charging electrostatically the surface of the exposed photopolymerizable layer opposite to that which was originally exposed layer to form a latent image of the electrostatic charge on the exposed areas;

(F) toning the electrostatically charged exposed image areas; and

(G) transferring the tones image to a receptor support.

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ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

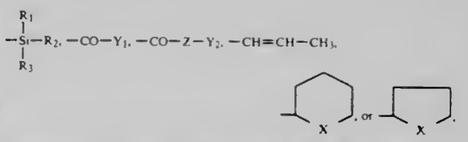
Filed May 2, 1988, Ser. No. 188,824

Claims priority, application Japan, May 1, 1987, 62-106417; Jun. 19, 1987, 62-151507

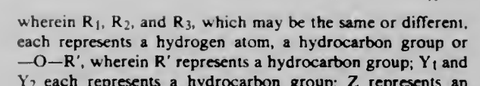
Int. Cl.[4] G03G *13/28*

U.S. Cl. 430—49 **11 Claims**

1. A lithographic printing plate precursor comprising an electrophotographic photoreceptor which comprises a conductive support having thereon at least one photoconductive layer and an outermost surface layer, used for producing an image on the photoconductive layer and then subjecting at least the surface layer to an oil-desensitization treatment, in which said surface layer contains, as the main functional component, at least one resin selected from the group consisting of (A) a resin obtained by polymerizing at least one monomer having at least one functional group which is capable of forming a hydroxyl group upon decomposition of the oil-desensitization treatment and which is represented by formula:



wherein L represents t,



wherein R_1, R_2, and R_3, which may be the same or different, each represents a hydrogen atom, a hydrocarbon group or —O—R′, wherein R′ represents a hydrocarbon group; Y_1 and Y_2 each represents a hydrocarbon group; Z represents an oxygen atom, a sulfur atom or —NH—; and X represents a sulfur atom or an oxygen atom, in the side chain thereof, and (B) a resin obtaining by polymerizing at least one monomer having at least one functional group in which at least two hydroxyl groups sterically near to each other are simultaneously protected with one protective group, and which is capable of forming at least two hydroxyl groups upon decomposition by the oil-desensitization treatment.

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METHOD FOR PREPARING A LITHOGRAPHIC PRINTING PLATE AND A LIGHT-SENSITIVE MATERIAL USED THEREFOR
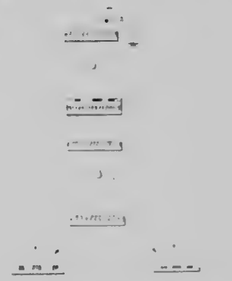
Takao Nakayama, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 478,569, Mar. 24, 1983, abandoned. This application Jan. 16, 1987, Ser. No. 3,885

Claims priority, application Japan, Mar. 24, 1982, 57-45557

Int. Cl.[4] G03G *13/28*

U.S. Cl. 430—49 **14 Claims**



1. In a method for preparing a lithographic printing plate using a light-sensitive material comprising an electroconductive support having a hydrophilic surface provided thereon, in order, a light-sensitive layer and a separate photoconductive insulating layer, said method comprising the steps of:

electrophotographically forming an electrostatic latent image on the photoconductive insulating layer;

developing the latent image with toners which are opaque to the light to which the light-sensitive layer is sensitive, thereby forming a toner image;

exposing the light-sensitive layer through the toner image; and

separating the exposed and unexposed areas of the light-sensitive layer,

said light-sensitive layer comprising (a) a light-sensitive material selected from the group consisting of a composition comprising an o-quinonediazide, a composition comprising a diazo resin and a composition which is a photopolymerizable composition and (b) an electroconductive agent which is incorporated in the light-sensitive layer so that the electric resistance of the light-sensitive layer is not more than $10^{10}\Omega/cm^2$ in the bulk direction.

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IMAGE FORMING METHOD
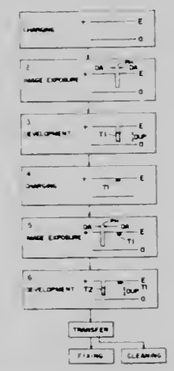
Hiroshi Shoji; Satoshi Haneda; Kunihisa Yoshino, and Yuki Okuyama, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,686

Claims priority, application Japan, Dec. 9, 1986, 61-294291; Dec. 9, 1986, 61-294292; Dec. 9, 1986, 61-294293; Dec. 12, 1986, 61-296889; Dec. 12, 1986, 61-296890

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—54 **11 Claims**



1. An image forming method comprising:

uniformly exposing an image retainer having a photoconductive layer, with a light containing a wavelength component of 750 nm or more;

forming a latent image by subjecting the image retainer to charging and image exposure;

forming a toner image by developing said latent image with a toner;

repeating at least once each of the steps of forming said latent image and forming said toner image; and

transferring a plurality of toner images formed on said image retainer to a transfer material;

wherein at least one of said toner images is formed with a toner having a spectral transmissivity such as to substantially absorb a visible light but substantially transmit a light having a wavelength of 750 nm or more.

4,897,331

REVERSAL IMAGE FORMING METHOD

Naoki Toyoshi; Hiroshi Okamoto; Kenji Tabuchi; Kaoru Takebe, and Tomoaki Yokoyama, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1988, Ser. No. 201,215

Claims priority, application Japan, Jun. 3, 1987, 62-140493; Jun. 12, 1987, 62-147336

Int. Cl.[4] G03G *13/16, 13/22*

U.S. Cl. 430—100 **4 Claims**

1. A reversal image forming method comprising the steps of:

uniformly charging a photosensitive member;

forming an electrostatic latent image in a charged surface of said photosensitive member;

developing said electrostatic latent image formed on said photosensitive member by using white toner;

uniformly charging said photosensitive member again;

uniformly developing the surface of said photosensitive member by using other toner different in color from the white toner; and

transferring the toner image formed on said photosensitive member onto a paper sheet.

4,897,332

CHARGE CONTROL AGENT COMBINATION OF LECITHIN AND PYRROLIDONE POLYMER FOR LIQUID TONER AND METHODS OF USE

George A. Gibson, Vandalia, and Ray H. Luebbe, Jr., Centerville, both of Ohio, assignors to AM International, Inc., Chicago, Ill.

Filed Oct. 5, 1988, Ser. No. 253,788

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—115 **14 Claims**

1. Liquid toner composition for electrophotography comprising a dispersion including a carrier liquid having an electric resistance of at least $10^9\Omega$ cm. and a dielectric constant of not more than 3.5, a pigment or dye, a binder material selected from the group of resins, polymer binders and waxes wherein said binder is insoluble in said carrier liquid at room temperature, and a charge control agent, said charge control agent comprising lecithin and an alkylated N-vinyl pyrrolidone polymer, both said lecithin and said N-vinyl pyrrolidone polymer being soluble in said carrier liquid.

4,897,333

COPYING METHOD

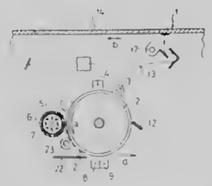
Kouji Matsushita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1988, Ser. No. 215,513

Claims priority, application Japan, Jul. 8, 1987, 62-170481

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—126 **4 Claims**



1. A method of copying a plurality of documents comprising the steps of:

(a) charging a photosensitive member which has an amorphous silicon photosensitive layer up to a predetermined electric potential;

(b) exposing said photosensitive member to form an electrostatic latent image thereon;

(c) developing said electrostatic latent image by toner;

(d) applying light to said photosensitive member, the wavelength of said light being primarily less than 600 nm, with the wavelength greater than 600 nm being limited below 30% in energy distribution ratio;

(e) transferring the toner image onto a transfer sheet by imparting electric charge to the entire surface of said transfer sheet from its rear side, said electric charge being in opposite polarity to the toner image;

(f) removing said toner remaining on said photosensitive member after the transfer; and

(g) applying another light to said photosensitive member, the wavelength of said another light being primarily between 500 and 700 nm, with the wavelength greater than 600 nm being limited between 30 and 60% in energy distribution ratio.

4,897,334

PHOTO-SENSITIVE RECORDING MEDIUM HAVING LIGHT-SHIELDING MEANS ON OPPOSITE SIDE EDGES OF THE FILM

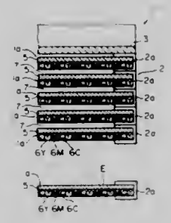
Yumio Matsumoto, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 2, 1988, Ser. No. 189,308

Claims priority, application Japan, May 12, 1987, 62-71288[U]

Int. Cl.[4] G03C *3/00, 1/72*

U.S. Cl. 430—138 **8 Claims**



1. A photo-sensitive recording medium comprising a continuous roll of a photo-sensitive web, said roll being composed of a resinous substrate having microcapsules thereon containing therein dye precursors, said microcapsules being coated on one side of said substrate in such a manner that said microcapsules are uniformly dispersed over the one side of said substrate and light-shielding means provided on opposite side edges of said web, said light-shielding means extending continuously along the opposite side edges of said web for shielding a light from penetrating into an interface between each pair of adjacent turns of said roll from opposite axial end faces of said roll.

4,897,335

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT POLYMERIZABLE COMPOUND, AND BASE ARRANGED OUTSIDE OF MICROCAPSULES

Fujio Kakimi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,492

Claims priority, application Japan, Mar. 11, 1986, 61-52992

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[4] G03C *1/72, 5/54*

U.S. Cl. 430—138 **9 Claims**

1. In a light-sensitive material comprising a light-sensitive layer which contains silver halide, a reducing agent and an ethylenically unsaturated polymerizable compound provided on a support, the improvement wherein the silver halide and the polymerizable compound are contained in microcapsules which are dispersed in the light-sensitive layer, the light-sensitive layer further contains dispersed grains of a hydrophobic organic base compound and/or base precursor having a melting point of from 80° to 180° C. which are arranged outside of the microcapsules, said polymerizable compound being contained in microcapsules in an amount of 5 to 1.2×10^5 times by weight as much as the amount of the silver halide.

4,897,336

SELF-DEVELOPING RADIATION SENSITIVE RESIST WITH AMORPHOUS POLYMER HAVING HALOALKYL SUBSTITUTION DERIVED FROM CYCIC ETHER

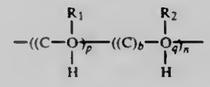
James C. W. Chien, 15 Coach La., Amherst, Mass. 01002

Continuation-in-part of Ser. No. 850,606, Apr. 11, 1986, abandoned. This application Dec. 8, 1987, Ser. No. 132,643

Int. Cl.[4] G03C *1/495*

U.S. Cl. 430—197 **12 Claims**

1. A radiation resist having extremely high sensitivity to energetic radiation, which resist is self-developing and is resistant to dry etching, said energetic radiation including electron beam radiation, ion beam radiation, x-ray radiation, and gamma ray radiation, said resist being in the form of a substantially amorphous oxygen heteroatom linear chain polymer with haloalkyl substituents, said polymer being derived from (a) a cyclic ether, (b) a haloalkyl substituted cyclic ether, or (c) a cyclic ether with an aliphatic aldehyde, at least one of which includes a haloalkyl substituent, which polymer is adapted to depolymerize in the absence or presence of photo initiators, said polymer being of the formula



wherein R_1 is a haloalkyl substituent of the formula $-CH_2-_aX_aR'$, R' is X or an alkyl, haloalkyl, aryl or silyl substituent having 1 to 6 carbon atoms, X is chlorine or fluorine, a is 1 or 2, excluding F_2CH- and FCH_2-; R_2 is H, an alkyl substituent selected from the group consisting of aliphatic primary, secondary or tertiary alkyl groups comprising 1 to 7 carbon atoms, or halogenated derivatives thereof; p is 0 or a small integer, q is a small integer greater than 0, b is small integer not less than 2, and n is a large integer.

4,897,337

METHOD AND APPARATUS FOR FORMING RESIST PATTERN

Yoshihide Kato, Kawasaki; Kei Kirita, Tokyo; Toshiaki Shinozaki, Yokohama; Fumiaki Shigemitsu, Yokohama; Kinya Usuda, Yokohama, and Takashi Tsuchiya, Urawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 789,366, Oct. 22, 1985, Pat. No. 4,717,645, which is a continuation of Ser. No. 571,092, Jan. 16, 1984, abandoned. This application Oct. 15, 1987, Ser. No. 108,767

Claims priority, application Japan, Jan. 19, 1983, 58-5876; Jan. 19, 1983, 58-5877; Jan. 19, 1983, 58-6984; Jan. 19, 1983, 58-6985

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—296 **6 Claims**



1. A method for forming a lithographic processed resist pattern for a semiconductor device, comprising the steps of:

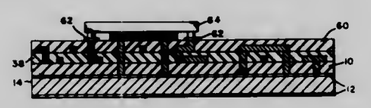
applying a resist material selected from the group consisting of a photoresist material, a far untraviolet sensitive material, an electron beam sensitive resist material, an X-ray sensitive resist material and an ion beam sensitive material to a rigid substrate to form a resist film thereon;
baking said resist film;
cooling said resist film, said cooling being controlled with a cooling means such that an entire area of said resist film is kept at a uniform temperature, said cooling means being a cooling plate for bringing into contact with or adjacent to said substrate;
selectively irradiating a surface of said resist film with at least one member selected from the group consisting of electron beams, light rays, X-rays and ion beams; and
developing said resist film to form a resist pattern.

4,897,338

METHOD FOR THE MANUFACTURE OF MULTILAYER PRINTED CIRCUIT BOARDS

Frank A. Spicciati, Baldwinsville, N.Y.; Howard A. Fraenkel, Lebanon; Joseph M. Ilardi, Sparta, and Bruce E. Kurtz, Lebanon, all of N.J., assignors to Allied-Signal Inc., Morris Township, N.J.

Filed Aug. 3, 1987, Ser. No. 80,932
Int. Cl.[4] G03L *5/16*
U.S. Cl. 430—314 17 Claims



1. A process for manufacturing a printed circuit board which comprises the steps of:
(a) applying a first layer of a radiation curable dielectric material to a given area of a substrate;
(b) placing a photomask defining a first conductor circuit pattern adjacent to the surface of said first layer of said curable dielectric material;
(c) exposing said material to a source of radiation and developing said material to expose those regions of said substrate where a first conductor circuit pattern is to be formed;
(d) forming a first conductor circuit pattern on the surface of said substrate by plating a metal coating over those regions of said substrate covered by said exposed first layer of said curable material to provide a printed circuit board of which the first layer of said dielectric material is a structural element, said forming step (d) comprising steps (e) to (i);
(e) electrolessly plating a metal coating onto the exposed surfaces of said substrate where said first conductor circuit pattern is to be formed thereby forming a portion of said first circuit pattern, and plating said coating onto the surface of said first layer of said dielectric material;
(f) applying a first layer of a plating resist to said coating;
(g) placing a photomask defining said first conductor circuit pattern adjacent to the surface of said first layer of said resist;
(h) exposing said resist to a source of radiation and developing said resist to expose those regions of said substrate where a first conductor circuit pattern is to be formed;
(i) plating a second metal coating onto those regions of said electrolesaly plated metal coating where said circuit pattern is to be formed forming the remainder of said first conductor circuit pattern;
(j) forming a second conductor circuit pattern on the surface of said first layer of said radiation curable material, said second conductor circuit pattern forming step (j) comprising steps (k) to (o):
(k) removing the remainder of said first plating resist and applying a second layer of plating resist to the surface of said electrolessly plated coating and to said first conductor circuit pattern;
(l) placing a photomask defining a second conductor circuit pattern adjacent to the surface of said second layer of said resist;
(m) exposing said second layer of said plating resist to a source of radiation and developing said resist to expose those regions of said electrolessly plated coating and/or said first conductor circuit pattern where said second conductor circuit pattern is to be formed;
(n) forming said second conductor circuit pattern by plating a metal coating onto the exposed regions of electrolessly plated metal coating and/or said first conductor circuit pattern; and
(o) removing plating resist from the surface of the electroless plated metal layer which does not form a part of said second conductor circuit pattern, and removing said metal layer to expose the surfaces of said first layer of radiation curable dielectric material.

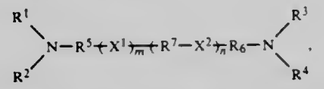
4,897,339

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND A COLOR DEVELOPING COMPOSITION COMPRISING HYDROXYLAMINES AND STABILIZING AGENTS

Kazuto Andoh; Takatoshi Ishikawa, and Morio Yagihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 84,941, Aug. 10, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 333,816
Claims priority, application Japan, Aug. 8, 1986, 61-186560; Sep. 3, 1986, 61-207545
Int. Cl.[4] G03C *7/30, 5/24*
U.S. Cl. 430—372 26 Claims

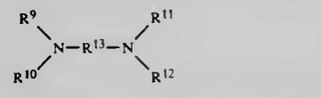
1. A method for processing a silver halide color photographic material comprising the step of developing a silver halide color photographic material with a developer containing an aromatic primary amine color developing agent and at least one compound represented by the following general formulae (Ia) and (Ib):


(Ia)

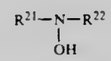
the material being image-wise exposed, wherein R^1, R^2, R^3 and R^4, which may be the same or different, each represents a hydrogen atom or an unsubstituted alkyl group; R^5, R^6 and R^7, which may be the same or different, each represents an unsubstituted alkylene group; X^1 and X^2, which may be the same or different, each represents



—O—, —S—, —CO—, $—SO_2$ or —SO—, or a combination thereof, and R^8 represents a hydrogen atom or an unsubstituted alkyl group; and m and n, which may be the same or different, each is 0, 1, 2 or 3; and


(Ib)

wherein R^{13} represents a substituted alkylene group; and R^9, R^{10}, R^{11} and R^{12}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group wherein said developer further comprises at least one compound capable of directly stabilizing a developing agent, which is selected from the group consisting of a hydroxylamine, a hydrazine, a hydrazide, a hydroxamic acid and an α-hydroxyketone, and wherein said hydroxylamine is represented by the following general formula (II):


(II)

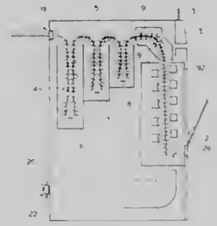
wherein R^{21} and R^{22}, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group or a substituted or unsubstituted aryl group, provided R^{21} and R^{22} do not represent a hydrogen atom at the same time; and provided that R^{21} and R^{22} may be linked to form a heterocyclic ring including the nitrogen atom of general formula (II).

4,897,340

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING A SPECIFIED WATER CONTENT, AND METHOD OF PROCESSING THE SAME

Shinichi Ohtani; Teruo Kashino; Katsushi Fujita; Akio Suzuki; Eiji Yoshida, and Satoru Nagasaki, all of Hino, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 25,196, Mar. 12, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 279,452
Claims priority, application Japan, Mar. 13, 1986, 61-53651
Int. Cl.[4] G03C *5/00, 5/36, 1/30, 1/34*
U.S. Cl. 430—403 15 Claims



12. A method of processing a silver halide photographic material having at least one hydrophiic colloidal layer on a support and at least one light-sensitive silver halide emulsion layer comprising silver halide grains comprising, exposing the silver halide photographic material and then developing and washing the exposed silver halide photographic material with a roller type automatic processor, the water content of said photographic material being from about 10 to 20 g/m2 when the washing step is completed.

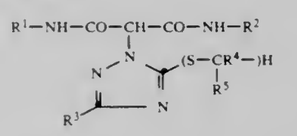
4,897,341

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A DIR-COUPLER

Heinrich Odenwälder, Leverkusen; Hans Ohlschläger, Gladbach; Friedrich-Wilhelm Kunitz, Leverkusen, and Dirk Hübner, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 109,762
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636824
Int. Cl.[4] G03C *7/36*
U.S. Cl. 430—544 4 Claims

1. Colour photographic recording material containing at least one light sensitive silver halide emulsion layer and a DIR-coupler which is associated with this layer and contains attached to the coupling position, a releasable, 1,2,4-triazolyl group, characterized in that the DIR-coupler corresponds to the following formula:



wherein
R^1, R^2 (identical or different) denote alkyl or a carboxylic or heterocyclic aromatic group,
R^3denotes H, or acylamino,
R^4 denotes H or alkyl
R^5 denotes alkyl, alkinyl, aryl, acyloxy, carbamoyl or a cyclic imido group, and
the total number of carbon atoms in R^3, R^4 and R^5 is greater than 3, but not greater than 11.

4,897,342

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Makoto Kajiwara; Masanobu Miyoshi, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 228,812, Aug. 2, 1988, abandoned, which is a continuation of Ser. No. 65,178, Jun. 16, 1987, abandoned, which is a continuation of Ser. No. 785,077, Oct. 7, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 339,865
Claims priority, application Japan, Oct. 18, 1984, 59-219485
Int. Cl.[4] G03C *1/08, 1/34*
U.S. Cl. 430—569 11 Claims

1. A method of preparing a light-sensitive silver halide photographic emulsion comprising
forming a silver halide emulsion containing photosensitive silver halide particles by mixing a solution containing a silver salt and a solution containing halide in the presence of an iridium compound, and
chemically ripening said emulsion by the use of an instable sulfur compound as a sensitizer in the presence of a nitrogen-containing heterocyclic compound capable of forming a complex with silver

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4,897,343

SILVER HALIDE PHOTOGRAPHIC EMULSION

Tadashi Ikeda; Haruo Takei, and Shunichi Aida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1988, Ser. No. 192,732
Claims priority, application Japan, May 13, 1987, 62-114406
Int. Cl.[4] G03C *1/28*
U.S. Cl. 430—570 10 Claims

1. A spectrally sensitized silver halide photographic emulsion comprising at least one alkali metal sulfite compound and at least one ascorbic acid compound as supersentizing agents for a spectrally sensitizing dye wherein the spectrally sensitizing dye is selected from the group consisting of a cyanine dye, a merocyanine dye and a complex cyanine dye of these dyes and wherein the molar ratio of said alkali metal sulfite compound to said ascorbic acid compound is 20:1 to 1:20.

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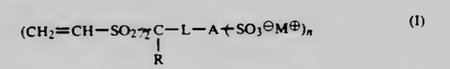
4,897,344

METHOD OF HARDENING GELATIN

Hisashi Okamura; Hiroshi Kawamoto, and Hiroshi Kawasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1988, Ser. No. 175,442
Claims priority, application Japan, Mar. 30, 1987, 62-76586
Int. Cl.[4] G03C *1/30*
U.S. Cl. 430—622 **10 Claims**

1. A method of hardening gelatin comprising adding to the gelatin to be hardened at least one compound represented by formula (I)



(I)

wherein L represents a divalent organic group, R represents a hydrogen atom or a univalent organic group, A represents a substituted or unsubstituted benzene ring which may be condensed with another ring, $M^{\oplus}$ represents a hydrogen ion, an alkali metal ion or an ammonium ion, and n has a value of 1 or 2 or 3.

4,897,345

POLLEN TUBE GROWTH ASSAY

Philip J. Harris, Auckland, New Zealand; Marilyn A. Anderson, Sunbury, and Adrienne E. Clarke, Parkville, both of Australia, assignors to Lubrizol Genetics Inc., Wickliffe, Ohio

Filed Jul. 20, 1987, Ser. No. 75,098
Int. Cl.[4] G01N *33/00, 33/554*
U.S. Cl. 435—7 **9 Claims**

1. A method for qualitative or quantitative measurement of in-vitro pollen germination and pollen tube growth comprising:

(a) incubating pollen at a desired germination stage with an antibody specific for a pollen tube structural component,

(b) measuring the amount of said antibody bound to said pollen, and

(c) relating said amount of bound antibody to pollen germination and to an amount of pollen tube growth according to a calibration curve comparing pollen tube length with amount of antibody bound under the same test conditions.

4,897,346

STABILIZED LIQUID ENZYME COMPOSITION FOR GLUCOSE DETERMINATION

Thomas H. Gawronski, Walnut, Calif., assignor to Beckman Instruments, Inc., Brea, Calif.

Filed Jul. 15, 1986, Ser. No. 886,180
Int. Cl.[4] C12Q *1/54, 1/48, 1/32*
U.S. Cl. 435—14 **47 Claims**

32. A method for the quantitative determination of glucose comprising the steps of:

(a) mixing:

(i) a test sample comprising glucose;

(ii) a homogeneous liquid enzyme reagent, the enzyme reagent comprising:

A. at least about 60% v/v of water;

B. a water-miscible polyol organic solvent in an amount of from about 20 to about 40% v/v;

C. hexokinase enzyme;

D. glucose-6-phosphate dehydrogenase enzyme; and

E. a stabilizer system comprising a metal ion chelating agent in a sufficient amount of at least about 0.5 mM such that the enzyme reagent has a shelf life of at least two years when stored at a temperature in the range of from about 2° to about 8° C.; and

(iii) a homogeneous coenzyme reagent comprising:

A. at least about 80% v/v of water;

B. a water-miscible polyol organic solvent in an amount of from about 5 to about 20% v/v;

C. adenosine triphosphate coenzyme;

D. nicotinamide-adenine dinucleotide coenzyme; and

E. magnesium ions;

to form an assay reaction mixture, the reagents and test sample being mixed in such proportions that the amount of chelating agent from the enzyme reagent is no more than about half of the amount of magnesium ions from the coenzyme reagent, on a molar basis; and

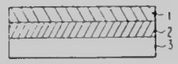
(b) measuring the formation of reduced nicotinamide-adenine dinucleotide.

4,897,347

MULTILAYER ANALYSIS FILM FOR ANALYZING TRANSAMINASE

Harumi Katsuyama, and Toshikazu Amano, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 389,345, Jun. 17, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 773,911
Claims priority, application Japan, Jun. 17, 1981, 56-93632
Int. Cl.[4] C12Q *1/52, 1/26, 1/28*
U.S. Cl. 435—16 **15 Claims**



1. A multilayer analysis film for transaminase analysis in a coupled reaction system which has formation of pyruvate by a kinetic method as part of the coupled reaction system, containing constituents for the quantitative analysis of transaminase, said film comprising a transanimase substrate, a pyruvate oxidase, an activator for the pyruvate oxidase and a color indicator for the detection of hydrogen peroxide, wherein a porous layer containing the transaminase substrate, a color indicator layer for the detection of hydrogen peroxide, and a transparent support are integrally laminated in this order, and the pyruvate oxidase and the activator for the pyruvate oxidase are contained in the porous layer or in an enzyme layer which is in contact with both the porous layer and the indicator layer, wherein the impregnation amount of the pyruvate oxidase is from about 4,698 to about 34,707 U/m^2 and an amount of a detectable species produced in said coupled reaction system by a kinetic method has a specific relation with time.
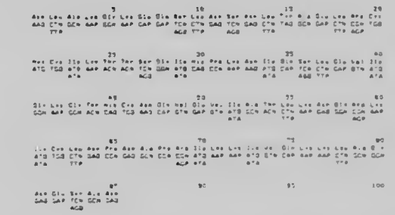
4,897,348

RECOMBINANT MATERIALS AND METHODS FOR PRODUCING HUMAN CONNECTIVE TISSUE-ACTIVATING PEPTIDE-III AND ANALOGS THEREOF

Paul H. Johnson, Menlo Park, and Nahid S. Walch, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 646,259, Aug. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 526,369, Aug. 25, 1983, abandoned. This application Nov. 4, 1987, Ser. No. 117,916
Int. Cl.[4] C12P *21/02;* **C12N** *15/00, 1/20, 1/00*
U.S. Cl. 435—69.1 **12 Claims**

1. A synthetic structural gene that encodes human connective tissue-activating peptide-III or a mutein thereof in which the methionine at position 21 is replaced with an amino acid having an acyclic side chain and hydrophobic properties similar to methionine wherein the gene has the DNA sequence:



where X represents ATG or a codon for said amino acid and Y represents a nonsense codon that is complementary to X.

4,897,349

BIOSYNTHESIS OF HYALURONIC ACID

David A. Swann, Lexington; Bernard P. Sullivan, Andover, both of Mass.; Gordon Jamieson; Kenneth R. Richardson, and Tarlach Singh, all of Cleveland, United Kingdom, assignors to MedChem Products, Inc., Woburn, Mass.

Filed Apr. 28, 1989, Ser. No. 344,896
Int. Cl.[4] C12P *19/04;* **C12R** *1/46*
U.S. Cl. 435—101 **4 Claims**

1. A process for the biosynthesis of hyaluronic acid, which comprises;

providing a strain of hyaluronic acid producing, hyaluronidase - negative microorganism;

providing a liquid nutrient medium for culturing the provided microorganism;

inoculating the provided medium with the provided microorganism;

cultivating the inoculate microorganism under aerobic conditions to a point of exponential growth wherein the biomass of the microorganism has increased by a factor of from 2 to about 10 times, based on dry weight of cells; and

cultivating the increased biomass of microorganism under aerobic conditions of reduced dissolved oxygen availability;

whereby the microorganism produces a disproportionately larger amount of hyaluronic acid during the exponential growth phase, than it would have in the absence of the reduced oxygen availability condition.

4,897,350

METHODS AND COMPOSITIONS FOR IMPROVING THE NUTRITIVE VALUE OF FOODS

Mohamed E. A. El-Megeed, Cairo, Egypt, and David C. Sands, Bozeman, Mont., assignors tc Research and Development Institute, Inc. at Montana State Univeristy of Bozeman Montana, Bozeman, Mont.

Continuation-in-part of Ser. No. 701,214, Feb. 13, 1985. This application Jan. 30, 1986, Ser. No. 809,070
Claims priority, application Egypt, Aug. 22, 1985, 528/85
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[4] C12P *13/08;* **C12N** *1/38, 1/20;* **A21D** *8/04*
U.S. Cl. 435—115 **30 Claims**

1. A composition comprising

a yeast in admixture with an heterofermentative microorganism produced from the bacterial species *Lactobacillus fermentum* comprising a spontaneous mutant of said wild type bacteria, which mutant produces lysine in a bread growth medium in greater quantity than the quantity of lysine produced by the wild type *Lactobacillus fermentum.*

13. A method for enhancing the protein quality of cereal grain, comprising adding to said cereal grain the composition of claim 1, and fermenting said cereal grain and said composition under lysine-producing conditions.

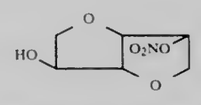
4,897,351

PROCESS OF SELECTIVE BIOCONVERSION OF ISOSORBITOL DINITRATE

Maryse Lenfant; Jacek Ropenga, both of Gif S. Yvette, and Eric Wimmer, Ballancourt, all of France, assignors to Societe National des Poudres et Explosifs and Centre National de la Recherche Scientifique, both of, France

Filed Jul. 13, 1987, Ser. No. 72,494
Claims priority, application France, Jul. 11, 1986, 86 10177
Int. Cl.[4] C12P *19/12, 1/66;* **C12R** *1/465*
U.S. Cl. 435—119 **9 Claims**

1. A process of selective bioconversion of dinitrate of isosorbitol (DINIS) into exo mononitrate of isosorbitol (MONIS-5) having the formula



wherein said DINIS is provided in a culture medium containing at least one microorganism possessing a glutathion transferase or an acellular extract of such a microorganism.

4,897,352

ACRYLATE BASED ADSORBENT RESIN FOR THE IMMOBILIZATION OF ENZYMES

Yohannes Chonde, Midland, Mich., and Marsha A. Paul, Natick, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 15, 1988, Ser. No. 144,205
Int. Cl.[4] C12N *11/08, 11/02, 11/04, 9/20*
U.S. Cl. 435—180 **20 Claims**

1. A process for preparing an immobilized enzyme which comprises adsorbing an enzyme on macroporous, hydrophilic resin beads comprised of:

10–70 weight percent methyl methacrylate;

10–70 weight percent methylacrylate;

5–40 weight percent ethylenically unsaturated monomer having at least one pendant hydroxyl group; and

10–25 weight percent divinylbenzene.

4,897,353

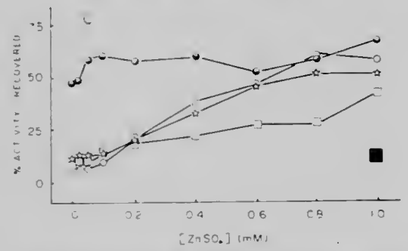
CRYOGENIC PROTECTION OF PHOSPHOFRUCTOKINASE USING AMINO ACIDS AND ZINC IONS

John F. Carpenter, David, Calif.; Steven C. Hand, Louisville, Colo.; Lois M. Crowe, and John H. Crowe, both of Davis, Calif., assignors to University of Southwestern Louisiana, Lafayette, La.

Continuation-in-part of Ser. No. 839,330, Mar. 13, 1986, Pat. No. 4,806,343. This application Oct. 30, 1986, Ser. No. 924,794
Int. Cl.[4] C12N *9/96, 9/12*
U.S. Cl. 435—188 **4 Claims**

1. A method of protecting phosphofructokinase against loss of biological activity due to freezing, the method comprising:

prior to freezing, exposing phosphofructokinase (PFK) to effective stabilizing amounts of Zn^{+2} and an amino acid



selected from the group consisting of proline, 4-hydroxyproline and glycine.

4,897,354

MONOCLONAL ANTIBODY-SPECIFIC MEROZOITE ANTIGENS

Wasim A. Siddiqui, Honolulu, Hi., assignor to University of Hawaii, Honolulu, Hi.

Filed Jul. 28, 1986, Ser. No. 891,209
Int. Cl.[4] C12N *5/00, 15/00;* C12P *21/00*
U.S. Cl. 435—240.27 **4 Claims**

1. Hybridoma cell line HB 9148 capable of producing a monoclonal antibody specific for an antigenic *Plasmodium falciparum* merozoite surface protein of approximately 185,000 dalton molecular weight.

4,897,355

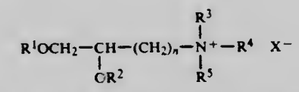
N[ω,(ω-1)-DIALKYLOXY]- AND N-[ω,(ω-1)-DIALKENYLOXY]-ALK-1-YL-N,N,N-TETRASUBSTITUTED AMMONIUM LIPIDS AND USES THEREFOR

Deborah A. Eppstein, Menlo Park; Philip L. Felgner, Los Altos; Thomas R. Gadek, Oakland; Gordon H. Jones, Cupertino, all of Calif., and Richard B. Roman, Fairhope, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 877,916, Jun. 24, 1986, which is a continuation-in-part of Ser. No. 689,407, Jan. 7, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 114,809
Int. Cl.[4] C12N *5/00*
U.S. Cl. 435—240.2 **13 Claims**

1. A method for introducing a polyanion into a cell, said method comprising:

forming a liposome from a positively charged lipid of Formula I



I

or an optical isomer thereof wherein R^1 and R^2 are the same or different and are an alkyl or alkenyl group of 6 to 24 carbon atoms; R^3, R^4 and R^5 are the same or different and are alkyl of 1 to 8 carbon atoms, aryl, aralkyl of 7 to 11 carbon atoms, or when two or three of R^3, R^4, and R^5 are taken together to form quinuclidino, pyrrolidino, piperidino, or morpholino; n is 1 to 8; and x is a pharmaceutically acceptable anion;

contacting the liposome with a polyanion to form a positively-charged polyanion-liposome complex; and

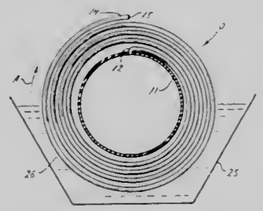
incubating the complex with a cell.

4,897,356

ROTATING COILED TUBE BIOLOGICAL CONTACTOR

James R. Simpson, and Winifred B. Simpson, both of Northumberland County, United Kingdom, assignors to Solids Dewatering Systems, Inc., St. Louis, Mo.

Filed Mar. 3, 1989, Ser. No. 318,726
Int. Cl.[4] D06M *16/00*
U.S. Cl. 435—262 **15 Claims**



1. A method of treating a fluid with a microorganism comprising the steps if

a. fixing a microorganism to the inner surface of a spiraled hollow process member having an open outer end and an inner end communicating with a central chamber which is sealed from contact with untreated fluid,

b. at least partially submerging the process member and central chamber in the fluid to be treated,

c. rotating the process member and central chamber in the fluid,

d. causing the fluid to enter the open end of the process member,

e. moving the fluid through the process member to contact the microorganism and be treated thereby, and

f. discharging the treated fluid from the inner end of the process member into the central chamber.

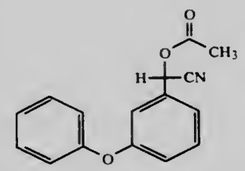
4,897,357

(S) α-CYANO-3-PHENOXY-BENZYL ACETATE

Frank J. Smith, and Jerry M. Roper, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 815,207, Dec. 31, 1985, Pat. No. 4,827,013. This application Aug. 1, 1988, Ser. No. 226,824
Int. Cl.[4] C07P *41/00;* C12P *13/00*
U.S. Cl. 435—280 **5 Claims**

1. A method for biotechnologically preparing optically active (S) α-cyano-3-phenoxy-benzyl acetate which comprises reacting (R,S) α-cyano-3-phenoxy-benzyl acetate of the formula



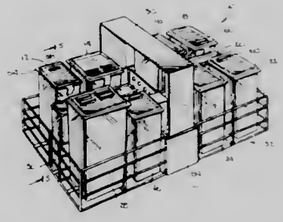
with a carboxylic acid hydrolase originating from a microorganism of the species *Candida cylindriae* and capable of asymmetrically hydrolyzing the ester of said formula to give optically active (S) α-cyano-3-phenoxy-benzyl acetate.

4,897,358

TISSUE STORAGE SYSTEM

Jose I. Carrasco, P.O. Box 4804, San Juan, P.R. 00905

Filed Dec. 2, 1985, Ser. No. 803,431
Int. Cl.[4] C12M *1/24*
U.S. Cl. 435—296 **21 Claims**



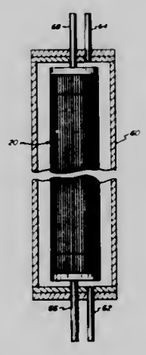
1. A tissue sample storage container comprising a hollow shell portion having opposite ends, a base at one end of said shell portion and a mouth portion at the opposite end of said shell portion, a cover member for closing said mouth portion when said cover member is in a closed position, such that said shell portion, said base and said cover member define an interior space of said container, said cover member being displaceable from said closed position to open said mouth portion, said cover member including at least one cover member recess defining a receiving space that is noncommunicable with the interior space of said container when said cover member is in said closed position, and wherein said cover member and said shell are formed of a plastic material, said container being of size to permit disposition in a portable tray with a plurality of other said containers and wherein said storage container includes at least one auxiliary container receivable in said recess, and said auxiliary container and said recess have complementary shaped cross sections.

4,897,359

APPARATUS FOR OXYGENATING CULTURE MEDIUM

Robert V. Oakley, Lafayette; Van Tainiol, Redwood City; Rudolpf F. Bliem, Castro Valley, and James F. Long, San Francisco, all of Calif., assignors to Bio-Response, Inc., Hayward, Calif.

Filed Mar. 27, 1989, Ser. No. 329,013
Int. Cl.[4] C12M *1/04*
U.S. Cl. 435—313 **11 Claims**



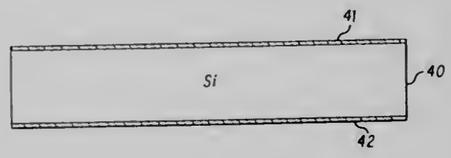
1. An apparatus for providing gas to a liquid, comprising a closely-packed collection of a plurality of elongate generally cylindrical hollow tubes constructed of gas-permeable, liquid-impermeable material, said tubes arranged substantially in parallel along their length, one open terminal end of said tubes being arranged in a substantially common plane to form an inlet face adapted to receive gas for flow through said tubes, and the other open terminal end of said tubes being arranged in a substantially common plane to form an outlet face through which said gas, upon traverse through said tubes, can be withdrawn, said tubes having an outside diameter of less than about 1 mm, and a wall thickness of from about 0.1 mm to about 0.25 mm.

4,897,360

POLYSILICON THIN FILM PROCESS

Henry Guckel, and David W. Burns, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 9, 1987, Ser. No. 131,082
Int. Cl.[4] H01L *21/00, 21/20*
U.S. Cl. 437—7 **16 Claims**



1. A method of forming a polysilicon film having selected mechanical properties, comprising the steps of:

(a) providing a substrate having a surface on which polysilicon can be deposited;

(b) preparing the substrate surface so that it is essentially free of defects and contaminants upon which nucleation of polysilicon crystal grains can occur;

(c) depositing silicon in a film onto the surface of the substrate by decomposition of silane at substantially 580° C. or less under conditions such that the film deposited has substantially uniform fine grain size; and

(d) annealing the deposited film at a temperature between about 650° C. and 950° C. and for a selected time such that the polysilicon film is in tensile strain after annealing;

wherein the crystal grains of the polysilicon have an average size less than about 300 Angstroms after annealing.

4,897,361

PATTERNING METHOD IN THE MANUFACTURE OF MINIATURIZED DEVICES

Lloyd R. Harriott, Hillsborough Township, Somerset County; Morton B. Panish, Springfield, and Henryk Temkin, Berkeley Heights, all of N.J., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

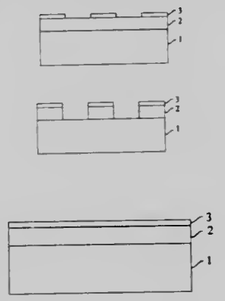
Filed Dec. 14, 1987, Ser. No. 132,757
Int. Cl.[4] H01L *21/265, 21/20*
U.S. Cl. 437—24 **16 Claims**

1. A method for making a device which comprises a patterned layer which here is designated as first layer,

patterning of said first layer comprising a step of selective removal of first-layer material by exposure to a removal agent in the presence of a patterned second layer,

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said second layer bing deposited as a layer of semiconductor material on said first layer, and



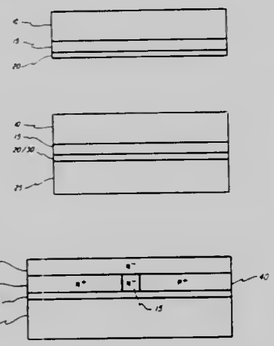
patterning of said second layer being by maskless ion-beam exposure.

4,897,362

DOUBLE EPITAXIAL METHOD OF FABRICATING SEMICONDUCTOR DEVICES ON BONDED WAFERS

Jose A. Delgado, Satellite Beach, and George Bajor, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 2, 1987, Ser. No. 92,975
Int. Cl.[4] H01L *21/265, 21/76*
U.S. Cl. 437—26 **13 Claims**



1. A method of manufacturing a semiconductor wafer comprising the steps of:

(a) providing a first layer of semiconductor material formed on a first support structure;

(b) providing a second layer of insulating material formed on a handle wafer;

(c) bonding said first layer of semiconductor material to said second layer of insulating material;

(d) removing said support structure from said first layer of semiconductor material and exposing a first surface of said first layer;

(e) selectively providing a conductive layer in said first layer of semiconductor material subsequent to removing said support structure, said conductive layer having an exposed top surface; and

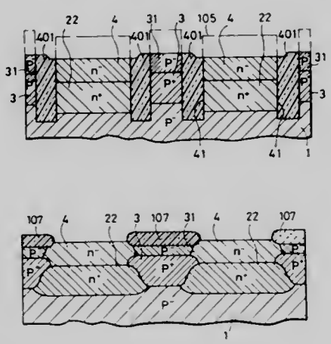
(f) providing a second layer of semiconductor material on said exposed surface of said conductive layer.

4,897,363

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE ISOLATION

Kakutaro Suda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 100,947, Sep. 25, 1987, Pat. No. 4,840,920. This application Apr. 24, 1989, Ser. No. 342,086
Claims priority, application Japan, Jul. 2, 1987, 62-167182
Int. Cl.[4] H01L *21/76, 21/302*
U.S. Cl. 437—63 **1 Claim**



1. A method of manufacturing a semiconductor device having adjacent ones of element regions isolated by isolation regions, said method comprising:

a first step of successively stacking a first oxide film and a first nitride film on a first conductivity type semiconductor substrate of low impurity concentration;

a second step of removing a plurality of portions of a two-layer film formed by said first oxide film and said first nitride film through etching to form first regions in which two-layer films are left and second regions surrounded by said first regions;

a third step of introducing second conductivity type impurity into said second regions of said semiconductor substrate by utilizing said two-layer films of said first regions as masks;

a fourth step of performing side etching of side walls of said first oxide films by utilizing said first nitride films as masks to retract edges of said first oxide films to prescribed positions in said first regions;

a fifth step of performing selective oxidation by utilizing said first nitride films as masks to form second oxide films being larger in thickness than said first, oxide films on said second regions of said semiconductor substrate and on regions exposed in said fourth step within said first regions of said semiconductor substrate;

a sixth step of diffusing said second conductivity type impurity introduced into said second regions of said semiconductor substrate in said third step by heat treatment to form second conductivity type buried layers of high impurity concentration;

a seventh step of introducing, after removing said first nitride films, first conductivity type impurity into only regions having surfaces covered by said first oxide films within said first regions of said semiconductor substrate through said first oxide films by utilizing said second oxide films as masks and further performing heat treatment to form first conductivity type buried layers of high impurity concentration in regions between adjacent ones of said second conductivitiy type buried layers; and

an eighth step of removing said first oxide films and said second oxide films and forming a second conductivity type epitaxial layer on said semiconductor substrate;

a ninth step of forming three-layer films of fifth oxide films, third nitride films and third resist films in regions corresponding to element regions on said epitaxial layer, subsequent to said eighth step, to introduce first conductivity type impurity into regions corresponding to isolation regions of said epitaxial layer by utilizing said three-layer films as masks;

a tenth step of removing said third resist films and performing heat treatment to diffuse said first conductivity type impurity introduced into said regions corresponding to isolation regions of said epitaxial layer thereby to form second diffusion layers of first conductivity type whose lower portions are connected to said first conductivity type buried layers; and

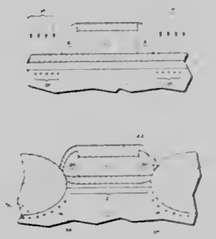
an eleventh step of performing selective oxidation by utilizing said third nitride films as masks to form sixth oxide films on said second diffusion layers of first conductivity type and removing said fifth oxide films and said third nitride films.

4,897,364

METHOD FOR LOCOS ISOLATION USING A FRAMED OXIDATION MASK AND A POLYSILICON BUFFER LAYER

Bich-Yen Nguyen; Philip J. Tobin; Shih-Wei Sun, and Michael Woo, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1989, Ser. No. 315,866
Int. Cl.[4] H01L *21/76*
U.S. Cl. 437—69 **10 Claims**



1. A method for fabricating a semiconductor device comprising the steps of:

providing semiconductor substrate;

forming a buffer layer comprising sequential layers of silicon oxide and polycrystalline silicon overlying said substrate;

depositing an oxidation masking layer overlying said buffer layer;

depositing a second layer of polycrystalline silicon overlying said oxidation masking layer;

patterning said oxidation masking layer and said second layer of polycrystalline silicon;

depositing a second oxidation masking layer overlying said patterned second layer of polycrystalline silicon and said buffer layer;

etching said second oxidation masking layer to form sidewalls; and

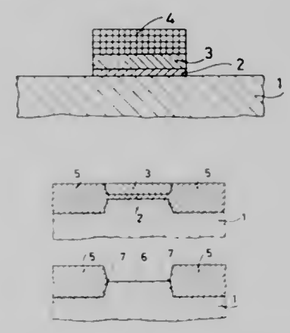
oxidizing said semiconductor substrate.

4,897,365

REDUCED-BEAK PLANOX PROCESS FOR THE FORMATION OF INTEGRATED ELECTRONIC COMPONENTS

Livio Baldi, Agrate Brianza; Daniela Beardo, Milan; Marco Icardi, Cairo Montenotte, and Adriana Rebora, Milan, all of Italy, assignors to SGS Microelecttronica S.P.A., Catania, Italy

Continuation of Ser. No. 784,324, Oct. 4, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 124,440
Claims priority, application Italy, Oct. 23, 1984, 23283 A/84
Int. Cl.[4] H01L *21/316*
U.S. Cl. 437—69 **2 Claims**



1. A method for reducing oxide wedges or bird beaks formed during a planox process for the formation of integrated electronic components, said method comprising the steps of:

(a) growing a layer of oxide on a silicon substrate, said layer having a thickness of 10 nm or less;

(b) depositing a layer of silicon nitride on said oxide layer;

(c) depositing a photoresist layer on selected areas of said silicon nitride layer, along with appropriate masking; said selected areas being those areas which will become active areas of the electronic components;

(d) etching, by use of one plasma having high selectivity with respect to silicon, the nitride and oxide layers previously deposited so as to remove those nitride and oxide layers surrounding said selected areas, thereby exposing the silicon surrounding said selected areas;

(e) removing said photoresist layer from said selected areas;

(f) growing a field oxide layer around said selected areas on the surface of said exposed silicon substrate; and

(g) removing residual oxide and silicon nitride from said selected areas so as to expose the silicon substrate in said selected areas.

4,897,366

METHOD OF MAKING SILICON-ON-INSULATOR ISLANDS

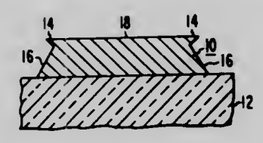
Ronald K. Smeltzer, Princeton, N.J., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 18, 1989, Ser. No. 298,148
Int. Cl.[4] H01L *21/00, 21/02, 21/205, 21/306*
U.S. Cl. 437—83 **12 Claims**

1. In a method of forming an island of single crystalline silicon on an insulating substrate wherein the island is formed

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on the substrate with sharp corners between the side walls and the top surface of the island, the improvement comprising:



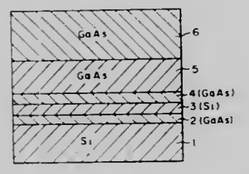
exposing the island to vapors of hydrogen chloride at a temperature of between 930° C. and 970° C. to round the corners of the islands.

4,897,367

PROCESS FOR GROWING GALLIUM ARSENIDE ON SILICON SUBSTRATE

Kazuto Ogasawara, Hatano, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 17, 1989, Ser. No. 324,880
Claims priority, application Japan, Mar. 18, 1988, 63-063112
Int. Cl.[4] H01L *21/20, 21/203*
U.S. Cl. 437—132 **12 Claims**



1. A process for growing a GaAs layer on an Si substrate, said process comprising:

forming a first GaAs layer in the amorphous state on the Si substrate at a first temperature, the first GaAs layer being formed with a thickness allowing formation of a single crystalline layer having a thickness of one to three monomolecular layers;

heating the first GaAs layer to change the amorphous state of the first GaAs layer to a single crystalline state;

forming an Si layer on the first GaAs layer at a second temperature higher than the first temperature, the Si layer being formed with a thickness having one to six monoatomic layers;

forming a second GaAs layer in the amorphous state on the Si layer at the first temperature, the second GaAs layer being formed with a thickness substantially the same as the thickness of the first GaAs layer;

heating the second GaAs layer to change the amorphous state of the second GaAs layer to a single crystalline state; and

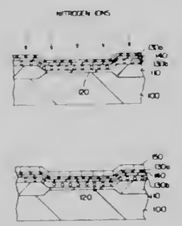
epitaxially growing a third GaAs layer on the second GaAs layer.

4,897,368

METHOD OF FABRICATING A POLYCIDEGATE EMPLOYING NITROGEN/OXYGEN IMPLANTATION

Kazuhiro Kobushi, Osaka; Shuichi Kameyama, Itami; Shozo Okada, Kobe, and Kazuhiko Tsuji, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1988, Ser. No. 195,836
Claims priority, application Japan, May 21, 1987, 62-124221; Jun. 23, 1987, 62-155822; Jun. 23, 1987, 62-155824; Jul. 15, 1987, 62-176176; Jul. 15, 1987, 62-176177; Jul. 15, 1987, 62-176178
Int. Cl.[4] H01L *21/265, 21/283*
U.S. Cl. 437—200 **21 Claims**



17. The method of fabricating a semiconductor device comprising:

(a) forming an insulating film on a surface of a semiconductor substrate;

(b) forming a low resistance polycrystalline silicon film on said insulating film;

(c) forming a nitrogen ion implanted layer within the body of said low resistance polycrystalline silicon film by ion-implantation;

(d) forming a metal-silicide film on said low resistance polycrystalline silicon film in which said nitrogen ion implanted layer is formed;

(e) annealing said metal-silicide film and said low resistance polycrystalline silicon film by heat treatment to at least partially mix these films and form an alloy layer; and

(f) patterning said low resistance polycrystalline silicon film and said metal-silicide film into a low resistance wiring pattern;

whereby the ion implanted layer is used for preventing the atoms composing the low resistance conductor film from diffusing by the heat treatment into the lower part of said polycrystalline conductor film through the ion implanted layer and reaching to said insulating film, and

wherein said nitrogen ion implanted layer is used for preventing the atoms composing the metal-silicide film from diffusing by the heat treatment into the lower part of said low resistance polycrystalline silicon film through the nitrogen ion implanted layer and reaching into to said insulating film.

4,897,369

METHOD FOR SHAPING THE EDGES OF SLICES OF SEMICONDUCTOR MATERIAL

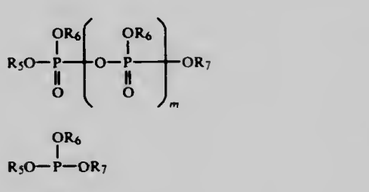
Giorgio Beretta, and Antonino Inserra, both of Catania, Italy, assignors to SGS-Thompson Microelectronics S.p.A., Catania, Italy

Filed Jun. 22, 1988, Ser. No. 210,049
Claims priority, application Italy, Jun. 29, 1987, 6615 A/87
Int. Cl.[4] H01L *21/304*
U.S. Cl. 437—225 **5 Claims**

1. A method of shaping an edge of a slice of a semiconductor material, comprising the steps of:

(a) sliding an edge of a slice of a semiconductor material in cyclic contact with a surface of a pad soaked with an acid substance capable of dissolving material from said slice;

(b) periodically washing portions of the edge of said slice with deionized water; and



(c) contacting said portions after washing with the deionized water again with said pad, said deionized water being provided in a bath below said pad, said slice is round, and said edge is slid in contact with said surface of said pad by rotating said slice to displace said edge through a notch formed in said pad and then through said bath.

4,897,370

PROCESS FOR PREPARING CERAMICS COMPOSITE SINTERED BODIES

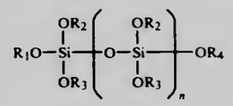
Yasunobu Horiguchi, Kamagaya; Nobuyuki Yamamoto, Edogawa, and Tuyoshi Goto, Kawasaki, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,307
Claims priority, application Japan, Jun. 30, 1987, 62-162707; Jun. 30, 1987, 62-162708; Jun. 30, 1987, 62-162709
Int. Cl.[4] C03C *10/00, 14/00*
U.S. Cl. 501—5 **13 Claims**

1. A process for preparing a glass or glass-ceramic composite sintered body which comprises reacting

(A) at least one silicic acid ester represented by the general formula (I)

[I]

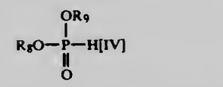


wherein R_1 to R_4 are each hydrogen or a group represented by $C_xH_{2x+1}(OC_2H_4)_y$— where x is 1 to 5, and y is 0 to 10, provided that R_1 to R_4 are not all hydrogen at the same time and n is 0 to 20;

(B) at least one phosphorus compound represented by the general formula (II), (III) or (IV):

[II]

[III]



wherein R_5 to R_9 are each hydrogen, an alkyl group having 1 to 5 carbon atoms, a phenyl group or an aralkyl group having 7 to 10 carbon atoms, and m is 0 to 10 and;

(C) at least one compound selected from the group consisting of water-soluble calcium salts; with water in an amount necessary for hydrolyzing the components (A)–(C) in the presence of the following component (D-1) and/or the following component (D-2) to form a gel, and drying, molding and then sintering the gel;

(D-1): at least one kind of ceramics fine particles having a composition different from a sintered body obtained from components (A) to (C) or having a crystal different from crystals formed in the sintered body,

(D-2): ceramic short fibers and/or whiskers.

4,897,371

GLASS ARTICLE PROTECTED FROM COLORING BY ELECTRON RAYS AND METHOD OF USING

Kouichi Suzuki, and Kazuo Shibaoka, both of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jan. 21, 1988, Ser. No. 146,449
Claims priority, application Japan, Feb. 3, 1987, 62-23216; Feb. 4, 1987, 62-24381; Sep. 25, 1987, 62-241591; Sep. 25, 1987, 62-241592
Int. Cl.[4] C03C *3/087*
U.S. Cl. 501—70 **4 Claims**

1. A glass article protected from coloring by electron rays, comprising:

soda-lime-silica a glass having a surface to which electron rays are irradiated, said glass being produced by a float process with molten tin and composed of 69–73% by weight of SiO_2, 0.5–1.5% by weight of Al_2O_3, 0–0.15% by weight of Fe_2O_3, 7–14% by weight of CaO, 0–4.5% by weight of MgO, 12–16% by weight of Na_2O, 0–1.5% by weight of K_2O, 0–0.1% by weight of TiO_2, and 0–0.5% by weight of SO_3, said surface being prevented from contact with the molten tin during glass production, and

lithium ions and at least one member selected from the group consisting of potassium ions, rubidium ions and cesium ions substituted for sodium ions around the surface of the glass, average content of Li_2O for a depth of 10 micra from the surface of the glass being 0.1–3 wt %.

3. A glass article protected from coloring by electron rays, comprising:

a glass article having a surface to which electron rays are irradiated, said glass article being composed of 69–73% by weight of SiO_2, 0.5–1.5% by weight of Al_2O_3, 0–0.15% by weight of Fe_2O_3, 7–14% by weight of CaO, 0–4.5% by weight of MgO, 12–16% by weight of Na_2O, 0–1.5% by weight of K_2O, 0–0.1% by weight of TiO_2, 0–0.5% by weight of SO_3, and 0.2–1.5% by weight of Li_2O, and

potassium ions substituted for sodium ions around the surface of the glass, and weight ratio of $Na_2O/(Na_2O+K_2O)$ being 0.2–0.6 for a depth of 0.5 micron or more from the surface of the glass.

4,897,372

HIGH THERMAL CONDUCTIVITY CERAMIC BODY

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

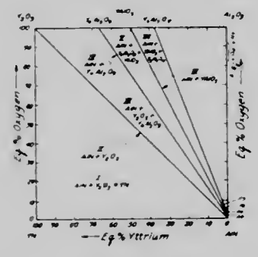
Filed Dec. 18, 1985, Ser. No. 810,473
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—96 **57 Claims**

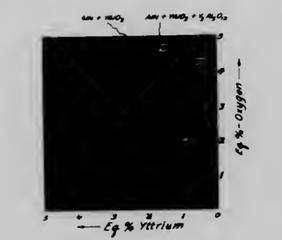
1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon A4F5F6F4 but excluding line F6F4 of FIG. 4, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.00 W/cm.K at 25° C. which comprises the steps:

(a) forming a mixture comprised of oxygen-containing aluminum nitride powder, yttrium oxide, and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent %

of yttrium and aluminum ranges from point F5 up to point F4 of FIG. 4, said yttrium ranging from about 2.1 equivalent % to greater than about 0.25 equivalent %, said aluminum ranging from about 97.9 equivalent % to less than about 99.75 equivalent %, said compact having an equivalent % composition of, Y, Al, O and N outside the composition defined and encompassed by polygon A4F5F6F4 of FIG. 4,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact





but below its pore closing temperature reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Y, O and N is defined and encompassed by polygon A4F5F6F4 but excluding line F6F4 of FIG. 4, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-containing nonoxidizing atmosphere at a temperature of at least about 1830° C. producing said polycrystalline body.

4,897,373

DIELECTRIC CERAMIC COMPOSITION

Yoshihito Inoue; Takashi Yamaguchi; Masashi Saito, and Takeshi Inoue, all of Saitama, Japan, assignors to Mitsubishi Mining and Cement Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,743

Claims priority, application Japan, Oct. 12, 1987, 62-256691

Int. Cl.⁴ C04B *35/46*

U.S. Cl. 501—134 **6 Claims**

1. A dielectric ceramic composition comprising $PbTiO_3$, $Pb(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$, and $Pb(Fe_{\frac{1}{2}}W_{\frac{1}{2}})O_3$, with 0.5 to 10 mol % of Pb atoms partly replaced by at least one of Ba atoms and Sr atoms as represented by the formula (I) below:

$$(Pb_{1-u}M_u)\{Ti_x(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})_y(Fe_{\frac{1}{2}}W_{\frac{1}{2}})_z\}O_3 \quad (I)$$

where

M denotes at least one of Ba and Sr,

$0.005 \leqq u \leqq 0.10$,

$0.10 \leqq x \leqq 0.40$,

$0.05 \leqq y \leqq 0.85$,

$0.05 \leqq z \leqq 0.55$, and

$Pb(Mn_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$ in an amount more than 0 an mol % of said above components.

4,897,374

DIELECTRIC CERAMIC AND PROCESS OF PREPARING IT

Kazutoshi Matsumoto, Matsudo; Ko Takada; Takehiro Hiuga, both of Ichikawa, and Tetsuya Mukai, Matsudo, all of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,695

Claims priority, application Japan, Dec. 16, 1987, 62-319961; Jun. 17, 1988, 63-149859

Int. Cl.⁴ C04B *35/00*

U.S. Cl. 501—134 **9 Claims**

1. A dielectric ceramic having the composition represented by the general formula (I):

$$Ba_xA_yB_{1-x-y}F_zO_w$$

wherein A is at least one selected from the group consisting of Mg, Zn, Ni and Co; B is at least one selected from Ta and Nb; x, y, and z are numbers represented by $0.48 \leqq x \leqq 0.52$, $0.15 \leqq y \leqq 0.19$ and $0.00025 \leqq z \leqq 0.05$, respectively; and w is a number such that the total electric charges of cations of A and B and anions of F are neutralized to make the ceramic substantially neutral as a whole.

4,897,375

PROCESS OF PREPARING CATALYTIC BRASS

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 359,212, Mar. 18, 1982, and a continuation-in-part of Ser. No. 302,979, Sep. 17, 1981, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, and a continuation-in-part of Ser. No. 311,621, Oct. 15, 1981, and a continuation-in-part of Ser. No. 242,350, Mar. 10, 1981, Pat. No. 4,464,430. This application Mar. 28, 1983, Ser. No. 479,211

Int. Cl.⁴ B01J *21/04, 23/06, 23/72*

U.S. Cl. 502—301 **4 Claims**

1. The process of preparing catalytic brass, which process is characterized by diffusing aluminum into the surface of a self-supporting brass web that contains about 10 to about 40% zinc, to cause the surface to pick up enough aluminum so that its aluminum content is at least about 17% by weight, and then subjecting the aluminized surface to the leaching action of aqueous mineral acid that leaches out much of the aluminum without significantly attacking the copper, and continuing the leaching at least until the leached surface becomes dark brown in color.

4,897,376

PROCESS FOR PREPARING A CATALYST FOR OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

Kindtoken H. Liu, Park Ridge, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Filed Jun. 27, 1988, Ser. No. 212,304

Int. Cl.⁴ B01J *23/04, 23/50*

U.S. Cl. 502—347 **18 Claims**

1. A process for preparing a supported silver catalyst useful for the vapor-phase oxidation of ethylene to ethylene oxide, comprising the steps of:

(a) impregnating a porous support having a surface area of about 0.2 to 2.0 2/g with a hydrocarbon solution of a silver salt of a neo-acid containing at least seven carbon atoms sufficient to provide 3 to 25 wt % silver on the support, and separating the impregnated support from said solution;

(b) activating said impregnated support by heating in air for sufficient time to produce an active catalyst;

(c) impregnating said activated catalyst with a solution containing an alkali metal compound in an amount sufficient to provide an amount of said alkali metal to depress the activity and selectivity of said activated catalyst to produce a catalyst precursor, said alkali metal being selected from the group consisting of sodium, potassium, cesium, and rubidium, and

(d) heat treating said catalyst precursor in a substantially inert atmosphere at a temperature of between 450° and 700? C. for between 0.1 to 4.5 hours at a steady state to reactivate the precursor to produce an active catalyst.

4,897,377

RECEIVER SHEET

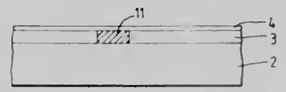
Richard A. Marbrow, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Apr. 19, 1988, Ser. No. 183,147

Claims priority, application United Kingdom, Apr. 24, 1987, 8709797

Int. Cl.⁴ B41M *5/035, 5/26*

U.S. Cl. 503—227 **9 Claims**



1. A thermal transfer printing receiver sheet for use in association with a compatible donor sheet, the receiver sheet comprising a supporting substrate having, on at least one surface thereof, a dye-receptive receiving layer to receive a dye thermally transferred from the donor sheet, wherein

(a) the substrate comprises an opaque, molecularly oriented film of a synthetic linear polyester, and

(b) the at least one receiving layer has a thickness not exceeding 7.5 μm, and comprises a dye-receptive, essentially amorphous, synthetic polyester resin containing one or more glycols selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol and neopentyl glycol.

4,897,378

PREPARATION OF THIN FILM SUPERCONDUCTING OXIDES

Yet-Ming Chiang, Ashland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 53,058, May 22, 1987. This application Nov. 23, 1987, Ser. No. 123,929

Int. Cl.⁴ B05D *5/12*; C01B *15/04*; C01F *17/00*; C04B *35/05*

U.S. Cl. 505—1 **67 Claims**

1. A method of preparing a copper oxide-based superconducting oxide/noble metal composite film comprising the steps of:

making an organic liquid solution of the cation constituents of the oxide film by chelating a precursor solution containing said cation constituents with an organic acid and adding a polymerizing alcohol;

adding a noble metal to said organic liquid solution;

forming the solution into a liquid film;

drying and heating the liquid film solution to obtain a solid organic polymer or resin; and

firing the polymer to obtain the copper oxide-based superconducting oxide/noble metal composite film.

4,897,379

N-[N$^{\alpha}$-(1(S)-CARBOXY-3-CYCLOHEXYLPROPYL)-L-LYSYL]-N-CYCLOPENTYLGLYCINE AS ANTIHYPERTENSIVES

Shizuo Saito; Motoshi Watanabe, both of Tokyo; Shuji Fukushima, Nagoya, and Shinichi Matsui, Tokyo, all of Japan, assignors to Asahi Breweries Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,565

Claims priority, application Japan, Mar. 24, 1987, 62-67770

Int. Cl.⁴ A61K *37/02*; C07K *5/06*

U.S. Cl. 514—19 **2 Claims**

1. N-[N$^{\alpha}$-(1(S)-carboxy-3-cyclohexylpropyl)-L-lysyl]-N-cyclpentylglycine and pharmaceutically acceptable salts thereof.

4,897,380

METHOD AND COMPOSITION FOR RELIEVING DIETARY-RELATED DISORDERS

Robert L. Pollack, 8442 Chippewa Rd., Philadelphia, Pa. 19128, and Lawrence Durst, 5 W. 5th St., Bridgeport, Pa. 19405

Continuation-in-part of Ser. No. 771,325, Aug. 30, 1985, Pat. No. 4,639,465. This application Jan. 27, 1987, Ser. No. 7,121 The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.⁴ A61K *31/40, 31/70, 31/435*

U.S. Cl. 514—23 **14 Claims**

1. A daily dietary supplement for relieving clinical depression, promoting sleep, reducing appetite, and relieving chronic pain in a patient, comprising:

from about 50 milligrams to about 15 grams of L-tryptophan for increasing production of serotonin within the patient's brain; and

from about 5 milligrams to about 20 grams of fructose for producing a steady release of insulin into the patient's blood so as to increase the concentration of L-tryptophan in the patient's blood and to provide a steady and prolonged increase in the transport of L-tryptophan from the patient's blood into the patient's brain.

4,897,381

ORGANIC AMIDE COMPOUNDS DERIVED FROM NITROGENOUS LIPIDS

Francesco della Valle, Padua, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia S.p.A., Abano Terme, Italy

Division of Ser. No. 807,841, Dec. 11, 1985, Pat. No. 4,757,053, which is a continuation of Ser. No. 404,706, Aug. 3, 1982, abandoned. This application Jun. 21, 1988, Ser. No. 209,490

Claims priority, application Italy, Aug. 3, 1981, 49031 A/81

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.⁴ C07D *473/08*; C07F *9/65*; A61K *31/52*

U.S. Cl. 514—25 **13 Claims**

1. An organic amide compound of the formula:

$$R_1{-}CO{-}\underset{\displaystyle R_2}{\underset{|}{N}}{-}R_3$$

wherein R_1—CO is a residue of a carboxylic acid which has biological or pharmaceutical activity, with the proviso that the carboxylic acid is not a natural fatty acid normally bound to nitrogen of nitrogenous lipids, R_2 is a hydrogen atom, a saturated $C_{1\text{-}7}$ alkyl group or a saturated $C_{4\text{-}7}$ cycloalkyl group, and R_3N is a residue of a phospholipid or sphingolipid, or a pharmaceutically acceptable salt thereof.

12. A pharmaceutical composition useful for treating disorders of the central and peripheral nervous systems comprising an effective amount of an organic amide compound according to claim 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier or diluent.

VOL 1110 ISS 5 JA 30 1990 UMI

4,897,382

ORGANIC AMIDE COMPOUNDS DERIVED FROM NITROGENOUS LIPIDS

Francesco della Valle, Padova, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia S.p.A., Abano Terme, Italy

Division of Ser. No. 807,841, Dec. 11, 1985, Pat. No. 4,757,053, which is a continuation of Ser. No. 404,706, Aug. 3, 1982, abandoned. This application Jun. 21, 1988, Ser. No. 209,565

Claims priority, application Italy, Aug. 3, 1981, 49031A

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

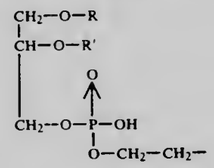
Int. Cl.[4] C07D *401/08;* **C07F** *9/65;* **A61K** *31/675*

U.S. Cl. 514—25 **17 Claims**

2. An organic amide compound of the formula:

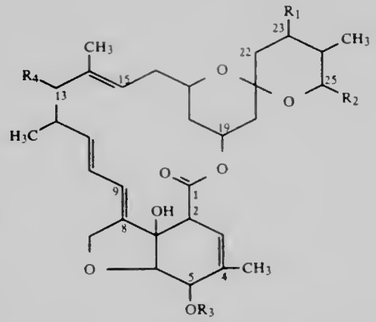


wherein R_1—CO is an acyl residue of a carboxylic acid selected from the group consisting of lysergic, isolysergic, dihydrolysergic, 2-bromolysergic, 2-bromodihydrolysergic, 1-methyllysergic, 1-methyldihydrolysergic, 1-methyl-2-bromolysergic, 1-methyl-2-bromodihydrolysergic, gamma-aminobutyric and valproic acid, R_2 is a hydrogen atom and R_3 is a residue of a phospholipid having the chemical structure:



wherein R and R′ each represent a hydrogen atom or an acyl residue of a member selected from the group consisting of stearic, palmitic, oleic, linolenic, linoleic and arachidonic acid, or a pharmaceutically acceptable salt thereof.

14. A pharmaceutical composition useful for treating disorders of the central and peripheral nervous systems comprising an effective amount of an organic amide compound according to claim **2, 3, 4, 5, 6, 7, 8, 9, 10** or **11**, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier or diluent.

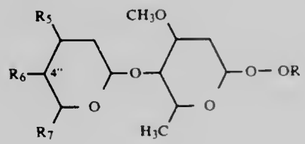


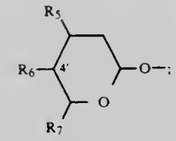
wherein the broken line at the 22,23 position represents a 22,23-single bond and wherein R_1 is hydrogen, hydroxy or keto, or the broken line represents a 22,23-double bond and R_1 is absent;

R_2 is an alpha branched C_3–C_8 alkyl or alkenyl group;

R_3 is hydrogen, loweralkyl or loweralkanoyl;

R_4 is





R_5 is hydrogen and R_6 is hydroxy, amino, N-loweralkylamino, N,N-diloweralkylamino, loweralkanoylamino, or N,N-diloweralkylalkanoylamino when the broken line to R_6 indicates a 4′ or 4″ single bond or R_6 is keto, semicarbazone, N-loweralkylsemicarbazone, N,N-diloweralkylsemicarbazone, oxime, or loweralkyloxime when the broken line to R_6 indicates a 4″ or 4″ double bond; or

R_5 is hydrogen or methoxy and R_6 is hydrogen; and

R_7 is methyl or hydrogen.

4,897,384

DRUG PREPARATIONS OF REDUCED TOXICITY

Andrew S. Janoff, Lawrenceville, N.J.; Carl R. Alving, Washington, D.C.; Michael W. Fountain, Plainsboro, N.J.; Robert P. Lenk, Lambertville, N.J.; Marc J. Ostro, North Brunswick, N.J.; Mircea C. Popescu, Plainsboro, N.J.; Paul A. Tremblay, Princeton, N.J., and Alan L. Weiner, Plainsboro, N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation of Ser. No. 604,503, May 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 498,268, May 26, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 844,248

Int. Cl.[4] A61K *31/70, 31/685*

U.S. Cl. 514—34 **25 Claims**

1. A drug preparation of reduced toxicity, comprising: a mixture of (a) an aminoglycoside which exhibits toxic effects in humans or animals by binding to a toxicity receptor, and (b) a ligand capable of preventing binding of the aminoglycoside to the toxicity receptor in vivo while allowing the aminoglycoside to retain its pharmaceutical activity, the aminoglycoside being present in molar ration of about 1:1 to about 1:3 aminoglycoside:ligand, and the ligand being selected from the group consisting of: lysophosphatidylcholine, phosphorylcholine, inositol hexaphosphate, phosphoglyceric acid, tripolyphosphate, phosphorylserine and phosphatidylinositol bisphosphate.

4,897,383

AVERMECTIN DERIVATIVES

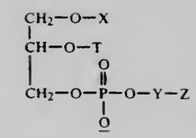
Peter J. Sinclair, Suffern, N.Y., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1989, Ser. No. 309,569

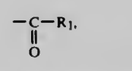
Int. Cl.[4] A61K *31/71;* **C07H** *17/08*

U.S. Cl. 514—30 **18 Claims**

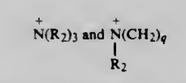
1. A compound having the formula:



wherein X is selected from the group consisting of a phenyl radical substituted at any position with a C_1–C_{20} branched or straight chain alkoxy or benzyloxy, alone, or further substituted at any other positions with one or more groups consisting of C_1–C_{15} branched or straight chain alkyl, C_1–C_{15} branched or straight chain alkoxy and halogen, and a naphthalene radical substituted at any position with a C_1–C_{20} branched or straight chain alkoxy or benzyloxy, alone, or further substituted at any other positions with one or more groups consisting of C_1–C_{15} branched or straight chain alkyl, C_1–C_{15} branched or straight chain alkoxy and halogen; T is selected from the group consisting of hydrogen and



wherein R_1 is selected from the group consisting of hydrogen, C_1–C_4 branched or straight chain alkyl, C_1–C_4 branched or straight chain alkoxy and C_1–C_4 branched or straight chain alkylamino; Y is selected from the group of bivalent radicals consisting of —$(CH_2)_p$—and—$(CHR)_p$—, wherein p is an integer from 2 to 10 and the moiety —$(CHR)_p$—represents an alkylene chain substituted with one or more C_1–C_8 alkyl groups or phenyl groups; Z is selected from the group consisting of



wherein q is an integer from 4–7 and R_2 may be the same or different and is selected from the group consisting of hydrogen and C_1–C_4 branched or straight chain alkyl.

4,897,385

ANTIHYPERTENSIVE PHOSPHATE DERIVATIVES

Allan Wissner, Ardsley, and Phaik-Eng Sum, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

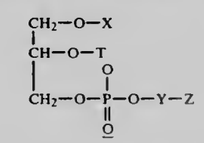
Continuation of Ser. No. 679,792, Dec. 10, 1984, Pat. No. 4,697,031. This application Sep. 15, 1987, Ser. No. 96,945

The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.

Int. Cl.[4] C07F *9/10;* **A01K** *31/685*

U.S. Cl. 514—77 **14 Claims**

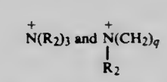
1. A method of treating hypertension in a warm-blooded animal comprising administering to said animal an effective amount of a compound, including the individual R and S enantiomers and racemic mixture, represented by the formula:



wherein X is selected from the group consisting of a phenyl radical substituted at any position with a C_1–C_{20} branched or straight chain alkoxy or benzyloxy, alone, or further substituted at any other positions with one or more groups consisting of C_1–C_{15} branched or straight chain alkyl, C_1–C_{15} branched or straight chain alkoxy and halogen, and a naphthalene radical substituted at any position with a C_1–C_{20} branched or straight chain alkoxy or benzyloxy, alone, or further substituted at any other positions with one or more groups consisting of C_1–C_{15} branched or straight chain alkyl, C_1–C_{15} branched or straight chain alkoxy and halogen; T is selected from the group consisting of hydrogen and



wherein R_1 is selected from the group consisting of hydrogen, C_1–C_4 branched or straight chain alkyl, C_1–C_4 branched or straight chain alkoxy and C_1–C_4 branched or straight chain alkylamino; Y is selected from the group of bivalent radicals consisting of —$(CH_2)_p$—and—$(CHR)_p$—, *wherein p is an integer from* 2 to 10 and the moiety —$(CHR)_p$—represents an alkylene chain substituted with one or more C_1–C_8 alkyl groups or phenyl groups; Z is selected from the group consisting of



wherein q is an integer from 4–7 and R_2 may be the same or different and is selected from the group consisting of hydrogen and C_1–C_4 branched or straight chain alkyl.

5. Compounds, including the individual R and S enantiomers and the racemic mixtures represented by the formula:

wherein X is selected from the group consisting of a phenyl radical substituted at any position with a C_1–C_{20} branched or straight chain alkoxy or benzyloxy, alone, or further substituted at any other positions with one or more groups consisting of C_1–C_{15} branched or straight chain alkyl, C_1–C_{15} branched or straight chain alkoxy and halogen, and a naphthalene radical substituted at any position with a C_1–C_{20} branched or straight chain alkoxy or benzyloxy, alone, or further substituted at any other positions with one or more groups consisting of C_1–C_{15} branched or straight chain alkyl, C_1–C_{15} branched or straight chain alkoxy and halogen; T is selected from the group consisting of hydrogen and

wherein R_1 is selected from the group consisting of hydrogen, C_1–C_4 branched or straight chain alkyl, C_1–C_4 branched or straight chain alkoxy and C_1–C_4 branched or straight chain alkylamino; Y is selected from the group of bivalent radicals consisting of —$(CH_2)_p$—and—$(CHR)_p$—, wherein p is an integer from 2 to 10 and the moiety —$(CHR)_p$—represents an alkylene chain substituted with one or more C_1–C_8 alkyl groups or phenyl groups; Z is selected from the group consisting of

wherein q is an integer from 4–7 and R_2 may be the same or different and is selected from the group consisting of hydrogen and C_1–C_4 branched or straight chain alkyl.

4,897,386

SYNERGISTIC COMPOSITIONS

Michael D. Matthewson, Berkhamsted, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 391,455, Jun. 23, 1982, abandoned, which is a continuation of Ser. No. 863,738, Dec. 23, 1977, abandoned. This application Jan. 31, 1984, Ser. No. 575,486

Claims priority, application United Kingdom, Dec. 24, 1976, 54049

Int. Cl.[4] A01N *53/00, 57/00*

U.S. Cl. 514—108 **4 Claims**

1. A method of controlling veterinary ectoparasites of mammals and birds of the sub-orders IXODOIDEA and Sarecoptiformes comprising the application of a synergistic composition comprising a parasiticidially effective, non-toxic amount of permethrin together with Ethion, said composition containing 5 to 95% of permethrin and 5 to 95% of Ethion.

VOL 1110 ISS 5 JA 30 1990 UMI

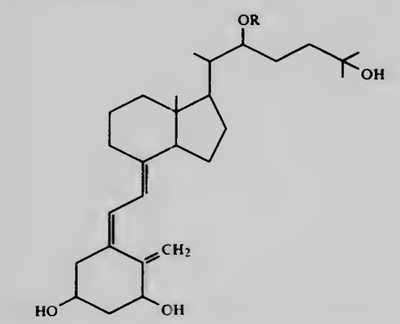
4,897,387

NOVEL VITAMIN D_3 DERIVATIVES

Nobuo Ikekawa, and Tadashi Eguchi, both of Tokyo, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,706
Claims priority, application Japan, Jun. 23, 1987, 62-156234; Dec. 29, 1987, 62-336467
Int. Cl.[4] A61K *31/59*; **C07J** *9/00*
U.S. Cl. 514—167 **9 Claims**

1. A compound of the formula:



wherein R represents a hydrogen atom or lower alkyl.

4,897,388

METHOD OF TREATING ALZHEIMER'S DISEASE

Hartmut H. Malluche, Versailles, Ky., assignor to Geriatric Research Institute, Inc., Brookfield, Wis.

Filed Dec. 20, 1988, Ser. No. 287,754
Int. Cl.[4] A61K *31/59*
U.S. Cl. 514—167 **3 Claims**

1. A method of treating Alzheimer's disease which comprises administering to a patient having the disease a safe and symptom-alleviating amount of a compound selected from the class consisting of:

1α,25-dihydroxy-7-dehydrocholesterol;
1α,24,25-trihydroxy-7-dehydrocholesterol;
24,25-dihyroxy-7-dehydrocholesterol;
1α-hydroxy-7-dehydrocholesterol;
1α,24-dihydroxy-25-fluoro-7-dehydrocholesterol;
25,26-dihydroxy-7-dehydrocholesterol;
25-hydroxy-7-dehydrocholesterol;
1α-hydroxy-ergosterol;
25-hydroxy-ergosterol;
1α,25-dihydroxy-ergosterol;
1α,25-dihydroxy-precholecalciferol;
1α,24,25-trihydroxy-precholecalciferol;
24,25-dihydroxy precholecalciferof;
1α,-hydroxy-precholecalciferol;
1α,24-dihydroxy-25-fluoro-precholecalciferol;
25-hydroxy-precholecalciferol;
1α-hydroxy-previtamin D_2;
25-hydroxy-previtamin D_2;
1α,25-dihydroxy-previtamin D_2;
Dihydrotachysterol$_2$;
Dihydrotachysterol$_3$;
5,6-trans-vitamin D_3;
25-hydroxy-5,6-trans vitamin D_3;
1α-hydroxy vitamin D_2;
25-hydroxy vitamin D_2;
1α,25-dihydroxy vitamin D_2;
calcitriol;
1α,24,25-trihydroxy-cholecalciferol;
24,25-dihydroxy-cholecalciferol;
1α,24-dihydroxy-25-fluoro-cholecalciferol;
25-hydroxy-cholecalciferol; and
1α-hydroxy-cholecalciferol.

4,897,389

TREATING CENTRAL NERVOUS SYSTEM DISEASES

Chaovanee Aroonsakul, 6907 S. Constance, Chicago, Ill. 60649

Continuation of Ser. No. 156,242, Feb. 16, 1988, which is a continuation-in-part of Ser. No. 666,254, Oct. 29, 1984, Pat. No. 4,791,099, and a continuation-in-part of Ser. No. 852,645, Apr. 16, 1986, Pat. No. 4,727,041. This application Jan. 3, 1989, Ser. No. 293,134
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—171 **5 Claims**

1. A method for treating central nervous system diseases in human beings, said diseases selected from Senile Dementia, Parkinson's disease, cerebral atrophy, Alzheimer's disease, cerebellar atrophy, senile tremor, and essential tremor, comprising:

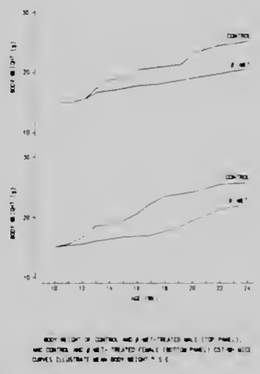
inducing into the blood stream of a female human being suffering from the disease an effective dosage of a female estrogenic sex hormone from the group consisting of: estradiol, estrone and estriol.

4,897,390

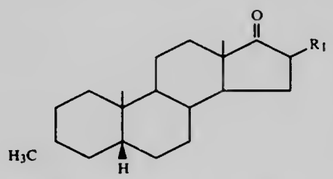
NOVEL ANTI-OBESITY COMPOUNDS AND METHOD OF USE

Rodney C. Ruhe, 1000 Willmar Ave., SW., Willmar, Minn. 56201

Filed Jul. 21, 1987, Ser. No. 76,077
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—177 **20 Claims**



1. A steroid selected from the group consisting of metabolically stable, pharmaceutically acceptable and therapeutically effective analogs of 5-β-androstan-3-α-ol-17-one having the structure:



wherein R_1 is selected from the group consisting of Cl, F, and Br.

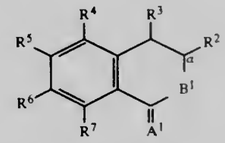
4,897,391

TRICYCLIC ANTI-ALLERGY, ANTIINFLAMMATORY AND ANTI-HYPERPROLIFERATIVE COMPOUNDS

Richard J. Friary, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Jun. 17, 1988, Ser. No. 208,304
Int. Cl.[4] A61K *31/55, 31/33*; **C07D** *455/04*
U.S. Cl. 514—183 **18 Claims**

1. A compound represented by the formula



or a pharmaceutically acceptable salt or solvate thereof, wherein:

the dotted lines represent optical double bonds, one of which may present in any given compound and when both are absent, the results are single bonds terminating at the ? carbon and at the two substitutents being represented by R^3 as defined below;

A^1=O or S; B^1 is NR^1 where NR^1 and R^2 together form $(CH_2)_aN$ wherein "a" is 3, 4, 5 or 6 and; R^3 is selected from H, alkyl, arylmethyl, aryl, OH, —O-alkyl, —O-acyl, —O-aroyl, when the dotted line terminating at R^3 is absent and the double bond terminating at the α carbon is present; or R^3 represents CHR^0 when R^0 is selected from H, alkyl, arylmethyl when the dotted line terminating at the α carbon is absent and the dotted line terminating at R^3 is present and represents a double bond; or R^3 represents two substituents selected from OH and aryl, OH and alkyl, or OH and arylmethyl when both dotted lines terminating at R^3 and at the α carbon are absent; R^4 and R^6 may be the same or different and each independently selected from H, halo, $—CF_3$, $—NO_2$, $—OR^8$, —-acyl, —O-aroyl, $-SR^8$, —S-acyl, —S-aroyl, $—SO_2$-alkyl, $—SO_2$-aryl, $—SO_2$-aralkyl, $—N(R^8)_2$, $—N(R^8)$-acyl, $—N(R^8)$-aroyl, $—CO_2R^8$, $—C(O)N(R^8)_2$, $—CO_2$-alkyl, $—CO_2$-aryl or $—CO_2$-aralkyl, with the proviso that at least one of R^4 and R^6 is selected from —SH, —OH, $—NHR^8$, —NH-acyl, —NH-aroyl, —O-acyl, —O-aroyl, —S-acyl, or —S-aroyl; R^5 and R^7 may be the same or different and each is independently selected from H, halo, $—CF_3$, $—NO_2$,alkyl, aryl, arylmethyl, $—S(O)_c$-alkyl or $—S(O)_c$-aryl (in both of which c is 0, 1 or 2), $—OR^8$-acyl, —O-aroyl, $—SR^8$, —S-acyl, —S-aroyl, $—N(R^8)_2$, $—N(R^8)$-acyl, $—N(R^8)$-aroyl, $—CO_2R^8$ or $—C(O)N(R^8)_2$; and each R^8 is independently selected from H or alkyl with the proviso that R^3 represents arylmethyl or aryl only when at least one of R^4, R^5, R^6 and R^7 represents —O-acyl.

16. A method for treating allergy in a mammal comprising administering to said mammal an anti-allergy effective amount of a compound as claimed in claim 1.

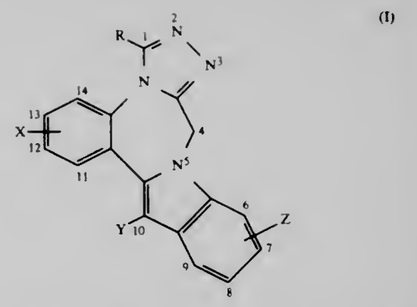
4,897,392

4H-INDOLO(1,2-D)(1,2,4)TRIAZOLO(4,3-A)(1,4)BENZODIAZEPINES

John J. Tegeler, Bridgewater; Eileen M. Gardenhire, Califon, and Grover C. Helsley, Pluckemin, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Jul. 3, 1989, Ser. No. 375,444
Int. Cl.[4] C07D *487/14*; **A01K** *31/55*
U.S. Cl. 514—219 **29 Claims**

1. A compound of the formula,



where X is H, halogen, —OH, $—OCH_3$, $—NO_2$ or $—CF_3$; Y is H, Cl or Br; Z is H, halogen, —OH or $—OCH_3$; and R is H, loweralkyl, $—CH_2OH$ or diloweralkylaminomethyl, or a pharmaceutically acceptable acid addition salt thereof.

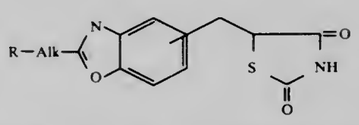
4,897,393

BENZOXAZOLE DERIVATIVES

Ikuo Iijima, Urawa; Masakatsu Ozeki, Wako; Kunihito Okumura, Urawa, and Masanori Inamasu, Misato, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Mar. 14, 1988, Ser. No. 167,391
Claims priority, application Japan, Mar. 18, 1987, 62-65359; Mar. 20, 1987, 62-67073
Int. Cl.[4] C07D *417/06, 417/14*; **A01K** *31/425*
U.S. Cl. 514—233.8 **15 Claims**

1. A benzoxazole derivative of the formula:



wherein R is a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group, a substituted or unsubstituted cycloalkyl group having 3 to 9 carbon atoms or a substituted or unsubstituted heterocyclic group selected from the group consisting of 1,3-thiazol-4-yl 1,3-oxazol-4-yl, pyridyl, benzoxazolyl, thienyl, quinolyl or benzofuranyl, and the substituents are (lower alkoxy) carbonyl group, a lower alkoxy group, a lower alkyl group, a trihalogeno-lower alkyl group, a lower alkylthio group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, phenyl group, phenoxy group, a phenyl-lower alkoxy group, hydroxy group, a halogen atom, nitro group, amino group, a lower alkanoylamino group, a di(lower alkyl)amino group, a cycloalkyl group, pyrrolidino group, piperidino group, morpholino group and pyrrolyl group, Alk is a single bond, a substituted or unsubstituted lower alkylene group, a lower alkenylene group or a lower alknylene group; and the group



is a group of the formula $—CH_2—$ or —CH= or a pharmaceutically acceptable salt thereof.

4,897,394

ANTIVIRAL COMBINATIONS

Thomas P. Zimmerman, and Gerald Wolberg, both of Cary, N.C., assignors to Burroughs Wellcome CO., Research Triangle Park, N.C.

Filed Jan. 29, 1987, Ser. No. 8,627

Claims priority, application United Kingdom, Jan. 30, 1986, 8602346

Int. Cl.[4] A61K *31/505, 31/52*

U.S. Cl. 514—258 **1 Claim**

1. A pharmaceutical formulation comprising dipyridamole and acyclovir, the amounts of dipyridamole and acyclovir being present in amounts to provide a synergistic antiviral effect.

4,897,395

TREATMENT WITH DIALKOXY PYRIDOPYRIMIDINES

David S. Duch, Cary; Charles A. Nichol, Durham, and Carl W. Sigel, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 24,678, Mar. 11, 1987, abandoned, which is a continuation of Ser. No. 590,547, Mar. 19, 1984, Pat. No. 4,661,490, which is a continuation of Ser. No. 384,147, Jun. 1, 1982, abandoned, which is a division of Ser. No. 228,164, Jan. 23, 1981, Pat. No. 4,372,164, which is a continuation of Ser. No. 159,243, Jun. 13, 1980, abandoned. This application Nov. 30, 1987, Ser. No. 125,721

Claims priority, application United Kingdom, Jun. 14, 1979, 7920703

Int. Cl.[4] A61K *31/505*

U.S. Cl. 514—258 **5 Claims**

1. The method of decreasing the volumn of a carcinoma in a human suffering from said carcinoma comprising administering to said human an effective carcinoma-volumn decreasing amount of the compound 2,4-diamino-6-(2,5-dimethoxybenzyl)-5-methylpyridopyrimidine or a pharmaceutically acceptable salt thereof.

4,897,396

2-PHENYLAMINO PYRIMIDINE DERIVATIVES AND THEIR USES AS MICROBICIDES

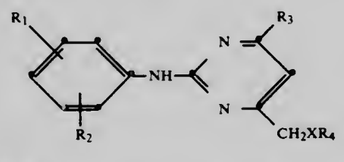
Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,770

Int. Cl.[4] C07D *239/02*

U.S. Cl. 514—275 **20 Claims**

1. Compounds of formula I



(I)

in which:

R_1 and R_2 independently of one another are hydrogen, halogen, C_1–C_3-alkyl, C_1–C_2-haloalkyl, C_1–C_3-alkoxy or C_1–C_3-haloalkoxy;

R_3 is hydrogen; C_1–C_4-alkyl; C_1–C_2-alkyl substituted by halogen or by hydroxy; cyclopropyl; or cyclopropyl substituted by halogen and/or by methyl;

R_4 is C_1–C_8-alkyl; C_2–C_6-alkyl substituted by halogen, hydroxy, cyano, C_1–C_4-alkoxy, C_3–C_4-alkoxyalkoxy or by C_1–C_3-alkylthio; C_3–C_6-alkenyl; C_3–C_6-alkynyl; C_3–C_7-cycloalkyl; or C_3–C_7-cycloalkyl substituted by methyl; and

X is oxygen or sulphur.

13. A composition for controlling or preventing an attack by insect pests or phytopathogenic microorganisms which comprises as the active component a compound of claim 1.

4,897,397

ARYL-ALKYNOIC, ALKENOIC OR ALKANOIC COMPOUNDS AND COMPOSITIONS USEFUL AS ANTIALLERGY AND ANTI-INFLAMMATORY AGENTS

Neng Y. Shih, Cedar Grove, and David J. Blythin, North Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 16, 1988, Ser. No. 285,894

Int. Cl.[4] C07D *277/28, 277/22, 277/42*; A61K *31/44, 31/425*

U.S. Cl. 514—277 **18 Claims**

1. A compound of the formula

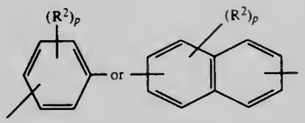
$$R^4(CHR^3)_m—Y—Ar—X—(CR^5R^6)_n—COR^1$$

or a pharmaceutically acceptable salt thereof, wherein

m represents an integer of from 0 to 4;

n represents an integer of from 2 to 6:

Ar represents



p is 0, 1 or 2;

X represents —C≡C—, —CH=CH— or —CH_2—CH_2—

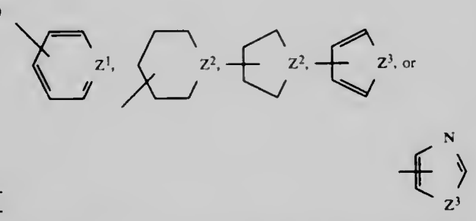
Y represents O, S, NR^7 or a covalent bond;

R^1 represents alkoxy, OH or $N(R^7)_2$;

each R^2 independently represents a substituent selected from halo, alkyl, alkoxy, CN, OH, NO_2, CF_3 or cycloalkyl;

R^3 represents H, alkyl, alkenyl, alkynyl, alkoxy, or alkylthio, with the proviso that if Y is O, S or NR^7, R^3 is not alkoxy or alkylthio on the carbon atom adjacent to Y;

R^4 represents H, alkyl, alkenyl, alkynyl or a cyclic group selected from:



wherein Z^1 is N, CH or CR^2, Z^2 is CHR^7, O, S or NR^7 and Z^3 represents NR^7, S or O; with the proviso that when M is O and Y is a covalent bond, R4 is not alkyl;

R^5 and R^6 may be the same or different and each independently represents H, alkyl, alkoxy, or alkylthio, with the proviso that R^5 and R^6 are not both alkoxy and/or alkylthio on the same carbon atom; and each R^7 is independently selected from H or alkyl.

16. A method for treating inflammation in a mammal comprising administering to said mammal an antinflammatory effective amount of a compound as defined in claim 1.

4,897,398

HYDROCHLORIDES OF CHLORIDES OF 2-AMINOALKYL-9-HYDROXY-ELLIPTICINIUM DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Pierre Gros, Montpellier, France; Emilio Crisafulli, Milan, Italy, and Guy Mazue, Mantry, France, assignors to Sanofi and Centre National de la Recherche Scientifique (C.N.R.S.), both of Paris, France

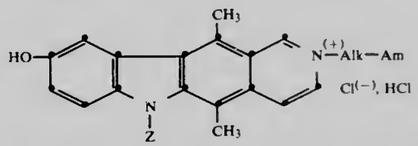
Filed Jun. 24, 1986, Ser. No. 877,801

Claims priority, application France, Jul. 4, 1985, 85 10257

Int. Cl.[4] A61K *31/475*

U.S. Cl. 514—284 **9 Claims**

1. 2-Aminoalkyl-9-hydroxyellipticinium chloride hydrochloride of formula:



in which Z represents hydrogen or a lower alkyl group, Alk represents a lower alkylene group and Am represents a di(lower alkyl) amino, pyrrolidino or piperidino group.

4,897,399

HETEROTERTRACYCLIC LACTAM DERIVATIVES, PHARMACEUTICAL COMPOSITIONS, AND METHOD OF TREATING IMPAIRED MEMORY AND LEARNING

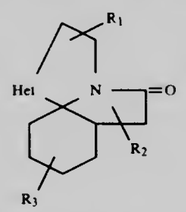
Jan W. F. Wasley, Chatham, N.J., assignor to Ciba-Geigy Corp., Ardsley, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,802

Int. Cl.[4] A61K *31/435*; C07D *471/02*

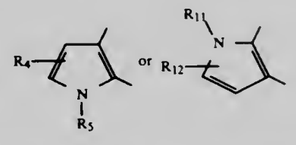
U.S. Cl. 514—288 **9 Claims**

1. A compound of the formula



(II)

wherein R_1, R_2 and R_3 independently represent hydrogen or lower alkyl; Het represents



wherein R_4, R_5, R_{11} and R_{12} independently represent hydrogen or lower alkyl.

4,897,400

9-AMINO-1,4-ETHANO-1,2,3,4-TETRAHYDROACRIDINE AND RELATED COMPOUNDS USEFUL FOR INCRESING THE CHOLINERGIC FUNCTION IN A MAMMAL

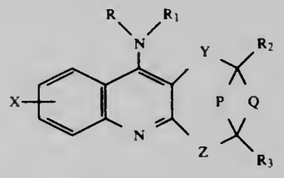
Gregory M. Shutske, Somerset, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Feb. 13, 1987, Ser. No. 14,753

Int. Cl.[4] A61K *31/47*; C07D *221/22*

U.S. Cl. 514—289 **50 Claims**

1. A compound of the formula



wherein R is hydrogen, loweralkyl or loweralkylcarbonyl; R_1 is hydrogen, loweralkyl, loweralkylcarbonyl, aryl, diloweralkylaminoloweralkyl, arylloweralkyl, diarylloweralkyl, oxygen-bridged arylloweralkyl or oxygen-bridged diarylloweralkyl; R_2 and R_3 are independently H or CH_3; X is hydrogen, loweralkyl, cycloalkyl, loweralkoxy, halogen, hydroxy, nitro, trifluoromethyl, formyl, loweralkylcarbonyl, arylcarbonyl, —SH, loweralkylthio, —NHCOR$_4$ or —NR_5R_6 where R_4 is hydrogen or loweralkyl, and R_5 and R_6 are independently hydrogen, loweralkyl or cycloalkyl; Y and Z are independently a direct bond, CR_7R_8 or CR_7R_8–CR_9R_{10}; and P and Q are independently $CR_7'R_8'$, $CR_7'R_8'$–$CR_9'R_{10}'$ or $CR_7'R_8'$–$CR_9'R_1$.0′–$CR_{11}R_{12}$, where each of R_7 through R_{12} and R_7' through R_{10}' is independently H or CH_3; a stereo, optical and geometrical isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

37. A pharmaceutical composition for increasing the cholinergic function in a mammal which comprises an effective amount of a compound as defined in claim 1 and a carrier therefor.

44. A method of increasing the cholinergic function in a mammal which comprises administering to the mammal an effective cholinergic function increasing amount of a compound as defined in claim 1.

4,897,401

N-(4-PIPERIDINYL) BICYCLIC CONDENSED 2-IMIDAZOLAMINE DERIVATIVES USEFUL IN TREATING ALLERGIC DISEASES

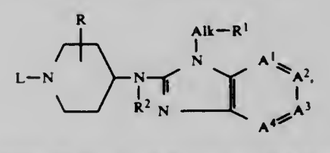
Frans E. Janssens, Boubeiden; Joseph L. G. Torremans, Beerse, and Gaston S. M. Diels, Ravels, all of Belgium, assignors to Janssen Pharmaceutical N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 63,899, Jun. 19, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,814

Int. Cl.[4] A61K *31/44*; C07D *471/04*

U.S. Cl. 514—303 **10 Claims**

1. A chemical compound of the formula:



(I)

a pharmaceutically acceptable acid-addition salt or a stereochemically isomeric form thereof, wherein:

A^1=A^2—A^3=A^4 represents a bivalent group of the formula:

—CH=CH—CH=CH— (a-1),

—N=CH—CH=CH— (a-2),

—CH=N—CH=CH— (a-3),

—CH=CH—N=CH— (a-4),

or

—CH=CH—CH=N— (a-5);

wherein one or two hydrogen atoms in said groups (a-1) through (a-5) may, independently from each other, be replaced by halo, C_{1-6}alkyl, C_{1-6}alkoxy, trifluoromethyl, or hydroxy;

Alk is C_{1-6}alkanediyl,

R is hydrogen;

R^1 is furanyl substituted with C_{1-6}alkyl;

R^2 is hydrogen or C_{1-4}alkyl; and

L is a group of the formula:

—Alk-R^3 (b-1);

—Alk-O-R^4 (b-2);

or

—Alk-Z-C(=O)-R^7 (b-4)

wherein Alk is C_{1-6}alkanediyl;

wherein R^3 is hydrogen, phenylsulfonyl, 4,5-dihydro-5-oxo-1H-tetrazol-1-yl being optionally substituted in its 4-position with C_{1-4}alkyl, 2,3-dihydro-1,4-benzodioxin-2-yl, 4-morpholinyl, 1-piperidinyl, or 1-pyrrolidinyl, or when A^1=A^2—A^3=A^4 is a bivalent group of formula (a-1) or (a-2), R^3 may also be 2,3-dihydro-2-oxo-1H-benzimidazol-1-yl, thienyl, furanyl, phenyl, or substituted phenyl;

wherein R^4 is C_{1-6}alkyl, phenyl, or substituted phenyl;

wherein R^7 is amino, mono- or di(C_{1-6}alkyl)amino, C_{1-6}alkyloxy, phenyl, substituted phenyl, or C_{1-6}alkyl optionally substituted with phenyl or substituted phenyl; and

wherein Z is O, NR^8, or a direct bond, wherein R^8 is hydrogen or C_{1-6}alkyl,

provided that A^1=A^2—A^3=A^4 is a group of formula (a-1) or (a-2) when L is a group of formula (b-4),

wherein said substituted phenyl is phenyl substituted with 1, 2, or 3 substitutents, each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylthio, mercapto, C_{1-6}alkylsulfonyl, C_{1-6}alkylsulfonylC_{1-6}alkyl, phenylC_{1-6}alkylsulfonyl, phenylsulfonylC_{1-6}alkyl, amino, mono- and di(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl.

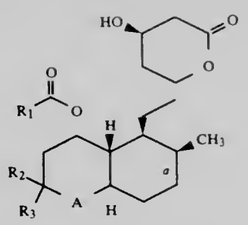
4,897,402

5-OXA, 5-THIA, 5-AZA HMG-COA REDUCTASE INHIBITORS

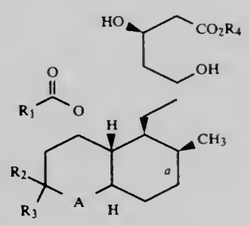
Mark E. Duggan, Wynnewood, and George D. Hartman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1988, Ser. No. 212,767
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—312 **18 Claims**

1. A compound represented by the following structural formulae (I) and (II):



(I)



(II)

wherein:

A is O or $S(O)_n$ or N—R_{13};

n is 0 to 2;

R_1 is selected from:

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substitutent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkylS(O)$_n$ in which n is 0 to 2,

(j) C_{3-8} cycloalkylS(O)$_n$,

(k) phenylS(O)$_n$,

(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(m) oxo;

(3) C_{1-10} alkoxy;

(4) C_{2-10} alkenyl;

(5) C_{3-8} cycloalkyl;

(6) substituted C_{3-8} cycloalkyl in which one substituent is selected from

(a) C_{1-10} alkyl,

(b) substituted C_{1-10} alkyl in which the substituent is selected from

(i) halogen,

(ii) hydroxy,

(iii) C_{1-10} alkoxy,

(iv) C_{1-5} alkoxycarbonyl,

(v) C_{1-5} acyloxy,

(vi) phenyl,

(vii) substituted phenyl in which the substituents are X and Y

(viii) C_{1-10} alkylS(O)$_n$,

(ix) C_{3-8} cycloalkylS(O)$_n$,

(x) phenylS(O)$_n$,

(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(xii) oxo,

(c) C_{1-10} alkylS(O)$_n$,

(d) C_{3-8} cycloalkylS(O)$_n$,

(e) phenylS(O)$_n$,

(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,

(g) halogen,

(h) hydroxy,

(i) C_{1-10} alkoxy,

(j) C_{1-5} alkoxycarbonyl,

(k) C_{1-5} acyloxy,

(l) phenyl, and

(m) substituted phenyl in which the substituents are X and Y;

(7) phenyl;

(8) substituted phenyl in which the substituents are X and Y;

(9) amino;

(10) C_{1-5} alkylamino;

(11) di(C_{1-5} alkyl)amino;

(12) phenylamino;

(13) substituted phenylamino in which the substituents are X and Y;

(14) phenyl C_{1-10} alkylamino;

(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y;

(17) R_5S in which R_5 is selected from

(a) C_{1-10} alkyl,

(b) phenyl, and

(c) substituted phenyl in which the substituents are X and Y;

R_2 and R_3 are independently selected from:

(1) hydrogen;

(2) C_{1-10} alkyl; and

(3) substituted C_{1-10} alkyl in which one or more substituents is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} alkylacyloxy,

(f) phenylacyloxy,

(g) phenoxycarbonyl,

(h) phenyl C_{1-5} alkylacyloxy,

(i) phenyl C_{1-5} alkyloxy,

(j) amino,

(k) C_{1-5} alkylamino,

(l) di(C_{1-5} alkyl)amino,

(m) phenylamino,

(n) substituted phenylamino in which the substituents are X and Y;

(o) phenyl C_{1-5} alkylamino,

(p) substituted phenyl C_{1-5} alkylamino in which the substituents are X and Y,

(q) C_{3-8} cycloalkyl,

(r) phenyl,

(s) substituted phenyl in which the substituents are X and Y,

(t) phenylS(O)$_n$,

(u) substituted phenyl S(O)$_n$ in which the substituents are X and Y,

(v) phenyl C_{1-5}alkyl S(O)$_n$,

(w) C_{1-5}alkylS(O)$_n$;

(x) phenylaminoacyloxy,

(y) C_{1-5}alkylaminoacyloxy,

(z) C_{1-5} alkylacylamino,

(cc) phenylC_{1-5} alkylacylamino;

(4) R_2 and R_3 together with the carbon atom to which they are attached form a C_{3-8} carbo-cyclic ring;

R_4 is selected from:

(1) hydrogen;

(2) C_{1-5} alkyl;

(3) substituted C_{1-5} alkyl in which the substituent is selected from

(a) phenyl,

(b) dimethylamino, and

(c) acetylamino, and

(4) 2,3-dihydroxypropyl;

R_{13} is selected from:

(1) hydrogen;

(2) C_{1-5} alkyl;

(3) substituted C_{1-5} in which the substituent is selected from:

(a) phenyl,

(b) dimethylamino, and

(c) acetylamino, and

(d) hydroxy, provided that hydroxy is substituted only at C-2, C-3, C-4 or C-5; and

(e) C_{1-5} alkoxy;

(4) C_{1-5} alkylcarbonyl;

(5) C_{1-5} alkyloxycarbonyl;

(6) C_{1-5} alkylaminocarbonyl;

X and Y independently are hydrogen, halogen, trifluoromethyl, C_{1-3} alkyl, nitro, cyano or group selected from:

(1) $R_6O(CH_2)_m$ in which m is 0 to 3 and R_6 is hydrogen, C_{1-3}alkyl or hydroxy-C_{2-3}alkyl;

(2)



$R_7CO(CH_2)_m$ or $R_7OCO(CH_2)_m$

in which R_7 is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, phenyl, naphthyl, amino-C_{1-3}alkyl, C_{1-3}alkylamino-C_{1-3}alkyl, di(C_{1-3} alkyl)amino-C_{1-3}alkyl, hydroxy-C_{2-3} alkylamino-C_{1-3}alkyl or di(hydroxy-C_{2-3}alkyl) amino-C_{1-3}alkyl; provided that in



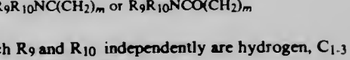
is not H;

(3)



in which R_8 is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3} alkyl, C_{1-3}alkoxy-C_{1-3}alkyl, phenyl or naphthyl;

(4) $R_9R_{10}N(CH_2)_m$,



$R_9R_{10}NC(CH_2)_m$ or $R_9R_{10}NCO(CH_2)_m$

in which R_9 and R_{10} independently are hydrogen, C_{1-3} alkyl, hydroxy-C_{2-3} alkyl;

(5) $R_{11}S(O)_n(CH_2)_m$ in which R_{11} is hydrogen, C_{1-3} alkyl, amino, C_{1-3} alkylamino or di(C_{1-3}alkyl)amino;

a is a single bond or a double bond;

halogen is F or Cl;

or a pharmaceutically acceptable salt thereof.

4,897,403

ANTIMALARIAL COMPOSITIONS AND METHODS

Samuel K. Martin, Silver Spring; Ayo M. J. Odusola, Gaithersburg, and Wilbur K. Milhous, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1986, Ser. No. 936,677
Int. Cl.[4] A61K *31/47, 31/275, 31/44*
U.S. Cl. 514—313 **2 Claims**

1. An antimalarial composition containing as the active ingredient a mixture of verapamil and chloroguine or therapeutically acceptable salts of chloroquine, being present in a molar ratio of from about 10:1 to 20,000:1 respectively.

VOL 1110 ISS 5 JA 30 1990 UMI

VOL 1110 ISS 5 JA 30 1990 UMI

4,897,404

ANTI-INFECTIVE METHODS AND COMPOSITIONS

Steven T. Blackman, New York, N.Y., assignor to Thames Pharmacal Co., Inc., Roaknoakoma, N.Y.

Division of Ser. No. 218,956, Jul. 14, 1988, Pat. No. 4,873,265.
This application Aug. 7, 1989, Ser. No. 390,293
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—343 15 Claims

1. A method of providing local antimycotic treatment to a human or animal tissue area in need thereof, comprising applying to said tissue area an effective antimycotic amount of a composition containing (a) from about 0.5 to about 5.0% by weight of an antihistaminic alkylamine derivative agent and pharmaceutically acceptable salts thereof, and (b) a pharmaceutically acceptable topical vehicle.

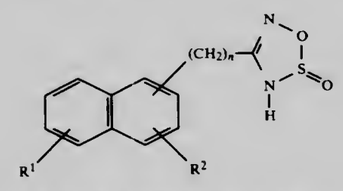
4,897,405

NOVEL NAPHTHALENYLALKYL-3H-1,2,3,5-OXATHIADIAZOLE 2-OXIDES USEFUL AS ANTIHYPERGLYCEMIC AGENTS

Thomas R. Alessi, Middlesex County, N.J.; Terence M. Dolak, Ontario County, N.Y.; John W. Ellingboe, Mercer County, and Louis J. Lombardo, Middlesex County, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 21, 1989, Ser. No. 341,340
Int. Cl.[4] C07D *291/04;* A61K *31/41*
U.S. Cl. 514—360 27 Claims

1. A compound of formula (I)



(I)

wherein R^1 and R'are independently hydrogen, lower alkyl containing 1 to 6 carbon atoms, alkoxy containing 1 to 6 carbon atoms, halogen, ethynyl, nitrile, methylthio, trifluoromethyl, vinyl, nitro or halogen substituted benzyloxy; or n is 0 to 4 or the pharmaceutically acceptable salts thereof.

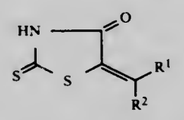
4,897,406

RHODANINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Hitoshi Inoue; Hiroyasu Koyama; Reiko Kubota, and Hirohiko Komatsu, all of Saitama, Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

Filed Nov. 9, 1988, Ser. No. 269,776
Claims priority, application Japan, Nov. 13, 1987, 62-288998
Int. Cl.[4] C07D *277/34;* A01K *31/425*
U.S. Cl. 514—369 2 Claims

1. A rhodanine derivative of Formula (I)



(I)

wherein R^1 is C_1–C_6 alkyl, a group $-(CH_2)_nCOOR^3$ in which n is an integer of 1 to 4 and R^3 is hydrogen or C_1–C_6 alkyl, and R^2 is a group $-CH=CH-R^4$ wherein R^4 is phenyl or substituted phenyl having one or more substituents selected from C_1–C_6 alkyl, C_1–C_6alkoxy, hydroxyl, halogen, carboxyl, and carboxyl-, alkoxycarbonyl—or tetrazolyl—substituted alkoxy, thienyl, halogen—substituted thienyl or pyrrolyl, or R^2 is a group $-CH_2-CH_2-R^4$ wherein R^4 is phenyl optionally substituted by C_1–C_6 alkyl, C_1–C_6 alkoxy or hydroxyl or a pharmaceutically acceptable salt thereof.

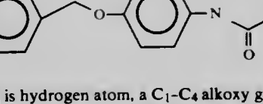
4,897,407

SYNERGISTIC FUNGICIDAL COMPOSITION

Digby H. Bartlett, Worcester, England, assignor to Uniroyal Chemical Limited, Edinburgh, Scotland

Division of Ser. No. 868,220, May 28, 1986, Pat. No. 4,767,774.
This application Jun. 1, 1988, Ser. No. 201,135
Claims priority, application United Kingdom, Jun. 5, 1985, 8514217; Apr. 30, 1986, 8610541
Int. Cl.[4] A01N *43/50, 43/78*
U.S. Cl. 514—365 6 Claims

1. A fungicidal composition comprising:
(A) a compound of the formula:



wherein R and R^1 are the same or different and are hydrogen or C_1–C_8 alkyl; and
(B) 3-(3,5-dichlorophenyl)-N-(1-methylethyl)-2,4-dioxo-1-imidazolidine carboxamide, wherein said A and B are present in a ratio between about 1:2 and about 10:1.

4,897,408

WATER-SOLUBLE LYSINE SALTS OF (T)2-(4-FLUOROPHENYL)-ALPHA-METHYL-5-BENZOXAZOLE ACETIC ACID AND THEIR PREPARATION PROCESS

Diego Furlan, Milan, Italy, assignor to Euroresearch, s.r.l., Milan, Italy

Filed Jan. 5, 1989, Ser. No. 293,668
Claims priority, application Italy, Jul. 13, 1988, 19057A/88
Int. Cl.[4] C07D *263/56;* A61K *31/42*
U.S. Cl. 514—375 2 Claims

1. Water-soluble salts of (+)2-(4-fluorophenyl)-alpha-methyl-5-benzoxazole acetic acid with DL-lysine, D-lysine or L-lysine.

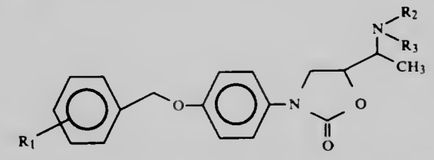
4,897,409

5-AMINOETHYLOXAZOLIDIN-2-ONE DERIVATIVES

Michel Langlois, Buc; Alain-René Schoofs, Paris; Jean-François Rumigny, Rueil Malmaison; Philippe Dostert; Margherita Strolin-Benedetti, both of Paris, and Patrice Renaut, Fontaine Les Dijon, all of France, assignors to Delalande S.A., Courbevoie, France

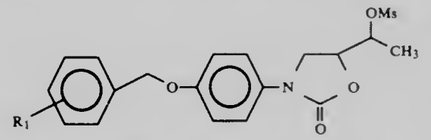
Filed Sep. 2, 1987, Ser. No. 92,126
Claims priority, application France, Sep. 3, 1986, 86 12369; Dec. 30, 1986, 86 18368
Int. Cl.[4] A61K *31/42;* C07D *263/22*
U.S. Cl. 514—376 6 Claims

1. The four individual stereoisomers of a compound of the formula:



wherein R_1 is hydrogen atom, a C_1-C_4 alkoxy group, a trifluoromethyl group, or one or two halogen atoms; and R_2 and R_3 are selected from the group consisting of a hydrogen atom and a C_1–C_4 alkyl group, each of the two pairs of the corresponding racemic diastereoisomers and a mixture of the four stereoisomers, as well as their pharmaceutically acceptable acid addition salts.

6. The four individual stereoisomers of a compound of the formula:



wherein Ms is a mesyl group and R_1 is a hydrogen atom, a C_1–C_4 alkoxy group, a trifluoromethyl group or one or two halogen atoms.

4,897,410

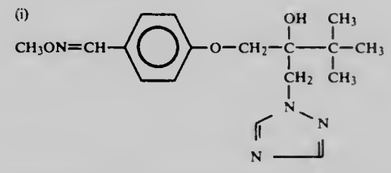
FUNGICIDAL COMPOSITIONS

Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Graham Holmwood, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 161,578, Feb. 29, 1988, Pat. No. 4,849,440, which is a continuation of Ser. No. 864,068, May 16, 1986, abandoned, which is a division of Ser. No. 644,749, Aug. 27, 1984, Pat. No. 4,623,653. This application Dec. 7, 1988, Ser. No. 281,128
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333412
Int. Cl.[4] A01N *43/38, 43/64*
U.S. Cl. 514—383 2 Claims

1. A fungicidal composition comprising a fungicidally effective amount of a substituted 1-hydroxyethyl-triazole of the formula

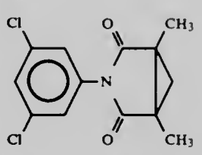
(i)



(Ib)

or an addition product thereof with an acid or metal salt, and

(ii)



(XIXa)

the weight ratio of (i):(ii) ranging from about 1:1.

4,897,411

METHOD OF TREATMENT OF PREMENSTRUAL SYNDROME

A. James Giannini, 3040 Belmont Ave., Youngstown, Ohio 44505

Filed Feb. 13, 1989, Ser. No. 309,407
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—401 4 Claims

1. A method of alleviating the symptoms of premenstrual syndrom in a patient by reducing the amount of norepinephrine released at presynoptic sites, comprising the administration to said patient of an effective amount of clonidine.

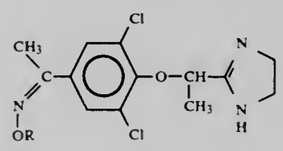
4,897,412

IMIDAZOLINES USEFUL IN LOWERING INTRAOCULAR PRESSURE

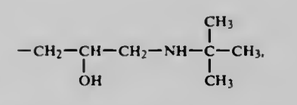
Gerard LeClerc, Grenoble, France; Didier Huber, Fort Worth, Tex.; Jacques Hiimber, Guebwiller, and Guy Andermann, Strasbourg, both of France, assignors to Laboratories Alcon S.A., Kaysersberg, France

Division of Ser. No. 154,267, Feb. 10, 1988, Pat. No. 4,801,617, which is a continuation-in-part of Ser. No. 35,119, Apr. 6, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 299,273
Int. Cl.[4] A61K *31/415;* C07D *233/22*
U.S. Cl. 514—401 3 Claims

2. A topical ophthalmic composition useful in the treatment of elevated intraoccular pressure, comprising an effective amount of a compound of formula:



wherein R is



and a pharmaceutically acceptable carrier therefor.

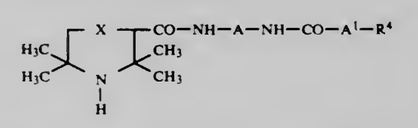
4,897,413

ALKYL DIAMINE DERIVATIVES

Kalman Hideg; Olga H. Hankovszky, both of Pecs; Laszlo Frank, Tiszavasvari; Ilona Bodi, Tiszavasvari, and Jozsef Csak, Tiszavasvari, all of Hungary, assignors to Alkaloida Vegyeszeti Gyar, Tiszavasvari, Hungary

Division of Ser. No. 662,298, Sep. 20, 1984, Pat. No. 4,703,056.
This application Oct. 16, 1987, Ser. No. 109,819
Claims priority, application Hungary, Jan. 21, 1983, 191; Feb. 4, 1983, 386; Feb. 4, 1983, 384; Feb. 4, 1983, 385; PCT Int'l Appl., Jan. 23, 1984, PCT/HU84/00005
Int. Cl.[4] A61K *31/40;* C07D *403/12*
U.S. Cl. 514—423 4 Claims

1. A compound of the Formula (I)



wherein
A is C_1 to C_5 alkylene which can be substituted by hydroxyl;
X is a single chemical bond or a double bond;

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R^4 is phenyl, thienyl, or pyridyl each unsubstituted or substituted by one or two hydroxyl, C_1 to C_4 alkoxy, halo, methylenedioxy, 1-propenyl, or 2-propenyl; and

A^1 is a single chemical bond, a C_1 to C_5 alkylene unsubstituted or substituted by hydroxyl, C_1 to C_5 oxyalkylene, or C_1 to C_5 thioalkylene; or a pharmaceutically acceptable acid addition salt thereof.

4. A method of treating arrhythmia in an animal subject which comprises the step of administering to said subject in need of antiarrhythmic treatment, a therapeutically effective amount of the compound of the Formula (I) defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

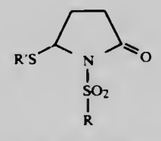
4,897,414

DERIVATIVES OF 1-BENZENSULPHONYL-2-OXO-5-ALKYLTHIO PYRROLIDINE, AND COMPOSITIONS CONTAINING THEM

Emilio Toja, Milan; Carlo Zirotti, Arona; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel UCAF, Paris, France

Filed Jun. 27, 1988, Ser. No. 211,720
Claims priority, application Italy, Jun. 29, 1987, 21098 A/87
Int. Cl.⁴ C07D *207/48*; A61K *31/40*
U.S. Cl. 514—425 **6 Claims**

1. Compounds of the formula (I):



(I)

in which R' represents hydrogen, linear or branched alkyl containing up to 8 carbon atoms, alkenyl containing from 2 to 8 carbon atoms, or aralkyl containing from 7 to 15 carbon atoms and R represents phenyl possibly substituted by CF_3, NO_2, free esterified or etherified hydroxy in which the ester or ether part contains from 1 to 18 carbon atoms or phenyl.

6. A therapeutic composition, comprising a therapeutically effective amount of a compound as defined in any one of claims 1, 2, 3, 4 or 5, and a pharmaceutically accepable carrier.

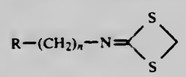
4,897,415

2-IMINO-1,3-DITHIETANES, THEIR USE AS PESTICIDES

Dieter Hübl; Ernst-Albrecht Pierob; Eberhard Richter, and Reinhold Puttner, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

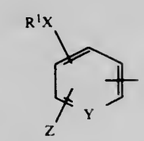
Filed Jan. 29, 1988, Ser. No. 149,414
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3703213; Sep. 4, 1987, 3730136
Int. Cl.⁴ C07D *331/04*; A61K *31/385*
U.S. Cl. 514—430 **18 Claims**

1. 2-imino-1,3-dithietane of formula I



(I)

in which
R is the group



in which
Y is CH,
R^1 is fluoro-C_{1-12}-alkyl, fluoro-C_{2-12}-alkenyl, fluoro-C_{2-12}-alkynyl, fluorocyclopropyl or fluorocyclopropylmethyl;
X is oxygen or sulphur,
Z is hydrogen, halogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{1-6}-alkylthio, di-C_{1-6}-alkylamino, halo-C_{1-6}-alkyl, halo-C_{1-6}-alkoxy, halo-C_{1-6}-alkylthio, C_{1-6}-alkoxycarbonyl, halo-C_{1-6}-alkoxycarbonyl, nitro, cyano, amino, phenoxy, halophenoxy, phenylthio or halophenylthio, and
n is 0, 1 or 2, or an their acid addition salt thereof.

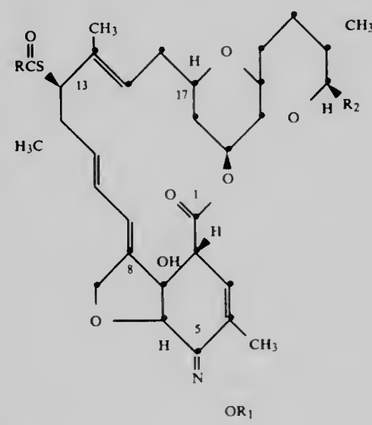
4,897,416

INSECTICIDES AND PARASITICIDES

Bruno Frei, Liestal, and Anthony C. Sullivan, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

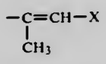
Filed Feb. 8, 1988, Ser. No. 153,696
Claims priority, application Switzerland, Feb. 18, 1987, 600/87-1
Int. Cl.⁴ A61K *31/365*; C07D *315/00*
U.S. Cl. 514—450 **14 Claims**

1. A compound of formula I



(I)

wherein
R_1 is hydrogen,
R_2 is methyl, ethyl, isopropyl or sec-butyl, or is the



group, wherein X is methyl, ethyl or isopropyl, and R is hydrogen; or is straight chain or branched C_1–C_{18}alkyl which is unsubstituted or substituted by 1 to 7 halogen atoms, 1 to 6 C_1–C_6alkylthio, 1 to 6 C_1–C_6alkoxy or an unsubstituted or halogenated phenyl or phenoxy group; or is C_2–C_6alkenyl which is unsubstituted or substituted by 1 to 7 halogen atoms, 1 to 6 C_1–C_6alkylthio or 1 to 6 C_1–C_6alkoxy; or is C_2–C_6alkynyl which is unsubstituted or substituted by 1 to 7 halogen atoms, 1 to 6 C_1–C_6alkylthio or 1 to 6 C_1–C_6alkoxy; or is C_3–C_6cycloalkyl which is unsubstituted or substituted by 1 to 7 halogen atoms, 1 to 6 C_1–C_6alkylthio, 1 to 6 C_1–C_6alkoxy or by C_1–C_4alkyl groups and, if said cycloalkyl is cyclopropyl, it may also be substituted by 2,2-dichlorovinyl; or is a phenyl or benzyl group each unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_4alkylthio, $CHCl_2$, CHF_2, CH_2Cl, CCl_3, CF_3, CH_2F, CH_2CH_2Cl, $CHBr_2$ and nitro; or is difluoromethylenedioxyphenyl, wherein the oxygen atoms are located at directly adjacent carbon atoms of the phenyl ring.

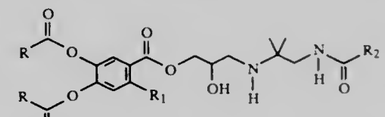
4,897,417

PRODRUGS OF 3,4-HYDROXY BENZOYLOXYPROPANOLAMINES

Ghanshyam Patil, Vernon Hills, Ill.; William L. Matier, Hockessin, Del., and Khuong H. X. Mai, Chatworth, Calif., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 15, 1988, Ser. No. 285,006
Int. Cl.⁴ A61K *31/24*; C07C *101/48*
U.S. Cl. 514—461 **24 Claims**

1. A compound of the formula



wherein R is straight or branched loweralkyl, R_1 is hydrogen, straight or branched loweralkyl, lowercycloalkyl, amino, loweralkoxy or acylamino, and R_2 is straight or branched loweralkyl, amino, lowercycloalkyl,morpholino, piperidino, tetrahydrofuranyl, dihydrofuranyl, tetrahydropyranyl, dioxolanyl, 2,2-dimethyl dioxolanyl, dioxanyl, pyrrolidinyl, tetrahydrooxazolyl, and dihydrooxazolyl, or a pharmaceutically acceptable salt thereof.

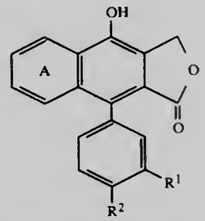
4,897,418

NOVEL NAPHTHALENE DERIVATIVE

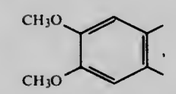
Tameo Iwasaki, Hishinomiya, and Kohki Takashima, Tokyo, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Division of Ser. No. 814,805, Dec. 30, 1985, Pat. No. 4,771,072. This application Jan. 11, 1988, Ser. No. 144,650
Claims priority, application Japan, Jan. 10, 1985, 63-3090
Int. Cl.⁴ A61K *31/34*; C07D *307/92*
U.S. Cl. 514—468 **20 Claims**

1. A naphthalene derivative of the formula:



wherein each of R^1 and R^2 is a lower alkoxy or one of R^1 and R^2 is a hydrogen atom and the other is a lower alkoxy, and Ring A is an unsubstituted benzene ring or a benzene ring having 1 to 3 substituent(s) selected from the group consisting of a lower alkyl group, a lower alkoxy group, a phenyl-lower alkoxy group, a hydroxy group, and a halogen atom, with the proviso that if Ring A is a benzene ring of the formula:



each of R^1 and R^2 is a lower alkoxy of at least 2 carbon atoms or one of R^1 and R^2 is a hydrogen atom and the other is a lower alkoxy,
or a pharmaceutically acceptable salt thereof.

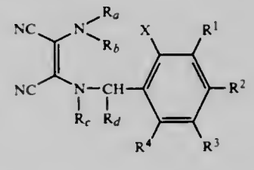
4,897,419

PEST-COMBATING AGENTS BASED ON DERIVATIVES OF 2,3-DIAMINOMALEONITRILE

Holger Heidenreich, Kudes, and Benedikt Becker, Mettmann, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

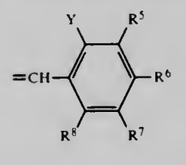
Filed Jun. 27, 1988, Ser. No. 211,798
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723621
Int. Cl.⁴ A01N *37/34*; C07C *121/66, 121/70, 121/78*
U.S. Cl. 514—523 **4 Claims**

1. A method for combating arachnida which comprises applying to arachnida and/or to a habitat thereof an effective arachnida pest combating amount of at least one derivative of a 2,3-diaminomaleonitrile of the formula



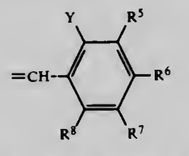
(I)

in which
X represents hydrogen, halogen, halogenoalkyl or CN,
R^1, R^2, R^3 and R^4 are identical or different and represent hydrogen, unsubstituted or substituted C_1–C_4 alkyl, unsubstituted or substituted C_1–C_4 alkoxy, halogen, CN, NO_2, unsubstituted or substituted di-alkylamino having up to 4 carbon atoms, alkoxy(C_1–C_4)carbonyl, unsubstituted or substituted alkyl(C_1–C_4) thio, unsubstituted or substituted alkyl(C_1–C_4)thionyl, unsubstituted or substituted alkyl(C_1–C_4)sulphonyl, OH, SH or NH_2,
wherein R_a and R_b together represent the radical

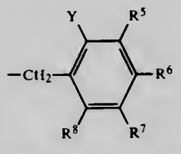


in which
Y represents hydrogen, halogen, halogenalkyl or CN,
R^5, R^6, R^7 and R^8 are identical or different and represent hydrogen, unsubstituted or substituted (C_1–C_4) alkyl, unsubstituted or substituted (C_1–C_4) alkoxy, halogen, CN, NO_2, unsubstituted or substituted dialkylamino having up to 4 carbon atoms, alkoxy(C_1–C_4)carbonyl, unsubstituted or substituted alkyl(C_1–C_4)thio, unsubstituted or substituted alkyl(C_1–C_4)thionyl, unsubstituted or substituted

alkyl(C_1–C_4)sulphoayl, OH, SH or NH_2, and in which R_c and R_d together represent a chemical bond,
or R_a and R_b together represent the radical



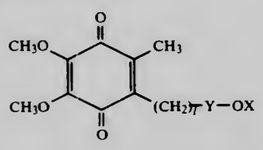
in which Y, R^5, R^6, R^7 and R^8 possess the meanings given above and in which R_c and R_d in each case represent hydrogen,
or R_a, R_b, R_c and R_d in each case represent hydrogen,
or R_a represents hydrogen and R_b represents the radical



in which Y, R^5, R^6, R^7 and R^8 possess the meanings given above and R_c and R_d represent hydrogen, wherein the substituents for the alkyl, alkoxy, dialkylamino, alkylthio, alkylthionyl and alkylsulphonyl are selected from the group consisting of halogen, OH and NH_2.

4,897,420
BENZOQUINONE DERIVATIVES, THEIR PRODUCTION AND USE
Masazumi Watanabe, Kawanishi, and Isuke Imada, Izumi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Division of Ser. No. 848,115, Apr. 4, 1986, abandoned. This application Dec. 5, 1988, Ser. No. 280,153
Claims priority, application Japan, Apr. 8, 1985, 60-75081
Int. Cl.[4] A61K *31/12, 31/22;* **C07C** *50/30, 69/24*
U.S. Cl. 514—546 **9 Claims**

1. A compound of the formula



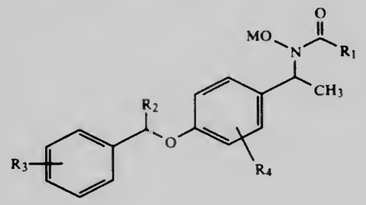
wherein l is an integer of 0 to 18, X is hydrogen, an alkyl having 1 to 4 carbon atoms or a carboxylic acyl having 2 to 4 carbon atoms and Y is a phenylene or a cycloalkylene having 3 to 7 carbon atoms.

4,897,421
OPHTHALMOLOGICAL COMPOSITION OF MATTER AND A METHOD FOR TREATMENT OF OCULAR INFLAMMATION BY SAID COMPOSITION
Pierre Braquet, Garches, France, assignor to Societe De Conseils de Recherches et D'Application (S.C.R.A.S.), France
Filed May 6, 1988, Ser. No. 190,761
Claims priority, application United Kingdom, May 7, 1987, 8710780
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—557 **8 Claims**

1. An ophthalmological composition comprising an ophthalmologically effective amount of eicosapentaenoic acid in a pharmaceutically acceptable carrier.

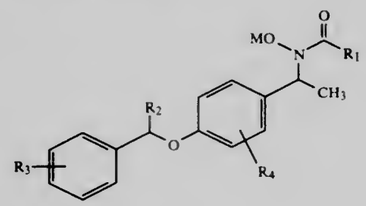
4,897,422
LIPOXYGENASE INHIBITING COMPOUNDS
James B. Summers, Jr., Libertyville, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed Feb. 10, 1987, Ser. No. 12,978
Int. Cl.[4] C07C *83/10;* **A61K** *31/185, 31/085, 31/13*
U.S. Cl. 514—575 **6 Claims**

1. Compounds of the formula:



wherein R_1 is amino;
R_2 is C_1–C_2 alkyl;
R_3 and R_4 are hydrogen;
and M is hydrogen or a pharmaceutically acceptable cation.

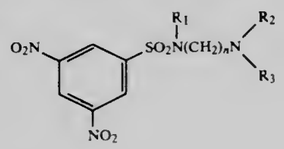
4. A method of inhibiting 5- and/or 12-lipoxygenase activity in a mammal in need of such treatment, comprising administering to such mammal a therapeutically effective amount of a compound of the formula:



wherein R_1 is amino;
R_2 is C_1–C_2 alkyl;
R_3 and R_4 are hydrogen;
and M is hydrogen or a pharmaceutically acceptable cation.

4,897,423
DINITROBENZENESULFONAMIDES
Walfred S. Saari, Lansdale, and Edward L. Engelhardt, Gwynedd Valley, both of Pa., assignors to Merck & Co. Inc., Rahway, N.J.
Filed Aug. 2, 1988, Ser. No. 227,567
Int. Cl.[4] A61K *31/18;* **C07C** *143/78*
U.S. Cl. 514—603 **5 Claims**

1. A compound of the following formula:



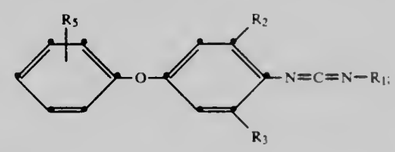
wherein:
n is an integer 2, 3, 4 or 5;
R_1 is hydrogen or a methyl group;

R_2 is hydrogen or a methyl group;
and R_3 is hydrogen or a methyl group.

5. A pharmaceutical composition for enhancing the therapeutic effect of radiation which consists of an effective amount of a compound defined in claim 1 and a non-toxic pharmaceutically acceptable carrier.

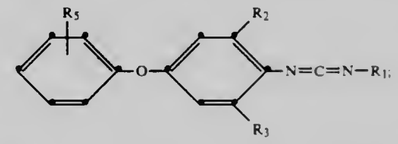
4,897,424
ARYLOXYPHENYLTHIOUREAS, ARYLOXYPHENYLISOTHIOUREAS AND ARYLOXYPHENYLCARBODIIMIDES AND PESTICIDAL COMPOSITIONS CONTAINING THEM
Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Jozef Drabek, Oberwil, and Josef Ehrenfreund, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jun. 9, 1988, Ser. No. 205,260
Claims priority, application Switzerland, Jun. 18, 1987, 2302/87
Int. Cl.[4] A61K *31/155*
U.S. Cl. 514—638 **9 Claims**

1. A compound of formula I



in which
R_1 represents C_1–C_{12}alkyl, C_1–C_{12}alkyl mono- or poly-substituted by halogen and/or by C_1–C_6alkoxy, C_3–C_8cycloalkyl, C_3–C_8cycloalkyl mono- or poly-substituted by C_1–C_3alkyl, or C_3–C_8cycloalkyl-C_1–C_4alkyl;
R_2 represents hydrogen or C_1–C_5alkyl;
R_3 represents C_1–C_5alkyl or C_5–C_6cycloalkyl;
R_4 represents hydrogen or methyl;
R_5 represents a —CH=CH—$_2$, —CH_2—$_3$ or —CH_2—$_4$ bridge in the 2,3- or 3,4-position;
and the salts thereof with organic or inorganic acids.

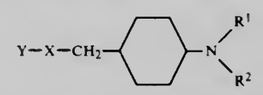
8. A method of controlling pests in and on animals and plants, characterised in that the pests in various stages of development are brought into contact with a compound of formula I



in which
R_1 represents C_1–C_{12}alkyl, C_1–C_{12}alkyl mono- poly-substituted by halogen and/or by C_1–C_6alkoxy, C_3—C_8cycloalkyl, C_3–C_8cycloalkyl mono- or poly-substituted by C_1–C_3alkyl, or C_3–C_8cycloalkyl-C_1–C_4alkyl;
R_2 represents hydrogen or C_1–C_5alkyl;
R_3 represents C_1–C_5alkyl or C_5–C_6cycloalkyl;
R_4 represents hydrogen or methyl;
R_5 represents a —CH=CH—$_2$, —CH_2—$_3$ or CH_2—$_4$ bridge in the 2,3- or 3,4-position
or with a salts thereof with an organic or inorganic acid.

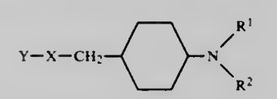
4,897,425
FUNGICIDAL CYCLOHEXYLAMINES
Bernhard Zipperer, Dirmstein; Ernst Buschmann, Ludwigshafen; Norbert Goetz, Worms; Ulrich Schirmer, Heidelberg; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Nov. 16, 1987, Ser. No. 120,670
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640247
Int. Cl.[4] C07C *101/72*
U.S. Cl. 514—649 **12 Claims**

1. A cyclohexylamine compound of the formula:



wherein: p1 X is a single bond or an alkylene chain of 1 to 12 carbon atoms which is unsubstituted or substituted by one or more alkyl groups, each of 1 to 5 carbon atoms, and in which said alkylene chain, 1 to 4 carbon atoms may be replaced by O, S or N;
Y is hydrogen, aryl, cyclohexyl, 4-cyclohexylcyclohexyl, or perhydro-1- or -2-naphthyl which may be substituted by one, two or three alkyl, alkoxy, alkylthio or alkylamino groups of 1 to 12 carbon atoms or by one, two or three halogen, amino, hydroxy or trifluoromethyl groups, and
R^1 and R^2 are identical or different and independently of one another are each hydrogen, alkyl, alkenyl, alkynyl, hydroxyalkyl, cycloalkyl, cycloalkenyl or aralkyl of 1 to 12 carbon atoms, which in turn may be substituted by one, two or three alkyl, alkenyl, alkynyl, alkoxy or alkylthio radicals of 1 to 4 carbon atoms or cyclohexyl or 4 -tert-butylcyclohexyl; and
addition salts of said cyclohexyl amine compounds with acids;
wherein when R^1, R^2, and Y are all hydrogen, X is a single bond or an alkylene chain of 1-3, 5 or 8-12 carbon atoms which is unsubstituted or an alkylene chain of 1 or 3-12 carbon atoms which is substituted by one or more alkyl groups, each of 1 to 5 carbon atoms, or X is an alkylene chain of 1 to 12 carbon atoms which is unsubstituted or substituted by one or more alkyl groups, each of 1 to 5 carbon atoms, and in which alkylene chain, 1 to 4 carbon atoms are replaced by O, S or N;
with the exception of those compounds in which X is a single bond, Y is cyclohexyl and R^1 and R^2 are each hydrogen or R^1 and R^2 are each methyl.

7. A fungicide containing a solid or liquid carrier and a cyclohexylamine compound of the formula:



wherein:
X is a single bond or an alkylene chain of 1 to 12 carbon atoms which is unsubstituted or substituted by one or more alkyl groups, each of 1 to 5 carbon atoms, and in which said alkylene chain, 1 to 4 carbon atoms may be replaced by O, S or N;
Y is hydrogen, aryl, cyclohexyl, 4-cyclohexylcyclohexyl, or perhydro-1- or -2-naphthyl which may be substituted by one, two or three alkyl, alkoxy, alkylthio or alkylamino groups of 1 to 12 carbon atoms or by one, two or three halogen, amino, hydroxy, or trifluoromethyl groups;
R^1 and R^2 are identical or different and independently of one another are each hydrogen, alkyl, alkenyl, alkynyl, hy-

VOL 1110 ISS 5 JA 30 1990 UMI

droxyalkyl, cycloalkyl, cycloalkenyl or aralkyl of 1 to 12 carbon atoms, which in turn may be substituted by one, two or three alkyl, alkenyl, alkynyl, alkoxy or alkylthio radicals of 1 to 4 carbon atoms or cyclohexyl or 4 -tert-butylcyclohexyl; and

addition salts of said cyclohexylamine compound with acids;

with the exception of those compounds in which X is a single bond, Y is cyclohexyl and R^1 and R^2 are each hydrogen or R^1 and R^2 are each methyl.

4,897,426

METHOD FOR BLOCKING CALCIUM CHANNELS

Rodolfo R. Llinas, New York, N.Y., and Yosef Yarom, Jerusalem, Israel, assignors to New York University, New York, N.Y.

Continuation of Ser. No. 213,466, Jun. 29, 1988, abandoned, which is a continuation of Ser. No. 837,088, Mar. 6, 1986, abandoned. This application Apr. 20, 1989, Ser. No. 341,271

Int. Cl.[4] A61Q *31/040*

U.S. Cl. 514—724 **21 Claims**

1. A method for partially or totally blocking low-threshold calcium channels in cell membranes of a mammal in need of such treatment comprising administering to said mammal an aliphatic alcohol selected from the group consisting of C_2–C_{10} alkyl alcobols and mixtures thereof in an amount sufficient to generate in the vicinity of said cells a concentration of said alcohol sufficient to partially or totally block low-threshold calcium channels in said cells and insufficient to have a noticeable effect on the high-threshold calcium conductance of said cells.

4,897,427

METHOD OF COMBATTING PRUNING WOUND DISEASES

Marc Barnavon, La-Seine-St.-Cloud; Philippe Dutruel, Rueil-Malmaison, and René Ravaux, Lardy, all of France, assignors to Sandoz Ltd., Basel, Switzerland

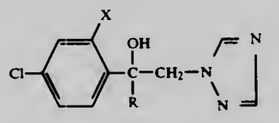
Filed Jan. 14, 1988, Ser. No. 144,887

Claims priority, application France, Jan. 14, 1987, 8700309; Jan. 14, 1987, 8700311

Int. Cl.[4] A61K *9/12, 3/41, 31/395*

U.S. Cl. 514—383 **16 Claims**

1. The method of combatting pruning wound diseases caused by microorganism selected from the group consisting of *Cylindrocarpon mali, Cytospora cincta, Erwinia amylovora, Pseudomonas spp., Agrobacterium tumefaciens, Erwinia vitivora, Stereum hirsutum* and *Eutypa lata* in pruning wounds on trees and perennial vines subject to infection by such microorganism, comprising applying to the pruning wound on a tree or perrenial vine subject to infection by such a micoorganism a composition comprising a pruning wound disease combatting effective amount of a compound of the formula



wherein

X is H or Cl, and

R is butyl, 1-cyclopropyl-ethyl or 1-cyclopropyl-1-methyl-ethyl,

said compound being in free base form or in agriculturally acceptable acid addition salt form.

4,897,428

INTERNAL MOLD RELEASE AGENT FOR USE IN MOLDING POLYURETHANES AND/OR POLYUREAS

John E. Dewhurst, Macungie; Gregory D. Williams, Pittsburgh, and Robert M. Loring, Library, all of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1988, Ser. No. 239,366

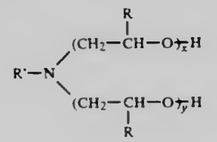
Int. Cl.[4] B29C *33/60, 45/00;* **C08G** *18/14*

U.S. Cl. 521—115 **3 Claims**

3. In a process for preparing a molded product by reacting an isocyanate with an isocyanate-reactive material in a mold, the improvement wherein the reaction mixture contains an internal mold release composition comprising

(a) a zinc carboxylate selected from the group consisting of zinc oleate and zinc laurate, and

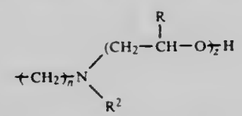
(b) a compatibilizer comprising a fatty amine derivative of the formula:



where

R represents hydrogen or methyl,

R' represents a C_8 to C_{20} straight or branched, saturated or unsaturated, aliphatic group or the group



where R^2 represents a C_8 to C_{20} straight or branched, saturated or unsaturated, aliphatic group, and n is an integer of from 1 to 4, x, y and z are each numbers between 1 and 49 and x+y+z is from 3 to 50, in an amount sufficient to solubilize the zinc carboxylate.

4,897,429

AROMATIC POLYESTER POLYOLS FROM DIMETHYL TEREPHTHALATE PROCESS RESIDUE AND TALL OIL FATTY ACIDS

John M. Trowell, Wilmington, N.C., and Scott F. Lange, Newark, Del., assignors to Cape Industries, Wilmington, Del.

Filed Mar. 27, 1989, Ser. No. 329,131

Int. Cl.[4] C08G *18/14;* **B32B** *3/26*

U.S. Cl. 521—157 **18 Claims**

12. A foamed article of manufacture having reduced surface friability, comprising: a foamed polyurethane or polyisocyanurate core having at least one surface; and one substrate outer layer attached to said surface, wherein said foamed polyurethane or polyisocyanurate core is produced by reacting an isocyanate in the presence of suitable catalysts, surfactants, and blowing agents with a polyester polyol produced by

(1) reacting: (a) from about 5 to about 40 percent tall oil fatty acids; (b) from about 20 to about 80 percent dimethyl terephthalate process residue; and (c) from about 20 to about 60 percent polyhydric alcohol, based on the weight of the reaction mixture, in the presence of an esterification/transesterification catalyst while continuously removing the water and methanol that are formed during the reaction, to form a first reaction product containing residual carboxylic acid functionality; and

(2) reacting from about 1 to about 25 percent of at least one alkylene carbonate, based on the weight of the product of step (1), or an equimolar amount of at least one alkylene oxide, with said residual carboxylic acid functionality in the presence of a catalyst.

4,897,430

ONE COMPONENT POLYUREA

George P. Speranza, and Wei-Yang Su, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,081

Int. Cl.[4] C08G *18/32*

U.S. Cl. 521—159 **8 Claims**

1. A method for curing a mixture of a liquid polyaromatic polyisocyanate and an amide consisting essentially of a tri- or higher amine functionally polyoxyalkyleneamine of less than 1000 molecular weight which are not reactive with each other at ambient temperature by raising the temperature of the mixture until reaction proceeds.

4,897,431

PROCESS FOR THE PREPARATION OF PRIMARILY CLOSED CELL RIGID FOAMS CONTAINING URETHANE GROUPS OR URETHANE- AND ISOCYANURATE GROUPS, AND THEIR USE

Dietrich Scherzer, Nottingham, Great Britain, and Joachim Streu, Diepholz, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,269

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642666

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] C08G *18/00, 18/14*

U.S. Cl. 521—172 **9 Claims**

1. A process for preparing primarily closed cell rigid foams containing urethane groups, or urethane and isocyanurate groups through the reaction of

(a) an organic polyisocyanate with

(b) a higher molecular weight polyol in the presence of

(c) a catalyst and

(d) a blowing agent and optionally further including at least one of

(e) chain extending agents and crosslinkers and

(f) auxiliaries and additives.

wherein said polyol (b) consists of at least 30 weight percent based on the weight of polyol (b), of a polyester polyol containing in bonded form at least 20 weight percent, based on the entire polyester polyol weight, of units having one or more of the structures selected from:

$$—O—CH_2—CH(CH_3)—CH_2—CH_2—CH_2O— \quad (I)$$

$$—O—CH_2—CH(C_2H_5)—CH_2—CH_2—O— \quad (II)$$

$$—OC—CH(CH_3)—CH_2—CH_2—CO— \text{ and} \quad (III)$$

$$—OC—CH(C_2H_5)—CH_2—CO—. \quad (IV)$$

4,897,432

PRODUCTION OF FOAMED POLYMER STRUCTURES

Raymond Lee, Elk Grove Village, Ill.; Carroll W. Lanier, Baker, and H. Eugene Broemmelsiek, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 208,757, Jun. 20, 1988, Pat. No. 4,804,504. This application Sep. 26, 1988, Ser. No. 248,618

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—184 **17 Claims**

1. A bun of cured polyimide foam produced by (i) exposing to microwave radiation of intensity sufficient to cause the development of a foamed polymer structure, a body of foamable polyimide precursors and the foam structure developing therefrom, (ii) while being exposed to microwave radiation maintaining said body of foamable polyimide precursor and foam structure as it is developing therefrom under a substantially vapor-impermeable microwave-compatible shroud that does not substantially restrict or impede development of the foam structure, and (iii) then thermally curing the developed foam structure to a bun of cured polyimide foam; said bun being characterized by having a greater amount and uniformity of cell structure than a bun made from another portion of the same foamable polyimide precursor under the same conditions but without use of such shroud.

4,897,433

PROCESS FOR PRODUCING AN ANTI-THROMBOGENIC MATERIAL BY GRAFT POLYMERIZATION

Takanobu Sugo; Jiro Okamoto; Seiryo Tasaki, all of Gunma, and Tadayuki Onishi, Kanagawa, all of Japan, assignors to Japan Atomic Energy Research Inst. and Sumitomo Bakelite Co., Ltd., both of Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 129,319

Claims priority, application Japan, Dec. 8, 1986, 61-292246; Jun. 9, 1987, 62-142138; Jul. 10, 1987, 62-172439

Int. Cl.[4] C08J *3/28, 7/16, 7/18;* **C08L** *51/06*

U.S. Cl. 522—116 **3 Claims**

1. A process for producing an anti-thrombogenic material in which

an acrylamide or methacrylamide selected from the group consisting of N,N-dimethylaminopropylacrylamide, N,N-diethyl aminopropylacrylamide, N,N-dimethylaminopropylmethacrylamide and N,N-diethylaminopropylmethacrlamide, and

a copolymerization promotor of at least one unsaturated monomer selected from the group consisting of an acrylate or methacrylate having an oligooxyethylene group whose degree of polymerization is 2–10, an acrylate or methacrylate having a hydrocarbon group with no more than 3 carbon atoms into which an alcoholic or glycolic hydroxyl group has been introduced, and acrylamide and N-vinylpyrrolidone

are graft polymerized with an ionizing radiation onto a high-molecular weight substrate comprising a polyurethane elastomeric polymer or a polyolefinic polymer.

4,897,434

AQUEOUS COATING RESIN COMPOSITIONS AND PROCESS FOR PRODUCING SAME

Hiroaki Shimada, Ageo; Yoshio Itoh, Urawa; Tadami Ueno, Ageo, and Norio Yokomichi, Washinomiya, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,925

Claims priority, application Japan, Jul. 24, 1987, 62-184788

Int. Cl.[4] C08K *3/20*

U.S. Cl. 523—409 **21 Claims**

1. In an aqueous coating resin composition, the improvement wherein a microgel composed of a resin reaction product having a three-dimensional network structure, which is obtained by the esterification reaction of (1) 40 to 90 parts by weight of an aromatic epoxy resin with (2) 10 to 60 parts by weight of a carboxyl group-containing vinyl polymer having a weight-average molecular weight of 5,000 to 100,000 comprising (a) a carboxyl group-containing vinyl monomer, (b) an aromatic vinyl monomer and (c) at least one monomer selected from the group consisting of an alkyl ester, a hydroxyalkyl ester and an N-hydroxyalkylamide of an alpha,beta-ethylenically unsaturated carboxylic acid, is dispersed into an aqueous medium.

4,897,435

WATER BASED HYDROXYALKYL CARBAMATE-CONTAINING RESINS AND METHOD OF MAKING THE SAME

William Jacobs, III, Bridgeport, and Werner J. Blank, Wilton, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 17, 1984, Ser. No. 581,009

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

Int. Cl.[4] C08G *59/14*

U.S. Cl. 523—414 **31 Claims**

1. A hydrophilic, substantially epoxy-free self-cross-linkable polymer containing hydroxyalkyl carbamate groups and one or more tertiary amine groups per molecule.

8. A hydrophilic, substantially epoxy-free polymer which is self-cross-linkable through urethane groups comprising a hydroxyalkyl carbamate-containing resin having more than one tertiary amine group and more than two hydroxyalkyl carbamate groups per molecule, said polymer containing from about 3.5 to about 5.7 meq hydroxyalkyl carbamate per gram of resin solids and being obtained by reaction of epoxy groups of one or more epoxides with a secondary amine group of one or more amines containing hydroxyalkyl carbamate groups or precursors thereof, said epoxide having an average epoxy equivalent weight of from about 100 to about 700.

4,897,436

NEW STABILIZERS AND THEIR USE FOR THE PRODUCTION OF STABILIZED POLYAMIDES AND RUBBER MATERIALS

Hans-Josef Buysch, Krefeld; Zsolt Szentivanyi, Leverkusen; Bert Brassat, and Christiane Oppenheimer-Stix, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

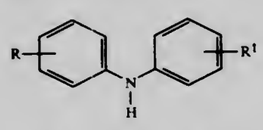
Filed Jan. 11, 1988, Ser. No. 141,960

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701738

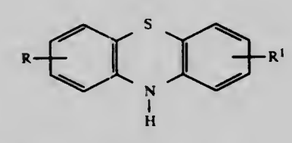
Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—83 **8 Claims**

1. Reaction products of diphenylamines corresponding to general formula (II) and phenothiazines corresponding to general formula (III) below



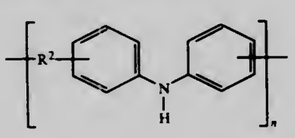
(II)



(III)

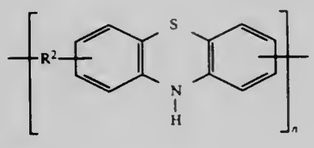
in which

R and R^1, which may be the same or different and are in the o-, m and/or p-position to the N-atom, represent hydrogen, C_1–C_{18} alkyl, C_7–C_{10} aralkyl, OH, Cl, a group corresponding to the following formula



(IIa)

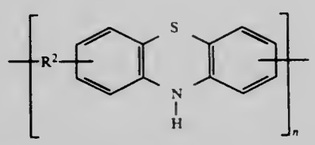
or a group corresponding to the following formula



(IIIa)

in which

R^2 is one of the following groups



(IIIa)

the groups (IIa) and (IIIa) being attached to the groups (II) and (III) by R^2, and

n is an integer of from 1 to 5, with isopropenylphenols corresponding to the following general formula

(IV)

in which the OH group is in the o-, m- or p-position to the isopropenyl group, or bisphenols corresponding to the following formula

in which the OH groups are in the ortho, meta and/or para position to the isopropylidene group, which are obtained by reaction of amines (II) and/or (III) with phenols (IV) and/or (V) in a molar ratio of from 0.1:1 to 2:1 in the presence of acid catalysts at temperatures of from 100° to 300° C., and, optionally, are additionally modified by further reaction with compounds corresponding to the following general formula

$$X-R^3-Y] \qquad \text{(VIII)}$$

in which

X and Y may be the same or different and represent H, OH, halogen, an ethylene, propylene or oxirane group; one of the two substituents or the expression in brackets may be H with the proviso that, in this case, X is neither OH nor halogen, in addition to which X may be —CH=O if the expression in the square brackets is an aliphatic group containing from 1 to 4 carbon atoms,

k- is a single- or double-bonded aromatic radical or a single- or double-bonded aliphatic radical containing from 1 to 12 carbon atoms which may contain one or more OH, ether, thioether, carbonyl, ester groups and/or double bonds and aromatic nuclei containing from 6 to 12 carbon atoms; this reaction may take place both at the OH groups and at the aromatic nuclei of the primary reaction products.

4,897,437

ETHYLENE-ACRYLIC ACID TYPE INTERPOLYMER COMPOSITIONS AND FILMS HAVING INCREASED SLIP AND REDUCED BLOCK

Osborne K. McKinney, Lake Jackson, Tex.; Alfred F. Castello, Midland, Mich., and Michael E. Rowland, Clute, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 69,471, Jul. 2, 1987, Pat. No. 4,751,262, which is a continuation-in-part of Ser. No. 771,945, Sep. 3, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 147,238

Int. Cl.[4] C08K *5/20*

U.S. Cl. 524—232 **12 Claims**

1. A composition, comprising:

(a) ethylene interpolymer selected from the group consisting of:

(1) ethylene interpolymers having acrylic acid interpolymerized therein in an amount of from about 2 to about 35 percent by weight of the interpolymer;

(2) ethylene interpolymers having methacrylic acid interpolymerized therein in an amount of from about 2 to about ±percent by weight of the interpolymer; and

(3) ionomers of such ethylene-acrylic acid and ethylene-methacrylic acid interpolymers in which from about 5 to about 95 percent of the carboxyl groups therein are neutralized with metal cations;

said ethylene interpolymer having a melt flow value of from about 0.01 to about 50 dg/min and being prepared by interpolymerization at reactor pressure and temperature above its respective two-phase transition zone; and

(b) compounded with said interpolymer, from about 0.05 to about 2 percent, by weight of the composition, of a mixed unsaturated secondary fatty acid amide of the formula R —CO—NH—R^1, wherein R is a saturated alkyl group having from 17 to 25 carbon atoms, and R^1 is a monoolefinically unsaturated alkyl group having from 20 to 24 carbon atoms.

4,897,438

STABILIZED SYNTHETIC RESIN COMPOSITION

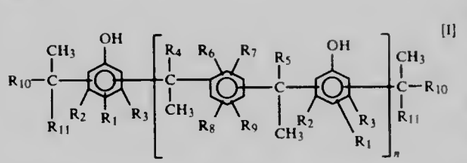
Tohru Kikuchi; Hiroyuki Kawakami; Takayuki Saito, all of Hitachi; Masaki Yagi, Omiya; Yutaka Nakahara, Okegawa, and Hiroshi Takahashi, Koshigaya, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,341

Int. Cl.[4] C08K *5/13*

U.S. Cl. 524—342 **7 Claims**

1. A stabilized synthetic resin composition comprising a synthetic resin and phenolic polymer represented by the formula:



[I]

wherein R_1 is an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms; R_2 and R_3 are independently hydrogen, an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms; R_4 through R_9 are independently hydrogen, or an alkyl group having 1 to 5 carbon atoms; R_{10} and R_{11} are independently an alkyl group having 1 to 5 carbon atoms; and n is 2 or more and 75 or less in average.

4,897,439

POLYMER-METAL BONDED COMPOSITE AND METHOD OF PRODUCING SAME

Steven E. Rau; Robert Roberts; Kevin P. Pochopien, all of Newark; Charles W. Paul, Newcastle; Royce A. Butler, Newark, all of Del.; Allan J. Mackinlay, Chapel Hill, N.C.; Harris L. Morris, Lima, Pa., and Raymond J. Weinert, Garfield Heights, Ohio, assignors to Edlon Products, Inc., Avondale, Pa.

Continuation-in-part of Ser. No. 881,371, Jul. 1, 1986, abandoned. This application Jun. 30, 1987, Ser. No. 68,432

Int. Cl.[4] C08L *27/12, 27/16, 27/18*

U.S. Cl. 524—404 **18 Claims**

1. A coating composition capable of flowing and fusing to form an adherent solid cohesive and nonporous material at ambient pressure and at a temperature of less than or about 700° F. and comprising a major amount of resin and a minor amount of property-improving additive, said resin being:

(A) a fluorocarbon resin selected from the group consisting of (1) perfluoroalkoxy tetrafluoroethylene copolymer resin (PFA), (2) ethylenechlorotrifluoroethylene copolymer resin (E-CTFE), (3) ethylenetetrafluoroethylene copolymer resin (E-TFE), (4) poly(vinylidine fluoride) resin (PVDF), (5) poly(chlorotrifluoroethylene resin (CTFE), or a mixture of two or more of said fluorocarbon resins; said additive being one or a mixture of the following:

(B) a polyether resin selected from the group consisting of (7) polyethersulfone resin (PES), (8) polyether ketone resin (PEK) and (9) polyether ether ketone resin (PEEK) or a mixture or two or more of said polyether resins;

(C) a poly(phenylene sulfide) (PPS); or

(D) an inorganic crystalline material selected from the group consisting of a nitride, a diboride, and silicon carbide, zirconium carbide, tungsten carbide or boron carbide.

4,897,440

ABRASION RESISTANT HULLING ROLLS FROM CARBOXYLATED NITRILE RUBBER

Ching-Tsan Lo, 18010 Oakworth Dr., Houston, Tex. 77084

Filed Mar. 3, 1988, Ser. No. 163,465

Int. Cl.[4] C08K *5/36;* **C08C** *19/20;* **B02B** *3/00*

U.S. Cl. 524—521 **20 Claims**

1. An abrasion resistant hulling roll comprising a solid supporting core and a covering consisting essentially of rubber composition comprising carboxylated nitrile rubber 50–100 parts by weight admixed with up to 50 parts by weight of other elastomers, said composition conjugated diene totaling 100 parts, in admixture with effective amounts, of a filler, a plasticizer, a tackifier, an antioxidant, a sulfur vulcanizer compound, an accelerator, and zinc oxide.

4,897,441

COMPATIBLE POLYMER MIXTURES

Werner Siol, Darmstadt-Eberstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 233,753

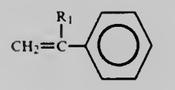
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730025

Int. Cl.[4] C08L *25/06, 25/04, 25/16, 33/10*

U.S. Cl. 524—523 **13 Claims**

1. A compatible polymer mixture, comprising:

(I) 0.1–99.9 wt. % of a polymer P1, comprised of monomer units of formula 1



(I)

wherein R_1 is hydrogen or a methyl group; and

(II) 99.9–0.1 wt. % of a copolymer P2, comprised of:

30–90 parts by wt. of a methacrylic acid ester monomer of formula II



(II)

wherein R_2 is methyl or ethyl;

70–10 parts by wt. of a methacrylic acid ester monomer of formula III



(III)

wherein R_3 is a hydrocarbon group with 3-24 carbon atoms; and

0–10 parts by wt. of a third monomer M which is copolymerizable with but different from the monomers of formulas II and III.

4,897,442

ANTI-WICK AGENT FOR TEXTILE PRINTING

Lawrence E. Ball, Akron, Ohio; Robert O. Rau, Greenville, S.C., and Philip Smith, Akron, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 11, 1988, Ser. No. 217,201

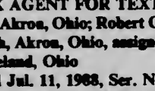
Int. Cl.[4] C08L *37/00*

U.S. Cl. 524—549 **7 Claims**

1. A printing paste for textiles comprising water, emulsified pigment, thickeners, binders and an anti-wick agent, wherein the anti-wick agent consists essentially of a polymer resulting from the polymerization of at least one first monomer selected from the group consisting of methacrylic acid, acrylic acid, maleic acid and maleic anhydride, and at least one second monomer selected from the group consisting of acrylate esters of the formula:

(I)

and N-substituted alkyl acrylamides of the formula



(II)

where R in formulas I and II is a C_1–C_8 alkyl group, and R, in formulas I and II is H or CH_3, and wherein the polymer consists essentially of from about 50 to 70 percent by weight of the first monomer and from about 30 to 50 percent by weight of the second monomer, and wherein the anti-wick agent comprises between about 0.1 and 3.0 weight percent of the printing paste.

4,897,443

POLYSULFIDE SHEETING

Raymond Robinson, Coventry; Timothy C. P. Lee, Kenilworth, both of England; Peter Endruschelt, Weinheim, Fed. Rep. of Germany; Lothar Hockenberger, Ludwigshafen, Fed. Rep. of Germany; Franz-Josef Bergmann, Laudenbach; Karl Ruehl, Bad Nauheim, and Ernst Scherp, Bruchkoebel, Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 31, 1987, Ser. No. 139,993

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700134

Int. Cl.[4] C08L *81/04*

U.S. Cl. 524—609 **3 Claims**

1. Polymeric sheeting consisting essentially of 1000 parts by weight of a polysulfide oligomer or polymer having the average structure:

$$HS(C_2H_4OCH_2OC_2H_4SS)_{23}C_2H_4OCH_2OC_2H_4SH$$

with about 2% cross-linking and an average molecular weight of 4000, 300 to 700 parts by weight of carbon black, and a hardener based on manganese dioxide, wherein said sheeting is formed by extrusion calendering, or knife coating, then cured at 80° C. to 100° C.

4,897,444

IMMOBILIZED FLUOROGENIC SUBSTRATES FOR ENZYMES; AND PROCESSES FOR THEIR PREPARATION

Paul J. Brynes, Libertyville, Ill., and Patricia Andrade-Gordon, Port Jefferson, N.Y., assignors to The Research Foundation of the State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 739,746, May 31, 1985, abandoned. This application Jun. 3, 1985, Ser. No. 740,706

Int. Cl.[4] C08L *89/00*

U.S. Cl. 525—54.1 **11 Claims**

1. An immobilized fluorogenic substrate for identifying and quantifying, intra- and extra-cellularly, the production and secretion of cell-specific enzymes in human and mammalian body fluids as well as in animal extracts, which has the structure:

$$R_1\text{-}NH\text{-}R_4\text{-}R_2\text{-}R_3$$

wherein

R_1 represents an oligopeptide which has an amino acid sequence that is enzyme-specific in terms of cleavage of the amino acid sequence at the peptide linkage proximal to a fluorogenic moiety, the oligopeptide comprising naturally occurring amine acids associated with mammalian and bacterial systems, R_1 being joined to NH via a carbonyl group in R_1;

R_2 represents a spacer group which comprises a group having the structural formula $(CH_2X_1X_{2a}(CH_2)_yX_3)$ wherein X_1 is CO or SO_2; X_2 is NH; a is zero or one, provided that when a is zero, X_1 is CO; X_3 is a member selected from the group consisting of NH, NHCO, CONH, OCO, COO or $Si(O—)_3$; and y is an integer from zero to 15;

R_3 represent a glass or polymer having a complementary group which forms an ester or amide linkage with the ωsulfonic acid or ω-carboxylic acid function of the spacer group or an ether linkage with the ω-carbon atom and hydroxyl group in the polymer; and

$NH\text{-}R_4$ represents a fluorogenic moiety having a second functional group to which is attached the spacer group, said fluorogenic moiety selected from the group consisting of aminoquinolines and their alkyl and alkoxyl derivatives; alkyl, alkoxyl and carboxyl derivatives of aminonaphthalenes; alkyl, akoxyl and carboxyl derivatives of aminocoumarines; alkyl, alkoxyl and carboxyl derivatives of acridines; and alkyl, alkoxyl, amino, nitro and carboxyl derivatives of benzofurazans.

4,897,445

METHOD FOR SYNTHESIZING A PEPTIDE CONTAINING A NON-PEPTIDE BOND

David H. Coy, and Simon J. Hocart, both of New Orleans, La., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

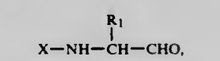
Division of Ser. No. 879,348, Jun. 27, 1986, Pat. No. 4,803,261. This application Mar. 4, 1988, Ser. No. 164,068

Int. Cl.[4] C08F *283/00*; A61K *37/02*

U.S. Cl. 525—54.11 **7 Claims**

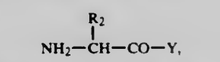
1. A method of solid-phase synthesis of a polypeptide having a non-peptide bond, comprising the steps of

(a) providing an amino aldehyde of the formula



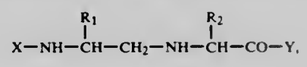
where X comprises a protecting group and R_1 is a side group of an amino acid,

(b) providing a complex of the formula



where Y comprises a solid phase and R_2 is a side group of an amino acid, and

(c) reacting said amino aldehyde with said complex in the presence of sodium cyanoborohydride to form



4,897,446

RUBBER COMPOSITIONS

Mitsuyoshi Aonuma, Tokyo, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,889

Claims priority, application Japan, Oct. 1, 1987, 62-249030; Oct. 1, 1987, 62-249031

Int. Cl.[4] C08L *51/04, 51/08*

U.S. Cl. 525—64 **5 Claims**

1. A rubber composition comprising

(1) 10 to 90% by weight of at least one of a butyl rubber and a halogenated butyl rubber as a first rubber component, ad

(2) 90 to 10% by weight of an epichlorohydrin rubber as a second rubber component,

at least part of at least one of said rubbers (1) and (2) being modified with maleic anhydride or its derivative.

4,897,447

THERMOPLASTIC COMPOSITIONS AND IMPACT MODIFIERS FOR SAME

William G. Williams, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corp., Baton Rouge, La.

Filed Dec. 28, 1987, Ser. No. 138,662

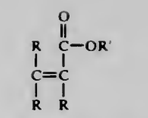
Int. Cl.[4] C08L *23/16, 51/04, 63/10*

U.S. Cl. 525—66 **14 Claims**

1. A modifier for improving the impact strength and toughness of thermoplastic matrix resins comprising

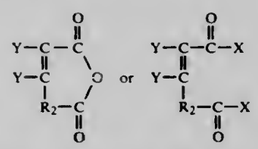
(1) an EPM or EPDM rubber grafted with

(a) 2–15 percent by weight of the rubber of an epoxy functional alpha-beta ethylenically unsaturated compound characterized by the general formula:



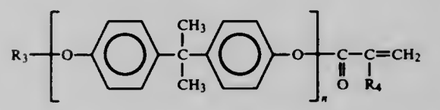
in which R' is an organic group having an epoxide functionally and each R is hydrogen, alkyl, aralkyl, cyclic, or aromatic group, or

(b) 0.2–5 percent by eight of the rubber of an alpha-beta unsaturated dicarboxylic acid or anhydride characterized by the general formula:



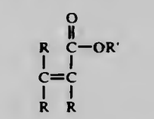
in which R_2 is an alkalene group having from 0–4 carbon atoms, Y is selected from the group consisting of hydrogen, halogen, or an organic group having from 1–12 carbon atoms and X is hydroxyl or ester forming group but in which at least one X is hydroxyl, and

(2) a biphenol A oligomer having terminal epoxy and acrylate groups having to general formula:

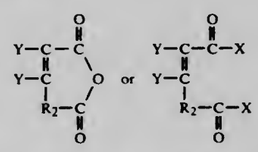


in which R_3 is an organic group having an epoxide functionality; R_4 is hydrogen or a methyl group; and n is an integer from 1 to about 20.

4. A thermoplastic molding composition comprising 70–90 parts by weight of (A) a continuous phase of a thermoplastic matrix resin and 30–10 parts by weight of (B) a modifier composition formed of 59–93 parts by weight of (1) an EPM or EPDM rubber grafted with (a) 2–15 percent by weight of the rubber of any epoxy functional alpha-beta ethylenically unsaturated compound having the following general formula:



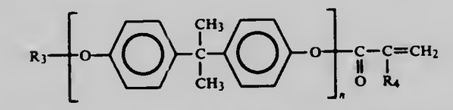
in which R' is an organic group having an epoxide functionality and R is hydrogen, alkyl, aralkyl, cyclic, or aromatic group or (b) 0.2–5 percent by weight of the rubber of an alpha-beta unsaturated dicarboxylic acid or anhydride having the following general formula:



in which R_2 is an alkylene group having from 0–4 carbon

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atoms, Y is selected from the group consisting of hydrogen, halogen, or an organic group having from 1–12 carbon atoms and X is a hydroxyl or ester forming group but in which at least one X is a hydroxyl, and 7–41 parts by weight of (2) an epoxy acrylate oligomer of bisphenol A having the following general formula:



in which R_3 is an organic group having an epoxide functionality; R_4 is hydrogen or a methyl group; and n is an integer from 1 to about 20.

4,897,448

POLYESTER/POLYCARBONATE BLENDS

Kenneth A. Romance, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1988, Ser. No. 176,519
Int. Cl.[4] C08L *67/02, 69/00*
U.S. Cl. 525—67 **8 Claims**

1. An impact modified polyester-polycarbonate blend, comprising:
(a) 20–45 wt% of a poly(ethylene terephthalate) resin,
(b) 20–50 wt% of polyester resin, the dicarboxylic acid component of which consists essentially of terephthalic acid and the glycol component of which consists of 1,4-cyclohexane-dimethanol,
(c) 10–50 wt% of a polycarbonate, and
(d) 8–20 wt% of an impact modifier selected from the group consisting of ethylene-propylene rubbers and acrylic core-shell polymers,
wherein the notched Izod impact strength of said blend is greater than 2.0 ft-lb/in. at −40° C. and greater than 18.5 ft-lb/in. at 23° C. as measured by ASTM D256 using ¼ inch molded bars.

4,897,449

MULTILAYER COMPOSITE INTERPOLYMER COMPRISING A BIMODAL PARTICLE DISTRIBUTION PROCESS FOR ITS PREPARATION AND ITS APPLICATION TO THE REINFORCEMENT OF THERMOPLASTIC MATRICES

Patrice Gaillard, Souchez, and Jean-Claude Robinet, Lamorlaye, both of France, assignors to Norsolor, Cedex, France

Filed Jan. 29, 1988, Ser. No. 150,021
Claims priority, application France, Jan. 30, 1987, 87 01169
Int. Cl.[4] C08L *19/00, 51/04, 51/00, 33/04*
U.S. Cl. 525—85 **17 Claims**

1. A multilayer composite interpolymer comprising at least:
an elastomeric inner phase having per se a glass transition temperature below or equal to 25° C., polymerized from a mixture comprising, per 100 parts by weight:
(a) from 50 to 99.9 parts by weight of at least one main monomer chosen from alkyl or aralkyl acrylates,
(b) from 0 to 49.9 parts by weight of at least one other monoethylenically unsaturated monomer copolymerizable with the said main monomer,
(c) from 0.05 to 8 parts by weight of at least one crosslinking monomer, and
(d) from 0.05 to 6 parts by weight of at least one grafting monomer, and
a relatively hard, nonelastomeric outer phase having per se a glass transition temperature above 25° C., polymerized in the presence of the inner phase, from a mixture comprising, per 100 parts by weight:
(a) from 50 to 99.9 parts by weight of at least one main monomer chosen from C_1–C_4 alkyl methacrylates,
(b) from 0.1 to 50 parts by weight of at least one monoethylenically unsaturated monomer copolymerizable with the said main monomer, and
(c) from 0 to 5 parts by weight of at least one chain-limiting agent,
the polymerized product of the inner and outer phases having:
(1) a population of particles whose mean diameter is between approximately 40 and 150 nm; and
(2) a population of particles whose mean diameter is between approximately 160 and 340 nm,
the weight ratio of population (1) to population (2) being between approximately 10/90 and approximately 90/10.

4,897,450

TRANSESTERIFICATION CURE OF THERMOSETTING COATINGS

Gary P. Craun, Berea; Susan M. Sobek, Brunswick, and Wellington F. Berghoff, Beachwood, all of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed Sep. 12, 1988, Ser. No. 242,544
Int. Cl.[4] C08L *33/14*
U.S. Cl. 525—176 **7 Claims**

1. A thermosetting paint composition containing a thermosetting polymeric binder, the binder comprising on a weight basis:
between 2% and 50% of a hydroxyl functional polyester polymer having a hydroxyl number between about 5 and 200 and a number average molecular weight between about 300 and 30,000 as measured by GPC;
between 50% and 98% of a beta-hydroxy ester copolymer of copolymerized ethylenically unsaturated monomers comprising between 1% and 50% beta-hydroxyl ester alkyl acrylate or methacrylate monomer, between 0% and 90% acrylic monomer other than said beta-hydroxyl ester monomer, with the balance being other ethylenic monomer; and
where said binder contains an activating transesterification catalyst combination for activating crosslinking between the polyester polymer and the beta-hydroxy ester acrylic copolymer, the catalyst combination comprising between 1 and 20 weight parts catalytic epoxy compound and between 0.1 and 10 weight parts nucleophile compound per 100 weight parts of said binder, said nucleophilic compound selected from (a) an onium salt, (b) a Lewis base, (c) a conjugate base of a weak acid having a pka between 2.5 and 14, or (d) an inorganic salt of a halide, an azide, a cyanide or a hydroxide.

4,897,451

CHLOROSULFONATED POLYETHYLENE

Tatsushi Nakagawa; Yoshiaki Ishida; Junichiro Kanesaka, and Yosuke Kaneshige, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jul. 15, 1987, Ser. No. 73,652
Claims priority, application Japan, Jul. 15, 1986, 61-164662
Int. Cl.[4] C08F *8/38*; C08L *23/34*
U.S. Cl. 525—192 **2 Claims**

1. A chlorosulfonated polyethylene having a bimodal molecular weight distribution of 14 or greater and containing from about 29 to 45 wt % chlorine and from 0.2 to 3.0 wt % sulfur, wherein the chlorosulfonated polyethylene has a Mooney viscosity (ML_{1+4}) at 100° C. of from about 67 to 120.

4,897,452

PROCESS FOR THE MANUFACTURE OF PROPYLENE HOMOPOLYMER OR COPOLYMER PELLETS

Bernard Berrier, Chateauneuf les Martigues, and Jean-Claude Roustant, Lavera, both of France, assignors to BP Chemicals Limited, London, England

Filed Mar. 31, 1988, Ser. No. 176,103
Claims priority, application France, Apr. 7, 1987, 87 04888
Int. Cl.[4] C08F *8/06*
U.S. Cl. 525—333.8 **10 Claims**

1. A process for the manufacture of pellets of propylene homopolymer or of a copolymer of propylene with at least one other alpha-olefin, according to which process the homopolymer or the copolymer is subjected to a thermomechanical degradation treatment in the presence of free radical generator so as to increase the melt index of the homopolymer or copolymer and to obtain tractable, non-sticky pellets, characterized in that:
(a) two free radical generators G1 and G2 are added to the homopolymer or copolymer, each in a quantity of between 0.001% and 2% by weight relative to the homopolymer or copolymer, the quantity of G1 being such that crosslinking phenomena during the pelletisation are avoided and the half-life of G2 being at least 20 times longer than that of G1 at the pelletisation temperature, and in that
(b) the homopolymer or the copolymer to which addition has thus been made is pelletised under conditions such that at least 80% by weight of the quantity of G2 initially added and not more than 20% by weight of the quantity of G1 initially added remain intact in the pellets manufactured and available for a subsequent decomposition during a conversion of the said pellets into finished articles.

4,897,453

COMPATIBLE BLENDS OF POLYESTER-ETHERS AND POLYCARBONATES

Thomas E. Flora, and Robert W. Seymour, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1988, Ser. No. 226,007
Int. Cl.[4] C08F *20/00*; C08L *69/00*
U.S. Cl. 525—439 **9 Claims**

1. A composition comprising a blend of:
A. about 10 to 90 weight percent of a polycarbonate; and
B. about 90 to 10 weight percent of a polyester-ether having an inherent viscosity of about 0.8 to 1.5 comprised of:
(1) 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 70;
(2) a glycol component comprising:
(a) 1,4-cyclohexanedimethanol; and
(b) from about 15 to 50 weight percent, based on the weight of the polyester-ether, of poly(oxytetramethylene) glycol having a molecular weight of about 500 to 1100: and
(3) from 0 to about 1.5 mole percent, based on the mole percent of the acid or glycol component, of a branching agent having at least three carboxyl, hydroxyl or both groups.

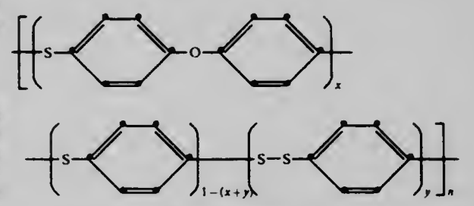
4,897,454

BLENDS OF POLY(ARYLENE SULFIDE) AND COPOLY(ARYLENE SULFIDE) MODIFIED WITH DIPHENYL ETHER

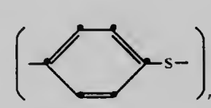
David R. Fagerburg; Joseph J. Watkins, and Paul B. Lawrence, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,119
Int. Cl.[4] C08L *81/04*; C08G *75/14*
U.S. Cl. 525—537 **3 Claims**

1. A composition comprising an admixture of
(A) from 99.9 to 90 weight percent, based on the weight of the admixture, of a polymer having repeating units corresponding to the structure



wherein y is in the range of 0.001 to 0.15, x is in the range of 0.01 to 0.50 and n is at least 100, and
(B) from 0.1 to 10 weight percent, based on the weight of the admixture, of a poly(phenylene sulfide) corresponding to the structure



where r is at least 25.

4,897,455

POLYMERIZATION PROCESS

Howard C. Welborn, Jr., Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 170,485, Mar. 18, 1988, Pat. No. 4,808,561, which is a continuation of Ser. No. 747,615, Jun. 21, 1985, abandoned. This application Dec. 2, 1988, Ser. No. 278,910
Int. Cl.[4] C08F *4/64, 4/68*
U.S. Cl. 526—129 **14 Claims**

1. A method for preparing polymers of ethylene and copolymers of ethylene and alpha olefins or diolefins, said method comprising effecting the polymerization in the presence of a supported catalyst comprising the supported reaction product of at least one metallocene of a metal of Group 4b of the Periodic Table and an alumoxane, the aluminum to transition metal molar ratio being in the range of 100:1 to 1:1, said product being formed in the presence of the support, said support being a porous inorganic metal oxide of Group 2a, 3a, 4a, or 4b metal, and wherein the metallocene is employed in the amount of about 0.001 to about 10 millimoles per gram of support.

4,897,456

RATE MODERATED TWO COMPONENT METATHESIS CATALYST SYSTEM

Lawrence L. Nelson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 53,429, May 18, 1987, Pat. No. 4,826,942. This application Jan. 13, 1989, Ser. No. 296,991
Int. Cl.[4] C08F *4/24, 4/22*
U.S. Cl. 526—141 **15 Claims**

1. A polymerization feed composition comprising:
(a) a methathesis polymerizable polycyclic cycloolefin selected from the group consisting of dicyclopentadiene, methyl dicyclopentadiene, tricyclopentadiene, norbornene, norbornadiene, alkylidene norbornenes, dimethanooctahydronaphthalene, and dimethanohexahydronaphthalene;
(b) a methathesis polymerization catalyst selected from the group consisting of molybdenum halides, tungsten halides and said halides wherein two valences are oxygen instead of halogen, wherein said catalyst is solubilizied with a phenol compound; and
(c) a catalyst activator comprising an alkyl aluminum com-

pound and a reaction rate modifier comprising a bidentate Lewis base within said Lewis base has one functional group which is chemically reactive with aluminum and a second functional group which forms an adduct with aluminum.

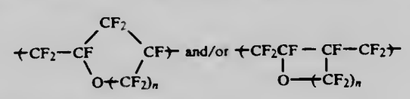
4,897,457

NOVEL FLUORINE-CONTAINING CYCLIC POLYMER

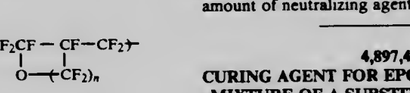
Masaru Nakamura, Tokyo; Izumu Kaneko, Yamato; Kazuya Oharu, Yokohama; Gen Kojima, Machida; Masashi Matsuo, Yokohama; Shunichi Samejima, Tokyo, and Motoi Kamba, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 233,820
Claims priority, application Japan, Aug. 14, 1987, 62-201864
Int. Cl.[4] C08F *16/24*
U.S. Cl. 526—247 **15 Claims**

1. A fluorine-containing thermoplastic resinous polymer which consists essentially of (a) of repeating units of a cyclic structure represented by the following general formula:



and/or



where n is an integer of 1 or 2,

said polymer having a molecular weight such that the intrinsic viscosity of the polymer is at least 0.1.

4,897,458

WATER-SOLUBLE COPOLYMERS AND THEIR PREPARATION

Hans-Peter Seelmann-Eggebert, Schriesheim; Dieter Boeckh; Heinrich Hartmann, both of Limburgerhof, and Wolfgang Trieselt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,049
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712326; Mar. 4, 1988, 3807085
Int. Cl.[4] C08F *210/02, 30/04*
U.S. Cl. 526—318.3 **4 Claims**

1. A water-soluble copolymer based on monoethylenically unsaturated carboxylic acids of 3 to 6 carbon atoms, wherein the copolymer has a K value of from 15 to 120 (determined on the sodium salt according to H. Fikentscher in aqueous solution at 25° C., a pH of 7 and a polymer concentration of the Na salt of 1% by weight) and contains, as copolymerized units,

(a) from 99.5 to 80 mol % of one or more monoethylenically unsaturated C_3–C_6-monocarboxylic acids and

(b) from 0.5 to 20 mol % of one or more comonomers which possess two or more ethylenically unsaturated, non-conjugated double bonds and one or more —CO—OX groups in which X is hydrogen, one equivalent of an alkali metal or alkaline earth metal or an ammonium group,

with the proviso that the sum of the mol % (a) and (b) is always 100.

4,897,459

CATALYST FOR PRODUCING FLUOROSILICONE POLYMERS

Edwin R. Evans, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

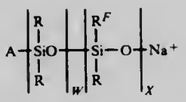
Filed Nov. 25, 1987, Ser. No. 125,304
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—18 **9 Claims**

1. A method to produce fluorosilicone polymer comprising:

(1) heating to a temperature of between 40° C. and 150° C. a mixture:

(i) a cyclosiloxane fluid of the empirical formula $(R_aR_b{}^FSiO)_t$ where R is a substituted or unsubstituted C_{1-8} hydrocarbon radical, R^F is a C_{1-8} fluorine substituted alkyl, t ranges from 3 to 3.5, a+b=2 and b ranges from 0.05 to 1.0;

(ii) 5 to 100 as equivalent to NaOH of sodium fluorosilanolate liquid catalyst having the general formula:



wherein W is 0 to 50; X is from 3 to 50; A is —OH, a C_{1-8} alkenyl, C_{1-8} alkyl, C_{1-8} aryl, C_{1-8} halosubstituted alkyl, C_{1-8} alkoxy, or $—O^-Na^+$; R is a substituted or unsubstituted C_{1-8} hydrocarbon radical; and R^F is a C_{1-8} fluorine substituted alkyl; and

(iii) an effective amount of chainstopper to control molecular weight; and

(2) neutralizing the sodium fluorosilanolate with an effective amount of neutralizing agent.

4,897,460

CURING AGENT FOR EPOXY RESINS FROM A MIXTURE OF A SUBSTITUTED UREA AND A DICARBOXYLIC ACID

Hiroshi Sakamoto, and Koji Takeuchi, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jan. 28, 1987, Ser. No. 7,672
Int. Cl.[4] C08G *59/40*
U.S. Cl. 528—113 **11 Claims**

1. A one-packed epoxy resin composition, comprising:

(1) an epoxy resin;

(2) an organic dibasic acid of the formula

$$HOOC(CH_2)_mCOOH$$

wherein m is an integer of from 4 to 18;

(3) a urea derivative of the formula

$$R_1NHCONR_2R_2$$

wherein R_1 is a hydrogen atom, an alkyl group, an aromatic group, or a substituted aromatic group; and R_2 is an alkyl group.

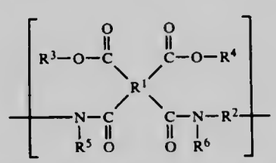
4,897,461

AMPHIPHILIC POLYIMIDE PRECURSOR AND PROCESS FOR PREPARING THE SAME

Masakazu Uekita, and Hiroshi Awaji, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 885,666, Jul. 15, 1986, Pat. No. 4,822,853. This application Jun. 29, 1988, Ser. No. 213,202
Claims priority, application Japan, Jul. 16, 1985, 60-157354
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—125 **5 Claims**

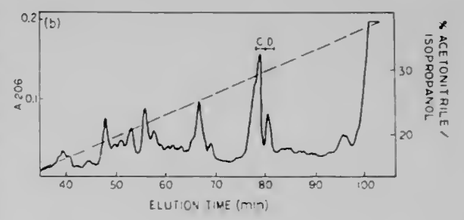
1. An amphiphilic polyimide precursor having at least 70% by mole of the recurring unit of the formula (1):



(1)

wherein R^1 is a tetravalent group having at least 2 carbon

atoms, R^2 is a bivalent group having at least 2 carbon atoms, and each of R^3, R^4, R^5 and R^6 is independently hydrogen or a monovalent group having 1 to 30 carbon atoms selected from the group consisting of an aliphatic group, an alicyclic group, an aromatic group, a group in which an aliphatic group is combined with an alicyclic group or an aromatic group, and the above groups substituted by a halogen atom, nitro group, amino group, cyano group, methoxy group or acetoxy group, provided that at least one of R^3 and R^4 is a hydrophobic monovalent group having 16 to 30 carbon atoms and at least one of R^5 and R^6 is a monovalent group having 1 to 30 carbon atoms.



4,897,462

PROCESS FOR PRODUCING RUBBER-BASED GRAFT COPOLYMERS

Haruhiko Yusa; Mitsuru Hoshino, and Haruki Isaka, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 119,030, Oct. 30, 1987, abandoned, which is a continuation of Ser. No. 720,601, Apr. 5, 1985, abandoned. This application Jun. 9, 1989, Ser. No. 364,496
Claims priority, application Japan, Apr. 11, 1984, 59-72230
Int. Cl.[4] C08J *3/16*
U.S. Cl. 528—486 **5 Claims**

1. A process for producing a rubber-based graft copolymer, which comprises contacting a latex of a graft copolymer which has been obtained by emulsion polymerizing 40% to 10% by weight of a hard polymer-forming monomer in the presence of a latex of 60 to 90% of a rubbery polymer and having a minimum film-forming temperature no higher than 65° C., with an aqueous electrolyte solution consisting essentially of water and an electrolyte, under stirring, thereby to coagulate the latex, and recovering the precipitated graft copolymer, characterized in that said graft copolymer latex is subjected to slow coagulation so as to allow said graft copolymer to precipitate as substantially spherical particles, wherein the term slow coagulation refers to coagulation which proceeds at a milder rate than that of coagulation in which the aqueous electrolyte solution is hydrochloric acid and the pH of the latex during coagulation is 1.8 or lower.

4,897,463

BIOLOGICALLY ACTIVE PEPTIDES WHICH INHIBIT TOXOPLASMA MULTIPLICATION

Naoyoshi Suzuki, Tokyo, and Humio Osaki, Kobe, both of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,039
Claims priority, application Japan, Dec. 28, 1987, 62-330142
Int. Cl.[4] C07K *7/06*
U.S. Cl. 530—329 **4 Claims**

1. A biologically active peptide having an activity to inhibit Toxoplasma multiplication and composed of an amino acid sequence of the formula:

Gly-Glu-Glu-Glu-Glu-Glu.

4,897,464

PURIFIED PROTEIN HAVING ANGIOGENIC ACTIVITY AND METHODS OF PREPARATION

Bert L. Vallee, Brookline, and James W. Fett, Waltham, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 778,387, Sep. 20, 1985, Pat. No. 4,727,137, Continuation-in-part of Ser. No. 724,088, Apr. 17, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 63,252
Int. Cl.[4] C07K *13/00*; A61K *37/00*
U.S. Cl. 530—350 **2 Claims**

1. A substantially pure human protein having the amino acid sequence:

1
<Glu—Asp—Asn—Ser—Arg—Tyr—Thr—His—Phe—Leu—
15
Thr—Gln—His—Tyr—Asp—Ala—Lys—Pro—Gln—Gly—
30
Arg—Asp—Asp—Arg—Tyr—Cys—Glu—Ser—Ile—Met—
Arg—Arg—Arg—Gly—Leu—Thr—Ser—Pro—Cys—Lys—
45
Asp—Ile—Asn—Thr—Phe—Ile—His—Gly—Asn—Lys—
60
Arg—Ser—Ile—Lys—Ala—Ile—Cys—Glu—Asn—Lys—
Asn—Gly—Asn—Pro—His—Arg—Glu—Asn—Leu—Arg—
75
Ile—Ser—Lys—Ser—Ser—Phe—Gln—Val—Thr—Thr—
90
Cys—Lys—Leu—His—Gly—Gly—Ser—Pro—Trp—Pro—
Pro—Cys—Gln—Tyr—Arg—Ala—Thr—Ala—Gly—Phe—
105
Arg—Asn—Val—Val—Val—Ala—Cys—Glu—Asn—Gly—
120
Leu—Pro—Val—His—Leu—Asp—Gln—Ser—Ile—Phe—
123
Arg—Arg—Pro—OH.

said protein characterized in that about 50 ng of the protein produces a positive angiogenic response in the rabbit cornea implantation test.

4,897,465

ENRICHMENT AND CONCENTRATION OF PROTEINS BY ULTRAFILTRATION

Christopher T. Cordle, Centerburg; Larry G. Criswell, Columbus, both of Ohio, and Ronald L. Thomas, Clemson, S.C., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 12, 1988, Ser. No. 256,813
Int. Cl.[4] C07K *3/26, 15/14*; B07C *5/18*
U.S. Cl. 530—387 **40 Claims**

1. A process for concentrating a protein from a fluid and enriching the protein with respect to concentrations of proteins having different sizes and/or isoelectric points, said process comprising:

(a) introducing a fluid to a first metallic oxide ultrafiltration membrane, at a pH which is below the isoelectric point of a selected protein, whereby a retentate containing the selected protein is produced.

(b) subjecting said retentate to a second ultrafiltration at a pH above the isoelectric point of the selected protein, whereby a permeate containing the selected protein is produced; and

(c) collecting the permeate containing the selected protein.

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4,897,466

HUMAN LYMPHOBLASTOID CELL LINE AND HYBRIDOMAS DERIVED THEREFROM

James W. Larrick, Woodside; Andrew R. Raubitschek, Palo Alto, and Kenneth E. Truitt, San Diego, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 604,068, Apr. 26, 1984, Pat. No. 4,624,921. This application Jun. 6, 1986, Ser. No. 871,529
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.[4] A61K *39/395*
U.S. Cl. 530—387 3 Claims

1. Neutralizing monoclonal antibody SA13 .

4,897,467

NITRILOPHORIC EDA-ADSORBENTS

Jerker O. Porath, Upsala, Sweden, assignor to Gelinnovation H.B., Lidingo, Sweden

Filed Feb. 9, 1987, Ser. No. 12,658
Claims priority, application Sweden, Feb. 13, 1986, 8600641
Int. Cl.[4] C08L *89/00, 89/02, 89/04;* B01J *20/00*
U.S. Cl. 530—415 14 Claims

1. A solid adsorbent for use in the isolation and immobilization of proteins by adsorption from a liquid phase, said solid adsorbent comprised of a hydrophilic polymer network having covalently bound ligands of the formula

—Y—X—R

in which R is an aliphatic substituent containing at least one nitrile group or a substituent having a heterocyclic ring system with at least one nitrogen atom in the ring with one or more side groups consisting of or including —CN, where

X is NQ, S or O,

Q is $H(CH_2)_n$ where n=0-3, and

Y is $—CH_2—CH_2—SO_2—CH_213\ CH_2—$ which joins R-X with the polymer network.

4,897,468

IMMOBILIZATION OF PEPTIDE-CONTAINING COMPOUNDS ON METAL HYDROXIDE GELS

Shotaro Oka, Muko; Shu Tahara, Nagaokakyo; Hiroyoshi Minakuchi, and Hajime Karatani, both of Kyoto, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 1,358, Jan. 8, 1987, abandoned, which is a continuation of Ser. No. 833,843, Feb. 26, 1986, abandoned, which is a continuation of Ser. No. 517,060, Jul. 25, 1983, abandoned. This application Sep. 9, 1988, Ser. No. 243,156
Claims priority, application Japan, Dec. 29, 1981, 56-230159; Jul. 29, 1982, 57-133055; Mar. 31, 1983, 58-57508
Int. Cl.[4] C07K *17/14;* C12N *11/14;* G01N *33/551, 33/552*
U.S. Cl. 530—811 10 Claims

1. A process for preparing a bioreactor, comprising the steps of:

(a) hydrolyzing a metal alkoxide compound in an aqueous solvent containing from 0.05 to 1.0 mole of hydrogen fluoride per mole of the metal alkoxide, while evaporating off said solvent, to form a gel of the corresponding fluoride-substituted metal hydroxy compound gel,

(b) treating said fluoride-substituted gel with a coupling agent, and

(c) chemically bonding a peptide-containing compound to the treated gel to form said bioreactor.

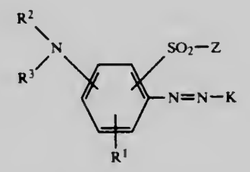
4,897,469

ANILINE SERIES AZO REACTIVE DYES ORTHO- OR PARA-SUBSTITUTED BY VINYL SULFONYL REACTIVE GROUPS

Heinz Ellingsfeld, Frankenthal, and Ruediger Iden, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 177,480
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711763
Int. Cl.[4] C09B *62/026, 62/507;* D06P *1/38*
U.S. Cl. 534—605 5 Claims

1. An azo reactive dye of the formula

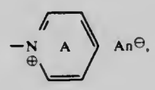


where

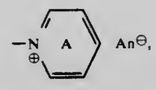
K is the radical of a coupling component,

R^1 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, carboxyl, C_1–C_4-alkoxycarbonyl, carbamoyl, C_1–C_4-mono- or dialkyl carbamoyl or hydroxysulfonyl,

Z is vinyl or the radical $CH_2—CH_2—Z^1$ where Z^1 is OSO_3H, SSO_3H, $OPO(OH)_2$, formyloxy, acetyloxy, the radical



or the radical



where the ring A is substituted by carboxyl or carbamoyl, and $An^{\ominus}$ is an anion,

R^2 is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkyl substituted by phenyl, and

R^3 is unsubstituted or carboxyl-substituted C_1–C_3alkenylcarbonyl, halogen-, C_1–C_4-alkylsulfonyl- or phenylsulfonyl-substituted C_2–C_3-alkenylcarbonyl, halogen-, C_1–C_4-alkylsulfonyl- or phenylsulfonyl-substituted propionyl, the radical $CO—CH_2—CH_2—Z^1$, where Z^1 has the abovementioned meaning, or a reactive group from a series of the 5- or 6-membered aromatic nitrogen heterocyclics which have one or more reactive substituents selected from halogen, ammonium, hydrazinium, pyridinium, carboxyl- or carbamoyl-substituted pyridinium, sulfonium, sulfonyl, azido, thiocyanato, thio, sulfino or sulfono, with the proviso that the radical $SO_2—Z$ is not in the meta-position relative to the azo bridge.

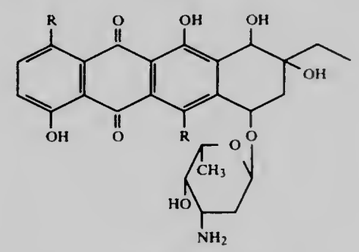
4,897,470

ANTHRACYCLINE ANTIBIOTICS DCP-1 AND 2

Akihiro Yoshimoto, Fujisawa; Osamu Jodo, Yokohama; Yoshio Watanabe, Fujisawa; Tomoyuki Ishikura, Chigasaki; Tsutomu Sawa, Ayase; Tomio Takeuchi, Tokyo, and Hamao Umezawa, deceased, late of Tokyo, all of Japan (by Mikeo Umezawa, Kazuo Umezawa and Yoji Umezawa, heirs), assignors to Sanraku Incorporated, Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 34,879
Claims priority, application Japan, Apr. 8, 1986, 61-79264
Int. Cl.[4] C07H *15/24*
U.S. Cl. 536—6.4 3 Claims

1. An anthracycline antibiotic of the formula (I):



(I)

(where R represents a hydrogen atom or a hydroxyl group).

4,897,471

CONSENSUS HUMAN LEUKOCYTE INTERFERON

Yitzhak Stabinsky, Boulder, Colo., assignor to Amgen, Thousand Oaks, Calif.

Continuation of Ser. No. 560,495, Dec. 12, 1983, Pat. No. 4,695,623, which is a division of Ser. No. 483,451, Apr. 15, 1983, which is a continuation-in-part of Ser. No. 375,494, May 6, 1982, abandoned. This application Sep. 21, 1987, Ser. No. 99,096
Int. Cl.[4] C07H *21/04;* C12P *21/00;* C12N *15/00*
U.S. Cl. 536—27 1 Claim

1. A manufactured gene capable of directing the synthesis in a selected host microorganism of consensus human leukocyte interferon.

4,897,472

PROCESS FOR ISOLATION AND PURIFICATION OF CYCLODEXTRINS

Timo Korpela; Simo Laakso, and Mauri Mäkelä, all of Turku, Finland, assignors to Oy Alko Ab, Norway

Continuation of Ser. No. 932,721, Nov. 19, 1986, abandoned. This application May 12, 1988, Ser. No. 195,460
Int. Cl.[4] C08B *30/18*
U.S. Cl. 536—46 6 Claims

1. A process for isolation and purification of cyclodextrin or its synthetic derivatives, comprising the steps of contacting a mixture containing a material selected from the group consisting of cyclodextrins and synthetic derivatives thereof with an adsorbent containing covalently bound ligands capable of penetrating the internal cavity of the molecules of said material to form an inclusion complex with said material, and eluting said complex from the mixture with an aqueous solution, said material including alpha cyclodextrin and said ligands being selected from an alkyl chain containing from 4 to 7 atoms and an alkyl chain containing polar groups selected from the group consisting of $—NH_3$, $—CONH_2$, —OH, $—R^1—NH—R^2$, —CN, $R^1—CH(OH)—R^2$, where R^1 and R^2 denote alkyl groups.

4,897,473

HOMOLOGATION OF CARBONYLOXY CONTAINING COMPOUNDS

Bernard D. Dombek, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 145,021, Apr. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 971,666, Dec. 21, 1978, abandoned. This application May 1, 1981, Ser. No. 259,378
Int. Cl.[4] C07C *51/10, 51/353, 67/333, 67/36;* C08B *11/12, 13/00*
U.S. Cl. 536—97 10 Claims

1. The process for homologating a carbonyloxy-containing compound selected from the class of carboxylic acids, carboxylic acid esters and carboxylic acid anhydrides which comprises homologating the carbonyloxy-containing compound in the position alpha to the carbonyl of the carbonyloxy groups of the compound by reacting the carbonyloxy-containing compound with carbon monoxide and hydrogen in the presence of a ruthenium-containing compound, a manganese-containing compound, a proton donor, and iodine and/or an iodine compound at a temperature of between about 50° C. and about 400° C. and a pressure of between about 500 psia and about 12,500 psia.

4,897,474

CARBOHYDRATE FATTY ACID ESTERS AND A PROCESS FOR PREPARING THEM

Peter Bickert, North Edison, N.J., assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,248
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623371
Int. Cl.[4] C07C *69/33, 67/62, 69/58;* C07H *13/06*
U.S. Cl. 536—119 14 Claims

1. A carbohydrate fatty acid ester-polyether polyol with improved color and free-flow properties, comprising a carbohydrate fatty acid ester containing from 1–15 wt. % of a polyether polyol.

4,897,475

PROCESS FOR SYNTHESIS OF 5α-CHOLEST-8(14)-EN-3β-OL-15-ONE AND OTHER 15-OXYGENATED STEROLS

George J. Schroepfer, Jr., Houston; William K. Wilson, Bellaire; Ker-Shi Wang, Galveston, and Alenka Kisic, Houston, all of Tex., assignors to William Marsh Rice University, Houston, Tex.

Filed Feb. 5, 1988, Ser. No. 152,476
Int. Cl.[4] C07J *71/00, 1/00*
U.S. Cl. 540—83 49 Claims

1. A process for converting 3β-benzoyloxycholesta-5,7-diene to 3β-benzoyloxy-5-cholesta-7,14-diene comprising:

(i) forming a first reaction mixture by contacting 3β-benzoyloxycholesta-5,7-diene, in a solvent at a temperature of at most about −55° C., with HCl at a concentration is said solvent of at least about 2.0M for a time sufficient to convert said 3β-benzoyloxycholesta-5,7-diene to said 3β-benzoyloxy-5-cholesta-7,14-diene;

(ii) neutralizing the resultant reaction mixture with a base to prevent formation of a significant amount of 3β-benzoyloxy-5-cholesta-8,14-diene; and

(iii) recovering said 3β-benzoyloxy-5-cholesta-7,14-diene.

4,897,476

PROCESS FOR PREPARING PENEMS

Nigel J. P. Broom, Betchworth, England, assignor to Beecham Group p.l.c., Brentford, England

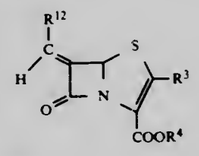
Filed May 12, 1988, Ser. No. 193,746

Claims priority, application United Kingdom, May 14, 1987, 8711391

Int. Cl.[4] *C07D 499/00; A61K 31/43*

U.S. Cl. 540—310 **12 Claims**

1. A process for the preparation of a compound represented by formula I



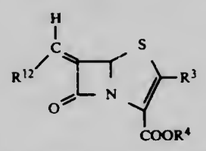
I

in which

R^3 denotes a hydrogen atom, (C_{1-10}) alkyl, (C_{1-10})alkylthio, substituted (C_{1-10})alkyl, or substituted (C_{1-10}) alkylthio, wherein the substituent may comprise hydroxy, (C_{1-6}) alkoxy, (C_{1-6})alkanoyloxy, halogen, mercapto, (C_{1-6})alkylthio, heterocyclylthio, amino, (mono or di)-(C_{1-6})alkylamino, (C_{1-6}) alkanoylamino, carboxy, or (C_{1-6})alkoxycarbonyl;

R^4 denotes a hydrogen atom, a carboxy-salt-forming ion, or a carboxy-ester-forming group; and

R^{12} denotes an unsubstituted or substituted (C_{1-6}) alkyl group or an unsubstituted or substituted phenyl group where the substituents are chosen from the group consisting of heterocyclyl, amino, (C_{1-6})alkanoylamino, (mono, di, or tri)-(C_{1-6})alkylamino, hydroxy, (C_{1-6})alkoxy, (C_{1-6}) alkoxy(C_{1-6})alkoxy, aryloxy, mercapto, (C_{1-6})alkylthio, heterocyclylthio, arylthio, sulphamoyl, carbamoyl, substituted carbamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, carboxy and salts and esters thereof, (C_{1-6})alkanoyloxy, arylcarbonyloxy, heterocyclylcarbonyloxy, acyl, acyloxy, cycloalkyl and aryl groups, or denotes an unsubstituted or substituted 5-membered or 6-membered aromatic heterocyclyl group having one or more ring hetero-atoms selected from oxygen, nitrogen or sulfur, the remaining atoms being carbon and the substituent(s) being one or more groups selected from (C_{1-6}) alkanoyl, (C_{1-6})alkanoyloxy, heterocyclyl, amino, (C_{1-6}) alkanoylamino, (mono or di)-(C_{1-6})alkylamino, hydroxy, (C_{1-6}) alkoxy, sulpho, mercapto, (C_{1-6})alkylthio, (C_{1-6})alkylsulphinyl, (C_{1-6})alkylsulphonyl, heterocyclylthio, arylthio, sulphamoyl, carbamoyl, amidino, guanidino, nitro, halogen, carboxy, carboxy salts, carboxy esters, arylcarbonyl, hetercyclylcarbonyl groups, and unsubstituted or substituted (C_{1-6})alkyl, (C_{2-6}) alkenyl, (C_{2-6})alkynyl, aryl, and aryl(C_{1-6})alkyl groups, which process comprises reacting, at a temperature in the range of from −30 to +100° C., a compound represented by formula II



II

in which R^3, R^4 and R^{12} are defined as above, with a compound represented by formula III

R^5—SH III

in which R^5 denotes an unsubstituted or substituted pyridyl, pyrazinyl, pyranidinyl, pyridazinyl, or benzthiazolyl group,

in the presence of a base selected from the group consisting of an alkali metal carbonate and a substituted amine, said base being present in the reaction mixture in an amount within the range of from 0.01 to 2 moles per mole of the compound represented by formula II.

4,897,477

SYNTHESIS OF VINBLASTINE AND VINCRISTINE TYPE COMPOUNDS

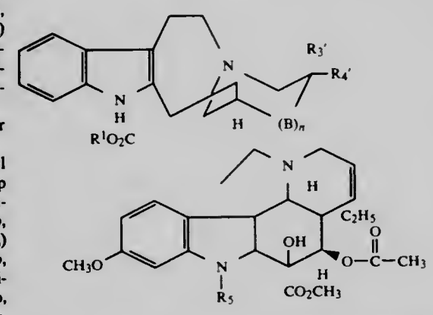
Martin Kuehne, Burlington, Vt., assignor to University of Vermont & State Agricultural College, Burlington, Vt.

Division of Ser. No. 50,807, May 18, 1987, Pat. No. 4,841,045, which is a continuation-in-part of Ser. No. 810,112, Dec. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 710,792, Mar. 12, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 148,461

Int. Cl.[4] *C07D 519/04*

U.S. Cl. 540—478 **17 Claims**

1. A compound of the formula:

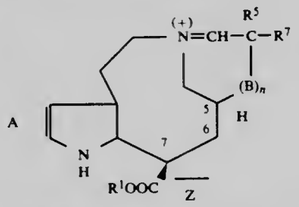


I-D

wherein n is an integer of from 0 to 1; B is an alkylene chain of from 1 to 4 carbon atoms; R^2 is lower alkyl; R_5 is methyl or formyl; R_3' is hydrogen, hydroxy, or lower alkyl; R_4' is hydrogen or lower alkyl with the proviso that when n is 1, B is methylene and one of R_3' or R_4' is ethyl; the other of said R_3' and R_4 is lower alkyl;

or pharmaceutically acceptable salts thereof or hydrolyzable ether thereof when R_3' is hydroxy.

12. A compound of the formula:



II

wherein n is an integer of from 0 to 1; A is the remaining portion of a benzene ring; B is an alkylene chain of from 1 to 4 carbon atoms; R^1 is lower alkyl; Y" is an anion; R^5 is hydrogen or lower alkyl; R^7 is hydrogen, hydroxy, or lower alkyl and Z is the remaining portion of ring selected from the group consisting of vindoline, 16-loweralkoxy-vindoline, des(N-methyl)-N-formyl-vindoline, des(N-methyl)-N-formyl-16-loweralkoxy-vindoline and 16-methoxy-2,3-dihydro-N^a-methyl-tabersonine; with the proviso that when n is 1, B is methylene, and one of R_5 or R_7 is ethyl; the other of said R_5 and R_7 is lower alkyl;

or mixtures thereof with the corresponding 7R-diastereomer having the configuration at C-5 opposite to that shown above.

4,897,478

PREPARATION OF HALOISATOIC ANHYDRIDES

Hartmut Kanter, Ludwigshafen; Heinrich Kowarsch, Oberderfingen, and Burkhard Ort, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

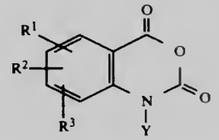
Filed Sep. 2, 1988, Ser. No. 239,654

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730539

Int. Cl.[4] **C07D** *265/26*

U.S. Cl. 544—94 **5 Claims**

1. A process for preparing a haloisatoic anhydride of the formula I



(I)

where

Y is hydrogen or C_1–C_4-alkyl and

R^1, R^2 and R^3 are identical or different and each is independently of the others hydrogen, chlorine, bromine, nitro, C_1–C_4-alkoxy, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkanoylamino, carbamoyl, C_1–C_4-monoalkyl- or -dialkylcarbamoyl, sulfamoyl or C_1–C_4-monoalkyl- or -dialkylsulfamoyl,

with the proviso that at least one of the radicals R^1, R^2 or R^3 is chlorine or bromine, comprising halogenating an isatoic anhydride of the abovementioned formula I where Y, R^1, R^2 and R^3 are each as defined above and at least one of the radicals R^1, R^2 or R^3 is hydrogen with elemental chlorine or bromine in the presence of chlorosulfonic acid at from −10° C. to +100° C. using not less than 0.5 mole of halogen per mole of isatoic anhydride.

4,897,479

ARYLSULFONYLOXY PURINE INTERMEDIATES

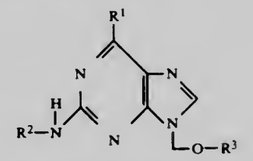
Richard L. Tolman, Warren; Wallace Ashton, Clark, and Malcolm Maccoss, Freehold, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 40,698, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 793,080, Oct. 31, 1985, abandoned, which is a continuation of Ser. No. 538,019, Sep. 30, 1983, abandoned. This application Feb. 29, 1988, Ser. No. 165,360

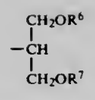
Int. Cl.[4] **C07D** *473/18, 473/26;* **C07F** *9/65;* **A61K** *31/675*

U.S. Cl. 544—244 **1 Claim**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein R^1 is —OSO_2Ar, where Ar is phenyl or alkyl-substituted phenyl, wherein the alkyl group has 1-to-6 carbon atoms: R^2 is H or alkanoyl of 1-to-8 carbon atoms or benzoyl: R^3 is A or B. wherein A is



where R^6 and R^7 are independently selected from H and



wherein R^8 and R^9 are independently selected from pharmaceutically-acceptable cations and H, or R^6 and R^7 taken together are:



where R^{10} is selected from pharmaceutically-acceptable cations and H.

4,897,480

PREPARATION OF N,N'-DIALKYL SUBSTITUTED CYCLIC UREA DERIVATIVES

Willibald Schoenleben, Heidelberg, Fed. Rep. of Germany, assignor to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

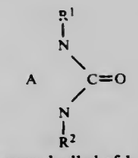
Filed Dec. 14, 1988, Ser. No. 284,245

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744120

Int. Cl.[4] **C07D** *239/10, 233/32*

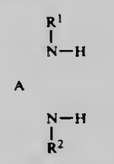
U.S. Cl. 544—315 **7 Claims**

1. A process for the preparation of an N,N'-dialkylsubstituted cyclic urea derivative of the formula I



(I)

where R^1 and R^2 are each alkyl of 1 to 8 carbon atoms and A is CR^3R^4-CR^5R^6- or CR^3R^4-CR^5R^6-CR^7R^8, where R^3 to R^8 are each hydrogen or alkyl of 1 to 17 carbon atoms, by reacting a diamine of the formula II



(II)

with carbon dioxide, wherein the reaction is carried out in the gas phase in the presence of an oxide of an element of main group three or four or subgroup two to six of the Periodic Table, or a mixture of these, or in the presence of an aluminum silicate or magnesium silicate.

4,897,481

PROCESS FOR THE MINIMIZATION OF RACEMIZATION IN THE PREPARATION OF OPTICALLY ACTIVE ((ARYLOXY)PHENOXY)PROPIONATE HERBICIDES

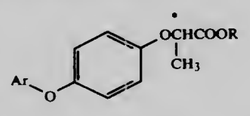
Larry D. Kershner, and Jimmy J. Tai, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1988, Ser. No. 200,400

Int. Cl.[4] C07D *241/36, 213/78, 277/68;* C07C *69/76*

U.S. Cl. 544—354 **4 Claims**

1. A process for reducing the amount of racemization in the preparation of an optically active 3-(4-aryloxy-phenoxy)propionic acid ester of formula (I)



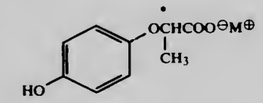
(I)

wherein

Ar represents an aryl group activated toward aromatic nucleophilic substitution reactions, and

R represents a straight-chained or branched alkyl group of from 1 to 8 carbon atoms inclusive or an alkoxyalkyl group having a total of from 3 to 8 carbon atoms inclusive,

which comprises contacting an alkali metal salt of optically active 2-(4-hydroxyphenoxy)propionic acid of formula (II)



(II)

wherein

M⊕ represents Li⊕, Na⊕ or K⊕ with a halogenated aromatic compound of formula (III)



(III)

wherein

Ar is as previously defined and

X represents F, Cl, Br or I

in a polar aprotic organic solvent in the presence of at least one equivalent of an alkali metal carbonate; and subsequently esterifying the resulting 2-(4-aryloxyphenoxy)propionic acid alkali metal salt.

4,897,482

PROCESS FOR THE PREPARATION OF OLIGOMERIC 2,2,4-TRIMETHYL-1,2-DIHYDROQUINOLINE

Manfred Blaszejak, Duesseldorf; Karl J. Wemmje, Burscheid, and Heinz Hammer, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,198

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1988, 3819776

Int. Cl.[4] C07D *401/02*

U.S. Cl. 546—181 **10 Claims**

1. Process for the preparation of oligomeric 2,2,4-trimethyl-1,2-dihydroquinoline from monomeric 2,2,4-trimethyl-1,2-dihydroquinoline, characterized in that monomeric 2,2,4-trimethyl-1,2-dihydroquinoline is heated in the presence of a polybasic aliphatic carboxylic acid and in the presence of small amounts of water.

5. Process according to claim 1 characterized in that the polybasic aliphatic carboxylic acid is oxalic acid, maleic acid, succinic acid, tartaric acid, citric acid or fumaric acid.

4,897,483

AMINO ACID DERIVATIVES AS ANTIHYPERTENSIVES

Shizuo Saito; Motoshi Watanabe; Toshiaki Waga, and Shinichi Matsui, all of Tokyo, Japan, assignors to Asahi Breweries Ltd., Tokyo, Japan

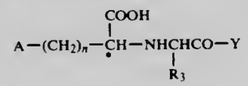
Filed Feb. 18, 1988, Ser. No. 157,737

Claims priority, application Japan, Feb. 19, 1987, 62-34440; Apr. 7, 1987, 62-83885; Jul. 17, 1987, 62-180654

Int. Cl.[4] C07D *401/12, 209/18, 207/10*

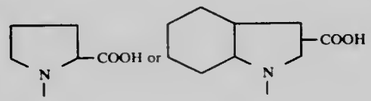
U.S. Cl. 546—201 **14 Claims**

1. A compound of the formula:

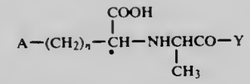


wherein

A is $-NH_2$ or



Y is



R_3 is $-CH_3$ or $-(CH_2)_4NH_2$

n represents a number of from 3 to 8, with the proviso than when A is amino, n is 7 or 8, and a pharmaceutical acceptable salt thereof.

4,897,484

PROCESS FOR THE PREPARATION OF SUBSTITUTED PYRIDINES

Claus D. Weis, Pfeffingen, and Peter Sutter, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

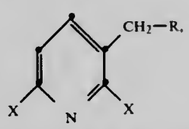
Filed Dec. 9, 1987, Ser. No. 130,486

Claims priority, application Switzerland, Dec. 19, 1986, 5096/86

Int. Cl.[4] C07D *213/133, 213/08, 211/02*

U.S. Cl. 546—252 **14 Claims**

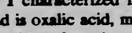
1. A process for the preparation of a compound of the formula



(I)

in which X is halogen and R is a phenyl, naphthyl, pyridyl or thienyl radical which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4alkoxy, halogen, nitro, cyano, trifluoromethyl or C_1–C_4-alkoxycarbonyl, with comprises the following process stages:

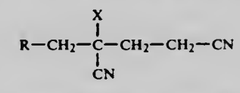
(a) diazotizing a compound of the formula



(2)

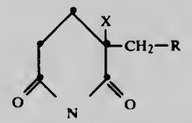
in the presence of a polar organic solvent, hydrochloric or hydrobromic acid and an ester of nitrous acid having 1 to 5 C-atoms, and reacting the diazotized compound with 2-methyleneglutaronitrile in the presence of a catalyst selected from the group consisting of metals of Group VIII or Ib, a salt of said metals and a mixture of a corresponding metal salt and metal powder,

(b) cyclizing the compound of the formula



(3)

obtained in accordance with (a) in an acid medium to give the piperidine-2,6-dione compound of the formula



(4)

and

(c) aromatizing the piperidine-2,6-dione compound of the formula (4) at a temperature of 50° to 250° C. in phosphorus oxybromide or phosphorus oxychloride without a catalyst or in the presence of hexamethylphosphoric acid triamide as catalyst, R and X each being as defined in formula (1).

4,897,485

INSECTICIDAL PYRID-3-YL-2,3-DIAZA-BUTADIEN-1-YL-DISULFIES

Saleem Farooq, Ariesdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

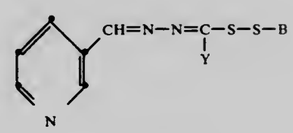
Filed Mar. 11, 1988, Ser. No. 166,945

Claims priority, application Switzerland, Mar. 18, 1987, 1028/87; Apr. 9, 1987, 1361/87

Int. Cl.[4] A61K *31/44;* C07D *211/80, 401/02, 401/14*

U.S. Cl. 546—264 **10 Claims**

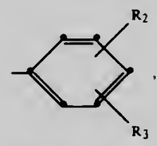
1. A compound of formula I



(I)

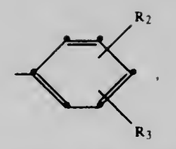
wherein

Y is pyridyl or the radical

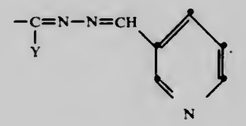


wherein R_2 and R_3 are each independently of the other hydrogen, halogen, C_1–C_4alkyl, trifluoromethyl, C_1–C_4alkoxy or nitro and

B is C_1–C_6alkyl, C_1–C_6alkyl which is substituted by halogen, C_1–C_4alkoxy-C_1–C_6alkyl, C_1–C_4alkylthio-C_1–C_6alkyl, C_1–C_6cyanoalkyl, C_1–C_4nitroalkyl, or is the radical



wherein R_2 and R_3 are each independently of the other hydrogen, halogen, C_1–C_4alkyl, trifluoromethyl, C_1–C_4alkoxy or nitro, or is the radical



4,897,486

5-TRIFLUOROMETHYLPYRIDYL-2-OXY-4-FLUOROANILINES AS INTERMEDIATES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 40,525, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 820,817, Jan. 17, 1986, Pat. No. 4,687,855, which is a continuation of Ser. No. 613,537, May 24, 1984, abandoned, which is a division of Ser. No. 439,457, Nov. 5, 1982, abandoned. This application Jan. 23, 1988, Ser. No. 212,028

Claims priority, application Switzerland, Nov. 10, 1981, 7208/81; Oct. 8, 1982, 5925/82

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] C07D *213/61, 213/64*

U.S. Cl. 546—300 **2 Claims**

1. 3-(5-Trifluoromethylpyridyl-2-oxy)-4-fluoroaniline.

2. 3-(3-Chloro-5-trifluoromethylpyridyl-2-oxy)-4-fluoroaniline.

4,897,487

PROCESS FOR PREPARING INTERMEDIATES FOR PHARMACEUTICALLY USEFUL BICYCLIC COMPOUNDS

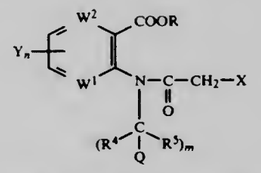
Dinesh Gala, East Brunswick; Martin Steinman, Livingston, and Ashit Ganguly, Upper Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Apr. 6, 1988, Ser. No. 178,176

Int. Cl.[4] C07D *213/81*

U.S. Cl. 546—309 **8 Claims**

1. A process for preparing a substituted acetamide compound of the formula



(III)

wherein W^1 and W^2 independently represent —CH= or —N=;

R^4 and R^5 independently represent H, alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, alkoxyalkyl having

from 1 to 6 carbon atoms in the alkoxy portion and from 2 to 6 atoms in the alkyl portion thereof, hydroxyalkyl having from 2 to 8 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, acyloxyalkyl having from 1 to 6 carbon atoms in the acyloxy portion and from 2 to 8 carbon atoms in the alkyl portion thereof, and -R^6-CO_2R^0 wherein R^6 represents an alkylene group having from 1 to 6 carbon atoms and R^0 represents hydrogen or an alkyl group having from 1 to 6 carbon atoms, with the provisos that the OH of the hydroxyalkyl group and the acylox of the acyloxyalkyl group are not joined to the same carbon atom as another heteroatom;

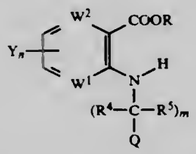
R is any of the values for R^4 or R^5 with the proviso that R is not hydrogen

m is an integer of from 0 to 3;

n is an integer of from 0 to 2;

Q represents an aryl or an aromatic heterocyclic group which can optionally be substituted with 1 to 3 substituents Y as defined below;

each Y substituent is independently selected from the group consisting of hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, NO_2, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynyloxy having from 3 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, —$S(O)_n$-R^8 (wherein R^8 represents alkyl having from 1 to 6 carbon atoms and n is as defined above), —SO_2, NH_2, —CO-R^9 (wherein R^9 represents OH, —NH—R^8, or —O-R^8, where R^8 is as defined above), —O-B-COR^9 (wherein B represents an alkylene group having from 1 to 4 carbon atoms and R^9 is as defined above), —NH_2, —NHCHO, —NH-CO-R^9 (wherein R^9 is as defined above, with the proviso that it is not hydroxy), —NH-$COCF_3$, -NH-SO_2R^8 (wherein R^8 is as defined above), and -$NHSO_2CF_3$, comprising contacting a secondary amine compound of the formula:



(I)

wherein Y, W^1, W^2, R^4, R^5, m and n are as defined hereinbefore, with a substituted acetic acid derivative of the formula

X—CH_2COR^7 II)

wherein X is halogen; and

R^7 is a leaving group which is halogen, tosylate, mesylate or $OCOCH_2X^2$ wherein X^1 is hydrogen or halogen; and said contacting is performed in the presence of an epoxide employed in amounts greater than equimolar to about equimolar amounts relative to the secondary amine compound of Formula (I).

4,897,488

PROCESS FOR THE PREPARATION OF 2-CHLORO-5-METHYLPYRIDINE

Bernd Gallenkamp, and Hans-Joachim Knops, both of Bayerwerk, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

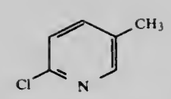
Filed Jan. 4, 1989, Ser. No. 293,260

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1988, 38001799

Int. Cl.[4] C07D *213/26*

U.S. Cl. 546—345 **10 Claims**

1. In the preparation of 2-chloro-5-methylpyridine of the formula



(I)

by reacting 3-methylpyridine 1-oxide with phosphorus oxychloride, the improvement which comprises carrying out the reaction in the presence of a basic organic nitrogen compound and in the presence of a diluent at a temperature between about −50° C. and +50° C.

4,897,489

ANTIBIOTIC DERIVATIVES, THEIR PRODUCTION AND USE

Kouichi Yoshioka, Kyoto; Setsuo Harada, Kawanishi; Michihiko Ochiai, Saita, and Hirotomo Masuya, Kawabe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 810,696, Dec. 18, 1985, abandoned. This application May 21, 1987, Ser. No. 58,265

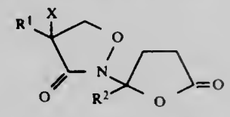
Claims priority, application PCT Int'l Appl., Dec. 18, 1984, PCT/JP84/00602; Jun. 25, 1985, PCT/JP85/00358; Japan, Sep. 4, 1985, 60-195075; Nov. 11, 1985, 60-253188; May 21, 1986, 61-116674; Jun. 12, 1986, 61-137741

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[4] C07D *413/04, 417/14*

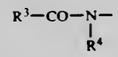
U.S. Cl. 548—128 **24 Claims**

1. A compound of the formula



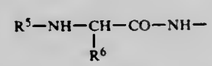
wherein R1 is hydrogen, amino, isonitrile or an acylamino group selected from the group consisting of

(1) a group of the formula:



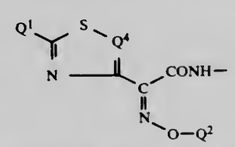
wherein R^3 is C_{1-6} alkyl which is substituted with phenyl, thi®nyl or triazoyl each of which is unsubstituted or may be substituted with halogen, R^4 is hydrogen;

(2) a group of the formula:



wherein R^5 is a group represented by the formula R^7-(CH_2)n-C(=Z)- wherein R^7 is piperadinyl which is unsubstituted or may be substituted with at least one of oxo and C_{1-6} alkyl; n is 0; Z is 0; R^6 is phenyl;

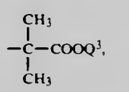
(3) a group of the formula:



wherein Q1 is amino; Q2 is hydrogen, C_{1-6} alkyl, a group -CH_2COOQ3 or a group

wherein Q3 is hydrogen or C_{1-6} alkyl, Q4 is -CH= or —N=;

(4) a group of the formula:



wherein R_{15} is phenyl, R_{16} is hydroxy, sulfamoyl, sulfo or sulfoxy, and

(5) a group of the formula:

R_{17}-R_{18}-CH_2-CO-NH—

wherein R_{17} is C_{2-6} alkenylene which is unsubstituted or may be substituted with halogen, cyano or carbamoyl, R_{18} is -S-; X is (a) hydrogen, (b) methoxy, (c) formylamino, (d) C_{1-6} alkyl which is unsubstituted or may be substituted with hydroxyl, C_{1-4} alkylsulfonyloxy or azido, (e) C_{1-6} alkyl thio in which the sulfur atom is unoxidized or may be oxidized or (f) azido, or X forms a double bond together with the adjacent carbon atom;

and R_2 is carboxyl; or a physiological acceptable salt thereof.

4,897,490

ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

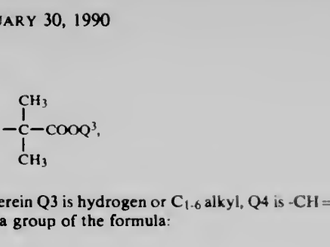
Sing-Ynen Sit, Meriden, and John J. Wright, Middletown, both of Conn., assignors to Bristol-Meyers Company, New York, N.Y.

Continuation-in-part of Ser. No. 18,542, Feb. 25, 1987. This application Feb. 18, 1988, Ser. No. 151,513

Int. Cl.[4] C07D *405/06, 257/02*

U.S. Cl. 548—253 **40 Claims**

1. A compound of the formula

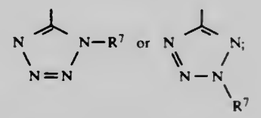


wherein

R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, or trifluoromethyl;

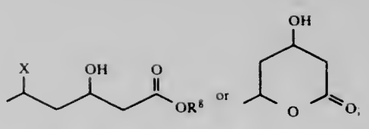
R^2,R^3,R^5 and R^6 each are independently hydrogen, halogen C_{1-4} alkyl or C_{1-4} alkoxy;

tet is



n is an integer of from 0 to 2, inclusive;

A is



R^7 is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy(lower) alkyl or (2-methoxyethoxy)methyl;

X is —OH or =O; and

R^8 is hydrogen, a hydrolyzable ester group or a cation to form a non-toxic pharmaceutically acceptable salt.

4,897,491

PROCESS FOR PRODUCING A GUANIDINE DERIVATIVE

Noboru Kawasaki; Yoshiaki Noguchi, both of Yokohama, and Kenichi Fujii, Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

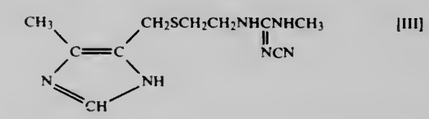
Filed Mar. 9, 1989, Ser. No. 321,111

Claims priority, application Japan, Mar. 17, 1988, 63-62008

Int. Cl.[4] C07D *233/64*

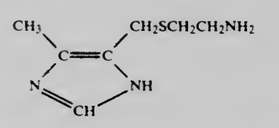
U.S. Cl. 548—342 **6 Claims**

1. A process for producing a guanidine derivative represented by the formula [III],



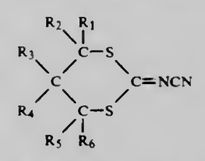
[III]

which comprises reacting a compound represented by the formula [I],



[I]

with a compound represented by the formula [II],



[II]

wherein R_1, R_2, R_3, R_4, R_5 and R_6, are selected from the group consisting of hydrogen, lower alkyl, phenyl, and a radical of the formula —OR_7 or —$COOR_7$, in which R_7 is selected from the group consisting of hydrogen, lower alkyl and alkali metal, followed by reaction with methylamine.

4,897,492

METHOD OF PREPARING LOW COLOR FATTY AMIDES

Bruce R. Bailey, III, and James M. Richmond, both of Naperville, Ill., assignors to Akzo America Inc., New York, N.Y.

Filed Feb. 9, 1988, Ser. No. 153,861

Int. Cl.[4] C07D *233/04*

U.S. Cl. 548—352 **8 Claims**

1. A method of preparing a fatty acid amide comprising reacting together a C_4 to C_{22} carboxylic acid and an amine, characterized in that the reaction is carried out in the presence

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of a color stabilizing amount of a synergistic mixture of hypophosphorous acid and a hindered phenol compound.

4,897,493

PRODUCTION OF SUBSTITUTED 1,3,4,9-TETRAHYDROPYRANO[3,4-B]INDOLE-1-ACETIC ACIDS

Chia-Cheng Shaw, and Karel Pelz, both of St. Laurent, Canada, assignors to American Home Products Corporation, New York, N.Y.

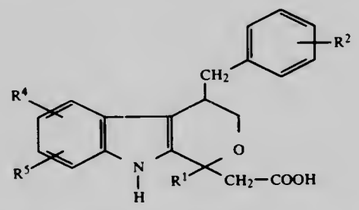
Division of Ser. No. 89,881, Aug. 27, 1987, Pat. No. 4,824,961. This application Jan. 31, 1989, Ser. No. 304,747

Int. Cl.[4] C07D *493/04*

U.S. Cl. 548—432 **1 Claim**

1. An improved process for producing compounds of formula (I)

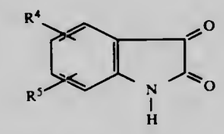
(I)



wherein R^1 is lower alkyl containing 1 to 4 carbon atoms; R^4 and R^5 are hydrogen, lower alkyl containing 1 to 6 carbon atoms, or halogen; and R^2 is hydrogen, 4-halogen, 2- and 4-dihalogen, 3-trifluoromethyl, or 4-methoxy; and the pharmaceutically acceptable salts thereof which comprises the steps

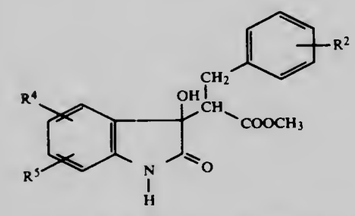
(a) alkylating isatin of formula (XI)

(XI)



wherein R^4 and R^5 are as defined above to produce the compound of formula (XIII)

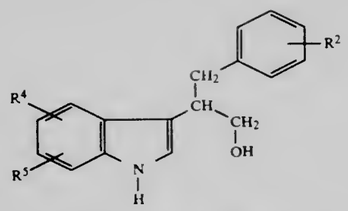
(XIII)



wherein R^2, R^4, and R^5 are as defined above

(b) reducing said compound of formula (XIII) to produce the substituted β-benzyltryptophol of formula (VII)

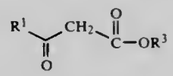
(VII)



wherein R^2, R^4, R^5 are as defined above

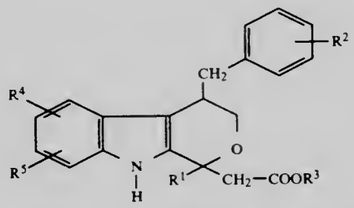
(c) reacting said tryptophol of formula (VII) with 3-oxo-2-alkanoic acid, alkyl ester of formula (VIII)

(VIII)



wherein R^1 is as defined above and R^3 is lower alkyl containing 1 to 8 carbon atoms to produce isomers A and B of the alkyl ester of formula (IX)

(IX)

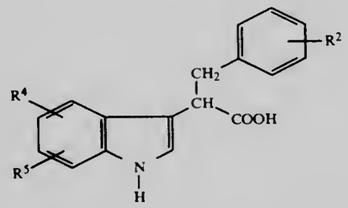


wherein R^1, R^2, R^3, R^4, and R^5 are as defined above

(d) separating said isomer A from isomer B by crystallizing isomer A from an alcohol solvent and hydrolyzing isomer A to obtain the desired compound of formula (I)

wherein in step (a) the improvement comprises in carrying out said alkylation in the presence of lithium diisopropylamide at about −5° C. and quenching the reaction mixture in an aqueous solution containing acetic acid and wherein in step (b) the improvement comprises in reducing and hydrolyzing said compound of formula (XIII) with sodium borohydride in dry tetrahydrofuran to produce the benzylindolylacetic acid of structural formula (V)

(V)



wherein R^2, R^4, and R^5 are as defined above and reducing the carboxylic acid group to the primary alcohol with $BF_3.Et_2O$ to produce said substituted β-benzyltryptophol of formula (VII).

4,897,494

BIS(INDOLYL)ETHYLENE PROCESS

Hubertus Psaar, and Horst Berneth, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

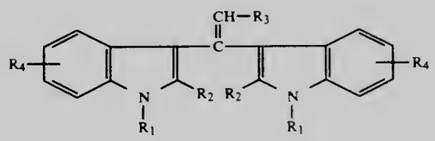
Filed Oct. 24, 1988, Ser. No. 261,945

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738237

Int. Cl.[4] C07D *403/06*

U.S. Cl. 548—455 **7 Claims**

1. A process for the preparation of a bis(indolyl)ethylene of the formula



wherein

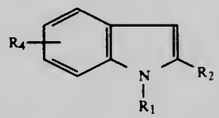
R_1 denotes hydrogen, C_1–C_{12}-alkyl, aralkyl, wherein said aralkyl is benzyl or phenylethyl, or phenyl,

R_2 denotes hydrogen, C_1–C_{12}-alkyl, or phenyl,

R_3 denotes hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, COOH or phenyl and

R_4 denotes hydrogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, cycloalkoxy or halogen C_1–C_4 alkoxy, said alkyl being unsubstituted or substituted by a halogen, C_1–C_4-alkoxy cyano or a carboxyl group, said aralkyl being unsubstituted or substituted by halogen, cyano, C_1–C_4-alkoxy or a carboxyl group, said phenyl being unsubstituted or substituted by a halogen, C_1–C_4-alkoxy, cyano, C_1–C_4-alkyl or a carboxyl group, said alkoxy being unsubstituted or substituted by a halogen, cyano or a carboxyl group, said cycloalkoxy being unsubstituted or substituted by a halogen, cyano or a carboxyl group,

by reaction of an indole of the formula



with a carboxylic acid of the formula

$R_3—CH_2—COOH$

, their chlorides, esters, or anhydrides in the presence of phosphorus oxychloride.

4,897,495

PROCESS FOR THE PREPARATION OF PYRROLIZINE DERIVATIVES

Masayasu Kurono; Yasuaki Kondo; Ryoichi Unno; Yukiharu Matsumoto; Hiromoto Kimura; Mitsuru Oka, and Kiichi Sawai, all of Aichi, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

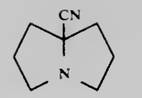
Filed May 12, 1989, Ser. No. 351,006

Claims priority, application Japan, Jan. 7, 1988, 63-138406

Int. Cl.[4] C07D *487/02*

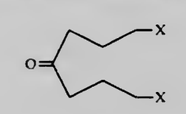
U.S. Cl. 548—453 **1 Claim**

1. A process for the preparation of 7a-cyano-2,3,5,6,7,7a-hexahydro-1H-pyrrolizine of the formula



(I-A)

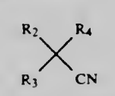
and a salt thereof, which comprises a step of reacting 1,7-di-substituted-4-heptanone of the formula



(II)

wherein X is a halogen atom or group of $R_1—SO_3$, in which R_1 is a hydrocarbon group,

with a cyanide of the formula



(III)

wherein R_2 and R_3 are same or different, each being hydrogen atom or a hydrocarbon atom, and R_4 is hydroxy or amino group,

and ammonia, and if necessary, converting the compound into the salt.

4,897,496

METHOD OF SYNTHESIZING FORSKOLIN FROM 9-DEOXYFORSKOLIN

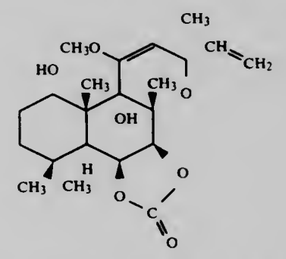
Nicholas J. Hrib, Somerville, N.J., assignor to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 147,421, Jan. 25, 1988, Pat. No. 4,822,896, which is a division of Ser. No. 846,550, Mar. 31, 1986, Pat. No. 4,734,513. This application Jan. 25, 1989, Ser. No. 300,878

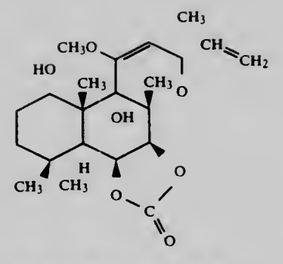
Int. Cl.[4] C07D *311/78, 407/04*

U.S. Cl. 549—229 **4 Claims**

1. A method of preparing the compound of the formula

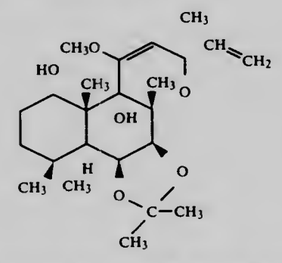


which comprises reacting the compound of the formula

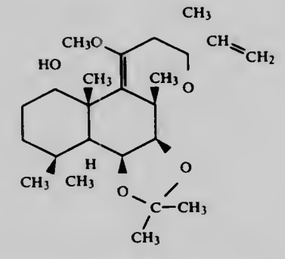


with a peroxy acid to afford said compound.

3. A method of preparing the compound of the formula



which comprises reacting the compound of the formula



with a peroxy acid to afford said compound.

4,897,497

LIGNOCELLULOSE DEGRADATION TO FURFURAL AND LEVULINIC ACID

Stephen W. Fitzpatrick, Framingham, Mass., assignor to Biofine Incorporated, Wilmington, Del.

Filed Apr. 26, 1988, Ser. No. 186,234
Int. Cl.[4] C07D *307/48, 307/50*
U.S. Cl. 549—489 **27 Claims**

1. A process for producing furfural and levulinic acid from lignocellulose, said method comprising

(1) in a first reactor having an entrance and an exit, subjecting a sample comprising lignocellulose to acid degradation at an elevated temperature for a time less than a minute to yield a degradation mixture comprising at least fifty percent of the furfural that theoretically can be derived from said sample:

(2) continuously supplying a volume of said sample to said first reactor through said entrance of said first reactor and continuously removing through said exit of said first reactor a corresponding volume of said degradation mixture and supplying said corresponding volume to a second reactor;

(3) in said second reactor, subjecting said degradation mixture to further acid degradation at elevated temperature to produce levulinic acid; and

(4) during step (3), continuously collecting furfural from said degradation mixture by condensation of furfural vapors arising from said mixture.

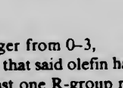
4,897,498

SELECTIVE MONOEPOXIDATION OF OLEFINS

John R. Monnier, Fairport, and Peter J. Muehlbauer, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,297
Int. Cl.[4] C07D *301/10*
U.S. Cl. 549—534 **14 Claims**

1. A process for the selective moncepoxidation of olefins having the structure:



wherein each R is independently selected from the group consisting of:

(a) hydrogen,

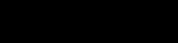
(b) aryl and substituted aryl groups having in the range of 7 up to 20 carbon atoms,

(c) tertiary alkyl groups of the formula:



where each R′ is independently:

R″,



where R″ is H, C_1–C_{10} alkyl or substituted alkyl, an aryl or substituted aryl grup having 6 up to 20 carbon atoms, and n is a whole number from 0–12;

(d)

(e) $R_2''N—$;

(f) $CR_2''=CR''—CR''=CR''—_y$, where y is an integer from 0–20; and

(g)

where X is O,

and m is an integer from 0–3,

with the proviso that said olefin have no allylic hydrogens and that at least one R-group not be hydrogen;

said process comprising contacting said olefin with a sufficient quantity of an oxygen-containing gas so as to maintain the molar ratio of olefin to oxygen in the range of 0.01 up to 20, in the presence of a promoted silver-containing catalyst containing at least one promoter selected from the group consisting of:

the salts of alkali metals,

the oxides of alkali metals,

the salts of alkaline earth metals,

the oxides of alkaline earth metals,

organic halides,

inorganic halides,

acid halides, and

elemental halogens,

as well as mixtures of any two or more thereof at a pressure in the range of 0.1 up to 100 atmospheres, at a temperature in the range of 75 up to 325° C. for a time sufficient to obtain olefin conversions in the range of 0.5 up to 75%.

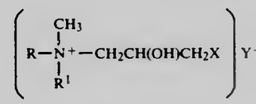
4,897,499

OIL SOLUBLE QUATERNARY AMMONIUM MONOMERS

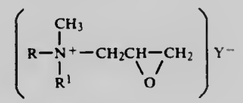
Thomas W. Hutton, Doylestown, and Richard F. Merritt, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 291,010, Aug. 7, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 513,951
Int. Cl.[4] C07D *303/36*
U.S. Cl. 549—552 **6 Claims**

1. An ethylenically unsaturated quaternary ammonium compound of the formula



or the formula



wherein R is:

$H_2C=C(R^4)—C(O)Z—A—$

wherein

R^4 is hydrogen or methyl,

Z is oxygen or $—NR^5—$

wherein R^5 is hydrogen or hydrocarbyl having up to about 10 carbons and A is a (C_2–C_4) alkylene group having at least two carbon atoms in a chain between the adjoined Z and N+ or polyoxyalkylene group of the formula

$$—(CH_2CH_2O)_xCH_2CH_2—$$

wherein

x is 1 to 11

R^1 is a linear C_1 to C_4 alkyl or hydroxyalkyl group,

X is chlorine, bromine or iodine, and

Y is a surfactant anion,

said compound being (A) the reaction product of quarternary ammonium salt and anionic surfactant, (b) efficiently polymerizable via solvent, emulsion or suspension polymerization to form polymers which (i) are stable with anionic additives selected from pigments, thickeners, dyes and fillers, and (ii) in the epoxy form cure with low energy requirements.

4,897,500

METHOD OF DEACTIVATING RESIDUES OF THE PRODUCTION OF DIMETHYLALUMINUM HYDRIDE AND DIMETHYLGALLIUM HYDRIDE

Benjamin C. Hui, Peabody, and Luis I. Victoriano, Danvers, both of Mass., assignors to CVD Incorporated, Woburn, Mass.

Filed Apr. 12, 1989, Ser. No. 336,953
Int. Cl.[4] C07F *5/00, 5/06*
U.S. Cl. 556—187 **11 Claims**

1. A method of deactivating a pyrophoric waste material containing a substantial amount of a compound of the formula $Li(MH_3R)$, wherein M is Al or Ga and R is a halogen or an alkyl moiety containing from 1–5 carbons, the method comprising:

dissolving or dispersing said waste in a non-reactive solvent selected to be of sufficient polarity to dissolve ionic deactivation products of said $Li(MH_3R)$ compound, and

reacting said waste with a non-proton-donor, carbonyl-containing compound in at least a stoichiometric amount relative to said $Li(MH_3R)$ compound.

4,897,501

PROCESS FOR PREPARING AMINOPROPYL ALKOXY SILANES

Kazutoshi Takatsuna, Saitama, Japan; Mamoru Tachikawa, Midland, Mich.; Kouji Shiozawa; Nobukazu Okamoto, both of Saitama, Japan, and Yoshiharu Okumura, Tokyo, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

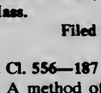
Filed Jul. 29, 1988, Ser. No. 226,086
Claims priority, application Japan, Jul. 31, 1987, 62-192263
Int. Cl.[4] C07F *7/10*
U.S. Cl. 556—413 **4 Claims**

1. A process for preparing aminopropyl alkoxy silanes which comprises reacting an allylamine of the formula [I]



[I]

wherein R_1 and R_2 each represents hydrogen, alkyl having from 1 to 10 carbon atoms, alkenyl having from 2 to 10 carbon atoms, phenyl, substituted phenyl, $—CH_2CH_2NHCH_2CH_2NH_2$ or $—CH_2CH_2NH_2$, and R_3 is hydrogen or alkyl having from 1 to 6 carbon atoms with a hydro-alkoxy silane of the formula [II]



[II]

wherein R_4, R_5 and R_6, each represents alkyl or alkoxy, at least one of R_4, R_5 and R_6, being alkoxy in the presence of a rhodium phosphide of the general formula

$$RhP(R_7R_8)L_n$$

wherein R_7 and R_8 each is alkyl having from 1 to 20 carbon atoms, alkoxy having from 1 to 20 carbon atoms, aryl having from 6 to 20 carbon atoms or aryloxy having from 6 to 20 carbon atoms, L is olefin, diolefin, aromatic amine, nitrile, isonitrile or carbonyl and n is from 1 to 2, or its oligomer, as a catalyst.

4,897,502

PROCESS FOR MAKING SOLID POLYHALOTRIARYL PHOSPHATE ESTERS

Louis T. Gunkel, Yardley, Pa., and John Crosby, Lawrenceville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 12,417, Feb. 9, 1987, abandoned. This application Oct. 7, 1987, Ser. No. 105,776

Int. Cl.[4] C07F 9/09

U.S. Cl. 558—102 **12 Claims**

1. A process for preparing a normally solid polyhalotriphenyl phosphate with the formula $(X_nAro)_3P=O$, in which each X is a halogen selected from the group consisting of chlorine and bromine, ArO is a phenoxy group, n is an integer in the range of from 1 to 5, and the ratio of X to P is in the range of from 3 to 10, comprising:

(a) incorporating into a reaction mixture approximately stoichiometric quantities of phosphorous oxychloride, and a halophenol of the formula X_nArOH, in which ArO, X and n are as defined above, and a catalytic quantity of anhydrous magnesium chloride,

(b) heating the reaction mixture to maintain the temperature of the reaction mixture above the temperature at which the polyhalotriphenyl phosphate will separate from the solution as a solid phase for a sufficient time to react substantially all of the phosphorous oxychloride,

(c) incorporating a solvent amount of a substantially inert alcohol into the reaction mixture to form an alcoholic solution, the alcohol having a Hildebrand solubility parameter δ_t of at least 20 and less than 23 SI units, and a Hansen dispersion component of between 14.2 and 15.5 SI units,

(d) cooling the alcoholic solution sufficiently to form a solid phase in the alcoholic solution, and

(e) separating the solid phase from the cooled alcoholic solution, said solid phase comprising the polyhalotriphenyl phosphate with a substantially reduced quantity of magnesium.

4,897,503

1,1,2-TRIARYL-1-ALKENE DERIVATIVES

Tetsuji Asao; Setsuo Takeda; Yoshikazu Sugimoto, all of Tokushima; Toshiyuki Toko, Toshiyuki; Yuji Yamada, Tokushima; Kazuo Ogawa, Tokushima, and Norio Uenai, Tokushima, all of Japan, assignors to Taiho Pharmaceutical, Tokyo, Japan

PCT No. PCT/JP87/00385, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/07609, PCT Pub. Date Dec. 17, 1987

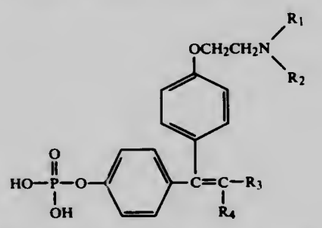
PCT Filed Jun. 12, 1987, Ser. No. 159,590

Claims priority, application Japan, Jun. 16, 1986, 61-139897

Int. Cl.[4] C07F 9/12

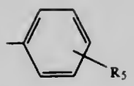
U.S. Cl. 558—155 **10 Claims**

1. A 1,1,2-triaryl-1-alkene derivative of the formula



(I)

wherein R_1 and R_2 each represent a lower alkyl group, one of R_3 and R_4 is a lower alkyl group and the other is a group of the formula



(in which R_5 is a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom or a $-OPO(OH)_2$ group); or a pharmacologically acceptable salt thereof.

4,897,504

METHOD FOR AMMOXIDATION OF PARAFFINS AND CATALYST SYSTEM THEREFOR

Linda C. Glaeser, Lyndhurst; James F. Brazdil, Jr., Mayfield Village, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 204,475, Jun. 9, 1988, Pat. No. 4,837,191, which is a continuation-in-part of Ser. No. 194,665, May 16, 1988, Pat. No. 4,843,055. This application Nov. 14, 1988, Ser. No. 270,188

The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[4] C07C 120/14

U.S. Cl. 558—319 **10 Claims**

1. A process for the ammoxidation of a C_3 to C_5 paraffin to an α,β-unsaturated mononitrile which comprises contacting in a reaction zone said paraffin in the vapor phase in admixture with ammonia, molecular oxygen, and optionally an inert gaseous diluent, with an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said feed to the reaction zone containing a mole ratio of paraffin:NH_3 in the range of 2 to 16, and a mole ratio of parrafin:O_2 in the range from 1 to 10 said first catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having oxygen and the cation components in the proportions indicated by the empirical formula:

$$Bi_aV_bL_lM_mT_tO_x, \qquad \text{formula (1)}$$

wherein

L is one or more of K, Cs, Rb and Tl;

M is one or more of Mo, W, Cr, Ge, Sb, Sn, P, Pb and B;

T is one or more of Zn, Nb, Ta, Fe, Co, Ni Cu, Mn, Ti and rare earths,

a = 1–25

b = 1–50

l = 0–1

m = 0.1–20

t = 0–20

x is determined by the oxidation state of the other elements in the catalyst,

(a+b):(l+m+t) = 20:1 to 1:5

a:b = 1:5–5:1

with the proviso that the atomic ratio of Mo:V is zero to <10; said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having oxygen and the cation components in the proportions indicated by the empirical formula:

$$Bi_kFe_lMo_{12}V_vD_dE_eF_fG_gO_x \qquad \text{formula (2)}$$

where

D is one or more of an alkali metal, Sm, Ag

E is one or more of Mn, Cr, Cu, Zn, Cd, La,

F is one or more of P, As, Sb, Te, W, B, Sn, Pb, Se

G is one or more of Co, Ni, alkaline earth metal, and

k is 0.1–12, l is 0.01–12, v is 0–0.5, d is 0–0.5, e is 0–10, f is 0–10, g is 0–12, $v+k+l+d+e+f+g \leqq 24$, and x is a number determined by the valence requirements of the other elements present, wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

4,897,505

PROCESS FOR THE PREPARATION OF 3-(2-CHLORO-2-(4-CHLORO-PHENYL)-VINYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLIC ACID

Reinhard Lantzsch, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 27, 1988, Ser. No. 290,216

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1988, 3800097

Int. Cl.[4] C07C 61/40

U.S. Cl. 560—008 **1 Claim**

1. A process for the preparation of 3-(2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethylcyclopropanecarboxylic acid or esters or derivatives thereof comprising reacting in a first step 3-chloro-3-(4-chlorophenyl)-propenal with chloromethyl isopropyl ketone to form 4,4-dimethyl-1,3,6-trichloro-1-(4-chlorophenyl)-hex-1-en-5-one and in a second step reacting said hex-1-ene-5-one, with or without isolation thereof from the first reaction, in the presence of aqueous base or in the presence of alkoxide to yield the acid or its ester.

4,897,506

ISOLATION OF ALPHA-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER FROM AQUEOUS MEDIUM

Ryuichi Mita, Omuta; Takeshi Oura, Zushi; Toshio Katoh, Kawasaki; Chojiro Higuchi; Akihiro Yamaguchi, both of Kamakura, and Masanobu Ajioka, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,838

Claims priority, application Japan, Oct. 13, 1987, 62-256406; Jun. 7, 1988, 63-138414

Int. Cl.[4] C07C 101/02

U.S. Cl. 560—41 **18 Claims**

1. In a method for the isolation of purified α-L-aspartyl-L-phenylalanine methyl ester (α-APM) wherein α-APM is separated from an admixture with an aqueous medium and then dried, the improvement which comprises dissolving in the aqueous medium, before separating the α-APM therefrom, at least one additive selected from the group consisting of sodium alginiate, sodium salt of carboxymethylcellulose, sodium starch glycolate and sodium polyacrylate, in an amount effective to produce isolated α-APM which when dried is readily soluble in water.

4,897,507

METHOD FOR PRODUCING α-L-ASPARTYL-L-PHENYLALANINE DERIVATIVES

Satoji Takahashi, and Tadashi Takemoto, both of Yokkaichi, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,214

Claims priority, application Japan, Jul. 22, 1987, 62-183199

Int. Cl.[4] C07C 103/52

U.S. Cl. 560—41 **9 Claims**

1. A method for producing α-L-aspartyl-L-phenylalanine methyl ester hydrochloride, which comprises:

reacting 3-benzyl-6-carboxymethyl-2,5-diketopiperazine or methyl ester thereof in a methanolic solvent containing water in an amount of 30 wt. % or less based on the solvent, in the presence of a strong acid thereby obtaining α-L-aspartyl-L-phenylalanine dimethyl ester; and then

separately reacting the dimethyl ester in an aqueous solvent containing hydrochloric acid and methanol to produce α-L-aspartyl-L-phenylalanine methyl ester.

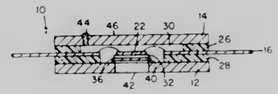
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4,897,508

METAL ELECTRONIC PACKAGE

Deepak Mahulikar, Meriden, Conn.; Sheldon H. Butt, Godfrey, Ill.; Jacob Crane, Woodbridge, Conn.; Anthony M. Pasqualoni, New Haven, Conn., and Edward F. Smith, Madison, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 10, 1988, Ser. No. 154,544
Int. Cl.[4] H01L *23/20*
U.S. Cl. 174—52.4 36 Claims



16. A package containing an enclosure for housing an electronic device, comprising:

a base component containing a first aperture;

a cover component;

a leadframe with first and second opposing sides disposed between said base component and said cover component, said leadframe containing a plurality of leads disposed about a centrally positioned die attach pad, said die attach pad positioned to seal said first aperture and adapted to support said electronic device, said electronic device electrically connected to said leads;

a first bonding means to seal said base component to said first side of said leadframe;

a second bonding means to seal said cover component to said second side of said leadframe; and

a third bonding means to seal said die attach pad to said base component.

4,897,509

GLASS-CERAMICS FOR ELECTRONIC PACKAGING

Louis M. Holleran, Big Flats; John F. MacDowell, and Francis W. Martin, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 42,980, Apr. 27, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 238,574
Int. Cl.[4] H05K *1/03*
U.S. Cl. 174—258 2 Claims

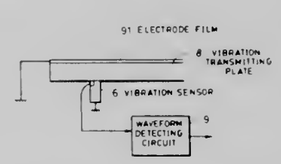
1. A multi-layer, inorganic integrated circuit package consisting of a plurality of individual circuit plies, wherein each ply comprises a substrate with a patterned, electrically conductive layer applied thereto with through hole connectors in each ply for connecting the patterned electrically conductive layers of the respective plies to form a wiring circuit, the substrate for said plies consisting of a non-porous glass-ceramic material exhibiting a dielectric constant less than about 6, a linear coefficient of thermal expansion between about $12–60\times10^{-7}$/°C., and containing cordierite solid solution as essentially the sole crystal phase, said glass-ceramic being crystallizable in situ at a temperature between 850°–1000° C. from a glass material having a composition essentially free from a nucleating agent, Li_2O, and Na_2O and consisting essentially, expressed in terms of weight percent on the oxide basis of 10–25% MgO+ZnO, consisting of 2–18% MgO and 0–21% ZnO, 20–38% Al_2O_3, 40–52% SiO_2, and 2–15% total of at least one oxide in the indicated proportion selected from the group consisting of up to 10% of a divalent metal oxide selected from the group consisting of CaO, SrO, BaO, and PbO, and up to 5% B_2O_3.

4,897,510

COORDINATE INPUTTING DEVICE INCLUDING AN ELECTRODE TO REDUCE NOISE COMPONENTS

Atsushi Tanaka, Kawasaki, and Shinnosuke Tanishi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 214,218, Jun. 27, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 331,029
Claims priority, application Japan, Jul. 14, 1987, 62-173987
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 4 Claims



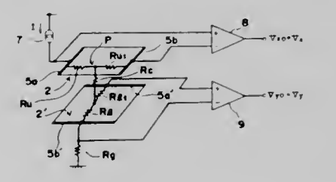
1. In combination with a coordinate inputting device in which the vibrations imparted from a vibration pen to a vibration transmitting plate are detected by a plurality of vibration sensors so as to enable the coordinates of a vibration input point to be detected using the time it takes for the vibrations to propagate on said vibration transmitting plate, a noise interrupting means affixed to said vibration transmitting plate for preventing noise coexistent with the vibrations for coordinate detection from being input to said vibration sensors.

4,897,511

METHOD OF DETECTION OF THE CONTACTING POSITION IN TOUCH PANEL SENSOR

Hisao Itaya; Kazuhiko Akebi, and Minoru Okabe, all of Moriyama, Japan, assignors to Gunze Limited, Kyoto, Japan

Filed Jun. 16, 1988, Ser. No. 207,616
Claims priority, application Japan, Jun. 17, 1987, 62-153121
Int. Cl.[4] G08C *21/00*
U.S. Cl. 128—18 11 Claims



1. A method of detecting a contact position in a touch panel, comprising the steps of:

providing first and second resistance layers opposite each other and separated by a predetermined gap, each said resistance layer supported by a respective substrate;

providing a conduction member on at least one edge of said first resistance layer, and providing a conduction member on at least one edge of said second resistance layer extending in a direction perpendicular to the conduction member of said first resistance layer;

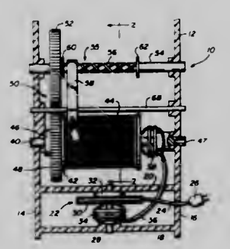
connecting a constant current source to the conduction member of said first resistance layer;

flowing a constant current from said constant current source when contact is made between said first and said second resistance layers at a contact point, through the conduction member of said first resistance layer, through said first resistance layer, and through said contact point to said second resistance layer; and

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detecting the coordinate position of said contact point by detecting a voltage drop generated by said constant current one each of said respective resistance layers.

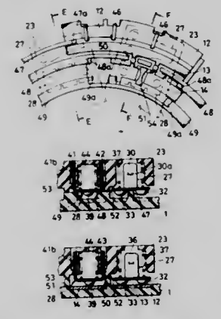
4,897,512
EXTENSION CORD APPARATUS
Bobby J. Johnston, 6419 Bandera #1, Dallas, Tex. 752253-3703
Filed Apr. 18, 1988, Ser. No. 182,727
Int. Cl.[4] H02G *11/02*; B65H *75/34*
U.S. Cl. 191—12.4 **1 Claim**



1. Improved electric extension cord storage apparatus including:
a hollow housing;
first reel means including a shaft journaled in said housing and a drum mounted on said saft for receiving a power cord;
second reel means including a second shaft journaled in said housing and a second drum on said second shaft for receiving said extension cord;
means in said housing for electrically interconnecting said power cord and extension cord;
level wind means including a level wind shaft having left and right-hand helical grooves therein;
a follower mounted for reciprocating movement along said level wind shaft and having said extension cord passing therethrough;
a gear mounted on and rotatable with said second shaft;
a gear mounted on and rotatable with said level wind shaft is mesh with said gear on said second shaft causes rotation of said level wind shaft whereby rotation of said second shaft causes rotation of said level wind shaft and reciprocation of said follower to distribute said extension cord substantially uniformly along said second drum; and
resilient means for storing energy when said second shaft rotates to feed said extension cord from said second reel means and for causing rotation of said second reel means in a direction to rewind said extension cord.

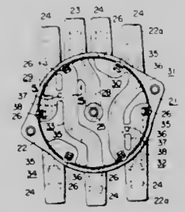
4,897,513
ROTARY SWITCH
Tsumoru Oka, and Mitsuki Shiraka, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1989, Ser. No. 301,783
Claims priority, application Japan, Mar. 11, 1988, 63-31644[U]; Mar. 11, 1988, 63-31645[U]
Int. Cl.[4] H01H *21/62*; B62D *65/00*
U.S. Cl. 200—11 EA **3 Claims**

1. A rotary switch comprising:
a synthetic resin substrate;
a plurality of fixed contacts arranged on the surface of said substrate;
a holder mounted on said substrate and movable over said fixed contacts and a further portion of said substrate not covered by said fixed contacts;
a movable conducting plate supported to said holder;
contact elements formed on said movable conducting plate and in sliding engagement with said fixed contacts such that the rotary switch is switched on by rotating said holder and thereby contacting at least two movable contact elements with said fixed contacts;
a rib projecting upwards from said substrate and positioned so that said movable conducting plate contacts said rib when the switch is in the off position, thereby raising said movable contact elements from the surface of said substrate;



said fixed contacts formed with curved ends and said substrate formed with a groove whereby a substantially planar, hour glass shaped slit is formed between said fixed contacts to be narrowest coincident with the sliding locus of said contact elements and widest outside the sliding locus so that the wider portions of said slit act as reservoirs for conductive wearing powder, thereby delaying a short circuit due to wearing powder accumulation.

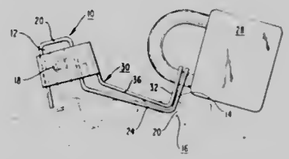
4,897,514
DISTRIBUTOR CAP FOR AN IGNITION DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE
Kouji Arima; Masaaki Chiba, and Toshiro Ota, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 21, 1989, Ser. No. 341,601
Claims priority, application Japan, Apr. 22, 1988, 63-98232
Int. Cl.[4] F02P *7/02*; H01H *19/00*
U.S. Cl. 200—19 DC **3 Claims**



1. A distributor cap for an internal combustion engine ignition distributor adapted to include a contact rotor rotatable in a plane, comprising:
a molded cap main body (22);
a plurality of external terminals (23, 24) disposed on said cap main body and connectable to external circuits;
a plurality of electrodes (25, 26) disposed inside of said cap main body for sequential power distribution by the contact rotor of the distributor;
a plurality of electrical conductor means (28–34) disposed within said cap main body for individually electrically connecting said external terminals to said electrodes;

electrical insulation means (38) for laterally interconnecting selected ones of said conductor means, and
positioning projections means (37) disposed on said insulation means for limiting the movement of said selected conductor means from a predetermined position during the molding of said cap main body, said positioning projection means extending substantially perpendicularly to the plane of rotation of the contact rotor, and said positioning projection means being located such that axes thereof do not intersect axes of said conductor means.

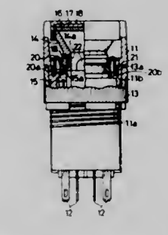
4,897,515
SECURING DEVICE FOR THE SWITCH HANDLE OF A CIRCUIT BREAKER
Eduard Zabar, and John R. Patrick, Stone Mountain, both of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Filed Dec. 9, 1988, Ser. No. 282,154
Int. Cl.[4] H01M *27/10*
U.S. Cl. 200—43.14 **8 Claims**



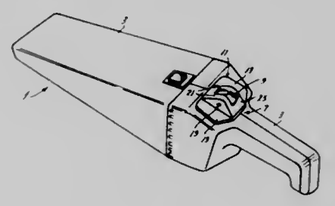
1. An apparatus for restricting the movement of a circuit breaker switch handle, wherein the circuit breaker is of the type including a housing and a switch handle movable between a first position and a second position, the apparatus comprising:
means adapted to interfere with the housing, the means adapted to interfere with the housing including a hooking member adapted to straddle the handle, and a locking flange adapted to interfere with the housing and accept a means for locking;
means for attaching the means adapted to interfere with the housing to the handle; and
means for restricting access to the means for attaching, the means for restricting including an attachment member mountable to the handle, and a lock flange adapted to accept the means for locking;
wherein the means for locking may be coupled to the lock flange and the locking flange and the handle is restrained in the first position when the means adapted to interfere interferes with the housing.

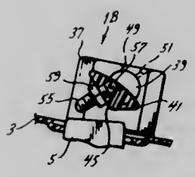
4,897,516
PUSH BUTTON SWITCH
Yoshihiro Wakatsuki, Izumo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Continuation of Ser. No. 891,613, Aug. 1, 1986, abandoned. This application Sep. 28, 1988, Ser. No. 251,077
Claims priority, application Japan, Aug. 5, 1985, 60-119371
Int. Cl.[4] H01H *13/06*
U.S. Cl. 200—302.2 **4 Claims**

1. A push button switch comprising a case, an operation section have an operation plunger system including upper and lower plungers, said upper and lower plungers being engaged together by an engagement which permits manual separation of said upper plunger from said lower plunger by a pulling force applied to said upper plunger, said plungers being able to be pushed into the case, said case comprising an inner surface for guiding said lower plunger, and a switch section which is made operative and inoperative by the pushing of an operation section thereof housed in the case by said lower plunger, a first seal member arranged between the lower plunger and the case, a second seal member arranged between the upper plunger and the lower plunger, said upper plunger including a lower portion having a first ring-shaped groove around an outer circumference of said lower portion, said lower plunger including an upper outer circumferential portion with a second ring-shaped groove, said second seal member being disposed within said first ring-shaped groove, and said first seal member being elongated and having on one end thereof an inner circumferential rim fitted into said second ring-shaped groove, said one end of said first seal member being movable with said lower plunger when said lower plunger is pushed to move relative to said case, said second seal member being detachable from said lower plunger with said upper plunger and remaining attached to said upper plunger by engagement with said first ring-shaped groove when said upper plunger is detached from said lower plunger.



4,897,517
VACUUM CLEANER SWITCH RETAINER
Joseph J. Gundlach, 121 Moonglow Dr., Belleville, Ill. 62221
Continuation of Ser. No. 38,133, Apr. 14, 1987, abandoned. This application May 1, 1989, Ser. No. 346,319
Int. Cl.[4] H01H *21/18*
U.S. Cl. 200—318.1 **4 Claims**





1. In an electrically powered appliance having a multiple position pushbutton switch controlling application of power to the appliance, the switch being biased to a first or "OFF" position whereby a user can maintain the switch in a second or "ON" position only by constant application of physical force, an improvement comprising cam means including a rotary cam acting on an outer face of the switch; rotating means including a shaft connected to the cam; a carrier offset from the pushbut-

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ton switch for supporting the shaft and having an outer portion, the carrier having a slot in the outer portion thereof; manually operable means for turning the shaft and the cam; and, the shaft having a pin extending through the slot for limiting the turning of the shaft, whereby the switch is movable from its first to its second position by the application of physical force and held in its second position after removal of such force thereby reducing user fatigue while using the appliance.

4,897,518

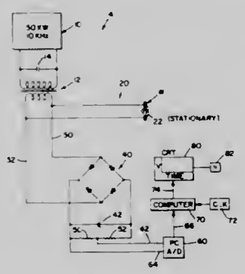
METHOD OF MONITORING INDUCTION HEATING CYCLE

George M. Mucha, Parma Heights, Ohio; Jonathan W. Alexander, Boaz, Ala.; George D. Pfaffmann, Farmington, Mich., and Richard H. McKelvey, Albertville, Ala., assignors to Tocco, Inc., Boza, Ala.

Continuation of Ser. No. 22,868, Mar. 6, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,825

Int. Cl.[4] H05B *6/06*

U.S. Cl. 219—10.41 **15 Claims**



1. A method of monitoring a heating cycle of an induction heating system wherein an inductor encircles a metal workpiece and an alternating current is applied through said inductor from a power supply during said heating cycle, said method comprising the steps of:

(a) generating an analog signal which varies during said heating cycle by changes in the electromagnetic characteristics of said workpiece as said workpiece is being heated;

(b) digitizing said analog signal;

(c) creating a trace of said digitized analog signal, said trace being indicative of the electromagnetic characteristics of said workpiece as sensed by said inductor during said heating cycle; and,

(d) evaluating said sensed electromagnetic characteristics by comparing said created trace with a preselected control pattern.

4,897,519

MORE CREEP RESISTANT TURBINE ROTOR, AND PROCEDURES FOR REPEAR WELDING OF LOW ALLOY FERROUS TURBINE COMPONENTS

Robert E. Clark, Orlando, Fla., and Dennis R. Amos, Rock Hill, S.C., assignors to Westinghouse Electric Co., Pittsburgh, Pa.

Filed Mar. 14, 1988, Ser. No. 168,097

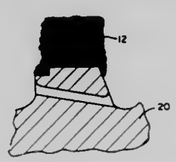
Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.14 **15 Claims**

1. A method of repairing a worn surface of a ferrous steam turbine component having less than about 6% alloying ingredients including Cr, Mo and V, comprising:

(a) providing a steam turbine component having a worn surface thereon;

(b) depositing a ferrous alloy on said worn surface in a multipass buildup comprising at least two spaced apart weldments, said ferrous alloy comprising about 7.0% to 11.0%



weight percent Cr and about 0.1% to 3.0% weight percent Mo; and

(c) machining said deposited alloy to a desired shape.

4,897,520

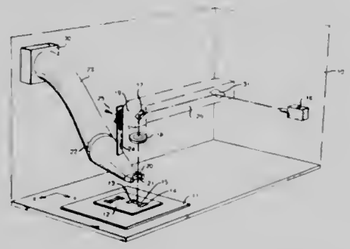
LASER DEBRIS VACUUM SCOOP

Ronald H. Carter; Brian F. Walker, both of Blue Springs, Mo.; Michael J. West, Yukon, Okla., and Randall T. Wingerter, Blue Springs, Mo., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 31, 1988, Ser. No. 265,174

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.68 **10 Claims**



1. Apparatus for trimming film materials comprising:

a movable head containing optical components for directing a laser beam toward said material; and

means mounted to said head for removing debris from the surface of the material caused by the incidence of the laser beam thereon, said means consisting essentially of a vacuum scoop mounted to said head, a flexible hose having one end mounted to the scoop, and exhaust means coupled to the other end of the hose.

4,897,521

WELD ARC SIMULATOR

Melvin J. Barr, Westminster, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 1, 1989, Ser. No. 317,494

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—124.03 **6 Claims**

5. A method of simulating a change in arc voltage of an automatic voltage controlled arc welder, said welder comprising:

electrode means for welding a workpiece spaced a predetermined distance across a gap from said electrode means;

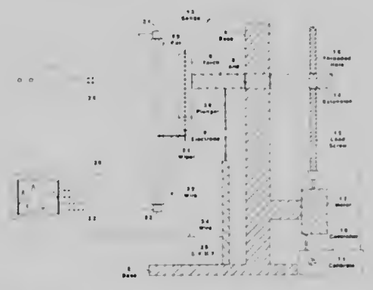
support means for controllably moving said electrode means in the direction of the gap, in response to a control signal, to maintain the gap at the predetermined distance; and

control means for generating said control signal in response to variations in arc voltage at said electrode caused by variations in the gap distance; and

said method comprising:

generating a simulation voltage;

applying said simulation voltage to said electrode when no arc is present;



adjusting said applied voltage at said electrode as a function of the position of said electrode; and

determining the movement of said electrode as a function of said simulation voltage.

4,897,522

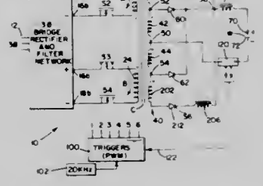
OUTPUT CONTROL CIRCUIT FOR INVERTER

Dale L. Bilczo, Rocky River; Larry L. Church, Jefferson, and Michael J. Kurchak, Eastlake, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Feb. 6, 1989, Ser. No. 306,470

Int. Cl.[4] B23K *9/10*; H02M *3/335*

U.S. Cl. 219—130.32 **15 Claims**



1. In a high frequency power supply for supply a D.C. current through a choke to a welding station including an electrode element and a workpiece element, said power supply including a transformer having a core, primary windings and first and second secondary windings connected in series at a common junction to define spaced winding ends defining first and second output terminals, means for connecting said common junction to one of said welding station elements and means for connecting said first and second output terminals to the other of said welding station elements, means for alternately passing current pulses through said primary windings to induce current flow through said second windings in pulses of opposite directions and first and second secondary unidirectional devices connected between each of said output terminals and said other element respectively whereby pulses of D.C. current are directed to said welding station filtered through said choke, the improvement comprising: a first auxiliary current boosting winding connecting to and in series with said first secondary winding and a first current control circuit means for connecting said first auxiliary winding to one of said welding station elements, said first current control circuit means including a first auxiliary unidirectional device poled the same as the said first secondary unidirectional device between said first output terminal and said other of said welding station elements and a current limiting element in series and a second auxiliary current boosting winding connected to and in series with said second secondary winding and a second current control circuit means for connecting said second auxiliary winding to said one of said welding station elements, said second current control circuit means including a second auxiliary unidirectional device poled the same as said second secondary unidirectional device between said second terminal and second terminal and said other of said welding station elements and current limiting element.

4,897,523

APPARATUS AND METHOD OF SHORT CIRCUITING ARC WELDING

John M. Parks, Solon, and Elliott K. Stava, Brecksville, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Continuation of Ser. No. 135,832, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 940,580, Dec. 11, 1986, Pat. No. 4,717,807. This application Feb. 10, 1989, Ser. No. 310,022

Int. Cl.[4] B23K *9/09*

U.S. Cl. 219—137 PS **34 Claims**



15. A method of short circuiting arc welding by a D.C. power supply for supplying welding current between a welding wire being fed at a controlled constant rate and the molten metal pool of workpiece toward which said wire is being fed, said method including a succession of short circuit conditions separated by arcing conditions, said method comprising the steps of:

(a) providing a background current through said wire and pool during both of said short circuit conditions and said arcing conditions, said background current having a high inductance component and a low level just above the level necessary for sustaining an arc when said wire and pool are separated;

(b) at the start of each of said arcing conditions, allowing said low background current to flow for a preselected time T_2 sufficient to allow said molten pool to be quelled;

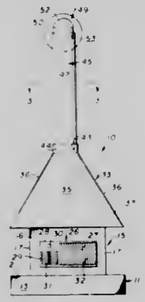
(c) after said pool is quelled, passing a high current pulse through said arc between said wire and said pool with a preselected I(t) area for melting a relatively constant volume of metal on the end of said wire and spaced from said pool;

(d) allowing said low background current to flow after said high current pulse for the remainder of said arcing condition; and,

(e) then feeding said wire with said volume of melted metal on its end into said molten metal pool to start the short circuit condition with an arc sustained by only said low background current.

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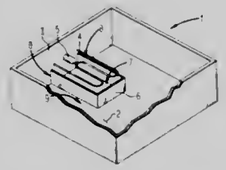
4,897,524
PORTABLE ELECTRIC FIREPLACE WITH SIMULATED CHIMNEY FLUE
James M. Brasell, 16707 Waycreek Dr., Houston, Tex. 77068
Filed Feb. 27, 1989, Ser. No. 315,481
Int. Cl.[4] H05B *1/00*; F24H *3/02*
U.S. Cl. 219—344 **20 Claims**



1. A portable electric fireplace of lightweight construction comprising;
a hollow hearth section having rear wall, side walls, and a front wall with an opening therethrough for receiving electric heater means,
a hollow canopy section removably mounted above said hearth section to overlie the upper end thereof and having a front wall extending beyond said hearth front wall, a rear wall substantially coplaner with said hearth rear wall, and an upper end adapted to removably receive an artificial chimney flue pipe,
an elongate artificial chimney flue pipe having a front wall, a rear wall, and top and bottom ends and adapted at its top and bottom ends to be removably secured on the surface of a wall,
an imitation pipe elbow removably received at one end in the top end of said chimney flue pipe and having a back plate at its other end substantially coplaner with said chimney flue pipe back wall to reside against the surface of the wall, whereby
the assembled hearth section and canopy section may be removably placed substantially close against the wall of a room and the lower portion of said chimney flue pipe received the within said canopy section extending upwardly therefrom and the assembly simulating the appearance of a real fireplace having a chimney flue pipe extending through the room wall.

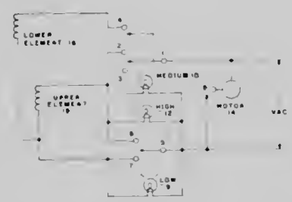
4,897,525
DEVICE FOR HEATING FOOD WITH STEAM
Paul Hirsch, Karl-Theodor-Strasse 91, 8000 München 40, Fed. Rep. of Germany
Filed Mar. 11, 1988, Ser. No. 166,567
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 8703814[U]; Nov. 2, 1987, 3737156
Int. Cl.[4] F22B *1/28*
U.S. Cl. 219—401 **15 Claims**

1. A device for heating food with steam, comprising:
a base having a bottom area and defining a water space which contains water;
a water container arranged in said base over only part of said bottom area of said base and being suitably dimensioned for receiving a small amount of water;
a depositing surface provided for food to be placed thereon and arranged in said base outside said water container;
heating means arranged in said water container for raising the temperature of said small amount of water to the boiling point; and
a partition arranged in said base for defining said water



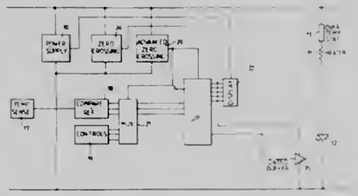
container in said water space, said partition being arranged at a small distance from a side wall of said base to define an aperture-like water passage connecting said water container with said water space.

4,897,526
KILN AUTOMATIC POWER LEVEL SWITCHING AND DISPLAY MECHANISM
Frank Anthony, 326 Atherton Dr., Metairie, La. 70005
Filed Dec. 17, 1987, Ser. No. 133,973
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—492 **24 Claims**



1. A kiln firing cycle controller for controlling the temperature of a kiln while firing ceramic ware comprising:
means for initiating said firing cycle;
drive motor means, energized by said means for initiating, for rotating a shaft,
first timing means coupled to said shaft for automatically setting said kiln at a low power level setting at a first predetermined time in said firing cycle;
second timing means coupled to said shaft for automatically setting said kiln at a medium power level setting at a second predetermined time in said firing cycle;
third timing means coupled to said shaft for automatically setting said kiln at a high power level setting at a third predetermined time in said firing cycle;
said first timing means including means for maintaining said low power setting for a period of time which substantially exceeds the time during which the medium power level or the high power level is maintained; and
operator override means for varying at least the time period during which said low power level is set.

4,897,527
PRESS FOR FABRICS
Alan H. Cripps, Hitchin, and Peter Williams, Biggleswade, both of United Kingdom, assignors to John Corby Limited, Hampshire, England
Continuation of Ser. No. 6,548, Mar. 9, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 324,991
Claims priority, application United Kingdom, May 9, 1985, 8511730
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—492 **8 Claims**



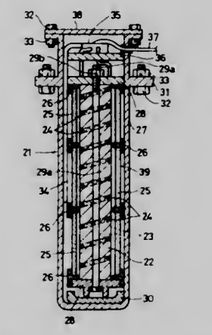
1. A fabric press comprising:
a press operable to perform a fabric pressing cycle with a heating element;
a temperature sensor; means for timing; and
a controller arranged to apply electrical power initially to the heating element for a predetermined boost period of said fabric pressing cycle during which the press temperature is limited to a boost temperature, and then, at the end of the predetermined boost period, to reduce the applied power and thereafter control the power in a further period of said fabric pressing cycle to maintain the press temperature at a substantially lower normal temperature until a pre-set time has elapsed.

4,897,528
KILN WITH CONTAMINANT AFTER-BURNER
Frank H. Anthony, 326 Atherton Dr., Metaire, La. 70005
Filed Mar. 21, 1988, Ser. No. 171,490
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **27 Claims**



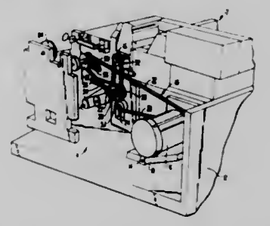
1. A kiln for firing ceramic wares, comprising:
means defining a kiln firing chamber for substantially enclosing ceramic wares to be fired, said chamber defining means including a gas venting channel through which emitted gas resultant from firing the wares is vented from said chamber defining means;
a contaminant eliminator system for said kiln including a housing in communication with said venting channel for receiving the emitted gas, a heating element means disposed within said housing and adjacent said gas venting channel to heat the gas resultant from firing the wares and emitted from said kiln chamber to a predetermined high temperature, said heating element means including:
a heating element;
means for detecting the temperature of said heating element and for generating a detected heating element temperature signal indicative of the heating element temperature; and
control means responsive to said detected heating element temperature signal for maintaining said heating element at substantially said predetermined high temperature; and
filter means for receiving gas which has been heated by said heating element means for removing contaminants therefrom.

4,897,529
BREWING TANK AND BREWING REGENERATIVE HEATER
Ko Haga, 105 Teppocho, Sendai-shi, Miyagi-ken, and Masanari Ioroi, Tokyo, both of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo and Ko Haga, Sendai, both of, Japan
Filed Feb. 9, 1988, Ser. No. 153,908
Int. Cl.[4] H05B *3/40*
U.S. Cl. 219—534 **4 Claims**



1. A brewing tank of the closed type comprising a housing wall, said wall being insulated, a regenerative heater inserted into the tank from outside of the tank through the wall of the tank, said regenerative heater comprising a regenerator having a regenerative bobbin, a heater wound on the outer periphery of the regenerative bobbin and a regenerative conduit on the other periphery of the regenerative bobbin.

4,897,530
METER BASE DRIVE ASSEMBLY
Richard J. Hendrickson, Danville, and Ward Paya, Pacheco, both of Calif., assignors to f.m.e Corporation, Hayward, Calif.
Filed Feb. 1, 1989, Ser. No. 305,149
Int. Cl.[4] G06C *5/02*; G06F *1/00*
U.S. Cl. 235—101 **17 Claims**

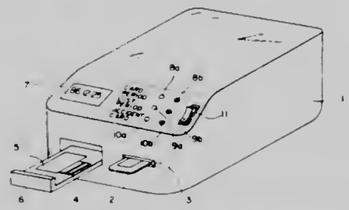


1. A meter base drive assembly for use with meter bases having a frame, an envelope drive and a print head drive both mounted to the frame, the assembly comprising:
a motor drive mounted to the frame;
a drive pulley driven by the motor drive in a first rotary direction;
a first driven pulley drivingly coupled to the envelope drive;

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a second driven pulley drivingly coupled to the print head drive;
a dual pulley, including first and second pulley elements, mounted to the frame;
a first drive belt engaging the drive pulley, the first pulley element of the dual pulley and a selected one of the first and second driven pulleys; and
a second drive belt engaging the second pulley element and the other of the first and second driven pulleys so the first drive belt drives the second drive belt through the dual pulley.

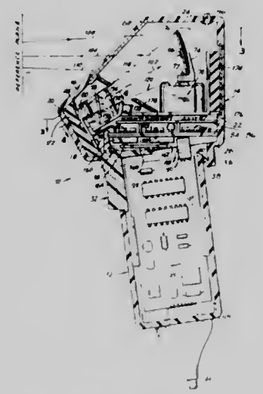
4,897,531
DATA IDENTIFYING SYSTEM
Hiromi Someya, Kawasaki, and Yasushi Kuramoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 26, 1988, Ser. No. 148,752
Claims priority, application Japan, Jan. 30, 1987, 62-19923
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—440 **19 Claims**



1. An apparatus for comparing identification information recorded on a card comprising:
first reading means for reading out the identification information recorded on said card;
a memory medium which is disengageably mounted in said apparatus and which has stored identification information indicative of an invalid card therein;
second reading means for reading out the identification information from said memory medium;
comparing means for comparing the identification information read out by said first reading means with the identification information read out by said second reading means; and
informing means for informing, on the basis of the comparison result, whether a card whose identification information is read out by said first reading means is valid or invalid.

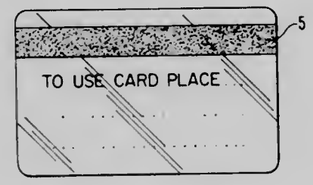
4,897,532
PORTABLE LASER DIODE SCANNING HEAD
Jerome Swartz, Setauket; Howard M. Shepard, Great River, both of N.Y.; Eric F. Barkan, San Francisco, Calif.; Mark J. Krichever; Boris Metlitsky, both of Hauppauge, N.Y., and Edward Barkan, South Setauket, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Division of Ser. No. 148,669, Jan. 26, 1988, Pat. No. 4,825,057, which is a division of Ser. No. 706,502, Feb. 28, 1985, abandoned, said Ser. No. 706,502, is a continuation of Ser. No. 196,021, May 19, 1988, Pat. No. 4,816,660. This application Jan. 9, 1989, Ser. No. 295,151
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—467 **26 Claims**

1. In a laser scanning system for reading symbols, a laser scanning head comprising:
(a) means including an actuatable laser light source mounted in the head and operative, when actuated, for generating an incident laser beam;
(b) optical means mounted in the head for optically directing said incident laser beam along a first optical path to a scanning mirror for reflection therefrom toward a reference plane located exteriorly of the head, and to a symbol located in a working distance range in the vicinity of the reference plane, thereby reflecting off the symbol reflected laser light, at least a returning portion of which travels along a second optical path away from the symbol back toward the head;
(c) scanning means mounted in the head for moving the scanning mirror and for sweeping said incident laser beam in a scan across the symbol, said returning portion of said reflected laser light having a variable intensity over the scan;



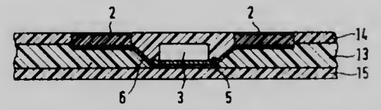
(d) sensor means mounted in the head for detecting the variable intensity of said returning portion of said reflected laser light over a field of view, and for generating an electrical analog signal indicative of the detected variable light intensity; and
(e) a reciprocally oscillatable, generally concave mirror mounted with the scanning mirror for joint movement therewith and operative, when moved by the scanning means, for collecting said returning portion of said reflected laser light over the field of view, and for directing said collected returning portion to the sensor means.

4,897,533
CREDIT CARD AND METHOD OF MAKING THE SAME
John L. Lyszczarz, Edison, N.J., assignor to National Business Systems, Inc., Ontario, Canada
Continuation-in-part of Ser. No. 70,714, Feb. 7, 1987, abandoned. This application Jul. 31, 1987, Ser. No. 79,921
Int. Cl.[4] G06K *19/00*
U.S. Cl. 235—487 **24 Claims**



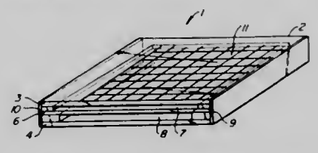
1. A credit card comprising a plastic substrate in the form of a card, a metal containing layer in the form of a metallic foil overlayed on at least substantially all of a first surface of said plastic substrate and having printed ink graphics thereon formed of an ultraviolet curable ink, and a transparent film located on said metallic foil.

4,897,534
DATA CARRIER HAVING AN INTEGRATED CIRCUIT AND A METHOD FOR PRODUCING THE SAME
Yahya Haghiri-Tehrani, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany
Filed Nov. 6, 1987, Ser. No. 117,541
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639630
Int. Cl.[4] G06K *19/02*
U.S. Cl. 235—488 **17 Claims**



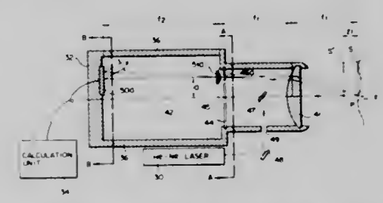
1. A data carrier having at least one IC module for processing electrical signals, the IC module being disposed on a substrate which is small compared to the area of the data carrier, communicating via leads with contact elements also provided on the substrate which allow for communication of the IC module with corresponding machines, and said IC module being disposed in a recess in a card layer, characterized in that the IC module (3) is covered on the side facing the interior of the card by a film strip (5) which is approximately as wide and at least as long as the IC module (3) and made of a material having higher deformability than the surrounding materials (13, 14, 15, 37) of the data carrier.

4,897,535
RANDOM NUMBER GAME RESULT CHECKING AID
Ross E. Gillies, 6 Flinders Street, Matraville, NSW, Australia (2036)
Filed Dec. 2, 1988, Ser. No. 278,646
Int. Cl.[4] G06K *21/06*
U.S. Cl. 235—495 **7 Claims**



1. A self aligning random number pattern visual checking aid for use with a game coupon said aid comprising:
a substantially planar base member and;
at least a first substantially planar member overlying the said planar base member but being spaced apart from said base member, to leave at least oue opening between said base member and said overlying member or members, means interconnecting said planar members at or near their ends so as to form sidewalls of said opening or openings which act as aligning guides for a coupon inserted within said opening or openings, said overlying planar member or members having means to enable provision of erassable markings on the outer surface of said overlying member or members, wherein,
when a marked coupon is to be checked, the coupon is manually fed mto one of said opening or openings between said planar members until a grid pattern on said coupon aligns with grid markings on said outer surface.

4,897,536
OPTICAL AXIS DISPLACEMENT SENSOR WITH CYLINDRICAL LENS MEANS
Takashi Miyoshi, Sapporo, Japan, assignor to Okada Inc., Shizuoka and Kokgakusha Engineering Co., Ltd., Sapporo, both of, Japan
Filed Feb. 10, 1988, Ser. No. 154,198
Claims priority, application Japan, Feb. 10, 1987, 62-27084
Int. Cl.[4] G01J *1/20*; **G01N** *21/86*
U.S. Cl. 250—201 **5 Claims**



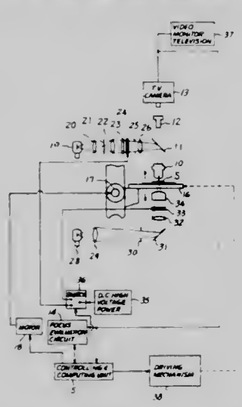
1. An apparatus for measuring a displacement of a target surface, comprising:
light source means for generating parallel light beams;
a convex lens for irradiating said parallel light beams from said light source means on the target surface;
a light shielding plate provided perpendicular to an optical axis of said convex lens and having a straight slit;
cylindrical lens means arranged so that a bus of said cylindrical lens means is parallel to the slit, for converging light beams which are reflected from said target surface and passed through said slit, the distance between said cylindrical lens means and said convex lens being a focal distance of said convex lens;
light receiving means having a plurality of sensors which are arrayed in a direction perpendicular to the bus, one of said sensors receiving light beams converged by said cylindrical lens means, the distance between said light receiving means and said cylindrical lens means being a focal distance of said cylindrical lens means; and
calculation means for detecting the distance between said one sensor receiving light beams and a predetermined sensor, and calculating the displacement of said target surface from a focal point of said convex lens, on the basis of said distance.

4,897,537
AUTOMATIC FOCUS ADJUSTING SYSTEM OF MICROSCOPE EMPLOYED IN SURFACE INSPECTION APPARATUS
Seiichi Miyamoto, Osaka; Yo Tajima, Ashiyashi; Masaru Maruki, Amagasaki, and Masaru Hasatani, Nishinomiyashi, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Hyogo, Japan
Filed Mar. 25, 1988, Ser. No. 173,416
Claims priority, application Japan, Mar. 30, 1987, 62-78484
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **2 Claims**

1. An automatic focus adjusting system of a microscope employed in inspecting a sheet surface having a sheet setting stage, a microscope for observing the surface of a sheet set on the sheet setting stage, and a television camera for picking up an image observed by the microscope comprising:
stage holding and stepping means for holding and vertically stepping said sheet setting stage to finely adjust the level of the sheet relative to the objective lens of the microscope;
back surface irradiation means for irradiating the back surface of an optically transparent sheet set on said sheet setting stage and for transmitting a light through the sheet to form an image, on the front surface to be observed,

having a contrast which varies depending on the inner physical structure of the sheet;

a focus evaluation circuit for calculating a focus evaluation degree represented by a contrast frequency of the image of the front surface according to a series of video signals generated along a pick-up scanning line of the image having a contrast picked up by the television camera through the microscope and held at a level relative to the objective lens, and comparing a focus evaluation degree currently obtained with that previously obtained when said sheet setting stage is at a level different from the current level by one step, and detecting whether or not



the focus evaluation degree currently obtained is greater than that obtained previously; and

a coatrolling and computing circuit for moving by one step said stage holding and stepping means in response to an output from said focus evaluation circuit indicating that a focus evaluation degree currently obtained is greater than that previously obtained, and for stopping the movement of said stage holding and stepping means in response to an output from said focus evaluation circuit indicating that the focus evaluation degree currently obtained is not greater than that previously obtained and thereby representing that the focal point of the microscope is matched with the area of the sheet surface to be inspected.

4,897,538

LIGHT PULSE DETECTING SYSTEM WITH HIGHLY REDUCED FALSE ALARM RATE, USABLE FOR LASER DETECTION

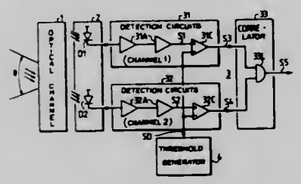
Jean M. Lemaire, Rueil Malmaison; Alain Belissant, Sevres, and Jean P. Fauchard, Les Ulis, all of France, assignors to Thomson CSF, Paris, France

Filed Jul. 21, 1988, Ser. No. 222,661

Claims priority, application France, Jul. 31, 1987, 87 10874

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—209 **14 Claims**



1. A system for detection of light pulses comprising:

optical means for receiving light pulse radiation in a defined total field, wherein said total field is one which is covered by at least one receiving optical channel and being formed, when there are several optical channels, by juxtaposed elementary fields;

photodetection means for the photodetecting said light pulse radiation received in the total field by the optical means, said photodetection means comprising, for each optical channel, at least two detecting elements each forming a respective detecting channel, means for determining signals above a given threshold as detected signals, and means for processing the detected signals to produce a subsequent selection, for each pair of detecting elements, only for signals which are present simultaneously on the two corresponding detecting channels.

4,897,539

PROCESS FOR PHOTOGRAMMETRIC DETERMINATION OF A STATIC OBJECT WITH THE USE OF AT LEAST ONE OPTOELECTRICAL SURFACE SENSOR

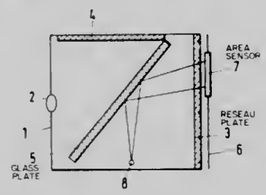
Wilfried Wester-Ebinghaus, Barsinghausen, Fed. Rep. of Germany, assignor to Rollei Fototechnic Verwaltungsgesellschaft mbH, Braunschweig, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,623

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712012

Int. Cl.⁴ G01C *11/04*

U.S. Cl. 250—216 **4 Claims**



1. A process for the photogrammetric acquisition of an image of a static object with a photogrammetric imaging system, wherein the photogrammetric imaging system includes at least one optoelectric solid-state area sensor having an image area smaller than that of the total image to be acquired, and a reseau having suitable point markings distributed in a grid fashion, wherein the area image sensor is arranged behind the reseau in such a way to be displaceable from reseau mesh to reseau mesh to thereby image the entire area of at least one reseau mesh and a portion of the image of the static object corresponding to the reseau mesh, said process including imaging the reseau onto the area sensor with a point illumination source and focusing the image of the static object onto the area sensor by displacing the area sensor in the direction of its optical axis.

4,897,540

APPARATUS FOR DETECTING THE PRESENCE OR ABSENCE OF OVERLAP AT TAPE JOINTS

Masaaki Sakaguchi, and Kazuo Kubota, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 27, 1988, Ser. No. 211,645

Claims priority, application Japan, Jul. 1, 1987, 62-164690

Int. Cl.⁴ G01N *9/04*

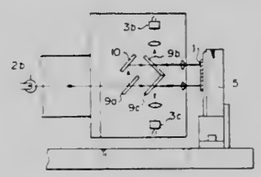
U.S. Cl. 250—223 R **5 Claims**

1. A joint inspection apparatus for determining whether or not first and second tapes are joined at respective edge portions without overlap, the apparatus comprising:

(i) a light irradiating means for irradiating light normal to the direction of the movement of a tape joint at which said respective edge portions are joined together,

(ii) a light receiving means for receiving the light irradiated by said light irradiating means to said tape joint and passing through said tape joint or reflected by said tape joint, and

(iii) a judgment means for judging the presence or absence of



an overlap of said respective tape edge portions one upon the other at said tape joint on the basis of information on the optical amount of the light received by said light receiving means in the vicinity of said tape joint, said judgment means including a discrimination circuit which compares the level of an amplified output signal generated by said light receiving means with a predetermined discrimination level indicative of the presence of overlap.

4,897,541

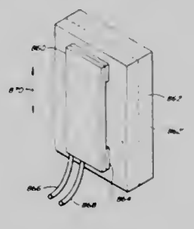
SENSORS FOR DETECTING ELECTROMAGNETIC PARAMETERS UTILIZING RESONATING ELEMENTS

Stephen R. Phillips, Walnut Creek, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 64,345, Jun. 19, 1987, abandoned, which is a division of Ser. No. 612,060, May 18, 1984, Pat. No. 4,678,905. This application Jun. 2, 1988, Ser. No. 201,599

Int. Cl.⁴ G01D *5/34*; G01L *9/00*

U.S. Cl. 250—227 **39 Claims**



1. A transducer apparatus for detecting a physical parameter comprising:

a body that changes dimension in response to the parameter;

a resonator adapted to vibrate mechanically at a resonance frequency, said resonator connected to said body so that when said body changes dimension, said body applies a force on said resonator or causes the resonator to change dimension, thereby modulating the resonance frequency of the resonator;

means for supplying light to the resonator to resonate the resonator; and

means for optically detecting modulations of the resonance frequency of the resonator caused by the force applied by the body to detect said parameter.

4,897,542

OPTICAL PRESSURE SENSOR

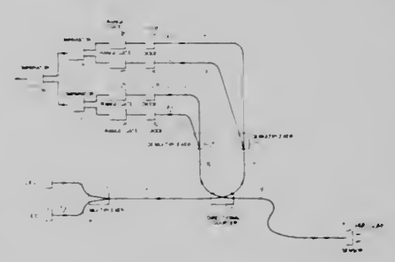
John P. Dakin, and Philip B. Withers, both of Hampshire, England, assignors to Plessey Overseas Limited, Ilford, United Kingdom

Filed Mar. 29, 1988, Ser. No. 174,734

Claims priority, application United Kingdom, Mar. 31, 1987, 8707616

Int. Cl.⁴ G01L *1/00*; H01J *5/16*

U.S. Cl. 250—227 **5 Claims**



1. An optical fibre sensor comprising a Fabry-Perot device including a pair of partial reflectors spaced apart by a distance which varies in dependence upon pressure applied to at least one of the reflectors, light source means for producing light at a plurality of wavelengths and optical fibre means for transmitting said light to said reflectors and for receiving light reflected back from said reflectors, in which the wavelength components of the transmitted light and wavelength components of the reflected light are received by range gates switched in accordance with the distance travelled by said wavelength components and are compared by comparator means to provide respective ratios of transmitted intensities and received intensities and in which said ratios are in turn compared by further comparator means to provide a ratio dependent upon the change in spacing between the reflectors but independent of any changes in the intensities of the transmitted light.

4,897,543

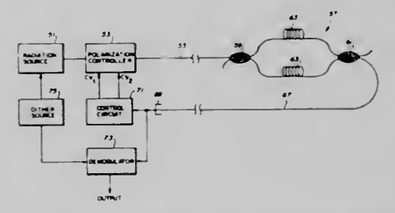
APPARATUS AND METHOD FOR MINIMIZING POLARIZATION-INDUCED SIGNAL FADING IN AN INTERFEROMETRIC FIBER-OPTIC SENSOR USING INPUT-POLARIZATION CONTROL

Alan D. Kersey, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 25, 1989, Ser. No. 301,301

Int. Cl.⁴ H01V *5/16*

U.S. Cl. 250—227 **17 Claims**



1. An apparatus for minimizing polarization-induced signal fading in an interferometric fiber-optic sensor, said apparatus comprising:

an optical source for providing an input light beam;

a polarization controller for changing the polarization state of said input light beam as a function of first and second control signals applied to said polarization controller;

means for conveying said input light beam with the changed polarization state to said interferometric fiber-optic sensor, said interferometric fiber-optic sensor being responsive to said input light beam with the changed polarization state for developing an interference pattern output;

photodetection means responsive to said interference pattern output for developing an electrical signal that has a peak-to-peak amplitude proportional to the visibility of said interference pattern output; and

control means responsive to said electrical signal for controllably developing said first and second control signals to change the polarization state of said input light beam so as to maximize the peak-to-peak amplitude of said electrical signal and thereby minimize the polarization-induced signal fading in said interferometric fiber-optic sensor.

4,897,544

SIGNAL PROCESSOR OF PULSE ENCODER

Katsuo Kobari, Tachikawa; Yoshitaka Takekoshi, Hachioji; Mitsuyuki Taniguchi, and Hirofumi Kikuchi, both of Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP87/00807, § 371 Date Jun. 16, 1988, § 102(e) Date Jun. 16, 1988, PCT Pub. No. WO88/03259, PCT Pub. Date May 5, 1988

PCT Filed Oct. 22, 1987, Ser. No. 219,542

Claims priority, application Japan, Oct. 23, 1986, 61-250757

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **3 Claims**



1. A signal processor of a pulse encoder for photoelectrically converting light ($h\nu$) made incident onto a light receiving element (1) into output signals (O_1, O_2) and supplying said photoelectrically converted output signals to a plurality of circuits to carry out predetermined processes, characterized in that said signal processor comprises:

an operation transistor (3) having a first input to which a first power source voltage (V_1) is applied through said light receiving element (1), a second input to which a second power source voltage (V_2) is applied and commonly connected to said first input, and a third input which is grounded;

a plurality of signal output resistors (*4a*, *4b*), one ends thereof being supplied with a third power source voltage (V_3); and

a plurality of signal output transistors (*5a*, *5b*) of a same number as that of said signal output resistors, having first inputs connected to the other ends of said signal output resistors (*4a*, *4b*), second inputs connected to said second input of said operation transistor (3), and third inputs which are grounded, to be operated in accordance with said operation transistor (3), said photoelectrically converted output signals (O_1, O_2) to be supplied in parallel to said plurality of circuits being separately supplied from respective connections between said signal output resistors (*4a*, *4b*) and said first inputs of said signal output transistors (*5a*, *5b*).

4,897,545

ELECTRON DETECTOR FOR USE IN A GASEOUS ENVIRONMENT

Gerasimos D. Danilatos, North Bondi, Australia, assignor to ElectroScan Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 52,700, May 21, 1987, Pat. No. 4,785,182, and a continuation-in-part of Ser. No. 158,208, Feb. 19, 1988, Pat. No. 4,823,006. This application Oct. 14, 1988, Ser. No. 257,754

Claims priority, application Australia, Oct. 16, 1987, PI4918

Int. Cl.[4] H01J *37/244*

U.S. Cl. 250—310 **50 Claims**



1. An improved environmental scanning electron microscope comprising:

(a) means for generating and directing an electron beam towards a specimen;

(b) means for detecting signals emanating from the surface of the specimen; said detecting means including a generally annular electrode assembly having an inner electron detector formed of a thin ring, an intermediate electron detector positioned radially outwardly of said inner electron detector and being formed of a first plurality of concentric arc segments, and an outer electron detector positioned radially outwardly of said intermediate electron detector and being formed of a second plurality of concentric arc segments, said first plurality of concentric arc segments being positioned generally normal to said second plurality of concentric arc segments to obtain a directional topography contrast, said inner, intermediate, and outer electron detectors being aligned along generally the same horizontal plane; and

(c) means for separately biasing said inner, intermediate and outer electron detector initially at the same electrical potential.

4,897,546

RADIATION IMAGE RECORDING, READ-OUT AND REPRODUCING APPARATUS

Toshitaka Agano, and Yoshihiko Okamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1988, Ser. No. 143,474

Claims priority, application Japan, Jan. 13, 1987, 62-5264; Oct. 20, 1987, 62-265013

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[4] G01N *23/04*; B65H *5/00*, *7/00*

U.S. Cl. 250—327.2 **5 Claims**

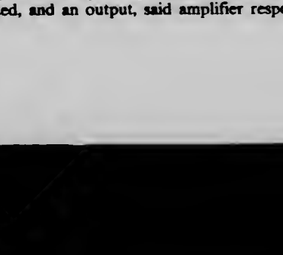
1. A radiation image recording, read-out and reproducing apparatus which comprises:

(i) a circulation and conveyance means for conveying at least one stimulable phosphor sheet along a predetermined circulation path,

(ii) a recording sheet feeding section for housing recording sheets and feeding out said housed recording sheets one by one,

(iii) an image recording section disposed on said circulation path for recording a radiation image on said stimulable phosphor sheet by exposing said stimulable phosphor sheet to a radiation carrying image information,

(iv) a light beam scanning section disposed on said circulation path and provided with a read-out main scanning means for deflecting a light beam by a light deflector and scanning said light beam in a main scanning direction on said stimulable phosphor sheet, a reproducing main scanning means for deflecting a light beam by a light deflector and scanning said light beam in the main scanning direction on said recording sheet, and a sub-scanning means for scanning said stimulable phosphor sheet and said recording sheet respectively in a sub-scanning direction by moving them in the sub-scanning direction approximately normal to said main scanning direction, wherein read-out of said radiation image is carried out by causing said stimulable phosphor sheet to emit light carrying said



radiation image by the light beam in said read-out main scanning means and detecting the emitted light by use of a light detection means, and reproduction of said radiation image on said recording sheet is carried out by modulating the light beam in said reproducing main scanning means in accordance with said radiation image thus read out, said read-out and said reproduction occurring at the same location along said circulation path.

(v) an erasing section disposed on said circulation path for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been carried out at said light beam scanning section, having said stimulable phosphor sheet release the radiation energy remaining on said stimulable phosphor sheet, and

(vi) a recording sheet conveyance means for receiving said recording sheet fed out of said recording sheet feeding section, conveying said recording sheet to said light beam scanning section, and thereafter conveying said recording sheet out of said light beam scanning section in a direction different from the direction of conveyance of said circulation and conveyance means.

4,897,547

GATE COUPLED INPUT CIRCUIT

Shigesato Iwasa, Harvard; Neal R. Butler, Acton, and Jeff L. McClelland, Somerville, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 26, 1986, Ser. No. 912,884

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[4] G01J *1/44*

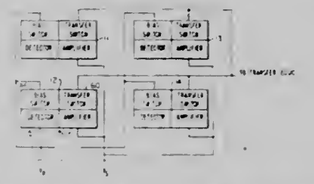
U.S. Cl. 250—338.1 **24 Claims**

5. A circuit for use in a thermal imaging system comprising:

an infrared detector for detecting an infrared signal impinging thereon,

an amplifier having an input to which said detector is connected, and an output, said amplifier responding to said detector detecting an infrared signal to provide an amplified electrical signal representing said infrared signal at its output, and

a bias bipolar transistor associated with and connected to the input of said amplifier, means for periodically operating



said bias transistor to apply a voltage to said amplifier and said detector connected to the input thereof to charge them to a predetermined bias level, and said bias transistor then being disabled to permit said detector to detect said infrared signal impinging on it.

4,897,548

APPARATUS FOR THE MULTIPLE ANALYSIS OF GASES

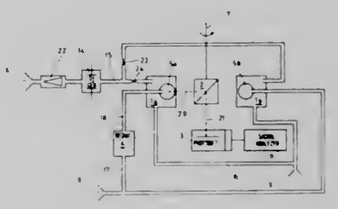
Peter Döme, Hombrechtikon; Heinz Wagner, and Alfred Meier, both of Zurich, all of Switzerland, assignors to Tecan AG Analytische Instrumente, Hombrechtikon, Switzerland

Filed Oct. 18, 1988, Ser. No. 259,524

Claims priority, application Switzerland, Oct. 19, 1987, 04090/87-2

Int. Cl.[4] G01N *21/27*, *21/76*

U.S. Cl. 250—343 **7 Claims**



1. An apparatus for the multiple analysis of gases which emit light when reacted with other gases, the apparatus comprising

a plurality of chemiluminescence reaction chambers (*1a*, *1b*) from each of which reaction chamber light is emitted when gases react therein;

a single photodetector (3);

an optical reflector (2) having a reflecting surface contained in a plane;

means for mounting said optical reflector for rotational motion about an axis which forms an acute angle with the plane containing said reflecting surface; and

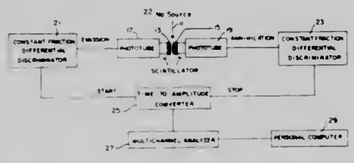
drive means for moving said reflector in rapid sequence between a plurality of positions such that said light

4,897,549

METHOD OF MEASURING PORE DIAMETERS BY POSITRONIUM DECAY

Tadeusz W. Zerda; Bruce Miller, and C. A. Quarles, all of TCU Physics Department, P.O. Box 32915, Fort Worth, Tex. 76129

Filed Dec. 19, 1988, Ser. No. 286,269
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—358.1 **4 Claims**



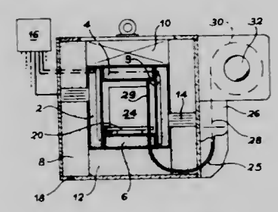
1. A method for measuring pore diameters in a specimen material, comprising the steps of:
providing a source of positron radiation;
directing positrons from said source into a selected zone of said specimen material;
sensing the timing of the application of the positrons to said selected zone;
sensing the annihilation of the positrons introduced into the selected zone of the specimen material;
measuring the time delay between the time of application of each positron to said selected zone and the annihilation thereof to obtain a decay rate characteristic of the specimen material, each time delay being measured over a substantial time scale, the time scale for determining each time delay being in the range from about 30 to 500 nsec.;
determining the pore diameters of the specimen material as a function of the decay rate; and
wherein the positrons directed from the source into the selected zone of the specimen material are directed to a depth of approximately 1 mm.

4,897,550

APPARATUS FOR THE CHARACTERIZATION OF FISSILE MATERIAL HAVING AT LEAST ONE NEUTRON RADIATION DETECTOR LOCATED IN A GAMMA RADIATION DETECTION SCINTILLATOR

Patrice Bernard, Venelles; Jacques R. Dherbey, Aix en Provence; Roland Bonner, Pierrevert, and Roger Berne, Aix en Provence, all of France, assignors to Commissariat a L'Energie Atomique, Paris, France

Filed Aug. 19, 1988, Ser. No. 234,177
Claims priority, application France, Aug. 21, 1987, 87 11805
Int. Cl.[4] G01T *3/00*; H01J *47/12*; G21G *1/06*
U.S. Cl. 250—390.01 **8 Claims**



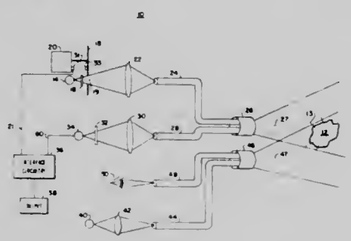
1. Apparatus for characterizing fissile material comprising an enclosure for receiving a quantity of fissile material contained in a receptacle, a neutron emitting source (**29**) for bombarding said fissile material, means (**28, 30**) for introducing said source (**29**) into the enclosure and for removing it from said enclosure, neutron radiation detection means (**9**), moderator means (**2, 4, 6**) for thermalizing a fission radiation emitted by said fissile material, means (**2, 4, 6**) being interposed between the neutron radiation detection means (**9**) and the fissile material, characterized in that it also has gamma radiation detection means (**6, 14**), which incorporate a scintillator (**6**) and at least one photomultiplier (**14**) associated with said scintillator (**6**), the scintillator material also constituting the moderator for thermalizing the fast neutrons directly emitted by source (**29**), as well as the neutrons resulting from spontaneous fissions of the α, n reactions and the neutrons resulting from fissions introduced in the fissle material, the neutron radiation detectors (**9**) being embedded in the scintillator material (**6**) constituting the moderator.

4,897,551

LEAK DETECTOR

Michael E. Gersh, Bedford; Steven M. Adler-Golden, Newtonville; Neil M. Goldstein, Medford, and Fritz Bien, Concord, all of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed Apr. 11, 1988, Ser. No. 179,847
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—461.1 **39 Claims**



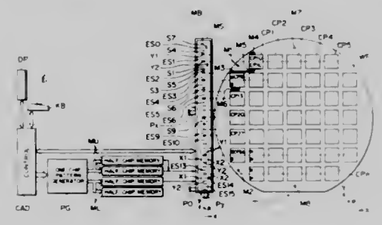
1. A leak detector for monitoring, in an area being investigated, the presence of a liquid having a characteristic fluorescence spectrum, comprising:
a radiation source;
means for providing the radiation from said source to said area being investigated;
means for collecting radiation, in the fluorescence emission band of said liquid being monitored, emitted from said area being investigated;
means, responsive to said means for collecting, for detecting a threshold level of said collected radiation to sense the presence of said liquid;
means, responsive to said means for collecting, for determining the size of the stain of said liquid relative to the size of the field of view of said means for collecting radiation;
means for determining the distance from said means for collecting radiation to said area being investigated; and
means, responsive to said means for determining the size of a stain relative to the field of view and responsive to said means for determining the distance, for resolving the actual size of said stain.

4,897,552

MULTI-ELECTRON-BEAM PATTERN DRAWING APPARATUS

Masahiko Okunuki, Tokyo; Isamu Shimoda, Zama; Mamoru Miyawaki, Tokyo; Takeo Tsukamoto, Atsugi; Akira Suzuki; Tetsuya Kaneko, both of Yokohama; Toshihiko Takeda, Tokyo, and Mitsuaki Seki, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,967
Claims priority, application Japan, Apr. 28, 1987, 62-103027; Apr. 28, 1987, 62-103028; Apr. 28, 1987, 62-103038
Int. Cl.[4] G21K *5/10*
U.S. Cl. 250—492.2 **8 Claims**



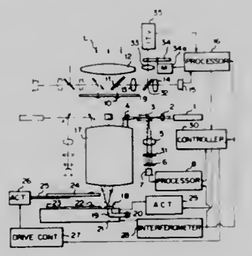
1. A charged-particle beam apparatus for forming patterns on a semiconductor wafer for use in the manufacture of microcircuit devices, said apparatus comprising:
beam source means comprising a plurality of charged-particle beam sources;
actuating means operable to selectively actuate said charged-particle beam sources; and
control means operable to control said actuating means so that separate zones of the semiconductor wafer are simultaneously irradiated with charged-particle beams from different charged-particle beam sources and so that different regions of each zone of the semiconductor wafer are irradiated with charged-particle beams from plural charged-particle beam sources, whereby plural patterns are formed substantially at the same time in the separate zones.

4,897,553

PROJECTION EXPOSURE APPARATUS

Kenji Nishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 164,946, Mar. 7, 1988, abandoned. This application May 17, 1989, Ser. No. 356,654
Claims priority, application Japan, Mar. 13, 1987, 62-58658
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—548 **23 Claims**



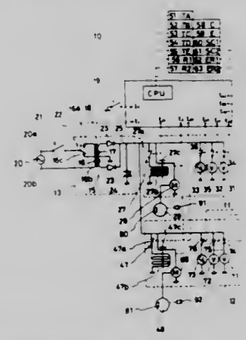
1. A projection exposure apparatus comprising:
a projection optical system disposed between a first plane and a second plane for forming an image of a pattern arranged in said first plane onto an exposure area in said second plane;
a movable stage adapted to support a substrate and provided with a fiducial mark at a predetermined position thereon;
detection mean for viewing a reference mark arranged in said first plane and for viewing said fiducial mark through said projection optical system to detect the position of said reference mark relative to said fiducial mark;
means for moving said stage between an exposure position at which said substrate is carried into said exposure area and a retracted position at which said substrate is carried outside of said exposure area;
said fiducial mark being arranged so that said fiducial mark may be viewed by said detection means through said projection optical system when said stage is at said retracted position;
means for interchanging said substrate on said stage with another substrate when said stage is at said retracted position; and
control means for controlling said detection means, said stage moving means and said interchanging means so that said detection means detects said relative position and said interchanging means interchanges said substrates when said stage is at said retracted position.

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ENGINE STARTING APPARATUS

Yuzuru Uehara, Chirya, and Jiro Hasano, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1988, Ser. No. 250,331
Claims priority, application Japan, Sep. 30, 1987, 62-148208[U]; Mar. 30, 1988, 63-074655
Int. Cl.[4] F02N *11/08*; H02J *1/00*
U.S. Cl. 290—38 R **10 Claims**



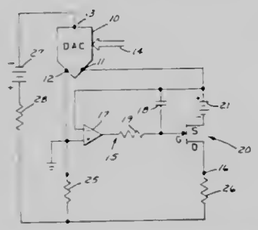
1. A starting apparatus comprising:
an engine for driving a device;
a starting motor operatively connected to said engine and operated at intervals for starting said engine; and
a rectifier supplying a high DC voltge to said starting motor during operation thereof and supplying a low DC voltage to one or more electric components in said device while said starting motor is not in operation.

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4,897,555
CURRENT SPLIT CIRCUIT HAVING A DIGITAL TO ANALOG CONVERTER

Eric L. Reed, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 23, 1988, Ser. No. 276,101
Int. Cl.[4] H02J 1/14; H03M 1/66
U.S. Cl. 307—32 **5 Claims**



1. A current split circuit connectable as a part of two circuit loops for providing a selectable ratio of current split between the two circuit loops, the circuit loops having a common power source and separate loads, the current split circuit including:

a multiplying digital to analog converter (DAC) for receiving a digital input which determines the ratio of the current split, said DAC having first, second and third terminals plus a digital input, the current at said first and second terminals being in accordance with the ratio of the current split provided said first and second terminals are at the same potential, the sum of the split currents being present at said third terminal of said DAC, said second terminal providing for connection of said DAC to one of the loads of the two circuit loops with said third terminal providing for connection of said DAC with the common power source; and

a controller circuit portion for establishing said first and second terminals of said DAC at the same potential having

(1) an operational amplifier with two input terminals and an output terminal, one of said input terminals operatively connected to said first terminal of said DAC and the other of said two input terminals connected to said second terminal of said DAC; and

(2) a negative feedback semiconductor linear circuit (NFSLC) operatively connected between said output terminal of said operational amplifier and said first terminal of said DAC, said NFSLC having a terminal conducting the current at said first terminal of said DAC, said terminal of said NFSLC providing for connection of the current split circuit to the other load of the two circuit loops.

4,897,556
HIGH VOLTAGE PULSE CONDITIONING

Ray M. Springfield, Sante Fe, and Robert M. Wheat, Jr., Los Alamos, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

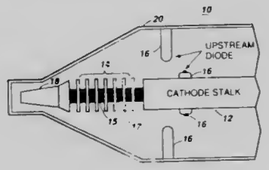
Filed Feb. 21, 1989, Ser. No. 313,201
Int. Cl.[4] H03K 3/537
U.S. Cl. 307—106 **8 Claims**

1. A particle accelerator capable of producing in a vacuum a pulse having a very fast rise time between a cathode and an anode comprising:

means for generating a high-voltage pulse;

a transmission line connected to said generating means for conducting said pulses, said transmission line having inherent capacitance and inductance capable of storing energy magnetically and electrostatically;

a plurality of diode means located radially about said transmission line between said cathode and said anode for diverting energy from said transmission line into said capacitance and inductance of said transmission line;

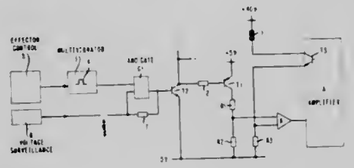


one or more series connected flashover switch means interposed in said cathode for delaying conductance of said pulse for a determinable period of time before closure of said one or more flashover switch means;

4,897,557
ELECTRONIC CONTROL SYSTEM, IN PARTICULAR FOR A PRINTER

Jürgen Krause, Niedereschach, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/DE87/00274, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO87/07987, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 12, 1987, Ser. No. 163,764
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620535
Int. Cl.[4] H02H 3/87; H03K 17/08
U.S. Cl. 307—134 **18 Claims**



1. An electronic control system comprising

an effector;

a power element connected in series to the effector and where the power element and the effector are dimensioned and connected for performing a pulse operation; a safety circuit for electronic device components endangered against excessive currents or excessive voltage including

a first resistor;

a second resistor connected in series to the first resistor;

a voltage source connected to the first resistor and to the second resistor furnishing a reference voltage which can be controlled during operation;

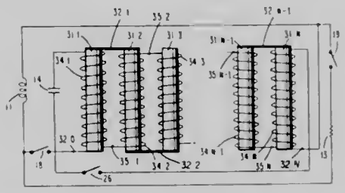
a comparator having a first input fed with the reference voltage and having a second input fed with a voltage related to a power passing through the effector;

switching means for switching the effector on where the power passing through the effector is within a permissible tolerance region and for switching the effector off where the power passing through the effector exceeds a limiting reference level of the reference voltage.

4,897,558
SUPERCONDUCTING DEVICE, APPARATUS AND METHOD FOR SELECTIVELY SUPPLYING CURRENT TO A LOAD

Derek A. Tidman, Silver Spring, Md., assignor to GT-Devices, Alexandria, Va.

Filed Dec. 1, 1987, Ser. No. 127,927
Int. Cl.[4] H03K 17/92
U.S. Cl. 307—245 **36 Claims**

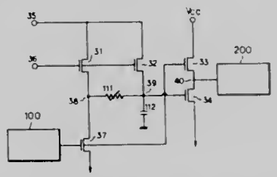


1. Apparatus for selectively supplying current to a load comprising an energy storing inductor, a superconducting device connected in shunt with the inductor, the superconducting device when in a normal state having an impedance much greater than that of the load and when in a superconducting state having an impedance much less than that of the load so that a circulating current from the inductor flows through the device while it is in a superconducting state, the device being switchable between the superconducting and normal states in response to a magnetic field applied to a superconducting structure of the device being above and below predetermined values thereof, means for connecting the load to the inductor so that when the device is in the normal state circulating current in the inductor is switched to flow from the device through the load, and means for selectively applying a magnetic field to the structure so the magnetic field applied to the structure is selectively above and below the predetermined value and thereby switch the device between the superconducting and normal states.

4,897,559
VARIABLE CLOCK DELAY CIRCUIT UTILIZING THE R-C TIME CONSTANT

Choi Yun-Ho, Inchon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 17, 1988, Ser. No. 169,491
Claims priority, application Rep. of Korea, Mar. 18, 1987, 1987-2458
Int. Cl.[4] H03K 5/13, 17/28, 19/096
U.S. Cl. 307—269 **22 Claims**



1. A circuit for delaying a clock signal between a first clock generator and a second clock generator, comprising:

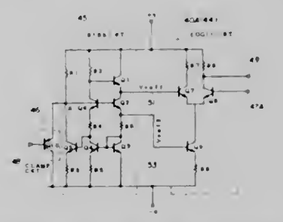
first means including a charging impedance stage, for controlling delay of a precharge clock signal to said charging impedance stage during a precharging period due to change in amplitude of a voltage; and

second means for gating a first clock signal output by a first clock generator to a second clock generator in reference to discharging of said charging impedance stage, thereby providing an output clock signal whereby change in delay of application of said first clock signal to said second clock generator due to change in amplitude of the voltage source is minimized.

4,897,560
SEMICONDUCTOR INTEGRATED CIRCUIT WITH REDUCED POWER CONSUMPTION

Shinji Saito, Kasugai; Kazuyuki Nonaka, Seto; Hideji Sumi, and Takehiro Akiyama, both of Kasugai, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed May 5, 1988, Ser. No. 190,745
Claims priority, application Japan, May 9, 1987, 62-112842
Int. Cl.[4] H03K 17/16, 19/086
U.S. Cl. 307—296.3 **10 Claims**



1. A semiconductor integrated circuit, comprising:

a first power source for supplying a first power source voltage;

a second power source for supplying a second power source voltage lower than the first power source voltage;

a logic circuit coupled between said first and second power sources, said logic circuit including at least first and second transistors constituting an emitter coupled transistor pair and having collectors coupled to said first power source, a third transistor used as a constant current source for supplying a current to said first and second transistors, an input terminal operatively coupled to a base of said first transistor for receiving an input signal to said semiconductor integrated circuit and an output terminal operatively coupled to a collector of said first transistor for outputting an output signal of said semiconductor integrated circuit;

a bias circuit coupled between said first and second power sources, said bias circuit including a fourth transistor having an emitter from which a first predetermined voltage is supplied to a base of said third transistor and impedance means having one end coupled to said first power source and another end coupled to a base of said fourth transistor to supply a second predetermined voltage thereto; and

a clamping circuit coupled between the base of said fourth transistor and said second power source and turned ON and OFF responsive to a control signal applied thereto,

said clamping circuit in an ON state turning OFF said fourth and third transistors,

said clamping circuit in an OFF state applying said second predetermined voltage to the base of said fourth transistor to turn ON said fourth transistor and applying said first predetermined voltage to the base of said third transistor to turn ON said third transistor.

VOL 1110 ISS 5 JA 30 1990 UMI

4,897,561

APPARATUS FOR AND METHOD OF DISCRIMINATING SIGNALS

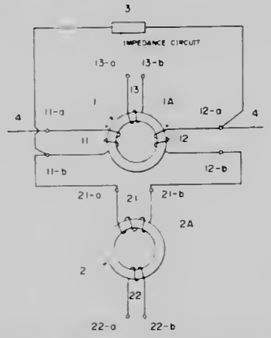
Akira Saigo, Chiba; Shigenari Maezawa, Kashiwa; Tomoaki Kageyama, Yamaguchi; Keizaburo Ishikura, Yamaguchi; Akio Sera, Yamaguchi, and Junji Suehiro, Otake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,579

Claims priority, application Japan, Aug. 7, 1987, 62-197811; Feb. 12, 1988, 63-30490; Feb. 29, 1988, 63-47212

Int. Cl.[4] H03K *17/82*

U.S. Cl. 307—413 **5 Claims**



1. A signal discriminator composed of a first winding with short-circuited ends and a second winding for detecting signals, said first and second windings and being wound on an annular core having an approximately linear BH characteristic with magnetomotive force and magnetic flux density roughly proportional to each other.

4,897,562

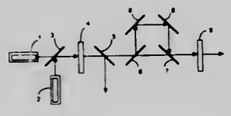
PROCESS AND APPARATUS FOR EFFICIENT SUM AND DIFFERENCE FREQUENCY GENERATION

J. S. Krasinski, Blairstown; Band, Y. B., Elizabeth, and D. F. Heller, Boundbrook, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 1, 1989, Ser. No. 345,870

Int. Cl.[4] H03F *7/00*

U.S. Cl. 307—427 **8 Claims**



6. Apparatus for sum and difference light beam generation by non-linear optical parametric mixing of laser beams of different central frequencies ω_1 and ω_2, at least one of said beams having two or more longitudinal modes, comprising, in combination:

(a) a first non-linear mixing medium to receive said laser beams of different central frequency and to convert portions of said beams into light of new frequency $\omega_1+\omega_2$ or $\omega_1-\omega_2$, to thereby generate a mixed light beam comprising light of central frequencies ω_1, ω_2 and $\omega_1+\omega_2$ or $\omega_1-\omega_2$;

(b) means for separating said mixed light beam exiting from said first mixing medium into its spectral components ω_1, ω_2 and $\omega_1+\omega_2$ or $\omega_1-\omega_2$;

(c) delay means for shifting the relative intensity modulation wave form of said separated ω_1 and ω_2 beams with respect to each other to temporally correlate the modulation peaks of said beams; and

(d) a second non-linear mixing medium to receive said ω_1 and ω_2 beams having temporally correlated modulation peaks, to convert them into light of central frequency $\omega_1+\omega_2$ or $\omega_1-\omega_2$.

4,897,563

N-WAY MMIC REDUNDANT SWITCH

Inder J. Bahl, Roanoke, Va., assignor to ITT Corporation, New York, N.Y.

Filed Aug. 1, 1988, Ser. No. 226,640

Int. Cl.[4] H03K *19/003, 19/007*

U.S. Cl. 307—441 **3 Claims**



1. A redundant switch comprising a plurality of FETs, each FET including a source, a gate and a drain, said switch comprising:

first, second and third sections, each section having first, second, third and fourth FETs having gates connected to a central node of said section, said first and second FETs of each section having drains connected to the sources of said third and fourth FETs respectively of said section, said first and second FETs of each section having their sources connected to a first node of said section and said third and fourth FETs of each section having their drains connected to a second node of said section;

said first section having a first input terminal connected to said first node for receiving a first input signal and having a second input terminal connected to said central node for receiving a second input signal;

said second section having a third input terminal connected to said central node and having its first node connected to said second node of said first section, and having its second node connected to ground;

said third section having a fourth input terminal connected to said central node and having its first node connected to said first node of said second section and to an output terminal, and having its second node connected to ground.

4,897,564

BICMOS DRIVER CIRCUIT FOR HIGH DENSITY CMOS LOGIC CIRCUITS

Chih-Liang Chen, Briarcliff Manor, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,596

Int. Cl.[4] H03K *19/003, 19/092, 19/401, 19/094*

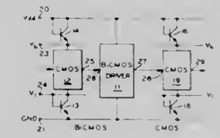
U.S. Cl. 307—446 **9 Claims**

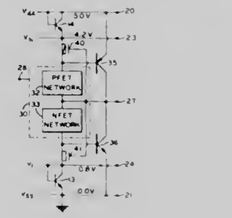
1. A BICMOS device for supplying bipolar logic signals to high density low threshold CMOS logic devices comprising:

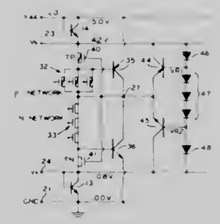
a complementary pair of bipolar transistors having collector circuits serially connected together to form an output node, and emitter circuits connected to respective terminals of a source of DC potential;

first and second voltage regulators connected to first and second terminals, respectively, of said source of DC potential;

first and second FET transistors connecting remaining respective ends of said first and second voltage regulators to a base connection of one of said bipolar transistors and each having gate connections connected to said collector circuit;







a PFET logic network connecting a base of one of said bipolar transistors to said connected collector circuits; and,

an NFET logic network connecting a base of a remaining of said transistors to said connected collector circuits;

said logic networks controlling said complementary transistors such that one or the other is conducting depending on the state of said logic networks, whereby said connected collector circuits provide a voltage swing equal to the difference between the voltage provided by remaining ends of said voltage regulators.

4,897,565

LOGIC CIRCUIT USING SCHOTTKY BARRIER FETS

Shoichi Shimizu, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1988, Ser. No. 249,989

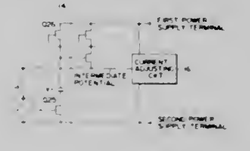
Claims priority, application Japan, Sep. 29, 1987, 62-244588; May 13, 1988, 63-116422

Int. Cl.[4] H03K *19/094, 19/003, 17/16, 17/687*

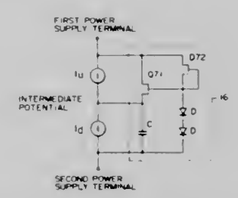
U.S. Cl. 307—448 **12 Claims**

1. A logic circuit using Schottky barrier FETs comprising:

a plurality of DCFL circuits connected in series between first and second power supply terminals, said each DCFL circuits containing a switching element and a load element, said elements consisting of Schottky barrier FETs and connected in a direct fashion; and







a potential stabilizing means for stabilizing a potential at the junction point between said adjacent DCFL circuits, by supplementally feeding the differential current between the current consumed by said adjacent DCFL circuits.

4,897,566

BIPOLAR TRANSISTOR LOGIC CIRCUIT

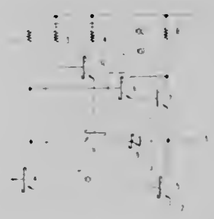
Takatsugu Kitora, and Youichirou Taki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1987, Ser. No. 115,725

Claims priority, application Japan, Oct. 31, 1986, 61-261210

Int. Cl.[4] H03K *19/20, 3/33, 3/01, 17/16*

U.S. Cl. 307—456 **1 Claim**



1. A bipolar transistor logic circuit comprising:

an input node;

an output node;

a first potential node connected to a first potential;

a second potential node connected to a second potential, different from said first potential;

first transistor circuitry connected to said input node and to said first potential node, wherein said first transistor circuitry comprises a first transistor having its base con-

nected to said input node and a first terminal connected to said first potential node;

second transistor circuitry provided between said output node and said first potential node, and further connected to said first transistor circuitry, wherein said second transistor circuitry comprises Darlington-connected transistors, a base of one of said Darlington-connected transistors being connected to said first terminal of said first transistor, first terminals of said Darlington-connected transistors being connected to said first potential node, and a second terminal of the other of said Darlington-connected transistors being connected to said output node;

third transistor circuitry connected between said output node and said second potential node, and further connected to said first transistor circuitry, wherein said third transistor circuitry comprises a second transistor having its base connected to a second terminal of said first transistor, a first terminal of said second transistor being connected to said output node, and a second terminal of said second transistor being connected to said second potential node; and

accelerated discharge means for discharging charge, stored in a charge storage device that is connected to said output node, to said third transistor circuitry through said first transistor circuitry, said charge being discharged at a time that is delayed with respect to a timing of a change in said first transistor circuitry from a non-conductive state to a conductive state, wherein said accelerated discharge means comprises:

switching means connected between said output node and said first terminal of said first transistor, wherein said switching means comprises a third transistor and a diode, a first terminal of said third transistor being connected to a cathode of said diode, an anode of said diode being connected to said output node, a second terminal of said third transistor being connected to said first terminal of said first transistor; and

switching delay means, responsive to a change in said first transistor from a non-conductive state to a conductive state, for delaying a corresponding change in conductivity of said switching means from a non-conductive state to a conductive state with respect to a timing of corresponding change in conductivity of said first transistor, wherein said switching delay means comprises:

a fourth transistor having a base and first and second terminals, the second terminal of said fourth transistor being connected to a base of said third transistor; and

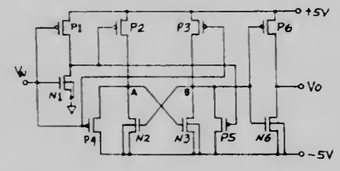
first and second load elements each having one end connected to said first potential node, the other end of said second load element being connected to the first terminal of said fourth transistor.

4,897,567

FAST LEVEL TRANSLATOR CIRCUIT

Kantilal Bacrania, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 13, 1988, Ser. No. 257,015
Int. Cl.[4] H03K *19/092, 19/017, 3/26*
U.S. Cl. 307—475 **6 Claims**



1. A level translator comprising:

an input inverter means for receiving input signals between a first and second value at its input and providing inverted input signals between a third and fourth value at its output;

first and second field effect transistors having their source-drain path connected between a first voltage terminal and a respective first and second node and their gates connected to said second and first nodes respectively;

third and fourth field effect transistors having their source-drain path connected between a second voltage terminal and a respective first and second node and their gates connected to the output and input of said input inverter means respectively;

fifth and sixth field effect transistors having their source-drain path connected between a third voltage terminal and a respective first and second node and their gates connected one to said input inverter means' input and one to said input inverter means' output so that said third and sixth transistors are on together and said fourth and fifth transistors are on together; and

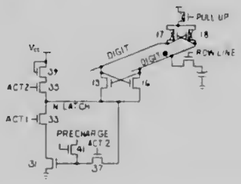
output means having an input connected to said second node for providing output signals between a third and fourth value at its output.

4,897,568

ACTIVE UP-PUMP FOR SEMICONDUCTOR SENSE LINES

Wen-Foo Chern; Ward D. Parkinson; Zhitong Chen; Gary M. Johnson; Tyler A. Lowrey, and Thomas M. Trent, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 30, 1988, Ser. No. 252,499
Int. Cl.[4] H03K *19/017;* **G11C** *7/02*
U.S. Cl. 307—530 **19 Claims**



1. Semiconductor memory device having an array of circuit elements and a voltage sensing circuit comprising:

(a) at least one pair of sense lines;

(b) switches to selectively connect the elements in the array to at least one of the sense lines;

(c) a low voltage latch node;

(d) a pair of transistors connected between the low voltage latch node and the pair of sense lines, the pair of transistors being cross-connected so that the gate of each transistor is connected to a terminal, other than the gate, of the transistor;

(e) a first pull down transistor connected to the low voltage latch node and conducting current from the low voltage latch node to a low potential source in response to a first active signal;

(f) a voltage control transistor providing a voltage control signal;

(g) a second pull down transistor connected between the first pull down transistor and the low potential source and gated off in response to the voltage control signal from the voltage control transistor;

(h) the voltage control transistor being responsive to a second active signal to conduct current from the low voltage latch node to a gate of the second pull down transistor in order to provide the voltage control signal to the second pull down transistor;

(i) a precharge circuit to gate the second pulldown transistor ON prior to the voltage control transistor responding to the second active signal;

(j) a high potential source;

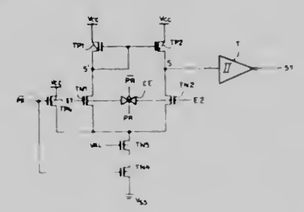
(k) a threshold current supply transistor for providing sufficient current from the high potential source to float the low voltage latch node to a predetermined level above the low voltage potential, wherein the threshold voltage supply transistor is gated on in response to a second active signal.

4,897,569

CMOS AMPLIFIER FOR MEMORIES

Philippe Calzi, Bouc Bel Air, France, assignor to SGS-Thomson Microelectronics S.A., Paris, France

Filed Feb. 22, 1988, Ser. No. 158,710
Claims priority, application France, Feb. 24, 1987, 87 02371
Int. Cl.[4] H03K *17/16*
U.S. Cl. 307—530 **6 Claims**



1. A read amplifier for a memory using CMOS technology, said amplifier comprising a differential amplifier having two inputs and two differential branches connected in parallel between a current source and a supply voltage, said amplifier further comprising an output for providing a voltage corresponding to one of a first and second logic level, and a balancing circuit controlled by a precharge signal, said balancing circuit comprising means for short-circuiting the two inputs of the differential amplifier during a balancing phase, wherein there is further provided means controlled by said precharge signal for establishing on the output of said differential amplifier during said balancing phase either a voltage substantially corresponding to a high logic level if the voltage on said output prior to the balancing phase was at a high logic level, or a voltage substantially corresponding to a low logic level if the voltage on said output prior to said balancing phase was at a low logic level.

4,897,570

STARTER MOTOR FOR AUTOMITOVE ENGINE

Yuzo Ishikawa; Masahiko Tahara, both of Yokosuka, and Yuji Hirabayashi, Zushi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 11, 1988, Ser. No. 154,693
Claims priority, application Japan, Feb. 12, 1987, 62-28357
Int. Cl.[4] H02K *1/18, 21/28*
U.S. Cl. 310—154 **2 Claims**

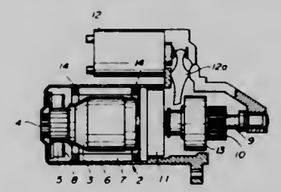
2. A starter motor for an automotive vehicle comprising:

an essentially stationary cylindrical housing;

a plurality of stationary, elongate permanent magnets disposed about the inner periphery of said stationary housing in such a manner that said magnets extend essentially parallel to the axis of said housing, said magnets having first and second ends;

a first annular, nonmagnetic, heat-absorbing member disposed within said housing and in contact with the first ends of said magnets;

a second annular, nonmagnetic, heat-absorbing member disposed within said housing and in contact with the second ends of said magnets, said second member being discrete from said first member; and



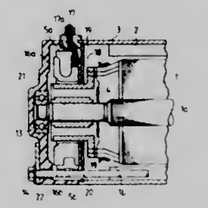
stationary fin means for increasing the amount of heat exchange with the ambient atmosphere, said fin means being formed on said first and second members.

4,897,571

STARTING ELECTRIC MOTOR

Shuzoo Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,431
Claims priority, application Japan, Aug. 31, 1987, 62-133387; Aug. 31, 1987, 62-133388; Oct. 6, 1987, 62-153897
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—239 **11 Claims**



1. A starting electric motor, comprising:

armature means;

armature rotary shaft means on which said armature means is mounted;

commutator means mounted on the rear end portion of said armature rotary shaft means;

brush means slidably held on said commutator means;

brush holder means for holding said brush means;

front bracket means;

rear bracket means made of resin for rotatably supporting said armature rotary shaft means in association with said front bracket means;

yoke means including magnetic field means, which is fixedly held between said rear bracket means and said front bracket means;

conducting base means made of electrically conductive material held between said yoke means and said rear bracket means, said brush holder means being mounted on said conducting means,

through-bolt means having a seat for integrally tightening said conducting base means and said yoke means through said rear bracket means and said front bracket means; and

metal plate means provided between said seat of said through-bolt means and the outer surface of said rear bracket means, said metal plate means having major surface areas which are substantially larger in size than said seat of said through-bolt means such that axial tensions of said through-bolt means are dispersed and are not allowed to act locally on said rear bracket means.

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4,897,572

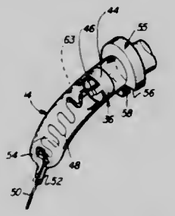
LIGHT TUBE WITH SLIDABLE ELECTRODES

Fred A. Plofchan, 11006 W. Jefferson, River Rouge, Mich. 48218

Division of Ser. No. 170,587, Mar. 21, 1988, Pat. No. 4,843,521. This application Jan. 19, 1989, Ser. No. 298,743

Int. Cl.[4] H01J *61/06*

U.S. Cl. 313—146 **2 Claims**



1. In a light source having a tube filled with an ionizable medium, the improvement comprising:

electrode means slidably supported interiorly of said tube for varying the pattern of ionization of the ionizable medium; said tube having inner and outer surfaces;

positioning means on said outer surface of said tube for locating said electrode means interiorly of said tube;

said electrode means including first and second spaced electrodes having friction springs thereon engageable with said inner surface of said tube for holding said first and second electrodes in an adjusted position; and

said positioning means including magnet means slidably supported on the outer surface of said tube.

4,897,573

ELECTRIC INCANDESCENT LAMP HAVING DISCHARGE ARC CONDUCTOR AND DISCHARGE ARC INTERRUPTION FUSE

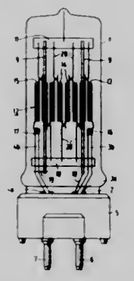
Leo F. M. Ooms, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 746,214, Jun. 18, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 107,873

Claims priority, application Netherlands, Jul. 3, 1984, 8402107

Int. Cl.[4] H01J *1/88*

U.S. Cl. 313—273 **5 Claims**



1. An electric incandescent lamp. comprising:

(a) a lamp envelope;

(b) current-supply conductors which enter said lamp envelope;

(c) a filament within said lamp envelope, each end of the filament being electrically connected to a respective current supply conductor to permit lamp operating current to flow through said filament;

(d) an arc discharge interruption fuse; and

(e) an arc discharge conductor within said lamp envelope having one end electrically connected in series with said arc discharge interruption fuse to a current supply conductor, said arc discharge conductor being spaced and electrically isolated from said filament whereby lamp operating current does not flow in said arc discharge conductor and does not flow in said arc discharge interruption fuse during normal lamp operation, said arc discharge conductor having a portion proximate said filament for facilitating arc transfer from said filament to said arc discharge conductor upon occurrence of a destructive arc between portions of said filament, such that the arc jumps to said arc discharge conductor and an arc current then flows through said arc discharge interruption fuse which opens in response to the arc current thereby interrupting the arc current and extinguishing the arc.

4,897,574

HOT CATHODE IN WIRE FORM

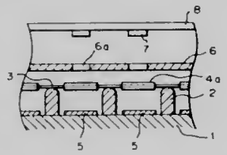
Masato Saito; Keiji Fukuyama; Masako Ishida; Keiji Watanabe, all of Kanagawa; Toyokazu Kamata, Kyoto; Kinjiro Sano, Kyoto, and Hisao Nakanishi, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 105,668

Claims priority, application Japan, Oct. 7, 1986, 61-239561; May 18, 1987, 62-122052; May 18, 1987, 62-122053

Int. Cl.[4] H01J *1/14*

U.S. Cl. 313—346 R **11 Claims**



1. A hot cathode in a wire form that holds an electron-emitting material on the surface of a heat-resistant metal in a wire form that contains at least one of tungsten, molybdenum and tantalum as a major component, said electron-emitting material being a mixture containing 0.2–20 wt. % of a rare earth metal oxide and an alkaline earth metal oxide containing barium oxide and calcium oxide, the weight ratio of calcium oxide to the rare earth metal oxide being in the range of 0.02–0.7.

4,897,575

ELECTRON GUN STRUCTURE FOR A COLOR PICTURE TUBE APPARATUS

Taketoshi Shimoma, Gunma; Shinpei Koshigoe, and Takahiro Hasegawa, both of Saitama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1988, Ser. No. 223,332

Claims priority, application Japan, Aug. 5, 1987, 62-194448

Int. Cl.[4] H01J *29/46, 29/56*

U.S. Cl. 315—15 **10 Claims**

1. A color picture tube apparatus responsive to a plurality of voltages including a focusing voltage, an accelerating voltage higher than the focusing voltage and at least one intermediate voltage between the focusing and accelerating voltage comprising:

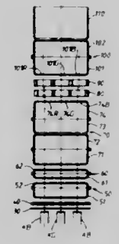
an envelope including a funnel having a front and rear sides, a face plate on the front side of the funnel having an inner surface, and a neck on the rear side of the funnel;

a phosphor screen on the inner surface of the face plate including a plurality of phosphor stripes extending in a vertical direction and arranged in a horizontal direction;

a shadow mask with a plurality of apertures therein disposed near the phosphor screen;

an electron gun structure in the neck for generating three electron beams arranged in the direction parallel to the horizontal direction including cathode means for emitting the electron beams,

a focusing electrode responsive to the focusing voltage including a first means for establishing common equipotential lines horizontally transversing a passing area of the electron beams so as to generate an asymmetric converging electric field near the focusing electrode which has a relative strong converging action one direction parallel to the vertical direction compared with the converging action in another direction perpendicular to the one direction,



an accelerating electrode responsive to the accelerating voltage including second means for establishing common equipotential lines horizontally transversing the passing area of the electron beams so as to generate an asymmetric diverging electric field near the accelerating electrode which has relative strong diverging action in the one direction compared with the diverging action in the other direction,

and at least one intermediate electrode between the focusing electrode and the accelerating electrode responsive to the intermediate voltage including three holes where the electron beams pass through for separating the converging electric field from the diverging electric field;

resistor means inside the envelope for supplying the intermediate voltage to the electron gun structure; and,

deflection means for generating a non-uniform deflection magnetic field to deflect the electron beams onto the screen.

4,897,576

METAL VAPOR DISCHARGE LAMP HAVING STARTER THEREIN

Takenobu Iida, Urawa; Jojiro Shiina, Gyoda, and Minoru Yasukawa, Kohnosu, all of Japan, assignors to Iwasaki Electric Co., Ltd., Tokyo, Japan

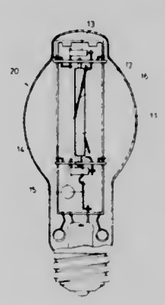
Filed Aug. 18, 1988, Ser. No. 233,622

Claims priority, application Japan, Aug. 31, 1987, 62-215352

Int. Cl.[4] H05B *41/14;* H01J *7/44, 17/34*

U.S. Cl. 315—73 **14 Claims**

1. A metal vapor discharge lamp which is constituted in such a manner that a starter which is in parallel connected to a luminous tube is accommodated in a light transmissible vacuum outer bulb thereof, said metal vapor discharge lamp being characterized in that: said starter comprising a coiled nonfusible metal wire which is wound to or laid along the outer wall of said luminous tube in a contact manner and a nonlinear



capacitor which is in series connected to said nonfusible metal wire.

4,897,577

ELECTROMECHANICALLY TRIGGERED SPARK GAP SWITCH

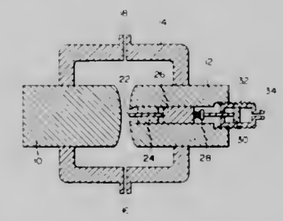
Frank Kitzinger, Montreal, Canada, assignor to Noranda Inc., Toronto, Canada

Filed May 20, 1988, Ser. No. 196,566

Claims priority, application Canada, Jul. 20, 1987, 542475

Int. Cl.[4] H01J *17/04*

U.S. Cl. 315—55 **5 Claims**



1. A spark gap switch comprising

(a) an anode and a cathode having facing surfaces separated by a predetermined gap;

(b) a trigger electrode located in the vicinity of said gap, and

(c) a piezoelectric generator connected between said trigger electrode and the cathode for triggering said spark gap switch.

4,897,578

HIGH EFFICIENCY INCANDESCENT LAMP WITH DIODE RECTIFIER

Christopher F. Goad, Sr., 7005 Monument Ave., Richmond, Va. 23226

Filed May 9, 1988, Ser. No. 191,405

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—71 **7 Claims**

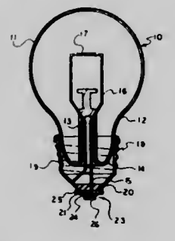
1. In an incandescent lamp comprising a glass envelope, a coiled tungsten filament disposed within said envelope, a base portion having a threaded metal sleeve, two lead wires extending from said base portion to said filament, and an electrically insulative plug which seals the lowermost portion of said sleeve and anchors one of said lead wires which terminates in a flat exterior surface of said plug, the improvement comprising in combination:

(a) the presence of a gas mixture within said envelope com-

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prised of 75%-85% krypton and the remainder nitrogen, and

(b) a rectifier having flat upper and lower surfaces and a flat semiconductor diode, said rectifier being adhered at said



upper surface to the exterior surface of the insulative plug and in electrical communication with said anchored lead wire,

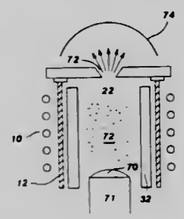
(c) said adhesion being achieved with a high melting point alloy comprised of 93-98 parts silver and 2-7 parts tin.

4,897,579

METHOD OF PROCESSING MATERIALS USING AN INDUCTIVELY COUPLED PLASMA

Donald E. Hull, and Thomas M. Bieniewski, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 37,898, Apr. 13, 1987, Pat. No. 4,795,879.
This application Dec. 23, 1988, Ser. No. 289,286
Int. Cl.[4] H01J *7/24*; B23K *9/00*
U.S. Cl. 315—111.51 **1 Claim**



1. A method of making fine powder in a gas-free environment using an electrically conductive ceramic or metal starting material which is initially in solid form comprising:

a. providing inductively coupled plasma apparatus comprising:

(1) an electrical induction coil having a central longitudinal axis;

(2) a dielectric tubular enclosure centered coaxially on said axis and located inside said coil;

(3) a segmented metal radiation shield which is grounded and centered coaxially on said axis inside said enclosure, said shield consisting of a plurality of elongate fluid-cooled metal shield segments extending parallel to said axis, said segments being disposed in a circular arrangement adjacent the interior surface of said enclosure and being substantially equally spaced apart circumferentially such that said shield has a generally tubular configuration, and said shield segments being shaped in cross section so as to occlude line-of-sight transmission of light through said radiation shield; and

(4) an outlet for material processed in said plasma apparatus;

b. placing said starting material within said radiation shield;

c. evacuating said tubular enclosure;

d. heating said starting material by use of said induction coil to vaporize said starting material and to form a plasma from the resulting vapor; and

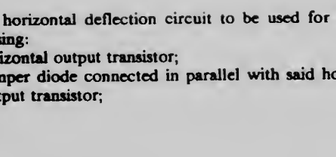
e. utilizing a powder collection surface adjacent to said outlet of said plasma apparatus to collect material emanating from said outlet.

4,897,580

AMPLIFIER DRIVE CIRCUIT FOR INDUCTIVE LOADS

Warren J. Schultz, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 20, 1989, Ser. No. 369,413
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—408 **14 Claims**



1. A circuit for driving an inductive load, comprising:

amplifying means having a first output terminal coupled to the inductive load, a second output terminal coupled to a common terminal, and an input terminal;

an inductor having first and second terminals wherein the first terminal is coupled to the amplifier input terminal;

a transformer having primary and secondary windings each having first and second terminals, wherein the first terminal of the primary is coupled to a switch for supplying current to the primary and the second terminal of the primary is coupled to the second terminal of the inductor, and first terminal of the secondary is coupled to the second terminal of the primary and the second terminal of the secondary is coupled through a unidirectional device to the common terminal; and

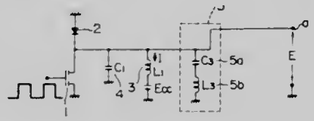
wherein the transformer windings are arranged so that the first terminals of the primary and secondary have the same polarity.

4,897,581

HORIZONTAL DEFLECTION CIRCUIT

Masanori Oguiso; Takeo Yamada, and Miyuki Ikeda, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 296,824
Claims priority, application Japan, Jan. 22, 1988, 63-10692
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—408 **3 Claims**



1. A horizontal deflection circuit to be used for a CRT, comprising:

a horizontal output transistor;

a damper diode connected in parallel with said horizontal output transistor;

a resonant capacitor connected in parallel with said damper diode;

a horizontal deflection coil connected in parallel with said horizontal output transistor; and

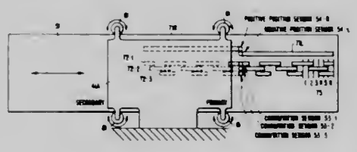
a series resonant means constituted by a series connection of a capacitor means and an inductor means and connected in parallel with said resonant capacitor so as to perform composite resonance in a retrace period in cooperation with said resonant capacitor and said deflection coil.

4,897,582

LINEAR DC MOTOR VIBRATION CONTROLLER

Thomas H. Otten, Indialantic; Warren H. Miller, Palm Bay; Willie T. Burton, Jr., Palm Bay; John W. Shipley, Palm Bay; Russell A. Johnson, Brandon, and Jeffery R. Anderson, Palm Bay, all of Fla., assignors to Harris Corp., Melbourne, Fla.

Filed Jan. 6, 1987, Ser. No. 773
Int. Cl.[4] B64G *1/38*; G05B *11/58*
U.S. Cl. 318—135 **29 Claims**



1. For use with a structure that is subject to vibrational movement, a system for imparting a controlled dampening force to said structure so as to counter said vibrational movement comprising:

a moveable mass to be translated in an oscillatory movement with respect to said structure and thereby impart to said structure a vibrational movement-compensating force against which said structure reacts, so that the vibrational movement thereof may be effectively countered by the controlled movement of said mass; and

first means, mechanically attached to said structure at a location whereat said vibrational movement may occur, for providing a rectilinear travel path for said mass to be translated there along in an oscillatory manner and for imparting a controlled force to said mass so as to cause said mass to oscillate along said rectilinear travel path; and wherein

one of said movable mass and said first means comprises a winding of an electric motor and the other of said mass and said means comprises a linear magnetic field responsive element, magnetically interacting with said winding of said electric motor, so that said winding may impart a force to said element, and wherein

the oscillatory translation of said movable mass is controlled exclusively by controlled magnetic field interaction between said winding and said linear magnetic field responsive element.

4,897,583

VARIABLE SPEED VARIABLE TORQUE BRUSHLESS DC MOTOR

Fenton L. Rees, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

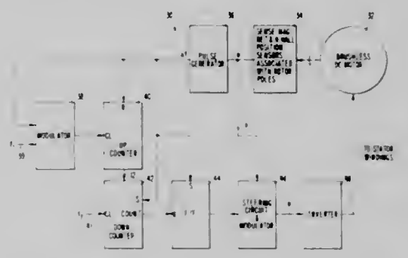
Filed Mar. 7, 1989, Ser. No. 319,719
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **12 Claims**

1. A variable speed variable torque brushless DC motor having a rotor, stator windings, and at least one rotor position sensor with each position sensor producing a position signal indicating position of the rotor and having a frequency equal to a frequency of excitation current applied for activating the stator windings of the motor, comprising:

a pulse generator, responsive to the at least one position sensor, for producing first pulses having a frequency which is equal to nf where n is the number of position sensors and f is the frequency of excitation current;

a source of a first signal having a frequency f1 wherein f1 > f;

a source of a variable frequency second signal having a frequency f2 with f2 ≧ f1;



an excitation circuit for applying excitation current pulses to the stator windings with the excitation current pulses occurring in response to the position signals produced by the at least one position sensor; and

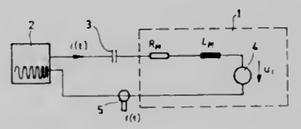
a delay circuit, responsive to the first pulses, the first signal, and the second signal for delaying application of the position signals to the excitation circuit with the delay being equal to mf1/mf2 wherein m is an integer.

4,897,584

DEVICE AND METHOD FOR DETECTING THE COIL TEMPERATURE OF A DIRECT-CURRENT MOTOR, ESPECIALLY A BRUSHLESS DIRECT-CURRENT MOTOR

Bertold Grützmacher, Schriesheim; Peter Elswirth, Heidelberg, and Helmut Meyer, Dossenheim, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 2, 1988, Ser. No. 162,874
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706659
Int. Cl.[4] G01K *7/16*; H02H *7/08*; G05D *23/20*
U.S. Cl. 318—471 **12 Claims**



1. Device for detecting the coil temperature of a direct-current motor by determining the resistance of at least one coil of the motor, comprising means for measuring a parameter of the at least one coil while the motor is running and during a time interval in which the coil is without current.

7. Method of detecting the coil temperature of a direct-current motor by determining the resistance of at least one coil of the motor, which comprises measuring a parameter of the one coil while the motor is running and during a time interval in which the coil is without current.

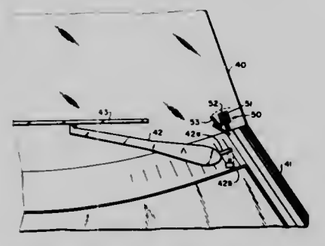
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4,897,585

MOISTURE SENSOR FOR AN AUTOMATIC VEHICLE WINDOW WIPER CONTROL

Donald L. Millerd, San Diego, and Marl J. Bell, Valley Center, both of Calif., assignors to Mist-Defy'R, Inc., LaJolla, Calif.

Filed Jul. 20, 1988, Ser. No. 221,866
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—483 **10 Claims**



1. In a moisture sensor for sensing ambient moisture in the vicinity of a vehicle window having a window wiper, said sensor comprising, in combination:

(a) a plurality of spaced apart conductive strips having an exposed surface, the electrical resistance between adjacent strips being dependent on the ambient moisture; and

(b) means for repetitively removing the moisture from said exposed surface and in the region between said strips;

the improvement wherein said plurality of conductive strips is located at a position other than in the area of sweep of said window wiper on said window and at least one of said removing means and said plurality of conductive strips is coupled to said window wiper;

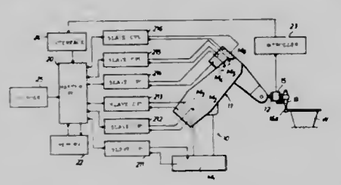
whereby said at least one of said removing means and said plurality of conductive strips is actuated by said window wiper and operates in synchronism therewith.

4,897,586

ELECTRIC CONTROL APPARATUS FOR INDUSTRIAL ROBOT

Shuichi Nakata, Kariya; Katsumi Yamamoto, Takahama; Toshio Aono; Shinichi Sugita, both of Kariya; all of Japan, and , assignors to Toyoda Koko Kabushiki Kaisha, Kariya, Japan

Filed Mar. 30, 1989, Ser. No. 330,488
Claims priority, application Japan, Mar. 30, 1988, 63-77073
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.1 **4 Claims**



1. An electric control apparatus for an industrial robot the arm of which is actuated to carry out machining of a workpiece by means of a machining tool attached thereto, comprising:

memory means for memorizing a plurality of teaching points representing the contour of said workpiece to be machined; and

execution means for operating said robot such that said machining tool is moved along a teaching line defined by the teaching points to carry out machining of said workpiece;

wherein the electric control apparatus further comprises:

a force sensor connected to detect reaction force acting on said machining tool;

second memory means for memorizing a maximum reaction force detected by said force sensor during each machining process of said workpiece in a plurality of split sections of the teaching line;

setting means for setting a value indicative of a limit of reaction force acting on said machining tool;

comparison means for comparing the memorized maximum reaction force with the set value and for producing an instruction signal therefrom when the memorized maximum reaction force exceeds the set value; and

control means for ascertaining as to whether or not said comparison means produces the instruction signal therefrom at each time when said machining tool arrives at each terminal point of the split sections and for producing a control signal therefrom when applied with the instruction signal from said comparison means; and

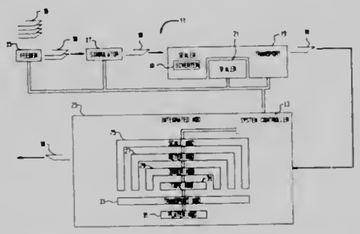
wherein said execution means is connected to operate said robot in response to the control signal from said control means such that said machining tool is once moved away from said workpiece and returned to each start point of the split sections to repeat machining in the same section.

4,897,587

MICROPROCESSOR MOTOR CONTROLLER HAVING DISCRETE PROCESSING CYCLES

Peter C. DiGiulio, Bridgeport; Francis E. McDermott, Danbury; Edilberto I. Salazar, Brookfield; Mark W. Van Gorp, Danbury, all of Conn., and Ido Weisman, Rego Park, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1988, Ser. No. 281,354
Int. Cl.[4] G06F *15/20*
U.S. Cl. 318—625 **20 Claims**



1. A motor controller system for controlling the respective motors of a plurality of cooperative apparatus associated with an article processing system, said article processing system for performing a plurality of functions upon an article traversing said article processing system, comprising:

a motor driver board having a plurality of input channels and a plurality of respective output channels;

said motors being in line communication with a respective one of said output channels of said motor driver board;

a programmable microprocessor in bus communication with said driver board's input channels;

a plurality of sensors respectively mounted to each of said apparatus and in bus communication with said programmable microprocessor, said sensors being strategically located on said apparatus to provide such information to said microprocessor as article size, position and velocity information and to provide apparatus operation information;

said microprocessor being programmed such that a control cycle is performed at a desired frequency, each control cycle being divided into discrete time intervals during which respective time interval said microprocessor transmits motor control command information to said driver board for respective motors and during other of said time intervals said microprocessor reads information from said sensors;

said microprocessor being further programmed to include schedule program means for scheduling the actuation of said motors relative to the respective motor control cycle for synchronous and cooperative operation of said motors during another one of said time intervals,

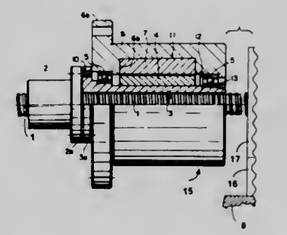
said microprocessor being further programmed to perform additional processing during at least one of said time intervals.

4,897,588

DOUBLE MOTOR FEED CONTROL SYSTEM

Seiji Takei, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Japan

Filed Jul. 21, 1988, Ser. No. 222,443
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—661 **14 Claims**



1. A feed control system for controlling a relative linear movement between two objects, comprising:

a first driving means to be fixedly mounted on one of said two objects;

a feed shaft driven to rotate by said first driving means, said feed shaft being threaded at least partly;

a slider means including a nut in thread engagement with said feed shaft and a second driving means having a rotor fixedly attached to said nut and a stator which is mounted around said rotor and which is to be fixedly mounted on the other of said two objects; and

wherein said other of said two objects may be driven at increased speed or reduced speed dependent on the relative rotational directions of said first driving means and said second driving means.

4,897,589

APPARATUS FOR INDEXING AN ORIGIN OF A MOVING MEMBER

Takashi Fujiwara, Okazaki, and Kiyotaka Ohara, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

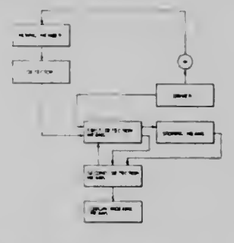
Filed May 16, 1988, Ser. No. 194,195
Claims priority, application Japan, May 15, 1987, 62-119346
Int. Cl.[4] G05B *19/40*
U.S. Cl. 318—685 **8 Claims**

1. In an origin indexing apparatus for indexing an origin of a moving member, including a detector for detecting a position of the moving member and outputting an origin signal when the moving member has reached a predetermined position, a multi-phase, rotatable stepper motor for moving the moving member, the stepper motor being rotated stepwise by sequentially exciting one of K phases of the stepper motor, and a driving unit for driving the stepper motor, wherein origin indexing of the moving member is performed on the basis of an excited phase at which the origin signal from the detector is produced, the improvement wherein said apparatus comprises:

a first detection means for detecting said excited phase at which the origin signal is produced from said detector while said stepper motor is being rotated in a predetermined direction;

a storage means for storing as a reference excitation phase said excited phase detected by said first detection means at a specific time instant;

a second detection means for detecting a phase difference between said reference excitation phase stored in said storage means and an indexed excitation phase, said indexed excitation phase being detected by said first detection means at the time of said origin indexing after said specific time instant; and



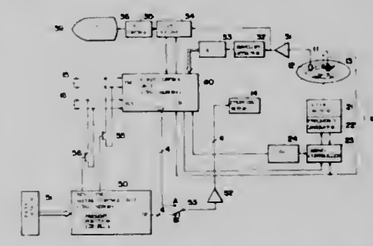
an origin indexing means for indexing one of the following three positions as said origin on the basis of said phase difference and said predetermined number K; a center position corresponding to a subsequent specified phase appearing in the same cycle following said indexed excitation phase while said stepper motor is being rotated in said predetermined direction, a position downstream from said center position by a distance corresponding to K phases and a position upstream from said center position by a distance corresponding to K phases of said stepper motor.

4,897,590

TRACK ACCESS APPARATUS IN A MAGNETIC RECORDING/PLAYBACK SYSTEM

Nobuo Misoura, Yokohama; Katsuo Nakadai, Tokyo; Toshikatsu Harase, Tokyo, and Satoshi Iwamatsu, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 919,140, Oct. 15, 1986, Pat. No. 4,803,573.
This application Nov. 17, 1988, Ser. No. 272,997
Claims priority, application Japan, Oct. 15, 1986, 61-227918; Oct. 15, 1986, 61-227919; Oct. 15, 1986, 61-227920; Oct. 15, 1986, 61-227921; Oct. 15, 1986, 61-227922
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **3 Claims**



1. An apparatus for controlling a stepping motor comprising first and second control units each for generating excitation

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patterns of pulses for driving a stepping motor, the excitation patterns of pulses generated by said first unit being applied to said second unit, which in turn applies all of said excitation patterns of pulses to the stepping motor, said second unit comprising:

means for storing an excitation pattern of pulses last outputted to said stepping motor;

decision means for deciding whether an excitation pattern of pulses applied by said first unit has changed; and

pulse generating means operable in response to a change detected by said decision means for outputting excitation patterns of pulses forming a continuum with the stored excitation pattern of pulses last outputted.

4,897,591

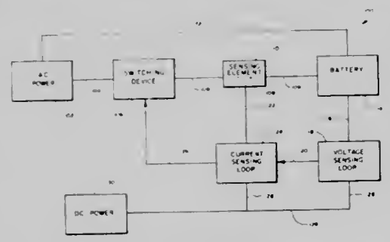
REGULATED BATTERY CHARGER

Wayne M. Spani, San Diego, Calif., assignor to Fisher Scientific Group Inc., San Diego, Calif.

Filed May 6, 1987, Ser. No. 47,413

Int. Cl.[4] H02J 7/04

U.S. Cl. 320—32 **23 Claims**



1. A circuit for regulating the average current through and the voltage applied across the first and second terminals of a load, the circuit comprising:

a transformer secondary having two end terminals and a center tap, the center tap being connected to the first terminal of the load;

a pair of individually and selectively operable switching elements, each of said switching elements being connected between the second terminal of the load and a respective one of the end terminals of the transformer secondary, each of said switching elements during the duty cycle thereof completing a closed current path in which current flows through the load in a single common current flow direction;

a sense element comprising a resistance of less than 1 ohm connected in series with the load for producing a sensed voltage proportional to the current through the load;

a current control loop connected to the sense element and the switching device, the current control loop adapted for controlling the duty cycle of the switching elements to maintain a constant average current through the load;

means for establishing a preselected threshold voltage; and

a voltage control loop having a comparator circuit for comparing the voltage present at the terminals of the load and a preselected threshold voltage for flexibly decreasing the duty cycle of the switching elements controlled by the current control loop, to maintain charging current above a trickle charge in proportion to the amount by which said load voltage exceeds said threshold voltage, and maintaining said load voltage at or below said preselected threshold voltage.

4,897,592

ELECTROSTATIC ENERGY FIELD POWER GENERATING SYSTEM

William W. Hyde, 1685 Whitney, Idaho Falls, Id. 83402

Filed Jun. 27, 1988, Ser. No. 211,704

Int. Cl.[4] H02N 1/08

U.S. Cl. 322—2 A **19 Claims**



1. An energy conversion system including a pair of electrodes maintained electrostatically charged at substantially equal potentials of opposite polarity, stator means mounted in operatively spaced relation to said electrodes for inducement therein of charges of opposite polarity through electric fields established by said equal potentials, power driven rotor means continuously disposed within said electric fields for receiving charged induced by said electric fields, means electrically connecting said rotor means to the stator means for equalizing of said induced charges therebetween, field linkage control means for movably shielding the stator means from the electric fields during rotation of the rotor means and output circuit means operatively connected to the stator means for extracting therefrom an operating voltage in response to movement of said shielding of the stator means.

4,897,593

REACTIVE POWER COMPENSATOR FOR ELECTRIC POWER SYSTEM

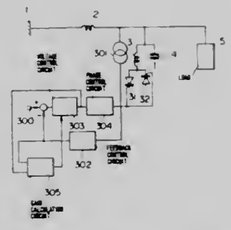
Hiroo Konishi, and Yasuo Matsuda, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 4, 1989, Ser. No. 293,450

Claims priority, application Japan, Jan. 5, 1988, 63-460

Int. Cl.[4] G05F 1/70

U.S. Cl. 323—210 **13 Claims**



1. A reactive power compensator for an electric power system, comprising:

(a) a voltage control circuit for amplifying the differential voltage between a potential command value and a potential signal corresponding to the voltage of the electric power system detected by a potential detector, said voltage control circuit outputting said difference as a reactive power compensation control signal;

(b) a reactive power output circuit supplied with the signal output from said voltage control circuit via a phase control circuit, said reactive power output circuit controlling the voltage of the power system so as to compensate for reactive power in the power system; and

(c) a gain calculation circuit for setting the gain of said voltage control circuit to a value proportional to the level of short-circuit capacity of the system power on the system power supply side of said reactive power output circuit.

4,897,594

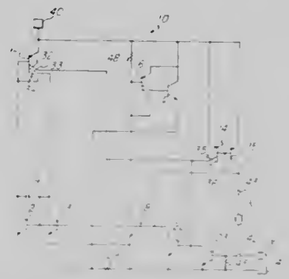
HIGH GAIN DRIVER CIRCUIT AND METHOD

Dan Agiman, Lewisville, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 118,710, Nov. 9, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 336,625

Int. Cl.[4] G05F 1/575

U.S. Cl. 323—273 **20 Claims**



1. A circuit for controlling current to a load device comprising:

a driving transistor coupled between a source of supply voltage and an output terminal, said driving transistor having a control electrode for receiving drive current;

at least one predrive transistor having an output coupled to said control electrode of said driving transistor, an input terminal for receiving a startup signal and another terminal coupled to said output terminal;

a startup circuit for providing said startup signal having an output coupled to said input terminal of said at least one predrive transistor and a control terminal for receiving a source of bias current; and

a feedback circuit coupled between said source of supply voltage and said output terminal and having an input coupled to said input terminal, said feedback circuit comprising circuitry for sensing the level of current supplied by said driving transistor and for controlling the current to said input terminal in response to the circuitry for sensing to control the level of said drive current.

4,897,595

BAND-GAP REFERENCE VOLTAGE CIRCUIT WITH FEEDBACK TO REDUCE COMMON MODE VOLTAGE

Eerke Holle, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1989, Ser. No. 312,505

Claims priority, application Netherlands, Feb. 19, 1988, 8800422

Int. Cl.[4] G05F 3/16

U.S. Cl. 323—314 **10 Claims**

1. A band-gap reference-voltage arrangement comprising:

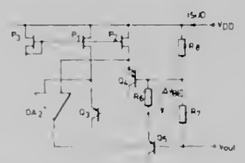
an MOS differential amplifier having two inputs and one output,

a first bipolar transistor whose base-emitter path is connected between one input of the differential amplifier and a first junction point and whose emitter-collector path is connected in a first current path for carrying a first current,

a second bipolar transistor whose base-emitter path is connected in series with a resistor between the other input of the differential amplifier and said first junction point and whose emitter-collector path is connected in a second current path for carrying a second current,

a series arrangement of a second and a third resistor coupled between a supply voltage terminal and an output terminal for taking off a reference-voltage, a second junction point between the second and the third resistor being coupled to the base of the second transistor,

the output of the differential amplifier being coupled to said output terminal of the arrangement,



means for supplying said first and second currents to said first and second current paths, characterized in that the first resistor is coupled between the base of the second transistor and said first junction point, which by means of the base-emitter path of a third transistor is coupled to one end of the series arrangement of the second and third resistor.

4,897,596

CIRCUIT ARRANGEMENT FOR PROCESSING SAMPLED ANALOGUE ELECTRICAL SIGNALS

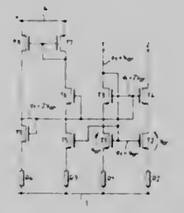
John B. Hughes, Hove, and Ian C. MacBeth, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1988, Ser. No. 286,599

Claims priority, application United Kingdom, Dec. 23, 1987, 8729987

Int. Cl.[4] G05F 3/24

U.S. Cl. 323—315 **16 Claims**



1. A circuit arrangement for processing sampled analogue electrical current signals, comprising: means for combining, in predetermined proportions, an input sample current in a present sample period with current(s) derived from input sample current(s) in one or more preceding sample periods, and means for deriving a processed output signal from a combined current produced by the combining means in successive sample periods, at least one current mirror circuit arrangement which comprises an input connected to an input circuit branch of a first current mirror circuit and an output connected to an output circuit branch of the first current mirror circuit, wherein the input circuit branch comprises a series arrangement of first and second MOS transistors, the output circuit branch comprises a series arrangement of third and fourth MOS transistors, gate electrodes of the first and third transistors being connected together and to a bias source, gate electrodes of the second and fourth transistors being connected together and to the input, wherein the bias source comprises

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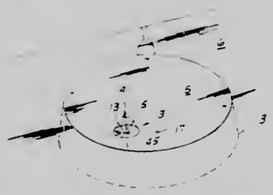
means for generating a bias current equal to the input current, the bias current generating means comprising a further output branch of the first current mirror circuit, means for applying the bias current to a diode connected transistor, and means for connecting the drain electrode of the diode connected transistor to the gate electrodes of the first and third transistors, wherein a gate width to length ratio of the diode connected transistor and the current through the diode connected transistor are selected so that a voltage of V_t+2V_{on} is produced across the diode connected transistor, where V_t is the threshold voltage and V_{on} is the saturation voltage.

4,897,597

APPARATUS AND METHODS FOR DETECTING WET AND ICY CONDITIONS

Miles B. Whitener, St. Louis, Mo., assignor to Surface Systems, Inc., St. Louis, Mo.

Filed Dec. 8, 1988, Ser. No. 281,822
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—693 **45 Claims**



1. Apparatus for detecting the presence and condition of precipitation on the surface of a pathway, comprising:

a block of electrically insulative material adapted to be embedded in the pathway and having a top surface exposed to precipitation; and

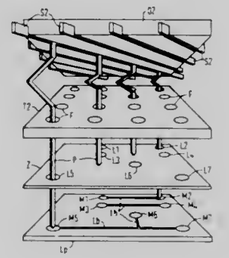
sensor means embedded in said block for sensing a physical property of the precipitation to produce a sensor output which is also influenced by a depth of the precipitation, wherein part of the top surface of the block has a well that is generally curved in outline above said sensor means for gathering precipitation for said sensor means, thereby diminishing the influence of precipitation depth on said sensor means.

4,897,598

APPARATUS FOR ELECTRICAL FUNCTION TESTING OF WIRING MATRICES, PARTICULARLY OF PRINTED CIRCUIT BOARDS

Guenter Doemens, Holzkirchen, and Thomas Rose, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 7, 1988, Ser. No. 164,856
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710594
Int. Cl.[4] G01R *31/02, 15/12*
U.S. Cl. 324—158 F **11 Claims**



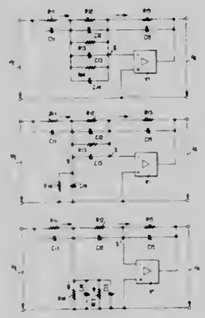
7. The apparatus according to claim 6, wherein the busbars are orientated at an angle of 45° relative to the principal directions of the wiring matrices to be tested.

4,897,599

SIGNAL PROCESSING DEVICE WITH A LEVEL ADAPTER CIRCUIT

Manfred Koslar, Berlin, Fed. Rep. of Germany, assignor to Createc Gesellschaft für Elektrotechnik mbH, Berlin, Fed. Rep. of Germany

PCT No. PCT/DE86/00143, § 371 Date Nov. 28, 1986, § 102(e) Date Nov. 28, 1986, PCT Pub. No. WO86/05886, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 27, 1986, Ser. No. 945,958
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511593; Mar. 27, 1985, 3511590
Int. Cl.[4] G01R *13/20, 19/00*
U.S. Cl. 324—115 **17 Claims**



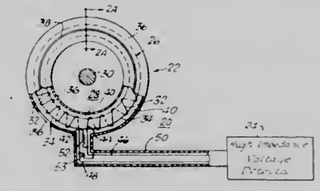
17. An input circuit as defined by claim 8, further including a multi-stage amplifier coupled to the input of one of the amplifier stages to effect feedback.

4,897,600

HIGH FREQUENCY AMMETER

Mark J. Hagmann, Miami, and Tadeusz M. Babij, Fort Lauderdale, both of Fla., assignors to Florida International University, Miami, Fla.

Filed Nov. 13, 1987, Ser. No. 122,201
Int. Cl.[4] G01R *1/22; H01F 15/04*
U.S. Cl. 324—127 **13 Claims**



1. A current detector for detecting high frequency currents flowing through an object comprising:

a high resistivity conductor wound in multiple turns around a substantially closed loop non-ferromagnetic core, said loop having an aperture greater than the corresponding dimensions of said object to be measured, and, at any given point along said loop the ratio of said turns spacing to said core cross-sectional area at said point are constant; and

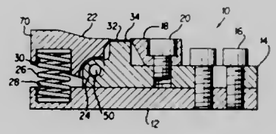
a shield of a high resistivity material surrounding and electrically separated from said wound conductor.

4,897,601

TEST FIXTURE FOR INTEGRATED CIRCUIT CHIPS

Vincent A. Hirsch; Edward D. Freymiller, and Edward C. Johnson, all of Boulder, Colo., assignors to Ball Corporation, Munice, Ind.

Filed Mar. 2, 1988, Ser. No. 162,786
Int. Cl.[4] G01R *31/02, 1/06*
U.S. Cl. 324—158 F **9 Claims**



1. A test fixture for non-destructive testing of integrated circuit chips of the type having spaced-apart edges and a ground plane surface that is disposed between said spaced-apart edges, which test fixture comprises:

a base;

a chip support being operatively secured to said base, and having a generally planar surface;

clamping means, comprising first and second chip stops that are operatively attached to said base, for placing a predetermined resilient force on said spaced-apart edges;

contacting means, comprising first and second wedging surfaces on respective ones of said chip stops, for pressing said ground plane surface against said planar surface with a contacting force that is a predetermined ratio of said predetermined resilient force; and

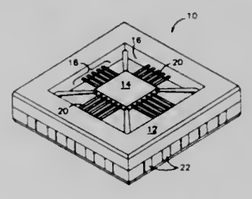
releasing means for selectively moving one of said chip stops away from the other of said chip stops.

4,897,602

ELECTRONIC DEVICE PACKAGE WITH PERIPHERAL CARRIER STRUCTURE OF LOW-COST PLASTIC

Paul T. Lin; Michael B. McShane; Charles G. Bigler, all of Austin; John A. Goertz, Red Rock, and Joan M. Hamilton, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 141,013, Jan. 4, 1988. This application Oct. 14, 1988, Ser. No. 258,235
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—158 F **16 Claims**



1. A packaged electronic device having a carrier structure comprising:

a lead frame comprising a plurality of leads peripherally surrounding an electronic element bonding area, each lead having a proximal end near the bonding area, a distal end away from the bonding area and an intermediate portion between the proximal end and the distal end;

an electronic element bonded to the proximal ends of leads in the lead frame;

a package body over the electronic element and at least an end portion of the proximal ends of each of the leads, the package body being a first material; and

a molded plastic carrier structure positioned to encapsulate at least a portion of the distal ends but not the extreme distal ends of a least some of the leads, the molded plastic carrier structure being of a second plastic material different from the first material;

at least the intermediate portions of the leads being exposed and not covered by either material.

4,897,603

ARRANGEMENT FOR DETERMINING THE SPEED AND ROTOR POSITION OF AN ELECTRIC MACHINE

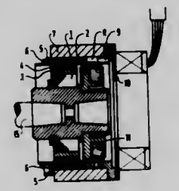
Joachim Bieber, Bad Neustadt; Manfred Frank, Heustreu, and Wolfgang Schneider, Fulda, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

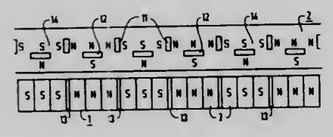
Filed Jan. 26, 1989, Ser. No. 302,828
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806438
Int. Cl.[4] G01B *7/30; G01P 3/48*
U.S. Cl. 324—208 **7 Claims**

1. An arrangement for determining the speed and rotor position of an electric machine comprising a tachometer generator having a permanent magnet-excited rotor, poles separated by pole gaps and a multi-phase stator winding; and a rotor position transmitter which is arranged coaxially to said tachometer generator at a preselected distance and has a rotor body equipped with first and second magnets; magnetic field-sensitive sensor elements are arranged around said rotor body with a circumferential spacing corresponding to the pole spacing, said rotor body (2) consisting of non-magnetic material, said first permanent magnets (11) being magnetized in the tangential direction at a spacing corresponding to the pole gaps (13) and being arranged centered with respect to said pole gaps (13) in such a manner that the sides of two first permanent magnets (11) facing each other have the same polarity as the magnet pole of the tachometer generator rotor (1) extending between the respective pole gaps (13); wherein at least one second permanent magnet magnetized in the direction of the

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axis of rotation (15) is arranged on the side of the rotor body (2) adjacent to the tachometer generator rotor (1) and centered between two first permanent magnets (11) in such a manner





that its side facing the tachometer generator rotor (1) has the opposite polarity as the magnet pole of the tachometer generator rotor (1).

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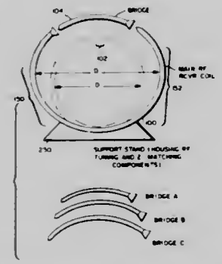
METHOD AND APPARATUS FOR SELECTIVE ADJUSTMENT OF RF COIL SIZE FOR MAGNETIC RESONANCE IMAGING

Joseph W. Carlson, Kensington; Leon Kaufman, San Francisco, and Peter A. Rothschild, Alameda, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 21, 1989, Ser. No. 312,189

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **14 Claims**



1. An MRI RF receiver coil comprising:

a solenoidal inductive coil having plural conductor turns;

mated conductive connectors separably connecting each of said turns across a predetermined joint area;

an RF tuning capacitance connected with said coil and having a predetermined adjustable tuning range for tuning the coil to a predetermined resonant RF frequency when loaded by the presence of an object to be imaged within said coil; and

a bridge element having plural bridge conductors thereacross with conductive connectors for mating separable serial connection with the conductive connectors of each of said turns within said joint area thereby expanding the size of said coil;

said bridge element having a sufficiently low net impedance when added to said coil that said RF turning capacitance remains capable of tuning the loaded expanded coil to resonance.

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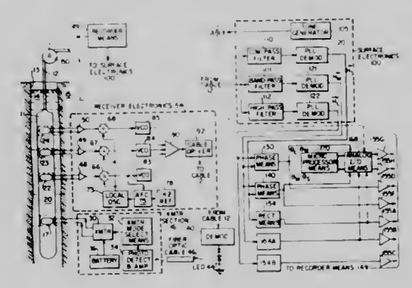
DEEP PENETRATION WELL LOGGING SYSTEM AND METHOD

Percy T. Cox; Wayne F. Warren, and Donald L. Johnson, Jr., all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 579,316, Apr. 6, 1984, Pat. No. 4,622,518, which is a continuation of Ser. No. 480,638, Mar. 31, 1983, abandoned. This application Mar. 17, 1986, Ser. No. 840,370

Int. Cl.[4] G01V *3/10, 3/18*

U.S. Cl. 324—341 **6 Claims**



1. A well logging system for determining the dielectric constant and/or resistivity of earth formations, some of which have been invaded by drilling fluid, traversed by a borehole comprising:

a well logging sonde adapted to be passed through the borehole including:

means for transmitting electromagnetic energy into the earth formation at a frequency which enables the electromagnetic energy to propagate throughout the surrounding earth formation,

first receiver means located a first predetermined distance from said transmitting means for receiving electromagnetic energy from the earth formation and providing a first receiver signal representative of the total electromagnetic field at that location,

second receiver means located a second predetermined distance from said transmitting means for receiving electromagnetic energy from the earth formations and providing a second receiver signal representative of the total electromagnetic field at that location, where said second predetermined distance is greater than said first predetermined distance,

third receiver means located a third predetermined distance from said transmitting means for receiving electromagnetic energy from the earth formations and providing a third receiver signal representative of the total electromagnetic field at that location, where said third predetermined distance is greater than said second predetermined distance, and

means connected to the three receiver means for processing the three receiver signals to provide a combined signal for application to well logging cable means,

well logging cable means connected to said signal processing means for conducting the combined signal from said signal processing means out of the borehole; and

surface electronics including

indication means connected to the well logging cable means for providing an indication of the dielectric constant and-/or the resistivity of the earth formation in accordance with portions of said combined signal conducted by said cable means representative of secondary electromagnetic fields at two of the three receiving means locations.

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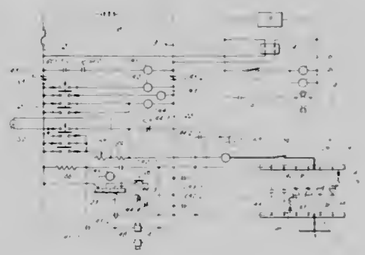
METHOD AND APPARATUS FOR UNDESIRED GROUND PATH DETECTION IN A SINGLE-POINT GROUNDED ELECTRICAL SYSTEM

Richard W. Cook, Austin, Tex., and Dennis J. Hildenbrand, Morris Plains, N.J., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Oct. 19, 1988, Ser. No. 259,931

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—509 **12 Claims**



1. An apparatus for testing a single -point earth grounded electrical system, comprising:

an electrical switch for selectively connecting and disconnecting a common grounding point of an electrical system to and from a desired single-point earth ground;

a voltage clamp connected in parallel with said electrical switch, a clamp voltage and a current carrying capacity of said voltage clamp being sized to ensure personnel protection from electrical shock when said common grounding point is disconnected from said desired single-point earth ground;

means, electrically referenced to said desired single-point earth ground, for connecting a source of electrical current to said common grounding point when said common grounding point is disconnected by said switch from said desired single-point earth ground;

means for monitoring an electrical potential of said common grounding point relative to said desired single-point earth ground due to said source of electrical current; and

means for indicating the existence of at least one undesired connection between said common grounding point and said desired single-point earth ground based on monitored electrical potential of said common grounding point.

4,897,607

METHOD AND DEVICE FOR DETECTING AND LOCALIZING FAULTS IN ELECTRICAL INSTALLATIONS

Peter Grünewald, Essen-Haarzopf; Kurt Fork, Neunkirchen; Jürgen Weidner, Essen-Überruhr, and Reinhold Koziel, Mülheim/Ruhr, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 13, 1987, Ser. No. 37,619

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1986, 36124475

Int. Cl.[4] G01R *31/34*

U.S. Cl. 324—512 **15 Claims**

1. Method for detecting and localizing faults in electrical installations, which comprises:

(a) performing partial discharge measurements and high frequency measurements at least at one location in the electrical installation and optionally in all phases;

(b) selectively comparing the measurement values with each other and with calibration signals;

(c) drawing conclusions from the measurements regarding the location and the type of the fault;

(d) selectively continuously and periodically performing the measurements at least at three measuring points while the installation is in operation;

(d) simulating the electrical installation in a computer as a high-frequency network, while simulating faults with the signals originating therefrom at the measuring points;

(e) comparing any measurement values which indicate faults with the simulated signal values for different fault types and fault locations; and



(f) determining the type and location of the fault from the simulated signal values which best agree with the measurement values and from the corresponding simulated fault; and concurrently monitoring and utilizing measuring values of sound measuring pickups and including them in the analysis of the fault.

4,897,608

CIRCUIT ARRANGEMENT FOR FREQUENCY-MODULATED PICTURE SIGNALS

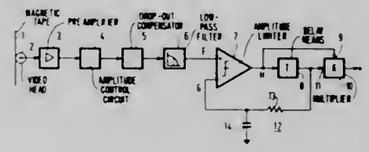
Heinz H. Gehrt, Hamburg, and Karl-Heinz Rehfeldt, Quickborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 9, 1987, Ser. No. 36,219

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612266

Int. Cl.[4] H03D *3/02*

U.S. Cl. 329—321 **7 Claims**



1. A circuit for a picture reproducing apparatus comprising an amplitude limiter having a first input for receiving a frequency-modulated picture signal and an output for outputting an output signal, which amplitude limiter is constructed to change the polarity of its output signal when the frequency-modulated picture signal on its input exceeds a threshold value, and a frequency demodulator which is coupled to the output of the amplitude limiter, characterized in that the output of the amplitude limiter is coupled to the input of a low-pass filter via a delay means whose delay time T is substantially equal to a quarter of a carrier period of the frequency-modulated picture signal and, the output of said low-pass filter being coupled to a second input of the amplitude limiter to apply the threshold value to the amplitude limiter.

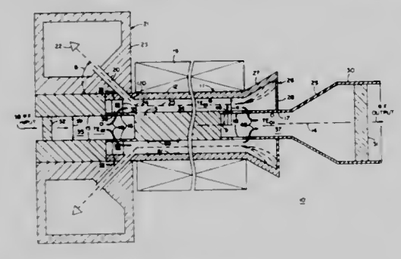
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4,897,609

AXIALLY COUPLED GYROTRON AND GYRO TWTA

Raghuveer Mallavarpu, Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 28, 1987, Ser. No. 138,740
Int. Cl.[4] H03F 3/58; H01J 25/00
U.S. Cl. 330—43 **18 Claims**



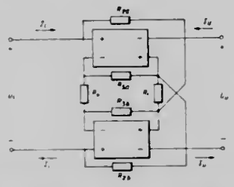
1. A gyro beam tube comprising:
said tube having a longitudinal axis of symmetry;
means for providing a hollow gyro electron beam concentric with said axis;
means for providing input rf energy along the axis of said tube;
means coupling said input rf energy to said beam; and
means coupling amplified rf energy out of said beam.

4,897,610

NEGATIVE-FEEDBACK AMPLIFIER WITH ACCURATELY DEFINED INPUT OR OUTPUT IMPEDANCE COMBINED WITH HIGH OR LOW OUTPUT OR INPUT IMPEDANCE RESPECTIVELY

Paulus T. M. Van Zeijl, Monster, Netherlands, assignor to Stichting Voor De Technische Wetenschappen, GA Utrecht, Netherlands

Filed Apr. 28, 1988, Ser. No. 187,597
Claims priority, application Netherlands, Apr. 29, 1987, 8701026
Int. Cl.[4] H03F 1/34
U.S. Cl. 330—84 **8 Claims**



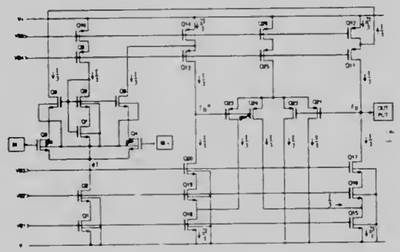
1. A negative-feedback amplifier having an input and an output port providing an output current, which amplifier comprises:
(1) an active amplifier section which has a high loop gain, active amplifier section including two nullor circuits, each operating approximately as a nullor circuit, said nullor circuits connected to each other in balance,
(2) a negative-feedback section comprising passive impedance which form two negative-feedback loops in which the output current is sensed,
said negative-feedback loops connected to said nullor circuits so as to form with each nullor circuit:
(a) a parallel-coupling circuit at the input port to feed back a current, derived from the output current, to the input port and
(b) a series-coupling circuit at the input port to feed back a voltage, derived from the output current, to the input port,
whereby an accurately defined or characteristic input impedance and a high output impedance is produced.

4,897,611

VERY HIGH GAIN POSITIVE FEEDBACK CMOS TRANSCONDUCTANCE AMPLIFIER

Carlos A. Laber, Los Altos, and Paul R. Gray, Orinda, both of Calif., assignors to Micro Linear Corporation, San Jose, Calif.

Filed Oct. 28, 1988, Ser. No. 264,401
Int. Cl.[4] H03F 1/38, 3/16
U.S. Cl. 330—253 **9 Claims**



1. A transconductance amplifier with a gain having an amplifier input, an amplifier output and an amplifier output impedance, said amplifier comprising:
a. a first amplification means coupled to said amplifier input and having a first transconductance; and
b. a second amplification means having a second amplifier input, a second transconductance and a second output with a second output impedance; and
c. positive feedback means for coupling the output of said amplifier to the second amplifier input of said second amplification means,
wherein the gain of the amplifier is a function of the first transconductance times the second transconductance times the amplifier output impedance times the second output impedance.

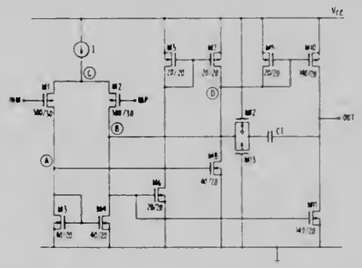
4,897,612

OPERATIONAL TRANSCONDUCTANCE AMPLIFIER WITH IMPROVED CURRENT SOURCE CAPABILITY

Kenneth J. Carroll, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 192,010, May 9, 1988. This application Apr. 24, 1989, Ser. No. 341,910
Int. Cl.[4] H03F 3/45, 3/16
U.S. Cl. 330—253 **5 Claims**

1. An operational transconductance amplifier comprising:
(a) a differential to single-ended input stage which receives a non-inverting input and an inverting input, the input stage being serially connected with a constant current source between positive and negative rails, the constant current source being connected to the positive rail; and
(b) an output stage which includes
(i) a pull-down device which receives the single-ended output of the input stage, the pull-down device being connected between the output node of the output stage and the negative rail; and
(ii) an input controlled current source, connected between the positive rail and the output node and to receive control signals comprising both the non-inverting input and the inverting input, for allowing the output stage to source current greater than twice the quiescent current of the output stage.



4,897,613

TEMPERATURE-COMPENSATED CIRCUIT FOR GAAS ECL OUTPUT BUFFER

Hayagriva V. Rao, Fairfield, Conn., and Gary A. Picard, Langborne, Pa., assignors to Grumman Corporation, Long Island, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,270
Int. Cl.[4] H03F 3/45, 3/16
U.S. Cl. 330—253 **16 Claims**



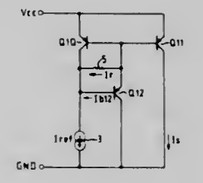
1. A temperature-compensated output buffer, comprising:
a first differential amplifier having an output node;
a bleeder transistor having first and second electrodes and a control terminal, said first electrode electrically connected to the output node of the first differential amplifier; and
a temperature-compensating electrical network, including a second differential amplifier and a temperature-dependent electrical component having an electrical characteristic that varies with temperature, said temperature-compensating network arranged to output a temperature-dependent signal to the control terminal of said bleeder transistor so that the electrical conductivity between the first and second electrodes of said bleeder transistor changes in response to the varying network output signal, thereby adjusting the output voltage on the output node of the first differential amplifier.

4,897,614

CURRENT MIRROR CIRCUIT

Koji Nishio, Mitaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 14, 1988, Ser. No. 218,799
Claims priority, application Japan, Jul. 17, 1987, 62-177274
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—257 **7 Claims**



1. A current mirror circuit comprising:
first and second power source terminals;
first transistor means for receiving an input current, having an emitter electrode, a base electrode and a collector electrode;
second transistor means for outputting an output current, having an emitter electrode, a base electrode and a collector electrode;
means for connecting the emitter electrodes of said first and second transistor means to the first power source terminal;
resistor means for connecting the base electrode of the first transistor means to the collector electrode thereof and for supplying current to the base electrodes of the first and second transmitter means to make the first and second transistor means conductive initially;
third transistor means for supplying a predetermined current to the base electrodes of the first and second transistor means when the voltage drop across the resistor means exceeds a predetermined value to increase the current to the base electrodes of the first and second transistor means; and
means for supplying the input current to the collector electrode of the first transistor means.

4,897,615

HIGH EFFICIENCY AMPLIFIER

Tzu-Hung Chen, East Brunswick, and Mahesh Kumar, Lawrenceville, both of N.J., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,094
Int. Cl.[4] H03F 3/30
U.S. Cl. 330—263 **9 Claims**



1. Apparatus for amplifying broadband input signals, the apparatus comprising:
a first signal branch for amplifying a first portion of the input signal having first input matching means and first output means for producing a first output branch signal,
a second signal branch for amplifying a second portion of the input signal having second input matching means for receiving the input signal and second output means for

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producing a second output branch signal, said first and second input matching means providing the broadband input signals in common phase relationship to each other,

each signal branch comprising at least one active device connected to its respective one of the first and second input matching means for providing efficient coupling of the input signal to the at least one active device, each signal branch and its at least one active device amplifying a complementary portion of their respective input signals compared to the portion being amplified by the other signal branch; and
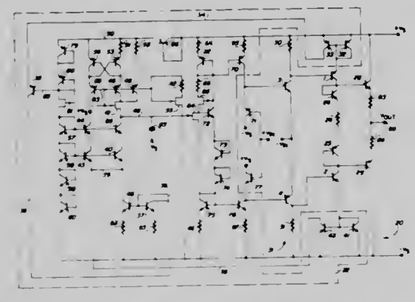
the first and second output means serially connected together in a complementary push-pull configuration to combine respective complementary output branch signals to produce a composite signal and coupled to output matching means for providing efficient coupling of the composite signal to a load.

4,897,616

WIDE BAND AMPLIFIER WITH CURRENT MIRROR FEEDBACK TO BIAS CIRCUIT

Anthony D. Wang, and R. Mark Stitt, II, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jul. 25, 1988, Ser. No. 223,796
Int. Cl.[4] H03F *3/30*
U.S. Cl. 330—265 **25 Claims**



9. A method of controlling a DC bias current in an output stage of an amplifier by feedback from the output stage to an input stage, comprising the steps of:

(a) sensing an emitter current of a first transistor in the output stage by means of a first current mirror to produce a first mirrored current;

(b) conducting a feedback current which is a certain percentage of the first mirrored current through a second transistor;

(c) comparing a first feedback current to a reference current to produce an error signal; and

(d) adjusting the DC bias voltage of the output stage in response to the error signal to cause the first feedback current to equal the reference current.

4,897,617

DOMINO EFFECT AMPLIFIER

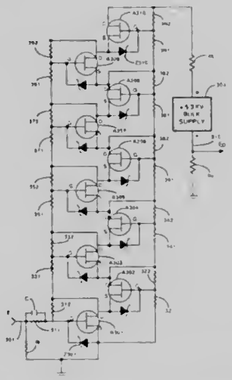
Walter E. Milberger, Severna Park; Franklin B. Jones, Catonsville, and Charles S. Kerfoot, Pasadena, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 28, 1989, Ser. No. 318,211
Int. Cl.[4] H03F *3/16*
U.S. Cl. 330—277 **5 Claims**

1. An amplifier comprising a plurality of stages in tandem from a first stage to an Nth stage, each stage being a three-terminal unit having an input terminal, an output terminal and a common terminal, input means coupled between the input and common terminals of the first stage, the output terminal of the Nth stage being coupled via a limiting resistor to a high-voltage power supply;

each stage after the first having its input terminal coupled to the common terminal of the preceding stage, and its common terminal coupled to the output terminal of the preceding stage;

each stage comprising an amplifying device having an inverting input, a non-inverting input and an output, a reference resistor connected between the input terminal of the stage and the inverting input of the amplifying device, a feedback resistor connected between the inverting input and the output of the amplifying device, the non-inverting input of the amplifying device being the common terminal of the stage, and the output of the amplifying device being the output terminal of the stage.

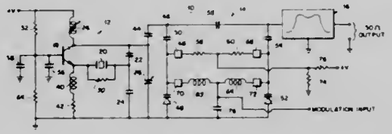


4,897,618

HARMONIC FREQUENCY SELECTING CIRCUIT

Dale G. Svetanoff, Arlington Heights, Ill., assignor to The Curran Company, Glendale Heights, Ill.

Filed Jun. 5, 1989, Ser. No. 361,948
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—76 **20 Claims**



1. A harmonic frequency selecting circuit comprising:

oscillator means for generating a fundamental frequency signal and a plurality of harmonic frequency signals of said fundamental frequency signal;

phase modulator means coupled to said oscillator means for selectively variably attenuating said generated frequency signals; and

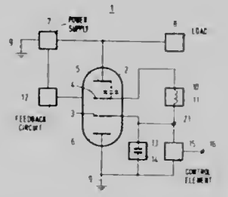
bandpass filter means coupled to said phase modulator means for selecting a predetermined harmonic frequency output signal.

4,897,619

HIGH-FREQUENCY GENERATOR

Christian S. A. E. Patron; Eugene J. Sowinski, and Aart P. Huben, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1988, Ser. No. 218,015
Claims priority, application Netherlands, Jul. 16, 1987, 8701679
Int. Cl.[4] H03J *3/00*
U.S. Cl. 331—167 **16 Claims**



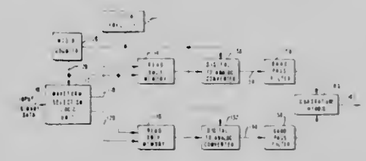
1. A high-frequency generator comprising: a multigrid electron tube comprising at least a cathode, an anode and a grid pair including a control grid and a screen grid, a power supply circuit coupled to said anode and cathode, means coupling said tube to a load, the grid pair being coupled to a main current path of the electron tube, a feedback circuit between the screen grid and the anode for generating a high-frequency signal in the main current path of the electron tube, characterized in that the feedback circuit substantially comprises an internal parasitic capacitance present between the screen grid and the anode of the electron tube, and an impedance element coupled between the control grid and the screen grid, said impedance element having an a.c. impedance with respect to the high-frequency signal that exceeds its d.c. resistance.

4,897,620

CONTINUOUS PHASE SHIFT MODULATION SYSTEM WITH IMPROVED SPECTRUM CONTROL

Ronald Y. Paradise, Hillsdale, N.J., assignor to Plessey Electronic Systems Corp., Wayne, N.J.

Filed Mar. 6, 1989, Ser. No. 319,100
Int. Cl.[4] H04L *27/12, 27/20*
U.S. Cl. 332—100 **7 Claims**



1. In a continuous phase shift modulation system wherein a sequence of binary data bits is converted into a waveform having an in-phase component and a quadrature component, each of said components comprising a carrier frequency modulated by half-cosine pulses of polarity determined by the value of alternate bits in the sequence and wherein at any given time the vector sum of the in-phase and quadrature components equals a constant value, the method comprising the steps of:

(a) determining in advance for each component whether successive pulses are to have the same or different polarity;

(b) if successive pulses in a component are to have the same polarity, providing a continuous transition modulation signal between the successive pulses in place of adjacent portions of the successive half-cosine pulses, said continuous transition modulation signal being a signal in the form of the preceding cosine segment inverted and biased to maintain continuity of the waveform and its first derivative; and

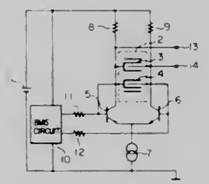
(c) adjusting the modulation signal of the other component during the time of the continuous transition modulation signal to maintain constant the vector sum of the component signals.

4,897,621

OSCILLATOR USING A PIEZO-ELECTRIC DEVICE

Youichi Masuda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 21, 1989, Ser. No. 312,557
Claims priority, application Japan, Feb. 27, 1988, 63-45666
Int. Cl.[4] H03B *5/32*
U.S. Cl. 331—107 A **15 Claims**



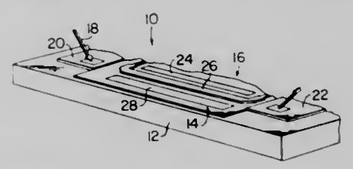
1. An oscillator using a piezo-electric device wherein a differential amplifier circuit is constituted by connecting collectors of first and second transistors to one terminal of a DC power source respectively through first and second resistors, emitters of said first and second transistors to the other terminal of said DC power source through a common first current-source, and bases of said first and second transistors to a bias circuit for applying a bias voltage, at least one port of a piezo-electric device having at least two ports on a single substrate is connected between said collectors of said first and second transistors, and the remaining port is connected between said bases of said first and second transistors.

4,897,622

SINGLE SIDEBAND WAVEGUIDE MODULATOR

Peter K. Cheo, Waterford, and Gerald Meltz, Avon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,291
Int. Cl.[4] G02B *6/12, 5/14;* **H01S** *3/00*
U.S. Cl. 330—4.3 **14 Claims**



1. A planar electro-optic modulator for modulating an infrared laser signal with a microwave signal to generate signals in a single frequency sideband, said modulator comprising:

a single mode thin film optical waveguide structure including a laser signal guide region and having a first major surface with optical coupling means disposed thereon at opposite ends of said guide region, said laser signal guide region providing guided propagation therethrough of the laser signal presented to said coupling means; and

a microstrip electrode means having a plurality of electrodes configured on said first major surface and an electrode

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configured on a second major surface displaced from said first major surface in register with said guide region and having launching electrodes at each end of said microstrip electrode means for coupling microwave signals to said laser signal guide region;

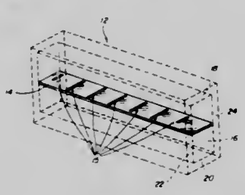
said waveguide structure and said microstrip electrode means configured to launch only circularly polarized and laterally confined laser signals and microwave signals, respectively, said waveguide structure further configured so that each of said circularly polarized laser and microwave signals that propagate along said guide region are characterized by phase velocities approximately equal in magnitude.

4,897,623

NON-CONTACTING PRINTED CIRCUIT WAVEGUIDE ELEMENTS

John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1988, Ser. No. 181,126
Int. Cl.[4] H01P *1/207*
U.S. Cl. 333—208 **15 Claims**



1. A printed circuit waveguide circuit element for a waveguide having first and second broadwalls and first and second narrow walls comprising:

means for filtering signals propagated in said waveguide in a dominant waveguide propagation mode, said means for filtering comprising:

a dielectric substrate having a surface plane that is oriented parallel to said waveguide narrow walls;

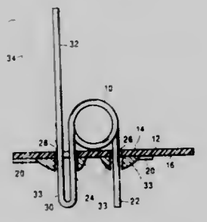
a plurality of conductive elements lying in said surface plane of said dielectric substrate, there being no conductive contact between said conductive elements and said first and second waveguide broadwalls or said waveguide first and second narrow walls.

4,897,624

UNITARY CAPACITANCE TRIMMER

Leroy S. Wignot, and Robert P. Parker, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Feb. 23, 1989, Ser. No. 320,257
Int. Cl.[4] H03J *3/20*
U.S. Cl. 334—80 **10 Claims**



1. An electronic device comprising:

an electronic component,

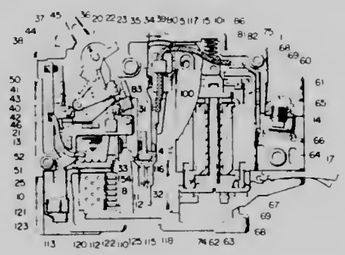
at least two electrically conductive leads emanating from said component in respective predetermined directions for electrical coupling of said component to external circuitry, said leads being extendable in a first direction through apertures disposed in a printed circuit board for securing electrical connection of the component to printed circuit conductors disposed on a surface of the printed circuit board, at least one of said leads being bent back in approximately a 180 degree reversal of direction and having a lead portion extending in a second direction opposite to said first direction back through the respective aperture of the printed circuit board, said lead portion being unsecured above the printed circuit board and positionally adjustable with respect to the component for providing one plate of an adjustable capacitive coupling to an other element.

4,897,625

REMOTELY CONTROLLABLE CIRCUIT BREAKER

Youichi Yokoyama, Amagasaki; Hideya Kondo, Hirakata; Youichi Kunimoto, Osaka, and Manabu Yano, Shijyonawate, all of Japan, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 9, 1989, Ser. No. 295,315
Claims priority, application Japan, Jun. 9, 1988, 63-142556
Int. Cl.[4] H01H *75/00*
U.S. Cl. 335—14 **6 Claims**



1. A remotely controllable circuit breaker comprising:

a housing;

a breaker contact comprising first and second movable contacts;

a first contact arm carrying said first movable contact and movable between an OFF position and an ON position;

a second contact arm carrying at its end said second movable contact for contact with said first movable contact in said ON position, said second contact arm extending along said first contact arm in generally parallel relation thereto;

a switching mechanism for opening and closing said breaker contacts, said switching mechanism including a manual handle connected to move said first contact arm between said OFF position and said ON position, said switching mechanism further including trip means acting to forcibly move said first contact arm toward its OFF position from its ON position upon the occurrence of an overcurrent flowing through the circuit of the breaker;

and L-shaped actuator having a horizontal member and a vertical member and carrying on its vertical member said second contact arm, said actuator pivotally supported in the housing at a portion adjacent the connection between said horizontal member and vertical member for pivotal movement between an operative position where the second contact is allowed to be in contact with said first contact in said ON position and an inoperative position where said second contact is away from said first contact;

an electromagnet with an axially movable plunger and energizeable by a remote control signal for driving said plunger in its axial direction, said plunger being operatively connected to said horizontal member of the L-shaped armature so as to move the second contact arm between said operative and inoperative positions upon the energization and deenergization of said electromagnet, said electromagnet having length and width dimensions which are respectively parallel to and perpendicular to the axial direction of said plunger;

said electromagnet disposed in said housing in side-by-side relation to said switching mechanism with said first and second contact arms interposed therebetween;

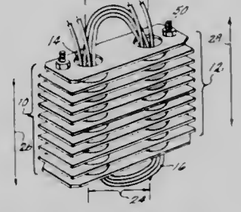
said L-shaped actuator being disposed in proximity to said electromagnet with its horizontal member extending over the width of said electromagnet and with its vertical member extending over the length of said electromagnet such that said horizontal member and vertical member have their substantial portions, respectively, within the width and length dimensions of said electromagnet.

4,897,626

COOLING ELECTROMAGNETIC DEVICES

Johan C. Fitter, 51 Mount Street, Bryanston, Transvaal, South Africa

Filed Oct. 28, 1988, Ser. No. 264,665
Claims priority, application South Africa, Oct. 28, 1987, 87/8086
Int. Cl.[4] H01F *27/08, 17/06*
U.S. Cl. 336—61 **8 Claims**



1. An electromagnetic device comprising:

at least one electrically conductive winding;

at least two elongate tubular magnetic frames disposed side by side and substantially enclosing said at least one electrically conductive winding;

each frame comprising a plurality of substantially toroidal core sections which are stacked end to end, a portion of said electrically conductive winding extending through each of said core sections, and defining a magnetic flux path having a length which is less than the length of the portion of said electrically conductive winding enclosed thereby; and

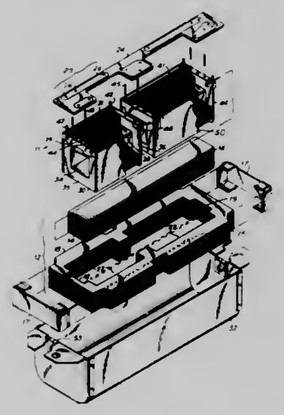
at least one common heat dissipation element located between adjacent core sections in each of said frames, said element in common with each of said frames and extending therebetween, and further extending transversely beyond said core sections.

4,897,627

FLUORESCENT BALLAST ASSEMBLY INCLUDING A STRIP CIRCUIT BOARD

Raymond H. Van Wagoner, Darien, Conn.; Robert A. Kulka, Livingston, N.J.; Frederick P. Bauer, Mendenhall, Miss., and Leonard J. Kargan, Lambertos, N.C., assignors to Magnetek Universal Mfg. Corp., Paterson, N.J.

Continuation-in-part of Ser. No. 122,577, Nov. 16, 1987, Pat. No. 4,766,406, which is a continuation of Ser. No. 39,780, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 747,353, Jun. 21, 1985, abandoned. This application Jun. 21, 1988, Ser. No. 209,437
Int. Cl.[4] H01F *15/02, 15/10*
U.S. Cl. 336—65 **7 Claims**



1. A fluorescent lamp ballast comprising:

a first bobbin, the bobbin having a central longitudinal opening extending from a substantially planar flange at one end of the bobbin to a second substantially planar flange at the other end of the bobbin;

a second bobbin, the second bobbin also having a central longitudinal opening extending from a substantially planar flange at one end of the second bobbin to a second substantially planar flange at the other end of the second bobbin, with one flange of each of the first and second bobbins disposed adjacent the other so that the central longitudinal opening of the first and second bobbins are substantially aligned;

a magnetic core having at least a first portion inside the aligned bobbin central openings, and second and third portions disposed on opposite sides of the bobbin;

each bobbin flange having a plurality of holes extending inwardly from an outer flange edge on a side of the respective bobbin without said second or third magnetic core portions disposed thereon;

a primary coil wound on one of the bobbins, and a lag coil wound on the other bobbin, the coils having starts, taps and finishes;

conductive pins partially inserted into a number of the flange edge holes, each of the pins being electrically coupled to one of the coil starts, taps and finishes; and,

a planar elongated strip circuit board whose length and width dimensions are approximately the same as that of the first and second bobbins positioned end to end, the circuit board having a predetermined pattern of holes therethrough, the holes being electrically coupled in a predetermined pattern by conductive metal strips on a first side of an insulating support, each hole having an end of the conductive metal strips disposed therein and on a second side of said insulating support to provide the only mechanical attachment of said strips to said support, for

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providing continuous conductive contact through the hole, the strip circuit board being substantially perpendicular to and in contact with each of the conductive pin bearing flange edges, each of the conductive pins extending through one of the holes through the strip circuit board and also being electrically coupled to the strip circuit board conductive strip in and adjacent to the hole through which each respective conductive pin passes.

4,897,628

GAS SENSOR AND METHOD OF MANUFACTURING THE SAME

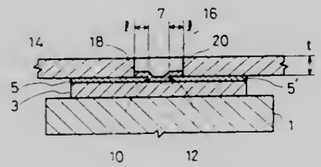
Masamichi Ippommatsu, Hyogo; Takeshi Matsumoto, Osaka; Shingo Yakushiji, Osaka; Katsuyuki Kuroki, Osaka, and Takashi Matsuzaka, Shizuoka, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Nov. 5, 1987, Ser. No. 116,986

Claims priority, application Japan, Nov. 5, 1986, 61-170831[U]; Mar. 18, 1987, 62-64834

Int. Cl.⁴ H01L *7/00*

U.S. Cl. 338—34 **7 Claims**



1. A gas sensor comprising a thin film of an n-type metal oxide conductor which changes resistivity according to the gas species detected, and an insulting film on a surface of said thin film, wherein the oxide film insulator contains one or more oxides selected from the group consisting of SiO_2, MnO_2, MNO and V_2O_5.

4,897,629

ELECTRICAL CONTROL DEVICE

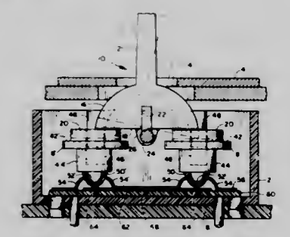
Thomas H. Lecklider, Saffron Walden, England, assignor to Gould Electronics Limited, London, England

Filed Apr. 4, 1988, Ser. No. 176,912

Claims priority, application United Kingdom, Apr. 6, 1987, 8708165; May 29, 1987, 8712662

Int. Cl.⁴ H01C *10/16, 10/10*

U.S. Cl. 338—128 **4 Claims**



1. An electrical control apparatus, comprising:

a substrate

a continuous resistive track positioned on said substrate;

a first electrical terminal connected to said continuous resistive track;

a second electrical terminal connected to said continuous resistive track;

a deformable curved member bridging a portion of said continuous resistive track and supported by said substrate;

a deformable conductive member supported by said deformable curved member and curved oppositely to said deformable curved member; and

means connected to said deformable conductive member, for transmitting a force to said deformable conductive member to bring said deformable conductive member into contact with said continuous resistive track and for varying the electrical impedance between said first terminal and said second terminal in a manner related to the amount of force supplied to said deformable curved member.

4,897,630

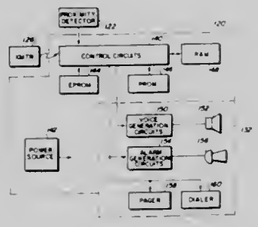
PROGRAMMABLE ALARM SYSTEM HAVING PROXIMITY DETECTION WITH VOCAL ALARM AND REPORTING FEATURES

Michael Nykerk, Encino, Calif., assignor to Electronic Security Products of California, Inc., Reseda, Calif.

Continuation-in-part of Ser. No. 5,873, Jan. 21, 1987, Pat. No. 4,794,368. This application Oct. 21, 1988, Ser. No. 260,933

Int. Cl.⁴ B60R *25/10;* **B60Q** *1/00*

U.S. Cl. 340—426 **23 Claims**



20. An improved alarm system, said alarm system including a proximity detector for detecting the presence of a body mass within a prescribed distance thereof, and synthetic speech means for issuing a vocal alarm, the improvement comprising:

(a) means for monitoring the proximity detector to determine if a body mass has entered within said prescribed distance;

(b) means for issuing a first vocal warning with said synthetic speech means in the event that the monitoring means determines that a body mass has entered within the prescribed distance; and

(c) means for triggering an audible alarm with said synthetic speech means in the event that the monitoring means determines that the body mass remains within the prescribed distance at the conclusion of a prescribed time period subsequent to the issuance of the first vocal warning.

4,897,631

CONTROL APPARATUS

Werner Jundt, Ludwigsburg, and Wolfgang Kosak, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,909

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714194

Int. Cl.⁴ B60Q *1/00;* **G11C** *7/00*

U.S. Cl. 340—438 **3 Claims**

1. A control apparatus such as for an internal combustion engine in a motor vehicle, the control apparatus comprising:

said control apparatus having a plurality of connecting terminals for accommodating a plurality of functions;

voltage supply means for supplying a voltage to a first one of said terminals;

switching means for connecting and disconnecting said voltage to and from said first one of said terminals of said control apparatus;

a circuit component for performing one of said functions, said circuit component being connected between a second one of said terminals and said voltage supply means so as to cause a voltage to be applied to said second terminal;



a memory for storing information therein which should not be lost when said switching means is actuated to disconnect the voltage from said control apparatus at said first terminal; and,

circuit means connected between said second terminal and said memory for supplying the voltage on said second terminal to said memory when said switching means is actuated to disconnect said voltage on said first one of said terminals from said control apparatus thereby preventing the information in said memory from becoming lost.

4,897,632

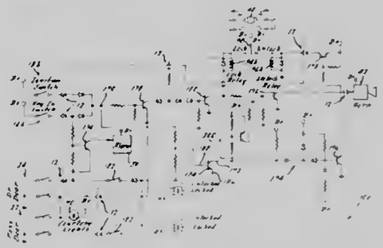
POWER DOOR LOCK INTERLOCK CIRCUIT

Darryl A. Hock, Harper Woods, and David L. Kaleita, Hamtramck, both of Mich., assignors to Jabil Circuit Company, Madison Heights, Mich.

Division of Ser. No. 10,418, Feb. 2, 1987, Pat. No. 4,789,851. This application Jun. 24, 1988, Ser. No. 211,340

Int. Cl.⁴ B60Q *5/00*

U.S. Cl. 340—457 **3 Claims**



1. A power door lock interlock circuit for use in a vehicle having a power door lock actuator with mechanism responsive to said actuator and operable between locked and unlocked positions, a horn, an ignition key sensing means for providing an indication when the ignition key is in the ignition, at least one door sensing means for providing an indication of the open and closed status of said door, and at least one manually actuable door lock operator operable between locked and unlocked positions, comprising:

a first transistor having a base coupleable to said ignition key sensing means, having a first lead coupleable to said power door lock mechanism and having a second lead;

at least one switch coupled to said second lead of said first transistor and responsive to said manually actuable door lock operator for providing an electrical indication of the locked and unlocked status of said operator;

said switch being further coupleable to said door sensing means;

a second transistor means responsive to said first transistor and coupled to said power door lock mechanism for causing said power door lock mechanism to go to the unlocked position when the key is in the ignition and a vehicle door is open and said manually actuable door lock operator is actuated to the locked position.

4,897,633

LIGHTING DEVICE FOR ILLUMINATING SWITCH ARRANGEMENT ON MOTOR VEHICLE STEERING WHEELS

Fumiyoshi Kuwano, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 19, 1987, Ser. No. 123,273

Claims priority, application Japan, Nov. 22, 1986, 61-279512

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—458 **2 Claims**



1. A lighting device for a switch arrangement mounted on an automotive steering wheel, comprising:

an electrically operable load powered at a predetermined first level of power supplied through a power supply circuit;

a first switch mounted on a steering wheel assembly and disposed within said power supply circuit, for commanding operation of said electric load when the first switch is manually operated;

a lighting element mounted on said steering wheel assembly and associated with said first switch for lighting the first switch when the lighting element is illuminated, said lighting element being illuminated at a predetermined second level of power which is lower than said first level of power;

a second switch for commanding lighting of said lighting element of illuminating said first switch;

a first power source of said power supply circuit for supplying said first level of power;

a second power source of said power supply circuit for supplying said second level of power and;

a common electric coupling means associated with said steering wheel assembly and commonly connected to said first and said second switches and said first and said second power sources, for supplying said second level of power to said lighting element upon said second switching operation and supplying said first level of power to said load when said first switch is operated.

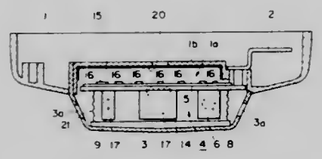
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4,897,634

SCATTERED-LIGHT SMOKE DETECTOR WITH A SHIELDING STRUCTURE OF DETECTOR CIRCUITS

Hiroshi Sawa, Machida; Atsushi Miyabe, Yokohama; Hironobu Kawai, Sagamihara, and Hiroshi Honma, Hino, all of Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,836
Claims priority, application Japan, Dec. 26, 1986, 61-310820
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—630 **7 Claims**



1. A scattered-light smoke detector comprising:
a smoke detecting sectioo including a planar base and a surrounding wall extending downwardly from a lower surface of said base and having at least one opening allowing smoke to enter therethrough, said surrounding wall defining a smoke detecting space therein;
a light emitting element and a photodetector element disposed at positions where they are not opposite each other and optical axes thereof intersect each other at a predetermined angle and said photodetector element can recieve light from the light emitting element scattered by smoke entering said smoke detecting space;
a printed circuit board attached on an upper surface of said base;
a shield layer interposed between said printed circuit board and said base, said shield layer comprising an electrically conductive material on a lower surface of said printed circuit board;
electrical parts formed in chips and packaged on an upper surface of the printed circuit board; said light emitting element and said photodetector element as well as said electrical parts passing through said base and said printed circuit board and being connected on an upper surface of said printed circuit board and
a shield case disposed so that it covers said electrical parts;
said electrically conductive material being flat on the lower surface of said printed circuit board; said shield layer being an electrically-conductive metal plate; said shield case comprising an electrically-conductive material coating on the inner surface of said case; a casing for accommodating therein a capacitor operating as a detecting circuit together with said electrical parts, said casing being located within said smoke detecting space at a side of said light emitting element and a side of said photodetector element, said casing being spaced from the optical axis of said light emitting element and from the optical axis of said photodetector element; said surrounding wall being formed by a plurality of substantially L-shaped wall elements and said casing, said L-shaped wall elements being arranged circumferentially at predetermined intervals.

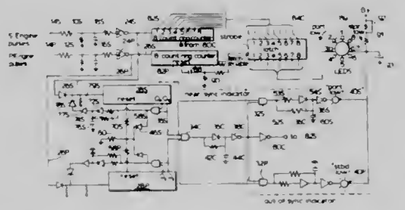
4,897,635

ROTARY DEVICE SYNCHRONIZER

Frederick V. Topping, 3 Kirkton Rd., Downsview, Ontario, Canada (M3H 1K6)

Filed Oct. 31, 1988, Ser. No. 264,841
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—681 **24 Claims**

1. Synchronization indicator for a pair of rotating devices comprising:
a predetermined number of sensible elements having ON and OFF states arranged in succession to provide a progressive indication,
means for deriving from each device a series of pulses at a rate proportional to its rotation rate,
a latch having a predetermined number of inputs and corresponding outputs connected respectively to said sensible elements,
means responsive to one series of pulses to cyclically serially activate said latch inputs,



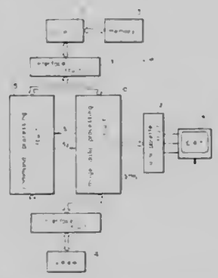
means responsive to the other series of pulses to produce a strobing pulse for every predetermined number of pulses in said series, connected to provide said strobing pulse to said latch,
said latch being designed, responsive to a strobing pulse, to connect any input then activated to the corresponding output to switch ON the connected sensible element.

4,897,636

VIDEO DISPLAY CONTROL SYSTEM FOR MOVING DISPLAY IMAGES

Kazuhiko Nishi; Takatoshi Ishii; Ryozo Yamashita, all of Tokyo; Shigemitsu Yamaoka, Hamamatsu; Takatoshi Okumura, Hamamatsu, and Misoru Morimoto, Hamamatsu, all of Japan, assignors to ASCII Corporation, Tokyo and Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, both of, Japan

Continuation of Ser. No. 721,059, Apr. 8, 1985, abandoned. This application Dec. 21, 1987, Ser. No. 139,170
Claims priority, application Japan, Apr. 10, 1984, 59-71593; Apr. 12, 1984, 59-73586; Apr. 12, 1984, 59-73587; May 25, 1984, 59-106090; May 25, 1984, 59-106091
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—724 **14 Claims**



1. In a video display control system including memory means having a storage area including a plurality of memory locations for storing a plurality of display data, and adapted to be connected to a video display unit for displaying on a screen of the video display unit, an image composed of a plurality of display elements each represented by a respective one of the plurality of display data stored in the storage area of the memory means, the video display control system comprising:
(a) first register means for storing first area information representative of a first display area on the screen;
(b) second register means for storing second area information representative of a second display area of the screen;
(c) address information generator means for generating first and second address information in accordance with said first and said second area information, respectively, said first address information indicative of first memory locations of the memory means in which display data representative of images of display elements in said first display area are stored, and said second address information indicative of second memory locations of the memory means in which display data representative of images of display elements in said second display area are stored;
(d) first reading means for reading, in accordance with said first address information, said display data representative of images of the display elements in said first display area from said first memory locations;
(e) second reading means for reading, in accordance with said second address information, said display data representative of the display elements in said second display area from said second memory locations;
(f) logical operation means for effecting a logical operation between said display data read from said first memory locations and a corresponding one of said display data read from said second memory locations to produce logically operated display data, said logical operation being an operation from the group consisting of AND, OR, NOT, EXCLUSIVE OR, or transparency processing; and
(g) writing means for writing, in accordance with said second address information, said operated display data read by said reading means into said second memory locations of said memory means.

4,897,637

DISPLAY CONTROLLER

Hiroshi Kobayashi; Takeshi Shibasaki, and Shinji Suda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,466
Claims priority, application Japan, Apr. 11, 1986, 61-84721
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—734 **13 Claims**



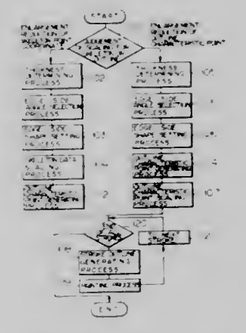
1. A display controller comprising
a first ROM for storing fixed data to be displayed on a fixed data area of a display device,
a RAM, for storing variable data to be displayed on a variable data area of said display device, said first ROM producing an output data for providing controlling addresses to said RAM,
a second ROM that, under control of data from a preselected one of said first ROM and said RAM, outputs display pattern data to be displayed on said display device, and
an output circuit that latches the display pattern data of said second ROM and sends it to the display device at a predetermined timing.

4,897,638

METHOD FOR GENERATING CHARACTER PATTERNS WITH CONTROLLED SIZE AND THICKNESS

Motohide Kokunishi; Tetsuzou Uehara, both of Tokyo; Satoru Sakamoto, Ome, and Mamoru Tada, Kadaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,062
Claims priority, application Japan, Feb. 27, 1987, 62-42553; Mar. 6, 1987, 62-50031
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—751 **35 Claims**



1. A method of generating character patterns for display on a display device, each character pattern being made up of a plurality of strokes, said method comprising the steps of:
(a) storing in a memory device stroke data representative of the positions of a plurality of skeleton points for each of the strokes making up a first character pattern and thickness data representative of the thickness of each of said strokes of said first character pattern, said plurality of strokes of said first character pattern constituting a first stroke group;
(b) designating a first scaling factor representative of the size of the character pattern to be generated in relation to the size of said first character pattern;
(c) determining the positions of skeleton points of a plurality of modified strokes in accordance with the first scaling factor and the positions of the skeleton points for each of the strokes of the first stroke group, the modified strokes making up a modified character pattern obtained by scaling said first character pattern by said first scaling factor and constituting a second stroke group;
(d) determining the thickness of said modified strokes by scaling the thickness of each of the strokes of said first character pattern by a second scaling factor different from said first scaling factor;
(e) generating an outline of each stroke of said second stroke group in accordance with the skeleton points and the thickness determined for said modified strokes to generate an outline of the character pattern; and
(f) painting the inside of the generated outline to produce the generated character pattern.

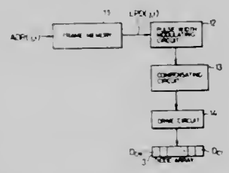
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IMAGE FORMING METHOD AND APPARATUS

Toshikiyo Kanayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1988, Ser. No. 199,840
Claims priority, application Japan, Apr. 30, 1987, 62-104494
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—812 **5 Claims**



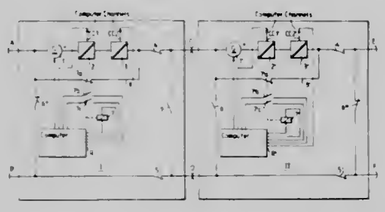
1. An image-forming apparatus comprising:
a plurality of arrays of light-emitting diodes, each of said arrays of light-emitting diodes being arranged in a first direction, said arrays being parallel to one another and facing a light sensitive material;
a plurality of lenses, one lens for each of said arrays, interposed between one of said arrays and said light sensitive material;
frame memory means for storing contrast data for each of said light emitting diodes in said arrays;
pulse width modulating means receiving said contrast data from said frame memory means and generating pulse signals with durations proportional to said contrast data;
compensating means receiving said pulse signals and adjusting the duration of said pulse signals in accordance with compensating data; and
drive means for supplying current to each of said light emitting diodes of said arrays in accordance with the output of said compensating means.

4,897,640

METHOD AND ELECTRICAL CIRCUIT FOR THE RELIABLE DETECTION OF PROCESS STATES WITHIN FREELY COUPLABLE UNITS

Klaus Rapoen, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 189,175
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714960
Int. Cl.⁴ G05B *23/02*; B60L *15/42*
U.S. Cl. 340—825.160 **14 Claims**



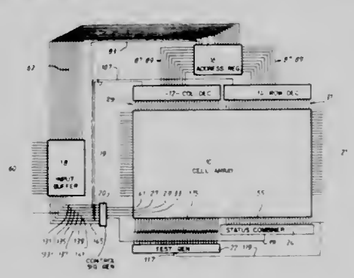
1. An arrangement for monitoring states of a process within freely couplable units, comprising:
a plurality of internal signal current loops, at least a corresponding one of which is internal to each of the units, each loop including a controllable current source and at least associated current detectors and series connected switches actuated by the process;
means for opening said internal signal current loops when the units are coupled together, and forming a closed common signal current loop passing through all of the coupled units, said common loop having the series connected switches and current sources therein and having the current detectors therein, so as to be actuated by the process;
a plurality of subloops, each subloop corresponding to one of said controllable current sources and bridging the current source and associated current detectors, each subloop having switch means for actuating the subloop so that the subloop current in the subloop is defined by the respective current source; and
means for monitoring said switch means, said monitoring means including means, having additional, position specific current loops, for monitoring said switch means by predetermined tests employing said additional, position specific current loops.

4,897,641

SPACE SWITCH

Albert B. James, Mooroolbark, Australia, assignor to Pascom Pty. Ltd., Mitcham, Australia

Filed Nov. 18, 1987, Ser. No. 122,226
Claims priority, application Australia, Dec. 4, 1986, PH09328
Int. Cl.⁴ H04Q *11/04*
U.S. Cl. 340—825.790 **2 Claims**



1. A space switch comprising an array of cells which are interconnected with one another, each cell having transmission means for allowing a signal to pass from an input into the cell to an output from the cell and actuating means for selectively actuating the transmission means to enable a signal to pass from the input to the output, said transmission means comprising a transmission gate and the actuating means comprising a latch which is coupled to the transmission gate for actuating the transmission gate to cause a signal to pass from the input to the output, selecting means for selecting one or more of said cells and for causing said actuating means in said one or more of said cells to actuate said transmission means in said one or more of said cells to enable a signal to pass from the input to the output such that said selecting means can select an appropriate cell or cells to cause said actuating means to actuate the transmission means so that any one input to said array of cells can be directed to any one of said cells and outputted to any one of said outputs; said cell further including gate means coupled to said actuating means, said gate means receiving signals from said selecting means and producing an output to said actuating means; said space switch also having input means for receiving input signals from an input device, said input means being coupled to said selecting means and also to a control signal generator means, said input means causing said selecting means to output at least one row signal and at least one column signal to select the appropriate cell or cells, and said control signal generator means outputting a read signal, a write signal, status review signal and a reset signal, said status review signal being applied to said actuating means, said write signal being applied to said gate means, and said reset signal being applied to said actuating means, and further comprising a circuit means, said

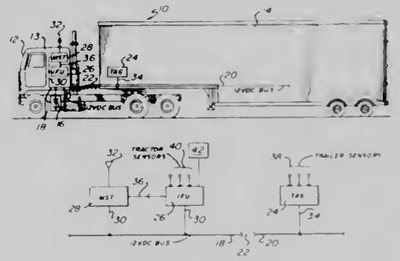
read signal together with said row signal and column signal being applied to said circuit means for generating an enable signal and a status line signal, said circuit means also receiving an output from said actuating means which is also applied to said transmission gate, said circuit means having its status line signals coupled to a status combiner for combining all of the status signals from the cells into a single status signal and said status combiner being coupled to said control signal generator means for providing said combined status signal to said control signal generator means.

4,897,642

VEHICLE STATUS MONITOR AND MANAGEMENT SYSTEM EMPLOYING SATELLITE COMMUNICATION

Joseph V. DiLallo, Rydal; Stephan C. Schifter, Philadelphia, both of Pa.; Michael Negin, Pennsauken, N.J., and Kenneth W. Paist, Philadelphia, Pa., assignors to Secura Corporation, Bala Cynwyd, Pa.

Filed Oct. 14, 1988, Ser. No. 258,162
Int. Cl.⁴ H04B *1/00*; G08B *5/22*
U.S. Cl. 340—825.060 **35 Claims**



1. Status monitoring apparatus for a vehicle having at least first and second parts comprising:
(a) a tag for placement on the second part of the vehicle, the tag providing signals containing a unique ID code when the second part of the vehicle is coupled to the first part of the vehicle; and
(b) an interface unit (IFU) for placement in the first part of the vehicle for detecting the presence of a valid ID code from the tag and for providing a status indication that the second part is connected when a valid ID code is detected and that the second part is disconnected when a valid ID code is not detected, the IFU having means for providing the status indication, and the ID code when a valid ID code has been detected, to a mobile satellite transmitter (MST) on the vehicle.

4,897,643

VEHICULAR ELECTRONIC EQUIPMENT WITH DOOR LOCK AND SIDE WINDOW ANTENNA

Mineharu Shibata, Ohtake, and Tatsuaki Taniguchi, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 4, 1987, Ser. No. 81,660
Claims priority, application Japan, Aug. 11, 1986, 61-186992; Aug. 11, 1986, 61-186993; Aug. 11, 1986, 61-186994
Int. Cl.⁴ G08C *13/00*
U.S. Cl. 340—825.69 **23 Claims**

1. Remote wireless controlled vehicular electronic system, comprising:
receiving means provided in a vehicle body for receiving control information transmitted from outside the vehicle through an antenna located in the vicinity of the lower edge of the door window glass; and
controlling means for controlling vehicular accessory apparatus according to control information received by the receiving means; and
wherein the said antenna is located approximately parallel to the sill of the door window and one end thereof is formed for an interface contact;
said controlling means including switching means and being coupled to provide a control signal to actuator means to open and close a switch between the antenna interface contact and an interface contact provided on said controlling means according to whether the window glass is moving or not moving; and
said antenna that received the control information being configured and positioned to limit any obstruction of visibility.

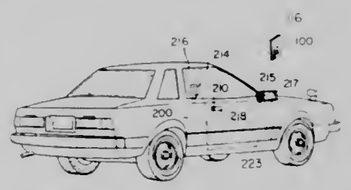


4,897,644

RADIO-WAVE TRANSMISSION SYSTEM OF KEYLESS ENTRY SYSTEM FOR AUTOMOTIVE VEHICLE DEVICES

Motoki Hirano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 651,784, Sep. 18, 1984, abandoned. This application Sep. 3, 1987, Ser. No. 94,073
Claims priority, application Japan, Sep. 19, 1983, 58-172683
Int. Cl.⁴ G06F *7/04*
U.S. Cl. 340—825.310 **6 Claims**



1. A keyless entry system for an automotive vehicle for operating one of a plurality of vehicle devices including a door lock device which is selectively operated to either of a first locked position and a second unlocked position, comprising:
a plurality of electrical actuators respectively associated with the corresponding vehicle devices and responsive to a control signal to operate said corresponding vehicle device to desired position, which includes a door lock actuator for operating said door lock device between said first locked position and said second unlocked position;
a plurality of manual switches, each operating one of the corresponding vehicle devices;
a transmitter outputting a radio signal indicative of a unique code which identifies the transmitter when one of said manual switches is manually operated;
a first antenna associated with said transmitter for transmitting said ratio signal therethrough;

a controller for receiving said radio signal from said transmitter, comparing the unique code indicated by said radio signal with a preset code, and producing said control signal when said unique code matches said preset code, said controller including means responsive to manual operation of said one of said manual switches for identifying one of said actuators to be operated and operating said identified actuator for operating one of the vehicle devices corresponding to the manual switch operated; and

a plurality of sets of second and third antennas, each set corresponding to each of said manual switches and each set connected to said controller for receiving said radio signal therethrough when one of said manual switches corresponding thereto is operated, said each set of second and third antennas being oriented perpendicular to each other, in which said second antenna of a given pair corresponding to said door lock actuator is mounted on a vehicular side door window and said third antenna of said given pair is mounted on a reflector surface of a vehicular door mirror, which reflector surface extends substantially perpendicular to said vehicular side door window.

4,897,645

BROADBAND SIGNAL SWITCHING EQUIPMENT

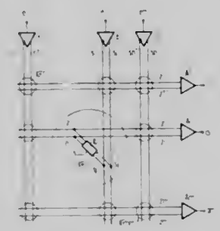
Ruediger Hofmann, Gilching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 103,909

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634154

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.910 **7 Claims**



1. In a broadband signal switching matrix for use with a digital signal input circuit having a plurality of differential output pairs, a digital output circuit having a plurality of differential input pairs, a switching signal source which generates a switching signal having a period, and a voltage source having first and second terminals, said switching matrix forming a plurality of input lines each consisting of first and second signal conductors respectively connected to the outputs of an output pair of said input circuit and a plurality of output lines each consisting of first and second signal conductors respectively connected to the inputs of an input pair of said output circuit, said matrix having a plurality of crosspoints at which an input line and an output line are selectively coupleable in response to a signal from said switching signal source, the improvement comprising:

a plurality of amplifiers in said output circuit operable in a trigger mode, each amplifier being connected to said voltage source and having two inputs forming the respective input pairs of said output circuit;

a plurality of pre-charging transistors each having a controlled path connecting one of said signal conductors of an output line to said first terminal of said voltage source, and having a control electrode;

a sampling transistor having a controlled path connected to said second terminal of said voltage source and a control electrode;

selection clock means for providing clock signals to the respective control electrodes of said plurality of pre-charging transistors and to the control electrode of said sampling transistor to oppositely switch said pre-charging transistors and said sampling transistor, said clock signals each having a period coextensive with said switching signal period and divided into a pre-charge phase followed by a switching phase; and

at each crosspoint of said matrix,

a first switching transistor having a controlled path connected to the first signal conductor of the output line at the crosspoint, and a control electrode connected to said switching signal source;

a first auxiliary transistor having a controlled path connected in series with said controlled path of said first switching transistor and connected to said controlled path of said sampling transistor, and having a control electrode connected to the first signal conductor of the input line at the crosspoint;

a second switching transistor having a controlled path connected to the second signal conductor of the output line at the crosspoint, and control electrode connected to said switching signal source; and

a second auxiliary transistor having a controlled path connected in series with said controlled path of said second switching transistor and connected to said controlled path of said sampling transistor, and having a control electrode connected to the second signal conductor of the input line at the crosspoint,

said pre-charge phase of said clock signal being of a level so that, during said pre-charge phase, said sampling transistor is non-conducting and said pre-charging transistor are conducting so that said first and second signal conductors of the output line at said crosspoint are charged substantially to the voltage at said first terminal of said voltage source.

4,897,646

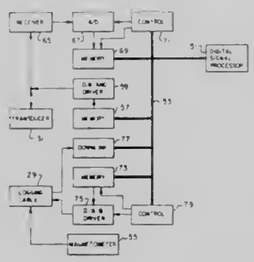
METHOD AND APPARATUS FOR REDUCING THE EFFECTIVE BANDWIDTH OF ULTRASONIC WAVEFORM FOR TRANSMISSION OVER A LOGGING CABLE

William P. Goodwill, and Donald G. Kyle, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1988, Ser. No. 291,525

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—853 **9 Claims**



1. A method of transmitting a waveform over a cable, said cable having a limited bandwidth, said waveform derived from an acoustic return from an ultrasonic logging apparatus operating in a well borehole, said ultrasonic logging apparatus generating an acoustic waveform at periodic intervals of time and receiving a respective acoustic return from the respective generated acoustic waveform, each of said acoustic returns being received in a first portion of said respective time intervals between said generated acoustic waveforms, said acoustic return having frequencies higher than said cable bandwidth, comprising the steps of:

(a) providing storage means for storing said acoustic returns, said storage means located in said ultrasonic apparatus;

(b) receiving said acoustic return in real time, and storing said acoustic return in said storage means;

(c) transmitting said stored acoustic return from said storage means over said cable at a rate of time which is slower than real time so as to effectively lower the high frequencies of said acoustic return to within said cable bandwidth, wherein said transmitted acoustic return is an analog waveform which is representative of said real time acoustic return and which has frequencies within said cable bandwidth.

4,897,647

METHOD FOR ABSOLUTE POSITION DETECTION AND AN APPARATUS THEREFORE

Keiji Sakamoto, and Akihito Nakayama, both of Hachioji, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

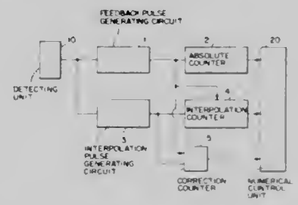
PCT No. PCT/JP88/00177, § 371 Date Sep. 13, 1988, § 102(e) Date Sep. 13, 1988, PCT Pub. No. WO88/06277, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 19, 1988, Ser. No. 251,377

Claims priority, application Japan, Feb. 21, 1987, 62-36887

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 340—870.190 **12 Claims**



1. A method for absolute position detection comprising steps of:

(a) generating a feedback pulse having a polarity corresponding to the moving direction of an object of position detection each time said object of position detection moves for a first predetermined distance;

(b) updating a stored value indicative of an approximate absolute position of said object of position detection each time said feedback pulse is generated;

(c) generating an interpolation pulse each time said object of position detection moves for a second predetermined distance shorter than said first predetermined distance;

(d) storing and retaining said stored value even after the power is turned off;

(e) counting said interpolation pulses generated during the time interval which elapses from the instant that the power is turned on again until the first one of said feedback pulses is generated, and temporarily storing the count value obtained;

(f) calculating the absolute position of said object of position detection reached when the power is turned on again, in accordance with said stored value retentively stored in said step (d), the count value of said interpolation pulses stored in said step (e), said first and second predetermined distances, and the moving direction designated by a movement command delivered when the power is turned on again.

4,897,648

ANALOG-TO-DIGITAL CONVERTER HAVING A GRAY CODE BOARD WITH THE LEAST SIGNIFICANT BIT PATTERN DISPOSED IN THE CENTER

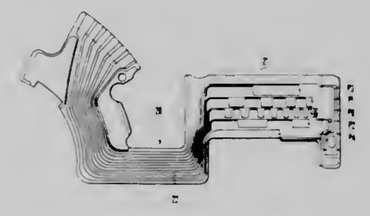
Shigeo Nakashima, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 129,973

Claims priority, application Japan, Jan. 12, 1987, 62-2614[U]

Int. Cl.[4] H03M *1/22*

U.S. Cl. 341—16 **10 Claims**



1. An analog to digital converter, comprising:

code board means comprising a Gray code pattern structure having at least three linearly-extending patterns arranged in substantially parallel rows disposed thereon, one of said three patterns which has a largest number of transition lines being arranged at a center portion of said patterns, and other patterns having smaller numbers of transition lines being arranged at positions outward from the center; and

reading means for reading said Gray code pattern structure and providing a digital output signal corresponding to said patterns.

4,897,649

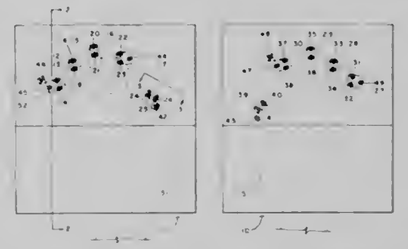
KEYBOARD FOR DATA ENTRY ON CONTROL PURPOSES

Larry R. Stucki, 1536 N. 1350 West, Provo, Utah 84604

Filed Dec. 2, 1986, Ser. No. 937,091

Int. Cl.[4] H03M *11/00;* **H03K** *17/965*

U.S. Cl. 341—22 **22 Claims**



1. A keyboard for data entry or control, comprising a base; sets of two or more keys mounted on the base, each key including a roller having a superficial touch area with the superficial touch area for each roller of a set of keys being arranged for receiving the tip of a finger of a hand of an operator thereover and configured so that a fingertip of an operator may easily move thereover, the superficial touch areas of each set being sized and clustered together whereby substantially the entire superficial touch areas of a respective set of keys are substantially simultaneously comprehended by and selectively operable by a single finger tip of an operator; and means controlled by respective keys of the sets of keys.

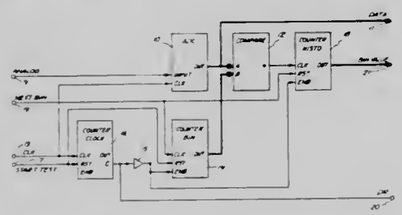
VOL 1110 ISS 5 JA 30 1990

4,897,650

SELF-CHARACTERIZING ANALOG-TO-DIGITAL CONVERTER

James T. Shott, III, and Edward B. Stokes, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 5, 1988, Ser. No. 178,045
Int. Cl.[4] H03M *1/10*
U.S. Cl. 341—120 **3 Claims**



1. An A/D converter architecture including an A/D converter and digital logic circuitry on a common chip, said A/D converter having an analog signal input for receiving a cyclically recurring test signal waveform and a digital code output, said digital logic circuitry comprising:

means for dividing the output signal of said A/D converter into a plurality of bins including bin counter means responsive to a next bin count input signal for providing a bin count output signal corresponding to a specific selectable digital value expected in said digital output code;

comparator means coupled to said A/D converter and responsive to said signal produced at the digital code output of said A/D converter and to said bin count output signal for generating an output signal for each match of said digital code output signal and said bin count output signal over a predetermined multiplicity of test signal waveform cycles; and

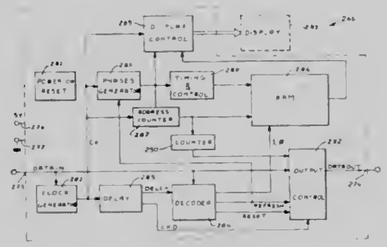
histogram counter means reset by said next bin count input signal and incremented by said output signal of said comparator means for accumulating code-density data, whereby to generate a histogram of digital codes correlated with said bins, said histogram being readable at a lower rate than a conversion rate of said A/D converter to provide dynamic characterization of said A/D converter.

4,897,651

KEY WITH SELECTIVE SYMBOL DISPLAY AND KEYBOARD USING SUCH KEY

Filippo DeMonte, Borgofranco, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 15, 1986, Ser. No. 919,137
Claims priority, application Italy, Oct. 15, 1985, 67873 A/85
Int. Cl.[4] H03K *17/00*
U.S. Cl. 341—23 **7 Claims**



1. A keyboard for a data entry system comprising a plurality of keys each one having a symbol display member having a matrix of electrically activatable terminals for displaying a matrix of areas representative of an associated symbol, and a controlling circuit for generating selection information for sequentially actuating the activatable terminals of the matrixes of said plurality of keys, wherein each display member is driven by an associated driver microcircuit and each driver microcircuit comprises:

display control circuit means connected with the activatable terminals of said display member for displaying the matrix of areas of the associated symbol;

at least an input conductor, wherein the input conductor of a first microcircuit is connected with said controlling circuit;

at least a data output conductor and an output control circuit feeding said data output conductor, wherein the input conductor of each other driver microcircuit is connected with the data output conductor of a preceeding driver microcircuit and said data output conductor is connected with a following microcircuit;

means for storing a predetermined number of selection information for the selective actuation of all the areas of the associated display; and

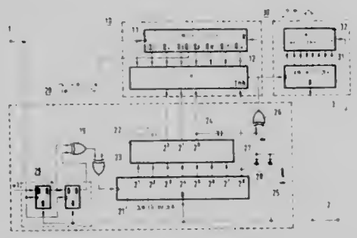
means conditioning said output control circuit for causing said output control circuit not to feed said selection information to the following driver microcircuit jointly with the storing of said predetermined number of selection information and to transmit said selection information to said following microcircuit after the storing of said predetermined number of selection information.

4,897,652

METHOD OF CODING NUMBERS IN BINARY FORM

Rémi Leon, Coatreven, France, assignor to Alcatel Cit, Paris, France

Filed Mar. 28, 1988, Ser. No. 174,470
Claims priority, application France, Mar. 27, 1987, 87 04278
Int. Cl.[4] H03M *7/34*
U.S. Cl. 341—51 **5 Claims**



2. A device for coding in binary form numbers provided in the form of a series of counting pulses using a pseudo-logarithmic compression law approximated by a curve made up of straight line segments, said device comprising:

a divider circuit with a plurality of division ratios operating on said series of counting pulses and having one output corresponding to a division ratio of 2^n and another output corresponding to a variable division ratio selected from powers of 4 corresponding to the rank numbers of the segments of the compression law as counted from the origin, the first segment having the rank number 0,

a synchronization and selector circuit for determining, by counting packets of 2^n counting pulses sent by the divider circuit and by registering when the number of said packets crosses a threshold 2^i-1 where i is an integer between 1 and n, when lower thresholds of subranges corresponding to the segments of the compression law curve with rank number i are crossed and for commanding said divider circuit to select a division ratio corresponding to the ith power of 4 and which resynchronizes said divider circuit after a subrange lower threshold has been crossed, and

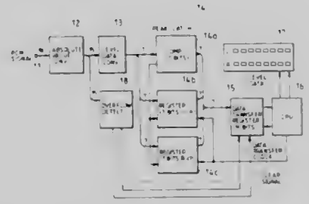
an n+1 stage counter circuit for counting pulses delivered by the variable division ratio output of said divider circuit and for providing a count which gives the value of the code word corresponding to the number of counting pulses applied to said divider circuit, wherein n is an invariant positive integer, said code word comprising a lefthand part determining the corresponding segment of the compression law curve and a righthand part determining the interval within the segment concerned.

4,897,653

DATA OUTPUTTING CIRCUIT

Shin-ichi Wakumura; Ichiro Miyake, both of Saitama; Hiroo Okamoto, and Yuuji Hatanaka, both of Kanagawa, all of Japan, assignors to Pioneer Electronic Corporation and Hitachi Ltd., both of Toyko, Japan

Filed Aug. 22, 1988, Ser. No. 234,862
Claims priority, application Japan, Aug. 20, 1987, 62-205042
Int. Cl.[4] H03M *7/20*
U.S. Cl. 341—95 **8 Claims**



1. A data outputting circuit comprising:

absolute value conversion means for converting digital data into absolute value data, said digital data being input successively with a predetermined sampling period;

data adjusting means including register means for comparing data corresponding to said absolute value data provided by said absolute value conversion means and storing the largest of said data corresponding to said absolute value data within a predetermined period of time; and

transferring register means for receiving said data from said register means and transferring said data to a processing means every predetermined period of time; the improvement comprising:

compression means included in said data adjusting means for compressing data into data with fewer bits;

said compression means subjecting said absolute value data provided by said absolute value conversion means to logarithmic approximation and compressing said data applied from said absolute value conversion means to said transferring register means.

4,897,654

DIGITAL-ANALOG CONVERTING METHOD, AND APPARATUS THEREFOR

Ryoichi Mori, 1-24-12, Hakusan, Bunkyo-ku, Tokyo 113, and Kazuo Toraichi, 1-14-2, Irimagawa, Sayama-shi, Saitama 350-13, both of Japan

Filed Oct. 27, 1988, Ser. No. 263,256
Claims priority, application Japan, Oct. 30, 1987, 62-274806
Int. Cl.[4] H03M *1/66*
U.S. Cl. 341—147 **7 Claims**

1. A digital-analog converting method for converting digital data successively generated every predetermined sampling period T into a continuous analog signal, comprising the steps of:

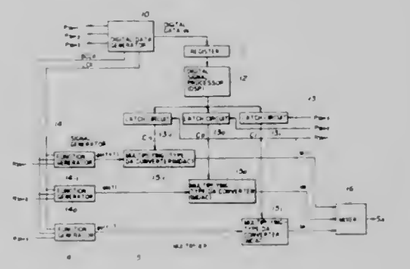
successively generating digital data V_K (K=. . . , −4, −3, −2, −1, 0, 1, 2, 3, . . .) every predetermined sampling period T;

repeatedly generating, successively at a period 3T, signals $\phi(t+T)$, $\phi(t)$, $\phi(t-T)$, where a unit pulse response signal $\psi(t)$ is expressed by

$$\psi(t)=\Sigma A_K\cdot\phi(t-K\cdot T)\ (K=-\infty\sim+\infty)$$

using a signal $\phi(t)$ $(0\leqq t\leqq 3T)$ expressed by three piecewise polynomials;

computing C in accordance with the equation



$$C=\Sigma A_{-K}\cdot V_K$$

(K=−M∼M, where M is an integer)

every sampling period T, where V_0 represents digital data prevailing at the present time, and cyclically storing the results of computation as C_{-1}, C_0, C_1 in successive fashion; and

generating a continuous analog signal by converting the digital data into an analog quantity in accordance with the equation

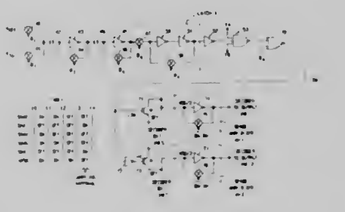
$$C_{-1}\cdot\phi(t+T)+C_0\cdot\phi(t)+C_1\cdot\phi(t-T)$$

4,897,655

HIGH SPEED APPARATUS FOR A SINGLE LATCH FLASH ANALOG-TO-DIGITAL CONVERTER

Victor Zazzu, Montgomery Township, Somerset County; Stanley F. Wietecha, South Bound Brook, and Mandel Glincman, Hillsborough Township, Somerset County, all of N.J., assignors to Harris Semiconductor Patents, Inc., Melbourne, Fla.

Filed Mar. 10, 1988, Ser. No. 166,483
Int. Cl.[4] H03M *1/36*
U.S. Cl. 341—159 **17 Claims**



1. In a comparator circuit particularly adapted for use in a flash-type analog-to digital converter, said comparator circuit of the type employing a latch device having an output coupled

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to one input of an AND'ING type gate means with said gate also responsive to the logic states of comparators above said comparator and below said comparator, and said comparator circuit monitoring a source of reference potential by comparing the value of an input signal with a reference level with the output of said AND'ING type gate means providing an input to a decoder means associated with said converter circuit, the improvement therewith of apparatus to enable high speed decoding while reducing the response of said circuit to an undesirable "sparkle" condition, comprising:

a controllable gate means coupled between the output of said AND'ING type gate means and said decoder means operative to provide an output signal when said input signal to said comparator circuit is stable in value, and

to then couple a latched value of said input signal to said decoder means.

4,897,656

COMPLEMENTARY VOLTAGE INTERPOLATION CIRCUIT WITH TRANSMISSION DELAY COMPENSATION

Rudy J. van de Plassche, Waalre, Netherlands, and Peter G. Baltus, Sunnyvale, Calif., assignors to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 96,793, Sep. 14, 1987, Pat. No. 4,831,379, which is a continuation of Ser. No. 809,453, Dec. 16, 1985, abandoned. This application Dec. 2, 1987, Ser. No. 127,867

Int. Cl.[4] H03M *1/36*

U.S. Cl. 341—159 17 Claims



1. An electronic circuit having input means responsive to an input parameter for providing multiple pairs of substantially complementary main signals, each of which varies with the input parameter, characterized by interpolation means comprising:

two strings of a selected number of impedance elements in which (a) a node is located between each pair of consecutive impedance elements in each string, at one end of one string, and at a corresponding end of the other string, (b) the pairs of nodes located at like positions along the strings are divided into pairs of corresponding input nodes and pairs of corresponding interpolation nodes, whereby at least one of the input nodes lies between the ends of each string, (c) at least one of the interpolation nodes is located between the two most distant input nodes in each string, and (d) each pair of corresponding input nodes receives a different one of the pairs of main signals; and

delay means for supplying interpolation output signals at multiple pairs of corresponding interpolation output points, the number of output points being equal to the number of nodes, the delay means comprising at least two additional pairs of impedance elements for which (a) each additional pair is associated with a different pair of corresponding nodes and with a different pair of corresponding output points, (b) the impedance elements in each additional pair are coupled between the associated nodes, respectively, and the associated output points, respectively, and (c) the remaining nodes, if any, are respectively coupled to the remaining output points.

4,897,657

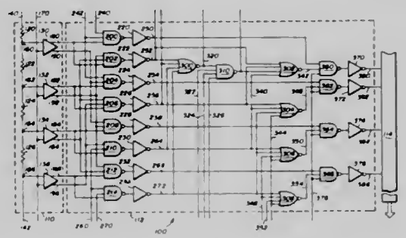
ANALOG-TO-DIGITAL CONVERTER HAVING ERROR DETECTION AND CORRECTION

James L. Brubaker, Campbell, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Jun. 13, 1988, Ser. No. 205,854

Int. Cl.[4] H03M *1/00*

U.S. Cl. 341—159 11 Claims



1. A thermometer-code-to-one-of-n converter for receiving a plurality of signals representing a number in thermometer code and for developing a plurality of signals representing the number in one-of-n code, the thermometer-code-to-one-of-n converter comprising in combination:

first error detecting means (206 and 226) connected to receive a first predetermined combination of at least two of the thermometer code signals, said first error detecting means for gating together said first combination of thermometer code signals and for developing a first error signal (256) the state of which indicates when said first combination of thermometer code signals has a first predetermined pattern of signal states;

first one-of-n detecting means (204 and 224) connected to receive a second predetermined combination of at least two of said thermometer code signals, said first one-of-n detecting means for gating together said second combination of thermometer code signals and for developing a first one-of-n signal (254) the state of which indicates when said second combination of thermometer code signals has a second predetermined pattern of signal states;

second error detecting means (202 and 222) connected to receive a third predetermined combination of at least two of said thermometer code signals, said second error detecting means for gating together said third combination of thermometer code signals and for developing a second error signal (252) the state of which indicates when said third combination of thermometer code signals has said first predetermined signal state pattern;

second one-of-n detecting means (200 and 220) connected to receive a fourth predetermined combination of at least two of said thermometer code signals, said second one-of-n detecting means for gating together said fourth combination of thermometer code signals and for developing a second one-of-n signal (250) the state of which indicates when said fourth combination of thermometer code signals has said second predetermined signal state pattern;

signal combining means (302 and 304) connected to said first and said second error detecting means, said signal combining means for gating together said first and said second error signals and for developing a first blocking signal (342) the state of which indicates when at least one of said first and said third combinations of thermometer code signals has said first predetermined signal state pattern;

first blocking means (362 and 372) connected to said first one-of-n detecting means and to said signal combining means, said first blocking means for gating together said first one-of-n signal and a signal derived from said first error signal and for developing a third one-of-n signal (382) having a predetermined state when said first combination of thermometer code signals has said first predetermined signal state pattern and having a state which indicates when said second combination of thermometer code signals has said second predetermined signal state pattern otherwise; and

second blocking means (360 and 370) connected to said second one-of-n detecting means and to said signal combining means, said second blocking means for gating together said second one-of-n signal and said first blocking signal and for developing a fourth one-of-n signal (380) having a predetermined state when at least one of said first and said third combinations of thermometer code signals has said first predetermined signal state pattern and having a state which indicates when said fourth combination of thermometer code signals has said second predetermined signal state pattern otherwise.

4,897,658

ANALOG-TO-DIGITAL CONVERTER OF SUCCESSIVE-APPROXIMATION TYPE

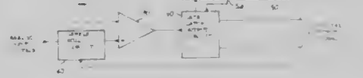
Hiroshi Fujii, Kariya; Kenji Kanemaru, Toyota; Yoshinori Fujihashi, Motosu, and Nobuyoshi Morita, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 18, 1988, Ser. No. 170,358

Claims priority, application Japan, Apr. 9, 1987, 62-87860

Int. Cl.[4] H03M *1/38*

U.S. Cl. 341—161 14 Claims



1. An analog-to-digital converter of the successive-approximation type for converting an analog level into a digital value, comprising:

a reference voltage source for generating a reference voltage;

a string of high resistance elements, connected to said reference voltage source, forming a series of voltage dividers for dividing the reference voltage into a series of divided voltages;

successive-approximation logic circuit means for successively generating selection signals based on a current digital value;

switch matrix circuit means coupled to said high resistance elements, for actuating to produce one divided voltage therefrom, when activated in response to an appropriate selection signal from said successive-approximation logic circuit means;

comparison means for successively comparing the analog level to be converted with said one divided voltage from said switch matrix circuit means, and for generating a comparison signal indicative of said comparing and indicative of a bit in said digital value;

output means coupled to said comparison means, for generating said current digital value as defined by the comparison signals from said comparison means, said output means being associated with said successive-approximation logic circuit means and providing said current digital value thereto;

a string of low resistance elements, of a lower resistance than a resistance of said high resistance elements, connected in parallel with a group of said high resistance elements; and

application means for operating during a short period of time immediately after said actuating of said switch matrix circuit means, to apply the reference voltage through at least one of said low resistance elements to at least one of said voltage dividers for said short period.

4,897,659

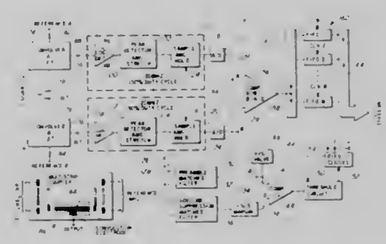
COMMUNICATION RECEIVER

Donald W. Mellon, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 3, 1981, Ser. No. 289,427

Int. Cl.[4] G01S *13/78*

U.S. Cl. 342—45 24 Claims



1. A communications receiver for receiving overlapping multibit coded message input i.f. signals from at least one transmitter, said messages comprised of a synchronization and data signal wherein one bit is of length T, comprising,

a convolver having a convolution interval of 2T, and an input port connected to receive said multibit i.f. coded message, a reference port connected to receive a reference signal having a bit length of T and a 50% duty cycle and an output port producing a full correlated i.f. bit amplitude signal when said reference signal and a bit of information from said coded input message exactly correlate and overlap in said convolver,

a signal processing means coupled to said output port for converting the full correlated i.f. signal to a video signal,

synchronization detection circuitry coupled to said signal processing means for detecting the time arrival of each message, and

memory means coupled to said signal processing means and said synchronization detection circuitry for storing said messages when synchronization occurs.

22. An IFF system according to claim 20 wherein the output from said digital differencing circuit is coupled to said sidelobe suppression circuit, said sidelobe suppression circuit comprising an n-tap transversal filter, where n equals the number of bits in said control signal, and having n-weighted taps which are matched to the control signal code.

4,897,660

STRUCTURE RESONANT RADAR DETECTION APPARATUS AND METHOD

Archie Gold, Bethesda, Md., and Robert L. Kirkwood, Pacific Palisades, Calif., assignors to R & D Associates, M. D. R., Calif.

Filed Jan. 14, 1986, Ser. No. 819,528

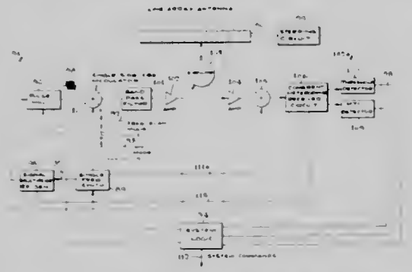
Int. Cl.[4] G01S *13/24*

U.S. Cl. 342—192 5 Claims

1. A method for locating a man-made structure located on

land which has a multiplicity of substantially uniformly spaced elements, from a flying craft, comprising:

transmitting radar signals in a plurality of different directions that are all at a downward incline from the craft toward the ground;



receiving reflections of said radar signals and detecting a resonant frequency that is of at least twice the amplitude of the average frequencies of the received signals; and

detecting the direction from which the received signals that included the resonant frequency, was received.

4,897,661

METHOD AND APPARATUS FOR DETERMINING THE POSITION OF A VEHICLE

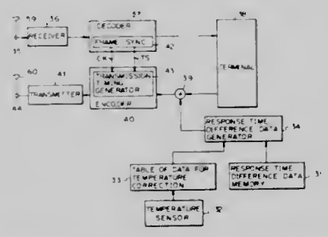
Hisaki Hiraiwa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,289

Claims priority, application Japan, Apr. 10, 1987, 62-88437

Int. Cl.⁴ G01S *3/02*

U.S. Cl. 342—457 **6 Claims**



1. A method for communicating with and determining the position which uses a satellite-based vehicle position determining and communicating service system comprising: transmitting with a transponder which is carried by each one of a plurality of vehicles which are traveling on or above the earth's surface a predetermined response signal in response to reception of an interrogation signal; receiving and retransmitting with at least two or more satellites which have repeaters in each satellite the response signal transmitted from said transponder and retransmitting the response signal, said satellites positioned at spaced orbital locations above the earth's surface; receiving with a ground station the response signal from said transponder which have been retransmitted from each of said satellites and said ground station determining the position of each vehicle which have a transponder on the basis of each received time of the signal from the time of transmission of said interrogation signal to the time of reception of said response signal, transmitting with said transponder of said vehicle information of the time lag of said vehicle transponder from the reception signal in said response signal, and calculating at said ground station, a position measurement difference of the vehicle by correcting each of said required times on the basis of said information of the time lag of said vehicle transponder.

4,897,662

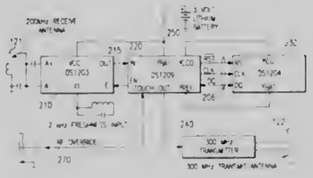
INTEGRATED CIRCUIT WITH WIRELESS FRESHNESS SEAL

Robert D. Lee, Denton, and Robert W. Mounger, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 9, 1988, Ser. No. 282,410

Int. Cl.⁴ H01Q *1/26*

U.S. Cl. 343—701 **19 Claims**



1. An integrated circuit, comprising:

input contacts connectable to an antenna;

a battery terminal, for connection to a battery;

enable logic, connected to said input contacts, comprising insulated gate field effect transistors which are connected to turn on only when the antenna provides a voltage greater than the threshold voltage of said transistors; and

other circuits, on a common integrated circuit with said enable logic, which have significant standby power consumption requirements and which are selectably connected to said battery terminal;

wherein said enable logic is connected to selectively disable said other circuits, and does not permit said other circuits to operate until said enable logic has detected a strong electromagnetically radiated signal at a predetermined low frequency.

4,897,663

HORN ANTENNA WITH A CHOKE SURFACE-WAVE STRUCTURE ON THE OUTER SURFACE THEREOF

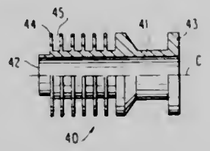
Mitsuhiro Kusano; Kazuo Kosukegawa, and Kazuhiko Kurokawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 945,979

Claims priority, application Japan, Dec. 25, 1985, 60-290777; Feb. 27, 1986, 61-42486

Int. Cl.⁴ H01Q *13/02*

U.S. Cl. 343—786 **7 Claims**



1. A horn antenna for radiating or receiving two lower and higher frequency waves, which comprises a multimode horn having an aperture at a front end and a cylindrical outer surface portion at the front side thereof, said multimode horn being formed to produce a dominant mode wave and a higher mode wave for the higher frequency wave so that the dominant mode wave and the higher mode wave are in-phase with each other at said aperture of the horn, said multimode horn being also formed to produce only a dominant mode wave without any higher mode wave for the lower frequency wave, said multimode horn being provided with a choke surface-wave structure on said cylindrical outer surface of said horn, said choke surface-wave structure comprising a plurality of axially spaced conductive radial fins being fixedly mounted on said cylindrical outer surface portion, said conductive fins generally radially extending in parallel with one another and defining annular grooves between adjacent ones on said cylindrical outer surface portion, each annular groove having a depth generally equal to a quarter of a wavelength of the lower frequency wave.

4,897,664

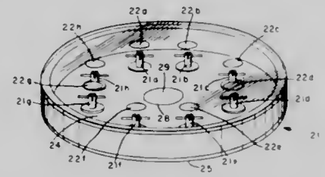
IMAGE PLATE/SHORT BACKFIRE ANTENNA

Henry T. Killackey, Covina, Calif., and Julia N. Martin, Marlon, Va., assignors to General Dynamics Corp., Pomona Division, Pomona, Calif.

Filed Jun. 3, 1988, Ser. No. 201,972

Int. Cl.⁴ H01Q *19/185*

U.S. Cl. 343—789 **24 Claims**



1. A high-gain antenna for transmitting or receiving electromagnetic radiation comprising:

a reflective base for reflecting electromagnetic radiation;

a radiating element positioned one-quarter of a wavelength above said reflective base;

a partially reflective plate positioned one-half of said wavelength above said reflective base and positioned parallel to said reflective base; and

a reflective plate disposed on a surface of said partially reflectiveplate, said reflective plate positioned above said radiating element.

4,897,665

METHOD OF DRIVING AN INK JET RECORDING HEAD

Makoto Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,014

Claims priority, application Japan, Oct. 9, 1986, 61-239232; Oct. 9, 1986, 61-239233; Oct. 9, 1986, 61-239234; Oct. 9, 1986, 61-239235

Int. Cl.⁴ G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—1.1 **5 Claims**

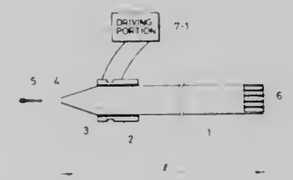
1. A method of driving an ink jet recording apparatus, the method comprising the steps of:

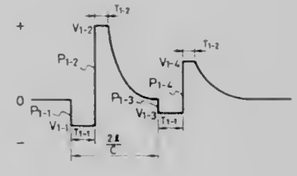
providing a recording head having a discharge port for discharging ink droplets, a discharge energy acting chamber communicating with said discharge port, and a piezoelectric element for generating discharge energy for ink droplet discharge mechanically coupled to said discharge energy acting chamber, in which an electric signal supplied to said piezo-electric element thereby varies the volume of said discharge energy acting chamber and causes ink droplets to be discharged from said discharge port to accomplish recording, and

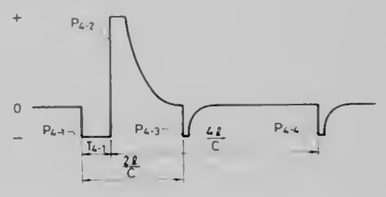
supplying said electrical signal to said piezo-electric element such that if the length from said discharge port to the portion of said recording head which reflects a pressure wave produced by the supply of said electrical signal is defined as l, and the speed of sound in the ink is defined as c, said electrical signal has a composite wave-configuration of at least two pulse wave-configurations, wherein following the lapse of a time 2 l/c after the first pulse wave-configuration has been supplied to said piezo-electric element, a second pulse wave-configuration is supplied to said piezo-electric element, wherein said electrical signal has a wave-configuration such that:

(i) first, the volume of said discharge energy acting chamber is abruptly increased;

(ii) following the lapse of a first predetermined time after (i), the volume of said discharge energy acting chamber is abruptly decreased thereby to pressurize the ink and cause an ink droplet to be discharged from said discharge port;







(iii) following the lapse of a second predetermined time after (ii), the volume of said discharge energy acting chamber is slowly increased so that a meniscus at said discharge port does not progress abruptly and beyond a predetermined amount after the ink droplet has been discharged;

(iv) following the lapse of a time 2 l/c after (i) the volume of said discharge energy acting chamber is again abruptly increased;

(v) following the lapse of said first predetermined time after (iv), the volume of said discharge energy acting chamber is again abruptly decreased; and

(vi) following the lapse of said second predetermined time after (v), the volume of said discharge energy acting chamber is again slowly increased.

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4,897,666

CONTINUOUS INK JET STIMULATION ADJUSTMENT USING IMPROVED OVERDRIVE DETECTION

James A. Katerberg, Kettering; Robert L. Wist, Trottwood, and Richard A. Lewis, Miamisburg, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,100
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—1.1 **2 Claims**

2. In a continuous ink jet printer of the kind having means for forming a plurality of ink streams, means for applying a stimulating energy signal of predetermined frequency to said ink streams and means located along drop break off points of said ink stream paths for charging stimulated in drops, an improved stimulation adjustment system comprising:

(a) electrometer means, located to receive such ink drop streams, for generating a current signal indicative of said drop stream charge;

(b) means for applying a sawtooth test charge voltage of frequency approximately equal to said stimulation frequency to said charge electrode;

(c) means for varying the amplitude of the stimulation signal between underdrive and overdrive filament conditions;

(d) means for storing the current signals from said electrometer means in identified relation to the variation of stimulation signal amplitude; and

(e) means for setting the operating stimulation voltage based on the overdrive inception point inflection in the stored stimulation amplitude versus detector charge current relation.

4,897,667

INK JET PRINTER

Tadamitsu Uchiyama; Katsuyuki Fujii, and Shoichiro Kakuta, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1988, Ser. No. 284,677
Claims priority, application Japan, Dec. 17, 1987, 62-317538; Feb. 9, 1988, 63-28218
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **13 Claims**

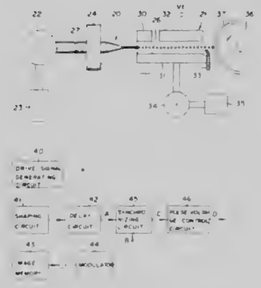
1. A ink jet printer comprising:

spouting means for spouting a column of ink through a nozzle,

nozzle oscillating means for dividing said column of ink into ink droplets,

voltage applying means for selectively applying a first pulse voltage to said ink droplets thereby charging them based on image data and applying a second pulse voltage lower than said first pulse voltage to said ink droplets immediately after the application of said first pulse voltage, and

means for producing a deflection electric field capable of deflecting one ink droplet charged by the application of said first pulse voltage and enabling another ink droplet



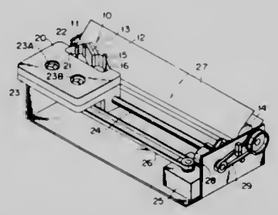
not charged to proceed straight in the direction of a recording medium.

4,897,668

APPARATUS FOR TRANSFERRING INK FROM INK RIBBON TO A RECORDING MEDIUM BY APPLYING HEAT TO THE MEDIUM, THEREBY RECORDING DATA ON THE MEDIUM

Hitoshi Nagato; Tadayoshi Ohno, Kawasaki; Tsutomu Kanai, Yokohama, and Akito Iwamoto, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 163,394
Claims priority, application Japan, Mar. 2, 1987, 62-45150; Jun. 2, 1987, 62-137675; Jul. 27, 1987, 62-186981; Jul. 29, 1987, 62-187630; Jul. 30, 1987, 62-190868; Jul. 30, 1987, 62-191409; Jul. 31, 1987, 62-190366
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **42 Claims**



1. An electrothermal printing apparatus for transferring ink onto a recording medium, thereby to record data on the recording medium, said apparatus comprising:

an ink ribbon including a base film being electrically resistive and having first and second surfaces, an electrically conductive layer formed on the first surface of the base film, and an ink layer formed on the conductive layer, and having a surface to face and contact with the recording medium;

ribbon-feeding means for feeding said ink ribbon in a first direction;

current-supplying means contacting with the second surface of the base film for supplying a signal current to the electrically conductive layer through the base film, thereby to generate heat in the base film, said heat being transferred to the ink layer through the electrically conductive layer, thereby to transfer ink to the recording medium from the ink layer; and

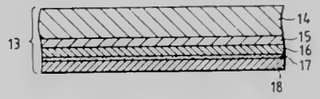
current-collecting means located upstream of said first direction with respect to said current-supplying means, and contacting with the second surface of the base film, for collecting the signal current supplied from said current-supplying means to the electrically conductive layer.

4,897,669

THERMAL TRANSFER RECORDING MEDIA

Eiichi Akutsu; Koichi Saito; Yoshihiko Fujimura; Nanao Inoue; Kiyoshi Horie, and Hiroshi Fujimagari, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,578
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **17 Claims**



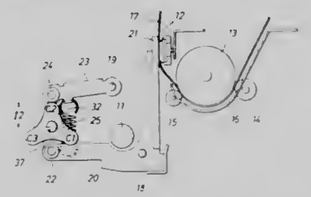
1. A current-conducting thermosensitive recording ink medium comprising: a stratified ink support having a surface dimension extending in a first direction and a thickness dimension extending in a second direction orthogonal to the first direction, said support having an electrical conductivity in the second direction greater than the electrical conductivity in the first direction; a thermogenetic resistor layer overlaying the ink support for producing heat by current conduction; an electrode layer electrically connected to and overlaying said thermogenetic resistor layer; a thermally melting ink layer, overlaying the electrode layer, composed of at least a thermoplastic high molecular material which is meltable by thermogenesis of said thermogenetic resistor layer; and an ink separating layer disposed between said electrode layer and said thermally melting ink layer for facilitating the separation of melted ink from said electrode layer, said ink separating layer having its critical surface tension of not larger than 38 dyne/cm and its decomposing point of 150° C. or more.

4,897,670

THERMAL TRANSFER PRINTER

Tai Hasegawa; Masatoshi Matsuzaki, and Jun Monnai, all of Kobe, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,556
Claims priority, application Japan, Jun. 30, 1987, 62-164987
Int. Cl.[4] G01D *15/10*; B41J *3/20*
U.S. Cl. 346—76 PH **17 Claims**



1. A thermal transfer printer for printing on recording paper with an ink ribbon comprising:

a head holding member for holding a printing head and applying an urging force for urging said printing head against a platen and for separating said printing head from said platen;

an elastic member for biasing said head holding member so that said printing head is urged against said platen;

regulating means for regulating displacement of said elastic member to change the urging force urging said printing head against said platen;

driving means for driving said regulating means;

ink ribbon detecting means for detecting the type of ink ribbon and generating an ink ribbon type signal in response thereto; and

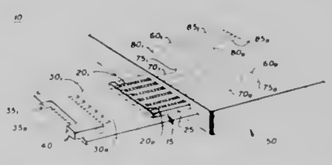
control means for controlling said driving means in response to said ink ribbon type signal whereby the urging force of said printing head is changed in accordance with the type of ink ribbon.

4,897,671

INTEGRATED OPTIC PRINT HEAD

Amaresh Mahapatra, Acton; Roy W. Miller, Stow, and Elias Saitzer, Wellesley, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 23, 1989, Ser. No. 300,570
Int. Cl.[4] G01D *9/42*; H01S *3/18*; G02B *6/12*
U.S. Cl. 346—107 R **10 Claims**



1. A print head having a predetermined spacing between outputs, which print head comprises:

a multiplicity of independently excitable light sources fabricated on a first substrate; and

an integrated waveguide structure comprising a multiplicity of waveguides having an input end and an output end fabricated on a second substrate, said first and second substrates being aligned so that light from said light sources is coupled into the input end of said waveguides, said waveguides having a shape which comprises a first bend disposed after said input end and a second bend disposed after said first bend and before said output end to form a substantially "S" shape, said waveguides being disposed so that the distance between adjacent waveguides is substantially equal to a predetermined spacing after said second bend and the distance between adjacent waveguides is substantially greater than another predetermined spacing at all other portions.

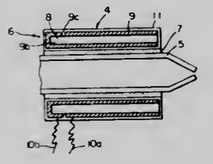
4,897,672
METHOD AND APPARATUS FOR DETECTING AND COMPENSATING LIGHT EMISSION FROM AN LED ARRAY
Mamoru Horiuchi; Yoshinori Wada, both of Kawasaki; Hirotoshi Shimizu, Machida; Yuji Uehara; Masahiro Wanou, both of Kawasaki, and Masatoshi Kimura, Ebina, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jun. 23, 1988, Ser. No. 210,335
Claims priority, application Japan, Jul. 2, 1987, 62-165794; Jul. 14, 1987, 62-175580
Int. Cl.[4] G01D *9/42, 15/14*
U.S. Cl. 346—107 R 27 Claims





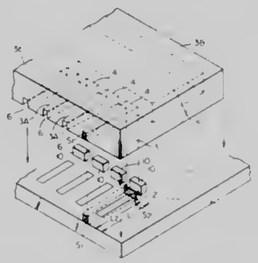
11. A method according to claim 8, wherein said detecting step comprises the substep of:
detecting a leakage emission from a light path from the light emitting elements to the target.

4,897,673
METHOD FOR CONNECTING NOZZLE TUBE OF INK JET NOZZLE WITH PIEZOELECTRIC ELEMENT
Mitsumasa Okabayashi, and Hisahiro Shimizu, both of Tokyo, Japan, assignors to Juki Corporation, Tokyo, Japan
Filed Feb. 28, 1989, Ser. No. 316,515
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 4 Claims



4. An ink jet nozzle of an ink jet printer and comprising a generally cylindrically shaped nozzle tube having a nozzle opening in one end, a piezoelectric element of a generally cylindrical shape and encircling the outer circumference of the nozzle tube, a bonding agent applied between the outer circumferential surface of the nozzle tube and the inner circumferential surface of the piezoelectric element, and a coating of a material having an adhesive property lower than that of the bonding agent being applied on the inner circumferential surface of the piezoelectric element so as to prevent the bonding agent from contacting directly with the piezoelectric element.

4,897,674
LIQUID JET RECORDING HEAD
Shinichi Hirasawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 942,809, Dec. 22, 1986, abandoned.
This application Oct. 11, 1988, Ser. No. 256,119
Claims priority, application Japan, Dec. 27, 1985, 60-293320
Int. Cl.[4] G01D *15/16;* B41J *3/04*
U.S. Cl. 346—140 R 7 Claims



1. A liquid jet recording head comprising:
a body having a plurality of orifice portions ending in orifices for discharging liquid droplets therefrom and a plurality of liquid flow paths therein through which liquid is adapted to flow;
a chamber for retaining liquid therein, wherein said plurality of liquid flow paths connect said orifices to said chamber, and wherein the cross-sectional are of each of said flow paths continuously decreases from said chamber to said orifices;
energy generating means provided in said plurality of liquid flow paths for generating energy to be imparted to the liquid; and
a plurality of members disposed in said chamber to provide walls upstream of said energy generating means, wherein:
the area of any said liquid flow path at said orifice portion is defined as S_1, the area of said liquid flow path at said chamber is defined as S_2, and the ratio S_2/S_1 is greater than one and no greater than five,
the length of any said liquid flow path from said orifice to said chamber is defined as L_1, the distance between said orifice and the end of said energy generating means proximate to said chamber is defined as L_2, and the ratio L_1/L_2 is no less than one and no greater than five, and
the distance from said orifices to said members is no greater than $3L_2$.

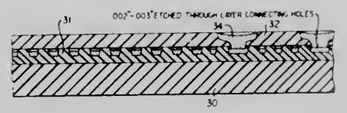
4,897,675
PRINTER
Kiyoshi Negishi, Saitama, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan
Filed Apr. 25, 1989, Ser. No. 342,874
Claims priority, application Japan, Apr. 27, 1988, 63-56933[U]
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—154 8 Claims

1. A printer for printing image information onto a recording medium, which comprises:
means for guiding opposite side edges of said recording medium to enable said recording medium to travel along a predetermined path, said guide means being movable widthwise of said recording medium in accordance with a width of said recording medium;
detecting means interlocked with said guide means for detecting a position of said guide means widthwise of said recording medium to generate a position signal that is representative of the position of said guide means; and
delay means operative in response to said position signal from said detecting means for delaying a timing signal,



widthwise of the recording medium, at which said image information is recorded onto said recording medium, thereby regulating a printing start-up position on said recording medium.

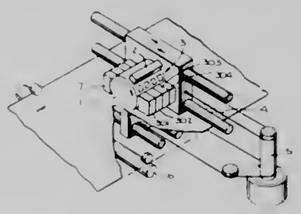
4,897,676
HIGH-DENSITY CIRCUIT AND METHOD OF ITS MANUFACTURE
Donald C. Sedberry, Gwynedd, Pa., assignor to Max Levy Autograph, Inc., Philadelphia, Pa.
Filed Jan. 5, 1988, Ser. No. 141,113
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—155 30 Claims



1. A high-density electronic circuit comprising a plurality of conductors, the conductors being formed in grooves in a substrate, the grooves having a width and a depth, the depth of the grooves being of the same order of magnitude as their width, the conductors being formed of a conductive cermet material, the width of each of the conductors being less than about 0.005 inches, and the width of the spaces between adjacent conductors being less than about 0.005 inches, the circuit extending over a total area exceeding about one square inch.

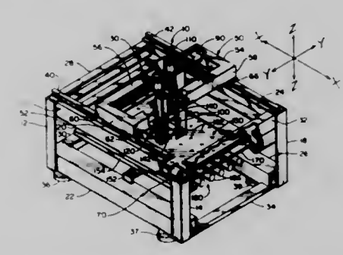
4,897,677
MULTICOLORED PRINTING METHOD AND DEVICE
Kou-Yen Lai, Taiwan, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, Taiwan
Filed Mar. 8, 1988, Ser. No. 165,655
Int. Cl.[4] G01D *15/06, 15/20;* B41J *3/02, 3/04*
U.S. Cl. 346—155 8 Claims

1. An electrophotographic printer which comprises:
i. a printer head including a photosensitive rotating drum and fixed exposure means and developer means, each positioned at the circumference of said drum and each comprising four zones axially spaced along the circumference of said drum, each of said exposure zones being capable of forming a latent image on a discrete area of the drum, and each of said developer zones adapted to deposit toner on one of said discrete areas, the discrete areas so formed forming the quadrants of a quadrilateral area;
ii. a transport means for moving a paper sheet in a first direction in predetermined incremental amounts, each after a defined pause, through an image transfer zone;
iii. a printer head drive means for rolling said drum of said printer head perpendicular to said first direction across said paper sheet through said image transfer zone; and



iv. control means for activating the printer head drive means so that said drum rolls through said image transfer zone during a defined pause, so as to be able to transfer the image on said drum to said paper sheet.

4,897,678
DOUBLE Z-AXIS TRANSLATIONAL MOUNTING APPARATUS FOR CAMERA IN PHOTOGRAMMETRY MENSURATION SYSTEMS
Franz W. Leberl; Dana Meyer, and Scott Lee, all of Boulder, Colo., assignors to Vexcel Corporation, Boulder, Colo.
Filed Aug. 3, 1987, Ser. No. 81,117
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—81 5 Claims



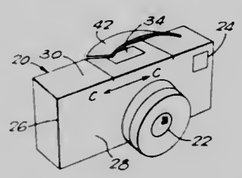
1. Camera translational mounting apparatus for mounting a camera and a lens in relation to an object, comprising:
an X-axis translation table structure;
a Y-axis platform mounted on said X-axis translation table in such a manner that said Y-axis platform is movable in relation to said X-axis translation table along a straight line defining an X-axis;
a double Z-axis mounting structure mounted in said Y-axis platform in such a manner that said double Z-axis mounting structure is movable in relation to said Y-axis platform along a straight line defining a Y-axis orthogonal to said X-axis, said double Z-axis mounting structure including an elongated, rigid mounting member having a longitudinal axis oriented parallel to said Z-axis;
camera carriage means for mounting the camera in said double Z-axis mounting structure, said camera carriage means being mounted in said double Z-axis mounting structure in such a manner that it is movable in relation to said Y-axis platform along a straight line defining a Z-axis orthogonal to both said X-axis and said Y-axis, wherein said camera carriage means includes a rigid plate positioned in said mounting member, slideable camera translation mounting means attached to said mounting member and to said plate for mounting said plate in said mounting member in such a manner that said plate is moveable in the direction of the Z-axis in relation to said mounting mem-

ber, and camera mounting means attached to said plate for mounting a camera on said plate; and

lens carriage means for mounting the lens in said double Z-axis mounting structure, said lens carriage means being mounted on said camera carriage means in such a manner that it is moveable in relation to said camera carriage means in a direction parallel to said Z-axis, wherein said lens carriage means includes a lens platform structure positioned adjacent said plate of said camera carriage means, slideable lens translation mounting means attached to said plate and to said platform structure for mounting said platform structure on said plate in such a manner that said lens platform structure is moveable in the direction of the Z-axis in relation to said plate, and lens mounting means for mounting a lens on said platform structure.

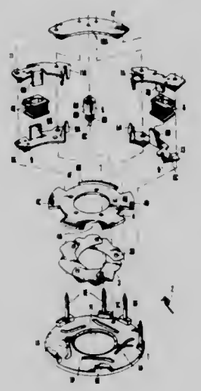
4,897,679
Patent Not Issued For This Number

4,897,680
PHOTOGRAPHIC CAMERAS
Anthony T. Lo, A12 Olympian Mansion, 9 Conduit Road, Hong Kong, Hong Kong
Filed Apr. 18, 1989, Ser. No. 339,833
Claims priority, application United Kingdom, Apr. 18, 1988, 8809142
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—145.1 **7 Claims**



1. A camera comprising a housing, a front face to said housing the lens in said front face viewing a forward direction and through which light from a scene being photographed passes to the interior of the camera for recording on a photographic recording medium, an electronic flash unit inset into said housing so as not to project significantly beyond said housing, and mounted so as to direct its light in an outward direction relative said forward direction viewed by said camera lens, and a hinged reflector positioned over said flash unit which can be hinged flush with said housing positioned over said flash unit when the flash unit is not in use and hinged to an inclined position when the flash unit is to be used whereby light from the flash unit passes to the reflector which then reflects the light forwardly in the direction viewed by the camera lens, the reflector being shaped such that light from the flash unit is directed predominantly into the area of a scene from which light will be collected by the camera lens for the picture, so avoiding significant wastage of light into areas outside the said area of the scene.

4,897,681
EXPOSURE AMOUNT ADJUSTING DEVICE
Hiroshi Yamamoto, Kanagawa; Tadashi Arai, and Akira Kurosawa, both of Saitama, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan
Filed Oct. 12, 1988, Ser. No. 256,569
Claims priority, application Japan, Oct. 14, 1987, 62-259101; Oct. 14, 1987, 62-259102; Oct. 14, 1987, 62-259103; Oct. 14, 1987, 62-259104; Oct. 14, 1987, 62-259105; Oct. 14, 1987, 62-259106; Oct. 14, 1987, 62-156848[U]
Int. Cl.[4] G03B *9/06*
U.S. Cl. 354—271.1 **6 Claims**



1. An exposure amount adjusting device comprising:

a stepping motor which serves as a drive source, said stepping motor including a rotor, a stator and an exciting coil; and

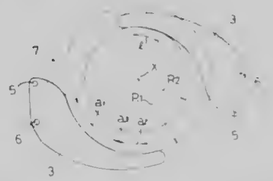
exposure amount adjusting means which is arranged to be driven by said stepping motor, said exposure amount adjusting means including:

a fixed member having an aperture arranged to provide a passage for a light beam, said fixed member being provided with a positioning member and a bearing which are arranged away from said aperture, said positioning member determining the position of said stator, said bearing rotatably carrying said rotor,

a rotary member which also has a light flux passing aperture, said rotary member being arranged to be driven by said rotor, and

a plurality of light shielding blades which are swingably carried by said fixed member and said rotary member, said plurality of light shielding blades being arranged to vary light shielding areas thereof for said two apertures in response to a rotating position of said rotary member.

4,897,682
STOP DEVICE FOR PHOTOGRAPHIC CAMERA
Minoru Kuwana, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 66,473, Jun. 26, 1987, abandoned. This application May 13, 1988, Ser. No. 195,378
Claims priority, application Japan, Jun. 28, 1986, 61-152003
Int. Cl.[4] G03B *9/02*
U.S. Cl. 354—274 **7 Claims**



1. A stop device comprising a plurality of stop blades adapted for defining an aperture opening with inner edges thereof,

said stop blades being arranged about an optical axis with adjacent pairs partially overlapping each other in the direction of the optical axis, and pivotable about pivotal axes positioned in end regions thereof so as to move toward and away from the optical axis,

each inner edge of said stop blades including a first uninterrupted inner edge portion for partially defining an aperture opening when said stop device is set to a full aperture position or to an aperture position equivalent thereto and a second uninterrupted inner edge portion disposed more distantly from said pivotal axis than said first inner edge portion for partially defining a small aperture opening when said stop device is set to a predetermined intermediate aperture position and an end edge portion formed continuously from said second inner edge portion to a free end of said stop blade having a form similar to that of an imaginary prolongation of said first inner edge portion,

wherein said first inner portion is formed arcuate for defining, along with only the first inner edge portions of the other stop blades, a circular aperture opening having a predetermined radius about the optical axis when said stop device is set to said full aperture position or said position equivalent thereto,

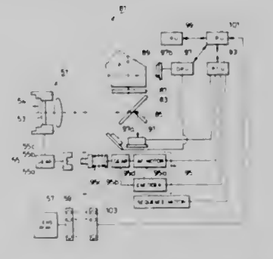
said second inner edge portion is formed at least partially arcuate for defining along with second inner edge portions of the other stop blades a substantially circular aperture opening having a radius smaller than said predetermined radius formed by said first inner edge portions about the optical axis when said stop device is set to said predetermined intermediate aperture position.

4,897,683
FOCUSING LENS DRIVE METHOD
Noboru Suzuki, and Shigeo Toji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1988, Ser. No. 174,466
Claims priority, application Japan, Mar. 26, 1987, 62-72669
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—400 **16 Claims**

1. A method for driving a focusing lens to a focused position, comprising the steps of:

applying a pulse-width-modulated signal to a drive device for moving said focusing lens toward said focused position, a duty ratio of said pulse-width-modulated signal being determined in accordance with prestored data;

detecting a speed of movement of said focusing lens towards said focused position; and



correcting said duty ratio of said pulse-width-modulated signal so as to move said focusing lens at a speed indicated by said prestored data.

4,897,684
AUTO-FLASH PHOTOGRAPHING SYSTEM
Yoshio Serikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 882,354, Jul. 7, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 235,840
Claims priority, application Japan, Jul. 6, 1985, 60-102448[U]; Jul. 18, 1985, 60-108898[U]; Jul. 19, 1985, 60-109762[U]; Aug. 12, 1985, 60-175924; Aug. 23, 1985, 60-183931
Int. Cl.[4] G03B *15/05;* **H05B** *41/14*
U.S. Cl. 354—416 **5 Claims**



1. An automatic flashing system, comprising:

a plurality of flash emitting units each of which includes a first input terminal and a second input terminal;

first means for supplying an activation signal to the first input terminal of each of said plurality of flash emitting units to have them activated at the same time in response to a trigger signal supplied thereto;

detecting means for detecting light reflecting from a subject of interest when said plurality of flash emitting units activated to emit flashes, said detecting means supplying a detection signal if a detected value is at least equal to a predetermined reference value corresponding to a proper exposure condition;

delaying means for delaying activation of said detecting means over a predetermined time period after activation of said plurality of flash units; and

second means for supplying a deactivation signal; to the second input terminal of each of said plurality of flash emitting units to have them deactivated at the same time in response to said detection signal.

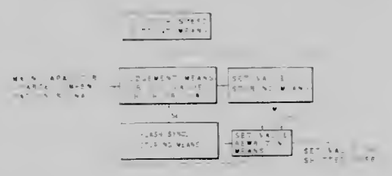
VOL 1110 ISS 5 JA 30 1990 UMI

4,897,685

SHUTTER SPEED SETTING APPARATUS

Takao Nishida, Urawa, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 137,359, Dec. 23, 1987, Pat. No. 4,833,499. This application Nov. 17, 1988, Ser. No. 272,260
Claims priority, application Japan, Dec. 23, 1986, 61-198057
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[4] G03B *7/093, 15/05*
U.S. Cl. 354—458 **24 Claims**



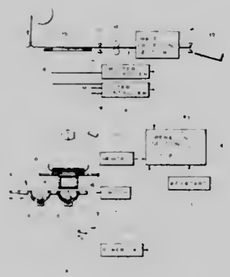
1. A shutter speed setting apparatus comprising:
shutter speed setting means for setting a shutter speed S through switching means used to increase and decrease a set value;
judgment means responsive to a signal from a flash unit for judging whether or not said set shutter speed S is higher than a flash synchronization speed S_O;
set value storing means for temporarily storing said set shutter speed S in the form of a value M when said judgment means judges that said set shutter speed S is higher than said flash synchronization speed S_O; and
set value rewriting means for rewriting said set shutter speed S with a given shutter speed not higher than said flash synchronization speed S_O when said judgment means judges that said set shutter speed S is higher than said flash synchronization speed S_O and for rewriting said set shutter speed S with said value M which is temporarily stored in said set value storing means after said signal has disappeared.

4,897,686

PHOTOGRAPHIC PRINTING APPARATUS

Kanji Tokuda, and Osamu Fukushima, both of Kanagawa, Japan, assignors to Fuji Pboto Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1988, Ser. No. 252,082
Claims priority, application Japan, Sep. 30, 1987, 62-246364
Int. Cl.[4] G03B *27/54, 27/80*
U.S. Cl. 355—37 **6 Claims**



1. A photographic printing apparatus comprising:
an illumination lamp unit having at least two illumination lamps selectively provided in a printing path for printing an image of an original on a photographic material;
memory means having data channels, one of said channels for each of said at least two illumination lamps for storing lamp data for a respective one of said illumination lamps, the print conditions of said photographic printing apparatus being adjusted based on said lamp data;
detecting means for detecting which one of said at least two illumination lamps is provided in such printing path and generating a signal corresponding to the result of said detection; and
control means for exciting said detected illumination lamp in said printing path to emit printing light, and reading out said lamp data from said data channel of said memory means corresponding to said detected illumination lamp.

4,897,687

ROLLED MICROFILM PRINTING SYSTEM AND METHOD

David S. Wise, Solon, Ohio, assignor to Tameran, Inc., Chagrin Falls, Ohio

Filed Apr. 8, 1988, Ser. No. 179,492
Int. Cl.[4] G03B *27/70, 27/54*
U.S. Cl. 355—43 **18 Claims**



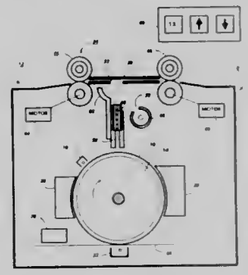
1. A roll microfilm printer comprising:
a first reel having microfilm strip rolled thereon, the microfilm strip containing microfilm images;
a second reel;
means to drive the microfilm strip under tension from the first reel sequentially through preview optics and printing optics to the second reel, the preview optics and printing optics having different optical paths,
the preview optics being operative to scan the images on the microfilm passing therethrough to sense and temporarily record information about each microfilm image; and
the printing optics being operative to automatically control at least one printing function in accordance with the temporarily recorded edge location data while the microfilm image passing therethrough is being printed onto plain paper.

4,897,688

DOCUMENT IMAGING SYSTEM WITH BI-DIRECTIONAL ANAMORPHIC MAGNIFICATION CAPABILITY

Abbott Smith, Webster; James D. Rees, Pittsford; David A. Bartman, Rochester, and Gilbert Aser, deceased, late of Rochester, all of N.Y. (by Diane B. Aser, executrix), assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1988, Ser. No. 285,172
Int. Cl.[4] G03B *27/68*
U.S. Cl. 355—52 **7 Claims**



1. An imaging system in a reproduction apparatus which transmits an image of an original document lying in an object plane onto a moving photosensitive image plane, said image being enlarged or reduced in at least one scanning dimension, said system comprising:
an illumination means adapted to provide an intense narrow beam of light to successive portions of the document to be copied,
a linear gradient index lens array arranged in the optical path so as to project light reflected from said document during said scan onto the image plane, said lens array forming an image plane irradiance profile of first width d_1
means for scan/illuminating said document at a speed which is selectively changeable relative to the speed of said image plane, and
a slit assembly aligned along the optical axis between the output face of said lens array and said image plane, said slit assembly having a slit aperture therethrough said slit aperture having a width d_2 less than said width d_1 whereby sucessive lens images are scanned and projected by the lens array through the slit aperture onto the image plane to form latent image of the document thereon.

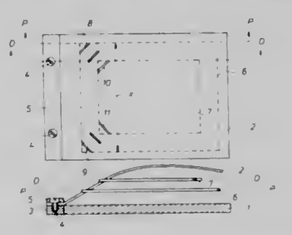
4,897,689

PHOTOGRAPHIC EXPOSURE APPARATUS INCLUDING A MEANS FOR THE RELATIVE POSITIONING OF A PHOTOGRAPHIC MATERIAL AND AN ORIGINAL IN SHEET FORM

Francis J. De Keyzer, Bornem, and Jean P. Moelants, Edegem, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Aug. 21, 1984, Ser. No. 642,884
Claims priority, application European Pat. Off., Sep. 2, 1983, 83201261
Int. Cl.[4] G03B *27/02*
U.S. Cl. 355—79 **6 Claims**

1. A photographic exposure apparatus comprising a support which serves as a carrier for sheet material which is an original, or a photographic material, or is an original together with a photographic material; and a translucent positioning sheet for covering at least partially said support, wherein said translucent positioning sheet is provided with a plurality of pairs of apertures spaced apart from each other so as to engage two neighboring corners of said sheet material, and each said pair being spaced apart to a differing degree so that sheet materials of differing sizes may be located by said positioning sheet, the



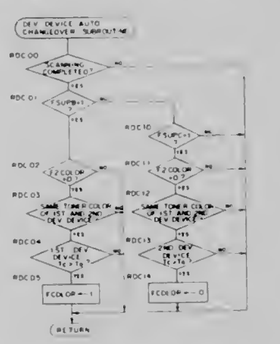
said positioning sheet being attached to the said support along one edge or at one corner.

4,897,690

IMAGE FORMING APPARATUS

Yoshiaki Takano, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 28, 1988, Ser. No. 250,150
Claims priority, application Japan, Sep. 30, 1987, 62-248541; Sep. 30, 1987, 62-248542; Sep. 30, 1987, 62-248543
Int. Cl.[4] G03G *15/01, 15/08*
U.S. Cl. 325—208 **11 Claims**



1. An image forming apparatus in which an electrostatic latent image formed on a photosensitive member is developed by a developer incorporating toner and carrier and subsequently transferred to a paper, the apparatus comprising:
first and second developing means selectively operable for developing the electrostatic latent image by first and second developers, respectively;
toner accommodating means for accommodating toner to be replenished to each of the developers;
detecting means for detecting toner density in each of the developers;
judging means for judging whether the first and second developers have same color;
selecting means responsive to said detecting means and judging means for automatically selecting said second developing means in the case where the toner density in the first developer is less than a specified value and where the toner density in the second developer is not less than the specified value under the judgment by said judging means that the first and second developers have same color;
replenishing means for replenishing toner to each of the first and second developers; and
means for activating said replenishing means so as to contin-

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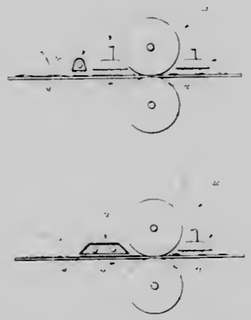
uously replenish toner to the first developer until the toner density therein reaches the specified value in the case where both of the toner density in the first and second developers are less than the specified value even if the first and second developers have same color, while prohibiting an image forming operation.

4,897,691

APPARATUS FOR DRYING AND FUSING A LIQUID IMAGE TO A COPY SHEET

Dexter A. Dyer, Williamson, and Thomas F. Szlucha, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1986, Ser. No. 858,152
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—288 **5 Claims**



1. A reproducing machine of the type having a latent large recorded on a member, wherein the improvement includes:

means for developing the latent image recorded on the member with a liquid developer material comprising at least a liquid carrier having pigmented particles dispersed therein;

means for transferring the developed image from the member to a sheet of support material;

a flash fuser arranged to radiate sufficient energy onto the developed image to permanently fuse the pigmented particles to the sheet of support material in image configuration;

a pressure roll; and

a heated roll cooperating with said pressure roll to form a nip through which the sheet of support material having the developed image thereon passes after said flash fuser has permanently fused the pigmented particles to the sheet of support material so as to vaporize substantially all of the liquid carrier transferred to the sheet of support material and to reheat the pigmented particles as the sheet of support material passes through the nip.

4,897,692

FAIL SAFE FUSER LAMP CONTROL

Robert S. Karz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

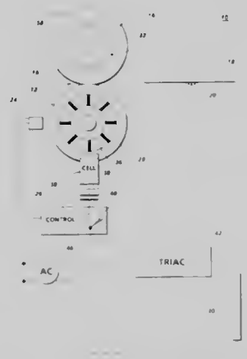
Filed Apr. 8, 1988, Ser. No. 179,369
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—288 **4 Claims**

1. In a contact fuser apparatus having a heated roll structure rotating in contact with a backup roll structure and forming a nip therewith through which copy substrates carrying toner images pass with the toner images contacting the heated fuser roll structure, the improvement comprising:

a heat lamp for elevating the temperature of said heated roll structure;

switching means operably coupling said heat lamp and a source of alternating power; and

means for periodically actuating said switch means for effecting operation of said heat lamp at approximately full power dissipation at a duty cycle low enough to prevent overloading of said heat lamp whereby any circuit failure causing continuous lamp energization will result in power interruption and safe shutdown through lamp filament failure before fire or overheating can occur;



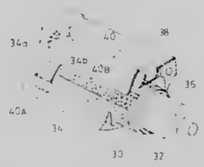
said means for periodically actuating said switch means comprising means responsive to the rotation of one of said roll structures for generating electrical signals indicative of roll structure rotation and the maximum frequency of said means for periodically actuating said switch means being low relative to the frequency of the alternating current energizing the lamp so that the maximum time average power dissipation does not exceed the lamp power rating.

4,897,693

MAGNETIC PARTICLE CARRYING APPARATUS

Noboru Sawayama, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 139,317
Claims priority, application Japan, Dec. 29, 1986, 61-200966[U]
Int. Cl.[4] G03G *15/09, 21/00*
U.S. Cl. 355—215 **10 Claims**



1. A magnetic particle carrying apparatus comprising:

(a) a housing having an opening adapted to face a latent image carrier;

(b) a magnetic particle carrying member installed in said housing for carrying magnetic particles, said magnetic particle carrying member being positioned so as to face the latent image carrier through the opening; and

(c) a sheet member:

(i) secured to a part of said housing opposite to a region on a periphery of the latent image carrier located just before the opening;

(ii) extending to the vicinity of an area in which the periphery of the latent image carrier and the periphery of said magnetic particle carrying member are close to each other; and

(iii) having two extensions covering areas near the ends of said magnetic particle carrying member, wherein:

(d) each of said two extensions of said sheet member covers the area which is located between a front end of said housing near the end of said magnetic particle carrying member and a position which is located inside an end of a magnetic particle carrying region on the periphery of said magnetic particle carrying member and which is in the vicinity of the end of the magnetic particle carrying region;

(e) an end of each of said two extensions of said sheet member is fitted into a corresponding groove formed at a part of said housing opposite to the part thereof at which said sheet member is secured; and

(f) said two extensions of said sheet member engage with corresponding projections located at the part of said housing opposite to the region on the periphery of the latent image carrier just before the opening.

4,897,694

PERFORATION HOLE IMAGE, ELIMINATING COPYING MACHINE

Katsushi Sakigara, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1988, Ser. No. 209,644
Claims priority, application Japan, Jan. 24, 1987, 62-157237
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—218 **4 Claims**

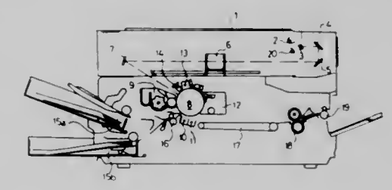
1. A copying machine which makes copies of an original having first row of perforations aligned on one end of the original and second row of perforations aligned on the other end of the original, comprising:

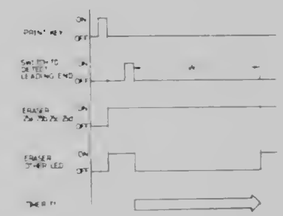
a photosensitive drum movable in a predetermined direction;

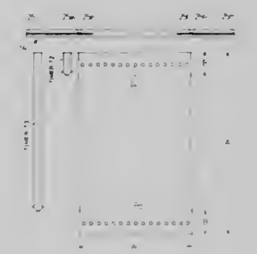
means for charging the photosensitive drum;

means for forming an electrostatic latent image onto the electrified photosensitive drum by projecting the images of the original;

means for irradiating the surface of the photosensitive drum corresponding to the first and second rows of perforations of the original for predetermined time so as to eliminate the electric charge corresponding to the first and second row of perforations of the original; and







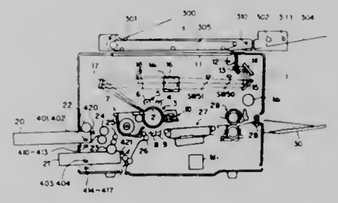
means for varying said predetermined time in accordance with the size of the original.

4,897,695

COPYING MACHINE

Masazumi Ito, and Yoshihiro Horie, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1989, Ser. No. 293,878
Claims priority, application Japan, Jan. 6, 1988, 63-1091
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—233 **11 Claims**



1. A copying machine which comprises:

a rotatable photosensitive member;

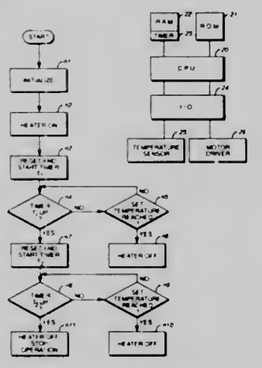
means for supporting a document for copying;
a scanning means for scanning the document positioned on the supporting means, wherein the document is scanned either in a first mode in which a first half portion and a second half portion thereof in the scanning direction are separately scanned so as to form the image of each portion on the photosensitive member, or in a second mode in which the entire surface of the document is scanned so as to form an image thereof on the photosensitive member;
means for varying a magnification of the image formed on the photosensitive member;
at least two cassettes for containing copy papers of various sizes;
means for detecting the sizes of the papers contained in each cassette;
means for detecting the size of the original document;
means for selecting an enlarging divisional copying mode so as to divide an image of the document into two parts and copy each part on an enlarged scale; and
control means operable upon selection of the enlarging divisional copying mode by the selecting means, for automatically setting a magnification and a paper size corresponding to the document size detected by the document size detecting means, and for copying the images of the first half portion and the second half portion of the document on separate papers in the first scan mode.

4,897,696

METHOD OF DETECTING ABNORMALITY IN HEAT ROLLER

Masabu Matsumoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1988, Ser. No. 248,425
Claims priority, application Japan, Oct. 7, 1987, 62-253055
Int. Cl.[4] G23N *15/00*
U.S. Cl. 355—285 3 Claims



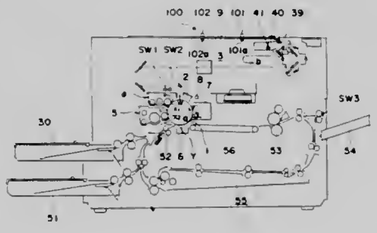
1. A method of detecting an abnormality in a rotatable heat roller comprising the steps of
starting to heat and rotate said heat roller at a starting time,
monitoring the surface temperature of said heat roller,
concluding that said heat roller is functioning normally if the surface temperature of said heat roller reaches a preset temperature level t_1 before a critical time interval $T_3+T_2-T_1$ passes from said starting time, where T_3 is indicative of a time length required for the surface temperature of said heat roller to reach said temperature level t_1 if said heat roller remains stationary, T_2 is indicative of another time length after which the rotation of said heat roller is stopped and T_1 is indicative of still another time interval required for the surface temperature of said heat roller to reach an intermediate temperature level t_0 if said heat roller remains stationary, said intermediate temperature level t_0 being indicative of the surface temperature level to be reached by said heat roller in time interval T_2 if said heat roller continues to rotate, and
concluding that said heat roller is functioning abnormally if said critical time interval $T_3+T_2-T_1$ passes from said starting time before the surface temperature of said heat roller reaches said temperature level t_1.

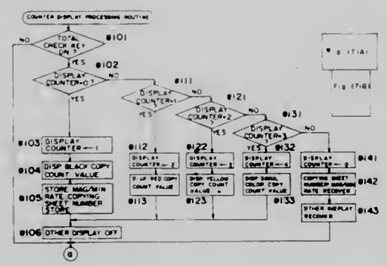
4,897,697

COUNTING SYSTEM FOR USE IN A COPYING MACHINE

Masazumi Ito, Toyohashi, and Kimihiko Higashio, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1987, Ser. No. 137,187
Claims priority, application Japan, Jul. 3, 1987, 62-167568
Int. Cl.[4] G03G *15/01, 21/00*
U.S. Cl. 355—326 8 Claims





1. A counting system in a copying machine comprising:
a platen for disposing an original document thereon,
scan means for scanning the original document disposed on said platen;
a photoconductor for preserving an electrostatic latent image of the original document image scanned by said scan means on the surface thereof;
a developing station for developing the electrostatic latent image formed on the surface of the photoconductor, including first and second developing units containing different color developer respectively;
transfer means for transferring the image developed by said developing station from the photoconductor onto a copying sheet;
mode selecting means for selecting one of three modes including a first copying mode in which the electrostatic image formed on the surface of the photoconductor is developed by the first developing unit, a second copying mode in which the electrostatic latent image formed on the surface of the photoconductor is developed by the second developing unit and a third copying mode n which

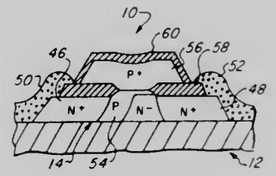
the electrostatic latent image formed on the surface of the photoconductor is developed by the first and the second developing units;
first processing means for applying power to the first developing unit so as to form a single colored copying image when the first copying mode is selected by said mode selecting means;
second processing means for applying power to the second developing unit so as to form a single colored copying image when the second copying mode is selected by said mode selecting means;
third processing means for applying power to the first and the second developing units so as to form a double colored copying image when the third copying mode is selected by said mode selecting means;
a first counter for determining a count value corresponding to the first developing unit;
a second counter for determining a count value corresponding to the second developing unit;
a third counter for counting the number of copying operations in the third copying mode to determine a count value; and
counter control means for increasing the count value of the first counter every time a copying operation in the first copying mode is performed, for increasing the count value of the second counter every time a copying operation in the second copying mode is performed and for increasing the count values of the first, the second and the third counters every time a copying operation in the third copying mode is performed.

4,897,698

HORIZONTAL STRUCTURE THIN FILM TRANSISTOR

Eldon J. Zorinsky; David B. Spratt, both of Plano, and James D. Guillory, Athens, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 12,749, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 666,942, Oct. 31, 1984, abandoned. This application Dec. 14, 1988, Ser. No. 285,348
Int. Cl.[4] H01L *29/04, 27/12, 49/02*
U.S. Cl. 357—4 7 Claims



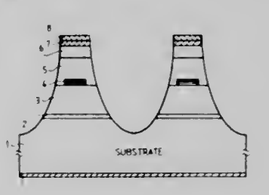
1. A horizontal bipolar transistor structure, comprising:
a substrate;
an insulating layer covering one surface of said substrate:
an island of epitaxial silicon of a first conductivity type located in said insulating layer and having an upper surface substantially coplanar with a surface of said insulating layer away from said substrate and a lower surface substantially parallel thereto and spaced toward said substrate, wherein said island is surrounded on all sides and below the lower surface by said insulating layer;
a first highly doped region of the first conductivity type disposed within said island along a first side thereof, and filling the island between the upper surface and the lower surface:
a second highly doped region of the first conductivity type disposed within said island along a second side thereof, wherein the second side is opposite the first side, and wherein the second side fills said island between the upper and lower surfaces; and
a third region of a second conductivity type disposed adjacent said first doped region and filling the island between the upper and lower surfaces, said third region having an essentially constant width between said first and second regions and having a doping profile with a largest concentration in a direction toward the first region and a lower concentration in a direction toward the second region:
insulation means contacting a portion of said first and second regions and a portion of said third region, having a window therein over said third region, whereby direct electrical contact can be made to said third region through said window;
and means overlying said third region and a portion of said insulation means for establishing direct electrical contact to said third region through said window.

4,897,699

GROUP III-V COMPOUND BASED OPTOELECTRONIC DEVICE ON SILICON SUBSTRATE

Manijeh Razeghi, Gif sur Yvette; Robert Blondeau, Ablis; Franck Omnes, les Ulis; Martin Defour, Courbevoie, and Gérard Doriath, Verrieres le Buisson, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 21, 1988, Ser. No. 247,390
Claims priority, application France, Sep. 22, 1987, 8713057
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—4 12 Claims



1. An optoelectronic device comprising at least the following, stacked on one another:
a substrate made of crystalline silicon with a defined lattice parameter;
a set of matching layers deposited successively on a surface of the substrate;
a first confinement layer made of a material containing at least indium and phosphorus elements and having a second defined lattice parameter;;
an active layer made of material containing at least elements of gallium, indium, arsenic and phosphorus and with a composition of the $Ga_x In_{1-x} As_{1-y} P_y$ type with y ranging between 0 and 1;
a second confinement layer;
the set of matching layers comprising at least one layer of a material comprising especially elements of gallium and arsenic and having a lattice parameter which differs little from the first lattice parameter of the substrate, and providing lattice matching of the first confinement layer with the substrate.

4,897,700

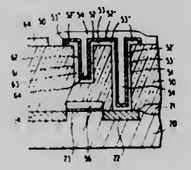
SEMICONDUCTOR MEMORY DEVICE

Kunio Nakamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 205,871
Claims priority, application Japan, Jan. 12, 1987, 62-146366
Int. Cl.[4] H01L *29/78, 27/02*
U.S. Cl. 357—23.6 4 Claims

1. A semicondutor memory device comprising a semiconductor substrate, a word line, a digit line, a reference potential line, a dynamic memory cell having one switching transistor and one storage capacitor connected to said switching transistor, and an insulating layer formed on said switching transistor,

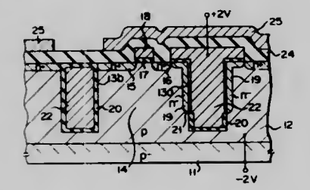
made of silicate glass and having a thickness ranging from 3 μm to 6 μm, said switching transistor including a pair of source and drain regions, a channel region positioned between said source and drain regions, a gate insulating film formed on said channel region and a gate electrode formed on said gate insulating film and coupled to said word line, one of said source and drain regions being coupled to said reference potential line, said insulating layer having a flat planar upper surface and an aperture formed substantially perpendicularly to said upper surface and reaching a surface portion of the other of said source and drain regions to expose said surface portion, and a trench formed from said upper surface into a predetermined depth at a position above said gate electrode such that between the bottom of said trench and said gate electrode a part of said insulating layer is interposed, and said storage capacitor including a lower electrode formed on the side wall of said



aperture, on said exposed surface portion of said other of said source and drain regions on said upper surface of said insulating layer, and on said bottom and the side wall of said trench, a dielectric film formed entirely on said lower electrode and an upper electrode formed on said dielectric film within said aperture, above said upper surface of said insulating layer and within said trench to constitute a first MOS type capacitor within said aperture by said lower electrode, said dielectric film and said upper electrode, a second MOS type capacitor above said upper surface of said insulating layer by said lower electrode, said dielectric film and said upper electrode a third MOS type capacitor within said trench by said lower electrode, said dielectric film and said upper electrode, the capacitance of said first MOS type capacitor within said aperture being larger than the capacitance of said second MOS type capacitor above said upper surface of said insulating layer, and said upper electrode being coupled to said digit line.

4,897,701
Patent Not Issued For This Number

4,897,702
SEMICONDUCTOR MEMORY DEVICE AND MANUFACTURING METHOD FOR THE SAME
Kazumasa Sunouchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 24, 1988, Ser. No. 159,597
Claims priority, application Japan, Feb. 24, 1987, 62-39022
Int. Cl.[4] H01L *29/78, 29/06, 29/02*
U.S. Cl. 357—23.6 **3 Claims**



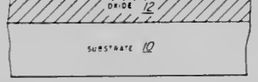
1. A semiconductor memory device comprising groove means formed in a semiconductor substrate for separating one memory cell-forming region from another, said memory cell comprising a MOS transistor formed in said memory cell-forming region and a capacitor connected in series to said MOS transistor, and said groove means including a first groove in which a first insulating layer for separating said memory cell-forming region and a second insulating layer for forming said capacitor are formed, and a second groove in which said first insulating layer is formed; wherein

said first insulating layer in said first groove is formed on the inner surface of a predetermined lower portion of said first groove and has a thickness which is less than half the width of said first groove, said second insulating layer has a thickness which is less than that of said first insulating layer,

said second insulating layer in said first groove is provided on the inner surface of the remaining upper portion of said first groove, and

a capacitor electrode is made of semiconductor material provided in said first groove along said first and second insulating layers and in said second groove, along said first insulating layer.

4,897,703
RECESSED CONTACT BIPOLAR TRANSISTOR AND METHOD
David B. Spratt, Plano; Robert L. Virkus, Dallas; Robert H. Eklund, and Eldon J. Zorinsky, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 29, 1988, Ser. No. 149,785
Int. Cl.[4] H01L *29/72, 27/12, 29/04*
U.S. Cl. 357—34 **11 Claims**



1. An integrated circuit having a transistor comprising:

a collector region of a first conductivity type formed in a semiconductor substrate;

a base region of a second conductivity type formed in an upper portion of said collector region;

an emitter region of said first conductivity type formed in a semiconductor layer overlying said base region;

a first sidewall insulator formed on the sides of said emitter region;

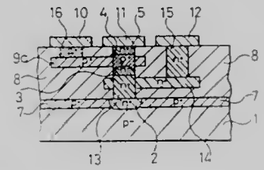
a plurality of recesses extending through at least a portion of said base region and having at least one wall aligned to said first sidewall insulator;

a second sidewall insulator formed on said first sidewall insulator and on said at least one wall;

a base contact region doped to said second conductivity type, formed in a selected one of said recesses on a first side of said emitter region and aligned to said first sidewall insulator; and

a collector contact region doped to said first conductivity type, formed in another one of said recesses on a second side of said emitter, spaced from said emitter region by an amount equal to the thickness of both the first and the second sidewall insulators and aligned to said second sidewall spacer.

4,897,704
LATERAL BIPOLAR TRANSISTOR WITH POLYCRYSTALLINE LEAD REGIONS
Hiromi Sakurai, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1988, Ser. No. 161,427
Claims priority, application Japan, Jan. 10, 1983, 58-3141
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—35 **4 Claims**



1. A semiconductor device comprising:

a silicon substrate of a first electrically conductive type;

an embedded collector layer of a second electrically conductive type opposite to said first electrically conductive type formed in said substrate, said embedded collector layer including first and second portions having predetermined surface areas, wherein said first portion of said embedded collector layer forms a PN junction with said substrate;

a transistor structure disposed above said substrate including,

a first collector region of said second electrically conductive type having a surface area substantially the same as said predetermined surface area of said first portion formed on said second portion of said embedded collector layer,

a second collector region of said second electrically conductive type having a surface area substantially the same as said predetermined surface area of said first portion formed on said first collector region having an impurity density lower than that of said first collector region,

a base region of said first electrically conductive type having a surface area substantially the same as said predetermined surface area of said first portion formed on said second collector region, and a first emitter region of said second electrically conductive type having a surface area substantially the same as said predetermined surface area of said first portion formed on said base region, wherein said first collector region, said second collector region, said base region, and said emitter region comprise a single crystalline silicon layer;

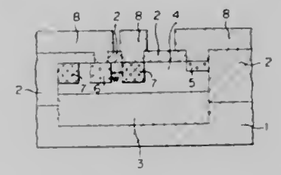
an insulating layer provided on said substrate and surrounding said transistor structure;

a first polycrystalline collector lead region formed in said insulating layer comprising said second electrically conductive type, said first collector lead region including first and second portions, wherein said first portion of said first collector lead region contacts said first collector region;

a second polycrystalline collector lead region formed in said insulating layer comprising said second electrically conductive type, said second collector lead region including first and second portions, wherein said first portion of said second collector lead region contacts said second portion of said first collector lead region, and said second portion of said second collector lead region is exposed through said insulating layer so as to permit further electrical contacts therewith; and

a polycrystalline base lead region of said first electrically conductive type, said base lead region including first and second portions, wherein said first portion of said base lead region contacts said base region, and said second portion of said base lead region is exposed through said insulating layer so as to permit further electrical contacts therewith.

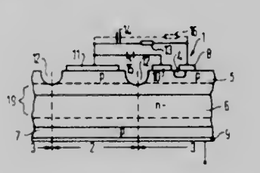
4,897,705
LATERAL BIPOLAR TRANSISTOR FOR LOGIC CIRCUIT
Takatsugu Kitora, and Youichirou Taki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 32,573, Apr. 1, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 328,799
Claims priority, application Japan, May 6, 1986, 61-105337
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—35 **2 Claims**



1. A semiconductor integrated circuit device comprising:

a lateral pup transistor having a base to which an input signal is applied and an npn transistor having a base to which a potential appearing at the emitter of said pnp transistor is applied, said both transistors constituting a bipolar logic circuit, wherein the emitter and the collector of said pnp transistor are formed by the same p^+ diffusion layer and the width between said emitter diffusion layer and said collector diffusion layer is in the range from 5 microns to 7 microns, whereby a diffusion capacity is increased so that a rising time of emitter potential in said lateral pnp transistor is shortened.

4,897,706
THYRISTOR PROTECTED AGAINST BREAKOVER FIRING
Peter Voss, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 16, 1988, Ser. No. 285,488
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1988, 3742895
Int. Cl.[4] H01L *29/74;* **H03K** *3/26, 3/35*
U.S. Cl. 357—38 **8 Claims**



1. A thyristor protected against breakover firing, including a semiconductor body having:

a three-layer structure and, at least partially, four layers of alternating conductivity type of which the two outer layers are first and second emitter zones, respectively, and the two inner layers first and second base zones, respectively;

a first region and a second region which has a lower breakdown voltage than the first region; wherein:

the four layers reside at least partially in the first region;

the first emitter zone is connected to a first emitter electrode;

the second emitter zone is connected to a second emitter electrode;

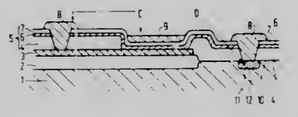
the first base zone, bordering on the first emitter zone, is connected to a control electrode;
the first emitter zone has at least one shunt;
the first base zone is connected to an auxiliary electrode in the second region;
a resistor is coupled between the first emitter electrode and the auxiliary electrode;
the second region is separated from the first region by a trench which is of such depth that it touches at least the space charge zone developing between the two base zones if the avalanche breakdown sets in in the blocking direction;
a breakover element is coupled between auxiliary electrode and control electrode which conducts at a given voltage drop across the resistor and initiates the firing process of the thyristor.

4,897,707

SEMICONDUCTOR DEVICE COMPRISING A CAPACITOR AND A BURIED PASSIVATION LAYER

Wilhelmus J. M. J. Josquin, Eindhoven, and Henderikus Lindeman, Nijmegen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 7, 1988, Ser. No. 203,675
Claims priority, application Netherlands, Jun. 11, 1987, 8701357
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 **8 Claims**



1. A semiconductor device comprising
(a) a semiconductor body having at a surface at least one semiconductor circuit element,
(b) a first electrically insulating layer covering at least a portion of said surface, said first electrically insulating layer being free of said at least one semiconductor circuit element,
(c) a silicon layer disposed on said first electrically insulating layer,
(d) a second electrically insulating layer covering said surface and at least a portion of said silicon layer,
(e) a phosphor glass layer disposed over said silicon layer and said second electrically insulating layer,
(g) a covering layer of an electrically insulating material disposed on said phosphor glass layer, said covering layer having a substantially smaller thickness than said second electrically insulating layer, and
(g) at least one metal layer disposed on said covering layer and said phosphor glass layer directly over said silicon layer,
wherein said covering layer and said phosphor glass layer over said silicon layer constitute a dielectric of a capacitor, and said silicon layer and said at least one metal layer constitute electrical plates of said capacitor.

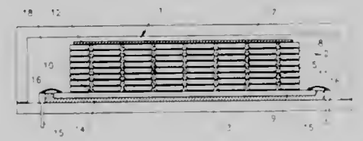
4,897,708

SEMICONDUCTOR WAFER ARRAY

Ken Clements, Santa Cruz, Calif., assignor to Laser Dynamics, Inc., Scotts Valley, Calif.

Filed Jul. 17, 1986, Ser. No. 887,129
Int. Cl.[4] H01L *23/48, 23/52*
U.S. Cl. 357—65 **16 Claims**

1. A wafer array comprising:
a plurality of wafers of material which are disposed in a stack one on top of another;
a through-hole in each of said wafers in said stack, said through-hole having an apex at one surface of said wafer and a base at the opposite surface of said wafer with an outwardly sloping sidewall extending from said apex to said base.
first retaining means for retaining said through-hole in one of said wafers in said stack in registration with said through-hole in an adjacent wafer in said stack;
an electrically conductive pad located adjacent to said apex of said through-hole in each of said wafers, said base of said through-hole being large enough to extend over the electrically conductive pad located adjacent to said apex of a through-hole in registration therewith on an adjacent wafer;



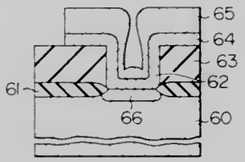
an electrically conductive liquid which extends through said through-hole in each of said wafers for electrically connecting said electrically conductive pad on one of said wafers with said electrically conductive pad on said adjacent wafer;
means for electrically isolating said electrically conductive liquid from exposed surfaces of said wafer material; and
second and third retaining means located on the top and bottom of said stack, respectively for retaining said electrically conductive liquid in said through-holes, said third retaining means including means for electrically connecting said electrically conductive liquid to an external device.

4,897,709

TITANIUM NITRIDE FILM IN CONTACT HOLE WITH LARGE ASPECT RATIO

Natsuki Yokoyama, Mitaka; Yoshio Homma, Tokyo; Kenji Hinode, and Kiichiro Mukai, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,269
Claims priority, application Japan, Apr. 15, 1988, 63-91556
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 **12 Claims**



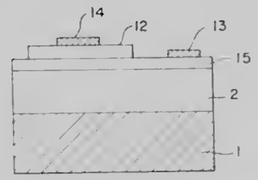
1. A semiconductor device comprising:
an insulating film, having a surface, formed on a surface of a semiconductor substrate, and having at least a hole whose side wall is substantially perpendicular to said substrate surface; and
a titanium nitride film disposed thereon, extending from the surface of said semiconductor substrate, exposed by said hole, along said side wall, and having a portion on the insulating film surface, said titanium nitride film extending along said side wall having a thinnest portion, the portion of the titanium nitride film on the insulating film surface having a film thickness, the thickness of said thinnest portion of said titanium nitride film within said hole, being more than 0.6 times as large as the film thickness of the titanium nitride film portion on said insulating film surface.

4,897,710

SEMICONDUCTOR DEVICE

Akira Suzuki, Nara; Katsuki Furukawa, Sakai; Akitsugu Hatano, Tenri, and Atsuko Uemoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 18, 1987, Ser. No. 86,490
Claims priority, application Japan, Aug. 18, 1986, 61-193158
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—71 **14 Claims**



1. A structure for a p-n junction gate type FET semiconductor device, comprising:
a substrate;
a first silicon carbide layer disposed on said substrate for electrically insulating said substrate;
a second silicon carbide layer disposed on said first silicon carbide layer for forming an active layer of the semiconductor device, wherein said second silicon carbide layer is electrically insulated from said substrate by said first silicon carbide layer;
a third silicon carbide layer disposed on a first portion of said second silicon carbide layer for forming a channel layer;
a first electrode layer disposed on a second portion of said second silicon carbide layer for forming a source electrode and a drain electrode; and
a second electrode layer disposed on said third silicon carbide layer for forming a gate electrode.

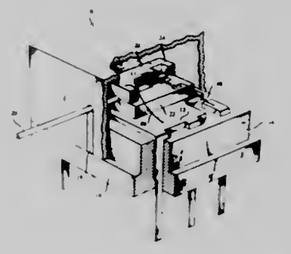
4,897,711

SUBASSEMBLY FOR OPTOELECTRONIC DEVICES

Greg E. Blonder, Summit, and Bertrand H. Johnson, Murray Hill, both of N.J., assignors to American Telephone and Telegraph Company and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1988, Ser. No. 163,664
Int. Cl.[4] H01L *23/02; G02B 6/30*
U.S. Cl. 357—74 **19 Claims**

1. A subassembly for an optoelectronic device comprising
a semiconductor base having a major surface and a first groove in said surface capable of receiving a portion of an optical fiber, said first groove having side walls and an end face formed by crystallographic planes which are oblique to said surface,
an insulative layer formed on at least a portion of said surface, and
metal contacts disposed on said layer, at least one of said contacts overlapping said end face and forming a reflector,



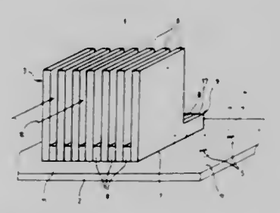
said device being disposed over said reflector and connected to said contacts, so that said reflector directs light between said device and said fiber.

4,897,712

HEAT SINK, PARTICULARY FOR THE COOLING OF ELECTRONIC ELEMENTS

Alexander Prokopp, Freiberg/Neckar, Fed. Rep. of Germany, assignor to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,049
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703873
Int. Cl.[4] H01L *23/34, 23/36, 23/40*
U.S. Cl. 357—81 **11 Claims**



1. A heat sink arrangement for cooling electronic structural component means and the like, comprising:
cooling element means,
and a base body for supporting the cooling element means and electronic structural component means to be cooled, wherein the cooling element means includes a plurality of sheet metal plate cooling sheets arranged essentially in parallel to one another and intermediate sheets interposed between the cooling sheets for determining the spacing between the cooling sheets, said cooling sheets and intermediate sheets being connected to one another and to said base body by solder connections, said cooling sheets extending transversely of said base body by a substantially greater distance than do the intermediate sheets such that gaps extend between the cooling sheets for accommodating cooling fluid flow therethrough.

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4,897,713

COLOR TELEVISION SIGNAL DECODING CIRCUIT

Antonius H. Nillesen, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1989, Ser. No. 301,572

Claims priority, application Netherlands, Feb. 10, 1988, 8800320

Int. Cl.[4] H04N *5/04, 9/44, 9/66*

U.S. Cl. 358—17 4 Claims



1. A color television signal decoding circuit comprising an analog-to-digital converter (3) having an input (1) for a video signal and an output (5) which is coupled to a first input (7) of a color synchronizing signal phase detection circuit (9) a second input (11) of which is coupled to an output (13) of a first digital oscillator (15) having a clock signal input (17) which, likewise as a clock signal input (19) of the analog-to-digital converter, is coupled to an output (27) of a second digital oscillator (29) which is controllable by means of a clock signal (f_c) having a stable frequency, a control signal input (37) of the first digital oscillator (15) being coupled to a control signal output (71) of the color synchronizing signal phase detection circuit, a control signal input (55) of the second digital oscillator (29) being coupled to a control signal output (63) of a line synchronizing signal phase detection circuit (65) which is also coupled (via 41) to the control signal input (37) of the first digital oscillator (15), and inputs (99, 97) of the line synchronizing signal phase detection circuit (65) being coupled to outputs (5, 27) of the analog-to-digital converter (3) and of the second digital oscillator (29) for receiving signals at the line frequency of the video signal, characterized in that the control signal output (63) of the line synchronizing signal phase detection circuit (65) is coupled to an input (87) of a stable state detection circuit (85) for detecting a stable synchronization state, said stable state detection circuit (85) having an output (83) which is coupled to an operation signal input (81) of a coupling correction circuit (41) for realizing, in the stable synchronization state, a coupling between the control signal output (71) of the color synchronizing signal phase detection circuit (9) and the control signal input (55) of the second digital oscillator (29) and a coupling between the control signal input (37) of the first digital oscillator (15) and an output (51) of a standard signal generating circuit (53), and for realizing a decoupling between the control signal output (63) of the line synchronizing signal phase detection circuit (65) and the control signal inputs (37, 55) of the first and the second digital oscillator.

4,897,714

PASSENGER VEHICLE SERVICE SYSTEM

Atsushi Ichise; Yoshiyuki Kondo, both of Tokyo; Masatoshi Hirayasu, Kanagawa, and Kenji Inoue, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,571

Claims priority, application Japan, Feb. 25, 1987, 62-042504

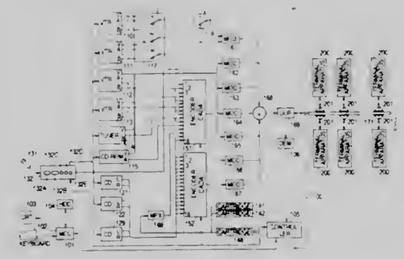
Int. Cl.[4] H04N *5/00, 7/18;* H04B *3/50*

U.S. Cl. 358—86 21 Claims

1. A passenger vehicle service system, comprising:

a head end apparatus having memory means for storing menu data, and means for recovering said menu data for subsequent transmission, where said menu data includes at least one menu and each menu includes at least one menu item;

a plurality of terminal units, each provided at a respective one of a plurality of passenger seats, each of the terminal units having means for displaying said menu data, means for selecting said at least one menu item from among the displayed menu data, and means for generating a request



signal which indicates the at least one menu item selected by the selecting means and which also includes an address signal identifying said each terminal unit; and

means for transmitting said menu data from said head end apparatus to the terminal units and for transmitting the request signals from the terminal units to the head end apparatus.

4,897,715

HELMET DISPLAY

William S. Beamon, III, Ormond Beach, Fla., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,621

Int. Cl.[4] H04N *7/18, 9/14, 3/08, 13/00*

U.S. Cl. 358—93 28 Claims



1. A helmet mountable display system for displaying a first raster-scanned image to an observer in response to a first plurality of light source means, each of the first plurality of light source means for supplying a respective first light signal having a respective first predetermined size, the display system comprising:

first input lens means having an input and an output, the input of the first input lens means optically coupled to the first plurality of light source means for receiving each first light signal, the first input lens means for providing a first collimated light pattern at the output of the first input lens means in response to each first light signal supplied to the input of the first input lens means;

a first deflecting surface moveable about a first axis, the first deflecting surface for deflecting the first collimated light pattern in a first direction along a first predetermined optical path;

a second deflecting surface moveable about a second axis and optically coupled to the first deflecting surface, the second deflecting surface for deflecting the deflected first collimated light pattern received from the first deflecting surface in a second direction along the first predetermined optical path;

first output lens means having an input and an output and optically coupled to receive the deflected first collimated light pattern deflected from the second deflecting surface, the first output lens means focusing the deflected first collimated light deflected from the second deflecting surface;

screen means optically coupled to the output of the first output lens means and disposed at the image plane of the first output lens means, the screen means for displaying the image of each of the first light signals and further for displaying a first raster scanned image when the first and second deflecting surfaces are moving in a predetermined pattern, the first raster scanned image having a first plurality of zones, each of the first plurality of zones scanned in response to a corresponding one of the first plurality of light source means; and

visor display means, the visor display means having a visor surface viewable by the observer, the visor surface optically coupled to the screen means for presenting the first raster displayed image to the observer.

4,897,716

METHOD AND APPARATUS FOR ADAPTIVELY DISPLAYING VIDEO SIGNALS

John O. Drewery, Sutton, and Arthur H. Jones, Horsham, both of United Kingdom, assignors to British Broadcasting Corporation, London, England

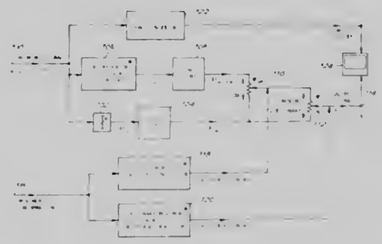
PCT No. PCT/GB87/00868, § 371 Date Aug. 1, 1988, § 102(e) Date Aug. 1, 1988, PCT Pub. No. WO88/04505, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 2, 1987, Ser. No. 227,906

Claims priority, application United Kingdom, Dec. 2, 1986, 8628813

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—105 7 Claims



1. A video display device comprising

a first input means for receiving a first video signal representing an image and having a first scanning standard;

a second input means for receiving a movement signal containing information as to whether designated areas of the image being represented by the first video signal contain stationary or moving information;

means for deriving from the first video signal a second video signal having a second scanning standard;

display means operable at the second scanning standard;

means for applying the second video signal to the display means; and

means for selectively blanking lines in the second video signal applied to the display means in each designated area of the image being represented in dependence upon the received movement signal.

4,897,717

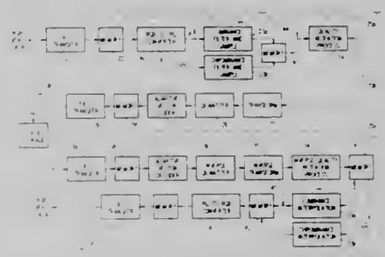
COMPUTER-BASED VIDEO COMPRESSION SYSTEM

Eric R. Hamilton, Cupertino; John L. Douglas, Santa Cruz, and Jeffrey B. Wildergren, Saratoga, all of Calif., assignors to StarSignal, Inc., Campbell, Calif.

Filed Mar. 30, 1988, Ser. No. 175,074

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—133 21 Claims



1. A system for compression and expansion of a frame of analog information comprising:

a first subsystem comprised of an analog to digital processor and a first random access memory (RAM);

a second subsystem for compression and expansion of digital data comprising: a second random access memory (RAM); means for compressing data operatively connected to said second RAM; means for expanding data operatively connected to a said second RAM;

a third RAM for storing said compressed data;

means for data management operatively connected to said first RAM, to said second RAM, and to said third RAM;

means for processing said frame of analog information;

wherein said means for processing said frame of analog information generates an analog signal representing information in said frame;

said means for processing said frame of analog information being operatively connected to said analog to digital processor so that said analog signal is an input signal to said analog to digital processor;

said analog to digital processor converting said analog signal to a frame of digital data;

said first RAM being operatively connected to said analog to digital processor so that said frame of digital data is stored in said first RAM;

said system having a first mode of operation wherein;

said means for data management transfers a selected portion of said stored digital data from said first RAM to said second RAM;

said means for compressing data retrieves said selected portion of digital data from said second RAM; compresses said selected portion, and stores said compressed data in said second RAM;

said means for data management transfers said compressed data from said second RAM to said third RAM;

said system having a second mode of operation wherein;

said means for data management transfers a selected portion of said compressed data from said third RAM to said second RAM;

said means for expanding data retrieves said selected portion of said compressed data from said second RAM; expands said selected portion; and stores said expanded data in said second RAM; and

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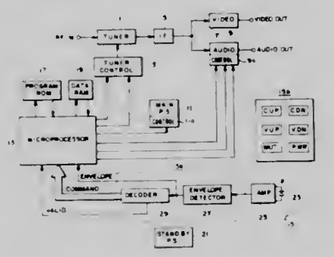
said means for data management transfers said expanded data from said second RAM to said first RAM.

4,897,718

RAPID ACCESS REMOTE CONTROL SYSTEM

William J. Testin, and Roger L. Richards, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 3, 1988, Ser. No. 183,505
Int. Cl.[4] H04N *5/44*
U.S. Cl. 358—194.1 **9 Claims**



1. In a remote control system for controlling a device in response to a remote control message including a carrier modulated with an encoded pulse signal and transmitted by a remote control transmitter, said encoded pulse signal conforming to a predetermined encoding format and having a predetermined time duration, apparatus comprising:

envelope detector means for deriving an envelope signal corresponding to said encoded pulse signal in response to said remote control message;

decoder means responsive to said envelope signal for generating a control signal corresponding to said remote control message when said envelope signal conforms to said predetermined encoding format and thereafter responsive to each of the end of a delay period longer than said predetermined duration of said encoded pulse signal and the absence of said envelope signal for a time interval shorter than said predetermined time duration for terminating said control signal; and

function control means responsive to said control signal for performing a predetermined function of said device each time said control signal is generated.

4,897,719

IMAGE PRE-PROCESSING SUB-SYSTEM

Hugh Griffin, R.R. #5, Box 410, Greenfield, Ind. 46140

Filed Mar. 19, 1987, Ser. No. 27,734
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—135 **14 Claims**

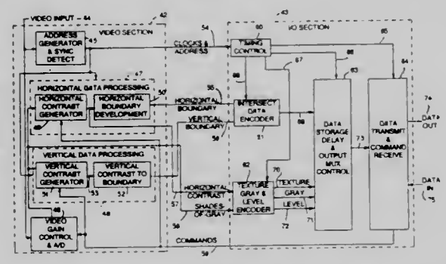
1. Apparatus for processing image data to condense the data to a smaller amount of data, the apparatus comprising:

means for receiving data from an image data generator;

means for comparing data from two spatially related regions of the image spaced apart by more than one region and for generating an output based upon that comparison, the output having a first state and a second state;

means for responding to the output of the comparing means for causing at least part of the data from the spatially related regions of the image to be discarded in response to the first state of the output and for causing at least part of the data from the spatially related regions of the image not to be discarded in response to the second state of the output;

means for coupling the means for comparing data from spatially related regions and for generating an output to the means for receiving data; and



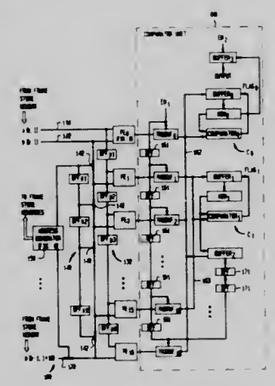
means for coupling the means for responding to the output of the comparing means to the comparing means.

4,897,720

CIRCUIT IMPLEMENTATION OF BLOCK MATCHING ALGORITHM

Lancelot Wu, Morristown, and Kun-Min Yang, Parsippany, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Mar. 14, 1988, Ser. No. 167,327
Int. Cl.[4] H04N *7/137*
U.S. Cl. 358—136 **14 Claims**



1. A circuit for implementing a full search block matching algorithm comprising

first input means for sequentially receiving pixel values from a block of pixels in a current video frame,

second input means for sequentially receiving pixel values from a search area of a previous video frame,

a plurality of processors for calculating in parallel using said pixel values a group of error functions corresponding to a group of positions of said block in said search area,

a first bus structure for transporting said sequentially received pixel values from said block to said processors,

a second bus structure for transporting said sequentially received pixel values from said search area to said processors, and

comparison means for comparing said error functions.

a plurality of processors for calculating in parallel a group of error functions corresponding to a group of positions of said block in said search area,

a first bus structure for transporting said sequentially received pixel values from said block to said processors,

a second bus structure for transporting said sequentially received pixel values from said search area to said processors, and

comparison means for comparing said error functions

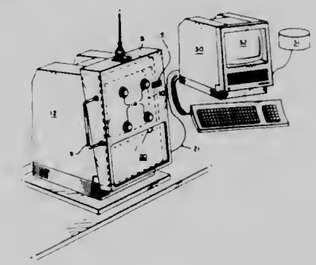
wherein said second input means comprises two distinct inputs for sequentially receiving pixel values from said search area.

4,897,721

AUTOMATED TESTING APPARATUS FOR SCREEN ALIGNMENT

Stephen J. Young, Milpitas, Calif.; Mike K. Blackwell, Pittsburgh, Pa.; Kevin J. Dowling, Pittsburgh, Pa.; Hans P. Moravec, Pittsburgh, Pa., and Lada Zajicek, Fremont, Calif., assignors to Apple Computer, Cupertino, Calif.

Filed May 16, 1988, Ser. No. 194,497
Int. Cl.[4] H04N *17/00*
U.S. Cl. 358—139 **18 Claims**



1. An automated testing apparatus for screen alignment of a video display screen comprising:

display generation means, coupled to a video screen to be tested, for generating predetermined patterns on said screen;

sensing means, coupled to said screen, having a plurality of sensors prepositioned and fixedly mounted in a sensor plate for sensing said predetermined patterns on said screen;

computing means, coupled to said sensing means, for receiving test data from said sensors and comparing said test data to data from an ideal screen such that the results of said comparison determine parameters for evaluating screen alignment and distortion.

4,897,722

WIDESCREEN TELEVISION TRANSMISSION SYSTEM UTILIZING CONVENTIONAL EQUIPMENT INCLUDING A CAMERA AND VCR

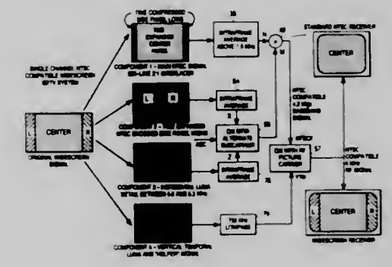
Robert E. Flory, Princeton, N.J., assignor to General Electric Company, Princeton, N.J.

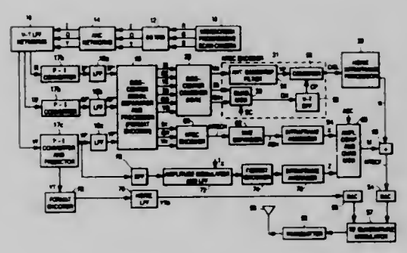
Filed Apr. 7, 1988, Ser. No. 178,954
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—141 **9 Claims**

1. In a widescreen enhanced definition television system intended for reproducing images having a greater aspect ratio and a greater horizontal resolution compared with images having a conventional aspect ratio and a conventional horizontal resolution and a conventional number of lines per field reproduced in a conventional television system operating in conformance to a conventional television transmission standard with conventional transmission channels of a conventional transmission bandwidth, apparatus comprising:

a conventional television camera for generating a television signal having said conventional number of horizontal lines per field, each horizontal line having a given active line interval normally corresponding to an image with said conventional aspect ratio, and a horizontal bandwidth corresponding to a horizontal resolution greater than said conventional horizontal resolution; said camera being normally intended to be used in said conventional television system in conjunction with low pass filter means for filtering said television signal generated by said camera to limit its horizontal bandwidth to said conventional horizontal bandwidth corresponding to said conventional horizontal resolution to produce a conventional television signal conforming to said conventional television transmission standard and suitable for transmission through one of said conventional transmission channels;

aspect ratio modification means for modifying said conventional camera so that said television signal generated by said camera is modified to be a widescreen television signal having said conventional number of horizontal lines per field, each horizontal line having said given active line interval but now corresponding to a widescreen image with an aspect ratio greater than said conventional aspect





ratio, and a horizontal bandwidth greater than said conventional horizontal bandwidth of said conventional television system; said widescreen television signal having within said given active image interval left side, center and right side signal portions corresponding to left side, center and right side image portions of said widescreen image;

encoder means having an input at which said widescreen television signal produced by said camera as modified is received and an output at which a compatible widescreen television signal suitable for transmission through one of said conventional transmission channels is produced; said compatible widescreen television signal including a first component corresponding to a lower frequency portion of a time-expanded version of said center signal portion relating at least approximately, to said conventional horizontal resolution of said conventional television system and lower frequency portions of time-compressed versions of said left and right signal portions, a second com-

ponent corresponding to upper frequency portions of said time-compressed versions of said left and right signal portions, and a third component corresponding to an upper frequency portion of said time-expanded version of said center signal portion relating to an enhanced horizontal resolution greater than said conventional horizontal resolution of said conventional television system; and

coupling means for coupling said widescreen television signal produced by said camera as modified to said input of said encoder substantially without reduction of its horizontal bandwidth.

4,897,723

CIRCUITRY FOR AND METHOD OF GENERATING VERTICAL DRIVE PULSE IN VIDEO SIGNAL RECEIVER

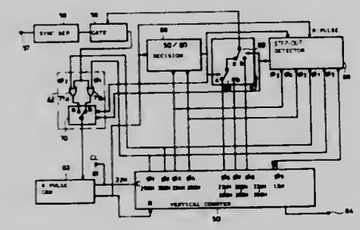
Hiromi Arai, Kumagaya, Japan, assignor to SanyoElectric Co., Ltd., Moriguchi, Japan

Filed May 16, 1989, Ser. No. 352,524

Claims priority, application Japan, May 17, 1988, 63-119657; May 19, 1988, 63-122318

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—158 **19 Claims**



1. An apparatus for generating a vertical drive pulse for defining a vertical scanning period of a display screen in response to a vertical synchronizing signal included in a video signal to be displayed, said apparatus receiving video signals in accordance with at least first and second broadcasting systems having different cycles of the vertical synchronizing signals, said apparatus comprising:

gate means (59; 70) for passing said vertical synchronizing signal included in said video signal to be displayed;

counter means (60; 360) for counting a clock signal and generating said vertical drive pulse and a plurality

of timing signals (ϕ1 to ϕ8; ψ1 to ψ15) synchronous with said clock signal, said clock signal having a frequency integral times that of a horizontal synchronizing signal included in said video signal, said plurality of timing signals including at least a first timing signal (ϕ6; ψ10) for defining a first gate period corresponding to said first broadcasting system, a second timing signal (ϕ7; ψ11) for defining a second gate period corresponding to said second broadcasting system and a third timing signal (ϕ8; ψ12) for defining a third gate period including said first and second gate periods;

means (62, 63, 65; 362,363,365) for deciding whether said video signal to be displayed is that of said first broadcasting system or that of said second broadcasting system in response to said vertical synchronizing signal from said gate means; and

gate period set means (66, 67; 366, 367) for selecting either said first or second timing signal in response to a decision result output from said decision means and supplying the selected timing signal to said gate means thereby to set a signal passage period in said gate means,

said gate period set means further including means (66, 69; 423) for selecting said third timing signal and applying the same to said gate means when said vertical synchronizing signal is not received in a predetermined period set for respective said first and second broadcasting systems.

4,897,724

APPARATUS AND METHOD FOR REPRODUCING DIGITIZED VIDEO PICTURES, WITH INCLINED PLANE ERROR RESTORATION

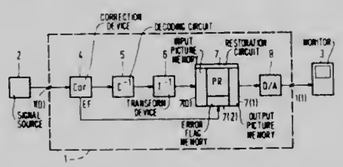
Raymond N. J. Veldhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,692

Claims priority, application Netherlands, Jun. 6, 1988, 8801440

Int. Cl.[4] H04N *5/94, 7/13*

U.S. Cl. 358—166 **5 Claims**



1. A device for reproducing digitally received video pictures composed of an array of picture elements comprising a reference sub-picture, said device including means for restoring erroneous picture elements located within said reference sub-picture within which said erroneous picture elements are enclosed by non-erroneous picture elements, means for performing a preset process and an iteration prediction process, characterized in that in said preset process a correction coefficient step is performed in which each non-erroneous picture element is reduced by a correction value dependent on the coordinates of the relevant non-erroneous picture element of the reference sub-picture thereby generating a first group of difference picture elements, and wherein said correction values are determined by a plurality of correction function coefficients, the actual values of which are obtained by minimizing the sum of the square values of said first group of difference picture elements.

4,897,725

GHOST CANCELING CIRCUIT

Tadaaki Tanaka; Fumiyoshi Sasaki; Tetsuro Miyazaki, all of Tokyo; Reiichi Kobayashi, Osaka; Tatsuya Shiki, Osaka, and Michio Kobayashi, Osaka, all of Japan, assignors to NEC Home Electronics Ltd., Osaka and Nippon Hoso Kyokai, Tokyo, both of, Japan

Filed Mar. 13, 1989, Ser. No. 322,157

Claims priority, application Japan, Mar. 11, 1988, 63-57544

Int. Cl.[4] H04N *5/123, 9/64*

U.S. Cl. 358—167 **11 Claims**

1. A ghost canceling circuit comprising:

means for generating a dummy ghost;

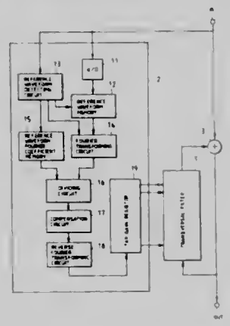
means for adding an output of said dummy ghost generating means to the received television signal; and

means for controlling a tap gain of said dummy ghost generating means in accordance with a reference waveform contained in the received television signal,

wherein said tap gain controlling means comprising:

means for extracting said reference waveform from the received television signal;

means for Fourier transforming said received reference waveform, said received reference waveform Fourier transforming means outputting a Fourier coefficient; and



means for reverse Fourier transforming said transformed reference waveform whereby outputting said tap gain.

4,897,726

METHOD AND APPARATUS FOR INTERACTING WITH TELEVISION IMAGES

Richard G. Morton, 17786 Aguamiel Rd., San Diego, Calif. 92127, and Kenneth Avicola, 5303 Sandy Grove, Kingwood, Tex. 77339

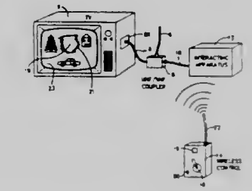
Division of Ser. No. 850,834, Apr. 11, 1986, Pat. No. 4,739,406.

This application Mar. 14, 1988, Ser. No. 167,541

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[4] H04N *5/272*

U.S. Cl. 358—183 **5 Claims**



1. An apparatus for interacting with a TV, comprising:

means for generating a disruption signal representative of an image to be superimposed over a portion of a scene displayed on the TV, the scene being derived from a video signal received by an antenna input of the TV from a source, the disruption signal generating means including an RF oscillator having a bandwidth that covers substantially all of a VHF band and a UHF band;

means for coupling the disruption signal generating means to the antenna input of the TV;

means for synchronizing the disruption signal with the video signal to produce a synchronized disruption signal;

means for adjusting the amount of delay of the synchronized disruption signal to thereby determine a vertical position and a horizontal position on the scene where the image will be superimposed; and

means for manually controlling the adjustable delay means for allowing a viewer to cause the superimposed image to appear over the selected portion of the scene at a selected time.

4,897,727

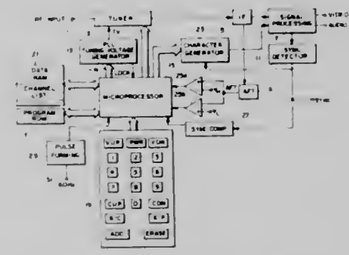
TELEVISION TUNING SYSTEM ALLOWING RAPID RESPONSE TO USER INITIATED COMMANDS

Roger L. Richards, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 9, 1988, Ser. No. 191,645

Int. Cl.[4] H04N *5/50, 5/44*

U.S. Cl. 358—194.1 **7 Claims**



1. In a receiver, apparatus comprising:

an input for receiving a periodic interrupt signal;

computer means operating in accordance with instructions of a stored program including a plurality of main subroutines, including a tuning control subroutine and a user command entry subroutine, executed in sequence in repetitive cycles of said program, and an interrupt subroutine executed in response to said interrupt signal, one of said main subroutines being interrupted when said interrupt subroutine is being executed and resuming when said interrupt subroutine is completed;

user command entry means for generating command signals when activated by a user;

said computer means being responsive to said command signals during the execution of said user command subroutine for generating control signals for respective portions of said receiver;

an input for receiving a plurality of RF signals corresponding to respective channels; and

tuner means operating in response to control signals generated by said computer means for tuning the one of said RF signals corresponding to a selected channel to produce an IF signal with a given characteristic;

said tuner means operating in a progressive sequence in accordance with different sections of said tuning control subroutine occurring during successive executions of said tuning control subroutine within respective successive cycles of said program; the particular one of said sections occurring during the execution of said tuning control subroutine within a respective cycle of said program being determined by the operation undertaken by said tuner means in accordance with the one of said sections which has occurred during the execution of said tuning control subroutine within the previous cycle of said program.

4,897,728

CHARGE TRANSFER DEVICE FOR SOLID STATE IMAGE PICKUP APPARATUS AND METHOD OF DRIVING THE SAME

Tetsuo Yamada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 6, 1988, Ser. No. 254,178

Claims priority, application Japan, Oct. 9, 1987, 62-255302

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.23 **19 Claims**

19. A method of driving a solid state image pickup apparatus including:

photosensitive element columns (1) each having a plurality of photosensitive elements; and

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charge storage/transfer devices for storing and transferring signal charges outputted from said photosensitive element column (1), each of which includes:

first and second charge storage/transfer devices (8 and 9) linked at both ends thereof to form a cyclic transfer path for cyclically transferring signal charges in either direction; and

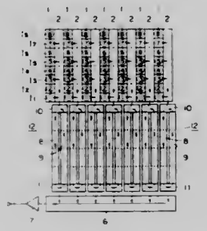
a parallel transfer device (17) disposed between the first and second charge storage/transfer devices (8 and 9),

said method comprising the steps of:

(a) transferring signal charges (1 , 3 , 5) and 7) of a first field of the photosensitive element column (1) in an interlace method to a cyclic transfer path (12) by a first column directional transfer operation;

(b) transferring signal charges (2 , 4 , 6 and 8) of a second field of the photosensitive element column (1) to the cyclic transfer path (12) by a second column directional transfer operation;

(c) continuously receiving signal charges (1 , 3 , 5 and



7) transferred in the first column directional transfer operation by the first charge storage device (8) of the cyclic transfer path (12);

(d) cyclically transferring received signal charges to the second charge storage device (9);

(e) simultaneously transferring the signal charges (1 , 3 , 5 and 7) in the second charge storage device (9) to the first charge storage device (8) by the parallel transfer device (17) to reverse an arrangement order of the signal charges;

(f) cyclically transferring the signal charges (7 , 5 , 3 and 1) of the first charge storage device (8) to the second charge storage/transfer device (9) by the cyclic transfer device (12);

(g) continuously receiving signal charges (2 , 4 , 6 , and 8) of the second column directional transfer by the first charge storage/transfer device (8); and

(h) alternately outputting signal charges (1 , 2 , 3 , 4 , 5 , 6 , 7 and 8) by the first and second charge transfer devices.

4,897,729

TELECINE WITH ELECTRONICALLY VARIABLE RASTER TO PRODUCE PICTURE EFFECTS

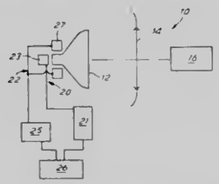
Ronald W. J. Mumford, Hitchin, and Terence W. Mead, Hertford, both of England, assignors to Rank Cintel Limited, United Kingdom

Filed Mar. 7, 1988, Ser. No. 164,523

Int. Cl.[4] H04N *3/36*

U.S. Cl. 358—216 **31 Claims**

1. A method of generating a video signal representing an image on a transparent film portion by scanning said film portion in a raster-scanning telecine, wherein said raster of said telecine is adjusted electronically to vary the angle of the raster relative to the said film portion, whereby said video signal



represents said image angularly displaced relative to the said film portion.

4,897,730

IMAGE PICKUP DEVICE WITH INDEX SIGNAL GENERATOR

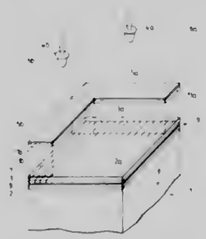
Makotoi Iwahara, Yokohama; Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Horosi Ichimura; Ichiro Negishi, both of Yokohama; Masaru Osada, Yokosuka, and Wataru Katase, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 1, 1988, Ser. No. 239,292

Claims priority, application Japan, Sep. 2, 1987, 62-134373[U]

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—217 **3 Claims**



1. An image pickup device having an image pickup tube; and index signal generating means having; illuminating means for illuminating a peripheral portion of a photosensitive layer of said image pickup tube; and light shield means for preventing said peripheral portion from being illuminated by light coming from other than said illuminating means; and a screen having a stripe pattern covering said peripheral portion, provided at a predetermined place between said illuminating means and said peripheral portion, said stripe pattern having opaque bars spaced at a predetermined interval and so arranged that horizontal electron beam scanning line of said image pickup tube perpendicularly intersects said opaque bars, the improvement comprises:

a filter means provided at a predetermined place between said illuminating means and said peripheral portion, having transmittance pattern which equalizes illuminance variation on said stripe pattern caused by said illuminating means so that illuminance at any point of said stripe pattern becomes uniform.

4,897,731

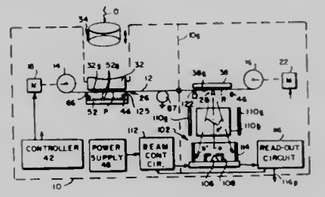
METHOD AND MEANS FOR READING ELECTRONIC SIGNAL PATTERNS STORED ON A MOVABLE IMAGE RECORDING SURFACE

Manfred R. Kuehnle, New London, N.H., assignor to XMX Corp., Burlington, Mass.

Filed May 11, 1987, Ser. No. 48,584

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—335 **28 Claims**



1. Apparatus for reading electronic data from a movable electronic signal-sensing recording medium, said apparatus comprising

A. an envelope;

B. a plural layer optoelectronic signal-sensing recording medium including a light modulating layer and movably positioned in said envelope, said medium carrying an electronic signal pattern representing an image projected onto the light modulating layer;

C. means in said envelope for positioning said medium at a read position in said envelope;

D. readout means at said read station for subjecting said medium to a controlled electric field so that said medium emits electrons whose numeric and spatial distribution corresponds to said signal pattern therein; and

E. detecting means in said envelope for detecting said emitted electrons.

4,897,732

ELECTRONIC CAMERA

Takao Kinoshita, and Yoshiyuki Takishima, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

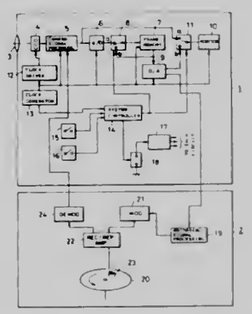
PCT No. PCT/JP86/00477, § 371 Date May 12, 1987, § 102(e) Date May 12, 1987

PCT Filed Sep. 13, 1986, Ser. No. 54,591

Claims priority, application Japan, Sep. 13, 1985, 60-201743

Int. Cl.[4] H04N *5/76, 5/782*

U.S. Cl. 358—335 **11 Claims**



1. An electronic camera comprising:

an image pickup section including an image pickup element and memory means, said image pickup section (1) converting an optical image into image signals with said image pickup section, and (2) storing the image signals in said memory means in response to an image pickup operation of said image pickup section; and

an external recording section detachably coupled to said image pickup section and including a recording member, said external recording section (1) receiving the image signals stored in said memory means in response to the image pickup operation of said image pickup section, and (2) recording the received image signals on said recording member.

4,897,733

COMMUNICATION SYSTEM IN FACSIMILE

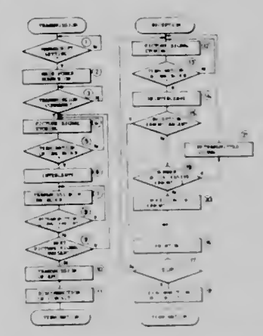
Yasunori Sakaguchi, Nara, and Makoto Yamamoto, Shiga, both of Japan, assignors to Murata Kakai Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 7, 1988, Ser. No. 203,492

Claims priority, application Japan, Jun. 12, 1987, 62-146292; Jun. 12, 1987, 62-146293

Int. Cl.[4] H04N *1/415*

U.S. Cl. 358—433 **16 Claims**



1. A facsimile communication system characterized in that, on a transmitting side, a writing is divided in blocks, picture signals for one block are stored in a transmitting picture signal memory, said stored picture signals are interleaved in a specific pattern, and then the interleaved signals are transmitted, and, on a receiving side, received picture signals for one block are stored in a received picture signal memory and said picture signals are deinterleaved in the order of of the writing.

4,897,734

IMAGE PROCESSING APPARATUS

Yasushi Sato; Yoshiyuki Suzuki, both of Kawasaki, and Tsukasa Kuge, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 923,026

Claims priority, application Japan, Oct. 28, 1985, 60-240756; Oct. 28, 1985, 60-240757; Oct. 28, 1985, 60-240758

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—448 **29 Claims**

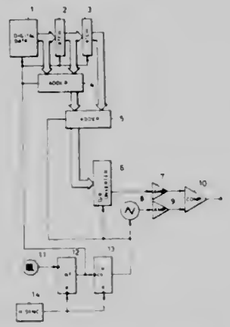
1. An image processing apparatus comprising:

pixel signal generating means for generating a pixel signal;

combining means for combining a plurality of pixel signals generated by said pixel signal generating means to output a combined pixel signal, said combining means forming a combined pixel signal having a greater number of tonal

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levels than said plurality of pixel signals by combining said plurality of pixel signals; and



means for forming a pulse-width modulated signal by utilizing the combined pixel signal output from said combining means.

4,897,735

IMAGE PROCESSING APPARATUS FOR MULTI-MEDIA COPYING MACHINE

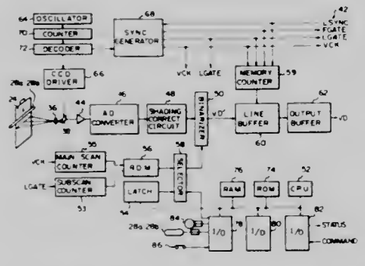
Shogo Oneda, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,517

Claims priority, application Japan, Oct. 28, 1987, 62-270405

Int. Cl.[4] H04N *1/040*

U.S. Cl. 358—449 **5 Claims**



1. An image processing apparatus comprising:

image reading means for reading a predetermined image to convert the image into an electric signal;

image forming means for forming an image on a paper based on the image signal;

data file reading means for reading a data file which is stored in an external storage medium;

signal converting means for converting the data file read by said data file reading means into an image signal for said image forming means to form an image;

size sensing means for sensing a size of the paper; and

editing means for editing the data file read out of the external storage medium in conformity to the size of the paper sensed by said size sensing means.

4,897,736

COLOR IMAGE PROCESSING APPARATUS USING A DEFORMED DOT MATRIX

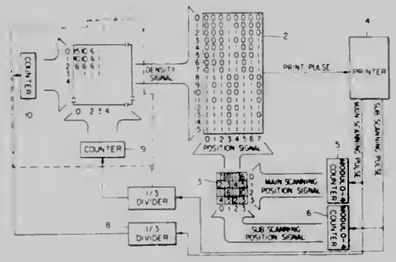
Takashi Sugino, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 168,601, Mar. 4, 1988, abandoned, which is a continuation of Ser. No. 876,669, Jun. 20, 1986, abandoned, which is a continuation of Ser. No. 500,348, Jun. 2, 1983, abandoned. This application May 22, 1989, Ser. No. 355,836

Claims priority, application Japan, Jun. 9, 1982, 57-97573

Int. Cl.[4] H04N *1/40, 1/46*

U.S. Cl. 358—457 **7 Claims**



1. Image reproducing apparatus comprising:

image forming means for printing an image by scanning in main and sub-scanning directions;

image data generating means for generating digital density data for an image frame to be printed by said image forming means responsive to first and second pulse signals representing an image forming position of said image forming means in the main and sub-scanning directions;

position data generating means for generating position data, the position data being obtained in response to the first and second pulse signals; and

a table memory, accessed in accordance with an address specified by the digital density data and the position data obtained in response to the first and second pulse signals for providing recording density data to be recorded by said image forming means at main and sub-scanning positions thereof corresponding to the position data, wherein the table memory includes a first table memory which is addressed in response to said first and second pulse signals for providing the position data and a second table memory which is addressed in response to the position data and the digital density data and provides the recording density data.

4,897,737

APPARATUS FOR SCAN ROTATION IN IMAGE SCANNING EQUIPMENT

Eli Shalev, Kfar Saba, Israel, assignor to Scitex Corporation Ltd., Herlia, Israel

Filed Sep. 19, 1988, Ser. No. 245,667

Claims priority, application Israel, Sep. 23, 1987, 84000

Int. Cl.[4] H04N *1/06*

U.S. Cl. 358—489 **15 Claims**

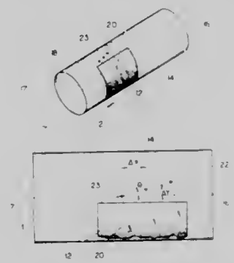
1. Apparatus for providing controllable scan rotation of the image representation of an original revolving in a drum scanner, said apparatus comprising:

illustration means defining an illuminated line segment parallel to the drum revolution axis on at least a portion of the revolving original; and

a scanning head moving in parallel to the drum revolution axis in accordance with a predetermined pitch, said scanning head comprising:

imaging means for providing the image of said illuminated line segment; and

deflection means providing a scanning beam with a controllable sweeping motion along said illuminated line segment image so as to scan successive points of light thereon during revolution of the drum,



said controllable sweeping motion being synchronized with the speed of the drum revolution so as to provide on said portion of the revolving original a locus of scanned points having an oblique angle with respect to the drum axis for rotating the image representation.

4,897,738

CIRCUIT FOR GENERATING A FREQUENCY-MODULATED SIGNAL INDICATIVE OF DATA TO BE RECORDED ONTO MAGNETIC TAPE

Michael J. Rogers, Bristol, England, assignor to Thorn EMI Datatech Limited, Feltham, England

Filed Feb. 8, 1988, Ser. No. 153,343

Claims priority, application United Kingdom, Feb. 18, 1987, 8703769

Int. Cl.[4] G11B *27/06, 5/02*

U.S. Cl. 360—30 **4 Claims**



1. A circuit for generating a frequency-modulated signal indicative of data to be recorded onto magnetic tape, said circuit including charge storage means, means for charging said charge storage means in dependence on an input voltage, means for discharging said charge storage means, means for sensing the speed of said tape, means for varying the amount by which said charge storage means is discharged in dependence on the sensed tape speed, and means for generating an output signal of frequency dependent on the voltage across said charge storage means, said frequency being indicative of said sensed tape speed.

4,897,739

MULTI-CHANNEL RECORDING APPARATUS USING A PLURALITY OF HEADS IN TURN

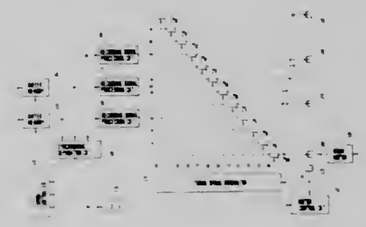
Masahide Hasegawa; Mitsuhiro Otokawa, both of Kanagawa; Hidetoshi Matsuoka, Tokyo, and Noritsugu Hirata, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 34,793

Claims priority, application Japan, Apr. 7, 1986, 61-078393; Apr. 9, 1986, 61-080146; Apr. 9, 1986, 61-080147; Jun. 23, 1986, 61-144713; Jun. 23, 1986, 61-144714

Int. Cl.[4] H04N *5/782*; G11B *15/14, 5/53*

U.S. Cl. 360—37.1 **6 Claims**



1. A multi-channel recording apparatus comprising:

(a) a cylinder member having n rotary heads (where n is an integer of not less than 3) on its outer peripheral surface to rotate with a phase difference of (360/n)° from each other;

(b) a tape guide member training a tape-shaped recording medium around said cylinder member over an angular range of not less than (360(n−1)/n)°;

(c) means for inputting (n−1) channels of a signal; and

(d) recording means including supply means capable of supplying the inputted signals of (n−1) channels to the (n−1) of said n heads which are tracing on said recording medium, said supply means including (n−1) switching means for circulating supply of said signals of (n−1) channels to each of said n heads.

4,897,740

RECORDING/REPRODUCING SYSTEM FOR A MAGNETIC RECORDING MEDIUM INCLUDING SYNCHRONIZATION DETECTING CIRCUIT

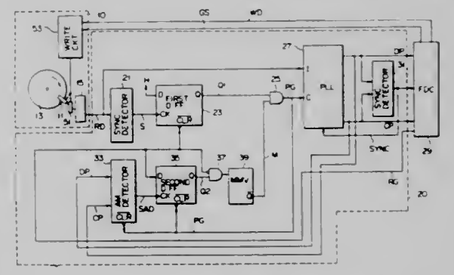
Hiroshi Suzuki, Monroeville, Pa., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 66,975, Jun. 29, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 220,373

Claims priority, application Japan, Jun. 30, 1986, 61-153530

Int. Cl.[4] G11B *27/22, 15/02, 20/16, 5/09*

U.S. Cl. 360—51 **25 Claims**



1. A recording/reproducing system comprising:

a magnetic head of preceding-erase type, in contact with a

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flexible magnetic recording medium, for recording data on said magnetic recording medium and reading out data stored in said recording medium, said magnetic head having a read/write head for writing data on, and reading data from, said magnetic recording medium, and an erase head arranged in front of said read/write head for erasing data recorded on said magnetic recording medium;

write means for turning said read/write head and said erase head on substantially simultaneously and for supplying a specified signal to said read/write head, thereby to erase data recorded on said magnetic recording medium, and to write data on said magnetic recording medium;

digital signal-outputting means for outputting a digital signal corresponding to the data read out by said read/write head from said magnetic recording medium;

PLL (Phase Locked Loop) circuit means for receiving the digital signal, and for oscillating in synchronism with the digital signal, thereby to output data pulses and clock pulses;

readout means for receiving the data pulses and the clock pulses and reading out data form said magnetic recording medium in accordance with the data pulses and the clock pulses;

external synchronization detecting means for detecting synchronization data formed of predetermined pattern data, in accordance with the digital signal, and for enabling said PLL circuit means to oscillate in synchronism with the digital signal after the synchronization data has been detected;

internal synchronization detection means for detecting the synchronization data in accordance with the data pulses and the clock pulses output from said PLL circuit means; and

preventing means for preventing said PLL circuit means from outputting the data pulses and the clock pulses when the digital signal is reproducing from overwritten areas, existing on the tracks of said magnetic recording medium, which have not been erased and in which new data has been written over the previously written data.

4,897,741

SIGNAL RECORDING APPARATUS

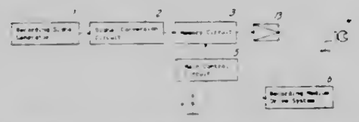
Syuzi Inoue, Ora; Hideki Osawa, Fukaya, and Nobumasa Nakagawa, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 4, 1988, Ser. No. 140,687

Claims priority, application Japan, Jan. 7, 1987, 62-1272; Jan. 8, 1987, 62-2121; Jan. 13, 1987, 62-5249; Jan. 13, 1987, 62-5250; Feb. 5, 1987, 62-25358

Int. Cl.[4] G11B *5/02, 5/00*

U.S. Cl. 360—64 **4 Claims**



1. A signal recording apparatus having a signal recording medium drive system controllable for starting and stopping by the manipulation of a control portion, a signal recording head opposed to the signal recording medium to be transported by the drive system, a signal conversion circuit 2 connected to a record signal generator 1 for converting the record signal from the generator to a digital signal, a memory circuit 3 interposed between the conversion circuit 2 and the recording head 4 for temporarily storing the digital signal produced by the conversion circuit 2, and a main control circuit 5 for controlling the memory circuit 3 for storing the signal therein and reading out the signal therefrom, the apparatus being characterized in that the main control circuit 5 has connected thereto an operation switch 7 serving as the operation portion and being provided with a timer circuit 51 for setting a time delay D approximately equal to or longer than a storage duration T of the memory circuit 3, the digital signal being continuously stored in the memory circuit 3 and being continuously read out therefrom as delayed from the storing time by the storing duration T and fed to the recording head 4, and when a recording-stop instruction is given by the operation switch 7, the main control circuit 5 feeds a stop instruction to the drive system 6 with the time delay D.

4,897,742

SINGLE BUTTON VCR OPERATION SYSTEM

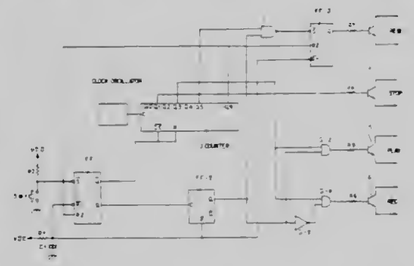
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 235,737

Claims priority, application Japan, Aug. 21, 1987, 62-207775

Int. Cl.[4] G11B *15/20*

U.S. Cl. 360—72.1 **5 Claims**



1. A VCR operation system and device having means for operating a VCR in various modes and having manual switches such as rewind, stop, play and record switches, wherein a user can play back short durations of scenes recently recorded by the VCR, comprising an additional manual switch, means responsive to a first momentary manual operation of said additional manual switch for rewinding a recording tape from a current position for a predetermined period of time (e.g., about 10 seconds) and then automatically setting the VCR to a playback mode so as to play back recorded scenes, and means responsive to a second momentary manual operation of said additional switch during playback for setting the VCR to a recording mode to continue recording from a position on the tape starting from the second momentary manual operation of said additional manual switch.

4,897,743

METHOD AND APPARATUS FOR RELEASING A MAGNETIC HEAD

Keiichi Kohno, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 18, 1987, Ser. No. 86,482

Claims priority, application Japan, Sep. 8, 1986, 61-211230

Int. Cl.[4] G11B *5/54*

U.S. Cl. 360—75 **13 Claims**

5. A method for releasing, in a magnetic disk file unit, adhesion between a magnetic head and a magnetic disk having a data area and a guard area, upon starting, rotation of the magnetic disk, comprising the steps of:

(a) initiating rotation of the magnetic disk;

(b) gradually moving the magnetic head radially with a small acceleration along the disk toward the guard area before the magnetic disk begins to rotate;

(c) holding the magnetic head in the guard area until the magnetic disk begins to rotate; and



(d) permitting the magnetic head to move toward the data area.

4,897,744

APPARATUS FOR SELECTIVELY LOADING SMALL OR LARGE TAPE CASSETTES

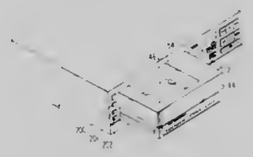
Tetsuro Tanaka, Hirakata; Jirou Kajino, Neyagawa; Yoshiyuki Shimizu, Osaka; Fuminari Saito, Hirakata, and Hironori Honsho, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 23, 1988, Ser. No. 197,402

Claims priority, application Japan, May 29, 1987, 62-135064; May 29, 1987, 62-135175; Jun. 25, 1987, 62-158209

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—94 **10 Claims**



1. A magnetic recording and/or reproducing apparatus for recording and/or reproducing signals using a magnetic tape encased in a tape cassette, wherein, as said tape cassette, both a first tape cassette having encased therein a first magnetic tape and a second tape cassette smaller in size than said first tape cassette and having encased therein a second magnetic tape can be used selectively, said apparatus having:

a tape cassette adapter for housing therein said second tape cassette and having a tape draw-out means for drawing out said second magnetic tape from said second tape cassette so as to attain a tape travel path substantially the same as that of said first tape cassette;

a magnetic tape drive means for driving said first magnetic tape in said first tape cassette or said second magnetic tape in said second tape cassette housed in said tape cassette adapter;

a loading means for loading said first tape cassette or said tape cassette adapter having housed therein said second tape cassette on said magnetic tape drive means; and

a moving means for moving said tape cassette adapter to a position where said tape cassette adapter will not interfere with a route to load said first tape cassette on said magnetic tape drive means.

4,897,745

METHOD OF ADJUSTING THE GAPS OF TWO MAGNETIC HEADS ARRANGED ON ONE HEAD DISC, AND HEAD DISC CARRYING TWO MAGNETIC HEADS

Wolfgang Binder-Kriegelstein, Vienna, Austria, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,758

Claims priority, application Austria, Dec. 10, 1986, 3278/86

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—109 **4 Claims**



1. A method of adjusting the gaps of two magnetic heads arranged on one head disc, which heads are disposed adjacent one another in one plane and by means of a common supporting plate are arranged on a head disc which is rotatable in operation, one end portion of the supporting plate being provided with a slot to form two limbs which project from a basic portion of the supporting plate and whose free ends each carry one of the two magnetic heads arranged on the same major surfaces of the limbs, the supporting plate being secured to the head disc with its basic portion after which the gap-length centers of the two magnetic heads are adjusted to be situated at a predetermined level relative to the head disc, characterized in that the distances between the gap-length centers of the two magnetic heads arranged on the limbs of the supporting plate and a major surface of the basic portion of the supporting plate, which major surface constitutes a reference surface and corresponds in level to the major surfaces of the limbs of the supporting plate which carry the magnetic heads, are measured to determine the magnetic head with the smaller distance, after which the basic portion of the supporting plate is retained and a notching tool exerts pressure on the transition between the limb carrying the magnetic head with the smaller distance and the basic portion of the supporting plate from the side which is remote from the magnetic head to offset substantially the entire limb until the gap-length center of the magnetic head on said limb is situated at the same level as the gap-length center of the magnetic head on the other limb, in that subsequently the supporting plate, with the major surface of the basic portion which constitutes the reference surface facing the head disc, is secured to the head disc in that area of the basic portion which is substantially remote from the limb, after which by means of a set-screw acting between that area of the basic portion of the supporting plate which is substantially remote from the limbs and the head disc said area of the basic portion of the supporting plate is bent to adjust both magnetic heads with their gap-length centers together to the predetermined level relative to the head disc.

4,897,746

MAGNETIC HEAD DEVICE

Shoji Saito, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,665

Claims priority, application Japan, Dec. 25, 1986, 61-307665

Int. Cl.[4] G11B *5/265*

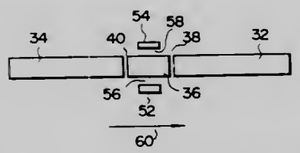
U.S. Cl. 360—118 **6 Claims**

1. A magnetic head device for a floppy disk drive apparatus, which can read data from, and write data on floppy disks of different recording densities and has a main axis extending in a

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tangential direction of rotation of said disk, said magnetic head device comprising:

a read/write head arranged along the main axis and having a first read/write gap for high recording density and a second read/write gap for low recording density, which extend in a direction substantially perpendicular to the main axis and are arranged at intervals substantially in the direction of the main axis, said first read/write gap having a first gap length, as measured in a direction parallel to the main axis, and a first gap width, as measured in the direction perpendicular to the main axis, and said second read/-



write gap having a second gap length, as measured in the direction parallel to the main axis, which is different from said first gap length, and a second gap width, as measured in the direction perpendicular to the main axis, which is the same as said first gap width;

an erase head having an erase gap;

detecting means for detecting the recording density of the floppy disk as loaded; and

means for selecting one of the first and second read/write gaps in accordance with the recording density detected by the detecting means.

4,897,747

WRITE/READ HEAD INCLUDING MONOCRYSTALLINE MAGNETIC THIN FILMS PROTECTED BY A COATING HAVING HARDENED AND LUBRICATING ZONES

Paul-Louis Meunier, Paris; Manijeh Razeghi, Gif sur Yvette, and Jean-Luc Rolland, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 4, 1988, Ser. No. 164,133
Claims priority, application France, Mar. 6, 1987, 87 03073
Int. Cl.[4] G11B *5/187*
U.S. Cl. 360—122 **2 Claims**



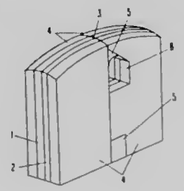
1. A read/write thin-film magnetic head comprising the following, deposited successively on a substrate: a first monocrystalline film of a magnetic material, a film of a non-magnetic material, a second monocrystalline film of a magnetic material, said magnetic head having a side with which the various films are flush, said side forming an active write surface against which moves a magnetic writing medium, wherein the active write surface is coated with at least one film of a material having hardened zones and lubricating zones stacked in two dimensions or three dimensions, wherein said lubricating zones have a lower coefficient of friction than said hardened zones and said hardened zones increase the head's resistance to wear.

4,897,748

MAGNETIC HEAD FOR AZIMUTH RECORDING IN A HIGH DENSITY MAGNETIC RECORDING SYSTEM

Ken Takahashi, Saita; Hiroshi Yohda, Hirakata, and Nobuyuki Kaminaka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 30, 1988, Ser. No. 175,241
Claims priority, application Japan, Apr. 3, 1987, 62-83220
Int. Cl.[4] G11B *5/147*
U.S. Cl. 360—126 **2 Claims**



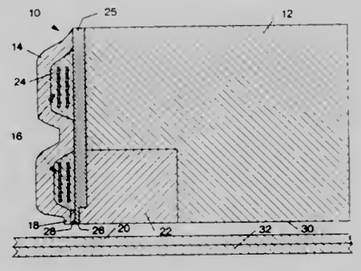
1. A magnetic head for azimuth recording comprising an entire magnetic core which is made of a plurality of layers of magnetic materials differing in saturation flux density in a direction of track width; wherein a layer of a material of said plurality of layers having a higher saturation flux density than that of the other layers of said plurality of layers is disposed at an overwriting side of the magnetic head.

4,897,749

COMBINATION PROBE AND RING HEAD FOR VERTICAL RECORDING

Craig M. Perlov, Los Altos, Calif.; Peter K. George, Bloomington, and Mark Jursich, Prior Lake, both of Minn., assignors to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Mar. 16, 1988, Ser. No. 168,820
Int. Cl.[4] G11B *5/127, 5/187*
U.S. Cl. 360—126 **2 Claims**



1. Apparatus for writing and reading magnetic flux from a recording surface comprising:

a recording medium having a magnetically permeable underlayer;

a ferrite substrate having a long surface facing said recording medium opposite said underlayer and movable in a direction of motion relative to the recording medium;

a highly permeable ring pole mounted on the ferrite substrate; the ring pole having a tip facing the recording medium; the tip being sufficiently thin in said direction of motion that it saturates during write operations;

a highly permeable probe pole mounted on said ring pole and magnetically connected in a back gap region; the probe pole having a tip facing the medium; the tip having a predetermined thickness in the direction of motion head

greater than the thickness of the ring pole but less thick than the length of said ferrite facing surface;

a read gap between said ring pole tip and said probe tip in said direction of motion; and

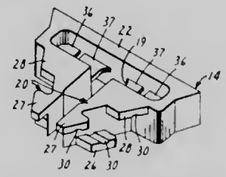
a large gap formed between said ring pole tip and said facing ferrite surface; whereby during write operations, flux is closed through said probe tip, vertically through said medium to said underlayer, through the underlayer to said long facing ferrite surface, and back through the ferrite substrate and ring pole to the probe pole; and whereby during read operation flux is closed across said read gap and through said probe pole and ring pole.

4,897,750

ENCODABLE INSERT FOR A RECORDING CASSETTE

Robert L. Hanson, and John E. Dunstan, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1988, Ser. No. 191,341
Int. Cl.[4] G11B *23/04*
U.S. Cl. 360—132 **8 Claims**



1. An encodable recording cassette comprising:

an insert formed with a plurality of coding holes, the insert including means for either blocking or unblocking each of the coding holes, and

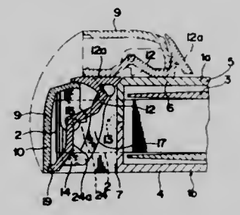
means for detachably fixing the insert to the cassette.

4,897,751

RECORDING TAPE CARTRIDGE

Shinichi Goto, Kyoto, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 920,943, Oct. 20, 1986, abandoned, which is a continuation of Ser. No. 494,069, May 12, 1983, abandoned. This application Sep. 30, 1988, Ser. No. 251,996
Claims priority, application Japan, May 12, 1982, 57-69983[U]; May 12, 1982, 57-69985[U]; Sep. 21, 1982, 57-143527[U]; Feb. 8, 1983, 58-17184[U]
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—132 **4 Claims**



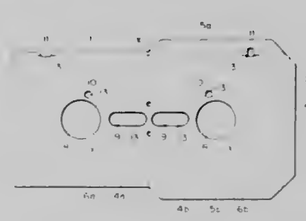
1. A recording tape cartridge comprising a cartridge case having a space at a front face of said case for accommodating a recording tape which passes therethrough, said cartridge including a case body, a front lid member rotatably mounted to a front portion of said case body having a straight front plate portion with a lower end which extends a minimum predetermined distance below but not beneath said recording tape when said front lid member is rotated to a closed position, said front lid member being movable in a rotatable manner relative to said case body between said closed position and an opened position, and a dust cover movable with respect to said front lid member for enclosing said recording tape within said space when said tape cartridge is not in use, positioned to the rear of said front plate portion of said front lid member, said dust cover being provided as a single body having a lower end portion which extends beneath said recording tape perpendicular to said front plate portion of said front lid member and parallel to a lower edge of said recording tape to form a closing interlocking engagement with said lower end of said front plate portion of said front lid member when said front lid member is in said closed position for isolating said tape accommodating portion of said cartridge, said closing interlocking engagement forming a seal between said respective ends of said dust cover and said front plate portion of said front lid member, said minimum predetermined distance being substantially equal to the thickness of said lower end portion of said dust cover thereby providing said seal formed by said closing interlocking engagement for preventing dust from entering said tape accommodating space of said tape cartridge while at the same time minimizing the size of said tape cartridge.

4,897,752

DISK CARTRIDGE

Hajime Doi; Toru Yamakawa, both of Ibaraki; Fujio Matsumoto, and Kunio Mizushima, both of Tsukuba, all of Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Filed Jan. 25, 1988, Ser. No. 147,515
Claims priority, application Japan, Jan. 28, 1987, 62-15981
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **9 Claims**



1. A disk cartridge which comprises a cartridge case, a disk rotatably encased in the cartridge case, and a cleaning sheet supported on the inside surface of the cartridge case by welding, the cartridge case being composed of a thermoplastic synthetic resin, and the cleaning sheet being composed at least of a mixed fabric comprising acrylic fibers and rayon fibers and being fixed to the inside surface of the cartridge case by welding.

4,897,753

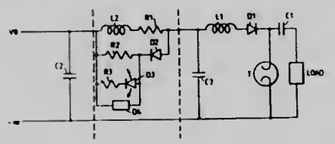
LASERS

Andrew J. Kearsley, 11 Eaton Court, Water Eaton Road, Oxford, and Graham A. Naylor, 40 Great Close Road, Yarnton, Oxfordshire, both of Great Britain

PCT No. PCT/GB86/00561, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/01882, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 19, 1986, Ser. No. 72,980
Claims priority, application United Kingdom, Sep. 19, 1985, 8523216
Int. Cl.[4] H02H *3/00*
U.S. Cl. 361—1 **11 Claims**

1. An electrical circuit comprising first capacitive means arranged to be charged from a power supply, a thyratron

arranged to close for discharging said first capacitive means through a load and then to open to enable said first capacitive means to recharge, wherein the improvement comprises second capacitive means connected across said thyratron and current limiting means arranged in the circuit between the



power supply and said second capacitive means, whereby upon continued closure of said thyratron said second capacitive means first discharges through said thyratron and then applies a reverse voltage to said thyratron causing opening of said thyratron.

4,897,754

SWITCHING APPARATUS

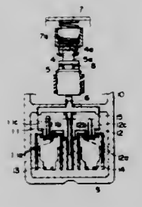
Keisuke Konishi, Takatsuki; Norio Iwakiri, Kyoto; Hiroyuki Yamada,, and Masanori Ishii, both of Saita, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 93,702, Sep. 8, 1987, abandoned. This application May 26, 1989, Ser. No. 357,275

Claims priority, application Japan, Sep. 12, 1986, 61-216543

Int. Cl.[4] H01H *35/00, 3/16*

U.S. Cl. 361—1 **7 Claims**



5. A switching apparatus comprising:

an actuator which causes a displacement by a contact with an object;

a first switch which is switched to the on state or the off state in association with a displacement of the actuator;

a second switch which is switched to the on state or the off state later than said first switch in association with the displacement of the actuator;

state detecting circuits which detect the on state and the off state of said first and second switches;

a switch output circuit which generates a switch output based on the on state of one of said first and second switches and the off state of the other of said first and second switches in response to output signals of said state detecting circuits; and

a failure predicting circuit which detects an abnormality of either of said first and second switches based on the outputs of said state detecting circuits and which outputs a failure prediction signal.

4,897,755

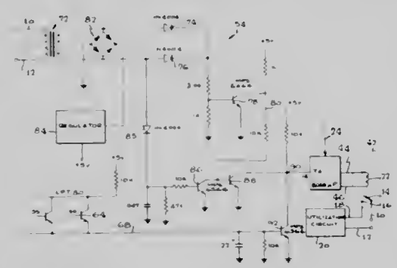
APPARATUS AND METHOD FOR RELAY CONTROL

Louis S. Polster, 1017 E. Fairmount Rd., Burbank, Calif. 91501, and Ronald R. Flinders, Sunland, Calif., assignors to Louis S. Polster, Burbank, Calif.

Filed Jun. 28, 1988, Ser. No. 212,437

Int. Cl.[4] H02H *3/00*

U.S. Cl. 361—2 **22 Claims**



1. An apparatus for the control of

a relay having relay contacts, comprising:

a control circuit;

command signal connection means forming part of said control circuit for receiving a signal signalling the actuation of a relay;

energization connection means forming part of said control circuit for connection to a relay for opening or closing the contacts of the relay;

observation means for observing electric arcing occurring during opening or closing of the relay contacts;

adjustment means forming part of said control circuit for controlling the energization point of said energization connection means, said observation means being connected to said adjustment means for adjusting said adjustment means so that the relay contacts open or close during a substantially zero current through the relay contacts.

4,897,756

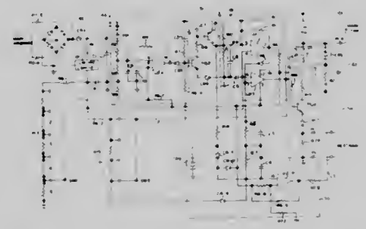
ADD-ON GROUND FAULT MODULE

Henry J. Zylstra, Alburnette, Iowa, assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 9,41[illegible], Jan. 30, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,288

Int. Cl.[4] H02H *3/16*

U.S. Cl. 361—44 **11 Claims**



2. A ground fault detection system as in claim 1 further including a restraint circuit operable in response to said metering signal above said selected reference level to provide a fault indicating signal to an upstream circuit breaker.

4,897,757

PROTECTION STRUCTURE FOR AN INTEGRATED CIRCUIT

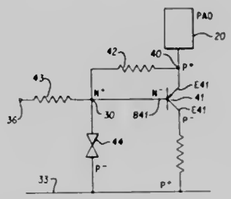
Francois Taillliet, Epinay/Seine, and Jean-Marie Gaultier, Rousset Sur Arc, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Dec. 6, 1988, Ser. No. 283,781

Claims priority, application France, Dec. 14, 1987, 87 17781

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 **3 Claims**



2. A protection circuit for an integrated circuit connected to a pad liable to receive overvoltages, wherein the pad (20; 50) is connected to a reference voltage (33; 70) through a first path comprising a transistor (41) and through a second path comprising a resistor (42) in series with an avalanche diode (44), and wherein the transistor base and the junction point of said resistor and said avalanche diode are interconnected to the integrated circuit access to be protected.

4,897,758

PROTECTING AN ICEMAKER AGAINST OVER CURRENT DAMAGE

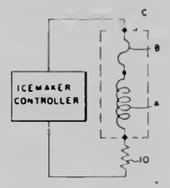
James M. Pick, Elk Grove, and Brian T. Creed, Elmhurst, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 22,557, Mar. 6, 1987, Pat. No. 4,791,523, which is a continuation of Ser. No. 736,222, May 20, 1985, abandoned. This application Aug. 31, 1988, Ser. No. 239,248

The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.[4] H02H *5/04*

U.S. Cl. 361—104 **3 Claims**



3. A control system for a refrigerator icemaker comprising:

(a) an encapsulated coil operative upon flow of a normal operating current to provide a predetermined magnetomotive force and adapted for actuation of an electromagnetically actuated valve for controlling icemaker waterfill, said coil defining an armature receiving cavity and having a plurality of turns of relatively fine wire chosen such that the turns increase in temperature and successively short out in the event said normal operating current continues to flow for a time greater than a predetermined normal waterfill cycle time, said shorted coils thereupon operative to decrease the resistance of said coil and the magnetomotive force below said predetermined level and operative to permit current greater than a normal operating current to flow therethrough;

(b) heater means electrically series connected with said coil and operative to perform an ice melting function upon flow of said normal operating current therethrough, said heater means having a resistance sufficient to act as a current limiter for said coil, which upon shorting continues flow of greater than normal current and is prevented from overheating and acting as a fuse;

(c) current terminating means electrically series connected with said heater means, said terminating means operative to create an open circuit only when a predetermined limit current above said normal operating current flows in said heater means; and,

(d) controller means, operative to effect switching of current to said coil for normal icemaker waterfill.

4,897,759

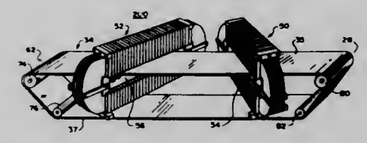
METHOD AND APPARATUS FOR ERASING INFORMATION FROM MAGNETIC MATERIAL

Donald G. Becker, Lincoln, Nebr., assignor to Garner Industries, Inc., Lincoln, Nebr.

Continuation-in-part of Ser. No. 933,013, Nov. 19, 1986, abandoned. This application Apr. 8, 1988, Ser. No. 180,681

Int. Cl.[4] H01F *13/00*

U.S. Cl. 361—151 **14 Claims**



1. A degausser for degaussing a magnetic recording medium comprising:

at least first and second degaussing stations; said first station having a first means for creating a first uniform horizontal magnetic field having a peak field strength in the range of 500 to 5,000 oersteds;

said second station including a second means for creating a second uniform horizontal magnetic field having a peak field strength in the range of 500 to 5,000 oersteds;

conveyor means for moving a magnetic media through said first and second uniform horizontal magnetic fields;

said fields having a fringe area of weaker field and an area of stronger field and the means for moving includes a means for moving at a speed which maintains the magnetic media within the stronger portion of the uniform field of said first means for generating a magnetic field through at least one peak of AC current applied to the means for generating the magnetic field and in said fringe area for a least one peak; each of said fields being in the center of a winding having an inductance of at least 0.5 henries;

said means for creating a first uniform horizontal magnetic field and said means for creating a second uniform horizontal magnetic field, each including a winding having a corresponding central window with a substantially horizontal axis;

said conveyor means including a portion passing through said windows in the plane of said horizontal axes and at a different angle to each, whereby said fields each primarily act on said magnetic material in a different direction; and

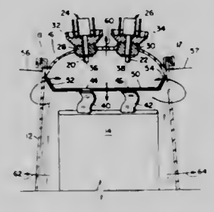
said conveyor means including an antistatic conveyor belt.

4,897,760

CAPACITOR DISCONNECTION

Emile J. Bourbeau, Winslow, Me., assignor to Aerovox, Inc., New Bedford, Mass.

Filed Jun. 29, 1988, Ser. No. 212,973
Int. Cl.[4] H02H 7/16
U.S. Cl. 361—272 14 Claims



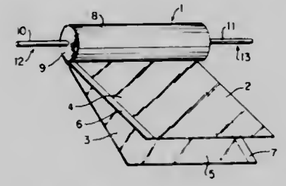
1. A self-disconnecting capacitor comprising:
a sealed casing containing a capacitor section,
a terminal extending through said casing,
an electrical conductor located within said casing and connected between said capacitor section and said terminal and
an actuator located within said casing and having at least two actuator sections connected at a hinge line to permit one section to bend about said hinge line relative to the other section.
said actuator being configured and positioned relative to said casing and said conductor so that deformation of said casing causes bending of said one actuator section about said hinge line relative to said other section and said bending aids disconnection of said conductor from said terminal.

4,897,761

METALLIZED FILM CAPACITOR

Edward M. Lobo, Shelton, and Michael F. Berman, Ansonia, both of Conn., assignors to Magnetek Universal Mfg. Corp., Paterson, N.J.

Filed May 10, 1988, Ser. No. 192,374
Int. Cl.[4] H01B 3/22, 3/20
U.S. Cl. 361—311 9 Claims



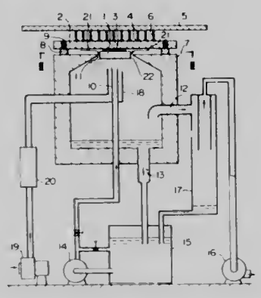
1. A metallized film capacitor including an aromatic ester dielectric fluid, with the dielectric fluid consisting essentially of:
2.0–5.0% by weight of an epoxide with the balance aromatic ester, the capacitor being metallized with a material from the group consisting essentially of aluminum, zinc, copper or alloys thereof, the fluid surrounding but not impregnating the capacitor.

4,897,762

COOLING SYSTEM AND METHOD FOR ELECTRONIC CIRCUIT DEVICES

Takahiro Daikoku, Ushiku, and Ryuichi Takagi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,098
Claims priority, application Japan, Jul. 22, 1987, 62-181028
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—382 7 Claims



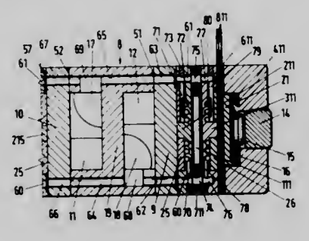
1. A cooling system for at least one electronic circuit device having a surface to be cooled comprising:
first means for spraying a liquid against the surface of the at least one electronic circuit device; and
second means for supplying a gas so as to substantially surround at least a portion of a spray of said liquid and to flow in a direction opposite to the flow of said liquid to prevent said liquid from flowing into contact with circuitry associated with said device.

4,897,763

CIRCUIT ARRANGEMENT HAVING A PLURALITY OF ELECTRICAL ELEMENTS TO BE COOLED

Emil Deuzler, Zurich, Switzerland, assignor to H.A. Schlatter AG., Schlieren, Switzerland

Filed Jul. 13, 1988, Ser. No. 218,560
Claims priority, application Switzerland, Aug. 3, 1987, 02975/87
Int. Cl.[4] H05K 7/20; H01L 25/04; H02M 1/00
U.S. Cl. 316—385 19 Claims



1. A circuit arrangement, comprising
a transformer (4) having at least one secondary winding (1, 2, 3) with a center tapping (13),
a plurality of rectifier elements (111–118, 121–128, 131–138),
a plurality of substantially plate-like electrical conductors (9, 10, 211, 311, 212, 312, 215, 315) for electrically connecting said rectifier elements (111–118, 121–128, 131–138), said plate-like electrical conductors having channels therethrough adapted to carry a cooling medium for cooling said rectifier elements,

a cooling medium distributor (8) in the form of a electrically conductive substantially rectangular bar having a first and a second side, opposite to one another, and a third side, and having an inlet cavity (11) and an outlet cavity (12) for a cooling medium, said inlet cavity (11) being in said first side and said outlet cavity (12) being in said second side,
said electrical conductors (9, 10, 211, 311, 212, 312, 215, 315) and said rectifier elements (111–118, 121–128, 131–138) being arranged in rows along said first side and said second side of said distributor (8), means holding said distributor (8) and said rows of said conductors and rectifier elements together in sandwich-like manner with the distributor in the middle, and
said third side of said electrically conductive cooling medium distributor being electrically connected with said center tapping (13) of said secondary winding (1, 2, 3).

4,897,764

CONDUCTIVE COOLING CUP MODULE

Richard A. Bruchmann, Blaine, and Richard B. Salmonson, Circle Pines, both of Md., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 31, 1988, Ser. No. 265,208
Int. Cl.[4] H01L 23/36
U.S. Cl. 361—387 18 Claims



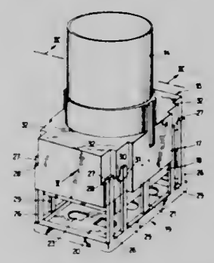
1. Apparatus for cooling at least one semiconductor element comprising:
(a) a heat sink;
(b) a thermally conductive compound means which has the property that it is deformable while conducting thermal energy;
(c) a substantially rigid and conductive cup means having an inner bottom surface and an inner side surface means extended from the inner bottom surface for containing a predetermined amount of said compound means, wherein said cup means is further operative as a heat spreader;
(d) a thermally conductive bonding means for bonding said cup means to a given semiconductor; and
(e) a substantially rigid boss means having an exterior bottom surface and an exterior side surface means extended from the exterior bottom surface, inserted into said compound means with said inner and exterior bottom surfaces facing one another and with said inner and exterior side surface means facing one another and with the compound means along and between the bottom and side surfaces, for providing a thermal path between said compound means and said heat sink, whereby the combination of said bonding means, said cup means, said compound means and said boss means, forms a continuous heat path between the semiconductor element and said heat sink.

4,897,765

SIGNAL GENERATING AND TRANSMITTING APPARATUS WITH MOBILE SHROUD FOR ELECTRIC TERMINALS

Fritz Berger, Oberbuchsiten, Switzerland, assignor to Elektro-Apparatebau Olten AG, Olten, Switzerland

Filed Jan. 11, 1989, Ser. No. 295,974
Claims priority, application Switzerland, Jan. 14, 1988, 110/88
Int. Cl.[4] H05M 5/00
U.S. Cl. 361—394 15 Claims



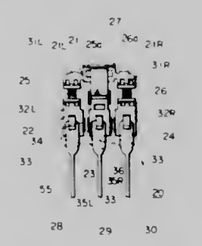
1. A current consuming apparatus, particularly a signal generating and transmitting apparatus, comprising a bousing including a front portion and a rear portion; a plurality of electric terminals carried by said housing and extending beyond said rear portion; an electrically insulating shroud mounted on and reciprocable relative to said housing along a substantially straight path between a first position in which said terminals are exposed and accessible, particularly for connection to or for disconnection from electrical conductor means, and a second position in which said terminals are at least partially confined in said shroud, said shroud having window means through which said terminals extend in the first position of said shroud; and detent means for releasably holding said shroud at least in said second position, said shroud being free to remain in either of said first and second positions upon completion of movement to said first and second position.

4,897,766

COMPOSITE TYPE CIRCUIT PARTS

Tadashige Konno, and Makoto Saitoh, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 12, 1988, Ser. No. 192,985
Claims priority, application Japan, May 14, 1987, 62-117536; May 14, 1987, 62-117539; May 14, 1987, 62-117537; May 14, 1987, 62-117538
Int. Cl.[4] H01F 15/10
U.S. Cl. 361—421 5 Claims



1. A composite type circuit part comprising:
a conductive plate formed with a central portion and two

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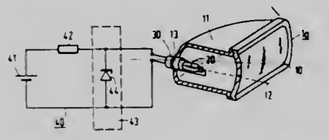
wing portions projecting therefrom, both wing portions having inductor mounting portions, respectively;
a pair of first intermediate coupling elements in which each has an inductor mounting portion formed at one end, each inductor mounting portion located opposed to each inductor mounting portion of said wing portions;
a second intermediate coupling element has one end arranged opposedly of said central portion of said conductive plate and arranged at a position between said pair of first intermediate coupling elements;
a lead wire coupling portion, holding a lead wire, is provided in each of said first intermediate coupling elements at another end and in said second intermediate coupling element at another end, lead wires being coupled to each lead wire coupling portion, respectively, said lead wires being flat at least at ends coupled to said lead wire coupling portions, said lead wire coupling portions including holder pieces resiliently holding the flat ends of said lead wires;
inductors placed between and bridging each of said opposed inductor mounting portions of said first intermediate coupling elements and said wings respectively; and
a chip capacitor placed over and between the central portion of the conductive plate and the one end of the second intermediate coupling element.

4,897,767

HEADLIGHT LANTERN SYSTEM AND ELECTRIC LAMP FOR THIS SYSTEM

Germain R. T'Jampens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1988, Ser. No. 249,026
Claims priority, application Netherlands, Sep. 24, 1987, 8702272
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—61 **18 Claims**



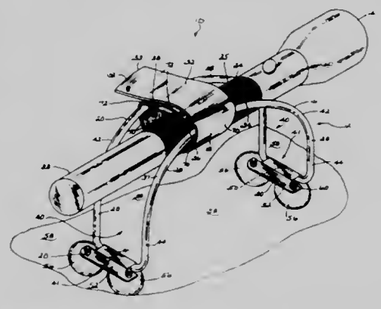
1. A headlight system for a vehicle comprising a pair of headlamps for producing a high beam and a pair of headlamps for producing a low beam, the headlamps of each pair being adapted for mounting on respective sides of a front portion of the vehicle, each headlamp comprising a concave flattened reflector defining an optical axis and a focus, a quadrangular translucent pane closing said reflector having an average height dimension smaller than 60 mm and an average width dimension larger than three times said height dimension, and a light source arranged in said reflector coaxial with said optical axis, wherein the improvement comprises:
said light source is an electric lamp comprising
a tubular translucent envelope sealed in a gas-tight manner and having an inner diameter between approximately 2 mm and approximately 6 mm,
an elongate filament extending within said tubular envelope having a color temperature during normal operation greater than 3300 degrees Kelvin,
a pair of current-supply conductors connected to said filament and passing through said envelope to the exterior in a gas-tight manner,
a gas fill within said tubular envelope having a pressure at ambient of 8 to 60 bar and consisting substantially of a gas chosen from xenon, krypton and xenon/krypton mixtures containing 2×10^{-8}–12×10^{-7} mol of Hal/cm^3, said Hal being chosen from Br, Cl, Br/Cl mixtures,
said electric lamp consuming during operation at nominal voltage a power between 40 W and 70 W, and
said electric lamp being secured in said reflector with said elongate filament coaxial with said optical axis of said reflector.

4,897,768

FLASHLIGHT HOLDER AND MOUNTED FLASHLIGHT

Andy J. Thul, 6914 Ann Arbor-Saline Rd., Saline, Mich. 48176

Filed Feb. 27, 1989, Ser. No. 315,846
Int. Cl.[4] F21L *15/20*
U.S. Cl. 362—191 **22 Claims**



1. A flashlight holder comprising a support member having a pair of spaced tracks and at least one base, said bases joining said tracks, a strap extending between and enwrapping said tracks, said strap being selectively loosened or tightened whereby a flashlight can be positioned between said tracks and held between said tracks and selectively adjusted in position.

4,897,769

RIGHT ANGLE LIGHT EMITTING DIODE ASSEMBLY WITH SNAP-IN FEATURE

John M. Lang, Redondo Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 18, 1988, Ser. No. 197,186
Int. Cl.[4] H01R *33/00*
U.S. Cl. 362—226 **4 Claims**



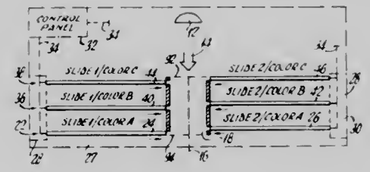
1. A right angle light emitting diode assembly comprising:
light emitting diode means,
insulating body means for receiving said diode means, said body means having generally parallel front and back surfaces, generally parallel top and bottom surfaces, and generally first and second parallel side surfaces, said front surface having a hole or cavity formed therein to receive part of said diode means, whereby some of said diode means protrudes beyond the front surface, said cavity having two holes at the rear of said hole or cavity through which are placed the leads of said diode means, said body means having two parallel slots formed therein, said slots being parallel to the sides of said body and extending from the top surface to the bottom surface and from the rear surface only part way towards said front surface, said slots being formed in said body means aligned with said holes formed at the rear of said hole or cavity such that the leads of said diode means can be bent down in said slots toward the bottom surface of said body,
further including an addition to the top surface of said body means which could accommodate a robotic insertion apparatus, and
further including split snap-in projection means extending downwardly from the bottom surface of said body means, said split snap-in projection means being capable of slight deformation to accommodate a hole in which the projection means are inserted into, wherein the projection means deform inwardly while in the hole and the ends thereof relax to the nominal position as the leading ends pass through and clear the ends of said hole.

4,897,770

SYMMETRICAL COLOR CHANGER SYSTEM

Dennis Solomon, 58 Miriah Dr., Yarmouth Port, Mass. 02675

Filed Mar. 4, 1988, Ser. No. 164,397
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—293 **20 Claims**



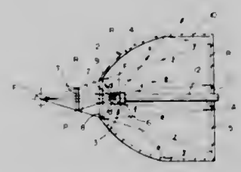
1. A color changer system including a source of white light forming a light beam having a beam axis of propogation and a beam aperture through which the light beam passes, the beam aperture having a center coextensive with the axis of propogation, comprising, in combination,
first color filter means positioned adjacent to the beam aperture and second color filter means positioned adjacent to the beam aperture opposite to said first color filter means, said first and second color filter means being movable across the beam aperture orthogonal to the beam axis, wherein selected light waves are deleted in predetermined amounts in accordance with the positions of said first and second color filter means so as to enhance a particular color contained in said light beam, said first and second color filter means being simultaneously movable into the light beam symmetrical to the beam axis of propogation so that distribution of color saturation of the light beam is symmetrical about the center of the beam aperture during movement of said first and second color filter means;
and each said first and second color filter means includes progressive variable filtering regions; and said first and second color filter means being movable to overlapping positions wherein said filtering regions are positioned across the beam apertures so that the effect of color enhancement of said particular color is additive.

4,897,771

REFLECTOR AND LIGHT SYSTEM

Jeffrey R. Parker, Concord, Ohio, assignor to Lumitex, Inc., North Royalton, Ohio

Filed Nov. 24, 1987, Ser. No. 125,323
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—298 **46 Claims**



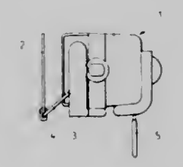
1. A reflector and light system comprising a reflector assembly including collector means having a first focus, a light source positioned substantially at said first focus, and reflector means having a second focus located externally and forward of said collector means, said collector means having opening means through which light is reflected by said reflector means toward said second focus, said collector means being operative to collect light rays emitted by said light source and direct such light rays onto said reflector means, and said reflector means being operative to redirect such light rays back through said collector means and out through said opening means, said light source comprising a lens-end bulb including a lens which projects a cone of light out through said opening means in said collector means, and said bulb also produces additional light rays which are emitted radially in the shape of a conical section onto said collector means which reflects such additional light rays onto said reflector means and said reflector means in turn re-reflects such additional light rays through said collector means and out through said opening means.

4,897,772

DENTAL ASTRAL LAMP

Masumi Ibusuki, Yokosuka, and Hidehito Ishikawa, Tokyo, both of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,250
Claims priority, application Japan, Dec. 25, 1987, 62-195844[U]
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—282 **3 Claims**



1. A dental astral lamp comprising:
(a) a lamp body, said lamp body being generally rectangular parallelepipedal in shape and having two sides, a front, and a top;
(b) a tungsten halogen lamp contained in said lamp body in position to project light through the front of said lamp body, said tungsten halogen lamp having a luminous intensity of between 15,000 luxes and 15,000 luxes and a color temperature of between 3,000 kelvins and 4,500 kelvins at its focal position;
(c) a U-shaped mounting bracket pivotally mounted at each end on a corresponding side of said lamp body and pivot-

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able through an angle of at least approximately 90° between a first position and a second position; and

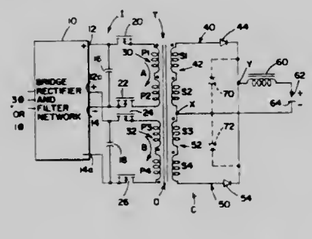
(d) a color temperature transducing filter mounted on said U-shaped mounting bracket such that, when said U-shaped mounting bracket is in its first position, said color temperature transducer filter is parallel to and spaced from said lamp body in front of said tungsten halogen lamp and, when said U-shaped mounting bracket is in its second position, said color temperature transducing filter is parallel to and spaced from the top of said lamp body, said color temperature transducing filter serving when said U-shaped mounting bracket is in its first position to reduce the luminous intensity at the focal position of said tungsten halogen lamp to between 1,500 luxes and 4,500 luxes and the color temperature at the focal position of said tungsten halogen lamp to between 5,000 kelvins and 7,500 kelvins.

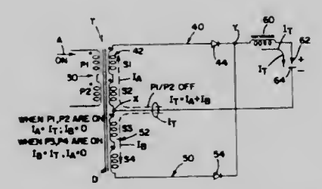
4,897,773

INVERTER OUTPUT CIRCUIT

Dale L. Bilczo, Rocky River, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed May 3, 1989, Ser. No. 346,655
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 **25 Claims**





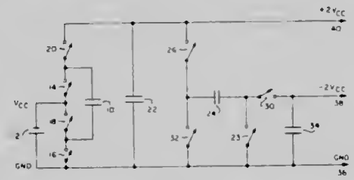
1. In an inverter power supply including an output transformer of the type having a high permeability magnetic core; input means for applying an input current pulses to said core, said input means including an input winding encircling said core; a first output winding wound on said core; and a second output winding wound on said core; said power supply further including first and second output terminals; a first output circuit for connecting said first output winding of said transformer in parallel with said terminals; a second output circuit for connecting said second output winding of said transformer in parallel with said terminals; a unidirectional device in said first output circuit allowing current flow from said first output winding across said terminals in a first polarity direction; a unidirectional device in said second output circuit allowing current flow from said second output winding across said terminals in said first polarity direction; an inductor adapted to be connected in electrical series with said terminals; and, means for connecting said terminals across an output load, the improvement in said power supply comprising: said first and second output windings having essentially the same number of turns and being wound in the same flux creating direction on said core whereby freewheeling current from said inductor following application of said input current pulse to said input winding flows through said first and second output windings in a direction to cause opposite polarity magnetizing flux in said core and means for mounting said first and second output windings adjacent each other on said core with a coefficient of coupling greater than 0.980.

4,897,774

INTEGRATED DUAL CHARGE PUMP POWER SUPPLY AND RS-232 TRANSMITTER/RECEIVER

David Bingham, San Jose, and Charles M. Allen, Sunnyvale, both of Calif., assignors to Maxim Integrated Products, Sunnyvale, Calif.

Continuation of Ser. No. 13,648, May 12, 1987, Pat. No. 4,809,152. This application Nov. 14, 1988, Ser. No. 271,160
Int. Cl.[4] 02M 7/25
U.S. Cl. 363—61 **4 Claims**



1. An integrated single-chip voltage supply comprising:

a means adapted to be connected to a supply voltage for charging a capacitor approximately to a supply voltage;

a means for coupling said charged capacitor in series with said supply voltage to create a source of positive voltage approximately double the supply voltage; and

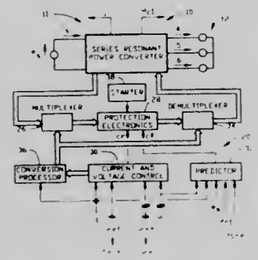
a means for inverting said doubled voltage and making it available on the same chip, thereby providing a source of two available supply voltages on the same chip, one being a positive voltage approximately two times said supply voltage, and the other being a negative voltage approximately two times said supply voltage.

4,897,775

CONTROL CIRCUIT FOR RESONANT CONVERTERS

J. Ben Klaassens, Holland, Netherlands, assignor to Robert F. Frijouf, Tampa, Fla., a part interest

Continuation of Ser. No. 874,600, Jun. 16, 1986, abandoned. This application Feb. 24, 1988, Ser. No. 161,422
Int. Cl.[4] H02M 7/758
U.S. Cl. 363—96 **12 Claims**



1. An improved resonant converter for transferring electrical power between first terminal means and second terminal means, comprising in combination:

a resonant circuit including a capacitor and an inductor;

a first and a second plurality of switch means interconnecting said resonant circuit with the first and second terminal means, respectively;

a control circuit comprising outer control means and inner control means having a predictor circuit for controlling said resonant circuit;

said outer control means selectively actuating said switch means for selectively initiating resonant portions in said resonant circuit to transfer electrical power between the first and second terminal means;

sensor means for instantaneously monitoring the operation of the resonant converter;

means connecting said sensor means to said predictor circuit for predicting the final waveform of each resonant portion prior to the completion of the resonant portion; and

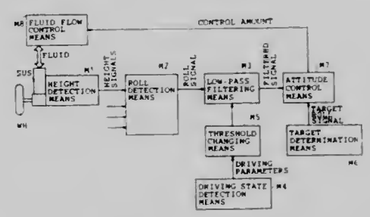
said inner control means comparing an output of said predictor circuit to a pre-established standard for initiating conduction of one of said switch means within each resonant portion to conform each of resonant portion to said pre-established standard.

4,897,776

ELECTRONIC CONTROLLED FLUID SUSPENSION SYSTEM FOR CONTROLLING ROLL AND PITCH OF A VEHICLE BODY

Shingo Urababe; Shunichi Buma; Toshio Aburaya, all of Toyota; Takashi Yonekawa, Mishima; Osamu Takeda, Susono, and Shunichi Doi, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 2, 1988, Ser. No. 240,134
Claims priority, application Japan, Sep. 4, 1987, 62-135883[U]; Sep. 4, 1987, 62-135885[U]; Jul. 28, 1988, 62-100380[U]; Jul. 28, 1988, 63-188874
Int. Cl.[4] B60G 17/00
U.S. Cl. 364—424.05 **6 Claims**



1. An electronic controlled fluid suspension system for a vehicle comprising:

a fluid suspension provided for each of a plurality of wheels of the vehicle;

a height detection means provided for each of the plurality of wheels for detecting a height of a body of the vehicle at said each wheel and for generating a height signal;

a roll detection means responsive to the height signals for generating a roll signal representing a roll of the body;

a low-pass filtering means for passing only a component of the roll signal having a frequency lower than a threshold frequency;

a driving state detection means for detecting driving parameters that affect a lateral acceleration of the body;

a threshold changing means responsive to the detected driving parameters for changing the threshold frequency of the low-pass filtering means to a higher value when the body is expected to develop a roll;

a target determination means for determining a target roll signal;

an attitude control means for generating a control amount in order to feedback-control the roll signal filtered by the low-pass filtering means to approach the target roll signal; and

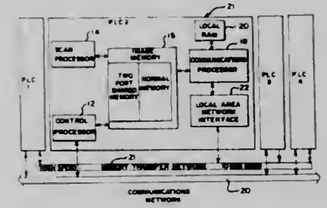
a fluid flow control means responsive to the control amount for controlling fluid flow to and from each of the fluid suspensions.

4,897,777

PEER-TO-PEER REGISTER EXCHANGE CONTROLLER FOR PLCS

Donald R. Janke; Kim J. Watt, both of Milwaukee, Wis., and Dirk I. Gates, Woodland Hills, Calif., assignors to Square D Company, Palatine, Ill.

Filed Apr. 11, 1988, Ser. No. 179,674
Int. Cl.[4] G06F 15/46, 15/16
U.S. Cl. 364—134 **13 Claims**



1. A peer-to-peer communications network for high speed transfer of data between devices comprising in combination:

a communications network;

at least two programmable logic controllers (PLC's) connected to communicate with said network, each of said PLC's including a control processor for sequentially performing a series of instructions, a multi-port image memory coupled between said control processor and said communications network and having a plurality of blocks, a first one of said plurality of blocks corresponding to its respective one of said PLC's, the other of said plurality of blocks corresponding to respective ones of the others of said PLS's, an input/output device, means for storing status data representing a status of said input/output device in said first one of said blocks; and

means for transferring said input/output status from each of said first ones of said blocks of said respective multi-port image memories to said respective blocks of said other of said multi-port image memories of said other PLC's independent of operation of said control processors.

4,897,778

MOTOR CONTROL DEVICE

Kazuki Miyamoto, Yokohama; Yutaka Komiya, Tokyo; Masato Ishida, Yokohama; Shinichi Nakamura, Tokyo; Masanori Miyata; Masayuki Hirose, both of Yokohama; Masahiro Tomozoda, and Hideki Adachi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 635,592, Jul. 30, 1909, abandoned. This application Mar. 25, 1988, Ser. No. 172,933
Claims priority, application Japan, Aug. 4, 1983, 58-141821; Aug. 4, 1983, 58-141822; Aug. 4, 1983, 58-141823; Aug. 4, 1983, 58-141824; Aug. 4, 1983, 58-141825; Aug. 4, 1983, 58-141826; Aug. 4, 1983, 58-141827; Aug. 4, 1983, 58-141828; Aug. 4, 1983, 58-141829; Aug. 4, 1983, 58-141830; Aug. 4, 1983, 58-141831
Int. Cl.[4] G06F 15/46; G03G 15/00
U.S. Cl. 364—174 **12 Claims**

1. A motor control device comprising:

a motor;

means for instructing a rotation speed of said motor;

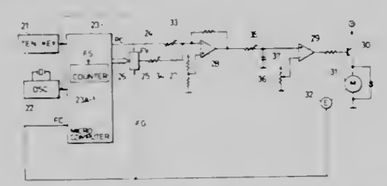
means for detecting the rotation speed of said motor;

a microcomputer for controlling said motor according to a predetermined program by using an input of said instruc-

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tion means and an output of said detection means, said microcomputer generating a reference frequency signal in accordance with the input of said instruction means and outputting a phase comparison signal in accordance with the reference frequency signal and the output of said detection means;

means for generating a predetermined speed control signal



according to the input of said instruction means and the output of said detection means; and

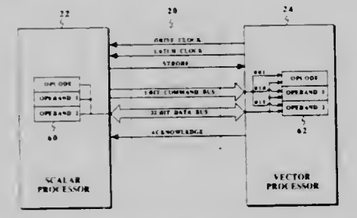
drive means for driving said motor on the basis of said phase comparison signal and said speed control signal, wherein said drive means supplies a motor drive signal to said motor and includes means for adjusting a level of the drive signal, said adjusting means comprising means for manually adjusting the level of the drive signal.

4,897,779

METHOD AND APPARATUS FOR OPTIMIZING INTER-PROCESSOR INSTRUCTION TRANSFERS

Robert Dickson, Arlington; W. Hugh Durdan, Waban, and George M. Uhler, Marlborough, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 20, 1988, Ser. No. 221,987
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **23 Claims**



1. A method for transferring an instruction between a first processor and a second processor, said instruction comprising an opcode and a variable number of operands, comprising the steps of:

sequentially transferring all of said variable number of operands from the first processor to the second processor;

thereafter, transferring said opcode from the first processor to the second processor; and

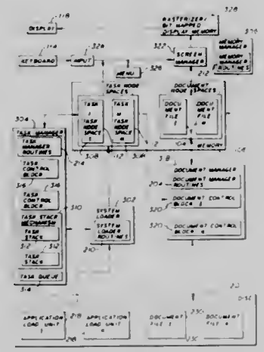
thereafter, transmitting from the second processor to the first processor a signal to acknowledge receipt of the opcode.

4,897,780

DOCUMENT MANAGER SYSTEM FOR ALLOCATING STORAGE LOCATIONS AND GENERATING CORRESPONDING CONTROL BLOCKS FOR ACTIVE DOCUMENTS IN RESPONSE TO REQUESTS FROM ACTIVE TASKS

David R. Lakness, Chelmsford, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 659,192, Oct. 9, 1984, abandoned. This application Dec. 18, 1987, Ser. No. 135,501
Int. Cl.[4] G06F *15/40, 15/62, 12/06, 3/14*
U.S. Cl. 364—200 **8 Claims**



1. A document processing system, comprising:

means for storing data, the stored data defining at least active document data representing a document structure or a portion of a document structure being processed;

means, coupled to said active document data storing means, for managing the allocation of storage locations within said storing means;

means, coupled to said active document data storing means, for concurrently executing one or more active tasks for performing document processing operations on said stored document data;

means, coupled to said active document data storing means, for storing inactive document data representing a document structure or a portion of a document structure not being processed;

wherein said document structure is organized as pages of document data and has data defining at least one page block for representing a page of document data;

each of said page blocks having data for defining at least one area block for subdividing a page into one or more contiguous and nonoverlapping areas, wherein each area contains at least one type of information,

in an area containing text information said area block having data for defining a column block for representing at least one column having text information, said column block having data for defining a line block for representing at least one line, each of said lines having a string of at least one text character;

said system further comprising:

means for managing said document structure comprising

means for receiving a request from an active task for access to document data defining at least a specific page of a document structure;

means, responsive to the operation of said request receiving means, for requesting said storage allocation manager means to allocate storage locations within said active document data storage means;

means, coupled to said active document data storage means and to said inactive document data storage means, for transferring document data from said inactive to said active document data storage means and for storing within the allocated storage locations the document data;

means, coupled to said active document data storage means, for generating and for storing a document control block at a specific location within said active document data storage means, said document control block comprising data fields defining at least a location within said active document data storage means of one of said page blocks; and

means, responsive to the operation of said generating and storing means, for providing to the active task data defining said specific location of said stored document control block within said active document data storing means.

4,897,781

SYSTEM AND METHOD FOR USING CACHED DATA AT A LOCAL NODE AFTER RE-OPENING A FILE AT A REMOTE NODE IN A DISTRIBUTED NETWORKING ENVIRONMENT

Albert Chang; Grover H. Neuman; Amal A. Shaheen-Gouda, and Todd A. Smith, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1987, Ser. No. 14,899
Int. Cl.[4] G06F *15/16, 11/00*
U.S. Cl. 364—200 **16 Claims**



5. A system for using cached data residing in a plurality of blocks in a client cache, of a client data processing system at a client node, from a file residing in a server data processing system at a server node, wherein said server data processing system and said client data processing system are connected by means of a communications link, said system comprising:

first means for recording, at the server data processing system, a one last modification time for the file whenever the file at the server data processing system is modified;

means for saving, in said client data processing system, said one last modification time, received from the server data processing system, for each of the cached data blocks for the file in the client cache when the file is closed at the client data processing system;

second means for recording, in the client data processing system, another last modification time, received from the server data processing system, of the file at the server processing system, at a time of a subsequent reopen of the file in the client data processing system; and

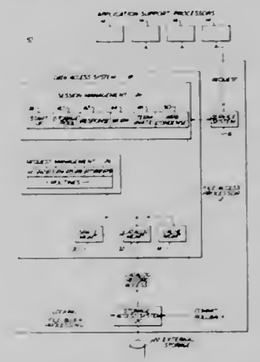
means coupled to said saving means and said second recording means for using at least one of the blocks of the file in the client cache if said using means determines that said saved one last modification time for each of said blocks is equal to the recorded another last modification time in the client data processing system.

4,897,782

LOCAL CACHE STRUCTURE FOR MAINTAINING UPDATED FILE CHARACTERISTICS IN A FILE SHARING SYSTEM

Robert B. Bennett, Endwell, N.Y., and Robert J. Catino, Grapevine, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1987, Ser. No. 110,461
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **26 Claims**



1. A method of operating a file sharing system including a central data access system, a plurality of application support processors connected to the data access system, and a data storage system also connected to the data access system and holding a data base, the method comprising the steps of:

forming a plurality of directories from data in the data base;

acquiring at least one of the directories in at least one of the application support processors;

for each directory acquired by at least one application support processor, establishing a directory gate block;

for each application support processor that has acquired at least one directory

(i) establishing a local control structure,

(ii) establishing a directory acquired block for each directory acquired by the application support processor, and identifying in each directory acquired block, a location of the directory gate block established for the directory for which the directory acquired block was established,

(iii) arranging in a local chain, directory acquired blocks established for the application support processor,

(iv) identifying a first of the directory acquired blocks in said local chain, in the local control structure, and

(v) identifying each successive directory acquired block in said local chain in a prior directory acquired block in the chain;

using the application support processors to activate the data access system to make changes to the database;

for each directory acquired by at least one application support processor,

(i) storing in the data access system, records of changes to the database that affect the directory,

(ii) arranging records of said changes in a record chain,

(iii) identifying a location of a first of the records in the record chain, in the directory gate block established for the directory, and

(iv) identifying a location of each successive record in the record chain, in a prior record in the chain; and

periodically transmitting to the application support processors, records of changes to the data base that affect the directories acquired by the application support processors to update the acquired directories, the transmitting step

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including the step of, for each application support processor that has acquired at least one directory,

(i) periodically checking the directory acquired blocks established for the application support processor to identify all the directories acquired by that application support processor, and

(ii) transmitting to the application support processor records of changes to the database that affect the directories acquired by the application support processor.

4,897,783

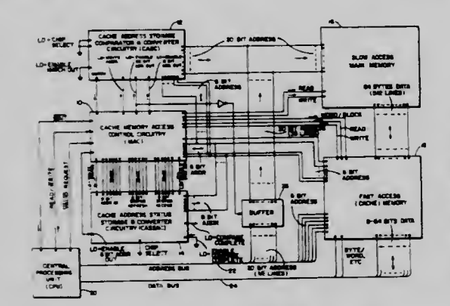
COMPUTER MEMORY SYSTEM

Daniel L. Nay, 30147 Via Borica, Palos Verdes, Calif. 90274

Continuation of Ser. No. 474,831, Mar. 14, 1983. This application Jun. 27, 1986, Ser. No. 879,465

Int. Cl.[4] G06F *12/08*

U.S. Cl. 364—200 **6 Claims**



1. In combination a central processor and a computer memory system, said computer memory system including: a relatively slow access relatively large main memory; a relatively fast access relatively small auxiliary memory; a plurality of parallel transfer lines intercoupling said main memory and said auxiliary memory; first control circuitry coupled to the central processor and to the main and auxiliary memories for accessing the auxiliary memory for all words addressed by the central processor which are stored in the auxiliary memory, and for accessing the main memory when a particular addressed work cannot be found in the auxiliary memory, said first control circuitry including storage means for storing the main memory address of all words presently stored in said auxiliary memory, comparator means for simultaneously comparing a desired main memory address received from the central processor against all the main memory addresses stored in said storage means, logic circuitry coupled to said comparator means for converting the desired main memory address into the corresponding auxiliary memory address if a match is made by said comparator means and for accessing the addressed work in said auxiliary memory, and further logic circuitry connected to said comparator means for effectively transferring the particular addressed word and a predetermined number of adjacent words from the main memory to the auxiliary memory along said parallel transfer lines when no match is made by said comparator means.

4,897,784

MULTI-LEVEL BUS ACCESS FOR MULTIPLE CENTRAL PROCESSING UNIT

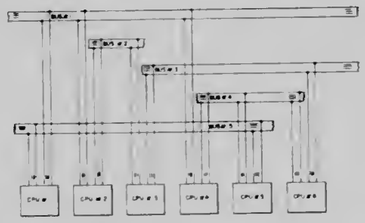
Daniel L. Nay, 30147 Via Borica Ave., Rancho Palos Verdes, Calif. 90274

Filed Jun. 10, 1985, Ser. No. 743,299

Int. Cl.[4] G06F *9/00, 13/00*

U.S. Cl. 364—200 **4 Claims**

1. A data processing system comprising a plurality of subsystem each capable of operating independently of one another; each of said sub-systems including a CPU and a general purpose bus consisting of address, data and control lines, connected thereto and controlled thereby; a takeover logic circuit for allowing one of said sub-systems to take over the bus of another of said sub-systems; said takeover logic circuit including a plurality of bi-directional buffers for interconnecting the respective lines of the buses of the two sub-systems when said buffers are enabled, and for isolating the buses from one another when said buffers are disabled, a pair of latches connected to the data lines of the two buses, one of said latches receiving data from one of the CPU's and for sending the data



to the other CPU, and the other of said latches receiving data from the other of said CPU's and for sending data to said one of said CPU's, and one of said latches being connected to said buffers to enable said buffers upon the receipt of selected signals from at least one of said CPU's; and a separate takeover logic circuit associated with each of said sub-systems to permit any one of said sub-systems to take over the bus of another of said sub-systems, and to reach through the other sub-system and take over the buses of subsequent ones of said sub-systems.

4,897,785

SEARCH SYSTEM FOR LOCATING VALUES IN A TABLE USING ADDRESS COMPARE CIRCUIT

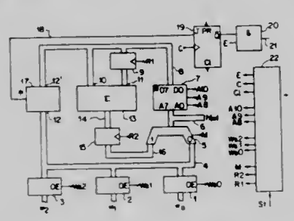
Stefan Zäger, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Division of Ser. No. 774,482, Sep. 10, 1985, abandoned. This application Jun. 17, 1988, Ser. No. 208,819

Claims priority, application Switzerland, Sep. 12, 1984, 4349/84

Int. Cl.[4] G06F *12/04, 15/40*

U.S. Cl. 364—200 **10 Claims**



1. An address compare circuit for determining whether a search key (w) is present in a memory, comprising:

(a) a memory;

(b) a control unit coupled with an input to said memory;

(c) a multiplexer coupled with address inputs of said memory;

(d) a sum register having an output coupled with a first multiplexer input;

(e) at least one temporary memory for a search key (w) having an output coupled with a second multiplexer input;

(f) an addend register having an input coupled with an output of said memory;

(g) an adder having a first input coupled with said memory output and a second input coupled with said addend register, an output of said adder being coupled with said sum register;

(h) a comparator having a first input coupled with said memory output and a second input coupled with said temporary memory output; and

(i) a bistable memory unit having an input coupled with an output from said comparator.

4,897,786

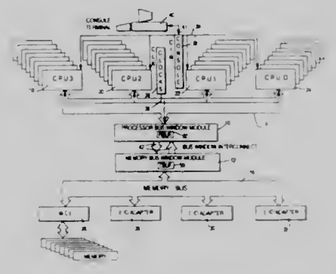
BUS WINDOW INTERLOCK

David W. Pinna, Nashua, N.H.; Paul J. Natusch, Westford, and Robert T. Silver, Marlboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,501

Int. Cl.[4] G06F *15/16, 9/46*

U.S. Cl. 364—200 **19 Claims**



1. A system for implementing an interlocking scheme between a plurality of processors and a memory controller coupled to a first bus and a second bus respectively, comprising:

(a) a first bus window module coupled to said first bus, said first bus window module receiving interlock transactions from said plurality of processors through said first bus;

(b) a second bus window module coupled to said second bus and further coupled to said first bus window module, said second bus window module receiving one of said interlock transactions from said first bus window module and passing said one of said interlock transactions to said second bus, and wherein said first and second bus window modules further include a deadlock prevention circuit operating in said first and second bus window modules to prevent a system deadlock when transferring said interlock transactions.

4,897,787

DATA PROCESSING SYSTEM

Ikuya Kawasaki, Kodaira; Keiichi Kurakazu, Tachikawa, and Hideo Maejima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,016

Claims priority, application Japan, Feb. 26, 1986, 61-39192

Int. Cl.[4] G06F *9/34*

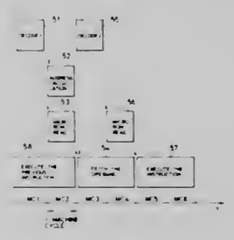
U.S. Cl. 364—200 **27 Claims**

1. A method of controlling processing in a microprocessor having a decoder for decoding a multi-word instruction including a first word having operand address information and means for controlling said execution means in response to an output of said decoder, comprising the steps of:

(a) decoding said first word using said decoder to produce a decoded result;

(b) providing said operand in response to the decoded result produced in said step (a);

(c) decoding said second word after completion of said step (a) using the decoder used in step (a) to determine an operation to be performed; and



(d) processing said operand using said execution means in response to the operation determined in said step (c).

4,897,788

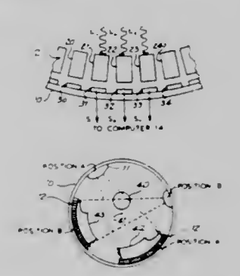
IMAGE CORRECTION FOR COMPUTED TOMOGRAPHY TO REMOVE CROSSTALK ARTIFACTS

Kevin F. King, New Berlin, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Apr. 18, 1988, Ser. No. 182,591

Int. Cl.[4] A61B *6/02*; G01N *23/02*

U.S. Cl. 364—413.15 **17 Claims**



1. A method for correcting individual flux measurements obtained from an array of detectors in a view of a Computed Tomography (CT) scan so as to reduce crosstalk artifacts in an image reconstructed from said measurements, said method comprising the steps of:

obtaining a plurality of x-ray measurements from the outputs of said detectors during said view, said measurements being contaminated by crosstalk errors arising between adjacent detectors; and

determining a corrected measurment from each respective x-ray measurement from a respective detector by summing therewith at least a portion of at least one adjacent x-ray measurement in said view from an adjacent detector multiplied by a crosstalk correction factor dependent on the crosstalk coupling of said respective detector with each of its adjacent detectors.

6. A method of finding correction factors to calibrate a plurality of output signals from a plurality of X-ray detectors in a CT scanner, said scanner including a source of X-rays, said method comprising the steps of:

radiating X-ray energy from said source toward said detectors in each of a plurality of views such that the energy arriving at said detectors in each respective view has a respective profile;

measuring the output signal from each of said detectors for each of said views; and

determining said correction factors for each respective de-

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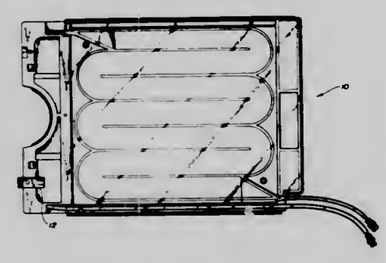
tector based on the variation of its output signals from each of said views.

4,897,789

ELECTRONIC DEVICE FOR AUTHENTICATING AND VERIFYING DISPOSABLE ELEMENTS

Martin J. King, Seminole, and Vernon H. Troutner, St. Petersburg, both of Fla., assignors to McNeilab, Inc., Spring House, Pa.

Filed Feb. 27, 1986, Ser. No. 834,293
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413.07 **8 Claims**



1. A combination for insertion into an apparatus having microprocessor means for controlling said apparatus, the combination comprising:

(a) a disposable or replaceable medical device for use in the photoactivated treatment of patient body fluids; and

(b) an integrated circuit permanently mounted to the medical device, wherein the circuit has a non-volatile electronic memory having encoded data pertinent to the use of the disposable or replaceable medical device and is capable of electrical connection with said microprocessor means when inserted into said apparatus.

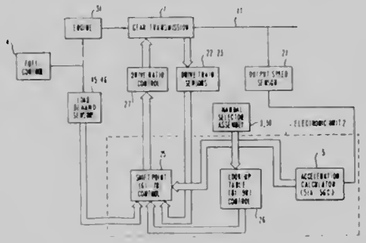
4,897,790

CONTROL ARRANGEMENT FOR THE SHIFTING OF VARIABLE CHANGE SPEED GEARS

Gerold Bieber, Langenargen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP86/00134, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05449, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 12, 1986, Ser. No. 930,369
Claims priority, application European Pat. Off., Mar. 23, 1985, 85/00124LU
Int. Cl.[4] B60K *41/06*; G06F *15/20*
U.S. Cl. 364—424.1 **11 Claims**

1. In a control system for an engine driven variable speed transmission (1) having a plurality of available drive ratios, including selector means (3,30) for rendering the transmission operative in forward (D) and reverse (R) travel conditions, fuel control means (4) responsive to displacement thereof for controlling instantaneous load demand on the engine, vehicle speed sensor means (21) operatively connected to the transmission for sensing output speed thereof, shift point control means (61–78) for effecting automatic change between said drive ratios in accordance with the output speed and the instantaneous load demand, acceleration calculating means (5) operatively connected to the vehicle speed sensor means for modifying the automatic drive ratio change effected by the shift point control means in accordance with acceleration determined from said sensing of the output speed and programmed means (81–98) establishing a plurality of command programs through which skipping of selected ones of the available drive ratios in



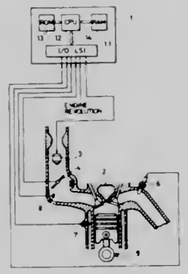
dependence on driving conditions assigns variable numbers of said drive ratios to the shift point control means for correspondingly limiting said automatic drive ratio change in upshift and downshift directions in the forward travel condition of the transmission.

4,897,791

ASYNCHRONOUS FUEL INJECTION METHOD

Teruji Sekozawa, Kawasaki; Makoto Shioya, Tokyo, and Motohisa Funabashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1986, Ser. No. 897,430
Claims priority, application Japan, Sep. 4, 1985, 60-193736
Int. Cl.[4] F02B *3/00, 3/08*
U.S. Cl. 364—431.05 **2 Claims**



1. A method of controlling an amount of fuel injection in accordance with information from a sensor within an engine, wherein an asynchronous fuel injection pulse width for injecting fuel in asynchronism with a crank angle is determined by a calculation periodically performed in asynchronism with the crank angle, said method comprising the steps of:

calculating an amount of increase of a throttle flow area during a period between a time k−1 and a time k in accordance with throttle angles at the time k−1 and k; and

determining the asynchronous fuel injection pulse width at the time k on the basis of the calculated amount of increase of the throttle flow area;

wherein the asynchronous fuel injection pulse width $T_{IS}(k)$ at the time k is determined by the following expression

$$T_{IS}(k) = K_I \cdot \frac{E(k-1)b[\cos\theta(k-1) - \cos\theta(k)]}{N(k)},$$

where:

K_I is a coefficient determined by characteristics of an injector,

N(k) is an engine r.p.m. at the time k,

E(k−1) is a quantity of air per unit throttle area, calculated at the time k−1,

b is an area of throttle valve,

θ (k−1) is a throttle angle at the time k−1, and

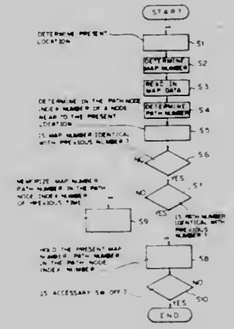
θ (k) is a throttle angle at the time k.

4,897,792

METHOD OF MEMORIZING TRAVEL LOCUS DATA FOR USE IN AN AUTOMOTIVE NAVIGATION SYSTEM

Masayuki Hosoi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,094
Claims priority, application Japan, Sep. 29, 1987, 62-245620; Sep. 29, 1987, 62-245621; Sep. 29, 1987, 62-245622
Int. Cl.[4] G06F *15/50*; G07B *29/10*
U.S. Cl. 364—449 **3 Claims**



1. A method of recording the travel locus data for an onboard navigation system of a motor vehicle, the method comprising the steps of:

storing previously determined location data of road maps in numerical form into a first memory including storing a map number for each map, a path number for each road within each map, and an index number for particular locations on each road in each map;

determining the present location data from the present location of the vehicle including a present map number, a present path number and a present index number while the vehicle is moving along a particular path; and

comparing the previously determined location data with the present location data and if the present map number is different from the previous map number or if the present path number is different than the previous path number, storing the previously determined location data into a second memory as said travel locus data.

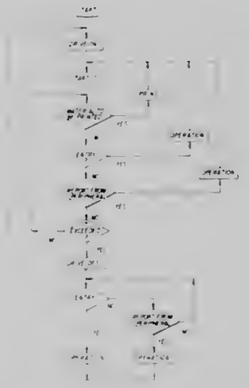
4,897,793

CONFIGURATION FOR A FRANKING MACHINE

Norbert Knoth, Berlin, Fed. Rep. of Germany, assignor to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,543
Int. Cl.[4] G07B *17/00*
U.S. Cl. 364—464.03 **10 Claims**

1. Configuration for a franking machine, comprising central control means in the form of a processor, a drive of the franking machine connected to said processor, a printing drum connected to said processor, an interface component connected to said processor for connection to drives of peripheral devices disposed upstream and downstream of the franking machine, a common keyboard connected to said processor for entering an amount to be printed and for controlling the franking machine for reducing mechanical wear and noise and for saving energy, and other control means in the form of a timing member associated with said processor, said timing member including means for placing said drive of the franking machine into a standby position by generating a switch-off signal if no



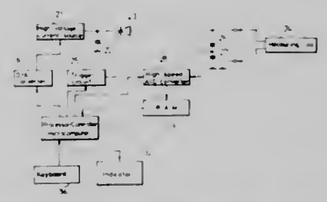
material to be stamped is touching said printing drum and no value has been entered through said keyboard during a given monitoring time period preset by said timing member, and means included in said timing member for controlling the drives of the peripheral devices through said interface component.

4,897,794

IMPULSE COIL TESTER

Keiichi Tsurumi, Tokyo, Japan, assignor to Egg Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1987, Ser. No. 76,386
Int. Cl.[4] G06F *11/32*; G01R *31/00*
U.S. Cl. 364—482 **1 Claim**



1. An impulse coil tester wherein an intrinsic damped oscillation current waveform produced in a measuring coil by impressing an impulse voltage thereon is compared with a damped oscillation current waveform of a reference master coil comprising:

terminal means for connection to successive individual measuring coils of a series of measuring coils;

means for generating a high voltage current source;

trigger circuit means for connecting said high voltage current source periodically to said terminal means and thereby to respective successive measuring coils;

first and second serially connected capacitive means connected across the terminals thereby to divide the damped oscillation voltage of an individual measuring coil;

a high-speed A/D converter having an input connected to a

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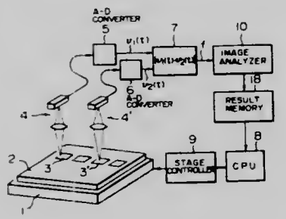
voltage dividing connecting point between the first and second capacitive means;
a first RAM connected to an output of the A/D converter;
a second memory means having a damped oscillation current waveform of a master coil permanently stored therein;
a CPU connected to the A/D converter, the trigger circuit and both memory means, the CPU being operable to actuate the trigger circuit repeatedly to feed an impulse voltage from the high voltage current source to the measuring coil, the A/D converter, and to read and compare respective successive damped oscillation current waveform signals from the first memory with the current oscillation waveform of the reference master coil stored in the second memory and,
an indicator connected to receive and display the compared signals from the CPU.

4,897,795

DIGITAL IMAGE ANALYSIS SYSTEM

Haruo Yoda, Tokyo; Hidesori Inoochi, Kokubunji; Hiroshi Sakou, Shiki, and Yozo Obuchi, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,807
Claims priority, application Japan, Mar. 6, 1987, 62-50033
Int. Cl.⁴ G06F *15/66*
U.S. Cl. 364—488 **10 Claims**



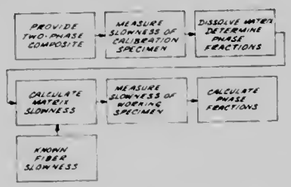
1. A digital image analysis system for determining a feature value of each clump on a digital input image formed by a raster scan method, the digital image analysis system comprising:
control image producing means for producing a control image by modifying the input image so as to fill up a hole in a clump and a recess at the bottom of a clump viewed in the sub-scanning direction of the raster scan method;
state detecting means successively applied with the value of adjacent pixels on two consecutive scanning lines of the control image, for detecting the state of a clump at a predetermined one of the scanning lines (that is, the generation and termination of the clump at one of the scanning lines and the continuity of the clump at the scanning lines), on the basis of the combination of the value of the adjacent pixels; and
feature value calculating means, including two memory means each for storing a feature value of a clump calculated up to one of the scanning lines, for calculating a feature value of a clump on the basis of the detected state of the clump, updating the feature value of a clump read out from one of said two memory means so that a new-feature value is generated including a feature of a portion on the one scanning line and for storing said new feature value in the other one of said two memory means.

4,897,796

NONDESTRUCTIVE MEASUREMENT OF FRACTIONS OF PHASES IN MIXTURES AND COMPOSITE MATERIALS

Carlos A. Salvado, Carlsbad, Calif., assignor to The Expert System Technologies, Inc., San Diego, Calif.

Continuation of Ser. No. 930,122, Nov. 12, 1986, Pat. No. 4,794,545. This application Nov. 22, 1988, Ser. No. 275,072
Int. Cl.⁴ G06F *15/46, 15/20*
U.S. Cl. 364—497 **20 Claims**



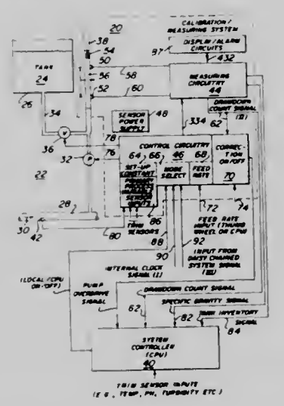
1. A process for determining fractions of phases present in a working specimen of a composite material, comprising the steps of:
providing at least one calibration specimen of a composite material;
nondestructively measuring a measurable property of the calibration specimen that varies with the fraction of the phases present in the calibration specimen;
destructively measuring the fraction of the phases present in the calibration specimen;
nondestructively measuring the measurable property of a working specimen; and
determining the fractions of the phases present in the working specimen utilizing information obtained in the nondestructive measurement of the calibration specimen and the destructive measurement of the calibration specimen.

4,897,797

PROPORTIONAL CHEMICAL FEEDING SYSTEM

Jerome J. Free, Jr., Lansdale; James C. Rodgers, Pipersville, and Davie B. Lawhon, Furlong, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 25, 1988, Ser. No. 185,752
Int. Cl.⁴ G06F *15/46*; G01M *19/00*
U.S. Cl. 364—500 **17 Claims**



1. In a treatment system for pumping a liquid into receiving means, said treatment system comprising tank means holding said liquid and having an outlet and controllable pump means having an inlet for cyclically pumping said liquid into said line receiving means, the improvement comprising a calibration/-measuring system for determining the volume of said liquid pumped each cycle of operation by said pump means and for controlling the operation of said pump means in response thereto, said calibration/measuring system comprising first and second sensor means, hollow container means connected to the outlet of said tank means and in fluid communication therewith for receiving said liquid from said tank means, measuring means, and control means, said hollow container means having an outlet connected to the inlet of said pump means and in fluid communication therewith to serve as the supply of said liquid to said pump means, said tank means serving to selectively provide said liquid to said container means, said pump means pumping said liquid from said container means into said receiving means, said first sensor means being operatively coupled to said container means for providing a first signal when the level of liquid in said container means reaches a first position and said second sensor means being operatively coupled to said container means for providing a second signal when the level of liquid in said container means reaches a second position located below said first position, said container means defining a first predetermined volume between said first and second positions, said control means establishing a predetermined number of cycles of operation of said pump means to pump said first predetermined volume from said container means into said receiving means and for providing a third signal indicative thereof, said measuring means responsive to said first and second signals for determining the actual number of cycles of said pump means required to pump said first predetermined volume into said receiving means and for providing a fourth signal indicative thereof, said control means comparing said third and fourth signals and providing an output signal responsive thereto, said pump means being controlled in response to said output signal.

4,897,798

ADAPTIVE ENVIRONMENT CONTROL SYSTEM

Lawrence J. Cler, Broomfield, Colo., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 8, 1986, Ser. No. 939,372
Int. Cl.⁴ G06F *15/20*; F23N *5/20*
U.S. Cl. 364—505 **46 Claims**



1. An adaptive environment control system for dynamically modifying operation of an HVAC system to control interior temperature of a building as a function of thermal properties of the building, comprising:
means for repeatedly determining the interior temperature and temperature outside of said building;
means connected to said determining means for repeatedly estimating, from said determined temperatures, values of said thermal properties;
means connected to said estimating means and responsive to said estimated values of said thermal properties for controlling the operation of said HVAC system based on said estimated values to bring the interior temperature of said building to a pre-set temperature at a predetermined time;
means connected to said estimating means for repeatedly predicting future values of said thermal properties from said estimated values; and
means connected to said estimating means and said predicting means for generating an alarm indication if values predicted for a given time differ from values estimated for said given time by more than a predetermined amount.

4,897,799

FORMAT INDEPENDENT VISUAL COMMUNICATIONS

Didier J. Le Gall, Springfield, and John D. Robbins, Mountain Lakes, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 15, 1987, Ser. No. 96,738
Int. Cl.⁴ G06F *15/62*; H04N *1/00, 1/32*
U.S. Cl. 364—514 **3 Claims**



1. A method for enabling the transmission of raster image data having a first raster format from a first display system to a second display system which uses a second raster format, said method comprising the steps of
providing a universal conversion unit including a group of algorithms for converting data from one raster format out of a multiplicity of possible raster formats to another raster format out of said multiplicity of possible raster formats,
comparing at said universal conversion unit information explicitly identifying a plurality of predetermined characteristics of said first raster format with information explicitly identifying a plurality of predetermined characteristics of said second raster format, said first and second raster formats belonging to said multiplicity of raster formats,
based on said comparison, selecting a subset of algorithms from said group of algorithms, said selected subset of algorithms comprising the subset of algorithms from said group of algorithms necessary to convert said raster image data in said first raster format to said second raster format,
processing said raster image data in said first raster format with said selected subset of algorithms so that said raster image data in said first raster format is converted to said second raster format, and
receiving said raster image data in said second raster format at said second display system.

4,897,800

ELECTRONIC GRAPH DRAWING APPARATUS

Akira Nakanishi, Sakurai, and Yasuhiro Nakanishi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1983, Ser. No. 528,657
Claims priority, application Japan, Sep. 8, 1982, 57-157324
Int. Cl.⁴ G06F *15/62*; G09G *1/06*
U.S. Cl. 364—520 **5 Claims**

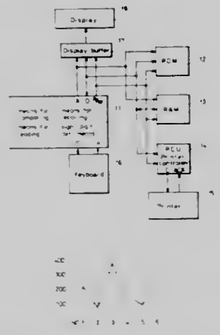
1. An electronic graph drawing apparatus comprising:
input means for introducing a plurality of numerical data values desired to be graphed;
first memory means, responsive to said input means, for storing said introduced numerical data values;
second memory means for storing graph drawing information including maximum scale information and number of

divisions for a plurality of graph classes, each said graph class corresponding to a class range of values of maximum data to be printed; and

processor means for producing graph scale data from said plurality of numerical data values, said processor means using stored logic programs, and comprising,

maximum value selection means for determining the maximum data value of said plurality of numerical data values stored in said first memory means,

means, responsive to said maximum value selection means, for comparing said maximum data value selected thereby to said class range of values corresponding to



each said graph class as stored in said second memory means, and for selecting said graph class having a class range of values within which said maximum data falls,

means, responsive to selection of said graph class by said means for comparing and selecting, for recalling said graph drawing information from said second memory means, and

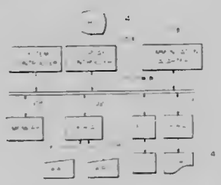
means, responsive to said graph drawing information from means for recalling, for reading said numerical data values from said first memory means and for printing a graph in said selected graph class of said plurality of data values, said means for reading and printing further printing scale indicia and scale lines.

4,897,801

DISPLAY TERMINAL EQUIPMENT WITH CONCURRENTLY OPERABLE PLURAL INPUT DEVICES

Yoshiharu Kazama, and Motonobu Nagafuji, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 85,768
Claims priority, application Japan, Aug. 25, 1986, 61-197114
Int. Cl.[4] G05F *3/037*
U.S. Cl. 364—521 **6 Claims**



4. A display terminal equipment comprising:

a plurality of input means each operated by an operator for inputting information;

display means for displaying display information;

control means connected to said display means for controlling different display information to be displayed at different positions on said display means; and

adapter means for interconnecting said plurality of input means and said control means, said adapter means includes means for adding identification information for identifying each of said input means to the display information inputted by the corresponding input means and for transferring said identification information and said display information to said control means;

wherein said control means comprises

a system bus,

a display controller connected to said system bus and having a plurality of cursor registers for controlling the display of data received from said system bus at a position, on said display means, addressed by a cursor register corresponding to a cursor register number which is received together with said data and

a system control means including a memory and system controller having at least one microprocessor, said memory has stored therein a control program for said microprocessor, both of said system controller and said memory having connected to said system bus, said microprocessor controls said system bus, receives data from said adapter means, adds to said data said cursor register number corresponding to any one of said input means, and sends both the data and cursor register number to said display controller, and

wherein said adapter means further includes

a plurality of data buffers corresponding in number to a plurality of keyboards,

a selector connected between said data buffers and said system bus, and

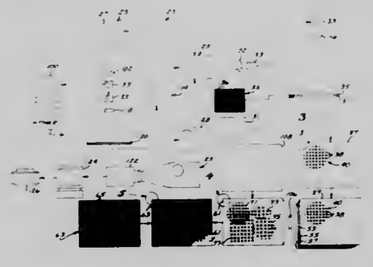
a controller for time divisionally scanning said data buffers, said controller including means for interrupting said system controller when there is data in a data buffer, and in response to a command from said system controller controlling said selector so as to output the data from a scanned and detected data buffer to said system bus and means for outputting a keyboard number obtained from a scan signal.

4,897,802

METHOD AND APPARATUS FOR PREPARING AND DISPLAYING VISUAL DISPLAYS

William B. Atkinson, Yorba Linda, and William R. Bronaugh, Garden Grove, both of Calif., assignors to John Hassmann, Laguna Hills and Vern Schooley, Long Beach, both of, Calif., part interest to each

Filed Nov. 19, 1986, Ser. No. 932,364
Int. Cl.[4] G06K *15/00*
U.S. Cl. 364—518 **10 Claims**



1. A display system having a single-frame transparency which contains up to four independent images, each of said images having spaced apart groups of pixels interlaced with groups of pixels of the other of said images, each of said images being selectable for projection by a movable grid mask, comprising:

a housing having a light source;

said single-frame transparency coupled to said housing wherein each of said images is defined by a plurality of spaced apart square shaped groups of pixels, respective groups of pixels for each of said images being juxtaposed in a square mosaic pattern;

said grid mask coupled to said housing in overlaying relation with said single-frame transparency, said grid mask being defined by a plurality of vertical and horizontal opaque grid lines in spaced relation to form a plurality of square shaped transparent apertures for alignment with one of said groups of pixels defining one of said images; and,

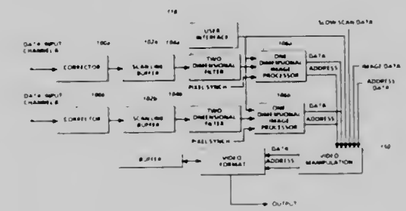
drive means coupled to said housing for displacing said grid mask relative to said single-frame transparency in equal increments to form a closed loop defining a square pattern to sequentially align said grid mask apertures with respective groups of pixels for each of said images to permit light from said light source to project therethrough, whereby each individual image is displayed sequentially.

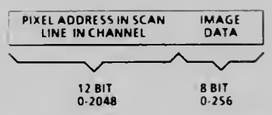
4,897,803

ADDRESS TOKEN BASED IMAGE MANIPULATION

Anthony F. Calarco, Fairport, and Lisa M. Yamonaco, East Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1987, Ser. No. 124,123
Int. Cl.[4] G06F *15/66*
U.S. Cl. 364—518 **9 Claims**





1. An image processing device for processing image data including:

image data input for receiving image data and providing a plurality of scan lines of image data bytes for processing;

data byte addressing means for generating an address token for each image data byte, identifying the position of the image data byte in a scan line, for combination with the image data byte to form an addressed image data byte defining a final image address along a scan line and image data for each data byte;

control means for selecting image manipulation routines and identifying addresses of interest for image manipulation;

address manipulation means for selectively arithmetically and logically manipulating address portions of addressed image data bytes at addresses of interest for image manipulation; and

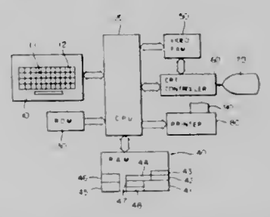
image data manipulation means for selectively manipulating image data portions of addressed image data bytes at addresses of interest for image manipulation of addressed image data bytes at addresses of interest.

4,897,804

DATA PROCESSING DEVICE WITH SCREEN SEPERATED INTO LINE FORMAT AREA AND DATA DISPLAY AREA

Yasushi Kawakami, Nagoya; Fukue Obata, Yokkaichi; Kayoko Makihara, Kamagori; Shiro Yamada, Kasugai; Minoru Oishi, Nagoya; Yoshisari Morimoto, Nagoya; Atsuko Kawasumi, Nagoya; Kazuko Nakagawa, Chita, and Yukimi Mizutani, Ichinomiya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jul. 15, 1987, Ser. No. 73,971
Claims priority, application Japan, Jul. 15, 1986, 61-165777; Jul. 15, 1986, 61-166273
Int. Cl.[4] G06F *15/20, 3/09*
U.S. Cl. 364—521 **6 Claims**



1. In a data processing device comprising input means for inputting character data and format data, display means for displaying the input data and means for processing the input data and displaying the processed input character data on said display means, the improvement comprising:

said display means includes a screen which is separated into (1) a line format area containing a horizontal scale which indicates the input range of one line with character columns corresponding to standard printing spacing and (2) a data display area for displaying processed character input data, and said processing device is further provided with shift means for shifting the data displayed on said line format area relative to the data displayed on said data display area.

4,897,805

METHOD AND APPARATUS FOR PERFORMING POLYGON FILLS IN GRAPHICAL APPLICATIONS

Jane Wang, Framingham, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed May 17, 1988, Ser. No. 194,832
Int. Cl.[4] G09G *1/00*
U.S. Cl. 364—521 **13 Claims**



1. A method of filling computer-generated polygon shapes, said shapes being formed on a matrix of pixels which is organized into individual horizontal raster lines, comprising the steps of:

(a) storing data representative of the vertices defining each polygon edge;

(b) computing points of intersection along one of said raster lines of a scan-line with said polygon edges, and assigning

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a crossed-edge count and a parity value based on said crossed edge count to each of said of intersections;

(c) combining at said point of intersection all horizontal edges which are colinear with said scan-line and all intersecting vertices into a colinear horizontal edge;

(d) calculating the number of polygon edges positioned above said colinear horizontal edge which have a vertex coincident with said colinear horizontal edge into an above edge count;

(e) calculating the number of polygon edges positioned below said colinear horizontal edge and which have a vertex coincident with said colinear horizontal edge into a below edge count;

(f) comparing said above edge count and said below edge count, whereby if both said above edge count and said below edge count have even parity, the parity of the crossed-edge count of the colinear horizontal edge is inverted; and

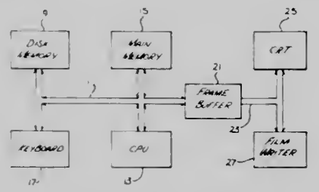
(g) modifying the string of said pixels along said raster line from the current point of intersection to the next point of intersection according to the parity of said crossed-edge count, said modification being executed if the parity of said crossed-edge count is odd and said modification not executed if the parity of said crossed-edge count is even.

4,897,806

PSEUDO-RANDOM POINT SAMPLING TECHNIQUES IN COMPUTER GRAPHICS

Robert L. Cook, San Anselmo; Thomas K. Porter, Fairfax, and Loren C. Carpenter, Novato, all of Calif., assignors to Pixar, San Rafael, Calif.

Filed Jan. 19, 1985, Ser. No. 746,626
Int. Cl.[4] G09G *1/06, 1/16*
U.S. Cl. 364—522 **54 Claims**



1. In a method of forming an electronic signal of a video image frame that individually specifies characteristic information of each of an array of pixels that forms said frame, wherein the characteristic information of each pixel is determined by sampling, at a plurality of points within a boundary of each of said pixels, data stored in a computer data base that specifies visual characteristics of an object scene for said image frame, the improvement comprising the steps of electronically determining, for the sample points individually, a range of angles of reflection of the object scene at such points, and pseudo-randomly selecting one such angle for each such sample point, whereby other portions of the object scene that are visible by reflection from a sampled point of the object scene are determined.

4,897,807

SWITCH DATA INPUT DEVICE

Toshifumi Ohsawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 139,971
Claims priority, application Japan, Jan. 12, 1987, 62-4588
Int. Cl.[4] G06F *1/00, 3/00*
U.S. Cl. 364—707 **7 Claims**



1. A switch data input device comprising:

a plurality of switches, each having an on-state and an off-state;

interrupt signal generating means responsive to the on-state of said respective switches for producing an interrupt signal having a prescribed pulse width duration shorter than the time width of the on-state; and,

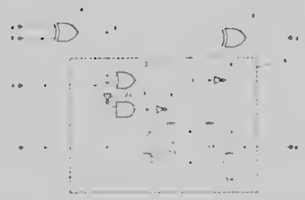
data processing circuit means, receptive of said interrupt signal and responsive to presence of the interrupt signal, for reading the on-state and the off-state of said respective switches as data, and having a program for executing a processing operation according to the read data, said data processing circuit reverting to a waiting state after completion of execution of the data reading and data processing operations.

4,897,808

ADDER CAPABLE OF USUAL ADDITION AND REVERSE CARRY ADDITION

Shin-ichi Nakagawa; Hideyuki Terane; Hiroyuki Kawai, and Kazuya Ishihara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 21, 1988, Ser. No. 209,682
Claims priority, application Japan, Jan. 12, 1988, 63-5296
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—784 **6 Claims**



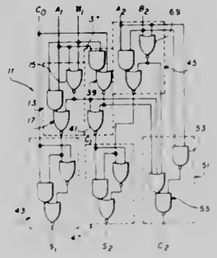
1. An adder provided with a carry signal input and a carry signal output and operating addition for one bit, comprising a carry input-output switching circuit disposed between said carry signal input and said carry signal output which switches between usual addition and reverse carry addition in response to a predetermined control signal, said switching circuit for receiving a first carry signal on said carry signal input and for outputting a second carry signal on said carry signal output.

4,897,809

HIGH SPEED ADDER

Iradj Shahriary, Santa Monica; George S. Des Brisay, Jr., Hemet, and Susan K. Avery, Altadena, all of, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 14, 1987, Ser. No. 95,969
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—784 **1 Claim**



1. A high speed cascadable adder comprising:

first means for providing the exclusive OR of first bits A_1 and B_1 of first and second digital words A and B, respectively, said first means including:

a first NOR gate having said first bits A_1 and B_1 of said first and second digital words A and B, respectively, as inputs and

a first merged AND/NOR gate having said first bits A_1 and B_1 of said first and second digital words A and B, respectively, as AND inputs and the output of said first NOR gate as a NOR input;

second means for providing the exclusive OR of the exclusive OR of first bits A_1 and B_1 of first and second digital words A and B, respectively, and a carry input C_o to provide a first sum output S_1; and

carry generating logic means for generating, with exactly two gate delays, an output carry C_1 corresponding to the sum of said input carry bit C_o and said first bits A_1 and B_1 of first and second digital words A and B, respectively, said carry generating logic means including:

a second merged AND/NOR gate having said first bits A_1 and B_1 of said first and second digital words A and B, respectively, as AND inputs and said input carry bit C_o as a NOR input, and

a second NOR gate having the output of said second merged AND/NOR gate as a first input and the output of said first NOR gate as a second input, whereby the output of said second NOR gate is said output carry C_1.

4,897,810

ASYNCHRONOUS INTERRUPT STATUS BIT CIRCUIT

Michael A. Nix, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

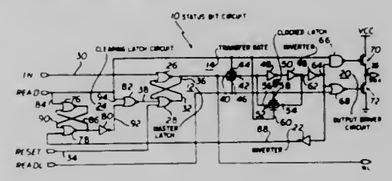
Division of Ser. No. 205,636, Jun. 13, 1988, Pat. No. 4,862,409.
This application Mar. 2, 1989, Ser. No. 318,098
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **6 Claims**

1. An asynchronous interrupt status bit circuit for use in conjunction with a microprocessor which guarantees that no interrupting conditions are missed and that no single interrupting condition is indicated twice, said circuit comprising:

master latch means (12) responsive to an interrupt input signal for generating an interrupting logic signal which is latched to a low logic level;

clocked latch means (14, 16, 18) responsive to true and complement read signals and said interrupting logic signal for generating a control signal;

output driver means (20) responsive to said control signal and said true and complement read signals for generating an output signal which is fed to the microprocessor so as to indicate reading of an interrupting condition when it is at a high logic level; and



said master latch means (12) being further responsive to a clear signal having a high logic level for clearing said interrupting logic signal to a high logic level only when said control signal is latched at a high logic level before the time the true read signal is making a high-to-low transition,

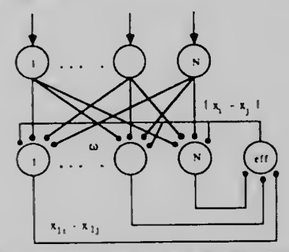
whereby the next true read signal causes the output signal to produce a low logic level if no interrupt input signal has occurred again.

4,897,811

N-DIMENSIONAL COULOMB NEURAL NETWORK WHICH PROVIDES FOR CUMULATIVE LEARNING OF INTERNAL REPRESENTATIONS

Christopher L. Scofield, Barrington, R.I., assignor to Nestor, Inc., Providence, R.I.

Filed Jan. 19, 1988, Ser. No. 145,630
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—900 **3 Claims**



1. An N-dimensional Coulomb neural network comprising, in combination:

(a) a plurality K of input terminals, each terminal (m) for receiving one of K input signals $f_m(t)$;

(b) a plurality N of neural cells, each neural cell (n) having K inputs and one output, and for producing a first output signal $x_n(t)$ at its output representing a sum of K signal representations applied to its inputs;

(c) a plurality N×K of input connection elements, each input connection element (mn) coupling one of said input terminals (m) with one of said neural cells (n) and providing a transfer of information from a respective input terminal (m) to a respective neural cell (n) in dependence upon a signal $f_m(t)$ appearing at an input terminal thereof and upon a connection strength ω_{nm} of said connection element;

(d) a plurality N of output connection elements, each output connection element (n) being coupled to said output of a respective one (n) of said neural cells and including:

(l) means for storing said first output signal $x_n(t)$ of the neural cell (n) to which it is coupled; and

(2) means for subtracting a next received first output signal $x_n(t+1)$ from a previously stored first output signal $x_n(t)$ to form a difference, and for producing a second output signal $(x_n(t)-x_n(t+1))^2$ representing a square of said difference;

(e) an effective cell connected to said output connection elements for receiving said second output signals and having means for computing a function of a state space distance, where L is an integer greater or equal to N−2, and for producing a third output signal representative thereof,

wherein each of said neural cells adjusts a connection strength (ω_{nm}) in accordance with the formula:

$$\delta\omega_{nm}=(+/-)|x(t)-x(t+1)|-(L+2)\Delta_{nm}(f(t),f(t+1))$$

where $\Delta_{nm}(f(t), f(t+1))$ is given by:

$$\Delta_{nm}(f(t), f(t+1)) = (F_n(f(t)) - F_n(f(t+1))) \times (F_n(f(t))(1 - F_n(f(t)))f_m(t) - F_n(f(t+1))(1 - F_n(f(t+1)))f_m(t+1)).$$

4,897,812

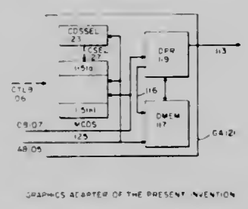
GRAPHICS ADAPTER

Paul A. Lessard, Merrimack, N.H., and John F. McDonald, Leominster, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 25, 1986, Ser. No. 878,450

Int. Cl.⁴ G06F *3/153*

U.S. Cl. 364—900 **37 Claims**



GRAPHICS ADAPTER OF THE PRESENT INVENTION

10. In graphics control apparatus for use with a display memory permitting addressing of a single byte of n bits or a plurality of n-bit bytes,

means for producing an m-bit result word where m/n is an integer for output to the display memory comprising:

read data receiving means connected to the display memory for receiving a first m-bit word from the display memory;

selection means connected to the read data receiving means for selecting an n-bit byte from the received word and forming an m-bit output word wherein each byte is identical to the selected byte; and

write data processing means connected to the selection means and the display memory for receiving the output word, using the m bits therein to process the bytes of an entire second m-bit word in parallel to produce the m-bit result word, and outputting the result word to the display memory.

4,897,813

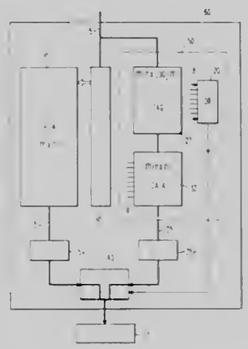
PARTIALLY PROGRAMMABLE READ-ONLY MEMORY SYSTEM

Cevat Kumbasar, Irvine, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 19, 1988, Ser. No. 157,775

Int. Cl.⁴ G11C *15/00*

U.S. Cl. 365—49 **8 Claims**



1. A partially programmable control store memory system comprising:

(a) a first Read Only Memory (ROM) means for storing data words;

(b) a Content Addressable Memory (CAM) means including a RAM TAG Memory means and a RAM data memory means wherein said TAG Memory means holds addresses, of any address locations of said ROM Memory means which are to be updated, and said RAM data memory means holds updated data words which are to replace any selected one or more data words in said ROM memory means;

(c) address bus input means for delivering a data word address simultaneously to said ROM memory means and to said Content Addressable Memory means;

(d) selection means for

(i) comparing an input address received by said CAM means with resident addresses in said TAG Memory means; and for

(ii) generating a hit signal to a multiplexer unit when a match occurs, or a no-hit signal when no match occurs; and for

(iii) accessing said data memory means to transfer an updated data word from the matching address to said multiplexer,

said multiplexer unit receiving said hit/no-hit signal to determined whether a data word from said ROM means or from said data memory means will be transmitted to an output register;

wherein said ROM means includes "m" addressable location where each location holds "n" bits forming a data word; and

said TAG memory means includes "m/r" addressable locations where each location holds Log_2 "m" bits of address data; and "r" represents the percentage proportion of the "m" addressable locations in said ROM means which are desired to be updated; and

said RAM data memory means includes "m/r" addressable locations where each location holds "n" bits forming an updated data word.

4,897,814

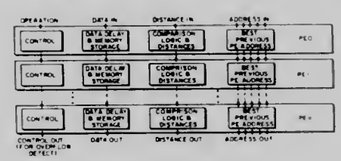
PIPELINED "BEST MATCH" CONTENT ADDRESSABLE MEMORY

Lawrence T. Clark, Scottsdale, Ariz., assignor to Arizona Board of Regents, Tempe, Ariz.

Filed Jun. 6, 1988, Ser. No. 202,376

Int. Cl.⁴ G11C *7/00, 15/00, 11/40*

U.S. Cl. 365—49 **13 Claims**



1. A pipelined content addressable memory for rapidly locating the best match therein and generating an address pattern therefrom comprising: a pipeline containing a plurality of identical processing elements, each processing element containing a delay section containing data, a storage section containing data, first means to generate a distance metric between said data in said delay section and said data in said storage section, and second means to compare the magnitude of said distance metric of one processing element with the distance metric generated by the immediately preceding one of said processing elements in said pipeline and when the distance metric of said one processing element is less than that of said immediately preceding processing element placing the address of said one processing element on the address pattern output of said processing element and when the distance metric of said one processing element is greater than or equal to that of said immediately preceding processing element, and placing said address of said immediately preceding processing element on said output; a control circuit generating clock signals which synchronize communication between each of said processing elements and said preceding processing element corresponding thereto; and means for collecting and recording the address pattern created thereby, each such processing element having a data delay memory storage unit, a local control unit having operation storage and used storage means for generating a distance metric between the data contained within said data delay and said memory storage units, means to compare the magnitude of said distance metric generated in said processing element with the smallest distance metric corresponding to the data which is contained in the processing element disposed prior thereto in said pipeline, a least previous distance metric storage unit, a best matching location (that address with the least distance metric) storage unit, and a control circuit having a single bit storage element therein for indicating the validity of the data stored within said processing element, said single bit storage element controlling the writing of new data to the storage of the processing element while avoiding overriding valid data already contained in said storage.

4,897,815

HIGH-SPEED WRITE TYPE NONVOLATILE SEMICONDUCTOR MEMORY

Sumio Tanaka, Tokyo; Shinji Saito, Yokohama; Shigeru Atsumi, Tokyo, and Nobuaki Ohtsuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 15, 1987, Ser. No. 96,458

Claims priority, application Japan, Dec. 24, 1986, 61-306306

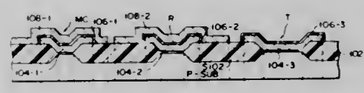
Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—148 **23 Claims**

1. A nonvolatile semiconductor memory comprising:

a memory cell array divided into a plurality of blocks, each of said divided blocks including data memory cell MOS transistors arranged in a matrix form and write circuits for sending write data to said cell MOS transistors; and

resistive elements, each resistive element included in only one of the blocks in said plurality of blocks, for connecting sources of said cell MOS transistors commonly connected



in each of said plurality of blocks to one end of a power circuit of said memory.

4,897,816

SERIAL DYNAMIC MEMORY SHIFT REGISTER

Grigory Kogan, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 3, 1989, Ser. No. 332,128

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 365—189.12 **4 Claims**



1. A serial dynamic memory shift register comprising:

a plurality of dynamic memory cells coupled to a column data bus having an input end to which input data is applied and an output end, each cell being coupled to the column data bus in response to an individual row command to transfer data between the cell and the column data bus; and

a temporary latch having an input and an output, the input being coupled to the output end of the column data bus to transfer data from the column data bus to the output of the temporary latch;

whereby the plurality of dynamic memory cells, column data bus and temporary latch form a serial subarray.

4,897,817

SEMICONDUCTOR MEMORY DEVICE WITH A BUILT-IN TEST CIRCUIT

Naoki Katanosaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 835,085, Feb. 28, 1986, abandoned. This application May 10, 1988, Ser. No. 195,391

Claims priority, application Japan, Feb. 28, 1985, 60-39136

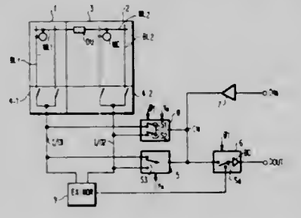
Int. Cl.⁴ G11C *29/00*

U.S. Cl. 365—201 **5 Claims**

1. A memory device comprising first and second groups of memory cells, each of said memory cells being expected to store data written thereto without changing state of the stored data, first and second data lines, a first selection circuit coupled

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between said first data line and said first group of memory cells for selectively performing data transfer between said first data line and one of said first group of memory cells, a second selection circuit coupled between said second data line and said group of memory cells for selectively performing data transfer between said second data line and one of said second group of memory cells, a data input terminal, a data input buffer having an input terminal coupled to said data input terminal and an output terminal for generating a write data signal, a common data line connected to the output terminal of said input buffer, a first control circuit coupled between said first and second data lines and said common data line, said first control circuit setting the state of one of said first and second data lines in accordance with said write data signal in a normal mode and setting both of said first and second data lines in the same state simultaneously with said write data signal in a test mode, a comparing circuit having a first input terminal connected to said first data line, a second input terminal connected



to said second data line and an output terminal, said comparing circuit operatively generating at its output terminal a detection signal of 1 bit data only when data at said first and second data lines are different from each other in said test mode, a second control circuit coupled between said common data line and said first and second data lines for selectively determining a state of said common data line by a state of one of said first and second data lines, a data output terminal, and a data output circuit having an output terminal coupled to said data output terminal, a first input terminal coupled to said common data line and a second input terminal coupled to the output terminal of said comparing circuit, said data output circuit being enabled to generate a data output signal at said data output terminal in accordance with the state of said common data line when said detection signal is not present and disenabled when said detection signal is present thereby to set said data output at a predetermined state irrespective of the state of said common data line.

4,897,818

DUAL-PORT MEMORY WITH INHIBITED RANDOM ACCESS DURING TRANSFER CYCLES

Donald J. Redwine, Houston, and Raymond Pinkham, Stafford, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 567,039, Dec. 30, 1983, Pat. No. 4,689,741. This application Jun. 18, 1987, Ser. No. 64,290

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—221 **18 Claims**

1. A dual port memory device providing both serial access and random access, comprising:

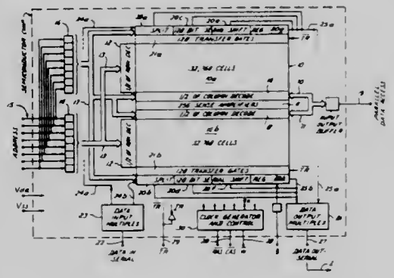
an array of rows and columns of read and write memory cells, and row and column lines connected to the rows and columns of said cells;

row addressing means for selecting one of said row lines in response to a plurality of row address bits to thereby couple each cell in a row of said cells to a separate column line;

column addressing means for selecting one of said column lines in response to a column address for random access, and means to couple said column to a data terminal;

a serial data register connectable to all of said column lines, having a number of bits equal to the number of columns; and

means connected to a control input to select between serial access and random access, and when serial access is se-



lected, to transfer data between said column lines and said serial data register and to prevent transfer of data between said data terminal of the device and said selected column line.

4,897,819

MEMORY PROTECTION CIRCUIT

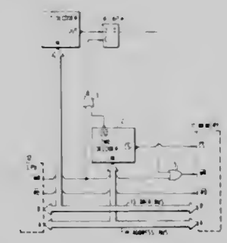
Hiroshi Takizawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,108

Claims priority, application Japan, Oct. 20, 1987, 62-265649

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—230.06 **22 Claims**



1. A protection circuit for a memory in which data from a processing device including a write control terminal may be written, comprising:

first decoder means for detecting a first pattern which is included in data to be written into said memory to produce a first detection output;

second decoder means for detecting a second pattern which is included in address data, to produce a second detection output; and

control means for enabling data to be written in said memory when both said first and second decoder means produce said first and second detection outputs, respectively, and for cancelling the enabled condition when said second decoder means produces said second detection output and said first decoder means does not produce said first detection output.

4,897,820

BI-CMOS TYPE OF SEMICONDUCTOR MEMORY DEVICE

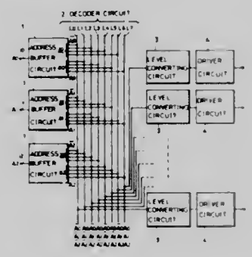
Toru Shiomi, and Kenji Anami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,432

Claims priority, application Japan, Aug. 25, 1987, 62-210602

Int. Cl.[4] G11C *11/34*

U.S. Cl. 365—230.08 **10 Claims**



1. A semiconductor memory device comprising a memory cell array including a plurality of MOS memory cells and selecting means for selecting a memory cell in said memory cell array, said selecting means comprising

a plurality of address buffer means each comprising a bipolar ECL circuit and receiving an address signal of an ECL level for outputting the same,

decoder means having a plurality of outputs and responsive to a plurality of address signals of the ECL level outputted from said address buffer means for driving a selecting signal of the ECL level to one of said outputs, and

a plurality of level converting means each connected to a corresponding output of said decoder means for converting the selecting signal of the ECL level derived from said decoder means into a selecting signal of an MOS level and applying the same to a corresponding memory cell in said memory cell array,

wherein each of said level converting means comprises MOS circuit means having a pair of opposite conductivity channel MOS transistors connected to said decoder means for providing said selecting signal of an MOS level to said memory cell array.

4,897,821

METHOD AND DEVICE FOR INITIALIZING DATA, AND PARTICULARLY SEISMIC DATA, ACQUISITION APPARATUS

Gérard Thierry, Paris, and Joseph Rialan, Meudon, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 86,558, Aug. 18, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 302,336

Claims priority, application France, Aug. 18, 1986, 86 11876

Int. Cl.[4] H04B *17/00*

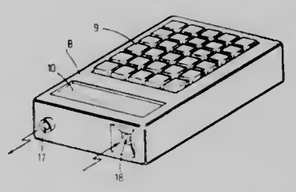
U.S. Cl. 367—13 **12 Claims**

1. A method for presetting seismic data acquisition apparatus distributed along a seismic profile to be explored, each adapted for collecting signals supplied by sensors, processing them and recording them and, on an order from a central laboratory, transferring thereto the data relative to said signals over a given transmission channel, which method includes:

providing a light ray transmission system that is independent of said given transmission channel having a first portable short range light ray control unit and a plurality of secondary units associated respectively with the different acquisition apparatus, for transmitting infrared rays modulated by signals to be transmitted and receiving demodulated infra-red light signals;

displacing the first portable control unit to the vicinity of each of the acquisition apparatus units successively;

transmitting operating parameters from said portable unit to the secondary unit associated with each of said acquisition apparatus units one at a time on a sequential basis; and



transmitting response signals from each of said secondary units back to said portable unit that confirm receipt of operating parameters transmitted by said portable unit before moving the portable unit.

4,897,822

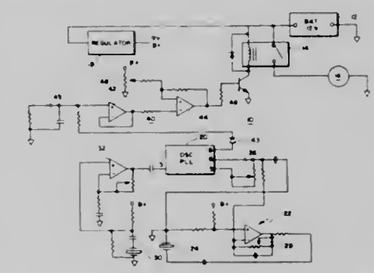
PLL SONIC BILGE PUMP SWITCH

Jerome B. Korten, 242 W. 104 #6WR, New York, N.Y. 10025, and Chauncey F. Korten, Box 459, Block Island, R.I. 02807

Filed Feb. 10, 1989, Ser. No. 309,075

Int. Cl.[4] G01S *3/80*

U.S. Cl. 367—124 **10 Claims**



1. An apparatus for activating and deactivating a bilge pump in response to the detection of the presence or absence of fluid in a bilge hold, comprising:

oscillator means for producing a periodic signal having a predetermined frequency to energize a first transducer means;

first transducer means for converting said periodic signal to an acoustic signal and operative to transmit said acoustic signal;

second transducer means for receiving said acoustic signal and operative to convert said acoustic signal to an electrical signal upon the condition that the magnitude of said acoustic signal exceeds a predetermined magnitude, said predetermined magnitude indicating the presence of fluid between said first and second transducer means;

detector means coupled to said second transducer means and said oscillator means, for detecting whether said received acoustic signal is of the same frequency as said predetermined frequency, and for producing an electrical trigger signal in response thereto; and

switch means coupled to said detector means for receiving said electrical trigger signal and connecting a bilge pump to a voltage source.

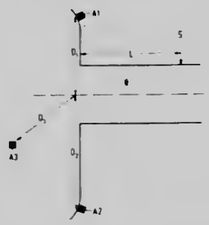
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4,897,823

METHOD FOR LOCATION OF SHOCKS WITH A STRUCTURE-BORNE SOUND MONITORING SYSTEM, IN PARTICULAR IN PRESSURIZED ENCLOSURES IN POWER PLANTS

Konrad Krien, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 150,885
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702879
Int. Cl.[4] G01S *3/80*
U.S. Cl. 367—127 **4 Claims**



1. In a method for location of shocks or bursts using a structure-borne sound monitoring system, which includes:

picking-up burst signals originating at a burst site with at least one structure-borne sound sensor mounted at least one different point on an enclosure to be monitored, and recording the burst signals with recording devices connected downstream of the at least one sensor; and

filtering two burst signal components (BS_1, BS_2) out of the burst signal spectrum at frequencies (f_1, f_2) including frequency bandwidths (Δf_1,Δf_2), and referring the two burst signal components (BS_1, BS_2) to a rise time difference ($\Delta t_{1,2}$) resulting from dissimilar arrival times (t_1, t_2) of the two burst signal components at a given one of the at least one structure-borne sound sensor, so that in accordance with a general formula

$$\left[L_{S-E} = \frac{\Delta t_{1,2} \cdot v_1 \cdot v_2}{v_1 - v_2} \right.$$

the sound travel distance (L_{S-E}) from the at least one structure-borne sound sensor to the burst site can be determined, wherein (v_1,v_2) represent the suspected propagation velocities at a given frequency:

the improvement which comprises: separating at least three burst signal components ($BS_i \ldots BS_n$) at frequencies ($f_1 \ldots f_n$) with electronic signal filter systems;

determining a group of signal onsets ($t_i \ldots t_n$) of the burst signal components ($BS_1 \ldots BS_n$), where ($i = 1, 2, 3 \ldots n$):

forming rise time differences ($t_i - t_r \ldots t_n - t_r$) with respect to a reference time (t_r) selected arbitrarily from the group of signal onsets ($t_i \ldots t_n$);

determining the dispersion behavior of the separated burst signal components ($BS_i \ldots BS_n$) from the rise time differences, as a function of the frequencies ($f_i \ldots f_n$) known from the filtering:

ascertaining the type of sound propagation ($a_0$mode, a_0 mode) of the individual burst signal components and the group velocities ($v_i \ldots v_n$) belonging to the individual burst signal components ($BS_i \ldots BS_n$) by taking into account the wall thickness of the enclosure carrying the signal and by comparative analysis with the theoretical dispersion behavior; and

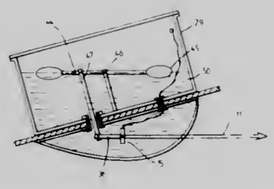
subsequently determining the sound travel distance (L_{S-E}) with at least double redundancy based on the general formula, with at least two parameter sets to be inserted into the general formula.

4,897,824

SONAR SYSTEMS

Peter J. Stokes, P.O. Box 532, Southport Queensland, Australia (4215)

Filed Feb. 9, 1989, Ser. No. 308,269
Claims priority, application Australia, Feb. 11, 1988, P16703
Int. Cl.[4] H04R *15/00*
U.S. Cl. 367—173 **8 Claims**



1. An apparatus adapted to be mounted to a water craft to sense the presence of objects forwardly of said craft, said apparatus including a transducer assembly adapted to be mounted to the hull of said water craft, said transducer assembly including a hollow housing adapted to be secured to the outside of said hull, a transducer supported pivotally in said housing for movement about an axis extending tranversely and abeam of said water craft, control means connected to said transducer so as to cause said transducer to transmit scanning signals forwardly of said craft and for sensing receipt of said transducer of scanning signals reflected from objects forwardly of said craft, and adjustment means for pivotally adjusting said transducer about said axis upon pitching movement of said craft whereby to maintain said scanning signals transmitted by said transducer in a substantially horizontal plane, said adjustment means including containing means disposed adjacent said housing and adapted for location on the side of said hull opposite said housing, said container means being in communication with said housing, a liquid filling said housing and partially filling said container means so as to define a liquid surface within said container means, float means within said container means and disposed on or adjacent said liquid surface and link means interconnecting said float means and said transducer whereby movement of said liquid surface and thus said float means relative to said container means consequent upon pitching movement of said craft is transmitted said link means to said transducer.

4,897,825

MAGNETIC SHIELDING STRUCTURE OF ANALOG ELECTRONIC TIMEPIECE

Masataka Ikenishi, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,808
Claims priority, application Japan, Apr. 5, 1988, 63-46159[U]
Int. Cl.[4] G04B *19/04, 37/00*
U.S. Cl. 368—228 **7 Claims**

1. An analog electronic timepiece comprising;

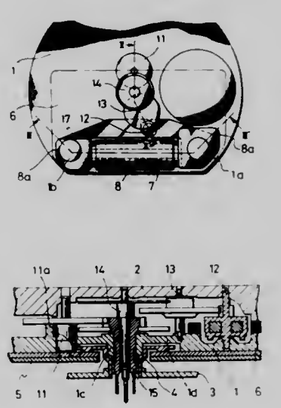
a main plate;

a motor assembly provided on the front side of said main plate including a magnetic core, coil block wound on said magnetic core, a stator having one opening and a rotor in said opening;

a wheel train including a plurality of wheels provided on the front side of said main plate for transmitting rotation of said rotor to hands;

an hour hand wheel provided on the rear side of said main plate and driven by one of said wheels;

an hour wheel supporting plate fixed on said rear side of said main plate for supporting said hour wheel;



said hour wheel supporting plate being made of a material having a high magnetic permeability and extended to the both ends of said magnetic core; and

a dial plate provided over said hour wheel supporting plate.

4,897,826

NOVELTY WRIST WATCH

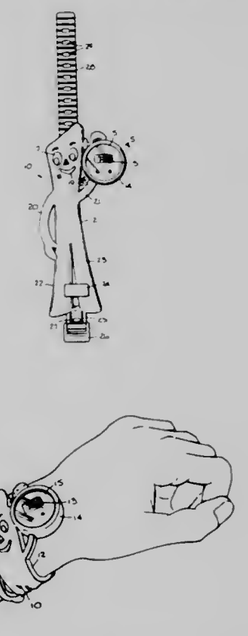
Allan Rigberg, 300 E. 75th St. (12B), New York, N.Y. 10021, and Jeff Lewis, 25 Guyer Rd., Westport, Conn. 06880

Filed Nov. 27, 1985, Ser. No. 802,325
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—282 **3 Claims**

1. A novelty wrist watch formed from a single piece of flexible plastic material having a flat undersurface to engage the wrist of a wearer, said single piece comprising:

A. a main body constituted by an elongated character and a case integral therewith and displaced therefrom to accommodate a timepiece movement, the length of the elongated character exceeding the width of the wrist of the wearer, said character including an arm which terminates in a hand that merges with the case, whereby the character appears to be holding the timepiece; and

B. two auxiliary members integral with the main body, one extending from one end of the character to define a first strap, the other extending from the opposite end of the character to define a second strap terminating in a buckle to receive the first strap, whereby when the wrist watch is strapped to the wrist, the character appears to be wrapped thereabout and gives the impression that the wearer's wrist is embraced by the character, said character including a pair of legs from which the second strap extends, said



legs being bridged by a hoop to hold the tail of the first strap which is received by the buckle.

4,897,827

VIDEO DISC PLAYER WITH RAPID TRACK ACCESS MEANS

Franz H. Raetzer, Harriman, and John J. Stitt, Knoxville, both of Tenn., assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 5,381, Dec. 12, 1987, abandoned, which is a continuation of Ser. No. 595,082, Mar. 30, 1984, abandoned. This application Jan. 3, 1988, Ser. No. 205,020
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] G11B *27/10, 21/10*
U.S. Cl. 369—32 **3 Claims**

1. An optical video disc playback apparatus in which video signals which have been recorded in successive tracks on the surface of an optical video disc are retrieved by a playback beam which follows the successive tracks, such apparatus being adapted to rapidly relocate the playback beam from any initial track location to any other track location on the disc recording surface within a predetermined distance from the initial track location without following the intervening tracks there-between, such relocation being effected during a relocation interval in response to externally supplied instructions to such apparatus specifying such other track location, such apparatus comprising:

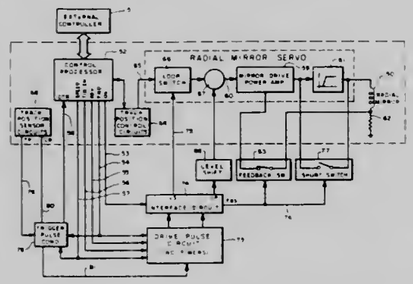
means for scanning the playback beam across the disc recording surface, such scanning means comprising a pivotally mounted mirror which controls the position of the playback beam on said disc, a servo actuator for controlling the pivoting of said mirror, and a feedback circuit for controlling said servo actuator to pivot said mirror so as to cause the playback beam to follow the tracks on said disc;

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track position sensing means for producing track position sensing signals indicating passage of the playback beam across the gtracks on said disc;

a control processor responsive to said track position sensing signals and to said externally supplied instructions to produce control signals signifying the speed and direction of pivoting of said mirror in order to relocate said playback beam from said initial track to said specified track;

and circuit means responsive to the control signals from said control processor to supply drive pulses to said servo actuator which cause it to pivot said mirror so that said playback beam is relocated in continuous movement from said initial track to said specified track without following the intervening tracks and at a rate dependent on the distance to said specified track;



said drive pulses comprising an initial coarse pulse during an initial portion of said relocation interval for accelerating the pivotting of said mirror during such initial portion of the relocation interval, speed correction pulses during an intermediate portion of the relocation interval for accurately maintaining the pivotting of said mirror at a uniform speed during such intermediate portion of the relocation interval, and a further coarse pulse during a final portion of the relocation interval for decelerating the pivotting of said mirror during such final portion of the relocation interval;

said drive pulse circuit means further supplying switching signals to disable said feedback circuit during said relocation interval.

4,897,828

OPTICAL PICKUP DEVICE

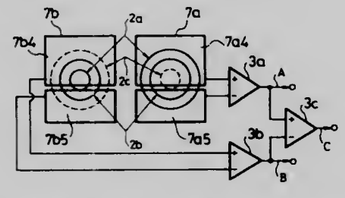
You Yoshitoshi, Ashiya; Hidehiro Kume, Tokyo; Yoshiyuki Matsumoto, Tokyo; Koji Mitsumori, Tokyo; Etsufumi Yamamoto, Kanagawa, and Hiroshi Oinoue, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,916

Claims priority, application Japan, Jul. 31, 1987, 62-191640

Int. Cl.[4] G11B 7/09

U.S. Cl. 369—46 **14 Claims**



1. In a focusing error detecting apparatus for detecting a focusing error signal by which an objective lens for always converging a laser beam emitted from a laser light source on a signal recording surface of an optical disc in accordance with the movement of said optical disc is moved in the direction parallel to an optical axis of said emitted laser beam incident on said optical disc, said focusing error detecting apparatus comprising:

(a) a first photo-detector located in the optical path ahead of a focus point of a reflected-back light from said optical disc through said objective lens and having divided first and second light receiving portions of different sizes which are asymmetrical with respect to the center of beam spot of said reflected-back light incident on said first and second light receiving portions;

(b) a second photo-detector located in the optical path behind the focus point of the reflected-back light from said optical disc through said objective lens and having divided first and second light receiving portions of different sizes which are asymmetrical with respect to the center of beam spot of said reflected-back light incident on said first and second light receiving portions of said second photo-detector; and

(c) calculating means for calculating a difference between detected outputs from said first and second photo-detectors to produce a focusing error signal.

4,897,829

CARDLIKE OPTICAL RECORDING MEDIUM

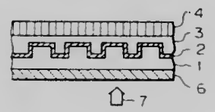
Keiko Ikoma; Noriko Kurihara, both of Yokohama; Keiji Hirabayashi, and Susumu Itoh, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 121,112

Claims priority, application Japan, Nov. 20, 1986, 61-275354

Int. Cl.[4] G11B 7/24

U.S. Cl. 369—288 **7 Claims**



1. In a cardlike optical recording medium comprising a transparent substrate having on one side, in sequence, a recording layer adapted to have information written thereupon and reproduced by a laser beam, and a protective layer subject to scratching or contamination, the improvement comprising providing on a second side of said transparent substrate an ultra-hard outer layer comprising a laser beam transmittable carbon matrix having at least one of an amorphous carbon phase to impart flexibility or a diamond phase to enhance hardness.

4,897,830

OPTICAL NETWORKS

Godfrey R. Hill, Ipswich; David W. Smith, Woodbridge, and Ian W. Stanley, Ipswich, all of England, assignors to British Telecommunications, public limited company, United Kingdom

PCT No. PCT/GB86/00017, § 371 Date Aug. 25, 1986, § 102(e) Date Aug. 25, 1986, PCT Pub. No. WO86/04205, PCT Pub. Date Jul. 17, 1986

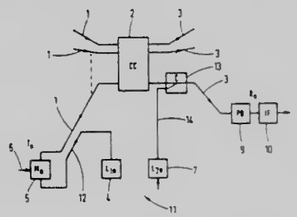
PCT Filed Jan. 10, 1986, Ser. No. 915,034

Claims priority, application United Kingdom, Jan. 10, 1985, 8500635

Int. Cl.[4] H04B 9/00

U.S. Cl. 370—4 **12 Claims**

1. An optical network comprising a plurality of distributed terminals including information transmitting and receiving terminals; transmitting and receiving terminal coupling means for optically coupling modulated carrier signals from transmitting terminals to receiving terminals; a plurality of optical sources grouped remotely from the distributed terminals; and means for optically coupling selected optical sources to the terminals to provide carrier signals to transmitting terminals for modulation and reference signals to receiving terminals to enable selection of a modulated carrier signal for reception, whereby local optical sources are not required in the transmitting terminals for supplying carrier signals and are not required in the receiving terminals to enable selection of a modulated carrier signal, wherein one of the sources is coupled to feed a



common carrier signal to each of a plurality of the transmitting terminals, the network further comprising a plurality of auxiliary receiving terminals grouped together, each auxiliary receiving terminal being associated with a respective transmitting terminal for receiving a modulated common carrier signal from that respective transmitting terminal and for controlling modulating means to modulate another carrier signal associated with that transmitting terminal in response to the received modulated common carrier, the modulated associated carrier signal being fed to the terminal coupling means.

4,897,831

DATA TRANSMISSION/RECEPTION APPARATUS

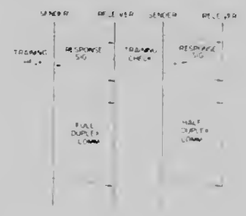
Tsuneo Negi, Yokohama; Sadasuke Kurahayashi, Niiza; Teruyuki Nishii, Yokohama; Yasuhide Ueno, Fuchu; Masahiro Sakamoto, Tokyo, and Takeshi Ono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,266

Claims priority, application Japan, Mar. 2, 1987, 62-045340; Mar. 2, 1987, 62-045341; Mar. 2, 1987, 62-045342

Int. Cl.[4] H04L 5/16

U.S. Cl. 370—29 **13 Claims**



1. A data transmission apparatus comprising:

means for transmitting data according to full duplex communication;

means for transmitting data according to half duplex communication;

means for transmitting a test signal prior to the data transmission;

means for detecting a signal from a destination responsive to the test signal during transmission of the test signal; and

means for selecting the full duplex communication or the half duplex communication on the basis of a detection result by said detection means.

4,897,832

DIGITAL SPEECH INTERPOLATION SYSTEM AND SPEECH DETECTOR

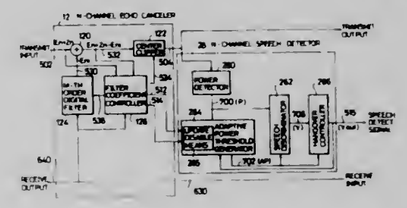
Takao Suzaki; Yuichi Shiraki; Osamu Noguchi, and Yasuo Shoji, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 297,668

Claims priority, application Japan, Jan. 18, 1988, 63-6771; Jan. 18, 1988, 63-6772

Int. Cl.[4] H04J 3/17; H04L 5/14

U.S. Cl. 370—81 **16 Claims**



1. A digital speech interpolation system, comprising:

a receiving apparatus for receiving a compressed input signal and adding to it a noise signal, thereby generating a receive input signal;

an N-channel echo canceler for receiving a multiplexed transmit input signal and said receive input signal, detecting double-talk to produce a double-talk detect signal, detecting echo of said receive input signal in said transmit input signal, and removing said echo from said transmit input signal by a process that includes center clipping to produce a multiplexed transmit output signal, said echo canceler also generating a center clipping detect signal when the center clipping is performed; and

a transmitting apparatus for receiving said transmit output signal, said center clipping detect signal, and said double-talk detect signal from said echo canceler, detecting the presence of speech in said transmit output signal by using an adaptive power threshold that is updated according to a background noise level in said transmit output signal, the updating being enabled or disabled according to said center clipping detect signal and said double-talk detect signal, and generating a compressed output signal consisting essentially of the speech portions of said transmit output signal.

4,897,833

HIERARCHICAL ARBITRATION SYSTEM

Allan R. Kent, Arlington; Ronald E. Goodstein, Newton, both of Mass., and Barry A. Henry, Penacook, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 16, 1987, Ser. No. 110,009

Int. Cl.[4] H04J 3/02

U.S. Cl. 370—85.2 **13 Claims**

1. A computer interconnect coupler for transmitting messages among multiple data processing devices each of which has a communication port, said coupler comprising

a plurality of electronic switching means each of which is connected to a communication port of one of said data processing devices to provide a communication channel for receiving messages from and sending messages to that device, said switching means having separate receiving means and transmitting means for each of said channels,

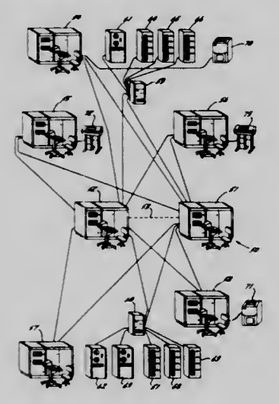
a plurality of connections associated with each of said switching means for transmitting messages among said switching means,

central switch logic means connected to all of said switching means for assigning connections to transmit the messages arriving at one of said switching means from a source

VOL 1110 ISS 5 JA 30 1990 UMI

device to a switching means connected to a destination device designated by the message, and

hierarchical rotating arbitration means for arbitrating the assignment of connections for messages transmitted simultaneously by different data processing devices, said arbitration means including



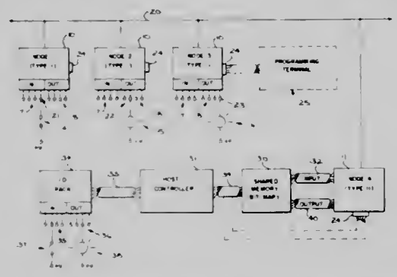
ring channel-group arbitration means for selecting different preselected groups of channels to which connections are to be assigned for the transmission of messages, and ring channel arbitration means for selecting different channels in a selected group to which connections are to be assigned for the transmission of messages.

4,897,834

BIT ORIENTED COMMUNICATIONS NETWORK

James R. Peterson, Brown Deer, Wis., and Richard C. Harwell, Broken Arrow, Okla., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Aug. 18, 1987, Ser. No. 87,034
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85.1 **38 Claims**



1. A bit oriented communications network for transferring information between at least one input resource and at least one output resource, comprising:

a plurality of nodes interconnected by a broadcast communications medium, said plurality of nodes including at least one sending node and one receiving node;

input means in at least one sending node connected to at least one of the input resources for accepting one or more input data bits from the input resource and producing a corresponding data field which includes the input data bits, with each input data bit being placed in contiguous bit positions in the data field to form a sequence of input data bits in a predetermined order;

transmission means in each sending node for broadcasting a message to all of the nodes on the communications medium, the message including the data field from the input means and a source address field which identifies the sending node;

reception means in at least one receiving node for receiving the message broadcast by the sending node; and

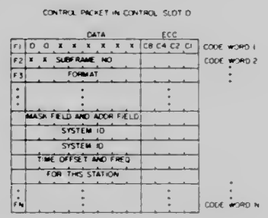
output means connected to at least one output resource bit in one of the output resources and connected to the reception means, the output means including a map address for each output resource bit which associates each respective output resource bit with one of said contiguous bit positions from one sending node, wherein the output means examines the source address field in the received message, and if the source node identified by the source address field is associated with one of the output resource bits, then the output means extracts the input data bit at the associated bit position from the data field in the received message and sets the state of said at least one output resource bit to correspond to the value of the associated input data bit.

4,897,835

HIGH CAPACITY PROTOCOL WITH MULTISTATION CAPABILITY

Garold B. Gaskill, Tualatin; Daniel J. Park, Beaverton; Norbert E. Dey, Newberg; William H. Peek, Beaverton, all of Oreg., and Lawrence H. Ragan, Richardson, Tex., assignors to AT&E Corporation, San Francisco, Calif.

Continuation of Ser. No. 121,139, Nov. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 802,844, Nov. 27, 1985, Pat. No. 4,713,808. This application May 12, 1989, Ser. No. 352,635
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—94.1 **14 Claims**



1. In a time division multiplexed communication method of transmitting periodic frames of a first duration subdivided into subframes having time slots of a second duration, the subframes and time slots having unique identification numbers, and assigning receivers an address that includes a unique number as one portion of the address and a subframe and time slot identification number as another portion, and encoding data into digital data packets bearing a time slot identification number, each packet of substantially equal duration to a time slot, a method of transmitting multiple messages for one or more receivers in a single time slot, comprising:

encoding format information within the data packet which alerts receivers assigned the time slot number as a portion of their address that more than one message is contained in the packet;

placing the messages in predetermined positions within the packet to be recognized by the alerted receivers as multiple messages; and

encoding within each message an address that corresponds to the unique numbered portion of the receiver address so that only the intended receiver reads the message.

4,897,836

PROGRAMMABLE CONNECTION PATH CIRCUIT

Mark E. Fitzpatrick; Yat-Sam Chan; Richard F. Pang, all of San Jose, and Gary R. Gouldsberry, Cupertino, all of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Filed Oct. 20, 1987, Ser. No. 111,389
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—112 **8 Claims**



1. A circuit having first and second input leads and an output lead, comprising:

first switch means having an input lead connected to the first input lead of the circuit, and an output lead connected to the output lead of the circuit;

second switch means having an input lead connected to the second input lead of the circuit and an output lead connected to the output lead of the circuit;

a control line connected to the first switch means for determining whether an input signal applied to the first switch means determines an output signal from the first switch means;

a disconnectable link in the output lead of the first switch means; and

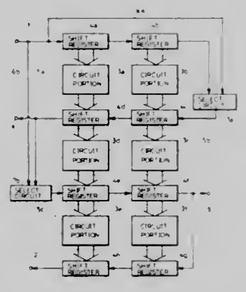
a disconnectable link in the output lead of the second switch means.

4,897,837

TEST CIRCUIT HAVING SELECTIVE BY PASS ARRANGEMENT FOR TEST DATA

Kazuya Ishihara, and Shin-ichi Nakagawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 182,867
Claims priority, application Japan, Apr. 14, 1987, 62-92734
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—22.3 **4 Claims**



1. A test circuit formed on a substrate for testing each of a plurality of circuit portions constituting a device fabricated on said substrate, comprising:

an input terminal for inputting a test pattern signal;

an output terminal for outputting a signal of the result of operation of said circuit portion; and

a plurality of shift registers connected in series between said input terminal and said output terminal for successively shifting and holding said test pattern signal; wherein

each of said shift registers applies corresponding test pattern signal to each of said circuit portions by shifting said inputted test pattern signal and takes in and shifts the result of operation from each circuit portion; said test circuit further comprising
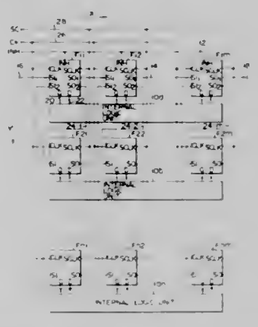
bypass circuit means for applying said test pattern signal from said input terminal directly to a selected shift register of said plurality of shift registers.

4,897,838

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE SUBJECTED TO SCAN-TESTING OF INTERNAL LOGIC FUNCTION

Akimitsu Tateishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1988, Ser. No. 175,192
Claims priority, application Japan, Mar. 31, 1987, 82-78551
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—22.3 **17 Claims**



1. A semiconductor integrated circuit device to be subjected to an internal logic diagnostic test, comprising:

(a) an input terminal for receiving input data including test data;

(b) an output terminal for generating data including operation result data of said device;

(c) an internal logic circuit device divided into internal logic units; and

(d) a scanning circuit means for supplying the test data to said internal logic units, and for scanning said logic units, said scanning circuit means comprising,

a first plurality of data-shifting circuits, provided between said input and said output terminals and connected in series with each other along a first scanning direction of said device, for sequentially shifting/transferring the data supplied from said input terminal between said first data-shifting circuits, and

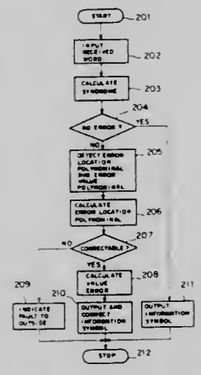
a second plurality of data-shifting circuits, branched off from said first data-shifting circuits and connected in series with each other along a second scanning direction of said device, for sequentially shifting/transferring data stored in at least one of said first data-shifting circuits between said second data-shifting circuits which are connected to at least one of said first data-shifting circuits.

4,897,839

CODING AND DECODING METHOD

Atsuhiro Yamagishi; Hideo Yoshida; Tohru Inoue; Toshihisa Nishijima, all of Kanagawa, and Yoshiaki Oda, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,550
Claims priority, application Japan, Mar. 25, 1987, 62-69037
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.1 **3 Claims**



1. A coding and decoding method, comprising the steps of:
calculating syndromes for a string of information symbols utilizing a nonzero constant in the syndrome calculation;
computing check symbols for each of the calculated syndromes;
transmitting a code word containing said information symbols and said check symbols;
receiving a transmitted code word;
calculating syndromes for said received code word utilizing a nonzero constant in the syndrome calculation;
determining the existence of an uncorrectable error in said received word when said nonzero constant is appended to a calculated syndrome at a predetermined position;
determining the existence of a correctable error in said received word when said nonzero constant is appended to a calculated syndrome at other than said predetermined position; and
determining the absence of error in said received word when the calculated syndromes are all zero.

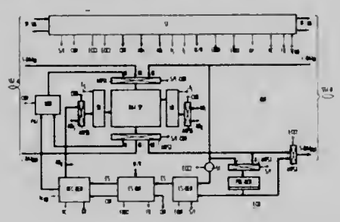
4,897,840

METHOD AND APPARATUS FOR CONTROLLING THE ERROR CORRECTION WITHIN A DATA TRANSMISSION CONTROLLER GIVEN DATA READ FROM MOVING PERIPHERAL STORAGES, PARTICULARLY DISK STORAGES, OF A DATA PROCESSING SYSTEM

Eckardt Weiss, Munich, and Peter Wentzel, Augsburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,391
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707680
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—40.1 **11 Claims**

1. A method for controlling error correction within a data transmission controller, said transmission controller controlling the transmission of data from a disk storage device to a data processing system, said data being recorded in said disk storage device in a plurality of blocks with check characters, said method comprising the steps of:
providing a buffer memory for intermediately storing data read from said disk storage device, in which recognized errors are corrected before the data are forwarded to said data processing system;
said buffer memory having a storage disk capacity corresponding to the maximum quantity of data that can be read from said disk storage device by a single read instruction;
successively transferring the data blocks read during a single read instruction into said buffer, without interruption, despite data errors that may be recognized;
calculating check characters in response to the data written into said buffer, while said data is being written;



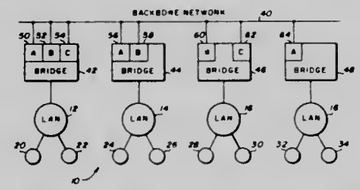
comparing the calculated check characters with check characters transmitted from said disk storage device, and in response to a noncomparison of such check characters, forming an error syndrome corresponding to the recognized error; and
intermediately storing said calculated error syndrome at a storage location allocated to the data containing the recognized error; and
correcting the data within said buffer memory in response to said calculated error syndrome before said data is read out from said buffer memory to said data processing system.

4,897,841

SYSTEM AND METHOD FOR BRIDGING LOCAL AREA NETWORKS USING CONCURRENT BROADBAND CHANNELS

Joseph M. Gang, Jr., Saratoga, Calif., assignor to Hughes Lan Systems, Inc., Mountain View, Calif.

Filed Jan. 11, 1989, Ser. No. 295,896
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85.13 **19 Claims**



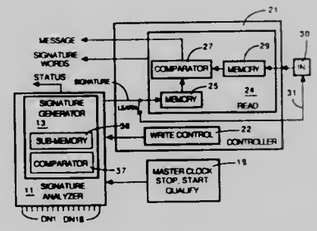
1. A system for bridging local area networks comprising:
a plurality of local area networks, each comprising at least one station;
a backbone network divided into a plurality of broadband channels; and
a plurality of bridges, each bridge connected between one of the local area networks and the backbone network, each bridge comprising, a network interface means connected to one of the local area networks for transmitting and receiving messages to and from the local area network to which the network interface means is connected, a plurality of backbone network interface means connected to the backbone network, each of said plurality of backbone network interface means for transmitting and receiving messages to and from said backbone network over an assigned channel, said assigned channel being one of said plurality of broadband channels, a memory means connected to the interface means and the plurality of backbone network interface means, for storing a bridge identification address, a table of addresses, and for temporarily storing said messages, and a logic means connected to the network interface means, the plurality of backbone network interface means, and the memory means, for transferring messages between the network interface means and one of the backbone network interface means and for selecting one of said plurality of broadband channels over which to send said messages.

4,897,842

INTEGRATED CIRCUIT SIGNATURE ANALYZER FOR TESTING DIGITAL CIRCUITRY

William S. Herz, Sunnyvale, and Robert A. Williams, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Nov. 5, 1987, Ser. No. 117,772
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—22.4 **13 Claims**



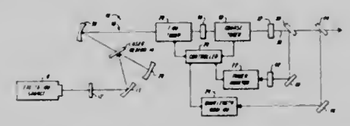
1. A system for testing digital electronic circuits comprising:
generator means integrated with circuits to be tested for generating words that are unique to identical streams of binary signals;
connecting means that connect the generator means to receive binary signals from a plurality of nodes in the digital circuit to be tested such that the generator means is simultaneously provided with bit streams from more that two nodes of the plurality of nodes; and
comparator and storage means for receiving, storing and comparing consecutively-generated signature words.

4,897,843

FREQUENCY-AGILE LASER SYSTEMS

Peter B. Scott, Winchester, Mass., assignor to Sparta, Inc., Lexington, Mass.

Filed Apr. 21, 1989, Ser. No. 341,699
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—20 **13 Claims**



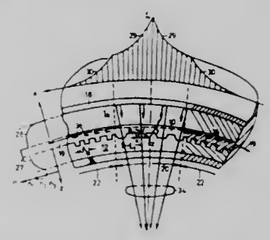
1. A tunable laser system comprising:
a laser for the generation of laser radiation over a broadband wavelength spectrum in response to excitation by a source of excitation energy;
a first intracavity electric optic tuning element providing coarse wavelength selection;
at least one further intracavity electro-optic tuning element providing fine linewidth control over wavelength selection by an electro-optic effect; and
control means for measuring the laser radiation and providing control signals to said tuning elements to adjust and optimize performance.

4,897,844

INFORMATION TRANSMISSION BY MODE MODULATION AND LASER OSCILLATORS THEREOF

Robert M. Schimpe, Georg-Kerschensteiner strasse 56, D-8012 Ottobrunn/Riemerling, Fed. Rep. of Germany

Continuation of Ser. No. 32,298, Mar. 30, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,270
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611182; European Pat. Off., Dec. 27, 1986, 86118086.7
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—26 **30 Claims**



1. An apparatus for varying a laser beam including first means comprising a semiconductor laser for emitting said laser beam essentially perpendicular to the substrate on which the active region of said semiconductor laser is deposited;
the improvement wherein proximate to said semiconductor laser is a second means for varying the spatial mode contact of said laser beam, which includes a material, through which at least a portion of the laser radiation generated by said semiconductor laser propagates, with a profile of the complex optical dielectric constant, which is variable by a quantity selected from the group comprising electrical charge and optical radiation; thereby varying said spatial mode content of said laser beam.

4,897,845

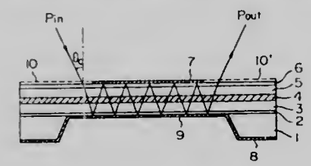
SEMICONDUCTOR OPTICAL AMPLIFYING ELEMENT

Katsuyuki Utaka, Musashino; Yuichi Matsushima, Tanashi; Kazuo Sakai, and Shigeyuki Akiba, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1989, Ser. No. 350,088
Claims priority, application Japan, May 17, 1988, 63-118298
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—45 **5 Claims**

1. A semiconductor optical amplifying element which has a semiconductor multilayer structure including at least a first semiconductor layer for providing an optical gain in response to the injection of carriers thereinto, and a p-side electrode and an n-side electrode for the carrier injection, characterised in:
that a first reflecting surface and a second reflecting surface are disposed thickwisely of the semiconductor multilayer structure and opposite to each other thereacross; and
that the element is designed so that light incident thereon from the thickwise direction of the semiconductor multilayer structure is amplified by propagating through the

element perpendicularly to the thickwise direction of the semiconductor multilayer structure while being multiple-



reflected between the first reflecting surface and the second reflecting surface.

4,897,846

SURFACE EMISSION TYPE SEMICONDUCTOR LIGHT-EMITTING DEVICE

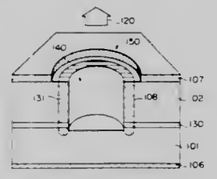
Tomoaki Yoshida, Sendai; Fumio Inaba, 1-13-1, Yagiyamaminami, Sendai-shi, Miyagi-ken; Hiromasa Ito, 390-82, Azasoba, Aramaki, Sendai-shi, Miyagi-ken; Tetsuro Saito, Sendai; Shiro Sato, Ogawara, and Junichi Azumi, Sendai, all of Japan, assignors to Fumio Inaba; Hiromasa Ito, both of Sendai and Ricoh Company, Tokyo, all of, Japan

Filed Mar. 3, 1988, Ser. No. 163,770

Claims priority, application Japan, Mar. 3, 1987, 62-46683; Jun. 25, 1987, 62-156615; Oct. 22, 1987, 62-265220; Jan. 13, 1988, 63-3862

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **46 Claims**



1. A semiconductor light-emitting device comprising:
a substrate having a main surface;
a current blocking layer formed on said main surface;
a semiconductor layer formed on said current blocking layer, said semiconductor layer being formed with a recess having a side wall extending substantially perpendicularly to said main surface and a bottom extending into said substrate, said semiconductor layer including a light-emitting activation region formed by a p-n junction around said recess and capable of emitting light in a direction substantially perpendicular to said main surface, and means for injecting current into said activation region.

4,897,847

MIRROR TRANSLATION APPARATUS FOR ALTERING FOCAL POINT POSITION IN A LASER

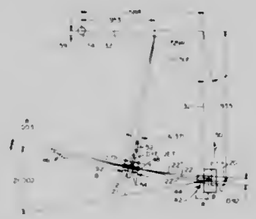
Stephen Wolgast, Fremont, Calif., assignor to Spectra Physics, Inc., San Jose, Calif.

Filed Sep. 30, 1987, Ser. No. 103,009

Int. Cl.[4] H01S *3/20*

U.S. Cl. 372—54 **8 Claims**

1. A method for tuning a dye laser including an excitation beam, a dye jet and a mirror having a curved surface and a focal point, comprising the steps of:
locating a pivot point at a relatively large distance from the mirror;
positioning the mirror in a location so as to intersect the excitation beam at an angle at a variable intersection point on the curved surface and to position the focal point in a region within the dye jet;
mounting the mirror at said location by means of a mirror support arm rotatably supported at said pivot point; and
pivoting the mirror about said pivot point by movement of said arm for varying said intersection point so as to move



the focal point, with variations in said intersection point being compensated by changes in said angle of intersection of the excitation beam with the curved surface such that the focal point is translated along a substantially straight line within the dye jet when the mirror is pivoted about said pivot point.

4,897,848

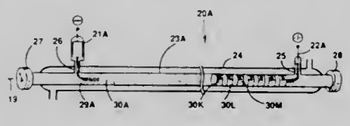
DISCHARGE DRIVEN PRECIOUS METAL CATALYST WITH APPLICATION TO CARBON MONOXIDE LASERS

John Macken, 3300 Coffey La., Santa Rosa, Calif. 95401

Continuation-in-part of Ser. No. 150,023, Jan. 29, 1988, abandoned. This application Aug. 23, 1988, Ser. No. 235,363

Int. Cl.[4] H01S *3/22*

U.S. Cl. 372—59 **6 Claims**



1. A carbon monoxide laser apparatus including a closed envelope made of a material capable of maintaning a partial vacuum, said envelope containing a cavity filled with a laser gas mixture which includes carbon monoxide; said laser also having electrically powered electrode means for establising an electric field and a discharge through said laser gas mixture in said cavity, and optical means for directing a laser beam through said discharge and means for extracting at least a portion of said laser beam from said cavity producing an output laser beam, the improved feature comprising:
said cavity having at least one wall surface facing said discharge;
a substantial portion of said wall surface of said cavity consisting of a solid substrate material coated with a precious metal chosen from the group consisting of gold, silver, platinum, palladium, rhodium and iridium;
wherein said precious metal provides a catalytic action in said gas mixture which improves the power of said output laser beam.

4,897,849

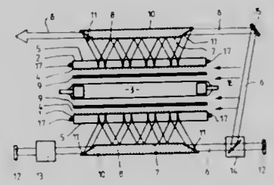
COMPACT SLAB LASER OSCILLATOR-AMPLIFIER SYSTEM

John L. Hughes, Melbourne, Australia, assignor to Austral Asian Lasers Ltd., Melbourne, Australia

Filed Aug. 12, 1988, Ser. No. 231,511

Int. Cl.[4] H01S *3/06*

U.S. Cl. 372—66 **8 Claims**



1. A powerful, compact, slab laser oscillator-amplifier system comprising:
(a) a slab laser oscillator operating in an open cavity configuration, a slab laser medium having its rear surface coated with a laser beam reflecting mirror and its front surface anti-reflection coated to minimize laser beam reflection losses, said slab laser medium being set parallel to a bevelled laser mirror substrate whose surface facing said slab is coated with a laser beam reflecting mirror and whose rear surface is coated to reflect optical radiation which is used to excite said slab, but not absorbed on its first passage through said slab, back again into its slab for further absorption, the optical cavity of said laser oscillator being defined by two cavity end reflectors, the mirrored bevelled edges of said substrate, the rear mirror of said slab and the mirrored surface of said substrate, a beam path progressing through said slab via a series of reflections off the respective mirrored surfaces of the said slab and optical substrate;
(b) a slab laser amplifier also opefating in the open cavity configuration as described for a section of said laser oscillator, a section of said laser amplifier being optically coupled to said laser oscillator section by way of an oscillator output beam being reflected off of at least one laser beam reflecting mirror so that the oscillator output beam is capable of being amplified in said amplifier section from which it is emitted after being reflected off an output bevelled, mirrored edge of the amplifier's optical substrate, said end reflectors of the optical cavity being set relative to each other so that when said slab laser is inserted between them, said laser oscillator is operable and its output laser beam is coupled into said amplifier section; and
(c) a common excitation source for the optical excitation of both the oscillator and amplifier slab laser media of the system, said optical excitation source being positioned between and parallel to the oscillator and amplifier sections so that its high power optical light output beam passes through an optical filter for each of the oscillator and amplifier sections into both the oscillator and amplifier sections which minimizes unwanted light and heat allowing only a portion of excitation light source output which matches light absorption bands of the slab laser media to enter said slab via the laser beam reflecting mirrors attached to their rear surfaces, the optical output of the excitation light being in a direction perpendicular to the lengths of the laser media slab in both the oscillator section and the amplifier section, both said excitation source and the rear surface of said slabs being water cooled.

4,897,850

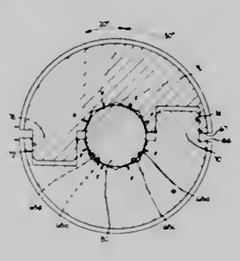
ASSEMBLY FOR ARRANGING OPTICAL COMPONENTS OF A LASER

Robert A. Crosby, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 1, 1989, Ser. No. 305,385

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—72 **20 Claims**



1. An assembly for arranging optical components of a laser, comprising:
(a) a plurality of support structures including at least a first and a second support structure each having an intermediate surface with indentations defining inner surfaces for supporting optical components to include at least a leans and a lasant material, said said inner surfaces of said intermediate surface exert radially compressive forces in an inward direction on said optical components to include said lens and said lasant material, said compressive forces being substantially uniform throughout said inner surfaces such that said optical components to include said lens and said lasant material are securely optical alignment with each other, said first support structure intermediate surface being substantially not in contact with said second support structure intermediate surface; and
(b) interlocking means positioned on each of said intermediate surfaces for interlocking said first and second support structures, said first support structure interlocking means being attached to said second support structure interlocking means.

4,897,851

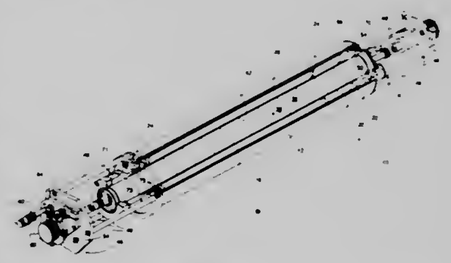
WATER COOLED LASER HOUSING AND ASSEMBLY

David L. Vecht, Mountain View, and Shinan-Chen S. Sheng, Sunnyvale, both of Calif., assignors to Spectra-Physics, San Jose, Calif.

Filed Oct. 28, 1988, Ser. No. 264,263

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—107 **25 Claims**

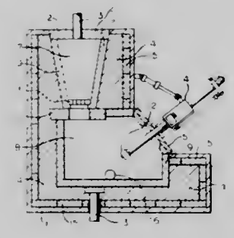


1. A laser housing comprising:
a resonator tube;
a magnet concentrically mounted in a spaced relationship

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within said resonator tube and defining with said resonator tube an outer coolant flow channel;
a plasma tube concentrically mounted in a spaced relationship within said magnet and defining with said magnet an inner coolant flow channel; and
at least one mirror plate assembly disposed externally to said resonator tube, supported by external mounting means.

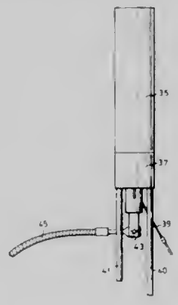
4,897,852
SILICON SMELTING PROCESS
Vishu D. Dosaj; James B. May, and John D. Oleson, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Aug. 31, 1988, Ser. No. 239,144
Int. Cl.[4] H05B *7/00*
U.S. Cl. 373—22 **5 Claims**

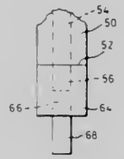


1. A silicon smelting furance comprising
(A) a furnace body, said furnace body being a substantially closed vessel, defining a reaction zone for containing solid reactarts and molten silicon;
(B) a shaft suitable for containing solid particulates of carbon and suitable for passing gases from the furnace body through the shaft, the shaft being attached to the top of the furnace body at a first opening in the furnace body;
(C) an energy source, said energy source being fit into the furnace body through a second opening in the furnace body;
(D) means for supporting solid particulates of carbon, said means for supporting solid particulates being positioned at the bottom of the shaft, said means for supporting solid particulates being capable of allowing gas to pass from the furnace body up through the shaft; and
(E) an anode for the energy source, said anode being positioned within the furnace body; and
(F) means for collecting molten silicon, said means being implemented at a third opening in the furnace body, said third opening being in the lower portion of the furnace body.

4,897,853
REFRACTORY CERAMIC ELECTRODE
Ronald D. Argent, Allison Park, Pa., assignor to King, Taudevin & Gregson (Holdings)Limited, Sheffield, United Kingdom
Filed Jun. 1, 1988, Ser. No. 200,710
Int. Cl.[4] C03B *5/027*
U.S. Cl. 373—36 **9 Claims**

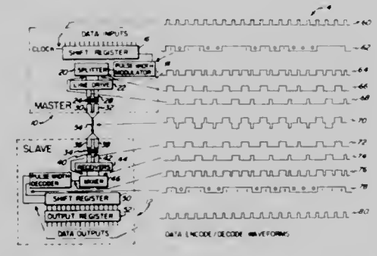
1. A refractory ceramic electrode for use in tbe electrical heating of a molten mass in a furnace having a refractory lining, said electrode comprising:
a tubular ceramic electrode body having a terminal region that in use is immersed in the molten mass and a basal region that in use fits sealingly into the refractory lining;
a core that is a close fit into the electrode body and projects from one end thereof, at least the outer surface of the core being of a metal that is non-reactive with the material of the refractory ceramic electrode at the temperature of the molten mass and which is itself molten at said temperature so that in use the metal in the terminal region of the electrode melts and establishes an intimate contact between the core and the electrode body;
a connector for use as a replacement section of the electrode comprising a socket in which the core projecting from the electrode body fits to establish a current path to the elec-





trode and a sleeve surrounding the socket and defining an abutment for the electrode body; and
jacking means for operative connection between the connector and a support so as to advance the electrode into the furnace.

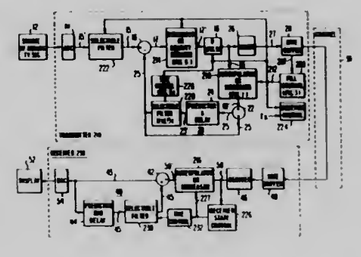
4,897,854
ALTERNATE PULSE INVERSION ENCODING SCHEME FOR SERIAL DATA TRANSMISSION
John Harris, and Nigel Bailey, both of El Paso, Tex., assignors to General Instrument Corporation, New York, N.Y.
Filed Feb. 24, 1989, Ser. No. 315,557
Int. Cl.[4] H04L *25/34*
U.S. Cl. 375—17 **8 Claims**



5. A method for serially transmitting and receiving data along a data path comprising the steps of:
pulse width modulating a stream of Ser. NRZ data bits;
splitting the pulse width modulated data into separate first and second data streams containing alternate pulses;
inverting said first data stream;

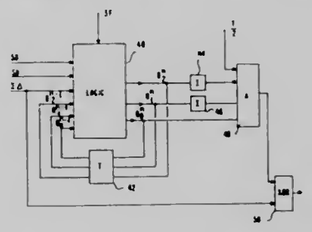
combining the inverted first data stream with the second data stream to produce a pulse width modulated data signal having alternating pulses of opposite polarity;
transmitting said pulse width modulated data signal over a communications network to a data receiver;
inverting the pulses of one polarity at said receiver; and
combining the inverted pulses with the other pulses from said pulse width modulated data signal to reconstruct the pulse width modulated stream of data bits.

4,897,855
DPCM SYSTEM WITH ADAPTIVE QUANTIZER HAVING UNCHANGING BIN NUMBER ENSEMBLE
Alfonse A. Acampora, Staten Island, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 1, 1987, Ser. No. 127,335
Int. Cl.[4] H04B *1/10, 14/04*
U.S. Cl. 375—27 **17 Claims**



1. A transmitter for processing information signals to obtain digital codewords for transmission through a channel to a receiver, said transmitter comprising:
subtracting means for subtracting predicted signals from said information signals for generating difference signals having a plurality of values;
quantizing means responsive to said difference signal values applied thereto for, in all operating modes out of a plurality of operating modes organizing the values of said difference signals into a plurality of sets of ranges of values, each value of said difference signals corresponding to only one of said ranges of values of a given set, each difference signal causing said quantizing means to produce a given output signal value corresponding to the range of that difference signal, and for, in a first operating mode of said plurality of operating modes representing a first quantizing characteristic, producing a first ensemble of given output signal values for classifying all possible values of difference signals in a first set of ranges, each given output signal value representing a different range in a set, and for, in all of said plurality of operating modes other than said first operating mode representing at least a second further quantizing characteristic, producing for each further quantizing characteristic, a respective ensemble of output signal values which are the same as at least a portion of said first ensemble given output signal values, each said respective ensemble being ordinarily numbered in correspondence with the further quantizing characteristic with which it is associated, each said respective ensemble containing no output signal values different than the first ensemble output signal values in response to all possible values of said difference signals, insofar as each further quantizing characteristic being concerned for classifying difference signals in sets of ranges other than said first set of ranges to thereby produce quantized signals each value of which is represented by one of said given output signal values;
adding means coupled to said quantizing means for adding said predicted signals to said quantized signals for producing sum signals;
prediction means coupled to said adding means, and to said subtracting means for processing said sum signals for producing a said predicted signals, said processing including signal delay;
coding means responsive only to values of said quantized signals included within said first and at least further ensembles, for sequentially generating said digital codewords, said coding means being of a type generating digital codewords having a bit rate that is subject to variation; and
means for selecting the mode of operation of said quantizing means among said plurality of operating modes, whereby the quantizing can be changed thereby to adjust the information rate in said sequentially generated digital codewords to be within an acceptable range.

4,897,856
OFFSET CORRECTION CIRCUIT FOR A SIGMA-DELTA CODING DEVICE
Maurice Cakier, Cagnes Sur Mer; Frederic Marciano, Biot, and Patrick Michel, La Gaude, all of France, assignors to International Business Machines, Armonk, N.Y.
Filed Oct. 7, 1988, Ser. No. 254,632
Claims priority, application European Pat. Off., Oct. 19, 1987, 87480015.4
Int. Cl.[4] H04B *14/04*
U.S. Cl. 375—28 **10 Claims**



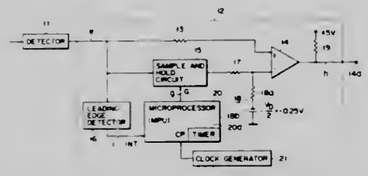
1. An offset correction circuit in a digital-to-analog coder (10) comprising a delta coder (18) providing a serial bit string at a rate provided by a clock at a frequency F in response to digital words supplied at a rate provided by a clock at a frequency f which is low with respect to said frequency F, and an analog integrator (22) providing an analog output signal (24) which is an analog representation of said digital words; said circuit being characterized in that it comprises:
time modifying means which lengthens or shortens by a predefined duration the time of one bit provided by said delta coder in response to an adjust signal which respectively slows down or speeds up said clock at a frequency f; and
correction means (FIG. 7) which produces a corrected pulse in place of the sigma-delta data provided by said delta coder in response to the detection that one bit has been lengthened or shortened thereby introducing an offset having respectively the same polarity as or the inverse polarity of the polarity of the lengthened or shortened bit, with said corrected pulse lasting half the predefined pulse duration and being generated as soon as the sigma-delta data polarity equals the polarity of said offset, and being of the same polarity as said detected bit when this one bit has been shortened and the inverse polarity of said detected bit when this one bit has been lengthened.

4,897,857

FSK DEMODULATING DEVICE

Yoshio Wakatsuki; Hajime Takeuchi, and Gichiro Shimizu, all of Tokyo, Japan, assignors to Max Design Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,734
Claims priority, application Japan, Sep. 9, 1987, 62-225525
Int. Cl.[4] H04L *27/14*
U.S. Cl. 375—88 **7 Claims**



1. A frequency shift keying (FSK) demodulating device in a transmission system for formatting digital data into a transmission frame including at least a preamble to transmit the data as a frequency shift keying signal, comprising:

detecting means for detecting the input frequency shift keying signal (FSK signal) to convert the detected signal into a voltage signal corresponding to each of carrier frequency values; and

discriminating means coupled to said detecting means for discriminating the voltage signal output from said detecting means to an original digital data signal representing said transmission frame, including:

sampling and holding means coupled to said detecting means for holding a signal value of the voltage signal in response to a hold command signal;

timer means coupled to said detecting means for counting a time lapse from a given change to a next change in a voltage increase direction;

sample and hold controlling means coupled to said detecting means and said sampling and holding means, for supplying the hold command signal to said sampling and holding means when the time lapse counted by said timer means reaches a predetermined time interval determined in correspondence with a time lapse of significant level of the preamble in said transmission frame;

reference voltage generating means coupled to said sampling and holding means, for generating a reference voltage which is a fraction of a predetermined value of an amplitude value of the voltage signal, and generating a difference voltage between the reference voltage and a voltage held by and output from said sampling and holding means as a comparison reference voltage signal; and

comparing means coupled to said detecting means and said reference voltage generating means, for comparing the input voltage from said detecting means with the comparison reference voltage value output from said reference voltage generating means to detect the level of the voltage signal input from said detecting means.

4,897,858

NUCLEAR FUEL PELLET COLLATING SYSTEM AND METHOD

Stuart L. Rieben; Ralph W. Kugler, both of Pittsburgh, Pa.; Joseph J. Scherpenberg, Columbia, and Dale T. Wiersema, Florence, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 172,827, Mar. 25, 1988, Pat. No. 4,842,808. This application Feb. 15, 1989, Ser. No. 310,558
Int. Cl.[4] G21C *19/00, 21/00*
U.S. Cl. 376—261 **9 Claims**

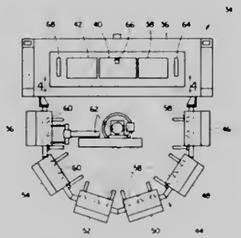
9. A method of collating nuclear fuel pellets, comprising the steps of:

(a) supporting a plurality of pellet supply trays and a plurality of pellet storage trays at a tray positioning station, each of the supply trays containing in at least one row thereon a plurality of nuclear fuel pellets of an enrichment different from the enrichments of pellets on at least some other of the supply trays, each of the storage tray being adapted to receive in at least one row thereon a plurality of nuclear fuel pellets of an enrichment different from the enrichments of pellets on at least some other of the storage trays;

(b) transferring one pellet supply tray from the tray positioning station and disposing the same at an input station of a pellet collating line;

(c) transferring one pellet storage tray from the tray positioning station and disposing the same at an output station of the pellet collating line;

(d) sweeping pellets in the at least one row thereof from the one pellet supply tray disposed at the input station onto a work station of the pellet collating line located between the input and output stations thereof;



(e) measuring a desired length of pellets in the at least one row thereof on the work station and separating the measured desired length of pellets from the remaining pellets, if any, in the row thereof;

(f) sweeping the remaining pellets, if any, in the row thereof from the work station back onto the one pellet supply tray disposed at the input station;

(g) transferring the one pellet supply tray and remaining pellets, if any, thereon from the input station back to the tray positioning station;

(h) sweeping the measured desired length of pellets from the work station onto the one pellet storage tray disposed at the output station; and

(i) transferring the one pellet storage tray and measured desired length of pellets thereon from the output station back to the tray positioning station.

4,897,859

APPARATUS FOR IDENTIFYING AND COUNTING LINENS IN BAGS OR BUNDLES

Hideo Tsukamoto; Masaru Nishimura, and Hidetoshi Ishihara, all of Aichi, Japan, assignors to Mitsubishi Jukogyo K.K., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 149,729
Claims priority, application Japan, Feb. 13, 1987, 62-31240
Int. Cl.[4] G06M *11/00*
U.S. Cl. 377—6 **7 Claims**

1. A system for identifying and counting linens that comprises:

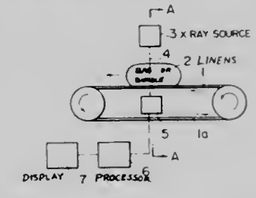
a plurality of pieces of linens packed in a bag and to which markers of different sizes and/or shapes that are made of materials opaque to X-rays are attached so as to identify the kind of each piece of linens;

an endless conveyor for carrying said linens;

an X-ray source for irradiating fanning X-rays over said conveyor;

X-ray detector means for detecting the X-rays passing through said linens and for capturing the shapes of shadows formed by said markers;

image processor means for finding the maximum length of each of said markers from the output of said detector



means and for counting the markers by their maximum lengths; and

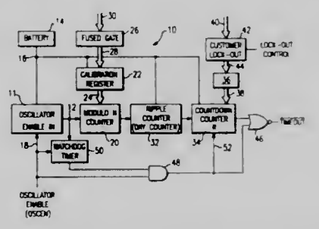
display means for displaying the total of counts for each maximum length.

4,897,860

PROGRAMMABLE TIME BASE CIRCUIT WITH PROTECTED INTERNAL CALIBRATION

Robert D. Lee, Denton, and Donald R. Dias, Carrollton, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Mar. 2, 1988, Ser. No. 163,279
Int. Cl.[4] H03K *21/00, 23/00; G04C 3/00*
U.S. Cl. 377—52 **20 Claims**



16. A method for providing a time base with internal calibration, comprising the steps of:

generating signal having a predetermined operating frequency;

storing a value of n received from an external source;

inhibiting alteration of the value of n after storage thereof;

dividing the operating frequency by the value of n to generate a reference signal having a reference frequency;

generating an internal battery voltage wherein the operating frequency varies as a function of voltage, the internally generated battery voltage enabling a virtually constant operating frequency; and

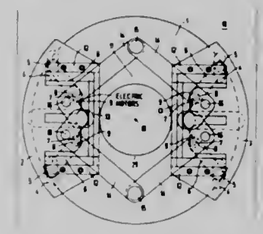
maintaining storage of the value of n as a function of the uninterrupted presence of said internal battery voltage.

4,897,861

PRIMARY RADIATION DIAPHRAGM FOR X-RAY DIAGNOSTICS EQUIPMENTS

Willi Schaefer; Gunter Bartmann, both of Erlangen, and Michael Meyer, Eckersdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 208,987
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 8711572
Int. Cl.[4] G21K *1/04*
U.S. Cl. 378—150 **4 Claims**



1. A primary radiation diaphragm for an x-ray diagnostics installation comprising:

two diaphragm plates disposed in a plane and defining a diaphragm aperture therebetween through which x-radiation is admitted;

means for adjustably seating said two diaphragm plates for permitting movement of said two diaphragm plates in said plane; and

means for adjusting the positions of said two diaphragm plates in said plane in two dimensions so that said diaphragm aperture can be continuously changed in shape between a rectangular shape and a V-shape.

4,897,862

ACOUSTIC ALARM DETECTION SYSTEM FOR TELEPHONE ACTIVATION

Kaseyuki Nishihara, Abiko; Akinobu Tomimori, Kashiwa, both of Japan, and Philip H. Rittmueller, St. Charles, Ill., assignors to NEC Corporation, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,481
Int. Cl.[4] H04M *11/04; G08B 3/10*
U.S. Cl. 379—40 **4 Claims**

1. An electronic device for generating an activation signal in response to detection of an acoustic signal having parameters within predetermined ranges, comprising:

converting means for producing square wave pulses having durations which correspond to durations of bursts of an acoustic signal having a frequency within a predetermined passband;

detection means coupled to said converting means for outputting a reset counter signal in response to each detection of a pulse having a duration outside of a first predetermined range a in response to each detection of a pulse interval between successive pulses having a duration outside of a second predetermined range, and outputting an increment counter signal in response to each detection of a trailing edge of a pulse; and

counting means for incrementing a count by unity in response to each detection of an increment counter signal and outputting an activation signal in response to a detection of a predetermined number of successive increment counter signals, said count being restarted in response to each detection of a reset counter signal.

4. An electronic device for generating an activation signal in response to detection of an acoustic signal having parameters,

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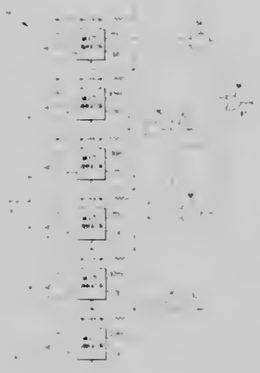
including burst durations and intervals between bursts, within predetermined ranges, comprising;

means for transducing an acoustic signal into an electrical signal; and

means for outputting an activation signal in response to detection of a predetermined number of bursts of an acoustic signal having said parameters within said respective predetermined ranges, said activation signal for coupling to a means for automatically dialing a prestored number and transmitting a prerecorded message in response to said activation signal,

wherein said parameters comprise the amplitude of said acoustic signal, the frequency of said acoustic signal, the duration of each burst of said acoustic signal, and the duration of each interval between successive bursts of said acoustic signal.



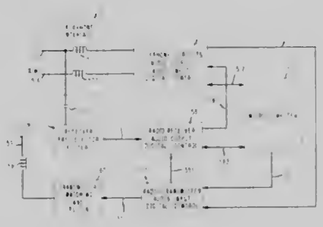


4,897,863

CORDLESS TELEPHONE ANTENNA ARRANGEMENT

Paul B. Newland, Middletown, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1988, Ser. No. 234,701
Int. Cl.[4] H04B 5/06; H01Q 1/00
U.S. Cl. 379—58 3 Claims



1. An antenna arrangement for use with a cordless telephone including a base unit and a handset unit, the base unit being connectable to a telephone line for communicating with a central office and for transmitting to and receiving radio frequency signals from a handset unit associated with the base unit, the handset unit also transmitting to and receiving radio frequency signals from the base unit, the antenna arrangement comprising:

a whip antenna operably connected to the base unit for providing a means for transmitting the radio frequency signals from the base unit for reception by the handset unit; and

antenna means operable in conjunction with the base unit for receiving radio frequency signals, the antenna means comprising the telephone line for providing the communications between the base unit and the central office and for receiving the radio frequency signals transmitted from the handset unit for reception by the base unit.

4,897,864

CONTROL METHOD AND APPARTUS FOR A RADIO TELEPHONE SYSTEM

Yoshitoshi Murata, Yokosuka; Kazuhiro Yoshizawa, Kashiwa; Akio Yotsutani, Tokyo, and Koichi Ito, Hino, all of Japan, assignors to Nippon Telegraph and Telephone Corp.; NEC Corp., both of Tokyo and Kabushiki Kaisha Toshiba, Kanagawa, all of, Japan

Continuation of Ser. No. 900,620, Aug. 26, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 178,844
Claims priority, application Japan, Aug. 27, 1985, 60-187761
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—61 21 Claims

1. A control system for a radio telephone apparatus comprising:

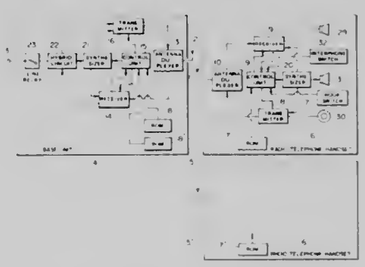
a plurality of radio telephone handsets, each having a radio transmitter and a radio receiver;

a base unit having a radio transmitter and a radio receiver, connected to a wired telephone line, and connected to said radio telephone handsets by a radio channel;

means for designating a first radio channel for said plurality of radio telephone handsets in response to a ring signal on said telephone line;

means for establishing a speech radio channel between said radio telephone sets and said base unit; and

intercom switch means, having an intercom switch, in each of said radio telephone handsets for turning OFF the transmitter of a respective one of said radio telephone handsets when said intercom switch means is OFF, and for turning ON the transmitter of the respective one of



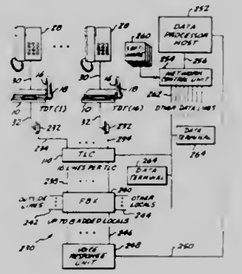
said radio telephone handsets when said intercom switch is turned ON.

4,897,865

TELEPHONE DATA COLLECTION DEVICE

Albert Canuel, Surrey, Canada, assignor to Epic Data, Inc., Richmond, Canada

Filed Apr. 29, 1988, Ser. No. 188,401
Int. Cl.[4] H04M 17/02
U.S. Cl. 379—91 23 Claims



1. Apparatus operable in a plurality of modes, including a program mode for reading encoded data that are stored in a nonvolatile medium, so that they may be transmitted from one location to another over a telephone system, comprising:

(a) means for scanning the encoded data, producing a data signal;

(b) processor means, connected to the means for scanning encoded data, for converting the data signal to ASCII data; said processor means including means for operating the processor means in the program mode that permits ASCII data converted from scanned encoded data to be stored, in response to an operator scanning a first predefined encoded data sequence with the means for scanning said first predefined encoded data scanned by the operator thus determining in which mode the apparatus operates;

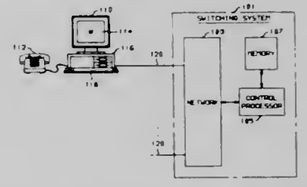
(c) nonvolatile memory means, connected to the processor means, for digitally storing the ASCII data in an addressable register as it is scanned by the operator, independent of the operation of the telephone system, for later transmission over the telephone system.

4,897,866

TELECOMMUNICATION SYSTEM WITH SUBSCRIBER CONTROLLED FEATURE MODIFICATION

Bhairav A. Majmudar, Iselin, and Vinh T. Vu, Middletown, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 19, 1988, Ser. No. 259,939
Int. Cl.[4] H04M 3/42, 11/00
U.S. Cl. 379—94 14 Claims



1. A telecommunication switching system for interconnecting a plurality of program controlled subscriber terminals, each assigned a predetermined set of switching system telecommunication features, comprising:

memory means for storing profile data defining the assigned switching system feature set for each of the terminals;

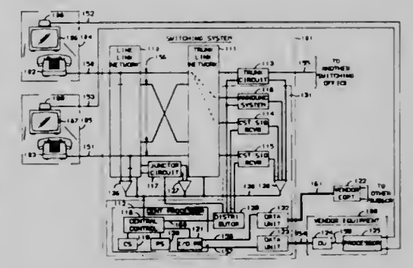
control means for controlling the provision of telecommunication services to the plurality of terminals in accordance with the stored profile data, the control means being responsive to a feature change request message from a requesting terminal, to transmit to the requesting terminal a message including profile data representing the assigned feature set for the requesting terminal and responsive to a message from the requesting terminal requesting a specific change in the feature set to modify the profile data in the memory means for the requesting terminal in accordance with the requested change.

4,897,867

METHOD OF AND AN ARRANGEMENT FOR FORWARDING A CUSTOMER ORDER

Robert W. Foster, Glen Ellyn; Charles B. Hirschman, and Marie L. Todd, both of Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 781,895, Sep. 30, 1985, abandoned. This application Mar. 15, 1988, Ser. No. 170,561
Int. Cl.[4] H04M 11/08, 15/00
U.S. Cl. 379—94 28 Claims



22. For use in a telephone switching system having a switching network for serving a plurality of customer lines and also having processor means for controlling establishment of connections through said network, an order entry arrangement for forwarding to a vendor data link a customer order received

from a requesting one of said lines, said order indicating a desired selection, comprising

receiver means for receiving customer signals including said customer order from said requesting line, and

wherein said processor means is responsive to said customer order received by said receiver means for sending said customer order to said vendor data link for the provision of said desired selection in response thereto without establishing a completed call connection through said network interconnecting said requesting line and said vendor data link.

4,897,868

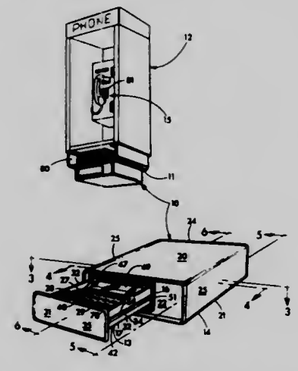
PUBLIC TERMINAL RECEPTACLE

Robert M. Engelke, Madison; Rodney D. Borst, Oregon, and Kevin Colwell, Madison, all of Wis., assignors to Ultratec, Inc., Madison, Wis.

Continuation of Ser. No. 74,625, Jul. 7, 1987, Pat. No. 4,777,469. This application Jul. 25, 1988, Ser. No. 224,118

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—96 **3 Claims**



2. A public terminal receptacle comprising:

(a) a terminal which is telephonically linked and physically adjacent to a public telephone through which the terminal may telecommunicate with other electronic devices;

(b) a housing which is adapted to be attached to a public telephone booth and which normally covers and protects the terminal; and

(c) means for allowing an user access to said terminal in response to specific electronic signals.

4,897,869

DATA COMMUNICATION APPARATUS

Masatomo Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 337,860

Claims priority, application Japan, May 17, 1988, 63-121089

Int. Cl.[4] H04M *11/08*

U.S. Cl. 379—100 **16 Claims**

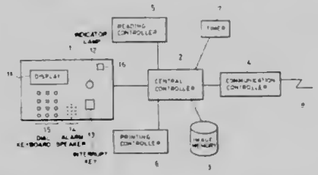
1. A data communication apparatus which is able to set up a plurality of communication processes successively via a communication line, comprising:

data communication means;

reserving means for making a reservation to request an interruption of the plurality of communication processes;

informing means for notifying an operator that the communication line is not busy, in response to a reservation being made by means of said reserving means; and

prohibiting means for prohibiting establishment of a successive communication process of said data communication



means, in response to the reservation being made by means of said reserving means.

4,897,870

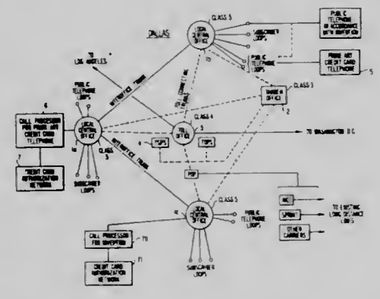
NETWORK IMPLEMENTED PAY TELEPHONE SET

Michael E. Golden, Reston, Va., assignor to Southlake Technologies, Inc., Reston, Va.

Continuation of Ser. No. 779,981, Sep. 25, 1985, abandoned. This application May 26, 1987, Ser. No. 54,051

Int. Cl.[4] H04M *17/02*

U.S. Cl. 379—144 **21 Claims**



1. A pay telephone for use in a telephone system comprising a plurality of central offices each of which serves a plurality of the subscriber telephones and pay telephones, a conventional switched telephone network connecting together said plurality of central offices, a call processor for providing call billing information for selected calls made from said pay telephone, said call processor being coupled to one of said plurality of central offices and being accessible by calling a predetermined telephone number, said pay telephone comprising:

handset means for transmitting and receiving voice signals to and from the central office which serves said pay telephone;

dial means for entering a user telephone number to be dialed; and

a logic circuit coupled to said handset means and to said dial means and adapted to be coupled to the central office which serves said pay telephone, said logic means including memory means for storing the user telephone number received from said dial means, wherein only in response to selected user telephone numbers received from said dial means said logic circuit automatically places a call request to said processor to request and receive desired information from said call processor, said call request being made concurrently with any action performed by the user on said telephone, immediately thereafter said logic circuit terminates said call to said call processor and in response to the receipt of said desired information automatically dials the user telephone number into said switched telephone network through said central office which serves said pay telephone to complete the user's call, when said call request is not made to said call processor said logic means immediately dialing the telephone number into said switch telephone network through said central office.

4,897,871

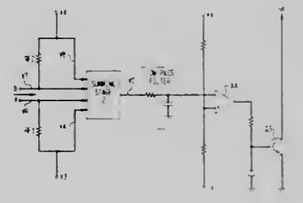
APPARATUS FOR TRANSMITTING AND/OR RECEIVING BALANCED SIGNALS ON A TWO-WIRE TELECOMMUNICATION LINE

Morris L. Mitch, Coral Springs, and Theodore W. Wagner, West Palm Beach, both of Fla., assignors to Siemens Corporation, Iselin, N.J.

Division of Ser. No. 627,243, Jul. 2, 1984, Pat. No. 4,682,356, which is a division of Ser. No. 350,028, Feb. 18, 1982, Pat. No. 4,485,277, which is a continuation-in-part of Ser. No. 137,810, Apr. 4, 1980, abandoned. This application Mar. 26, 1987, Ser. No. 31,336

Int. Cl.[4] H04M *3/22*

U.S. Cl. 379—377 **3 Claims**



1. A telecommunication DC line current asymmetry detection circuit comprising:

a summing stage having first, second, third, and fourth inputs and an output, said summing stage being connected to the telecommunication line for providing at said output an output voltage proportional to VT+VR−VA−VB where

VR is the voltage on a first wire of the telecommunication line;

VT is the voltage on a second wire of the telecommunication line, said first and second inputs being connected to said first and second wires, respectively;

VA is a voltage at a first terminal of a first resistor connected to said first wire, said first terminal being further connected to a first reference voltage;

VB is a voltage at a second terminal of a second resistor connected to said second wire, said second terminal being further connected to a second reference voltage, said third and fourth inputs being connected to said first and second terminals, respectively;

a low pass filter coupled to said output of said summing stage for filtering the effects of voltage transients; and

a threshold circuit comprising a comparator for comparing the output of said low pass filter with a pre-established threshold value and providing an output indicating an asymmetric DC line current condition when said threshold is exceeded.

4,897,872

INTERFACE CIRCUIT BETWEEN A SUBSCRIBER'S TELEPHONE LINE AND EXCHANGE CONTROL COMPONENTS, WITH REDUCED CURRENT CONSUMPTION IN THE CASE OF A GROUNDED CABLE

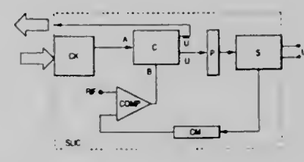
Marco Siligoni, Vittuone, and Emilio Lorena, Parona, both of Italy, assignors to SGS-Thomson Microelectronics Srl, Agrate Brianza, Italy

Filed Dec. 28, 1988, Ser. No. 291,297

Claims priority, application Italy, Dec. 28, 1987, 23236 A/87

Int. Cl.[4] H04M *19/00*

U.S. Cl. 379—412 **5 Claims**



1. A telephone circuit for forming an interface between a subscriber's telephone line and exchange control components, comprising: a means for supplying the subscriber's telephone line; a means for receiving, amplifying and transmitting signals under the control of the exchange control components; a current detecting means for generating a measurement signal corresponding to the instantaneous value of the common-mode currents on the line and a circuit biasing means having at least a control terminal for enabling the normal operation of the telephone circuit and for causing the disconnection of at least said means supplying the subscriber's telephone line when a signal is supplied to said control terminal; a threshold comparator having a first input terminal to which the signal generated by said means for detecting current is supplied; a second input terminal to which a reference signal is supplied and an output terminal via which said comparator generates a signal when the value of said signal supplied to said first input terminal exceeds a predetermined value of said reference signal, and a control circuit means having a first input terminal which is connected to a source of timing signals, spaced in a predetermined way and each having a predetermined duration, and having a second input terminal which is connected to said output terminal of said threshold comparator and at least a first output terminal connected to said control terminal of the circuit biasing means, and wherein said control circuit is inhibited from generating an output signal during the time intervals in which a timing signal is supplied to said first input terminal and generating an output signal for the whole time interval between a first timing signal and the timing signals subsequent thereto when, at the moment at which the supply of this first timing signal to said first input terminal ceases, a signal is simultaneously supplied to said second input terminal.

4,897,873

MULTIPURPOSE HINGE APPARATUS FOR FOLDABLE TELEPHONES

Scott D. Beutler, Hoffman Estates, and James H. Barber, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1988, Ser. No. 267,156

Int. Cl.[4] H04R *1/03*; E05D *11/10*; F16C *11/06*

U.S. Cl. 379—433 **4 Claims**

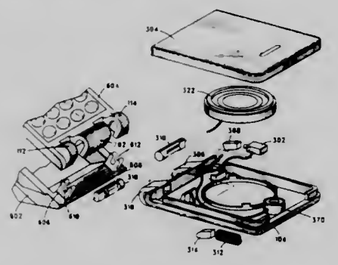
1. A hinge apparatus for a foldable telephone apparatus having a body portion and a flip element portion, the hinge apparatus capable of maintaining the flip element portion in at least two positions of rotation relative to the body portion, a first position being parallel to a front surface plane of the body portion and a second position being at an obtuse angle to the

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front surface plane of the body portion, the hinge apparatus comprising:

a first cylindrical hinge shaft rotatably coupling the flip element portion to the body portion;

first and second recesses disposed in the wall of said first cylindrical hinge shaft, said first and second recesses having essentially planar bottom surfaces, the plane of said essentially planar bottom surface of said first recess intersecting the plane of said essentially planar bottom surface of said second recess an acute angle; and



a first cam disposed within said flip element portion and having at least one flat surface which contacts said essentially planar bottom surface of said first recess when the flip element portion is in the first position and which contacts the essentially planar bottom surface of said second recess when the flip element portion is in the second position.

4,897,874

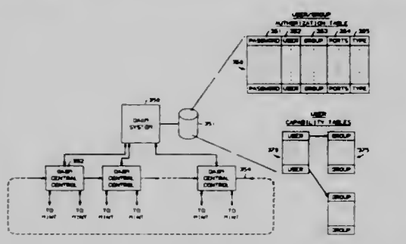
METROPOLITAN AREA NETWORK ARRANGEMENT FOR SERVING VIRTUAL DATA NETWORKS

William P. Lidinsky, Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville; Ronald C. Weddige, Western Springs, and Bruce R. Zelle, Naperville, all of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,548

Int. Cl.[4] H04L 9/00, 11/00

U.S. Cl. 380—3 **8 Claims**



1. In a network for serving users of a plurality of user groups, a method of preventing users of one group from obtaining unauthorized access to users of another group, comprising the steps of:

generating a user authorization data base for authorizing access by a first user to members of ones of a plurality of groups from input from a superuser;

processing a login packet, comprising an identification of a login destination user group and an identification of said first user, from said first user to determine whether said first user is authorized in said authorization data base to access said destination user group;

if said determining step determines that said first user is authorized to access said destination user group, recording data in a source checker data base indicating that said first user is authorized to send packets to said destination user group;

thereafter, ascertaining in said recorded data, for every data entity, comprising said identification of said first user and an identification of a destination user group for said data entity, whether said first user is authorized to send data to said destination user group; and

transmitting said data entry to a user of said destination user group if said ascertaining step indicates that said first user is authorized.

4,897,875

KEY MANAGEMENT SYSTEM FOR OPEN COMMUNICATION ENVIRONMENTS

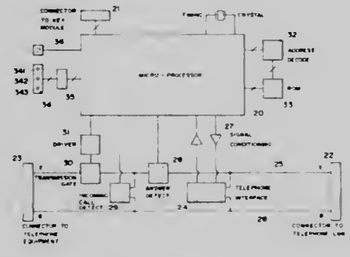
Alan J. Pollard, and James R. Lemire, both of Winnipeg, Canada, assignors to The Manitoba Telephone System, Winnipeg, Canada

Continuation of Ser. No. 710,429, Mar. 11, 1985, abandoned. This application Sep. 3, 1987, Ser. No. 92,625

Claims priority, application United Kingdom, Sep. 4, 1986, 8621333

Int. Cl.[4] H04L 9/02

U.S. Cl. 380—21 **22 Claims**



1. A security system for authenticating a potential user of a service comprising a first unit associated with the service, a second unit associated with the user, each of said first and second units including means for communicating with the other through a communication medium, each of said first and second units including memory means, each of said memory means having stored therein a plurality of groups of random numbers, the numbers of each group being logically associated together as a group with a logical address in the memory, said random numbers of said groups and the associated addresses in the memory means of the first unit being identical to those of the memory means of the second unit, said first unit including control circuit means arranged such that, in a first cycle of operation said circuit means acts, to extract from the memory means thereof one of the random numbers in one of said groups at a respective address to communicate said one random number to said second unit, to compare a received signal from the second unit with another of the random numbers in said one of said groups, and to provide authentication of said user only upon a match of said received signal with said another of the random numbers, and in each subsequent cycle of operation to extract one of the random numbers from a respective different one of the groups in the memory means, said second unit including control circuit means arranged such that it acts on receipt from said first unit of said one of the random numbers in said one of said groups to extract from said memory means thereof said another of said random numbers of said group.

4,897,876

METHOD OF AND AN ARRANGEMENT FOR DIGITAL SIGNAL ENCRYPTION

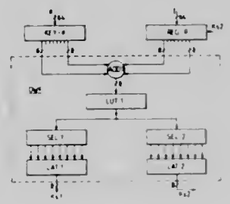
Andrew K. Davies, Purley, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 2, 1988, Ser. No. 189,010

Claims priority, application United Kingdom, May 1, 1987, 8710382

Int. Cl.[4] H04L 9/00

U.S. Cl. 380—43 **26 Claims**



1. A method of digital signal encryption comprising the steps of:

(a) providing a key signal;

(b) providing an initial number signal;

(c) combining said key signal and said number signal in a cipher algorithm to produce a first keystream signal;

(d) performing an exclusive-OR logical operation with the first keystream signal and a digital data signal to produce an enciphered or a deciphered signal;

(e) modifying progressively the number signal using a feedback control with a second keystream signal which is different from said first keystream signal and is derived either indirectly or directly from the latter by at least one logical operation not involving the actual digital data signal being processed wherein the second keystream signal is produced by the cipher algorithm from the same combined key signal/number signal data as that used to produce the first keystream signal;

(f) providing the key signal with m bytes each containing n bits;

(g) providing the initial number signal also with m bytes each containing n bits;

(h) adding modulo-2^n each key signal byte and a respective initial number signal byte to produce m new bytes each containing n bits;

(i) using each of the m new bytes in a function to obtain m modified bytes;

(j) selecting a first different bit from each of the modified new bytes to obtain a first single resultant byte which constitutes a byte of the first keystream signal;

(k) selecting a second different bit from each of the modified new bytes to obtain a second single resultant byte which constitutes a byte of the second keystream signal;

(l) replacing one of the initial number signal bytes with the second single resultant byte for the second keystream signal to form a new initial number signal; and

(m) repeating steps (h) to (l) until all the data bytes of the digital data signal have been dealt with by performing the exclusive-OR logical operation with successive bytes of the first keystream signal and the digital data signal.

4,897,877

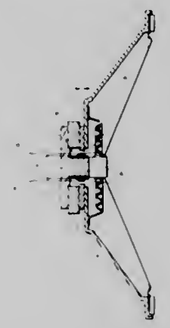
SUB-WOOFER DRIVER COMBINATION WITH DUAL VOICE COIL ARRANGEMENT

Robert J. Tetzlaff, Elgin, Ill., assignor to Oxford Speaker Company, Chicago, Ill.

Filed May 18, 1987, Ser. No. 50,560

Int. Cl.[4] H04R 5/02

U.S. Cl. 381—24 **24 Claims**



1. In a vehicle sound system including in combination a radio and plural loudspeaker enclosures together containing a combination of speakers covering a range of audio frequencies, the improvement wherein at least one of said enclosures includes a dual voice coil dynamic loudspeaker structure having a diaphragm, a coil former operatively connected to the diaphragm and first and second electrically isolated voice coils wound coaxially on the coil former one over the other for driving the diaphragm, the first voice coil being connected for ultra-low frequency response, and the second voice coil being connected for higher frequency response, the first coil being connected to a radio output through an ultra-low frequency sub-woofer amplifier, and the second voice coil being connected directly to a radio output.

4,897,878

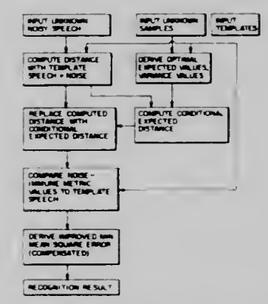
NOISE COMPENSATION IN SPEECH RECOGNITION APPARATUS

Steven F. Boll, and Jack E. Porter, both of San Diego, Calif., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,215

Int. Cl.[4] G10L 7/08

U.S. Cl. 381—43 **8 Claims**



1. A method of compensating for noisy input speech in order to improve the recognition result of a speech recognition apparatus having an input for unknown speech, converting

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means for converting the unknown speech into time-sampled frames of speech signals representing its spectral distribution over a given range of frequencies, storing means for storing templates of known speech in the form of speech signals representing its spectral distribution over the given range of frequencies, computing means for computing the minimum mean square error of the Euclidean squared distance between the speech signals of the unknown speech compared with the speech signals of the template speech, and recognizer means for producing a recognition result based upon the minimum mean square error computed by the computing means,

wherein said method of compensating for noisy input speech comprises the following steps for producing an improved minimum mean square error estimate conditioned by compensatory characteristics of the noisy input speech:

(a) computing optimal estimated distance values over the given range of frequencies for noise-free template speech, based upon comparing known speech segments, which are input in a noise-free environment and converted into corresponding templates of known speech signals t_s, with unknown speech segments, which are input in a noise-free environment and converted to unknown speech signals u_s;

(b) computing estimated variance values corresponding to the optimal estimated distance values for a sample population of noise-free speech segments;

(c) storing said optimal estimated distance values and variance values on a look-up table associated with the template speech;

(d) computing squared distance values over the given range of frequencies for input noisy unknown speech signals u_{s+n} compared with signals t_{s+n} representing template speech to which a spectral representation of noise n in the actual input environment is added;

(e) replacing the computed squared distance values for the unknown speech signals with conditional expected distance values calculated using the optimal estimated distance values and variance values obtained from the look-up table, in order to derive noise-immune metric values for the unknown speech signals; and

(f) computing the minimum mean square error of the noise-immune metric values for the unknown speech signals compared with the noise-free template speech signals, whereby an improved recognition result is obtained.

4,897,880

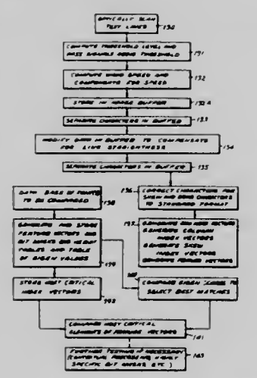
DATA ACQUISITION CONTROL METHOD AND SYSTEM FOR A HAND HELD READER

Scott A. Wilber; David Joffe; Brian Van Duzee, all of Boulder; Mark Haas, Lafayette; Andrew Goldstein, Boulder, and Chris M. Wieland, Longmont, all of Colo., assignors to Soricon Corporation, Boulder, Colo.

Continuation of Ser. No. 15,220, Feb. 17, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,930

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—13 **3 Claims**



4,897,879

MULTI-WAY LOUDSPEAKER SYSTEM

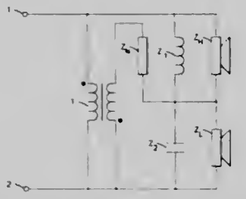
Ronald J. Geluk, Nootdorp, Netherlands, assignor to B & W Loudspeakers Limited, West Sussex, United Kingdom

Continuation of Ser. No. 36,230, Apr. 9, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 250,978

Claims priority, application Netherlands, Apr. 9, 1986, 8600901

Int. Cl.[4] H03G *5/00*

U.S. Cl. 381—99 **10 Claims**



1. A multi-way loudspeaker system comprising at least two series connected loudspeakers connected to a common signal input for reproducing different parts and in particular a low-frequency part and a high-frequency part of the full frequency spectrum of an audio signal applied to the signal input and provided with a passive dividing network including a first impedance connected in parallel to a first loudspeaker for reproducing a first part of the audio-frequency spectrum and a second impedance connected in parallel to a second loudspeaker for reproducing a second part of the audio-frequency spectrum in which a compensating circuit is provided to feed a compensating current to the junction of said first loudspeaker and said second loudspeaker in a direction opposite to the direction of the current being fed to said junction through the first loudspeaker.

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1. Apparatus for pattern recognition comprising:

(a) means for scanning an unknown pattern to produce a first matrix of column and row signals representing the scanned image of the unknown pattern,

(b) means for producing from the first matrix a reduced size standard matrix of constant height and width containing an image only of a single character of the pattern, said producing means comprising:

(i) means for normalizing the height of the scanned image,

(ii) means for correcting the scanned image for skew by dividing the matrix with normalized height image into top and bottom parts, determining the center of mass separately for each of the top and bottom parts, and horizontally shifting rows of the image until the mass centers are vertically aligned,

(iii) means for normalizing the width of the horizontally shifted image by modifying the image by replicating and deleting vertical lines of the image until the image just fits within the standard matrix,

(c) means for creating from the standard matrix with normalized height and width image a multiple-word feature vector characteristic of the image by subdividing the image into smaller units and generating a word characteristic of the image part in each smaller unit,

(d) means for comparing the feature vector thus obtained or signals derived therefrom with corresponding signals obtained from known characters and stored in memory to assist in identifying a character of the unknown pattern.

4,897,881

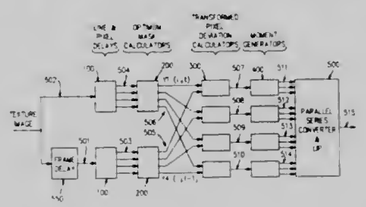
OPTIMUM FAST TEXTURAL FEATURE EXTRACTOR

Chou T. Ledinh, Broussard; Vincent Lacasse, Montréal, and Paul Cohen, Cote St-Luc, all of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Mar. 23, 1988, Ser. No. 172,229

Int. Cl.[4] G06K *9/52, 9/46, 9/66*

U.S. Cl. 382—28 **20 Claims**



1. An electronic processing system for textural feature extraction of picture pixels, said system comprising a calculator circuit for producing four picture uncorrelated transformed signals from any four original pixels automatically selected in a rectangular pattern, deviation and moments calculator means for analyzing each said transformed signals by measuring the three central moments thereof and generating signal parameters representative of the texture of said pixels, and processing circuit means for converting said signal parameters for use in classification or learning mode.

4,897,882

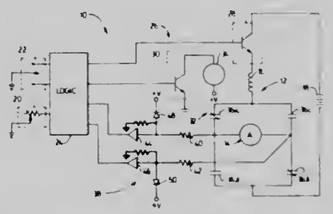
MOTOR CONTROL APPARATUS AND METHOD

William Pickering, University Heights, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Mar. 10, 1989, Ser. No. 321,694

Int. Cl.[4] H02P *5/16*

U.S. Cl. 388—801 **10 Claims**



1. Apparatus for controlling a motor associated with a vehicle, said vehicle including an electric motor having armature and field windings, an electric power source, speed selection means for controllably producing motor speed demand signals, and direction selection means for controllably producing motor direction demand signals, comprising:

logic means for receiving said speed and direction demand signals and responsively producing respective motor speed command and motor direction command signals;

motor control means for receiving said speed and direction command signals and responsively controllably directing electrical current from said power source through at least one of said motor armature and field windings;

transducer means for sensing the actual direction of electrical current flow through said motor and producing respective motor direction feedback signals in response to said sensed direction of current flow; and

wherein said logic means produces at least one motor direction interrogation pulse in response to receiving said speed and direction demand signals, said motor control means receives said direction interrogation pulse and responsively controllably directs a predetermined amount of electrical current from said power source through said motor, said predetermined amount of current being insufficient to cause said motor to rotate, and wherein said logic means compares said direction demand signals and said direction feedback signals and produces said speed command signals only in response to said comparison of signals indicating that the actual motor direction corresponds to the desired motor direction established by said direction demand signals.

4,897,883

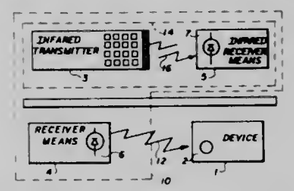
INFRARED REMOTE CONTROL APPARATUS

Christopher C. Harrington, Pittsburgh, Pa., assignor to Modcom Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 135,014, Dec. 18, 1987, Pat. No. 4,864,647. This application May 23, 1988, Ser. No. 197,750

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—603 **4 Claims**



1. A remote control apparatus for activating a device capable of being controlled by an infrared signal comprising:

an infrated radiation transmitter for transmitting a first infrared radiation signal, said transmitter being an encoder;

means for receiving the first infrared radiation signal, said first infrared radiation signal receiving means including an infrared photodiode having an output corresponding to the first infrared radiation signal received by it; a driver for receiving the output of the photodiode and producing a corresponding signal that is capable of being carried by carrier-current; an optical filter disposed between the photodiode and the infrared transmitter such that the first infrared signal transmitted by the infrared transmitter must pass through the opticalfilter in order to be received by the photodiode; a positive voltage source electrically connected to the photodiode for reverse biasing the photodiode such that the photodiode is rendered conducting upon receipt of the first infrared signal; a grounded resistor electrically connected to the photodiode for proper photodiode biasing; a first bandpass filter electrically connected to the driver and capable of producing a signal corresponding to the signal received from the driver; and a second plug electrically connected to the first bandpass filter and capable of coupling the signal from the bandpass filter to the carrier current; and

means for receiving the signal of the carrier current and producing an infrared signal, said carrier-current receiving means having a carrier-current receiver capable of receiving the signal on the carrier current, and an infrared light emitting diode electrically connected to the carrier current receiver and capable of producing a second infrared signal that corresponds to the signal of the carrier current that is received by it.

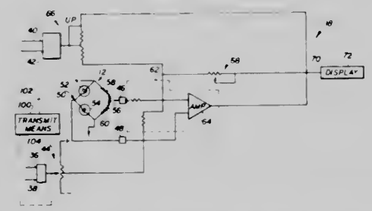
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4,897,884

APPARATUS FOR NON-INVASIVE CALIBRATION OF A FLUID SENSOR

Herbert Heller, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Nov. 20, 1987, Ser. No. 123,267
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—603 **6 Claims**



1. An apparatus for non-invasive calibration of a fluid sensor comprising: a means for transmitting an electromagnetic signal including an infrared radiation transmitter acting as an encoder and a means for receiving the electromagnetic signal from the transmitting means including an infrared radiation receiver acting as a decoder, the receiving means being situated remotely from the transmitting means and producing a signal corresponding to the electromagnetic signal received; and

a detector circuit electrically connected to the receiving means which is capable of recalibrating the sensor according to the signal produced by the receiving means;

wherein the encoder includes a first switch means for transmitting an encoded zero up signal, a second switch means for transmitting an encoded zero down signal, a third switch means for transmitting an encoded span up signal and a fourth switch means for transmitting an encoded span down signal;

wherein the decoder is capable of producing a zero up signal, a zero down signal, a span up signal or a span down signal when an encoded zero up signal, an encoded zero down signal, an encoded span up signal or an encoded span down signal, respectively, is received by the decoder;

wherein the decoder has a zero up output port, a zero down output port, a span up output port and a span down output port through which the zero up signal, the zero down signal, the span up signal and the span down signal, respectively, are able to pass out of the decoder; and wherein the detector circuit has a zero up input port, a zero down input port, a span up input port and a span down input port which are electrically connected to the zero up output port, the zero down output port, the span up output port and the span down output port, respectively, of the decoder.

DESIGN PATENTS

GRANTED JAN. 30, 1990

ERRATA

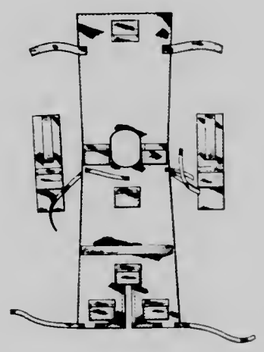
For CLASS	See PATENT NO.
D09-341	305,705

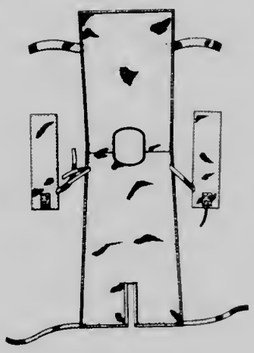
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DESIGNS

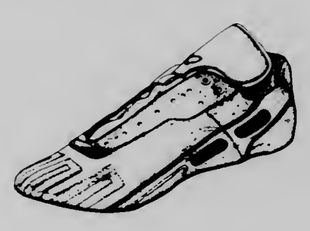
JANUARY 30, 1990

305,700
MULTI-BADGE DOSIMETRY VEST
Larry P. Werner, P.O. Box 1674, Dothan, Ala. 36302
Filed Jun. 17, 1988, Ser. No. 208,124
Term of patent 14 years
U.S. Cl. D2—225

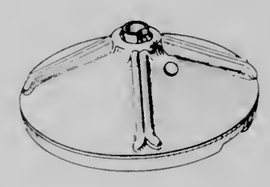




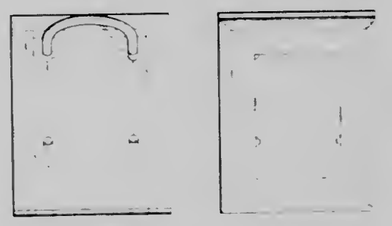
305,701
SPORT SHOE UPPER
Jan H. Whatley, Nashville, Tenn., assignor to Genesco Inc., Nashville, Tenn.
Filed Feb. 11, 1988, Ser. No. 155,019
Term of patent 14 years
U.S. Cl. D2—314



305,702
UMBRELLA BASE
Dennis Taliani, Hoffman Estates, and George L. Garcia, Naperville, both of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Jul. 30, 1986, Ser. No. 890,567
Term of patent 14 years
U.S. Cl. D3—10

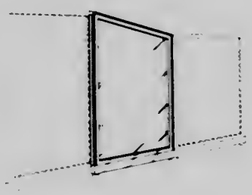


305,703
PHOTOGRAPH FRAME MOUNT
Thomas T. M. Wang, No. 1, Alley 10, Lane 22, Kuang Fu South Rd., Taipei, Taiwan
Filed Apr. 15, 1987, Ser. No. 38,594
Term of patent 14 years
U.S. Cl. D6—314

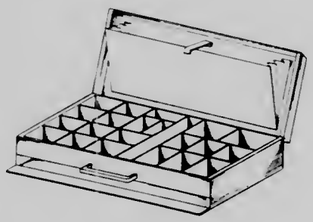


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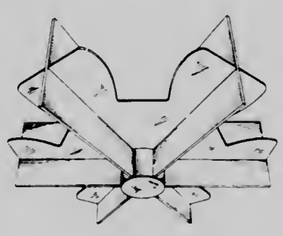
305,704
SPACE-DIVIDER PANEL FOR USE PRIMARILY IN AN OFFICE
Jane L. Jones, Park Township, Ottawa County, and Douglas J. Maat, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Oct. 7, 1986, Ser. No. 916,446
Term of patent 14 years
U.S. Cl. D6—332



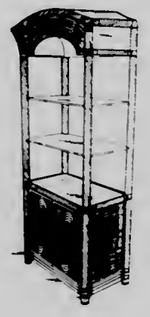
305,705
BOARD GAME CASE
Katharine Stewart, 311 W. 100th St., New York, N.Y. 10025
Filed Jun. 19, 1987, Ser. No. 64,295
Term of patent 14 years
U.S. Cl. D9—341



305,706
MULTIPLE DESK UNIT
Edward H. Mark, South Bend, Ind., assignor to Packard Industries, Inc., Niles, Mich.
Filed Oct. 13, 1987, Ser. No. 107,537
Term of patent 14 years
U.S. Cl. D6—421

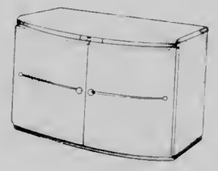


305,707
ETAGERE
Darrell G. Lowman, Hickory, N.C., assignor to The Lane Company, Alta Vista, Va.
Filed Jan. 13, 1987, Ser. No. 3,374
Term of patent 14 years
U.S. Cl. D6—436



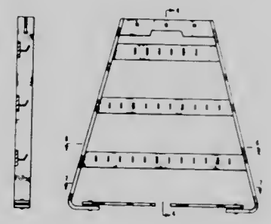
305,708
CABINET
Thomas J. Newhouse, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Jun. 2, 1987, Ser. No. 57,829
Term of patent 14 years
U.S. Cl. D6—446







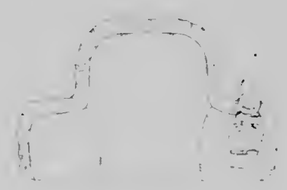
305,709
COMBINED KEY STORAGE STAND AND CARRIER
James C. Blignaut, 803 Cimarron Pkwy., Dunwoody, Ga. 30350
Filed Feb. 24, 1987, Ser. No. 17,804
Term of patent 14 years
U.S. Cl. D6—468



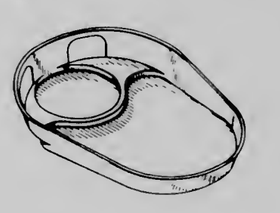
305,710
COMPUTER TABLE
Hoe S. Ng, and Kim S. Chua, both of 319-H, Lorong Buang Kok, Singapore (1954)
Filed Jun. 30, 1987, Ser. No. 67,857
Claims priority, application Singapore, Dec. 31, 1986, 1039043
Term of patent 14 years
U.S. Cl. D6—474



305,711
PILLOW WITH POCKET AND DOLL
Sonia S. Wood, 3779 University, Houston, Tex. 77005
Filed Sep. 15, 1986, Ser. No. 907,644
Term of patent 14 years
U.S. Cl. D6—601

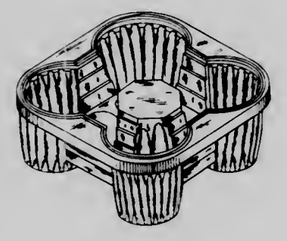


305,712
COMBINED FOOD AND BEVERAGE TRAY
Charles E. Bauman, and Barbara M. Bauman, both of Lakewood, Colo., assignors to Tres Suave, Inc., Lakewood, Colo.
Filed Oct. 23, 1986, Ser. No. 922,562
Term of patent 14 years
U.S. Cl. D7—38



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305,713
DRINKING CUP CADDY
Bruce W. Seifried, Clinton, Wis., assignor to The Packaging House, Inc., Chicago, Ill.
Filed Aug. 5, 1986, Ser. No. 893,197
Term of patent 14 years
U.S. Cl. D7—71



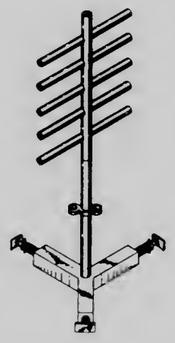
305,714
COOLER BOX FOR BOTTLES
Arthur R. Carlson, Rowville, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Aug. 15, 1986, Ser. No. 897,065
The portion of the term of this patent subsequent to Jun. 2, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—77



305,715
CANNISTER
Pasquale Bruno, Chicago, Ill., assignor to Amco Corporation, Chicago, Ill.
Filed Sep. 26, 1986, Ser. No. 912,815
Term of patent 14 years
U.S. Cl. D7—79

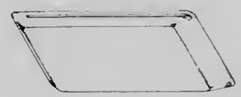


305,716
PLANT STEM HOLDER
Serkai Ghafoorzai, 4031 Park Center, Apartment A, Fremont, Calif. 94538
Filed Jul. 31, 1987, Ser. No. 79,916
Term of patent 14 years
U.S. Cl. D8—1

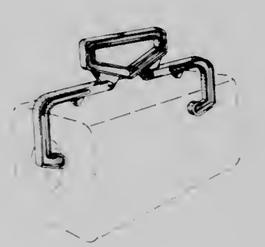


305,717
BATTERY HOUSING FOR A PORTABLE TELEPHONE OR SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 97,462, Sep. 11, 1987, Pat. No. D. 300,742. This application Apr. 8, 1988, Ser. No. 179,006
Term of patent 14 years
U.S. Cl. D8—13

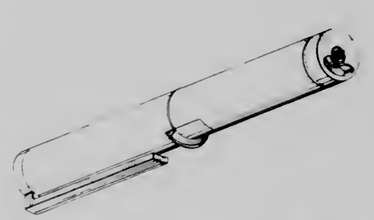


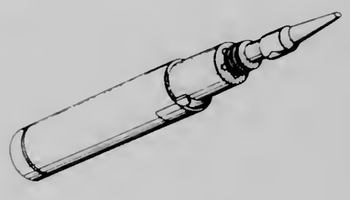


305,719
SALT BLOCK CARRIER
Lowell C. Babcock, 22014 Anthony Rd., Marengo, Ill. 60152
Filed Jun. 2, 1986, Ser. No. 869,946
Term of patent 14 years
U.S. Cl. D8—14

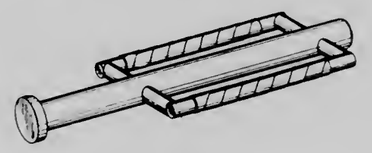


305,720
SOLDERING IRON WITH REMOVABLE CAP
Bryan D. Leech, Enniscorthy; John V. McNulty, Dublin; Alfred P. Oglesby, Springhill; John P. Oglesby, Shrule, and Derek W. Butler, Carlow, all of Ireland, assignors to Olgesby & Butler Plc, Carlow, Ireland
Filed Aug. 10, 1987, Ser. No. 83,987
Claims priority, application Ireland, Feb. 9, 1987, 20/87
Term of patent 14 years
U.S. Cl. D8—30



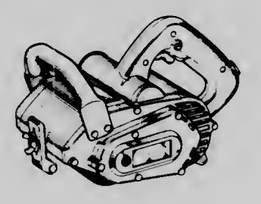


305,718
BATTERING RAM
Wesley R. Ashcraft, 5132 Limerick Ave., San Diego, Calif. 92117
Filed May 19, 1986, Ser. No. 864,943
Term of patent 14 years
U.S. Cl. D8—14

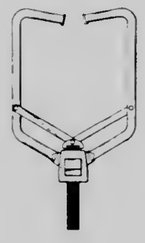


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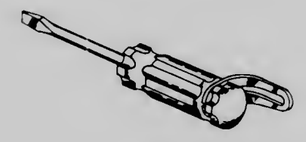
305,721
ELECTRIC FINISHING SANDER
Fusao Fushiya, and Yasuo Itoh, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Japan
Filed May 15, 1987, Ser. No. 52,062
Term of patent 14 years
U.S. Cl. D8—62



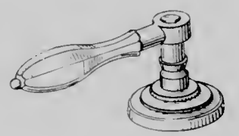
305,722
CLAMP
Merry S. Rieha, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 7, 1986, Ser. No. 929,222
Term of patent 14 years
U.S. Cl. D8—72



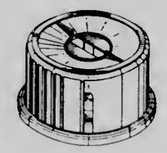
305,723
SCREWDRIVER WITH SWIVELED FINGER HOOK
Richard C. Wilson, P.O. Box 26, 725 Bradford, Champlin, Minn. 55316
Filed Aug. 25, 1986, Ser. No. 899,646
Term of patent 14 years
U.S. Cl. D8—82

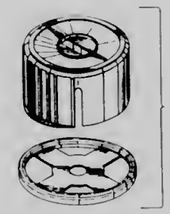


305,724
COMBINED HANDLE AND ROSETTE
Duane L. Mosch, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.
Filed Feb. 26, 1987, Ser. No. 19,299
Term of patent 14 years
U.S. Cl. D8—308

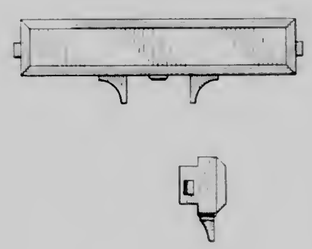


305,725
KNOB
Kai K. Yung, Block A-3m, Hong Kong Industrial Centre, 11th Floor, 489-491 Castle Peak Road, Kowloon, Hong Kong
Filed Sep. 3, 1987, Ser. No. 92,691
Claims priority, application United Kingdom, Jun. 1, 1987, 1042543
Term of patent 14 years
U.S. Cl. D8—312





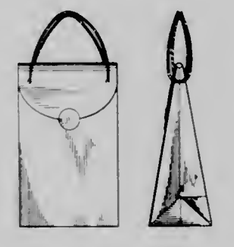
305,726
VIDEO CASSETTE RECORDER LOCK
Joseph M. Halay, 4259 San Pablo Dam Rd. #8, El Sobrante, Calif. 94803
Filed Jul. 6, 1988, Ser. No. 215,919
Term of patent 14 years
U.S. Cl. D8—341



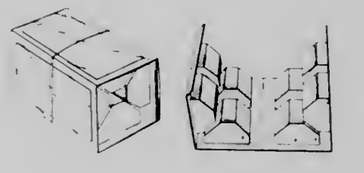
305,727
VENT SECURING DEVICE FOR CASEMENT WINDOWS
Phillip J. Cunningham, Claymont; Leon F. Slocomb, Jr., and George Wilkie, both of Wilmington, all of Del., assignors to Slocomb Industries, Inc., Wilmington, Del.
Filed Sep. 30, 1986, Ser. No. 913,855
Term of patent 14 years
U.S. Cl. D8—400



305,728
COMBINED GREETING CARD AND GIFT BAG
Laura Tufariello, Clifton, N.J., assignor to Design House, Inc., Teaneck, N.J.
Filed Nov. 4, 1986, Ser. No. 926,784
Term of patent 14 years
U.S. Cl. D9—305



305,729
MULTI-UNIT CONTAINER
Christophe Bridel, Rennes, France, assignor to Laiteries E. Bridel, Retiers, France
Filed Nov. 18, 1987, Ser. No. 122,424
Claims priority, application France, May 19, 1987, 87 2948
Term of patent 14 years
U.S. Cl. D9—341



305,730
BOTTLE WITH HANDLE
Ronald G. Cramer, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 11, 1987, Ser. No. 14,725
Term of patent 14 years
U.S. Cl. D9—376

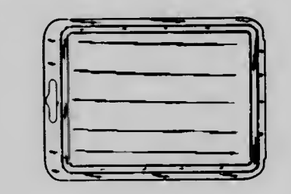


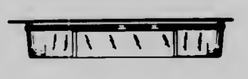
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305,731
BOTTLE
Andre Jacobs, Meise, Belgium; Richard May, Worms, Fed. Rep. of Germany; Marcel Vandebroek, Grimbergen, and Frieda Sporen, Houthalen, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jul. 10, 1986, Ser. No. 884,923
Claims priority, application United Kingdom, Jan. 16, 1986, 1031640
Term of patent 14 years
U.S. Cl. D9—378



305,732
CONTAINER
Frederick B. Hadtke, New Providence, N.J., assignor to Champion Spark Plug Company, Toledo, Ohio
Filed Jul. 8, 1986, Ser. No. 883,483
Term of patent 14 years
U.S. Cl. D9—415



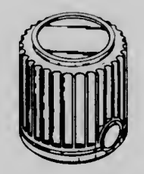


305,733
GOLF BALL PACKAGE
Michael R. Ferris, Feeding Hills, Mass., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Nov. 18, 1987, Ser. No. 122,432
Term of patent 14 years
U.S. Cl. D9—415

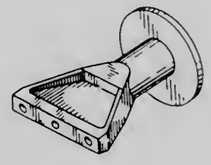


305,734
COMBINED CLOSURE AND OPENER FOR CONTAINER
David O. Allen, Wilmington, Ohio, assignor to Allen Tool Company, Inc., Wilmington, Ohio
Continuation-in-part of Ser. No. 526,352, Aug. 25, 1983, Pat. No. Des. 285,056. This application Aug. 8, 1986, Ser. No. 894,674
Term of patent 14 years
U.S. Cl. D9—438

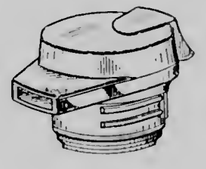
305,735
TAMPER RESISTANT CAP
Gerald Zinsbauer, Toledo, Ohio, assignor to Kardon Industries, Inc., Philadelphia, Pa.
Filed Aug. 15, 1986, Ser. No. 897,148
Term of patent 14 years
U.S. Cl. D9—438



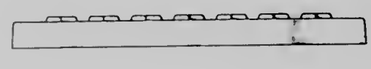
305,736
DISPOSABLE NOZZLE FOR CARTRIDGE DISCHARGING ADHESIVE
Marvin Berg, 1785 Lois Dr., New Brighton, Minn. 55112, and Bruce Gracheck, 5734 Ridge Creek Rd., Shoreview, Minn. 55126
Filed Aug. 20, 1987, Ser. No. 87,626
Term of patent 14 years
U.S. Cl. D9—447

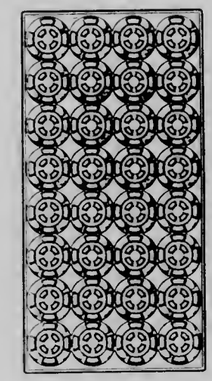


305,737
DISPENSING CLOSURE
Harry F. Collins, Minnetonka, Minn., assignor to Service Ideas, Inc., Minneapolis, Minn.
Filed Mar. 23, 1987, Ser. No. 29,416
Term of patent 14 years
U.S. Cl. D9—448

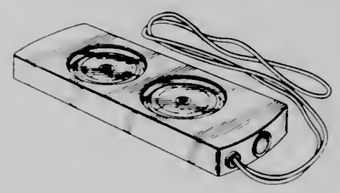


305,738
TIER SHEET FOR A DISPLAY MODULE
Gerald G. Day, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed May 2, 1986, Ser. No. 859,877
Term of patent 14 years
U.S. Cl. D9—456



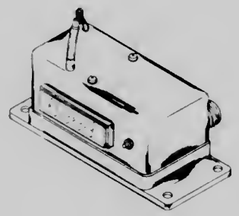


305,739
COMPASS CLINOMETER
Raimo Raitmaa, Kaunisaisea, Finland, assignor to Oy Masters Instruments Ltd., Finland
Filed Mar. 9, 1987, Ser. No. 23,294
Claims priority, application Finland, Sep. 16, 1986, 919/86
Term of patent 14 years
U.S. Cl. D10—68

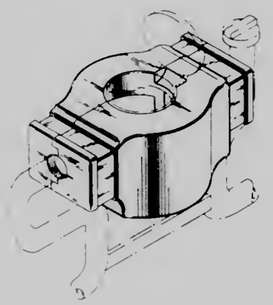


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305,740
LINEAR MOVEMENT TRANSDUCER
William J. Onderdonk, Westlake Village, Calif., assignor to Transducer Controls Corp., Canoga Park, Calif.
Filed Mar. 2, 1987, Ser. No. 20,496
Term of patent 14 years
U.S. Cl. D10—70



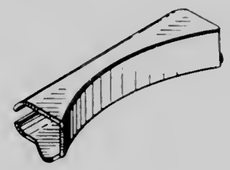
305,741
METER INSULATING JACKET
Mack Goodrich, 4051 Lofgren Ct., Lexington, Ky. 40509
Filed Sep. 15, 1986, Ser. No. 907,527
Term of patent 14 years
U.S. Cl. D10—103



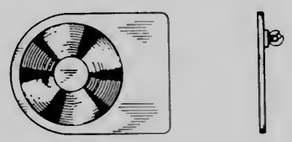
305,742
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,114
Claims priority, application Italy, Oct. 31, 1986, 36211/86[U]
Term of patent 14 years
U.S. Cl. D11—17



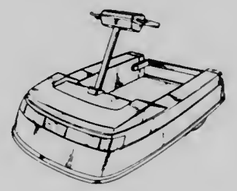
305,743
END ATTACHMENT FOR WATCH BAND
Hermann Hirsch, Hirschstrasse 5, A-9021 Klagenfurt, Austria
Filed Sep. 25, 1987, Ser. No. 101,947
Claims priority, application Austria, May 13, 1987, 1585/87
Term of patent 14 years
U.S. Cl. D11—94



305,744
LAPEL BUTTON
Robert J. De brey, 4502 Browndale Ave., Edina, Minn. 55424
Filed Jul. 16, 1987, Ser. No. 74,017
Term of patent 14 years
U.S. Cl. D11—99



305,745
SELF-PROPELLED THREE WHEELED VEHICLE
Osamu Hayata, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Dec. 23, 1986, Ser. No. 946,281
Claims priority, application Japan, Jun. 28, 1986, 61-25295; Jun. 28, 1986, 61-25296
Term of patent 14 years
U.S. Cl. D12—85



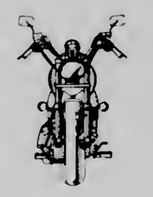
305,746
EXTERIOR SHELL OF AN AERODYNAMIC HIGHWAY TRACTOR
L. David Allendorph, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Feb. 17, 1987, Ser. No. 15,184
Term of patent 14 years
U.S. Cl. D12—96



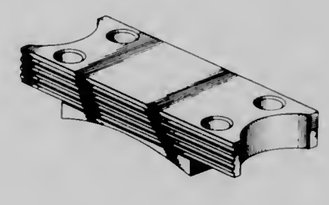
305,747
MOTORCYCLE
Makoto Kitagawa; Tetsuro Katsoka; Shiari Chibuka, and Kazahiro Sakamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,775
Claims priority, application Japan, Aug. 8, 1986, 61-31102
Term of patent 14 years
U.S. Cl. D12—110



305,748
MOTORCYCLE
Akiyoshi Kaneko; Masamoto Ito, and Hiroyuki Aoki, all of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 9, 1987, Ser. No. 12,712
Claims priority, application Japan, Aug. 21, 1986, 61-32567
Term of patent 14 years
U.S. Cl. D12—110



305,749
MOTORCYCLE FORK STABILIZER
Jerome C. Jorgensen, 434 Rosepaw Way, Placentia, Calif. 92670
Filed Aug. 7, 1987, Ser. No. 82,563
Term of patent 14 years
U.S. Cl. D12—117

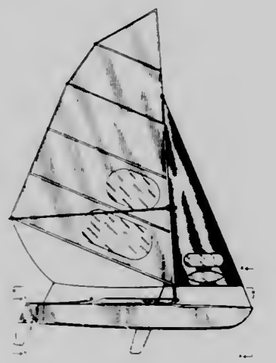


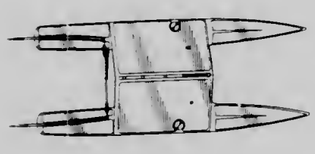
305,750
JUVENILE WALKER
Richard E. Cone, 6348 Cheri Lynn Dr., Dayton, Ohio 45416
Filed Dec. 28, 1987, Ser. No. 139,044
Term of patent 14 years
U.S. Cl. D12—130



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305,751
SAIL BOAT
Robert F. Roberson, San Clemente, Calif., assignor to Hot Sports, Inc., Newport Beach, Calif.
Filed Sep. 8, 1987, Ser. No. 93,871
Term of patent 14 years
U.S. Cl. D12—304

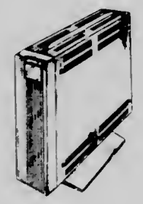




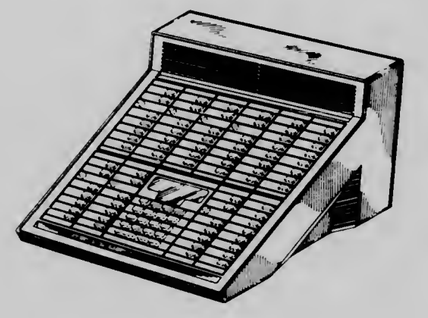
305,752
BARBEQUE BRIQUET
Peter M. Chow, P.O. Box 4106, Alhambra, Calif. 91803
Filed Jun. 30, 1987, Ser. No. 68,050
Term of patent 14 years
U.S. Cl. D13—3.2



305,753
COMPUTER
Nobuhiko Hoshino, Boardinghouse of Tokyo Sanyo, 1939-24 Shimokoizumi, Ohizumi-Cho, Ohra-Gun, Gunma-ken, Japan
Filed Sep. 23, 1986, Ser. No. 910,761
Claims priority, application Japan, Mar. 28, 1986, 61-11552
Term of patent 14 years
U.S. Cl. D14—102



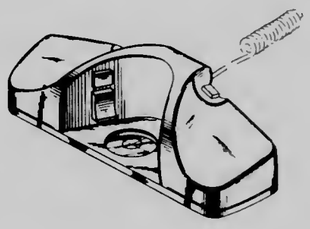
305,754
CONTROL CONSOLE OR SIMILAR ARTICLE OF MANUFACTURE
Leonid Soren, Lincolnwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 17, 1986, Ser. No. 920,350
Term of patent 14 years
U.S. Cl. D14—106



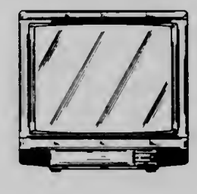
305,755
DISPLAY MONITOR
Tsutomu Suyama; Masaharu Wakamatsu, both of Hyogo, and Sbozoo Fujita, Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 17, 1987, Ser. No. 87,946
Claims priority, application Japan, Feb. 17, 1987, 62-5875
Term of patent 14 years
U.S. Cl. D14—113

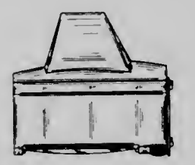


305,756
CURSOR
Nicky S. Parker, Huntsville; G. Lloyd Philpo't, Decatur; Charles N. Van Valkenburgh, Huntsville, all of Ala., and Kenneth M. Brazell, Columbus, Ohio, assignors to Intergraph Corporation, Huntsville, Ala.
Filed May 28, 1986, Ser. No. 867,690
Term of patent 14 years
U.S. Cl. D14—114

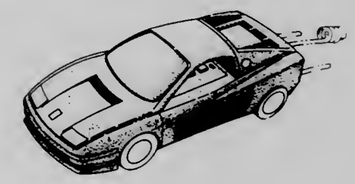


305,757
TELEVISION SET
Ryunosuke Kitagawa, and Harumi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,730
Claims priority, application Japan, May 26, 1987, 62-21006
Term of patent 14 years
U.S. Cl. D14—126





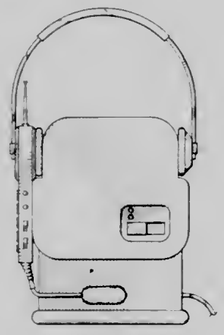
305,758
TELEPHONE SET
Chan W. K. Wilson, Prime View Garden, Hong Kong, assignor to Cartier International B.V., Amsterdam, Netherlands
Filed Oct. 14, 1988, Ser. No. 258,330
Claims priority, application France, Apr. 26, 1988, 88 2741
Term of patent 14 years
U.S. Cl. D14—143

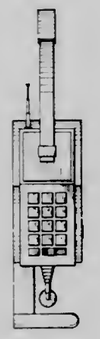




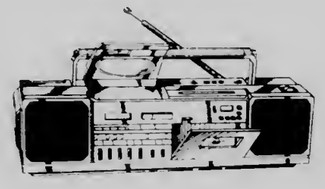
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305,759
CORDLESS HEADSET TELEPHONE
Jesus B. Balbuena, 3984 Catamarca Dr., San Diego, Calif. 92124-3406
Filed Sep. 2, 1988, Ser. No. 240,103
Term of patent 14 years
U.S. Cl. D14—147

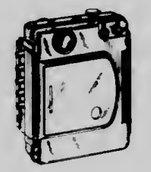




305,761
COMBINED TAPE RECORDER, DIGITAL AUDIO DISC PLAYER AND RADIO
Kazuo Kawabe, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 18, 1987, Ser. No. 16,055
Claims priority, application Japan, Aug. 19, 1986, 61-32357
Term of patent 14 years
U.S. Cl. D14—163



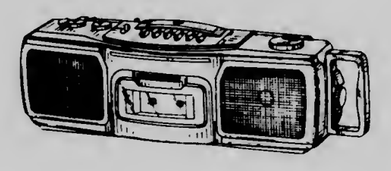
305,762
COMBINED TAPE PLAYER AND RADIO TUNER
Shingo Yoda, and Masayoshi Tsuchiya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 16, 1987, Ser. No. 121,724
Claims priority, application Japan, May 13, 1987, 62-18702
Term of patent 14 years
U.S. Cl. D14—163



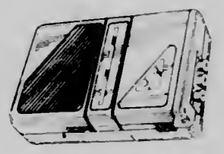
305,760
COMBINED CAR RADIO AND CASSETTE PLAYER
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Feb. 20, 1987, Ser. No. 18,130
Claims priority, application United Kingdom, Aug. 20, 1986, 1036227; Aug. 20, 1986, 1036228
Term of patent 14 years
U.S. Cl. D14—157



305,763
COMBINED TAPE RECORDER AND RADIO RECEIVER
Toshiyuki Matsuoe and Ichiro Hino, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 19, 1987, Ser. No. 122,658
Claims priority, application Japan, May 19, 1987, 62-19623
Term of patent 14 years
U.S. Cl. D14—163



305,764
COMBINED RADIO AND CASSETTE PLAYER
Barbara A. Westfield, and Leon H. Dreimann, both of Chicago, Ill., assignors to Salton, Inc., Mt. Prospect, Ill.
Filed Oct. 14, 1987, Ser. No. 108,803
Term of patent 14 years
U.S. Cl. D14—188



305,767
ROCKER COVER
John R. Tauschke, Dandenong, Australia, assignor to Tauschke Nominees Pty. Ltd., Victoria, Australia
Filed Dec. 7, 1987, Ser. No. 129,075
Claims priority, application Australia, May 29, 1987, 1887/87
Term of patent 14 years
U.S. Cl. D15—5



305,765
PAGING RECEIVER OR SIMILAR ARTICLE
David W. Davis, Boca Raton, and William J. Scheid, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 19, 1987, Ser. No. 64,271
Term of patent 14 years
U.S. Cl. D14—191



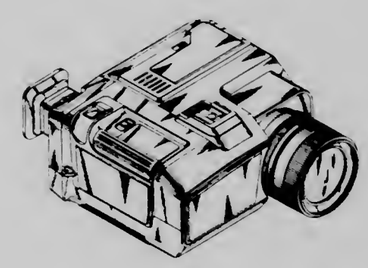
305,768
NOVELTY CONTACT LENS
Jeffrey C. Barkley, 5757 W. Hefner Rd., No. 623, Oklahoma City, Okla. 73132
Filed Jan. 21, 1987, Ser. No. 5,741
Term of patent 14 years
U.S. Cl. D16—100



305,766
INDOOR ANTENNA
Guo-Bang Tai, Taipei, Taiwan, assignor to King Feng Co., Ltd., Taipei, Taiwan
Filed Sep. 19, 1986, Ser. No. 909,411
Claims priority, application Taiwan, Aug. 5, 1986, 75304072
Term of patent 14 years
U.S. Cl. D14—231

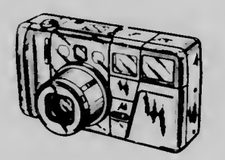


305,769
STILL VIDEO CAMERA
Samuel F. Swayze, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 3, 1987, Ser. No. 34,314
Term of patent 14 years
U.S. Cl. D16—202



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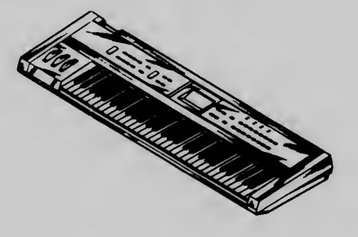
305,770
CAMERA
Jun Akabane, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Feb. 17, 1987, Ser. No. 15,608
Claims priority, application Japan, Sep. 11, 1986, 61-36005
Term of patent 14 years
U.S. Cl. D16—209



305,771
MICROFILM READER
Hiroshi Fukuda, and Masahiro Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 8, 1986, Ser. No. 904,500
Claims priority, application Japan, May 6, 1986, 61-16575
Term of patent 14 years
U.S. Cl. D16—229



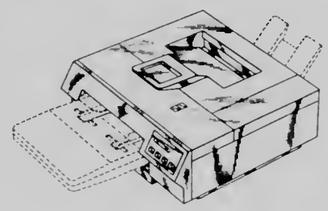
305,772
ELECTRONIC MUSIC SYNTHESIZER
Shigeru Kitsuya, Kunitachi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 91,523
Term of patent 14 years
U.S. Cl. D17—1



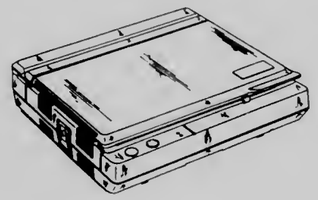
305,773
GUITAR OR THE LIKE
Dale Young, 1414 Gringo Rd., Aliquippa, Pa. 15001
Filed Jun. 22, 1987, Ser. No. 64,874
Term of patent 14 years
U.S. Cl. D17—18



305,774
PRINTER
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1987, Ser. No. 29,874
Claims priority, application Japan, Oct. 3, 1986, 61-39384
Term of patent 14 years
U.S. Cl. D18—13



305,775
COPYING MACHINE
Kenji Tamada, Sayama, Japan, assignor to Silver Seiko, Limited, Tokyo, Japan
Filed Oct. 8, 1986, Ser. No. 916,854
Claims priority, application Japan, May 7, 1986, 61-16854
Term of patent 14 years
U.S. Cl. D18—36



305,776
BALL-POINT PEN
Suk J. Kim, Seoul, Rep. of Korea; Atsushi Deguchi, Tokyo, and Sadao Yoshinaga, Ichikawa, both of Japan, assignors to Yoshinaga Prince Company Limited, Tokyo, Japan
Filed Feb. 26, 1987, Ser. No. 19,490
Claims priority, application Japan, Sep. 19, 1986, 61-37070
Term of patent 14 years
U.S. Cl. D19—42



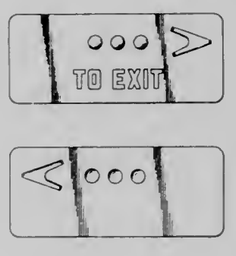
305,777
WRITING INSTRUMENT HOLDER
A. T. Lee, Taipei, Taiwan, assignor to Pioneer Industrial Corp., Taipei, Taiwan
Filed Mar. 27, 1987, Ser. No. 32,072
Term of patent 14 years
U.S. Cl. D19—85



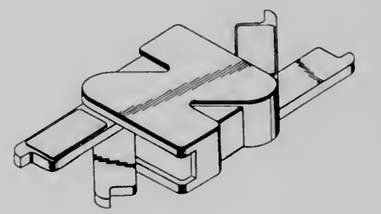
305,778
CAROUSEL SIGN DISPLAY
James W. Caulk, 1618 S. Park Dr., Leesburg, Fla. 32748
Filed Jul. 17, 1987, Ser. No. 74,498
Term of patent 14 years
U.S. Cl. D20—21



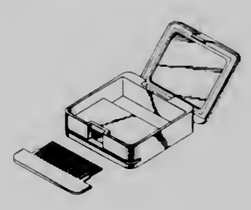
305,779
MARKER FOR EMERGENCY EVACUATION
Frederick G. Schriever, 64 Claireview, Grosse Pointe Shores, Mich. 48236
Filed Sep. 11, 1986, Ser. No. 906,231
Term of patent 14 years
U.S. Cl. D20—40



305,780
SIMULATIVE TOY TOOL
Hiroshi Ukisu, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,527
Term of patent 14 years
U.S. Cl. D21—59

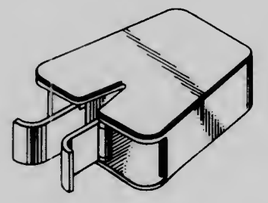


305,781
SIMULATIVE TOY COMPACT AND COMB
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,529
Term of patent 14 years
U.S. Cl. D21—59

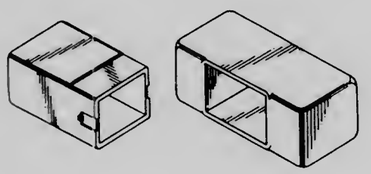


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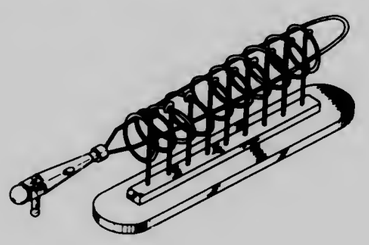
305,782
SIMULATIVE TOY TOOL HOLDER
Hiroshi Ukisu, Matsudo a, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,553
Term of patent 14 years
U.S. Cl. D21—59



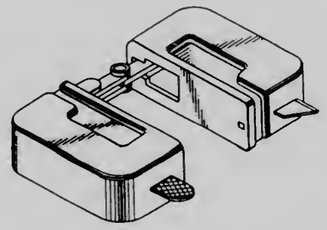
305,783
SIMULATIVE TOY BOX
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 132,059
Term of patent 14 years
U.S. Cl. D21—59



305,784
PUZZLE TOY
James A. Bertagnoli, 620 McDonough St., Joliet, Ill. 60436
Filed Jul. 7, 1987, Ser. No. 70,508
Term of patent 14 years
U.S. Cl. D21—106



305,785
SIMULATIVE TOY TOOL
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 132,041
Term of patent 14 years
U.S. Cl. D21—120

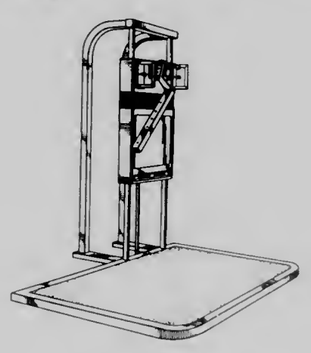


305,786
RECONFIGURABLE ROBOTIC HUMANOID TOY
Kouzin Ohno, Chiba, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 25, 1987, Ser. No. 18,968
Claims priority, application Japan, Dec. 25, 1986, 61-51590
Term of patent 14 years
U.S. Cl. D21—150





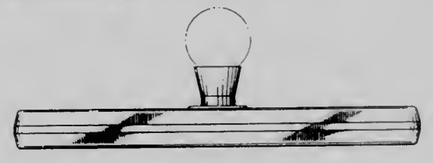
305,787
PHYSICAL EXERCISER
Brad Olschansky, Baltimore, and Raymond H. Lee, Jr., Lutherville, both of Md., assignors to Lifeing, Inc., Pikesville, Md.
Filed May 14, 1987, Ser. No. 49,452
Term of patent 14 years
U.S. Cl. D21—198



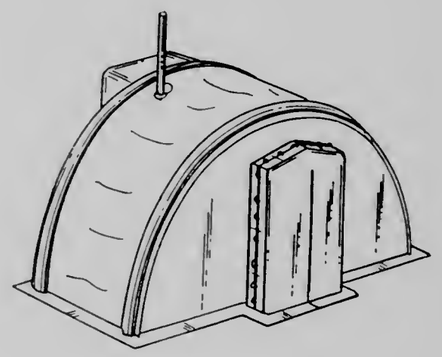
305,788
TOY BALL
Gerald R. Herren, Rte. 4, Box 146, Baxter, Tenn. 38544
Filed Apr. 3, 1987, Ser. No. 33,597
Term of patent 14 years
U.S. Cl. D21—204



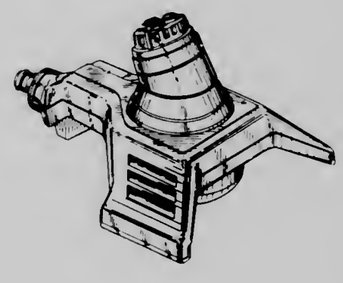
305,789
TOY GOLF TEE
William J. Maloney, II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 70,887
Term of patent 14 years
U.S. Cl. D21—208



305,790
TENT
Hans S. Söderström, Trelleborg, Sweden, assignor to Trelleborg AG, Trelleborg, Sweden
Filed Sep. 3, 1987, Ser. No. 92,782
Claims priority, application Sweden, Mar. 5, 1987, 87-0520
Term of patent 14 years
U.S. Cl. D21—253

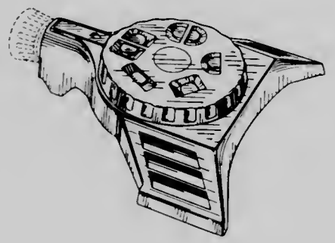


305,791
LAWN SPRINKLER
John M. Lang, Oxfordshire, United Kingdom, assignor to Hozelock-ASL Limited, Aylesbury, England
Filed Nov. 22, 1985, Ser. No. 800,671
Claims priority, application United Kingdom, Jul. 13, 1985, 1027905
Term of patent 14 years
U.S. Cl. D23—214

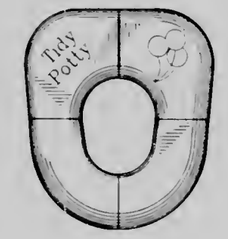


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305,792
LAWN SPRINKLER
Malcolm Hastings, Coventry, and Norman Brown, Yardley Gobion, both of England, assignors to Hozelock-ASL Limited, Aylesbury, England
Filed Jun. 1, 1987, Ser. No. 56,754
Claims priority, application United Kingdom, Dec. 24, 1986, 1039025
Term of patent 14 years
U.S. Cl. D23—214

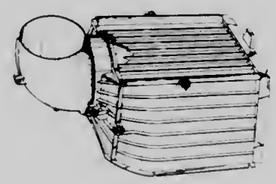


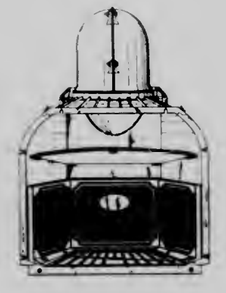
305,793
FOLDABLE TOILET SEAT COVER FOR CHILDREN
Marva J. Croak, 5426 E. Holly Rd., Holly, Mich. 48442
Filed Dec. 23, 1988, Ser. No. 288,810
Term of patent 14 years
U.S. Cl. D23—311



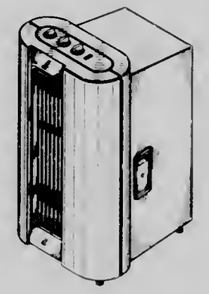


305,794
BURNING CHAMBER FOR FIREPLACES
Niels E. Heger, Jessheim, Norway, assignor to A/S Jotul, Oslo, Norway
Filed Aug. 31, 1987, Ser. No. 91,502
Claims priority, application Norway, Mar. 12, 1987, 68122
Term of patent 14 years
U.S. Cl. D23—344

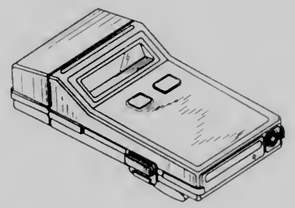




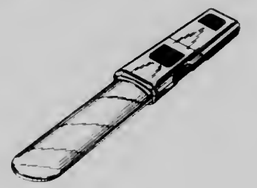
305,795
ROOM AIR CONDITIONER
Tooru Harashima, 89-banchi, Oota 7-chome, Yao-shi, Osaka, Japan
Filed Jan. 20, 1987, Ser. No. 4,700
Claims priority, application Japan, Aug. 29, 1986, 61-33997
Term of patent 14 years
U.S. Cl. D23—351

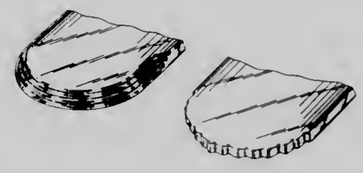


305,796
AMBULATORY ECG CABINET
Ralph E. Forland, and Kail R. Peterson, both of McMinnville, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 27, 1987, Ser. No. 19,992
Term of patent 14 years
U.S. Cl. D24—17

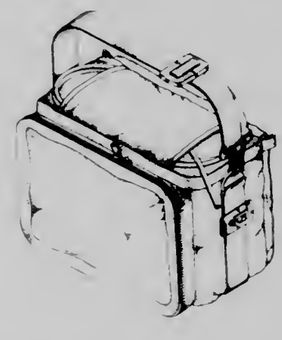


305,797
TONGUE DEPRESSOR
Herbert L. Robinson, Hoboken, and Allen S. Epstein, Clifton, both of N.J., assignors to Med-Struments, Inc., Totowa, N.J.
Filed May 8, 1987, Ser. No. 47,646
Term of patent 14 years
U.S. Cl. D24—19

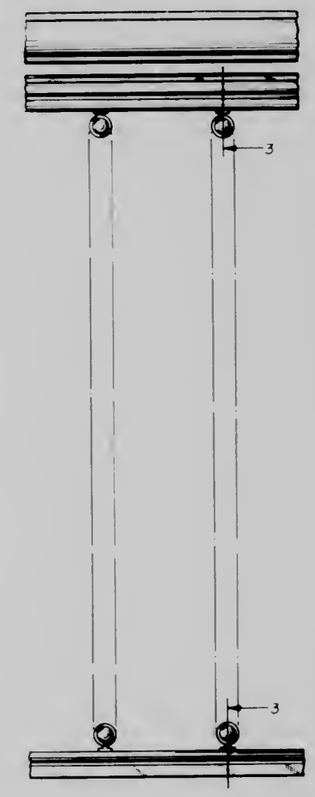




305,798
PORTABLE MEDICAL SUCTION UNIT
Sam L. Say, 1210 El Vago St., La Canada, Calif. 91011
Filed Apr. 15, 1987, Ser. No. 39,598
Term of patent 14 years
U.S. Cl. D24—51

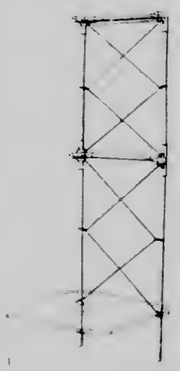


305,799
COMBINED TOP AND BOTTOM RAIL FOR A STAIRCASE BALUSTRADE
Louis Manzo, 8 Putnam Ct., Holmdel, N.J. 07733
Filed Nov. 6, 1987, Ser. No. 117,731
Term of patent 14 years
U.S. Cl. D25—38



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305,800
PLANTER TRELLIS
Russell P. Mottmiller; Jody A. Hobson; William C. Gerber, all of Wooster, and Patrick C. Scofield, Columbus, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 25, 1987, Ser. No. 18,951
Term of patent 14 years
U.S. Cl. D25—100



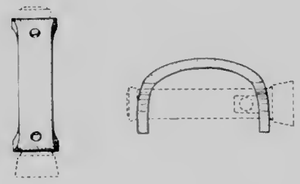
305,801
OIL CANDLE FOR INSERTION INTO A WINE BOTTLE OR SIMILAR ARTICLE
Lester A. Herb, 2533 Topaz Dr., Novato, Calif. 94945
Filed Dec. 3, 1986, Ser. No. 937,522
Term of patent 14 years
U.S. Cl. D26—11



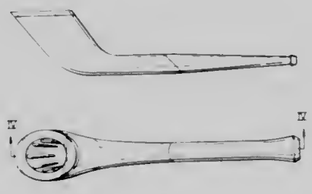
305,802
CHIMMEY FOR OIL CANDLE
Lester A. Herb, 2533 Topaz Dr., Novato, Calif. 94945
Filed Feb. 12, 1987, Ser. No. 14,382
Term of patent 14 years
U.S. Cl. D26—23



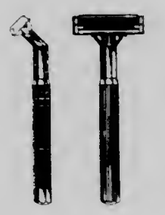
305,803
COMBINED CARRYING HANDLE AND SUPPORT BASE FOR FLASHLIGHT
Eric Sutcliffe, 906 W. Monroe, Austin, Tex. 78704
Filed May 16, 1986, Ser. No. 864,371
Term of patent 14 years
U.S. Cl. D26—140



305,804
SMOKER'S PIPE
Shane C. Browning; Robert Carlisle; Alexander H. Wright, all of Co. Antrim, Ireland, and Kenneth M. Bray, London, England, assignors to Gallaher Limited, United Kingdom
Filed Jun. 29, 1987, Ser. No. 68,047
Claims priority, application United Kingdom, Dec. 31, 1986, 1039034; May 29, 1987, 1041486
Term of patent 14 years
U.S. Cl. D27—163



305,805
RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed May 12, 1987, Ser. No. 48,914
Term of patent 14 years
U.S. Cl. D28—46



305,806
ELECTRIC SHAVER
Hiroshi Fujisawa, Sakura, Japan, assignor to Kabushiki Kaisha Kawasaki Seiki Seisakusho, Tokyo, Japan
Filed May 26, 1987, Ser. No. 54,169
Term of patent 14 years
U.S. Cl. D28—50



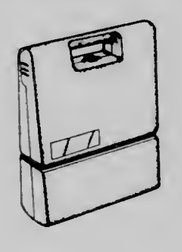
305,807
DRY SHAVER
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Dec. 7, 1987, Ser. No. 132,545
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 73MR9590
Term of patent 14 years
U.S. Cl. D28—51

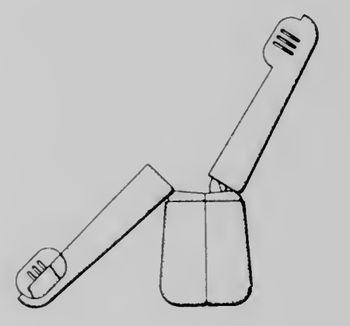


305,808
CLIP-ON MIRROR
Kenneth D. Eisenbraun, Troy, Mich., and Michael I. Lerner, Chestnut Hill, Mass., assignors to Safety 1st, Inc., Chestnut Hill, Mass. and Tech Accessories Group, Inc., Troy, Mich.
Filed Jul. 5, 1988, Ser. No. 215,899
Term of patent 14 years
U.S. Cl. D28—64.1



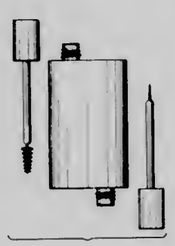
305,809
COSMETICS CASE
Betsy Weber, San Diego, Calif.; Farouk Arjani, Los Altos Hills, and Richard A. Varga, Poway, all of Calif., assignors to Beauty Mate, San Diego, Calif.
Filed Aug. 17, 1987, Ser. No. 86,657
Term of patent 14 years
U.S. Cl. D28—76





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305,810
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 736,448, May 21, 1985. This application Mar. 20, 1989, Ser. No. 326,900
Term of patent 14 years
U.S. Cl. D28—77





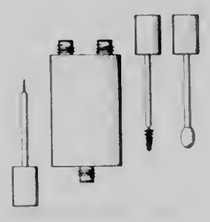


305,811
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 736,448, May 21, 1985. This application Mar. 28, 1989, Ser. No. 329,496
Term of patent 14 years
U.S. Cl. D28—77



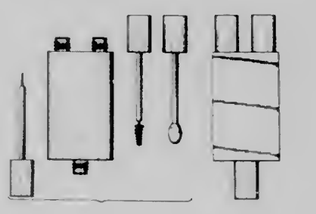


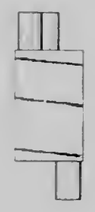
305,812
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 765,394, Aug. 14, 1985. This application Apr. 14, 1989, Ser. No. 337,535
Term of patent 14 years
U.S. Cl. D28—77





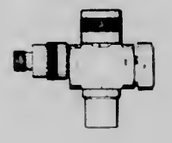
305,813
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 765,394, Aug. 14, 1985. This application Apr. 14, 1989, Ser. No. 337,536
Term of patent 14 years
U.S. Cl. D28—77





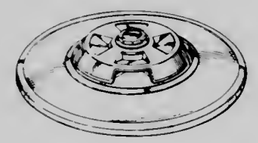
305,814
RESUSCITATOR INHALATOR VALVE
Thomas F. Fangrow, Jr., Corona, Calif., assignor to Life Support Products, Inc., Irvine, Calif.
Filed Mar. 21, 1986, Ser. No. 845,415
Term of patent 14 years
U.S. Cl. D29—7

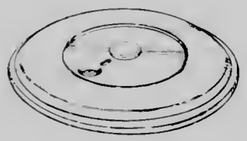




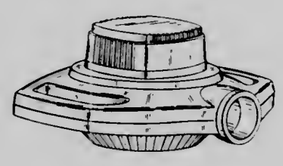
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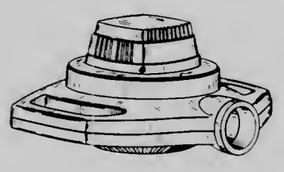
305,815
SURFACE UNIT FOR A SWIMMING POOL CLEANING APPARATUS
David A. Brooks, Roodepoort, South Africa, assignor to Spooner Est., Liechteanstein
Filed Nov. 7, 1986, Ser. No. 928,120
Term of patent 14 years
U.S. Cl. D32—1



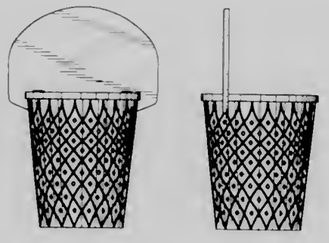


305,816
PORTABLE BLOWER
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Craig A. Seasholtz, Avis, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Jun. 25, 1987, Ser. No. 66,723
Term of patent 14 years
U.S. Cl. D32—15





305,817
CLOTHES HAMPER
Mark P. Elliott, 5118 Lansdowne Dr., Solon, Ohio 44139
Filed Oct. 26, 1987, Ser. No. 112,525
Term of patent 14 years
U.S. Cl. D32—37



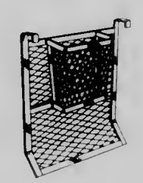


305,818
PAINT SCRAPER
Chun-Yong Chen, No. 1, Alley 10, Lane 143, Hsing Ming Rd., Taipei, Taiwan
Filed Aug. 24, 1987, Ser. No. 88,198
Term of patent 14 years
U.S. Cl. D32—48





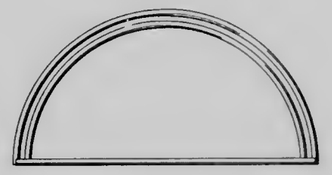
305,819
COMBINATION PAINT ROLLER WIPER AND PAINTBRUSH HOLDER
Robert K. Yoakman, and William G. Szakacs, both of 811 N. Main St., Crown Point, Ind. 46307
Filed Dec. 31, 1986, Ser. No. 948,287
Term of patent 14 years
U.S. Cl. D32—54



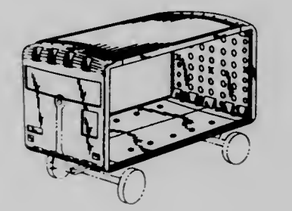


305,820
PAINT BRUSH WIPER
Vincent Beato, 1249 W. 15th St., San Pedro, Calif. 90731
Filed Jul. 23, 1987, Ser. No. 76,937
Term of patent 14 years
U.S. Cl. D32—54

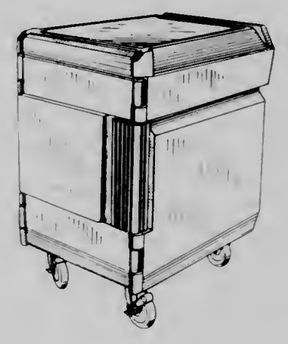


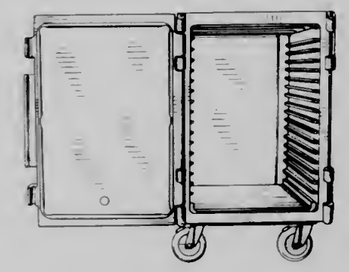


305,821
BAGGAGE CART BODY
Pierre R. Gobier; Mark N. Parson, and Walter D. Compton, all of Orlando, Fla., assignors to United Tractor Company, Cleveland, Ohio
Filed Sep. 24, 1986, Ser. No. 911,624
Term of patent 14 years
U.S. Cl. D34—12



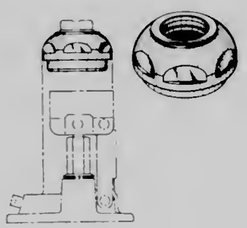
305,822
INSULATED FOOD TRANSPORTING CABINET
Albert Kolvites, Mountaintop; John L. Giangu, Dresher, and Robert J. Cohn, Dallas, all of Pa., assignors to InterMetro Industries Corporation, Wilkes-Barre, Pa.
Filed Sep. 17, 1987, Ser. No. 97,940
Term of patent 14 years
U.S. Cl. D34—19



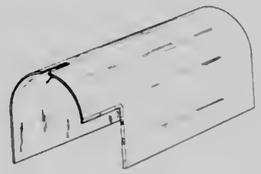


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305,823
MAIN NUT FOR HYDRAULIC JACKS
Anders Persson, Eskilstuna, Sweden, assignor to Aktiebolaget Nike, Eskilstuna, Sweden
Filed Jul. 7, 1988, Ser. No. 216,437
Term of patent 14 years
U.S. Cl. D34—31



305,824
MAILBOX COVER
Nancy B. Carter, 1203 Mountain Rd., Asheboro, N.C. 27203
Filed Mar. 17, 1987, Ser. No. 26,554
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JANUARY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Nakata, Shuichi; Yamamoto, Katsumi; Aono, Toshio; Sugita, Shinichi; and , 4,897,586, Cl. 318-568.100.

A. & M. Cousin Etablissements Cousin Freres: *See*—
Pipon, Yves; and Chales, Bernard, 4,896,398, Cl. 16-337.000.

A.R.I.S.S.p.A.: *See*—
Peretti, Claudio; and Rebuffatti, Guglielmo, 4,896,845, Cl. 244-3.100.

A. V. Syntec Pty Ltd.: *See*—
Bull, Paul F., 4,897,302, Cl. 428-283.000.

Aalborg Vaerft A/S: *See*—
Holm, Ejler L.; and Clausen, Jens C., 4,896,631, Cl. 122-4.00D.

Abb Stal AB: *See*—
Pillai, Krishna K., 4,896,497, Cl. 60-39.120.

Abbe, Robert C.; and Baker, David G., to ADE Corporation. Rotary to linear motion robot arm. 4,897,015, Cl. 414-744.800.

Abbott Laboratories: *See*—
Adjei, Akwete L.; Johnson, Edwin S.; and Kesterson, James W., 4,897,256, Cl. 424-43.000.
Cordle, Christopher T.; Criswell, Larry G.; and Thomas, Ronald L., 4,897,465, Cl. 530-387.000.
Summers, James B., Jr., 4,897,422, Cl. 514-575.000.
Wallace, Patrick B.; and Moore, Larry W., 4,897,244, Cl. 422-100.000.

Abe, Masahiro: *See*—
Katsura, Toshihiko; and Abe, Masahiro, 4,897,172, Cl. 204-298.000.

Absenger, Erich: *See*—
Hatz, Ernst; Kochanowski, Hans A.; and Absenger, Erich, 4,897,024, Cl. 417-499.000.

Abu-Shumays, Ibrahim K.: *See*—
Shumays, Adam A.; Shumays, Sami A.; and Abu-Shumays, Ibrahim K., 4,896,893, Cl. 280-14.200.

Aburaya, Toshio: *See*—
Urababa, Shingo; Buma, Shuuichi; Aburaya, Toshio; Yonekawa, Takashi; Takeda, Osamu; and Doi, Shunichi, 4,897,776, Cl. 364-424.050.

Acampora, Alfonse A., to General Electric Company. DPCM system with adaptive quantizer having unchanging bin number ensemble. 4,897,855, Cl. 375-27.000.

Achter, Eugene K.: *See*—
Arney, Michel D.; Zaccai, Gianfranco; Achter, Eugene K.; Burke, Edward J.; Miskolczy, Gabor; and Sonin, Ain A., 4,896,547, Cl. 73-863.810.

Action Products, Inc.: *See*—
Lawrence, Don R., 4,896,899, Cl. 280-775.000.

Adachi, Hideki: *See*—
Miyamoto, Kazuki; Komiya, Yutaka; Ishida, Masato; Nakamura, Shinichi; Miyata, Masanori; Hirose, Masayuki; Tomosada, Masahiro; and Adachi, Hideki, 4,897,778, Cl. 364-174.000.

Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, to Union Special Corporation. Hemmer seamer assembly. 4,896,619, Cl. 112-306.000.

Adco-Applied Development Co. Inc.: *See*—
Beckett, Thomas A., Jr., 4,896,595, Cl. 101-44.000.

ADE Corporation: *See*—
Abbe, Robert C.; and Baker, David G., 4,897,015, Cl. 414-744.800.

Adema, Gretchen M.: *See*—
Berger, Henry R.; and Adema, Gretchen M., 4,897,287, Cl. 427-96.000.

Adjei, Akwete L.; Johnson, Edwin S.; and Kesterson, James W., to Abbott Laboratories. LHRH analog formulations. 4,897,256, Cl. 424-43.000.

Adler-Golden, Steven M.: *See*—
Gersh, Michael E.; Adler-Golden, Steven M.; Goldstein, Neil M.; and Bien, Fritz, 4,897,551, Cl. 250-461.100.

Administrators of the Tulane Educational Fund, The: *See*—
Coy, David H.; and Hocart, Simon J., 4,897,445, Cl. 525-54.110.

Advanced Micro Devices, Inc.: *See*—
Nix, Michael A., 4,897,810, Cl. 364-900.000.

Aeroquip Corporation: *See*—
Bradley, Andrew H.; Knowles, Steven M.; and Pilon, Frederick J., 4,896,696, Cl. 137-513.300.

Aerospatiale Societe Nationale Industrielle: *See*—
Blin, Michel, 4,897,006, Cl. 411-368.000.
Ravel, Maurice; and Viala, Jean, 4,896,502, Cl. 60-270.100.

Aerovox, Inc.: *See*—
Bourbeau, Emile J., 4,897,760, Cl. 361-272.000.

Agano, Toshitaka; and Okamoto, Yoshihiko, to Fuji Photo Film Co., Ltd. Radiation image recording, read-out and reproducing apparatus. 4,897,546, Cl. 250-327.200.

Agfa-Gevaert Aktiengesellschaft: *See*—
Odenwalder, Heinrich; Ohlschlager, Hans; Kunitz, Friedrich-Wilhelm; and Hubner, Dirk, 4,897,341, Cl. 430-544.000.

AGFA-Gevaert, N.V.: *See*—
De Keyzer, Francis J.; and Moelants, Jean P., 4,897,689, Cl. 355-79.000.

Agiman, Dan, to Texas Instruments Incorporated. High gain driver circuit and method. 4,897,594, Cl. 323-273.000.

Aida, Shunichi: *See*—
Ikeda, Tadashi; Takei, Haruo; and Aida, Shunichi, 4,897,343, Cl. 430-570.000.

Air Products and Chemicals, Inc.: *See*—
Burgoyne, William F., Jr.; and Langsam, Michael. 4.897.092. Cl 55-16.000.

Aisin AW Kabushiki Kaisha: *See*—
Ito, Yasunobu; and Mizuno, Yasuo, 4,896,569, Cl. 74-866.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hoshihara, Naoaki, 4,896,918, Cl. 297-284.000.
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Sakane, Shinsuke; and Miyachi, Tetsuya, 4,896,924, Cl. 303-96.000.
Nagashima, Takashi; and Miura, Eiji, 4,896,923, Cl. 303-9.630.
Uehara, Yuzuru; and Hanano, Jiro, 4,897,554, Cl. 290-38.00R.

Aisin-Warner Limited: *See*—
Hayakawa, Yoichi; Kobatake, Tamotu; Fukumura, Kagenori; and Nishikawa, Seiichi, 4,896,561, Cl. 74-606.00R.
Miura, Masakatsu; Iwatsuki, Tatsuya; and Kubo, Seitoku, 4,896,739, Cl. 180-248.000.

Ajinomoto Co., Inc.: *See*—
Sakamoto, Hiroshi; and Takeuchi, Koji, 4,897,460, Cl. 528-113.000.
Takahashi, Satoji; and Takemoto, Tadashi, 4,897,507, Cl. 560-41.000.

Ajioka, Masanobu: *See*—
Mita, Ryuichi; Oura, Takeshi; Katoh, Toshio; Higuchi, Chojiro; Yamaguchi, Akihiro; and Ajioka, Masanobu, 4,897,506, Cl. 560-41.000.

Akebi, Kazuhiko: *See*—
Itaya, Hisao; Akebi, Kazuhiko; and Okabe, Minoru, 4,897,511, Cl. 128-18.000.

Akema, Tsuyoshi, to Emhart Industries, Inc. Bundling band. 4,896,852, Cl. 248-74.300.

Akermans Verkstad AB: *See*—
Tordenmalm, Lars O.; and Bruhn, Ingvar, 4,896,582, Cl. 91-361.000.

Akiba, Juji, to Junkosha Co., Ltd. Solvent leak detecting sensor. 4,896,527, Cl. 73-40.50R.

Akiba, Shigeyuki: *See*—
Utaka, Katsuyuki; Matsushima, Yuichi; Sakai, Kazuo; and Akiba, Shigeyuki, 4,897,845, Cl. 372-45.000.

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Kikuchi, Tohru; Kawakami, Hiroyuki; Saito, Takayuki; Yagi, Masaki; Nakahara, Yutaka; and Takahashi, Hiroshi, 4,897,438, Cl. 524-342.000.

Hitachi, Ltd.: *See*—
Daikoku, Takahiro; and Takagi, Ryuichi, 4,897,762, Cl. 361-382.000.
Kawasaki, Ikuya; Kurakazu, Keiichi; and Maejima, Hideo, 4,897,787, Cl. 364-200.000.
Kazama, Yoshiharu; and Nagafuji, Motonobu, 4,897,801, Cl. 364-521.000.
Kokunishi, Motohide; Uehara, Tetsuzou; Sakamoto, Satoru; and Tada, Mamoru, 4,897,638, Cl. 340-751.000.
Konishi, Hiroo; and Matsuda, Yasuo, 4,897,593, Cl. 323-210.000.
Miwa, Hiroaki; Tajima, Tetsuo; and Sudo, Ryoichi, 4,897,228, Cl. 264-22.000.
Nagano, Masami; Atago, Takeshi; Miyake, Junji; and Sakamoto, Masahide, 4,896,641, Cl. 123-422.000.
Oguino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, 4,897,581, Cl. 315-408.000.
Sekozawa, Teruji; Shioya, Makoto; and Funabashi, Motohisa, 4,897,791, Cl. 364-431.050.
Tsuchitani, Shigeki; and Yamada, Kazuji, 4,896,930, Cl. 350-96.120.
Wakumura, Shin-ichi; Miyake, Ichiro; Okamoto, Hiroo; and Hatanaka, Yuuji, 4,897,653, Cl. 341-95.000.
Yoda, Haruo; Inouchi, Hidenori; Sakou, Hiroshi; and Ohuchi, Yozo, 4,897,795, Cl. 364-488.000.
Yokoyama, Natsuki; Homma, Yoshio; Hinode, Kenji; and Mukai, Kiichiro, 4,897,709, Cl. 357-68.000.

Hitachi Maxell, Ltd.: *See*—
Doi, Hajime; Yamakawa, Toru; Matsumoto, Fujio; and Mizushima, Kunio, 4,897,752, Cl. 360-133.000.
Goto, Shinichi, 4,897,751, Cl. 360-132.000.
Miwa, Hiroaki; Tajima, Tetsuo; and Sudo, Ryoichi, 4,897,228, Cl. 264-22.000.

Hitachi Metals, Ltd.: *See*—
Dekura, Takateru; and Endo, Juro, 4,897,211, Cl. 252-54.000.

Hiuga, Takehiro: *See*—
Matsumoto, Kazutoshi; Takada, Ko; Hiuga, Takehiro; and Mukai, Tetsuya, 4,897,374, Cl. 501-134.000.

Ho, Floyd F.-L., to Hercules Incorporated. Plasma treatment with organic vapors to promote a meal adhesion of polypropylene film. 4,897,305, Cl. 428-333.000.

Hocart, Simon J.: *See*—
Coy, David H.; and Hocart, Simon J., 4,897,445, Cl. 525-54.110.

Hochiki Kabushiki Kaisha: *See*—
Sawa, Hiroshi; Miyabe, Atsushi; Kawai, Hironobu; and Honma, Hiroshi, 4,897,634, Cl. 340-630.000.

Hock, Darryl A.; and Kaleita, David L., to Jabil Circuit Company. Power door lock interlock circuit. 4,897,632, Cl. 340-457.000.

Hockenberger, Lothar: *See*—
Robinson, Raymond; Lee, Timothy C. P.; Endruscheit, Peter; Hockenberger, Lothar; Bergmann, Franz-Josef; Ruehl, Karl; and Scherp, Ernst, 4,897,443, Cl. 524-609.000.

Hoechst Aktiengesellschaft: *See*—
Boergerding, Heinz; and Stroszynski, Joachim, 4,897,168, Cl. 204-129.430.

Hoechst Roussel Pharmaceuticals, Inc.: *See*—
Hrib, Nicholas J., 4,897,496, Cl. 549-229.000.
Tegeler, John J.; Gardenhire, Eileen M.; and Helsley, Grover C., 4,897,392, Cl. 514-219.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Shutske, Gregory M., 4,897,400, Cl. 514-289.000.

Hoffman-La Roche Inc.: *See*—
Leenhouts, Frans, 4,896,947, Cl. 350-337.000.

Hofmann, Ruediger, to Siemens Aktiengesellschaft. Broadband signal switching equipment. 4,897,645, Cl. 340-825.910.

Hoggenstaller, Rolf: *See*—
Hauser, Georg; and Hoggenstaller, Rolf, 4,896,617, Cl. 112-176.000.

Hohmann, Michael: *See*—
Jonsson, Sigurd; Hohmann, Michael; Gross, Gerhard; and Bergmann, Hans W., 4,897,111, Cl. 75-0.50C.

Holik, Herbert: *See*—
Weissahuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,897,158, Cl. 162-259.000.

Holle, Eerke, to U.S. Philips Corporation. Band-gap reference voltage circuit with feedback to reduce common mode voltage. 4,897,595, Cl. 323-314.000.

Holleran, Louis M.; MacDowell, John F.; and Martin, Francis W., to Corning Incorporated. Glass-ceramics for electronic packaging. 4,897,509, Cl. 174-258.000.

Hollevoet, Willy C.: *See*—
Desnijder, Dirk J.; Gunst, Wilfried E. D.; Hollevoet, Willy C.; Jonckheere, Marc R. M.; and Van Herpe, Francois, 4,897,071, Cl. 460-10.000.

Holleyman, John E. Pressurized-fluid-operated engine. 4,896,505, Cl. 60-370.000.

Holm, Ejler L.; and Clausen, Jens C., to Aalborg Vaerft A/S. Fluidized bed reactor. 4,896,631, Cl. 122-4.00D.

Holmes, Michael, to Lucas Industries public limited company. Method and apparatus for engine control and combustion quality detection. 4,896,639, Cl. 123-419.000.

Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. 1-hydroxyethyl-azole compounds and agricultural compositions. 4,897,107, Cl. 71-92.000.

Holmwood, Graham: *See*—
Brandes, Wilhelm; Hansaler, Gerd; Reinecke, Paul; Scheinpflug, Hans; and Holmwood, Graham, 4,897,410, Cl. 514-383.000.

Holt, John K.; Vaughan, David E.; and Creswell, Roger L., to Harbor Branch Oceanographic Institution, Inc. Shellfish culture methods and apparatus. 4,896,626, Cl. 119-4.000.

Homma, Yoshio: *See*—
Yokoyama, Natsuki; Homma, Yoshio; Hinode, Kenji; and Mukai, Kiichiro, 4,897,709, Cl. 357-68.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hikichi, Koichi; and Minami, Hideyuki, 4,896,550, Cl. 74-6.000.

Namiki, Kou; Mukumoto, Takaji; and Gunji, Keiichiro, 4,897,016, Cl. 414-757.000.
Sato, Chiharu; Kamiyama, Yoichi; and Ikegami, Hiroyuki, 4,896,921, Cl. 301-5.00R.
Shitanoki, Kazuaki; Kusumi, Masashi; Shinozaki, Hidetaka; and Higuchi, Takahiro, 4,896,742, Cl. 180-270.000.

Honeycutt, LeRoy, to National Aluminum Corporation. Apparatus for and process of direct casting of metal strip. 4,896,715, Cl. 164-479.000.

Honeywell Inc.: *See*—
Iwasa, Shigesato; Butler, Neal R.; and McClelland, Jeff L., 4,897,547, Cl. 250-338.100.
Jenson, Mark L., 4,897,288, Cl. 427-123.000.
Kasprzyk, Donald J., 4,897,051, Cl. 439-620.000.

Hong, Wu-Hsin, to Hsin Yu Album Enterprise Co., Ltd. Loose-leaf photo album. 4,896,900, Cl. 281-15.100.

Honma, Hiroshi: *See*—
Sawa, Hiroshi; Miyabe, Atsushi; Kawai, Hironobu; and Honma, Hiroshi, 4,897,634, Cl. 340-630.000.

Honma, Mikio: *See*—
Hayakawa, Hatsuo; and Honma, Mikio, 4,896,907, Cl. 292-216.000.

Honsho, Hironori: *See*—
Tanaka, Tetsuro; Kajino, Jirou; Shimizu, Yoshiyuki; Saito, Fuminari; and Honsho, Hironori, 4,897,744, Cl. 360-94.000.

Hood, Clarence E., Jr.; Garrett, Thomas R.; and DuBose, Charles R., to Clemson University. Hopper for dispensing seed, grain and the like. 4,896,615, Cl. 111-177.000.

Hook, Randall L.: *See*—
Farmer, Marion R.; and Hook, Randall L., 4,896,856, Cl. 248-219.400.

Hopper, James H. Automatic fishhook baiting system. 4,896,449, Cl. 43-4.000.

Horaguchi, Mitsuhiro; Tomisawa, Shigechika; Iida, Yukio; and Tonomura, Joji, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treating exhaust gas. 4,897,248, Cl. 423-240.000.

Hordyk, Jan; Grande, Karel A.; and Pickard, Douglas M., to RMT Engineering Ltd. Transport system. 4,896,763, Cl. 198-803.200.

Hori, Yasuaki: *See*—
Nakamura, Hitoshi; and Hori, Yasuaki, 4,896,990, Cl. 403-162.000.

Horie, Hironobu: *See*—
Hikishima, Keisaku; Horie, Hironobu; and Watanabe, Kosaku, 4,896,487, Cl. 56-11.800.

Horie, Kiyoshi: *See*—
Akutsu, Eiichi; Saito, Koichi; Fujimura, Yoshihiko; Inoue, Nanao; Horie, Kiyoshi; and Fujimagari, Hiroshi, 4,897,669, Cl. 346-76.0PH.

Horie, Yoshihiro: *See*—
Ito, Masazumi; and Horie, Yoshihiro, 4,897,695, Cl. 355-233.000.

Horiguchi, Yasunobu; Yamamoto, Nobuyuki; and Goto, Tuyoshi, to Lion Corporation. Process for preparing ceramics composite sintered bodies. 4,897,370, Cl. 501-5.000.

Horiuchi, Kenji; and Ichinose, Toru, to Yamaha Hatsudoki Kabushiki Kaisha. Supercharged motor vehicle. 4,896,734, Cl. 180-68.300.

Horiuchi, Mamoru; Wada, Yoshinori; Shimizu, Hirotoshi; Uehara, Yuji; Wanou, Masahiro; and Kimura, Masatoshi, to Fujitsu Limited. Method and apparatus for detecting and compensating light emission from an LED array. 4,897,672, Cl. 346-107.00R.

Hosford, Gregory S., to Sundstrand Corporation. Solar power system. 4,896,507, Cl. 60-641.800.

Hoshihara, Naoaki, to Aisin Seiki Kabushiki Kaisha. Lumbar support regulating apparatus. 4,896,918, Cl. 297-284.000.

Hoshino, Mitsuru: *See*—
Yusa, Haruhiko; Hoshino, Mitsuru; and Isaka, Haruki, 4,897,462, Cl. 528-486.000.

Hoskin, Dennis H.; and Shu, Paul, to Mobil Oil Corporation. Cross-linked polyvinyl alcohols and oil reservoir permeability control therewith. 4,896,723, Cl. 166-272.000.

Hosoi, Masayuki, to Pioneer Electronic Corporation. Method of memorizing travel locus data for use in an automotive navigation system. 4,897,792, Cl. 364-449.000.

Hossain, Shafi U.; and Smith, Kenneth R., to Kimberly-Clark Corporation. Virucidal composition, the method of use and the product therefor. 4,897,304, Cl. 428-289.000.

Hoszowski, Andrew K., to Moeller Mfg. Co. Insert for a boat trailer roller. 4,896,758, Cl. 193-37.000.

Houghton, Thomas J., to Phillips Petroleum Company. Hydrodesulfurization pressure control. 4,897,181, Cl. 208-209.000.

Howk, Richard A.: *See*—
Weetman, Ronald J.; and Howk, Richard A., 4,896,971, Cl. 366-330.000.

Howland, Leland L., to Thermo King Corporation. Compartmentalized transport refrigeration system. 4,896,512, Cl. 62-117.000.

Howlett, David J., to Bespak PLC. Dispensing apparatus for metered quantities of pressurised fluid. 4,896,832, Cl. 239-322.000.

Hoyle, Michael D.; and Snyder, Charles V., to Carbonic Technologies, Inc. Carbon dioxide storage and dispensing apparatus and method. 4,897,226, Cl. 261-129.000.

Hrib, Nicholas J., to Hoechst Roussel Pharmaceuticals, Inc. Method of synthesizing forskolin from 9-deoxyforskolin. 4,897,496, Cl. 549-229.000.

Hsia, Chung-Hueng; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corp. Catalytic reactor system for conversion of light olefin to heavier hydrocarbons with sorption recovery of unreacted olefin vapor. 4,897,245, Cl. 422-131.000.

Hsin Yu Album Enterprise Co., Ltd.: *See*—
Hong, Wu-Hsin, 4,896,900, Cl. 281-15.100.

Huang, Shyh-Chin, to General Electric Company. Rapidly solidified and heat-treated manganese and niobium-modified titanium aluminum alloys. 4,897,127, Cl. 148-133.000.

Hubbell Incorporated: *See*—
Heath, Kenneth A., 4,896,784, Cl. 220-3.200.

Hubele, Adolf, to Ciba-Geigy Corporation. 2-phenylamino pyrimidine derivatives and their uses as microbicides. 4,897,396, Cl. 514-275.000.

Huben, Aart P.: *See*—
Patron, Christian S. A. E.; Sowinski, Eugene J.; and Huben, Aart P., 4,897,619, Cl. 331-167.000.

Huber, Didier: *See*—
LeClerc, Gerard; Huber, Didier; Himber, Jacques; and Andermann, Guy, 4,897,412, Cl. 514-401.000.

Hubig, markus: *See*—
Maschlanka, Walter; and Hubig, markus, 4,896,810, Cl. 266-200.000.

Hubl, Dieter; Pieroh, Ernst-Albrecht; Richter, Eberhard; and Puttner, Reinhold, to Schering Aktiengesellschaft. 2-imino-1,3-dithietanes, their use as pesticides. 4,897,415, Cl. 514-430.000.

Hubner, Dirk: *See*—
Odenwalder, Heinrich; Ohlschlager, Hans; Kunitz, Friedrich-Wilhelm; and Hubner, Dirk, 4,897,341, Cl. 430-544.000.

Huck Manufacturing Company: *See*—
Rosier, Hendrik E., 4,896,522, Cl. 72-391.000.

Hudson, Carl E. Multi-tank/multi-pump water pressure booster system. 4,897,022, Cl. 417-7.000.

Hueckler, Volker; and Eckhardt, Ulrich, to Deere & Company. Wheel bearing support. 4,896,740, Cl. 180-255.000.

Huels Aktiengesellschaft: *See*—
Bickert, Peter, 4,897,474, Cl. 536-119.000.

Hufnagel, Robert E.: *See*—
Akkapeddi, Prasad R.; and Hufnagel, Robert E., 4,897,325, Cl. 430-5.000.

Hughes Aircraft Company: *See*—
Shahriary, Iradj; Des Brisay, George S., Jr.; and Avery, Susan K., 4,897,809, Cl. 364-784.000.

Hughes, Donald W. K.: *See*—
Connell, Alistair D.; Hughes, Donald W. K.; and VanDerStuyf, Allen P., 4,897,047, Cl. 439-189.000.

Hughes, John B.; and MacBeth, Ian C., to U.S. Philips Corporation. Circuit arrangement for processing sampled analogue electrical signals. 4,897,596, Cl. 323-315.000.

Hughes, John L., to Austral Asian Lasers Ltd. Compact slab laser oscillator-amplifier system. 4,897,849, Cl. 372-66.000.

Hughes Lan Systems, Inc.: *See*—
Gang, Joseph M., Jr., 4,897,841, Cl. 370-85.130.

Hughes, Nathaniel, to Vortran Corporation. Vortex generating mass flowmeter. 4,896,541, Cl. 73-861.220.

Hui, Benjamin C.; and Victoriano, Luis I., to CVD Incorporated. Method of deactivating residues of the production of dimethylaluminum hydride and dimethylgallium hydride. 4,897,500, Cl. 556-187.000.

Hull, Donald E.; and Bieniewski, Thomas M., to United States of America, Energy. Method of processing materials using an inductively coupled plasma. 4,897,579, Cl. 315-111.510.

Hull, Harold L.; and Partee, Charles. Cleaning device. 4,896,392, Cl. 15-1.700.

Hull, Harold L.; Tostenson, Carroll T.; and Tostenson, Drusilla M. Self sharpening wood log slicer. 4,896,574, Cl. 83-675.000.

Hunan Research Inst. of Machinery: *See*—
Zhou, Ganxu, 4,896,567, Cl. 74-804.000.

Hunt, Terance J. Building block and system. 4,896,472, Cl. 52-593.000.

Hunt, Warren H., Jr.: *See*—
Bretz, Philip E.; Sawtell, Ralph R.; and Hunt, Warren H., Jr., 4,897,126, Cl. 148-12.70A.

Hunter, Robert L., to Emory University. Methods and compositions for treatment of pathological hydrophobic interactions in biological fluids. 4,897,263, Cl. 424-83.000.

Hunter, Robert M. Portable wastewater flow meter. 4,896,542, Cl. 73-861.630.

Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. High thermal conductivity ceramic body. 4,897,372, Cl. 501-96.000.

Hutto, Joe D., to Masco Corporation of Indiana. Combination plaster guard and mounting bracket for mixing valve. 4,896,381, Cl. 4-191.000.

Hutton, Thomas W.; and Merritt, Richard F., to Rohm and Haas Company. Oil soluble quaternary ammonium monomers. 4,897,499, Cl. 549-552.000.

Hy-Roll Manufacturing, Inc.: *See*—
Ellis, Arthur S., 4,896,714, Cl. 160-311.000.

Hyde, William W. Electrostatic energy field power generating system. 4,897,592, Cl. 322-2.00A.

Hylsa, S.A.: *See*—
Becerra-Novoa, Jorge-Octavio; Lopez-Gomez, Ronald-Victor-Manuel; Dominguez-Ahedo, Carlos; and Chapa-Martinez, Leobardo, 4,897,113, Cl. 75-34.000.

Hylton, Charles L.: *See*—
Wilkinson, Ivan E.; Hylton, Charles L.; and Pence, R. Gregory, 4,896,562, Cl. 74-626.000.

Ibusuki, Masumi; and Ishikawa, Hidehito, to G-C Dental Industrial Corp. Deatal astral lamp. 4,897,772, Cl. 362-282.000.

Icardi, Marco: *See*—
Baldi, Livio; Beardo, Daniela; Icardi, Marco; and Rebora, Adriana, 4,897,365, Cl. 437-69.000.

Ichimura, Horosi: *See*—
Iwahara, Makotoi; Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Horosi; Negishi, Ichiro; Osada, Masaru; and Katase, Wataru, 4,897,730, Cl. 358-217.000.

Ichinose, Isao: *See*—
Shida, Takafumi; Kubota, Yoshikazu; Ichinose, Isao; Yamazaki, Shiro; and Shinkawa, Hiroyasu, 4,897,106, Cl. 71-92.000.

Ichinose, Toru: *See*—
Horiuchi, Kenji; and Ichinose, Toru, 4,896,734, Cl. 180-68.300.

Ichise, Atsushi; Kondo, Yoshiyuki; Hirayasu, Masatoshi; and Inoue, Kenji, to Sony Corporation. Passenger vehicle service system. 4,897,714, Cl. 358-86.000.

Idea Resources Corporation: *See*—
Harrington, Max G., 4,896,820, Cl. 229-100.000.

Iden, Ruediger: *See*—
Eilingsfeld, Heinz; and Iden, Ruediger, 4,897,469, Cl. 534-605.000.

Idenawa, Hiroyuki, to Ricoh Company, Ltd. Sheet feeder for an image recording apparatus. 4,896,871, Cl. 271-9.000.

Igarashi, Noriko: *See*—
Kaneko, Mutsuo; Suzuki, Isamu; Sato, Chuichi; Igarashi, Noriko; and Nishimura, Yumi, 4,896,677, Cl. 128-696.000.

Iida, Shigehira: *See*—
Arai, Takayoshi; Iida, Shigehira; Saitoh, Keishi; Hashizume, Junichiro; and Takei, Tetsuya, 4,897,281, Cl. 427-8.000.
Arai, Takayoshi; Iida, Shigehira; Hashizume, Junichiro; Takei, Tetsuya; and Saitoh, Keishi, 4,897,284, Cl. 427-39.000.

Iida, Takenobu; Shiina, Jojiro; and Yasukawa, Minoru, to Iwasaki Electric Co., Ltd. Metal vapor discharge lamp having starter therein. 4,897,576, Cl. 315-73.000.

Iida, Yukio: *See*—
Horaguchi, Mitsuhiro; Tomisawa, Shigechika; Iida, Yukio; and Tonomura, Joji, 4,897,248, Cl. 423-240.000.

Iijima, Ikuo; Ozeki, Masakatsu; Okumura, Kunihito; and Inamasu, Masanori, to Tanabe Seiyaku Co., Ltd. Benzoxazole derivatives. 4,897,393, Cl. 514-233.800.

Iijima, Tashi: *See*—
Nankai, Shiro; Kawaguri, Mariko; and Iijima, Tashi, 4,897,173, Cl. 204-403.000.

Iizuka, Yo: *See*—
Kouyama, Toshitaka; Katto, Takayuki; Shiiki, Zenya; Satake, Yoshikatsu; Mizuno, Toshiya; and Iizuka, Yo, 4,897,238, Cl. 264-288.400.

Ikeda Bussan Co., Ltd.: *See*—
Muraishi, Masakazu; and Matsuura, Ichiro, 4,896,919, Cl. 297-452.000.

Ikeda, Miyuki: *See*—
Oguino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, 4,897,581, Cl. 315-408.000.

Ikeda, Tadashi; Takei, Haruo; and Aida, Shunichi, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,897,343, Cl. 430-570.000.

Ikegami, Hiroyuki: *See*—
Sato, Chiharu; Kamiyama, Yoichi; and Ikegami, Hiroyuki, 4,896,921, Cl. 301-5.00R.

Ikekawa, Nobuo; and Eguchi, Tadashi, to Yamanouchi Pharmaceutical Co., Ltd. Novel vitamin D_3 derivatives. 4,897,387, Cl. 514-167.000.

Ikenishi, Masataka, to Seiko Instruments Inc. Magnetic shielding structure of analog electronic timepiece. 4,897,825, Cl. 368-228.000.

Ikoma, Keiko; Kurihara, Noriko; Hirabayashi, Keiji; and Itoh, Susumu, to Canon Kabushiki Kaisha. Cardlike optical recording medium. 4,897,829, Cl. 369-288.000.

Ilardi, Joseph M.: *See*—
Spicciati, Frank A.; Fraenkel, Howard A.; Ilardi, Joseph M.; and Kurtz, Bruce E., 4,897,338, Cl. 430-314.000.

Illinois Tool Works Inc.: *See*—
Knight, Richard K., 4,897,074, Cl. 493-381.000.

Im, Byung-Do; and Spector, George. Protecting sleeve with cover and clip. 4,896,983, Cl. 401-107.000.

Imada, Isuke: *See*—
Watanabe, Masazumi; and Imada, Isuke, 4,897,420, Cl. 514-546.000.

Imi-Tech Corporation: *See*—
Ferro, Gregory A., 4,897,234, Cl. 264-109.000.

Imperial Chemical Industries PLC: *See*—
Marbrow, Richard A., 4,897,377, Cl. 503-227.000.

Inaba, Fumio: *See*—
Yoshida, Tomoaki; Inaba, Fumio; Ito, Hiromasa; Saito, Tetsuro; Sato, Shiro; and Azumi, Junichi, 4,897,846, Cl. 372-46.000.

Inamasu, Masanori: *See*—
Iijima, Ikuo; Ozeki, Masakatsu; Okumura, Kunihito; and Inamasu, Masanori, 4,897,393, Cl. 514-233.800.

Industrial Technology Research Institute: *See*—
Lai, Kou-Yea, 4,897,677, Cl. 346-155.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
DeMoate, Filippo, 4,897,651, Cl. 341-23.000.

Ingersoll-Rand Company: *See*—
Massey, C. Richard, 4,896,890, Cl. 277-3.000.

Inglis, John, to Otis Elevator Company. Modular elevator system. 4,896,747, Cl. 187-1.00R.

Innovative Design and Marketing, Inc.: *See*—
Milton, Edward L., 4,896,798, Cl. 222-307.000.

Ino, Mayumi, to Casio Computer Co., Ltd. Accompaniment line principal tone determination system. 4,896,576, Cl. 84-634.000.

Inouchi, Hidenori: *See*—
Yoda, Haruo; Inouchi, Hidenori; Sakou, Hiroshi; and Ohuchi, Yozo, 4,897,795, Cl. 364-488.000.

Inoue, Hidekimi: *See*—
Kajita, Ryota; and Inoue, Hidekimi, 4,896,885, Cl. 273-167.00H.

Inoue, Hitoshi; Koyama, Hiroyasu; Kubota, Reiko; and Komatsu, Hirohiko, to Nisshin Flour Milling Co., Ltd. Rhodanine derivatives and pharmaceutical compositions. 4,897,406, Cl. 514-369.000.

Inoue, Kenji: *See*—
Ichise, Atsushi; Kondo, Yoshiyuki; Hirayasu, Masatoshi; and Inoue, Kenji, 4,897,714, Cl. 358-86.000.

Inoue, Nanao: *See*—
Akutsu, Eiichi; Saito, Koichi; Fujimura, Yoshihiko; Inoue, Nanao; Horie, Kiyoshi; and Fujimagari, Hiroshi, 4,897,669, Cl. 346-76.0PH.

Inoue, Syuzi; Osawa, Hideki; and Nakagawa, Nobumasa, to Sanyo Electric Co., Ltd. Signal recording apparatus. 4,897,741, Cl. 360-64.000.

Inoue, Takeshi: *See*—
Inoue, Yoshihito; Yamaguchi, Takashi; Saito, Masashi; and Inoue, Takeshi, 4,897,373, Cl. 501-134.000.

Inoue, Tohru: *See*—
Yamagishi, Atsuhiro; Yoshida, Hideo; Inoue, Tohru; Nishijima, Toshihisa; and Oda, Yoshiaki, 4,897,839, Cl. 371-37.100.

Inoue, Yoichi, to Mitsuba Electric Manufacturing Co., Ltd. Waterproof device for joint section. 4,896,988, Cl. 403-134.000.

Inoue, Yoshihito; Yamaguchi, Takashi; Saito, Masashi; and Inoue, Takeshi, to Mitsubishi Mining and Cement Co., Ltd. Dielectric ceramic composition. 4,897,373, Cl. 501-134.000.

Inselmann, Jurgen, to Herbert Kannegiesser GmbH & Co. Process and apparatus for bonding textile sheet-like structures. 4,897,147, Cl. 156-498.000.

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Kobler, Ingo, to Man Roland Druckmaschinen AG. Compact transport and storage system for folded or connected sheet products. 4,896,870, Cl. 270-60.000.

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Kohno, Keiichi, to Fujitsu Limited. Method and apparatus for releasing a magnetic head. 4,897,743, Cl. 360-75.000.

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Simon, Jaime; Volkert, Wynn A.; Wilson, David A.; Troutner, David E.; and Goeckeler, William F., to Dow Chemical Company, The. Radioactive compositions for the treatment of calcific tumors. 4,897,254, Cl. 424-1.100.

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Singletary, David L. Stroller carseat apparatus. 4,896,894, Cl. 280-30.000.

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Slusser, Boyd C., to Sebright Products, Incorporated. Vertical trash compactor. 4,896,593, Cl. 100-53.000.

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Smeltzer, Ronald K., to Harris Corporation. Method of making silicon-on-insulator islands. 4,897,366, Cl. 437-83.000.

Smith, Abbott; Rees, James D.; Bartman, David A.; and Aser, Gilbert, deceased (by Aser, Diane B., executrix), to Xerox Corporation. Document imaging system with bi-directional anamorphic magnification capability. 4,897,688, Cl. 355-52.000.

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Zubar, Eduard; and Patrick, John R., to Siemens Energy & Automation, Inc. Securing device for the switch handle of a circuit breaker. 4,897,515, Cl. 200-43.140.

Zuger, Stefan, to BBC Brown, Boveri & Company, Limited. Search system for locating values in a table using address compare circuit. 4,897,785, Cl. 364-200.000.

Zylstra, Henry J., to Square D Company. Add-on ground fault module. 4,897,756, Cl. 361-44.000.

2V Industries, Inc.: *See*—
Bedi, Ram D.; and Benedyk, Donald T., 4,897,095, Cl. 55-279.000.

501 Schmalbach Lubeca AG: *See*—
Bolte, Georg; Heinecke, Dieter; Hexel, Gunter; and Hinterwaldner, Rudolf, 4,896,788, Cl. 220-359.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JANUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abon Corporation: *See*—
Hahn, Norbert; and Olson, Arthur A., Jr., Re. 33,154, Cl. 414-401.000.

Akutsu, Eiichi; Murakami, Kakuji; and Aruga, Tamotsu, to Ricoh Company, Limited. Aqueous ink for ink jet printing. Re. 33,155, Cl. 106-22.000.

Aruga, Tamotsu: *See*—
Akutsu, Eiichi; Murakami, Kakuji; and Aruga, Tamotsu, Re. 33,155, Cl. 106-22.000.

DeSoto, Inc.: *See*—
Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., Re. 33,156, Cl. 526-301.000.

Eldridge, Emmojean: *See*—
Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., Re. 33,156, Cl. 526-301.000.

Hahn, Norbert; and Olson, Arthur A., Jr., to Ahon Corporation. Vehicle restraint. Re. 33,154, Cl. 414-401.000.

Heck, Joseph P., to Motorola, Inc. Null initiated method and system for monitoring a priority channel. Re. 33,157, Cl. 455-166.000.

Kail, James E.: *See*—
Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., Re. 33,156, Cl. 526-301.000.

Motorola, Inc.: *See*—
Heck, Joseph P., Re. 33,157, Cl. 455-166.000.

Murakami, Kakuji: *See*—
Akutsu, Eiichi; Murakami, Kakuji; and Aruga, Tamotsu, Re. 33,155, Cl. 106-22.000.

Olson, Arthur A., Jr.: *See*—
Hahn, Norbert; and Olson, Arthur A., Jr., Re. 33,154, Cl. 414-401.000.

Ricoh Company, Limited: *See*—
Akutsu, Eiichi; Murakami, Kakuji; and Aruga, Tamotsu, Re. 33,155, Cl. 106-22.000.

Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., to DeSoto, Inc. Alkali soluble latex thickeners. Re. 33,156, Cl. 526-301.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Gieschen, John A., to Nordberg Inc. Conical crusher. B1 4,478,373, 1-30-90, Cl. 241-208.000.

Klock, John C.: *See*—
Mielke, C. Harold; Scannon, Patrick J.; Sohmer, Paul R.; and Klock, John C., B1 4,664,913, Cl. 424-101.000.

Martens, John A.; and Williams, Brian H., to Minnesota Mining and Manufacturing Company. Processable radiation curable poly(vinyl chloride) resin compositions. B1 4,559,382, 1-30-90, Cl. 524-535.000.

Mielke, C. Harold; Scannon, Patrick J.; Sohmer, Paul R.; and Klock, John C., to Xoma Corporation. Method for treating plasma for transfusion. B1 4,664,913, 1-30-90, Cl. 424-101.000.

Minnesota Mining and Manufacturing Company: *See*—
Martens, John A.; and Williams, Brian H., B1 4,559,382, Cl. 524-535.000.

Nordberg Inc.: *See*—
Gieschen, John A., B1 4,478,373, Cl. 241-208.000.

Scanley, Clyde S. Dispersions of water soluble polymers in oil. B1 4,052,353, 1-30-90, Cl. 524-801.000.

Scannon, Patrick J.: *See*—
Mielke, C. Harold; Scannon, Patrick J.; Sohmer, Paul R.; and Klock, John C., B1 4,664,913, Cl. 424-101.000.

Sohmer, Paul R.: *See*—
Mielke, C. Harold; Scannon, Patrick J.; Sohmer, Paul R.; and Klock, John C., B1 4,664,913, Cl. 424-101.000.

Williams, Brian H.: *See*—
Martens, John A.; and Williams, Brian H., B1 4,559,382, Cl. 524-535.000.

Xoma Corporation: *See*—
Mielke, C. Harold; Scannon, Patrick J.; Sohmer, Paul R.; and Klock, John C., B1 4,664,913, Cl. 424-101.000.

LIST OF DESIGN PATENTEES

A/S Jotul: *See*—
Heger, Niels E., 305,794, Cl. D23-344.000.

Akabane, Jun, to Nikon Corporation. Camera. 305,770, 1-30-90, Cl. D16-209.000.

Aktiebolaget Nike: *See*—
Persson, Anders, 305,823, Cl. D34-31.000.

Allen, David O., to Allen Tool Company, Inc. Combined closure and opener for container. 305,734, 1-30-90, Cl. D9-438.000.

Allen Tool Company, Inc.: *See*—
Allen, David O., 305,734, Cl. D9-438.000.

Allendorph, L. David, to Navistar International Transportation Corp. Exterior shell of an aerodynamic highway tractor. 305,746, 1-30-90, Cl. D12-96.000.

Amco Corporation: *See*—
Bruno, Pasquale, 305,715, Cl. D7-79.000.

Aoki, Hiroyuki: *See*—
Kaneko, Akiyoshi; Ito, Masamoto; and Aoki, Hiroyuki, 305,748, Cl. D12-110.000.

Arjani, Farouk: *See*—
Weber, Betsy; Arjani, Farouk; and Varga, Richard A., 305,809, Cl. D28-76.000.

Ashcraft, Wesley R. Battering ram. 305,718, 1-30-90, Cl. D8-14.000.

Babcock, Lowell C. Salt block carrier. 305,719, 1-30-90, Cl. D8-14.000.

Balbuena, Jesus B. Cordless headset telephone. 305,759, 1-30-90, Cl. D14-147.000.

Barkley, Jeffrey C. Novelty contact lens. 305,768, 1-30-90, Cl. D16-100.000.

Bauman, Barbara M.: *See*—
Bauman, Charles E.; and Bauman, Barbara M., 305,712, Cl. D7-38.000.

Bauman, Charles E.; and Bauman, Barbara M., to Tres Suave, Inc. Combined food and beverage tray. 305,712, 1-30-90, Cl. D7-38.000.

Beato, Vincent. Paint brush wiper. 305,820, 1-30-90, Cl. D32-54.000.

Beauty Mate: *See*—
Weber, Betsy; Arjani, Farouk; and Varga, Richard A., 305,809, Cl. D28-76.000.

Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., to Shop-Vac Corporation. Portable blower. 305,816, 1-30-90, Cl. D32-15.000.

Berg, Marvin; and Gracheck, Bruce. Disposable nozzle for cartridge discharging adhesive. 305,736, 1-30-90, Cl. D9-447.000.

Bertagnoli, James A. Puzzle toy. 305,784, 1-30-90, Cl. D21-106.000.

Blignaut, James C. Combined key storage stand and carrier. 305,709, 1-30-90, Cl. D6-468.000.

Braun Aktiengesellschaft: *See*—
Ullmann, Roland, 305,807, Cl. D28-51.000.

Bray, Kenneth M.: *See*—
Browning, Shane C.; Carlisle, Robert; Wright, Alexander H.; and Bray, Kenneth M., 305,804, Cl. D27-163.000.

Brazell, Kenneth M.: *See*—
Parker, Nicky S.; Philpo't, G. Lloyd; Van Valkenburgh, Charles N.; and Brazell, Kenneth M., 305,756, Cl. D14-114.000.

Bridel, Christophe, to Bridel, Laiteries E. Multi-unit container. 305,729, 1-30-90, Cl. D9-341.000.

Bridel, Laiteries E.: *See*—
Bridel, Christophe, 305,729, Cl. D9-341.000.

Brooks, David A., to Spooner Est. Surface unit for a swimming pool cleaning apparatus. 305,815, 1-30-90, Cl. D32-1.000.

Brown, Norman: *See*—
Hastings, Malcolm; and Brown, Norman, 305,792, Cl. D23-214.000.

Browning, Shane C.; Carlisle, Robert; Wright, Alexander H.; and Bray, Kenneth M., to Gallaher Limited. Smoker's pipe. 305,804, 1-30-90, Cl. D27-163.000.

Bruno, Pasquale, to Amco Corporation. Cannister. 305,715, 1-30-90, Cl. D7-79.000.

Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Necklace. 305,742, 1-30-90, Cl. D11-17.000.

Butler, Derek W.: *See*—
Leech, Bryan D.; McNulty, John V.; Oglesby, Alfred P.; Oglesby, John P.; and Butler, Derek W., 305,720, Cl. D8-30.000.

Canon Kabushiki Kaisha: *See*—
Yomo, Takashi, 305,774, Cl. D18-13.000.

Carlisle, Robert: *See*—
Browning, Shane C.; Carlisle, Robert; Wright, Alexander H.; and Bray, Kenneth M., 305,804, Cl. D27-163.000.

Carlson, Arthur R., to Decor Corporation Proprietary Limited, The. Cooler box for bottles. 305,714, 1-30-90, Cl. D7-77.000.

Carter, Nancy B. Mailbox cover. 305,824, 1-30-90, Cl. D99-29.000.

Cartier International B.V.: *See*—
Wilson, Chan W. K., 305,758, Cl. D14-143.000.

Casio Computer Co., Ltd.: *See*—
Kitsuyu, Shigeru, 305,772, Cl. D17-1.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 305,810, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 305,811, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 305,812, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 305,813, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 305,810, 1-30-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 305,811, 1-30-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 305,812, 1-30-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 305,813, 1-30-90, Cl. D28-77.000.

Caulk, James W. Carousel sign display. 305,778, 1-30-90, Cl. D20-21.000.

Champion Spark Plug Company: *See*—
Hadtke, Frederick B., 305,732, Cl. D9-415.000.

Chen, Chun-Yong. Paint scraper. 305,818, 1-30-90, Cl. D32-48.000.

Chibuka, Shinri: *See*—
Kitagawa, Makoto; Kataoka, Tetsuro; Chibuka, Shinri; and Sakamoto, Kazuhiro, 305,747, Cl. D12-110.000.

Chow, Peter M. Barbeque briquet. 305,752, 1-30-90, Cl. D13-3.200.

Chua, Kim S.: *See*—
Ng, Hoe S.; and Chua, Kim S., 305,710, Cl. D6-474.000.

Coca-Cola Company, The: *See*—
Day, Gerald G., 305,738, Cl. D9-456.000.

Cohn, Robert J.: *See*—
Kolvites, Albert; Giungo, John L.; and Cohn, Robert J., 305,822, Cl. D34-19.000.

Collins, Harry F., to Service Ideas, Inc. Dispensing closure. 305,737, 1-30-90, Cl. D9-448.000.

Compton, Walter D.: *See*—
Gohier, Pierre R.; Person, Mark N.; and Compton, Walter D., 305,821, Cl. D34-12.000.

Cone, Richard E. Juvenile walker. 305,750, 1-30-90, Cl. D12-130.000.

Cramer, Ronald G., to S. C. Johnson & Son, Inc. Bottle with handle. 305,730, 1-30-90, Cl. D9-376.000.

Cronk, Marva J. Foldable toilet seat cover for children. 305,793, 1-30-90, Cl. D23-311.000.

Cunningham, Phillip J.; Slocomb, Leon F., Jr.; and Wilkie, George, to Slocomb Industries, Inc. Vent securing device for casement windows. 305,727, 1-30-90, Cl. D8-400.000.

Davidson, Grant M. N., to U.S. Philips Corp. Combined car radio and cassette player. 305,760, 1-30-90, Cl. D14-157.000.

Davis, David W.; and Scheid, William J., to Motorola, Inc. Paging receiver or similar article. 305,765, 1-30-90, Cl. D14-191.000.

Day, Gerald G., to Coca-Cola Company, The. Tier sheet for a display module. 305,738, 1-30-90, Cl. D9-456.000.

De brey, Robert J. Lapel button. 305,744, 1-30-90, Cl. D11-99.000.

Decor Corporation Proprietary Limited, The: *See*—
Carlson, Arthur R., 305,714, Cl. D7-77.000.

Deguchi, Atsushi: *See*—
Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, 305,776, Cl. D19-42.000.

Design House, Inc.: *See*—
Tufariello, Laura, 305,728, Cl. D9-305.000.

Dreimann, Leon H.: *See*—
Westfield, Barbara A.; and Dreimann, Leon H., 305,764, Cl. D14-188.000.

Eastman Kodak Company: *See*—
Swayze, Samuel F., 305,769, Cl. D16-202.000.

Eisenbraun, Kenneth D.; and Lerner, Michael I., to Safety 1st, Inc.; and Tech Accessories Group, Inc. Clip-on mirror. 305,808, 1-30-90, Cl. D28-64.100.

Elliott, Mark P. Clothes hamper. 305,817, 1-30-90, Cl. D32-37.000.

Epoch Company, Ltd.: *See*—
Ukisu, Hiroshi, 305,780, Cl. D21-59.000.
Ukisu, Hiroshi, 305,781, Cl. D21-59.000.
Ukisu, Hiroshi, 305,782, Cl. D21-59.000.
Ukisu, Hiroshi, 305,783, Cl. D21-59.000.
Ukisu, Hiroshi, 305,785, Cl. D21-120.000.

Epstein, Allen S.: *See*—
Robinson, Herbert L.; and Epstein, Allen S., 305,797, Cl. D24-19.000.

Fangrow, Thomas F., Jr., to Life Support Products, Inc. Resuscitator inhalator valve. 305,814, 1-30-90, Cl. D29-7.000.

Ferris, Michael R., to Spalding & Evenflo Companies, Inc. Golf ball package. 305,733, 1-30-90, Cl. D9-415.000.

Forland, Ralph E.; and Peterson, Kail R., to Hewlett-Packard Company. Ambulatory ECG cabinet. 305,796, 1-30-90, Cl. D24-17.000.

Fuji Photo Film Co., Ltd.: *See*—
Fukuda, Hiroshi; and Fukuda, Masahiro, 305,771, Cl. D16-229.000.

Fujisawa, Hiroshi, to Kabushiki Kaisha Kawasaki Seiki Seisakusho. Electric shaver. 305,806, 1-30-90, Cl. D28-50.000.

Fujita, Shozoo: *See*—
Suyama, Tsutomu; Wakamatsu, Masaharu; and Fujita, Shozoo, 305,755, Cl. D14-113.000.

Fukuda, Hiroshi; and Fukuda, Masahiro, to Fuji Photo Film Co., Ltd. Microfilm reader. 305,771, 1-30-90, Cl. D16-229.000.

Fukuda, Masahiro: *See*—
Fukuda, Hiroshi; and Fukuda, Masahiro, 305,771, Cl. D16-229.000.

Fushiya, Fusao; and Itoh, Yasuo, to Makita Electric Works, Ltd. Electric finishing sander. 305,721, 1-30-90, Cl. D8-62.000.

Gallaher Limited: *See*—
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Garcia, George L.: *See*—
Taliani, Dennis; and Garcia, George L., 305,702, Cl. D3-10.000.

Genesco Inc.: *See*—
Whatley, Jan H., 305,701, Cl. D2-314.000.

Gerber, William C.: *See*—
Mottmiller, Russell P.; Hobson, Jody A.; Gerber, William C.; and Scofield, Patrick C., 305,800, Cl. D25-100.000.

Ghafoorzai, Serkai. Plant stem holder. 305,716, 1-30-90, Cl. D8-1.000.

Gillette Company, The: *See*—
Gray, Michael J., 305,805, Cl. D28-46.000.

Giungo, John L.: *See*—
Kolvites, Albert; Giungo, John L.; and Cohn, Robert J., 305,822, Cl. D34-19.000.

Gohier, Pierre R.; Person, Mark N.; and Compton, Walter D., to United Tractor Company. Baggage cart body. 305,821, 1-30-90, Cl. D34-12.000.

Goodrich, Mack. Meter insulating jacket. 305,741, 1-30-90, Cl. D10-103.000.

Gracheck, Bruce: *See*—
Berg, Marvin; and Gracheck, Bruce, 305,736, Cl. D9-447.000.

Gray, Michael J., to Gillette Company, The. Razor. 305,805, 1-30-90, Cl. D28-46.000.

Hadtke, Frederick B., to Champion Spark Plug Company. Container. 305,732, 1-30-90, Cl. D9-415.000.

Halay, Joseph M. Video cassette recorder lock. 305,726, 1-30-90, Cl. D8-341.000.

Harashima, Tooru. Room air conditioner. 305,795, 1-30-90, Cl. D23-351.000.

Hastings, Malcolm; and Brown, Norman, to Hozelock-ASL Limited Lawn sprinkler. 305,792, 1-30-90, Cl. D23-214.000.

Haworth, Inc.: *See*—
Jones, Jane L.; and Maat, Douglas J., 305,704, Cl. D6-332.000.

Hayata, Osamu, to Yamaha Hatsudoki Kabushiki Kaisha. Self-propelled three wheeled vehicle. 305,745, 1-30-90, Cl. D12-85.000.

Heger, Niels E., to A/S Jotul. Burning chamber for fireplaces. 305,794, 1-30-90, Cl. D23-344.000.

Herb, Lester A. Oil candle for insertion into a wine bottle or similar article. 305,801, 1-30-90, Cl. D26-11.000.

Herb, Lester A. Chimney for oil candle. 305,802, 1-30-90, Cl. D26-23.000.

Herman Miller, Inc.: *See*—
Newhouse, Thomas J., 305,708, Cl. D6-446.000.

Herren, Gerald R. Toy ball. 305,788, 1-30-90, Cl. D21-204.000.

Hewlett-Packard Company: *See*—
Forland, Ralph E.; and Peterson, Kail R., 305,796, Cl. D24-17.000.

Hino, Ichiro: *See*—
Matsuo, Toshiyuki; and Hino, Ichiro, 305,763, Cl. D14-163.000.

Hirsch, Hermann. End attachment for watch band. 305,743, 1-30-90, Cl. D11-94.000.

Hobson, Jody A.: *See*—
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Hoshino, Nobuhiko. Computer. 305,753, 1-30-90, Cl. D14-102.000.

Hot Sports, Inc.: *See*—
Roberson, Robert F., 305,751, Cl. D12-304.000.

Hozelock-ASL Limited: *See*—
Hastings, Malcolm; and Brown, Norman, 305,792, Cl. D23-214.000.
Lang, John M., 305,791, Cl. D23-214.000.

Intergraph Corporation: *See*—
Parker, Nicky S.; Philpo't, G. Lloyd; Van Valkenburgh, Charles N.; and Brazell, Kenneth M., 305,756, Cl. D14-114.000.

InterMetro Industries Corporation: *See*—
Kolvites, Albert; Giungo, John L.; and Cohn, Robert J., 305,822, Cl. D34-19.000.

Ito, Masamoto: *See*—
Kaneko, Akiyoshi; Ito, Masamoto; and Aoki, Hiroyuki, 305,748, Cl. D12-110.000.

Itoh, Yasuo: *See*—
Fushiya, Fusao; and Itoh, Yasuo, 305,721, Cl. D8-62.000.

Jacobs, Andre; May, Richard; Vandebroek, Marcel; and Sporen, Frieda, to Procter & Gamble Company, The. Bottle. 305,731, 1-30-90, Cl. D9-378.000.

Jones, Jane L.; and Maat, Douglas J., to Haworth, Inc. Space-divider panel for use primarily in an office. 305,704, 1-30-90, Cl. D6-332.000.

Jorgensen, Jerome C. Motorcycle fork stabilizer. 305,749, 1-30-90, Cl. D12-117.000.

Kabushiki Kaisha Kawasaki Seiki Seisakusho: *See*—
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Kaneko, Akiyoshi; Ito, Masamoto; and Aoki, Hiroyuki, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 305,748, 1-30-90, Cl. D12-110.000.

Kardon Industries, Inc.: *See*—
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Kataoka, Tetsuro: *See*—
Kitagawa, Makoto; Kataoka, Tetsuro; Chibuka, Shinri; and Sakamoto, Kazuhiro, 305,747, Cl. D12-110.000.

Kawabe, Kazuo; and Yamasaki, Tsutomu, to Sharp Corporation. Combined tape recorder, digital audio disc player and radio. 305,761, 1-30-90, Cl. D14-163.000.

Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, to Yoshinaga Prince Company Limited. Ball-point pen. 305,776, 1-30-90, Cl. D19-42.000.

King Feng Co., Ltd.: *See*—
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Kitagawa, Makoto; Kataoka, Tetsuro; Chibuka, Shinri; and Sakamoto, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 305,747, 1-30-90, Cl. D12-110.000.

Kitagawa, Ryunosuke; and Sakamoto, Harumi, to Sharp Corporation. Television set. 305,757, 1-30-90, Cl. D14-126.000.

Kitsuyu, Shigeru, to Casio Computer Co., Ltd. Electronic music synthesizer. 305,772, 1-30-90, Cl. D17-1.000.

Kolvites, Albert; Giungo, John L.; and Cohn, Robert J., to InterMetro Industries Corporation. Insulated food transporting cabinet. 305,822, 1-30-90, Cl. D34-19.000.

Lane Company, The: *See*—
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Lang, John M., to Hozelock-ASL Limited. Lawn sprinkler. 305,791, 1-30-90, Cl. D23-214.000.

Lee, A. T., to Pioneer Industrial Corp. Writing instrument holder. 305,777, 1-30-90, Cl. D19-85.000.

Lee, Raymond H., Jr.: *See*—
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Leech, Bryan D.; McNulty, John V.; Oglesby, Alfred P.; Oglesby, John P.; and Butler, Derek W., to Olgesby & Butler Plc. Soldering iron with removable cap. 305,720, 1-30-90, Cl. D8-30.000.

Lerner, Michael I.: *See*—
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Life Support Products, Inc.: *See*—
Fangrow, Thomas F., Jr., 305,814, Cl. D29-7.000.

Lifeing, Inc.: *See*—
Olschansky, Brad; and Lee, Raymond H., Jr., 305,787, Cl. D21-198.000.

Lowman, Darrell G., to Lane Company, The. Etagere. 305,707, 1-30-90, Cl. D6-436.000.

Maat, Douglas J.: *See*—
Jones, Jane L.; and Maat, Douglas J., 305,704, Cl. D6-332.000.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao; and Itoh, Yasuo, 305,721, Cl. D8-62.000.

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Manzo, Louis. Combined top and bottom rail for a staircase balustrade. 305,799, 1-30-90, Cl. D25-38.000.

Mark, Edward H., to Packard Industries, Inc. Multiple desk unit. 305,706, 1-30-90, Cl. D6-421.000.

Matsuo, Toshiyuki; and Hino, Ichiro, to Sony Corporation. Combined tape recorder and radio receiver. 305,763, 1-30-90, Cl. D14-163.000.

May, Richard: *See*—
Jacobs, Andre; May, Richard; Vandebroek, Marcel; and Sporen, Prieda, 305,731, Cl. D9-378.000.

McNulty, John V.: *See*—
Leech, Bryan D.; McNulty, John V.; Oglesby, Alfred P.; Oglesby, John P.; and Butler, Derek W., 305,720, Cl. D8-30.000.

Med-Struments, Inc.: *See*—
Robinson, Herbert L.; and Epstein, Allen S., 305,797, Cl. D24-19.000.

Meland, Ronald F.: *See*—
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492 4,896,644
506 4,896,645

CLASS 124
51 R 4,896,646

CLASS 125
14 4,896,647
21 4,896,648
23 R 4,896,649

CLASS 126
9 R 4,896,650
30 4,896,651
41 R 4,896,652
45 4,896,653
58 4,896,654
59 4,896,655
92 B 4,896,656
299 D 4,896,657
362 4,896,658

CLASS 128
18 4,897,511
75 4,896,659
77 4,896,660
200.25 4,896,664
201.25 4,896,665
202.13 4,896,666
207.14 4,896,667
642 4,896,671
660.03 4,896,673
660.09 4,896,672
661.09 4,896,674
671 4,896,675
681 4,896,676
696 4,896,677
751 4,896,678
865 4,896,679

CLASS 131
339 4,896,682
342 4,896,683

CLASS 132
73 6 4,896,684
278 4,896,685

CLASS 134
22 18 4,897,121
29 4,897,122
167 C 4,896,686

CLASS 135
75 4,896,687

CLASS 136
256 4,897,123

CLASS 137
68 1 4,896,688
70 4,896,689
73 4,896,690
100 4,896,691
269 4,896,692
454 5 4,896,693
491 4,896,694
512.1 4,896,695
513.3 4,896,696
614 4,896,698
614.03 4,896,697
630 4,896,699
884 4,896,700

CLASS 138
108 4,896,701

CLASS 139
383 A 4,896,702

CLASS 140
104 4,896,703

CLASS 141
9 4,896,704
86 4,896,705
114 4,896,706
337 4,896,707

CLASS 144
363 4,896,708

CLASS 148
2 4,897,124
12.7 A 4,897,125
4,897,126
133 4,897,127
241 4,897,128
256 4,897,129
302 4,897,130
308 4,897,131
327 4,897,132

CLASS 152
543 4,896,709
556 4,896,710

CLASS 156
64 4,897,133
73.1 4,897,134
94 4,897,135
145 4,897,136
157 4,897,137
158 4,897,138
188 4,897,139
250 4,897,140
4,897,141
257 4,897,142
273.9 4,897,143
307.3 4,897,144
442.1 4,897,145
462 4,897,146
498 4,897,147
584 4,897,148
610 4,897,149
628 4,897,150
630 4,897,151
637 4,897,152
643 4,897,153
4,897,154

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CLASS 157

1.22 4,896,711
1.24 4,896,712

CLASS 160

168.1 4,896,713
311 4,896,714

CLASS 162

18 4,897,155
65 4,897,156
240 4,897,157
259 4,897,158
260 4,897,159
343 4,897,160

CLASS 164

479 4,896,715

CLASS 165

54 4,896,716
104.18 4,896,717
141 4,896,718
170 4,896,719

CLASS 166

4,896,720
214 4,896,721
250 4,896,722
267 4,896,725
272 4,896,723
285 4,896,724
312 4,896,726

CLASS 168

4 4,896,727

CLASS 169

37 4,896,728

CLASS 171

84 4,896,729

CLASS 172

40 4,896,730
225 4,896,731
311 4,896,732

CLASS 174

52.4 4,897,508
258 4,897,509

CLASS 175

26 4,896,733

CLASS 178

18 4,897,510

CLASS 180

68.3 4,896,734
79.1 4,896,735
89.16 4,896,736
140 4,896,737
233 4,896,738
248 4,896,739
255 4,896,740
268 4,896,741
270 4,896,742

CLASS 181

0.5 4,896,743

CLASS 182

88 4,896,744
200 4,896,745

CLASS 184

92 4,896,746

CLASS 187

1 R 4,896,747
9 E 4,896,748

CLASS 188

5 4,896,749
24.19 4,896,750
197 4,896,751
299 4,896,752
344 4,896,753

CLASS 191

12.4 4,897,512

CLASS 192

21.5 4,896,754
36 R 4,896,755
84 C 4,896,756
4,896,757

CLASS 193

37 4,896,758

CLASS 198

324 4,896,759
365 4,896,760
750 4,896,761
761 4,896,762
803.2 4,896,763
812 4,896,764
847 4,896,765

CLASS 200

11 EA 4,897,513
19 DC 4,897,514
43.14 4,897,515
302.2 4,897,516
318.1 4,897,517

CLASS 203

51 4,897,161

CLASS 204

1 T 4,897,162
11 4,897,163
15 4,897,164
24 4,897,165
51 4,897,166
52.1 4,897,167
129.43 4,897,168
183.2 4,897,169
294 4,897,170
298 4,897,171
4,897,172
403 4,897,173
425 4,897,174

CLASS 206

45.15 4,896,766
63.3 4,896,767
210 4,896,768
232 4,896,769
333 4,896,770
349 4,896,771
484.2 4,896,772
494 4,896,773
516 4,896,774
557 4,896,775
576 4,896,776

CLASS 208

12 4,897,175
48 R 4,897,176
79 4,897,177
111 4,897,178
127 4,897,179
189 4,897,180
209 4,897,181
321 4,897,182

CLASS 209

235 4,897,183

CLASS 210

7 4,896,826
17 4,896,827
87 4,897,184
90 4,897,185
108 4,897,186
137 4,897,187
169 4,897,188
195.2 4,897,189
228 4,897,190
321.81 4,897,191
330 4,897,192
359 4,897,193
4,897,194
603 4,897,195
616 4,897,196
635 4,897,197
4,897,198
639 4,897,199
692 4,897,200
729 4,897,201
754 4,897,202
4,897,203
758 4,897,204
766 4,897,205
791 4,897,206

CLASS 211

41 4,896,777
175 4,896,778
184 4,896,779

CLASS 215

291 4,896,780
328 4,896,781
329 4,896,782
330 4,896,783

CLASS 219

10.41 4,897,518
76.14 4,897,519
121.68 4,897,520
124.03 4,897,521
130.32 4,897,522
137 PS 4,897,523
344 4,897,524
401 4,897,525
492 4,897,526
4,897,527
497 4,897,528
534 4,897,529

CLASS 220

3.2 4,896,784
82 R 4,896,785
338 4,896,786
339 4,896,787
359 4,896,788
367 4,896,789
416 4,896,790

CLASS 221

7 4,896,791
11 4,896,792
73 4,896,793

CLASS 222

1 4,896,794
63 4,896,795
145 4,896,796
175 4,896,797
307 4,896,798
321 4,896,799
416 4,896,800
590 4,896,801

CLASS 223

46 4,896,802
112 4,896,803

CLASS 224

153 4,896,804
236 4,896,805
242 4,896,806

CLASS 226

21 4,896,807
42 4,896,808
188 4,896,809

CLASS 228

5.5 4,896,811
32 4,896,812
116 4,896,813
119 4,896,814
120 4,896,815
122 4,896,816
123 4,896,817
170 4,896,818

CLASS 229

8 4,896,819
69 4,896,821
4,896,822
73 4,896,823
100 4,896,820
125.42 4,896,824
167 4,896,825

CLASS 232

7 4,896,826
17 4,896,827

CLASS 235

101 4,897,530
440 4,897,531
467 4,897,532
487 4,897,533
488 4,897,534
495 4,897,535

CLASS 236

10 4,896,828

CLASS 237

2 A 4,896,829
12.1 4,896,830
69 4,896,831

CLASS 239

322 4,896,832
654 4,896,833
691 4,896,834

CLASS 241

74 4,896,835
81 4,896,836
121 4,896,837
208 B1 4,478,373
275 4,896,838

CLASS 242

7.02 4,896,839
35.5 R 4,896,840
35.6 E 4,896,841
58.6 4,896,842
107.7 4,896,843
4,896,844

CLASS 244

3.1 4,896,845
75 R 4,896,846
158 R 4,896,847
4,896,848
4,896,849

CLASS 246

476 4,896,850

CLASS 248

72 4,896,851
74.3 4,896,852
97 4,896,853
156 4,896,854
206.3 4,896,855
219.4 4,896,856
279 4,896,857
311.2 4,896,858
549 4,896,859

CLASS 250

201 4,897,536
4,897,537
209 4,897,538
216 4,897,539
223 R 4,897,540
227 4,897,541
4,897,542
4,897,543
231 SE 4,897,544
310 4,897,545
327.2 4,897,546
338.1 4,897,547
343 4,897,548
358.1 4,897,549
390.01 4,897,550
461.1 4,897,551
492.2 4,897,552
548 4,897,553

CLASS 251

129.05 4,896,860
129.15 4,896,861

CLASS 252

2 4,897,207
8.6 4,897,208
32.7 E 4,897,209
41 4,897,210
54 4,897,211
99 4,897,212
143 4,897,213
170 4,897,214
174.24 4,897,215
299.63 4,897,216
301.4 P 4,897,217
313.1 4,897,218
520 4,897,219
546 4,897,220
633 4,897,221
4,897,222

CLASS 254

1 4,896,862
134.3 FT 4,896,863

CLASS 256

23 4,896,864

CLASS 260

397.2 4,897,224
400 4,897,225

CLASS 261

129 4,897,226

CLASS 264

6 4,897,227
22 4,897,228
28 4,897,229
40.1 4,897,230
46.7 4,897,231
56 4,897,232
108 4,897,233
109 4,897,234
134 4,897,235
211.23 4,897,236
222 4,897,237
288.4 4,897,238

CLASS 266

200 4,896,810
285 4,896,865

CLASS 267

64.26 4,896,866
140.1 4,896,867
4,896,868

CLASS 269

60 4,896,869

CLASS 270

4,896,870

CLASS 271

9 4,896,871
11 4,896,872
35 4,896,873
186 4,896,874
236 4,896,875
265 4,896,876

CLASS 272

30 4,896,877
85 4,896,878
119 4,896,879
122 4,896,880
900 4,896,881

CLASS 273

1.5 A 4,896,882
32.5 4,896,883
153.3 4,896,884
167 H 4,896,885
184 A 4,896,886
189 R 4,896,887
240 4,896,888
272 4,896,889

CLASS 277

3 4,896,890
235 B 4,896,891

CLASS 279

1 A 4,896,892

CLASS 280

14.2 4,896,893
30 4,896,894
607 4,896,895
618 4,896,896
655 4,896,897
735 4,896,898
775 4,896,899

CLASS 281

15.1 4,896,900

CLASS 283

90 4,896,901

CLASS 285

93 4,896,902
337 4,896,903
381 4,896,904

CLASS 290

38 R 4,897,554

CLASS 292

5 4,896,905
48 4,896,906
216 4,896,907
4,896,908
341.16 4,896,909

CLASS 293

117 4,896,910
128 4,896,911

CLASS 294

1.3 4,896,912
31.2 4,896,913
88 4,896,914

CLASS 296

180.1 4,896,915

CLASS 297

181 4,896,916
217 4,896,917
284 4,896,918
452 4,896,919

CLASS 299

42 4,896,920

CLASS 301

5 R 4,896,921
63 PW 4,896,922

CLASS 303

9.63 4,896,923
96 4,896,924

CLASS 307

32 4,897,555
106 4,897,556
134 4,897,557
245 4,897,558
269 4,897,559
296.3 4,897,560
413 4,897,561
427 4,897,562
441 4,897,563
446 4,897,564
448 4,897,565
456 4,897,566
475 4,897,567
530 4,897,568
4,897,569

CLASS 310

154 4,897,570
239 4,897,571

CLASS 312

12 4,896,925
111 4,896,926
190 4,896,927

CLASS 313

146 4,897,572
273 4,897,573
346 R 4,897,574

CLASS 315

15 4,897,575
55 4,897,577
71 4,897,578
73 4,897,576
111.51 4,897,579
408 4,897,580
4,897,581

CLASS 316

385 4,897,763

CLASS 318

135 4,897,582
254 4,897,583
471 4,897,584
483 4,897,585
568.1 4,897,586
625 4,897,587
661 4,897,588
685 4,897,589
696 4,897,590

CLASS 320

32 4,897,591

CLASS 322

2 A 4,897,592

CLASS 323

210 4,897,593
273 4,897,594
314 4,897,595
315 4,897,596

CLASS 324

115 4,897,599
127 4,897,600
158 F 4,897,598
4,897,601
4,897,602
208 4,897,603
318 4,897,604
341 4,897,605
509 4,897,606
512 4,897,607
693 4,897,597

CLASS 325

208 4,897,690

CLASS 329

321 4,897,608

CLASS 330

4.3 4,897,622
43 4,897,609
84 4,897,610
253 4,897,611
4,897,612
4,897,613
257 4,897,614
263 4,897,615
265 4,897,616
277 4,897,617

CLASS 331

76 4,897,618
107 A 4,897,621
167 4,897,619

CLASS 332

100 4,897,620

CLASS 333

208 4,897,623

CLASS 334

80 4,897,624

CLASS 335

14 4,897,625

CLASS 336

61 4,897,626
65 4,897,627

CLASS 338

34 4,897,628
128 4,897,629

CLASS 340

426 4,897,630
438 4,897,631
457 4,897,632
458 4,897,633
630 4,897,634
681 4,897,635
724 4,897,636
734 4,897,637
751 4,897,638
812 4,897,639
825.060 4,897,642
825.160 4,897,640
825.310 4,897,644
825.69 4,897,643
825.790 4,897,641
825.910 4,897,645
853 4,897,646
870.190 4,897,647

CLASS 341

16 4,897,648
22 4,897,649
23 4,897,651

51 4,897,652
95 4,897,653
120 4,897,650
147 4,897,654
159 4,897,655
4,897,656
4,897,657
161 4,897,658

CLASS 342

45 4,897,659
192 4,897,660
457 4,897,661

CLASS 343

701 4,897,662
786 4,897,663
789 4,897,664

CLASS 346

1.1 4,897,665
4,897,666
75 4,897,667
76 PH 4,897,668
4,897,669
4,897,670
107 R 4,897,671
4,897,672
140 R 4,897,673
4,897,674
154 4,897,675
155 4,897,676
4,897,677

CLASS 350

1.6 4,896,928
3.85 4,896,929
96.12 4,896,930
4,896,931
96.15 4,896,932
4,896,933
96.16 4,896,934
96.20 4,896,935
4,896,936
4,896,937
96.21 4,896,938
96.23 4,896,939
4,896,940
96.25 4,896,941
96.33 4,896,942
105 4,896,943
247 4,896,944
332 4,896,945
336 4,896,946
337 4,896,947
355 4,896,948
358 4,896,949
427 4,896,950
429 4,896,951
445 4,896,952
452 4,896,953
632 4,896,954

CLASS 351

41 4,896,955
50 4,896,956
137 4,896,957
160 R 4,896,958
203 4,896,959

CLASS 352

193 4,896,960

CLASS 354

81 4,897,678
106 4,897,679
145.1 4,897,680
271.1 4,897,681
274 4,897,682
400 4,897,683
416 4,897,684
458 4,897,685

CLASS 355

37 4,897,686
43 4,897,687
52 4,897,688
79 4,897,689
215 4,897,693
218 4,897,694
233 4,897,695
285 4,897,696
288 4,897,691
4,897,692
326 4,897,697

CLASS 356

73 4,896,961
152 4,896,962
328 4,896,963
376 4,896,964
417 4,896,965
442 4,896,966
4,896,967

CLASS 357

4 4,897,698
4,897,699
23.6 4,897,700
4,897,702
34 4,897,703
35 4,897,704
4,897,705
38 4,897,706
51 4,897,707
65 4,897,708
68 4,897,709
71 4,897,710
74 4,897,711
81 4,897,712

CLASS 358

17 4,897,713
86 4,897,714
93 4,897,715
105 4,897,716
133 4,897,717
135 4,897,719
136 4,897,720
139 4,897,721
141 4,897,722
158 4,897,723
166 4,897,724
167 4,897,725
183 4,897,726
194.1 4,897,718
4,897,727
213.23 4,897,728
216 4,897,729
217 4,897,730
335 4,897,731
4,897,732
433 4,897,733
448 4,897,734
449 4,897,735
457 4,897,736
489 4,897,737

CLASS 360

30 4,897,738
37.1 4,897,739
51 4,897,740
64 4,897,741
72.1 4,897,742
75 4,897,743
94 4,897,744
109 4,897,745
118 4,897,746
122 4,897,747
126 4,897,748
4,897,749
132 4,897,750
4,897,751
133 4,897,752

CLASS 361

1 4,897,753
4,897,754
2 4,897,755
44 4,897,756
91 4,897,757
104 4,897,758
151 4,897,759
272 4,897,760
311 4,897,761
382 4,897,762
387 4,897,764
394 4,897,765
421 4,897,766

CLASS 362

61 4,897,767
191 4,897,768
226 4,897,769
282 4,897,772
293 4,897,770
298 4,897,771

CLASS 363

56 4,897,773
61 4,897,774
96 4,897,775

CLASS 364

134 4,897,777
174 4,897,778
200 4,897,779
4,897,780
4,897,781
4,897,782
4,897,783
4,897,784
4,897,785
4,897,786
4,897,787
413.07 4,897,789
413.15 4,897,788
424.05 4,897,776
424.1 4,897,790
431.05 4,897,791
449 4,897,792
464.03 4,897,793
482 4,897,794
488 4,897,795
497 4,897,796
500 4,897,797
505 4,897,798
514 4,897,799
518 4,897,802
4,897,803
520 4,897,800
521 4,897,801
4,897,804
4,897,805
522 4,897,806
707 4,897,807
784 4,897,808
4,897,809
900 4,897,810
4,897,811
4,897,812

CLASS 365

49 4,897,813
4,897,814
148 4,897,815
189.12 4,897,816
201 4,897,817
221 4,897,818
230.06 4,897,819
230.08 4,897,820

CLASS 366

10 4,896,968
88 4,896,969
296 4,896,970
330 4,896,971
340 4,896,972

CLASS 367

13 4,897,821
124 4,897,822
127 4,897,823
173 4,897,824

CLASS 368

228 4,897,825
282 4,897,826

CLASS 369

32 4,897,827
46 4,897,828
288 4,897,829

CLASS 370

4 4,897,830
29 4,897,831
81 4,897,832
85.1 4,897,834
85.13 4,897,841
85.2 4,897,833
94.1 4,897,835
112 4,897,836

CLASS 371

22.3 4,897,837
4,897,838
22.4 4,897,842
37.1 4,897,839
40.1 4,897,840

CLASS 372

20 4,897,843
26 4,897,844
45 4,897,845
46 4,897,846
54 4,897,847
59 4,897,848
66 4,897,849
72 4,897,850
107 4,897,851

CLASS 373

22 4,897,852
36 4,897,853

CLASS 374

56 4,896,973

CLASS 375

17 4,897,854
27 4,897,855
28 4,897,856
88 4,897,857

CLASS 376

254 4,897,239
261 4,897,858
328 4,897,240
438 4,897,241

CLASS 377

6 4,897,859
52 4,897,860

CLASS 378

150 4,897,861

CLASS 379

40 4,897,862
58 4,897,863
61 4,897,864
91 4,897,865
94 4,897,866
4,897,867
96 4,897,868
100 4,897,869
144 4,897,870
377 4,897,871
412 4,897,872
433 4,897,873

CLASS 380

3 4,897,874
21 4,897,875
43 4,897,876

CLASS 381

24 4,897,877
43 4,897,878
99 4,897,879

CLASS 382

13 4,897,880
28 4,897,881

CLASS 384

47 4,896,974
114 4,896,975
549 4,896,976

CLASS 388

801 4,897,882

CLASS 400

120 4,896,977
555 4,896,978
605 4,896,979
618 4,896,980

CLASS 401

57 4,896,981
65 4,896,982
107 4,896,983
140 4,896,984

CLASS 403

11 4,896,985
14 4,896,986
24 4,896,987
134 4,896,988
154 4,896,989
162 4,896,990
290 4,896,991
297 4,896,992

CLASS 404

33 4,896,993
64 4,896,994
90 4,896,995

CLASS 405

21 4,896,996
156 4,896,997
160 4,896,998
286 4,896,999

CLASS 408

79 4,897,000
212 4,897,001

CLASS 409

293 4,897,002

CLASS 411

43 4,897,003
4,897,004
175 4,897,005
368 4,897,006
401 4,897,007
432 4,897,008

CLASS 414

22.66 4,897,009
24.6 4,897,010
401 Re.33,154
459 4,897,011
540 4,897,012
703 4,897,013
729 4,897,014
744.8 4,897,015
757 4,897,016
790.8 4,897,017
794.2 4,897,018
795.6 4,897,019

CLASS 415

115 4,897,020
173.7 4,897,021

CLASS 417

7 4,897,022
423.15 4,897,023
499 4,897,024

CLASS 418

171 4,897,025

CLASS 420

23 4,897,242
488 4,897,243

CLASS 422

100 4,897,244
131 4,897,245
186.3 4,897,246

CLASS 423

210 4,897,247
240 4,897,248
280 4,897,249
308 4,897,250
578 R 4,897,251
591 4,897,252
651 4,897,253

CLASS 424

1.1 4,897,254
4,897,255
43 4,897,256
44 4,897,257
53 4,897,258
59 4,897,260
61 4,897,261
71 4,897,262
83 4,897,263
85.5 4,897,264
87 4,897,265
101 B1 4,664,913
195.1 4,897,266
422 4,897,267
4,897,268
450 4,897,269
465 4,897,270

CLASS 425

115 4,897,026
117 4,897,027
144 4,897,028
222 4,897,029
384 4,897,030
388 4,897,031
556 4,897,032

CLASS 426

7 4,897,271
17 4,897,272
118 4,897,273
127 4,897,274
289 4,897,275
307 4,897,276
491 4,897,277
577 4,897,278
583 4,897,279
656 4,897,280

CLASS 427

8 4,897,281
34 4,897,282
4,897,283
39 4,897,284
4,897,285
44 4,897,286
96 4,897,287
123 4,897,288
125 4,897,289
162 4,897,290
393 4,897,291

CLASS 428

8 4,897,292
34.1 4,897,294
34.8 4,897,295
40 4,897,293
102 4,897,296
4,897,297
4,897,298
131 4,897,299
195 4,897,300
209 4,897,301
283 4,897,302
284 4,897,303
289 4,897,304
333 4,897,305
336 4,897,306
398 4,897,307
402.2 4,897,308
403 4,897,309
412 4,897,310
433 4,897,311
450 4,897,312
489 4,897,313
529 4,897,314
552 4,897,315
612 4,897,316
629 4,897,317
635 4,897,318
690 4,897,319
694 4,897,320

CLASS 429

51 4,897,321
62 4,897,322
94 4,897,323
206 4,897,324

CLASS 430

5 4,897,325
31 4,897,326
45 4,897,327
49 4,897,328
4,897,329
54 4,897,330
100 4,897,331
115 4,897,332
126 4,897,333
138 4,897,334
4,897,335
197 4,897,336
296 4,897,337
314 4,897,338
372 4,897,339
403 4,897,340
544 4,897,341
569 4,897,342
570 4,897,343
622 4,897,344

CLASS 431

253 4,897,033

CLASS 432

241 4,897,034

CLASS 433

17 4,897,035
18 4,897,036
166 4,897,037

CLASS 434

153 4,897,038

CLASS 435

7 4,897,345
14 4,897,346
16 4,897,347
69.1 4,897,348
101 4,897,349
115 4,897,350
119 4,897,351
180 4,897,352
188 4,897,353
240.2 4,897,355
240.27 4,897,354
262 4,897,356
280 4,897,357
296 4,897,358
313 4,897,359

CLASS 437

7 4,897,360
24 4,897,361
26 4,897,362
63 4,897,363
69 4,897,364
4,897,365
83 4,897,366
132 4,897,367
200 4,897,368
225 4,897,369

CLASS 439

189 4,897,047
211 4,897,048
365 4,897,049
372 4,897,039
401 4,897,040
404 4,897,041
4,897,042
482 4,897,043
504 4,897,044
578 4,897,045
579 4,897,046
585 4,897,050
620 4,897,051
631 4,897,054
652 4,897,052
751 4,897,053
924 4,897,055

CLASS 440

50 4,897,056
57 4,897,057
80 4,897,058
88 4,897,059
89 4,897,060
4,897,061
101 4,897,062

CLASS 441

68 4,897,063
124 4,897,064

CLASS 446

63 4,897,065
97 4,897,066
207 4,897,067
217 4,897,068
219 4,897,069
273 4,897,070

CLASS 455

166 Re.33,157
603 4,897,883
4,897,884

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	CLASS 460	77	4,897,385	557	4,897,421	64	4,897,446	46	4,897,472	534	4,897,498
10	4,897,071	108	4,897,386	575	4,897,422	66	4,897,447	97	4,897,473	552	4,897,499
99	4,897,072	167	4,897,387	603	4,897,423	67	4,897,448	119	4,897,474		**CLASS 556**
	CLASS 464		4,897,388	638	4,897,424	85	4,897,449		**CLASS 540**	187	4,897,500
70	4,897,073	171	4,897,389	649	4,897,425	176	4,897,450	83	4,897,475	413	4,897,501
	CLASS 493	177	4,897,390	724	4,897,426	192	4,897,451	310	4,897,476		**CLASS 558**
381	4,897,074	183	4,897,391	938	4,897,259	333.8	4,897,452	478	4,897,477	102	4,897,502
	CLASS 494	219	4,897,392		**CLASS 521**	439	4,897,453		**CLASS 544**	155	4,897,503
84	4,897,075	233.8	4,897,393	115	4,897,428	537	4,897,454	73	4,897,223	319	4,897,504
	CLASS 501	252	4,897,394	157	4,897,429		**CLASS 526**	94	4,897,478		**CLASS 560**
5	4,897,370	275	4,897,395	159	4,897,430	129	4,897,455	244	4,897,479	41	4,897,506
70	4,897,371	277	4,897,396	172	4,897,431	141	4,897,456	315	4,897,480		4,897,507
96	4,897,372	284	4,897,397	184	4,897,432	247	4,897,457	354	4,897,481	008	4,897,505
134	4,897,373	288	4,897,398		**CLASS 522**	301	Re.33,156		**CLASS 546**		**CLASS 600**
	4,897,374	289	4,897,399	116	4,897,433	318.3	4,897,458	181	4,897,482	7	4,897,076
	CLASS 502	303	4,897,400		**CLASS 523**		**CLASS 528**	201	4,897,483	18	4,897,077
301	4,897,375	312	4,897,401	409	4,897,434	18	4,897,459	252	4,897,484		**CLASS 604**
347	4,897,376	313	4,897,402	414	4,897,435	113	4,897,460	264	4,897,485	22	4,897,079
	CLASS 503	343	4,897,403		**CLASS 524**	125	4,897,461	300	4,897,486	117	4,897,080
227	4,897,377	360	4,897,404	83	4,897,436	486	4,897,462	309	4,897,487	175	4,897,081
	CLASS 505	365	4,897,405	232	4,897,437		**CLASS 530**	345	4,897,488	180	4,897,082
1	4,897,378	369	4,897,407	342	4,897,438	329	4,897,463		**CLASS 548**	192	4,897,083
	CLASS 514	375	4,897,406	404	4,897,439	350	4,897,464	128	4,897,489	385.2	4,897,084
19	4,897,379	376	4,897,408	521	4,897,440	387	4,897,465	253	4,897,490		**CLASS 606**
23	4,897,380	383	4,897,409	523	4,897,441	415	4,897,466	342	4,897,491	74	4,896,668
25	4,897,381	401	4,897,410	535	B1 4,559,382	811	4,897,467	352	4,897,492	79	4,896,663
	4,897,382	423	4,897,411	549	4,897,442		4,897,468	432	4,897,493	86	4,896,661
30	4,897,383	425	4,897,412	609	4,897,443		**CLASS 534**	453	4,897,495	94	4,896,662
34	4,897,384	430	4,897,413	801	B1 4,052,353	605	4,897,469	455	4,897,494	194	4,896,669
		450	4,897,414		**CLASS 525**		**CLASS 536**		**CLASS 549**		4,896,670
		461	4,897,415	54.1	4,897,444	6.4	4,897,470	229	4,897,496	218	4,896,680
		468	4,897,416	54.11	4,897,445	27	4,897,471	489	4,897,497		
		523	4,897,417								
		546	4,897,418								
			4,897,419								
			4,897,420								

CLASSIFICATION OF DESIGNS

D2—	225	305,700	72	305,722	D11—	17	305,742		305,763	106	305,784	D28—	46	305,805
	314	305,701	82	305,723		94	305,743	188	305,764	120	305,785		50	305,806
D3—	10	305,702	308	305,724		99	305,744	191	305,765	150	305,786		51	305,807
D6—	314	305,703	312	305,725	D12—	85	305,745	231	305,766	198	305,787		64.1	305,808
	332	305,704	341	305,726		96	305,746	D15—	5 305,767	204	305,788		76	305,809
	421	305,706	400	305,727		110	305,747	D16—	100 305,768	208	305,789		77	305,810
	436	305,707	D9— 305	305,728			305,748		202 305,769	253	305,790			305,811
	446	305,708	341	305,705		117	305,749		209 305,770	D23— 214	305,791			305,812
	468	305,709		305,729		130	305,750		229 305,771		305,792			305,813
	474	305,710	376	305,730		304	305,751	D17—	1 305,772	311	305,793	D29—	7	305,814
	601	305,711	378	305,731	D13—	3.2	305,752		18 305,773	344	305,794	D32—	1	305,815
D7—	38	305,712	415	305,732	D14—	102	305,753	D18—	13 305,774	351	305,795		15	305,816
	71	305,713		305,733		106	305,754		36 305,775	D24— 17	305,796		37	305,817
	77	305,714	438	305,734		113	305,755	D19—	42 305,776	19	305,797		48	305,818
	79	305,715		305,735		114	305,756		85 305,777	51	305,798		54	305,819
D8—	1	305,716	447	305,736		126	305,757	D20—	21 305,778	D25— 38	305,799			305,820
	13	305,717	448	305,737		143	305,758		40 305,779	100	305,800	D34—	12	305,821
	14	305,718	456	305,738		147	305,759	D21—	59 305,780	D26— 11	305,801		19	305,822
		305,719	D10— 68	305,739		157	305,760		305,781	23	305,802		31	305,823
	30	305,720	70	305,740		163	305,761		305,782	140	305,803	D99—	29	305,824
	62	305,721	103	305,741			305,762		305,783	D27— 163	305,804			

CLASSIFICATION OF PLANTS

P.—	2	7,126	10	7,128	68	7,130	7,132		
	8	7,127	18	7,129	69	7,131	7,133	7,134	7,135

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,896,609	4,896,960	4,897,796		4,897,138	4,896,558		4,896,492
	4,896,797	4,896,975	4,897,802		4,897,144	4,896,573		4,896,506
	4,897,268	4,896,983	4,897,806		4,897,297	4,896,586		4,896,580
04 :	4,896,598	4,896,985	4,897,809		4,897,327	4,896,590		4,896,970
	4,896,611	4,897,001	4,897,813		4,897,439	4,896,619		4,897,013
	4,896,707	4,897,002	4,897,836		4,897,456	4,896,686		4,897,282
	4,896,899	4,897,004	4,897,841	12	4,896,381	4,896,743		4,897,756
	4,897,169	4,897,007	4,897,842		4,896,423	4,896,775	20	4,896,452
	4,897,246	4,897,022	4,897,847		4,896,445	4,896,778		4,896,483
	4,897,580	4,897,035	4,897,848		4,896,450	4,896,860		4,896,571
	4,897,616	4,897,046	4,897,851		4,896,454	4,896,863		4,896,657
	4,897,814	4,897,068	4,897,878		4,896,488	4,896,875	21	4,896,839
05 :	4,896,744	4,897,075	4,664,913		4,896,500	4,896,912		4,897,170
	4,896,857	4,897,076	08	4,896,378		4,896,537	4,896,954		4,897,293
	4,896,995	4,897,079		4,896,402		4,896,539	4,897,031		4,897,388
06 :	4,896,376	4,897,083		4,896,448		4,896,546	4,897,044	22	4,896,505
	4,896,390	4,897,150		4,896,457		4,896,549	4,897,065		4,896,545
	4,896,393	4,897,151		4,896,833		4,896,626	4,897,120		4,896,570
	4,896,395	4,897,152		4,896,993		4,896,774	4,897,167		4,896,627
	4,896,430	4,897,202		4,897,184		4,896,805	4,897,175		4,896,720
	4,896,434	4,897,203		4,897,185		4,896,886	4,897,180		4,896,726
	4,896,437	4,897,205		4,897,471		4,897,014	4,897,182		4,896,996
	4,896,440	4,897,221		4,897,521		4,897,187	4,897,234		4,897,357
	4,896,444	4,897,243		4,897,601		4,897,362	4,897,256		4,897,445
	4,896,446	4,897,247		4,897,678		4,897,519	4,897,389		4,897,447
	4,896,463	4,897,307		4,897,798		4,897,567	4,897,417		4,897,526
	4,896,501	4,897,346		4,897,880		4,897,582	4,897,422		4,897,528
	4,896,519	4,897,348	09 :	4,896,406		4,897,600	4,897,432	23 :	4,896,468
	4,896,540	4,897,353		4,896,420		4,897,715	4,897,444		4,896,581
	4,896,541	4,897,355		4,896,429		4,897,789	4,897,492		4,897,760
	4,896,543	4,897,359		4,896,523		4,897,871	4,897,517	24 :	4,896,872
	4,896,552	4,897,466		4,896,538	13	4,896,385	4,897,583		4,896,880
	4,896,554	4,897,530		4,896,815		4,896,652	4,897,618		4,896,931
	4,896,622	4,897,541		4,896,973		4,896,660	4,897,758		4,897,069
	4,896,629	4,897,585		4,897,005		4,896,938	4,897,850		4,897,207
	4,896,646	4,897,591		4,897,021		4,896,940	4,897,867		4,897,403
	4,896,650	4,897,604		4,897,049		4,897,183	4,897,873		4,897,558
	4,896,673	4,897,611		4,897,118		4,897,263	4,897,874		4,897,617
	4,896,719	4,897,612		4,897,129		4,897,291	4,897,877		4,897,660
	4,896,730	4,897,623		4,897,145		4,897,515	18	4,896,411		4,897,764
	4,896,736	4,897,630		4,897,241	15 :	4,897,354		4,896,630	25	4,896,438
	4,896,771	4,897,657		4,897,315	16 :	4,896,798		4,896,663		4,896,449
	4,896,804	4,897,664		4,897,325		4,897,195		4,896,782		4,896,496
	4,896,811	4,897,708		4,897,435		4,897,568		4,896,989		4,896,511
	4,896,812	4,897,717		4,897,490		4,897,592		4,897,009		4,896,534
	4,896,819	4,897,721		4,897,508	17 :	Re.33,156		4,897,028		4,896,544
	4,896,820	4,897,726		4,897,587		4,896,443		4,897,036		4,896,547
	4,896,847	4,897,749		4,897,613		4,896,447		4,897,093		4,896,621
	4,896,849	4,897,755		4,897,622		4,896,467		4,897,624		4,896,655
	4,896,884	4,897,769		4,897,627		4,896,507		4,897,718		4,896,703
	4,896,928	4,897,774		4,897,761		4,896,508		4,897,719		4,896,777
	4,896,935	4,897,783	10	4,896,683		4,896,513		4,897,727		4,896,966
	4,896,955	4,897,784		4,897,108		4,896,532	19	4,896,491		4,896,967

	4,897,015		4,896,687		4,896,596		4,896,855		4,897,375		4,897,524
	4,897,077		4,896,784		4,896,647		4,896,897		4,897,380		4,897,549
	4,897,081		4,896,883		4,896,746		4,896,906		4,897,402		4,897,594
	4,897,165		4,896,913		4,896,757		4,896,911		4,897,423		4,897,602
	4,897,174		4,897,011		4,896,769		4,896,917		4,897,428		4,897,605
	4,897,249		4,897,135		4,896,770		4,896,994		4,897,499		4,897,606
	4,897,283		4,897,520		4,896,783		4,897,012		4,897,502		4,897,646
	4,897,313		4,897,597		4,896,817		4,897,052		4,897,642		4,897,659
	4,897,336	30 :	4,896,542		4,896,828		4,897,100		4,897,676		4,897,662
	4,897,349		4,897,161		4,896,877		4,897,137		4,897,740		4,897,698
	4,897,378	31 :	4,896,795		4,896,889		4,897,162		4,897,797		4,897,703
	4,897,464		4,897,759		4,896,915		4,897,208		4,897,853		4,897,781
	4,897,497	32 :	4,896,392		4,896,929		4,897,265		4,897,858		4,897,810
	4,897,500		4,896,574		4,896,948		4,897,294		4,897,883		4,897,818
	4,897,547	33 :	4,896,666		4,896,952		4,897,321		4,897,884		4,897,854
	4,897,551		4,896,670		4,896,958		4,897,332	43 :	4,897,358		4,897,860
	4,897,609		4,896,672		4,896,971		4,897,411	44 :	4,896,405	49 :	4,896,439
	4,897,671		4,896,939		4,897,008		4,897,442		4,896,791		4,896,465
	4,897,770		4,896,980		4,897,055		4,897,450		4,897,811		4,896,486
	4,897,779		4,897,731		4,897,091		4,897,465	45 :	4,896,407		4,896,780
	4,897,780		4,897,786		4,897,101		4,897,504		4,896,410		4,897,082
	4,897,805		4,897,812		4,897,127		4,897,518		4,896,615		4,897,649
	4,897,833	34	4,896,382		4,897,146		4,897,522		4,896,823	50 :	4,897,213
	4,897,843		4,896,414		4,897,153		4,897,523	46	4,896,428		4,897,477
26 :	4,896,473		4,896,548		4,897,154		4,897,666	47	4,896,688	51 :	4,896,413
	4,896,593		4,896,595		4,897,155		4,897,687		4,896,751		4,896,435
	4,896,612		4,896,636		4,897,157		4,897,771		4,896,856		4,896,458
	4,896,635		4,896,661		4,897,178		4,897,773		4,896,914		4,896,474
	4,896,749		4,896,669		4,897,199		4,897,882		4,897,117		4,896,555
	4,896,752		4,896,717		4,897,230	40 :	4,896,679		4,897,448		4,896,562
	4,896,834		4,896,723		4,897,259		4,896,689		4,897,453		4,896,846
	4,896,844		4,896,779		4,897,260		4,896,690		4,897,454		4,896,965
	4,896,854		4,896,825		4,897,338		4,897,103		4,897,827		4,897,099
	4,896,892		4,896,864		4,897,372		4,897,181	48	Re.33,157		4,897,296
	4,896,898		4,896,934		4,897,383	41 :	4,896,471		4,896,383		4,897,543
	4,896,944		4,896,937		4,897,384		4,896,761		4,896,470		4,897,563
	4,896,956		4,897,030		4,897,385		4,896,838		4,896,472		4,897,578
	4,896,984		4,897,037		4,897,404		4,896,997		4,896,499		4,897,870
	4,897,095		4,897,070		4,897,426		4,897,116		4,896,518	53 :	4,896,403
	4,897,197		4,897,119		4,897,459		4,897,319		4,896,528		4,896,577
	4,897,276		4,897,122		4,897,498		4,897,816		4,896,599		4,896,588
	4,897,352		4,897,164		4,897,509		4,897,835		4,896,614		4,896,620
	4,897,481		4,897,245		4,897,532	42 :	4,896,455		4,896,651		4,896,624
	4,897,572		4,897,258		4,897,564		4,896,469		4,896,662		4,896,656
	4,897,632		4,897,262		4,897,630		4,896,477		4,896,685		4,896,667
	4,897,768		4,897,361		4,897,688		4,896,484		4,396,721		4,896,733
	4,897,852		4,897,366		4,897,691		4,896,628		4,896,722		4,896,786
27	4,896,394		4,897,376		4,897,692		4,896,695		4,896,724		4,896,851
	4,896,512		4,897,391		4,897,782		4,896,704		4,896,725		4,897,062
	4,896,559		4,897,392		4,897,803		4,896,705		4,896,848		4,897,143
	4,896,607		4,897,397		4,897,822		4,896,768		4,896,878		4,897,255
	4,896,632		4,897,399		4,897,826		4,896,822		4,896,903		4,897,473
	4,896,659		4,897,400		4,897,855		4,896,827		4,896,910	54 :	Re.33,154
	4,896,776		4,897,405	37 :	4,896,701		4,896,836		4,896,968	55 :	4,896,412
	4,896,800		4,897,474		4,896,715		4,896,858		4,896,969		4,896,462
	4,896,835		4,897,479		4,896,754		4,896,862		4,897,063		4,896,489
	4,896,879		4,897,487		4,896,890		4,896,893		4,897,074		4,896,578
	4,896,942		4,897,496		4,897,047		4,896,902		4,897,090		4,896,583
	4,896,943		4,897,533		4,897,159		4,896,949		4,897,098		4,896,634
	4,897,051		4,897,562		4,897,287		4,896,959		4,897,102		4,896,653
	4,897,134		4,897,615		4,897,394		4,897,023		4,897,139		4,896,789
	4,897,136		4,897,620		4,897,395		4,897,041		4,897,176		4,896,807
	4,897,186		4,897,655		4,897,429		4,897,050		4,897,177		4,896,894
	4,897,194		4,897,711	38 :	4,896,916		4,897,067		4,897,192		4,897,057
	4,897,271		4,897,720	39 :	4,896,375		4,897,085		4,897,210		4,897,058
	4,897,288		4,897,722		4,896,377		4,897,086		4,897,226		4,897,059
	4,897,390		4,897,799		4,896,391		4,897,087		4,897,231		4,897,061
	4,897,555		4,897,863		4,896,475		4,897,092		4,897,244		4,897,196
	4,897,750		4,897,866		4,896,476		4,897,126		4,897,254		4,897,304
	4,559,382		4,052,353		4,896,510		4,897,141		4,897,303		4,897,360
28	4,896,485	35 :	4,896,424		4,896,531		4,897,206		4,897,364		4,897,777
	4,896,702		4,896,806		4,896,692		4,897,209		4,897,430		4,897,788
	4,896,758		4,897,556		4,896,696		4,897,217		4,897,437		4,897,834
	4,896,882		4,897,579		4,896,760		4,897,218		4,897,440		4,897,868
29 :	4,896,386	36 :	4,896,464		4,896,766		4,897,252		4,897,455		4,478,373
	4,896,404		4,896,522		4,896,796		4,897,292		4,897,475		4,896,764
	4,896,422		4,896,533		4,896,853		4,897,305		4,897,512	56 :	

DESIGN PATENTS

01 :	305,700		305,809		305,719		305,779		305,722		305,817
	305,756		305,814		305,754		305,793		305,769	40 :	305,768
06 :	305,716		305,820		305,764		305,808		305,789	41 :	305,796
	305,718	08 :	305,712		305,784	27 :	305,723		305,810	42 :	305,773
	305,726	10 :	305,727	18 :	305,706		305,724		305,811		305,816
	305,740	12 :	305,765		305,746		305,736		305,812		305,822
	305,749		305,778		305,819		305,737		305,813	47 :	305,701
	305,751		305,821	21 :	305,741		305,744	37 :	305,707		305,788
	305,752	13 :	305,709	24 :	305,787	34 :	305,728		305,824	48 :	305,711
	305,759		305,738	25 :	305,733		305,732	39 :	305,734		305,803
	305,798	17 :	305,702		305,805		305,797		305,735	55 :	305,713
	305,801		305,715	26 :	305,704		305,799		305,750		305,730
	305,802		305,717		305,708	36 :	305,705		305,800		

PLANT PATENTS

06 :	7,126		7,127		7,128		7,129	34 :	7,130		

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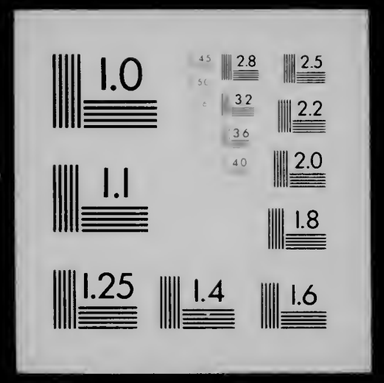
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